

IONOSPHERIC DATA IN JAPAN

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« Real Time Ionograms on the Webhttp://wdc.nict.go.jp/index_eng.html »



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

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

National Institute of Information and Communications Technology, Japan.

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

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

IONOSPHERE

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

A1. Automatic Scaling

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

The published data consist of tabulations of hourly values of three factors ($foF2$, 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 ionospheric reflections
$h'Es$ $h'F$	Minimum virtual height on the ordinary wave for the Es and F layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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 associated with high absorption and large *fmin*.
- n** The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.
- k** The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

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

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

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

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

HOURLY VALUES OF fof2 AT Wakkanai

JUN. 2021

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	42	37	40	41	41	47	45	A	69	A	48	A	53	57	A	A	A	55	A	A	66	61	57	55
2	50	45	43	40	41	41	50	A	61	55	55	52	49	53	A	51	A	55	55	A	70	A	65	A
3	44	44	47	44	39	44	A	61	49	49	47	A	A	A	51	A	A	125	53	A	A	59	55	A
4	A	A	42	36	A	35	44	73	96	78	47	A	51	A	A	48	51	52	39	A	54	56	A	49
5	47	47	41	40	42	44	45	50	A	A	A	50	A	A	A	51	48	A	41	50	59	59	58	52
6	46	A	A	36	38	45	101	48	A	A	A	A	A	A	48	A	47	41	47	57	67	62	57	49
7	48	45	49	49	49	45	A	A	45	47	48	A	A	A	A	43	A	46	51	55	62	57	46	45
8	49	49	43	49	44	42	44	111	47	53	49	A	134	A	A	A	54	A	52	52	A	62	A	49
9	44	42	41	39	42	51	A	A	A	A	A	A	55	A	A	A	50	A	A	55	66	67	61	48
10	45	49	45	45	40	40	43	49	54	A	47	A	51	A	60	57	49	47	44	55	73	73	67	62
11	58	53	52	49	43	51	51	50	59	53	52	54	A	A	51	47	56	59	60	73	77	76	63	61
12	54	51	39	37	34	35	A	A	46	49	45	A	A	51	A	A	52	50	62	52	62	56	A	A
13	53	42	39	42	46	50	42	A	53	53	53	50	47	A	53	52	A	53	51	56	59	A	55	48
14	35	38	38	37	39	39	55	A	A	A	62	56	A	A	A	50	38	A	46	56	67	A	56	A
15	A	A	A	A	A	A	A	51	55	C	C	C	C	C	C	C	C	49	71	57	67	64	62	A
16	A	A	48	38	35	43	A	52	61	C	C	C	C	C	C	C	A	48	A	A	58	63	63	57
17	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	61
18	55	47	50	49	52	50	A	41	45	A	49	A	A	A	A	48	52	46	49	56	60	65	59	62
19	56	49	43	43	37	38	43	56	67	A	A	A	A	A	51	49	52	A	A	A	A	A	A	A
20	A	A	A	41	37	44	A	70	A	78	50	49	47	46	A	47	47	43	53	59	65	63	57	A
21	46	41	37	36	42	48	A	53	54	A	57	60	59	49	A	47	50	52	56	57	67	65	62	59
22	54	47	45	44	40	55	53	57	59	A	A	A	A	53	50	53	51	60	61	67	75	75	79	53
23	50	44	39	36	34	36	39	44	54	56	56	56	52	A	54	53	55	52	77	59	A	A	A	A
24	A	A	A	A	A	55	72	86	48	88	A	A	A	55	55	52	A	43	49	A	66	68	66	A
25	49	43	42	40	41	A	48	54	63	59	A	53	A	A	53	55	A	A	A	52	63	60	60	53
26	50	42	41	40	43	50	53	57	57	63	56	A	54	50	52	A	209	89	58	61	65	71	60	56
27	48	44	41	39	40	44	A	44	49	A	A	A	A	A	49	A	A	A	A	51	A	A	A	A
28	A	A	A	49	38	48	A	A	54	A	52	49	A	45	A	A	A	A	53	A	A	A	A	A
29	A	50	A	A	43	47	A	A	A	A	A	A	A	A	54	53	A	49	49	A	57	58	59	59
30	55	47	51	44	49	47	54	49	A	73	A	A	A	A	56	A	61	A	56	104	A	A	56	34
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	22	23	26	26	27	17	20	21	16	17	10	11	9	13	18	17	20	23	20	22	21	22	19
MED	49	45	42	40	41	45	48	52	54	54	50	52	52	51	53	50	51	51	53	56	66	63	60	53
U Q	54	49	47	44	43	50	53	59	61	68	55	56	55	54	54	53	54	55	58	59	67	67	63	59
L Q	46	42	40	38	38	41	43	49	48	49	47	50	49	47	51	48	48	46	49	53	60	59	57	49

HOURLY VALUES OF fEs AT Wakkanai

JUN. 2021

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	G	G	G	G	G	120	40	70	71	72		117	87	44	51	89	70	50	127	84	41	G	G	28	
2	G	G	28	G	G	33	46	60	40	49	49	49	50		56	46	60	38	34	71	40	69	70	73	
3	G	60	40	35	40	134	48	60		153	103	104	67	78	94	113	90			107	105	84	72	115	
4	92	54	34	32	54	72	40	92	118	92		59	65	85	59	54	44	49	48	49	54	57	135	33	
5	41	G	G	G	G		49	82	126	108	62	62	62	78	94	38	36	50	111	61	43	42	38	47	
6	57	60	69	39	33	50	109	156	121	116	148	94	64	86		54	75	94	112	34	26	28	G	24	
7	G	G	G	G	G	35	71	92	71	84	136	84	58	59	61	37	84	50	91	29	43	39	30	29	
8	26	40	32	28	30	34	46	103	153	70	103	127		72	55	62	55	60	47	40	63	53	60	41	
9	60	G	27	33	39	33	53	74	79	96	93	63	56	89	159	124	126	124	71	34	39	38	30	G	
10	30	G	G	G	34	35	114		56	91	53	56	59	61	57	46	38	34	33	33	26	G	32	30	
11	G	26	25	G	26	34	39	43	47	47	44	82	62	112	48	40	38	40	49	55	46	G	26	G	
12	30	G	G	G	G	32	56	55	92	82	46	58	45	41	55	58	37	65		57	54	59	72	60	
13	G	G	G	G	G	40	44	62	65	71		74	96	95	56	54	55	50	43	32	43	72	45	25	
14	G	35	33	28	G	31	38	58	52	78	66	50	75	69	118	103	83	117	92	128	57	109	46	90	
15	161	111	70	59	70	59	178	135	79	C	C	C	C	C	C	C	C		66		110	112	70	59	60
16	83	59	38	27	27		58	95		C	C	C	C	C	C	C		116		144	60	41	58	59	84
17	C	C	C	C	C	C	C	C	C		61	134	60	47	70	61	62	104	62	126	131	103	91	46	
18	25	G	G	G	G	41	60	62	92	153		66	77	104	58	49	46	39	33	45	46	44	54	34	
19	32	G	25	G	G	35	48	55	51	66	160	58	65	81	45	95	45	58	128	101	128	128	91	72	
20	82	107	70	29	28	40	62	92	175				111	111	51	49	52	40	41	46	32	24	34	60	
21	60	39	28	G	G	36	51	115	51	71	52	54	41	43	40	116	37	39	30	29	28	30	39	35	
22	34	28	G	G	G	138	39	46	56	78	113	92	62	64	37	38	33	39	36	35	29	35	33	G	
23	28	31	G	G	26	33	42		47	54	48	50	52	85		45	51	51	72	66	69	126	115	132	
24	83	92	59	58	121	56	83	108	129			66	90	39	49	43	43	146	40	60	48	39	41	71	
25	G	33	31	27	35	90	44	42	47	56	53	57	41	40	116	40	70	122	81	35	28	30	26	33	
26	32	32	G	28	G	32	54	60	52	46	50	48	50	94	92	106	144	116		34	32	37	38	30	
27	28	G	G	34	G	33	90	59	72		70	129	47	50	40	111	60	60	69	81	126	116	84	148	
28	90	84	58	36	36	58	111	54	66	90		96	55	45	78	91	81	71		122	151	166	127	74	
29	69	59	70	59	G	37	53	69	86	108	66	72	56	90	62	51	80	95	43	150	88	40	36	40	
30	27	G	28	31	G	33	60	79	113	61	72	88	84	57	60	61	69	87	38	94	70	112	29	32	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	29	27	29	27	27	24	21	27	27	27	26	28	29	28	25	30	30	30	30	30	
MED	30	31	28	27	G	36	53	69	71	78	66	66	62	72	58	54	60	59	49	58	46	48	43	40	
U Q	64	59	39	33	34	58	66	92	113	94	103	94	75	89	78	93	80	94	91	94	70	84	72	72	
L Q	G	G	G	G	G	33	44	58	52	63	51	57	52	47	51	45	43	44	39	35	39	35	32	30	

HOURLY VALUES OF fmin AT Wakkanai

JUN. 2021

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	17	16	16	14	15	16	14	14	14	13	15	13	19	15	15	15	15	14	33	14	15	15	14	15
2	16	16	15	16	16	16	14	16	15	16	17	16	15	15	14	15	17	16	16	15	14	16	16	16
3	18	15	15	14	13	16	15	14	16	15	13	20	15	20	18	15	14	11	7	5	19	15	15	16
4	17	15	15	16	15	15	15	16	15	14	16	20	19	17	15	13	14	15	15	15	15	15	15	16
5	15	15	15	16	18	16	14	14	15	16	19	18	17	16	16	16	17	14	17	14	15	14	15	16
6	15	15	15	15	16	15	14	16	10	11	13	15	15	16	15	14	14	8	11	16	15	16	15	16
7	16	15	15	17	14	15	13	13	15	15	15	15	14	15	15	14	14	14	14	15	14	15	16	16
8	16	16	16	16	15	15	13	13	12	13	15	18	5	15	16	15	15	14	14	15	14	14	15	15
9	17	16	16	16	15	14	13	15	14	12	14	15	13	19	16	16	13	14	15	15	15	15	15	14
10	15	14	16	16	13	15	15	14	13	15	19	14	16	17	16	15	15	15	13	14	16	16	16	16
11	17	15	16	16	16	15	14	14	14	16	18	16	17	18	15	15	15	15	14	15	15	15	15	16
12	15	15	14	15	15	14	15	14	16	15	16	21	15	19	19	16	15	14	13	14	15	15	15	16
13	17	15	14	15	15	15	14	14	14	15	14	16	17	19	18	14	13	14	13	15	15	14	15	15
14	16	15	15	15	15	15	14	14	14	11	14	21	17	16	15	16	15	15	15	15	15	17	15	14
15	5	14	15	15	15	17	14	15	14	C	C	C	C	C	C	C	C	14	14	14	16	14	15	15
16	16	14	15	15	15	15	13	15	13	C	C	C	C	C	C	C	13	14	15	14	15	15	14	16
17	C	C	C	C	C	C	C	C	C		14	11	15	15	15	16	16	14	14	12	5	15	15	15
18	16	16	16	14	15	14	13	14	15	16	17	17	16	7	19	13	14	15	14	15	13	16	15	15
19	15	16	15	17	15	16	14	14	13	15	16	15	16	19	16	16	15	15	12	15	5	14	15	14
20	16	17	15	16	15	15	13	15	38	5	33	14	9	16	15	15	15	14	13	13	15	16	17	15
21	15	15	16	16	17	17	14	15	14	14	15	14	16	15	15	15	16	14	15	15	15	15	15	15
22	17	15	14	15	15	15	14	15	14	15	14	11	20	20	15	15	15	14	16	15	14	15	18	16
23	16	16	17	21	15	15	15	14	14	14	15	16	15	17	16	14	15	15	13	15	14	13	15	5
24	15	15	15	15	13	15	15	17	9	5	75	16	17	15	16	17	15	14	14	15	15	15	16	15
25	16	15	15	15	16	14	14	15	14	14	18	19	14	15	14	15	13	7	12	16	15	15	15	15
26	16	15	16	15	15	17	14	15	17	15	14	16	21	17	13	40	20	8	14	16	15	15	15	15
27	16	16	15	15	17	14	15	14	15	13	14	14	14	16	15	15	15	15	15	14	16	13	15	15
28	17	16	15	15	15	15	13	14	15	16	14	14	17	15	16	16	15	14	14	6	5	15	11	15
29	15	16	15	16	16	16	15	13	15	17	21	15	17	20	20	15	17	15	14	73	13	14	15	15
30	15	14	16	15	16	17	15	14	13	14	15	15	15	21	17	15	14	14	15	13	14	15	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	27	28	28	28	28	28	28	29	30	30	30	30	30	30	30
MED	16	15	15	15	15	15	14	14	14	15	15	16	16	16	16	15	15	14	14	15	15	15	15	15
U Q	17	16	16	16	16	16	15	15	15	15	17	17	17	19	16	16	15	15	15	15	15	15	15	16
L Q	15	15	15	15	15	15	13	14	13	13	14	14	15	15	15	15	14	14	13	14	14	14	15	15

HOURLY VALUES OF fof2 AT Kokubunji

JUN. 2021

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	36	A	31	33	32	37	51	61	63	A	57	61	59	A	A	56	91	A	59	A	A	A	A	50	
2	46	43	39	36	35	43	47	47	49	62	55	55	52	A	A	55	A	52	57	67	63	61	A	A	
3	A	A	A	A	42	40	A	A	54	55	47	51	A	A	A	47	60	56	56	A	65	58	A	50	
4	A	40	37	37	38	46	A	A	55	55	74	69	76	A	A	A	59	49	73	43	59	57	A	A	
5	A	42	A	A	A	A	A	A	63	53	52	A	59	A	53	49	A	A	A	62	69	67	56	50	
6	41	A	A	31	33	41	40	60	78	56	A	46	46	47	53	58	62	55	51	58	67	59	50	47	
7	41	37	38	33	36	47	49	A	53	58	A	A	A	N	47	35	48	A	A	66	57	55	A	46	
8	A	40	44	43	40	45	45	64	65	46	A	A	60	66	50	62	53	A	A	63	72	A	A	A	
9	A	52	A	A	A	44	47	A	59	48	A	A	50	A	61	A	59	61	A	69	A	61	A	37	
10	A	43	40	39	35	39	47	59	62	A	A	47	A	57	61	61	A	A	54	56	A	70	53	49	
11	42	44	48	43	39	44	46	66	59	A	A	58	55	59	59	56	63	72	74	84	85	69	64	53	
12	62	58	53	48	A	A	48	A	A	54	44	A	A	A	55	A	A	45	A	54	A	56	A	A	
13	A	A	41	A	37	38	46	A	54	71	54	108	A	A	N	82	A	A	55	A	70	70	A	A	
14	A	A	A	A	A	A	55	37	49	50	49	A	A	A	50	64	61	58	57	A	70	67	51	45	
15	42	A	A	A	35	38	46	49	A	62	A	A	A	A	50	A	65	65	67	67	57	A	A	A	
16	A	A	A	A	A	45	53	51	48	55	81	54	69	95	A	59	65	A	52	59	A	A	A	A	
17	A	53	A	A	42	A	56	69	56	A	A	139	A	A	A	A	59	55	A	59	A	62	60	55	
18	56	55	57	42	39	40	A	A	A	A	A	A	A	A	69	A	A	53	52	63	64	69	62	59	
19	59	60	55	59	47	38	55	73	79	A	99	158	A	47	A	58	60	60	65	73	71	64	62	61	
20	58	56	54	52	46	52	53	54	A	55	A	48	A	50	54	54	53	56	50	58	A	56	49	A	
21	41	A	A	32	31	A	50	50	73	A	A	55	57	57	53	55	62	61	56	58	64	69	56	55	
22	51	48	46	42	40	47	53	A	55	57	A	56	53	A	71	50	65	68	77	84	91	67	62	61	
23	63	59	52	49	A	38	A	53	A	49	51	67	38	A	59	37	A	64	65	A	A	53	53	55	
24	54	50	49	43	39	44	A	51	68	47	89	N	N	72	66	48	75	49	A	A	A	63	A	A	
25	A	41	44	37	38	43	53	67	59	A	A	56	A	A	A	N	67	A	A	A	A	A	A	A	
26	A	A	A	37	41	A	A	A	A	50	A	A	A	A	46	56	54	43	A	71	A	A	A	A	
27	A	A	A	45	39	43	47	A	A	A	A	A	A	A	46	56	54	43	A	51	57	56	59	A	
28	A	41	A	38	37	38	54	A	57	A	63	51	N	A	A	A	A	A	49	55	A	A	56	56	
29	48	A	40	37	33	49	39	A	73	63	A	A	64	69	70	65	52	48	47	53	61	A	58	A	
30	57	A	A	50	41	42	47	A	68	N	51	A	A	N	A	67	N	A	68	A	67	A	60	A	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	16	18	18	21	23	25	24	17	23	19	13	17	16	12	20	22	20	19	20	21	20	19	17	16	
MED	50	46	44	39	38	43	48	54	59	55	55	56	58	57	54	56	60	56	56	62	64	62	56	52	
U Q	57	55	52	45	40	45	53	65	68	58	77	68	66	66	61	62	62	61	66	68	70	69	61	55	
L Q	41	41	40	36	35	38	46	50	55	50	50	51	51	48	50	52	53	52	52	57	60	57	53	48	

HOURLY VALUES OF fEs AT Kokubunji

JUN. 2021

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	180	38	25	24	23	29	41	62	56	60	56	46	40	55	70	67	87	150	103	176	107	70	58	60	
2	26	33	G	32	27	34	70	72		84	G	49		84	57	57	92	69	50	31	31	31	90	148	
3	107	84	45	59	40	40	55	49	60	83	101	106	107	84	39	G	34	39	29	70	87	41	91	43	
4	111	114	31	26	26	27	107	66	58	94	132	109		79	62	71	80		143	149	37	83	125	110	
5	93	41	60	40	40	40	66	71	60	40	41	92	53	80	57	40	175	62	144	49	56	60	59	113	
6	27	79	40	G	37	G	31	57	53	50	71	157			41	45	50	41	46	83	41	53	53	29	
7	26	33	27	31	35	31	37	60	56	71	83	92	75	95	107	57	84	78	60	35	90	53	40	36	
8	55	40	33	G	G	29	43	53	47	144	97	40	38	76	133	106		140	114	80	107	145	60	93	
9	60	55	57	57	58	45	G	65	62	74	97			75	61	75	71	41	65	60	84	39	43	38	
10	55	G	G	G	G	31	45	59	50	59	62	70	42	52	43	117	87	80	54	60	58	37	41	33	
11	G	G		G	G	169	36	55	56	57	61	42		41	58	50	38	52	33	46	38	39	57	50	
12	60	30	32	G	54	60	40	54	50	59		40	70	75	41	169	72	80	128	112	43	69	41	90	
13	94	59	72	43	28	G	48	63	79	63		97	151		136	145	143	133		88	49	41	83	71	
14	94	69	104	53	53	60	56	80	140	148			152	73	93	36	G		52	31	58	50	36	34	28
15	40	47	90	60	29	57	40	60	55	57	61	62	67	92	144	101	82	40	57	35	38	60	54	69	
16	69	59	45	42	52	39		95	82			87	125	117	92	31	46	59	50	31	107	106	107	112	
17	91	51	72	49	31	62	47	58	39	74	58	148	147	53	75	62	60	107	86	49	57	35	31	93	
18	40	40	33	35	35	28	43	57	65	90	79	65	110	146	88	150	71	49	46	33	31	34	39	32	
19	30	G	29	29	34	G	39	135		60		164	166	105	64	53	50	59	40	50	35	30	36	28	
20	28	G	G	G	G	G	36	54	61	60	70	76	126	71	53	57	48	49	39	34	G	G	G	G	106
21	65	60	43	32	27	40	42	73	72	81	65	50	56	40	37	38	35	33	32						
22	G	G	G	G	G	30	34	112	40	54	39	52			84	112	171	61	50	49	27	25	34	47	
23	46	39	24	25	52	31	40	43	60	118				146			125	47	53	60	71	39	33	29	
24	G	G		31	24	35	37	60	68	63	99		150	90	61	107		109	148	95	83	59	81	111	108
25	70	G	G		27	28	31	35	49	85	76	65	53	71	59	129	167	128	149	162	155	163	128		116
26	90	56	93	82		34	42	73	71	108	169		148				G		47	65	103	93	127	93	107
27	61	65	39	39	39	32	52	54	70	91	110	109	168	120	116	37	50	32	40	40	G		30	49	89
28	131	39	38	36	28	40	60	113	95	129	78	75	93	78	59	165	142	83	35	41	117	142	47	36	
29	57	71	43	40	28	55		104	58	168	152	116	71			81	52	27	35	28	40	111		84	
30	59	74	60	G	G	29	42	60	84	113	112	113	134	144	135		92	81		124	57	92	53	93	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	29	30	28	30	28	29	23	26	23	25	27	26	29	29	28	30	30	30	28	30	
MED	60	40	38	32	29	33	42	61	60	76	71	82	93	78	70	64	72	59	52	54	56	50	51	70	
U Q	91	60	57	42	39	40	53	73	71	103	101	109	147	100	107	112	100	82	90	83	87	83	71	106	
L Q	30	30	27	G	24	29	38	55	55	59	61	52	67	60	57	45	49	44	39	35	38	36	39	36	

HOURLY VALUES OF fmin AT Kokubunji

JUN. 2021

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	14	15	16	15	16	15	15	15	17	16	19	30	17	21	21	20	15	5	11	14	16	15	15	15
2	16	15	15	15	15	16	16	16	21	28	45	44	20	23	22	18	16	14	15	15	16	15	15	11
3	16	14	16	16	15	14	15	15	15	17	16	26	26	25	19	31	16	17	15	15	15	15	15	15
4	19	15	14	15	15	15	15	15	20	18	18	17	18	21	22	19	16	11	15	5	16	17	16	12
5	12	16	15	15	15	15	15	14	20	23	20	22	21	22	17	33	21	17	14	15	16	15	15	5
6	16	15	15	16	15	15	17	15	18	21	22	17	17		44	21	21	16	15	15	14	15	15	15
7	15	16	15	16	15	15	16	13	17	16	20	21	21	20	17	21	15	15	15	15	14	15	15	15
8	15	15	14	15	15	16	15	15	16	17	18	18	17	16	23	17	13	5	15	15	13	12	15	11
9	15	16	15	15	15	15	16	17	17	24	20		17	23	23	16	17	13	13	15	16	14	15	15
10	16	14	13	14	14	14	17	15	17	19	19	21	23	23	16	17	14	15	15	15	15	15	15	15
11	16	13	15	15	22	108	17	15	14	18	16	21	20	19	21	20	15	15	16	14	14	15	15	15
12	16	16	16	14	15	15	15	14	15	15		21	20	23	33	17	16	15	13	6	15	15	16	15
13	14	16	16	15	15	15	16	14	17	22	20	20	16	24	14	21	70	42	8	15	15	15	14	15
14	14	15	16	15	15	14	15	15	8	11	15	21	20	21	22	16	16	15	15	15	15	15	15	15
15	15	15	10	14	16	14	15	17	18	17	18	24	20	23	19	19	15	15	14	15	16	15	15	14
16	15	16	15	15	15	15	15	12	19	15	9	21	27	24	24	44	19	15	15	15	13	14	12	9
17	13	15	16	15	15	14	16	14	13	15	20	20	19	23	27	22	18	17	14	14	15	15	15	11
18	14	15	16	16	16	15	14	15	17	19	16	19	21	18	21	15	15	14	14	16	15	15	15	16
19	15	15	15	16	14	15	14	9	17	18	12	42	22	20	18	17	16	14	14	15	15	16	14	15
20	16	17	15	13	14	15	17	15	15	17	17	19	22	20	22	19	15	15	14	15	14	15	15	12
21	15	15	15	15	15	17	15	12	15	15	17	21	23	19	22	23	17	17	15	17	17	15	14	15
22	14	14	15	16	16	15	15	15	17	22	22	20	24		24	18	15	15	14	15	15	16	14	15
23	15	15	16	16	15	15	15	15	20	17	20	21	17	18	5	17	14	14	13	14	15	15	16	15
24	15	14	15	15	14	17	15	15	15	13	69	21	22	23	23	19	11	8	14	15	14	15	12	13
25	15	14	16	15	15	15	15	14	16	17	20	21	22	19	22	15	17	5	44	5	13	14		16
26	15	15	15	15		16	15	16	15	18	24	23	23	26		17	31	15	15	9	15	11	14	15
27	15	15	15	15	15	16	15	13	15	15	19	19	32	107	21	17	17	17	14	14	15	16	14	15
28	11	16	15	15	15	15	17	17	14	19	19	21	24	24	20	14	8	15	15	14	5	13	15	14
29	15	16	15	15	16	15	7	17	19	13	23	28	20	21	21	23	17	16	17	15	15	14	15	6
30	16	14	15	15	13	15	15	16	17	15	23	19	19	48	22	21	17	15	15	8	15	14	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	29	30	30	30	30	30	29	29	30	28	29	30	30	30	30	30	30	30	29	30
MED	15	15	15	15	15	15	15	15	17	17	19	21	20	22	22	19	16	15	15	15	15	15	15	15
U Q	16	16	16	15	15	15	16	15	18	19	21	22	23	23	23	21	17	16	15	15	15	15	15	15
L Q	14	15	15	15	15	15	15	14	15	15	17	19	19	20	19	17	15	14	14	14	14	14	14	12

HOURLY VALUES OF foF2 AT Yamagawa

JUN. 2021

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	40	40	37	54	56	53	A	A	A	48	A	53	63	A	63	60	53	A	A	55	49	
2	A	44	40	38	36	37	43	51	A	N	46	67	A	A	54	56	59	59	46	A	61	65	71	66	A
3	48	A	40	A	A	38	51	A	A	A	A	A	A	A	A	A	A	A	66	69	80	69	56	A	53
4	56	A	43	A	38	34	A	49	A	A	A	55	46	N	55	50	A	59	55	49	51	59	59	A	A
5	A	A	A	A	A	A	47	A	A	A	A	A	A	A	A	50	50	48	48	47	56	60	59	52	51
6	A	A	A	A	A	A	A	52	64	A	A	51	A	53	55	A	61	55	53	53	A	49	A	A	A
7	A	A	A	A	A	A	A	A	A	A	A	48	A	A	A	A	60	A	A	63	48	47	44	46	
8	A	A	A	A	36	36	49	56	55	49	A	A	A	73	79	73	75	77	74	65	69	A	A	A	
9	A	A	A	A	A	32	48	53	A	A	A	A	A	A	A	A	A	A	81	71	67	A	A	A	
10	A	A	34	A	A	A	46	65	51	A	A	A	A	A	A	73	79	80	65	68	59	63	50	44	
11	A	50	43	37	A	33	48	63	A	A	67	A	A	A	A	63	71	83	92	100	A	A	A	A	
12	53	48	A	47	40	49	A	45	A	A	A	A	A	A	A	59	61	66	66	54	A	A	43	46	
13	A	A	40	A	A	33	43	58	75	A	A	A	A	A	62	A	81	71	A	A	60	59	51	49	
14	A	A	A	A	A	33	A	A	64	A	A	A	A	A	59	69	74	64	A	A	71	65	A	43	
15	A	41	39	37	37	37	43	51	A	61	A	A	A	49	51	64	74	73	75	80	55	50	45	A	
16	47	41	A	41	40	33	49	60	56	49	A	A	49	A	A	68	74	61	A	A	A	54	A	A	
17	A	A	A	A	39	39	A	65	A	A	A	A	A	A	A	A	A	N	72	61	A	A	69	63	57
18	56	59	60	57	37	37	35	49	A	62	57	A	49	A	A	A	52	59	62	71	71	75	59	57	
19	59	56	56	48	47	40	49	54	A	53	A	44	A	A	A	A	A	60	63	69	63	69	60	B	55
20	60	59	57	50	46	38	47	49	59	60	A	A	A	83	45	37	47	73	37	A	A	A	45	A	A
21	A	A	37	A	34	33	39	A	A	A	A	A	A	A	A	A	62	60	56	57	70	64	52	49	
22	43	43	43	40	39	39	44	44	51	A	A	A	A	A	54	65	69	70	87	85	77	A	60	59	
23	53	57	57	48	42	40	41	47	63	50	A	A	A	55	A	65	80	87	56	A	64	A	A	55	
24	54	55	57	47	43	39	45	57	69	57	A	65	A	A	45	A	57	A	A	A	62	A	A	A	A
25	39	40	A	39	38	35	A	A	A	A	61	A	A	47	A	A	A	A	57	A	A	A	A	A	A
26	A	A	A	A	43	41	48	57	63	A	A	37	A	51	A	N	57	59	55	62	70	A	A	A	A
27	A	A	A	A	A	A	50	A	46	A	A	A	48	A	49	54	52	A	A	51	60	64	54	52	
28	A	42	38	39	38	41	50	43	48	55	49	54	A	A	A	58	A	57	57	60	63	A	61	61	
29	54	45	42	A	A	A	A	A	A	A	A	45	38	A	A	68	73	63	61	65	63	61	49	43	
30	41	41	40	37	38	35	45	53	A	76	A	A	A	A	A	A	78	76	81	65	66	70	57	A	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	13	15	17	15	19	24	22	22	14	11	5	8	6	9	12	17	23	25	23	22	21	18	18	17	
MED	53	45	42	40	39	37	47	53	58	55	61	50	48	54	54	63	62	64	62	65	63	62	53	51	
U Q	56	56	56	48	42	39	49	57	64	61	67	54	49	64	57	68	74	73	74	71	69	69	60	56	
L Q	45	41	39	38	37	33	43	49	51	49	53	44	46	50	49	57	59	58	56	56	60	56	49	46	

HOURLY VALUES OF fEs AT Yamagawa

JUN. 2021

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	45	58	70	45	31	G	80	40	45	50	88	116	66	92	53	46	84	60	49	41	82	71	40	32
2	70	38	24	29	33	23	32	46	74	82	76	63	66	50	48	48	54	62	70	33	56	40	56	73
3	48	58	73	59	40	31	40	61	69	91	82	110	66	56	62	95	79	62	35	36	37	56	69	50
4	G	83	32	59	43	40	43	69	112	76	63	56	84	56	106	150	44	37	38	30	G	40	70	60
5	59	54	69	44	58	46	38	108	135	153	165	124	124	58	52	53	54	38	36	27	92	48	55	33
6	71	60	128	84	55	61	69	37	57	90	56	50	57	53	51	64	54	50	43	40	57	34	70	70
7	72	72	72	58	70	40	42	57	92	115	159	109	98	76	87	112	88	90	127	54	38	32	41	40
8	59	69	54	46	34	G	36	60	54	89	110	100	81	69	58	69	45	35	48	43	40	125	59	92
9	60	70	69	54	38	G	40	50	60	92	100	127	58	117	126	61	124	148	113	36	34	60	49	50
10	56	57	G	56	54	40	40	52	56	92	84	125	152	116	85	71	49	56	48	53	46	35	35	41
11	57	40	32	G	40	31	40	50	60	61	66	129	100	92	88	83	73	61	78	38	92	84	82	70
12	50	39	90	35	G	80	72	92	93	94	57	53	62	102	73	51	50	34	39	G	61	59	38	44
13	56	47	57	44	40	32	34	40	56	68	77	72	92	62	61	83	59	62	128	90	49	41	49	115
14	93	54	104	92	91	54	71	55	44	116	63	113	93	80	49	45	46	60	84	152	92	60	60	33
15	84	35	G	G	G	28	33	49	91	50	128	97	49	50	40	54	40	40	42	44	32	G	40	58
16	38	32	49	G	27	24	G	38	39	39	70	114	114	115	75	52	61	54	92	61	136	135	49	71
17	106	72	71	110	40	54	72	50	91	144	170	137	69	89	95	168	163	79	56	92	84	69	57	40
18	41	40	32	33	36	36	40	46	81	70	81	136	88	100	125	102	48	49	53	60	59	G	32	35
19	46	40	40	41	33	34	32	47	67	44	57	146	163	158	150	91	106	90	45	37	42	33	G	B
20	G	G	G	29	28	G	32	40	56	60	84	66	62	98	84	95	74	80	114	116	92	60	45	51
21	59	41	38	41	30	41	45	88	72	70	78	68	77	70	58	70	50	35	34	G	G	G	G	G
22	G	G	G	G	G	28	35	36	47	96	84	74	76	50	54	46	46	40	45	56	82	53	32	35
23	38	37	38	32	38	G	40	38	50	48	69	60	61	56	67	69	55	92	55	92	58	60	60	40
24	38	38	40	28	38	38	33	38	49	43	68	52	69	100	80	79	49	69	64	71	45	91	94	80
25	45	116	105	31	56	35	73	135	92	84	127	134	115	150	117	109	92	54	54	150	91	60	60	
26	73	73	70	56	33	G	41	48	56	78	103	139	112	50	60	56	53	45	38	36	54	56	82	60
27	59	58	70	83	54	42	54	74	111	152	124	153	152	112	63	42	54	74	74	61	43	39	33	54
28	65	G	G	G	G	G	45	60	116	92	116	98	72	126	156	50	77	47	60	49	35	110	G	34
29	57	40	34	53	46	44	54	91	126	163	152	79	116	153	74	54	44	46	G	41	34	39	40	G
30	G	G	33	G	G	G	34	46	105	79	110	130	103	148	113	111	91	43	42	58	G	30	70	72
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	29
MED	56	44	44	42	38	33	40	50	68	83	84	110	82	89	74	69	54	58	51	46	52	54	49	50
U Q	65	60	70	56	46	41	54	61	92	94	116	129	112	113	95	95	79	74	74	61	82	69	60	70
L Q	41	38	32	29	30	G	34	40	56	61	69	68	66	56	58	52	49	43	42	36	37	35	38	35

HOURLY VALUES OF fmin AT Yamagawa

JUN. 2021

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

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

HOURLY VALUES OF foF2 AT Okinawa

JUN. 2021

LAT. 26°41.0'N LON. 128°09.0'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	33	38	38	31	A	A	44	57	60	59	59	52	51	A	61	A	65	A	44	A	A	62	61	A	
2	42	43	A	36	39	33	41	56	A	A	65	49	A	48	A	73	75	67	A	71	A	A	67	45	
3	A	A	A	40	33	33	45	A	A	A	60	65	A	A	A	A	A	89	93	93	61	A	A	49	
4	A	45	40	39	39	A	A	47	A	A	A	A	65	A	37	A	61	57	63	65	61	53	47	50	
5	40	A	43	40	35	25	40	49	A	A	A	A	A	A	A	A	A	55	65	75	74	56	A	44	
6	A	43	42	A	A	A	A	A	59	A	56	A	A	58	71	69	64	61	64	58	A	46	39	A	
7	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	61	69	A	90	59	A	A	A	42	
8	A	A	40	N 35	33	33	46	54	59	49	A	A	A	A	84	86	89	95	68	67	65	A	A	48	
9	A	A	A	39	37	34	49	56	A	A	A	A	A	A	A	71	81	91	97	78	56	45	39	A	
10	A	A	A	A	A	A	A	A	A	A	A	A	65	A	79	A	95	103	97	89	67	63	56	51	
11	50	47	52	50	37	36	44	A	A	75	A	A	A	A	A	78	86	136	A	115	A	A	A	A	
12	56	59	54	48	33	A	A	A	A	A	A	A	A	A	A	72	67	A	A	A	A	52	51	47	
13	A	A	A	A	37	A	43	66	64	A	A	A	A	A	67	83	87	83	75	75	71	59	46	A	
14	A	44	A	41	36	34	39	62	58	A	A	53	A	A	A	75	92	97	87	72	73	A	A	A	
15	37	38	A	A	33	31	39	54	67	59	59	A	A	49	56	A	77	81	87	79	63	55	40	B 36	
16	37	35	A	N 24	24	25	50	55	50	55	72	53	A	47	A	73	79	71	A	A	A	A	49	A	
17	A	A	A	37	A	37	55	49	52	A	A	A	A	A	A	70	83	A	A	76	83	64	56	52	
18	55	55	52	47	A	A	41	53	A	A	63	55	A	A	A	67	A	A	A	A	95	89	59	62	
19	63	62	61	55	60	53	42	49	51	55	55	59	A	A	51	A	A	A	A	A	81	60	57	58	
20	59	63	61	53	41	32	40	51	A	61	A	A	A	A	64	73	77	78	A	A	A	55	A	37	
21	A	A	A	33	A	A	A	53	A	A	A	A	A	A	74	81	75	A	63	71	81	57	49	44	
22	44	43	40	40	40	30	39	46	A	64	74	60	66	51	73	83	88	91	99	93	75	61	60	60	
23	54	57	59	47	39	36	A	65	A	A	A	A	A	65	A	A	96	A	86	A	76	69	A	64	
24	69	67	66	51	40	A	49	55	69	A	47	70	70	A	A	A	71	67	A	A	A	54	A	A	
25	A	A	39	43	31	25	A	48	62	65	70	73	74	A	82	A	81	82	79	73	63	A	A	A	
26	A	54	49	46	46	38	A	A	A	A	A	A	A	A	A	51	70	73	78	75	62	A	A	A	
27	A	A	A	A	A	A	43	48	A	A	64	61	A	A	53	54	A	62	61	A	55	A	A	A	
28	A	43	A	41	43	A	A	57	46	60	A	A	A	A	55	67	66	69	68	61	62	65	60	48	
29	54	52	49	44	43	33	44	A	38	A	66	A	A	72	86	87	97	106	111	105	82	61	57	50	
30	44	43	38	35	41	B 40	45	53	A	49	49	48	A	62	70	76	83	89	87	88	87	66	59	53	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	15	19	18	23	22	18	20	22	13	11	13	12	6	9	15	21	24	22	22	21	21	21	18	19	
MED	50	45	46	41	38	33	44	54	59	59	60	57	66	58	67	73	78	81	82	75	73	60	56	49	
U Q	56	57	54	47	41	36	45	56	63	64	65	63	70	68	74	81	87	91	90	88	81	63	59	53	
L Q	40	43	40	36	33	31	40	49	50	55	55	52	65	48	55	68	69	67	65	69	62	54	47	44	

HOURLY VALUES OF fEs AT Okinawa

JUN. 2021

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	24	G	30	24	37	36	32	43	44	47	48	53	47	58	48	78	62	96	110	96	93	91	43	71	
2	30	39	74	31	30	28	59	42	70	84	122	126	92	163	155	57	54	47	73	115	132	103	36	30	
3	72	83	36	40	28	G	31	110	127	113	53	60	78	83	91	77	84	87	65	33	28	60	48	57	
4	71	41	29	35	28	43	67		111	115	144	92	84	72	141	78	43	35	39	41	33	38	37	32	
5	33	103	54	55	46	27	33	47	70	93	100	151	150	92	70	79	60	32	40	40	30	38	70	43	
6	92	59	124	126	133	60	59	90	60	85	49	48	58	49	38	41	52	62	47	41	82	26	32	114	
7	50	110	134	58	92	94	59	136	124	176	126	109	124	76	80	47	46	77	69	28	92	91	47	45	
8	72	56	43	32	34	24	31	43	47	52	65	115	164	91	52	55	57	42	77		51	74	55	44	
9	93	72	56	24	27	23	118	58	110	149	158	180	122	148	100	78	61	81	105	41	38	35	55	33	
10	59	73	59	56	33	49	57	106	72	89	143	146	51	78	115	161	65	62	63	53	35	32	32	31	
11	35	35	59	46	33	26	32	70	82	76	82	98	124	163	129	69	89	122	139	127	176	91	125	93	
12	38	45	60	56	41	110	56	92	92	81	148	150	70	74	65	51	39	73	134	162	126	105	35	38	
13	60	93	61	55	36	54	37	48	60	53	93	130	125	152	45	51	73	49	67	40	32	60	47	58	
14	58	37	74	33	38	G	28	35	58	80	66	52	67	66	89	66	110	95	48	45	60	116	135	81	
15	G	35	56	61	43	39	29	37	49	46	48	51	66	48	49	69	48	59	39	33	38	32	32	B	
16	G	25	48	G	38	G	34	109	50	44	44	44	46	47	67	52	49	35	78	78	81	56	27	84	
17	106	112	113	35	87	32	38	43	115	56	58	60	132	164	101	111	144	166	74	128	60	33	39	28	
18	34	31	46	58	90	94	170	39	176	145	62	110	145	148	126	150	128	115	115	115	50	35	28	29	
19	27	26	29	24	40	44	34	36	38	72	50	87	80	105	149	145	126	130	150	93	45	35	48	33	
20	28	G	G	G	G	G	27	46	92	70	65	69	84	88	54	66	85	116	85	116	84	48	44	35	
21	79	60	48	29	56	33	36	48	71	104	114	130	84	91	62	66	69	100	69	56	38	27	24	G	
22	24	G	28	27	26	27	28	39	78	51	59	71	52	46	54	55	45	54	61	38	40	31	28	40	
23	28	26	38	32	54	28	58	52	72	90	180	64	84	91	74	158	67	137	70	108	69	56	59	46	
24	41	36	30	33	34	65	G	45	89	90	47	52	53	75	85	82	56	92	124	63	58	70	147	168	
25	109	116	37	28	24	27	70	116	70	146	150	50	98	69	156	150	126	70	46	56	59	53	113	105	
26	73	29	36	27	29	24	60	83	81	107	146	64	81	61	57	39	66	72	94	51	42	90	60	112	
27	60	60	59	59	71	50	33	37	93	79	62	60	118	66	52	49	61	45	57	86	52	104	107	60	
28	49	33	60	29	43	60	47	88		70	147	132	133	146	53	49	46	50	56	54	28	G	37	30	
29	38	G	32	G	30	28	42	74	116	166	112	103	114	96	48	60	41	35	50	G	G	24	G	G	
30	36	G	G	G	G	B	31	41	93	60	154	41	95	56	58	63	58	53	34	52	26	26	26	G	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	29	30	29	29	30	30	30	30	30	30	30	30	30	30	29	30	30	30	29	
MED	45	38	48	32	36	32	36	48	78	82	88	79	84	80	68	66	61	71	69	54	50	50	44	43	
U Q	72	72	60	55	46	52	59	89	101	107	144	126	124	105	101	79	84	96	94	102	81	90	59	76	
L Q	30	26	32	27	29	25	31	41	60	60	58	53	67	66	53	52	49	49	50	40	35	32	32	30	

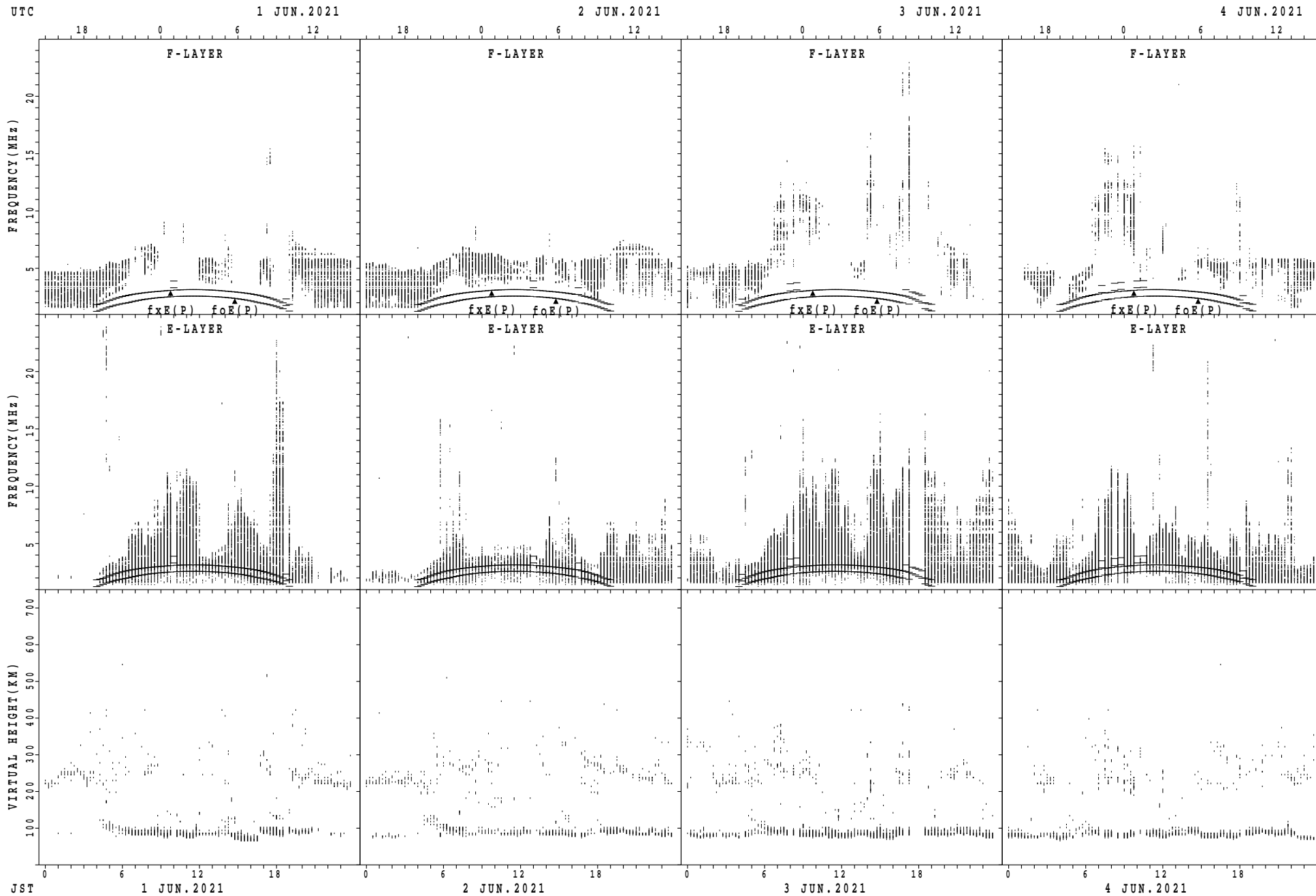
HOURLY VALUES OF fmin AT Okinawa

JUN. 2021

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

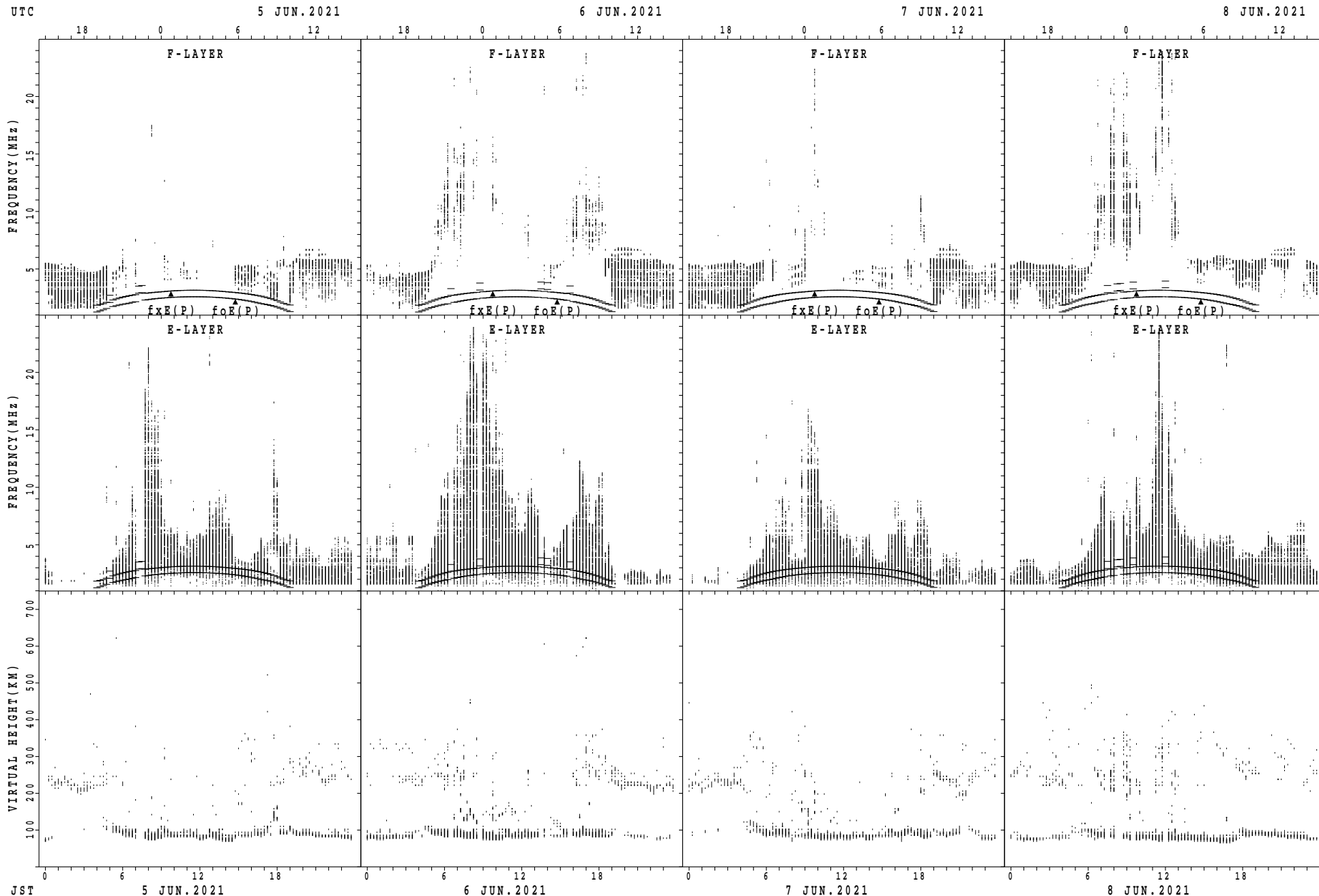
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	16	15	16	16	16	13	15	14	18	18	20	15	18	17	16	15	12	15	14	15	16	16
2	15	16	16	16	16	16	16	14	14	19	15	21	17	8	85	18	16	15	13	15	14	7	15	15
3	16	13	16	16	16	15	15	16	33	10	18	16	21	21	14	13	15	14	14	15	15	16	15	15
4	15	16	16	15	16	15	15	5	17	14	84	16	19	18	9	18	16	15	13	14	16	15	15	15
5	16	14	15	15	15	16	15	13	13	11	11	37	52	16	16	14	16	17	15	14	16	15	15	16
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7	16	15	10	15	15	14	15	5	12	32	17	19	18	19	17	15	17	13	14	15	11	15	15	16
8	16	16	15	15	16	15	15	14	15	14	15	18	7	12	21	16	13	13	13	5	16	15	17	15
9	15	16	16	16	16	15	15	10	5	34	120	20	18	19	18	19	18	13	14	15	15	15	15	16
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12	15	15	15	15	15	13	15	13	13	14	9	11	21	19	17	16	17	14	5	29	14	18	15	15
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14	16	15	15	15	15	14	15	15	15	13	15	16	19	16	17	16	15	15	14	15	15	5	11	16
15	15	15	15	13	15	16	15	15	14	14	16	18	18	17	20	15	15	13	14	16	15	15	16	^B 14
16	15	16	16	17	15	16	16	15	15	18	19	18	19	19	21	21	19	16	13	15	13	16	16	12
17	13	13	13	15	12	16	15	15	15	15	15	18	18	12	18	17	17	10	14	5	15	15	16	16
18	15	17	15	16	17	8	14	15	10	7	18	18	9	16	19	18	81	15	14	13	15	15	16	15
19	15	15	16	16	14	15	16	14	15	17	17	19	20	19	89	104	16	7	6	13	15	16	18	16
20	15	15	15	15	17	14	15	13	13	14	15	16	21	16	19	18	15	14	13	6	13	15	15	15
21	16	15	16	16	15	16	15	15	14	14	14	9	16	17	17	17	17	12	15	15	15	17	16	15
22	16	15	15	16	15	15	16	15	15	15	18	18	23	19	19	20	16	15	13	14	15	16	16	15
23	16	16	16	15	14	15	14	14	14	14	13	19	18	20	17	17	17	5	13	13	15	15	16	15
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25	13	13	15	16	16	15	15	9	13	5	16	19	19	18	10	16	13	16	14	14	16	16	14	15
26	15	16	15	16	16	16	14	13	13	13	8	15	20	23	18	17	18	13	13	15	15	17	16	15
27	16	15	15	16	17	15	16	15	8	14	17	19	21	16	19	15	12	14	14	12	15	14	14	16
28	16	16	16	16	15	15	15	16	69	13	5	19	15	32	11	16	15	14	15	14	16	16	15	16
29	15	15	15	16	16	^B 15	15	15	9	6	41	18	16	13	19	18	16	16	15	15	16	15	14	15
30	15	16	18	14	14		15	15	14	16	15	22	18	20	21	15	20	14	14	15	16	16	16	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	16	15	15	15	14	14	14	16	18	18	18	18	17	16	14	14	14	15	15	15	15
U Q	16	16	16	16	16	16	15	15	15	16	18	19	20	19	19	18	17	15	14	15	16	16	16	16
L Q	15	15	15	15	15	15	15	13	13	13	15	16	17	16	17	15	15	13	13	13	14	15	15	15

SUMMARY PLOTS AT Wakkanai



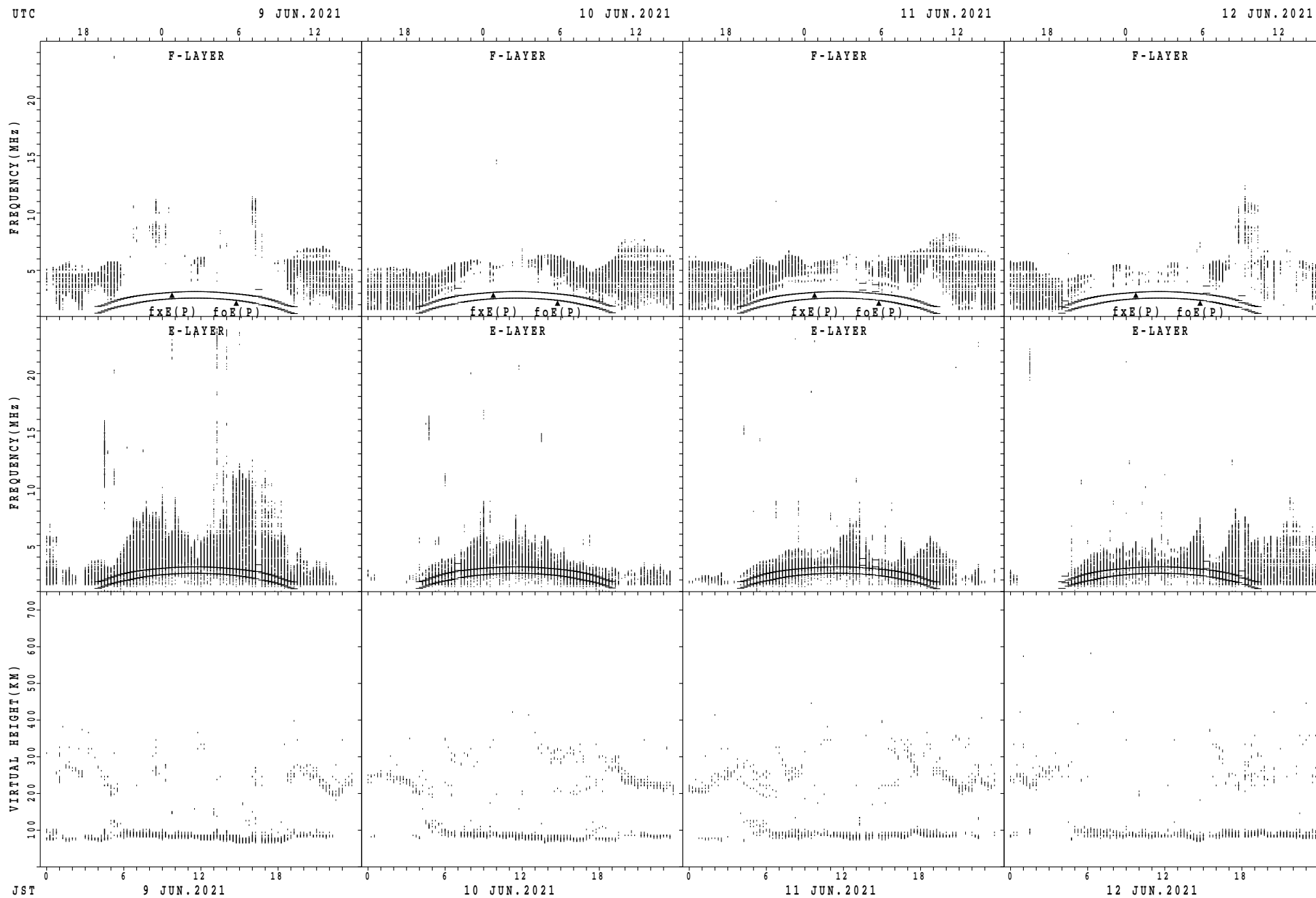
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



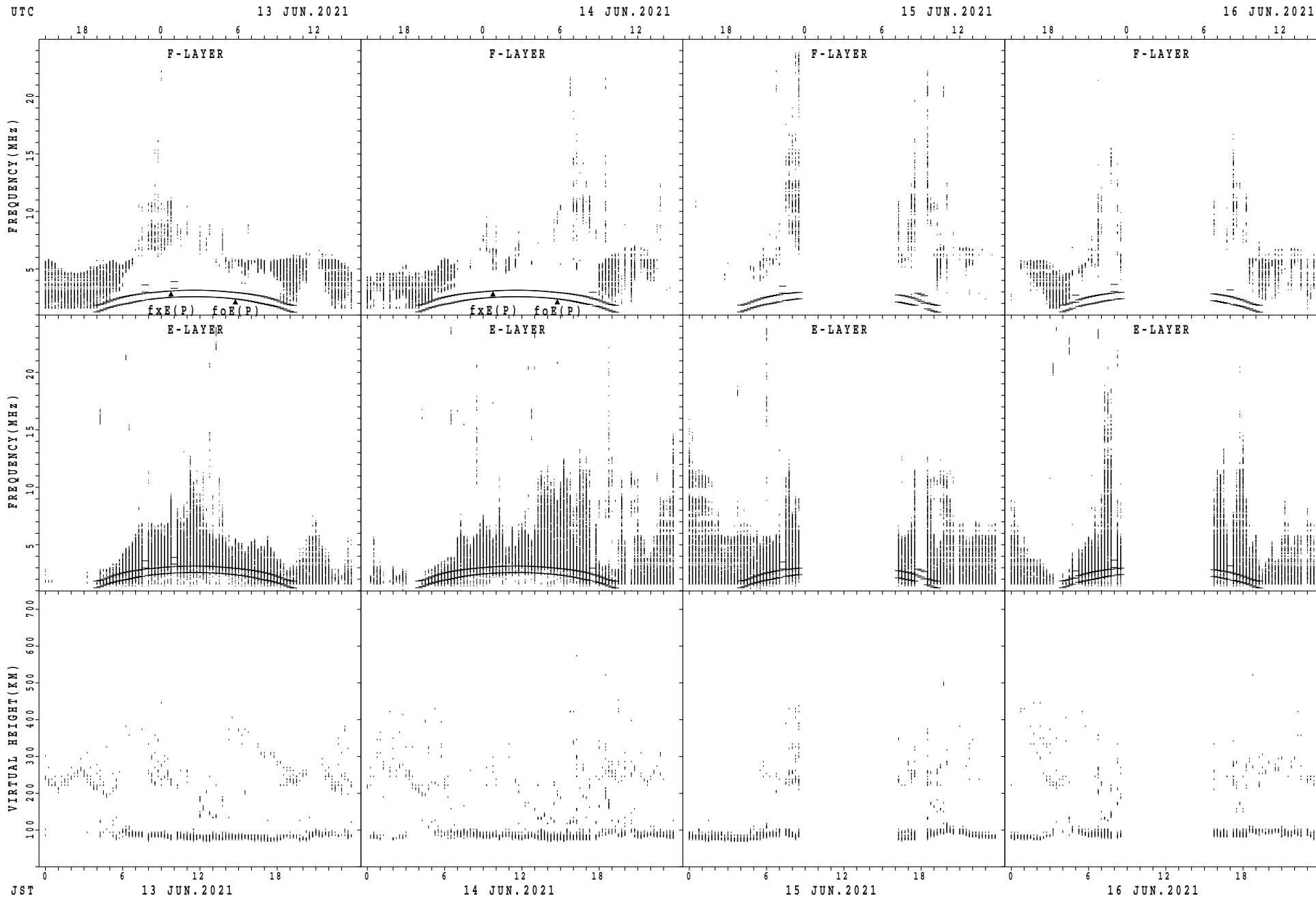
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



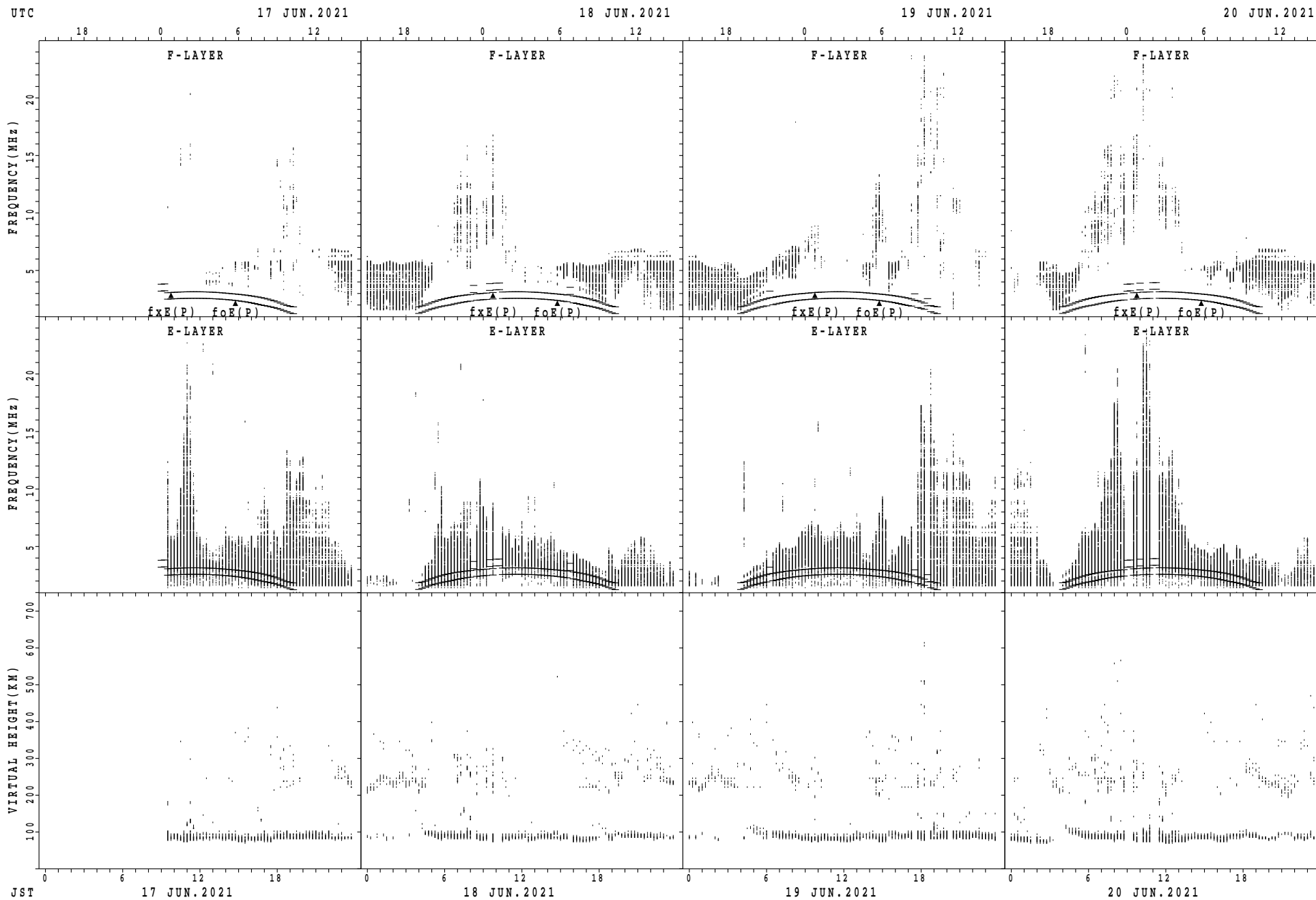
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



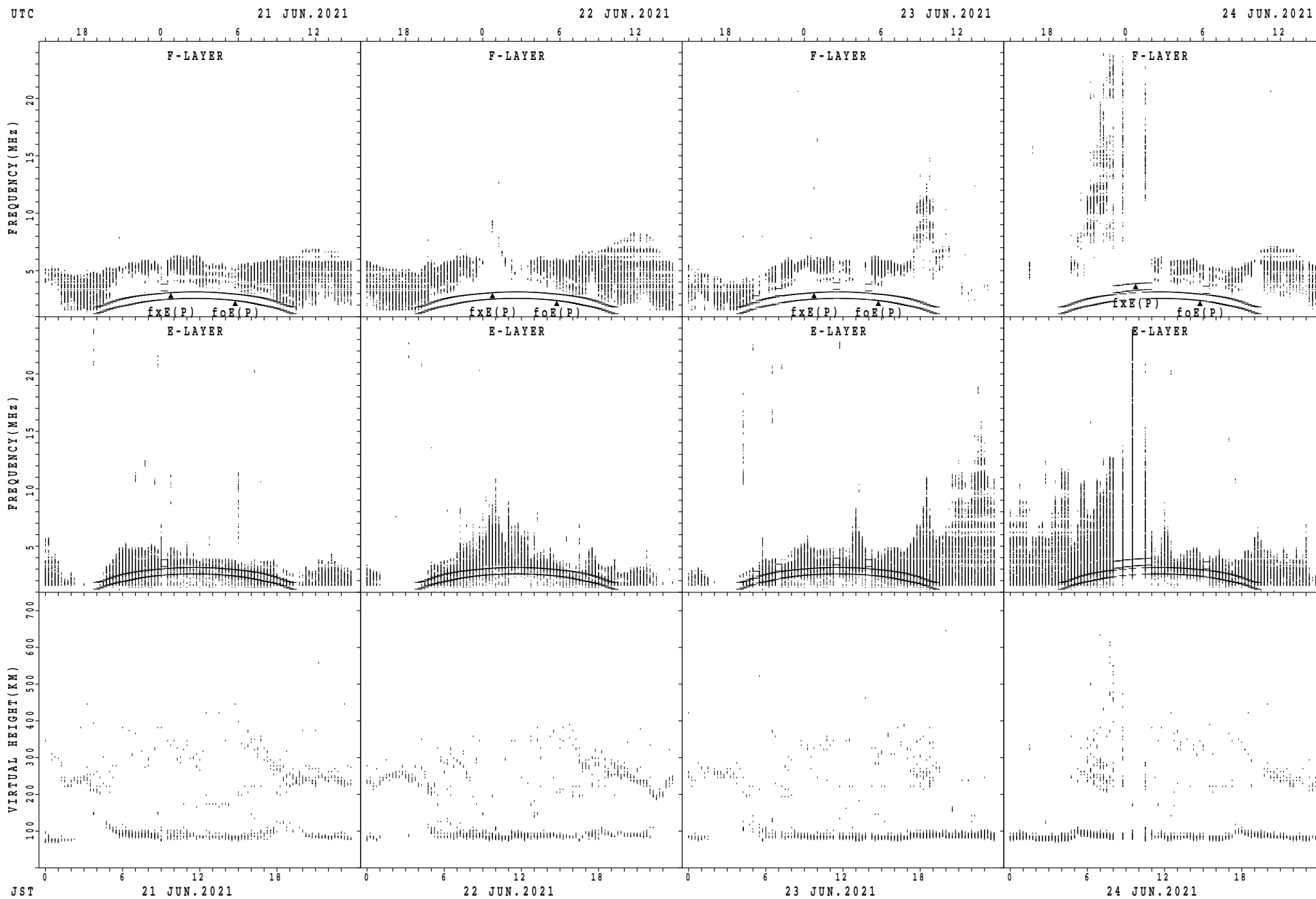
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



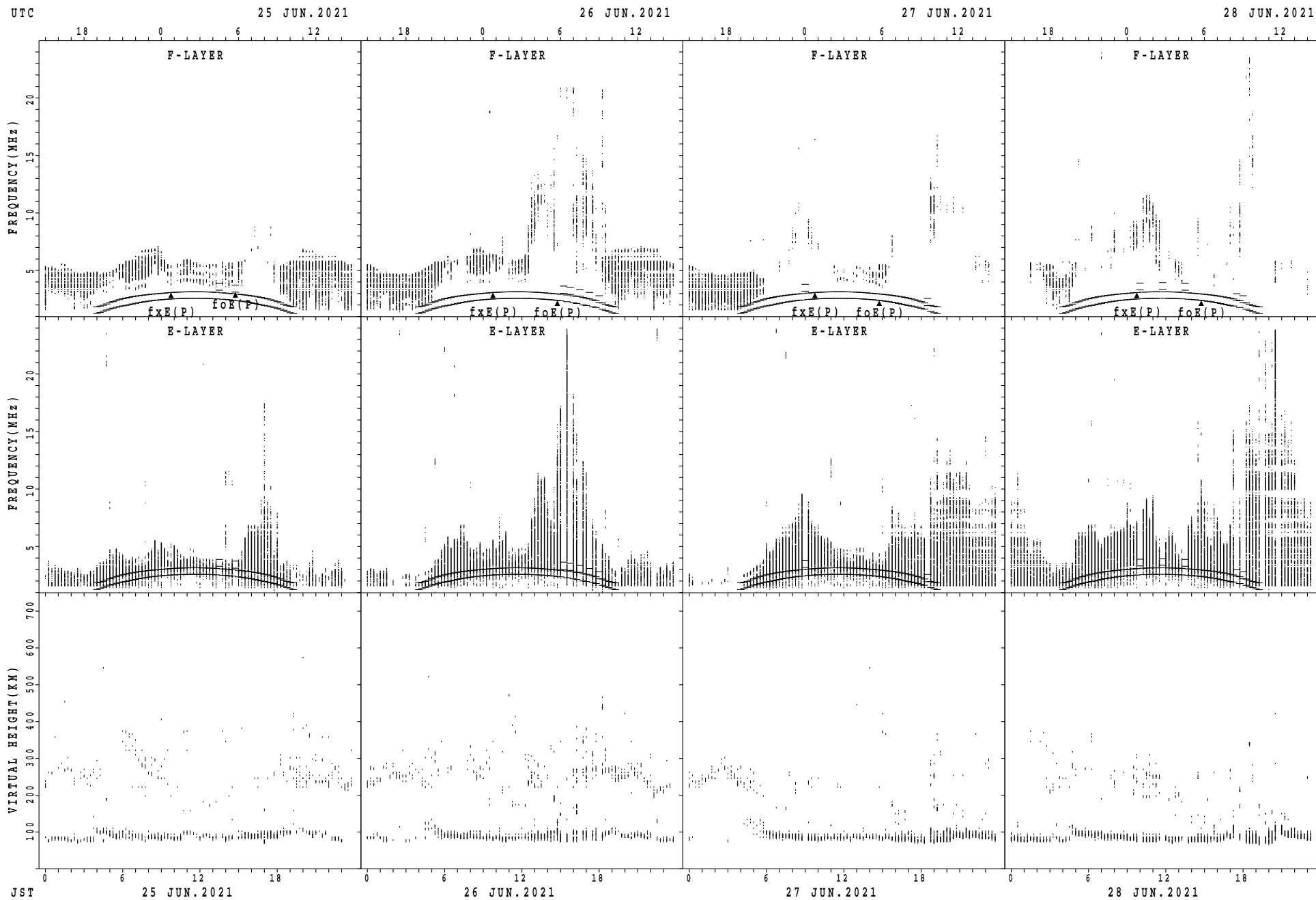
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 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



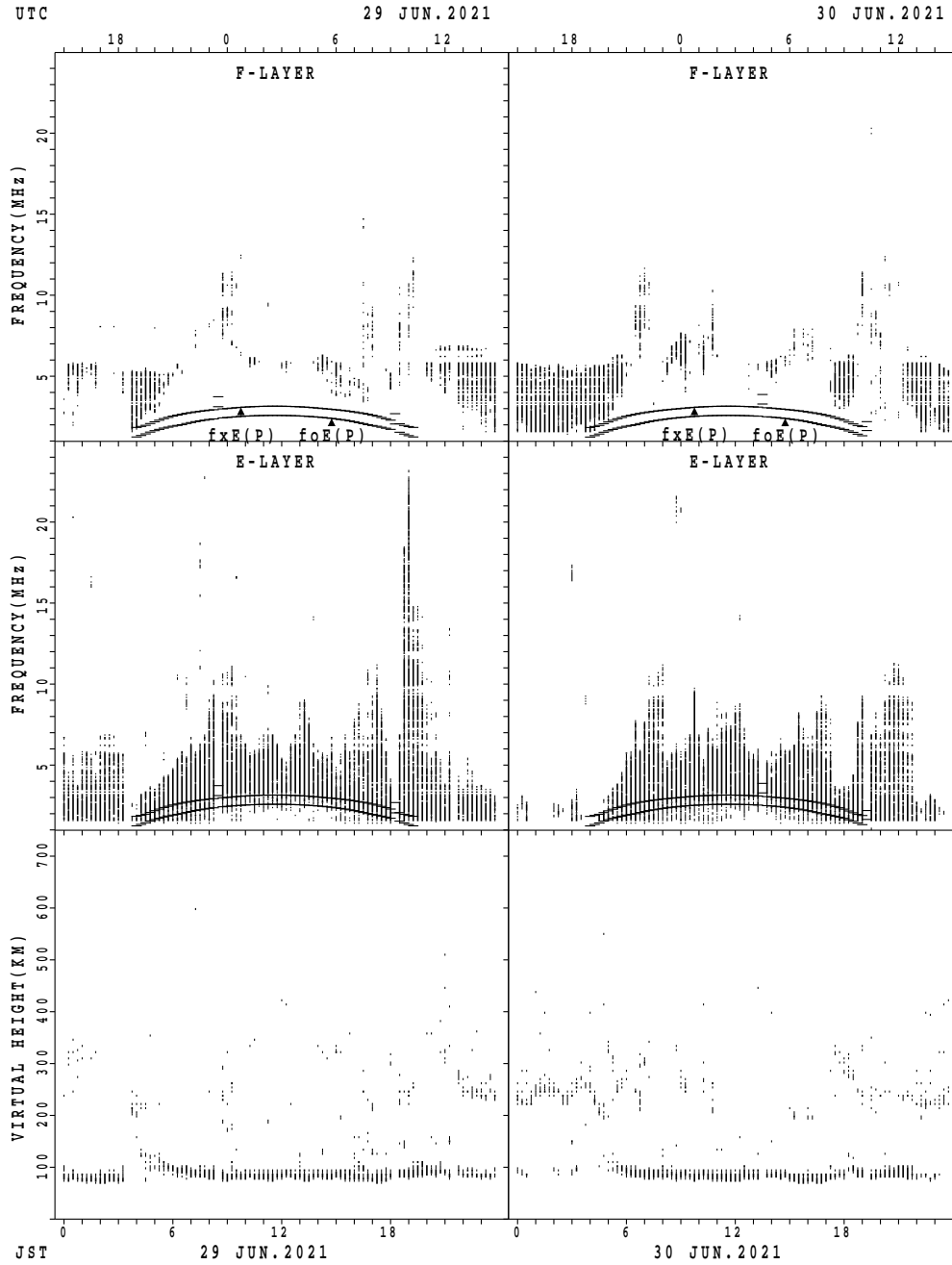
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



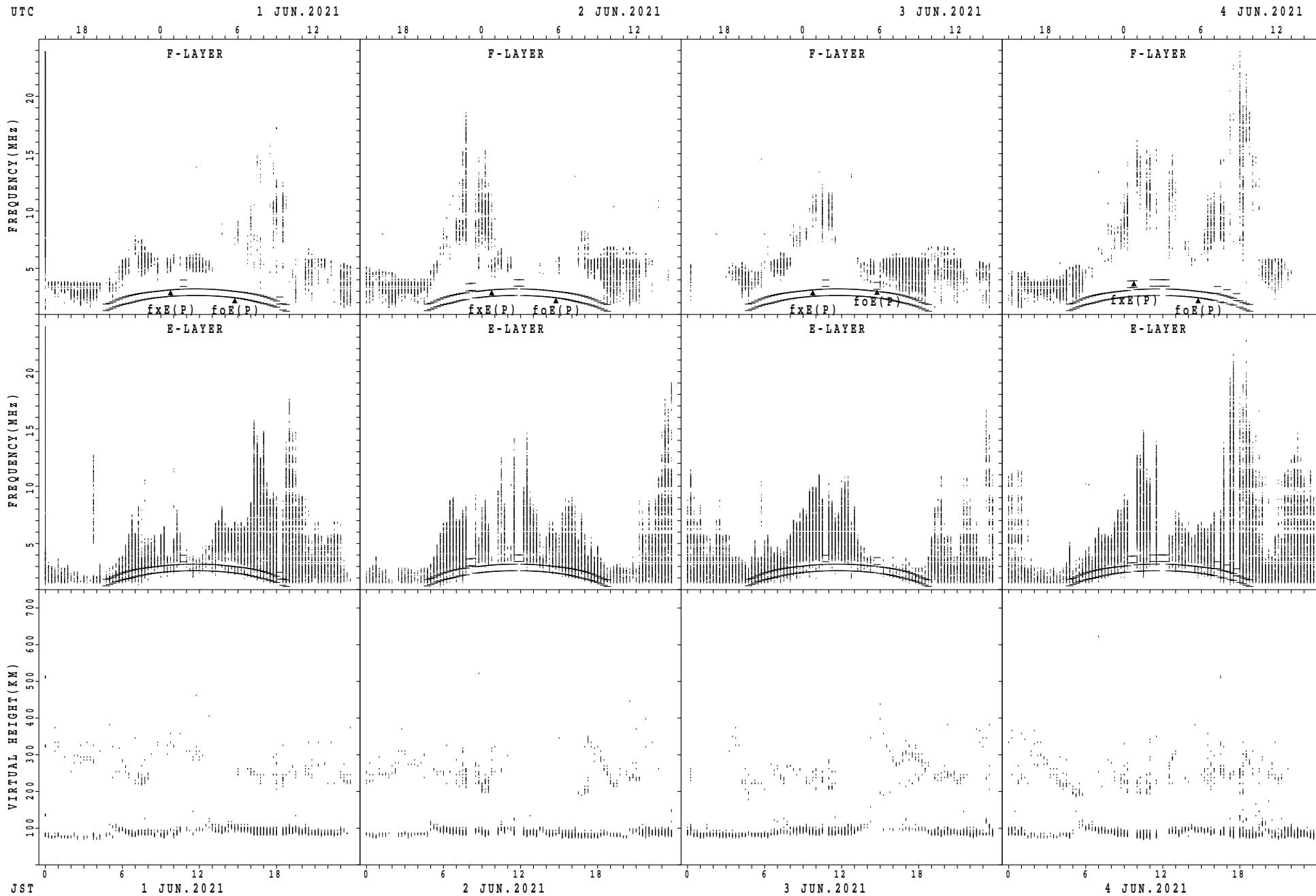
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



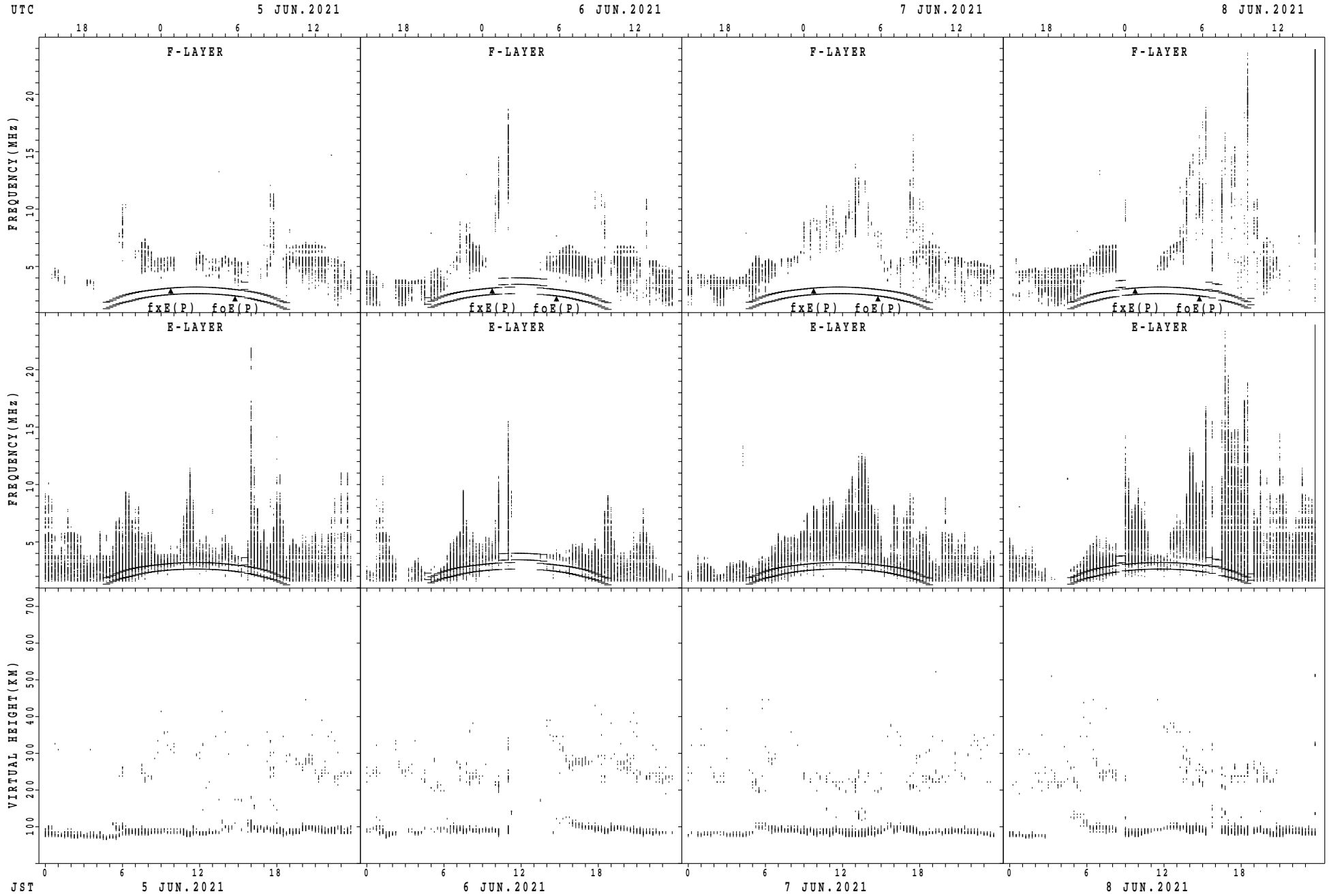
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



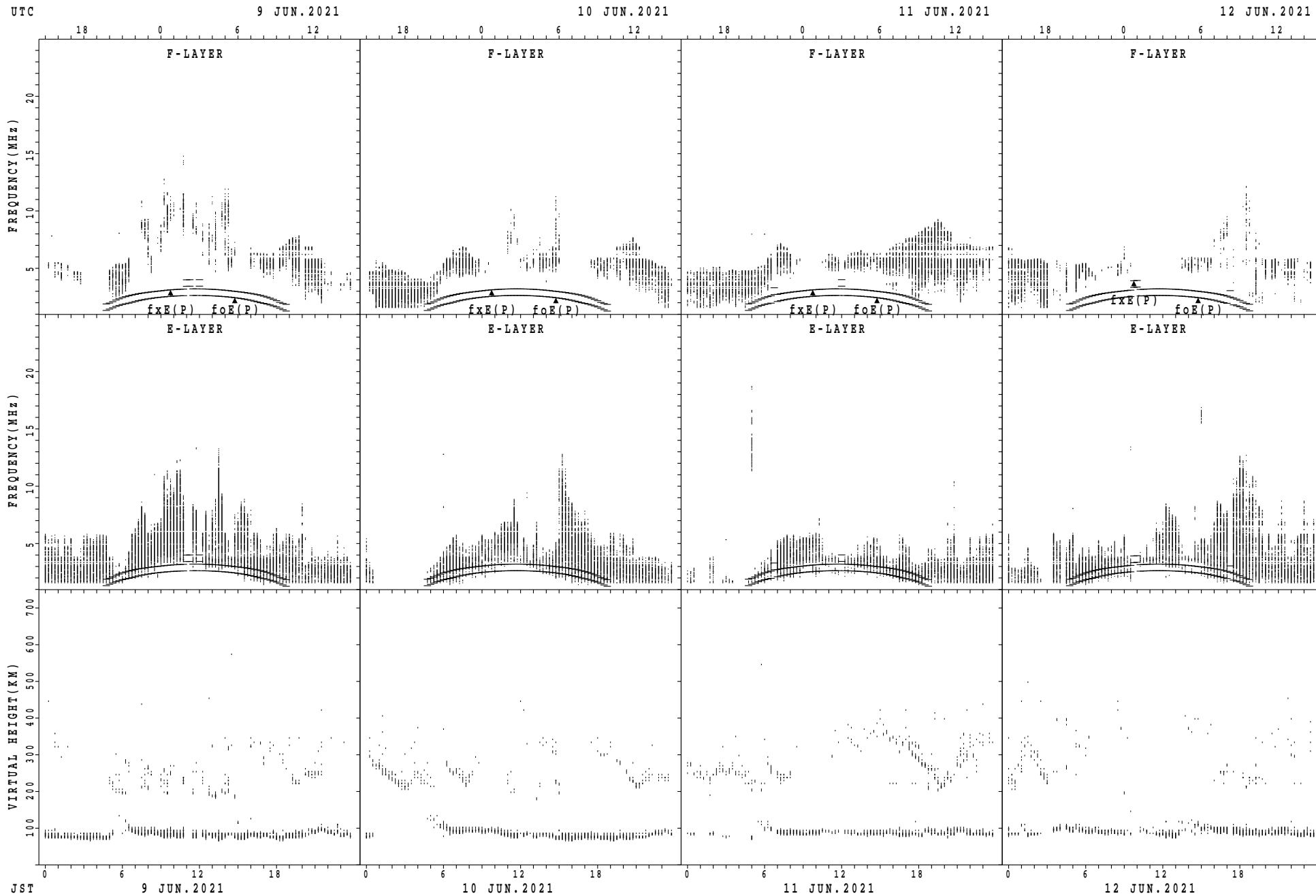
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



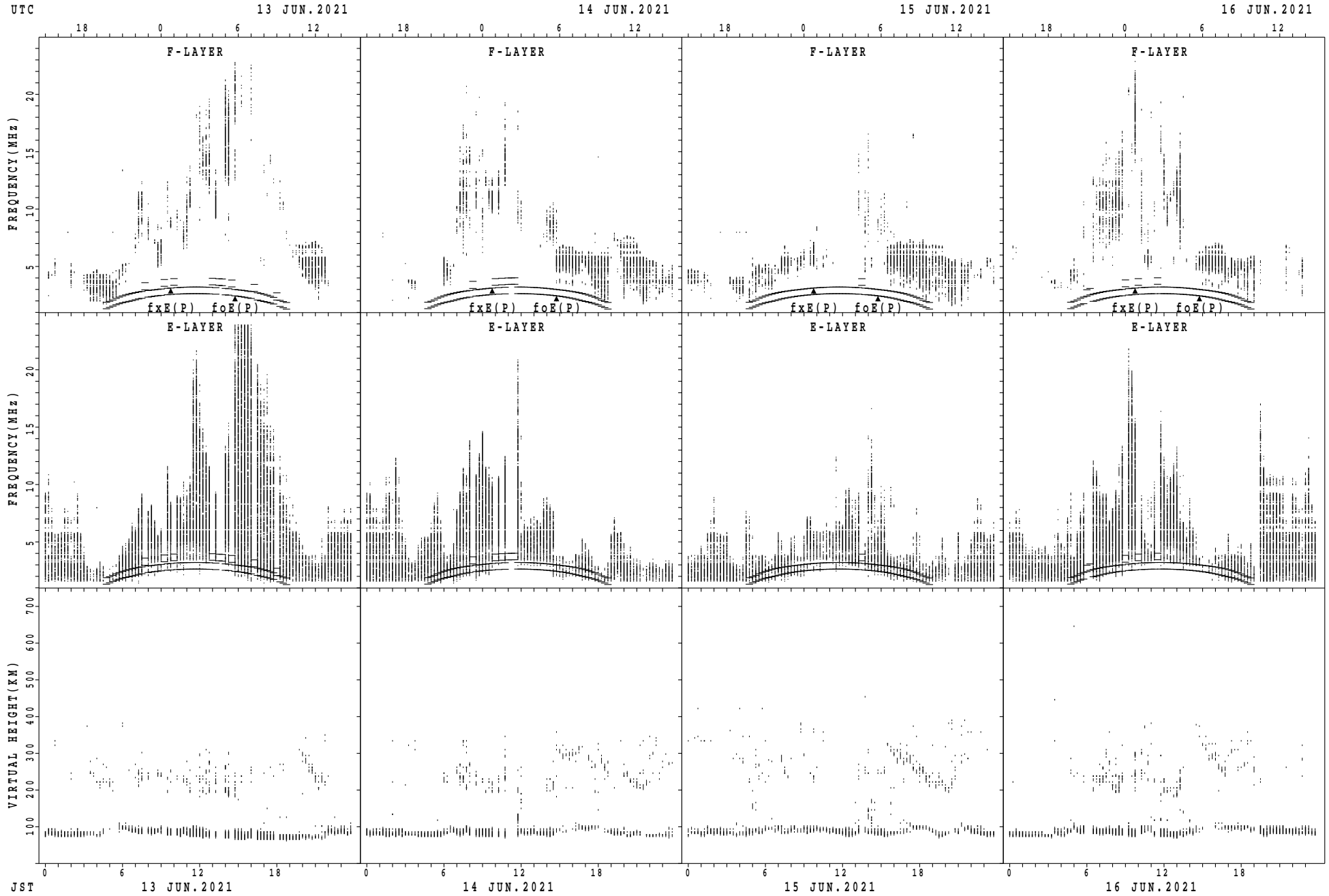
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



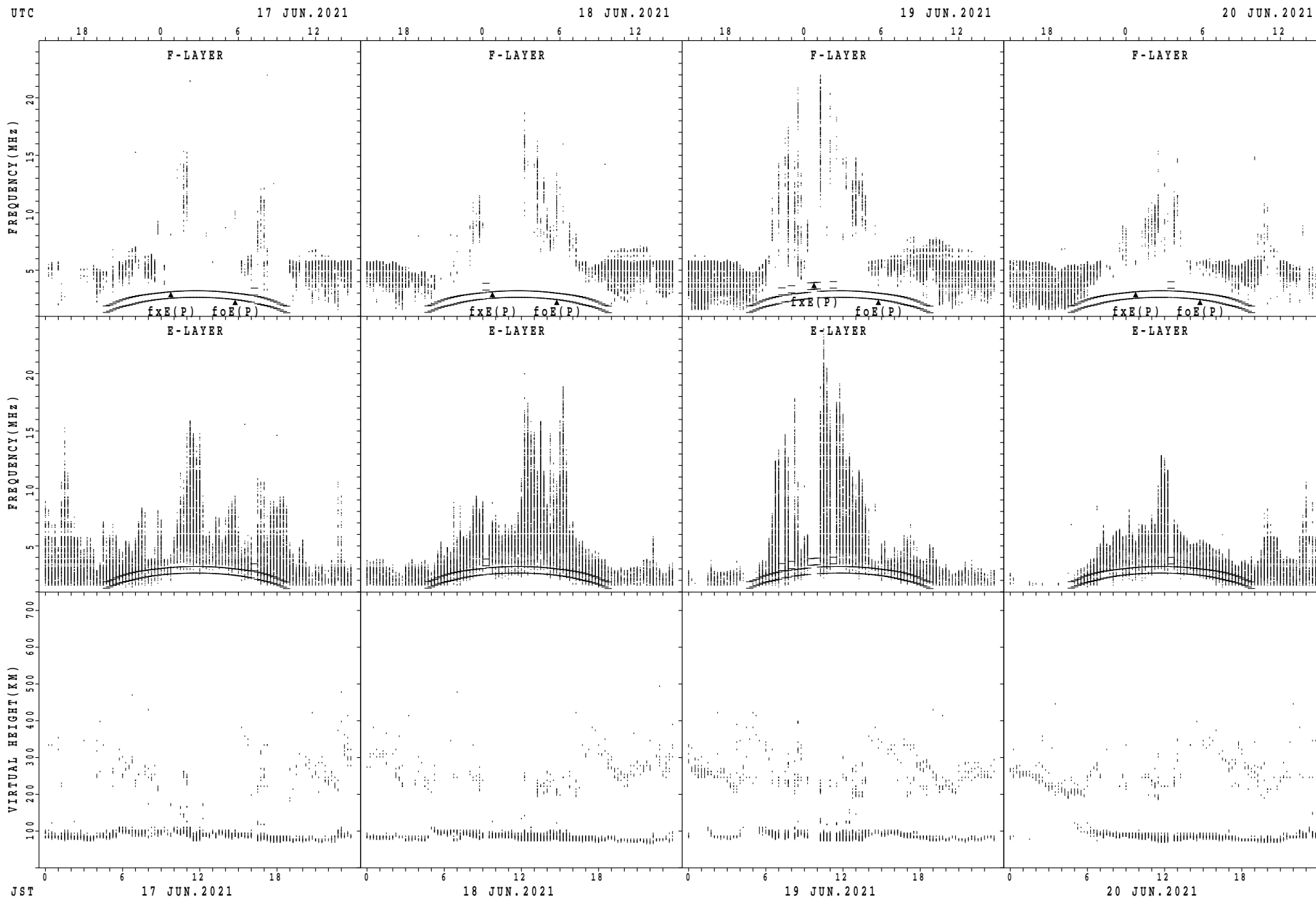
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



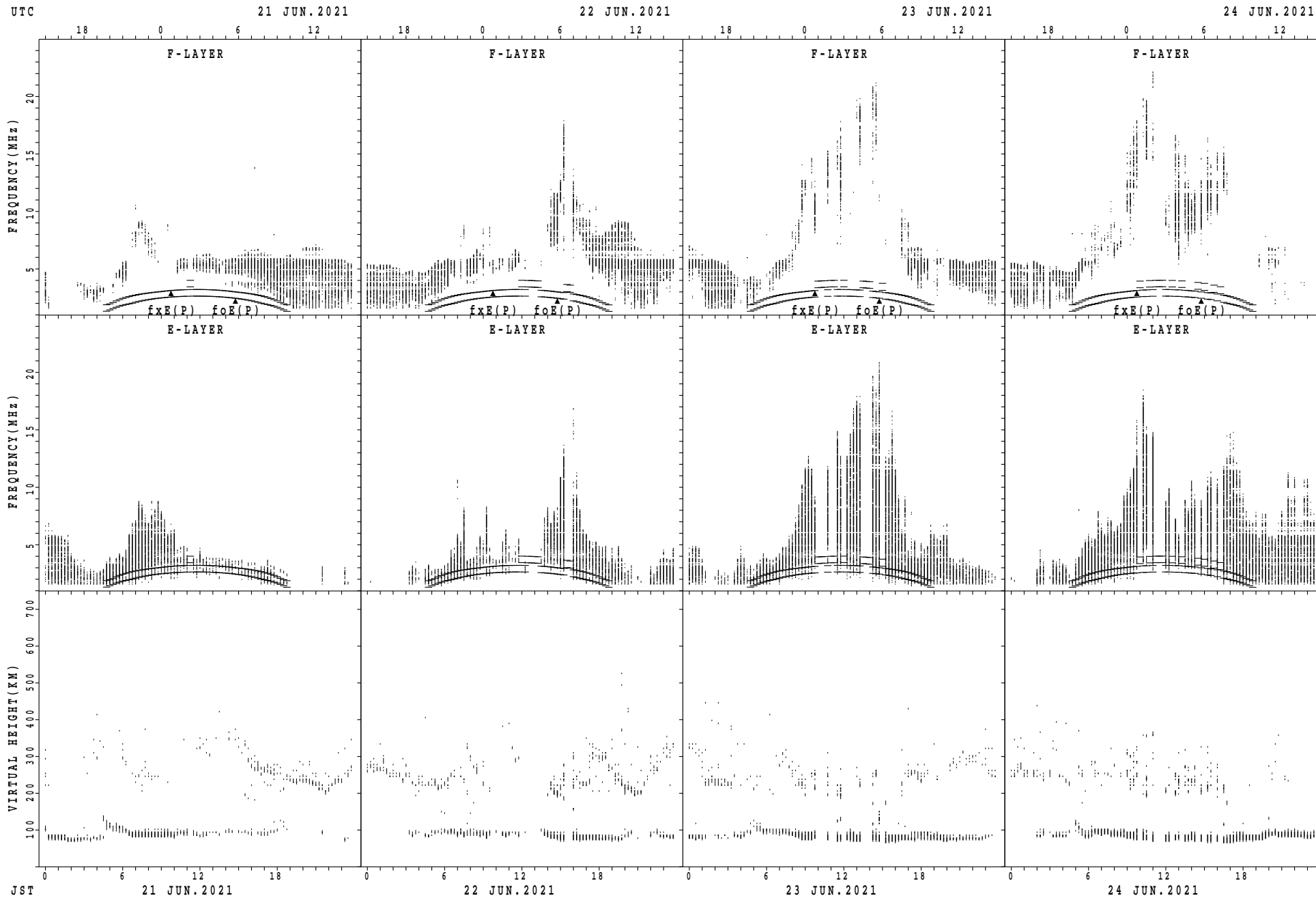
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



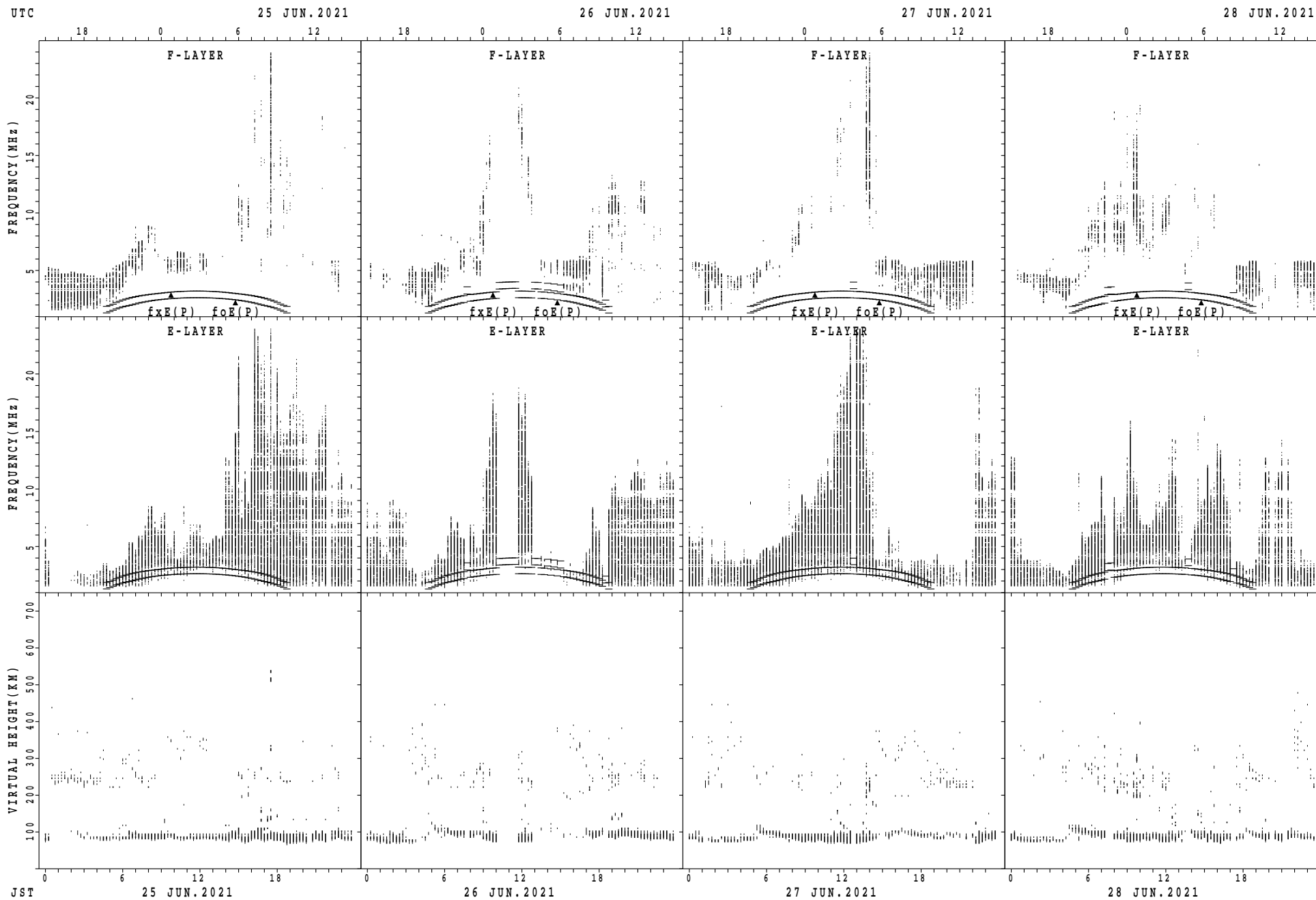
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



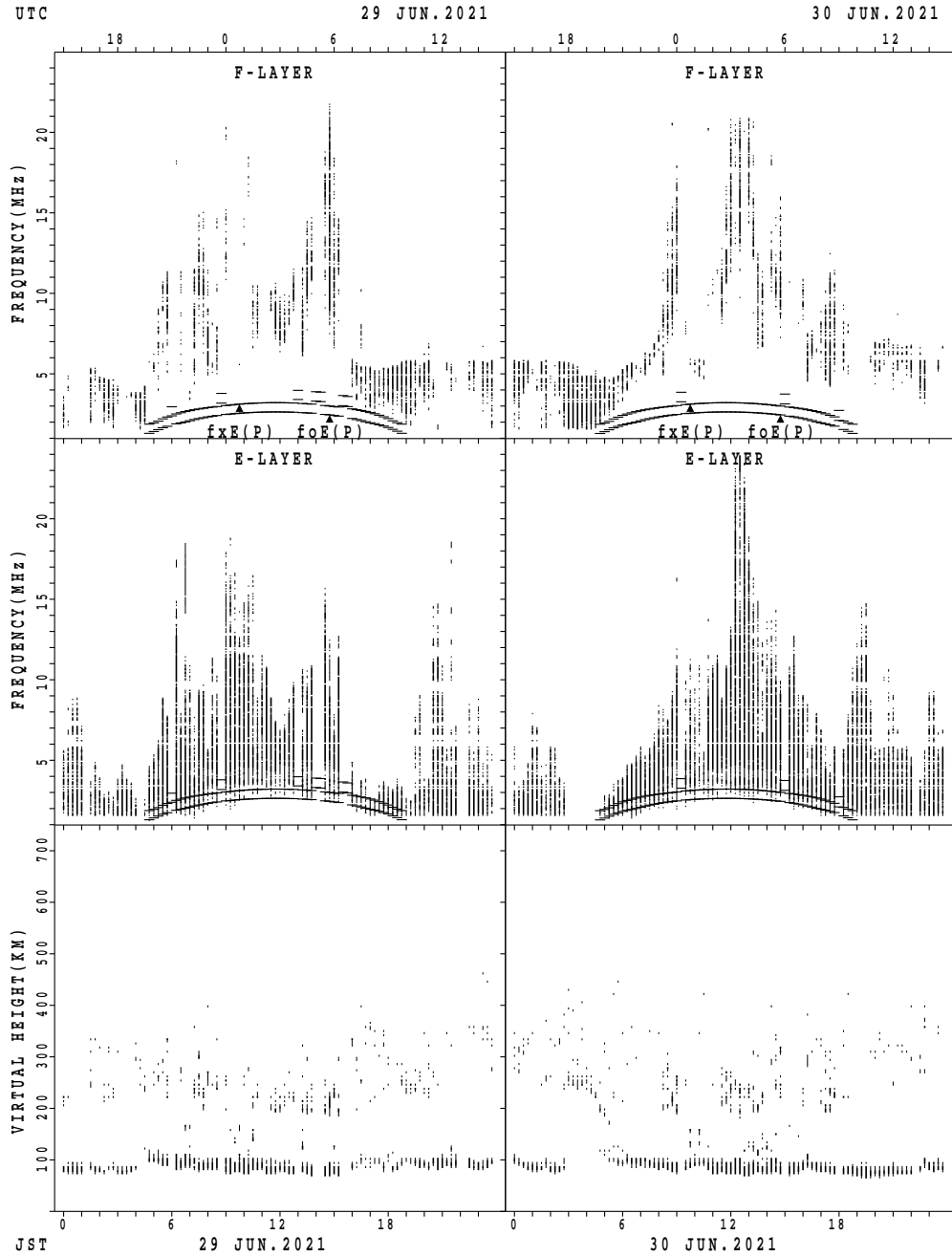
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



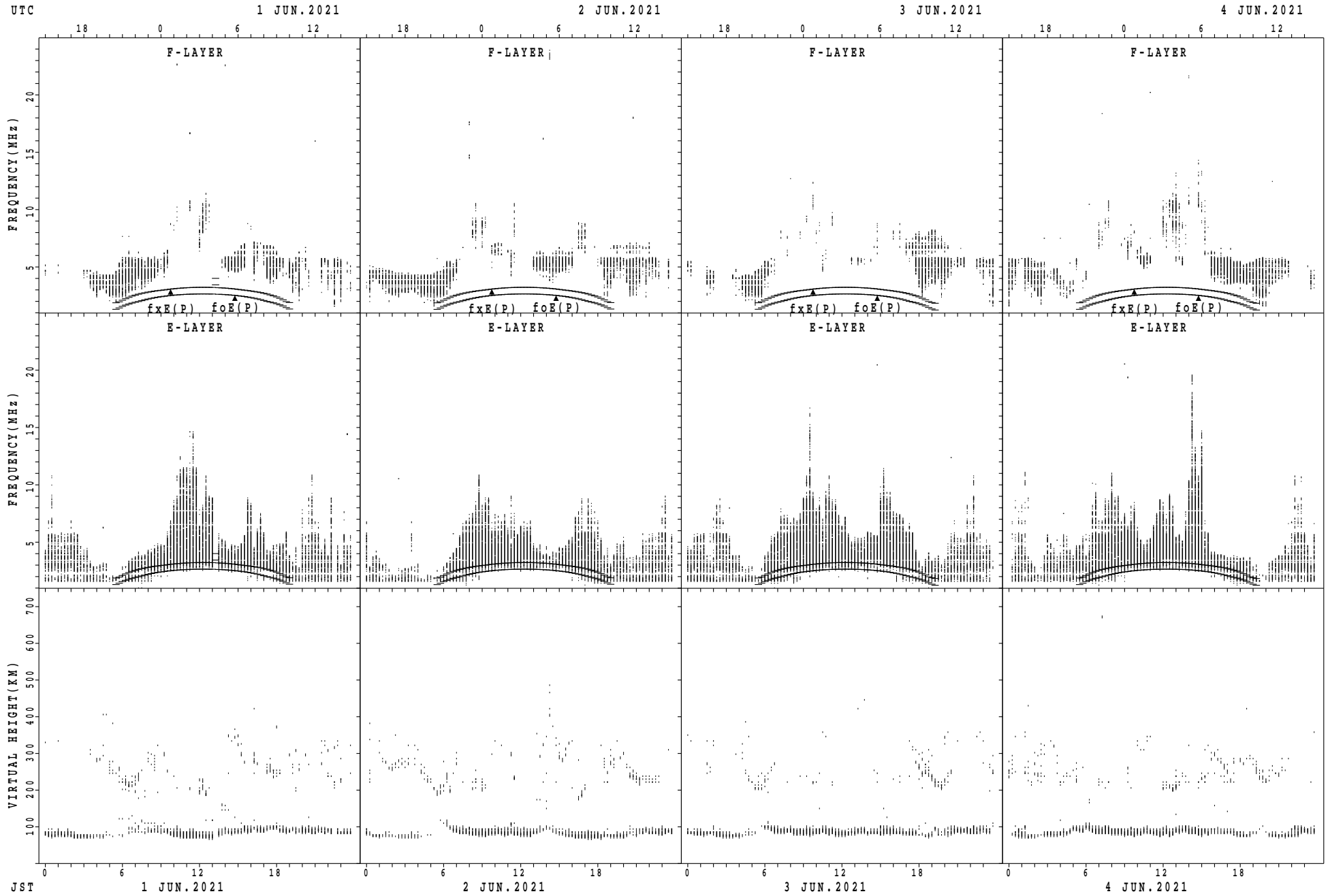
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



