

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 iono-spheric reflections
$h'Es$ $h'F$	Minimum virtual height on the ordinary wave for the Es and F layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

of values.

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

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

d. Reliability of Automatic Scaling

The results of the comparison between automatically-scaled values and manually-scaled ones showed that hourly values of $foF2$, 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

APR. 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	53	53	51	50	43	41	53	51	53	63	64	62	65	61	63	62	61	65	57	52	49	43	40	41
2	42	42	40	41	37	35	43	47	52	66	73	65	60	61	64	64	60	53	49	51	49	49	49	49
3	47	48	50	48	49	38	43	47	53	61	62	63	60	67	74	68	58	51	48	53	55	54	49	49
4	49	48	53	38	35	35	44	50	52	57	64	68	63	60	64	61	57	53	47	50	49	43	41	38
5	38	39	45	34	33	37	41	45	50	55	63	65	62	59	54	53	51	53	49	54	51	48	44	39
6	37	38	37	37	30	32	39	47	48	53	61	57	55	54	55	55	55	53	51	57	55	51	49	37
7	38	37	37	35	33	35	46	49	51	55	60	57	61	59	55	60	57	52	48	57	60	58	47	43
8	32	32	33	32	31	33	36	41	47	54	64	59	65	62	63	57	57	55	47	50	48	46	43	38
9	36	35	33	34	31	38	42	48	53	53	63	60	61	56	57	57	53	53	60	55	49	46	41	41
10	39	38	37	37	33	38	43	49	54	59	59	67	64	57	60	61	59	53	47	45	45	45	41	40
11	42	40	39	37	34	37	42	44	47	51	60	65	80	62	57	60	58	51	48	52	51	49	45	41
12	43	44	41	41	40	38	40	42	47	49	52	51	51	51	61	62	57	57	56	64	61	49	43	49
13	47	50	52	45	47	40	41	41	50	51	45	52	56	54	61	56	55	53	49	51	48	42	42	37
14	39	39	36	34	25	34	41	42	48	54	54	55	55	54	51	55	57	49	46	50	49	44	49	41
15	41	41	40	39	35	35	40	45	52	51	58	59	60	65	60	65	57	54	57	60	59	52	42	36
16	33	36	35	37	38	N 40	47	48	49	50	54	55	59	67	65	61	57	52	53	55	59	60	48	45
17	43	45	44	40	30	39	45	43	49	51	A	53	A	49	49	51	53	51	50	56	53	55	50	52
18	48	49	48	41	40	42	41	43	43	49	A	54	53	59	51	55	48	48	49	55	56	53	45	35
19	33	35	34	33	34	39	54	61	55	53	60	53	59	57	53	61	57	54	51	54	55	51	47	38
20	41	39	40	37	33	37	50	39	A	A	50	A	53	53	60	65	60	53	44	49	47	43	43	43
21	42	40	39	35	32	35	41	46	50	56	58	51	56	54	59	61	62	55	51	51	53	53	53	54
22	51	51	48	45	36	39	42	48	56	58	64	64	65	57	59	57	56	54	52	49	50	51	51	43
23	37	34	35	38	35	41	39	42	41	51	53	54	59	56	54	60	59	55	53	55	54	51	45	42
24	44	39	38	36	34	39	41	43	51	52	53	49	55	57	51	57	57	57	55	56	57	52	43	37
25	35	34	34	34	32	34	45	45	A	47	54	53	49	74	54	64	63	62	48	49	55	50	43	41
26	42	43	38	33	34	39	A	56	61	A	59	60	A	68	71	62	A	68	65	68	60	A	57	55
27	51	40	33	33	33	35	A	68	A	A	51	A	51	N 56	A	51	56	51	55	53	60	57	55	52
28	44	38	37	39	34	A	47	A	45	A	A	48	A	50	51	A	53	53	49	52	52	47	44	41
29	41	38	37	37	36	43	46	51	48	49	56	A	A	52	53	62	63	66	56	65	63	56	A	49
30	A	42	37	36	A	A	46	46	A	A	A	54	A	A	55	53	55	58	57	57	A	53	53	49
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	30	30	30	29	28	28	29	26	25	26	27	25	29	29	29	29	30	30	30	29	29	29	30
MED	42	40	38	37	34	38	42	46	50	53	59	57	59	57	57	60	57	53	50	54	53	51	45	41
U Q	45	44	44	40	36	39	46	49	53	56	63	63	62	61	62	62	59	55	55	56	58	53	49	49
L Q	37	38	36	34	32	35	41	43	48	51	54	53	55	54	53	55	55	52	48	51	49	46	43	38

HOURLY VALUES OF fEs AT Wakkanai

APR. 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	G	G	29	G	G	G	31	38	36	39	44	41	45	40	35	35	33	28	26	G	G	G	G	G
2	G	G	G	31	24	G	40	42	34	36	93	35	38	53	36	36	34	27	G	G	G	G	G	G
3	G	G	G	G	G	24	29	36	39	46	48	49	46	43	34	35	36	31	26	25	G	G	G	G
4	G	G	G	G	G	G	47	32	35	46	48	48	40	45	40	33	37	58	27	G	G	G	G	G
5	G	G	G	G	G	G	33	143	38	41	34	108	36	46	38	36	32	G	G	G	G	G	G	G
6	G	G	G	G	G	G	33	33	36	38	36	49	40	36	38	36	34	28	G	G	G	G	G	G
7	G	G	G	G	G	G	29	46	35	38	41	36	42	38	38	36	37	30	G	G	G	G	G	G
8	G	G	G	G	G	G	28	32	36	40	41	36	36	36	84	38	32	29	G	G	G	G	G	G
9	G	G	28	G	G	G	45	34	38	36	41	41	39	39	36	37	36	28	G	G	G	G	G	G
10	G	G	G	G	G	G	144	44	36	38	33	36	54	34	37	37	34	29	24	G	G	G	G	G
11	G	G	G	G	11	G	33	38	40	38	37	38	34	85	34	37	35	30	G	G	G	G	G	G
12	G	G	G	G	G	G	29	33	35	36	35	48	112	46	38	36	163	31	G	G	G	G	G	G
13	G	G	G	G	G	G	28	35	34	42	43	38	43	45	42	39	34	29	G	G	G	G	G	G
14	G	G	G	G	11	G	31	39	43	38	44	36	40	36	38	39	32	28	G	G	G	G	G	G
15	G	G	G	G	G	G	33	34	34	37	50	50	60	38	38	34	34	G	G	G	G	G	G	G
16	G	G	G	G	G	G	35	40	43	46	38	34	37	39	161	112	38	31	G	G	30	28	G	G
17	G	G	G	35	G	G	59	58	71	57	50	37	40	37	33	33	84	G	G	G	25	28	G	G
18	G	G	G	G	G	141	41	41	46	46	37	35	34	G	33	32	30	G	G	G	G	G	G	G
19	G	G	G	G	G	30	34	37	36	38	36	50	39	101	40	37	49	32	32	G	G	33	28	34
20	25	G	G	G	G	G	30	40	50	48	58	37	41	43	41	38	36	34	33	32	G	G	G	G
21	G	G	G	G	G	32	32	36	40	34	43	40	40	39	37	38	35	G	34	G	G	G	G	G
22	G	G	G	G	G	G	24	33	36	91	33	38	50	40	35	35	34	35	G	G	G	G	G	G
23	G	G	G	G	G	G	34	40	108	45	71	45	41	41	34	34	33	39	36	32	27	G	26	G
24	G	G	G	G	94	G	60	34	35	39	35	37	40	38	38	43	114	39	37	G	G	G	G	G
25	G	G	G	G	G	28	32	44	60	55	38	38	43	35	39	47	35	27	20	27	G	G	G	G
26	G	G	G	26	G	32	71	56	48	70	46	44	98	38	34	46	84	54	38	111	113	72	59	54
27	35	29	G	29	G	33	60	64	61	70	64	144	110	71	93	34	45	52	48	69	40	41	54	47
28	41	27	G	24	G	58	54	70	56	92	60	94	58	58	61	48	39	40	32	31	G	23	G	
29	G	G	G	G	G	134	36	40	35	70	70	72	88	69	54	40	35	31	G	26	G	26	84	33
30	70	G	32	34	90	38	43	62	94	108	125	91	66	92	40	35	34	26	32	40	60	41	59	40
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	29	29	30	30	29	30	30	30	30	29	30	30	30	30	30
MED	G	G	G	G	G	G	33	40	38	41	43	42	40	40	38	36	35	30	G	G	G	G	G	G
U Q	G	G	G	G	G	30	43	44	48	62	53	50	54	46	40	39	38	36	33	26	G	G	23	G
L Q	G	G	G	G	G	G	30	34	35	38	36	37	38	38	36	35	34	28	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

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

HOURLY VALUES OF fof2 AT Kokubunji

APR. 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	43	42	43	38	32	35	48	57	62	63	66	69	79	64	63	64	71	81	77	61	40	37	35	35
2	37	39	39	39	33	31	49	49	59	63	73	70	77	75	71	71	55	59	67	58	42	38	37	35
3	37	38	39	41	33	31	43	50	57	64	61	67	69	77	82	77	65	61	60	62	47	41	39	37
4	40	37	36	36	26	26	43	48	57	59	61	65	67	76	80	87	81	65	62	58	51	42	31	31
5	32	32	33	32	27	29	41	45	57	71	62	58	64	64	66	60	59	53	55	65	63	57	44	37
6	38	38	34	36	24	29	43	49	59	64	60	65	61	66	66	64	59	58	60	73	71	44	35	35
7	34	33	32	33	25	24	43	51	54	66	61	65	64	65	63	61	56	57	57	66	61	55	51	44
8	39	35	34	41	37	29	46	54	63	76	63	76	84	87	67	63	63	57	59	62	54	45	40	41
9	38	38	35	37	24	30	44	52	60	64	54	59	62	63	61	60	69	62	63	62	55	40	40	39
10	38	38	37	39	29	N 29	47	54	57	65	74	73	65	62	55	67	66	61	53	46	A	40	40	38
11	38	37	38	38	27	26	41	51	53	55	72	91	96	84	65	59	60	59	67	62	53	40	43	42
12	42	41	38	38	32	32	42	52	53	61	56	54	59	59	58	70	82	67	63	62	47	41	41	40
13	39	39	37	41	25	29	45	47	47	52	61	67	72	67	71	74	65	55	57	55	47	43	42	42
14	40	40	41	43	23	30	42	50	50	56	70	70	67	58	55	64	64	59	55	57	56	50	49	49
15	43	41	41	38	32	33	47	56	62	59	59	66	67	74	86	72	68	71	72	76	78	N 41	30	34
16	34	35	33	33	33	36	52	53	55	61	67	69	80	76	68	69	72	63	55	62	61	59	52	49
17	49	44	51	A	A	33	47	N 70	A	57	52	61	74	64	66	61	61	61	A	61	58	41	43	42
18	44	42	46	31	31	35	52	51	48	50	A	59	71	75	60	50	51	51	55	68	59	50	39	37
19	37	35	34	32	31	31	56	66	71	56	73	76	59	68	68	68	73	54	58	59	61	50	49	42
20	39	41	39	37	35	39	48	60	57	64	71	66	71	85	74	64	67	66	61	56	53	52	45	49
21	43	42	40	35	32	36	49	55	60	67	81	64	63	61	75	79	63	55	50	55	58	53	54	54
22	51	50	44	39	29	35	45	48	58	68	77	71	64	60	67	73	67	56	51	57	54	49	49	46
23	42	43	40	34	31	33	47	51	53	62	67	69	71	72	79	70	66	63	67	66	57	42	42	A
24	39	35	34	31	30	35	43	50	66	66	54	61	64	81	74	72	77	70	81	70	63	43	43	43
25	41	35	35	31	26	34	48	54	A	61	65	59	54	81	93	75	84	85	70	55	53	54	52	50
26	49	50	49	40	34	39	69	58	A	50	61	55	66	64	85	70	66	73	86	93	72	A	A	A
27	43	41	33	27	29	36	57	58	A	63	65	A	77	84	97	72	69	51	62	73	69	60	A	52
28	52	47	43	39	36	43	45	A	A	51	N 71	56	66	A	67	83	85	73	57	53	55	A	A	41
29	39	38	36	36	33	41	47	49	A	A	A	56	65	65	120	A	94	91	79	67	52	43	42	44
30	42	43	37	36	34	39	54	55	52	51	A	A	66	69	75	75	73	69	68	71	60	55	52	52
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	29	29	30	30	29	25	29	27	28	30	29	30	29	30	30	29	30	29	28	27	28
MED	40	39	38	37	31	33	47	52	57	62	65	66	66	68	68	70	66	61	61	62	56	44	42	42
U Q	43	42	41	39	33	36	49	55	60	64	71	69	72	76	79	73	73	69	67	67	61	52	49	47
L Q	38	37	34	33	26	29	43	49	53	56	61	59	64	64	65	63	63	57	56	57	52	41	39	37

HOURLY VALUES OF fEs AT Kokubunji

APR. 2021

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	G	G	G	G	30	36	39	34	31	45	39	39	38	46	42	G	25	46	G	G	G		
2	G	G	G	G	G	G	28	34	32	34	32	G	G	G	34	31	37		G	G	33	G	G	G	
3	G	G	G	G	G	G	32	35	40	36	37	G	G		37	40	G	G	31	G	27	31	G	G	
4	G	G	G	G	G	G	G	30	34	G	36	38	43	50	38	49	57	46	49	29	G	24	G	G	
5	G	34	28	G	G		28	31	41	39	40	49	59	47	37	34	N	G	G	G	G	G	G	G	
6	G	G	G	G		G	37	29	33	G	41	40	40	N	38	31	33	G	G	G	11	G	G	G	
7	G	G	G	G	G	G	41	33	34	35	37	44	54	40	34	36	32	G	G	G	G	G	G	G	
8	G	G	G	G	41	G	26	32	40	41	41	45	35	39	38	G	33	28	G	G	G	G	G	G	
9	G	G	G	G	G	G	29	30	39	31	33	39	37	G	G	G	34	32	G	G	G	G	G	G	
10	G	G	G	G	G	G	36	29	34	37	38	G	G		34	45	30	28	33	G	23	32	31	24	
11	G	G	G	G	G	G	33	40	40	38	G	G	G	G	47	46	40	31	G	G	G	G	G	28	
12	G	G	G	G	G	G	41	38	41	37	40	41	G	G	G	G	40	G	G	G	29	24	G	G	
13	G	G	G	G		G	34	42	43	47	50	54	G		40	37	32	G	G	G	23	23	G	G	
14	G	G	G	G		G	34		G	G	40	33	G		39	G	G	28	G	G	G	G	G	G	
15	G	G	G	G	G	G	29	44	37	36	G	G	50	G	G	G	29	30	29	G	G	32	24	G	
16	G	G	G	G	G	G	33	31	42	37	48	40	49	84	40	34	54	34	45	29	G	40	39	31	
17	124	G	G		33	55	34	G	59	54	52	41	38	40	61	42	45	33	56	31	G	29	G	G	
18	G	G	G	G	G	G	G		39	39	37	41	41	40	33	37	30	37	28	25	25	28	72	G	G
19	G	28	G	G	G	G	G	33	G	G	39	G	G		53	40	G	G	42	G	G	32	31	24	G
20	G	G	G	G	G	G	33	29	36		44	40	57	G		37	38	41	44	G	G	29	33	57	G
21	39	32	G	G	G	G	27	32	42	46	54	34	44	G		37	G	28	29	G	G	G	G	G	G
22	G	G	G	G	G	G	24	27		31	G	G	G		41	G	G	G	39	40	35	G	29	G	G
23	G	G	G	G	G	158	33	40	125	52	54	G	37	G	G	G	42	40	39	32	53	43	31	39	
24	G	G	G	G	26	G	38	54	57	56	41	40	56	G		41	51	51	57	43	33	29	G	G	G
25	G	G	G	G	G	24	33	41	45	36	G	G	G	G	G	G	G	G	G	G	35	G	G	G	G
26	33	25	G	G	G	32	40	55	89		55	49	40	58	39	50	54	56	60	55	65	59	67	72	
27	39	40	31	28		G	53	61	127	G	78	84	77	53	40	35	47		40	29	40	34	144	39	
28	38	55	33	31	G	G	35	57	61	81	150	87	53	95	40	31	G	G	31	G	38	32	43	52	G
29	G	G	G	G	G	G	24	42	50	61	53	54	47	64	110	106	G		61	33	G	32	27	G	
30	G	28	G	G	G	27	42	53	57	54	73	40	48	65	59	G	G		32	33	37	33	35	24	24
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	26	29	30	29	30	29	30	30	30	29	30	30	28	27	30	30	30	30	30	29	
MED	G	G	G	G	G	G	33	35	40	37	40	40	40	39	38	31	34	31	G	12	6	26	G	G	
U Q	G	G	G	G	G	G	36	42	50	46	52	45	49	51	40	38	42	39	40	33	32	33	24	G	
L Q	G	G	G	G	G	G	28	30	34	31	36	G	G	G	34	G	14	G	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Kokubunji

APR. 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	15	13	13	14	14	14	16	17	15	17	17	21	17	23	40	17	15	14	15	15	16	14	14	
2	15	17	22	14	14	13	14	17	15	17	17	41	17	22	17	16	15	15	15	14	16	15	15	16
3	14	14	14	14	15	14	14	17	17	16	20	44	42	17	16	15	14	15	16	15	15	15	15	18
4	14	14	14	14	14	14	18	15	17	17	17	20	18	20	18	18	15	15	15	15	15	16	15	14
5	13	15	15	14	15	15	16	16	15	16	17	18	20	19	15	16	15	15	17	14	14	14	14	14
6	18	14	14	14		17	18	15	15	17	26	26	17	18	17	23	15	15	15	14	14	14	15	14
7	14	14	14	14	14	15	18	17	17	15	15	13	19	20	15	19	15	15	17	14	15	14	30	15
8	15	14	17	14	13	14	22	17	16	15	15	18	17	15	17	16	17	15	15	13	13	14	26	15
9	14	13	13	14	17	17	15	16	15	15	17	44	17	16	16	15	15	15	17	14	17	15	14	17
10	15	17	14	14	15	18	17	16	16	15	15	45	16	16	19	16	16	15	17	15	15	15	15	14
11	18	14	14	14	14	15	15	17	15	17	17	17	46	16	15	15	17	15	15	15	20	14	13	15
12	14	14	14	14	15	17	18	15	16	17	16	43	24	16	16	16	15	15	15	14	16	16	15	17
13	14	14	14	14		14	18	15	17	31	18	19	46	19	18	16	15	15	18	14	15	15	14	14
14	17	15	14	14		15	17	15	16	17	16	46	45	44	17	31	15	15	18	14	14	14	14	14
15	14	14	14	41	14	14	15	15	15	17	43	15	18	47	17	15	15	17	15	17	17	15	16	14
16	14	18	14	15	14	14	14	15	17	17	21	22	20	26	24	16	15	16	15	16	15	15	14	15
17	6	16	15	15	15	17	20	14	15	21	19	19	47	23	18	16	14	15	15	15	16	15	14	17
18	14	14	15	20	17	14	15	14	15	17	16	34	21	28	17	15	15	16	15	15	15	15	15	17
19	15	16	14	18	20	20	15	16	15	14	17	45	16	18	14	15	15	15	17	15	15	15	16	15
20	15	15	17	15	14	18	15	17	15	53	33	30	17	18	17	17	16	15	16	15	15	16	14	15
21	15	15	14	15	20	15	15	17	17	17	20	16	19	16	16	15	15	15	15	21	15	15	15	14
22	14	17	14	17	17	14	17	15	17	17	46	16	45	46	42	40	16	15	14	15	15	16	15	14
23	15	17	14	14	14	33	26	16	10	21	26	48	31	45	45	43	28	15	14	16	14	15	15	16
24	14	14	15	14	15	17	17	17	23	24	33	47	23	50	17	33	16	16	15	16	15	16	14	14
25	17	15	17	18	17	17	15	15	14	17	46	45	47	47	46	44	15	14	21	16	17	15	14	17
26	16	15	17	15	14	16	15	15	19	17	23	19	21	19	44	18	21	14	15	14	16	15	15	15
27	15	14	16	16	16	15	15	17	15	45	19	27	25	25	31	28	19	19	15	16	15	15	11	15
28	15	15	15	15	14	18	18	16	15	20	23	17	25	23	17	16	16	15	16	14	15	15	15	15
29	14	13	18	14	14	15	15	17	20	18	34	20	23	17	17	14	18	16	15	15	15	16	16	16
30	15	15	16	15	17	14	18	15	15	31	17	33	21	21	20	16	16	15	15	15	16	14	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29
MED	15	14	14	14	15	15	16	16	15	17	18	24	21	20	17	16	15	15	15	15	15	15	15	15
U Q	15	15	16	15	17	17	18	17	17	20	26	44	31	26	20	19	16	15	17	15	16	15	15	16
L Q	14	14	14	14	14	14	15	15	15	17	17	18	17	17	16	15	15	15	15	14	15	14	14	14

HOURLY VALUES OF foF2 AT Yamagawa

APR. 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	43	44	44	40	35	32	37	49	60	65	67	77	87	89	75	73	70	75	81	73	59	39	34	33
2	33	^B 35	33	34	34	^B 24	32	48	60	61	72	68	77	82	81	70	55	62	67	62	53	^A 33	^A 35	34
3	34	35	33	35	33	32	33	48	53	55	58	63	70	81	85	83	68	69	75	69	^A	^A	^A	38
4	38	36	35	35	35	32	38	46	57	57	58	63	65	77	89	93	89	81	66	63	71	^N 62	^A	^A
5	30	32	32	33	31	^B 24	33	50	59	69	61	61	63	76	78	75	65	60	64	67	75	64	42	37
6	34	34	36	40	27	^B 24	33	48	64	65	63	63	69	79	84	81	63	60	61	73	69	39	33	^B 34
7	33	33	32	34	32	^B	32	47	52	61	65	69	73	79	78	69	69	62	66	65	63	59	41	41
8	41	41	36	45	^A	^B	33	48	67	67	67	76	89	91	79	77	63	60	64	61	57	47	41	42
9	39	36	37	41	33	^B 23	33	51	57	62	58	50	60	71	73	77	74	71	57	53	55	42	35	36
10	36	36	34	36	31	^B	34	47	59	65	71	71	67	61	67	69	66	59	57	53	49	47	47	47
11	43	42	45	43	33	^B	33	47	53	55	68	93	97	97	83	65	64	64	72	65	60	43	37	37
12	38	36	35	39	37	^B	37	49	52	58	61	59	57	67	71	87	82	69	74	75	60	40	40	39
13	36	35	36	39	^B 25	^B 26	37	48	51	55	^A	67	87	85	82	81	67	69	63	49	48	46	43	44
14	41	39	40	41	^N 25	^B 24	38	50	55	56	61	71	76	69	75	58	63	66	64	60	62	^A 55	^A 46	49
15	44	41	41	39	35	34	44	63	56	59	59	74	81	91	93	93	84	88	87	91	95	^A	^A	^A
16	^A	31	30	^B 31	31	^B 23	40	52	63	58	67	80	81	79	70	67	71	73	75	69	70	60	40	39
17	37	40	40	35	^A	^B 24	40	79	52	^A	^A	83	108	94	88	76	78	85	^A	63	60	^A	^A	39
18	^A	39	39	^A	31	34	45	58	53	57	51	64	88	78	67	56	52	61	70	83	61	54	43	40
19	37	37	^A	33	33	33	42	62	60	56	64	76	80	71	76	71	71	79	69	71	^A	59	49	41
20	37	39	37	36	33	31	41	65	66	65	67	87	80	95	85	65	69	85	70	60	59	53	48	^A
21	48	49	43	39	33	^B 32	48	51	67	64	70	71	73	89	91	78	65	60	56	61	62	60	53	46
22	52	45	44	42	33	31	40	52	66	74	77	71	59	71	73	82	81	70	59	65	61	^A	49	43
23	40	44	41	36	^B 28	31	41	51	58	60	66	76	73	82	90	89	88	90	87	88	61	45	37	^A
24	36	35	35	33	34	31	41	53	77	59	56	58	66	84	88	87	92	92	95	89	59	45	46	45
25	45	43	43	40	^B 27	27	41	52	55	59	71	60	63	81	90	77	92	99	97	63	55	^A	57	52
26	52	50	50	37	34	32	52	60	53	63	^A	65	63	72	82	79	77	87	99	98	75	36	37	38
27	40	^A	^A	^A	^A	27	43	62	65	^A	^A	^A	^A	^A	99	97	99	89	80	83	73	62	51	45
28	42	41	39	39	35	33	45	54	^A	51	59	58	57	61	74	90	99	83	63	57	57	^A	^A	^A
29	38	^A	39	35	33	31	43	54	49	51	57	57	61	68	77	90	100	102	95	68	55	53	49	49
30	47	45	41	39	36	35	50	51	54	50	^A	^A	72	83	^N 95	94	94	89	76	76	^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	28	28	28	28	27	25	30	30	29	28	25	28	29	29	30	30	30	30	29	30	27	23	24	24
MED	38	39	38	38	33	31	40	51	57	59	64	68	73	79	82	78	71	72	70	66	60	47	42	40
U Q	43	42	41	40	34	32	43	54	63	64	67	76	81	87	88	87	88	87	80	75	69	59	48	45
L Q	36	35	35	35	31	24	33	48	53	56	58	62	63	71	75	70	65	62	63	61	57	42	37	37

HOURLY VALUES OF fEs AT Yamagawa

APR. 2021

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	G	G	G	G	G	28	31	34	166	40	40	40	45	36	34	G	G	G	35	G	G	G	
2	G	B	G	G	G	B	G	32	38	46	45	47	44	46	43	37	30	32	G	G	11	G	G	G	
3	G	G	G	G	G	G	G	35	40	43	46	40	39	55	49	46	48	32	28	58	70	91	45	35	
4	28	36	G	G	G	G	G	40	39	42	46	44	39	44	44	46	41	38	31	28	G	29	41	54	
5	G	G	G	G	G	B	G	33	40	42	43	43	42	43	44	36	37	32	G	G	G	48	G	G	
6	G	G	G	G	G	B	G	32	33	36	42	50	50	40	36	46	36	31	29	G	11	G	G	B	
7	G	G	G	G	G	B	G	40	42	39	45	45	39	63	40	46	44	36	36	G	G	11	G	G	
8	G	G	G	G	36	B	G	33	38	41	40	47	49	47	46	44	44	32	32	G	24	G	G	G	
9	G	G	G	G	33	B	G	31	37	42	46	54	41	46	39	42	36	34	G	G	G	G	G	G	
10	G	G	G	G	31	B	G	34	40	38	38	42	35	49	40	58	38	54	40	31	G	G	G	G	
11	G	G	G	33	33	B	G	39	43	44	45	50	50	48	45	45	42	47	40	32	G	G	G	G	
12	G	G	G	G	39	B	G	44	43	43	45	48	40	34	51	46	38	36	58	31	11	G	G	G	
13	G	G	G	G	B	B	G	36	44	50	56	46	46	50	38	44	33	G	G	G	43	33	28	G	
14	G	G	G	11	G	B		35	41	48	55	52	47	49	52	38	35	36	32	31	38	G	G	G	
15	37	30	G	G	G	G	G	34	155	46	51	40	46	49	43	41	40	36	38	76	G	54	49	54	
16	58	G	G	B	G	B	G	35	40	46	51	60	46	43	41	52	64	45	34	28	G	G	29	G	
17	G	37	54	G	31	B	29	37	52	52	66	54	62	45	42	52	61	70	102	40	44	39	55	35	
18	59	G	28	66	G	G	G	43	44	42	44	46	44	57	44	41	48	41	35	36	56	G	28	G	
19	G	G	55	G	G	G	G	G	37	39	40	40	46	49	59	50	G	49	36	48	84	G	G	39	
20	G	G	32	G	G	G	29	36	37	50	33	40	40	41	36	40	38	37	G	35	27	35	G	60	
21	58	40	34	G	G	B	29	34	56	40	47	44	43	44	38	36	35	34	30	G	23	G	G	G	
22	G	G	G	G	G	G	G	36	40	44	41	44	44	43	44	45	41	39	G	38	40	33	G	G	
23	36	G	G	G	B	G	28	36	42	48	62	54	49	58	54	39	N	44	54	60	40	G	G	41	
24	G	G	34	G	G	G	32	39	40	42	46	49	49	49	66	54	49	54	78	76	49	G	G	G	
25	G	G	G	G	B	G	29	38	44	50	58	46	56	57	55	49	40	34	23	40	43	57	41	46	
26	G	G	G	G	G	G	29	39	50	67	85	58	47	45	48	48	69	78	73	50	33	40	G	29	
27	41	70	113	79	50	G	38	41	60	65	98	136	106	96	60	56	40	39	30	G	G	44	G	28	
28	29	32	36	31	34	G	35	41	60	48	57	46	51	45	49	43	41	G	G	30	29	55	56	46	
29	G	39	31	G	G	G	39	41	44	47	50	49	41	40	50	61	56	54	38	G	G	32	G	G	
30	39	29	G	G	G	G	32	46	50	47	60	90	60	56	40	35	40	34	G	G	70	57	57	45	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	30	29	27	16	29	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	29	
MED	G	G	G	G	G	G	G	36	42	44	46	46	46	46	44	45	40	36	32	30	26	6	G	G	
U Q	29	29	31	G	31	G	29	40	44	48	57	52	49	50	50	49	46	45	38	40	43	40	29	40	
L Q	G	G	G	G	G	G	G	34	39	42	44	44	41	43	40	40	36	32	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Yamagawa

APR. 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	14	27	24	16	15	15	24	15	16	14	15	21	20	20	19	17	17	15	14	14	15	24	15	221
2	27	B	16	23	15	B	23	15	17	15	17	20	17	17	21	19	28	15	22	15	14	15	15	15
3	15	15	14	14	15	18	14	16	14	15	17	21	21	21	19	20	18	16	15	15	14	14	17	15
4	15	16	16	15	16	16	15	15	16	16	22	20	21	19	22	20	20	15	15	15	16	15	15	15
5	15	14	17	17	15	B	16	15	14	15	19	20	22	20	18	17	16	15	22	16	26	15	15	22
6	14	14	14	14	22	B	15	16	15	15	21	21	21	19	19	21	18	16	16	15	15	23	15	B
7	24	15	15	15	15	B	15	17	17	17	17	19	20	21	23	19	17	16	15	14	15	14	14	14
8	14	15	14	15	14	B	23	16	16	19	21	21	22	20	20	17	16	14	15	15	15	17	15	22
9	22	26	15	15	15	B	15	15	17	17	20	21	23	19	20	19	15	17	14	16	15	15	17	15
10	15	16	15	16	17	B	18	15	17	16	20	20	17	21	21	17	18	17	17	16	16	15	15	15
11	15	23	15	14	14	B	18	15	16	17	20	20	17	17	19	19	16	19	14	15	16	15	15	14
12	15	15	15	15	15	B	18	16	15	19	19	22	17	27	21	21	17	15	19	15	16	15	15	15
13	15	15	14	15	B	B	20	14	15	17	19	20	21	19	19	21	17	15	14	15	15	16	15	15
14	15	17	15	15	20	B		15	15	15	19	20	22	21	20	17	28	15	15	16	14	17	15	15
15	15	16	16	15	16	15	18	16	16	21	19	20	21	23	21	19	17	16	15	14	15	15	15	15
16	16	71	15	B	15	B	16	15	15	19	17	21	22	21	20	19	16	15	15	15	17	16	16	15
17	16	15	14	16	15	B	14	15	18	20	21	20	21	22	23	19	21	15	12	15	15	15	15	15
18	14	15	15	15	15	26	17	16	14	19	19	21	22	20	19	20	21	17	16	16	16	16	16	16
19	15	22	15	15	15	15	15	15	18	19	21	19	23	23	17	20	30	16	15	14	13	15	16	15
20	15	15	16	15	15	23	15	16	16	21	21	21	21	19	22	20	15	16	15	15	15	15	16	15
21	15	15	15	15	14	B	15	16	17	19	20	22	24	19	19	15	15	14	15	16	15	15	23	24
22	27	15	23	15	15	15	15	16	15	20	19	22	22	23	21	26	17	16	15	15	15	16	15	16
23	15	15	15	15	B	24	15	15	18	19	21	21	26	18	21	21	18	17	16	14	15	17	15	15
24	15	15	16	16	15	15	16	17	17	19	21	22	23	20	24	21	15	13	15	17	16	15	15	15
25	15	15	16	15	B	15	14	17	18	19	20	21	20	18	19	18	17	17	26	15	14	15	15	15
26	17	15	15	15	26	15	15	14	15	19	19	20	21	24	20	20	16	18	15	15	14	15	15	16
27	15	15	17	12	15	15	14	15	14	18	20	19	22	21	22	19	19	17	15	16	15	15	16	15
28	16	15	15	15	16	17	15	17	18	21	20	21	20	23	23	18	17	15	14	15	16	15	14	15
29	15	16	15	15	15	15	14	15	16	20	20	22	24	20	21	21	15	15	14	16	15	15	16	15
30	15	16	15	15	14	15	16	17	17	16	20	23	22	21	18	21	16	15	13	15	15	16	19	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	29	30	29	27	18	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29
MED	15	15	15	15	15	15	15	15	16	19	20	21	21	20	20	19	17	16	15	15	15	15	15	15
U Q	16	16	16	15	16	17	18	16	17	19	21	21	22	21	21	21	18	17	16	16	16	16	16	15
L Q	15	15	15	15	15	15	15	15	15	16	19	20	20	19	19	18	16	15	14	15	15	15	15	15

HOURLY VALUES OF fof2 AT Okinawa

APR. 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	45	44	44	42	38	B 31	B 28	50	57	66	77	88	97	101	103	101	85	82	90	91	76	50	31	31
2	B 32	31	31	36	31	B 23	N 23	55	56	68	70	79	85	97	89	81	67	71	73	71	A	37	30	27
3	31	30	31	33	23	B 23	29	50	53	58	60	68	77	86	90	98	90	88	103	91	A	A	33	A
4	A	A	31	33	31	A	A	53	57	62	64	59	67	87	103	110	109	105	97	89	103	67	A	30
5	31	30	31	33	34	24	29	53	69	69	64	66	79	92	99	103	91	78	85	91	92	78	30	33
6	33	33	36	41	31	B 24	N 24	49	60	68	68	70	74	93	106	93	82	78	82	82	59	41	33	35
7	35	33	34	37	27	B	26	48	52	66	71	75	83	101	99	82	79	85	79	84	72	50	39	37
8	36	37	33	37	N 23	B	N 25	45	73	72	72	83	97	92	95	98	78	65	72	66	65	51	40	40
9	39	37	39	41	26	B 23	31	53	58	63	61	53	57	82	95	100	87	76	67	61	50	41	32	33
10	33	31	33	38	N 22	B	29	45	59	71	80	88	74	79	91	101	85	71	64	65	58	53	B 48	48
11	44	39	41	55	B	B	30	44	54	61	76	97	94	106	95	81	70	78	88	80	65	39	34	35
12	33	33	34	45	A	B	31	46	55	58	65	75	77	80	92	96	80	74	87	91	78	51	36	37
13	36	A	33	33	A	N 23	34	50	52	55	60	75	93	101	90	98	85	96	78	59	51	51	43	51
14	41	40	41	44	N 23	B 23	33	51	60	57	65	76	84	89	87	78	77	73	82	79	68	60	A	44
15	43	40	39	33	32	33	40	57	59	68	64	73	93	110	120	125	129	130	142	151	125	43	39	34
16	33	36	43	46	50	38	36	53	70	64	74	89	79	85	91	89	85	93	103	83	79	61	34	34
17	34	34	39	25	A	A	33	71	53	49	A	A	118	113	93	96	90	104	105	65	A	A	A	39
18	A	A	A	A	A	34	45	54	63	71	65	76	95	93	93	99	87	86	96	95	64	A	A	A
19	41	43	50	39	A	38	43	63	72	71	63	85	97	87	94	75	87	105	82	79	76	61	50	47
20	38	38	36	34	32	N 26	35	66	86	70	70	91	101	108	109	85	77	93	95	90	73	65	53	A
21	51	49	49	47	A	N 25	35	66	67	66	63	77	91	122	114	79	72	68	71	70	64	61	53	49
22	50	49	43	45	31	29	38	54	68	81	81	63	87	A	90	99	103	104	111	109	88	42	41	43
23	43	43	43	41	34	30	35	59	62	69	A	78	84	104	115	133	136	141	145	132	109	73	A	36
24	A	A	35	33	N 24	25	42	63	68	62	54	64	75	90	103	108	117	119	113	105	60	53	50	A
25	A	A	50	53	A	B 23	36	60	59	63	72	65	66	87	110	94	101	119	114	76	57	59	59	A
26	53	51	55	39	34	33	44	65	56	62	63	71	81	81	89	93	91	107	123	115	A	A	A	A
27	A	35	A	A	A	A	37	68	65	66	71	77	92	105	112	125	134	133	126	113	97	61	50	45
28	43	44	38	A	A	30	44	63	57	55	A	66	A	83	94	110	113	106	84	75	63	A	A	A
29	46	42	A	A	31	B 23	41	58	A	59	57	58	75	87	94	104	119	125	100	78	67	57	49	50
30	46	41	40	40	36	31	43	55	54	A	A	A	75	91	108	116	122	117	104	92	67	61	51	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	27	26	20	20	29	30	29	29	26	28	29	29	30	30	30	30	30	30	26	26	23	22
MED	39	38	39	39	31	28	35	54	59	66	65	75	84	92	95	98	87	93	92	84	68	55	40	37
U Q	44	43	43	44	34	32	40	63	67	69	72	81	93	102	106	104	109	107	105	92	79	61	50	45
L Q	33	33	33	33	25	23	29	50	55	60	63	66	75	86	91	89	80	78	82	75	63	50	33	34

HOURLY VALUES OF fEs AT Okinawa

APR. 2021

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	26	23	G	G	G	B	B							N	45	50	41	29	59	G	G	11	G	G	
2	B	G	G	G	11	B	G	30	38	37	37	46	48	44	46	44	34	106	29	43	45	28	28	G	
3	G	G	G	G	G	B	G	31	39	43	41	44	48	51	52	45	41	36	32	33	34	40	25	28	
4	28	45	56	29	32	57	32	39	33	37	42	47	44	46	45	42	38	34	28	24	49	58	40	26	
5	58	G	G	G	G	G	G	31	38	41	42	45	47	48	48	60	42	52	44	G	G	61	G	G	
6	G	G	G	G	33	B	G	33	34	36	38	49	50	49	45	39	36	32	30	G		22	19	G	G
7	G	G	G	G	11	B	G	26	38	40	46	55	56	40	47	46	34	33	27	G	G	G	G	G	
8	24	G	G	G	28	B	G	34	38	41	38	39	55	49	42	45	35	G	36	25	43	40	G	G	
9	G	G	G	G	G	B	G	31	37	36	37	36	48	47	46	N	36	35	25	28	G	G	G	G	
10	G	G	G	G	G	B	G	33	40	36	37	40	45	46	48	32	48	40	33	G		G	B	G	
11	G	G	G	11	B	B	59	33	39	43	G	46	48	48	47	36	69	50	36	31	20	G	28	27	
12	G	G	G	G	21	B	84	38	38	44	49	50	55	47	38	44	57	46	38	38	29	24	G	G	
13	G	47	G	29	35	G	G	39	39	46	55	52	48	49	41	46	44	38	32	40	G	44	90	G	
14	G	G	G	G	G	B	G	35	43	48	47	51	53	51	46	45	40	34	38	24	26	48	58	25	
15	24	G	G	G	26	30	G	36	40	46	55	48	46	45	54	58	110	85	59	58	73	35	24	G	
16	28	38	38	39	37	G	G	34	33	44	40	38	54	58	40	40	45	35	70	26	27	35	34	G	
17	25	G	G	30	40	32	25	35	45	47	63	88	69	64	54	57	47	35	33	42	58	28	31	29	
18	128	93	70	59	40	24	G	25	34	45	54	48	51	51	58	46	39	62	60	48	40	71	49	40	
19	31	29	27	36	36	30	33	46	40	40	40	56	36	53	53	50	35	40	35	35	29	45	G	G	
20	39	112	G	G	G	G	28	42	40	33	42	48	48	55	74	70	58	32	36	34	35	43	28	93	
21	G	G	29	30	57	144	28	28	48	40	48	44	50	44	50	46	60	57	28	28	30	G	G	G	
22	G	G	G	G	G	G	27	35	40	45	52	52	39	95	G	32	51	72	96	91	33	28	G	G	
23	G	G	G	G	24	24	25	36	46	54	113	70	63	62	50	32	G	G	49	54	36	24	39	28	
24	27	32	26	G	24	27	G	38	59	46	59	67	67	51	53	48	36	G	38	45	39	71	41	57	
25	69	56	G	24	24	B	30	42	46	53	62	50	46	40	34	37	33	28	28	11	24	30	32	43	
26	44	34	29	G	24	G	24	39	51	54	64	62	58	56	45	46	55	59	80	85	73	93	52	108	
27	93	G	54	117	40	41	24	39	49	62	64	75	67	54	53	43	36	50	43	30	31	39	41	35	
28	39	35	26	35	40	G	25	36	56	51	64	60	70	47	51	51	61	42	37	40	G	57	60	79	
29	48	G	40	43	G	B	28	44	53	49	56	50	63	54	47	91	105	108	86	108	26	33	56	36	
30	32	29	28	G	G	G	28	41	55	66	66	73	50	56	40	33	36	33	32	G	G	29	28	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	29	30	30	30	29	17	29	30	30	30	30	30	30	29	30	29	30	30	30	30	30	30	29	30	
MED	25	G	G	G	24	24	24	35	40	44	48	50	50	49	47	45	41	37	36	32	29	34	28	13	
U Q	39	34	28	30	35	31	28	39	46	48	59	56	56	54	52	50	55	52	49	43	39	45	41	36	
L Q	G	G	G	G	G	G	G	33	38	40	40	46	48	46	45	39	36	33	32	24	20	24	G	G	

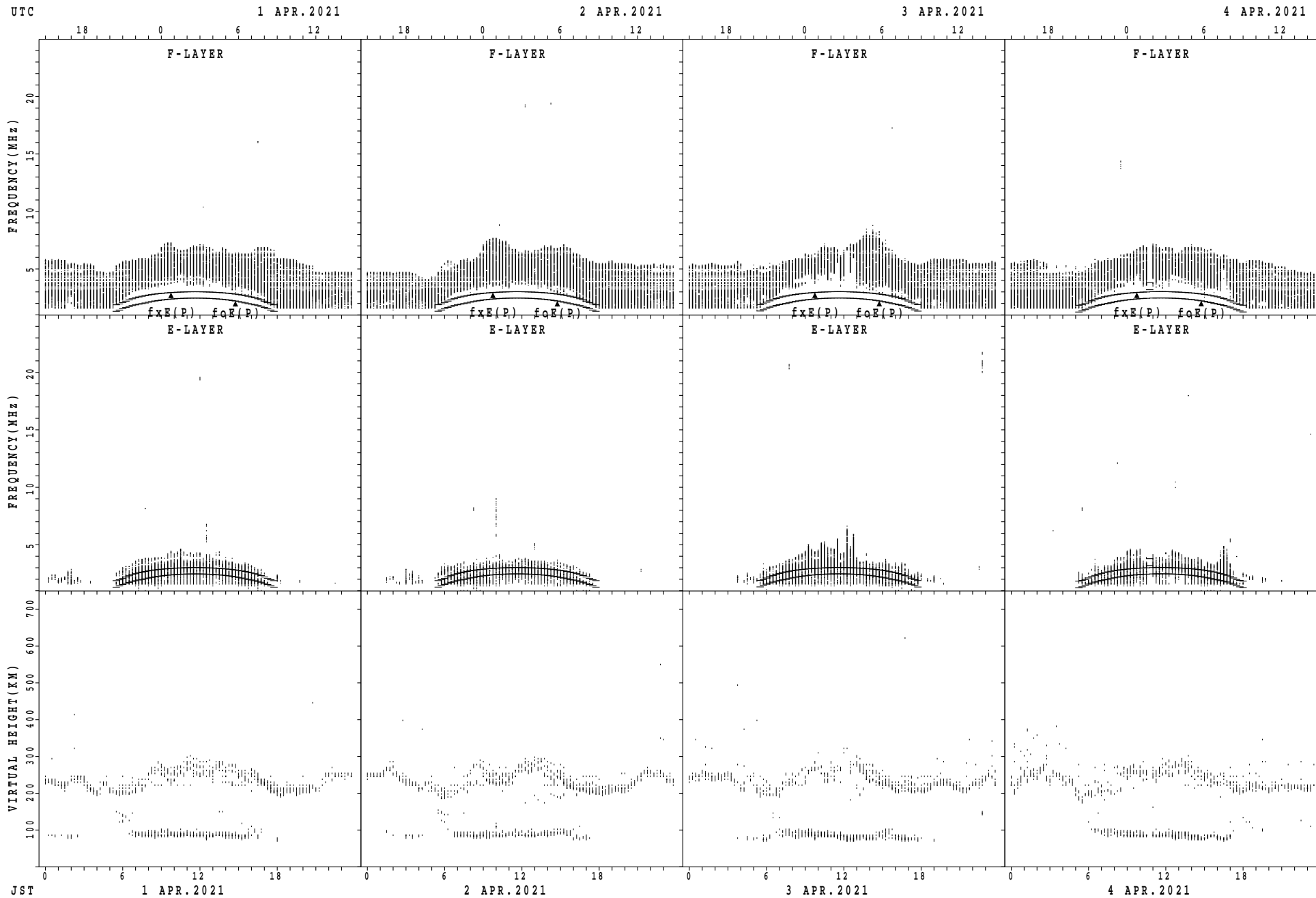
HOURLY VALUES OF fmin AT Okinawa

APR. 2021

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

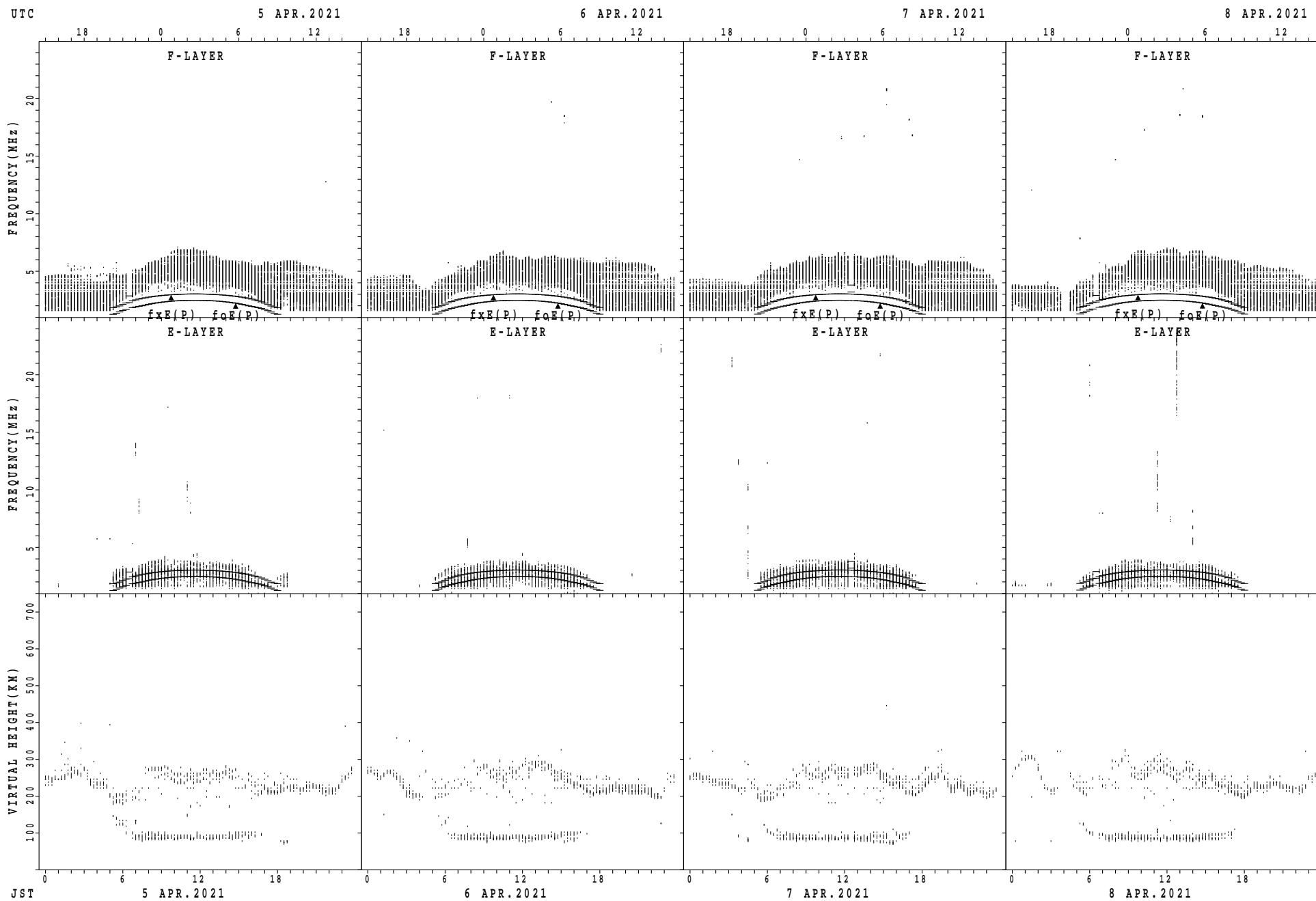
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	17	15	15	B	B	15	16	13	15	17	13	17	17	17	13	15	14	16	27	22	15	16
2	B	15	15	18	14	B	17	15	15	15	15	17	16	19	15	16	15	12	14	15	15	16	15	14
3	15	14	14	14	15	B	15	17	15	14	16	17	17	16	17	15	15	15	14	15	16	14	15	15
4	16	15	15	16	16	15	16	15	15	14	16	18	21	20	17	18	17	15	15	16	14	16	16	15
5	14	15	14	14	14	18	14	15	17	15	18	17	18	16	15	15	14	13	16	15	15	14	14	15
6	14	15	15	14	15	B	14	15	15	14	17	17	17	26	17	15	16	15	15	15	16	15	17	15
7	14	14	15	14	14	B	14	15	17	15	16	16	21	18	17	16	16	16	15	14	14	15	15	16
8	15	15	14	15	15	B	14	16	16	14	16	16	17	17	16	15	15	13	15	15	15	16	18	15
9	14	17	15	15	14	B	15	16	15	15	15	17	17	17	16	17	15	15	15	15	15	15	14	14
10	14	14	15	15	14	B	14	16	17	15	16	16	17	22	17	17	14	14	15	15	15	14	B	15
11	17	15	15	14	B	B	15	15	15	15	15	17	18	16	17	16	13	13	15	15	15	16	15	15
12	15	15	15	15	16	B	39	15	16	16	18	18	19	18	17	19	14	14	15	14	15	16	15	15
13	15	15	14	16	15	15	15	15	15	14	15	18	16	15	17	17	14	15	15	15	14	15	16	15
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15	16	15	15	15	16	16	16	16	15	15	21	17	17	17	17	15	17	13	15	15	15	16	15	15
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17	15	15	15	16	15	16	17	15	15	15	15	17	20	16	16	16	14	17	15	15	16	16	16	16
18	5	14	14	15	16	16	16	15	15	15	19	19	19	22	17	17	15	15	14	14	14	16	15	15
19	15	15	15	16	15	15	16	16	15	16	19	20	20	21	17	17	15	15	15	14	15	15	16	15
20	15	16	15	15	15	14	15	14	15	17	19	22	20	15	17	17	15	15	15	16	15	16	15	15
21	15	15	15	16	15	58	15	15	13	14	15	18	20	16	17	15	14	13	14	15	15	15	14	14
22	15	14	14	18	17	14	15	15	15	16	14	16	20	18	36	33	17	15	13	14	15	16	15	15
23	14	37	14	15	16	15	15	15	15	15	13	20	21	17	18	17	16	15	14	15	15	15	15	16
24	16	17	16	14	15	15	15	16	15	16	18	19	19	22	20	15	17	15	16	14	15	15	15	14
25	15	17	15	15	15	B	15	15	14	17	16	20	20	17	16	18	17	14	15	15	15	15	15	15
26	15	15	15	17	16	14	15	15	13	15	15	17	20	16	17	18	17	15	15	14	15	15	15	13
27	13	15	16	16	14	15	15	14	13	18	19	18	18	16	19	15	17	13	15	15	15	16	15	15
28	15	16	15	16	15	16	15	17	14	17	17	20	18	20	21	14	13	13	14	15	15	15	16	15
29	15	15	15	15	16	B	15	14	15	15	17	16	18	20	20	17	16	15	15	15	16	16	15	15
30	17	15	16	16	16	14	15	15	15	16	16	17	19	19	26	17	17	17	15	15	15	15	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	29	17	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30
MED	15	15	15	15	15	15	15	15	15	15	16	17	19	18	17	16	15	15	15	15	15	15	15	15
U Q	15	15	15	16	16	16	15	16	15	16	18	18	20	20	17	17	17	15	15	15	15	16	15	15
L Q	14	15	15	15	15	14	14	15	15	14	15	17	17	16	17	15	14	13	14	15	15	15	15	15

SUMMARY PLOTS AT Wakkanai



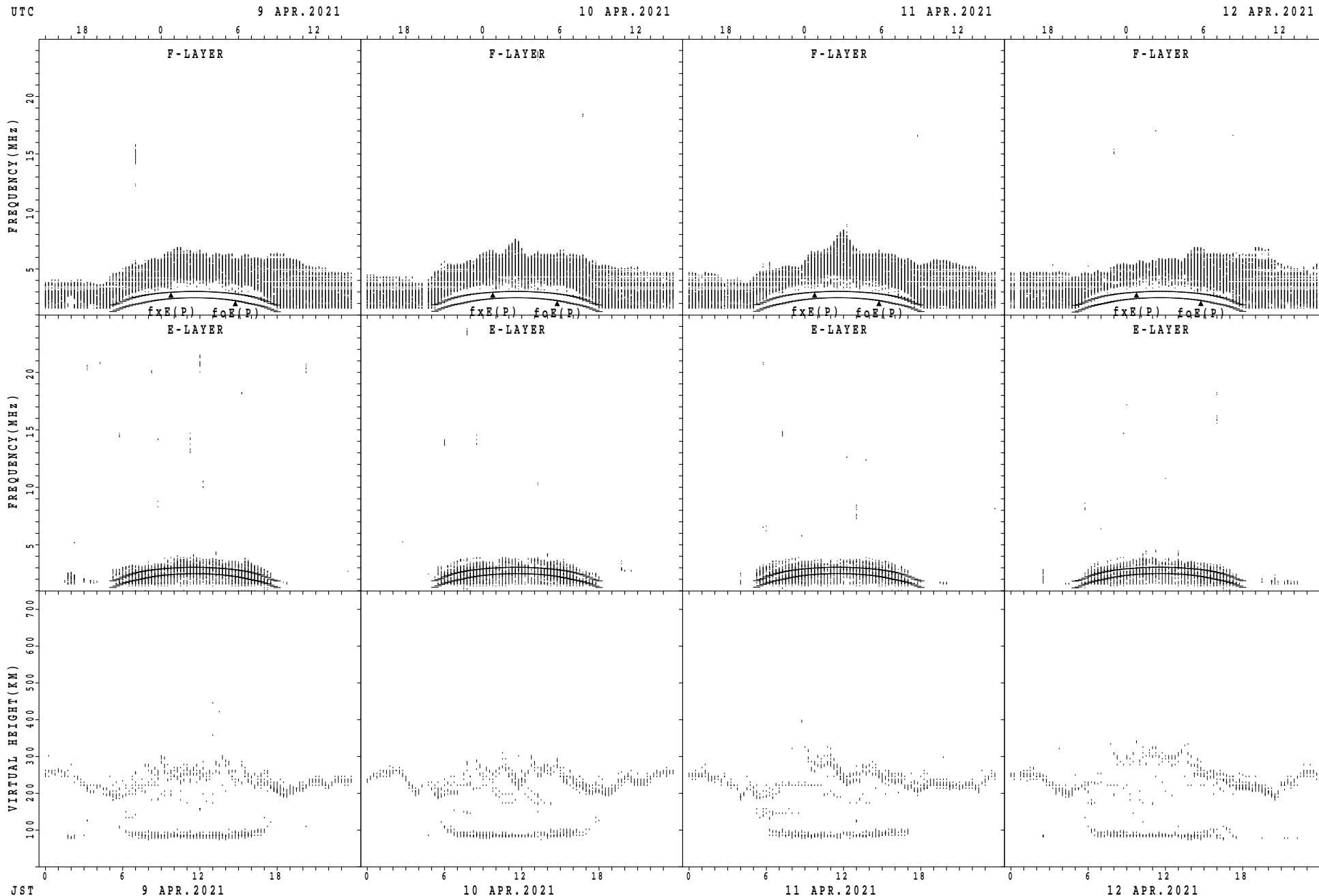
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



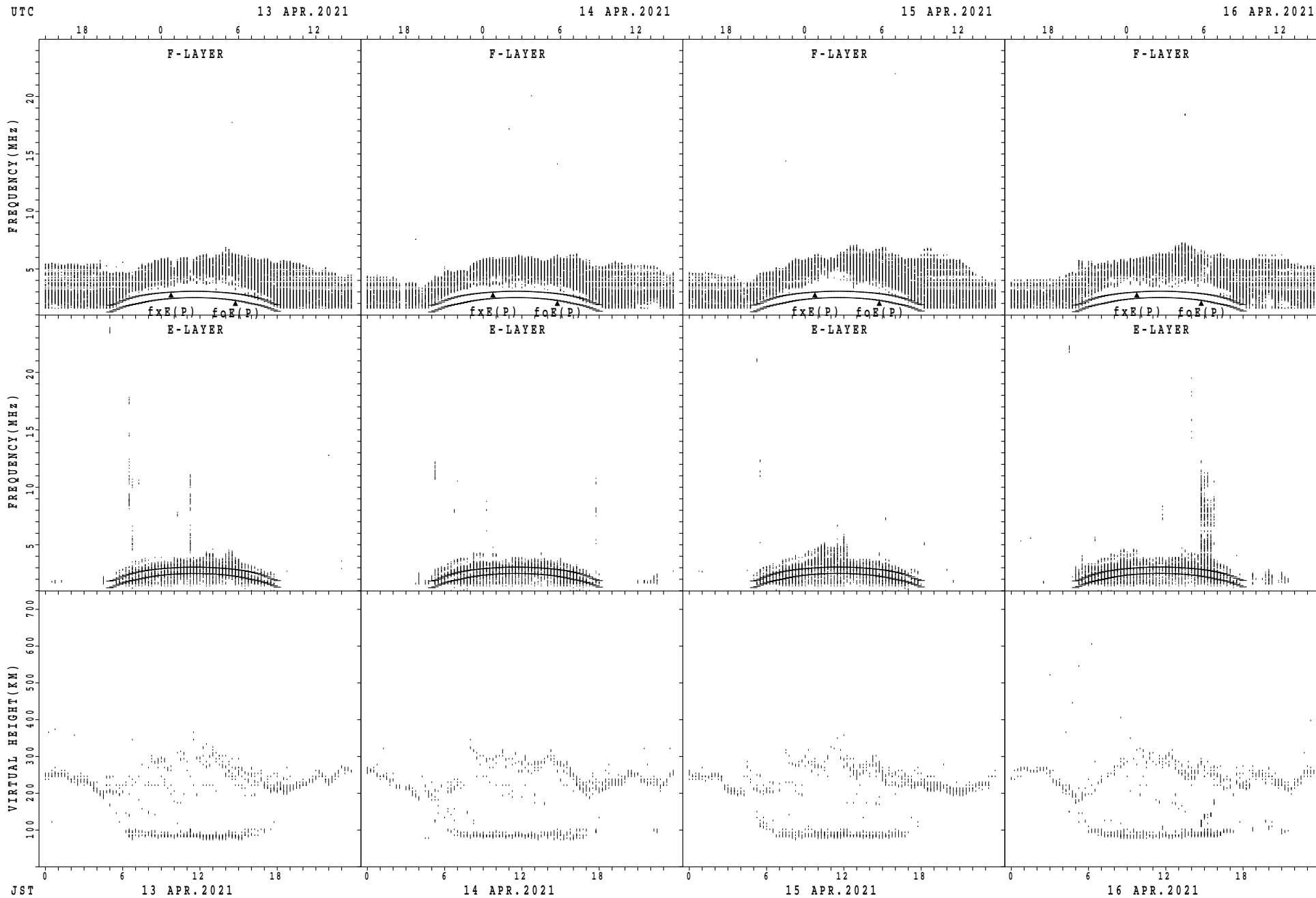
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



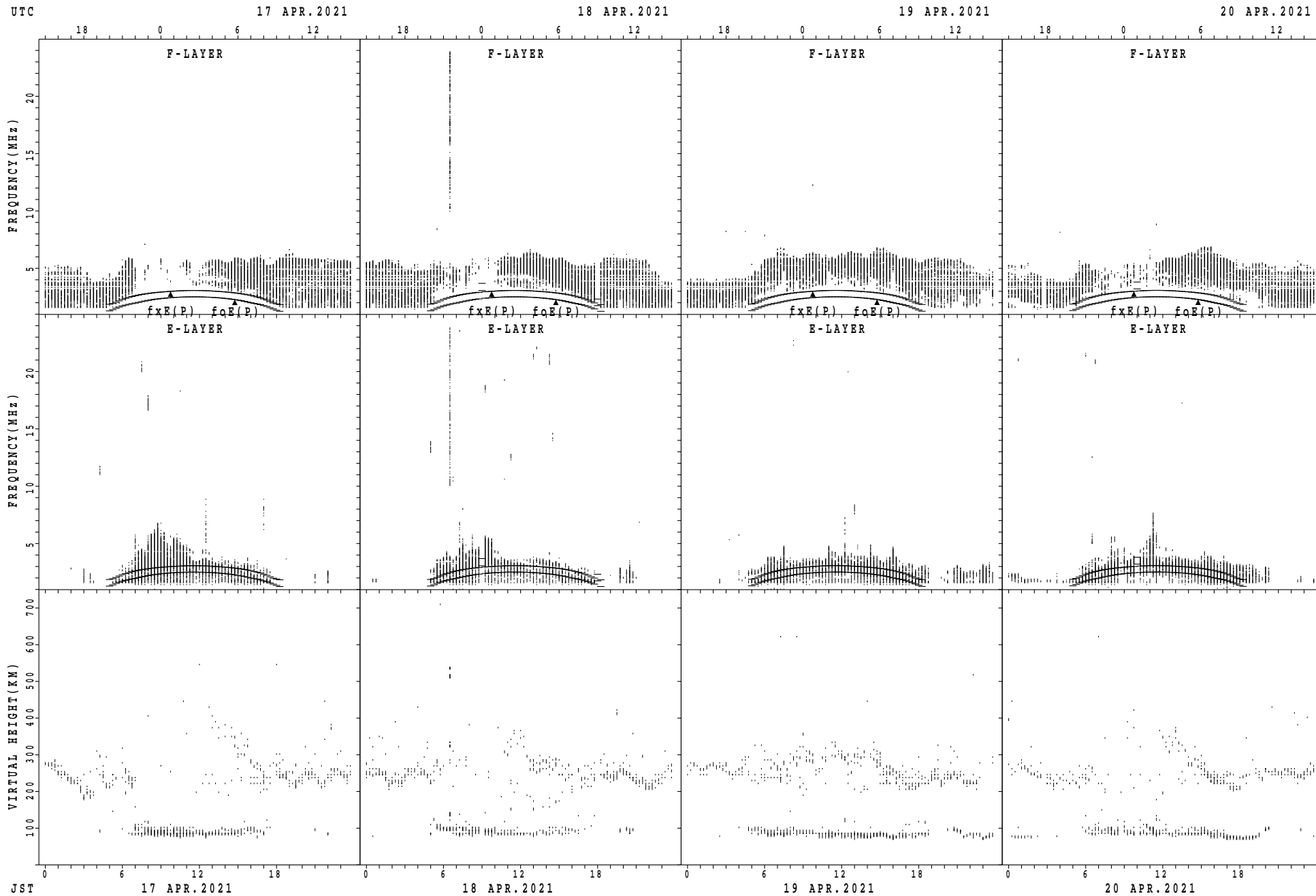
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



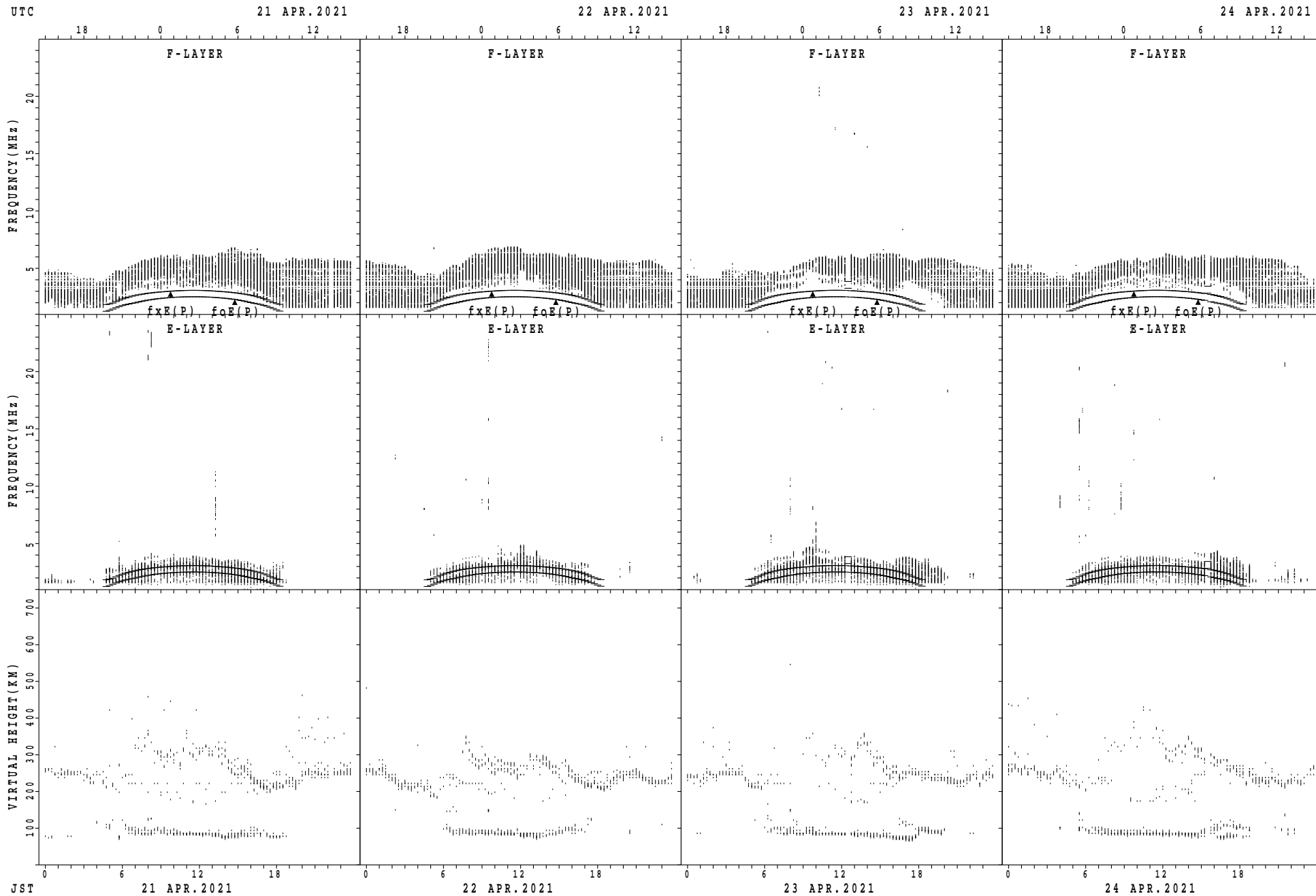
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



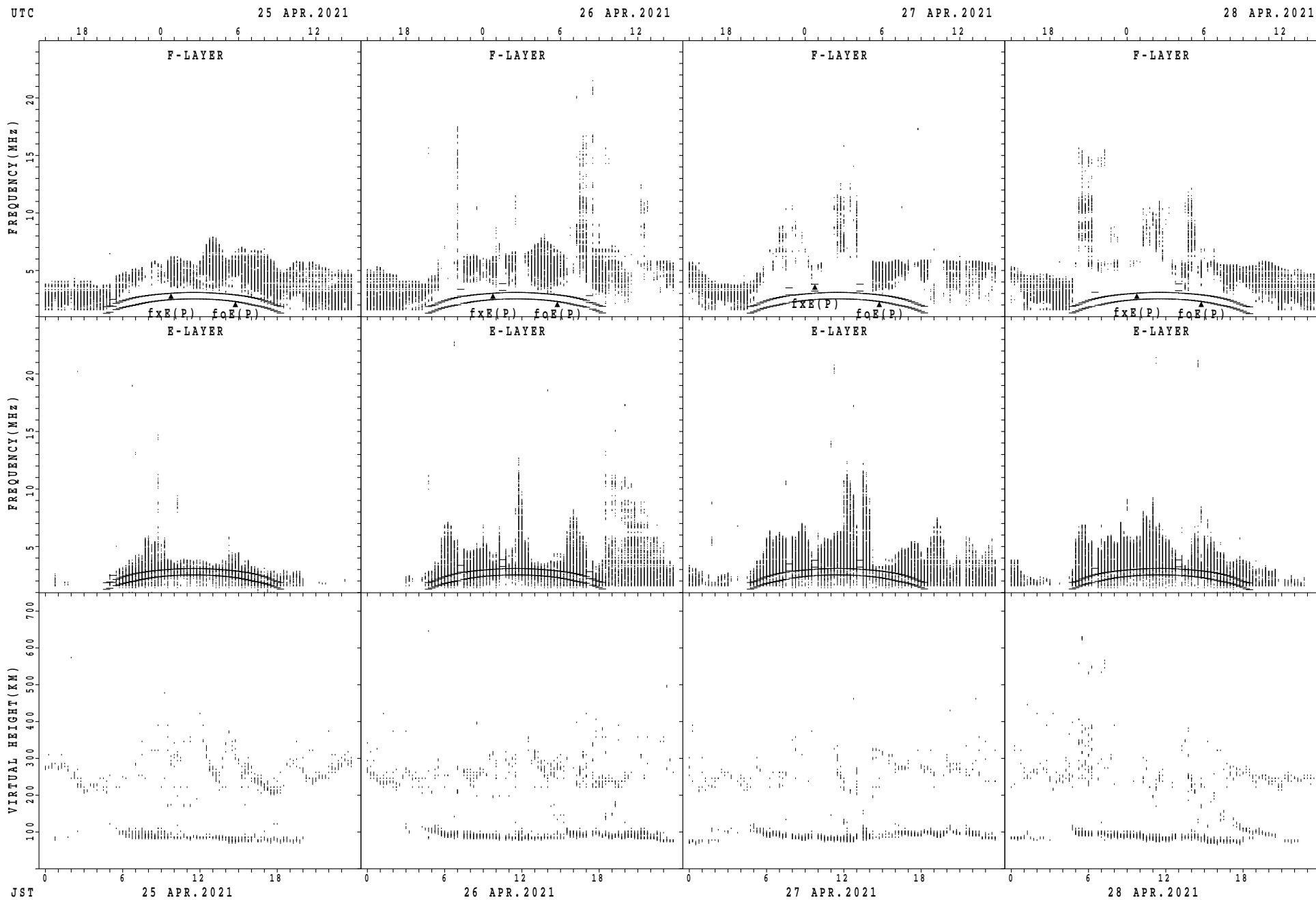
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



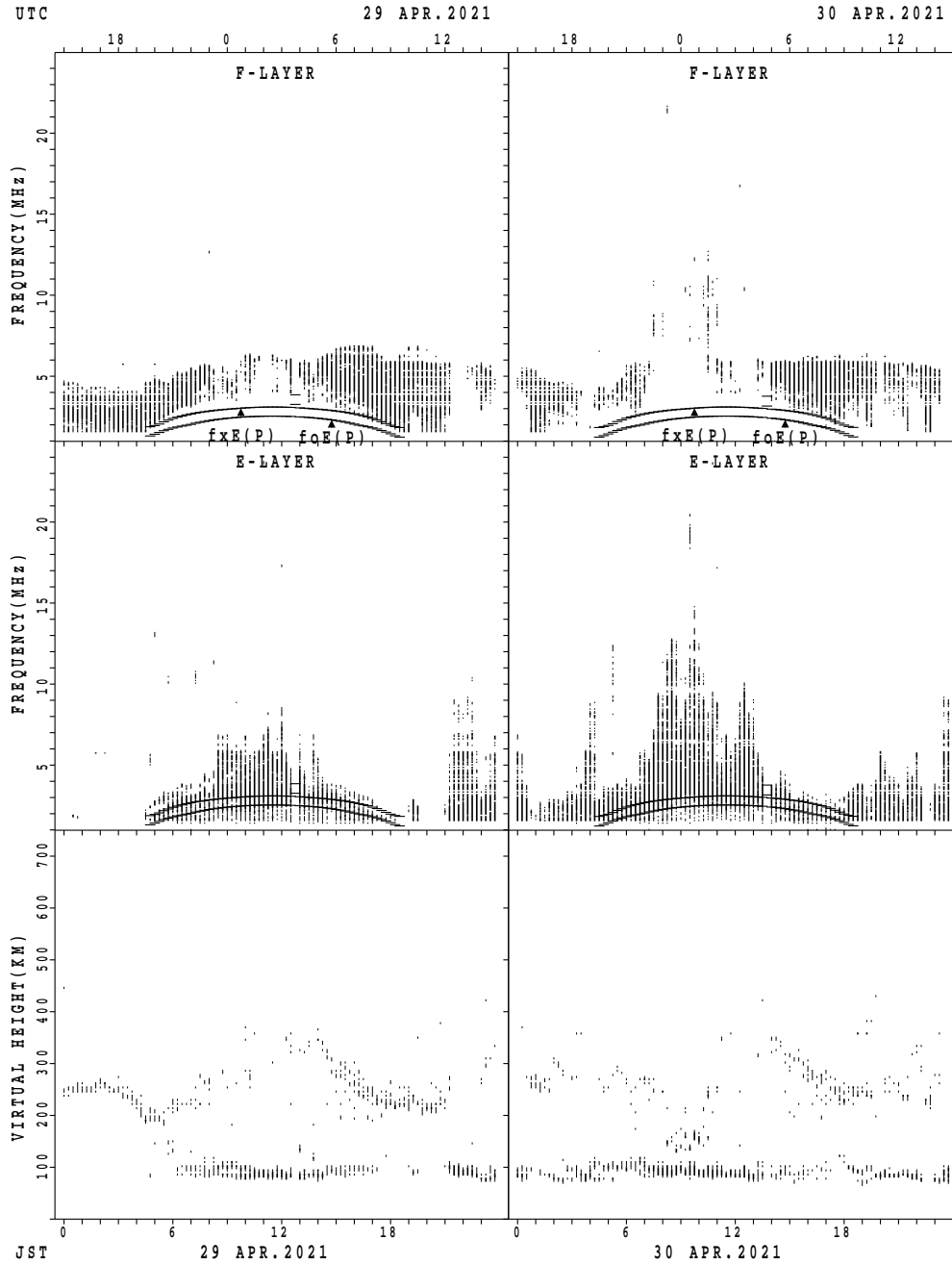
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



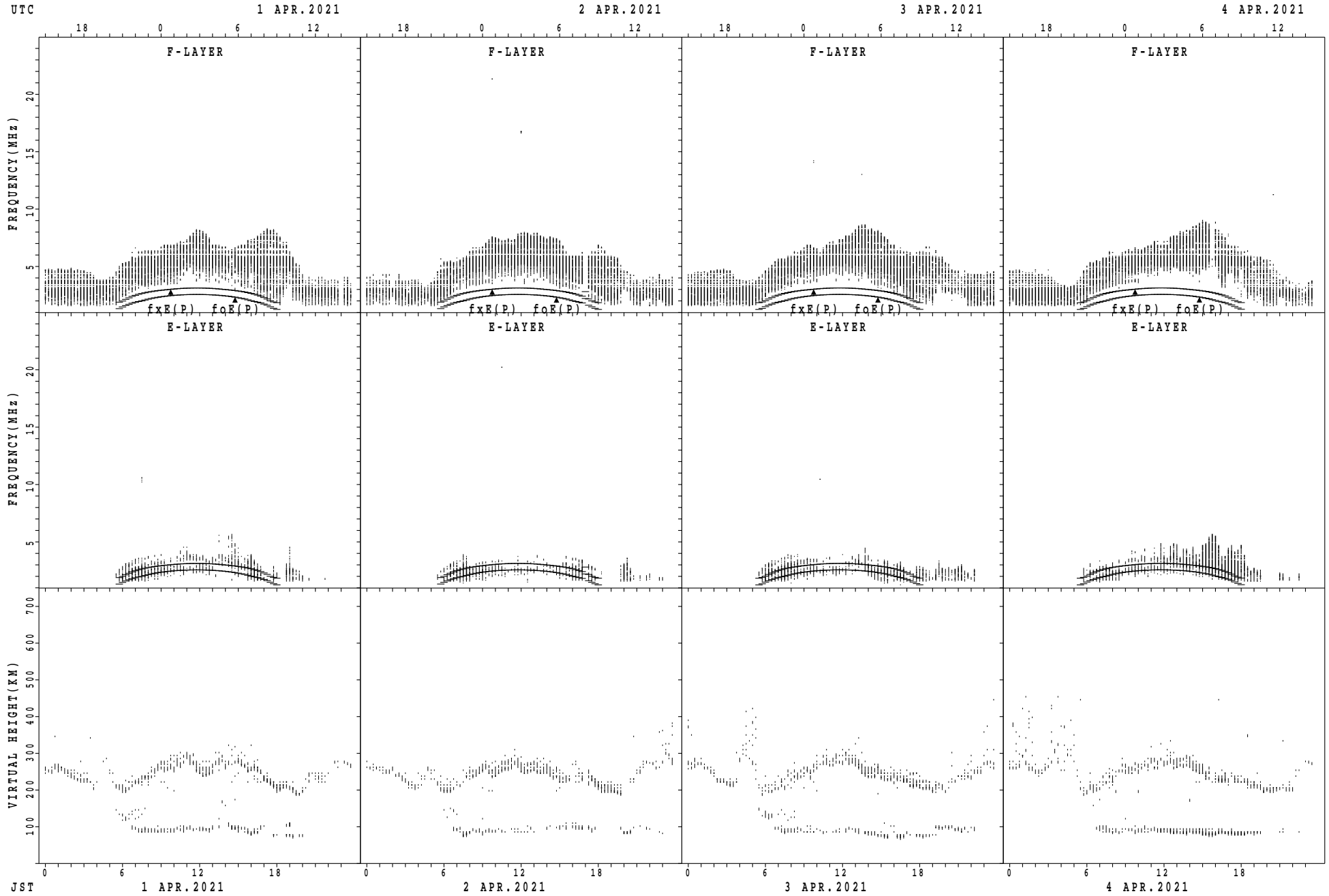
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



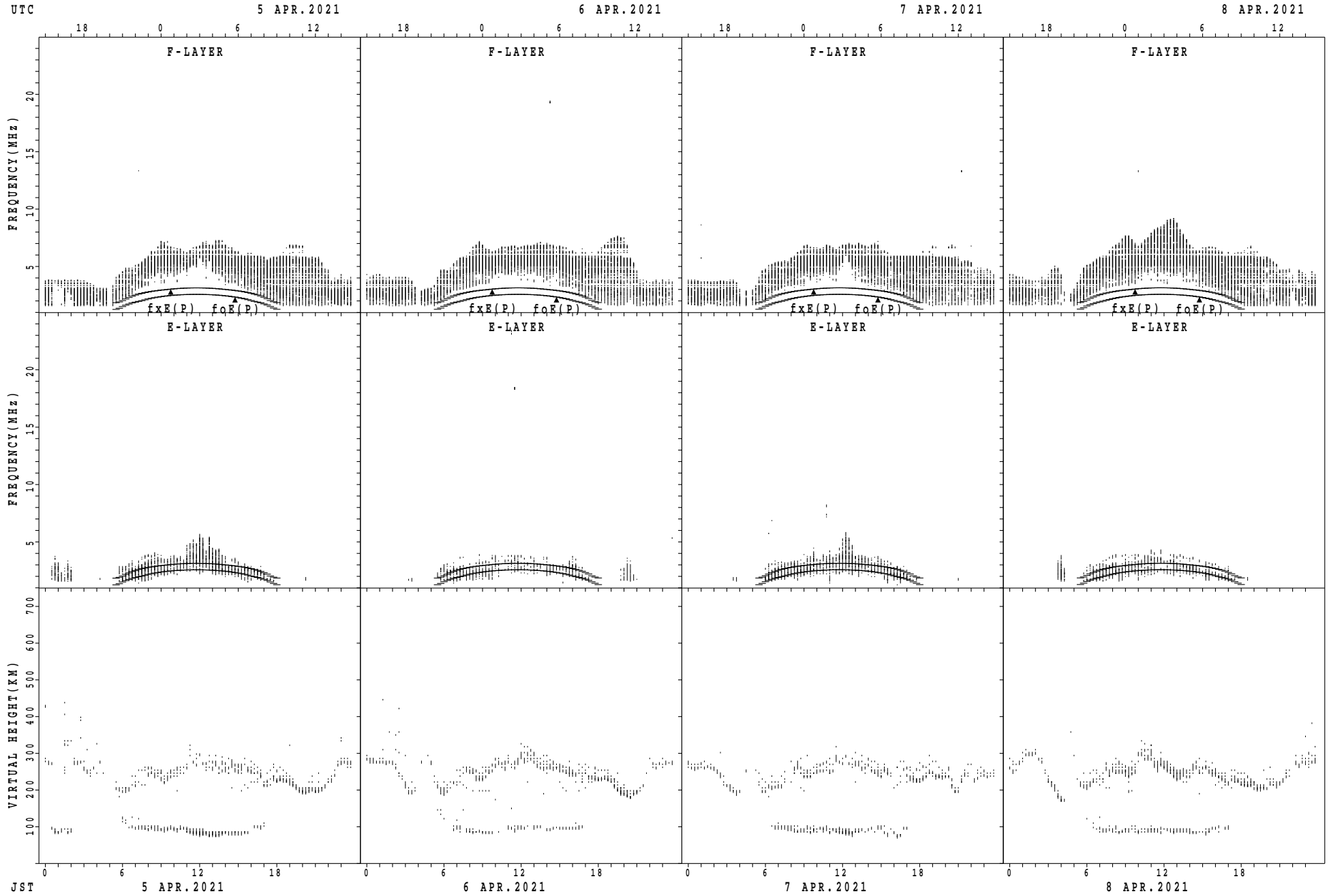
$f_{xE}(P)$; PREDICTED VALUE FOR f_{xE}
 $f_{oE}(P)$; PREDICTED VALUE FOR f_{oE}

SUMMARY PLOTS AT Kokubunji



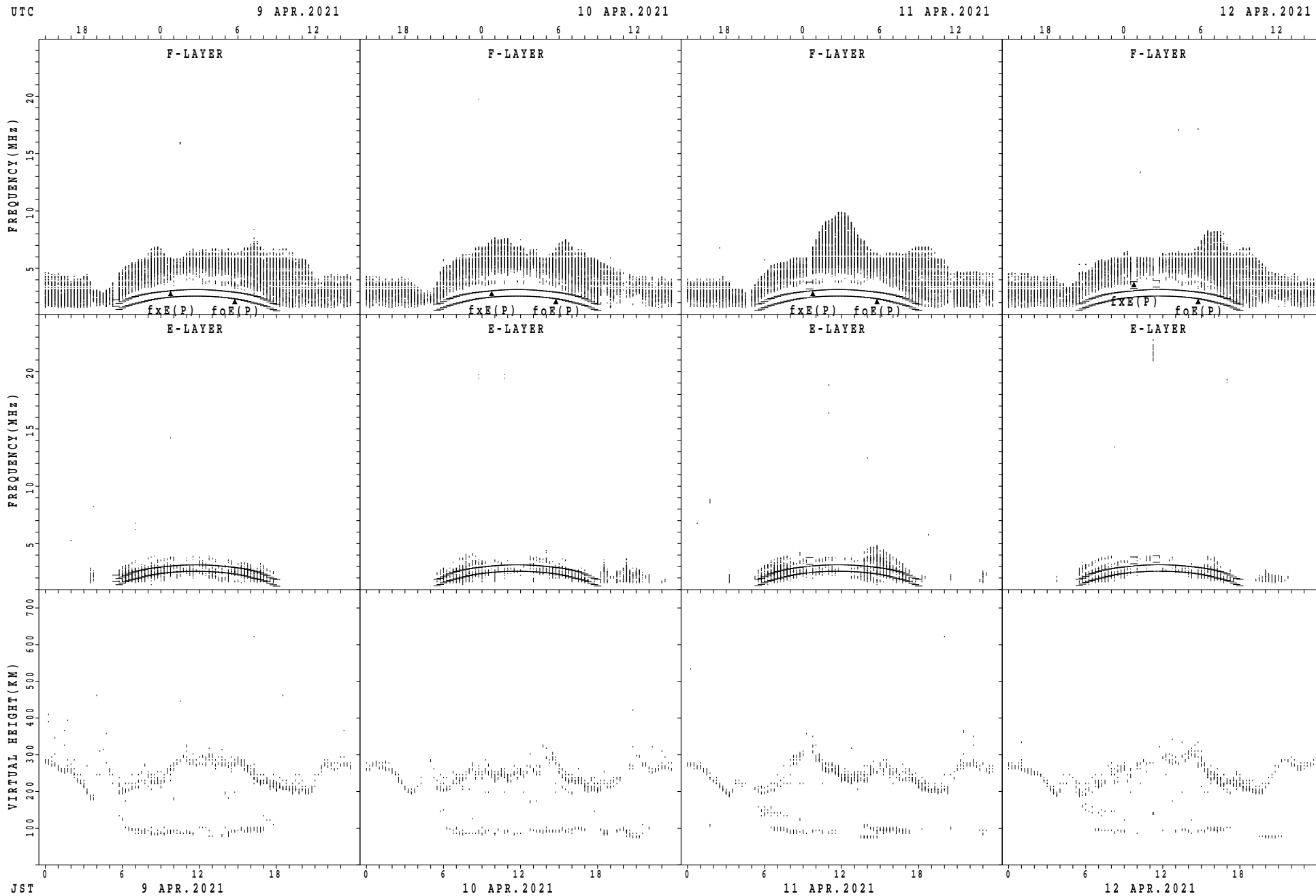
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



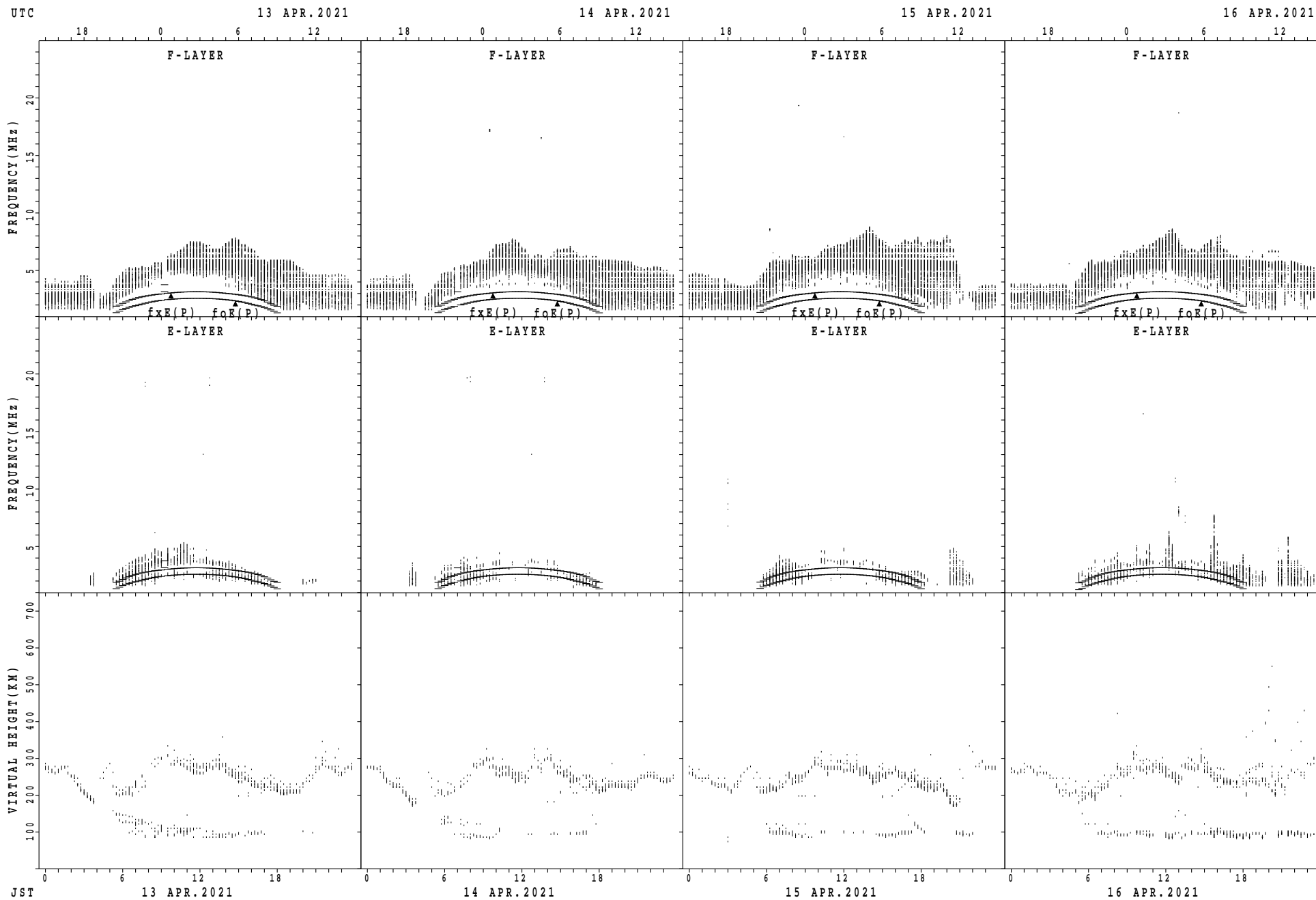
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



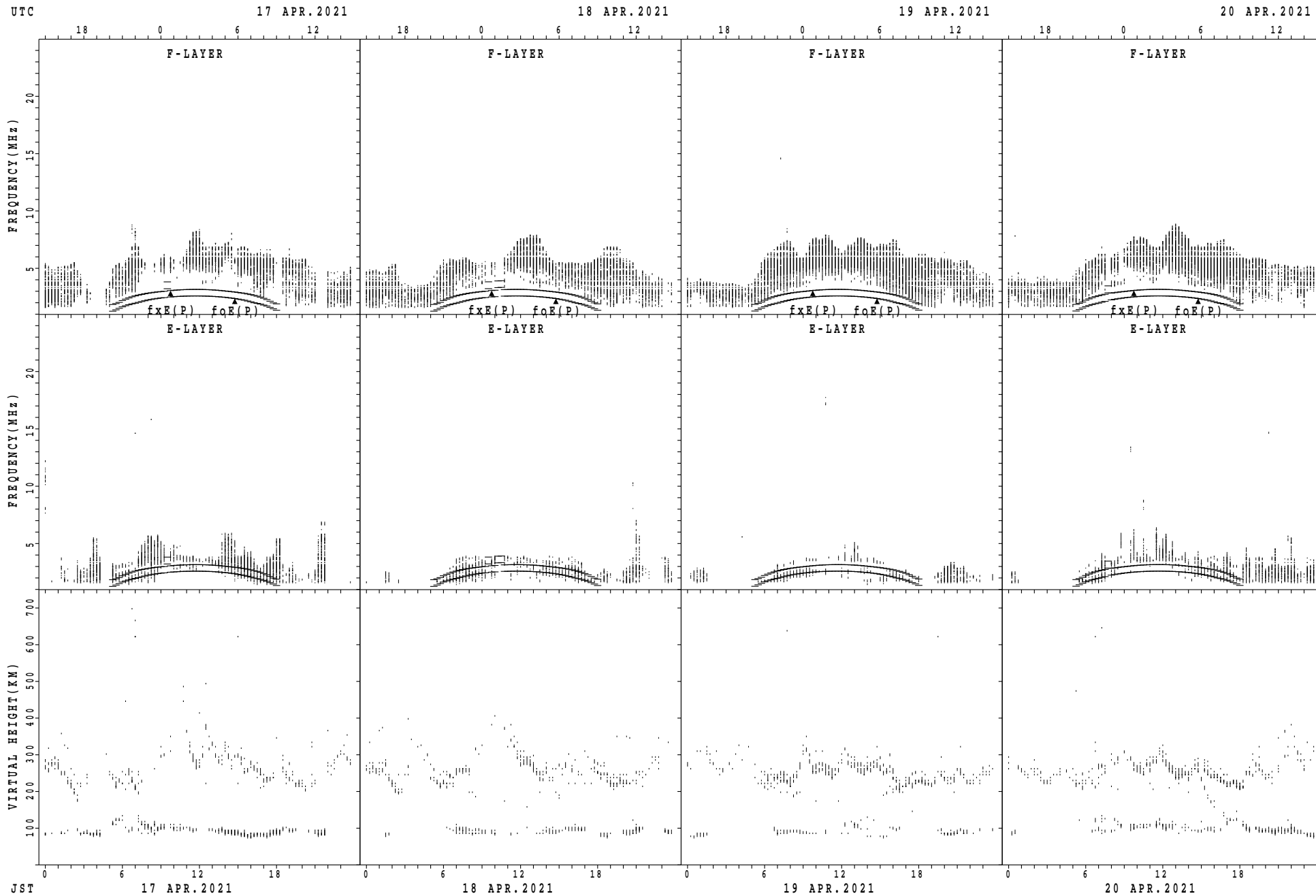
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



