

IONOSPHERIC DATA IN JAPAN

FOR July 2022

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



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

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

and Communications Technology, Japan.

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

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

IONOSPHERE

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

1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

(ii) Qualifying Letters

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

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

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

HOURLY VALUES OF fof2 AT Wakkanai

JUL. 2022

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	63	60	59	54	51	52	67	70	A	63	63	65	61	63	64	59	55	56	A	77	77	81	70	69	
2	63	60	57	55	53	57	65	79	71	68	65	60	51	67	72	73	74	73	78	77	81	72	73	75	
3	70	68	67	60	61	63	69	71	60	A	N	62	52	A	A	62	64	59	A	91	71	71	71	68	
4	61	57	54	50	52	47	A	65	63	A	59	53	57	52	61	63	67	A	76	80	73	73	70	69	
5	72	67	51	48	55	64	61	65	A	A	63	59	54	A	53	56	A	A	52	61	72	75	70	65	
6	A	59	53	53	51	55	65	64	77	75	65	50	N	65	49	63	65	68	58	59	61	71	67	75	71
7	66	64	56	61	62	59	53	A	A	A	67	63	58	62	A	62	54	79	A	55	63	A	A	A	
8	53	51	49	44	41	51	51	A	A	A	A	47	A	A	N	45	48	A	A	50	A	51	A	50	
9	50	50	47	51	53	65	69	79	A	61	A	A	A	A	58	59	56	61	61	62	69	A	61	64	
10	65	59	57	55	52	54	55	67	51	45	A	A	67	73	A	A	61	A	A	73	86	75	A	64	
11	62	A	56	60	56	51	54	A	113	47	54	A	69	A	58	53	A	A	61	66	65	71	68	64	
12	64	62	63	52	A	51	64	A	59	66	A	62	59	A	A	A	65	66	73	69	76	64	63	57	
13	58	58	54	57	59	50	67	A	A	50	N	47	A	A	A	A	59	57	A	A	68	69	66	67	
14	59	59	57	54	48	50	61	A	68	63	A	A	62	56	52	A	63	53	N	61	71	77	A	65	61
15	61	58	54	47	51	64	70	69	69	59	A	A	A	53	58	57	49	55	54	A	64	69	A	67	
16	53	A	55	52	51	A	67	51	48	A	A	A	51	52	60	63	57	63	65	68	A	72	73	67	61
17	55	54	55	52	55	62	64	63	65	63	54	54	A	A	A	58	59	58	46	60	A	65	67	64	
18	61	59	54	57	58	63	73	A	55	59	A	54	A	A	49	60	52	N	A	A	71	70	61	60	
19	65	66	60	54	51	51	54	A	69	57	A	65	59	53	53	59	62	62	A	86	87	96	75	68	
20	61	55	43	45	44	54	41	A	A	A	A	A	A	A	51	A	A	59	51	59	A	A	A	67	
21	60	60	56	55	54	61	64	61	53	51	A	A	A	A	A	51	53	71	57	A	59	61	64	63	
22	60	54	43	39	40	51	51	65	62	64	A	A	65	N	69	65	67	50	65	69	79	A	A	A	
23	61	A	A	50	48	49	A	74	49	60	64	69	71	73	63	76	76	77	80	92	77	79	71	65	
24	65	62	60	57	62	63	64	69	A	71	70	71	75	78	A	77	74	65	69	A	71	A	71	67	
25	A	A	57	A	55	54	A	46	A	67	A	58	51	65	60	63	51	104	49	A	73	72	75	63	
26	56	56	53	53	53	62	A	45	60	65	A	A	A	A	72	71	69	63	59	46	A	71	69	63	
27	A	62	58	56	50	51	58	A	67	65	62	A	65	A	65	A	59	68	N	59	70	A	A	64	
28	62	61	57	59	53	61	70	79	73	94	49	54	A	65	58	60	66	47	64	75	85	A	77	67	
29	63	57	52	A	A	46	48	73	A	71	59	A	A	53	59	A	A	66	55	60	61	A	A	A	
30	A	53	49	50	50	46	53	87	A	63	82	49	A	50	A	60	N	A	58	65	A	76	78	65	
31	55	53	A	53	A	46	53	64	70	66	A	A	A	50	47	56	65	56	69	81	83	71	66	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	27	27	29	29	28	29	27	21	20	23	17	17	17	18	22	23	26	24	24	25	25	22	23	27	
MED	61	59	55	53	52	54	64	67	64	63	63	58	61	59	58	60	60	62	61	69	72	71	70	65	
U Q	64	62	57	56	55	62	67	73	69	67	65	64	66	67	63	65	67	67	69	76	78	75	73	67	
L Q	58	55	52	50	50	50	53	63	57	59	56	52	55	52	53	57	57	56	56	60	68	69	66	63	

HOURLY VALUES OF fEs AT Wakkanai

JUL. 2022

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	34	G	26	49	52	35	54	61	109	61	81	60	60	50	59	50	113		101	48	59	37	29	30	
2	32	34	G	G	G	177	65	50	56	83	55	54	46	47	35	35	31	32	49	35	28	29	24	G	
3	G	G	G	G		27	34	45	56		60	124	92	86	151	90	77	71	105	106		42	56	46	57
4	59	60	54	53	49	41	58	61	62	68	71	48	55		33	60	60	97		39	41	41	26	G	
5	31	G	G	G	G		32	48	110	109	150	59	89	60	64	52	37	64	146	96		39	40	29	59
6	81	54	36	33	35	35	45	76	64			91	61	87	60	64	65	116	61	62	28	38	52	G	
7	26	28	G	26	24	23	36	60	93	167	84	44	52	52	72	58	92	127	136		147	90	104	70	
8	60	41	26	41	33	52	41	59	62	116	121		105	91	89	116	112	57	105	58	62	40	85	57	
9	25	31	39	34	35	36	47	73	92	124	146	152	62	60	50	53	40	50	69	40	38	60	46	48	
10	46	G	46	56	32	30	45	132	92		163	103	117	73	151	109	91	95	110	92	57	60	92	31	
11	56	93	48	48	50	46	91	130			92	71	94	60	103	84	74	59	146	83	40	40	46	49	
12	31	G	29	36	60	40	57	94	69	59	52	82	78	61	69	94	127	60	33	33	32	27	G	28	
13	28	49	47	40	31	58	49	74	116	106	117	100	66	44	91	136	51	38	62	71	65	41	41	59	
14	27	32	G	43	27	39	39	62	54	70	60	101	63	102	56	85	65	86	96	32	G	60	58	59	
15	45	40	24	28	G	45	54	70	84	135	136	133	91	43	45	51	47	45	55	60	35	84	93	60	
16	46	59	53	44	41	61	108			65	65	94	47	49	84	44	36	32	40	31	29	64	65	33	
17	G	G	G	G	G		28	31	36	48	55	50	48	48	43	52	57	156	112			94	60	40	57
18	48	G	G		G		39	56	115	47	56	60		161	44	44	58	64	145	127	124	59	34	38	G
19	30	28	39	156	33	36	40	124	57	59	129	48	54	53	52	46	81	177	59	46	24	24	G	G	
20	G	32	23	G	26	33	31	56	81	65	66	61	89	65	36	69	113	128	110	134	128	65	72	61	
21	G	G	G	G		34	59	43	54	74	70	58	66	69	77	92	76	56	116	38	61	59	40	60	41
22	39	29	30	G	28	G		43	48	57	64	128	128		143	93	77	93	83	124	149	164	107	92	107
23	33	71	60	49	41	39	72	84	132	58	64	50	52	62	57	56	39	48	76	59	69	G	G	26	
24	28	35	43	44	48	34	48	42	108	56	51	71	54	63	110	65	79	98		70	42	80	60	46	
25	55	65	92	59	70	39	78	113	124	83	137	116	128	70	67	66	101	104	93	78	58	48	49	57	
26	48	41	28	49	40	39	73	102	123	145	128	101	107	132	71	59	116	60	72		74	49	57	55	
27	69	33	55	46	41	30		65	70	92	82	96	84	94	49	97	72		83	67	81	116	108	53	
28	33	50	41	44	36	32	43	46	72	86	117	96	90	55	116		52	77		G	52	115	44	38	
29	33	49	33	59	80	51	154	84	84	92	60	96	136	107	75	110	91	78	119			154	146	93	
30	72	39	G	48	43	93	91	102	144	104	109	81	131		116	62	80	77	57	58	71	43	40	43	
31	31	34	73	94	110	48	48	61	70		139	106	92	111	133	146	110	116	126	91	60	58	57	71	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	30	30	28	27	30	29	30	29	31	30	31	29	27	25	30	31	31	31	
MED	33	34	30	43	35	39	48	68	78	70	83	91	74	63	69	64	74	86	93	60	58	49	49	49	
U Q	48	49	47	49	48	48	65	102	108	106	128	101	94	92	92	85	101	116	110	80	69	65	72	59	
L Q	28	G	G	26	27	33	43	56	62	60	60	60	55	51	52	56	56	58	59	39	38	40	38	30	

HOURLY VALUES OF fmin AT Wakkanai

JUL. 2022

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	16	15	13	15	13	14	12	13	14	15	16	16	15	15	14	15	13	15	14	15	16	16
2	15	15	15	16	15	13	15	14	15	15	16	20	16	19	15	18	17	14	14	15	15	15	16	15
3	15	14	17	14	14	15	13	13	12	16	9	15	16	15	17	17	13	13	11	17	13	16	14	15
4	15	17	15	15	16	14	13	14	14	16	13	15	13	17	16	14	14	13	14	15	15	15	16	14
5	16	16	16	14	15	16	14	15	8	5	17	17	19	17	15	16	15	8	13	15	15	15	15	16
6	16	15	15	15	15	16	14	12	17	16	15	14	15	21	22	15	15	13	13	14	15	14	15	17
7	16	15	17	15	15	15	16	14	15	16	18	18	17	15	16	15	14	5	11	5	5	16	16	15
8	16	15	16	15	16	13	15	13	14	13	13	13	14	15	15	16	14	13	13	14	13	15	15	16
9	16	15	15	16	15	16	15	18	14	13	20	18	22	22	21	15	15	16	14	13	15	16	15	15
10	15	15	15	16	16	15	14	14	16	13	41	9	14	29	10	16	15	10	16	16	14	16	17	17
11	14	14	15	15	15	14	16	18	18	13	17	21	13	18	14	18	13	14	13	15	15	15	16	15
12	17	15	16	15	15	16	14	16	15	16	15	15	17	21	17	15	14	14	14	16	13	16	15	16
13	16	15	14	15	15	17	15	15	13	14	14	23	18	19	18	16	14	15	13	13	14	15	15	15
14	16	15	15	14	15	14	14	14	15	15	18	17	19	17	18	19	14	12	13	15	17	15	15	15
15	15	15	16	15	15	14	14	13	14	13	9	15	20	15	18	15	15	15	13	15	15	14	15	15
16	16	15	15	17	16	15	15	18	15	15	19	18	21	17	17	15	15	15	13	15	15	16	15	16
17	14	14	14	14	15	15	15	15	15	14	20	18	21	18	16	16	5	13	8	15	16	15	16	16
18	16	14	16	15	16	16	14	16	17	14	15	16	34	19	16	14	15	6	15	5	14	15	15	16
19	16	15	15	15	15	17	15	12	14	15	16	20	19	19	19	14	13	14	15	15	15	16	14	14
20	14	16	16	16	15	16	17	13	14	13	13	14	19	15	19	16	17	5	15	5	12	14	16	15
21	17	15	15	15	16	15	15	15	15	21	18	16	18	19	18	20	15	14	15	15	16	16	15	15
22	15	15	16	14	15	15	15	14	13	14	13	11	19	17	11	16	14	15	5	14	16	15	15	8
23	17	15	13	15	15	15	15	14	19	14	19	19	16	17	17	14	15	14	16	15	16	14	16	16
24	15	15	16	16	15	17	13	15	12	14	16	16	18	15	8	15	17	12	13	14	14	14	15	15
25	15	15	15	16	15	15	14	14	11	16	17	19	15	16	15	17	15	13	12	17	15	15	15	15
26	17	17	16	16	15	15	14	11	11	11	12	9	18	21	16	16	16	16	13	13	15	14	15	16
27	15	17	16	15	16	16	15	13	13	14	15	20	15	13	16	16	13	11	14	15	15	14	15	15
28	16	15	16	16	15	15	14	15	15	16	16	19	20	17	17	16	15	15	14	16	14	17	15	15
29	16	15	15	15	16	14	14	14	15	14	13	14	9	16	15	14	18	15	18	17	13	13	5	17
30	17	15	15	15	15	14	15	11	14	15	17	14	8	13	13	15	14	14	12	15	14	15	14	15
31	16	15	15	14	15	15	15	13	14	16	10	10	17	11	17	6	15	9	9	15	14	15	14	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	15	15	15	15	15	15	14	14	14	16	16	17	17	16	16	15	14	13	15	15	15	15	15
U Q	16	15	16	16	16	16	15	15	15	16	18	19	19	19	18	16	15	15	14	15	15	16	16	16
L Q	15	15	15	15	15	14	14	13	13	13	13	14	15	15	15	15	14	12	13	14	14	14	15	15

HOURLY VALUES OF fof2 AT Kokubunji

JUL. 2022

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	51	A	55	52	54	56	56	70	71	A		106	68	68	68	67	64	65	A	A	72	69	64	62
2	62	63	55	55	54	56	73	72	66	A	64	A	A	A	99	71	77	93	96	94	74	48	71	75
3	81	84	58	A	54	63	97	77	A	109	129	A	N	81	79	74	108	92	78	88	A	A	A	58
4	71	72	A	A	51	55	70	A	A	181		88	129	90			A	99	A	A	A	A	A	35
5	A	73	69	45	53	54	68	189	93	86	93	101	86	96	70	70	116	64	A		79	73	70	A
6	A	58	55	52	51	57	63	68	70	76	80	76	73	100	71	72	A	66	65	64	67	70	N	71
7	67	69	65	55	55	50	51	63	71	68	67	72	73	77	74	75	71	A	A		67	65	66	61
8	57	51	55	49	44	45	52	49	A	A	79		A	168	A	69	59	55	55	57	63	54	A	46
9	52	52	48	52	53	59	69	70	A	169	56	61	A	169	A	107	66	61	A	A		81	74	63
10	55	A	55	54	53	54	59	A	81	67	70	75	71	69	75	67	65	66	A		94	101	63	61
11	59	67	66	64	63	56	59	A	A	62		A	A		146	68	61	A		63	69	71	75	67
12	63	62	57	57	61	50	55	79	74	54		A	65	72	67	68	69		A	74	81	65	70	69
13	65	68	78	69	60	64	81	64	51	90				66	60	61	59	A		70	73	73	68	61
14	64	65	65	63	61	55	64	66	80	74			A	73	71		A		71	82	94	73	67	A
15	63	66	62	67	64	59	61	65	65	70	A	58	110	A	A	A	A			89	63	66	A	57
16	A	A		54	53	45	70	87	88	N	79	62	68	73	78	72	70	75	75	92	79	67	63	65
17	61	60	61	62	58	66	64	71	A	A		A			A	68	N	67	69	68	65	69	67	70
18	65	65	63	60	54	61	93	73	67		A	109	169	133	62	64	63	64	89	75	80	66	A	A
19	64	71	53	53	52	50	61	79	71	69		A	65	68	64	65	148	74	A		95	72	A	A
20	77	82	A	71	61		53	53	51	74	A	61	A		N	65		59	65		63	59	69	65
21	69	68	62	60	60	60	81		55	A			131		57	61	67	67	66	63	58	55	58	64
22	69	75	54	45	49	53	51	N	A		64	51	67	72	81	75	73	71	73	71	A	A	74	A
23	A	56	66	62	A	A		89	91	85	79	99	N		133	101	91	91	96	91	94	95	72	A
24	70	73	67	69	70	73	73	83	64	A	130	77	79	91	99	89		A		89	85	86	77	A
25	64	64	A	55	65	57		N	79	70	66	53	140		106	78		N		74	71	82	78	63
26	62	62	57	51	53		A	88	82	A	63	A	A	72	83	89	77	68	65	71	73	66	71	65
27	65	A	A	68	66	66	68	78	69	139		A	A	A		A	A	A			75	74	A	A
28	A	A		51	54	61	60	67	109	87	65	A	A	85	76	79	67	N	A		A	A	A	A
29	89	39	A	A	A	A		65	67	110					75	68	79	74	76		A	A	A	A
30	A	69	66	52	57	58	59	75	142		A	A		66	69		A		71	72	75	75	82	73
31	A	A	47	A	43	45	57	79	76	57	58	61		A	A	65	68	106	75	74	76	A	68	63
	00	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	25	26	27	29	27	28	26	24	20	15	16	16	22	25	24	22	26	23	25	25	24	17	17
MED	64	66	58	55	54	56	64	74	71	74	70	74	73	79	75	69	68	72	74	75	73	68	64	64
U Q	69	71	65	63	61	60	71	79	81	99	93	94	98	106	82	74	77	89	81	87	80	71	70	65
L Q	61	61	55	52	53	53	58	66	66	66	63	61	68	72	68	67	64	66	66	65	69	66	61	57

HOURLY VALUES OF fEs AT Kokubunji

JUL. 2022

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	40	69	56	48	28	29	61		150	146		97	47	39	53	53	115	57	37	109	40	50	59	61	
2	29	39	33	28	39	35	37	56	87	80	79	166	97	108	100	47	40	43	39	37	39	41	31	37	
3	40	24	G	122	37	31	56	65		81	100	83	142	144		63	124	115		54	71	84	115	60	
4	57	60	90	65	30	29	47	75	77	108		84	109	92			112	110	167	134	127	93	93	93	
5	84	24	G	G	G		50	84	94	93	79	62	77	90	97	61	117	145	146	113	78	59	84	71	78
6	92	81	93	71	64	71	35	38	57	81	40	59	54	77	56	62	95	70	60	55	39	28	47	53	
7		49	39	37	G	G		33	38	50	62	47	86	57	64	60	54	51	117	90	28	35	31	56	28
8	47	49	41	27	G		33	34	40	59	60	78		80	152	83	110	91	40	37	33	43	46	70	92
9	59	60	50	34	24	41	86	129	133	158	41	109	60	101	152	77	57	45	77	79	45	28	82	40	
10	36	71	39	29	G		31	41	85	90	55	65		92	42	43	42	32	62	130	84	42	59	38	90
11	91	40	54	32	31	G		54	70	73	88	169	136	131		127	65	87	127	57	50	56	31	70	69
12	60	55	42	31	G	G		42	57	60	57	64	40	52	65	40	48		52	63	55	G	34	28	G
13	50	57	58	33	30	41	78	94	70	88	88			39	53	35	38	92	42	62	57	48	65	92	
14	61	46	40	47	33	55	43	53	64	78			125	40	48	78	98	61	55	52	34	40	114	124	
15	59	56	48	33	32	51	52	132	178		63	52	53	116	81	63	55	89	62	55	115	92	81	70	
16	136	139	71	39	27	G		45	72	94	113	51	65	80		35	54	74	45	40	31	37	32	G	48
17	107	45	33	29	G	G		32	53	96	69		142			74	43	62	44	49	60	33	33	40	47
18	39	57	40	32	29	G		39	42	40		64	102	112	48	G	43	57	71	88	93	G	59	93	84
19	48	25	136	69	39	33	36	38	41	56		88	64	63	55	36	34	154	40	116	54	39	144	87	
20	59	53	106	106	27	62	43	40	52	78	74	93	64		79	80	81	41	91	43	59	59	81	38	
21	84	37	40	41	G		31	57		56	75	56	89	73		40	45	42	42	37	36	23	G	53	37
22	43	39	43	34	25	G		48	127	70		53	55	72	54	68	60	64	40	46	40	92	82	59	85
23	92	58	42	95	84	92	52	65	80	90	112	152		95	69	60	62	61	30	G	28	69	80	60	
24	46	40	26	40	G	G		31	40	47	113	141	115	61	51	57	79	97	115	111	31	88	110	116	70
25		57	89	57	54	35		65	93	70	55	107		91	79		113			57	81	49	59	58	
26	54	39	39	32	28		139	56	74	149	150	126	73	65	41	59	38	46	104	43	60	40	56	54	
27	90	152	60	40	40	G		37	53	91	113	152	148	161	150	146	144	113	140		151	152	127	129	106
28	84	57	40	42	G		43	115	94		83	113	62	87	70	57	59	101	137	92	111	31	46	109	110
29	106	109	94	80	117	120	80	82		96					106	79	95	68	57		108	84	169	89	
30	110	48	39	26	G		32	46	48	145		167	115	115	81	127	140	75	40	31	50	60	47	60	116
31	117	72	36	93	72	37	32	53	93		40	51	62	80	53	63	82	129	94	130	113	42	41	72	
	00	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	31	31	31	31	30	30	29	28	26	25	26	26	25	29	29	30	30	28	30	31	31	31	31	
MED	59	55	42	39	28	32	46	57	76	81	65	91	76	77	60	60	78	65	58	55	54	47	70	70	
U Q	91	60	60	65	39	43	57	83	93	108	112	115	109	99	82	78	98	115	91	84	81	82	93	90	
L Q	46	40	39	32	G	G	37	45	58	70	54	65	61	52	50	47	55	45	40	40	35	34	53	48	

HOURLY VALUES OF fmin AT Kokubunji

JUL. 2022

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15	15	15	14	16	17	14	17	19	21	20	51	19	15	15	13	14	13	15	14	16	15
2	16	15	15	15	15	16	16	13	16	15	17	13	14	17	19	19	16	14	14	15	15	15	15	16
3	15	16	13	5	15	15	13	13	14	17	16	15	14	11	16	19	12	12	13	14	16	14	10	15
4	15	17	15	15	16	14	15	12	16	17	18	16	18	40	14	19	18	17	71	5	11	15	15	14
5	15	16	16	16	15	15	17	13	15	15	17	17	26	26	30	36	15	5	14	13	15	14	14	14
6	13	14	16	15	15	15	15	14	14	16	17	17	21	20	22	18	11	16	14	15	15	15	14	15
7	15	15	15	15	15	18	16	14	15	18	50	20	39	40	30	15	15	14	15	16	14	15	13	15
8	15	15	15	16	13	15	17	16	15	14	15	20	20	33	24	21	17	14	14	16	14	16	15	13
9	15	16	15	15	15	14	17	16	15	25	22	21	24	21	12	17	19	14	11	15	15	15	12	15
10	15	15	15	13	15	16	15	15	14	19	18	23	23	22	20	26	16	17	11	13	15	16	15	15
11	15	15	15	15	16	14	14	17	16	19	15	27	96	19	19	15	19	15	14	17	15	15	16	15
12	15	15	15	15	14	20	15	15	17	20	17	31	35	23	21	16	14	15	13	14	15	16	16	15
13	15	14	15	15	15	14	15	13	17	19	21		21	17	22	17	15	13	14	15	15	15	15	14
14	15	15	15	15	16	15	14	14	15	18	16	17	20	19	39	16	17	13	13	13	15	15	19	7
15	15	16	15	16	14	13	14	20	5	14	14	21	20	21	22	23	19	13	14	15	12	13	10	15
16	8	5	16	15	15	15	14	15	16	15	19	18	20	23	20	20	18	14	15	16	16	16	15	15
17	15	15	15	16	15	15	16	15	11	17	17	93		20	26	17	15	15	14	15	15	14	15	15
18	16	15	15	15	15	15	15	15	15	15	17	19	14	18	17	17	16	13	13	14	15	14	14	14
19	14	15	15	16	15	16	15	15	15	18	16	15	27	21	46	17	17	7	14	13	15	15	5	15
20	16	15	15	17	16	14	15	15	15	18	20	21	19		17	15	15	15	13	14	14	16	15	15
21	15	14	15	15	14	15	14		18	20	21	21	24	16	17	15	15	15	14	13	15	15	15	14
22	15	15	16	16	16	18	13	8	14		18	16	17	38	17	34	15	15	14	14	13	15	14	15
23	14	16	16	15	17	13	14	14	17	16	21	25	24	21	19	19	15	14	14	15	16	15	15	15
24	15	15	15	15	14	15	15	14	15	15	9	25	22	34	18	15	23	17	12	16	15	15	16	16
25	15	15	17	15	15	14		15	14	16	21	19	22	23	20	13	15	13	15	16	15	16	15	15
26	15	15	15	16	16		9	13	19	18	21	16	20	21	17	22	18	14	14	15	15	15	15	16
27	16	19	15	15	15	15	14	14	13	17	85	18	23	25	25	21	8	7	7	27	11	11	5	10
28	14	16	16	15	15	15	13	13	14	17	19	21	19	14	15	34	13	38	13	11	15	15	13	15
29	14	16	13	15	10	12	13	14	14	15	15	19	27	19	17	16	14	13	14		9	15	67	11
30	13	15	15	16	14	16	14	14	8	7	17	20	19	19	14	9	16	15	15	15	15	15	15	17
31	13	16	16	15	15	14	16	14	15	18	18	38	18	19	17	17	15	7	13	19	16	15	16	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	30	30	31	30	31	30	30	30	31	31	31	31	31	30	31	31	31	31
MED	15	15	15	15	15	15	15	14	15	17	18	20	20	21	19	17	15	14	14	15	15	15	15	15
U Q	15	16	16	16	15	15	16	15	16	18	21	21	24	25	22	21	17	15	14	16	15	15	15	15
L Q	14	15	15	15	15	14	14	13	14	15	16	17	19	19	17	15	15	13	13	13	14	15	14	14

HOURLY VALUES OF fof2 AT Yamagawa

JUL. 2022

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	47	63	53	50	54	54	55	A	A	N	A	A	A	A	A	A	73	A	84	82	80	70	65	67
2	A	63	59	54	58	51	59	66	71	48	51	A	A	A	A	47	A	A	99	A	84	76	79	86
3	84	93	68	69	76	78	90	79	A	55	81	63	146	47	46	144	83	87	79	A	A	A	A	A
4	A	A	58	56	A	51	68	62	A	A	A	49	49	69	A	A	A	A	87	82	A	77	A	A
5	75	A	A	40	41	41	54	59	81	A	93	95	A	77	82	72	75	78	77	78	A	68	63	63
6	A	68	A	A	A	60	51	61	70	71	75	74	56	69	77	83	79	80	72	60	65	A	63	64
7	60	58	61	65	53	50	53	68	71	A	A	71	82	86	81	78	89	85	80	75	72	65	72	A
8	60	54	62	67	57	55	52	57	51	A	A	63	A	A	A	75	65	61	61	62	57	59	A	53
9	55	A	61	56	56	55	63	71	65	A	A	79	73	67	76	77	78	75	74	88	87	77	65	67
10	68	62	57	59	61	A	A	75	76	73	77	65	63	75	72	75	81	84	95	91	89	81	71	74
11	72	76	A	62	66	59	59	78	85	79	A	A	A	A	92	A	A	N	A	94	91	90	73	71
12	68	72	65	61	64	58	55	65	63	56	A	A	A	A	53	67	70	73	77	71	72	77	67	71
13	63	65	77	81	54	56	54	61	53	A	A	A	A	66	65	67	69	71	79	85	79	62	60	A
14	A	A	A	63	61	67	66	72	68	A	A	A	75	75	72	65	76	87	92	86	71	71	65	59
15	67	60	74	A	A	57	70	75	A	75	68	A	64	62	68	57	67	A	75	78	82	A	60	61
16	57	58	57	57	55	57	68	70	77	67	A	A	106	105	81	84	87	86	85	91	83	62	A	62
17	61	A	61	66	59	61	85	80	79	A	67	67	63	A	70	A	A	77	74	76	80	68	65	66
18	60	65	63	60	60	55	62	70	69	69	64	A	A	A	67	71	A	70	81	88	82	75	66	71
19	A	64	74	58	57	55	61	73	77	73	72	74	A	A	78	71	A	71	78	39	93	A	A	69
20	73	75	A	56	57	53	56	52	A	A	67	73	A	A	A	A	70	73	77	58	A	73	80	80
21	79	77	70	66	63	59	65	A	66	A	63	64	55	63	63	A	74	77	77	67	65	72	70	63
22	69	73	A	52	56	59	65	49	A	A	A	A	A	75	85	76	70	75	70	A	A	81	A	A
23	A	53	51	51	49	45	65	66	79	69	A	50	51	47	35	A	95	97	A	A	A	A	69	64
24	68	77	68	73	80	83	75	74	A	73	73	67	85	A	87	91	A	A	38	99	87	65	72	65
25	63	61	A	53	57	61	75	73	48	A	37	70	A	82	36	A	79	A	93	87	A	A	57	53
26	49	52	54	54	52	53	61	88	80	77	56	A	61	81	85	88	81	79	81	80	82	75	71	69
27	C	C	C	C	C	C	C	C	C	C	C	C	C	48	47	A	92	83	77	81	83	A	60	37
28	A	A	53	61	56	53	A	95	N	A	62	64	74	83	86	86	87	87	79	81	91	87	81	A
29	69	A	69	58	63	62	64	67	A	66	71	63	A	60	108	75	A	45	91	73	A	83	68	64
30	A	58	64	61	59	60	67	A	N	N	51	65	A	62	65	68	67	77	87	87	89	89	65	57
31	67	60	A	A	52	47	52	75	70	62	65	56	55	66	77	81	82	87	88	82	86	82	65	66
	00	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	22	27	27	29	28	27	22	17	18	19	19	22	26	22	23	25	29	27	23	25	24	25
MED	67	63	62	59	57	56	62	70	70	69	67	65	63	69	74	76	78	78	79	81	82	72	67	65
U Q	69	73	68	65	61	60	67	75	77	73	73	73	75	77	82	83	83	86	87	88	87	79	71	69
L Q	60	58	57	54	54	53	55	62	65	55	63	63	56	63	67	71	71	71	76	73	72	65	64	61

HOURLY VALUES OF fEs AT Yamagawa

JUL. 2022

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	53	G	47	56	59	59	43	93	94	105	97	151	63	73	92	90	56	146	55	78	58	40	108	43
2	60	49	36	43	32	33	32	41	56	92	117	116	150	136	146	85	147	127	92	116	60	45	45	41
3	57	35	45	38	33	G	31	69	89	67	58	72	136	135	88	148	70	59	90	94	61	45	73	60
4	90	66	43	50	89	49	55	106	154	160	169	95	116	60	127	152	116	124	61	52	60	76	144	93
5	56	80	92	29	32	G	32	49	108	112	73	81	84	77	73	42	37	42	44	49	58	46	46	56
6	116	41	85	78	70	50	72	50	50	50	57	56	45	46	55	49	61	62	47	43	40	59	33	G
7	54	47	39	48	34	30	31	60	60	67	90	54	53	71	65	54	46	42	38	29	G	41	G	39
8	48	50	49	37	G	G	32	48	50	74	55	60	76	78	66	58	58	45	G	54	59	40	49	39
9	40	85	49	33	47	G	43	44	60	105	145	84	59	61	90	41	56	42	32	30	G	31	42	46
10	G	G	G	G	41	72	69	43	60	56	60	55	58	55	52	42	39	35	74	42	40	50	48	G
11	G	40	60	55	56	43	41	59	78	66	125	151	116	95	105	150	126	85	145	83	70	49	35	32
12	48	53	41	G	36	35	59	40	50	48	55	53	48	43	46	60	42	45	35	33	32	31	33	40
13	33	27	G	39	30	G	37	44	53	71	72	147	62	63	46	41	49	50	38	41	37	G	43	83
14	84	106	84	43	50	50	33	52	65	154	91	60	44	57	55	47	50	50	43	G	40	G	G	G
15	G	33	40	153	71	G	G	35	72	56	75	86	48	48	54	47	44	76	57	46	58	92	G	35
16	34	46	G	G	G	G	44	44	57	60	92	65	112	101	66	60	51	46	42	34	G	36	40	33
17	46	53	72	48	32	G	33	44	50	92	70	60	61	69	53	75	96	61	56	50	84	39	42	46
18	48	33	36	34	G	G	46	40	41	60	50	75	88	102	57	50	96	46	44	34	28	47	58	57
19	70	70	60	36	G	G	39	42	52	60	55	73	132	105	102	56	64	57	64	71	61	60	69	
20	48	49	104	54	44	31	57	44	56	130	54	66	69	78	78	93	50	92	61	57	73	G	50	41
21	38	G	35	46	31	G	38	94	146	115	61	56	46	51	56	78	69	50	40	42	31	49	G	G
22	54	58	84	49	56	G	47	92	109	71	65	71	78	109	75	51	62	59	84	71	45	77	92	
23	59	41	48	40	40	37	65	60	56	54	64	113	86	127	136	148	70	73	84	110	94	109	57	45
24	54	33	G	G	35	36	42	91	69	61	68	74	73	104	109	53	97	149	116	88	60	49	58	46
25	50	33	94	90	57	39	70	59	90	134	93	86	94	60	113	137	80	92	91	70	83	59	55	33
26	G	G	G	G	32	39	G	67	60	92	55	71	56	62	52	44	43	41	41	31	34	49	43	45
27	C	C	C	C	C	C	C	C	C	C	C	C	C				175	68	66	78	85	143	128	55
28	103	92	40	58	49	48	91	92	103	168	90	53	65	63	84	48	71	46	35	44	25	24	38	107
29	56	60	58	36	32	G	29	160	109	105	62	55	70		93		162	111	59	48	74	29	57	28
30	116	49	33	32	174	G	50	80	72	117	164	72	84	56	75	62	52	41	41	46	60	40	70	48
31	58	60	116	84	106	93	39	60	72	70	56	52	52	61	67	59	71	73	73	62	73	69	31	57
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	31	31	31	31	31	31	31	29
MED	54	48	46	42	38	30	40	51	62	83	70	72	70	69	74	60	61	59	56	49	59	45	46	43
U Q	59	60	72	54	56	43	55	69	90	112	92	86	88	98	102	90	80	85	74	78	71	59	58	56
L Q	40	33	36	33	32	G	32	44	56	60	57	56	56	58	55	48	50	45	41	41	34	36	35	33

HOURLY VALUES OF fmin AT Yamagawa

JUL. 2022

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	14	16	16	14	16	21	21	21	18	22	23	18	21	20	15	16	16	15	15	14	15
2	14	15	15	16	16	15	16	15	18	19	23	22	14	19	10	20	19	16	15	11	16	15	15	15
3	15	15	15	15	15	16	15	15	19	20	21	21	16	19	22	5	22	17	15	14	15	14	16	15
4	10	15	17	15	15	15	15	13	14	7	12	21	19	22	23	17	20	15	18	15	14	15	7	16
5	15	15	14	15	16	14	15	15	19	18	21	22	22	22	23	24	20	16	14	14	15	15	15	15
6	8	16	17	16	17	15	15	15	18	22	21	23	22	22	22	20	21	14	15	15	15	16	16	15
7	16	15	15	14	16	16	16	13	17	21	19	22	22	16	21	22	18	17	15	16	15	15	15	15
8	14	15	15	15	16	15	16	15	20	20	23	21	21	21	22	21	20	19	15	15	14	16	15	16
9	16	14	16	16	19	14	14	15	15	19	15	21	19	15	22	23	23	21	16	15	16	15	15	15
10	21	24	18	15	15	15	17	15	21	22	23	21	22	23	22	23	21	17	17	15	15	14	16	26
11	15	15	16	17	15	15	16	19	16	20	21	22	23	21	21	11	15	18	17	18	15	16	16	15
12	14	15	17	16	15	15	18	17	18	21	22	21	22	22	22	23	22	18	16	15	16	16	15	15
13	16	15	15	15	15	18	16	17	19	21	21	15	20	21	24	21	21	21	16	15	15	15	15	15
14	17	8	16	15	14	16	15	16	19	5	22	21	21	22	20	24	22	22	15	16	15	15	16	15
15	15	16	15	9	16	16	15	15	19	21	21	17	21	20	21	23	22	19	15	17	14	9	15	15
16	16	15	24	15	14	15	17	19	16	18	20	16	21	23	15	19	22	16	17	16	15	15	15	15
17	18	16	17	15	16	15	23	17	21	22	21	22	21	22	27	21	21	17	16	15	16	15	15	15
18	16	15	15	16	15	17	15	17	19	20	23	20	21	21	22	22	21	20	17	16	16	17	15	15
19	16	11	15	15	15	16	16	17	21	19	22	21	24	20	23	22	18	20	14	17	17	14	16	15
20	15	15	10	15	15	16	16	15	18	17	20	19	23	22	19	23	21	19	18	14	15	15	15	16
21	15	16	15	16	15	15	17	17	14	23	22	21	21	22	23	21	18	18	18	14	16	15	15	18
22	15	15	14	15	17	15	15	17	16	21	23	23	18	21	22	20	21	17	17	16	14	15	15	17
23	15	15	15	15	15	15	17	18	20	20	22	19	21	23	17	15	20	19	15	11	10	12	15	15
24	15	16	16	16	16	15	15	16	21	21	23	23	18	20	23	19	17	9	17	14	15	15	15	15
25	15	15	15	13	17	15	19	18	19	12	21	23	22	21	21	19	19	15	15	15	15	17	14	17
26	16	16	16	16	15	15	16	15	19	23	21	23	21	21	21	21	21	19	15	15	16	15	15	15
27	C	C	C	C	C	C	C	C	C	C	C	C	C	65	73	22	16	14	15	14	17	13	15	21
28	15	16	16	15	16	14	16	15	17	8	17	22	19	19	18	18	11	14	16	14	16	17	15	15
29	15	13	14	15	15	15	15	15	17	19	16	18	17	24	19	20	15	14	15	15	15	16	15	16
30	5	16	15	16	16	15	15	15	15	13	18	16	19	21	19	17	17	14	13	15	15	15	16	15
31	14	16	17	16	16	13	16	13	17	16	16	17	22	20	19	19	17	13	14	14	16	15	16	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31
MED	15	15	15	15	16	15	16	15	18	20	21	21	21	21	22	21	20	17	15	15	15	15	15	15
U Q	16	16	16	16	16	16	16	17	19	21	22	22	22	22	23	22	21	19	17	16	16	16	16	16
L Q	15	15	15	15	15	15	15	15	17	18	20	19	19	20	19	19	18	15	15	14	15	15	15	15

HOURLY VALUES OF fof2 AT Okinawa

JUL. 2022

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	61	56	60	55	53	A	54	72	67	70	65	A	71	71	79	83	A	A	37	81	84	69	70	60	
2	63	A	63	59	52	51	53	76	58	A	A	A	A	A	A	N	53	91	104	105	109	77	74	72	78
3	82	72	67	69	A	A	75	81	A	89	71	105	149	N	78	87	87	93	93	94	77	A	A	A	
4	A	A	A	55	48	51	61	59	A	A	75	59	64	76	A	88	91	99	100	107	A	81	77	64	
5	A	73	59	A	52	46	47	A	70	81	91	A	A	91	100	84	80	93	94	93	66	67	59	59	
6	60	64	71	60	60	42	49	62	77	63	84	66	77	90	96	89	89	93	88	77	69	69	65	61	
7	63	61	55	51	54	53	53	69	65	57	76	73	85	96	81	95	96	95	92	84	81	82	75	66	
8	72	A	69	61	60	56	51	A	45	A	A	73	A	A	72	75	A	76	73	78	60	64	55	A	
9	59	58	57	55	60	55	51	64	A	A	A	73	71	76	82	85	89	95	109	104	97	70	64	65	
10	64	65	61	61	61	59	60	A	A	A	75	A	69	70	81	85	93	107	110	97	95	81	72	67	
11	69	73	71	61	61	53	57	63	81	78	A	78	94	110	100	79	89	A	A	109	99	101	90	79	
12	59	75	75	73	69	66	58	59	65	A	A	67	68	77	84	77	71	77	89	72	65	66	67	64	
13	67	67	79	94	41	43	43	67	66	A	65	A	79	A	A	79	85	91	93	93	77	64	61	56	
14	60	59	61	51	A	57	62	69	75	69	A	73	79	79	77	82	87	105	99	90	89	73	72	73	
15	66	71	73	65	55	58	65	65	68	74	81	76	56	A	78	85	80	80	91	96	77	61	A	A	
16	59	60	57	A	A	54	64	82	69	A	A	A	A	85	85	95	98	94	A	A	A	A	63	63	
17	65	63	66	64	62	66	79	75	66	65	77	75	75	75	79	72	82	80	89	96	74	75	A	66	
18	65	64	A	66	67	60	61	63	69	62	62	55	72	78	78	76	80	83	87	96	81	65	67	69	
19	61	78	62	61	59	57	66	67	74	82	A	72	74	A	88	86	A	A	84	98	A	A	A	73	
20	72	83	78	54	57	56	49	A	47	A	A	79	86	A	83	77	80	85	90	88	73	77	80	75	
21	74	82	71	79	72	54	56	71	70	69	81	63	73	78	81	79	92	95	92	90	83	77	77	69	
22	66	75	60	50	52	58	57	51	A	69	59	A	65	83	A	A	80	85	75	73	89	80	69	A	
23	A	A	69	59	61	56	59	73	75	74	59	61	67	A	95	91	94	106	111	106	81	77	70	73	
24	67	78	80	79	80	86	61	A	A	A	A	A	83	A	94	A	97	106	119	109	76	73	67	64	
25	62	68	A	57	70	59	56	69	77	77	A	A	A	93	A	A	99	106	108	92	A	64	60	55	
26	54	53	57	56	53	55	56	82	83	83	A	63	68	A	91	94	101	89	95	89	79	69	71	66	
27	66	62	65	61	61	59	66	63	66	54	68	71	76	75	95	103	98	94	91	98	75	71	A	A	
28	57	A	A	55	54	52	62	79	A	A	A	74	78	93	99	98	93	97	94	96	103	97	81	63	
29	61	A	57	61	70	61	53	50	65	76	69	67	69	67	79	85	A	101	95	88	96	85	70	69	
30	64	63	68	65	61	60	69	67	57	57	A	A	A	A	78	79	91	95	99	A	76	A	58	49	
31	59	59	58	A	A	43	A	65	64	62	62	60	61	66	86	96	95	91	97	100	90	94	A	62	
	00	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	25	27	28	27	29	30	26	24	20	17	21	25	20	26	28	27	28	29	29	27	27	25	26	
MED	64	65	65	61	60	56	58	67	68	70	71	72	73	78	82	85	91	94	93	94	79	73	70	66	
U Q	66	74	71	65	62	59	62	73	74	77	79	74	79	90	94	90	95	100	99	99	89	81	73	69	
L Q	60	60	59	55	53	52	53	63	65	62	63	63	68	75	79	79	82	87	89	88	75	67	63	62	

HOURLY VALUES OF fEs AT Okinawa

JUL. 2022

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	48	45	33	34	41	89	50	60	80	163	116	64	57	54	61	128	84	142	110	110	58	57	50	56
2	49	58	30	34	G	G	30	59	52	166	117	153	163	92	163	167	90	54	82	76	59	55	46	38
3	39	39	40	56	112	167	36	49	108	50	109	116	136	115	61	83	47	56	86	74	50	72	72	112
4	116	88	94	41	39	36	34	45	180	152	92	57	96	63	100	135	96	70	40	34	110	26	38	37
5	60	57	148	94	58	38	40	92	58	56	88	111	126	91	61	73	48	33	32	40	30	42	48	30
6	46	46	45	58	52	36	45	53	56	69	93	66	58	49	51	48	46	36	46	50	56	36	33	26
7	25	41	41	40	54	43	29	40	104	52	54	55	54	57	54	56	65	57	44	36	27	40	26	28
8	39	60	56	53	35	32	38	67	44	47	59	88	60	66	66	58	98	52	46	76	26	56	26	108
9	44	32	44	47	G	92	36	49	92	105	78	91	95	53	47	36	42	39	36	G	30	G	G	G
10	29	33	G	G	G	G	48	72	134	92	72	79	51	45	50	57	63	44	41	55	25	G	35	G
11	G	28	28	G	33	27	30	59	109	78	78	58	76	93	61	55	44	153	154	67	69	72	36	29
12	G	90	29	36	34	32	G	42	55	69	59	52	55	62	51	62	66	56	109	34	26	26	G	24
13	25	24	G	G	G	G	G	127	55	72	62	78	62	79	95	50	40	39	42	44	40	46	35	G
14	33	53	33	39	61	40	59	50	46	45	106	66	51	45	58	55	55	50	41	50	47	27	25	29
15	41	G	31	34	G	52	40	145	44	51	51	43	117	73	55	44	41	49	53	51	61	54	103	93
16	73	G	38	62	57	G	31	45	57	132	135	103	174	64	80	91	88	130	112	107	164	93	55	53
17	39	G	40	28	27	28	28	44	50	64	45	46	57	65	62	60	66	93	54	36	43	33	58	36
18	35	113	60	53	45	41	G	38	108	50	57	52	53	53	55	59	55	53	48	57	32	44	38	59
19	32	40	46	G	G	G	28	42	50	60	85	56	58	92	63	55	83	88	73	40	159	90	69	49
20	54	67	58	43	G	35	57	106	114	70	58	62	79	86	65	71	66	75	110	62	55	69	60	70
21	106	43	49	30	26	35	31	48	50	56	48	54	48	52	57	60	60	60	46	55	40	60	38	28
22	G	33	104	53	46	45	40	40	59	75	53	66	83	94	109	85	65	62	67	63	146	43	32	72
23	91	92	26	38	39	34	39	46	72	68	51	164	50	132	34	46	70	133	90	110	59	30	28	32
24	40	38	33	25	G	28	27	69	92	167	92	116	59	136	58	127	70	82	41	40	59	60	56	36
25	39	29	59	53	53	60	41	32	44	65	91	102	102	82	88	107	116	95	46	55	61	48	36	44
26	41	G	G	G	G	27	33	56	60	102	76	53	59	81	48	62	71	61	47	49	34	G	26	45
27	30	25	G	39	58	37	40	33	43	47	50	56	51	52	72	70	63	58	53	58	58	59	67	58
28	49	92	138	43	31	37	54	59	62	76	94	49	52	61	61	84	52	74	39	69	40	52	28	47
29	40	105	35	24	G	G	G	43	33	48	50	56	62	71	63	73	95	64	75	96	78	92	48	28
30	G	G	G	G	G		23	39	43	48	153	92	146	126	70	76	54	54	40	125	60	178	47	27
31	47	73	46	94	94	33	161	89	57	67	53	59	60	63	70	54	62	64	62	41	37	48	60	45
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	40	41	40	39	34	35	36	49	57	68	76	64	60	66	61	62	65	60	48	55	55	48	38	37
U Q	49	67	56	53	53	41	41	67	92	92	93	92	96	92	70	84	83	82	82	74	61	60	56	56
L Q	30	28	29	25	G	27	28	42	50	51	53	55	54	54	55	55	52	52	41	40	34	33	28	28

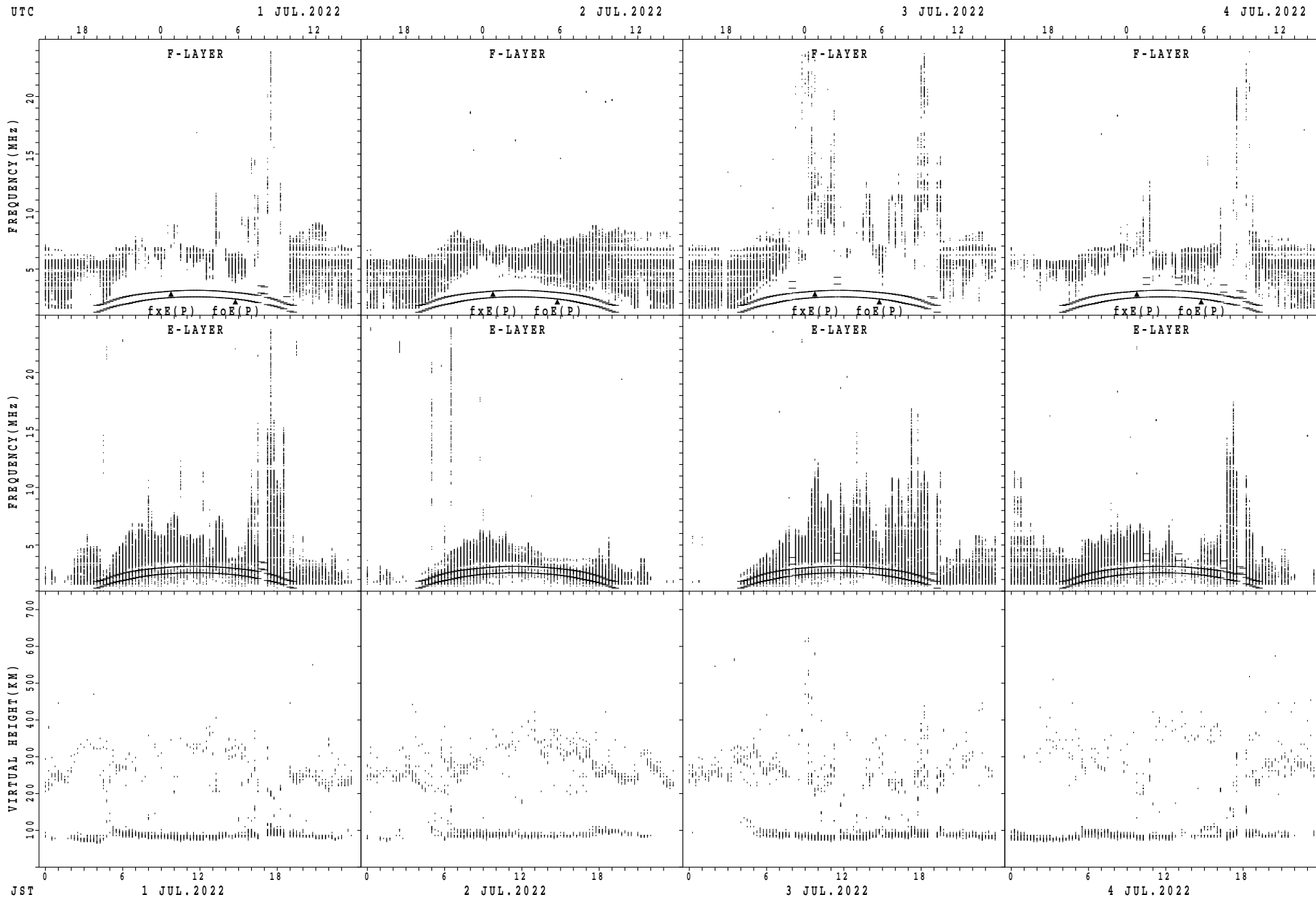
HOURLY VALUES OF fmin AT Okinawa

JUL. 2022

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

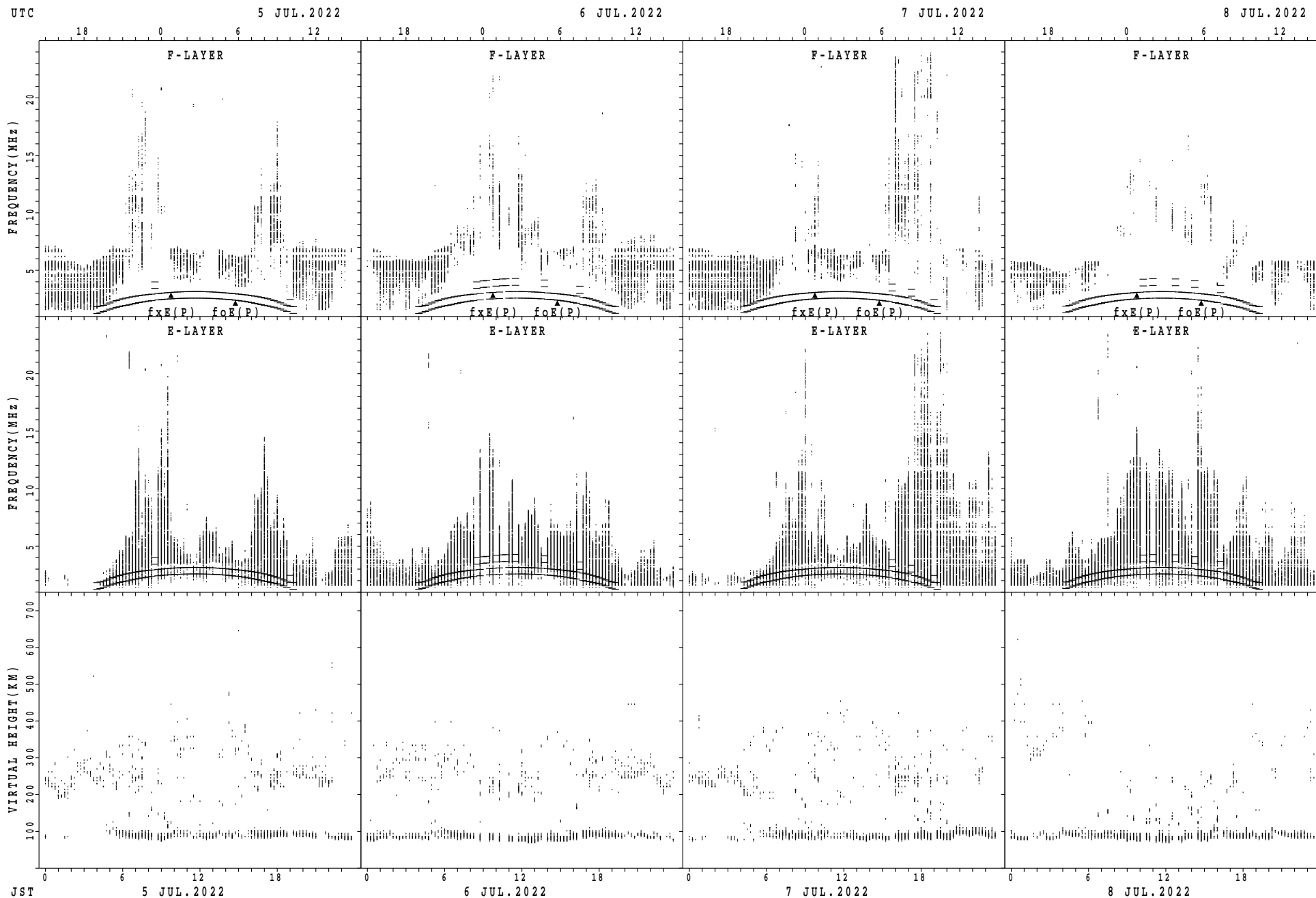
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	15	15	16	15	15	15	14	12	21	19	18	22	21	19	21	16	5	16	18	16	15	15	16
2	15	15	17	16	15	14	16	14	14	15	17	15	20	21	9	13	17	14	12	14	17	15	16	15
3	15	16	15	15	14	15	15	14	15	15	17	19	27	17	22	20	17	16	14	14	15	14	15	13
4	12	15	15	15	15	15	15	15	5	9	19	17	17	21	14	21	16	15	15	16	7	16	15	16
5	14	15	13	13	14	15	14	15	13	19	22	20	22	24	23	22	17	15	14	13	16	15	15	16
6	15	15	15	15	15	15	15	15	13	15	19	16	19	20	21	18	19	17	15	16	16	16	16	15
7	15	15	15	14	16	15	15	15	13	15	22	21	39	20	28	19	17	18	13	15	16	15	16	16
8	15	16	15	14	15	15	17	13	15	17	19	21	22	22	20	20	16	15	13	16	16	15	15	10
9	15	16	15	16	15	17	13	15	16	19	18	19	21	21	21	19	19	15	15	15	15	16	16	15
10	15	16	16	15	15	14	15	15	13	16	17	18	24	18	24	20	19	17	14	15	15	15	14	15
11	15	15	15	15	16	15	15	13	17	18	17	20	17	22	21	21	19	5	29	15	15	15	15	16
12	14	10	17	15	16	16	15	15	17	18	22	22	23	24	21	20	15	16	13	15	16	16	15	16
13	16	16	16	14	15	17	15	16	15	17	21	21	21	21	23	19	17	14	14	14	15	15	15	16
14	16	15	16	15	15	15	14	15	16	19	21	22	26	23	41	23	21	18	14	15	14	15	16	15
15	16	16	15	16	16	15	15	15	15	15	20	21	21	14	21	23	16	15	15	15	15	14	5	11
16	15	15	15	14	14	16	16	15	15	5	11	17	17	23	24	21	17	5	14	14	21	16	16	16
17	15	15	15	16	16	16	15	15	17	16	18	22	39	21	23	21	17	16	13	15	15	16	15	15
18	15	6	15	15	15	15	17	15	16	19	19	21	21	21	23	21	22	16	14	16	15	15	15	15
19	16	15	16	15	15	15	15	14	14	19	21	22	33	18	21	38	15	16	16	15	7	10	16	15
20	16	16	15	16	14	15	15	13	17	17	19	22	23	20	19	19	16	14	5	15	15	14	15	16
21	5	15	15	16	16	14	16	15	15	18	23	21	41	20	22	18	18	16	17	13	16	15	15	15
22	16	16	5	15	15	15	15	14	13	18	18	21	19	24	19	20	17	17	13	15	15	16	16	16
23	17	15	15	15	15	15	15	15	17	17	22	22	23	23	21	20	17	17	14	14	15	16	17	15
24	15	15	16	15	15	15	15	15	18	13	19	19	19	21	19	19	17	18	13	15	15	15	15	15
25	15	16	15	14	15	16	15	15	16	16	21	19	19	19	18	19	15	15	15	16	16	16	16	15
26	15	15	16	18	15	15	16	13	14	14	17	21	22	19	20	20	22	18	18	15	15	16	16	15
27	16	16	15	17	14	15	14	14	14	15	19	15	21	23	18	19	15	14	13	15	16	16	16	16
28	15	16	19	15	16	15	15	15	15	17	20	21	20	22	22	19	15	15	15	16	15	15	15	14
29	15	18	15	15	15	15	17	15	15	20	21	19	20	15	20	16	17	13	14	14	15	16	15	15
30	16	15	15	15	15		15	15	15	17	8	24	13	21	21	17	16	14	13	5	16	74	15	15
31	15	16	15	12	11	16	15	14	13	18	20	20	20	21	17	19	15	14	11	16	16	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	15	15	15	15	15	15	15	15	15	17	19	21	21	21	21	20	17	15	14	15	15	15	15	15
U Q	16	16	16	16	15	15	15	15	16	18	21	21	23	22	23	21	18	17	15	16	16	16	16	16
L Q	15	15	15	15	15	15	15	14	13	15	18	19	19	20	19	19	16	14	13	14	15	15	15	15

SUMMARY PLOTS AT Wakkanai



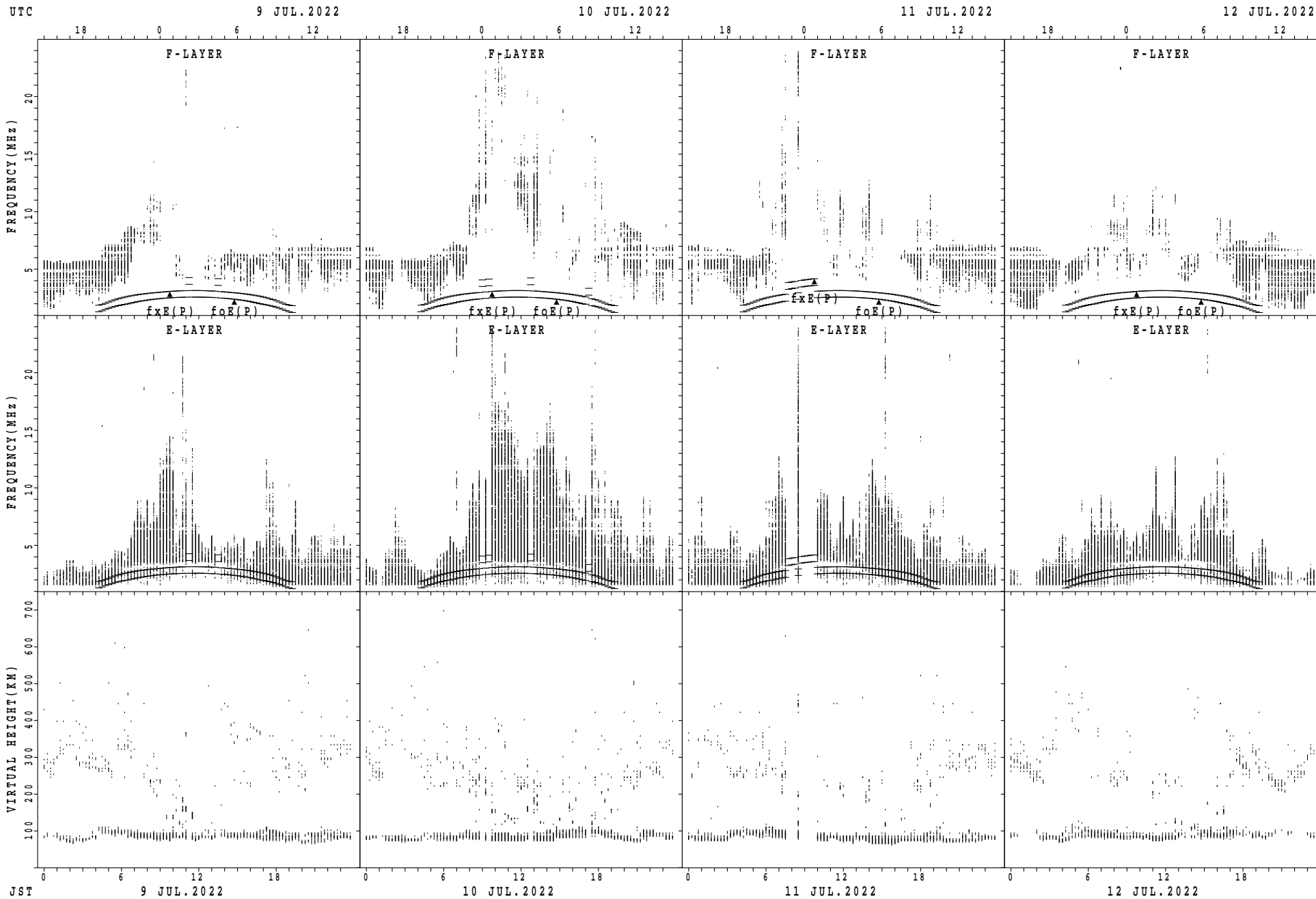
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



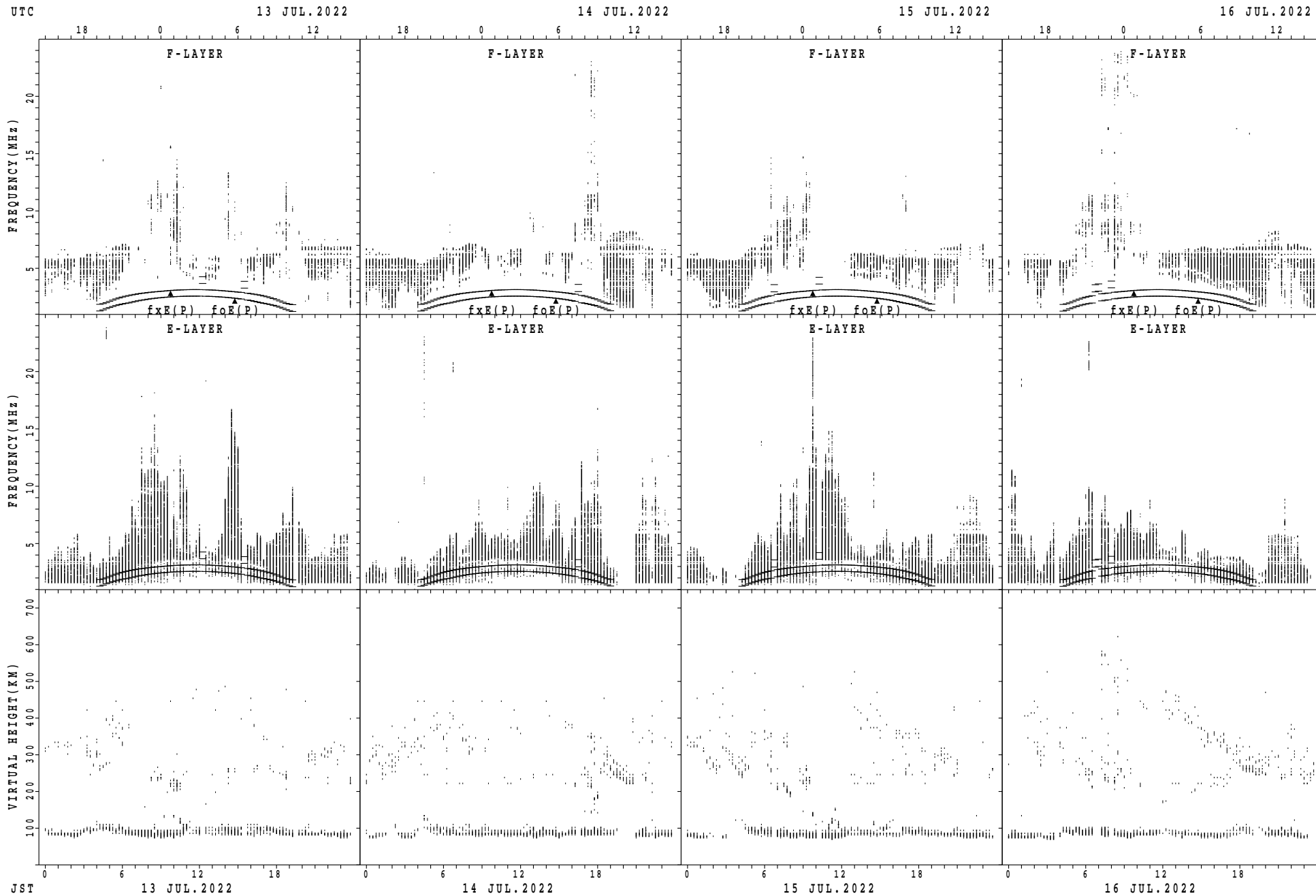
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



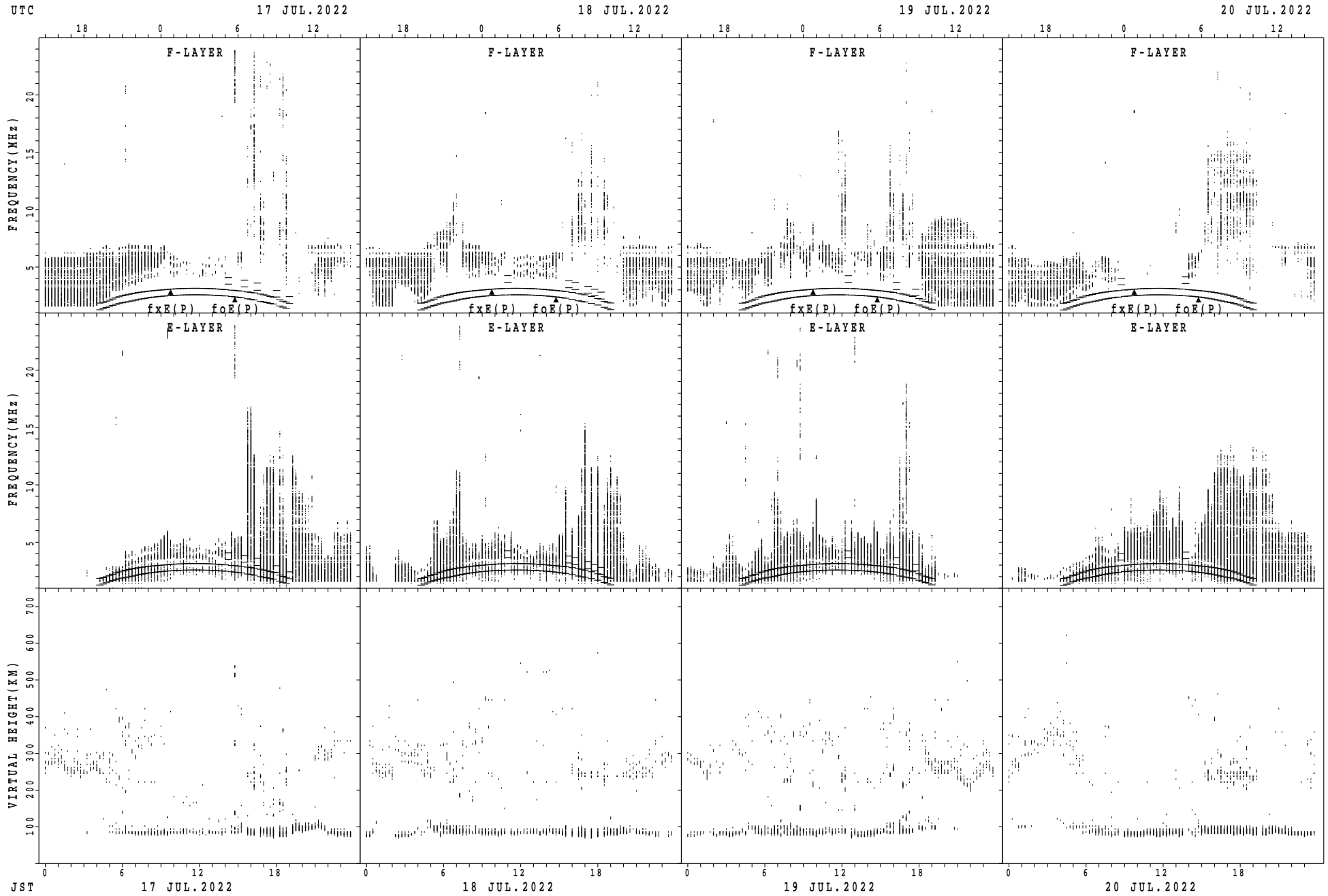
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



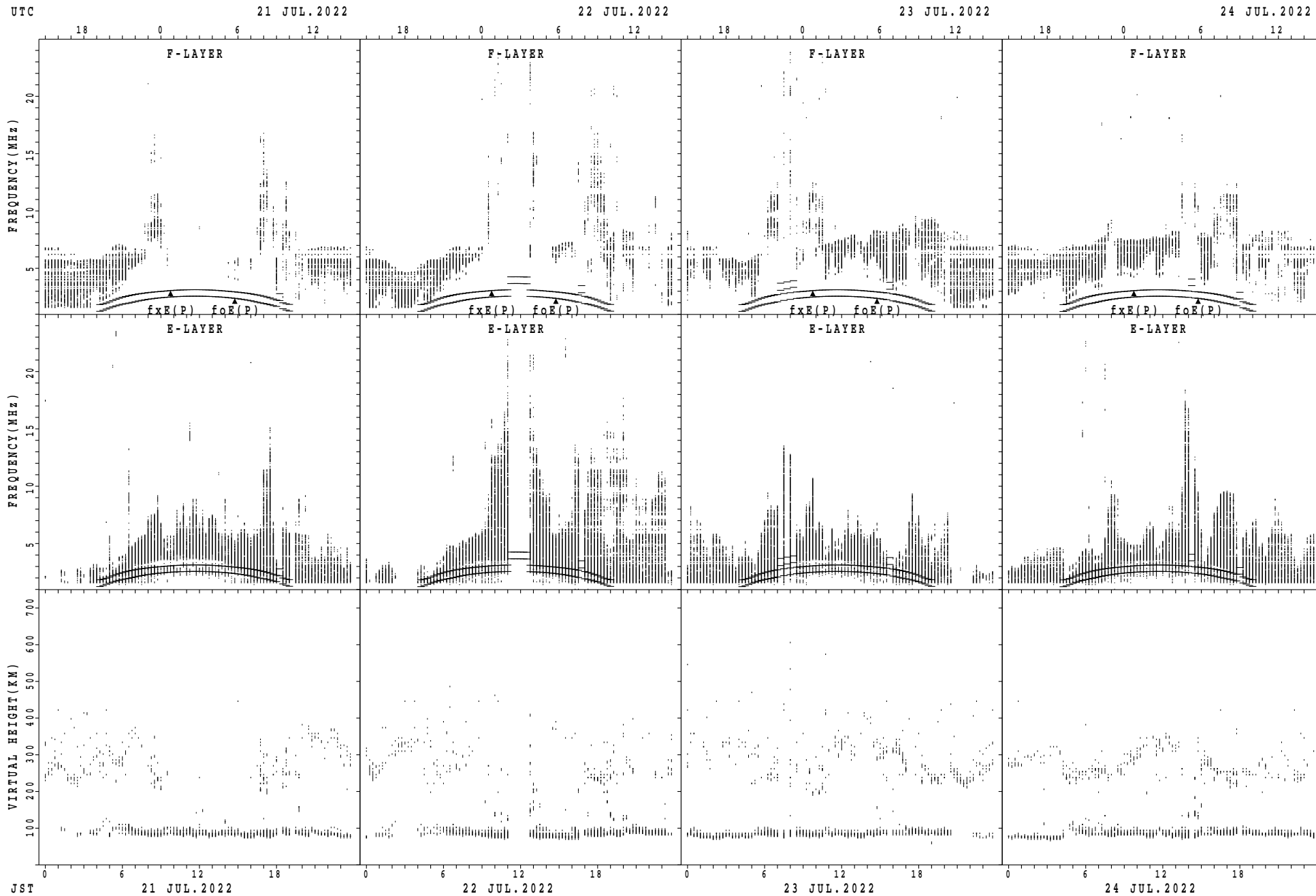
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



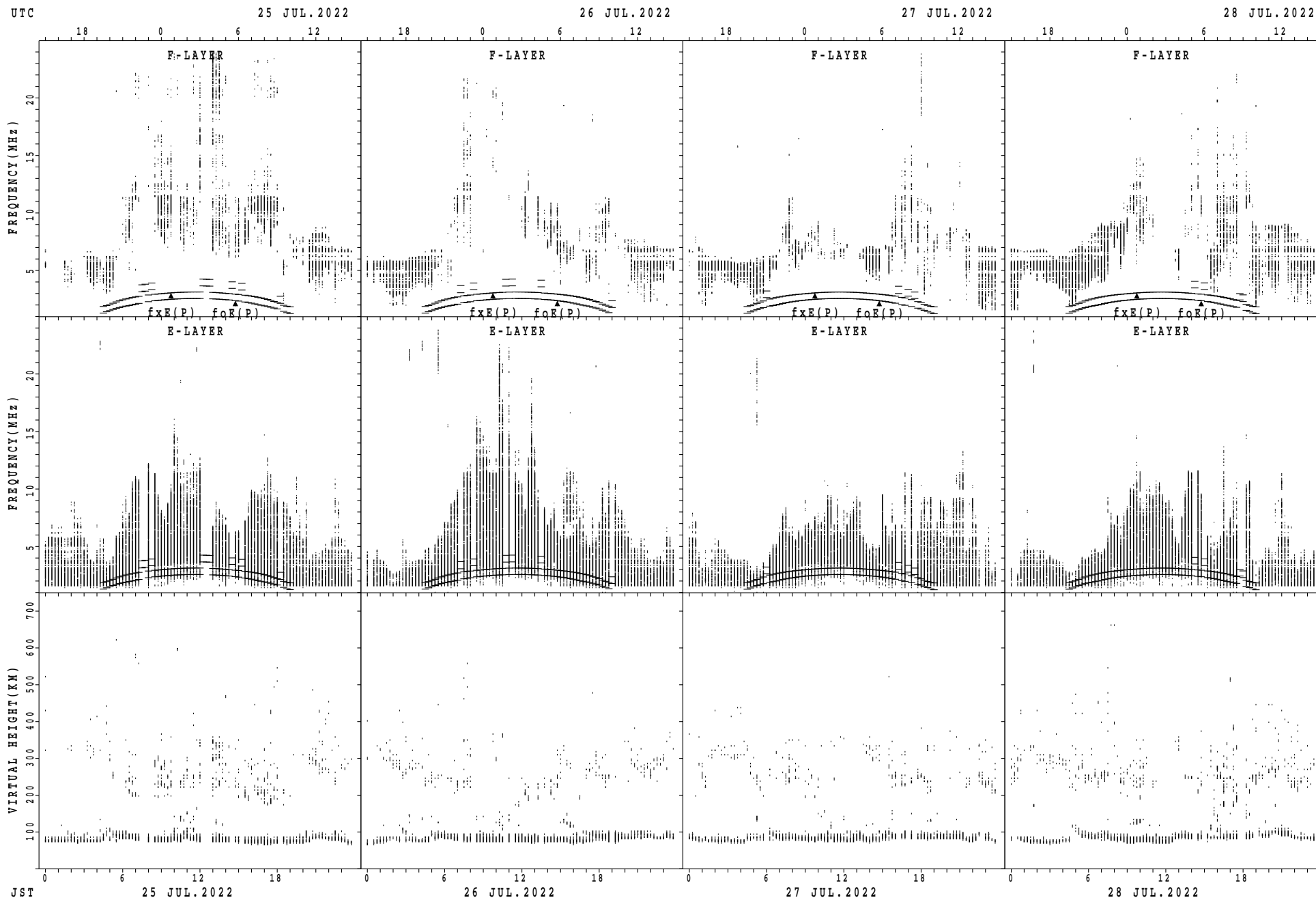
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



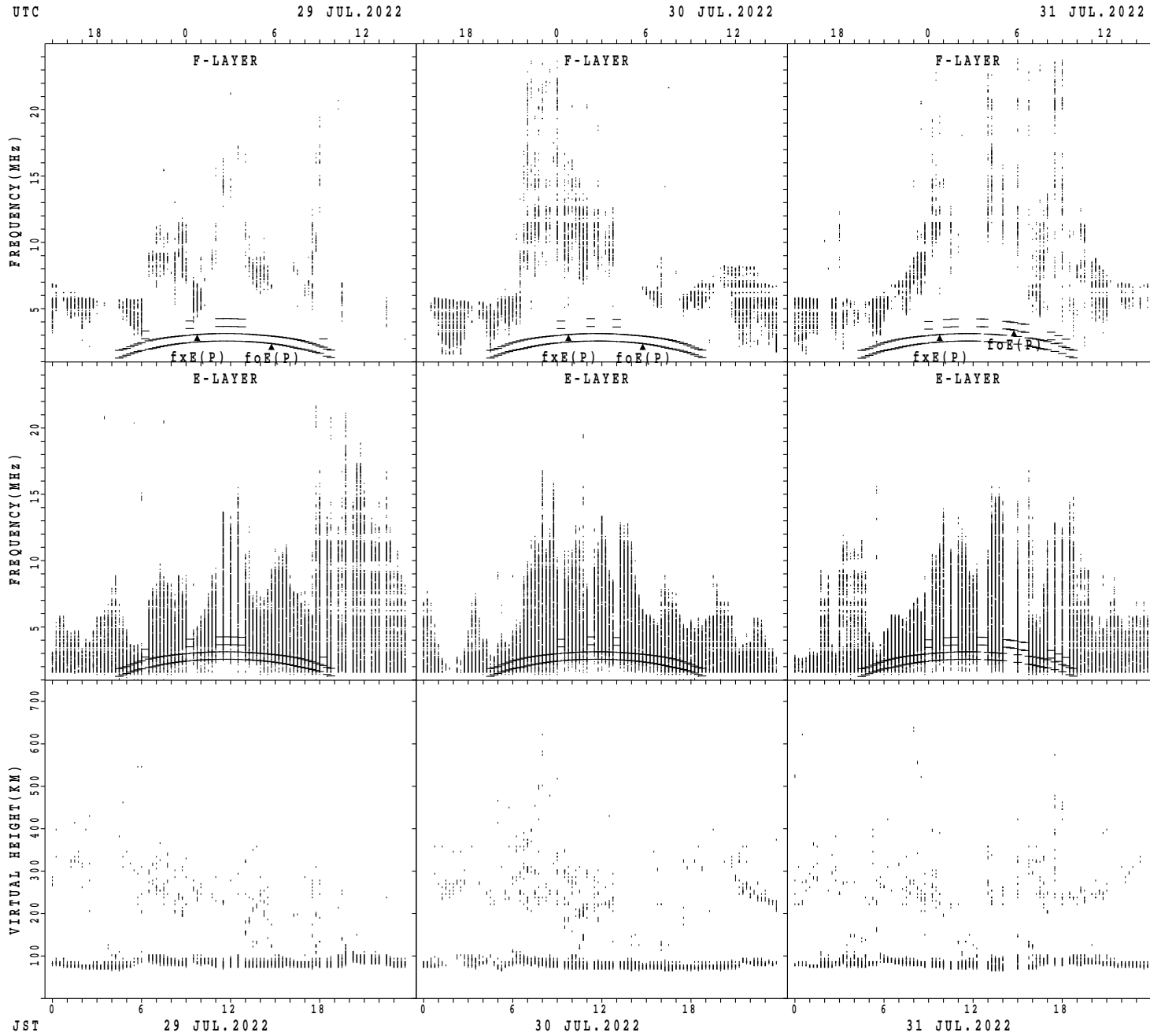
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



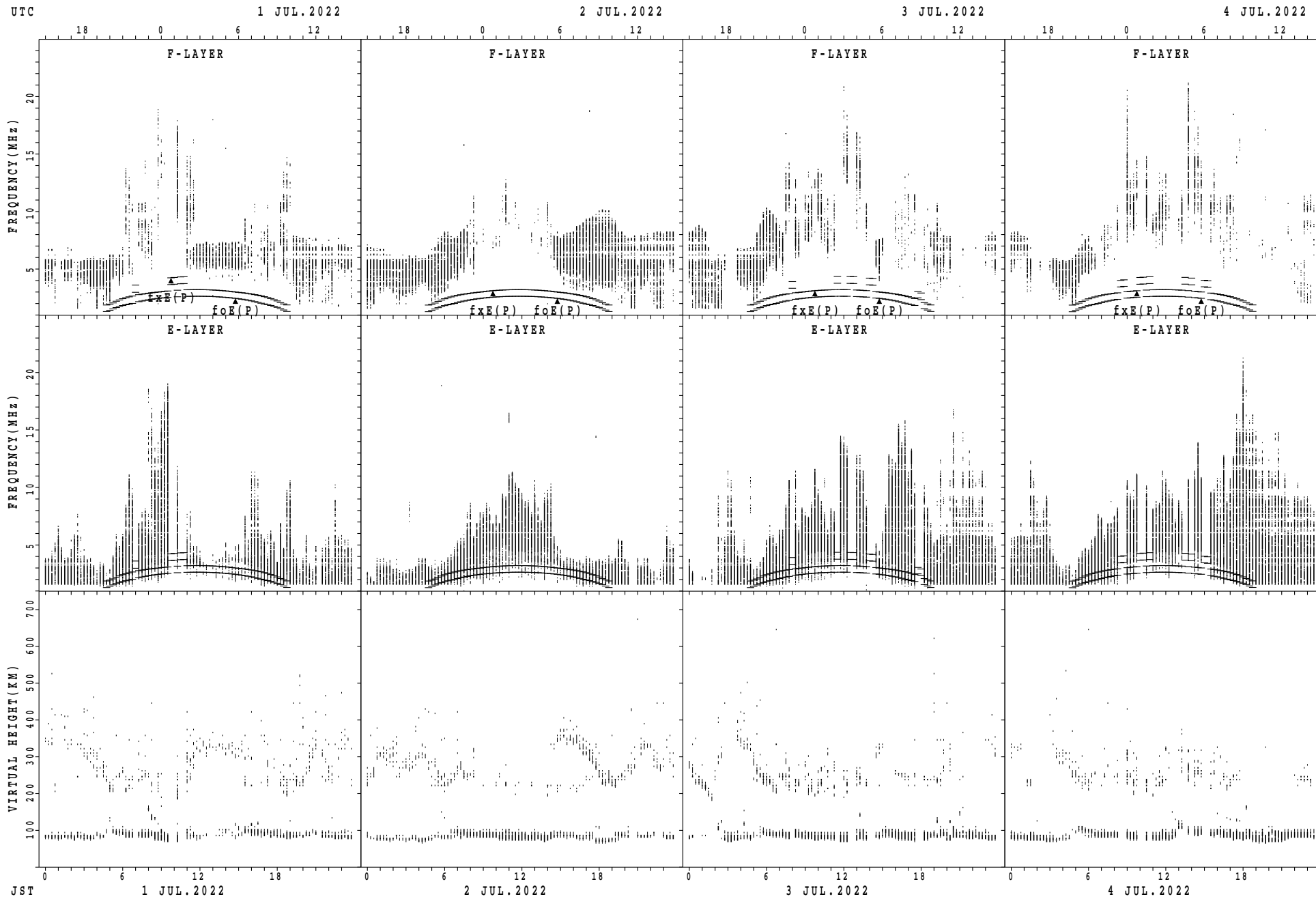
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



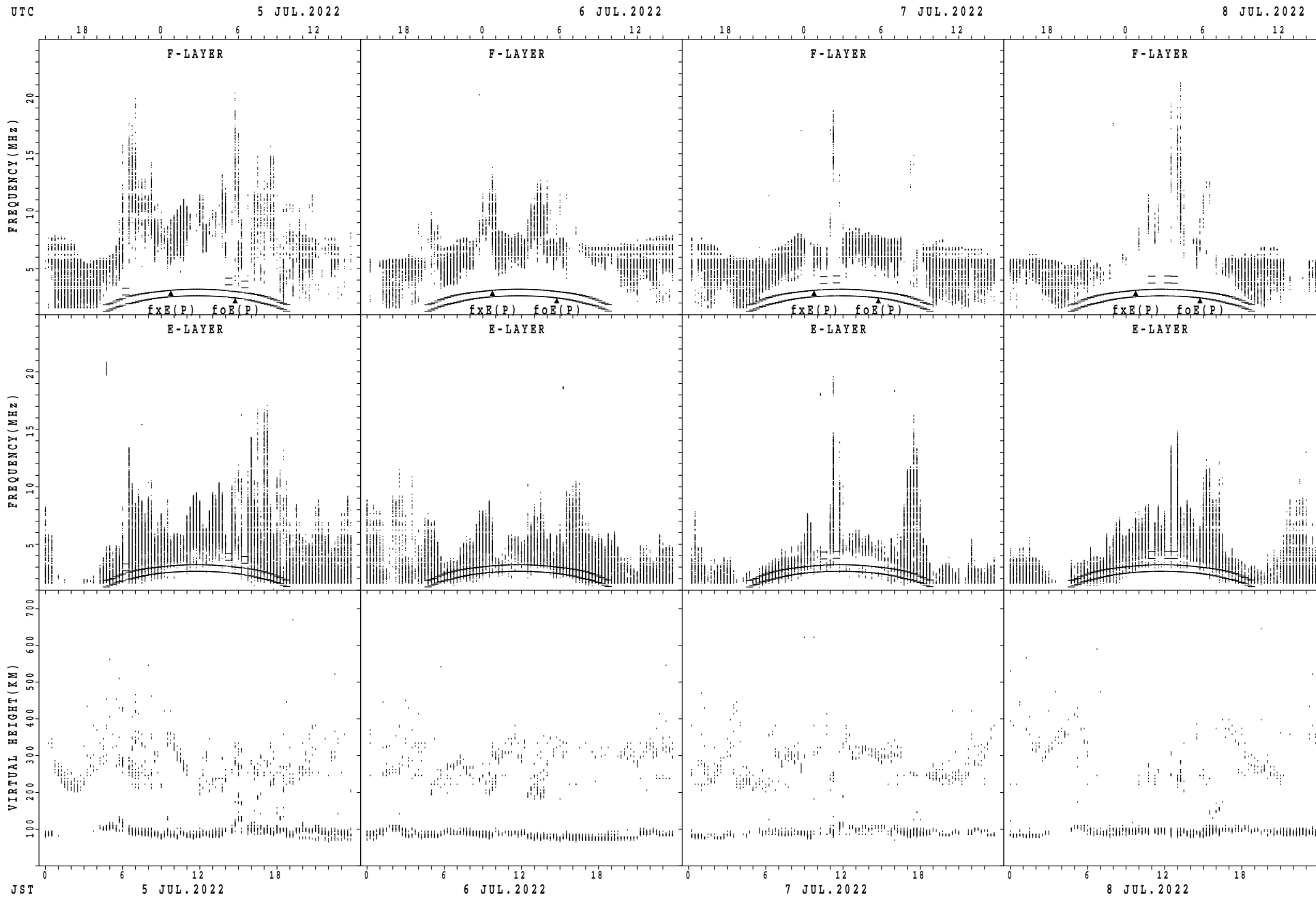
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



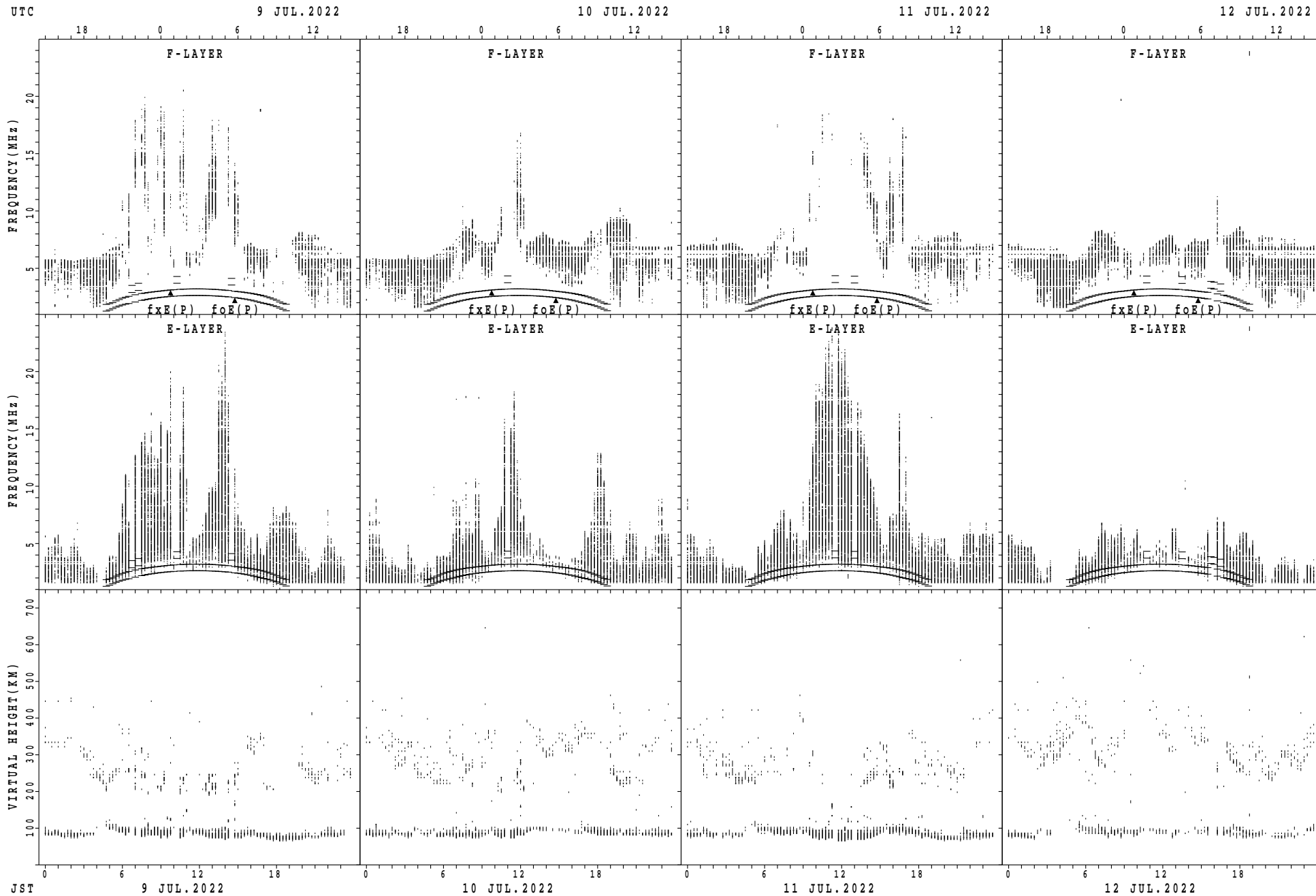
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



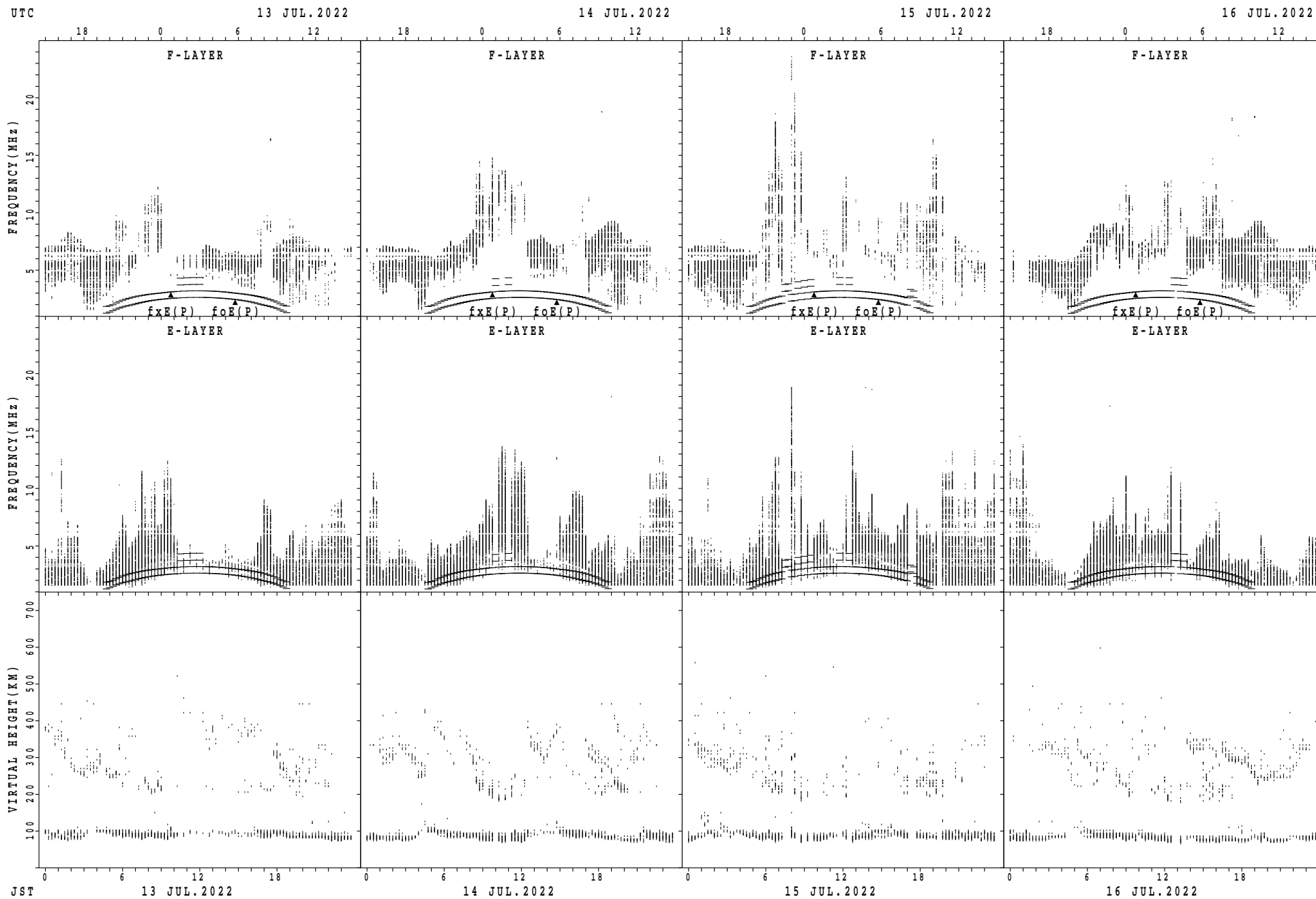
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



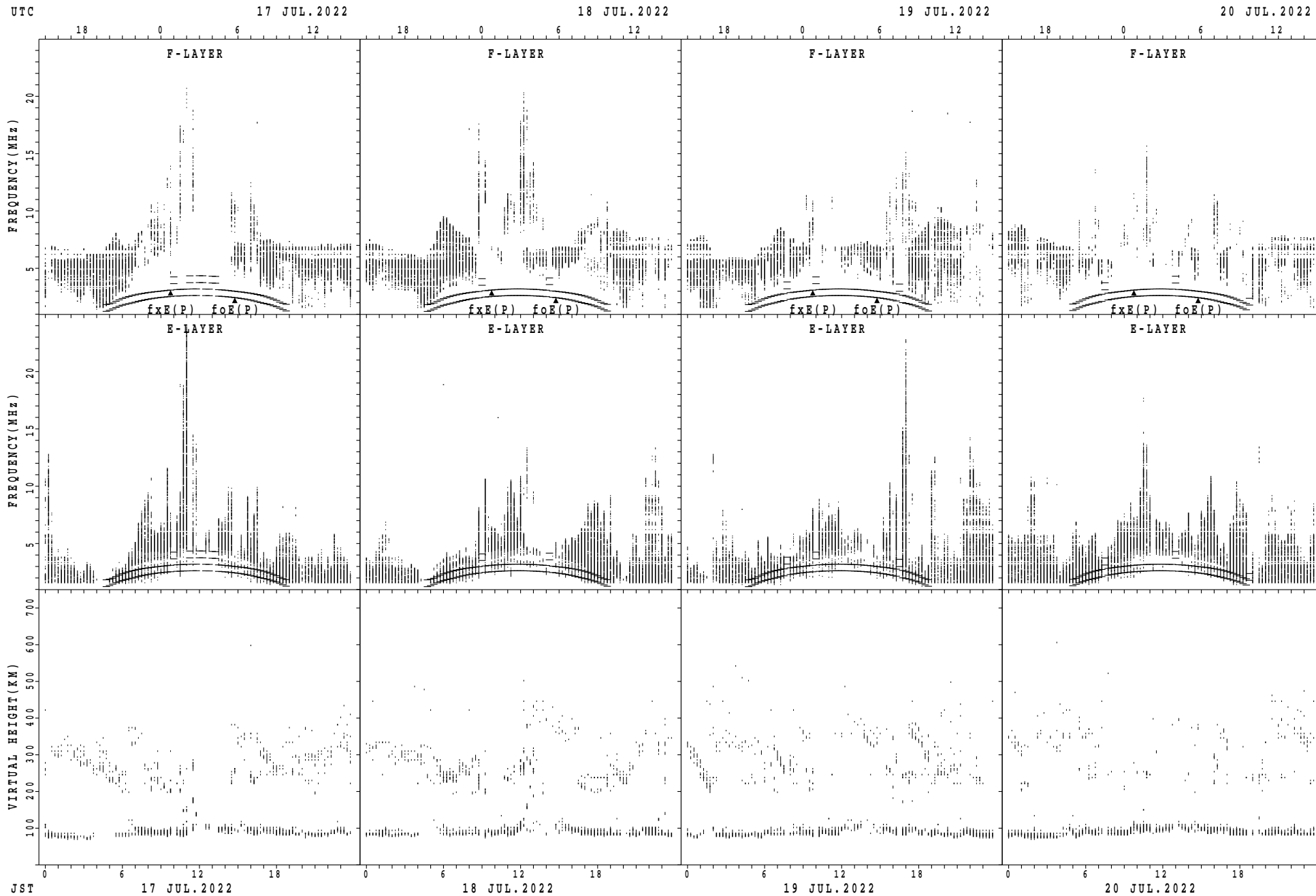
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



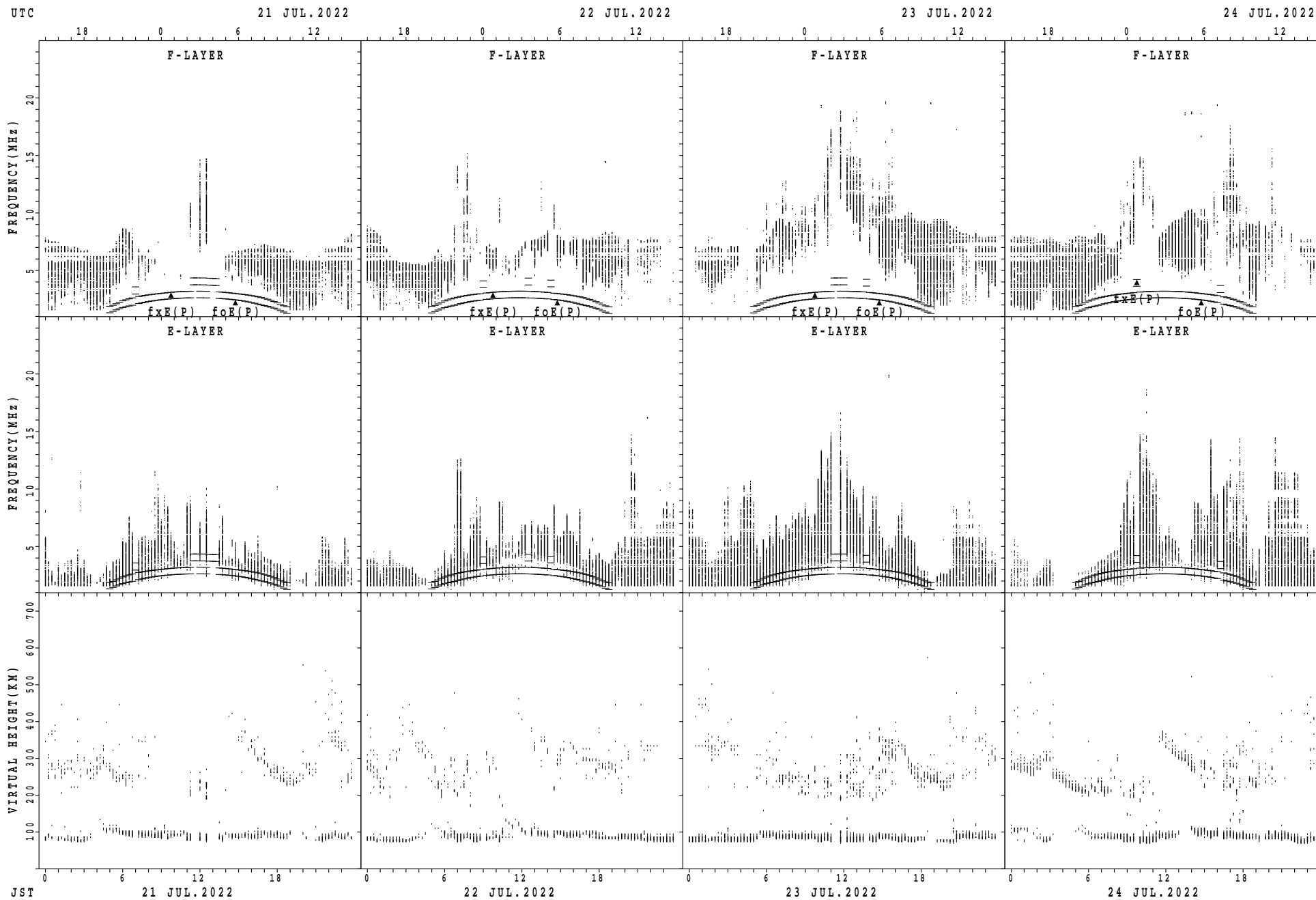
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