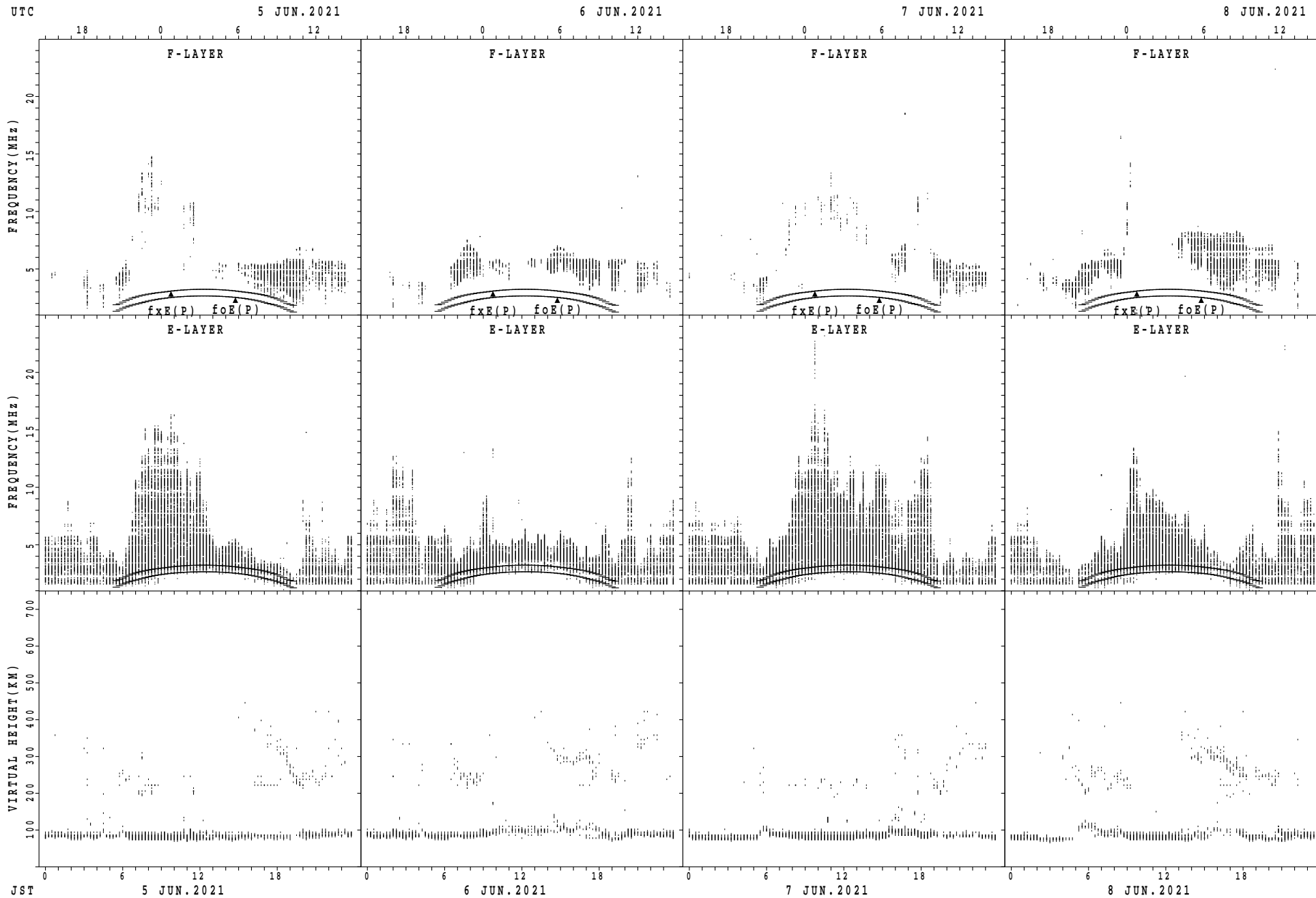
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



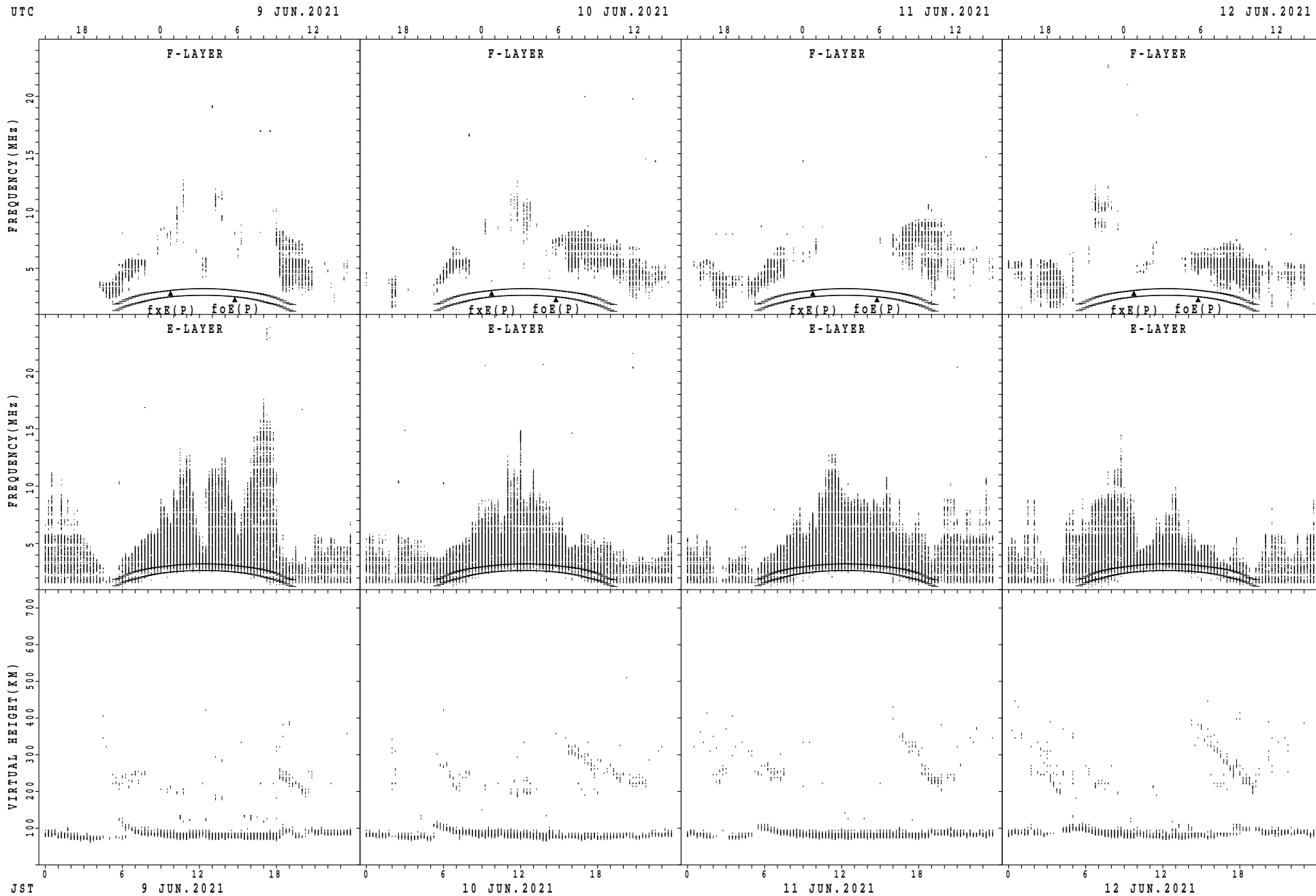
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



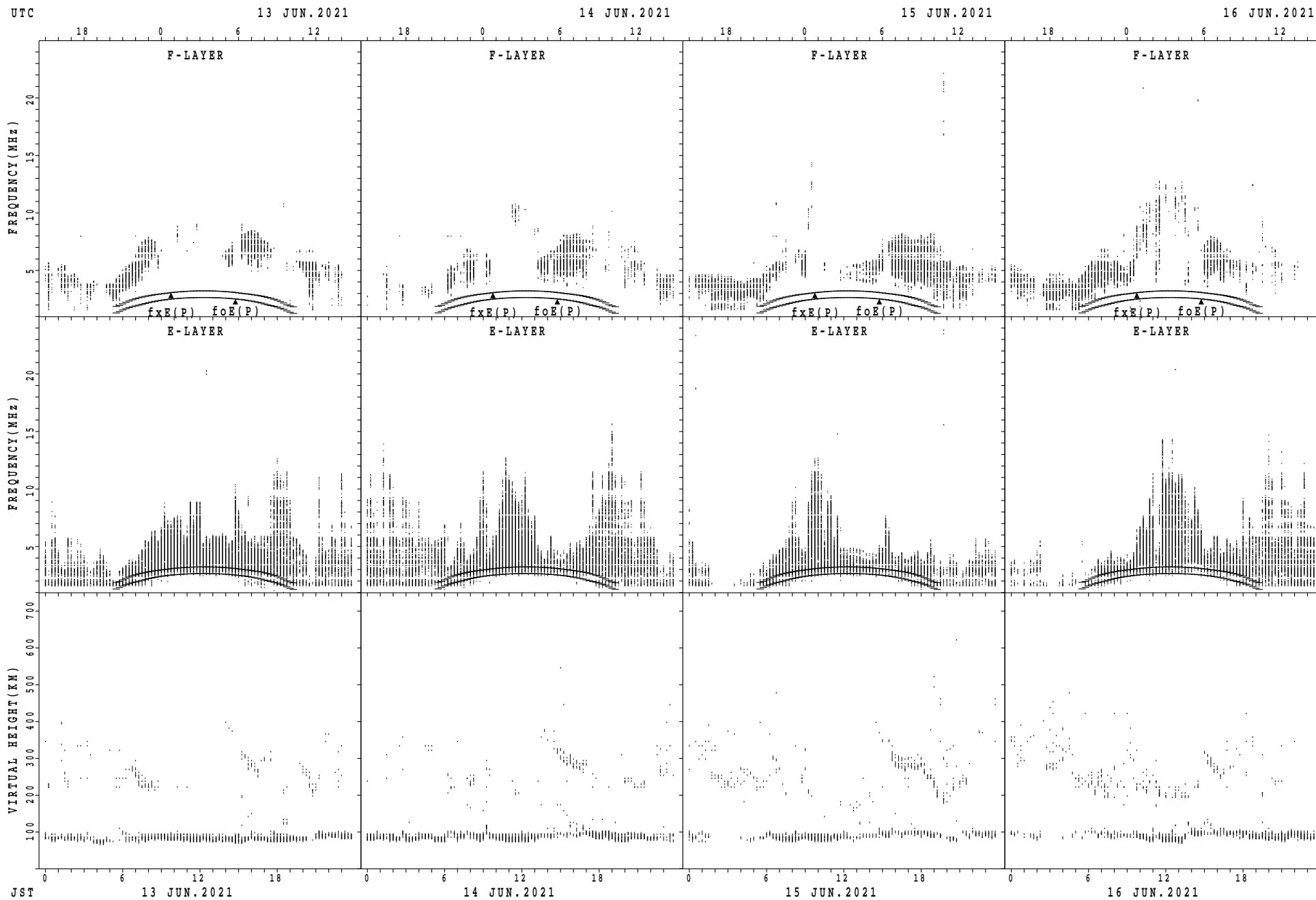
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



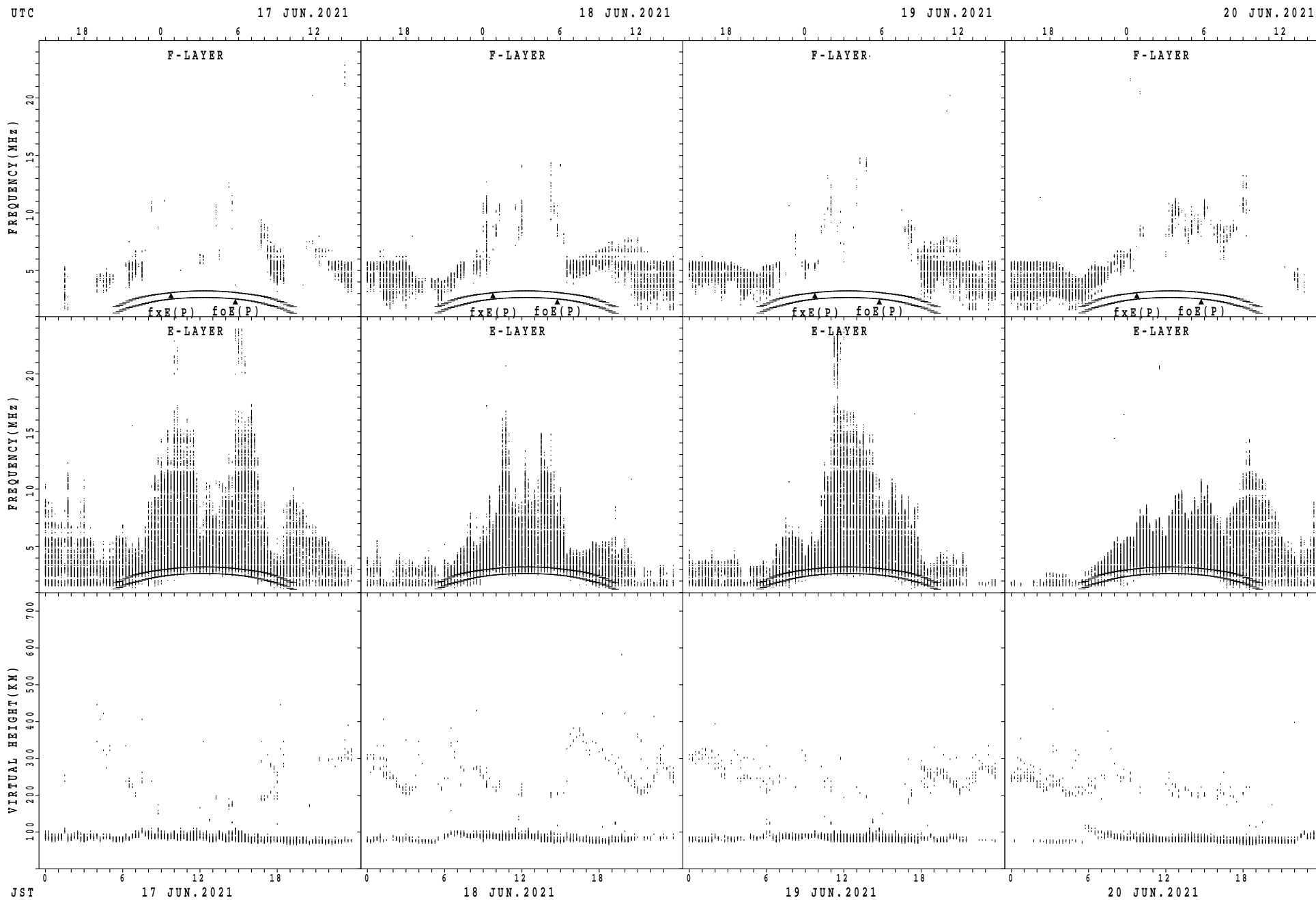
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



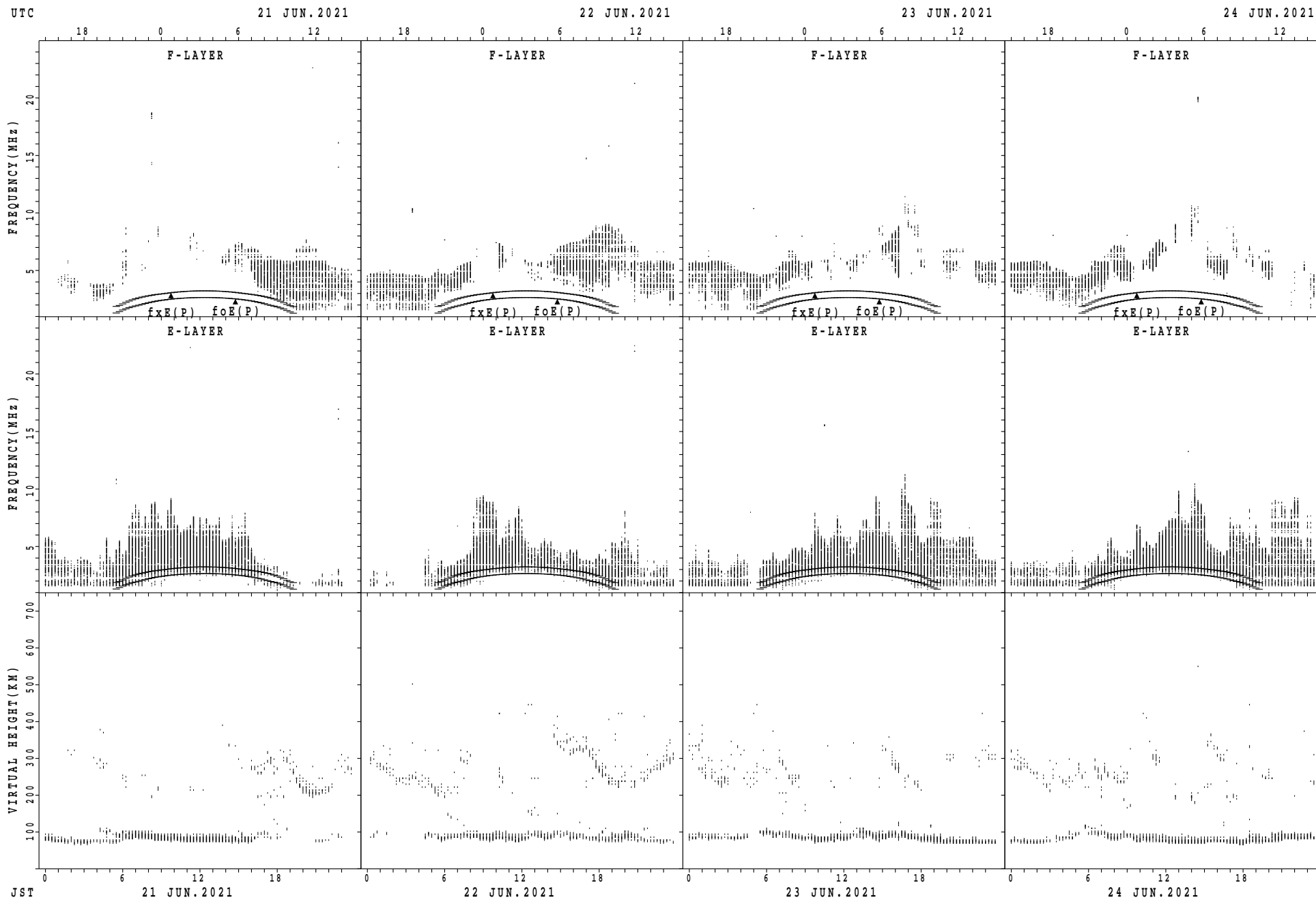
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



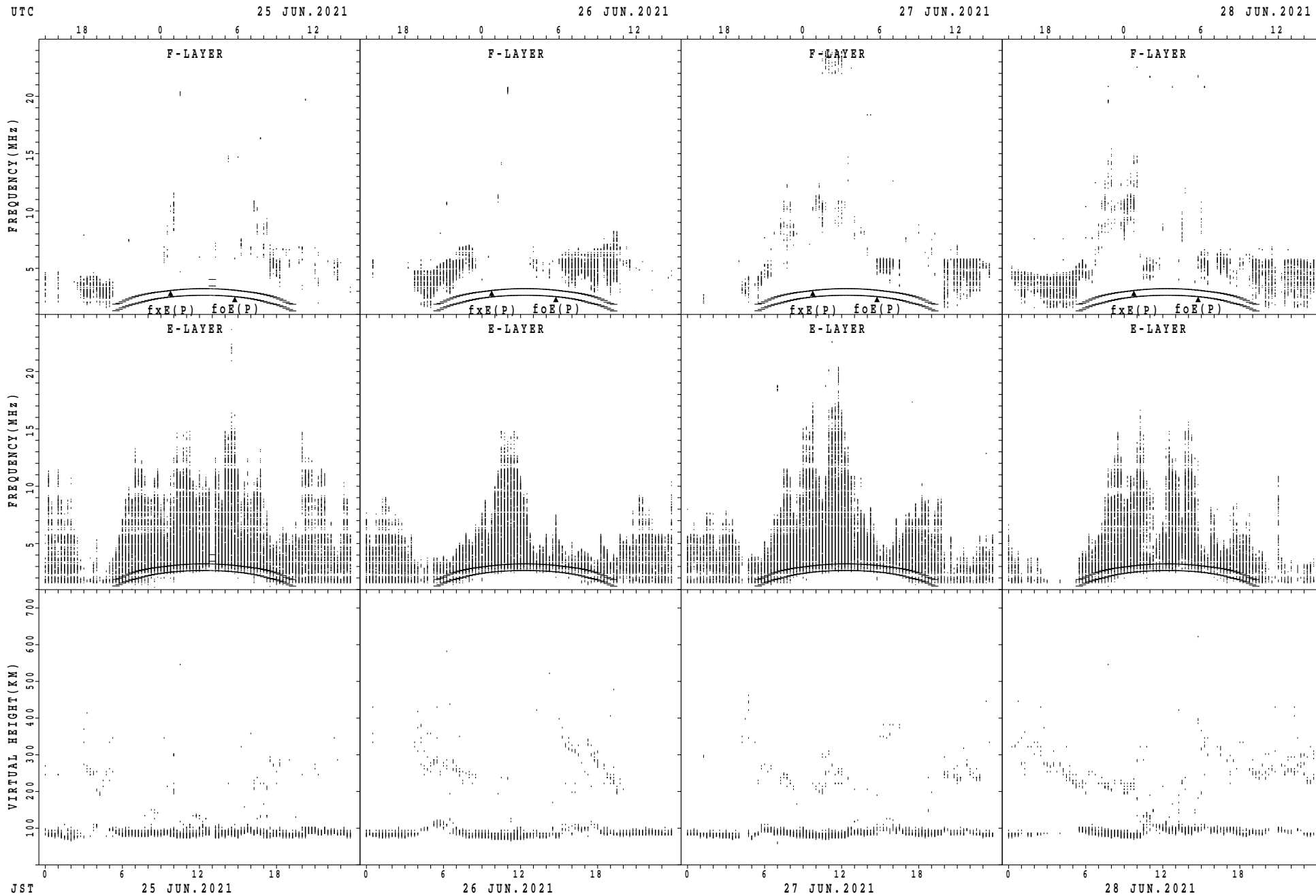
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



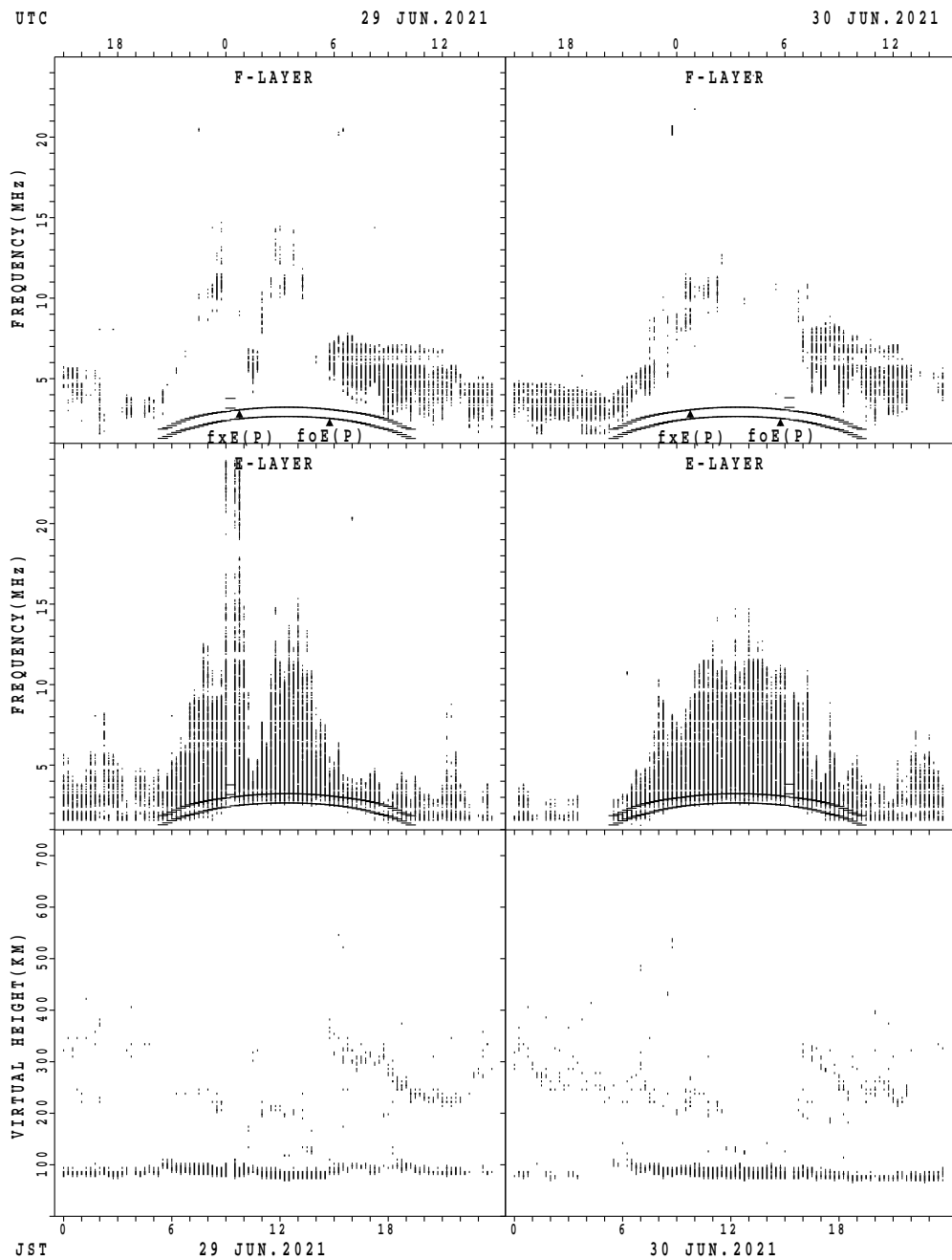
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



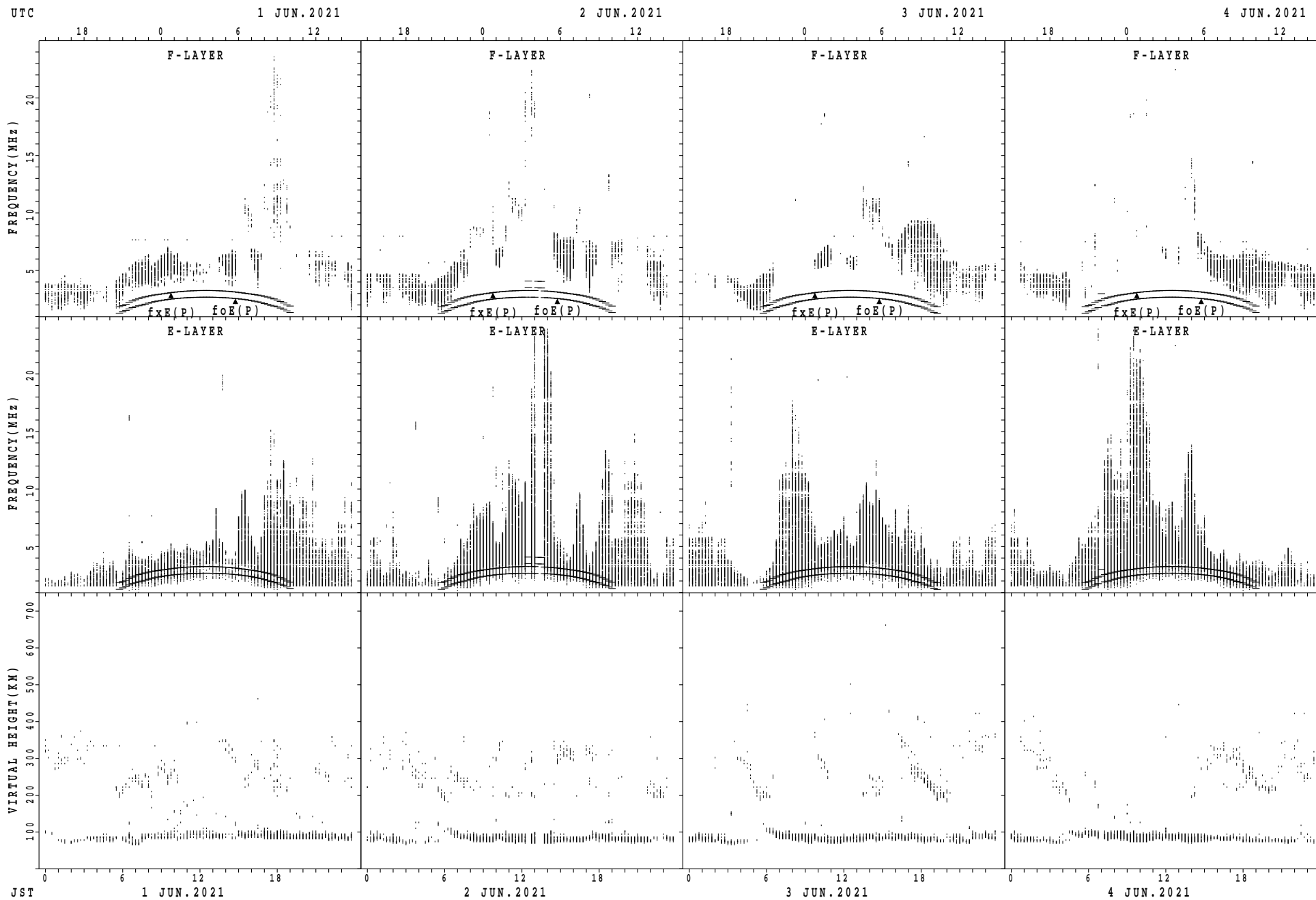
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



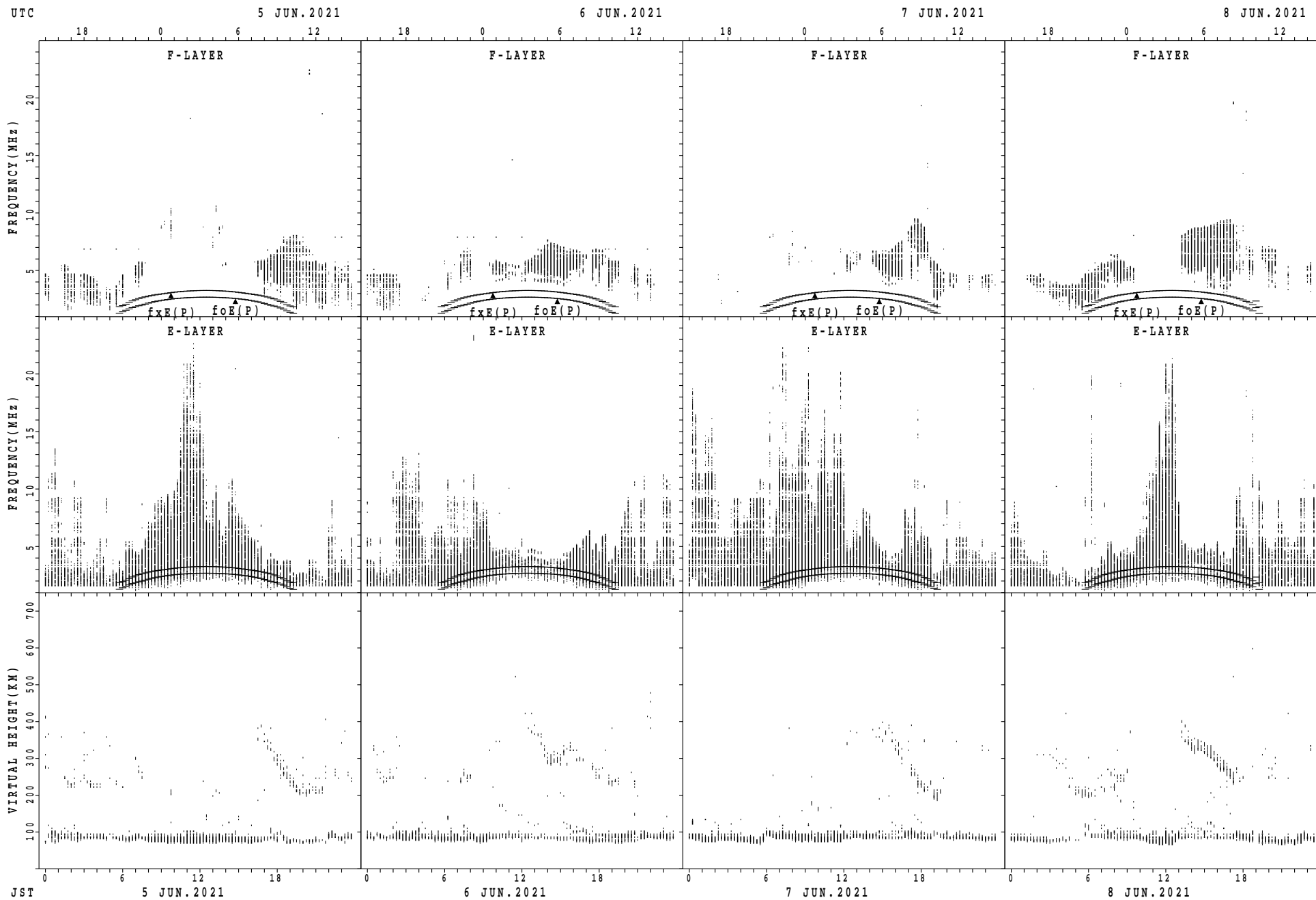
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



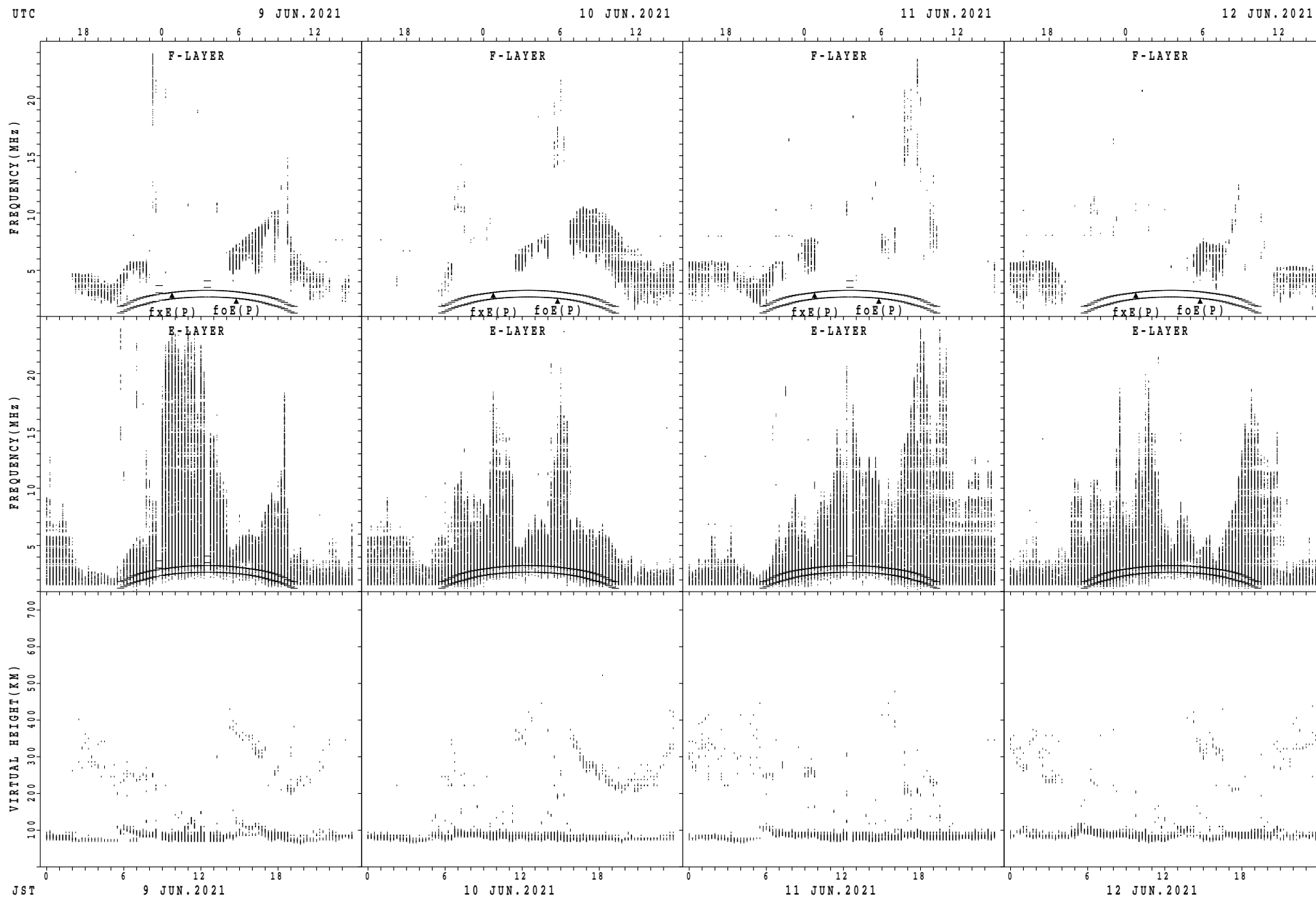
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



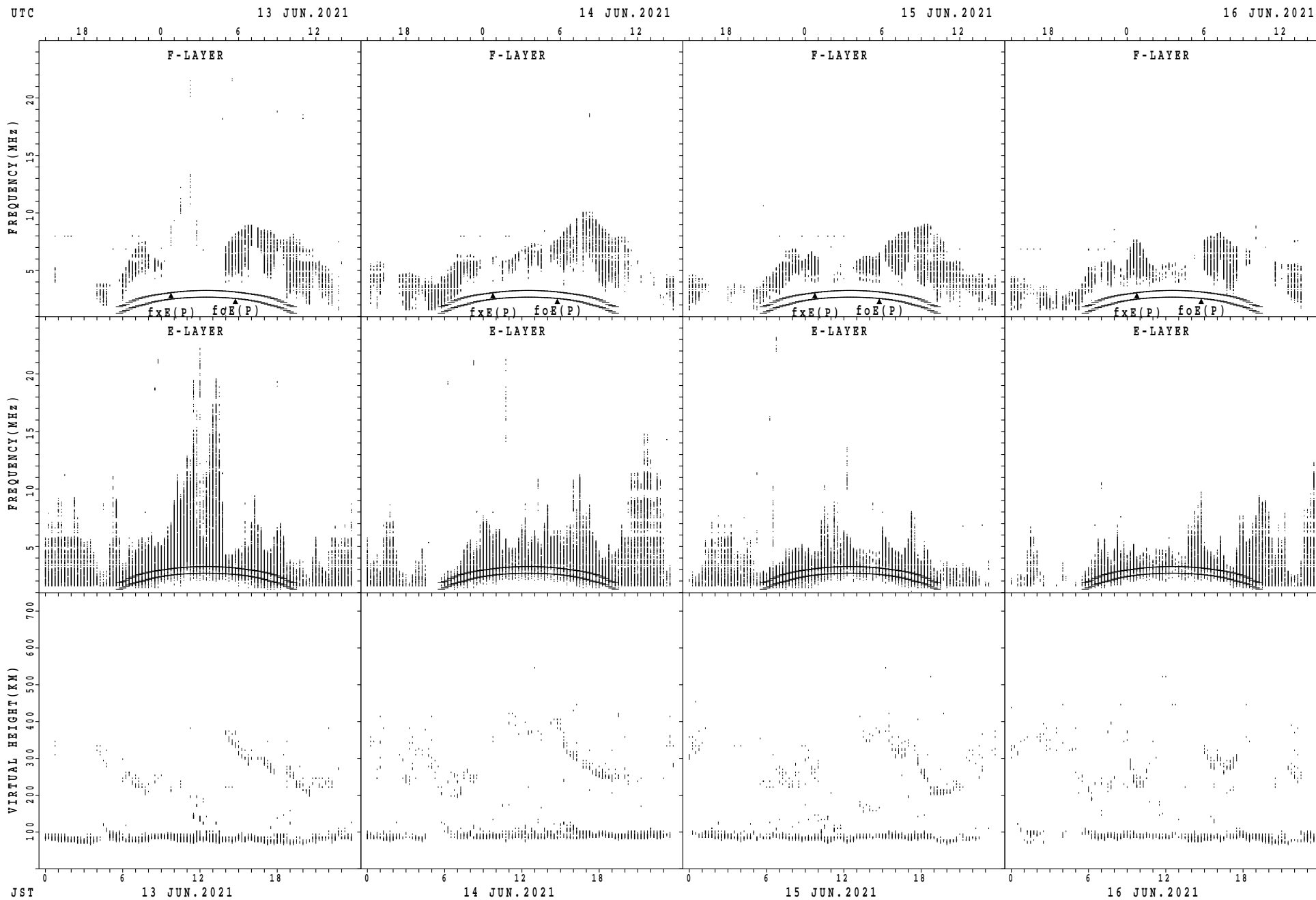
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



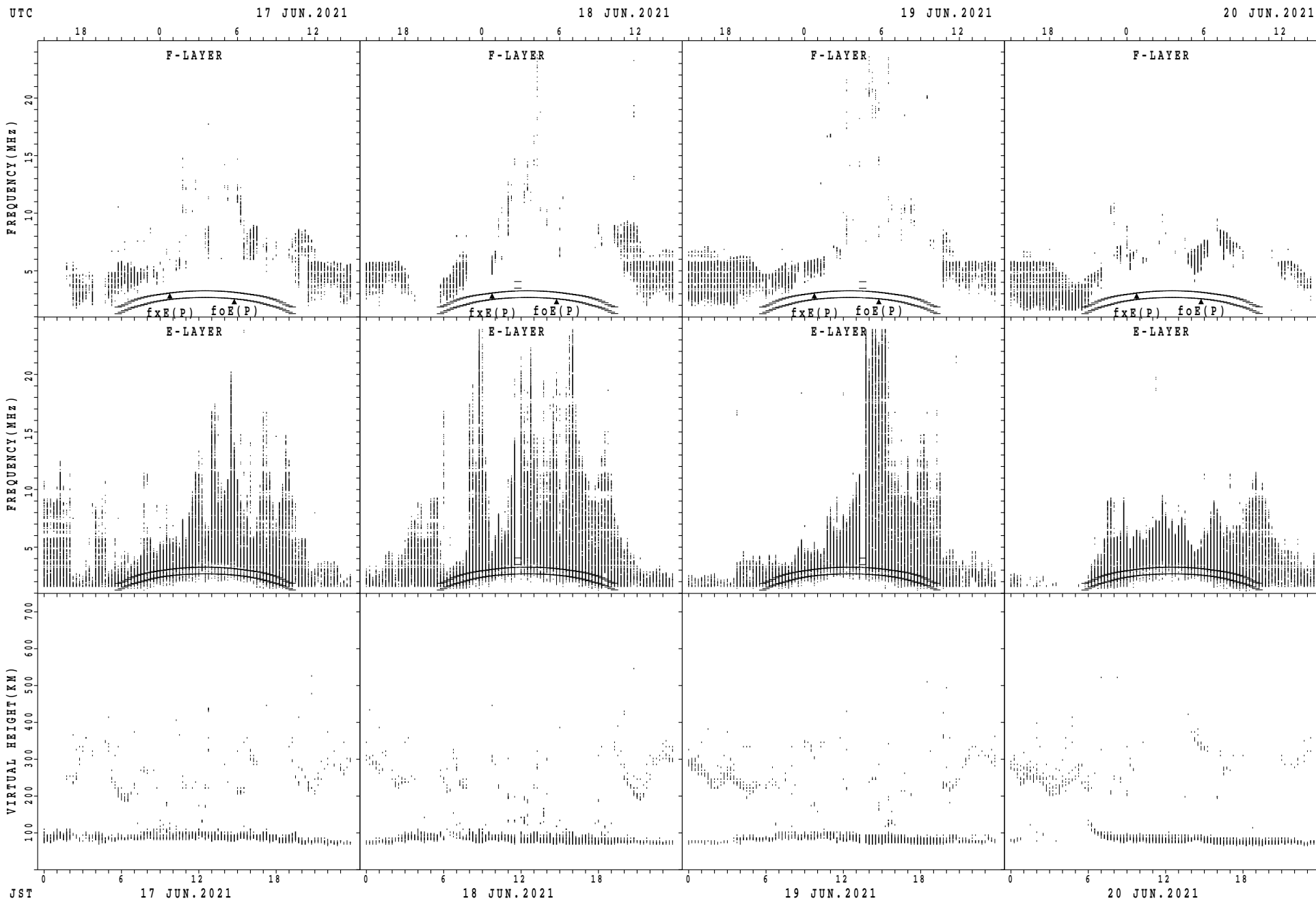
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



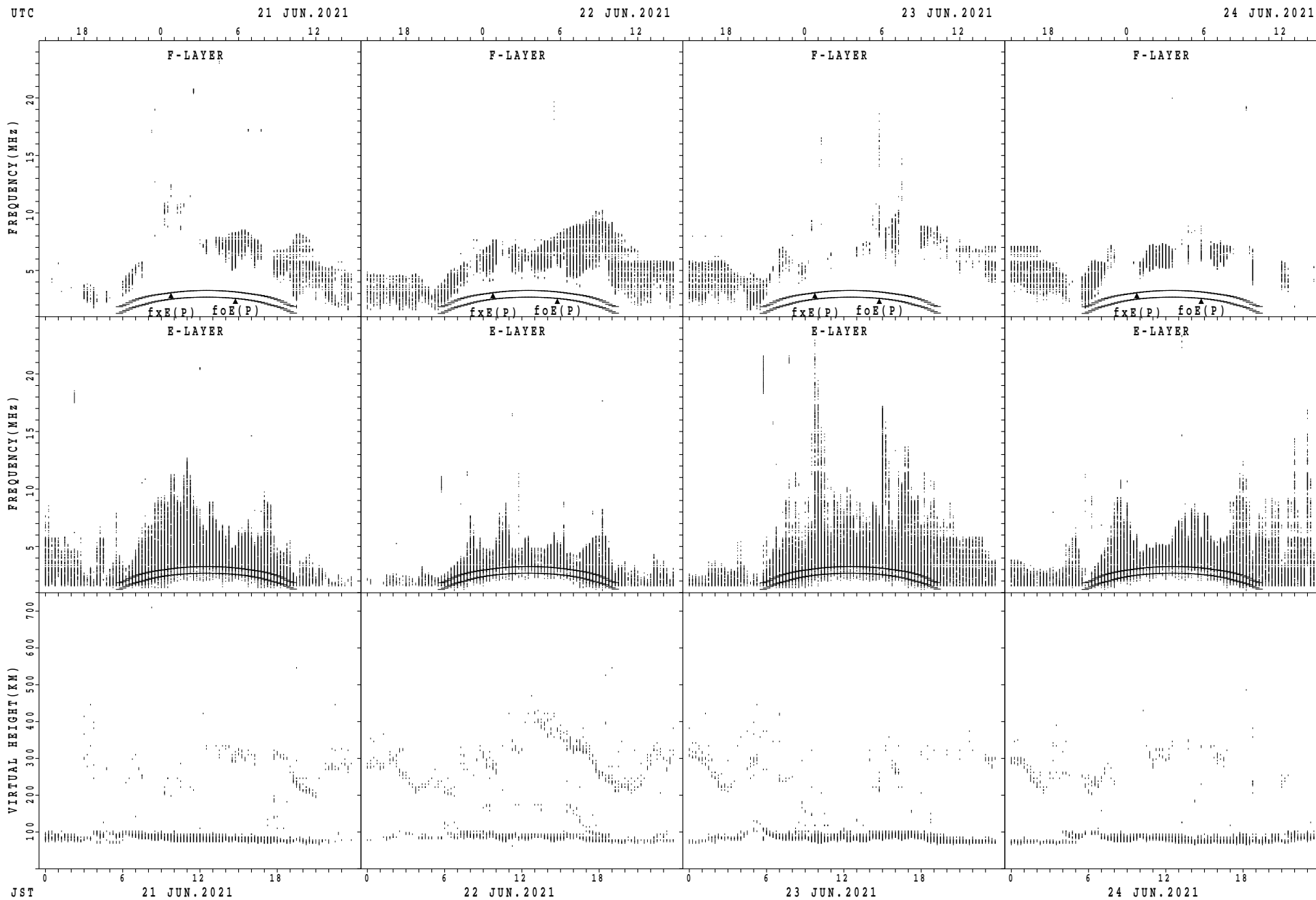
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



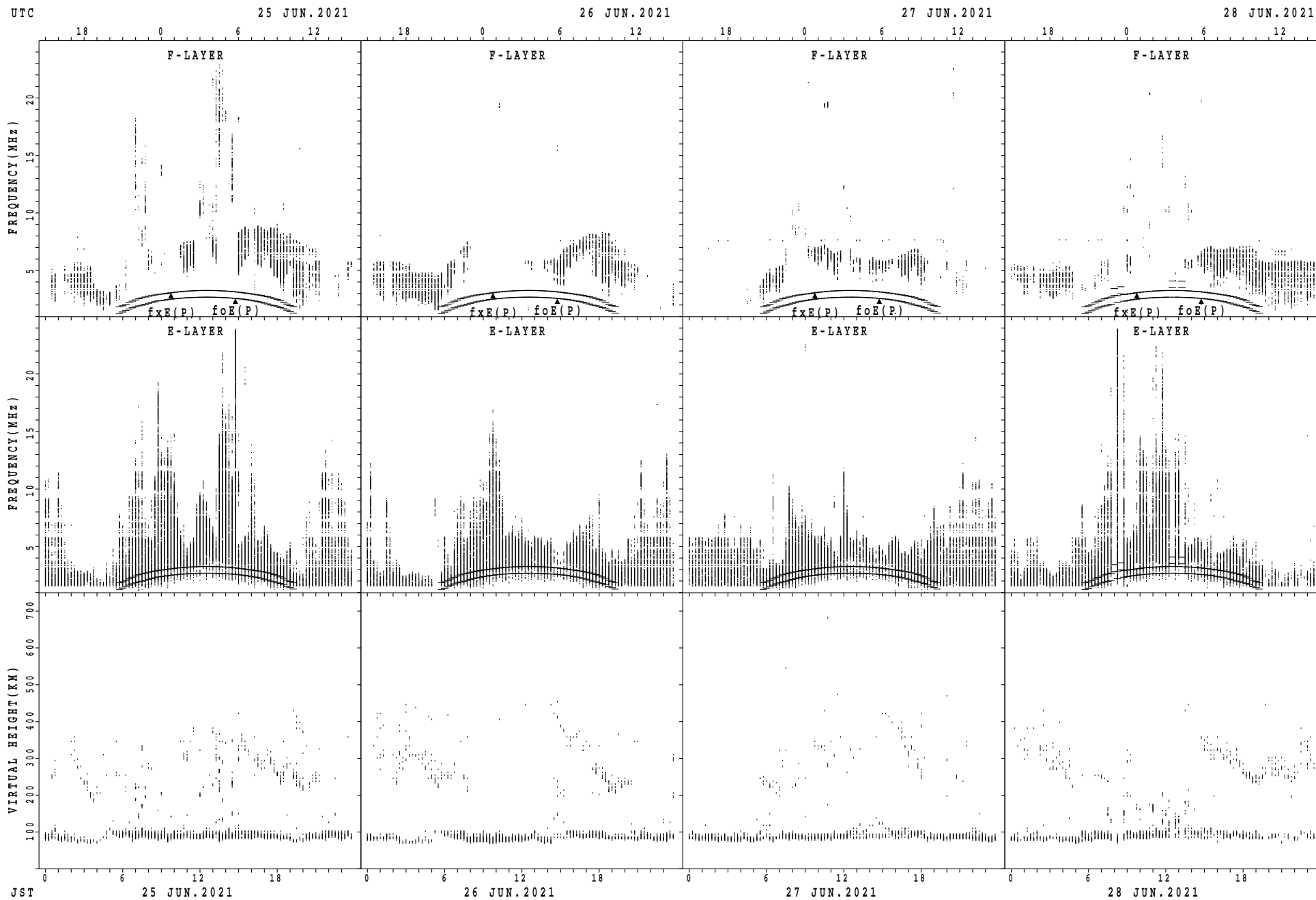
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



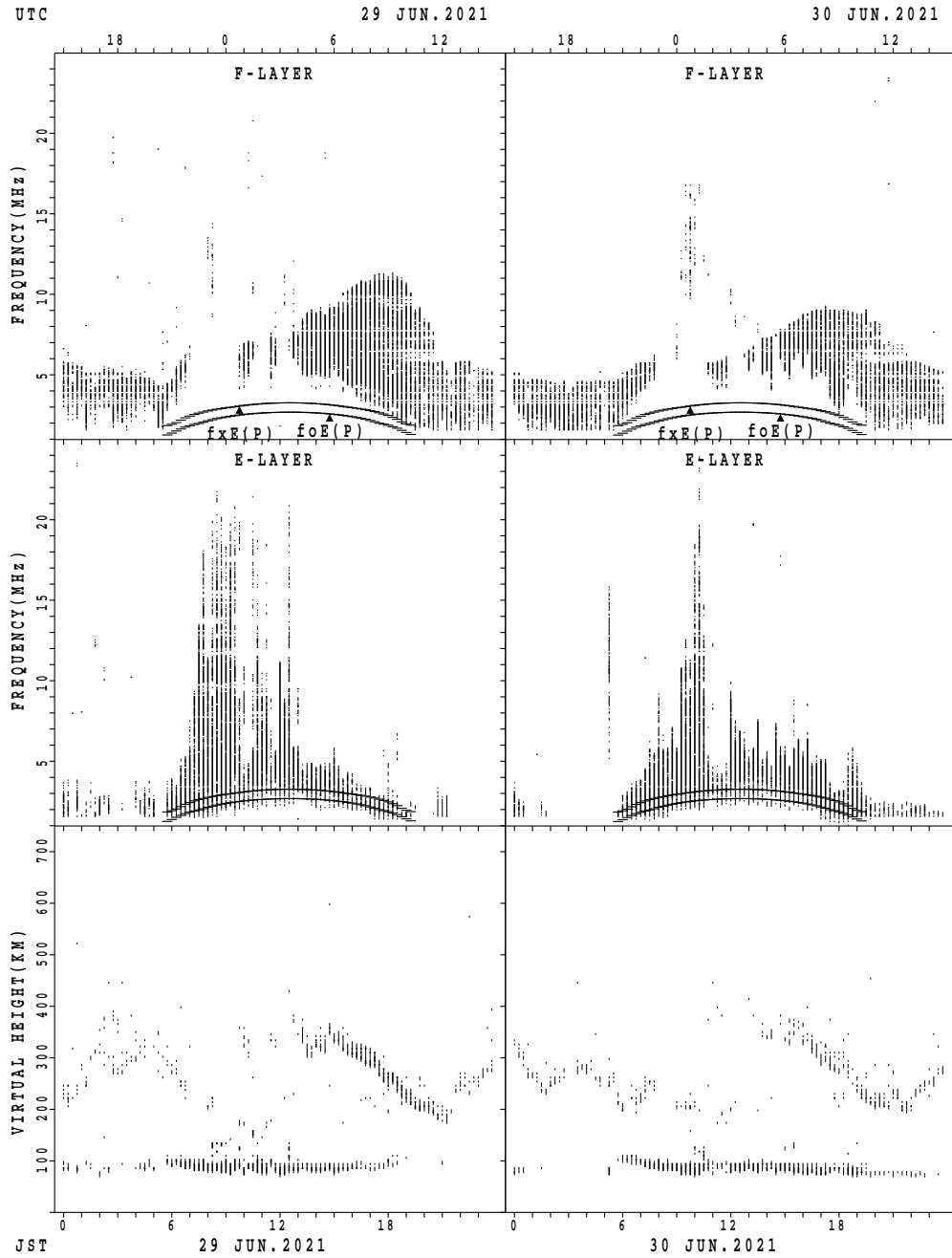
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



$f_{xE}(P)$; PREDICTED VALUE FOR f_{xE}
 $f_{oE}(P)$; PREDICTED VALUE FOR f_{oE}

MONTHLY MEDIANS OF h'F AND h'Es
 JUN. 2021 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							4											8	5	4	4	1	1	
MED							224											232	206	237	280	244	256	
U Q							239											293	235	276	294	122	128	
L Q							209											214	196	201	255	122	128	

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	26	26	26	21	29	29	29	29	27	28	28	28	28	28	28	29	30	30	30	30	29	29	29
MED	98	97	96	96	96	100	98	96	98	96	96	95	94	96	94	97	96	97	98	98	97	98	98	96
U Q	98	98	98	98	98	100	100	98	98	98	98	96	98	98	97	98	98	98	98	98	100	98	98	98
L Q	92	92	92	94	94	98	96	96	94	94	94	94	94	93	92	94	94	94	94	96	96	95	95	94

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1						3	10										8	5	8	5			
MED	326						264	213										234	252	278	282			
U Q	163						276	238										284	329	306	310			
L Q	163						216	198										206	195	237	251			

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	24	28	27	26	30	30	30	30	30	28	29	30	28	29	29	29	30	30	29	29	30	28	30
MED	94	94	94	94	96	98	98	96	96	96	96	96	96	94	94	96	96	96	95	94	94	94	94	96
U Q	97	96	97	96	96	98	100	96	98	96	96	97	98	96	97	98	97	98	98	98	98	96	96	98
L Q	91	91	91	94	94	96	98	94	96	94	94	94	94	94	94	93	94	92	92	92	92	94	94	94

h'F STATION Yamagawa LAT. 31°12.0'N LON. 130°37.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1		5	4									12	9	4	4	1		
MED						230		226	213									255	276	243	277	200		
U Q						115		273	237									305	289	249	301	100		
L Q						115		212	195									203	265	220	237	100		

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	28	29	29	30	26	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	94	94	94	94	94	96	98	98	96	96	96	95	96	96	96	96	96	96	94	95	94	95	94	94
U Q	96	96	96	96	96	98	98	98	98	98	96	98	96	96	98	98	98	98	98	96	98	98	98	96
L Q	92	92	91	91	92	94	96	96	94	96	94	94	94	92	92	94	92	92	92	94	92	94	92	94

MONTHLY MEDIANS OF h'F AND h'Es
 JUN. 2021 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			2	1		1		3	6									17	18	13	6	1	1	
MED			271	324		242		236	219									262	232	240	253	224	244	
U Q			282	162		121		240	232									290	284	272	264	112	122	
L Q			260	162		121		192	194									217	206	217	240	112	122	

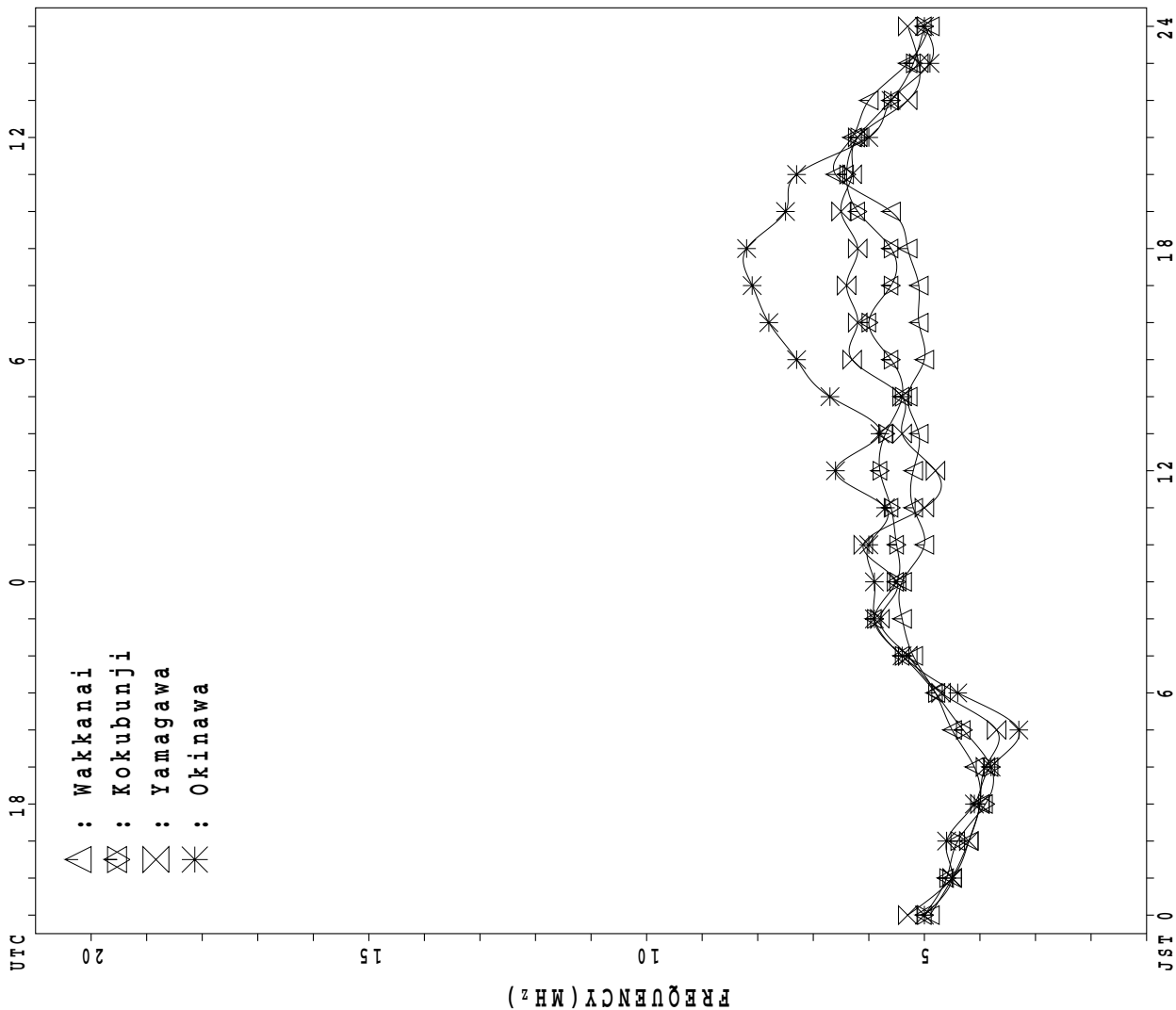
h'Es

	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	29	29	29	28	27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	29	29
MED	94	94	94	94	94	98	97	96	97	96	96	96	96	96	96	96	96	96	96	94	94	94	96	94
U Q	96	96	96	96	96	98	98	98	100	98	98	98	98	98	98	96	98	98	98	96	96	96	96	96
L Q	92	92	92	92	92	94	96	96	94	94	94	94	94	94	94	94	94	94	92	92	92	92	93	94

MONTHLY MEDIANS PLOT OF fOF2

JUN. 2021

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 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 51	X 46	X 46																			X 65	X 65	X 62
2	X 55	X 54	X 51																			X 76	X 69	X 61
3	X 52	X 50	X 54					113														X 64	X 63	A
4	A	X 51	X 50	54																		X 62	X 59	X 60
5	X 55	X 54	X 54	51																		X 67	X 65	X 60
6	X 54	X 45	X 46																			X 66	X 66	X 55
7	X 55	X 55	X 55																			X 65	X 55	X 55
8	X 55	X 56	X 58																			X 66	X 66	X 56
9	X 53	X 55	X 57	57																		X 71	X 68	X 56
10	X 54	X 54	X 54																			X 79	X 74	X 70
11	X 65	X 61	X 60																			X 81	X 72	X 67
12	X 60	X 60	X 54																			X 63	X 61	X 58
13	X 56	X 53	X 48																			A	X 61	X 55
14	X 45	X 45	X 45	54																		X 72	X 63	A
15	A	A	A	55																		X 71	X 65	X 66
16	X 52	X 60	X 60	58																		X 66	X 67	X 61
17	C	C	C																			X 66	X 69	X 67
18	X 62	X 55	X 59																			X 70	X 66	X 66
19	X 64	X 57	X 52	58																		A	X 85	X 82
20	X 58	X 57	X 57	55																		X 67	X 63	X 59
21	X 51	X 49	X 44																			X 72	X 70	X 66
22	X 61	X 54	X 53																			X 85	X 86	X 62
23	X 55	X 51	X 47																			A	X 70	X 60
24	A	X 58	X 54	58																		X 74	X 68	X 59
25	X 55	X 51	X 50																			X 65	X 65	X 61
26	X 56	X 51	X 49																			X 78	X 63	X 63
27	X 56	X 52	X 48																			A	X 65	X 60
28	X 54	A	X 57	58																		X 59	X 59	A
29	X 59	X 57	X 55	56																		X 71	X 72	X 70
30	X 59	X 59	X 54	59																		X 72	X 61	C
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	28	12				1														26	30	26
MED	X 55	X 54	X 54	56				113														X 68	X 66	X 61
U Q	X 59	X 57	X 56	58																		X 72	X 69	X 66
L Q	X 54	X 51	X 48	54																		X 65	X 63	X 59

JUN. 2021 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	44	39	39	42	42	48	48	54	64	57	50	A	55	53	50	A	A	52	48	59	64	58	58	55			
2	48	47	44	42	41	44	51	57	61	55	55	52	50	53	50	50	51	53	53	59	69	69	62	54			
3	45	43	47	45	42	47	48	92	F	A	A	A	51	46	52	54	A	A	55	63	67	57	56	A			
4	A	44	43	F	F	37	35	44	A	A	A	48	A	A	46	A	50	50	50	44	47	55	55	52	53		
5	48	47	45	F	F	39	41	44	45	49	55	56	48	51	A	53	A	49	48	47	R	43	48	60	60	58	53
6	47	38	39	38	38	44	A	A	50	58	A	R	A	47	51	48	48	A	A	R	50	58	66	59	59	48	
7	48	48	48	51	49	48	52	47	49	47	A	52	49	44	47	47	46	48	51	55	64	58	48	48	48		
8	48	49	44	F	F	47	44	46	46	A	A	56	A	A	52	52	50	56	54	52	52	59	59	59	49		
9	46	48	42	F	F	40	42	52	42	A	A	A	52	54	56	52	52	A	54	52	51	55	64	64	61	49	
10	47	47	47	45	39	41	45	50	54	52	49	51	53	56	60	57	51	47	47	55	72	72	67	J	R	63	
11	58	54	53	50	43	52	52	52	58	51	52	53	55	55	53	53	58	60	61	73	76	74	65	60	60		
12	53	53	47	38	36	39	41	41	50	50	46	R	47	50	A	48	52	50	A	54	60	56	54	51	51		
13	49	46	41	41	44	51	47	54	A	57	56	A	48	50	54	53	52	52	52	56	60	A	54	48	48		
14	38	38	38	F	F	38	44	56	52	48	61	56	A	52	A	A	49	A	48	57	63	65	56	A	A		
15	A	A	A	F	F	42	39	45	54	52	A	C	C	C	C	C	C	C	A	60	66	64	58	F	45		
16	45	F	F	F	35	44	52	54	A	C	C	C	C	C	C	C	C	R	50	60	66	64	58	45	45		
17	C	C	C	C	C	C	C	C	C	C	A	A	E	G	E	G	49	52	41	49	56	A	R	60	59	62	60
18	55	48	52	50	52	48	46	A	44	A	49	A	A	49	48	42	52	48	51	55	59	63	59	59	59		
19	57	50	45	F	R	38	42	46	58	67	53	R	50	51	51	50	A	52	R	A	69	72	A	F	F	58	
20	51	50	F	F	V	40	46	A	A	A	A	A	A	A	A	47	47	47	46	52	59	63	60	56	F	46	
21	44	42	37	37	41	48	47	50	52	48	57	57	56	50	48	50	50	52	55	58	63	65	63	59	59		
22	54	47	46	44	41	54	52	56	58	53	60	56	52	54	54	54	56	62	60	68	73	78	79	55	55		
23	48	44	40	37	36	38	44	48	53	55	57	56	53	53	54	54	51	52	A	59	68	A	63	53	53		
24	A	51	47	44	44	50	A	A	A	A	A	55	53	55	55	50	48	44	48	55	66	67	61	52	52		
25	48	44	43	41	41	43	51	56	62	62	50	54	50	50	52	52	A	A	A	50	52	60	58	58	54		
26	49	44	42	41	43	48	55	55	57	61	58	53	54	56	50	A	A	A	56	60	67	69	56	56	56		
27	49	45	41	39	40	44	A	A	42	A	50	49	45	48	46	50	48	46	44	47	A	A	58	53	53		
28	47	A	F	F	42	48	38	A	A	48	54	A	A	48	46	R	A	55	A	48	A	A	52	52	A		
29	52	50	48	F	42	47	J	R	48	57	A	58	57	52	57	57	53	50	48	48	A	58	F	F	F		
30	52	F	47	F	50	51	A	A	V	54	72	64	58	R	55	52	55	55	59	54	56	A	J	A	C		
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	26	26	27	25	29	28	23	21	19	17	19	18	21	27	23	23	24	25	26	26	28	26	28	25			
MED	48	47	44	42	41	46	47	52	54	55	52	54	52	52	52	50	51	50	51	56	64	60	58	53			
U Q	52	49	47	45	43	48	52	56	58	58	58	56	54	53	54	54	53	52	55	59	68	65	62	57			
L Q	47	44	41	39	38	44	45	48	50	52	49	51	48	49	48	49	48	48	48	54	60	58	56	49			

JUN. 2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					L	L	L	A	L	L	A	A	L	L	L	A	A		L	A				
2						L	L	L	L	L	L	L	444	L	A	L	L	380			A			
3							L	L	A	A	A	A	A	L	L	A	A	A	A					
4					336	L	L	A	A	A	A	A	A	420	A	L	L	L	L					
5						L	L		L	L	L	L	A	L	A	L	L	L		L				
6						L	A	A	A	A	A	L	A	L	L	L	A		L	L				
7					L	L	A		L	A	L	L		A	408	392		L	L		264			
8						L	400	A	A	A	A	A	A	A	L	432	392		L					
9						L	L	A	A	A	A	A	L	L	L	A	A	A	A					
10						L			L	L	L	A	L	L	A	L		408	380	348				
11					L	340	388		L	L	L	L	L	L	L	L	412							
12					L	L	L	L	L	L	L	R	R	L	A	A	L	A	A	A	A			
13					L	L	L	A	A	A	A	A	436	436	L	L	A	A	L	L	L			
14					L	L	L	L	L	A	A	L	A	L	A	A	A	A	A	L	L			
15					A	L	A	L	A	C	C	C	C	C	C	C	C	A	A					
16					A	A	A	A	C	C	C	C	C	C	C	C	L	A	A					
17				C	C	C	C	C	C	C	A	A		432	L	L	L	A	L	A				
18					L	L	L	A	A	A	A	A	A	A	L	A	L	L	L					
19					L	L	L	A	A	A	A	L	A	L	L	A	L	A	A					
20						L	A	A	A	A	A	A	A	A	L		424	A	L	L				
21						L	A	L	L		L	L	L	L	L	L	L	L	L	L				
22							L	L	A	A		L	L	L	L	L	L	L	L					
23						340	388		L	A		L	L	L	L	L	L	A	A	A	A			
24				A	A	A	A	A	A	A	A	L	L	L	L	L	440	388		L				
25						L	L		L	L	L	L	L	L	L	L	A	A	L	L	L			
26							396	428																
27					252	344		A	A	L	444	L	L	L	L	A	A	A	L					
28						L	A	A	A	A	A	L	L	L	L	A	L	L	L			A		
29						A	A	A	A	A	A	A	A	L	A	L	A	A	A	A	A			
30						L	L	A	A	L	L	A	A	A	L	A	A	A	L	L	A	A		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	4	5	5	2	2	1	1	4	3	1	4	5	5	3	1				
MED					252	340	388	400	424	438	448	436	440	420	452	428	408	380	348	264				
U Q					342	394	406						454	432		440	426	384	348					
L Q					338	378	392						422	388		416	392	376	336					

JUN. 2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				B	B	204	252	292	308	320	320	320	320	328	332	A	A	252	192	A	A			
2				B	184	200	264	296	320	324	356	324	348	332	304	304	212	248	224	A	A			
3				B	A	200	264	288	324	324	340	324	324	344	308	308	308	252	204	A	A			
4				A	260	224	252	288	308	308	336	328	332	296	352	264	228	244	268	276	A	A		
5				B	B	220	260	292	296	304	328	320	292	296	272	308	272	252	220	A	A			
6				B	232	204	256	276	296	320	320	A	324	336	296	308	288	256	200	248	A	192		
7				B	B	212	240	284	316	336	344	344	304	292	280	308	292	248	192	A	A			
8				B	A	224	256	292	292	316	316	328	324	300	252	A	A	A	212	A	A			
9				A	A	212	268	276	324	324	324	332	332	296	A	A	A	A	A	196	A	B		
10				B	A	216	276	304	324	324	332	332	288	A	A	304	304	264	204	A	B			
11				B	176	196	260	304	324	324	344	344	344	320	320	264	296	300	220	A	A			
12				B	184	216	228	288	304	304	308	320	320	320	320	260	304	264	204	A	A			
13					204	188	212	264	288	320	320	340	340	292	296	296	A	A	A	196	216			
14				A	B	208	248	292	316	328	344	344	320	316	304	304	252	A	A	A	A			
15				A	A	272	260	308	308	C	C	C	C	C	C	C	C	308	264	A	A			
16				B	A	208	264	280	304	C	C	C	C	C	C	C	304	264	236	A	224			
17				C	C	C	C	C	C	C	C	320	348	328	328	328	A	288	244	216	176	A		
18				B	B	200	248	276	312	312	312	348	348	344	324	320	268	A	212	232	A			
19				B	164	208	244	272	304	320	328	332	320	292	300	300	300	232	288	292	A			
20				A	164	208	244	276	300	312	312	308	308	288	304	304	280	244	224	A	A			
21				B	A	216	280	292	320	320	324	340	320	344	320	304	288	252	232	212	208			
22				B	B	196	264	312	312	320	336	320	324	324	352	304	292	260	216	A	B			
23				B	B	220	248	288	308	320	316	328	328	308	308	300	348	308	220	192	A			
24				A	A	A	256	292	316	328	348	348	348	348	A	A	A	260	228	A	A			
25				B	248	216	232	276	312	324	324	364	336	336	336	320	296	256	212	A	B			
26				B	196	200	248	300	324	324	332	320	320	320	336	364	308	276	220	B	B			
27					208	180	216	264	300	320	320	320	272	316	312	328	296	300	A	A	A			
28				B	A	208	260	296	328	328	328	348	304	A	A	A	A	264	A	A	A			
29				B	200	216	276	308	308	324	324	308	344	320	320	300	A	A	A	A	A			
30				B	B	240	260	288	316	332	344	344	316	316	316	288	A	288	272	A	A			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				2	12	28	29	29	29	27	28	27	28	26	24	21	21	24	24	9	4			
MED				206	186	212	260	292	312	320	328	332	322	320	314	304	292	258	220	212	212			
U Q					216	216	264	298	320	324	340	344	332	332	326	308	304	270	230	262	220			
L Q					178	204	248	282	306	320	320	320	312	296	302	300	276	250	208	194	200			

JUN. 2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 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	E 16	B 16	E 16	B 15	E 16	B 26	J 32	A 62	J 64	A 65	J 76	A 113	J 41	A 36	J 44	A 70	J 62	A 44	J 179	A 82	J 54	A 16	B 16	J 21	
2	J 21	A 24	J 20	A 23	J 23	A 26	J 39	A 53	J 36	A 47	J 40	A 37	J 38	A 36	J 48	A 40	J 53	A 31	J 26	A 63	J 37	A 64	B 64	J 85	
3	J 27	A 52	J 42	A 32	J 32	A 26	J 45	A 52	J 68	A 152	J 95	A 96	J 61	A 50	J 54	A 157	J 83	A 119	J 157	A 107	J 104	A 84	B 65	J 65	
4	J 86	A 52	J 37	A 26	J 42	A 109	J 32	A 85	J 111	A 89	J 50	A 51	J 63	A 68	J 52	A 48	J 44	A 50	J 44	A 49	J 52	A 52	B 131	J 32	
5	J 36	A 21	J 22	A 27	E 16	B 30	J 52	A 64	J 217	A 87	J 55	A 58	J 60	A 70	J 87	A 33	J 31	A 46	J 105	A 54	J 38	A 35	B 40	J 53	
6	J 51	A 52	J 63	A 49	J 27	A 49	J 103	A 153	J 229	A 270	J 109	A 88	J 55	A 80	J 35	A 48	J 69	A 88	J 108	A 27	J 27	A 21	B 20	J 24	
7	J 23	A 24	J 23	A 31	E 16	B 28	J 64	A 63	J 83	A 42	J 137	A 76	J 53	A 37	J 55	A 36	J 60	A 43	J 85	A 25	J 37	A 44	B 32	J 25	
8	J 23	A 38	J 32	A 21	J 26	A 26	J 39	A 94	J 101	A 53	J 103	A 101	J 159	A 66	J 56	A 61	J 53	A 62	J 42	A 33	J 59	A 46	B 64	J 51	
9	J 52	A 26	J 28	A 28	J 37	A 26	J 52	A 65	J 78	A 102	J 87	A 56	J 50	A 60	J 257	A 119	J 138	A 108	J 68	A 30	J 38	A 31	B 25	J 15	
10	E 16	B 16	J 22	A 22	J 59	A 28	J 34	A 38	J 51	A 84	J 45	A 56	J 58	A 53	J 49	A 40	J 30	A 28	J 24	A 37	J 19	A 26	B 32	J 32	
11	J 20	A 24	J 26	A 18	J 31	A 27	J 32	A 36	J 40	A 51	J 39	A 84	J 55	A 45	J 50	A 34	J 38	A 41	J 42	A 49	J 40	A 25	B 19	J 23	
12	J 24	A 21	E 15	B 24	J 20	A 25	J 35	A 49	J 51	A 78	J 39	A 53	J 40	A 41	J 55	A 55	J 34	A 60	J 63	A 52	J 48	A 53	B 65	J 52	
13	J 36	A 15	J 15	A 25	J 25	A 25	J 37	A 60	J 62	A 65	J 65	A 70	J 58	A 69	J 53	A 47	J 51	A 45	J 38	A 27	J 49	A 70	B 39	J 27	
14	J 22	A 31	J 34	A 23	E 16	B 32	J 32	A 50	J 46	A 72	J 63	A 42	J 65	A 63	J 97	A 104	J 55	A 116	J 33	A 31	J 62	A 106	B 45	J 85	
15	J 157	A 109	J 63	A 52	J 64	A 63	J 53	A 80	J 80	A C	J C	A C	J C	A C	J C	A C	J C	A C	J 63	A 157	J 54	A 109	B 61	J 52	A 63
16	J 86	A 50	J 28	A 26	J 19	A 39	J 51	A 64	J 87	A C	J C	A C	J C	A C	J C	A C	J 117	A 74	J 139	A 52	J 37	A 64	B 71	J 87	
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J 55	A 95	J 56	A 143	J 124	A 104	B 85	J 47	
18	J 20	A 23	E 16	B 16	E 16	B 34	J 51	A 79	J 50	A 79	J 64	A 61	J 69	A 118	J 53	A 41	J 39	A 32	J 25	A 43	J 40	A 51	B 54	J 35	
19	J 30	E 16	B 23	A 16	E 16	B 28	J 39	A 53	J 45	A 61	J 62	A 48	J 57	A 77	J 39	A 94	J 40	A 50	J 168	A 149	J 161	A 127	B 105	J 83	
20	J 118	A 162	J 75	A 33	J 21	A 33	J 61	A 84	J 169	A 136	J 168	A 119	J 110	A 68	J 43	A 41	J 52	A 31	J 34	A 39	J 25	A 21	B 33	J 51	
21	J 51	A 32	J 27	A 20	J 32	A 29	J 44	A 44	J 45	A 63	J 47	A 51	J 38	A 40	J 109	A 32	J 31	A 27	J 21	A 21	J 24	A 41	B 41	J 34	
22	J 30	A 24	J 16	A 20	E 16	B 37	J 32	A 38	J 51	A 62	J 64	A 84	J 60	A 38	J 38	A 34	J 34	A 32	J 28	A 27	J 23	A 36	B 63	J 21	
23	J 29	A 27	J 24	A 16	E 16	B 19	J 25	A 34	J 34	A 40	E 14	A 41	J 52	A 48	J 83	A 47	J 40	A 47	J 44	A 67	J 60	B 62	A 115	J 92	A 138
24	J 82	A 86	J 52	A 51	J 118	A 49	J 77	A 101	J 122	A 151	J 233	A 59	J 63	A 48	J 49	A 37	J 37	A 34	J 34	A 52	J 42	A 37	B 42	J 65	
25	J 21	A 31	J 61	A 27	J 34	A 41	J 38	A 35	J 39	A 48	J 45	A 50	J 39	A 37	J 132	A 40	J 66	A 169	J 73	A 28	J 29	A 34	B 21	J 27	
26	J 29	A 29	J 25	A 23	J 21	A 26	J 46	A 55	J 47	A 49	J 45	A 41	J 38	A 95	J 89	A 166	J 186	A 116	J 49	A 28	J 27	A 33	B 43	J 25	
27	J 30	A 22	J 22	A 50	J 29	A 26	J 52	A 53	J 65	A 111	J 65	A 48	J 42	A 45	J 36	A 121	J 55	A 55	J 61	A 84	J 119	A 117	B 82	J 85	
28	J 85	A 85	J 51	A 51	J 33	A 52	J 63	A 49	J 62	A 81	J 79	A 89	J 55	A 37	J 75	A 75	J 73	A 64	J 86	A 140	J 164	A 168	B 121	J 76	
29	J 83	A 53	J 64	A 52	J 21	A 30	J 45	A 63	J 80	A 86	J 65	A 64	J 53	A 65	J 55	A 51	J 46	A 61	J 36	A 234	J 81	A 33	B 33	J 42	
30	E 28	B 16	J 32	A 27	E 16	B 52	J 54	A 73	J 99	A 55	J 68	A 64	J 81	A 52	J 46	A 53	J 62	A 89	J 31	A 89	J 65	A 107	B 28	C	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	29	29	29	29	29	27	28	28	28	28	28	28	29	30	30	30	30	30	30	29	
MED	J 30	A 27	J 27	A 26	J 23	A 29	J 45	A 60	J 64	A 72	J 64	A 60	J 55	A 52	J 52	A 50	J 53	A 52	J 52	A 50	J 45	A 48	B 44	J 47	
U Q	J 67	A 52	J 46	A 32	J 32	A 40	J 52	A 76	J 93	A 89	J 83	A 86	J 62	A 68	J 60	A 84	J 64	A 88	J 86	A 82	J 65	A 84	B 65	J 70	
L Q	E 22	B 22	E 22	B 20	G		J 26	A 34	J 49	A 46	J 53	A 46	J 51	A 44	J 40	A 45	J 40	A 38	J 41	A 34	J 30	A 37	B 33	J 26	

JUN. 2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 16	E 16	E 16	E 15	E 16	24	30		A		E 42	A 113	A 37	A 36	A 39	A 70	A 62	30	20	25	21	E 16	E 16	E 17	
2	E 16	E 16	E 16	E 16	E 16	23	33	36	33	34	37	36	34	G 34	E 46	33	35	26	23	32	22	23	22	21	
3	19	19	18	16	22	25	33	39	A 68	A 152	A 95	A 96	E 46	G 34	E 41	A 48	A 83	A 119	A	21	21	20	20	A 65	
4	A 86	A 18	A 18	A 18	G 25	G 20	A 29	A 85	A 111	A 89	A	A 51	A 63	A 36	A 52	A 36	A 30	A 26	A 26	G 20	G 24	E 33	E 16	18	
5	22	E 16	E 16	E 16	E 16	26	30	30	34	35	40	38	A 60	A 30	A 87	A 29	A 30	A 25	A 23	A 20	19	21	21	21	
6	21	21	16	16	G 16	A 27	A 103	A 153	A 36	A	A 109	A 40	A 55	A 36	A 35	A 35	A 69	A 27	A 27	G 20	G 16	17	19	18	
7	E 16	E 16	E 16	E 16	E 16	24		A 33	A 34	A 38	A 137	A 41	A 39	A 34	A	A 33	A 36	A 29	A 26	A 16	20	E 16	E 16	E 16	
8	E 16	E 21	E 16	E 16	E 17	24	E 37	A 94	A 101	A 46	A 103	A 101	A 159	A	A 33	A 30	A 22	A 27	A 32	A 24	E 50	A 25	A 25	19	
9	17	E 17	E 16	E 16	22	23	G 23	A 65	A 78	A 102	A 44	E 45	A 38	A 39	A 40	A 119	A	A 39	A	A 17	20	21	20	E 15	
10	E 16	E 16	E 16	E 16	E 16	25	G 28	A 35	A 38	A 38	A 38	A	A 40	A 36	E 45	A 28	A 28	A 25	A 22	A 19	E 17	17	17	17	
11	E 17	E 17	E 17	E 16	G 15	25	28	34	36	36	38	38	38	38	A 35	A 29	G 29	G 29	A 29	A 29	20	E 16	E 16	E 16	
12	16	E 16	E 15	E 16	E 16	22	26	32	32	36	35	35	33	A 36	A 55	A	A 30	A	A 63	A 30	27	E 41	A	22	
13	E 17	E 15	E 15	E 17	E 16	24	32	32	A 62	A 50	A 47	A 70	A 38	A 39	E 39	A	A	A 26	A 24	A 18	G 18	A 70	19	E 17	
14	E 17	E 17	E 17	E 17	E 16	22	28	34	A 36	A 72	A 46	A 38	A 65	A 38	A 97	A 104	A	A 116	A 21	A 19	21	18	22	A 85	
15	A 157	A 109	A 63	E 22	E 26	24	A 31	A 34	A 80	A	C	C	C	C	C	C	C	A 27	A 157	A 19	22	23	23	23	
16	A	E 16	E 16	E 16	E 16	A	A	A 87	A	A	C	C	C	C	C	C	C	G 28	A	A	G 25	18	18	15	
17	C	C	C	C	C	C	C	C	C	A 50	A 235	A 38	A 36	A 36	A 28	A 28	A	A	A 21	A 143	A 16	20	17	17	
18	E 16	E 16	E 16	E 16	E 16	24	A 29	A 79	A	A 79	A 46	A 61	A 69	A 40	A 32	A	A 29	A 29	A 21	A 20	22	A 26	E 16	E 16	
19	E 16	E 16	E 16	E 16	G	22	E 30	A 45	A 43	A	A 62	A 38	E 45	A 34	A 35	A 94	A 33	A	A 168	A 29	20	A 127	31	17	
20	23	22	E 17	E 16	18	27	A 61	A 84	A 169	A 136	A 168	A 119	A 110	A 68	A 40	A 40	A 42	A 29	A 25	A 22	20	E 16	25	20	
21	20	E 20	E 16	E 16	E 16	25	E 39	A 36	A 36	A 38	A 37	A 36	A 36	G	G 32	A 33	A 30	A 28	A 24	A 21	G 17	18	18	21	
22	16	E 16	E 16	E 16	E 16	24	29	33	36	35	A 52	A 36	A 36	A 36	A 36	A 34	A 31	A 30	A 24	A 24	20	21	E 16	E 16	
23	E 16	E 16	E 16	E 16	E 16	23	32	33	36	E 14	A 40	A 38	A 38	A 38	A 35	A 35	A 41	E 41	A 67	A	A 22	A 115	25	18	
24	A 82	A 21	A 23	E 21	E 27	39	A 77	A 101	A 122	A 151	A 233	A 40	A 38	A 38	A 38	A 35	A 27	A 28	A 30	A 30	27	18	27	22	
25	E 16	18	16	E 16	G 22	30	31	33	34	39	41	A 38	A 38	A 34	A 36	A 36	E 42	A 42	A 23	A 18	17	E 17	E 17	18	
26	E 16	E 16	E 16	E 16	G 18	23	E 40	A	A 36	A 37	A 37	A 38	A 38	E 51	A	A 166	A 186	A 116	A 28	A 24	E 24	A 24	A 28	20	
27	17	E 15	E 15	E 15	E 17	26	A 52	A	A 65	A 111	A 46	A 40	A 36	A 39	A 33	A 32	G 40	A 26	A 26	A 30	A 119	A 117	17	17	
28	21	A 85	A 21	E 17	A 23	52	A 63	A	A 39	A 81	A 79	A 89	A	A 34	A 75	A 40	A 73	A 64	A	A 140	A 164	19	19	A 76	
29	19	19	24	24	G 18	27	A	A	A 86	A	A	A	A	A 42	A 37	A 37	A 29	A	A 20	A 234	20	20	E 17	17	
30	E 16	E 16	E 16	E 16	E 16	24	A 54	A 73	A 34	A 38	E 51	A 47	A 50	A 40	A	A	A 49	A	A	A 29	A 29	28	26	17	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	29	29	29	29	28	26	23	27	25	25	26	26	27	25	24	26	25	26	29	30	30	29	29	
MED	17	E 16	E 16	E 16	E 16	24	31	36	36	39	A 45	A 40	A 38	A 36	A 36	A 35	A 31	A 28	A 26	A 24	20	20	19	18	
U Q	20	20	17	16	22	26	A 40	A 79	A 78	A 88	A 87	A 70	A 55	A 39	A 46	A 44	A 42	A 40	A 29	A 30	24	26	22	21	
L Q	E 16	E 16	E 16	E 16	E 16	23	29	33	34	36	39	38	38	34	35	32	G 29	G 26	A 23	A 20	E 19	E 18	E 17	E 17	

JUN. 2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 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	16	15	16	16	14	15	15	15	15	16	15	15	16	17	15	16	11	15	15	16	16	17
2	16	16	16	16	16	16	14	15	15	15	18	17	14	15	16	16	15	16	16	16	16	16	16	15
3	16	16	16	15	15	16	15	12	15	14	16	20	16	19	19	14	15	14	12	10	16	16	16	17
4	16	16	16	16	16	16	16	16	16	16	23	24	24	16	14	16	13	14	14	16	16	16	16	16
5	16	16	16	16	16	14	14	12	15	15	24	18	16	16	16	17	15	14	16	16	15	16	16	16
6	16	16	16	16	16	14	15	14	16	16	14	17	16	15	15	14	16	14	10	16	16	16	15	16
7	15	16	16	16	16	12	13	12	16	14	15	16	12	16	14	14	14	12	13	16	11	15	16	16
8	16	16	16	16	17	15	11	11	15	14	15	16	16	15	16	14	14	12	12	15	15	15	16	16
9	16	16	16	16	16	9	15	14	14	13	16	16	15	15	15	16	13	13	15	17	17	17	17	15
10	16	16	16	17	16	14	14	14	14	14	19	16	14	14	18	13	13	13	13	16	16	16	16	16
11	16	16	16	16	14	10	13	13	13	17	19	17	14	14	14	14	14	15	13	15	14	15	13	15
12	16	16	15	15	14	13	13	13	15	15	18	22	13	15	18	16	14	14	12	16	15	16	16	15
13	15	15	15	16	16	16	15	15	15	15	15	15	16	18	16	14	14	14	15	15	15	15	15	15
14	15	15	15	10	16	16	14	14	13	15	15	23	16	16	15	18	14	14	15	16	16	15	15	15
15	16	16	16	16	16	13	16	16	16	C	C	C	C	C	C	C	C	14	13	13	16	16	16	16
16	16	16	16	17	15	14	10	10	12	C	C	C	C	C	C	C	15	14	14	15	15	15	15	15
17	C	C	C	C	C	C	C	C	C	C	12	15	11	16	16	14	16	14	14	16	15	15	16	16
18	15	15	16	16	16	13	13	13	16	16	17	13	13	13	15	15	15	14	10	14	15	16	16	16
19	16	16	15	16	17	13	12	12	12	14	14	14	14	14	17	15	15	16	12	15	16	16	16	15
20	16	15	15	15	15	15	16	16	16	15	16	16	16	15	16	16	14	14	10	10	16	16	16	15
21	16	16	16	16	16	14	13	16	16	15	15	15	19	14	16	16	14	15	14	16	16	16	16	16
22	16	16	16	16	16	16	12	14	14	14	14	14	17	16	15	16	16	16	14	15	15	15	15	15
23	16	15	16	16	16	14	15	14	14	14	14	14	14	16	16	14	15	15	14	14	16	16	16	16
24	15	17	15	15	15	15	15	15	15	15	25	18	18	15	16	16	16	15	14	14	17	17	15	15
25	16	15	16	16	16	16	15	14	14	15	22	28	15	14	14	14	14	14	14	16	16	16	16	16
26	16	15	16	14	16	16	14	14	18	16	16	16	23	16	16	21	17	15	15	15	15	15	17	17
27	16	16	16	16	16	13	13	14	14	14	14	14	14	16	14	14	17	16	15	15	16	17	17	16
28	16	17	17	16	14	14	12	14	13	14	13	17	16	16	15	15	14	12	13	16	14	16	16	16
29	17	17	17	17	16	15	15	13	16	18	21	16	16	19	19	15	15	15	14	16	16	15	17	16
30	16	16	16	16	16	16	14	14	14	14	14	13	17	25	18	15	15	17	13	15	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	27	28	28	28	28	28	28	29	30	30	30	30	30	30	30
MED	16	16	16	16	16	14	14	14	15	15	16	16	16	16	16	15	15	14	14	15	16	16	16	16
U Q	16	16	16	16	16	16	15	15	16	15	18	18	16	16	16	16	15	15	14	16	16	16	16	16
L Q	16	16	16	16	16	13	13	13	14	14	14	15	14	15	15	14	14	14	12	15	15	15	16	15

JUN. 2021 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 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	328	311	310	321	295	304	301	307	362	331	330	A	342	318	293	A	A	322	319	313	321	325	315	325	
2	329	320	317	315	331	291	313	326	343	319	319	334	297	310	330	313	308	330	330	308	311	307	329	328	
3	325	299	324	317	316	349	329	304	F	A	A	A	322	293	300	299	A	A	228	299	310	314	316	A	
4	A	296	296	309	F	358	271	305	A	A	A	297	A	A	302	A	299	305	340	305	311	311	294	322	305
5	299	297	314	327	F	299	358	291	325	333	339	R	A	A	A	316	335	265	R	299	299	305	314	313	313
6	322	293	306	293	299	328	A	A	318	312	A	R	A	R	285	271	A	A	R	309	318	327	321	317	
7	314	317	307	316	313	291	325	321	287	299	A	304	301	384	256	271	208	312	309	306	330	322	301	299	
8	296	312	317	304	339	301	267	A	A	319	A	A	A	291	294	280	320	314	320	306	305	293	314	311	
9	296	279	314	296	F	322	366	363	A	A	A	298	313	332	301	292	A	318	318	311	303	302	312	346	320
10	300	297	307	336	359	355	305	337	321	338	284	289	296	300	316	320	320	332	292	295	317	317	317	R	
11	316	331	304	320	303	330	349	322	363	327	298	314	317	317	294	283	306	305	294	316	313	313	313	313	
12	312	289	287	286	285	285	267	251	262	310	259	R	225	296	A	264	302	299	A	296	318	286	228	292	
13	286	321	320	320	318	304	277	331	A	232	248	A	275	258	298	307	304	317	316	316	315	A	298	307	
14	307	307	306	F	359	282	379	324	279	A	C	C	C	C	C	C	236	A	302	301	301	306	337	F	
15	A	A	A	F	285	248	297	337	288	A	C	C	C	C	C	C	C	328	R	310	292	291	290	F	
16	290	F	F	F	289	245	299	296	A	C	C	C	C	C	C	C	231	295	326	307	306	299	299	301	
17	C	C	C	C	C	C	C	C	C	C	A	A	G	G	272	294	293	290	298	A	R	304	294	307	
18	307	304	302	299	332	269	337	A	281	A	236	A	A	288	268	287	314	312	296	313	303	307	289	289	
19	289	317	303	F	303	303	R	281	338	348	327	R	327	309	306	303	A	302	302	R	A	302	302	F	
20	349	304	F	F	V	300	339	A	A	A	A	A	A	A	A	281	282	282	295	324	305	312	343	334	302
21	316	318	317	301	344	340	289	292	343	304	319	319	349	293	357	289	305	317	328	307	309	306	312	311	
22	311	314	309	306	309	375	321	320	340	306	326	244	279	304	286	310	294	294	306	296	306	309	321	321	
23	318	299	299	300	323	261	276	276	343	309	332	332	297	293	306	324	351	327	A	336	310	A	300	325	
24	A	306	321	281	307	304	A	A	A	A	A	319	288	305	331	331	280	298	295	295	302	307	342	326	
25	317	299	299	298	337	290	296	299	336	312	246	325	256	280	313	304	330	330	304	300	318	314	314	312	
26	301	301	300	300	297	318	310	307	316	347	315	269	308	302	R	A	A	A	314	304	304	299	312	312	
27	306	303	303	303	311	350	A	258	A	A	315	272	375	264	261	308	305	224	312	300	A	A	300	297	
28	300	A	F	F	354	331	A	A	286	333	A	A	A	265	R	A	R	A	A	312	A	A	289	306	A
29	303	295	293	F	357	334	285	R	229	A	325	303	286	331	330	330	330	312	310	A	281	278	F	F	F
30	317	289	279	F	302	300	A	A	271	334	322	286	317	271	304	303	340	306	306	A	305	287	C		
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	26	26	25	25	29	28	23	20	19	17	18	17	21	24	23	23	24	25	25	26	28	25	28	22	
MED	309	304	306	303	313	304	305	307	333	319	315	314	297	298	298	299	305	312	309	306	308	307	313	312	
U Q	317	314	316	318	334	340	329	324	343	332	325	326	320	308	313	313	320	324	318	310	314	314	321	320	
L Q	300	297	300	F	300	290	285	290	281	308	284	288	277	284	285	282	294	296	298	300	302	296	300	302	

JUN. 2021 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					L	L	L	A	L	L	A	A	L	L	L	A	A		L	A				
2						L	L	L	L	L	L	L	424	L	A	L	L	353		A				
3							L	L	A	A	A	A	A	L	L	A	A	A	A					
4					403	L	L	A	A	A	A	A	A	401	A	L	L	L	L					
5						L	L		L	L	L	L	A	L	A	L	L	L		L				
6						L	A	A	A	A	A	L	A	L	L	L	A		L	L				
7					L	L	A	A		L	A	L	L		A			L	L					
8						L		A	A	A	A	A	A	A	L			L						
9						L	L	A	A	A	A	A	L	L	L	A	A	A	A					
10						L			L	L	L	A	L	L	A	L			L					
11					L	365	382		L	L	L	L	L	L	L	L	L	354						
12					L	L	L	L	L	L	L	R	R	L	A	A	L	A	A	A	A			
13					L	L	L	A	A	A	A	A	L	L	L	A	A	L	L	L				
14					L	L	L	L	L	A	A	L	A	L	A	A	A	A	A	L	L			
15					A	L	A	L	A	C	C	C	C	C	C	C	C	A	A					
16					A	A	A	A	C	C	C	C	C	C	C	C	L	A	A					
17				C	C	C	C	C	C	C	A	A	L		L	L	L	A	L	A				
18					L	L	L	A	A	A	A	A	A	A	L	A	L	L	L					
19					L	L	L	A	A	A	A	L	A	L	L	A	L	A	A					
20						L	A	A	A	A	A	A	A	A	L	A	A	L	L					
21						L	A	L	L		L	L	L	L	L	L	L	L	L	L				
22						394	380		L	L	A	A	407		391		L	L	L	L				
23						L			L	A		L	L	L	L	L	A	A	A	A				
24				A	A	A	A	A	A	A	A	L	L	L	L	L			L					
25					L	L			L	L	L	L	L	L	L	L	A	A	L	L	L			
26						388	395				L	L	L	L	L	A	A	A	L					
27					359	364		A	A	L	L	L	L	L	L	A	A	A	L					
28						L	A	A	A	A	A	L	460	A	L	A	L	A	A	A	A			
29						A	A	A	A	A	L	A	A	L	L			L	A	L	A			
30					L	L	A	A	L	L	A	A	A	L	A	A	A	L	L	A	A			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	4	5	4	2	2	1		4	3	1	3	5	5	3	1				
MED					359	380	380	394	395	410	388		416	401	391	375	364	360	355	355				
U Q						398	392	397					442	453		384	380	376	358					
L Q						364	332	390					386	398		353	326	340	344					

JUN. 2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUN. 2021 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					298	318	378	302	264	288	302	A	304	330	408	A	A	304	294	262				
2						364	306	306	274	320	308	316	392	366	312	360	340	284	284	300				
3					248	302	278	A	A	A	A	A	346	340	386	336	A	A	A	E	A			
4					220	354	A	A	A	A	364	A	A	388	A	A	376	342	292	290				
5					246	388	334	300	292	306	352	A	A	362	A	A	342	304	338	326	326			
6					330	A	A	332	A	A	A	394	A	374	394	438	A	A	A	A				270
7					270	346	320	330	374	376	A	360	380	224	E	A	490	438	A	326	310	276		
8					290	428	A	A	A	A	A	A	A	372	388	410	A	324	318					
9					236	248	A	A	A	A	348	348	328	402	386	A	292	308	306					
10					240	370	310	310	304	378	388	390	356	316	314	314	288	322	294					
11					308	284	266	332	266	314	388	350	344	316	382	412	330	330						
12					326	394	442	384	426	366	A	A	366	380	A	458	352	346	A	A	314	274		
13					268	232	416	308	A	A	A	A	434	488	376	346	344	300	286	286				
14					246	246	246	322	374	A	266	328	A	A	A	A	536	A	344	280				
15					A	492	320	266	388	A	C	C	C	C	C	C	C	308	A					
16					424	340	332	A	C	C	C	C	C	C	C	C	512	348	292					
17			C	C	C	C	C	C	C	A	A	G	G	424	376	362	362	306	A					
18					236	348	298	A	422	A	A	A	A	394	452	382	344	332	324					
19					308	342	390	278	262	302	A	340	352	354	392	A	338	328	A					
20					292	A	A	A	A	A	A	A	A	A	A	368	420	368	334	298				
21					262	352	362	296	366	316	328	294	388	352	408	350	306	264	270					
22					226	278	290	274	348	310	A	440	360	402	338	366	286	294						
23					432	420	420	290	350	318	318	392	392	378	314	288	312	A	260					
24				A	300	276	330	A	A	A	A	352	394	358	314	334	448	364	338					
25					318	360	338	290	276	A	346	A	438	358	364	292	312	316	308	270				
26					330	286	294	334	326	268	322	452	360	A	392	A	A	A	300					
27					268	A	E	A	A	A	338	A	224	426	A	366	366	322	290				A	
28					A	A	398	326	A	A	A	E	A	A	A	428	A	A	A	A	A			
29					256	364	522	E	A	A	308	356	394	314	314	314	316	338	280	A				
30					284	322	A	A	420	284	296	358	348	434	350	350	270	314	304	A	300			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				1	12	28	23	21	19	15	15	16	20	25	22	23	23	25	22	12	3			
MED				A	300	291	291	352	332	305	304	316	351	368	374	382	366	342	318	300	283	274		
U Q					317	336	388	386	374	350	348	359	394	407	394	412	366	336	322	304	300			
L Q					269	247	294	307	274	288	306	334	345	355	352	338	314	305	290	270	270			

JUN. 2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUN. 2021 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	242	252	250	260	206	214	220		A	196	212		A	196	198	208		A	A	208	218		A	230	230	236	236					
2	230	252	246	252	224	190	226	216	196	196	196	186	186	198		A	192	212	206	214		A	250	260	230	240						
3	232	256	248	246	204	204	206	232		A	A	A	A	202		A	A	A	A	A		242	228	236	236		A					
4		A	220	240	208	206	180	210		A	A	A	A	A	210		A	A	A		200	204	274	268		A	236	236				
5	248	238	238	224	230	200		A	202	214	186	206	194		A	202		194	206	228	216	248	266	252	244	244						
6	230	256	250	244	222	248		A	A		A	A	200		A	200	200		A	A		222	222	230	234	238	220					
7	228	228	252	250	226	216		A	A		A	A	188	194	184		A	204	380	224	224	208	236	212	240	264						
8	254	254	228	236	258	206		A	A		A	A	A		A																	
9	278	248	272	274	262	204	204		A	A	A	A	A		A	200	200	214		A	A		A	258	258	258	226	226				
10	248	270	252	244	220	202	214	198	214	192	184		A	202	202		196	196	196	218	218	264	254	242	230							
11	230	220	252	264	238	222	212	202	200	192	192	192	204	204	192	210	202	226	278	262	254	232	232	246								
12	264	264	240	270	236	236	196	206	206	208	198	208	216	196		A	A		220		A	A		A	284		A	268				
13	268	220	252	270	208	194	226		A	A	A	A		204	A	A	A	A	A	204	216	200	238		A	258	228					
14	214	276	276	260	212	200	210		A	202		180		A	A	A	A	A	A		216	230	262	262	224							
15		A	A	A	286		206	210		A	C	C	C	C	C	C	C	C		A	A	258	258	274	236	206						
16		A	332	272	218	198		A	A	A	A	C	C	C	C	C	C		224		A	A	268	268	258	276	242					
17		C	C	C	C	C	C	C	C	C	A	A		200	210	200	200	218		A	218		A	244	278	276	256					
18	222	252	228	246	210	210	210		A	A	A	A	A		198		198	198	198	254	254	260	274	260								
19	248	236	252	252	234	220	212		A	A	A	A	192		A	192	200		A	214		A	268	252		A	288	250				
20	228	236	262	262	236	228		A													210		256	224	222	228	294					
21	246	256	238	250	234	216		A	234	212	200	198	196	202	194	188	196	214	214	214	218	244	244	244	244							
22	244	246	268	268	242	198	198	216	198	192		A	192	184	196	212	202	208	232	272	272	250	222	222								
23	262	268	270	266	224	216	216	216	198		208	200	196	218	192	228						262			246							
24		A	224	224		A	A	A	A	A	A		180	186	194	206	192	202	198	244	266	260	244	244	244							
25	244	270	270	254	240	232	204	200	200		A	A	194	194	194	194	204		A	A		212	212	222	266	248	248					
26	248	258	270	256	224	224		A	A	196	196	188	188	188								268	268	268	280	234						
27	244	244	270	270	268	216		A	A	A	A	A	A	176	208	196	200		A	200	200		A	260	260							
28	208		208	202	246		A	A	A	A	A	A	A		194	228					A	A	A	A		A	250	274				
29	242	242	244	244	222	214		A	A	A	A	A	A		A	196	196	196		A	204		A	264	288	248	248					
30	248	248	254	248	228	206		A	A	206	200		A	A	A	200					A	A		A	234	230						
31																																
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT	25	27	28	28	27	26	15	11	14	11	8	13	16	21	15	15	15	16	19	21	25	25	28	26								
MED	244	252	252	252	226	212	210	210	200	196	197	192	196	200	196	200	206	207	216	254	254	254	243	244								
U Q	248	258	269	265	238	220	216	216	206	206	202	198	202	203	200	210	218	218	232	267	264	266	259	250								
L Q	230	236	240	244	212	202	204	202	198	192	190	187	190	194	194	196	198	200	212	220	237	235	234	234								