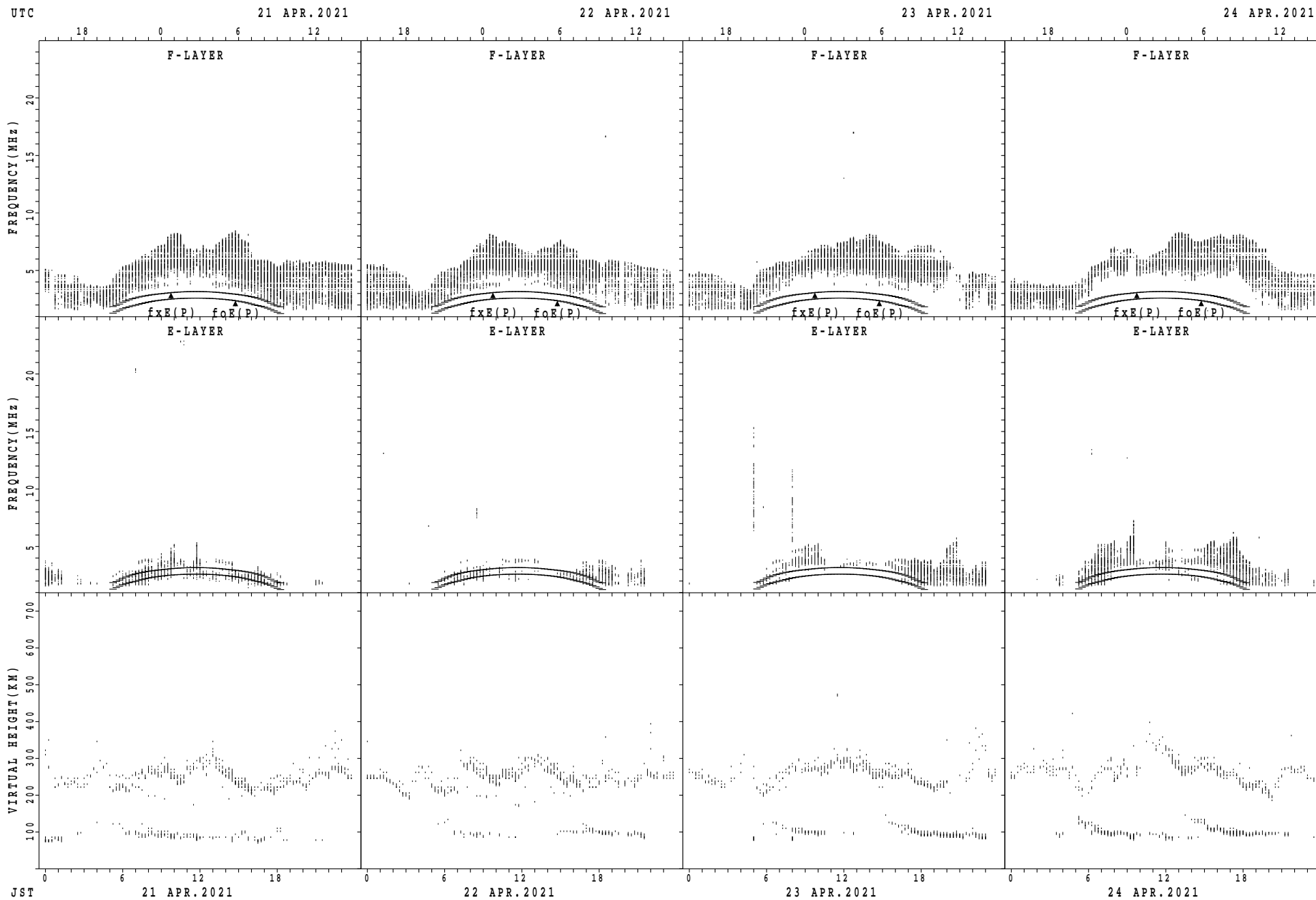
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



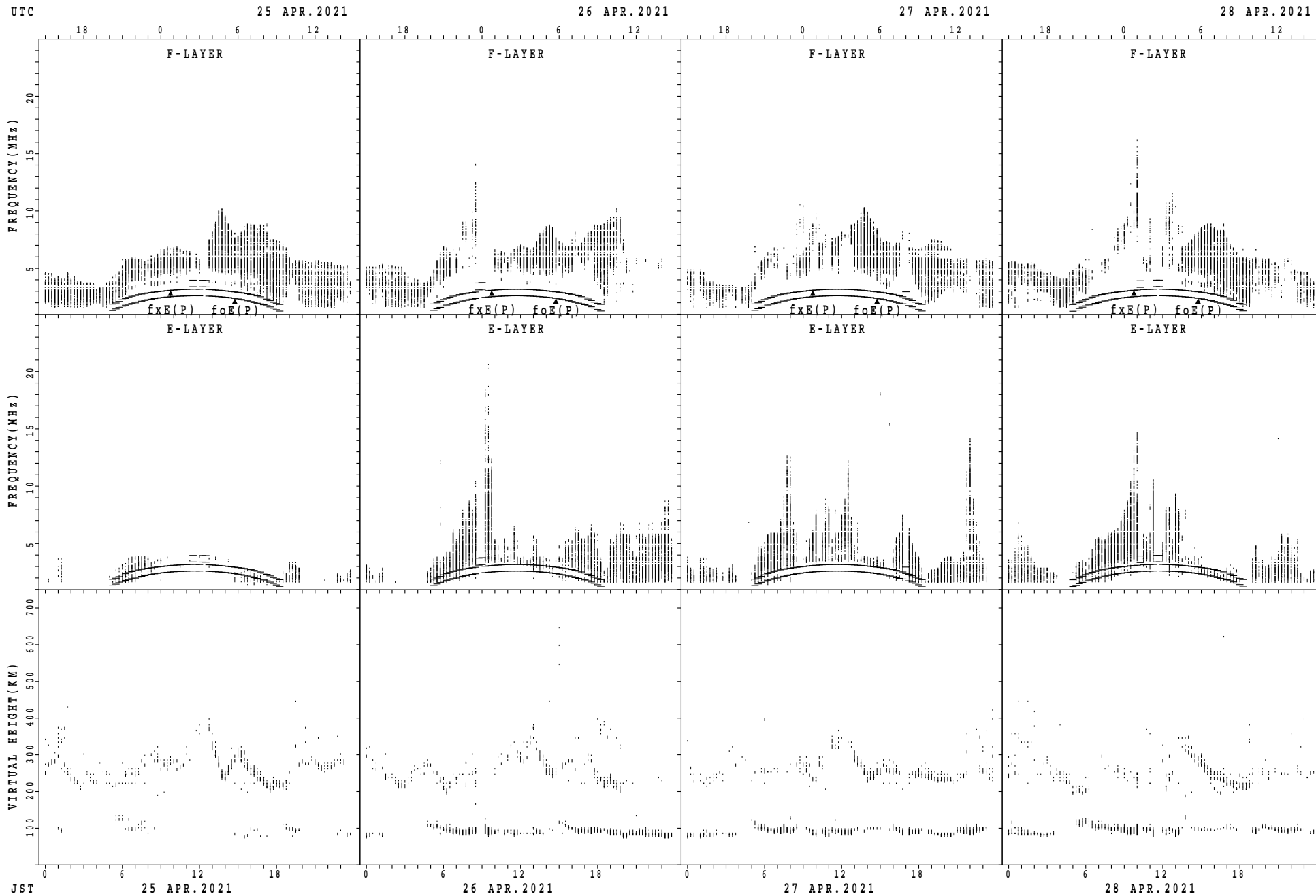
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



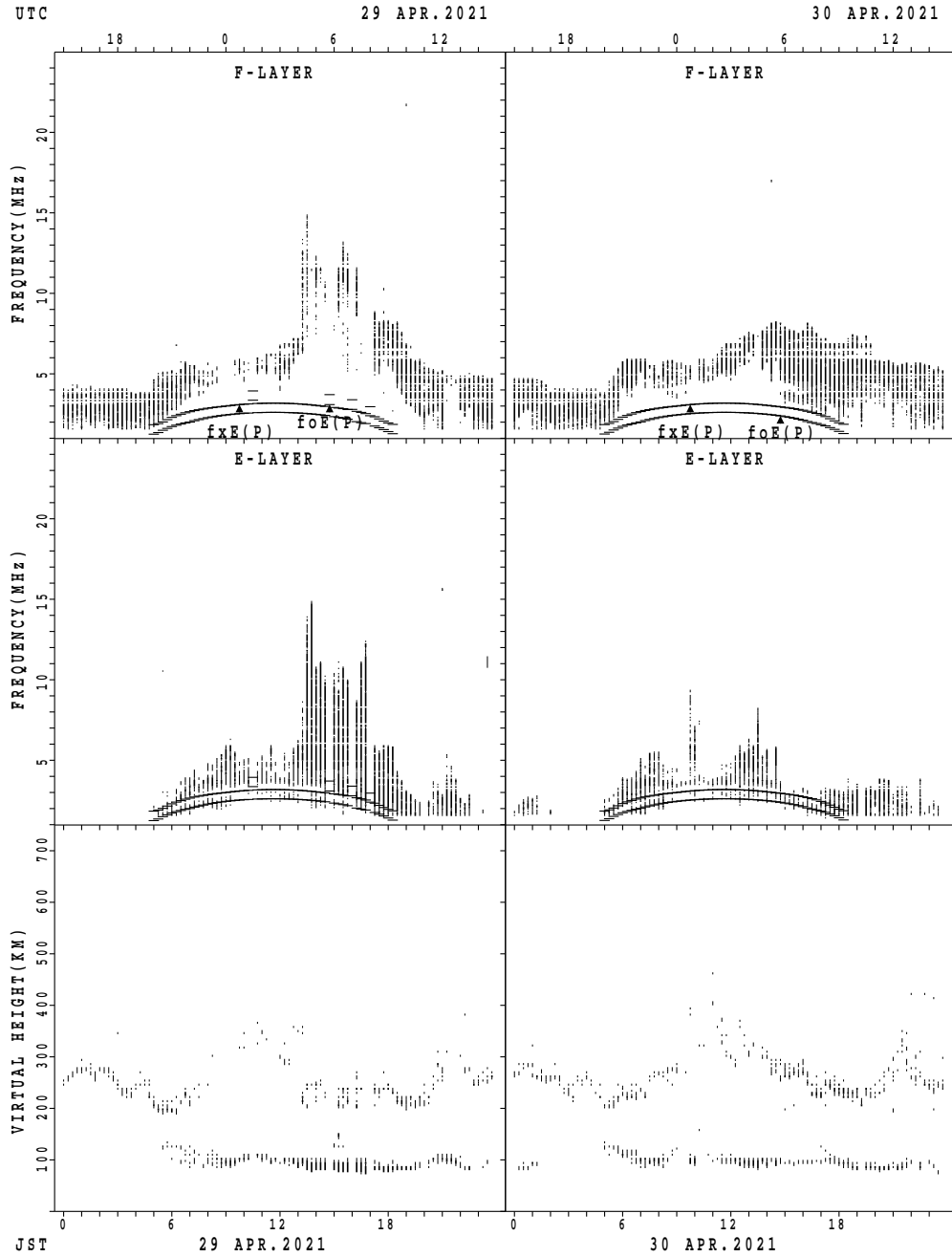
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



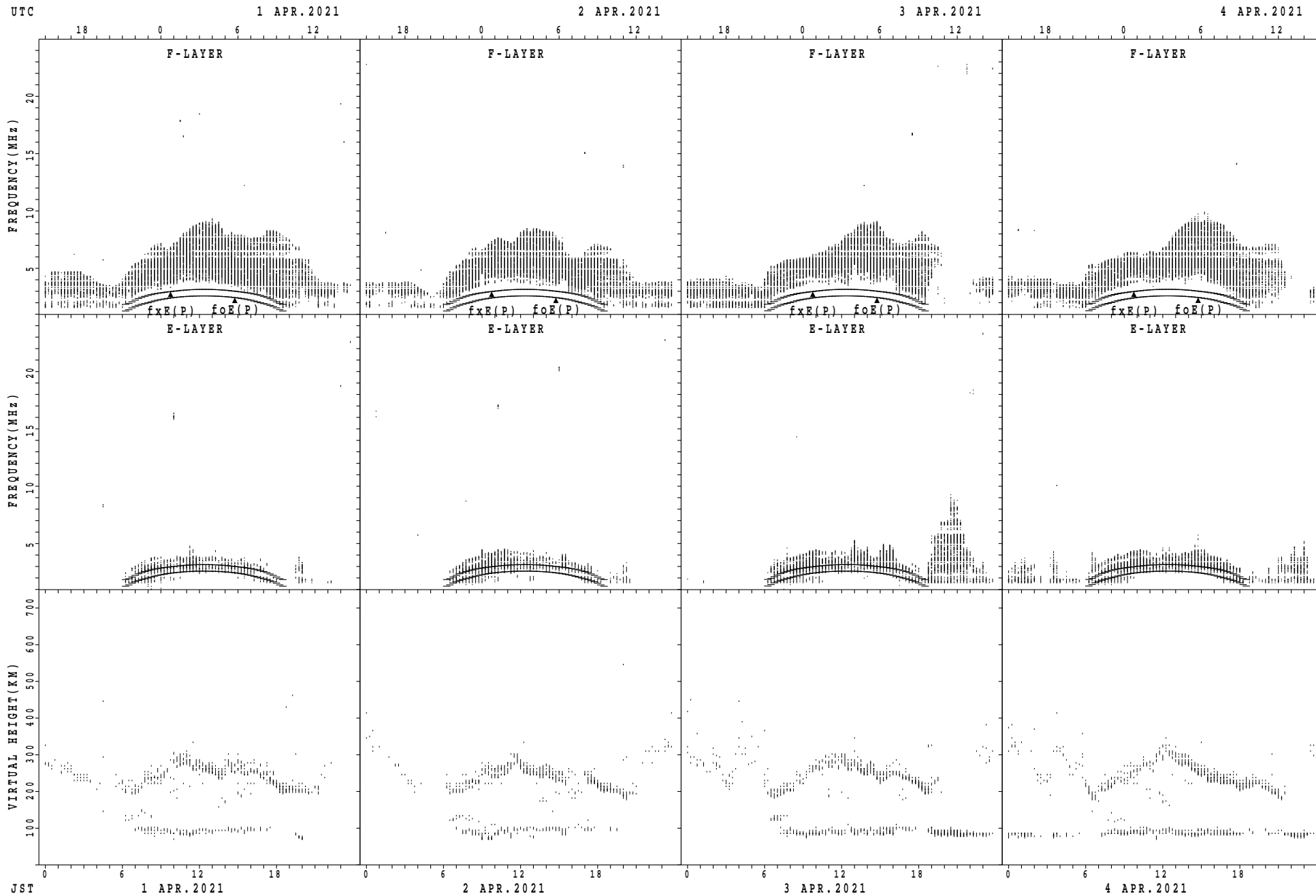
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



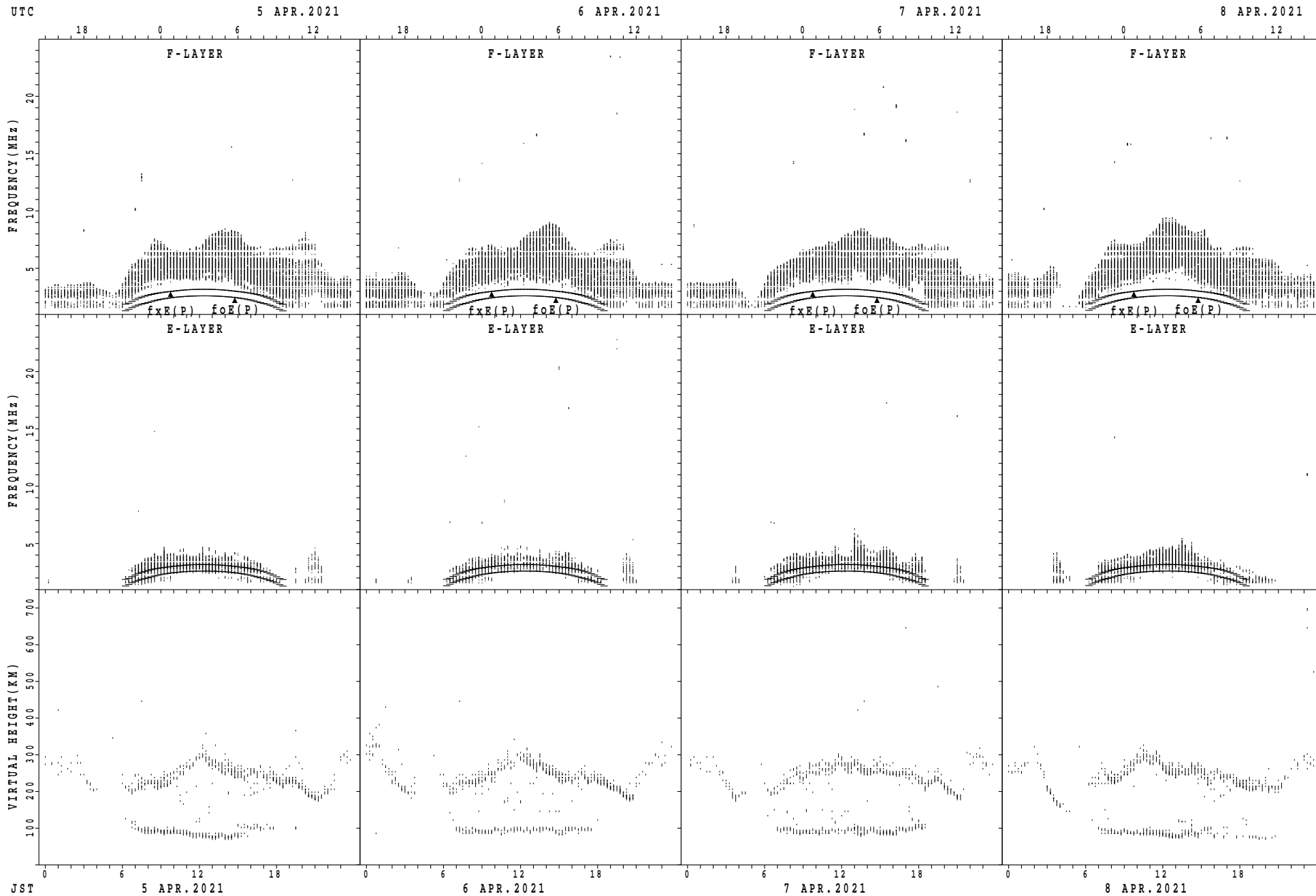
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



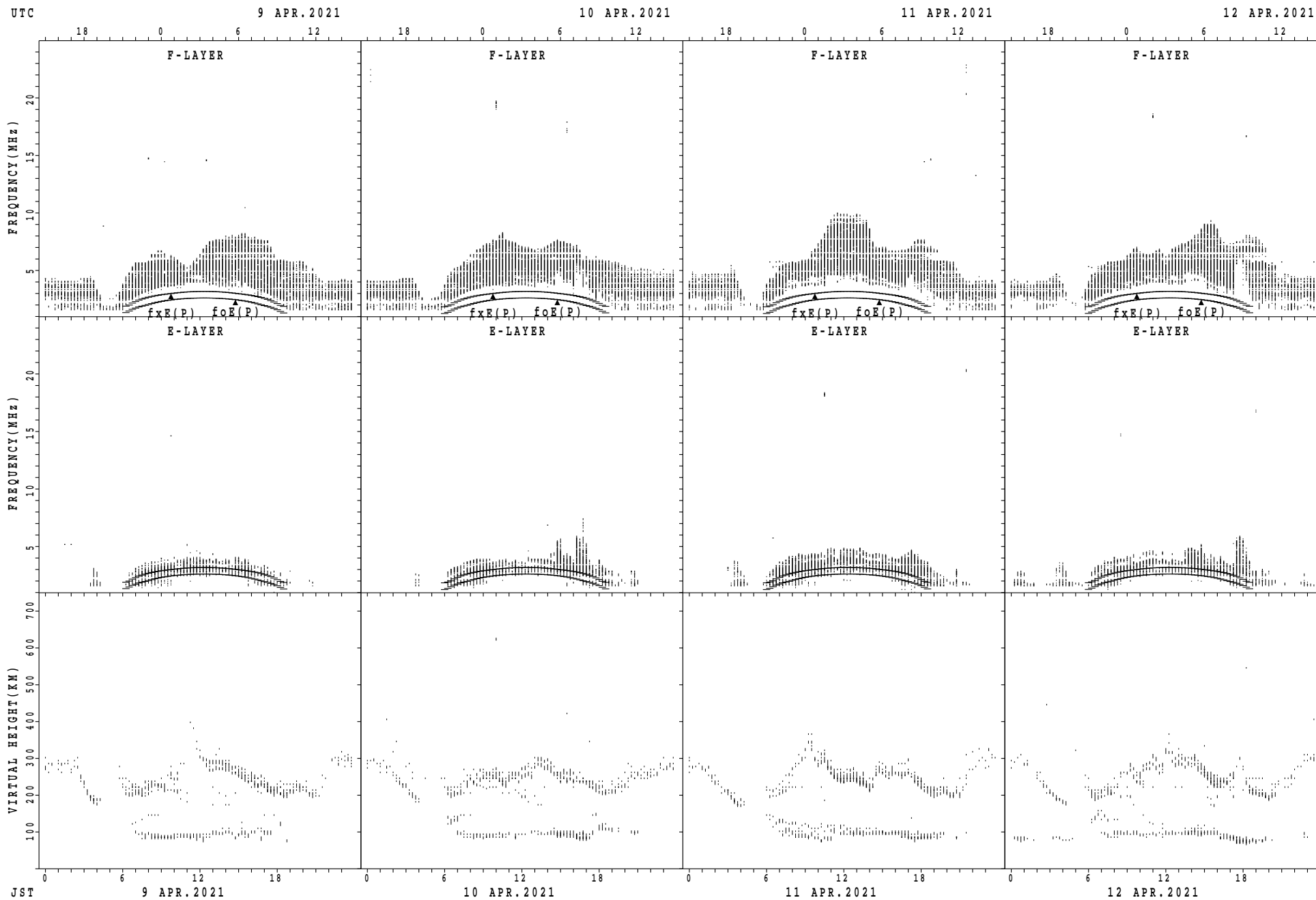
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



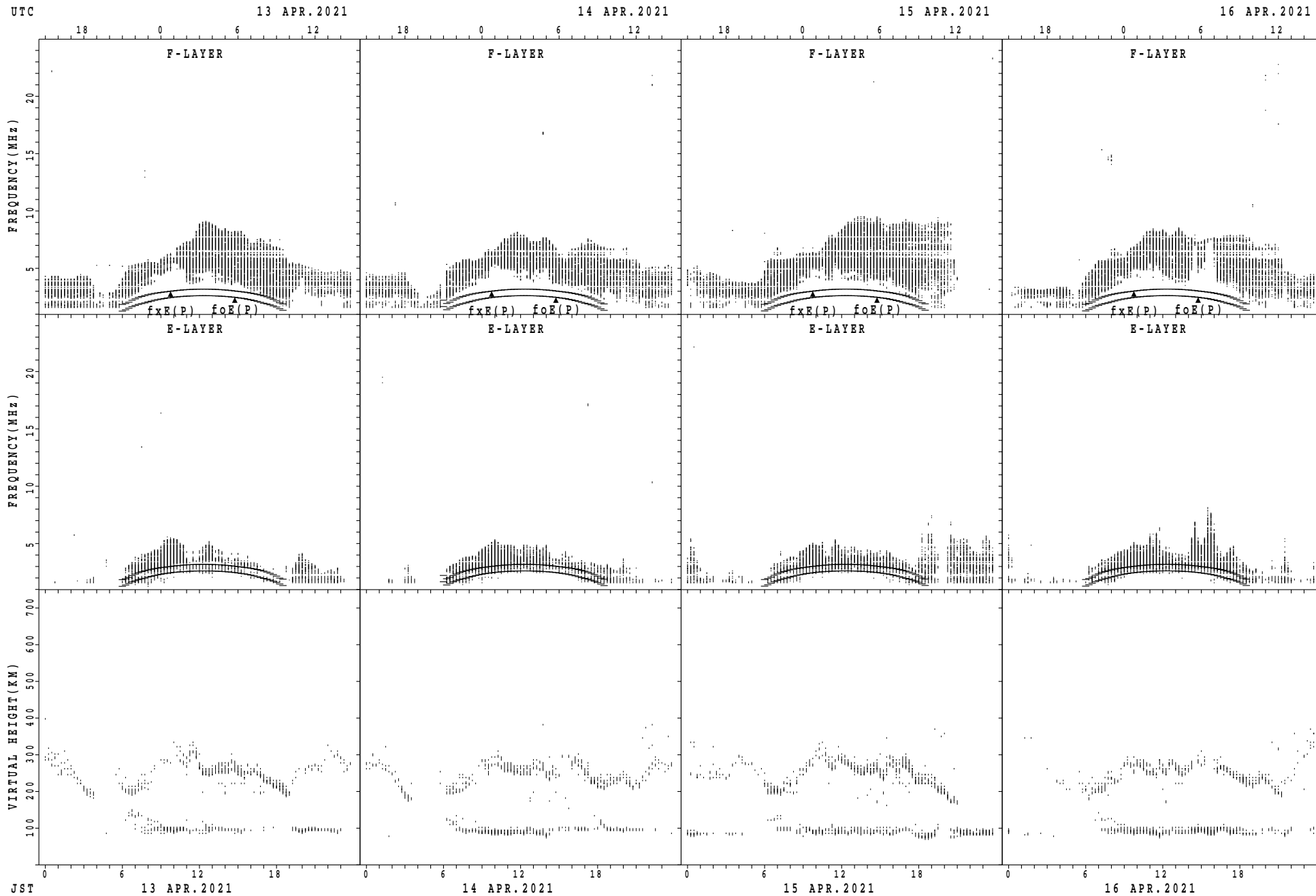
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



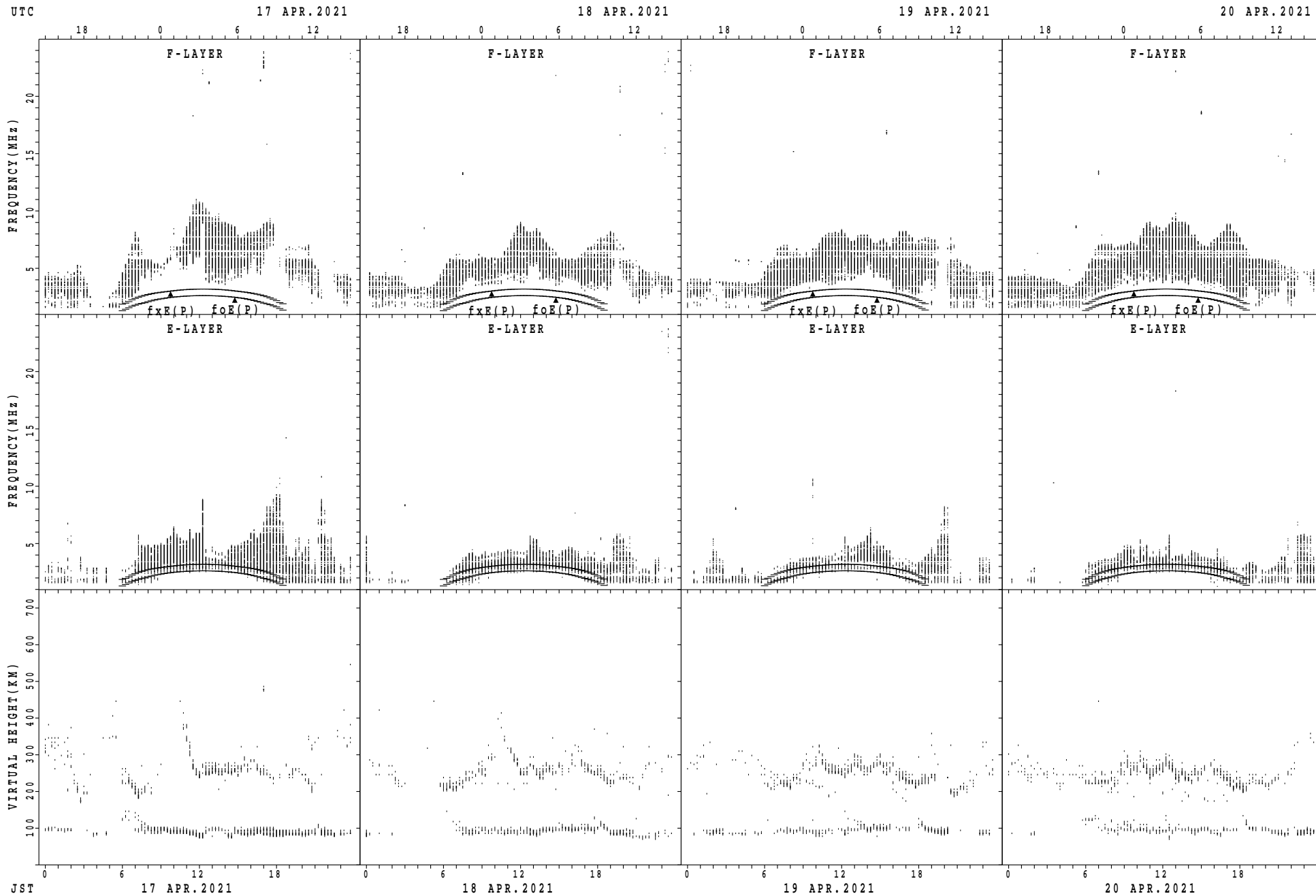
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



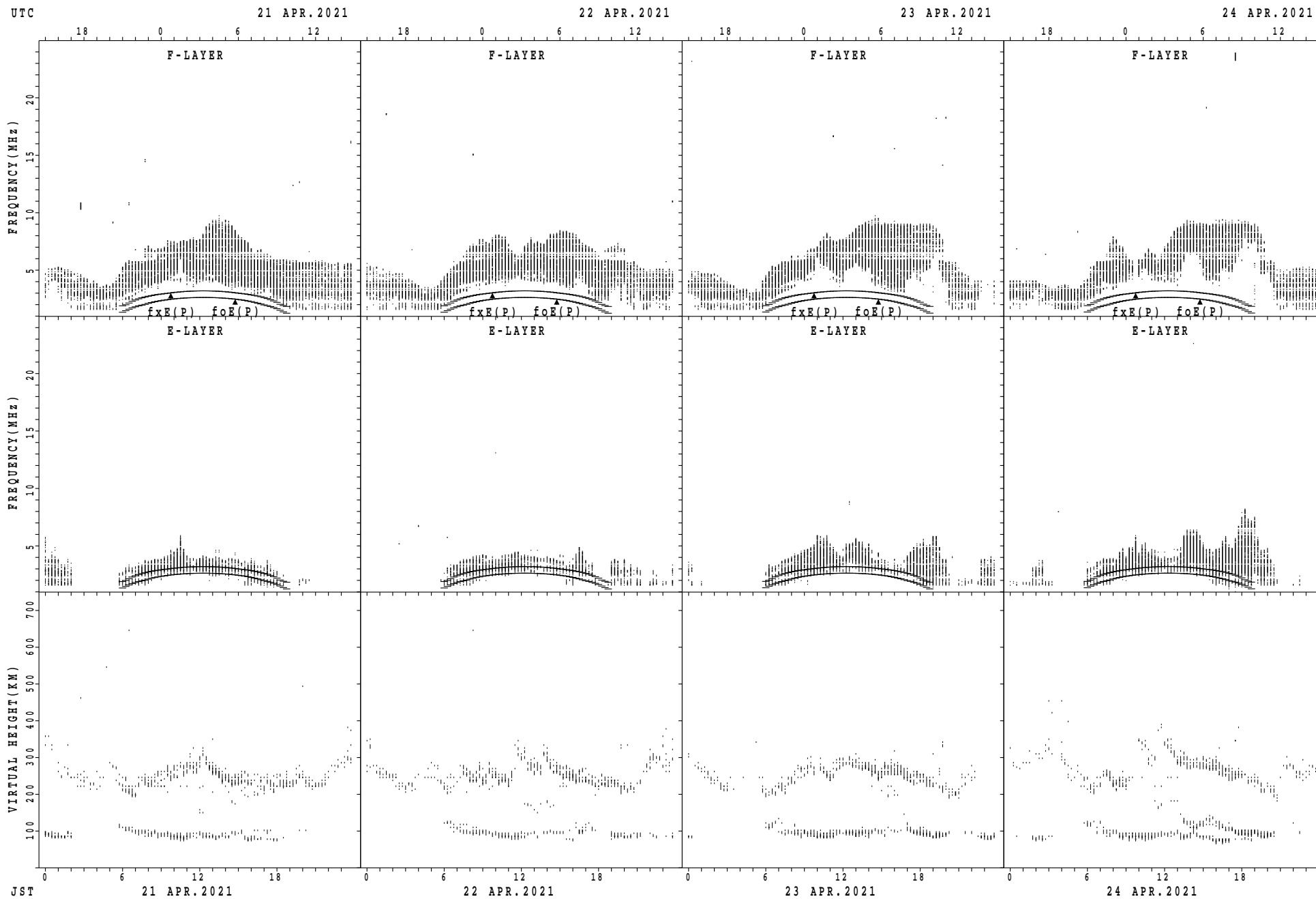
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



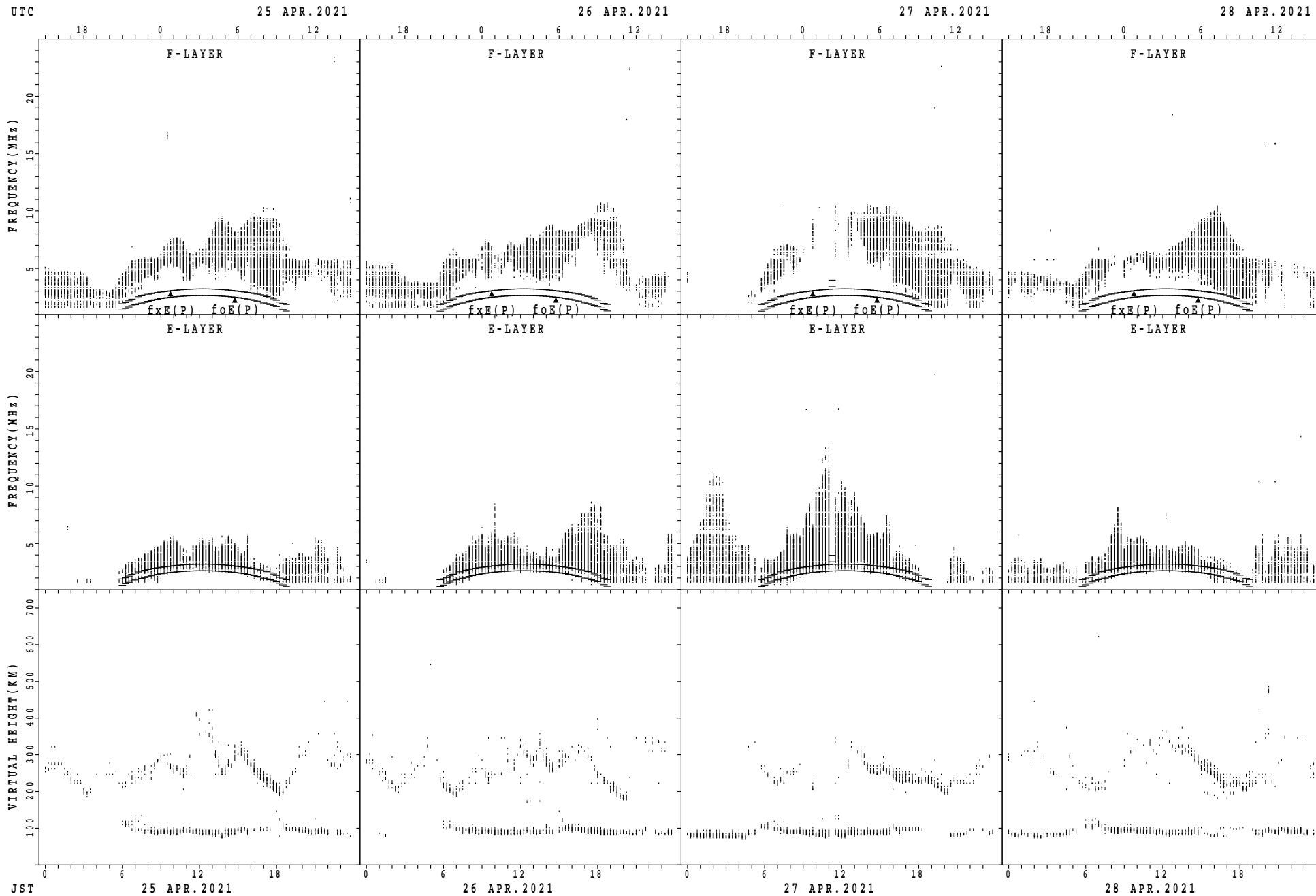
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



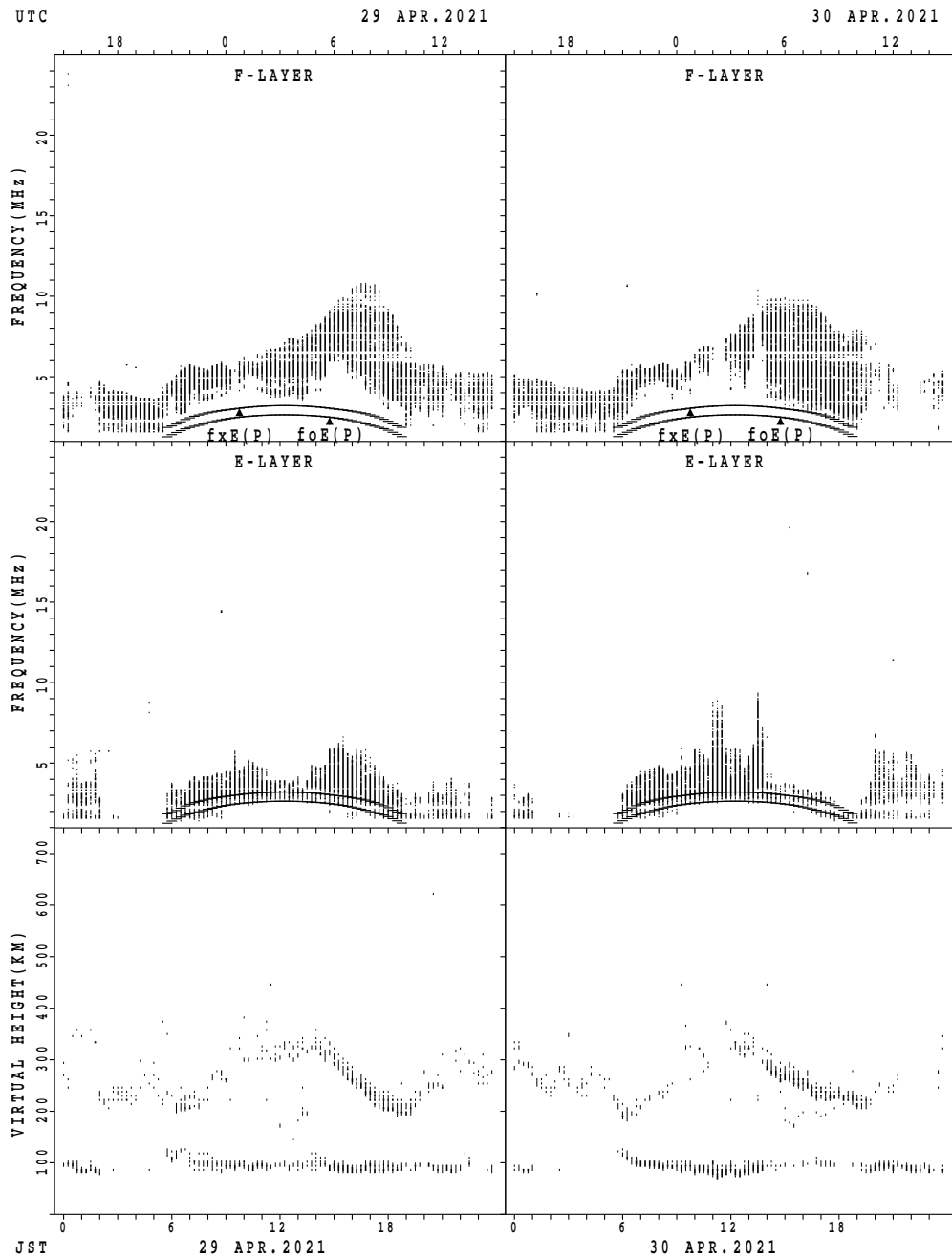
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



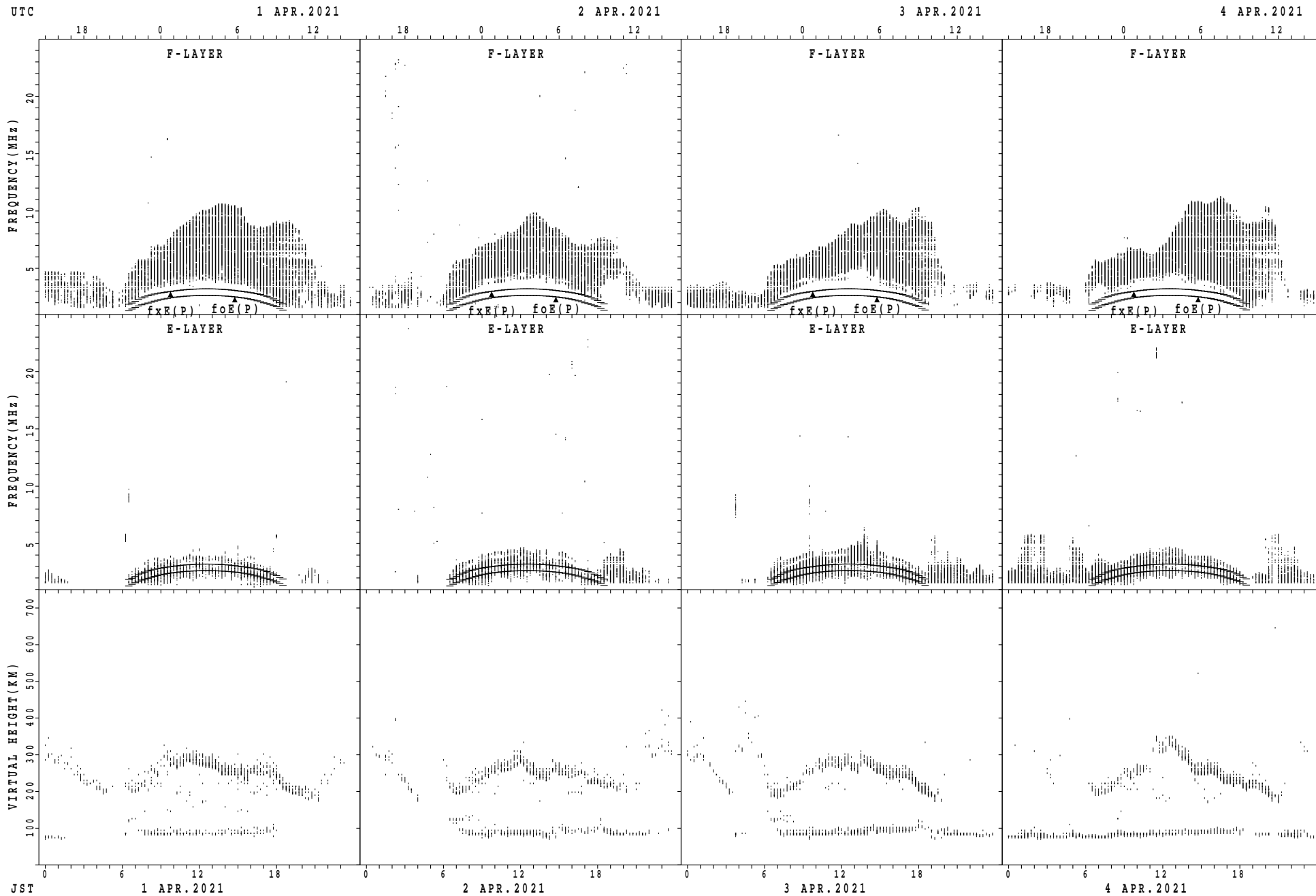
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



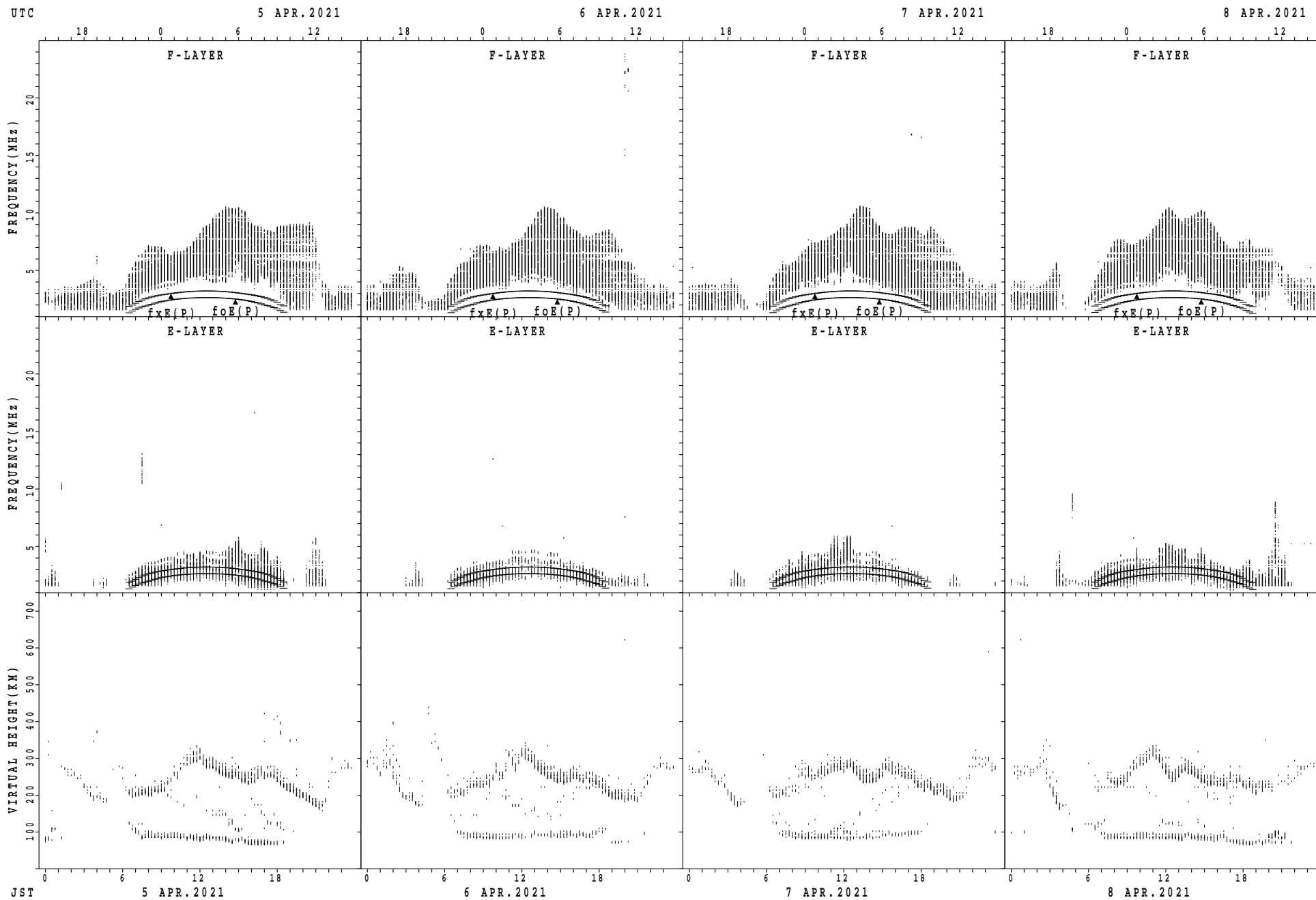
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



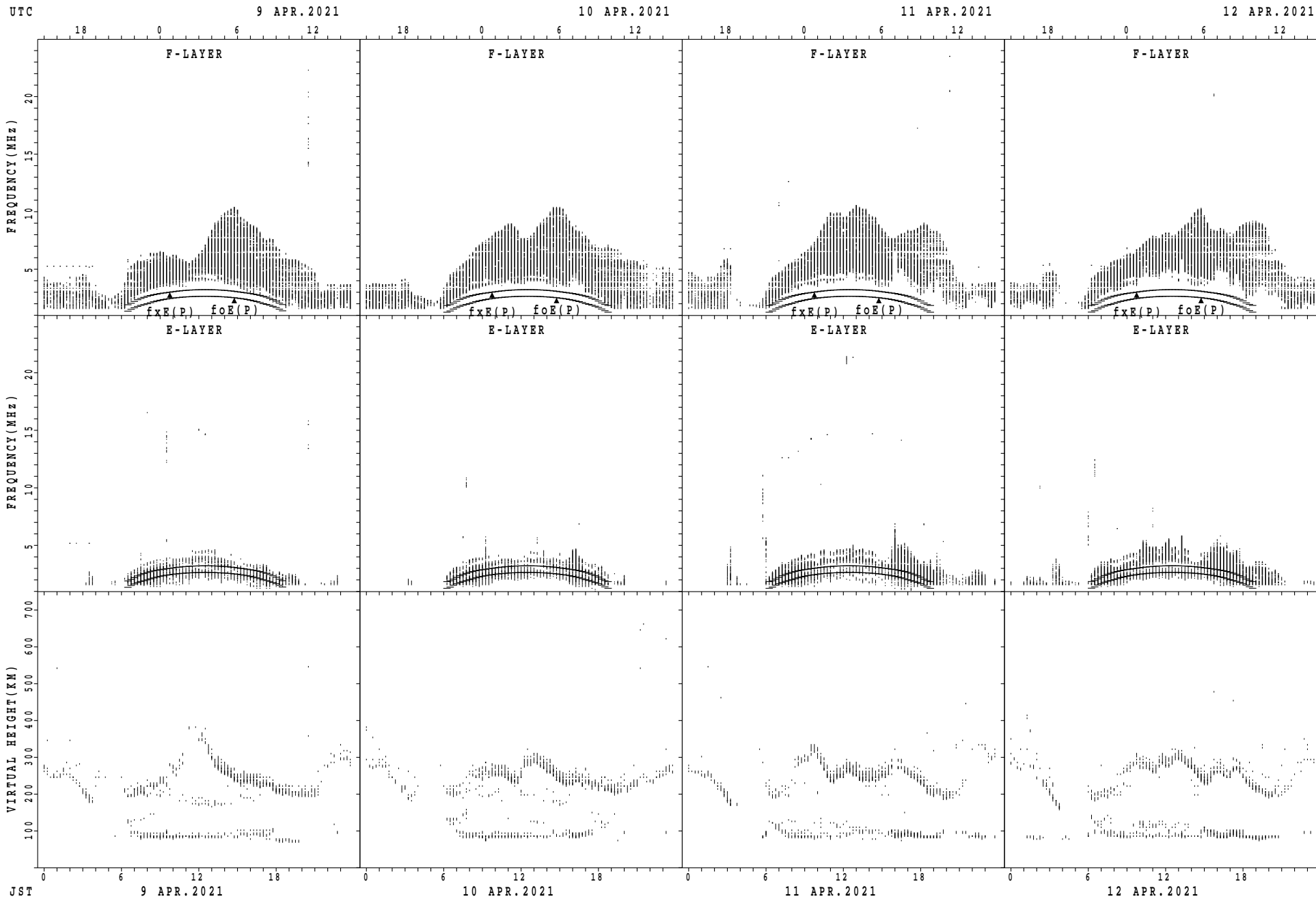
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



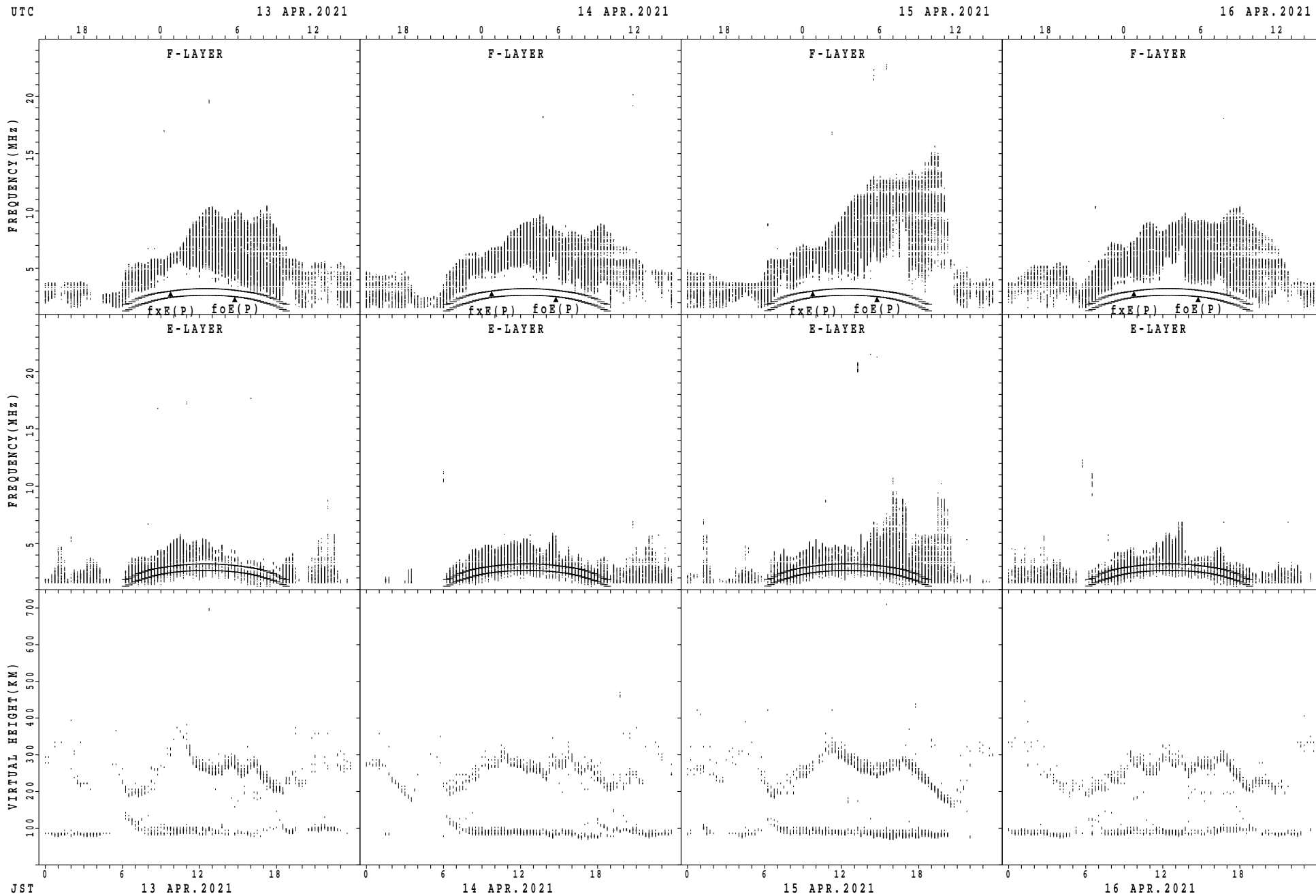
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



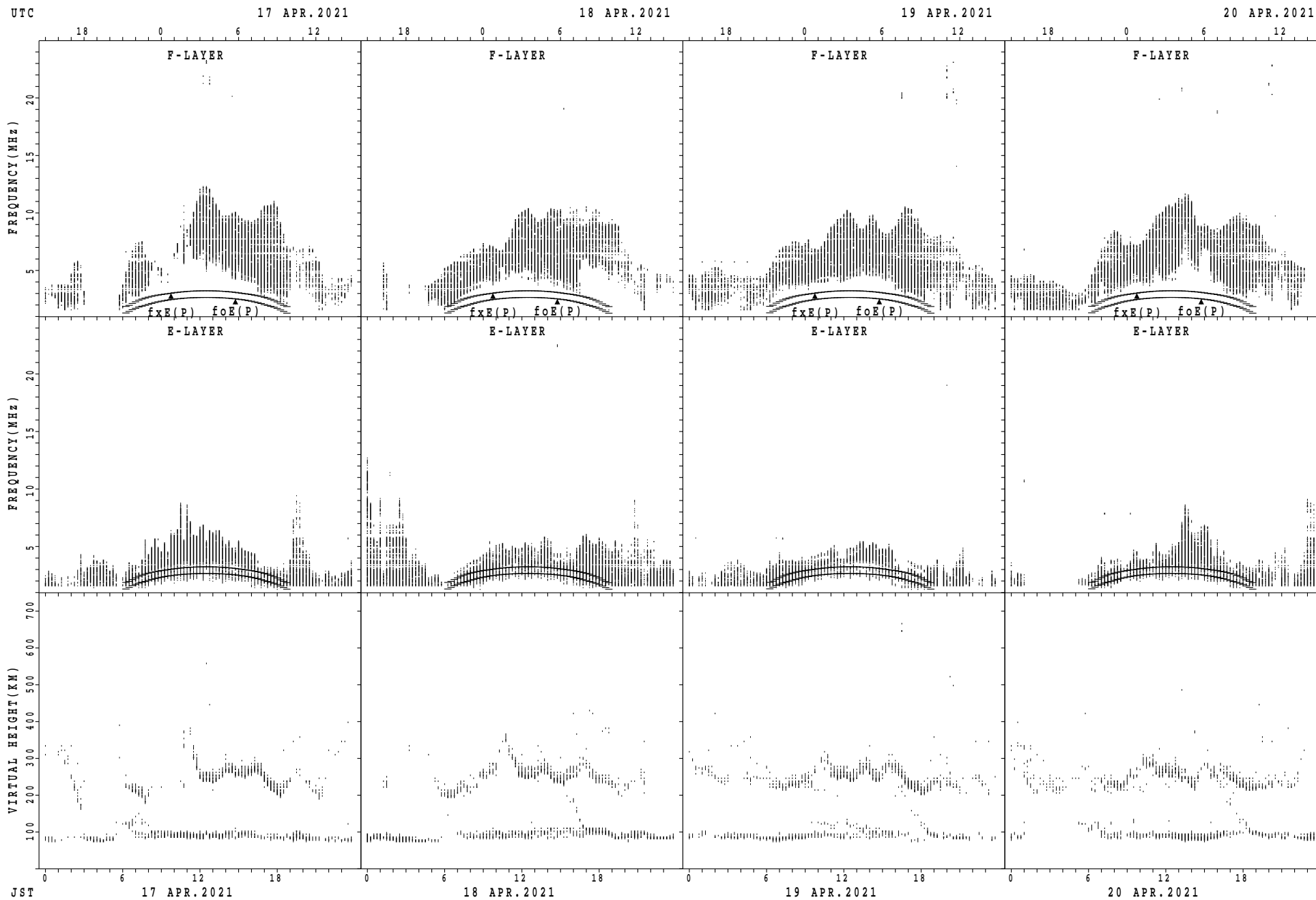
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



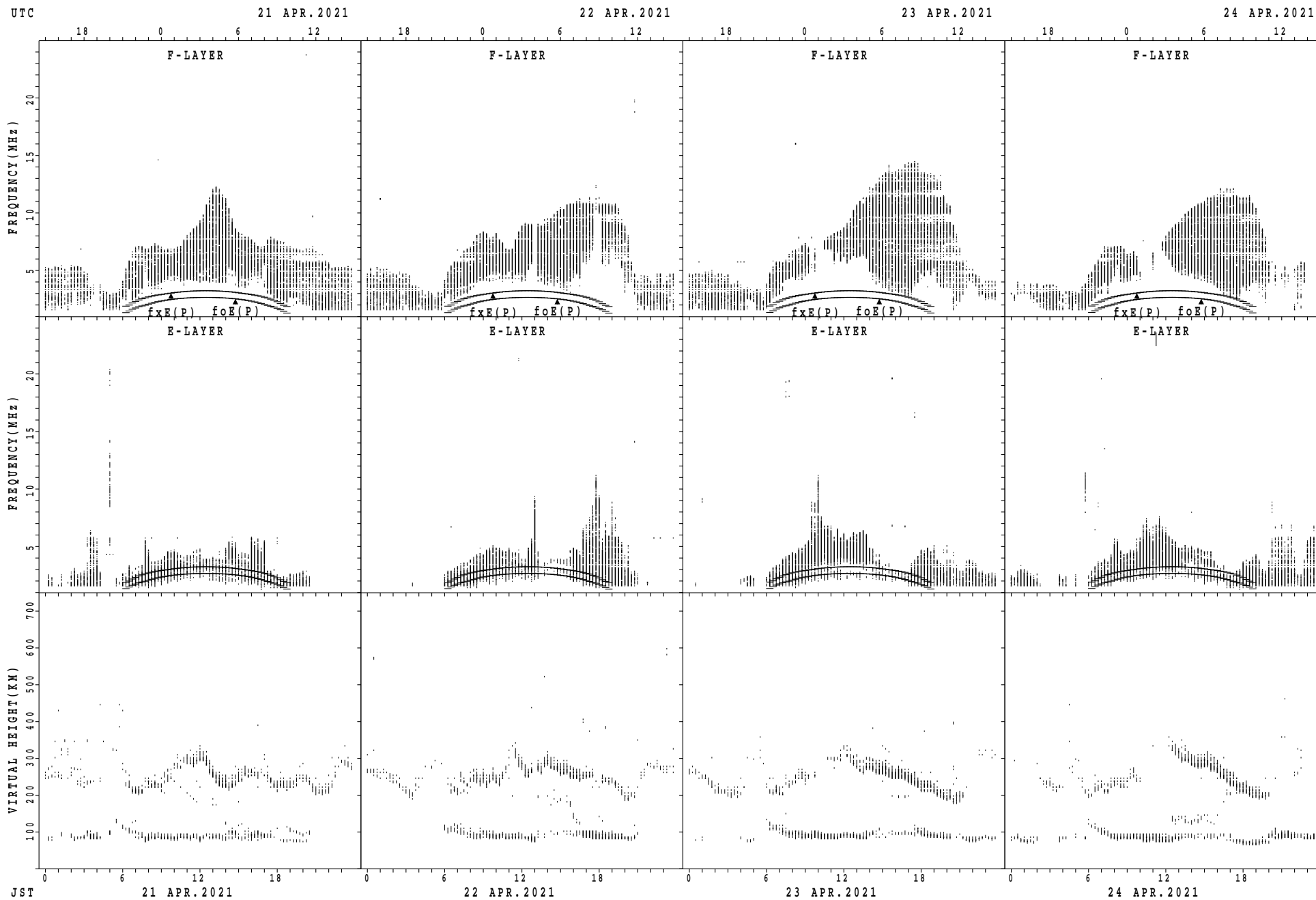
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



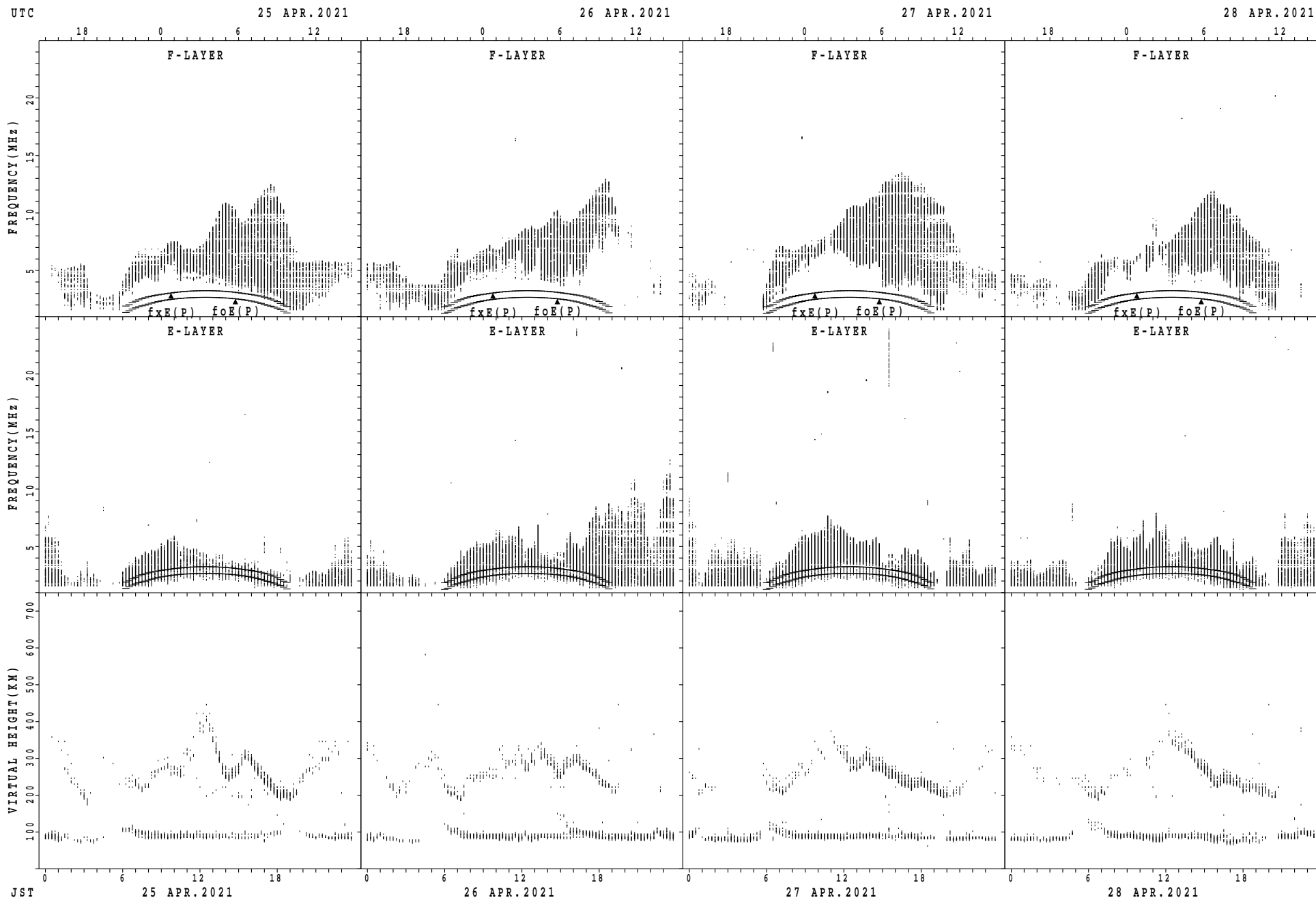
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



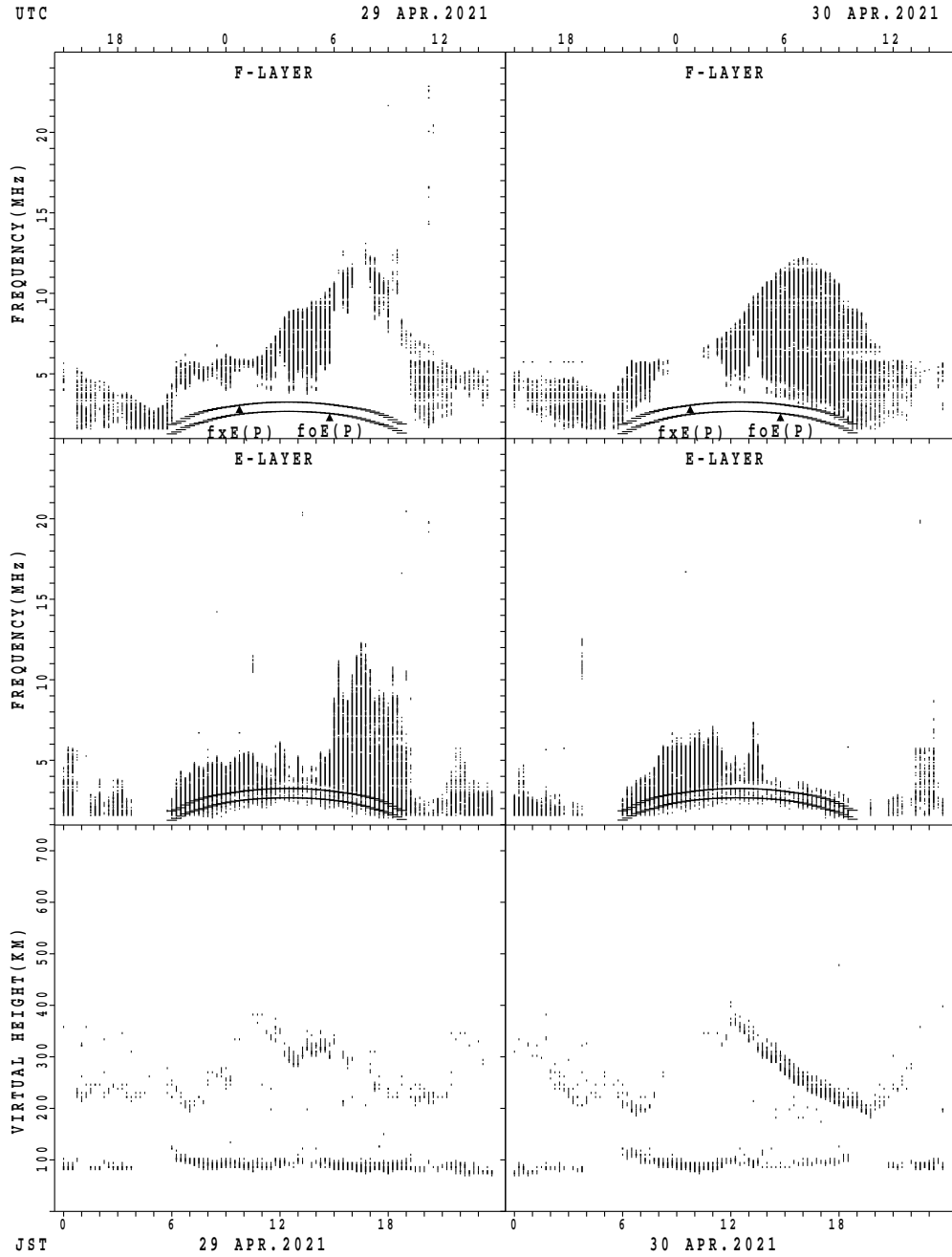
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es
 APR. 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							1	3									6	2	1	2				
MED							232	216									270	247	230	243				
U Q							116	256									282	252	115	268				
L Q							116	210									248	242	115	218				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	14	12	14	10	16	30	30	30	30	30	30	30	30	30	30	30	29	18	16	17	16	14	13
MED	98	98	98	98	98	98	98	100	98	98	98	98	98	98	98	98	98	98	98	97	98	98	98	98
U Q	98	98	98	98	98	100	98	100	100	98	100	98	100	100	98	100	100	100	98	98	98	98	98	98
L Q	94	96	96	98	96	97	98	98	98	96	98	98	98	98	96	96	96	96	96	95	95	98	96	95

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	1	3								17	8	5	4	2			
MED							220	214	264								256	240	232	258	213			
U Q							110	107	268								266	252	248	263	234			
L Q							110	107	240								246	228	228	254	192			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	10	7	6	5	6	29	30	30	28	27	24	23	25	27	26	30	30	20	18	21	21	19	13
MED	98	96	98	96	98	100	123	98	98	98	98	98	97	96	98	98	98	98	98	98	98	98	98	98
U Q	98	98	98	98	136	127	137	100	100	100	98	103	98	98	100	99	98	98	98	98	99	98	98	98
L Q	94	94	98	96	95	98	98	98	96	96	96	96	96	94	96	96	96	96	96	96	97	96	98	89

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	6								1	19	15	10	2	2		
MED								200	253								262	248	246	237	222	208		
U Q								100	258								131	266	252	248	228	212		
L Q								100	240								131	232	232	218	216	204		

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	16	13	16	13	14	8	14	30	30	30	30	30	30	30	30	30	29	30	28	25	26	22	22	18
MED	96	98	96	98	98	96	98	98	100	98	98	98	98	98	98	98	100	98	98	98	98	96	98	96
U Q	98	98	98	98	167	98	98	100	100	100	98	98	98	98	98	98	100	100	98	98	98	98	98	98
L Q	95	96	95	97	96	96	98	98	98	98	96	96	98	96	98	98	98	96	96	96	96	94	96	94

MONTHLY MEDIANS OF h'F AND h'Es
 APR. 2021 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

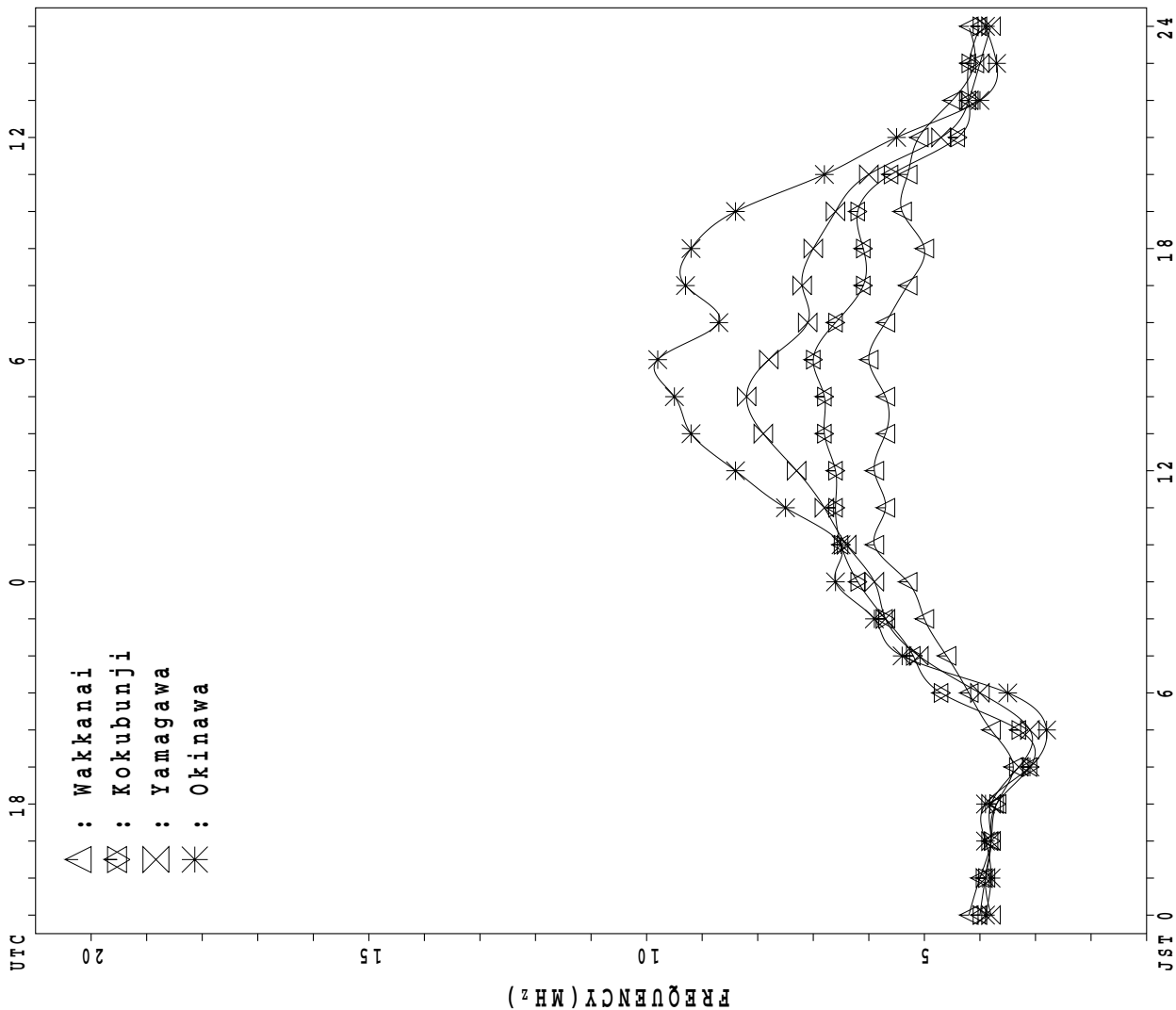
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	7									28	28	24	10	2		
MED								227	232									246	228	233	221	193		
U Q								237	250									262	244	240	236	196		
L Q								220	224									229	215	219	210	190		

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	21	20	17	16	21	12	20	30	30	30	30	30	30	30	29	30	30	30	30	25	27	26	20	19
MED	96	96	96	98	96	98	98	98	98	98	98	97	96	96	96	98	96	97	98	98	98	98	96	96
U Q	96	98	98	98	98	98	99	100	100	98	98	98	98	98	98	98	100	98	98	98	98	98	98	98
L Q	95	94	94	96	94	96	98	98	98	96	96	96	96	96	95	96	96	96	94	96	96	96	94	94

MONTHLY MEDIANS PLOT OF fOF2

APR. 2021



IONOSPHERIC DATA STATION Wakkanai

APR. 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 60	X 60	X 57	X 57	X 52																X 57	X 51	X 49	X 50	
2	X 50	X 49	X 48	X 48	X 46																	X 57	X 56	X 55	X 55
3	X 55	X 55	X 56	X 55	X 56																	X 61	X 61	X 56	X 56
4	X 58	X 58	X 58	X 58	X 58	54																X 55	X 52	X 49	X 48
5	X 46	X 53	X 57	X 55	X 49																	X 58	X 55	X 53	X 46
6	X 46	X 46	X 45	X 45	X 41																	X 63	X 60	X 55	X 46
7	X 45	X 45	X 45	X 43																		X 66	X 65	X 55	X 51
8	X 40	X 39	X 39	X 39																		X 55	X 54	X 51	X 45
9	X 45	X 44	X 42	X 41																		X 57	X 54	X 51	X 49
10	X 47	X 45	X 45	X 45																		X 53	X 53	X 50	X 49
11	X 49	X 48	X 48	X 44																		X 59	X 56	X 54	X 50
12	X 51	X 51	X 49	X 49																		X 67	X 56	X 53	X 54
13	X 53	X 53	X 58	X 53																		X 55	X 51	X 51	X 46
14	X 46	X 46	X 46	X 41																		X 55	X 55	X 55	X 50
15	X 50	X 49	X 47	X 46																		X 65	X 59	X 49	X 44
16	X 42	X 44	X 43	X 45																		X 66	X 66	X 55	X 54
17	X 51	X 53	X 51	X 48	39																	X 60	X 60	X 58	X 58
18	X 54	X 54	X 54	X 49																		X 63	X 61	X 54	X 43
19	X 41	X 43	X 42	X 43																		X 62	X 60	X 55	X 48
20	X 57	X 46	X 46	X 45																		X 54	X 54	X 52	X 56
21	X 51	X 46	X 46	X 44																		X 58	X 58	X 60	X 57
22	X 58	X 53	X 53	X 52																		X 59	X 58	X 58	X 53
23	X 46	X 43	X 42	X 54																		X 59	X 57	X 53	X 49
24	X 58	X 58	X 50	X 43	46																	X 63	X 61	X 53	X 45
25	X 43	X 44	X 41	X 42																		X 60	X 58	X 52	X 54
26	X 51	X 51	X 50	X 41																		X 66	X 62	X 61	X 59
27	X 57	X 47	X 41	X 40																		X 65	X 63	X 59	X 57
28	X 54	X 45	X 51	X 46																		X 59	X 54	X 52	X 49
29	X 48	X 46	X 45	X 45																		X 68	X 63	X 59	X 57
30	X 53	X 57	X 45	X 44																		X 65	X 61	X 59	X 56
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	8	1															30	30	30	30	
MED	X 50	X 48	X 46	X 45	X 48	X 54															X 60	X 58	X 54	X 50	
U Q	X 54	X 53	X 51	X 49	X 54																X 65	X 61	X 56	X 56	
L Q	X 46	X 45	X 45	X 43	X 44																X 57	X 54	X 52	X 48	

APR. 2021 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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 \ 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	53	53	50	50	45	42	51	52	53	63	64	62	66	61	61	60	60	64	56	53	50	44	42	43	
2	43	42	41	41	39	37	45	48	52	66	72	66	60	61	64	65	60	54	50	52	50	49	48	48	
3	48	48	49	48	49	44	44	46	52	58	60	63	62	68	75	68	59	51	49	53	54	54	49	49	
4	47	46	F	F	F	F		44	50	51	56	63	66	63	59	64	61	57	52	48	50	48	45	42	41
5	39	38	F	F	F	F		41	46	51	55	62	64	62	58	54	54	51	53	50	54	51	48	46	39
6	39	39	38	38	F	F		40	46	48	54	59	57	54	55	57	56	56	54	52	56	56	53	48	39
7	38	38	38	36	34	36	46	48	52	55	57	57	61	60	56	60	56	53	49	57	59	58	48	44	
8	33	32	32	32	23	32	38	43	48	55	62	60	64	60	63	57	56	56	48	50	48	47	44	38	
9	38	37	35	34	31	39	44	47	53	54	62	61	61	58	57	54	54	53	59	55	50	47	44	42	
10	40	38	38	38	35	38	46	48	52	59	58	65	62	58	58	61	58	54	47	47	46	46	43	42	
11	42	41	41	37	36	38	43	45	46	52	60	65	79	63	58	58	57	52	48	53	52	49	47	43	
12	44	44	42	42	42	38	40	43	46	49	E G	51	51	52	52	61	61	59	58	58	62	60	49	46	47
13	46	46	46	46	47	42	42	43	49	53	E G	46	55	56	55	61	56	54	54	49	52	48	44	44	39
14	39	39	39	34	28	35	42	43	47	52	52	54	56	54	53	55	56	51	47	51	48	48	48	43	
15	43	42	40	39	36	36	41	45	52	52	57	54	59	65	60	64	57	55	58	60	58	52	42	37	
16	35	37	36	38	39	42	47	49	50	50	54	57	59	65	65	60	58	52	52	56	59	59	48	47	
17	44	46	44	41	F	F	39	47	44	48	54	A	49	46	51	50	54	52	52	49	V	53	53	F	F
18	47	47	47	42	41	44	42	45	45	49	46	55	55	59	53	54	48	48	49	56	56	54	47	36	
19	34	36	35	36	36	39	51	R	60	54	55	57	54	58	56	53	62	57	54	49	53	55	53	48	41
20	Z	48	39	39	38	33	38	48	42	39	49	49	44	52	52	59	63	59	52	44	47	47	47	F	F
21	44	39	39	37	34	36	42	47	50	56	56	52	55	55	60	61	61	54	50	51	51	51	48	50	
22	F	46	46	46	45	37	38	42	48	54	57	62	64	62	58	58	56	56	55	51	48	52	51	51	46
23	39	36	35	F	F	37	41	40	42	E G	38	50	52	52	55	55	59	57	54	50	55	52	50	46	42
24	F	F	F	F	F	39	41	45	49	51	53	52	55	55	52	56	56	54	54	56	56	54	46	38	F
25	36	37	34	35	32	34	42	45	48	48	57	52	54	74	56	65	62	61	48	48	53	51	45	42	
26	44	44	38	34	34	39	A	52	60	55	58	60	59	67	70	61	64	69	64	68	59	55	54	52	
27	50	40	34	33	33	36	A	A	A	A	51	51	A	54	52	51	55	49	54	A	58	56	52	50	
28	44	38	38	39	36	A	A	42	A	A	46	A	48	51	52	51	51	51	48	51	52	47	45	42	
29	41	39	38	38	38	44	45	49	51	49	58	55	56	56	56	62	64	62	56	64	61	56	52	50	
30	46	F	38	37	33	35	46	46	46	47	53	54	52	55	52	54	56	54	56	58	58	54	52	49	
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	30	30	30	30	28	27	29	28	28	29	29	29	30	30	30	30	30	30	29	30	30	30	30	
MED	43	40	38	38	36	38	43	46	50	54	57	55	58	58	58	60	57	54	50	53	52	51	46	43	
U Q	46	46	43	41	38	40	46	48	52	56	61	62	62	61	61	61	59	55	54	56	58	54	48	47	
L Q	39	38	36	36	33	36	41	44	48	50	52	52	54	55	53	55	56	52	48	51	50	47	45	41	

APR. 2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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						
2									L	416	432	440	432	424	424	396								
3									L	L					L	L								
4							L		L	L						396		L						
5								L		L							L	L						
6								L	L							L	L	L						
7								L									L	L						
8							L	L								L	L							
9								L	L	L					L		L		L					
10									L	L						L	L	L	L					
11							L			L	L	L				L	L	L						
12								L		L		L			L		L	L	L					
13						L			R					L	L			L						
14							U	L	L							L	L							
15							2	6	8		420	432	440	440	428	428		384						
16							3	6	8	408	416	432			L	436		L						
17							L	L		L	L	L	440		L	L		388		L	L			
18							3	4	8	L	A	L	A	L	412	416		L	L		364	L	L	
19								L		392	A	L	L		428	420		368						
20						L	L	L	L	L	L	L	L		348		L	L						
21							L			L	L		432	440	436	412		388		L	L			
22							3	9	6	L	L		432	444		L	416							
23						L	L	L	L		436		L		436	436		L	L	L				
24							L	L		L	L	L		L	L	L		L	L					
25						L	L		404	404	428	428		L	428		400			L	L			
26							3	9	2	L	L	L	L	L	L		432	388						
27							A	A	L	L	L		448	L	L	444		L	L					
28							A	A	A	A	A	A	A	A	L	A		L	A	A	A			
29							A	A	A	A	A	A	A	A	L	L	A	L	L					
30								L	L	L	L	L	L	L	L	L		L	L					
31								L	L	A	L	L	L	L	L	L		L	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	6	10	13	13	15	13	16	16	8	11							
MED							348	394	404	420	432	436	440	432	426	406	384							
U Q							396	412	422	434	440	440	436	432	414	388								
L Q							368	396	414	428	428	430	428	416	396	364								

APR. 2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	236	240	284	300	304	316	316	288	A	276	260	200	A	B				
2						B	192	240	272	300	312	312	312	312	300	288	256	204	B	B				
3						B	204	244	276	312	312	312	A	312	300	272	252	228	A	A				
4						B	208	244	264	304	312	304	284	A	296	288	252	A	U	A	B			
5						204	204	264	288	308	300	328	336	324	304	284	244	188	A	A				
6					B	B	216	256	296	312	300	328	336	312	312	288	256	184	B	B				
7					B	B	212	248	276	296	300	316	336	328	320	284	240	196	B	B				
8					B	B	212	228	268	276	288	316	324	320	292	288	232	176	B	B				
9					B	B	212	228	264	276	328	328	328	324	300	284	U	A	B	B				
10					B	B	212	244	272	300	292	324	324	312	308	296	248	224	224	B				
11					B	B	204	244	284	296	308	308	312	292	324	288	252	A	228	B				
12					B	B	204	236	280	304	320	328	328	328	304	292	260	216	224	A				
13					B	B	224	240	272	288	320	316	312	336	304	284	260	196	B	B				
14					B	B	216	248	284	300	320	316	300	328	304	300	264	192	192	B	B			
15					B	B	204	252	284	316	324	332	340	328	312	276	260	220	B	B				
16					B	B	220	264	292	304	324	316	336	320	308	296	236	A	B	A				
17					B	B	224	256	288	312	316	324	336	320	308	280	260	212	B	B				
18					B	B	220	252	284	308	320	320	304	296	316	288	264	236	248	B				
19					B	A	224	236	280	300	308	308	324	316	316	284	268	232	188	B				
20					B		184	224	256	292	316	316	336	336	320	316	292	260	244	A	A			
21					184	176	220	264	284	320	320	320	292	312	312	288	268	224	176	A				
22					B		188	220	252	296	324	332	320	A	320	320	288	280	232	B	B			
23					220	180	224	264	292	312	324	324	336	316	316	292	276	244	A	B				
24					B		192	224	264	296	320	332	332	328	316	316	288	272	232	216	B			
25					B		172	224	268	296	304	320	348	328	296	304	304	272	216	176	188			
26					B	B	224	272	296	308	332	332	A	304	312	292	272	224	A	A				
27					B		244	224	268	292	316	316	316	316	304	304	268	224	B	B				
28					B		200	220	256	292	308	328	328	328	304	288	308	A	244	176	B			
29					B		172	232	268	296	324	324	332	344	300	272	280	284	232	192	200			
30					B	B	232	276	296	320	324	324	332	A	308	296	260	228	184	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	11	29	30	30	30	30	30	27	28	29	30	29	27	13	2				
MED					202	188	220	252	284	308	320	322	328	316	308	288	260	224	192	194				
U Q					204	224	264	292	316	324	328	336	322	316	292	268	232	224						
L Q					176	210	244	276	300	308	316	312	308	302	284	252	200	180						

APR. 2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	22	22	27	19	E B E B	J A								J 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	
2	E B	16	21	24	J A	J A	E B	23	28	30	32	J A	88	34	36	74	35	29	J A	27	19	16	16	16	16
3	E B	16	20	16	E B E B	E B	21	24	26	28	31	39	40	42	38	51	34	29	J A	J A	J A	J A	24	16	16
4	E B	16	16	16	E B E B	E B E B	E B	J A	G	21	27	32	38	J A	42	37	36	37	J A	30	36	J A	E B	21	21
5	E B	16	20	16	E B	E B	J A	16	20	26	29	33	48	J A	34	36	34	38	G			J A	19	26	19
6	E B	16	16	16	E B E B	E B E B	E B	E B	E B	24	29	G	34	J A	34	36	39	37	35	29	30	22	E B E B	E B	20
7	E B	16	16	16	E B E B	E B E B	E B	E B	E B	G	29	32	37	34	37	52	41	35	36	28	23	E B E B	E B E B	E B E B	E B E B
8	19	19	E B	16	21	15	16	22	27	31	33	34	34	J A	42	35	79	33	J A	J A	J A	E B E B	E B E B	E B E B	E B E B
9	E B	16	16	28	22	21	16	24	26	29	32	41	36	38	39	36			G	J A	31	23	16	16	16
10	E B	16	16	16	E B E B	E B E B	E B	E B	E B	26	31	32	53	J A	34	32	37	36	J A	40	31	J A	J A	E B E B	E B E B
11	21	16	16	16	16	16	16	23	30	33	34	36	35	36	35	35	33	28	J A	23	29	16	21	16	16
12	E B	16	16	16	E B	E B	J A	23	26	24	29	32	34	35	36	106	37	34	J A	J A	J A	J A	E B	19	19
13	E B	16	19	20	E B E B	E B E B	E B	26	29	32	J A	35	35	35	J A	37	42	56	33	G	J A	E B E B	E B E B	E B E B	E B E B
14	E B	16	16	16	E B	E B	J A	18	16	27	32	36	38	36	36	34	36	34	J A	34	28	24	20	E B	19
15	21	E B	16	16	16	16	18	25	30	34	37	42	40	J A	58	39	36	33	27	28	E B E B	E B E B	E B E B	E B E B	E B E B
16	E B	15	15	20	E B E B	E B E B	E B	28	32	36	39	38	38	37	37	203	45	J A	J A	J A	J A	E B	J A	23	29
17	E B	16	16	16	E B E B	E B E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	G				G	J A	E B E B	E B E B	E B E B	E B E B
18	E B	16	24	20	E B	J A	25	21	35	34	47	47	38	37	36	33	33	33	J A	30	24	G	24	24	22
19	E B	16	15	25	J A	J A	J A	28	31	J A	J A	J A	J A	J A	J A	44	39	96	40	36	J A	43	28	22	J A
20	26	22	22	19	E B	J A	20	33	32	J A	51	40	38	58	36	38	38	35	J A	J A	J A	J A	J A	J A	J A
21	21	20	21	21	J A	14	24	25	30	32	G	36	36	34	34	36	J A	J A	J A	J A	J A	J A	J A	J A	J A
22	E B	16	16	16	E B E B	E B E B	E B	24	30	32	J A	86	G	J A	J A	38	43	35	33	31	29	28	19	16	16
23	22	22	E B E B	E B	J A	J A	26	27	34	36	38	63	38	32	35	33	80	31	32	J A	J A	J A	E B	E B	E B
24	E B	16	16	16	E B E B	E B E B	E B	J A	J A	J A	J A	25	30	33	39	46	40	36	34	32	35	36	31	J A	29
25	E B	16	20	16	E B E B	E B E B	E B	J A	27	35	59	108	37	40	G	39	34	39	J A	28	26	25	23	23	22
26	E B	16	16	16	E B E B	E B E B	E B	J A	64	59	41	64	41	37	J A	98	36	G	39	J A	77	61	43	62	75
27	J A	J A	J A	J A	J A	E B	32	J A	52	71	54	63	57	50	64	64	77	34	37	J A	J A	J A	J A	J A	J A
28	J A	37	27	23	23	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
29	J A	23	E B E B	E B	J A	E B	16	22	29	33	36	66	63	67	81	44	51	33	G	G	J A	E B	J A	J A	J A
30	J A	63	48	25	36	J A	J A	J A	J A	J A	J A	J A	J A	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	E B	E B	E B	E B	E B	E B	20	26	30	33	38	38	37	37	37	35	33	29	26	22	18	19	18	E B	E B
U Q	21	21	22	22	J A	23	24	28	34	41	60	46	42	51	42	40	36	31	31	J A	J A	J A	J A	J A	J A
L Q	E B	E B	E B	E B	E B	E B	E B	24	29	32	34	35	36	36	35	33	31	27	23	E B	E B	E B	E B	E B	E B

APR. 2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

APR. 2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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

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

APR. 2021 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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