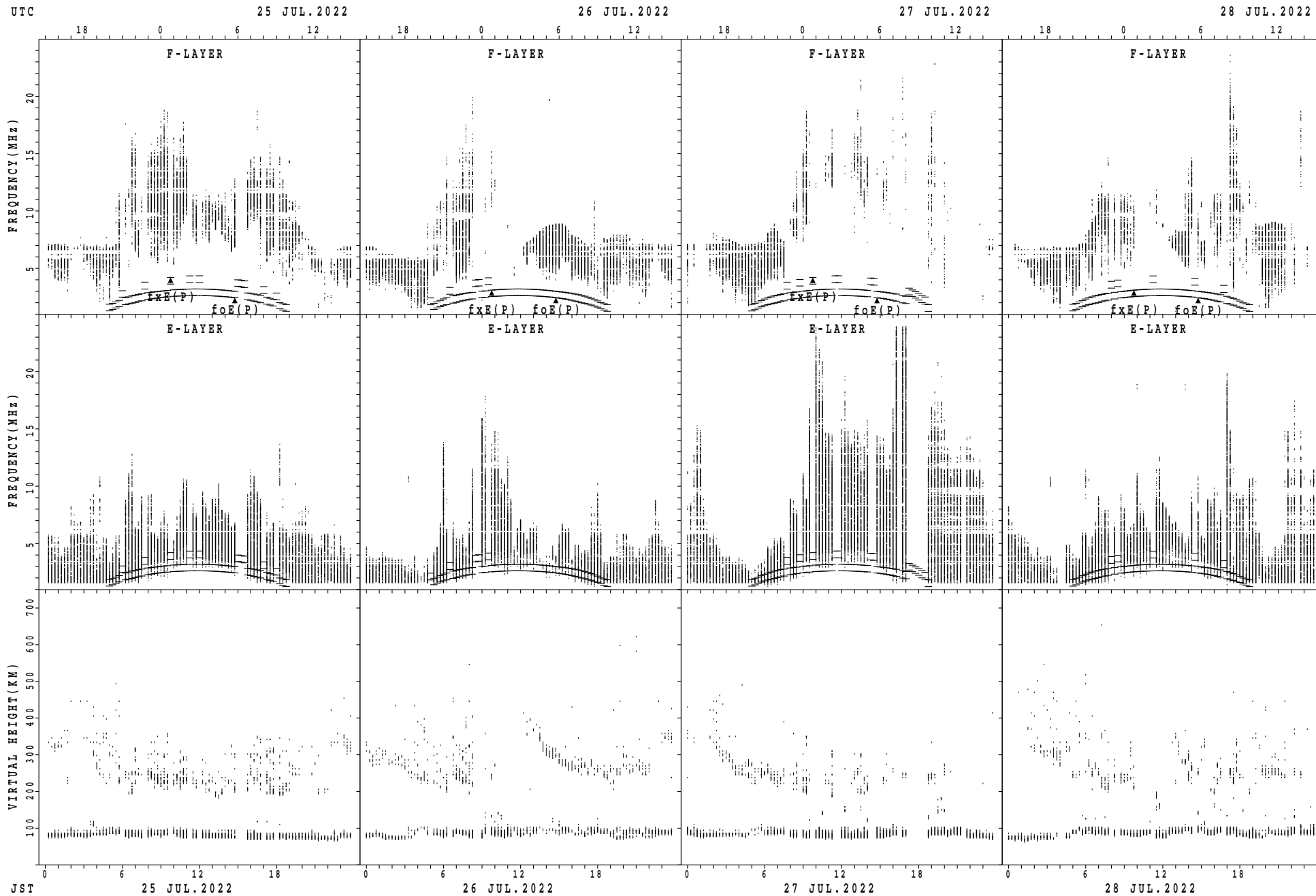
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



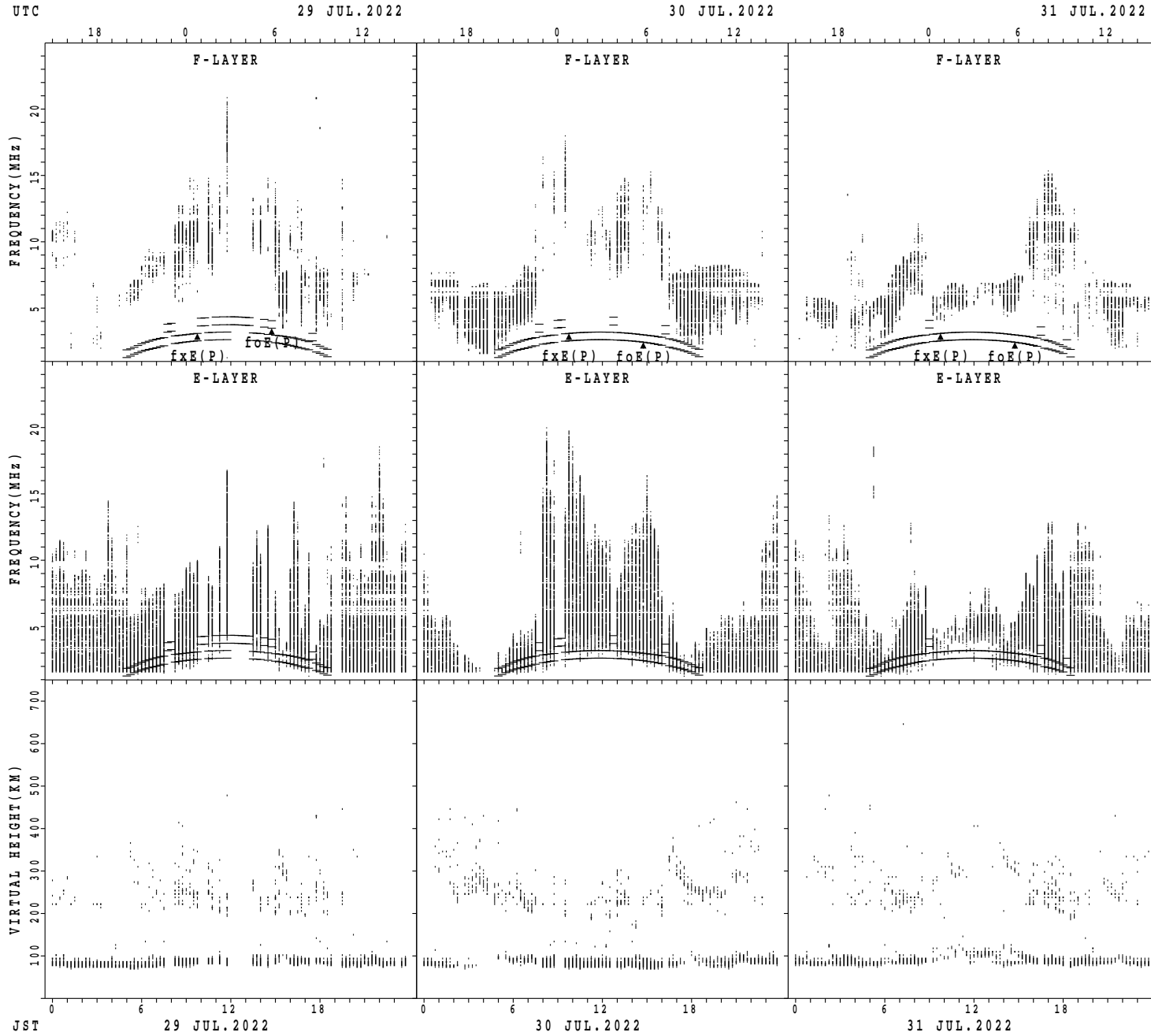
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



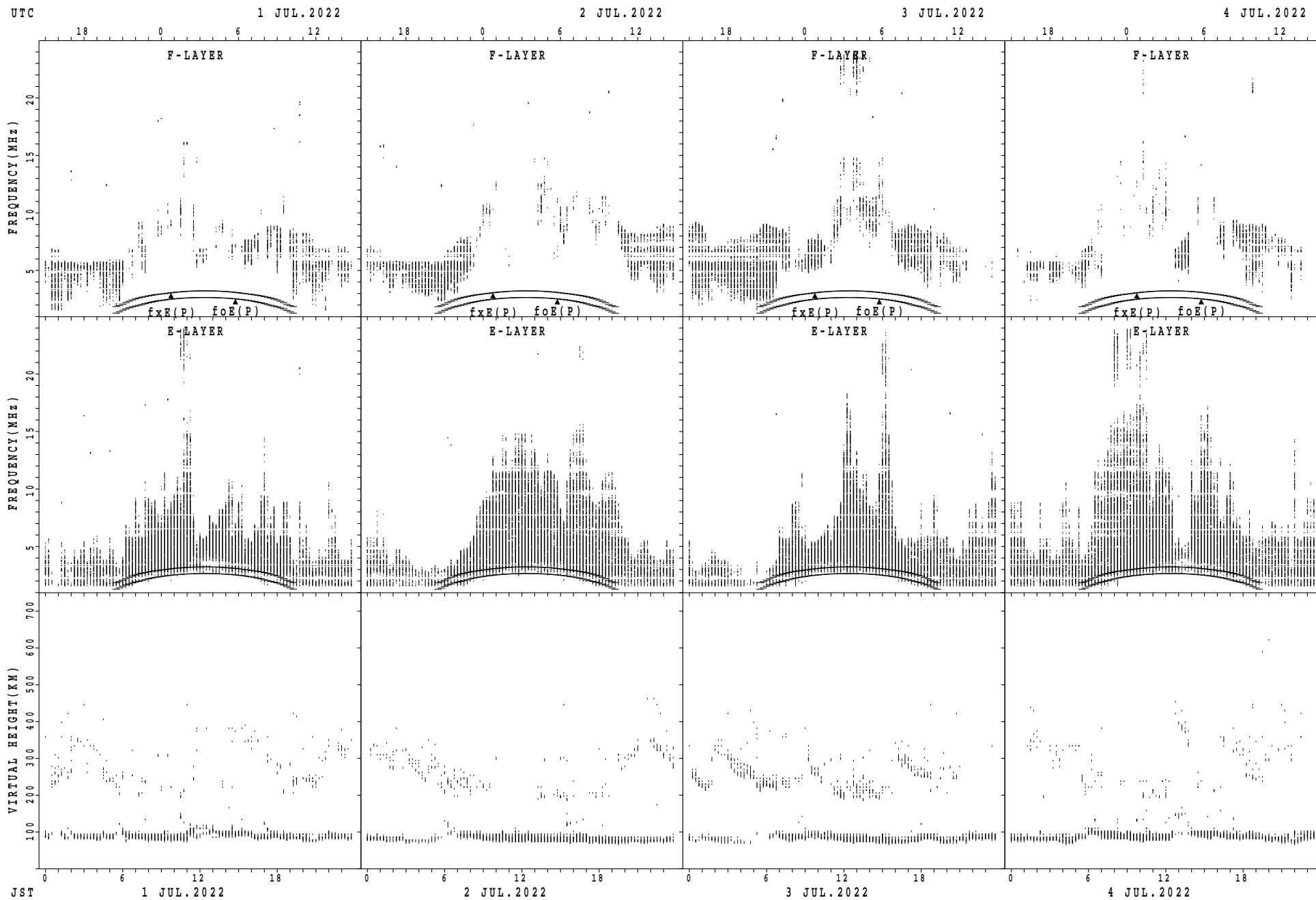
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



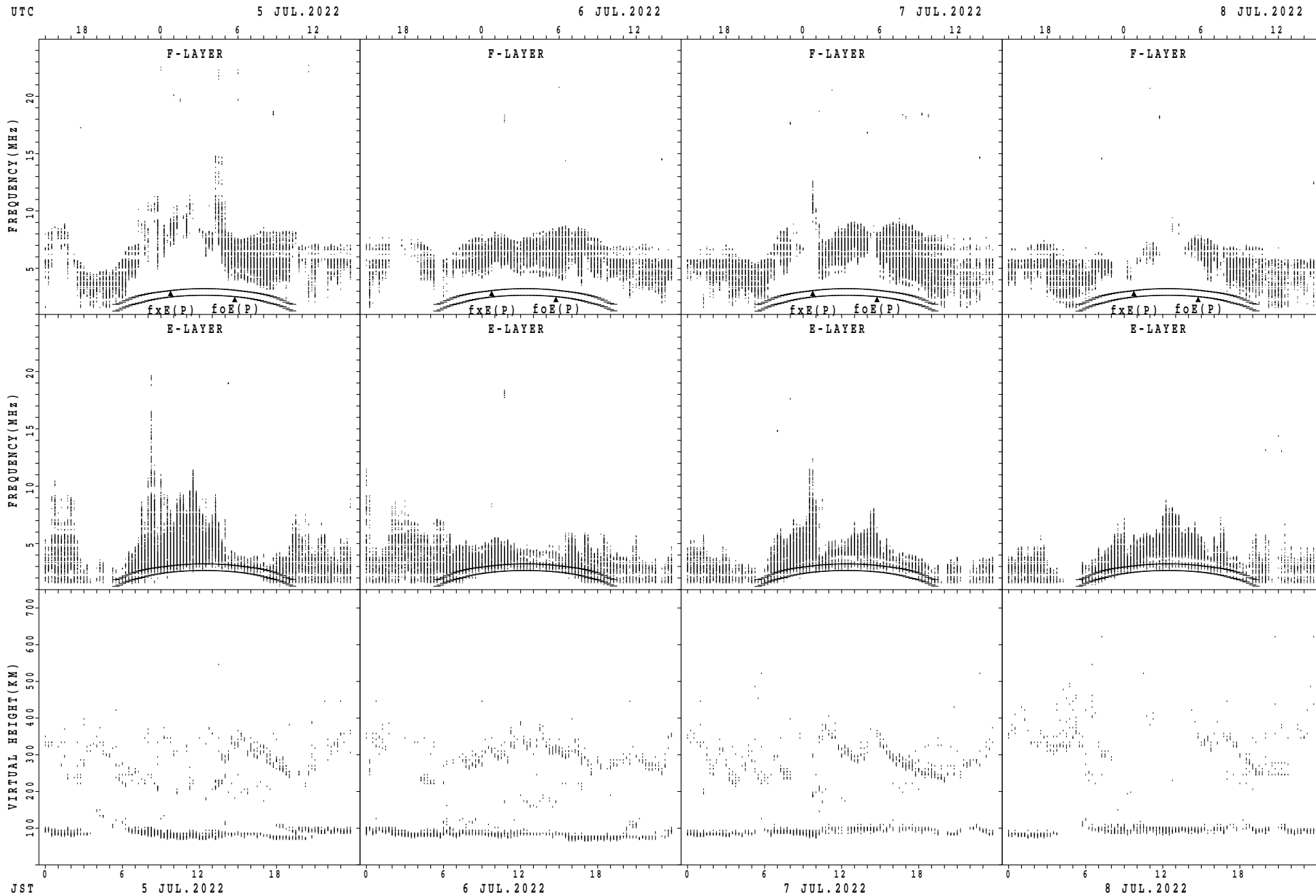
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



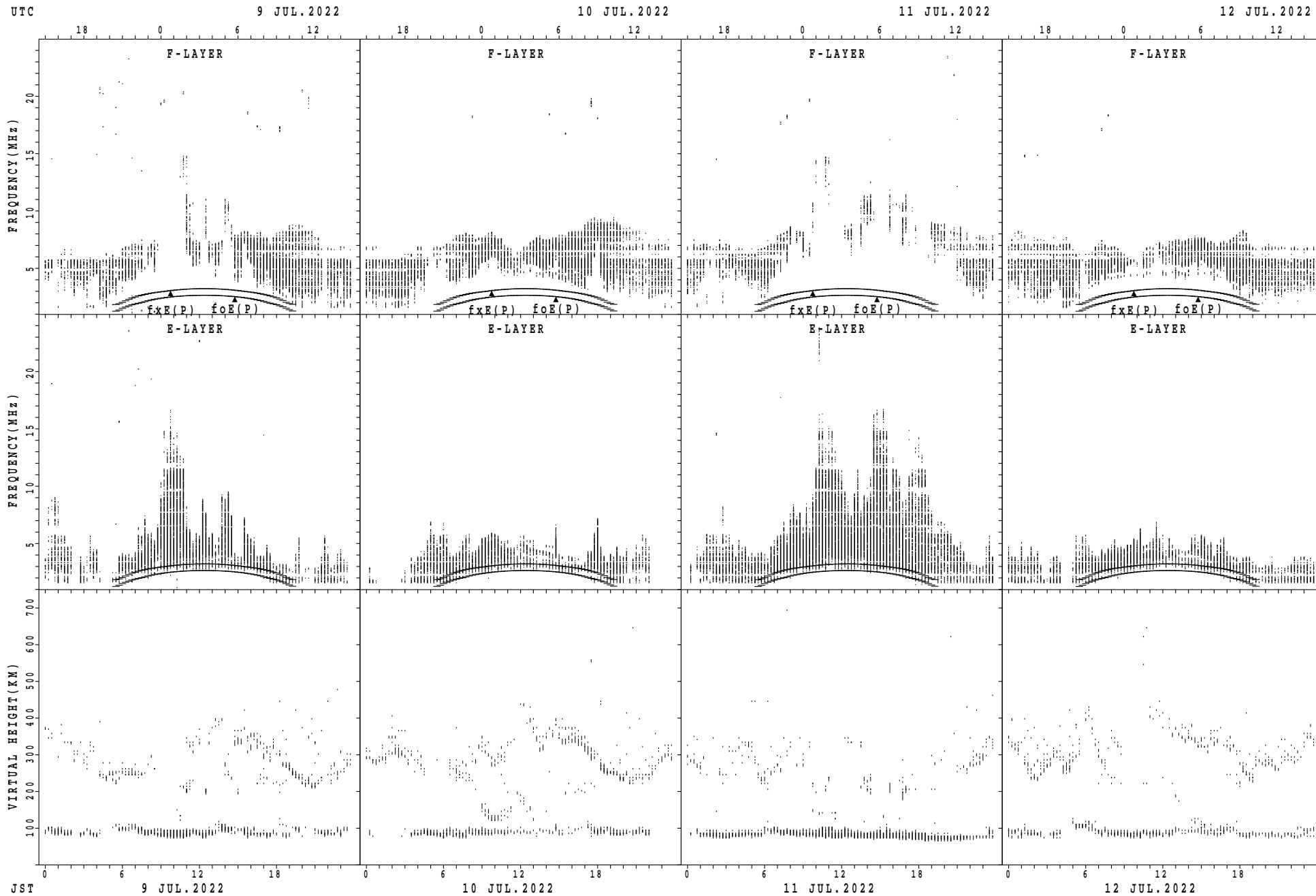
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



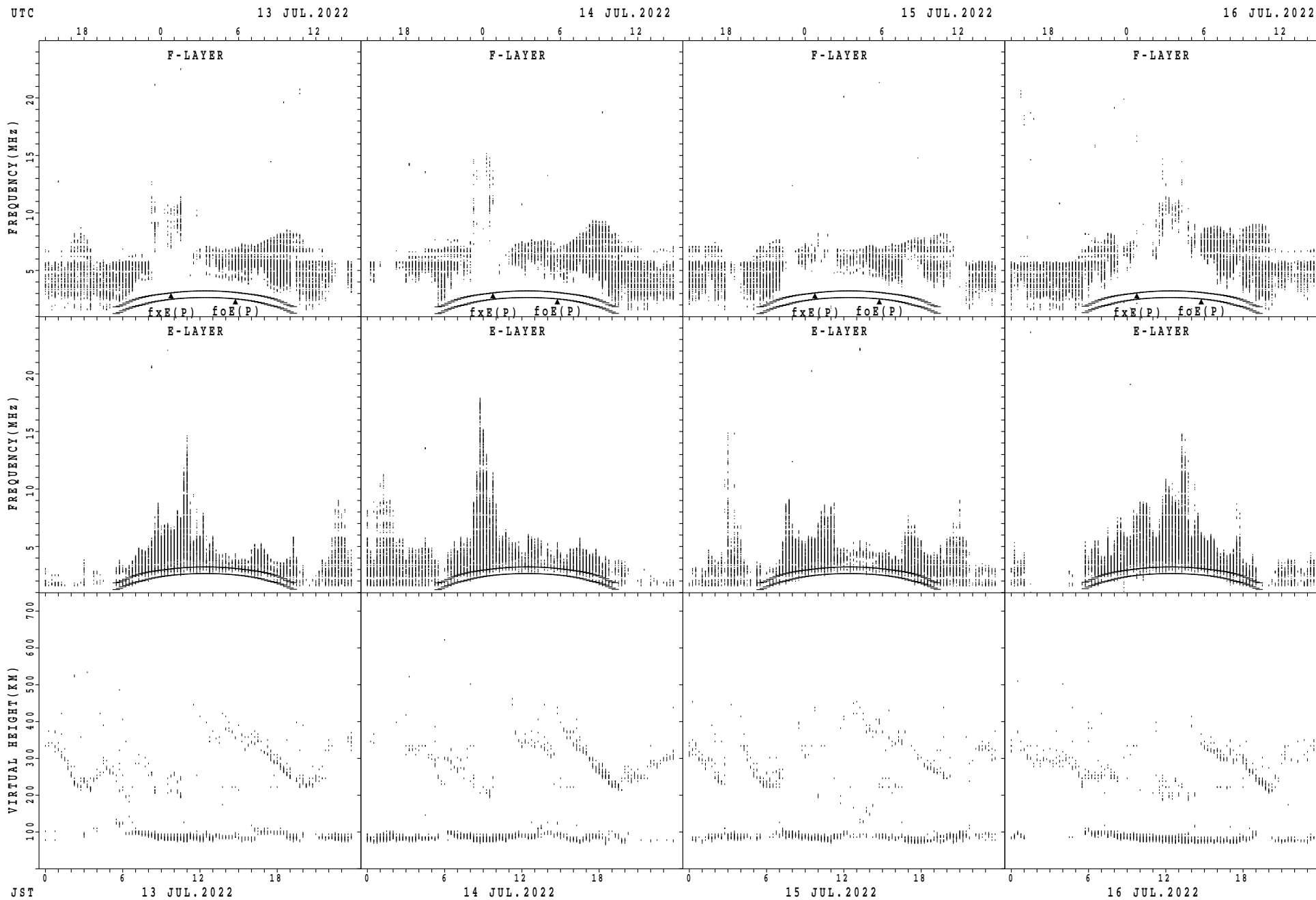
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



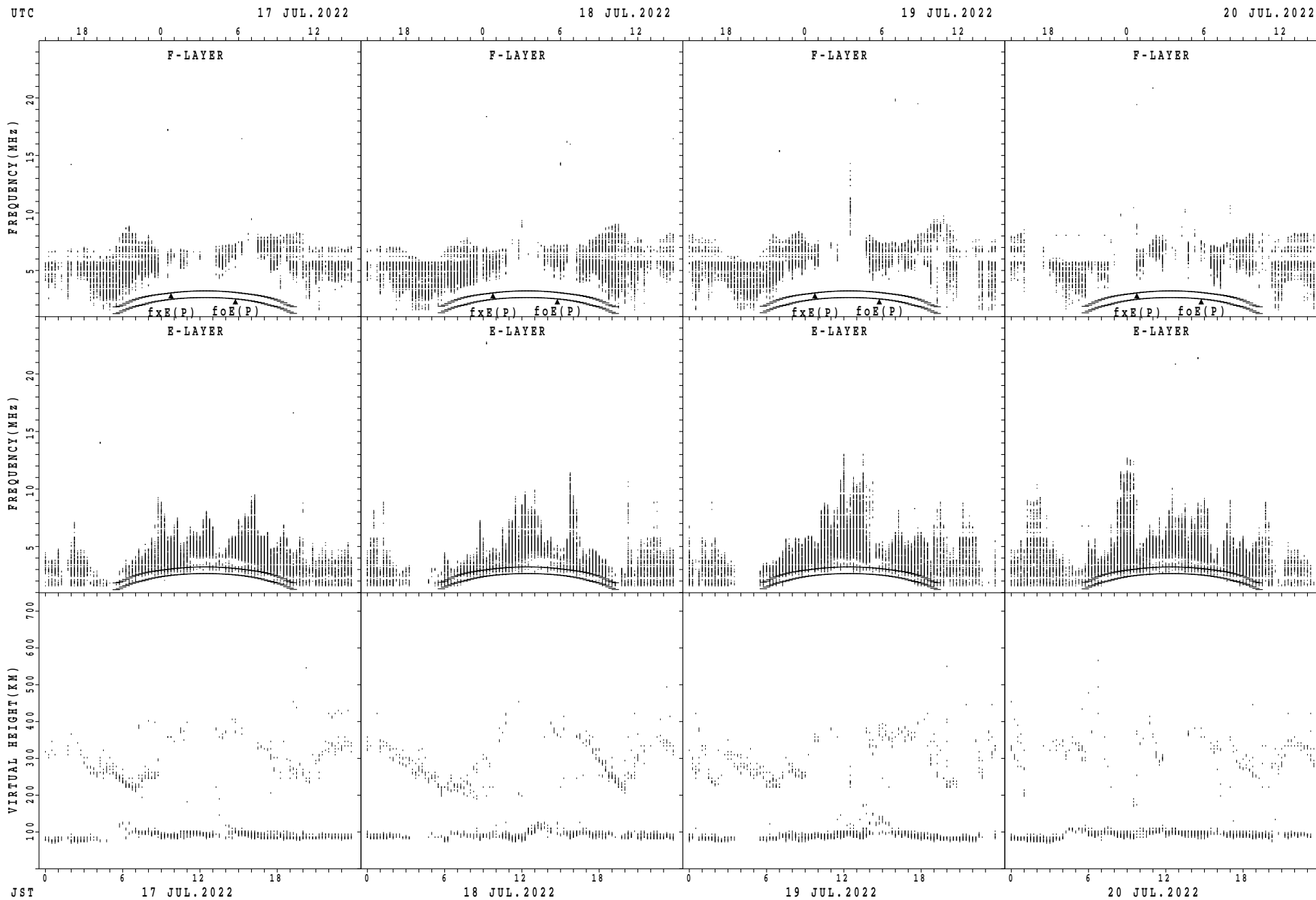
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



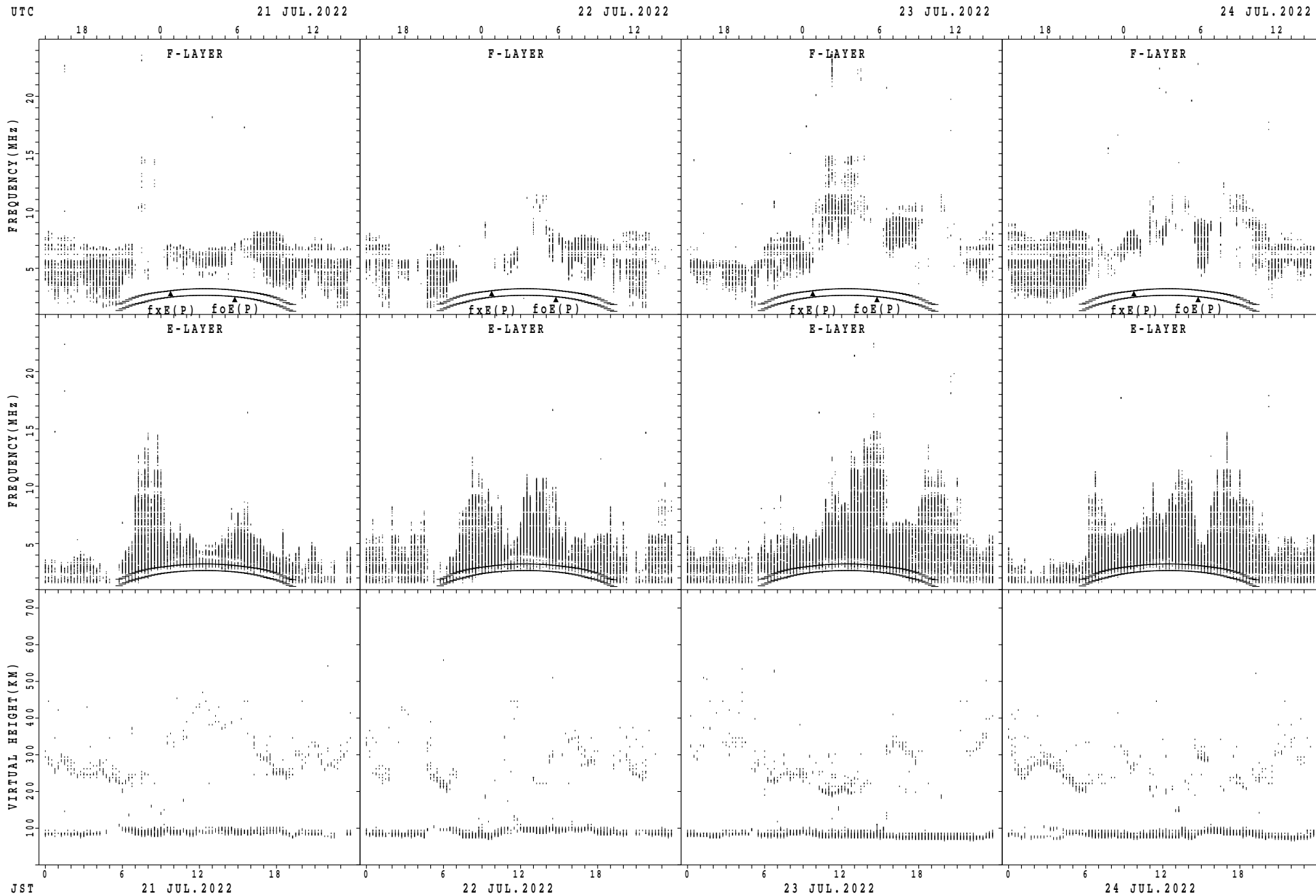
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



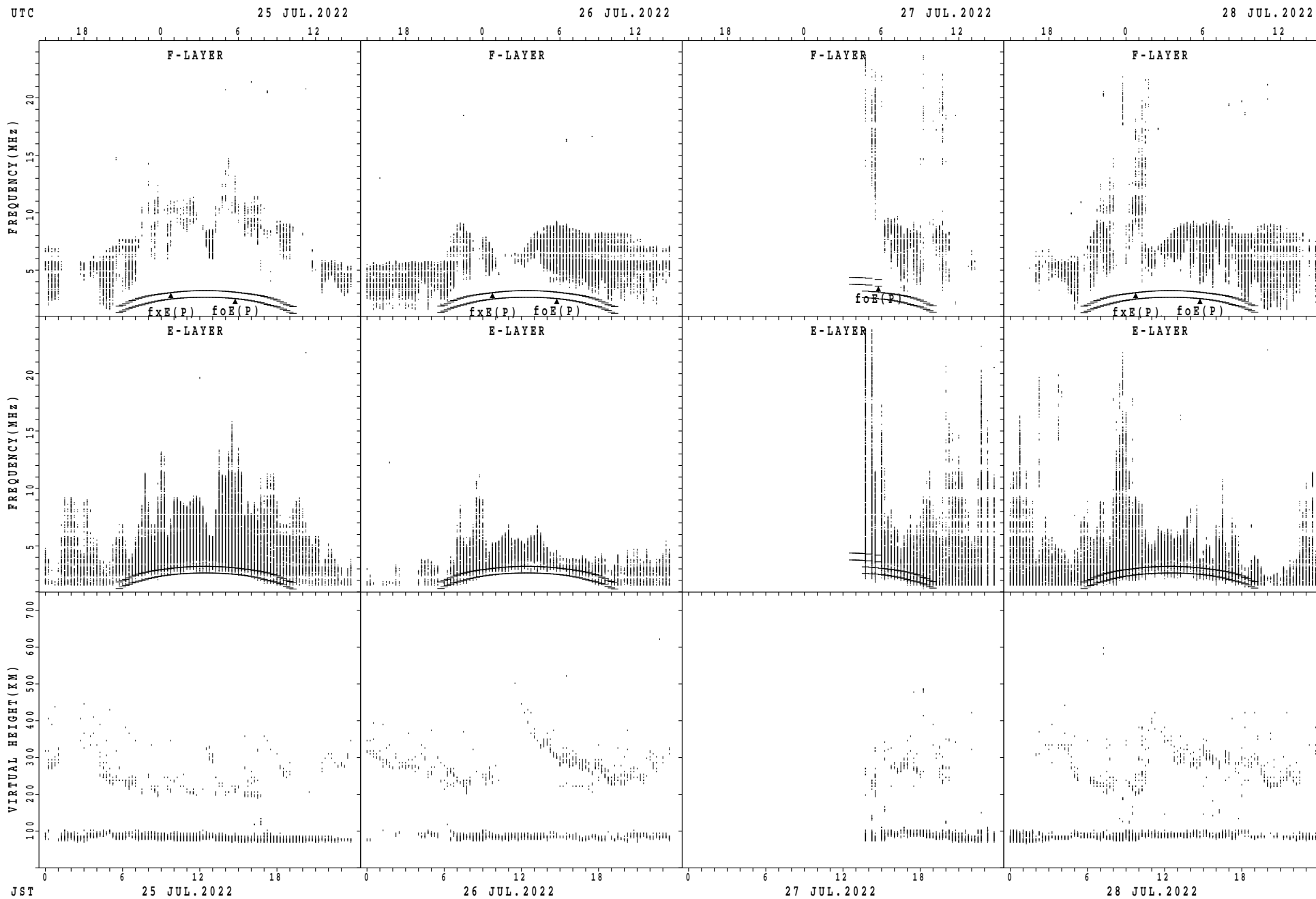
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



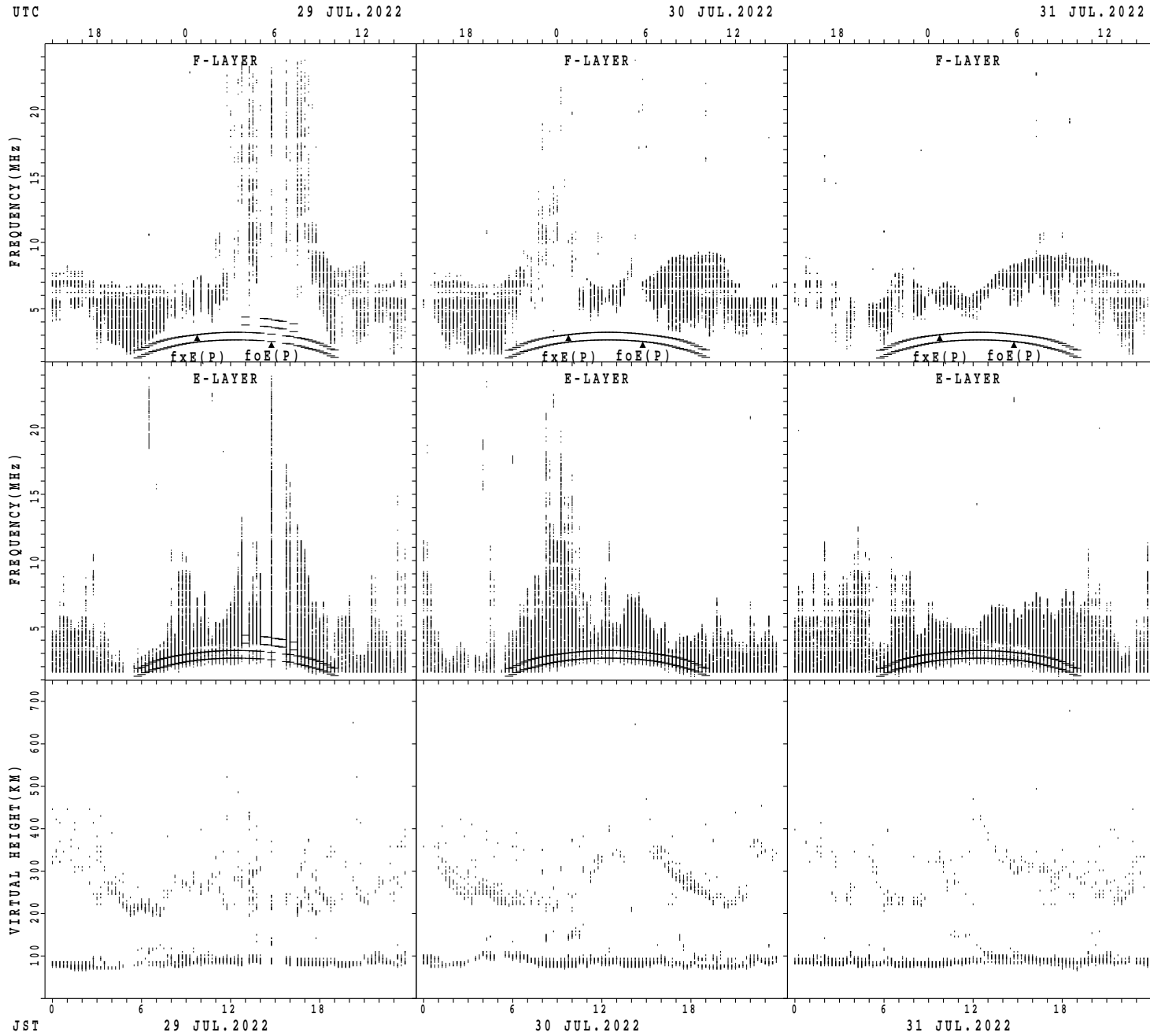
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



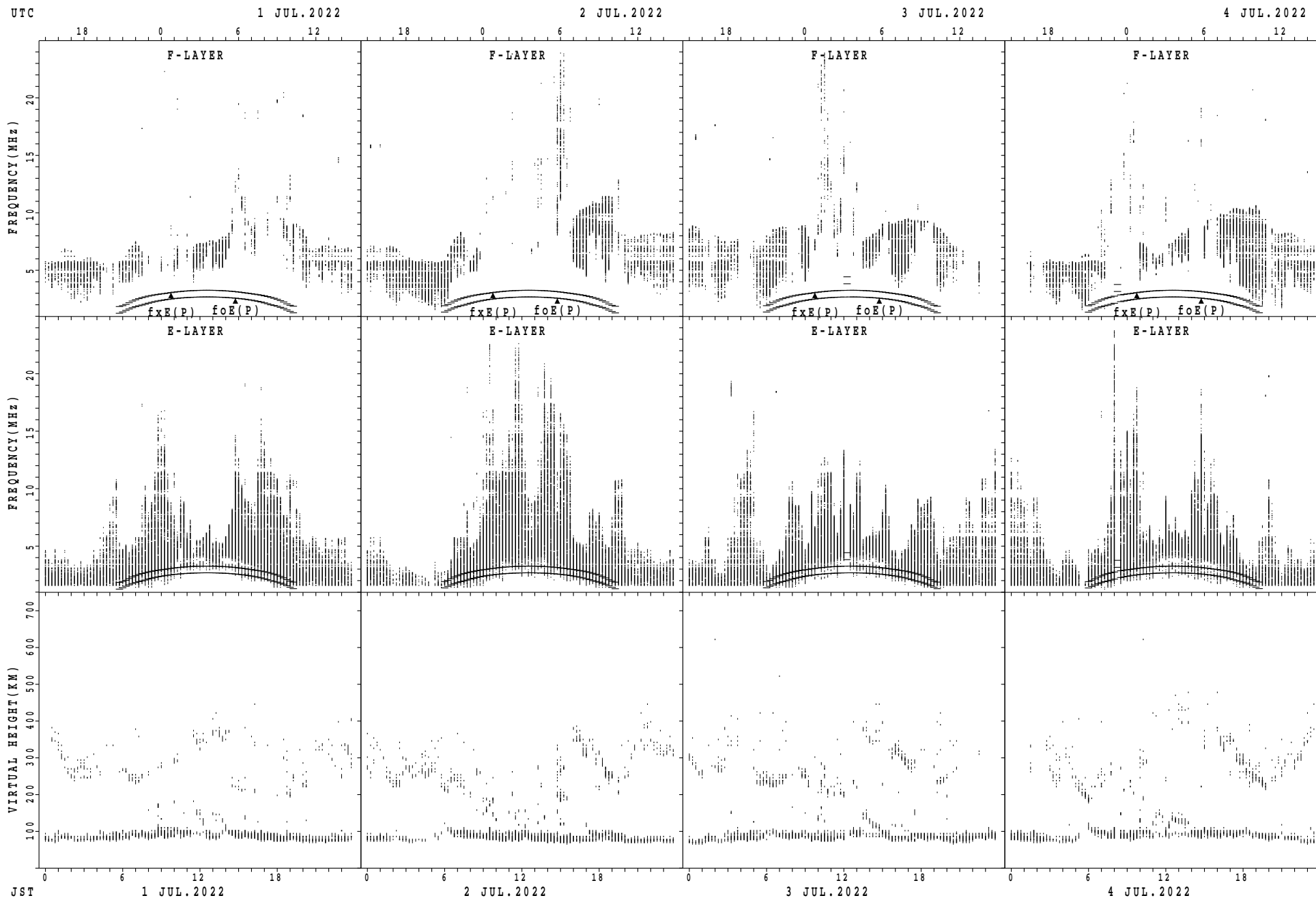
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



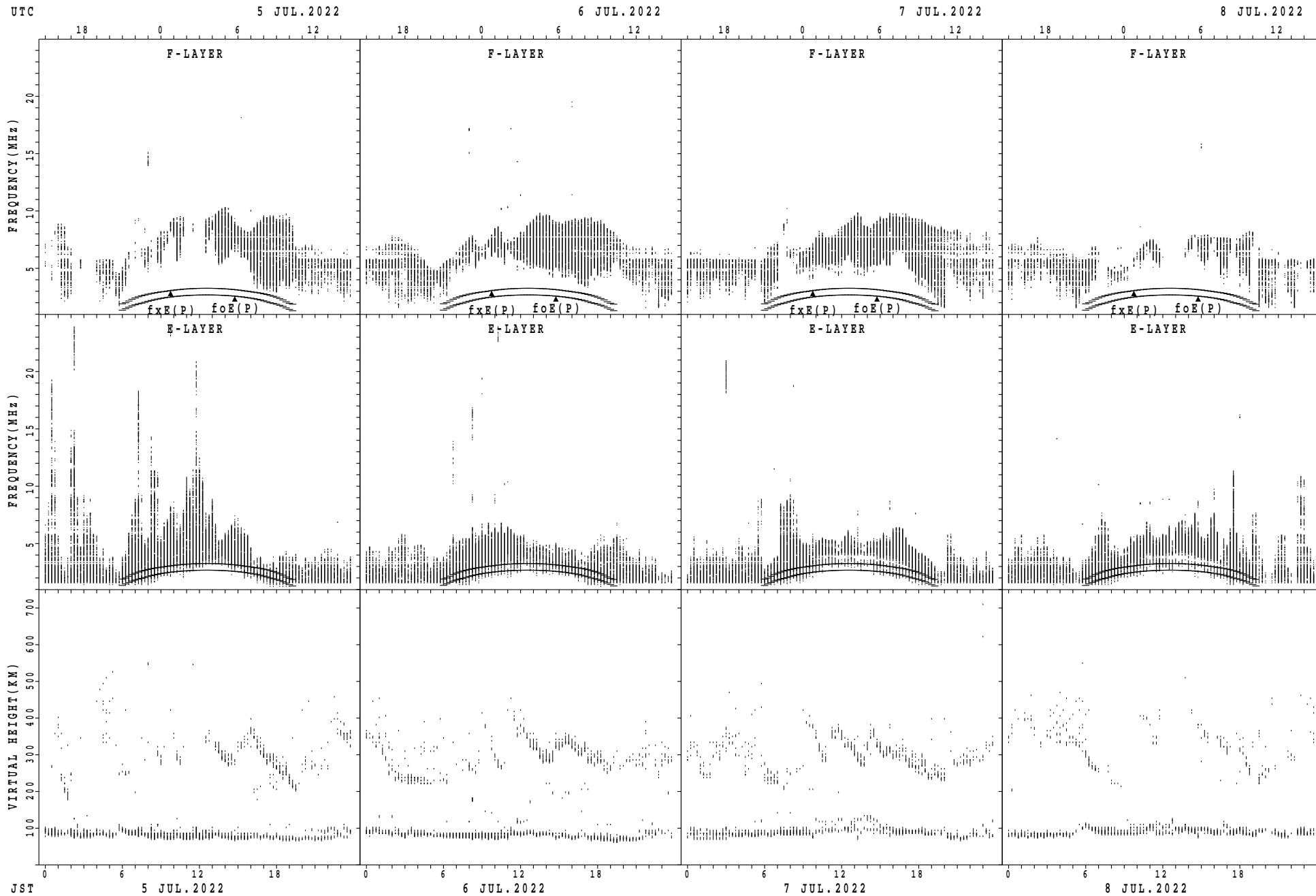
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



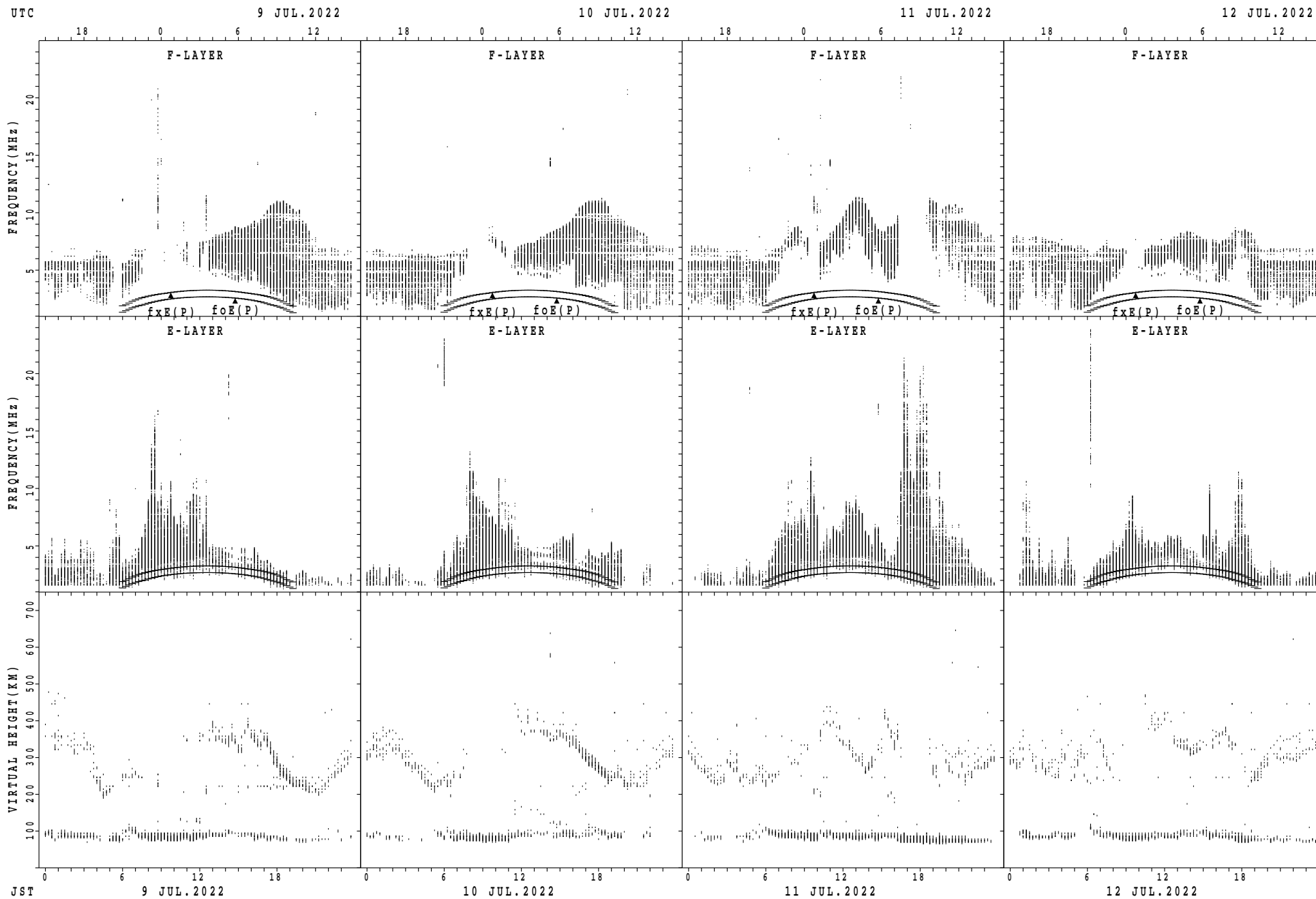
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



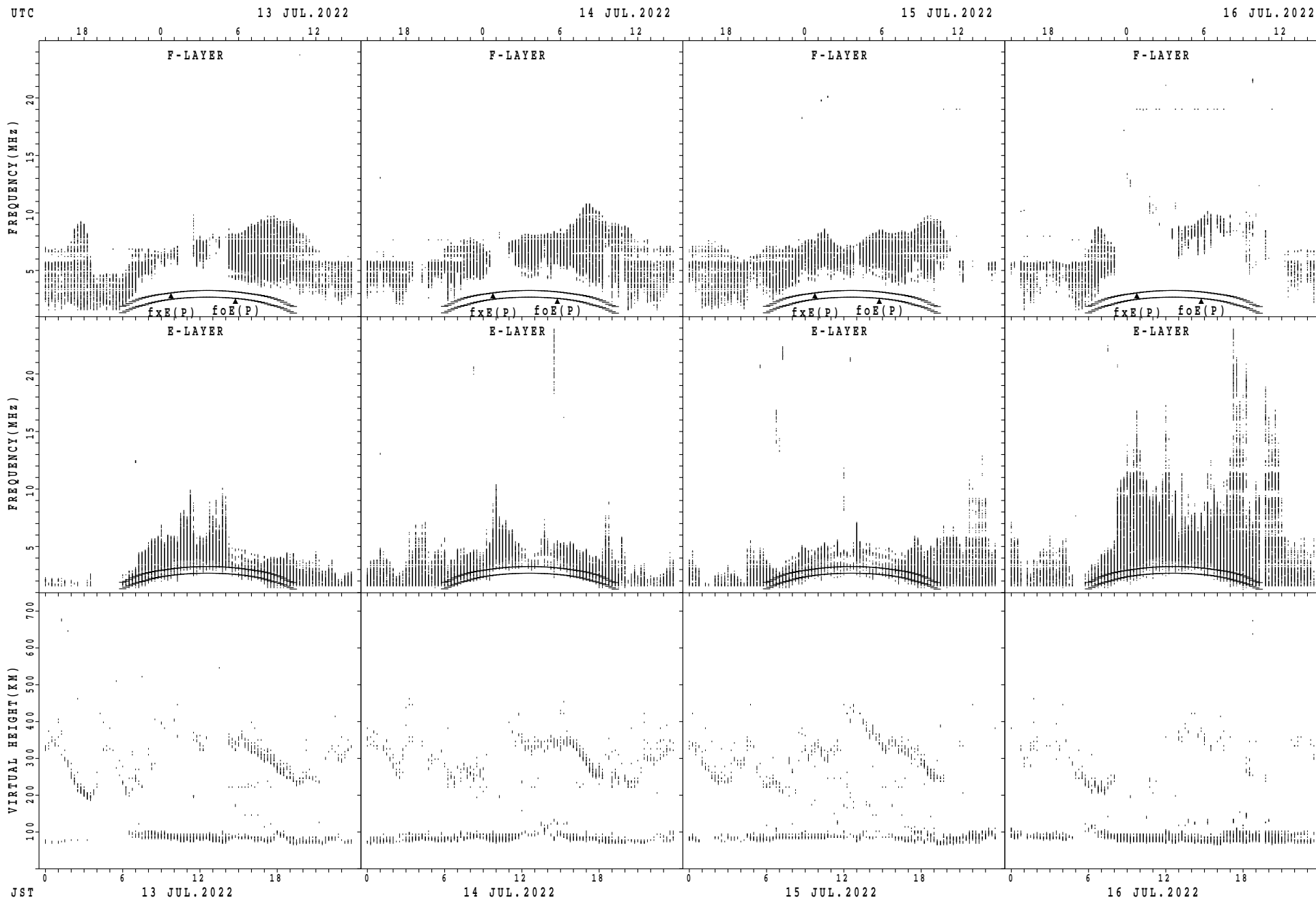
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



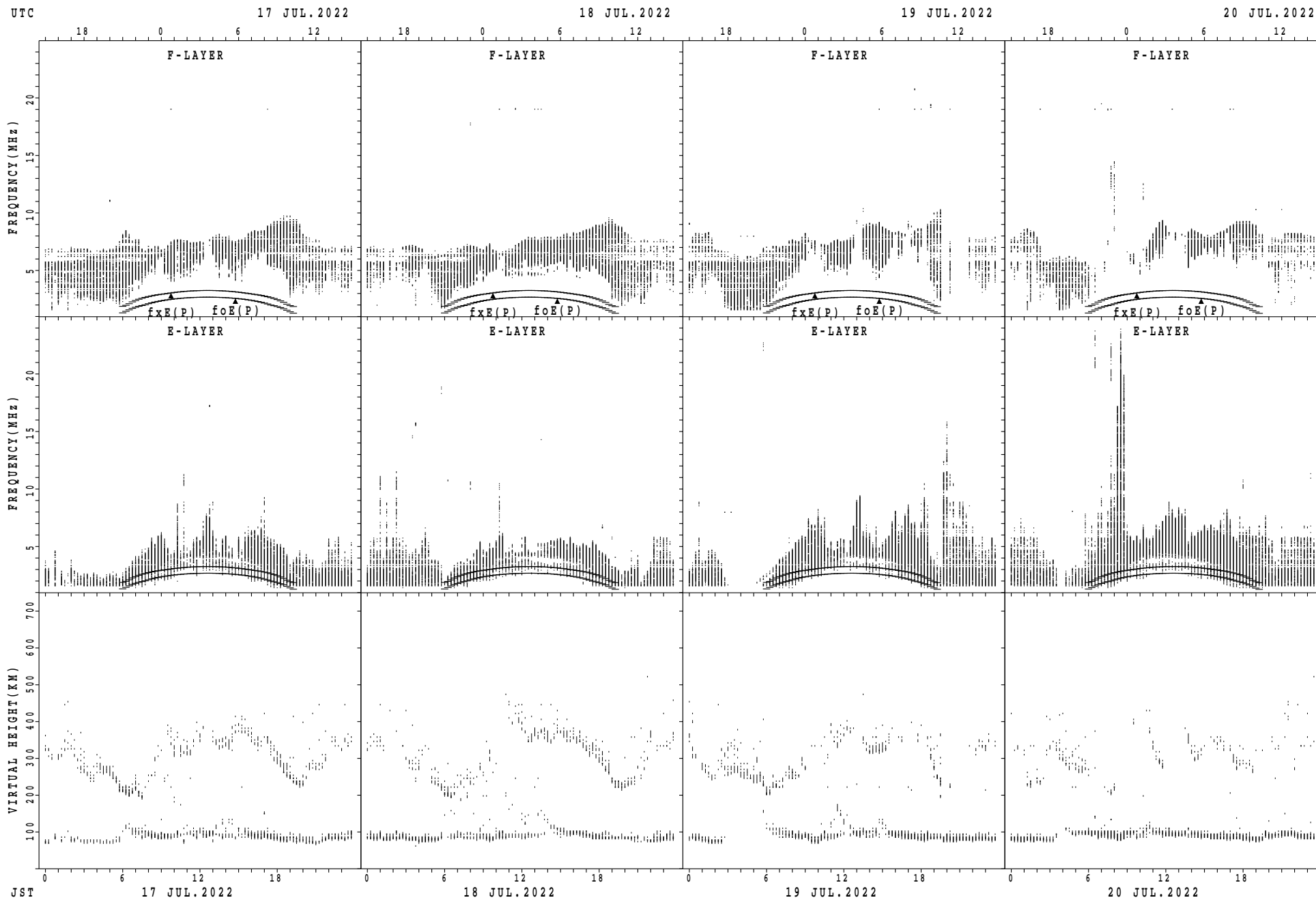
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



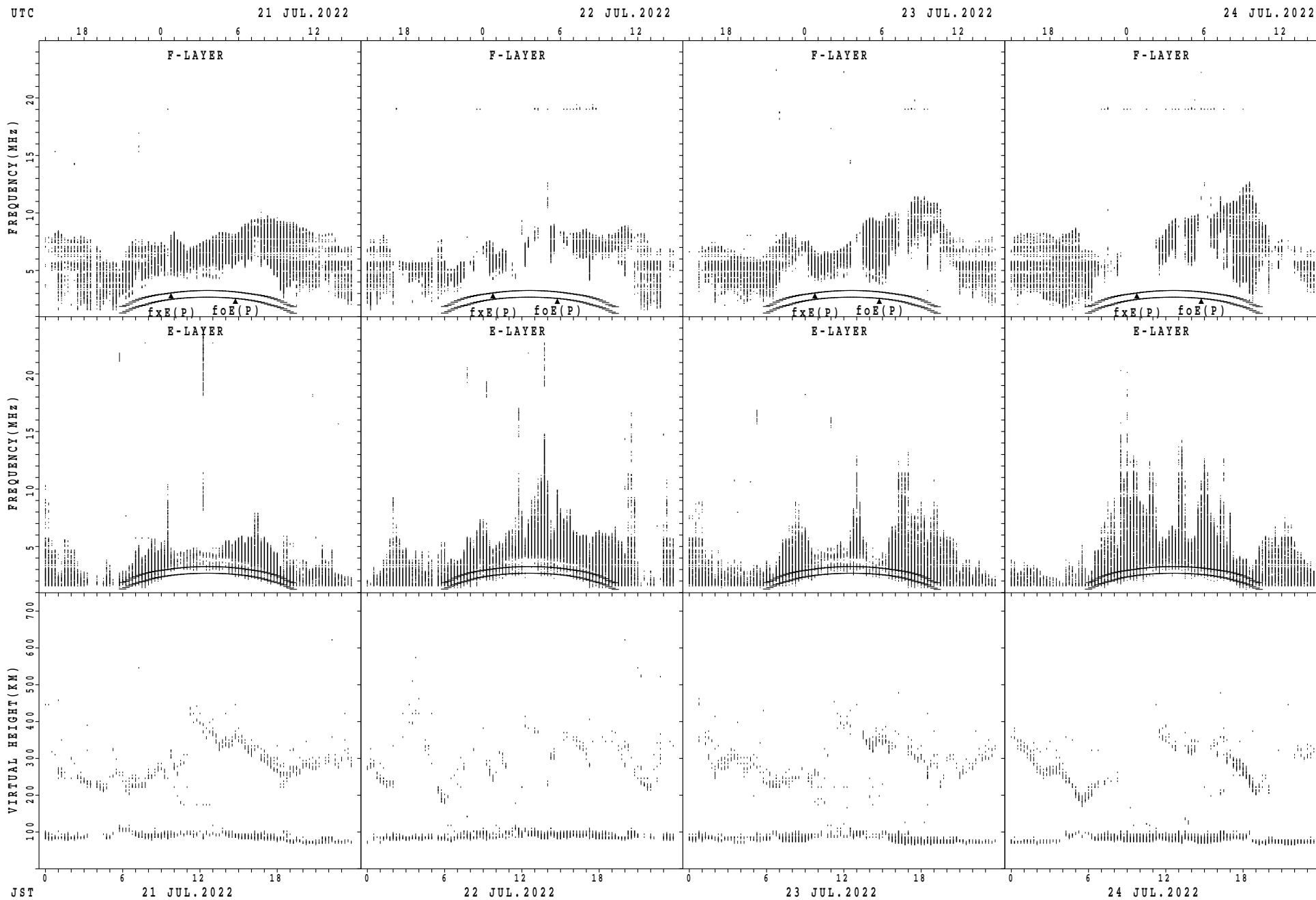
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



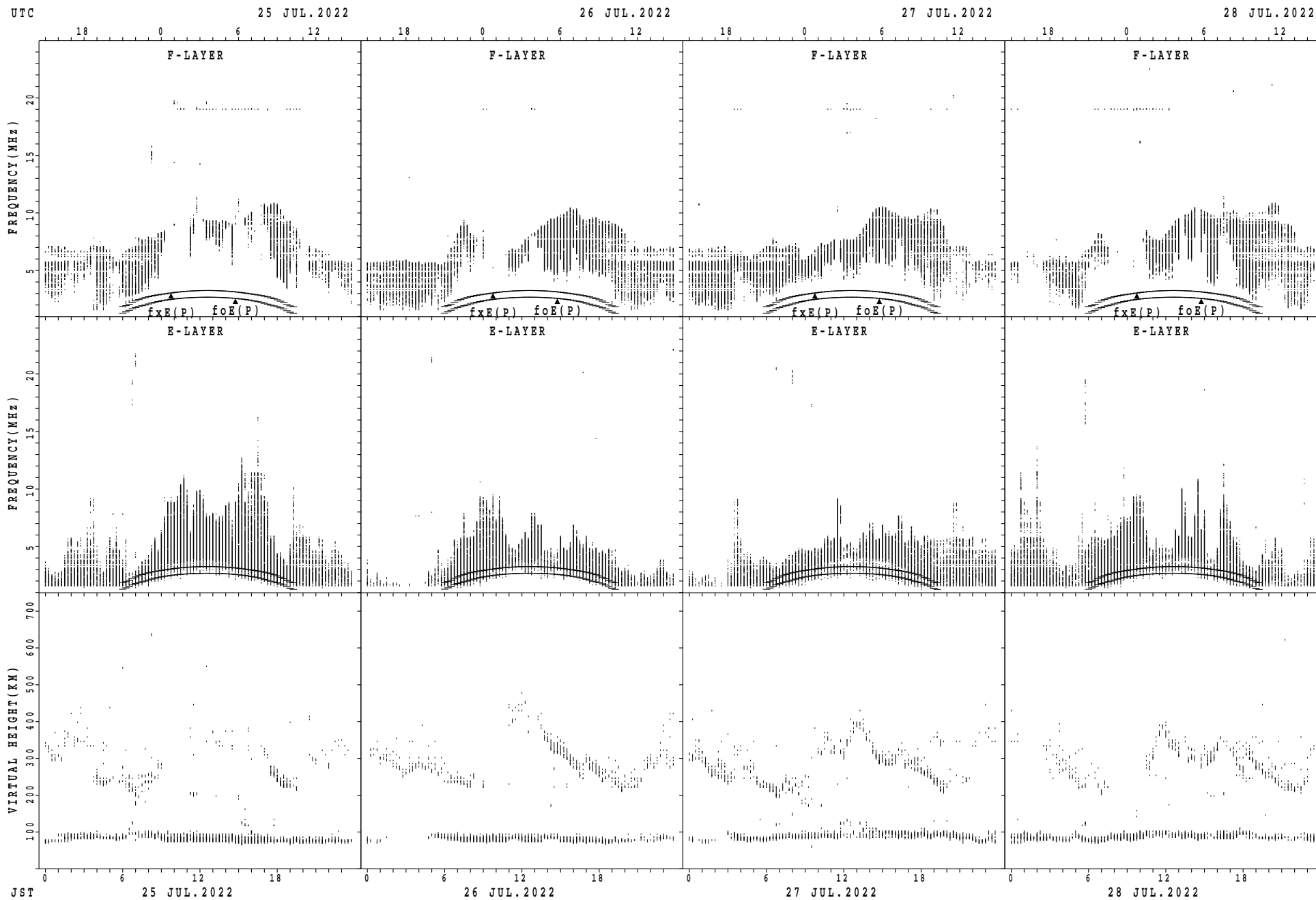
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



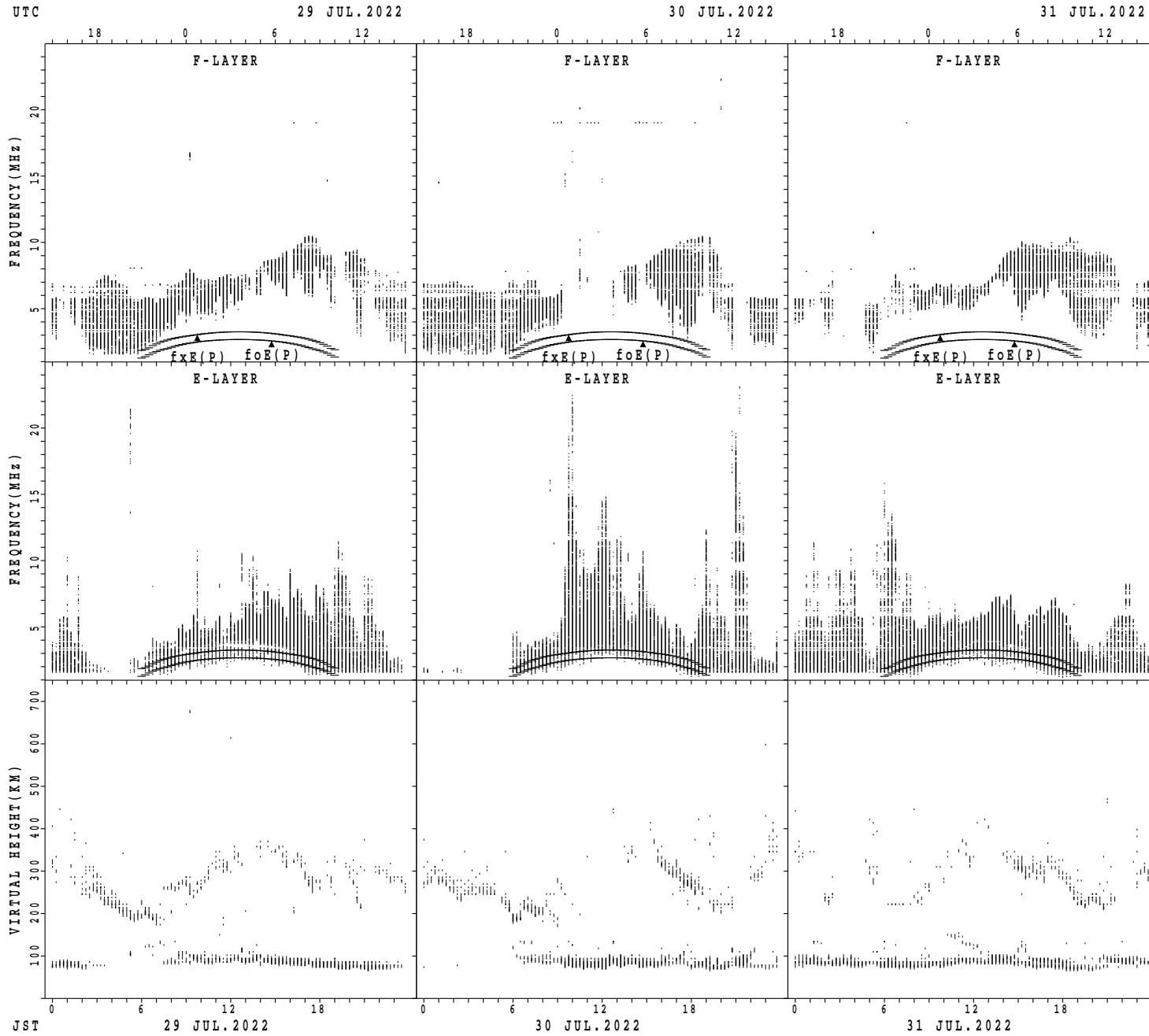
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

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

h'F STATION Wakkanai LAT. 45°10.0'N LON. 141°45.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1			1		2	6	6										17	15	7	11	8	6	1
MED	288			192		327	333	206										206	206	250	272	278	314	292
U Q	144			96		340	340	254										246	222	288	314	294	322	146
L Q	144			96		314	306	194										200	198	200	204	270	292	146

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	29	27	29	27	28	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30	28
MED	96	96	96	92	96	98	98	96	96	96	96	96	96	94	96	96	96	96	96	96	96	96	96	94
U Q	97	98	98	98	98	100	100	98	98	98	98	98	98	96	98	98	98	98	98	98	98	98	98	96
L Q	92	92	92	90	94	94	96	94	94	94	96	94	92	94	94	94	92	94	94	94	94	94	94	92

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	3	5	2			1	14	20										18	14	15	12	5	2	4
MED	202	304	250			198	245	221										258	276	240	255	300	325	331
U Q	346	326	274			99	306	267										310	288	272	306	361	336	397
L Q	192	268	226			99	232	211										204	210	210	234	269	314	262

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	31	31	30	31	27	26	30	30	31	30	31	30	30	30	31	31	31	31	31	30	31	31	31	31
MED	94	94	94	96	96	98	98	97	96	96	96	96	96	96	98	96	96	96	96	95	94	96	96	94
U Q	96	96	96	96	98	98	98	98	98	96	98	98	98	98	100	98	100	98	98	98	98	96	98	96
L Q	92	92	92	92	96	96	96	96	94	94	96	96	94	96	96	94	94	92	94	94	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	3	5		2	4	3	6	9	15									23	21	14	11	6	3	
MED	378	284		275	326	330	245	240	240									296	274	269	272	305	292	
U Q	458	379		276	398	372	272	298	274									320	312	286	298	342	320	
L Q	352	256		274	244	244	216	215	216									262	211	258	250	264	290	

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	29	28	29	29	30	25	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	29
MED	94	94	94	96	96	96	97	96	96	96	96	96	96	96	96	96	98	96	96	94	94	96	94	94
U Q	96	96	96	96	96	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	96
L Q	92	93	92	93	94	94	96	96	94	96	94	94	94	94	94	96	94	94	94	92	92	92	92	94

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	6	7	2	2	1	4	9	16									28	27	26	16	4	4	2
MED	374	310	290	260	331	216	240	232	246									293	270	263	259	299	313	346
U Q	187	356	304	298	406	108	274	241	269									309	286	268	295	324	317	362
L Q	187	292	274	222	256	108	224	220	216									225	242	242	239	251	288	330

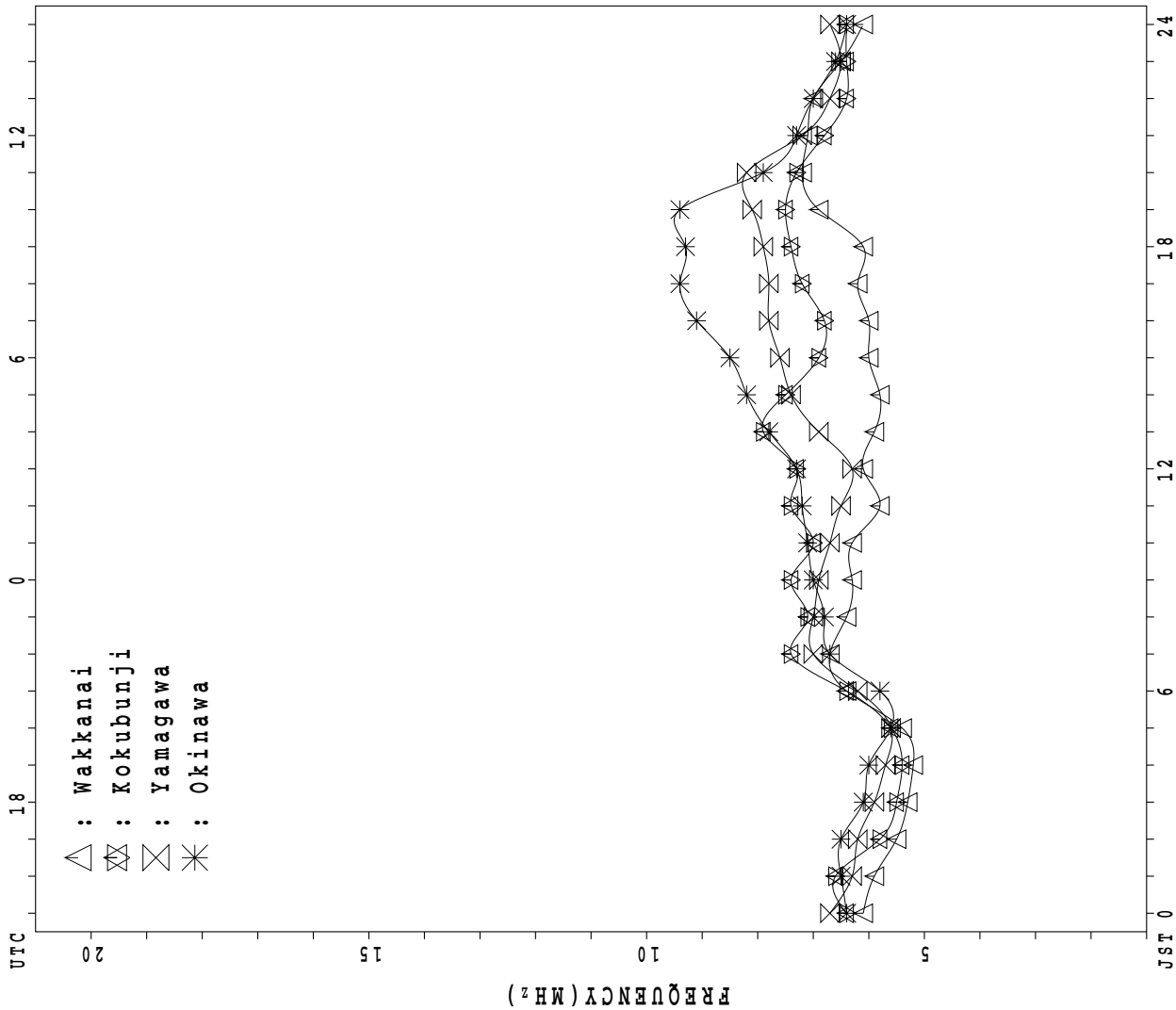
h'Es

	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	31	31	28	27	25	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	94	96	96	96	96	96	96	98	96	96	96	96	96	96	96	98	94	96	96	94	94	94	96	94
U Q	96	96	98	96	96	98	98	98	98	98	96	98	98	98	98	98	98	98	98	96	96	96	96	96
L Q	92	92	92	92	92	94	92	94	96	94	94	94	94	94	92	94	94	94	94	94	92	90	92	92

MONTHLY MEDIANS PLOT OF fOF2

JUL. 2022

AUTOMATIC SCALING



UTC

FREQUENCY (MHz)

18

0

6

12

18

24

0

5

10

15

20

IONOSPHERIC DATA STATION Wakkanai

JUL. 2022 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 71	X 65	X 66																			X 91	X 78	X 72	
2	X 67	X 66	X 64																				X 79	X 84	X 87
3	X 79	X 76	X 71																				X 77	X 83	X 89
4	X 70	X 63	X 58	57																			X 79	X 77	X 76
5	X 78	X 77	X 60																				X 79	X 76	X 72
6	X 66	X 66	X 60																				X 78	X 83	X 77
7	X 70	X 70	X 63																				X 71	X 71	X 64
8	X 58	X 57	X 56																				X 59	X 59	X 60
9	X 58	X 57	X 55																				X 76	X 82	X 69
10	X 66	X 65	X 59																				X 85	X 73	X 73
11	X 72	X 70	X 70	69																			X 74	X 74	X 74
12	X 71	X 70	X 70																				X 71	X 68	X 65
13	X 65	X 65	X 61																				X 75	X 75	X 75
14	X 66	X 66	X 63																				X 83	X 71	X 65
15	X 65	X 64	X 58	58																			X 77	X 72	X 73
16	X 61	X 61	X 58																				X 79	X 71	X 71
17	X 63	X 60	X 59																				X 76	X 77	X 72
18	X 66	X 66	X 63																				X 78	X 73	X 70
19	X 72	X 72	X 66																				X 99	X 87	X 77
20	X 70	X 63	X 55																				X 70	X 72	X 71
21	X 70	X 66	X 63																				X 72	X 71	X 71
22	X 71	X 59	X 54																				X 82	X 70	X A
23	X 84	X 82	X 63																				X 87	X 77	X 73
24	X 71	X 70	X 67																				X 83	X 81	X 76
25	X 71	X 66	X 63																				X 92	X 84	X 70
26	X 68	X 63	X 59		64																		X 78	X 76	X 71
27	X 71	X 70	X 66																				0 99	X 67	X 73
28	X 70	X 66	X 65		65			91															X 90	X 87	X 78
29	X 68	X 65	X 57		64	58																	X A	X A	X 65
30	X 58	X 58	X 57																				X 83	X 83	X 74
31	X 63	X 59	X 58																				X 77	X 72	X 66
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	3	3	1		1														30	30	30	
MED	X 70	X 66	X 61	58	64	58		91														X 78	X 76	X 72	
U Q	X 71	X 70	X 65	69	65																	X 83	X 82	X 75	
L Q	X 65	X 63	X 58	57	64																	X 76	X 71	X 70	

JUL. 2022 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

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	64	58	59	55	51	55	65	68	62	64	63	64	62	63	62	59	56	A	A	72	79	84	71	65	
2	60	59	57	55	54	57	66	77	72	67	64	63	63	68	72	72	73	74	80	79	80	72	J R 77	80	
3	72	69	64	60	61	68	70	72	62	62	62	J A 57	63	67	64	65	64	58	A	70	71	70	F 70	F	
4	58	56	51	F 47	53	52	58	64	65	64	60	60	59	59	62	65	67	A	78	78	72	72	70	69	
5	71	70	53	49	55	63	60	A	54	A	63	62	58	52	56	56	58	A	A	62	72	72	69	65	
6	59	59	53	52	52	57	64	72	75	75	66	R 64	65	A	61	64	65	R 62	60	60	71	71	76	70	
7	63	63	56	57	58	58	54	56	58	62	66	63	58	61	59	60	A	A	59	A	64	64	64	57	
8	51	50	49	43	42	46	52	A	A	A	A	A	A	A	A	51	48	45	46	48	52	52	52	53	
9	51	50	48	50	51	63	70	79	72	63	57	56	54	55	56	58	56	59	60	62	66	69	F 58	62	
10	59	58	52	F 51	49	53	60	67	65	76	J R U 61	63	68	70	A	62	61	62	62	75	87	78	66	66	
11	65	63	57	F 57	53	54	58	58	A	A	57	57	A	54	56	56	58	60	61	63	66	67	67	67	
12	64	63	63	52	48	53	62	66	59	63	50	62	59	54	57	61	61	64	69	69	76	64	R 61	58	
13	58	58	54	54	57	55	66	63	A	A	A	52	54	56	A	A	55	57	59	59	68	68	68	68	
14	59	59	56	54	48	53	60	60	67	63	56	60	61	58	58	59	60	60	63	70	78	76	64	58	
15	58	57	51	46	51	60	72	70	72	H 60	55	60	56	58	57	57	54	54	54	56	68	70	65	66	
16	54	54	51	52	50	56	65	58	A	58	R 60	59	57	59	62	64	61	62	65	68	71	72	64	64	
17	54	53	52	52	56	60	64	66	63	62	55	R 50	R 52	R 54	56	59	60	J R 56	59	A	69	70	65	65	
18	59	59	56	58	58	62	77	78	62	60	51	56	56	56	56	58	58	A	61	69	72	71	66	63	
19	65	65	59	54	51	54	59	59	70	59	A	63	60	58	58	62	60	64	70	85	90	92	80	70	
20	63	56	48	48	47	54	45	51	49	56	A	52	56	A	56	60	A	58	60	59	A	63	65	64	
21	63	59	56	54	54	61	66	60	A	A	A	R 48	54	54	51	54	54	A	56	52	58	65	64	64	
22	64	52	47	41	41	52	54	63	62	66	A	63	64	68	63	64	67	63	67	71	76	F 63	63	A	
23	F	F	56	50	48	53	59	A	A	61	64	68	69	73	69	78	76	80	81	91	77	80	70	66	
24	64	63	60	58	60	64	64	70	71	71	71	73	73	78	A	76	75	75	69	70	78	76	73	69	
25	64	59	56	58	55	58	64	A	A	A	62	A	66	61	64	A	A	A	A	70	72	68	F 68	63	
26	F 55	56	52	55	F 52	62	63	A	A	72	66	A	66	A	71	71	67	62	64	60	72	71	69	64	
27	S 59	63	F 52	52	50	53	58	60	68	65	64	64	67	64	66	67	67	70	66	70	82	92	60	66	
28	59	59	58	56	F 53	61	70	F 79	71	92	A	61	61	63	R 61	A	67	62	70	76	83	83	79	71	
29	60	58	50	50	F 48	46	50	A	70	73	60	A	A	A	54	60	62	63	67	A	60	64	A	58	
30	51	51	50	48	48	49	54	A	A	68	A	A	A	A	A	63	60	58	55	56	66	74	76	76	67
31	56	52	51	51	49	55	56	68	73	72	A	A	A	A	A	A	63	A	A	79	81	70	65	59	
	00	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	31	30	31	31	31	24	22	25	21	25	25	25	27	27	28	23	25	30	29	29	28	29	
MED	59	58	53	52	51	55	62	66	66	64	61	62	60	59	60	62	61	62	62	69	72	71	66	65	
U Q	64	63	57	55	55	61	66	71	71	72	64	63	64	66	63	65	67	64	69	72	78	76	70	68	
L Q	58	56	51	50	48	53	58	60	62	62	56	57	56	54	56	58	58	58	59	60	68	68	64	62	

JUL. 2022 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	L	A	A	488	A	A	468	A	A	A	L				
2			L	L	L	364	408	432	440		A	488	488	488	472	472	452	L		L				
3				L	L	356	408	444	524		A	A	A	L	A		464	456	428	A				
4					252		A	A	A	A	A	L	L	488	492	480	448	A	A	A				
5					U L	360	L	A	A	A	468	472	472	484		L	L		A	A				
6							432	U L	608	A	A	A	R	A	A	L	A	A	A	A	L			
7					U L	340	420	472	452	480	468	500	488	480		A		A	A	A	A			
8				L	A		380		A	A	A	A	A	A	A		444		424	408	372			
9					L		L	A	A		484	484	484	484		A	472	452	L	A	L			
10					232		L	L	A	A	A	A	A	A	A		A	A	A	L				
11					U L	404	A	A	A	A	A	496		A	496	484	A	A		L	L			
12			L	A		360		A	A	A	460			508	484		A	A	L	L	L			
13			A	L		372	404		A	A	A	A	476	484	480		A	A	U L	L	A	A	A	
14				U L	256	360	400		A	A	A	508		L	A		L	A	A	A	L			
15					412		A	688		480		A	A		504	480	452	464	L	H	L	L	A	
16					L	A	A	A	A	A	536	508	508	H	512	512	484		L	L	L	L		
17					L		392	436	464	A	488	484	492		L	484	A	A	A	A		A		
18				L	L		A	A		L	476	488	480	480	488	488	484	460	460	L	A	A	A	
19					L	368	412		A	L	468	492		A	500	560	492	472	476	L	A	A	L	
20				U L	240	316	L	A		A	440	A	U L	488	488		A	A	A	L	A	A	A	A
21					L	L	A	A	A	L	L	L	488		A	U L	460	460	436	A	L	A		
22				L	L	364		L	A	A	A	A	A		496		A	L	A	A	A			
23					L	A	A	A		A	472		492	L	L	U L	L	L	A					
24							L	A	L	L	492		492	A	A		460	A	L	L	A			
25					376		A	A	A	A	A	476		A	A	548		A	A	A	A			
26							A	A	A	A	A	A	A	A	A	L	A	L	A	A	A	A		
27					L	L	400	A	A	A	L	472		A		L	E	A	A	A	A	A		
28					L	L	L	A	L	A	A	A		A	492		A	A	440	A	A	L		
29					L	L	A	A	L	A	464		A	A		A	A	A	A	A		A		
30					L	L	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
31						L	A		A	A	A	A	A	A	A	A		424	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				1	3	14	11	7	8	7	9	16	15	16	16	16	10	7	2					
MED				U L	304	256	360	404	444	460	480	484	488	488	492	484	465	452	432	370				
U Q				L	272	368	412	608	472	488	490	500	492	496	490	478	460	436						
L Q				U L	240	340	400	436	446	472	468	478	484	482	476	460	436	424						

JUL.2022 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				A	236	208	268	300	336	336	348	348	328	264	328	352	388	296	280	224	A			
2				B	B	232	272	312	324	344	364	364	380	336	348	348	320	280	240	268	A			
3				B	180	212	272	296	312	332	352	344	352	356	A	340	300	276	228	A	A			
4				A	A	A	272	300	336	344	340	344	320	A	364	332	308	284	232	A	A			
5				B	A	208	284	296	340	340	340	356	A	364	340	340	328	276	228	B	B			
6				A	A	232	292	316	344	356	368	348	348	316	324	A	364	284	236	A	A			
7				A	A	232	284	316	332	372	372	372	388	360	328	360	A	A	236	A	A			
8				220	220	208	252	300	332	368	360	332	324	344	336	348	316	280	212	A	A			
9				A	216	216	296	312	332	348	348	348	348	336	340	304	344	320	264	212	A			
10				A	A	228	A	A	360	372	360	368	A	356	A	356	320	296	240	A	A			
11				A	A	224	284	316	348	364	360	A	A	A	A	A	A	A	A	A	A			
12				A	A	236	280	320	348	368	368	368	352	368	356	356	336	292	256	A	A			
13				A	232	232	284	316	344	356	360	A	360	360	368	356	324	288	244	A	A			
14				A	A	228	276	316	348	356	372	356	356	332	352	A	360	296	212	176	B			
15				A	A	228	252	316	320	356	356	356	344	356	380	360	332	308	244	A	B			
16				A	224	248	288	324	340	348	364	372	372	372	A	A	A	332	284	248	216	A		
17				B	216	224	272	312	336	344	368	368	A	388	368	356	324	276	A	A	A			
18				A	A	224	280	328	336	348	348	348	364	308	316	360	284	A	232	A	A			
19				A	A	212	272	292	336	348	360	360	300	320	288	288	332	288	244	B	184			
20				180	192	224	264	304	324	340	348	348	A	360	364	336	320	276	228	A	A			
21				A	216	216	268	312	328	360	376	376	364	348	328	292	284	224	224	A	244			
22				B	172	220	256	304	320	340	348	324	348	320	A	A	A	288	224	A	A			
23				A	A	A	264	304	332	348	348	356	356	320	A	320	316	284	204	A	A			
24				A	A	200	252	300	316	320	348	356	356	348	328	336	300	268	212	A	A			
25				232	224	260	296	312	336	336	364	344	352	320	A	A	A	A	A	A	A			
26				A	A	204	260	292	320	320	328	A	A	A	328	216	A	A	228	284	A			
27				A	A	212	240	300	312	332	332	348	336	324	364	332	304	272	196	B	A			
28				244	244	192	252	296	308	244	324	336	A	340	340	340	308	256	192	224	A			
29				A	A	300	268	300	328	328	356	340	356	304	304	488	356	A	A	A	A			
30				A	220	A	272	300	320	320	320	320	A	A	A	A	A	A	A	A	A			
31				A	A	A	248	292	312	328	328	336	336	312	A	252	264	268	224	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				4	12	27	30	30	31	31	31	28	23	27	23	24	25	24	26	7	2			
MED				226	218	224	272	304	332	344	352	352	352	344	340	340	320	284	230	224	214			
U Q				238	228	232	280	316	340	356	364	364	360	360	364	356	334	290	244	268				
L Q				200	204	212	260	300	320	332	340	344	336	320	328	326	306	276	224	212				

JUL. 2022 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	J A	24	26	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A		
2	J A	J A	23	22	E B	D	J A	J A	J A	J A	J A	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		
3	E B	E B	E B	E B	26	26	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A		
4	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B		
5	J A	26	21	16	20	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	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	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	25	19	23	23	41	53	70	73	78	45	46	47	71	51	89	123	218	136	143	85	101	84		
8	J A	J A	41	26	40	32	49	34	51	58	107	125	93	105	57	43	118	58	55	100	42	61	39	81	83	
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	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	23	52	51	26	26	38	25	4	87	122	169	167	110	68	162	76	76	88	105	85	62	63	79	52	
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	J A	J A	
12	J A	J A	31	37	53	32	53	87	63	64	45	81	58	55	63	87	64	62	32	33	25	29	26	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	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	22	41	20	32	32	54	50	63	51	52	57	93	50	84	57	81	89	24	16	53	32	52		
15	J A	J A	24	22	20	38	51	70	J A	86	58	129	147	84	45	46	49	40	J A	45	54	54	38	86	86	52
16	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
17	E B	E B	E B	E B	E B	24	29	31	36	41	47	42	41	42	43	45	50	J A	J A	J A	J A	J A	J A	J A	J A	
18	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	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	J A	J A	
20	E B	J A	22	22	20	25	31	49	39	61	61	53	64	58	61	105	121	106	134	124	62	78	61	J A		
21	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
22	J A	J A	31	16	26	28	34	40	49	60	121	146	63	119	87	50	64	82	111	51	J A	J A	J A	J A		
23	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
24	28	31	40	39	45	27	41	37	103	48	47	69	48	63	177	70	70	89	57	63	35	76	53	41		
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	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
27	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	
29	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
30	J A	J A	22	50	39	39	42	100	162	96	103	75	128	93	108	55	56	63	51	53	67	52	40	40		
31	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MED	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A		
U Q	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A		
L Q	24	23	23	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A		

JUL.2022 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B	E B	E B	E B	E A			E A	E A		E A	E A		A		47	42	A	A	A	G			E B
2	E B	E B	E B	E B	E B								G		G		G				G		E B	E B
3	E B	E B	E B	E B	G														A	A				E B
4	21	18	18	22	26	20	47	49	52	56	50	37	40	39		G		A	A	A			E B	E B
5	E B	E B	E B	E B	E B			A	A	A	A							A	A	A				E B
6	18	E B	E B	E B	E B	G						A	E A	A	A		A						E B	
7	E B	E B	E B	E B	E B	G											G	A	A	A		A	A	E B
8	22	24	E B	G	G			A	A	A	A	A	A	A	A		A	A					A	18
9	E B	E B			G													G						E B
10	20	16	18	18	22	G									A	A								E B
11	20	16	22	16	22	34	34	52	123	161	51	43	107	43	39	51	37	35	27	23	23	20	20	23
12	16	16	16	20	31	28	E A	50	48	39	41	56	55	42	41	46		A		G			E B	
13	E B	21	28	20	20	21	36		A	A	A	A	A		G	A	A	A						E B
14	E B	16	E B	E B	E B																			E B
15	24	16	E B	E B	E B																			E B
16	25	23	17	22	G	G		A	A												G		E B	
17	E B	E B	E B	E B	E B	G												A	A			A	A	E B
18	21	E B	E B	E B	E B													A	A					E B
19	E B	E B	E B	21	22	22	28	45	40	40	A	A						A	A				E B	
20	E B	21	E B	G	G						A	A					A	A			A	A	E B	
21	E B	E B	E B	E B	E B	G												A	A				E B	
22	21	E B	E B	E B	E B	G																		E B
23	21	23	23	16	21	23	55	77	125	43	51	41	42	42	38	38		G					E B	
24	17	18	18	19	24	24	36	32	47	44	41	57	44	54	177	37	48	43	40	62	24	44	24	19
25	24	22	E B	G				A	A	A	A	A	A		A	A		A	A	A	A			E B
26	20	22	16	17	24	24	56	A	A	A														E B
27	35	21	21	28	G	G																		E B
28	E B	34	27	G	E B													A	A					E B
29	18	30	23	23	23	28	32	75	46	49	42	90	131	40	47	54	46	43	163	22		A	A	E B
30	45	20	E B	23	31	25	35	100	162	55	103	75	128	93	41	45	29	36	42	43	54	24	22	22
31	20	20	25	16	22	36	30	46	45	54	144	99	87	108	142	120	36	116	120	22	23	24	37	38
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	30	31	31	31	30	31	30	30	29	29	30	31	31	30	31	30	31
MED	18	16	16	17	21	24	34	47	48	51	50	42	44	43	41	42	39	43	39	23	22	21	22	21
U Q	21	21	21	22	23	28	38	A	A	A	A	A	A	A	A			A	A	A				E B
L Q	E B	E B	E B	E B	E B	G																		E B

JUL.2022 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

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

JUL.2022 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	304	303	289	280	324	293	316	317	289	331	266	U W 309	311	316	323	291	309	A	A	295	295	294	319	298				
2	303	302	296	287	284	299	299	327	297	333	301	301	270	287	309	289	284	284	307	284	295	288	R 297					
3	283	291	285	298	279	283	308	324	317	279	327	J A 251	296	317	300	319	233	231	A	309	292	277	F 297					
4	303	303	319	F 296	290	270	289	335	324	331	330	267	287	265	282	287	279	A	A	304	314	291	290	277	280			
5	296	310	309	285	298	296	295	A	255	A	294	294	289	286	327	318	318	A	A	307	298	298	297	297				
6	307	307	268	286	291	295	301	318	309	330	285	R 216	317	A	298	298	317	R	317	296	287	304	293	303				
7	300	295	294	303	353	352	281	278	316	282	309	308	300	299	299	299	A	A	233	A	301	294	292	262				
8	262	247	270	269	268	237	266	A	A	A	A	A	A	A	A	A	A	A	A	232	257	243	267	277	273	270	266	264
9	263	263	272	297	295	302	275	309	329	310	290	290	265	278	290	298	292	300	303	294	294	296	F 262	262				
10	281	258	257	289	286	308	274	306	237	206	R U R 278	298	315	A	295	295	294	299	285	309	297	275	275	275				
11	281	280	F	F	295	286	324	235	A	A	270	259	A	248	278	300	297	307	299	289	283	297	298	264				
12	283	261	286	258	245	269	261	260	262	295	319	285	292	308	277	286	286	298	306	270	286	318	289	267				
13	264	283	279	276	276	273	284	305	A	A	A	298	264	265	A	A	262	288	288	287	288	288	281	281				
14	286	285	281	271	271	271	283	283	307	282	272	271	294	295	265	290	284	302	304	295	295	302	324	272				
15	269	260	275	257	278	266	275	238	288	254	255	276	267	269	288	288	259	308	292	284	283	301	288	288				
16	293	265	264	261	272	267	295	306	A	281	R	312	274	272	277	292	279	294	288	299	293	312	271	271				
17	264	262	275	276	290	300	278	310	302	301	312	R	R	R	246	290	291	290	R	290	A	273	272	288				
18	287	287	284	283	282	311	280	301	278	314	350	284	247	264	251	269	277	A	228	283	286	302	278	271				
19	272	289	288	285	282	280	280	207	304	303	A	302	275	272	270	287	269	270	255	277	284	297	297	266				
20	276	265	254	253	267	297	296	273	247	303	A	247	279	259	302	A	296	224	206	A	288	264	275	275				
21	274	275	290	287	285	293	292	298	A	A	A	R	270	308	269	279	301	A	311	225	282	247	276	287				
22	286	283	267	255	254	316	288	347	321	321	A	269	319	289	306	282	294	290	287	292	292	F 272	A	272				
23	F	F	294	285	283	280	240	A	A	312	295	305	298	297	264	286	281	297	277	313	291	303	302	281				
24	280	289	284	297	296	298	316	343	334	301	301	287	304	304	A	320	320	272	305	284	296	304	304	310				
25	302	282	267	282	279	302	302	A	A	A	A	291	A	315	294	300	A	A	A	300	316	F 310	F 310	310				
26	F	286	276	293	291	323	290	A	A	232	318	A	290	A	290	307	306	320	287	241	287	286	304	284				
27	S 268	312	F	286	283	304	308	308	324	324	304	302	301	301	298	298	304	327	309	287	286	324	268	293				
28	278	297	289	289	F 289	303	A	303	334	A	284	291	304	212	R 212	A	315	314	273	289	299	292	316	283				
29	301	280	278	275	F 304	278	297	A	301	354	354	A	A	A	A	268	294	323	317	317	A	316	287	316				
30	291	306	289	287	314	288	320	A	A	267	A	A	A	A	A	330	315	315	288	291	291	291	272	295	320			
31	320	300	278	296	314	309	308	309	322	299	A	A	A	A	A	A	312	A	A	306	306	304	304	304				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	29	30	29	30	30	31	31	23	22	25	19	24	24	24	27	27	28	22	24	30	29	28	26	28				
MED	283	286	281	285	284	293	292	306	304	303	301	286	290	292	288	295	293	295	292	290	291	296	290	282				
U Q	300	300	289	289	295	302	303	318	321	327	319	302	299	306	299	302	310	307	304	299	296	302	302	297				
L Q	273	265	271	275	278	278	280	278	288	282	285	270	272	270	265	287	279	288	275	284	286	288	275	271				

JUL.2022 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

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	A	L	A	A	400	A	A	363	A	A	A	L				
2			L	L	L	362	366	375	403		A	372	379	400	384	361	360		L		L				
3				L	L	349	355	356		A	A	A	A	386		L	A	349	345	286		A			
4					A	A	A	A	A	A	A	L	L	377	370	357	361		A	A	A				
5					U L		L	A	A	A	A	U L	378	379	394	364		L	L		A	A			
6							343	343		U L	A	A	A	R	A	A	L	A	A	A	A	L			
7					U L	377	347	312	H	367	371	362	369	H	406	410		A		A	A	A			
8				L	A		347		A	A	A	A	A	A	A		388		354	346	302				
9					L		L	A	A		345	405	380	394		A	367		A	L	A				
10					362		L	L	A	A	A	A	A	A	A	A		376		A	A	L			
11					U L	372		A	A	A	A	A		A	383	352		A	A		L	L			
12			L	A		305		A	A	A		L			A	368	365		A	A	L	L	L		
13			A	L		334		A	A	A	A	A			A	394		A	L	U L	A	A	A		
14				U L	327	327	359		A		A	A		L	A			L	A	A	A	L			
15					332		A	283		395		A	A		A	356	366	401	348		L	H	L	L	A
16					L		A	A	A	A		354	376	H	289	357	347	352		L	L	L	L		
17					L		386	365	368		A	416	444	H	394		L	372		A	A	A	A		A
18				L	L		A	A		399	368	413	363	402	402	368	414	311		L	L	A	A	A	
19					L	334	346		A		353	344		A	406	302	367	400	361		L	L	A	A	L
20				U L	291	329		L	A	407		A	U L	380	391		A	360		A	A	L	A	A	A
21					L	L	A	A	A	A	L	L		A	A	U L	399	374	364		U L	A	L	A	
22				L	L	352		L	331		A	A	A	A		A		A	L	A	A	A			
23					L		A	A	A		392		A	L	L	358	346	353		U L	L	L	A		
24							L	A	A	L	L	377		A	379		A	A	354		A	L	L	A	
25					319		A	A	A	A	A	A		A	A	A	A	A	A	A	A	A	A		
26							A	A	A	A	A	A	A	A	A	A	L	A	L	A	A	A	A	A	
27					L	L	363		A	A	A	L		A		L	A	A	A	A	A	A	A		
28					L	L	L	L	A	L	A	A	A		A	353		A	A	350		A	A	L	
29					L	L	A	A	L		403		A	A	A	309		A	A	A	A	A	A		A
30					L	L	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
31						L	A		A	A	A	A	A	A	A	A	A	A		A	A				
																		377							
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	3	13	10	7	7	7	9	16	13	16	15	14	10	7	2					
MED					U L	302	334	357	343	372	371	378	382	394	368	366	360	352	335	324					
U Q					U L	327	358	366	365	403	395	409	402	400	384	372	374	360	348						
L Q					U L	291	328	347	312	367	345	367	378	378	356	357	353	345	324						

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUL. 2022 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						252	296	290	304	294	A		342	332	312	334	330	A	A	282				
2				286	274	294	320	260	326	286	358	330	412	382	312	346	352	330	278					
3					324	352	284	300	318	390	310		382	314	350	300	484	464	A					
4						254	328	288	310	304	316	410	374	456	390	378	388	A	288					
5						302	332	A	A	A	346	394	372	464	316	328	306	A	A					
6							310	310	306	288	320	A	318		356	352	312	406	306	300				
7						258	338	406	336	378	350	350	390	396	358	360	A	A	550					
8					392	510	430	A	A	A	A	A	A	A	548		468	464	394					
9						298	368	302	312	326	382	414	496	448	418	352	368	358	290	264				
10						230	394	276	546	A	282	E A 376	A	326	346	A	358	332	364	322				
11						322	272	578	A	A	460	472	A	518	414	E A 370	356	346	324	308				
12					314	370	428	428	382	426	378	322	410	A	396	390	A	A	372	322	288	306		
13						306	322	398	358	318	A	A	A	438	A	A	A	442	362	338	322	316		
14						346	384	378	364	346	380	454	454	370	354	448	386	378	330	330	284			
15						354	350	384	336	342	A	380	A	448	398	366	366	300	306	320				
16						362	328	326	A	416	526	368	436	462	404	360	376	336	322	290				
17						296	396	318	358	366	370	368	310	318	536	412	A	334	280		A			
18						330	274	358	308	392	340	274	406	512	468	506	434	404	A	A	A			
19						346	384	A	308	354	A	356	438	422	402	396	412	382	354	314				
20						360	346	346	410	478	386	A	A	416	A	460	354	A	342	A	A	A		
21						316	294	368	A	A	A	348	442	360	472	422	378	A	306					
22						394	332	360	298	322	294	A	426	322	374	330	372	312	312	316				
23						310	A	A	A	368	348	350	344	306	428	318	338	280	350					
24								262	280	298	316	346	340	306	A	286	296	416	306	360				
25						312	332	A	A	A	A	370	A	314	354	338	A	A	A	358				
26							332	A	A	A	304	A	316	A	350	316	294	268	292	A	310			
27						286	326	322	292	304	342	346	350	344	340	348	334	286	276	284				
28						316	272	272	324	286	A	402	374	350	A	A	314	328	344	298				
29						Q 334	342	A	328	258	268	A	A	A	404	358	308	308	288	A				
30						328	292	A	A	A	A	A	A	A	A	304	316	278	294	302	282			
31							272	314		338	A	A	A	A	A	A	324	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				3	9	27	29	23	20	22	19	20	23	24	26	27	27	23	23	15	3			
MED				306	346	316	332	314	325	339	342	371	374	378	393	353	352	334	306	300	316			
U Q				314	381	352	364	368	352	378	370	408	416	448	428	378	378	364	338	320	322			
L Q				286	323	294	303	290	309	294	310	350	340	338	350	328	312	300	290	284	310			

JUL. 2022 h'F2 (KM)

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JUL. 2022 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	220	264	282	292	256		A	A	A	200	A	A	204	A	A	258	A	A	A	224	258	258	240	246	
2	264	286	266	244	226	240	220	230	230	A	222	202	188	186	196	204	256	230	230	278	256	278	304	250	
3	262	288	280	260	262	246	244	A	A	A	A	A	204	A	A	212	268	330	A	A	274	274	274	308	268
4	268	268	264	288	298	A	A	A	A	A	A	196	196	190	224	216	A	A	A	262	272	290	312	274	
5	274	222	236	292	266	246	236	A	A	A	200	202	208	A	A	250	234	A	A	292	274	272	262	262	
6	278	252	272	278	260	240	236	236	A	A	A	A	A	A	226	A	A	A	A	226	274	276	276	242	
7	262	254	242	278	242	194	200	228	218	248	204	192	208	200	A	232	A	A	A	246	300	294	A	A	
8	346	344	314	306	A	A	236	A	A	A	A	A	A	A	214	A	262	262	278	344	312	302	A	286	
9	286	298	334	290	286	228	244	A	A	A	208	208	208	A	232	A	212	A	228	A	246	274	270	270	
10	288	262	330	280	282	198	220	206	A	A	A	A	A	A	A	236	A	A	228	278	258	232	290	290	
11	276	290	310	264	264	264	226	A	A	A	A	A	204	A	210	216	A	A	222	216	206	262	278	262	290
12	278	292	260	252	A	288	A	A	A	186	220	404	A	210	250	A	A	268	232	244	252	220	266	294	
13	304	272	304	A	A	256	A	A	A	A	A	A	214	A	194	A	236	236	A	A	A	260	276	276	
14	258	294	294	304	264	270	226	A	222	A	A	A	202	238	A	222	246	A	A	240	260	266	228	222	
15	300	306	284	320	264	252	A	A	A	218	A	A	A	232	222	210	234	242	A	A	292	248	A	268	
16	254	A	306	314	314	242	A	A	A	A	224	202	186	212	218	224	238	230	240	A	282	270	272	236	
17	262	292	256	252	292	232	228	226	226	A	194	192	194	222	228	A	A	A	A	262	A	298	290	276	
18	260	268	242	272	262	240	A	A	200	214	196	208	206	206	222	210	A	A	A	A	246	258	256	296	
19	286	280	278	284	304	244	220	A	250	244	A	180	220	234	200	218	238	A	A	254	270	266	212	266	
20	250	304	316	360	322	254	226	A	210	A	A	200	206	A	206	A	238	A	A	A	282	308	302	302	
21	258	274	244	250	304	228	226	A	A	A	206	194	A	A	198	204	218	A	222	A	276	308	300	276	
22	276	248	296	328	274	236	222	A	A	A	A	A	A	212	A	240	A	A	A	262	262	292	A	A	
23	270	A	276	270	306	226	A	A	A	A	216	198	198	240	204	214	218	232	A	246	254	252	272	264	
24	280	272	290	276	276	250	264	194	A	208	216	A	224	A	A	232	A	238	248	A	280	A	262	264	
25	280	280	288	282	274	266	A	A	A	A	A	202	A	A	A	A	A	A	A	A	250	288	256	262	
26	268	280	288	260	276	252	A	A	A	A	A	A	A	A	A	192	A	228	A	A	A	262	262	302	
27	332	262	294	282	298	218	218	A	A	A	214	192	A	232	200	A	A	A	A	A	300	286	340	258	
28	250	300	302	276	284	222	212	212	A	232	A	A	A	262	A	A	236	A	A	236	266	312	238	260	
29	290	302	282	284	266	240	220	A	A	A	220	212	A	A	A	304	A	A	A	232	A	A	A	260	
30	A	240	272	292	258	204	236	A	A	A	A	A	A	A	A	A	A	A	A	A	302	268	262	238	
31	238	268	310	286	272	242	222	A	246	A	A	A	A	A	A	A	224	A	A	254	262	258	268	300	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	31	30	28	28	21	7	8	10	12	18	15	16	17	17	13	12	9	18	26	29	27	29	
MED	272	280	284	282	274	240	226	226	224	217	210	202	206	212	218	218	236	237	230	254	264	274	270	268	
U Q	286	293	304	292	295	252	236	230	238	232	218	204	208	233	225	238	247	252	244	274	276	289	294	288	
L Q	260	263	266	270	263	228	220	206	214	208	202	194	196	203	202	210	221	230	225	236	256	259	262	259	