JUN. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				B	B	104	106	110	98	98	98	98	102	98	98	A	A	98	108	A	A			
2				B	108	104	98	98	94	94	106	102	102	94	94	94	94	96	114	A	A			
3				B	A	102	102	102	102	102	102	104	100	100	100	100	100	100	100	A	A			
4				A	94	94	100	100	100	100	100	100	94	94	100	100	100	100	100	100	A			
5				B	B	112	112	98	98	98	94	94	94	94	94	98	98	100	108	A	A			
6				B	112	104	104	104	98	100	100	A	94	94	92	96	96	102	102	108	98			
7				B	B	108	102	102	98	98	98	98	98	98	90	98	104	104	104	A	A			
8				B	A	106	92	92	92	92	92	96	94	94	94	A	A	A	106	A	A			
9				A	A	106	98	102	102	102	102	102	102	102	A	A	A	A	A	102	A			
10				B	A	100	100	100	102	102	94	94	94	A	A	94	94	94	94	A	B			
11				B	120	96	96	96	96	96	102	102	102	102	102	102	102	114	104	A	A			
12				B	122	106	100	100	100	100	100	100	100	100	100	100	100	100	100	A	A			
13				92	98	98	98	98	98	98	98	98	98	98	98	A	A	A	A	98	98			
14				A	B	98	98	98	98	98	98	98	98	98	98	98	98	A	A	A	A			
15				A	A	98	98	98	98	C	C	C	C	C	C	C	C	98	98	A	A			
16				B	A	98	98	98	98	C	C	C	C	C	C	C	98	98	102	A	116			
17				C	C	C	C	C	C	96	98	98	98	98	98	A	98	100	100	108	A			
18				B	B	90	102	102	102	102	102	88	88	96	96	96	96	A	96	96	A			
19				B	104	104	104	104	98	98	98	98	98	98	98	98	98	98	98	108	A			
20				A	124	112	100	100	100	100	100	100	100	100	100	100	98	98	98	A	A			
21				B	A	98	98	98	98	98	98	98	98	88	98	98	98	98	98	126	104			
22				B	B	110	110	110	110	92	92	92	92	92	94	94	102	102	102	A	B			
23				B	B	102	102	102	102	92	92	98	98	98	98	98	102	102	102	110	A			
24				A	A	102	102	102	102	102	102	102	102	102	A	A	A	114	114	A	A			
25				B	114	104	98	98	98	98	98	98	98	96	102	102	102	102	102	A	B			
26				B	116	106	102	102	102	102	102	100	100	92	92	92	92	92	92	B	B			
27				92	92	98	98	98	98	98	98	98	98	98	98	98	98	98	A	A	A			
28				B	A	98	98	98	98	100	100	100	100	A	A	A	A	100	A	A	A			
29				B	E	B	124	100	100	100	100	100	100	100	100	100	A	A	A	A	A			
30				B	B	100	100	100	100	100	100	100	100	100	100	100	A	100	100	A	A			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				2	12	28	29	29	29	27	28	27	28	26	24	21	21	24	24	9	4			
MED				92	112	102	100	100	98	98	99	98	98	98	98	98	98	100	101	108	101			
U Q				121	106	102	102	102	100	101	100	100	100	100	100	100	101	102	104	109	110			
L Q				101	98	98	98	98	98	98	98	98	96	94	94	96	97	98	98	99	98			

JUN. 2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 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		B	B	B	B	B	112	112	112	112	102	102	104	100	104	118	92	92	112	108	108	108		B	B	94
2		94	94	94	94	92	128	118	112	128	114	160	104	102	104	104	104	104	98	110	110	112	110	108	100	
3		100	100	100	100	98	128	122	112	112	104	104	100	100	106	102	106	108	108	108	108	102	112	104	104	
4		104	104	92	104	94	96	116	106	106	96	104	104	104	108	114	102	100	100	100	108	108	102	102	92	
5		92	92	92	110	B	128	116	114	110	104	104	110	94	104	98	100	140	114	140	122	106	106	106	106	
6		100	100	100	106	106	112	112	112	100	104	104	110	110	110	116	124	112	112	108	108	108	100	100	98	
7		98	114	114	90	B	124	110	116	88	110	100	100	100	106	94	122	106	118	102	112	108	108	108	96	
8		102	94	94	100	100	138	118	106	106	104	104	98	96	96	96	96	96	96	110	110	110	108	108	98	
9		96	88	90	102	98	138	120	116	114	104	104	100	100	100	100	98	106	104	104	104	104	104	104	B	
10		B	B	96	96	94	130	112	106	106	106	106	106	98	98	96	92	92	118	120	92	92	102	102	102	
11		94	94	94	94	102	120	120	120	112	106	106	96	96	94	94	94	100	100	112	112	104	118	96	96	
12		96	110	B	110	116	118	116	116	100	108	108	108	106	124	96	96	130	112	112	112	108	108	102	102	
13		102	B	B	106	98	140	116	116	110	104	106	100	100	100	100	100	98	98	98	98	98	110	110	110	
14		100	100	100	100	B	124	112	112	112	102	102	102	94	98	100	100	100	100	100	102	106	106	106	106	
15		106	100	100	100	100	106	106	114	114	C	C	C	C	C	C	C	C	114	114	114	124	116	104	104	
16		104	102	98	102	102	116	108	110	116	C	C	C	C	C	C	C	116	108	106	112	112	112	112	112	
17		C	C	C	C	C	C	C	C	C	C	112	110	100	100	100	102	102	102	102	102	102	112	112	96	
18		102	102	B	B	B	108	108	108	108	108	108	94	110	92	112	100	100	100	110	110	110	110	110	110	
19		98	B	98	B	G	108	108	108	108	98	98	98	98	104	G	102	122	112	112	118	118	120	114	106	
20		116	118	96	96	130	116	106	106	106	106	106	106	104	104	100	106	100	100	114	112	100	106	102	102	
21		88	88	88	94	88	128	112	112	112	86	108	108	108	G	100	92	150	114	146	124	110	102	102	102	
22		102	98	B	96	B	118	122	122	108	108	102	98	108	108	190	166	194	118	110	110	104	110	110	104	
23		94	94	98	B	126	126	108	130	114	B	102	104	104	96	106	136	98	122	104	104	104	106	106	106	
24		106	106	98	98	104	110	110	110	106	106	106	106	106	104	104	104	104	124	120	108	108	108	108	108	
25		90	100	94	100	116	116	116	116	104	104	104	104	156	100	92	112	112	88	104	114	114	114	102	98	
26		98	98	98	90	114	130	110	110	110	110	102	102	112	112	112	106	122	118	118	118	110	110	110	98	
27		98	98	98	94	102	132	112	112	112	102	102	102	102	122	100	92	108	108	100	100	104	120	114	114	
28		110	110	102	102	102	114	114	114	106	106	102	94	94	94	94	98	98	104	100	100	100	124	120	112	
29		112	94	94	94	148	120	120	104	104	104	104	104	104	104	104	104	104	102	102	102	112	112	112	106	
30		106	B	106	106	B	100	126	108	108	102	102	102	100	100	100	100	100	100	114	108	108	108	102	C	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		27	24	24	25	21	29	29	29	29	26	28	28	28	27	27	28	29	30	30	30	30	29	29	28	
MED		100	100	98	100	102	120	112	112	108	104	104	103	101	104	100	101	104	108	109	109	108	110	106	103	
U Q		104	103	100	103	115	128	118	116	112	106	106	106	106	106	106	106	114	114	114	112	110	112	110	106	
L Q		96	94	94	94	98	112	110	108	106	102	102	100	99	98	96	97	100	100	102	104	104	106	102	98	

JUN. 2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2021 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						C3	C4	C5	C3	C2	C2	C3	C2	C2	C2	L4	L6	C4	C5	C5	C6			F3	
2	F2	F2	F3	L1	C1	C2	C3	C4	C2	C1	H1	C1	C1	C1	C2	C2	C3	LC2	C2	L8	L8	F6	F4	F3	
3	F1	F4	F3	L3	L4	CL22	C3	C3	C4	C6	C4	C3	C2	C2	C2	C3	C5	C8	C8	L5	L5	F6	F7	F9	
4	F6	F8	F5	L3	L3	LC11	C2	C4	C6	C3	C2	C3	C3	C2	C2	C4	C4	C2	C3	C3	C5	F9	F2	F4	
5	F3	F1	F1	L1		C2	C3	C3	CQ21	CQ21	C2	C2	C2	C2	L3	LC11	H1	C2	CQ22	L3	L7	F4	F4	F8	
6	F6	F5	F3	L4	LH11	C3	CQ61	CQ31	CC42	CC32	C4	L2	C2	C3	C	C	C5	C8	C5	C3	C2	F3	F2	F2	
7	F1	F1	F1	L1		C3	C3	C3	LC21	C3	C3	C2	C2	C2	C3	C3	C2	C3	C4	L2	L3	F1	F1	F2	
8	FQ21	FQ31	FQ31	L1	L2	H2	C3	C5	C5	C2	C4	C3	C42	C3	C2	L2	L3	LQ21	CQ41	C6	C8	F7	F9	F5	
9	F4	F2	F2	L2	L3	H2	C3	C4	C5	C5	C2	C3	C2	C2	C3	L4	LQ41	LQ41	LQ41	CQ11	L6	FQ21	F3		
10			F1	L2	L1	C2	C2	C2	C3	C2	C1	C2	C2	L3	L2	C2	CL21	CL21	CL21	LL22	L1	F1	F2	F2	
11	F1	F2	F2	L1	LC11	C2	C3	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C8	L5	L6	F1	F1	F1	
12	F3	F1		L1	LC11	C2	C2	C2	C2	C2	C2	C2	C2	C2	C4	C3	C2	C4	C8	C8	L8	F9	F6	F9	
13	F2			C1	C11	CL3	C4	C6	C3	C4	C3	C2	C2	C2	C2	L4	L4	L4	L3	C2	CQ51	F81	F5	F1	
14	F1	F4	F3	L2		C2	C2	C4	C3	C4	C3	C2	C2	C3	C3	C4	C3	L5	L3	L3	L5	F5	F6	F9	
15	F6	F9	F6	L9	L5	C4	C7	C3	C5								C3	C8	L7	L8	F8	F9	F8		
16	F8	F4	F3	LQ21	L1	C4	C4	C4	CQ51								C4	C4	C5	L4	C7	F4	F7	F3	
17											C3	CQ32	C2	C2	C1	L3	C2	C4	C6	C8	L4	F4	F3	F3	
18	F1	F1			C4	C4	C3	C3	C6	C3	C2	C2	C3	C2	C3	C3	C3	L4	C2	C5	L6	F7	F3	F3	
19	F2		F1		C3	C4	C3	C2	C2	C3	C2	C3	C2	C2	C2	C5	C4	C4	C7	C7	C5	F8	F4	F5	
20	F7	F4	F4	L2	C2	C5	C4	C5	C4	C8	C5	C3	C5	C3	C3	C3	C3	C2	C4	C5	L4	F1	F4	F6	
21	F6	F5	F2	L1	L1	C3	C5	C3	C3	LC21	C2	C1	C1	C	C	LC21	H2	C1	C2	C3	C2	F3	F3	F4	
22	F3	F1		L1		C2	C2	C2	C2	C2	C3	C3	C1	C2	C1	C1	C2	C2	C2	C3	L2	F5	F11	F1	
23	F2	F2	F1		C1	C2	C2	C2	C2		C2	C2	C2	C2	C2	C2	C2	C2	C2	C7	L8	F8	F8	F5	
24	F6	FQ41	FQ51	L6	LQ41	LQ41	C8	C6	C5	C7	CQ42	C2	C1	C1	C2	L2	L4	LC11	C5	L7	L5	F4	F4	F5	
25	F1	FQ31	F3	L3	C3	C5	C3	C2	C2	C3	C2	C2	H1	CH11	CH11	C2	C3	CC32	C3	L1	L2	F2	F2	F4	
26	F2	F2	F1	L2	C2	C2	C3	C4	C2	C2	C2	C2	C2	C2	C4	CQ32	CQ52	CQ42	CQ51	C3	C3	F6	F3	F3	
27	F2	F2	F1	C1	C1	CL21	C3	C3	C4	C5	C3	C2	C1	C1	C2	C2	C3	C3	LQ32	LQ32	LQ42	F7	F4	FQ32	
28	FQ32	FQ52	FQ32	LQ32	LQ41	CQ51	CQ51	CQ41	CQ41	CQ41	CQ41	C3	C2	L2	L3	L2	L3	L4	LQ42	LQ42	LQ31	FQ51	F6	F6	
29	F5	F4	F4	LQ51	H1	C2	C3	C4	C4	C4	C3	C3	C2	C3	C2	C2	L2	L4	L4	L5	L5	F5	FQ31	F4	
30	F2		F2	L2		LC11	CQ41	C5	CC21	C2	C4	C3	CQ31	CQ21	C2	C3	CQ51	CQ41	C2	C8	C9	C8	F2	C	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

JUN. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2021 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	39	42	X 38	X 38	X 38															X 63	X 66	X 65	X 60	X 55	
2	X 52	X 50	X 47	X 44	X 42															X 72	X 70	X 66	X 65	X 70	
3	59	X 46	X 42	X 54	X 54															X 72	X 77	X 66	X 60	X 58	
4	59	X 48	X 44	X 47	X 44															A	X 66	X 64	X 60	X 59	
5	60	48	O 44	X 43	X 38															X 67	X 72	X 72	X 65	X 60	
6	X 47	X 47	X 45	X 39	X 40															X 65	X 70	X 68	X 58	X 54	
7	X 48	X 45	X 44	X 44	X 46															X 72	X 64	X 60	X 57	X 52	
8	51	47	X 51	X 51	X 46															X 72	X 74	X 58	X 59	A	
9	60	58	X 52	X 48	A							C								X 74	X 74	X 69	X 54	X 49	
10	53	58	X 52	X 49	X 42															X 64	X 77	X 74	X 58	X 53	
11	X 49	X 52	X 52	X 56	X 50															X 89	X 90	X 74	X 78	X 73	
12	71	62	X 60	X 57	X 60	57														X 65	X 59	X 59	X 58	X 58	
13	56	58	X 56	X 44	X 49															X 70	X 72	X 72	X 59	A	
14	A	A	47	X 42	X 39															A	X 75	X 72	X 58	X 52	
15	X 50	X 45	X 46	X 43	X 43															X 70	X 65	X 62	X 59	X 60	
16	60	46	X 45	X 47	X 43															X 65	X 68	A	70	61	
17	61	60	A	55	55	57				60										X 66	X 64	X 66	X 65	X 62	
18	62	62	X 62	X 60	X 46															X 67	X 72	X 72	X 67	X 63	
19	65	X 64	X 64	X 60	X 58															X 79	X 77	X 70	X 68	X 65	
20	X 63	X 61	X 59	X 56	X 53															X 65	X 72	X 66	X 57	X 60	
21	55	A	42	42	42															X 64	X 70	X 74	X 63	X 60	
22	X 56	X 54	X 52	X 50	X 47															X 92	X 94	X 76	X 66	X 70	
23	72	69	X 58	X 53	X 45															X 66	X 66	X 59	X 58	X 60	
24	X 57	X 55	X 53	X 56	X 56															X 62	X 68	X 65	X 57	X 52	
25	57	56	X 48	X 50	X 45															A	X 71	A	C	62	
26	58	55	50	53	C															A	A	A		A	
27	62	62	X 60	X 46	X 49										A					X 57	X 63	X 62	X 64	X 60	
28	60	X 48	X 48	X 46	X 48															X 62	X 65	X 66	X 62	X 60	
29	60	X 52	X 57	X 45	X 37															X 60	X 66	X 64	X 60	X 60	
30	67	64	59	60	60															X 79	X 73	X 73	X 66	X 69	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	28	29	30	28	2				1										1	26	29	27	28	27
MED	59	54	X 51	X 48	46	57				60										66	X 70	X 66	X 60	X 60	
U Q	62	60	58	55	52															72	74	72	65	62	
L Q	X 52	X 48	X 45	X 44	X 42																X 64	X 66	X 64	X 58	X 55

JUN. 2021 f_{XI} (0.1MHz)

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JUN. 2021 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	F	32	32	32	37	52	60	61	54	58	58	54	A	54	A	62	A	57	61	59	54	49		
2	46	44	41	38	36	41	A	A	A	63	57	56	53	A	52	56	59	52	56	66	64	60	F	F	
3	F	40	F	F	F	43	45	52	58	A	A	A	58	55	53	52	61	57	57	66	71	60	F	F	
4	F	42	38	F	38	46	46	A	58	60	A	A	A	A	55	54	60	A	A	A	60	F	F	F	
5	F	F	38	37	32	37	47	61	63	54	54	A	59	52	56	56	48	A	A	61	66	F	F	F	
6	41	F	F	33	F	42	39	57	72	58	A	A	R	49	55	58	62	55	52	59	64	F	F	48	
7	42	38	38	F	F	48	50	49	52	58	A	A	A	A	A	50	A	A	62	66	58	54	51	46	
8	F	F	45	44	40	48	48	64	64	A	A	50	58	68	A	64	59	64	59	66	68	52	F	A	
9	F	F	46	42	A	45	47	58	59	A	A	C	A	A	62	60	59	60	58	67	68	F	F	F	
10	F	F	F	F	F	39	49	59	59	52	52	R	53	58	61	64	64	56	54	58	71	68	52	47	
11	43	46	46	F	F	43	48	66	58	A	A	58	57	60	59	59	64	70	78	82	84	68	F	F	
12	F	F	F	F	F	F	48	A	46	A	46	53	R	A	A	56	56	58	A	63	59	53	53	F	F
13	F	F	F	F	F	38	47	55	63	70	56	A	A	A	A	A	A	A	A	64	66	66	F	A	
14	A	A	F	36	32	44	52	A	A	A	A	A	A	A	A	64	62	58	58	A	69	66	52	46	
15	44	39	40	37	F	39	46	50	58	61	56	57	A	A	53	59	68	67	68	64	59	F	F	F	
16	F	F	39	41	F	44	54	A	A	A	A	56	A	A	55	61	65	54	52	59	62	A	F	F	
17	F	F	A	F	F	F	58	66	57	F	A	A	A	54	59	54	60	56	A	60	58	60	59	F	
18	F	F	F	F	39	40	41	45	A	A	A	50	A	A	A	A	A	54	53	61	66	66	61	F	
19	F	58	F	54	F	42	54	A	75	54	A	A	A	A	54	58	60	60	65	73	70	64	62	59	
20	57	55	53	50	47	50	53	54	48	56	50	A	A	A	55	55	52	55	52	59	66	F	F	F	
21	F	A	F	F	F	35	50	A	72	A	A	56	58	58	55	57	62	62	57	58	64	68	57	54	
22	50	48	46	44	41	47	53	51	55	60	54	58	56	58	A	A	68	72	77	86	88	70	60	F	
23	F	F	52	47	39	39	42	54	62	A	A	A	A	A	59	A	A	64	64	60	60	53	52	54	
24	51	49	47	F	F	44	52	A	68	A	A	A	72	68	A	A	A	A	53	56	62	F	F	46	
25	F	F	44	F	39	44	55	67	60	62	61	59	61	50	A	66	A	F	A	A	65	A	C	F	
26	F	F	F	F	C	41	48	A	71	A	A	A	A	A	54	54	55	57	A	A	A	A	A	A	
27	F	F	F	F	F	44	A	A	A	A	A	A	A	A	53	57	55	47	50	51	57	56	58	F	
28	F	42	42	40	F	38	57	A	A	A	A	A	A	A	A	56	56	56	50	56	59	60	F	F	
29	F	46	F	F	31	A	A	53	73	64	55	57	66	68	A	67	56	50	50	54	60	F	F	F	
30	F	F	F	F	F	43	46	53	68	A	58	A	A	A	A	67	A	70	70	73	F	F	60	F	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	8	12	16	16	12	27	27	20	24	14	13	12	12	13	18	25	22	23	23	26	28	18	12	9	
MED	45	45	43	40	38	43	48	54	60	59	55	56	58	58	55	57	60	57	57	60	64	60	58	48	
U Q	50	48	46	44	40	44	53	60	68	62	58	58	60	64	59	62	62	64	64	66	68	66	60	54	
L Q	42	41	38	37	32	39	46	52	58	54	53	54	56	53	54	54	56	55	52	58	60	56	52	46	

JUN. 2021 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

JUN.2021 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						312	U L 380	A	A	A	A			A	A	A	A	A	A					
2							A	A	A	A	464	U L 448	U L 452	A	A	U L 440	A	A	L					
3						A		A	A	A	A	A			444	432	400	U L 400	348					
4								A	A	A	A	A	A	A	A	A	A	A	A					
5						A	A	A	A	U L 436	460	A	A	452	428	428	392		A	A				
6								A	416	A	A	A	U L 428	432	440	U L 440	A	A	384	A				
7						L 380		A	A	A	A	A	A	A	A	A	A	A	A					
8							372	404	436	A	A	A	A	A	A	A	A	A	A					
9							U L 444	A	A	A	A	C	A	A	A	A	A	A	372	A				
10							388	A	440	A	A		U L 460	A	456		A	A	A					
11							396	A	A	A	A		U L 480	480	456	A	456	424	A	344				
12							368	A	U L 400	A	U L 428	U L 456	A	A	A	A	A	A	A					
13							U L 420	A	A	A	A	A	A	A	A	A	A	A	A					
14						A	L	A	A	A	A	A	A	A	A	U L 436	424	372	L					
15						A	384	A	A	A	A	A	A	A	A	A	A	368	384	L				
16							A	A	A	A	A	A	A	A	A	A	A	A	L	L				
17							A	A		U L 424	432	A	A	A	A	A	A	A	U L 384	A				
18								392	A	A	A	A	A	A	A	A	A	A	384	A				
19						296	356	A	L	A	A	A	A	A	A	A	A	420	A	A				
20							L	A	A	A	A	A	A	A	A	A	A	A	A					
21							372	A	A	A	A	U L 452	464	460	452	436	412	384	L					
22								A				A	U L 516	A	A	A	A	A	A					
23							364	408	A	A	A	A	A	A	A	A	A	A	392	A				
24						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
25							380	A	A	A	A	460		A	A	A	A	A	A					
26								A	A	A	A	A	A	A	A	U L 468	420	A	A					A
27								A	A	A	A	A	A		A	432	408	396	U L 396					
28							A	A	A	A	A	A	A	A	A	A	U L 440	396	L					
29							A	A		A	A	A	A	A	A	A	A	A	L					
30							376	396	A	A	A	472	A	A	A	A	A	A	A					
31											476													
	00	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	14	4	6	3	6	6	6	5	5	9	10	12	4					
MED						312	380	406	430	U L 436	462	458	U L 460	456	444	436	416	384	346					
U Q						376	396	422	440	460	472	460	464	488	454	448	424	396	372					
L Q						296	372	398	416	U L 432	460	U L 452	U L 452	442	434	430	400	384	340					

JUN.2021 foF1 (0.01MHz)

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JUN.2021 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						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
2						B	A	A	A	A	U R 360	A	A	A	A	A	A	A	A	A				
3						B	A	A	A	A	A	A	A	A	A	U R 316	U R 292	A	A	U R 240				
4						U R 196	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
5						B	A	A	A	A	A	A	A	A	A	U A 308	A	A	A	A				
6						A U 260	A	A	A	A	A	A	U R 348	R U 320	A U 312	A U 284	A	A	A	A				
7						U R 200	U R 264	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
8						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
9						B U 256	A	A	A	A	A	C	A	A	A	A	A	A	A	B				
10						U A 180	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
11						U R 208	A	A	A	A	A	A	A	A	A	A	A	A	A	U A 224				
12						B	A	A	A	A	U R 376	A	A	A	U A 344	A	A	A	A	A				
13						U A 192	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
14						B	A	A	A	A	A	A	A	A	A	U R 352	A	A	A	B				
15						U A 220	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
16						B	A	A	A	A	A	A	A	A	A	U A 324	A	A	A	A				
17							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
18						U R 200	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
19						U R 200	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
20						U R 188	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
21						B	A	A	A	A	A	A	A	U R 364	U R 360	U R 328	U A 288	A	A	A				
22						B U 272	A	A	A	A	A	A	A	U R 380	A	A	A	A	A	A				
23						U R 224	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
24						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
25						B U 272	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
26						U A 196	A	A	A	A	A	A	A	A	A	U R 348	U R 320	A	A	A	A			A
27						B	A	A	A	A	A	A	A	A	A	U A 324	A	U R 288	A	A				
28						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
29						B	A	A	A	A	A	A	A	A	A	A	A	U R 288	A	A				
30						A U 196	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						12	6		1		2		1	2	3	8	4	2	2					
MED						U R 198	U R 262		364		U R 368		U R 348	U R 372	U R 344	U R 324	U R 290	U R 288	U R 232					
U Q						U R 204	U R 272								U R 360	U R 338	U R 306							
L Q						U A 194	U A 256								U A 320	U A 314	U A 286							

JUN.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION kokubunji

JUN.2021 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 51	A J 34	A J 28	A 23	A 23	J 23	J 38	A J 60	A J 52	A J 57	A J 53	42	41	J 51	A J 66	A J 63	A J 81	A J 146	A J 104	A J 189	A J 90	A J 64	A J 55	A J 64	
2	J 27	A J 31	A J 24	A J 28	A J 26	A J 27	J 64	A J 67	A J 208	A J 87	G	42	J 84	A J 82	A J 56	A J 53	A J 85	A J 67	A J 44	A J 27	A J 28	A J 30	A J 86	A J 131	
3	J 124	A J 90	A J 53	A J 75	A J 34	A J 45	A J 51	A J 42	A J 55	A J 78	A J 95	A J 104	A J 102	A J 79	A J 39	G	35	A J 34	G	A J 66	A J 85	A J 68	A J 68	A J 44	
4	J 111	A J 136	A J 39	A J 27	A J 27	G	A J 41	A J 62	A J 54	A J 90	A J 131	A J 104	A J 102	A J 76	A J 56	A J 65	A J 73	A J 93	A J 160	A J 161	A J 54	A J 76	A J 128	A J 110	
5	J 88	A J 54	A J 64	A J 39	A J 37	A J 34	A J 81	A J 66	A J 60	A J 43	A J 44	A J 96	A J 58	A J 46	A J 55	A J 39	A J 167	A J 58	A J 80	A J 48	A J 55	A J 54	A J 54	A J 111	
6	J 29	A J 83	A J 47	A J 24	A J 33	A J 22	A J 32	A J 53	A J 51	A J 55	A J 69	A J 152	G	G	42	A J 42	A J 44	A J 35	A J 43	A J 76	A J 43	A J 50	A J 52	A J 30	
7	J 24	A J 30	A J 26	A J 26	A J 36	G	G	A J 61	A J 53	A J 63	A J 78	A J 90	A J 76	A J 82	A J 105	A J 70	A J 76	A J 75	A J 58	A J 31	A J 88	A J 55	A J 36	A J 34	
8	J 49	A J 40	A J 36	A J 25	A J 32	A J 25	A J 38	A J 49	A J 44	A J 103	A J 102	A J 54	A J 44	A J 76	A J 128	A J 116	A J 98	A J 148	A J 111	A J 80	A J 88	A J 145	A J 54	A J 104	
9	J 68	A J 55	A J 52	A J 54	A J 58	A J 51	A J 28	A J 62	A J 58	A J 70	A J 100	C	J 77	A J 73	A J 58	A J 66	A J 54	A J 44	A J 60	A J 60	A J 84	A J 38	A J 48	A J 35	
10	J 54	A E 16	A E 16	A E 15	A E 21	A J 24	A J 40	A J 53	A J 48	A J 53	A J 57	A J 66	A J 42	A J 48	A J 40	A J 51	A J 82	A J 87	A J 50	A J 56	A J 56	A J 43	A J 44	A J 36	
11	J 27	A E 16	A J 42	A J 34	A E 16	G	A J 29	A J 51	A J 53	A J 53	A J 61	A J 48	A J 42	A J 39	A J 53	A J 45	A J 37	A J 51	A J 29	A J 44	A J 37	A J 66	A J 53	A J 49	
12	J 74	A J 28	A J 32	A E 16	A J 50	A J 55	A J 36	A J 50	A J 48	A J 60	G	A J 52	A J 80	A J 72	A J 44	A J 53	A J 67	A J 77	A J 123	A J 108	A J 41	A J 67	A J 47	A J 106	
13	J 105	A J 54	A J 35	A J 44	A J 27	A J 24	A J 45	A J 58	A J 74	A J 58	A J 64	A J 92	A J 187	A J 99	A J 131	A J 293	A J 259	A J 161	A J 112	A J 67	A J 49	A J 30	A J 86	A J 68	
14	J 102	A J 66	A J 40	A J 47	A J 56	A J 53	A J 54	A J 74	A J 135	A J 143	A J 122	A J 160	A J 59	A J 68	A J 93	G	A J 37	A J 48	A J 29	A J 53	A J 48	A J 34	A J 30	A J 26	
15	J 36	A J 44	A J 86	A J 59	A J 35	A J 30	A J 35	A J 54	A J 52	A J 55	A J 58	A J 55	A J 62	A J 60	A J 51	A J 90	A J 38	A J 44	A J 52	A J 32	A J 48	A J 55	A J 52	A J 64	
16	J 68	A J 68	A J 48	A J 36	A J 49	A J 42	A J 81	A J 98	A J 78	A J 148	A J 160	A J 49	A J 122	A J 113	A J 66	A J 41	A J 40	A J 52	A J 44	A J 37	A J 104	A J 105	A J 115	A J 112	
17	J 105	A J 50	A J 75	A J 49	A J 32	A J 65	A J 45	A J 56	A J 39	A J 70	A J 56	A J 87	A J 140	A J 56	A J 74	A J 59	A J 56	A J 81	A J 83	A J 66	A J 55	A J 34	A J 25	A J 100	
18	J 45	A J 42	A J 35	A J 34	A J 35	G	A J 42	A J 52	A J 66	A J 88	A J 69	A J 63	A J 91	A J 142	A J 83	A J 108	A J 69	A J 47	A J 43	A J 32	A J 32	A J 33	A J 36	A J 27	
19	J 24	A J 20	A J 28	A J 27	A J 33	G	A J 32	A J 130	A J 79	A J 55	A J 156	A J 170	A J 164	A J 92	A J 62	A J 50	A J 47	A J 56	A J 36	A J 48	A J 32	A J 27	A J 38	A J 30	
20	J 26	A E 15	A E 21	A E 15	A E 19	G	A J 29	A J 48	A J 54	A J 55	A J 65	A J 73	A J 124	A J 72	A J 51	A J 51	A J 46	A J 45	A J 34	A J 33	A J 81	A J 46	A J 40	A J 107	
21	J 67	A J 54	A J 43	A J 33	A J 28	A J 36	A J 37	A J 68	A J 68	A J 77	A J 65	A J 52	A J 53	G	G	G	33	A J 31	A J 26	A J 14	A J 15	A J 22	A J 14	A J 22	
22	22	A E 16	A E 16	A E 24	A E 26	A J 29	G	A J 61	G	A J 56	A J 40	A J 50	A J 53	G	A J 82	A J 106	A J 102	A J 61	A J 46	A J 46	A J 33	A J 23	A J 32	A J 52	
23	J 45	A J 45	A J 23	A J 24	A J 50	G	A J 31	A J 38	A J 67	A J 117	A J 83	A J 93	A J 120	A J 178	A J 222	A J 108	A J 132	A J 44	A J 48	A J 59	A J 66	A J 35	A J 32	A J 28	
24	J 34	A E 15	A J 27	A J 36	A J 36	A J 34	A J 57	A J 64	A J 65	A J 94	A J 208	A J 144	A J 84	A J 58	A J 102	A J 105	A J 95	A J 127	A J 109	A J 86	A J 57	A J 77	A J 126	A J 114	
25	J 66	A E 15	A J 32	A J 29	A J 28	A J 26	G	A J 54	A J 83	A J 76	A J 66	A J 58	A J 65	A J 54	A J 66	A J 210	A J 122	A J 142	A J 202	A J 171	A J 170	A J 147	C	A J 118	
26	J 89	A J 66	A J 89	A J 55	A J 26	A J 35	A J 68	A J 68	A J 65	A J 164	A J 156	A J 159	A J 85	A J 47	G	G	A J 40	A J 63	A J 103	A J 103	A J 127	A J 98	A J 106		
27	J 68	A J 65	A J 51	A J 38	A J 36	A J 32	A J 52	A J 48	A J 69	A J 88	A J 111	A J 103	A J 197	A J 290	A J 122	A J 38	A J 35	G	A J 41	A J 36	A J 34	A J 34	A J 66	A J 87	
28	J 128	A J 50	A J 41	A J 33	A J 23	A J 33	A J 58	A J 108	A J 92	A J 92	A J 76	A J 72	A J 90	A J 80	A J 58	A J 92	A J 143	A J 82	A J 34	A J 36	A J 122	A J 151	A J 54	A J 39	
29	J 52	A J 66	A J 46	A J 34	A J 28	A J 52	A J 122	A J 78	A J 60	A J 121	A J 153	A J 113	A J 67	A J 118	A J 117	A J 63	A J 48	G	28	A J 28	A J 50	A J 113	A J 56	A J 89	
30	J 69	A J 76	A J 66	A J 31	A E 16	A J 25	A J 35	A J 56	A J 80	A J 120	A J 108	A J 108	A J 131	A J 197	A J 107	A J 107	A J 87	A J 76	A J 54	A J 110	A J 75	A J 84	A J 54	A J 88	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	30	
MED	J 60	A J 48	A J 40	A J 33	A J 32	A J 26	A J 38	A J 59	A J 60	A J 73	A J 72	A J 87	A J 82	A J 74	A J 64	A J 61	A J 68	A J 57	A J 49	A J 54	A J 55	A J 54	A J 53	A J 66	
U Q	J 88	A J 66	A J 51	A J 39	A J 36	A J 36	A J 52	A J 67	A J 74	A J 92	A J 111	A J 106	A J 122	A J 92	A J 102	A J 105	A J 95	A J 82	A J 83	A J 80	A J 85	A J 77	A J 67	A J 106	
L Q	J 34	A E 28	A E 28	A E 25	A E 26	A E 22	A J 32	A J 52	A J 52	A J 56	A J 58	A J 53	A J 58	A J 54	A J 51	A J 42	A J 40	A J 44	A J 36	A J 36	A J 41	A J 34	A J 37	A J 35	

JUN.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2021 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E A 19	18	E B 16	E B 16	E B 16	20	32	52	41	49	45	40	38	47	A A 66	43	A A 81	49	A A 104	30	25	20	41	E B 16	
2	18	19	E B 16	E B 16	E B 16	24	A A 64	A A 67	A A 208	A A 53	G	40	42	A A 82	42	32	45	40	26	20	E B 15	35	24		
3	28	23	E B 16	26	19	24	34	35	44	78	95	104	45	51	37		32	29		G	46	25	28	28	26
4	E B 16	E B 16	E B 16	E B 16	E B 16	G	35	A A 62	47	54	131	104	102	76	46	46	48	A A 93	A A 160	A A 161	21	21	22	22	
5	23	23	28	E B 16	23	24	32	42	42	37	37	96	44	37	37	36	34	A A 58	A A 80	30	27	18	21	E B 16	
6	E B 16	E B 16	E B 16	E B 16	E B 16	17	20	28	46	37	44	A A 69	A A 152	G	G	40	40	40	32	36	35	26	28	E B 16	E B 16
7	E B 16	21	E B 16	19	19	G	G	42	42	50	78	90	76	82	105	46	A A 76	A A 75	43	27	48	34	22	25	
8	28	29	22	E B 15	E B 15	22	34	34	35	A A 103	A A 102	45	42	46	A A 128	49	53	55	42	40	24	25	36	A A 104	
9	33	33	29	27	A A 58	26	27	48	47	70	100		77	73	46	52	48	33	46	30	46	22	24	20	
10	20	E B 16	E B 16	E B 15	E B 16	22	31	43	37	40	46	55	41	44	35	43	54	45	30	35	39	22	E B 16		
11	E B 16	E B 16	E B 16	20	E B 16	G	29	44	42	A A 53	A A 61	38	37	37	44	36	32	46	25	34	22	20	23	25	
12	E B 16	E B 16	E B 16	E B 16	E B 15	24	28	50	32	60		37	80	72	41	46	53	A A 77	43	35	26	34	24	30	
13	32	26	22	E B 16	19	19	35	50	56	49	49	92	187	99	131	293	259	161	112	50	28	23	26	A A 68	
14	A A 102	A A 66	19	21	23	35	28	A A 74	A A 135	A A 143	A A 122	A A 160	59	68	93		34	29	22	A A 53	E A 17	E A 15	E B 16	E B 19	
15	19	20	22	22	E B 15	27	27	42	43	47	47	46	A A 62	A A 60	43	45	30	31	24	23	E B 15	E B 15	18	26	
16	25	28	24	27	E B 15	24	42	A A 98	A A 78	A A 148	A A 160	42	122	113	49	35	38	33	27	18	E B 15	E A 105	26	30	
17	29	34	A A 75	29	18	28	34	44	34	35	56	87	140	46	46	45	44	28	A A 83	25	46	23	20	28	
18	20	22	20	22	19	G	36	35	66	88	69	45	91	142	83	108	69	28	32	24	24	24	25	20	
19	E B 16	E B 16	E B 16	E B 18	E B 16	G	30	A A 130	44	46	156	170	164	92	43	44	37	37	31	29	26	19	19	E B 16	
20	E B 16	E B 15	E B 15	E B 15	E B 15	G	27	42	42	43	45	73	124	72	44	44	42	40	26	21	52	34	34	E B 16	
21	E B 16	A A 54	27	16	E B 16	24	30	A A 68	50	A A 77	A A 65	41	39		G	G	G	32	30	24	14	E B 15	E B 14	E B 15	
22	E B 15	E B 16	E B 16	E B 16	E B 16	20	G	44		40	38	43	50		G	A A 82	A A 106	56	51	42	30	19	E B 14	E B 16	29
23	38	19	E B 16	E B 16	E B 23	G	28	34	48	A A 117	A A 83	93	120	178	49	108	132	32	32	36	37	20	16	18	
24	E B 15	E B 15	18	E B 15	18	28	41	A A 64	51	94	208	144	65	49	102	105	95	A A 127	45	36	43	46	22	25	
25	22	E B 15	E B 15	E B 15	17	22	G	42	48	46	46	41	46	46	A A 66	46	A A 122	46	A A 202	A A 171	44	A A 147		C	39
26	24	20	21	21	C	24	27	A A 68	52	A A 65	A A 164	A A 156	A A 159	A A 85	46		G	G	37	A A 63	A A 103	A A 103	A A 127	A A 98	A A 106
27	24	25	18	28	20	25	A A 52	A A 43	A A 69	A A 88	A A 48	A A 103	A A 197	A A 290	48	37	32		G	23	28	18	16	E B 16	29
28	28	E B 16	26	23	19	26	44	A A 108	92	92	76	72	90	80	80	58	51	35	35	25	25	E B 16	24	E B 16	16
29	E B 16	20	22	E B 16	E B 16	52	122	33	47	46	41	48	59	56	A A 117	53	42		G	26	18	22	19	19	E B 17
30	E B 16	E B 16	E B 16	E B 16	E B 16	21	32	45	49	A A 120	41	A A 108	A A 131	A A 197	A A 107	52	A A 87	50	46	49	27	33	34	36	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	30	
MED	20	20	17	E B 16	E B 16	23	32	44	47	54	63	73	70	70	47	45	44	38	34	30	26	22	22	24	
U Q	28	25	22	22	19	25	35	A A 64	A A 52	A A 88	A A 100	A A 104	A A 122	A A 85	A A 83	52	69	51	46	40	39	33	27	29	
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	42	42	46	45	42	44	46	43	36	34	31	26	25	E 20	19	E B 17	E B 16	

JUN. 2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN.2021 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	16	16	20	21	21	21	22	22	21	16	16	16	16	16	17	17	16
2	16	16	16	16	16	16	14	16	18	21	26	25	25	24	23	23	17	15	15	15	15	15	15	15
3	15	15	16	16	16	13	13	13	14	21	18	22	25	27	24	19	19	16	16	16	16	16	16	15
4	16	16	16	16	16	15	15	15	18	17	20	20	22	20	22	20	18	16	15	16	16	15	16	15
5	16	16	16	16	15	16	16	15	16	19	18	24	20	18	18	22	16	16	15	15	16	16	16	16
6	16	16	16	16	16	15	15	15	16	16	16	18	18	29	25	23	19	16	15	16	15	15	16	16
7	16	16	16	16	16	16	16	14	14	16	16	20	20	20	22	22	16	16	16	16	16	16	16	15
8	16	16	16	15	15	16	15	15	15	16	16	18	18	19	23	19	18	15	15	15	15	16	16	16
9	16	16	16	16	16	16	16	16	16	18	22	C	16	27	27	21	16	12	14	14	15	15	15	16
10	16	16	16	15	16	15	16	16	16	16	18	18	20	20	18	18	16	16	15	15	15	14	15	16
11	16	16	16	16	16	14	14	15	15	15	16	22	22	20	20	18	13	12	12	12	14	14	15	15
12	16	16	16	16	15	15	14	14	15	16	20	20	31	28	21	21	18	14	14	16	16	16	16	16
13	16	16	16	16	16	15	15	15	16	24	20	21	21	22	20	15	15	13	15	15	15	15	15	17
14	16	16	16	16	16	14	15	14	14	17	18	20	20	22	23	17	17	15	15	15	15	15	16	16
15	16	16	16	15	15	15	14	16	16	18	20	22	22	20	18	18	14	15	15	15	15	15	15	15
16	16	16	16	15	15	14	15	15	16	17	22	20	20	28	18	17	17	16	14	16	15	15	16	16
17	16	16	16	16	15	16	16	16	15	15	16	19	19	21	22	22	15	13	16	14	15	15	16	16
18	15	15	15	15	15	15	15	15	16	16	16	18	20	22	22	16	16	14	14	16	16	16	16	16
19	16	16	16	16	16	16	14	14	19	16	16	17	19	20	20	18	17	16	14	16	16	16	16	16
20	16	15	15	15	15	16	15	15	15	15	17	17	21	21	22	19	16	15	15	14	14	14	16	16
21	16	16	15	16	16	14	16	14	16	16	16	17	19	20	21	21	20	15	14	14	15	15	14	15
22	15	16	16	16	16	16	16	15	16	18	20	20	20	24	24	18	18	16	15	15	14	14	16	16
23	16	16	16	16	16	14	14	15	18	19	20	20	20	20	19	19	16	14	14	14	14	15	15	16
24	15	15	13	15	15	13	14	14	16	16	18	18	21	25	26	24	17	15	14	14	14	14	15	15
25	16	15	15	15	15	16	16	16	16	18	18	20	20	20	20	20	17	17	15	15	15	15	C	16
26	16	15	15	14	C	16	14	14	14	16	16	24	28	30	30	16	16	16	14	16	16	16	16	16
27	16	16	16	16	15	14	15	15	15	15	19	20	20	28	23	20	19	18	16	16	16	16	16	16
28	16	16	16	16	15	16	16	16	17	17	20	24	24	23	24	17	18	17	16	16	16	16	16	16
29	16	16	16	16	16	16	14	17	18	18	22	26	24	24	23	23	18	16	16	15	16	16	15	17
30	16	16	16	16	16	14	15	17	17	18	22	24	23	24	24	24	20	16	16	16	15	15	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	30
MED	16	16	16	16	16	15	15	15	16	17	18	20	20	22	22	20	17	16	15	15	15	15	16	16
U Q	16	16	16	16	16	16	16	16	16	18	20	22	22	25	24	22	18	16	16	16	16	16	16	16
L Q	16	16	16	15	15	14	14	14	15	16	16	18	20	20	20	18	16	15	14	15	15	15	15	15

JUN.2021 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2021 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

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	316	316	322	291	332	334	356	330	336	337	332	286	A	301	A	322	A	308	310	298	317	316		
2	339	325	321	305	323	336	A	A	A	346	319	327	323	A	293	312	322	317	306	320	311	333	F	F		
3	F	319	F	F	F	379	359	335	361	A	A	A	A	339	335	302	278	317	311	312	320	287	333	F	F	
4	F	322	310	F	361	385	385	A	326	330	A	A	A	A	318	321	336	A	A	A	310	F	F	F		
5	F	F	303	306	337	339	312	334	351	284	343	A	A	A	340	315	328	281	320	A	A	313	307	F	F	F
6	325	F	F	320	F	358	380	340	373	381	A	A	R	A	251	297	315	332	334	318	293	302	F	F	326	
7	329	339	340	F	F	356	314	297	329	360	A	A	A	A	A	294	A	A	A	330	338	318	323	286	295	
8	F	F	315	319	348	333	310	364	365	A	A	253	289	297	A	315	305	319	320	329	339	328	F	F	A	
9	F	F	297	310	A	350	314	351	362	A	A	A	A	A	316	315	319	323	306	316	336	F	F	F		
10	F	F	F	F	F	330	308	351	372	361	317	R	279	294	291	312	323	294	297	301	315	354	334	321		
11	321	309	309	F	F	344	317	357	372	A	A	321	310	308	309	276	286	295	287	307	335	283	F	F		
12	F	F	F	F	F	F	332	A	284	A	297	250	R	A	A	295	295	293	A	315	325	300	298	F	F	
13	F	F	F	F	F	364	297	329	360	360	356	A	A	A	A	A	A	A	A	A	319	293	315	F	A	
14	A	A	F	311	344	337	373	A	A	A	A	A	A	A	A	307	315	315	305	A	309	350	298	302		
15	311	301	311	306	F	314	332	307	337	331	350	350	A	A	277	296	302	304	321	331	358	F	F	F		
16	F	F	314	303	F	352	340	A	A	A	A	326	A	A	299	314	321	308	299	304	299	A	F	F		
17	F	F	A	F	F	F	326	387	350	F	A	A	A	A	290	277	278	305	309	A	322	300	316	321	F	
18	F	F	F	F	344	339	363	261	A	A	A	298	A	A	A	A	A	A	331	305	300	320	299	323	F	
19	F	296	F	318	F	282	312	A	347	343	A	A	A	A	321	321	315	317	308	317	327	312	308	316		
20	306	298	306	314	331	368	360	363	315	339	329	A	A	A	328	326	310	342	319	315	336	F	F	F		
21	F	A	F	F	F	310	327	A	372	A	A	300	317	324	291	302	336	337	319	304	306	329	333	313		
22	304	314	329	310	350	331	359	367	328	353	303	295	345	324	A	A	283	285	289	302	339	307	286	F		
23	F	F	324	321	310	339	268	345	331	A	A	A	A	A	291	A	A	A	339	351	307	307	297	294	288	
24	304	308	316	F	F	311	322	A	337	A	A	A	A	A	A	A	A	A	A	327	311	329	A	C	F	
25	F	F	322	F	320	324	313	334	356	341	317	315	323	278	A	329	A	F	A	A	295	A	C	F		
26	F	F	F	F	C	329	333	A	366	A	A	A	A	A	293	292	294	330	A	A	A	A	A	A	A	
27	F	F	F	308	F	339	A	306	A	A	298	A	A	A	284	312	323	315	302	324	313	318	340	F		
28	F	303	302	317	F	310	356	A	A	A	A	A	A	A	A	318	318	333	314	326	318	312	F	F		
29	F	308	F	F	309	A	A	291	342	350	283	299	294	322	A	327	320	299	316	324	344	F	F	F		
30	F	F	F	F	F	334	294	296	331	A	289	A	A	A	A	312	A	312	306	313	F	F	285	F		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	8	12	16	16	12	27	27	20	24	14	13	12	12	13	18	25	22	23	23	26	28	18	12	9		
MED	316	308	314	310	334	337	327	334	350	344	317	308	323	308	296	312	318	317	312	316	312	316	312	316		
U Q	327	320	322	318	346	352	359	354	364	360	340	326	336	323	316	316	322	331	319	324	332	329	328	324		
L Q	305	302	308	306	321	324	312	306	331	331	298	296	302	288	291	294	305	308	305	307	304	299	290	298		

JUN. 2021 M(3000)F2 (0.01)

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IONOSPHERIC DATA STATION Kokubunji

JUN. 2021 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						342	U L 376	A	A	A	A				A	A	A	A	A	A				
2							A	A	A	A	399	U L 439	U L 436		A	A	U L 398	A	A	L				
3						A		A	A	A	A	A			395	406	383	U L 380	340					
4								A	A	A	A	A	A	A	A	A	A	A	A	A				
5						A	A	A	A	U L 410	395	A	A		436	457	426	373		A	A			
6								A	407	A	A	U L 437	U L 389	U L 383		A	A		389	A				
7						L 390		A	A	A	A	A	A	A	A	A	A	A	A	A				
8							383	393	411		A	A	A	A	A	A	A	A	A	A				
9							U L 382	A	A	A	A	C	A	A	A	A	A	A		399	A			
10							385	A		A	A		U L 388	A			A	A	A	A				
11							359	A	A	A	A		U L 393	419	431		A	380	363		A			
12							356	U L 393	U L 411	U L 413			A	A	A	A	A	A	A	A				
13							U L 331	A	A	A	A	A	A	A	A	A	A	A	A	A				
14						A	L	A	A	A	A	A	A	A	A	U L 403	397	389		L				
15						A		A	A	A	A	A	A	A	A	A					L			
16							374	A	A	A	A	A	A	A	A	A		447	389					
17							A	A		U L 425	433	A	A	A	A	A	A	A	U L 373	A				
18								411	A	A	A	A	A	A	A	A	A	A		379	A			
19						380	383	A	L	A	A	A	A	A	A	A	A			A	A			
20							L	A	A	A	A	A	A	A	A	A	A	A	A					
21							361	A	A	A	A	U L 365	375	389	397	394	403	397			L			
22								A				A	U L 427	A	A	A	A	A	A	A				
23							382	379	A	A	A	A	A	A	A	A	A	A			A			
24						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
25							365	A	A	A	A	348	A	A	A	A	A	A	A	A				
26								A	A	A	A	A	A	A	U L 371	380								A
27							A	A	A	A	A	A	A		A		387	382	368	U L 333				
28						A	A	A	A	A	A	A	A	A	A	U L 389	379			L				
29						A	A	380	A	A	416	A	A	A	A	A	A			368	L			
30							393	371	A	A	A	397	A	A	A	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	14	4	6	3	6	6	6	5	5	9	10	12	4					
MED						380	375	386	409	U L 410	398	402	U L 410	427	395	398	382	384	343					
U Q						393	383	402	412	U L 433	411	U L 413	U L 436	434	427	404	397	390	355					
L Q						342	361	380	393	391	395	365	388	389	388	384	373	376	336					

JUN. 2021 M(3000)F1 (0.01)

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JUN. 2021 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						372	290	E A 290	A 246	E A 330	294	304	290	E A 400	A	348	A	E A 286	A					
2							A	A	E A 266	A 314	290	334		A	386	328	280	E A 290	290					
3					216			252	242		A	A		E A 296	324	356	388	286	316	294				
4								A	E A 294	A 320	A	A		A	E A 328	E A 316	E A 282		A	A				
5					E A 254	320	274	240	376	284		A	284	360	310	366	352		A	A				
6								284	236	242		A	A	430	540	364	312	256	278	E A 272				
7					248	318	E A 372	E A 314	E A 270		A	A		A	A	E A 398		A	E A 264					
8						322	236	240		A	E A 518	E A 368	318		A		E A 288	E A 356	E A 336	E A 286				
9						332	E A 256	254		A	A	C		A		312	330	E A 308	E A 286	E A 306				
10						350	256	246	282	E A 350			426	368	348	318	E A 306	E A 358	E A 288					
11						320	246	250		A		324	334	334	342	396	348	E A 328	E A 298					
12						316	A	356		378	440		A	A	A	E A 362	E A 368	E A 386		A	274			
13						382	E A 324	284	238	276			A	A	A		A	A	A					
14					E A 260	238		A	A	A	A						A	304	298	294	320			
15					E A 310	320	E A 368	270	292	254	268			A	A	410	348	296	290	276				
16						E A 274	A	A	A	A	E A 294			A	E A 360	E A 328	288	288	312					
17						248	236	250	350		A	A		E A 376	E A 412	E A 402	298	298		A				
18							460				A	390							A	288	302			
19						372	316	A	258	304														
20						254	238	354	270	E A 330							316	316	338	264	288			
21						294	A	236		A				356	326	310	364	328	282	268	268			
22							E A 274	298	276	348	348		E A 306	R 372		A		E A 356	E A 330	E A 284				
23						410	268	E A 268	A	A	A			A	E A 354				A	270	236			
24					E A 256	E A 306	A	E A 266	A	A	A		E A 316	290		A	A	A	A	E A 302				
25						298	258	E A 258	288	316	320	306	E A 394		A	290			E A 274	A				
26							A		A	A	A													A
27							A	E A 354	A	E A 366	A	A			E A 408	E A 320	298	342	342					
28					E A 364	232	A	A	A	A	A				A	E A 342	334	278	314					
29							A	382	254	254	396	374	E A 382	E A 308		A	290	322	348	292				
30						306	344	E A 344	264		376						E A 328	E A 286	E A 270					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						10	21	20	24	15	13	12	13	13	18	25	22	24	23					
MED						U 269	316	U 262	253	276	322	329	321	U 339	354	322	298	286	287					
U Q						364	327	E A 349	277	320	371	382	375	E A 385	374	367	348	322	302					
L Q						254	282	254	245	266	289	299	301	314	328	314	288	278	274					

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JUN. 2021 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 336	A 300	E 246	B 256	B 246	E 208	B 226	A	A	A	A	A	200	200	A	A	A	A	A	A	232	E 232	A 250	E 260	E 222
2	216	E 234	A 240	B 264	B 254	E 218	A	A	A	A	200	194	194	A	A	192	A	A	202	220	E 230	A 220	E 270	E 218	
3	218	E 244	A 286	B 280	E 240	A	200	A	A	A	A	A	A	186	194	194	208	208	E 230	A	214	214	E 214	E 266	
4	E 264	B 230	B 254	B 244	E 210	E 194	204	A	A	A	A	A	A	A	A	A	A	A	A	E 234	A	234	212	226	E 306
5	E 272	A 266	A 308	E 274	E 274	A	A	A	A	A	202	198	A	A	198	198	198	206	A	E 260	A 252	E 240	E 240	E 226	
6	E 216	B 230	B 266	B 226	E 226	206	206	A	202	A	A	A	202	202	212	A	A	212	A	E 258	E 258	E 226	E 226	E 214	
7	E 228	B 248	A 220	B 234	E 250	E 206	206	A	A	A	A	A	A	A	A	A	A	A	A	206	E 306	E 256	E 286	E 294	
8	E 284	A 282	E 240	A	210	200	214	E 234	210	192	A	A	A	A	A	A	A	A	A	E 248	A	224	E 220	E 308	A
9	E 302	A 302	E 280	E 280	A	218	200	A	A	A	A	C	A	A	A	A	A	200	A	E 234	E 256	E 220	E 286	E 264	
10	E 266	A 254	B 228	E 204	E 228	214	214	A	214	A	A	214	214	A	208	A	A	A	A	E 264	E 258	E 208	E 208	E 230	
11	E 248	B 232	B 232	E 240	E 232	210	210	A	A	A	A	214	198	198	A	208	204	A	208	E 254	E 218	E 262	E 290	E 278	
12	E 234	B 234	B 262	B 226	E 232	232	210	A	210	A	210	202	A	A	A	A	A	A	A	224	E 224	E 300	E 266	E 282	
13	E 308	A 306	E 218	E 252	E 220	220	238	A	A	A	A	A	A	A	A	A	A	A	A	E 278	E 278	E 220	E 220	A	
14	A	A	E 258	E 258	E 270	A	196	A	A	A	A	A	A	A	A	196	202	202	202	A	E 234	E 208	E 208	E 236	
15	E 260	E 292	E 254	E 280	E 252	A	194	A	A	A	A	A	A	A	A	A	202	202	212	206	194	E 302	E 254	E 300	
16	212	E 304	A 304	E 284	E 256	204	A	A	A	A	A	A	A	A	A	200	A	206	212	E 252	E 256	A	E 216	E 284	
17	E 300	A 300	A	E 300	E 230	288	A	192	192	A	A	A	A	A	A	A	A	198	A	214	E 314	E 236	E 224	E 286	
18	E 250	A 266	A 266	E 252	E 216	194	208	208	A	A	A	A	A	A	A	A	A	208	A	E 266	E 232	E 244	E 244	E 244	
19	E 268	B 246	B 240	E 240	E 224	224	E 246	A	216	A	A	A	A	A	A	E 254	A	A	E 238	218	E 218	E 232	E 232	E 232	
20	E 246	B 246	B 236	E 214	E 214	214	212	A	A	A	A	A	A	A	A	A	A	A	202	206	E 266	E 228	E 280	E 242	
21	E 212	A	208	E 252	E 252	220	228	A	A	A	A	228	206	190	190	190	190	196	198	E 222	E 226	E 216	E 216	E 216	
22	E 252	B 252	B 246	B 246	E 226	218	214	A	198	226	218	A	A	210	A	A	A	A	A	E 246	E 210	E 200	E 264	E 304	
23	E 304	A 232	B 226	B 226	E 264	210	194	218	A	A	A	A	A	A	A	A	A	200	A	E 256	E 268	E 242	E 260	E 260	
24	E 238	B 238	B 238	E 238	E 232	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E 258	E 270	E 284	E 308	E 214	
25	E 288	A 232	B 238	E 228	E 228	206	210	A	A	A	A	E 238	A	A	A	A	A	A	A	E 286	A	A	C 278	E 278	
26	E 278	A 270	A 280	E 272	C	214	214	A	A	A	A	A	A	A	A	214	214	A	A	A	A	A	A	A	A
27	E 328	A 264	A 232	E 300	E 266	228	A	A	A	A	A	A	A	A	A	232	196	196	202	E 240	E 222	E 222	E 196	E 256	
28	E 290	A 282	B 282	E 252	E 252	A	A	A	A	A	A	A	A	A	A	A	206	210	206	E 234	E 224	E 254	E 272	E 272	
29	214	E 268	A 228	E 228	E 266	A	A	198	A	A	198	A	A	A	A	A	A	A	198	210	E 234	E 230	E 254	E 258	
30	E 268	B 260	B 258	B 248	E 240	208	208	A	A	A	208	A	A	A	A	A	A	A	A	E 264	E 264	E 252	E 262	E 296	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	28	29	30	28	23	22	4	7	3	6	7	6	5	5	9	10	13	11	26	29	27	28	27	
MED	E 264	E 257	A 246	B 250	E 236	214	208	209	202	202	204	208	201	198	198	198	202	201	206	E 239	E 234	E 228	E 257	E 260	
U Q	E 289	A 282	A 266	E 272	E 253	220	E 214	E 214	E 214	226	210	228	206	206	210	211	206	208	210	E 258	E 265	E 254	E 271	E 284	
L Q	E 231	E 236	B 232	B 228	E 226	206	204	203	192	192	198	200	198	194	188	193	196	198	202	E 224	E 224	E 218	E 222	E 230	

JUN. 2021 h'F (KM)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	A	A	A	A	A	A		A	A	A	A	A	A	B				
2						B	A	A	A	A			104	A	A	A	A	A	A					
3						B	A		112	112	A	A	A	A		112	112	112	112	112				
4						116		A	A	A	A	A	A	A	A	A	A	A	A					
5						B		114	A	A	A	A	A	A	A		108	A	A	A				
6						108	108		A	A	A	A	A	108	116	116	116	116	116					
7						116	116		A	A	A	A	A	A	A	A	A	A	A	B				
8						B		116	110		A	A	A	A	A	A	A	A	A					
9						B		110	A	A	A	A	C	A	A	A	A	A	A	B				
10						114	110		A	A	A	A	A	A	A	A	A	A	A	B				
11						110	110		A	A	A	A	A	A	A	A	A	A	A	110				
12						B		A	A	A	A		A	A	A		A	A	A	A				
13						110		A	A	A	A	A	A	A	A	A	A	A	A					
14						B		A	A	A	A	A	A	A	A		112	112		A	B			
15						112		A	A	A	A	A	A	A	A	A	A	A	112		A			
16						B		A	A	A	A	A	A	A	A		110	110		A	A			
17							110	110	110		A		A	A	A	A	A	A	A	A				
18						110		A	A	A	A	A	A	A	A	A	A	A	A	A				
19						120	114		A	A	A	A	A	A	A	A	A	A	A	A				
20						114	114		A	A	A	A	A	A	A	A	A	A	A	A				
21						B		114	A	A	A	A	A		112	112	112	112	110	110				
22						B		110		110		110	A	A		110	A	A	A	A				
23						126	120		A	A	A	A	A	A	A	A	A	A	A	A				
24						110		A	A	A	A	A	A	A	A	A	A	A	A	A				
25						B		110	A	A	A	A	A	A	A	A	A	A	A	A				
26						110	110		A	A	A	A	A	A	A		110	110	108					A
27						B		108	A	A	A	A	A		A		108		108					
28						A		108	A	A	A	A	A	A	A	A	A	A	A	A				
29						B		A	A	A	A	A	A	A	A	A	A	A		110	110			
30						110	110		A	A	A	A	A	A	A	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						14	18	3	3		4	1	3	3	4	8	6	7	4					
MED						111	110	110	110		110	112	108	112	112	111	112	110	110					
U Q						116	114	112	112		111		110	116	114	112	112	112	111					
L Q						110	110	110	110		110		104	110	111	109	110	108	110					

JUN. 2021 h'E (KM)

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JUN. 2021 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		84	84	84	84	84	108	104	92	92	92	92	96	102	102	102	102	102	94	94	94	94	94	94	94	
2		92	92	92	92	92	110	106	98	98	98	G	108	98	98	98	94	88	88	88	88	88	96	96	92	
3		92	92	92	88	88	84	88	120	120	90	90	96	96	96	114	G	154	116	G	98	98	98	98	98	
4		94	94	94	86	86	G	100	100	100	96	92	86	86	92	96	102	96	96	96	92	102	94	94	94	
5		94	88	88	88	86	80	112	94	94	94	94	84	86	86	100	110	102	102	94	94	94	94	94	94	
6		94	94	88	88	88	130	122	96	96	96	96	96	G	G	136	118	114	114	100	100	100	100	90	90	
7		90	90	90	90	90	G	G	96	96	94	88	88	88	88	88	88	88	98	94	94	94	94	94	92	
8		84	84	84	84	84	124	118	108	100	90	90	92	106	106	98	98	98	98	98	98	98	94	94	94	
9		94	82	82	82	82	82	120	94	94	94	94	C	94	88	88	88	88	88	88	88	88	88	100	92	
10		92	B	B	B	86	126	122	104	102	102	98	98	98	90	90	86	82	82	82	82	82	82	86	90	
11		90	B	90	90	B	G	118	98	98	98	98	98	98	98	96	96	96	96	110	102	102	102	98	98	
12		94	112	90	B	102	100	100	100	100	94	G	94	94	94	122	106	106	104	92	92	92	92	92	92	
13		86	86	86	86	86	126	108	102	100	100	100	94	86	86	78	84	84	82	82	82	82	82	90	90	
14		90	90	90	90	90	90	90	90	90	82	82	90	90	90	G	114	100	100	96	96	96	82	82		
15		86	86	86	90	90	150	96	100	100	102	102	100	92	92	92	88	88	114	104	96	94	94	94	94	
16		86	86	86	86	86	110	98	96	96	92	92	102	92	82	94	108	108	102	102	102	92	92	92	92	
17		92	92	92	92	92	92	108	108	108	98	108	102	94	94	94	94	94	88	82	82	82	82	82	88	
18		88	88	88	88	88	G	94	94	92	92	92	92	90	90	90	90	88	88	82	82	82	82	82	82	
19		90	98	98	94	94	G	112	92	92	92	92	80	88	88	94	94	94	94	94	88	86	86	86	86	
20		86	B	86	B	86	G	114	100	96	96	96	96	88	88	88	88	88	88	86	86	B	B	B	86	
21		106	88	86	86	86	116	116	88	88	88	88	94	94	G	G	G	140	114	114	B	B	96	B	90	
22		90	B	B	90	90	92	G	98	G	98	108	98	98	G	96	84	84	84	84	84	84	84	84	86	92
23		86	86	86	86	86	G	112	100	100	86	86	86	86	86	94	80	84	84	90	90	90	90	90	90	
24		90	B	90	96	96	126	G	94	94	100	90	90	88	88	88	88	88	78	78	86	86	92	92	92	92
25		92	B	100	100	94	96	G	96	96	96	96	96	96	94	94	102	G	G	94	94	94	94	C	94	
26		90	90	90	86	C	122	122	100	100	100	88	88	88	94	102	G	G	112	104	104	104	104	88	92	
27		92	92	88	88	88	98	106	98	96	96	96	84	84	84	84	116	102	G	102	94	94	94	94	94	
28		94	86	86	86	86	106	110	96	96	96	92	92	92	94	100	100	82	90	90	90	90	90	94	94	
29		90	90	84	84	84	106	102	102	94	94	88	92	92	92	84	84	90	G	116	116	98	98	98	96	
30		102	90	90	118	B	124	122	106	102	94	94	94	94	84	86	86	90	90	90	82	82	82	82	88	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		30	24	28	27	27	23	27	30	29	30	28	29	29	27	29	26	29	28	29	29	29	30	28	30	
MED		90	90	88	88	88	108	108	98	96	94	92	94	92	90	94	94	94	94	94	92	92	94	92	92	
U Q		94	92	90	90	90	124	118	100	100	98	96	97	96	94	99	102	102	102	101	97	97	96	94	94	
L Q		88	86	86	86	86	92	100	94	94	92	90	88	88	88	88	88	88	88	87	86	86	86	86	90	

JUN. 2021 h'Es (KM)

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JUN. 2021 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F4	F5	F2	F2	F2	L2	L2	L3	L2	L3	L2	L1	L1	L2	L2	L2	L4	L5	L6	F4	F7	F6	F6	F3
2	F2	F4	F2	F2	F2	C2	L4	L4	L6	L4		C1	L2	L3	L2	L2	L2	L4	L4	F2	F3	F3	F3	F5
3	F6	F5	F3	F3	F3	L3	L3	C2	C2	L3	L4	L3	L3	L2	C1		H1	C1		F4	F5	F5	F5	F5
4	F3	F3	F2	F2	F2		L5	L3	L2	L4	L4	L4	L4	L3	L2	L3	L3	L5	L5	F5	F4	F5	F5	F5
5	F5	F8	F5	F3	F4	L3	C3	L2	L2	L2	L2	L3	LC21	L1	L1	C2	L3	L4	L5	F4	F4	F7	F7	F5
6	F2	F2	F2	F1	F3	C1	C2	L2	L1	L2	L3	L3			H1	C2	C2	C3	L3	F5	F7	F6	F4	F2
7	F4	F6	F2	F3	F5			L3	L3	L2	L4	L3	L3	L4	L4	L3	L3	L3	L4	F4	F5	F5	F8	F9
8	F8	F7	F5	F2	F1	C2	C2	C2	L2	L3	L2	L1	C1	L2	L4	L4	L4	L4	L4	L5	F2	F4	F5	F5
9	F5	F7	F6	F4	F3	F2	C2	L4	L3	L3	L3		L3	L3	L3	L3	L2	L2	L3	F3	F4	F5	F7	F5
10	F2				F1	C2	C3	L2	L1	L2	L2	L3	L2	L3	L1	L2	L3	L3	L3	F3	F4	F5	F2	F2
11	F2		F2	F2			C1	L3	L3	L3	L2	L2	L1	L1	L2	L3	L1	L4	L2	F7	F4	F6	F7	F7
12	F4	F2	F4		F8	L5	L5	L4	L2	L4		L1	L2	L2	L1	L2	L4	L4	L5	F4	F5	F7	F6	F6
13	F5	F5	F6	F3	F5	CL22	L4	L3	L4	L2	L2	L3	L4	L4	L4	L6	L5	L5	L5	F6	F3	F4	F4	F6
14	F5	F5	F6	F7	F5	L4	L3	L5	L4	L4	L5	L6	L2	L3	L3		C1	L2	L2	F4	F3	F3	F5	F6
15	F3	F5	F5	F5	F2	H1	L2	L2	L2	L3	L2	L2	L2	L2	L2	L2	L2	L3	L2	F4	F2	F5	F7	F5
16	F6	F5	F6	F6	F2	F4	L4	L3	L4	L4	L4	L2	L3	L3	L2	C1	C2	L2	L2	F3	F6	F6	F5	F5
17	F5	F9	F6	F8	F3	F3	C2	C2	C1	L2	C2	L3	L2	L2	L2	L1	L2	L2	L3	F4	F6	F5	F3	F2
18	F3	F6	F3	F3	F3		L2	L2	L3	L7	L2	L2	L3	L4	L4	L5	L4	L2	L3	F2	F3	F3	F6	F2
19	F2	F1	F3	F4	F2		C2	F5	F3	L2	L5	L4	L4	L4	L2	L2	L2	L3	L3	F5	F5	F4	F3	F2
20	F2		F1		F2		C2	L2	L2	L2	L3	L3	L4	L4	L2	L2	L2	L4	L5	F4	F7	F6	F5	F5
21	F2	F6	F5	F2	F2	F2	C3	L5	L4	L3	L2	L2	L2				H1	C1	C1			F1		F1
22	F1			F1	F2	L3		L3		L2	L1	L2	L1		L3	L6	L5	L3	L4	F5	F3	F2	F2	F6
23	F6	F6	F2	F2	F6		C2	L2	L3	L4	L3	L4	L4	L3	L5	L3	L3	L3	L3	F4	F3	F2	F2	F2
24	F1		F4	F2	F5	C2	L4	L3	L3	L4	L4	L4	L4	L3	L4	L5	L5	L5	L3	F5	F6	F8	F3	F6
25	F5		F1	F1	F3	L3		L3	L3	L2	L2	L2	L2	L2	L4	L3	L4	L3	L3	F6	F4	F6		F5
26	F5	F3	F4	F2		C2	L3	L4	L4	L3	L4	L6	L4	F2	L1			C3	L3	F6	F8	F9	F7	F5
27	F5	F7	F6	F5	F2	L2	L4	L3	L4	L4	L2	L4	L4	L4	L2	C1	L1		L2	F2	F2	F4	F1	F4
28	F5	F6	F5	F3	F4	L3	C3	L4	L4	L4	L4	L4	L3	L2	L2	L3	L2	L2	L2	L4	F4	F4	F2	F3
29	F3	F5	F4	F6	F2	L6	L5	L2	L2	L3	L3	L2	L2	L3	L5	L2	L2		C1	F3	F7	F5	F4	F2
30	F2	F2	F3	F1		C2	C2	L3	L3	L5	L2	L3	L4	L5	L3	L3	L4	L3	L3	F4	F4	F4	F7	F7
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUN. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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	56	57	57	50	50	44														X 60		59	61	64	
2	57	X 51	X 47	X 44	X 43															X 68	X 74	X 78	X 72	57	
3	57	58	51	45	50	45														X 84	X 75	X 67	X 66	61	
4	63	58	60	58	45															X 56	X 65	X 65	X 54	A	
5	59	55	56	45	41															X 63	X 69	X 67	60	60	
6	A	50	48	45	42															X 60	X 65	60	58	58	
7	56	47	46	48	47															X 68	X 57	A	55	54	
8	A	A	49	44	44	48														X 73	X 75		60	57	
9	A	A	50	X 41	X 36	40														X 79	X 74	X 48	X 51	X 53	
10	59	59	44	A	A															X 75	X 77	X 71	59	55	
11	54	60	58	50	45	45														X 103	X 90	X 78	X 73	71	
12	64	61	59	59	50															X 62	X 56	X 57	59	59	
13	58	57	57	44	44	42														A	X 70	X 66	X 60	X 54	
14	55	58	48	40	40	42														A	X 78	X 74	X 54	X 51	
15	48	52	52	50	X 41	47														X 84	X 64	X 56	57	58	
16	58	53	46	50	50	44	X 54													X 63	X 70	X 58	60	55	
17	A	A	A	49	49		X 52													X 68	X 82	X 79	X 69	68	
18	64	69	70	X 64	X 48	45	X 40													X 77	X 81	X 79	X 66	X 64	
19	X 64	66	64	60	54	54														X 76	X 80	X 76	X 66	X 66	
20	X 66	69	68	X 57	X 54															A	A	A	X 53	A	
21	A	49	51	43	43	40															X 77	X 73	X 60	X 54	
22	X 51	X 51	X 50	X 47	X 46	X 46														X 90	X 83	X 72	X 66	X 66	
23	58	68	69	60	54	50														A	X 66	X 71	70	67	
24	63	61	62	X 53	X 50																A	X 67	A	A	60
25	50	50	47	46	48	46														X 66	X 72	X 70	59	59	
26	64	A	58	56	57	57														X 78	A	X 59	A	A	
27	A	A		57	60	45														X 58	X 66	X 73	62	X 58	
28	60	53	X 45	X 45	X 45															X 66	X 69	X 69	X 66	X 66	
29	63	60	58	47	46	42														X 74	X 73	X 70	X 54	X 50	
30	50	X 53	54	50	48	46														X 79	X 77	X 76	65	60	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	24	25	28	29	29	19	3													24	27	27	28	27	
MED	58	57	53	49	47	45	X 52													X 70	X 73	X 70	60	59	
U Q	63	60	58	56	50	47	X 54													X 78	X 77	X 74	X 66	X 64	
L Q	56	52	48	45	44	42	X 40													X 63	X 66	X 59	58	55	

JUN. 2021 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUN. 2021 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	F	F	F	F	F	54	58	54	52	60	A	A	A	55	62	A	66	60	54	58	F	F	F	
2	F	45	41	38	37	38	44	52	A	A	66	61	A	56	56	62	59	A	56	61	68	72	65	F	
3	F	F	F	F	F	F	51	53	A	A	A	62	A	45	56	A	A	68	75	78	69	61	F	F	
4	F	F	F	F	F	32	42	50	A	70	63	57	A	56	A	A	59	57	51	50	59	59	48	A	
5	F	F	F	F	F	A	46	A	A	A	A	A	56	50	50	50	50	50	52	57	R	63	61	F	
6	A	F	F	F	F	A	A	56	68	54	54	51	A	55	58	65	61	56	52	54	59	F	F	F	
7	F	F	F	F	F	31	40	A	A	A	A	A	A	A	53	58	61	56	A	62	51	F	F	F	
8	A	A	F	F	F	F	50	59	58	A	A	A	62	74	80	76	76	76	74	67	69	A	F	F	
9	A	A	F	A	F	F	48	56	56	A	A	A	52	A	A	61	A	A	81	73	68	42	F	47	
10	F	F	F	A	A	A	46	A	52	A	A	A	A	A	68	73	77	80	68	69	70	65	53	49	
11	F	F	F	F	F	F	49	62	58	60	66	A	A	A	A	64	73	83	91	97	84	F	F	F	
12	F	F	F	F	F	A	A	A	A	A	47	50	A	53	55	60	63	69	69	56	50	51	F	F	
13	F	F	F	F	F	F	44	60	74	A	A	A	A	55	64	76	81	72	A	A	64	60	F	48	
14	F	F	F	F	F	F	43	51	62	60	A	A	A	A	61	71	76	72	A	A	72	68	48	45	
15	F	F	F	F	F	35	45	52	56	58	62	A	A	A	A	44	52	54	64	76	76	76	78	58	50
16	F	F	F	F	F	F	48	59	59	49	64	A	A	A	A	70	75	63	36	57	64	52	F	F	
17	A	A	A	F	F	39	46	68	A	A	A	A	60	63	63	70	A	73	65	62	F	73	63	F	
18	F	F	F	F	F	F	34	48	56	61	A	A	A	54	A	A	58	60	64	71	75	74	60	58	
19	58	F	F	F	F	F	52	56	54	54	54	A	A	A	A	60	56	64	68	70	74	70	60	60	
20	60	F	F	51	48	39	46	50	58	62	A	A	A	A	A	A	A	A	A	A	A	A	47	A	
21	A	F	F	F	F	F	42	A	58	A	54	A	A	58	60	68	66	60	55	58	71	66	54	48	
22	45	45	44	41	40	40	45	46	54	69	70	54	54	50	57	67	71	74	86	84	77	66	R	60	
23	F	F	F	F	F	F	40	50	61	51	54	52	60	58	60	69	80	85	56	A	60	65	F	F	
24	F	F	56	47	44	37	45	58	70	57	A	66	68	A	A	A	59	57	58	A	61	A	A	F	
25	F	F	F	F	F	F	A	A	63	68	60	63	64	A	A	67	66	64	59	60	66	64	F	F	
26	F	A	F	F	F	F	48	56	63	58	A	A	A	54	50	58	62	59	63	71	A	53	A	A	
27	A	A	A	F	F	F	48	A	A	60	63	A	A	56	53	55	53	A	A	51	60	67	F	52	
28	F	F	39	39	39	43	51	A	A	A	A	A	55	A	A	54	61	61	59	57	60	63	63	60	60
29	F	F	F	F	F	F	A	A	A	A	A	A	A	A	68	69	74	68	68	68	66	64	48	44	
30	F	47	F	F	F	F	41	54	58	A	A	A	A	58	63	A	77	77	81	73	71	70	F	F	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	3	3	4	7	7	8	26	21	20	16	14	10	9	17	21	24	25	26	25	25	27	23	12	11	
MED	58	45	42	41	39	38	46	56	58	59	61	56	60	55	57	64	66	67	64	62	66	64	57	49	
U Q	60	47	50	51	44	40	48	58	62	62	64	62	63	58	63	70	76	74	74	72	71	68	60	60	
L Q	45	45	40	38	35	34	43	50	56	54	54	52	53	52	54	60	59	59	56	57	60	59	48	47	

JUN. 2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	L			A	A	A	A	A		A	A						
2							L		424	432		A	A			424		A	A	A				
3								388	A	A	448	A	A	448	444	436		A	A	A				
4								A	A	A	A	A	A	A	A		A	A			356			
5						A		A	A	A	A	A					428	404						
6						A	A			L	A		472	448	448	432	408	400	364					
7							A	412	412		A		A	A	448		A	A	A					
8								A	A	A	A	A			436	428	408	404			A			
9								A	A	A	A	A		444	A	A	424	388			A			
10						A		A	A	A	A	A		A	A		420		A	A				
11							L	A	A	A	A	A	A	A	A		A							
12						A	A	A	A	A			A	A	A		A							
13							L			A	A	A	A	A	A		A	A	A					
14							A	A			A	A	A	A		448	428	432			A	A		
15								A	A	424	452		A	440	440	444		A	404	376				
16							L		424	404		A	A	A	A		424		A	A	A			
17									A	A	A		448		A	A	A	A	A					
18						A		376	416	416		A	A	A	A		A							
19								A	A	U L	A	A	A	A	A		A	A	A					
20							L	L	A	A	A	A	A	A	A		A	A	A					
21						A		360	A	A	A	A	A	A		A					L	L		
22									U L	A	A		476	472	468	456	436	436	404					
23								376	416	440		A		460		A	A	A	A					
24							L	L			A		A	A	A		A		A	A				
25							A	A		A	A	A		A	A		A		A	A				
26								L	A		A	A		A			464	448	444	432	480	364		
27			A			A	A	A	A	A	A	A		464		A		A	A					
28								A	A	A	A		468		A		A				L			
29							A	A	A	A	A	A		A		A								
30							L		A	A	A	A		A		A		A						
31								412						484										
	00	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	9	9	3	5	7	7	10	12	16	14	7					
MED							360	388	416	432	448	452	460	464	446	434	422	404	364					
U Q								412	430	440	452	472	472	468	448	442	428	420	372					
L Q								376	414	420	432	452	440	448	444	428	418	400	356					

JUN. 2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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 296	A	A	A	A	A	A 364	A	A	A	A			A				
2							B 228	A	A	A	A	A	A	A	352	A	A	A	A						
3							B	A	A	A	A	A	A	A	A	A	A	A	A	B					
4							B	A	A	A	A	A	A	A	A	A	A	A	A	B					
5							B	A	A	A	A	A	A	A	A	A	A	A 276	A	B					
6							B	A 300	A	A	A	A	A	A 368	A	A 336	A 304	A 280	A	A					
7							B	A	A	A	A	A	A	A	A	A	A	A	A						
8							B	A 252	A	A	A	A	A	A	A	A	A	A 288	A	A					
9							B	A	A	A	A	A	A	A	A	A	A	A	A						
10							B 220	A	A	A	A	A	A	A	A	A	A	A	A						
11							232	A	A	A	A	A	A	A	A	A	A	A	A						
12							B	A	A	A	A	A	A	A	A	A	A	A	276	A					
13							U 224	A	A	A	A	A	A	A	A	A	A	A	A	A					
14							B	A	A	A	A	A	A	A	A	A	A 316	A	A	A					
15							U 236	A	A	A	A	A	A	A 364	U 356	A	A 324	A 296	A	A					
16							B	A 308	A 324	A	A	A	A	A	A	A 316	A	A	A	A					
17							B	A	A	A	A	A	A	A	A	A	A	A	A	A					
18							B	A	A	A	A	A	A	A	A	A	A	A	A	A					
19							B 248	U 368	A	A	A	A	A	A	A	A	A	A	A	A					
20							B 240	A	A	A	A	A	A	A	A	A	A	A	A	A					
21							B	A	A	A	A	A	A	A	A	A	A	A 284	U 244	U 200					
22							A 276	A	A	A	A	A	A	A	A	A	A	A 288	A	A					
23							B	A 288	A	A	A	A	A	A 376	A	A	A	A	A	B					
24							B 224	A	A	A	A	A	A	A	A	A	A	A	A	A					
25							B	A	A	A	A	A	A	A	A	A	A	A	A	A					
26							A	A	A	A	A	A	A	A	A	A	A 320	A 284	A	A					
27			A				B	A	A	A	A	A	A	A	A	A 372	A	A	A	A					
28							B	A	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	A 248	U R					
30							B 204	A	A	A	A	A	A	A	A	A	A	A	A	A					
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							10	5	2	1				3	3	3	4	8	2	1					
MED							U 226	R 288	A 302	A 324	A			U 368	A 356	U 336	A 318	A 284	A 246	U 200	R				
U Q							U 236	R 334						U 376	A 364	A 372	A 322	A 288							
L Q							U 220	R 264	A					U 364	R 352	U 316	A 310	A 278							

JUN. 2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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	J	A
2	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
3	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
4	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
5	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
6	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
7	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
8	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
9	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
10	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
11	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
12	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
13	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
14	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
15	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
16	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
17	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
18	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
19	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
20	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
21	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
22	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
23	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
24	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
25	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
26	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
27	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
28	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
29	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
30	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
LQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A

JUN. 2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN.2021 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	18	24	26	26	24	E B 16	21	29	33	36	54	A A 120	A A 64	A A 86	44	38	A A 81	A A 50	27	31	30	29	25	E B 16	
2	25	25	24	23	24	19	G	32	A A 73	A A 89	38	44	A A 60	37	G	37	43	A A 65	46	23	24	22	26	26	
3	27	27	E B 16	E B 17	E B 16	E B 16	23	49	A A 64	A A 84	A A 79	45	A A 62	41	43	A A 97	A A 75	47	28	28	24	38	28	28	
4	E B 16	23	18	E B 16	22	25	25	42	A A 112	A A 53	47	45	A A 86	46	A A 100	A A 149	32	28	27	22	E B 16	E B 27	A A 27	A A 54	
5	26	26	19	23	24	A A 43	24	A A 102	A A 129	A A 148	A A 166	A A 127	43	38	38	35	33	30	27	18	E B 16	E B 16	27	26	
6	A A 64	29	E B 16	24	19	A A 64	A A 63	30	32	35	44	41	A A 53	44	41	55	46	43	35	24	47	24	27	26	
7	24	24	25	25	25	24	24	A A 50	A A 86	A A 112	A A 156	A A 105	A A 99	A A 74	41	40	32	36	A A 120	24	28	24	23	23	
8	A A 65	A A 66	A A 24	28	24	E B 16	27	49	36	A A 86	A A 80	A A 96	50	46	40	51	37	G	36	31	A A 26	A A 126	24	24	
9	A A 66	A A 54	25	23	27	18	28	39	50	A A 86	A A 95	A A 128	37	A A 118	A A 124	48	A A 103	A A 174	61	28	22	30	32	37	
10	28	26	E B 16	E B 51	A A 57	A A 39	G	A A 46	A A 42	A A 68	A A 84	A A 123	A A 147	A A 114	39	46	36	39	38	34	34	23	19	28	
11	27	E B 16	E B 15	E B 15	E B 21	E B 16	G	38	50	48	52	A A 127	A A 102	90	82	46	34	28	45	26	67	28	40	40	
12	24	24	20	E B 16	E B 16	E B 78	A A 66	A A 85	A A 88	A A 93	36	40	58	43	43	43	34	28	E B 26	16	24	24	19	24	
13	24	24	E B 16	E B 16	E B 26	E B 16	G	30	29	A A 64	A A 71	A A 71	86	51	49	61	42	46	A A 125	A A 86	25	20	29	16	
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	27	43	35	35	A A 62	A A 109	A A 98	79	39	35	38	39	A A 78	A A 157	32	30	28	20	
15	20	22	E B 16	E B 16	E B 16	19	G	40	48	37	36	A A 98	36	G	G	42	36	32	32	26	E B 16	E B 15	27	25	
16	25	E B 15	24	E B 16	E B 16	E B 16	20	26	34	37	56	A A 73	A A 109	A A 110	70	38	49	40	29	40	25	28	24	24	
17	A A 107	A A 67	A A 84	A A 26	24	23	33	27	A A 89	A A 142	A A 166	A A 162	39	47	45	45	A A 172	64	29	34	47	56	36	26	
18	E B 16	E B 16	E B 16	E B 15	23	24	24	34	31	34	A A 78	A A 147	A A 106	46	A A 122	A A 96	33	33	39	34	23	23	20	19	
19	23	E B 16	27	24	18	22	G	G	39	36	43	A A 106	A A 167	A A 153	A A 148	49	48	57	24	28	28	23	E B 15	E B 16	
20	E B 16	E B 16	E B 16	E B 16	E B 18	E B 16	G	28	46	50	80	A A 66	A A 64	A A 91	A A 86	A A 90	A A 77	A A 74	A A 110	A A 110	89	54	27	A A 52	
21	A A 53	27	27	26	22	23	24	A A 81	45	66	49	A A 68	A A 73	52	45	36	34	G	26	G	E B 16	E B 16	E B 16	E B 16	
22	E B 16	E B 16	E B 17	E B 16	E B 16	19	24	30	35	60	63	40	40	38	38	36	34	31	34	27	E B 17	24	24	24	
23	23	23	20	E B 16	E B 15	E B 16	G	24	34	36	48	42	42	45	55	46	41	72	37	A A 90	26	40	38	25	
24	24	24	24	E B 16	18	20	G	29	34	34	64	40	58	A A 94	A A 80	A A 76	38	50	54	65	30	85	89	27	
25	E B 16	E B 16	18	E B 16	E B 16	E B 16	A A 67	A A 137	35	45	48	53	40	A A 102	A A 146	54	47	40	42	38	28	28	27	27	
26	31	A A 83	26	26	24	E B 16	24	29	41	39	A A 99	A A 137	A A 111	39	39	39	35	33	28	27	A A 49	A A 43	A A 81	A A 54	
27	A A 55	A A 63	A A 84	29	26	25	40	A A 73	A A 105	51	53	A A 150	A A 165	42	46	39	40	A A 73	A A 70	35	E B 16	E B 16	22	23	
28	28	E B 16	E B 16	E B 16	E B 16	E B 16	23	A A 56	A A 110	A A 92	A A 119	38	A A 66	A A 121	45	38	39	31	27	24	E B 16	23	23	E B 16	
29	18	22	23	23	27	E B 16	A A 47	A A 86	A A 124	A A 250	A A 155	A A 74	A A 110	A A 146	46	39	35	36	G	31	23	23	26	E B 16	
30	E B 16	E B 17	E B 17	E B 17	E B 16	E B 16	G	31	49	79	A A 105	A A 126	A A 96	40	A A 46	A A 105	46	32	33	28	20	22	24	28	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	24	24	20	17	22	18	24	38	46	56	64	85	65	49	45	46	38	39	34	28	25	24	26	25	
U Q	A A 28	A A 27	A A 25	A A 25	A A 24	A A 24	27	A A 50	A A 86	A A 86	A A 95	A A 126	A A 102	A A 94	A A 80	A A 55	A A 47	A A 50	A A 46	A A 35	30	30	28	28	
L Q	E B 18	E B 16	E B 16	E B 16	E B 16	E B 16	G	29	35	37	48	45	50	42	40	38	34	31	27	24	E B 20	E B 23	E B 23	E B 20	

JUN.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN.2021 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	14	13	15	18	22	22	22	24	24	20	16	16	14	16	16	16	16
2	16	16	16	16	16	16	16	16	16	18	20	23	23	23	24	23	18	14	14	16	16	16	16	16
3	16	16	16	16	16	16	15	14	14	16	16	22	22	24	18	22	20	17	17	15	15	15	15	15
4	16	16	16	16	16	16	16	13	13	14	18	23	25	25	25	24	17	16	15	14	16	16	16	16
5	16	16	16	16	16	16	16	14	14	22	22	25	26	25	25	25	22	17	16	13	16	16	16	16
6	16	16	16	16	15	16	14	16	17	18	24	23	27	27	27	27	24	15	14	16	16	16	16	16
7	16	16	16	16	16	15	15	15	15	15	17	20	22	22	25	24	18	18	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	16	16	17	19	21	25	26	24	24	12	15	15	15	15	15	16
9	16	16	16	16	16	15	16	15	15	22	22	22	22	24	23	23	23	18	16	15	15	16	16	16
10	16	16	16	16	16	16	15	13	14	20	20	25	24	25	17	17	13	14	12	16	15	15	15	15
11	15	16	15	15	16	16	14	14	15	15	22	22	23	22	22	22	16	17	14	15	15	17	16	16
12	16	16	16	16	16	16	16	14	15	16	24	23	23	23	23	18	20	14	12	16	15	15	16	16
13	15	16	16	16	16	16	16	15	15	15	24	23	22	22	22	21	14	15	15	15	15	15	16	16
14	16	16	16	16	16	16	16	14	14	20	23	23	26	22	22	20	20	17	15	16	16	16	16	16
15	16	16	16	16	16	16	16	17	17	17	20	23	26	25	24	23	20	17	12	12	15	15	16	16
16	15	15	16	16	16	16	16	16	16	16	24	24	22	26	26	25	24	16	13	15	15	15	17	16
17	16	16	16	16	16	16	15	15	15	16	16	22	23	26	24	26	24	23	15	15	15	16	16	16
18	16	16	15	15	16	16	16	13	13	16	23	23	26	26	26	25	23	16	15	12	16	16	16	16
19	16	16	16	16	16	16	15	14	14	16	24	24	24	23	23	23	22	16	14	15	15	15	15	16
20	16	16	16	16	16	16	15	15	15	15	23	22	25	24	23	23	23	16	16	15	16	16	15	15
21	16	16	16	16	15	16	15	15	16	14	25	25	24	23	23	22	22	14	11	16	16	16	16	16
22	16	16	17	16	16	14	14	18	18	18	25	25	26	26	25	24	23	22	12	16	17	17	17	17
23	16	16	16	16	15	16	15	15	15	14	15	20	20	22	22	23	22	20	18	15	16	16	16	15
24	16	16	16	16	16	16	16	16	14	14	26	26	28	25	25	25	18	18	14	15	15	15	15	15
25	16	16	15	16	16	16	15	12	14	14	16	24	24	24	24	24	23	22	14	16	15	16	16	16
26	16	16	16	16	16	16	15	15	16	17	19	23	26	26	24	24	23	17	17	16	16	16	15	15
27	16	16	16	16	16	16	16	15	15	15	24	24	26	26	25	25	24	18	15	14	16	16	16	16
28	16	16	16	16	16	16	13	15	16	16	24	24	24	24	24	24	24	16	16	16	16	16	16	16
29	16	16	16	16	16	16	16	16	16	18	21	21	24	26	28	23	23	22	16	16	16	15	15	16
30	16	17	17	17	16	16	15	14	15	16	20	23	27	24	24	24	24	22	15	14	15	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	15	15	16	22	23	24	24	24	24	22	17	15	15	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	18	24	24	26	26	25	24	23	18	16	16	16	16	16	16
L Q	16	16	16	16	16	16	15	14	14	15	18	22	22	23	23	23	20	16	14	15	15	15	15	16

JUN.2021 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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	F	F	F	357	360	327	296	353	A	A	A	308	305	A	328	340	309	299	F	F	F	
2	F	303	327	333	313	345	339	327	A	A	326	353	A	314	312	323	311	A	313	307	299	328	360	F	
3	F	F	F	F	F	F	374	363	A	A	A	A	A	315	319	A	A	302	306	329	341	284	F	F	
4	F	F	F	F	F	363	359	310	A	350	318	325	A	304	A	A	321	338	332	309	324	341	354	A	
5	F	F	F	F	F	A	361	A	A	A	A	A	340	274	271	305	300	302	304	316	339	341	F	F	
6	A	F	F	F	F	A	A	341	374	355	345	308	A	295	306	331	336	323	326	326	330	F	F	F	
7	F	F	F	F	F	341	322	A	A	A	A	A	A	A	292	289	303	343	A	360	316	F	F	F	
8	A	A	F	F	F	F	352	359	344	A	A	A	272	279	300	302	302	324	341	318	324	A	F	F	
9	A	A	F	F	F	F	374	360	366	A	A	A	280	A	A	286	A	A	311	347	372	297	F	293	
10	F	F	F	A	A	A	348	A	386	A	A	A	A	A	275	290	287	321	304	317	320	321	315	294	
11	F	F	F	F	F	F	325	344	343	315	337	A	A	A	A	A	275	273	294	313	348	347	F	F	
12	F	F	F	F	F	A	A	A	A	A	A	257	302	A	266	289	292	318	321	342	367	301	294	F	
13	F	F	F	F	F	F	320	346	374	A	A	A	A	287	286	295	309	327	A	A	325	359	F	309	
14	F	F	F	F	F	F	331	335	381	361	A	A	A	A	304	306	306	291	A	A	336	367	296	315	
15	F	F	F	F	F	F	317	317	362	347	335	360	A	365	276	271	290	307	309	317	353	311	316	F	
16	F	F	F	F	F	F	352	358	346	295	318	A	A	A	A	302	321	331	371	300	313	337	F	F	
17	A	A	A	F	F	318	359	384	A	A	A	A	304	301	297	293	A	313	311	301	F	310	312	F	
18	F	F	F	F	F	F	397	327	342	337	A	A	A	278	A	A	294	305	292	297	318	325	317	291	
19	308	F	F	F	F	F	363	347	347	348	322	A	A	A	A	306	295	303	314	306	323	341	307	295	
20	321	F	F	F	F	F	348	340	368	335	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
21	A	F	F	F	F	F	310	A	344	A	314	A	A	304	311	322	334	325	317	290	330	339	330	307	
22	316	296	332	318	326	326	393	352	332	310	343	347	292	274	280	282	295	284	311	332	330	315	306	286	
23	F	F	F	F	F	F	344	341	367	416	296	308	313	299	304	312	307	346	320	A	313	292	F	F	
24	F	F	338	341	338	345	336	347	352	364	A	312	324	A	A	A	320	334	332	A	317	A	A	F	
25	F	F	F	F	F	F	A	A	329	351	320	303	310	A	A	311	319	325	328	327	295	325	F	F	
26	F	A	F	F	F	F	331	338	352	349	A	A	A	305	251	303	302	287	325	324	A	336	A	A	
27	A	A	A	F	F	F	363	A	A	A	A	A	A	299	279	299	305	A	A	308	308	323	F	317	
28	F	F	286	295	295	308	381	A	A	A	A	A	338	A	A	280	311	322	324	324	308	297	289	304	307
29	F	F	F	F	F	F	A	A	A	A	A	A	A	A	296	306	297	293	293	311	321	335	362	282	
30	F	271	F	F	F	F	335	327	325	A	A	A	A	308	304	A	315	306	319	310	312	316	F	F	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	3	3	4	7	7	8	26	21	20	16	14	10	9	17	21	24	25	26	25	25	27	23	12	11	
MED	316	296	330	333	326	341	350	346	347	342	324	318	310	299	296	302	307	321	317	316	320	325	314	295	
U Q	321	303	335	344	345	345	363	360	368	353	345	344	332	304	305	308	320	327	330	330	330	339	342	309	
L Q	308	271	306	318	313	322	331	336	342	316	318	308	286	277	280	291	298	302	311	308	311	310	305	291	

JUN. 2021 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	L			A	A	A	A	A		A	A						
2								L	A	A		A	A				A	A	A					
3								409	A	A	400	A	A	410	431	394								
4								A	A	A	A	A	A	A	A	A								
5						A		A	A	A	A	A												
6						A	A			L	A		A	A		A	A	A	A					
7							A	A	A	A	A	A												
8								A	A	A	A	A												
9								A	A	A	A	A												
10						A		A	A	A	A	A												
11							L	A	A	A	A	A	A	A	A									
12						A	A	A	A	A			A	A	A									
13							L			A	A	A	A	A	A									
14							A	A			A	A	A											
15								A	A	455	405		A	457	457	433								
16								L			A	A	A	A	A									
17										A	A													
18						A					A	A	A	A	A									
19								A	A	U	L	A	A	A	A	A								
20							L	L	A	A	A	A	A	A	A	A								
21						A		A	A	A	A	A	A	A	A									
22										U	L	A	A											
23																								
24							L	L			A													
25							A	A		A	A	A												
26								L	A		A	A												
27			A			A	A	A	A	A	A	A												
28								A	A	A	A													
29								A	A	A	A	A												
30							L		A	A	A	A												
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	6	9	9	3	5	7	7	10	12	16	14	7					
MED							333	388	390	427	405	410	437	423	416	408	396	374	374					
U Q							409	420	451	418	424	454	442	431	428	404	388	384						
L Q							384	378	397	400	380	406	410	375	392	384	360	368						

JUN. 2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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							246	240	294	336	E A 268	A	A	A	344	328	A	262						
2							280	286	A	A	286	258	A	350	342	294	304	A E A 314						
3								E A 284	A	A	A	284	A	E A 350	326	A	A	306	276					
4								E A 306	A E A	260	290	320	A	350	A	A	300	262	276					
5						A		A	A	A	A	A	310	398	454	380	380	358	326					
6						A	A	274	228	242	294	370	A	370	340	290	286	296	288					
7							242	A	A	A	A	A	A	A	402	376	342	288	A					
8							E A 260	230	A	A	A	E A 400	A	296	290	302	270	252						
9							242	E A 258	A	A	A	A	420	A	A E A 352	A	A E A 302							
10						A		A	A	A	A	A	A	A	356	332	308	278	252					
11							274	246	E A E A 296	316	280	A	A	A	A	386	374	310	278					
12						A	A	A	A	A	A	A	A	434	390	372	320	284	252					
13							316	266				A	A	E A 424	E A 364	E A 350	288	262	A					
14							E A 320	E A 300	244	264		A	A	A	A	352	314	278	288	A				
15								252	E A 278	278	254	A	340	432	432	344	290	284	284					
16							266	274	340	322	E A 322	A	A	A	A	322	260	280	E A 250					
17									A	A	A	A	340	348	348	338	A E A 330	244						
18						E A 236		326	304	274		A	A	A	396		350	320	292					
19								250	262	286	340	A	A	A	A	E A 326	E A 368	E A 350	E A 284					
20							256	264	264	264		A	A	A	A	A	A	A	A					
21						E A 264	322		E A 258	E A 350	A	A	E A 350	328	286	286	286	286	312					
22									302	320	292	292	394	450	422	342	330	330	272					
23							300	242	314	378	E A 378		326	346	E A 362	290	280	E A 262	270					
24							304	260	254	254	A	302	302	A	A	A	308	318	322					
25							A	A	284	254	E A E A 306	E A 348	300		A	E A 316	292	282	258					
26							268	238	272		A	A	A	380	526	366	324	376	280					
27			A			E A 280	E A 266	A	A E A 314	E A 276	A	A	A	362	428	358	358	A	A					
28								A	A	A	A	330	A	A	430	312	310	296	290					
29							A	A	A	A	A	A	A	A	334	330	314	320	280					
30							306	306	E A 296	A	A	A	A	356	330		292	292	256					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	11	19	19	16	14	9	9	16	21	24	25	26	24	1				
MED						E A 264	277	263	258	270	E A 293	311	333	362	350	329	306	288	276	312				
U Q						E A 280	316	300	294	315	340	359	397	411	425	355	336	320	289					
L Q						E A 236	256	252	244	262	E A 280	288	306	350	337	313	289	280	257					

JUN. 2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUN. 2021 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	210	E A E A	E A E A	E A E A	E A E B	234	204	200	196	192	A	A	A	A	A	202	A	A	220	E A E A	E A E A	E A	E B	210		
2	E A E A	E A E A	E A E A	E A E A	E A E A	218	190	194	A	A	194	A	A	194	178	186	A	A	E A E A	E A E A	236	252	228	202	218	
3	E A E A	E A E B	E A E B	E A E B	E A E B	208	208	A	A	A	A	A	A	A	A	A	A	A	208	212	206	302	318	272	A	
4	E B E A	E A E A	E A E A	E A E A	E A E A	200	216	216	A	A	A	A	A	A	A	A	188	186	198	218	E B	218	224	224	A	
5	E A E A	E A E A	E A E A	E A E A	E A E A	A	A	A	A	A	A	A	218	182	180	180	200	196	200	220	198	198	248	270	A	
6	E A E A	E A E A	E A E A	E A E A	E A E A	A	A	A	A	A	A	A	232	A	E A E A	A	A	A	A	222	E A E A	E A E A	E A E A	310	A	
7	E A E A	E A E A	E A E A	E A E A	E A E B	A	A	A	A	A	A	A	A	E A E A	276	212	204	264	A	206	230	270	288	292	A	
8	A	E A E A	E A E A	E A E A	E A E B	212	A	A	A	A	A	A	A	360	206	A	206	196	A	E A E A	E A E A	E A E A	E A E A	234	318	
9	A	E A E A	E A E A	E A E A	E A E A	220	A	A	A	A	A	A	174	A	A	A	A	A	A	210	202	286	324	324	A	
10	E A E A	E A E A	E A E A	E A E A	E A E A	232	A	A	A	A	A	A	A	A	A	A	A	A	A	E A E A	E A E A	E A E A	E A E A	E A E A	260	
11	E A E B	E B E B	E B E B	E B E B	E A E B	A	A	A	A	A	A	A	A	A	A	A	212	204	A	218	232	220	314	314	A	
12	E A E A	E A E A	E A E A	E A E B	A	A	A	A	A	A	A	A	A	A	A	A	200	200	200	200	E A E A	E A E A	E A E A	E A E A	308	
13	E A E A	E A E A	E A E A	E A E B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A E A	E A E A	E A E B	E A E B	E A E B	246	
14	E B E B	E B E B	E B E B	E B E B	E B E B	226	A	A	196	196	A	A	A	A	196	184	214	A	A	A	218	212	282	246	A	
15	E A E A	E A E A	E A E A	E A E B	E A E B	226	216	A	A	192	192	A	192	186	186	A	216	216	216	216	184	E B E A	212	262	306	
16	E A E B	E B E B	E B E B	E B E B	E A E B	214	214	198	194	194	A	A	A	A	A	E A E A	232	A	A	E A E A	298	248	198	248	250	
17	A	A	E A E A	E A E A	E A E A	270	248	238	214	A	A	A	198	A	A	A	A	A	A	E A E A	274	300	284	268	268	
18	E B E B	E B E B	E B E B	E B E A	E A E B	A	A	A	A	A	A	A	A	A	A	A	202	208	A	E A E A	266	238	216	220	272	
19	E A E B	E B E B	E B E B	E A E A	E A E A	236	210	A	A	182	A	A	A	A	A	A	A	A	196	E A E A	E A E A	E A E A	E B E B	E B E B	252	
20	E B E B	E B E B	E B E B	E A E A	E A E A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	286
21	E A E A	E A E A	E A E A	E A E A	E A E A	226	A	A	A	A	A	A	A	A	A	A	220	204	194	194	222	212	206	206	240	
22	E B E B	E B E B	E B E B	E B E B	E B E B	216	196	202	202	A	A	202	188	182	262	206	206	206	A	206	198	208	260	260	A	
23	E A E A	E A E A	E A E A	E B E B	E B E B	216	206	206	188	A	204	204	A	A	A	A	A	A	A	E A E A	262	262	276	274	A	
24	E A E A	E A E A	E A E A	E A E A	E A E A	220	220	220	202	194	180	200	A	A	A	E A E A	236	A	A	E A E A	236	A	A	E A E A	316	
25	E B E B	E B E B	E A E B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A E A	246	248	244	302	248	
26	E A E A	E A E A	E A E A	E A E A	E B E A	242	216	A	198	A	A	A	A	192	192	192	192	208	208	216	A	E A E A	A	A	A	
27	A	A	E A E A	E A E A	E A E A	A	A	A	A	A	A	A	A	A	E A E A	222	A	A	E A E A	E B E B	E B E B	E B E B	E A E A	E A E A	244	
28	E A E B	E B E B	E B E B	E B E B	E B E B	218	206	A	A	A	A	206	A	A	A	198	268	204	204	E A E A	226	234	286	254	250	
29	E A E A	E A E A	E A E A	E A E B	E A E B	258	A	A	A	A	A	A	A	A	A	214	194	228	200	252	226	220	200	246	A	
30	E B E B	E B E B	E B E B	E B E B	E B E B	222	212	202	A	A	A	A	A	202	A	A	A	A	A	E A E A	E A E A	E A E A	E A E A	E A E A	E B E B	262
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	24	25	28	29	29	23	23	13	10	10	3	6	7	8	10	12	16	14	11	25	28	27	28	27		
MED	E A E A	E A E A	E A E A	E A E A	E A E A	217	210	202	200	193	194	203	192	193	192	200	204	204	200	E A E A	E A E A	E A E A	E A E A	E A E A	262	
U Q	E A E A	E A E A	E A E A	E A E A	E A E A	248	220	210	206	198	194	206	204	203	232	217	213	208	208	248	248	274	284	306	A	
L Q	E B E B	E B E B	E B E B	E B E B	E B E B	218	208	199	196	188	192	200	188	184	186	189	200	196	198	216	218	212	227	246	A	