$\frac{H}{D}$	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	320	326	308	317	314	335	349	365	342	331	351	318	337	337	345	342	328	353	353	319	337	333	306	298			
2	298	308	294	313	313	333	373	357	342	342	347	346	323	323	334	333	359	358	346	328	329	311	301	300			
3	299	297	312	310	324	272	366	365	357	357	330	329	300	319	327	360	360	360	332	317	317	324	314	311			
4	296	288	285	F	F	F	F	361	360	340	356	343	353	336	342	348	334	334	362	343	329	326	322	319			
5	310	309	F	F	F	346	387	353	339	336	353	343	342	350	344	340	339	339	338	315	313	329	326	318			
6	288	295	294	320	F	314	368	359	320	332	356	339	329	329	333	342	342	341	331	319	327	327	345	303			
7	314	313	312	312	335	334	368	367	347	347	346	338	341	340	324	340	340	340	327	304	312	317	325	336			
8	314	297	297	345	345	344	344	341	331	326	353	319	336	352	343	343	343	342	342	327	318	315	330	313			
9	312	311	313	337	335	361	371	361	344	323	344	345	352	275	344	319	344	343	348	337	333	308	308	318			
10	318	318	311	311	343	342	339	372	355	355	355	354	367	332	340	342	346	364	350	322	310	323	306	305			
11	304	319	318	319	362	359	369	369	332	311	324	324	350	350	329	353	348	348	321	314	326	323	320	317			
12	307	311	307	314	344	344	363	352	321	337	346	G	315	330	329	327	337	331	331	331	324	346	317	291			
13	299	296	310	306	327	332	333	330	340	328		342	333	318	336	342	342	342	341	323	320	303	303	302			
14	301	314	322	340	357	357	359	355	321	333	343	345	346	346	318	331	341	345	342	313	311	308	313	312			
15	311	311	310	344	338	337	356	352	340	339	350	326	335	342	342	353	353	328	328	318	318	330	330	330			
16	329	313	313	312	331	370	365	362	362	336	322	327	318	339	352	352	340	339	338	300	300	329	326	298			
17	297	303	319	338	F	301	356	306	382	371	348	A	325	240	290	300	316	315	331	295	V	292	289	F			
18	290	288	323	299	293	330	347	335	302	323	273	326	289	328	336	335	339	323	320	297	287	314	325	306			
19	305	305	304	297	293	302	314		R	328	314	346	315	323	323	293	318	331	341	333	312	311	311	297			
20	Z	292	303	314	314	323	322	348	345	383	310	312	307	304	302	339	330	362	349	332	311	310	295	F			
21	F	290	322	307	306	311	320	351	300	296	314	343	308	323	323	323	350	349	348	335	312	280	291	F			
22	F	294	292	310	307	323	368	351	336	331	334	350	334	347	342	329	341	341	340	339	333	300	308	305	316		
23	F	309	309	287	F	286	359	331	349		G	322	330	335	335	335	308	334	334	334	333	313	313	318	309	314	
24	F	F	F	277	290	290	350	337	334	314	315	322	289	308	322	304	322	322	322	328	312	309	308	F	337		
25	301	282	331	353	315	314	345	324	305	338	326	304	271	329	304	314	314	352	341	289	298	295	287	F	279		
26	279	303	315	306	334	357		A	331	359	340	329	337	316	316	330	330	311	327	327	327	306	307	290	287		
27	300	319	318	318	317	334		A	A	A	A	306	314		A	309	307	330	329	320	320	A	285	294	317	288	
28	317	303	293	288	287		A	A	337		A	A	222		A	289	304	317	314	325	336	331	320	320	304	301	300
29	300	304	303	303	325	381	353	348	363	349	328	322	325	324	305	328	327	327	326	315	330	323	312	291			
30	288	280	280	280	314	347	349	345	342	323	324	308	287	318	318	314	339	328	327	323	317	316	299	306			
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	29	29	29	27	28	28	27	28	28	28	29	29	29	30	30	30	30	30	30	29	30	30	30	29			
MED	301	305	310	312	324	343	351	352	340	334	343	326	329	328	329	334	340	340	332	317	313	314	309	306			
U Q	312	313	314	320	336	357	366	362	351	341	348	340	339	340	340	342	344	348	341	324	326	323	321	316			
L Q	295	296	296	306	312	331	344	336	321	323	323	315	306	318	317	328	329	331	327	312	306	307	302	298			

APR. 2021 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	365	361	388	388	387	365	345	L	L						
2									L	363	375	L	375	374	L	L	403							
3									L	L	371	371	370	381	L	376	L							
4							L		L	L	376	394	375	362	359	378	L							
5								L	L	375	372	L	390	368	384	383	385	L	L					
6								L	L	374	L	393	L	374	371	L	L	L						
7								L	L	374	370	385	396	385	386	365	L	L						
8							L	L	L	360	382	384	380	366	L	386	L	L						
9								L	L	L	L	385	387	387	L	364	L	L	L					
10									L	380	376	L	L	L	410	L	L	L	L					
11							L		L	356	L	L	L	L	384	362	L	L	L					
12								L	L	378	L	413	L	377	L	396	L	L	L					
13						L			L	376	372	372	387	L	L	L	383	380	L					
14							U	L	L	354	L	358	375	374	373	399	367	L	L					
15								L	L	405	373	396	371	L	L	354	L	L						
16								L	L	L	L	L	L	L	L	L	L	L	L					
17							340	L	A	L	A	L	L	400	362	L	L	358	L	L				
18								L	L	366	A	L	L	L	383	380	L	392	L	L				
19						L	L	L	L	L	L	L	L	L	L	422	L	L						
20							L		L	L	L	L	L	L	L	L	L	L	L					
21								L	L	347	L	L	387	387	L	L	353	L	L					
22						L	L	L	L	L	L	L	L	L	399	368	L	L	L					
23								L	L	L	L	L	L	L	L	L	L	L	L					
24						L	L	352	372	385	396	L	L	387	L	L	355	L	L					
25						L	L	352	L	L	L	L	L	L	L	343	376	L	L					
26							A	A	L	L	L	363	L	L	359	L	L							
27							A	A	A	A	A	A	A	L	A	356	L	A	A	A				
28						A	A	A	A	A	A	A	A	L	L	A	L	L						
29								L	L	L	L	L	L	L	L	L	359	L	L					
30							L	L	A	L	L	L	L	L	L	L	L	L						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	6	10	13	13	15	13	16	16	8	11							
MED							340	353	374	372	376	387	375	385	368	366	376							
U Q								371	376	379	386	394	388	393	384	380	392							
L Q								352	366	366	372	376	369	378	363	349	359							

APR. 2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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									266	274	258	286	272	266	266	266	272	260							
2									266	268	248	248	282	294	266	266	246								
3									264	256	294	294	338	298	266	244	236								
4							224		300	266	264	268	280	280	276	258	258								
5								232	280	280	266	266	266	268	278	276	258	270							
6								268	312	282	264	288	310	302	288	270	246	246							
7								252	280	278	278	284	280	280	280	270	262								
8							254	246	286	308	262	296	282	264	270	262	262								
9								236	278	298	266	274	264	372	286	282	260	262							
10									256	256	260	270	244	284	276	264	254	242							
11							216		322	352	294	310	252	256	284	254	254	262							
12								254	328	302	296	318	302	308	296	270	258	258							
13						230			290	292	G	292	308	324	276	276	276	258							
14								236	338	302	302	296	280	284	318	280	256								
15								256	278	298	274	324	296	264	274	264	264								
16								244	274	288	318	306	304	280	266	266	276	238							
17							332	234	A	266	A	358	518	392	374	312	300	248	300						
18								306	372	330	326	322	364	282	282	282	266	280							
19						290	308	278	304	352	280	312	312	302	328	294	256								
20							258		366	360	308	374	366	290	286	246	246								
21								328	356	314	298	364	312	320	308	270	254	244							
22						214	248	248	310	286	270	274	266	282	290	266	266	254							
23								300	G	338	322	316	316	302	328	290	276	250							
24						282	250	312	332	330	346	412	354	316	356	312	292	286							
25						270	268	296	366	308	298	362	452	276	334	308	284	248	236						
26							A	280	254	282	292	286	330	318	272	292	304								
27							A	A	A	A			A	366	318	310	280	298	272	A					
28						A	A	A	A	A	A	A	A		384	338	314	314	274						
29								264	270	278	308	326	314	318	350	300	284	262	262						
30								270	270	220	334	340	314	380	336	342	314	286	288						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						5	10	20	26	28	28	29	28	30	30	30	30	21	4						
MED						270	256	260	288	295	294	306	306	300	287	276	263	258	267						
U Q						286	270	288	328	322	320	323	334	320	328	294	280	272	286						
L Q						222	248	245	270	278	266	285	280	280	276	266	256	247	249						

APR. 2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	244	240	250	252	208	234	234	234	210	210	204	204	204	188	216	208	212	232	232	232	232	226	256	256	
2	256	266	272	250	228	232	210	232	202	222	214	214	188	194	194	200	200	238	228	228	228	260	258	258	
3	252	266	254	264	232	248	210	214	202	224	224	222	196	202	222	224	206	238	242	250	238	230	230	252	
4	232	262	252	232	236	216	190	224	196	226	264	190	206	206	194	208	216	234	224	224	224	236	226	218	
5	250	256	270	276	238	216	202	202	202	200	200	200	190	192	186	200	202	212	236	240	236	232	244	254	
6	266	266	266	214	210	240	222	198	220	198	198	202	190	200	200	204	214	210	234	242	228	228	228	216	
7	260	252	256	236	228	246	214	208	210	210	200	200	194	194	200	210	212	240	254	260	254	238	222	218	
8	238	298	282	216	216	228	224	206	204	202	202	202	198	192	208	200	230	228	218	234	248	242	236	248	
9	264	274	258	230	228	216	218	198	198	202	202	194	192	190	198	192	202	216	232	232	232	248	230	242	
10	242	276	274	244	220	234	216	222	208	202	210	196	228	196	180	194	208	208	232	228	258	250	250	268	
11	258	252	254	240	200	220	170	230	210	220	206	200	188	198	192	218	226	214	240	254	242	236	236	246	
12	256	262	260	226	212	242	226	212	216	208	198	190	200	194	204	194	200	224	238	236	218	236	244	274	
13	258	262	250	246	222	200	230	236	220	208	200	194	184	196	188	220	214	222	236	236	240	248	248	278	
14	278	256	238	220	196	212	232	206	246	232	214	208	198	186	190	212	212	226	228	246	248	264	238	236	
15	266	256	256	224	212	238	228	216	226	204	226	220	192	192	196	238	202	266	242	242	240	226	226	230	
16	242	270	270	252	216	202	220	208	216	216	198	198	216	188	198	216	202	196	240	274	258	228	238	278	
17	278	270	244	196	272	228	264	208	A	A	A	228	198	206	202	200	222	204	238	240	246	270	246	254	
18	266	266	234	246	274	244	264	238	236	A	204	204	204	196	196	196	206	218	274	256	262	246	224	248	
19	268	260	280	276	260	236	210	202	196	210	214	200	208	208	202	226	204	238	250	260	260	232	244	278	
20	278	278	254	242	242	246	214	228	210	202	210	200	210	200	202	222	208	196	232	266	256	268	254	254	
21	264	260	264	256	256	254	244	206	212	198	198	206	194	186	196	204	214	196	242	252	260	260	260	260	
22	260	260	248	228	224	202	196	196	218	202	202	202	202	192	196	190	204	222	244	244	256	256	246	246	
23	246	238	254	254	254	234	238	226	200	222	202	210	192	186	192	206	200	174	246	250	250	228	246	234	
24	274	254	260	240	242	230	208	232	220	212	194	188	208	196	198	232	246	236	246	262	242	242	242	244	
25	278	278	238	204	234	206	214	208	A	198	216	200	200	204	200	204	206	220	202	294	260	256	280	292	
26	270	242	242	266	248	230	A	A	232	212	198	200	224	226	194	212	A	274	264	248	246	282	280	280	
27	260	244	244	258	258	236	A	A	A	A	A	A	A	A	A	206	216	238	A	A	278	270	270	284	
28	284	264	268	256	256	A	A	A	A	A	A	A	A	A	206	198	A	198	216	256	252	252	238	248	260
29	260	260	272	260	238	218	236	206	208	210	196	226	202	200	200	230	210	210	210	256	236	236	266	248	
30	288	270	276	260	260	238	224	224	A	190	198	206	200	206	190	210	198	222	256	242	242	256	274	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	30	30	30	30	30	29	27	27	25	26	27	28	28	30	29	29	29	29	29	29	30	30	30	30	
MED	260	262	256	245	233	232	220	212	210	209	202	201	199	196	198	208	208	222	238	246	246	242	245	254	
U Q	270	270	270	256	254	239	232	228	220	216	214	207	205	204	201	219	214	235	246	256	256	256	256	268	
L Q	252	256	250	228	216	216	210	206	202	202	198	199	192	192	193	200	202	210	232	236	236	232	236	244	

APR. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	118	106	94	100	96	96	96	96	A	102	102	102	A	B				
2						B	126	116	96	96	96	102	102	102	94	94	104	104	B	B				
3						B	90	106	106	106	104	104	A	92	94	102	92	92	A	A				
4						B	102	102	102	102	102	102	96	A	96	96	96	A	118	B				
5						B	104	104	100	100	100	98	104	104	104	104	104	92	A	A				
6					B	B	92	98	98	98	98	98	100	102	98	98	92	92	B	B				
7					B	B	108	98	98	98	98	98	98	96	96	98	90	90	B	B				
8					B	B	96	92	100	100	100	100	100	96	94	98	98	100	B	B				
9					B	B	112	102	92	92	104	106	96	96	96	96	96	108	B	B				
10					B	B	108	108	100	100	100	98	98	98	98	98	104	104	B	B				
11					B	B	102	102	102	90	94	102	98	98	104	104	104	A	84	B				
12					B	B	106	96	96	96	96	106	94	100	100	108	104	104	100	A				
13					B	B	112	94	104	92	100	100	100	100	100	100	102	102	B	B				
14					B	B	102	102	102	96	96	96	96	98	98	98	98	100	B	B				
15					B	B	98	98	98	98	98	98	98	98	106	98	108	108	B	B				
16					B	B	104	104	98	98	98	98	98	98	98	98	98	A	B	A				
17					B	B	110	110	96	96	96	96	96	96	98	98	110	96	B	B				
18					B	B	114	98	98	98	98	98	98	98	98	98	108	108	120	B				
19					B	A	102	100	100	100	98	88	88	96	96	96	96	96	108	B				
20					B	B	108	108	96	100	100	100	96	102	102	102	102	98	98	A	A			
21					B	B	112	104	104	96	96	96	96	96	96	96	96	96	108	A				
22					B	B	100	100	100	100	100	100	100	A	100	100	104	104	104	B	B			
23					98	110	110	106	106	100	100	100	100	100	100	98	98	92	A	B				
24					B	B	104	104	94	94	100	100	100	100	100	94	94	94	94	B				
25					B	B	102	102	102	102	102	102	102	106	106	98	98	98	94	94	84			
26					B	B	98	98	98	100	100	100	98	98	98	98	104	104	A	A				
27					B	B	116	104	104	104	98	98	98	98	98	98	98	98	B	B				
28					B	B	114	102	102	102	102	102	98	98	98	92	92	A	92	96	B			
29					B	B	96	96	96	92	96	96	96	96	96	96	110	110	110	110				
30					B	B	102	102	102	102	102	102	102	A	102	102	96	106	B	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	9	29	30	30	30	30	30	28	28	29	30	29	27	10	2				
MED					98	108	104	102	100	99	99	98	98	98	98	98	98	100	104	97				
U Q					113	109	104	102	100	100	102	100	100	100	100	102	104	104	110					
L Q					102	101	98	96	96	96	98	96	96	96	96	96	96	94	94					

APR. 2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	104	100	98	98	B	B	158	132	120	116	114	110	110	98	98	116	124	158	96	B	B	B	B	B	
2	B	100	100	100	100	B	160	164	154	134	116	104	162	88	110	110	110	94	B	B	B	B	B	B	
3	B	94	B	B	96	94	88	148	140	118	112	106	102	96	96	110	92	92	92	92	B	B	B	B	
4	B	B	B	B	B	98	132	148	124	108	108	102	102	102	94	120	100	100	150	B	114	114	B	B	
5	B	96	B	96	B	102	128	134	110	114	110	172	108	96	G	106	150	124	88	96	94	B	B	B	
6	B	B	B	B	B	B	140	126	124	122	106	168	174	118	104	110	110	142	B	B	106	B	B	B	
7	B	B	B	B	B	B	G	166	152	108	108	108	114	104	112	112	112	138	B	B	B	B	B	B	
8	98	98	B	98	B	B	152	136	146	104	100	132	102	100	92	112	112	164	B	B	B	B	B	B	
9	B	B	96	98	98	B	160	144	144	116	110	106	102	102	100	G	100	134	B	B	B	B	B	B	
10	B	B	B	B	B	B	168	150	140	98	116	108	176	114	98	110	102	102	124	B	B	B	B	100	
11	100	B	B	B	B	B	150	142	150	130	120	124	108	108	108	174	110	110	118	B	90	B	B	B	
12	B	B	B	B	90	96	170	150	152	134	130	188	118	118	150	100	98	98	92	B	100	92	92	92	
13	B	124	118	B	B	B	168	148	136	148	108	116	100	100	90	92	G	114	B	B	B	B	B	B	
14	B	B	B	B	100	B	152	140	138	126	112	104	98	98	94	110	120	134	140	B	92	114	114	114	
15	96	B	B	B	B	144	132	148	120	120	118	114	106	102	174	168	112	170	B	B	B	B	B	B	
16	B	B	118	B	B	B	144	144	124	124	114	118	178	96	104	112	104	114	B	116	120	108	112	112	
17	B	B	B	B	120	B	104	108	120	116	116	104	104	104	G	104	G	102	B	B	B	102	102	B	
18	B	102	126	B	98	124	112	116	116	116	116	116	116	106	94	100	186	128	G	114	114	114	B	B	
19	B	B	92	104	114	112	104	104	150	132	122	98	132	98	92	102	98	162	128	100	92	110	98	98	
20	92	92	92	92	B	92	100	122	108	118	118	118	126	126	112	104	104	92	92	92	110	100	B	100	
21	96	98	98	96	118	118	142	118	110	G	104	104	94	94	96	104	100	100	90	90	96	B	B	96	
22	B	B	B	B	B	98	134	150	126	94	G	94	102	96	110	136	126	126	B	B	B	B	B	94	
23	100	96	B	B	96	96	150	122	122	120	94	110	96	106	106	106	152	122	116	108	108	B	98	B	
24	B	B	B	B	106	120	130	126	114	106	106	96	156	104	108	144	122	116	116	88	B	102	102	102	
25	B	102	B	B	B	128	128	112	112	112	102	102	G	102	124	96	112	162	90	90	92	108	108	108	
26	B	B	B	118	126	118	112	112	118	108	108	102	116	104	G	138	120	108	108	108	108	108	108	96	
27	96	90	90	118	B	130	112	112	112	106	106	100	100	108	108	148	130	118	118	116	118	118	116	102	
28	102	102	98	98	122	118	118	110	110	110	106	106	106	106	120	108	88	88	126	118	110	100	96	B	
29	96	B	B	98	B	148	120	124	124	114	114	104	104	104	104	184	G	G	146	112	B	122	108	104	
30	104	122	100	112	112	116	116	124	116	110	110	110	98	98	122	122	G	148	128	110	98	98	98	90	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	11	14	12	13	13	18	29	30	30	29	29	30	29	30	27	29	26	29	19	15	17	15	13	14	
MED	98	99	98	98	100	117	132	133	124	116	110	107	106	102	104	110	111	118	116	108	106	108	102	100	
U Q	102	102	109	108	116	124	152	148	140	123	116	116	122	106	112	129	122	140	128	114	112	114	110	104	
L Q	96	96	94	97	97	98	114	118	116	108	107	104	102	98	96	104	100	101	92	92	93	100	98	96	

APR. 2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	F1	F2	F4	F1			H2	C2	C2	C2	C2	C2	C2	C2	L2	CL22	CL21	HL21	L2						
2		F1	F2	F2	F1		H2	H2	HL21	C2	C2	C2	H1	LC11	C1	CL21	CL22	LC21							
3		F1			F1	L2	LC21	HL21	H2	C2	C2	C3	L3	L3	LC21	C2	LC21	LC21	L2	L1					
4					L1	C2	H2	CL21	C2	C2	C2	CL21	L2	L3	C2	CL22	L3	L2	H2		F1	F1			
5		F2		F1	L1	C2	CL21	C2	C2	C1	HL11	C2	C1		C2	H2	C1	L2	L1	F1	F1				
6						H2	C2	C2	C2	C2	H1	H1	C1	C1	C1	C2	H2				F1				
7							HL21	HL21	C2	C2	C2	C2	C2	C2	C1	C2	C2	C2							
8	FF11	F1		F1		H2	H2	H2	C2	C2	C2	C2	L2	LC22	C2	C2	H2								
9			F3	F2	L1		HL11	C1	C2	C2	C2	C2	C2	LC21	LC11		LC21	CL11							
10							HL21	HL22	HL22	LC21	CL11	CL11	HL11	C1	C1	C1	L2	LC11	C1					F1	
11	F1					H2	HL22	HL21	HL21	CL21	CL21	CL21	C1	C1	H1	HL11	L2	L3	C1		F2				
12					L1	L1	H1	HL11	HL11	CL11	CL11	HL11	C1	C1	HL22	LC11	LC11	LC31	L1		F1	F1	F2	F1	
13		F1	F1			H1	H2	H1	HL11	C1	CL11	C1	C2	C2	C2		C2								
14					L1	H2	H2	H2	C2	C2	C2	C2	C2	C2	CL21	C2	C2	C2	H1		F1	F1	F1	F1	
15	F1				H1	C2	H2	C2	C2	C2	C2	C2	LC11	HL11	C1	C2	H1								
16			F1			H2	H2	C2	C2	C1	C1	HL11	C1	C1	C2	C2	L1		L1	F3	F3	F1	F1		
17					C1	LC11	LC22	CL31	CL31	C3	C2	C1	C1		C2		LC11					FC41	F2		
18		F1	F1		L1	C1	C4	C3	C3	C2	C1	C2	C1	C1	LC11	C2	HL11	C2	L1	F1	F1				
19			F1	F1	L1	C2	C2	C2	HL11	C1	C1	C2	CL11	LC21	C2	L2	LC21	HL11	CL21	LL11	F1	F4	F3	F4	
20	F2	F2	F1	F1	L1	LC11	C3	C1	C1	C1	C1	C1	C1	C2	C2	C2	C3	L3	L3	F2	F1			F1	
21	F2	F2	F2	F1	L1	C3	HL21	CL21	C1		C2	C2	C2	LC21	LC21	LC11	LC11	LC11	L1	F1				F1	
22					L1	H1	H2	C1	C1		C1	L2	LC21	CL11	CL11	CL11	CL21							F1	
23	F1	F1			LC11	LC11	H1	C2	C2	LC11	C1	CL11	C1	C1	C1	HL22	CL22	C3	L3	F3		F2			
24					L1	C2	C2	C2	C1	C2	C1	HL11	C1	C1	H2	C3	CL22	CL11	L1		F1	F1	F1		
25		F1			C2	C2	C3	C3	C2	C1	C2		C1	CL22	LC21	C2	H1	LC21	C2	F1	F1	F1	F1		
26			F1		C1	C3	C4	C4	C3	C2	C2	C2	C2		C2	C5	C3	L1	L3	FF31	F3	FF31	F4		
27	F6	F4	F2	F3		C2	C5	C3	C3	C3	C2	C3	C2	C2	C1	C3	C7	C8	L4	F5	F3	F6	F8		
28	F6	F3	F2	F2		C5	C5	C3	C3	C2	C4	C3	C2	C3	C4	C5	LC21	C5	L3	F3	F2	F2			
29	F1			F1		H2	C2	C2	C3	C2	C2	C2	C2	C2	C1			H2	C1		F1	F3	F2		
30	F2	F1	FQ21	FQ41	LQ21	C3	C3	C3	C2	C2	C2	C2	C2	L2	C1	C1		H2	C3	LL32	F5	F3	F4	F3	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

APR. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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	X 48	X 49	X 50	X 46	X 40	X 41														X 66	X 49	X 45	X 42	X 42	
2	X 44	X 45	X 46	X 45	X 40	X 39															X 64	X 50	X 45	X 45	X 48
3	X 45	X 47	X 47	X 47	X 41	X 41															X 65	X 54	X 48	X 45	X 46
4	X 47	X 48	X 50	X 46	X 38	X 33															X 64	X 58	X 48	X 39	X 37
5	X 40	X 40	X 42	X 40	X 34	X 33															X 70	X 68	X 64	X 50	X 45
6	X 44	X 44	X 44	X 43	X 31	X 34															X 76	X 76	X 52	X 43	X 41
7	X 40	X 40	X 39	X 39	X 32	X 32															X 69	X 66	X 60	X 57	X 51
8	X 45	X 42	X 41	X 46	X 46	X 33															X 68	X 62	X 52	X 49	X 48
9	X 50	X 45	X 46	X 44	X 32	X 34															X 68	X 62	X 47	X 47	X 46
10	X 45	X 45	X 44	X 44	X 35	X 33															X 53	X 50	X 46	X 46	X 44
11	X 44	X 44	X 44	X 44	X 34	X 34															X 68	X 60	X 48	X 48	X 48
12	X 48	X 47	X 45	X 45	X 38	X 38															X 68	X 53	X 48	X 48	X 46
13	X 45	X 45	X 43	X 47	X 33	X 35															X 62	X 54	X 49	X 49	X 49
14	X 46	X 47	X 47	X 49	X 30	X 36															X 63	X 63	X 56	X 55	X 54
15	X 50	X 49	X 47	X 45	X 38	X 39															X 79	X 82	X 48	X 37	X 40
16	X 42	X 42	X 41	X 40	X 39	X 44													X	X 62	X 68	X 67	X 62	X 60	X 54
17	X 55	X 53	X 53	X 39	A	X 40															X 67	X 65	X 50	X 50	X 51
18	X 52	X 50	X 52	X 38	X 37	X 41															X 72	X 66	X 56	X 47	X 44
19	X 45	X 42	X 41	X 39	X 39	X 39															X 66	X 66	X 57	X 55	X 50
20	X 46	X 48	X 46	X 44	X 43	X 46															X 60	X 60	X 54	X 52	X 54
21	X 51	X 49	X 48	X 41	X 38	X 42															X 62	X 64	X 59	X 59	X 57
22	X 56	X 55	X 52	X 46	X 35	X 41															X 63	X 61	X 56	X 54	X 52
23	X 50	X 50	X 46	X 42	X 38	X 38															X 72	X 63	X 50	X 48	X 48
24	X 47	X 43	X 40	X 38	X 37	X 40															X 76	X 67	X 51	X 51	X 50
25	X 47	X 48	X 49	X 38	X 34	X 42															X 63	X 59	X 58	X 58	X 56
26	X 54	X 54	X 54	X 48	X 42	X 46															X 97	X 79	X 45	A	A
27	X 52	X 52	X 40	X 35	X 34	X 43															X 76	X 76	X 66	X 61	X 60
28	X 60	X 58	X 58	X 45	X 44																X 60	X 61	X 54	X 48	X 48
29	X 47	X 45	X 43	X 43	X 39																X 72	X 60	X 52	X 52	X 52
30	X 50	X 50	X 45	X 44	X 42																X 76	X 69	X 59	X 63	X 58
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	29	27													1	30	30	30	29	29	
MED	X 47	X 47	X 46	X 44	X 38	X 39													X 62	X 68	X 62	X 52	X 49	X 48	
U Q	X 50	X 50	X 49	X 46	X 40	X 41														X 72	X 67	X 57	X 55	X 53	
L Q	X 45	X 44	X 43	X 40	X 34	X 34														X 63	X 59	X 48	X 46	X 46	

APR. 2021 f_{XI} (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 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

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	43	44	40	34	35	48	56	61	62	66	70	77	66	63	64	69	77	76	60	43	39	36	36	
2	38	39	40	39	34	33	48	50	59	63	71	70	75	74	70	68	56	58	64	58	44	39	39	F	
3	39	F	41	41	F	F	43	50	58	62	62	67	69	78	79	75	65	60	59	59	48	41	39	40	
4	41	F	F	F	F	27	45	48	57	60	60	66	67	74	77	85	79	64	61	58	53	42	33	31	
5	F	F	F	F	28	27	41	46	56	66	62	59	64	64	65	59	58	54	55	64	62	58	44	39	
6	38	38	F	37	25	28	44	51	59	64	60	63	63	67	65	63	59	58	60	70	70	46	37	35	
7	34	34	33	33	26	26	44	50	53	63	62	63	64	64	62	61	56	56	56	63	60	54	51	45	
8	39	36	35	40	40	27	47	52	62	72	63	74	82	83	64	62	62	57	59	62	55	46	43	42	
9	F	39	F	37	26	28	45	51	59	62	55	60	61	63	61	60	67	61	61	62	56	41	41	40	
10	39	39	38	38	29	27	47	55	58	64	72	72	65	64	57	67	65	60	53	47	44	40	40	38	
11	38	38	38	38	28	28	41	50	54	56	71	88	94	81	64	58	59	58	65	62	54	42	42	42	
12	42	41	39	39	32	32	43	52	55	60	56	55	59	59	60	70	78	67	62	62	47	42	42	40	
13	39	39	37	41	27	29	45	48	48	52	60	68	71	66	69	72	64	55	56	56	48	43	43	43	
14	40	41	41	43	24	30	44	50	50	57	67	70	66	58	57	64	62	59	56	57	57	50	49	48	
15	44	43	41	39	32	33	48	56	61	59	59	66	69	74	84	70	68	70	70	73	76	42	31	34	
16	36	36	35	34	33	38	55	54	56	61	66	69	77	74	64	67	70	62	56	62	61	56	F	48	
17	49	47	47	33	A	34	49	69	53	58	53	61	V	79	64	67	62	60	61	54	61	58	44	44	45
18	46	44	46	32	31	35	51	53	52	52	52	60	73	73	60	52	50	50	56	66	60	50	41	38	
19	39	36	35	33	33	33	56	66	70	58	72	74	60	69	67	67	71	55	59	60	60	51	49	44	
20	40	42	40	38	37	40	48	59	58	63	70	67	69	83	71	64	67	67	60	54	54	48	46	48	
21	45	43	42	35	32	37	48	56	60	68	78	64	64	64	73	76	61	55	50	56	58	53	53	51	
22	50	49	46	40	29	35	46	47	60	68	75	70	63	61	65	72	64	57	53	57	55	50	48	46	
23	44	44	40	36	32	32	47	51	54	60	67	67	70	71	77	70	66	63	67	66	57	44	42	42	
24	41	37	34	32	31	34	46	52	66	66	57	60	66	80	74	72	76	72	77	70	61	45	45	44	
25	41	F	F	32	28	36	48	55	56	61	64	60	56	78	92	74	84	83	71	57	53	52	52	50	
26	48	48	48	42	36	40	66	59	A	A	60	59	66	65	82	71	66	72	83	91	73	39	A	A	
27	F	46	34	29	28	37	57	59	54	61	64	67	77	86	94	72	67	A	61	70	70	60	F	F	
28	F	F	F	39	38	45	46	A	A	A	A	58	65	A	67	80	81	73	58	54	55	48	42	42	
29	41	39	37	37	33	44	47	52	48	56	54	57	63	67	A	A	90	87	79	66	54	46	F	46	
30	44	44	39	38	36	40	53	56	53	53	A	56	66	70	75	75	73	68	67	70	63	53	F	52	
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	25	24	28	27	29	30	29	28	28	28	30	30	29	29	29	30	29	30	30	30	30	25	27	
MED	41	41	40	38	32	33	47	52	56	61	62	66	66	69	67	68	66	61	60	62	56	46	42	42	
U Q	44	44	42	40	34	37	48	56	60	64	68	70	73	76	76	72	71	69	67	66	61	51	47	46	
L Q	39	38	36	34	28	28	45	50	54	58	60	60	64	64	64	62	61	57	56	57	53	42	40	39	

APR. 2021 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 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									L			U L	A			L	L								
2									L	L						L									
3																		L							
4									L								A	A							
5									L									L							
6									L	L							L	L	L						
7									L								L	L	L						
8									L								U L	L							
9									L	L							U L	L	L						
10									L	L							U L	L							
11									U L							A	U L	L	L						
12									A								U L	L	L						
13									A								L								
14									L	L							L	L							
15									L	L							L	L							
16									A	L							L	L							
17								A	A	A	A	A	A	U L	A		L	L	A						
18									L								A								
19								L	L	L	L						U L	A	A						
20								L	L	U L	L						U L	A	A						
21								L	L	U L	L	A					A	L	L	A					
22																			A	A					
23									A	A	A	A					A	L	A						
24								L	A	A	A						A	A							
25								L	L																
26																	A	L	A	A	A				
27									A	A	A	A	A	A			A	A	A						
28									A	A	A	A	A	A			U L	L							
29									A	A	A	A	A	A			A	A	A	A					
30									A	A	A	A						L	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	1	4	20	20	25	20	24	22	21	6								
MED							228	304	412	434	442	448	448	452	438	424	400								
U Q									426	444	444	458	456	456	440	432	404								
L Q									408	428	434	436	444	444	432	422	392								

APR. 2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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 228	A 276	A 308	A	R	A	A	A 320	R	A	A 228	R	B					
2							B 228	A 312	A	A	A 352	R	A 360	A	A 308	R	A	A	B					
3							B 240	A 288	A 304	A	A	A 340	R	A	A 308	R	A 264	A 220	B					
4							B 248	A 288	A	A	A	A	A	A	A	A	A	A	B					
5							U 208	R 272	R	A	A	A	A	A	A	A 304	R 264	R 236	R	B				
6							U 192	A 248	A 288	A	A	A	A 372	R	A 336	R 320	R	A	R	B				
7							U 200	R 272	R	A	A	A	A	A 384	R 344	R	A	A 268	A 228	B				
8							U 204	R 264	R	A	A	A	A	A	A 348	R 324	R	A 312	A 276	A	B			
9							U 192	A 256	R	A	A 344	R 348	R	A 344	A 316	R 308	R	A 204	A	B				
10							U 204	A 256	A 292	A	A	A 340	R 352	R 348	R	A	A	A 276	R 228	B				
11							U 208	A 248	A 296	A	A	A	A 328	R 328	R	A	A	A	A	B				
12							U 192	A 252	A 296	A 320	A	A	A 328	R	A 320	R	A 304	A 216	B					
13							U 200	A 252	A 292	A	A	A	A	A	A	A	A	A 276	A 212	B				
14							A 264	A 288	R	A	A	A 348	R 356	R	A	A	R 308	A 276	A 224	B				
15							U 212	A 284	A 312	A	A	A	R	A	A	R	A 300	A 280	A 224	B				
16							U 212	A 292	R	A	A	A	A	A	A 336	R 296	R	A	A					
17							U 220	A 276	A 292	A	A	A	A	A	A	A	A	A	A	B				
18							U 204	A	A	A	A	A	A 352	R 356	R	A 312	R	A 212	B					
19							U 200	A 300	R	A	A 336	R	A 360	R	A 332	R	A 288	A 232	B					
20							U 208	A 268	A	A	A	A	A	A	A	A	A	A 284	A 220	B				
21							U 216	A 260	A	A	A	A 372	R	A 360	R 324	R 332	R 276	R 252	B					
22							U 232	R 276	R	A	A 332	R	A 352	R 336	R	A 312	R 280	A	B					
23							U 220	A	A	A	A	A 380	R	A	A	R	A 280	A	B					
24							A	A	A	A	A	A	A	A 356	A 340	R	A	A	A	B				
25							A 264	A	A	A	R	A	A 360	R	A 340	R 324	R 300	R 248	B					
26							A	A	A	A	A	A	A	A 344	R	A	A	A	B					
27							A	A	A	B	A	A	A	A	A	A	A	A	B					
28						B	A 268	A 300	A	A	A	A	A	A	A	A	A 268	A	B					
29						B	A 268	A	A	A	A	A	A	A	A	A	A	A	B					
30						B	A	A	A	A	A	A	A	A	A	A 292	R 288	R 248	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							18	21	16	4	3	7	9	11	11	15	16	17						
MED							U	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
U Q							206	260	292	310	336	348	352	348	336	308	276	224						
L Q							U	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
							212	268	296	316	344	372	360	360	340	312	282	234						
							U	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
							200	248	288	306	332	340	346	336	324	304	272	216						

APR. 2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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 16	E 16	E 15	E 16	E 16	E 16	22	28	31	33	G	38	37	37	G	30	30	G	17	31	E 16	E 16	E 16	E 16	
2	E 16	E 16	E 16	E 16	E 16	E 16	21	28	G	33	34	G	36	G	35	G	30	23	18	E 16	19	17	E 16	E 16	
3	E 16	E 16	E 16	E 16	E 16	E 16	23	28	32	34	36	G	G	36	32	G	G	G	18	18	16	19	20	E 16	E 16
4	E 16	E 16	E 16	E 16	E 16	E 16	17	28	31	33	34	36	37	37	32	39	47	36	38	19	E 16	E 16	E 16	E 16	
5	E 16	20	E 16	E 16	E 16	E 17	G	G	32	34	35	38	47	34	32	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
6	E 16	E 16	E 16	E 16	E 16	E 16	22	27	32	33	34	34	G	34	G	G	31	G	E 16	E 16	E 16	E 16	E 16	E 16	
7	E 16	E 16	E 16	E 16	E 16	E 16	G	G	31	32	36	38	44	G	G	G	G	G	E 17	15	16	16	16	16	
8	E 17	E 16	E 16	E 16	E 16	E 16	22	G	30	34	36	36	35	38	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
9	E 16	E 16	E 16	E 16	E 15	E 15	23	28	32	34	G	G	36	G	G	G	G	24	25	E 16	E 16	E 16	E 16	E 16	
10	E 16	E 17	E 15	E 15	E 15	E 15	23	28	33	35	36	G	G	38	38	31	G	G	E 15	E 16	20	20	E 16	E 16	
11	E 16	E 16	E 16	E 15	E 15	E 15	24	30	34	36	36	36	36	36	37	36	30	24	E 16	E 16	E 16	E 16	E 16	19	
12	E 16	E 16	E 16	E 16	E 16	E 16	25	30	33	36	35	36	36	G	36	G	32	G	E 16	E 16	21	E 16	E 16	E 16	
13	E 16	E 16	E 16	E 16	E 16	E 16	26	33	36	39	42	44	43	38	36	31	G	22	18	15	16	E 16	E 16	E 16	
14	E 16	E 16	E 16	E 16	E 16	E 15	26	31	34	34	37	G	G	37	G	33	G	23	18	E 16	E 16	E 16	E 16	E 16	
15	E 16	E 16	E 16	E 15	E 16	E 16	23	28	33	34	35	G	44	36	G	G	G	26	20	E 16	E 16	20	E 16	E 16	
16	E 16	E 16	E 16	E 16	E 16	E 16	25	32	35	35	38	38	41	34	G	34	31	25	31	15	15	16	21	E 16	
17	E 16	E 16	E 16	E 16	E 16	E 17	26	29	49	46	45	42	38	35	45	32	30	25	40	20	E 16	E 16	E 16	E 16	
18	E 15	E 16	E 17	E 15	E 16	E 16	22	28	30	32	40	35	G	G	35	G	G	G	E 18	E 17	E 16	E 16	E 16	E 16	
19	E 16	E 16	E 16	E 16	E 16	E 16	22	26	G	G	36	G	G	39	38	G	G	28	19	E 16	20	20	20	E 16	
20	E 16	E 17	E 16	E 16	E 16	E 16	24	30	33	36	36	37	40	37	35	35	34	35	18	18	18	21	E 16	E 16	
21	E 21	E 16	E 16	E 17	E 17	E 17	24	29	33	34	45	G	40	G	G	G	G	G	E 20	E 16	E 16	E 16	E 16	E 16	
22	E 16	E 17	E 16	E 16	E 17	E 16	G	G	32	34	G	35	G	G	G	G	G	31	34	28	15	E 16	E 16	E 16	
23	E 16	E 15	E 16	E 16	E 16	E 16	26	31	38	42	44	G	39	35	G	G	34	29	22	23	38	20	E 16	24	
24	E 16	E 16	E 15	E 16	E 16	E 16	28	40	48	47	39	40	42	40	40	42	42	49	21	E 16	20	E 16	E 16	E 16	
25	E 16	E 16	E 16	E 16	E 16	E 16	24	33	35	35	G	37	G	G	G	G	G	G	E 15	E 28	15	15	E 16	E 16	
26	E 21	E 20	E 16	E 16	E 16	E 21	26	44	A 83	AA 116	44	38	38	39	38	36	46	46	42	46	60	18	A 63	AA 68	
27	E 20	E 19	E 16	E 16	E 16	E 20	45	45	38	E 35	49	50	50	45	35	35	36	A 85	A 31	21	26	26	28	E 16	
28	E 16	E 23	E 21	E 20	E 16	E 18	27	A 53	AA 60	AA 81	AA 146	44	44	89	35	33	G	G	19	24	26	35	23	E 16	
29	E 16	E 16	E 16	E 16	E 16	E 16	25	35	41	50	44	45	39	56	105	96	78	64	51	24	E 16	E 16	20	E 16	
30	E 16	E 16	E 16	E 16	E 16	E 18	35	42	42	40	A 70	39	41	45	45	G	G	G	21	28	24	24	E 16	E 16	
31																									
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E 16	E 16	E 16	E 16	E 16	E 16	24	29	33	34	36	36	38	36	34	G	29	24	18	E 16	E 16	E 16	E 16	E 16	
U Q	E 16	E 16	E 16	E 16	E 16	E 16	26	33	38	39	44	38	41	38	37	34	34	29	22	23	20	20	E 16	E 16	
L Q	E 16	E 16	E 16	E 16	E 16	E 16	22	28	32	34	35	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	

IONOSPHERIC DATA STATION Kokubunji

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

APR. 2021 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 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	309	299	319	321	311	330	373	383	370	343	340	323	339	330	347	335	340	333	345	360	325	314	312	312		
2	299	324	314	333	337	322	404	369	353	358	352	342	344	348	340	368	334	353	360	359	339	313	305	F		
3	294	F	315	350	F	F	375	364	355	364	350	336	329	324	337	357	344	367	359	362	377	325	310	284		
4	307	F	F	F	F		331	369	376	371	359	358	329	332	322	332	327	349	351	360	344	350	368	328	325	
5	F	F	F	F			330	344	381	378	374	377	368	341	343	339	352	354	348	347	341	330	347	358	331	294
6	300	304	F	348	324	324	388	354	357	365	335	330	321	334	342	351	353	339	330	335	363	357	310	313		
7	320	315	322	362	377	325	362	375	351	370	356	361	346	349	338	356	333	340	334	314	314	330	306	326		
8	327	304	297	351	387	327	361	362	345	344	328	315	327	354	356	340	341	339	342	341	334	329	299	288		
9	F	305	F	336	287	334	372	364	365	383	350	338	346	335	340	338	351	346	347	341	354	316	295	307		
10	310	310	320	363	352	329	363	362	351	361	363	363	358	347	324	345	354	369	356	334	319	307	308	314		
11	309	316	341	378	348	323	379	358	340	328	309	323	346	360	360	338	340	335	340	348	363	296	300	311		
12	300	304	323	343	368	328	378	385	367	355	369	344	332	333	328	329	347	359	343	343	341	308	303	317		
13	307	308	321	368	337	314	371	375	353	327	335	329	336	337	335	341	360	367	360	344	318	301	301	301		
14	312	306	341	389	319	337	372	367	357	328	352	349	359	320	327	337	346	346	356	325	328	307	310	308		
15	314	317	333	348	320	319	353	362	367	345	343	333	329	318	341	347	326	335	335	336	358	403	303	312		
16	306	309	316	324	335	341	366	377	348	354	343	336	350	347	335	340	346	344	326	315	305	327	F	298		
17	286	299	352	399	A	332	338	394	366	335	309	295	281	V	290	328	319	330	333	316	317	338	321	289	283	
18	307	298	345	303	289	326	346	352	368	331	300	317	322	339	364	350	349	312	326	336	342	317	301	308		
19	306	299	310	318	295	303	341	354	367	315	339	356	330	341	344	340	349	342	329	325	332	296	318	312		
20	304	316	316	333	323	335	335	341	308	321	334	344	335	338	359	330	342	354	358	315	306	313	295	300		
21	281	326	327	330	308	339	368	347	327	327	351	330	317	318	352	372	377	358	336	314	324	312	296	288		
22	303	306	323	365	323	349	360	349	334	354	357	354	350	339	340	349	362	348	355	326	316	320	313	303		
23	312	313	335	326	306	328	376	373	348	351	339	339	328	326	337	345	342	330	341	347	362	313	305	308		
24	311	303	303	323	310	352	340	341	365	366	343	311	303	326	327	326	316	324	338	339	363	299	299	310		
25	312	F	F	312	336	340	347	348	A	A	340	333	306	291	343	302	320	348	346	337	287	290	291	288		
26	297	304	320	340	308	335	376	363	A	A	353	332	329	305	337	335	315	311	A	328	346	380	296	A	A	
27	F	335	325	297	286	323	342	347	336	341	329	324	309	302	343	341	335	A	330	320	328	310	F	F		
28	F	F	F	322	322	357	377	A	A	A	A	331	338	A	311	320	A	344	365	345	319	329	335	312	312	
29	312	308	300	315	316	363	401	384	353	334	326	316	328	306	A	A	327	344	331	350	324	288	F	298		
30	295	311	314	321	299	352	369	370	353	354	A	288	314	325	306	323	323	349	336	339	343	299	F	306		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	26	25	24	28	27	29	30	29	28	28	28	30	30	29	29	29	30	29	30	30	30	30	25	27		
MED	307	308	320	334	322	331	369	364	353	352	343	332	331	333	340	340	343	346	341	336	336	313	305	308		
U Q	312	316	330	356	337	340	376	376	366	360	352	342	344	340	346	350	349	354	355	344	354	327	311	312		
L Q	300	304	314	322	308	324	353	353	346	332	334	323	322	319	330	330	333	335	331	325	324	301	299	298		

APR. 2021 M(3000)F2 (0.01)

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APR. 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									L	382	389	U L	A	382	414	L	L								
2									L	L	414	399	410	396	401	L									
3										401	398	405	419	403	378	376	L								
4									L	392	404	404	401	387	390	A	A								
5								454	L	391	425	410	A	397	402	382	L								
6									L	L	420	399	399	399	392	L	L	L							
7							435		L	393	402	403	A	399	413	L	L	L							
8									L	387	422	389	393	A	408	U L	L								
9									L	L	397	410	404	404	388	U L	L	L							
10									L	L	394	420	417	421	A	U L	L								
11									U L	361	383	385	414	401	401	A	U L	L	L						
12									A	386	392	U L	417	437	426	377	388	361	U L	L					
13									A	U L	383	A	A	A	404	408	367	L							
14									L	U L	385	390	389	403	U L	397	418	376	L	L					
15									L	L	396	395	390	A	U L	393	419	397	L	L					
16									A	L	393	411	404	436	394	401	406	L	L						
17							A	A	A	A	A	A	A	U L	A	A	376	L	L	A					
18									L	403	367	A	U L	432	402	L	417	A							
19							L	L	L	L	367	404	L	365	L	U L	379	392	A	A					
20									L	U L	399	388	385	402	390	416	390	U L	A	A					
21									L	U L	377	A	U L	401	398	385	387	A	L	L	A				
22										384	389	395	414	418	411	405	386	404	A	A					
23									A	A	A	A	399	404	415	385	411	A	L	A					
24							L	A	A	A	404	382	A	399	A	A	A	A							
25									L	L	399	388	393	397	386	417	378	370							
26										A	A	A	394	398	377	A	L	A	A	A					
27							A	A	A	A	A	A	A	A	A	385	386	A	A	A					
28									A	A	A	A	A	A	A	U L	422	386	382	L					
29									A	A	A	A	A	A	A	A	A	A	A	A					
30							A	A	A	421	A	390	417	A	A	379	410	L	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	1	4	20	20	25	20	24	22	21	6								
MED							435	454	385	392	400	401	404	396	404	380	387								
U Q									394	395	416	410	418	402	414	393	404								
L Q									372	384	390	390	400	386	388	376	370								

APR. 2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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APR. 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									248	266	266	286	250	252	264	274	266								
2									256	256	250	260	260	260	260	232									
3									246	266	270	274	274	274	252	238	254								
4									234	246	252	274	274	270	270	256	238								
5								234	244	240	240	260	272	268	268	258	266								
6									266	238	264	274	288	280	272	258	244	262							
7							226		274	250	254	254	266	266	272	246	266	266							
8									266	258	286	286	272	238	238	266	262								
9									250	238	260	288	282	282	284	284	258	258							
10								258	258	242	242	242	250	254	292	262	238								
11									280	296	296	262	240	240	238	264	264	264							
12								222	252	260	266	286	292	280	286	280	246	244							
13								226		310	284	276	264	270	270	252	252								
14									264	288	266	266	254	294	298	272	254	254							
15								242	242	252	282	278	266	276	246	254	274	270							
16								224	278	270	270	270	264	244	276	276	252	244							
17							224	216	E A 284	E A 296	E A 354	360	272	322	304	304	278	248	E A 272						
18								268	258	312	374	324	286	268	264	264	260								
19							260	248	224	308	262	252	292	278	266	266	246	226	226						
20								268	286	310	260	260	286	248	242	266	250	224							
21								276	276	260	248	284	294	308	264	230	230	248	228						
22									288	252	240	246	260	278	268	246	246	248	232						
23								240	272	272	272	272	280	280	262	252	252	258	232						
24							280	254	244	254	270	336	310	280	264	280	266	E A 262							
25								262	272	272	290	306	348	320	248	302	258								
26									A 244	A 294	294	290	324	250	274	282	274	252							
27							E A 252	E A 252	270	272	294	296	294	292	244	246	254	A 250							
28								A 214	A 262	A 314	A 310	A 312	288		A 308	A 284	A 242	A 228							
29								E A 214	E A 262	E A 314	E A 310	E A 322	E A 296	E A 332	A 308	A 284	A 242	E A 228	E A 318	E A 244	E A 240				
30							234	230	264	268		394	296	286	292	264	274	238	238						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							6	17	26	28	28	30	30	29	29	29	29	19	9						
MED							243	241	264	262	266	276	277	277	266	264	254	248	235						
U Q							260	260	274	292	285	296	292	289	280	275	266	262	251						
L Q							226	225	250	251	253	262	264	263	251	252	246	244	230						

APR. 2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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	B	E	B	E	B	E	B	E	B	E	B	A	204	192	200	206	224	210	210		E	B	E	B
2	E	B	E	B	E	B	E	B	E	B	E	B	204	186	186	186	190	196	218	208	E	B	E	B	
3	E	B	E	B	E	B	E	B	E	B	E	B	210	210	210	206	206	190	190	190	E	B	E	B	
4	E	B	E	B	E	B	E	B	E	B	E	B	250	284	244	256	246	246	194	206	A	A	210	220	
5	E	B	E	B	E	B	E	B	E	B	E	B	258	310	268	256	228	244	200	186	A	A	210	222	
6	E	B	E	B	E	B	E	B	E	B	E	B	270	270	270	208	220	244	200	208	198	198	186	184	
7	E	B	E	B	E	B	E	B	E	B	E	B	260	260	252	214	206	234	182	198	A	A	196	196	
8	E	B	E	B	E	B	E	B	E	B	E	B	254	272	280	218	184	244	200	206	206	198	186	186	
9	E	B	E	B	E	B	E	B	E	B	E	B	270	254	246	214	226	226	208	208	212	204	200	186	
10	E	B	E	B	E	B	E	B	E	B	E	B	252	260	248	212	208	250	214	214	208	198	198	198	
11	E	B	E	B	E	B	E	B	E	B	E	B	260	260	226	198	212	218	206	214	206	206	206	198	
12	E	B	E	B	E	B	E	B	E	B	E	B	258	258	250	220	202	230	194	A	192	198	194	186	
13	E	B	E	B	E	B	E	B	E	B	E	B	268	258	252	206	198	248	208	A	208	224	A	A	
14	E	B	E	B	E	B	E	B	E	B	E	B	262	262	220	204	204	216	206	212	202	202	202	202	
15	E	B	E	B	E	B	E	B	E	B	E	B	258	236	224	218	226	232	218	208	208	196	194	190	
16	E	B	E	B	E	B	E	B	E	B	E	B	258	258	258	244	202	202	202	A	206	196	196	196	
17	E	B	E	B	E	B	E	B	E	B	E	B	262	262	220	212	A	242	A	A	A	A	A	A	
18	E	B	E	B	E	B	E	B	E	B	E	B	252	246	216	224	304	238	206	206	204	200	A	188	
19	E	B	E	B	E	B	E	B	E	B	E	B	254	274	266	248	268	252	212	194	194	196	216	196	
20	E	B	E	B	E	B	E	B	E	B	E	B	254	254	246	224	232	226	216	216	212	196	212	202	
21	E	B	E	B	E	B	E	B	E	B	E	B	284	226	226	216	236	226	226	212	196	200	A	204	
22	E	B	E	B	E	B	E	B	E	B	E	B	240	248	232	198	230	226	204	204	202	202	202	190	
23	E	B	E	B	E	B	E	B	E	B	E	B	244	240	226	226	246	230	216	A	A	A	A	206	
24	E	B	E	B	E	B	E	B	E	B	E	B	242	264	260	252	264	218	206	A	A	A	204	232	
25	E	B	E	B	E	B	E	B	E	B	E	B	234	284	228	208	208	216	216	208	214	198	222	208	
26	E	B	E	B	E	B	E	B	E	B	E	B	278	268	236	220	232	250	220	220	A	A	A	212	
27	E	B	E	B	E	B	E	B	E	B	E	B	240	226	226	236	242	226	A	A	A	198	A	A	
28	E	B	E	B	E	B	E	B	E	B	E	B	232	288	272	264	228	206	202	A	A	A	A	A	
29	E	B	E	B	E	B	E	B	E	B	E	B	240	256	260	238	228	214	196	A	A	A	A	A	
30	E	B	E	B	E	B	E	B	E	B	E	B	262	260	254	226	244	210	A	A	A	206	A	190	
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	27	20	22	24	20	25	21	24	24	26	22	23	21	30	30	30	29	29	
MED	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
UQ	257	260	245	220	228	230	206	208	206	200	200	196	196	196	192	194	198	209	212	215	212	231	250	256	
LQ	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
	262	268	258	236	243	244	214	213	208	204	205	203	199	204	198	198	202	216	221	222	228	246	262	262	
	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
	244	252	226	212	208	218	200	205	202	198	195	190	189	191	190	190	194	202	209	210	202	210	241	240	

APR. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2021 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							B	114	114	110	110	A	A	A	110	A	A	110	B						
2							B	110	110	110	110	110	A	110	A	110	110	A	B						
3							B	110	110	110	A	110	110	A	A	110	110	110	B						
4							B	108	108	108	108	A	A	A	A	A	A	A	B						
5							108	108	108	A	A	A	A	A	A	108	108	108	B						
6							108	108	108	108	108	108	112	A	112	112	112	112	B						
7							114	114	114	A	A	A	A	114	114	114	108	108	B						
8							108	108	A	A	A	A	A	112	112	112	112	112	B						
9							112	110	110	110	110	110	110	110	110	110	A	110	B						
10							118	114	108	108	A	108	108	108	A	A	108	108	B						
11							122	122	118	116	116	112	112	108	108	108	A	A	B						
12							118	110	110	108	108	108	108	108	108	108	A	110	B						
13							120	114	114	A	114	114	108	A	A	108	108	B							
14							124	120	112	112	112	112	112	112	112	112	112	112	B						
15							112	112	112	112	112	112	A	A	112	112	112	112	B						
16							112	112	112	112	112	112	A	A	112	112	A	A							
17							112	112	112	A	A	A	A	A	A	A	A	A	B						
18							118	A	A	A	A	A	118	118	A	114	A	114	B						
19							114	112	108	108	108	108	108	A	108	108	108	108	B						
20							108	108	108	108	108	108	A	108	108	108	108	108	B						
21							108	108	A	A	A	108	A	108	108	108	108	108	B						
22							108	108	108	A	108	A	108	108	108	108	108	108	B						
23							108	108	A	A	A	108	A	A	110	122	122	A	B						
24							114	A	A	A	A	A	A	112	112	112	112	A	B						
25							112	110	110	110	110	A	110	110	110	110	110	112	B						
26							A	A	A	A	A	A	A	A	112	112	A	A	B						
27							A	A	A	B	A	A	A	A	A	A	A	A	B						
28						B	112	108	108	A	A	A	A	A	108	108	108	108	B						
29						B	108	108	A	A	A	A	A	A	A	A	A	A	B						
30						B	108	A	A	108	A	108	A	A	A	108	108	108	B						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							24	24	21	16	15	15	12	15	19	23	19	20							
MED							112	110	110	110	110	108	110	110	110	110	108	109							
U Q							116	113	112	111	112	112	112	112	112	112	112	112							
L Q							108	108	108	108	108	108	108	108	108	108	108	108							

APR. 2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	116	124	126	126	G	106	104	104	G	104	90	G	90	106	88	B	B	B
2	B	B	B	B	B	B	124	132	G	126	118	G	104	G	102	G	110	110	108	B	100	100	100	94
3	B	B	B	B	B	B	130	130	126	120	106	G	G	100	96	G	G	88	88	98	98	98	98	B
4	B	B	B	98	98	B	118	150	140	114	114	104	98	98	98	90	90	90	90	90	96	96	96	96
5	B	96	96	B	96	96	G	G	108	106	100	100	94	94	94	G	G	G	B	B	B	B	B	B
6	B	B	B	B	B	B	124	130	134	114	114	114	G	104	G	G	114	G	B	B	B	B	B	B
7	B	B	B	B	B	B	G	G	132	104	104	98	98	G	G	112	G	G	B	B	B	B	B	B
8	116	B	B	B	B	B	154	G	94	94	94	94	94	164	G	G	G	122	B	B	B	B	B	B
9	B	B	B	B	B	B	126	126	126	126	G	G	112	G	G	G	102	120	B	B	B	B	B	B
10	B	B	B	B	B	B	150	142	130	110	104	G	G	166	106	106	G	G	B	100	100	94	106	106
11	B	B	B	B	B	B	138	138	132	124	124	120	116	116	108	108	102	102	B	B	B	B	B	96
12	B	B	B	B	B	B	140	140	140	124	124	114	130	G	128	G	104	G	B	B	78	78	80	B
13	B	B	B	B	B	B	128	122	122	112	112	108	114	114	102	98	G	138	B	B	114	114	B	B
14	B	B	B	B	B	B	134	130	124	114	112	G	G	112	G	146	G	120	114	B	110	B	B	B
15	B	B	110	B	B	B	142	120	120	116	114	G	104	104	G	G	G	130	122	B	B	102	102	B
16	B	B	B	90	B	B	128	128	124	124	112	112	96	104	G	112	106	106	98	98	98	98	98	98
17	98	98	100	100	94	128	126	126	116	106	102	102	102	102	94	94	94	92	92	96	96	96	120	B
18	80	B	B	B	B	B	126	106	102	102	96	96	G	G	96	G	98	G	98	96	96	104	98	108
19	104	94	B	B	B	B	130	98	G	G	160	G	G	102	128	G	G	156	122	96	96	96	96	B
20	96	96	B	B	B	B	130	140	122	122	118	114	104	112	112	120	154	118	118	110	110	110	104	100
21	90	90	B	96	120	B	126	126	106	98	98	G	98	G	G	G	G	G	104	B	92	92	92	B
22	B	B	B	B	B	B	G	G	110	98	G	98	G	G	G	G	G	116	104	104	104	104	104	B
23	88	B	B	B	B	128	140	118	106	106	104	G	104	102	G	G	122	104	104	104	102	98	98	94
24	B	B	94	B	94	B	114	102	102	98	98	98	92	156	132	128	118	102	102	102	102	102	102	B
25	B	102	B	B	98	116	116	114	114	114	G	100	G	G	G	G	G	G	B	100	B	B	B	100
26	90	90	B	B	126	112	106	104	98	98	98	98	98	98	140	110	108	108	104	96	96	96	96	92
27	88	88	88	88	88	118	102	102	102	B	96	96	96	96	104	104	104	102	102	102	92	94	94	94
28	94	94	94	90	120	116	114	106	98	98	98	98	98	90	112	112	G	G	104	104	104	104	104	104
29	104	B	B	B	B	B	124	122	102	102	104	104	104	104	98	92	92	92	92	92	98	102	98	96
30	96	96	96	B	B	132	124	106	106	110	98	110	106	100	100	G	G	G	100	100	100	98	98	98
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	10	7	6	8	8	27	26	28	28	26	21	22	22	18	15	16	19	20	18	22	21	20	14
MED	95	95	96	93	97	119	126	125	118	111	104	102	103	104	103	108	104	108	103	100	98	98	98	97
U Q	101	96	100	98	109	128	134	130	126	121	114	111	104	112	112	112	112	120	106	104	102	103	103	100
L Q	89	90	94	90	94	114	118	114	106	102	98	98	98	100	98	98	96	102	95	96	96	96	96	94

APR. 2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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							C2	C2	C2	C2		L2	L1	L1		L1	L2		L2	FF52	F2			
2							C1	C2		C1	C1		L1		L1		C2	L1	L1		F2	F2	F2	F2
3							C2	C2	C2	C1	L1			L2	L2			L1	L3	F2	F3	F4	F2	
4				F1	F1		C2	H2	H1	C1	C1	L1	L2	L2	L2	L3	L4	L4	L4	F3	F1	F1	F1	F1
5		F6	F2		F1	F1			C1	L1	L1	L2	L3	L2	L2									
6							C2	C2	H1	C1	C1	C1		L1			C2							
7									H1	L1	L1	L1	L2			C1								
8	F1						H1		L2	L2	L1	L1	L1	H1				C1						
9							C2	C2	C1	C1			C1				L2	C1						
10							H2	H1	C2	C1	L1			H1	L1	L2				F1	F2	F2	F3	F2
11							C2	H2	C2	C2	C1	C1	C1	C1	CL12	C2	L2	L2						L4
12							H2	H2	H1	C1	C1	C1	C1		C1		L2				F3	F2	F2	
13							C2	C2	C2	C2	C2	L2	C1	C2	C1	L1		H1			F1	F2		
14							C2	C1	C1	C1	C1			C1		H1		C1	C1		F1			
15			F1				H1	C2	C1	C1	C1		L1	L1				C1	C3			F2	F2	
16				F1			C2	C2	C2	C1	C1	C1	L2	L2		C1	L2	L3	F3	F2	F2	F2	F4	F3
17	F2	F2	F1	F3	F4	F1	C2	C2	C2	L1	L2	L2	L2	L2	L2	L1	L2	L3	L3	F3	F1	F3	F2	
18	F1						C1	L3	L1	L1	L1	L1		L1			L2		L1	F1	F3	F2	F1	F1
19	F1	F2					C2	L2			H1			L1	C1			H1	C2	F1	F3	F4	F2	
20	F2	F1					H2	H2	C2	C1	C2	C1	L2	C1	C1	C1	H2	C2	C2	F3	F3	F3	F3	F2
21	F4	F2		F1	F1		C1	C1	L1	L1	L3		L2						L1		F1	F2	F1	
22									C1	L1		L1						C2	L3	F2	F1	F3	F1	
23	F1				F1		H1	C1	L2	L1	L2		L3	L1			C1	L1	L3	F6	F6	F5	F2	F4
24			F1		F2		C2	L3	L2	L2	L1	L1	L2	H1	H1	H2	C2	L3	L4	F1	F2	F2	F1	
25		F2			F1	F2	C2	C2	C2	C1		L1								F3				F3
26	F3	F2			F1	F3	L2	L3	L4	L4	L3	L1	L1	L1	H1	C2	L3	L3	L3	F4	F6	F6	F4	F5
27	F2	F5	F2	F2	F2	F2	L4	L3	L2		L2	L2	L2	L1	L1	L1	L2	L6	L4	F4	F4	F3	F3	F3
28	F3	F4	F5	F3		C2	C2	C3	C3	L3	L4	L2	L2	L3	C1	C1			L2	F5	F3	F8	F6	F3
29	F1					C1	C2	L2	L2	L2	L2	L1	L1	L2	L4	L4	L5	L5	L5	F6	F2	F3	F2	F2
30	F2	F2	F2		C1	C3	L3	L3	L2	C2	L2	C1	L1	L2	L2				L3	F6	F5	F5	F2	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																								

APR. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	X 51	X 50	X 50	X 47	X 40	X 36														X 78	X 66	X 47	X 40	X 40	
2	X 38	X 39	X 39	X 40	X 36	X 29															X 68	X 59	X 39	X 40	X 40
3	45	47	44	45	39	39	46														X 75	A	A	A	46
4	46	46	46	45	41	42	48														X 71	X 77	X 71	A	X 32
5	X 35	X 37	X 37	X 38	X 35	X 28															X 72	X 80	X 74	X 50	X 44
6	48	50	50	46	31	29															X 76	X 76	X 45	X 40	X 40
7	X 39	X 39	X 38	X 39	X 34	X 26															X 70	X 71	X 67	X 47	X 48
8	X 48	X 48	X 43	X 52	X 36	X 25	X 40														X 69	X 64	X 55	X 48	X 48
9	X 47	X 43	X 43	X 46	X 39	X 28															X 62	X 62	X 50	X 42	X 42
10	X 43	X 43	X 42	X 43	X 34	X 26															X 60	X 56	X 54	X 53	X 54
11	X 52	X 50	X 50	X 51	X 36	X 25															X 73	X 66	X 50	X 44	X 44
12	X 45	X 43	X 43	X 45	X 41	X 26															X 81	X 66	X 49	X 45	X 48
13	46	46	41	46	29	29															X 58	X 55	X 53	X 49	X 51
14	X 48	X 47	X 47	X 48	X 31	X 28															X 69	X 68	X 63	X 53	X 54
15	X 52	X 55	X 48	X 45	X 41	X 40															X 94	X 104	X 44	A	X 32
16	X 33	X 35	X 35	X 33	37	27															X 76	X 77	X 70	X 48	X 45
17	48	48	50	45	A	35															X 72	X 72	X 57	X 47	X 46
18	X 47	X 47	X 44	X 37	X 34	X 35															X 85		X 62	X 51	X 48
19	X 44	X 42	X 41	X 41	X 40	X 40															X 77		X 65	X 55	X 48
20	X 44	X 44	X 44	X 43	X 38	X 36															X 66	X 66	X 60	X 54	X 52
21	58	53	50	46	40	41															X 67	X 66	X 66	X 60	X 58
22	X 58	X 57	X 52	X 49	X 39	X 37															X 73	X 68	X 60	X 53	X 53
23	X 52	X 50	X 48	X 41	X 36	X 35															X 94	X 70	X 53	X 45	X 44
24	X 43	X 42	X 41	X 41	X 40	X 34															X 96	X 71	X 53	X 54	X 53
25	X 53	X 51	X 50	X 48	X 34	X 33															X 68	X 62	X 62	X 65	X 60
26	X 58	X 55	X 57	X 45	X 40	X 38															X 105	X 80	X 44	X 44	X 51
27	48	A	A	A	A	X 32															X 88	X 82	X 69	X 56	X 52
28	X 50	X 48	X 46	X 45	X 42	X 38															X 64	X 63	X 56	X 52	X 54
29	49	49	49	43	39	38															X 75	X 63	X 59	X 55	X 54
30	X 52	X 52	X 47	X 45	X 44	X 42															X 81	X 81	X 56	X 56	X 56
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	29	29	28	30	3													30	27	29	27	30	
MED	X 48	X 47	X 46	X 45	X 38	X 34	46														X 73	X 68	X 56	X 50	X 48
U Q	X 52	X 50	X 50	X 46	X 40	X 38	48														X 81	X 77	X 64	X 54	X 53
L Q	X 44	X 43	X 42	X 41	X 34	X 28	40														X 68	X 63	X 50	X 45	X 44

APR. 2021 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	45	44	44	41	34	30	36	50	60	68	68	79	87	90	76	74	72	74	80	72	60	41	34	34	
2	32	33	33	34	30	23	31	48	60	62	72	69	78	81	79	71	56	60	68	62	53	33	34	34	
3	F	F	F	F	F	F	F	50	52	56	58	64	69	79	83	83	69	69	75	69	A	A	A	F	
4	F	F	F	F	F	F	F	47	57	60	58	62	65	76	88	92	88	79	68	64	71	65	A	26	
5	29	31	30	32	29	22	34	50	60	70	62	62	64	75	77	76	65	61	64	66	74	68	44	38	
6	F	F	F	40	25	23	32	49	63	63	63	63	69	79	84	82	65	60	62	70	70	39	34	34	
7	33	33	32	33	28	20	32	46	53	62	66	68	72	78	78	71	71	62	67	64	65	61	41	42	
8	42	42	37	46	30	19	34	49	68	67	67	76	89	89	78	76	62	60	65	63	58	49	42	42	
9	41	37	37	40	33	22	34	52	57	62	58	51	61	72	72	77	75	72	58	56	56	44	36	36	
10	37	37	36	37	28	20	34	49	59	67	73	71	68	64	68	71	68	59	58	54	50	48	47	46	
11	46	44	44	45	30	19	34	48	52	55	70	91	96	96	82	66	63	66	73	67	60	44	38	38	
12	39	37	37	39	35	20	37	49	53	60	62	61	58	67	72	86	82	70	73	75	60	43	39	F	
13	F	F	35	40	22	23	37	48	51	54	59	69	85	84	80	79	69	69	65	52	49	47	43	45	
14	42	41	41	42	25	22	38	50	55	57	62	71	75	69	73	59	62	68	66	63	62	56	47	48	
15	46	F	42	39	35	34	45	63	58	59	59	73	80	91	91	92	84	91	86	88	S	A	26	26	
16	27	29	29	27	F	21	39	53	61	58	66	78	80	79	70	70	73	74	76	70	71	64	42	39	
17	F	F	F	F	A	F	41	78	52	48	61	82	109	93	87	76	76	85	A	66	66	51	41	40	
18	41	39	38	31	28	29	46	58	54	56	52	65	87	78	68	57	54	61	70	79	A	63	56	45	42
19	38	36	35	35	34	34	43	62	62	58	65	76	80	70	75	70	70	79	71	71	A	59	49	42	
20	38	38	38	37	32	30	44	67	67	66	69	86	80	94	83	66	72	84	73	60	60	54	48	46	
21	F	47	44	40	34	F	47	53	67	66	71	72	73	89	90	77	65	61	58	60	60	60	54	52	
22	52	51	46	43	33	31	42	51	68	74	76	70	62	70	72	80	79	67	60	67	62	54	47	F	
23	46	44	42	35	30	29	41	51	58	60	67	75	73	84	90	89	90	90	86	88	64	47	39	38	
24	37	36	35	F	F	28	42	54	76	60	56	61	67	83	88	88	91	92	94	90	65	47	48	47	
25	47	45	44	42	28	27	42	54	56	60	72	63	63	80	90	79	92	99	96	62	56	56	59	54	
26	52	49	51	39	34	32	52	58	54	63	60	66	66	71	82	80	78	88	101	99	74	38	38	F	
27	F	A	A	A	A	26	44	62	66	62	A	77	86	95	104	97	99	89	80	82	76	63	50	46	
28	44	42	40	39	36	32	46	54	57	53	59	58	59	67	74	89	97	82	65	58	57	50	F	F	
29	F	F	F	37	33	F	44	52	49	54	59	59	65	69	77	92	101	104	R	94	69	57	53	49	48
30	46	46	41	39	38	36	51	52	52	50	61	64	73	82	94	96	93	88	76	75	75	50	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	22	22	24	25	24	25	28	30	30	30	29	30	30	30	30	30	30	30	29	30	28	29	25	24	
MED	42	40	38	39	31	26	41	52	58	60	62	69	73	79	80	78	72	73	71	67	62	50	43	42	
U Q	46	44	43	40	34	30	44	54	62	63	68	76	80	89	88	88	88	88	80	75	70	58	48	46	
L Q	37	36	35	35	28	22	34	49	53	56	59	63	65	71	74	71	65	62	65	62	58	44	38	37	

APR. 2021 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 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	460	456	460	460	448	424	L	L							
2										L	444	456	456	456	400	440	L	L							
3										L	436	456	456	A	444	432	L	L							
4										424	448	444	440	452	452	428	L	L							
5									L	L	448	448	464	448	444	436	L	L							
6									L	420	L	460	A	460	448	412	L	L	A						
7										420	432	432	448	448	440	424	L	L							
8									L	432	444	444	448	448	448	436	L	L							
9									L	L	L	460	440	448	444	416	416	L	L						
10									L	424	448	448	448	456	448	428	424	L	A						
11										436	436	A	A	460	440	432	L	A							
12										L	444	444	464	448	444	420	L	L	A						
13										L	A	452	444	444	428	428	412	L							
14										U	L	A	A	452	440	436	436	408	L						
15									L	436	464	452	464	464	452	424	420	L	L						
16										L	A	A	A	456	460	448	A	L	L						
17						A				A	A	A	A	460	472	A	A	A	A						
18									L	U	L	444	444	444	444	444	L	A	L	L					
19								L		L	456	448	456	A	A	A	L	L	A		A				
20								A	L	U	L	452	452	464	464	452	L	U	L						
21									L	L	U	L	456	472	468	464	456	432	416						
22									L	440	448	452	464	436	456	444	L	L							
23									L	428	A	460	468	A	A	460	436	A	A						
24								L	404	L	A	468	468	464	448	A	A	A	A						
25								L	L	A	A	464	464	472	448	A	424	L							
26									A	U	L	A	456	476	464	444	444	A	A	A					
27						A	A	A	A	A	A	A	A	A	A	A	424	L							
28									A	460	A	472	460	452	452	436	420	L	L						
29									U	L	440	440	448	460	452	440	A	A	A						
30										A	A	448	456	448	428	416	392	L							
31										452															
	00	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	18	17	24	26	26	26	22	12	1							
MED									404	436	448	454	458	454	448	432	420	392							
U Q									U	L	444	456	460	464	460	452	436	424							
L Q										424	442	448	448	448	444	424	416								

APR. 2021 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 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							B	U	R	A	U	A	U	A	U	R	U	R	U	R	U	A			
2							236	268	296	320	336	352	332	324	312	292	276	172							
3							B	A	A	A	A	A	A	A	A	A	A	U	R	U	A				
4							B	U	R	U	A	A	A	A	A	A	A	A	A	B					
5							B	U	R	A	A	A	A	A	A		R	U	R	U	R				
6							B	U	R	U	A	A	U	A	U	A	U	R	U	A	B				
7							B	U	A	U	A	A	A	A	A	A	A	A	A	B					
8							U	R	A	A	U	R	A	A	U	A	U	R	U	A					
9							B	U	R	A	U	A	U	R	A	U	R	U	A	U	A				
10							B	U	A	U	A	U	A	U	A	U	R	A	A	A	B				
11							B	U	A	U	A	U	A	A	A	A	A	A	A	B					
12							B	U	A	U	A	A	U	A	A	A	A	A	A	A					
13							B	U	A	U	A	U	A	A	A	U	A	U	R	B					
14							B	A	U	A	A	A	A	A	A	A	U	R	U	A					
15							U	R	A	U	A	A	A	A	R	A	A	A	B						
16							B	U	A	A	A	A	A	U	R	A	A	A	B						
17							B	A	A	A	A	A	A	A	A	A	A	A	B						
18							B	U	R	A	A	A	A	A	A	A	A	A	A			A			
19							B	U	R	A	U	R	A	A	A	A	U	A	U	A		A			
20							B	U	A	U	A	A	U	A	U	R	R	A	U	R					
21							B	A	U	R	R	A	U	A	U	R	R	A	U	R	B				
22							U	R	A	U	A	A	A	U	R	R		A	U	R					
23							U	R	A	U	A	A	A	U	R	A	U	R	U	A					
24							B	U	A	A	A	A	A	U	A	U	A	A	A						
25							B	A	A	A	A	A	A	A	A	A	A	U	R	U	A				
26							B	A	A	A	A	A	A	A	A	U	A	A	A						
27							B	A	A	A	A	A	A	A	A	A	A	A	B						
28							A	A	A	A	A	A	A	A	A	A	U	A	U	R					
29							A	U	A	U	A	A	A	U	A	U	A	A	A	A					
30							A	A	A	A	A	A	A	A	U	A	U	R	U	R					
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	21	16	13	7	8	8	10	11	12	13	15	13						
MED							U	R	A	U	A	U	A	U	A	U	U	R	U	R	U	A			
U Q							192	248	290	312	332	346	356	356	344	326	302	268	210						
L Q							168	226	270	298	320	332	344	344	328	314	294	256	186						

APR. 2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	21	23	E B	E B	E B	E B	E B	G	30	34	34	G	38	38	G	G	G	G	21	16	31	17	19	E B	
2	E B	E B	E B	E B	E B	E B	E B	24	32	J A	38	40	38	37	36	G	G	G	22	J A	E B	E B	20	E B	
3	E B	E B	E B	E B	E B	E B	E B	28	32	36	43	39	39	51	44	42	46	G	23	55	64	86	46	33	
4	J A	J A	J A	J A	J A	24	22	21	G	32	34	39	38	36	39	39	41	36	32	26	27	29	28	43	51
5	E B	E B	E B	E B	E B	E B	E B	G	32	J A	J A	J A	42	38	39	35	G	G	G	24	15	15	15	14	
6	E B	E B	E B	E B	E B	E B	E B	G	32	33	36	G	43	40	39	36	37	G	24	E B	E B	E B	E B	E B	
7	E B	E B	E B	E B	E B	E B	E B	27	35	35	38	39	38	60	38	41	39	29	30	16	16	16	15	15	
8	E B	19	15	15	15	23	23	G	J A	51	36	G	J A	J A	J A	39	35	26	G	J A	24	21	16	16	
9	E B	E B	E B	E B	E B	E B	E B	G	35	34	G	39	G	38	36	G	G	28	23	22	20	18	16	16	
10	E B	E B	E B	E B	E B	E B	E B	28	31	34	35	35	38	G	36	57	47	49	36	29	23	23	16	15	
11	E B	E B	E B	E B	E B	E B	J A	J A	J A	36	37	39	44	47	43	39	38	36	43	38	30	26	16	19	16
12	J A	25	20	20	21	21	19	30	35	36	36	40	39	40	48	44	36	30	63	28	21	20	16	24	
13	E B	E B	E B	E B	E B	E B	E B	20	32	37	47	52	40	40	43	38	37	30	G	E B	E B	J A	J A	24	24
14	E B	E B	E B	E B	E B	E B	E B	20	32	34	42	52	47	42	45	48	35	G	J A	25	29	34	32	22	21
15	J A	J A	22	22	24	19	G	28	34	39	J A	47	40	J A	48	G	J A	J A	J A	J A	J A	24	J A	J A	54
16	J A	E B	E B	E B	E B	E B	E B	28	34	40	48	58	45	G	39	48	66	41	34	29	24	28	28	24	
17	J A	J A	J A	E B	J A	E B	E B	30	J A	J A	J A	J A	J A	60	38	40	J A	J A	J A	J A	J A	J A	J A	J A	35
18	J A	J A	J A	E B	E B	E B	G	J A	39	35	36	42	40	58	42	37	42	37	29	30	53	33	25	25	
19	E B	E B	J A	21	22	22	20	G	35	G	G	G	41	42	55	46	33	32	30	J A	J A	E B	15	22	37
20	E B	J A	21	21	16	24	30	33	48	36	38	39	40	G	G	G	33	31	G	J A	30	28	31	48	53
21	J A	J A	J A	E B	E B	E B	E B	32	G	G	J A	J A	J A	G	G	36	G	G	J A	31	23	23	16	15	15
22	E B	E B	E B	E B	E B	E B	G	30	33	39	37	40	38	G	G	38	35	33	G	J A	J A	J A	J A	J A	27
23	J A	22	15	15	15	15	30	35	42	62	52	G	54	49	G	G	J A	J A	J A	J A	43	21	24	40	
24	J A	22	34	J A	E B	E B	J A	32	33	36	44	43	36	43	62	53	43	50	74	73	47	15	22	15	
25	E B	E B	E B	E B	E B	E B	23	32	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	G	J A	J A	J A	J A	J A	47
26	22	21	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	41	J A	J A	J A	J A	J A	J A	J A	28
27	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	J A	J A	J A	J A	23
28	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	G	G	J A	J A	J A	J A	23
29	J A	J A	J A	E B	E B	E B	J A	34	34	38	42	45	44	40	40	46	60	56	48	36	27	30	28	29	16
30	J A	J A	J A	J A	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	G	G	G	G	20	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	20	19	21	E B	E B	E B	20	30	34	38	42	40	40	42	39	38	36	32	26	J A	28	30	28	23	24
U Q	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
L Q	E B	E B	E B	E B	E B	E B	E B	G	32	35	36	39	38	38	38	35	G	G	G	G	E B	E B	E B	E B	

APR. 2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	E 16	E 16	E 16	E 15	E 15	E 15	E 16	G	30	32	33	G	36	37	G	G	G	G	20	16	E 26	E 17	E 16	E 16
2	E 16	E 16	E 16	E 16	E 16	E 16	E 16	23	29	35	36	38	37	36	34	G	G	G	20	22	E 16	E 16	E 16	E 16
3	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	29	32	37	36	37	42	35	35	32	G	21	22	A 64	A 86	A 46	A 20
4	18	20	E 16	E 16	E 16	E 16	E 16	G	30	33	37	36	36	36	34	34	30	27	21	20	22	18	A 43	A 16
5	E 16	E 16	E 15	E 15	E 15	E 15	E 16	G	30	33	33	35	36	38	33	32	G	G	G	16	E 15	E 15	E 15	E 14
6	E 16	E 16	E 16	E 16	E 15	E 15	E 15	G	30	32	35	G	42	38	37	35	32	G	22	E 15	E 15	E 15	E 15	E 15
7	E 16	E 16	E 16	E 15	E 15	E 15	E 16	25	33	33	35	38	38	41	36	32	32	28	26	16	E 16	E 16	E 15	E 15
8	E 16	E 16	E 15	E 15	E 15	E 17	E 17	G	28	32	G	37	38	35	37	34	23	G	22	18	22	E 16	E 16	E 16
9	E 16	E 16	E 15	E 15	E 15	E 15	E 15	25	G	33	34	G	35	G	36	34	G	28	21	16	E 16	E 16	E 16	E 16
10	E 16	E 16	E 16	E 16	E 15	E 16	E 16	26	30	32	34	34	37	G	35	37	30	35	28	19	E 16	E 15	E 16	E 15
11	E 16	E 16	E 15	E 15	E 16	E 15	E 15	19	28	33	36	37	43	42	39	37	36	33	36	30	24	24	E 16	E 16
12	E 15	E 17	E 15	E 16	E 16	E 16	E 16	18	27	34	34	36	39	38	37	37	36	30	27	40	23	E 16	E 16	E 16
13	E 16	E 16	E 16	E 16	E 15	E 15	E 15	18	28	36	38	47	37	37	39	36	36	30	G	E 15	E 15	33	25	19
14	E 16	E 15	E 16	E 16	E 16	E 15	E 15	18	27	32	36	43	42	37	37	37	34	G	27	24	23	28	22	E 16
15	24	E 16	E 16	E 16	E 20	E 15	E 15	G	27	30	36	40	38	38	39	G	33	31	29	25	24	E 16	E 16	50
16	E 20	E 15	E 16	E 16	E 14	E 16	E 16	26	32	36	41	46	36	G	36	38	38	30	24	24	E 16	E 17	E 16	E 16
17	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	28	42	42	52	42	53	37	37	40	47	46	A 96	A 26	26	25	24
18	E 26	E 16	E 18	E 16	E 16	E 16	E 17	G	29	32	34	36	36	37	38	35	38	28	24	24	26	21	20	18
19	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	29	G	G	G	39	40	50	40	32	31	28	25	A 80	A 15	E 16	E 23
20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	27	30	37	36	36	38	38	G	G	31	30	G	24	24	E 26	E 26
21	E 16	E 23	E 18	E 16	E 16	E 15	E 15	21	28	G	G	38	36	39	G	G	34	G	G	22	22	E 16	E 15	E 15
22	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	28	31	32	34	38	37	G	G	37	33	29	G	25	23	E 22	E 16
23	18	E 16	E 15	E 15	E 15	E 15	E 15	G	28	33	38	42	40	G	45	45	G	G	32	38	48	E 36	E 16	E 24
24	E 16	E 16	E 22	E 16	E 16	E 16	E 16	24	27	32	34	35	36	36	40	54	42	40	41	69	64	42	E 15	E 19
25	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	29	33	40	42	39	41	39	35	38	30	G	23	24	33	37	32
26	E 16	E 16	E 16	E 16	E 16	E 16	E 16	18	24	28	36	40	39	38	35	35	38	56	67	64	25	24	24	E 16
27	23	A 68	A 111	A 87	A 50	A 16	A 16	26	26	46	54	A 96	47	62	88	50	45	32	28	23	E 16	E 16	E 26	E 18
28	20	20	23	22	E 25	E 16	E 16	25	27	44	37	44	38	38	36	39	37	31	G	G	21	22	28	27
29	E 16	E 16	E 16	E 16	E 16	E 16	E 16	30	31	34	37	39	38	36	38	40	52	45	35	27	21	27	25	E 16
30	E 16	E 16	E 16	E 16	E 16	E 16	E 16	23	35	37	36	43	51	36	40	37	G	G	G	G	18	48	23	29
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	26	30	34	37	38	37	38	36	35	31	28	23	22	24	17	E 16
U Q	16	16	16	E 16	E 16	E 16	E 16	20	28	33	37	42	39	38	39	37	38	33	31	28	24	28	25	20
L Q	E 16	E 16	E 16	E 16	E 15	E 15	E 16	G	23	29	32	34	36	36	36	34	33	G	G	G	E 20	E 18	E 16	E 16

APR. 2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

APR. 2021 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 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	308	309	337	331	331	333	351	375	352	353	319	315	323	332	327	336	332	320	359	350	352	349	309	310		
2	288	308	308	336	356	324	333	380	369	352	349	347	330	336	340	359	339	341	362	352	369	324	304	304		
3	F	F	F		F	F	F		386	379	361	347	341	331	323	328	346	330	353	361	367	A	A	F		
4	F	F	F	F	F	F	F	F		371	365	363	374	342	330	310	317	337	338	350	351	327	346	373	A	300
5	319	314	323	345	356	340	332	361	373	370	364	329	320	331	349	337	340	339	335	326	348	379	337	293		
6	F	F	F	348	368	312	340	360	381	372	348	337	323	329	335	361	363	348	345	351	373	354	309	309		
7	315	315	309	351	362	293	353	377	352	352	352	351	330	329	342	325	326	344	336	328	333	343	303	298		
8	300	308	295	353	428	276	342	339	363	355	321	314	324	342	338	342	343	342	349	343	341	336	295	301		
9	292	306	319	347	350	318	345	378	367	389	381	324	325	325	334	345	346	362	352	340	338	328	296	301		
10	296	296	316	326	391	318	340	368	362	353	350	358	344	325	326	349	353	351	351	342	332	314	305	313		
11	311	303	339	380	398	330	353	364	359	321	310	330	340	340	368	336	331	334	349	351	364	347	297	297		
12	306	310	311	372	416	329	348	374	360	343	366	335	317	322	309	343	364	323	327	351	368	335	307	F		
13	F	F	310	353	365	331	364	387	372	327	317	320	332	337	332	337	335	350	353	335	321	311	295	307		
14	310	303	332	382	357	316	364	379	370	330	336	340	348	339	351	335	345	339	340	330	327	339	299	299		
15	306	F	309	331	306	308	361	388	366	359	322	333	316	324	328	329	312	304	323	326	S	A	270			
16	312	305	305	323	F	373	371	372	370	336	338	344	340	342	326	326	324	330	312	326	321	355	314	305		
17	F	F	F	F	A	F	332	384	394	362	286	278	341	334	329	334	322	330	A	324	309	351	275	276		
18	303	312	315	341	271	322	376	361	367	359	335	306	341	338	339	353	335	320	328	343	A	350	313	322		
19	306	310	310	310	302	306	328	350	373	338	306	344	348	319	342	327	328	349	332	330						
20	311	315	308	318	371	328	330	361	362	331	318	345	330	349	357	336	325	347	364	333	337	320	296	304		
21	F	307	315	339	315	F	372	334	370	351	356	320	315	331	343	345	357	345	328	340	332	319	307	276		
22	288	293	319	331	326	312	346	355	355	367	355	364	308	332	317	328	343	349	342	340	357	323	296	F		
23	299	310	320	344	308	309	369	369	369	348	329	349	319	313	327	323	307	326	338	351	343	334	315	300		
24	312	303	314	F	F	335	350	364	369	375	291	333	300	318	319	308	307	322	341	357	343	296	312	298		
25	311	301	327	350	336	312	348	362	357	337	346	356	299	290	319	293	315	345	367	360	293	298	309	285		
26	305	303	330	330	306	286	348	380	380	342	363	338	320	326	311	317	302	307	339	353	385	288	288	F		
27	F	A	A	A	A	302	350	367	372	344	A	316	307	318	314	322	335	338	332	337	343	341	317	299		
28	299	311	289	329	328	337	365	351	356	336	313	314	296	300	300	319	336	348	348	352	339	326	F	F		
29	F	F	F	323	343	F	375	384	376	359	330	325	306	308	286	302	321	344	360	R	358	320	310	296	304	
30	290	317	319	317	318	312	373	387	382	348	323	330	288	289	310	308	326	343	328	343	307	333	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	22	22	24	25	24	25	28	30	30	30	29	30	30	30	30	30	30	30	29	30	28	29	25	24		
MED	306	308	315	339	346	318	350	370	369	352	336	334	324	328	328	336	334	342	342	342	338	334	304	300		
U Q	311	311	322	350	366	330	364	380	373	361	354	344	332	336	340	343	343	348	352	351	350	350	310	306		
L Q	299	303	309	328	316	308	341	361	362	338	318	320	315	318	317	323	324	330	332	330	324	320	296	298		

APR. 2021 M(3000)F2 (0.01)

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APR. 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	395	399	398	398	391	415	L	L									
2										L	380	L	398	398	398	441	370	L	L								
3										L	414	L	397	408	A	420	376	L	L								
4											393	388	407	424	413	394	389	L	L								
5										L	L	381	L	403	416	391	395	390	L	L							
6										L	406	L	425	A	403	401	438	L	L	A							
7											399	396	411	404	405	412	409	L	L								
8										L	383	391	407	388	389	389	400	L	L								
9										L	L	L	424	444	399	404	431	373	L	L							
10										L	406	393	393	423	417	418	429	L	L	A							
11											387	398	A	A	405	406	415	L	A								
12											L	404	404	386	400	404	428	L	L	A							
13											L	A	373	415	402	418	406	385	L								
14											U	L	A	A	404	416	420	401	380	L							
15											L	397	392	404	393	393	404	431	383	L							
16											L	A	A	A	410	408	405	401	A	L	L						
17							A				A	A	A	A	385	376	A	A	A	A							
18										L	410	U	L	396	396	396	396	L	A	L	L						
19										L	L	385	416	408	A	A	A	L	L	A		A					
20										A	L	U	L	401	397	390	390	390	400	L	U	L	L				
21											L	L	U	L	U	L	403	406	393	425	398						
22											L	377	393	407	407	448	424	375	L	L							
23											L	396	A	415	409	A	A	368	388	A	A						
24										L	381	L	418	399	402	403	A	A	A	A	A						
25										L	L	A	A	390	408	402	410	A	L								
26											A	U	L	384	A	403	388	397	415	384	A	A	A				
27							A	A			A	A	A	A	A	A	A	369	L								
28											A	A	375	388	398	405	405	385	401	L	L						
29											U	L	405	421	420	409	416	445	A	A	A						
30											L	A	A	393	424	390	398	416	376	397	L						
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT										1	18	17	24	26	26	26	22	12	1								
MED										381	394	395	403	406	402	404	404	380	397								
U Q										401	402	409	410	406	418	425	386										
L Q										383	390	394	398	396	396	385	374										

APR. 2021 M(3000)F1 (0.01)

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APR. 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										252	292	286	268	260	260	266	266	278							
2										244	262	256	256	272	260	260	246	252	262						
3										238	270	270	284	278	260	232	248	248							
4										248	256	268	286	286	278	254	242	240							
5										240	234	242	274	296	274	260	254	254	254						
6										240	242	256	284	292	276	262	240	234	238	234					
7										242	254	262	278	278	248	266	266	252							
8										244	248	282	282	264	248	248	248	250	250						
9										250	226	230	320	310	276	276	254	250	234	234					
10										258	256	256	248	248	280	280	246	246	232						
11										312	286	260	240	240	226	260	276	264							
12										272	240	284	318	298	288	258	234	262	254						
13										298	^{E A} 306	274	270	248	256	256	256	242							
14										294	274	266	256	268	252	252	268	268							
15										236	254	300	272	282	260	260	242	276	276						
16										260	284	274	252	258	266	266	278	264	268	256					
17							238			^{E A} 254	^{E A} 406	338	252	252	252	244	262	254	^A						
18										254	254	296	322	252	264	264	270	280	292	258					
19								258		268	272	254	254	274	250	280	280	248	234	^A					
20								234	238	262	266	248	254	248	238	260	260	254							
21										232	252	254	260	284	262	246	240	240							
22										240	240	250	238	308	266	290	262	250	250						
23										242	262	276	246	284	282	270	254	266	242	242					
24								250	230	230	346	280	336	288	262	278	278	244	244						
25								244	264	284	260	256	352	344	248	298	270	242							
26										216	268	244	280	316	280	280	^{E A} 296	^{E A} 300	246						
27							250	228	^{E A} 228	^{E A} 274	^A	274	^{E A} 296	^{E A} 336	272	258	242	242							
28										250	282	^{E A} 304	324	346	322	318	270	252	244	244					
29										264	306	306	306	308	320	292	260	232							
30										292	306	286	330	320	300	274	262	234	246						
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	5	18	30	29	30	30	30	30	30	30	29	11						
MED							244	244	241	257	266	273	284	274	261	258	259	249	244						
U Q								254	250	274	298	284	308	286	278	270	268	263	254						
L Q								231	236	248	255	256	258	260	252	248	250	242	234						