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JUL. 2022 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1				A	100	108	108	108	100	96	96	98	98	98	98	98	100	98	110	110		A			
2				B	B	116	106	102	102	102	100	108	98	98	98	108	106	108	108	112		A			
3				B	116	110	104	104	102	100	100	96	104	104		A	110	96	102	106		A	A		
4				A	A	A	102	102	100	106	98	98	98		A	100	102	102	104	114		A	A		
5				B	A	106	104	104	106	106	106	106		A	106	106	106	106	104	104		B	B		
6				A	A	104	106	104	104	106	100	96	96	96	96		A	100	100	106		A	A		
7				A	A	100	112	102	102	94	102	102	104	96	96	106		A	A	104		A	A		
8				112	112	112	102	102	102	102	102	100	98	100	100	100	102	108	108		A	A			
9				A	102	106	106	106	106	102	102	102	102	98	98	100	102	100	104	102		A			
10				A	A	94			96	98	92	92		A	92		102	100	100	104		A	A		
11				A	A	108	106	106	100	100	100		A	A	A	A	A	A	A	A	A	A	A		
12				A	A	102	102	100	100	100	98	98	98	104	104	102	102	108	106		A	A			
13				A	112	112	100	100	100	98	98		98	98	102	102	102	102	106		A	A			
14				A	A	106	106	102	100	94	96	96	96	96	96		A	104	102	96	118		B		
15				A	A	106	106	96	96	96	102	102	102	102	102	102	100	106	104		A	B			
16				A	118	118	110	100	100	100	104	104	104		A	A	A	102	102	100	96		A		
17				B	128	116	108	104	104	98	98	94		A	98	100	100	106	100		A	A	A		
18				A	A	100	108	108	104	104	98	98	98	98	98	94	98		98		A	A			
19				A	A	108	108	108	104	104	104	104	104	100	100	100	110	110	110		B	106			
20				118	122	114	108	102	100	100	100	100		A	102	102	102	102	102	110		A	A		
21				A	108	108	108	108	108	102	104	104	100	100	100	100	100	100	100		A	118			
22				B	114	100	108	108	102	96	102	102	102	102		A	A	A	102	106		A	A		
23				A	A	A	106	106	106	106	106	104	102	102		A	98	98	98	104		A	A		
24				A	A	108	100	102	102	100	96	100	100	100	100	100	100	102	108		A	A			
25				108	A	108	108	108	108	108	108	108	108	96	106		A	A	A	A		A	628		
26				A	A	116	110	106	106	104	102		A	A	A	102	102		102	98		A			
27				A	A	104	104	104	104	102	104	104	104	104	104	104	104	104	104		B	A			
28				100	100	102	102	102	102	96	96	96		A	100	100	100	112	112	108	108		A		
29				A	A	108	108	98	98	98	98	98	98	98	98	106	106		A	A	A	A		A	
30				A	A	A	108	108	108	102	102	94		A	A	A	A	A	A	A	A	A		A	
31				A	A	A	100	100	100	100	100	100	100	100		A	96	96	96	106		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				4	11	27	30	30	31	31	31	28	23	26	23	24	25	24	26	7	3				
MED				110	112	108	106	104	102	100	100	100	100	100	100	102	102	102	106	108	118				
U Q				115	118	112	108	106	104	104	102	104	104	102	102	103	105	105	108	112	628				
L Q				104	102	104	104	102	100	98	98	97	98	98	98	100	100	100	104	98	106				

JUL. 2022 h'E (KM)

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JUL. 2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

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		100	92	92	88	88	134	110	104	98	106	98	98	94	94	102	130	110	106	110	110	104	94	96	96
2		96	96	96	96	B	114	90	118	110	102	106	106	106	100	108	204	112	128	116	112	112	108	102	B
3		102	B	B	B	134	124	112	110	100	104	100	92	98	102	102	112	112	98	102	104	104	104	106	98
4		98	106	94	94	86	100	110	110	106	104	96	96	96	96	G	110	110	100	104	104	104	104	104	B
5		94	100	100	B	100	108	114	106	108	94	108	108	112	102	102	102	112	104	104	104	104	104	104	104
6		98	108	102	102	102	116	116	108	106	104	100	92	94	90	94	94	104	110	110	106	106	106	98	98
7		98	96	106	94	90	124	198	108	112	106	106	108	108	104	100	112	104	102	110	96	100	116	110	110
8		98	98	98	98	118	104	116	104	104	98	98	98	98	98	98	98	112	102	100	110	102	110	106	106
9		98	98	84	88	98	110	110	100	100	100	110	102	102	100	106	98	G	108	106	104	86	98	108	102
10		100	96	94	92	92	98	96	90	100	100	100	98	98	98	98	102	118	118	110	102	94	102	104	108
11		98	98	94	98	104	110	120	106	100	106	96	96	92	100	100	88	90	92	90	96	86	98	98	98
12		98	98	106	98	94	126	116	104	104	112	104	94	96	104	118	110	112	106	G	102	102	108	100	110
13		106	100	100	106	116	114	116	102	102	102	98	116	102	G	112	104	116	122	108	102	102	102	102	94
14		98	94	104	94	100	108	112	102	108	98	98	98	104	104	102	96	110	102	100	100	B	100	94	100
15		98	92	92	96	120	110	110	98	92	96	106	106	96	108	100	114	122	116	106	102	100	102	94	94
16		96	96	92	92	96	102	106	106	98	98	104	92	100	98	102	92	136	126	106	106	100	98	104	92
17		B	B	B	B	148	112	124	118	100	96	106	104	98	118	122	128	100	106	96	102	112	112	102	96
18		96	B	96	96	102	120	120	106	106	106	106	100	102	102	102	102	96	98	98	98	102	102	100	100
19		92	92	94	98	96	110	110	106	108	104	92	106	106	98	98	100	114	106	114	114	108	108	B	B
20		B	114	112	122	122	118	116	108	116	90	96	98	100	100	G	108	100	104	104	98	96	102	102	94
21		98	B	B	98	100	92	116	106	98	102	104	104	106	98	98	98	102	96	104	104	104	106	100	100
22		92	96	116	B	100	114	114	108	108	104	98	98	98	98	96	94	100	100	100	100	104	104	104	104
23		96	96	88	98	96	96	100	100	98	106	98	98	98	98	98	106	106	112	104	104	104	B	92	92
24		92	92	92	90	88	118	104	118	104	108	104	94	102	96	96	102	110	102	110	98	98	98	98	98
25		90	90	102	92	96	96	106	94	94	94	104	108	96	96	92	90	90	84	86	90	92	94	94	96
26		80	92	92	98	98	118	106	96	100	100	96	96	100	100	92	92	94	98	108	96	100	106	106	100
27		100	94	94	94	94	98	106	106	100	100	100	100	96	100	100	100	102	102	102	102	102	108	94	96
28		90	94	94	90	90	116	106	106	96	96	92	92	92	104	104	104	110	100	104	106	110	118	106	98
29		98	98	90	94	96	96	130	106	106	102	102	94	94	94	100	106	106	106	102	104	114	110	110	100
30		96	96	96	96	106	86	114	102	102	94	90	90	90	94	90	90	90	98	92	92	84	96	96	96
31		96	90	96	96	102	94	106	106	94	94	94	92	96	96	96	108	104	104	100	100	100	100	94	94
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		29	27	28	27	30	31	31	31	31	31	31	31	31	30	29	31	30	31	30	31	30	30	30	28
MED		98	96	95	96	99	110	112	106	102	102	100	98	98	99	100	102	108	104	104	102	102	104	102	98
U Q		98	98	101	98	104	118	116	108	106	104	104	104	102	102	102	110	112	108	108	104	104	108	104	101
L Q		95	92	92	92	94	98	106	102	98	96	96	94	96	96	98	96	100	100	100	98	100	100	96	96

JUL. 2022 h'Es (KM)

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IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2	F2	F2	L6	L5	C2	C3	C3	C2	C2	C4	C2	C3	C2	C2	CL21	C3	C4	CQ52	LL41	L3	F4	F2	F2
2	F1	F3	F2	L1		CH12	LH12	C3	C2	C5	C2	C2	C2	C2	C1	C1	C1	C2	C3	C3	L3	F3	F2	
3	F1				C1	C2	C3	C3	C3	C3	C3	C3	C3	C4	C4	C2	C5	C3	C8	L6	L4	F6	F4	F5
4	F6	F4	F5	L3	LQ21	L5	C6	C4	C3	C3	C3	C2	C2	L1		C1	C3	C3	C4	L3	L3	L2	L2	
5	L2	L1	L1		L1	C2	C2	C5	C3	C5	C1	C1	C1	C2	C2	C2	C2	C4	C5	C5	L6	F5	F2	F3
6	F4	F3	F3	L4	L4	C2	C2	C4	C2	C4	C3	C2	C3	C2	C2	L3	C3	C5	C5	C4	L2	F4	F5	F1
7	F2	F4	F1	L2	L1	CL21	CL21	C2	C2	C2	C2	C2	C2	C2	C3	C2	LL42	LL52	C5	L9	L4	F7	F4	F7
8	F4	F5	F2	LQ41	C5	C4	C2	C3	C3	C4	C3	C3	CQ31	CC21	C1	CQ31	C1	C2	C4	L4	L4	F3	F6	F2
9	FQ21	F2	F4	L3	CL22	C2	C2	C2	C3	C2	C2	C1	C2	C3	C2	C2		C2	CL22	C4	LQ31	FF22	F5	F9
10	F4	F1	F5	LQ31	LQ21	LC11	L3	L2	C4	C7	CQ31	CQ31	LQ31	C4	C6	C2	C2	C5	C3	C3	L8	FF33	F3	F3
11	F5	FQ31	FQ41	LL22	L3	C3	C2	C4	C6	C6	C3	C2	L2	L2	L3	LQ41	L3	L2	L3	L3	L3	FQ31	F3	F4
12	F2	F1	FQ11	LQ31	L5	C3	C4	C2	C3	C1	C2	C3	C3	C2	C2	C2	C4	C3		L3	L4	F3	F1	F4
13	F3	F6	F5	L5	L3	C3	C2	C3	C4	C3	C3	L1	C2		C4	C4	C3	C2	C5	L4	L9	F6	F6	F4
14	F2	FF12	F1	LQ21		C2	C2	C3	C2	C2	C2	C1	C2	C2	C1	C2	C3	C5	C4	LC22		F5	F3	F6
15	F6	F6	F2	L2	F4	C5	C5	C3	C3	C2	C3	C3	C3	C1	C1	C2	C1	C2	C3	L4	L5	F4	F4	F6
16	F5	F6	F4	L5	L3	C5	C5	C4	C4	C3	C2	C2	C1	C2	L1	L2	HL11	C2	C4	C4	L5	F5	F3	F5
17					H1	C2	C2	C2	C2	C3	C2	C1	L2	C1	CL11	C2	C4	C4	CL32	L6	L7	F5	F6	F6
18	F4		F2	L4	L2	L2	C4	C4	C2	C2	C2	C1	C1	C1	C1	C3	C3	LL73	CL72	L8	L3	F4	F4	F2
19	F3	F2	F3	L6	L3	C3	C4	C4	C2	C2	C5	C2	C1	C2	C2	C2	C4	C5	C2	C1	F2			
20		F4	F1	C1	C1	C2	C2	C1	C3	C3	C2	C2	C2	C2		C3	C4	C4	C6	L9	LQ51	F5	F5	F8
21	F2			F1	LQ21	LC12	C3	C3	C4	C3	C2	C2	C2	C2	C1	C2	C2	C2	C3	L8	LQ41	F7	F4	F5
22	F4	F4	F3		L2	C1	C2	C3	C3	C3	C5	C4	C2	C2	C3	L2	L2	L4	C5	L3	L3	F7	F8	F8
23	F2	F5	F8	L3	LQ31	L3	C4	C8	C8	C2	C3	C2	C2	C2	C2	C2	C3	C5	C5	L3	L3		F1	F2
24	F3	F4	F4	L7	LQ41	C4	C3	C2	C4	C3	C2	C4	C2	C2	C5	C2	C3	C5	C5	L8	L5	F8	F8	F9
25	F5	F5	F3	C4	LQ31	LC12	C4	C8	C6	C6	C4	C2	C6	C3	C4	C3	L6	L7	L8	L9	L7	F9	F7	F5
26	F7	FQ51	F2	LL32	L4	C4	C4	C7	C7	C5	CQ41	CQ41	LQ41	LQ31	C3	C3	L3	L2	C4	C5	L9	F5	F5	F5
27	F9	F5	F4	L5	LQ41	LQ21	C3	C4	C3	C4	C2	CL22	C2	C2	C2	C4	C4	C4	C3	L8	L5	F8	F5	F3
28	F2	F5	F3	C6	C2	C2	C3	C3	C4	C5	C4	C3	L3	C2	C5	C6	C3	C4	C8	C2	L5	F8	F5	F8
29	F7	F8	F6	L8	LQ51	LQ41	C2	C6	CQ61	CQ41	C2	C3	C6	C4	C3	CQ42	CQ71	CQ41	L8	LQ31	LQ81	FQ81	FQ51	FQ51
30	F8	F3	F1	L5	LQ41	L5	C2	C6	C7	C7	C5	C4	L4	L3	L5	L3	L4	L4	L5	L5	L6	FQ42	F9	F5
31	F4	F4	FQ51	L3	L5	L4	C5	C6	C5	C5	C6	C4	C4	CQ41	CL33	CL44	C2	C3	C9	L8	L6	F5	F7	F5
	00	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																								

JUL. 2022 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2022 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	79	72	88	70	69	64															X 80	X 77	X 76	X 81	
2	79	70	71	X 62	63	69	84	78													X 82	X 82	X 83	X 84	
3	X 85	X 87	X 65	72	70	74	104														X 80	X 78	X 77	X 93	
4	85	83	64	69	62	65															X 80	X 78	X 78	A	
5	83	81	X 75	60	60		82														X 82	X 78	X 78	X 68	
6	X 65	X 65	X 63	68	60																X 74	X 75	X 79	X 82	
7	83	78	X 71	X 60	X 60																X 76	X 74	X 68	X 68	
8	X 64	X 59	X 62	X 58	X 57																X 71	X 64	X 57	X 55	
9	65	59	X 56	X 59	X 58																X 83	X 80	X 71	X 70	
10	X 65	65	64	64	X 60																X 100	X 78	X 70	X 70	
11	79	79	78	76	70										A						X 83	X 82	X 72	X 70	
12	76	72	71	72	70																X 80	X 78	X 76	X 74	
13	X 71	X 76	X 84	X 74	X 68																X 82	X 75	X 71	X 70	
14	73	77	X 71	X 70	X 68																X 81	X 77	X 77	X 72	
15	X 71	77	78	72	69																X 80	X 78	X 68	X 68	
16	X 69	X 68	X 62	X 62	X 59																X 85	X 78	X 71	X 72	
17	X 76	X 69	X 66	X 68	X 65																X 76	X 76	X 76	X 73	
18	X 74	X 71	X 68	X 65	X 61																X 85	X 78	X 79	X 81	
19	X 78	X 78	X 64	X 61	X 60																X 100	X 86	X 85	X 82	
20	X 84	X 89	X 77	X 76	X 69																X 74	X 75	X 84	X 80	
21	X 79	X 75	X 70	X 68	X 66				C												X 65	X 64	X 77	X 78	
22	93	83	X 64	X 60	X 56					C											X 78	X 78	X 79	X 78	
23	79	83	83	83	77																X 94	X 84	X 86	X 80	
24	85	82	80	83	X 76																X 88	X 94	X 77	X 92	
25	80	76	78	91	73	70				C											X 83	X 71	X 62	X 70	
26	72	X 66	67	60	62																X 80	X 76	X 75	X 70	
27	77	76	85	X 74	X 72																X 90	A	A	A	
28	X 72	72	69	70	72	70															X 89	X 91	X 92	X 80	
29	A		A	80	71	70															C	X 79	X 81	X 69	X 77
30	80	90	86	76	72	66	69														X 86	X 82	X 82	X 72	
31	A	X 59	X 54	X 54	X 55	X 53															X 84	X 72	X 69	X 64	
	00	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	31	30	31	31	9	4	2													31	30	30	29	
MED	78	76	70	69	66	69	83	81													X 82	X 78	X 76	X 73	
U Q	82	81	78	74	70	70	94														X 85	X 81	X 79	X 80	
L Q	X 72	X 69	X 64	X 61	X 60	X 64	76														X 79	X 75	X 71	X 70	

JUL.2022 f_{XI} (0.1MHz)

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	F	F	F	F	F	F	57	65	69	63	A	62	68	67	68	67	65	66	C	72	74	71	70	F	
2	F	F	F	F	F	F	F	74	69	68	64	A	A	A	71	A	74	80	90	96	92	76	76	77	78	
3	79	81	59	F	F	F	F	91	77	A	A	A	A	A	A	A	A	A	A	77	78	80	74	F	F	
4	F	F	F	F	F	F	F	70	A	69	70	A	A	A	A	A	A	82	90	85	79	74	72	72	A	
5	F	F	F	F	F	F	F	70	A	88	79	93	101	90	A	70	70	A	66	72	81	76	72	72	62	
6	59	59	57	F	54	58	63	68	72	72	79	74	75	70	72	72	74	66	65	66	68	69	71	72	F	
7	F	72	65	54	54	53	54	64	70	70	68	68	72	77	76	74	72	74	67	69	70	68	62	62	F	
8	58	53	56	52	51	48	57	49	52	57	A	A	A	A	A	70	70	59	56	57	58	65	58	51	48	
9	F	54	52	50	53	52	60	70	80	76	A	62	61	60	A	A	63	68	62	64	71	77	74	65	64	
10	59	F	F	F	F	54	54	60	70	79	69	69	73	72	71	76	68	66	69	84	92	94	72	64	F	
11	F	F	F	F	F	64	56	61	68	63	62	62	A	A	A	A	68	63	62	64	74	77	76	66	64	
12	F	F	F	F	F	61	50	59	78	72	63	60	64	72	67	66	69	J A	68	75	82	70	74	72	70	68
13	65	70	78	68	62	63	A	63	57	A	57	61	62	65	60	62	60	63	70	72	76	69	65	64	64	
14	F	F	F	F	62	56	63	67	78	74	A	A	A	A	73	70	69	A	71	81	90	75	71	71	66	
15	65	68	F	F	63	58	61	67	64	68	65	58	61	66	66	63	58	A	63	67	74	72	62	62	62	
16	63	62	56	57	53	52	70	84	85	A	61	68	67	69	76	73	73	74	75	89	79	72	65	66	66	
17	70	63	60	62	59	65	64	70	72	60	55	A E G	51	56	62	68	68	71	69	66	70	70	70	67	F	
18	68	65	62	59	55	61	91	79	71	A	A	A	A	62	62	65	64	65	70	77	79	72	73	73	F	
19	72	72	58	55	54	53	63	78	72	68	A	A	64	67	69	65	66	67	76	90	94	80	79	76	F	
20	78	83	71	70	63	61	58	54	53	A	64	61	A	59	62	A	60	64	66	66	68	69	F	70	F	
21	73	69	64	62	60	60	80	C	62	A U R	54	A	A	56	58	63	66	68	66	63	59	58	F	67	F	
22	F	F	F	F	50	54	53	A	60	C	65	54	68	72	80	74	73	72	74	76	72	72	73	67	F	
23	F	F	F	F	F	63	72	89	84	64	A	67	71	A	80	90	92	96	91	91	88	78	80	73	F	
24	F	F	F	F	70	72	72	80	66	74	A	75	82	90	98	89	83	84	86	87	78	F	71	F	F	
25	F	F	F	F	F	F	C	F	76	73	66	59	A	A	A	77	A	A	75	75	84	77	65	56	60	
26	F	F	F	F	F	C	A	85	80	68	64	A	63	73	82	86	75	68	67	73	74	70	69	64	A	
27	F	F	F	F	66	66	69	77	A	A	64	A	A	A	A	80	A	A	A	76	84	A	A	A	A	
28	66	62	F	F	60	62	66	104	82	65	64	59	A	75	81	70	A	A	A	79	83	85	F	F	F	
29	A	F	A	F	F	F	A	68	A	A	A	A	A	59	A	68	75	74	74	C	73	75	63	65	F	
30	F	F	F	F	F	F	F	72	A	69	A	61	62	66	68	A	71	72	75	77	80	F	F	F	F	
31	A	53	48	48	F	47	58	78	75	58	59	62	59	66	65	71	A	A	A	78	78	66	63	58	F	
	00	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	26	24	24	27	29	28	26	28	21	20	18	18	23	25	27	24	27	27	30	31	27	25	22		
MED	67	66	60	56	55	58	64	74	72	68	64	63	68	67	70	70	68	71	74	76	76	72	70	66		
U Q	72	72	65	64	62	61	70	79	77	70	65	72	72	73	76	74	74	75	81	84	79	74	72	68		
L Q	64	62	56	52	53	54	58	67	65	63	60	61	62	65	66	67	64	66	66	70	73	69	64	62		

JUL.2022 foF2 (0.1MHz)

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	A	484	480	476	A	464	A	A	C					
2							L	A	A	A	A	A	A	A	A	488	444	428	A					
3						L	352	A	A	A	A	A	A	A	A	472	A	A	A					
4						L		A	A	A	A	A	A	A	A	A	A	A	A					
5						U L		A	A	A	A	A	A	A	A	468	A	416						
6						L		456	468	A	496	512	500	A	A	A	A	A						
7								436	460	A	472	A	A	A	A	A	C	A	A					
8						316	388	412	448	A	A	A	A	A	A	A	A	416	400	U L				
9							A	A		A	484	492	A	A	A	A	452	444	388	U L				
10							452	464	488	A	496	A	A	R	U L	476	484	500	468	448	388			
11							A	A	A	496	A	A	A	A		A	A	A						
12						320	368	A	456	528	500	504	516	504	500	484	A	A	A	A				
13							A	440	A	A	488	488	500	500	496	476	468	396	L					
14						A	396	440	A	A	A	A	A	504	504	484	A	A						
15						L	432	452	464	A	A	512	500	A	A	A	A	A	A	A				
16							432	A	A	A	512	U L	524	A	A	500	500	A	440	396	L			
17							L	A	A	A	496	A	512	512	A	488	472	440	A					
18						U L	384	L	L	L	A	A	A	512	492	504	H	476	A	A	A			
19							L	452	464	504	A	A	520	A	524	U L	L	A	384	L				
20							372	420	468	A	A	A	A	L	A	A	A	476	424	L	A			
21						L		C	456	A	476	A	A	492	480	464	476	432	L					
22						L	L	A	A	C	488	488	A	496	A	A	A	460	L					
23							412	A	A	A	A	A	A	A	A	488	460	436	L					
24								L	U L	484	A	A	A	492	484	476	A	A	A	L				
25						L	C	A	A	A	492	A	A	A	A	A	A	A	A	A				
26						C	A	440	A	A	484	A	A	A	484	472	444	408	L	L				
27						L	L	L	A	A	A	A	A	A	A	A	A	A	A	A				
28						L	U L	492	A	A	A	A	A	A	468	468	A	A	A	A				
29								A	A	A	A	A	A	476	A	A	A	A	A	C				
30								408	A	A	A	A	A	A	A	A	A	396	L					
31							L	A	A	468	488	480	A	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						4	12	12	12	5	13	10	7	12	12	17	12	13	7					
MED						352	388	440	464	496	488	494	500	498	488	484	468	432	388	L				
U Q						U L	384	422	452	472	516	496	512	516	508	500	494	476	442	396	L			
L Q						318	370	420	458	478	484	488	500	484	482	470	456	416	384	L				

JUL.2022 foF1 (0.01MHz)

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	244	284	312		A	A	A		340	336	332	316	280	224				
2						A	A	288	316	352	364	364	360	332		A	A	A	A	A				
3						A	232	284	320	340	356	360		A	A	A		A	A	A				
4						A	252	288	316	332	348	356	344		A	348	340	320	280		A	A		
5						A	260	284		A	A	A	A		A	R	A							
6						A	A	300	336	348	376		A	356		A	A	A	A	A				
7						A	248	300	328		A	A	A		392		A	A		A	B			
8						A	256	300	324	348	364	380	376	368		A	324	300	284	212				
9						A	284	308	336	340	360	376	376	360		A	A	A		292		A	A	
10						A	A	A	A	A		372		A	380	372	360	360	316	288	224			
11					192	252	308	340	364		A	A	A	A			A	336	292		A	A		
12						A	256	308	340	356		392		A	A		336	360	324	284	224			
13						A	240	304	340	360	372	408	388	392	384	356	324	280						
14						A	248	304	344		A	A		372	416	388	368	332	292	224				
15						A	A	A	A	A	A	A	A	A	A		368	336	284	220				
16						A	252	296	344	360	368		A	A	A	A	A	A	A	A				
17					200	252	304	340	348	372		A	R	412	400	380	368	328	292		A	A		
18					192	248	296	324	360	364		A	380	392	396	360	336	292		A	A			
19						A	A	324	340	360	360	372		A	388	376	356	332	300	212				
20						A	A	296	328	344	380	384	392	384	368	348	328	280	204					
21						A	244		C	A	356		388		A	A	A	A		284		A	A	
22						A	248	292	312		C	348	380	392	384	360	344	320	280		A	A		
23						A	240	304	332	344	352	352		A	A	340	288							
24						B	252		A	A	A		A		360	364	340	316	276	180				
25						A	C	272		A	328	352	364	352		A	A	A	A	A				
26						C	228		A	316		A	A	A		A	A	304		A	A			
27						A	240	292	320	336		A	A	A	A	A	A		264	196				
28						A	220	264		A	A	A	A		368	348	332	292	260		A	A		
29						A	A	A	A	A	A		352		352		A	304	252		A	C		
30						A	A	280	304		A	A	A		A	A	A	A	A		184			
31							236	284		A	A	332	364	360	352		A	332	300	256				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	22	25	22	18	18	16	15	16	16	19	21	23	12					
MED						192	248	296	328	348	362	372	376	370	362	348	324	284	216					
U Q						200	252	304	340	360	372	382	392	390	378	360	330	292	224					
L Q						192	240	284	316	340	352	362	360	356	348	332	310	280	200					

JUL.2022 foE (0.01MHz)

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IONOSPHERIC DATA STATION kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	J	A	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	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	30	30	30	31	30	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	
MED	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
LQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A

JUL.2022 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	24	27	25	E B	E B	21	42	50	51	59	A A	43	42	39	48	42	43	48	C	51	E B	28	E B	24	
2	E B	E B	E B	E B	E B	21	29	41	49	52	51	A A	A A	54	102	38	32	29	33	22	18	E B	21	E B	
3	E B	E B	E B	E B	E B	20	29	47	A A	A A	A A	A A	A A	51	57	46	A A	116	67	44	19	E B	48	45	19
4	27	18	E B	E B	E B	20	33	A A	A A	A A	A A	A A	A A	86	114	98	61	53	50	44	43	E B	46	A A	
5	28	E B	E B	E B	E B	29	43	A A	A A	72	64	44	57	84	91	52	43	A A	138	32	26	21	E B	47	E B
6	E B	E B	E B	E B	E B	21	43	28	35	45	56	42	50	44	67	48	50	50	42	29	33	E B	19	E B	
7	22	E B	E B	E B	E B	19	G	34	36	47	40	56	50	56	52	46	42	44	42	16	E B	22	E B	E B	
8	24	25	21	E B	E B	26	28	32	37	48	A A	A A	A A	A A	65	53	45	31	28	20	18	E B	E B	E B	
9	E B	E B	E B	E B	E B	29	51	76	39	A A	152	43	43	51	A A	A A	50	34	32	33	34	E B	16	E B	
10	26	E B	E B	E B	E B	21	28	36	40	40	53	46	55	40	41	39	34	32	32	16	E B	30	20	E B	
11	E B	E B	E B	E B	E B	G	42	49	54	43	52	A A	A A	A A	A A	51	49	47	26	24	E B	21	42	24	
12	25	27	26	E B	E B	20	28	46	39	39	45	G	46	44	39	40	63	43	36	46	E B	16	E B	E B	
13	22	19	E B	E B	E B	23	72	42	46	64	45	G	G	G	43	38	35	49	32	48	44	E B	43	48	
14	28	E B	24	E B	E B	46	34	43	46	56	A A	A A	A A	A A	G	46	46	A A	51	46	36	E B	24	E B	
15	21	E B	E B	E B	E B	21	29	44	36	58	54	45	45	52	56	54	42	A A	83	38	44	48	29	E B	
16	22	20	21	E B	E B	20	34	57	64	A A	107	44	48	55	54	40	44	64	33	28	20	18	E B	E B	
17	E B	E B	E B	E B	E B	G	28	44	48	57	41	A A	248	45	G	58	40	42	35	36	19	E B	18	E B	
18	E B	20	20	E B	E B	G	27	35	35	A A	A A	A A	A A	46	G	39	45	51	62	43	E B	16	16	39	
19	E B	E B	E B	E B	E B	20	26	G	40	44	A A	A A	70	49	56	46	G	36	57	27	50	E B	16	E B	
20	E B	43	36	E B	E B	38	32	36	40	A A	74	50	50	58	G	A A	74	44	33	45	22	E B	28	E B	
21	E B	E B	E B	E B	E B	20	36	C	44	A A	69	44	82	67	46	40	36	35	34	29	16	E B	16	E B	
22	E B	E B	E B	E B	E B	18	32	A A	45	C	42	46	56	45	58	51	47	34	37	24	E B	16	16	35	
23	28	20	24	31	44	28	34	45	46	59	A A	105	52	66	A A	94	56	47	38	36	24	E B	44	E B	
24	E B	E B	E B	E B	E B	G	33	37	62	A A	135	64	51	40	46	44	53	50	30	18	E B	52	28	35	
25	18	27	22	E B	E B	C	48	47	57	45	A A	A A	A A	A A	A A	A A	A A	A A	52	57	31	20	E B	E B	
26	25	E B	E B	E B	E B	C	A A	34	50	53	43	A A	126	55	50	40	44	37	37	23	20	20	25	E B	
27	23	25	26	19	E B	18	31	39	A A	A A	84	106	51	141	158	142	128	62	A A	A A	A A	A A	A A	A A	
28	28	35	26	17	E B	22	36	62	54	47	50	50	81	58	45	44	A A	102	197	85	43	E B	16	E B	
29	A A	34	A A	E B	E B	32	51	86	61	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	C	30	42	41	
30	30	30	E B	E B	E B	20	29	35	A A	A A	157	56	180	55	50	60	53	A A	158	64	29	22	41	E B	
31	A A	E B	E B	E B	E B	16	26	41	53	44	46	45	48	56	38	55	A A	A A	A A	A A	E B	24	22	E B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	30	30	30	31	30	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31
MED	22	18	E B	E B	E B	20	32	44	46	58	51	56	56	54	52	46	47	44	34	24	E B	19	18	E B	
U Q	27	25	24	19	E B	26	36	50	54	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	20	29	35	35	
L Q	E B	E B	E B	E B	E B	19	28	35	40	48	44	46	49	42	43	40	38	33	28	19	E B	16	16	E B	

JUL.2022 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

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

JUL.2022 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	F	F	F	F	F	F	F	F	A	293	304	292	312	299	308	295	C	314	327	288	304	F
2	F	283	F	296	F	292	F	300	F	336	317	F	A	A	279	A	269	269	277	299	317	287	266	275	286
3	290	332	280	F	F	F	F	F	F	F	F	A	A	A	A	A	A	A	A	A	306	318	316	316	F
4	F	286	F	297	F	270	F	293	F	330	F	A	A	A	A	A	A	286	304	291	299	275	279	271	A
5	F	288	F	303	F	320	F	294	F	285	F	A	A	A	A	A	A	A	A	A	308	285	316	289	301
6	300	302	296	F	301	297	328	316	310	323	301	309	302	313	A	302	302	318	319	313	294	275	291	284	F
7	F	305	306	300	309	302	329	319	312	317	309	273	298	312	299	319	285	312	317	297	306	298	280	278	
8	263	252	278	258	249	253	302	258	239	289	A	A	A	A	A	A	281	296	291	274	289	295	298	253	269
9	F	284	281	273	290	316	329	293	A	H	283	A	305	282	302	A	A	287	301	283	291	308	302	311	296
10	269	274	F	284	274	297	299	306	313	322	317	294	310	303	288	310	284	289	273	294	272	340	296	287	F
11	F	284	F	297	F	285	308	322	315	328	302	281	286	A	A	A	A	314	314	300	297	290	286	292	281
12	F	262	F	276	F	272	F	265	272	264	313	308	290	248	269	282	325	271	291	J	286	296	315	270	284
13	250	260	302	289	275	324	A	289	288	A	249	282	271	289	279	297	287	297	297	298	304	290	286	271	
14	F	283	F	268	F	290	F	277	290	277	274	295	308	329	A	A	A	304	297	299	A	291	295	315	311
15	277	282	F	284	F	294	F	282	313	290	298	277	294	265	284	272	296	291	289	295	A	305	291	290	312
16	270	277	286	273	273	269	296	298	309	A	331	284	295	281	298	291	294	299	287	298	305	288	278	270	
17	277	280	288	286	284	300	315	293	331	291	253	A	A	A	G	260	274	300	296	304	313	294	287	284	285
18	279	277	287	293	278	282	329	297	312	A	A	A	A	A	A	276	282	288	288	296	295	303	305	269	282
19	269	304	302	282	282	280	316	305	323	298	A	A	A	304	300	300	281	289	268	265	282	301	275	293	268
20	257	295	267	257	250	273	274	315	267	A	299	286	A	A	A	265	286	A	304	301	311	287	279	271	F
21	289	295	286	288	284	301	343	C	313	A	U	R	A	A	264	278	288	302	318	320	300	279	281	F	F
22	F	307	F	287	F	253	271	294	337	A	C	H	326	315	282	297	305	311	300	291	281	290	272	277	290
23	F	F	F	F	F	F	309	303	334	351	334	A	298	282	A	273	278	288	297	292	300	320	279	291	282
24	F	282	F	288	F	279	F	284	311	329	323	377	320	323	A	299	281	294	306	306	295	310	291	304	F
25	F	296	F	288	F	270	F	303	F	293	C	F	322	334	343	317	A	A	A	315	A	A	306	314	318
26	F	291	F	301	F	301	F	308	305	C	A	330	325	364	314	A	271	286	293	308	321	310	304	304	304
27	F	267	F	314	F	289	F	298	302	319	363	A	A	306	A	A	A	A	292	A	A	A	293	307	A
28	288	275	F	F	F	282	293	294	353	345	338	320	294	A	292	307	291	A	A	A	A	287	290	304	F
29	A	F	A	F	F	285	F	321	341	A	311	A	A	A	A	294	300	320	320	306	C	294	310	302	297
30	F	282	F	F	F	F	F	305	F	322	358	A	258	A	316	308	303	295	A	271	296	294	304	312	F
31	A	308	303	282	F	302	330	353	367	337	283	318	280	312	302	308	A	A	A	A	312	327	301	309	309
		00	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	26	24	24	27	29	28	25	28	21	20	18	18	22	24	27	24	27	27	30	31	27	25	22
MED		282	288	287	286	285	301	318	317	314	317	302	296	288	293	298	297	295	299	297	298	302	290	286	279
U Q		288	304	299	294	303	322	333	340	332	335	312	311	304	303	306	308	303	308	313	308	311	301	298	286
L Q		269	277	280	274	278	281	299	298	305	292	274	284	280	281	284	288	288	291	291	290	287	279	280	275

JUL. 2022 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	A	424	414	414	A	A	A	A	C					
2							L	A	A	A	A	A	A	A	A	359	371	336	A					
3						L	395	A	A	A	A	A	A	A	A	A	A	A	A					
4						L		A	A	A	A	A	A	A	A	A	A	A	A					
5						U L		A	A	A	417	A	A	A	A	356	A	357						
6							L	362	A	A	403	A	393	A	A	A	A	A	371					
7								359	392	A	456	A	A	A	A	A	A	A	A					
8						A	351	364	381	A	A	A	A	A	A	A	A	U L	328					
9							A	384	A	A	416	A	A	A	A	A	366	337	361					
10							368	379	394	A	424	A	R	412	U L	393	361	356	332					
11							A	A	A	383	A	A	A	A		A	A	A						
12						305	379	A	397	349	416	379	356	377	377	360	A	A	A					
13							A	A	A	A	385	408	389	385	390	373	367	A	L					
14						A	367	A	A	A	A	A	A	403	A	A	A	A						
15						L	336	A	420	A	A	425	443	A	A	A	A	A	A					
16							343	A	A	A	399	A	A	A	394	352	A	353	341					
17							L	A	A	A	412	A	433	391	A	371	A	356	A					
18						U L	L	L	L	A	A	A	A	A	369	360	A	A	A	A				
19							L	372	375	404	A	A	A	A	A	U L	346	333	A					
20							359	370	371	A	A	A	A	L	A	A	A	L	A					
21						L		C	A	A	439	A	A	A	399	383	344	348	L					
22						L	L	A	A	C	419	411	A	A	A	A	A	L						
23							349	A	A	A	A	A	A	A	A	A	360	345	L					
24								L	U L	L	A	A	A	A	394	A	A	A	A	L				
25						L	C	A	A	A	A	A	A	A	A	A	A	A	A					
26						C	A	370	A	A	437	A	A	A	381	A	374	A	L					
27						L	L	A	A	A	A	A	A	A	A	A	A	A	A					
28						L	U L	A	A	A	A	A	A	A	A	A	A	A	A					
29								A	A	A	A	A	A	A	A	A	A	A	A	C				
30								396	A	A	A	A	A	A	A	A	A	360	L					
31							L	A	A	A	A	A	A	A	A	A	A	A	A					
							379		393						395									
CNT						3	12	8	10	5	10	7	6	9	8	10	9	12	7					
MED						U L	327	363	369	382	393	416	416	404	391	392	360	361	354	332				
U Q						U L	335	384	371	392	399	437	424	433	408	397	373	369	356	361				
L Q							305	350	363	375	366	403	408	389	375	379	356	352	344	328				

JUL. 2022 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 2022 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								282	266	348	A	382	328	338	324	314	306	326	C					
2							232	262	260	280	320	A	A	366	A	364	352	322	260					
3					304	240	240	A	A	A	302	A	A	310	318	314	A	348	254					
4					266			A	282	320	A	A	A	A	A	A	A	338	284	316				
5					370			A	E A	A	318	310	334	260	340	A	338	316	A	300				
6						260	288	262	336	306	320	298	E A	440	322	334	290	278	272					
7							306	304	290	322	406	334	306	314	298	316	284	268						
8					426	312	470	E A	558	382	A	A	A	A	E A	504	330	362	372	360				
9						308	E A	396	282	A	338	418	366	A	A	382	320	344	298					
10							276	276	274	354	322	336	370	306	368	328	368	298						
11						284	266	E A	342	402	370	A	A	A		318	302	304						
12					372	400	290	316	378	516	430	370	304	416	354	E A	400	324	270	E A	304			
13						A	350	358	A	518	414	438	388	420	356	382	340	316						
14					370	362	312	312	276	A	A	A	A	332	314	342	A	344						
15					278	334	314	380	344	A	426	420	440	364	360	386	260	A	306	306				
16						314	300	302	A	296	350	364	394	342	342	356	308	302						
17						252	344	276	402	538	A	A	A	G	508	448	350	344	308	266				
18					324	248	244	264	A	A	A	A	A	A	414	406	372	376	332	E A	366	270		
19						280	304	278	354	A	A	A	344	348	348	376	356	416	348					
20						356	312	446	A	356	408	A	A	E A	456	408	A	344	332	288				
21					288		C	294	A	570	A	A	A	458	424	366	348	304	278					
22					310	232	A	278	C	284	346	386	340	316	304	318	308							
23						304	254	238	310	A	A	E A	352	416	A	348	330	306	286	262				
24							228	270	308	A	338	342	316	286	286	294	286	286						
25					308	C	260	250	268	300	A	A	A	A	298	A	A	292	276					
26					C	A	248	242	244	324	A	422	356	320	296	274	282	262						
27					278	266	232	A	A	324	A	A	A	A	A	326	A	A	A					
28					256	322	244	228	258	318	372	A	334	304	330	A	A	A						
29							A	E A	A	A	A	A	A	A	A	316	316	288	E A	C				
30						224	A	472	A	322	348	350	334	A	E A	414	306	276						
31						268	232	232	276	398	302	414	322	346	306	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					13	19	26	28	21	20	18	18	23	25	27	24	27	23	3					
MED					308	284	275	278	310	336	351	360	353	331	330	326	308	277	304					
U Q					370	322	312	317	366	412	408	416	394	407	364	356	340	306	306					
L Q					278	252	244	263	276	319	322	340	332	315	314	306	288	268	270					

JUL. 2022 h'F2 (KM)

IONOSPHERIC DATA STATION Kokubunji

JUL. 2022 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

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	302	E A 318	E A 272	268	244	222	E A 254	A	A	A	A	192	200	190	A E A 282	A	A	C E A 262	226	E A 296	236	E A 246			
2	230	274	292	258	270	232	220	A	A	A	A	A	A	A	212	220	226	A	232	236	284	E A 288	266		
3	248	224	244	E A 364	290	252	E A 218	A	A	A	A	A	A	A	A	A	A	A	250	238	E A 324	E A 280	E A 260		
4	E A 274	236	242	E A 294	270	238	226	A	A	A	A	A	A	A	A	A	A	A	E A 258	E A 314	E A 280	E A 352	A		
5	E A 280	246	216	218	264	248	260	A	A	A	216	A	A	A	A	272	A	226	264	248	246	E A 286	E A 304	252	
6	236	260	256	256	248	250	216	224	A	A	200	E A 210	A	A	A	A	A	A	236	E A 254	276	260	288	E A 292	
7	250	240	236	286	220	222	214	220	200	A	174	A	A	A	A	A	E A 260	A	A	250	242	248	274	286	
8	E A 354	E A 364	282	294	342	E A 304	228	218	208	A	A	A	A	A	A	A	A	232	244	278	260	218	298	304	
9	294	282	298	268	240	224	A	A	222	A	E A 250	182	A	A	A	A	198	226	258	E A 254	254	236	228	260	
10	E A 326	E A 312	292	276	252	234	228	234	E A 232	194	A	200	A	182	186	180	192	210	E A 272	260	208	200	E A 254	320	
11	272	E A 282	264	246	228	240	A	A	A	218	A	A	A	A	A	A	A	A	246	262	276	230	E A 314	E A 300	
12	E A 300	E A 290	E A 260	286	296	266	232	A	A	A	210	238	212	E A 272	E A 234	218	226	A	A	A	248	250	274	278	
13	E A 338	318	258	252	268	254	A	A	A	A	248	222	220	222	228	216	226	A	282	278	274	E A 258	E A 298	366	
14	E A 300	290	276	284	256	A E A 236	A	A	A	A	A	A	A	A	E A 194	E A 270	E A 304	A	A	298	264	E A 212	E A 286	282 286	
15	308	280	268	266	276	252	246	A	196	A	A	182	176	A	A	A	A	A	A	A	E A 316	242	234	246	
16	316	314	282	290	284	238	246	A	A	A	214	E A 280	A	A	A	E A 210	E A 262	A	234	256	262	224	232	264 292	
17	256	268	268	266	252	244	216	A	A	A	198	178	208	A	250	E A 282	E A 236	A	A	252	252	250	268	292	
18	284	276	258	274	274	244	236	210	194	A	A	A	A	E A 278	E A 250	E A 206	H E A 294	A	A	A	226	278	276	E A 356	
19	294	254	216	284	272	252	228	208	222	206	A	E A 306	A	E A 266	E A 218	222	A	264	E A 280	240	242	236	E A 320		
20	310	E A 306	E A 330	298	294	316	246	234	248	A	A	A	A	222	A	A	E A 306	228	A	244	254	E A 320	360	312	
21	284	262	240	234	270	262	252	C	A	A	194	A	A	E A 276	192	184	206	234	250	242	252	256	326	310	
22	248	234	248	E A 352	306	242	E A 212	A	A	C	196	218	A	A	A	A	A	A	C	226	272	266	242	E A 248 272 272	
23	E A 286	E A 286	E A 280	E A 290	E A 292	E A 250	258	A	A	A	A	A	A	A	A	A	E A 224	E A 228	E A 238	E A 250	E A 232	E A 286	E A 250	E A 292	
24	272	266	262	262	244	226	212	220	200	A	A	A	A	180	A	E A 274	A	A	258	238	234	254	E A 254	E A 314	
25	250	E A 282	E A 318	E A 302	256	242	C	A	A	A	E A 208	A	A	A	A	A	A	A	A	254	218	224	E A 316	286	
26	E A 278	258	E A 264	240	234	C	A	218	A	A	178	A	A	A	A	E A 218	E A 278	218	A	222	244	244	E A 254	302	
27	E A 306	270	E A 322	E A 270	238	238	220	A	A	A	A	A	A	A	A	A	A	A	A	A	270	242	A	A	
28	E A 268	E A 304	E A 278	E A 262	278	216	236	A	A	A	A	A	A	A	E A 276	E A 272	A	A	A	E A 294	250	244	E A 258	E A 326	
29	A	E A 304	A	E A 304	E A 266	E A 248	246	A	A	A	A	A	A	E A 236	A	A	A	A	A	C	E A 232	E A 274	E A 276	E A 308	
30	E A 296	E A 278	238	236	264	234	230	214	A	A	A	A	A	A	A	A	A	A	208	234	256	236	254	E A 278	E A 324
31	A	254	258	278	258	214	226	A	A	E A 226	E A 284	E A 278	A	A	196	A	A	A	A	232	218	242	244	254	
00	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	31	30	31	31	29	26	10	10	5	13	9	7	11	11	15	12	12	16	27	31	30	30	29	
MED	276	268	260	268	265	241	228	219	206	212	203	202	U 194	U 202	U 207	U 217	U 209	227	255	252	241	248	U 264	U 279	
U Q	304	304	282	E A 290	278	252	246	224	222	232	232	E A 250	E A 272	E A 236	E A 266	E A 274	E A 271	E A 233	E A 268	E A 264	254	E A 280	E A 298	E A 313	
L Q	262	258	248	258	248	233	220	214	200	200	195	187	178	190	196	212	212	226	241	248	232	242	254	269	

IONOSPHERIC DATA STATION Kokubunji

JUL.2022 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	104	102	102	A	A	A	A	102	102	102	102	102	106	A				
2						A	A	104	100	100	100	100	100	A	A	A	A	A	A	A				
3						A	100	100	100	100	100	100	A	A	A	100	A	A	A	A				
4						A	100	100	100	100	100	100	A	100	110	104	104	A	A					
5						A	104	100	A	A	A	A	A	A	A	100	102	102	108	A				
6						A	A	102	100	100	100	A	100	A	A	A	A	A	A	A				
7						A	100	100	100	A	A	A	100	A	A	100	102	106	A	B				
8						A	102	100	100	100	100	100	100	100	A	100	100	106	106	A				
9						A	100	102	102	102	102	102	102	100	A	A	A	100	A	A				
10						A	A	A	A	A	98	A	98	102	102	102	104	100	106	B				
11					120	102	102	100	100	A	A	A	A	A	A	A	104	104	A	A				
12						A	104	104	102	102	100	A	A	A	100	100	98	100	112	A				
13						A	102	102	102	102	102	102	102	102	102	102	102	102	A	A				
14						A	102	100	100	A	A	100	106	106	106	104	102	102	A					
15						A	A	A	A	A	A	A	A	A	A	100	100	100	100	A				
16						A	100	100	96	96	100	A	A	A	A	A	A	A	A	A				
17					126	102	100	98	98	98	A	98	98	98	98	102	102	A	A					
18					116	96	100	100	98	98	A	98	98	98	98	98	102	A	A					
19						A	A	100	100	100	100	100	A	100	100	100	100	106	102	A				
20						A	A	100	100	100	100	100	100	100	100	104	104	104	104	A				
21						A	104	C	A	102	A	102	A	A	A	A	A	102	A	A				
22						A	102	100	100	C	100	100	100	100	100	100	102	102	A	A				
23						A	102	100	98	98	98	100	A	A	100	100	A	A	A	A				
24						B	100	A	A	A	100	A	A	100	100	100	102	102	100	A				
25						A	C	100	A	100	100	100	102	A	A	A	A	A	A	A				
26						C	102	A	102	A	A	A	102	A	102	A	102	A	A	A				
27						A	102	100	100	100	A	A	A	A	A	A	A	100	100	A				
28						A	100	100	A	A	A	A	102	102	102	102	102	A	A	A				
29						A	A	A	A	A	A	102	102	A	A	A	102	102	A	C				
30						A	A	102	100	A	A	A	A	A	A	A	A	A	100	A				
31							110	102	A	A	102	100	100	100	A	100	100	100	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						3	22	25	22	18	18	16	15	16	16	19	21	23	12					
MED						120	102	100	100	100	100	100	100	100	100	100	102	102	103					
U Q						126	102	102	100	100	100	101	102	102	102	102	103	104	106					
L Q						116	100	100	100	100	100	100	100	100	100	100	100	100	100					

JUL.2022 h'E (KM)

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JUL.2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

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	98	96	96	94	96	152	106	106	102	112	94	104	94	110	110	112	120	108	100	100	100	104	100	98
2	96	92	92	86	86	90	130	114	104	104	102	98	98	110	92	100	100	104	112	108	102	100	100	98
3	96	96	B	94	94	98	106	106	102	100	98	94	94	94	94	110	108	106	104	104	104	100	100	114
4	98	94	94	90	88	128	116	104	104	104	100	100	100	126	112	110	108	102	98	94	104	102	102	102
5	100	96	B	96	134	120	126	108	104	94	100	96	98	96	108	134	118	110	110	98	112	110	104	100
6	100	100	108	96	96	96	102	112	108	100	112	100	100	94	94	92	92	90	90	108	90	90	102	98
7	98	92	92	126	124	140	G	140	112	100	108	110	124	112	112	116	112	102	102	102	98	102	102	106
8	100	96	96	96	B	114	124	122	112	110	110	102	108	104	100	98	106	112	106	106	100	100	100	100
9	100	96	94	94	106	118	108	104	104	100	106	106	102	96	96	92	100	96	90	88	86	90	96	98
10	96	100	100	96	106	98	94	96	98	94	100	102	100	104	112	148	150	108	104	102	98	100	100	100
11	116	98	94	100	96	G	114	106	104	104	98	96	90	96	96	104	108	104	104	92	86	86	100	96
12	96	94	88	98	B	158	138	124	106	102	96	G	102	100	104	120	106	106	112	100	94	90	94	94
13	108	108	106	102	112	112	106	106	104	102	102	G	G	G	122	134	140	106	106	102	100	98	94	96
14	96	96	96	96	102	114	110	108	102	96	94	94	94	G	124	112	108	108	104	96	92	90	96	96
15	98	100	100	112	106	104	100	98	102	96	96	98	100	98	122	114	114	102	102	100	100	100	96	100
16	96	94	94	98	98	116	116	106	102	100	100	96	96	94	96	92	90	90	108	106	88	88	96	94
17	94	88	90	88	92	G	124	114	104	104	114	102	114	G	114	124	108	106	102	102	98	94	94	104
18	96	96	94	94	96	G	116	112	110	102	102	102	118	122	G	124	114	106	100	102	98	98	102	102
19	100	92	106	98	96	96	120	G	114	108	100	102	108	116	G	126	G	114	106	102	98	96	96	96
20	96	96	94	92	92	102	114	108	106	100	114	110	110	G	110	108	108	110	100	100	100	106	102	102
21	96	94	94	94	156	126	112	C	106	104	106	100	100	98	104	100	110	108	104	104	104	104	100	100
22	96	96	92	92	98	134	110	100	100	C	102	126	120	122	108	108	106	112	102	100	98	98	96	94
23	94	92	92	114	96	96	108	102	106	102	100	98	98	98	98	98	98	96	94	94	90	102	100	100
24	112	116	96	96	B	114	G	100	100	100	96	96	100	106	116	116	110	106	104	96	100	100	96	94
25	96	94	100	100	100	102	C	98	98	98	100	98	98	96	94	92	92	92	92	92	90	90	86	94
26	94	94	88	88	104	C	98	104	98	96	98	104	102	104	136	120	114	112	108	102	100	104	102	102
27	100	96	96	96	96	100	106	106	102	96	98	98	98	98	98	98	108	102	104	102	104	100	96	94
28	90	84	86	86	96	102	106	106	104	102	98	128	94	106	108	114	102	104	100	98	98	98	102	104
29	98	94	94	94	94	90	94	110	106	106	104	104	102	108	102	102	104	102	102	C	96	102	102	100
30	100	96	90	92	B	104	102	106	96	96	98	98	98	96	96	94	94	94	116	102	98	100	100	102
31	100	98	96	96	96	96	130	110	104	112	130	124	116	116	122	116	104	100	100	96	96	98	98	96
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	29	31	27	27	28	29	31	30	31	29	30	27	30	30	31	31	31	30	31	31	31	31
MED	98	96	94	96	96	104	110	106	104	101	100	100	100	104	108	110	108	106	102	100	98	100	100	100
U Q	100	96	96	98	106	120	118	111	106	104	106	104	108	110	114	116	114	108	106	102	100	102	102	102
L Q	96	94	92	92	96	98	106	104	102	98	98	98	98	96	96	98	102	102	100	96	94	94	96	96

JUL.2022 h'Es (KM)

IONOSPHERIC DATA STATION Kokubunji

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

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

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F3	F5	F4	F2	F3	H1	C4	C3	C3	CL32	L3	C1	L2	C1	C1	C2	C2	C2	C3	C4	F4	F4	F6	F3
2	F2	F4	F3	F2	F2	L2	HL12	C2	C2	C2	C2	L3	L2	CL12	L3	C2	C2	C1	CL23	CL32	F5	F2	F2	F3
3	F3	F1		FQ41	FQ21	L2	C3	C2	C4	C3	L3	L2	L3	L2	L3	C2	C3	CL42	CL42	C6	FF32	F6	FQ31	FQ31
4	FQ31	FQ41	FQ31	FQ41	F3	C1	C3	C3	C3	C3	C4	C3	C2	C2	C4	C4	C3	C3	L3	L3	FF23	FF22	F7	F6
5	F5	F2		F2	F1	C3	C3	C4	C3	L2	C2	L2	L4	L3	C2	H1	C3	L3	C4	L5	FF11	FF62	FF33	FF32
6	FF32	F3	F2	F2	F3	L3	C2	C1	C1	C3	C1	C1	C2	L3	L1	L3	L2	L3	L3	CL22	F2	F2	F5	F6
7	F5	F4	F4	FF22	F1	H2		H1	C1	C2	C2	C2	C1	C2	C2	C2	C2	C2	C3	C1	F3	F2	F4	F3
8	F5	F5	FQ41	F2		C3	C1	C2	C2	C2	C2	C3	C2	C3	C2	C2	C2	C1	C2	C2	F5	F3	F3	F3
9	F2	F2	F2	F3	F1	C3	C3	C4	C2	C3	C1	C1	C1	L3	L3	L2	C1	LC11	L3	L4	F3	F3	F3	F4
10	F2	FQ31	F2	F2	F2	L1	L3	L2	L2	L1	C2	C2	C2	C1	C1	H1	H1	C2	C2	C3	F3	F3	F3	F4
11	FF23	F2	F3	F2	F3		C2	C2	C2	C1	L3	L3	LQ31	LQ31	L3	C1	C3	C2	C2	C3	F4	F4	F3	F4
12	F4	F3	F3	F2		H1	H1	C3	C2	C1	L1		C1	C1	C1	C1	C1	C1	C1	C5	F2	F2	F2	F2
13	F4	F3	FF43	F3	F2	C3	C4	C2	C2	C2	C1				C1	H1	H1	C3	C2	C4	F6	F5	F5	FQ41
14	FQ41	FQ21	FQ21	FQ41	F3	C3	C2	C3	C2	C3	L2	L3	L3		C1	C2	C3	C2	C3	C3	F3	F5	F2	F4
15	FF33	F2	F3	F3	F3	C4	C4	L2	C1	L3	L3	L1	C1	LQ21	CL21	C2	C1	C4	C3	C7	F5	F3	F3	F3
16	F4	F3	F3	F2	F2	C2	C3	C3	C3	C3	C1	L2	L3	L2	L1	L2	L4	LC21	CL23	C3	F3	F4	F1	F2
17	F2	F3	F2	F2	F1		CL11	C2	C3	C2	C1	CQ31	C1		C2	C1	C2	C2	C4	C3	F4	F4	F5	F3
18	F4	F3	F5	F3	F3		C1	C1	C1	C4	C2	C2	C2	C1		C1	C3	C4	C5	C5	F1	FQ21	F4	F7
19	F2	F2	F1	F2	F4	L3	CL12		C2	C1	C3	C2	C2	C2	C1		C1	C2	C3	L2	F4	F4	F3	F5
20	F4	F7	F6	F3	F2	C3	C2	C2	C2	C2	C2	C2	C2		C3	C2	C2	C1	C4	C4	F3	F4	F7	F4
21	F4	F3	F4	F3	F1	C1	C2		C2	C1	C1	C2	C3	C1	C1	C1	C1	C2	C2	C2	F1	F2	F3	F7
22	F3	F3	F4	F6	F3	H2	C2	C4	C3		C1	C1	C2	C1	C2	C1	C2	C2	C3	C3	F3	F3	F3	F5
23	FQ41	F2	F3	FF24	F3	L3	C3	C3	C2	C2	C3	L3	L3	L3	L3	L2	L2	L3	L2	L1	F2	F5	F3	F4
24	F2	FF11	F2	F4		C1		C3	C1	C3	L4	L3	C1	C1	C1	C2	C3	C3	C3	LC21	F3	F3	F3	F2
25	F3	F3	F4	FQ31	F3	C3		L3	L3	L3	C1	L3	L3	L3	L3	L4	L4	L3	L4	L6	F5	F5	F4	F5
26	F2	F3	F3	F2	F2		C4	C2	L2	L2	L2	C2	C2	C1	H1	CL21	C1	C2	C2	CL32	FF43	F3	F4	F4
27	F4	F3	F5	F5	F2	C1	C2	C3	C3	C3	L4	L4	L3	L4	L3	L3	C4	C4	C6	C3	F4	F3	FQ31	FQ41
28	FQ41	FQ41	F2	F2	F1	C2	C2	C4	C3	C2	L2	CL21	L3	C2	C2	C2	C3	C4	C4	L3	F2	F3	F5	F3
29	F4	F6	F6	F7	F3	L2	L3	CL33	CL42	CL42	C4	C3	C5	C1	C3	C2	C4	C4	C4		F3	F4	F3	FQ31
30	FQ31	FQ31	F2	F2		C2	C3	L2	L4	L3	L3	L2	L2	L3	L2	L3	L4	L2	C1	C4	FF32	F3	F5	FQ41
31	F6	F3	F6	F5	F3	F4	HC12	C2	C3	C2	HC11	C1	C2	C2	CL12	C2	C3	C3	C4	C4	F3	F4	F4	F6
	00	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																								

JUL. 2022 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2022 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	78	71	70	X 66	X 64																X 86	X 76	X 73	X 79	
2	X 80	X 69	X 72	X 69	X 62																	X 90	X 83	X 87	X 92
3	X 97	X 91	X 74	X 76	X 80		93	87														X 81	X 72	X 72	X 61
4	A	X 55	X 71	X 69	X 69	62																X 89	X 83	X 77	X 84
5	92	92	X 86	X 57	X 51																	A	X 74	X 76	X 73
6	X 79	X 81	X 79	X 78	X 82	69																X 74	X 73	X 72	X 70
7	X 68	X 71	X 72	X 71	X 68	60																X 82	X 78	X 78	X 78
8	X 70	X 65	X 77	X 76	X 71																	X 66	X 69	X 61	X 60
9	X 62	X 68	X 68	X 64	X 62																	X 89	X 82	X 74	X 72
10	X 72	X 70	X 64	X 65	X 70																	X 94	X 88	X 83	X 80
11	X 78	X 79	X 80	X 78	X 70																	X 93	X 92	X 82	X 79
12	X 82	X 84	X 80	X 78	X 78	72																X 76	X 74	X 78	X 74
13	X 75	X 72	X 82	X 82	X 61																	X 83	X 74	X 67	X 71
14	64	77	X 70	X 77	X 65																	X 78	X 77	X 75	X 74
15	X 76	X 78	X 78	X 60	X 64																	X 85	X 71	X 66	X 66
16	X 63	X 65	X 62	X 64	X 59																	X 88	X 72	X 72	X 70
17	X 70	X 68	X 68	X 72	X 66																	X 85	X 76	X 73	X 72
18	X 72	X 72	X 71	X 68	X 63																	X 86	X 79	X 78	X 80
19	X 84	X 81	X 82	X 68	X 63																	X 99	X 80	X 83	X 79
20	X 84	X 85	X 80	X 65	X 63																	X 77	X 79	X 83	X 85
21	X 86	X 81	X 77	X 76	X 69																	X 75	X 78	X 78	X 68
22	X 82	X 80	X 69	X 62	X 64																	X 83	X 85	X 84	X 68
23	79	X 63	X 60	X 63	X 63	59																A	X 80	X 78	X 82
24	93	X 86	X 78	X 82	X 84		X 82															X 91	X 79	X 83	X 79
25	X 74	X 71	X 67	X 68	X 70	72																X 80	X 68	X 64	X 60
26	X 55	X 58	X 62	X 60	X 60																	X 85	X 82	X 77	X 77
27	C	C	C	C	C	C	C	C	C	C	C	C	C									X 87	X 71	X 67	A
28	80	79	72	72	71	71																X 95	X 91	X 88	90
29	83	87	91	72	76	70	71													X 81		X 81	X 87	X 72	X 72
30	80	90	84	76	77	72																X 92	X 72	X 62	70
31	87	93	90	78	63	58																X 89	X 86	X 73	X 72
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	30	30	30	10	3	1												1	29	31	31	30	
MED	X 79	X 78	X 73	X 70	X 66	70	82	87													X 81	X 85	X 78	X 76	X 74
U Q	84	84	80	76	71	72	93														X 90	X 83	X 82	X 79	
L Q	X 71	X 69	X 69	X 65	X 63	60	71															X 80	X 73	X 72	X 70

JUL.2022 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

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

JUL.2022 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	A	A	A	A	A	A	A	464	A	A					
2							L	L	A	A	A	A	A	A	A	A	A	A						
3								A	A	508	A	R	A	A	A	A	A	444	L					
4								L	A	A	A	A	A	A	A	A	A	A	A					
5								L	A	A	A	A	A	A	A	A	484	480	468	472	436			
6								A	472	476	A	496	508	508	492	488	484	A	L	A				
7									A	A	A	508	492	A	A	480	468	448	428	L	L			
8							U L	396	428	A	A	A	A	A	A	A	A	436	392					
9								L	A	A	A	A	504	A	A	492	484	448	L	L				
10						A		L	L	A	A	508	A	504	496	496	484	460	A					
11								L	A	504	A	A	A	A	A	A	A	A	A					
12							L	448	504	U L	496	500	508	508	496	A	476	480	436					
13								U L	456	A	A	A	A	508	504	492	492	452	420					
14							U L	428	460	A	540	520	508	524	508	504	492	468						
15								L	A	476	A	A	512	508	520	488	480	456	424					
16							L	424	452	600	A	A	A	A	536	516	512	492	428					
17								L	476	A	500	U L	548	516	A	516	A	A	A					
18								L	L	U L	532	520	A	A	A	500	A	460	424	L				
19								L	L	A	524	A	A	A	516	504	A	484	A					
20							A	392	452	484	500	508	A	536	A	508	504	460	A					
21									472	488	500	500	524	500	500	A	480	444	L					
22								L	A	A	492	484	A	A	A	A	488	460	A	A				
23									L	448	472	A	A	A	A	A	A	A	A	A				
24								L	L	A	A	A	A	A	A	492	A	A	A					
25									A	A	A	A	A	A	A	A	A	A	A					
26							L	A	460	460	480	500	488	A	492	468	472	452	L					
27						C	C	C	C	C	C	C	C	A	A	A	A	448						
28							L	A	A	A	A	560	484	492	484	488	A	444	408	L				
29								L					A	A	A	A	A	A	A					
30									A	A	A	A	A	A	A	A	472	448	420	372				
31								L	U L	472	476	L	480	496	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							3	10	15	14	11	14	12	10	13	16	16	20	11					
MED							U L	368	424	460	480	500	500	506	508	500	492	482	454	424				
U Q							U L	380	436	476	504	520	508	510	508	516	502	490	464	432				
L Q							U L	344	412	448	472	480	496	490	500	492	484	470	446	408				

JUL.2022 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	184	A	A	A	356	A	368	364	360	348	320	284	248	A				
2						A	232	264	A	A	348	A	A	352	328	A	A	A	A	A				
3						B	A	A	A	A	348	360	360	A	A	A	A	A	A	A				
4						A	200	268	A	328	352	356	352	352	368	356	332	292	232	A				
5						B	A	264	288	A	A	A	A	A	A	A	328	296	A	A				
6						A	A	A	A	A	A	A	A	A	A	356	A	A	A	A				
7						B	A	276	308	348	348	372	384	380	376	360	340	304	248	A				
8						B	192	264	308	336	356	376	376	372	364	348	332	304	A	A				
9						B	A	284	328	356	A	376	A	368	380	360	A	304	256	A				
10						A	A	A	A	A	A	A	384	384	376	364	336	312	252	A				
11						A	A	276	A	356	376	A	A	A	360	A	A	A	A	A				
12						A	208	264	A	A	A	A	A	A	388	364	340	312	A	A				
13						B	196	272	324	352	368	376	376	A	A	364	344	308	248	A				
14						A	208	A	304	A	340	A	396	376	360	A	A	316	256	A				
15						B	A	280	328	344	368	A	A	396	388	A	A	A	A	A				
16						B	224	276	328	348	356	A	356	A	A	A	A	A	A	A				
17						B	A	276	328	344	A	392	404	392	384	368	356	308	A	A				
18						A	A	276	316	344	368	A	A	A	376	376	344	328	268	A				
19						B	A	260	A	A	A	A	384	364	356	372	352	316	268	A				
20						A	180	232	308	344	368	372	372	392	372	356	340	308	244	A				
21						B	A	268	A	A	368	380	396	388	368	356	332	288	236	A				
22						B	A	A	A	A	A	376	388	376	368	356	336	316	252	A				
23						B	A	A	A	348	356	356	A	360	352	A	A	A	A	A				
24						A	A	A	A	A	A	A	A	A	A	A	328	292	236	A				
25						B	A	244	300	324	344	360	372	364	352	A	A	A	A	A				
26						A	A	236	A	A	A	A	A	A	A	A	A	A	A	A				
27						C	C	C	C	C	C	C	C	344	A	A	320	288	224	A				
28						B	A	A	A	A	328	A	368	368	A	344	A	272	224	A				
29						B	A	A	A	A	348	360	364	364	352	348	320	276	A					
30						B	A	252	296	A	A	A	A	348	332	A	316	244	A					
31						B	A	A	A	A	A	A	A	376	360	336	324	284	228	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							9	19	13	13	18	13	17	21	22	18	19	21	17					
MED							200	268	308	344	356	372	376	368	366	356	332	304	248					
U Q							216	276	328	350	368	376	386	382	376	364	340	312	254					
L Q							188	260	302	340	348	360	366	362	356	348	324	288	234					

JUL.2022 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
23	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
24	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
25	J	A	J	A	J	A	J	A	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
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
28	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
29	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
31	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
	00	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	31	31	31	31	31	31	31	31	31	31	31
MED	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
LQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A

JUL.2022 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	29	E B	E B	E B	E B	19	28	46	A A	52	58	58	50	63	A A	A A	A A	A A	46	50	35	E B	26	25	
2	E B	16	34	24	27	20	G	30	43	A A	A A	A A	A A	A A	A A	A A	A A	62	61	47	40	26	27	24	
3	34	E B	E B	E B	E B	E B	22	52	51	37	49	46	140	128	82	223	54	41	32	74	44	25	54	28	
4	A A	88	26	24	22	31	27	37	31	A A	A A	A A	A A	A A	A A	A A	63	68	49	44	40	27	23	26	
5	45	25	63	E B	E B	E B	23	39	44	74	50	60	75	56	39	39	28	34	28	37	A A	E B	25	25	
6	E B	E B	E B	39	44	28	24	26	38	38	41	49	45	41	45	40	G	44	45	30	28	25	28	E B	
7	25	31	E B	E B	E B	E B	24	50	48	56	A A	43	45	51	55	42	38	34	29	21	E B	24	E B		
8	24	26	28	E B	E B	E B	24	32	36	68	46	51	70	54	59	51	50	35	28	26	E B	16	E B		
9	E B	E B	E B	E B	E B	E B	28	32	51	60	A A	65	44	52	59	38	39	34	28	25	E B	E B	E B		
10	E B	E B	E B	E B	E B	A A	28	34	32	50	51	46	51	46	44	G	38	G	64	32	29	19	E B		
11	E B	16	18	28	25	23	25	25	37	60	45	122	51	58	62	65	A A	A A	A A	A A	50	36	24	E B	
12	E B	E B	E B	E B	E B	25	18	28	31	36	38	40	44	42	41	44	51	38	35	27	24	E B	E B		
13	E B	E B	E B	E B	E B	E B	24	32	39	52	66	142	53	46	40	G	40	39	30	29	28	19	E B		
14	23	21	E B	27	21	21	25	37	40	A A	153	50	47	46	45	46	42	39	37	34	24	E B	E B		
15	E B	E B	E B	E B	E B	E B	22	32	50	43	63	52	46	46	43	38	35	32	30	28	25	25	E B		
16	E B	16	28	18	16	16	27	30	39	44	85	55	106	96	48	50	37	32	28	24	E B	23	E B		
17	E B	E B	E B	21	20	E B	23	30	37	A A	96	42	42	51	59	48	61	65	47	42	27	25	E B		
18	20	20	18	E B	E B	22	26	29	34	40	41	54	82	96	52	40	50	36	33	24	18	16	20	26	
19	23	E B	28	20	E B	E B	26	33	41	51	48	60	A A	126	58	43	44	56	43	44	28	26	30	E B	
20	25	30	51	E B	24	23	35	32	40	40	41	46	56	44	62	48	36	37	44	28	42	E B	E B		
21	E B	16	20	21	19	E B	29	35	32	43	43	45	G	42	46	50	40	34	29	33	E B	E B			
22	E B	E B	E B	E B	E B	E B	23	31	51	46	42	42	60	70	67	52	40	37	41	78	62	16	27	28	
23	24	25	25	E B	E B	25	28	30	37	40	50	77	81	123	130	51	51	62	74	A A	109	100	52	28	24
24	24	E B	E B	E B	23	24	28	32	39	49	56	61	64	76	110	40	71	A A	A A	A A	49	29	30	27	28
25	30	E B	16	29	24	E B	29	36	87	128	90	79	87	52	109	131	70	56	50	42	65	36	25	24	
26	25	E B	E B	E B	21	20	22	40	35	42	41	48	48	52	44	38	34	30	26	23	24	19	19	18	
27	C	C	C	C	C	C	C	C	C	C	C	C	C	A A	A A	A A	46	56	36	32	59	E B	A A		
28	19	44	20	20	E B	21	52	42	38	50	41	44	44	44	40	43	36	25	36	E B	E B	E B	E B		
29	19	31	E B	E B	E B	E B	21	29	35	36	43	45	55	50	87	50	60	A A	A A	41	23	46	16	E B	
30	E B	E B	E B	E B	E B	E B	23	56	42	118	49	60	44	46	62	43	42	34	16	35	20	17	E B	27	
31	43	E B	E B	E B	E B	E B	22	30	33	40	38	44	43	51	57	49	62	60	51	53	37	34	E B	E B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	
MED	20	E B	18	E B	E B	25	32	40	48	50	51	54	52	57	48	44	37	33	32	28	19	20	19		
U Q	25	26	25	20	25	21	28	38	50	A A	A A	A A	A A	A A	A A	A A	60	60	49	47	42	28	26	26	
L Q	E B	E B	E B	E B	E B	E B	23	31	36	40	43	45	45	46	44	40	38	34	28	25	E B	E B	E B	E B	

JUL.2022 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

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

JUL.2022 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F						A						A	A		A						
2	R	F	F	F						A	A	A	A	A	A	A		A						
3	F	F	F	F											A	A		A						
4	A	F	F	F	F	F	F	F	A	A	A	A	A		A	A								
5	F	F	F	F	F	F	F	F																
6	290	288	282	296	319	335	331	319	326	314	307	319	281	273	297	297	292	303	306	291	287	276	309	304
7	279	296	316	304	302	307	303	321	349	324		284	307	307	302	292	305	319	314	299	299	285	279	284
8	258	244	266	274	268	258	275	301	331		250	288		228	257	294	298	285	293	308	296	287	265	267
9	257	286	281	293	304	326	325	336	329	302		A	J	R										
10	279	286	270	284	290		306	313	314	295	336	304	268	286	275	290	280	284	299	303	310	297	291	276
11	286	J	R	F																				
12	262	275	295	290	290	287	271	308	276	292	246	278	283	287	293	302	298	295	303	299	280	273	276	265
13	255	275	309	334	307	282	304	308	323	262														
14	F	F		F							A													
15	265	285	302	308	282	296	318	345	336	318	296	262	272	270	283	283	289	287	310	305	319	286	270	269
16	269	283	276	273	275	285	320	332	339	307		277			A	A								
17	279	279	273	304	297	294	345	359	348		A													
18	278		F																					
19	281	291	329	279	288	298	327	337	321	325	298	300		A										
20	271	302		F																				
21	279	282	302	328	304	307	344	339	319	318	334	297	274	286	280	289	300	299	301	307	284	278	290	273
22	284	305	297	247	261	317	344	348	320	324	377	347	287	292	316	310	287	303	297		A			
23	F	F	F	F	F	F																		
24	F																							
25	297	296	283		R	F	F	F																
26	276	279	296	288	294	312	313	348	357	357	363	292	257	276	279	305	292	312	303	305	313	300	289	294
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	A								
28	F	F	F	F	F	F																		
29	F	F	F	F	F	F																		
30	F	F	F	F	F	F																		
31	F	F	F	F	F	F																		
	00	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	27	27	28	30	29	30	30	27	23	22	25	21	25	22	25	29	28	29	29	29	31	31	29
MED	279	291	295	294	298	304	329	338	329	318	308	297	288	287	293	291	294	296	303	307	307	287	282	281
U Q	286	309	302	308	304	314	344	348	353	326	346	312	304	300	304	298	300	303	308	316	318	300	293	293
L Q	269	283	282	284	288	293	306	319	314	295	296	284	277	276	280	285	288	288	294	300	296	281	273	271

JUL. 2022 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	A	A	A	A	A	A	A	A	A	A					
2							L	L	A	A	A	A	A	A	A	A	A	A						
3								A	A		A	R	A	A	A	A	A	A	L					
4								L	A	A	A	A	A	A	A	A	A	A	A					
5								L	A	A	A	A	A	A					L					
6								366																
7								399	A	A	A	A	A	A	413	397	386	333	356					
8								A	374	389	A	A	412	373	428	400	A	A	L	A				
9									A	A	A	A	406	449	A	A	400	381	362	365	L	L		
10							U L				A	A	A	A	A	A	A	A						
11							348	365	394										363	349				
12								L	A	A	A	A	402		A	A	390	379	365	L	L			
13											A	A	A	A	A	A								
14							A	L	L	A	A		A			A			A					
15								L	A															
16								358		370														
17								L		U L							A		L					
18								321	356	349	390	381	404	379	401	403		380	338	357				
19								U L		A														
20								368	369						391	397	385	348	377	346				
21								U L		A						A								
22								342	366	384		368	415	413	363		378	368	358					
23								L			A	A	A	A	A	A								
24										371			377	396		395	373	360	351					
25								L			A	A	A	A		A								
26								372	380	350					357		347	345	339					
27								L		A	U L								A					
28								371		388	383													
29								L	L	U L									L					
30								394	357	389						369		366	344					
31								L	L	A	A	A	A	A			A	A	A					
32								363							377	373								
33								A		A	A	A	A	A		A								
34											A	A							A					
35								376		339	388			367			353	371						
36															A	A			L					
37									365	374	386	407	388	398			364	357						
38								L	A	A				A	A	A			A		A			
39											403	428					354	347						
40									L		A	A	A	A	A	A	A	A	A	A				
41								379	395															
42								L	L	A	A	A	A	A										
43								A	A	A	A	A	A	A	A	A	A	A	A	A				
44																								
45																								
46								L	A			A	A	A	A				L					
47									378	392	404					384	367	354						
48							C	C	C	C	C	C	C	A	A	A	A							
49								L	A	A	A			A				358						
50												357	375		375	364		A	356	342				
51								L			A	A	A	A	A	A	A	A	A	A				
52									A	A	A	A	A	A	A									
53										388														
54								A	A	A	A	A	A	A										
55																365			363	363				
56								L		U L		L			A	A	A	A						
57								397	388	413	387	381												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	10	14	13	9	10	9	8	7	14	13	18	11					
MED							U L												L					
U Q							342	366	378	382	388	405	388	394	397	384	367	358	349					
L Q							U L												L					
							348	372	384	390	404	415	412	400	413	395	380	363	357					
							L	L											L					
							321	364	369	364	384	386	378	370	375	373	354	354	344					

JUL.2022 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 2022 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A E	A E	A E	A A	E A	E A	A	A		A						
2							272	250	216	A	A	A	A	A	A	A	338	E A	274					
3								240	238	370	268	322		A	A	A		326	290	266				
4								248	A	A	A	A	A	406		A	356	E A	284					
5								268	316	E A	422	300	302	E A	318	342	290	336	330	322	296			
6								258	280	290	312	296	396	320	336	320	316	292	296	248				
7									242	296	A	370	306	296	310	336	300	274	276	270				
8								318	338	296	A	506	374	E A	E A	E A		334	352	312				
9								256	E A	362	A	E A	332	342	346	E A	372	346	330	308	316	276		
10						A		278	268	328	278	338	444	376	354	352	A	A	E A	298				
11								288	318	282	A	376	366	320	324			330						
12								370	310	380	328	518	408	378	382	356	340	342	338	288				
13								298	306	E A	476	A	A	390	360	392	388	362	330	302				
14								312	280	302	A	886	430	342	348	324	410	348	324					
15								262	300	312	382	450	418	432	386	382	352	342	286					
16								260	262	258	370	A	388		A	396	342	320	330	304				
17								228	256	A	310	408	432	E A	428	380	364	350	316	274				
18								242	246	306	348	402	A	A	418	370	362	348	308					
19								246	238	282	262	348	354	A	358	346	364	344	380	354				
20								326	386	420	336	354	346	342	416	340	318	340	322	284				
21									296	320	300	360	422	394	390	368	346	302	270					
22								244	E A	286	262	314	E A	E A	430	306	312	354	306	280		A		
23									244	242	264	A	A	A	A		344	332	302	290		A		
24								240	244	306	268	E A	390	332	342	A	300	324	A	A				
25								234	A	A	A	A	A	300		A	E A	350	314	274				
26								284	250	244	256	266	378	460	364	348	294	294	286	286				
27						C	C	C	C	C	C	C	C	A	A		320	284	294					
28								270	224	222	318	328	414	344	300	292	324	286	302	302				
29								234		270	260	328	E A	360	424	A	336	308	A	256				
30								210	216	A	278	E A	322	324	356	E A	396	368	346	294	276			
31								226	226	276	310	288	426	366	322	310	304	290						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							9	26	26	23	22	25	21	25	22	25	29	28	25	3				
MED							284	250	260	301	308	363	364	359	344	342	336	315	286	270				
U Q							322	278	302	336	354	396	420	411	390	366	349	330	302	276				
L Q							265	238	244	282	268	325	342	342	324	320	318	298	275	248				

JUL. 2022 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 2022 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E A 270	248	248	E A 266	250	236	248	E A 250	A	A	A	A	A	A	A	A	A	A	A	E A 272	242	208	292	E A 290	
2	E A 252	E A 266	E A 266	E A 268	E A 256	252	220	212	A	A	A	A	A	A	A	A	A	A	E A 274	E A 230	244	E A 306	E A 334	E A 296	
3	270	224	294	274	254	254	242	A	A	200	A	E A 242	A	A	A	A	A	E A 274	244	E A 348	E A 260	E A 230	E A 354	E A 300	
4	A	224	E A 324	E A 272	E A 262	266	218	200	A	A	A	A	A	E A 274	A	A	A	A	E A 244	E A 260	E A 260	E A 274	E A 310	E A 334	
5	E A 340	252	E A 234	E A 246	312	290	238	224	A	A	A	A	A	A	A	196	210	176	240	230	238	A	E A 254	E A 284	E A 300
6	280	298	E A 324	E A 316	230	202	230	A	210	212	A	E A 226	188	266	184	172	A	A	226	A	E A 262	E A 282	260	248	
7	E A 312	E A 294	234	252	E A 234	268	234	E A 284	A	A	A	200	178	A	A	202	230	204	222	250	236	248	274	E A 290	
8	E A 336	E A 368	314	298	324	344	252	234	206	A	A	A	A	A	A	A	A	238	206	272	E A 268	E A 246	E A 272	312	
9	334	268	284	264	246	234	240	236	A	A	A	A	212	A	A	204	208	226	218	256	232	210	222	250	
10	288	272	324	298	E A 268	A	246	236	196	A	A	200	A	208	E A 208	198	210	208	A	262	230	230	232	282	
11	274	248	E A 262	240	E A 244	268	228	236	A	E A 244	A	A	A	A	A	A	A	A	A	A	254	E A 264	E A 252	E A 254	272
12	322	264	240	262	E A 274	286	280	240	194	194	202	202	244	198	204	H A	214	212	218	242	268	258	276	E A 298	
13	318	310	248	232	238	262	228	220	E A 228	A	A	A	A	222	180	208	248	242	230	262	244	238	246	314	
14	E A 314	290	248	E A 290	270	270	238	E A 230	206	A	268	206	212	238	E A 234	212	230	224	276	234	234	238	262	280	
15	310	284	248	248	306	254	232	228	A	E A 246	A	A	254	228	E A 242	212	218	214	220	276	232	E A 242	274	304	
16	306	E A 298	292	282	288	268	234	204	218	230	A	A	A	A	E A 258	A	226	224	228	252	218	264	288	278	
17	270	294	306	266	254	264	248	214	200	198	188	A	A	A	E A 302	A	A	A	A	264	248	E A 266	274	294	
18	278	304	282	270	262	242	216	210	196	202	192	A	A	A	A	206	A	224	E A 230	260	216	262	274	E A 310	
19	278	264	226	E A 274	262	256	226	226	238	A	E A 274	A	A	A	222	240	A	E A 312	A	266	230	240	E A 312	258	
20	306	260	E A 310	276	E A 308	326	A	208	E A 270	E A 270	212	236	A	222	A	A	208	206	A	256	E A 284	272	306	290	
21	268	260	256	238	246	236	216	230	198	E A 244	206	204	186	194	E A 306	A	E A 226	E A 206	212	252	258	308	262	286	
22	290	224	286	350	350	246	226	214	A	A	196	178	A	A	A	A	A	E A 222	240	A	E A 352	246	264	246	
23	E A 310	E A 262	E A 298	E A 284	E A 302	262	240	230	218	206	A	A	A	A	A	A	A	A	A	A	A	E A 324	E A 282	E A 322	
24	E A 296	240	264	272	262	226	210	208	E A 210	A	A	A	A	A	A	210	A	A	A	254	222	E A 282	298	270	
25	E A 298	290	E A 322	278	278	238	232	A	A	A	A	A	A	A	A	A	A	A	A	240	E A 294	E A 284	262	266	
26	E A 308	290	258	270	264	260	224	A	194	E A 224	210	E A 338	E A 330	A	E A 284	218	204	210	226	240	238	232	262	266	
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	A	A	A	228	258	E A 276	234	192	E A 300	
28	278	E A 340	290	262	268	252	232	A	A	A	A	190	258	254	246	236	A	230	206	E A 286	228	228	242	222	
29	288	E A 308	280	216	242	220	226	210	190	190	A	E A 244	A	A	A	A	A	A	A	226	E A 270	228	228	236	
30	266	262	258	232	250	232	212	A	A	A	A	A	E A 256	A	A	E A 262	E A 290	238	240	244	210	200	284	E A 322	
31	E A 328	246	258	236	214	240	218	212	202	200	172	E A 240	218	A	A	A	A	A	A	290	270	E A 246	E A 226	220	268
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	30	30	30	29	29	24	17	13	10	14	11	10	13	14	14	20	19	28	29	31	31	30	
MED	U 285	264	266	266	258	254	232	219	202	203	202	U 194	U 203	220	E A 234	210	214	222	227	253	236	238	268	U 268	
U Q	E A 313	294	E A 298	278	278	268	240	235	218	244	212	E A 240	E A 256	E A 254	E A 271	218	230	239	244	268	E A 263	E A 272	E A 292	E A 300	
L Q	276	252	248	248	246	237	222	211	196	200	196	200	188	208	200	204	208	211	218	243	231	230	260	266	

JUL. 2022 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUL.2022 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	108	A	A	A	102	A	102	102	102	102	102	102	102	A				
2						A	102	102	A	A	102	A	A	102	102	A	A	A	A	A				
3						B	A	A	A	A	102	102	102	A	A	A	A	A	A	A				
4						A	102	102	A	100	100	100	100	100	100	100	106	102	102	A				
5						B	A	102	102	A	A	A	A	A	A	A	112	106	A	A				
6						A	A	A	A	A	A	A	A	A	A	100	A	A	A	A				
7						B	A	100	100	100	100	100	100	100	100	104	104	102	102	A				
8						B	110	100	100	100	102	102	102	102	102	102	102	108	A	A				
9						B	A	108	96	96	A	96	A	96	100	102	A	100	100	A				
10						A	A	A	A	A	A	A	100	100	100	100	100	102	102	A				
11						A	A	102	A	102	102	A	A	A	100	A	A	A	A	A				
12						A	104	100	A	A	A	A	A	A	100	100	100	104	A	A				
13						B	104	104	102	100	100	100	100	A	A	100	106	106	106	A				
14						A	106	A	102	A	100	A	100	100	100	A	A	106	102	A				
15						B	A	100	100	100	100	A	A	100	100	A	A	A	A	A				
16						B	E	112	100	100	100	102	A	100	A	A	A	A	A	A				
17						B	A	106	106	100	A	100	100	100	100	100	100	104	A	A				
18						A	A	102	102	102	102	A	A	A	102	102	102	102	102	A				
19						B	A	102	A	A	A	A	102	102	102	102	102	102	102	A				
20						A	102	102	102	102	102	100	100	100	100	100	100	100	102	A				
21						B	A	100	A	A	100	100	100	100	100	100	100	100	100	A				
22						B	A	A	A	A	A	100	100	100	102	102	104	106	106	A				
23						B	A	A	A	106	100	102	A	102	102	A	A	A	A	A				
24						A	A	A	A	A	A	A	A	A	A	A	102	104	100	A				
25						B	A	100	100	100	100	100	100	100	100	A	A	A	A	A				
26						A	A	100	A	A	A	A	A	A	A	A	A	A	A	A				
27						C	C	C	C	C	C	C	C	100	A	A	100	100	100	A				
28						B	A	A	A	A	100	A	100	100	A	100	A	100	104	A				
29						B	A	A	A	A	104	100	100	100	100	100	100	100	A					
30						B	A	100	100	A	A	A	A	100	100	A	100	108	A					
31						B	A	A	A	A	A	A	A	108	106	102	102	106	106	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							9	19	13	13	18	13	17	21	22	18	19	21	17					
MED							104	102	100	100	101	100	100	100	100	100	102	102	102					
U Q							109	102	102	102	102	101	101	102	102	102	104	106	105					
L Q							102	100	100	100	100	100	100	100	100	100	100	100	101					

JUL.2022 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	102	106	106	102	98	98	112	102	100	100	100	100	126	120	108	108	108	104	104	102	96	90	102	102		
2	94	94	90	88	86	86	G	124	110	100	100	100	100	96	96	96	94	94	94	92	92	92	92	88		
3	98	94	94	84	82	84	136	102	102	108	104	106	96	96	94	94	90	94	106	98	86	94	100	100		
4	98	94	94	94	100	94	116	106	104	104	100	100	100	154	110	110	110	104	104	98	96	100	100	104		
5	104	96	96	96	102	120	120	112	104	96	96	92	92	108	98	152	G	94	174	118	110	108	106	106	104	
6	100	106	100	98	98	96	122	94	124	124	118	94	136	178	98		90	88	88	88	84	118	86	90		
7	100	94	96	96	96	96	B	100	110	106	104	98	114	114	110	116	118	118	120	110	104	90	96	106	104	
8	96	96	94	94	98		128	110	120	112	120	116	110	108	112	108	110	132	114	106	102	108	100	100		
9	100	102	100	92	92	102	110	114	100	100	100	100	100	102	110	152	100	100	134	116	90	98	102	98		
10	B	B	B		98	98	100	94	98	104	162	136	144	186	132	150	G	158	G	106	106	100	100	96	96	
11	96	96	96	94	94	94	110	110	100	102	96	98	94	94	96	96	94	94	92	88	90	84	86	86		
12	102	102	98	90	98	128	B	118	114	100	100	100	96	98	106	142	118	G	122	112	118	96	94	90	90	108
13	92	110	90	102	112		122	118	114	102	100	100	100	100	98		124	116	116	106	102	100	96	96		
14	96	102	102	98	98	94	126	106	102	96	96	96	160	102	122	124	96	106	106	114	88	88	88	88		
15	88	102	100	96	96	100	92	136	112	102	100	92	156	158	152	102	98	94	90	106	102	102	88	102		
16	96	96	B	96	100		B	114	114	104	100	100	96	96	96	92	92	92	88	94	104	88	88	92	88	
17	90	90	94	90	90	94	132	116	116	104	102	114	112	108	130	110	110	104	104	100	100	100	100	96		
18	100	98	98	96	B	98	90	134	120	96	114	100	98	118	122	128	106	112	106	102	98	98	102	102		
19	94	94	96	90	90		B	92	112	106	106	106	104	108	108	128	144	110	108	100	98	94	94	94	94	
20	94	92	96	90	96	110	110	112	112	108	114	116	116	112	110	108	114	108	108	106	104	104	104	100	B	
21	92	96	96	96	96	102	B	110	104	102	102	102	102	G	118	106	104	104	104	104	102	102	100	88		
22	100	96	96	96	98		B	106	108	96	116	98	112	118	110	110	108	114	108	104	102	98	98	98	98	
23	96	96	90	102	96	98	98	96	100	104	102	100	100	98	98	96	96	96	90	88	88	88	88	84		
24	92	84	86	88	84	100	96	96	96	94	94	96	96	94	92	100	106	102	98	98	88	88	88	88		
25	104	84	96	104	98	106	98	100	100	100	100	100	100	100	100	96	94	92	112	90	90	88	88	92	88	
26	88	B	98	98	100	102	116	100	100	106	100	98	98	98	98	98	98	94	108	90	90	96	96	96		
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C		96	96	98	108	112	108	98	98	100	92	94
28	94	94	92	94	94	102	100	96	100	104	100	100	102	102	104	146	100	106	108	102	98	98	96	96		
29	96	90	90	88	84	92	92	120	108	110	110	106	106	104	104	104	100	98	98	98	94	102	110	94		
30	102	104	92	98	118		B	108	108	100	94	94	96	98	100	98	98	110	92	92	106	110	88	102	100	
31	102	100	106	98	100	100	96	94	98	96	96	144	144	118	112	120	108	104	106	100	104	102	98	98		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	29	28	28	30	29	24	29	30	30	30	30	30	29	31	31	28	31	30	31	31	31	31	31	31	30	
MED	96	96	96	96	98	99	110	109	103	102	100	100	100	106	106	108	106	104	104	102	96	98	96	96		
U Q	100	102	98	98	99	102	119	114	110	106	104	106	117	118	116	119	110	112	108	106	102	100	102	100		
L Q	94	94	93	90	93	94	97	100	100	100	98	96	98	98	98	98	96	94	94	98	90	90	90	90		

JUL. 2022 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

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	F1	F1	F4	F2	L2	C3	C5	C4	C4	C4	C3	C2	C3	C3	C2	C4	C4	C5	F9	F3	F3	F2	
2	F2	F3	F3	F2	F2	L2		C2	C3	C5	C4	C4	C3	L4	L5	L5	L4	L6	L6	F5	F6	F5	F2	
3	F2	F2	F2	F2	F1	L1	HC11	C4	C5	C2	C2	C3	L3	L5	L3	L5	L6	L4	CL42	L6	F6	F5	F8	F7
4	F4	F3	F4	F3	FF62	L2	C6	C3	C6	C4	C5	C4	C5	H1	C4	C2	C4	C4	C5	F5	FF34	FF33	FF82	
5	F8	F4	F5	F3	F1	C1	C2	C4	C4	L5	L3	L3	L3	CL22	L1	HC11	LC11	HL11	CL22	CL83	FF84	F2	F3	F2
6	F3	F3	F7	F7	F5	L4	CL23	C4	CL32	CL22	CL32	L2	HL11	HL11	L1		L4	L5	L6	L7	F2	FF32	F3	F2
7	F4	F4	F2	F3	F3	L3	L1	C8	C5	C3	L3	C1	C1	C2	C2	C3	C1	C1	C2	C1	F1	F5	F2	F4
8	F4	F5	F5	F6	F2		C1	C3	C2	C2	C1	C2	C2	C3	C2	C2	C2	C2	C1	C4	F3	F2	F2	F2
9	F2	F2	F2	F2	F3	C1	C3	C2	C3	C2	C3	C2	C1	C2	C2	H1	C3	C1	H1	CL11	F2	F3	F3	F2
10				F1	F5	C6	L3	L3	C1	HC21	HC21	HC11	H1	H1	H1		H1		C6	C7	F6	F2	F3	F1
11	F1	F2	F2	F3	F2	L2	C1	C4	C3	C3	L3	L2	L2	L4	L3	L3	L5	L5	L5	L9	F7	F3	F4	F2
12	F2	FF22	F2	F1	F2	C2	C2	C2	C2	C2	C2	C2	L1	C1	H2	C3	C1	C2	CL11	L1	F2	F2	F3	F2
13	F2	F2	F1	F3	F1		C1	C2	C2	C3	C3	C4	C2	C2	C1		CL21	C3	C1	C4	F4	F2	F2	F3
14	FF32	FF22	F3	F2	F4	L4	C1	C5	C3	C6	L2	L2	HC11	C1	CL11	CL11	L2	CL22	C4	C1	F3	F1	F3	F2
15	F2	FF24	F2	F3	F2	L2	L1	H1	C4	C3	C2	L2	HC11	H1	C1	C1	C3	L6	L6	F9	F3	F1	F2	
16	F2	F2		F1	F1		C1	C1	C2	C2	C2	L2	L4	L5	L2	L3	L3	L3	LC11	C2	F1	F4	F3	F2
17	F2	F3	F3	F2	F3	L1	H1	C2	C3	C3	C2	C1	C2	C2	H1	C2	C5	C3	C6	C6	F3	F3	F2	F2
18	F2	F2	F2	F3		L1	L2	H1	C1	LC11	C1	C2	L4	C2	C1	C3	C2	C3	C1	F2	F2	C2	F2	
19	F3	F2	F4	F2	F1		LC21	C2	CL42	CL22	C2	C3	C3	C2	CL11	H1	C3	C3	C4	F3	F5	F8	F1	
20	F3	F5	F7	F2	F4	C3	C3	C3	C3	C2	C1	C2	C2	C2	C3	C2	C1	C2	C4	C5	F9	F2	F2	F2
21	F2	F2	F3	F3	F4	C1	C3	C6	C2	C2	C2		C1	C2	C3	C2	C3	C2	C6	F3	F4	F2		
22	F3	F3	F3	F3	F5		CH11	C3	L4	CL23	LC21	C1	C3	C3	C3	C4	C2	C3	C5	C5	F2	F3	F3	F3
23	F2	F3	F3	F2	F3	L2	L4	L2	C2	C3	C4	C3	L7	L6	L3	L4	L5	L8	L7	F8	F7	F7	F4	
24	F2	F3	F2	F2	F3	C2	L3	L3	L3	L3	L3	L3	L3	L5	L5	L5	C4	C6	C8	F5	F5	F6	F2	
25	F5	F2	F5	FF23	F3	C1	L3	C4	C9	C5	C4	C3	C2	C6	C7	L4	CL26	LQ31	LQ61	F8	F6	F2	F2	
26	F3		F1	F1	F3	C3	C1	C4	C3	CL12	C2	L4	L2	L2	L2	L1	L2	L3	CL21	L1	F3	FF32	F2	F3
27														L7	L5	L3	C3	C2	C5	L4	F6	FF45	F6	FQ41
28	FQ31	FQ31	FQ41	F3	FQ31	CQ21	C4	L4	C4	C3	C4	C2	C2	C2	C2	C1	C3	C2	C4	F1	F1	F4	F6	
29	F3	F3	FQ31	FQ21	FQ21	L1	LC11	CL23	CL21	CL21	C3	C2	C3	C3	C4	C4	C5	L7	L7	L2	F5	F1	F2	F2
30	F3	F2	F3	F3	F1		C3	C4	C4	L5	L3	L3	L2	C2	L4	L3	C2	LH11	LC12	63	FF15	F3	F2	F5
31	F8	F5	F3	F4	F3	C4	LC22	LQ41	L3	L3	L2	HL11	HC11	C2	C3	C2	C4	C4	C7	C8	F4	F9	F3	F3
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUL. 2022 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 2022 f_{XI} (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUL. 2022 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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

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

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	63	59 ^F	58 ^F	58	52	52	53	70	66	70	66	65	70	71	78	A	84	91	A	A	82	67	71	72	
2	69	64 ^F	66	58	56 ^F	51 ^F	53	74	57	60	A	67	66	65	A	A	92	101	105	110	80	76	78	78 ^A	
3	81	78	76	70	73	67	75	81	72	84	70	A	A	A	76	85	86	92	92	88	76	66	56	A	
4	A	70	56 ^F	58 ^F	52 ^F	50 ^F	60	58	A	68	70	60	A	77	86	90	93	98	99	102	88	80	76	67	
5	77	83 ^F	65	52 ^F	52 ^F	49 ^F	48	A	66	78	89	87	85	91	98	83	79	92	92	92	68	66	60	60	
6	60 ^F	63 ^F	70 ^F	66 ^F	60 ^F	44 ^F	48	62	73	64	80	69	74	90	93	87	89	91	88	83	70	69	66	61	
7	61	61	53 ^U	54 ^F	54 ^F	52 ^F	53	71	66	61	74	74	81	92	82	92	94	94	90	84	80	79	77	75	
8	70	65	70 ^U	66 ^F	60 ^F	56 ^F	50 ^F	62	44	48	59	72	57	60	72	75	73	74	72	77	62	62	55	55	
9	57	58	60	58	62	56	51	62	65	66	A	71	71	74	79	85	87	95	108	103	94	76	68	64	
10	64	64	61	60	60	59	60	63	A	73	74	62	68	70	78	84	92	105	107	96	91	83	74	69	
11	70	72	70	64	61	54	58	66	80	75	J R	71	77	93	109	99	79	88	A	A	108	103	102	96	78
12	U R	76	75	73	72	67	65	62	64	66	62	56	68	68	76	80	74	70	76	85	76	64	68	68	68
13	66	66	76	86	46	45	46	65	65	62	66	67	76	77	77	79	90	92	92	91	78	68	62	59	
14	60	62	59	54	56 ^F	55 ^F	61	69	74	67	A	71	76	78	78	80	88	104	97	90	87	74	73	73 ^F	
15	71	71	73	64	56	57	66	67	67	72	78 ^R	74	67	70	77	83	80	81	88	95	75	62	60	F	
16	58	60	56	55	52	53	64	82	67	72	69	72	A	84	86	95	95	95	96	98	77	63	63	63	
17	64	64	64	64	61	63	75	74	67	66	73	72	71	77	76	72	81	82	90	95	79	74	67	65	
18	67	65	63 ^F	68 ^F	65	60	60	66	68	64	64	64	72	76	76	76	79	82	86	93	82	74	72	72	
19	66	76	65	61	58	57	66	68	74	78	70	71	72	A	88	84	79	A	85	96	90	A	76	75	
20	74	82	74	54	57	57	49	A	A	61	58	78	85	A	82	76	78	85	90	86	75	77	78	76	
21	76	80	73	76	70	54	57	71	72	70	79	65	70	76	81	82	90	94	93	89	84	80	78	71	
22	68	75	60	52	52 ^F	56	57	50	56	68	61	61	65	83	86	81	79	82	77	77	86	80	70	66	
23	64	72 ^F	72	63	59	54	59	71	74	70	59	62	68	78	93	91	95	105	110	106	82	76	72	74	
24	R	76 ^R	79 ^R	81	77	77	82	64	60	63	69	76	72	82	92	94	93	96	104	118	105	79	73	69	64
25	63	67	63	62	70	60	58	67	73	77	A	A	A	90	90	88	96	103	103	90	68	65	59	55	
26	52	52	56	54	52	52	55	77	78	80	60	64	69	80	90	94	99	90	92	87	78	70	69	67 ^F	
27	65	62 ^F	69	64	62	59	66	64	66	57	67	71	74	76	92	101	96	93	92	95	76	70	59	F	
28	U	62 ^F	62 ^F	58 ^F	55 ^F	52 ^F	63	76	56	64	71	74	77	92	98	97	93	97	92	95	104	92	80	66	
29	63	F	F	66	67	63	52	51	63	73	68	67	69	70	78	84	91	100	94	85	92	84	74	69	
30	67	64	66	62	59	62	70	68	59	58	65	71	A	70	78	81	90	94	98	A	78	62	56	56	
31	F	62 ^F	62 ^F	52 ^F	53 ^F	48 ^F	53 ^F	65	64	61	62	58	62	67	84	93	95	92	95	97	88	86	A	66	
	00	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	31	31	31	31	29	28	31	27	29	26	28	30	29	31	29	29	29	31	30	30	28	
MED	66	65	65	62	59	56	58	67	66	68	69	71	71	77	82	84	90	93	92	93	80	74	70	67	
U Q	70	75	72	66	62	60	64	71	72	73	74	72	76	87	90	92	94	99	98	98	88	80	76	72	
L Q	62	62	60	55	53	52	53	62	64	62	62	64	68	70	78	80	80	88	89	86	76	67	62	64	

JUL.2022 foF2 (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1								A	A			A	A		A	A	A	A	A						
2								L	L	484	492		A	A	A	A	456	436		A	A				
3								L	A	H	A	A	A	A	A	A	468	448		A					
4								L	A	A	L	U	L	A	A	A	A	468	412		L				
5								A	U	L			A	A		A	A								
6								L	L	U	L	A	A	524	492	496	460	488	448						
7								L	A	U	L	U	L	520	496	516									
8										456		A	A	A	A	A	A	472	432						
9									A	A	A	500	520	536	488	476	472	528	416						
10							A	L	A	A	A	A	508	500	508	512		448	420						
11								L	A	A		548	536	524		508		468							
12							L	L	U	L	U	L	444	480	500	496	524	520	508	496	476	508	472	412	288
13								380	492	504	520		A	496	516		516	484	476	416					
14								L	L		A	A		520	532	504	520	492	468	436					
15								L	L	456	484	496	508	552		500	488	480	456	416					
16									A	U	L	A	A		552	544		A	A	492					
17								L		A		520	536	528		A	A	508	492	476					
18								L	U	L	U	L	436	476	556	524	532	532	532		508	468	440		
19								L	L	A					A			A	A	A	L				
20							L	A	A		476	528		A	A	A	A	A	A	A					
21								L		A		460	492	512	516	528	508	512		A	A	476	L		
22									A	A	U	L		516	580		A	A	A	A	A				
23								L	A	A				484	508	516	516	492	464		A	A	A		
24										A	A	U	L	532	516		496		512		392				
25									L	A	A	A	A	A	A	A	A	A	A			384			
26								L			U	L			A		A	A				L			
27								L	L	444	484	492	496	496	528		H	A	A	A	448	412			
28									A	A		496	516	500		A	A	A	504	452		L	L		
29									U	L	L				A	A	A	A	A	A	L				
30								L			A	A			A							A			
31									A	L	A	U	L	A	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								3	13	18	20	18	19	14	16	11	15	20	15	1					
MED								L	L	404	460	476	502	516	520	512	502	496	480	468	416	288			
U Q								L	U	L	U	L	444	476	492	520	536	528	532	514	516	504	476	432	
L Q								L				380	440	468	494	504	508	500	494	476	460	448	408		