JUN. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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							110	110	110	110	A	A	A	A	110	A	A	A	A		A			
2						B	110	A	A	A	A	A	A	A	108	A	A	A	A					
3						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
4						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
5						B	A	A	A	A	A	A	A	A	A	A	A	108		B				
6						B	A	108	A	A	A	108	108	108	108	108	108	108	108					
7						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
8						B	108	108	A	A	A	A	A	A	A	A	108	108		A				
9						B	122	A	A	A	A	A	A	A	A	A	A	A	A					
10						B	122	A	A	A	A	A	A	A	A	A	A	A	A					
11							122	A	A	A	A	A	A	A	A	A	A	A	A					
12						B	A	A	A	A	A	A	A	A	A	A	A	116		A				
13							116	A	A	A	A	A	A	A	A	A	A	A	A					
14						B	A	A	114	A	A	A	A	A	114	114	110		A	A				
15							110	A	A	A	A	A	A	110	110		110	110	110					
16						B		A	110	110	A	A	A	A	110	110		A	A	A				
17						B		A	A	A	A	A	A	A	A	A	A	A	A					
18								110	A	A	A	A	A	A	A	A	A	A	A					
19						B	110	110	A	A	A	A	A	A	A	A	A	A	A					
20						B	116	108	A	A	A	A	A	A	A	A	A	A	A					
21						B	108	A	A	A	A	A	A	A	A	A	A	110	110	110				
22							A	110	110	A	A	A	A	A	A	A	A	110	110					
23						B	A	110	A	A	A	A	A	110		A	A	A	A	B				
24						B	110	112	A	A	A	A	A	A	A	A	A	A	A					
25						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
26							A	112	A	A	A	A	A	A	A	A	112	112	112					
27			A			B	A	A	A	A	A	A	A	A	A	112	112		A	A				
28						B	A	A	A	A	A	112	112		A	A	112		A	A				
29							A	A	A	A	A	A	A	A	A	A	112		A	112				
30						B	112	A	A	A	A	A	A	A	A	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							13	10	4	2		2	2	3	6	5	7	8	6	1				
MED							110	110	110	110		110	110	110	110	112	110	110	110	110				
U Q							119	110	112					110	110	113	112	111	112					
L Q							110	108	110					108	108	109	108	108	110					

JUN. 2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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	88	88	88	84	84	84	114	120	120	120	92	86	86	86	138	102	102	102	102	98	98	98	98	98
2	92	80	80	80	80	80	G	92	92	92	92	92	92	92	G	92	92	82	82	82	82	90	90	90
3	90	90	90	80	80	94	106	102	102	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92
4	92	92	78	86	86	96	100	100	94	94	94	94	94	94	94	90	90	90	90	90	90	90	90	94
5	94	94	94	94	86	84	102	92	92	92	92	80	86	86	86	86	86	134	84	84	94	94	94	94
6	94	94	94	86	86	84	90	122	90	98	104	112	112	112	118	112	112	112	112	84	84	96	96	96
7	96	90	90	90	88	90	102	98	98	92	92	88	88	88	90	90	98	98	G	90	90	90	90	90
8	90	90	90	78	78	90	120	112	98	94	92	86	86	90	90	90	116		98	98	82	90	90	90
9	90	82	82	82	82	82	126	98	92	92	82	82	88	88	88	88	84	84	84	94	90	90	90	90
10	90	90	90	90	90	78	G	90	90	90	90	90	86	86	78	78	80	80	80	80	80	80	82	86
11	86	86	86	86	86	86	G	92	92	92	88	88	88	88	88	88	88	88	88	92		92	92	92
12	92	92	92	92	100	100	100	96	90	90	90	90	90	90	90	90	90	114	106	B	94	94	94	94
13	94	94	94	86	82	82	G	90	90	90	90	90	90	90	90	84	90	90	90	90	90	90	90	90
14	90	90	90	90	90	90	90	110	98	98	90	90	90	118	118	128	102	100	96	96	96	96	96	96
15	96	96	98	B	88	88	G	88	88	88	88	88	88	G	G	94	150	124	116	104	98	98	104	104
16	104	96	96	B	96	96	106	98	114	114	100	92	84	84	108	122	98	98	98	98	94	94	94	94
17	94	94	94	94	94	94	94	100	100	100	98	98	98	96	92	92	84	84	84	84	84	84	84	84
18	84	84	88	88	88	82	92	114	102	98	96	96	96	96	88	86	86	86	86	86	86	86	86	86
19	86	86	92	92	92	92	G	G	82	90	90	90	90	90	90	90	90	86	86	86	86	86	B	86
20	82	B	82	82	82	80	G	118	98	96	90	90	90	90	90	90	90	86	86	84	84	84	84	86
21	86	86	86	86	86	86	114	98	98	98	96	94	84	84	82	82	82	G	116	G	84	84	94	96
22	96	B	96	96	96	96	96	124	124	90	90	90	90	92	92	100	100	118	116	102	102	98	90	82
23	90	90	90	90	90	104	104	G	100	94	94	94	94	122	98	98	98	98	90	90	82	82	82	82
24	78	78	78	78	86	94	G	114	106	100	92	92	88	88	84	86	86	86	78	88	88	88	88	92
25	92	92	88	88	102	102	92	92	92	92	92	92	92	90	90	90	94	94	94	94	94	94	94	94
26	94	94	92	92	94	118	118	118	94	94	86	86	86	86	86	86	108	108	114	102	92	92	94	94
27	94	92	94	92	90	82	B	98	98	94	94	86	86	84	90	90	138	122	92	92	92	96	96	88
28	88	88	90	90	90		96	96	96	96	88	116	104	100	100	116	102	102	102	102	102	102	94	94
29	94	94	94	94	94	94	B	94	94	94	96	96	94	86	86	86	96	116	100	G	100	100	98	98
30	98	98	88	88		B	B	G	94	94	94	94	92	92	92	92	86	86	86	86	86	86	80	80
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	30	28	29	28	21	28	30	30	30	30	30	29	28	30	30	28	29	28	30	30	29	30
MED	92	90	90	88	88	90	100	98	94	94	92	90	90	90	90	90	92	93	90	91	90	91	92	92
U Q	94	94	94	92	93	95	110	113	100	98	94	94	92	92	93	98	102	102	102	98	94	96	94	94
L Q	88	87	88	85	85	83	94	92	92	92	90	88	86	87	88	86	86	86	86	86	84	86	89	86

JUN. 2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2021 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	F4	F6	F4	F3	F2	C2	C2	C3	C3	L5	L5	L5	L6	H2	L2	L4	L4	L3	F6	F8	F7	F9	F4
2	F4	F3	F3	F7	F3	F3		L6	L7	L6	L4	L3	L3	L2		L3	L5	L4	L8	F4	F2	F2	F3	F3
3	F4	F9	F3	F3	F2	F1	L2	L7	L7	L5	L4	L2	L3	L3	L2	L4	L7	L6	L3	F4	F3	F8	F8	F6
4	F2	F5	F3	F3	F3	L3	L2	L7	L6	L4	L4	L4	L5	L3	L5	L4	L2	L1	L3	F3	F1	F4	F6	F6
5	F4	F7	F4	F3	F3	L9	L3	L8	L9	L7	L5	L4	L3	L3	L3	L2	L2	H2	L4	F2	F3	F3	F7	F9
6	F9	F6	F5	F4	F4	L7	L7	C3	L2	L2	L2	C3	C3	C2	C2	C2	C4	C2	C6	F2	F9	F9	F7	F7
7	F3	F5	F5	F4	F4	L3	L3	L8	L6	L7	L6	L6	L4	L4	L3	L3	L2	L3	L6	F2	F8	F6	F5	F6
8	F9	F9	F6	F6	F3	L1	C2	L4	L3	L5	L4	L4	L4	L3	L3	L4	C3		L6	F7	F3	F6	F4	F6
9	F8	F8	F4	F4	F4	L2	CL21	L8	L6	L6	L5	L5	L3	L4	L5	L4	L6	L6	L4	F4	F5	F4	F9	F9
10	F8	F8	F5	F6	F5	L6		L6	L4	L6	L4	L4	L4	L4	L3	L5	L4	L5	L7	F9	F5	F5	F5	F5
11	F5	F5	F3	F3	F3	F2		L6	L6	L5	L4	L3	L4	L3	L4	L3	L4	L3	L6	F2	F7	F4	F9	F8
12	F6	F8	F9	F3	F5	L8	L8	L9	L4	L2	L2	L2	L4	L2	L2	L3	L2	L2	L3		F5	F4	F2	F6
13	F5	F7	F4	F3	F3	F2		L3	L3	L5	L4	L3	L3	L4	L3	L4	L4	L7	L6	F8	F9	F6	F8	F4
14	F3	F3	F8	F5	F4	L4	L4	L6	L3	L3	L3	L6	L4	L5	L2	C2	C2	C4	L7	F5	F4	F5	F4	F2
15	F3	F5	F2		F2	F2		L4	L5	L3	L3	L2				L3	H3	C3	C3	F3	F3	F2	F3	F3
16	F2	F2	F2		F2	L1	L1	L1	L1	L2	L3	L7	L5	L3	C2	C2	L4	L4	L5	F6	F4	F4	F3	F4
17	F6	F7	F6	F4	F6	L3	L7	L3	L4	L6	L3	L3	L2	L3	L3	L3	L5	L5	L5	F9	F9	F8	F5	F4
18	F2	F2	F3	F1	F3	L4	F2	C3	L3	L3	L5	L4	L4	L3	L4	L7	L4	L3	L6	F5	F3	F3	F3	F4
19	F3	F2	F3	F2	F3	L2			L4	L2	L3	L4	L5	L5	L4	L4	L4	L6	L4	F6	F3	F2		F1
20	F2		F2	F2	F3	L2		C3	L6	L4	L7	L3	L4	L8	L4	L9	L7	L9	L8	F8	F9	F9	F6	F7
21	F7	F3	F3	F3	F4	L2	C2	L8	L4	L6	L4	L4	L4	L4	L3	L3	L3		C1		F1	F2	F1	F2
22	F1		F2	F1	F3	F2	C2	C2	L4	L3	L2	L2	L2	L2	L2	L2	L2	C2	C3	F2	F3	F2	F3	F5
23	F3	F2	F3	F3	F6	L2	L2		L2	L1	L4	L3	L3	L2	L3	L3	L3	L5	L5	F6	F3	F8	F8	F4
24	F3	F5	F3	F2	F2	L4		C1	L4	L2	L3	L3	L3	L5	L4	L4	L4	L8	L9	F8	F9	F7	F9	F8
25	F3	F4	F3	F2	F3	F2	F6	L4	L3	L3	L4	L4	L2	L3	L5	L4	L4	L6	L7	F6	F3	F5	F3	F2
26	F4	F8	F3	F2	F5	L1	L2	C4	L4	L4	L6	L6	L4	L2	L2	L2	C2	C2	C2	F2	F9	F6	F8	F9
27	F9	F9	F7	F5	F5	F4	L8	L8	L9	L4	L5	L5	L6	L2	L5	H2	C2	L8	L8	F7	F2	F2	F3	F3
28	F3	F2	F2	F1	F2		L2	L8	L6	L6	L6	C1	L3	L3	L3	C2	L4	L3	L3	F2	F3	F2	F2	F2
29	F3	F2	F3	F3	F3	F2	L8	L8	L6	L5	L4	L4	L6	L4	L3	L2	C2	L4		F4	L5	F4	F2	F1
30	F3	F2	F2	F2			L4	L5	L6	L7	L5	L4	L3	L3	L3	L5	L4	L3	L6	F8	F3	F4	F3	F4
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUN. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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		44	X 38	47	41	X 34																A	X 68	X 68	X 68	A	
2		56	56	54	53	53	39																78	82	74	56	
3		A	X 52	57	54	49																	X 67	X 55	X 52	X 58	
4		58	58	58	53	48																	X 68	X 59	X 56	X 56	
5		55	58	58	48	X 40	38																X 78	X 62	X 54	X 52	
6		X 47	57	52	48	X 40																	A	X 52	X 59	X 56	
7		A	A	A	A	A																	A	X 50	X 47	X 48	
8		A	49	48	47	X 38																	X 72	X 60	X 59	X 60	
9		A	59	57	54	49																	X 63	X 52	X 47	X 49	
10		A	A	A	A	X 31																	X 76	X 71	X 61	X 56	
11		65	67	64	X 57	50	46																X 88	X 66	A	A	
12		69	68	68	60	X 36																	A	X 56	X 54	X 55	
13		55	58	55	47	46									A								X 76	X 65	X 54	X 55	
14		57	59	58	55	X 44	45																X 79	X 70	X 54	X 43	
15		58	51	48	46	X 38																	X 71	X 60	X 48	X 50	
16		51	47	47	35	35																	A	X 59	X 59	A	
17		A	A	64	58	49	57																X 88	X 72	X 61	X 59	
18		X 58	X 58	X 58	X 53	X 43																	X 96	X 92	X 65	X 65	
19		72	72	71	X 58	68	62																X 84	X 64	X 62	X 64	
20		69	72	72	67	53	44																A	X 62	X 59	X 45	
21		X 44	46	41	40	X 34																	X 83	X 64	X 54	X 53	
22		X 50	X 49	X 46	X 47	X 46																	X 80	X 70	X 64	X 68	
23		68	63	68	X 54	X 44	49																X 82	X 78	X 71	X 74	
24		X 71	X 72	X 75	X 58	X 48	49																X 66	X 62	X 58	A	
25		X 54	X 48	54	58	X 35																	X 78	X 71	X 60	X 58	
26		64	64	71	60	58	54																X 68	X 55	X 54	X 42	
27		A	A	A	A	39																	X 65	X 65	X 65	X 55	
28		58	58	56	56	55																	X 66	X 69	X 65	X 59	
29		X 68	X 55	X 56	X 53	X 54																	X 87	X 67	X 63	X 55	
30		56	X 50	X 46	X 43	X 47																	X 86	X 74	X 65	X 59	
31																											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		23	26	27	27	29	10															24	30	29	26		
MED		58	58	57	53	X 46	48															X 78	X 64	X 59	X 56		
U Q		68	63	64	58	50	54															X 84	X 70	X 64	X 59		
L Q		X 54	X 50	48	47	X 38	44															X 68	X 59	X 54	X 52		

JUN. 2021 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F 33	F 32	F 33	F 30	28	28	44	54	59	58	59	52	51	52	60	63	64	62	A	A	A	62	62	A	
2	F 39	F 40	F 37	F 36	F 32	F 30	40	56	A	A	65	A	A	A	A	74	74	69	70	71	72	75	68	50	
3	A	46	F 42	F 38	F 32	33	44	49	62	52	59	64	54	57	A	A	71	85	90	88	61	49	46	F	
4	F 45	F 44	F 40	F 39	F 41	A	36	51	A ^J	R ^R 63	71	A	66	64	A	73	60	57	62	63	62	53	50	50	
5	F 40	F 44	F 47	F 41	F 34	F 27	42	50	A	56	A	A	A	A	55	50	53	56	65	73	72	56	48	46	
6	41	F 45	F 42	F	34	32	A	56	60	57	55	51	51	59	70	67	63	61	64	58	A	46	F	F	
7	A	A	A	A	A	A	29	A	69	66	53	54	60	61	64	62	68	81	87	58	A	44	41	42	
8	A	F 42	F 40	F 36	32	32	46	52	58	49	50	A	A	71	82	84	89	90	76	66	66	54	45	F F	
9	A	F	F	F	F 35	32	46	57	55	A	A	A	A	A	62	71	80	91	97	76	57	46	41	F 38	
10	A	A	A	A	25	23	46	A	50	A	A	A	65	71	79	A	93	101	96	84	70	65	55	50	
11	F 52	F 50	F 50	F 51	F 38	F 36	44	55	A	74	71	A	55	64	A	78	83	A	A	109	82	60	A	A	
12	F	F 54	F 52	F 48	30	23	A	A	A	51	A	A	A	51	58	70	68	69	A	A	A	50	48	F 44	
13	F	F 47	F	F 41	F 36	32	42	64	61	53	A	A	A	A	68	80	86	81	74	76	70	59	48	F	
14	F 40	F 47	F	F 41	F 38	F 32	39	61	60	A	58	56	64	67	H 67	A	76	88	97	88	76	73	64	48	37
15	F 38	F 39	F 38	F 35	32	30	39	52	64	58	56	50	49	55	60	64	77	80	85	78	A	54	42	44	
16	F 35	F 38	F 32	F 23	F 22	F 25	48	53	49	54	69	49	50	52	57	72	78	72	A	A	A	53	49	F A	
17	A	A	F 50	F 33	F 30	F 32	53	48	51	A	50	55	54	A	A	70	83	76	71	74	82	66	55	53	
18	52	52	52	47	R 37	33	40	55	56	54	62	53	A	A	73	68	A	A	75	79	84	90	86	59	59
19	F 62	F 62	F 59	F 52	F 58	F 51	41	48	51	53	54	60	63	59	A	61	A	A	A	76	78	58	56	58	
20	F 58	F 58	F	F 51	F 39	F 31	40	48	60	60	55	A	A	A	63	72	79	76	65	A	A	56	53	39	
21	38	F 34	F 30	F 30	28	27	36	51	A	56	A	A	62	74	74	80	76	A	63	71	77	58	48	47	
22	44	43	40	41	40	30	38	47	56	63	73	64	64	64	74	80	85	89	97	88	74	64	58	59	
23	F 56	F 52	F 52	48	38	F 38	38	63	57	51	A	59	57	66	70	A	95	80	84	82	76	72	65	68	
24	65	66	69	52	42	F 39	48	54	68	A	53	69	69	A	A	68	70	70	72	60	60	56	48	F A	
25	48	42	F 40	F 42	29	26	38	51	62	66	61	70	76	77	77	80	82	82	84	78	72	65	54	52	
26	F 52	F 49	F	F 44	F 40	F	47	59	67	A	58	58	54	53	55	60	70	76	77	72	62	49	J 48	R 36	
27	A	A	A	A	F 27	28	42	48	A	A	64	61	A	58	55	54	58	62	61	A	59	59	59	49	
28	F	F 48	F 42	F 41	F 44	A	41	58	A	60	60	56	54	54	55	65	63	66	69	62	60	63	59	53	
29	62	49	46	47	F 43	40	43	A	A	61	66	72	A	76	85	88	102	104	108	104	81	61	57	49	
30	F 42	44	40	37	41	42	46	56	A	50	A	53	A	62	70	76	83	87	87	84	80	68	59	53	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	20	25	22	25	29	26	28	26	20	22	22	19	19	22	22	26	29	27	25	25	24	30	28	22	
MED	F 44	F 46	F 42	F 41	35	32	42	54	60	56	59	56	57	62	66	72	77	76	77	76	72	58	52	50	
U Q	F 54	F 51	F 50	F 48	F 40	F 33	46	56	62	61	65	64	64	67	74	78	84	87	88	84	78	64	58	53	
L Q	F 40	F 42	F 40	F 36	30	28	39	50	56	53	55	53	54	55	58	65	66	69	67	68	62	53	48	44	

JUN. 2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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								U L 372	388	428	432	452	444	A	444	A	A	A	A	A				
2								L 380	A	A	A	A	A	A	A	436	A	404	A					
3								A	A	460	436	A	452	A	A	A	A	A	A					
4						A		A	A	A	A	A	A	A	A	A	416	U L 404	364					
5									A	A	A	A	A	A	444	436	A	376	356					
6							A	380	416	436	444	440	440	440	444	424	420	A	A					
7						A		A	A	428	456	448	444	452	U A 428	412	A	A						
8								A	U L 408	420	436	A	A	A	448	A	420	404	364					
9								A	L 416	A	A	A	A	A	456	436	U A 436	A	A	A				
10								A	A	A	A	A	456	A	A	A	A	A	A					
11								A	A	U A 420	452	A	A	A	A	A	A	A	A					
12							A	A	A	A	A	A	A	A	A	428	412	A	A	A				
13							L 372	A	A	A	A	A	A		436	432	A	416	A	L				
14								376	400	A	A	440	A	444	A	440	U A 424	A	A					
15								L 388	400	424	460	444	452	448	436	A	420	A	360					
16								U L 416	424	432	444	456	444	A	A	408	432	400	A	A				
17								L 416	A	444	440	444	A	A	A	A	A	396	A					
18								A	A	A	A	A	A	A	A	A	A	A	A	A				
19								380	U L 408	432	436	A	A	A	A	A	A	A	A					
20								L 372	A	A	A	A	A	A	A	A	A	A	A	A				
21								U L 388	A	A	A	A	A	A	U A 448	A	A	A	400					
22								L 456	460	448	472	460	468	456	444	420	A	A	A	L				
23								A	L 436	L 464	A	448	456	460	A	A	424	A	A					
24								L 432	A	A	456	448	464	A	A	A	A	A	A					
25								L 432	A	A	468	460	A	A	A	444	A	A	380					
26									A	A	A	A	464	A	452	440	A	464	368					
27									A	A	A	472	A	U A 460	456	444	A	388	L 376	A				
28						A		A	A	A	A	464	456	460	A	440	432	400	376					
29								A	A	A	464	A	A	472	468	448	428	400	372					
30								L 376	A	456	A	456	A	A	U A 452	448	A	U A 416	388	L				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	12	12	14	14	13	10	14	16	12	12	11					
MED								L 378	416	430	446	448	456	456	450	438	420	402	372					
U Q								L 380	424	458	456	460	458	460	456	444	426	410	380					
L Q								L 372	404	424	436	444	444	444	444	430	418	398	364					

JUN. 2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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	300	324	344	A	336	328	336	304	268	204	A				
2						B	A	220	272	304	328	348	340	A	A	A	A	A	220	A				
3						B	A	220	260	A	A	A	A	A	336	316	296	244	204	A				
4						A	A	228	280	A	316	336	360	336	336	A	A	A	A	A				
5						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
6						A	A	A	A	A	A	A	A	348	336	324	292	272	228	A				
7						A	A	216	284	A	A	A	A	352	340	324	288	276	228	A				
8						B	A	240	260	284	A	A	A	A	308	332	304	A	212	A				
9						B	A	240	280	304	A	A	A	A	A	336	324	276	A	A				
10						B	A	236	268	308	316	A	320	A	A	A	A	A	A	A				
11						B	A	224	268	296	316	A	A	A	A	A	A	276	A	A				
12						A	A	216	260	292	A	A	A	A	A	A	A	276	208	A				
13						B	A	A	A	312	332	332	A	A	A	A	A	A	A	A				
14						B	A	232	268	304	328	352	360	352	A	328	316	276	232	A				
15						B	A	212	248	A	A	A	A	A	344	328	304	264	204	A				
16						B	A	212	280	308	320	340	328	344	A	A	A	A	228	A				
17						B	A	A	284	304	316	348	356	352	336	328	300	252	A	A				
18						B	A	236	276	A	332	344	340	340	A	A	A	A	A	A				
19						A	A	252	280	312	A	352	352	348	A	A	264	A	A	A				
20						B	A	232	264	300	316	336	344	332	A	A	A	A	A	A				
21						B	A	232	276	304	328	336	344	344	A	292	A	A	A	A				
22						A	A	A	280	312	328	A	A	A	A	A	A	A	A	A				
23						B	A	236	A	A	A	A	U A	A	A	A	340	316	280	232	A			
24						A	176	232	268	A	A	332	A	A	A	A	A	A	A	A				
25						B	A	224	284	308	A	A	332	348	344	320	312	276	232	A				
26						B	A	A	A	A	A	A	A	A	A	328	308	268	224	A				
27						B	A	A	268	300	A	348	364	352	348	332	320	276	220	A				
28						A	A	224	276	312	340	356	348	A	348	336	312	272	224	A				
29						B	A	240	296	308	A	328	348	A	A	A	A	280	248	A				
30						B	A	228	292	312	320	A	A	356	332	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	22	25	20	16	15	15	14	13	15	15	16	16					
MED							176	230	276	304	322	344	344	348	336	328	304	276	224					
U Q							236	280	310	328	348	356	352	344	336	316	276	230						
L Q							220	268	300	316	336	336	340	334	324	296	268	210						

JUN. 2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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	J	A
2	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
3	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
4	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
5	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
6	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
7	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
8	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
9	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
10	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
11	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
12	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
13	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
14	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
15	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
16	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
17	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
18	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
19	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
20	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
21	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
22	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
23	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
24	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
25	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
26	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
27	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
28	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
29	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
30	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
LQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A

JUN. 2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1	E	16	16	16	16	16	18	21	28	31	36	42	41	38	46	40	54	43	48	A	A	A	A	A	A									
2	E	16	16	19	19	E	B	21	30	A	A	A	A	A	A	A	36	44	32	66	46	44	33	18	20									
3	A	A	33	20	28	E	B	22	35	40	42	40	45	40	46	A	86	71	62	43	39	19	18	24	E	B	26							
4	27	E	B	E	B	20	E	22	43	A	A	50	52	A	85	49	46	A	34	29	28	23	E	B	20	23	E	B	16					
5	20	28	E	B	E	B	E	21	32	A	A	A	A	A	A	A	40	40	46	30	31	24	21	22	E	B	16	23						
6	E	16	E	16	20	21	20	25	A	A	52	27	33	42	38	36	39	41	38	36	41	49	38	29	A	A	E	B	20	27				
7	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
8	A	A	73	26	22	19	18	16	20	32	34	35	36	A	A	A	51	40	45	42	33	32	30	27	50	37	22	E	B	E	B			
9	A	A	101	40	18	20	19	16	26	37	36	199	239	252	264	144	42	44	48	57	56	28	21	17	16	16	E	B	E	B				
10	A	A	A	A	A	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B		
11	E	16	E	16	16	28	24	16	21	38	79	36	45	93	53	49	122	51	46	143	254	64	66	52	101	88	A	A	A	A				
12	E	16	E	16	18	16	16	16	49	86	72	44	143	137	64	46	47	38	34	64	128	162	86	16	16	16	E	B	E	B	E	B		
13	24	E	B	16	36	E	B	21	16	22	28	41	43	86	125	81	162	38	41	51	40	56	19	20	44	19	E	B	16	16				
14	21	17	36	E	B	E	B	16	16	18	27	35	68	53	38	51	42	A	82	40	42	50	40	37	40	42	E	B	E	B	16	16		
15	E	B	22	22	19	16	E	B	21	29	34	35	40	40	39	37	G	55	40	46	31	27	24	16	16	E	B	E	B	16	16			
16	E	16	E	16	16	16	16	16	25	32	34	35	36	39	39	38	46	38	41	28	A	A	A	A	A	E	B	A	A	81	16			
17	A	A	A	A	E	B	E	B	21	28	34	48	42	41	38	164	94	53	46	33	52	51	35	21	28	18	E	B	16	16	16			
18	19	19	28	20	E	B	E	B	22	30	45	44	45	49	156	143	48	48	A	265	66	73	66	36	24	22	21	E	B	16	16			
19	E	16	E	16	19	E	B	20	28	20	28	30	38	36	51	50	51	A	A	A	A	55	A	A	A	49	36	25	25	20	20			
20	18	E	B	E	16	16	16	16	20	32	50	49	51	63	78	65	46	54	65	54	50	110	84	36	29	20	E	B	16	16	16			
21	18	24	21	E	B	E	B	16	16	28	35	65	47	88	125	51	63	45	55	44	A	96	37	36	27	22	E	B	E	B	16	16		
22	E	16	E	16	16	16	16	17	20	30	40	35	42	41	40	38	40	40	37	45	52	20	19	18	16	24	E	B	16	16	16			
23	E	16	E	16	19	16	16	16	24	40	32	34	A	A	40	42	42	53	A	168	36	50	39	50	35	33	34	27	E	B	16	16		
24	19	22	21	20	E	B	16	20	19	30	45	83	37	42	44	68	78	58	43	52	40	52	30	21	20	182	A	A	16	16	16			
25	E	16	E	16	16	16	16	16	23	34	34	47	44	40	72	55	62	39	66	42	33	49	18	16	16	E	B	E	B	16	16			
26	21	E	16	16	16	16	16	16	33	53	48	104	47	46	43	49	42	38	45	40	32	34	33	39	E	B	E	B	16	16				
27	A	A	A	A	A	A	E	B	22	28	A	A	A	A	A	A	A	46	39	41	49	31	30	A	A	40	E	B	16	20	24	24		
28	29	18	22	E	B	18	A	24	39	A	212	44	52	40	42	41	46	40	37	34	30	20	24	16	16	16	E	B	E	B	16	16		
29	E	16	E	16	21	16	16	16	33	70	109	44	36	50	108	40	38	38	34	G	G	17	20	E	B	E	B	E	B	16	16			
30	21	E	16	16	16	16	16	16	22	30	A	A	42	140	41	94	48	45	43	46	42	25	20	E	B	E	B	E	B	16	16			
31																																		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED		19	E	B	19	16	16	16	22	32	42	44	46	46	50	48	46	44	44	44	40	36	32	22	18	20	E	B	16	16	16	16		
UQ		A	A	29	26	22	20	18	17	25	39	65	50	86	93	85	65	78	54	49	52	56	52	44	33	23	26	E	B	16	16	16	16	
LQ		E	16	E	16	16	16	16	21	29	34	38	40	40	40	42	40	39	40	33	32	23	21	16	16	16	E	B	E	B	E	B	16	16

JUN. 2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUN. 2021 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
3	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
4	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
5	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
6	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
7	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
8	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
9	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
10	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
11	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
12	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
13	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
14	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
15	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
17	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
18	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
19	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
20	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
21	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
22	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
23	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
24	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
25	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
26	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
27	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
28	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
29	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
30	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	25	22	25	29	26	28	26	20	22	22	19	19	22	22	26	29	27	25	25	24	30	28	22
MED	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
U Q	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
L Q	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

JUN. 2021 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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								U L 378	415	423	439	463	432	A	395	A	A	A	A	A				
2								L 379	A	A	A	A	A	A	A	403	A	377	A					
3								A	A	A	414	441	A	A	A	A	A	A	A					
4					A			A	A	A	A	A	A	A	A	A	433	U L 382	368					
5									A	A	A	A	A	A	429	381	A	383	387	A				
6							A	399	386	A	415	442	439	428	407	426	A	A	A					
7					A			A	A	A	409	416	429	434	420	A	437	403	A	A				
8								A	U L 399	425	440	A	A	A	396	A	A	364	386					
9								A	U A 389	A	A	A	A	A	397	A	A	A	A					
10								A	A	A	A	A	424	A	A	A	A	A	A					
11								A	A	A	A	A	A	A	A	A	A	A	A					
12							A	A	A	A	A	A	A	A	A	380	383	A	A	A				
13							L	386	A	A	A	A	A		404	A	A	A	A	A	L			
14								389	419	A	A	441	A	A	368	389	A	A	A					
15								L 372	409	435	392	443	424	439	453	A	A	A	381					
16								U L 402	402	410	417	412	401	A	449	A	A	381	A	A				
17								L 404	A	A	422	410	436	A	A	A	A	387	A					
18								364	A	A	A	A	A	A	A	A	A	A	A	A				
19								U L 393	365	429	A	A	A	A	A	A	A	A	A	A				
20								L 392	A	A	A	A	A	A	A	A	A	A	A	A	A			
21								A	A	A	A	A	A	A	A	A	A	A	A	A				
22									A	L 406	A	391	429	425	444	398	415	A	A	A	L			
23								A	L 387	L 421	A	449	440	389	A	A	404	A	A					
24								L 374	A	A	409	448	376	A	A	A	A	A	A					
25									L 374	A	A	430	A	A	A	417	A	A	367					
26									A	A	A	A	396	A	408	417	A	366	380					
27									A	A	A	A	A	A	422	376	A	382	358	L	A			
28					A			A	A	A	A	438	434	429	A	417	403	390	371	L				
29								A	A	A	427	A	A	424	424	420	406	395	383					
30								L 389	A	399	A	420	A	A	A	387	A	A	364	L				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								9	11	10	11	13	13	9	11	14	7	10	10					
MED								L 386	399	415	416	438	432	424	408	410	404	382	376					
U Q								L 390	409	423	429	446	438	428	429	420	415	387	383					
L Q								L 375	L 387	402	410	418	418	395	397	387	403	377	367					

JUN. 2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUN. 2021 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								246	234	288	282	384	402	434	338	326	300	328	A	A				
2								254	A	A	294	A	A	A	A	300	312	326	E A	A				
3								246	240	350	312	282	378	374	A	A	E A	A	398	308	258			
4						A		292	A	312	294	A	338	378	A	278	318	314	280					
5									A	300	A	A	A	A	388	468	396	358	300					
6							A	278	240	308	356	496	508	380	306	302	334	314	256					
7						A		A	274	278	360	408	384	378	364	362	340	286	238					
8								232	230	276	546	A	A	A	390	342	334	296	264	258				
9								230	254	A	A	A	A	A	402	372	342	296	258					
10								A	224	A	A	A	368	380	380	A	344	274	250					
11								270	A	262	268	A	E A	A	A	396	388	A	A					
12							A	A	A	332	A	A	A	A	518	428	312	324	E A	A	A	A		
13							290	234	216	264	A	A	A	A	380	330	288	300	294	276				
14								246	252	A	320	398	372	370	A	372	312	284	266					
15								274	242	306	296	418	500	406	360	372	322	336	278					
16								242	248	370	248	330	472	470	418	332	316	290	A	A				
17								224	270	A	392	374	424	A	A	372	312	284	344					
18								280	252	334	286	E A	468	A	A	320	342	A	E A	E A	A	330		
19									294	344	336	342	324	336	A	A	E A	A	A					
20								308	280	286	348	A	A	A	378	320	328	262	288			A		
21								300	A	324	A	A	E A	A	400	340	322	314	286	322				
22									326	320	280	392	340	416	378	372	332	334	260	246				
23								254	262	472	A	356	426	346	308	A	276	286	288					
24								260	234	A	492	294	308	A	A	E A	A	352	304	306	262			
25								300	290	290	390	312	E A	446	344	380	310	342	274	272				
26									214	A	326	356	422	498	444	402	330	306	278					
27									A	A	308	346	A	362	422	426	350	326	262			A		
28						A		262	A	306	298	326	398	460	460	338	336	302	272	240				
29								A	A	348	336	334	A	358	334	346	320	302	260					
30								236	A	424	A	446	A	404	358	354	344	306	286	254				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	21	20	22	22	19	19	22	22	26	29	27	25	5				
MED							290	254	250	310	313	356	392	380	378	342	325	304	269	254				
U Q							279	272	344	356	408	446	416	402	372	343	326	291	303					
L Q							239	234	288	294	330	368	362	338	320	312	286	259	243					

JUN. 2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	304	264	298	282	268	248	204	190	192	190	214	170	200	A	228	A	A	A	A	A	A	240	222	A			
2	218	264	274	240	224	240	200	206	A	A	A	A	A	A	A	196	A	204	A	284	262	250	206	200			
3	A	E A	E A	E A	E A	E A	A	A	A	E A	A	A	A	A	A	A	A	A	A	A	220	190	248	326	306		
4	E A	284	264	252	250	206	A	212	A	A	A	A	A	A	A	A	182	194	230	244	218	242	256	244			
5	254	E A	288	214	228	210	248	214	224	A	A	A	A	A	A	190	256	A	220	E A	228	244	212	210	256	274	
6	238	242	250	E A	E A	E A	A	A	A	A	A	194	168	182	208	196	192	A	A	A	240	A	192	346	E A	294	
7	A	A	A	A	A	A	E A	A	A	A	A	A	A	A	A	178	228	A	A	A	206	A	E A	E A	E A	280	
8	A	E A	E A	E A	E A	248	210	212	A	198	182	174	A	A	A	226	A	A	246	246	244	250	296	346	E A	286	
9	A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	E A	
10	A	A	A	A	314	276	232	A	A	A	A	A	A	A	A	A	A	A	A	A	212	200	242	296	310		
11	284	282	256	218	E A	296	240	214	A	A	A	A	A	A	A	A	A	A	A	A	A	224	242	E A	E A	E A	
12	304	268	274	224	224	310	A	A	A	A	A	A	A	A	A	A	236	220	A	A	A	A	264	278	268		
13	E A	356	254	E A	264	296	284	238	198	A	A	A	A	A	A	196	A	A	A	A	214	214	240	222	282		
14	326	258	E A	332	246	258	264	184	214	200	A	A	182	E A	E A	A	240	A	A	A	250	248	208	272	242		
15	288	300	E A	324	244	262	246	218	248	202	172	222	180	184	178	172	A	A	A	246	218	204	208	264	292		
16	314	312	312	328	318	256	224	238	E A	222	192	208	206	198	218	A	194	A	198	A	A	A	E A	E A	A		
17	A	A	236	288	294	276	204	190	196	A	A	212	224	186	A	A	A	A	198	A	300	242	212	272	260		
18	286	256	244	222	242	252	234	208	A	A	A	A	A	A	A	A	A	A	A	A	A	244	202	E A	292		
19	274	262	228	246	214	206	214	206	190	254	170	A	A	A	A	A	A	A	A	A	264	230	224	294	300		
20	274	242	258	210	228	254	230	214	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A	E A	246		
21	286	296	298	268	232	264	E A	E A	E A	A	A	A	A	A	A	A	A	A	A	A	A	272	216	200	262	274	
22	274	272	274	246	212	232	218	210	E A	260	184	238	212	172	180	180	216	206	A	A	220	222	218	282	278		
23	300	288	242	206	282	246	234	A	194	172	A	174	188	E A	230	A	196	A	A	270	274	276	280	274			
24	270	264	228	238	240	262	218	216	A	A	188	196	264	A	A	A	A	A	A	E A	278	234	214	278	A		
25	244	260	256	226	206	244	236	230	208	A	E A	280	188	A	A	A	192	A	A	E A	248	286	230	230	E A	288	
26	E A	280	266	232	288	278	248	248	E A	274	A	A	A	A	230	216	196	A	228	224	220	232	E A	322	256	304	
27	A	A	A	A	260	272	220	198	A	A	A	A	A	A	A	A	E A	A	A	200	230	A	A	270	226	234	238
28	E A	306	270	E A	282	258	264	A	220	A	A	A	176	200	190	A	200	198	E A	E A	222	222	262	258	248	270	
29	218	242	274	250	274	262	274	A	A	A	178	A	A	A	192	170	196	170	196	208	230	208	186	244	244		
30	298	258	246	260	280	238	210	192	A	224	A	200	A	A	A	274	A	A	A	210	212	212	226	198	236		
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	23	26	27	27	29	27	28	19	12	11	13	13	13	9	11	14	7	10	10	24	24	30	29	26			
MED	282	264	251	246	259	248	218	208	198	188	197	184	188	191	196	197	198	200	228	234	230	226	259	272			
U Q	304	288	E A	268	280	264	234	E A	230	215	226	218	203	200	E A	224	218	240	220	228	246	267	246	E A	258	281	292
L Q	270	258	240	228	226	240	212	198	195	182	179	175	183	185	180	194	182	198	222	220	213	212	244	246			

JUN. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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	100	100	100	A	100	100	104	104	104	104	A				
2						B	A	102	102	102	102	102	102	A	A	A	A	A	104	A				
3						B	A	104	102	A	A	A	A	A	102	102	102	102	102	A				
4						A	A	104	104	A	102	102	102	102	102	A	A	A	A	A				
5						B	A	A	102	A	102	A	A	A	A	A	A	A	A	A	A			
6						A	A	A	A	A	A	A	A	102	102	104	104	104	A	A				
7						A	A	104	102	A	A	A	A	104	100	102	102	108	106	A				
8						B	A	108	102	102	A	A	A	A	102	100	102	A	104	A				
9						B	A	106	102	100	A	A	A	A	A	104	104	104	A	A				
10						B	A	104	104	104	102	A	102	A	A	A	A	A	A	A				
11						B	A	102	102	102	102	A	A	A	A	A	A	102	A	A				
12						A	A	104	102	102	A	A	A	A	102	A	A	106	106	A				
13						B	A	A	A	102	102	102	A	A	A	A	A	A	A	A				
14						B	A	104	104	102	102	104	104	102	A	102	100	108	104	A				
15						B	A	104	98	A	A	A	A	A	102	102	102	102	102	A				
16						B	A	100	102	102	102	102	102	102	A	A	A	A	102	A				
17						B	A	A	104	104	104	104	104	102	102	102	102	102	A	A				
18						B	A	106	102	A	102	102	102	102	A	A	A	A	A	A				
19						A	A	102	102	102	A	102	102	102	A	A	102	A	A	A				
20						B	A	104	104	102	100	100	100	100	A	A	A	A	A	A				
21						B	A	104	104	102	102	102	102	102	A	104	A	A	A	A				
22						A	A	A	102	102	102	A	A	A	A	A	A	A	A	A				
23						B	A	102	A	A	A	A	A	A	A	100	104	104	106	A				
24						A	110	106	102	A	A	98	A	A	A	A	A	A	A	A				
25						B	A	102	102	102	A	A	100	100	102	102	102	106	110	A				
26						B	A	A	A	A	A	A	A	A	A	102	102	102	102	A				
27						B	A	A	104	100	A	100	100	100	100	100	100	102	102	A				
28						A	A	102	102	102	102	102	102	A	102	102	102	102	102	A				
29						B	A	104	104	102	A	102	102	A	A	A	A	110	102	A				
30						B	A	104	104	104	102	A	A	102	102	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	22	25	20	16	15	15	14	13	15	15	16	15					
MED							110	104	102	102	102	102	102	102	102	102	102	104	104					
U Q								104	104	102	102	102	102	102	102	104	104	106	106					
L Q								102	102	102	102	100	100	100	101	102	102	102	102					

JUN. 2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 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	106	86	84	84	94	96	94	104	106	112	116	110	106	120	142	108	112	110	104	102	102	102	100	98
2	92	100	92	84	84	112	116	106	102	98	98	96	98	96	94	94	98	98	102	100	96	92	90	96
3	94	94	92	86	86	86	114	104	102	102	100	94	98	110	106	104	104	102	100	96	104	94	100	104
4	98	90	90	90	90	108	112	106	106	100	98	104	104	104	96	98	98	98	96	94	94	90	90	102
5	86	98	98	112	96	100	98	100	100	100	96	96	96	96	96	96	94	134	110	88	88	88	104	96
6	104	100	100	100	116	100	98	98	108	100	122	106	150	122	142	146	116	118	112	104	102	104	102	106
7	102	96	94	98	98	94	110	104	100	100	98	98	108	108	104	108	120	108	104	108	100	100	96	94
8	94	96	90	90	90	90	122	124	112	108	108	94	96	108	126	110	110	150	104	104	94	88	86	102
9	96	94	94	86	86	82	114	106	102	100	96	122	112	96	94	126	128	112	106	104	104	102	100	96
10	96	100	92	90	84	100	92	106	106	102	100	96	100	96	98	94	94	94	94	94	94	90	90	92
11	96	94	94	92	86	92	118	106	104	104	100	98	98	96	92	96	112	102	102	96	96	94	94	98
12	98	116	102	98	96	108	112	104	104	104	96	96	92	124	116	90	138	108	102	102	100	110	94	100
13	98	94	92	88	88	106	98	96	102	104	102	96	98	98	94	104	100	106	108	86	86	100	114	98
14	100	94	96	96	96	B	118	134	110	104	106	114	116	116	116	118	122	114	108	104	102	102	108	104
15	98	100	100	102	96	106	102	152	126	100	144	92	96	100	G	106	110	102	100	98	86	102	92	86
16	104	112	104	82	100	104	110	102	102	142	104	158	142	136	96	96	102	100	108	102	96	104	86	102
17	100	118	106	100	100	98	104	118	114	124	106	116	112	102	104	104	102	100	102	96	92	88	86	86
18	100	92	88	98	102	102	108	132	112	100	106	100	98	98	96	98	94	96	92	90	92	90	88	86
19	86	86	86	82	96	100	98	110	124	106	108	106	102	102	94	96	98	96	94	90	92	90	100	96
20	92	88	112	84	B	B	142	114	102	100	100	100	98	98	100	96	94	92	92	90	90	90	88	88
21	102	98	98	94	108	106	106	108	104	104	100	96	98	98	98	96	98	92	118	90	90	88	88	108
22	88	B	98	104	96	96	122	124	104	110	100	104	100	106	100	98	158	120	110	106	88	86	88	100
23	86	88	98	98	98	116	112	102	98	102	100	98	104	96	120	104	108	104	104	104	88	88	88	88
24	88	88	86	84	110	100	134	104	98	98	102	98	100	92	92	92	94	92	94	102	88	92	104	98
25	98	98	94	90	86	114	106	106	110	106	108	108	106	108	104	116	106	106	106	102	102	104	102	100
26	100	96	102	88	88	84	106	106	94	96	96	94	96	116	118	148	110	108	104	100	98	100	100	96
27	92	94	94	92	94	90	124	118	102	102	100	100	106	116	120	128	112	116	112	98	98	98	98	96
28	94	94	102	94	94	88	98	102	100	114	106	108	108	112	110	110	114	102	104	98	96	96	98	98
29	98	96	94	94	104	112	108	106	98	104	108	98	94	100	96	100	98	96	102	118	B	98	B	B
30	94	B	B	B	B	B	116	116	106	104	98	158	100	106	102	102	98	96	158	92	88	86	86	84
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	29	28	27	30	30	30	30	30	30	30	30	29	30	30	30	30	30	29	30	29	29
MED	97	95	94	92	96	100	110	106	104	103	100	99	100	103	100	103	105	102	104	99	94	94	94	98
U Q	100	99	100	98	99	106	116	116	108	106	106	108	106	112	116	110	112	110	108	104	100	102	100	101
L Q	92	93	92	86	88	92	102	104	102	100	98	96	98	98	96	96	98	96	100	94	89	90	88	93

JUN. 2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2021 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUN. 2021 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

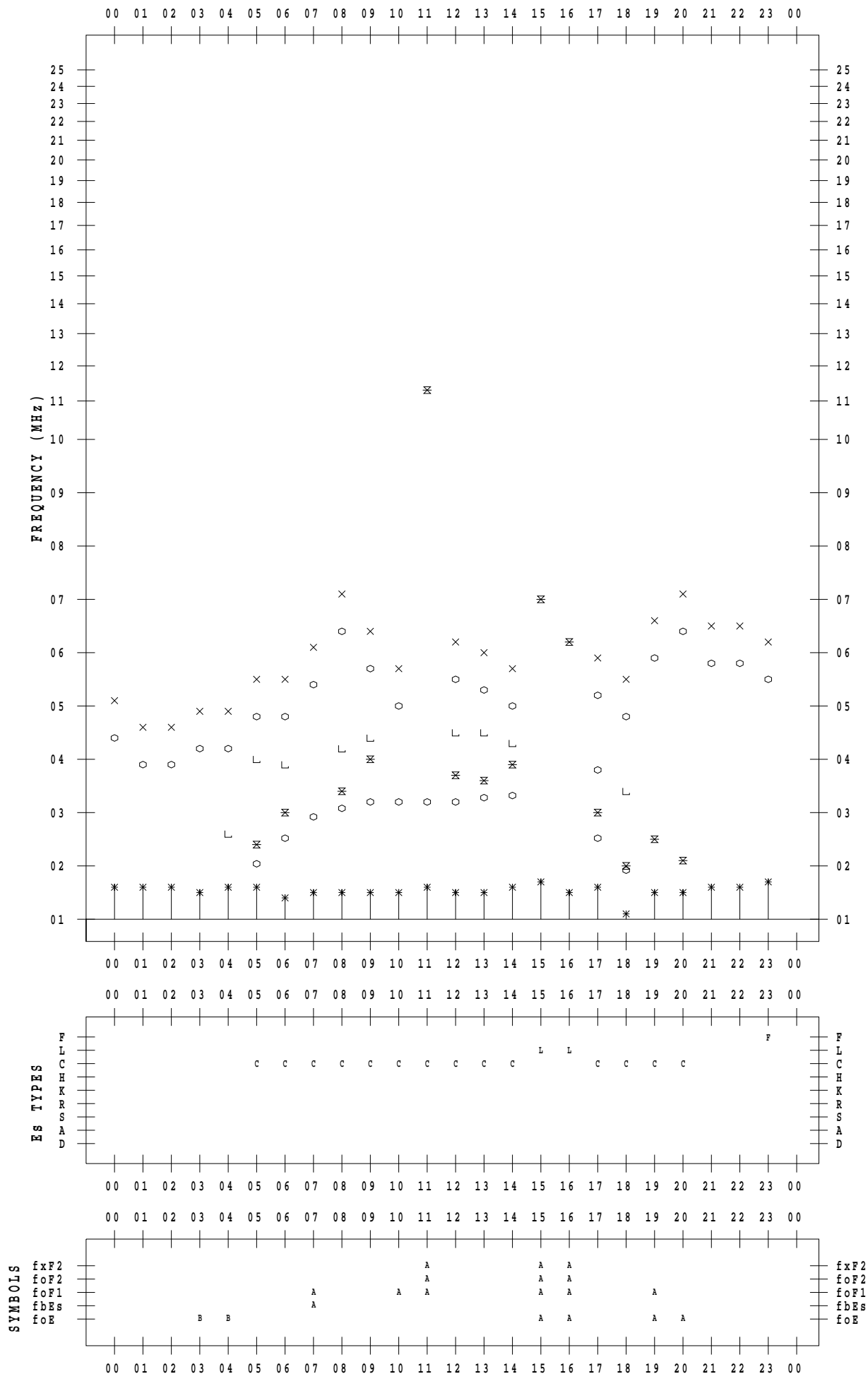
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 1

135 ° E MEAN TIME



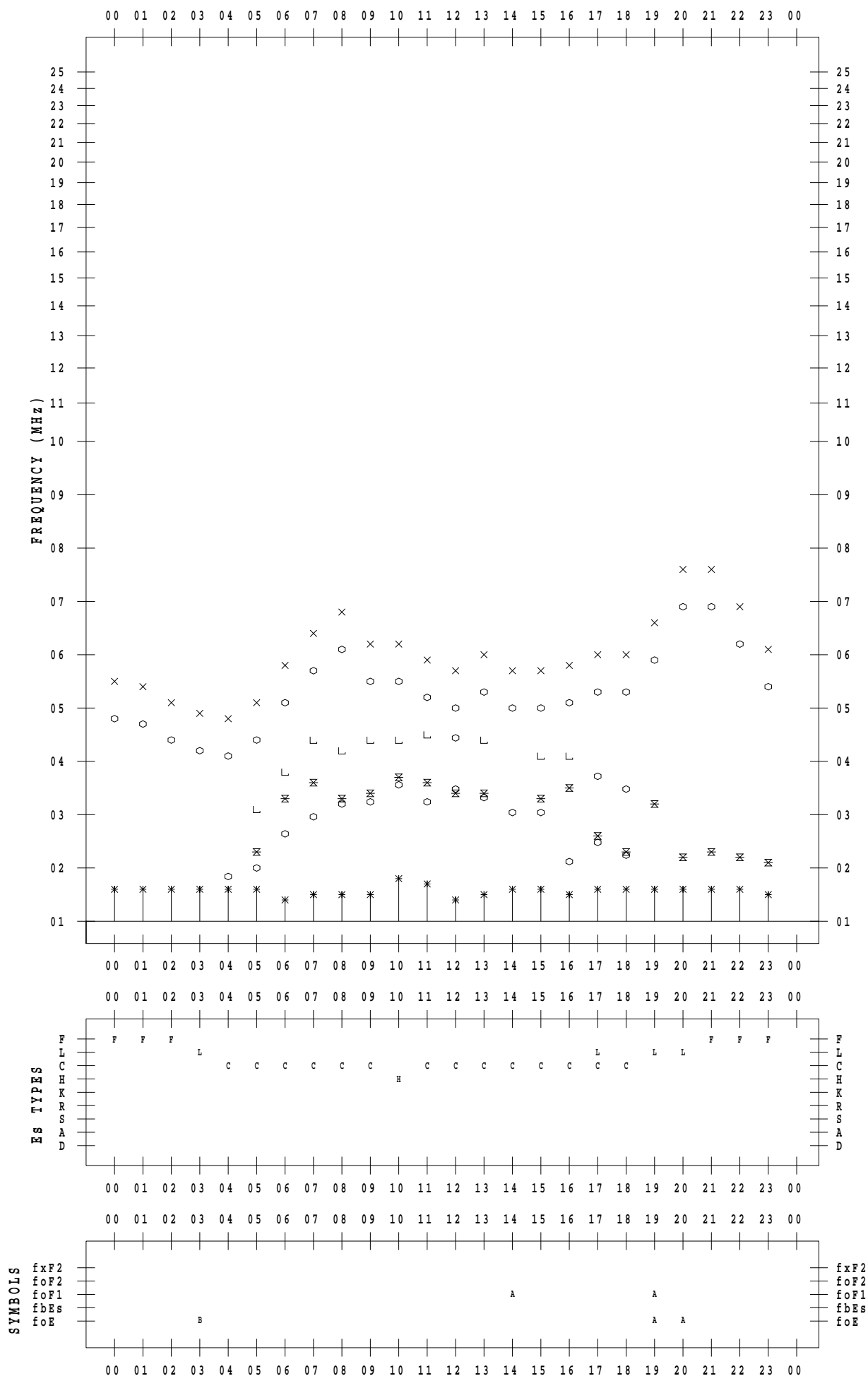
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 2

135 ° E MEAN TIME



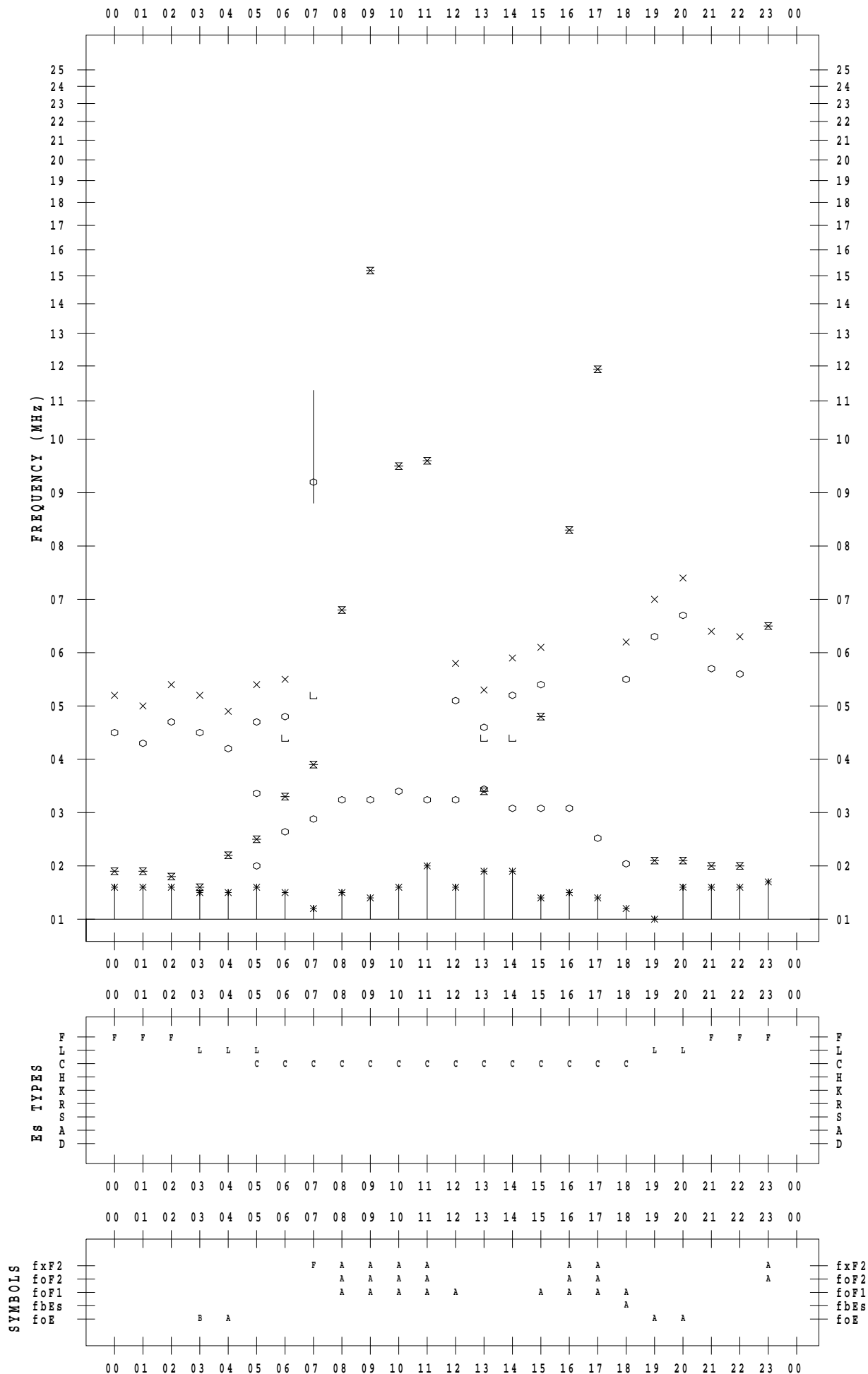
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 3

135 ° E MEAN TIME



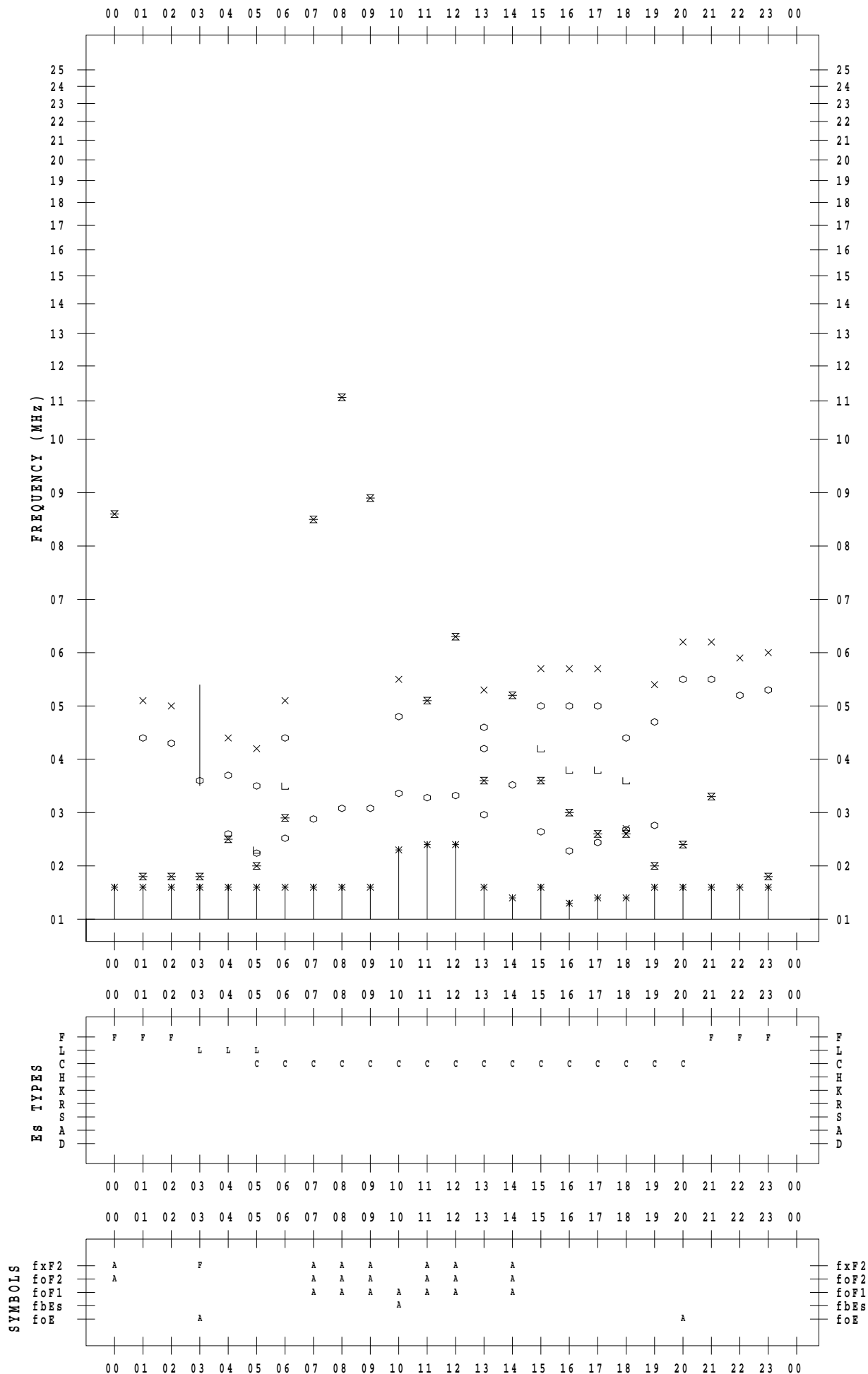
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 4

135 ° E MEAN TIME



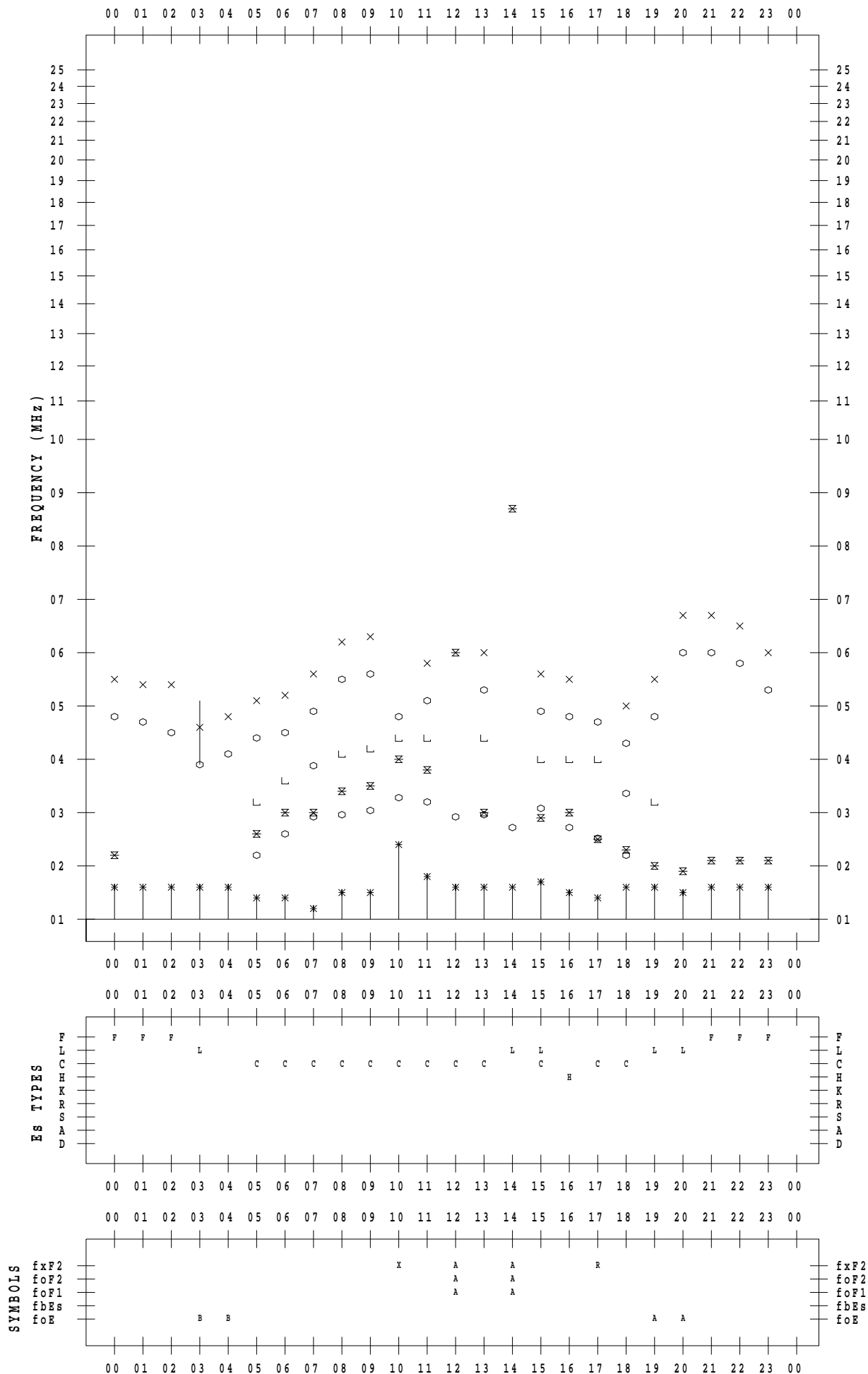
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 5

135 ° E MEAN TIME



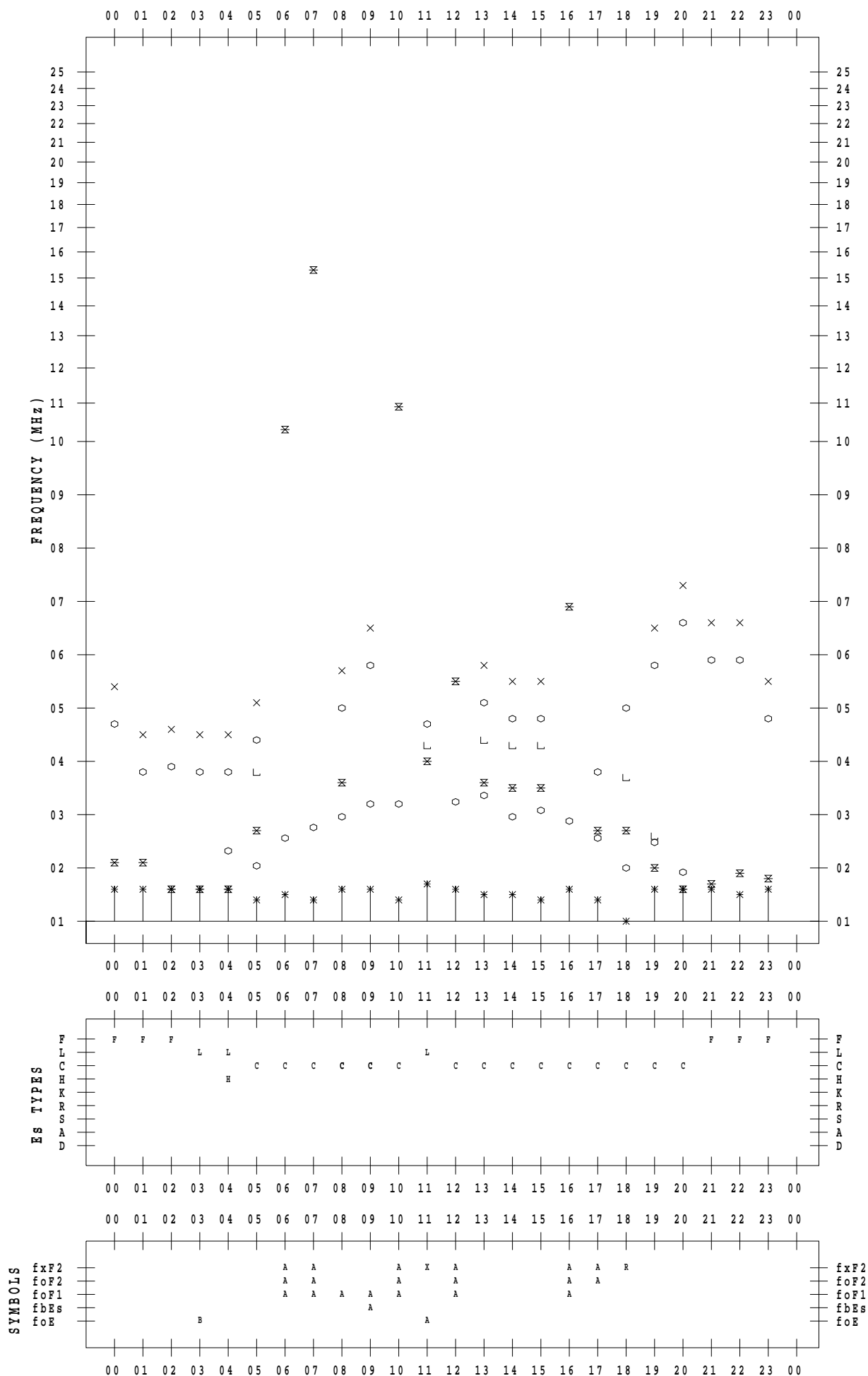
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 6

135 ° E MEAN TIME



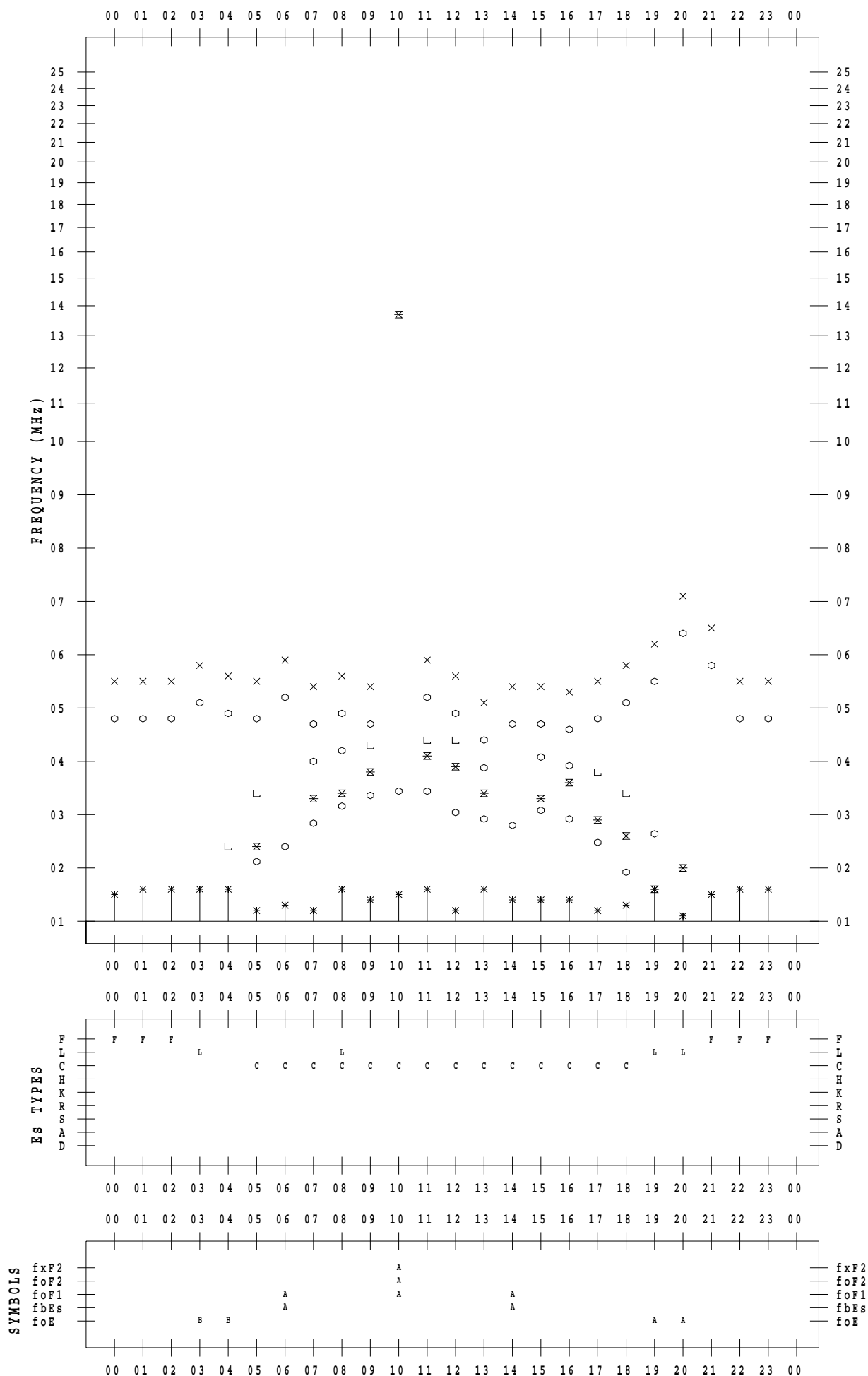
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 7

135 ° E MEAN TIME



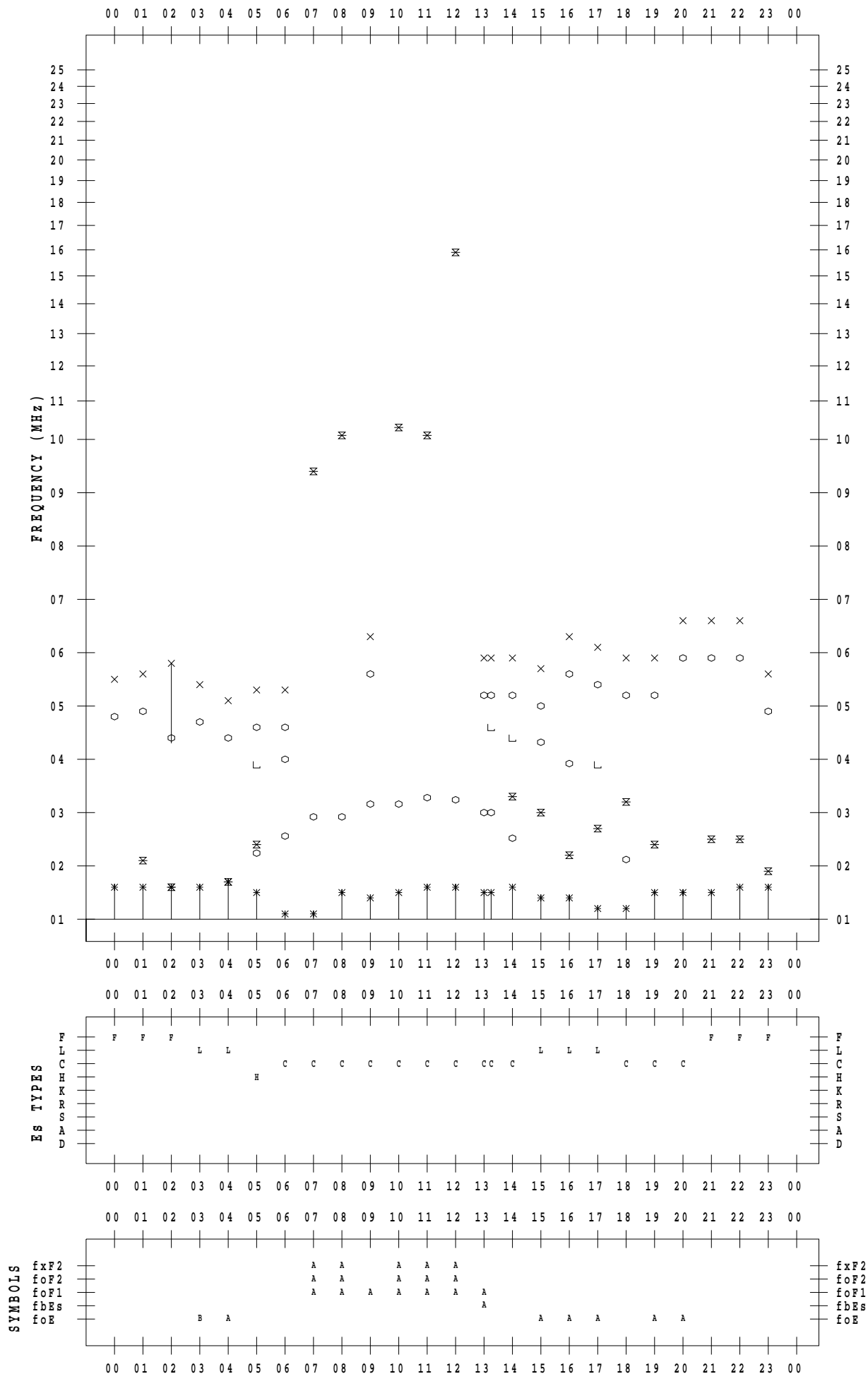
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 8

135 ° E MEAN TIME



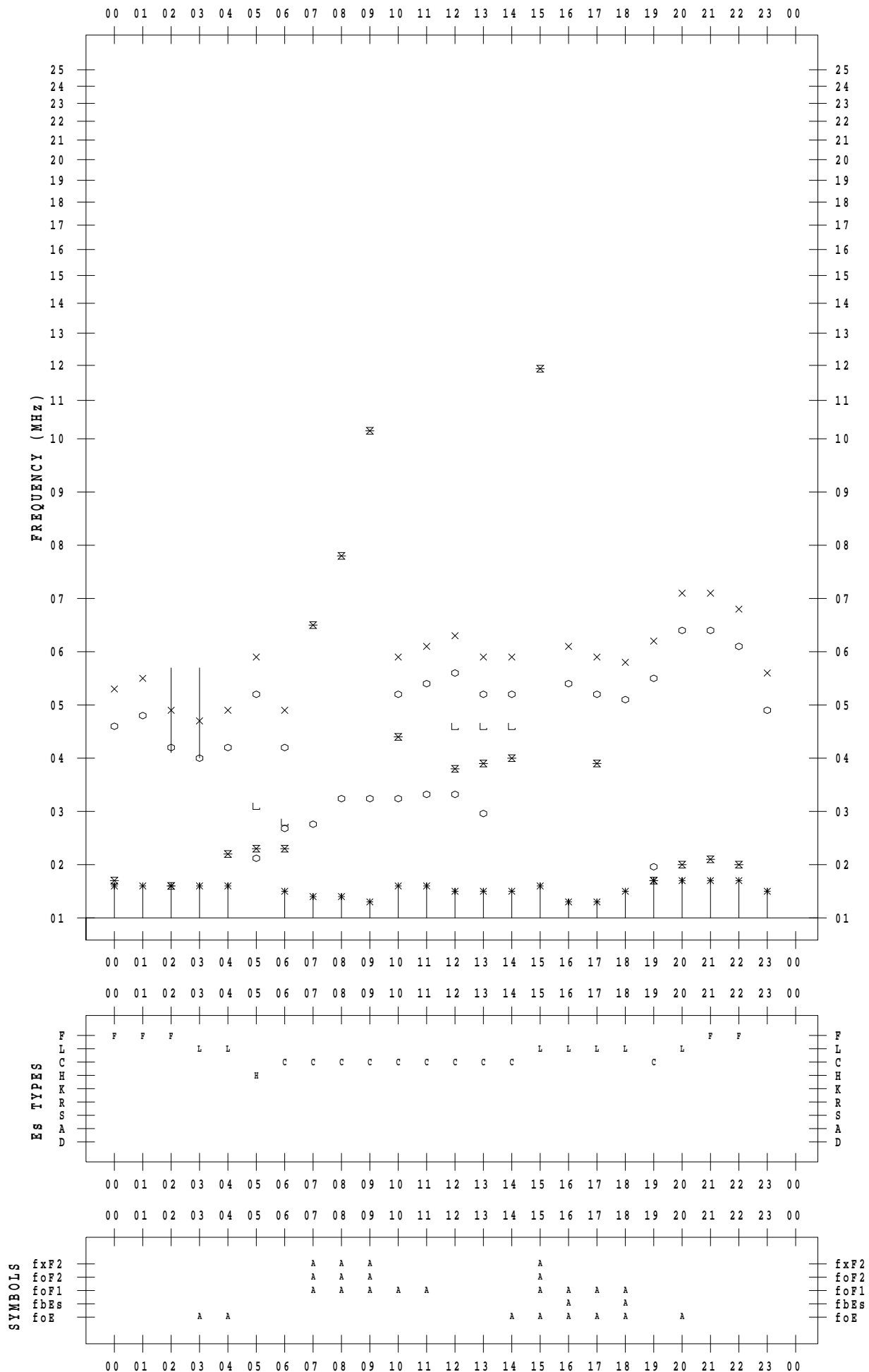
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 9

135 ° E MEAN TIME



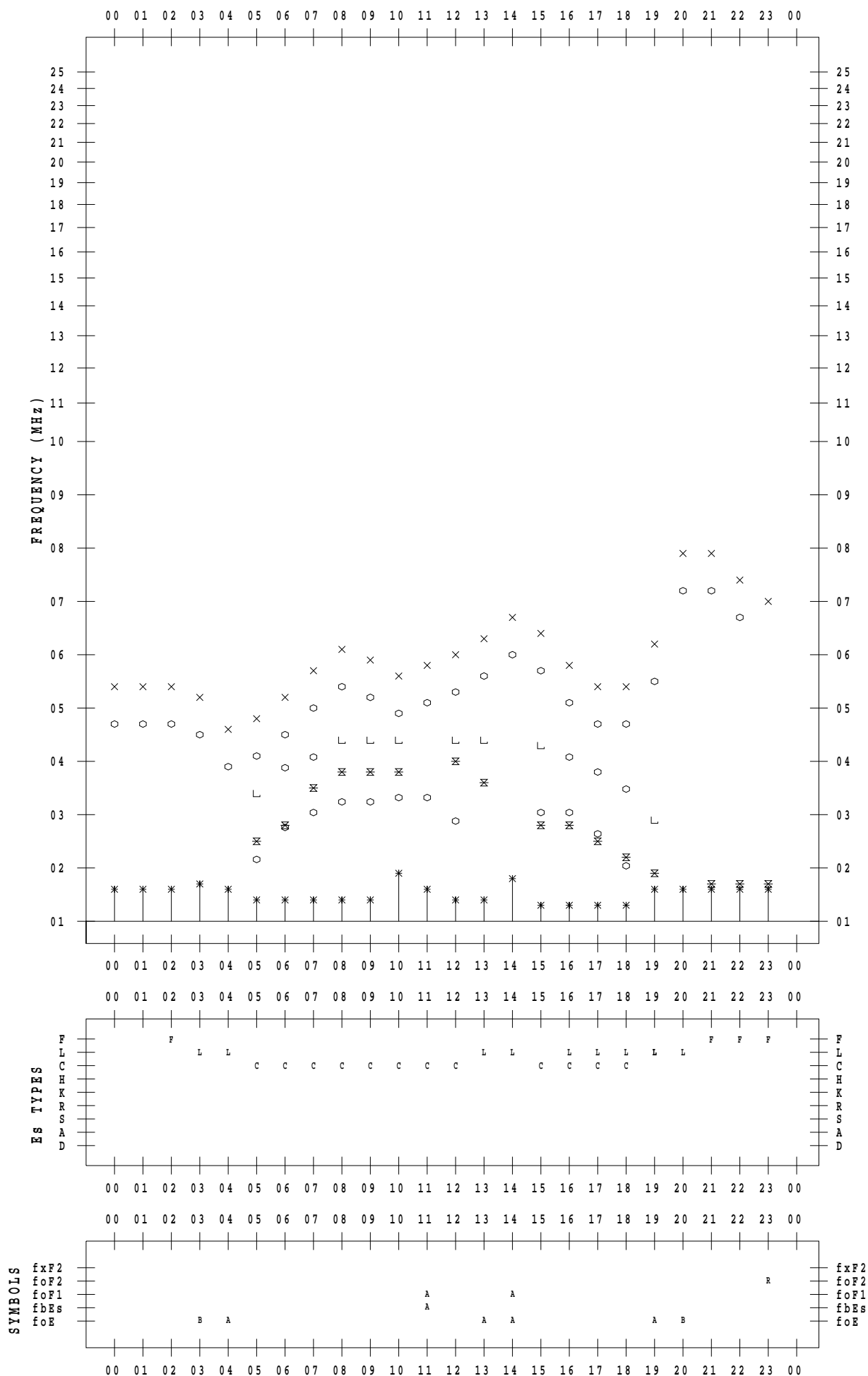
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 10

135 ° E MEAN TIME



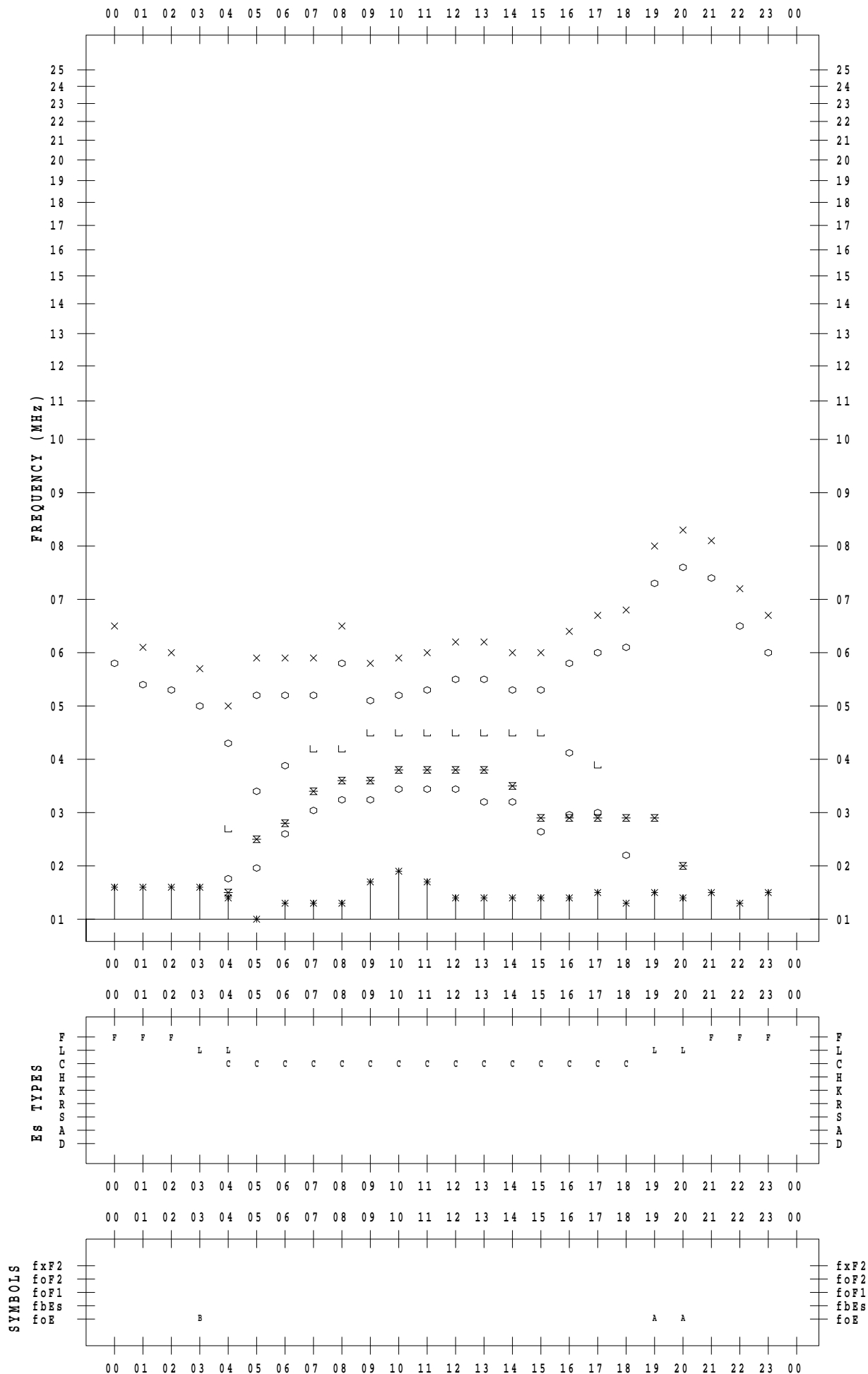
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 11

135 ° E MEAN TIME



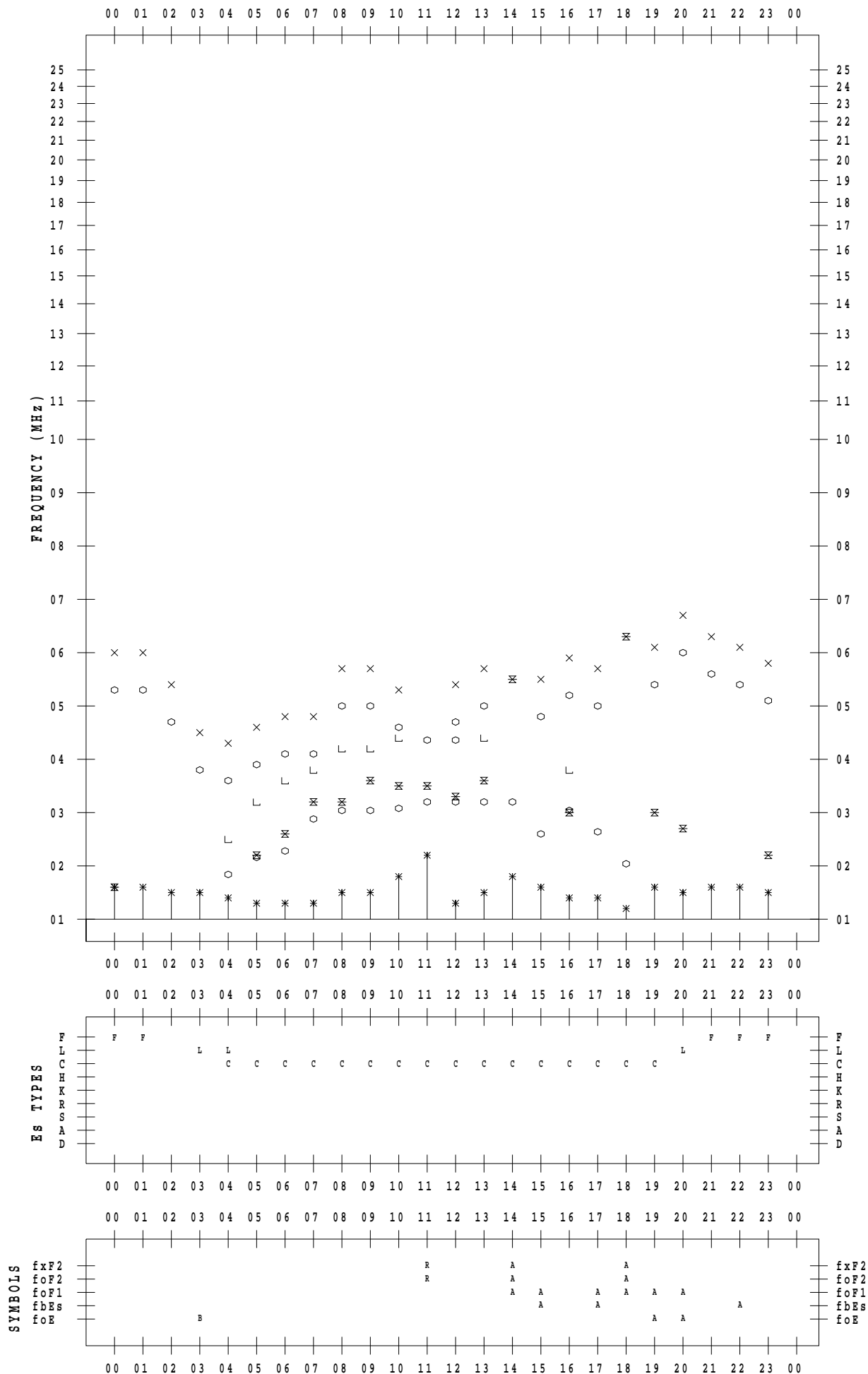
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 12

135 ° E MEAN TIME



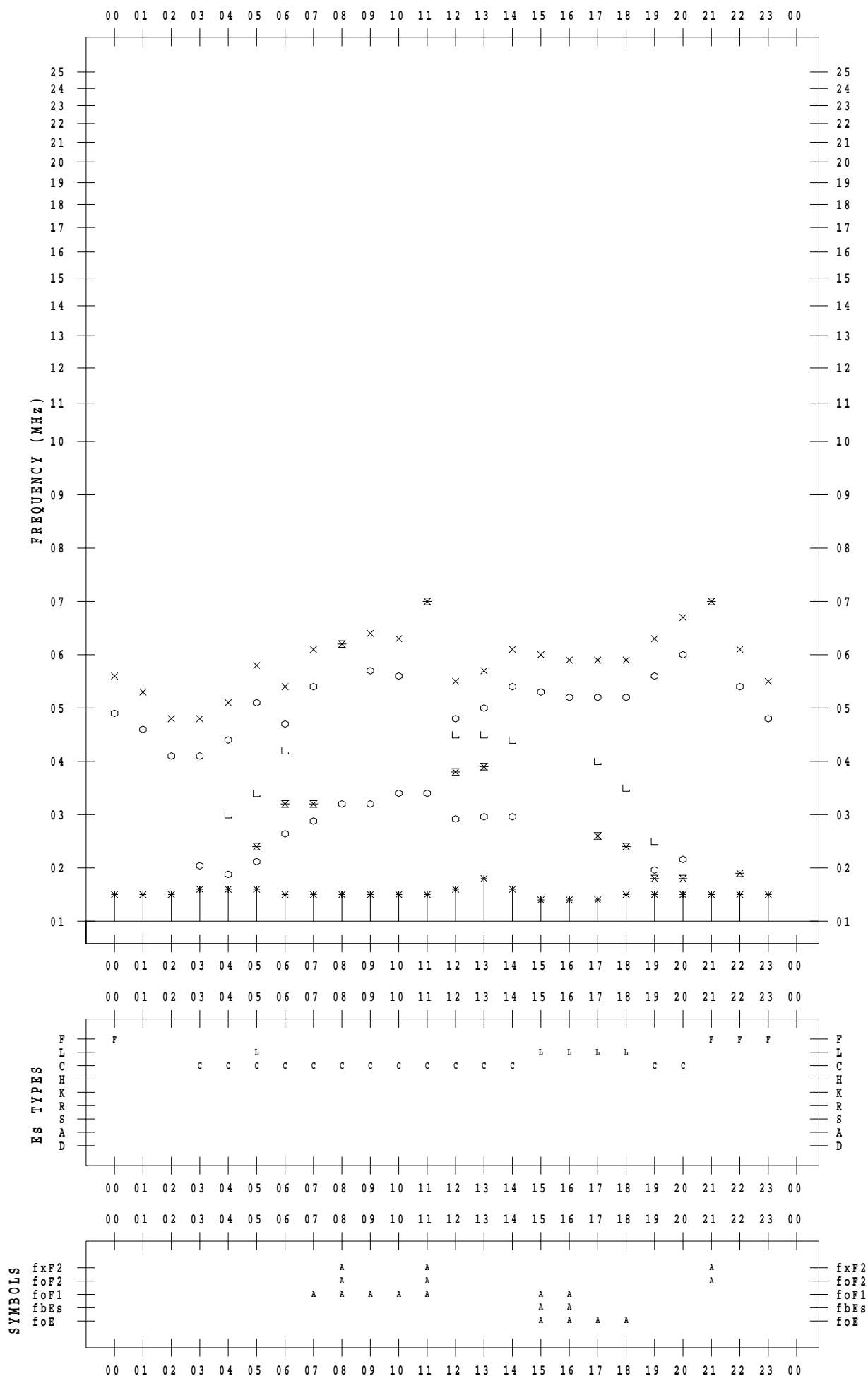
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 13

135 ° E MEAN TIME



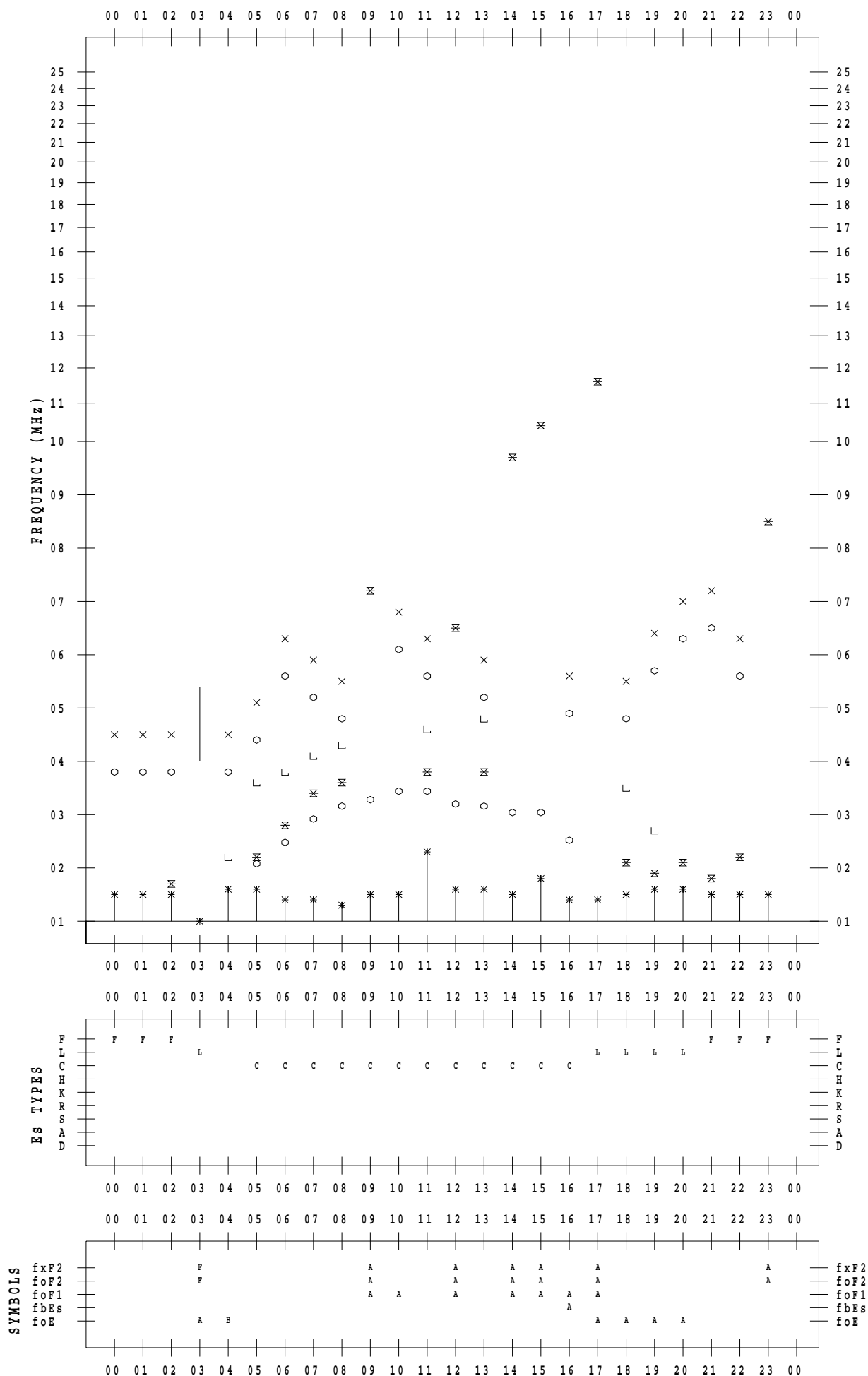
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 14

135 ° E MEAN TIME



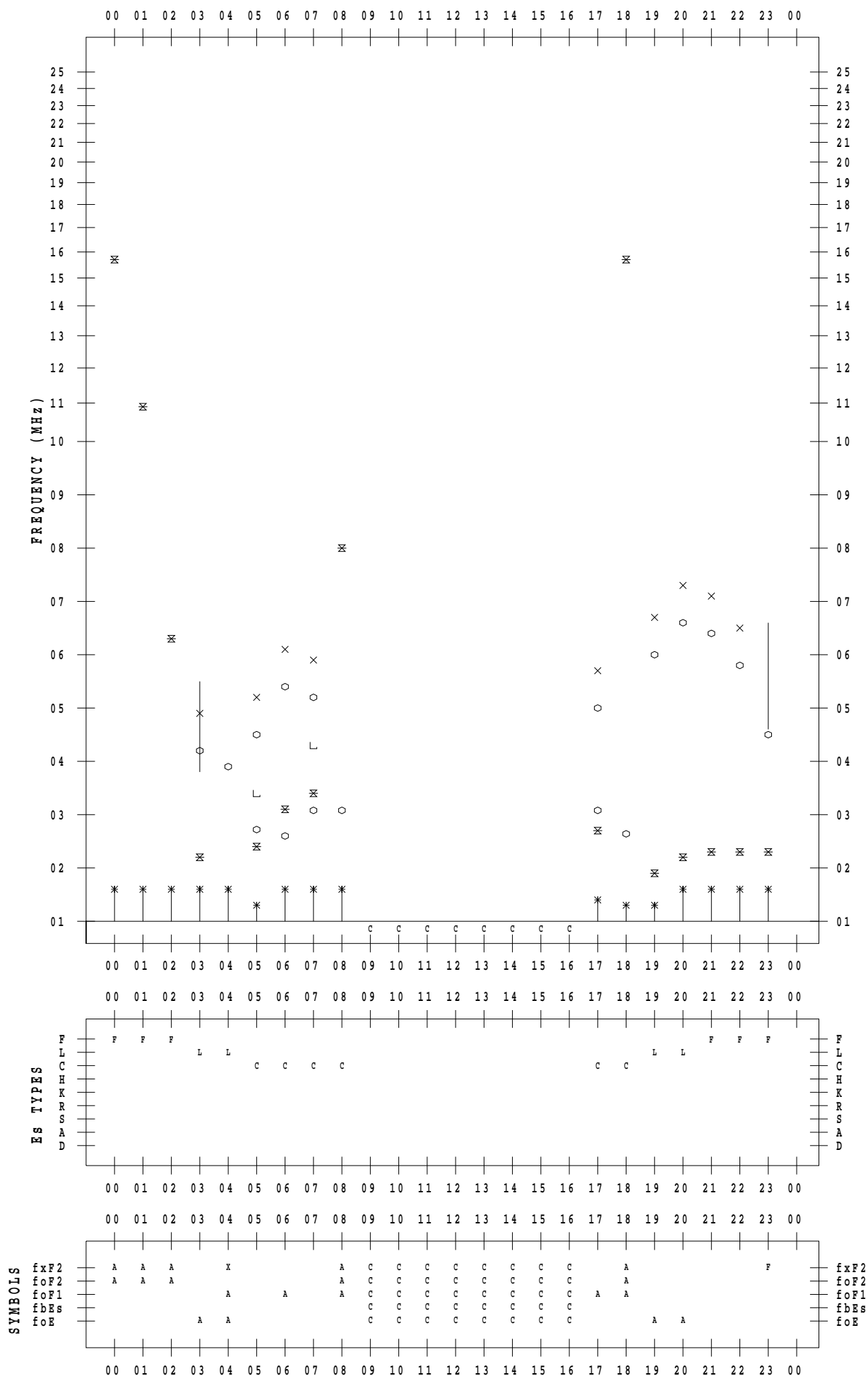
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 15

135 ° E MEAN TIME



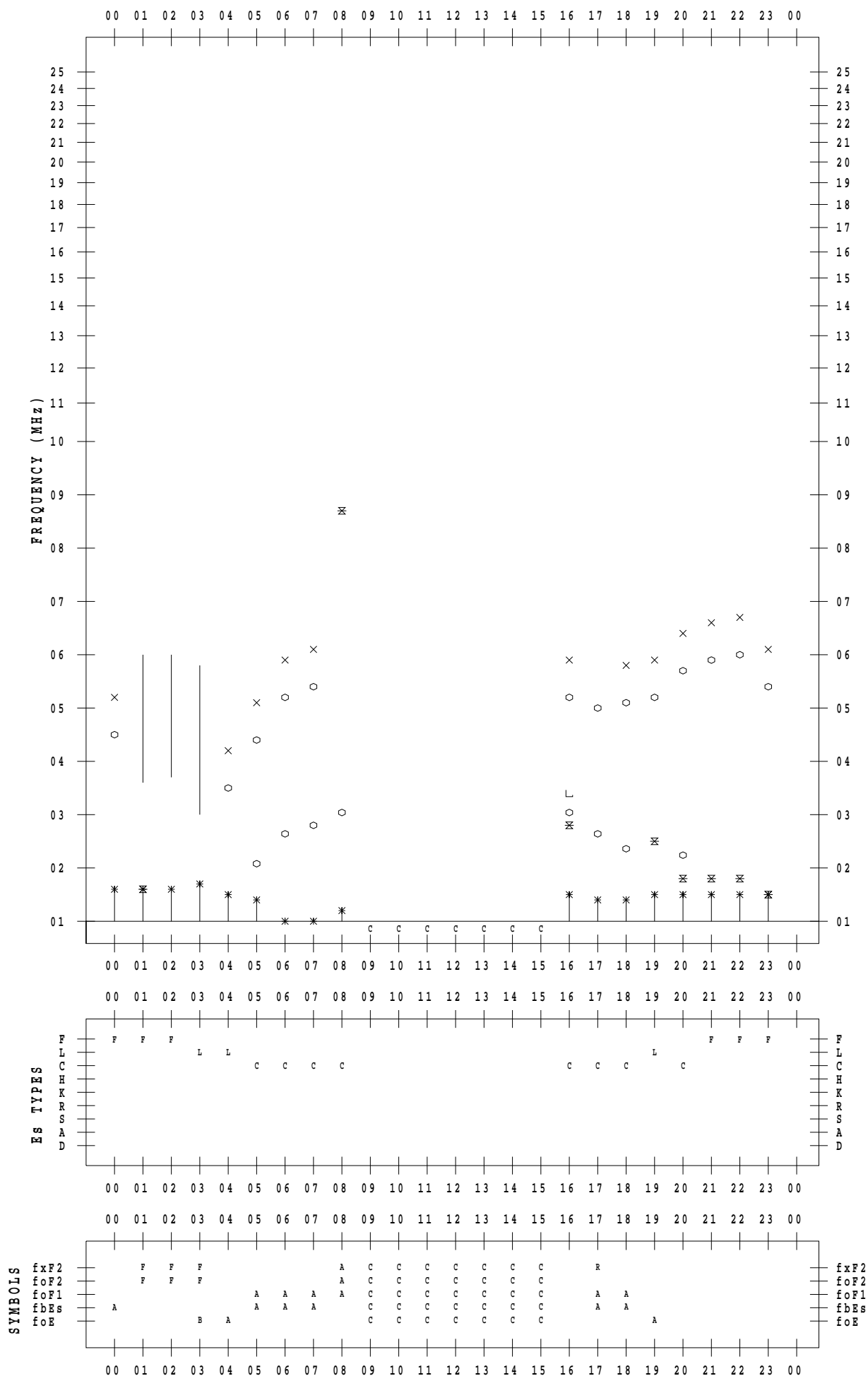
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 16

135 ° E MEAN TIME



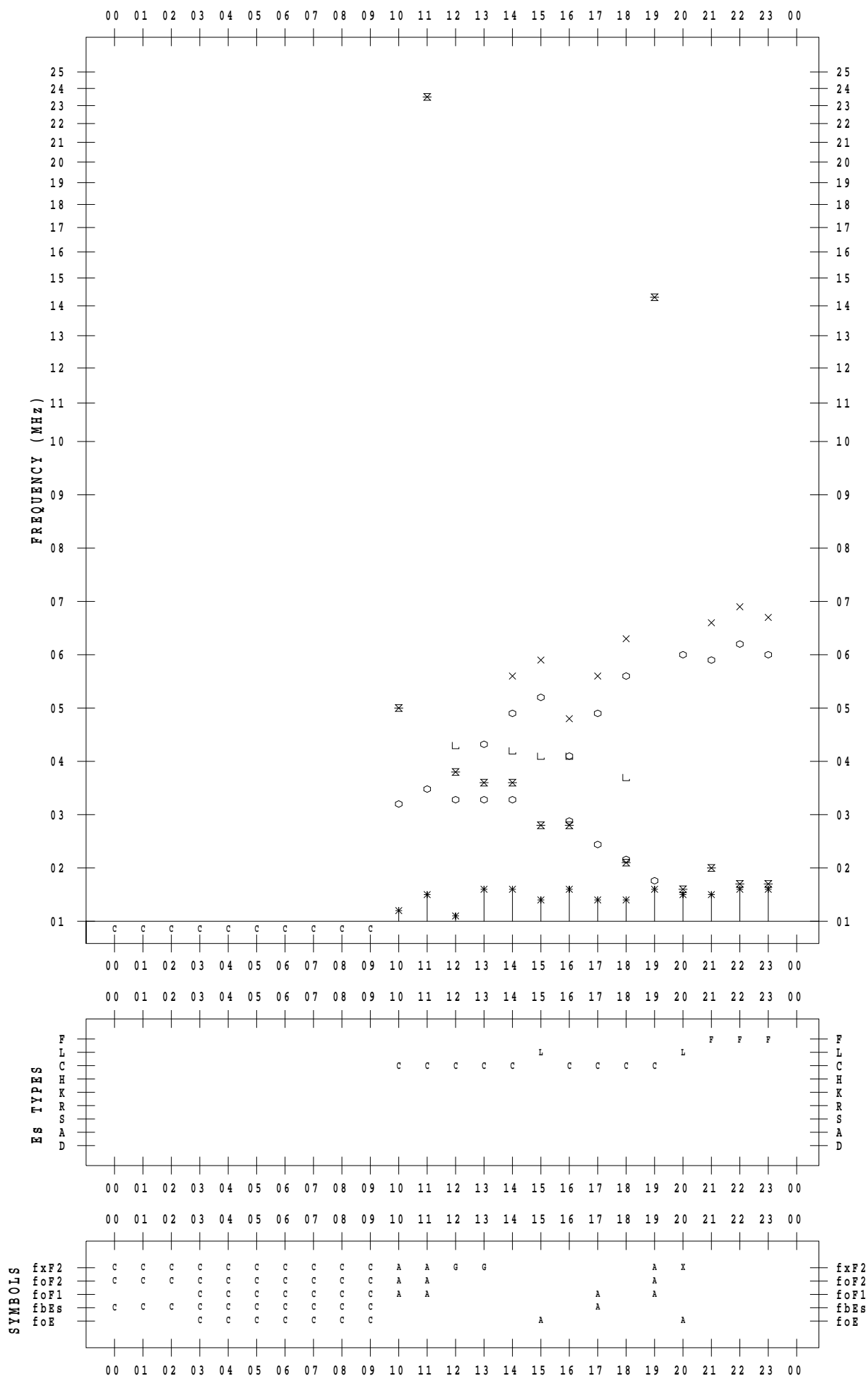
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 17