APR. 2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	E B	E B	E B	E B	E B	E B	E B	212	204	214	198	198	198	194	186	196	196	208	216	E B	202	E B	E B	E B
2	E B	E B	E B	E B	E B	E B	E B	216	206	210	200	200	200	194	194	188	188	188	212	204	194	E B	E B	E B
3	E B	E B	E B	E B	E B	E B	E B	220	198	204	206	198	188	188	A	184	200	200	196	220	200	A	A	A
4	E A	E A	E A	E B	E B	E B	E B	222	200	210	200	206	204	194	194	194	190	192	192	206	210	210	196	A
5	E B	E B	E B	E B	E B	E B	E B	218	212	206	198	198	194	194	202	202	202	190	190	212	224	E B	E B	E B
6	E B	E B	E B	E B	E B	E B	E B	216	200	208	200	200	182	A	196	196	192	196	186	A	208	200	E B	E B
7	E B	E B	E B	E B	E B	E B	E B	214	206	206	194	194	194	194	194	192	184	208	214	220	220	216	E B	E B
8	E B	E B	E B	E B	E B	E B	E B	222	214	214	202	202	216	E A	200	200	192	184	186	210	210	210	E B	E B
9	E B	E B	E B	E B	E B	E B	E B	210	210	202	198	198	192	180	180	180	186	196	196	196	204	204	204	E B
10	E B	E B	E B	E B	E B	E B	E B	218	212	204	196	204	196	196	184	184	192	186	A	208	208	218	E B	E B
11	E B	E B	E B	E B	E B	E B	E B	192	206	206	206	206	204	A	204	192	192	200	A	218	200	206	E B	E B
12	E B	E B	E B	E B	E B	E B	E B	210	200	200	200	192	202	202	202	202	202	196	A	198	192	194	E B	
13	E B	E B	E B	E B	E B	E B	E B	210	200	204	216	A	216	192	220	196	202	192	192	208	200	258	258	E B
14	E B	E B	E B	E B	E B	E B	E B	212	206	206	206	A	A	196	196	202	184	184	200	210	218	226	E B	
15	E A	E A	E A	E B	E B	E B	E B	216	210	198	198	220	188	188	200	200	192	180	196	212	212	E B	E B	
16	E A	E A	E A	E B	E B	E B	E B	206	206	206	198	A	A	192	192	186	202	A	228	210	210	224	192	E B
17	E B	E B	E B	E B	E B	E B	E B	202	208	A	A	A	A	210	210	A	A	A	A	A	242	238	206	E A
18	E A	E A	E A	E B	E B	E B	E B	204	204	204	204	196	196	196	196	196	A	206	216	216	216	216	216	E A
19	E B	E B	E B	E B	E B	E B	E B	210	202	202	202	202	190	190	A	A	A	194	196	A	222	A	E B	E B
20	E B	E B	E B	E B	E B	E B	E B	214	A	194	194	186	186	186	204	190	190	190	208	208	210	210	220	E B
21	E B	E B	E B	E B	E B	E B	E B	212	210	198	198	198	198	198	198	182	182	208	208	220	228	226	E B	
22	E B	E B	E B	E B	E B	E B	E B	210	210	210	206	194	194	190	184	184	210	E A	218	198	212	212	208	E B
23	E A	E A	E A	E B	E B	E B	E B	200	212	204	204	A	200	198	A	A	198	192	A	A	202	206	E B	
24	E B	E B	E B	E B	E B	E B	E B	202	214	210	186	186	186	186	222	A	A	A	A	A	222	214	E B	
25	E B	E B	E B	E B	E B	E B	E B	212	204	202	A	A	E A	204	200	A	188	196	204	212	E A	E A	E A	
26	E B	E B	E B	E B	E B	E B	E B	216	194	A	194	A	194	194	194	194	222	A	A	A	216	194	E A	
27	E A	A	A	A	E B	E B	A	A	A	A	A	A	A	A	A	A	A	200	200	210	226	202	E B	
28	E A	E A	E A	E A	E A	E A	E A	216	210	A	A	A	200	200	194	200	E A	208	188	192	202	214	E A	
29	E B	E B	E B	E B	E B	E B	E B	210	206	206	198	198	194	194	184	184	A	A	A	202	202	234	E A	
30	E B	E B	E B	E B	E B	E B	E B	198	194	210	196	A	A	184	212	196	196	190	190	202	214	E A	E 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	29	29	29	28	30	28	28	27	27	20	24	26	26	26	24	24	23	23	30	28	29	27	30
MED	E B	E B	E B	E B	E B	E B	E B	212	206	206	199	198	195	194	196	195	193	192	196	210	209	206	E B	E B
U Q	E B	E B	E B	E B	E B	E B	E B	216	210	210	204	202	200	198	204	200	202	200	206	212	218	225	E A	E A
L Q	E B	E B	E B	E B	E B	E B	E B	210	201	202	198	195	191	190	194	186	190	188	190	206	202	203	E B	E B

APR. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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							B	108	108	108	108	108	112	112	112	112	112	112	112					
2							B	112	112	A	112	112	A	A	112	112	112	112	110					
3							B	110	110	110	110	110	110		A	A	A	A	108	108				
4							B	108	108	108	108	108	108		A	A	A	A	A	B				
5							B	114	114	A	A	A		A	A	108	110	110	110					
6							B	110	110	110	110	110	110	104	104	104	104	106		B				
7							B	110	110	110	110	112	112	A	112		A	112		B				
8								112	A	112	112		A	A	A	112	102	102	102	108				
9							B	108	108	108	108	108	108	108	108		A	108	114	114				
10							B	112	112	112	112	110	110	110	110		A	A	A	B				
11							B	110	112	112	112	108	108	108	108	108		A	A	B				
12							B	108	108	108	108	108	108	108		A	108	A	A	A				
13							B	108	108	108	108	108	108	108	108	108	108	108	108		B			
14							B	108	110	110		A	A	A	A		110	112	A	112				
15							112	112	112	112	A	108		A	A	108		A	A	A	B			
16							B	108	108	108		A	A	A		108	108	A	A	A	B			
17							B	108	108	A	A	A	A		108	A	A	A	A	B				
18							B	108	A	108	108	A	108		A	A	108	A	A	A	A			A
19							B	108	A	108	108	108	108	108	108		A	108	114	114				A
20							B	114	114	114	114	114	114	114	114	114		A	114	114				
21							B	114	114	114		A	A	114	114	114	116	116	112					
22							118	118	118	118	A	A	A		110	110	110	110	110	110				
23							114	114	114		A	A	A	114		A	114	114	114	A				
24							B	114	A	A	A	A	A		114	112	112		A	A	A			
25							B	112	112	112		A	A	A	A	A		A	112	112				
26							B	A	A	A	A	A	A	A		A	112	A	A	A				
27							B	A	A	A	A	A	A	A	A	A	A	A	A	B				
28							112	112	A	A	A		112	A	A	112	114	110	112	112				
29							A	112	112	A	A	A		112	112	112		A	A	A	A			
30							114	A	A	A	A	A	A		A	110	110	110	110	110				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	27	22	20	15	15	17	15	19	18	14	17	13					
MED							114	110	111	110	110	108	110	108	110	110	110	112	112					
U Q							116	112	112	112	112	112	113	112	112	112	112	113	113					
L Q							112	108	108	108	108	108	108	108	108	108	108	109	110					

APR. 2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	110	124	B	B	B	B	B	G		132	132	128		144	150	G	G	G	G		B		B	82	82	B					
2	B	B	B	B	B	B	B	B		122	122	86	112	108	104	100	110	G	G	G		B	B		96	B					
3	96		B	B	B	B	B	B		114	114	118	116	118	110	98	98	98	98	G				120	102	96	96	96	94		
4	94	88	88	88	88	88	96	G		130	116	110	110	110	100	96	96	96	96	G	G	G		96	96	96	96	88	92		
5	92	B	B	B	B	B	B	G		110	100	100	102	114	140	90	110	G	G	G		B	B	B	B	B	B	B			
6	B	B	B	B	B	B	B	G		154	128	128		158	150	140	140	114	G				112	B	B	B	B	B			
7	B	B	B	B	B	B	B	B		128	120	120	116	116	124	106	126	98	98	124	120		B	B	B	B	B	B			
8	B	128	B	B	B	134	132	G		100	108		94	94	94	120	128	86	G				130	80	80	80	B	B			
9	B	B	B	B	B	B	B	G		116		136	128		114	G	126	102	G				130	130	88	88	96	B	B		
10	B	B	B	B	B	B	B	B		120	124	124	124	124	148		130	96	96				94	108	108	92	98	B	B		
11	B	B	B	B	B	B		142	136	122	116	112	112	112	112	112	102	98	98	98	98		B		98		B	B			
12	96	90	90	90	90	90	126	140	116	122	122	116	116	116	102	114	106	98	84	84	84	84	84	84	84	84	84	92	92		
13	B	B	B	B	B	B		128	128	128	118	110	110	110	116	158	146	G					98	98	98	98	98	98	98		
14	B	B	88	B	B	B		132	124	124	116	104	98	98	98	90	146	G					102	124	106	100	100	100	100		
15	96	96	96	96	96	96		G		124	124	116	96	108	104	98		G					98	96	102	96	88	90	96	96	96
16	96		96		96	96		B		120	120	116	102	96	94		124	106	96	102	102	102	102	102	102	102	102	102	102		
17	102	102	102		98		B			122	122	118	100	100	96	90	108	98	98	98	98	94	94	94	94	94	94	94	94		
18	94	94	94	90	88		B			G																					
19	B	B	96	96	96	96	96	96		G																					
20	B	104	98	96	84		B			112	112	122	122	136	110	124	124	G	G					106	150		106	106	100	100	100
21	100	100	92	B	B	B		108	116		G	G																			
22	B	B	B	B	B	B		G		114	114	114	100	98	96		G	G													
23	94	80		B	B	B		G		112	112	102	96	96		G	G														
24	96	96	90	90		B	B			116	116	102	102	96	96	96	156	118	118	122	112	102	102	94		120	B	B			
25	B	B	94	B	B	B		B		114	114	108	108	98	98	96	96	96	96	98				134	102	102	92	92	92		
26	92	92	B	B	B	B		B		110	102	102	102	100	100	100	100	100	122	104	104	98	98	98	98	98	94	98	94		
27	94	90	90	84	84	84	106	102		96	96	96	90	90	90	92	92	100	100	100	G	G					100	96	96	96	
28	96	96	84	84	84	102	116	118		104	104	98	114	94	94	108	112	112													
29	96	96	96	90		B	B			106	114	114	104	98	98	122	132	116	98	98	98	98	98	98	98	98	98	98	98		
30	98	98	98	98		B				98	122	102	102	102	92	92	92	92	112	G	G	G	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	17	16	16	11	10	9	17	23	28	28	28	26	29	25	25	25	22	19	24	25	26	21	22	18							
MED	96	96	94	90	89	96	116	116	115	115	103	99	110	100	110	110	101	102	102	98	97	96	98	96							
U Q	97	101	96	96	96	100	127	124	123	119	116	110	119	120	119	122	112	122	125	102	98	98	98	98							
L Q	94	91	90	88	84	89	107	114	103	102	98	96	96	97	97	98	98	98	98	94	94	94	96	94							

APR. 2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	F1	F1							C2	C1	C1		H1	H1					H2		F4		F1		
2								C2	C1	L4	C2	C1	L1	L2	C1				H1	F3			F3		
3	F1							C2	C2	C3	C2	C2	C2	L2	L2	L3	L3		C1	F7	F8	F8	F7	F4	
4	F3	F3	F3	F3	F2	F3	L1		H2	C2	C2	C1	C1	L2	L2	L2	L3	L3	L2	F8	F4	F7	F9	F8	
5	F4								C3	L2	L2	L2	C2	HL12	L3	CL11				F1					
6									H1	C1	C2		H2	H2	H1	H1	C1		C2						
7								C2	C2	C2	C2	C2	C2	L2	C2	L2	L3	C2		C3					
8		F1				F1	F1		L2	C2		L3	L3	L2	CL23	C2	L2		C1	F2	F3	F1			
9								C1		H2	C1		C1		C1	L1		C1	C1	F1	F2	F1			
10								C2	C3	C1	C1	C1	H1		C1	L2	L2	L5	C3	F1	F3	F3			
11							H1	C3	C2	C2	C2	C3	C2	C2	C2	C1	L2	L5	L5	F3	F3		F1		
12	F1	F7	F2	F1	F3	F2	C2	C2	C3	C1	C1	C2	C1	C1	L1	C2	L1	L2	L7	F3	F1	F1		F2	
13							C2	C3	C3	C2	C3	C2	C1	C1	C1	H1	H1				F8	F5	F8	F2	
14			F3				C3	C2	C2	C3	C3	L2	L2	L2	L2	H2		L2	C2	F8	F6	F5	F1	F2	
15	F3	F4	F2	F2	F4	F1		C1	C2	C2	L2	C1	L1	L2		L2	L3	L2	L2	F3	F1	F2	F5	F4	
16	F4		F2		F1	F1		C1	C2	C2	C3	C3	L1		C1	L3	L4	L3	L3	F5	F2	F3	F2	F2	
17	F2	F3	F2		F3		C2	C2	C3	L3	L3	L3	L3	C1	L3	L3	L5	L5	L6	F5	F9	F3	F5	F4	
18	F4	F2	F5	F1	F1				L3	C2	C1	L2	C1	L2	L1	C1	L3	L1	L2	F3	F3	F5	F3	F2	
19			F3	F3	F3	F2	L1		L2				C1	C1	C2	L2	H1	H2	C2	F4	F9		F1	F6	
20		F1	F2	F1	F1		C2	C2	C1	C2	H2	C1	C1	C2			L2	H1		F3	F2	F4	F2	F3	
21	F3	F7	F3				C3	C1			L3	L2	H1			C1			L2	F2	F1				
22								C2	C3	C2	C2	L2	L2	L2		H2	HL22	C1		F2	F3	F2	F2	F2	
23	F2	F2						C1	C3	L3	L3	L2		L3	L2			C2	L8	F8	F5	F1	F2	F7	
24	F2	F1	F4	F2			C2	C2	L1	L2	L3	L2	L1	H1	C3	C2	CL34	CL33	L8	F8	F9		F3		
25			F2				C2	C3	C3	C3	L4	L2	L3	L3	L2	L2	L2	L1	C1	F8	F8	F9	F4	F5	
26	F2	F1					C2	L3	L1	L2	L3	L2	L2	L2	L2	C2	L7	L8	L8	F2	F6	F6	F2	F6	
27	F5	F9	F9	F9	F4	F2	L2	L3	L5	L5	L5	L3	L3	L3	L4	L4	L2	L1	L1		F1	F8	F1	F4	
28	F8	F5	F8	F6	F6	F1	C3	C2	L3	L3	L3	C2	L2	L2	C2	C2	C1			F1	F2	F3	F8	F7	
29	F3	F7	F6	F2			L6	C3	C3	L2	L2	L2	C2	C1	C3	L5	L5	L4	L5	F3	F4	F7	F3		
30	F3	F3	F2	F2		F1	C2	L5	L3	L3	L3	L3	L2	L2	C2					F1	F3	F2	F2	F3	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

APR. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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

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 51	X 50	X 49	X 44	X 35															X 80	X 56	X 38	X 38		
2	X 37	X 37	X 37	X 41	X 36	X 26																X 59	X 43	X 36	X 36	
3	X 36	X 36	X 38	X 39	X 32	X 32																X 47	X 39	X 40	X 38	
4	X 38	X 36	X 37	X 39	X 36	X 32																X 107	X 74	X 34	X 34	
5	X 35	X 36	X 36	X 39	X 39	X 30																X 93	X 80	X 37	X 40	
6	X 38	X 40	X 52	X 51	X 38	X 25																X 65	X 50	X 40	X 41	
7	X 41	X 41	X 40	X 44	X 33	X 22																X 76	X 56	X 45	X 44	
8	X 44	X 43	X 40	X 47	X 31	B																X 72	X 56	X 47	X 45	
9	X 45	X 44	X 45	X 47	X 34	X 29																X 58	X 48	X 39	X 39	
10	X 39	X 38	X 38	X 41	X 28	X 24																X 64	X 59	X 54	X 53	
11	X 51	X 45	X 45	X 60	X 23	X 22																X 71	X 46	X 41	X 42	
12	X 41	X 39	X 41	X 49	X 25	X 21																X 82	X 56	X 44	X 44	
13	X 43	X 38	X 37	X 39	X 30	X 30																X 57	X 56	X 57	X 55	
14	X 48	X 45	X 46	X 48	X 29	X 27																X 72	X 66	A	X 51	
15	X 50	X 48	X 45	X 40	X 39	X 38																X 123	X 55	X 52	X 42	
16	X 40	X 46	X 54	X 53	X 56	X 44																X 82	X 70	X 45	X 42	
17	X 41	X 42	X 46	X 32	A	A																X 72	X 68	X 47	X 45	
18	X 52	X 55	X 53	X 44	X 37	X 41																X 74	X 58	X 54	X 50	
19	X 48	X 50	X 54	X 47	X 50	X 44																X 78	X 67	X 54	X 52	
20	X 44	X 45	X 42	X 44	X 38	X 33																X 78	X 70	X 59	X 53	
21	X 55	X 54	X 53	X 51	X 42	X 33																X 71	X 71	X 60	X 55	
22	X 55	X 54	X 50	X 50	X 37	X 34																X 92	X 50	X 47	X 49	
23	X 50	X 51	X 50	X 47	X 40	X 35																X 115	X 78	X 52	X 44	
24	X 42	X 40	X 40	X 40	X 34	X 33																X 67	X 58	X 57	X 54	
25	X 56	X 53	X 54	X 57	X 31	X 30																X 64	X 64	X 64	X 62	
26	X 58	X 56	X 58	X 45	X 40	X 38																A	A		X 46	X 45
27	X 48	X 44	X 38	A	A	X 27																X 101	X 68	X 56	X 52	
28	X 50	X 48	X 45	X 42	X 36	X 35																X 69	X A	X 40	X A	
29	X 59	X 54	X 47	X 40	X 36	X 29																X 72	X 62	X 54	X 55	
30	X 53	X 47	X 51	X 48	X 43	X 37																X 75	X 66	X 57	X 58	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	29	28	28															29	28	29	29		
MED	X 46	X 45	X 45	X 45	X 36	X 32															X 72	X 58	X 47	X 45		
U Q	X 51	X 51	X 51	X 49	X 40	X 35															X 82	X 68	X 55	X 53		
L Q	X 41	X 40	X 40	X 40	X 32	X 27															X 66	X 56	X 40	X 42		

APR. 2021 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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

$\begin{matrix} H \\ D \end{matrix}$	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	45	44	43	38	29	28	49	58	65	77	86	95	99	102	100	83	81	89	89	74	50	32	32	
2	31	31	31	35	30	20	24	51	56	65	69	77	82	94	88	81	69	66	71	70	53	37	30	30	
3	30	30	32	33	26	23 ^F	25	48	54	56	61	67	76	85	88	95	90	89	98	87	41	33	34	32	
4	32	30	31	33	30	26	32	51	55	59	62	58	66	83	101	105	105	103	94	87	101	68	28	28	
5	29	30	30	33	33	24	28	53	68	66	62	66	78	92	100	101	90	82	84	88	87	74	31	34	
6	32	34	42 ^F	42 ^F	30 ^F	18 ^F	26	48	59	66	64	67	75	92	100	93	82	77	78	79	59	44	34	35	
7	35	35	34	38	27	16 ^B	26	47	52	64	69	75	83	100	98	81	80	85	78	82	70	50	39	38	
8	38	37	34	41	25		25	47	72	71	72	82	98	91	93	97	78	65	70	67	66	50	41	39	
9	39	38	39	41	28	23	29	50	57	61	58	52	60	80	94	97	85	72	67	60	52	42	33	33	
10	33	32	32	35	22	18	29	46	58	69	78	85	73	77	90	100	83	78	66	64	58	53	48	47	
11	45	39	39	54	17	17 ^{J B}	28	43	52	61	74	95	92	101	93	82	73	80	84	80	65	40	35	36	
12	35	33	34	43	19	15	31	46	53	58	66	74	78	79	91	93	80	75	85	89	76	50	38	38	
13	37	32	31	33	24	24	34	50	50	53	59	74	92	99	90	96	88	93	82	58	51	50	51	49	
14	42	39	40	42	23	21	33	50	58	56	63	74	84	89	85	78	78	72	82	77	66	60		45	
15	44	40 ^F	39	35	33	32	42	55	58	66	64	72	91	109	120	125	128	127	136	151	117	49	45	36	
16	34	40	48	47	50	38 ^A	36	54	69	64	74	86	78	85	90	90	87	94	99	85	76	64 ^Z	39	36	
17	35	34 ^F	40	26			32	70	53	48	61	82	116	109	94	95	89	102 ^{J R}	101	68	66	62	41	39	
18	40 ^F	49	47	38	31	34	44	54	62	69	65	75	96	91	97	99	99	101 ^{J R}	98	92	68	52	48	44	
19	42	44	48	41	44	38	43	64	70	69	64	84	95	86	93	79	85	99	83	75	72	61	48	46	
20	38	39	36	38	32	27	36	65	80	69	69	88	102	108	106	85	80	90	95	88	72	64	53	47	
21	49	48	47	45	36	27	37	66	65	64	65	76	89	115	108	78	73	68	71	69	65	65	54	49	
22	49	48	44	44	31	28	38	54	66	79	78	64	85	85	90	100	104	109	102	107	86	45	41	43	
23	44	45	44	41	34	29	37	57	62	69	67	76	83	102	117	130	134	140	134	131	109	72	46	38	
24	36	34	34	34	28	27	41	60	66	60	55	64	75	90	100	106	116	117	109	100	61	52	51	48	
25	50	47	48	51	25	24	38	59	58	62	71	66	68	84	104	91	98	115	111	76	58 ^A	58 ^A	58	56	
26	52	50	52	39	34	32	44	64	56	62	63	70	80	83	89	93	90	103	118	114			40	39	
27	42	38	32			21	38	68	62	68	70	78	92	102	108	121	128	128	122	109	95	62 ^A	50	46 ^A	
28	44	42	39	36	30	29	44	59	57	56	61	69	69	79	92	108	108	101	83	74	63		34		
29		46 ^F	41 ^F	34	30	23	41	58	50	58 ^A	56	60	76	87	90	102	115	119	100	76	66	56	48	49 ^F	
30	47	41	41 ^F	42	37	31	43	52	55		58	66	74	90	103	113	119	114	102	88	69	60	51	50 ^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	29	30	30	29	28	28	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	28	29	29	
MED	39	39	39	39	30	25	35	54	58	64	64	74	82	90	94	96	88	94	92	84	66	52	41	39	
U Q	44	45	44	42	34	29	41	59	65	68	70	82	92	100	102	102	105	109	102	89	76	62	49	47	
L Q	34	34	34	34	26	21	28	49	55	58	61	66	75	85	90	90	80	78	82	74	60	50	34	36	

APR. 2021 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Okinawa

APR. 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										L	420	448	452	460	456	440	U L	L	L					
2										L	432	436	456	464	452	444	448	420	380					
3											U L	436	468	448	444	448	448	420	396					
4										L U	436	444	452	452	448	452	444	420	384	L	L			
5										L	424	448	460	472	456	460	A	428	A					
6										L	L	452	476	436	476	448	436	424	L	288				
7										L	424	452	444	452	440	444	440	428	404	L	L			
8										L	428	448	460	A	464	448	432	412	368	L	L			
9								L	L	L	432	444	460	U L	444	436	444	436	420	L	L			
10										L	428	436	448	456	456	440	440	412	L	L				
11											436	436	436	440	452	448	452	A	L	396	L			
12										L	L	436	448	452	A	448	444	444	444	L	L			
13											A	456	452	448	456	440	456	L	L					
14										L U	L	436	444	448	460	460	448	452	432	U L	L	L		
15										L	L	440	448	460	464	468	456	440	A	A	L			
16										L	436	452	452	472	A	452	444	440	412	L	L			
17										A	A	A	A	A	A	A	A	452	400	L	L			
18								L			448	452	460	464	472	468	452	436	L	L	A			
19										L	L U	L	436	452	464	472	476	480	444	480	L			
20										L	L U	L	440	460	480	484	480	452	A U	L	L			
21										L	L U	L	440	472	464	484	436	460	444	L	L	L		
22										L	L	436	456	468	476	A	460	448	A	A				
23											A	A	A	A	A	A	472	460	432	396	L			
24								L	A	L		444	468	472	468	464	452	428	412	L	L			
25										A	L	456	480	488	452	452	448	408	408	L	L			
26										L	L	464	460	464	460	460	444	A	A					
27										A	A	A	A	A	468	468	460	436	400					
28								L		U L	A	A	464	456	452	436	A	A	404					
29										A	424	A	A	A	A	A	A	A						
30										A	404	460	468	A	456	448			L	L	L			
31										A	A	A	A	476	A	440	436	424	396	336				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										19	24	25	24	25	30	26	23	15	2					
MED										L	436	448	460	464	456	452	444	428	400	312				
U Q										L	436	454	468	472	468	460	448	440	408					
L Q											428	444	452	452	448	448	440	420	396					

APR. 2021 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Okinawa

APR. 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							B																		
								192	220		A	316	332	340	332	324	308	288	256	192					
2							B	A						A	A										
								244	284	316	328						312	296	256	192					
3							B	A							U A										
								244	284	308	328	336	324	308	316	296	248	180							
4							A	A	A																
								296			A	324		316	296	280									
5							B																		
								184	268	296	312														
6							B																		
								204	276	300	328	336		A	336	328	308	300	264						
7							B																		
								204	264	304	324	340	348	348	344	332	296	260	192						
8							B																		
								200	256	292	308	316													
9							B																		
								180	248	292	316	320	332	340											
10							B																		
								184	256	296	324	336	348	344	332	320	296	268	200						
11							B																		
								188	268	300	320	332	344	336	332	316	292	260							
12							B																		
								204	256	292	328	336	344	344	336	320	288	256							
13							B																		
								236	268	308	324	340	352	352	336	312	288	256	196						
14							B																		
								192	268	296	324	344	348	340											
15							B																		
								212	276	304	328	344	344	U A	348	332	308								
16							B																		
								196	260	296	332	340	352	340	312	312	296	252	228						
17							A																		
								192	264	300	328	340	348	344	328	316	300	260							
18							B																		
								200	256	292	328	340	344	328											
19							A	A	A																
								300	328	344	356	352	340	324	304	264	196								
20							A																		
								228	280	320	332	348	368												
21							A																		
								212		A	A														
22							A																		
								224	276	312	332														
23																									
							176	216	268	304	324	332	352	344	340	308	312	268	212						
24							A																		
								200	268	292															
25							A																		
								260	264	304	332	348	352	348	320	324	304	272	204						
26							B	U A																	
								224	268	312	324														
27							B																		
								224	272	312	328	344	352	344	332	316	288	256							
28							A																		
								216	284	304	324	U A	328												
29							A																		
								212	272	300	320	348	348	348	344	328	296	248							
30							A																		
								224	280	300	320														
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	26	27	28	27	25	20	22	22	25	24	26	18						
MED							176	204	268	300	324	340	348	344	332	316	296	262	198						
U Q								224	272	304	328	344	352	348	340	324	302	268	204						
L Q								192	256	294	320	330	344	336	328	310	292	256	196						

APR. 2021 foE (0.01MHz)

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IONOSPHERIC DATA STATION Okinawa

APR. 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	E B			E B	E B	G				G		G	J A				G	E B	E B	E B	E B	E B
2	E B	E B	E B	E B	E B	E B	E B	E B	26	30	35	38	39	J A	J A	J A			G	J A	J A	J A	J A	J A
3	J A	E B	E B	E B			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	E B	E B	E B	E B	E B	E B	24	30	34	38	38	J A		J A	J A		J A	E B	E B	E B	E B	E B
6	E B	E B	E B	E B	E B	E B	E B	E B	26	30	34		G	G				G	G	J A	J A	J A	E B	E B
7	E B	E B	E B	E B	E B	E B	E B	E B	25	32	34	39	J A	J A						E B	E B	E B	E B	E B
8	J A	J A	E B	E B	E B	J A	J A												G	J A	J A	J A	E B	E B
9	E B	E B	E B	E B	E B	E B							G	G					G	J A		E B	E B	E B
10	E B	E B	E B	E B	E B	E B	E B	E B	26	32	34	36	37	38	39	37			G	J A		J A	E B	E B
11	E B	E B	E B	E B	E B	E B	J A												J A	J A	J A	J A	J A	J A
12	20	20	J A		J A		E B	J A											J A	J A	J A	J A	J A	J A
13	20	J A	J A	J A	J A	J A	E B												G	G		J A	J A	J A
14	E B	E B	E B	E B	E B	E B	E B	E B	27	36	40	40	44	45	J A	J A	J A			J A	J A	J A	J A	J A
15	J A	29	19	20	J A	J A	J A	J A	29	33	38	49	40	40	J A	J A	J A	54	108	J A	J A	J A	J A	J A
16	J A	J A	J A	J A	J A	J A	E B												J A		J A	J A	J A	J A
17	J A	J A	J A	J A	J A	J A														G	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	42	32	35	38	J A							J A	J A	J A	J A	E B
20	J A	J A	E B	E B	E B	E B	J A	J A												J A	J A	J A	J A	J A
21	J A	J A	J A	J A	J A	J A														J A	J A	J A	J A	E B
22	E B	E B	E B	E B	E B	E B														G	J A	J A	J A	E B
23	E B	E B	E B	E B	J A	J A														G	G	J A	J A	J A
24	J A	J A	J A	E B	J A	J A														G	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												G	G	E B	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
28	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	E B														J A	J A	J A	J A	J A
30	J A	J A	J A	J A	J A	E B	J A													G	G	G	E B	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	20	18	18	J A	19	16	17	28	32	37	42	42	43	42	40	38	36	31	28	J A	J A	J A
U Q	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
L Q	E B	E B	E B	E B	E B	E B	E B	E B												G	G	E B		E B

APR. 2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	29	32	34	G	40	G	37	24	33	30	G	E 16	E 16	E 16	E 16	E 16	
2	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	30	34	36	38	38	36	36	36	32	G	22	32	37	E 16	E 16	E 16	
3	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	31	35	34	36	40	41	36	35	32	28	24	25	22	18	E 16	E 16	
4	18	18	E 16	19	18	E 16	18	29	29	32	35	38	37	38	35	34	30	28	21	E 16	E 16	E 16	E 16	E 16	
5	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	29	34	35	37	38	40	39	51	31	43	36	E 16	E 16	E 16	E 16	E 16	
6	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	30	33	G	G	40	37	38	35	G	G	22	E 16	E 16	E 16	E 16	E 16	
7	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	30	33	38	38	40	38	38	36	33	29	22	E 16	E 16	E 16	E 16	E 16	
8	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	30	33	34	36	44	41	35	35	30	18	G	E 16	21	20	E 16	E 16	
9	E 16	E 16	E 16	E 16	E 16	E 16	E 16	23	30	32	35	G	G	36	35	35	G	G	21	18	E 16	E 16	E 16	E 16	
10	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	32	33	35	36	37	38	36	G	40	30	24	E 16	E 16	E 16	E 16	E 16	
11	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	30	35	35	38	40	39	38	35	53	37	27	22	E 16	E 16	18	E 16	
12	E 16	E 16	E 16	E 16	E 16	E 16	E 16	27	31	36	41	42	46	39	37	36	38	35	32	22	20	E 16	E 16	E 16	
13	E 16	E 16	E 16	E 16	E 16	E 16	E 16	28	31	37	46	43	40	40	40	G	G	31	24	23	E 16	E 16	E 16	E 16	
14	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	33	38	39	42	43	42	38	34	31	30	28	20	E 16	E 16	52	E 16	
15	E 16	E 16	E 16	E 16	E 16	E 16	E 16	29	32	37	43	39	38	37	41	42	47	40	27	22	23	E 16	E 16	E 16	
16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	30	36	35	37	41	46	36	36	37	27	26	19	E 16	E 16	20	E 16	
17	E 16	E 16	E 16	E 16	E 16	E 16	E 16	27	36	39	53	64	57	55	44	48	38	G	22	23	28	18	22	20	
18	20	E 16	30	19	E 16	E 16	E 16	24	30	36	36	40	42	37	37	36	32	53	41	32	29	E 16	E 16	32	
19	19	E 16	18	18	E 16	E 16	18	24	30	29	32	37	41	40	44	44	41	34	32	27	22	21	21	E 16	
20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	33	31	36	37	40	40	44	43	63	34	33	28	E 16	27	26	18	
21	E 16	E 16	E 16	E 16	E 16	E 16	E 16	17	26	34	32	36	36	40	37	40	36	38	33	24	21	18	E 16	E 16	
22	E 16	E 16	E 16	E 16	E 16	E 16	E 16	18	27	32	36	40	40	36	59	38	G	42	50	89	58	22	E 16	E 16	
23	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	28	38	45	51	54	54	54	46	34	G	G	34	26	28	E 16	E 16	
24	20	E 16	E 16	E 16	E 16	E 16	E 16	19	30	43	37	38	44	42	45	46	42	35	G	29	33	22	25	E 16	
25	21	21	E 16	E 16	E 16	E 16	E 16	22	32	36	43	44	40	39	38	37	33	G	G	23	16	E 16	24	24	
26	22	E 16	20	E 16	E 16	E 16	E 16	29	35	40	42	40	37	40	38	36	44	52	68	74	A 70	A 101	A 34	E 16	
27	E 16	E 16	20	A 52	A 36	A 16	E 16	31	40	52	54	58	56	45	45	35	35	35	35	22	E 16	20	E 16	26	
28	24	22	E 16	22	20	E 16	18	28	39	40	54	50	38	37	38	41	52	34	28	20	E 16	A 58	24	A 75	
29	29	E 16	18	E 16	E 16	E 16	E 16	21	35	38	39	42	40	54	43	38	65	92	100	71	55	E 16	21	22	
30	20	E 16	E 16	E 16	E 16	E 16	E 16	20	32	40	A 58	52	47	42	46	38	G	G	G	24	E 16	E 16	E 16	E 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	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	27	31	36	38	40	40	40	38	36	34	30	26	22	E 16	E 16	E 16	E 16	
U Q	19	E 16	16	16	16	E 16	18	29	36	39	43	42	42	44	40	41	38	35	32	25	22	21	20	20	
L Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	30	33	35	37	38	37	37	34	30	G	G	G	E 16	E 16	E 16	E 16	

APR. 2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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

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

APR. 2021 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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

$\begin{matrix} H \\ D \end{matrix}$	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	294	301	307	315	354	362	321	369	345	321	313	308	314	316	324	328	320	316	331	350	371	372	329	312	
2	307	312	307	360	395	303	326	388	365	359	339	335	314	333	344	331	336	348	354	359	364	360	299	287	
3	305	302	318	365	315	291 ^F	334	397	374	359	332	335	329	330	316	330	334	318	360	387	352	306	302	317	
4	331	316	313	340	331	287	338	394	377	351	358	329	305	293	318	330	326	344	339	328	353	403	290	304	
5	300	312	317	345	365	306	311	368	388	387	344	324	303	314	326	334	326	313	320	335	368	401	313	303	
6	293	309	292 ^F	384 ^F	412 ^F	310 ^F	338	370	360	363	347	309	288	314	337	329	329	332	348	368	356	356	320	305	
7	308	299	327	361	397	239	340	371	355	355	345	328	318	327	339	315	311	317	341	351	350	328	291	301	
8	310	312	300	351	398		311	335	356	345	309	293	328	321	326	342	339	343	348	342	343	334	307	301	
9	310	327	325	358	324	323	330	372	364	365	347	320	299	309	333	350	345	350	373	348	347	354	308	288	
10	303	302	334	378	356	324	329	376	348	350	344	348	338	307	321	326	338	299	325	344	338	315	325	309	
11	311	316	345	401	363	304	354	378	340	320	299	343	330	336	344	323	313	321	340	358	369	327	299	291	
12	289	313	347	353	426		356	386	369	345	333	333	320	306	320	348	322	309	319	348	355	344	299	295	
13	303	311	316	371	330	320	348	386	350	333	307	290	325	335	320	333	310	348	339	347	328	295	311	300	
14	296	315	324	378	343	314	336	369	368	337	336	322	325	320	348	317	305	315	331	340	336	342		A 309	
15	321	319 ^F	322	290	306	316	330	387	370	356	320	299	303	320	319	325	311	314	313	353	401	292	270	271	
16	297	277 ^F	289	312	355	361	351	358	359	349	329	342	308	320	322	311	286	308	337	319	340	341	318	280	
17	300	298 ^F	327	350		A A	332	368	389	367	282	274	339	345	306	318	314	337	353	317	323	343	286	278	
18	271 ^F	307	331	333	294	324	363	362	347	343	332	294	324	326	302	334	262	266 ^{J R}	322	349	339	290	306	306	
19	299	307	315	326	297	319	318	358	359	353	306	331	333	337	327	302	307	355	343	325	307	337	316	324	
20	289	327	354	329	340	322	323	359	369	340	305	316	320	328	350	315	301	328	337	333	322	324	319	295	
21	305	314	317	338	275	294	316	363	366	367	319	310	303	338	354	331	335	318	334	332	311	342	328	290	
22	303	312	315	356	315	314	334	357	354	361	363	316	321	320	290	314	321	312	317	322	364	299	308	302	
23	305	310	341	358	348	311	329	383	355	362	324	321	296	308	299	315	318	329	343	350	341	349	267	288	
24	313	307	321	332	322	327	368	372	367	347	355	302	278	299	311	312	317	335	347	363	367	294	296	290	
25	289	285	320	378	321	305	331	362	367	332	338	311	274	277	338	314	306	342	366	347	294	297	290	307	
26	302	304	359	333	304	295	335	397	361	347	347	329	310	295	302	319	298	312	349	372		A A			
27	318	319	412		A A	294	325	368	357	349	306	285	299	308	308	315	326	343	320	334	358	353	305	293	
28	287	297	325	338	313	322	359	385	361	349	312	307	272	287	296	323	348	336	348	335	350		A A		
29		F F	321	334	332	320	347	386	373	360	320	291	291	305	296	304	320	344	351	338	331	325	299	299	
30	281	302	316 ^F	336	348	304	358	392	374		A	314	314	268	289	304	320	327	344	345	355	330	316	299	321 ^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	29	30	30	29	28	27	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	28	29	29	
MED	303	310	321	350	336	314	334	372	362	350	330	316	312	318	320	323	320	328	340	347	347	336	305	300	
U Q	309	315	331	363	360	322	348	386	369	360	344	329	325	328	337	331	329	343	348	353	361	351	314	306	
L Q	294	302	315	333	315	303	326	363	355	344	312	302	299	306	306	315	310	314	331	334	330	310	294	289	

APR. 2021 M(3000)F2 (0.01)

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APR. 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										L	408	411	368	394	401	384	U L	L	L					
2										L	380	390	388	396	399	396	378	381	389					
3											U L	407	380	405	A	397	399	381	370					
4										L	U L	380	392	395	411	429	410	385	378	382	L	L		
5										L	388	394	398	409	382	377	A	406	A					
6										L	L	386	392	430	428	399	415	376	L	384				
7										L	384	399	396	396	421	400	393	363	369	L	L			
8										L	374	375	386	A	A	396	395	401	404	L	L			
9								L	L	L	382	390	397	421	431	397	378	381	L	L				
10										L	372	395	397	400	403	402	398	A	L					
11											364	386	411	427	417	411	381	A	A					
12										L	L	377	378	A	A	400	385	378	366	L				
13											A	A	383	420	401	404	357	L						
14										L	U L	386	397	A	A	373	399	380	369	366	U L	L		
15										L	376	A	410	400	411	388	A	A	A	L	L			
16										L	384	402	399	394	A	A	396	401	367	356	L	L		
17										A	A	A	A	A	A	A	A	359	367	L	L			
18								L			368	375	396	A	A	A	L	L	A					
19										L	L	U L	376	382	399	390	A	A	L	345				
20										L	L	U L	392	382	380	374	A	A	U L	L	L			
21										L	L	U L	397	377	402	384	434	397	401	L	L	L		
22										L	L	U L	387	394	413	388	A	401	397	A	A			
23											A	A	A	A	A	A	A	361	373	366	L			
24								L	A	L	406	A	U A	A	A	A	A	371	363	L	L			
25											A	A	L	374	368	392	394	382	395	361				
26										L	L	L	383	404	398	373	380	373	A	A				
27										A	A	A	A	A	A	A	372	364	375					
28								L		U L	410	A	A	396	406	395	A	A	367					
29										A	A	A	374	A	A	399	A	A	A					
30										A	A	A	A	376	A	413	382	388	373	390	L	L		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										18	21	21	22	18	24	22	22	14	2					
MED										L	381	390	397	396	404	397	384	376	368	387				
U Q										L	387	398	403	405	421	401	398	381	375					
L Q											376	382	387	383	392	394	378	L	366	366				

APR. 2021 M(3000)F1 (0.01)

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IONOSPHERIC DATA STATION Okinawa

APR. 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										290	288	296	288	282	264	252	266	262	256					
2									230	250	266	274	296	260	246	262	254	254						
3										280	290	276	272	286	266	252	252							
4									228	266	262	280	326	334	294	258	260	234	234					
5									216	224	270	298	314	290	268	260	254	260						
6									240	240	280	324	322	292	262	252	262	256	236					
7										262	266	280	280	272	250	270	274	260	236					
8									248	254	300	326	278	264	274	250	240	256						
9								226	238	246	276	324	362	308	268	248	246	238						
10									260	256	268	256	260	302	278	250	244	246						
11										304	316	250	260	266	250	266	280	268						
12									230	278	288	278	294	310	284	244	274	260						
13										328	334	274	264	276	268	278								
14									242	288	282	294	282	272	252	280	298	274	246					
15									240	256	300	318	308	282	270	258	276	282	252					
16									246	252	282	260	296	282	254	278	282	288	250					
17									210	236	394	366	266	256	280	272	278	254						
18								222		264	286	326	268	262	274	250	264	286						
19									242	254	274	270	264	258	274	264	290							
20									236	256	272	296	278	268	238	282	256	262						
21									238	238	298	304	312	266	238	254	262	286	240					
22									256	254	250	298	288	280	302	274	262	266						
23										248	298	290	314	292	288	278	258	256						
24								240	238	256	256	338	364	316	298	298	278	246						
25										290	278	324	390	354	264	278	298	248						
26									248	252	266	286	302	296	302	260	300	282						
27									248	266	318	332	312	284	302	282	258	240						
28								226		262	340	304	366	340	318	278	240	248						
29									230	254	324	376	344	300	320	310	294	270						
30									232		340	316	376	344	314	282	260	242	222					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	21	27	30	30	30	30	30	30	30	28	9					
MED								226	238	256	281	298	296	282	274	266	263	258	240					
U Q								233	247	266	300	324	322	302	294	278	278	269	251					
L Q								224	230	250	270	280	278	266	262	254	256	248	235					

APR. 2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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	272	270	262	226	210	206	240	214	218	214	192	188	256	196	198	206	206	232	220	212	196	182	224	262		
2	286	290	282	226	184	350	264	210	210	212	204	200	188	180	204	204	204	214	240	222	216	200	292	320		
3	296	300	258	216	302	306	248	200	224	218	196	188	206	A	182	166	206	210	220	198	204	246	262	258		
4	256	282	268	238	234	334	240	204	216	208	202	202	184	182	164	188	192	214	216	228	204	176	298	286		
5	298	268	256	224	200	244	248	214	210	210	196	178	174	232	220	A	198	A	256	224	202	184	240	280		
6	296	258	252 ^Q	196	178	338 ^Q	234	212	222	210	188	196	200	168	196	198	200	212	222	210	192	194	240	282		
7	270	264	246	214	184	628 ^{E B}	236	208	216	222	196	200	220	182	212	196	212	232	222	218	206	194	282	286		
8	270	260	266	226	170	B	256	230	234	216	192	204	A	E A	240	192	222	194	194	240	218	220	208	250	278	
9	270	246	254	214	230	250	236	204	210	208	196	190	184	174	174	220	198	210	218	216	206	202	270	302		
10	278	282	248	220	220	320	224	214	224	200	198	188	206	198	202	180	A	220	226	222	220	230	236	258		
11	264	256	232	192	286	398 ^{E B}	222	212	216	222	212	200	192	186	188	184	A	A	242	204	198	204	286	310		
12	282	268	240	210	180	B	216	208	202	208	240	E A	A	A	206	220	204	242	244	E A	258	218	196	202	250	288
13	282	274	254	196	E A	294	266	236	208	210	222	E A	316	220	204	196	188	196	238	218	218	222	278	252	272	
14	274	272	230	198	230	282	224	218	226	228	212	E A	222	A	E A	252	218	188	198	218	238	216	206	220	A	276
15	254	262	248	252	276	272	228	212	214	232	282	E A	194	184	180	222	A	A	A	242	214	186	178	242	306	
16	290	284	266	244	218	196	208	224	224	208	194	196	208	A	190	194	232	196	242	216	226	210	E A	208	306	
17	306	294	258	204	A	A	250	218	A	A	A	A	A	A	A	A	A	242	232	222	236	250	208	E A	328	
18	E A	248	E A	E A	312	260	212	208	220	212	206	204	E A	252	190	212	190	234	A	242	230	210	216	242	E A	296
19	282	268	252	230	258	236	256	230	212	216	204	E A	212	206	A	E A	A	196	236	218	236	228	204	244	216	
20	298	262	208	228	218	246	240	244	226	222	204	214	218	E A	254	A	212	236	238	226	232	218	234	E A	316	
21	256	248	254	222	312	284	242	224	222	206	204	200	218	184	216	192	246	248	228	228	250	214	218	290		
22	270	254	240	212	222	264	236	220	216	206	214	196	192	A	204	196	A	A	318	238	198	206	280	270		
23	262	252	218	204	200	272	236	218	246	A	A	A	A	A	A	A	214	204	206	230	220	198	198	E A	284	
24	290	280	256	232	230	262	210	228	A	214	204	E A	318	246	A	A	A	218	214	224	210	194	294	E A	304	
25	296	280	242	198	258	288	236	240	234	A	A	220	210	220	210	194	206	222	210	204	248	276	E A	268		
26	270	258	220	214	262	290	230	206	218	A	E A	236	194	188	236	224	228	A	A	246	218	A	E A	372	302	
27	256	200	192	A	A	352	236	230	A	A	A	A	A	A	A	A	198	222	234	246	222	200	206	E A	288	
28	306	284	250	234	266	248	214	218	228	218	A	A	200	194	218	A	A	A	236	222	220	208	E A	A	288	
29	E A	226	236	240	216	270	228	210	A	E A	E A	232	A	A	200	A	A	A	A	236	236	226	226	278	278	
30	304	276	264	230	214	250	220	212	A	A	A	A	232	A	204	206	192	186	208	218	202	240	252	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	30	30	30	29	28	27	30	30	25	24	23	24	23	20	25	22	23	23	30	30	29	28	29	29		
MED	279	268	252	220	222	269	236	214	218	213	200	198	203	190	203	196	206	219	228	218	206	207	248	282		
U Q	296	280	258	230	264	320	240	224	225	222	212	213	220	226	218	206	222	236	242	226	224	223	284	303		
L Q	270	256	240	207	205	250	224	208	213	208	196	194	188	182	194	188	198	210	220	216	198	199	240	271		

APR. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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							B			A										B				
2							B	120	104		102	102	102	102	102	102	102	104	110		A			
3							B	A													A			
4							A	A	A	102	A							A	A	A	B			
5							B											A	A		B			
6							B	102	102	102	102					110			110		B			
7							B	104	104	104	100	100		A					A	B				
8							B	124	104	104	102	102	102	102	102	102	104	104	106		B			
9							B	104	104	104	104	102						102	104		A			
10							B	104	102	102	102	102	102	114	A	104	102	102	106		A			
11							B	104	102	102	102	102	102	102	102	102	102	106	108		A			
12							B	108	102	102	102	102	102	102	102	102	102	102		A	A			
13							B	104	102	102	102	102	102	102	102	110	104	104			A			
14							B	110	102	102	102	102	102	102	102	102	102	102	110		A			
15							B	104	104	104	104	102	102	102				A	A	A	A			
16							B	104	104	104	104	102	102	102				A	A	A	A			
17							B	110	100	100	100	100	100	100	100	100					A			
18							B	110	102	102	102	102	102	102	102	102	102	102	108		A			
19							A	102	102	102	102	102	102	102	102	98	102	104		A	A			
20							A	104	104	104	104	102	102	102		102		102	108		A			
21							A	104	104	104	104	102	102	102		102		102	108		A			
22							A	104	104	104	104	102	102	102		102		102	108		A			
23							A	110	100	100	100	100	100	100	100	100					A			
24							A	104	102	102	102	102	102	102	102	102	102	102	108		A			
25							A	104	118	106	106	104	102					102	108		A			
26							A	102				102		A				102	108		A			
27							A	112	110	104	102			A			102	102	106	102				
28							A	136	104	104	102	100	100	100	100	102	102	102	104	104				
29							A	104	102	102		A		A		102	102	102		A	A			
30							A	104	104	104	104	102	102	102		102		102	108		A			
31							A	104	104	102	102		A			102		102	104	104	102			
							A	104	104	102	102		102	102	102	102	102	104	104	104				
	00	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	26	27	28	27	25	20	22	22	25	24	26	18					
MED							136	104	102	102	102	102	102	102	102	102	102	103	107					
U Q								108	104	104	104	102	102	102	102	102	103	104	108					
L Q								104	102	102	102	102	102	102	102	102	102	102	104					

APR. 2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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	82	82	B	98	96	B	B	G	126	130	140	G	180	G	156	94	142	194	G	B	B	B	102	B	
2	B	B	B	B	B	B	B	130	134	124	116	112	96	96	94	110	118	G	152	104	98	98	98	102	
3	98	B	B	B	96	106	96	140	124	116	118	118	108	106	108	108	110	106	116	108	102	98	98	96	
4	92	90	106	92	92	94	94	92	138	132	120	108	108	102	102	102	104	102	102	98	96	96	96	100	
5	90	84	B	B	B	B	B	114	130	112	108	98	96	162	142	122	86	154	138	B	B	B	B	B	
6	B	B	96	B	B	B	B	144	172	158	G	G	172	110	156	150	G	G	120	84	82	104	B	B	
7	B	B	B	B	B	B	B	144	132	144	136	112	118	122	162	166	164	188	150	B	B	B	B	B	
8	108	104	B	B	B	144	130	130	132	122	110	100	130	130	104	122	146	88	88	108	100	100	B	B	
9	B	B	B	B	B	B	100	134	154	134	134	G	G	124	116	166	G	G	170	86	86	B	B	106	
10	B	B	B	B	B	B	B	136	132	132	134	144	134	126	122	G	106	172	146	118	108	B	B	B	
11	B	B	B	B	B	B	102	130	138	120	134	124	120	112	112	112	102	106	102	100	102	104	98	98	
12	98	94	94	96	94	158	B	134	144	128	126	120	116	122	122	118	100	106	104	96	98	98	B	102	
13	98	94	96	96	96	96	B	126	148	116	112	112	118	112	116	G	G	168	142	104	104	108	108	100	
14	B	B	B	B	B	B	B	124	116	110	110	106	106	104	102	98	98	164	126	90	108	108	92	96	
15	96	98	94	94	92	94	102	120	118	110	106	106	102	106	100	100	94	94	100	94	96	B	84	84	
16	102	100	98	98	92	92	B	136	136	116	126	132	108	104	122	128	110	120	142	118	98	94	96	102	
17	92	88	88	100	96	96	132	132	124	118	110	108	104	106	112	108	108	G	100	100	100	94	94	92	
18	98	98	96	92	92	90	98	136	118	108	110	108	108	110	112	112	134	126	116	104	100	106	100	98	
19	100	104	100	100	100	98	96	98	98	134	128	122	132	120	116	116	120	176	128	104	100	98	98	B	
20	94	96	B	B	B	B	118	116	138	150	130	110	142	104	100	96	106	190	132	110	102	98	98	96	
21	108	84	98	98	98	106	124	144	98	104	98	124	94	146	130	122	108	106	148	118	108	86	B	B	
22	B	B	B	B	B	B	120	120	114	114	106	102	98	94	114	G	148	110	102	100	100	102	98	B	
23	B	B	B	B	94	94	G	124	112	110	106	104	108	106	108	126	G	G	112	106	102	102	94	100	
24	94	92	92	B	94	98	136	122	102	102	100	98	96	144	134	150	150	G	G	84	84	100	102	100	98
25	100	96	98	88	92	134	122	118	114	106	104	108	108	116	106	130	G	G	152	B	110	102	100	98	
26	94	100	92	92	86	B	128	112	106	104	104	98	96	104	102	140	122	112	104	98	98	98	98	104	
27	102	122	94	96	94	94	130	114	112	104	104	102	102	106	108	122	156	104	100	98	94	94	98	96	
28	94	92	92	92	94	100	130	124	110	108	102	98	102	112	110	108	104	106	120	102	100	100	100	106	
29	100	140	98	96	96	B	126	112	110	112	104	108	106	118	120	104	100	100	102	98	94	96	100	100	
30	90	90	98	92	90	B	130	116	112	106	100	100	114	114	132	G	G	G	130	B	104	100	102	100	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	21	20	17	16	19	16	19	29	30	30	29	27	29	29	30	26	24	22	29	25	27	24	22	21	
MED	98	95	96	96	94	97	122	124	124	116	110	108	108	112	113	117	109	111	120	100	100	99	98	100	
U Q	100	100	98	98	96	106	130	135	136	130	127	118	119	122	122	128	138	168	142	107	102	102	100	102	
L Q	93	90	93	92	92	94	100	116	112	108	104	102	102	105	106	108	103	106	102	97	98	97	96	96	

APR. 2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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					C	CL	H		H		H	LH	H	H					F	
2									H	H	C	C	C	L	L	L	C	C		H	C	F	F	F	F
3	F				F	F	L	HL	CL	CL	CL	C	C	C	C	C	C	C	C	C	C	F	F	F	F
4	F	F	FF	F	F	F	L	L	HL	HL	CL	C	CL	C	C	C	C	C	C	C	L	F	F	F	F
5	F	F							C	H	C	C	L	L	HL	HL	CL	L	HL	HL					
6			F						H	H	H			HL	C	HC	HC			C	L	F	F		
7								HL	H	H	H	C	C	C	C	H	H	H	H	H	H				
8	F	F			F	H	H	H	C	C	C	C	HL	HL	C	CL	H	L	L	L	CL	FF	FF		
9						L	H	H	H	H				HL	C	H				HL	L	F			F
10							H	H	H	H	H	H	H	C	C	C	C	H	H	H	CL	F			
11						C	H	H	C	H	C	C	C	C	C	C	C	CQ	C	L	F	F	F	F	F
12	F	F	F	F	F		H	H	C	C	C	C	C	C	C	C	C	C	C	L	F	FF		F	
13	F	F	F	F	F		C	H	C	C	C	C	C	C	C			H	H	C	F	F	F	F	
14							C	C	C	C	C	C	C	C	C	L	L	HL	CL	F	F	F	F	F	
15	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	L	L	L	LQ	L	F		F	F	
16	FF	F	F	F	F		H	H	C	C	H	C	C	C	C	C	C	HC	CL	F	F	F	F	F	
17	F	F	F	F	F	H	H	C	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	F	
18	FF	F	F	F	F	L	H	C	C	C	C	C	C	C	C	C	H	C	C	C	F	F	F	F	
19	F	FF	F	F	F	L	L	L	HL	C	C	CL	C	C	C	C	H	C	C	C	F	F	F		
20	F	F				C	C	HL	H	H	C	HL	C	L	L	C	H	H	C	F	F	F	F	F	
21	F	F	F	F	F	C	H	L	C	L	CL	LH	H	H	C	C	C	H	CL	FF	F				
22						C	C	C	C	C	C	L	L	C		H	C	C	C	F	F	F			
23				F	F		C	C	C	C	C	C	C	C	C	C			C	C	F	F	F	F	
24	F	F	F		F	F	H	C	C	C	L	L	HL	H	H	H		L	L	FF	F	F	F	F	
25	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	HL			H		F	F	F	F	
26	F	F	F	F	F	C	C	C	C	C	L	L	C	CH	HC	C	C	C	C	L	F	F	F	F	
27	F	FF	F	F	F	H	C	C	C	C	C	C	C	C	C	C	H	C	C	L	F	F	F	F	
28	F	F	F	F	F	H	C	C	C	C	L	C	CL	C	C	C	CL	CL	CL	C	F	F	F	F	
29	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	C	C	C	CL	L	F	F	FF	FF	
30	F	F	F	F	F	H	C	C	C	C	C	C	C	C	H				H		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																									

APR. 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

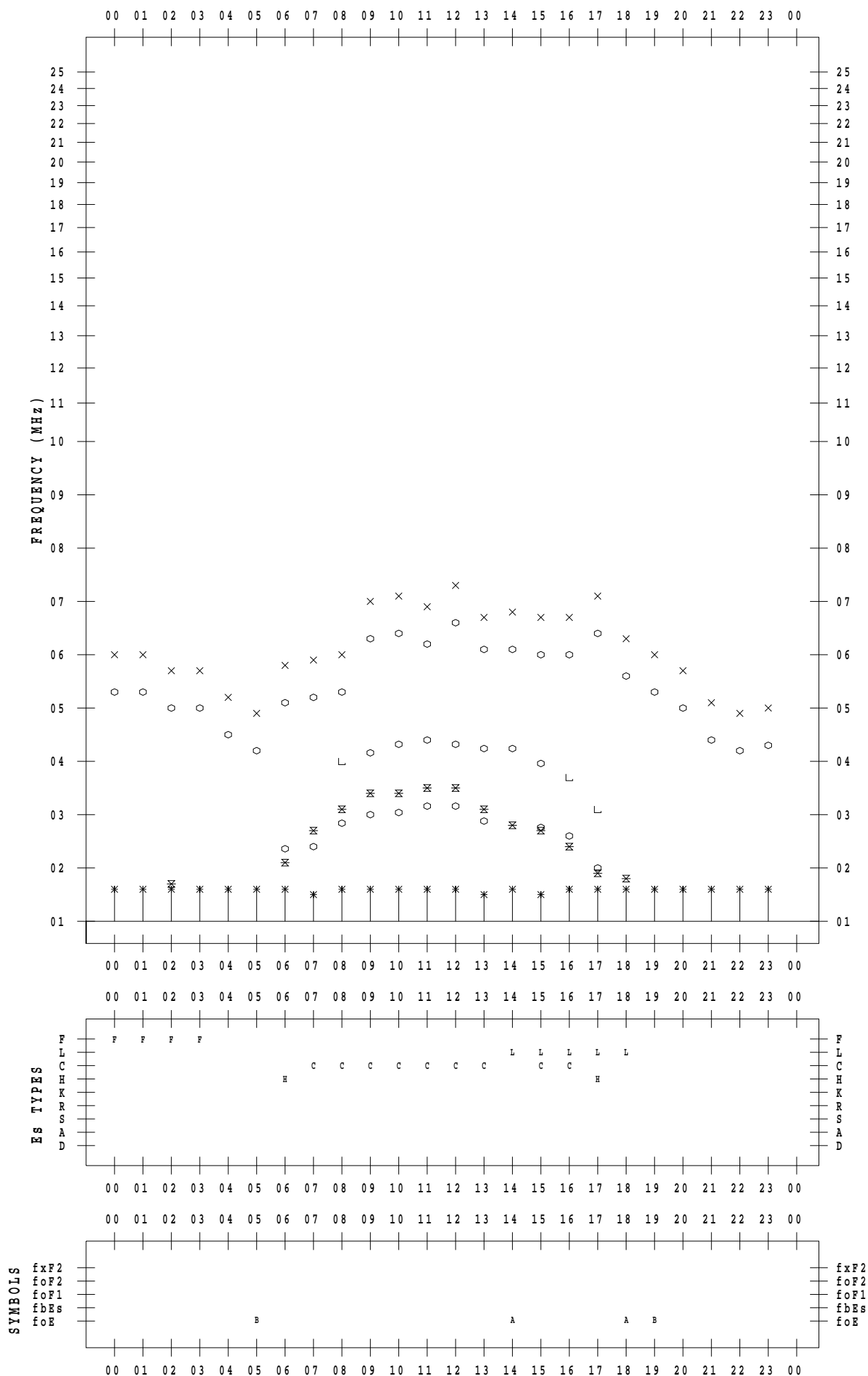
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 1

135 ° E MEAN TIME



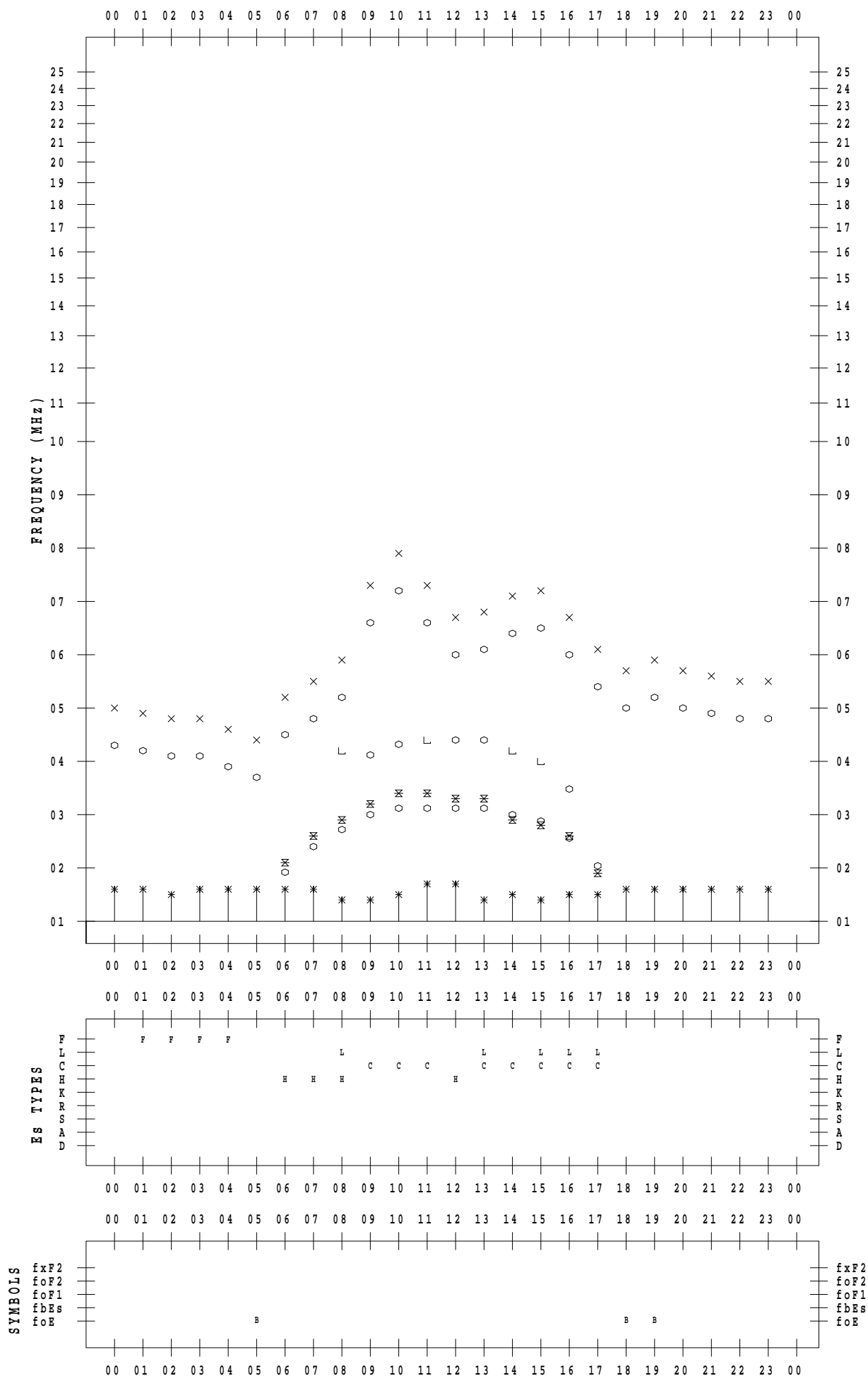
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 2

135 ° E MEAN TIME



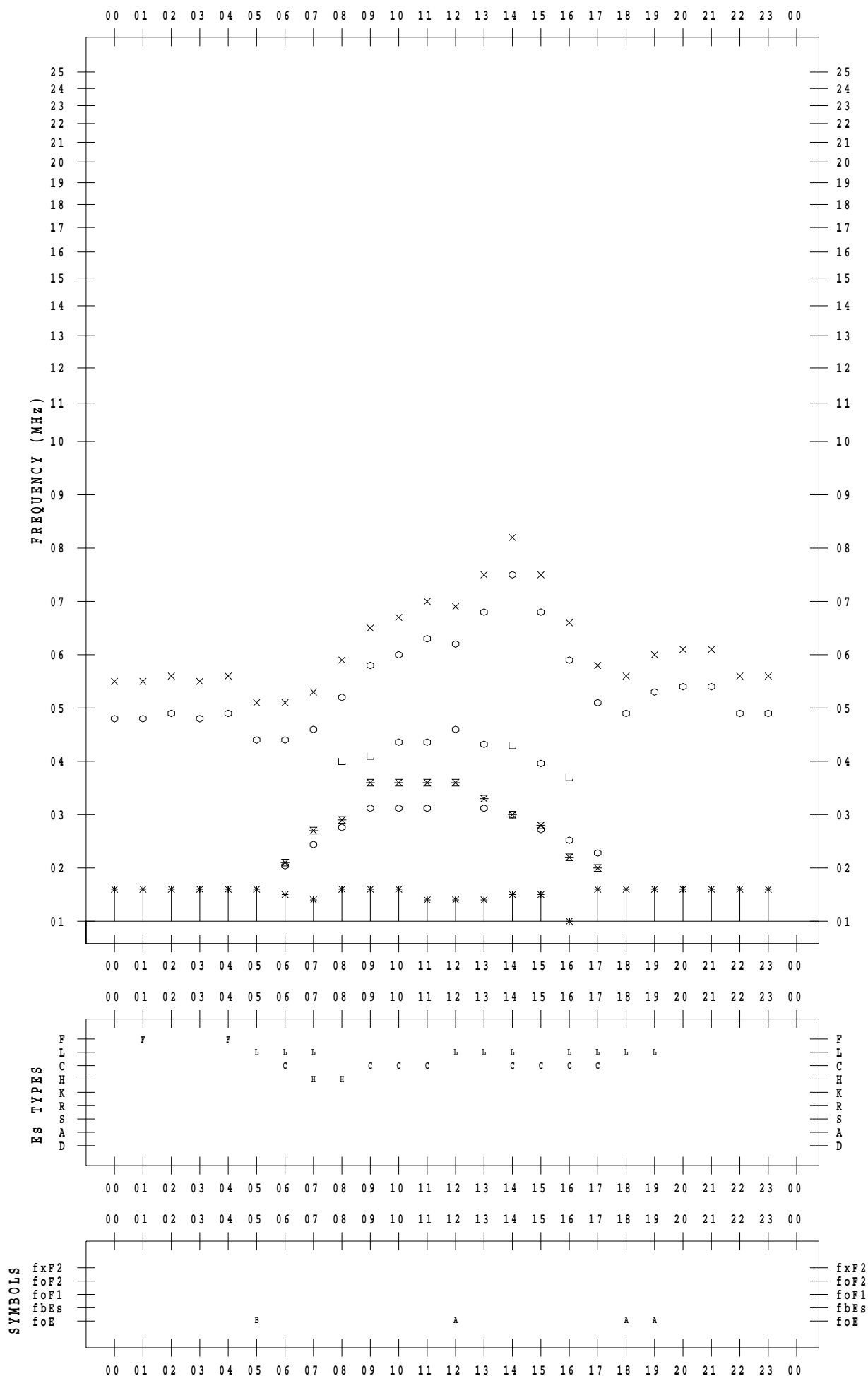
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 3

135 ° E MEAN TIME



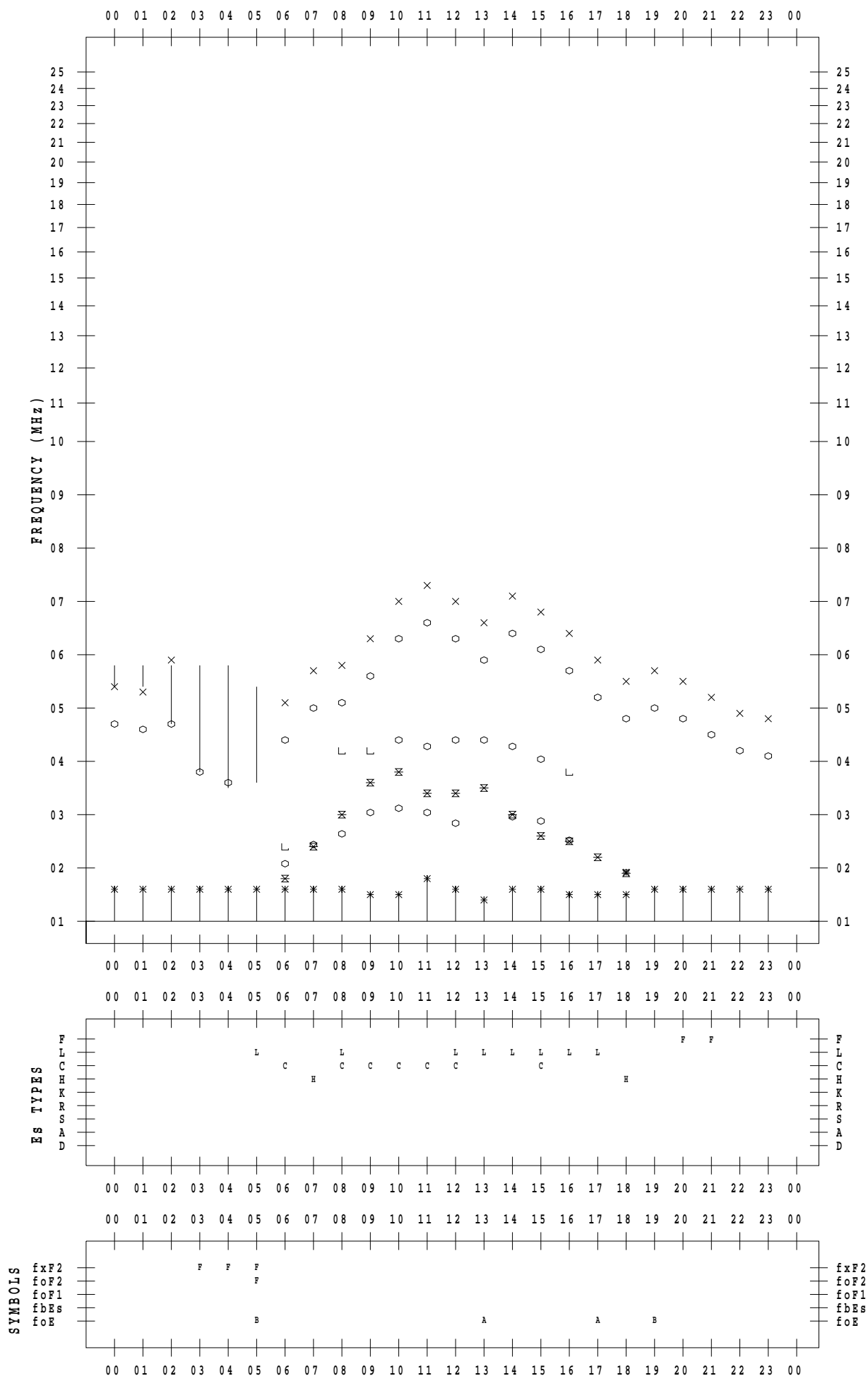
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 4

135 ° E MEAN TIME



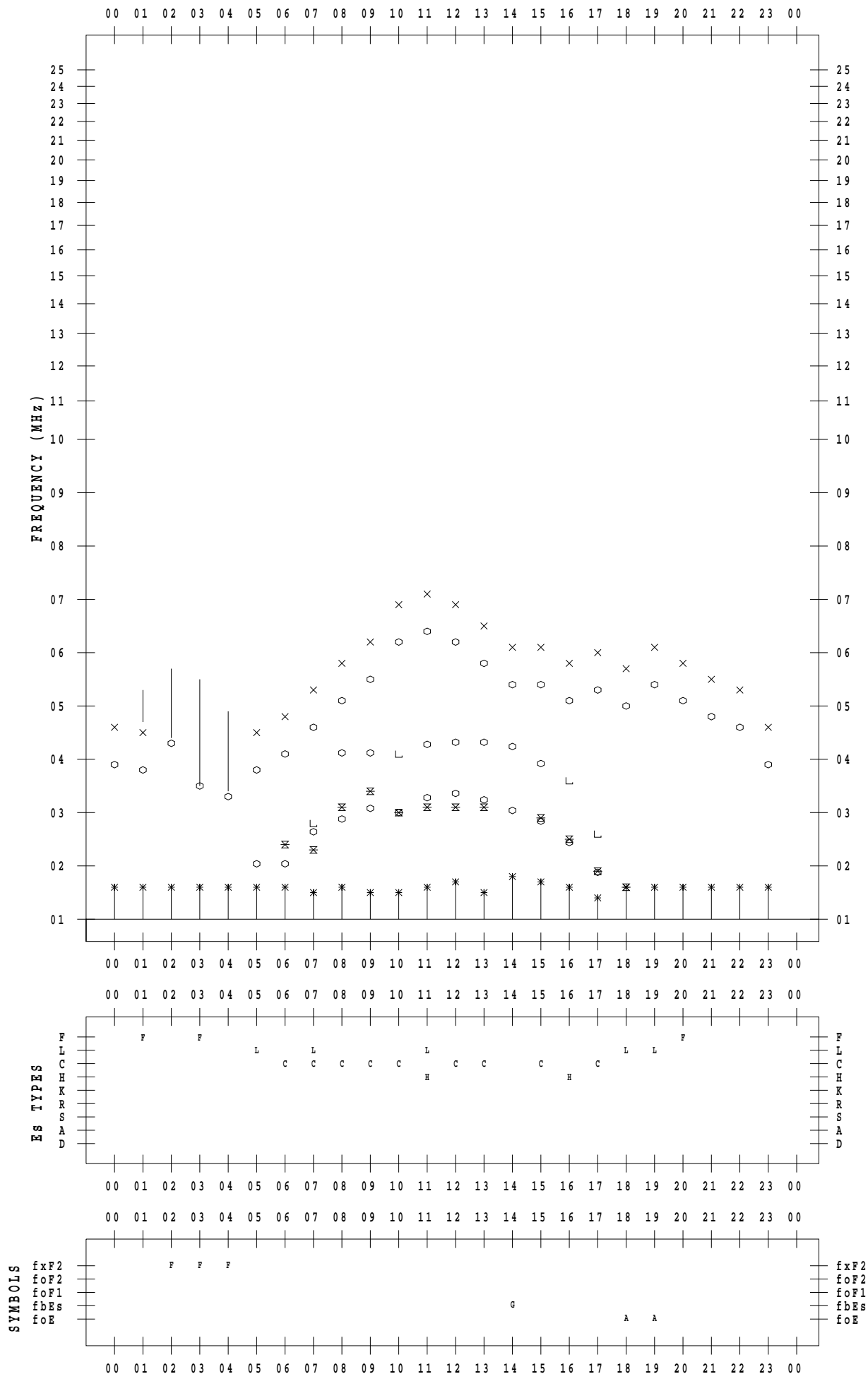
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 5

135 ° E MEAN TIME



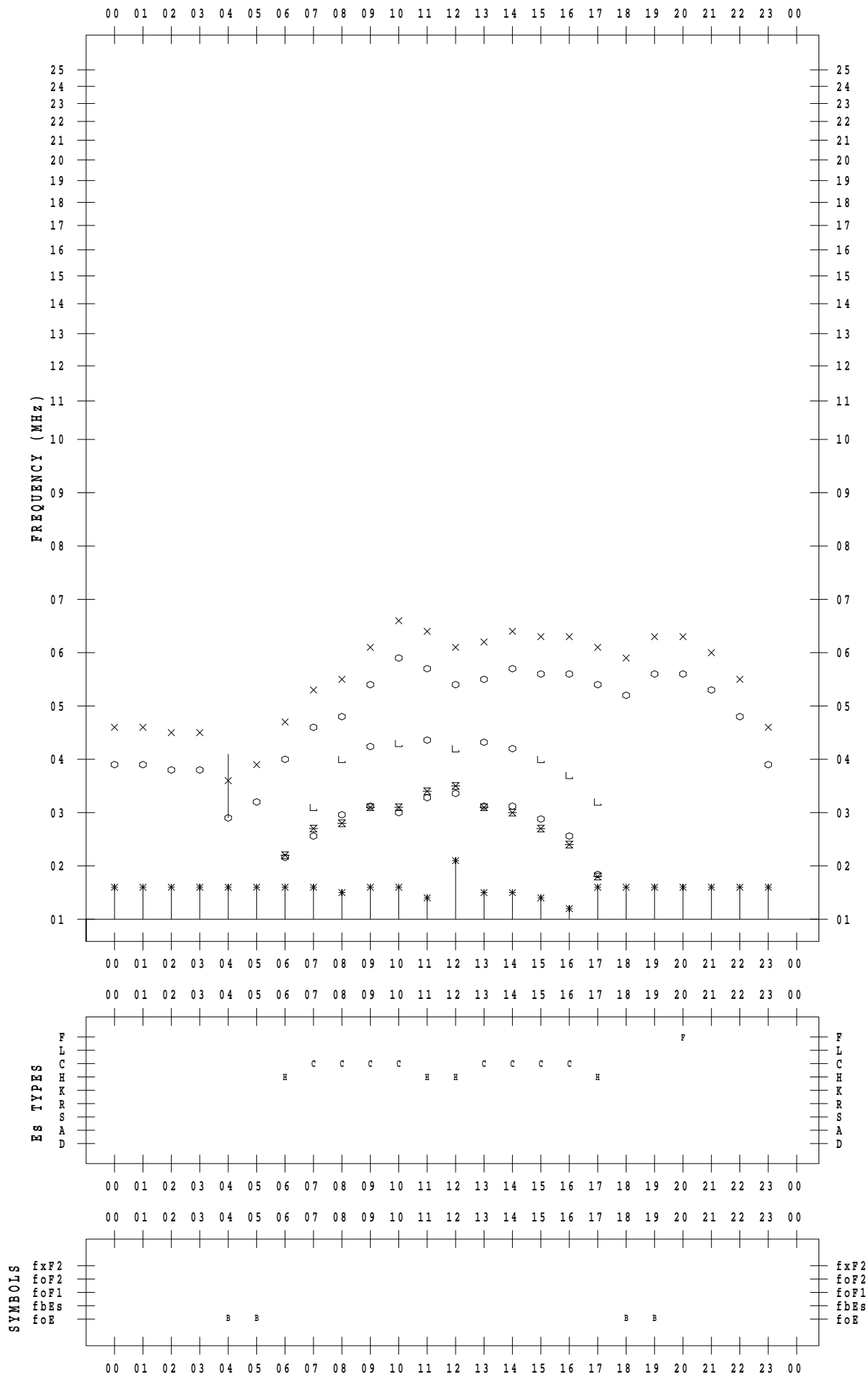
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 6

135 ° E MEAN TIME



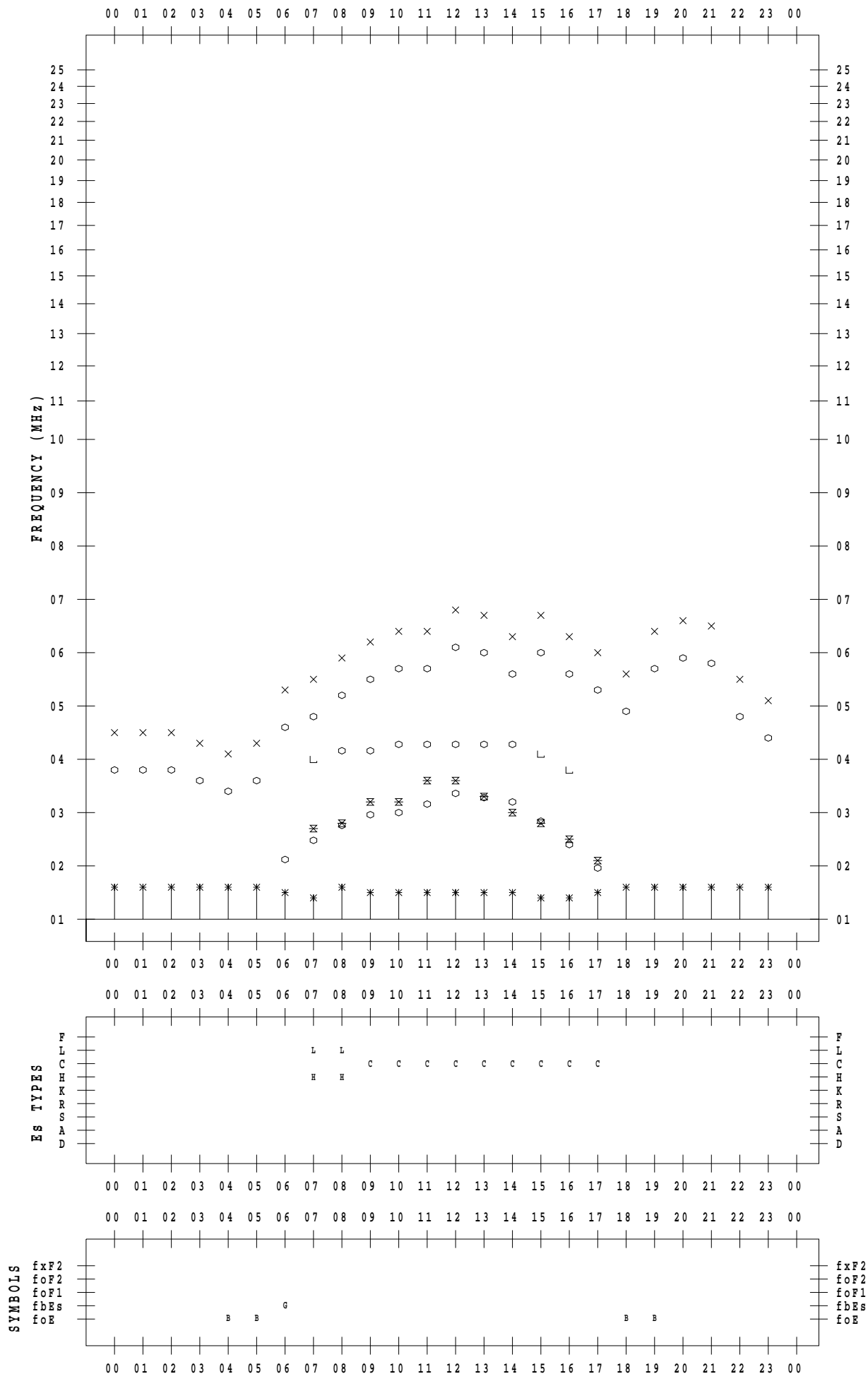
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 7

135 ° E MEAN TIME



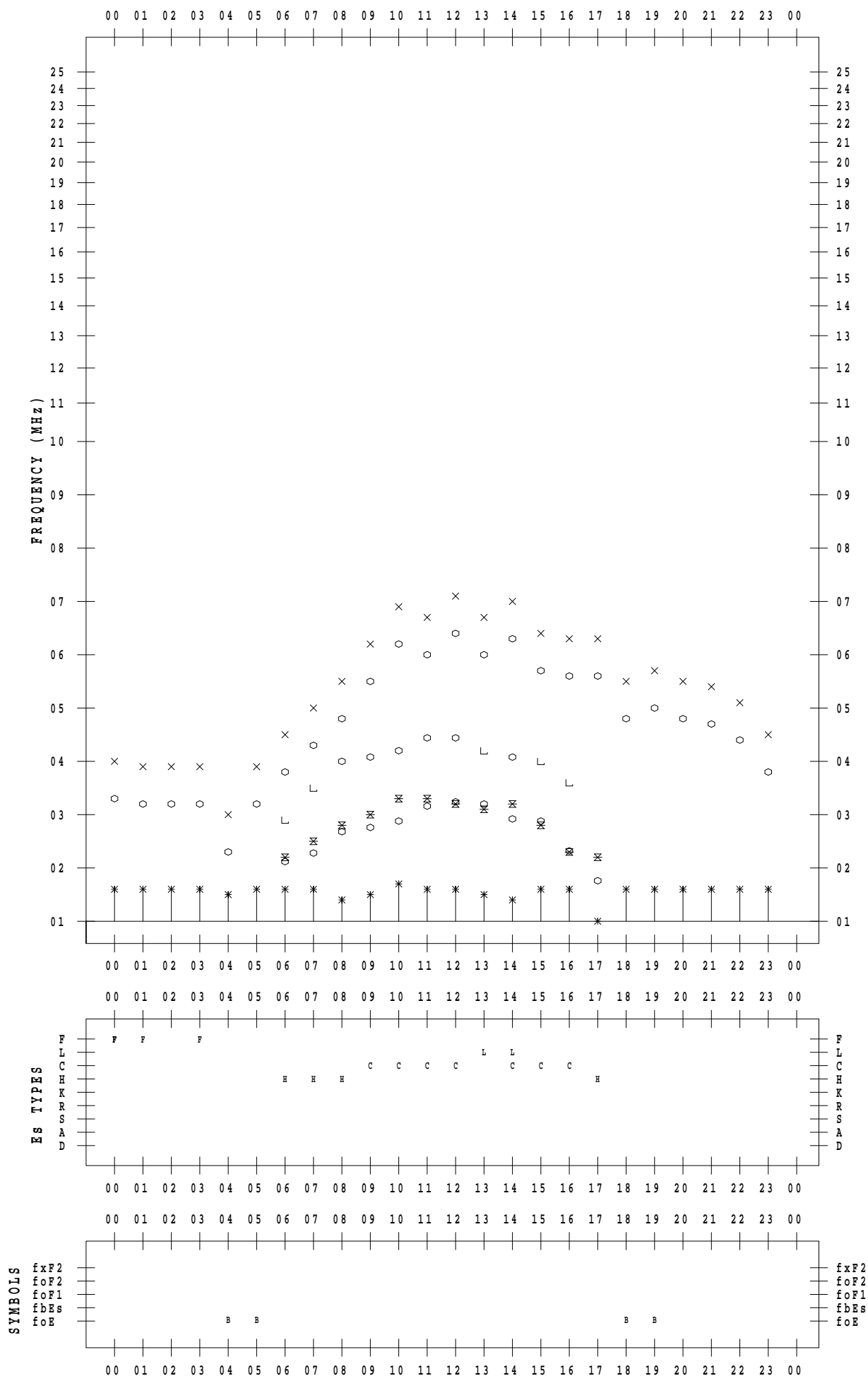
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 8

135 ° E MEAN TIME



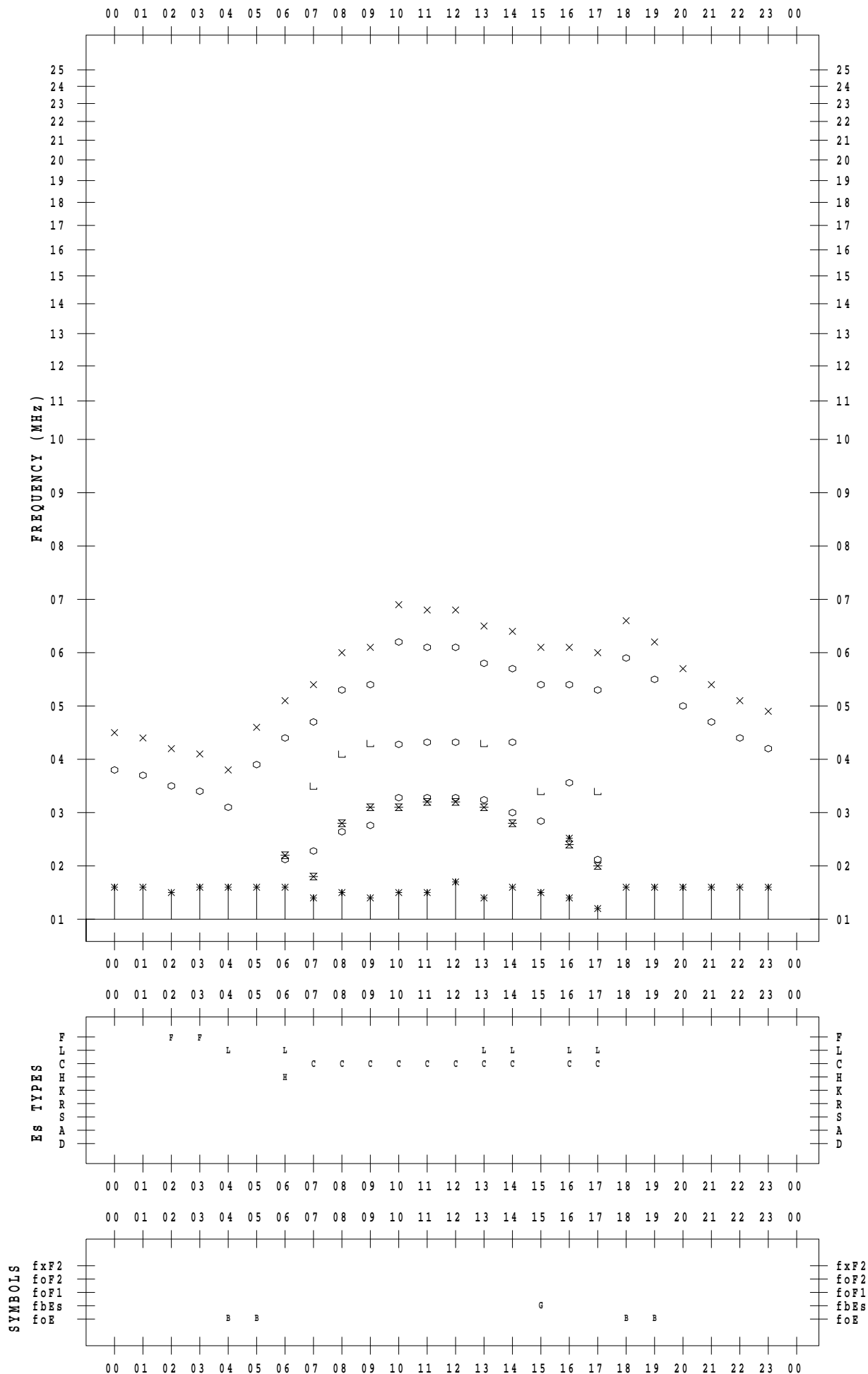
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 9

135 ° E MEAN TIME



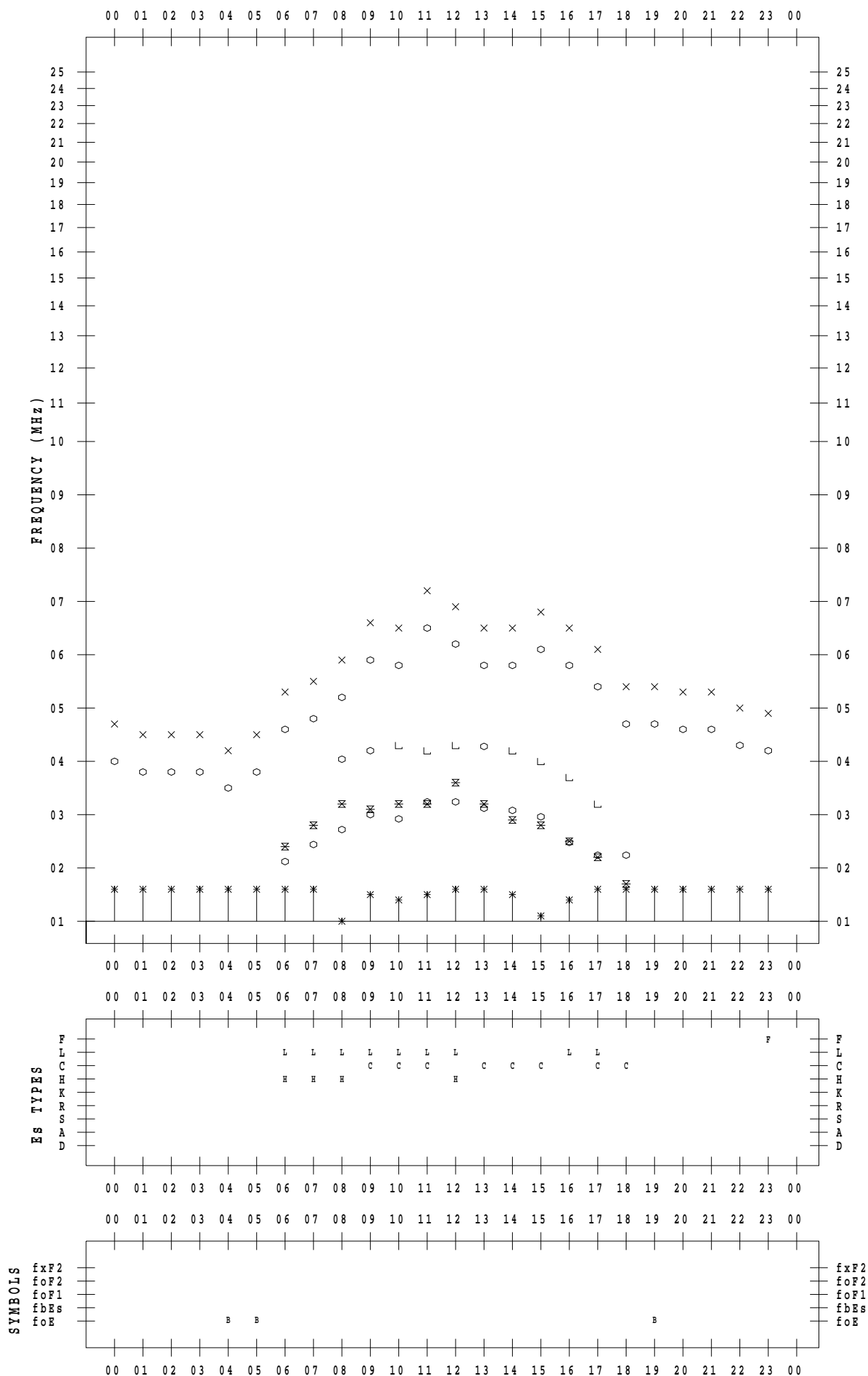
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 10