JUL.2022 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A						A	A					A	A				
2						B		240		336	360	372			372	352	328	288						
3						B	A			A					A			A	A					
4						B	A	244	292		344	360	368	372	360	340			A	A				
5						B	A	244	296	336	364	368		368	364	352	332	308	256					
6						B	A	236	264		A	A	A	A	A	A	A	A	288	252				
7						B	A	A	A	A	A	A	A	A	A	A	A	A	304	A	A			
8						A	A																	
9							A	248	304	336	364	388	396	388	380	364	344	304	256					
10							A	168	248	308	344	368	396	388	388	372	348	324	304	260				
11							A																	
12							A	260	316		372	388	392	388		360								
13							A	248	296		A	A	A	A										
14							A	244	308	348								348	312	256				
15							A	A	A	A	A	A												
16							A																	
17							A	256		336		380												
18							A	248	308	344		392	408	400	396	376	348	316	256					
19							A																	
20							A	172		304	348	376	400		396	384	356	328	264					
21							A	248	304	348		A	A	A	400	380	372	352	316					
22							A																	
23							A	236	308	340	364	376	388	388	376	360	340	300	244					
24							A	240	300	336		A	A	A	388	376	360	328	296					
25							A	252	292	328	356	384	384	384	376	364	336	308	260					
26							A	A	A	A	A	A												
27							A																	
28							A	196	280		A	A	A	A	A	A	A	A	A					
29							A	240	288	324	344	356	372	368	356									
30							A	204		A	A	A	A	A	A	A	A	A	A					
31							A	A	A	A	A	A	A	A	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							3	22	22	18	17	18	14	18	19	21	18	20	18	1				
MED							172	244	298	336	360	374	384	386	376	360	338	302	256	188				
U Q							180	248	308	344	366	388	392	388	380	370	348	310	260					
L Q							168	236	288	328	348	364	376	368	360	348	328	290	244					

JUL.2022 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
23	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
24	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
25	J	A	J	A	J	A	J	A	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
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
28	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
29	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
31	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J	A	J	A	J	A	J	A	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
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

JUL.2022 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E B 16	22	E B 16	E B 16	20	28	26	40	49	37	40	48	49	45	51	A A 124	54	42	A A A A 104	A A A A 106	36	24	32	E B 16	
2	32	30	20	22	E B 16	E B 16	22	33	36	53	A A 97	52	52	53	A A A A 165	113	40	35	50	62	27	28	30	E B 16	
3	19	24	E B 16	16	23	E B 16	20	33	64	37	53	A A 110	A A 128	A A 114	48	61	38	39	73	68	20	30	E B 16	A A 89	
4	A A 144	30	35	18	22	E B 16	23	33	A A 236	47	38	46	88	54	76	50	48	34	29	20	46	E B 16	23	22	
5	20	24	E B 16	29	16	E B 16	30	A A 85	36	38	40	55	64	43	53	52	39	G 24	27	23	22	32	26	E B 16	
6	19	21	20	E B 16	18	E B 16	20	31	40	47	56	57	47	41	44	39	37	34	35	32	31	29	25	E B 16	
7	E B 16	E B 16	E B 16	E B 16	E B 16	22	20	32	48	44	44	47	46	45	47	47	57	48	35	27	E B 16	18	E B 16	E B 16	
8	18	20	18	20	18	E B 16	25	50	34	39	49	52	50	54	56	50	55	40	34	56	18	23	E B 16	18	
9	E B 16	E B 16	20	26	E B 16	E B 16	22	30	50	58	A A 71	45	46	42	40	G	37	32	28	G	18	E B 16	E B 16	E B 16	
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	34	32	A A 138	60	52	52	46	44	43	43	50	36	33	36	E B 16	E B 16	E B 16	E B 16	
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	41	50	62	40	45	50	64	47	48	36	A A A A 148	A A A A 156	56	46	32	24	21	
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	32	34	45	41	43	46	45	42	44	38	38	35	20	E B 16	E B 16	E B 16	E B 16	
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	G	40	46	47	54	44	46	52	42	38	35	32	32	20	17	E B 16	E B 16	
14	E B 16	22	20	20	20	20	23	33	36	36	A A 100	53	45	44	43	46	45	36	32	22	23	19	E B 16	18	
15	24	E B 16	E B 16	E B 16	E B 16	18	25	28	35	43	42	42	G	55	48	43	40	36	40	32	37	36	21	34	
16	19	E B 16	19	22	24	E B 16	20	33	40	56	48	61	A A 91	48	51	56	66	40	38	34	32	30	E B 16	E B 16	
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	31	41	50	38	42	46	53	52	44	48	42	41	26	E B 16	20	20	E B 16	
18	21	E B 16	21	E B 16	24	20	20	30	34	40	46	G	45	45	46	51	46	A A 43	38	26	E B 16	E B 16	E B 16	22	
19	20	20	30	E B 16	E B 16	E B 16	20	32	39	51	46	48	49	A A 86	49	46	74	A A 82	44	22	79	A A 86	56	26	
20	20	50	19	27	E B 16	18	22	A A A A 75	111	42	46	52	63	79	54	61	51	66	46	49	43	25	E B 16	29	
21	E B 16	E B 16	E B 16	20	E B 16	E B 16	22	28	38	42	40	42	41	43	49	51	50	43	35	28	32	26	E B 16	20	
22	E B 16	E B 16	E B 16	27	E B 16	E B 16	20	31	48	49	41	51	61	67	76	66	53	54	56	44	36	21	20	E B 16	
23	22	32	E B 16	E B 16	17	E B 16	19	24	28	42	44	G	42	42	43	40	40	54	48	62	53	45	20	18	22
24	23	22	20	E B 16	E B 16	E B 16	19	42	36	62	47	42	46	62	46	87	48	54	36	30	22	37	32	E B 16	
25	E B 16	20	22	21	E B 16	20	26	G	34	48	A A A A 86	98	96	71	71	74	54	46	35	34	39	26	25	E B 16	
26	E B 16	E B 16	E B 16	E B 16	E B 16	18	20	32	37	44	46	42	48	66	40	52	61	38	32	21	E B 16	E B 16	E B 16	24	
27	E B 16	E B 16	E B 16	E B 16	E B 16	18	28	27	32	36	39	46	42	44	51	52	51	42	34	21	17	21	E B 16	28	
28	29	29	E B 16	E B 16	E B 16	E B 16	24	33	49	56	44	40	41	52	51	49	37	40	28	24	32	20	E B 16	16	
29	23	22	20	E B 16	E B 16	15	18	27	31	39	42	40	48	58	52	62	76	50	65	35	62	50	30	E B 16	
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	17	28	34	34	50	58	A A 140	50	40	43	43	36	28	A A 119	19	19	19	E B 16	
31	20	26	E B 16	E B 16	20	E B 16	22	29	34	42	46	46	51	52	59	46	53	56	51	27	28	20	A A 53	E B 16	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	18	20	E B 16	E B 16	E B 16	E B 16	22	32	39	44	46	47	48	52	49	50	48	40	35	32	27	21	18	E B 16	
U Q	21	24	20	20	18	18	24	33	49	51	50	53	A A 61	62	53	61	54	48	50	49	37	30	25	22	
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	34	39	40	42	45	44	44	44	39	36	32	23	E B 18	E B 18	E B 16	E B 16	

JUL. 2022 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

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

JUL.2022 fmin (0.1MHz)

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	302	289 ^F	320 ^F	306	323	326	329	361	359	313	318	305	298	277	274	A	278	293	A	A	324	289	291	306	
2	325	301 ^F	341	304	300	292 ^F	349	369	399	346	A	291	293	262	A	A	264	279	297	331	306	258	267	271	
3	282	298	294	289	280	294	316	328	316	347	326	A	A	A	286	281	286	307	322	328	308	279	289	A	
4	A	317	309 ^F	310 ^F	319 ^F	339 ^F	395	339	A	343	324	281	A	258	258	273	266	276	292	314	296	279	291	268	
5	262	307 ^F	314 ^F	311 ^F	268 ^F	277 ^F	321	A	283	312	294	292	279	286	305	293	267	297	301	343	298	297	303	264	
6	294 ^F	291 ^F	329 ^F	344 ^F	331 ^F	320 ^F	324	325	344	287	325	267	272	277	301	286	283	286	280	277	296	292	291	287	
7	294	316	304	287 ^U	308 ^F	310 ^F	325	341	354	274	292	273	280	296	283	287	300	302	290	282	293	289	284	276	
8	266	250	262	264 ^U	270 ^F	259 ^F	305	369	383	246	256	296	264	221	253	274	294	303	287	315	283	286	289	259	
9	276	273	287	284	333	363	331	331	312	300	A	292	293	280	289	285	264	268	300	315	332	293	285	282	
10	281	277	277	282	297	322	333	339	A	323	325	319	283	277	279	266	270	294	309	305	302	289	284	272	
11	274	294	327	279	325	311	317	315	319	306	282	263	277	309	308	274	274	A	A	310	286	276	277	285	
12	R	281	295	298	281	283	273	278	297	300	228	276	272	304	311	299	289	286	314	304	274	267	265	264	
13	266	258	299	367	274	262	311	343	303	283	282	268	304	292	276	278	272	293	311	318	302	303	272	271	
14	263	273	299	279	280	298 ^F	324 ^F	313 ^F	324	330	A	285	298	295	280	283	281	299	307	282	310	285	273	274 ^F	
15	274	276	306	308	289	297	328	322	321	307	285	R	303	255	252	279	289	284	289	300	318	317	275	276	
16	278	284	280	272	283	301	336	366	339	320	291	293	A	281	263	273	288	283	295	317	314	258	274	266	
17	276	263	270	292	294	304	351	362	311	321	310	313	293	289	300	281	289	277	289	311	302	284	272	265	
18	271	279	272 ^F	303 ^F	302	323	352	336	340	311	299	271	277	283	287	277	275	285	288	313	299	280	253	287	
19	268	296	318	297	307	299	362	333	333	341	305	282	285	A	286	286	283	A	264	294	312	A	277	264	
20	269	294	330	271	272	299	331	A	A	284	225	296	320	A	307	302	299	302	306	303	273	270	280	273	
21	266	293	293	314	335	282	305	350	324	323	334	297	272	281	281	272	293	291	289	280	281	290	281	270	
22	283	321 ^F	331	266	257	295	399	335	305	311	335	249	273 ^U	292	306	306	289	293	278	274	290	303	301	266	
23	287	269 ^F	302	287	293	303	322	350	334	342	351	293	281	273	277	263	267	285	298	303	298	297	281	274	
24	R	268 ^R	294	294	291	353	344	344	352	307	319	280	267	283	286	288	291	301	318	348	303	276	291	282	
25	269	292	279	286	320	327	318	339	339	326	A	A	A	276	290	283	304	314	328	326	305	300	308	289	
26	277	280	286	297	281	300	315	346	360	369	315	278	254	260	272	286	307	286	320	309	306	295	279	285	
27	280	284 ^F	302	318 ^F	309	316 ^F	345	345	357	334	305	301	300	259	279	296	295	297	311	329	317	301	314	F	
28	F	278 ^F	302 ^F	306 ^F	309	323 ^F	338	378	362	315	308	301	280	292	295	302	283	285	282	287	296	325	314	291	
29	282	F	F	312	322	342	352	372	336	338	331	311	316	290	291	287	294	297	326	305	A	304	312	287	283
30	286	293	301	300	301	308	368	373	380	331	300	313	A	274	283	261	279	294	311	A	359	293	291	269	
31	F	293 ^F	349 ^F	343 ^F	324 ^F	305 ^F	345 ^F	370	344	356	327	300	299	278	291	293	293	287	301	308	315	337	A	291	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	30	30	31	31	31	31	29	28	31	27	29	26	28	30	29	31	29	29	29	31	30	30	28	
MED	276	286	302	297	300	304	331	343	338	320	308	292	280	280	286	285	284	293	300	310	302	289	284	274	
U Q	284	294	318	310	320	323	349	364	356	338	325	301	298	291	295	291	293	298	311	318	312	297	291	285	
L Q	268	276	287	284	281	295	318	332	318	306	291	277	272	274	279	274	274	285	289	298	296	279	276	267	

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A			A	A		A	A	A	A	A					
2								L	L	372	401		A	A	390		A	A	A	A				
3								L	A	H	A	A	A	A	A	A	A	A	A	A				
4								L	A	A	A	U	L	A	A	A	A	A	A	A				
5								A	U	L	A	A	A	A	A	A	A	A	A	A				
6								L	L	U	L	A	A	379	430	391	401	410	329	354				
7								L	A	U	L	A	A	396	432		A	A	A	A				
8										375		A	A	A	A	A	A	A	A					
9									A	A	A	A	420	409	386	424	394	394	313	359				
10							A	L	A	A	A	A	400	415	389	372		A	369	363				
11								L	A	A			A	A	389		A	399	A	A				
12							L	L	U	L	A	356	385				L	351	349	378				
13								385	350		A	A	A	424	408		A	365	346	349				
14								L	L	405		A	A	385	370	397	359	A	360	364				
15								L	L	391	411	403	396	H	A	A	A	391	386	366				
16										A	A	A	A	A	A	A	A	A	L	A				
17								L		A			A	A	A	A	A	A	343	A				
18								L	U	L	U	L	383	388		A	A	A	A	L				
19								L	L	A	384	357		A	A	A	A	A	A	A	L			
20							L	A	A			A	A	A	A	A	A	A	A	A				
21								L				U	L			A	A	A	A	L				
22									A	A	U	L	390	396	399		A	A	A	A				
23								L	A	A		U	L					A	A	A				
24										A	A	U	L		A	A	A	A	A	A				
25									L	A	A	A	A	A	A	A	A	A	A	A				
26								L		A	A		A	A		A	A	A	A	L				
27								L	L	409	386	399		397	369		H	A	A	L				
28									A	A		381	379	395		A	A	A	L	L				
29									U	L	L		A	A	A	A	A	A	A	L				
30								L	L	377	373	374	396		A	A	A	A	A	A				
31									A	A	A	A	A	A	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								3	13	14	16	15	13	13	10	10	10	16	12	1				
MED								L	L	385	376	380	382	388	396	395	391	382	378	350	352	378		
U Q								L	L	396	396	391	395	407	398	412	398	395	399	362	361			
L Q								L	U	L	L		323	362	372	374	373	386	379	389	365	362	344	348

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JUL. 2022 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								238	252	288	302	328	340	380	364	A	352	304	A	A				
2								230	208	E A 286	A	360	374	408	A	A	360	320	302	252				
3								244	E A 302	260	278			A	A	360	358	326	284	E A 290				
4								262	A	274	304	428		A	E A 416	446	342	368	348	300	256			
5								A	332	294	320	308	352	330	300	308	376	308	278					
6								280	274	378	302	E A 380	392	332	302	330	334	326	304					
7								242	244	404	358	346	360	318	332	326	310	302	288					
8										560	490	350	462	616	456	358	342	322	326					
9										E A 282	352	A	356	358	390	356	330	368	364	292				
10							248	250	A	316	294	300	386	388	376	374	354	308	276					
11								250	278	E A 308	382	404	352	294	288	290	342	A	A					
12							322	364	302	342	604	406	416	344	324	340	352	348	280	258				
13								252	314	396	396	436	342	350	380	352	330	306	280					
14								278	276	260	A	382	360	338	342	344	344	296	270					
15								238	282	338	348	334	454	454	370	340	350	324	302					
16										296	308	358	A	368	384	354	320	314	298					
17								236		280	326	328	366	352	352	384	352	316	304					
18								264	246	268	356	426	398	378	364	384	374	338	306					
19								240	262	284	336	386	378	A	330	334	E A 410	A	352	282				
20							266	A	A	400	618	344	286	A	328	314	338	308	282					
21								234	260	286	286	314	414	378	350	362	328	306	288					
22									E A 340	318	278	548	E A 448	338	E A 350	E A 316	342	308	E A 324					
23								236	238	260	260	324	396	378	344	356	346	320	284					
24										358	290	334	364	322	328	E A 416	320	302	272					
25										252	280	A	A	E A 352	E A 336	E A 366	302	290	258					
26								252	226	236	282	402	446	430	358	328	286	294	268	252				
27								216	230	270	332	334	316	398	350	298	302	298	274					
28									E A 256	326	322	318	370	320	318	294	334	304	294	290				
29									274	282	276	324	300	360	348	E A 332	E A 336	E A 296	260	254				
30								230	218	290	362	304	A	388	342	368	330	304	274					
31									242	262	280	352	350	390	336	324	314	322	274					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	20	24	31	27	29	26	28	30	29	31	29	29	7				
MED							266	243	258	288	320	348	366	373	346	337	340	308	285	256				
U Q							322	257	282	342	358	394	398	390	364	360	352	322	302	282				
L Q							248	236	243	274	286	326	352	338	330	325	326	302	274	252				

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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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	278	E A	308	242	E A	E A	234	264	228	A	A	204	182	A	A	E A	A	A	A	A	A	226	270	E A	236		
2	E A	E A	282	220	E A	242	262	224	224	200	A	A	A	A	A	A	230	236	A	A	220	E A	314	326	290		
3	294	244	260	286	306	248	240	224	A	190	A	A	A	A	A	A	226	270	E A	E A	272	230	E A	264	270	A	
4	A	E A	E A	E A	E A	E A	246	212	194	226	A	A	170	E A	A	A	A	A	210	228	232	E A	256	260	262	E A	326
5	342	266	202	E A	278	320	302	252	A	220	178	204	A	A	A	A	198	192	220	236	246	E A	E A	258	340		
6	290	E A	310	242	228	218	202	218	236	E A	E A	A	E A	234	182	210	184	186	218	E A	234	246	256	E A	E A	272	
7	270	258	256	280	E A	252	270	242	216	A	E A	E A	E A	E A	E A	E A	A	A	A	246	236	246	258	276	290		
8	314	358	326	310	E A	322	310	310	250	208	218	A	A	A	A	A	A	A	288	254	278	250	282	268	340		
9	326	298	290	288	230	204	244	218	A	A	A	198	194	188	182	188	202	222	222	244	230	216	224	264			
10	292	290	300	282	262	220	A	224	A	A	A	A	224	196	202	E A	208	A	226	236	244	230	222	226	284		
11	298	266	236	288	240	230	238	232	A	A	200	204	E A	A	244	A	192	A	A	256	260	246	236	266			
12	292	286	264	254	270	258	248	242	206	E A	274	198	208	E A	226	204	228	222	230	224	262	220	286	278	288	304	
13	324	326	252	206	226	318	246	216	E A	E A	E A	E A	A	190	200	A	222	218	228	238	260	236	232	292	284		
14	316	298	262	290	288	270	248	228	204	200	A	A	228	228	206	E A	E A	E A	252	270	230	216	228	240	230	290	298
15	302	290	244	240	274	256	230	224	214	210	186	188	186	A	A	228	210	228	A	252	242	E A	E A	E A	336		
16	306	286	306	288	E A	300	252	234	226	222	A	254	A	E A	E A	E A	A	A	252	A	260	216	E A	322	290	292	
17	286	288	316	258	248	258	226	212	230	A	188	180	E A	A	A	252	E A	A	E A	A	258	210	E A	270	294		
18	298	288	326	258	E A	254	236	216	210	192	210	250	174	216	222	270	A	E A	E A	286	250	220	234	322	284		
19	324	268	238	266	258	242	218	218	226	A	E A	E A	E A	E A	E A	E A	302	276	A	A	256	E A	E A	352	312		
20	E A	E A	220	E A	304	296	274	256	A	E A	E A	222	304	A	A	A	A	A	A	A	262	E A	E A	296	300	268	302
21	314	258	246	242	226	250	238	208	214	E A	220	200	190	186	196	A	A	E A	E A	282	246	260	280	274	268	290	
22	272	236	224	E A	340	326	256	196	240	A	A	214	274	A	A	A	A	A	A	E A	318	282	242	216	292		
23	E A	E A	244	268	268	272	240	216	A	A	188	212	192	188	202	222	A	A	A	A	266	E A	246	262	300		
24	316	304	258	256	258	204	208	244	216	A	A	176	264	E A	232	A	A	A	A	216	204	E A	E A	300	284	280	
25	304	280	E A	318	308	232	238	232	212	206	A	A	A	A	A	A	A	A	A	A	228	E A	E A	E A	280		
26	304	296	278	260	284	268	232	216	210	E A	242	174	300	A	194	A	A	A	238	252	230	214	226	280	288		
27	292	290	256	228	252	246	226	202	198	190	180	250	212	224	A	A	A	A	E A	254	242	198	244	226	E A	326	
28	E A	E A	262	254	258	240	240	208	A	E A	208	190	186	A	A	A	A	228	280	208	272	254	212	218	232		
29	E A	E A	236	256	222	202	206	194	184	220	210	186	A	A	A	A	A	A	A	224	E A	E A	E A	278	262	278	268
30	254	276	250	248	256	238	198	212	198	186	A	A	A	A	194	260	318	208	228	A	204	214	264	296			
31	304	E A	220	212	E A	220	266	224	216	A	E A	248	E A	286	A	A	A	A	A	238	238	216	A	262			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	31	31	31	31	31	30	28	19	17	20	18	18	14	14	11	13	18	16	28	31	30	30	30			
MED	298	286	253	258	254	251	232	217	208	202	195	190	203	200	206	215	214	227	234	246	235	242	266	288			
U Q	314	298	278	288	284	268	242	227	222	240	246	250	234	224	270	252	250	260	253	260	256	274	288	302			
L Q	290	276	238	248	234	236	218	212	200	195	188	186	192	196	202	208	200	222	225	234	220	232	262	280			

JUL. 2022 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.2022 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A		A				A	A					A	A				
2						B		102		102	102	102		A		102	102	102	102					
3						B	A	104	102	102	102	102		A		A	A	A	A		108			
4						B	A	102	102		A		102	102	102	102			A	A				
5						B	A	102	102	102	102	102		A	102	102	102	102	102	102	104			
6						B	A	100	100		A	A	A	A	A	A	A	A		102	106			
7						A	A			A	A	A	A	A	A	A	A	A		104				
8							A	102	102	102	102	102	102	102	102	102	102	102	102	104				
9							124	106	104	104	102	102	102	102	102	102	102	100	102					
10							A	106	100	98	98		A	100		A	102		A	102	120			
11							A	A	A	A	A	A	A		100	102	102	100	102	106				
12							A	104	102		A		100	100		A	100		A	A				
13							A	104	104		A	A	A	A		A	A		A	A				
14							A	104	104	102		A	A	A		A		102	102	102				
15							A	A	A	A	A	A	A		100	100	100		A	A	A			
16							A	A	102	102	102	102	102	A	A	A	A	A	A	A				
17							A	108		100		100		A	A	A	A	A	A					
18							A	102	102	100		A	98	98	100	102	102	102	102	102				
19							A	102	102	102		A	A	A		102	100	102	104	102				
20							A	102	102	102	102	102	102	102	102	102	102	102	102	102				
21							A	102	102	102		A	A	A		102	102	102	102	102				
22							A	120	100	100	100	102	100	100	100	102	102	102	102					
23							A	A	A	A		102	102	102	100	100	100	100		A	A			
24							A	100	100		A	A	A	A	A	A	A	A	A					
25							A	104	104	102	102	102	102	102	100			A	A	A	A			
26							A	100		A	A	A	A	A	A	A	A	A	A					
27							A	A	A	A		102	102	100	102	102	102	102	100	100				
28							A	A		A		102	102	100	A		102	102	102					
29							A	106		104	104		102	102	102	102		A	102	104				
30							A	104	102	102	102	102	102	102	102	102	100	100		A	A			
31							A	102	102	102		A	A	A	A	A		102	102	106				
							A	A	A	A	A	A	A	A		96		A	100	100				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	22	22	18	17	18	14	18	19	21	18	20	18	1				
MED							114	102	102	102	102	102	102	102	102	102	102	102	102	102	120			
U Q							124	104	102	102	102	102	102	102	102	102	102	102	102	104				
L Q							100	102	102	102	102	102	100	100	102	100	102	101	102					

JUL.2022 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	94	106	98	92	96	96	114	108	106	112	116	114	150	158	124	108	106	100	100	98	92	88	92	106
2	94	94	90	90	84	88	122	110	112	102	102	100	100	100	94	96	96	126	106	106	98	88	90	90
3	88	86	96	92	96	98	104	104	104	112	100	98	102	108	140	114	124	116	102	100	108	100	98	98
4	94	96	98	92	88	90	124	112	106	102	110	132	112	142	112	114	108	106	114	102	98	102	90	88
5	102	100	96	92	96	96	110	100	96	96	94	94	92	94	92	92	92	90	138	110	82	106	104	100
6	100	102	102	96	98	96	96	94	126	94	92	116	128	100	96	92	92	146	88	86	86	106	102	98
7	92	96	100	106	98	96	100	122	106	112	126	124	124	120	136	122	108	106	106	100	100	90	88	118
8	96	96	96	100	94	98	120	110	120	140	120	120	118	116	112	112	106	120	106	98	102	98	92	102
9	104	106	100	98	88	94	106	112	100	100	100	98	102	102	106		104	98	142		88	88	122	86
10	102	100	94	88	86		100	96	96	96	96	94	178	164	146	120	110	142	118	102	102	98	100	98
11	92	100	88	86	94	98	114	108	104	100	100	104	102	102	102	98	102	92	88	88	88	88	86	86
12	86	102	110	98	98	98	136	124	100	94	98	98	98	98	166	116	106	104	90	92	94	88	90	88
13	86	86	86	84	92		140		118	108	100	98	98	94	94	150	144	128	114	102	88	96	96	88
14	84	90	88	90	100	92	94	96	104	102	94	96	168	134	124	124	96	112	108	90	90	88	88	100
15	96	90	96	98	90	98	98	150	122	110	102	102		96	164	172	158	130	116	104	100	96	104	100
16	116	102	104	96	96		114	112	100	96	96	96	94	94	94	94	92	106	104	104	104	104	98	98
17	100	96	92	86	86	86	120	114	112	102	104	116	116	114	126	120	110	106	104	102	98	86	98	96
18	98	100	98	98	92	96	150	176	168	128	122		146	160	138	118	114	108	104	104	98	98	92	96
19	94	96	90	88			122	112	112	106	92	128	138	112	118	128	110	104	102	100	94	94	96	96
20	94	94	92	94	138	108	108	106	106	110	124	120	114	110	116	110	104	102	102	96	102	108	108	102
21	98	98	96	98	102	98	116	108	108	104	104	104	110	120	110	104	102	102	98	92	88	86	94	84
22	84	96	98	98	98	98	98	118	110	114	122	114	110	110	106	106	110	110	106	104	98	98	98	96
23	96	98	98	92	94	92	96	100	96	96		116	128	108	120	104	94	104	90	88	90	90	90	86
24	84	88	88	84	84	102	104	98	100	96	96	98	100	96	96	94	94	102	104	90	88	88	86	86
25	88	90	98	102	102	98	98		114	102	98	96	98	98	96	92	92	94	92	92	90	90	90	88
26	86	84	84	84			100	100	98	96	96	94	98	96	94	98	94	92	94	92	88	86	94	98
27	92	86	92	106	94	94	94	128	130	114	114	110	130	140	118	114	112	110	108	104	104	100	98	108
28	102	98	96	98	92	98	94	92	104	102	104	110	108	110	106	102	110	104	108	104	98	96	92	94
29	92	92	90	86	84		134	132	144	124	116	112	110	106	114	104	102	100	98	94	90	90	86	86
30	86	86	86				128	124	114	122	100	96	96	98	100	98	112	108	112	100	90	98	112	86
31	100	98	98	98	96	94	96	94	92	112	98	102	132	124	116	124	112	108	104	86	106	104	100	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	31	31	31	30	28	25	31	29	31	31	30	30	30	31	31	30	31	31	31	30	31	31	31	31
MED	94	96	96	93	94	96	108	110	106	102	100	103	110	108	112	109	106	106	104	100	94	96	94	96
U Q	100	100	98	98	98	98	122	120	114	112	114	116	128	120	124	120	110	112	108	104	100	100	100	100
L Q	88	90	90	88	89	94	98	99	100	96	96	98	100	98	98	98	96	102	98	92	88	88	90	88

JUL. 2022 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F3	FF22	F2	F3	F5	L4	CL21	C4	C4	C2	C3	C2	H1	HL11	C1	C6	C3	C3	C7	L8	F6	F6	F6	FF12	
2	F3	F2	F1	F3	F1	L1	C2	C4	C3	C4	C4	C4	L2	C3	L5	L7	L2	CL24	CL61	CL73	FF24	F8	F5	F4	
3	F5	F5	F2	F2	F5	L4	C1	C2	C3	CH11	C3	L6	L5	C3	H1	C6	CL12	CL32	C8	C9	FF76	F5	F4	F7	
4	F6	F5	FF23	F3	F2	L2	C4	C4	C4	C5	C1	C1	C4	H2	C4	C2	C3	C2	C1	C3	F4	F3	F5	F4	
5	F8	F5	F3	F3	F4	L3	C4	C9	L3	L2	L2	L3	L4	L2	L2	L4	L2	L1	HL11	CL23	F5	FF23	FF43	F3	
6	F2	F5	F3	F3	F4	L6	L4	L4	CL23	LC41	LC32	CL23	CL11	C1	LH11	L2	L1	HL12	L4	L6	F7	FF42	F5	F2	
7	F2	FF22	FF32	FF22	F3	L3	L2	C2	C4	C2	C1	C1	C1	C1	H1	C1	C2	C3	C2	C2	F4	F3	F2	FF22	
8	F7	F4	F4	F5	F6	C4	C4	C1	C1	H2	C2	C2	C2	C2	C2	C1	C2	C2	C5	L2	F2	F4	F1	F4	
9	F2	FF22	F4	F2	F1	F1	C1	C2	C4	C3	C4	L2	C1	C1	C1		C1	L1	HL11		F3	F1	FF11	F1	
10	F2	F2	F1	F1	F2		C4	L4	L6	L5	L2	L2	HC11	H1	H1	C1	C2	H1	C1	C5	F1	F1	F3	F1	
11	F1	F1	F1	F1	F3	F1	C1	C5	C4	C2	C2	C1	C3	C4	C2	L1	C1	L8	L9	L9	F7	F5	F7	F5	
12	F1	F3	FF12	F4	F2	F3	H1	C2	C2	L3	L1	L1	L1	L1	H2	C2	C2	C3	L2	L2	F1	F1	F1	F3	
13	F3	F2	F2	F1	F1		H1		C2	C3	C2	L2	L1	L3	L2	HL11	H1	CL12	C2	C3	F4	FF33	F3	F1	
14	F3	F2	F3	F3	FQ31	F4	L4	L2	C1	C1	L2	L2	HL11	H1	C1	CC11	L2	CL12	CL12	L2	F5	F3	F2	F4	
15	F4	F1	F1	F1	F2	F3	L4	HL11	C1	C1	C1	C1		L3	HC11	H1	HL11	HL12	C3	CL52	FF86	FF65	F3	F3	
16	FF15	F1	F4	F3	F5		C2	C2	C2	L5	L3	L3	L3	L2	L3	L3	L5	CL22	CL32	CL42	FF33	FF33	FF22	FF22	
17	FF14	F2	F3	F3	F1	F2	CL11	C2	C2	C3	C1	C1	C1	C2	C2	C2	C3	C4	C2	C3	FF32	F3	F3	F3	
18	F2	F2	F3	F3	F4	F4	H1	HC11	H1	C1	C1		HC11	HL11	H1	C2	C2	C2	C3	C2	F4	F3	F3	F2	
19	F3	F3	F5	F1			C1	C2	C2	C3	L3	CL11	H1	C3	C2	C1	C3	C6	C4	C3	F5	F6	F8	F4	
20	F7	F5	F6	F8	F1	F4	C4	C3	C6	C2	C1	C1	C3	C3	C2	C4	C2	C6	C5	C8	F6	F3	F2	F3	
21	F3	F3	F3	F2	F1	F3	C2	C2	C2	C2	C1	C1	C1	C1	C1	C2	C2	C3	C2	C7	F6	F6	FF32	F2	
22	F1	F2	F3	F8	F5	F3	LC32	CL31	C2	C2	C1	C2	C4	C3	C4	C3	C2	C2	C8	C9	F7	F2	F2	F3	
23	F3	F2	F3	F4	FF22	F5	L3	C3	L4	L3		C1	C1	C1	C1	C1	LC41	CL35	L8	L6	F9	F5	F3	F5	
24	F4	F3	F4	F2	F1	F3	CL22	L4	C3	L7	L2	L2	L2	L3	LH21	L8	L3	CL21	CL21	L3	F3	F3	F4	F3	
25	F3	F2	F3	F3	F2	F4	L2		C1	C3	L6	L3	L5	L3	L3	L7	L4	LQ21	L4	L5	F5	F4	F4	F4	
26	F3	F2	F1	F1		F2	L3	L4	L3	L3	L3	L1	L2	L3	L1	L3	L4	L3	L4	L3	F2	F1	F1	F2	
27	F1	F3	F1	F2	F3	F4	L5	CL11	HL11	C1	C1	C2	H1	H1	C2	C2	C3	C4	C4	C3	F3	FF32	F3	FF24	
28	FF34	F6	F3	F2	F3	F2	L4	L3	C5	C4	C2	C1	C1	C2	C2	C2	C1	C3	C1	C4	F3	F3	F2	F3	
29	F3	F2	F2	F1	F1		H1	H1	H1	C1	C1	C1	C2	C2	C2	C3	C4	C5	C8	C7	F5	F6	F4	F4	
30	F2	F1	F1				C2	C1	C1	C4	L5	L5	L2	L2	L3	L3	CL21	C3	CL31	L6	F3	F3	FF22	F3	
31	F2	F3	F3	F4	F5	F2	L4	L4	L3	CL13	LH21	CH11	HC21	C2	C3	C1	C5	C7	C8	L3	FF33	FF32	F9	F2	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

JUL. 2022 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

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

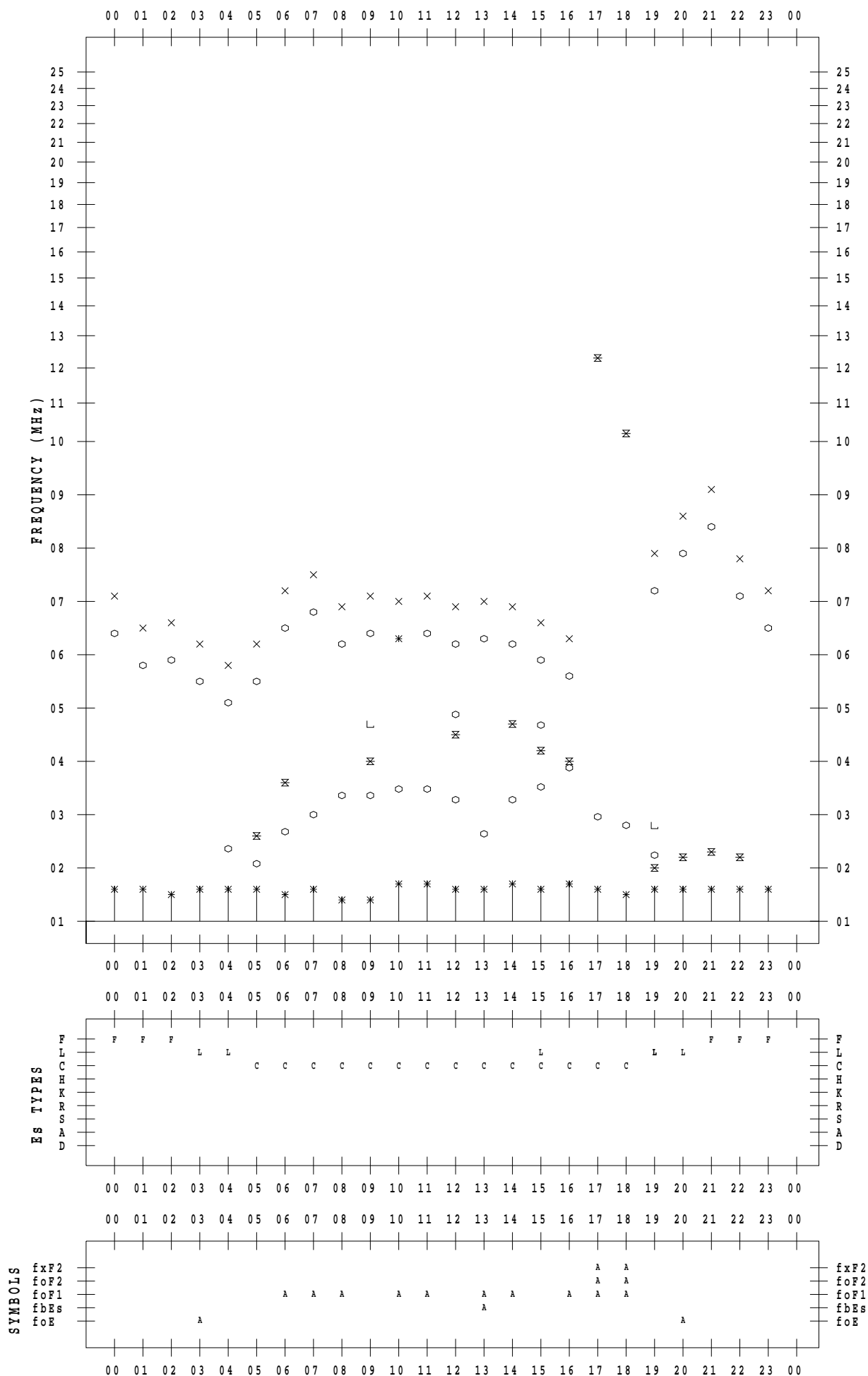
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 1

135 ° E MEAN TIME



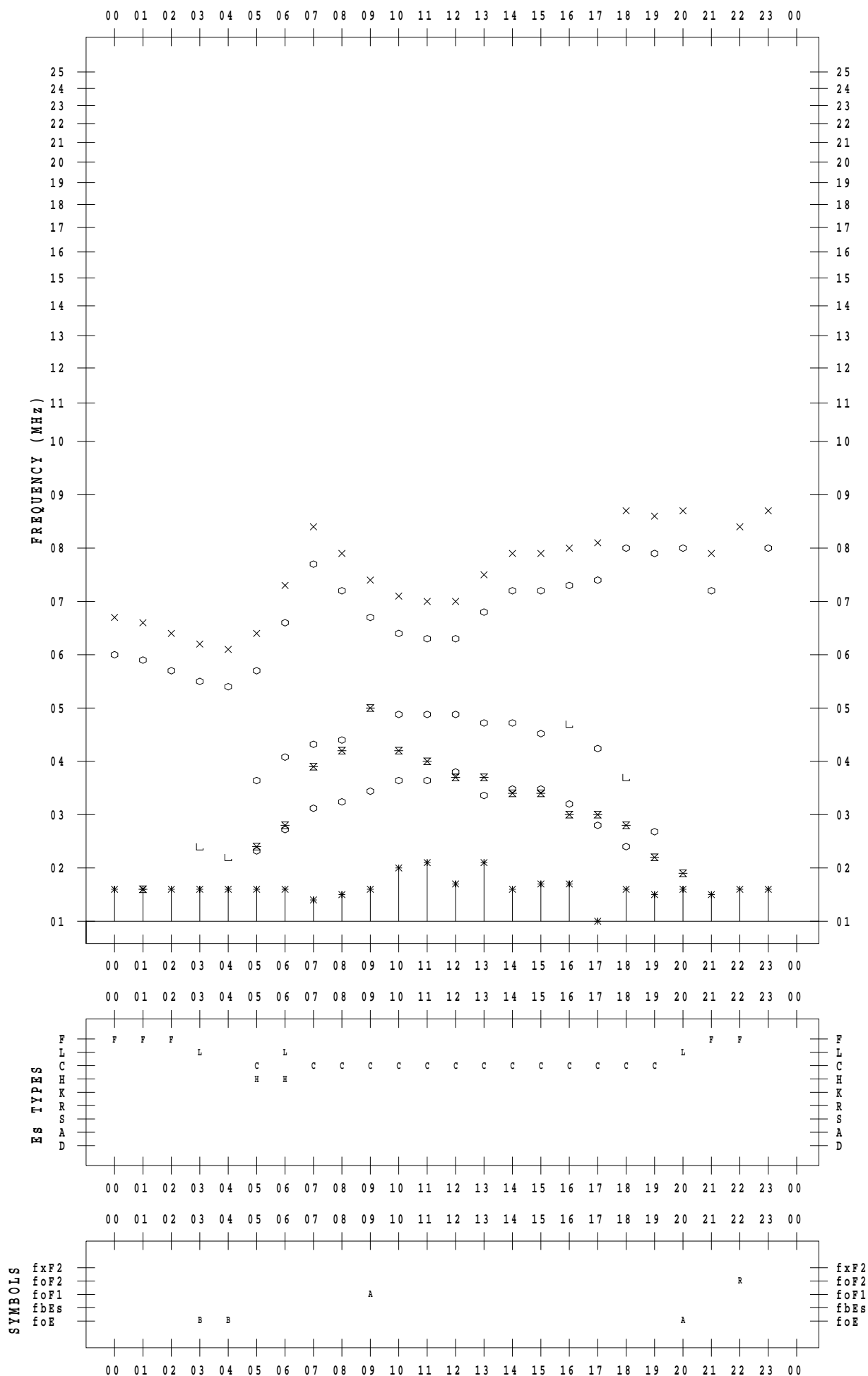
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 2

135 ° E MEAN TIME



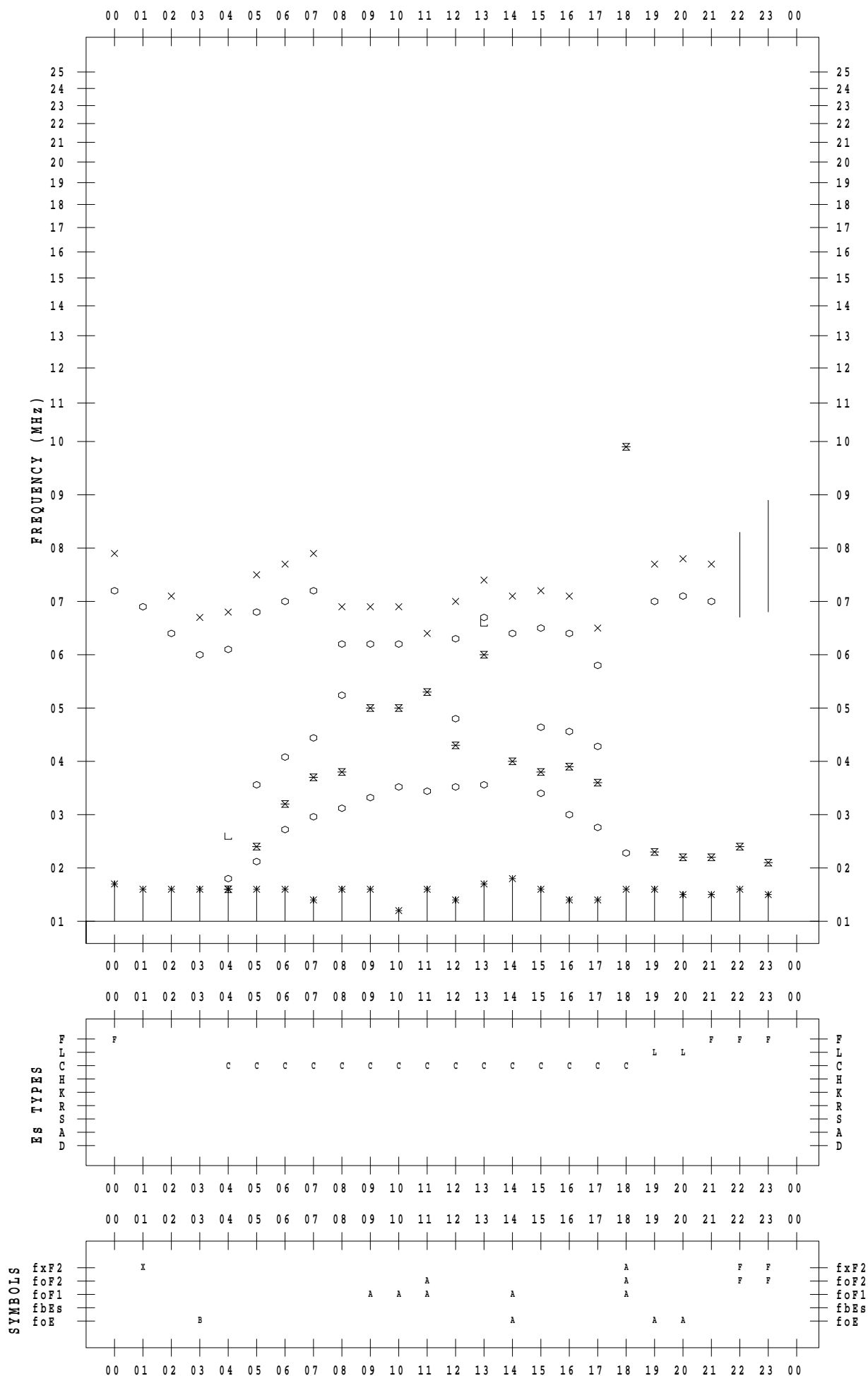
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 3

135 ° E MEAN TIME



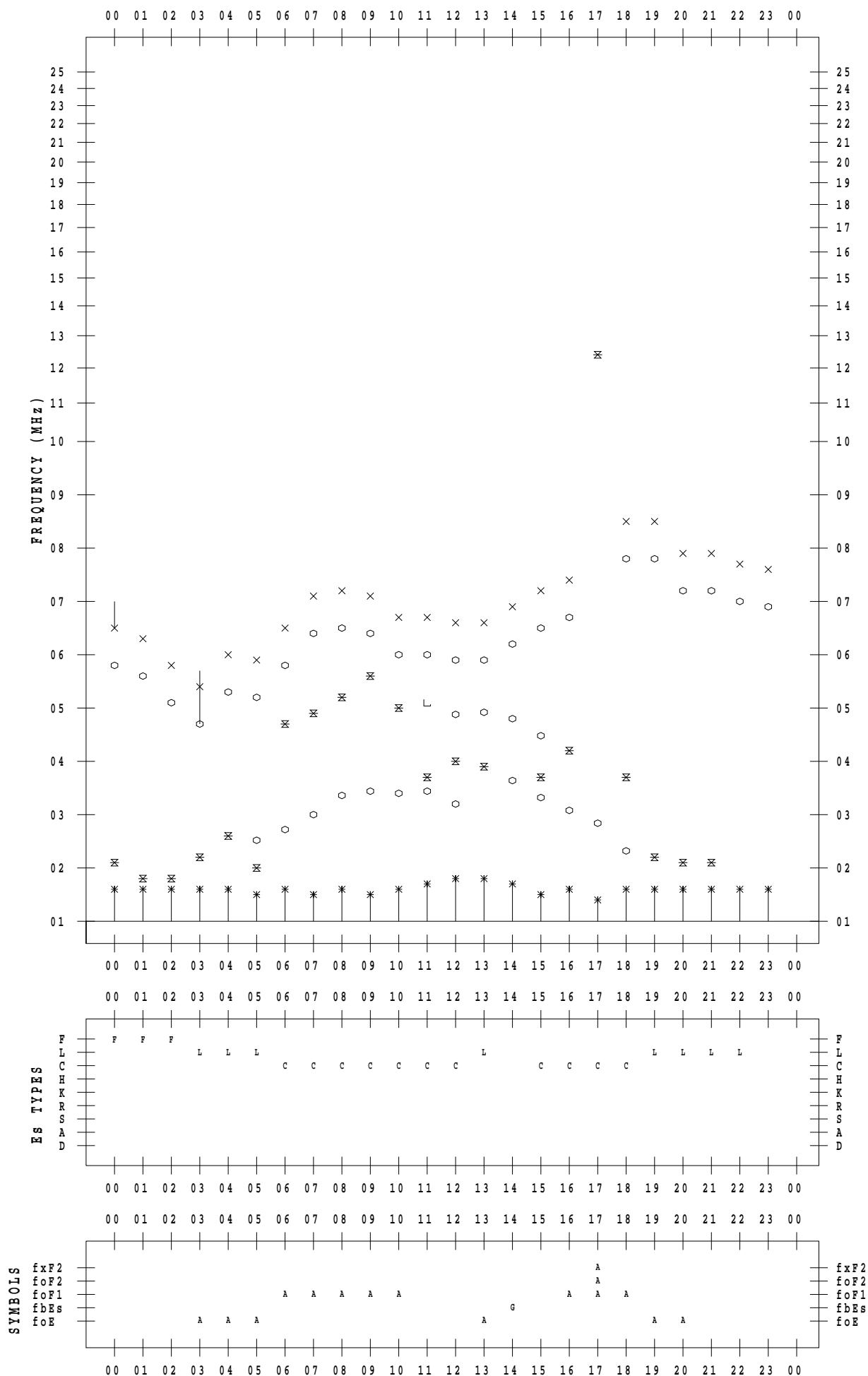
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 4

135 ° E MEAN TIME



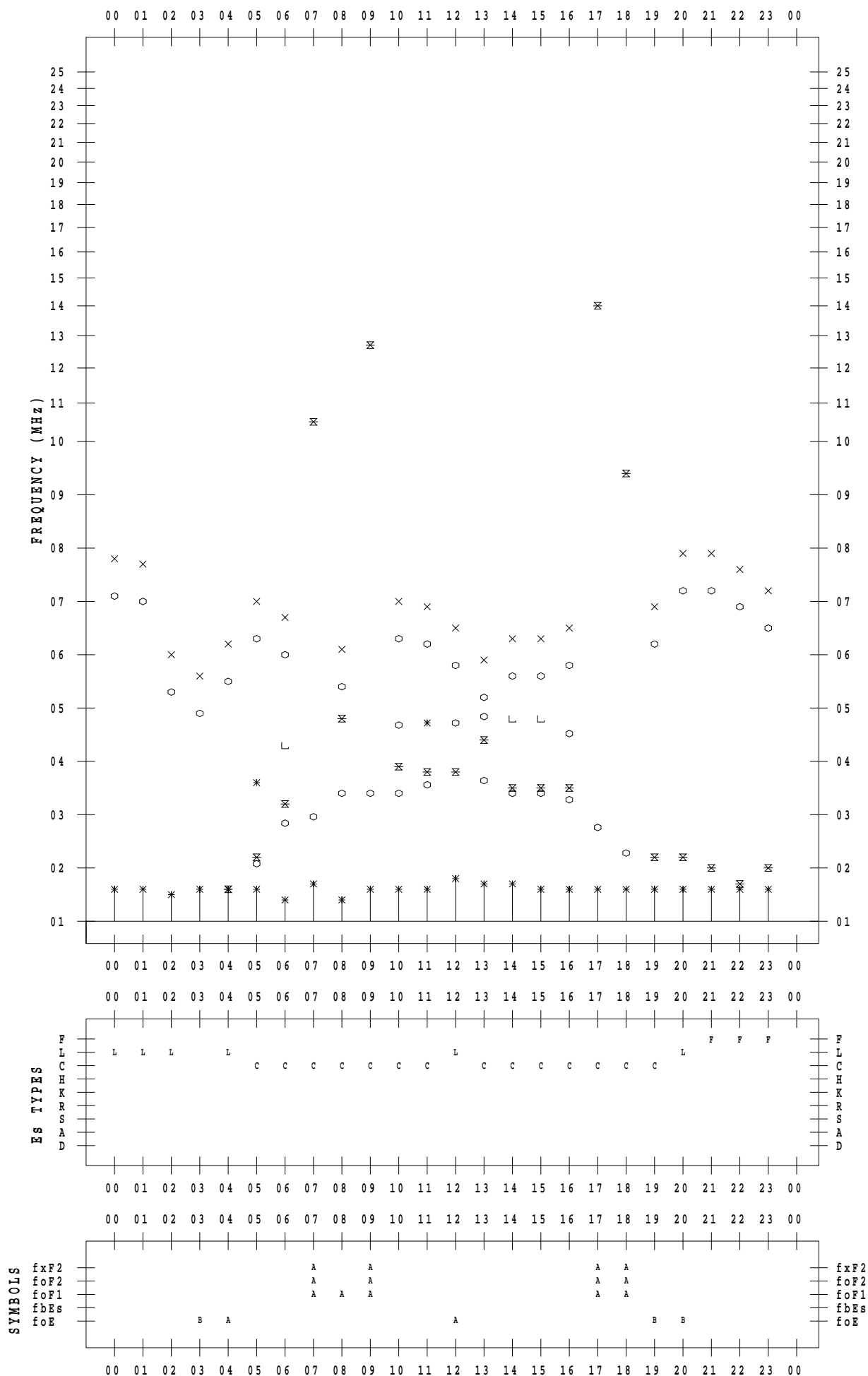
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 5

135 ° E MEAN TIME



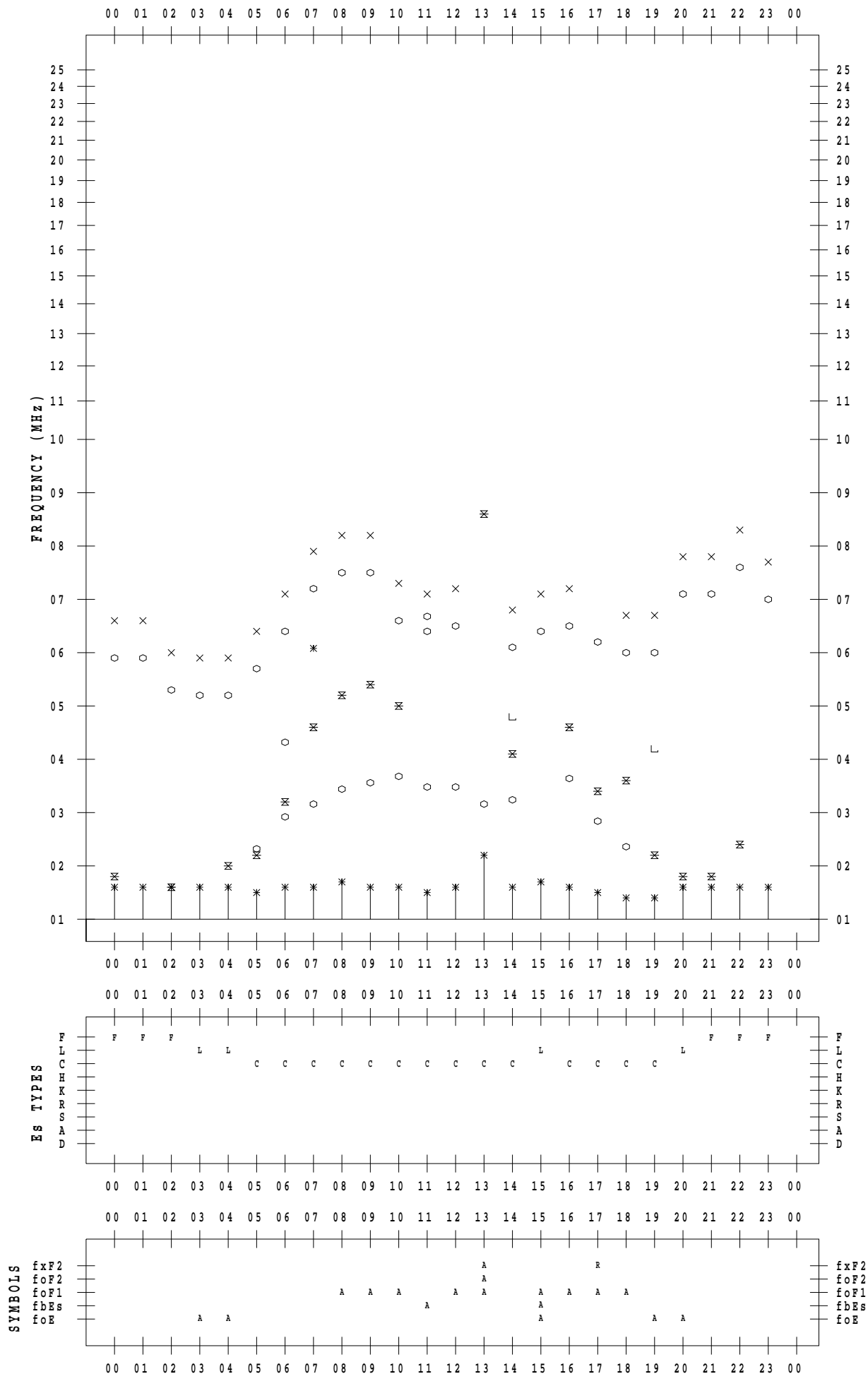
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 6

135 ° E MEAN TIME



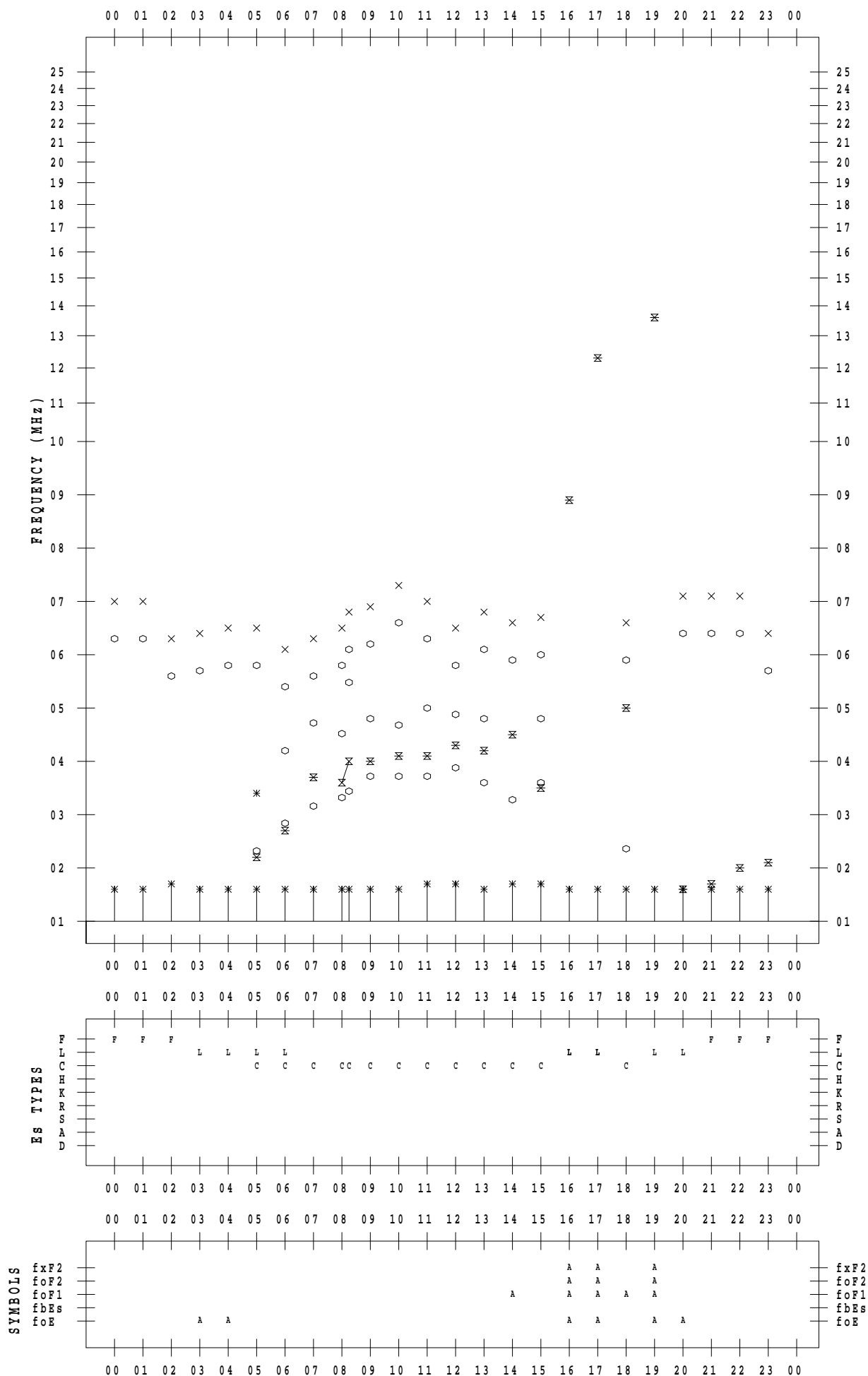
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 7

135 ° E MEAN TIME



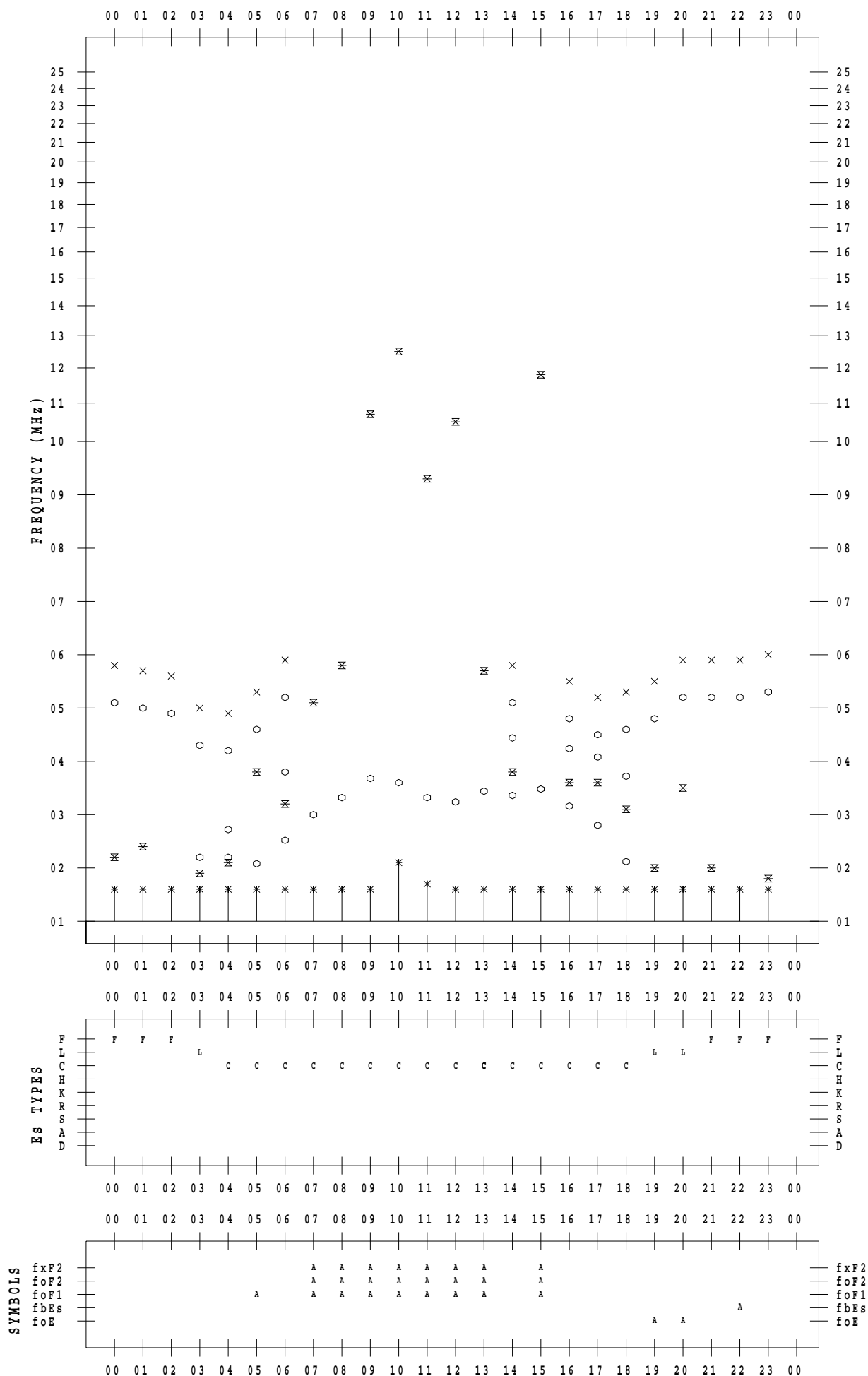
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 8

135 ° E MEAN TIME



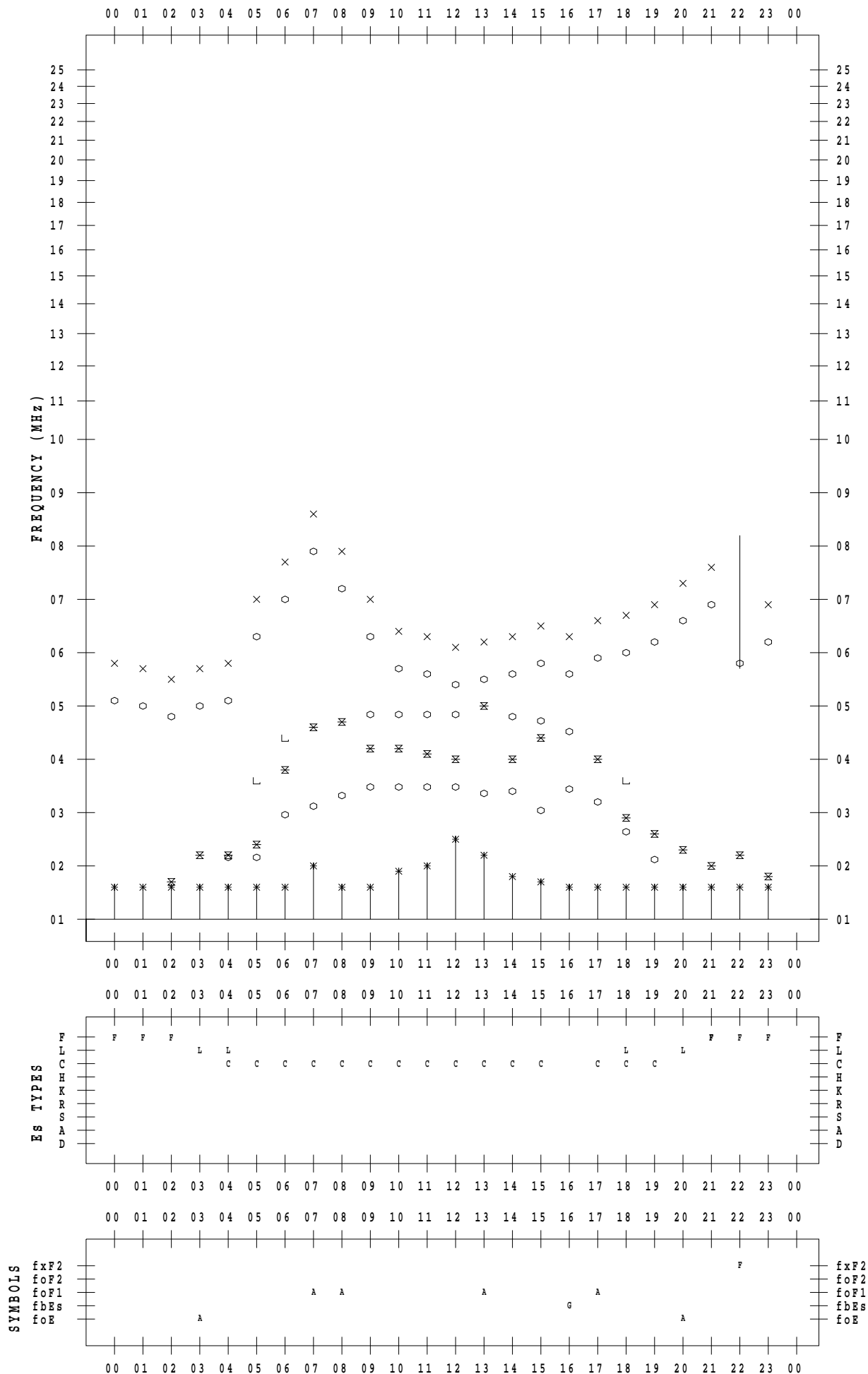
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 9

135 ° E MEAN TIME



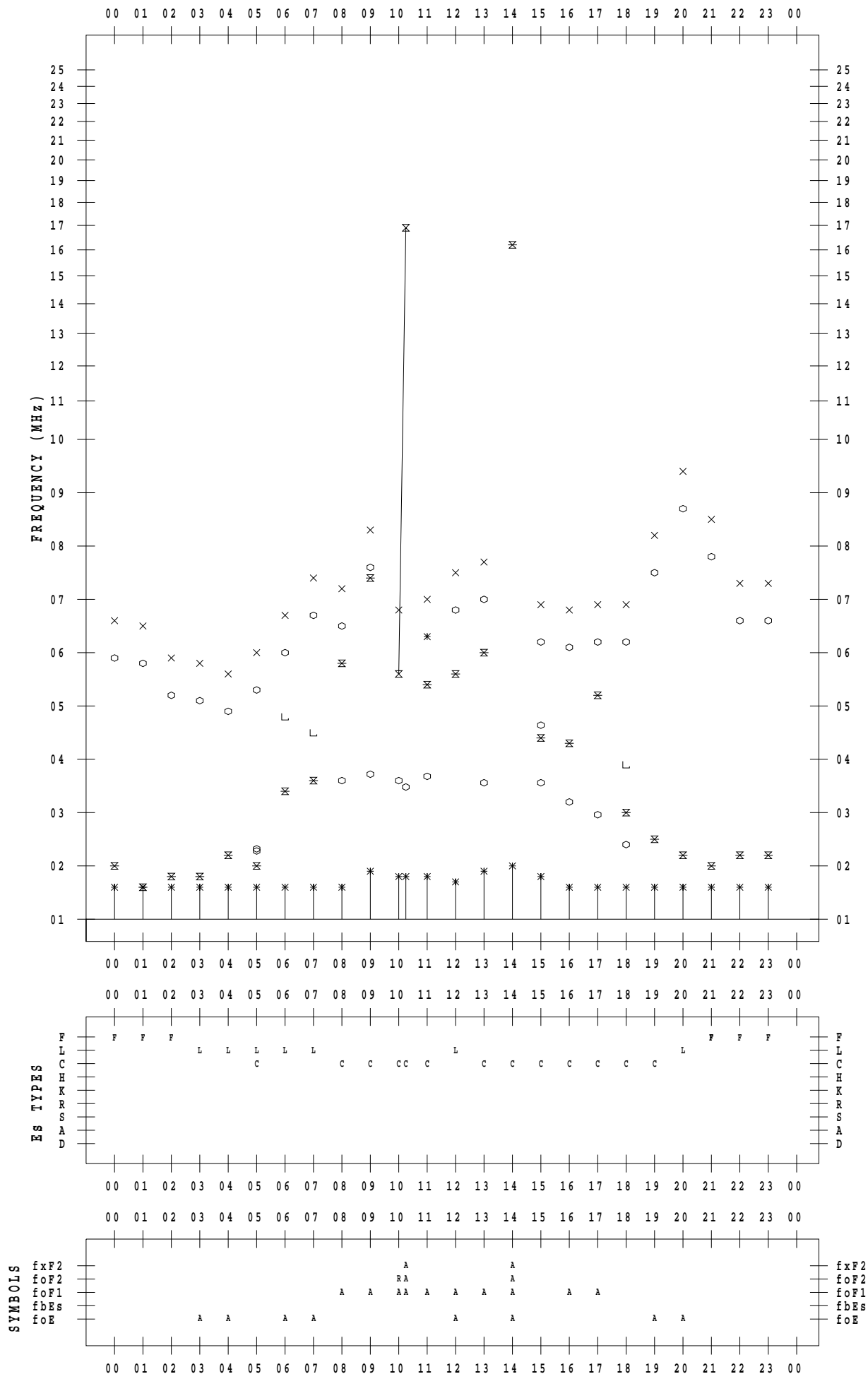
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 10

135 ° E MEAN TIME



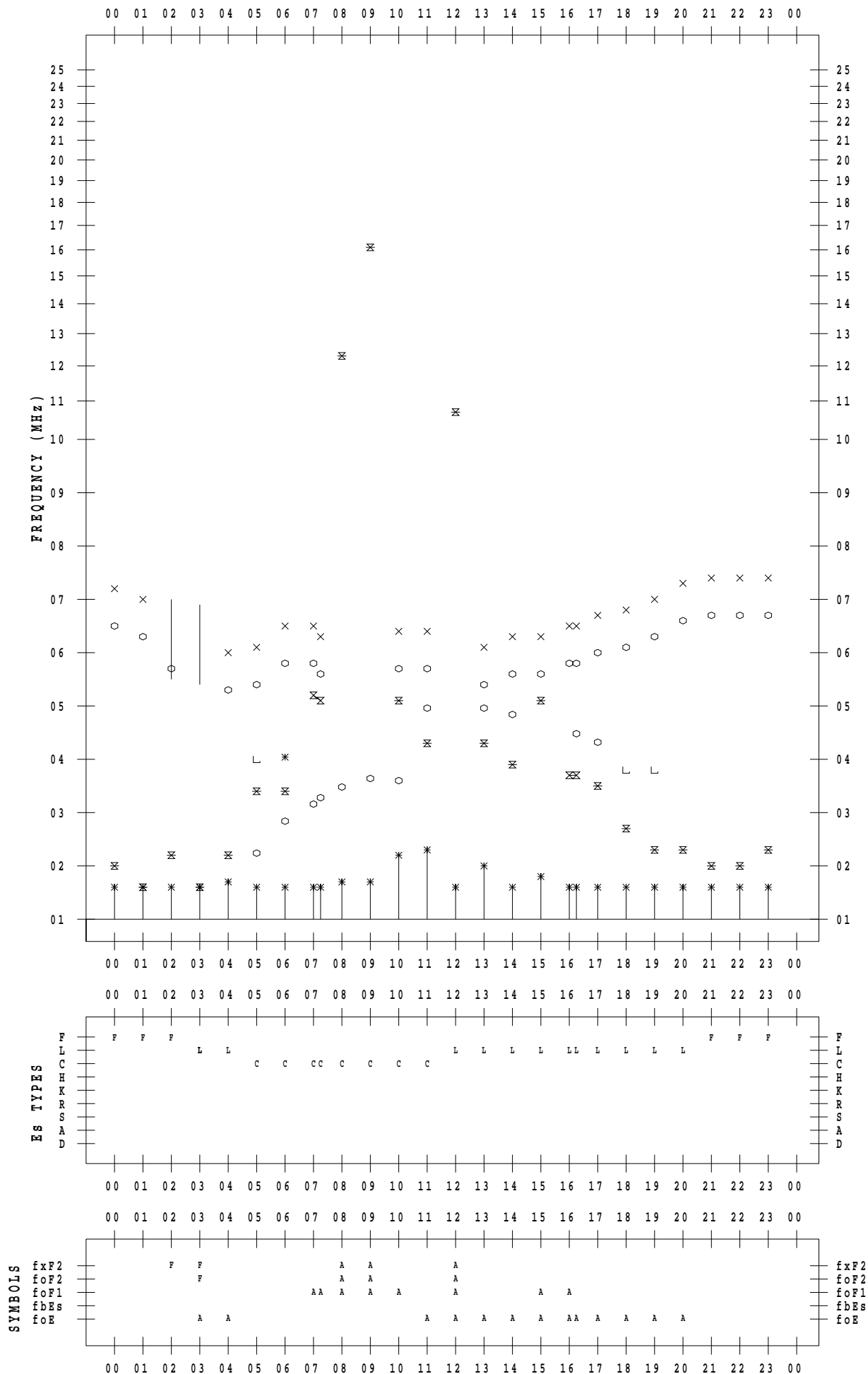
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 11

135 ° E MEAN TIME



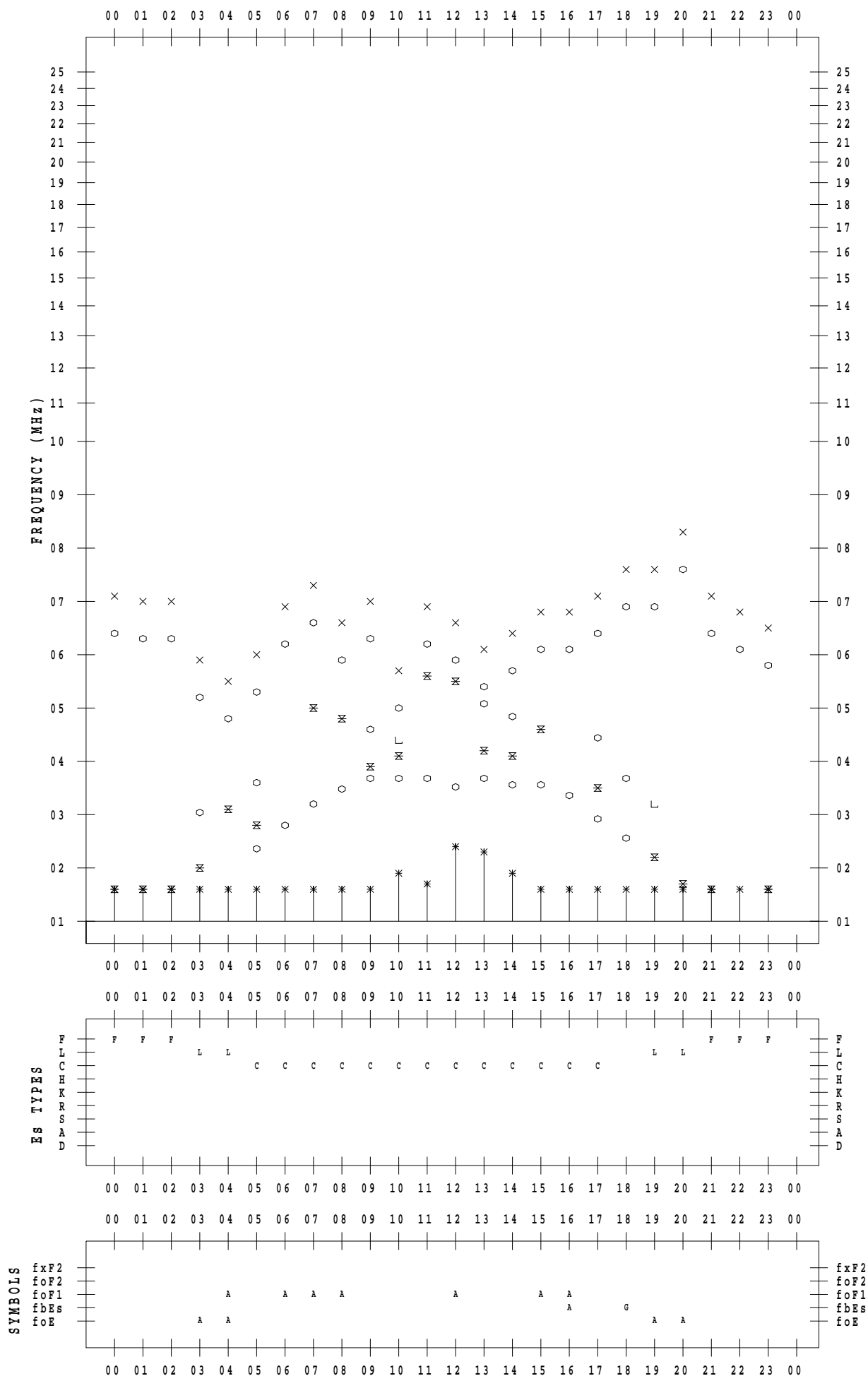
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 12

135 ° E MEAN TIME



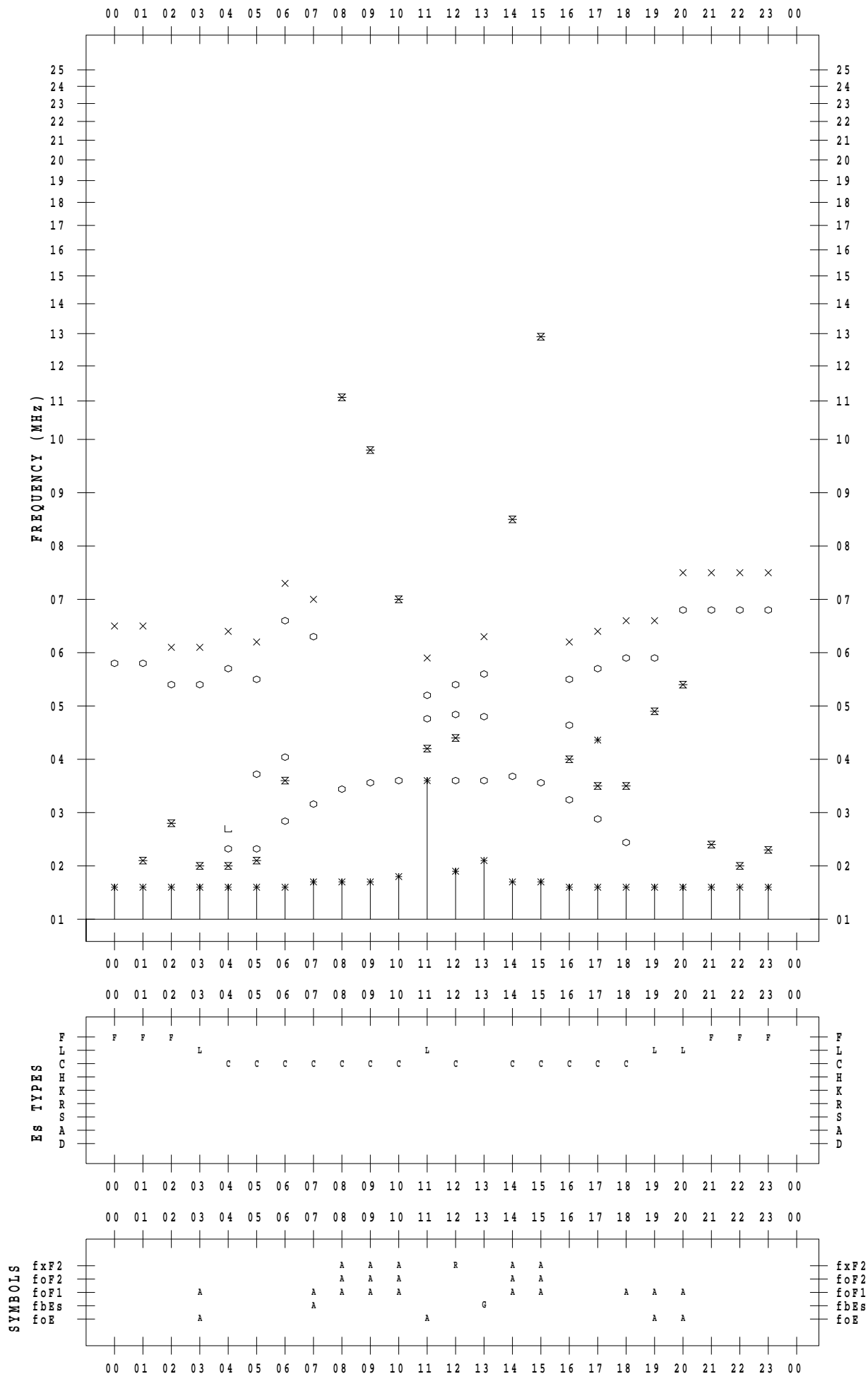
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 13

135 ° E MEAN TIME



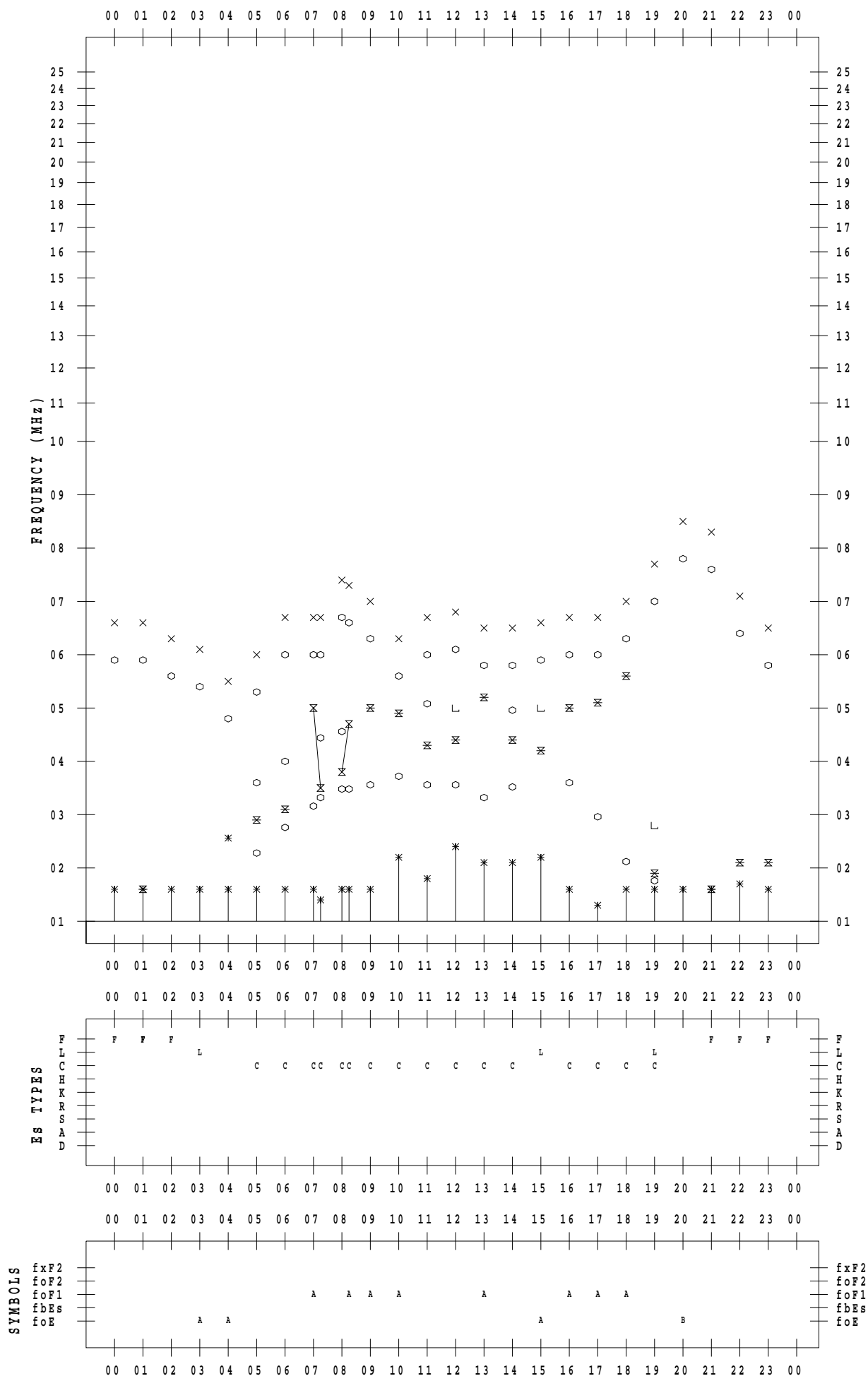
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 14

135 ° E MEAN TIME



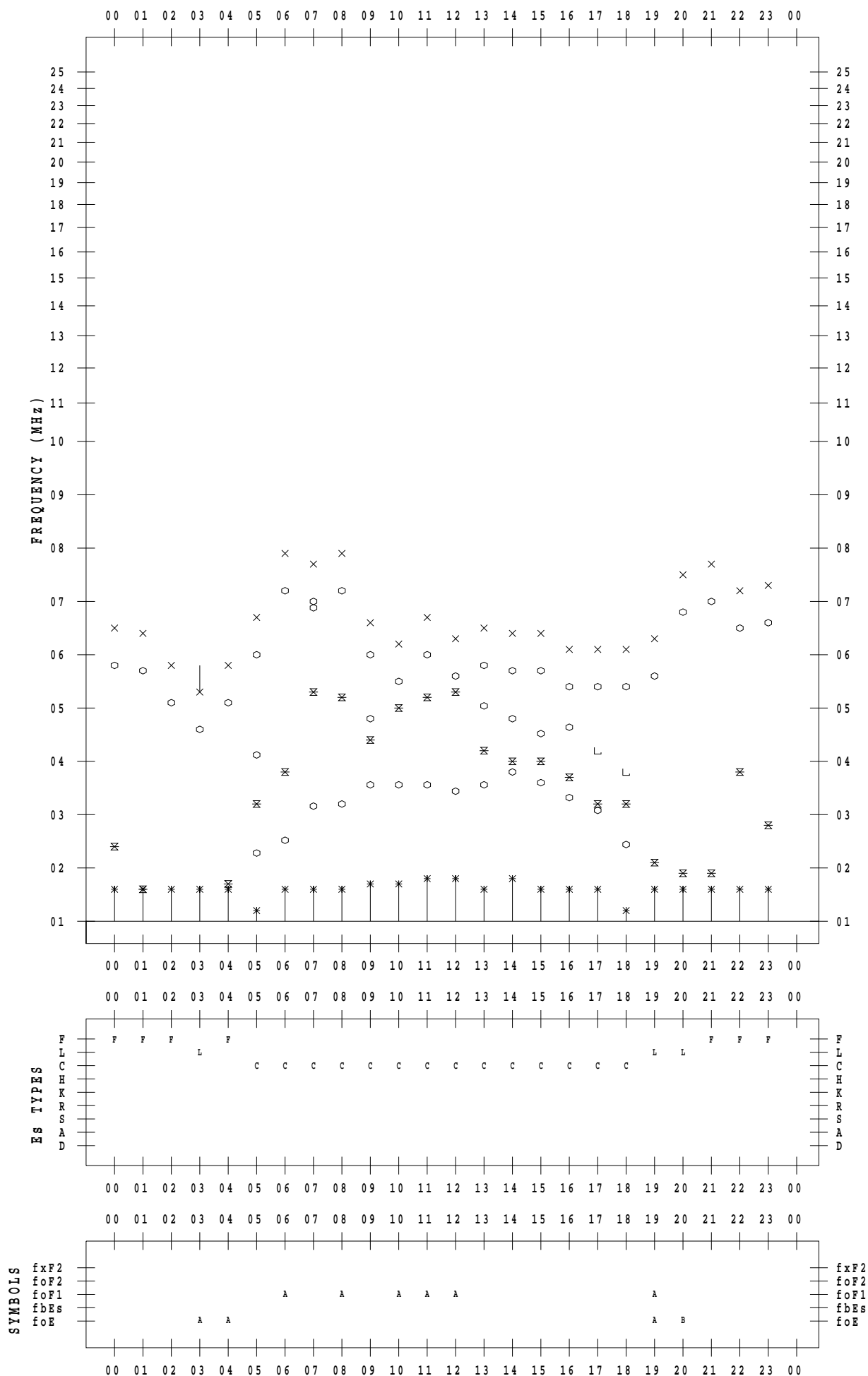
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 15

135 ° E MEAN TIME



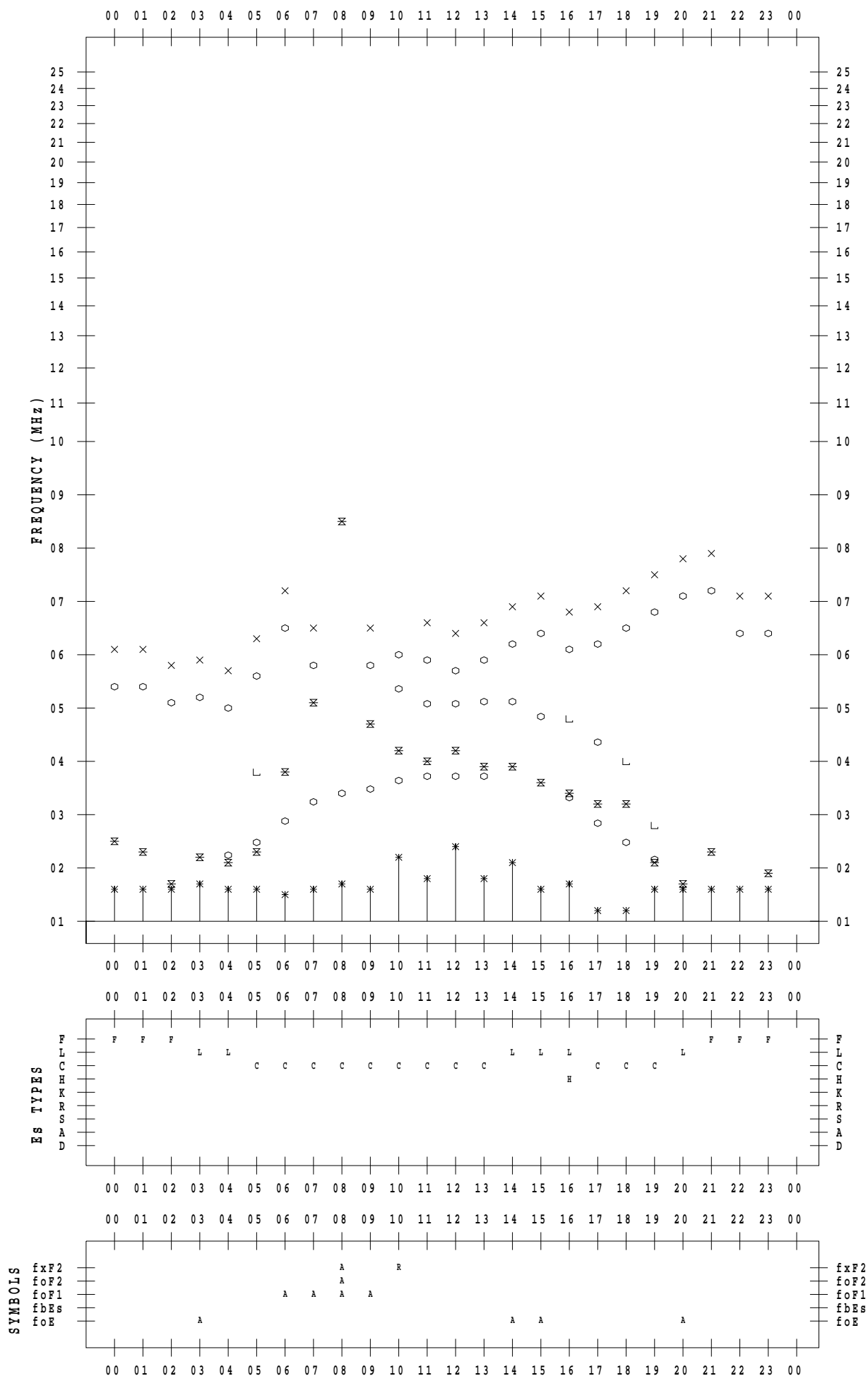
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 16

135 ° E MEAN TIME



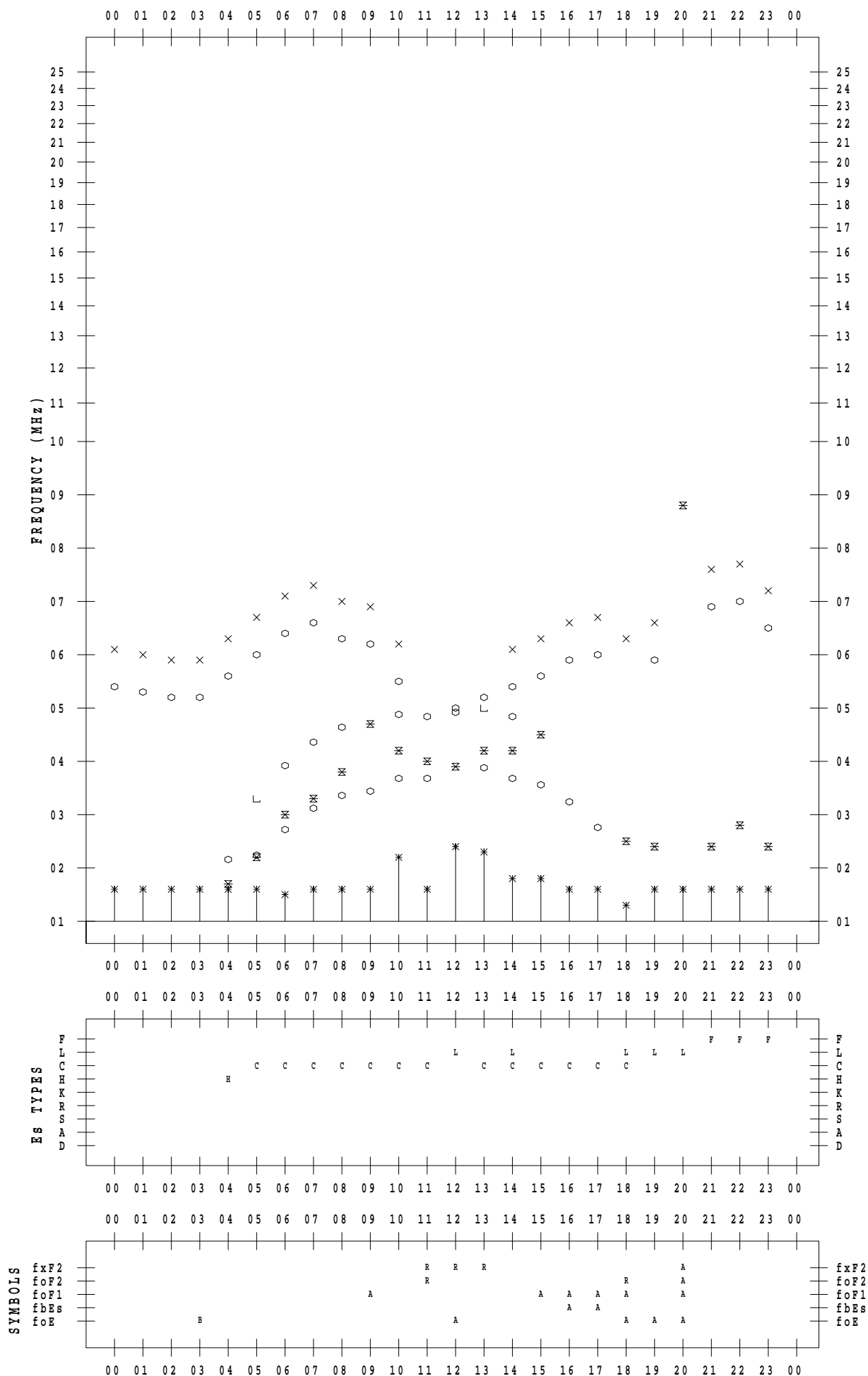
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 17

135 ° E MEAN TIME



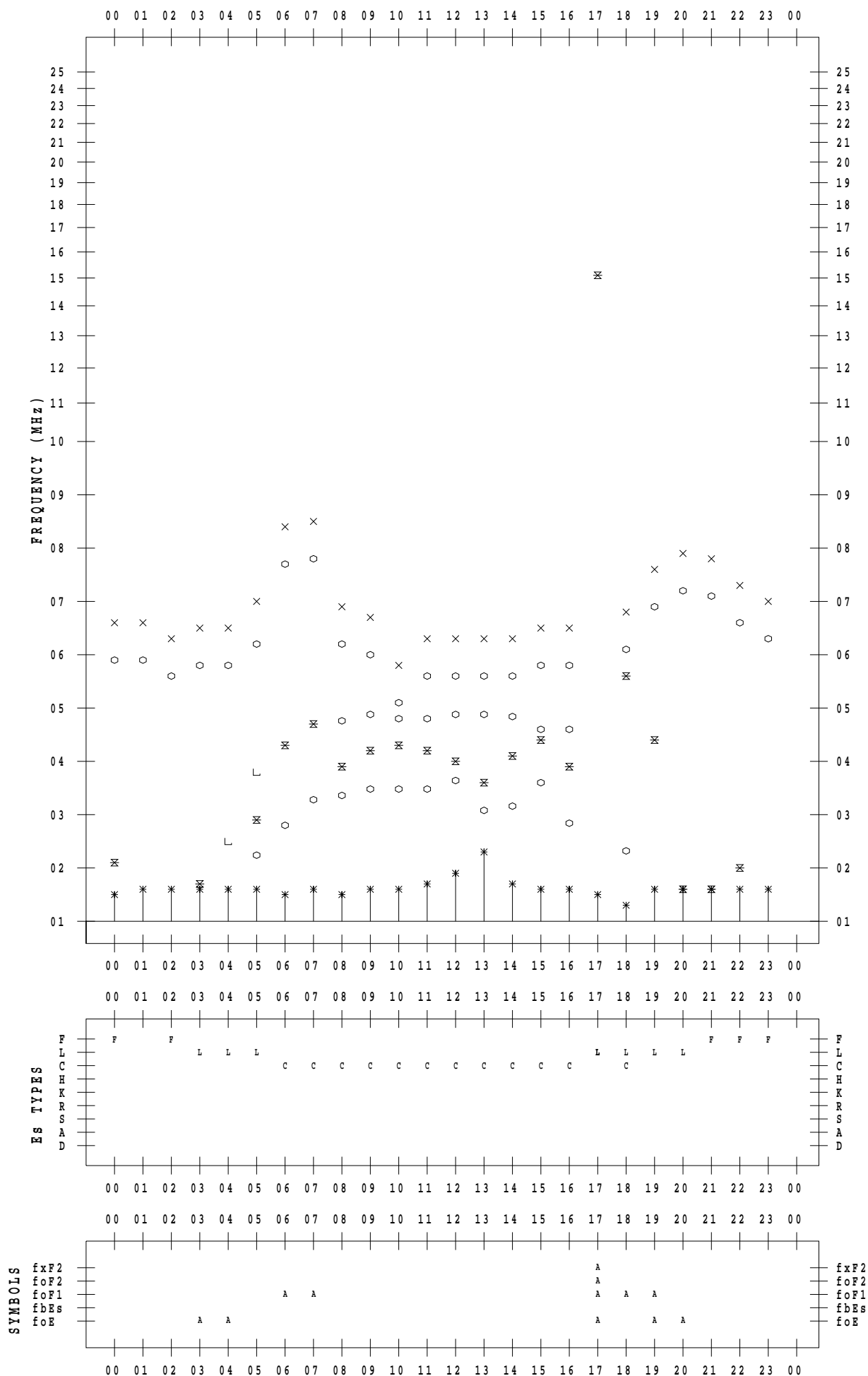
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 18

135 ° E MEAN TIME



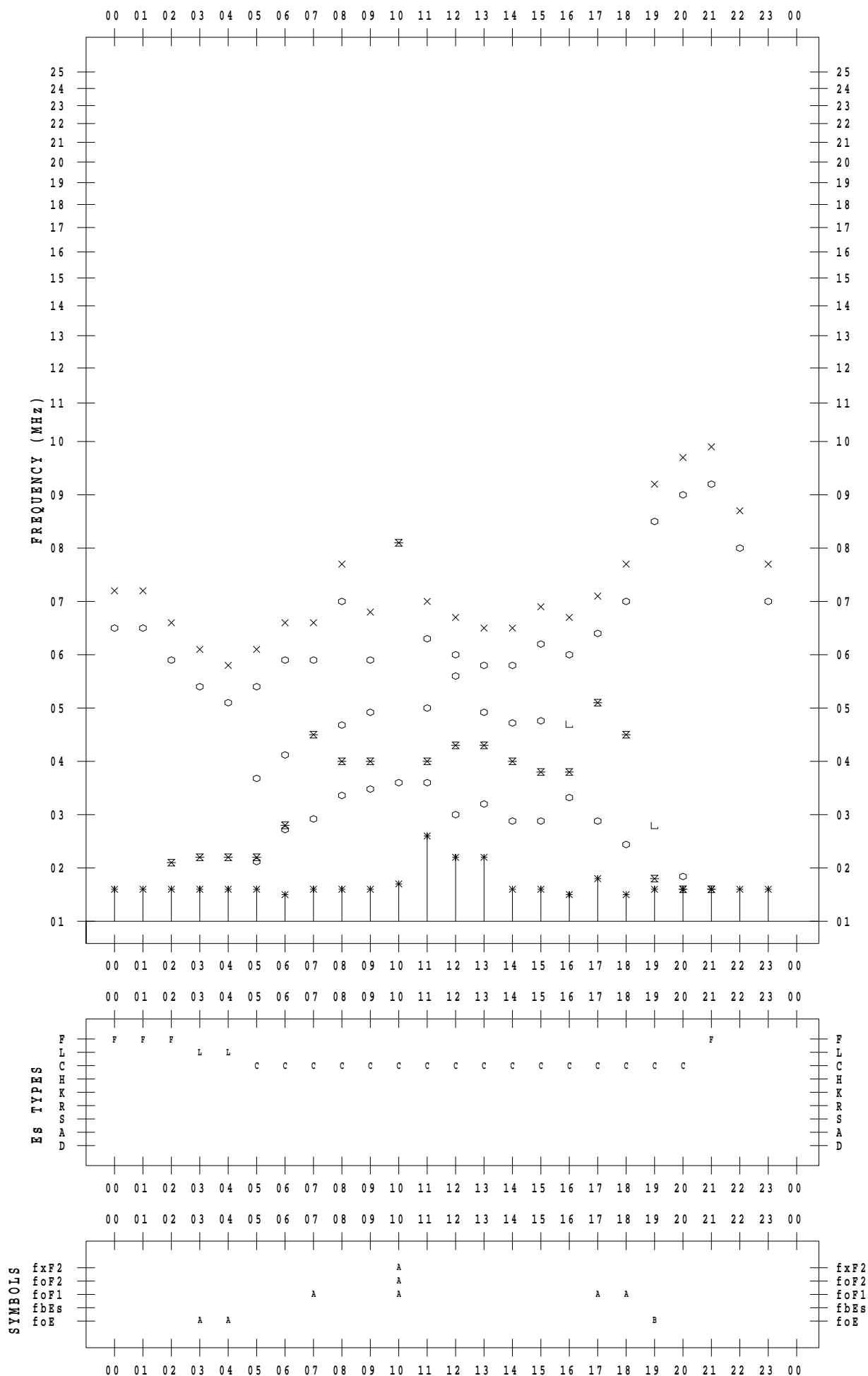
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 19