135 ° E MEAN TIME



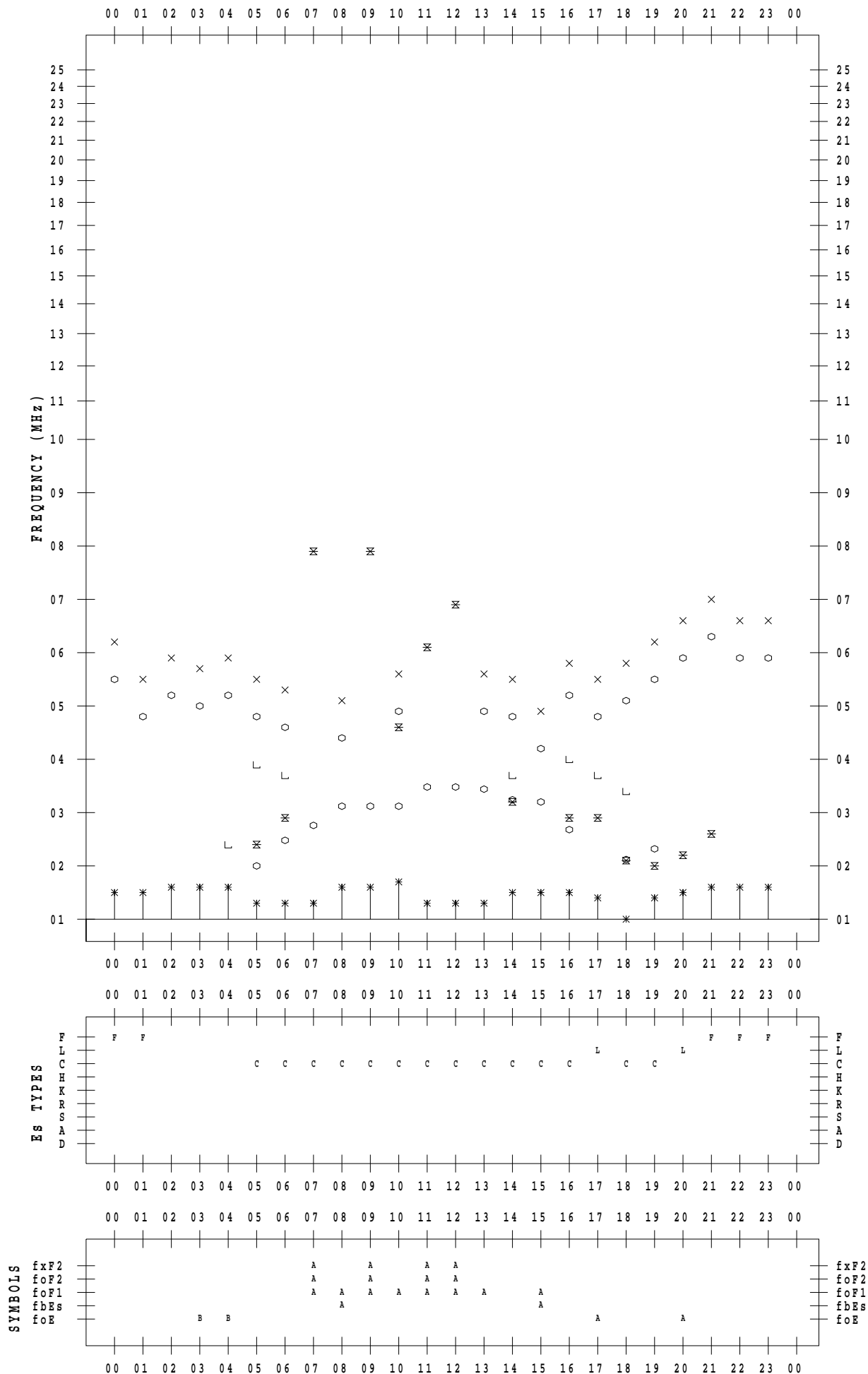
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 18

135 ° E MEAN TIME



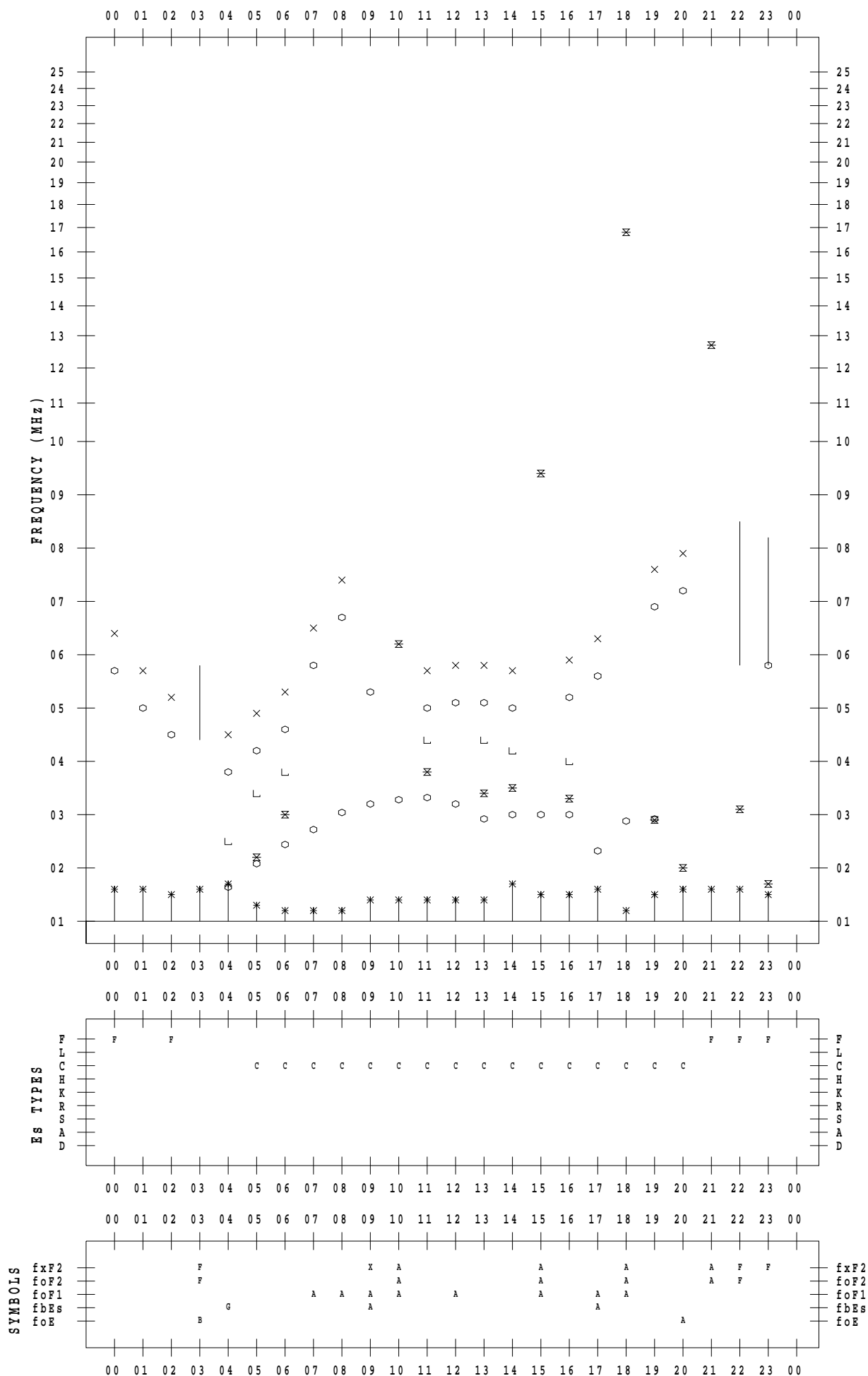
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 19

135 ° E MEAN TIME



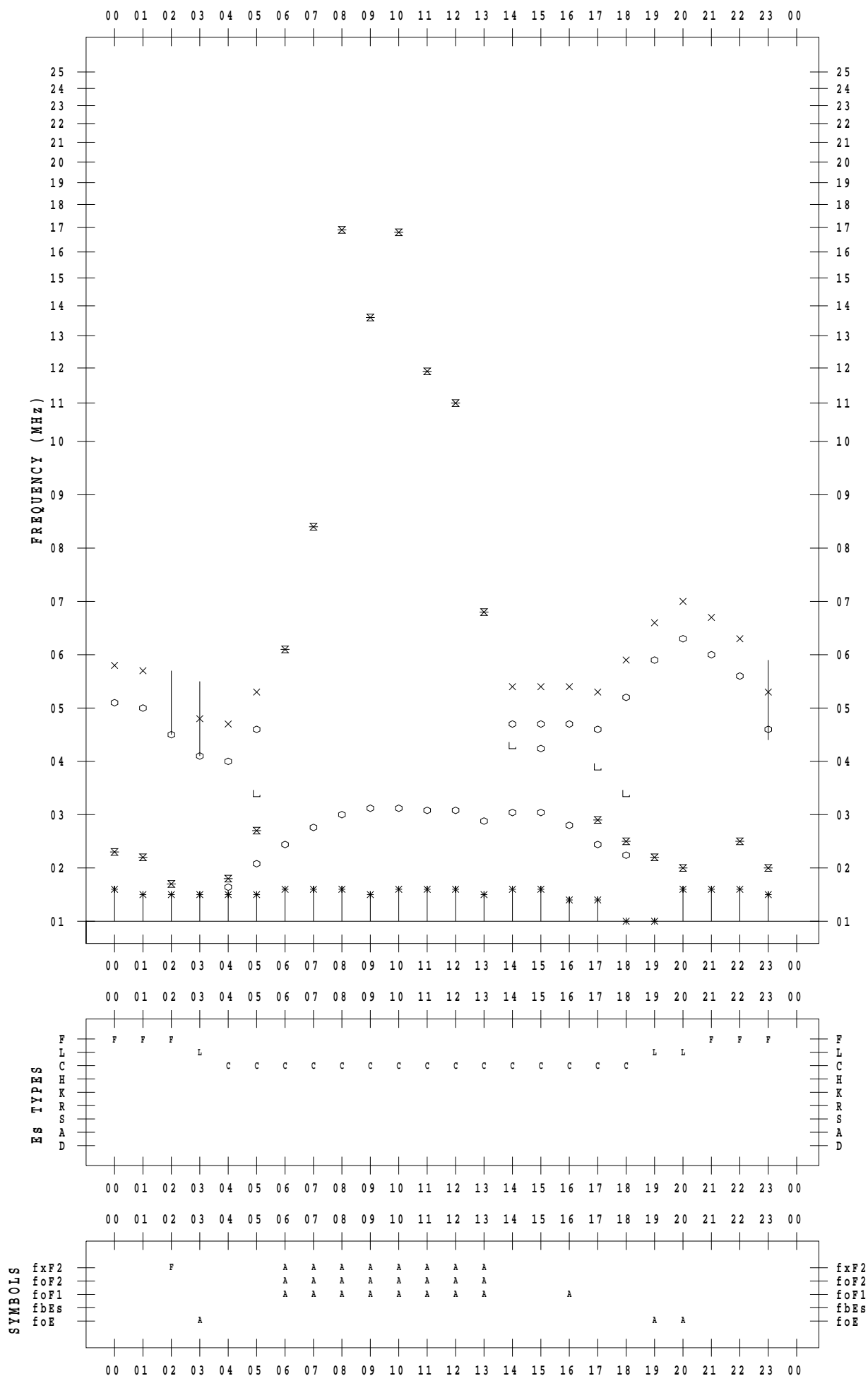
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 20

135 ° E MEAN TIME



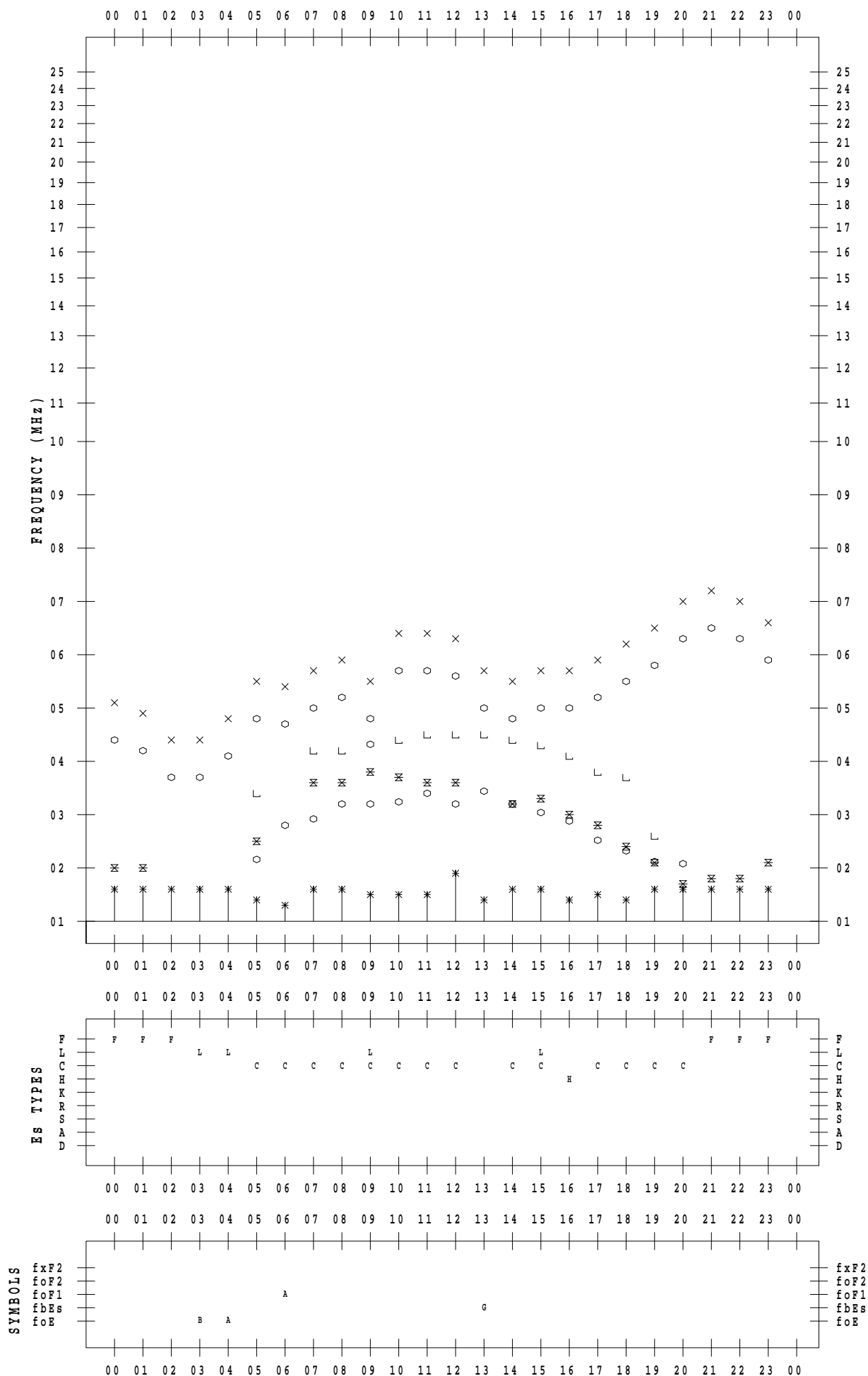
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 21

135 ° E MEAN TIME



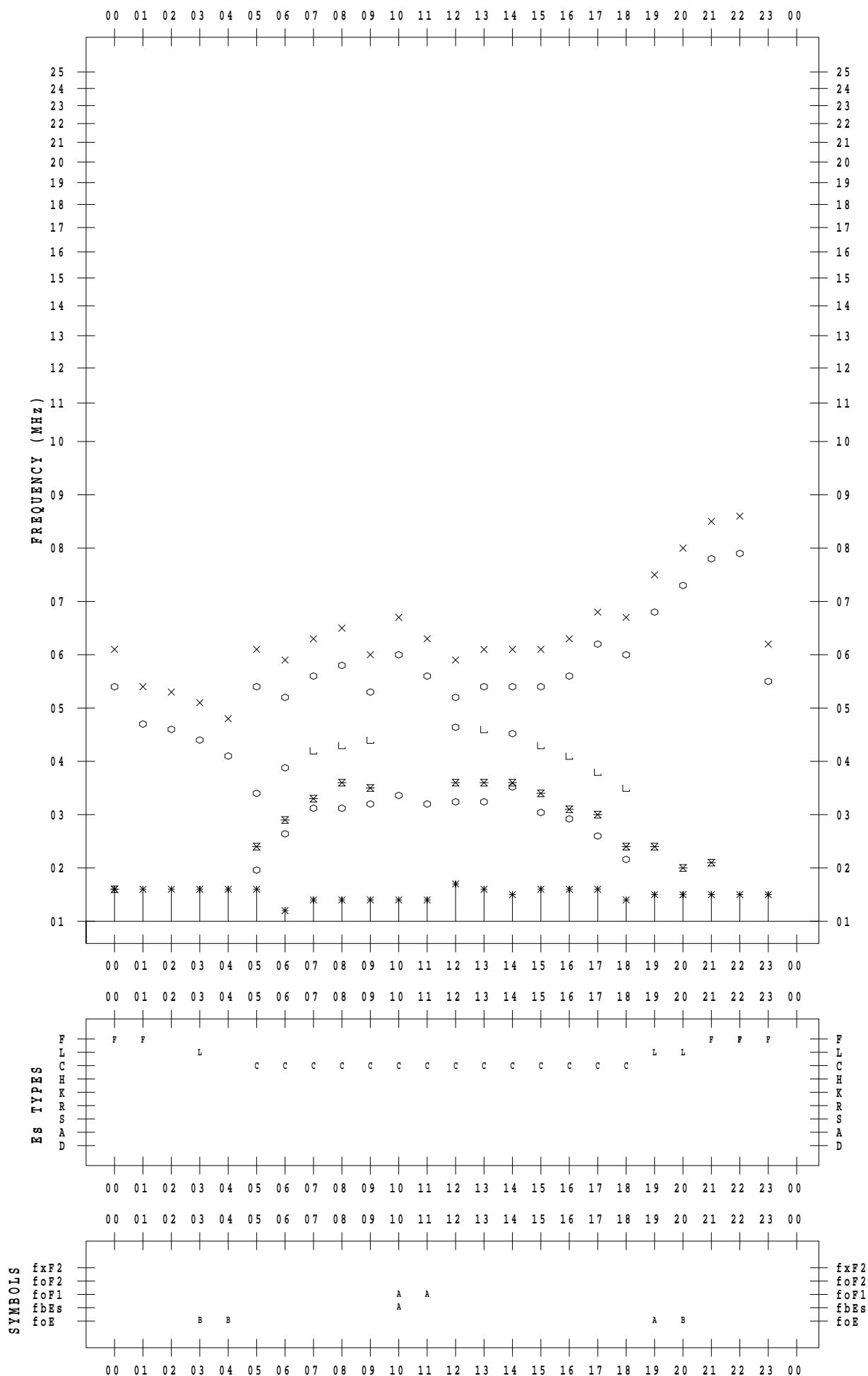
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 22

135 ° E MEAN TIME



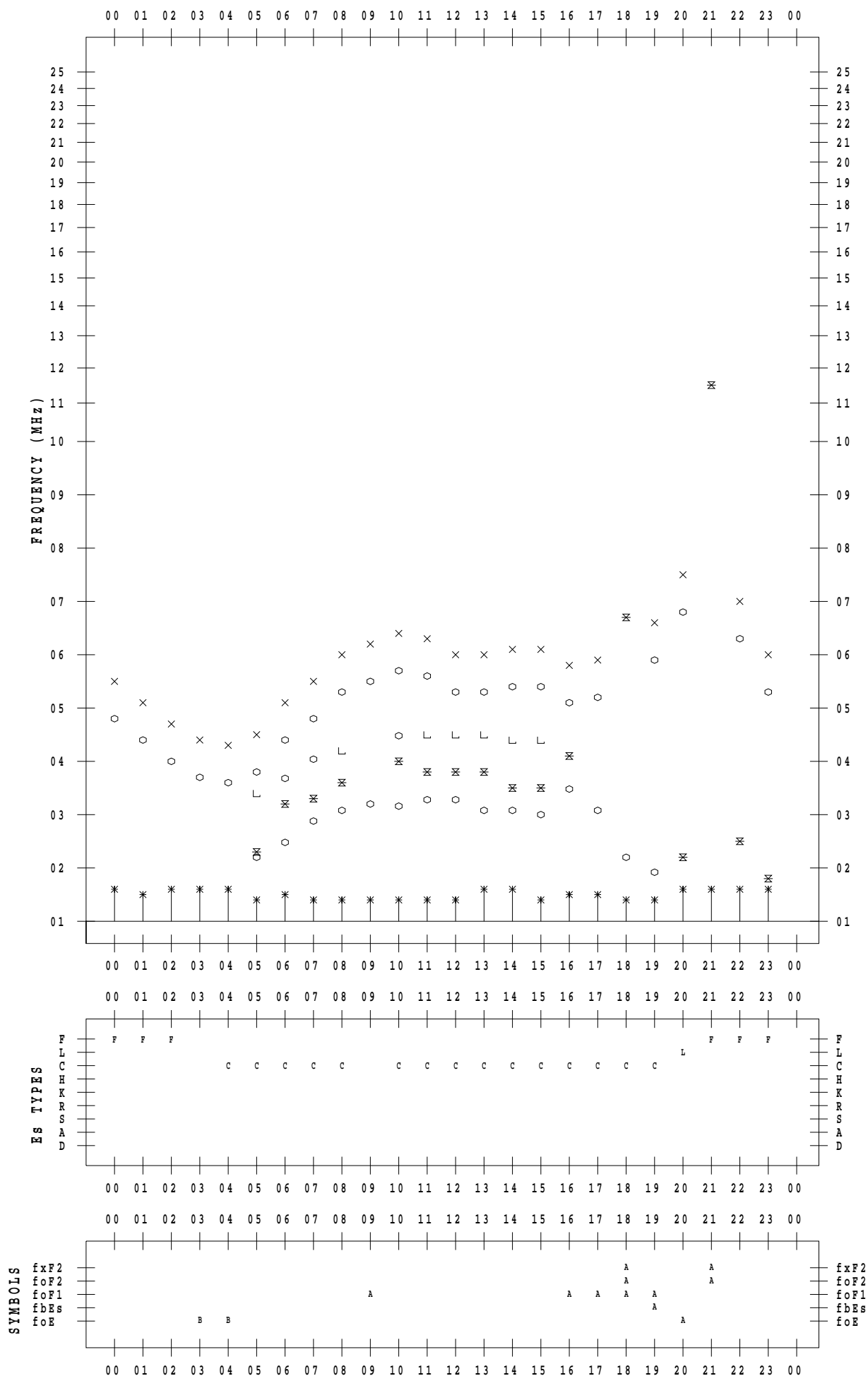
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 23

135 ° E MEAN TIME



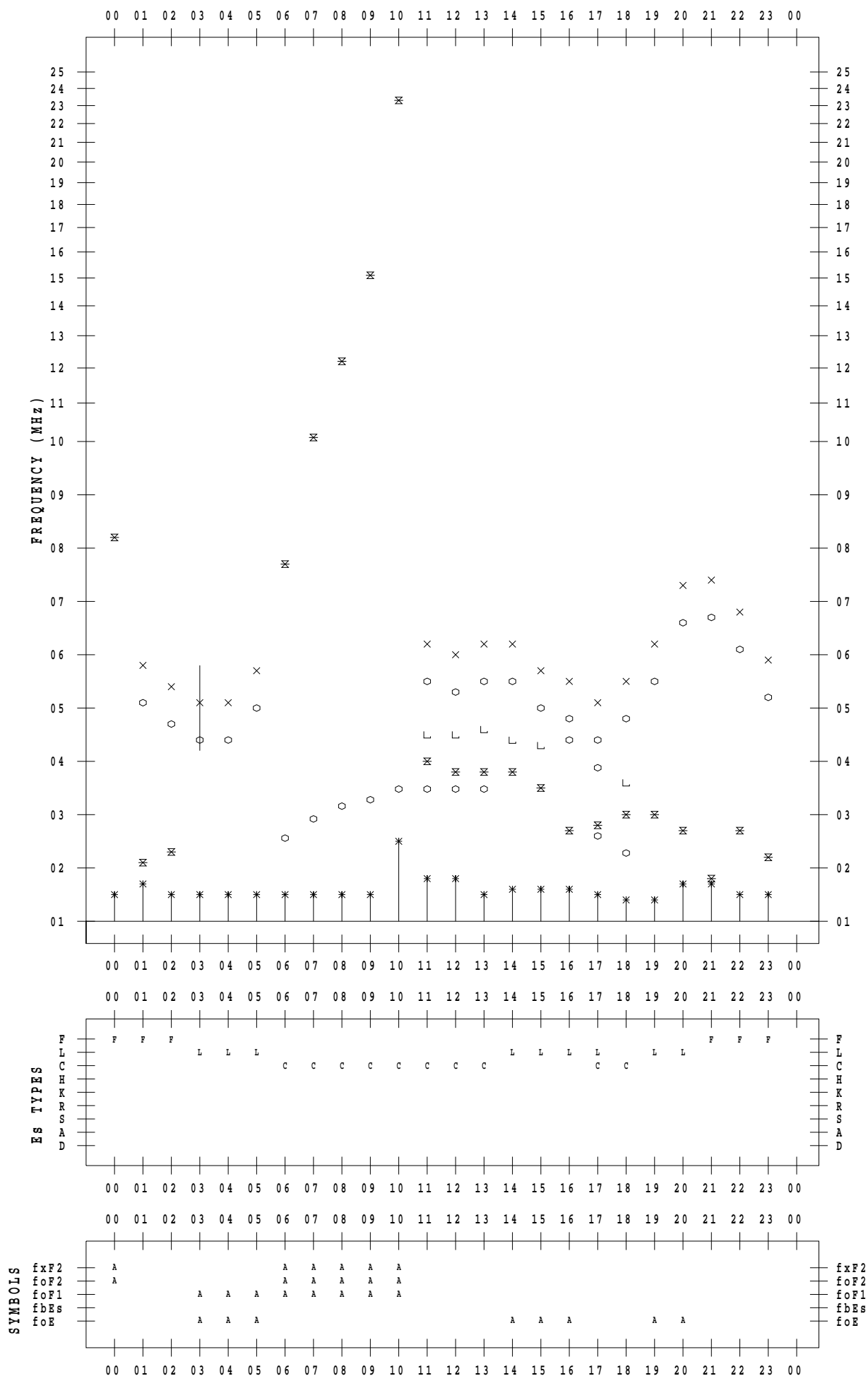
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 24

135 ° E MEAN TIME



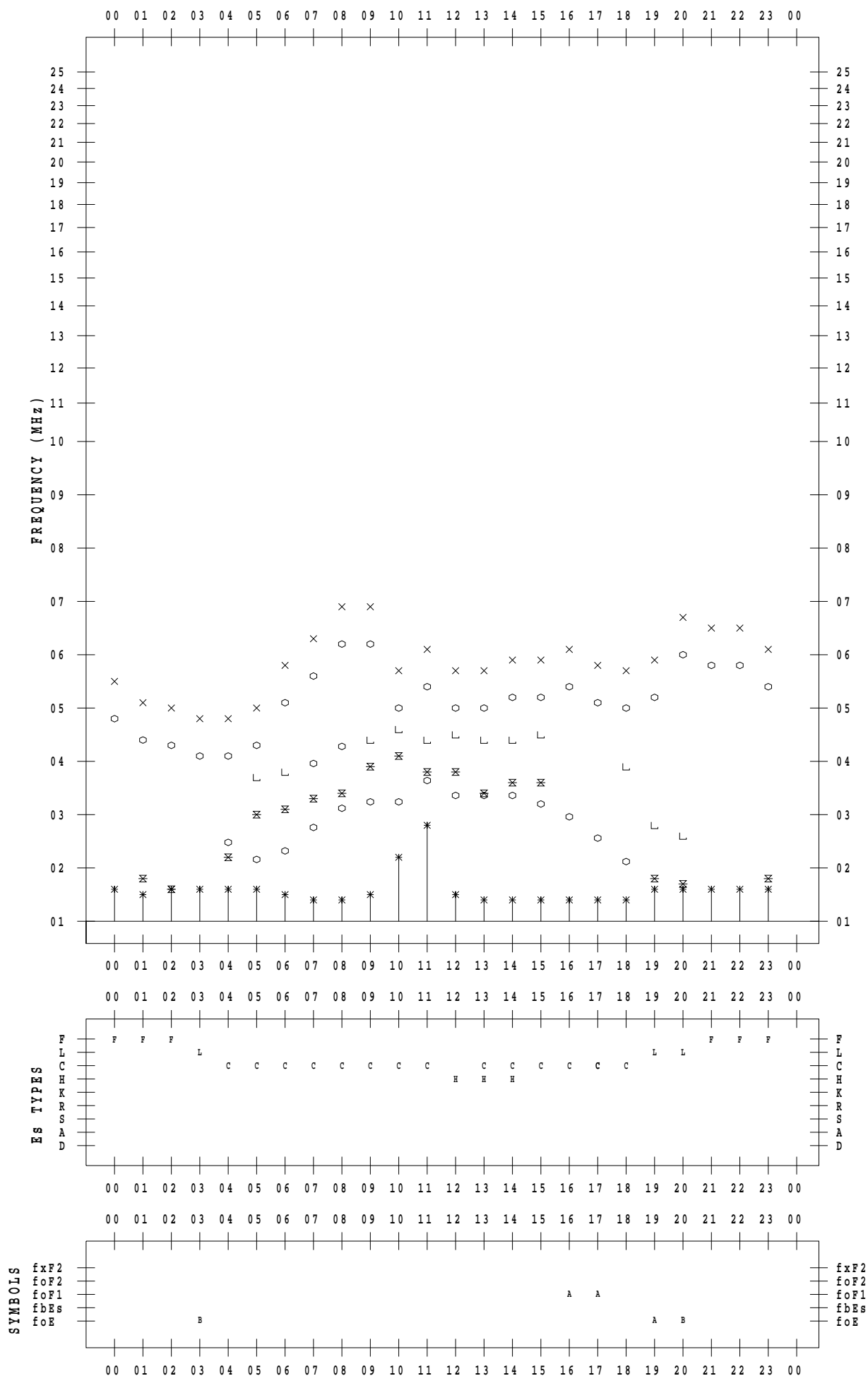
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 25

135 ° E MEAN TIME



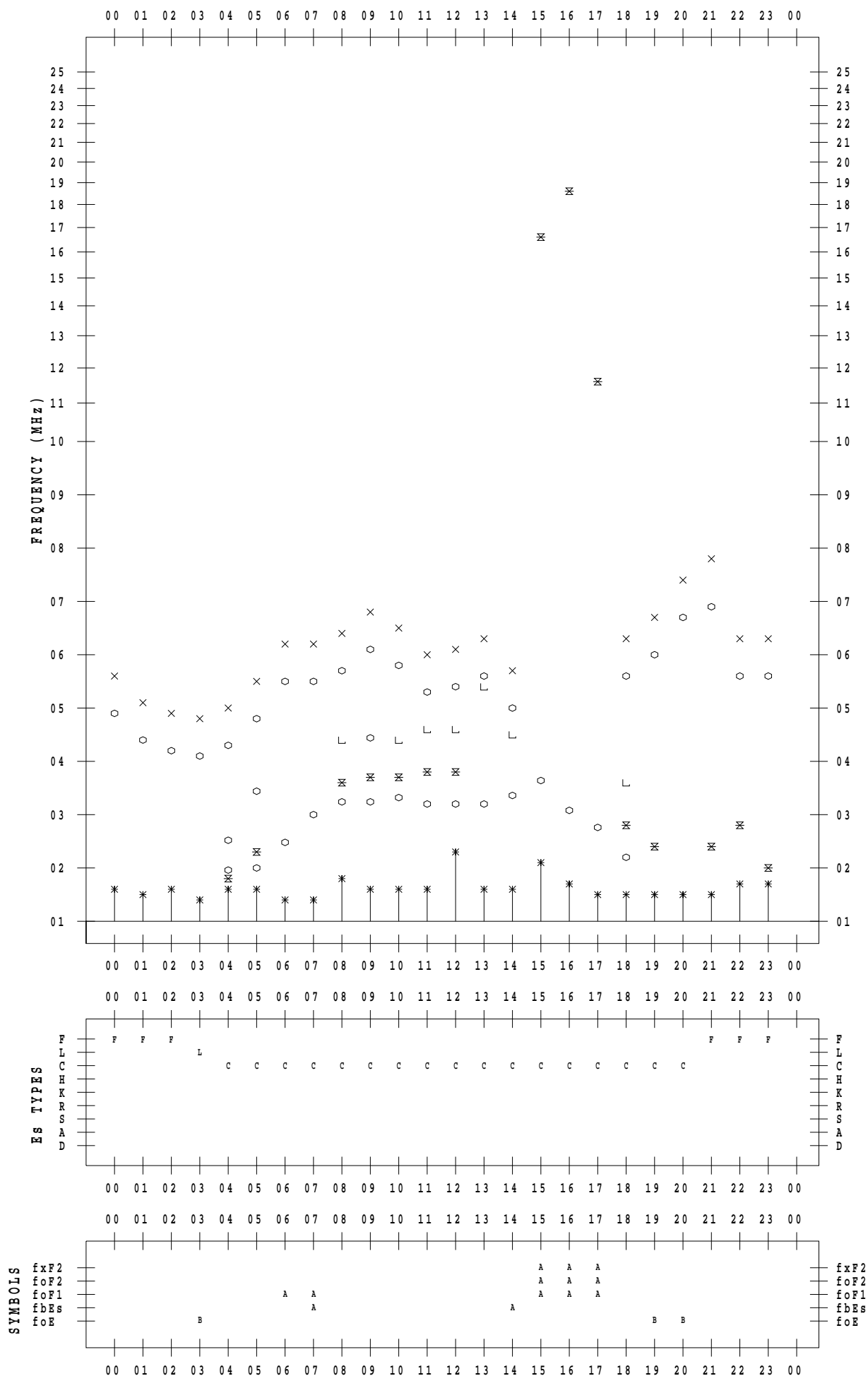
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 26

135 ° E MEAN TIME



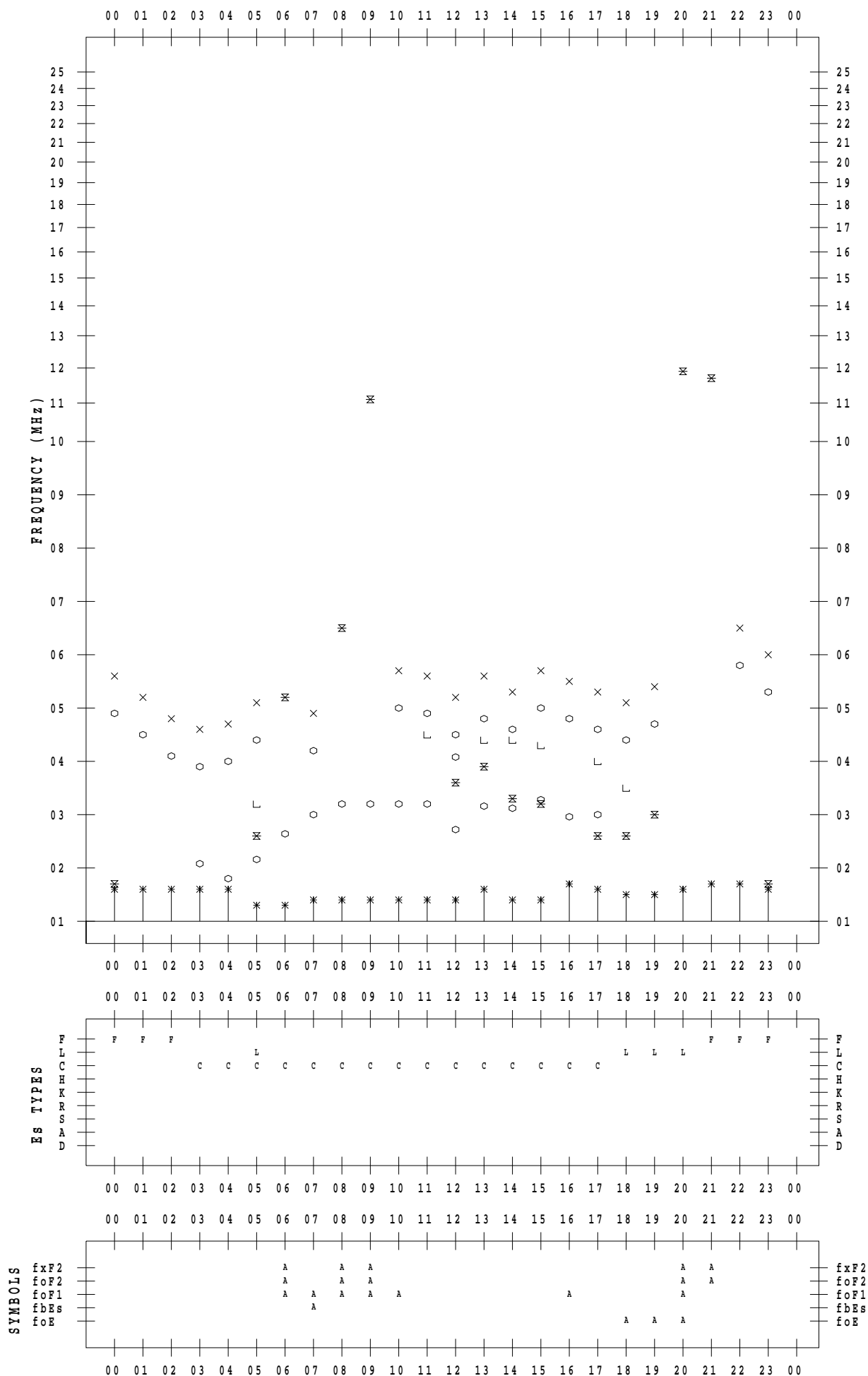
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 27

135 ° E MEAN TIME



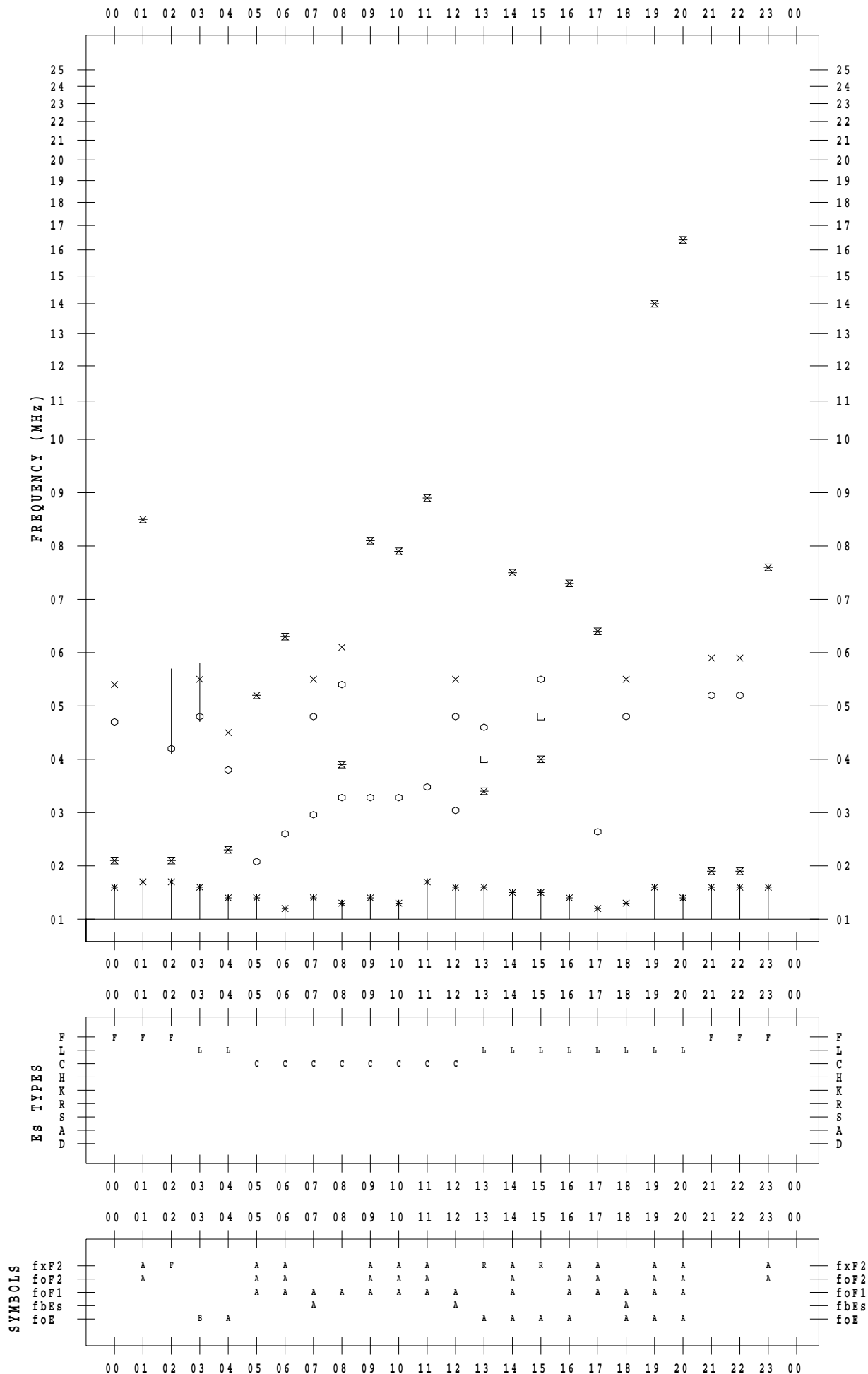
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 28

135 ° E MEAN TIME



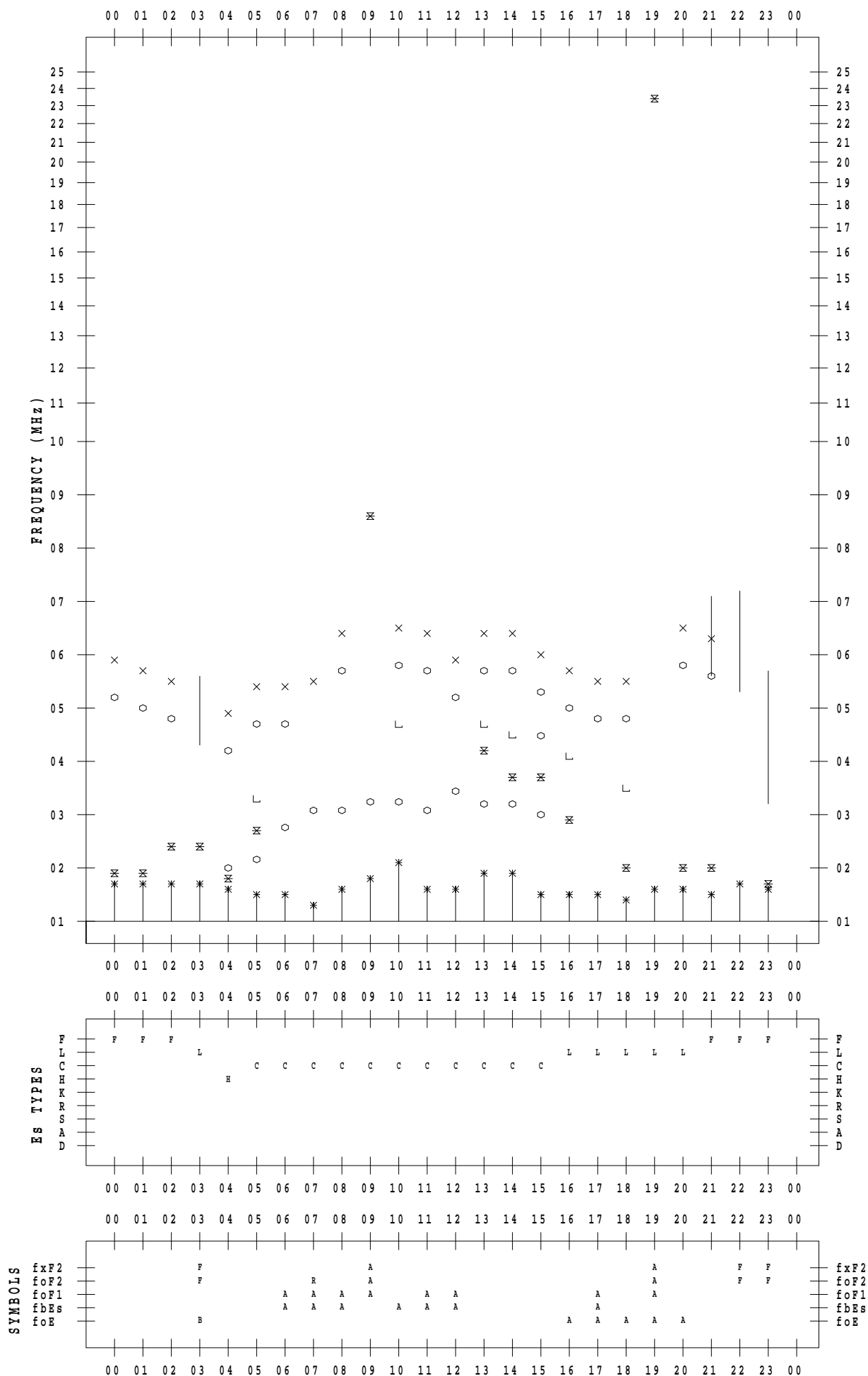
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 29

135 ° E MEAN TIME



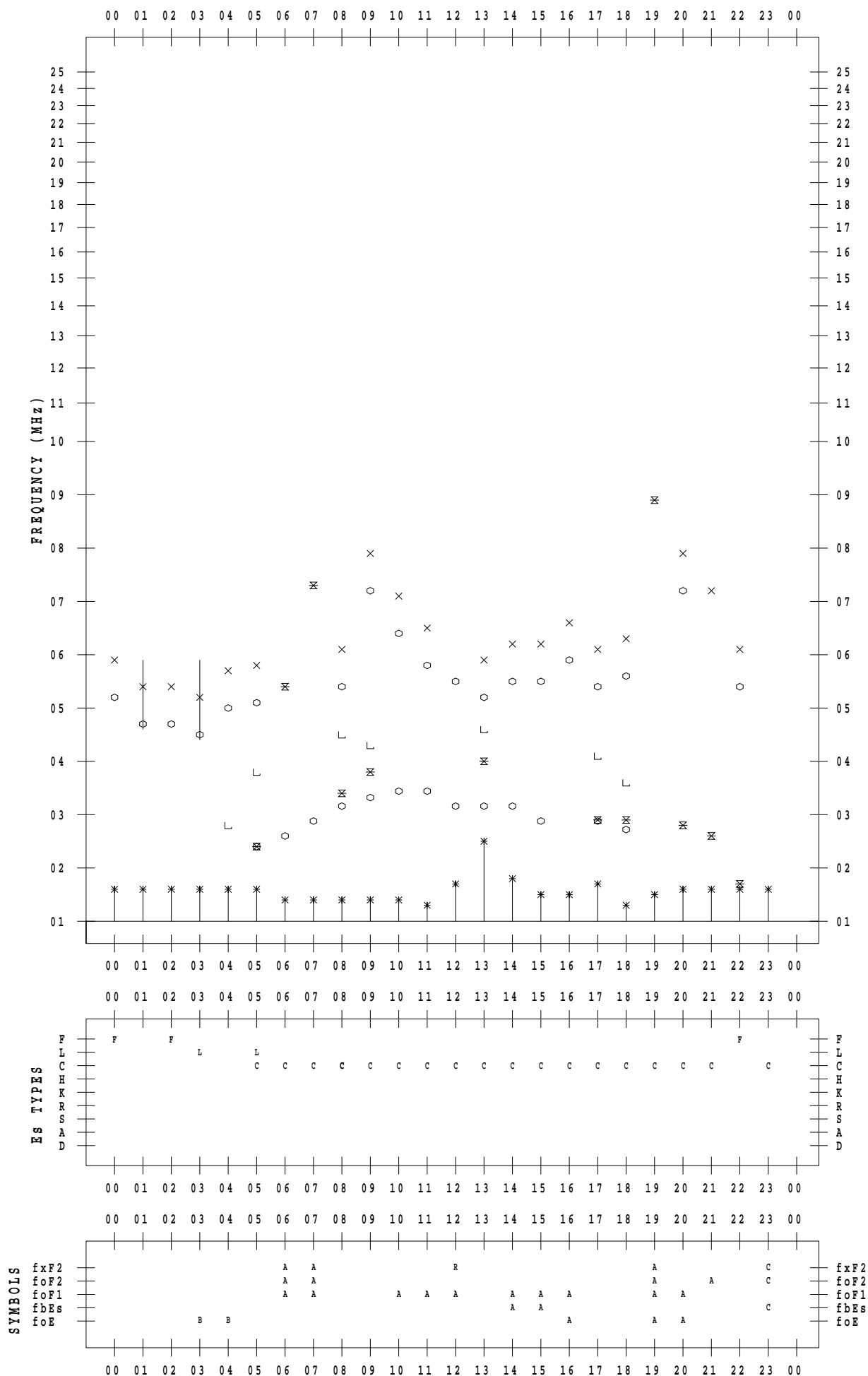
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 6 / 30

135 ° E MEAN TIME



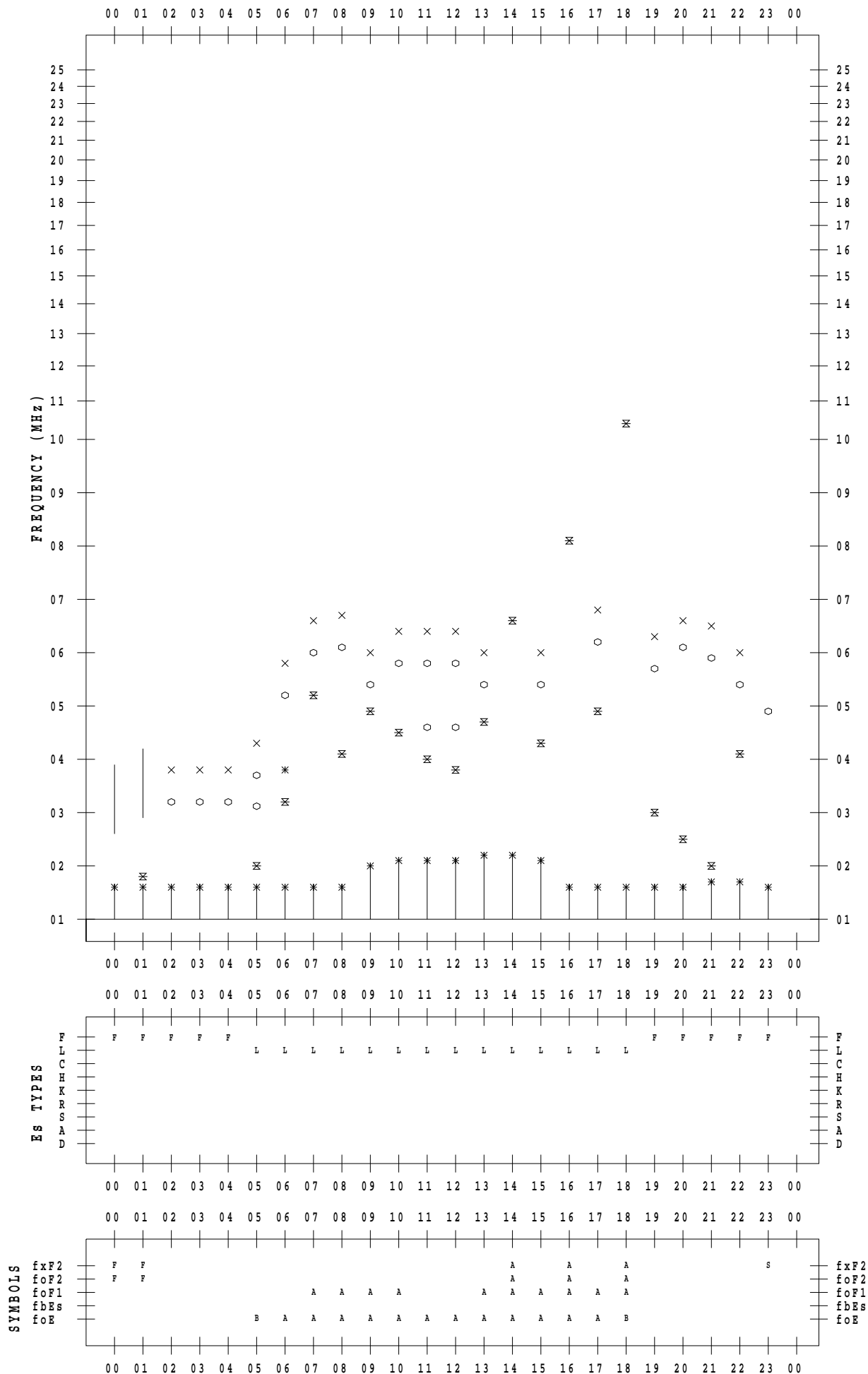
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 1

135 ° E MEAN TIME



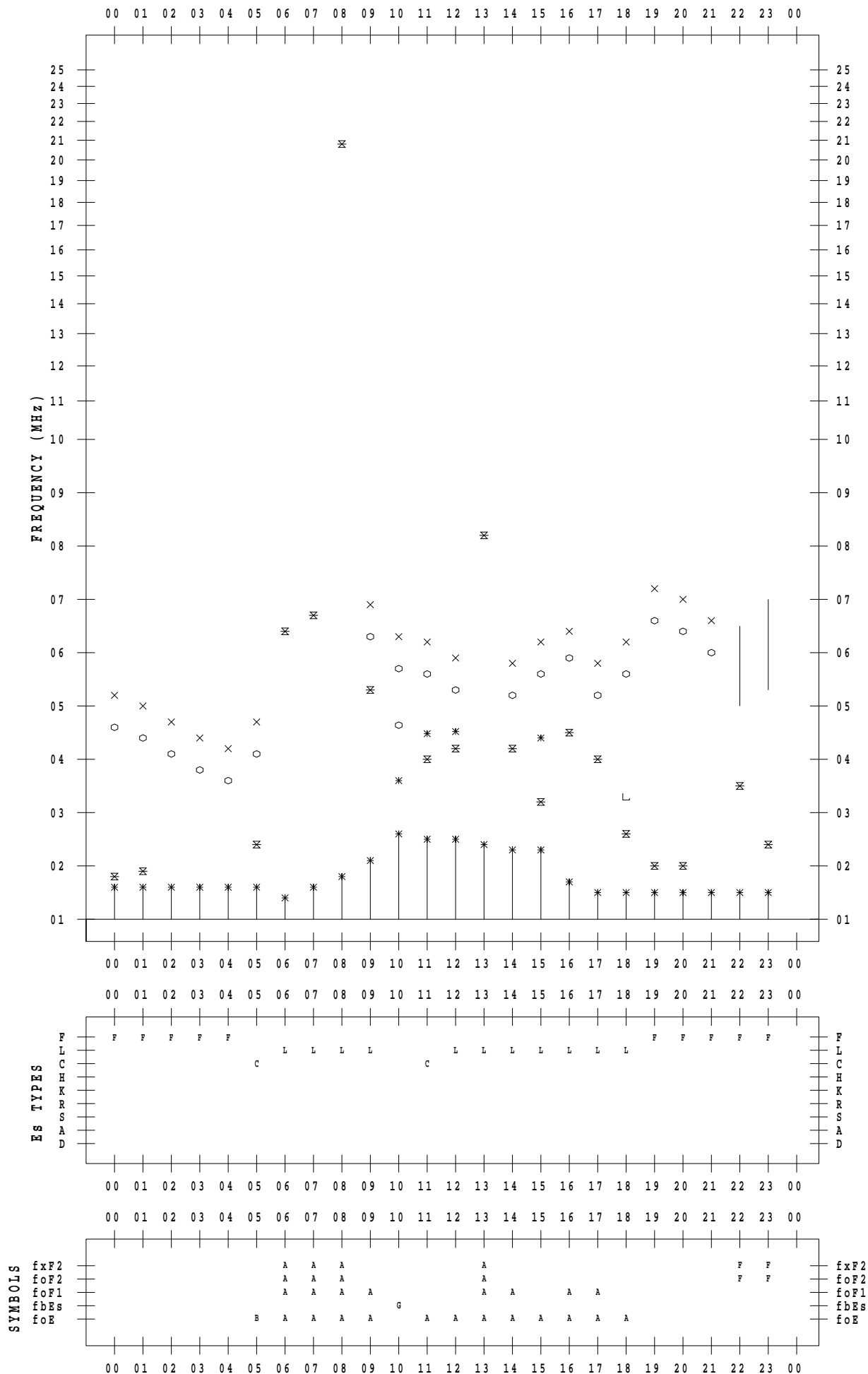
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 2

135 ° E MEAN TIME



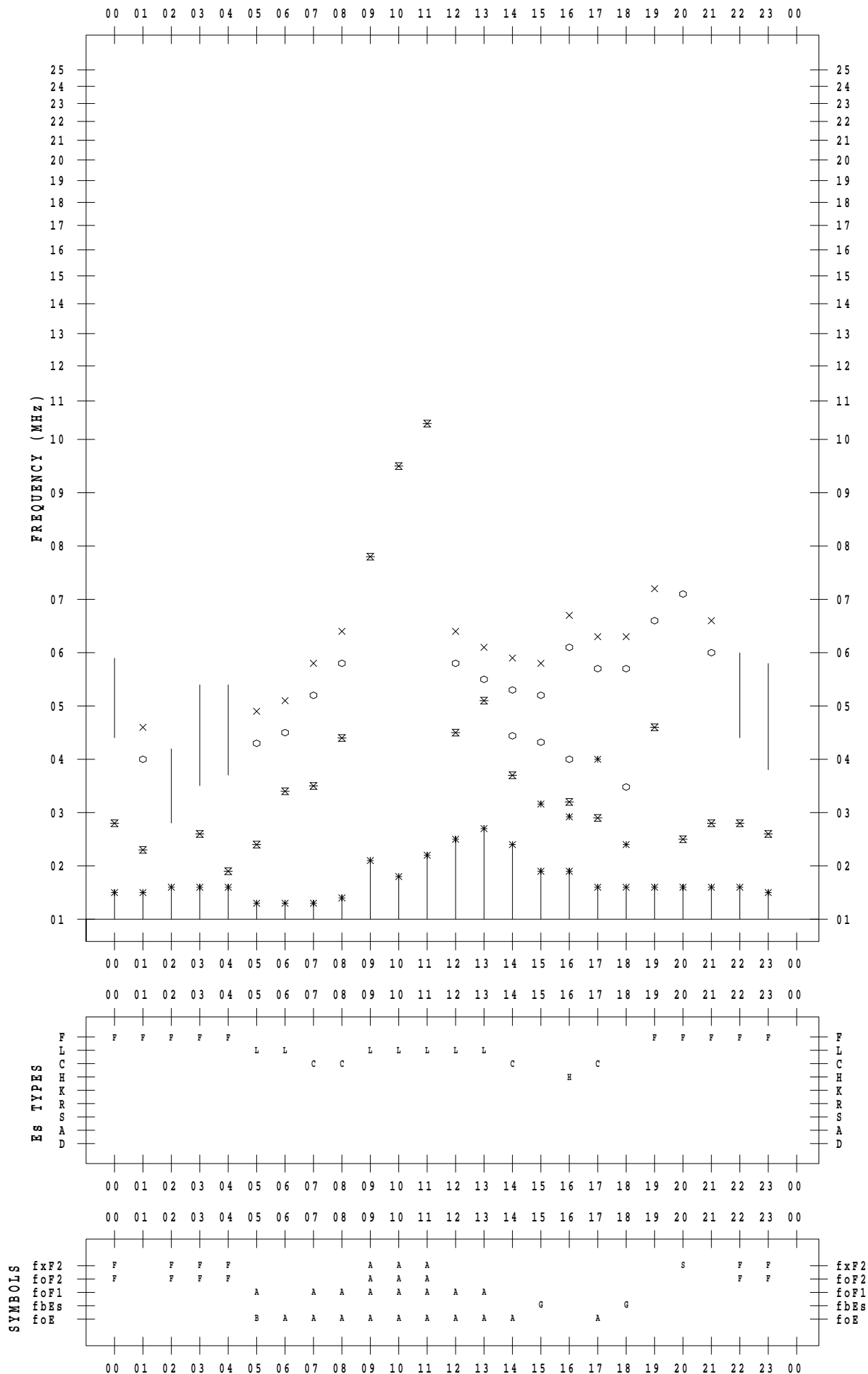
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 3

135 ° E MEAN TIME



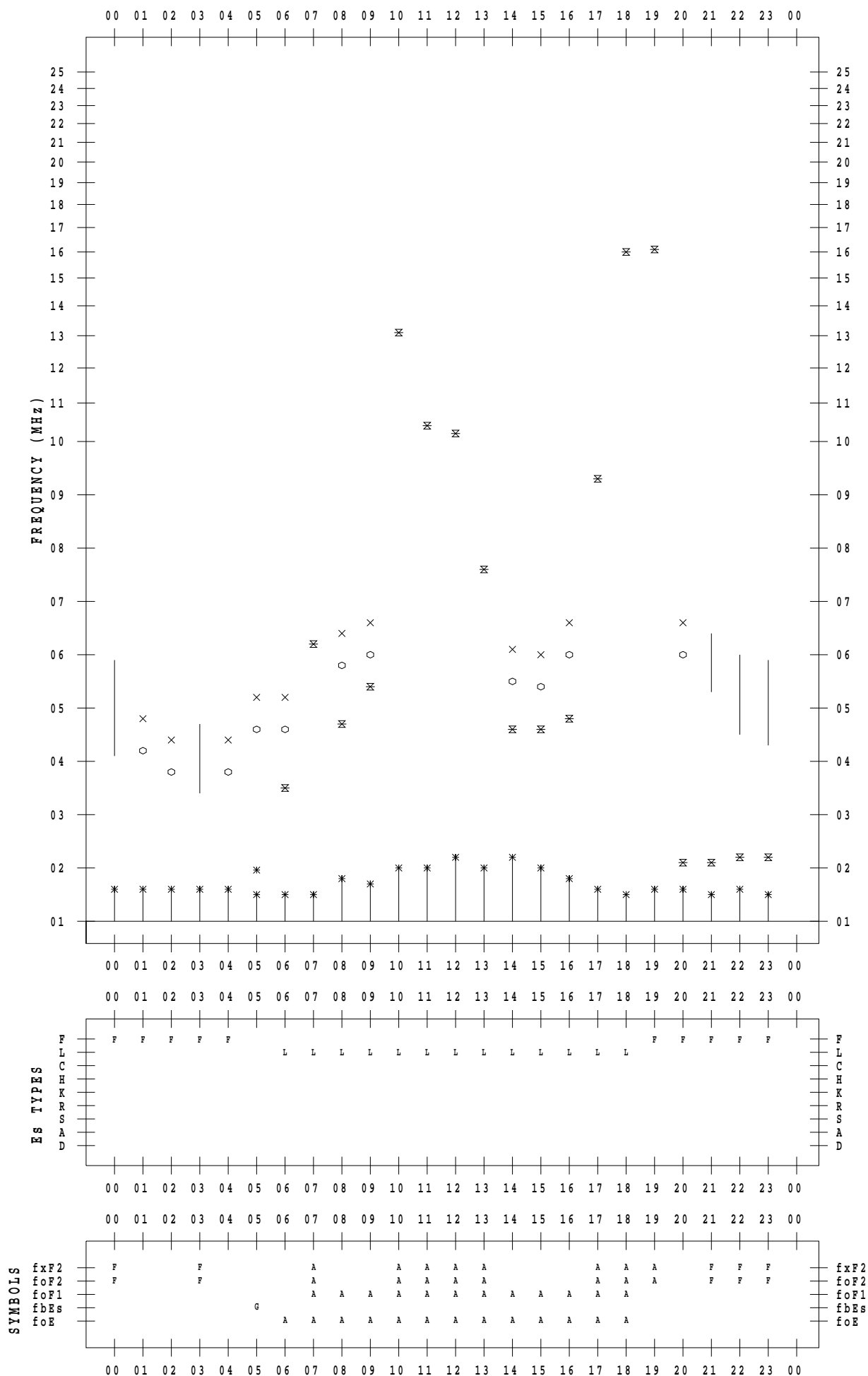
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 4

135 ° E MEAN TIME



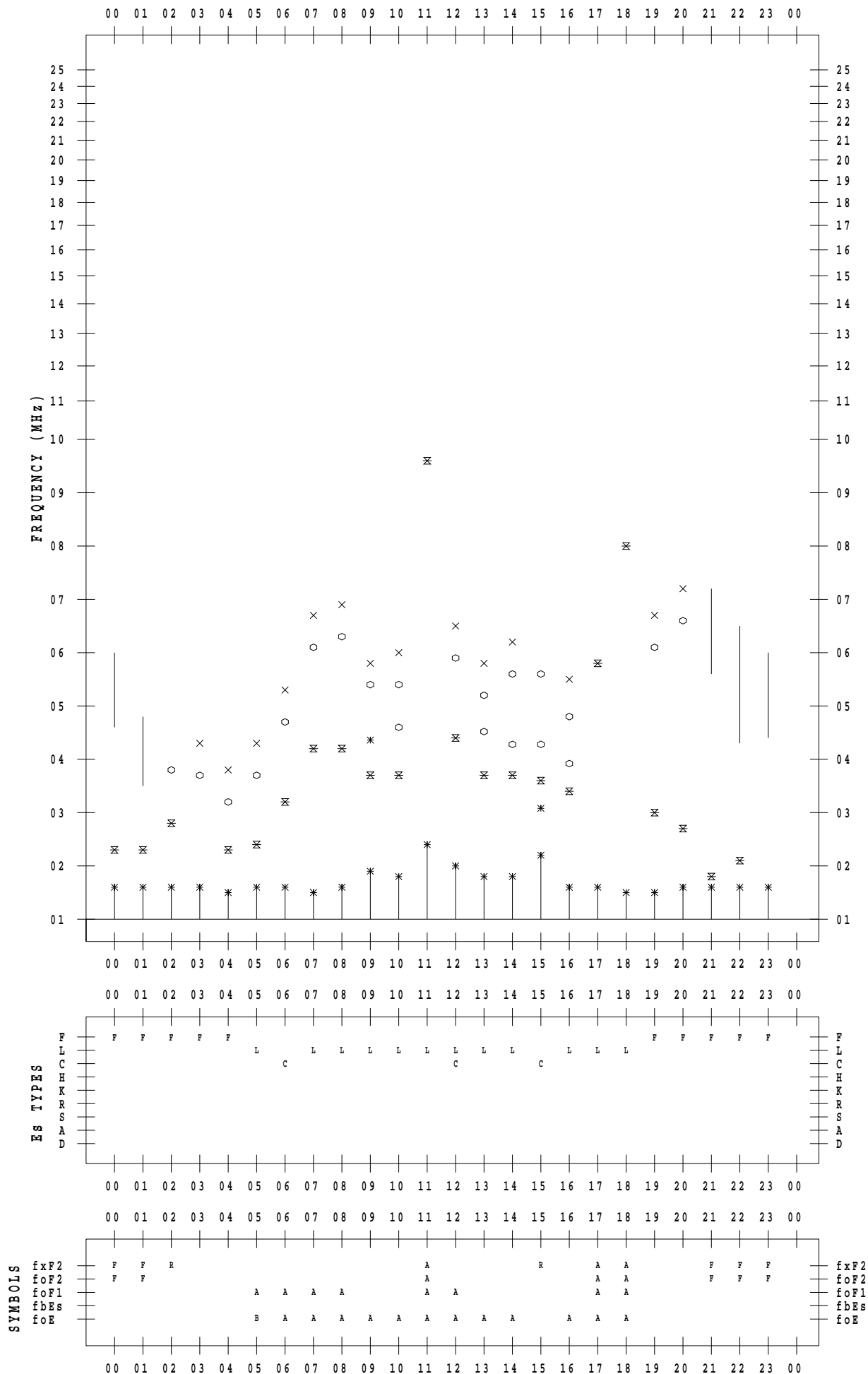
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 5

135 ° E MEAN TIME



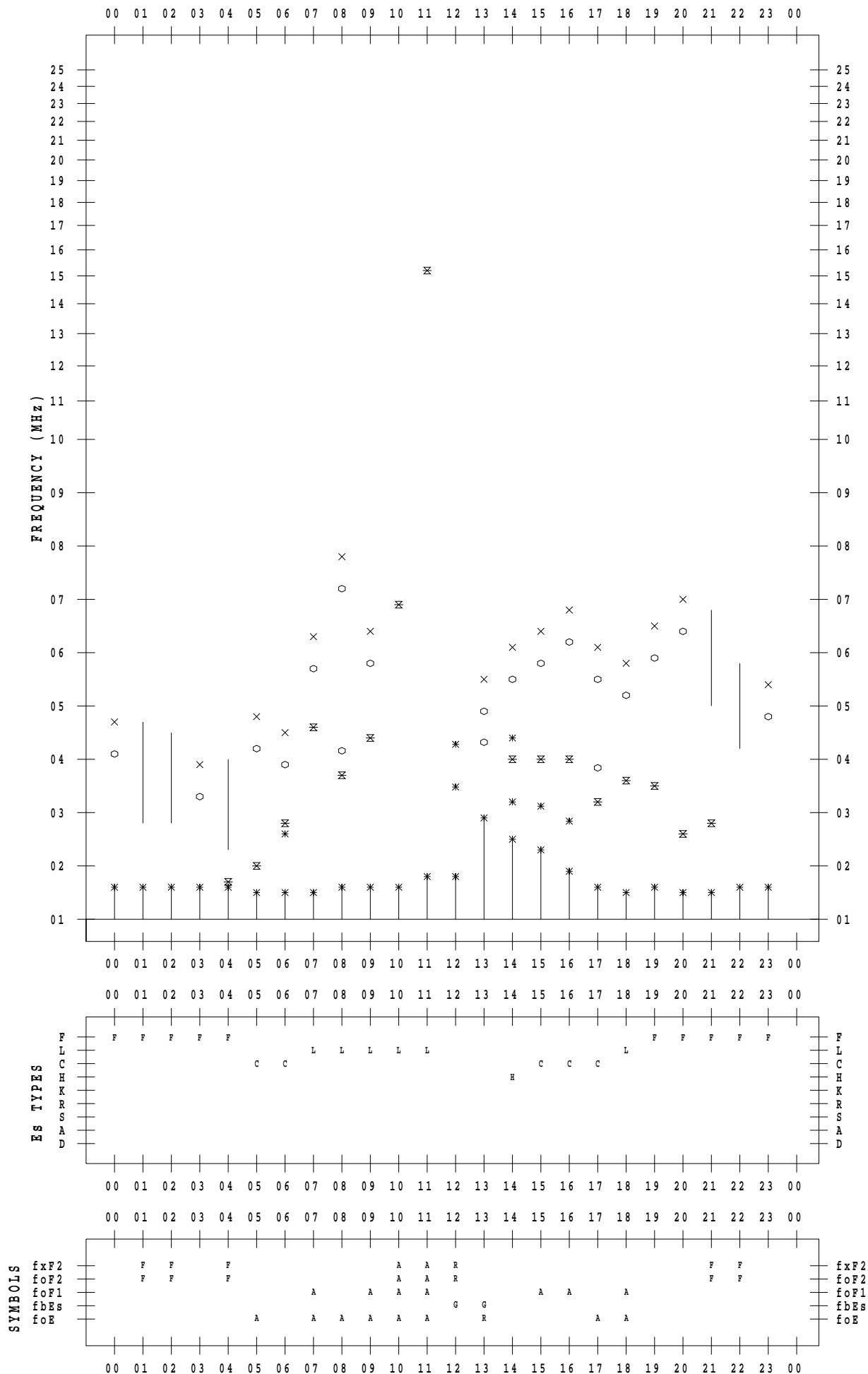
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 6

135 ° E MEAN TIME



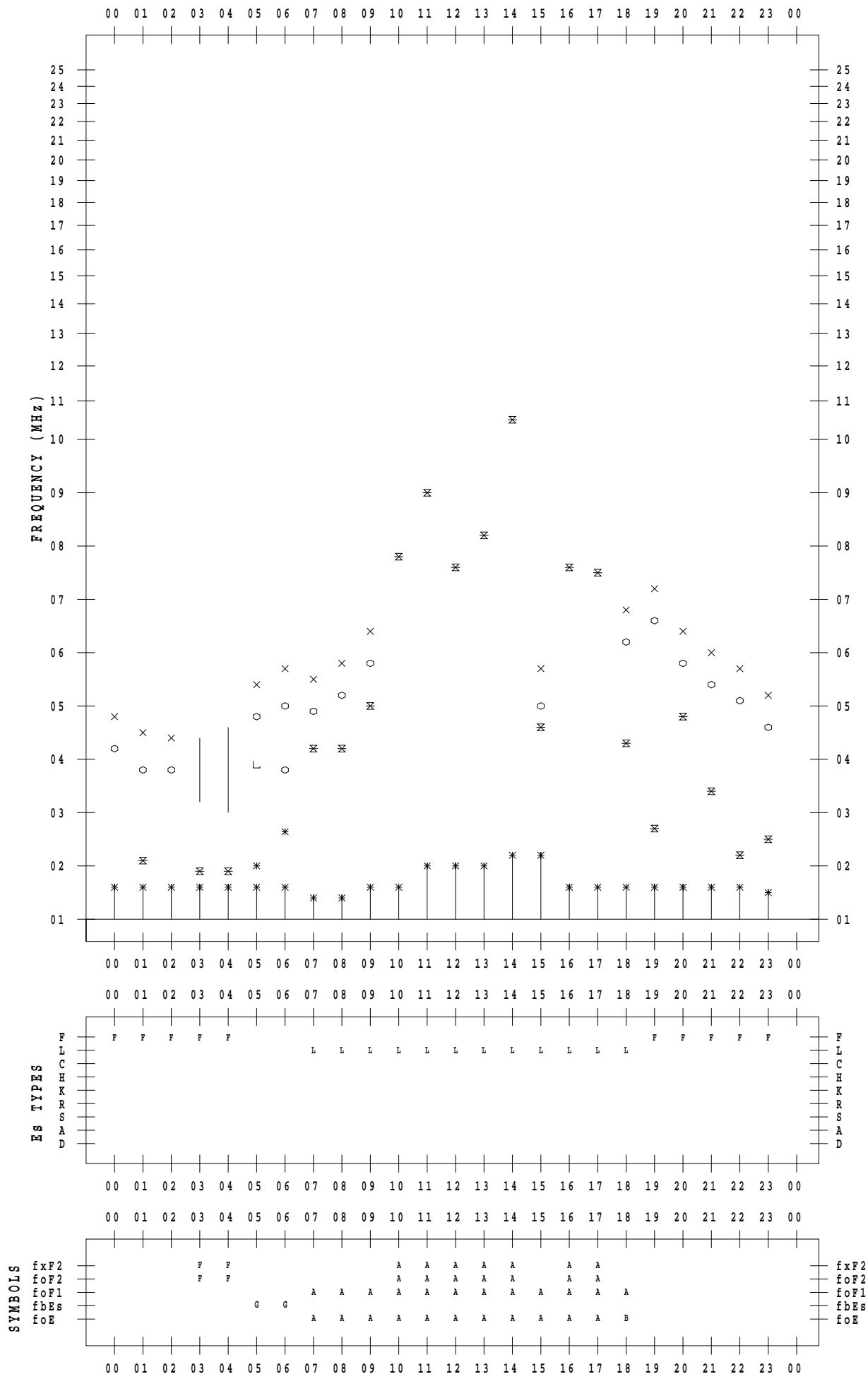
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 7

135 ° E MEAN TIME



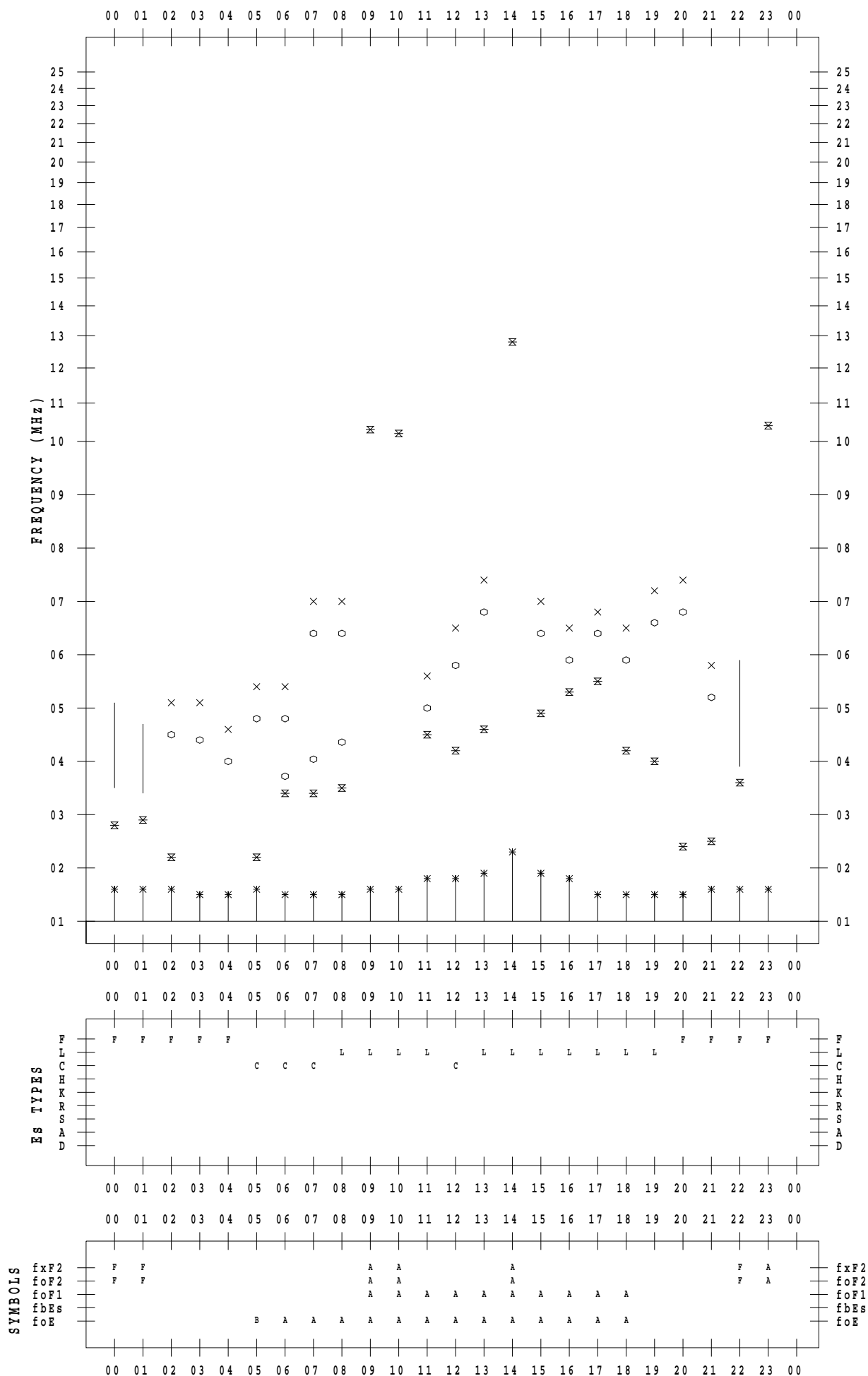
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 8

135 ° E MEAN TIME



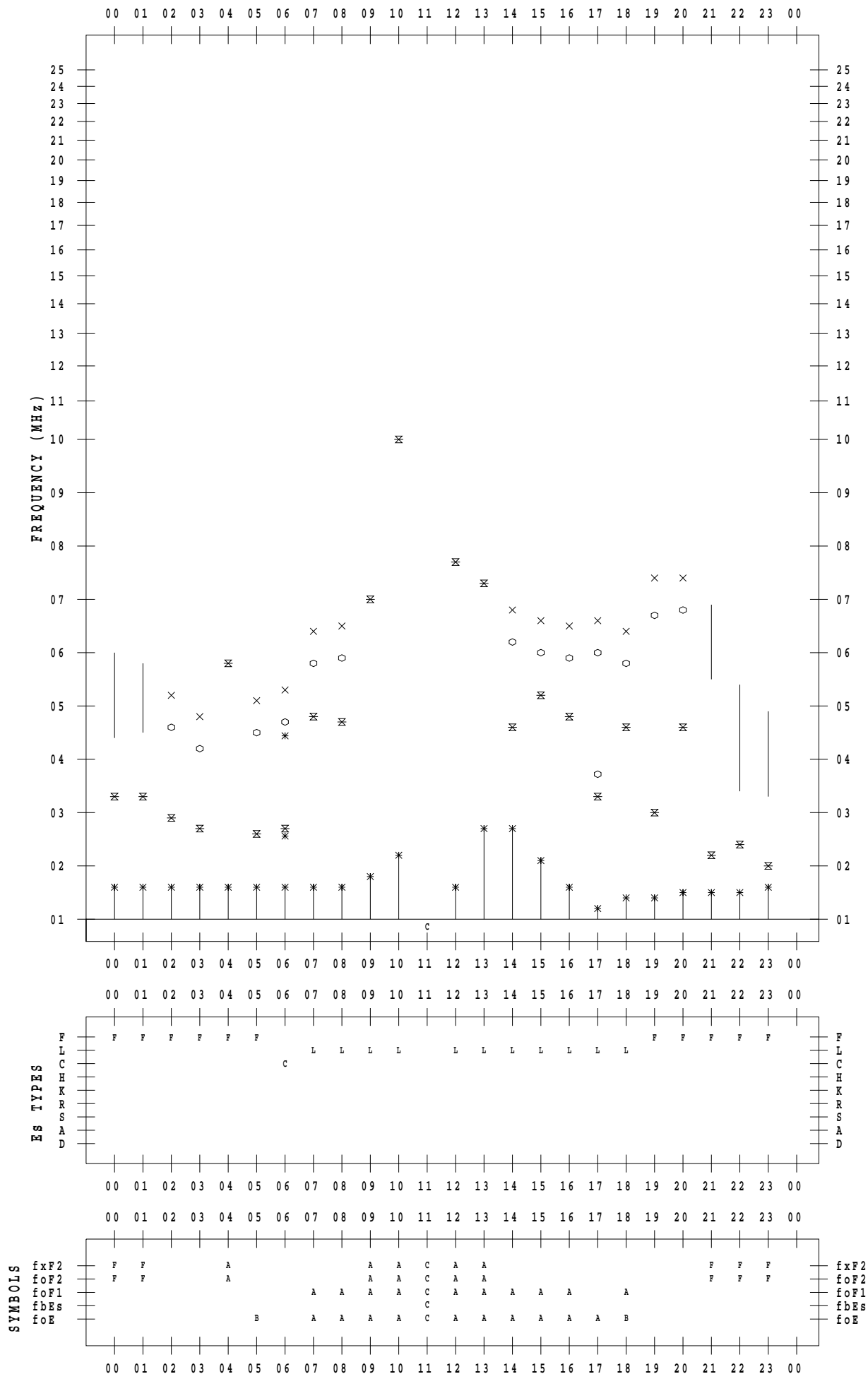
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 9

135 ° E MEAN TIME



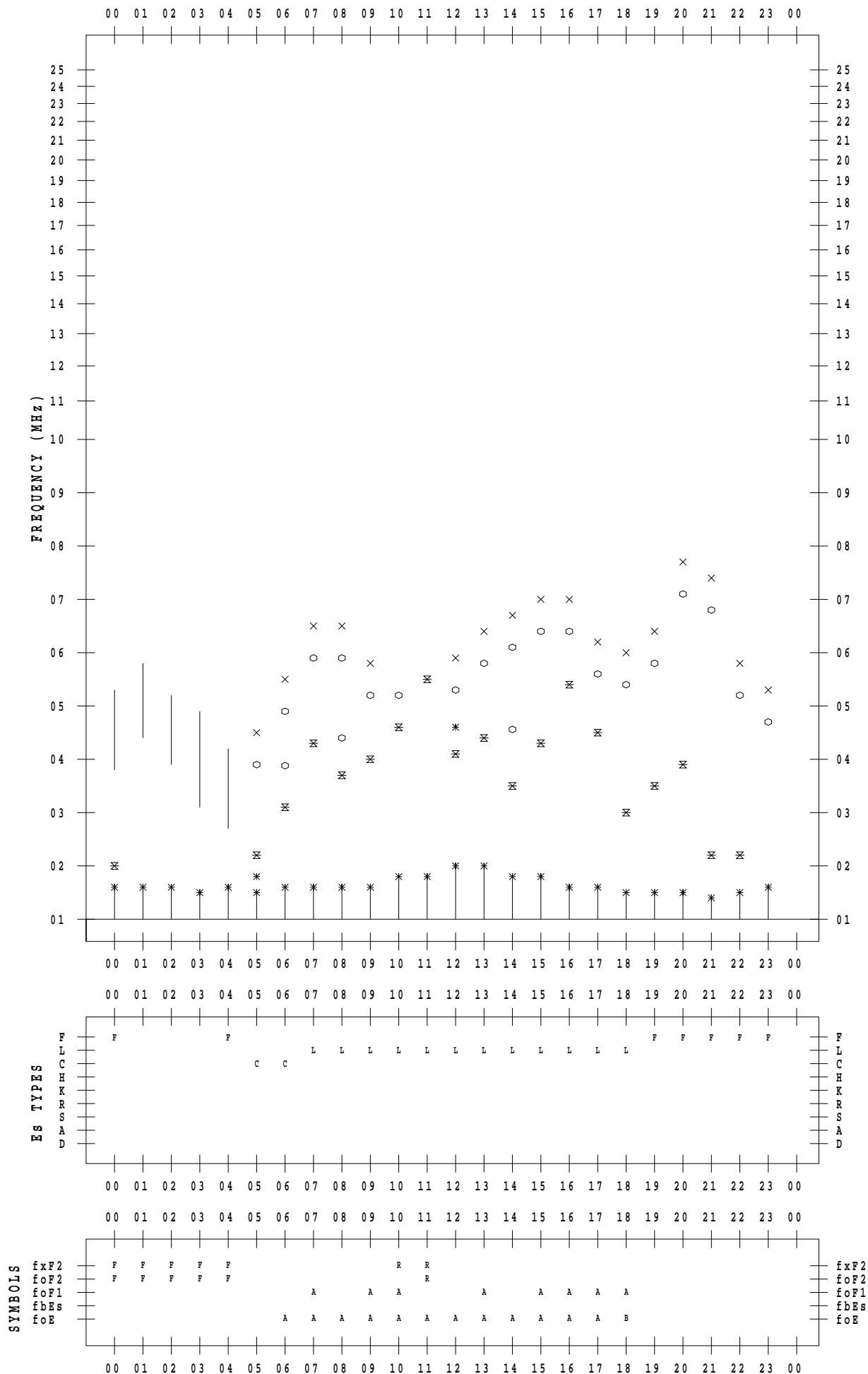
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 10

135 ° E MEAN TIME



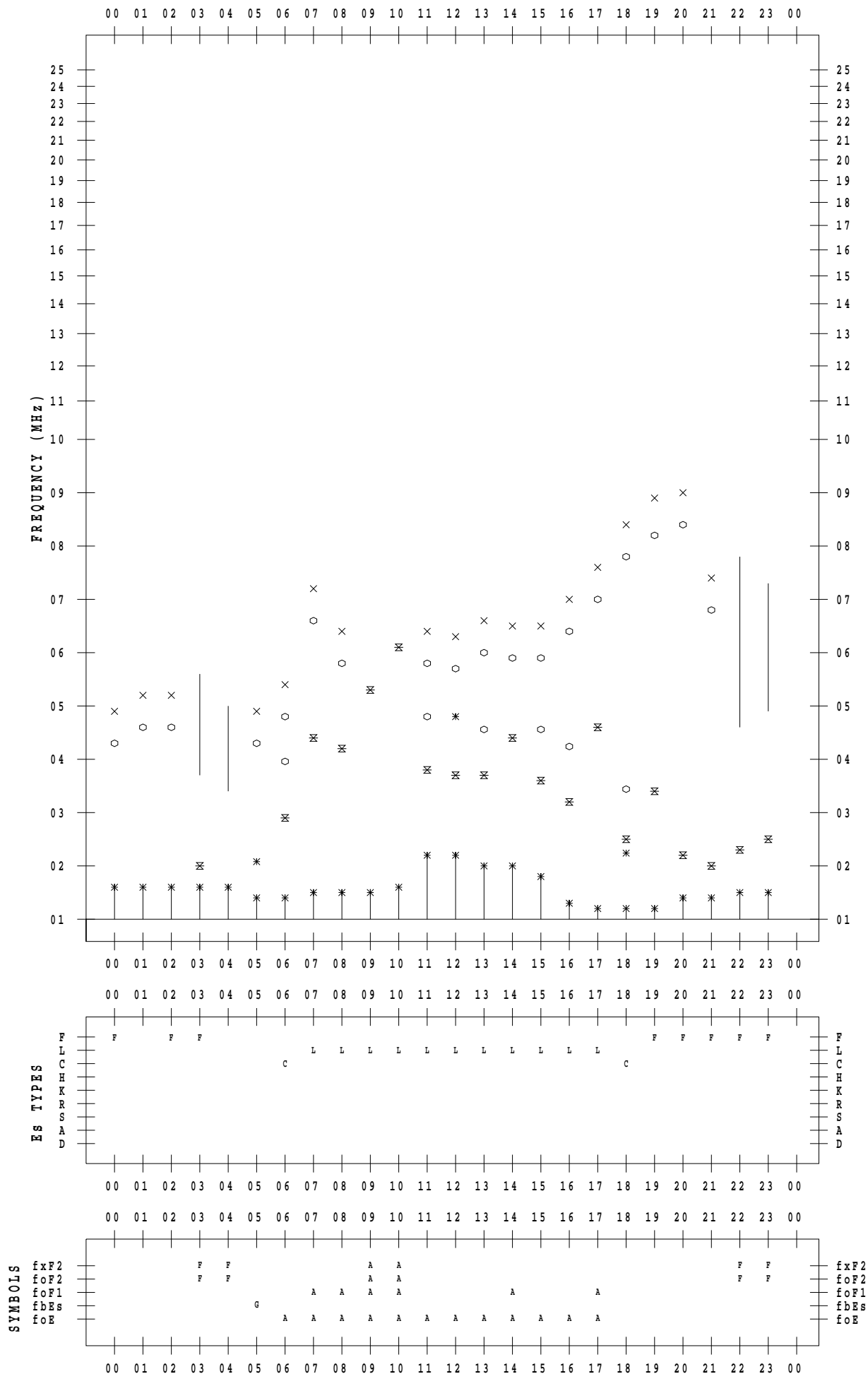
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 6/11

135 ° E MEAN TIME



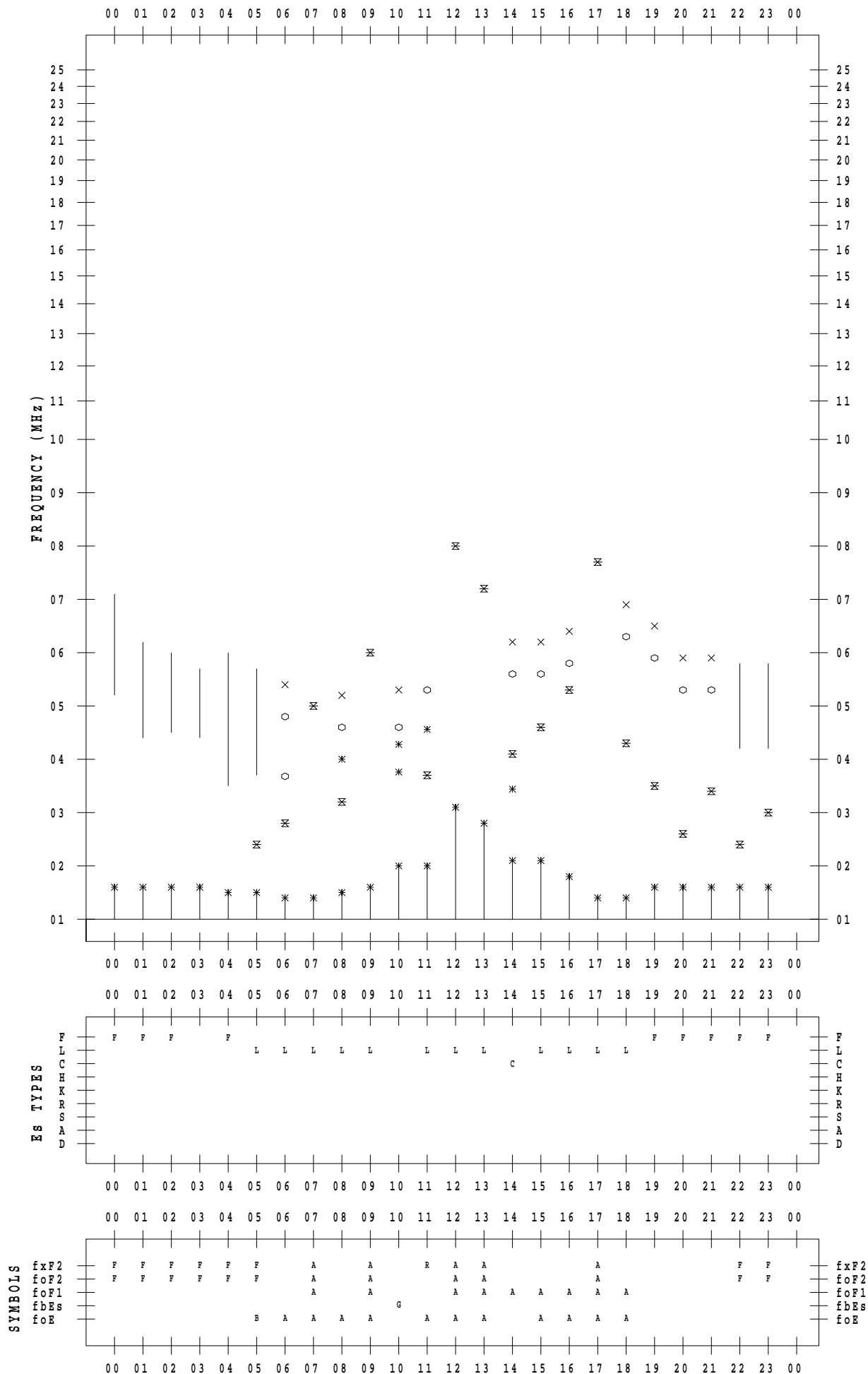
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 12

135 ° E MEAN TIME



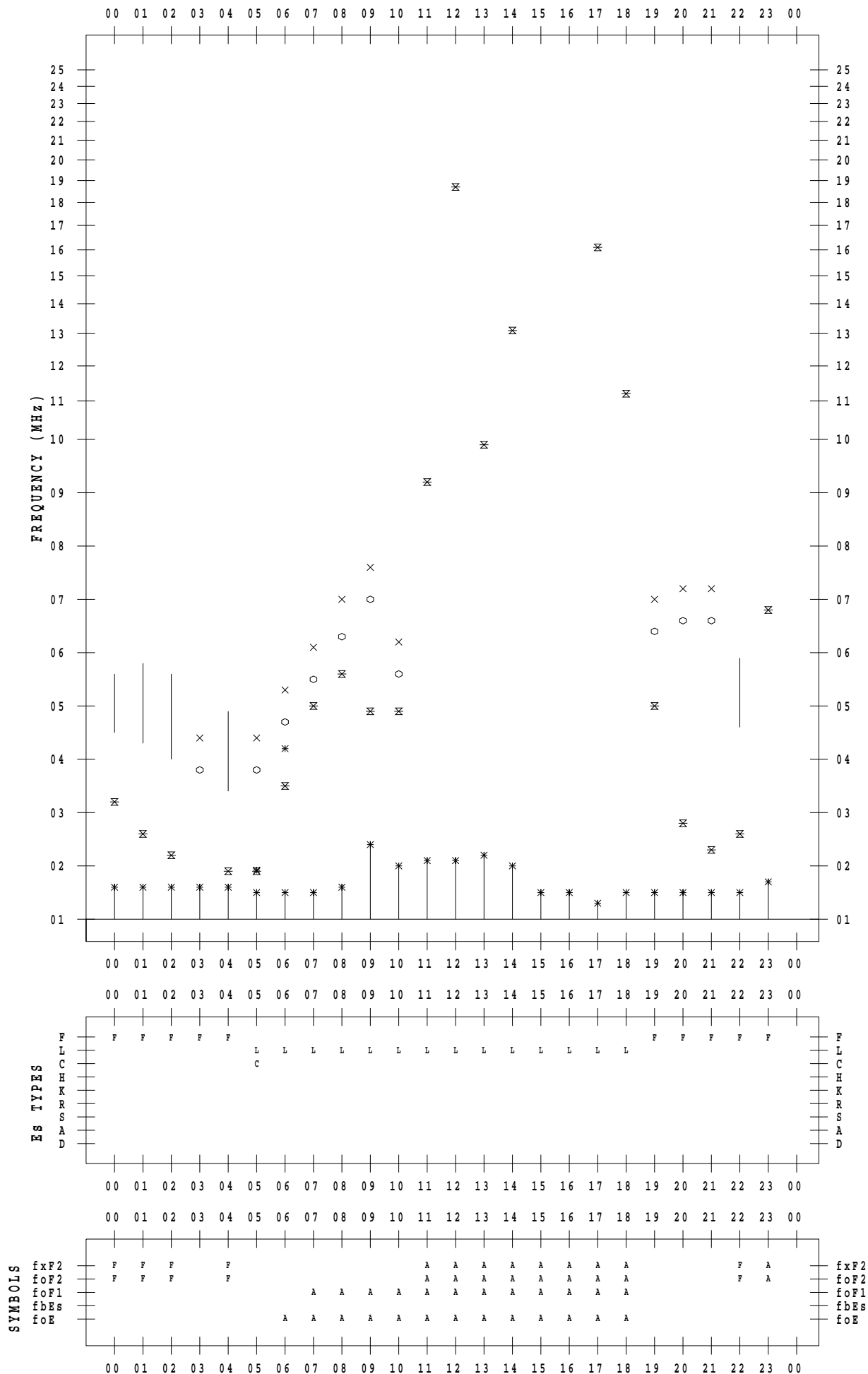
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 13

135 ° E MEAN TIME



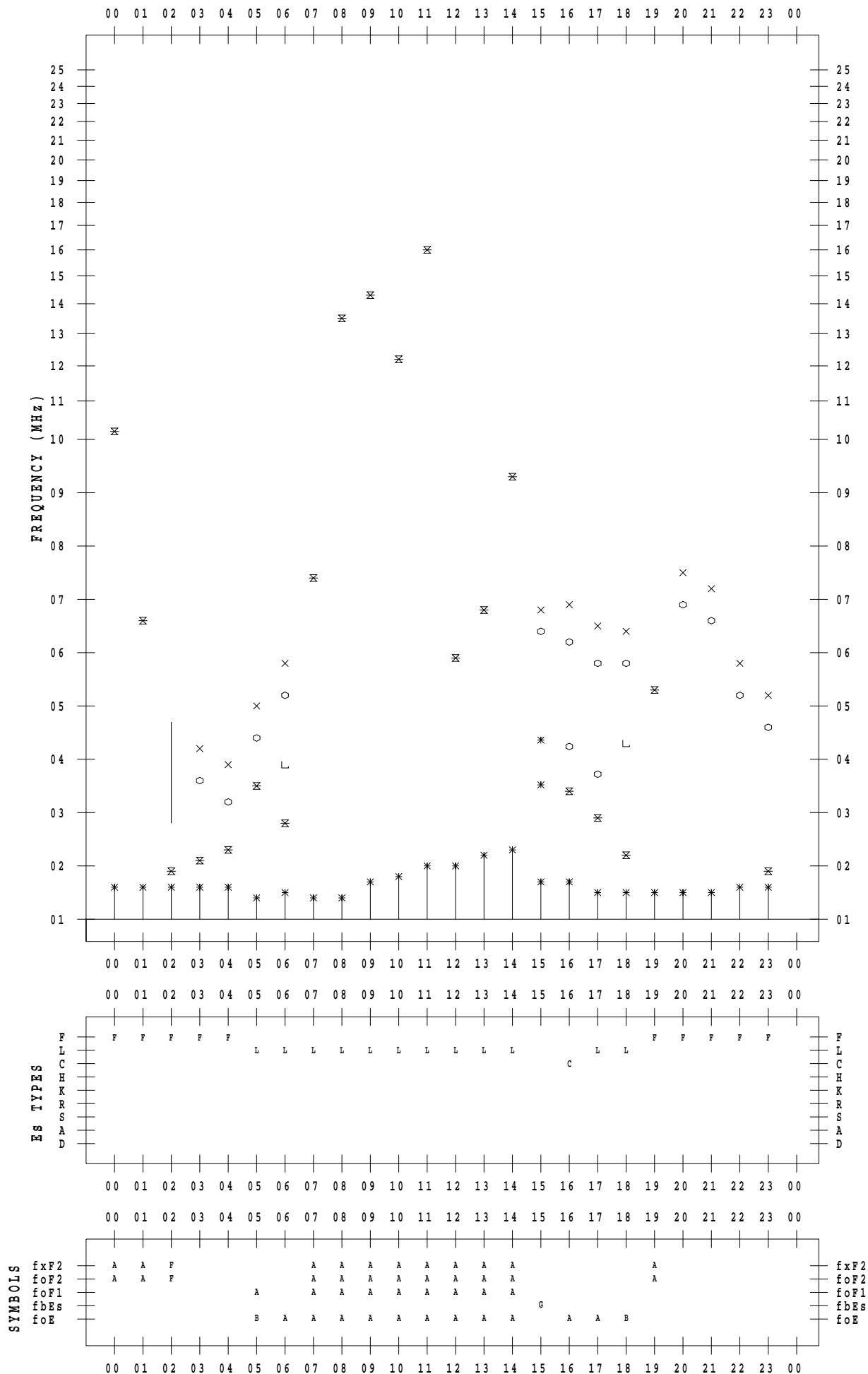
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 14

135 ° E MEAN TIME



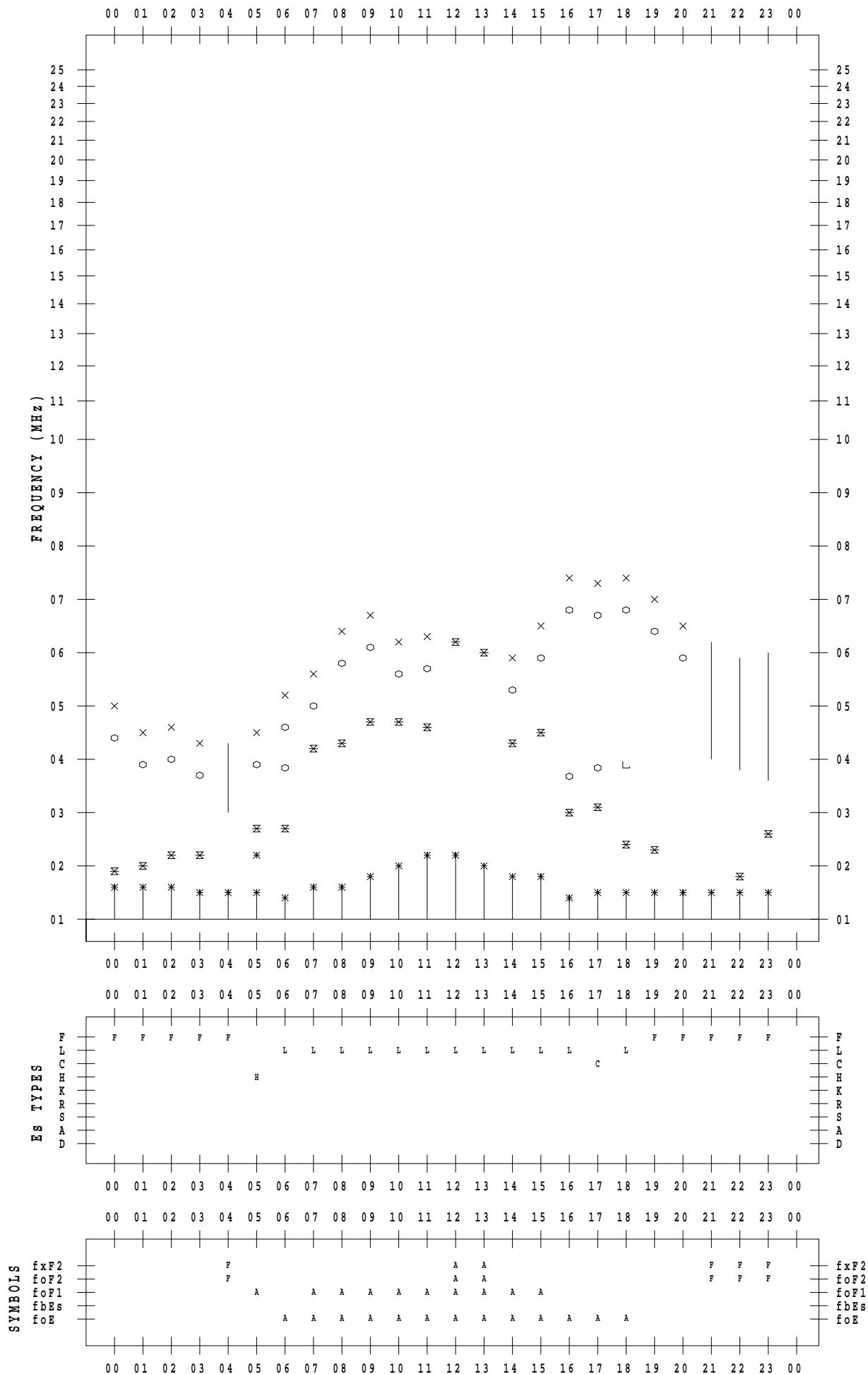
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 15