135 ° E MEAN TIME



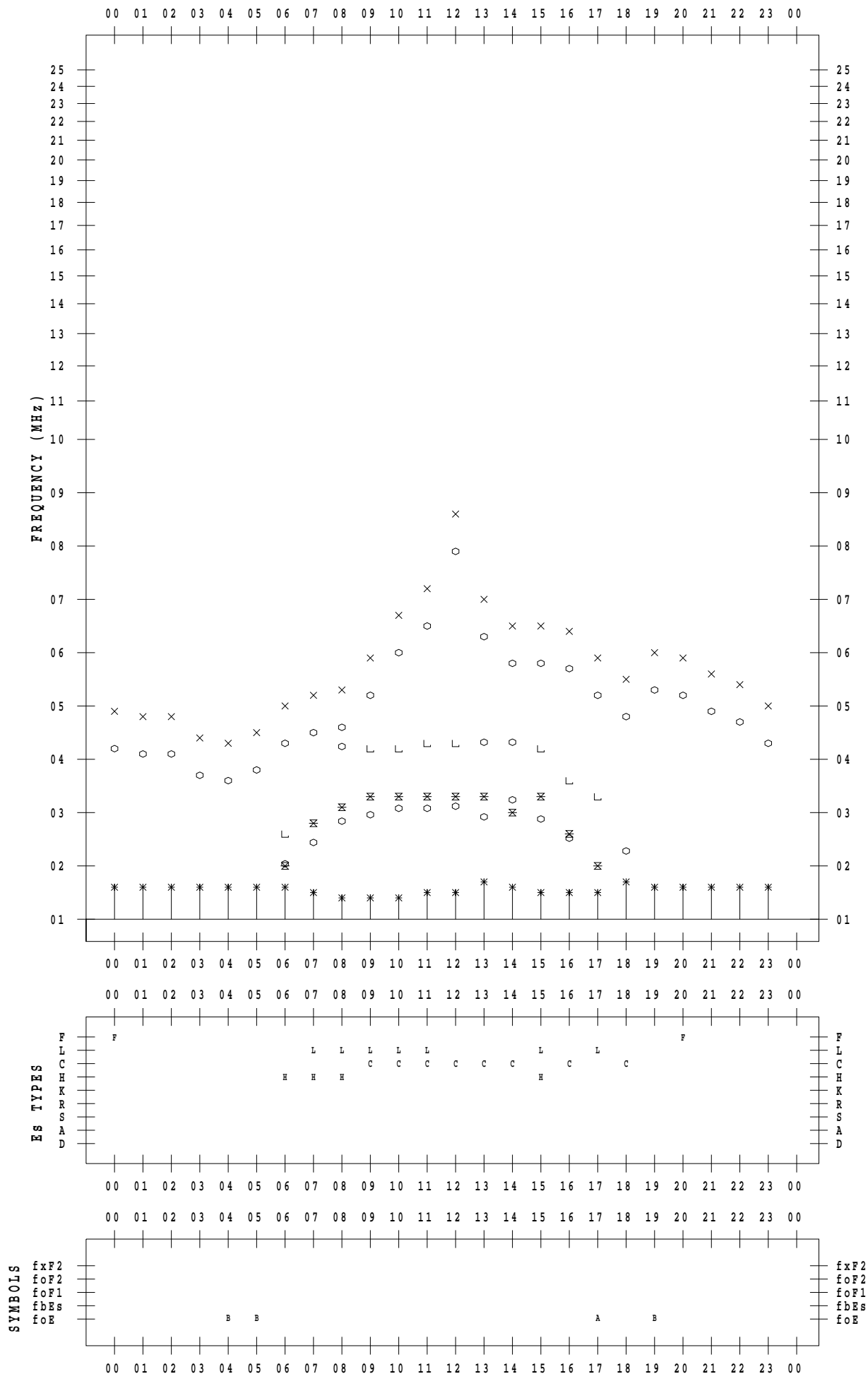
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 11

135 ° E MEAN TIME



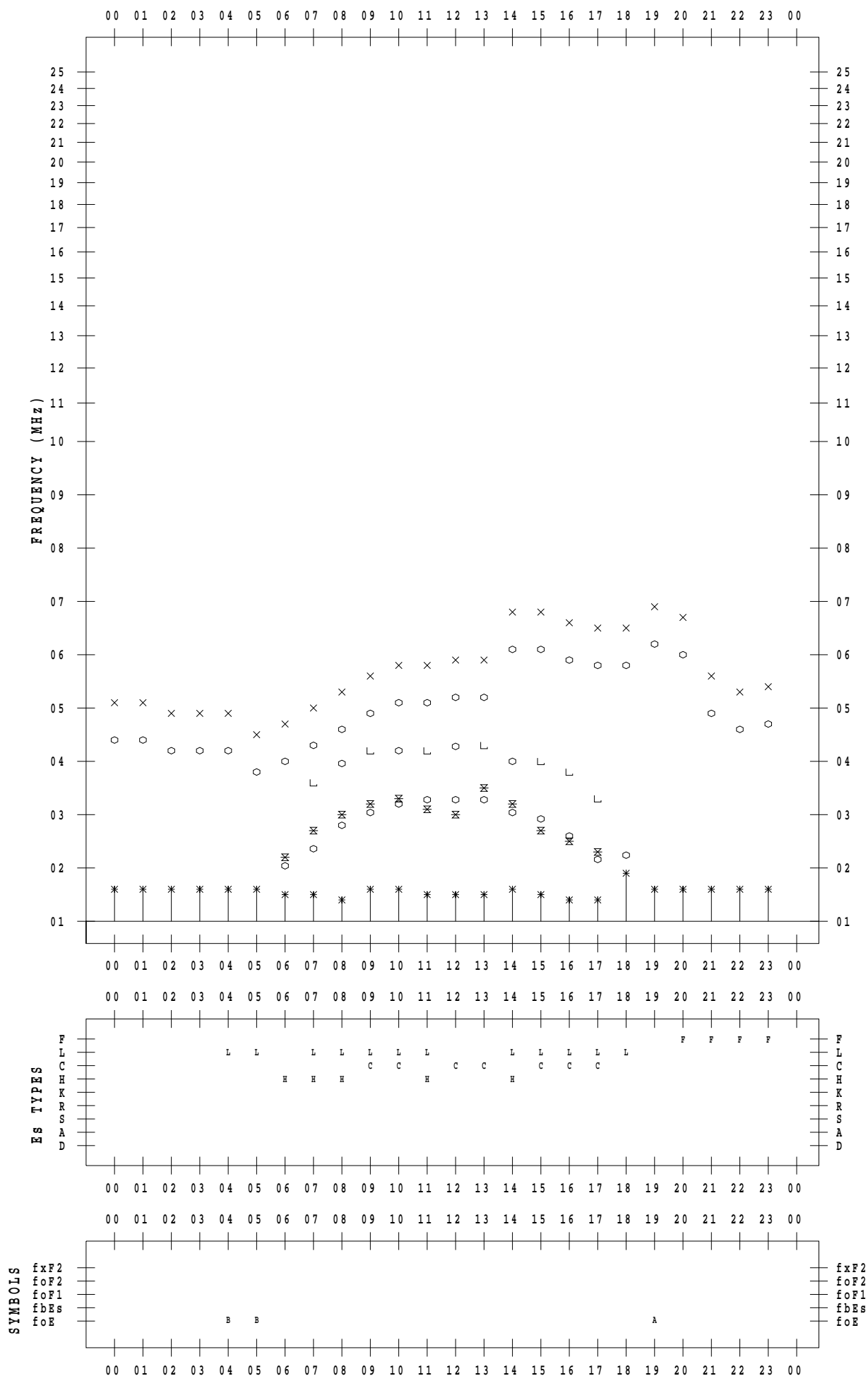
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 12

135 ° E MEAN TIME



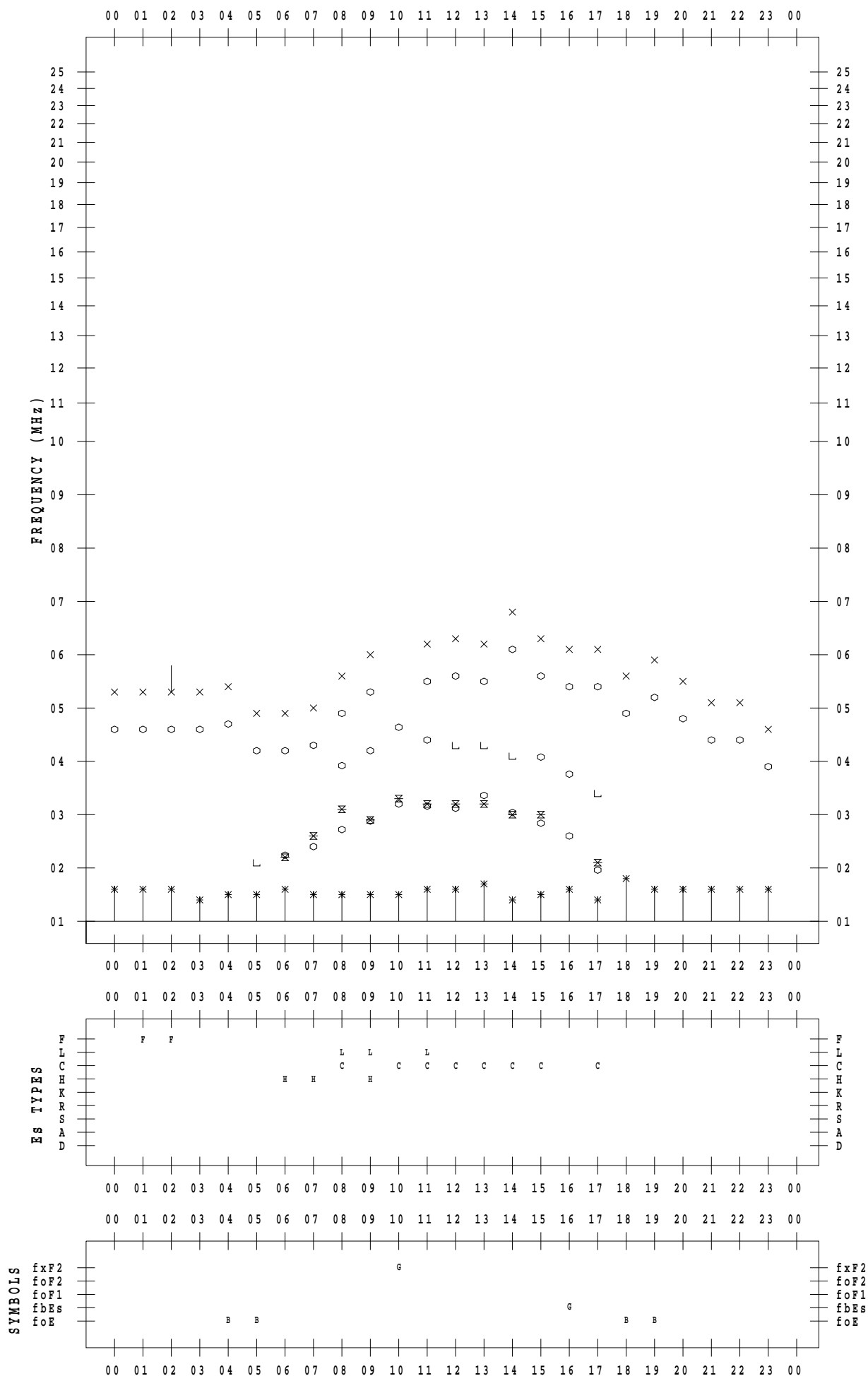
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 13

135 ° E MEAN TIME



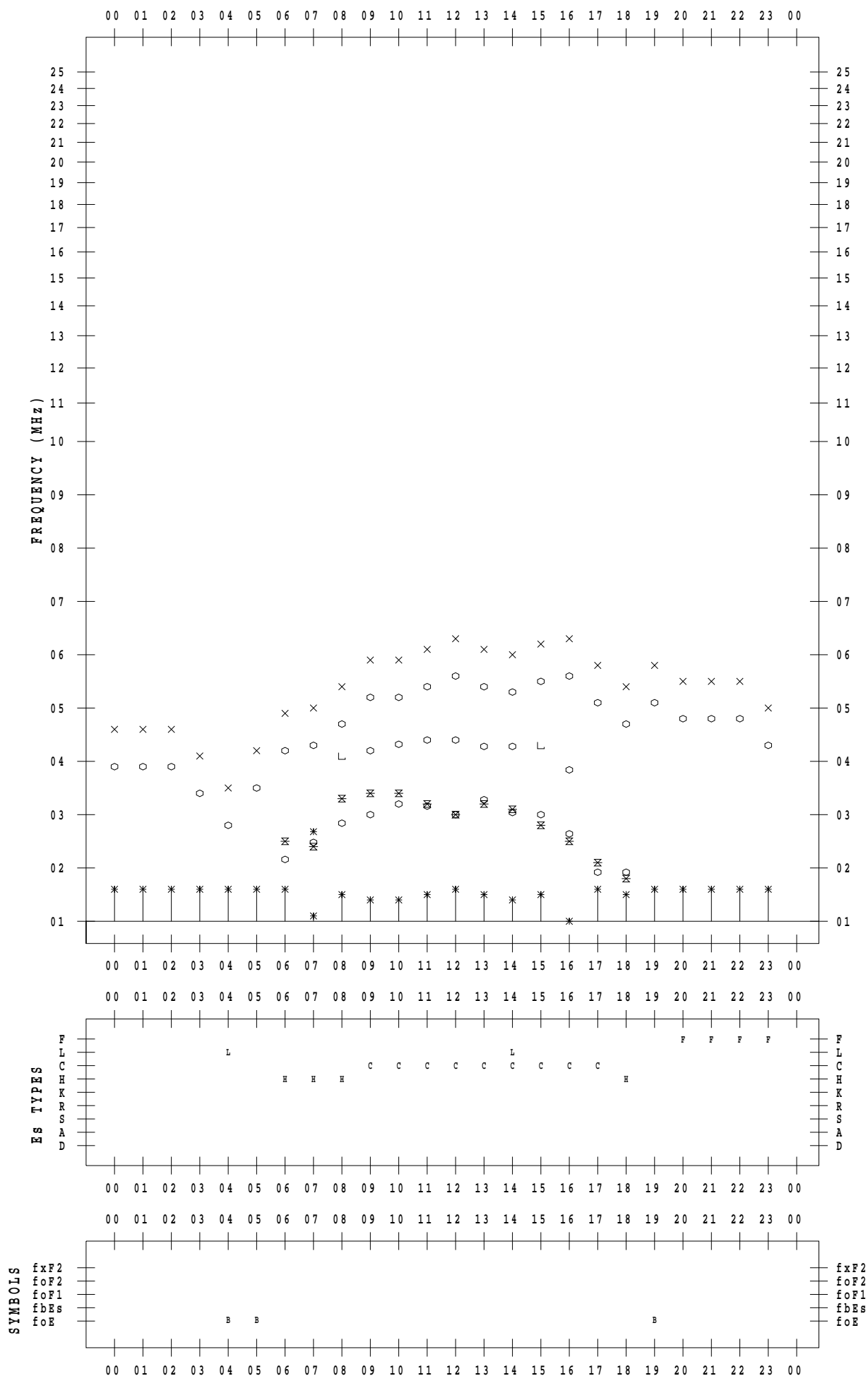
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 14

135 ° E MEAN TIME



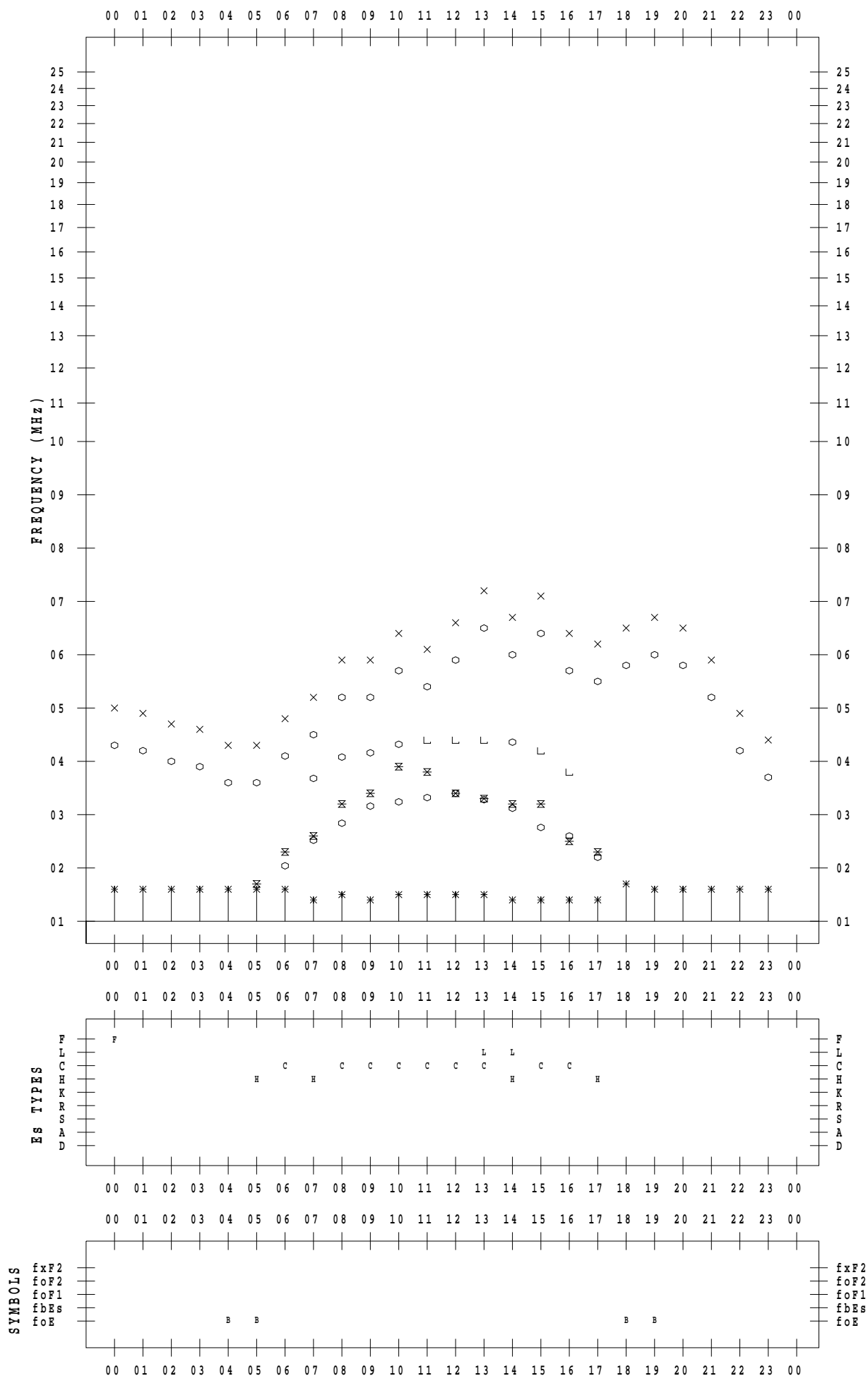
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 15

135 ° E MEAN TIME



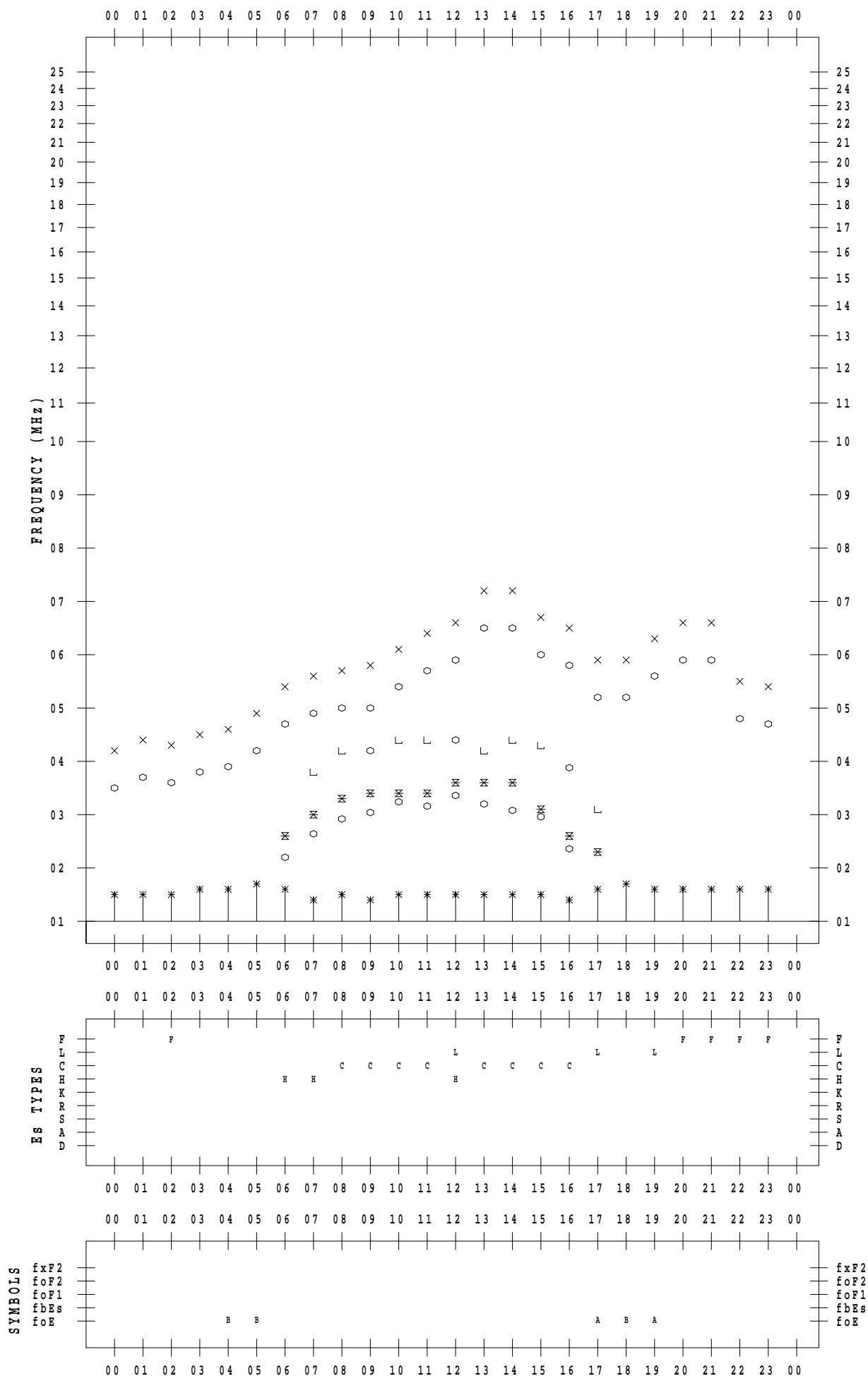
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 16

135 ° E MEAN TIME



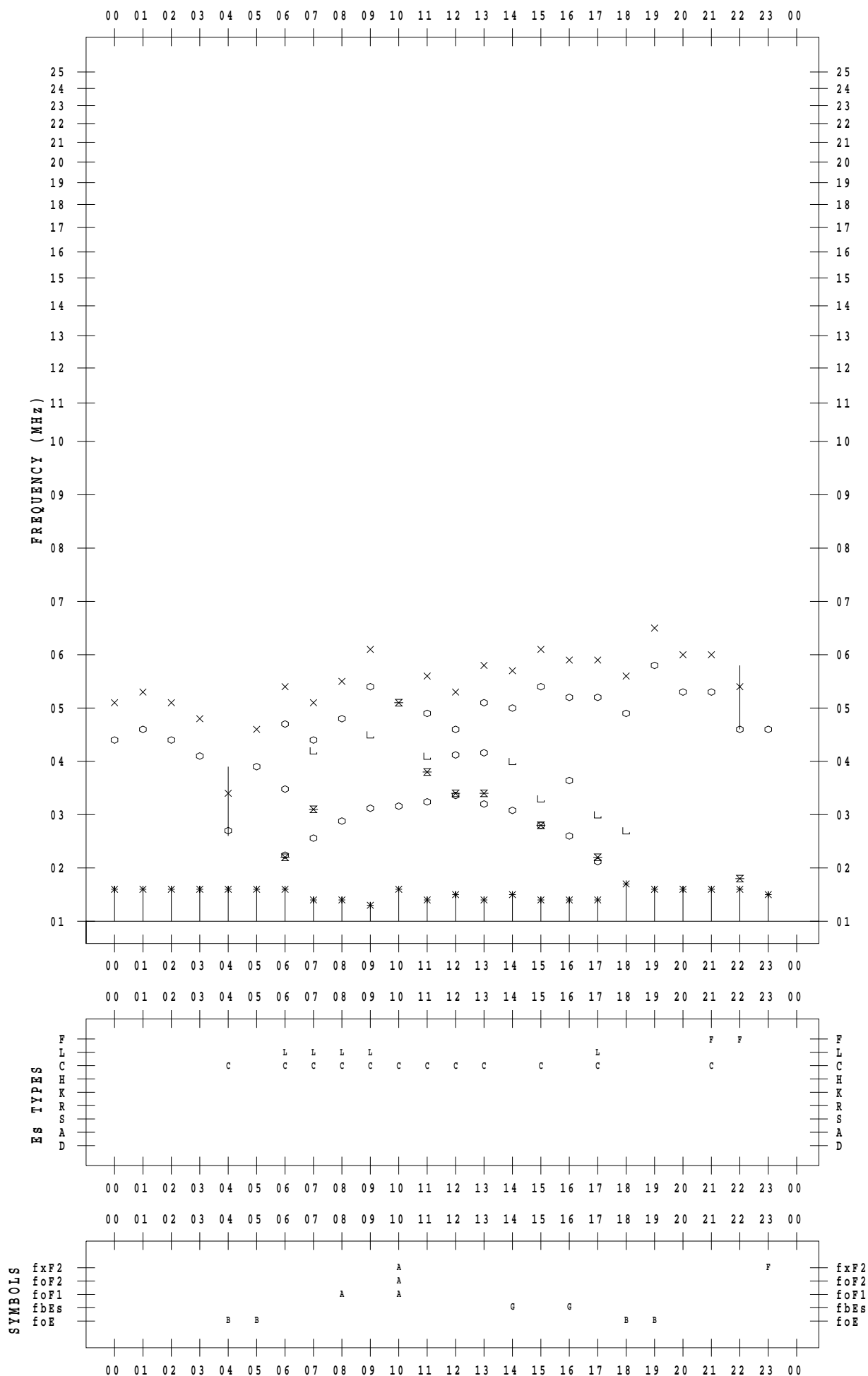
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 17

135 ° E MEAN TIME



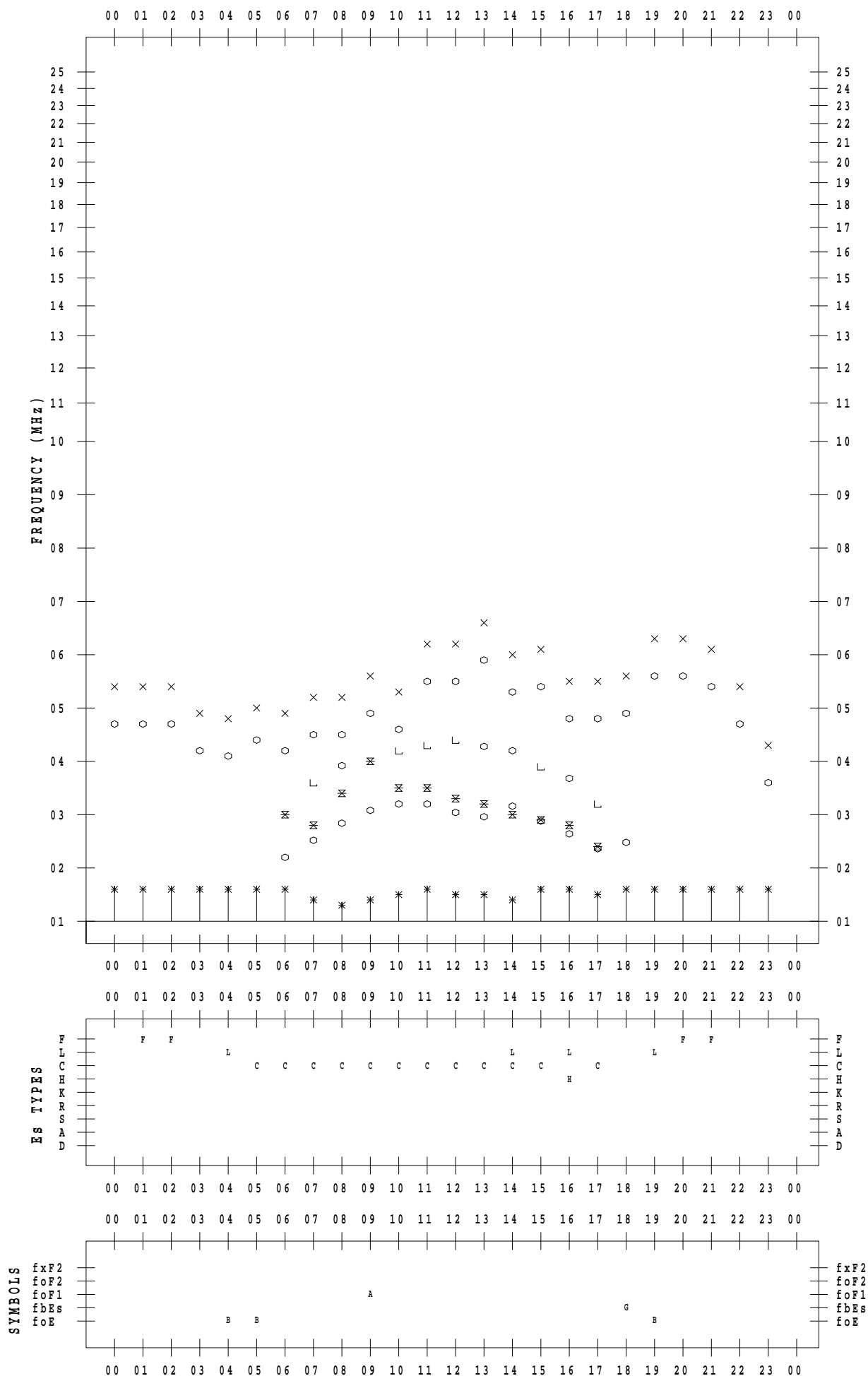
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 18

135 ° E MEAN TIME



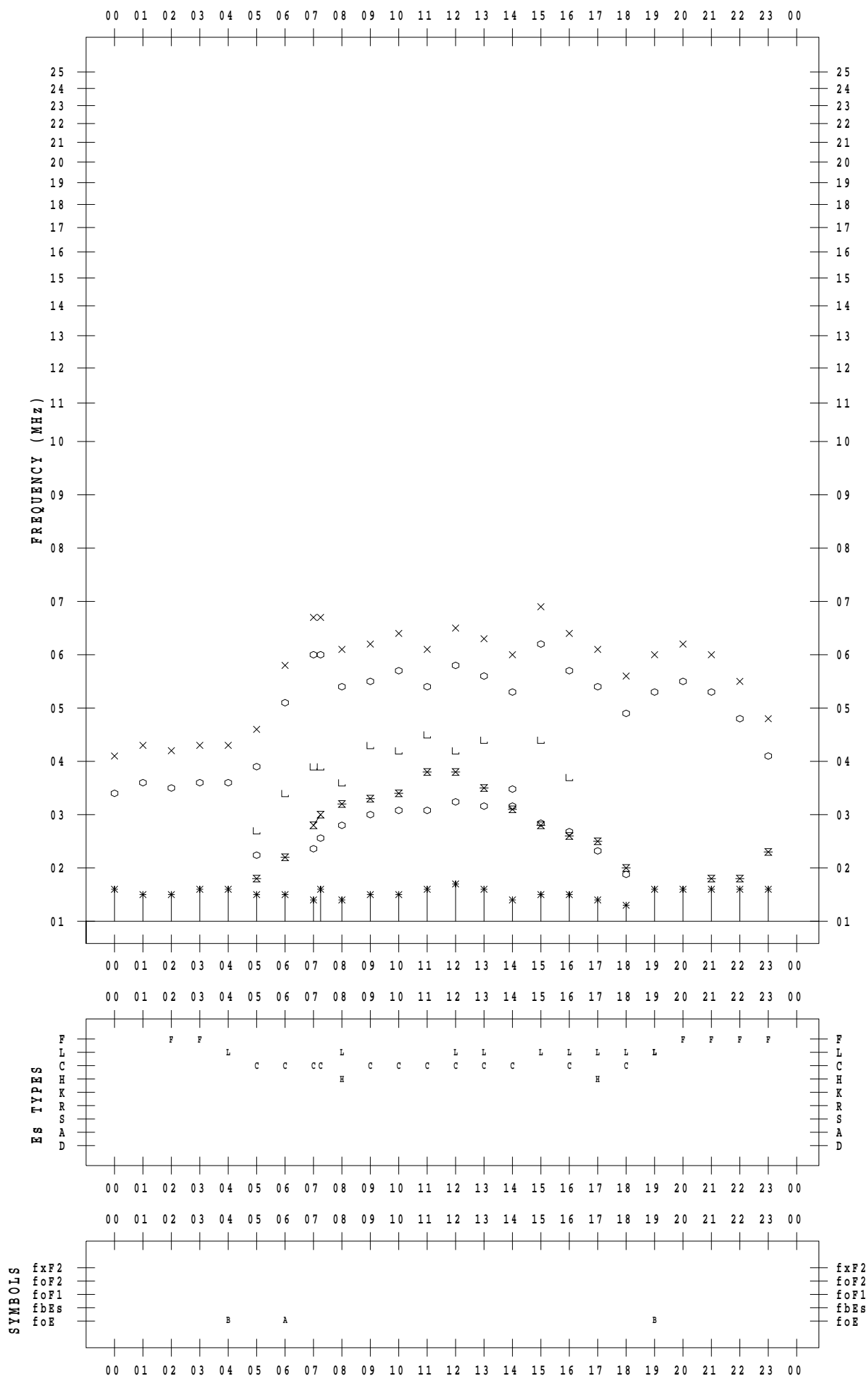
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 19

135 ° E MEAN TIME



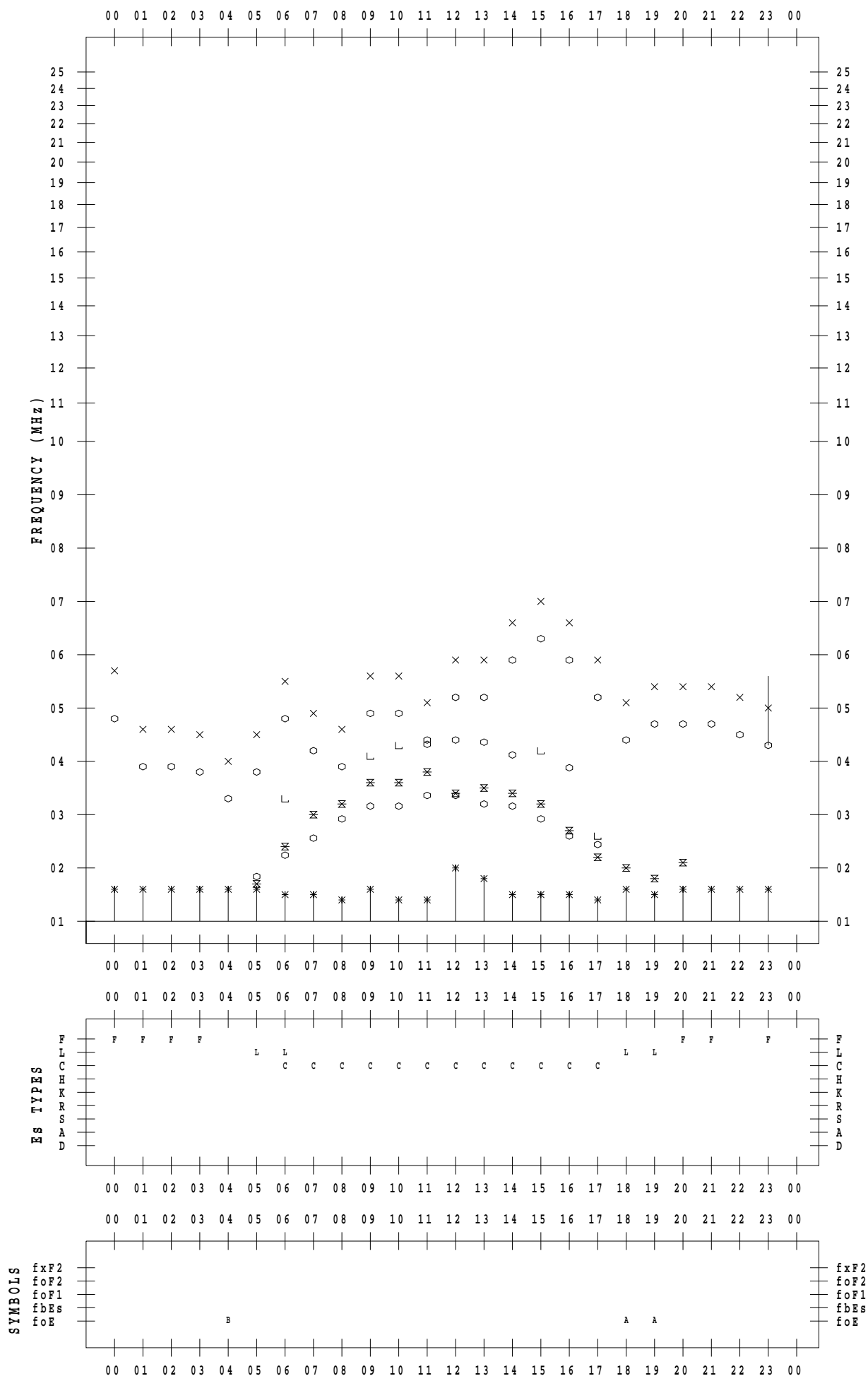
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 20

135 ° E MEAN TIME



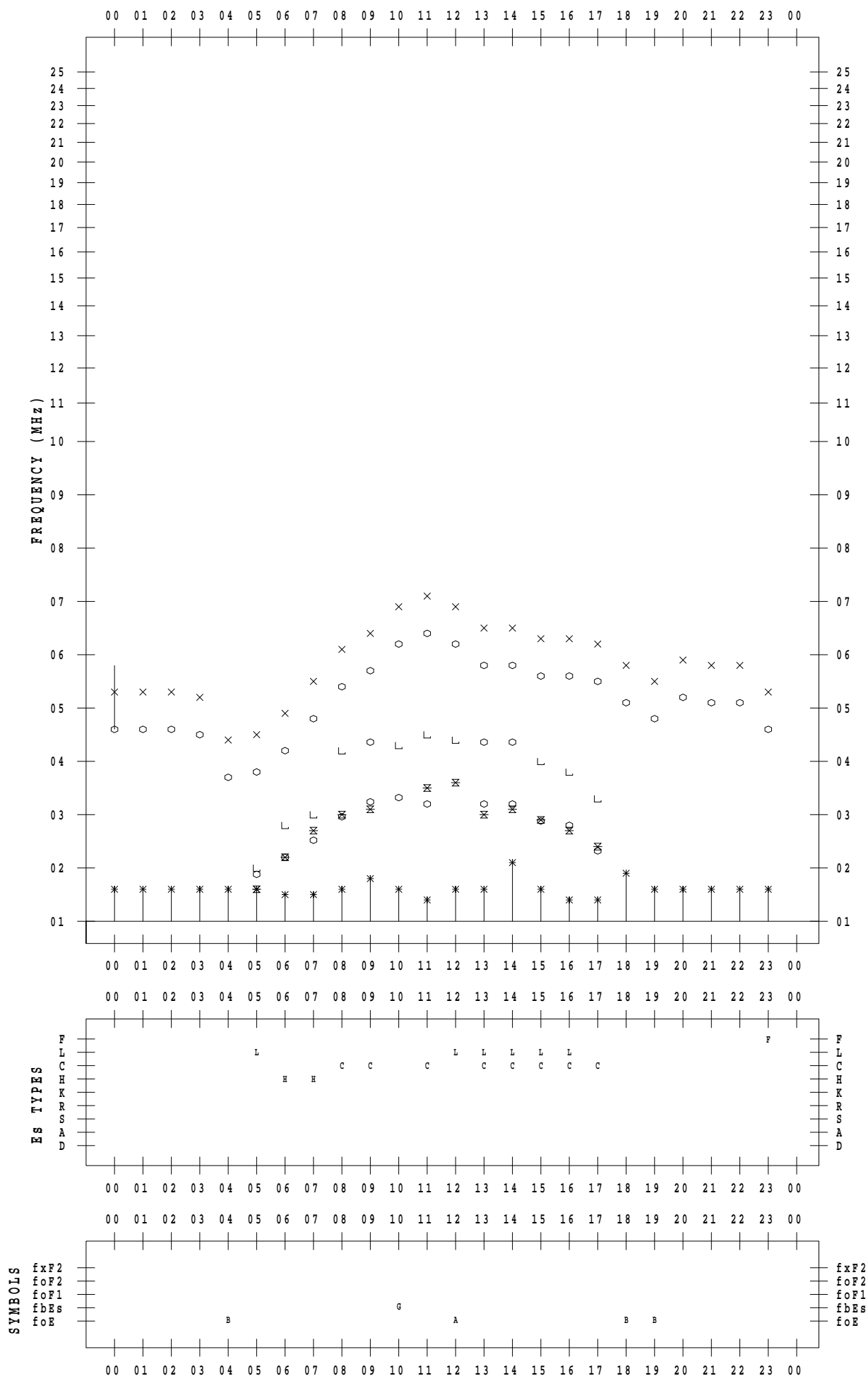
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 22

135 ° E MEAN TIME



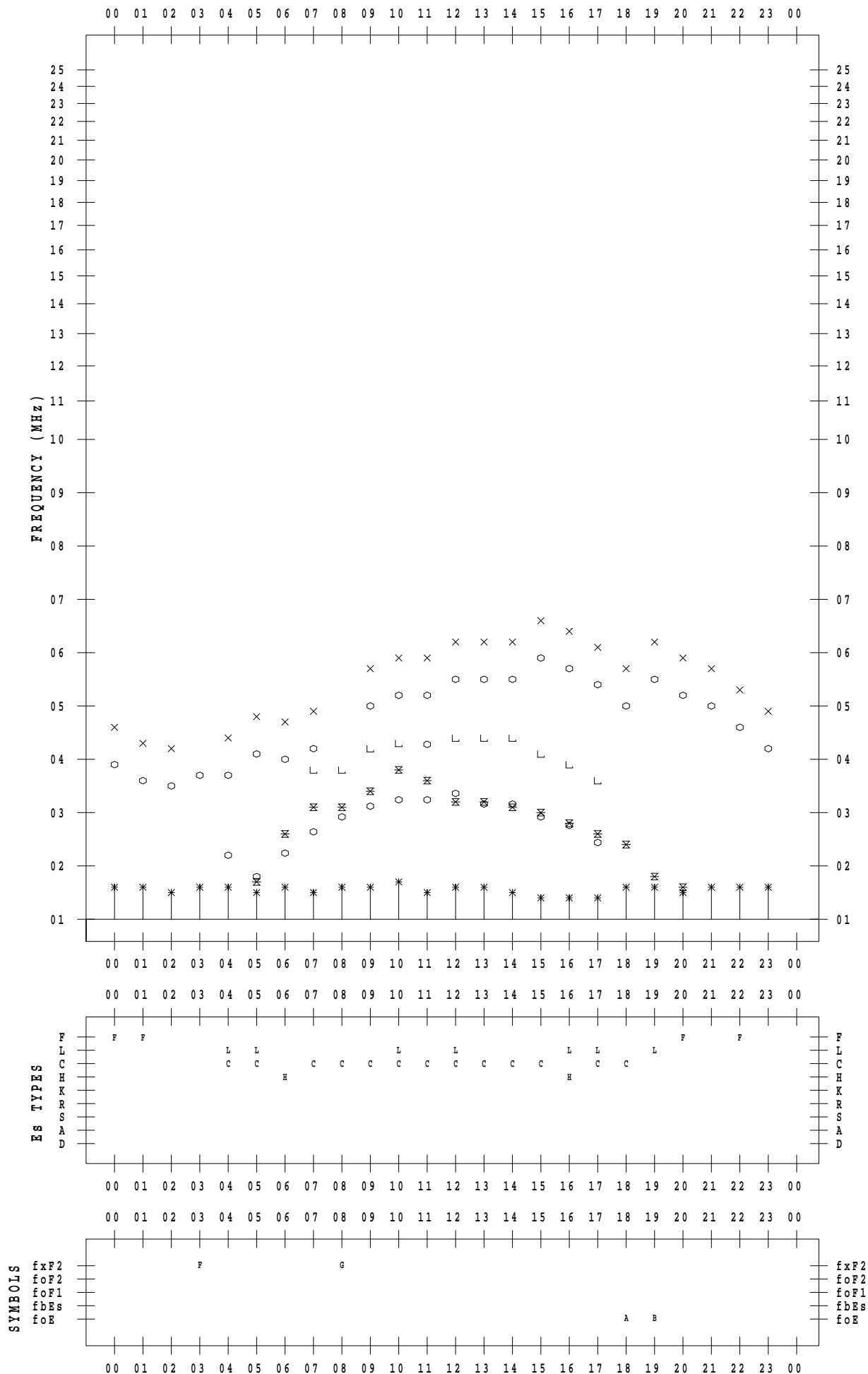
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 23

135 ° E MEAN TIME



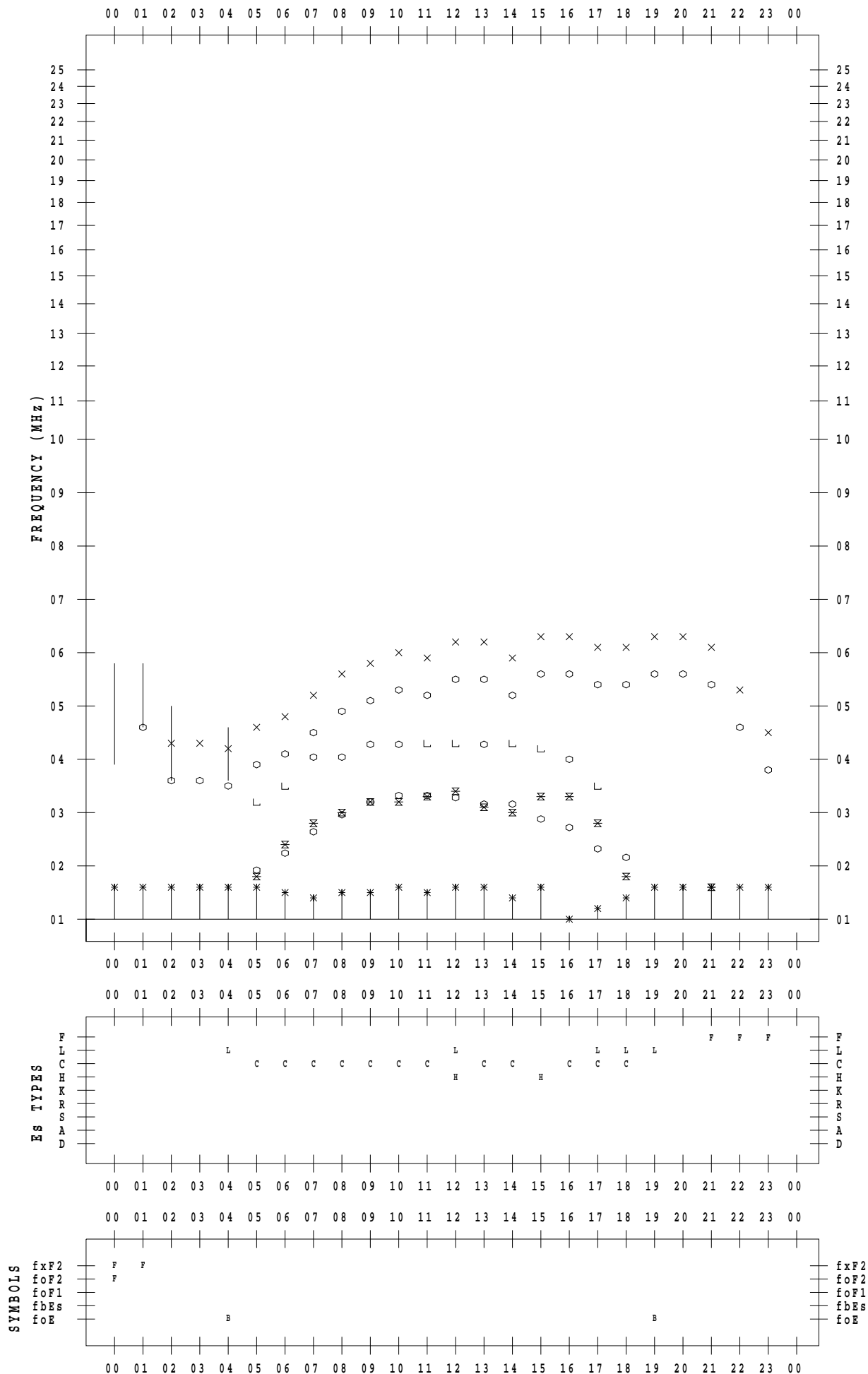
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 24

135 ° E MEAN TIME



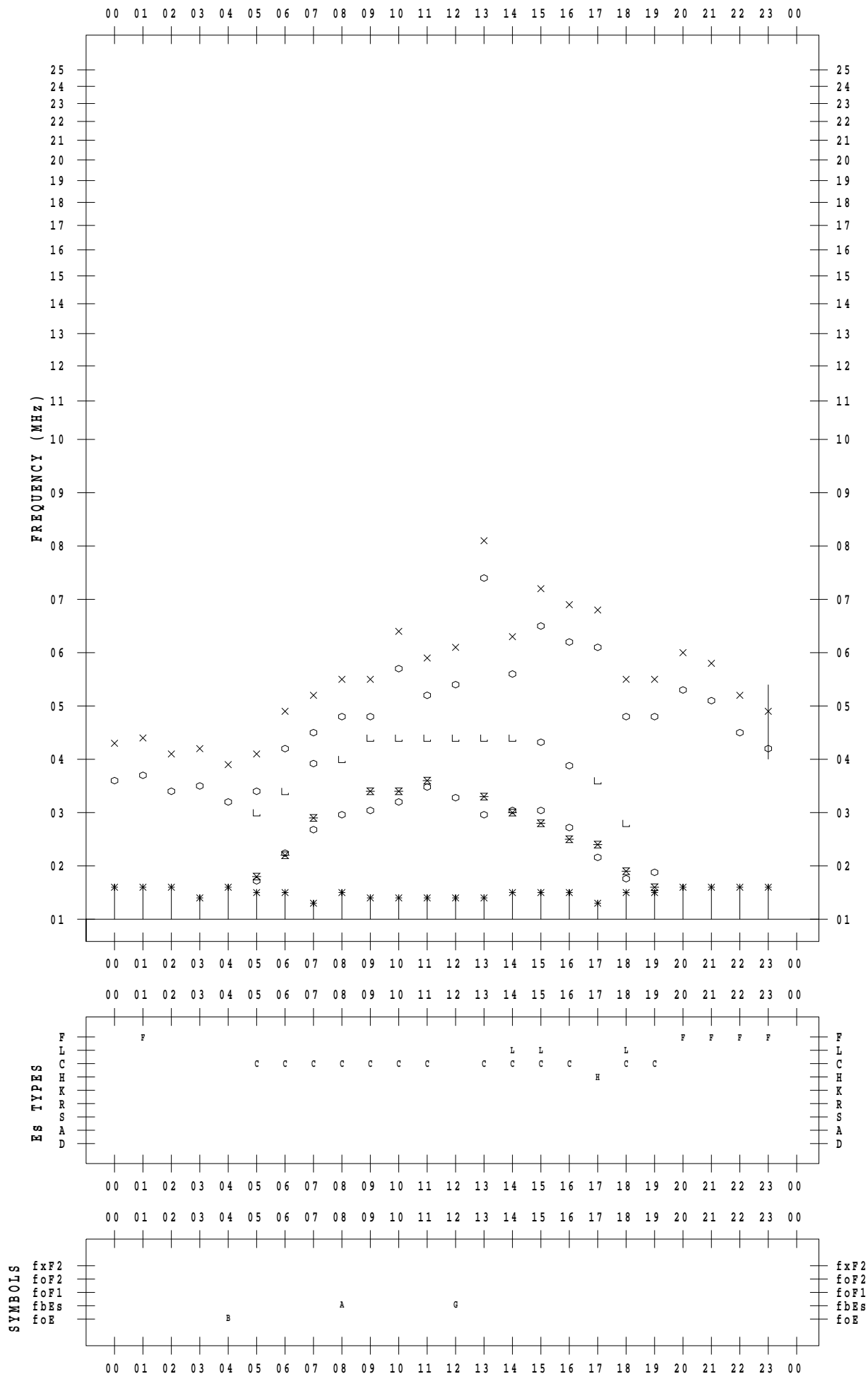
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 25

135 ° E MEAN TIME



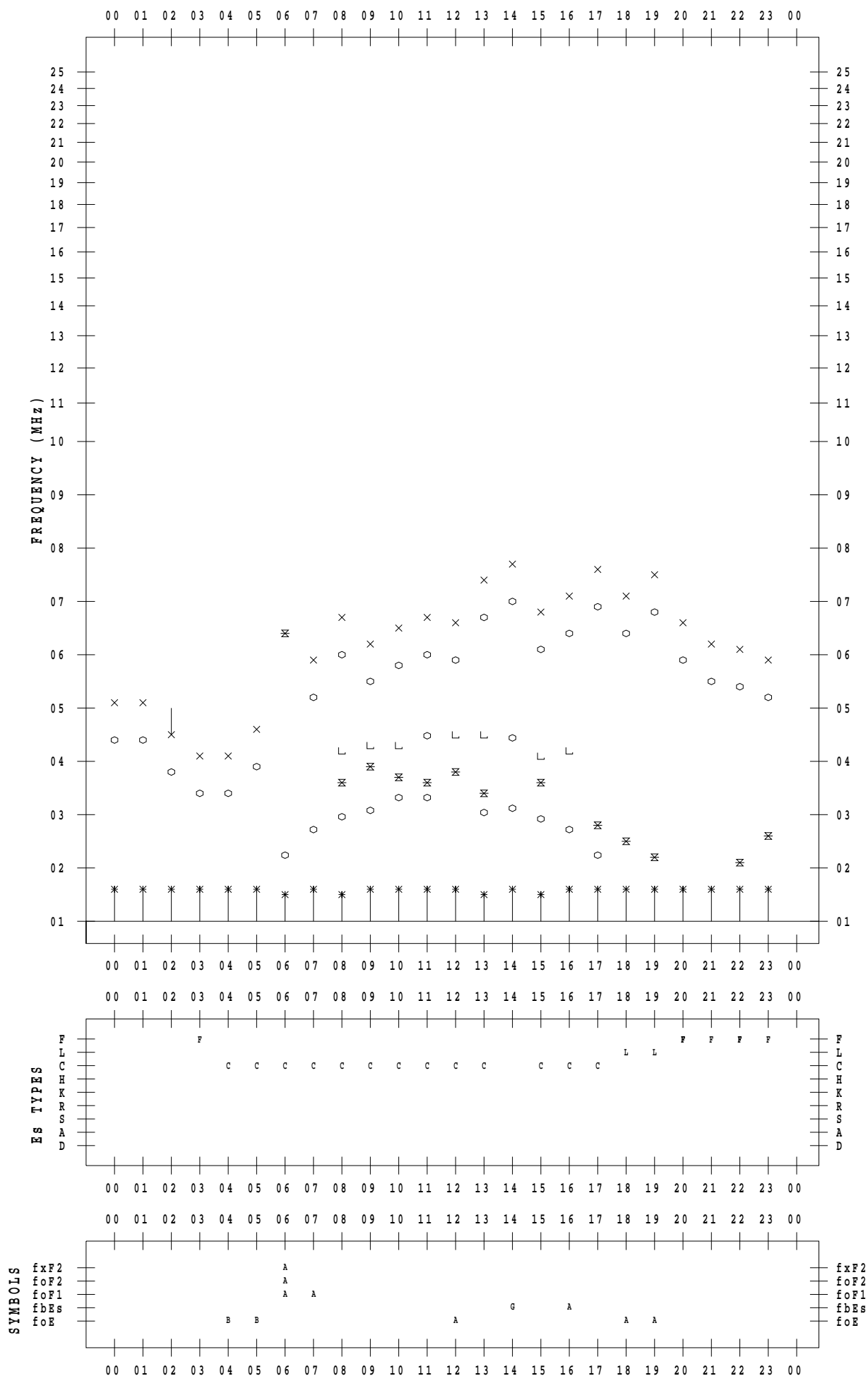
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 26

135 ° E MEAN TIME



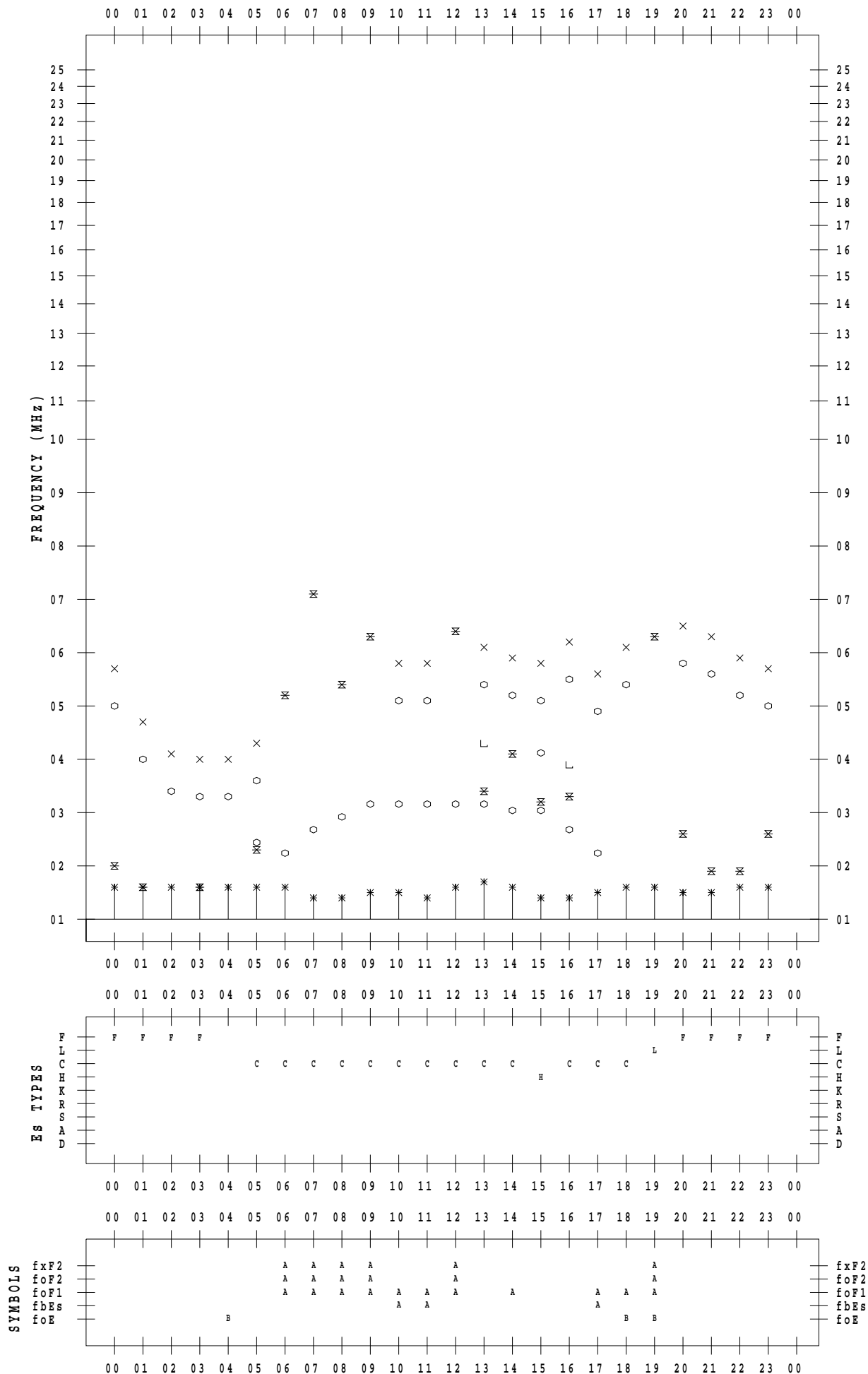
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 27

135 ° E MEAN TIME



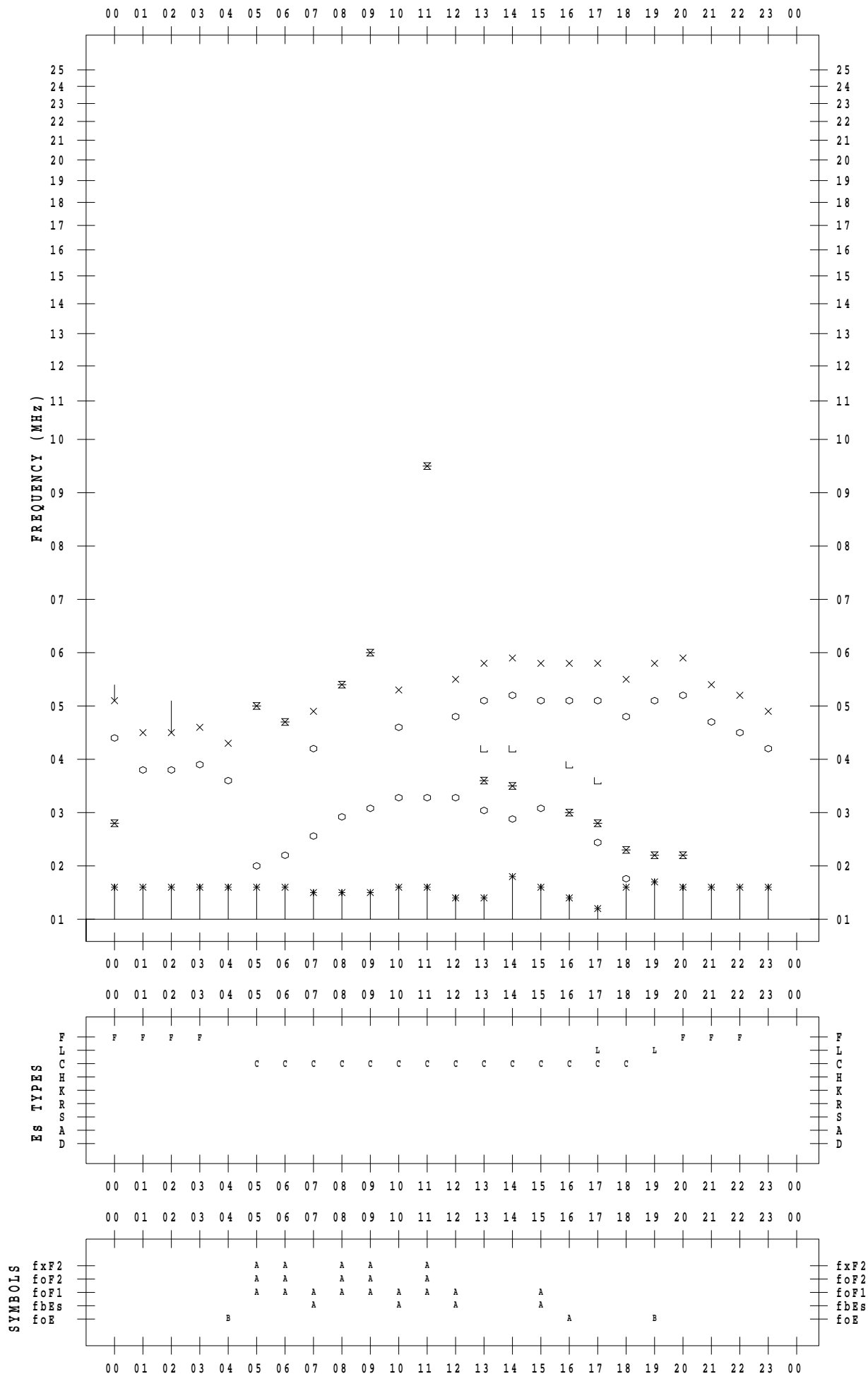
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 28

135 ° E MEAN TIME



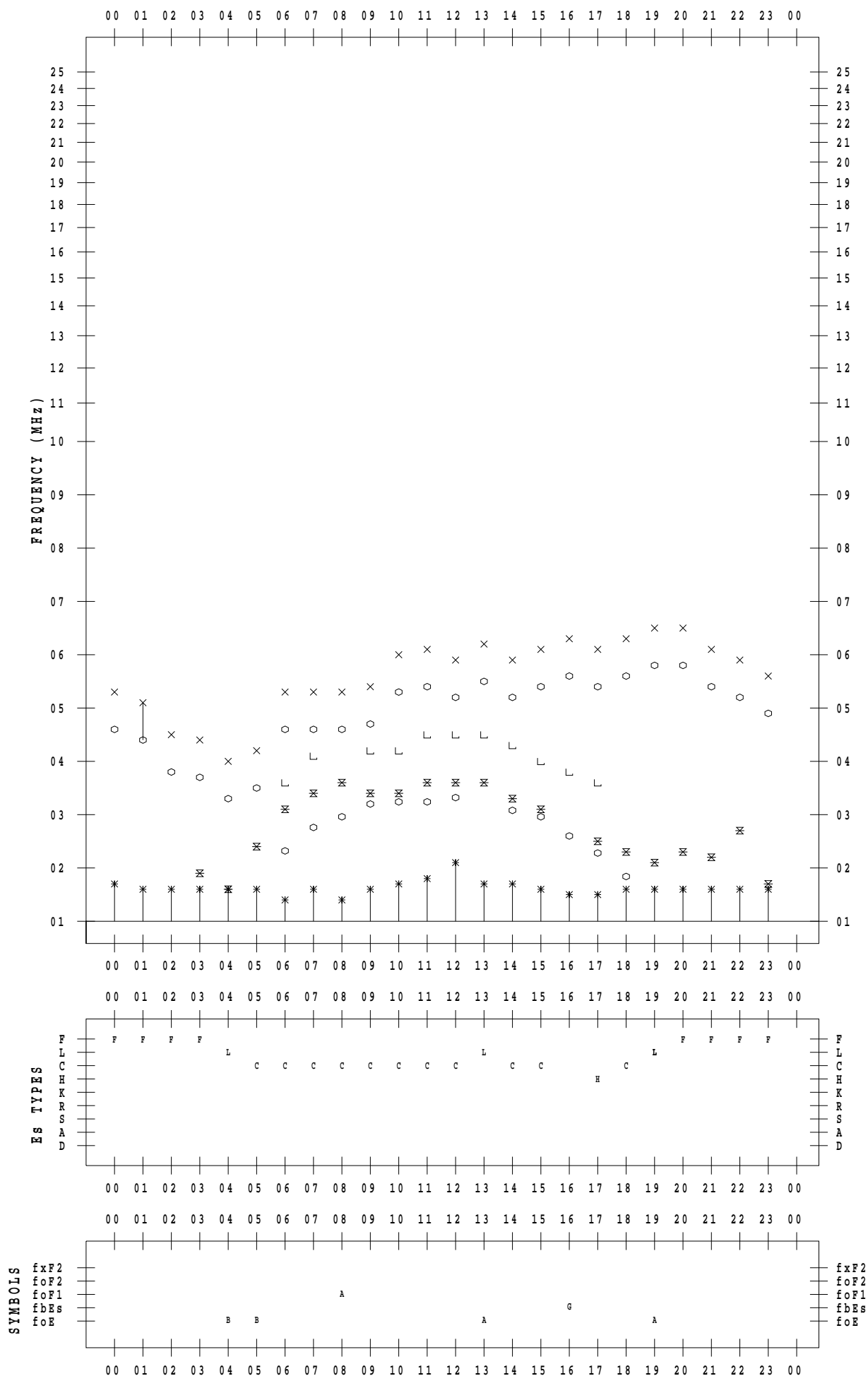
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021 / 4 / 30

135 ° E MEAN TIME



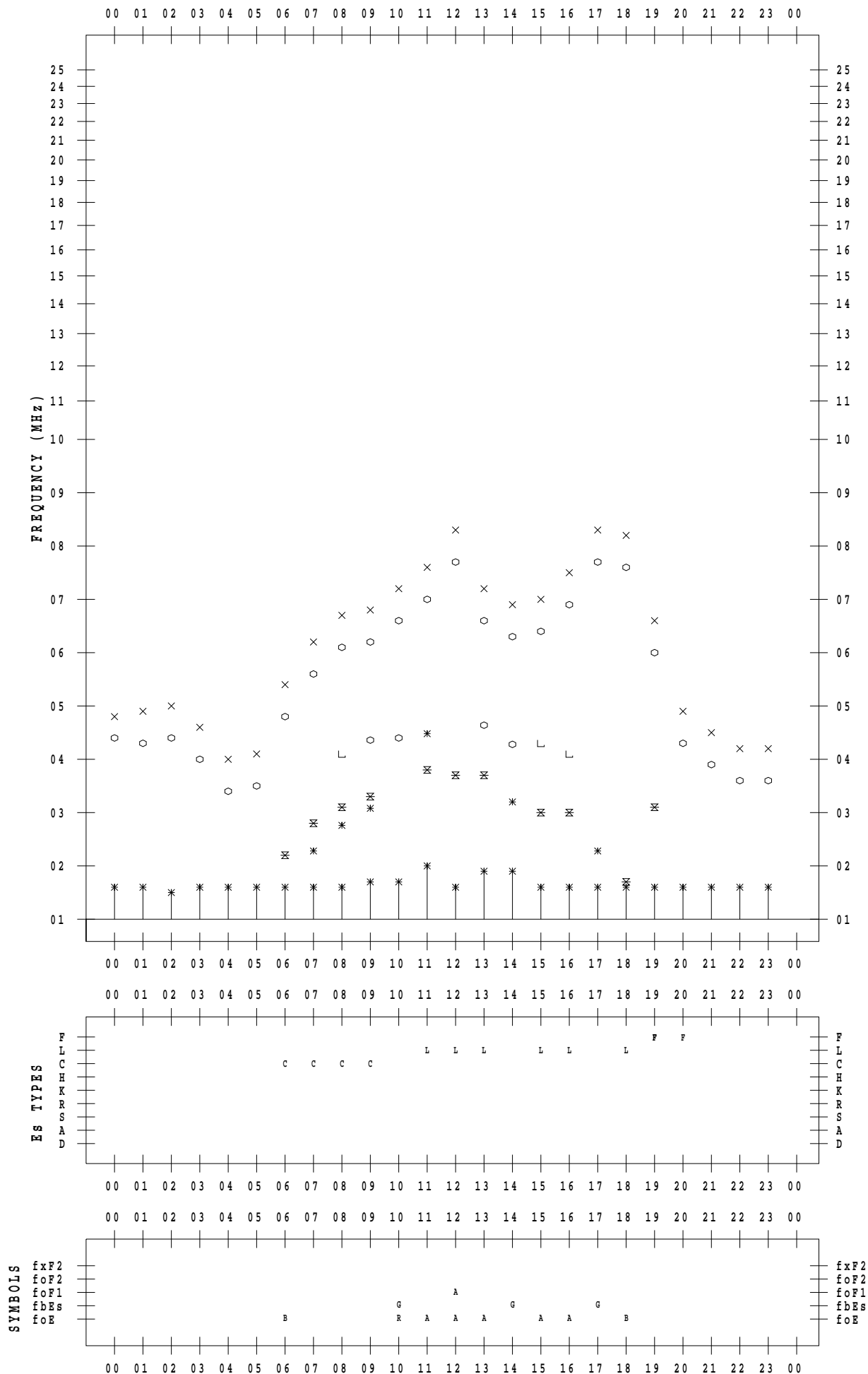
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 1

135 ° E MEAN TIME



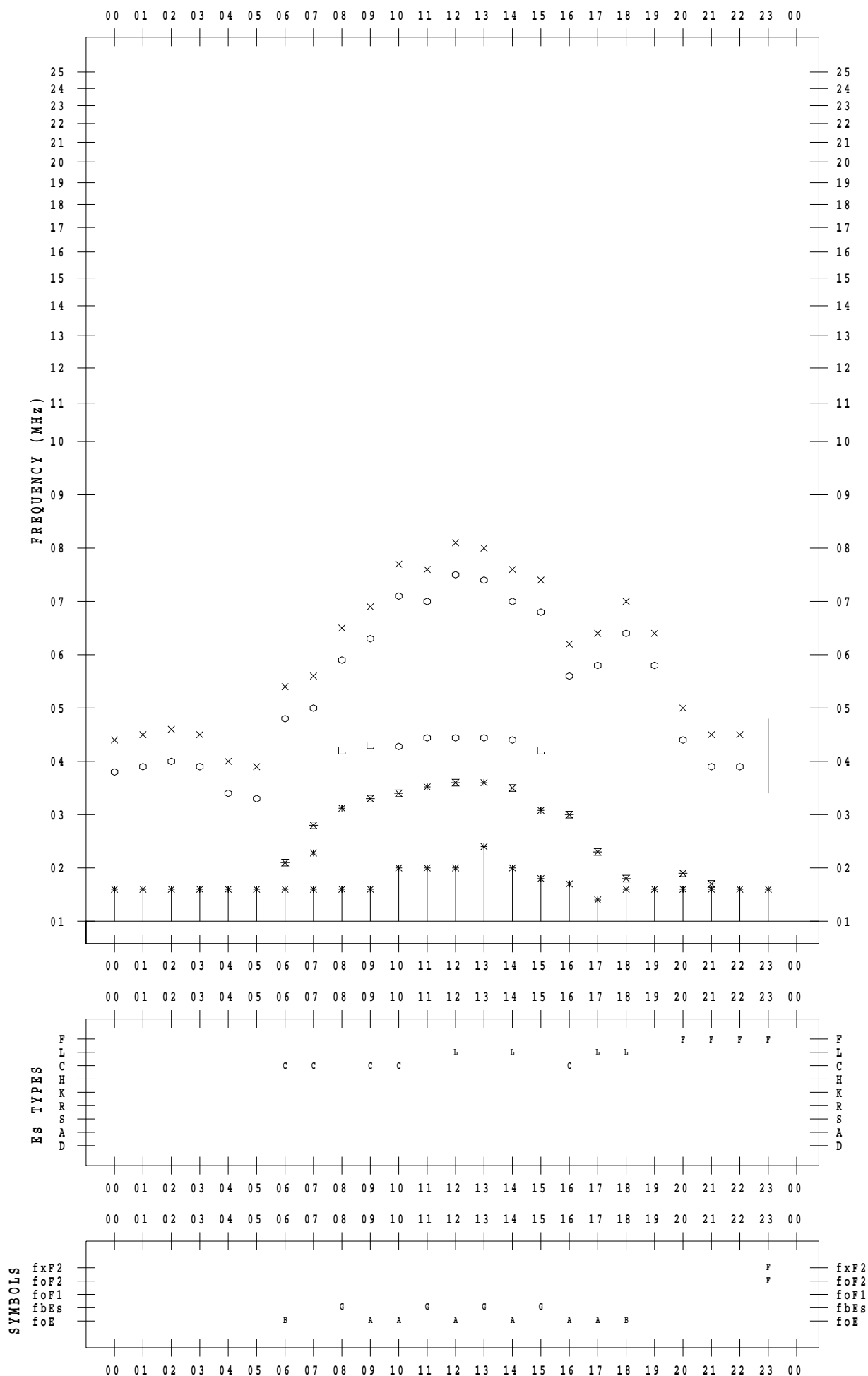
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 2

135 ° E MEAN TIME



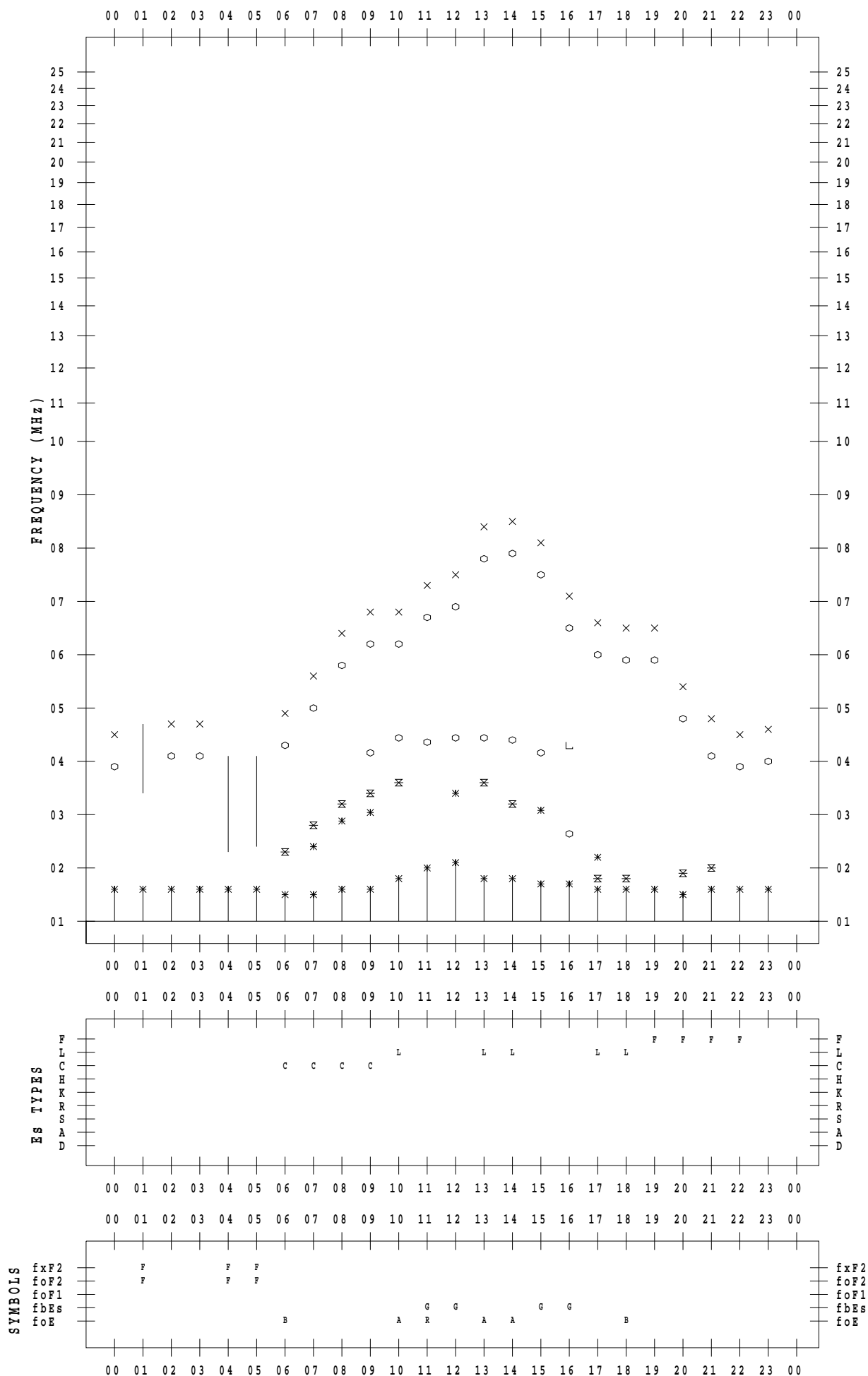
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 3

135 ° E MEAN TIME



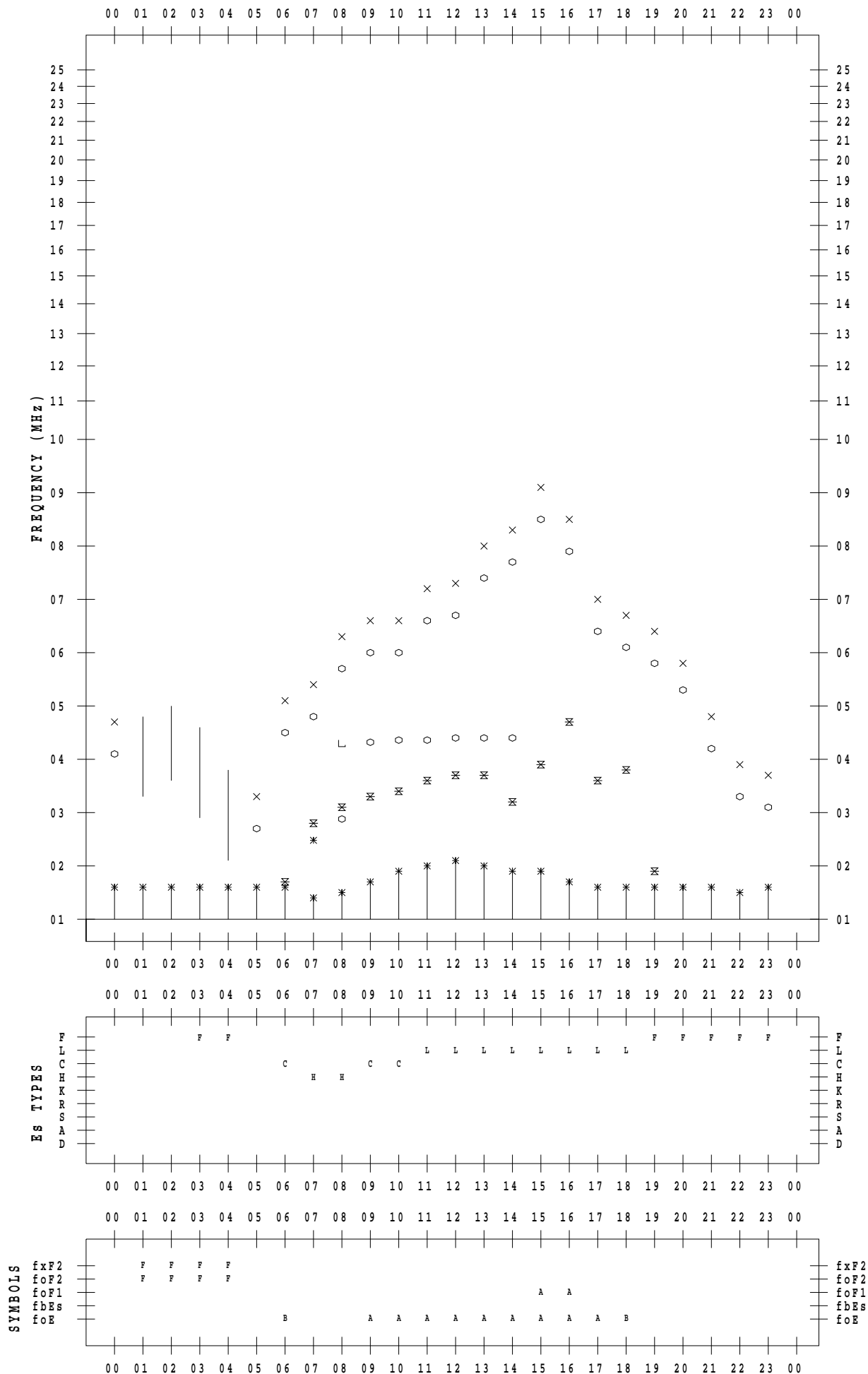
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 4

135 ° E MEAN TIME



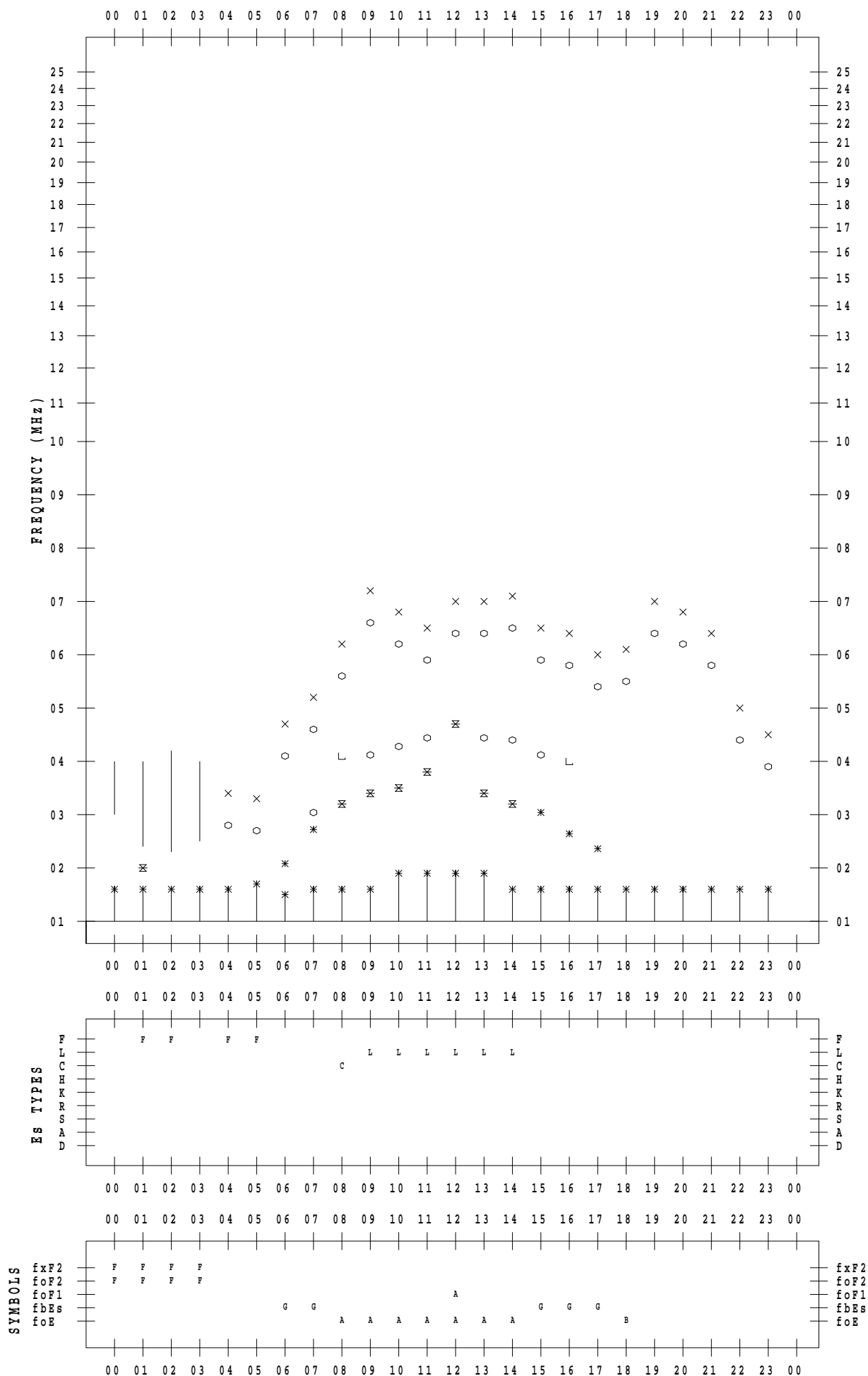
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 5

135 ° E MEAN TIME



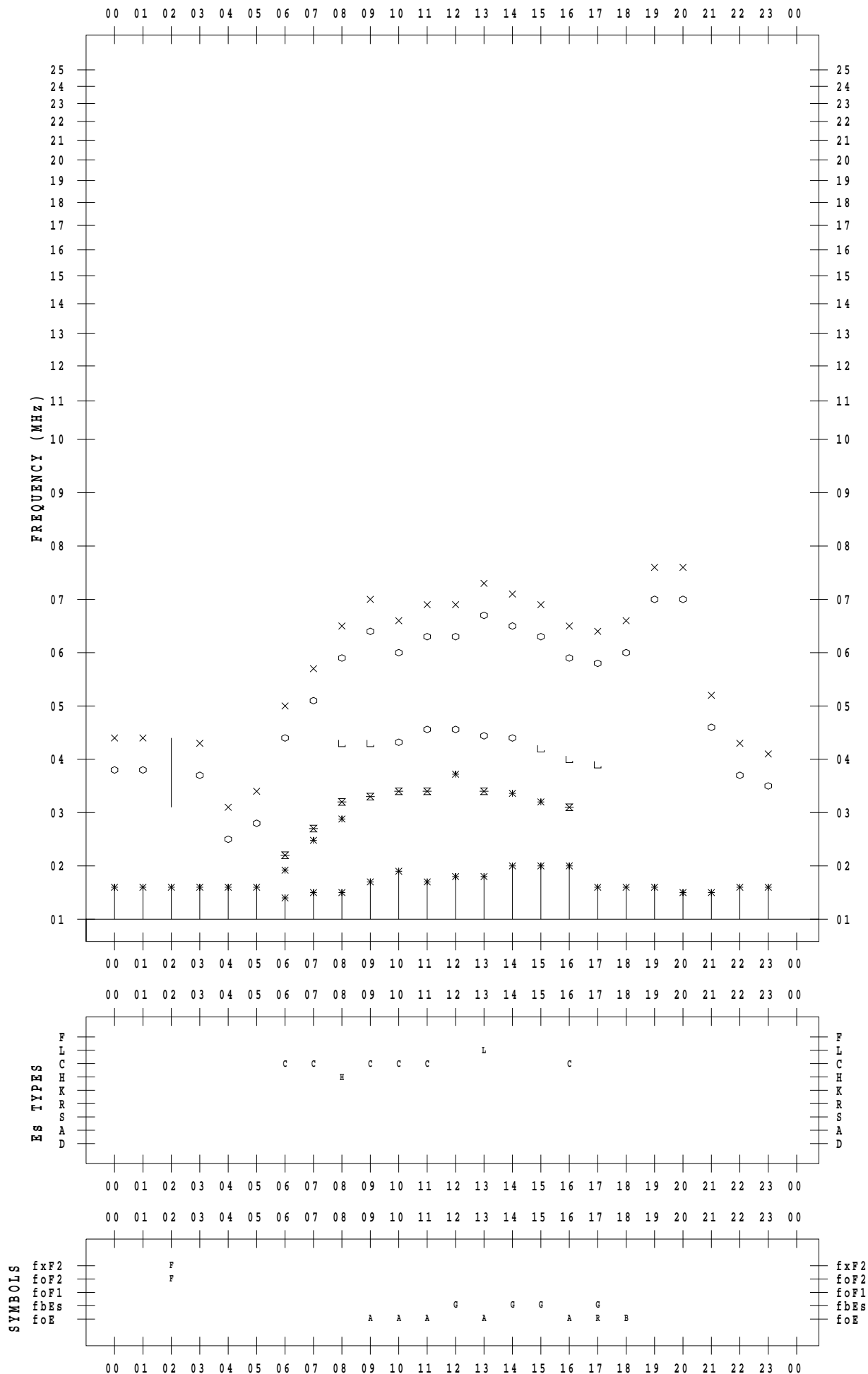
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 6

135 ° E MEAN TIME



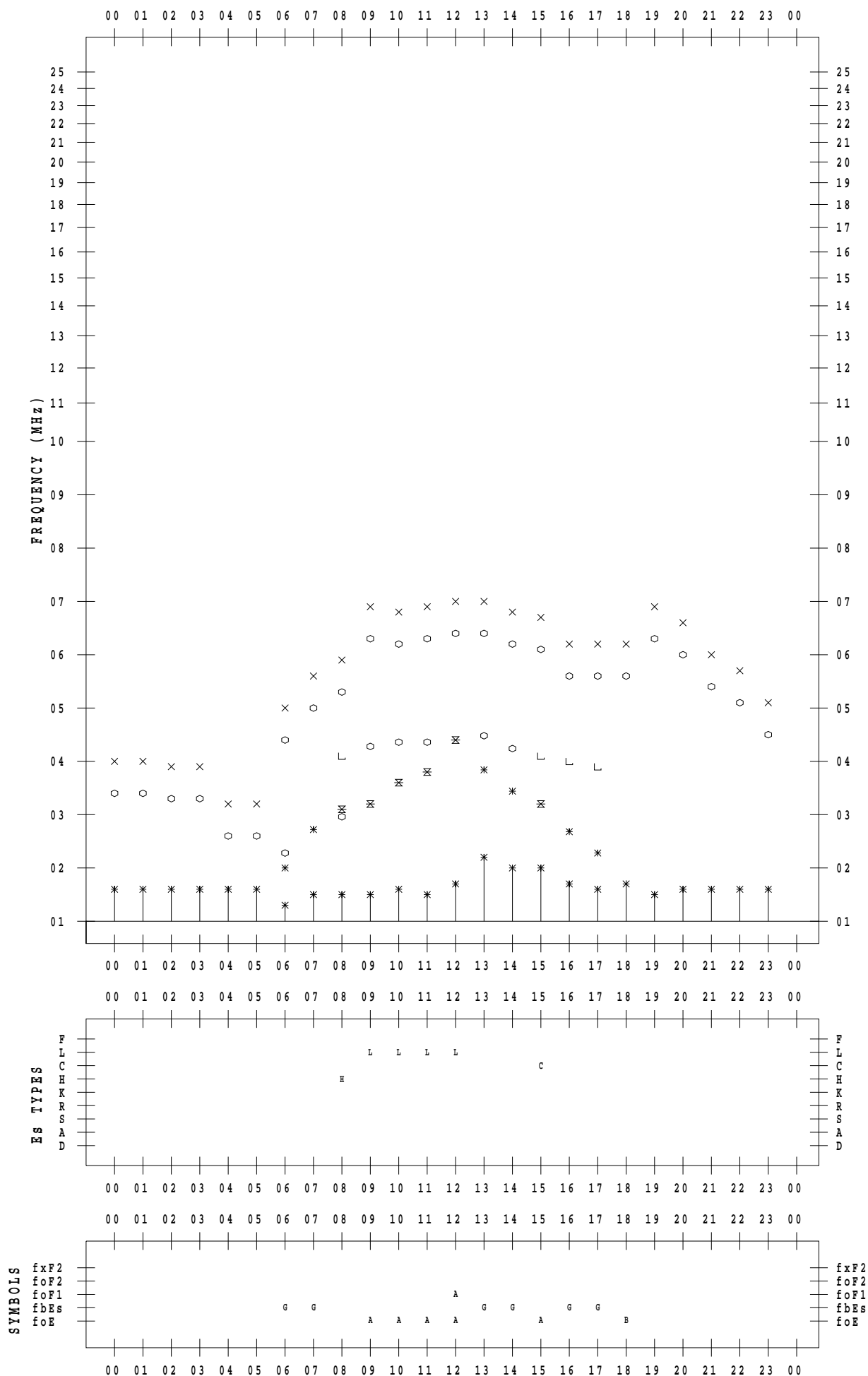
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 7