135 ° E MEAN TIME



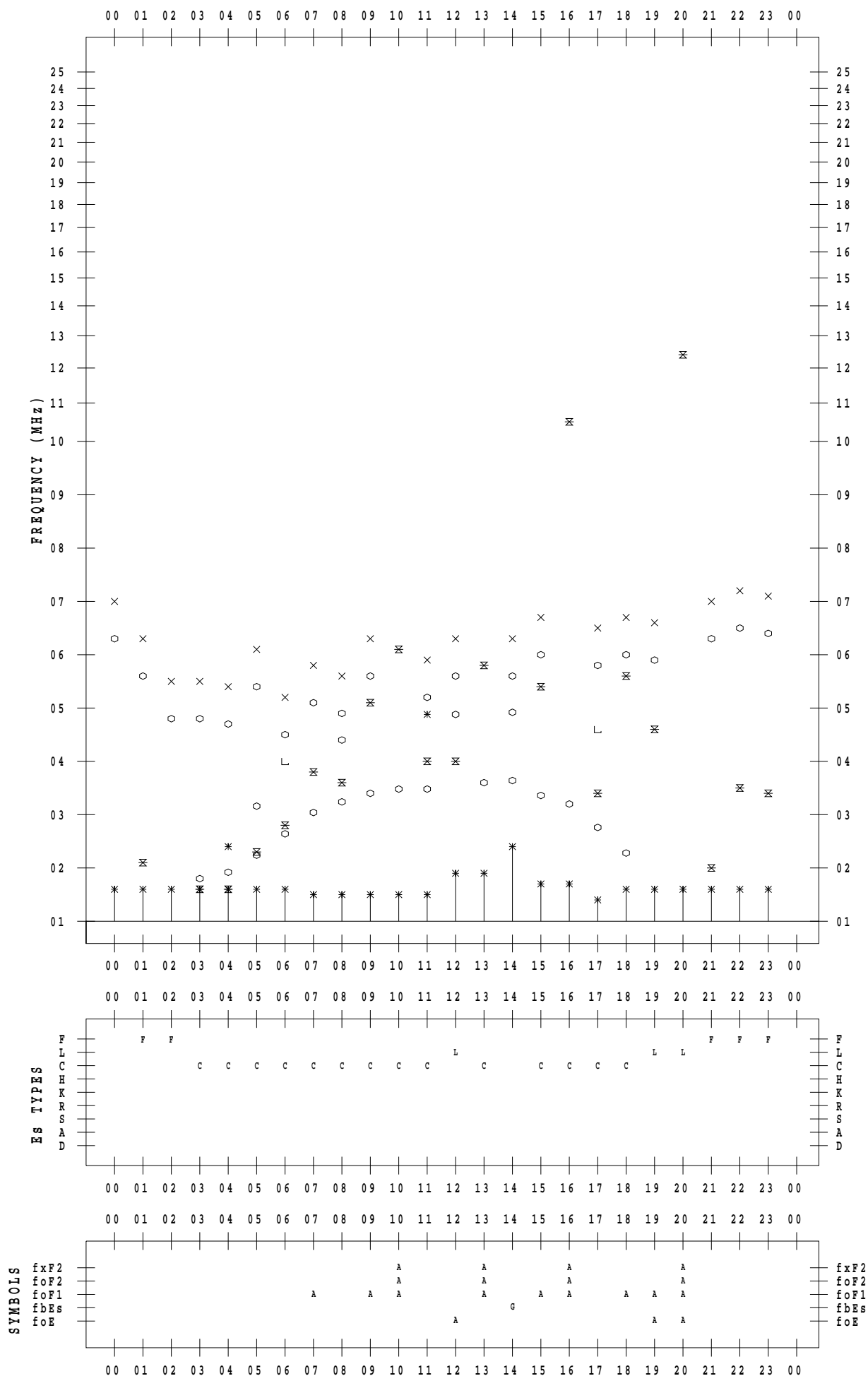
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 20

135 ° E MEAN TIME



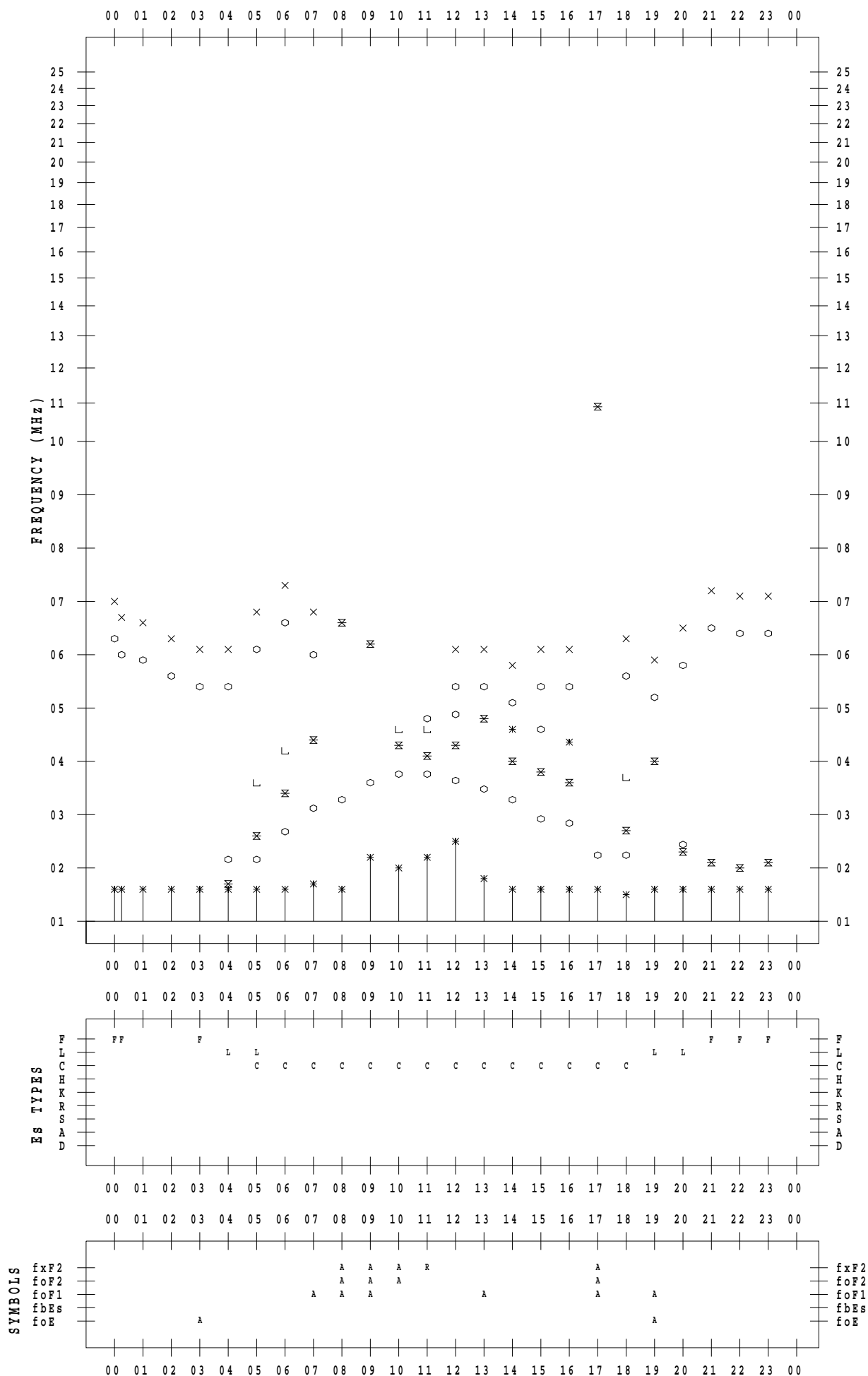
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 21

135 ° E MEAN TIME



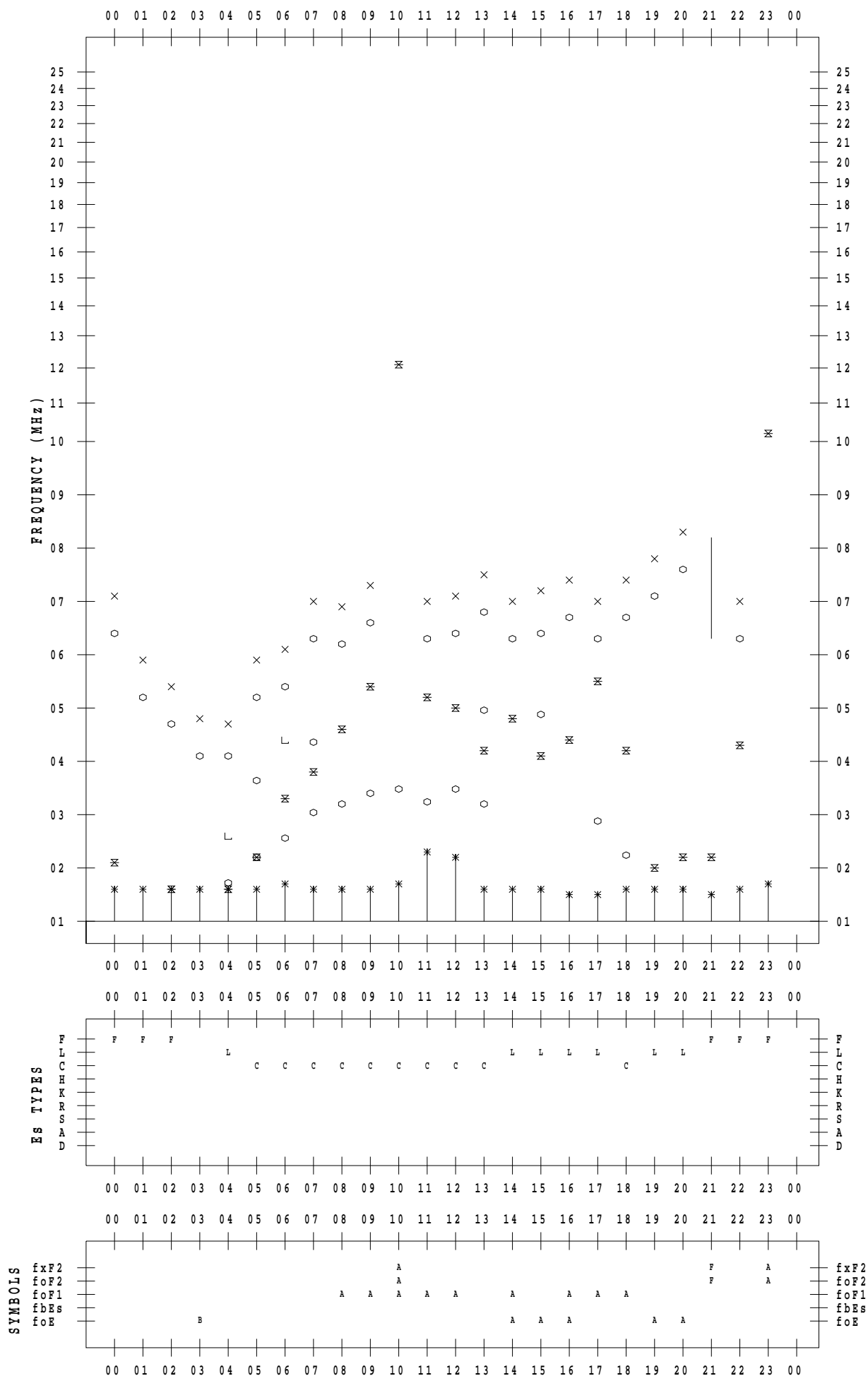
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 22

135 ° E MEAN TIME



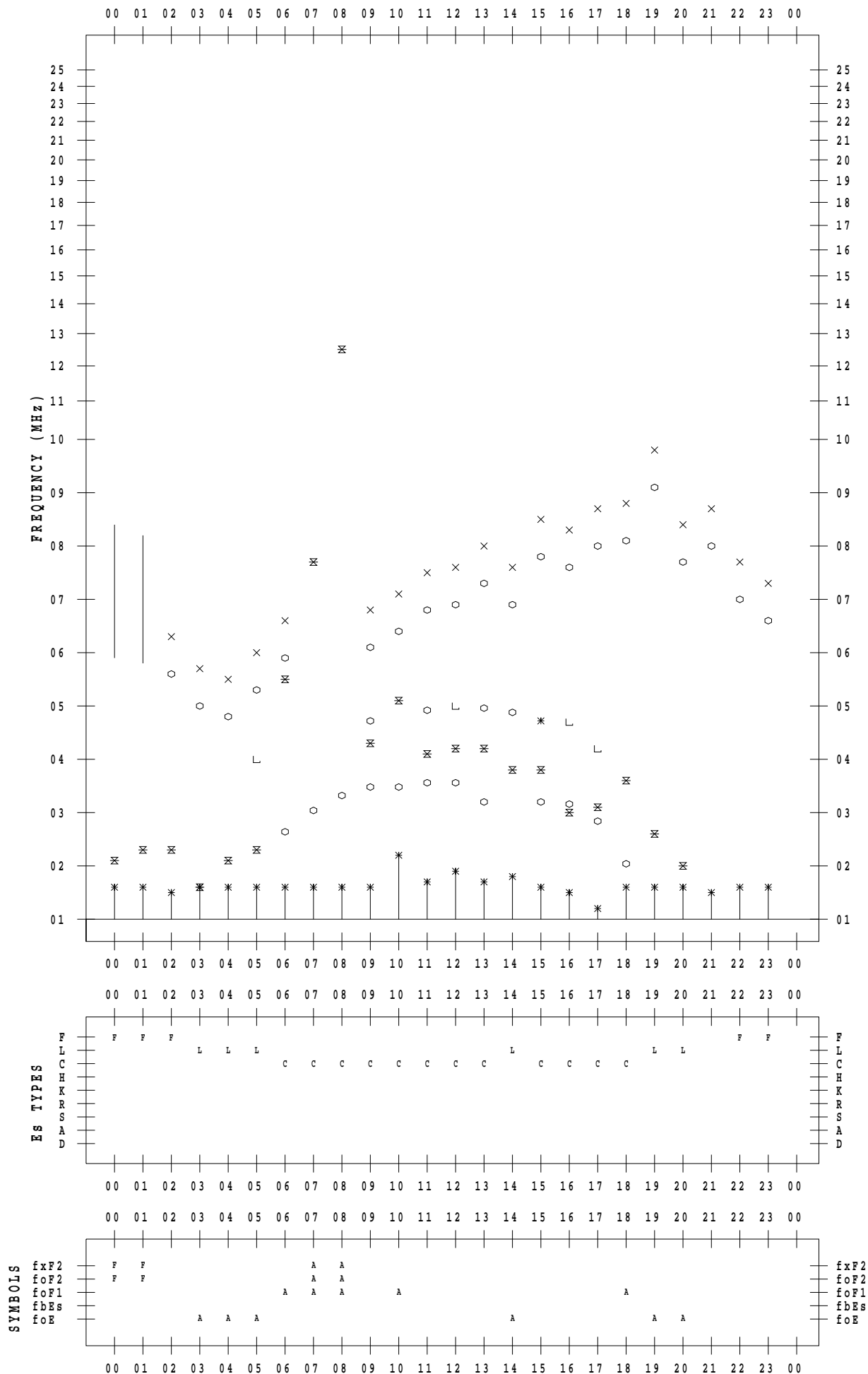
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 23

135 ° E MEAN TIME



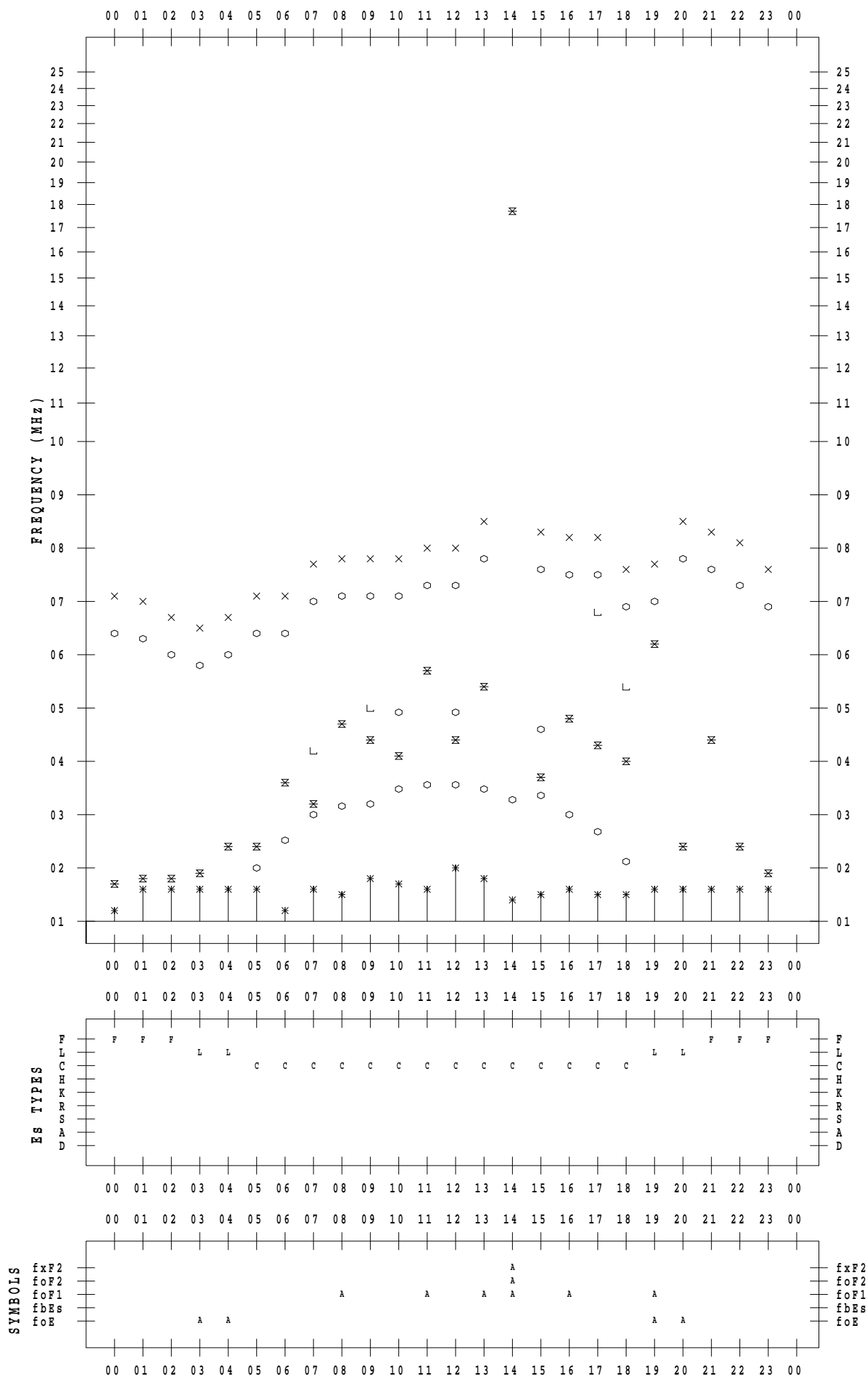
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 24

135 ° E MEAN TIME



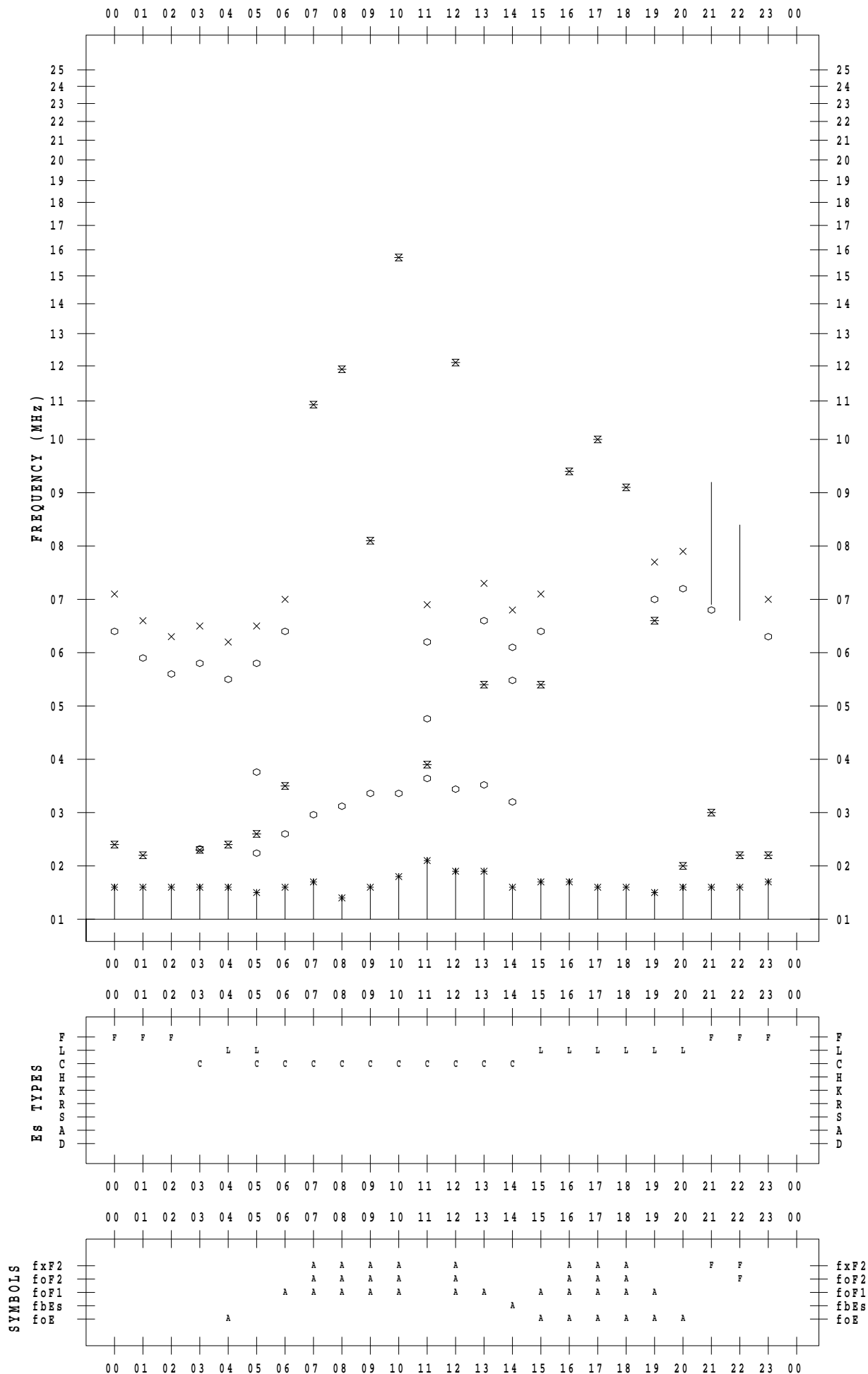
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 25

135 ° E MEAN TIME



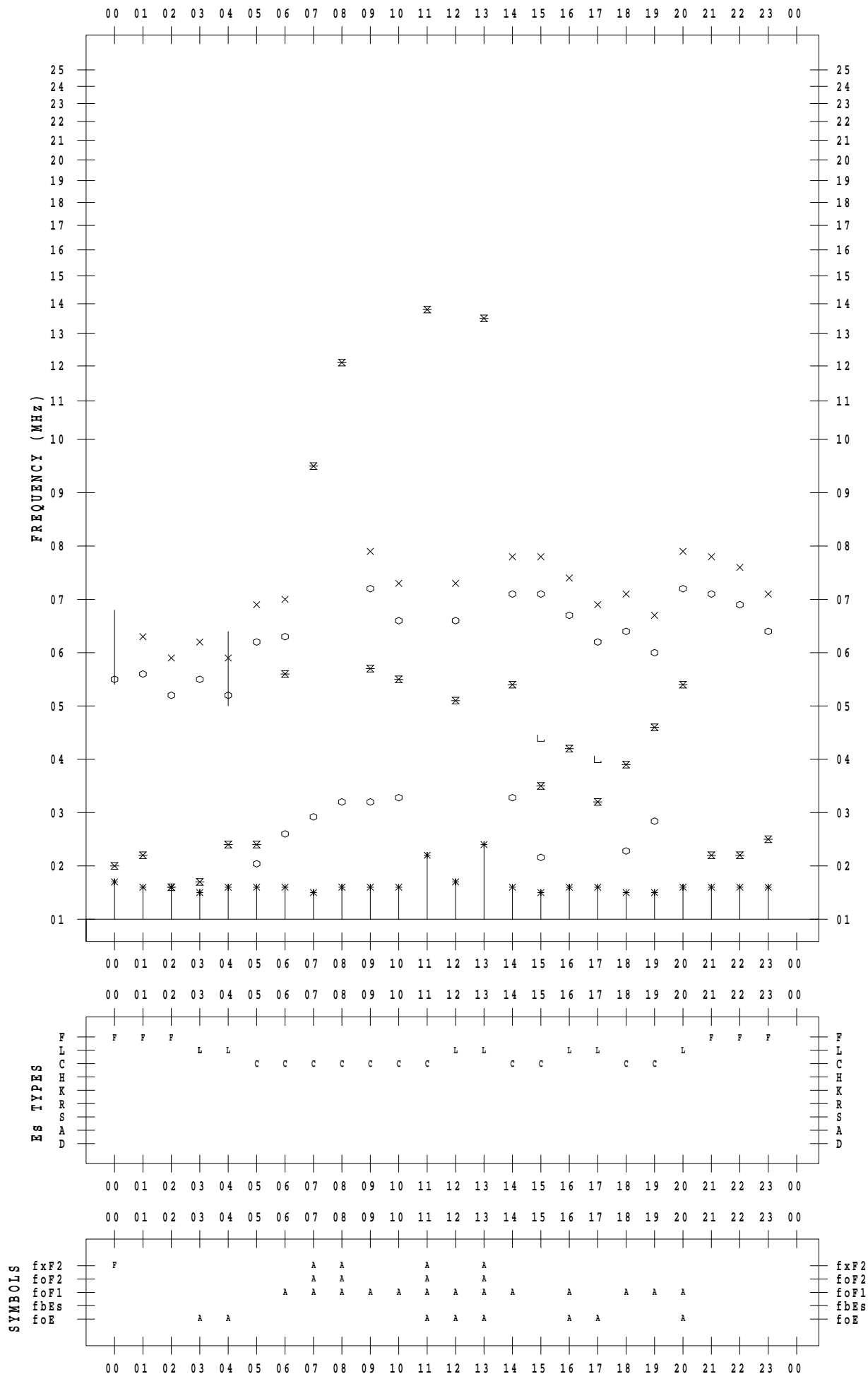
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 26

135 ° E MEAN TIME



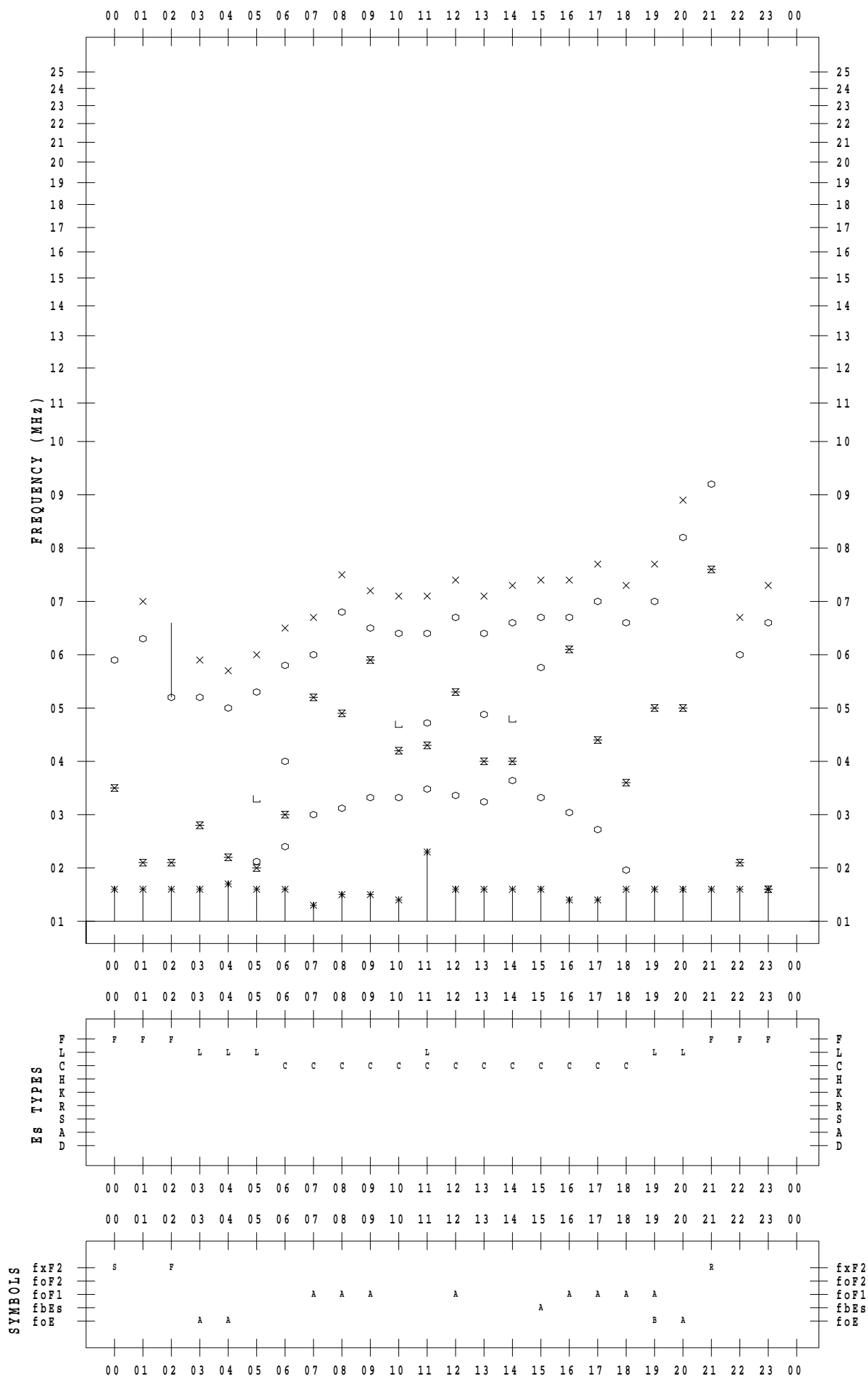
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 27

135 ° E MEAN TIME



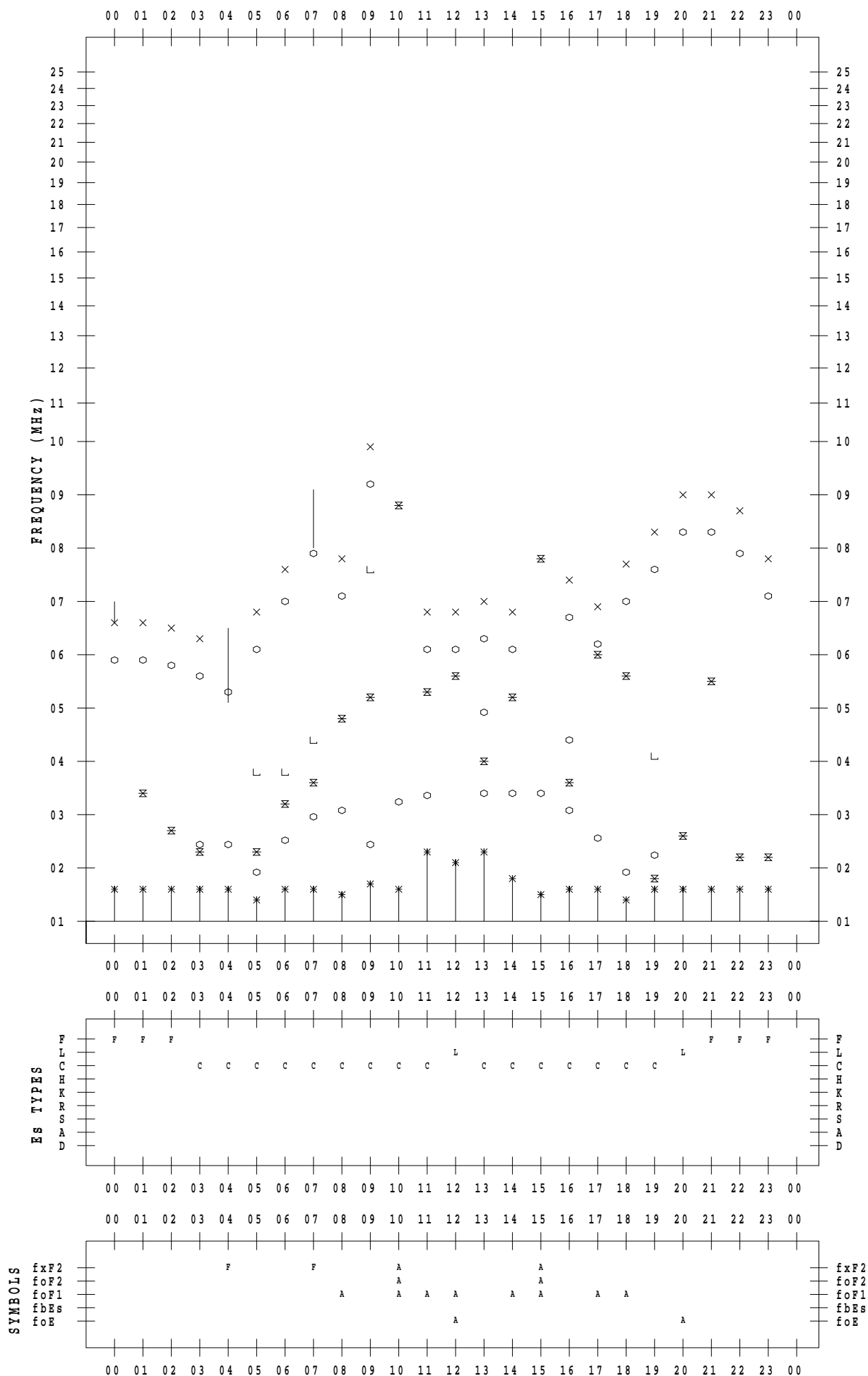
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 28

135 ° E MEAN TIME



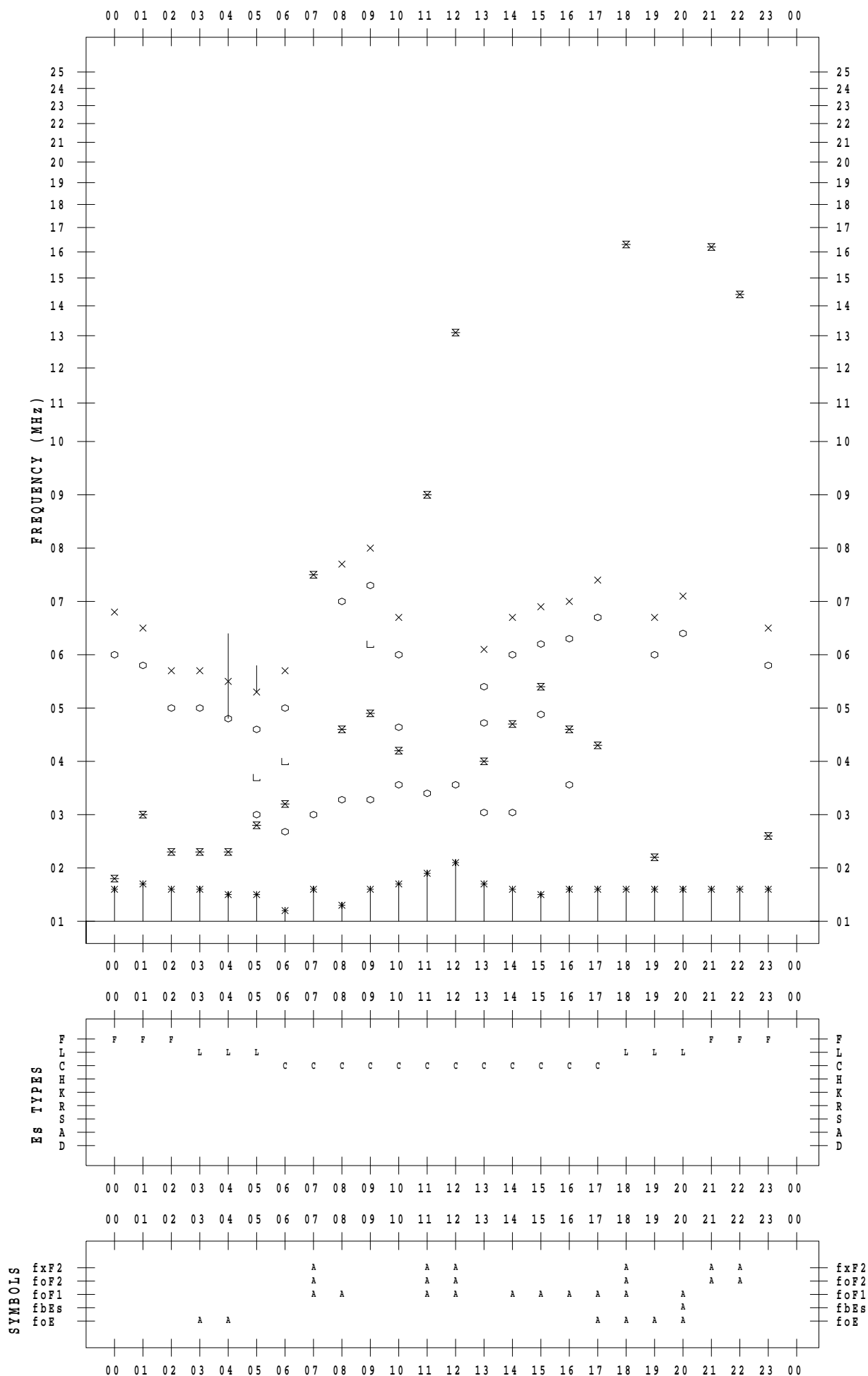
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 29

135 ° E MEAN TIME



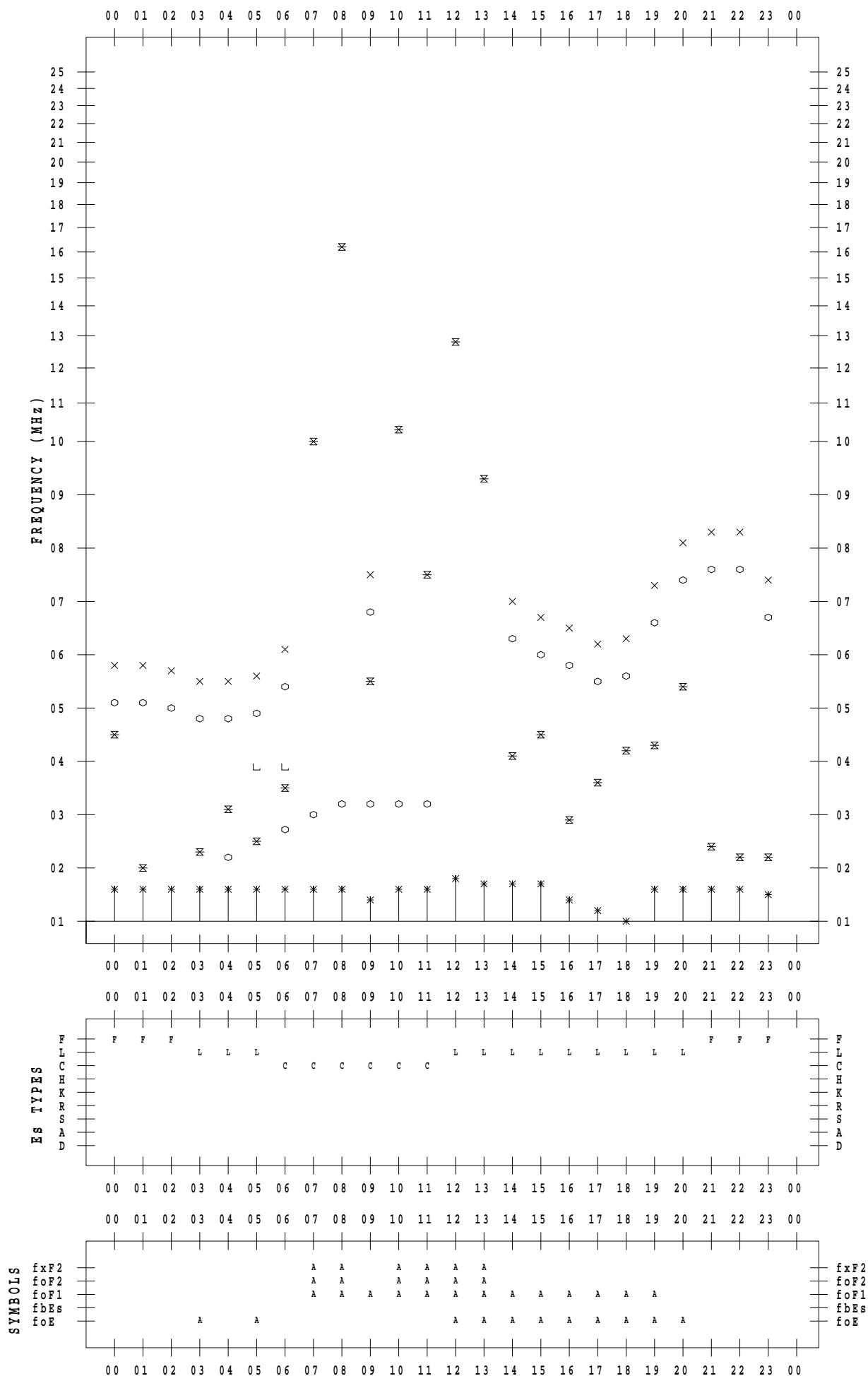
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 30

135 ° E MEAN TIME



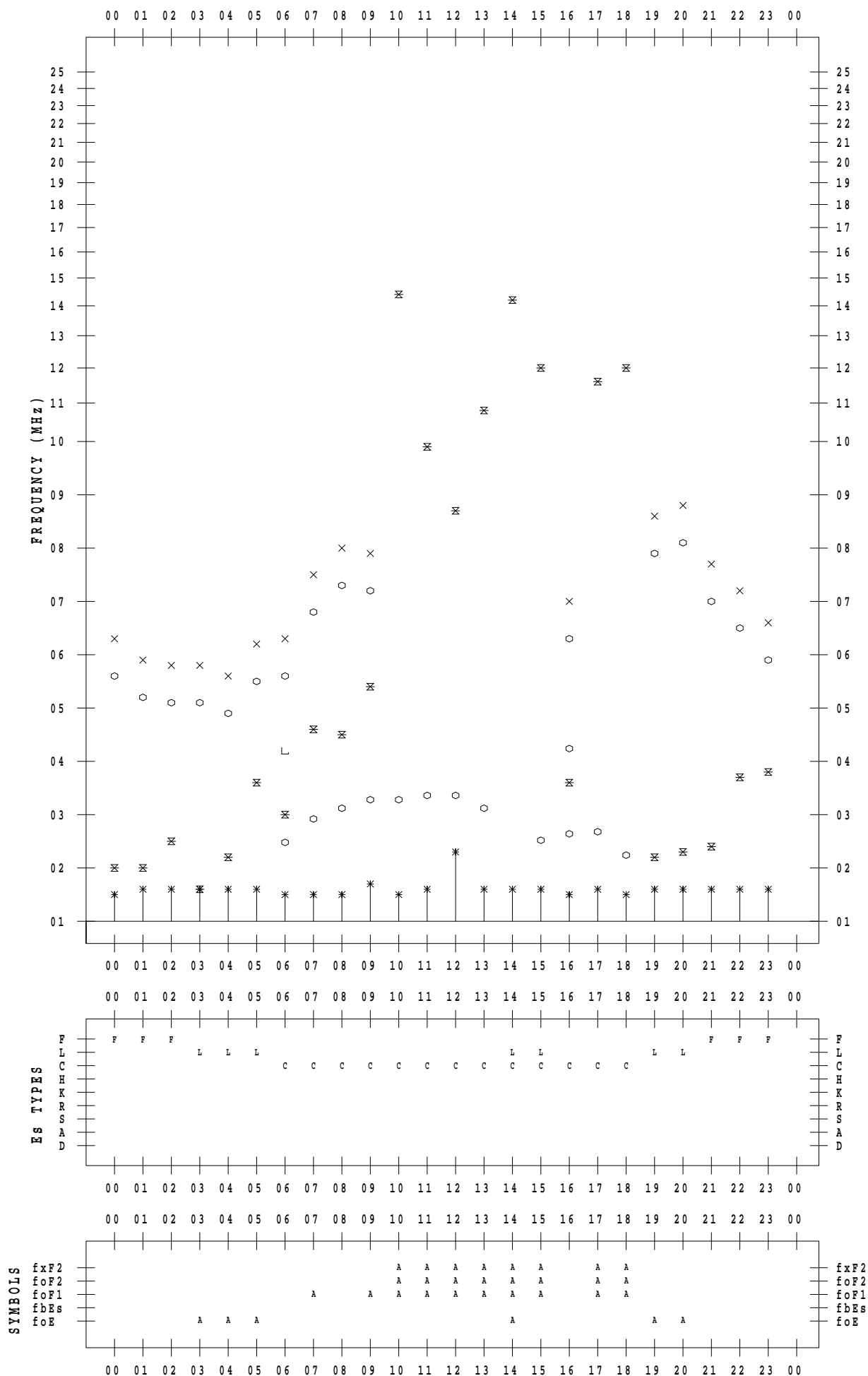
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 7 / 31

135 ° E MEAN TIME



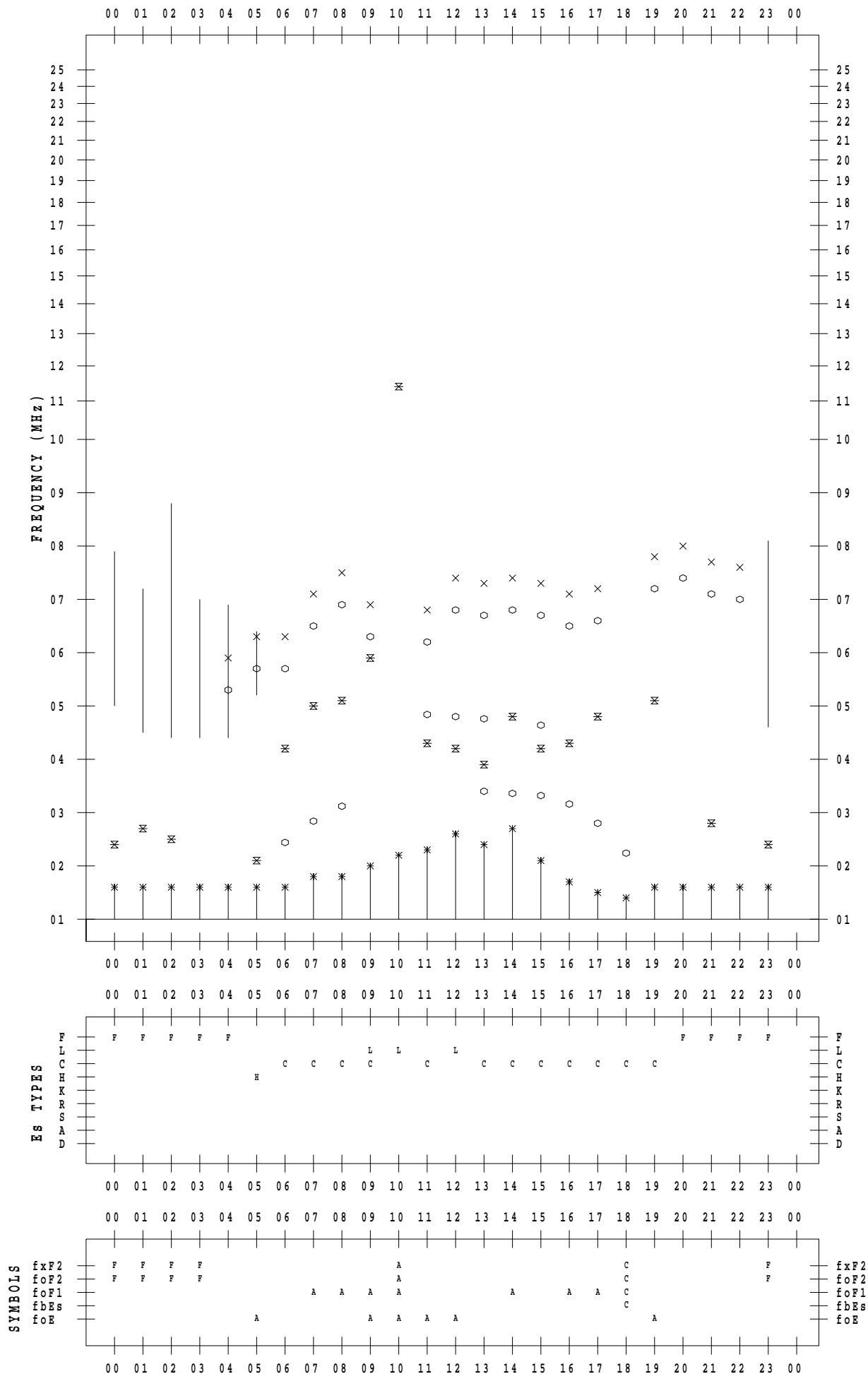
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 1

135 ° E MEAN TIME



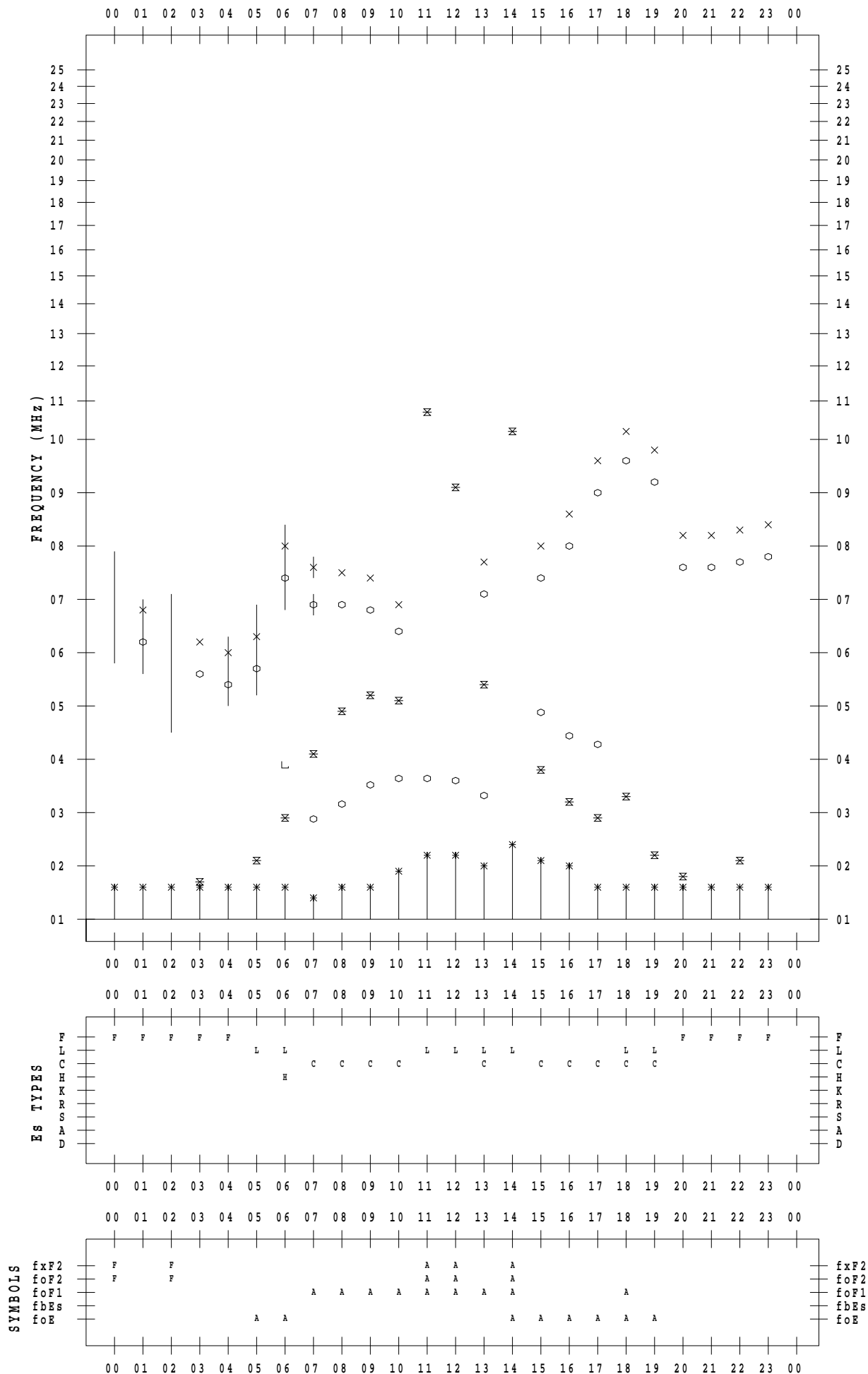
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 2

135 ° E MEAN TIME



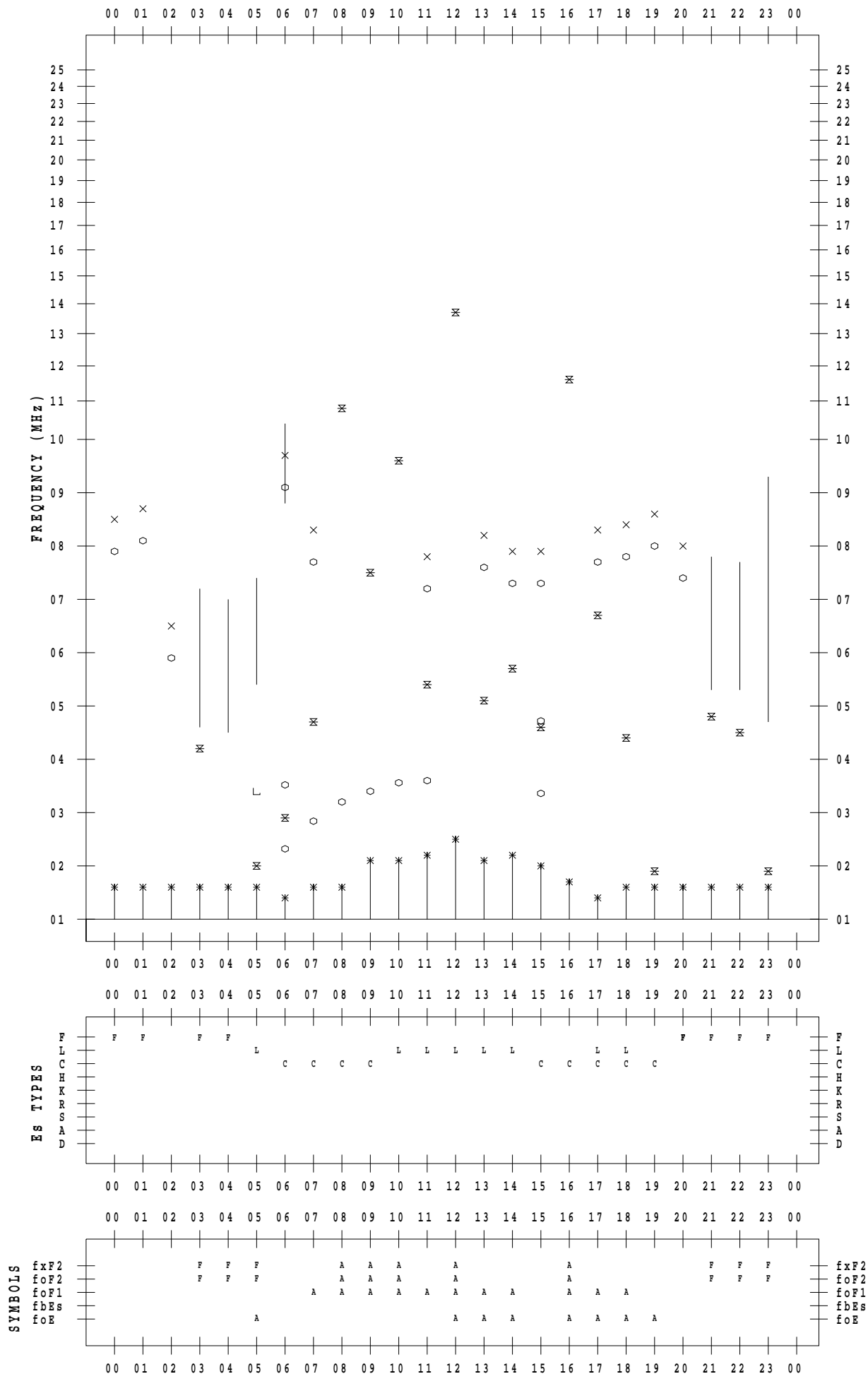
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 3

135 ° E MEAN TIME



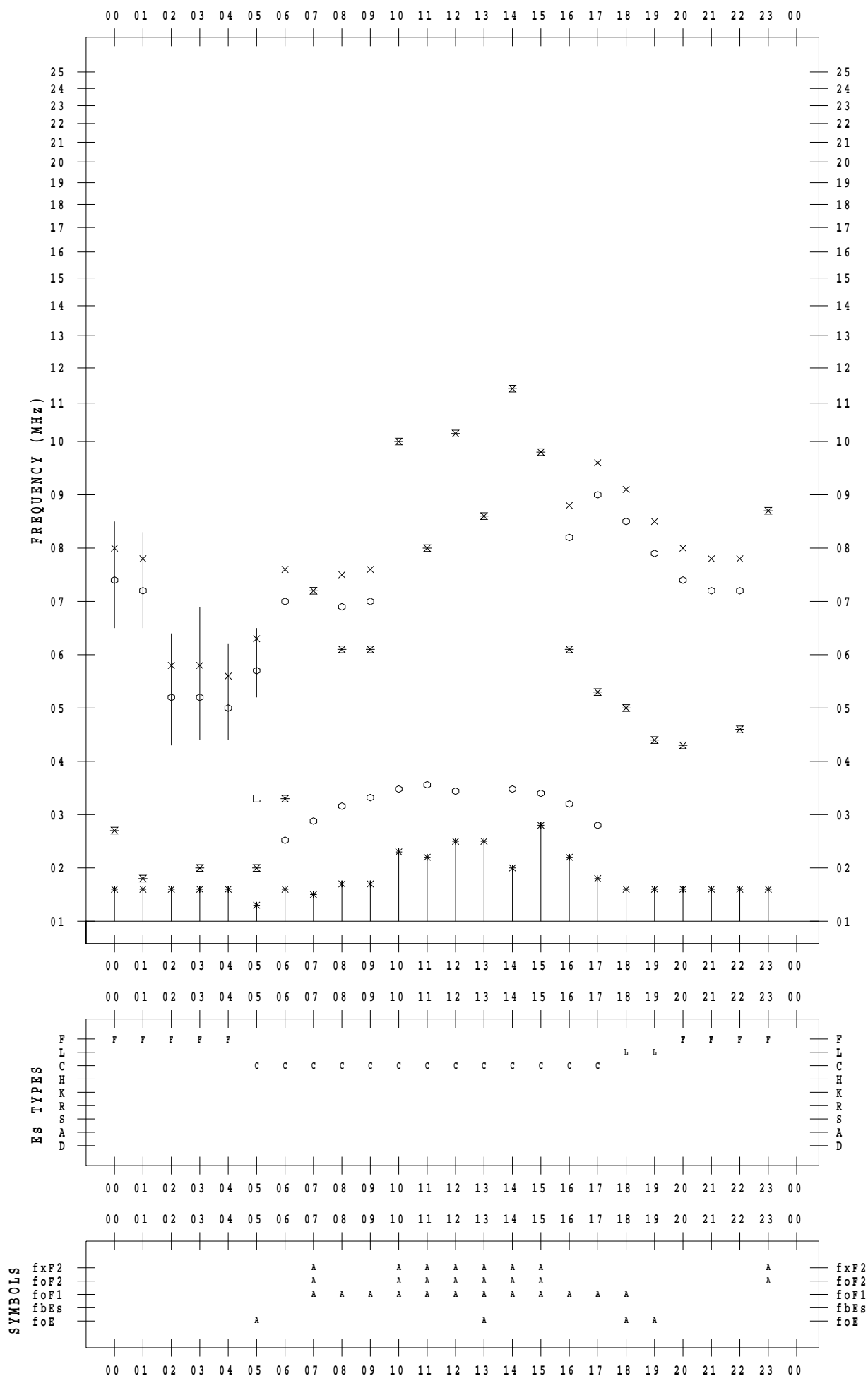
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 4

135 ° E MEAN TIME



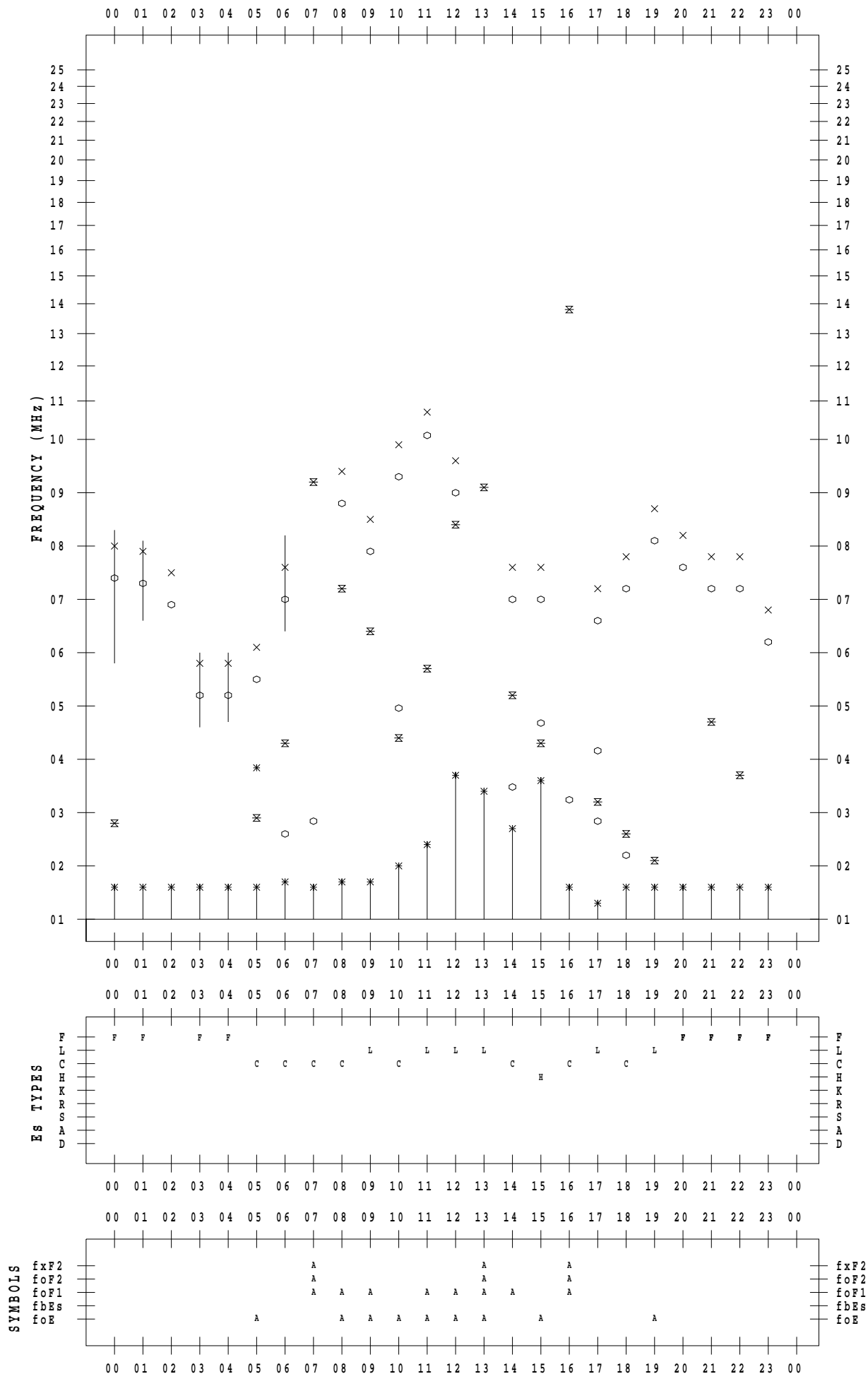
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 5

135 ° E MEAN TIME



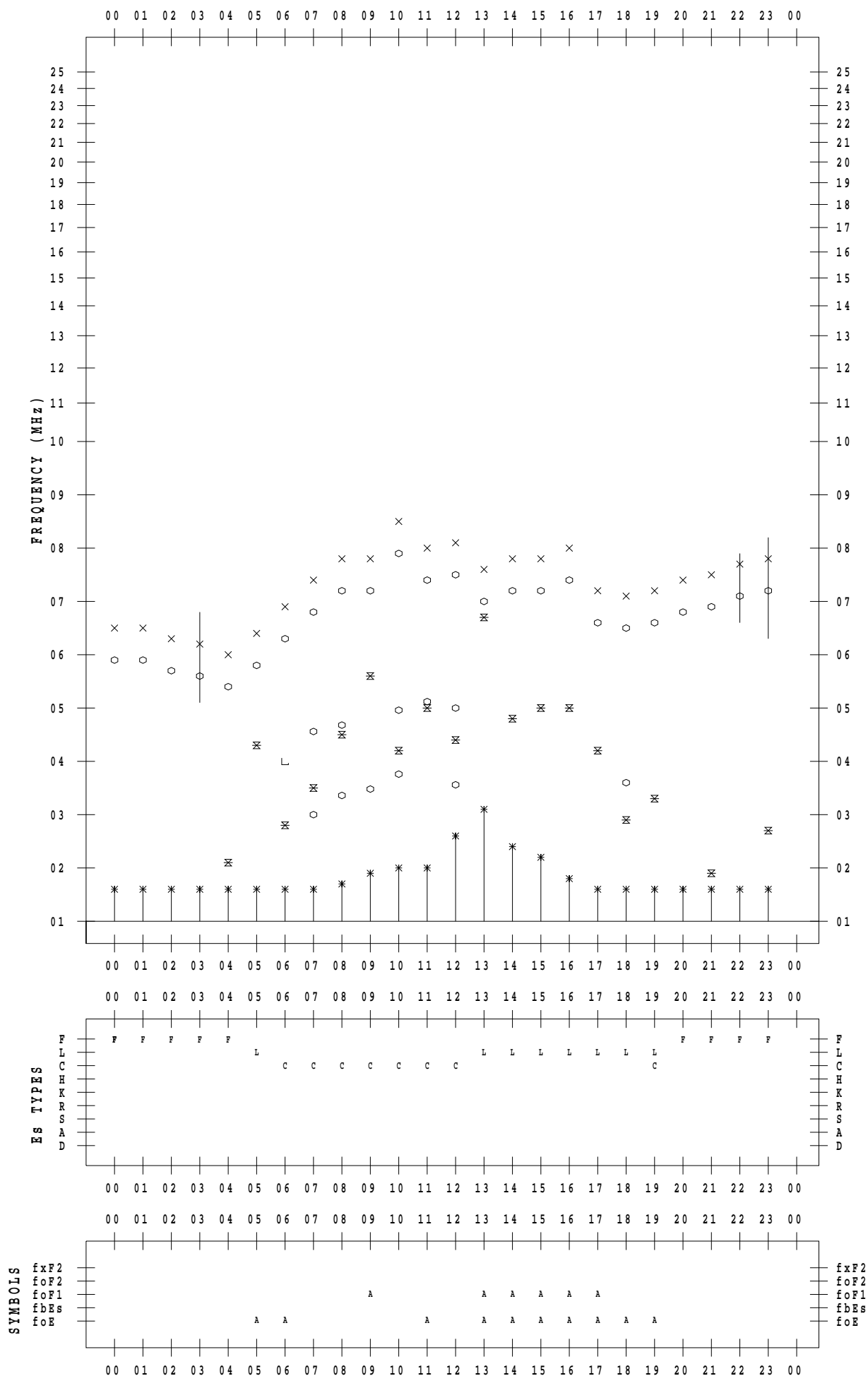
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 6

135 ° E MEAN TIME



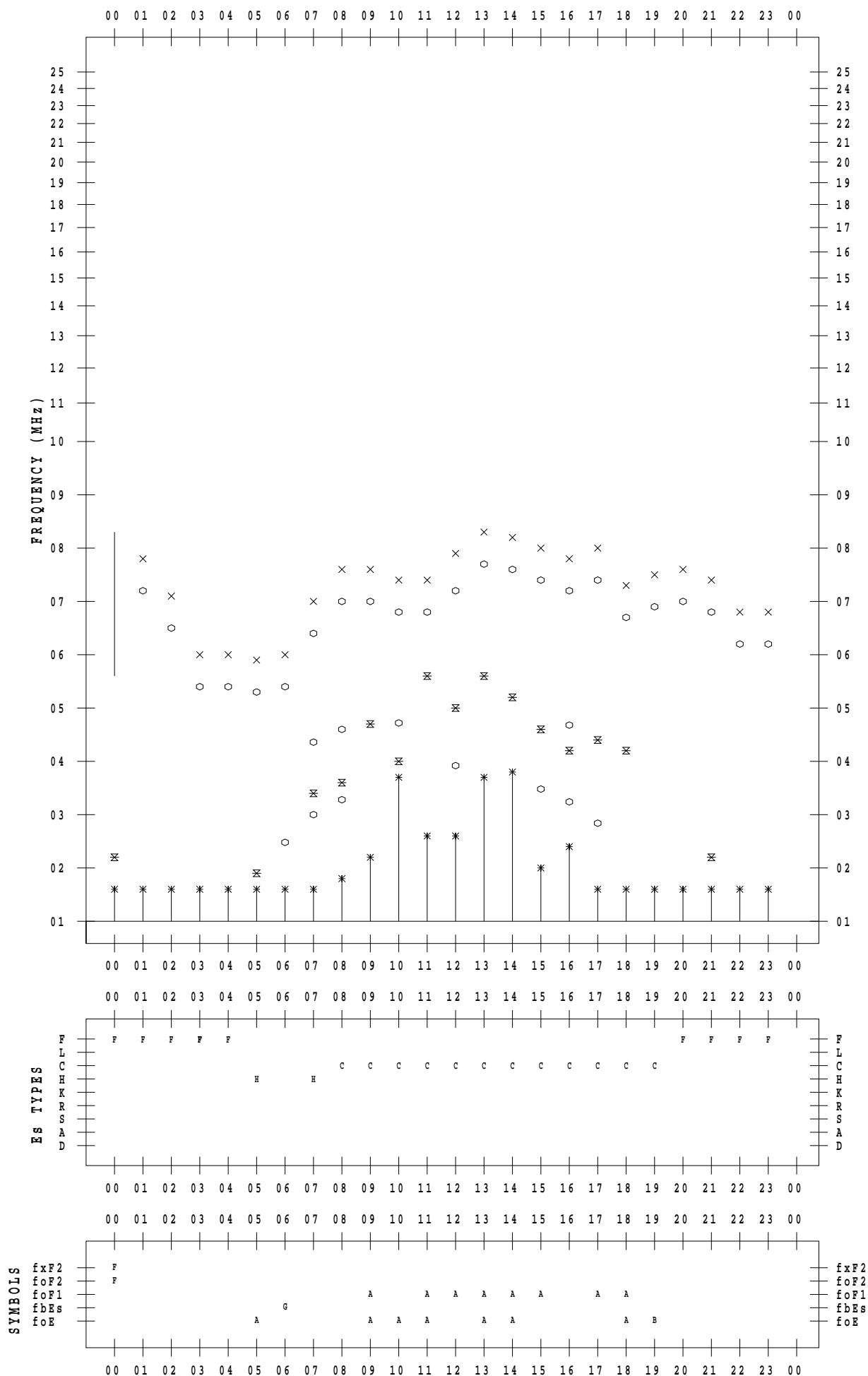
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 7

135 ° E MEAN TIME



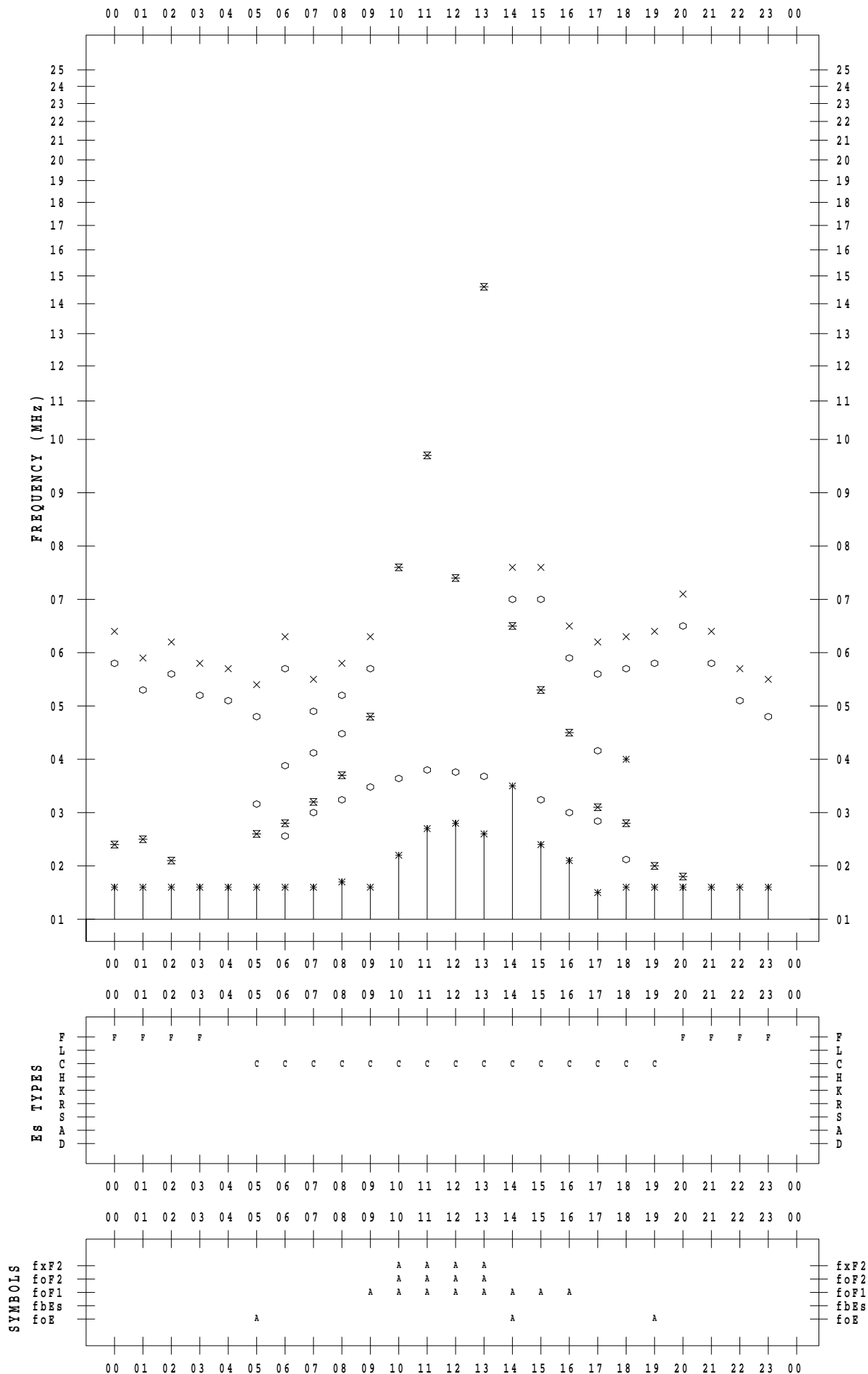
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 8

135 ° E MEAN TIME



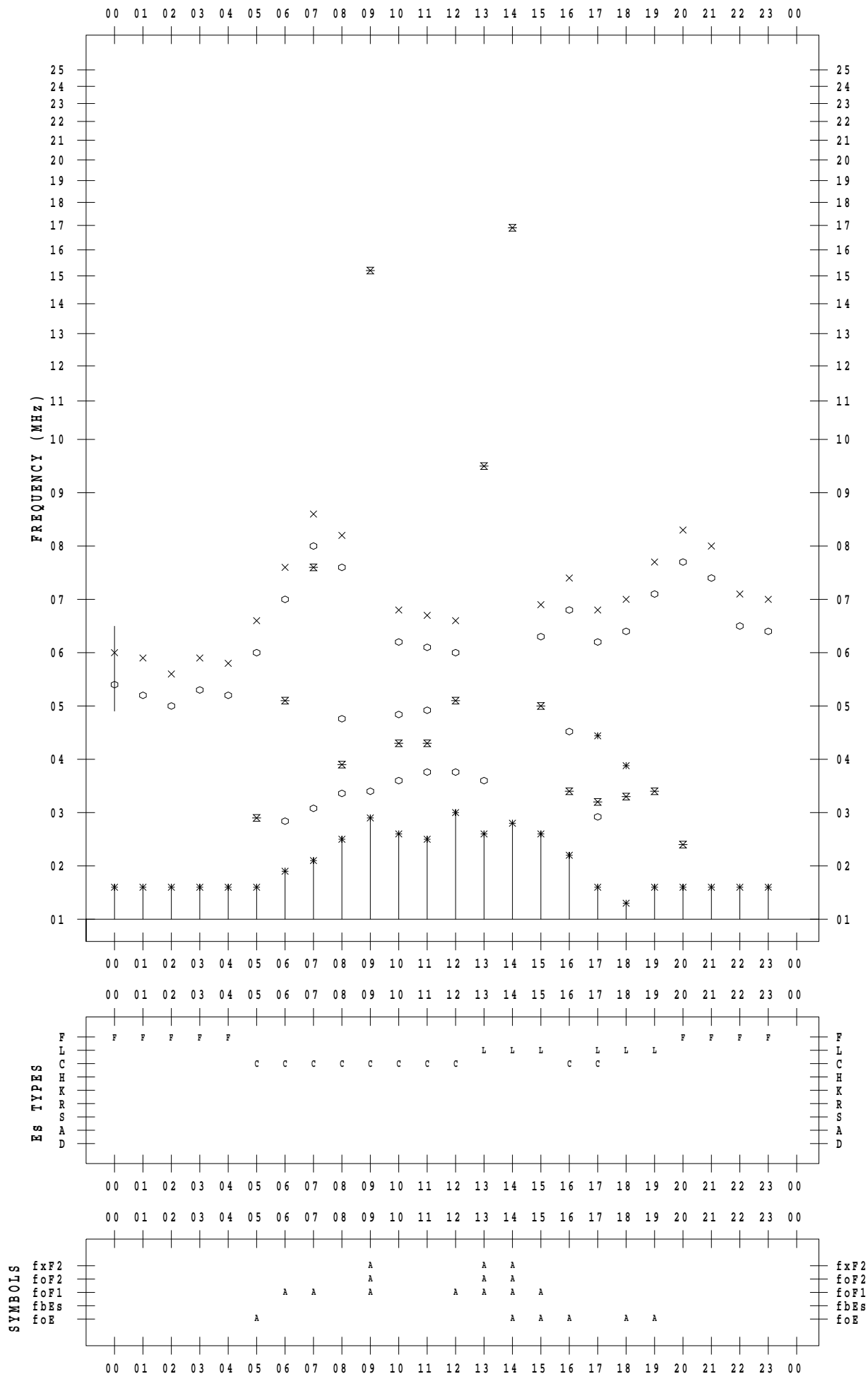
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 9

135 ° E MEAN TIME



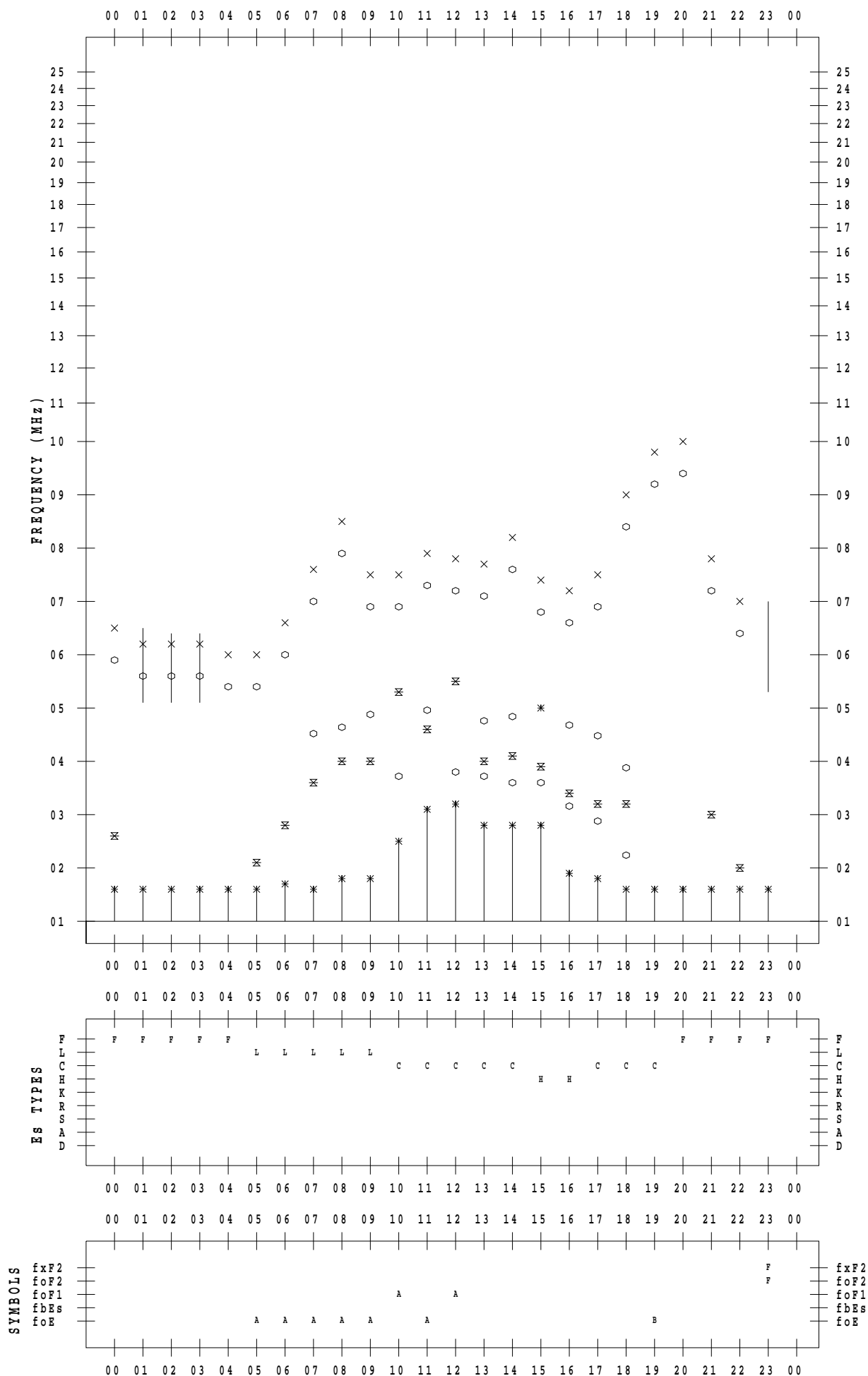
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 10

135 ° E MEAN TIME



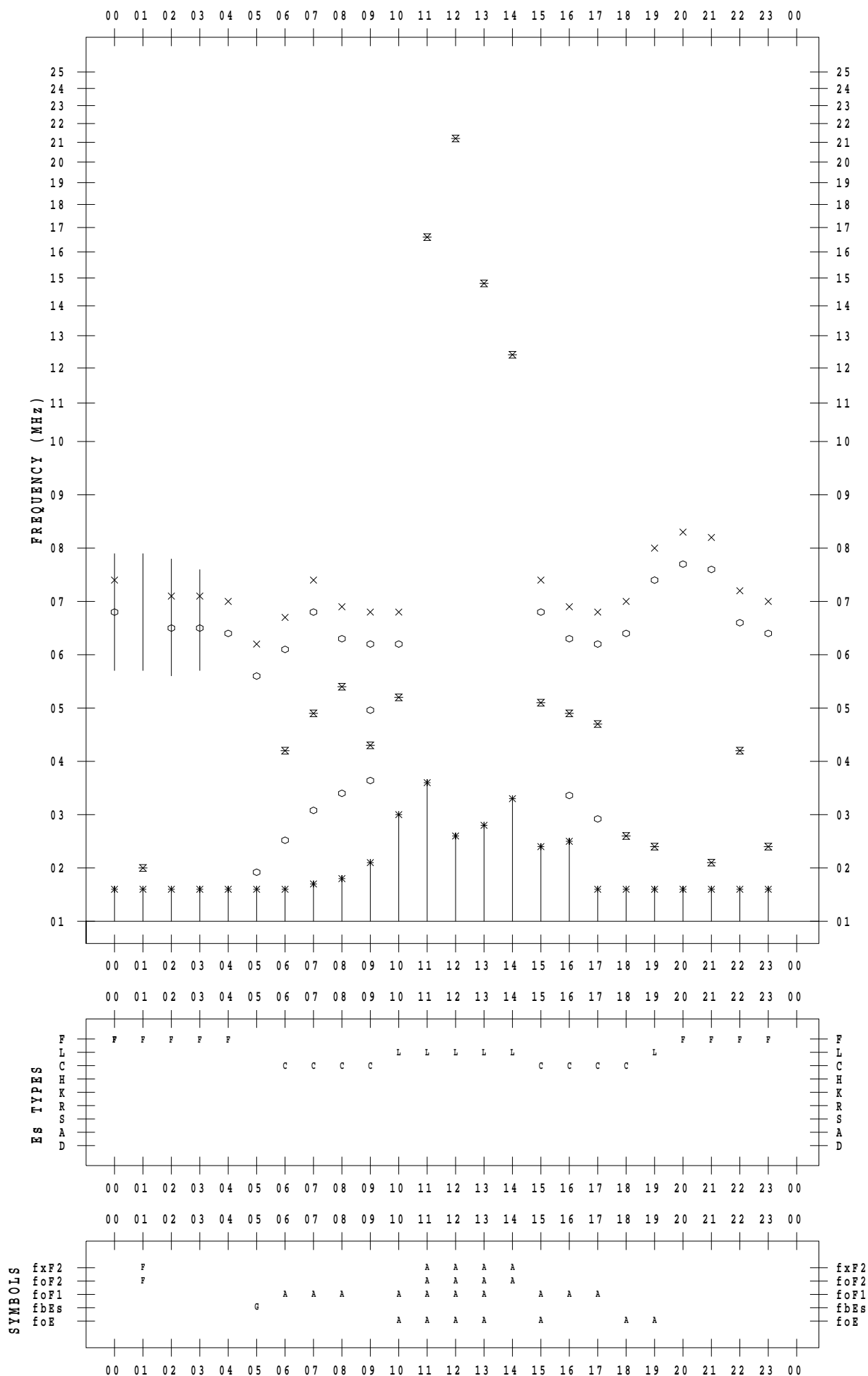
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 11

135 ° E MEAN TIME



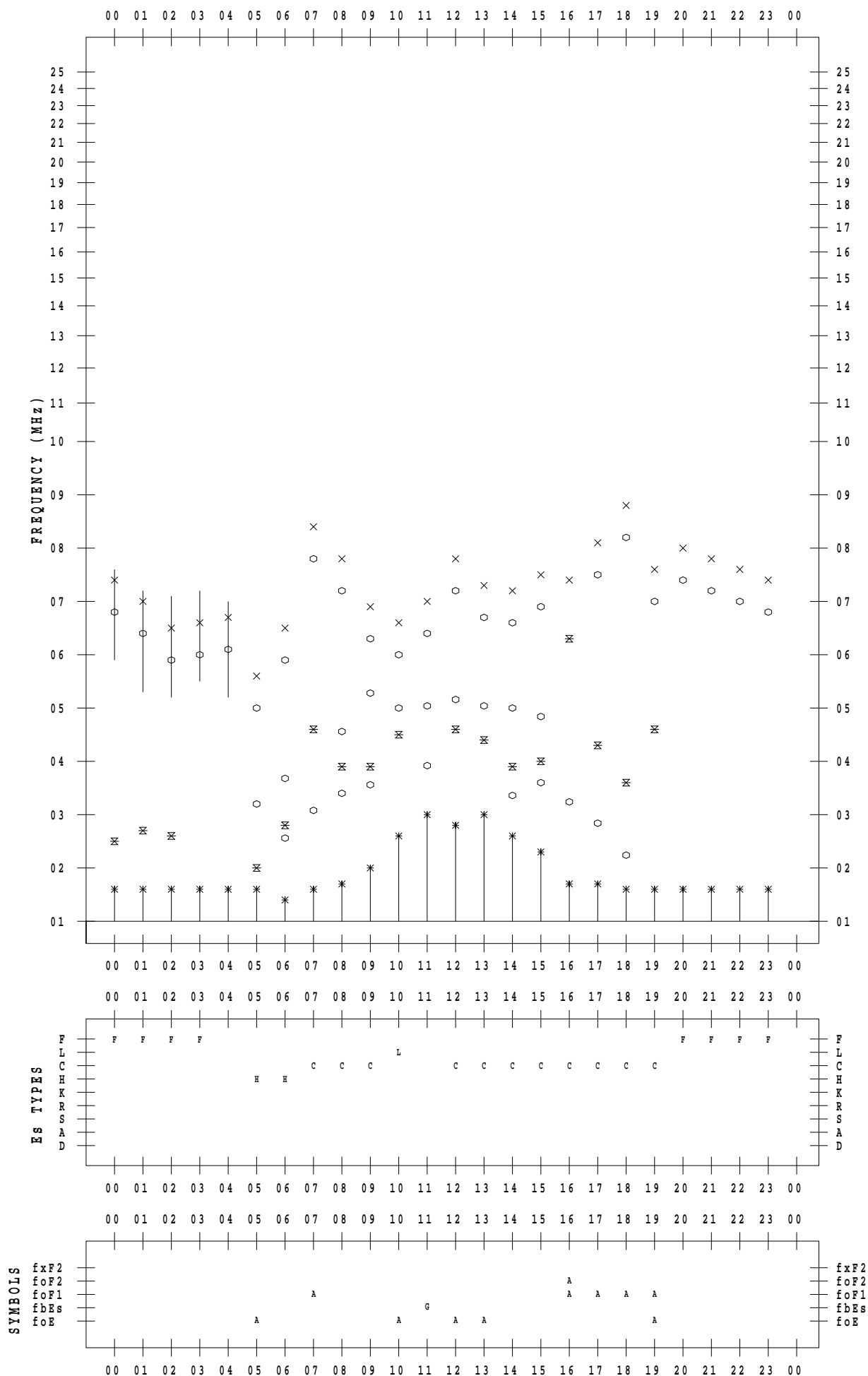
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 12

135 ° E MEAN TIME



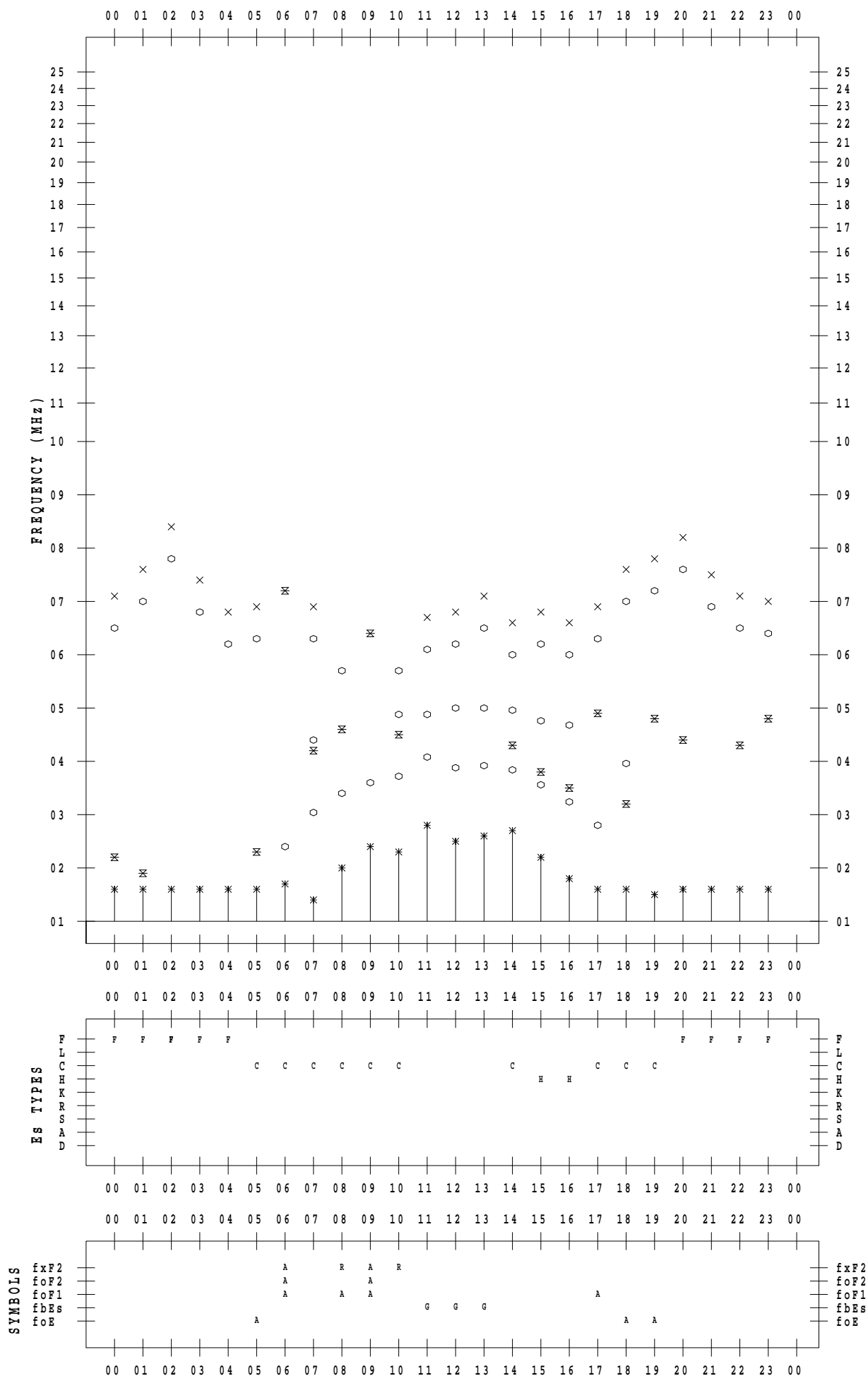
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 13

135 ° E MEAN TIME



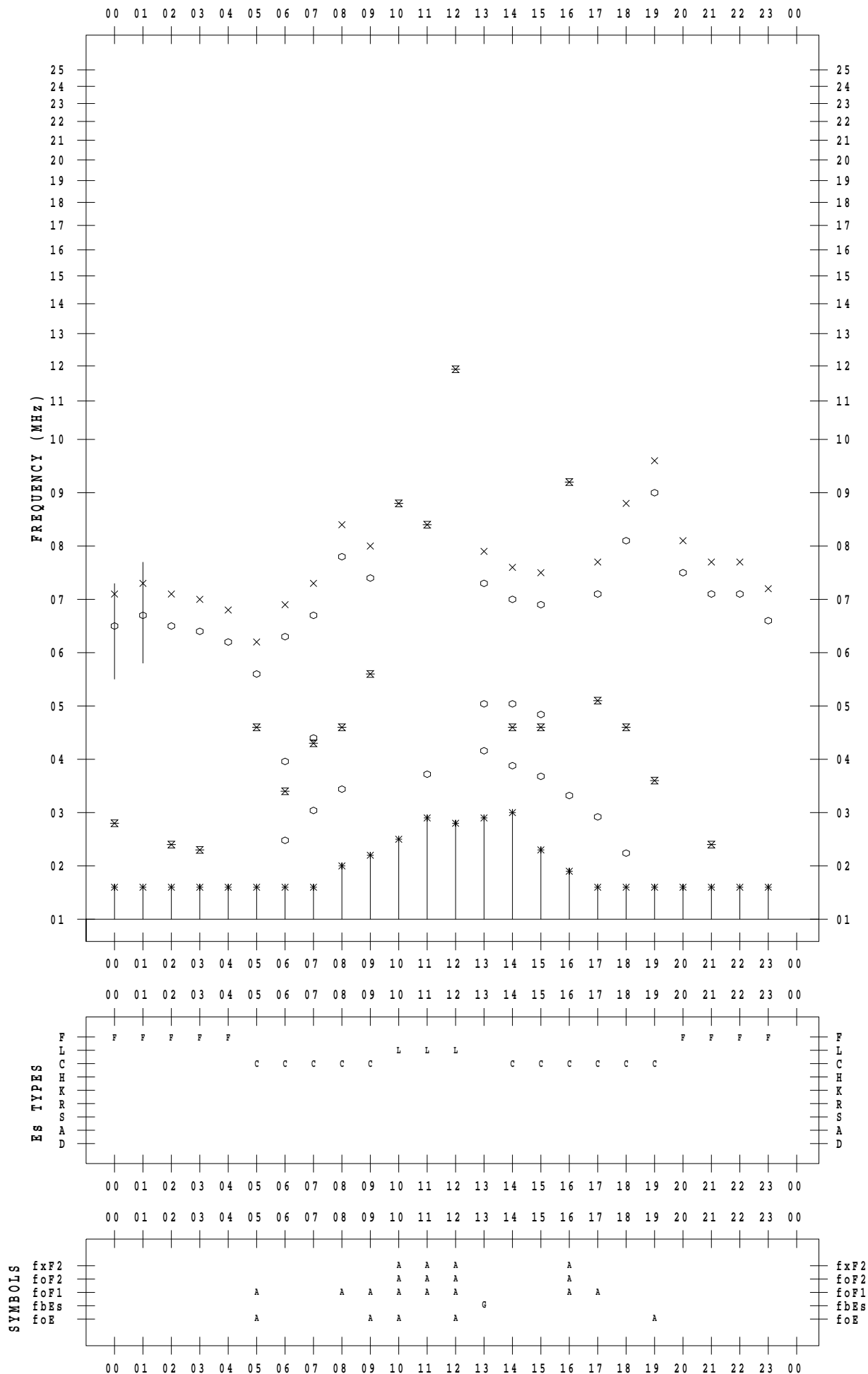
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 14

135 ° E MEAN TIME



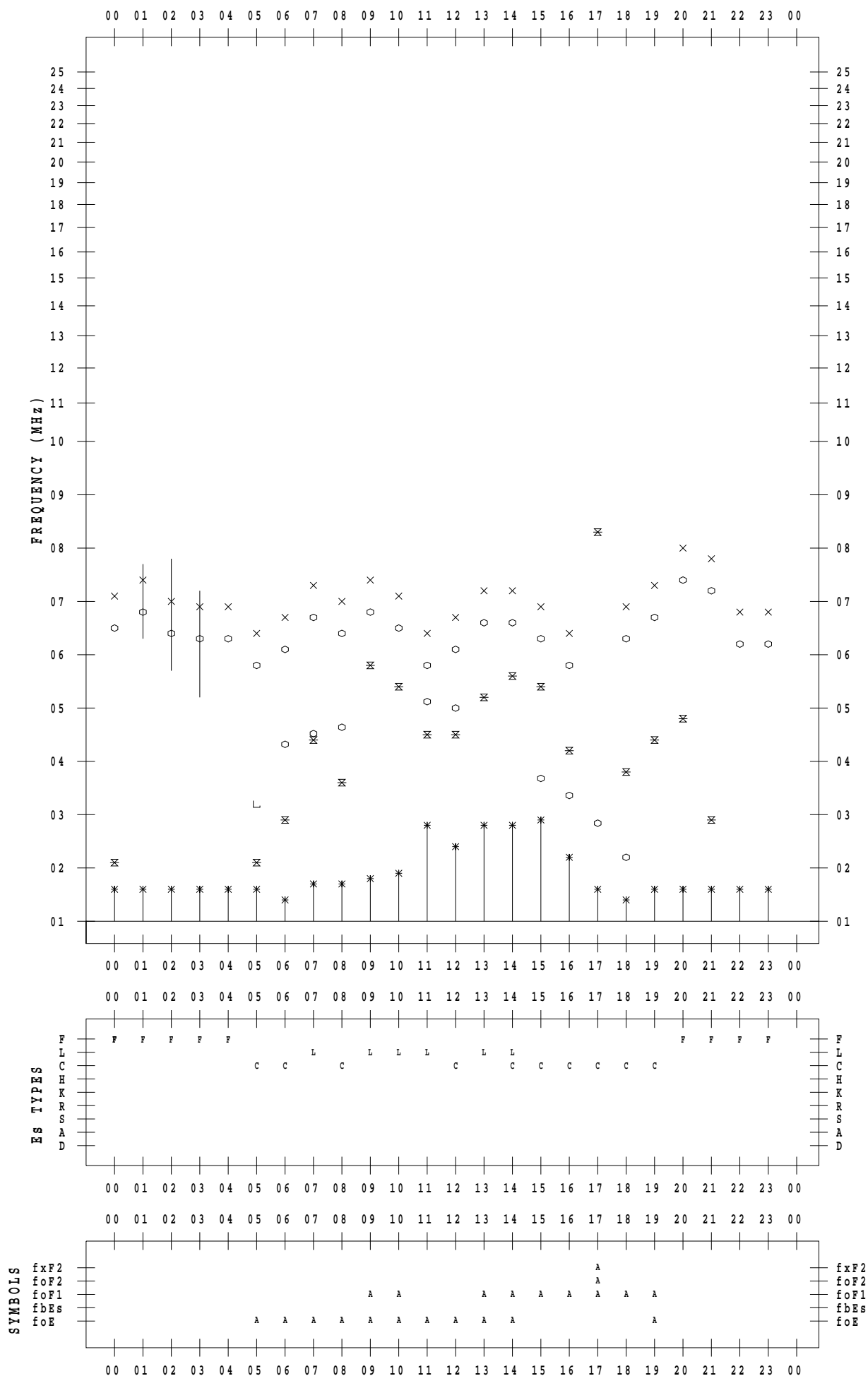
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 15