135 ° E MEAN TIME



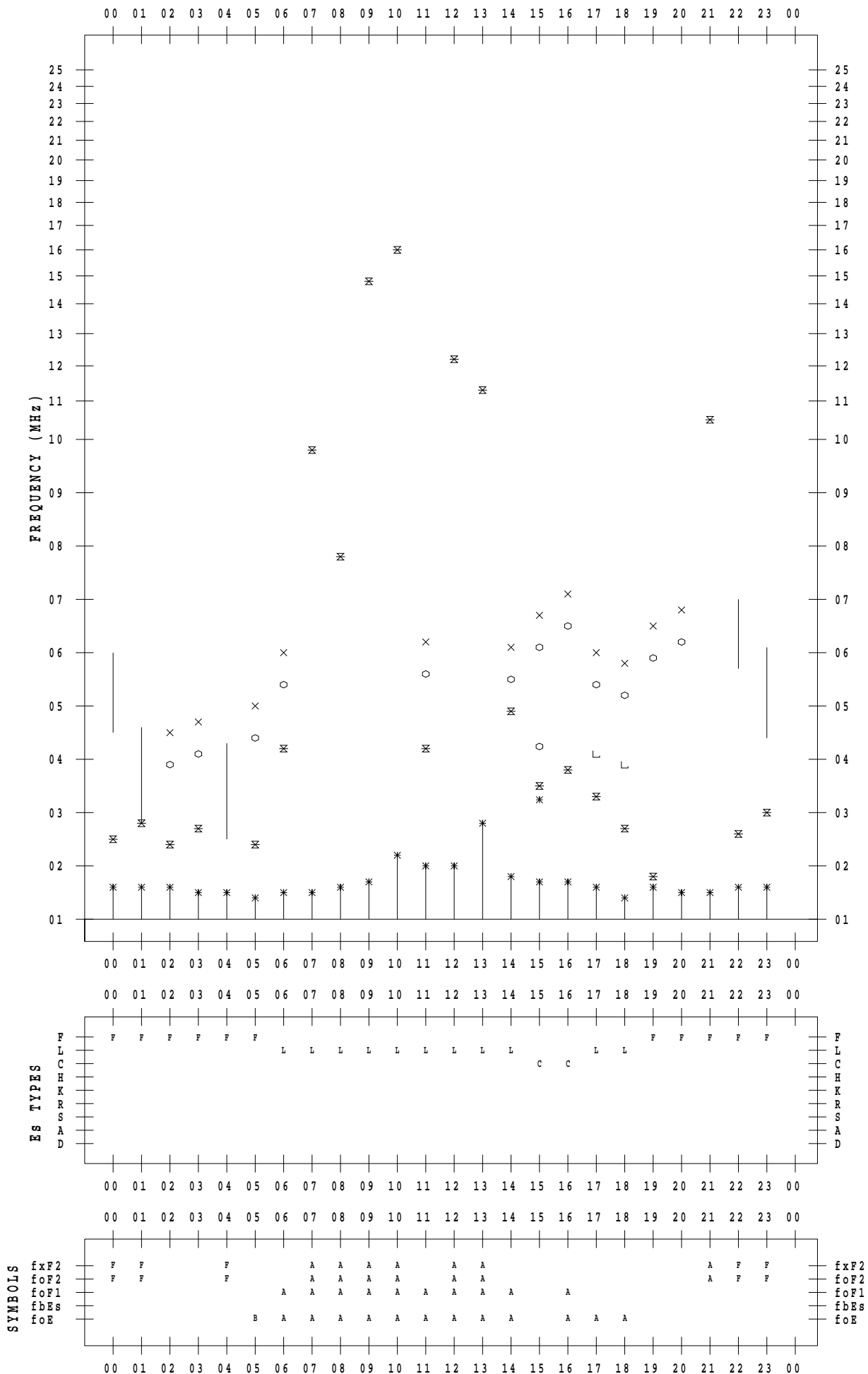
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 16

135 ° E MEAN TIME



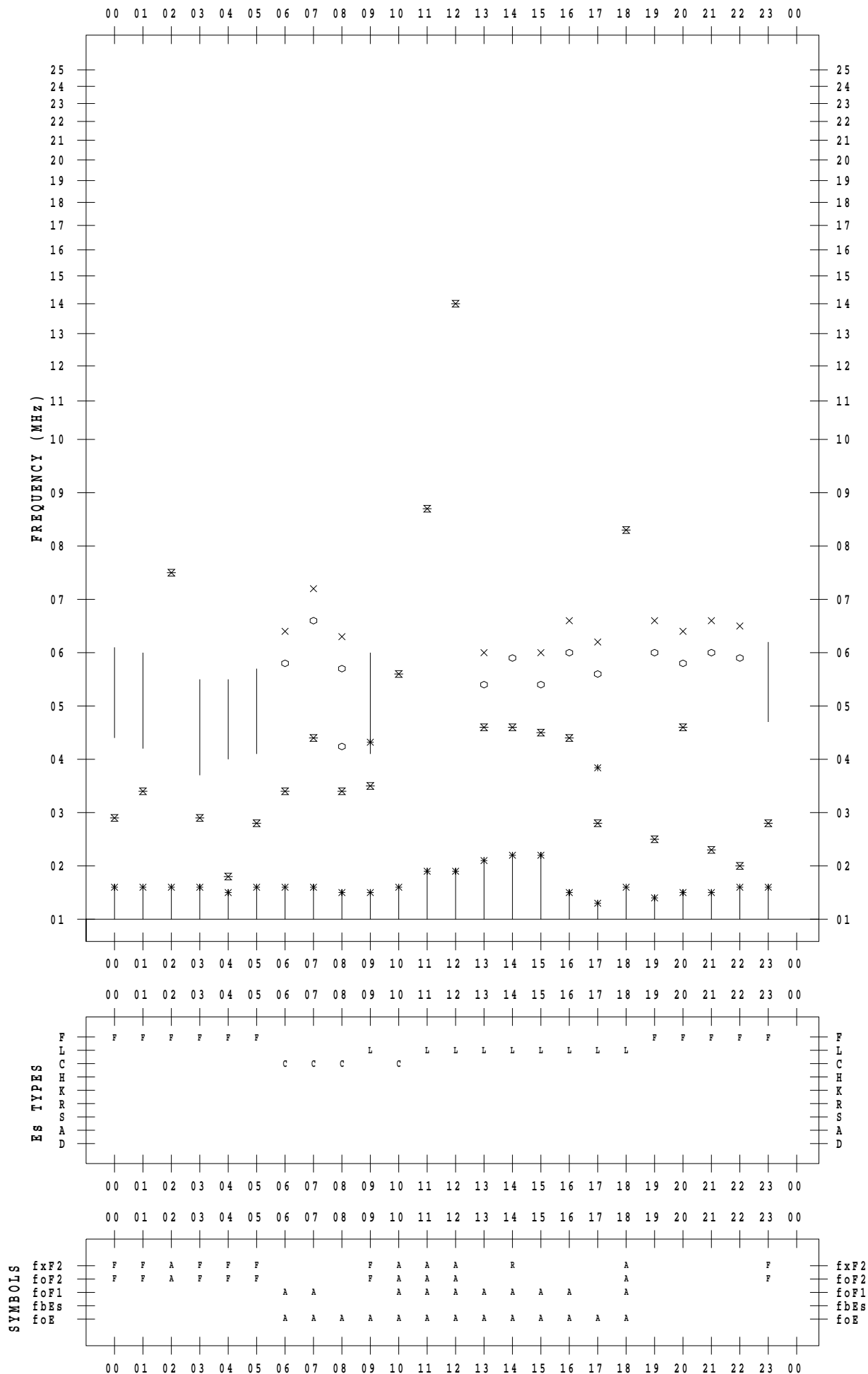
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 17

135 ° E MEAN TIME



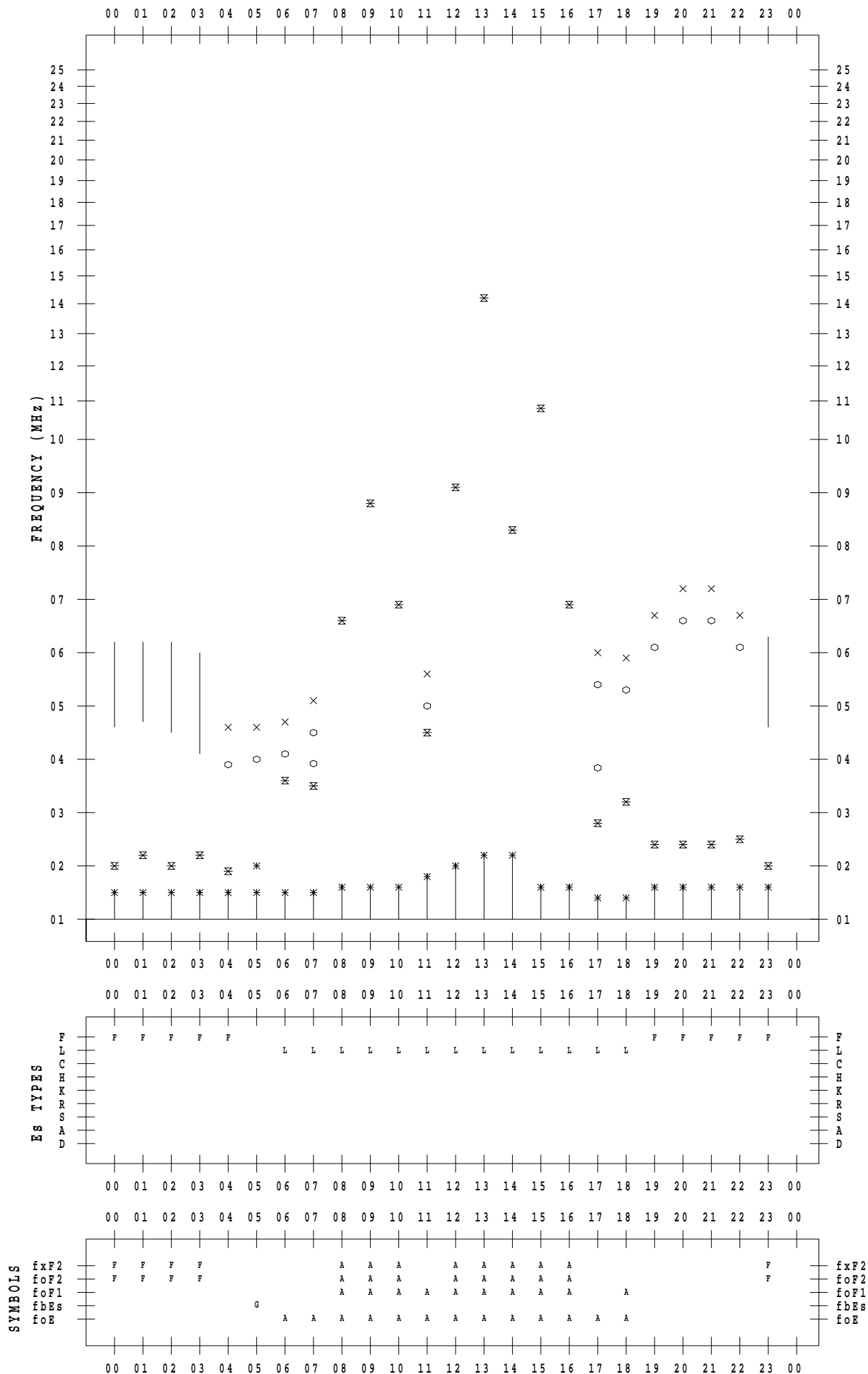
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 18

135 ° E MEAN TIME



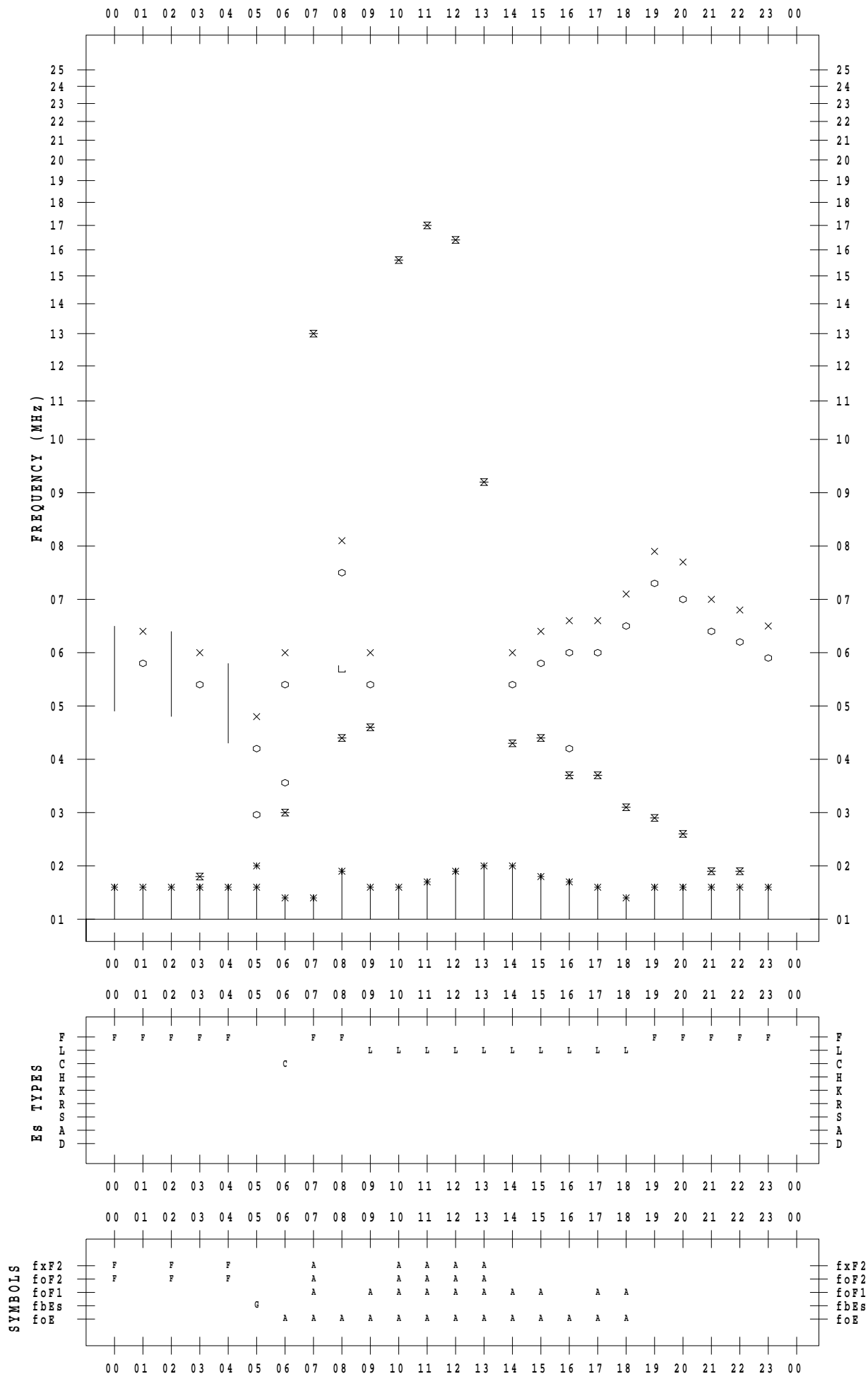
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 19

135 ° E MEAN TIME



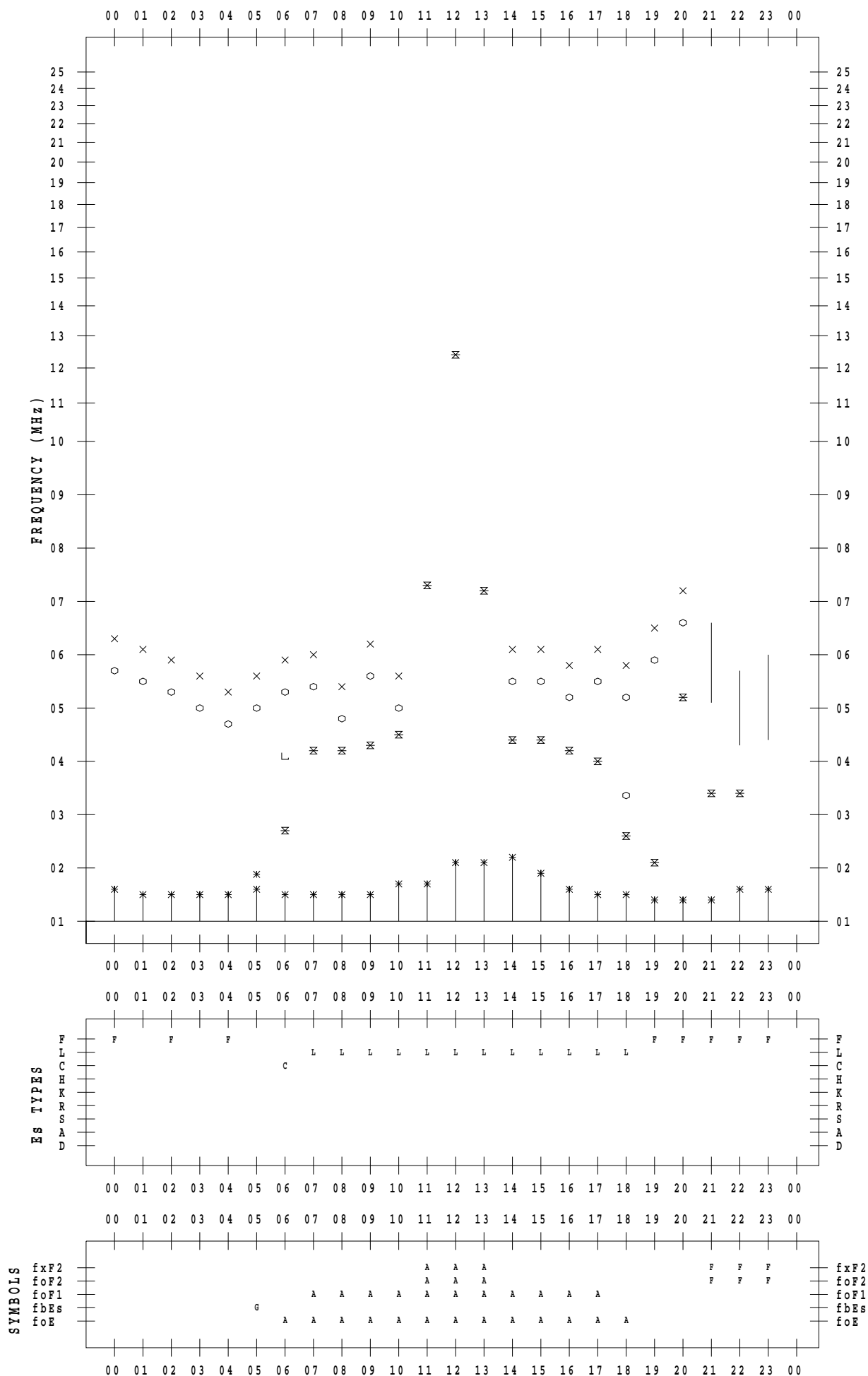
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 20

135 ° E MEAN TIME



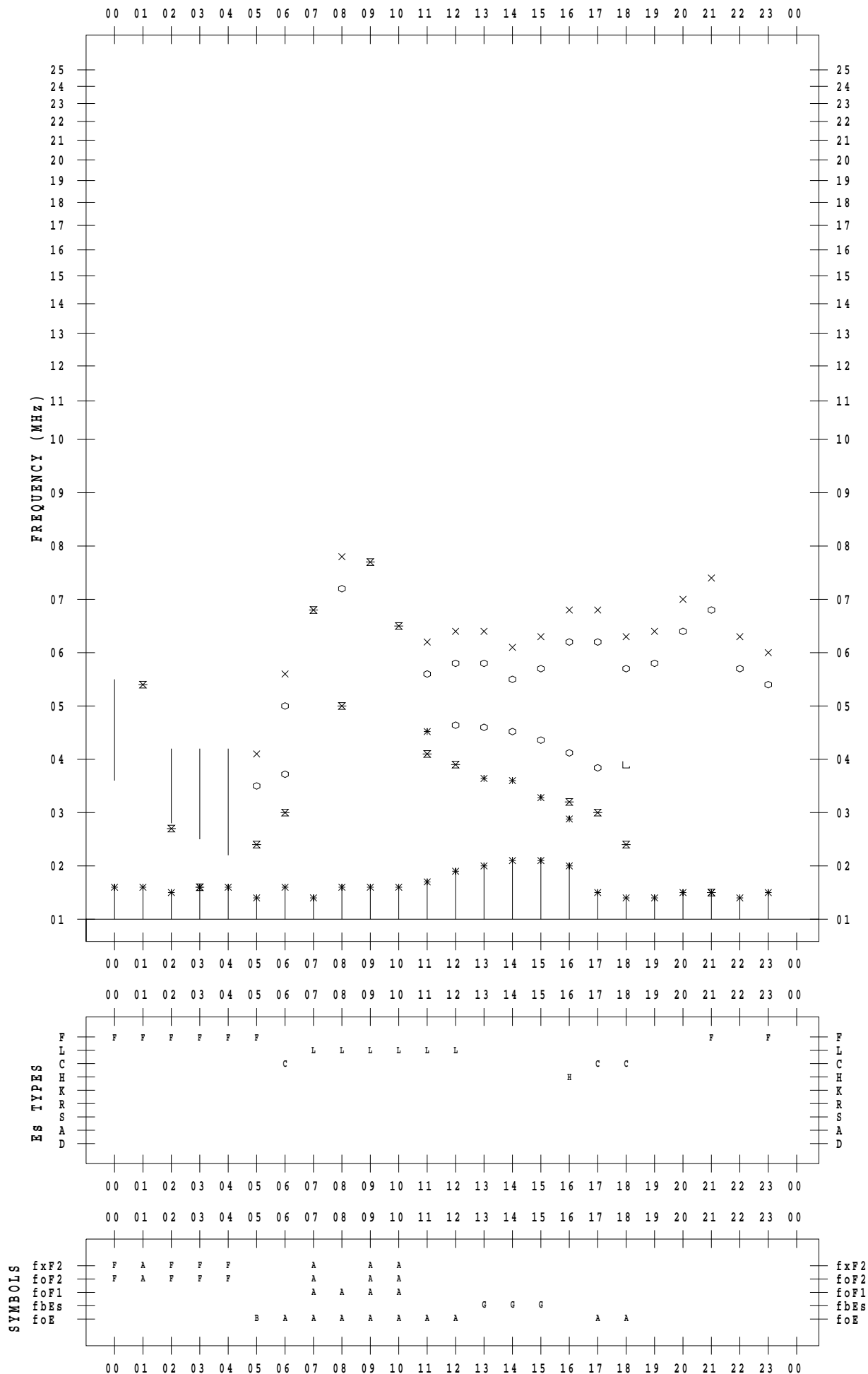
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 21

135 ° E MEAN TIME



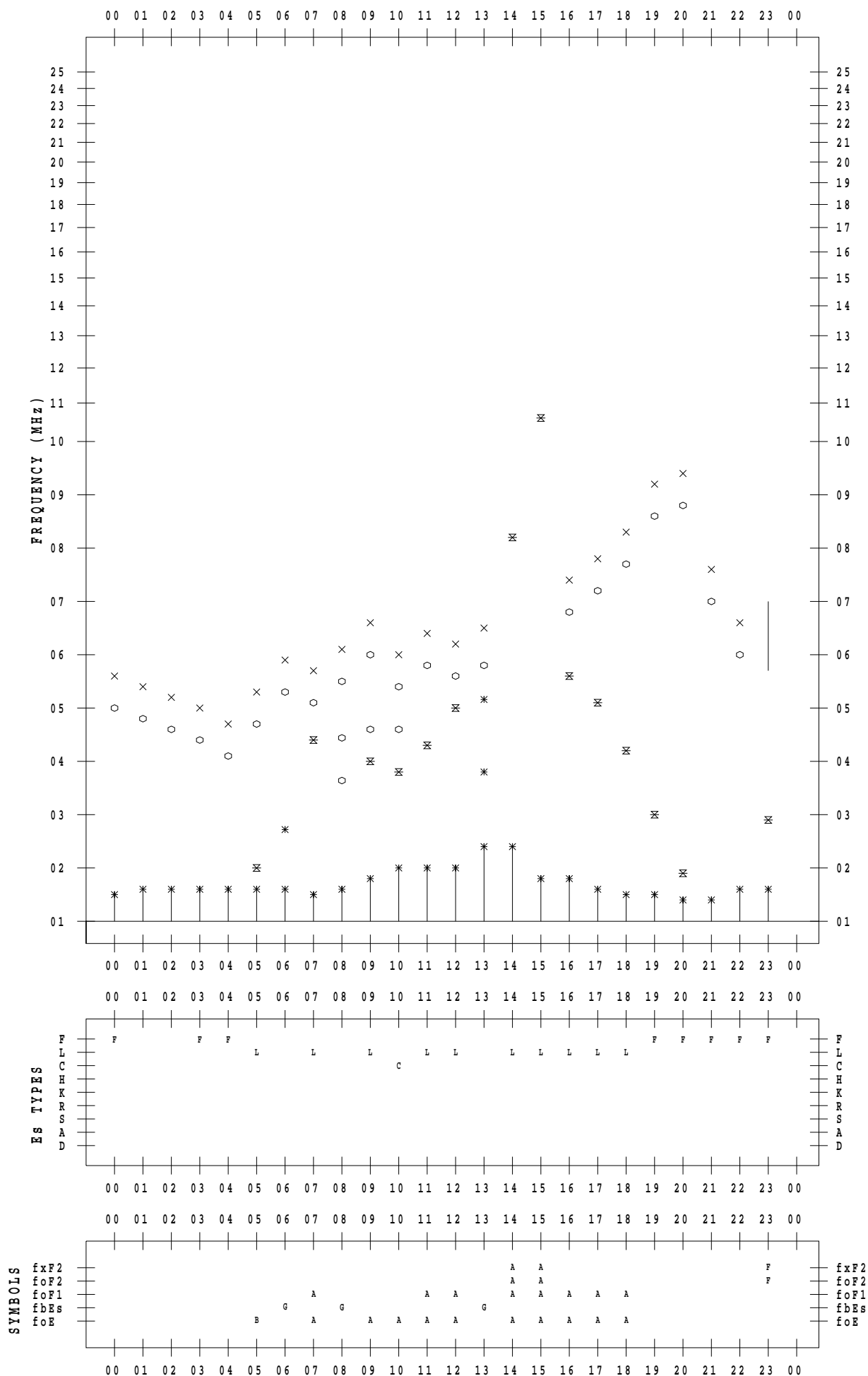
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 22

135 ° E MEAN TIME



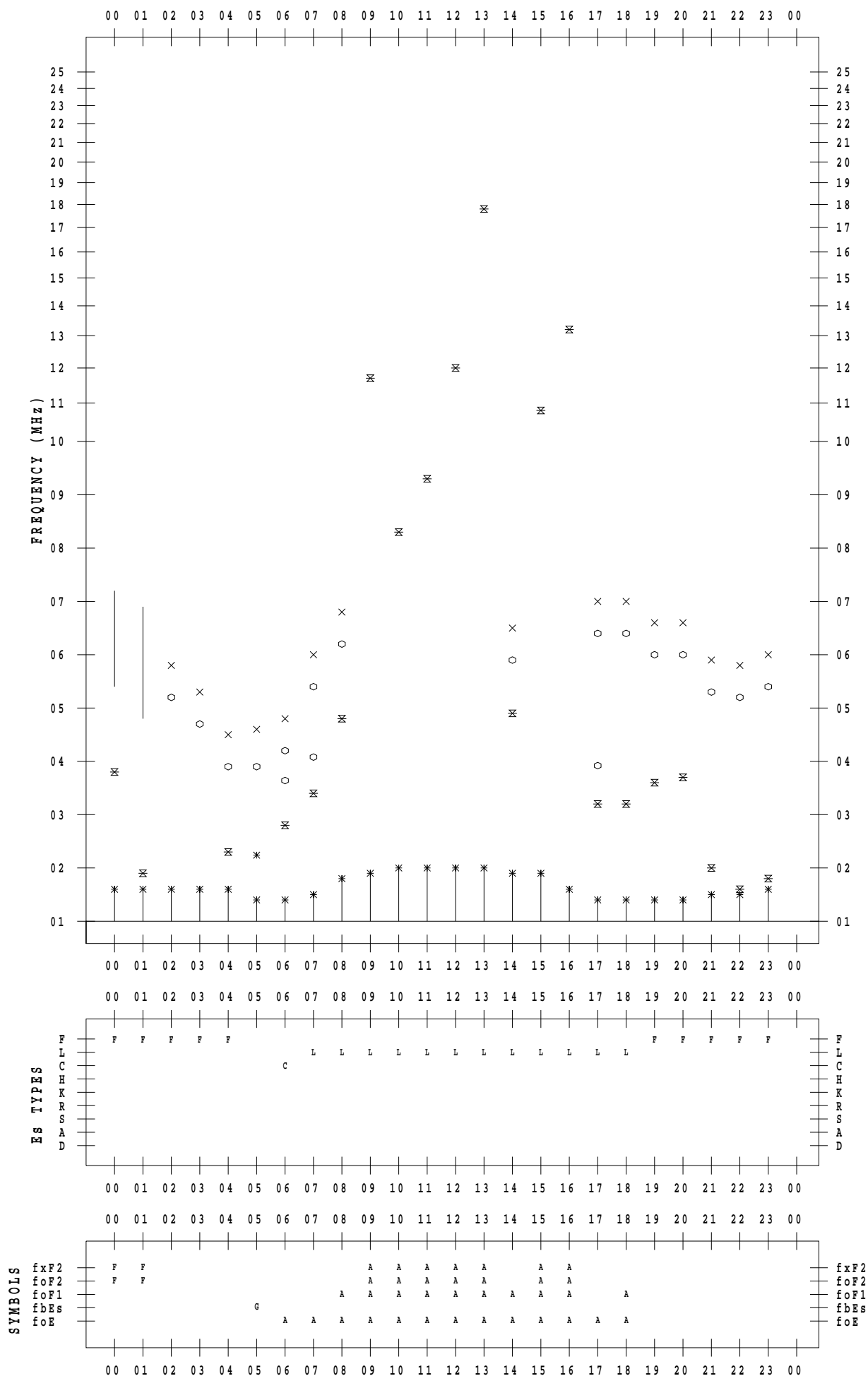
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 23

135 ° E MEAN TIME



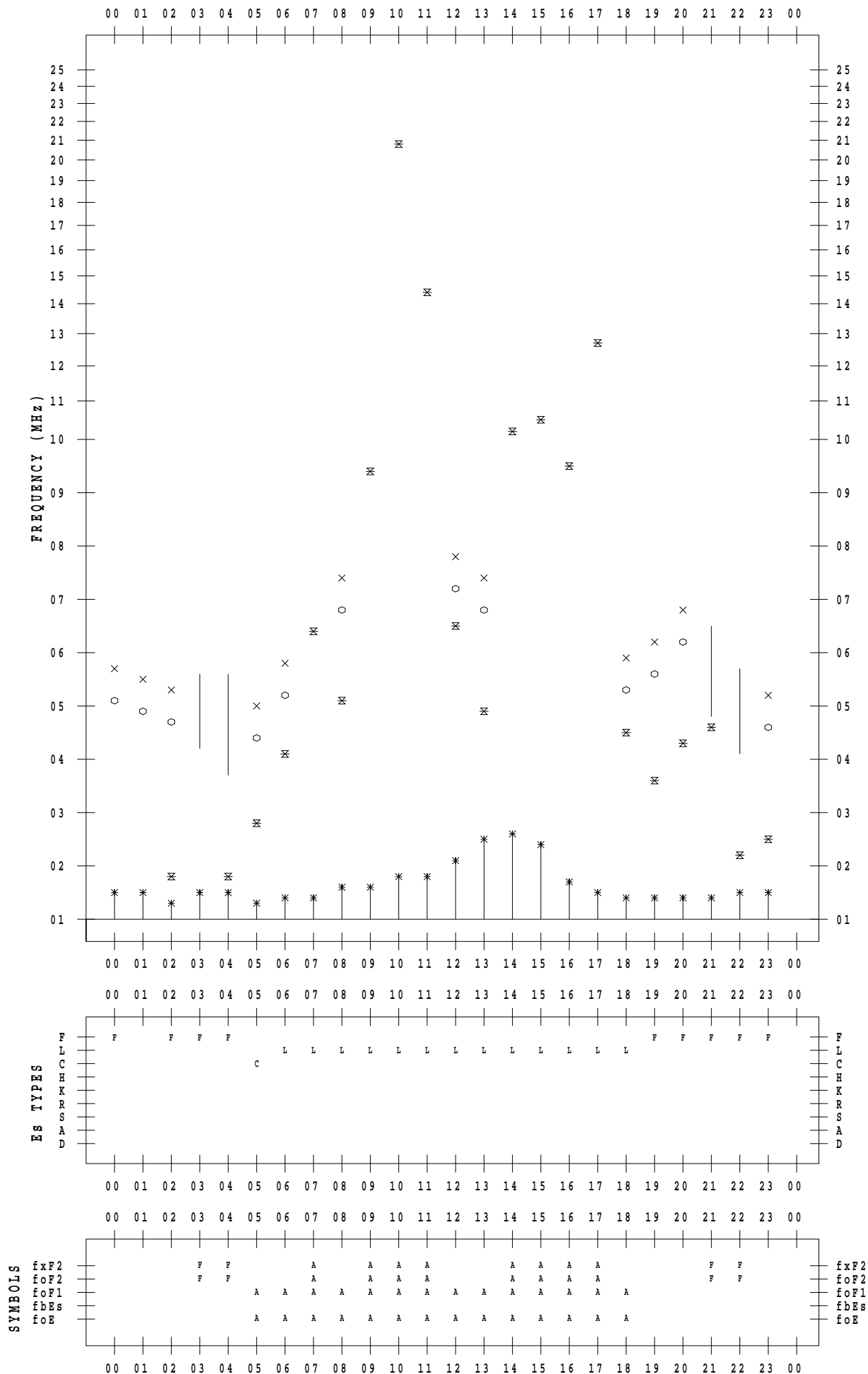
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 24

135 ° E MEAN TIME



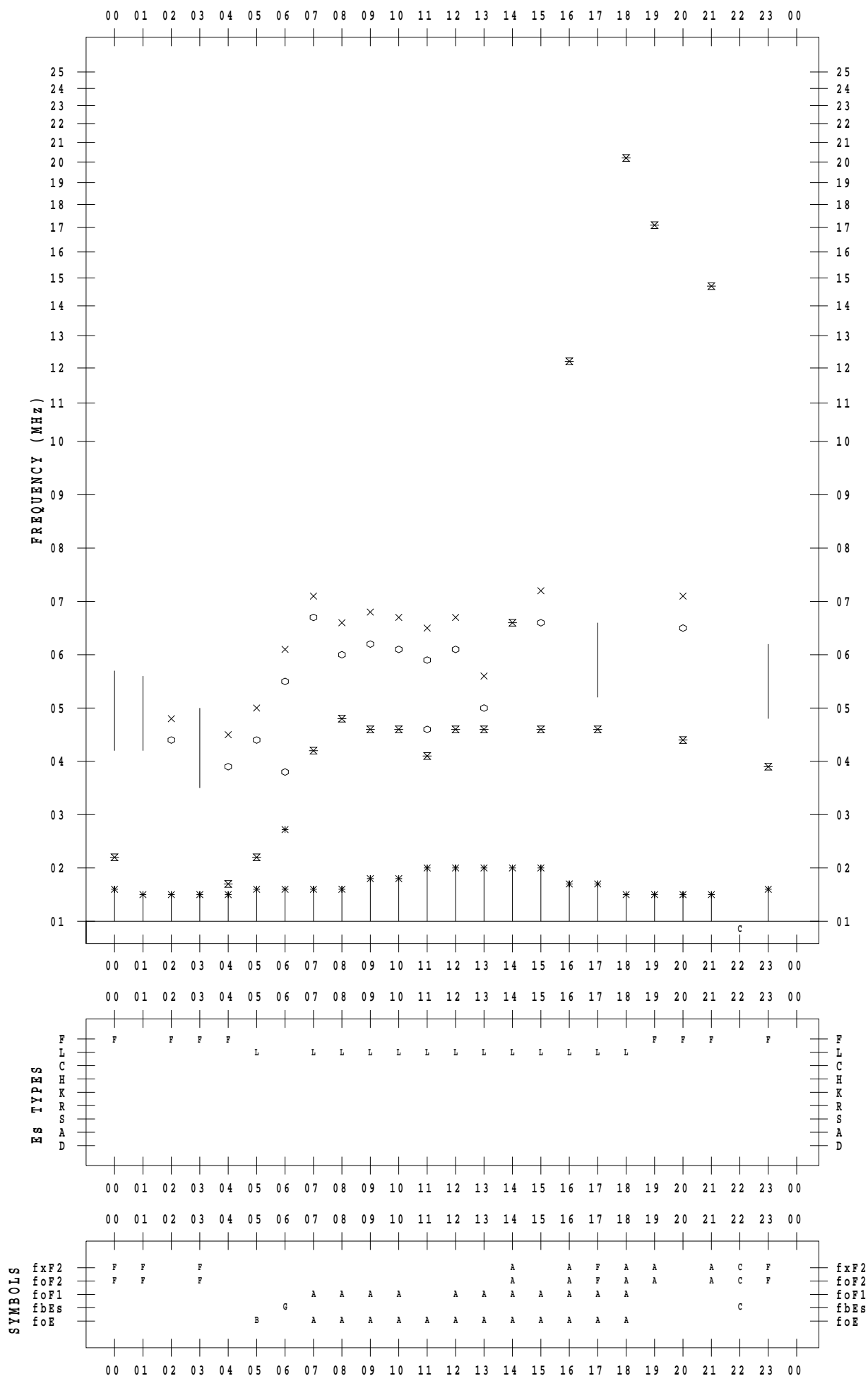
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 25

135 ° E MEAN TIME



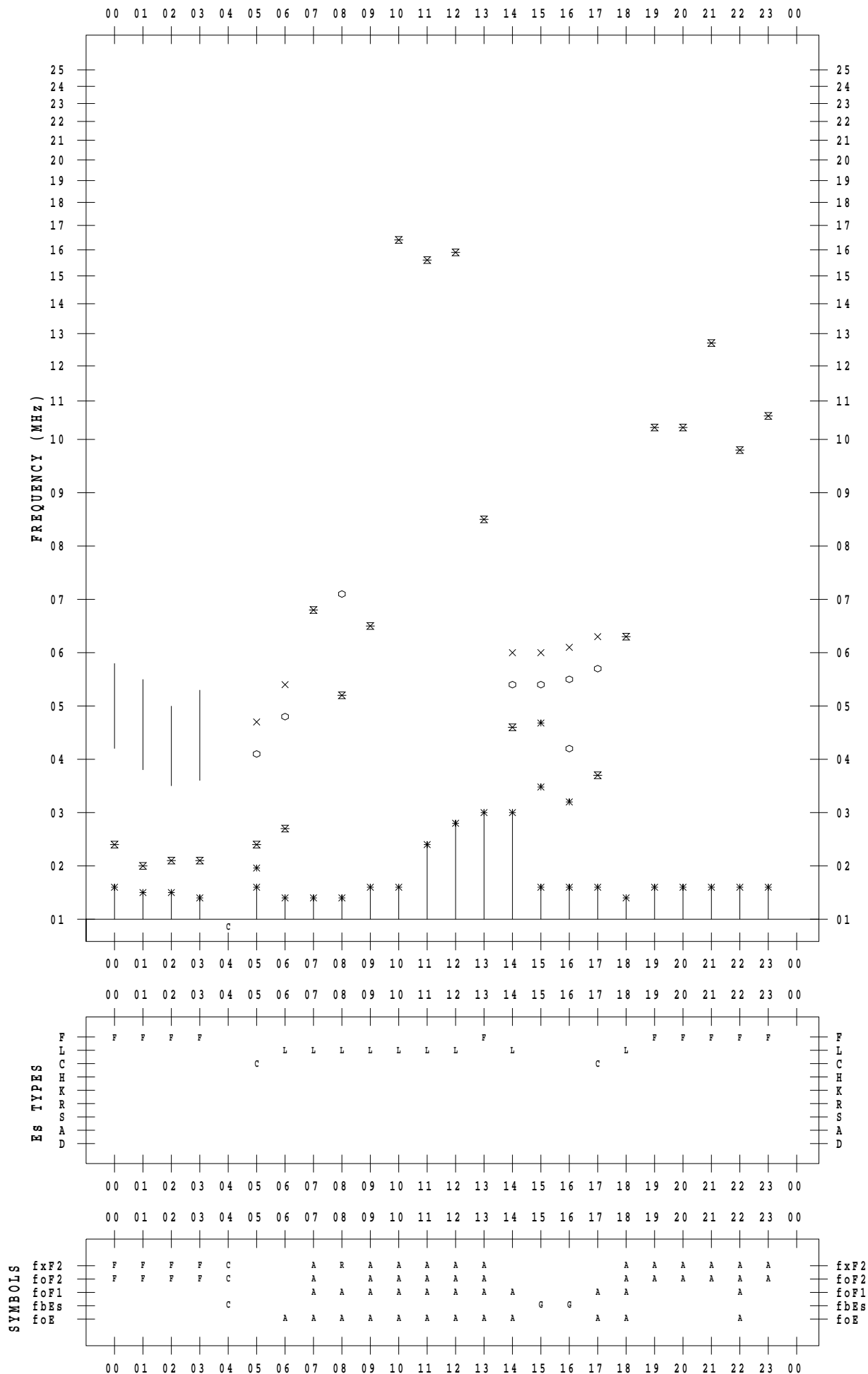
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 26

135 ° E MEAN TIME



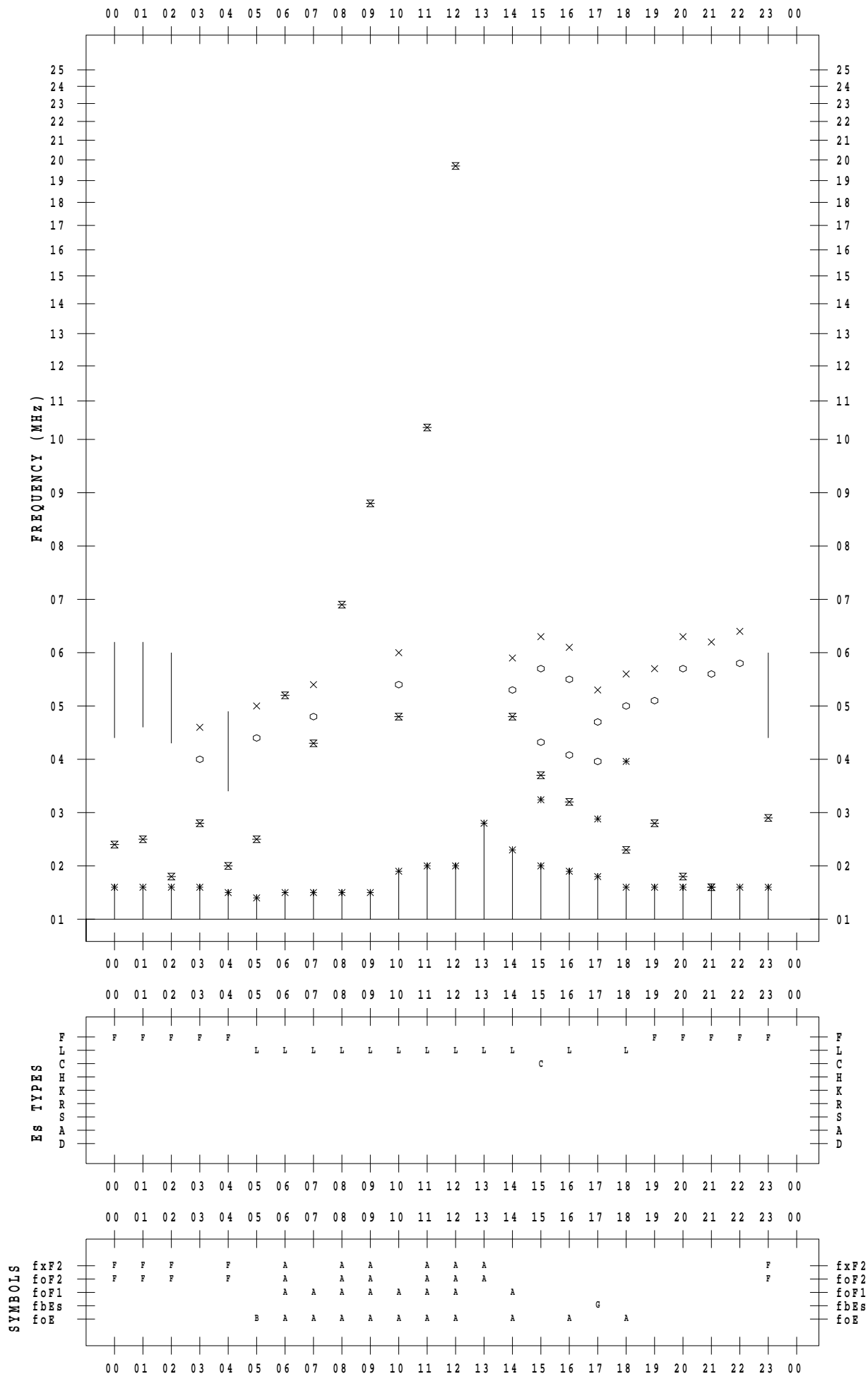
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 27

135 ° E MEAN TIME



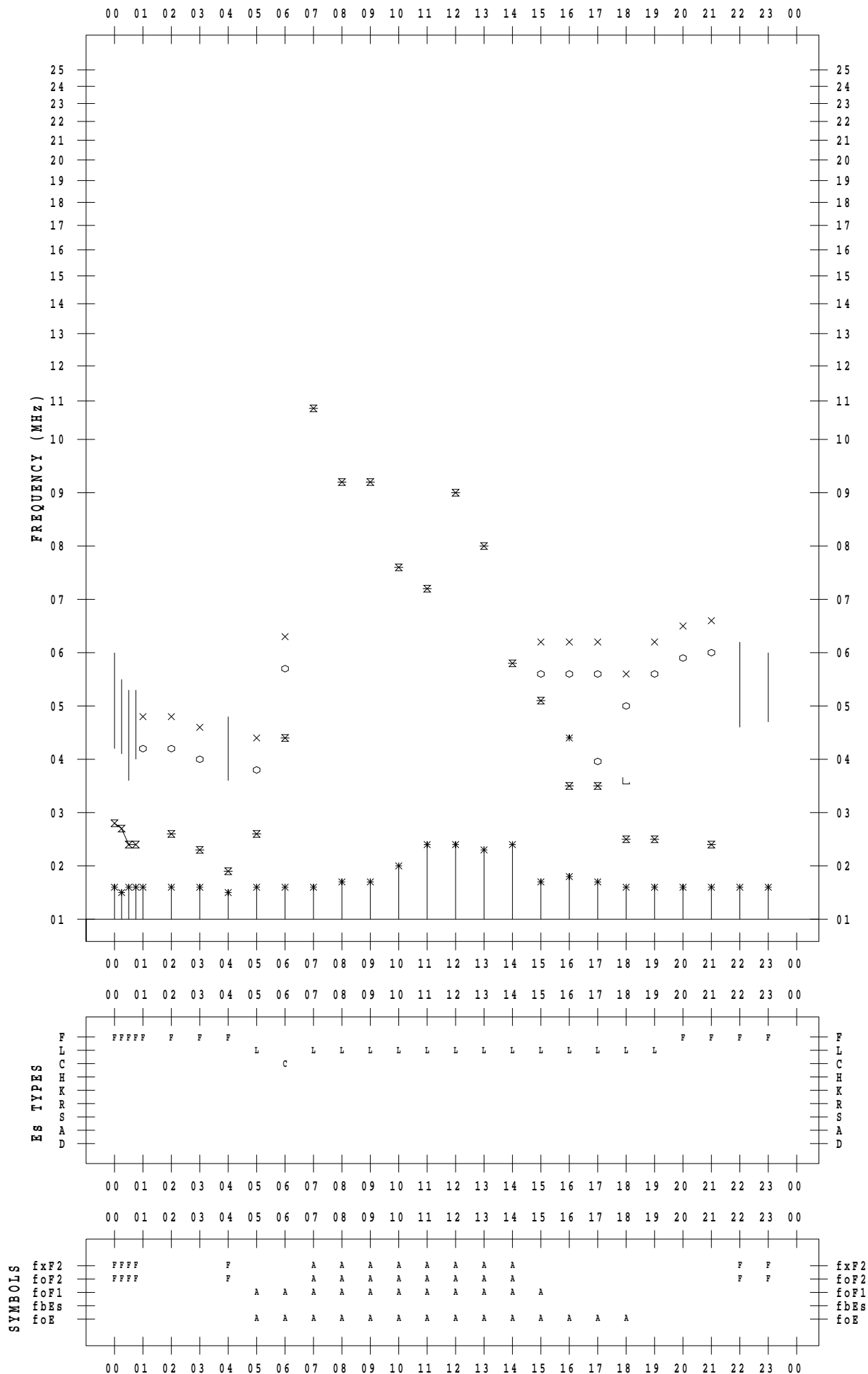
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 28

135 ° E MEAN TIME



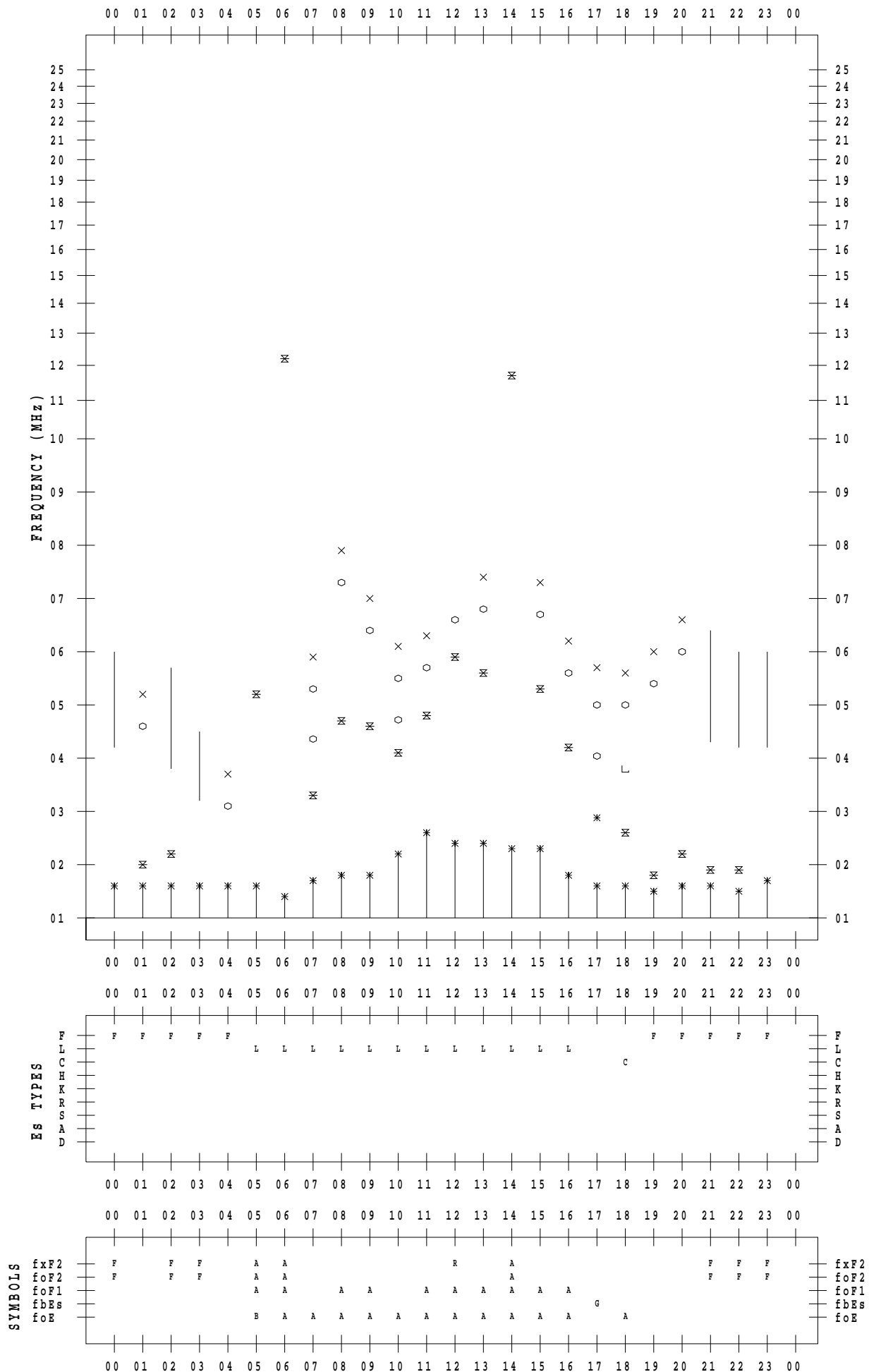
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 29

135 ° E MEAN TIME



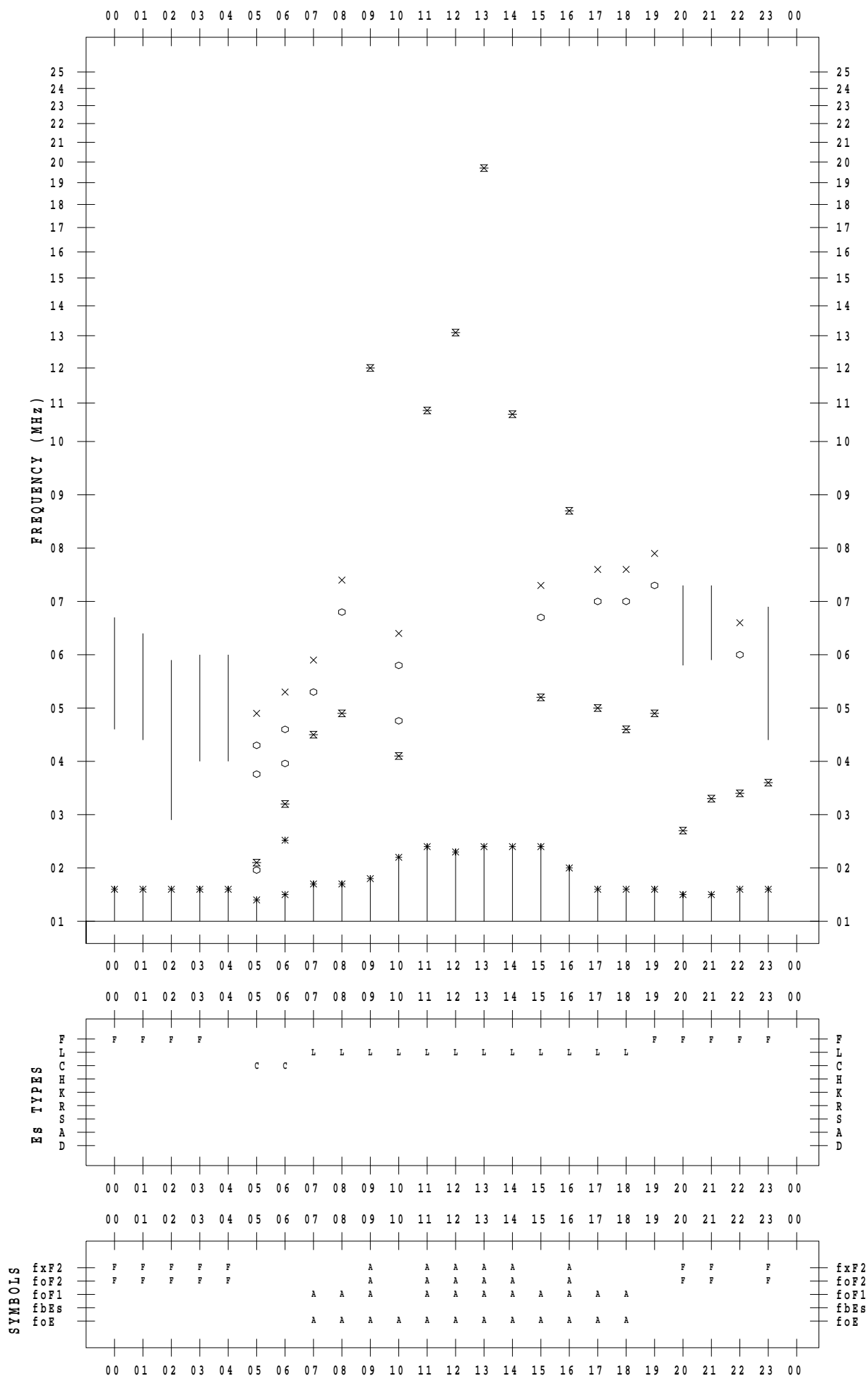
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 6 / 30

135 ° E MEAN TIME



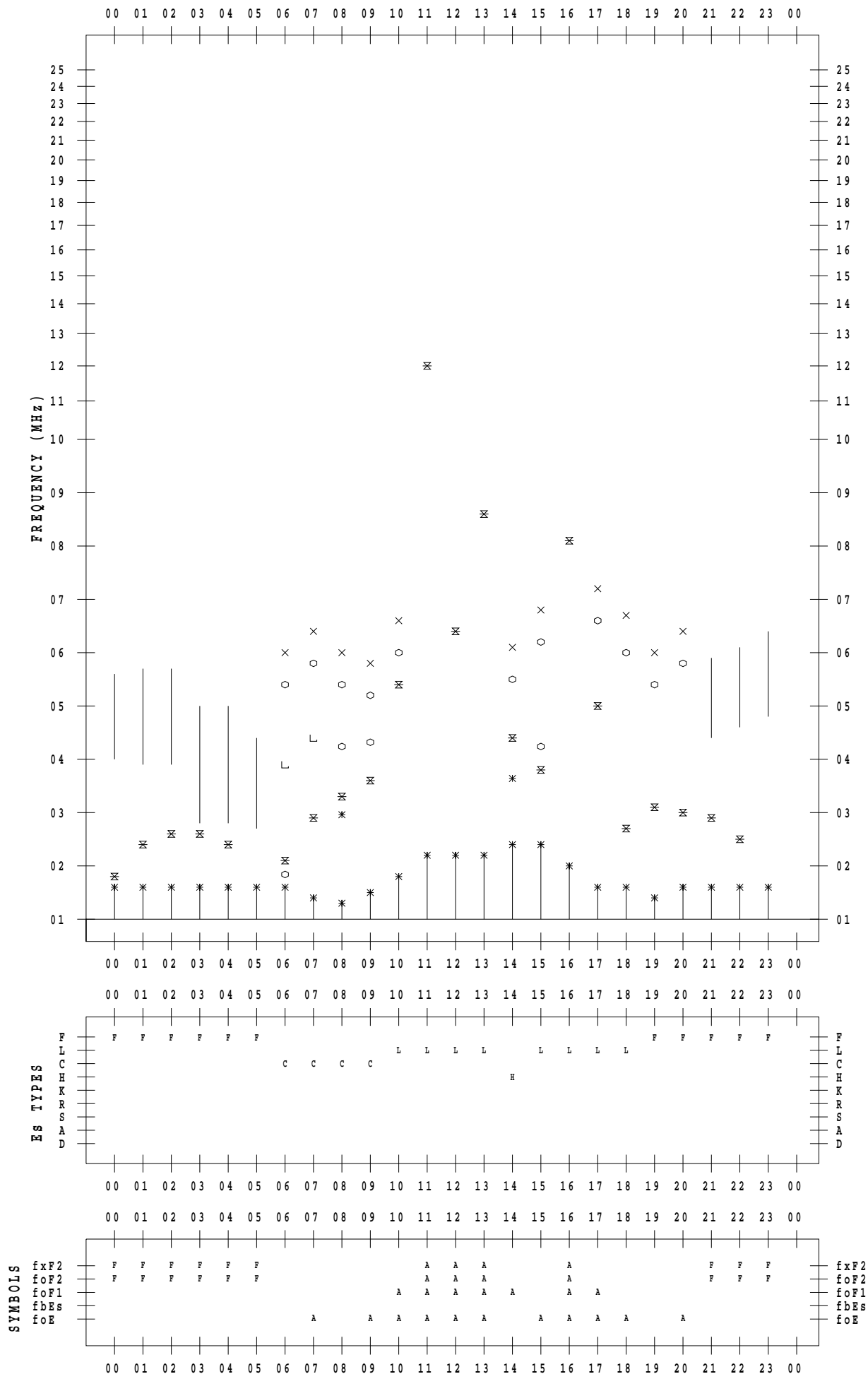
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 1

135 ° E MEAN TIME



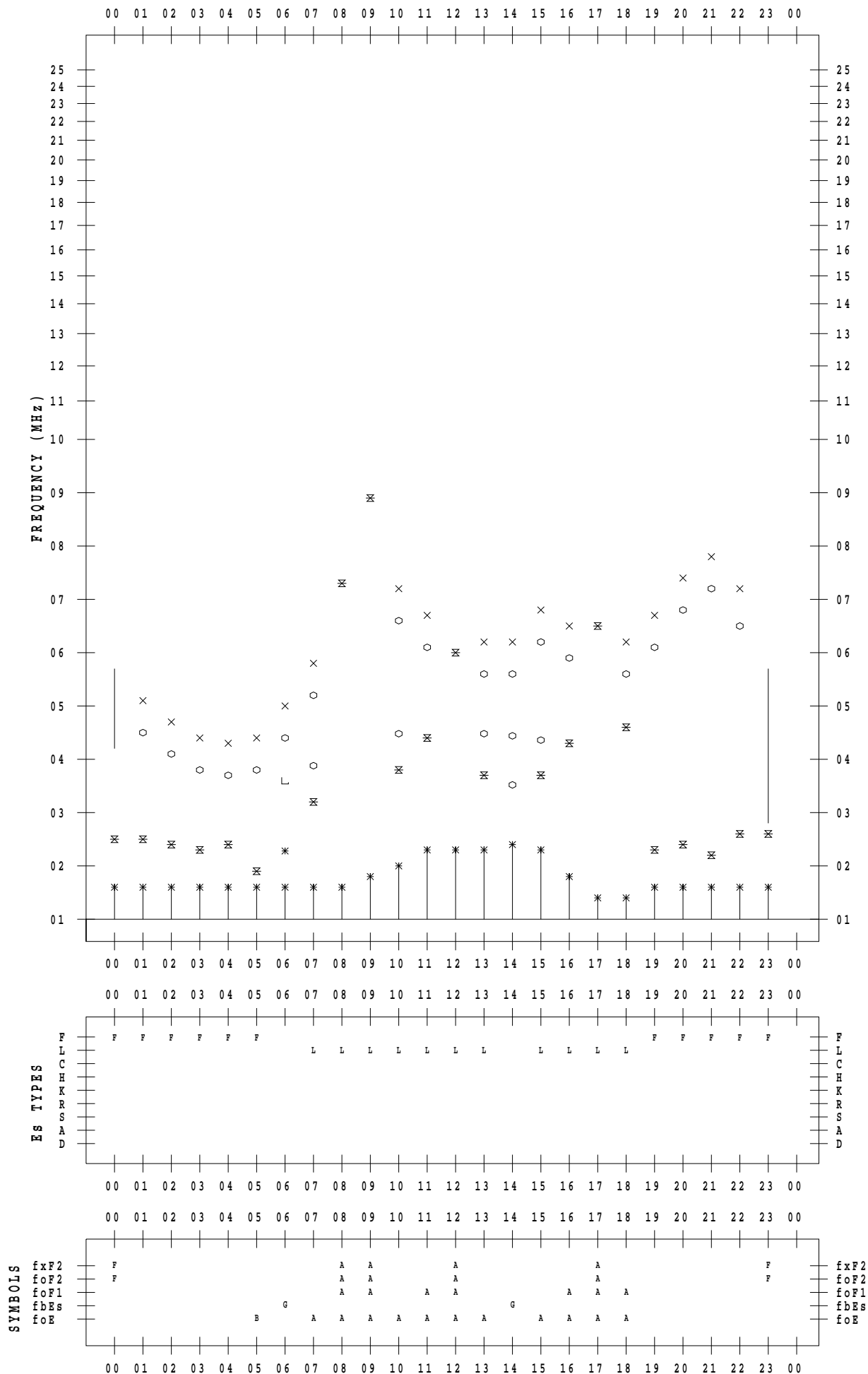
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 2

135 ° E MEAN TIME



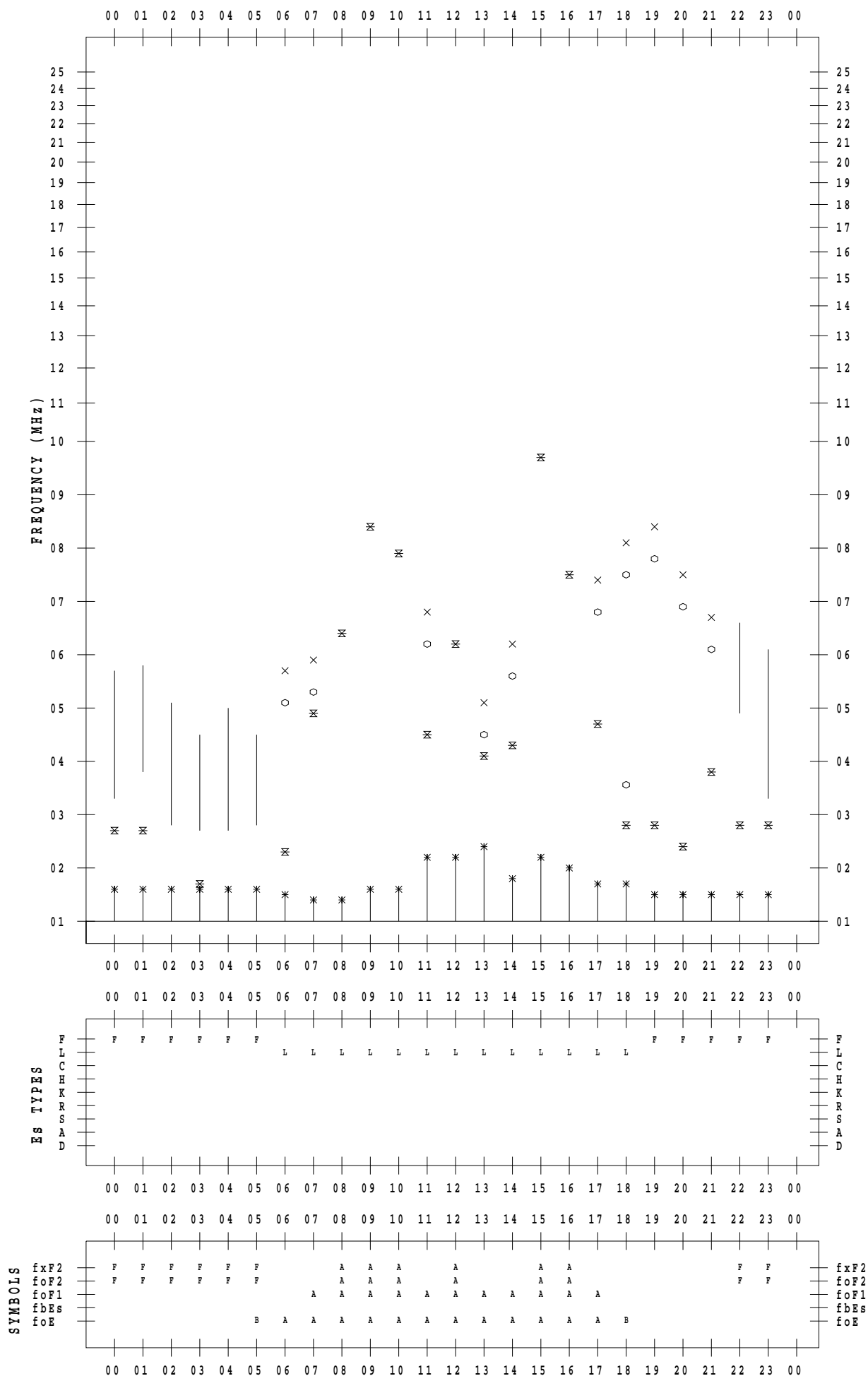
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 3

135 ° E MEAN TIME



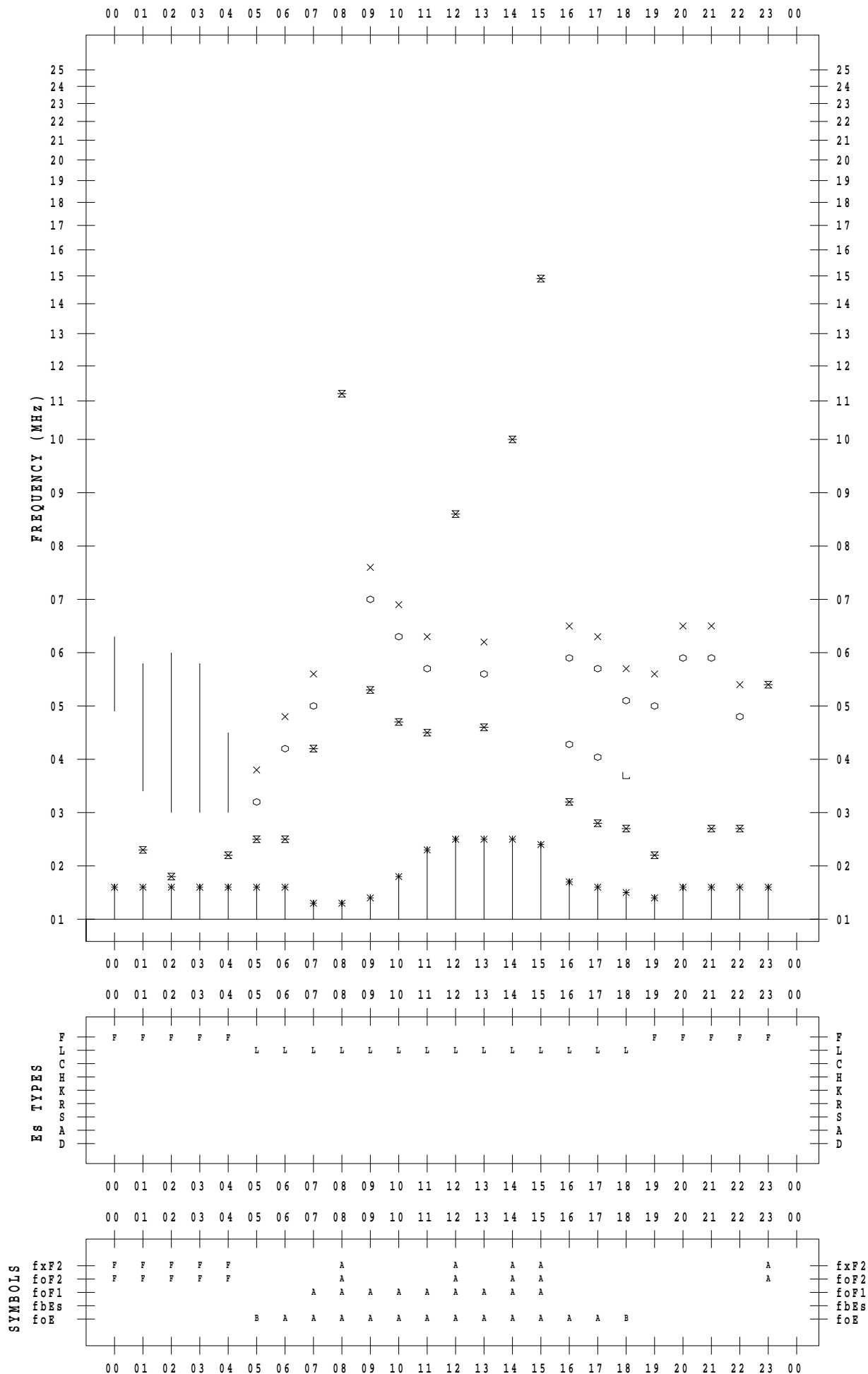
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 4

135 ° E MEAN TIME



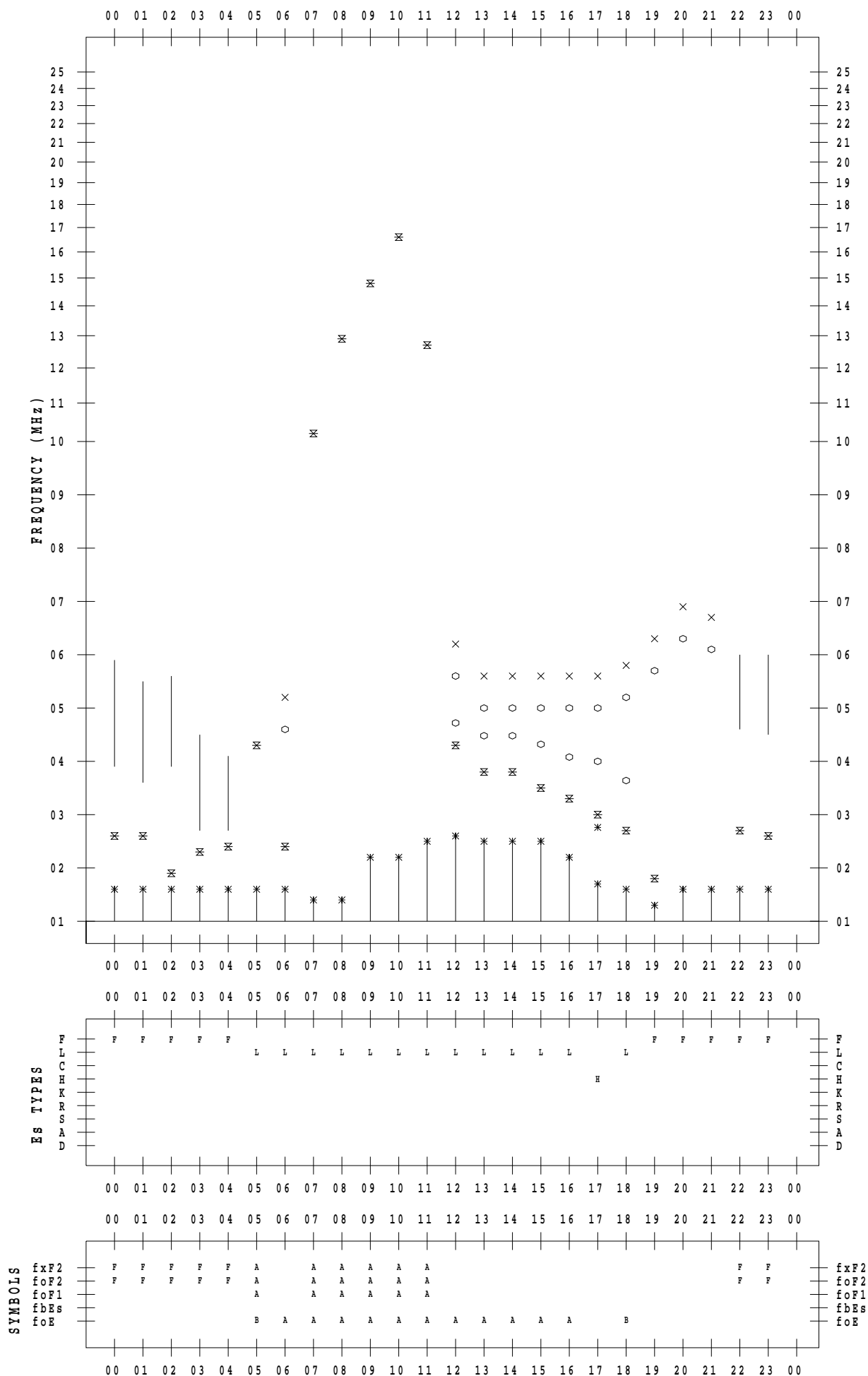
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 5

135 ° E MEAN TIME



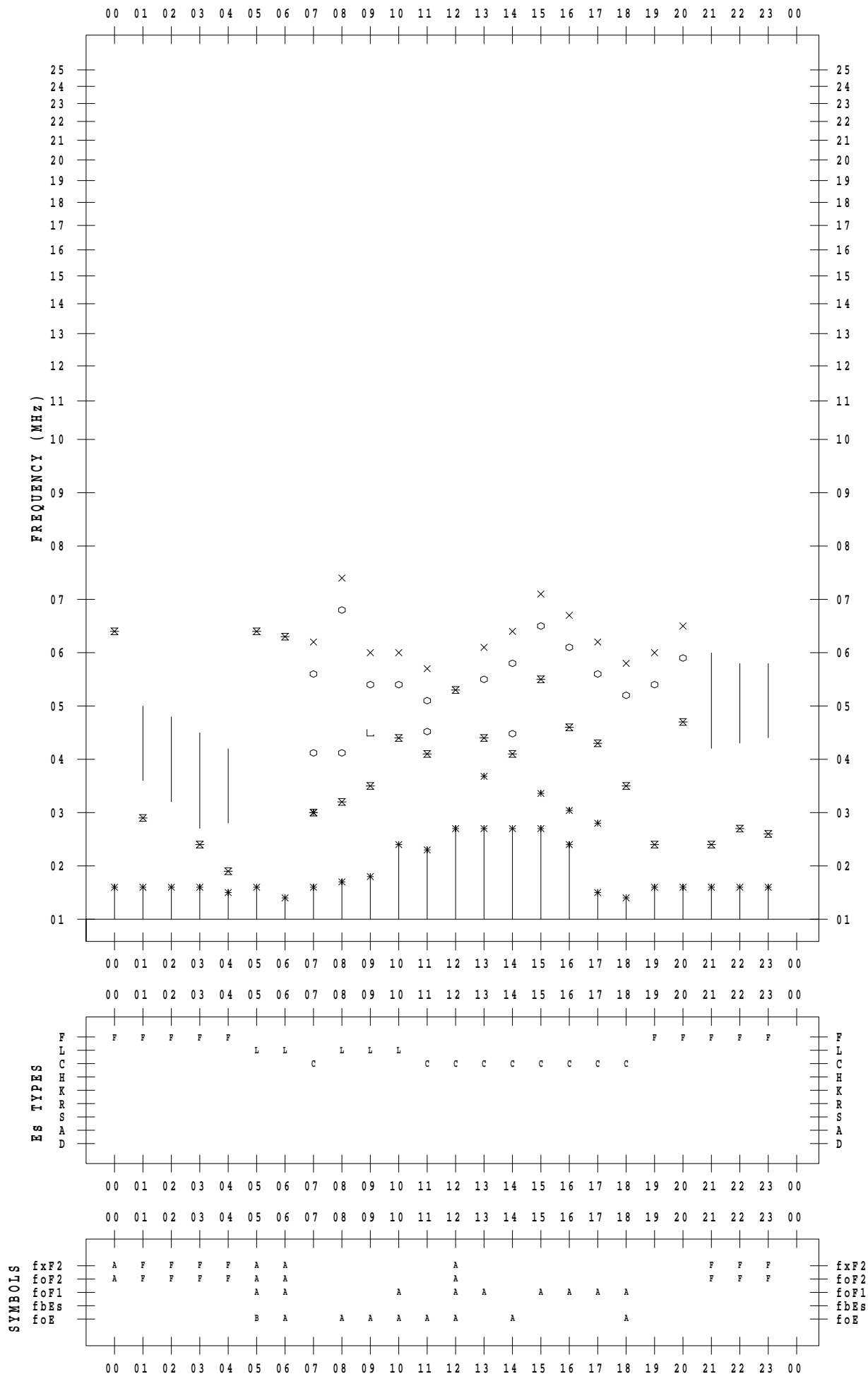
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 6

135 ° E MEAN TIME



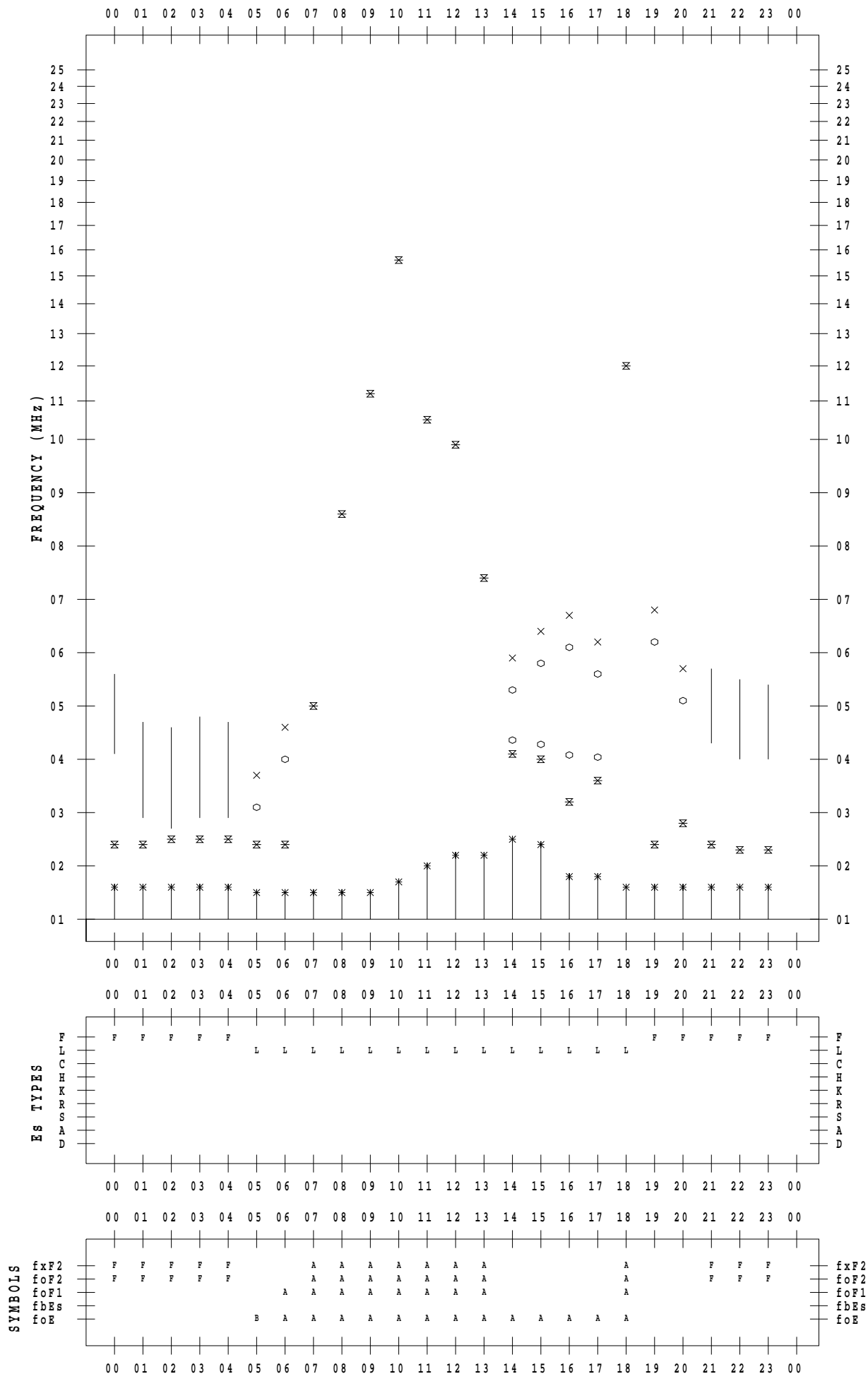
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 7

135 ° E MEAN TIME



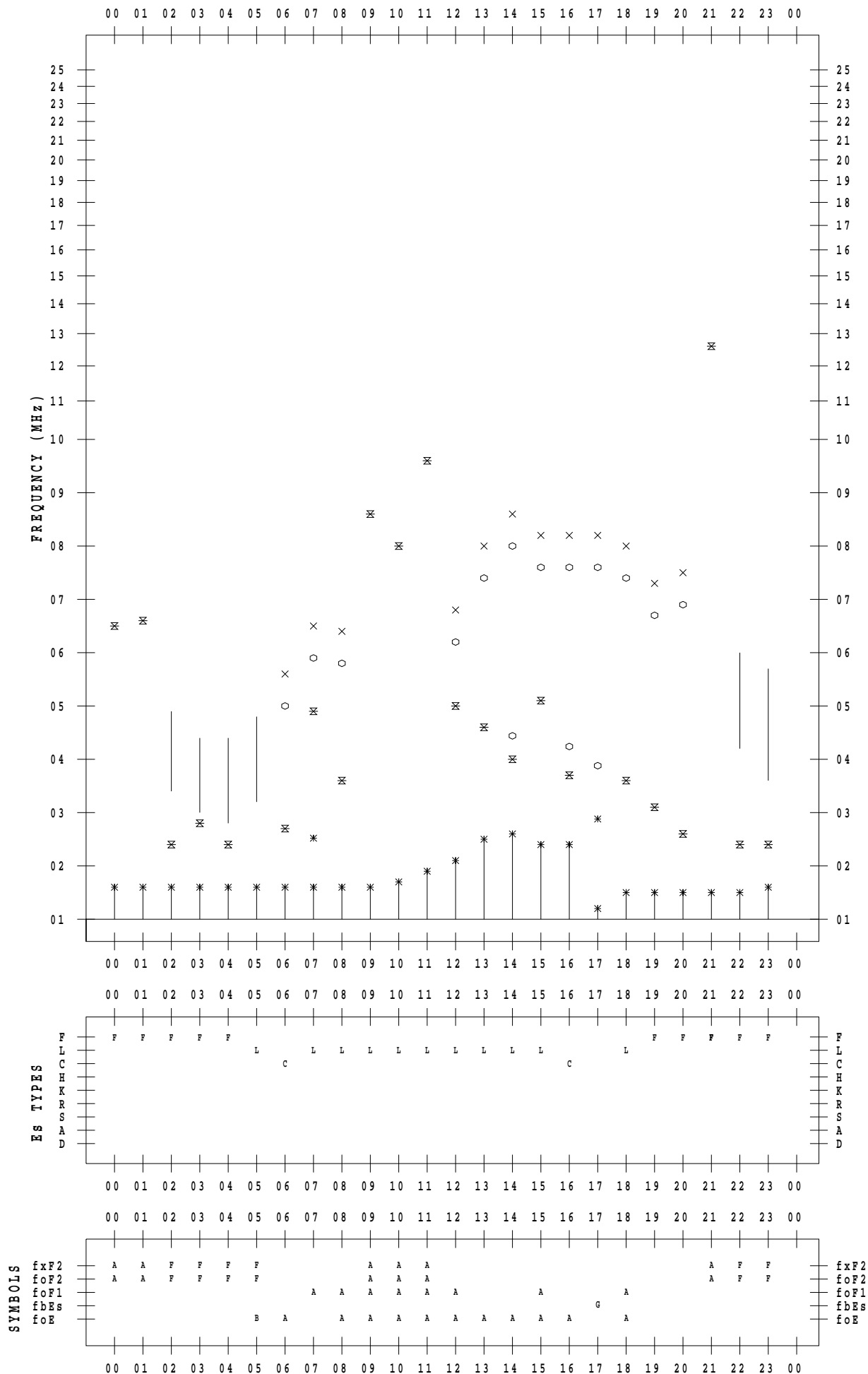
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 8

135 ° E MEAN TIME



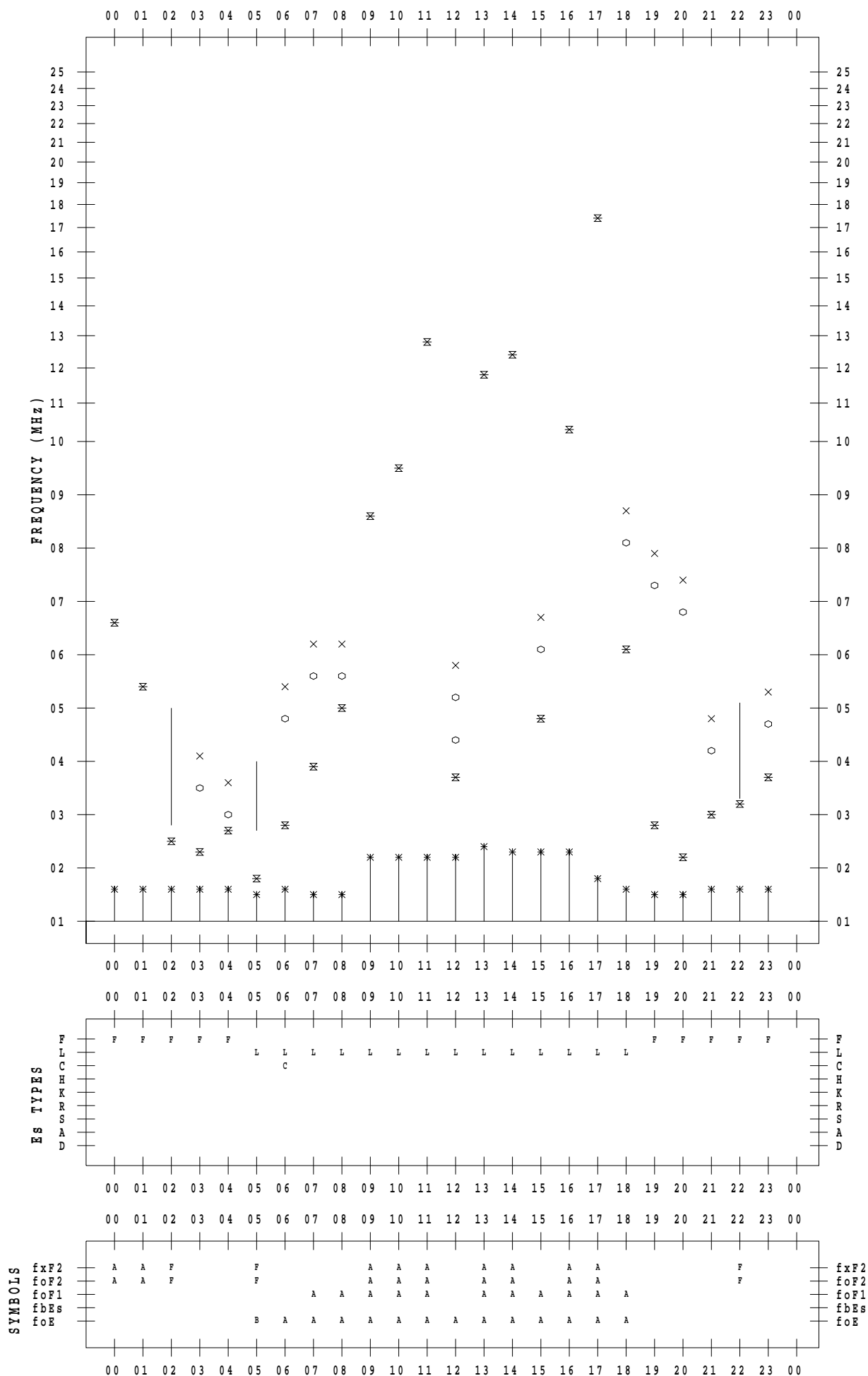
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 9

135 ° E MEAN TIME



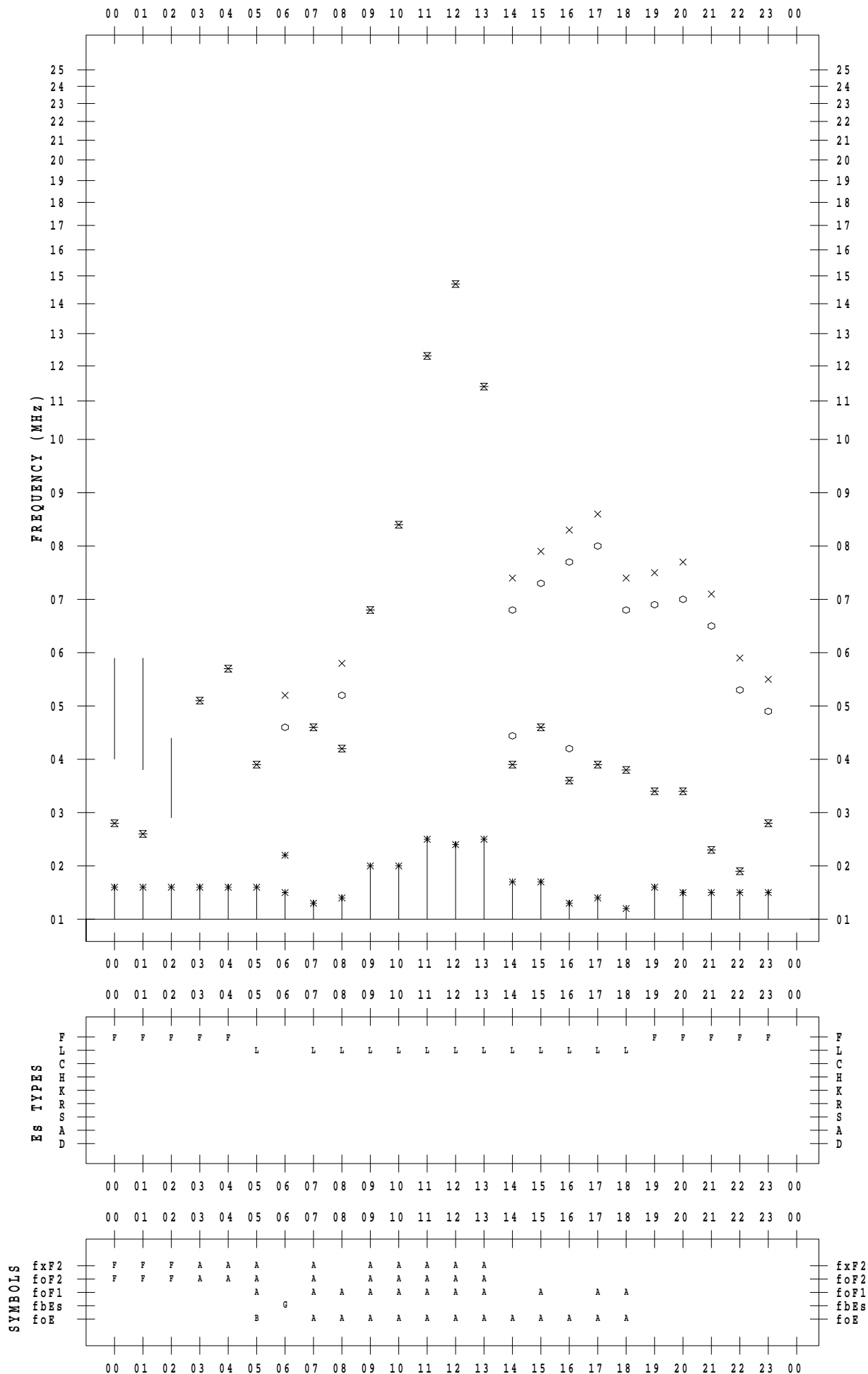
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 10

135 ° E MEAN TIME



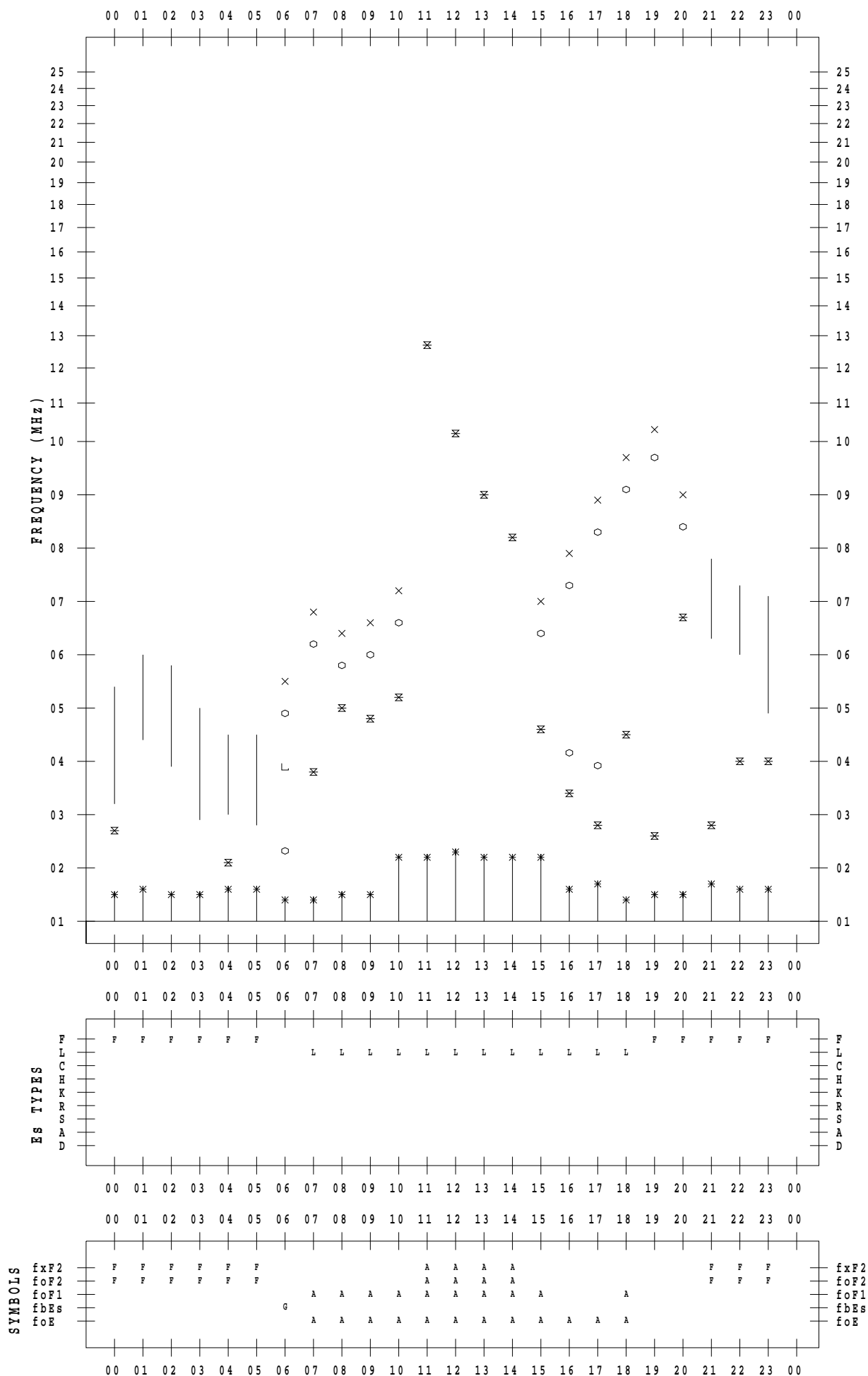
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 11

135 ° E MEAN TIME



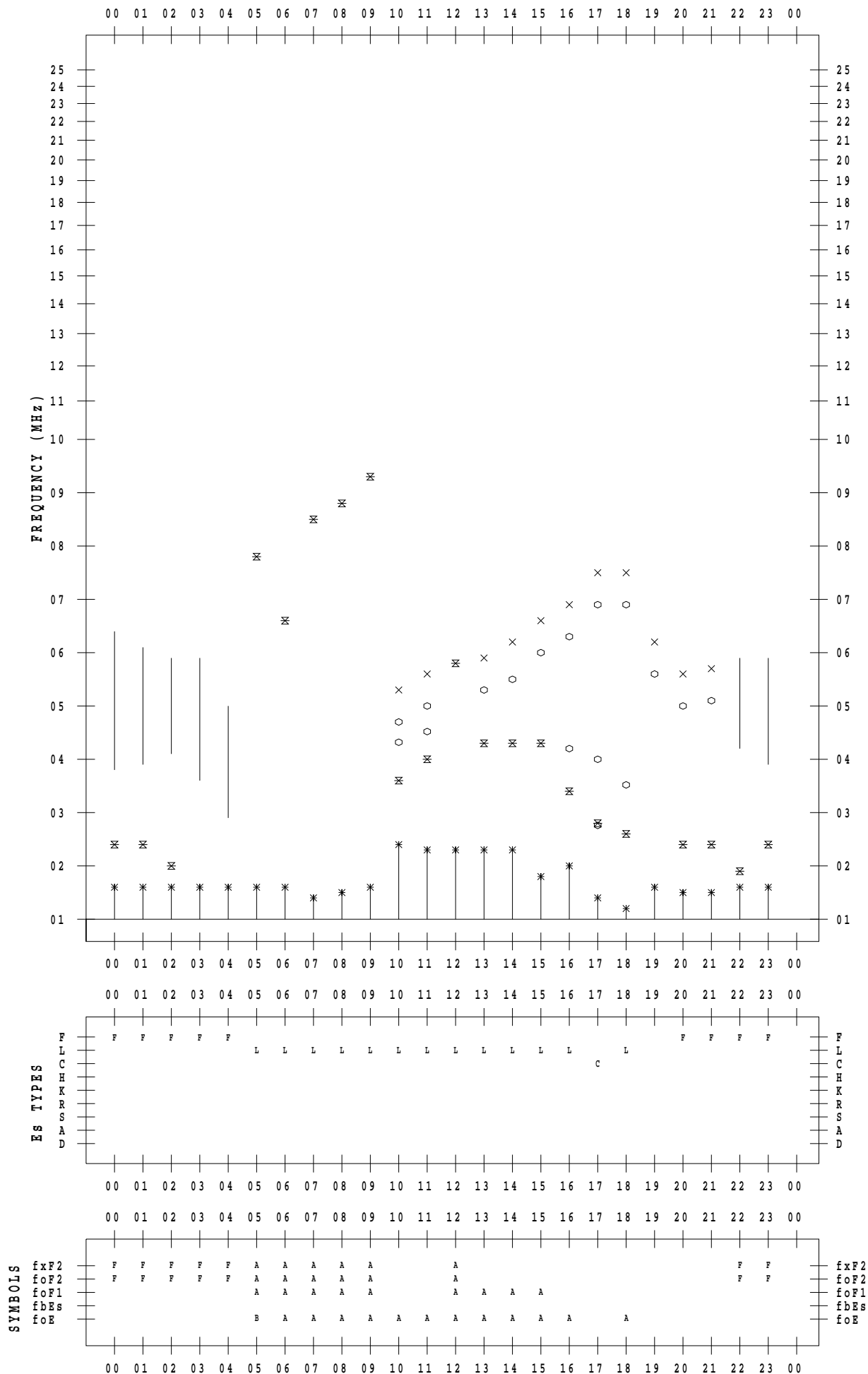
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 12

135 ° E MEAN TIME



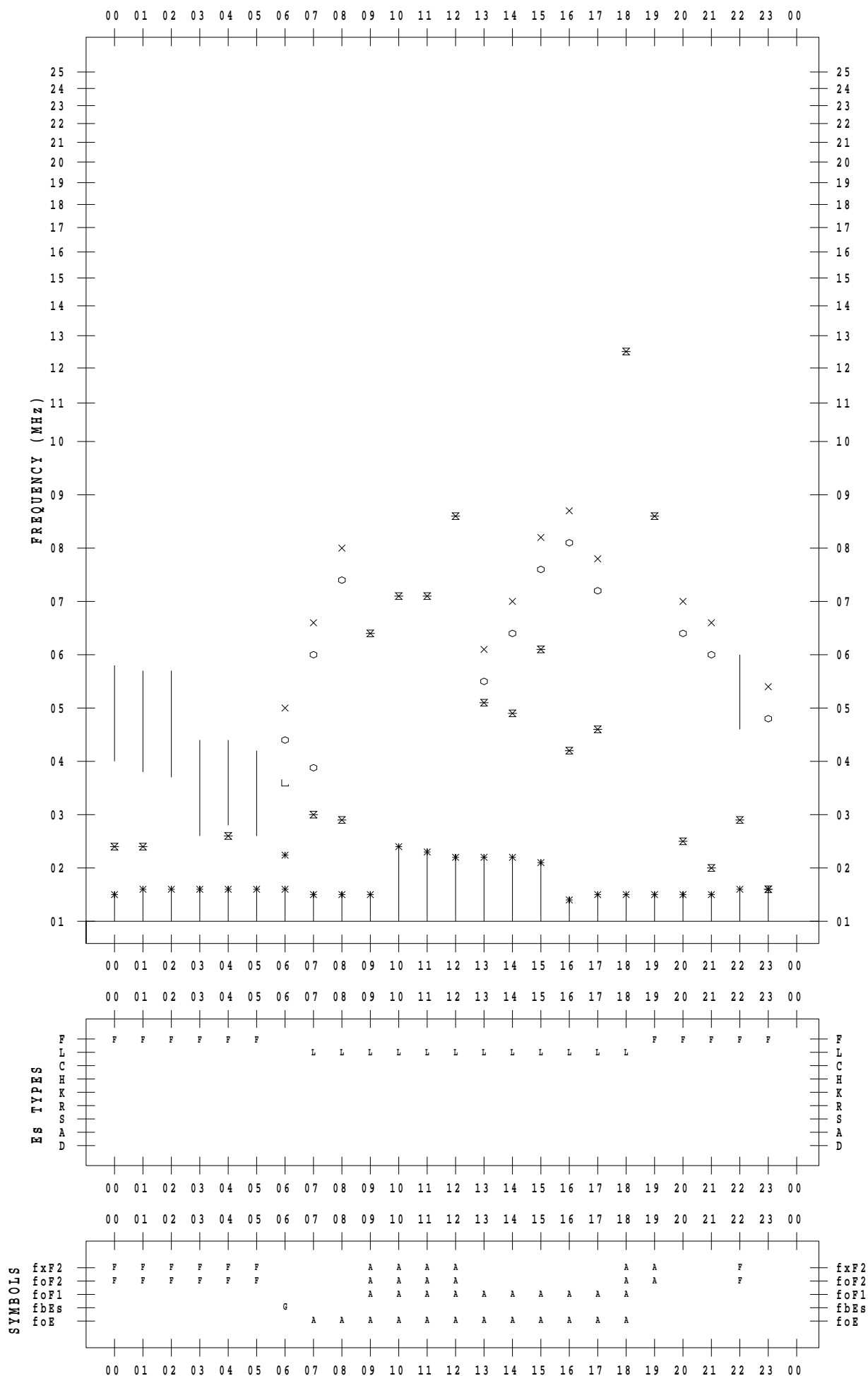
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 13

135 ° E MEAN TIME



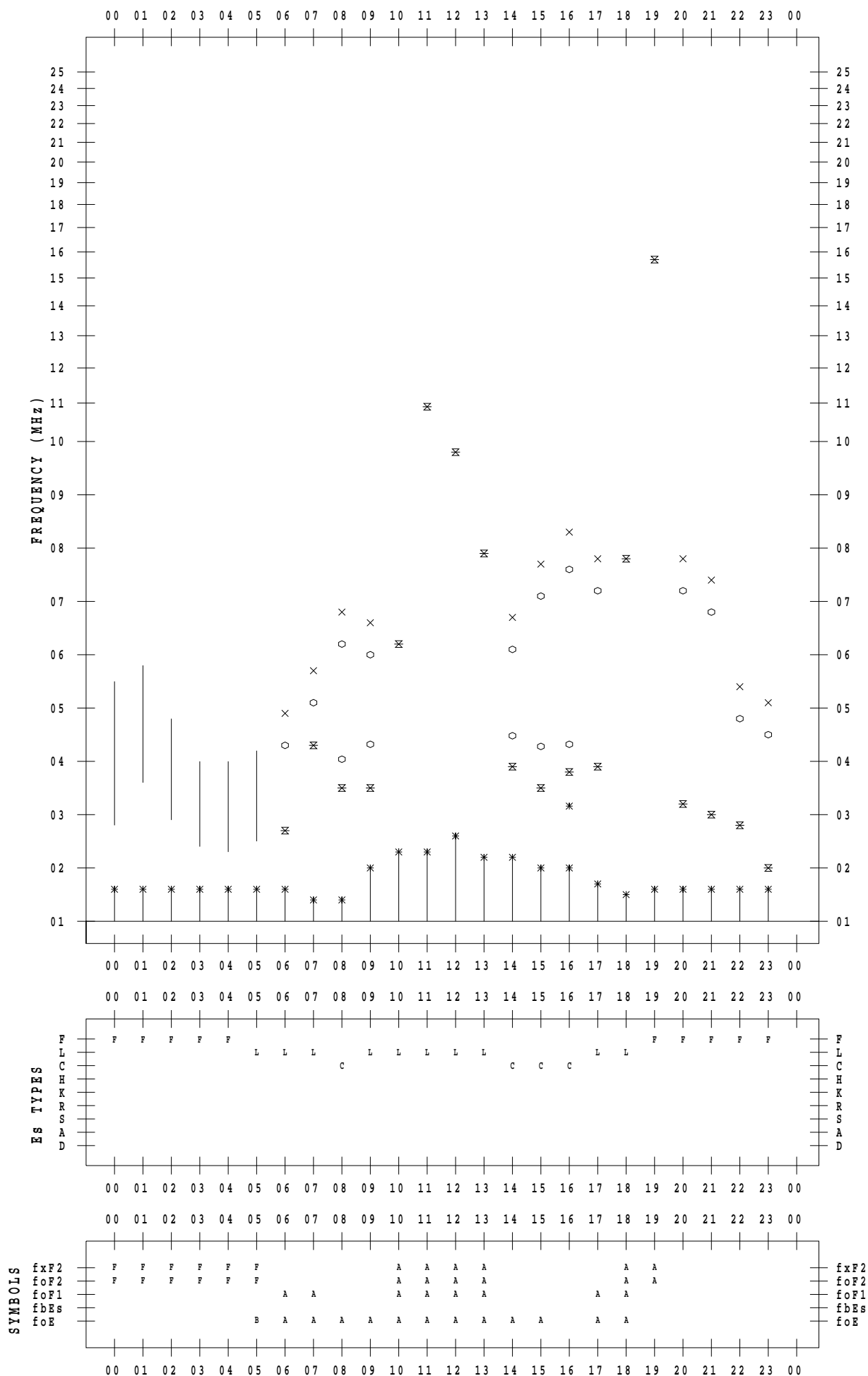
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 14