135 ° E MEAN TIME



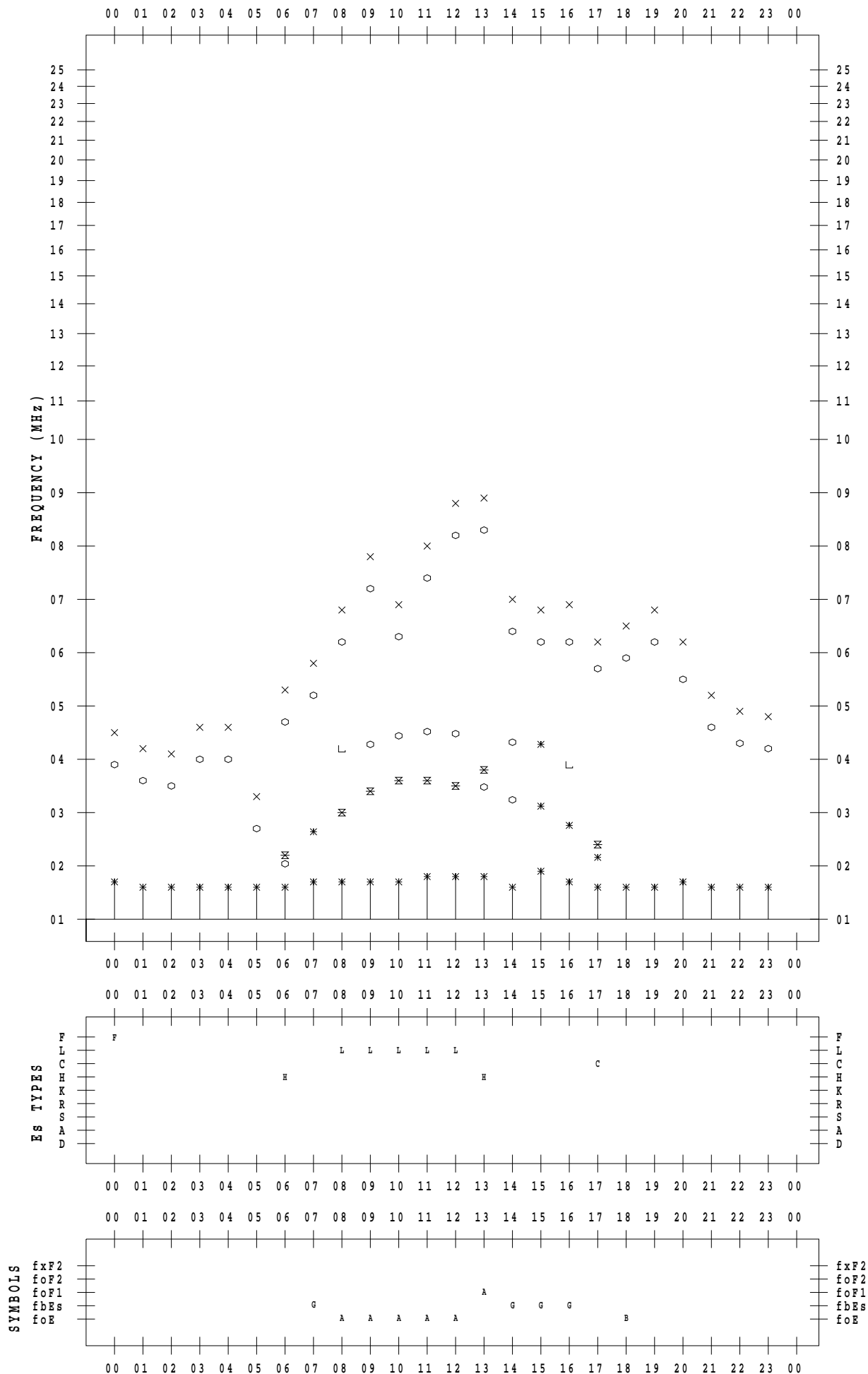
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 8

135 ° E MEAN TIME



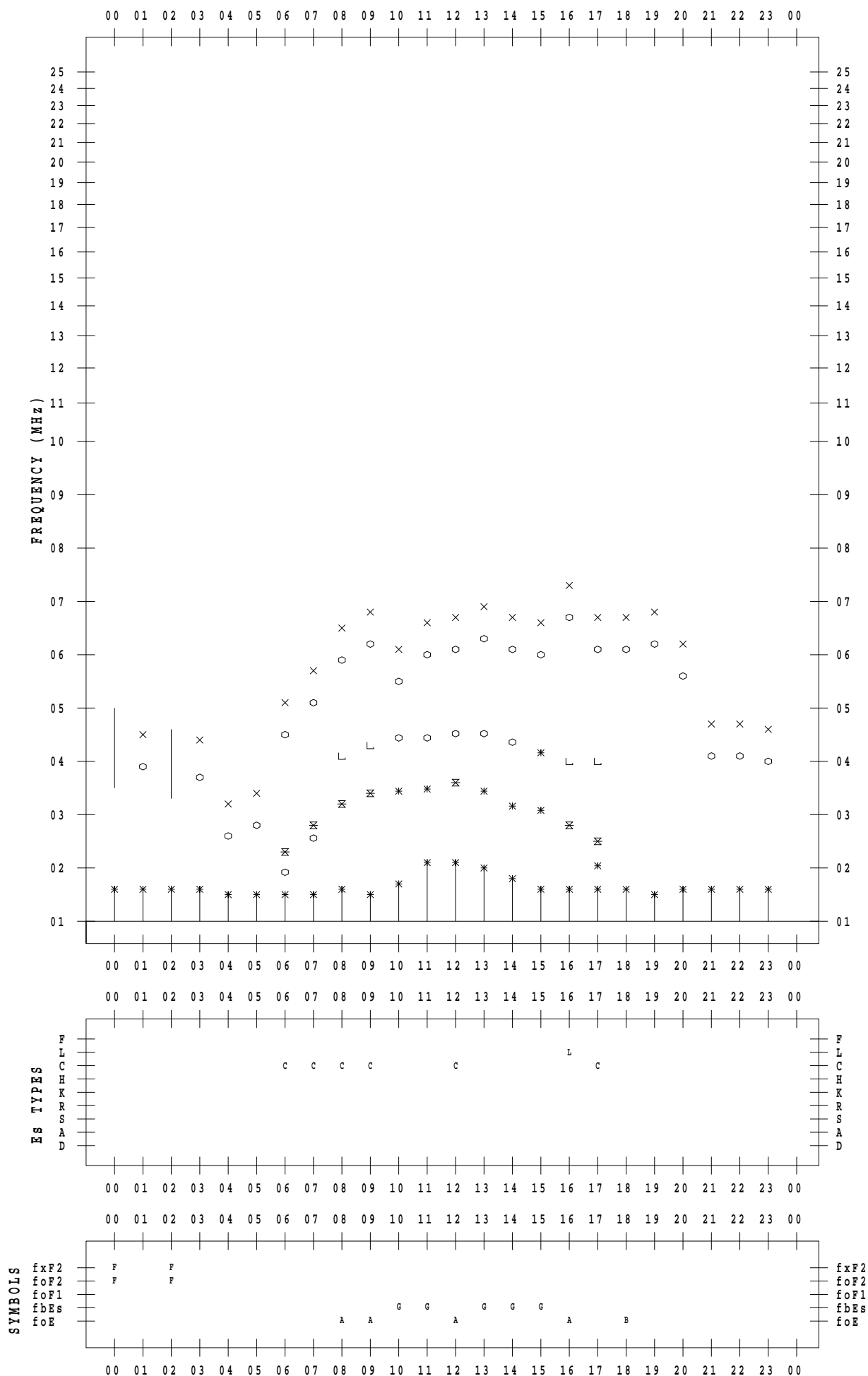
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 9

135 ° E MEAN TIME



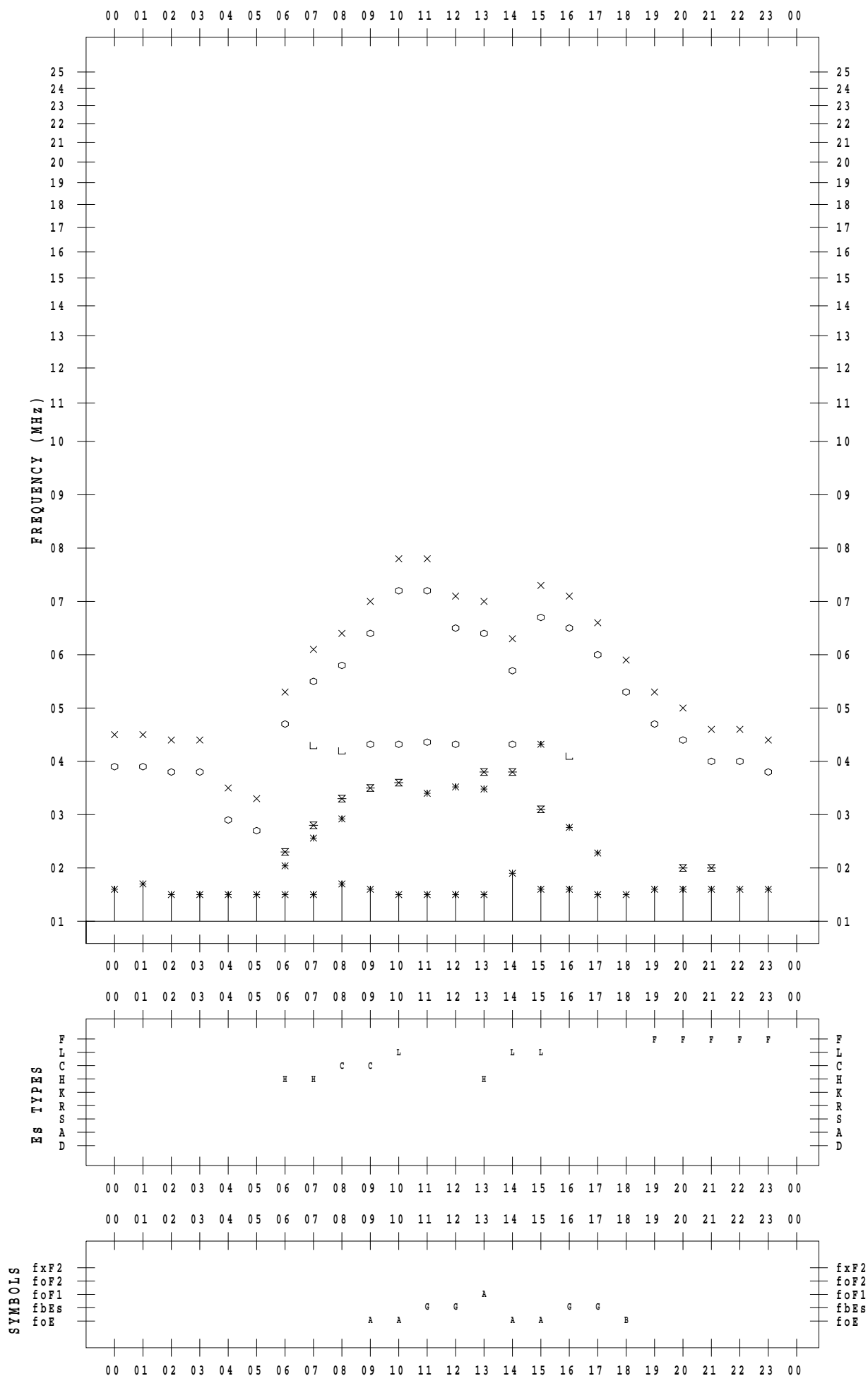
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 10

135 ° E MEAN TIME



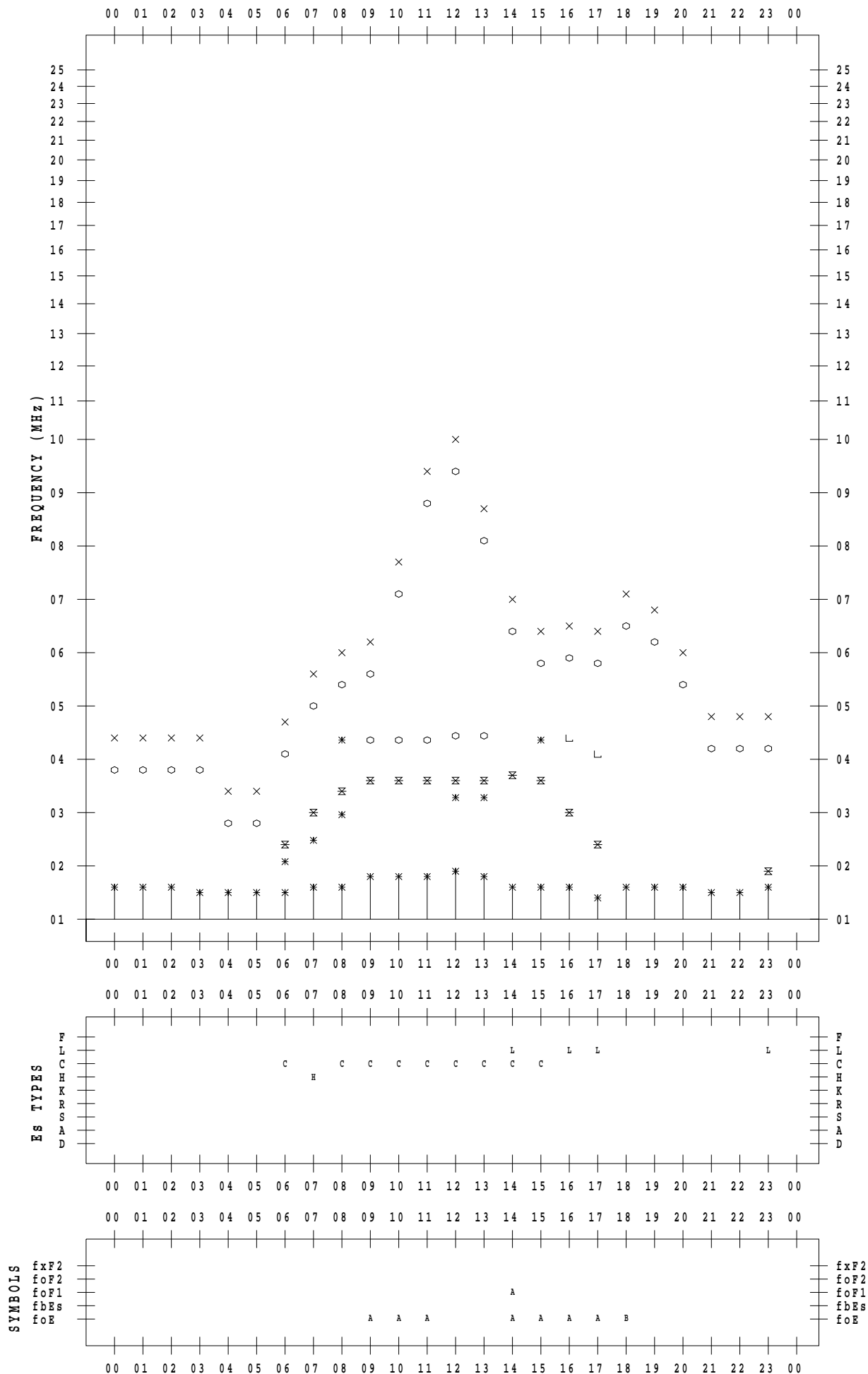
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 11

135 ° E MEAN TIME



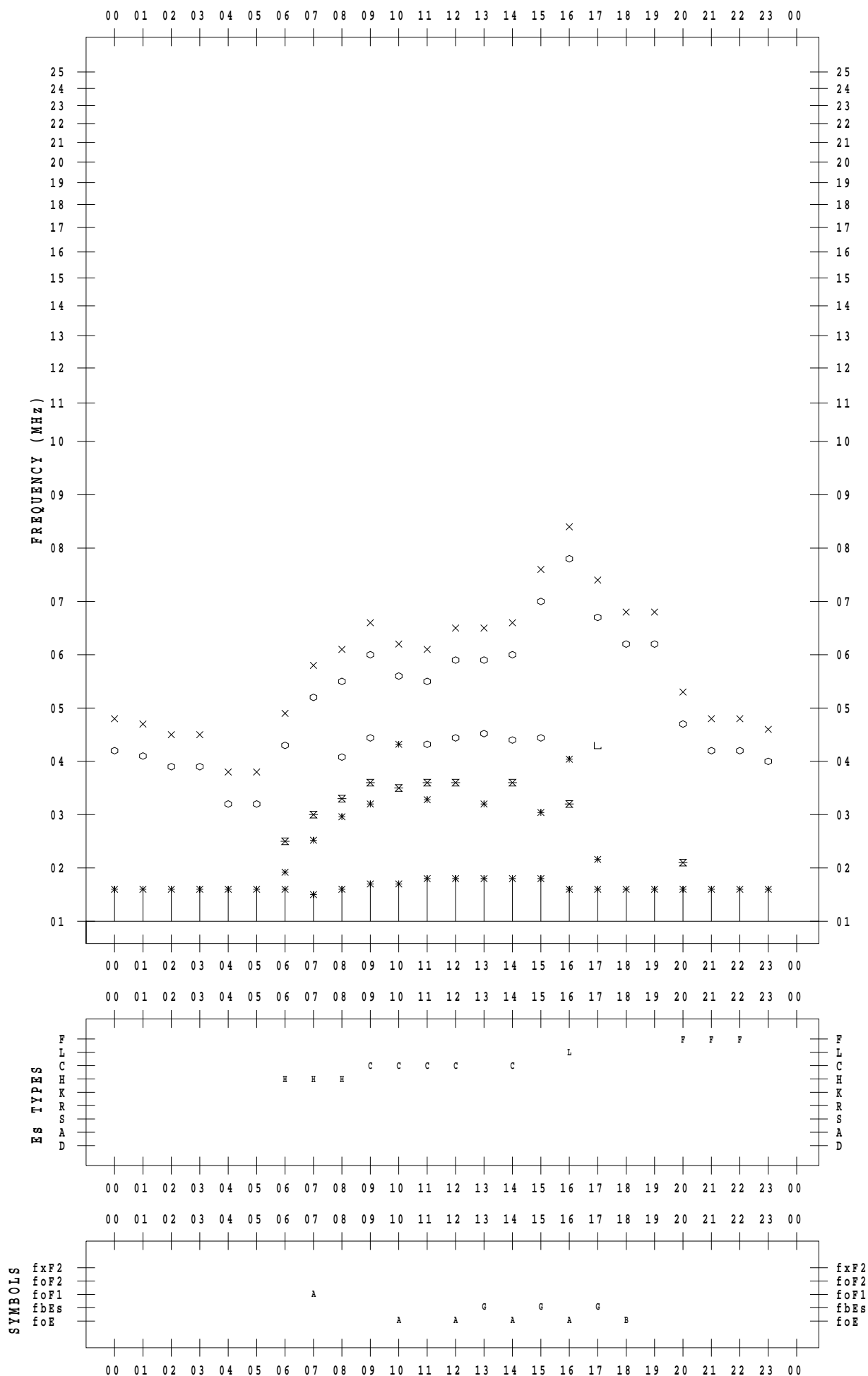
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 12

135 ° E MEAN TIME



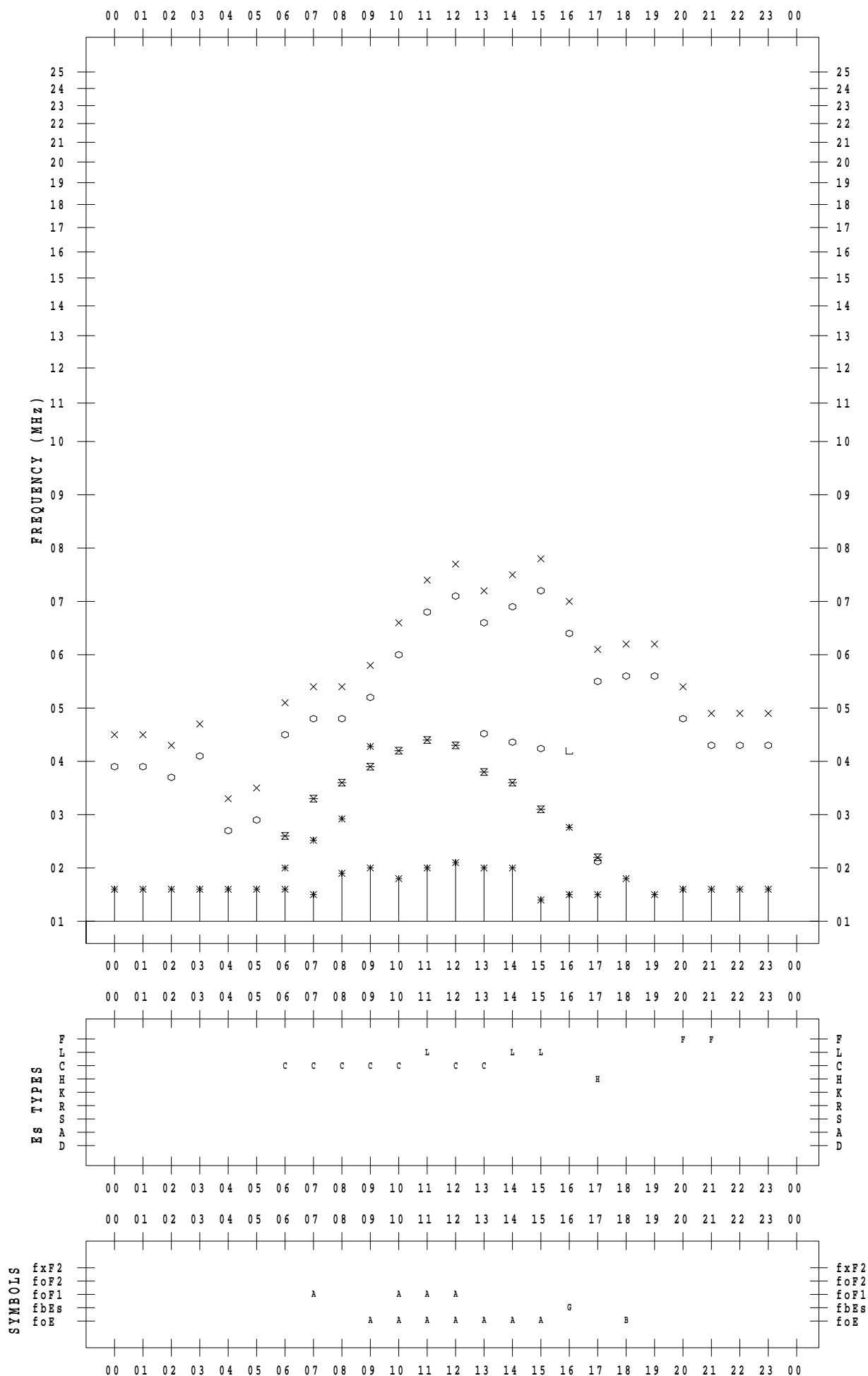
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 13

135 ° E MEAN TIME



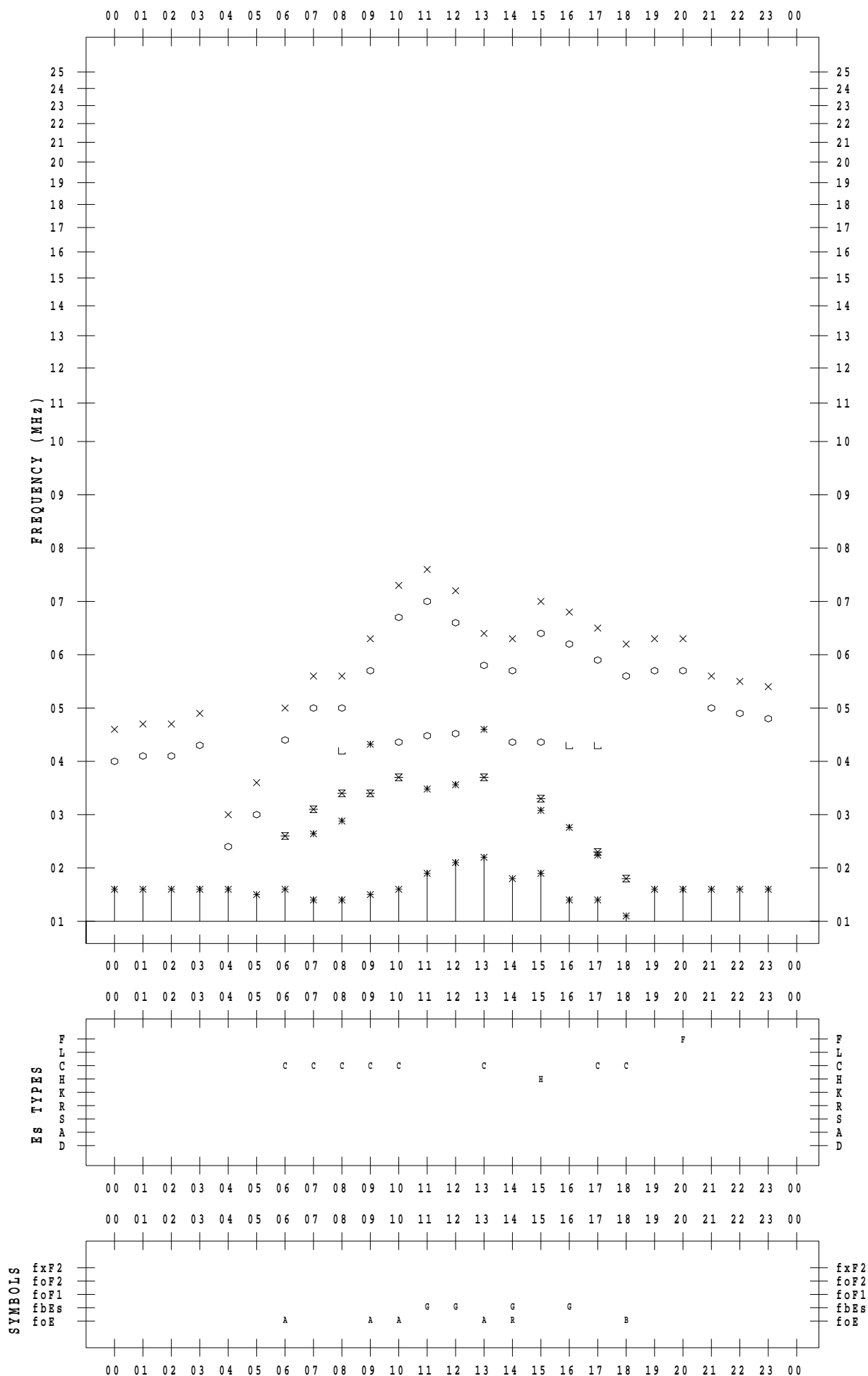
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 14

135 ° E MEAN TIME



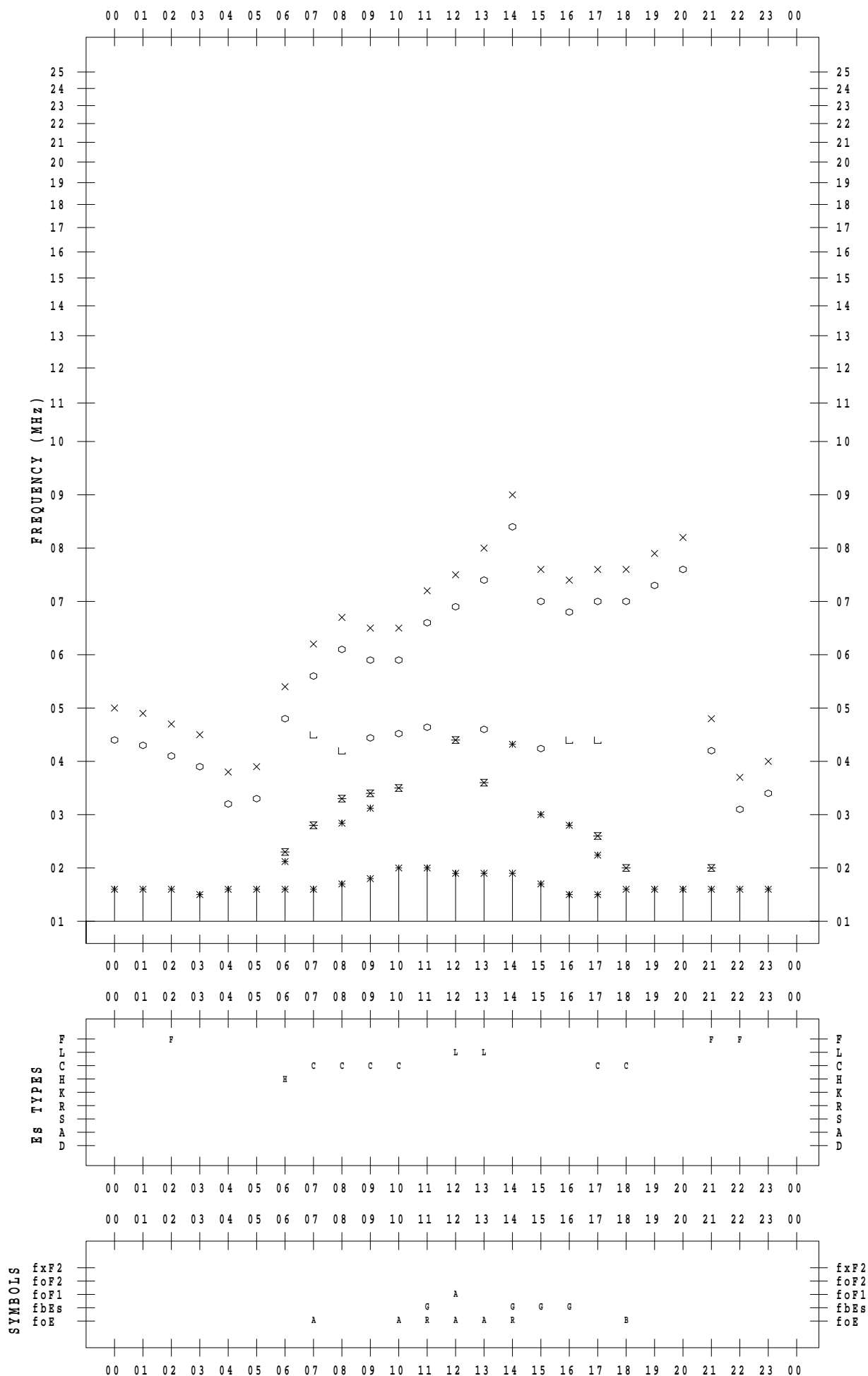
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 15

135 ° E MEAN TIME



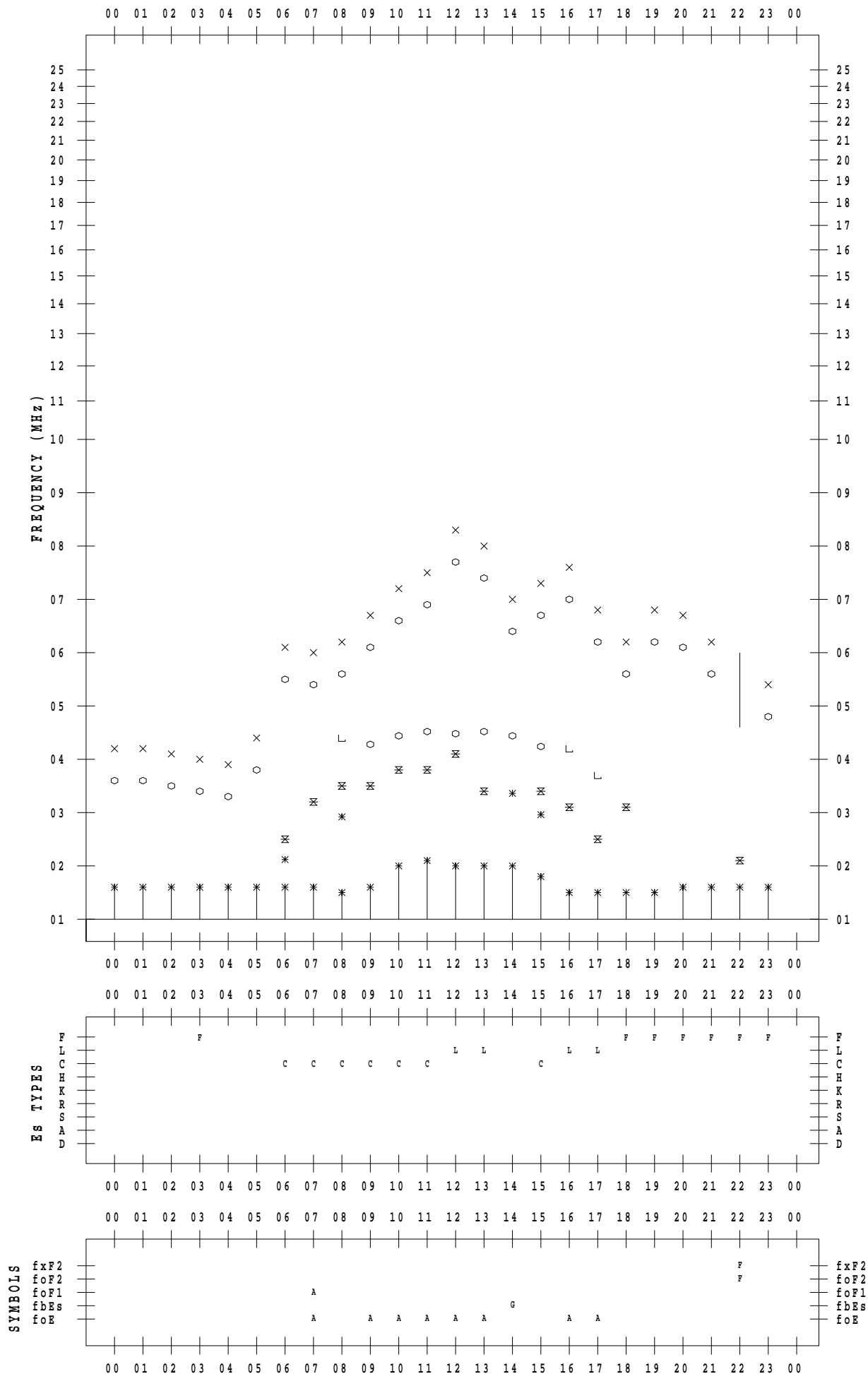
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 16

135 ° E MEAN TIME



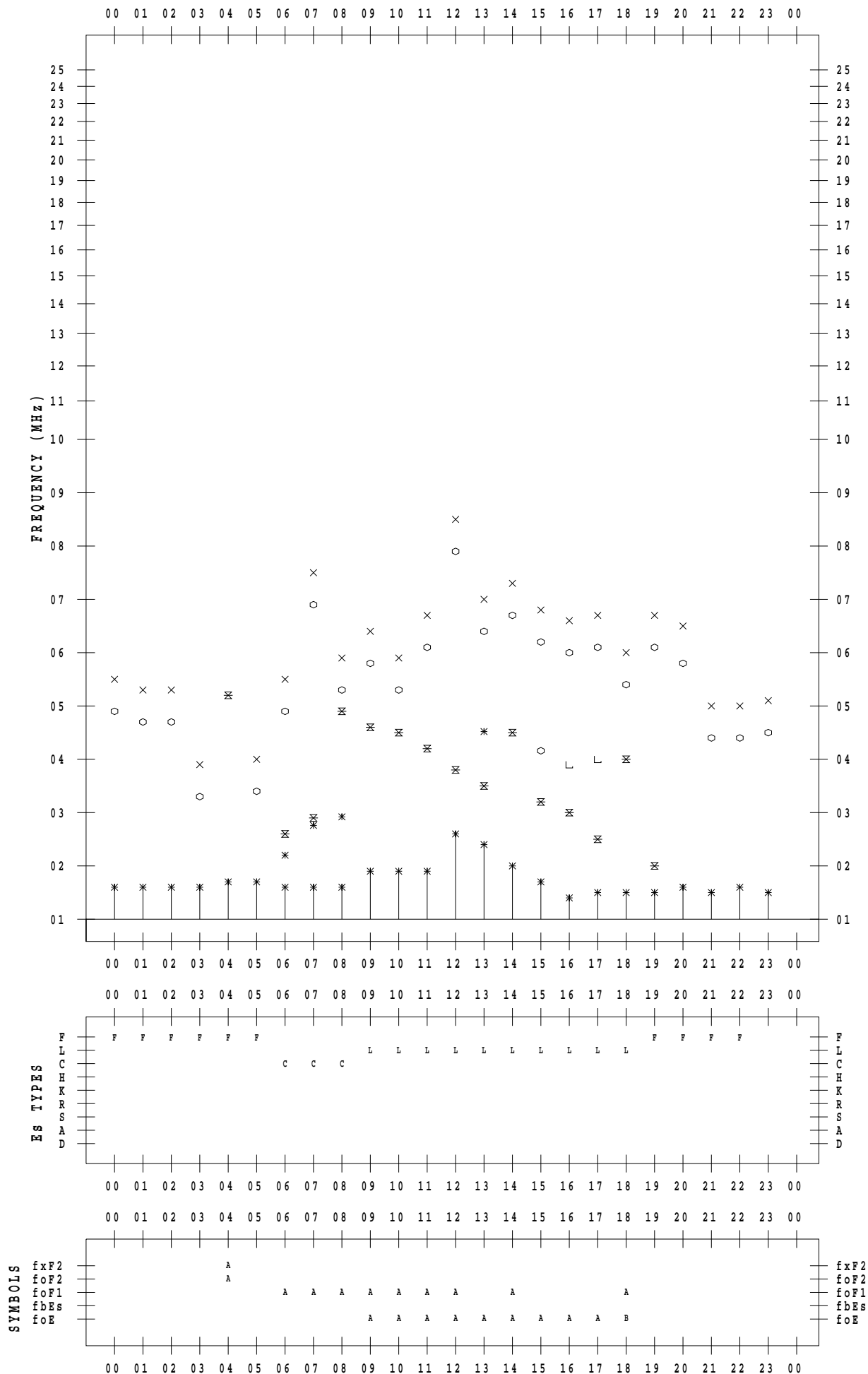
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 17

135 ° E MEAN TIME



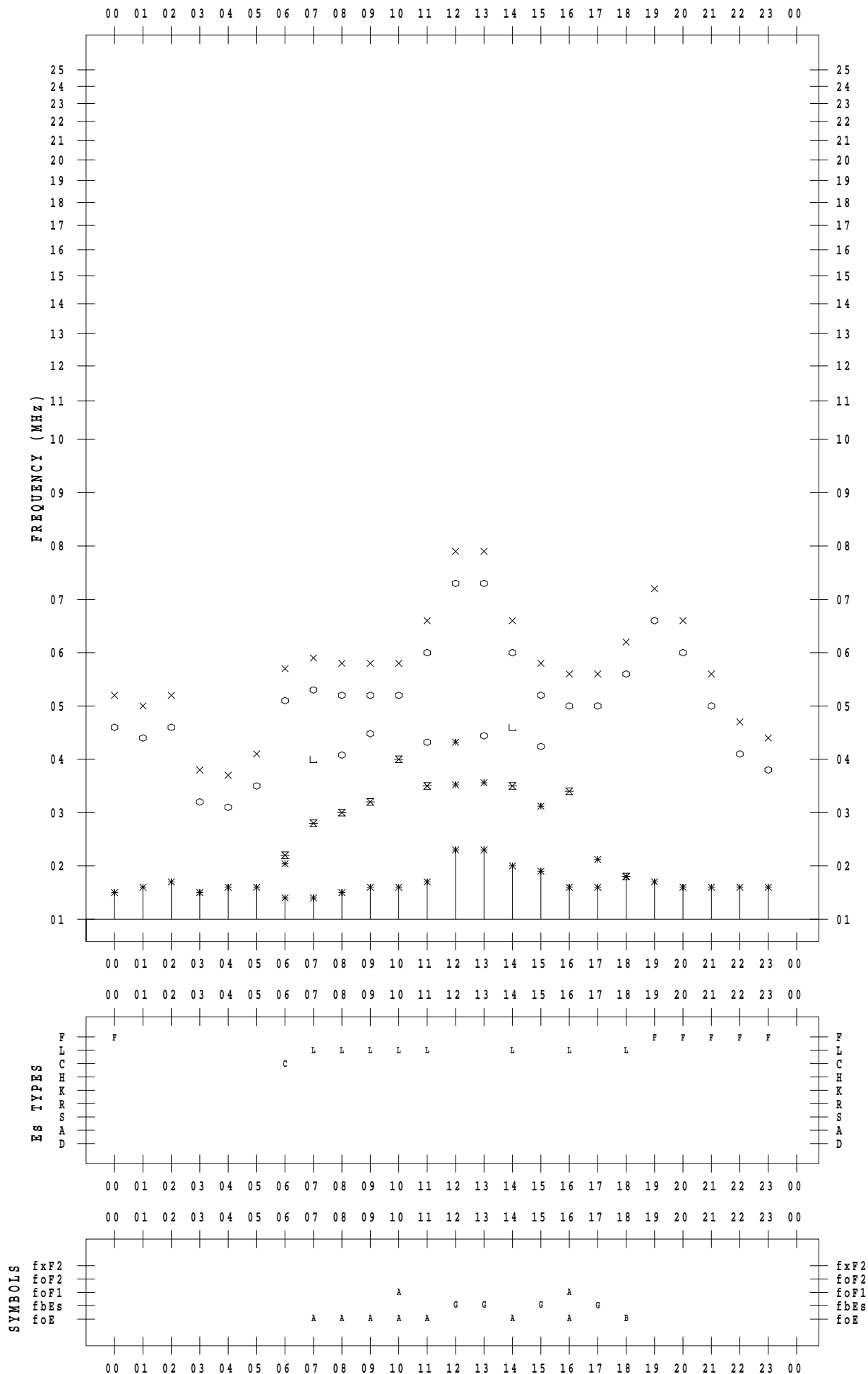
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 18

135 ° E MEAN TIME



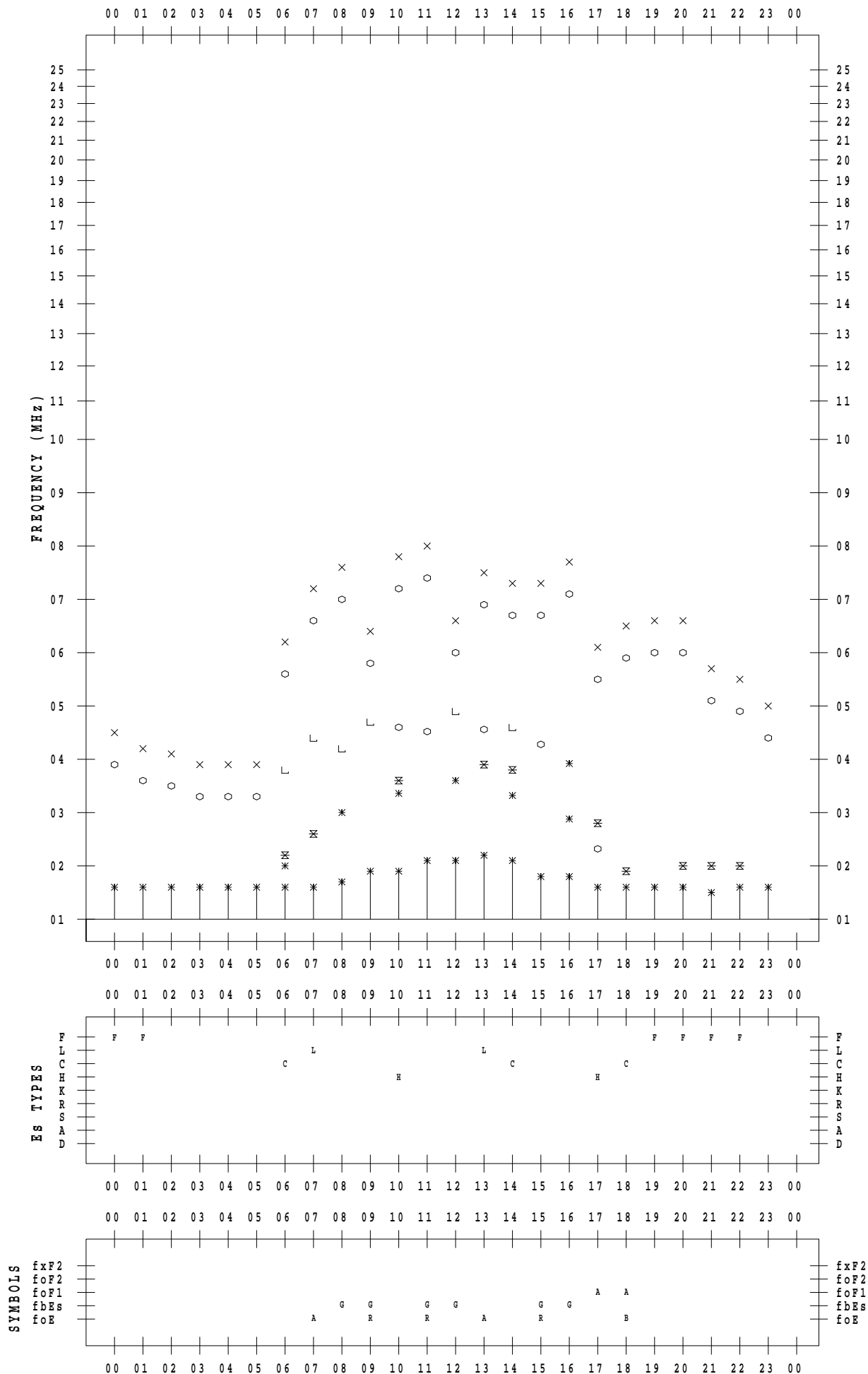
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 19

135 ° E MEAN TIME



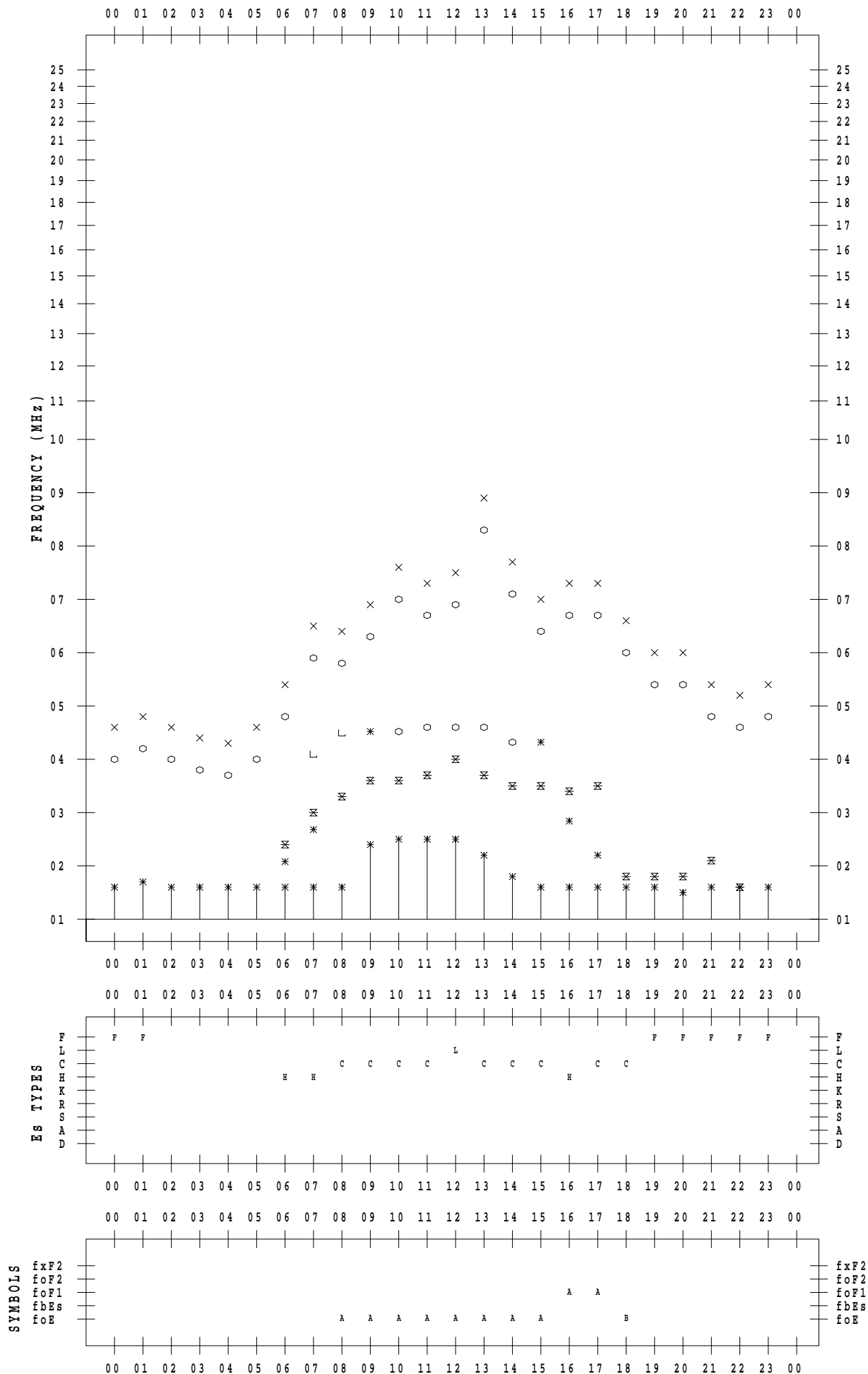
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 20

135 ° E MEAN TIME



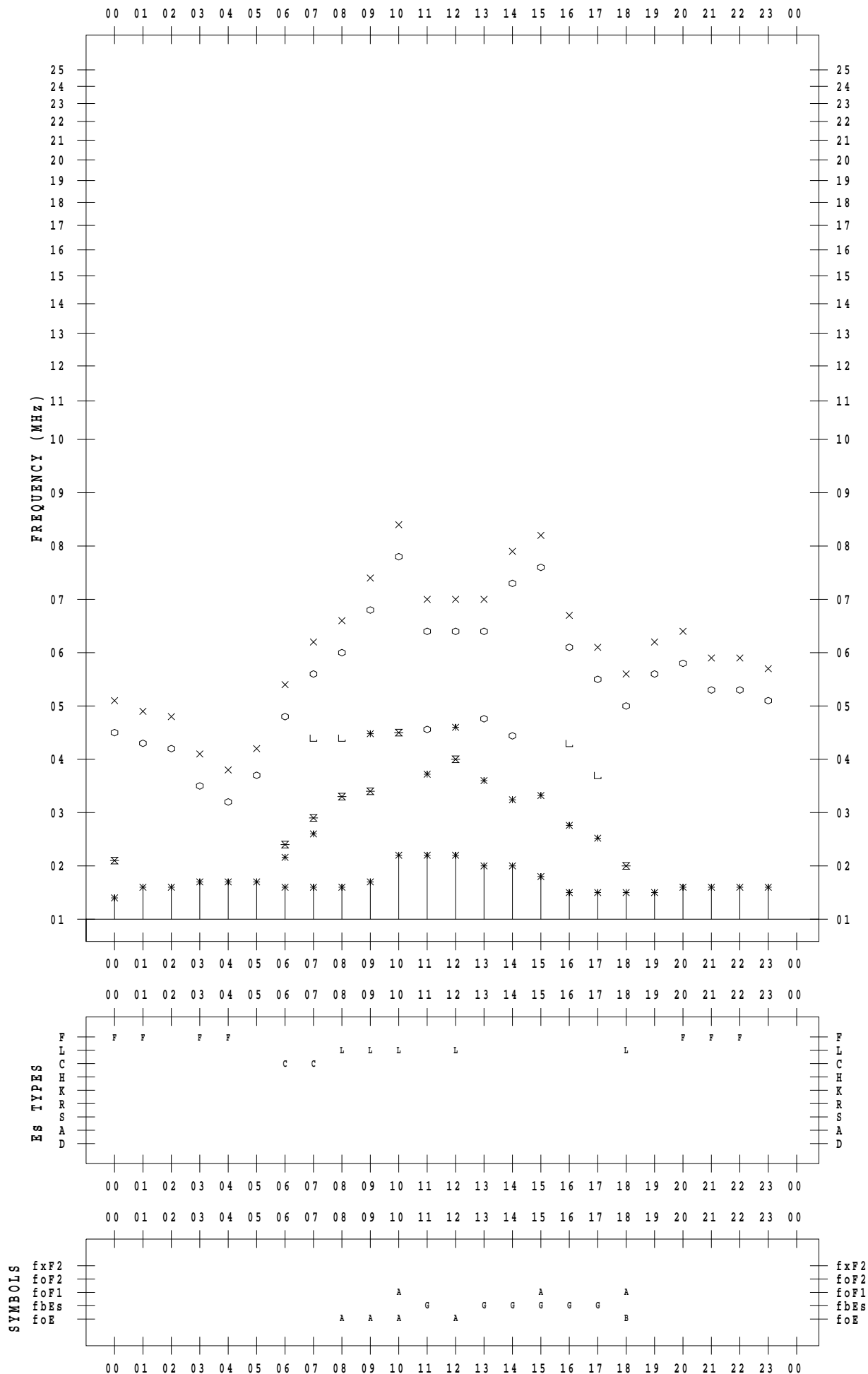
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 21

135 ° E MEAN TIME



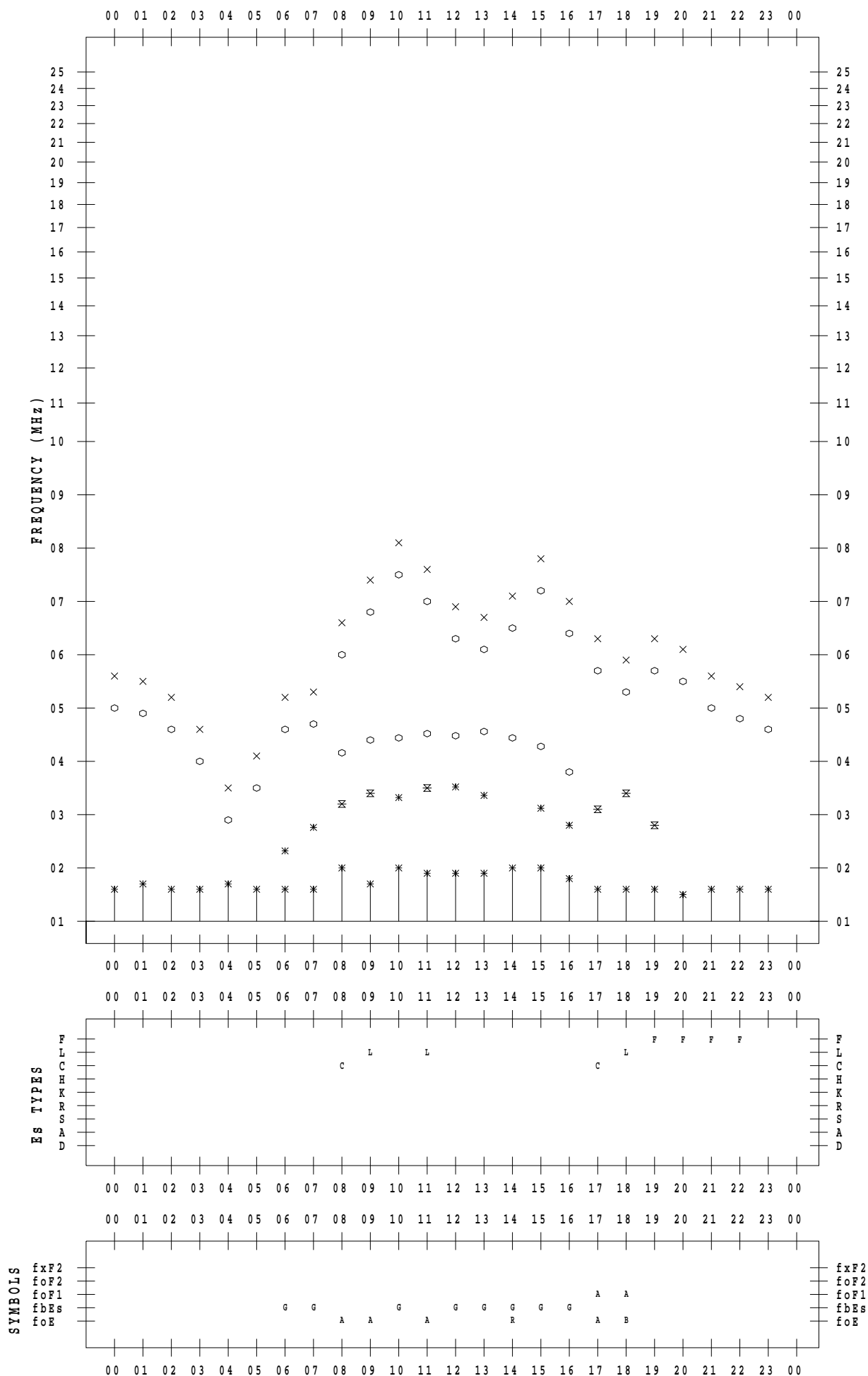
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 22

135 ° E MEAN TIME



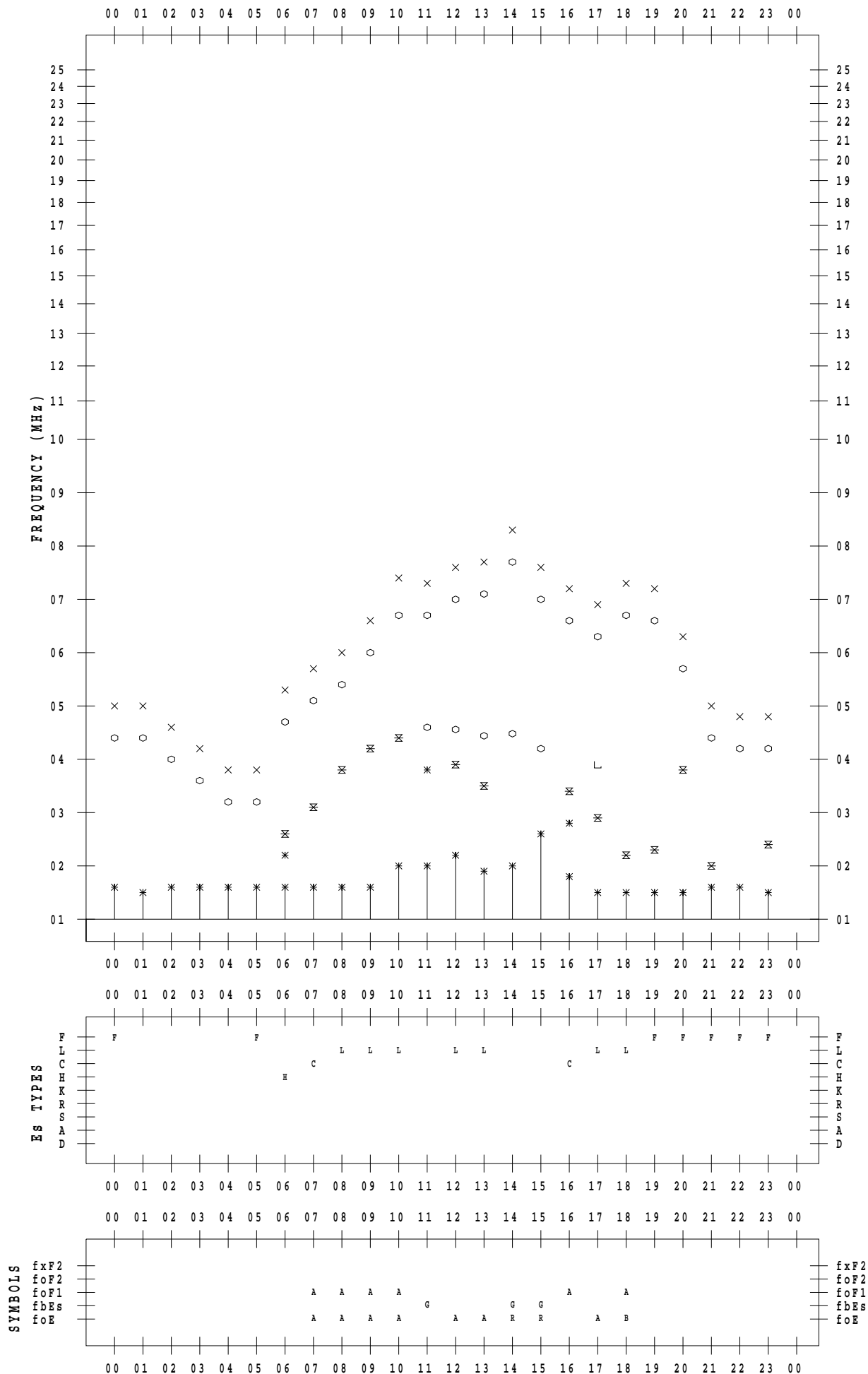
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 23

135 ° E MEAN TIME



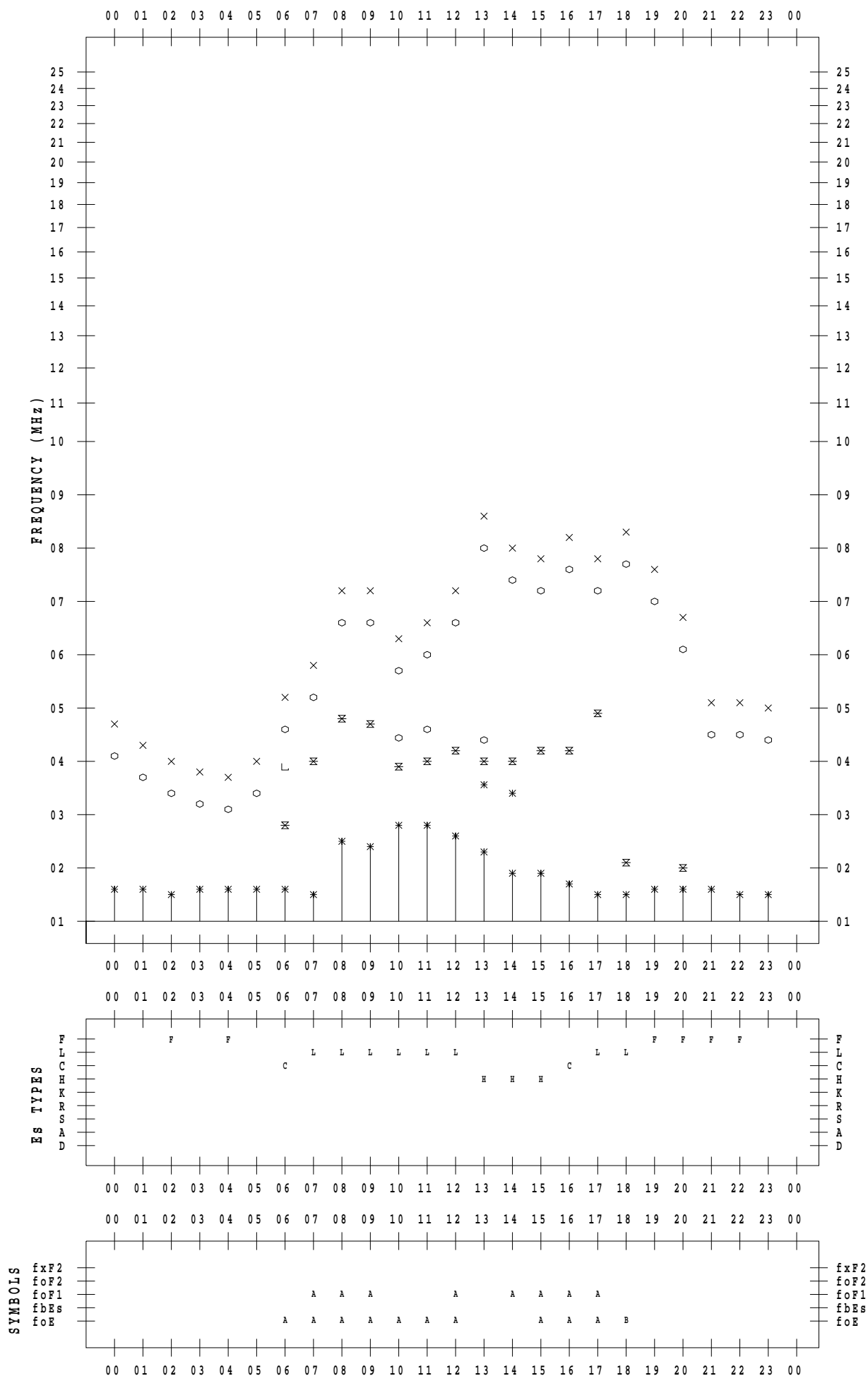
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 24

135 ° E MEAN TIME



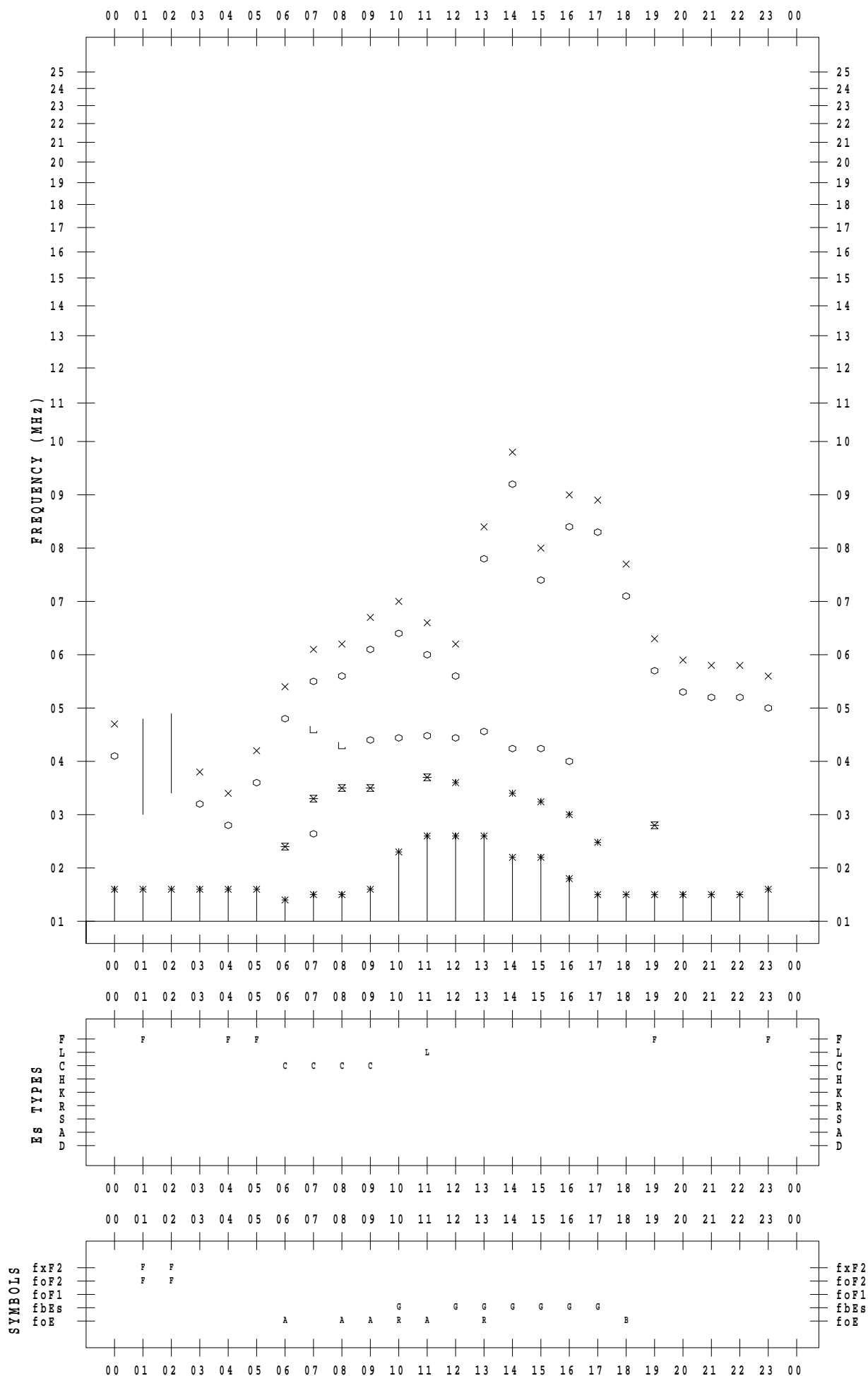
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 25

135 ° E MEAN TIME



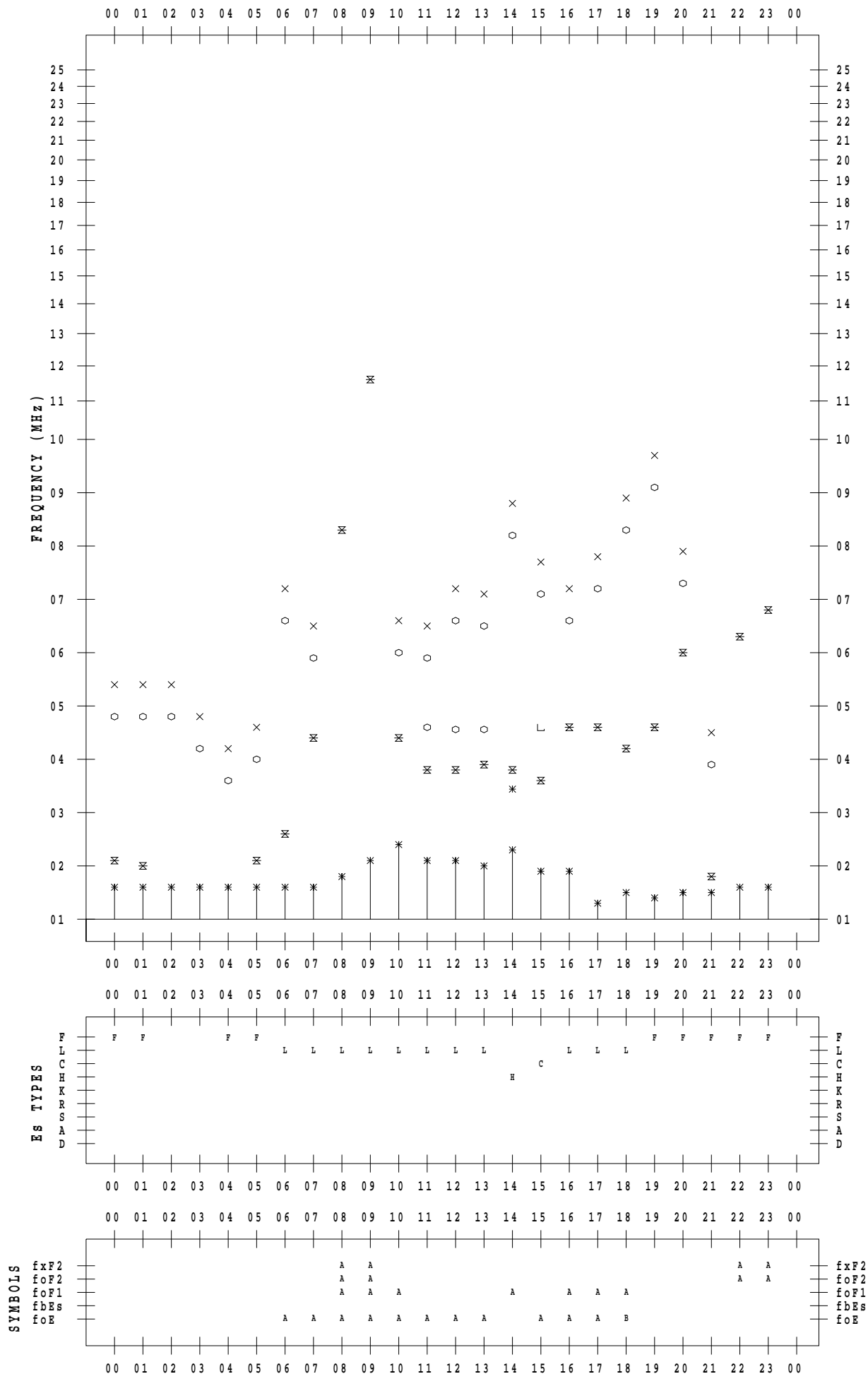
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 26

135 ° E MEAN TIME



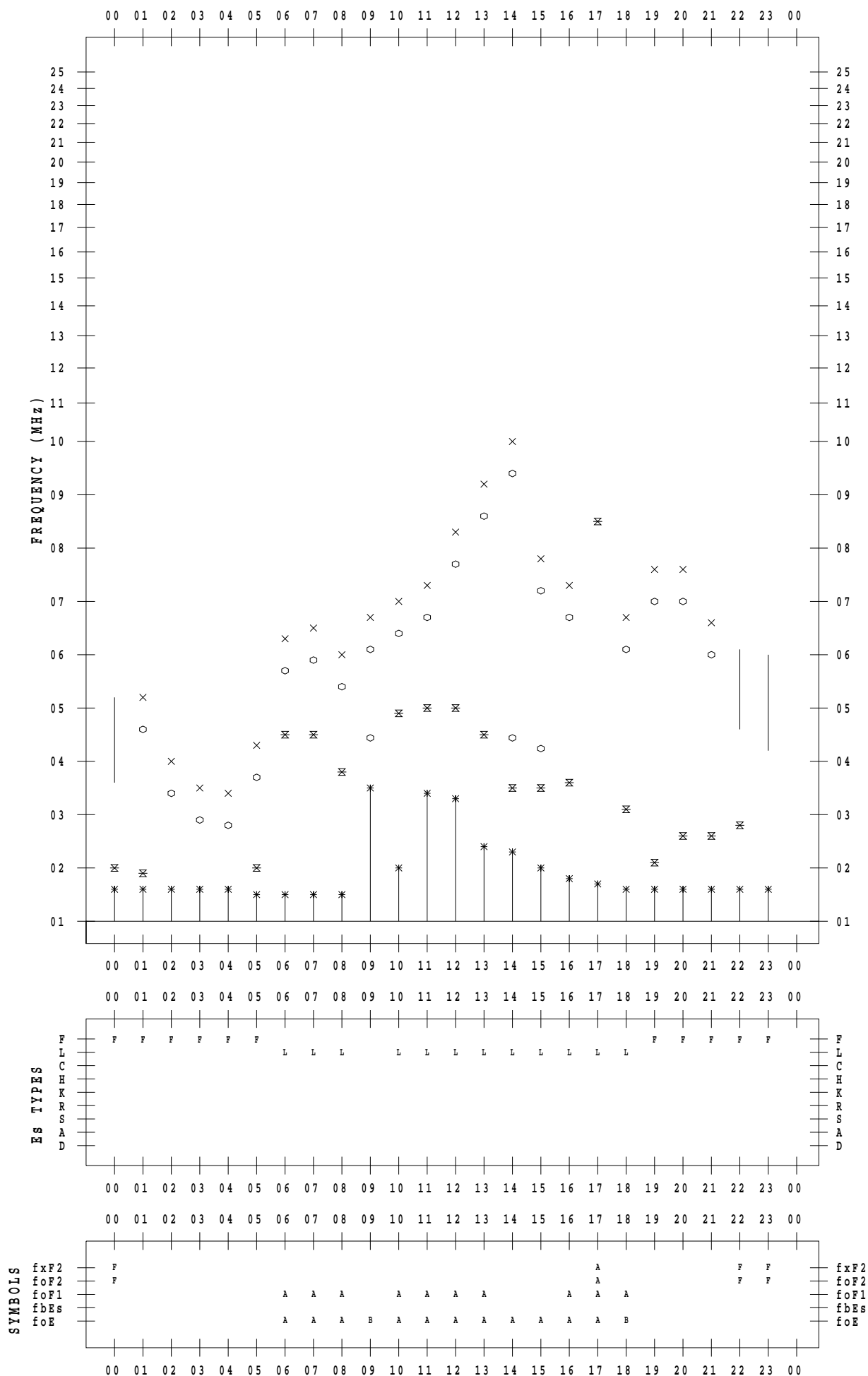
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 27

135 ° E MEAN TIME



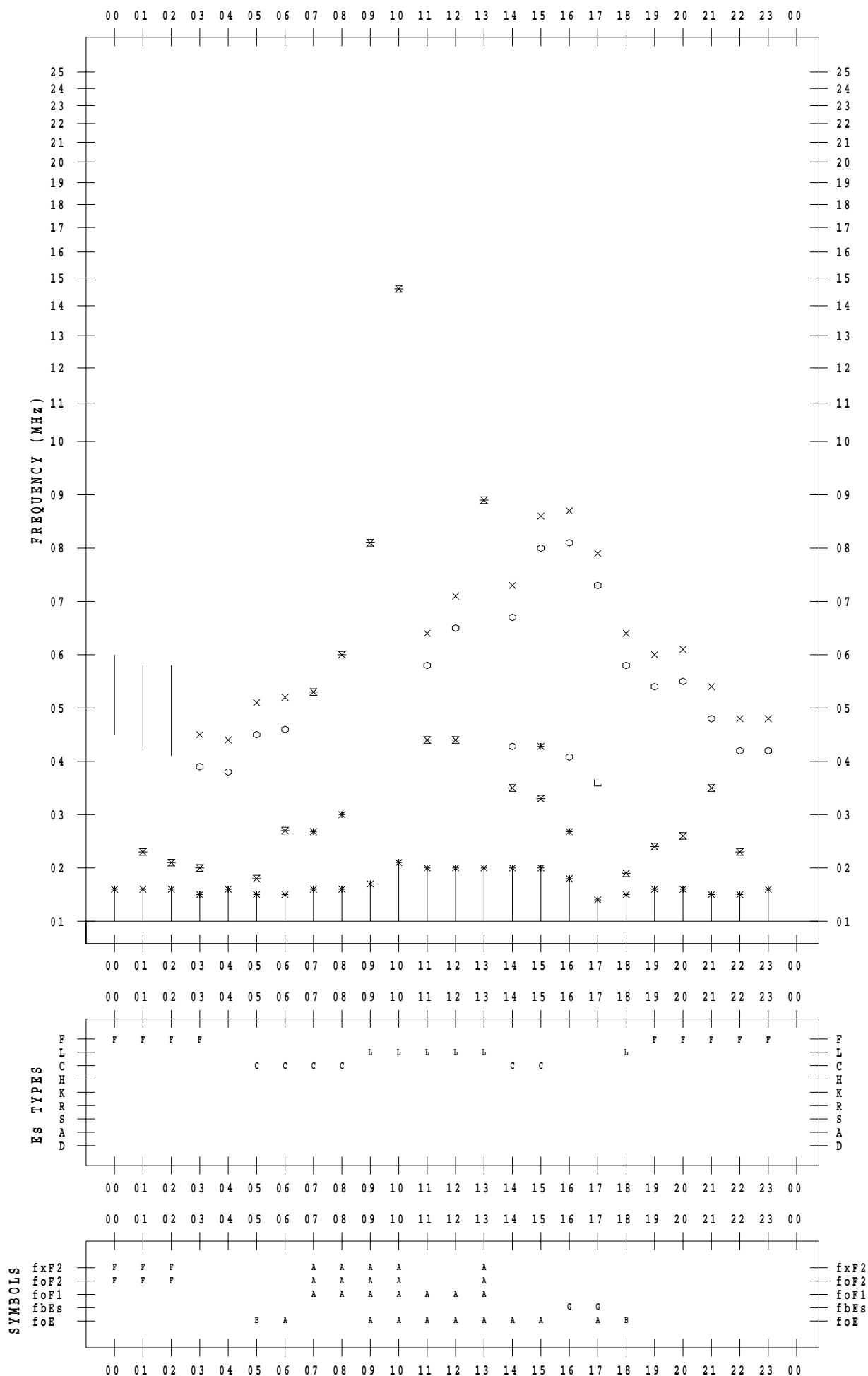
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 28

135 ° E MEAN TIME



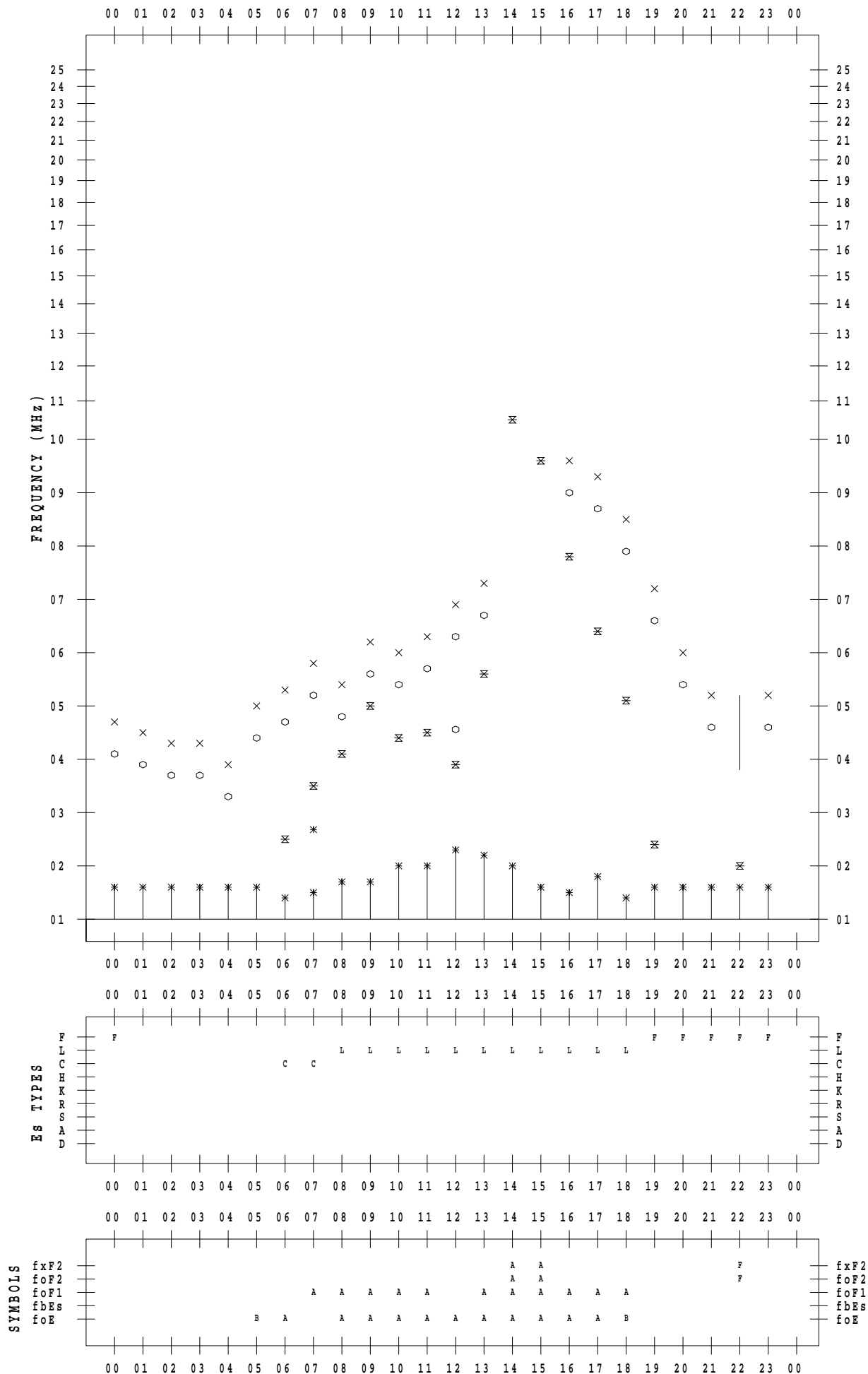
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 29

135 ° E MEAN TIME



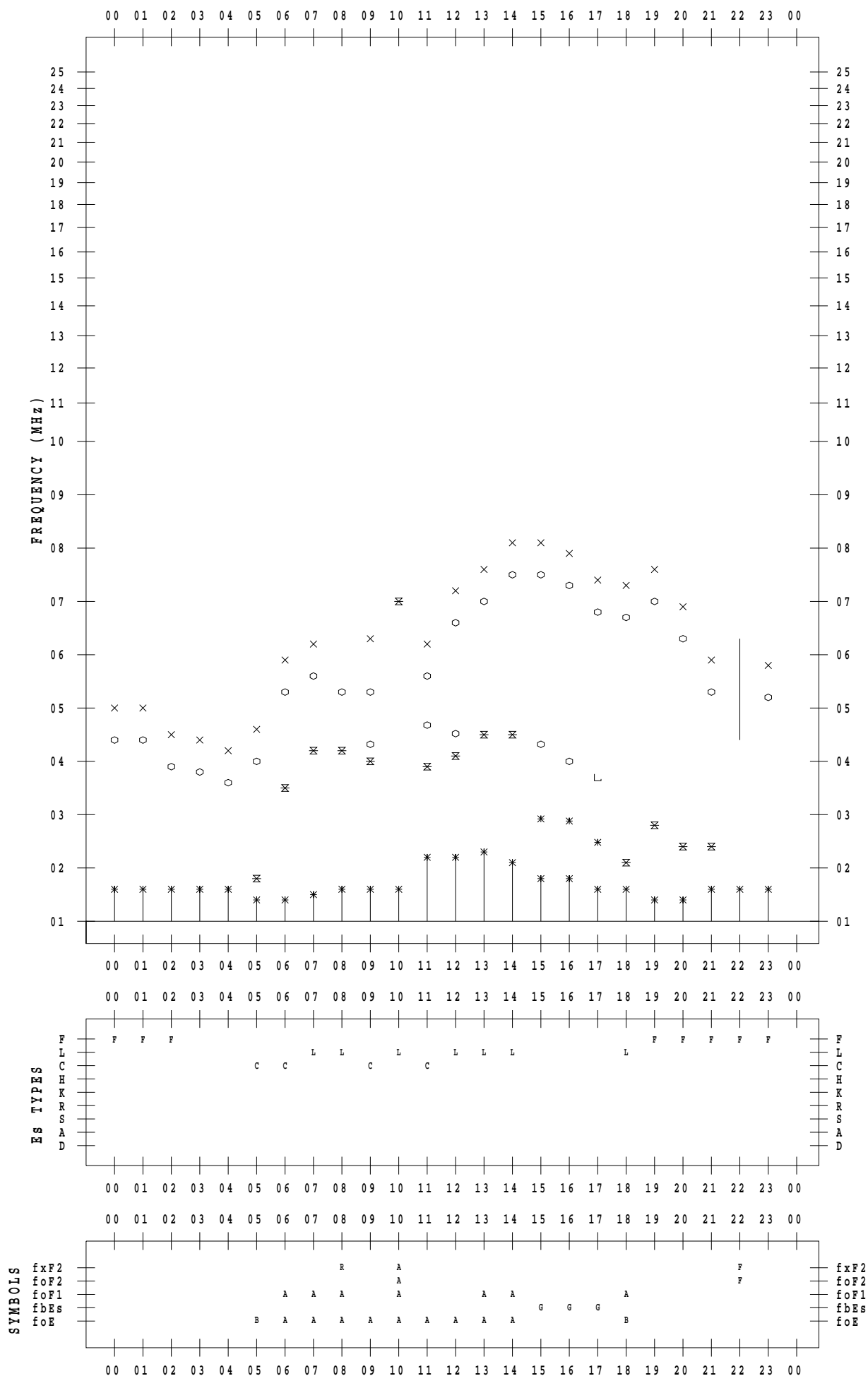
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021 / 4 / 30

135 ° E MEAN TIME



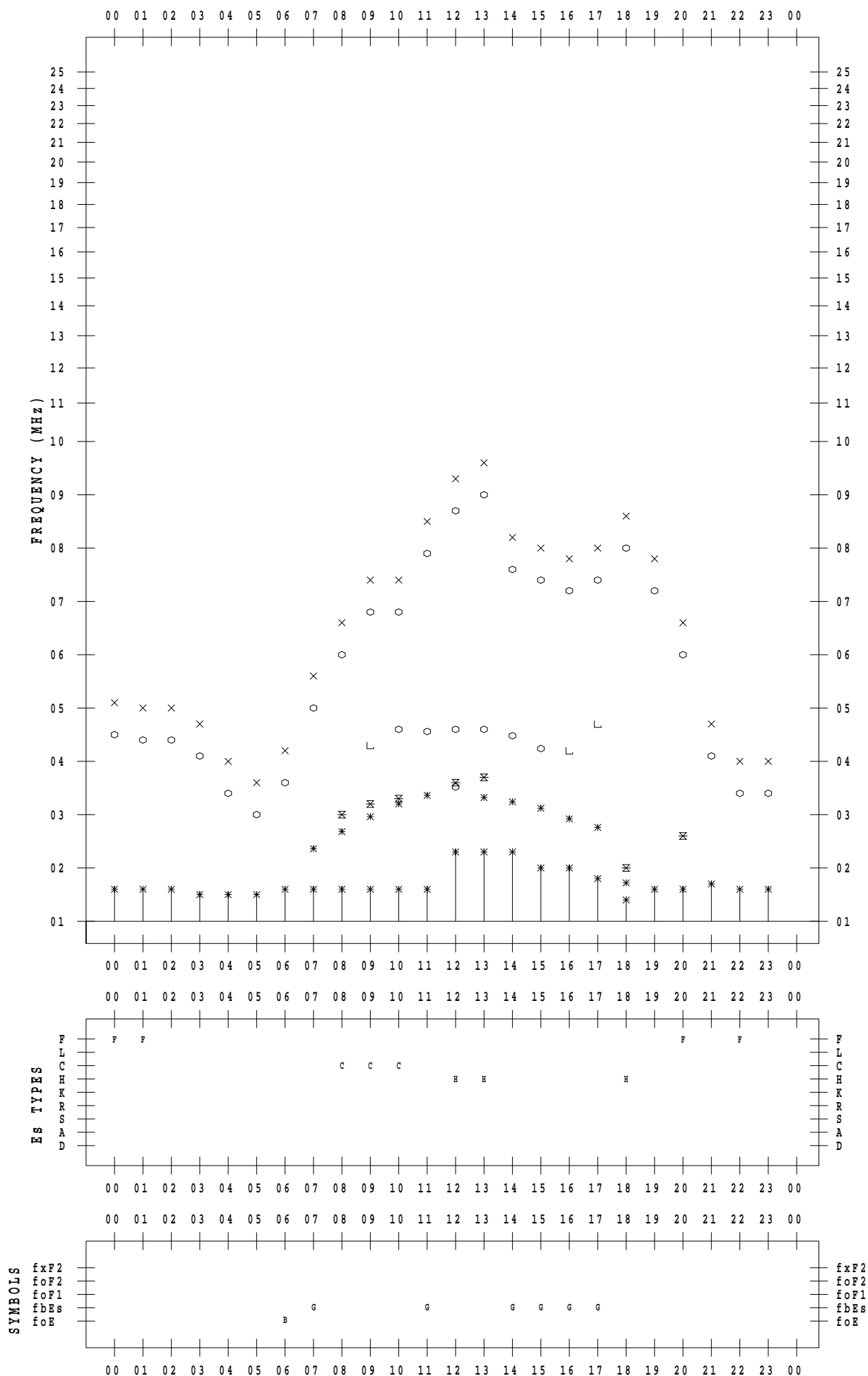
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 1

135 ° E MEAN TIME



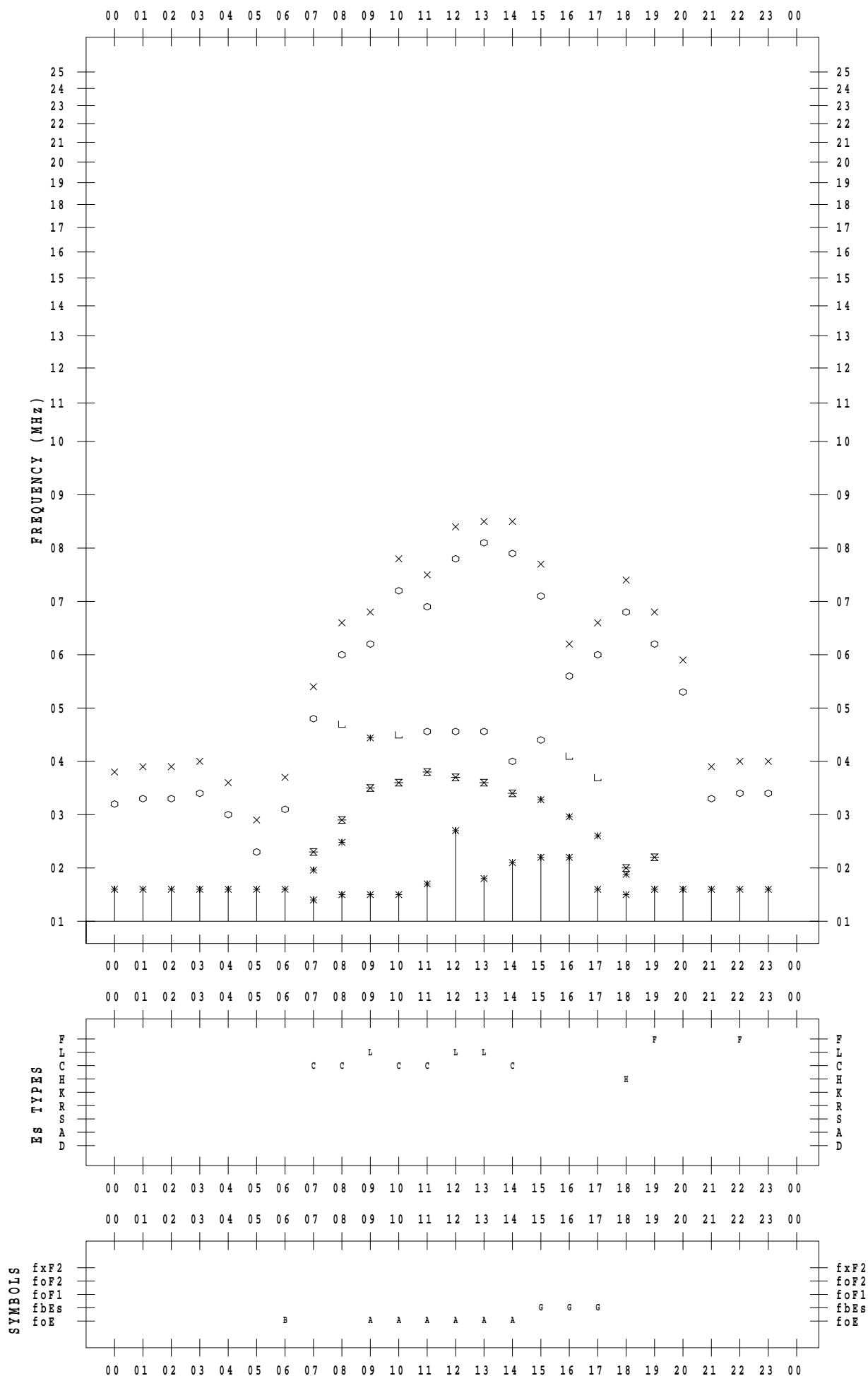
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 2