135 ° E MEAN TIME



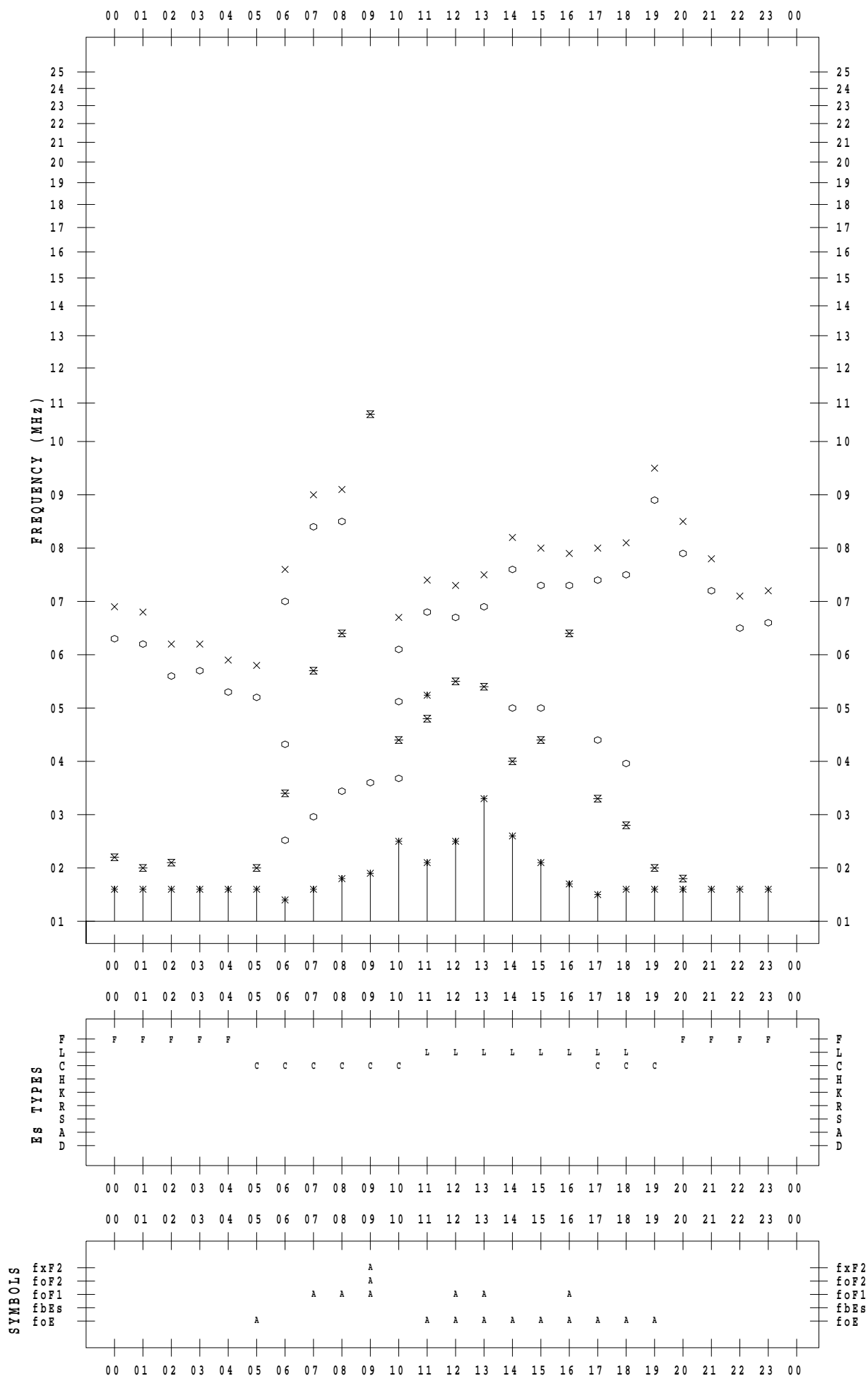
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 16

135 ° E MEAN TIME



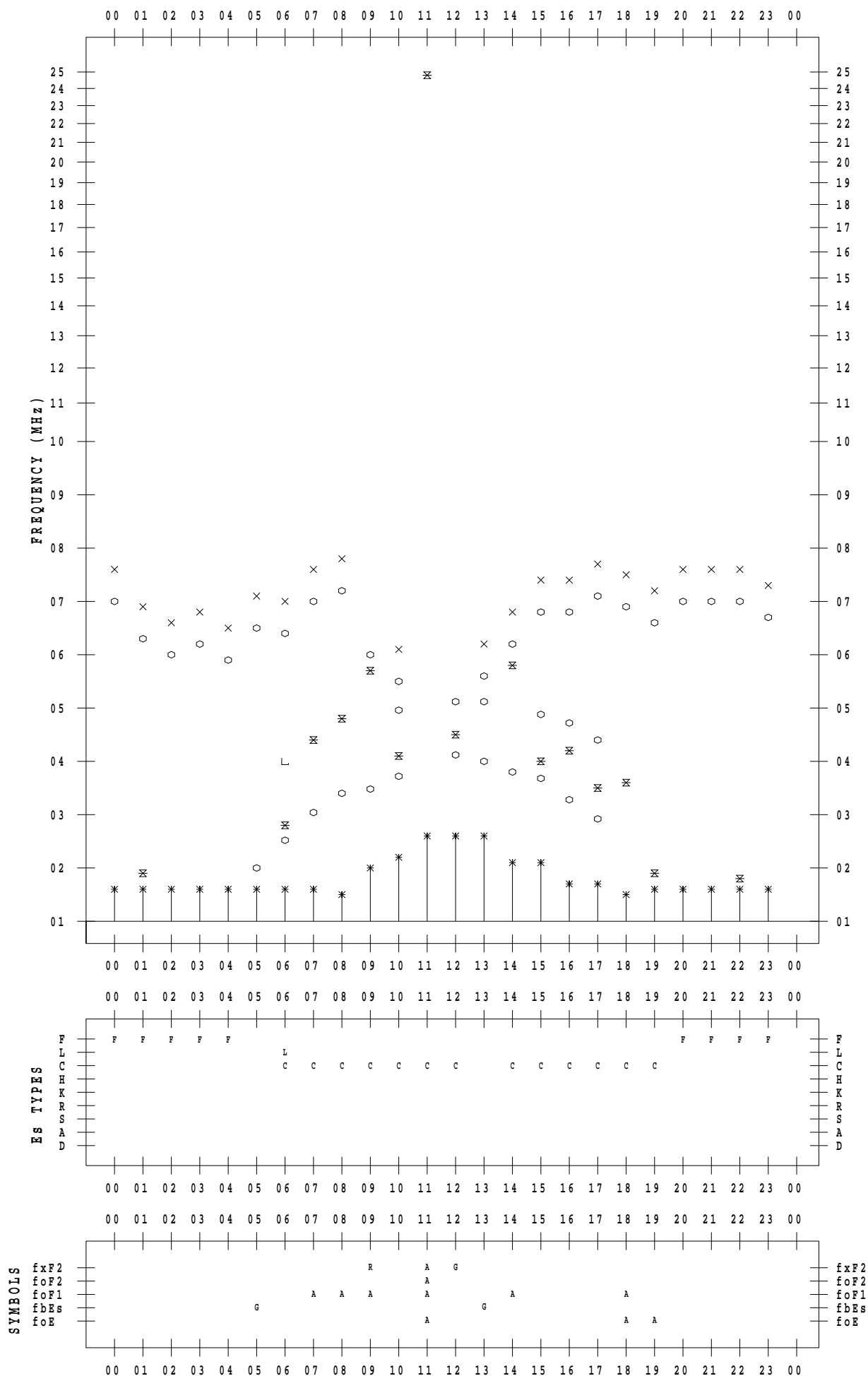
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 17

135 ° E MEAN TIME



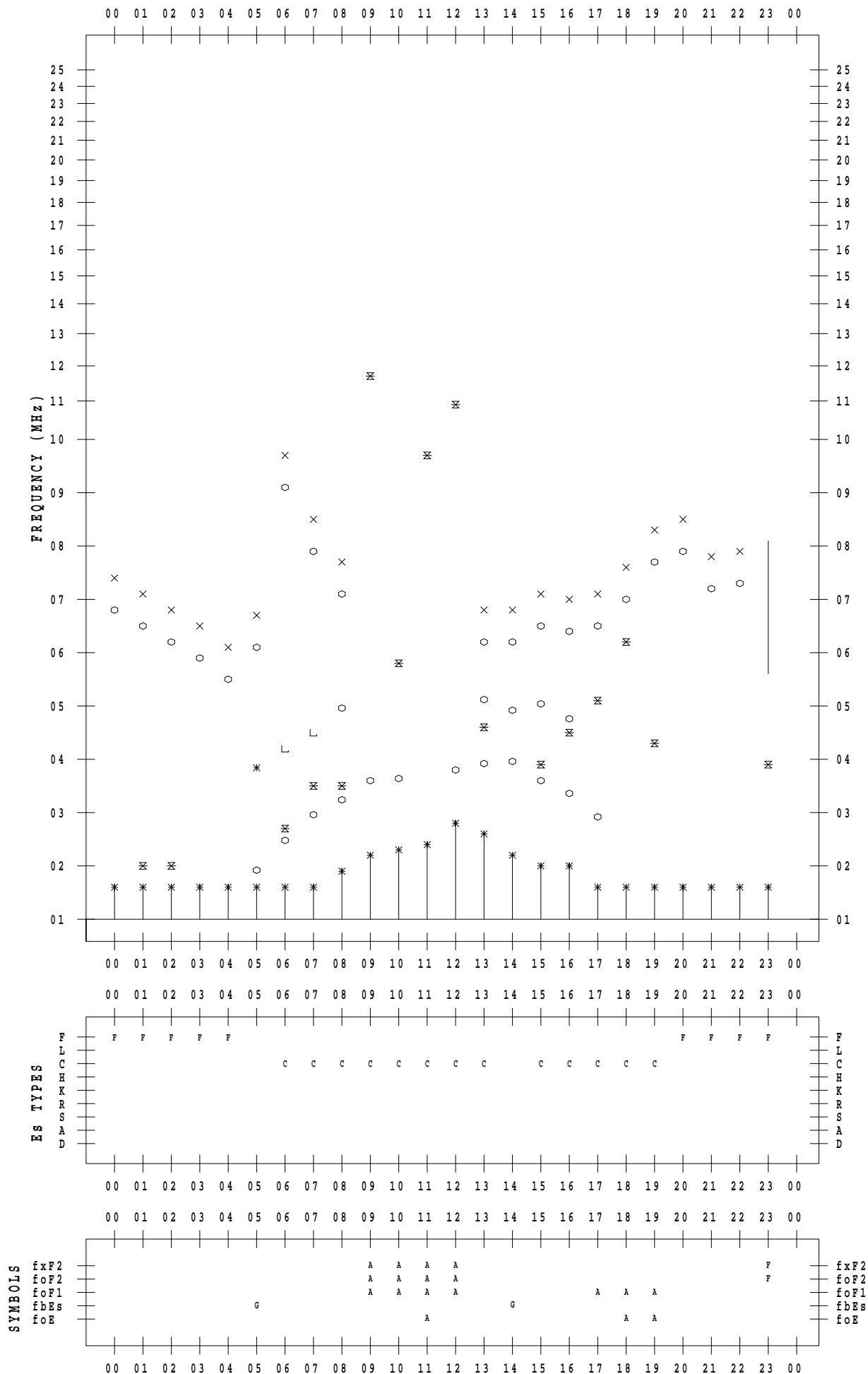
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 18

135 ° E MEAN TIME



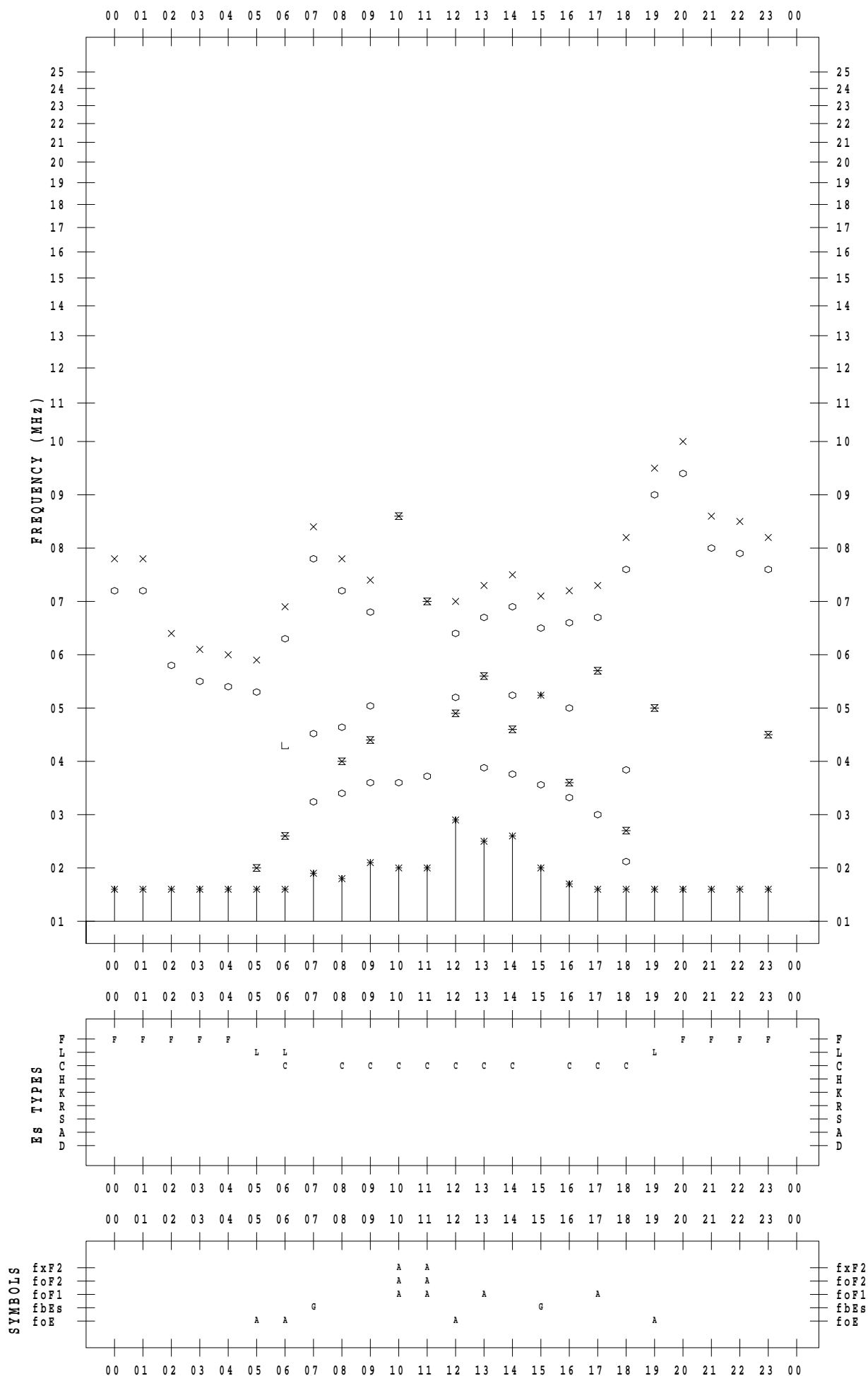
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 19

135 ° E MEAN TIME



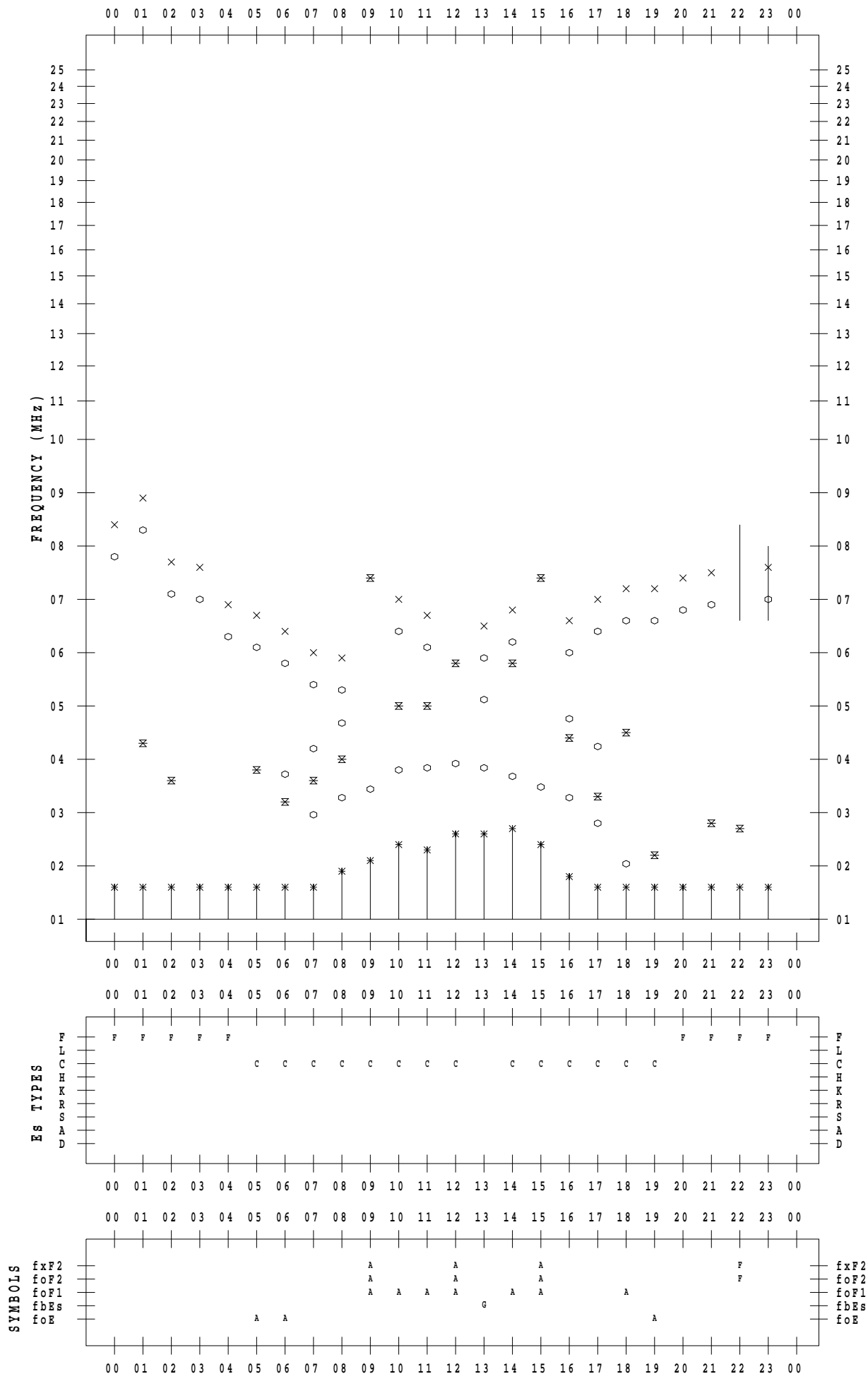
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 20

135 ° E MEAN TIME



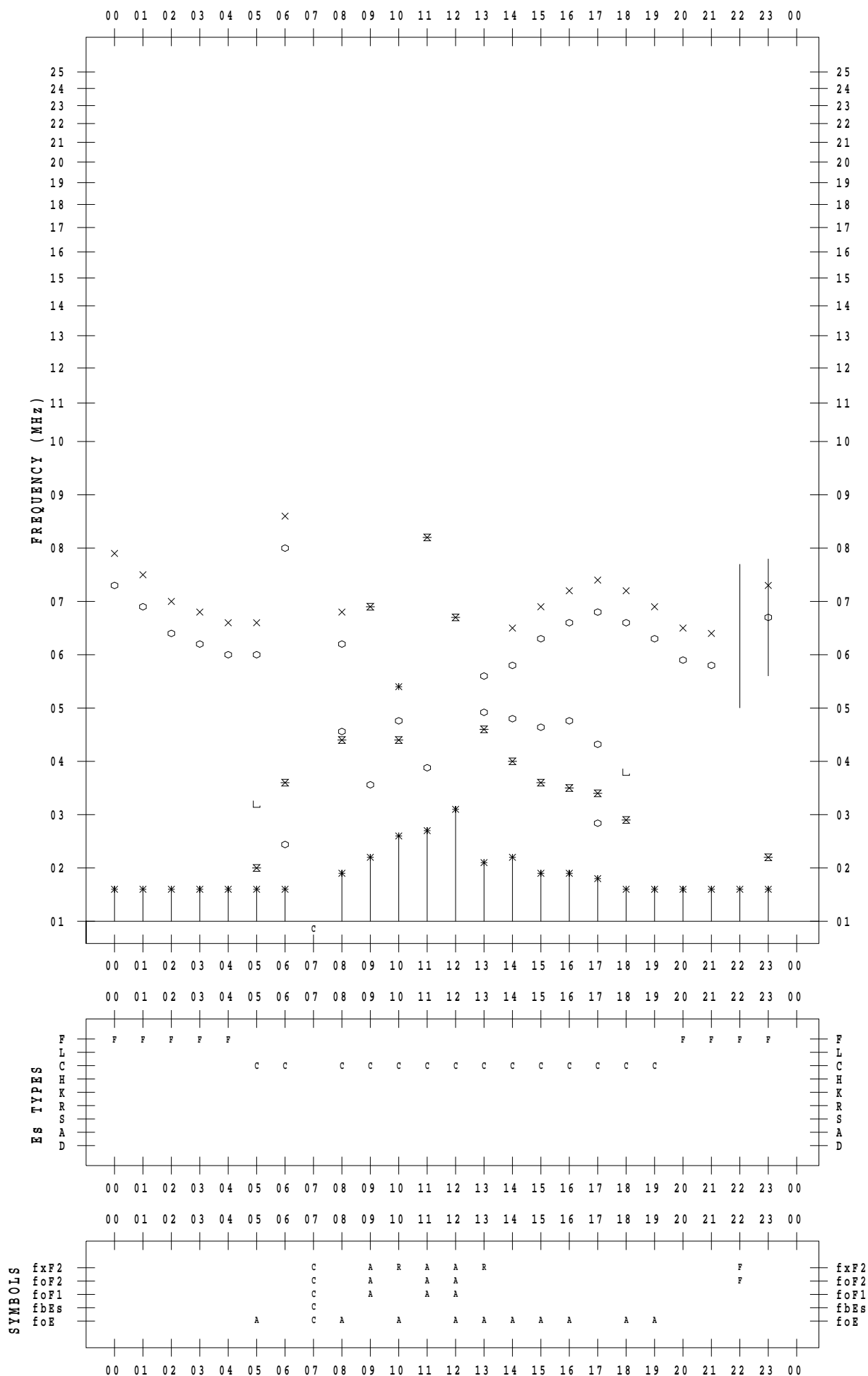
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 21

135 ° E MEAN TIME



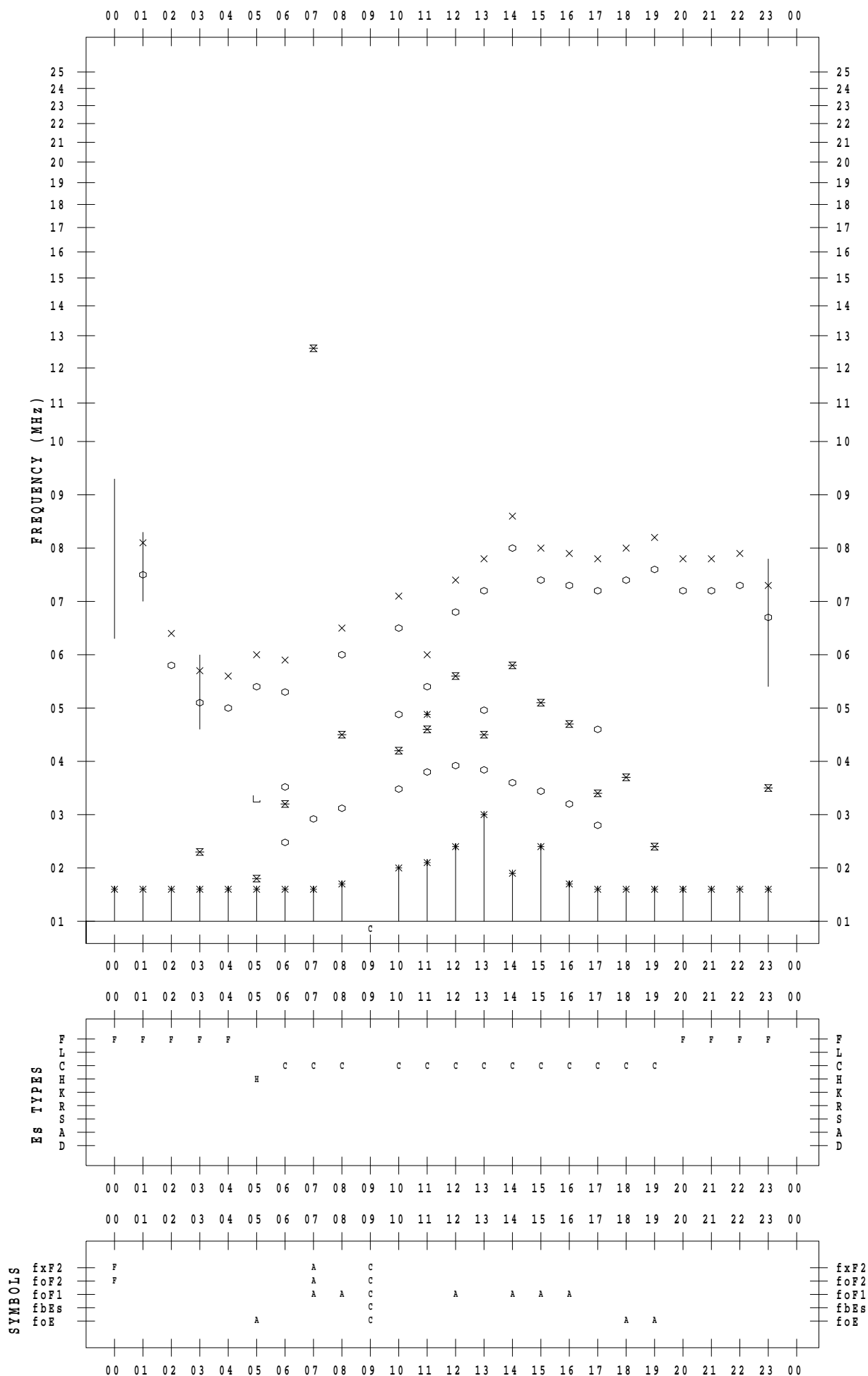
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 22

135 ° E MEAN TIME



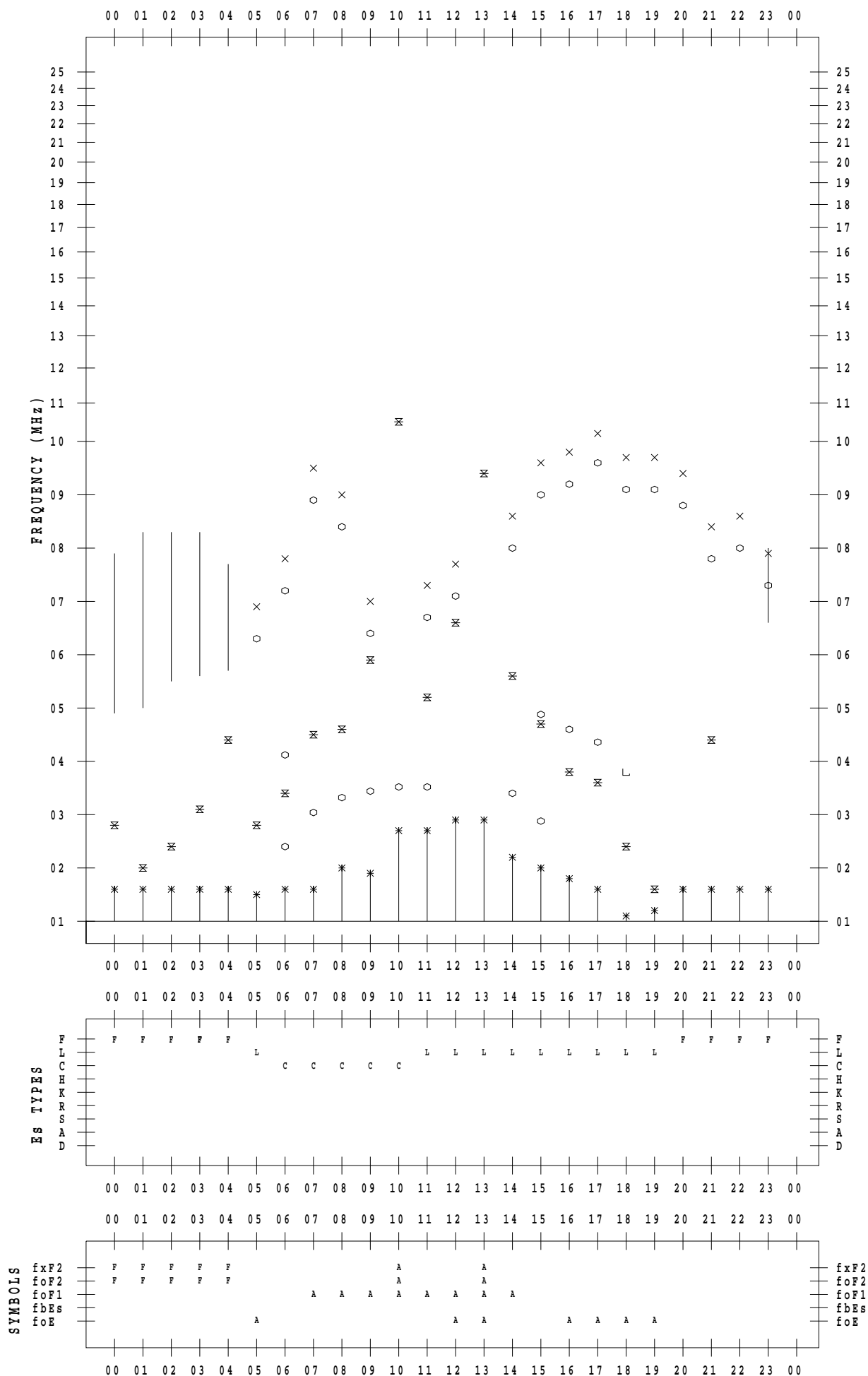
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 23

135 ° E MEAN TIME



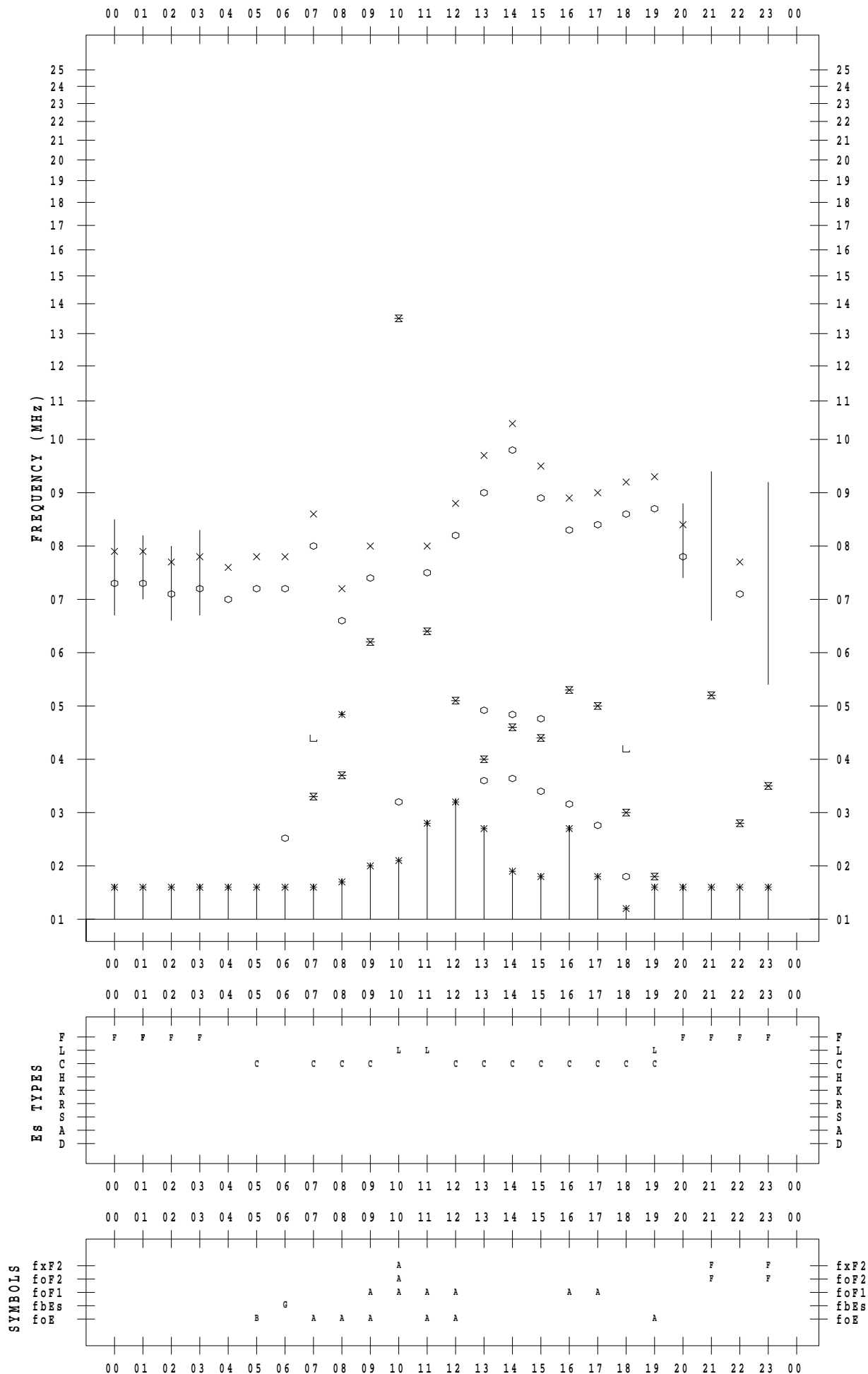
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 24

135 ° E MEAN TIME



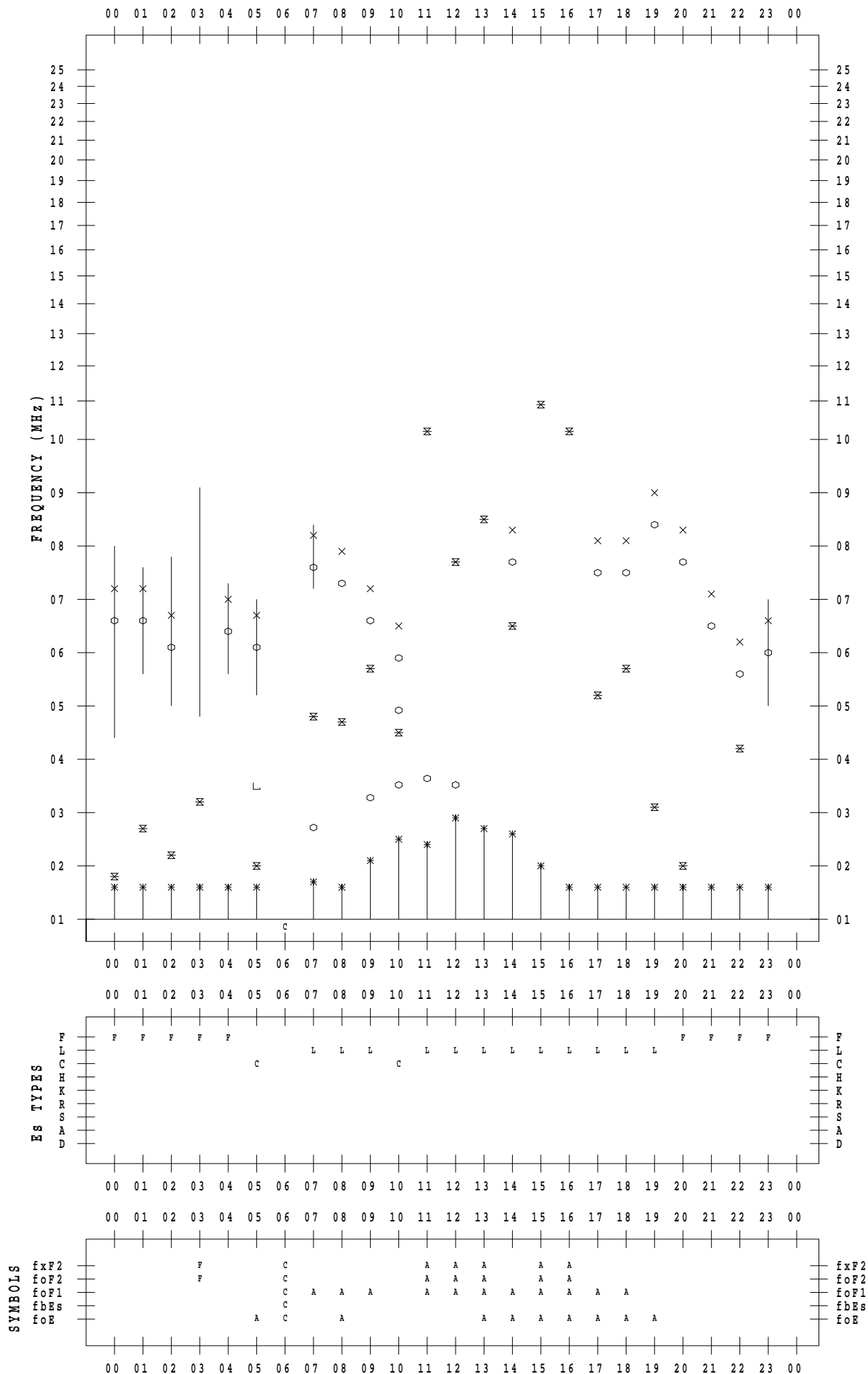
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 25

135 ° E MEAN TIME



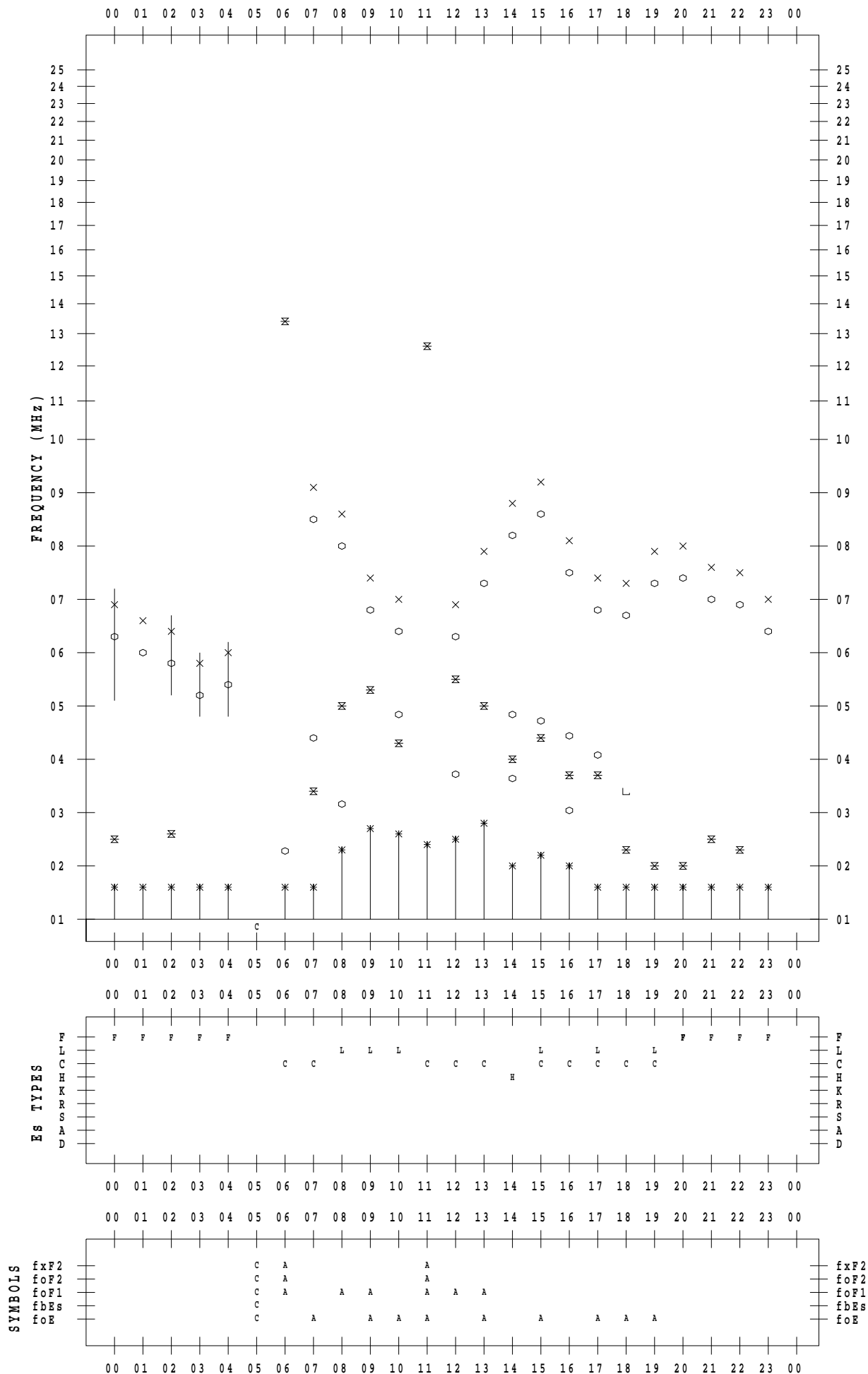
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 26

135 ° E MEAN TIME



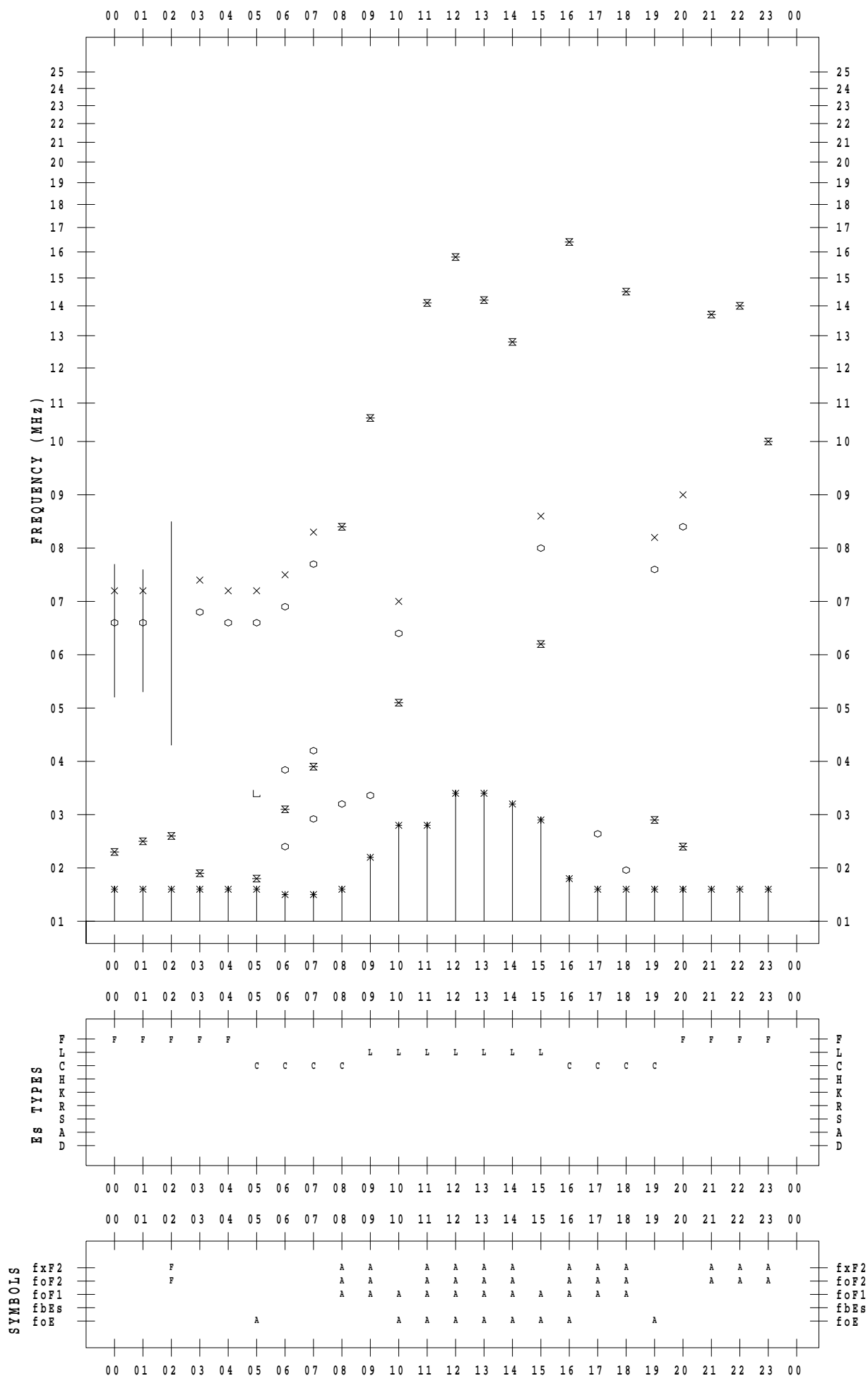
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 27

135 ° E MEAN TIME



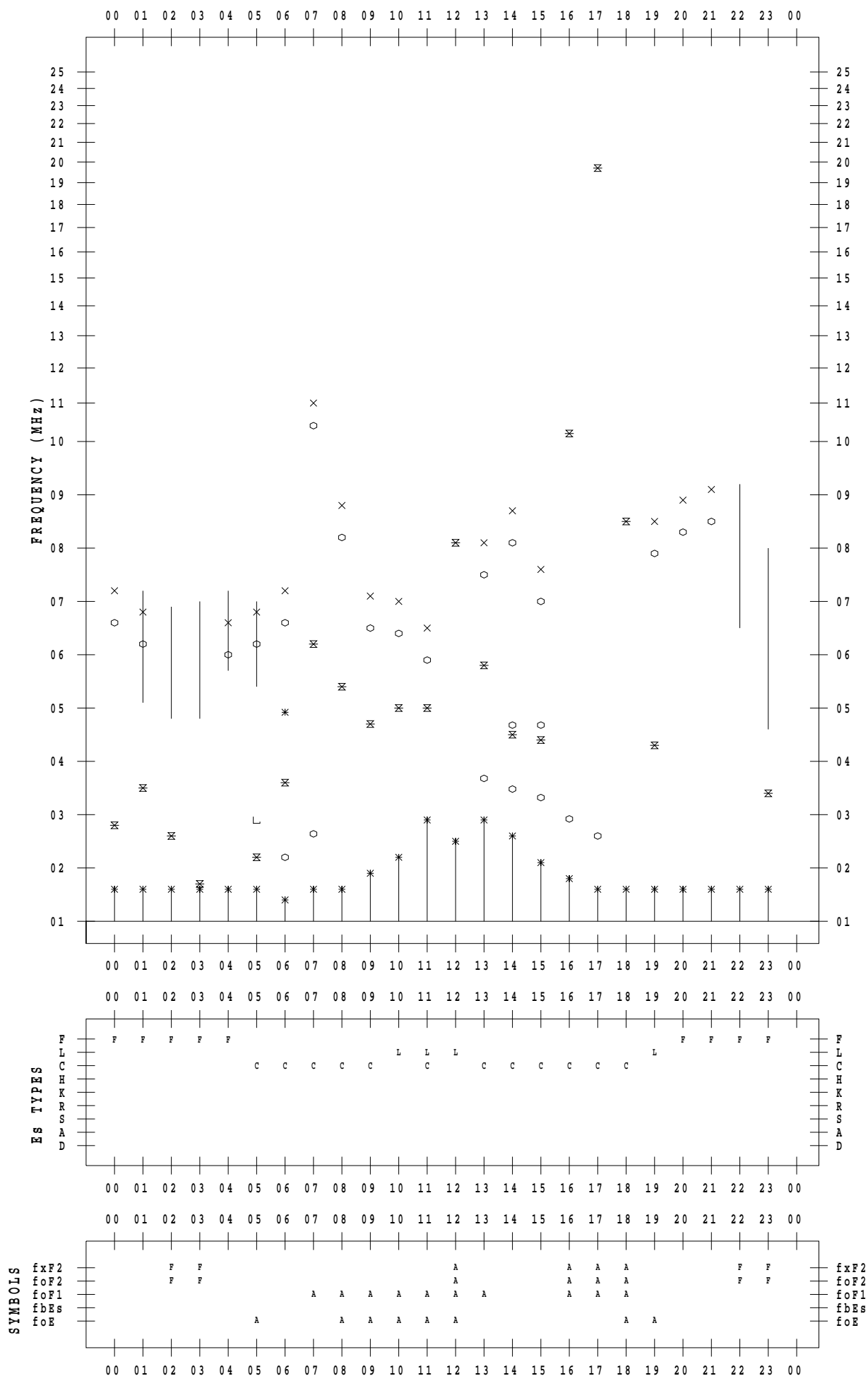
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 28

135 ° E MEAN TIME



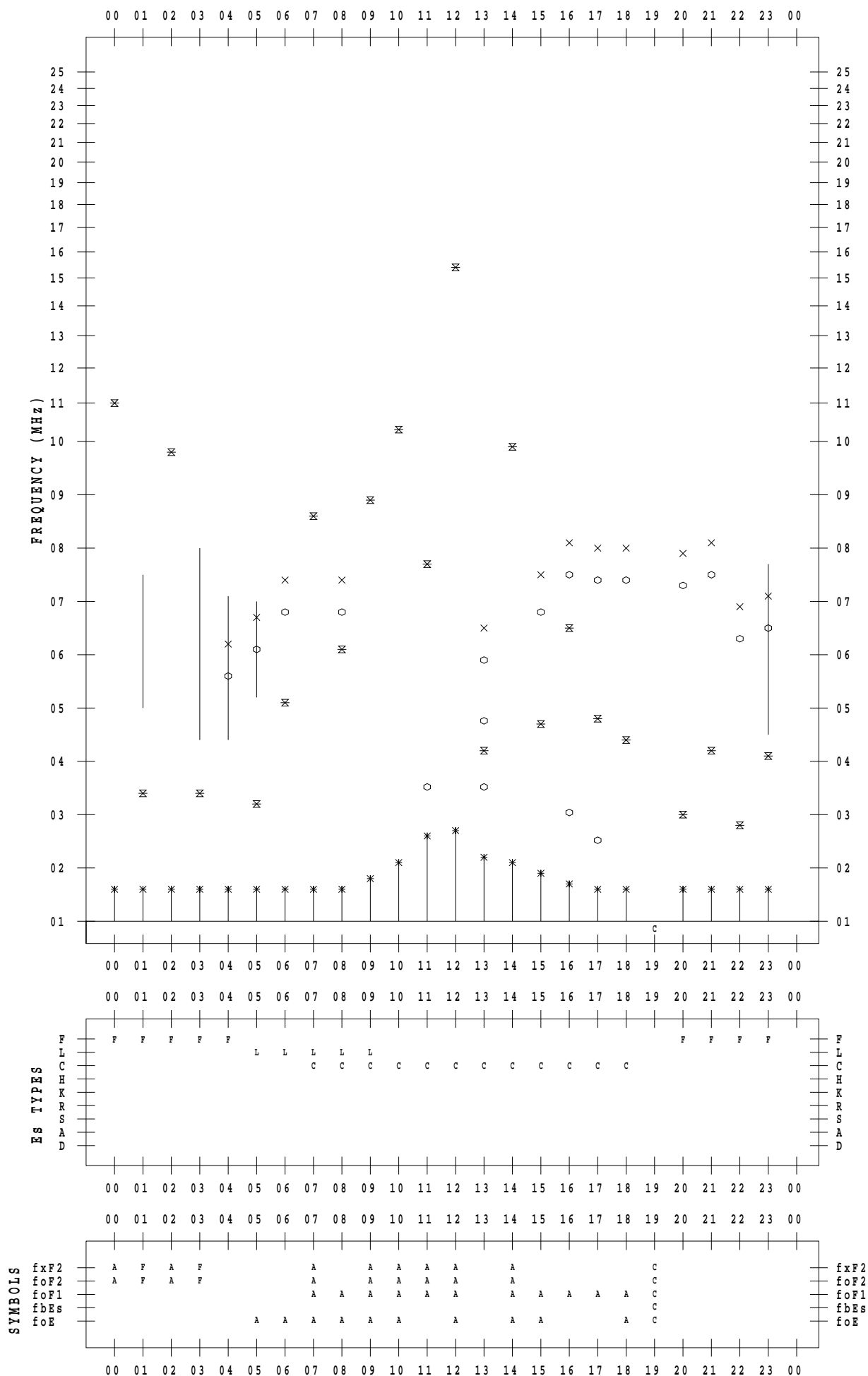
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 29

135 ° E MEAN TIME



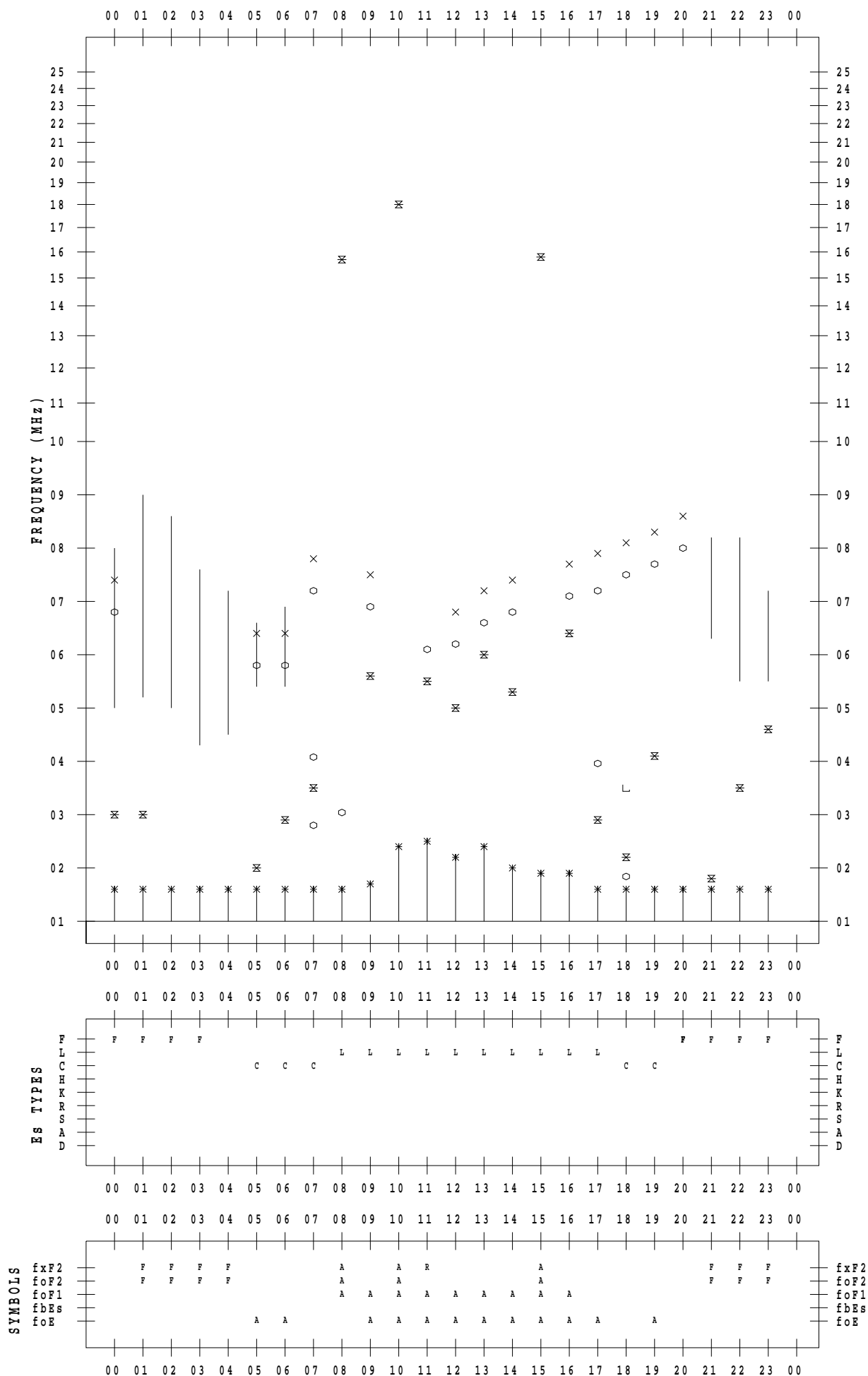
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 30

135 ° E MEAN TIME



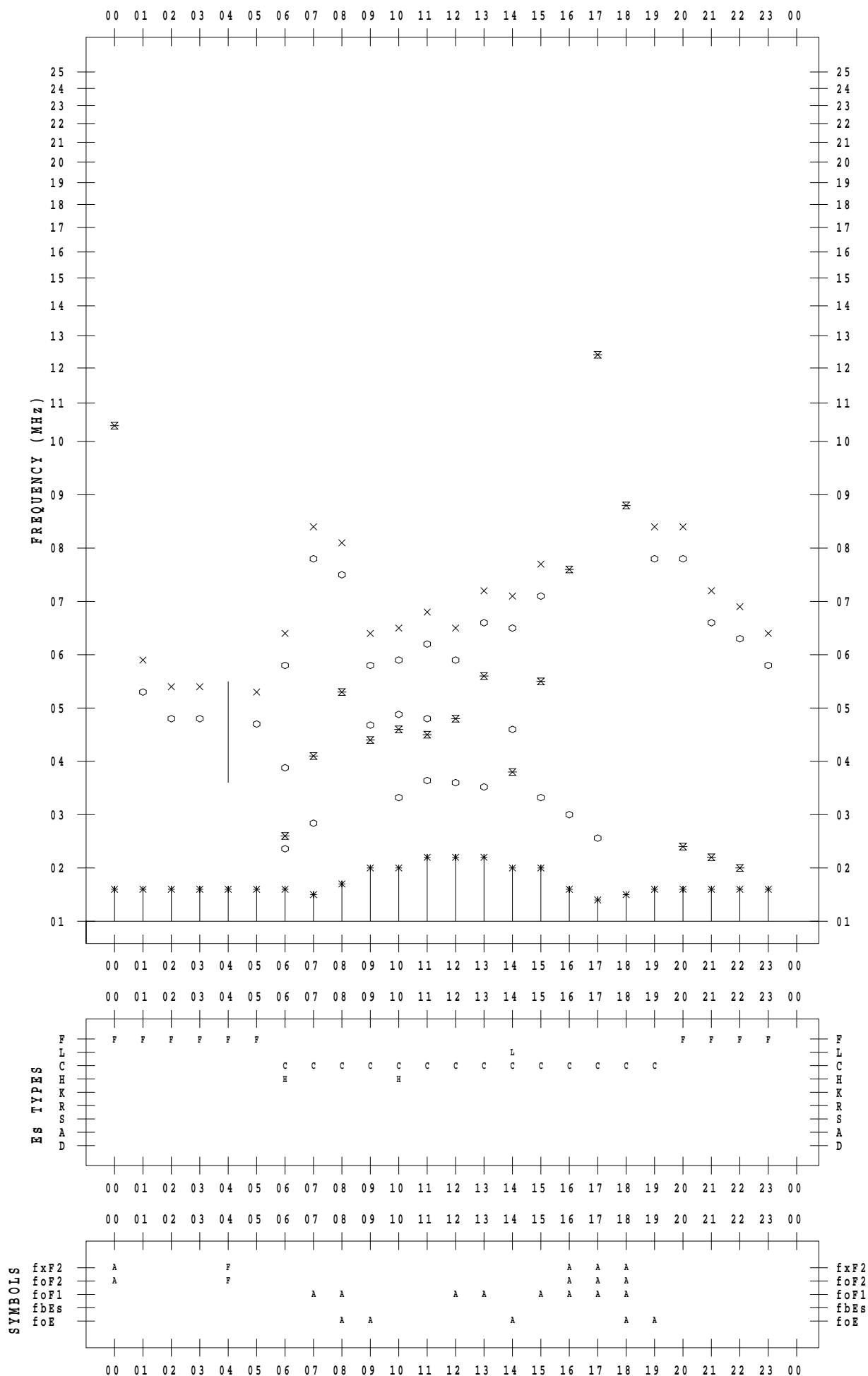
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2022 / 7 / 31

135 ° E MEAN TIME



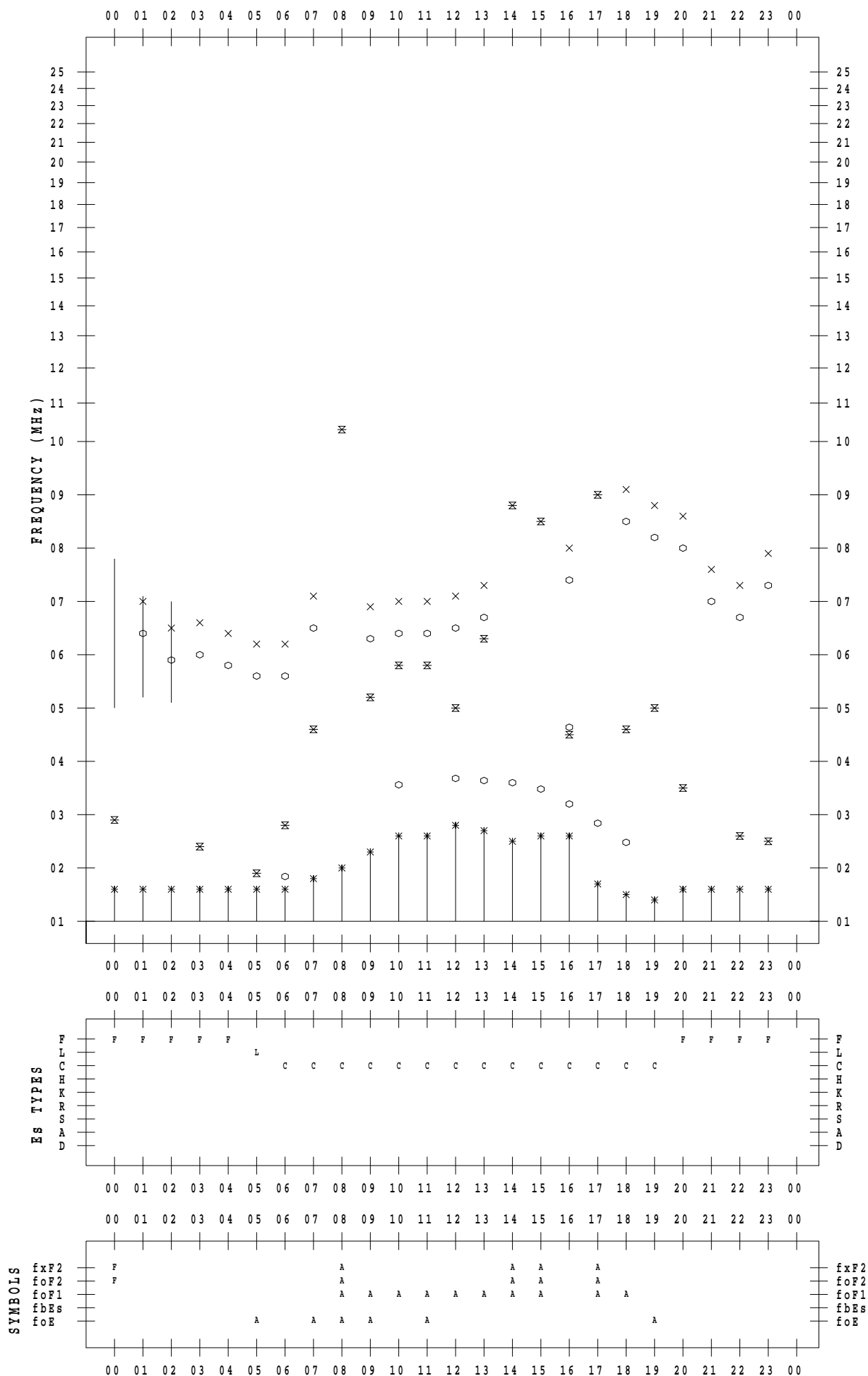
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 1

135 ° E MEAN TIME



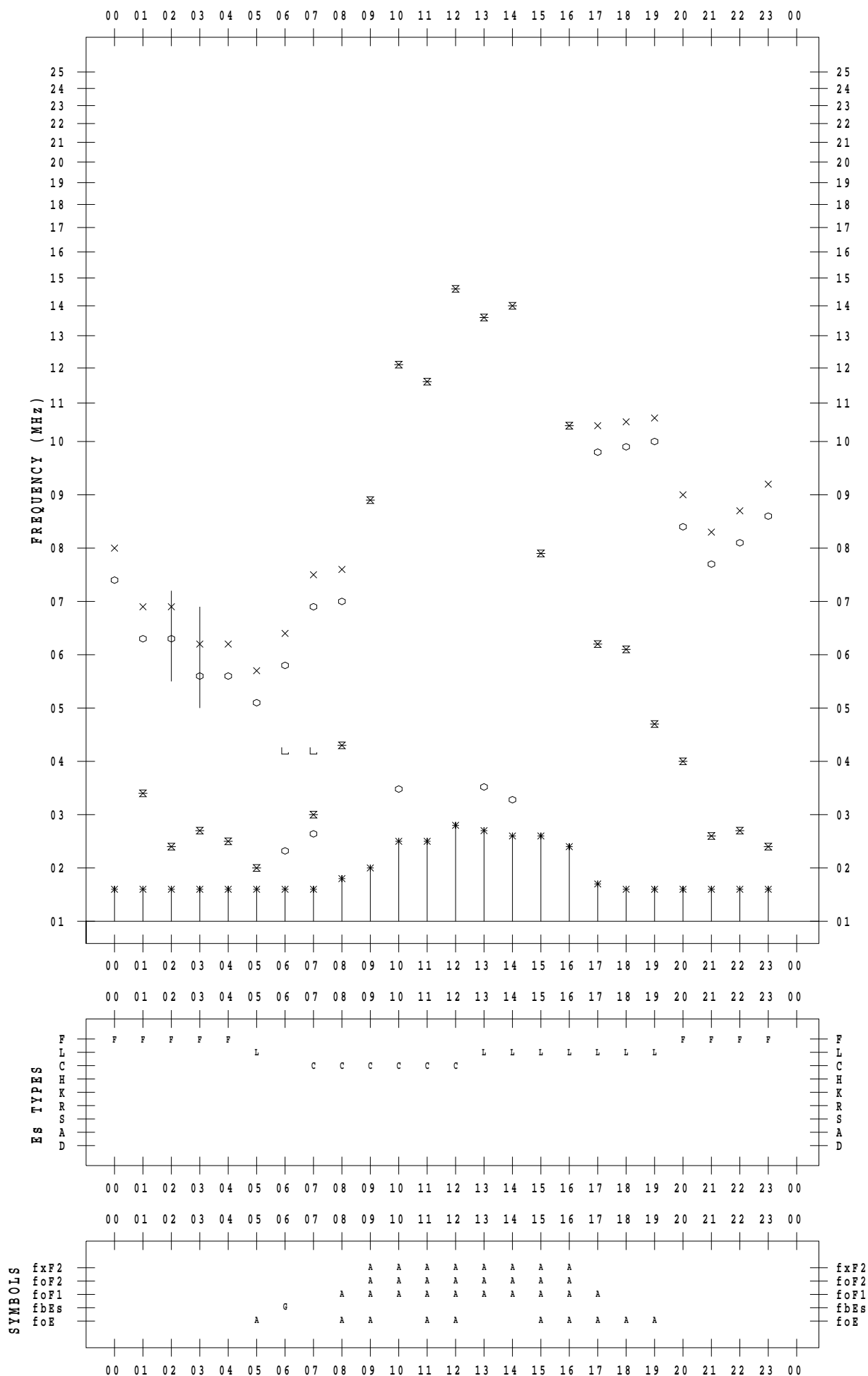
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 2

135 ° E MEAN TIME



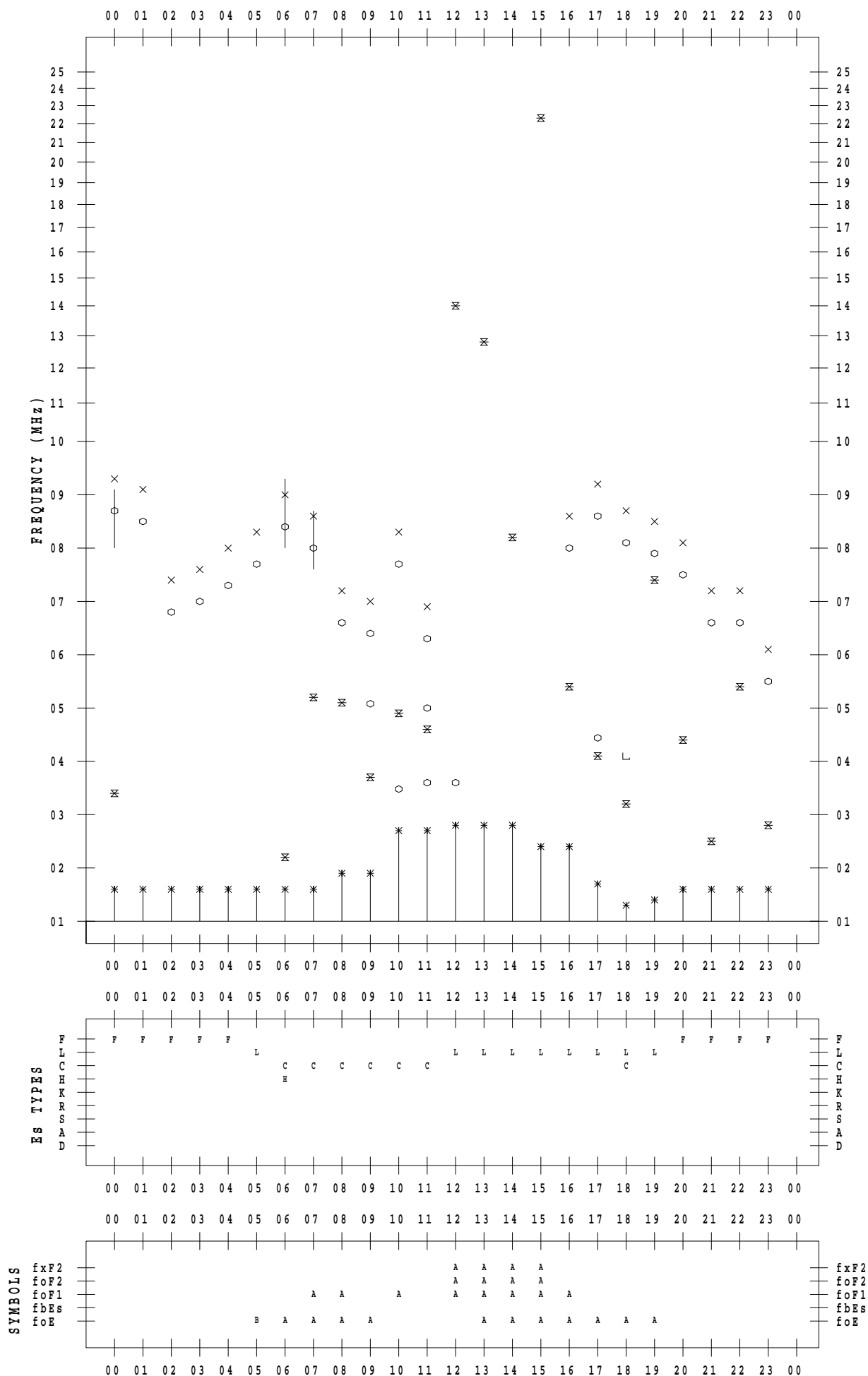
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 3

135 ° E MEAN TIME



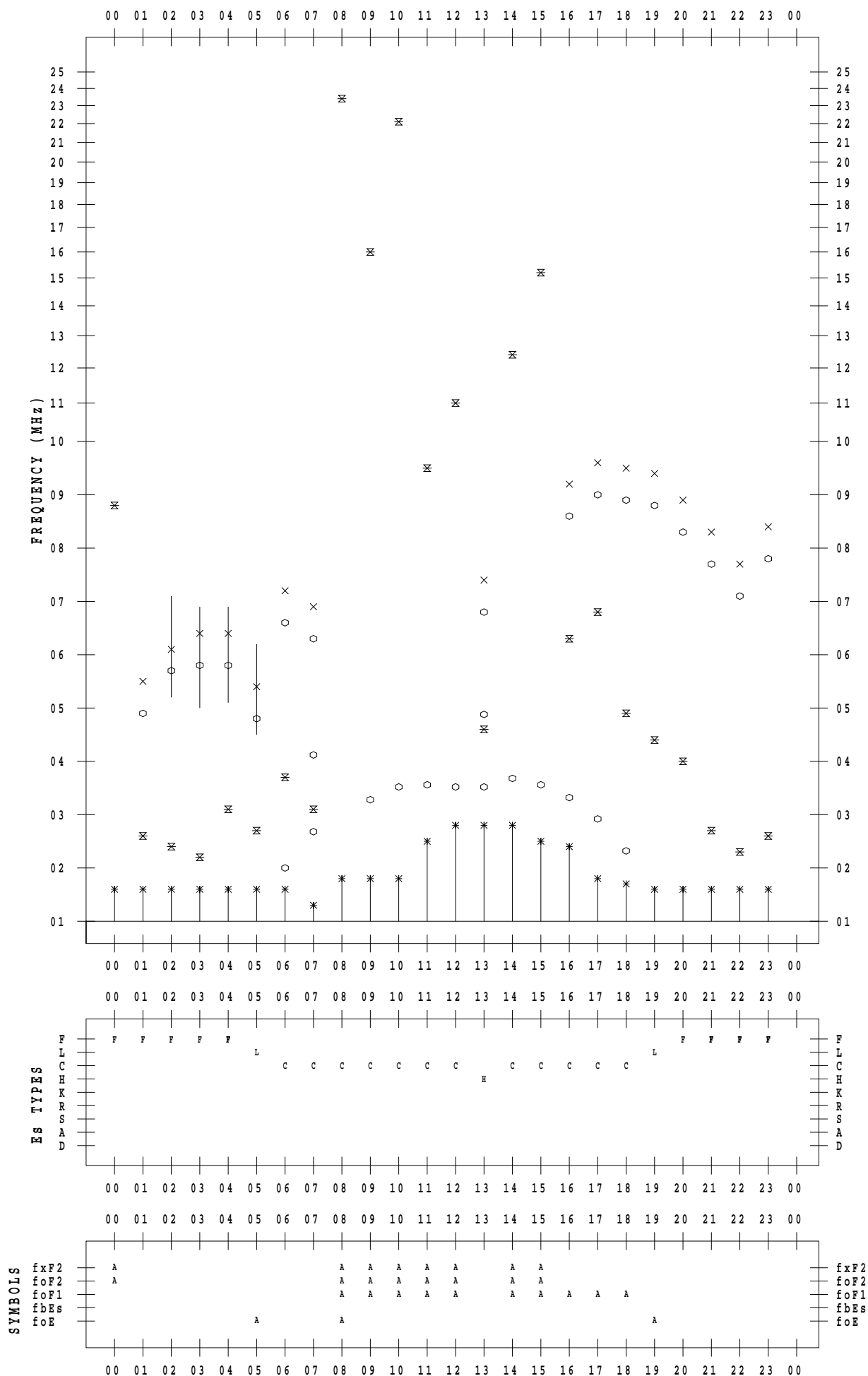
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 4

135 ° E MEAN TIME



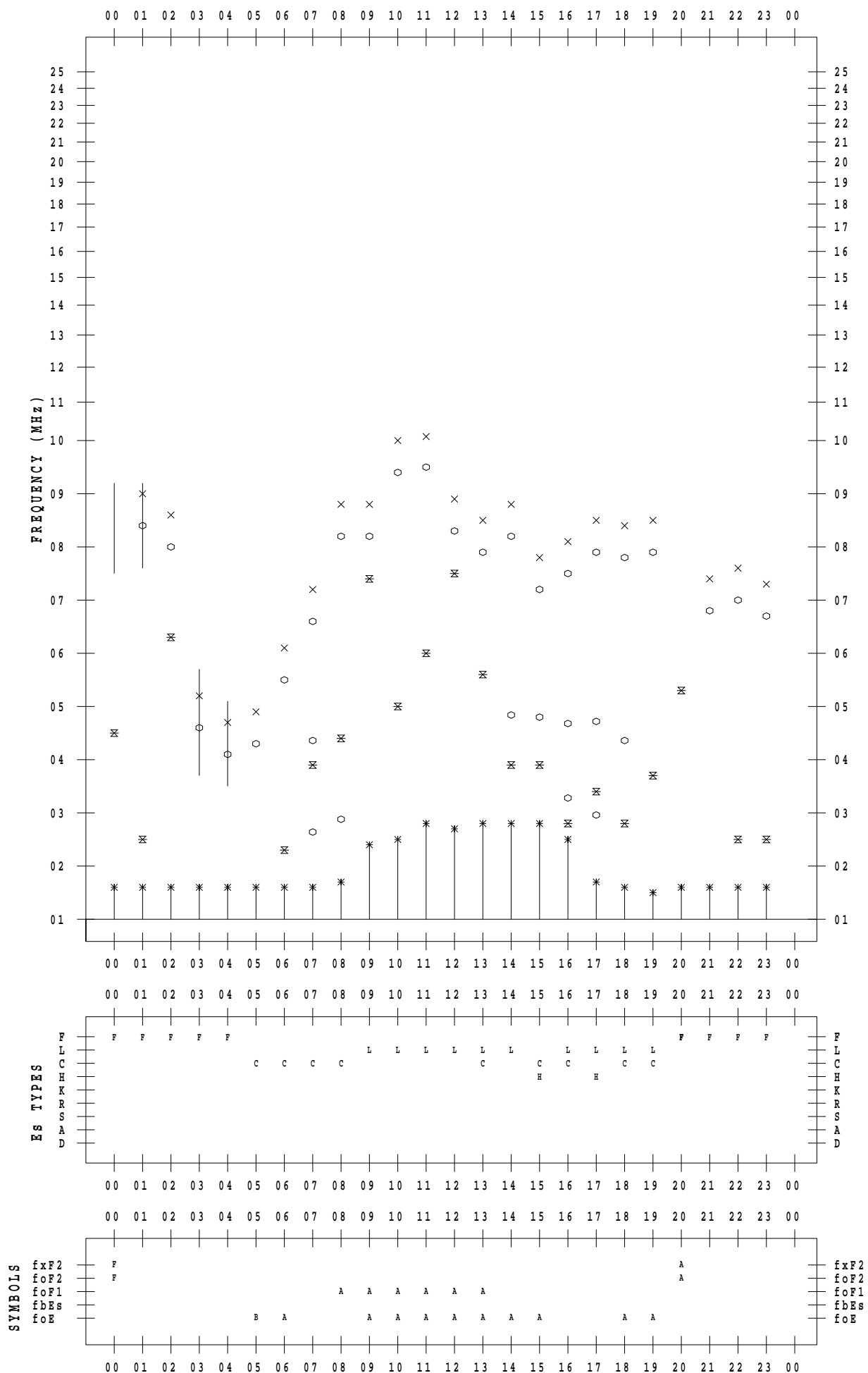
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 5

135 ° E MEAN TIME



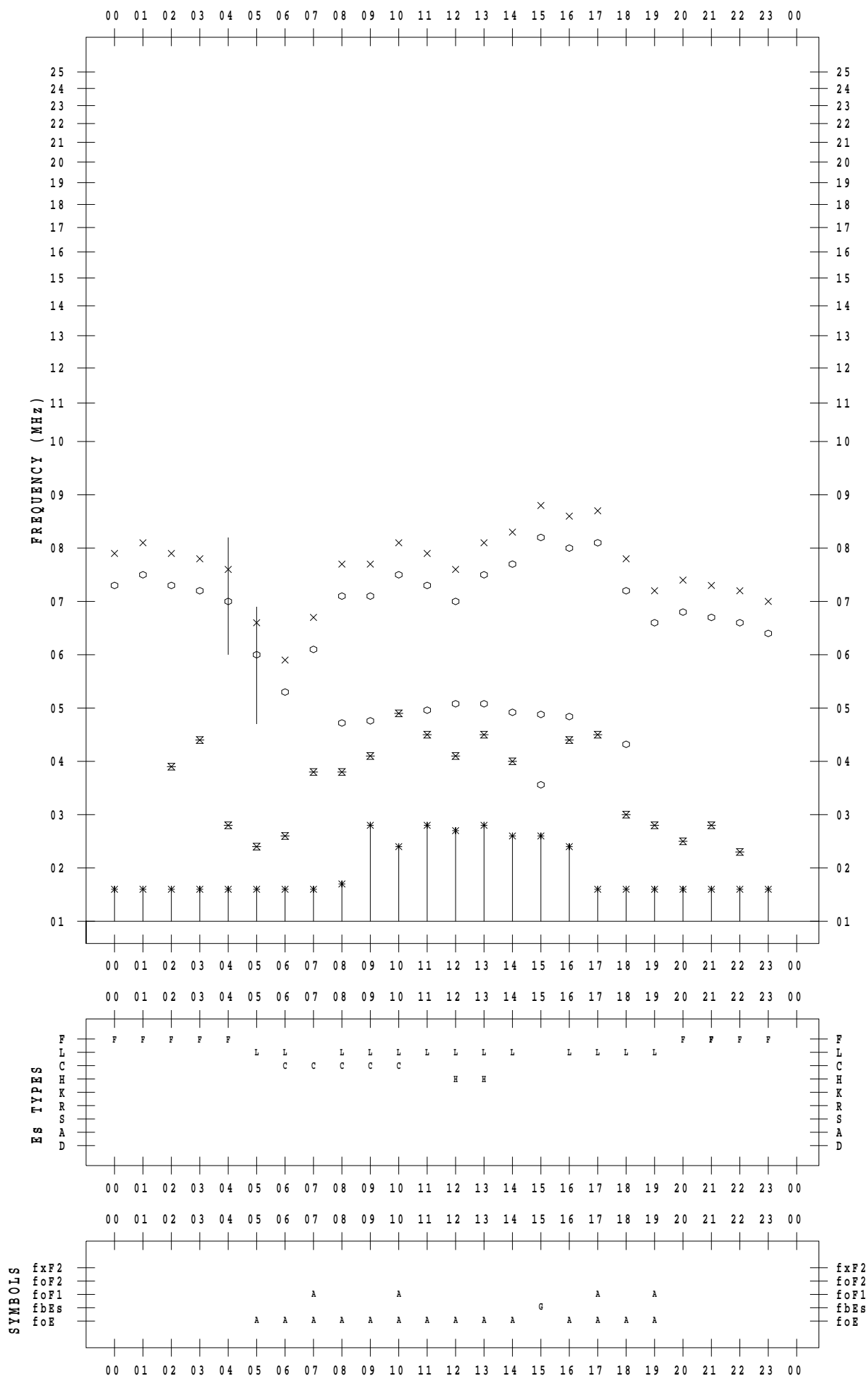
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 6

135 ° E MEAN TIME



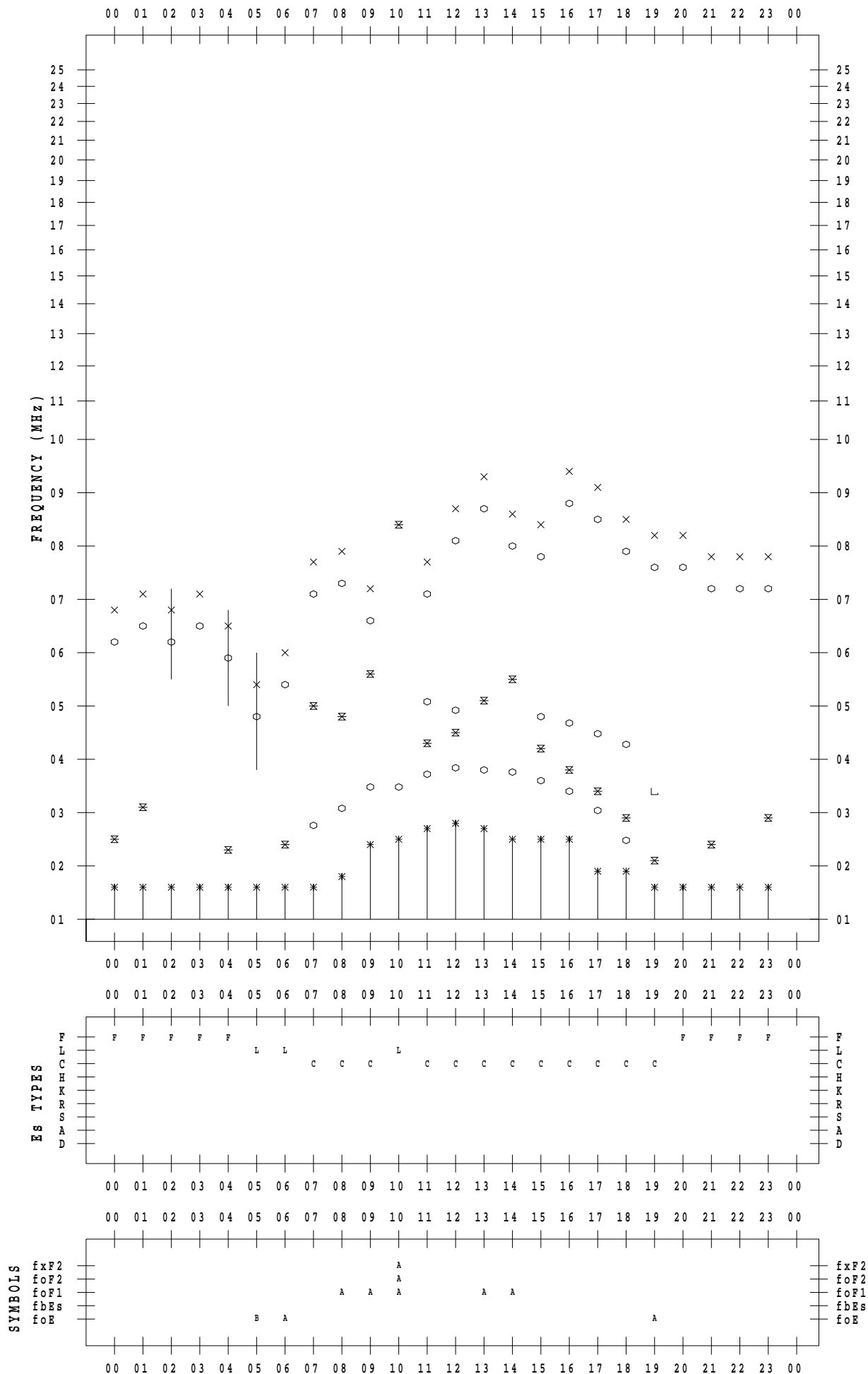
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 7

135 ° E MEAN TIME



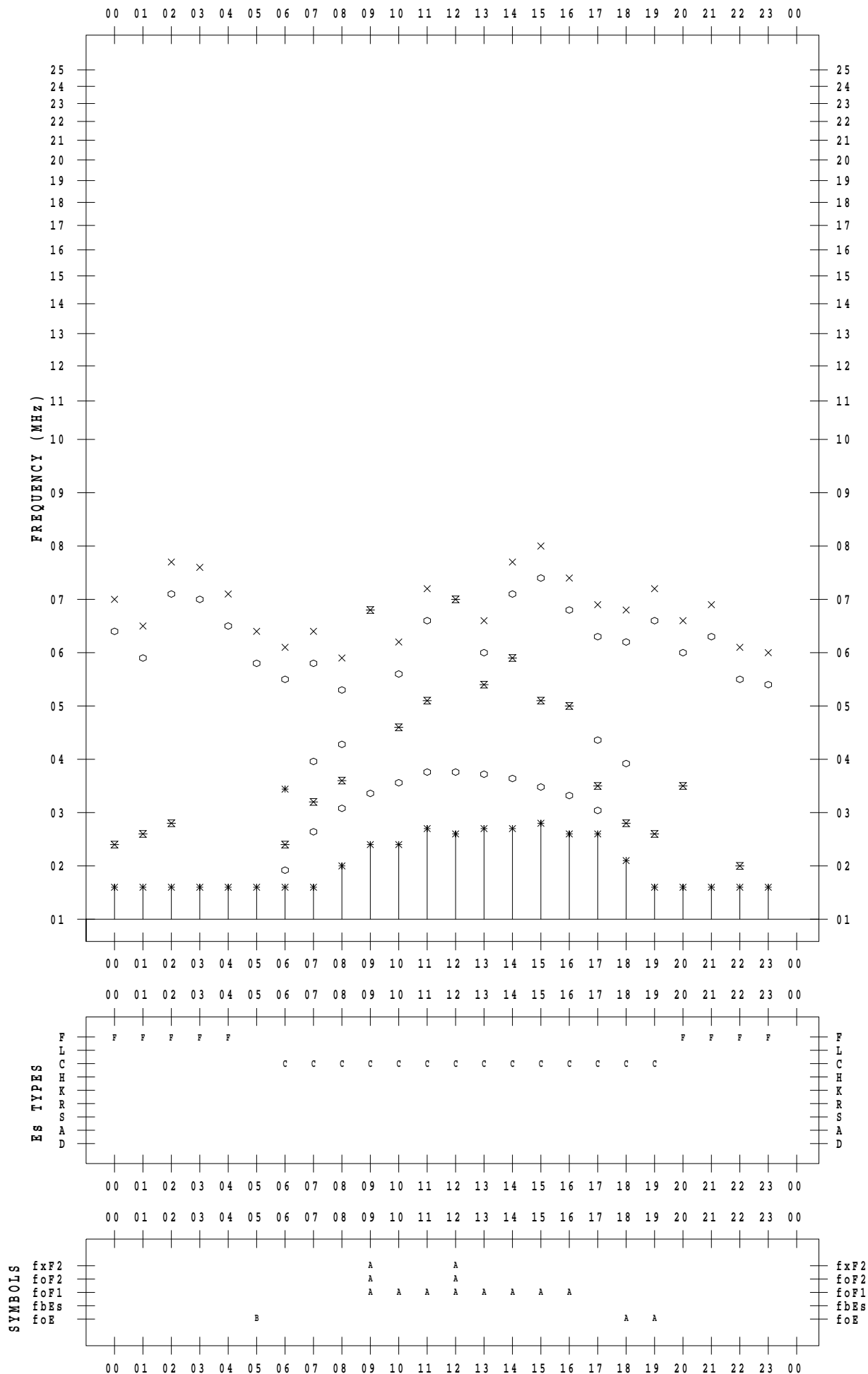
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 8

135 ° E MEAN TIME



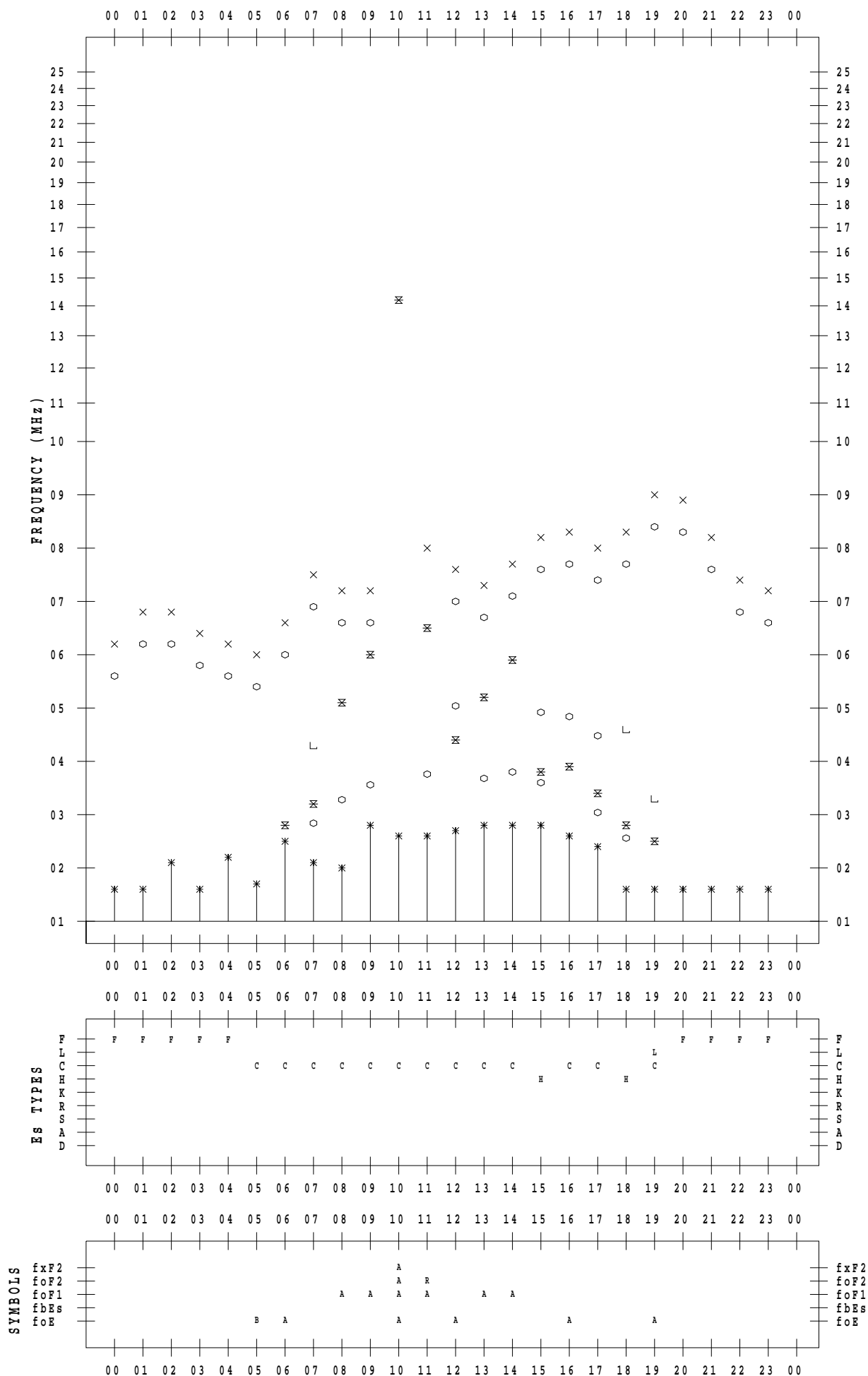
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 9

135 ° E MEAN TIME



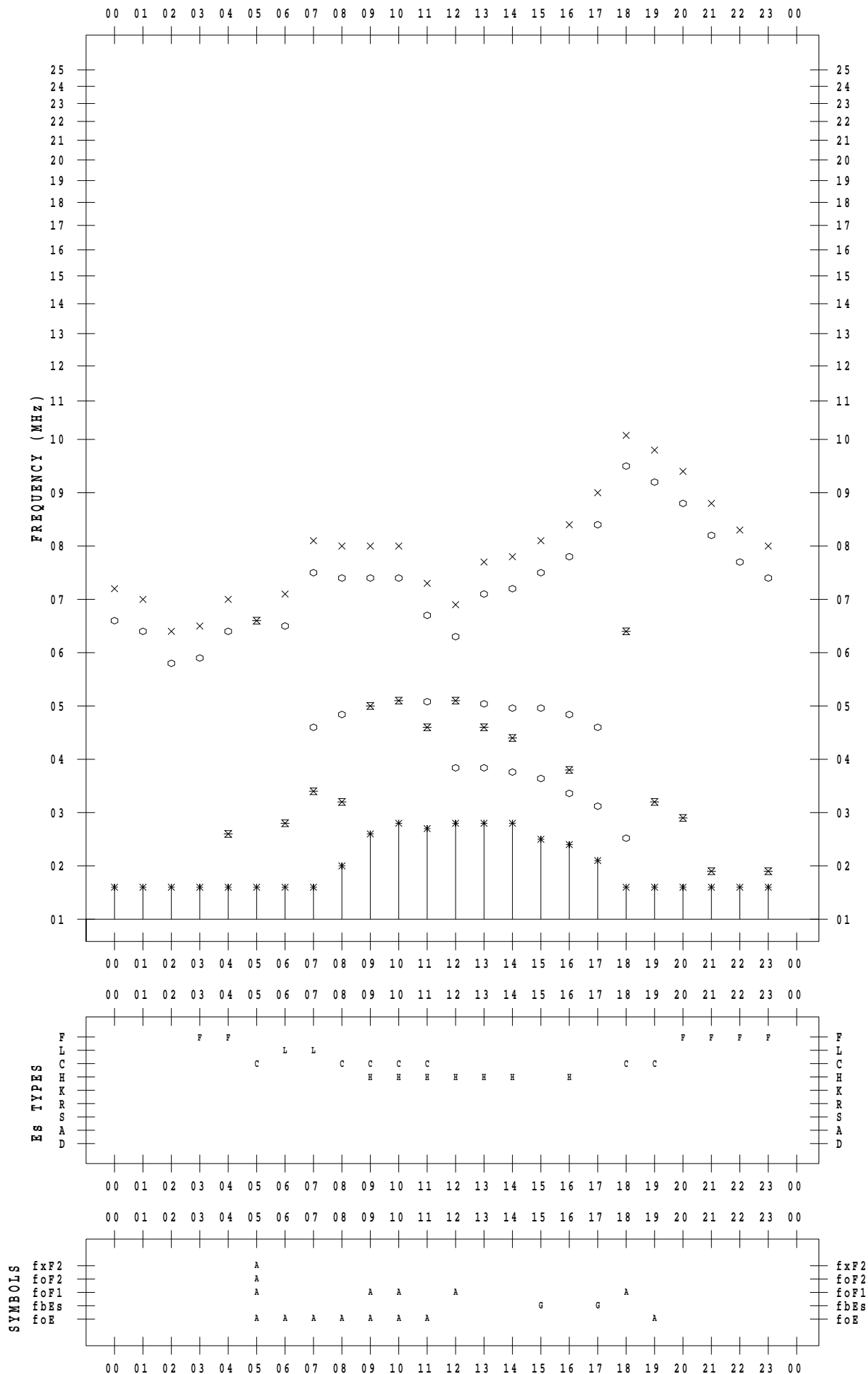
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 10

135 ° E MEAN TIME



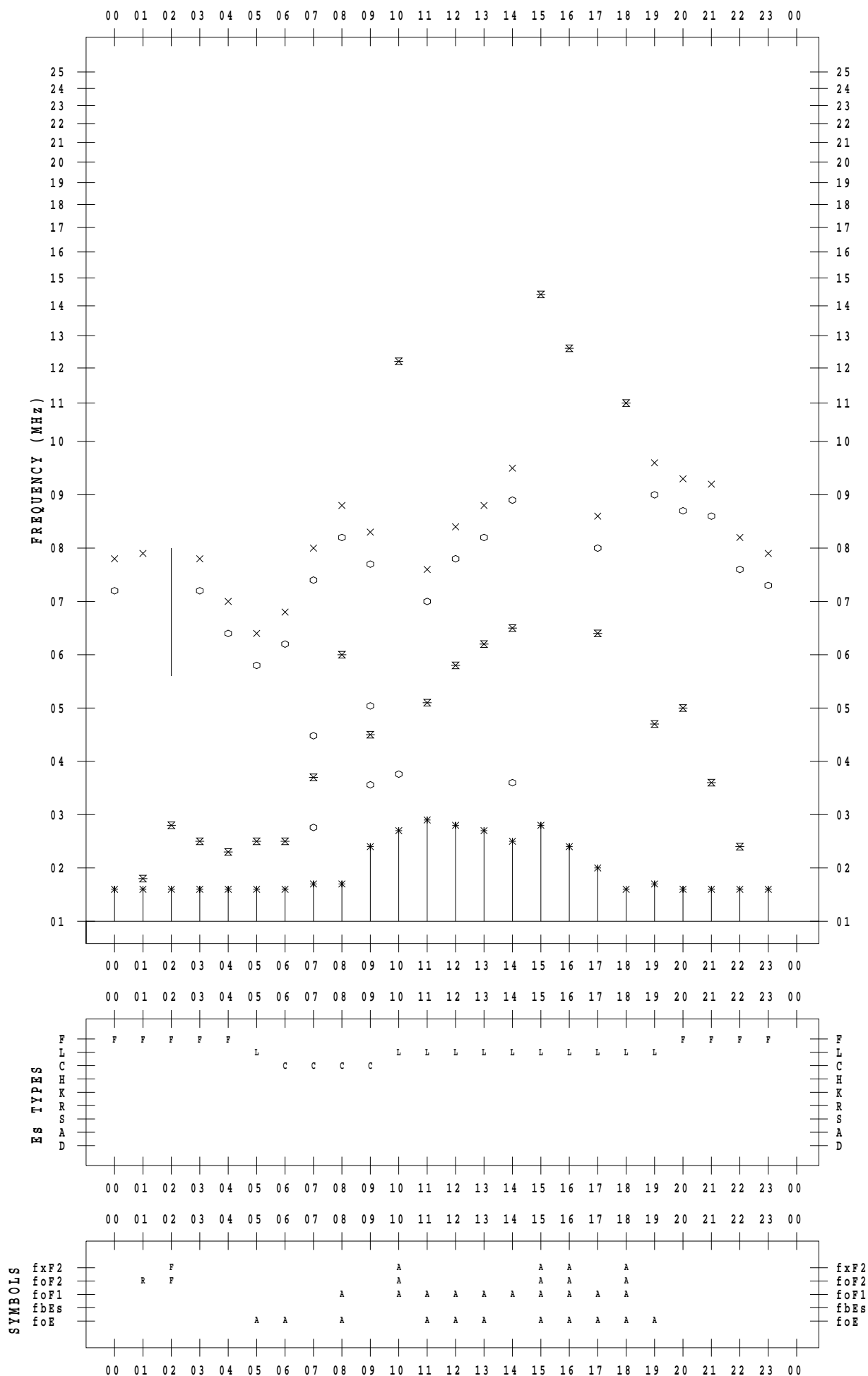
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 11

135 ° E MEAN TIME



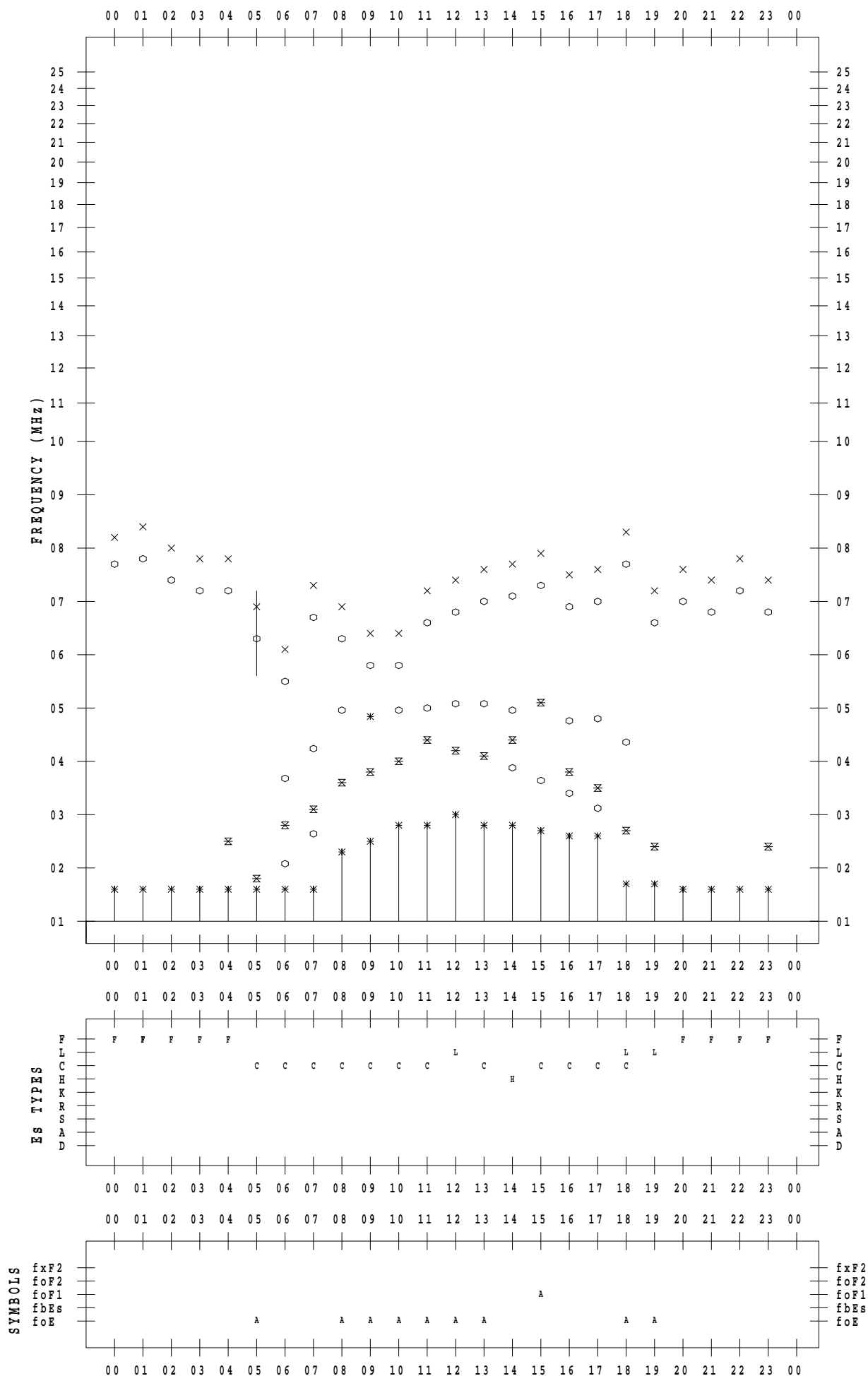
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 12