135 ° E MEAN TIME



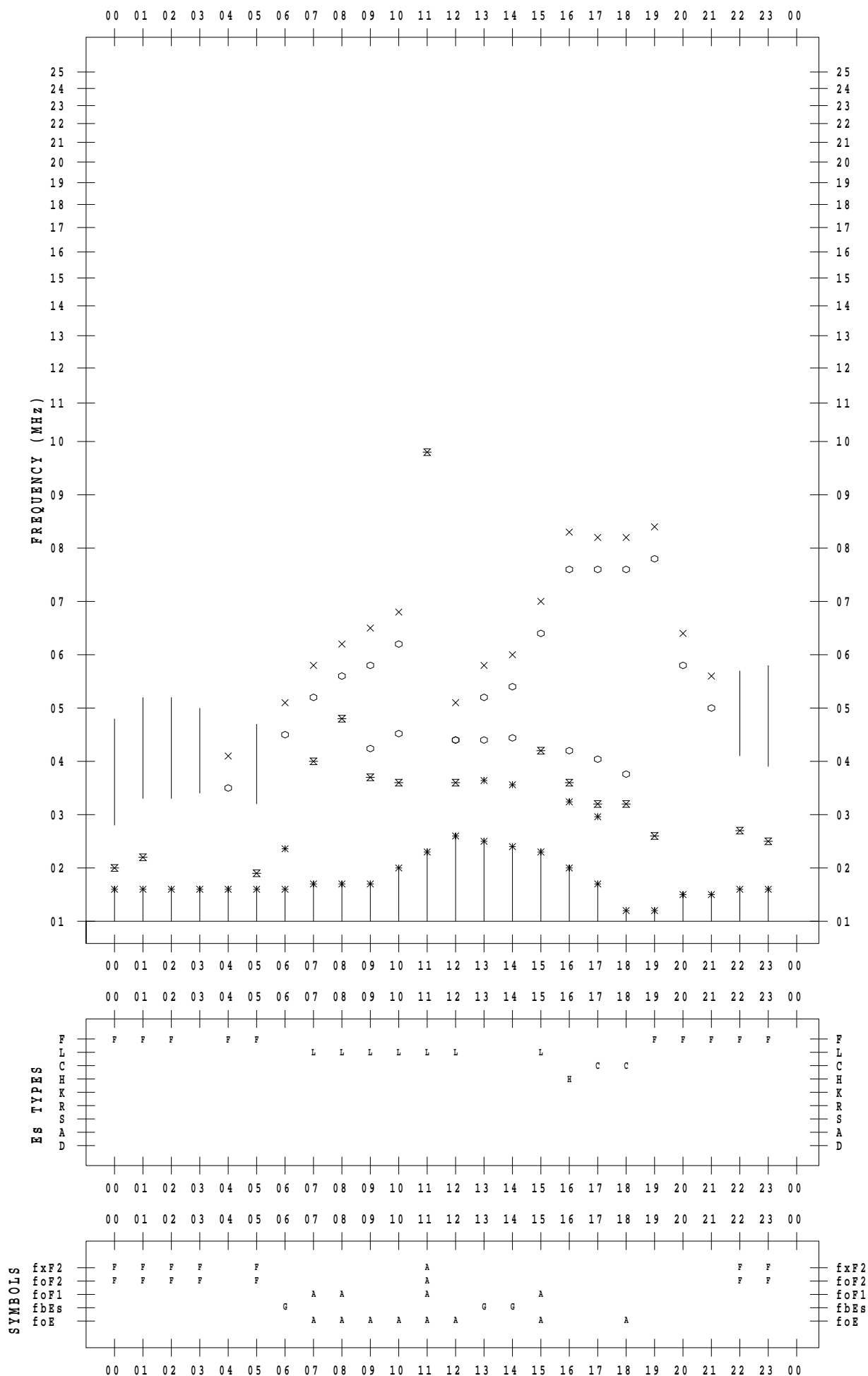
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 15

135 ° E MEAN TIME



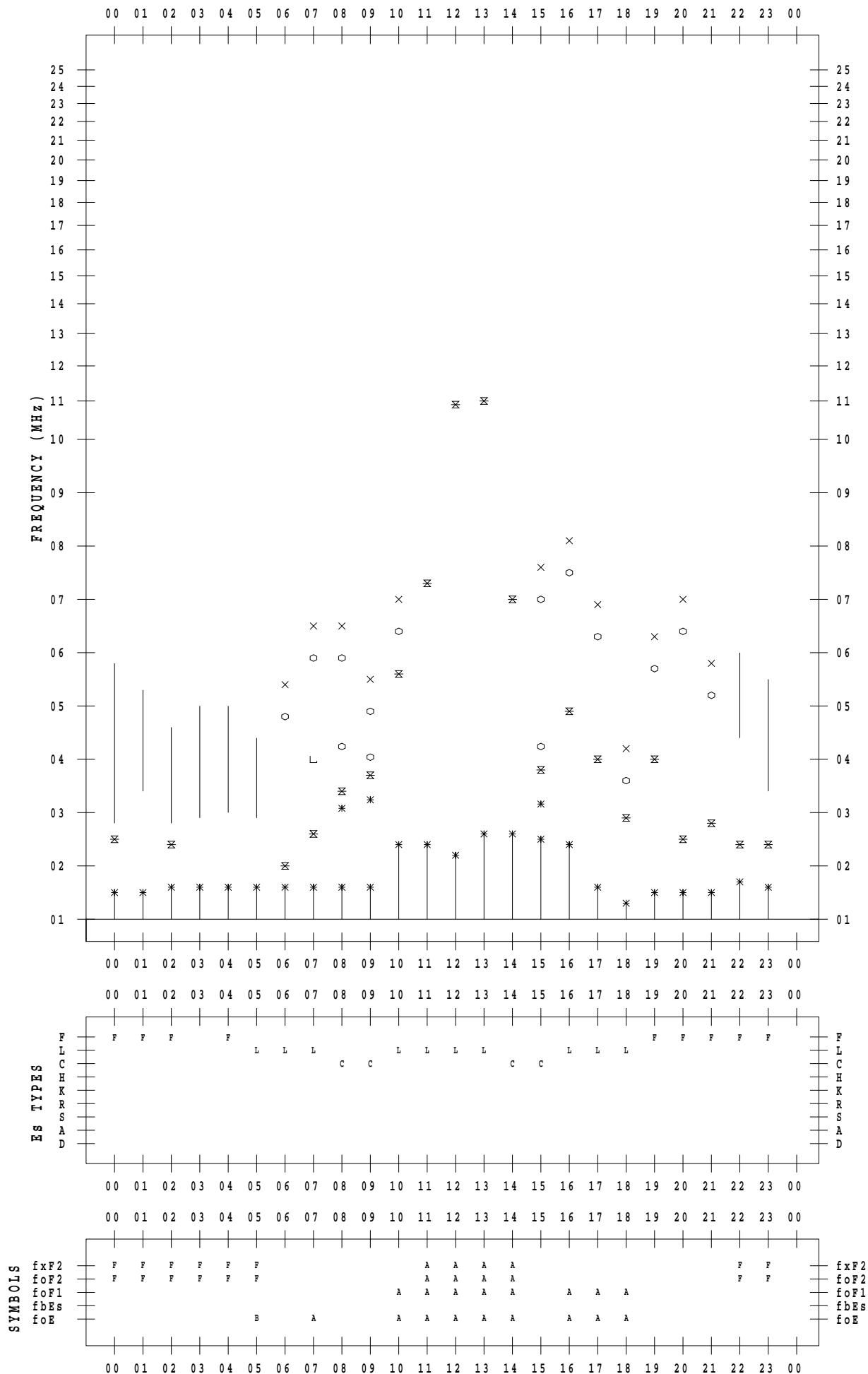
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 16

135 ° E MEAN TIME



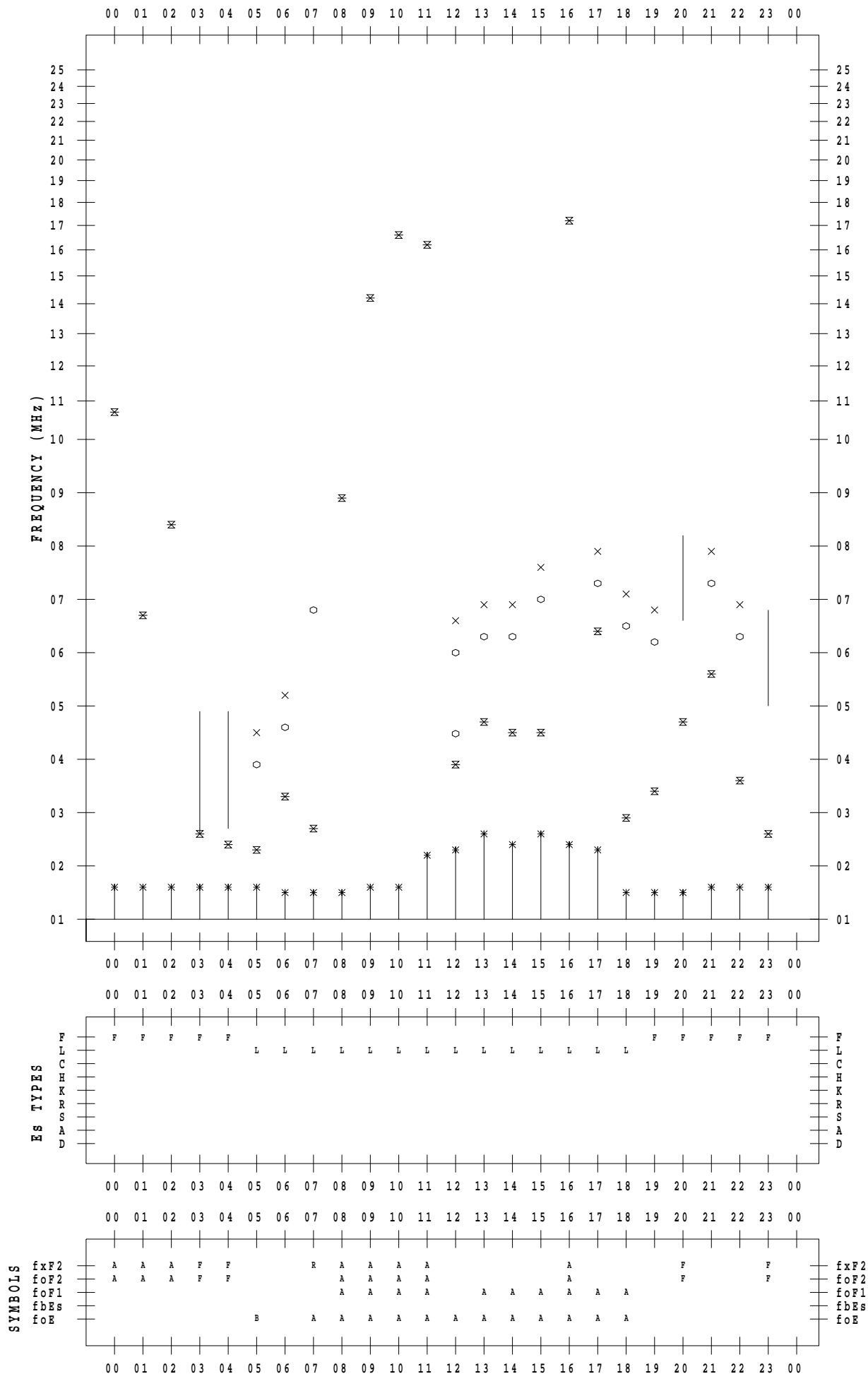
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 17

135 ° E MEAN TIME



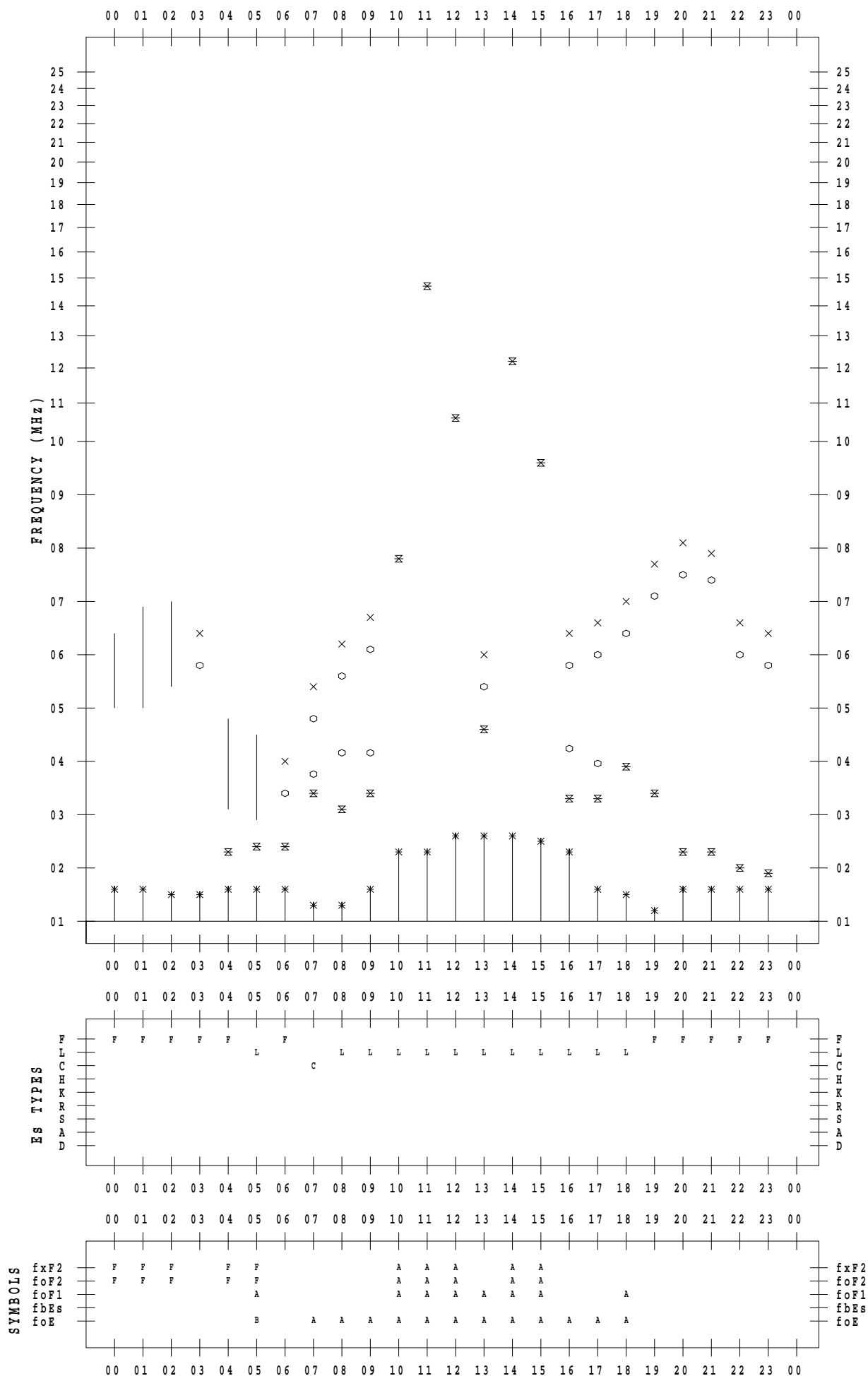
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 18

135 ° E MEAN TIME



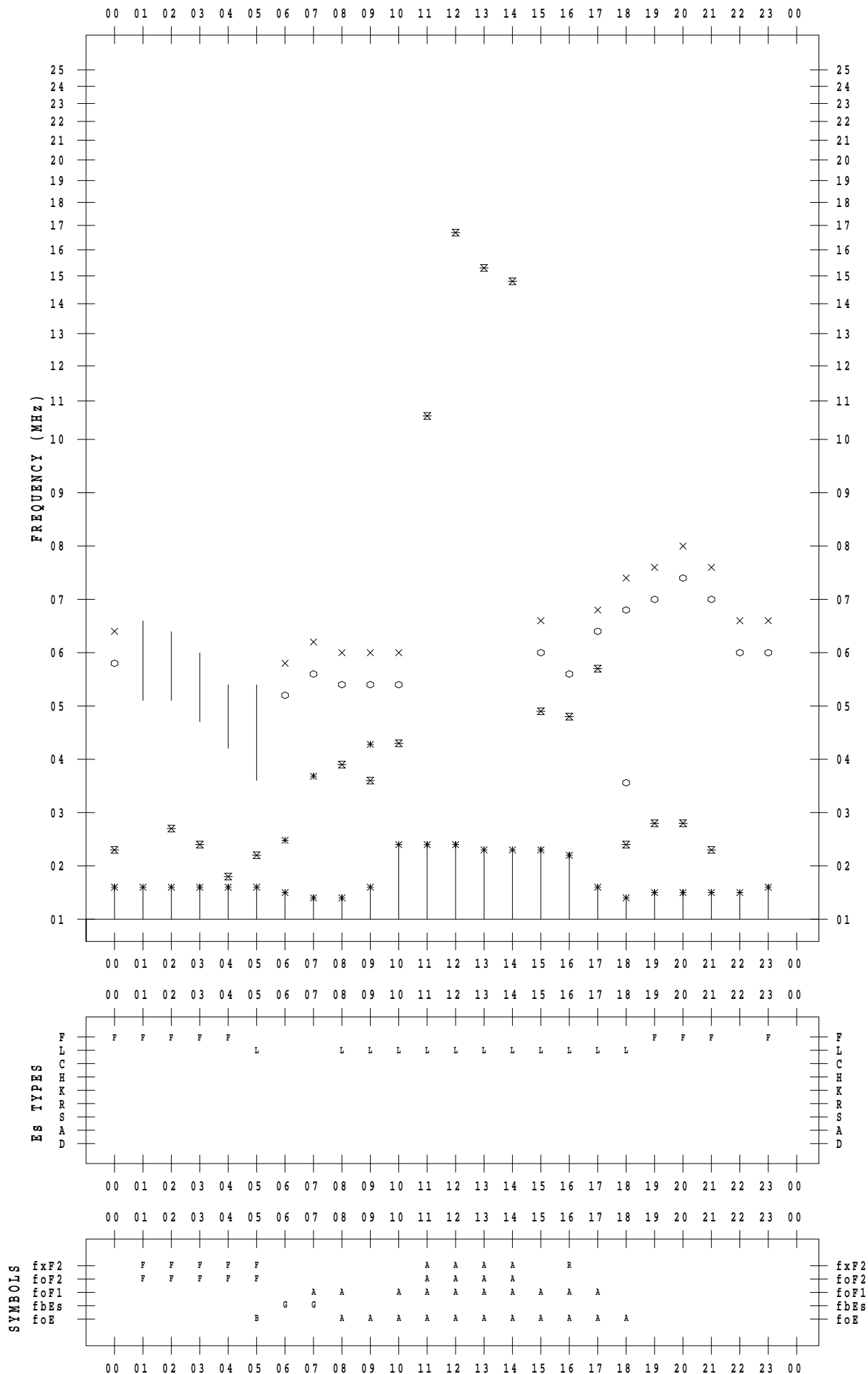
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 19

135 ° E MEAN TIME



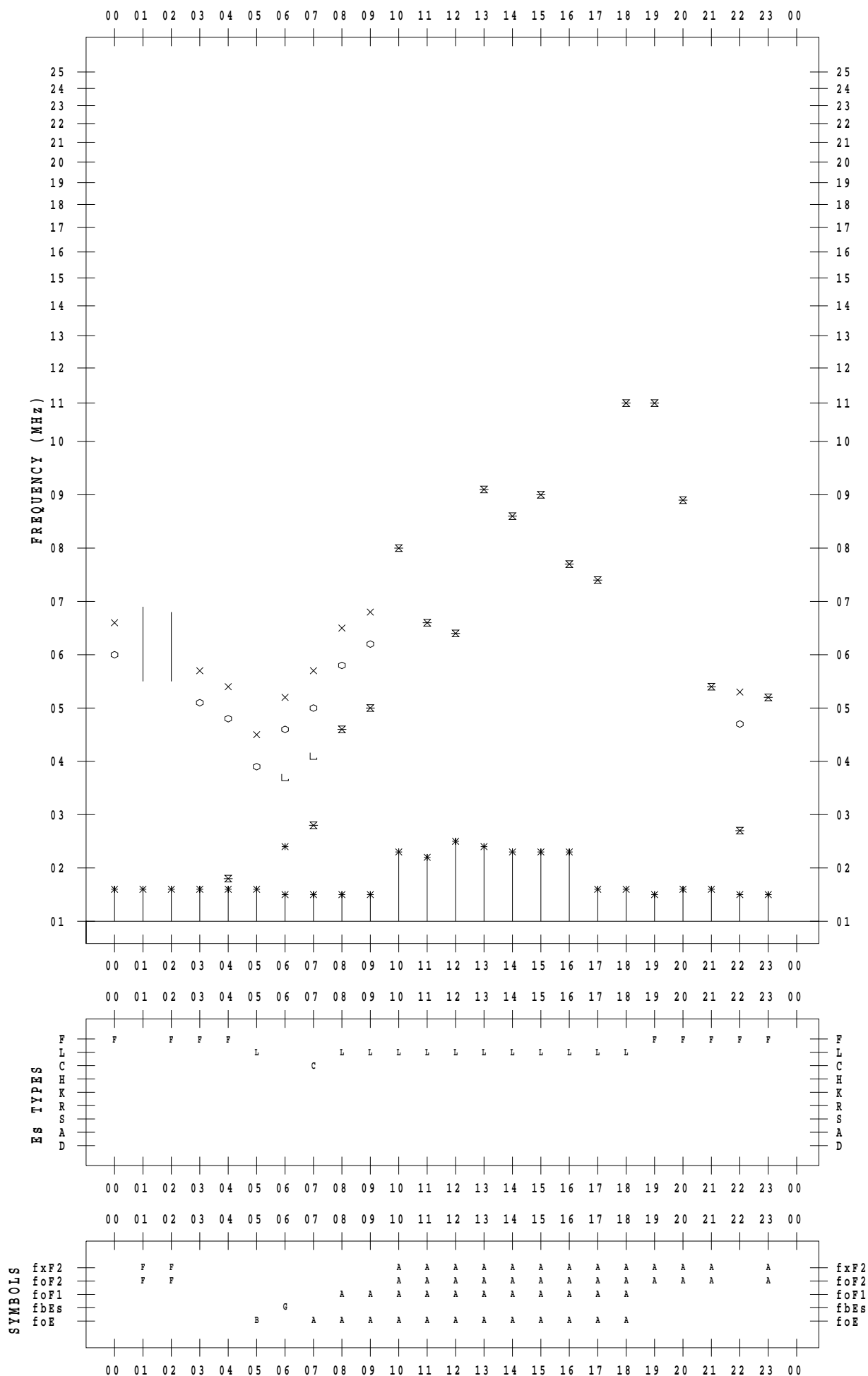
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 20

135 ° E MEAN TIME



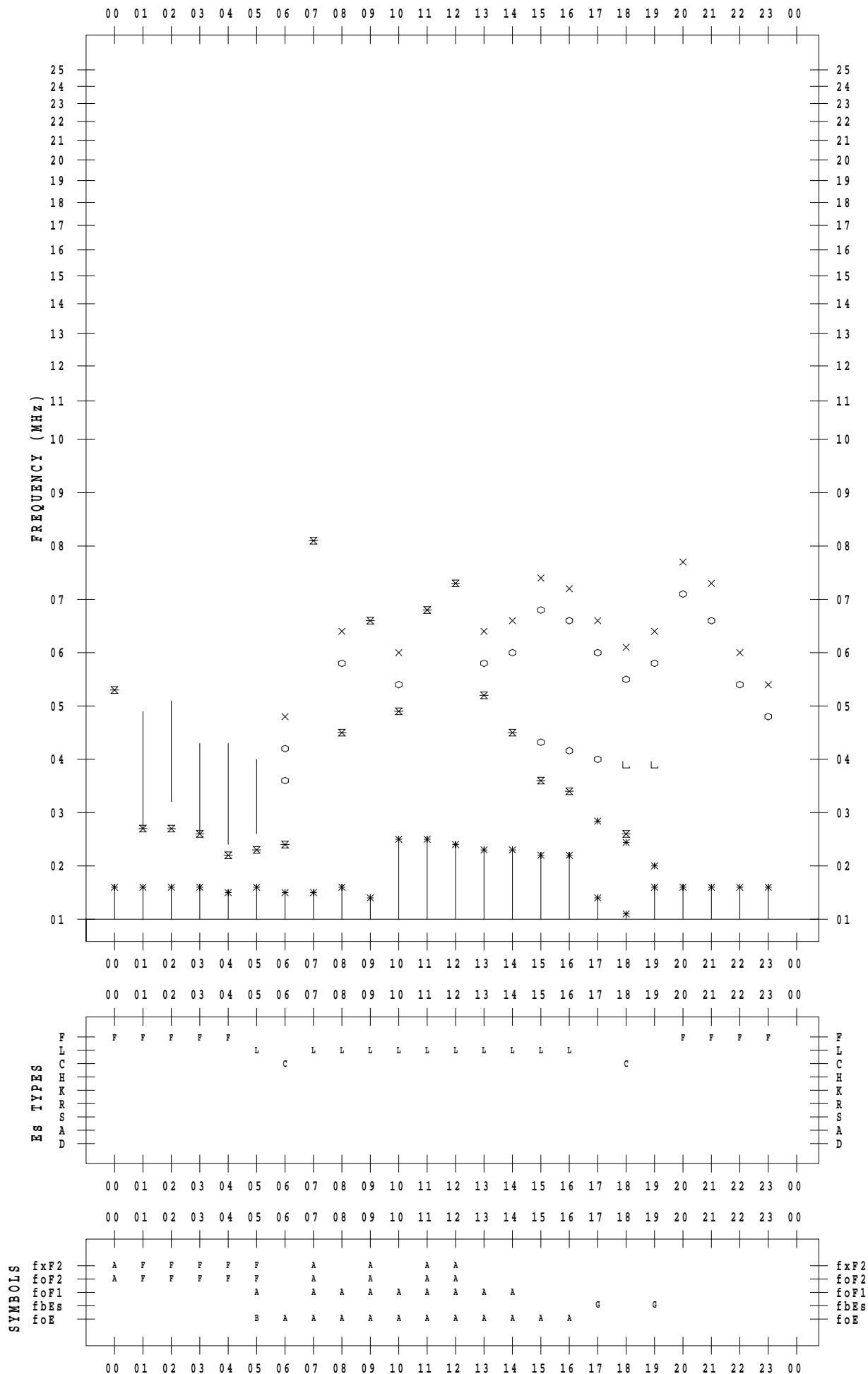
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 21

135 ° E MEAN TIME



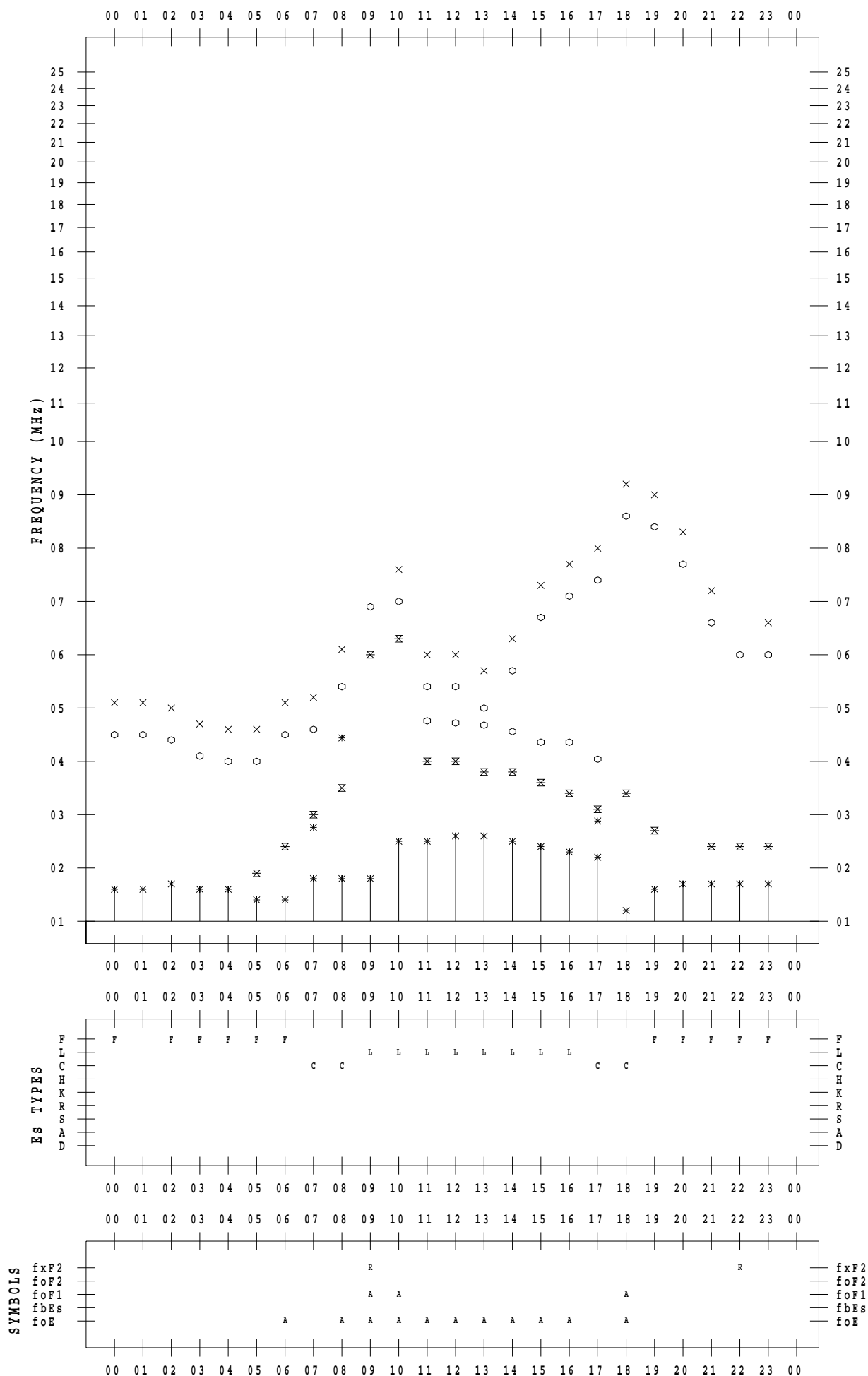
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 22

135 ° E MEAN TIME



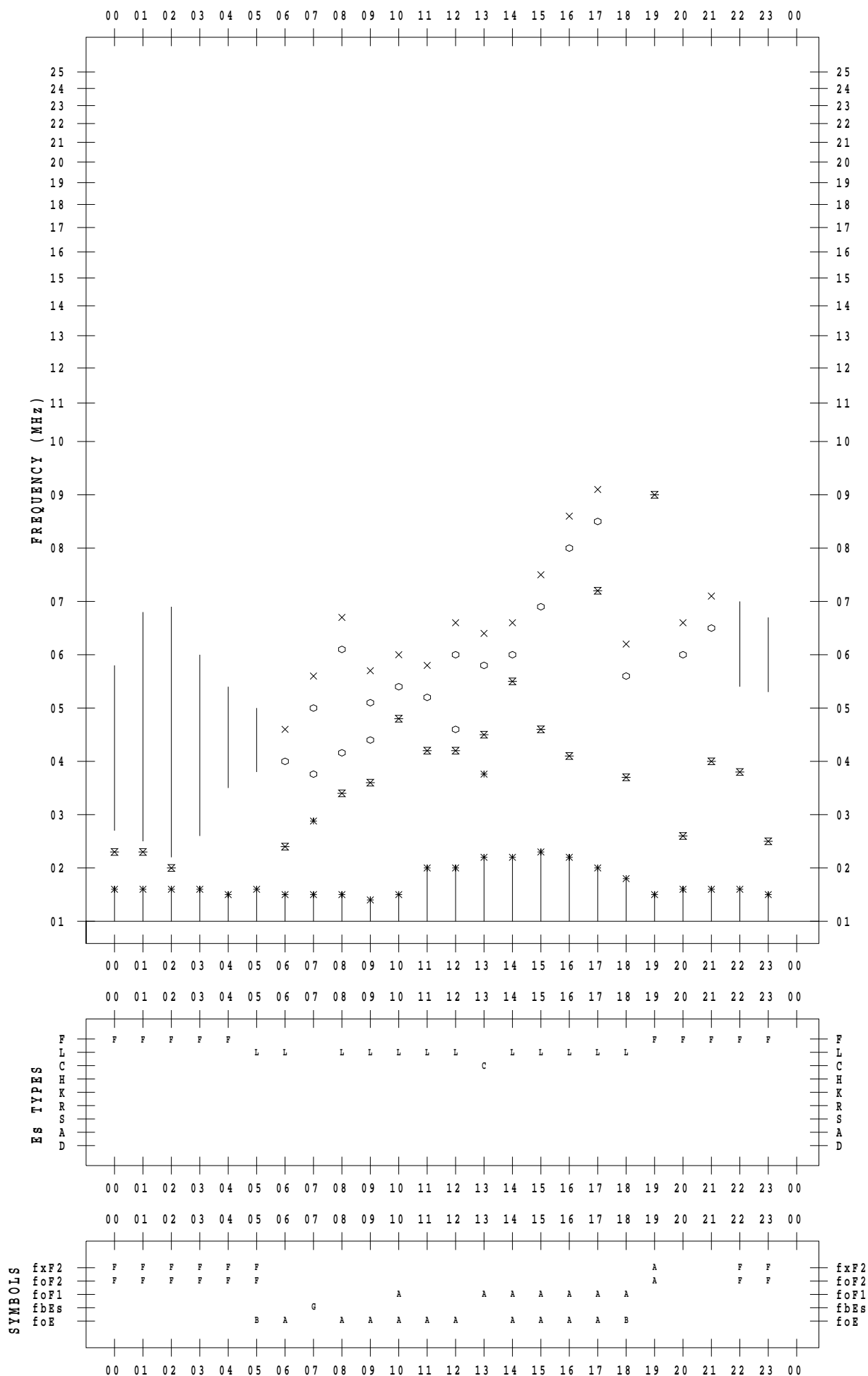
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 23

135 ° E MEAN TIME



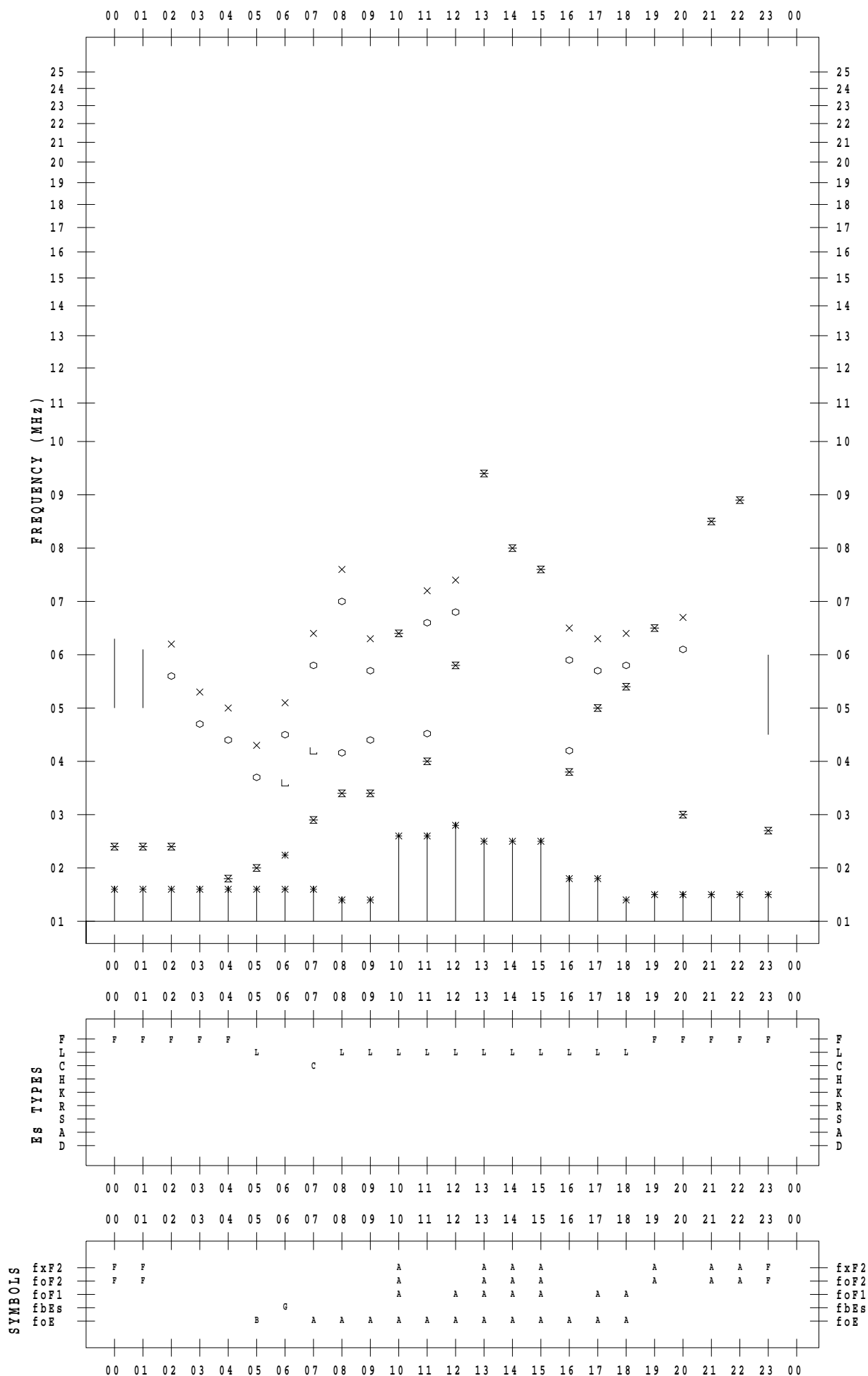
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 24

135 ° E MEAN TIME



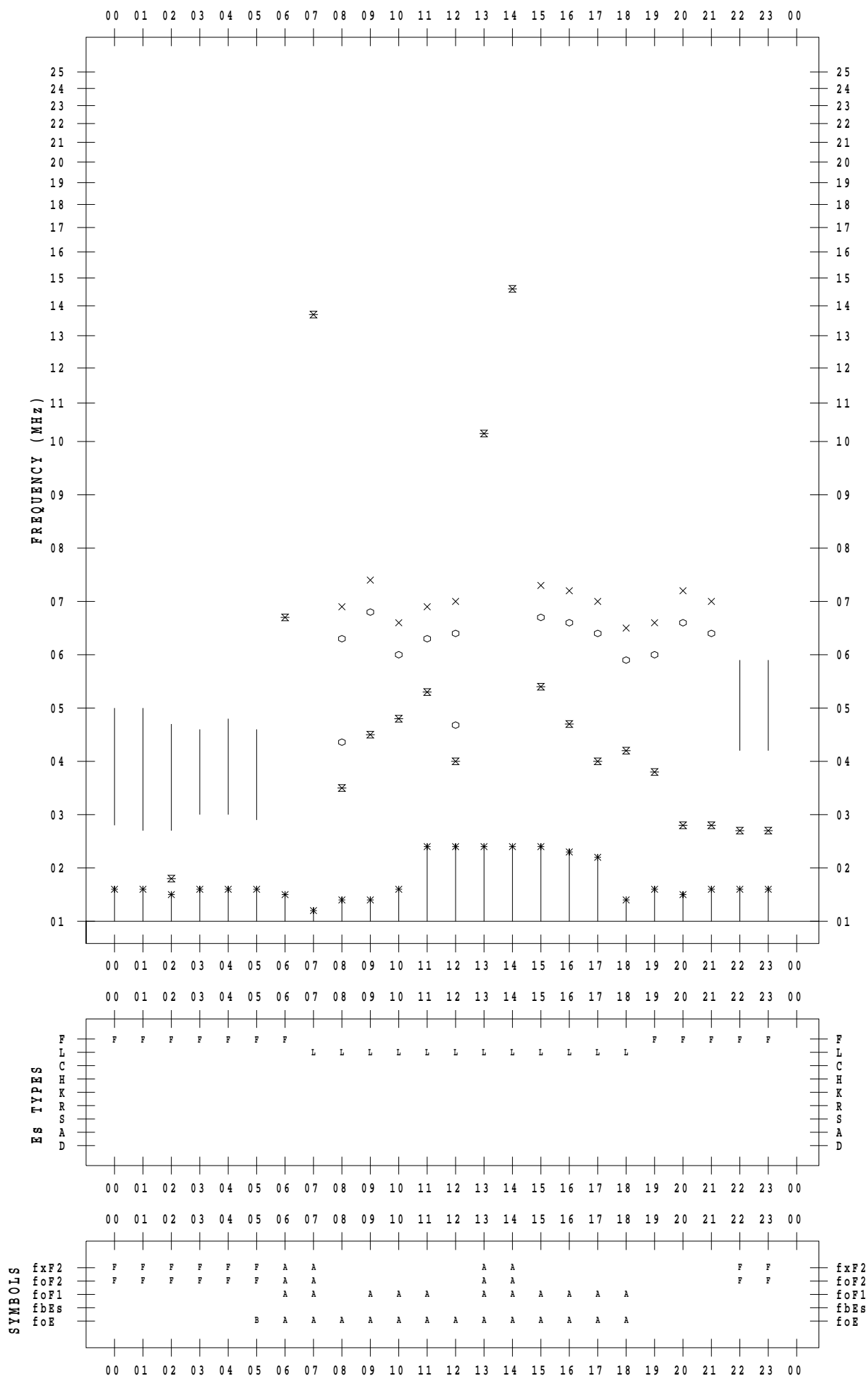
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 25

135 ° E MEAN TIME



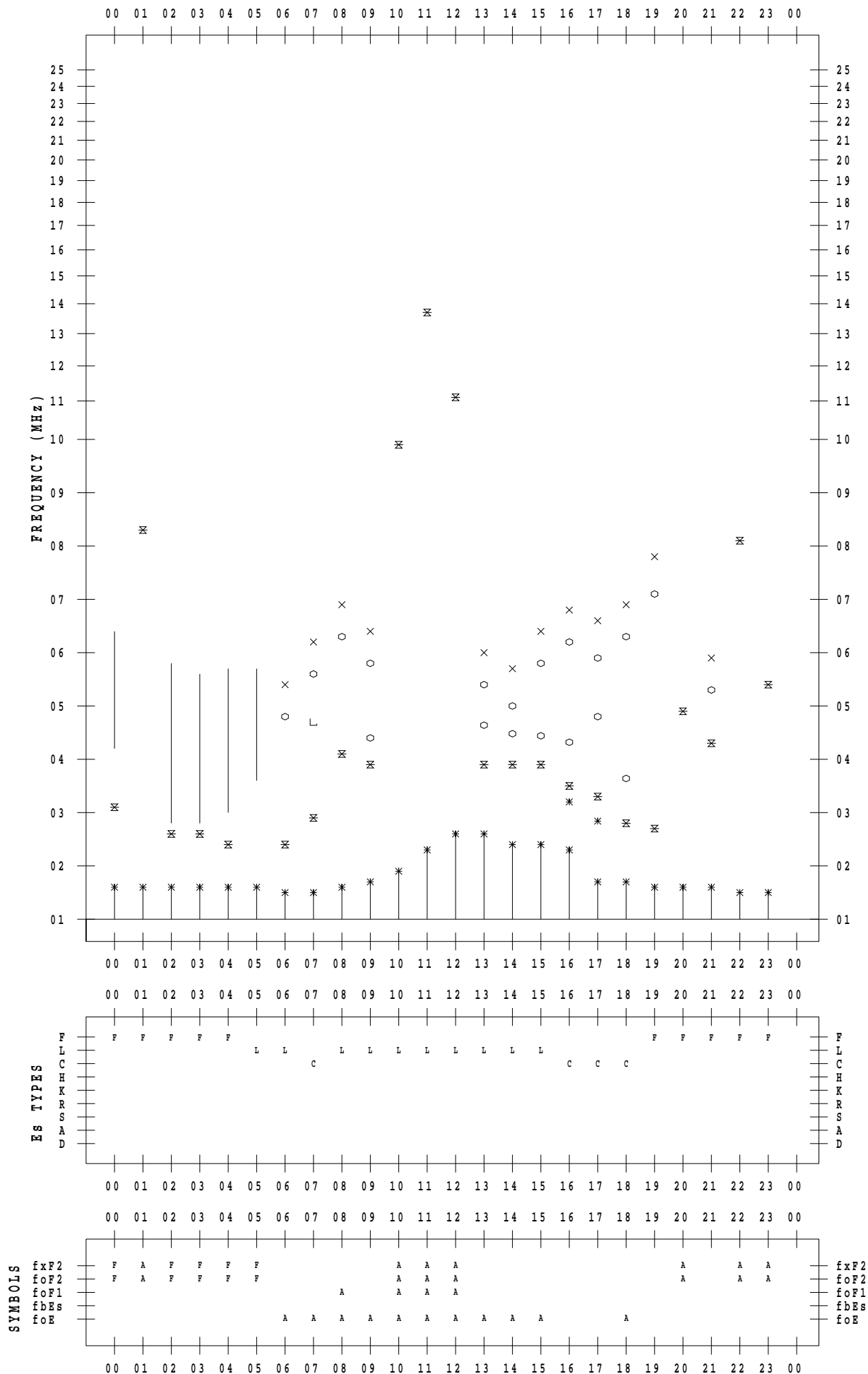
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 26

135 ° E MEAN TIME



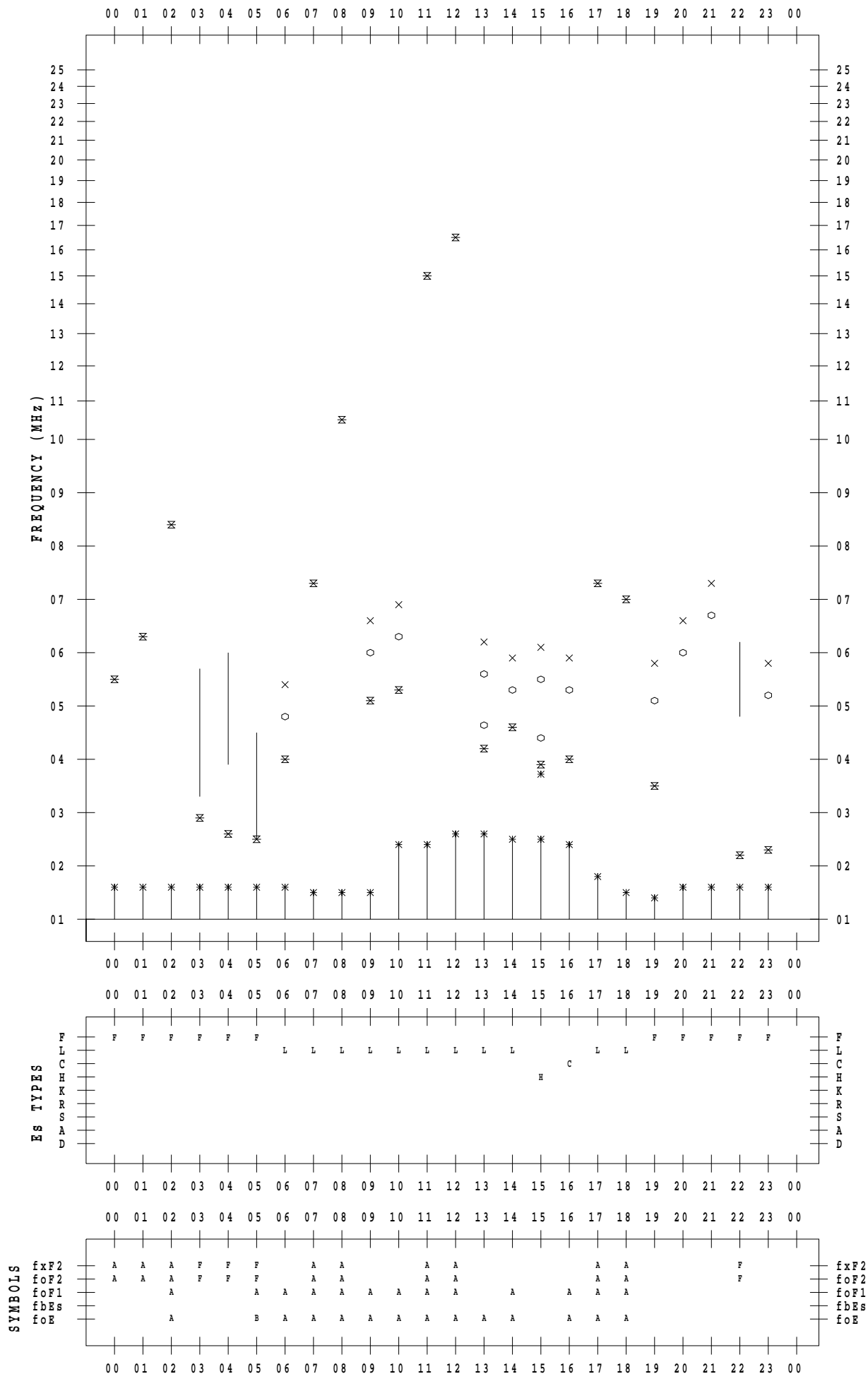
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 27

135 ° E MEAN TIME



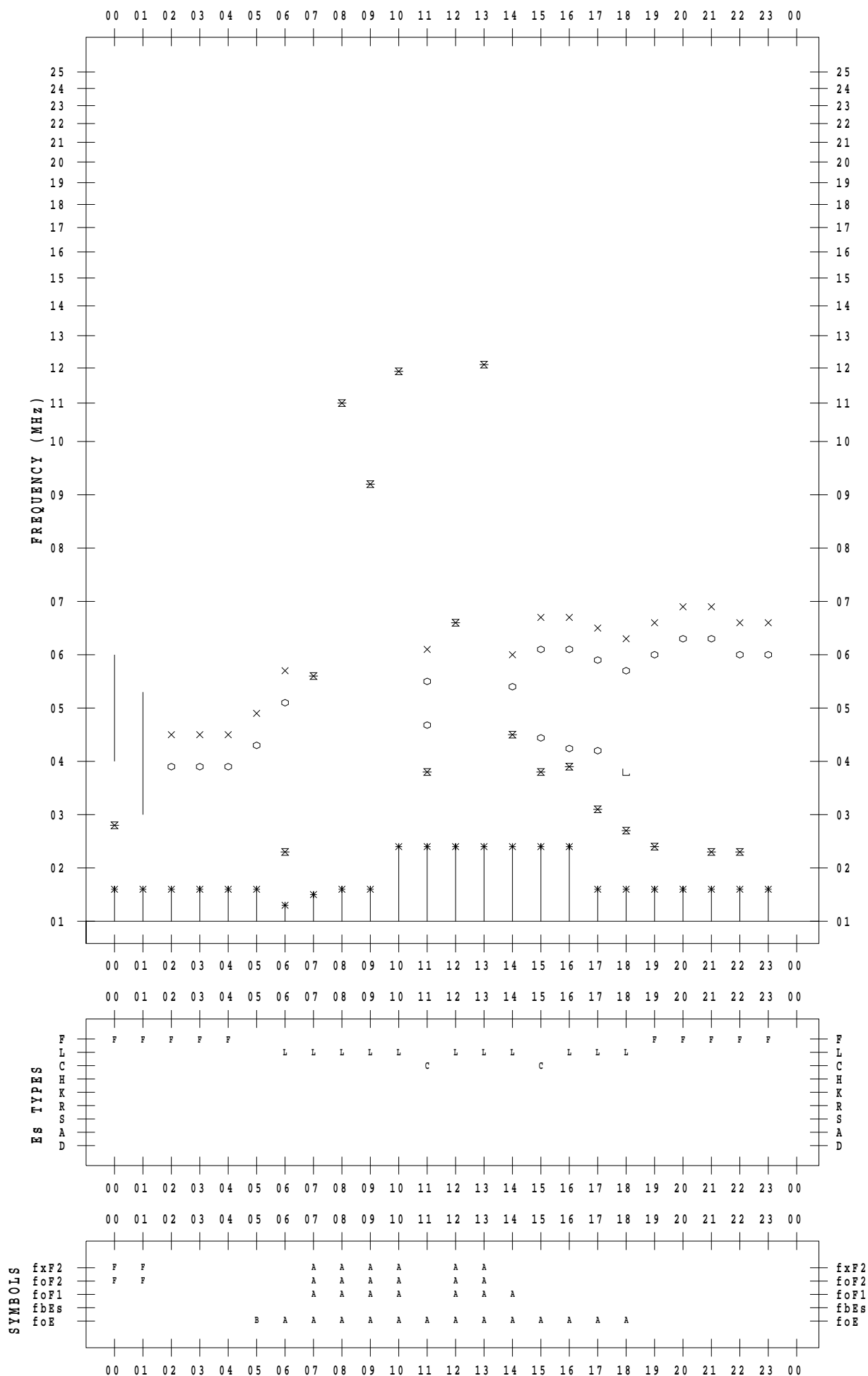
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 28

135 ° E MEAN TIME



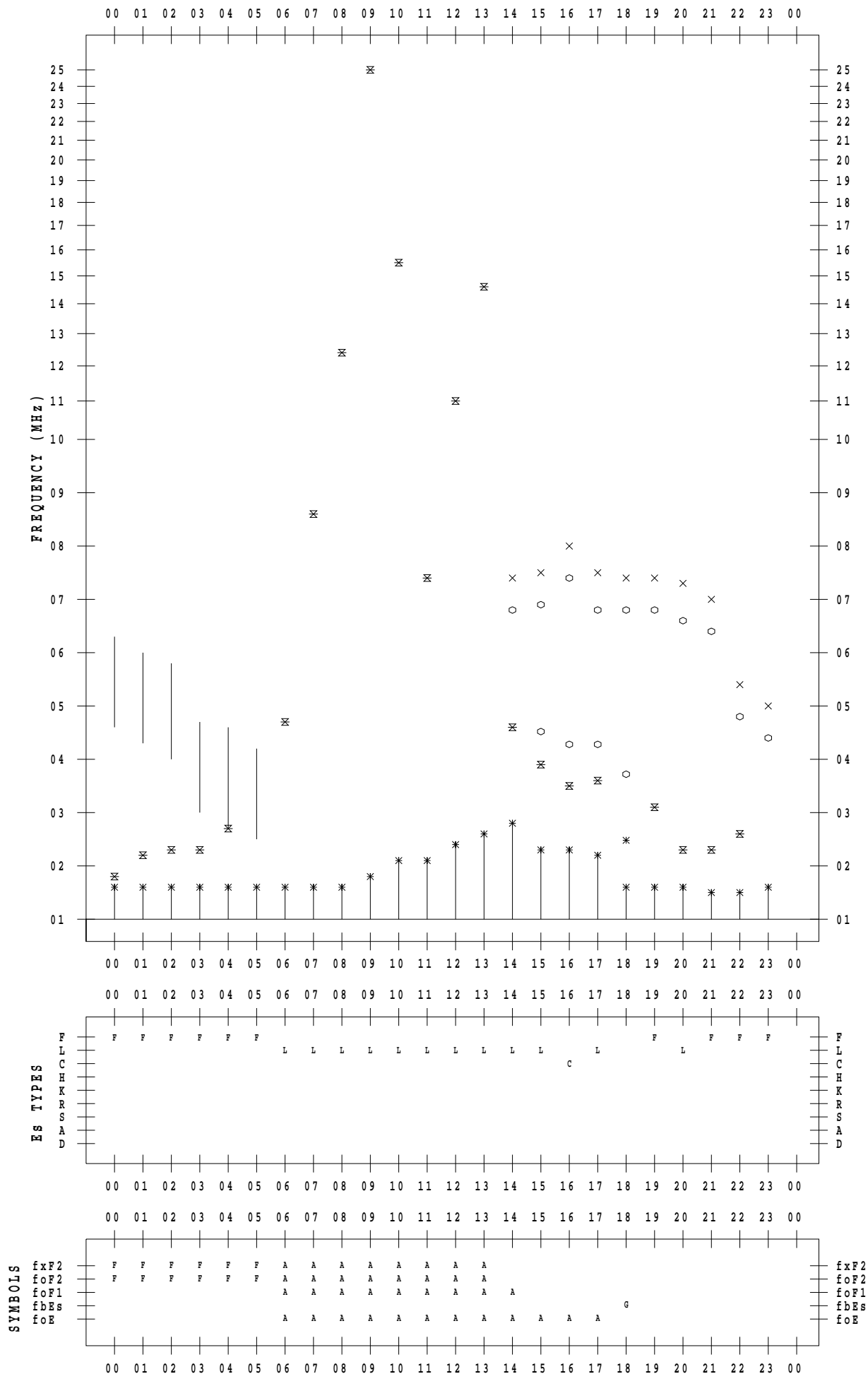
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 29

135 ° E MEAN TIME



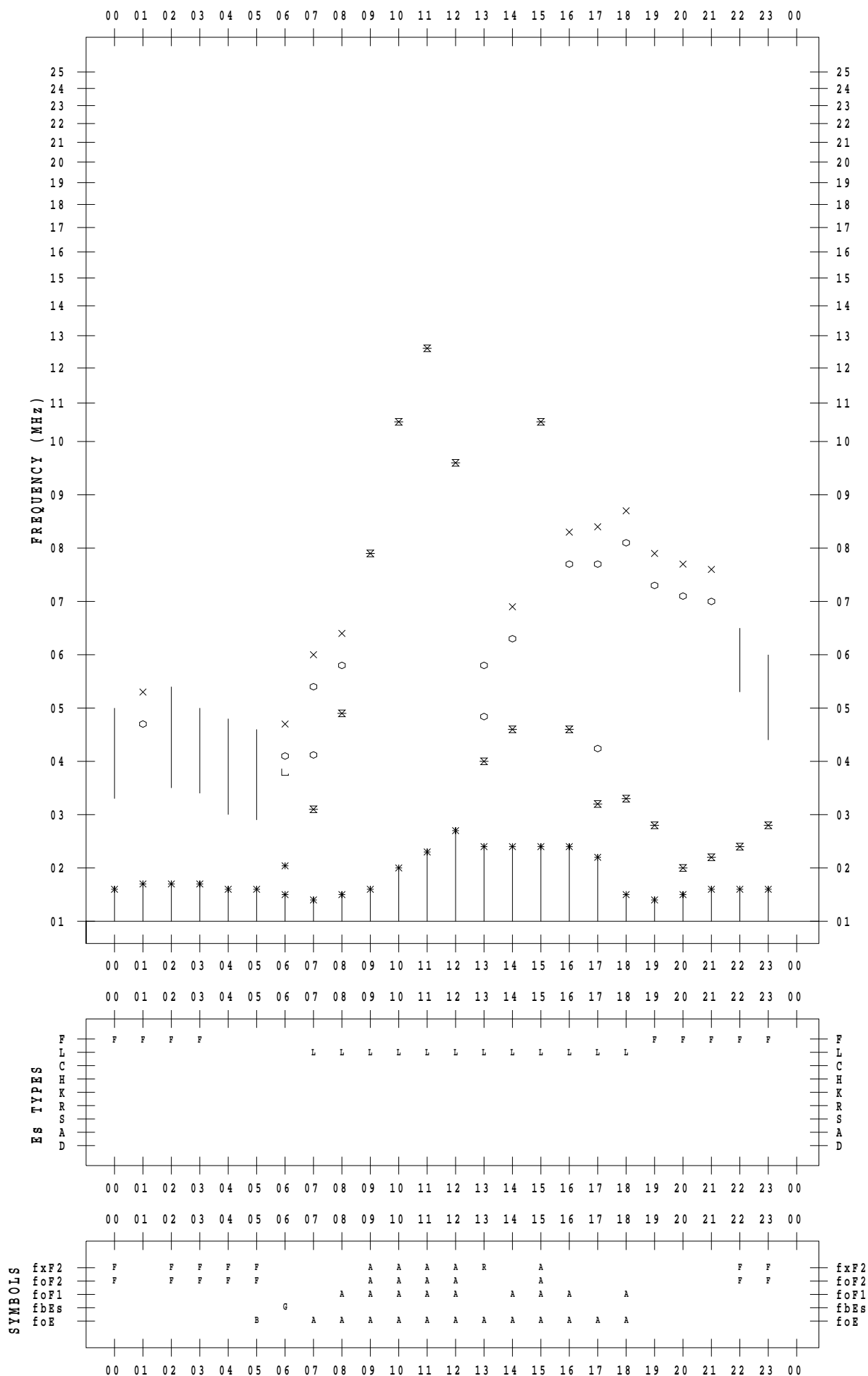
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 6 / 30

135 ° E MEAN TIME



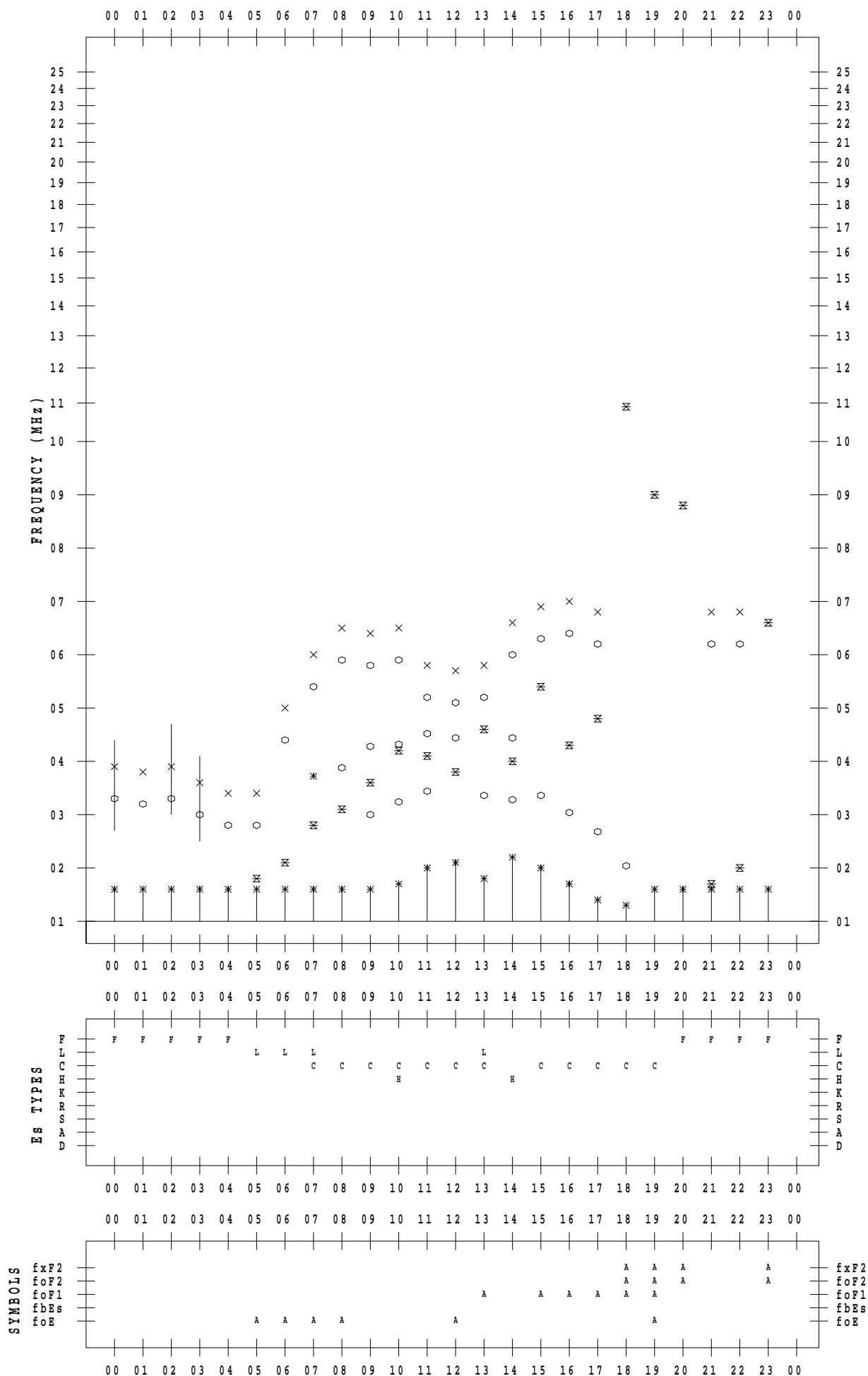
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 1

135 ° E MEAN TIME



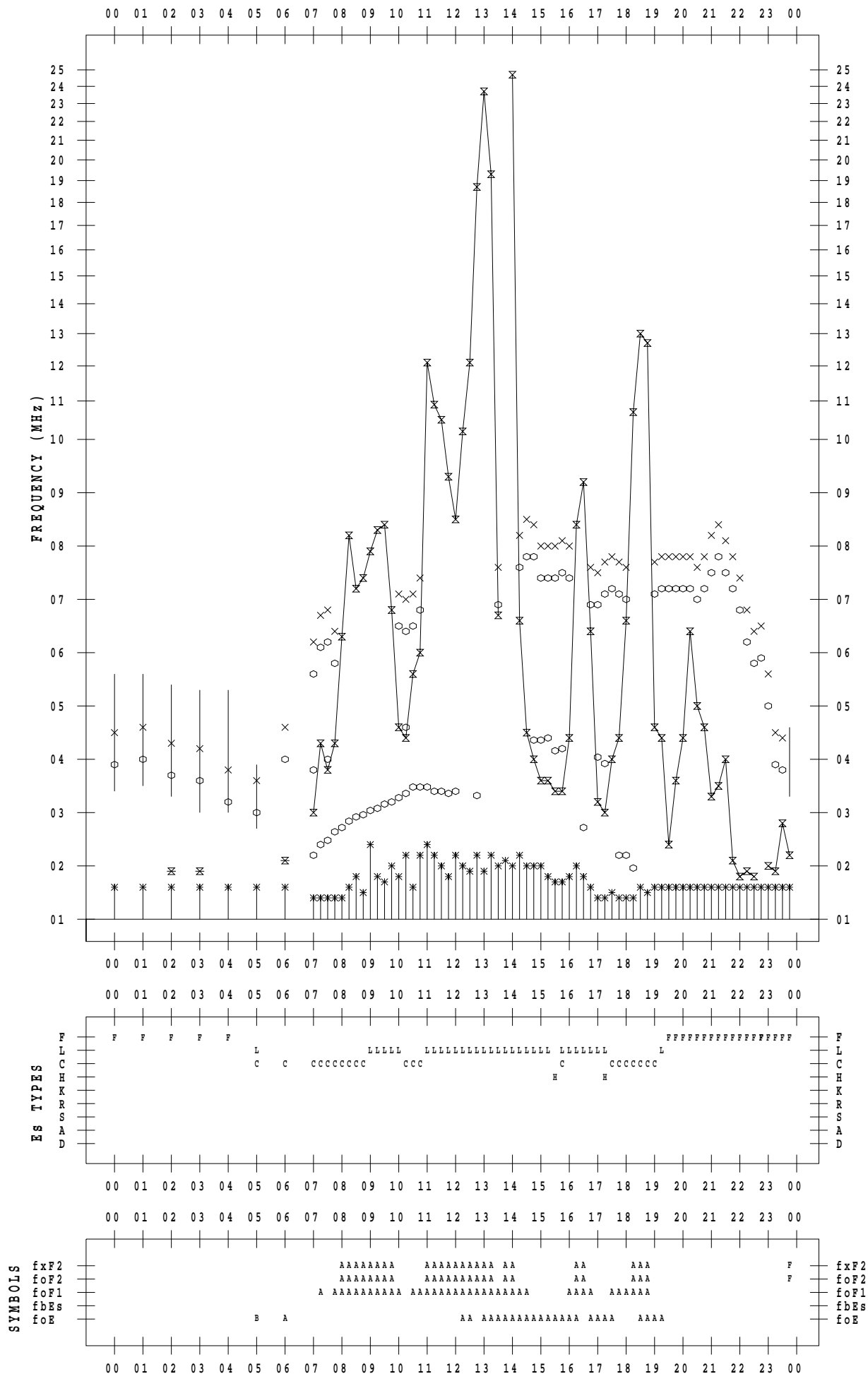
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 2

135 ° E MEAN TIME



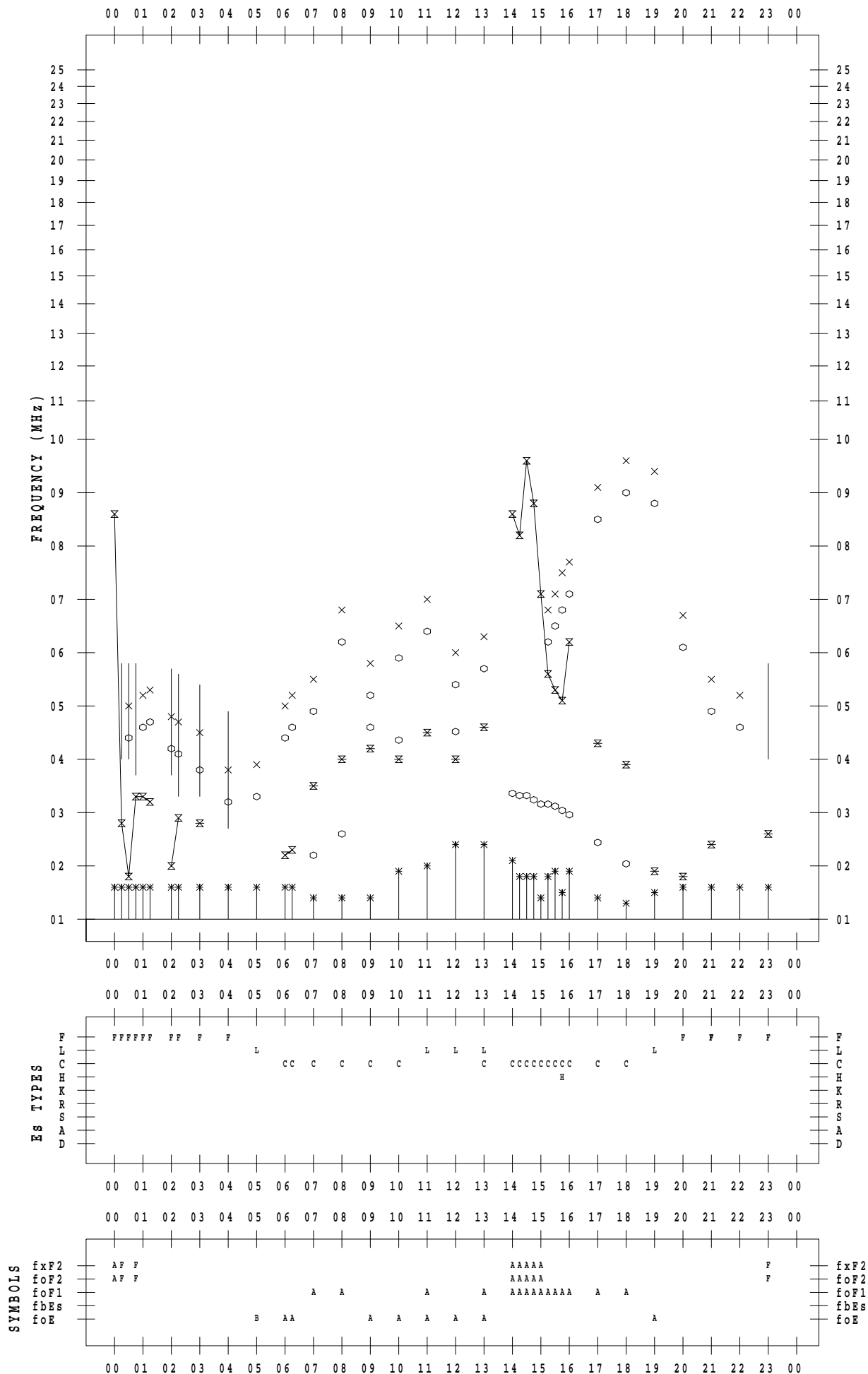
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 3

135 ° E MEAN TIME



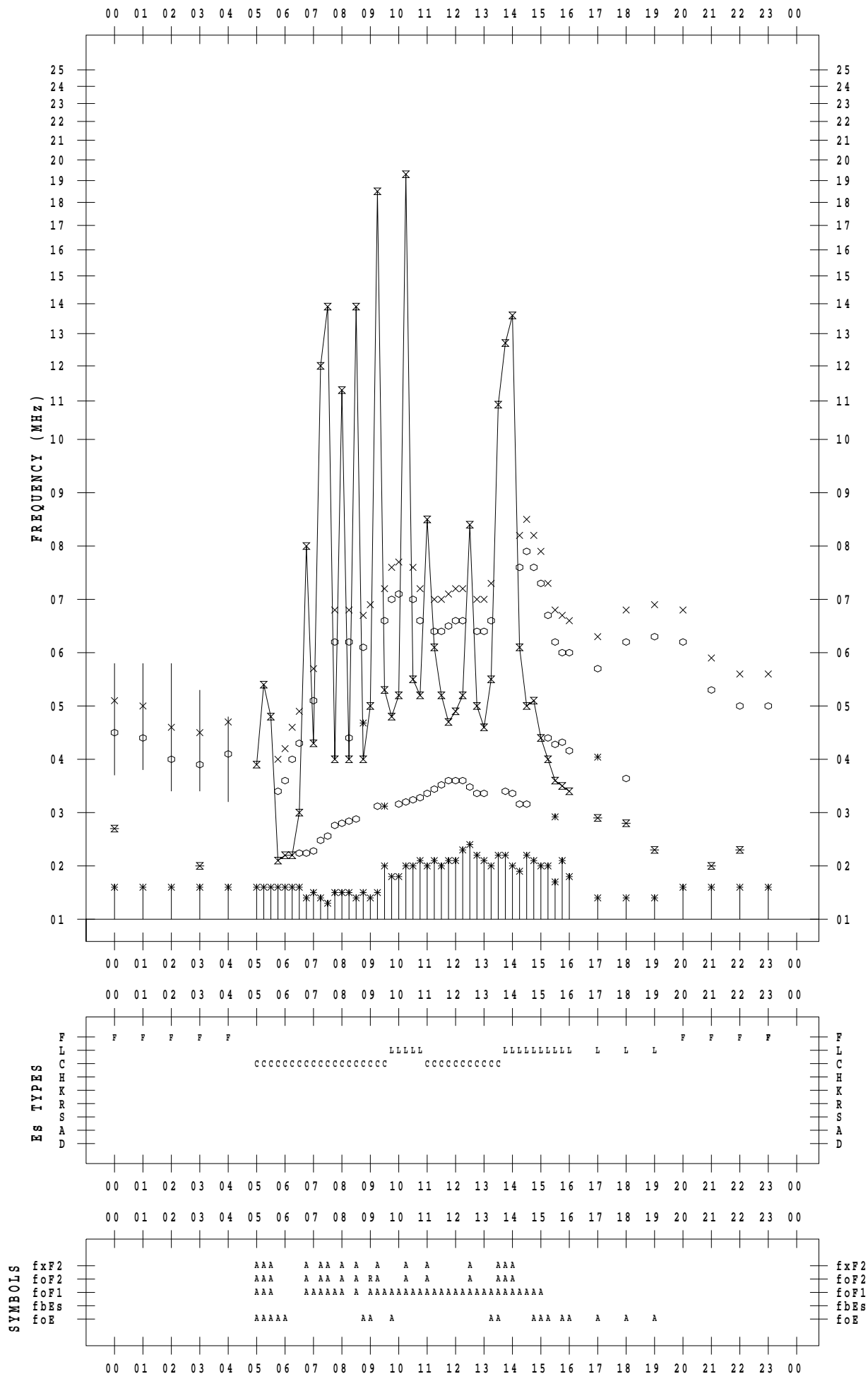
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 4

135 ° E MEAN TIME



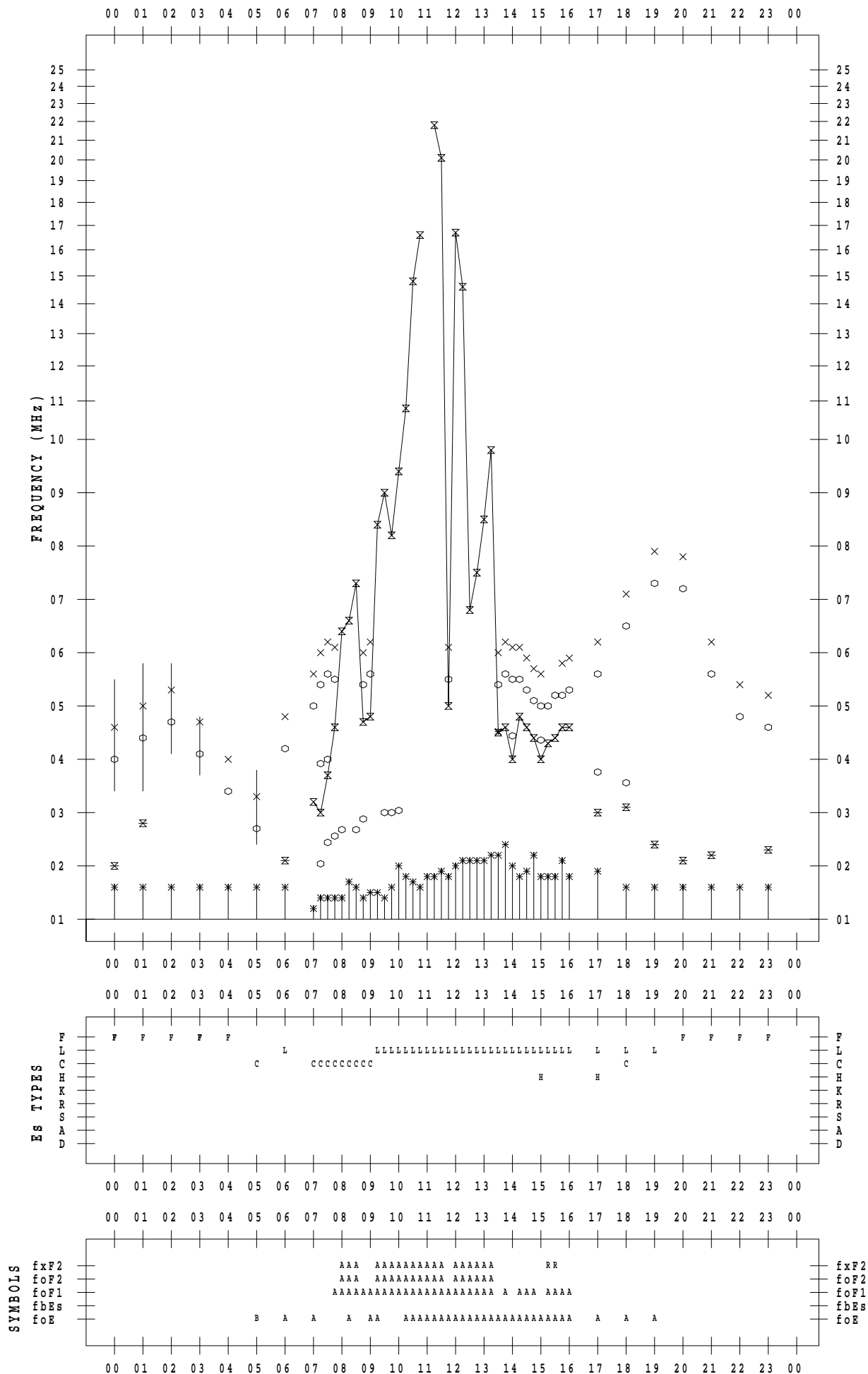
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 5

135 ° E MEAN TIME



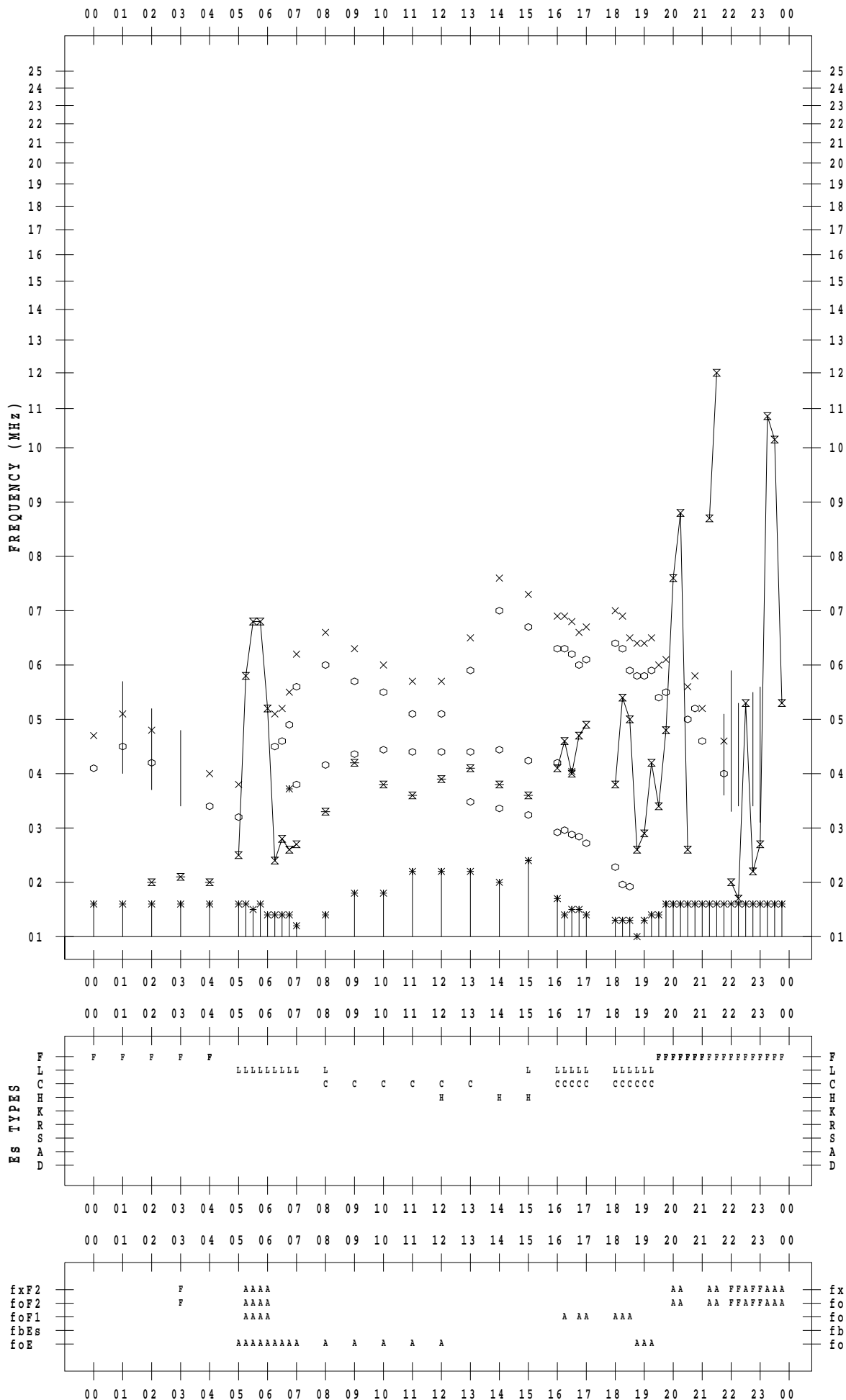
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 6/ 6

135 ° E MEAN TIME



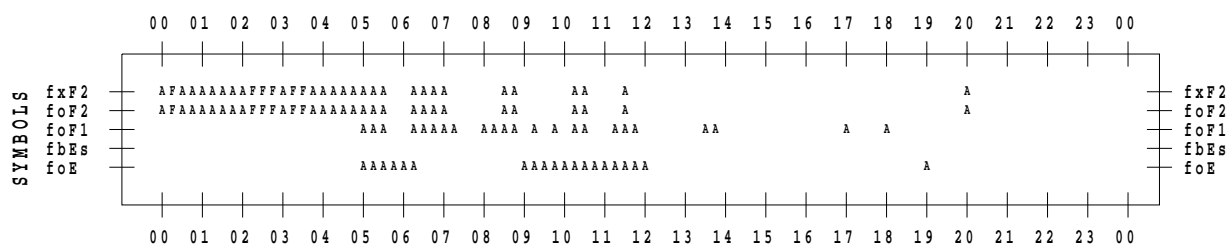
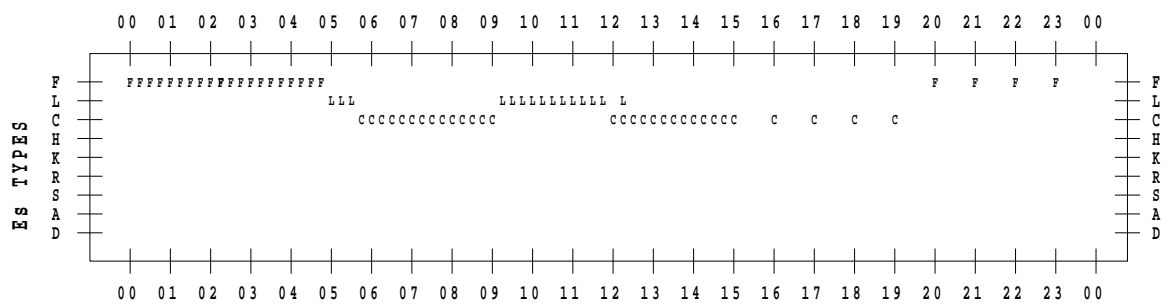
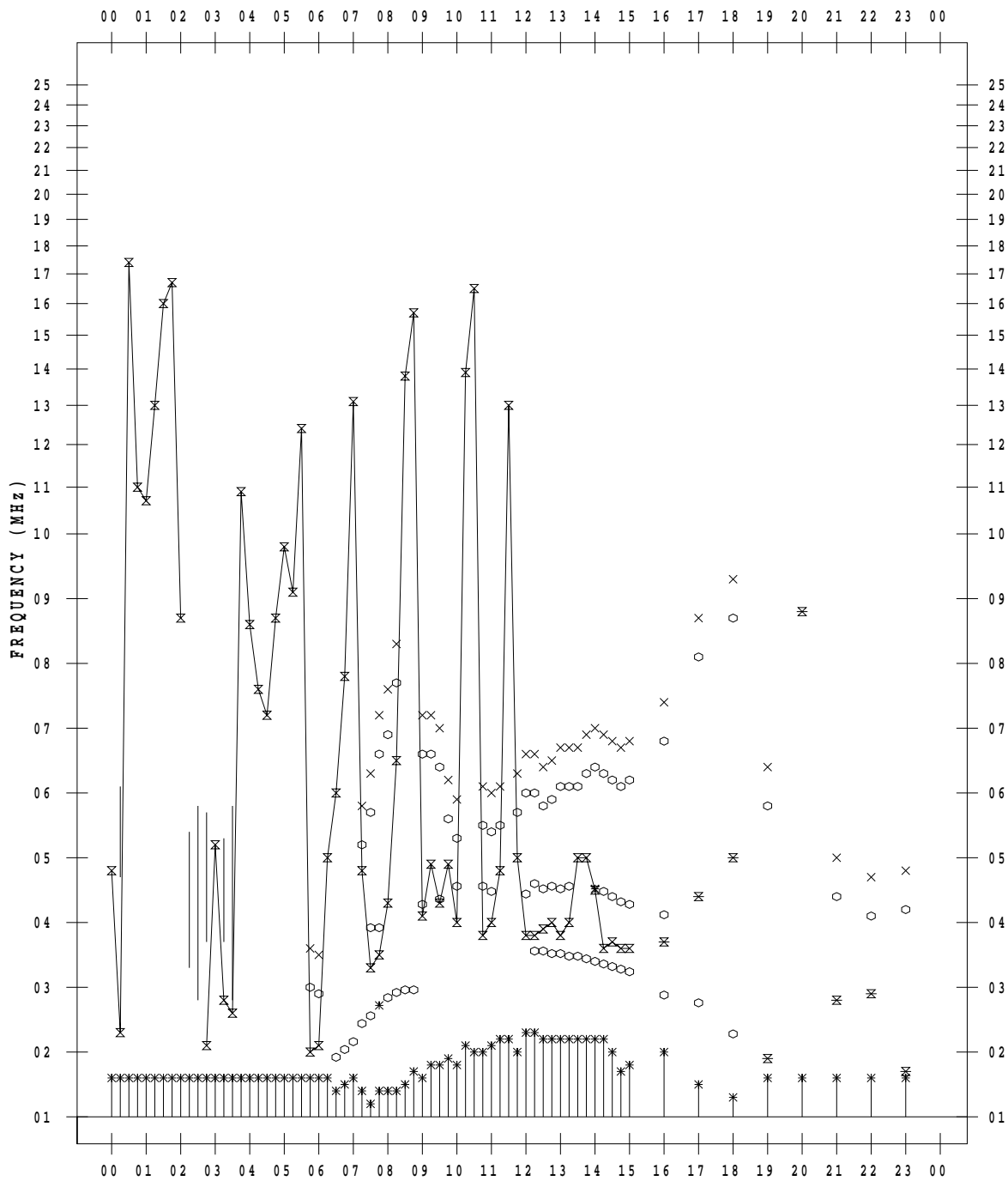
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 7

135 ° E MEAN TIME



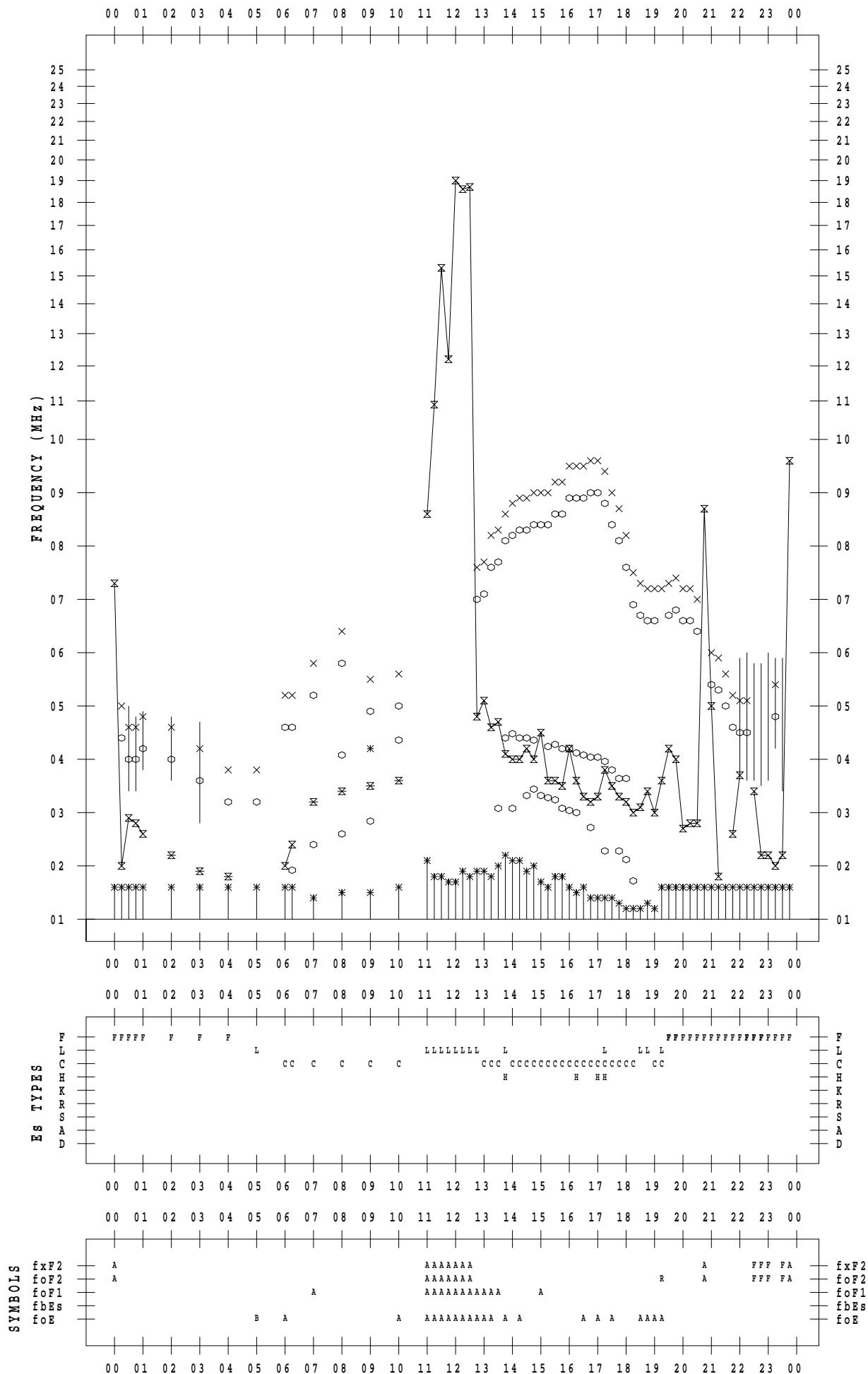
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 8

135 ° E MEAN TIME



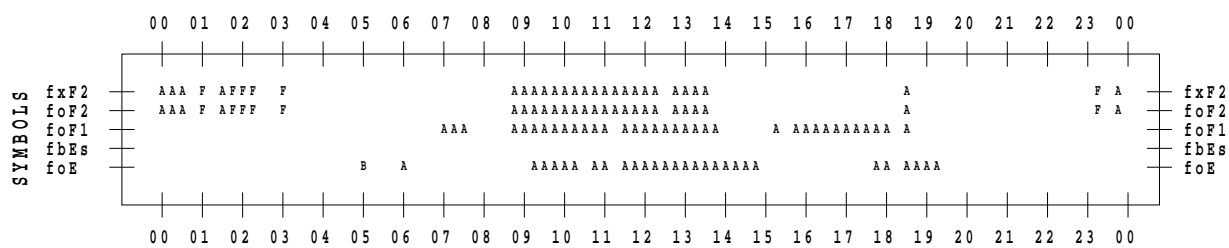
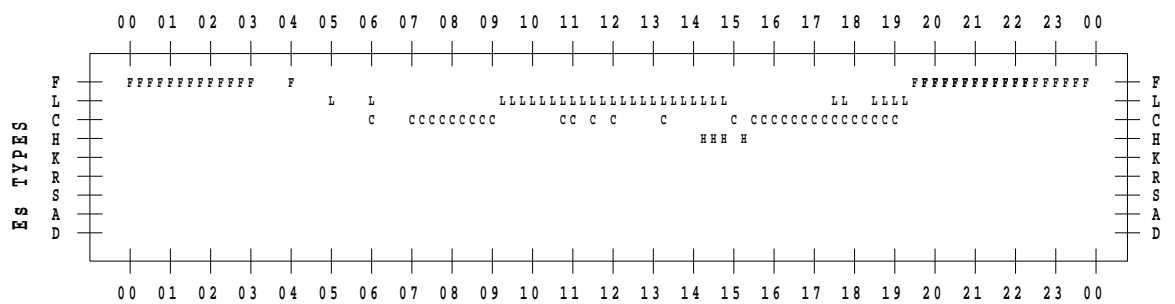
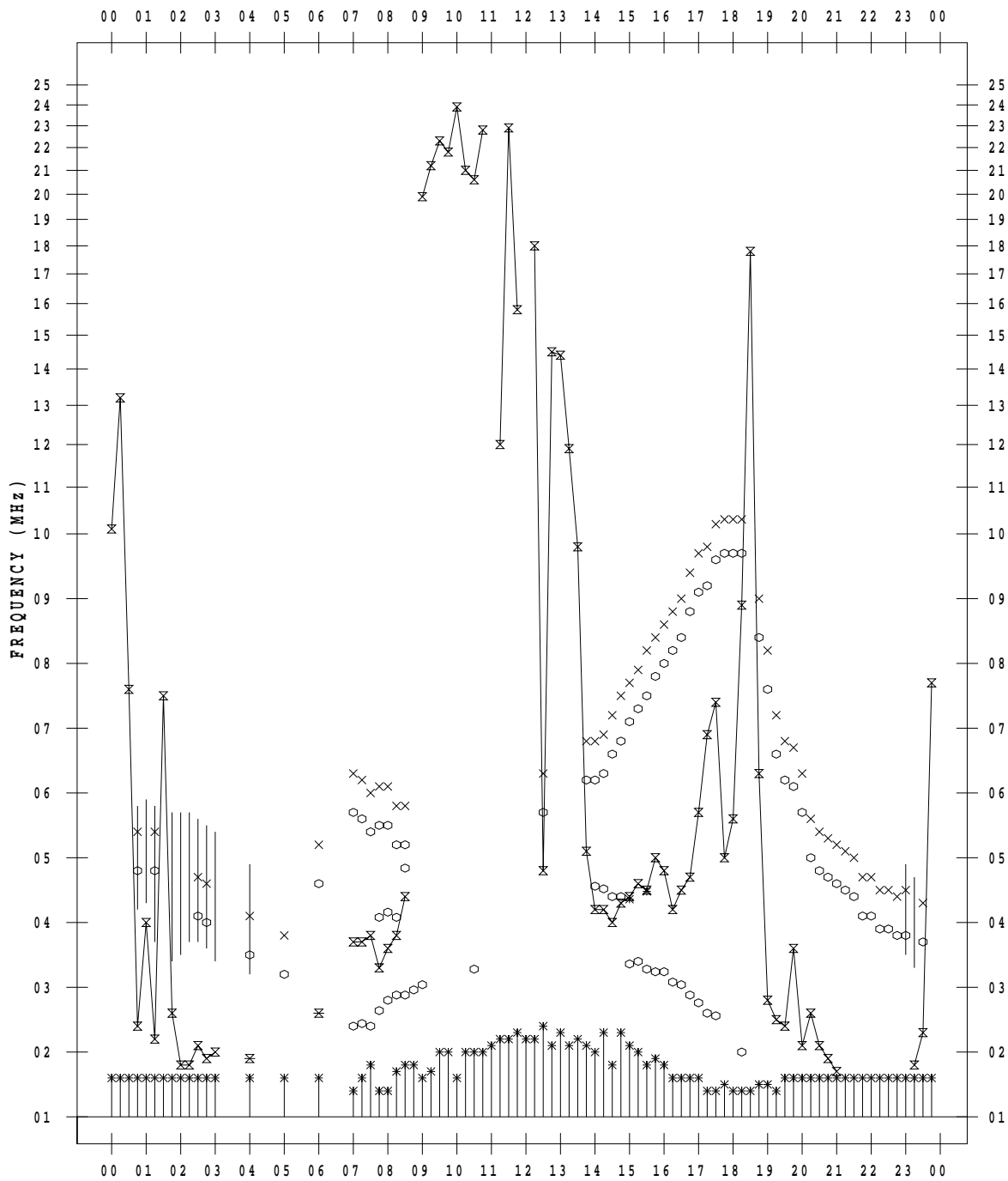
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 9

135 ° E MEAN TIME



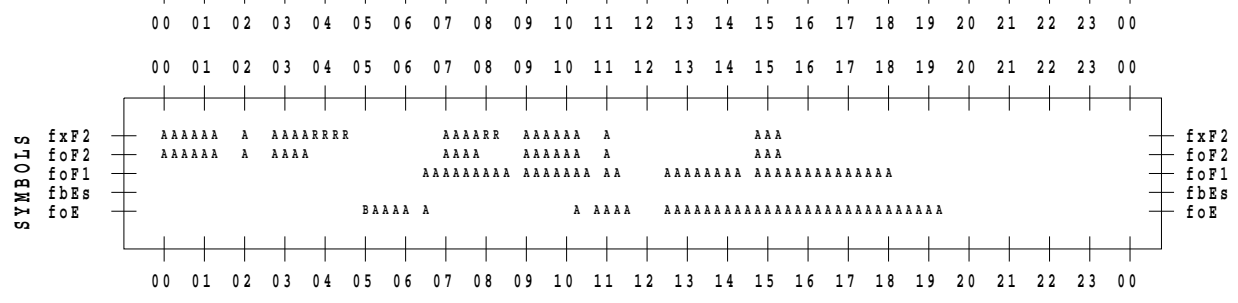
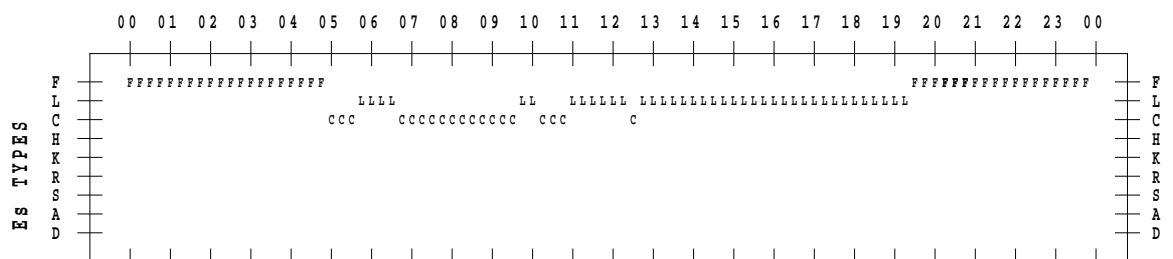
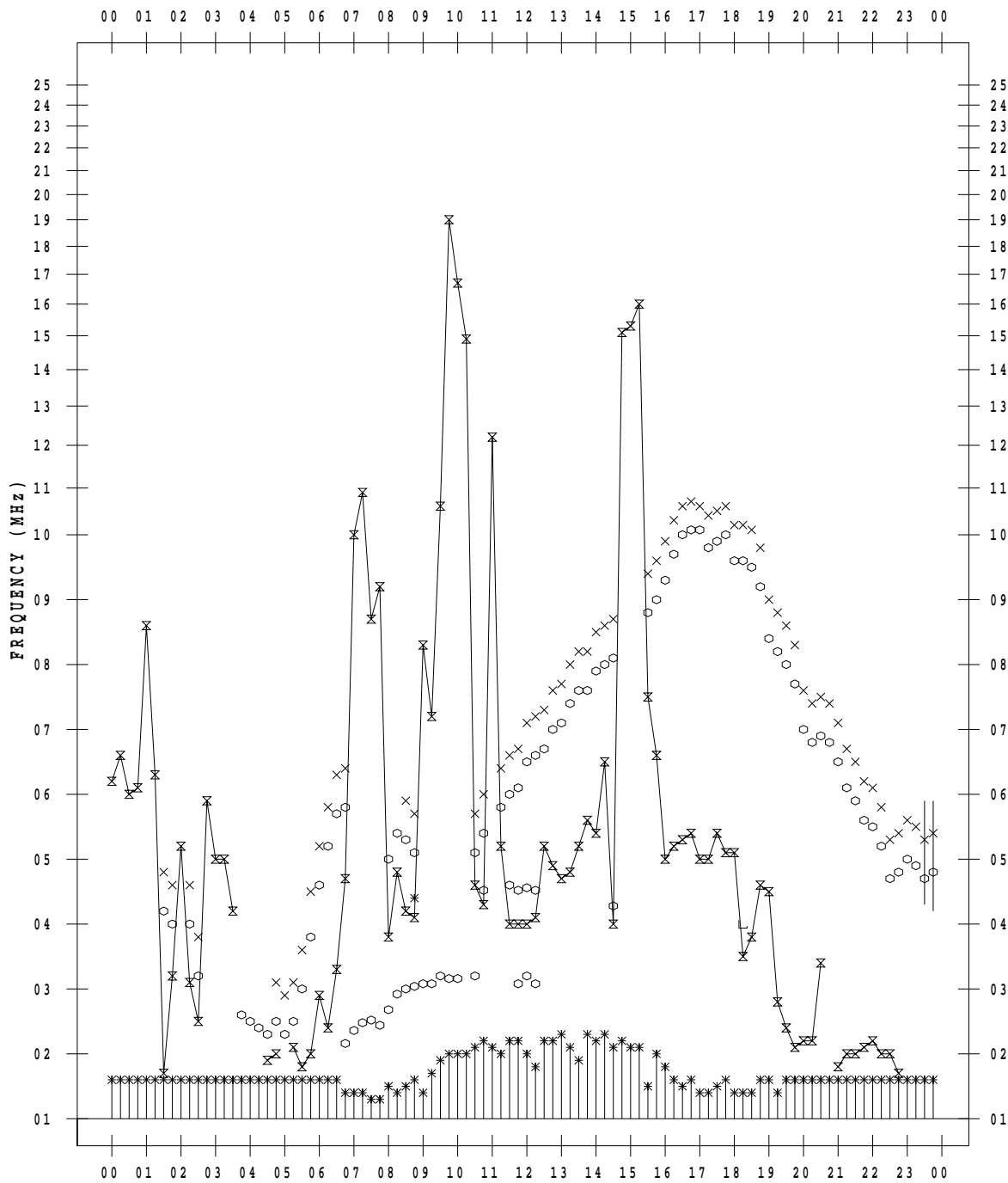
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 6/10