135 ° E MEAN TIME



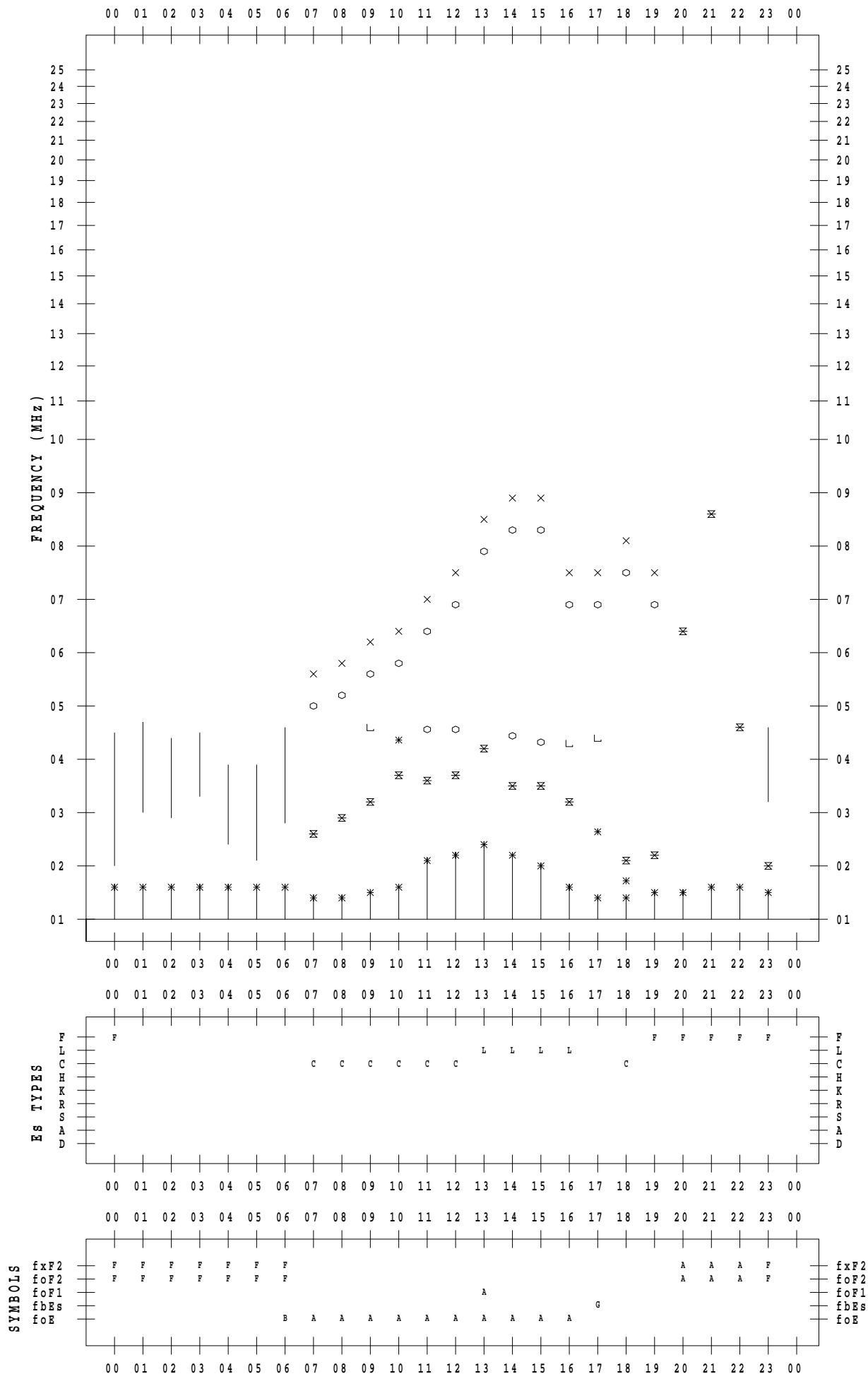
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 3

135 ° E MEAN TIME



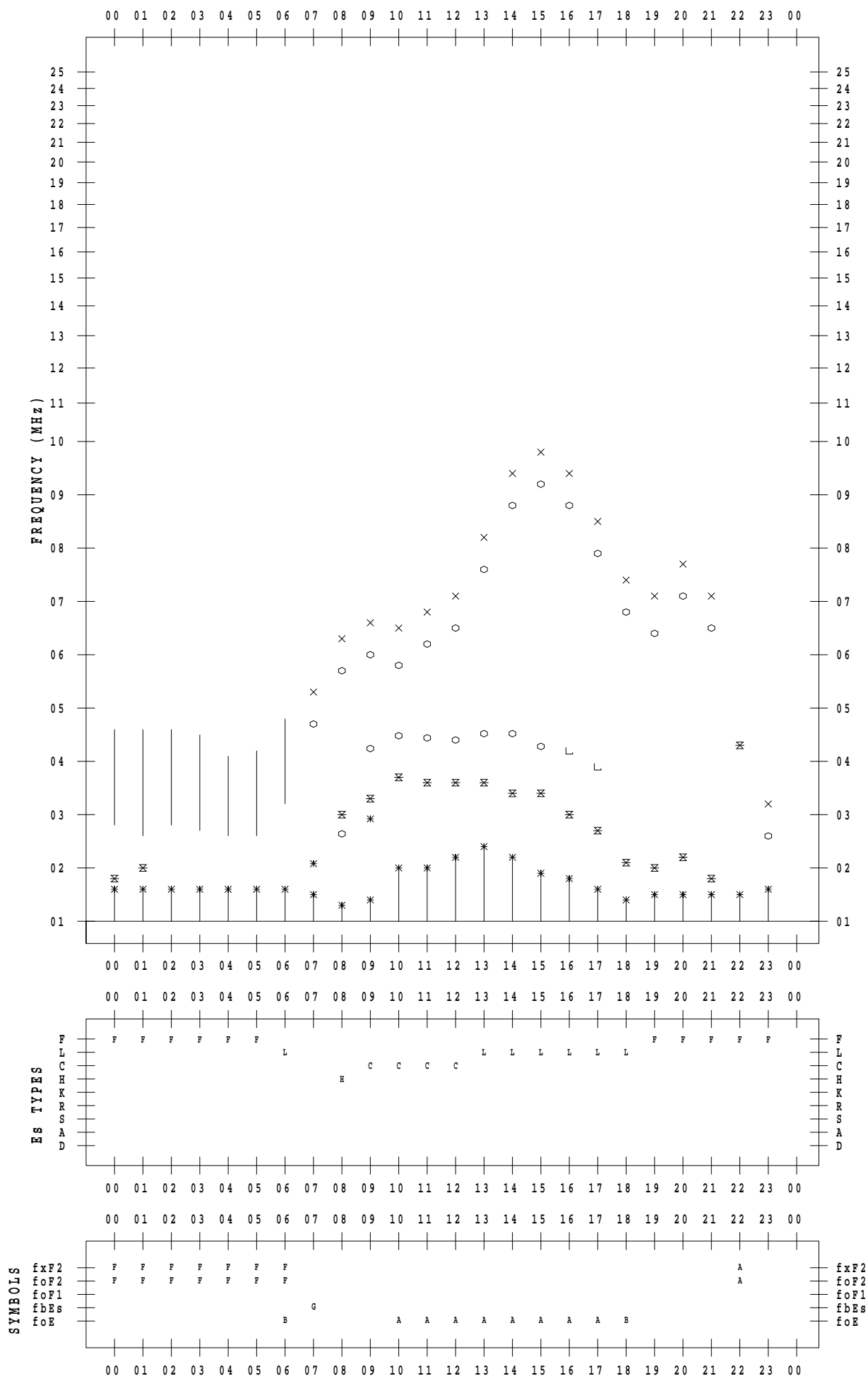
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 4

135 ° E MEAN TIME



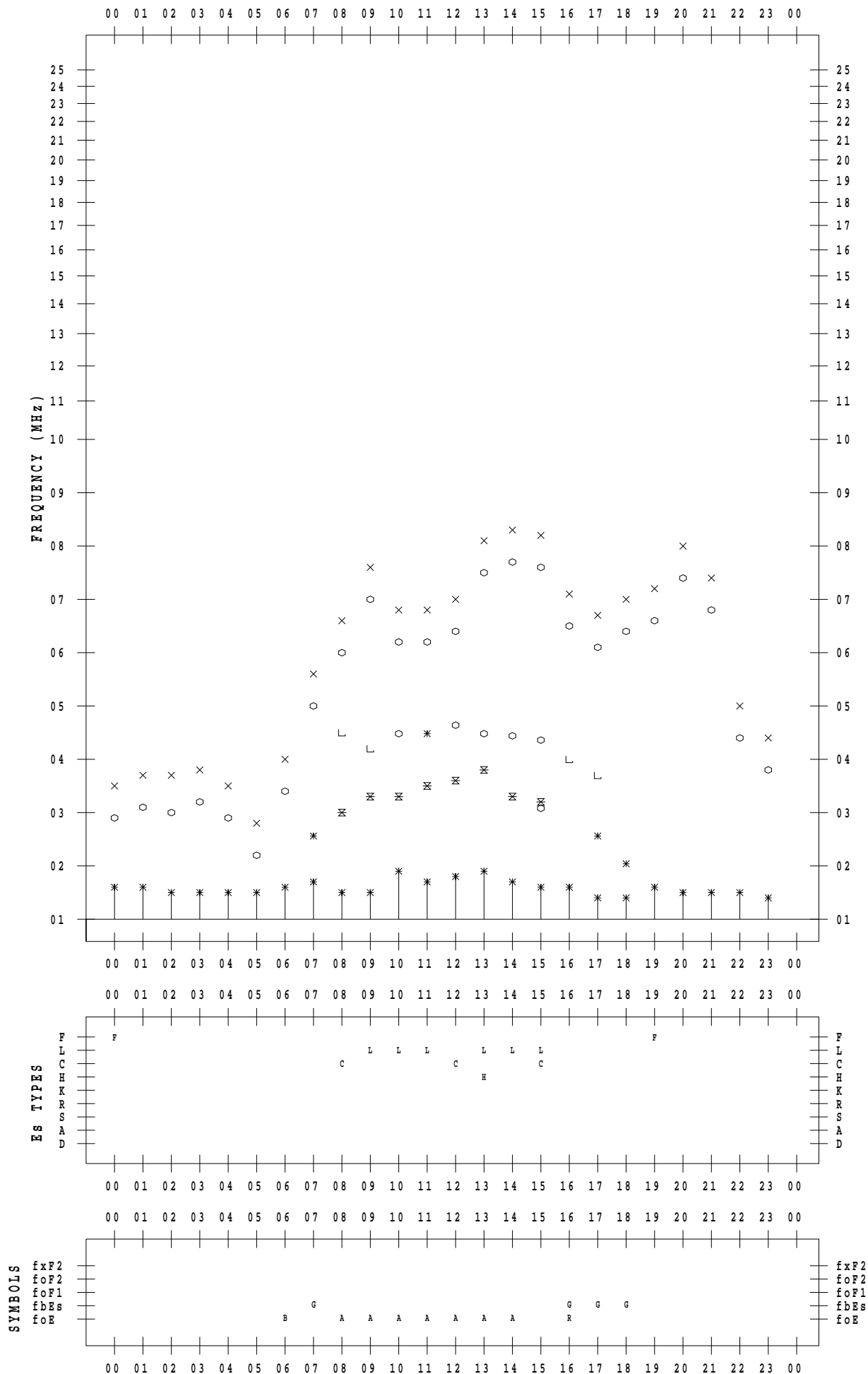
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 5

135 ° E MEAN TIME



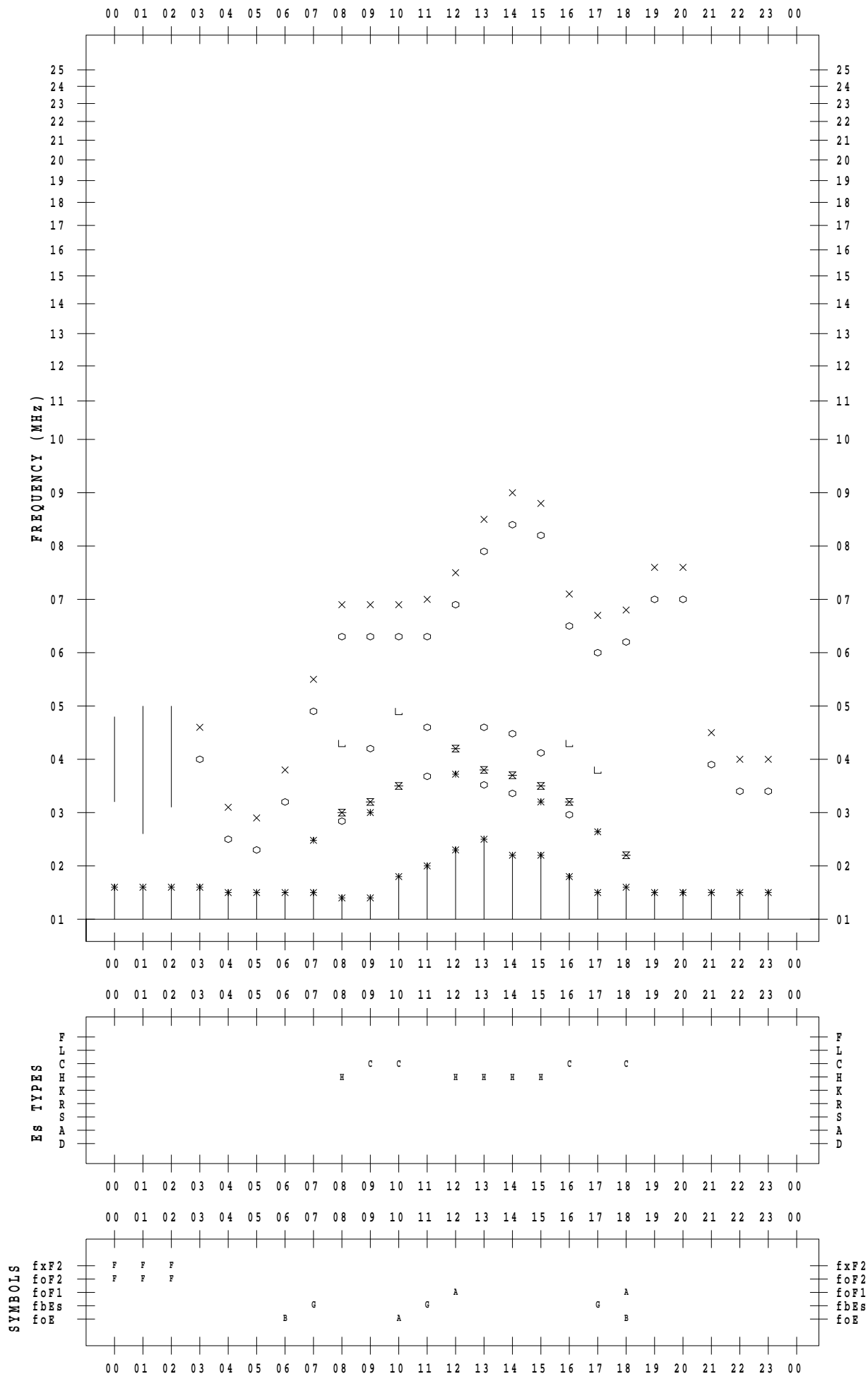
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 6

135 ° E MEAN TIME



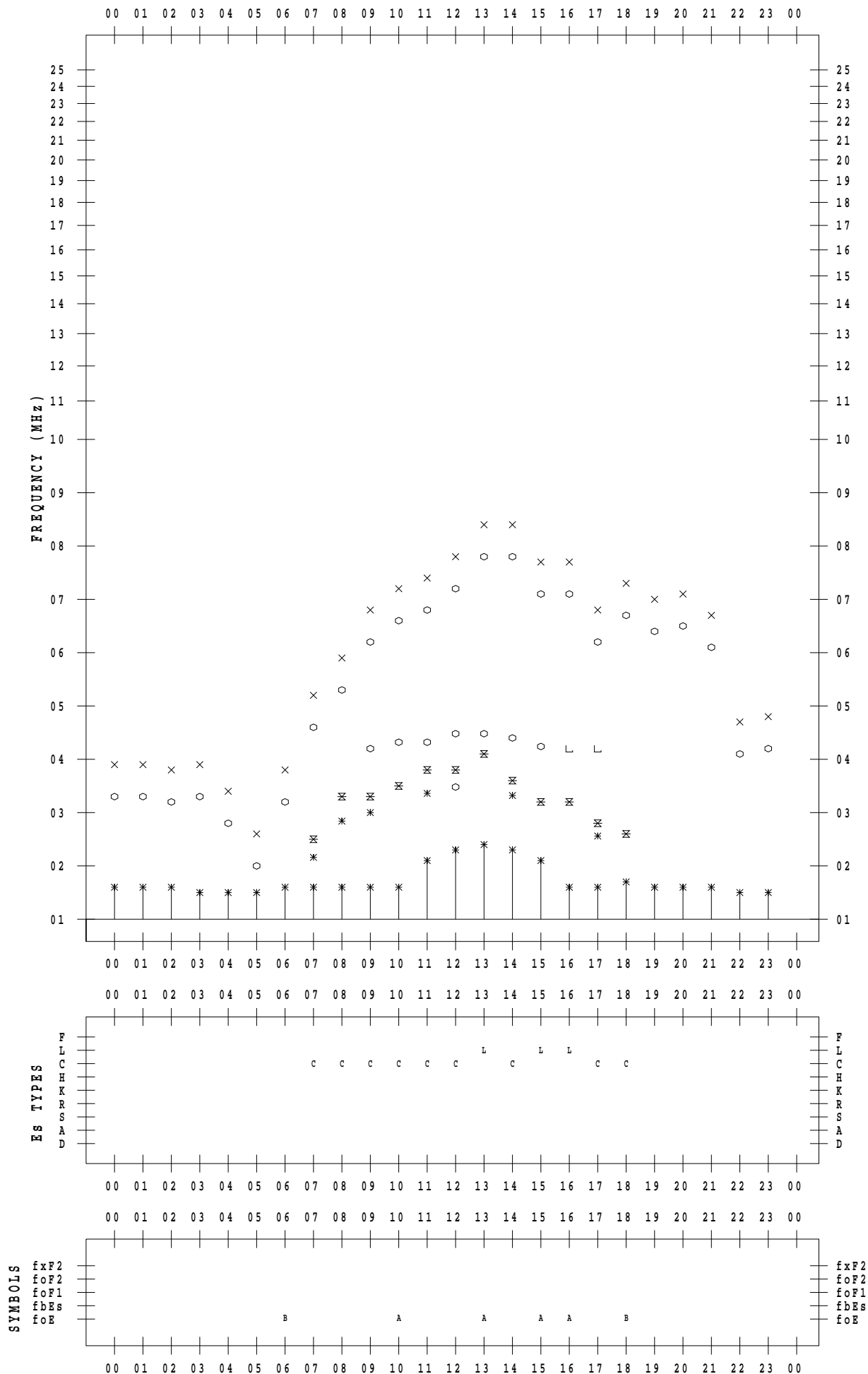
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 7

135 ° E MEAN TIME



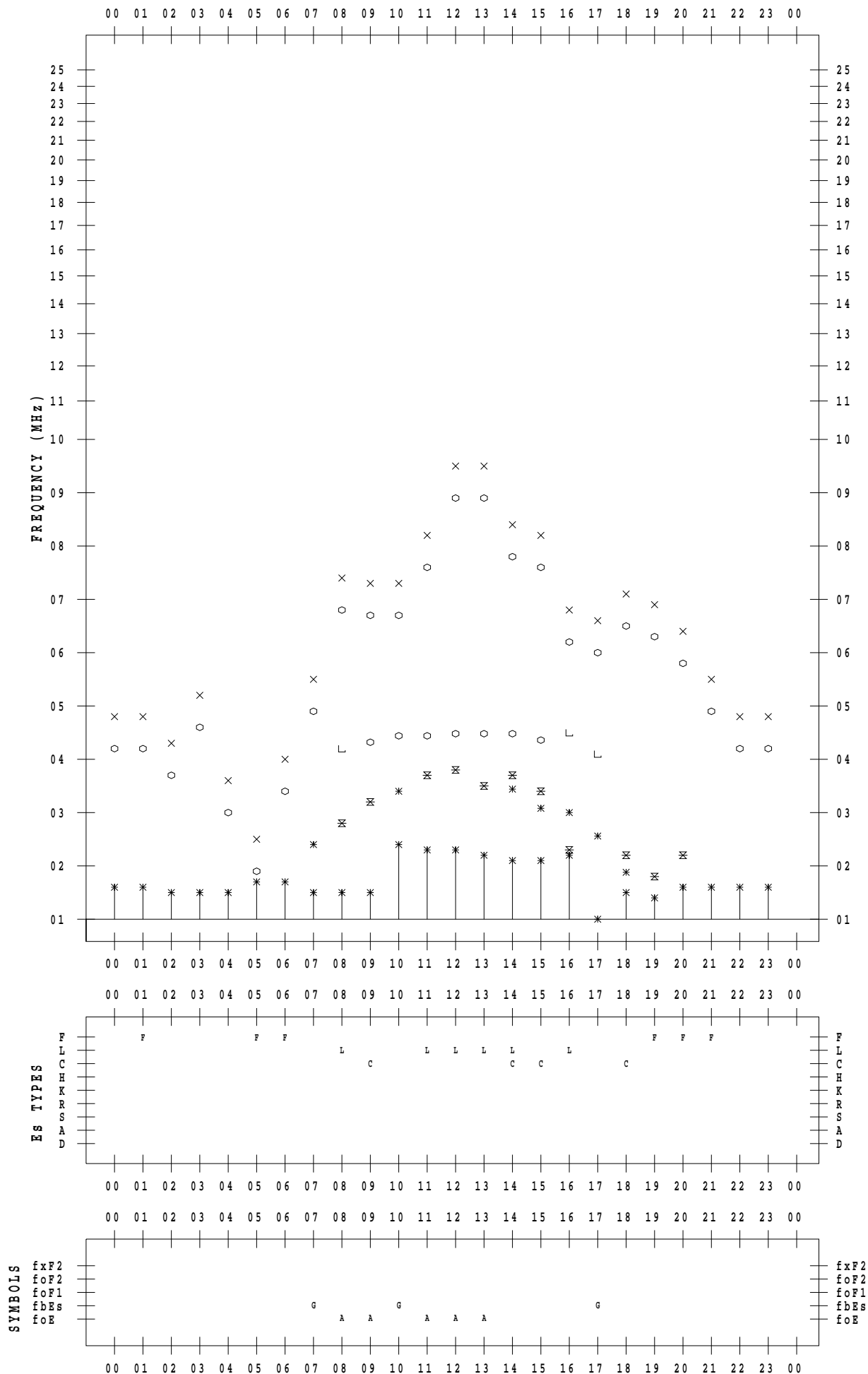
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 8

135 ° E MEAN TIME



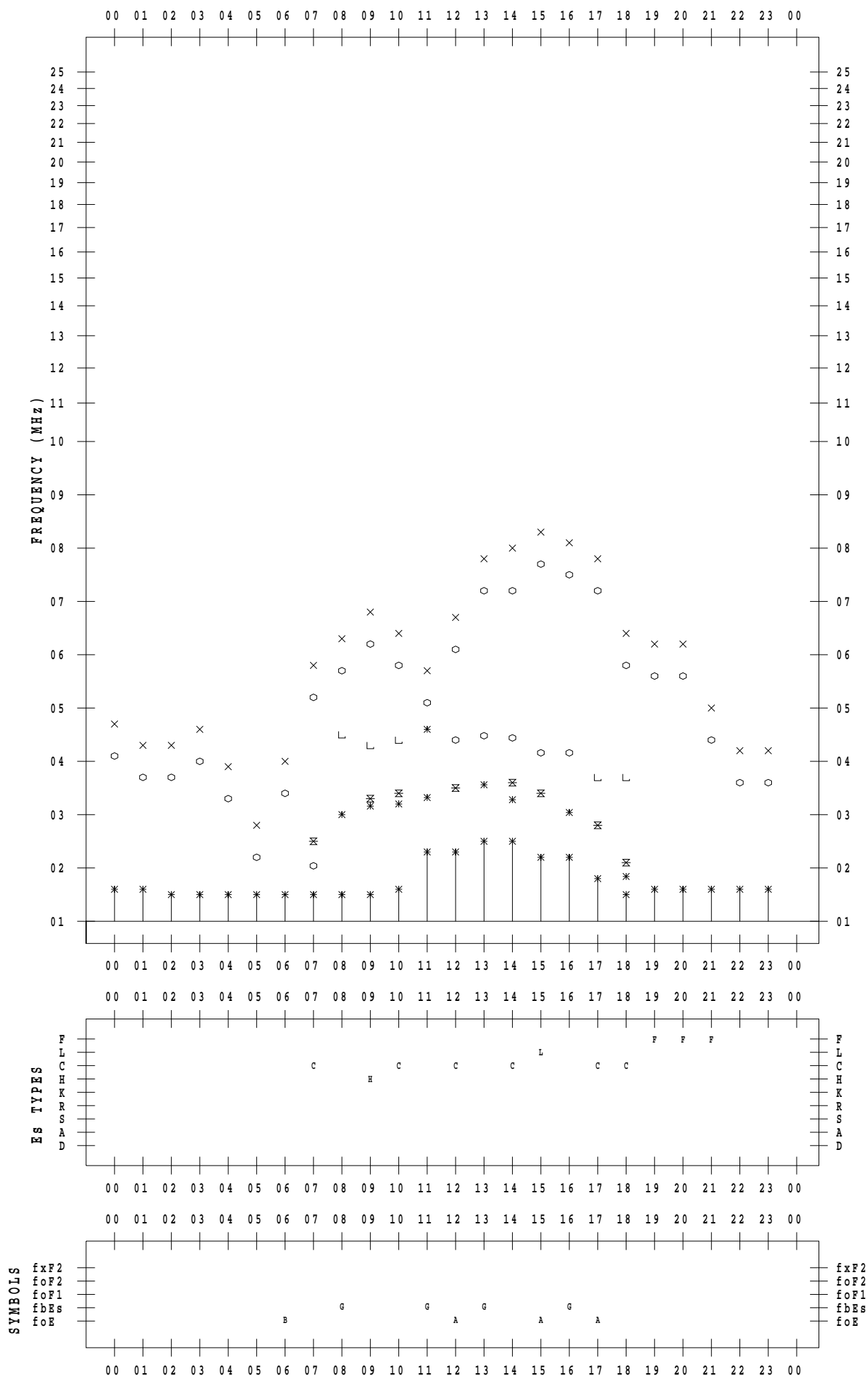
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 9

135 ° E MEAN TIME



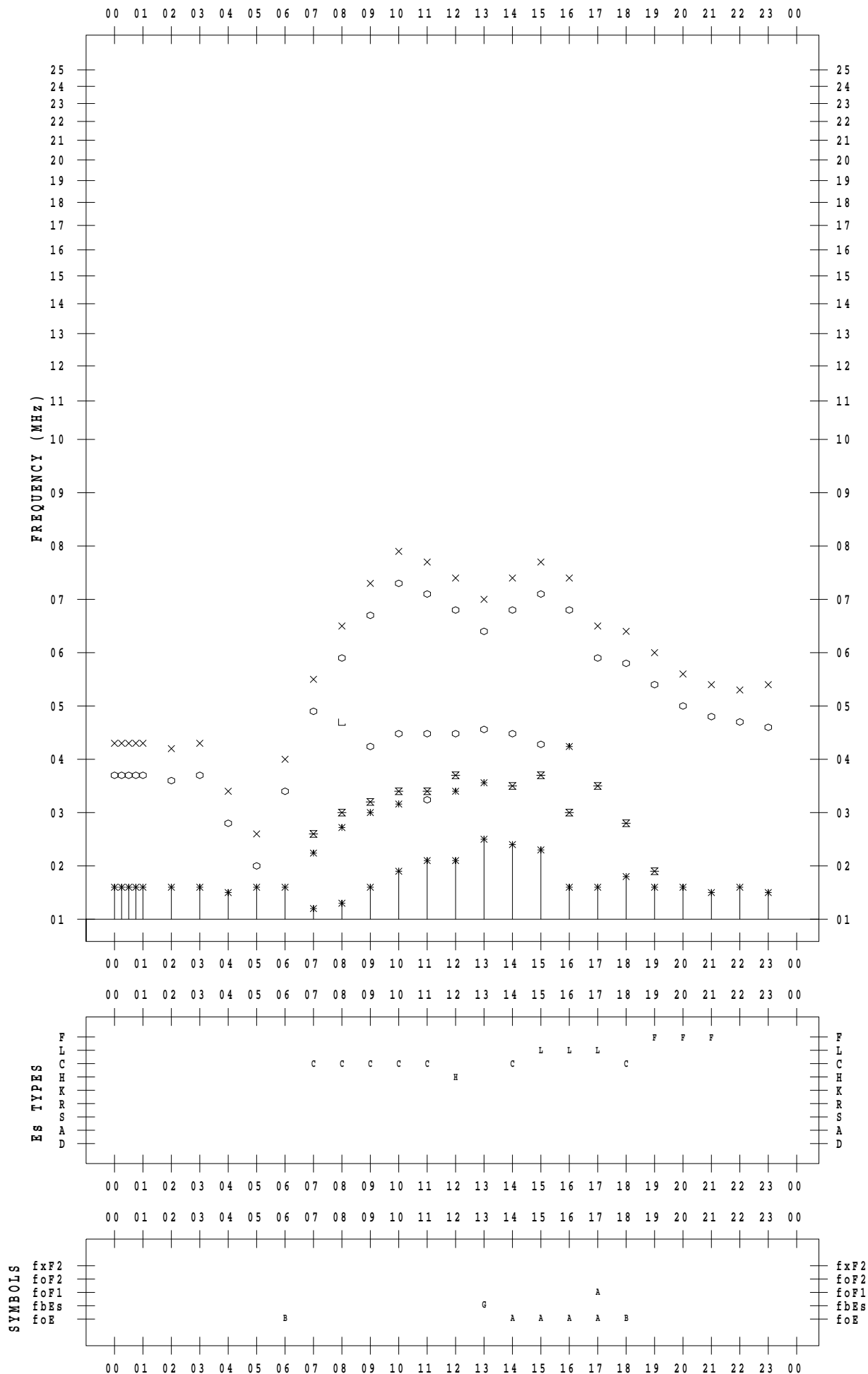
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 10

135 ° E MEAN TIME



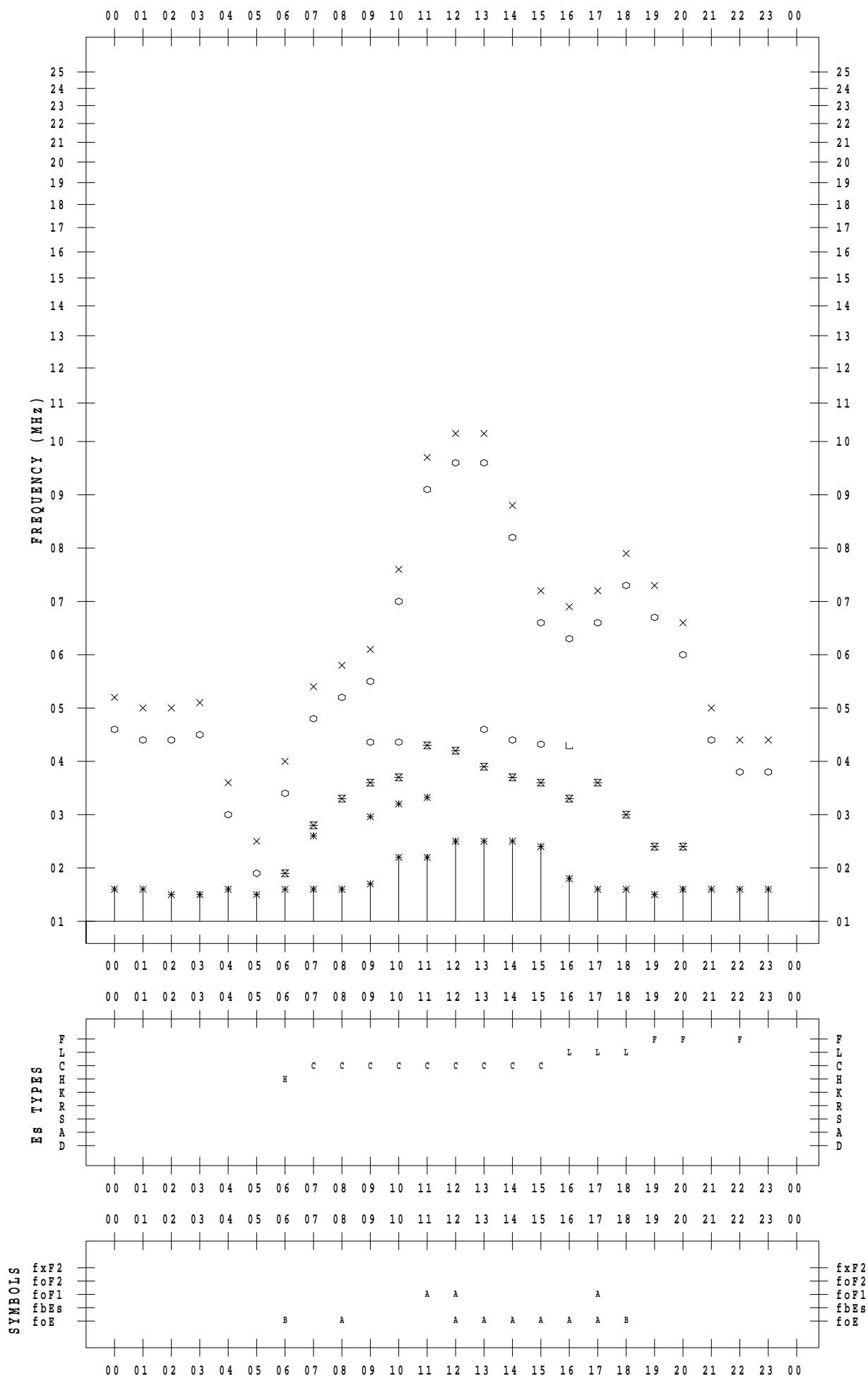
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 11

135 ° E MEAN TIME



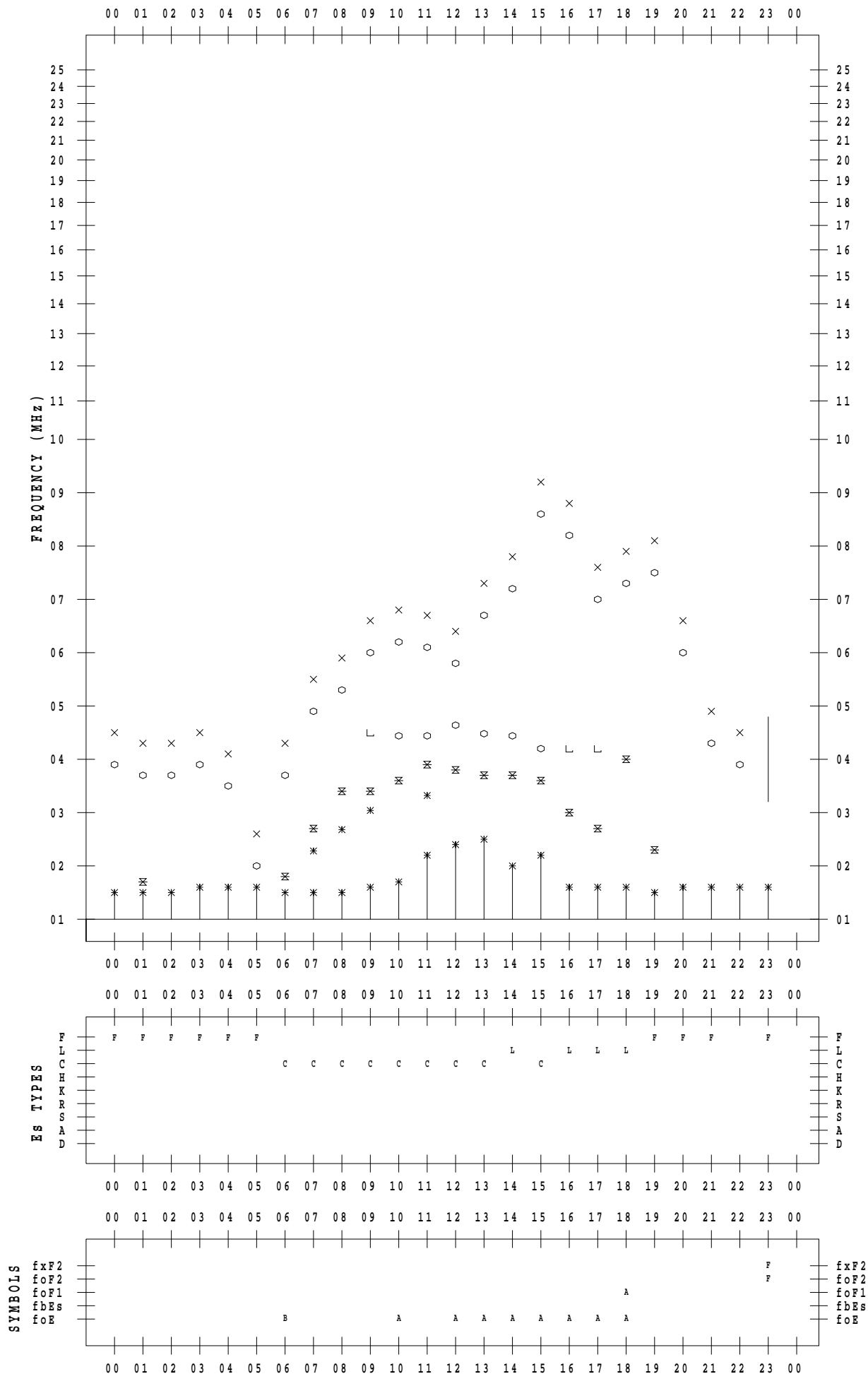
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 12

135 ° E MEAN TIME



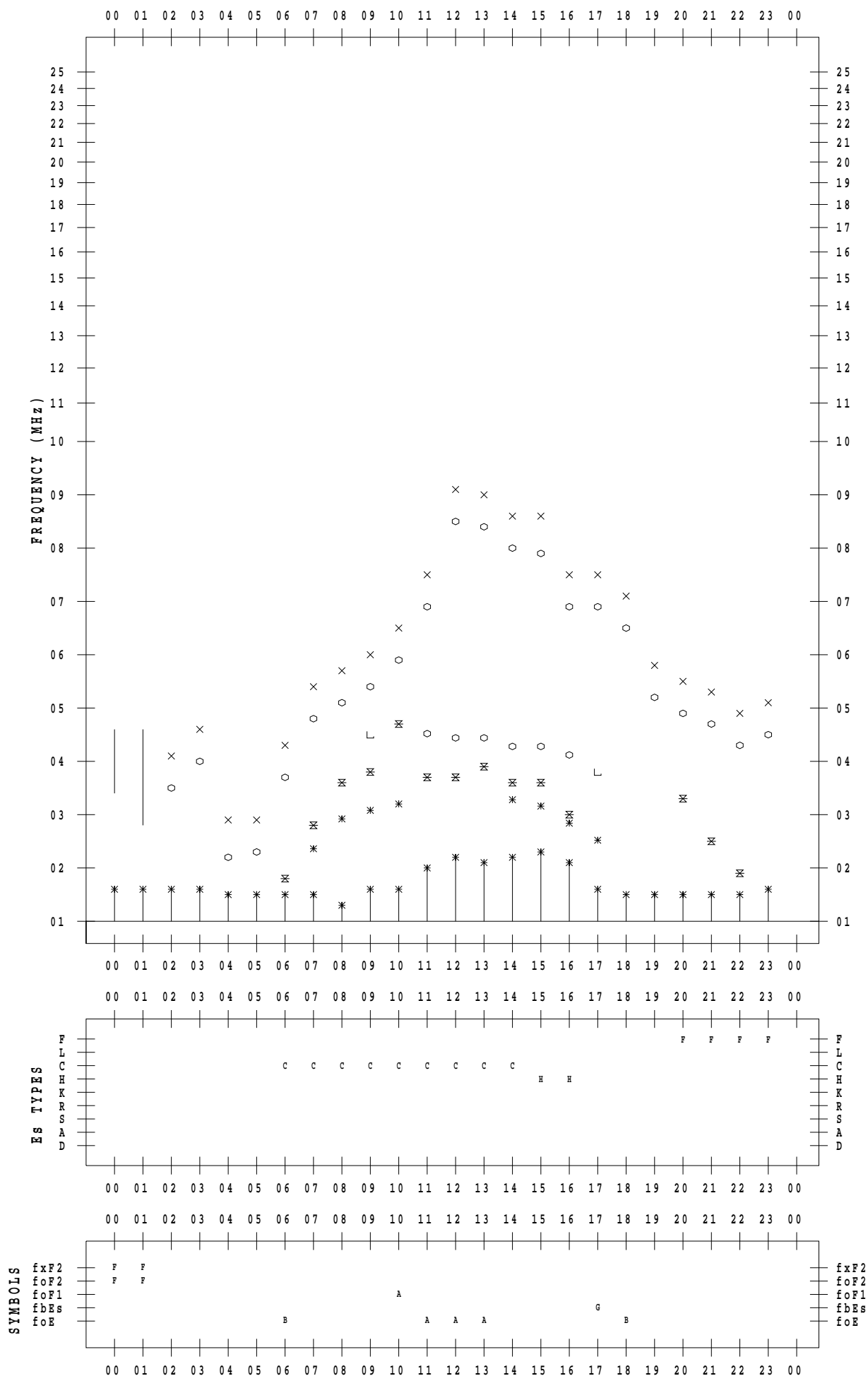
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 13

135 ° E MEAN TIME



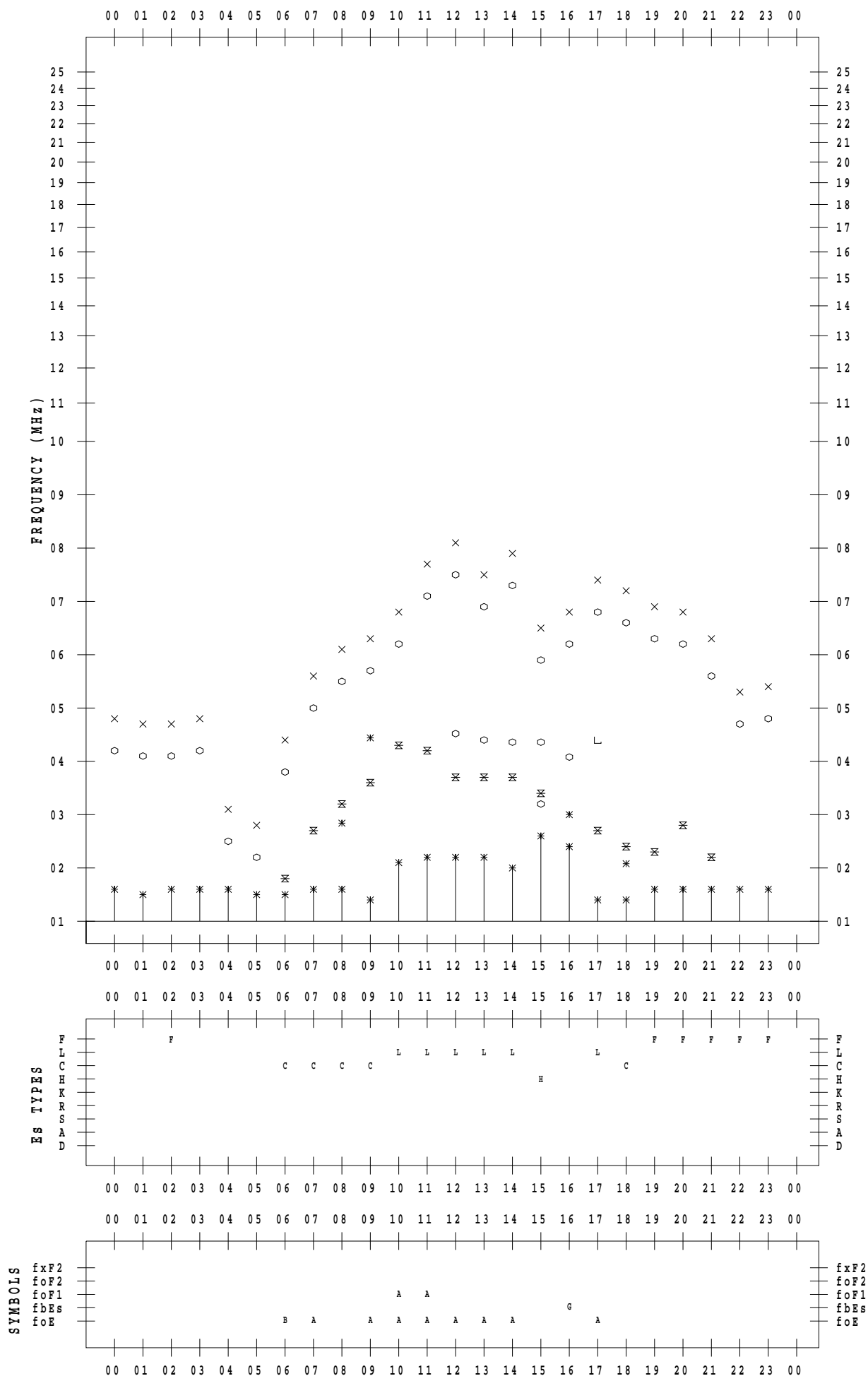
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 14

135 ° E MEAN TIME



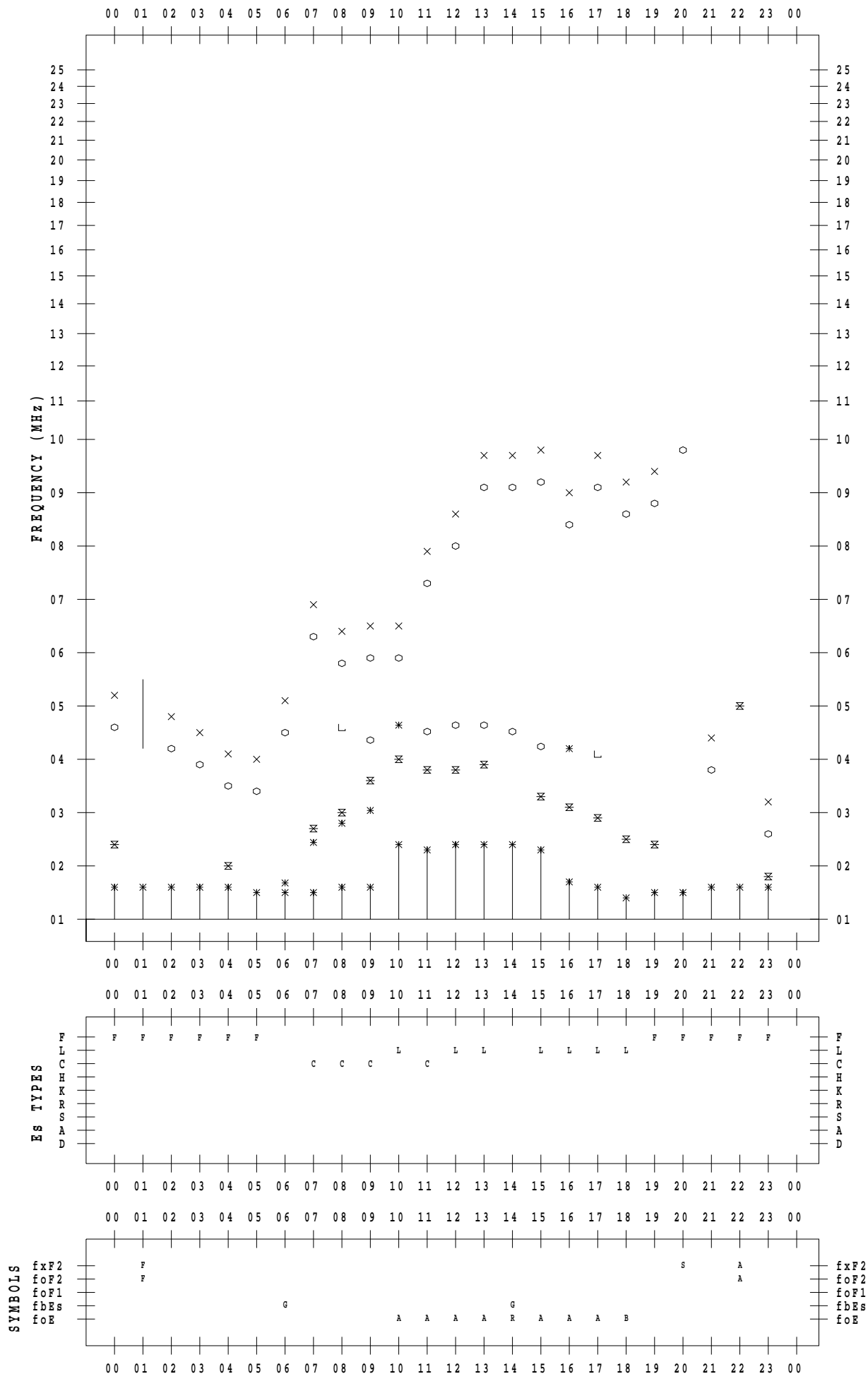
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 15

135 ° E MEAN TIME



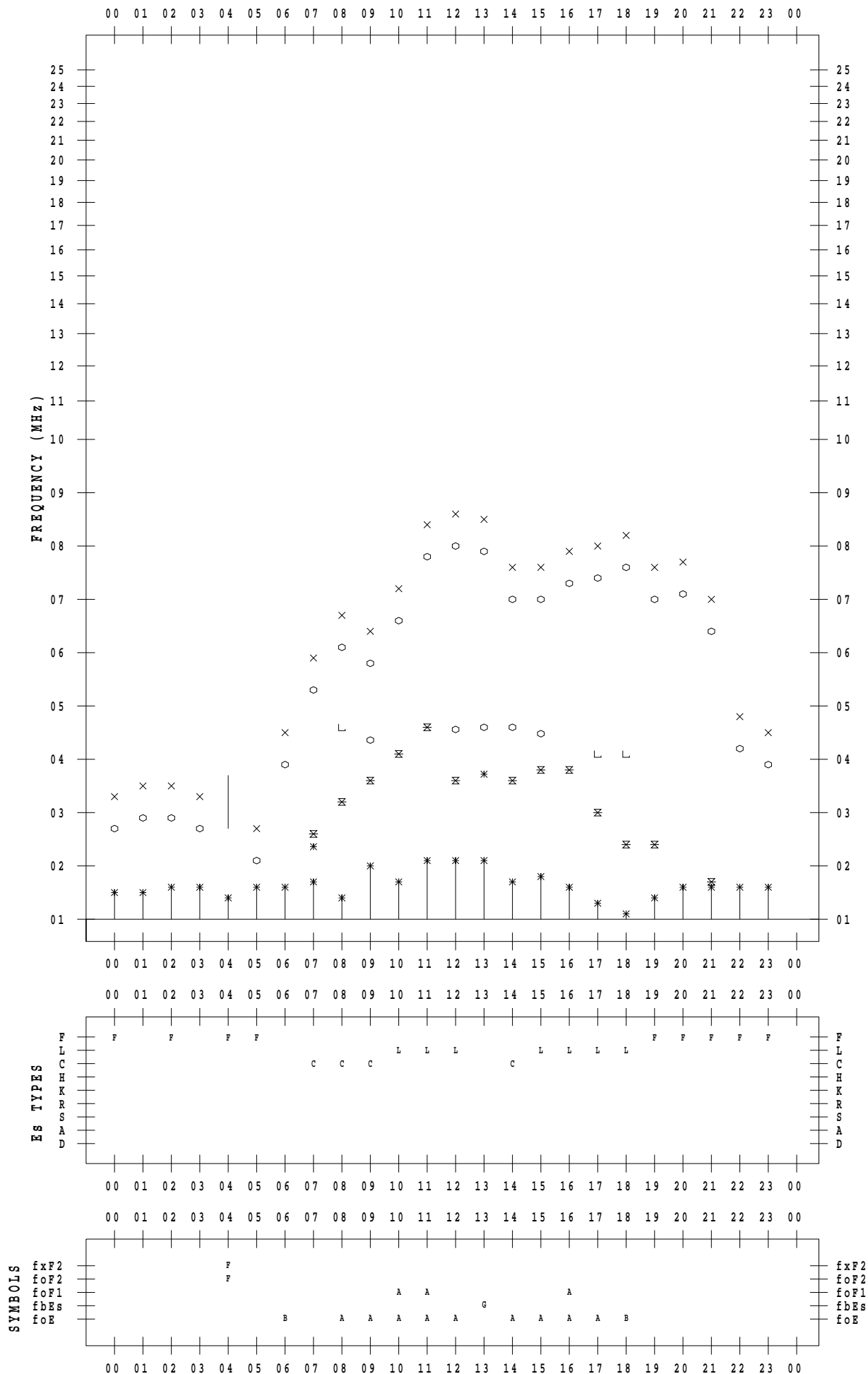
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 16

135 ° E MEAN TIME



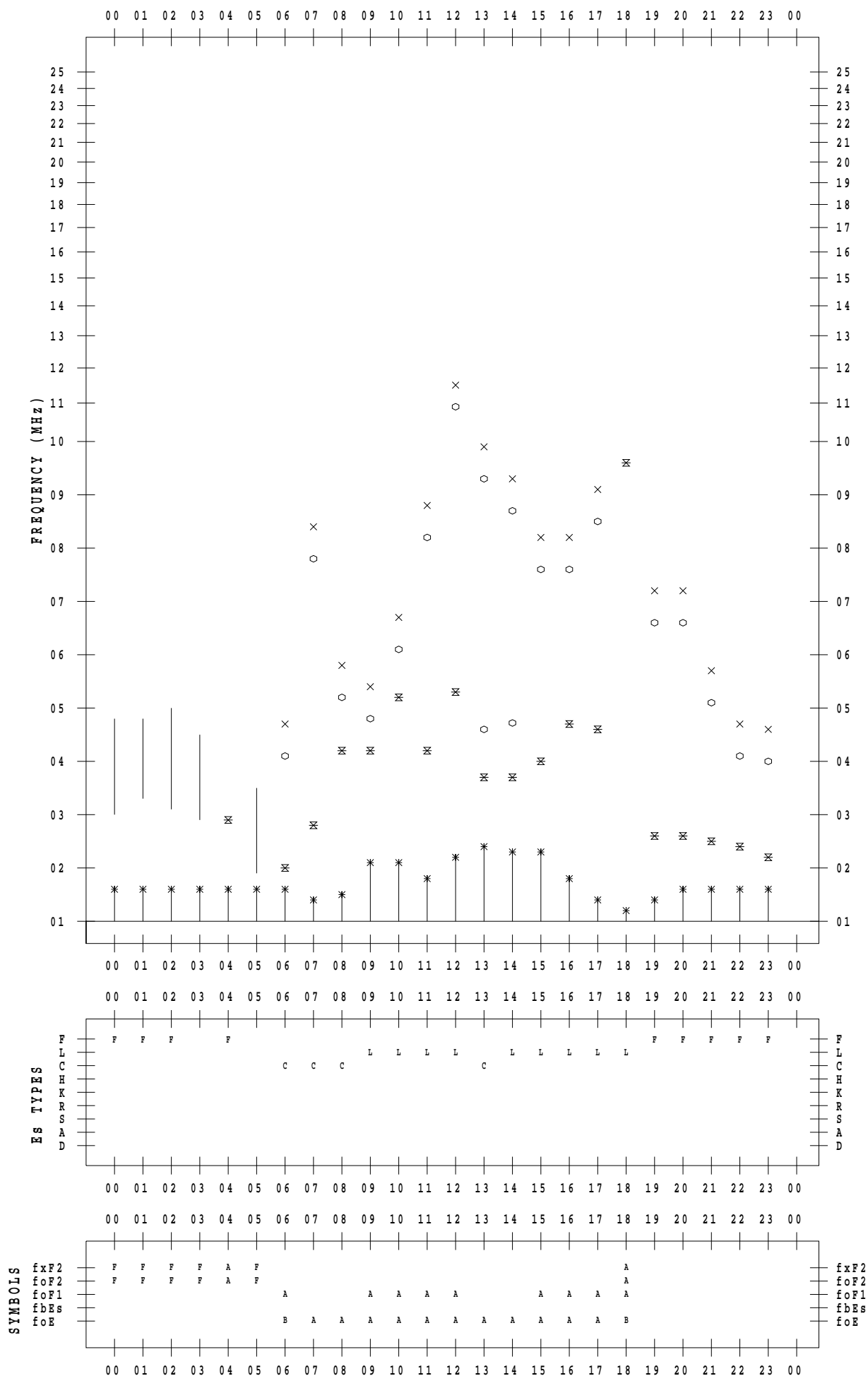
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 17

135 ° E MEAN TIME



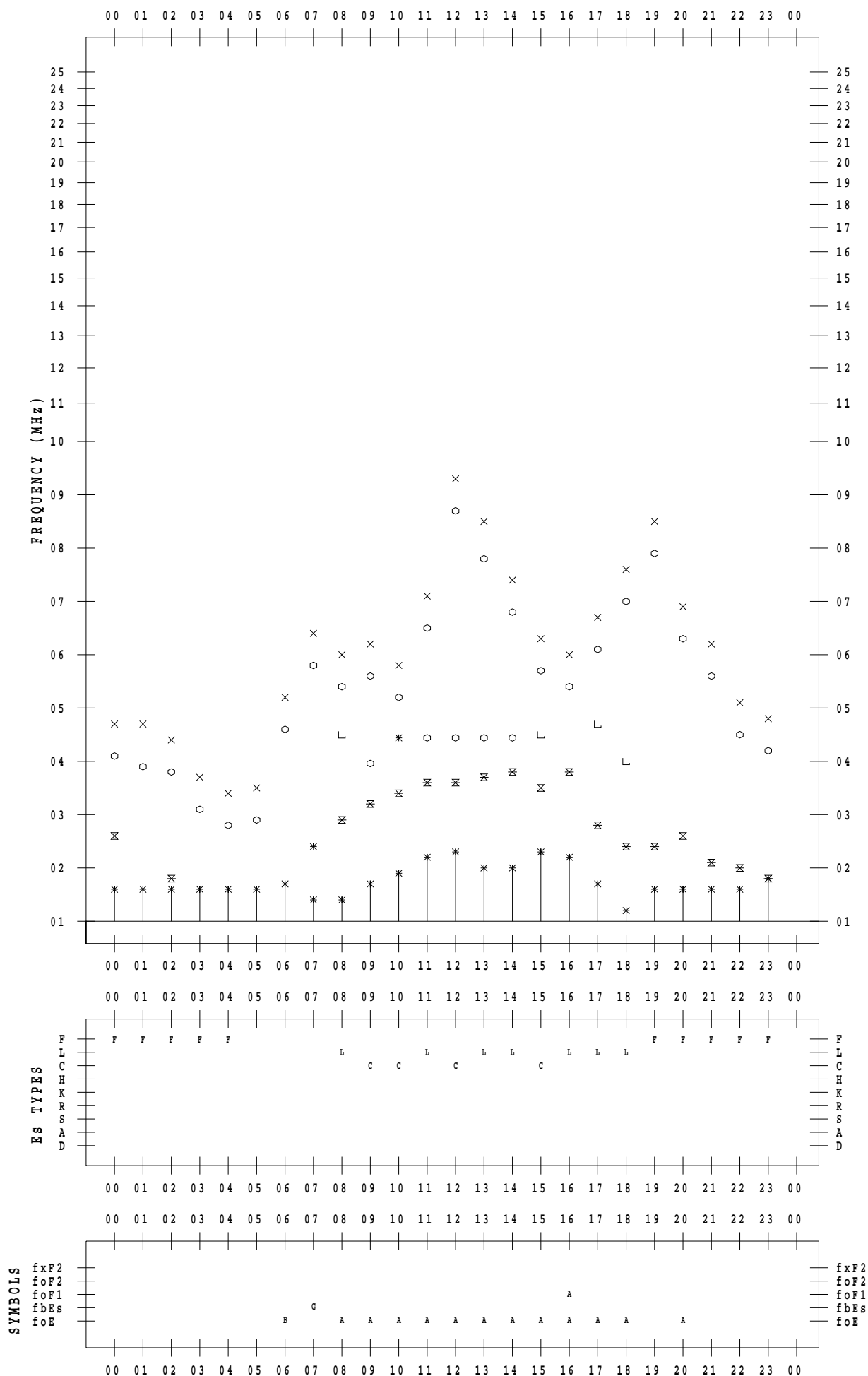
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 18

135 ° E MEAN TIME



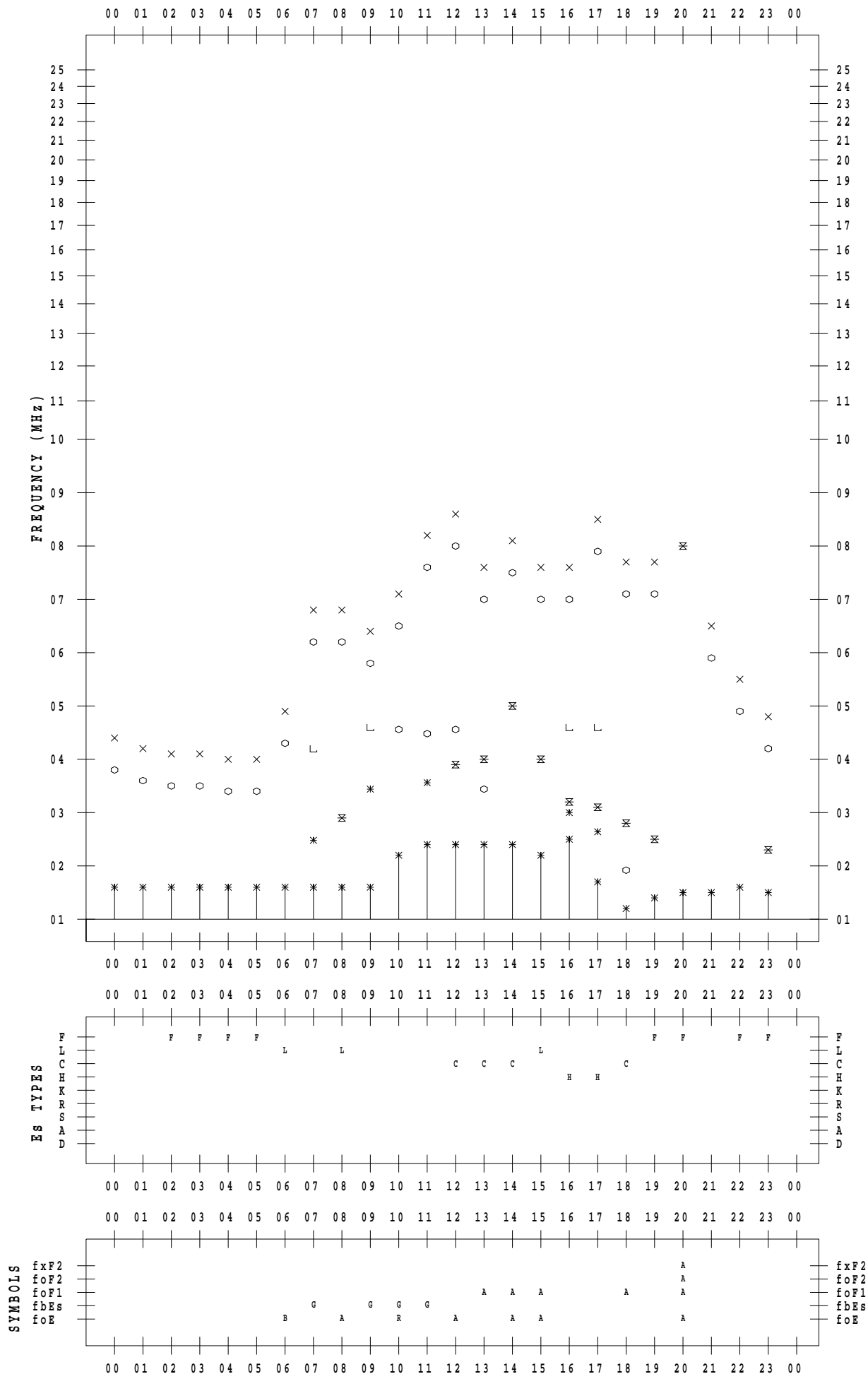
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 19

135 ° E MEAN TIME



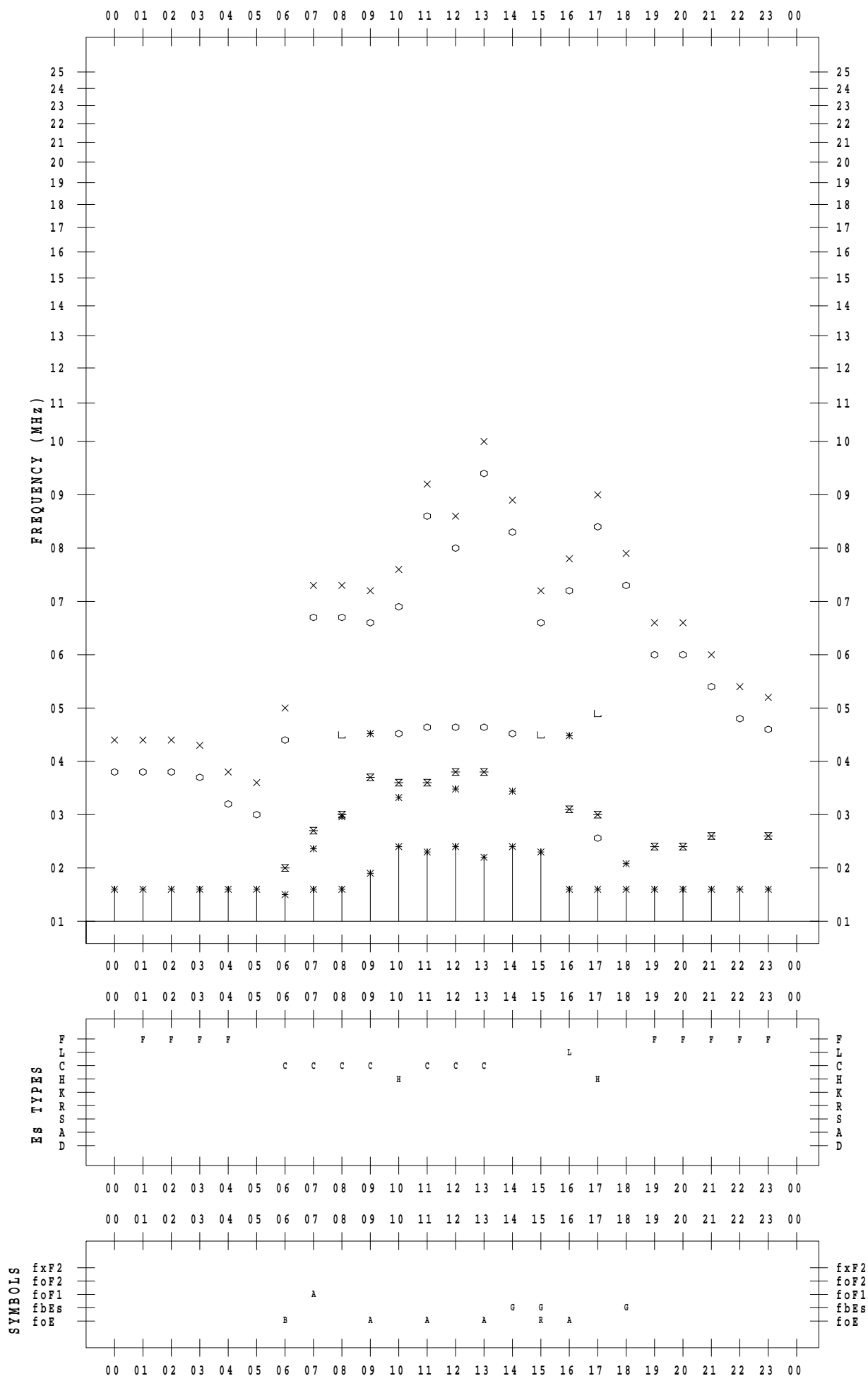
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 20

135 ° E MEAN TIME



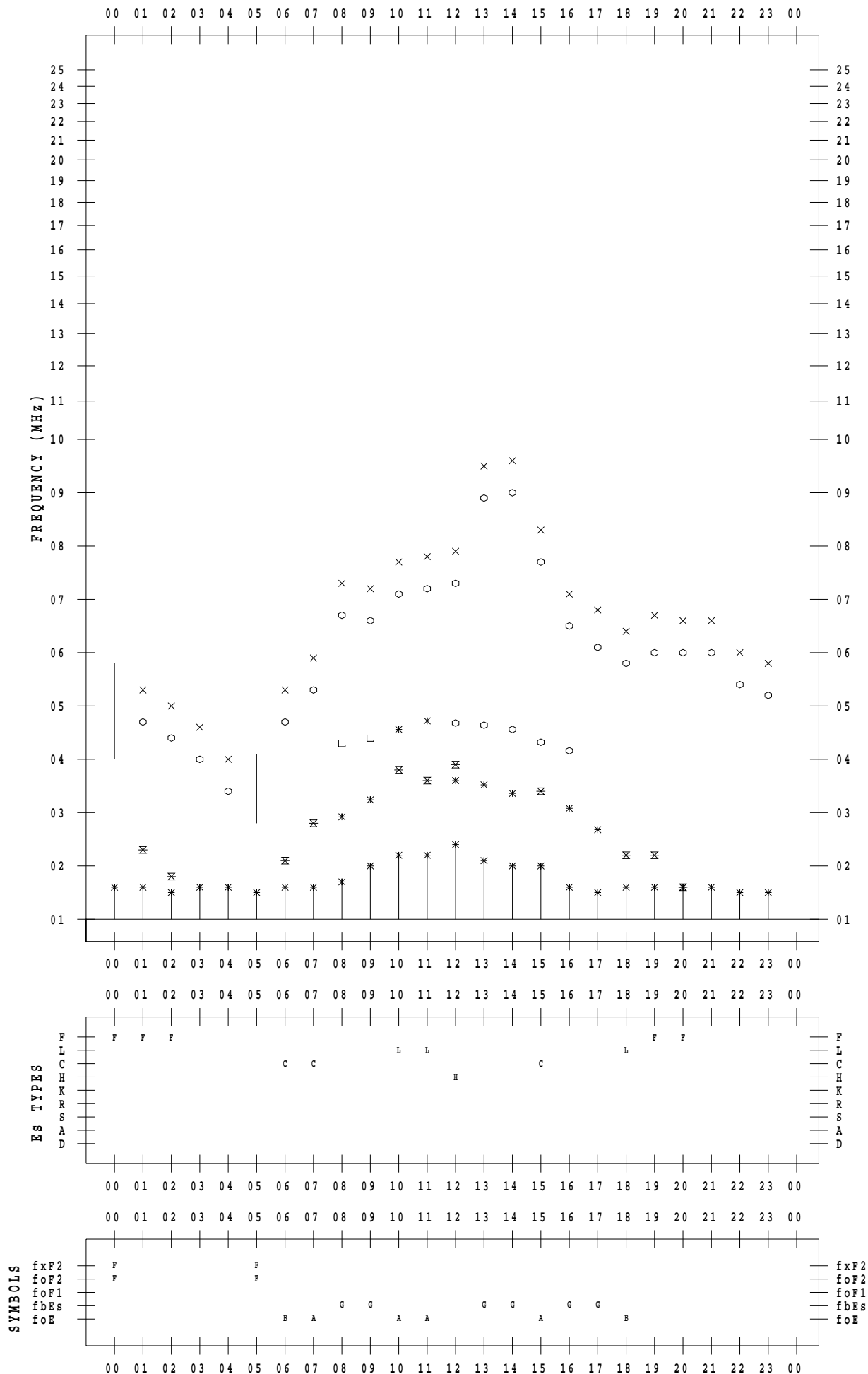
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 21

135 ° E MEAN TIME



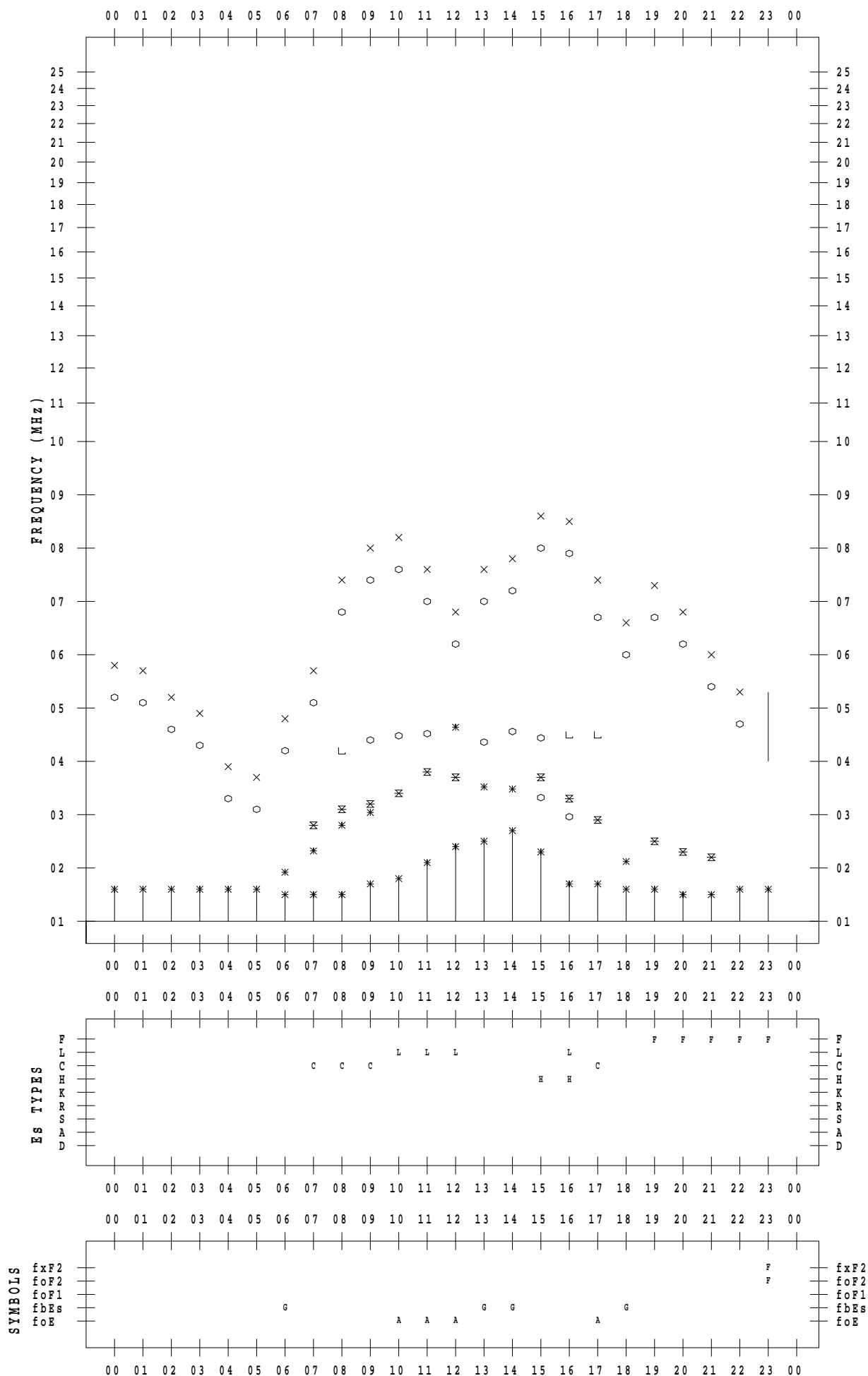
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 22

135 ° E MEAN TIME



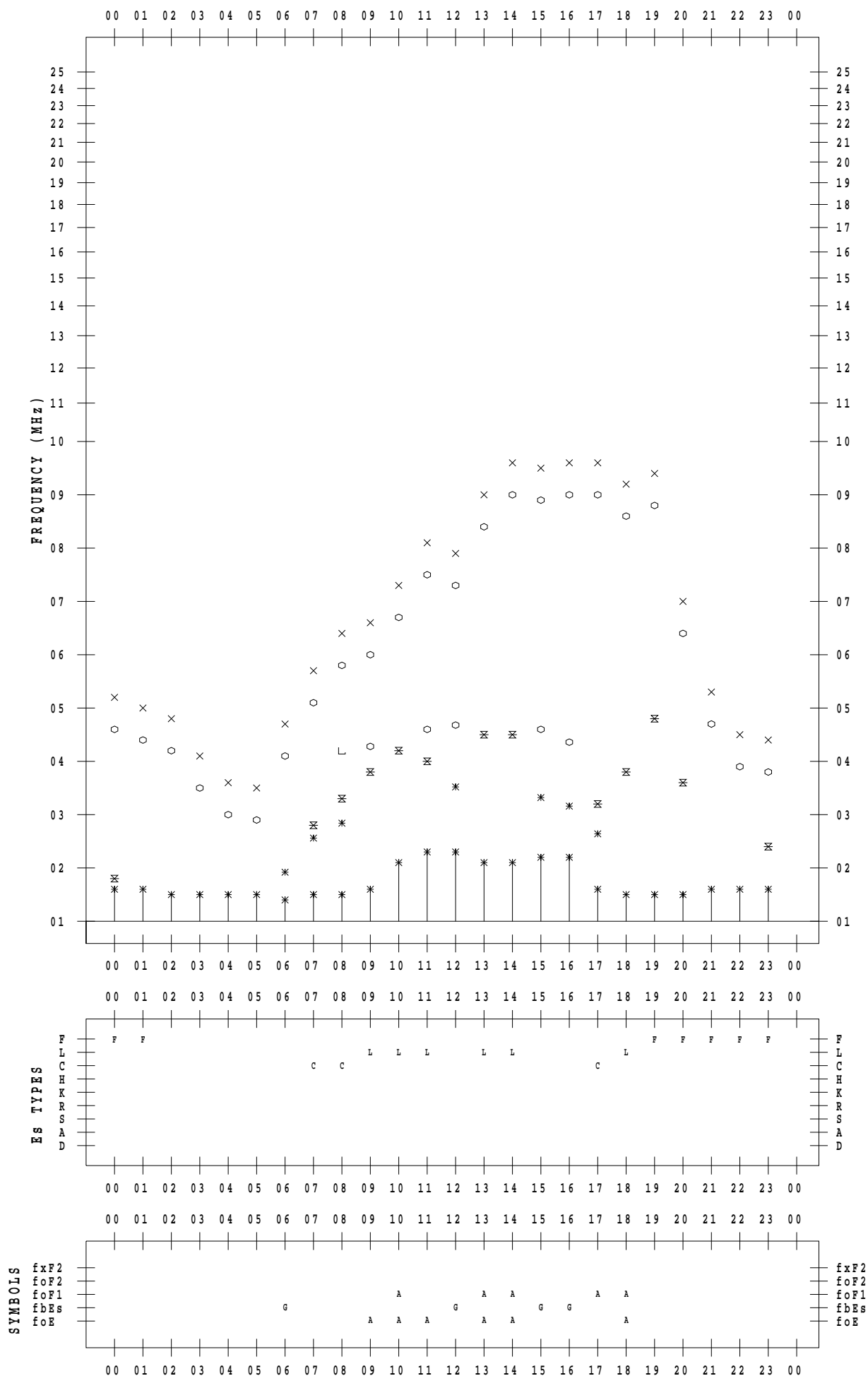
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 23

135 ° E MEAN TIME



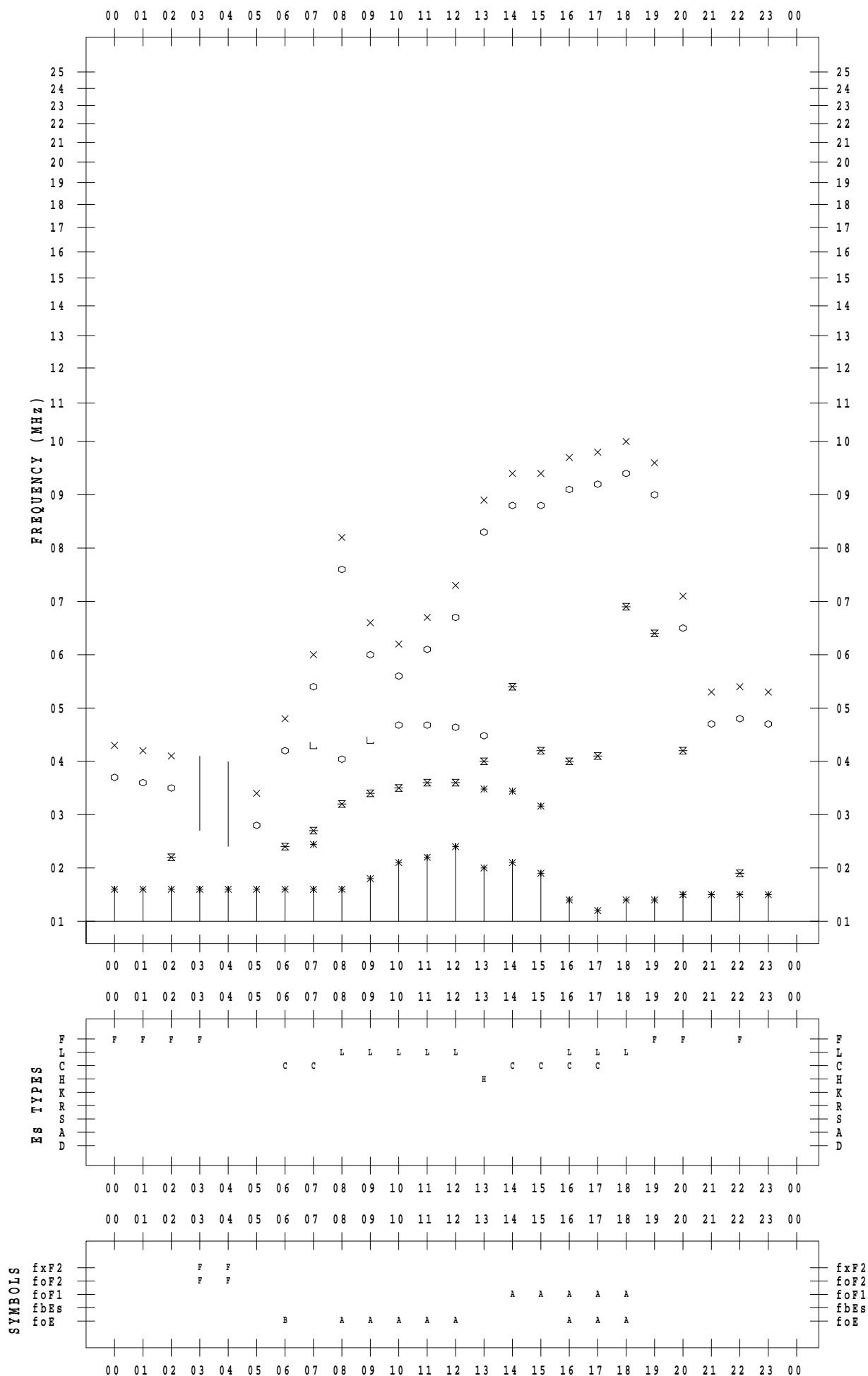
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 24

135 ° E MEAN TIME



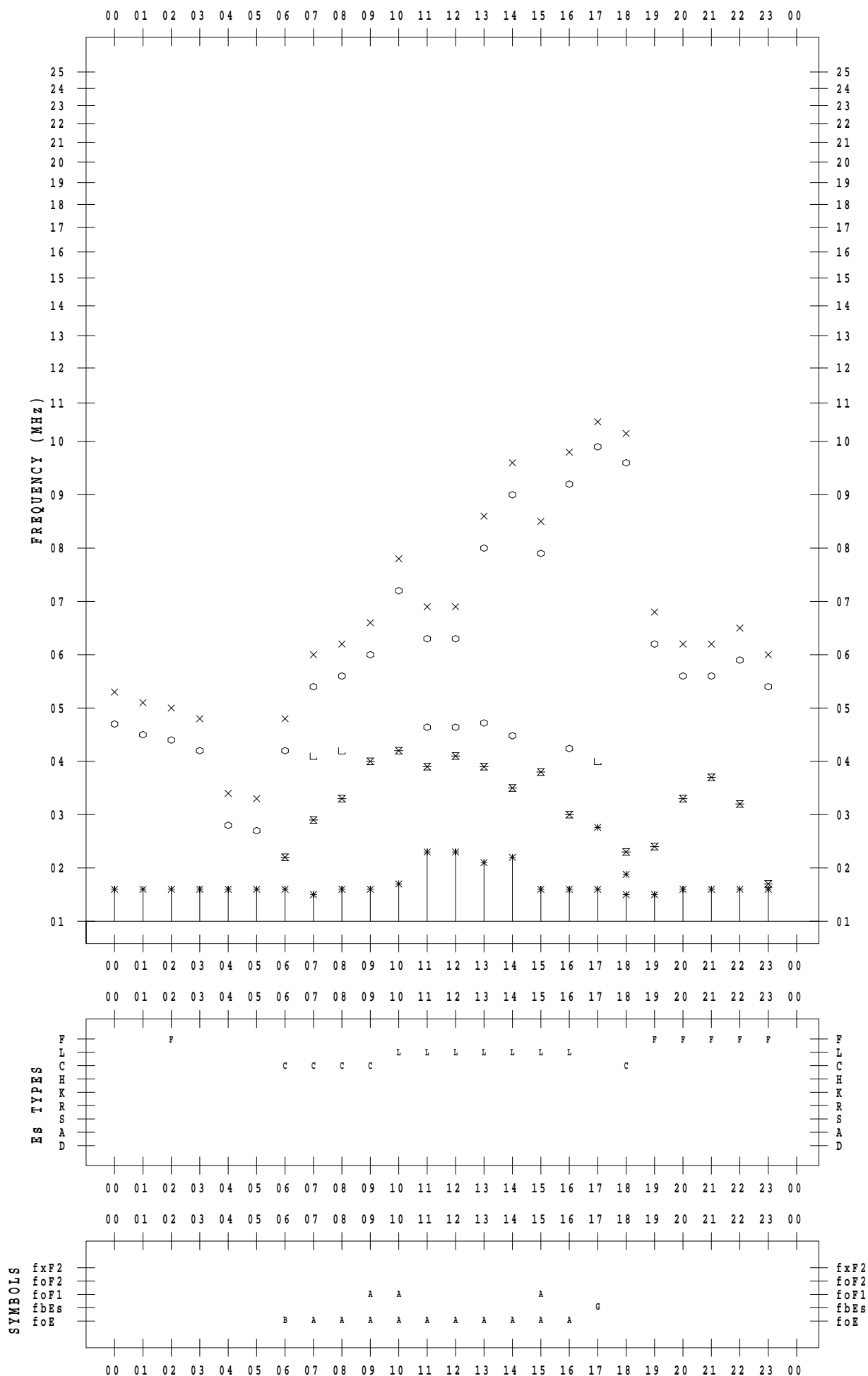
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 25

135 ° E MEAN TIME



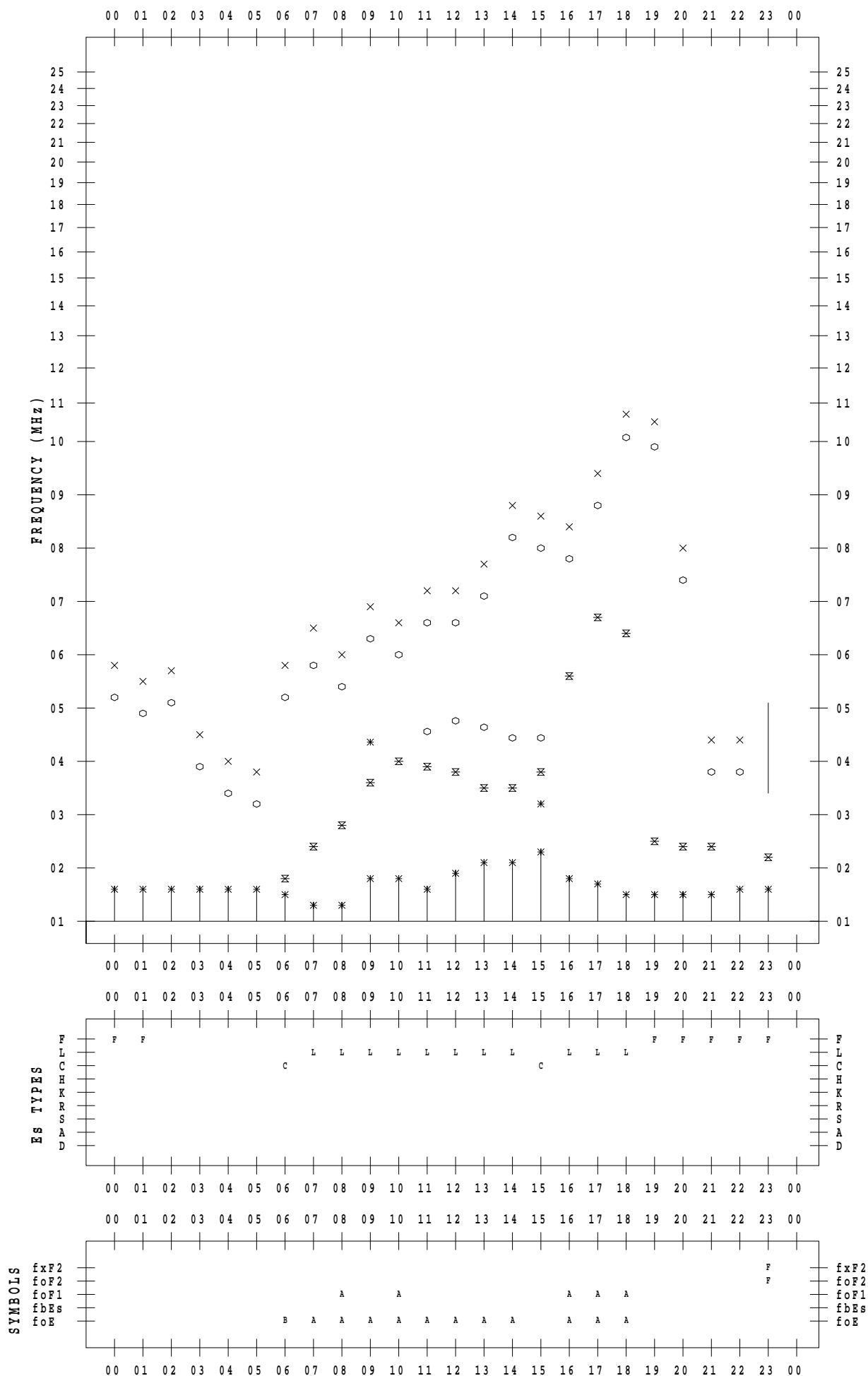
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 26

135 ° E MEAN TIME



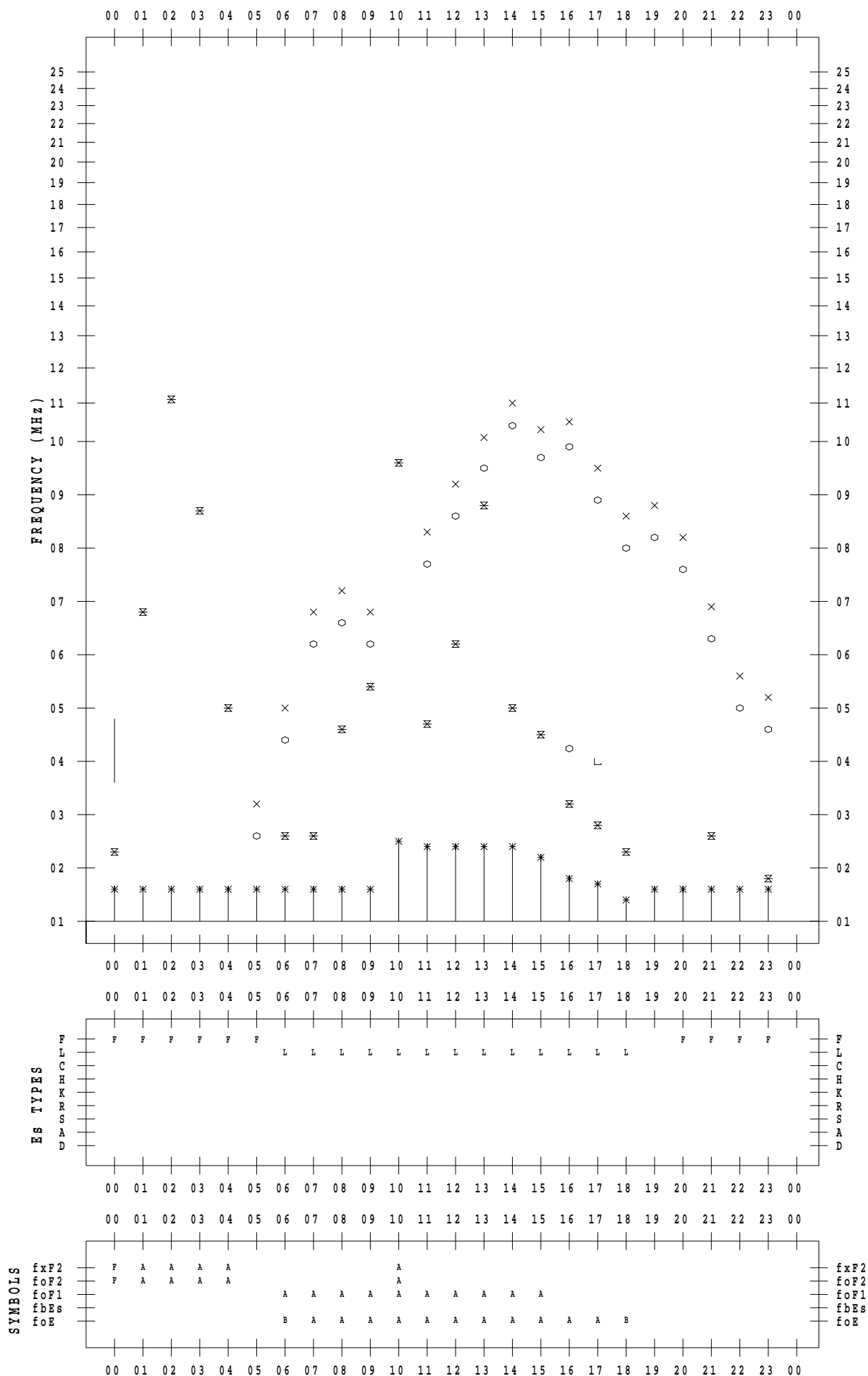
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 27