135 ° E MEAN TIME



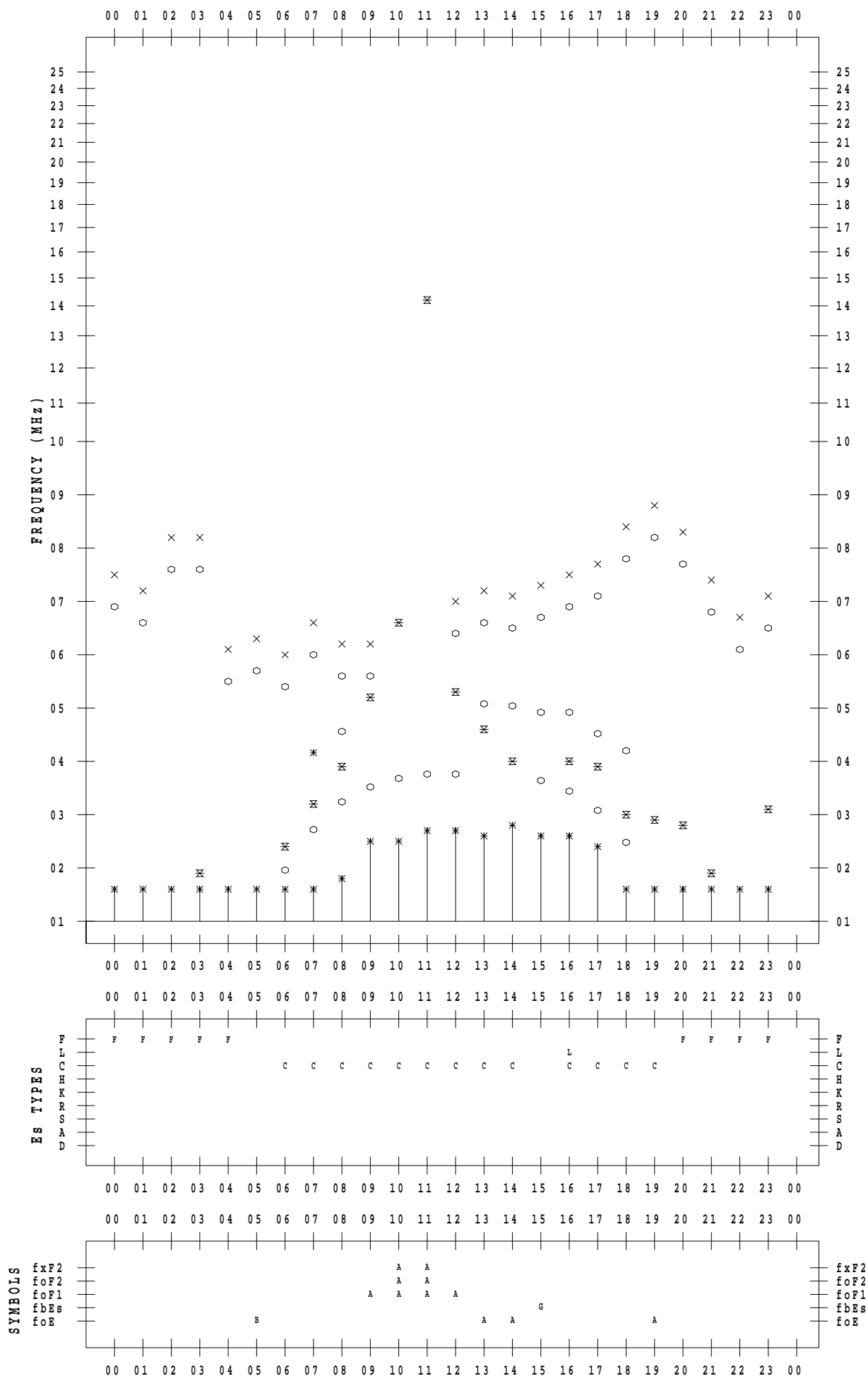
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 13

135 ° E MEAN TIME



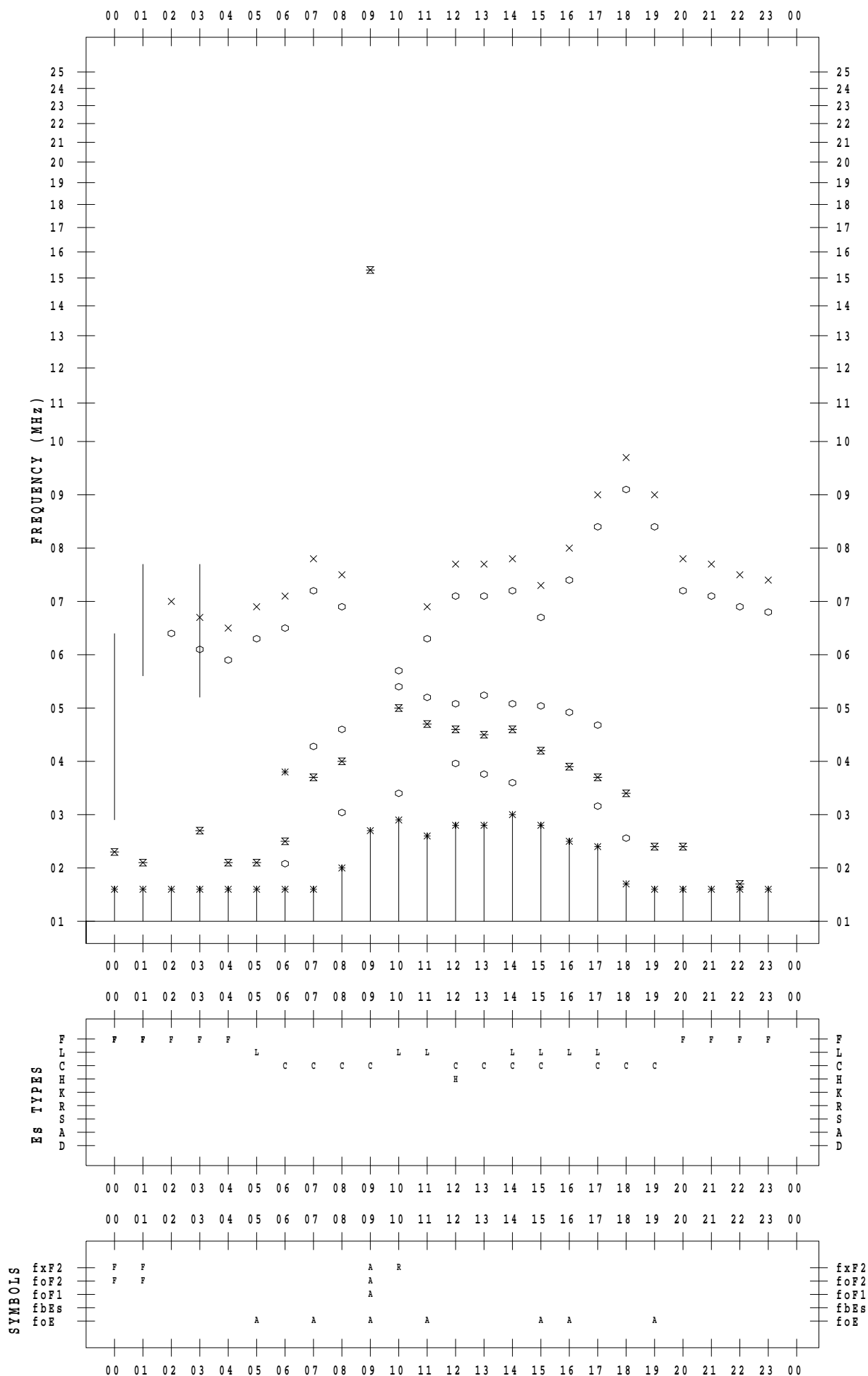
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 14

135 ° E MEAN TIME



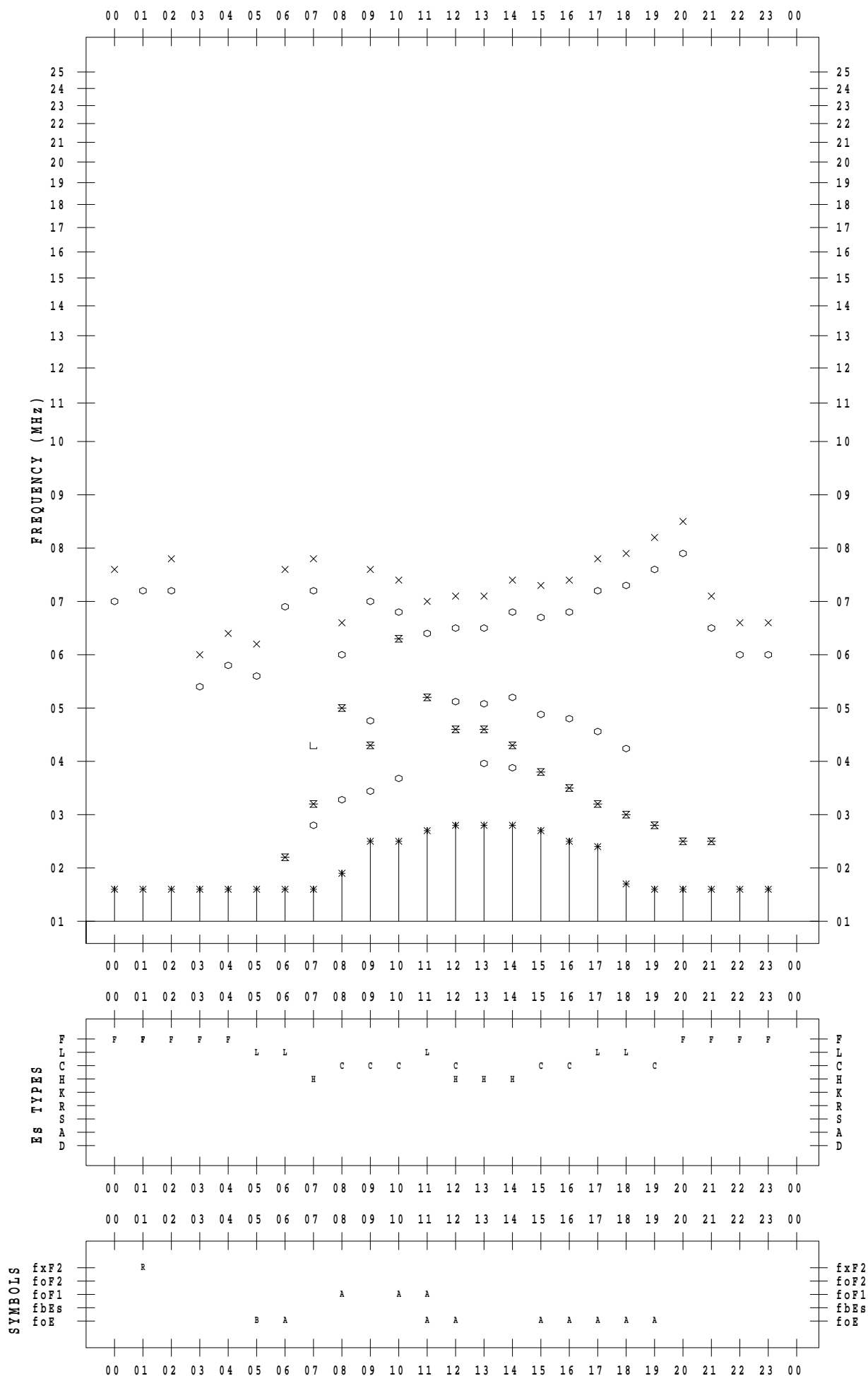
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 15

135 ° E MEAN TIME



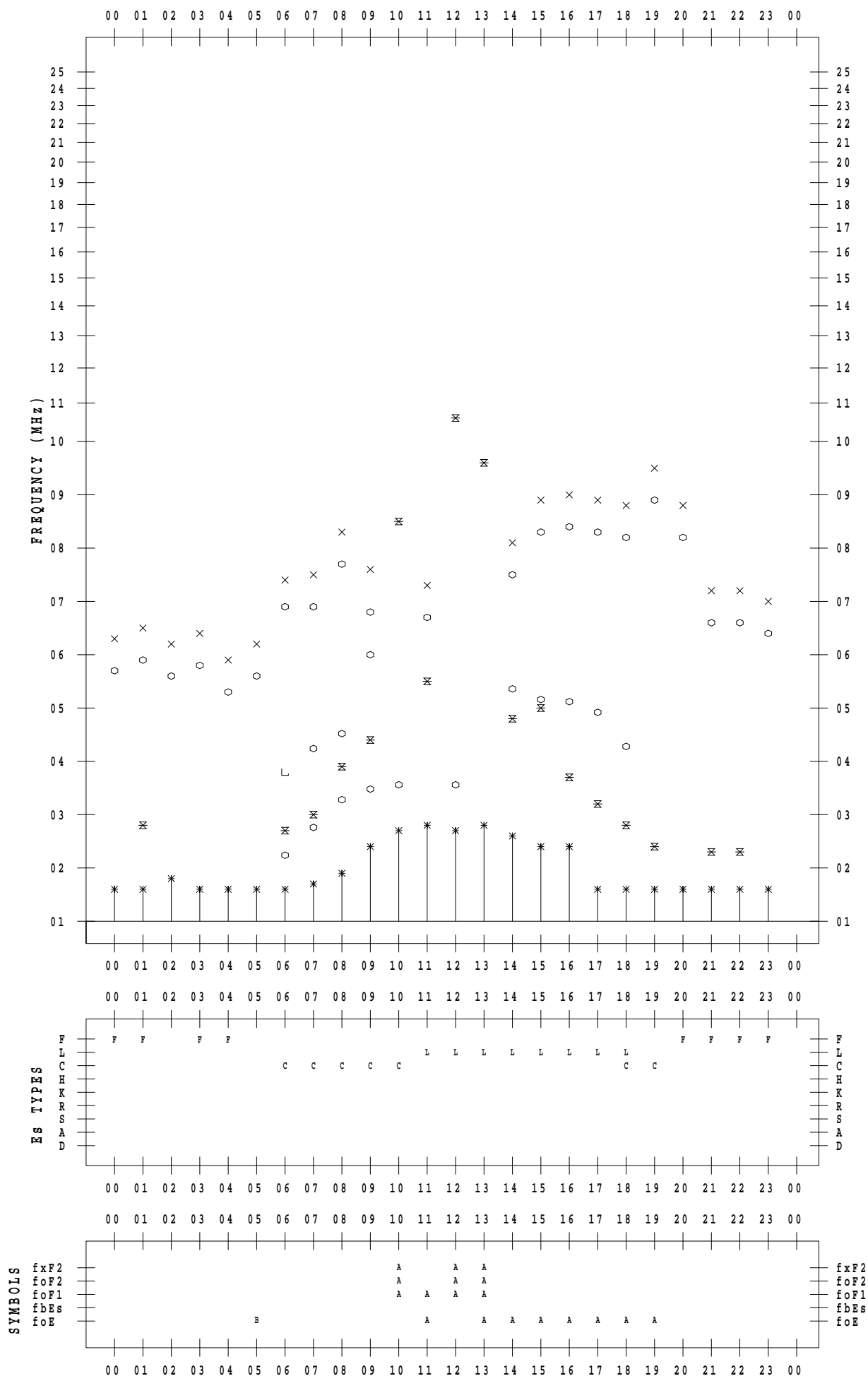
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 16

135 ° E MEAN TIME



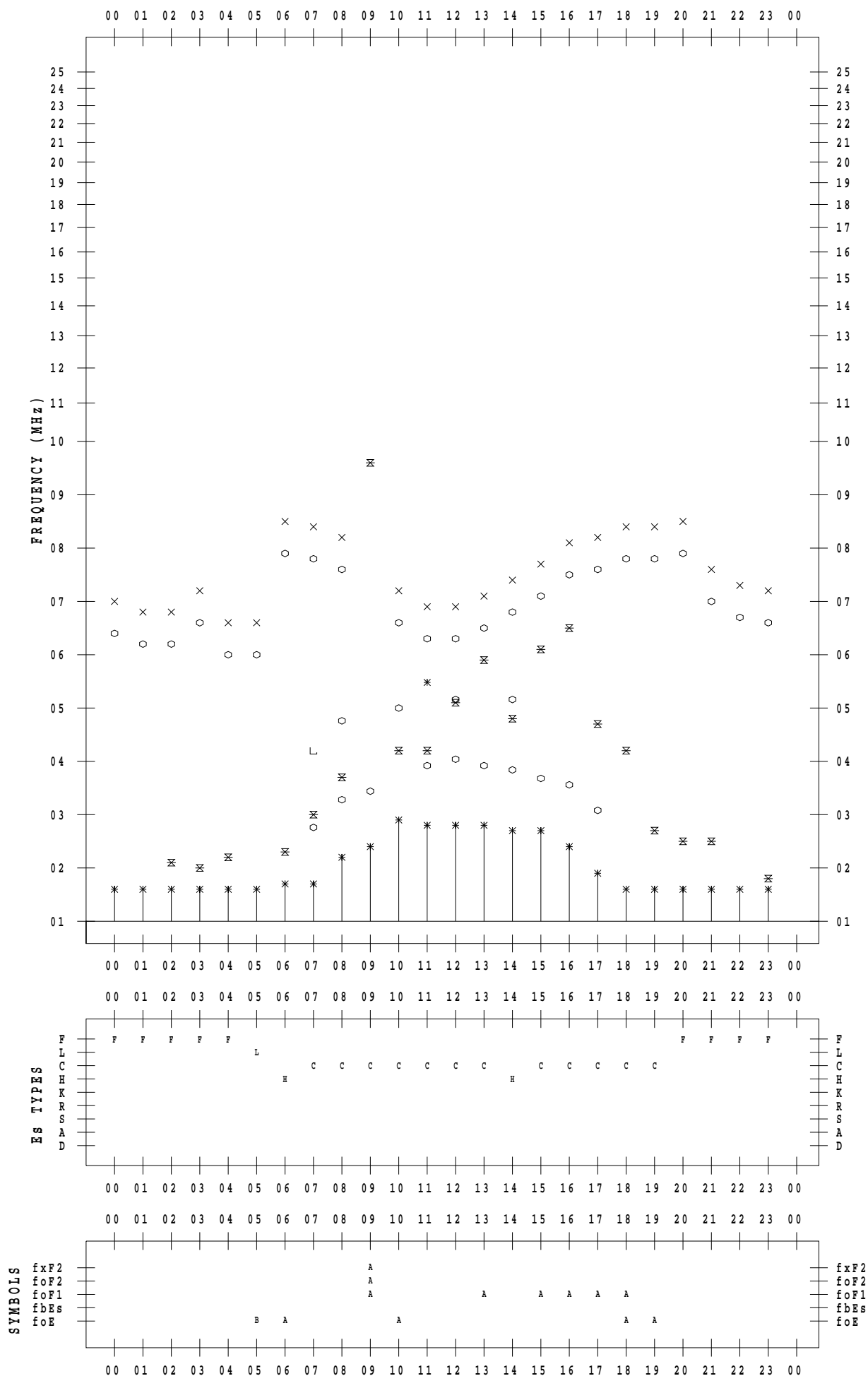
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 17

135 ° E MEAN TIME



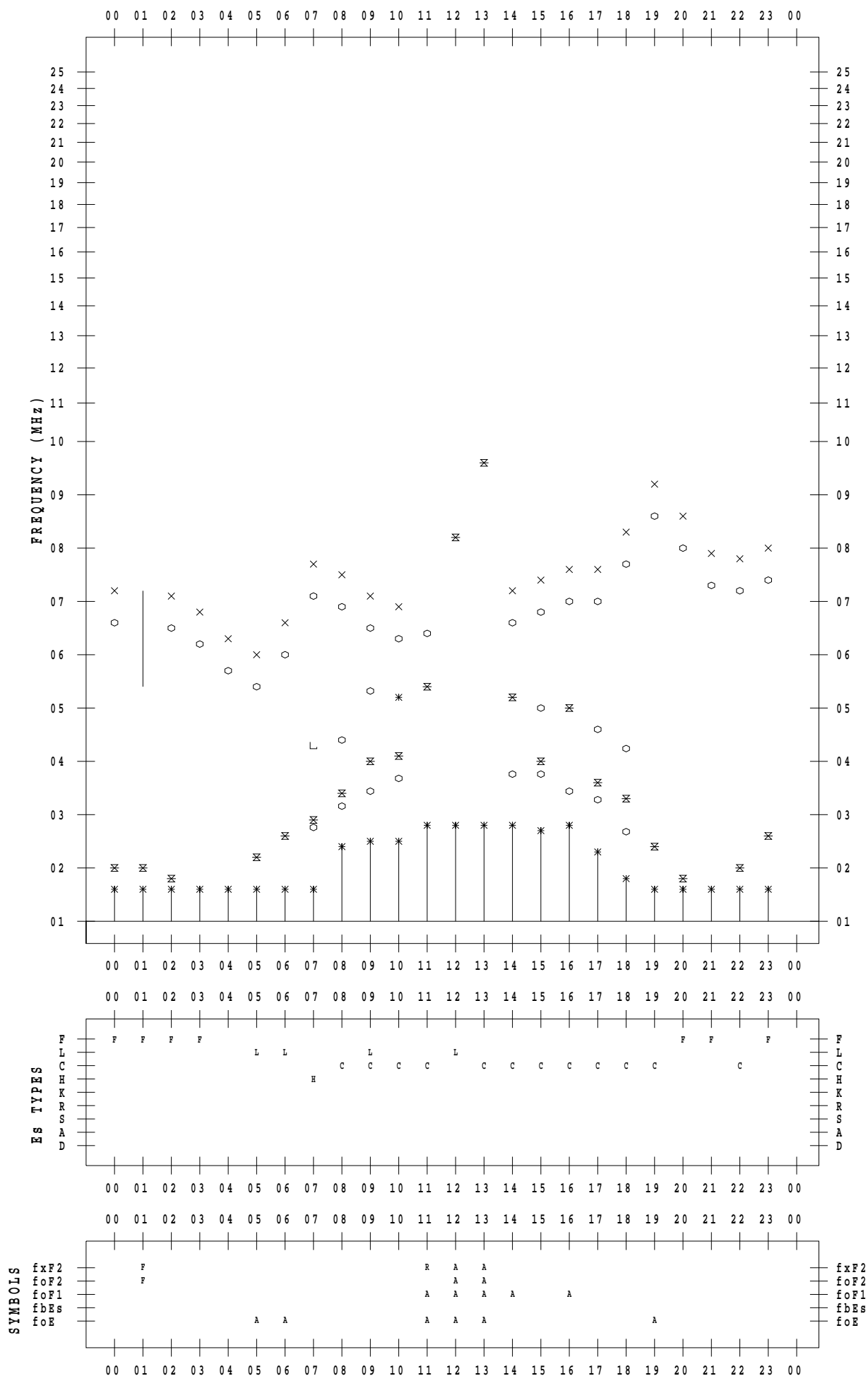
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 18

135 ° E MEAN TIME



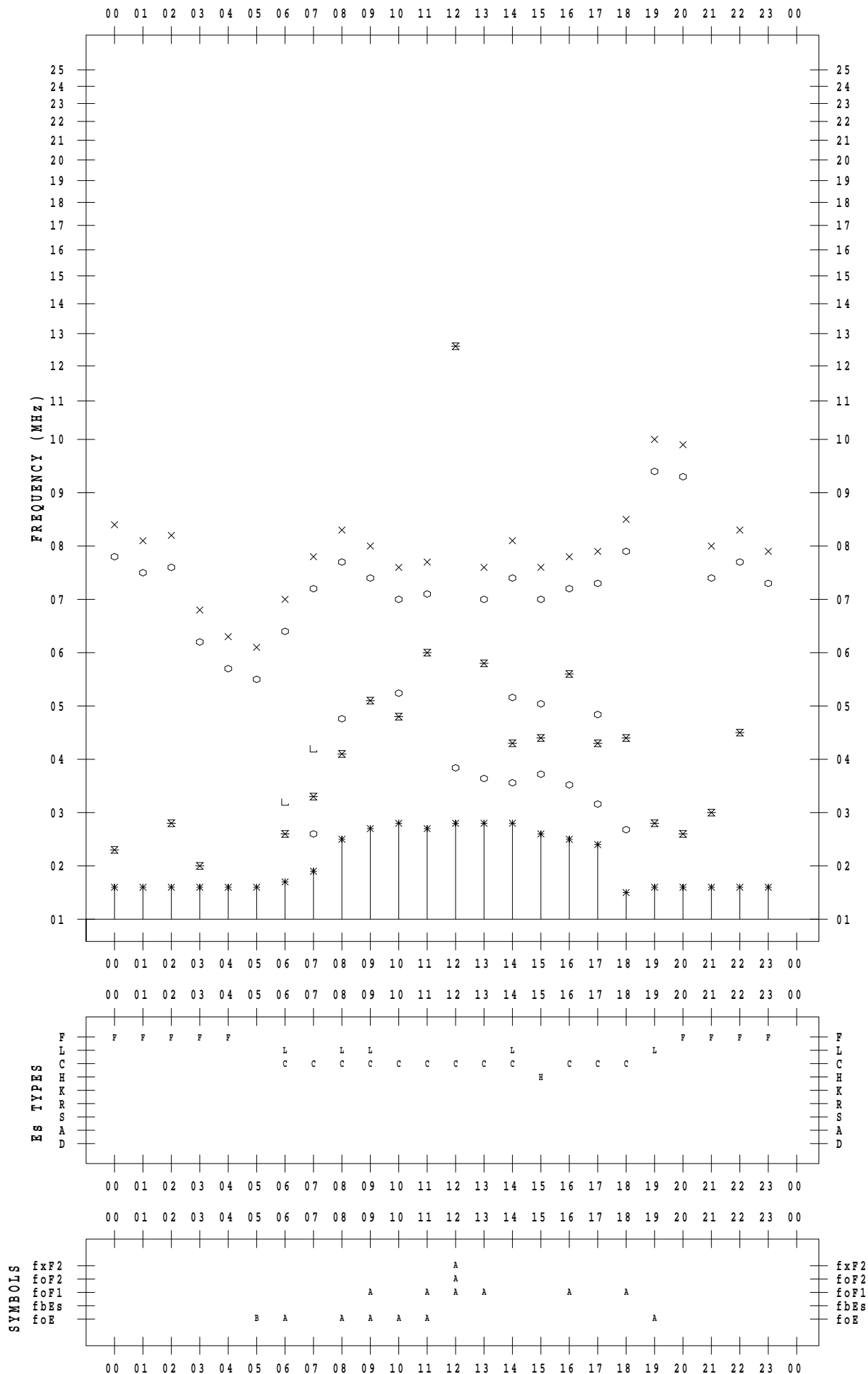
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 19

135 ° E MEAN TIME



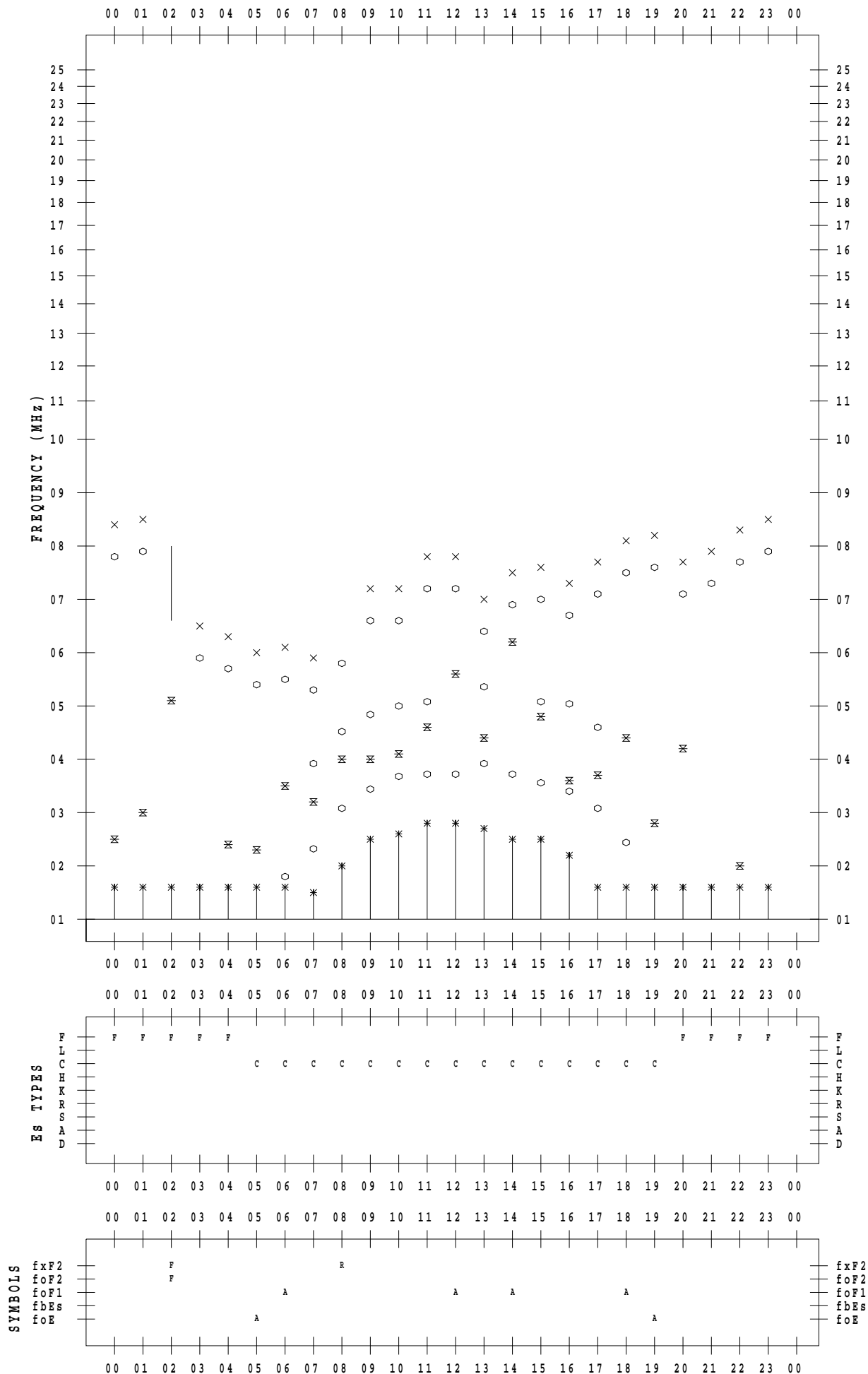
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 20

135 ° E MEAN TIME



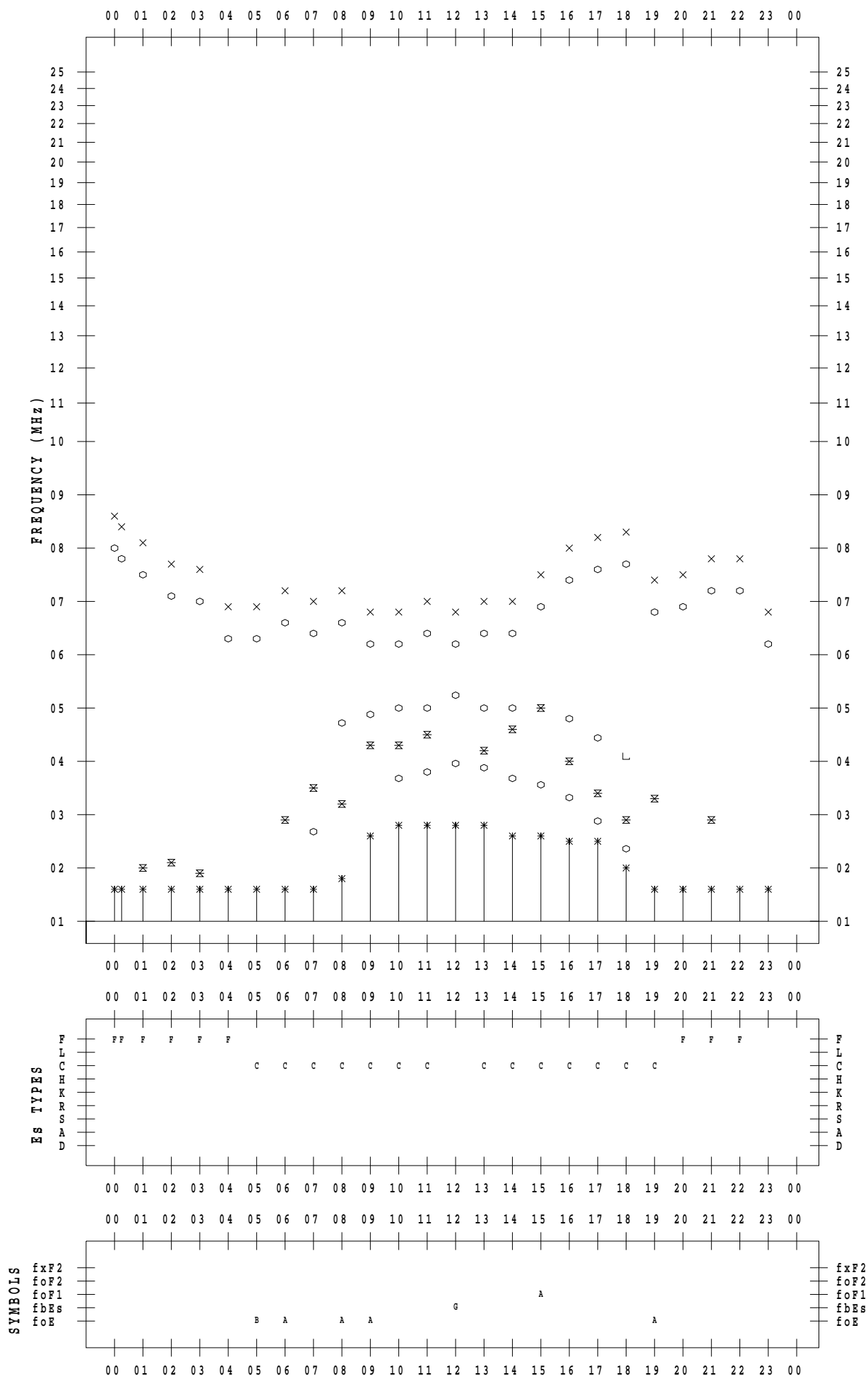
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 21

135 ° E MEAN TIME



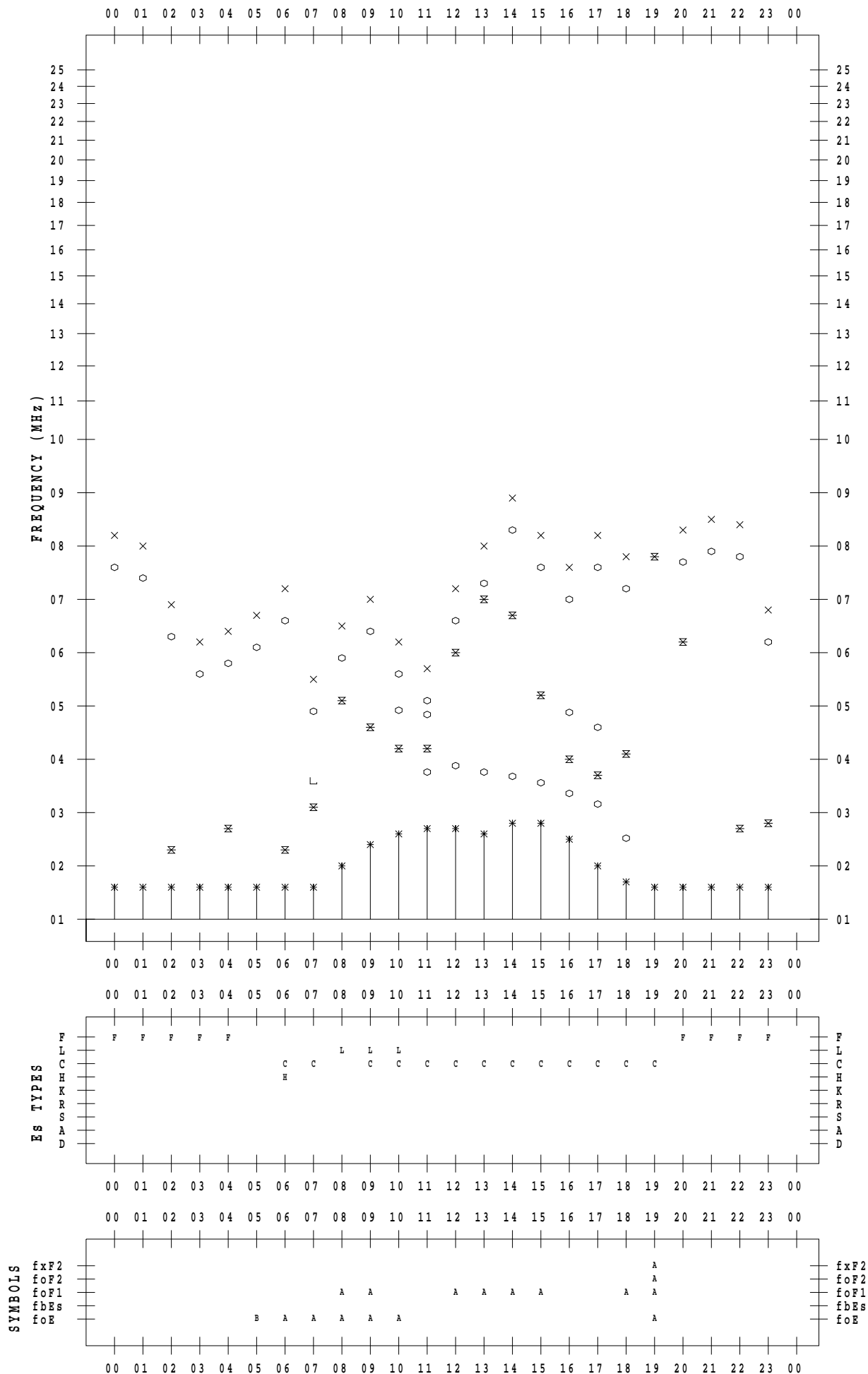
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 22

135 ° E MEAN TIME



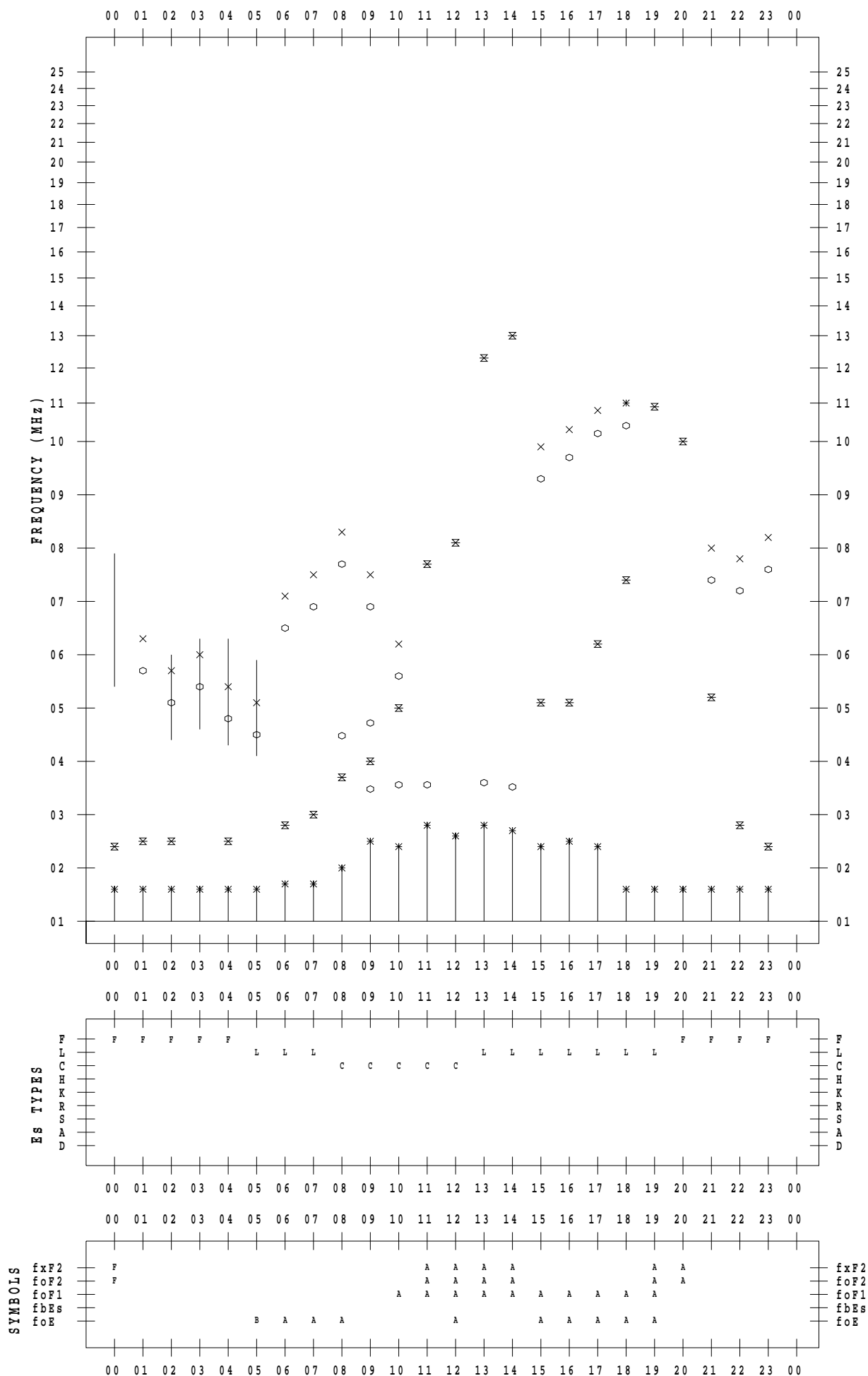
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 23

135 ° E MEAN TIME



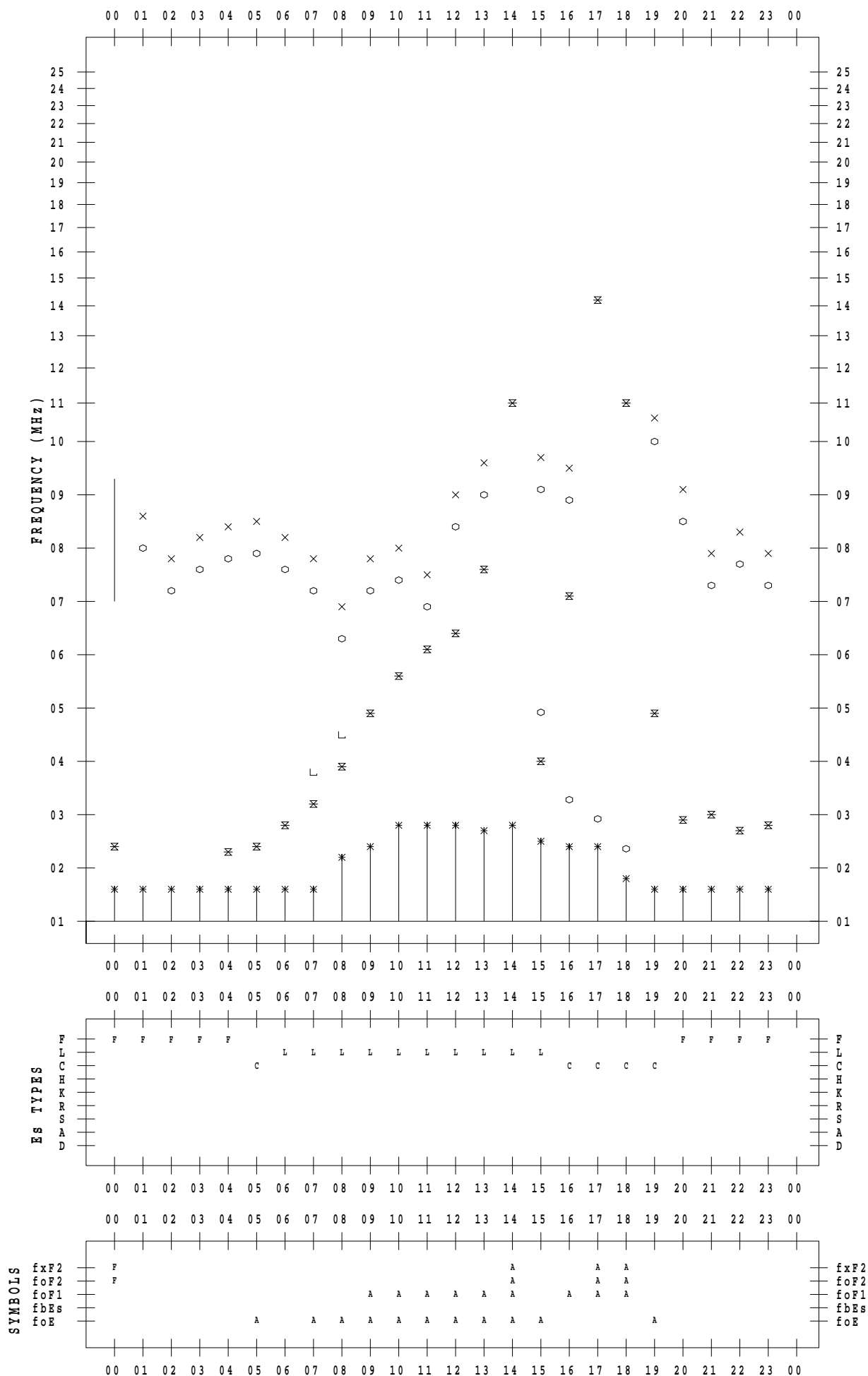
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 24

135 ° E MEAN TIME



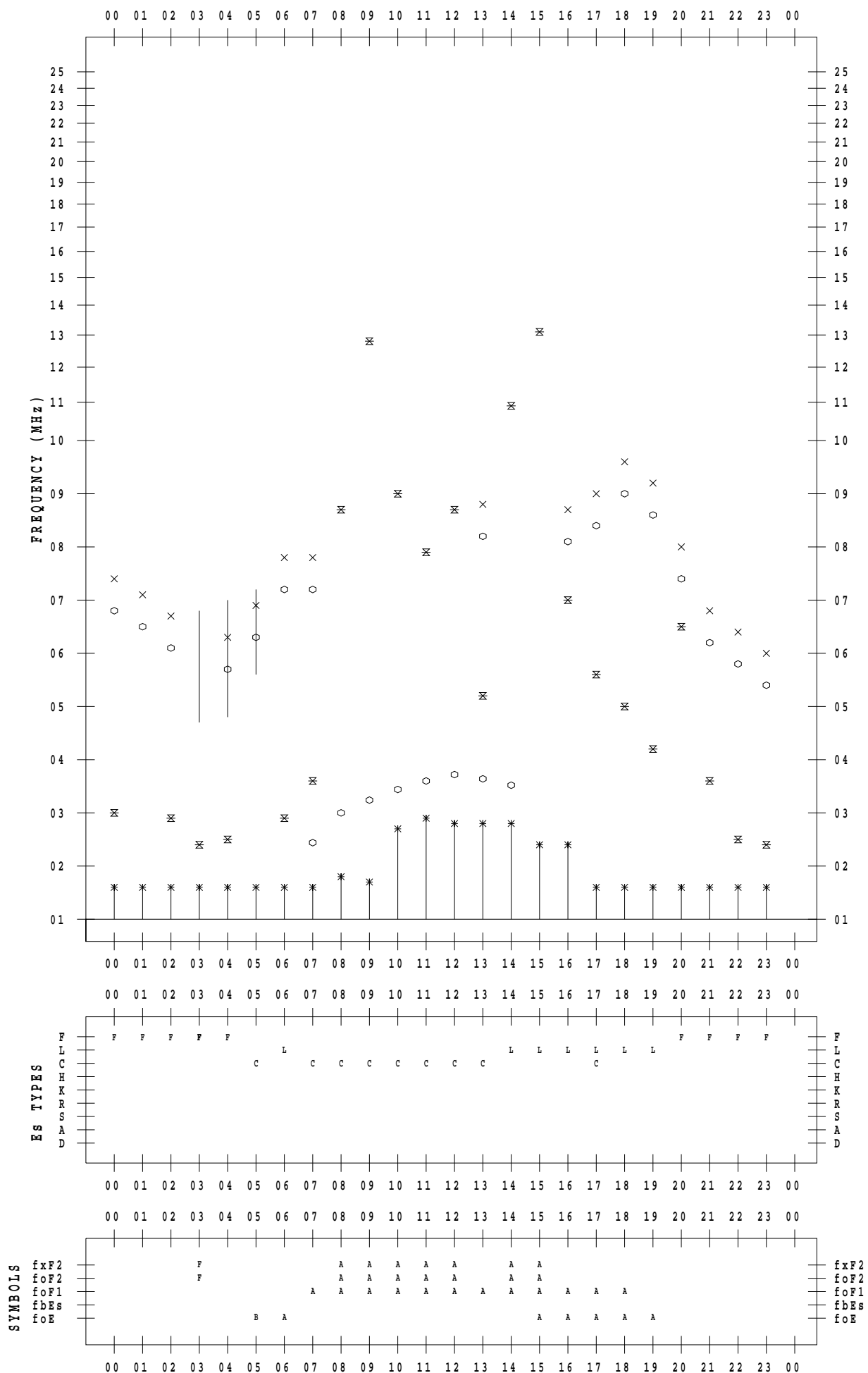
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 25

135 ° E MEAN TIME



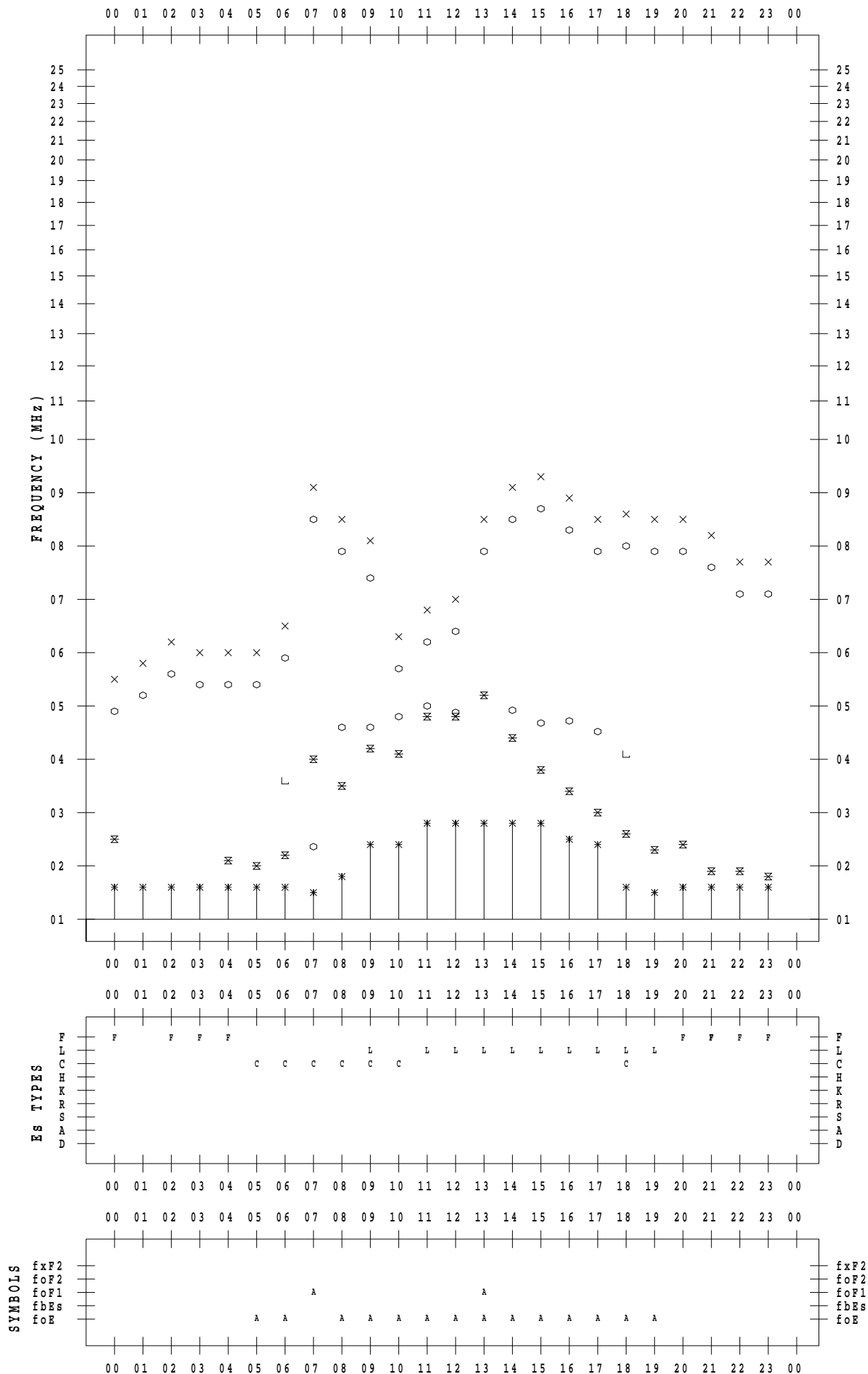
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 26

135 ° E MEAN TIME



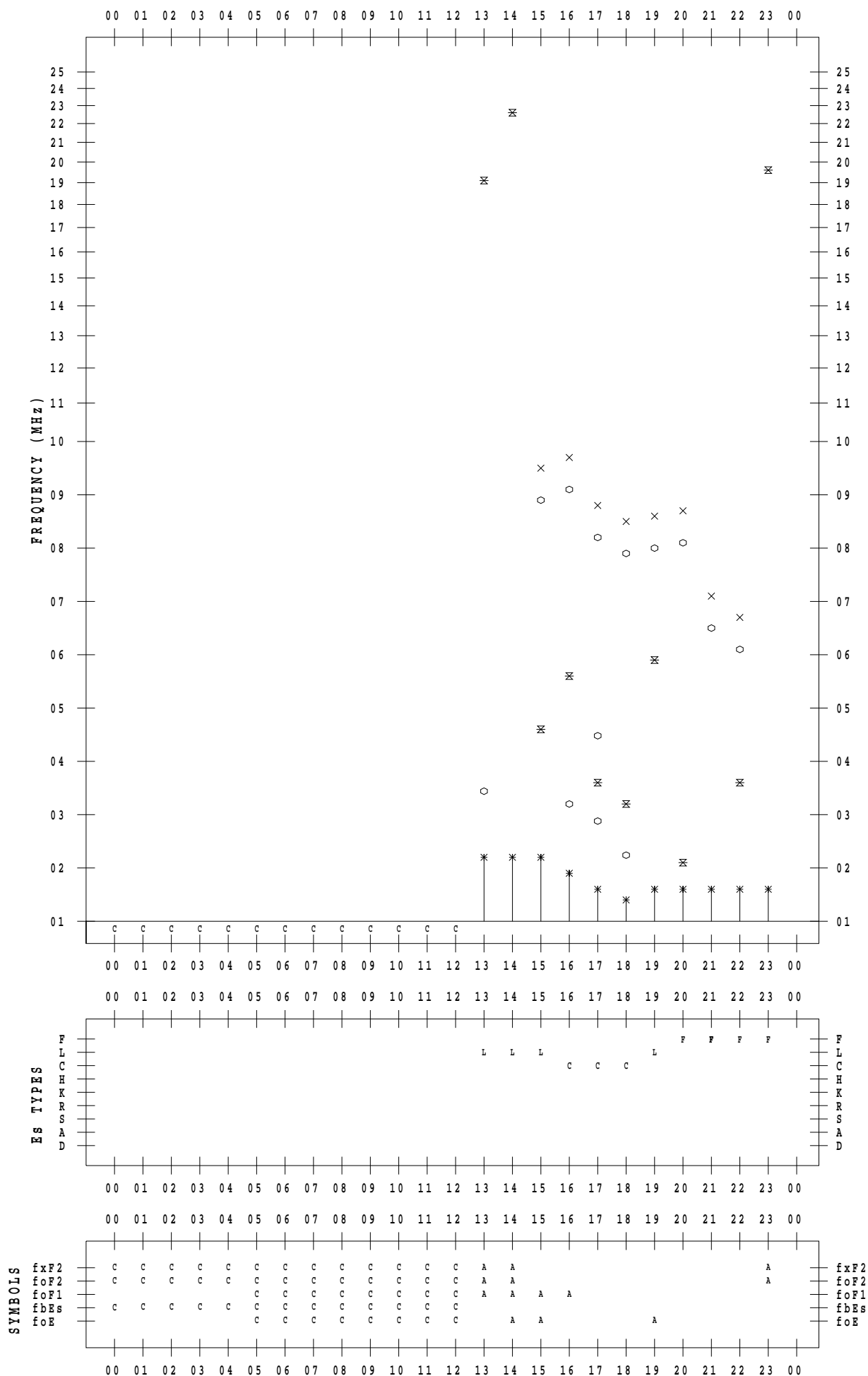
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 27

135 ° E MEAN TIME



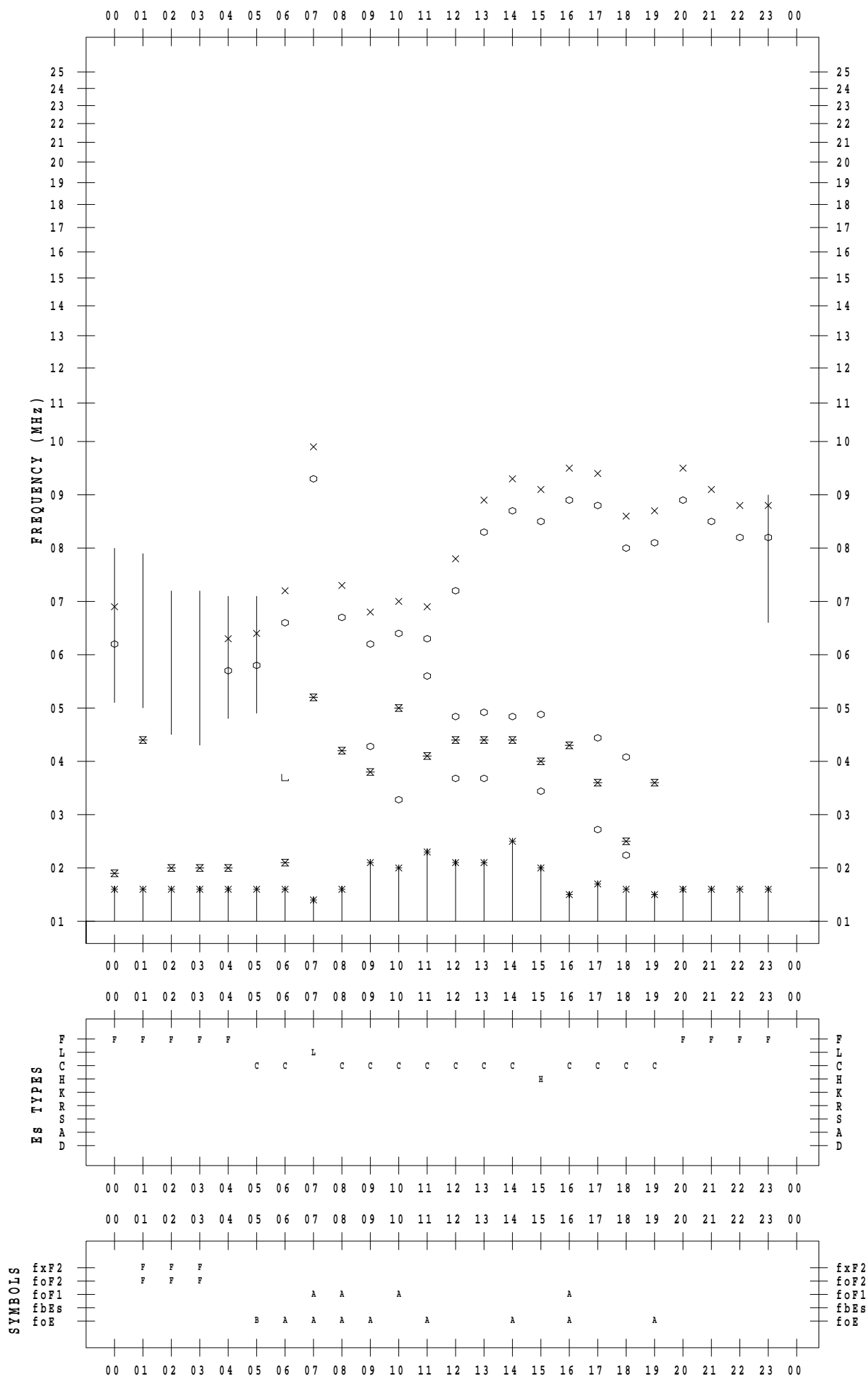
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 28

135 ° E MEAN TIME



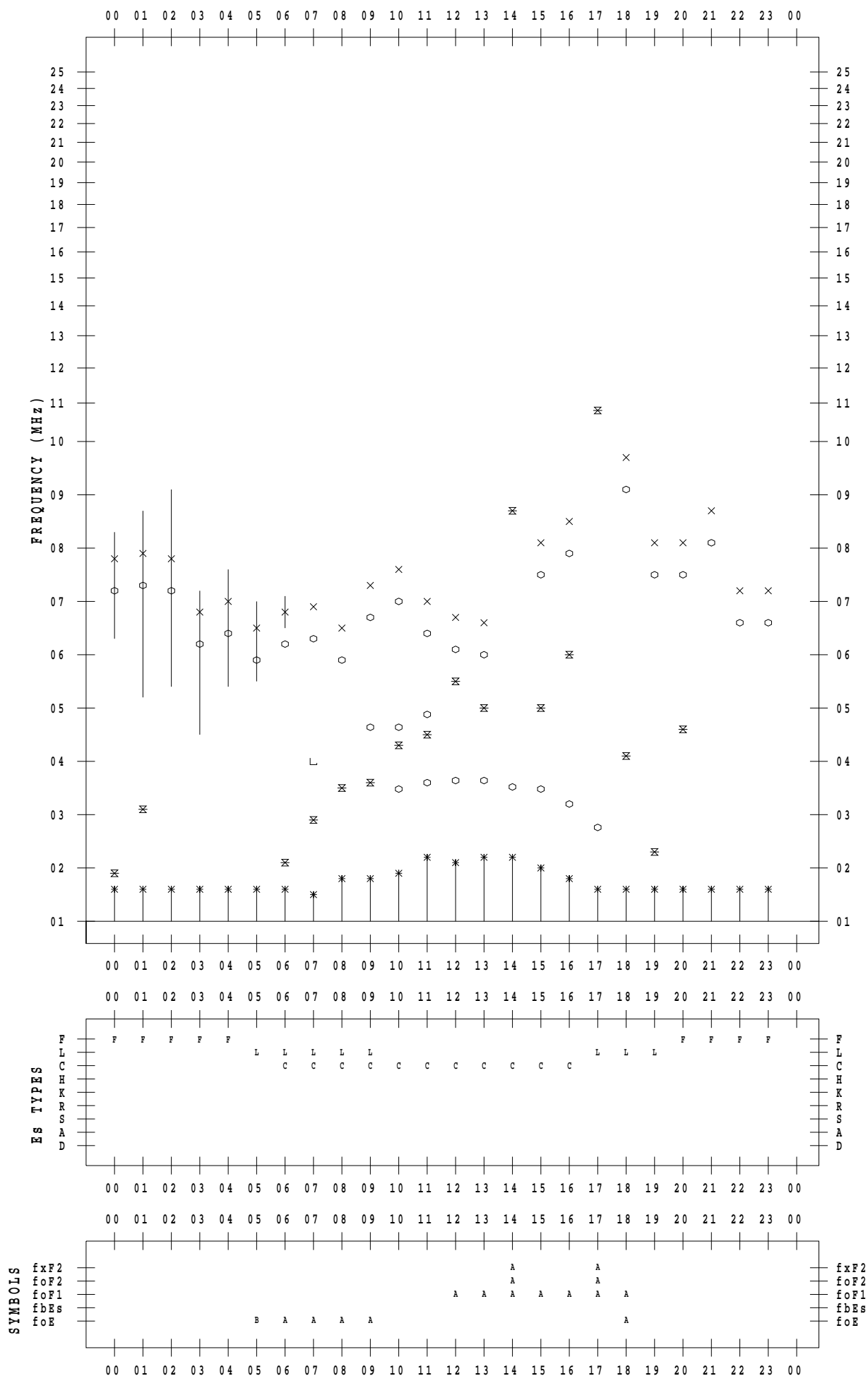
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 29

135 ° E MEAN TIME



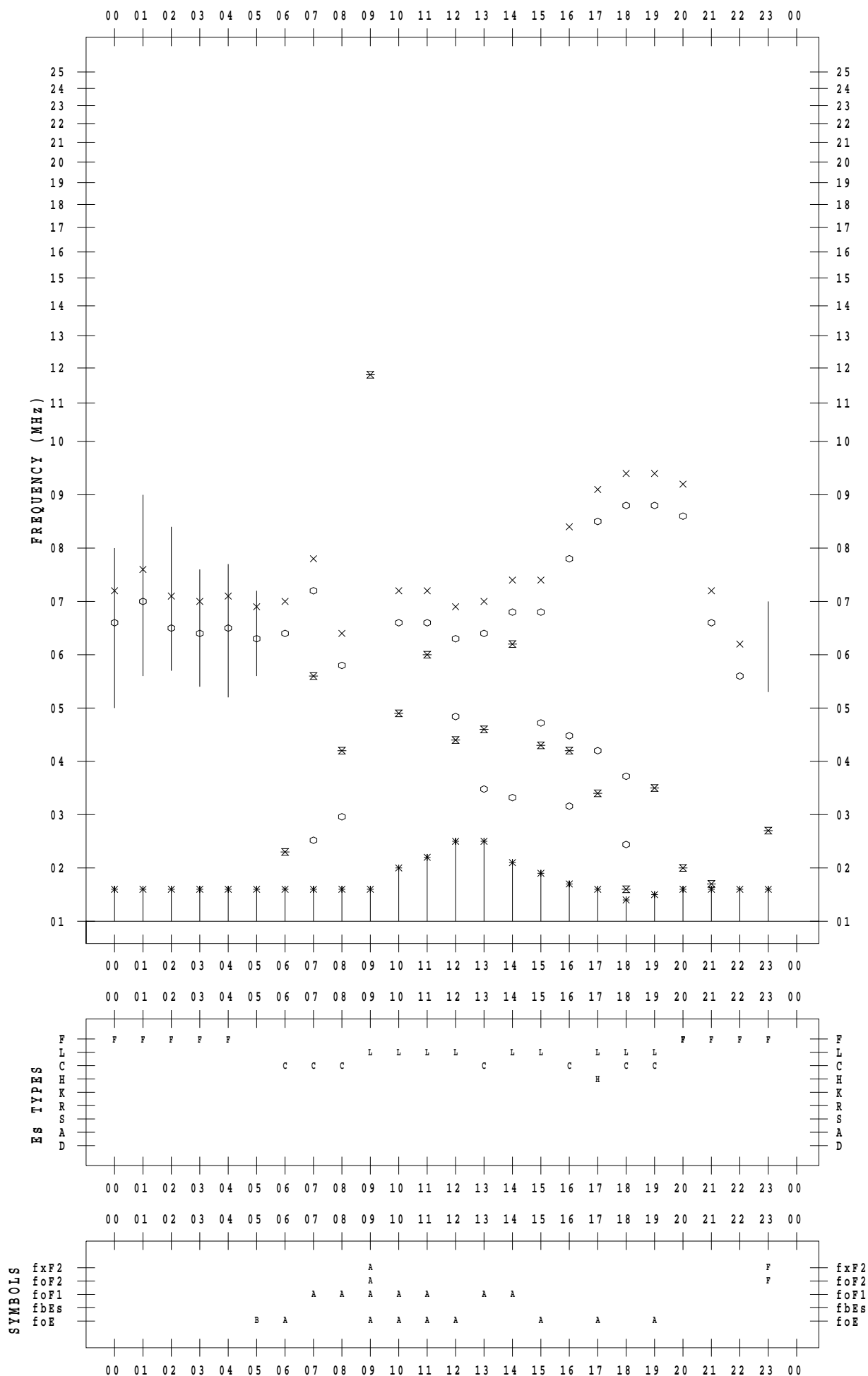
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 30

135 ° E MEAN TIME



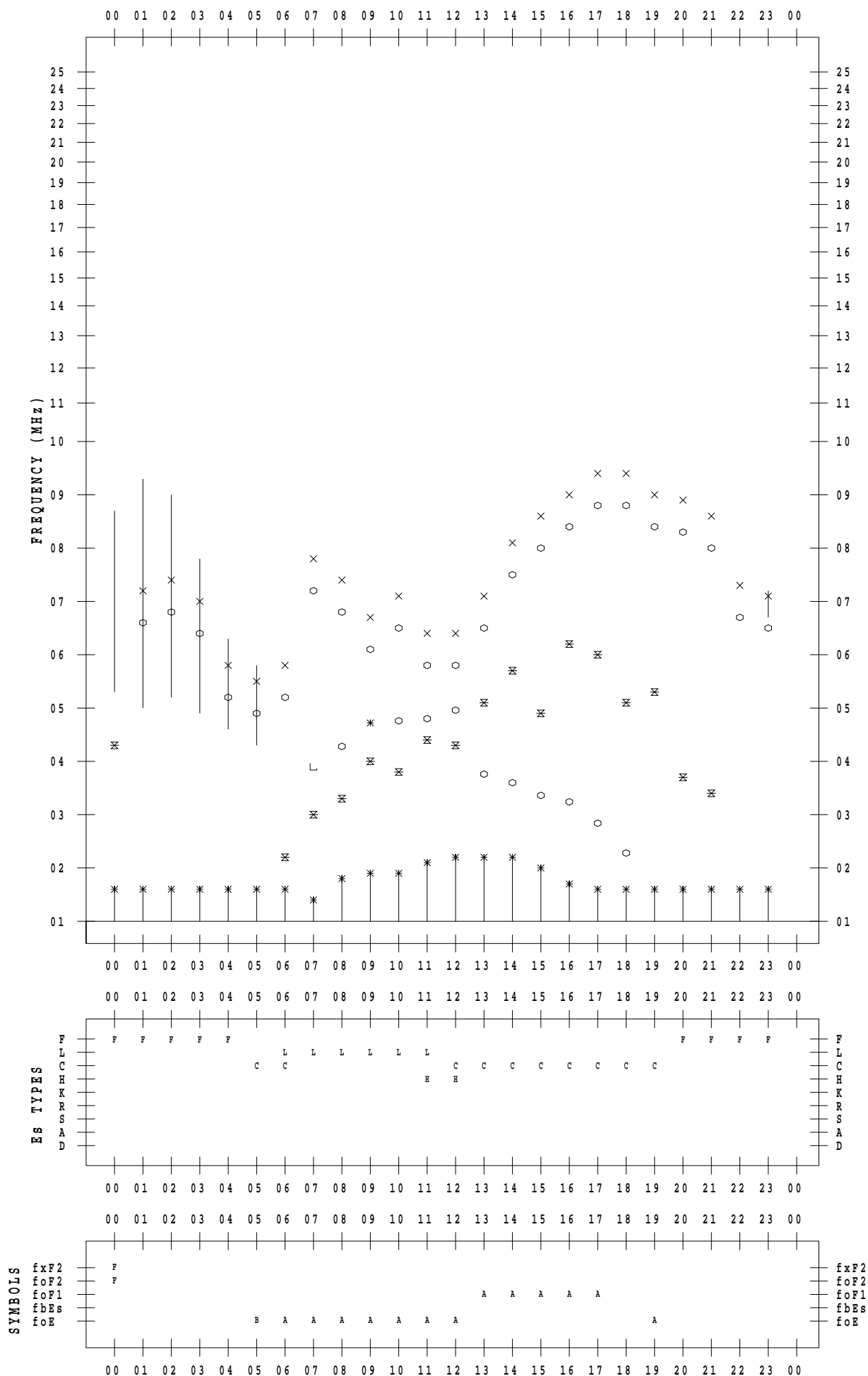
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2022 / 7 / 31

135 ° E MEAN TIME



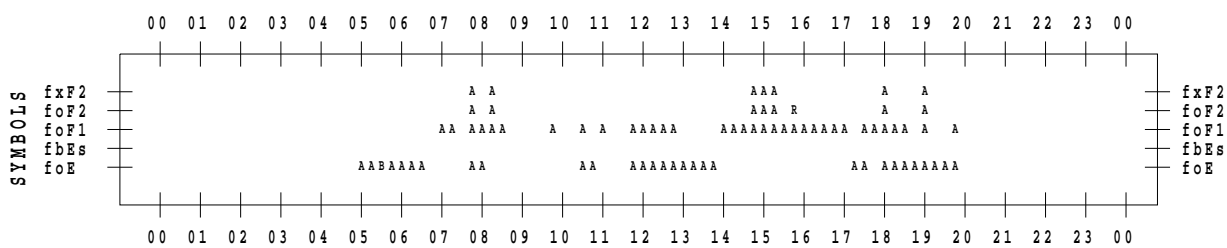
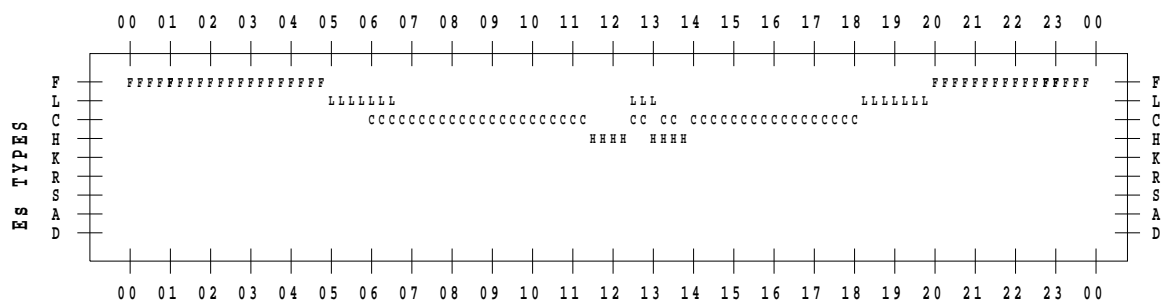
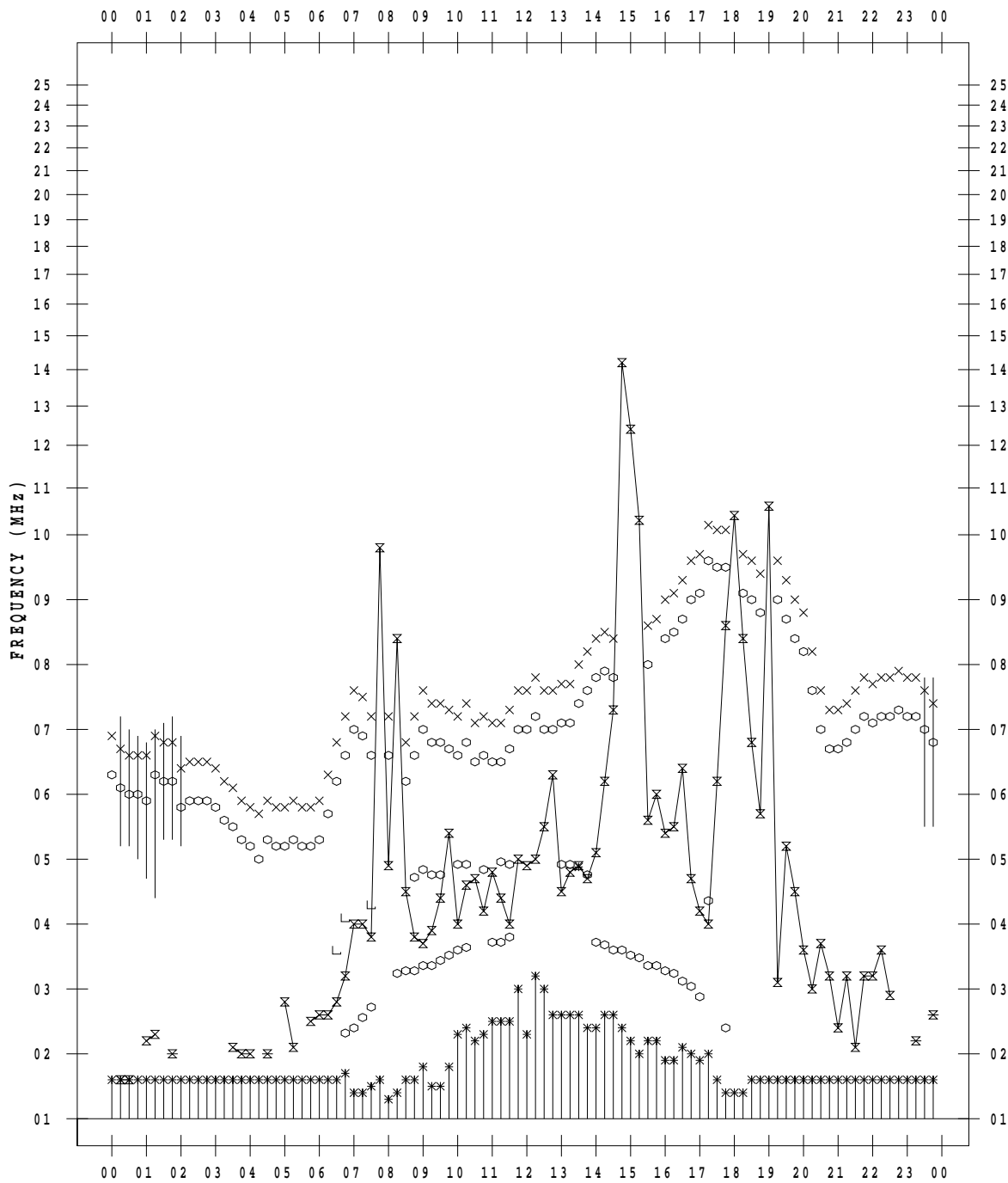
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 1

135 ° E MEAN TIME



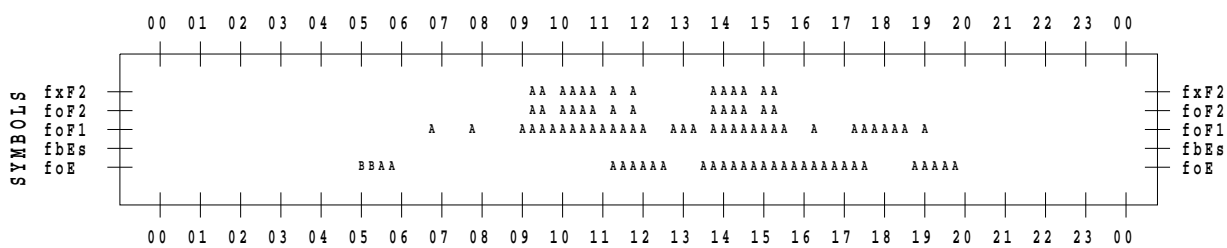
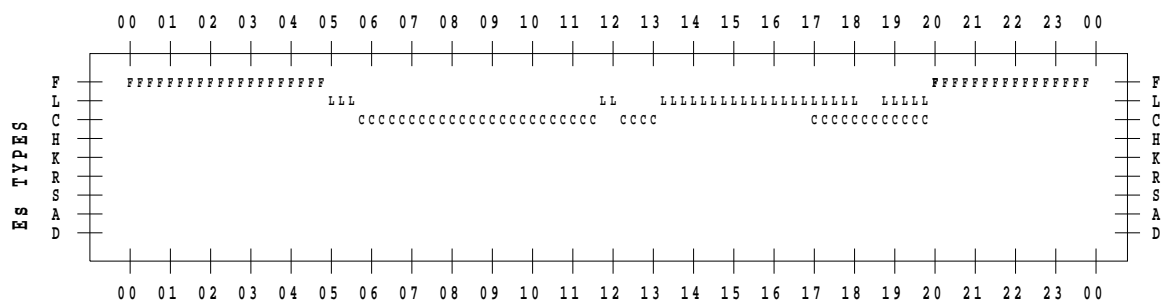
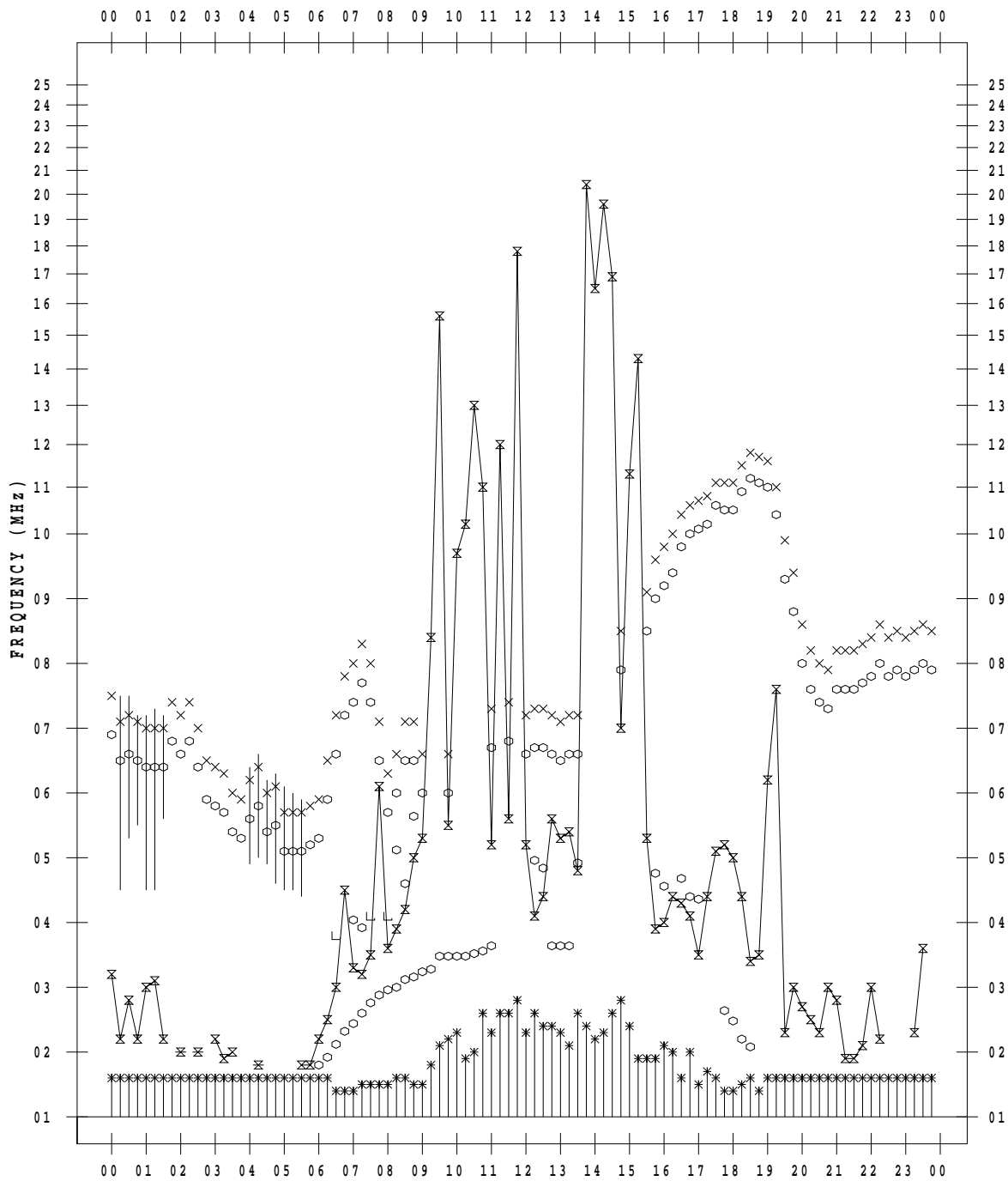
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 2

135 ° E MEAN TIME



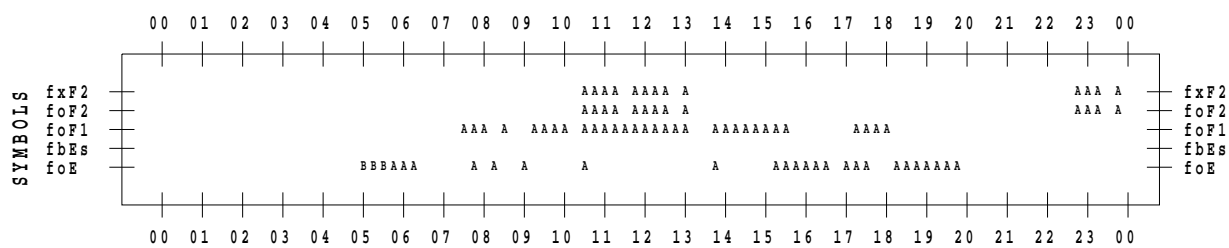
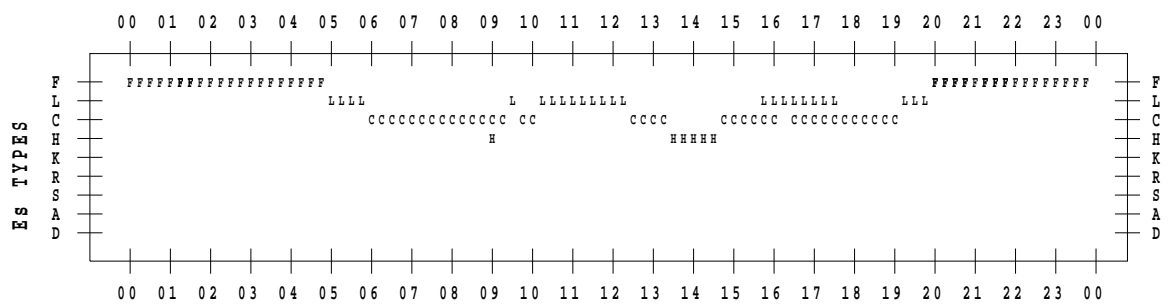
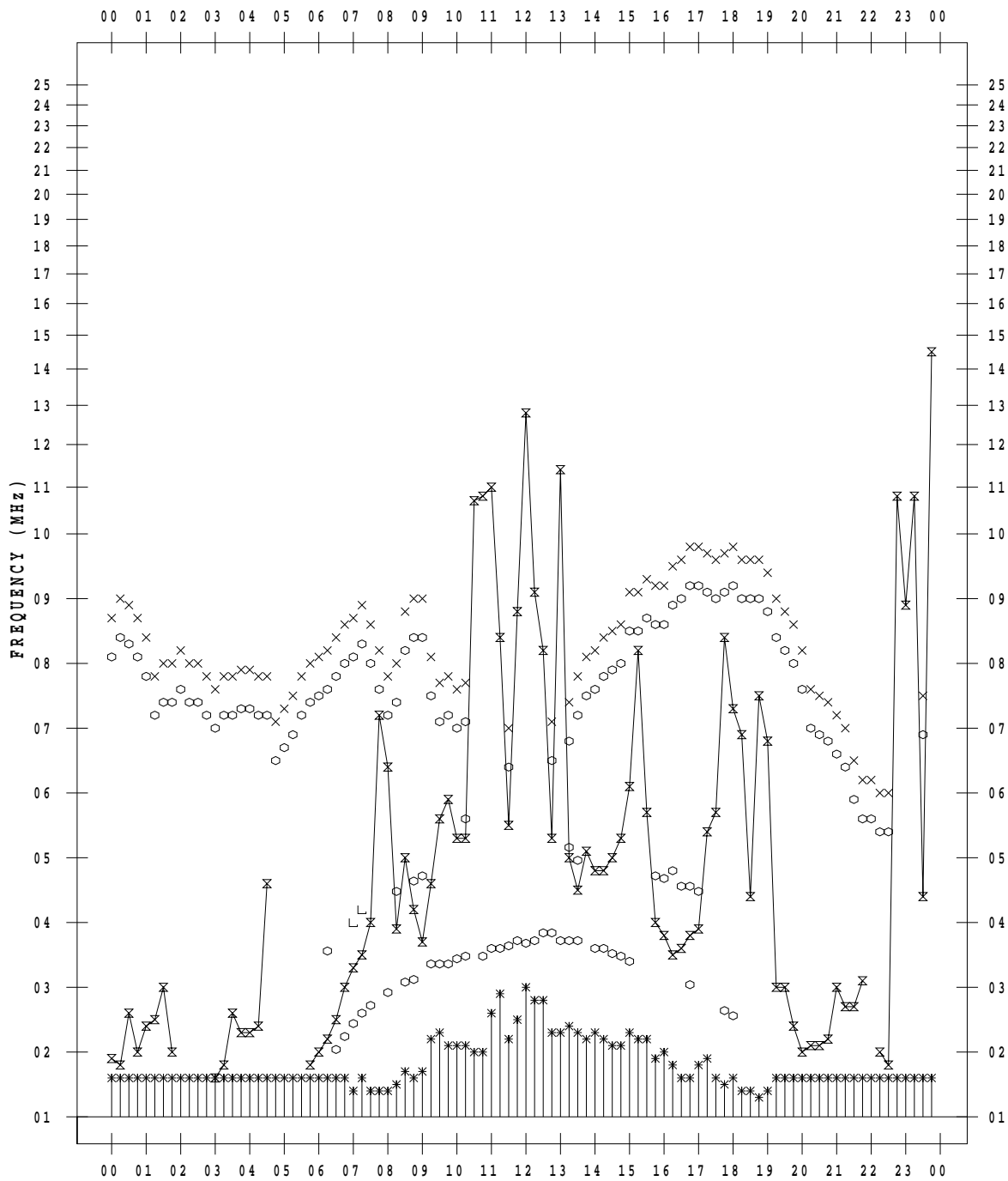
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 3

135 ° E MEAN TIME



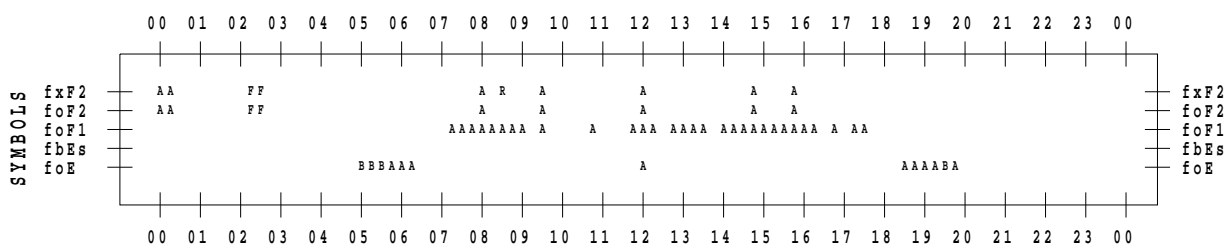
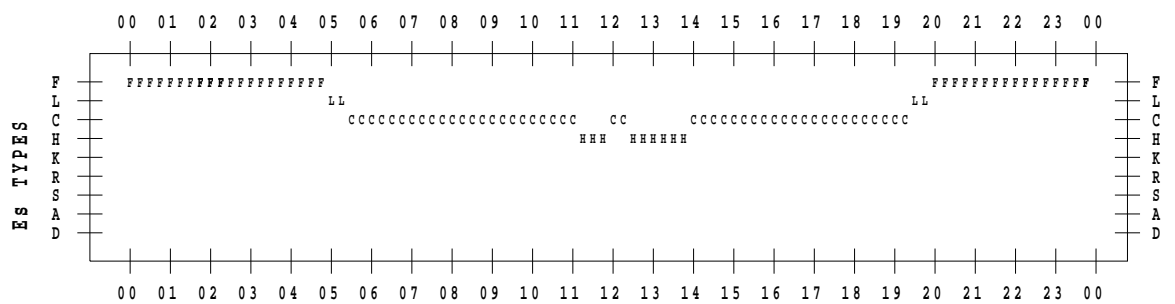
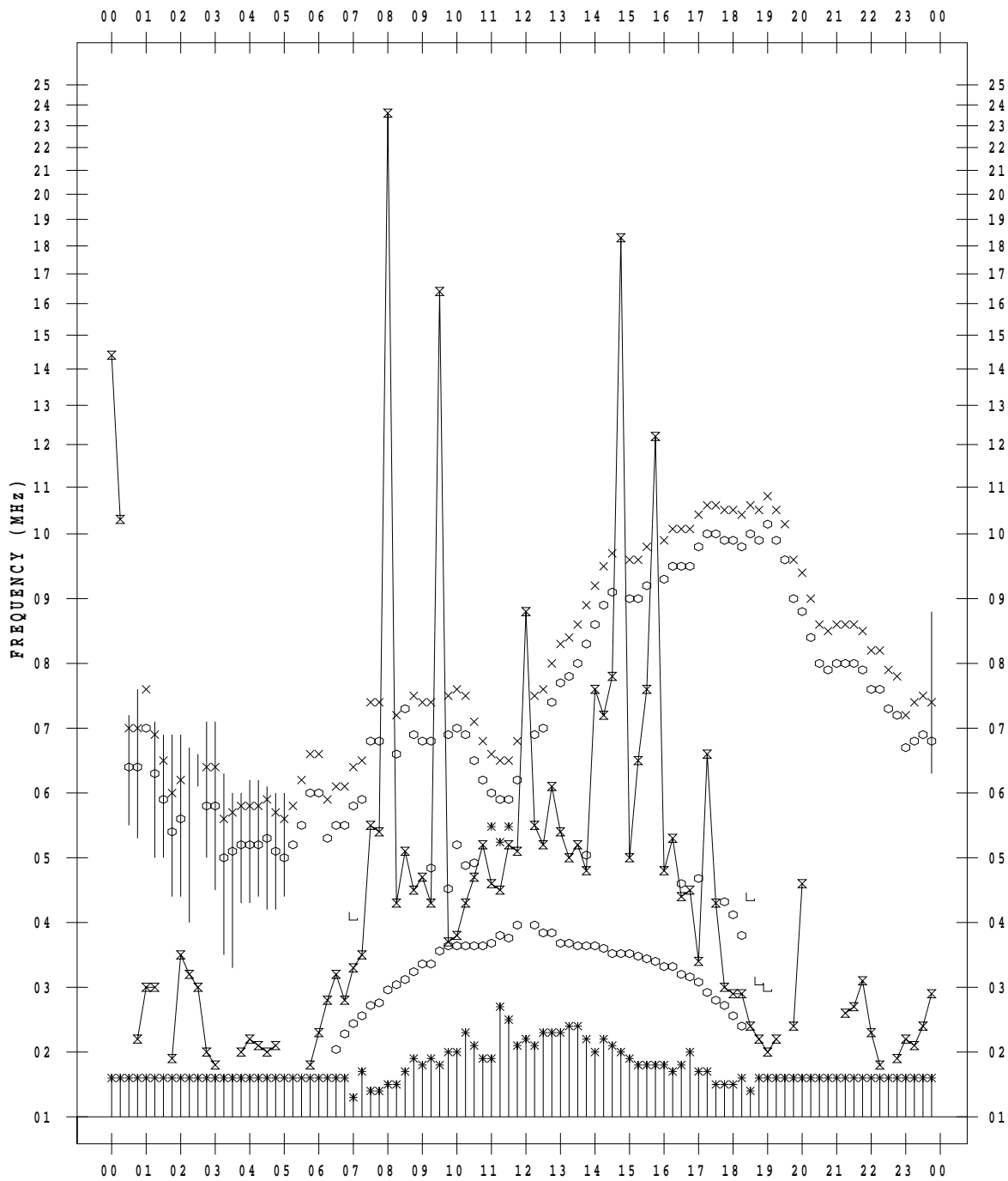
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 4

135 ° E MEAN TIME



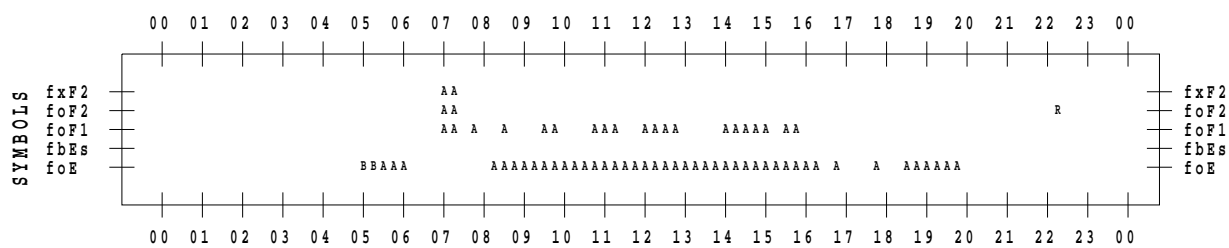
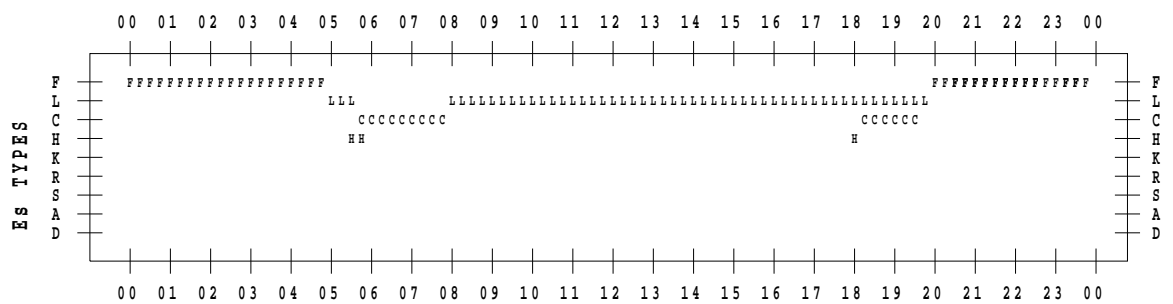
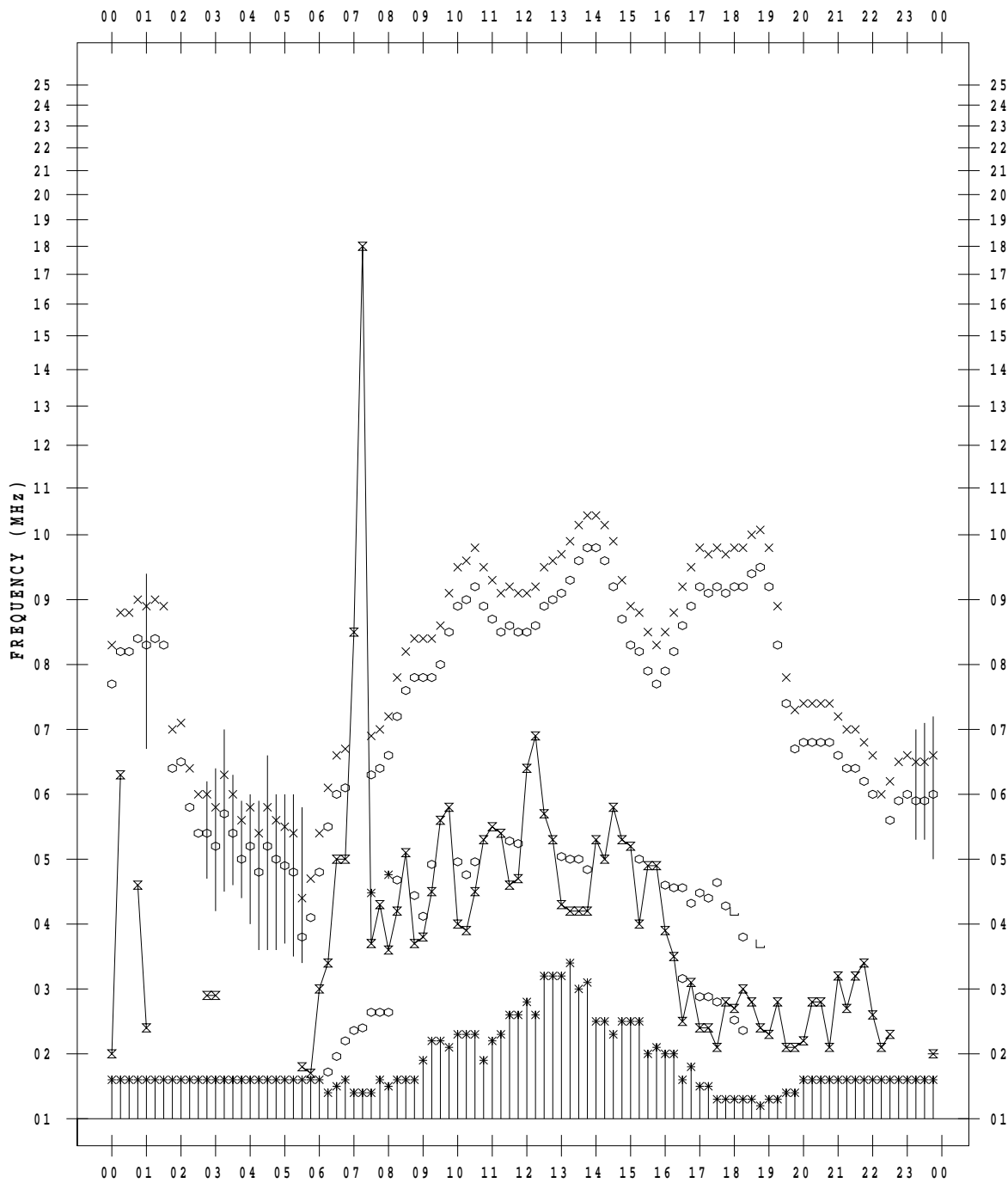
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 5