135 ° E MEAN TIME



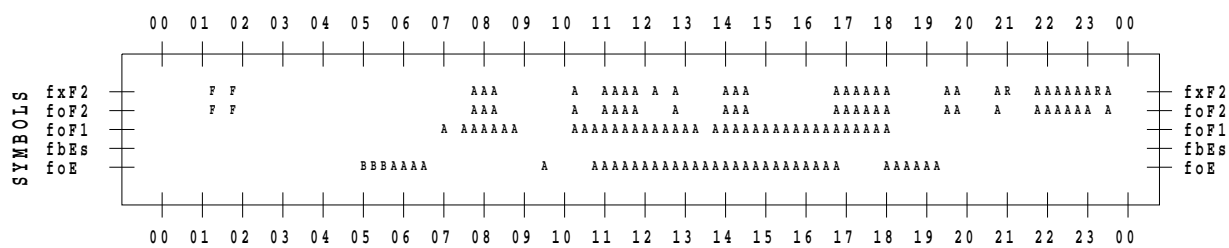
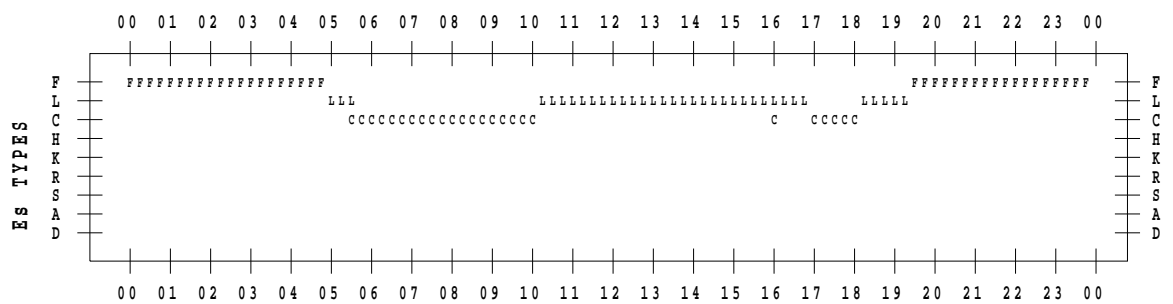
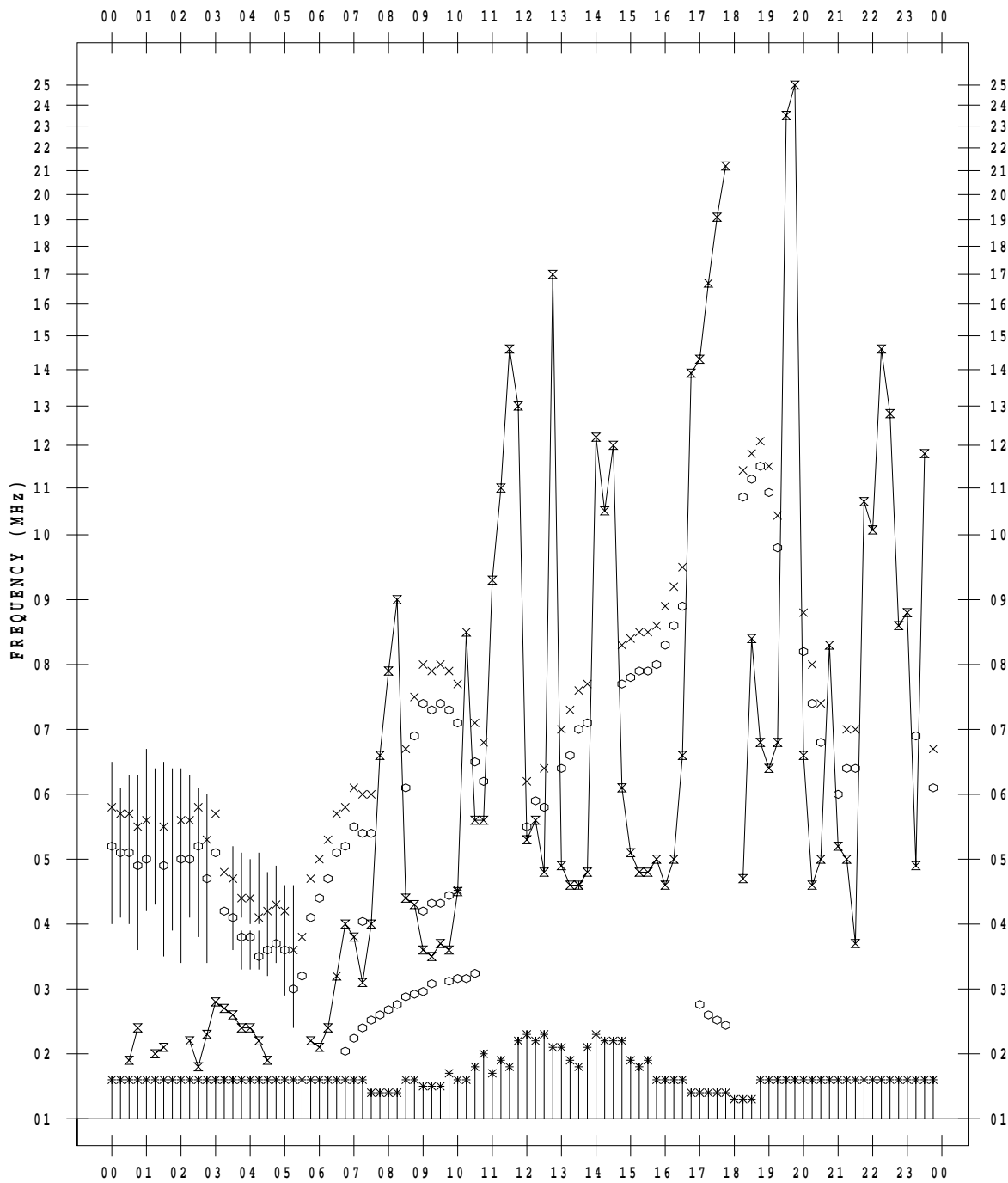
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 6/11

135 ° E MEAN TIME



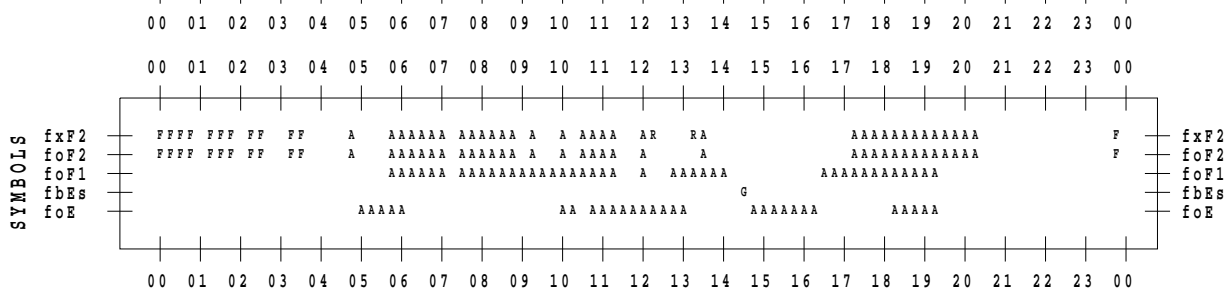
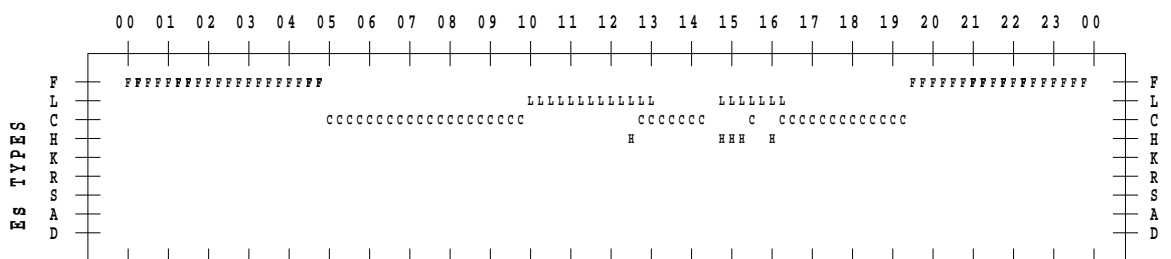
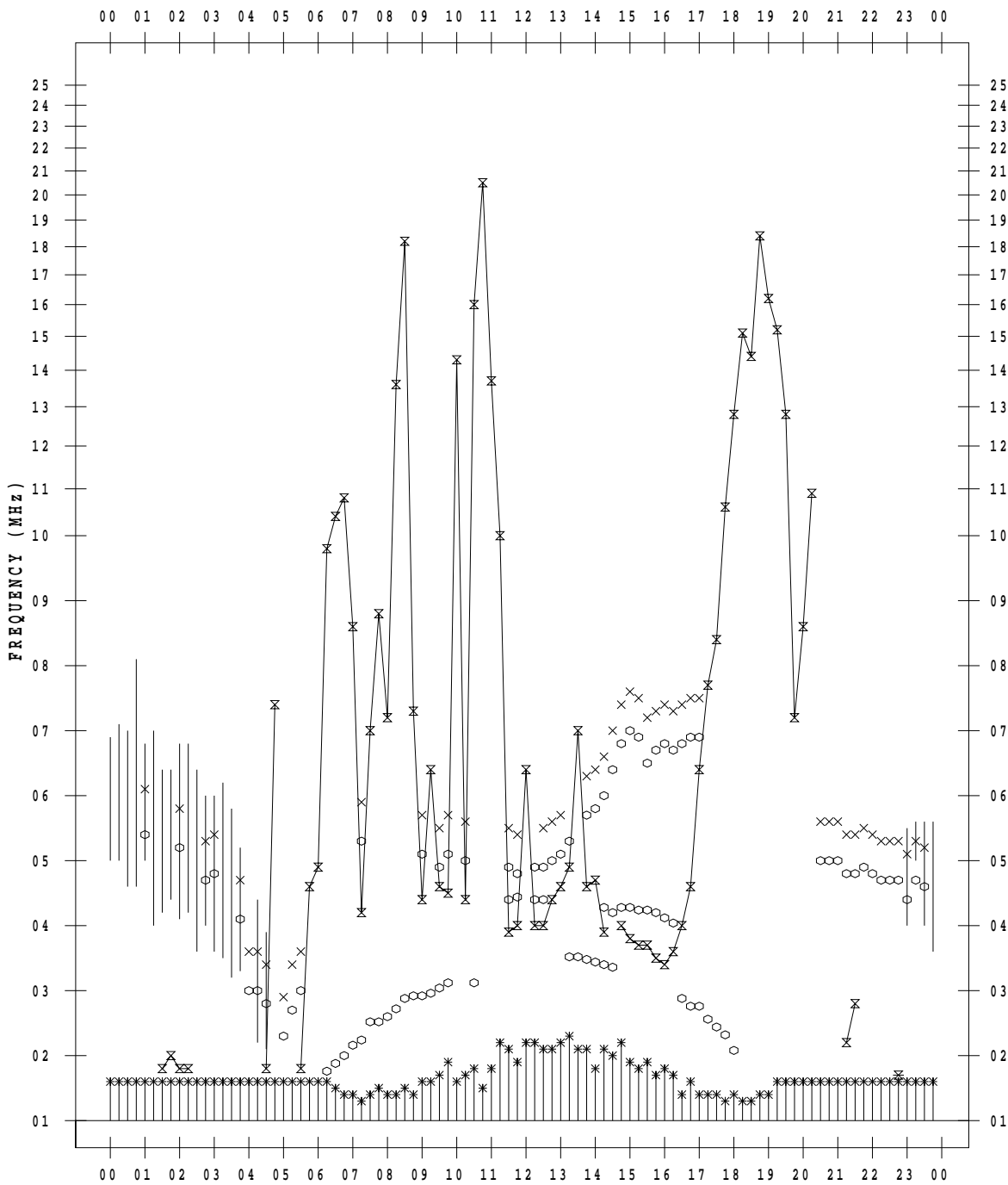
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 12

135 ° E MEAN TIME



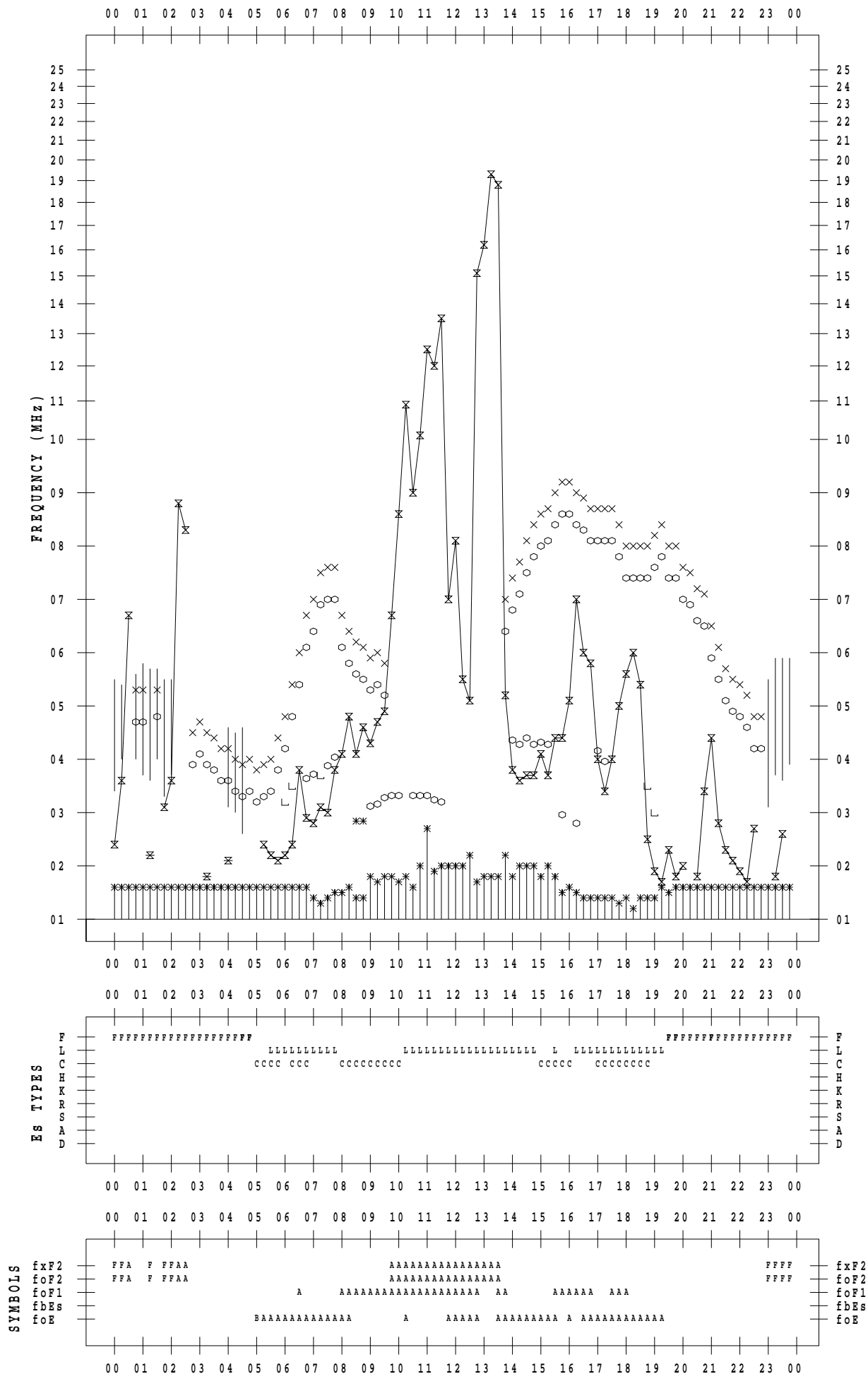
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 13

135 ° E MEAN TIME



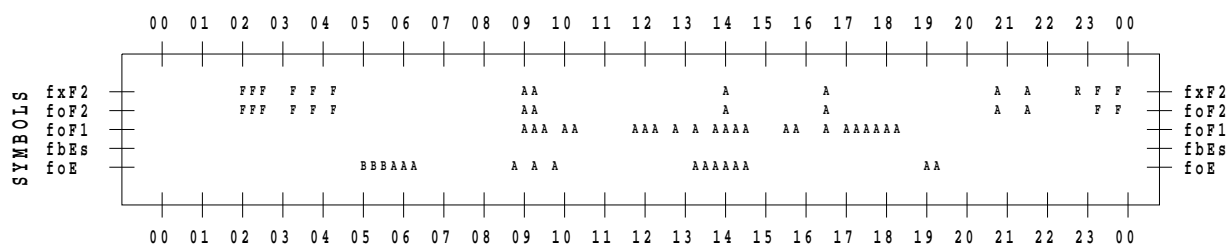
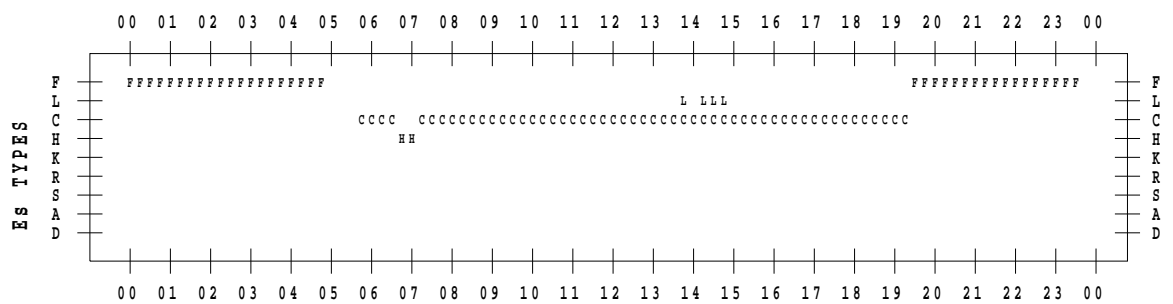
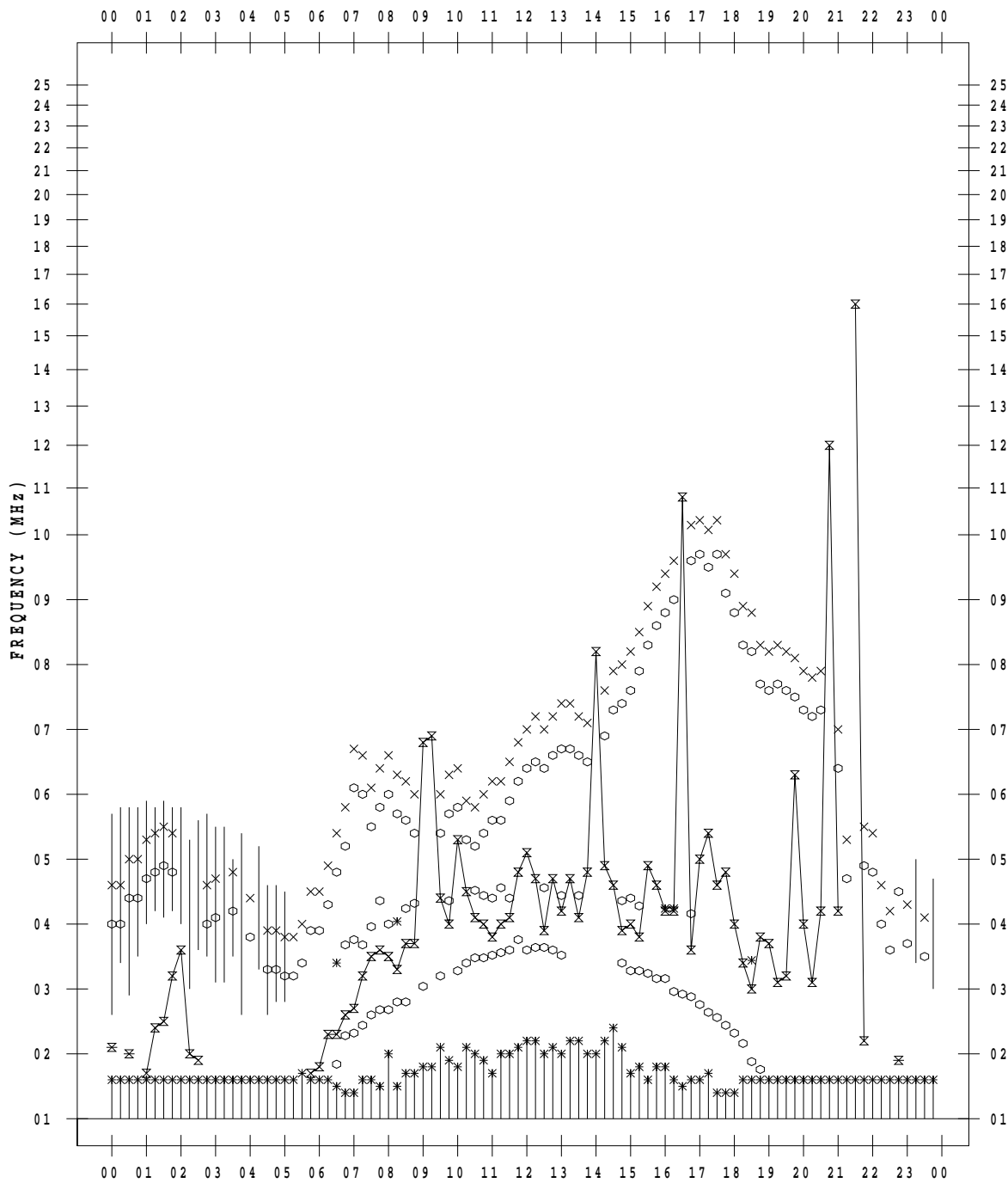
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 6/14

135 ° E MEAN TIME



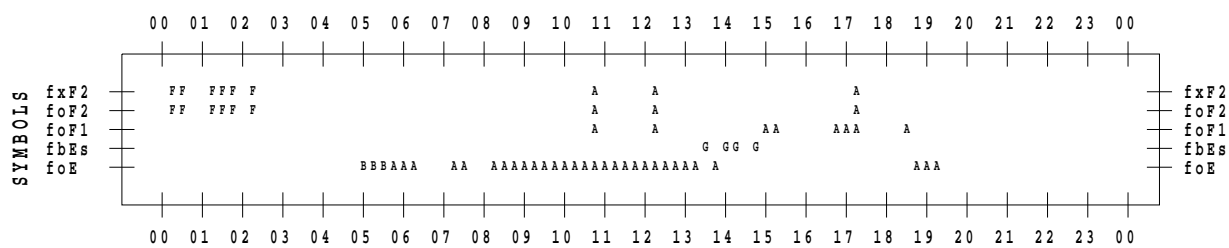
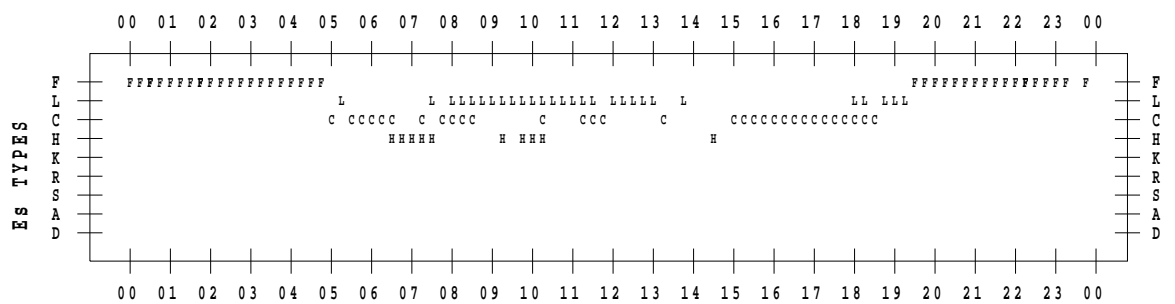
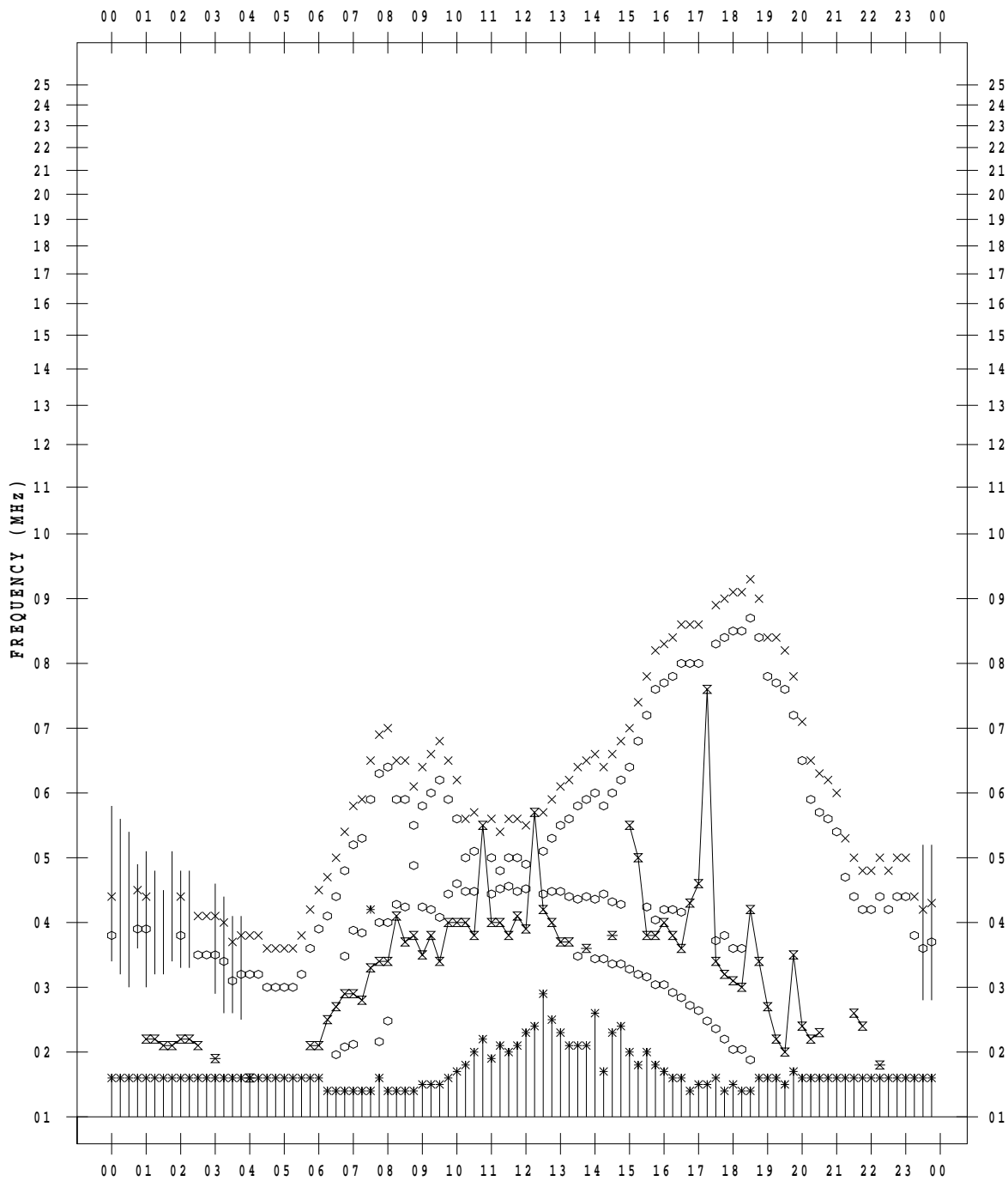
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 15

135 ° E MEAN TIME



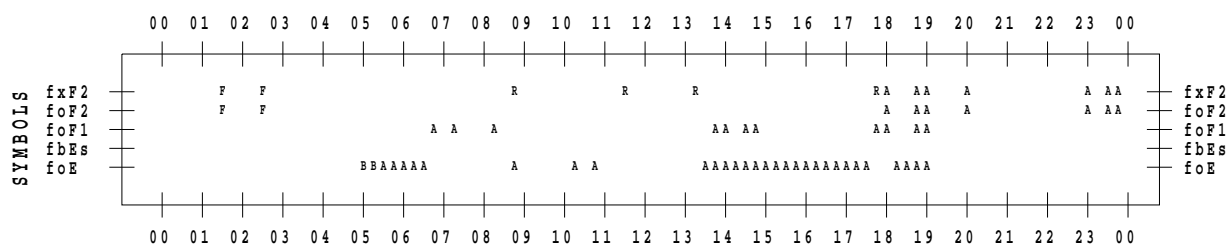
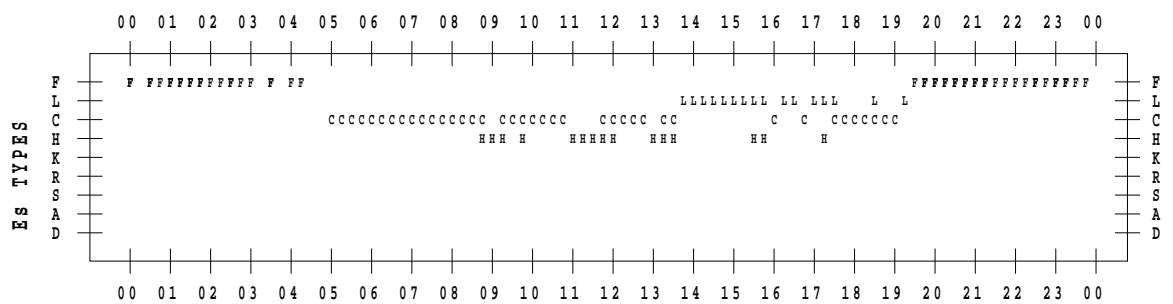
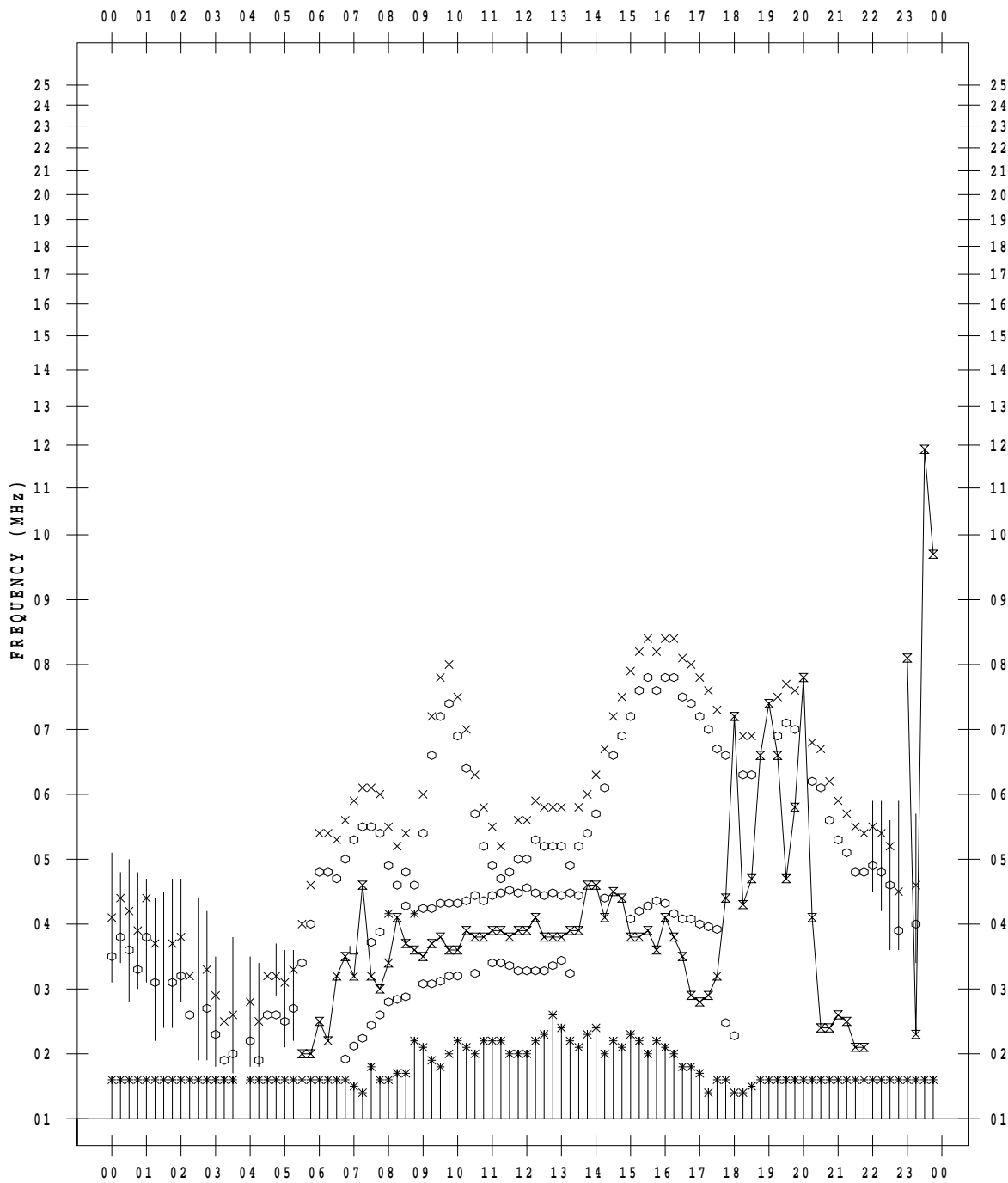
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 16

135 ° E MEAN TIME



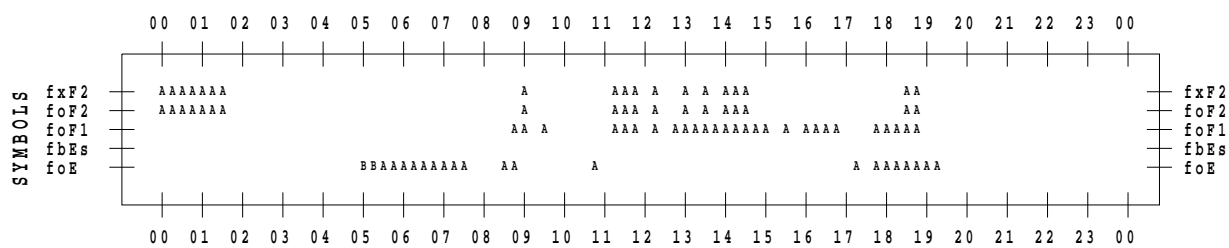
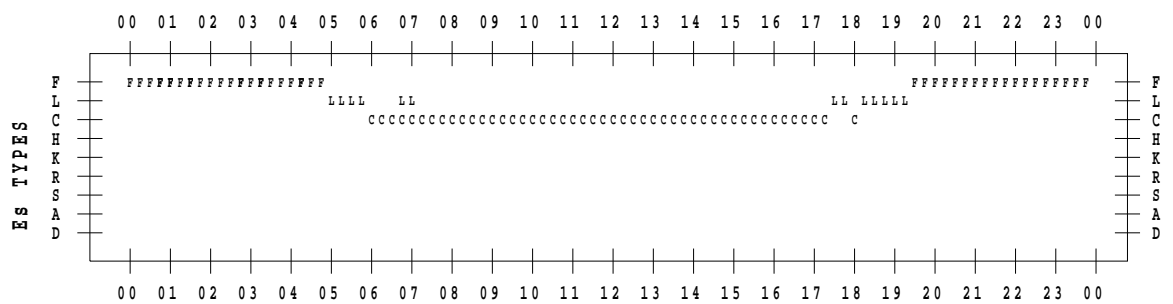
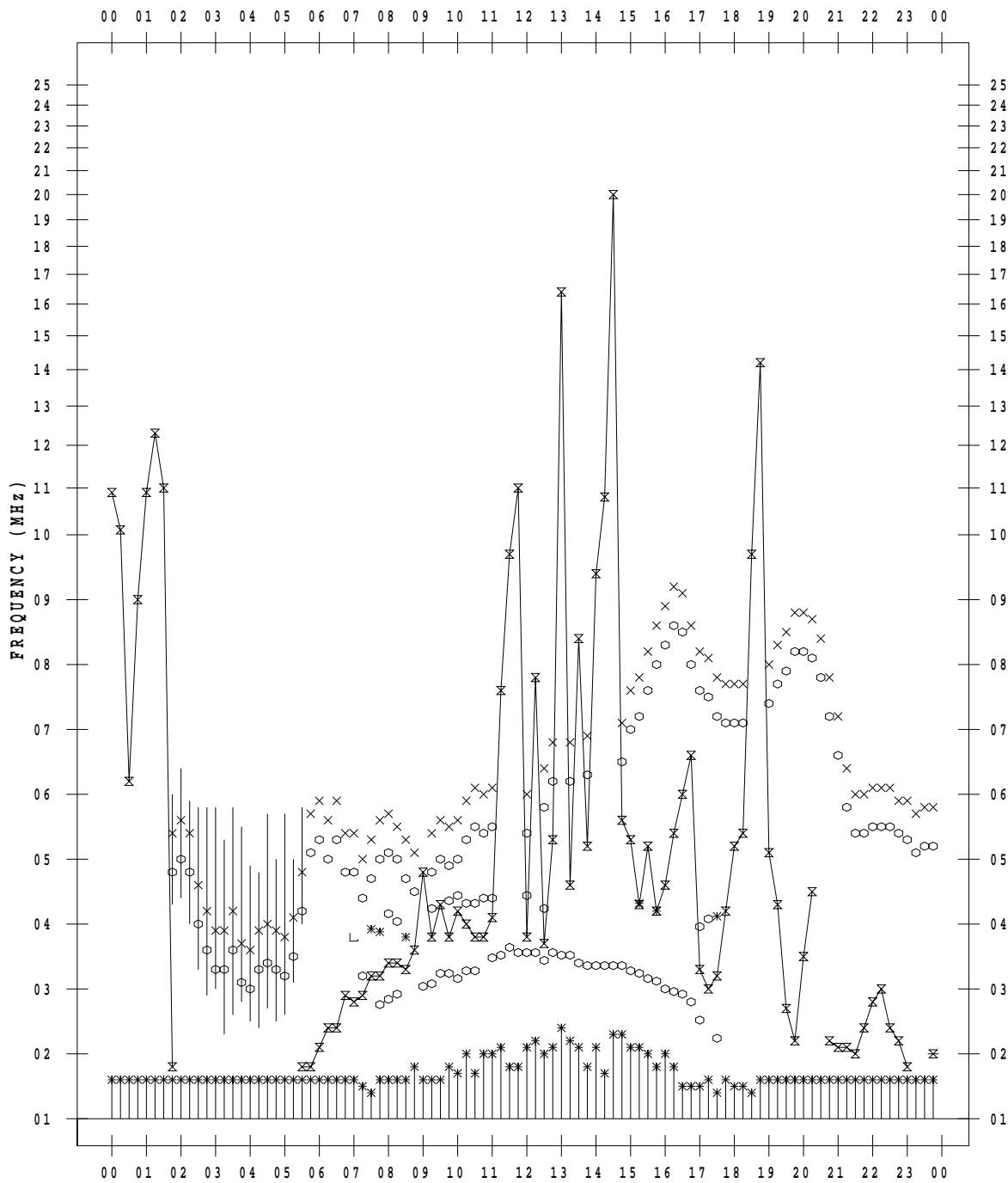
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 6/17

135 ° E MEAN TIME



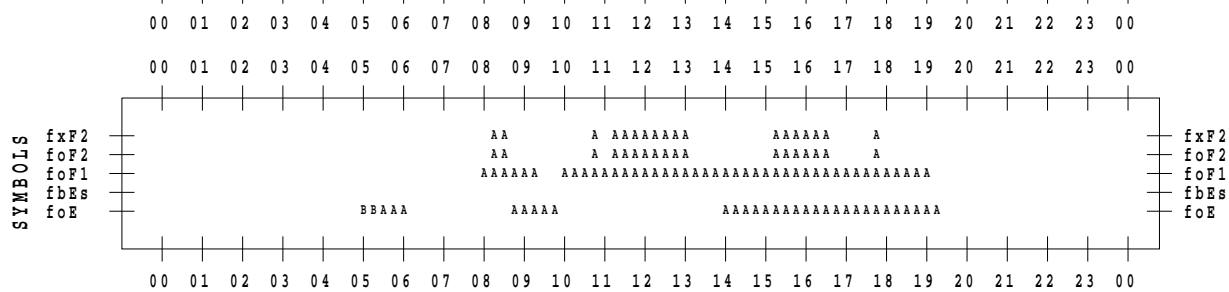
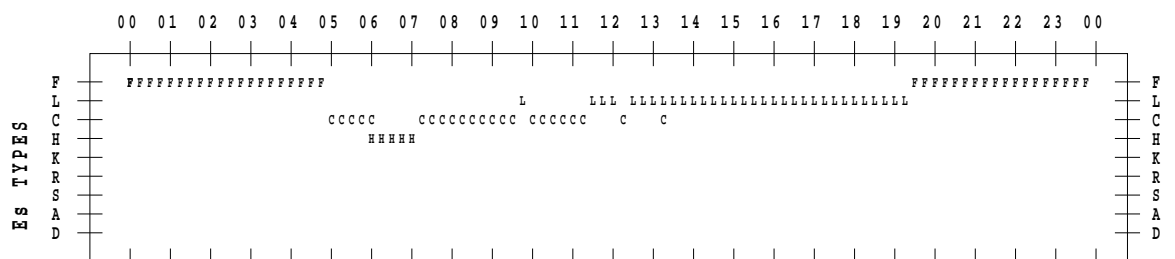
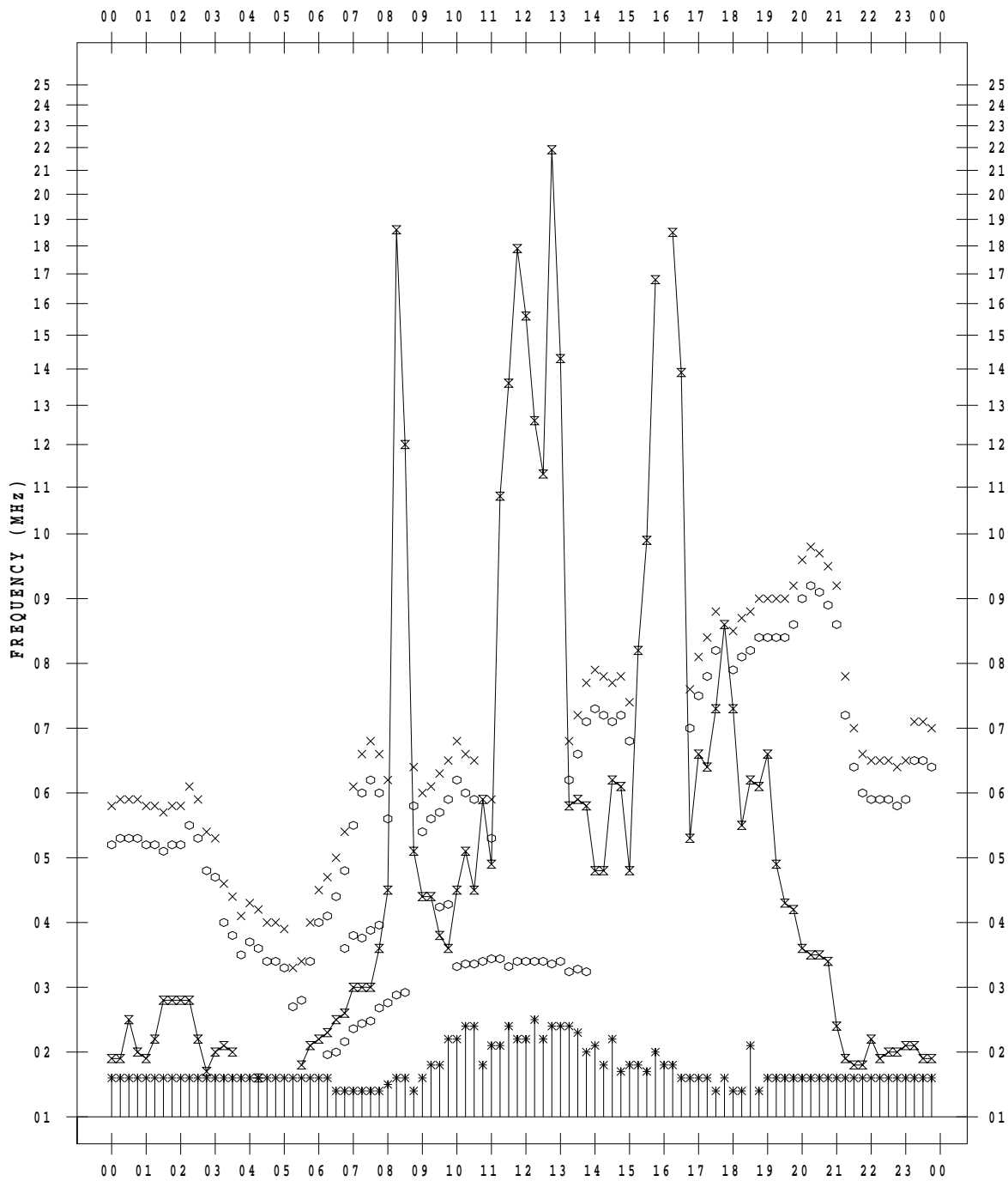
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 18

135 ° E MEAN TIME



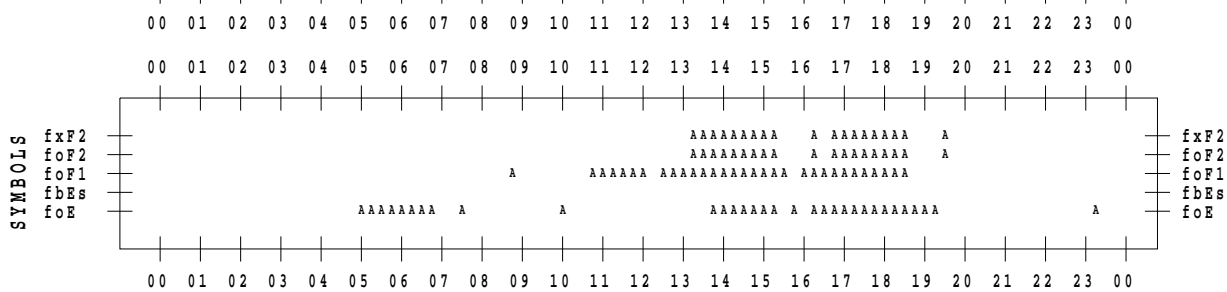
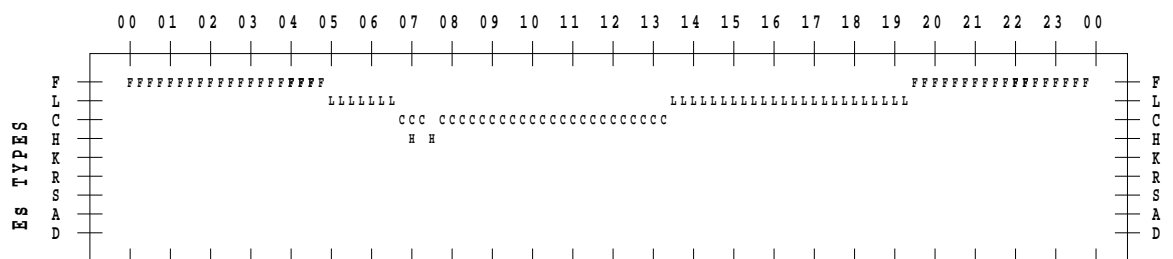
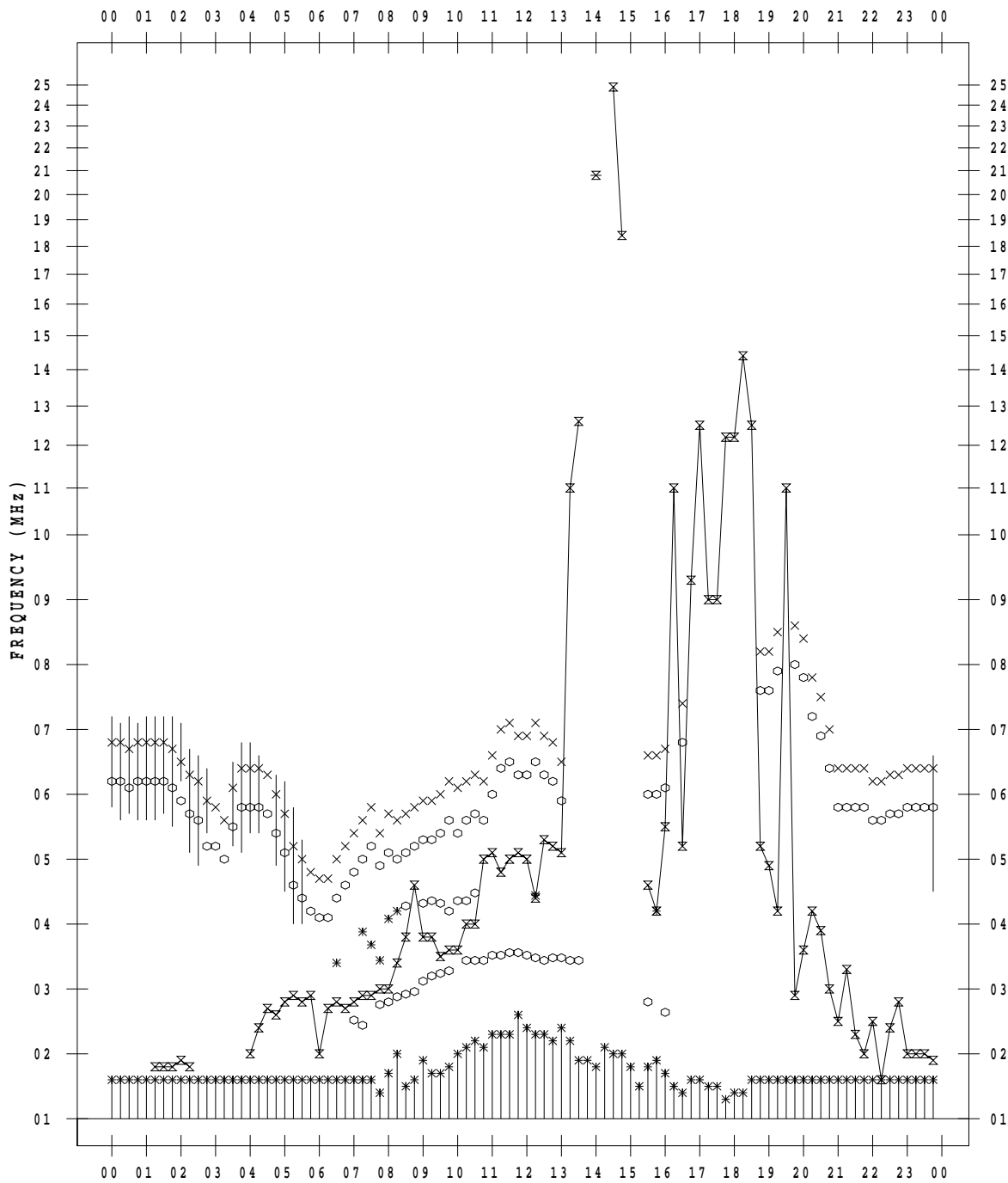
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 6/19

135 ° E MEAN TIME



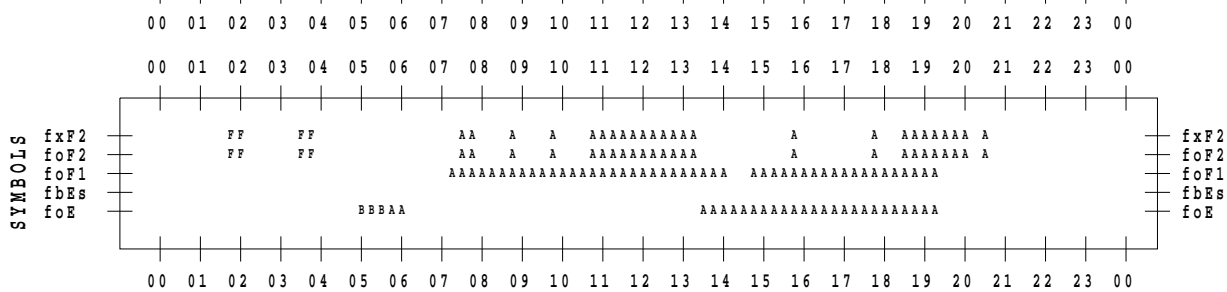
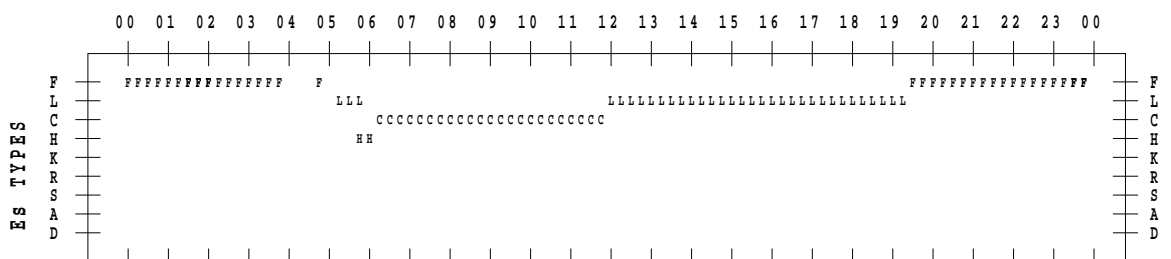
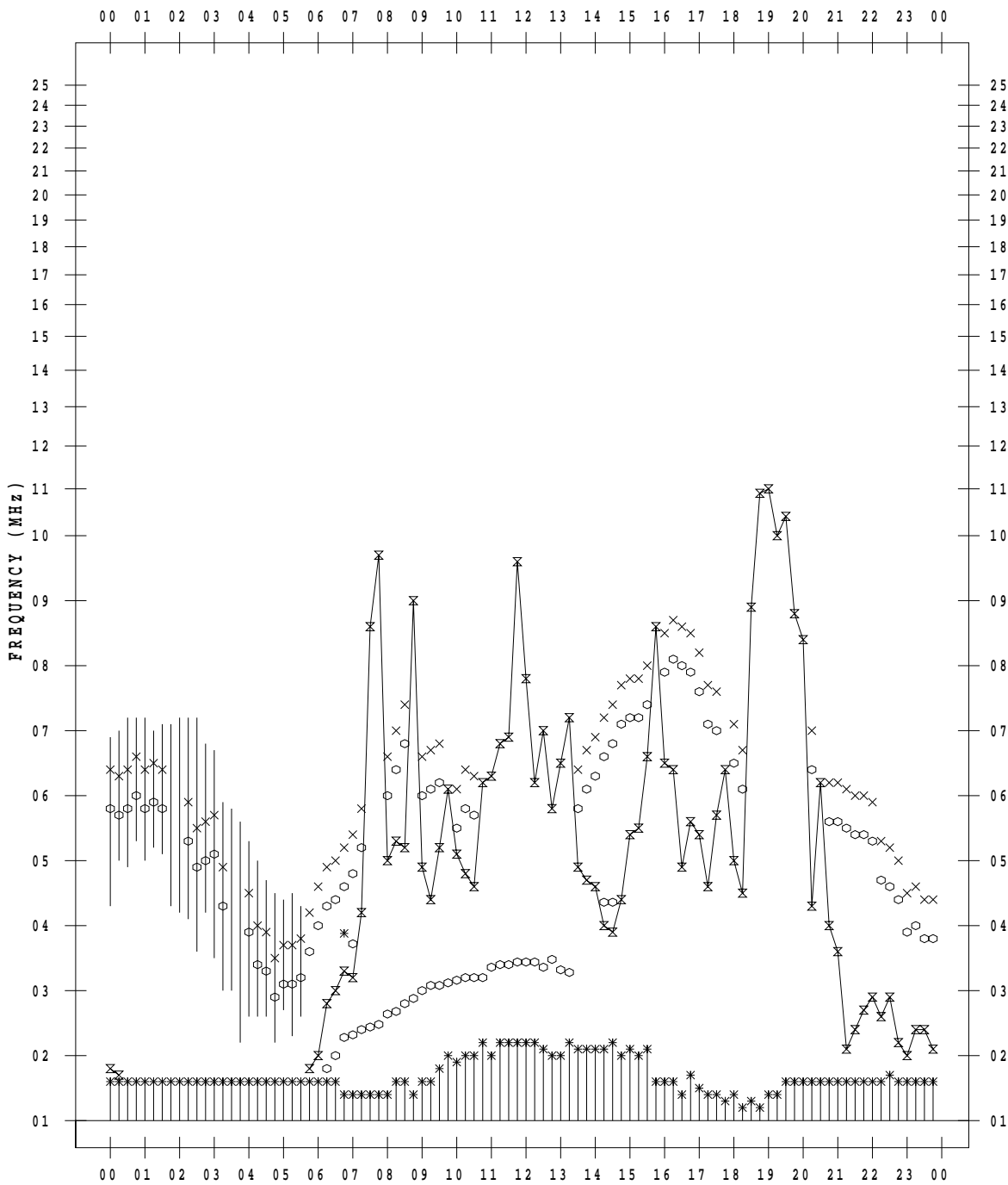
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 6/20

135 ° E MEAN TIME



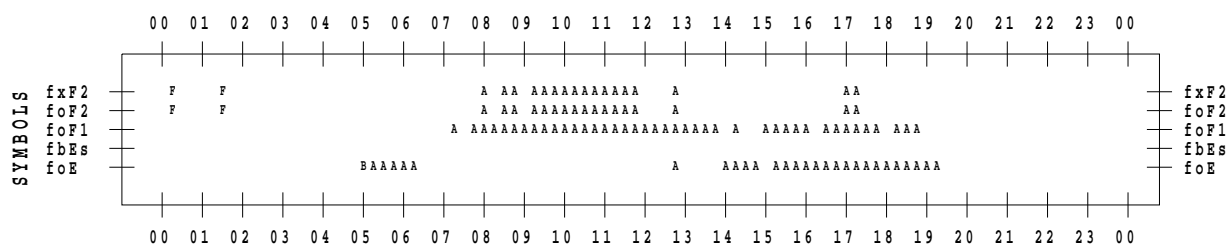
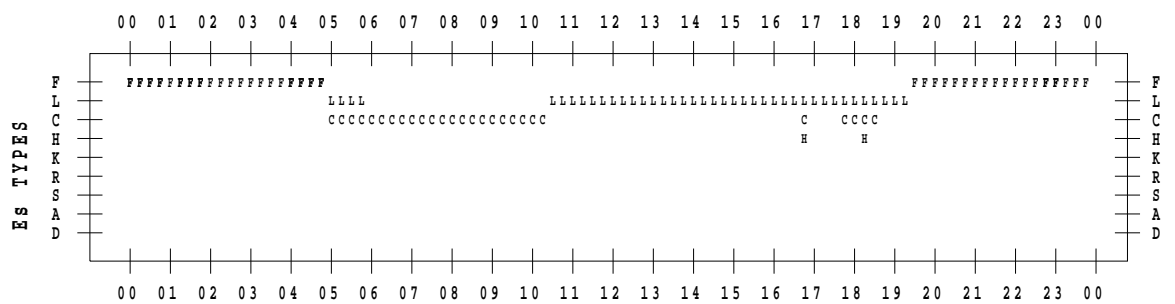
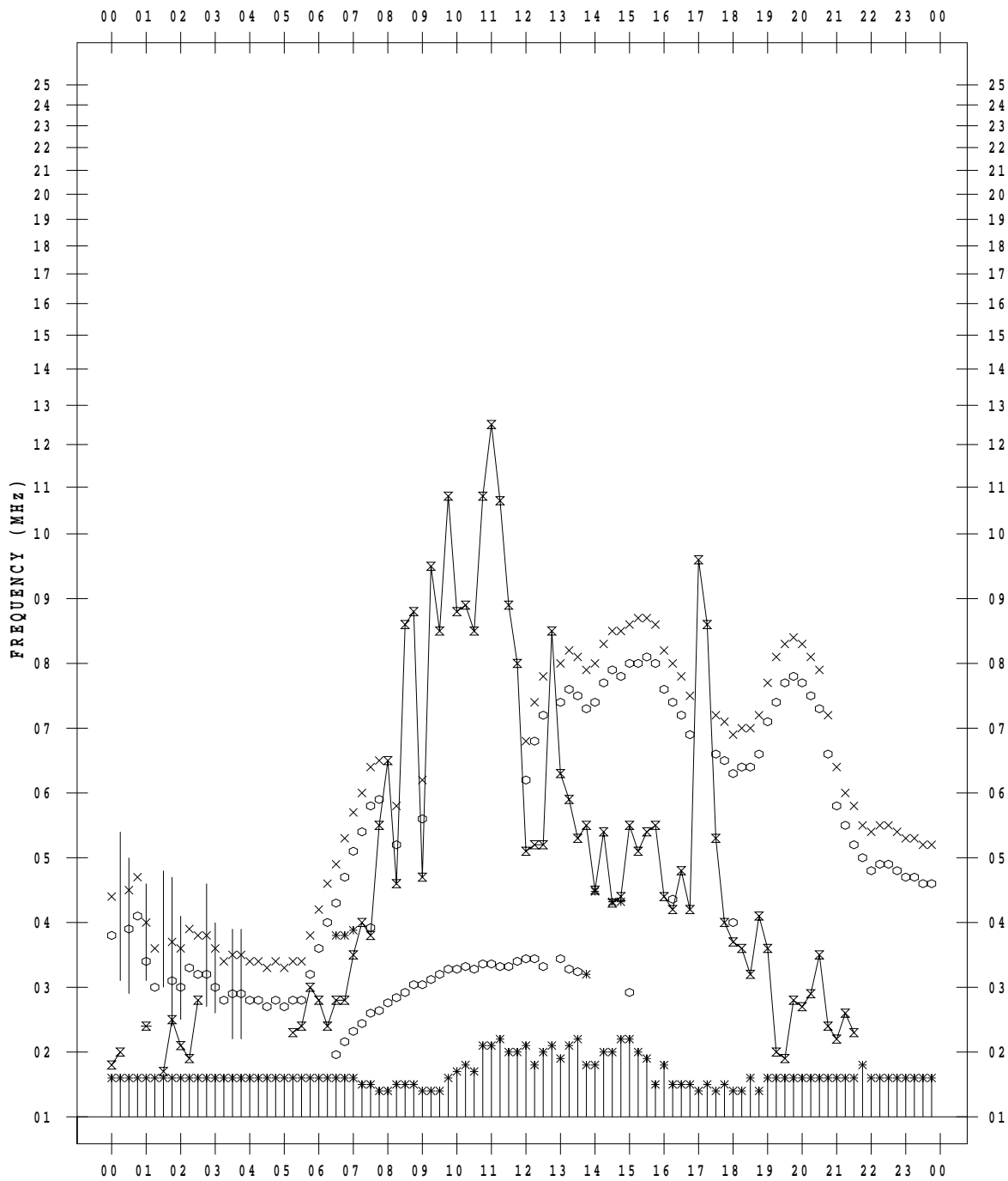
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 21

135 ° E MEAN TIME



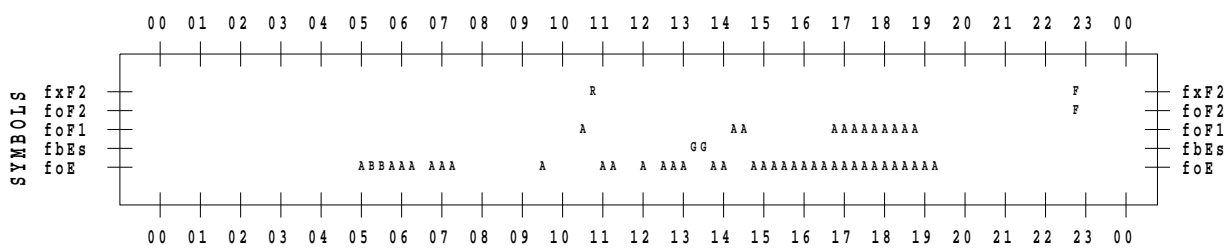
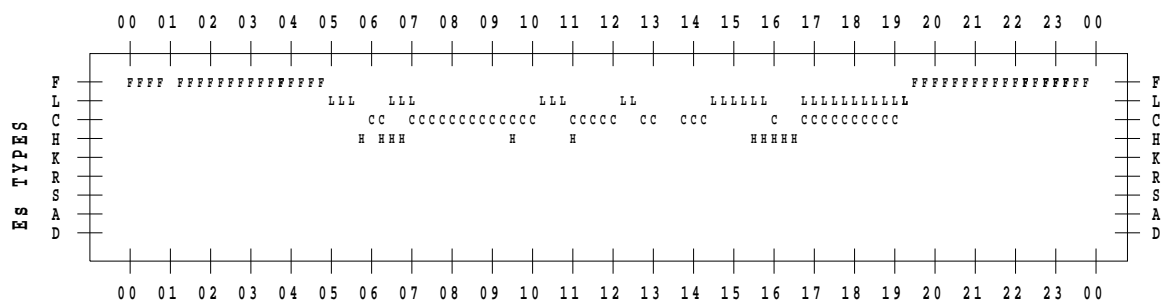
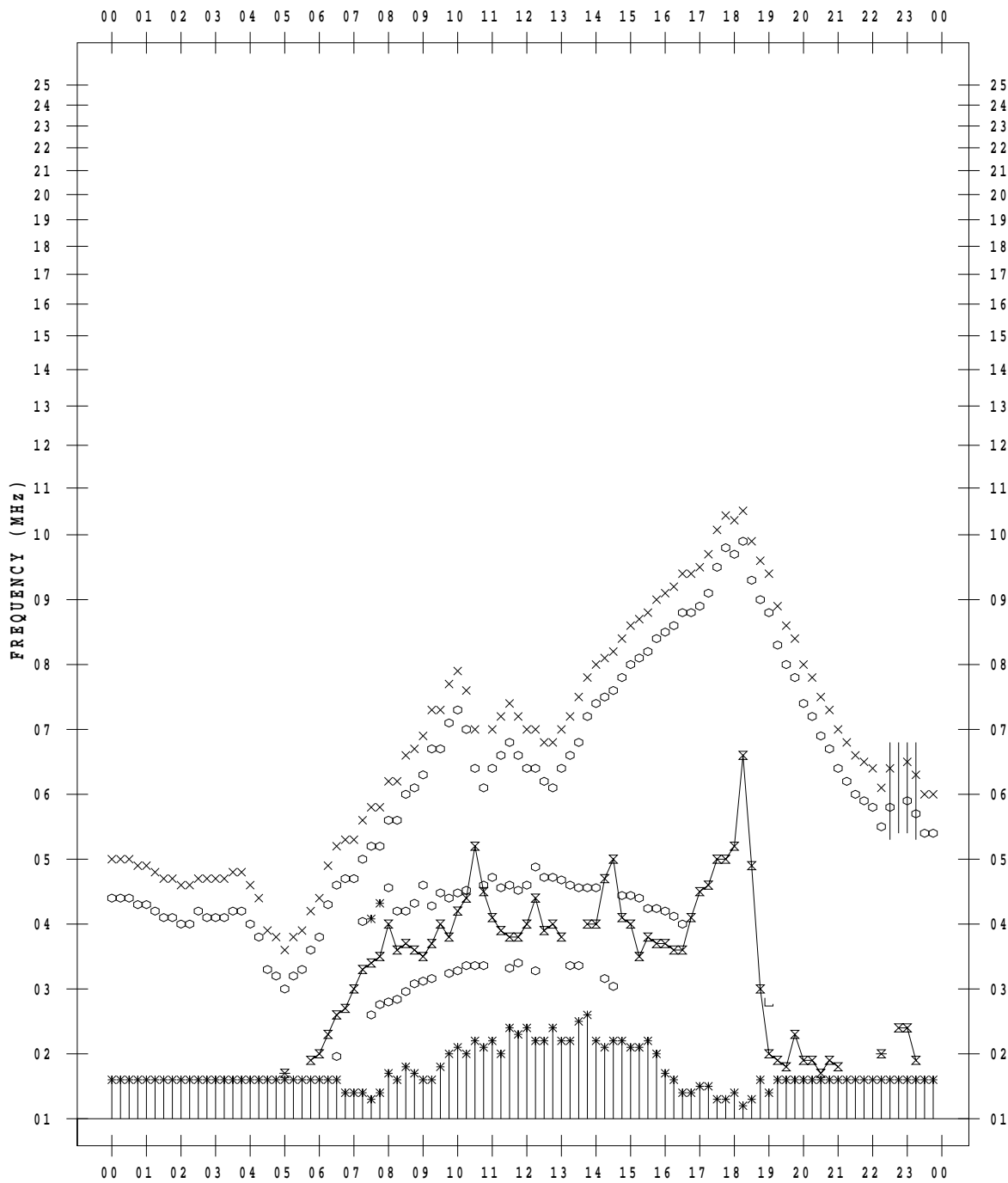
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 22

135 ° E MEAN TIME



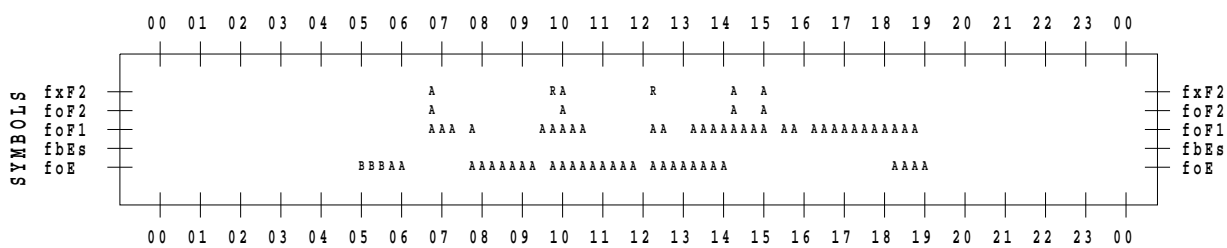
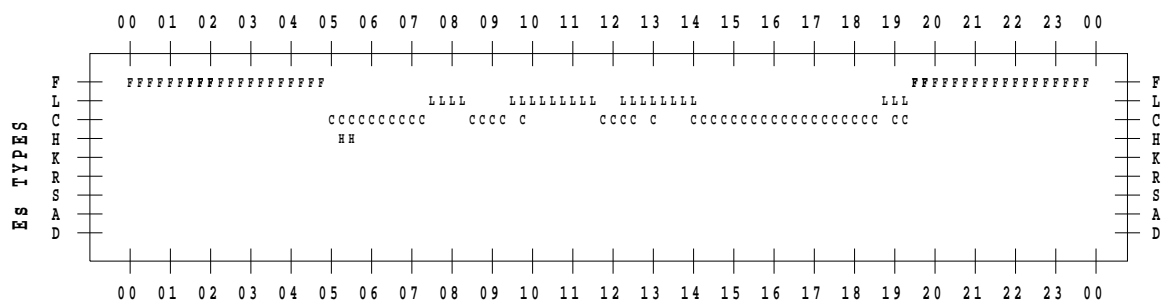
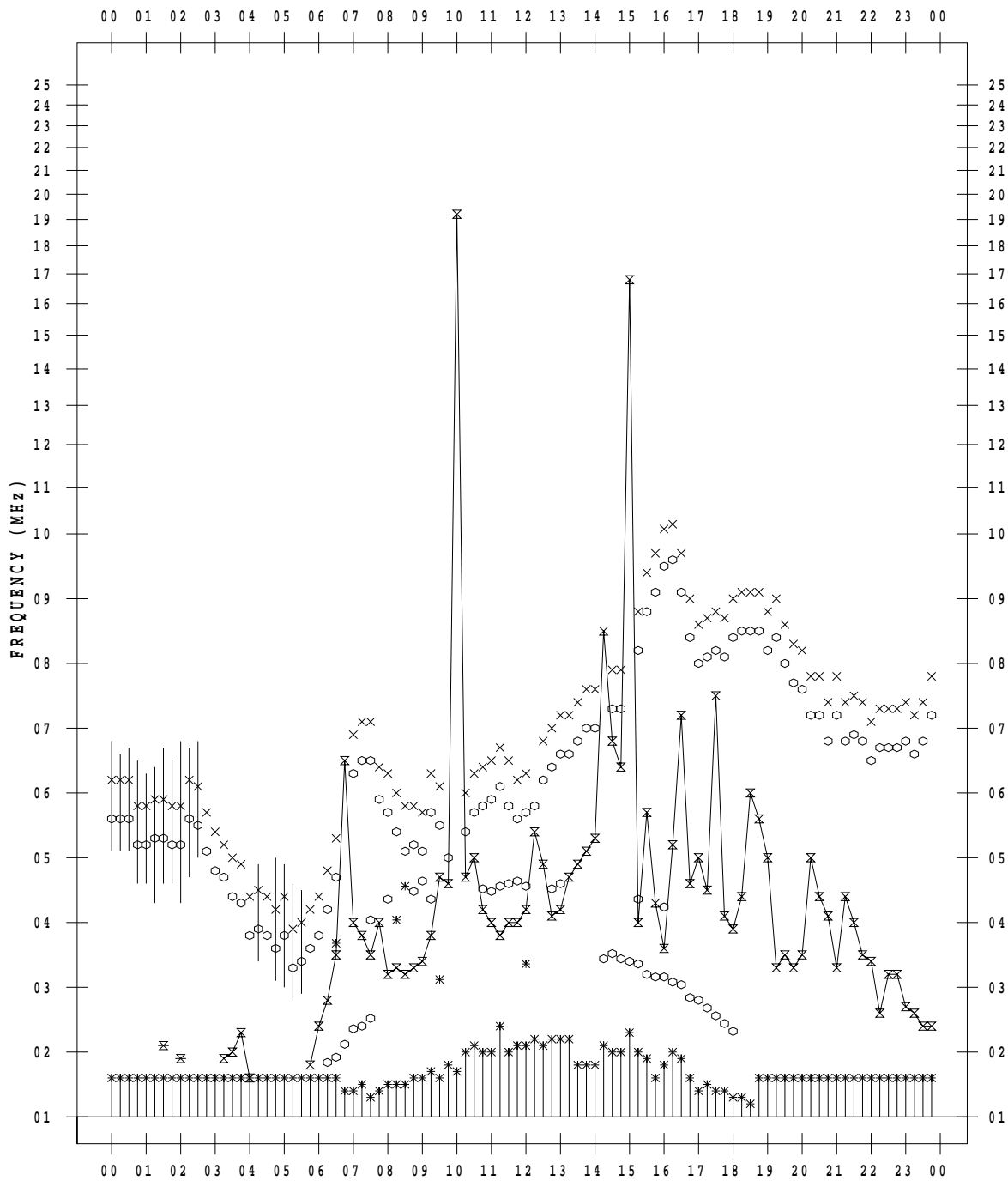
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 23

135 ° E MEAN TIME



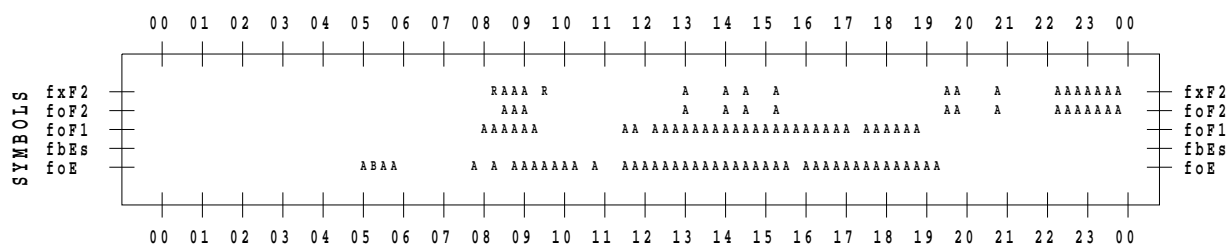
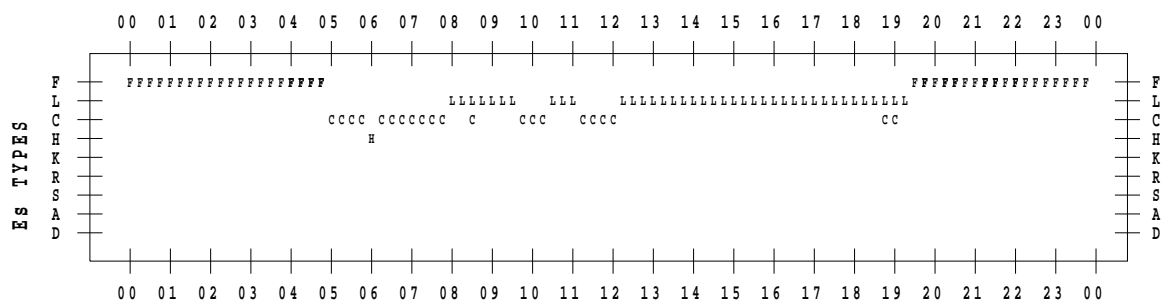
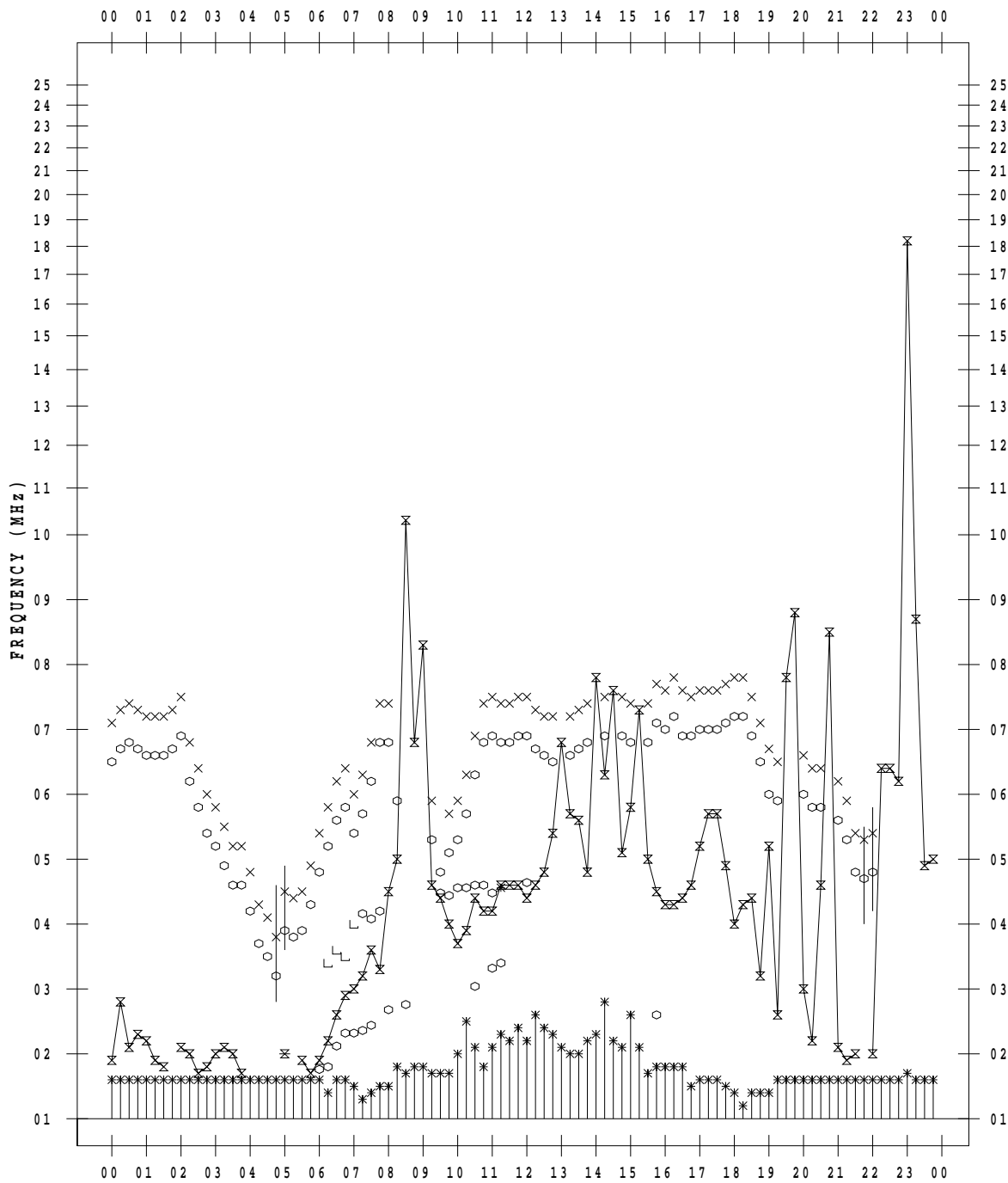
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 24

135 ° E MEAN TIME



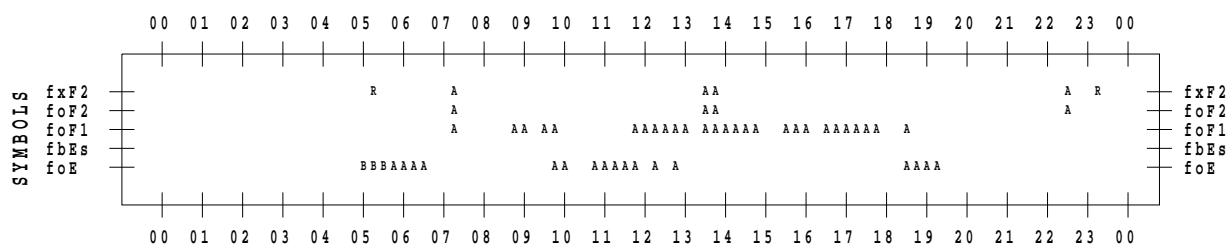
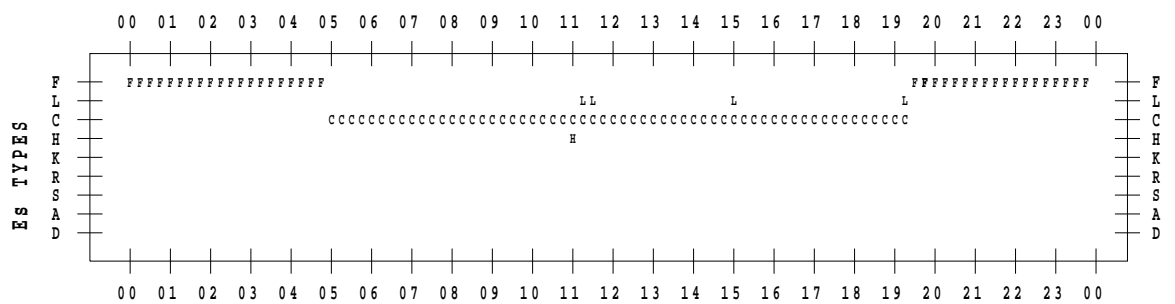
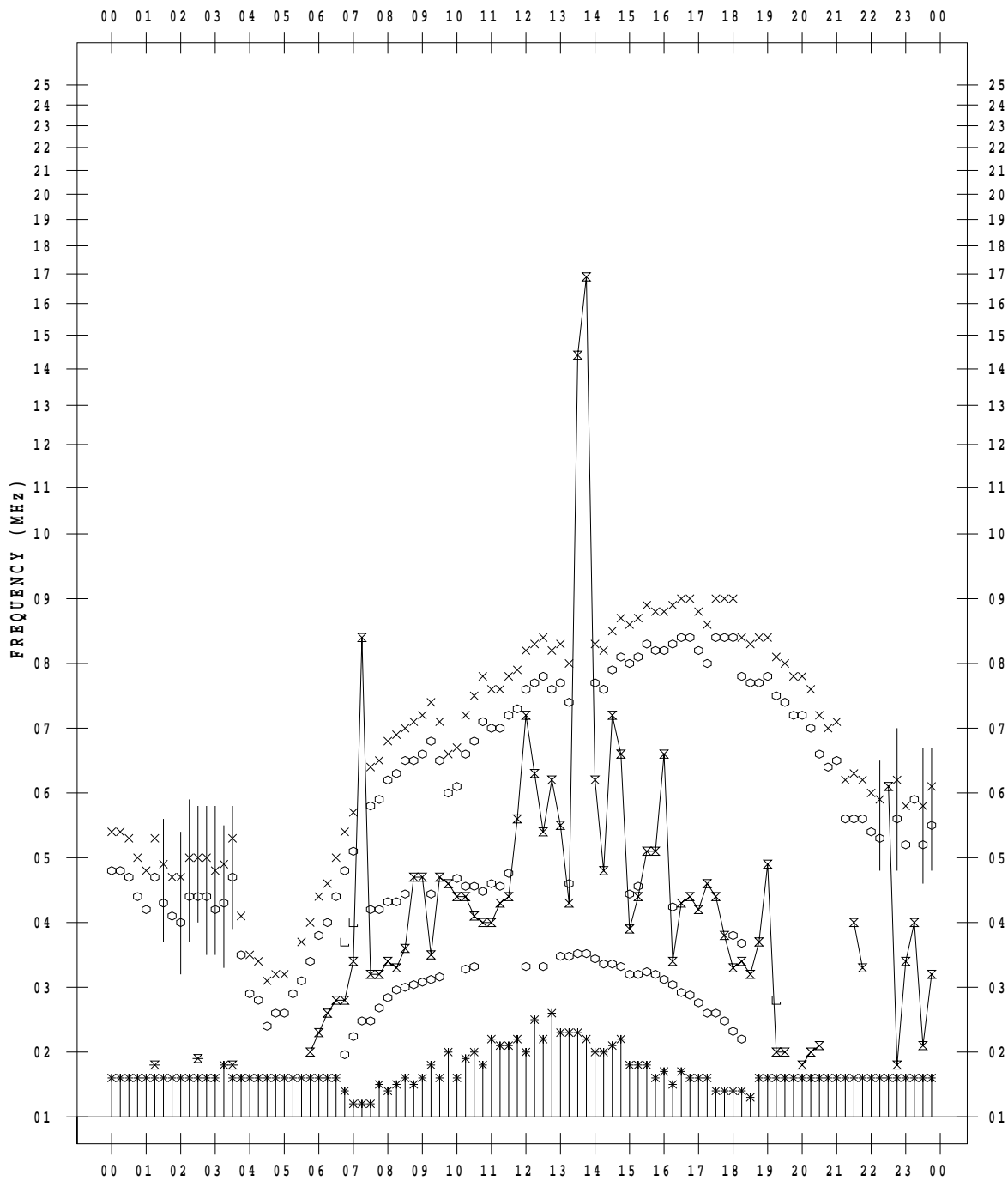
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 25

135 ° E MEAN TIME



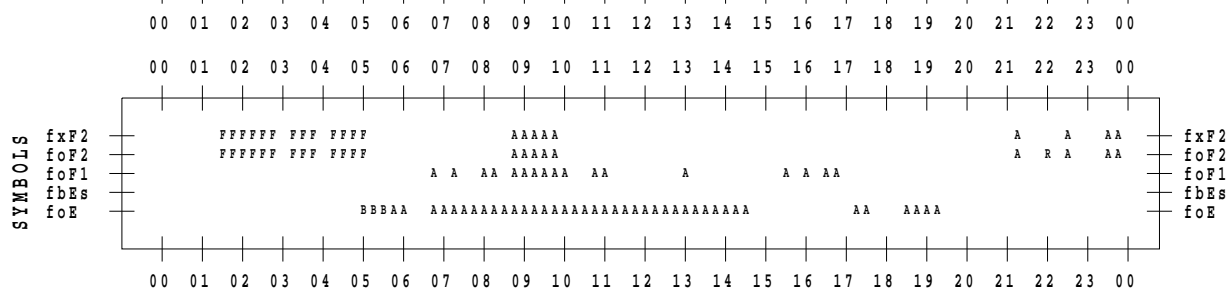
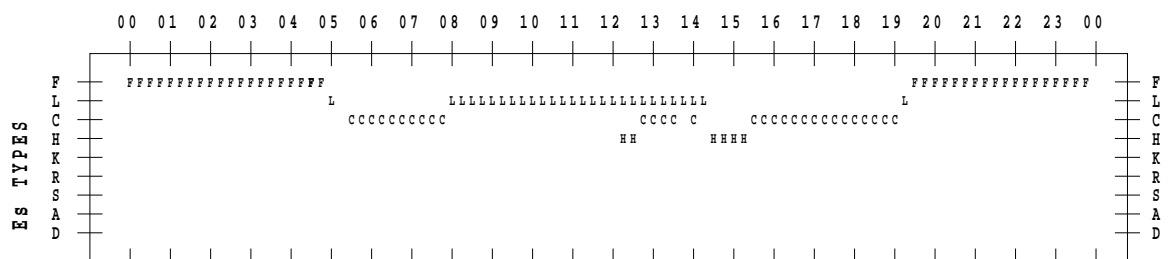
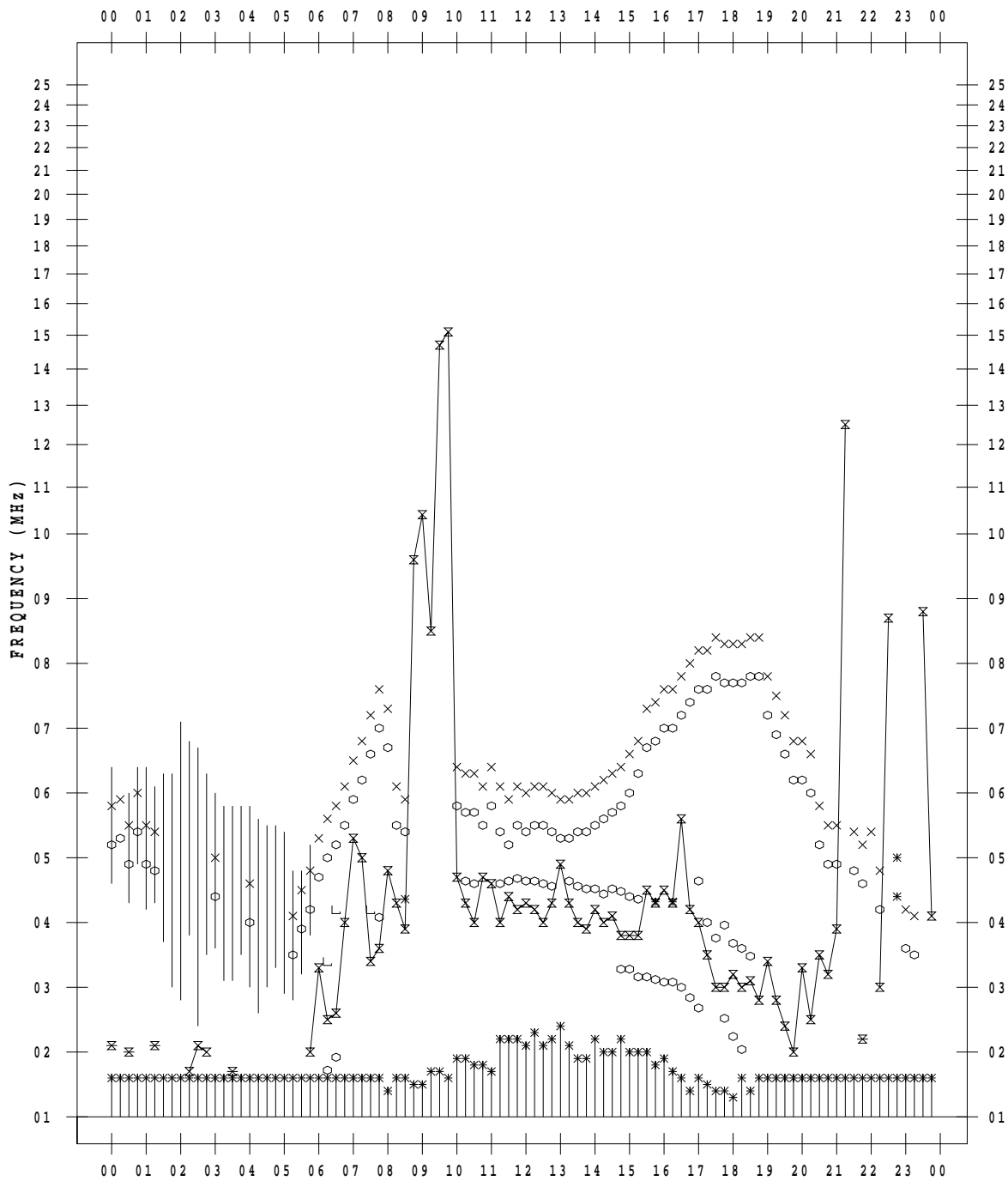
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 26

135 ° E MEAN TIME



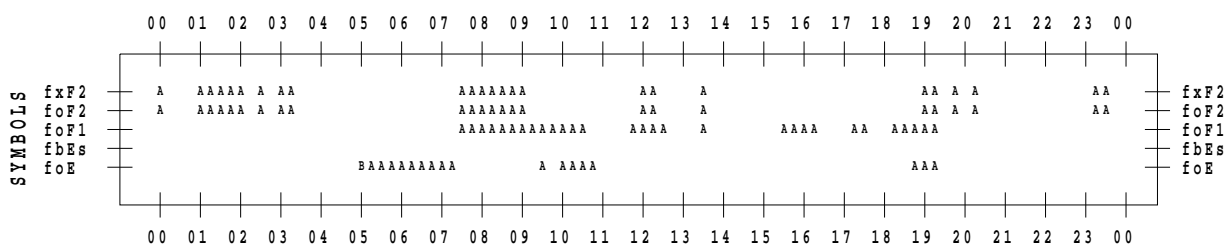
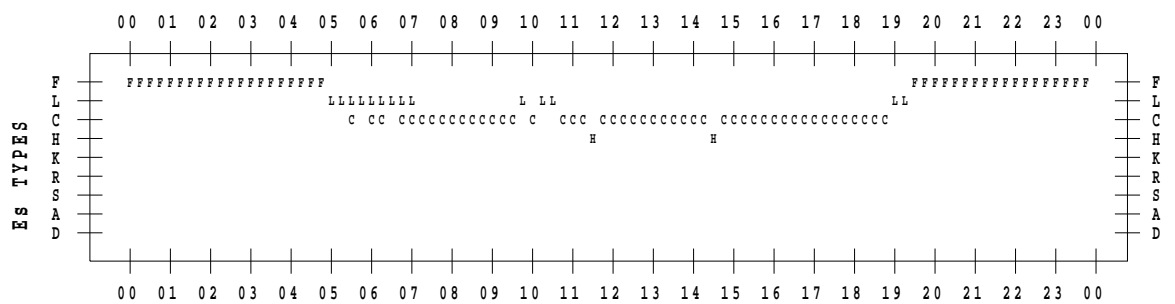
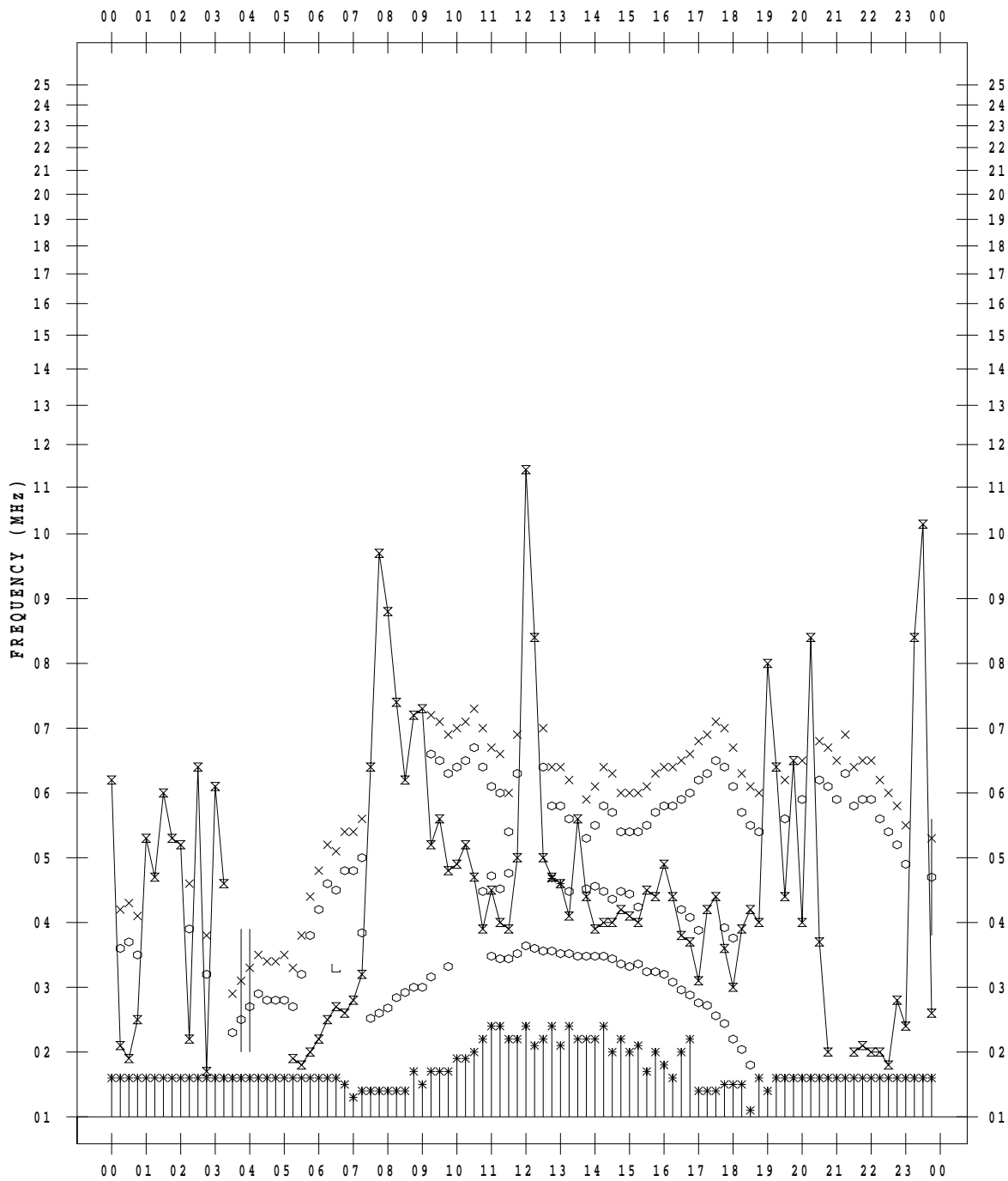
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 27

135 ° E MEAN TIME



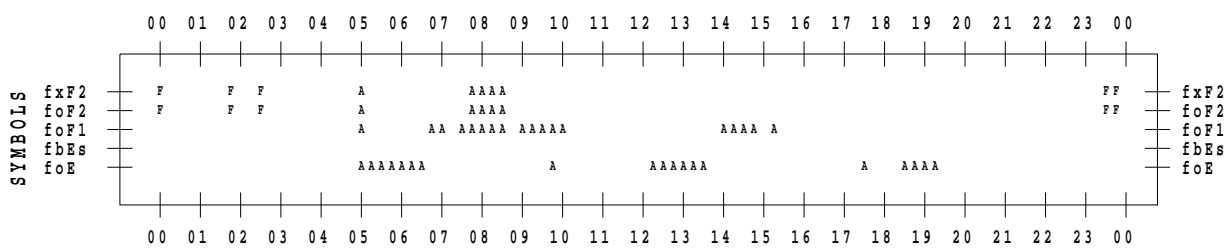
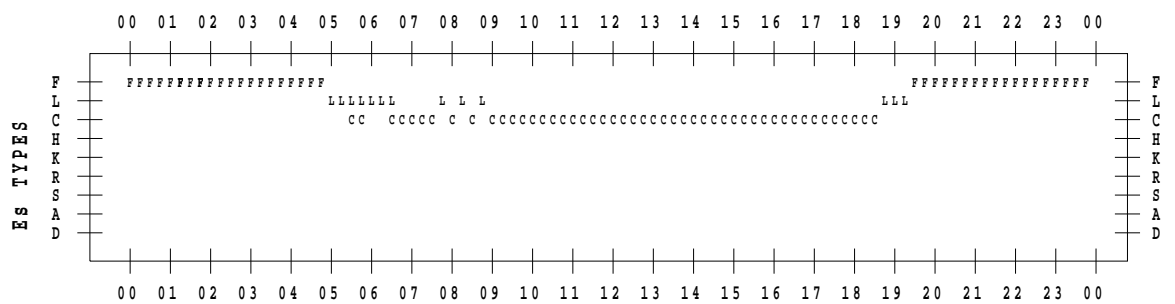
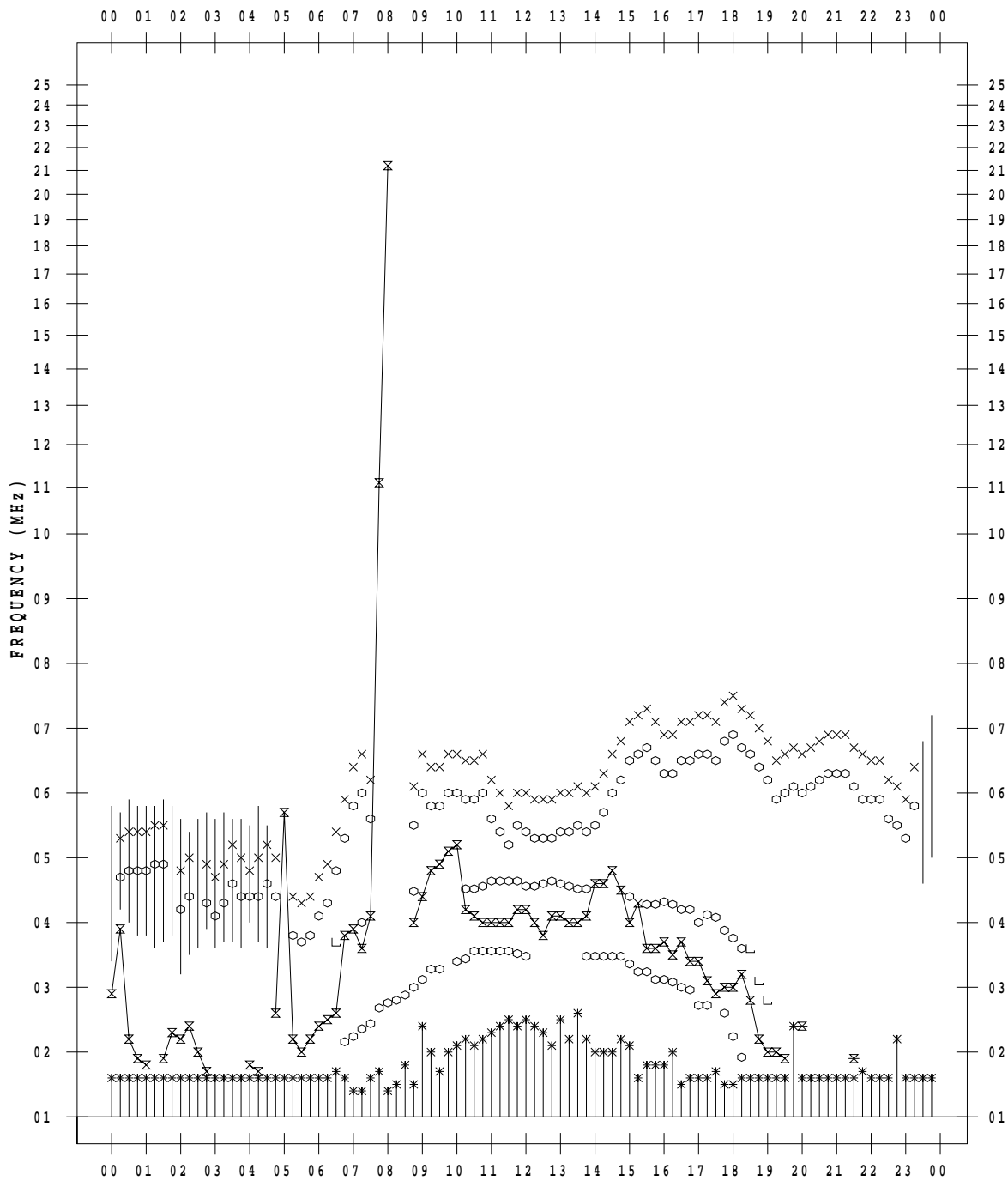
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 28

135 ° E MEAN TIME



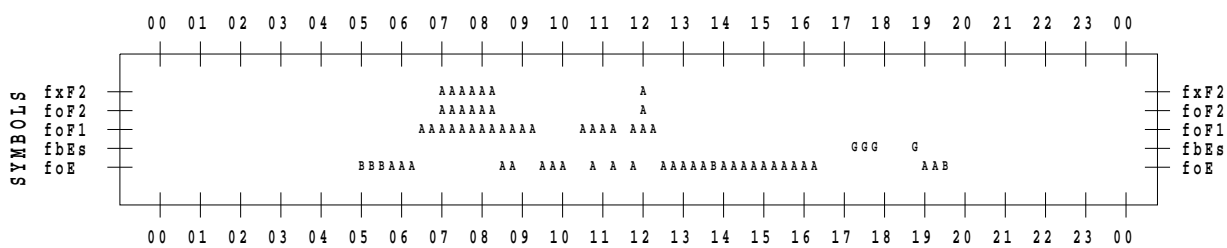
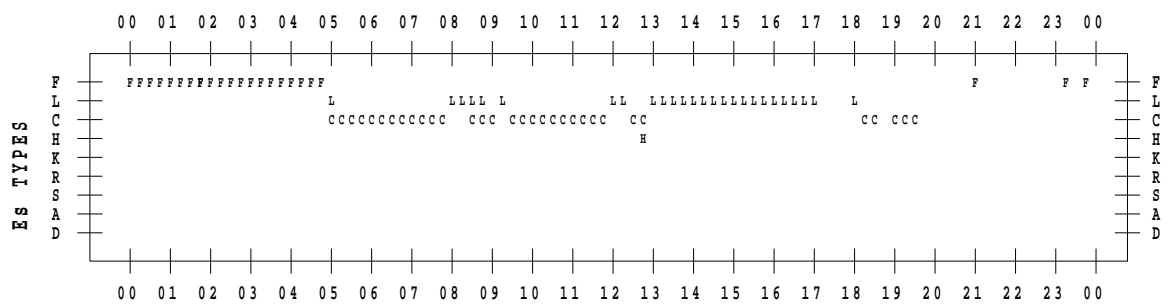
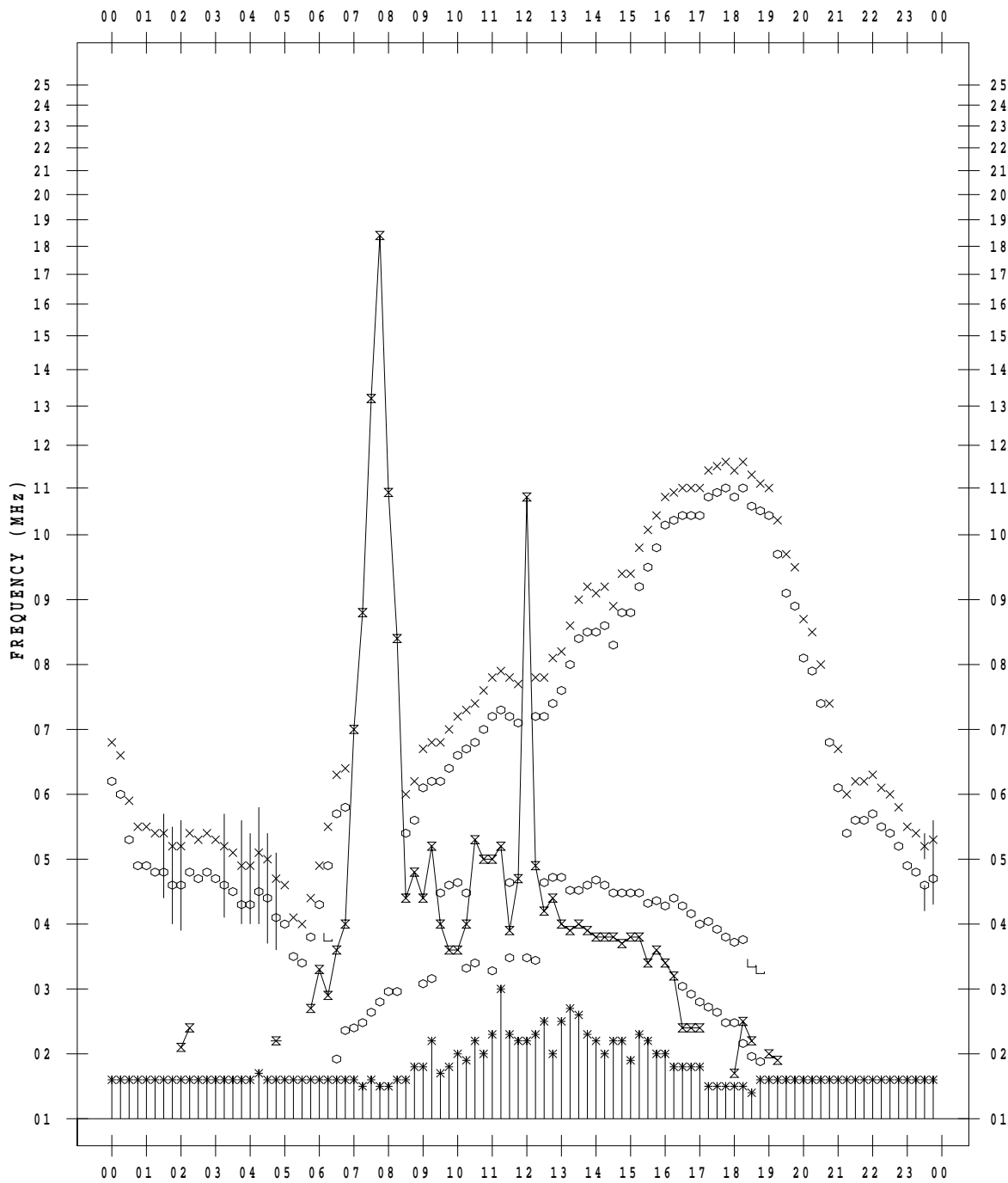
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 29

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 6 / 30

135 ° E MEAN TIME