135 ° E MEAN TIME



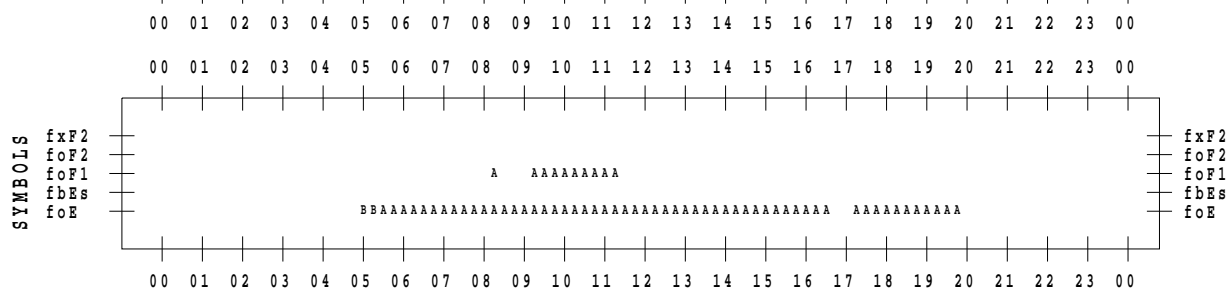
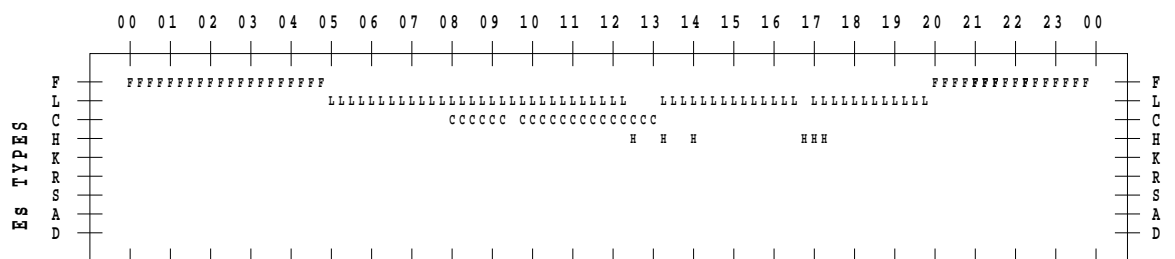
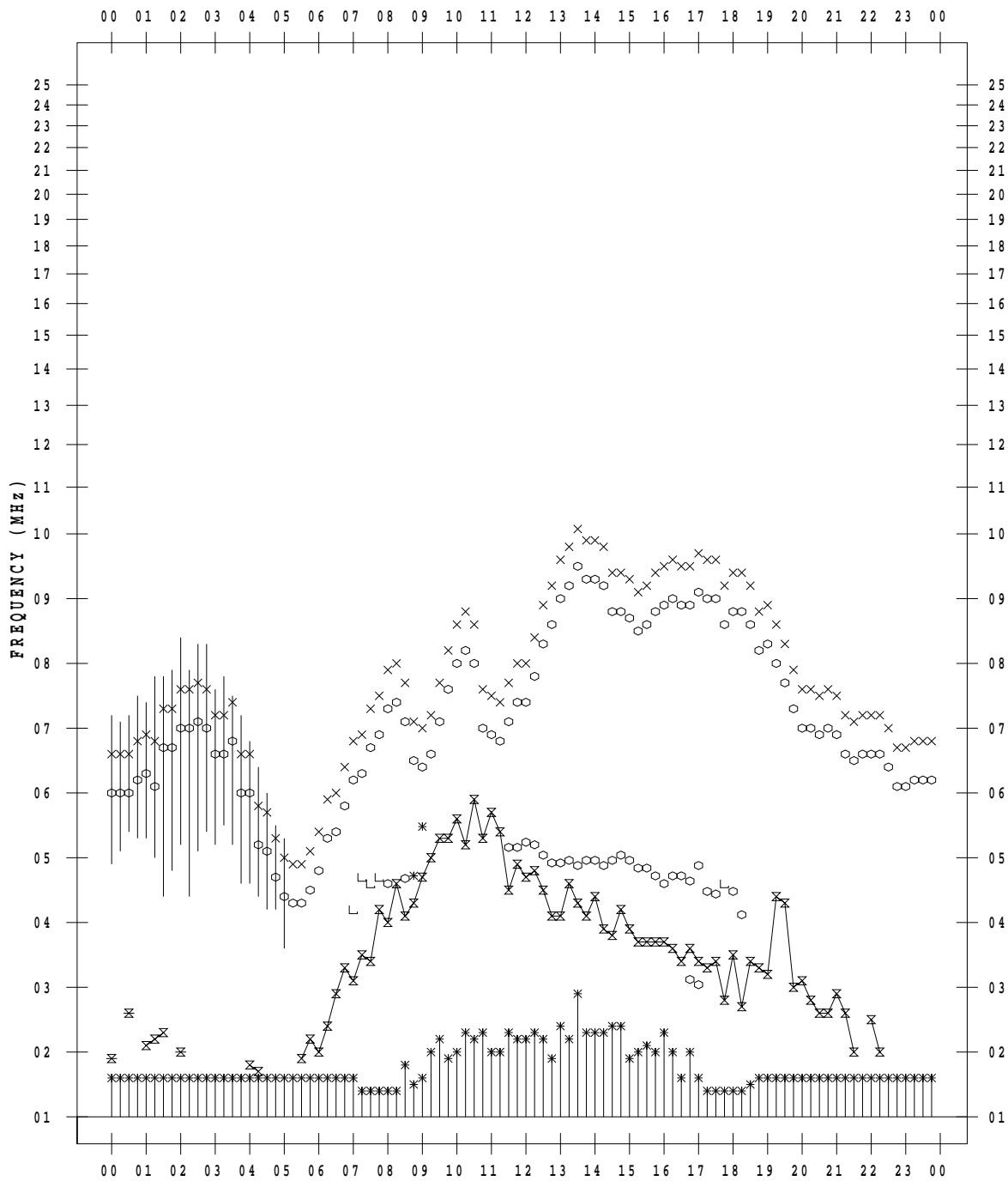
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 6

135 ° E MEAN TIME



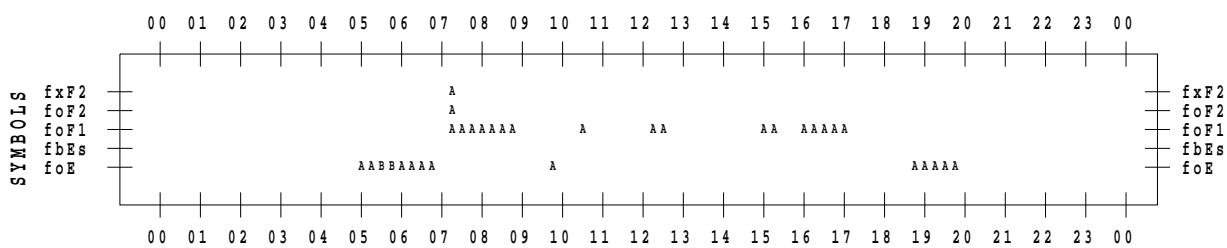
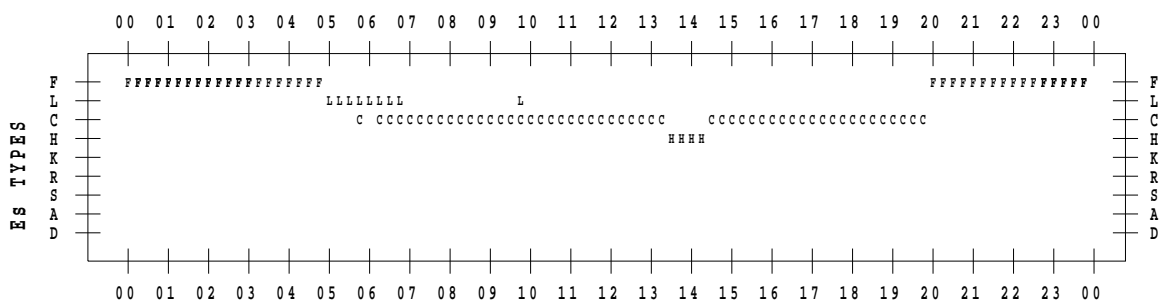
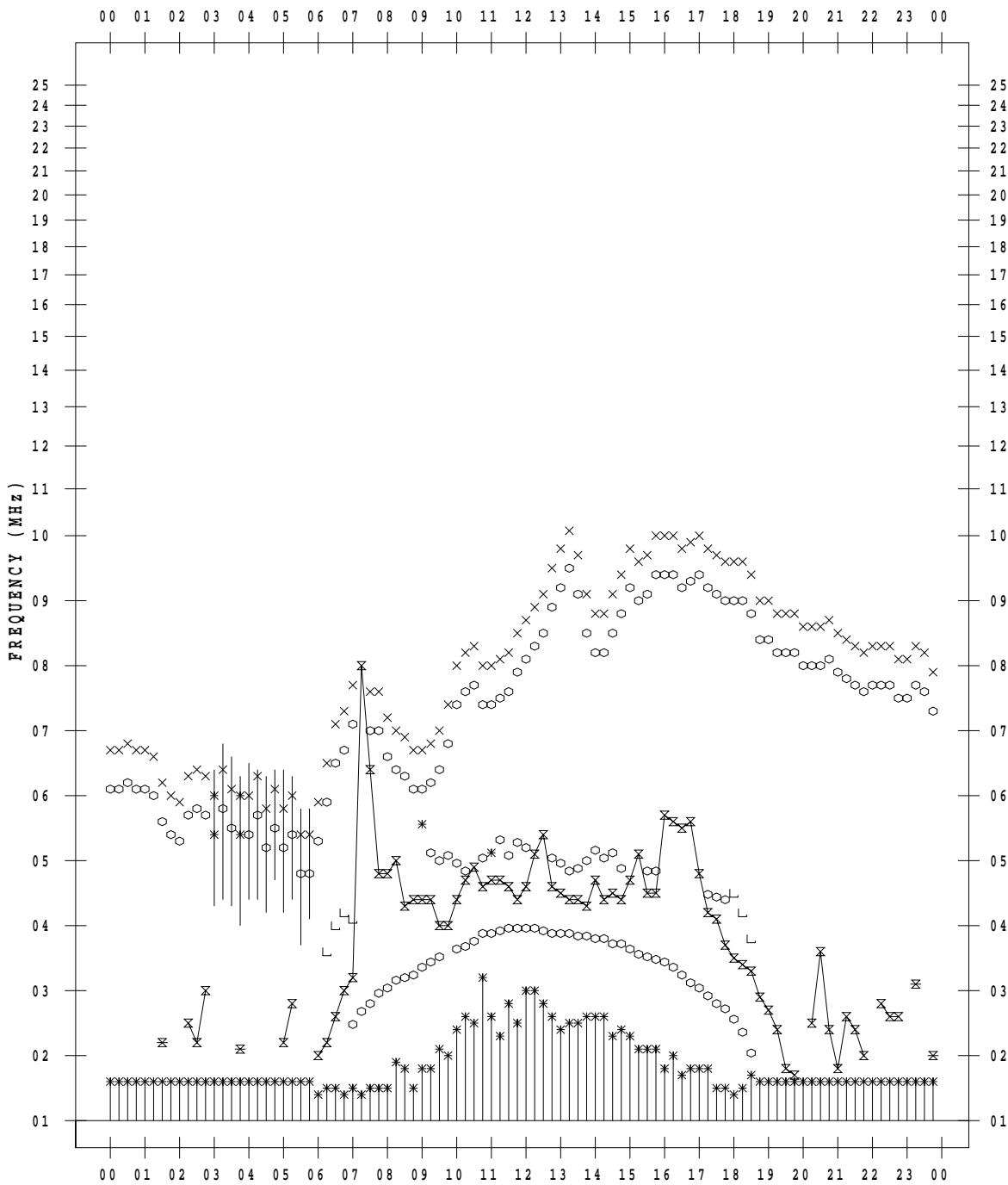
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 7

135 ° E MEAN TIME



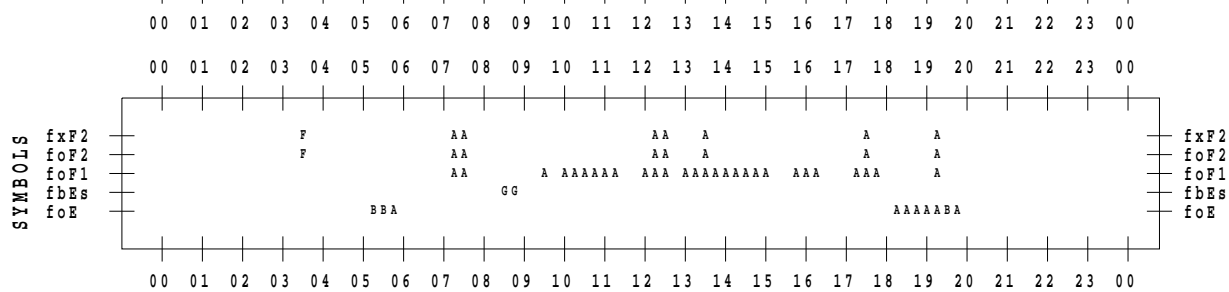
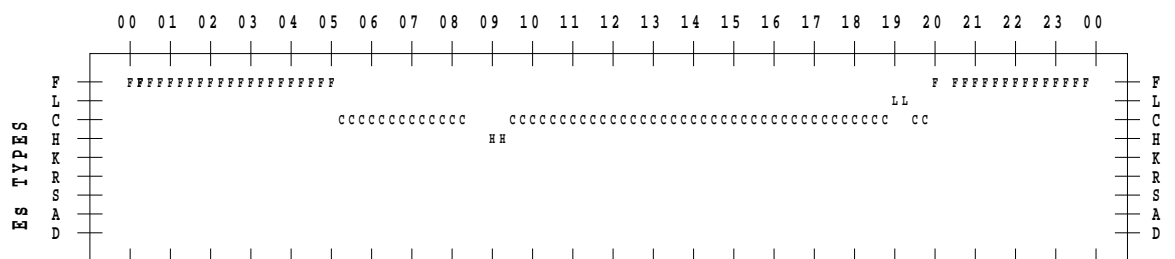
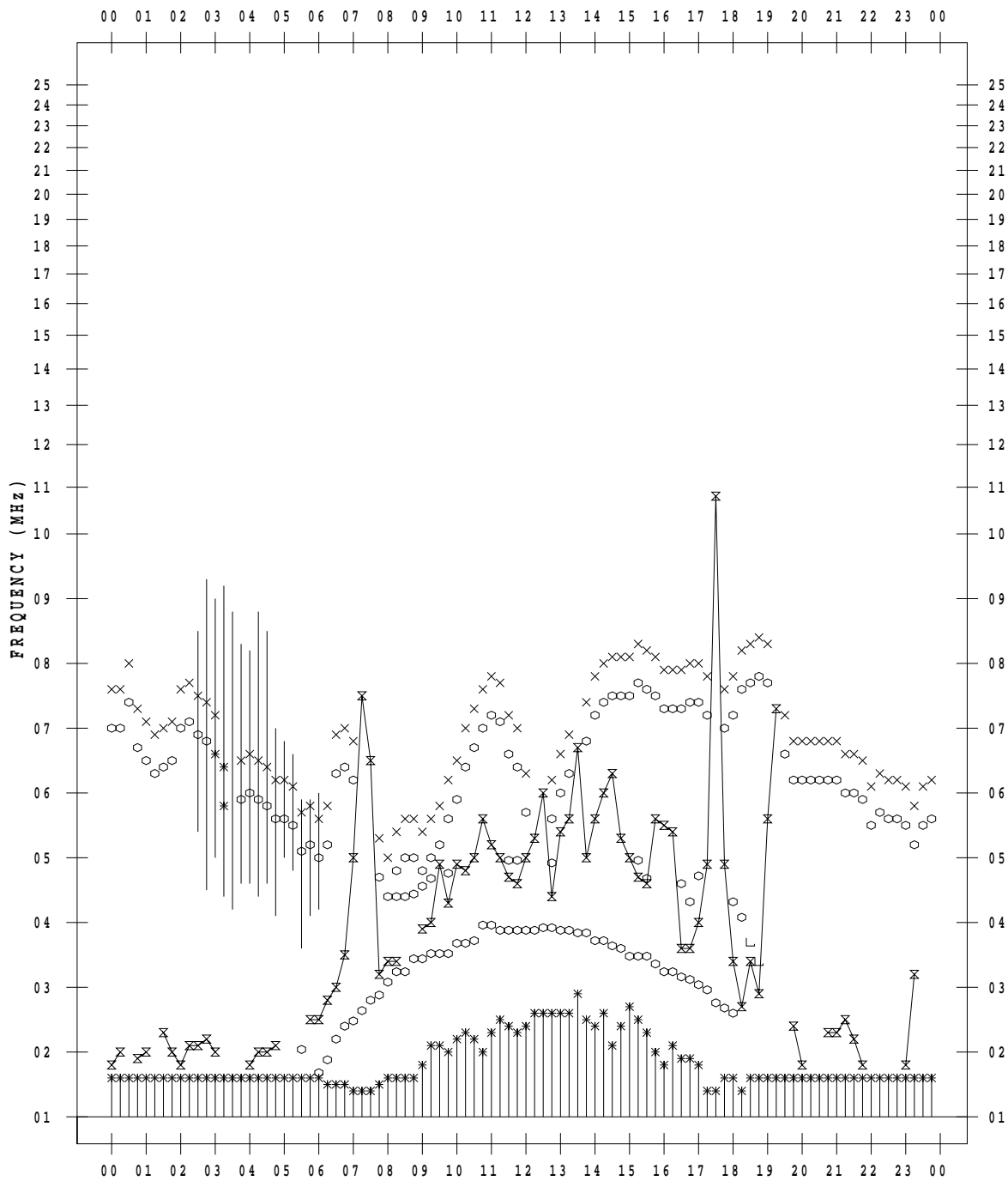
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 8

135 ° E MEAN TIME



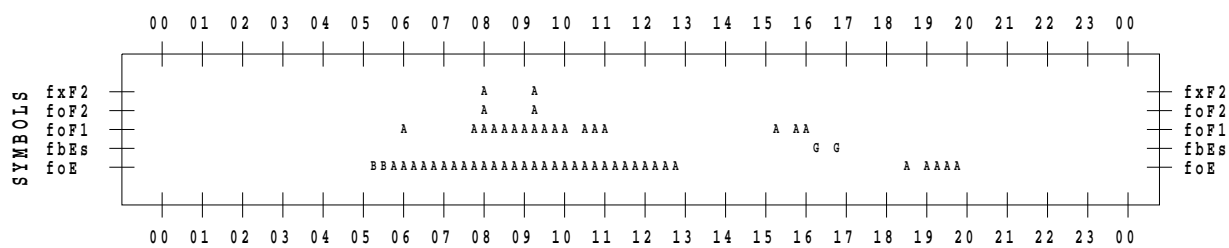
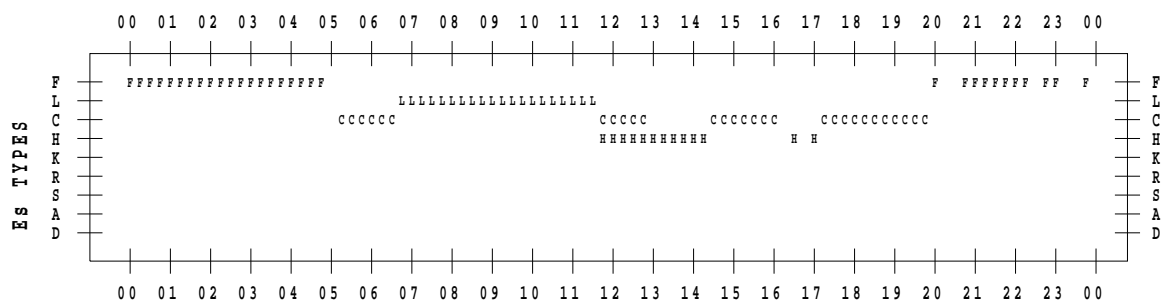
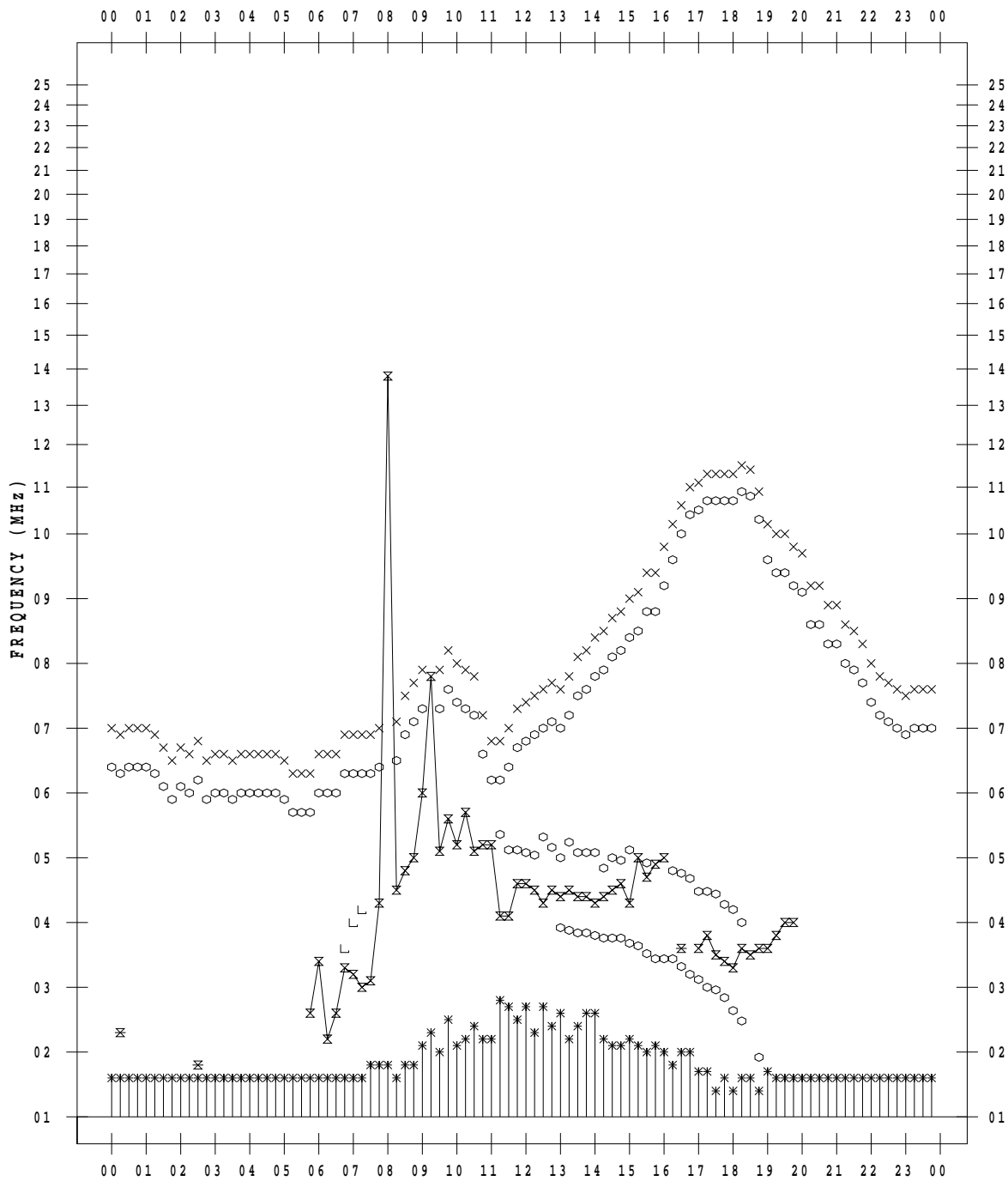
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 10

135 ° E MEAN TIME



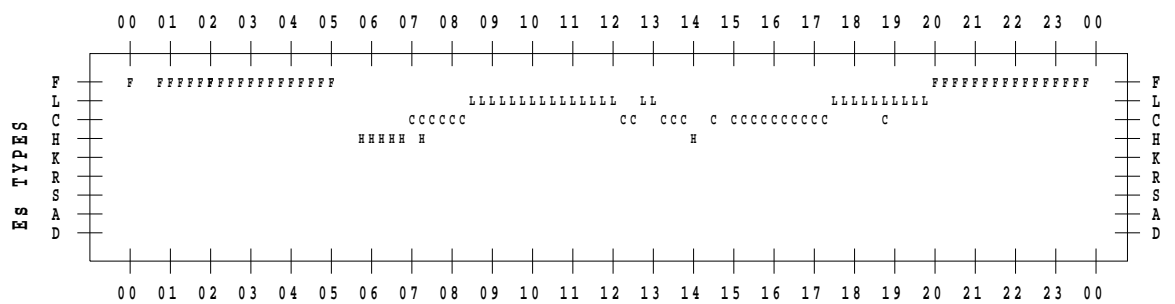
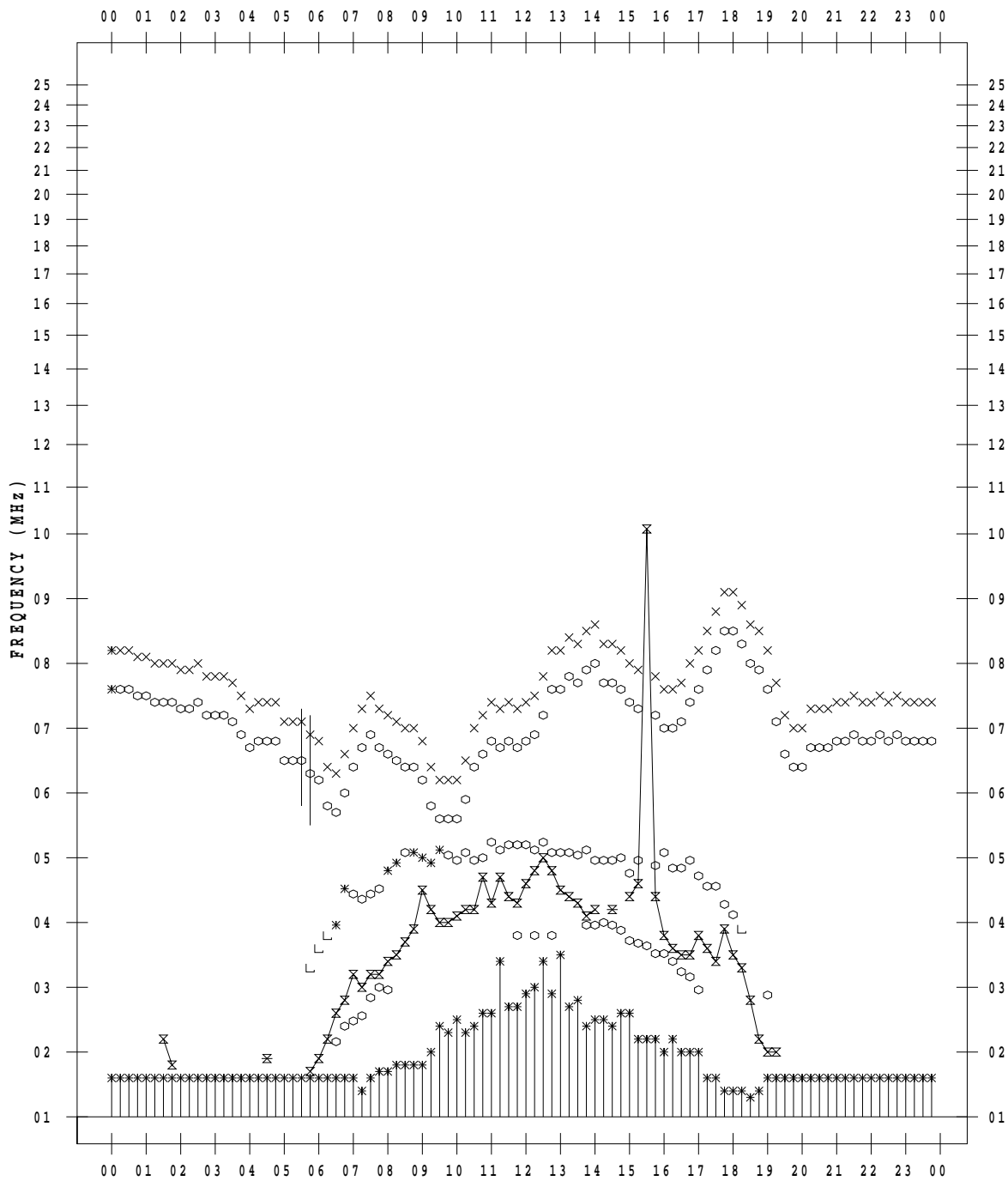
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 12

135 ° E MEAN TIME



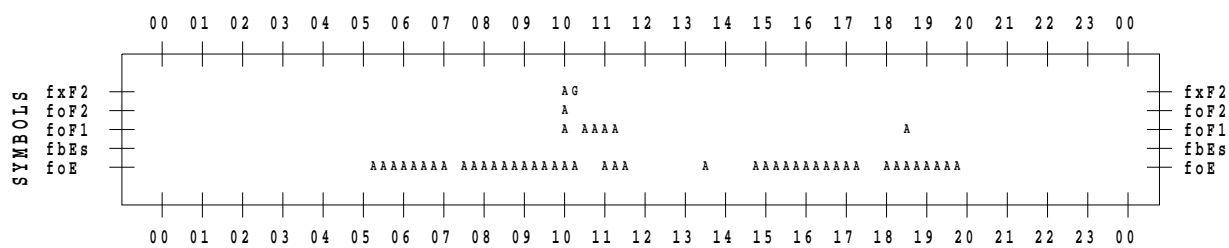
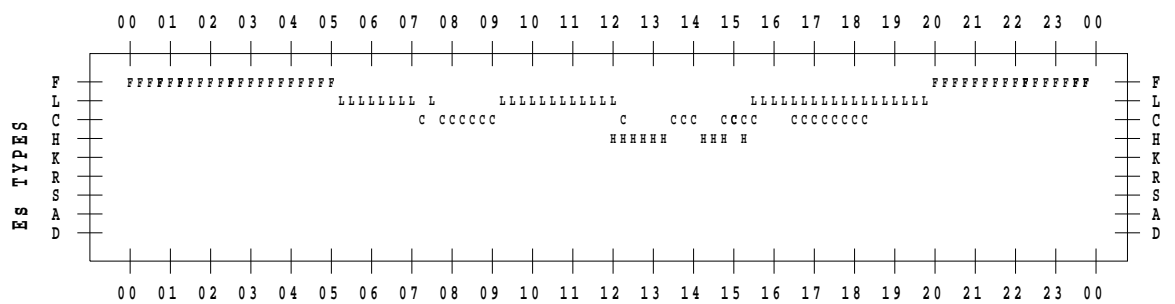
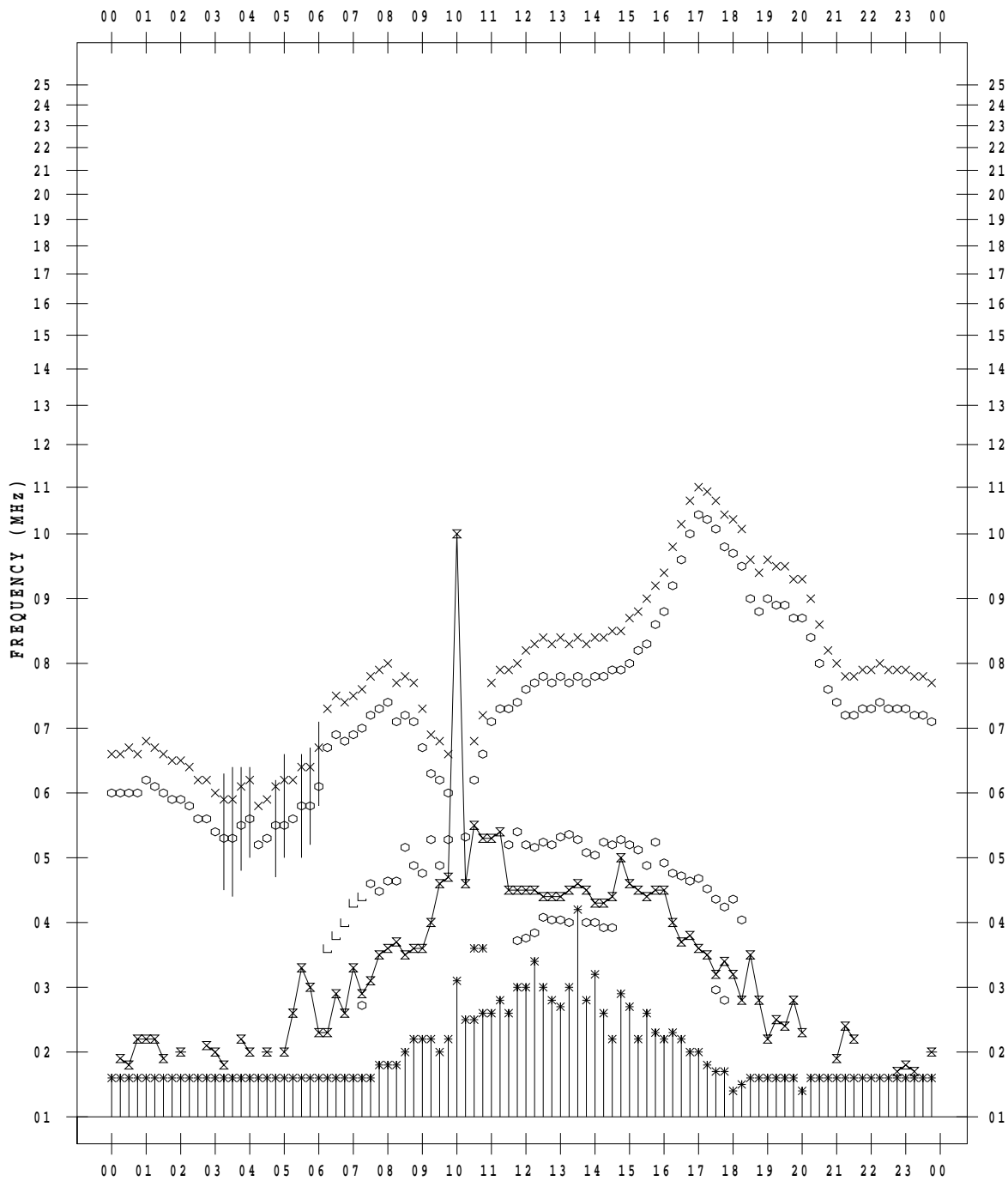
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 14

135 ° E MEAN TIME



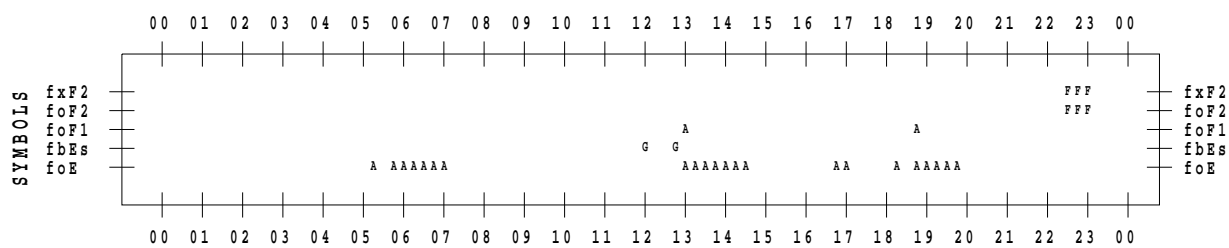
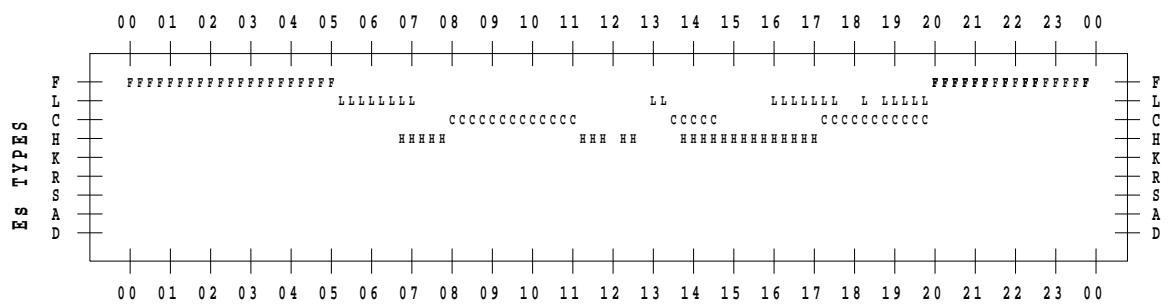
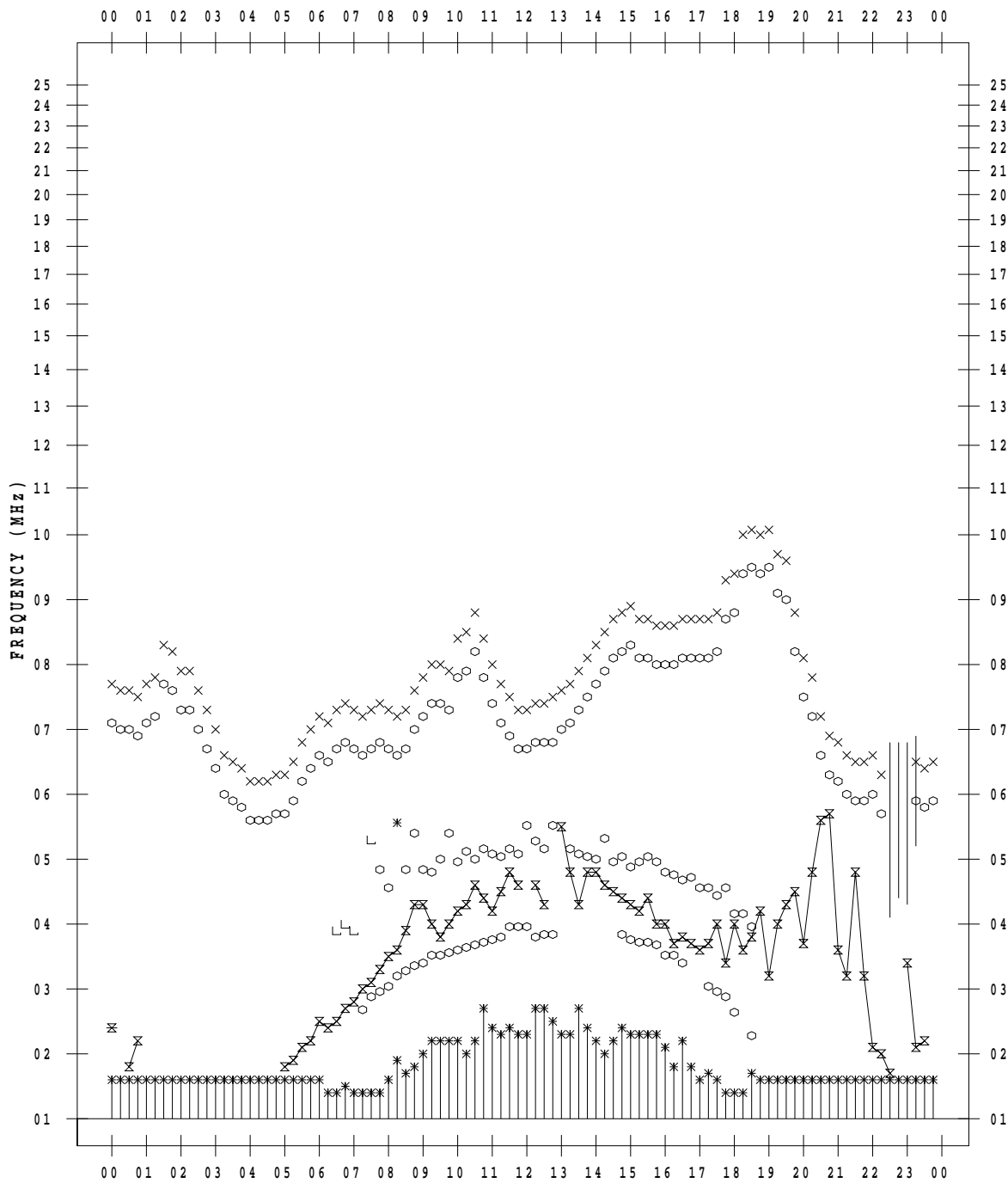
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 15

135 ° E MEAN TIME



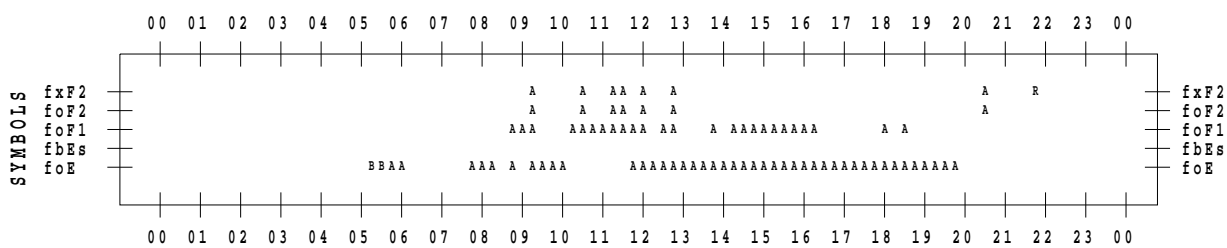
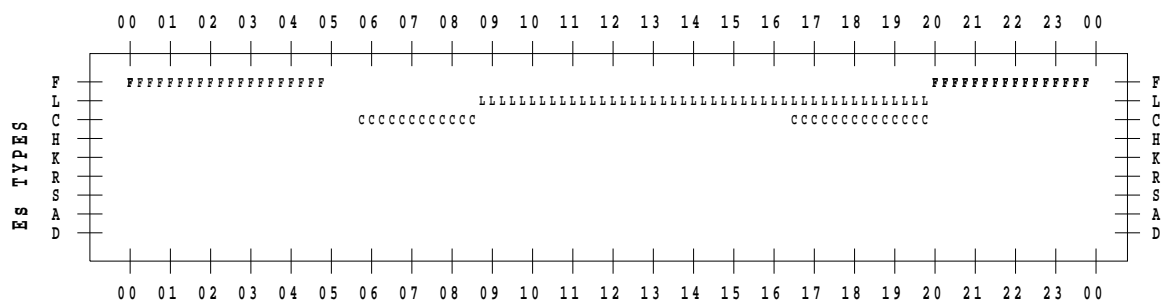
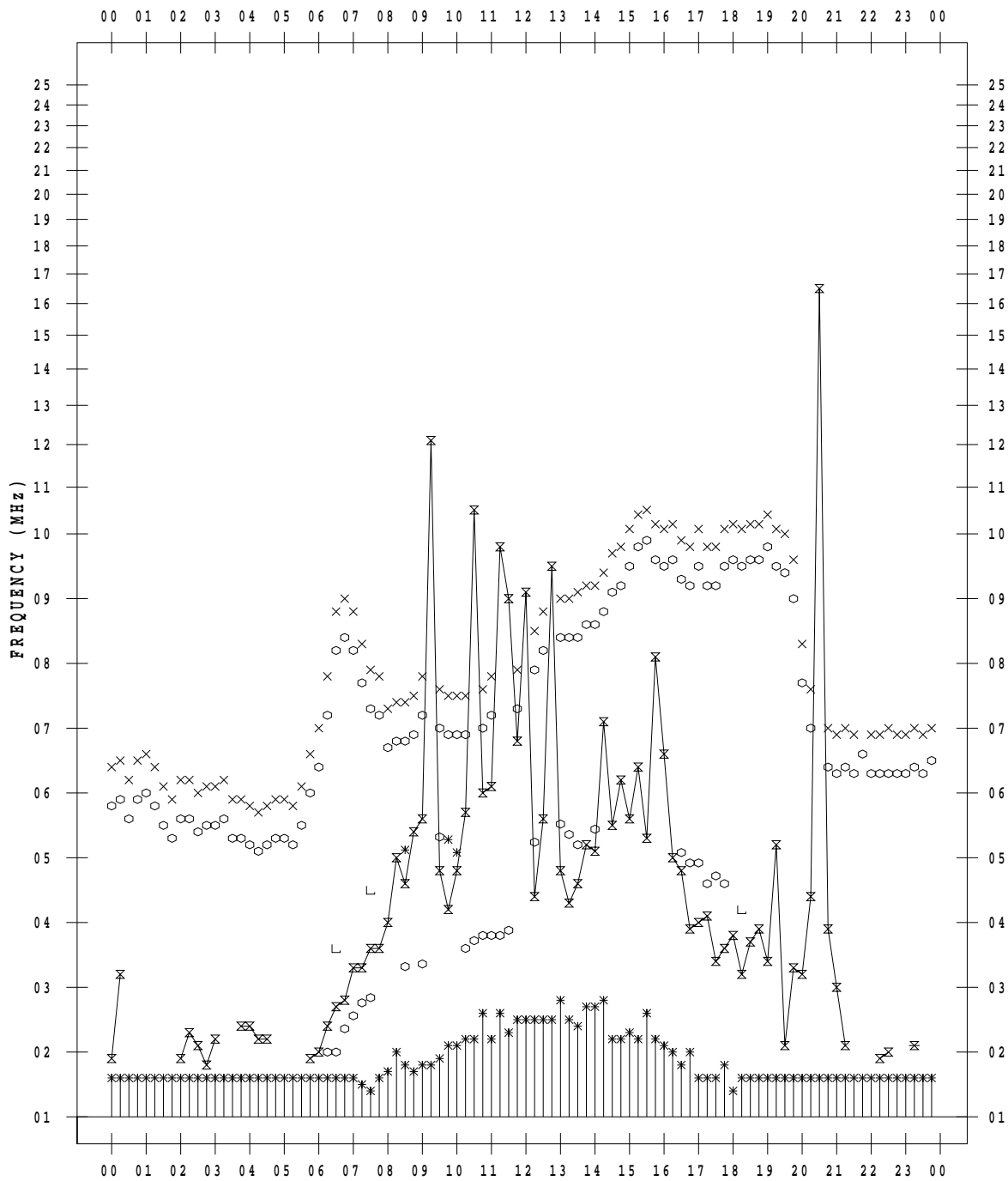
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 16

135 ° E MEAN TIME



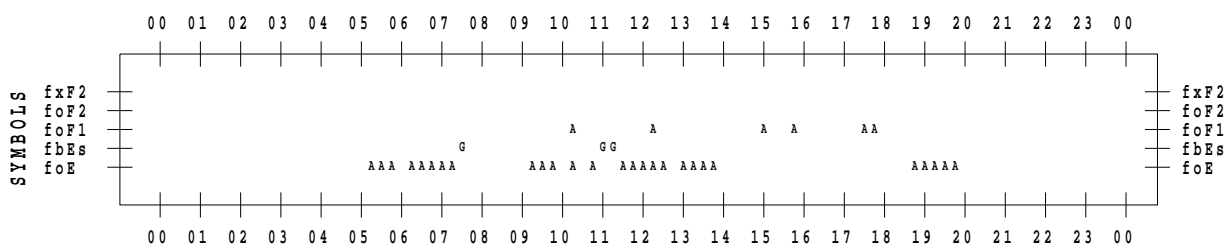
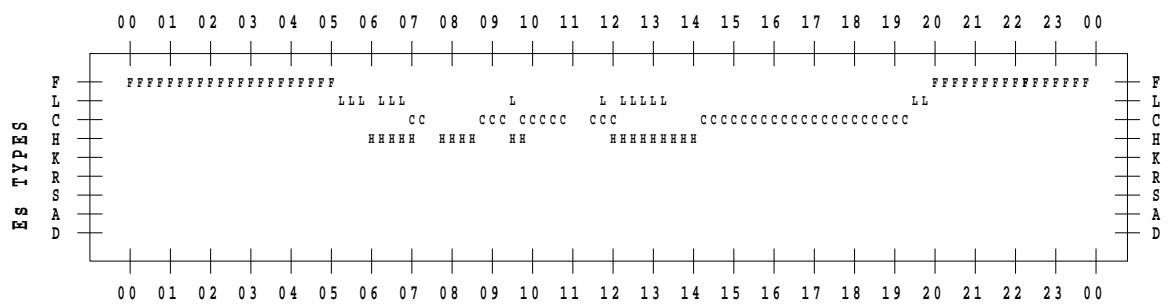
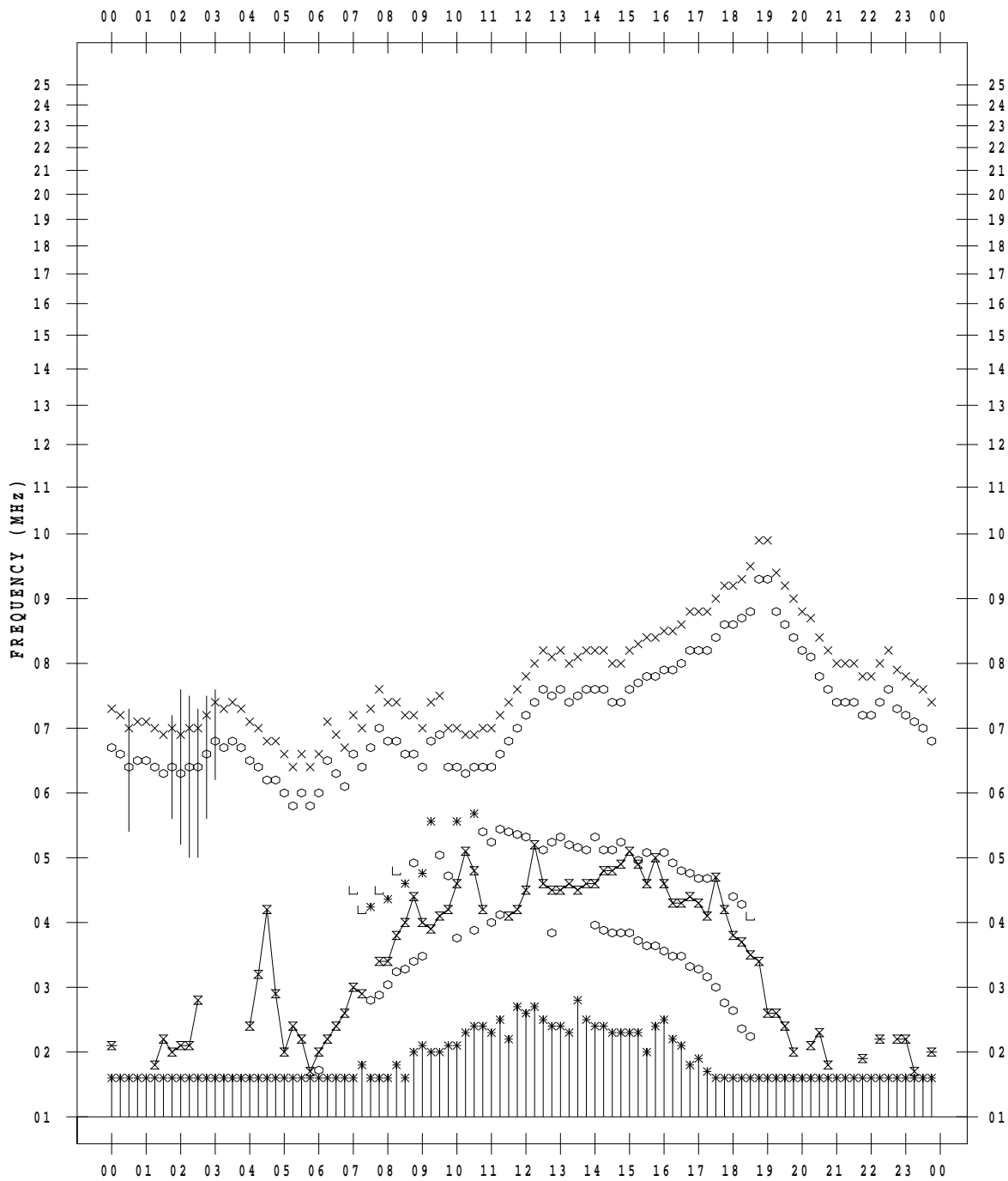
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 18

135 ° E MEAN TIME



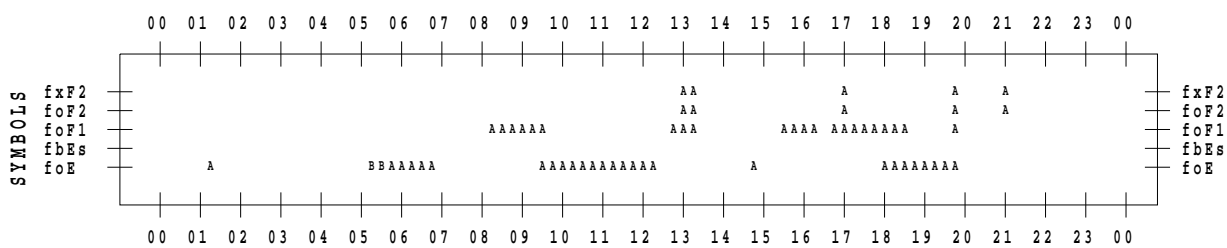
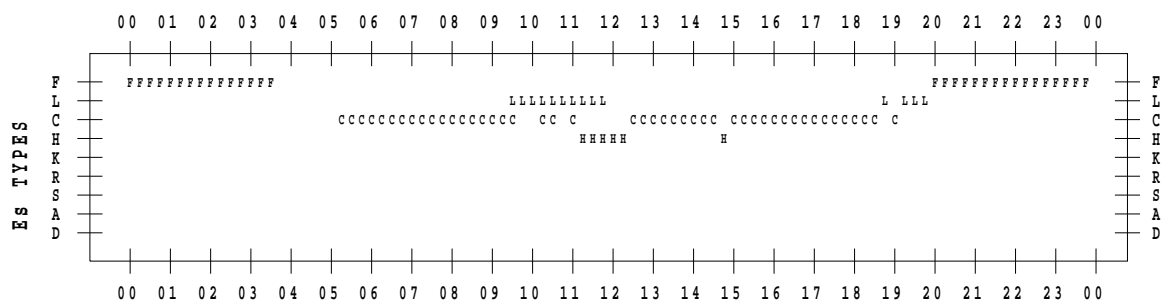
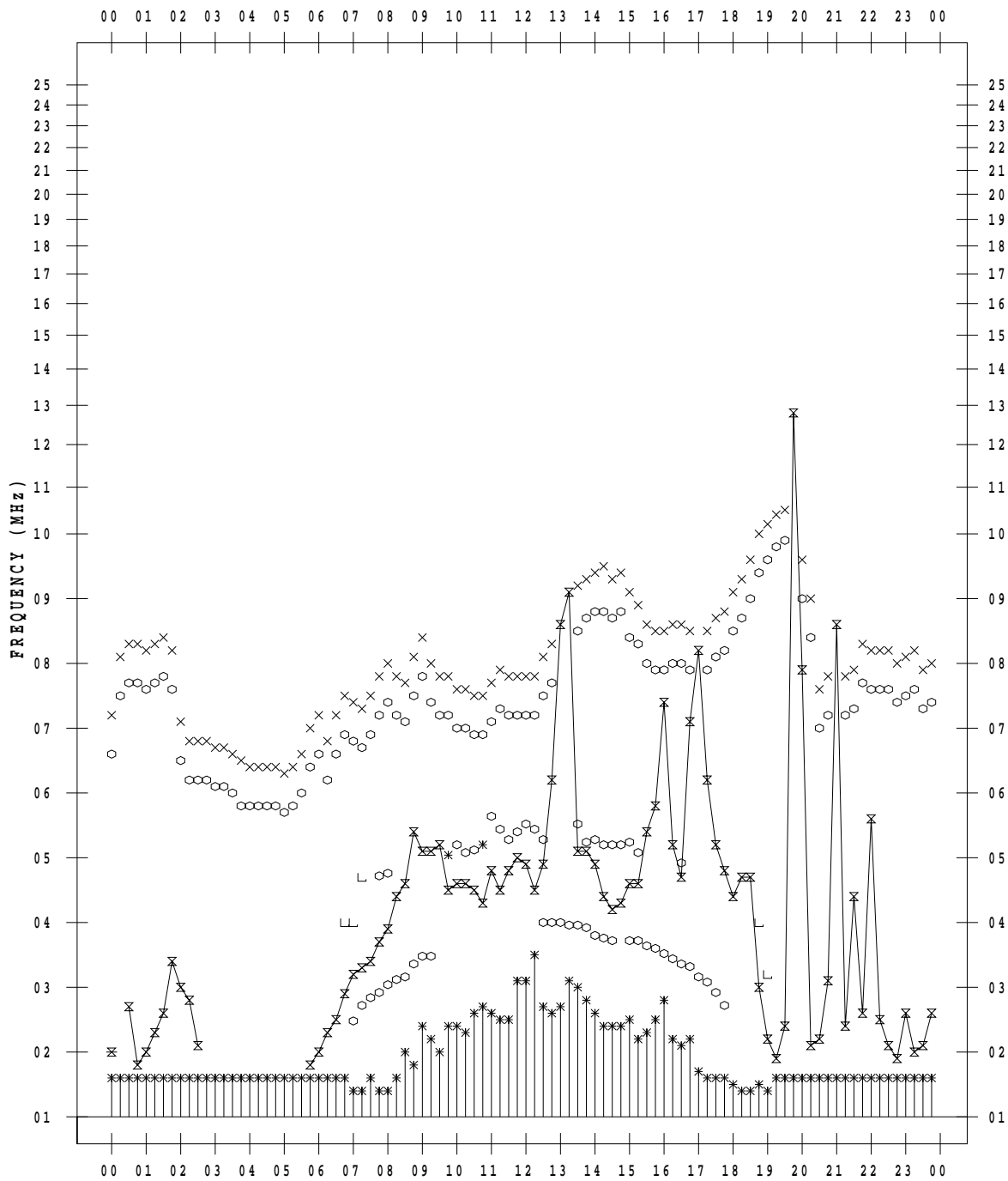
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 19

135 ° E MEAN TIME



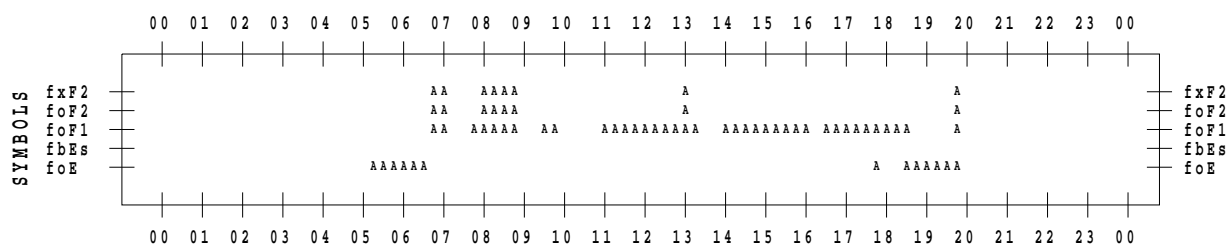
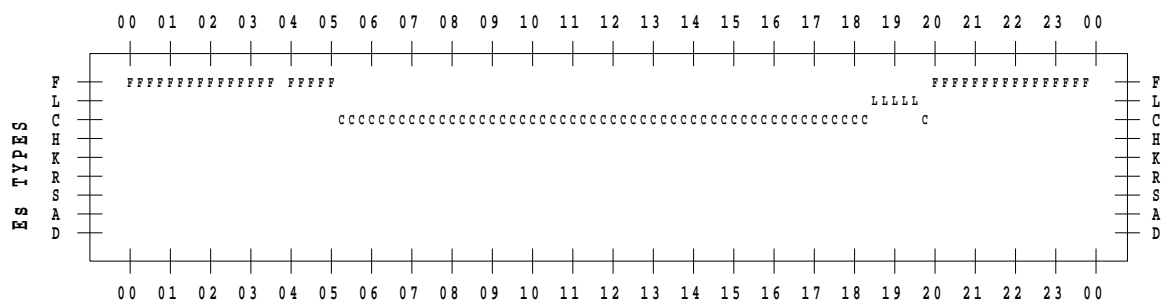
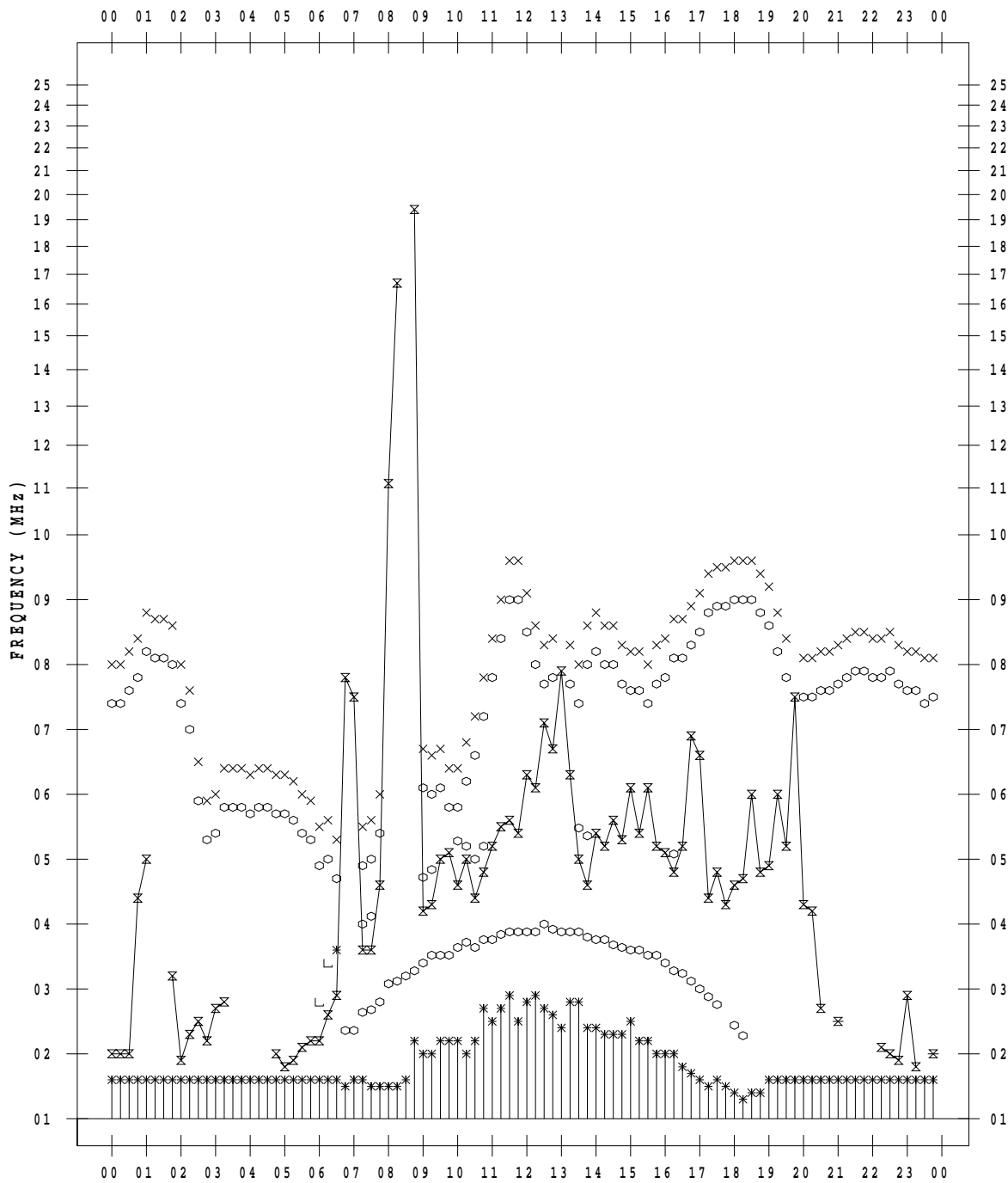
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 20

135 ° E MEAN TIME



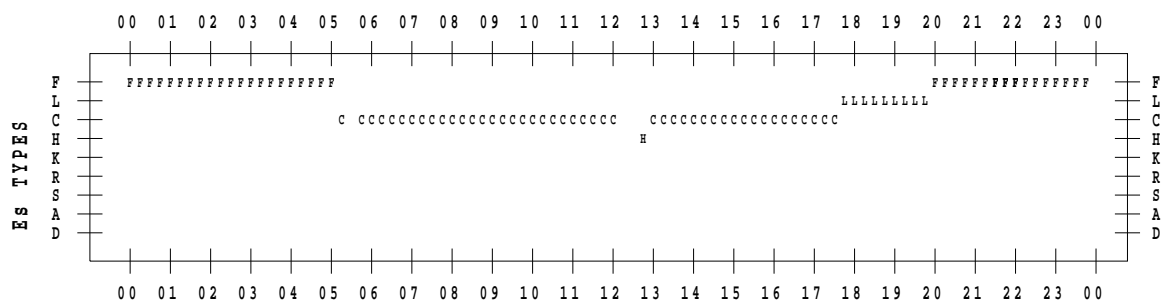
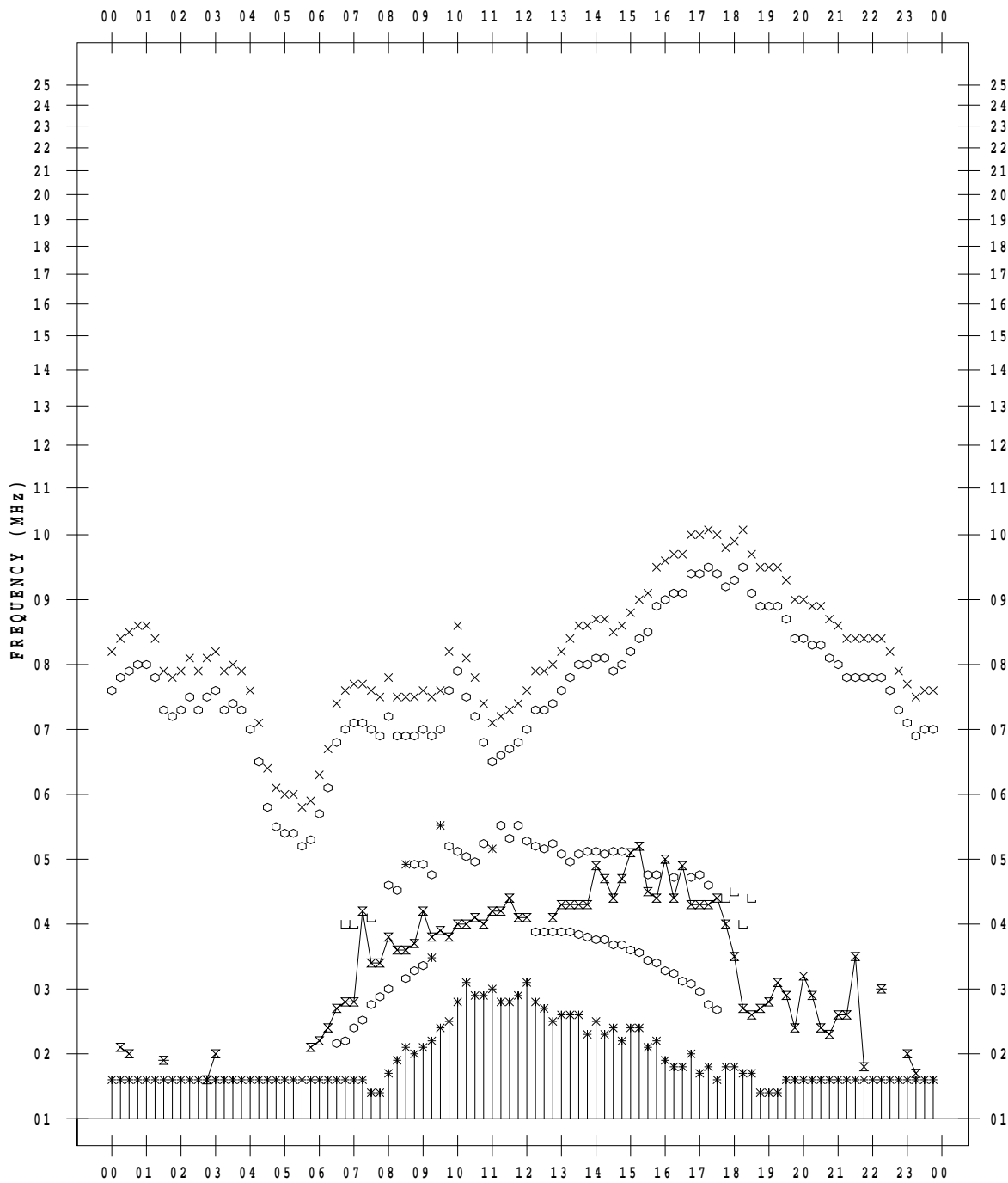
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 21

135 ° E MEAN TIME



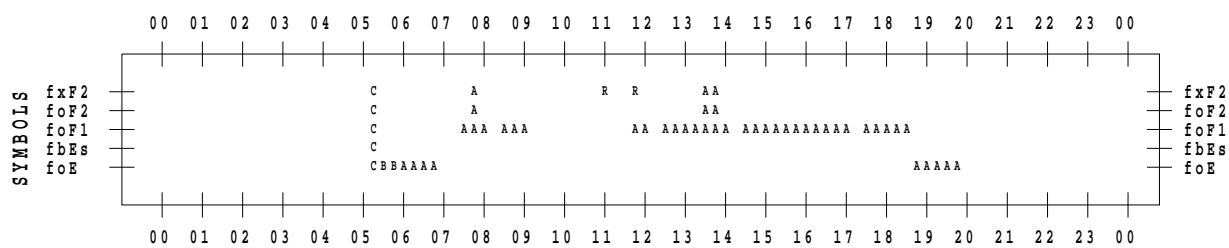
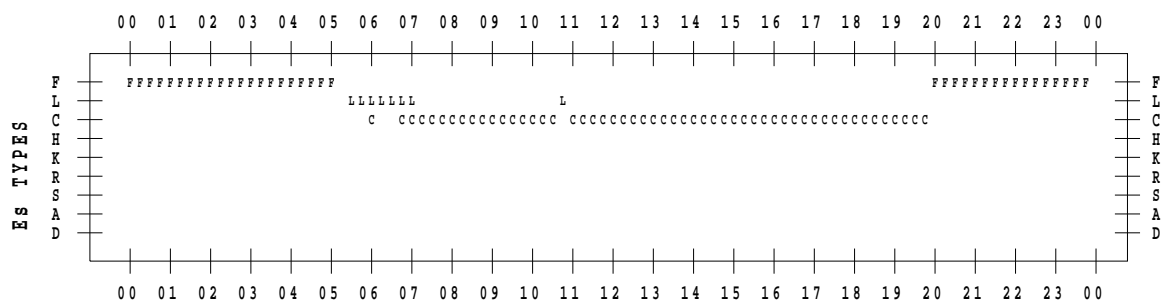
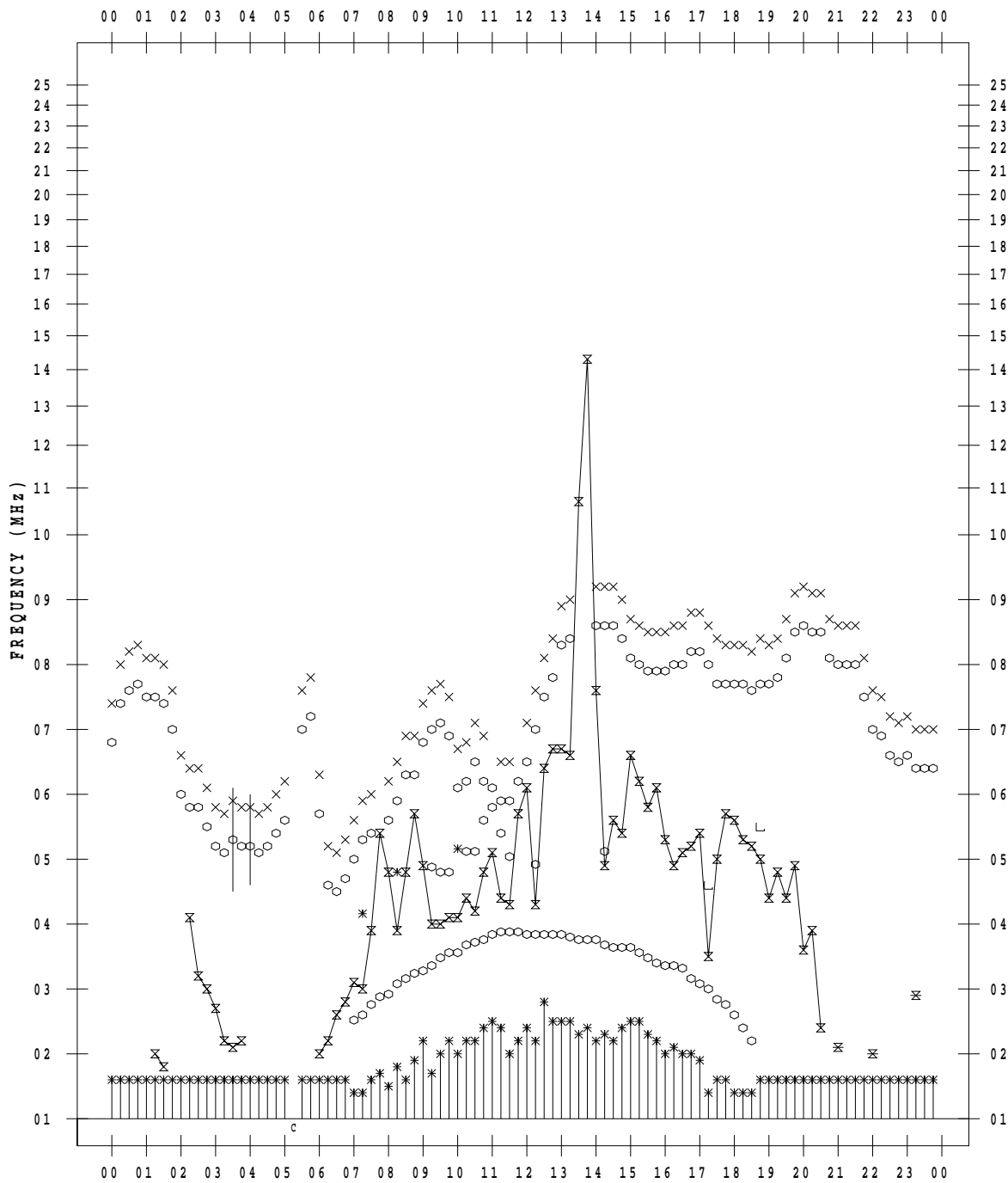
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 22

135 ° E MEAN TIME



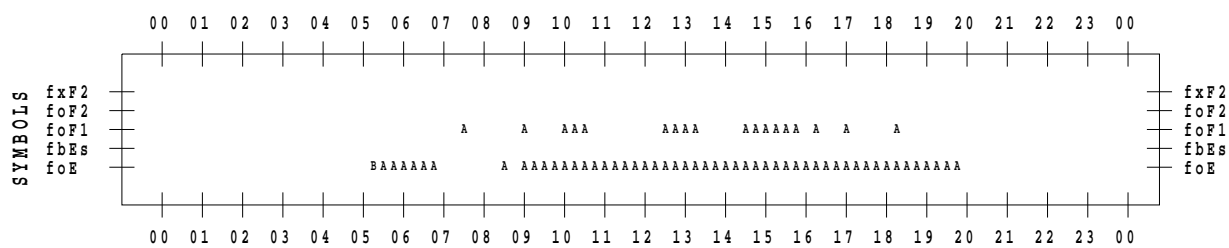
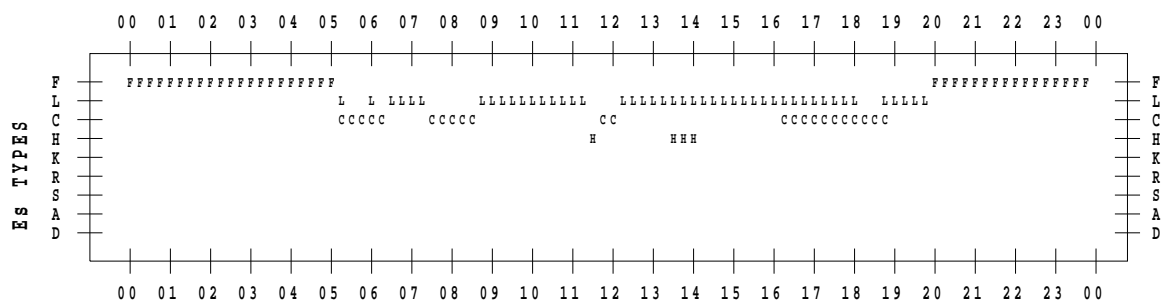
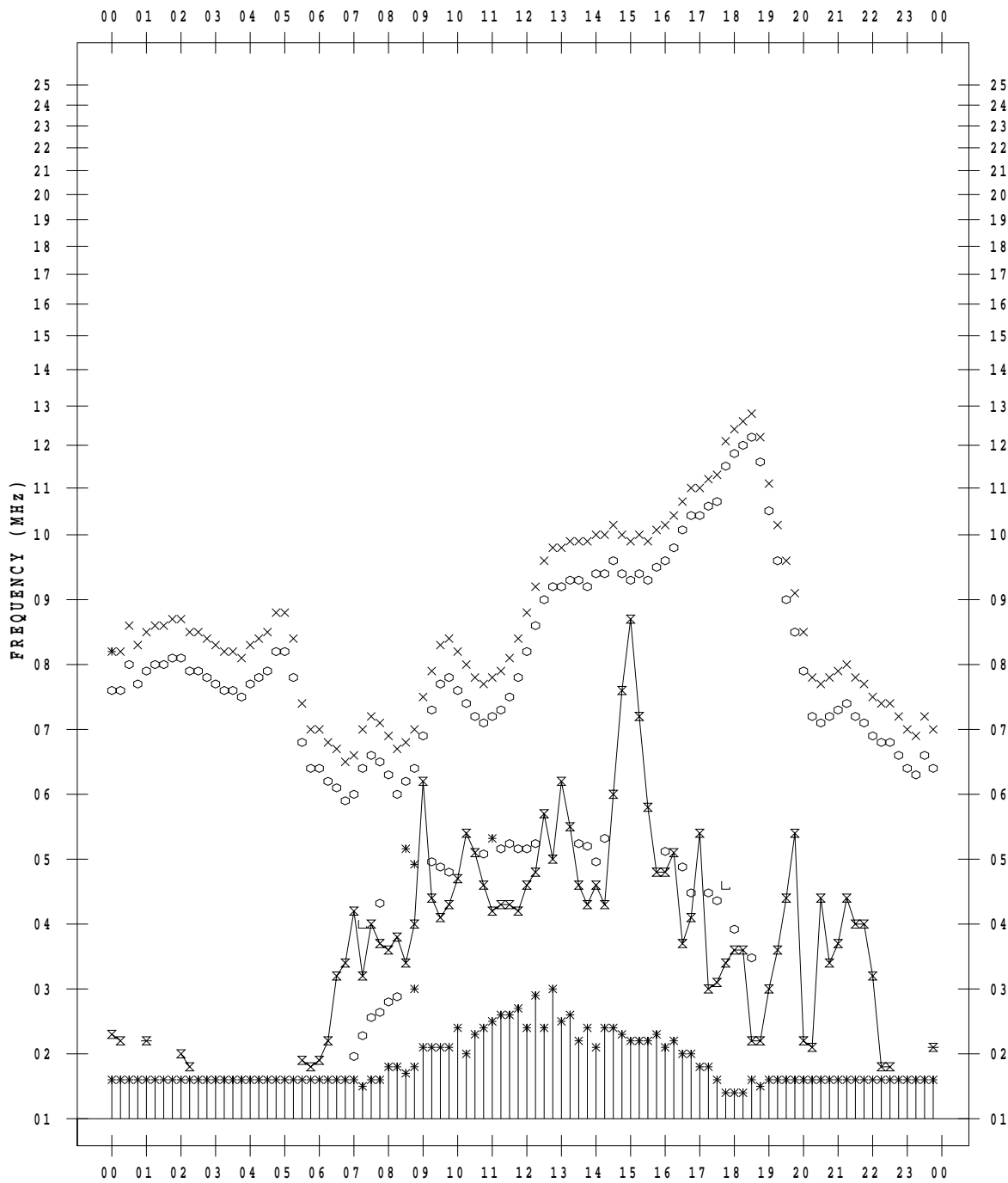
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 24

135 ° E MEAN TIME



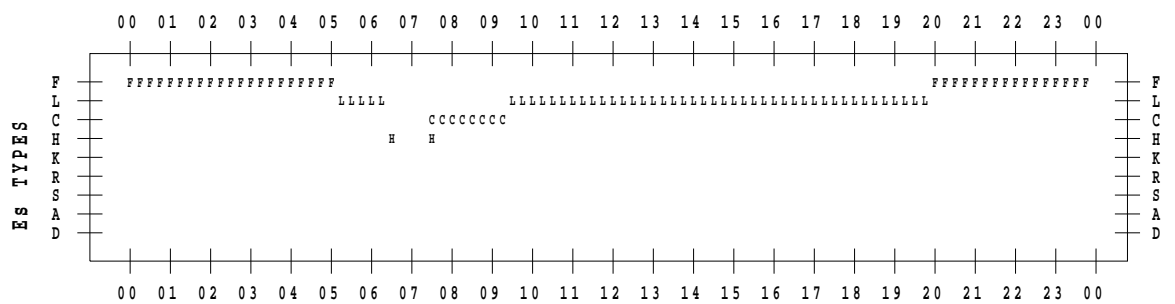
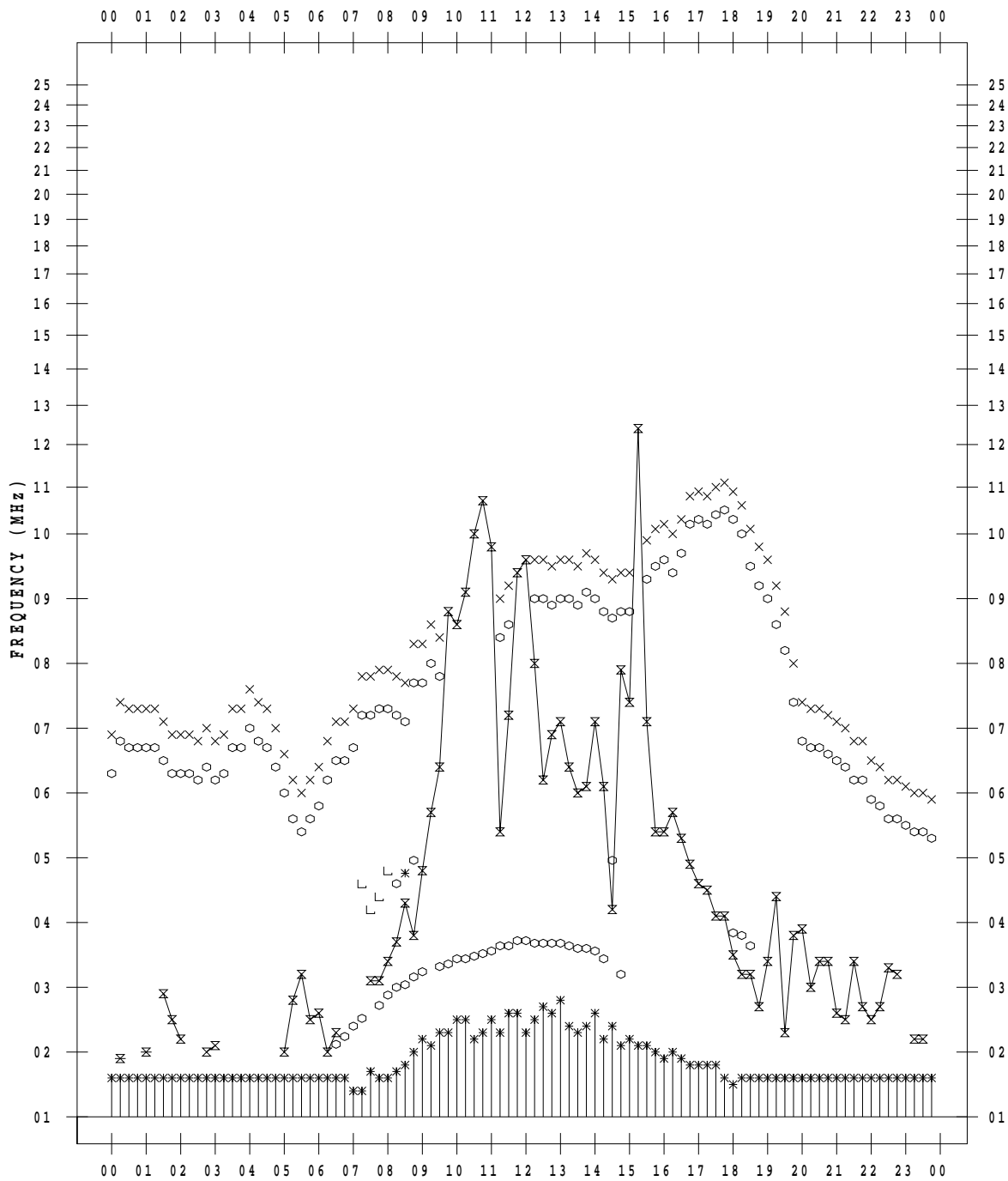
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 25

135 ° E MEAN TIME



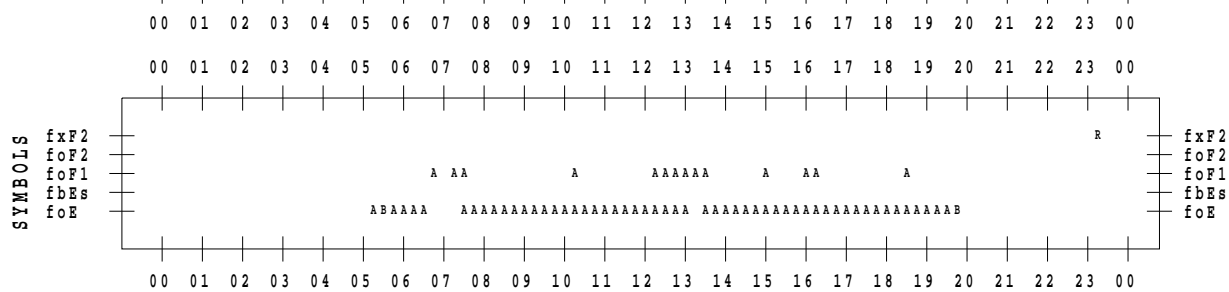
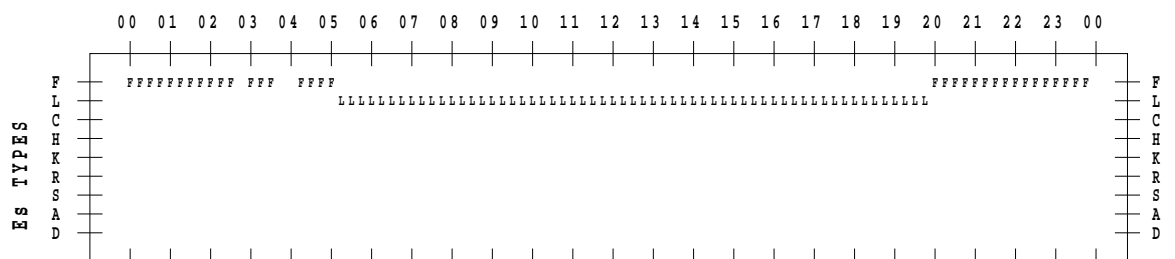
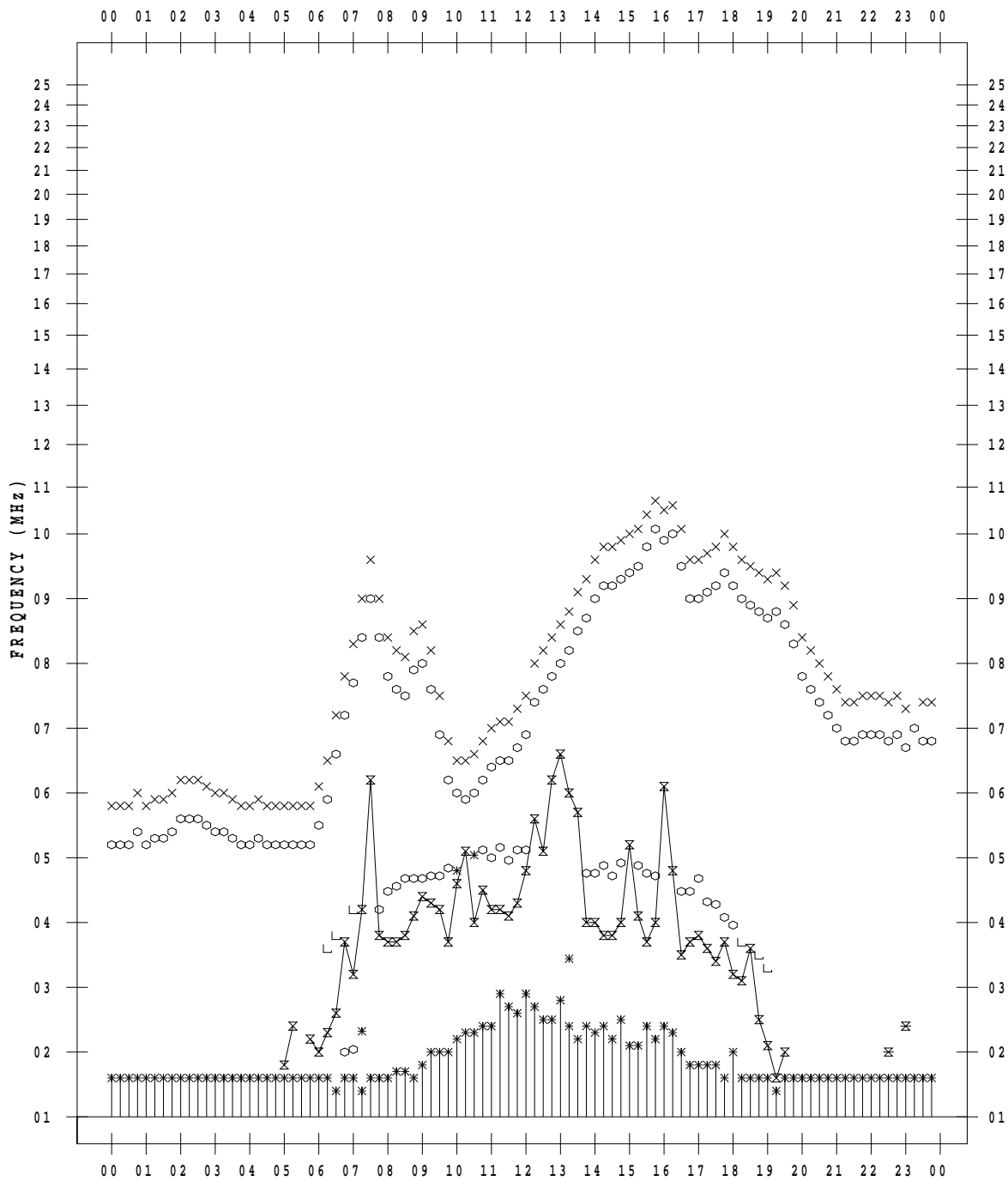
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 26

135 ° E MEAN TIME



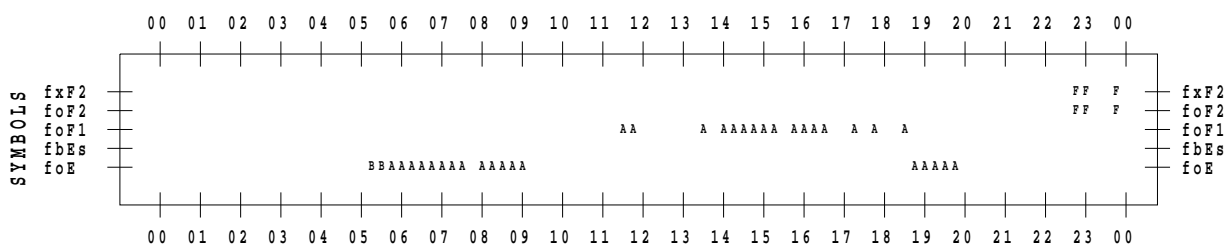
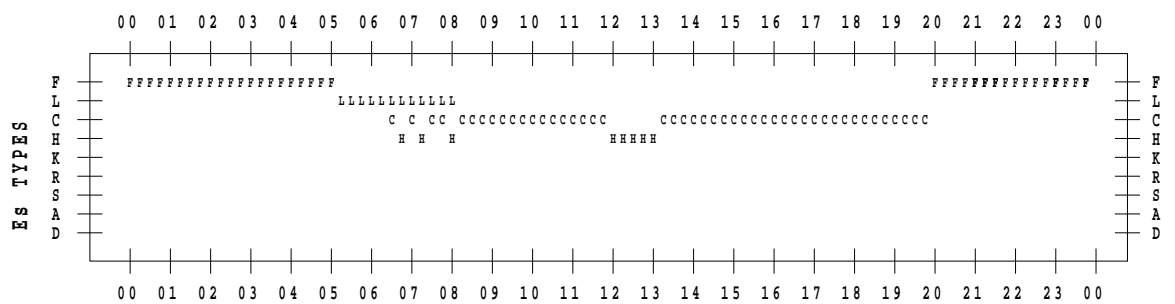
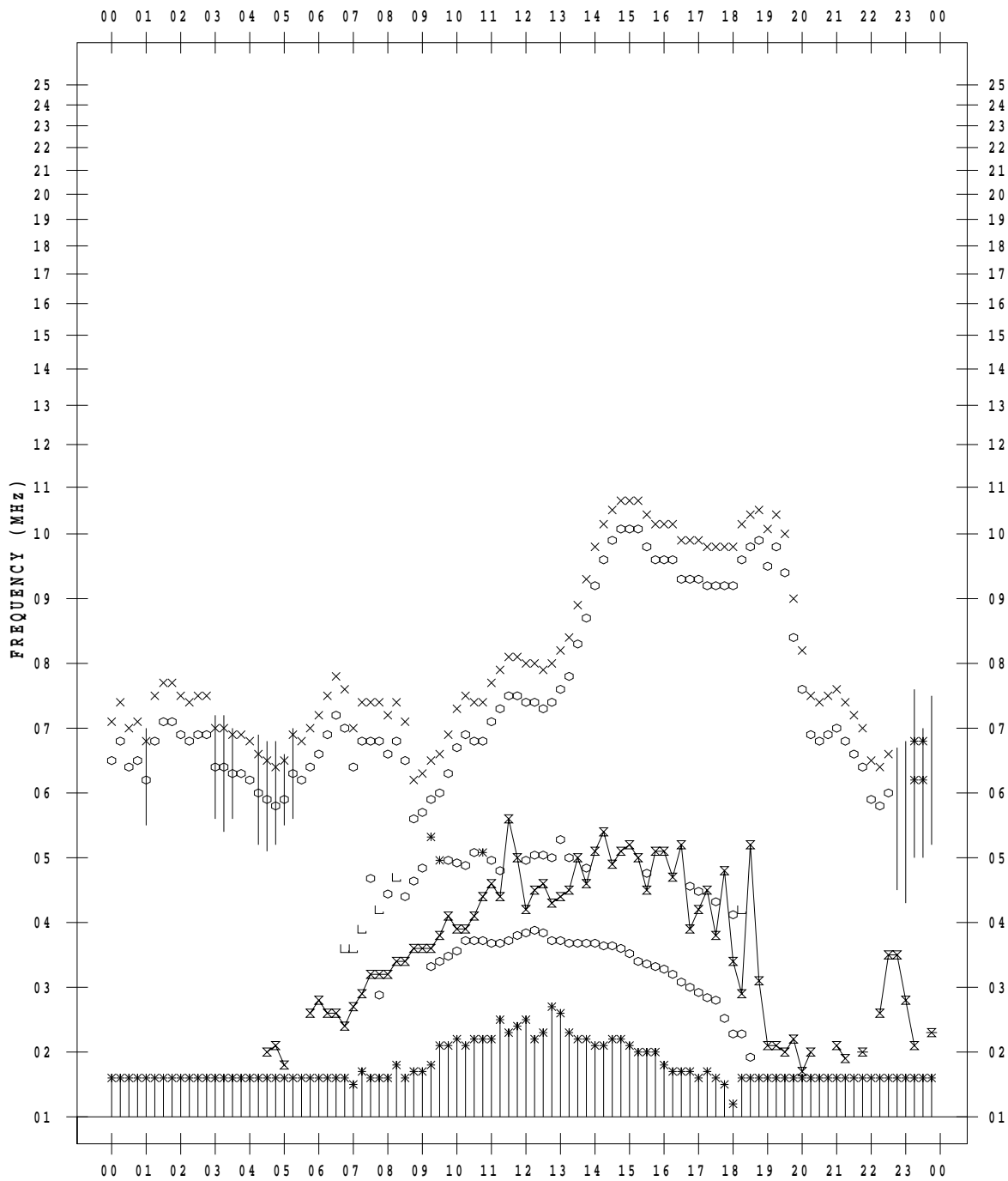
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 27

135 ° E MEAN TIME



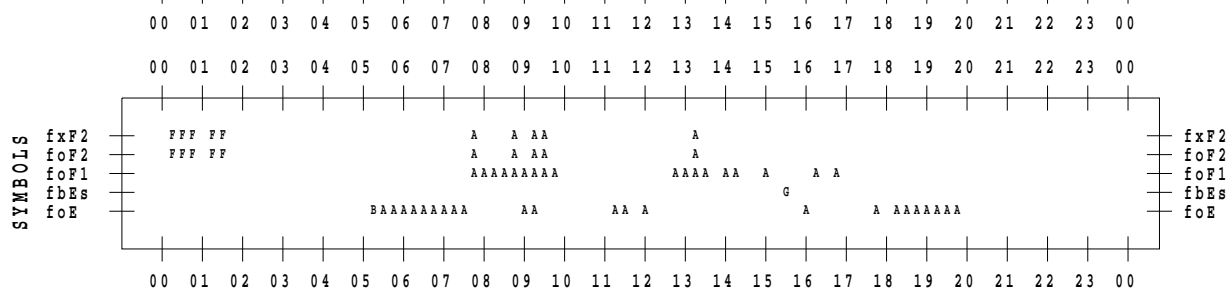
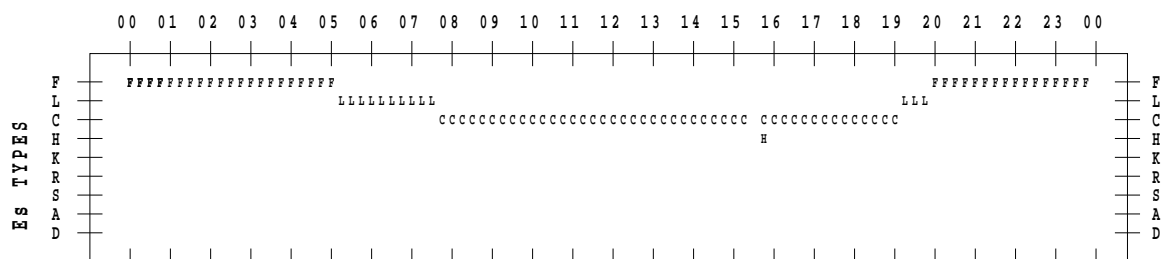
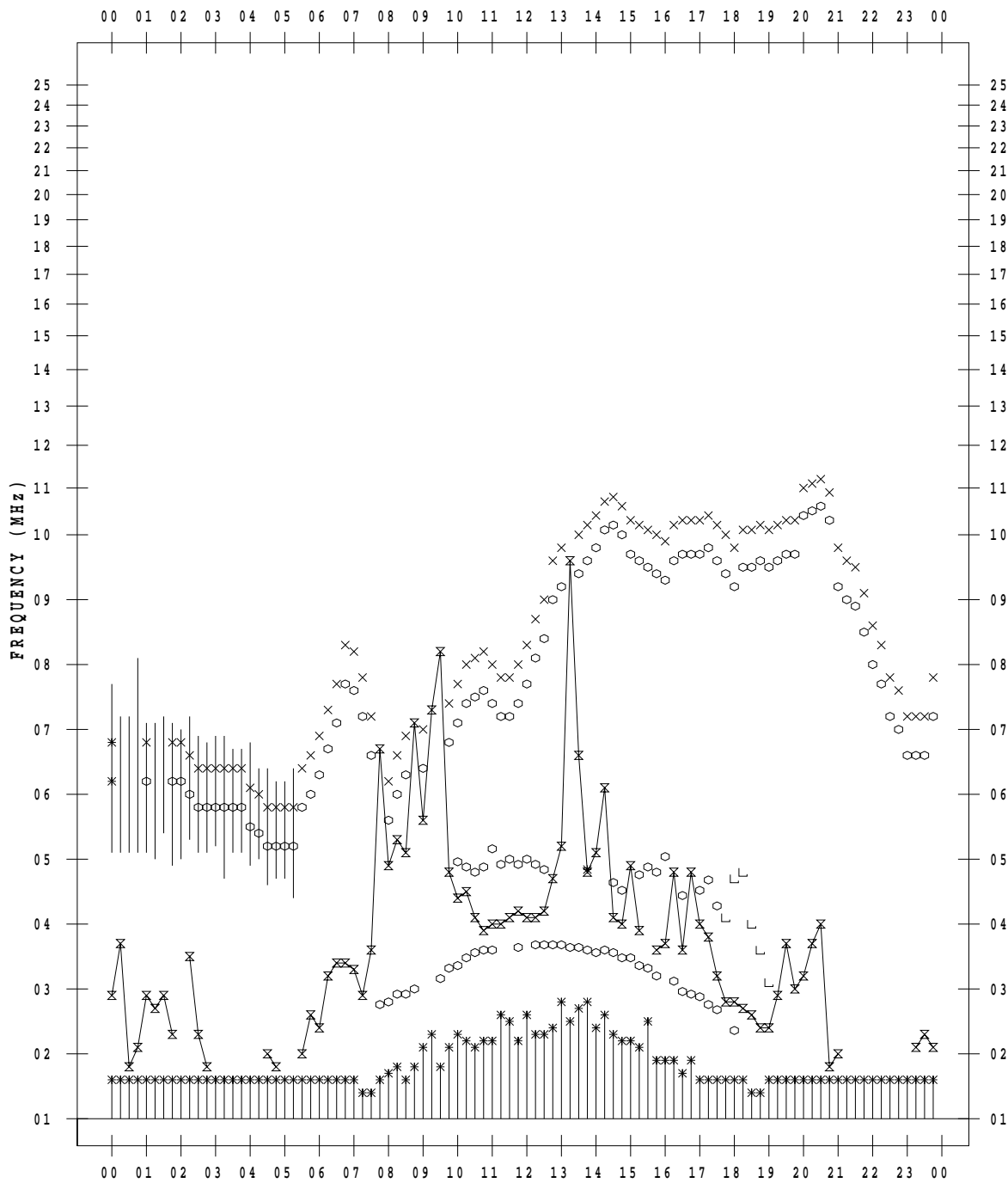
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 28

135 ° E MEAN TIME



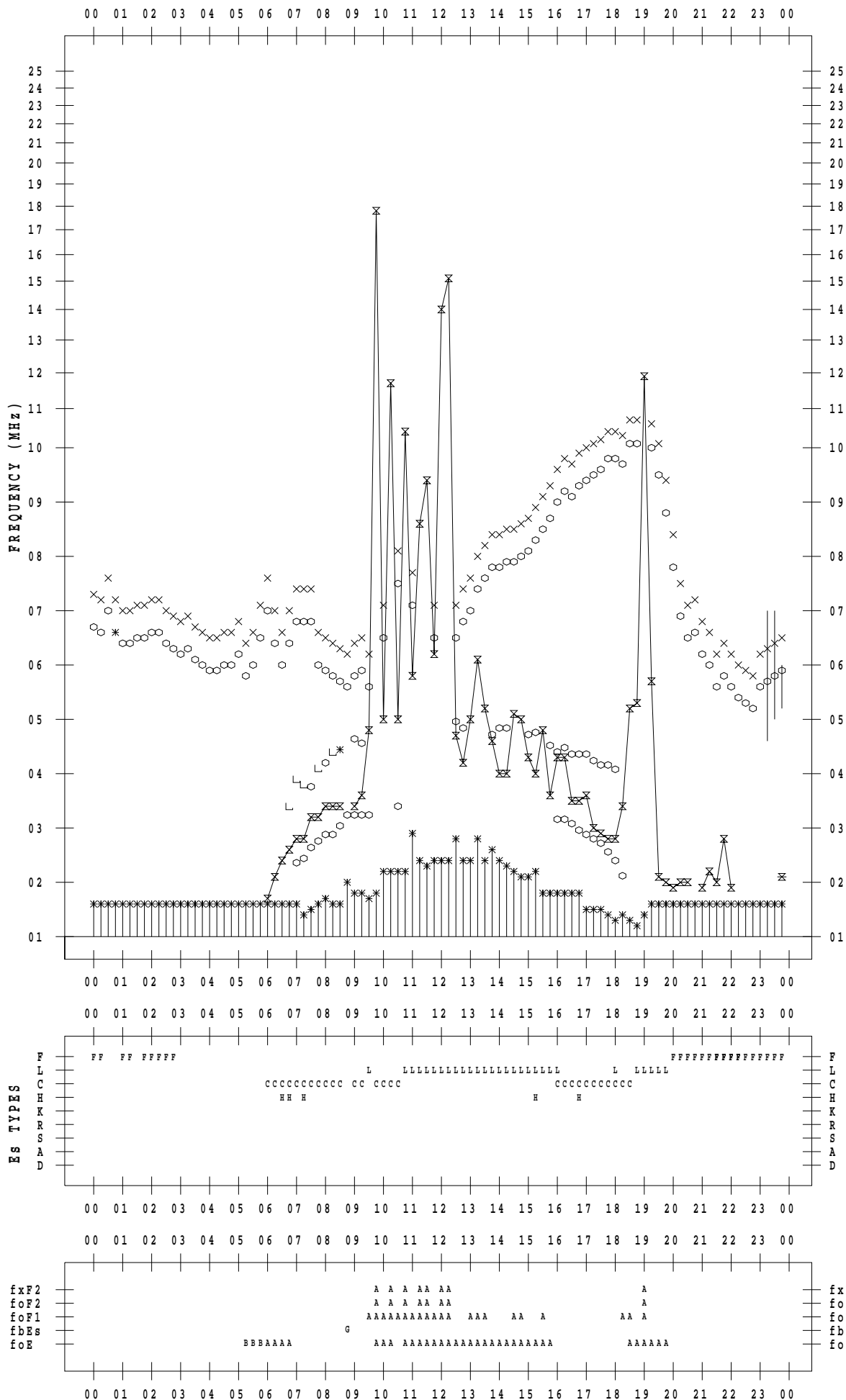
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 30

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 7 / 31

135 ° E MEAN TIME