135 ° E MEAN TIME



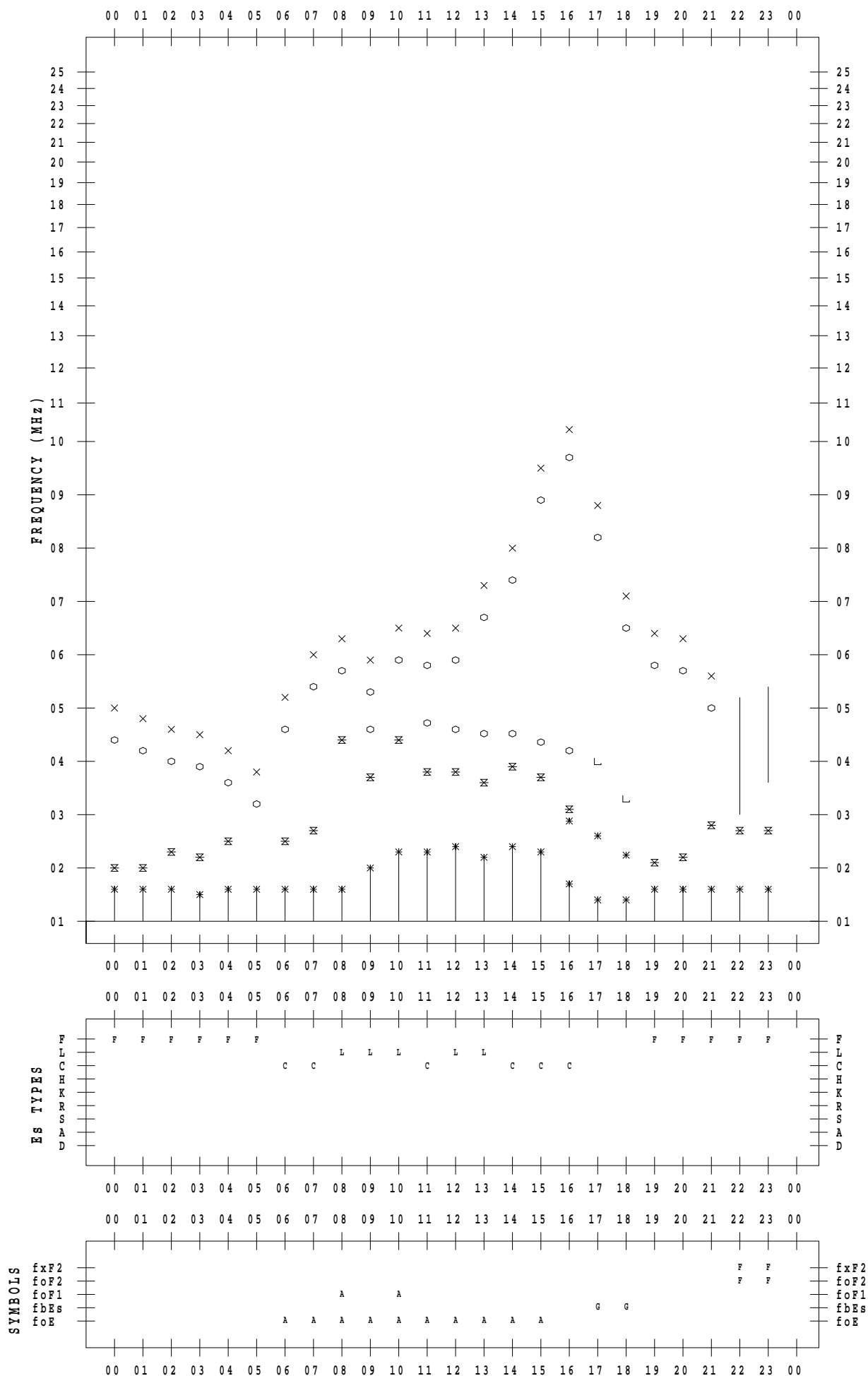
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 28

135 ° E MEAN TIME



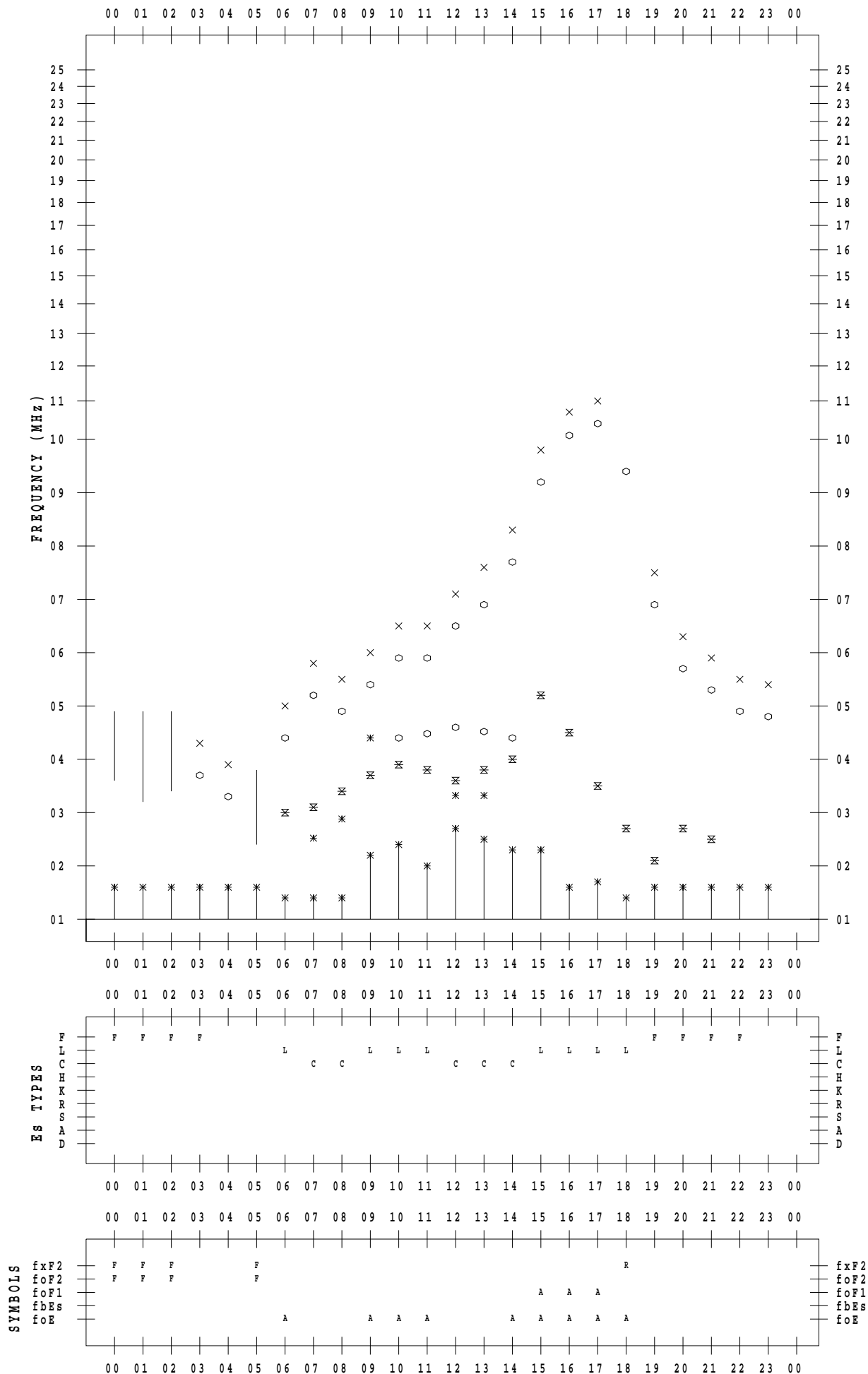
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 29

135 ° E MEAN TIME



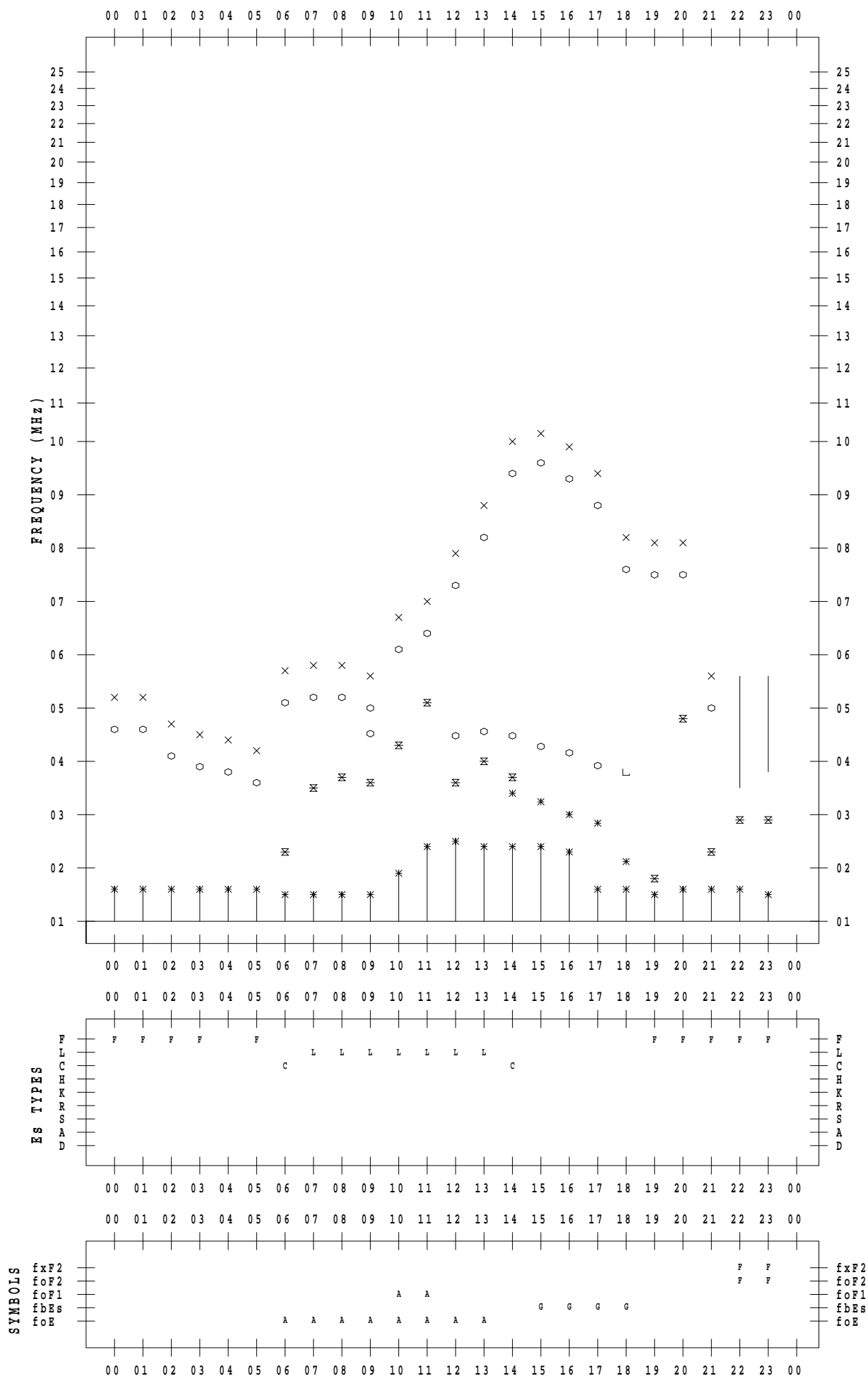
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021 / 4 / 30

135 ° E MEAN TIME



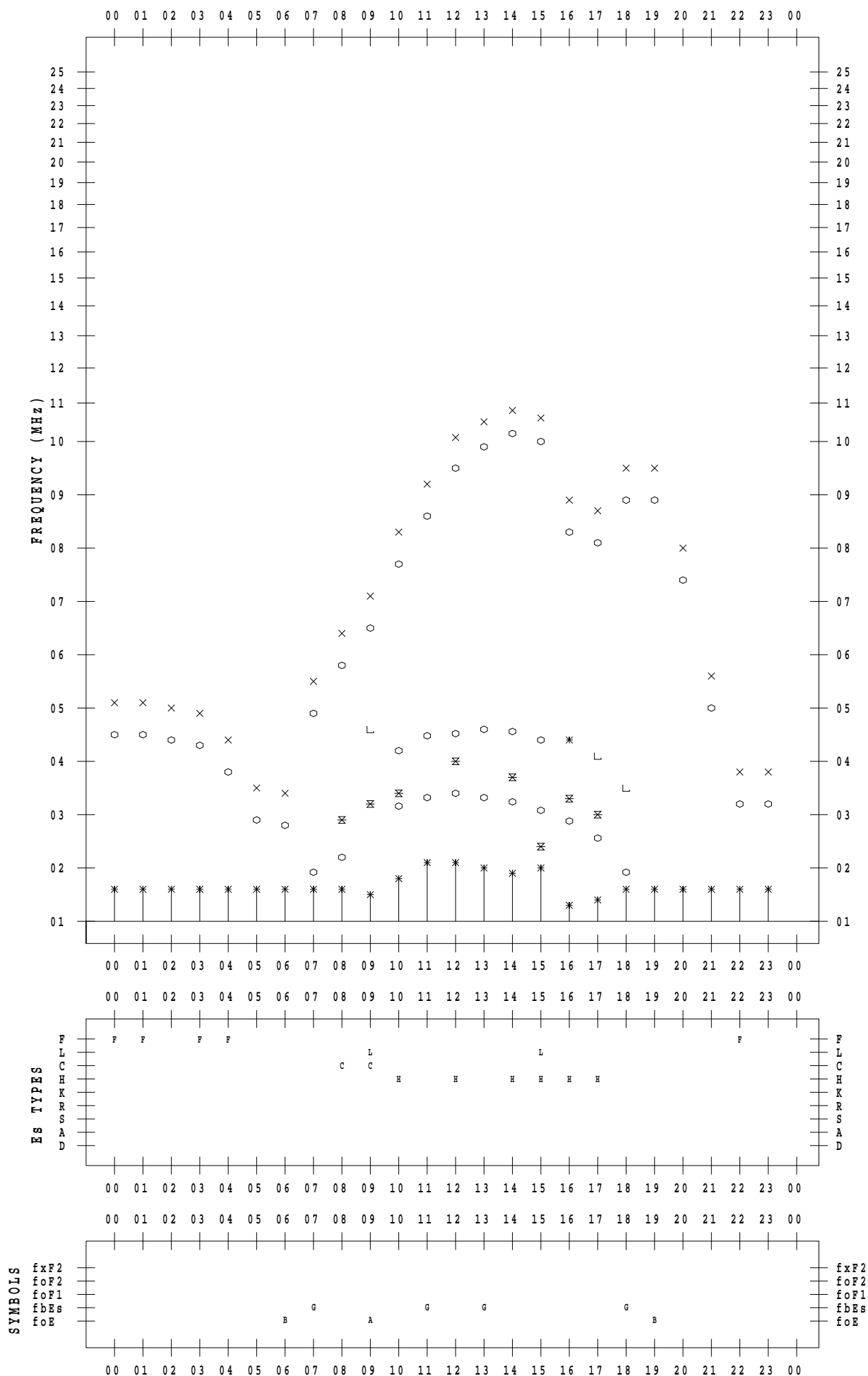
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 1

135 ° E MEAN TIME



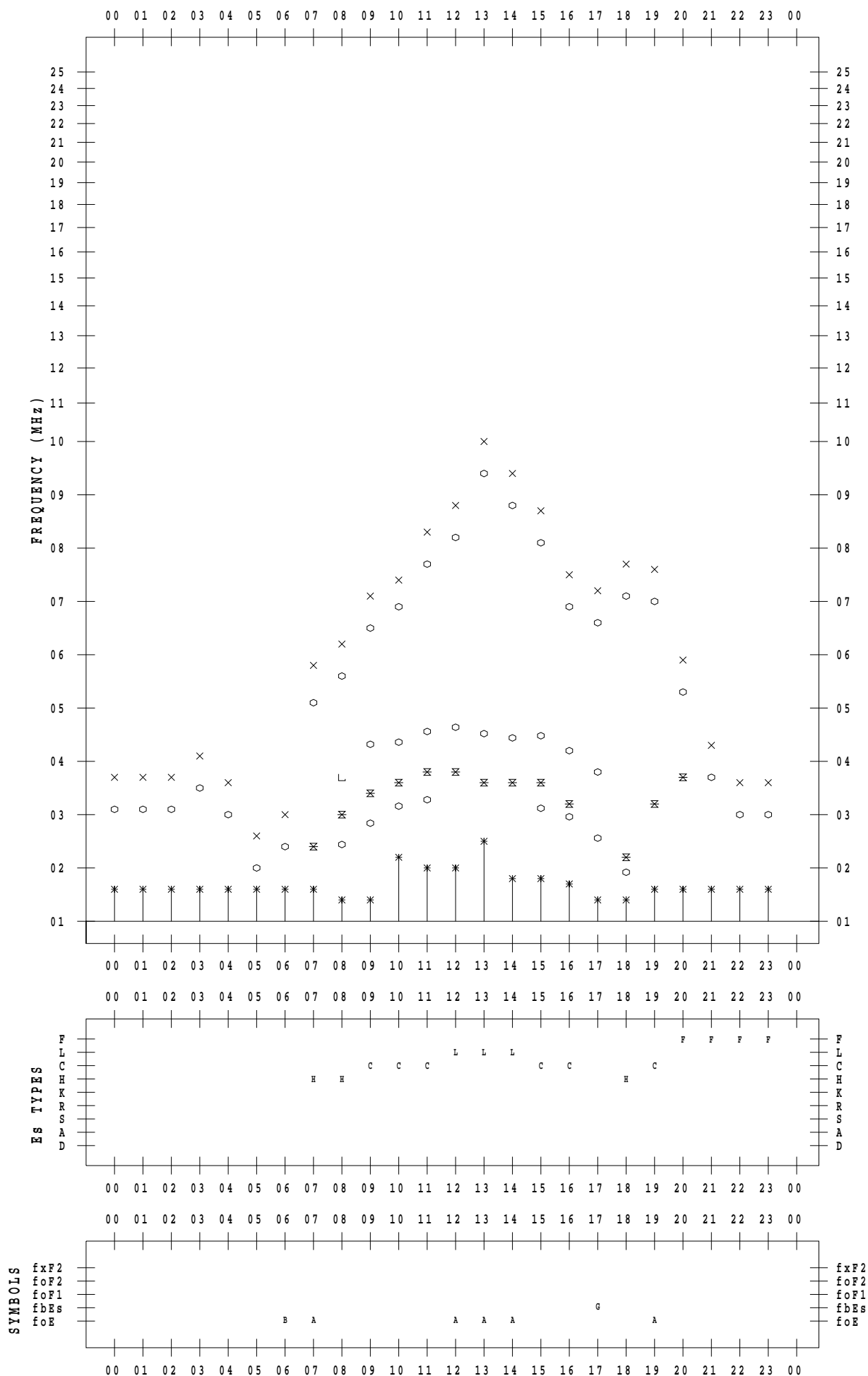
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 2

135 ° E MEAN TIME



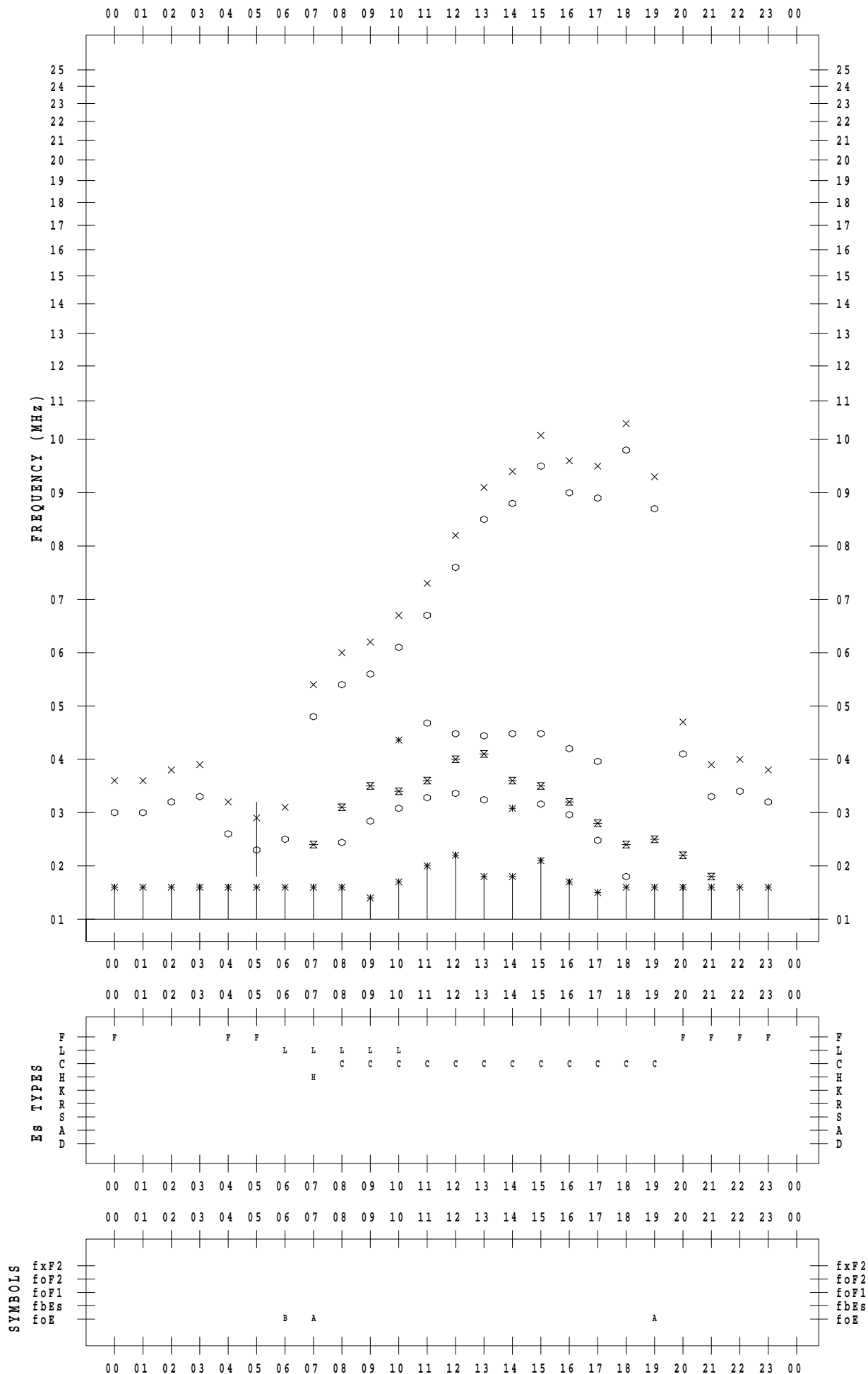
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 3

135 ° E MEAN TIME



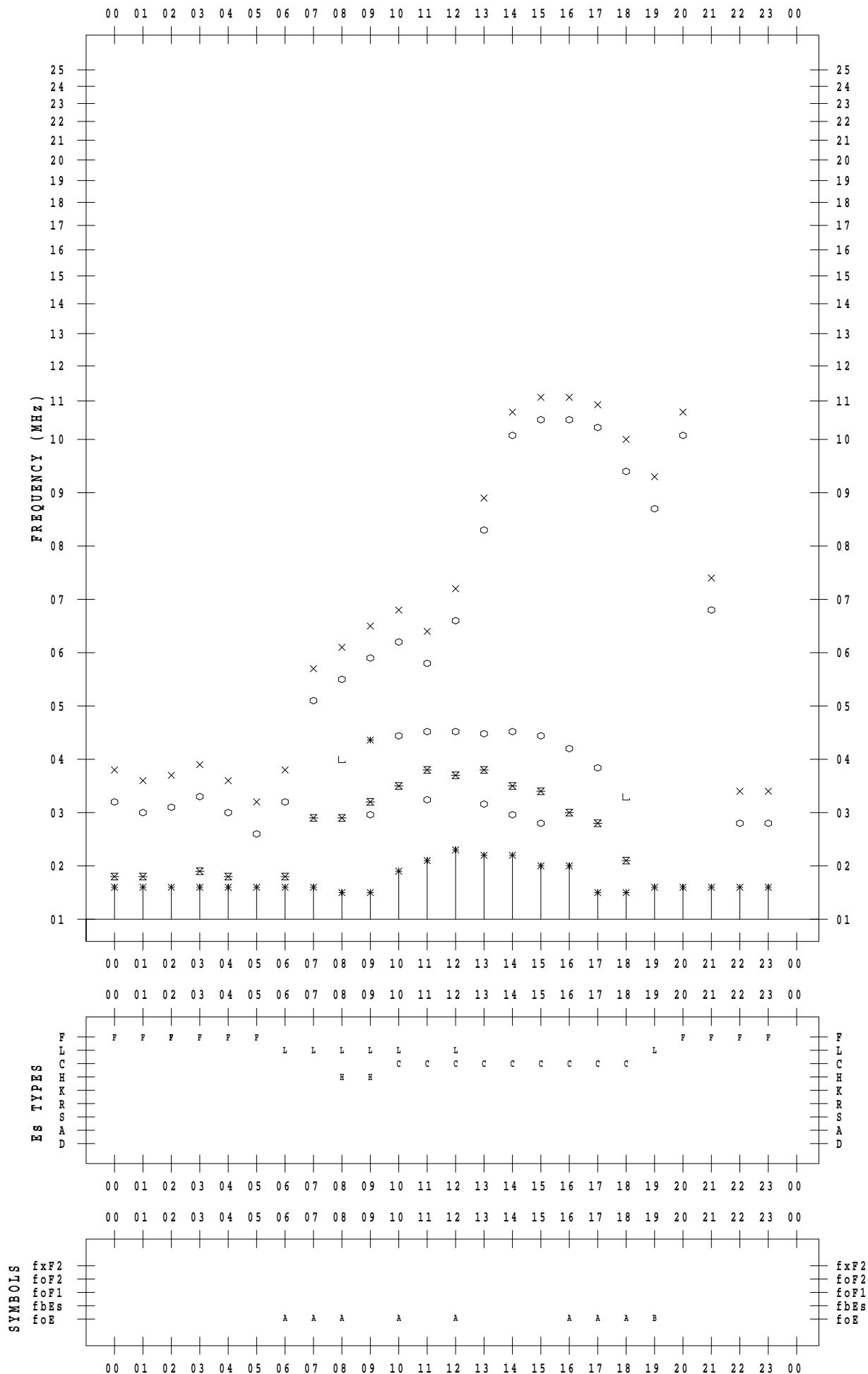
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 4

135 ° E MEAN TIME



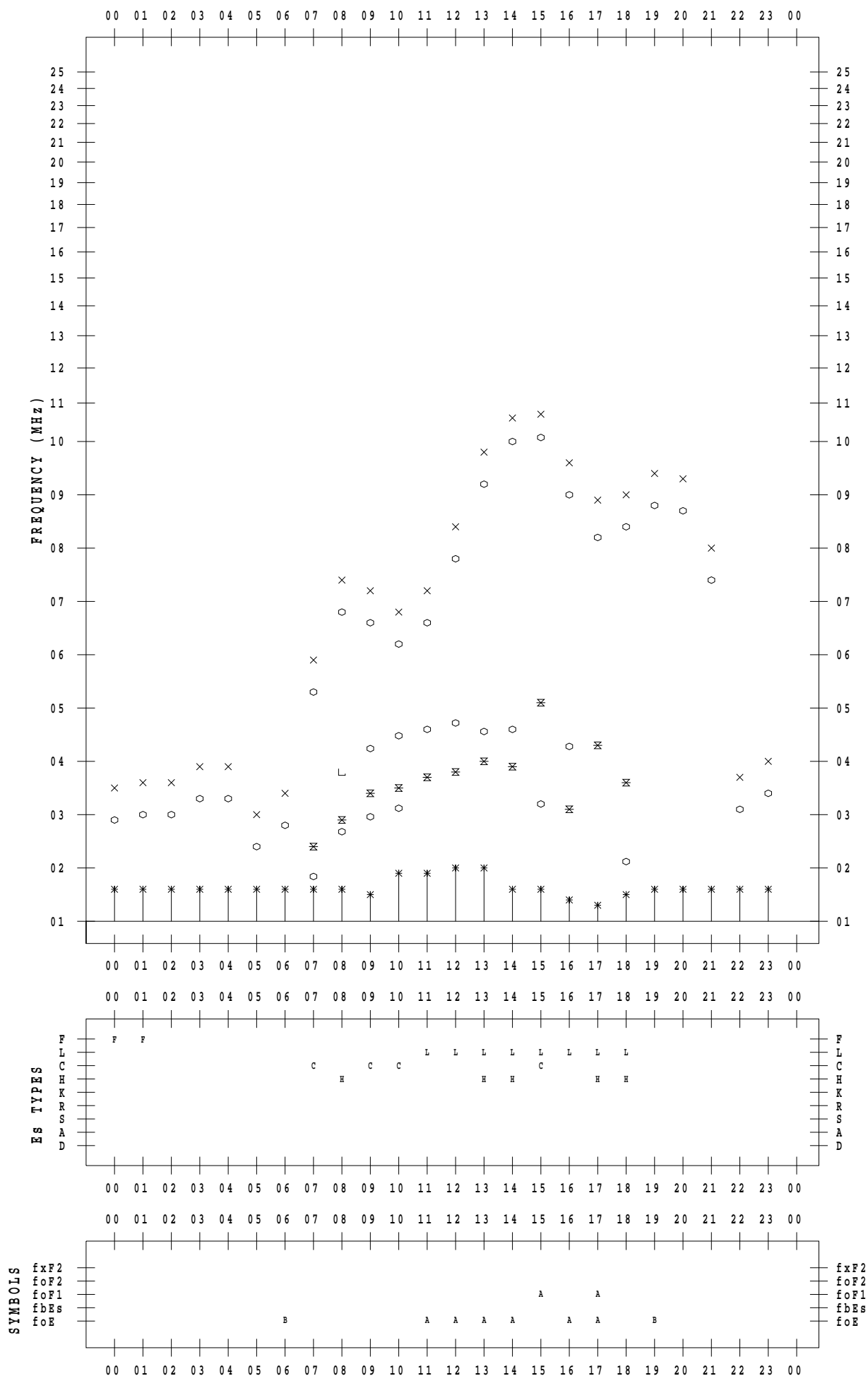
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 5

135 ° E MEAN TIME



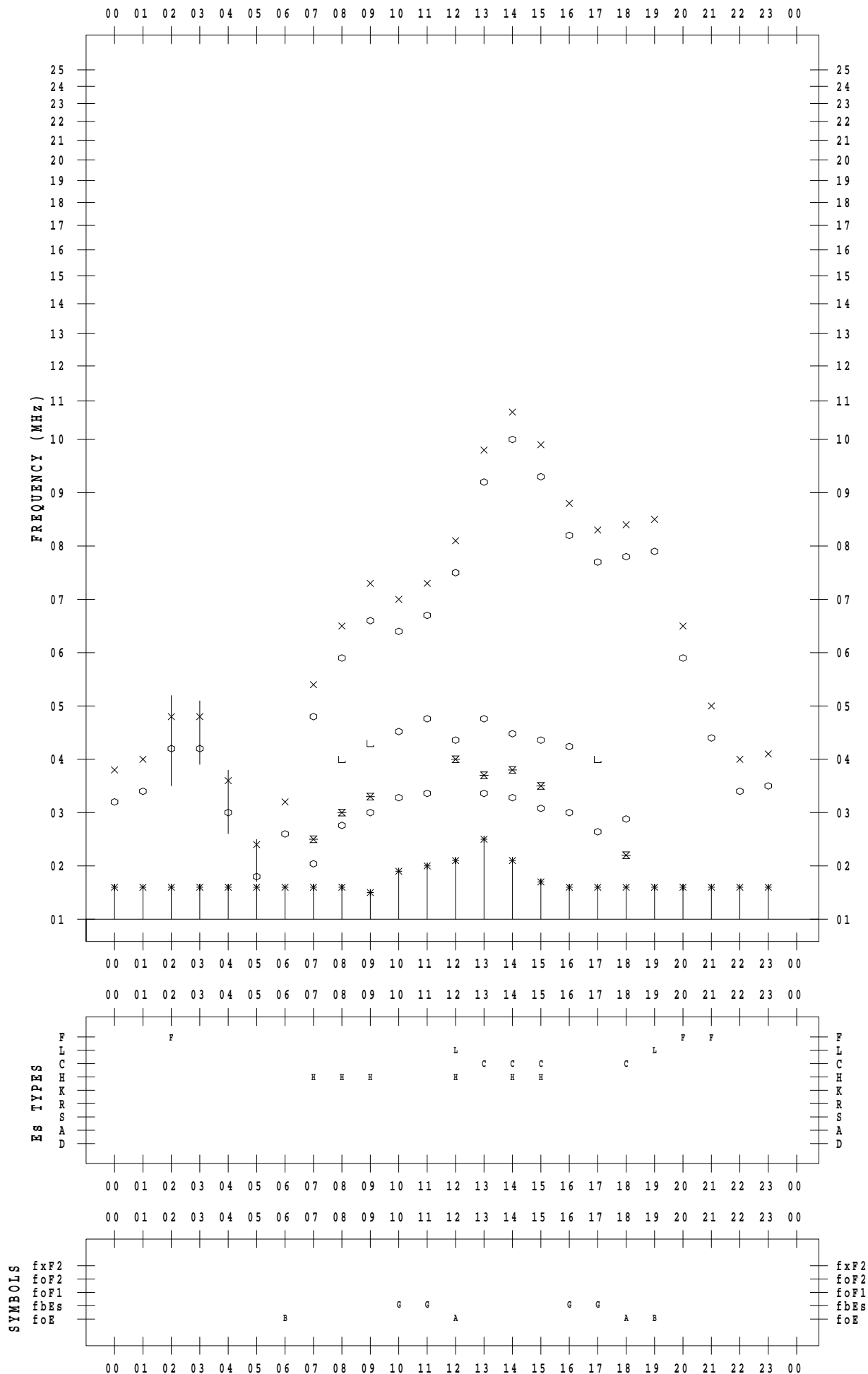
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 6

135 ° E MEAN TIME



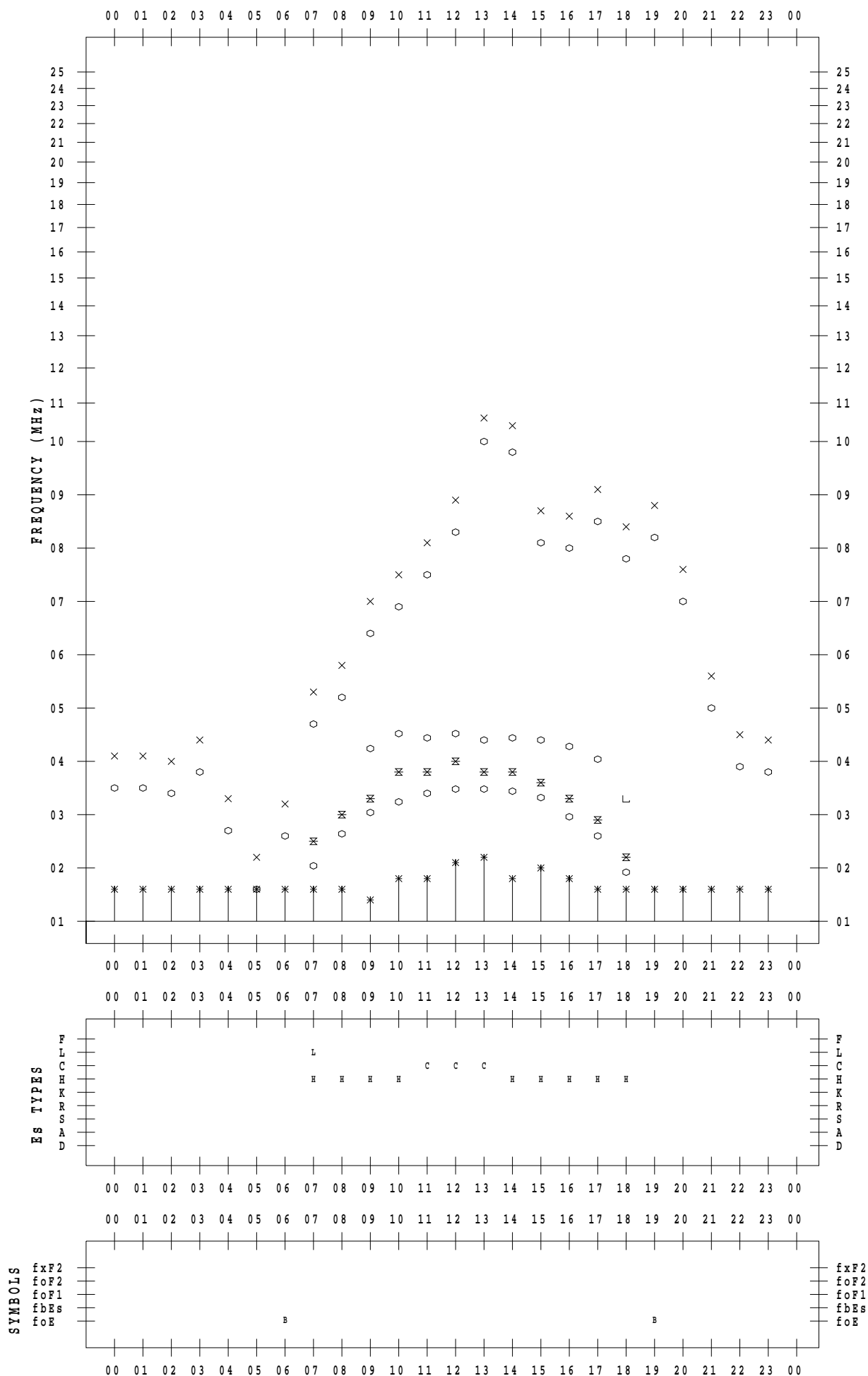
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 7

135 ° E MEAN TIME



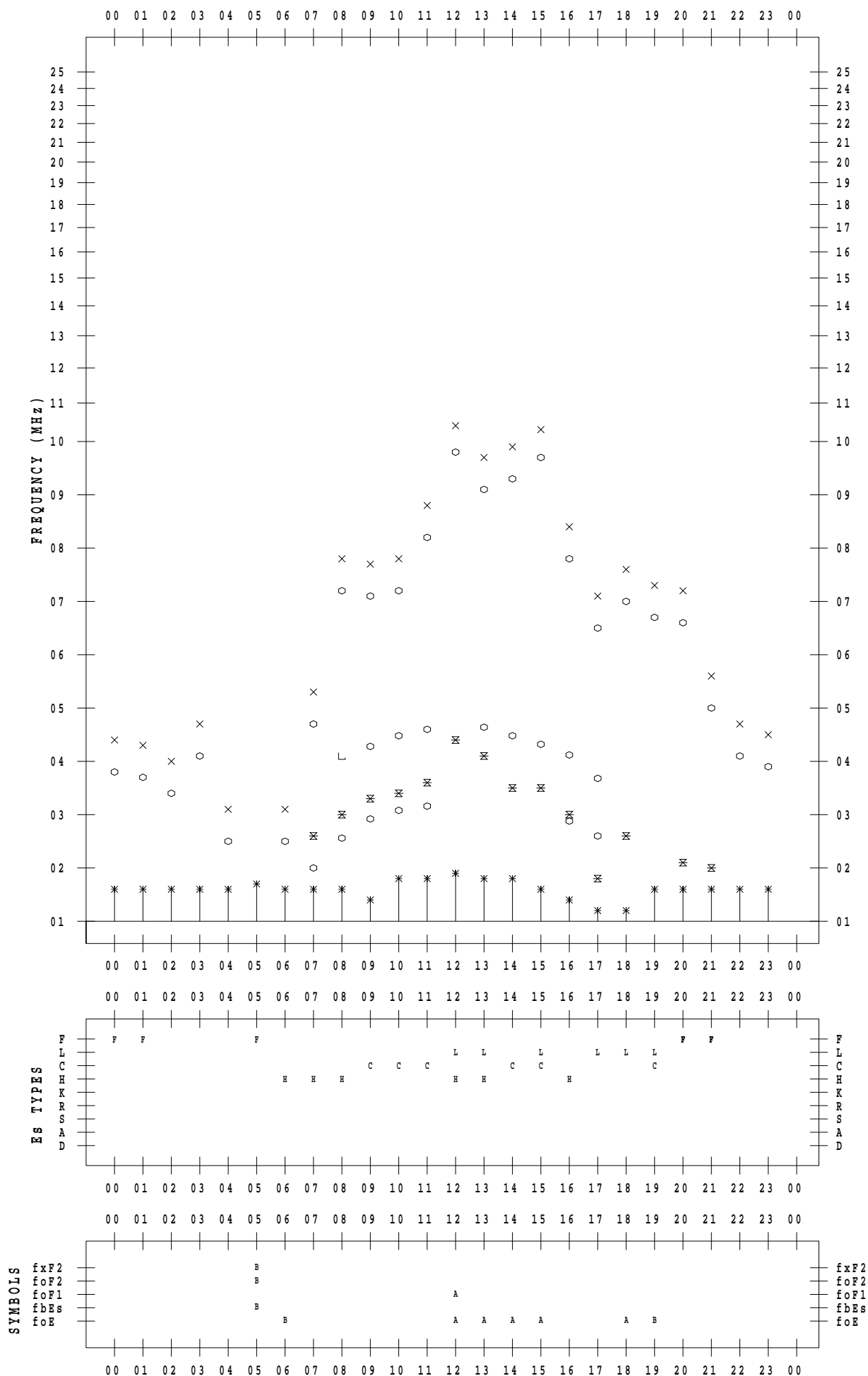
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 8

135 ° E MEAN TIME



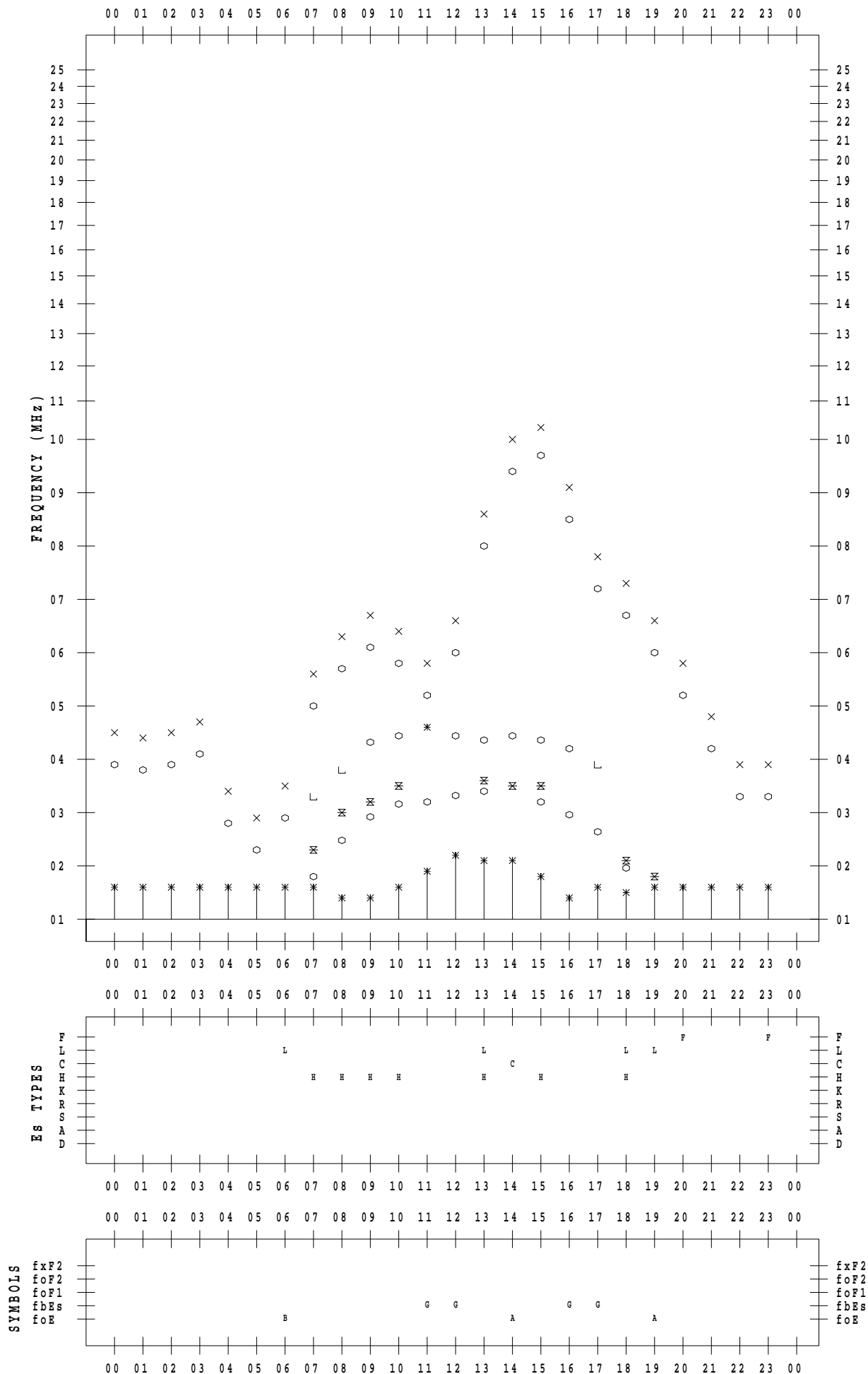
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 9

135 ° E MEAN TIME



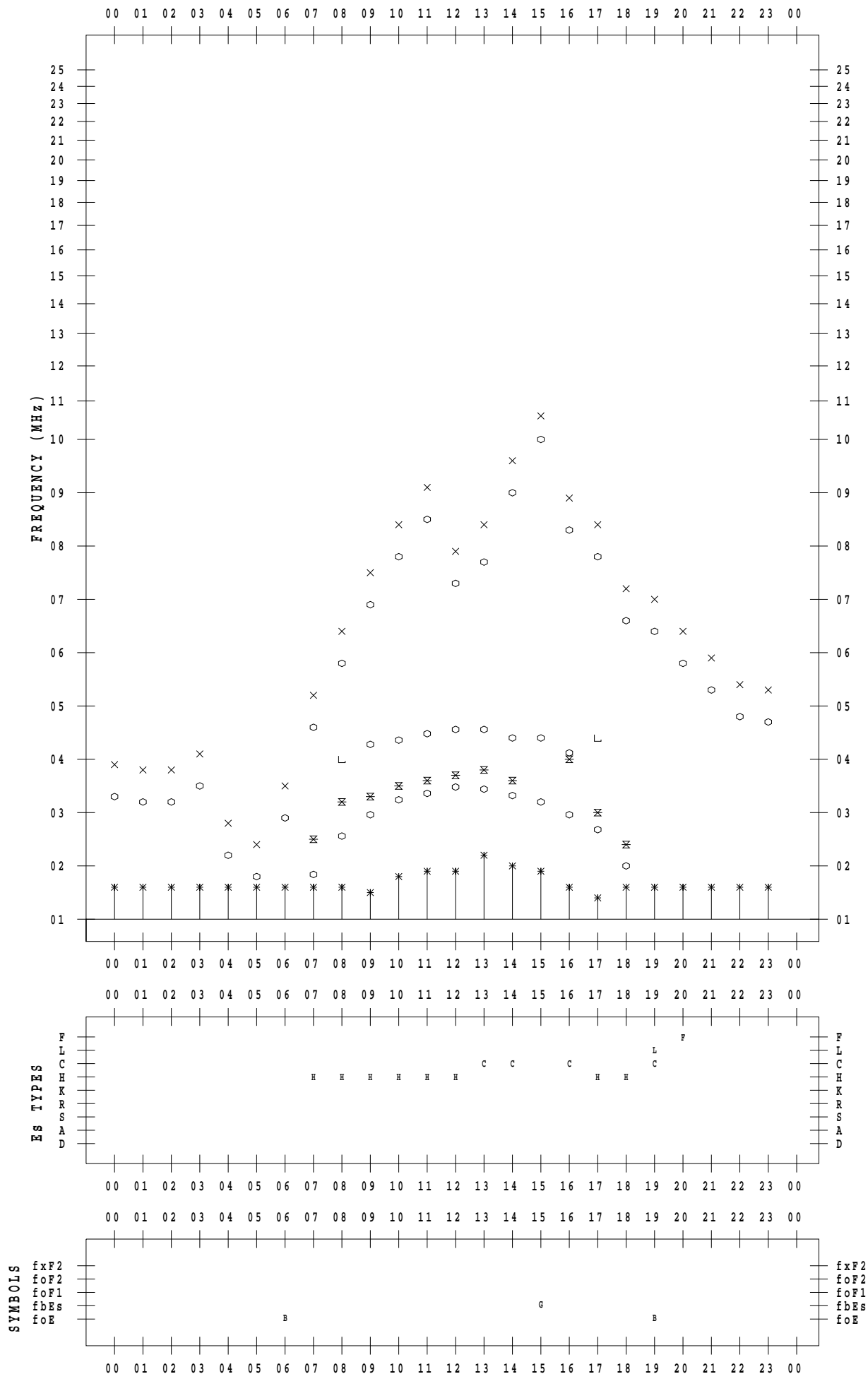
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/10

135 ° E MEAN TIME



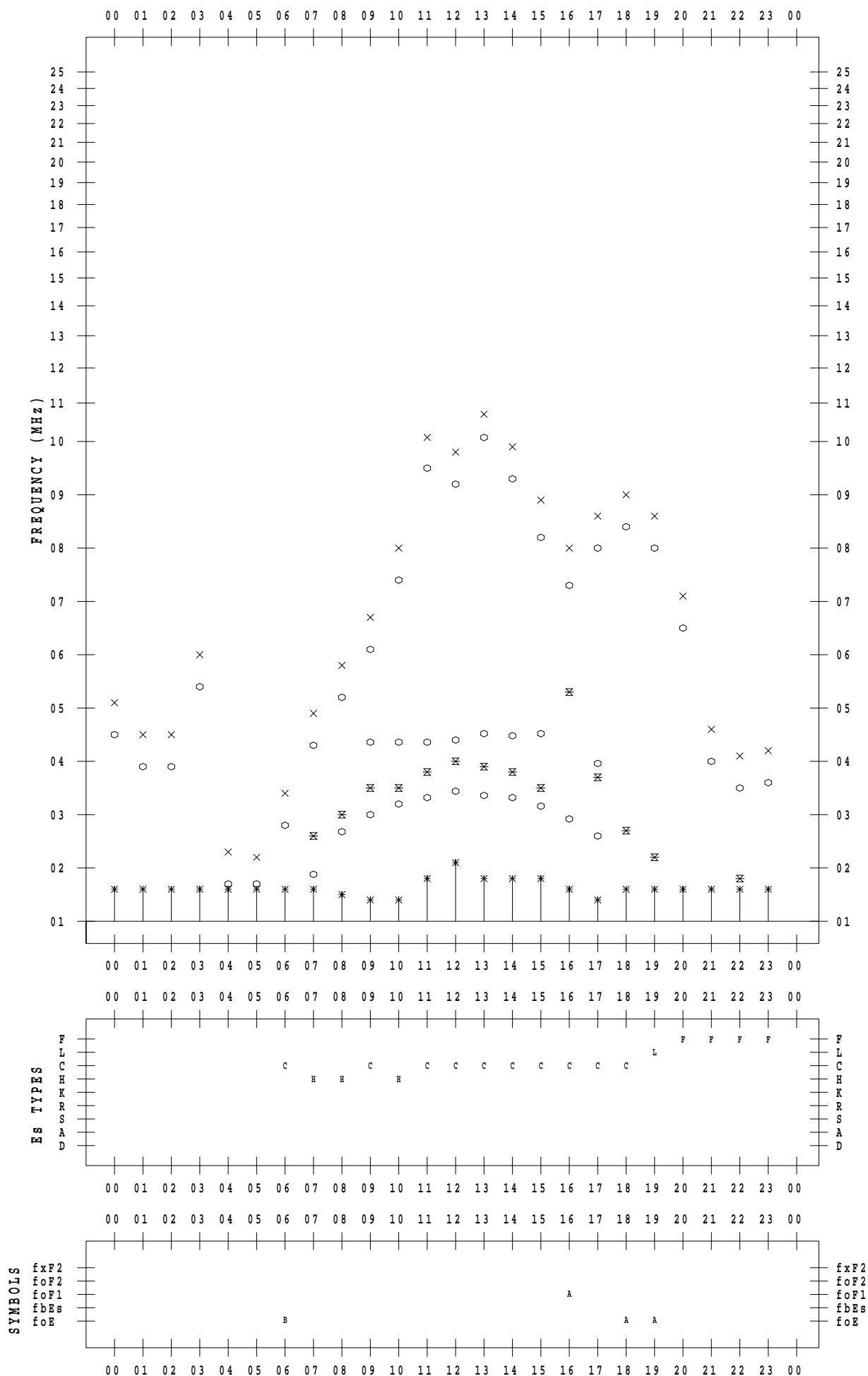
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 11

135 ° E MEAN TIME



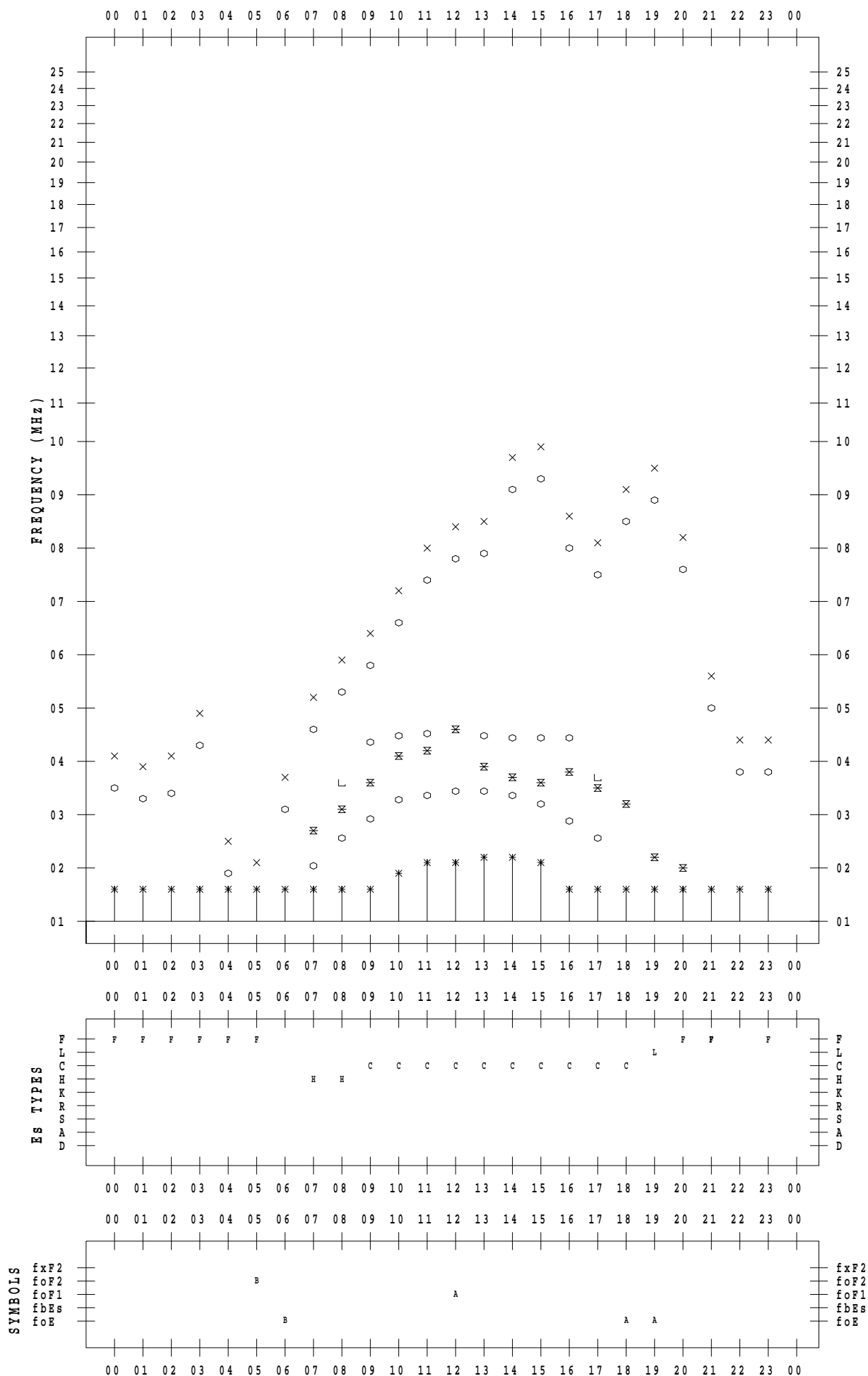
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/12

135 ° E MEAN TIME



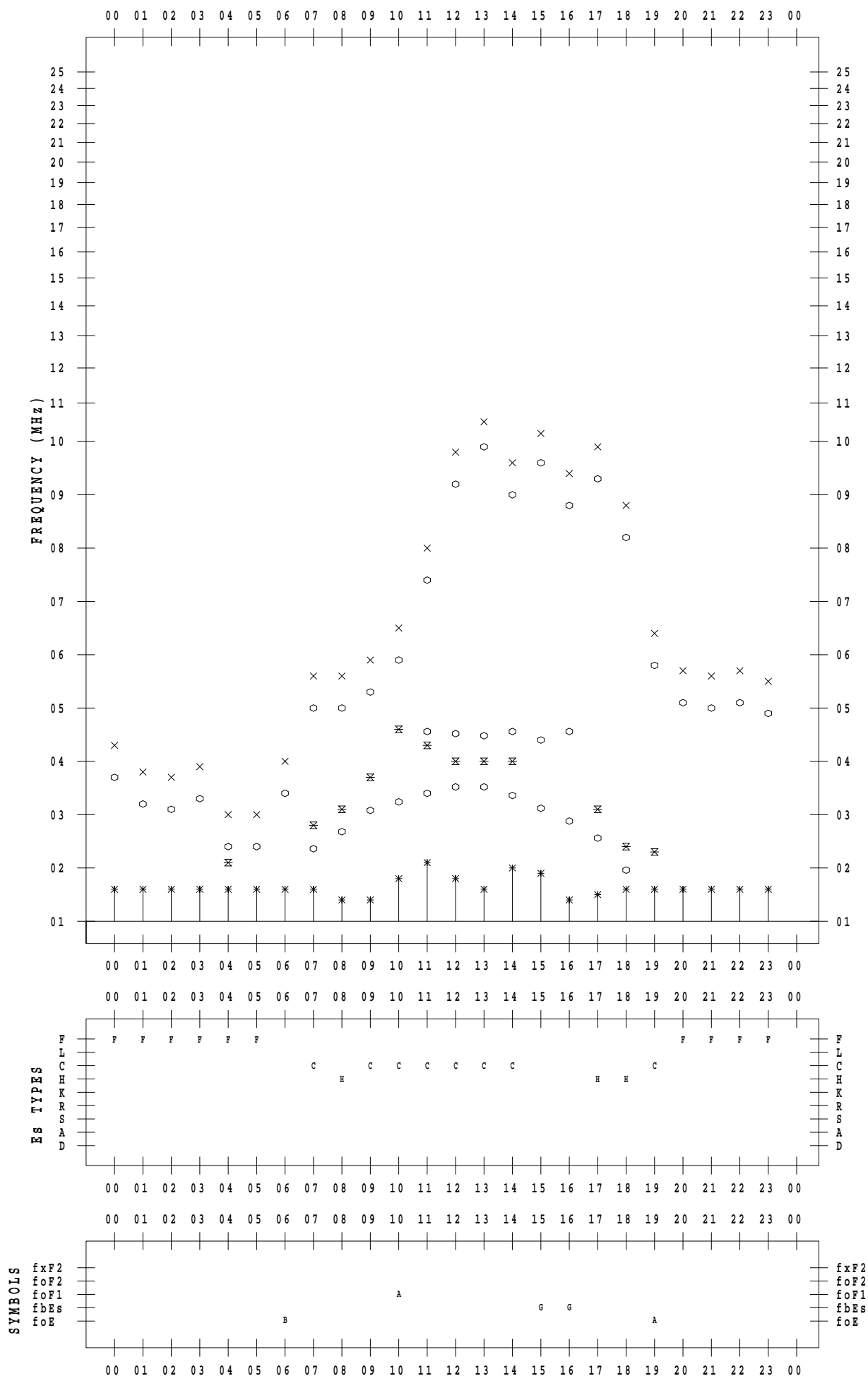
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 13

135 ° E MEAN TIME



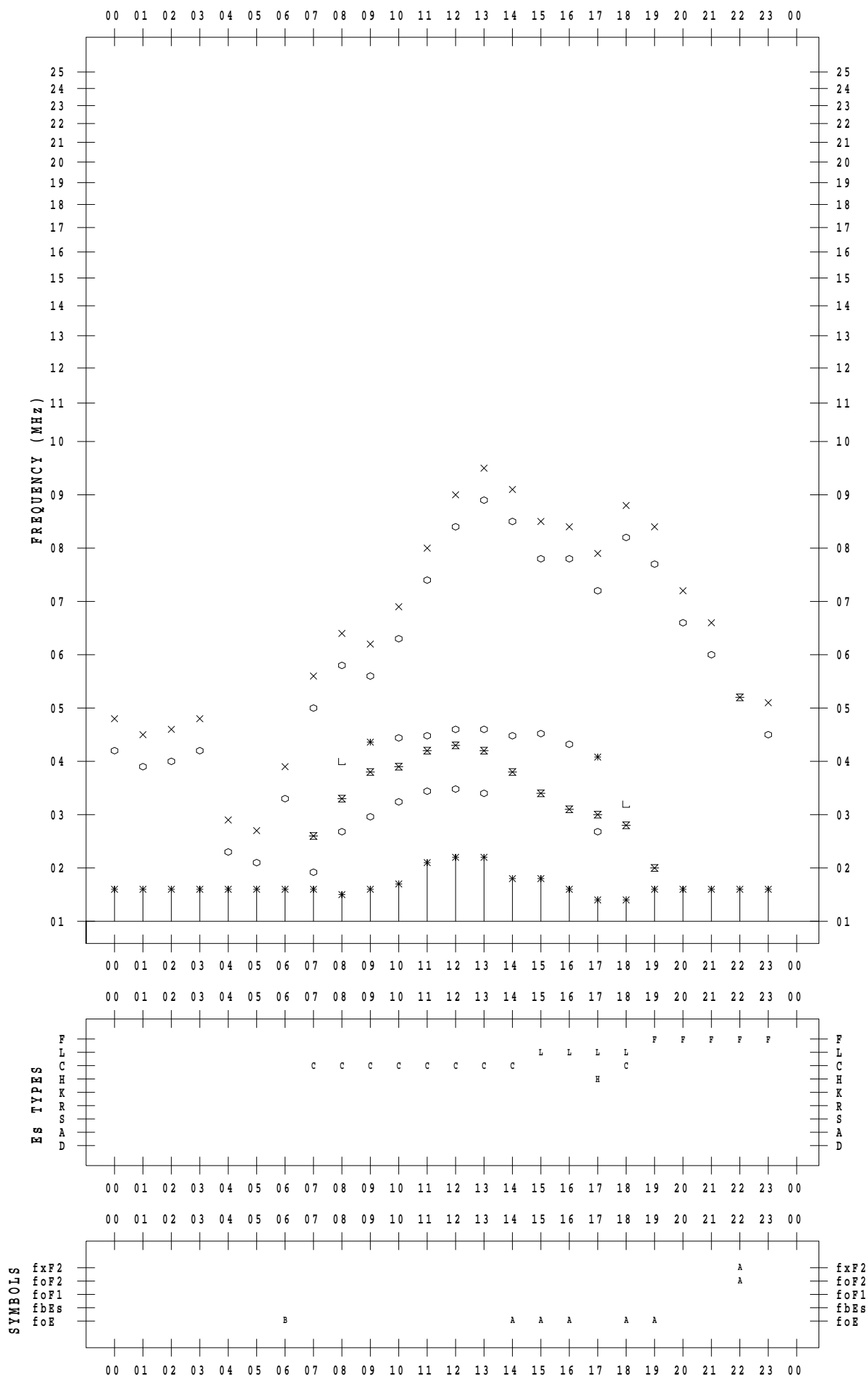
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/14

135 ° E MEAN TIME



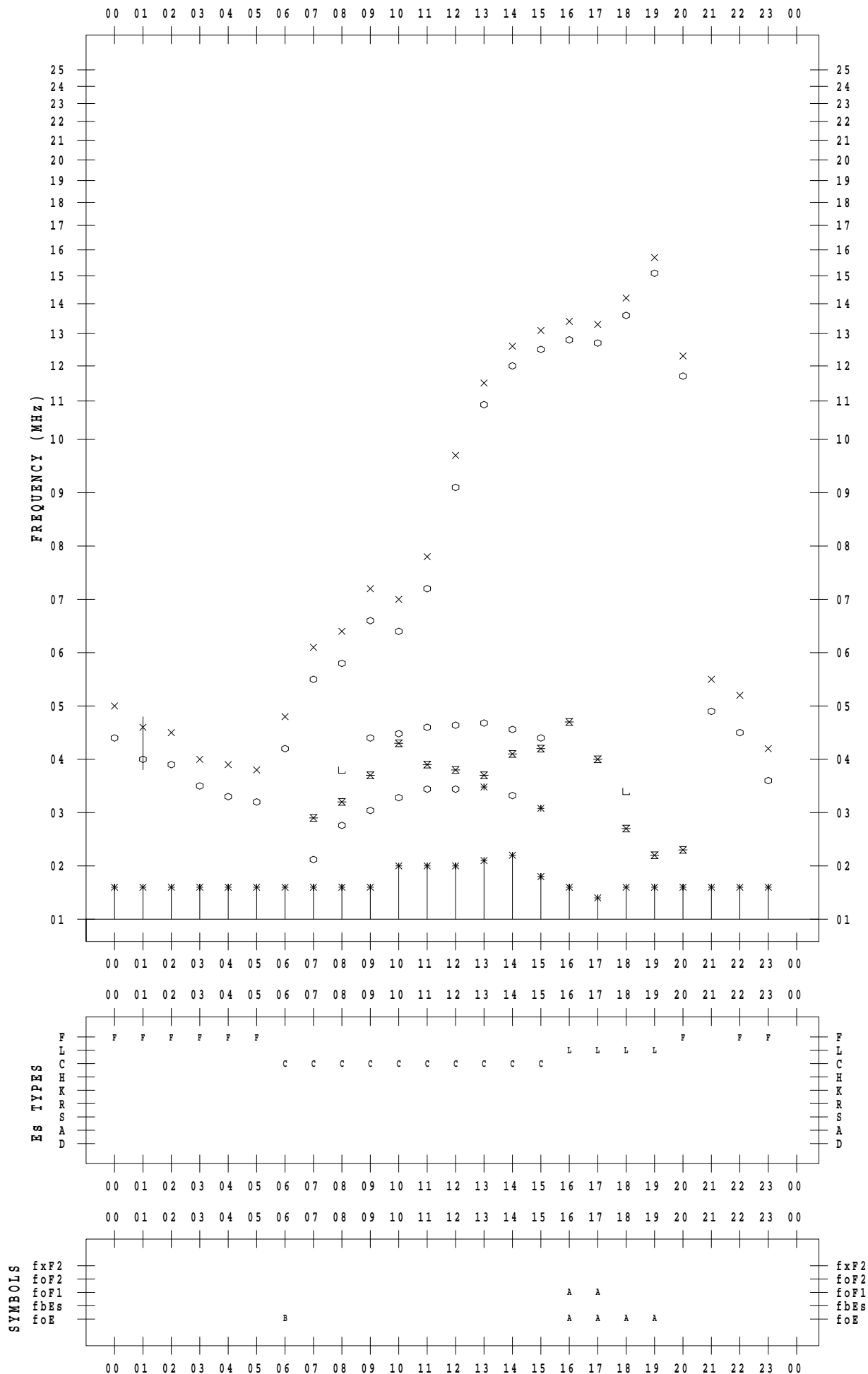
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 15

135 ° E MEAN TIME



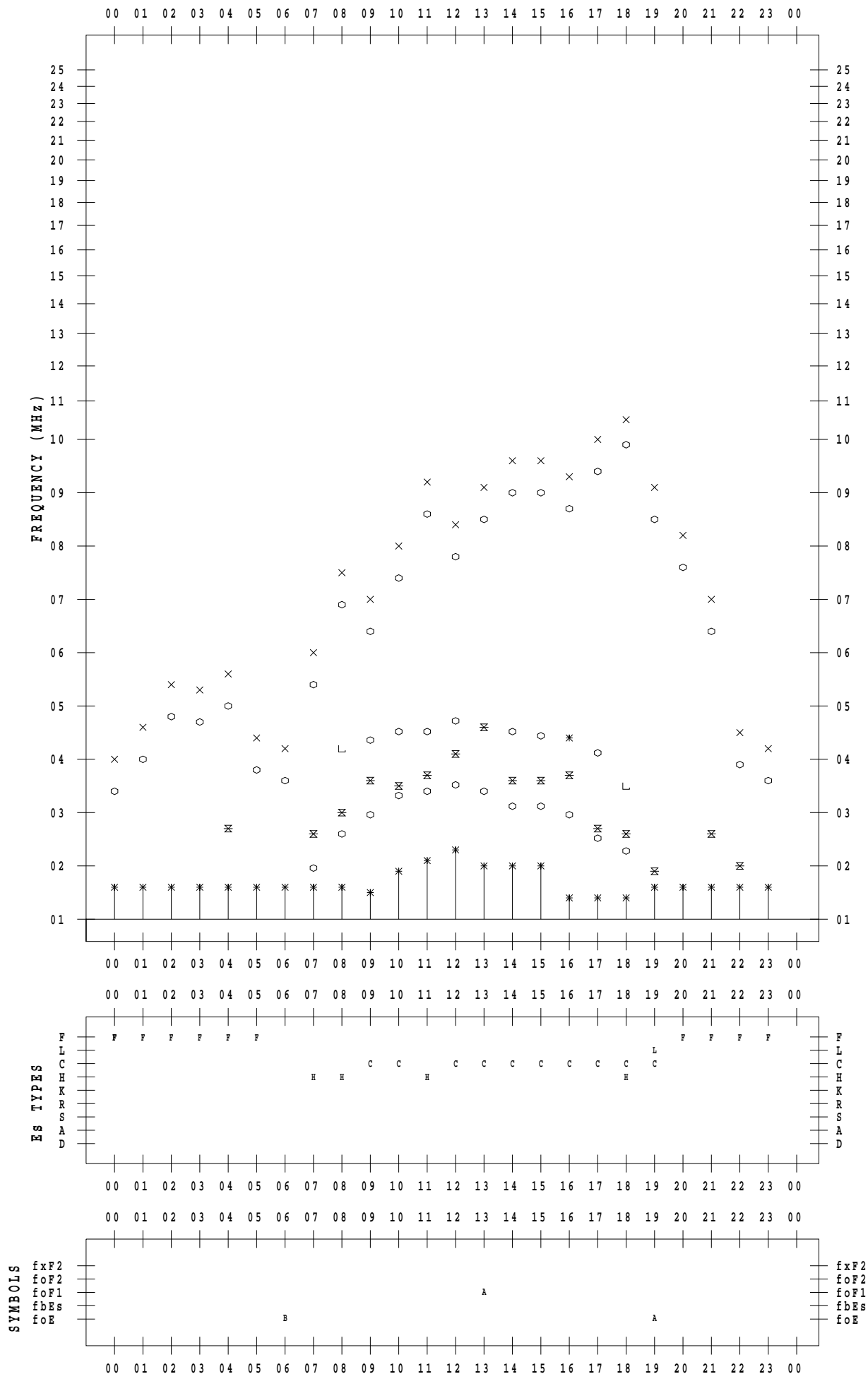
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/16

135 ° E MEAN TIME



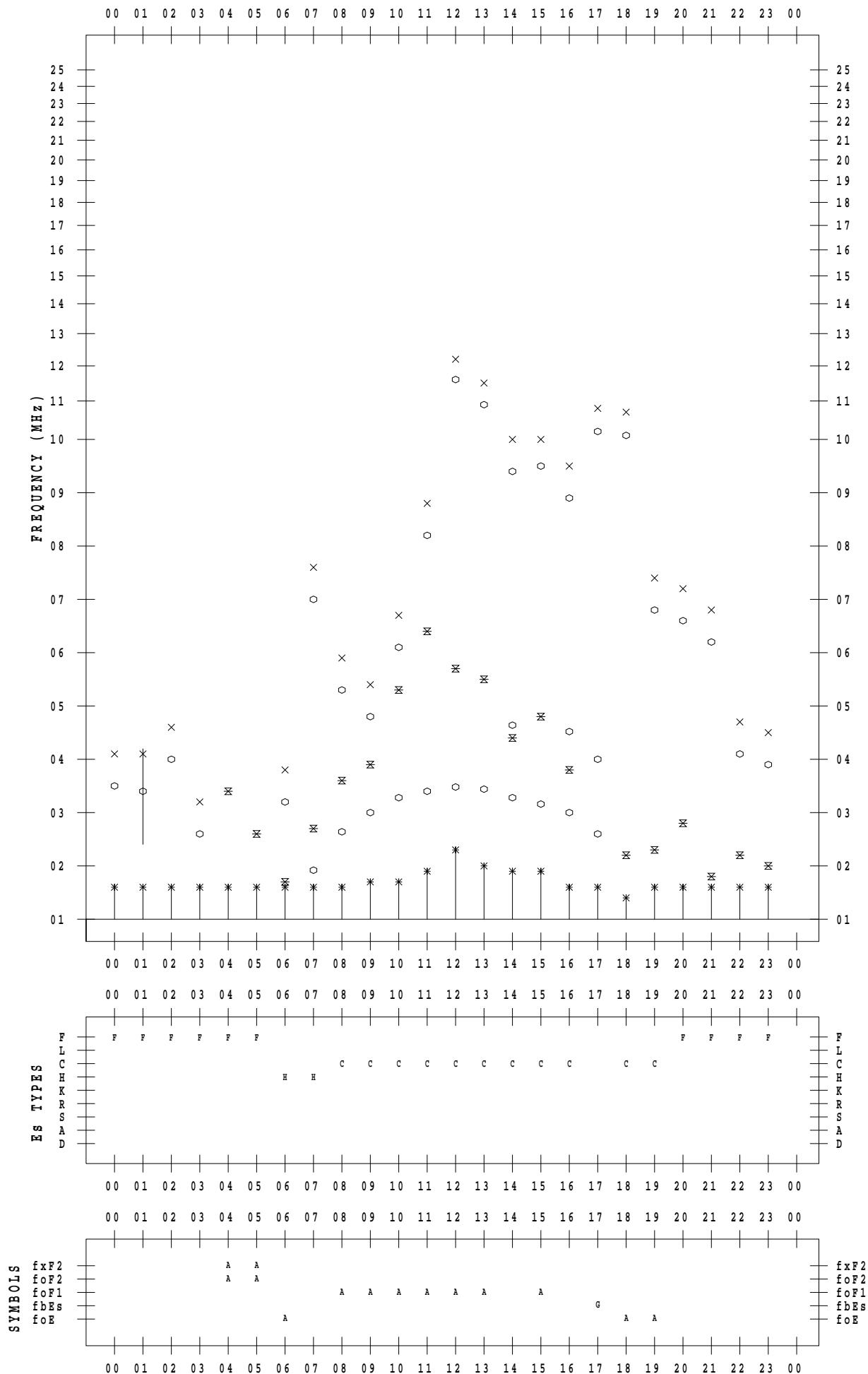
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 17

135 ° E MEAN TIME



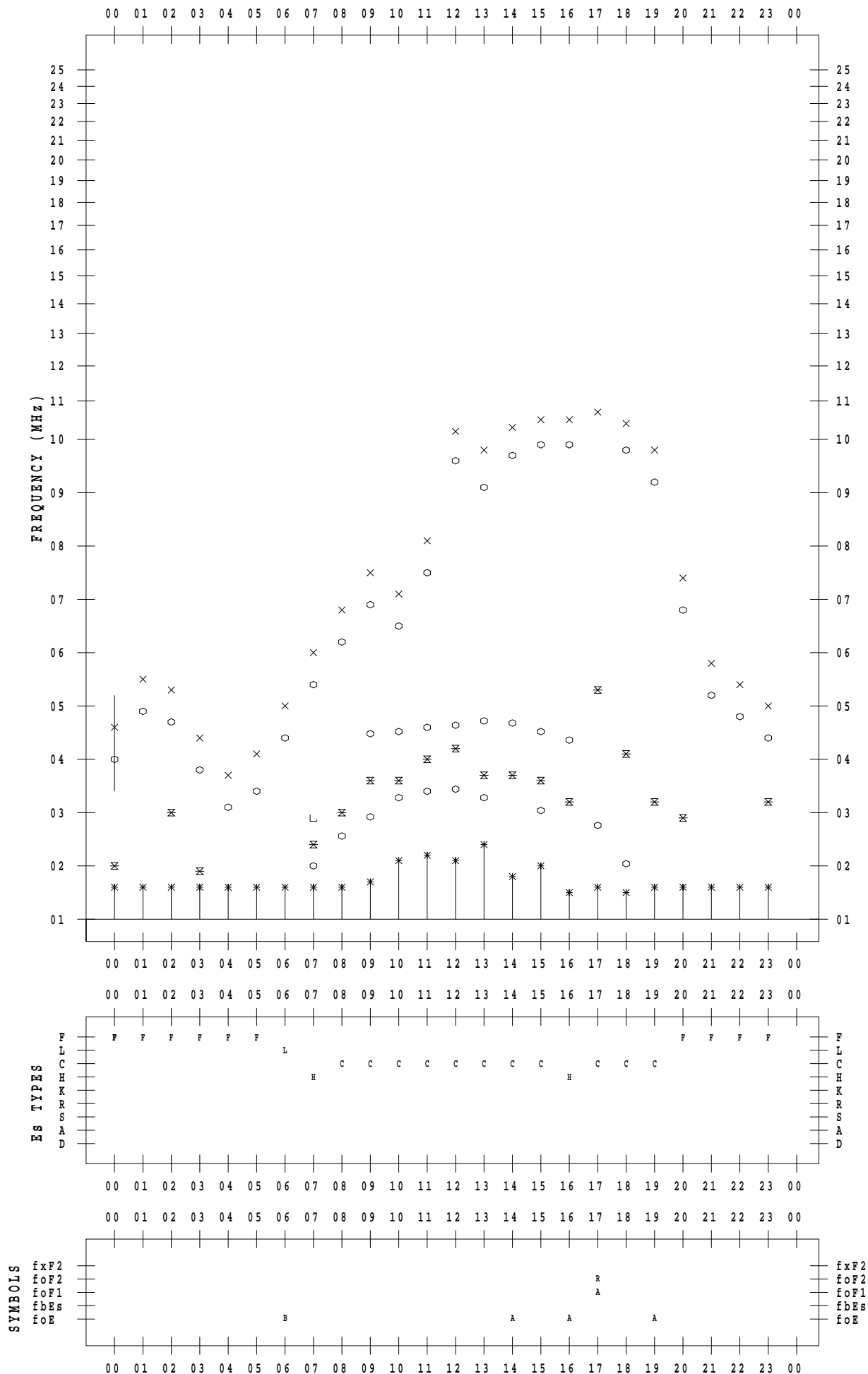
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 18

135 ° E MEAN TIME



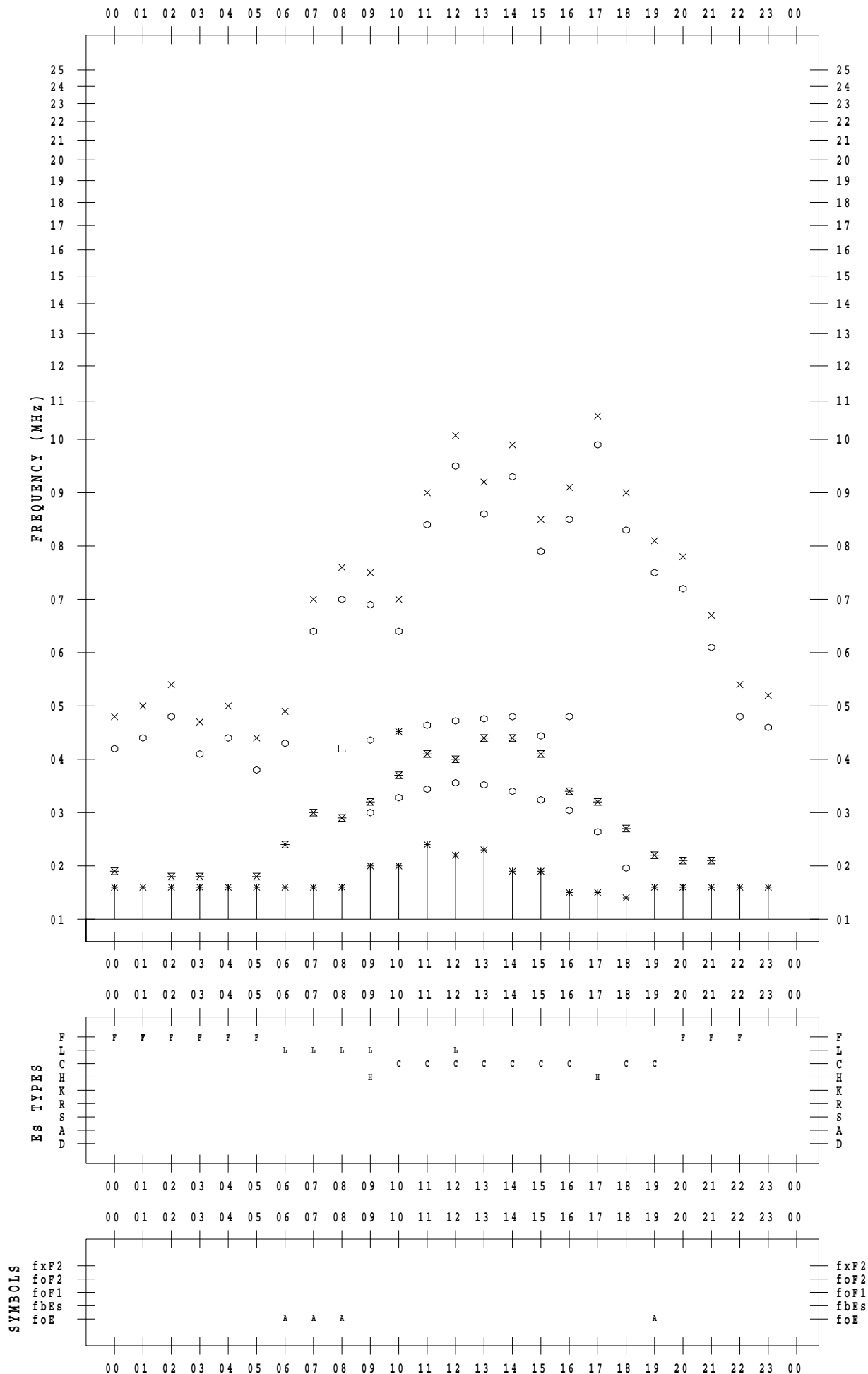
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/19

135 ° E MEAN TIME



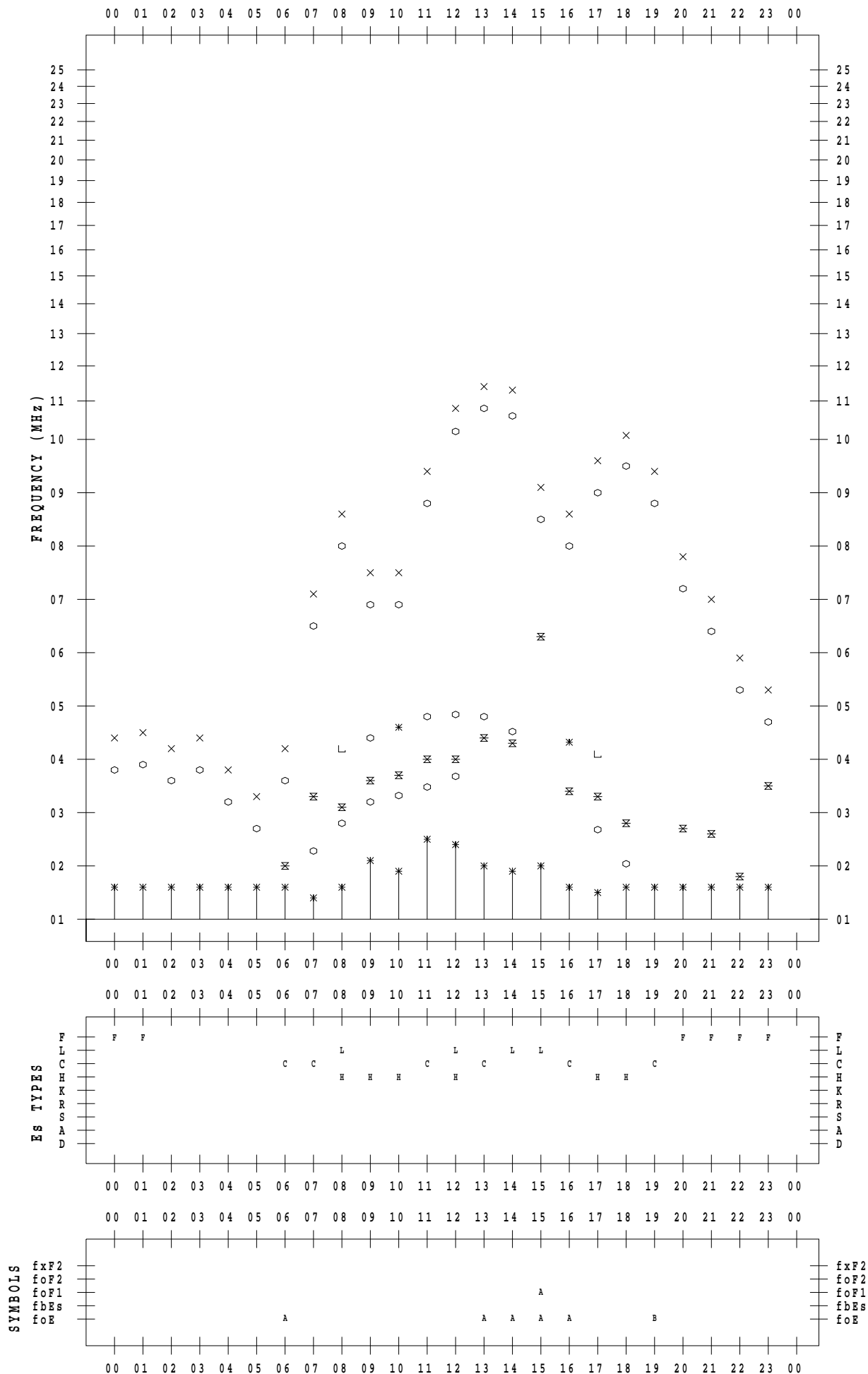
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/20

135 ° E MEAN TIME



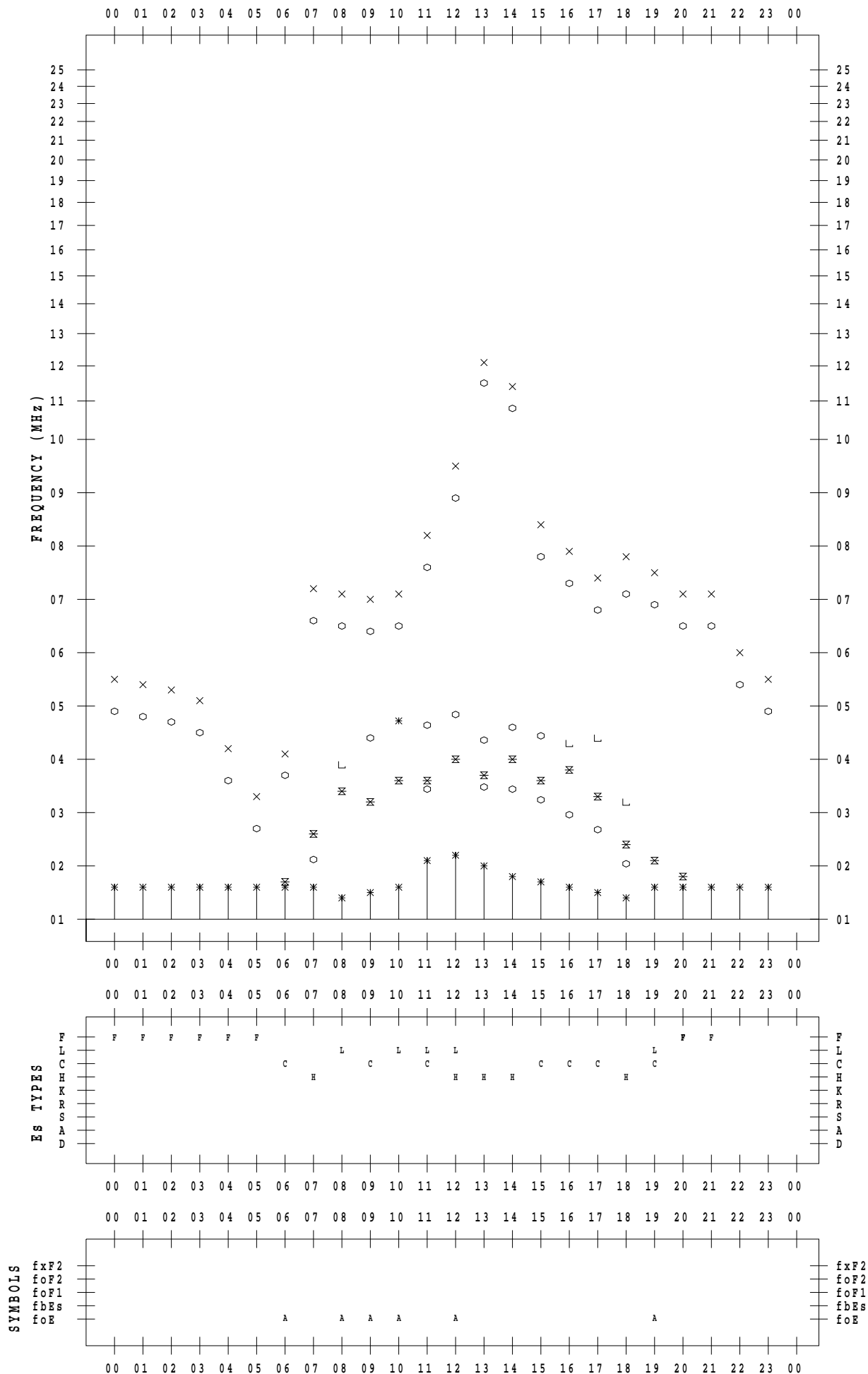
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 21

135 ° E MEAN TIME



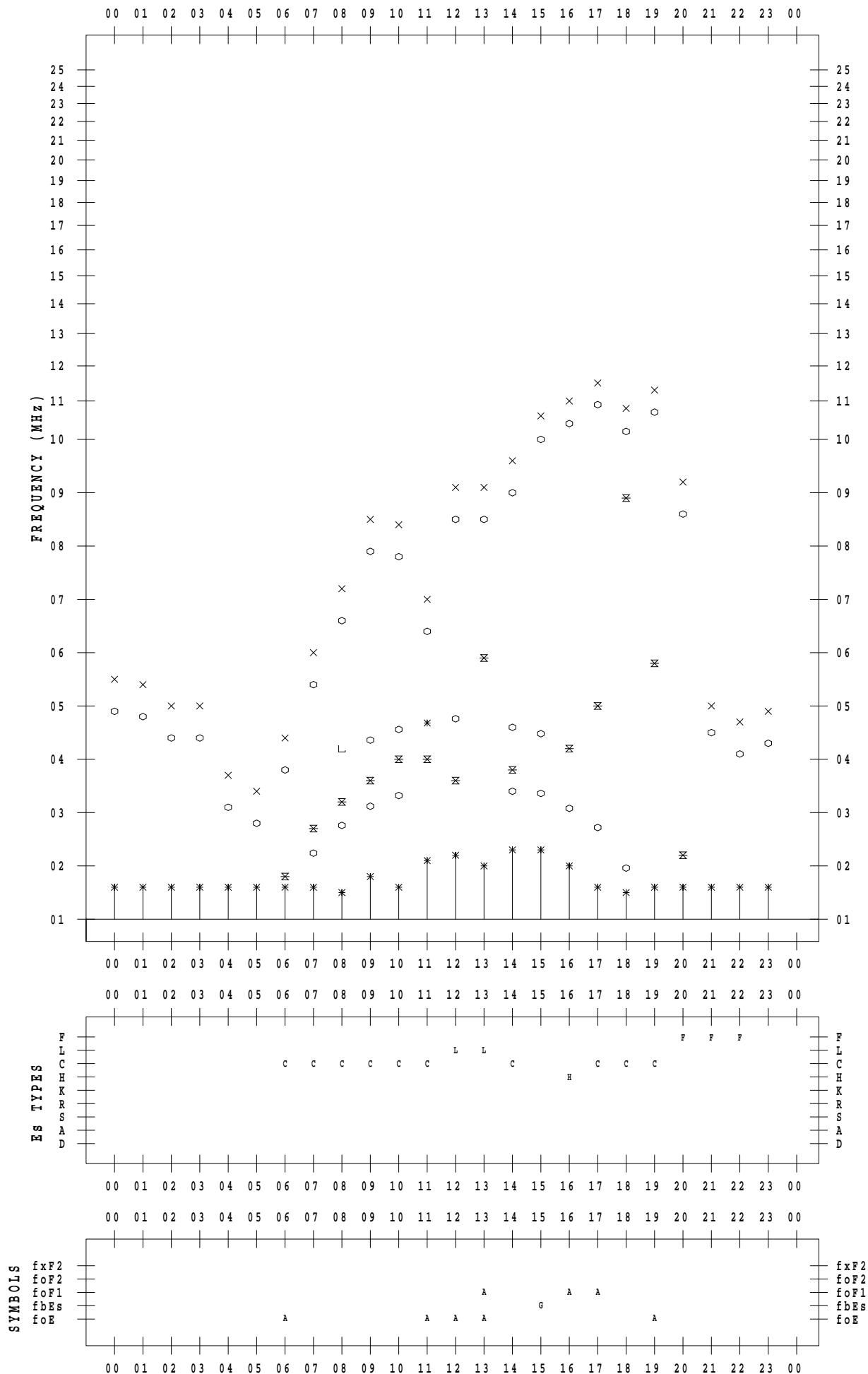
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/22

135 ° E MEAN TIME



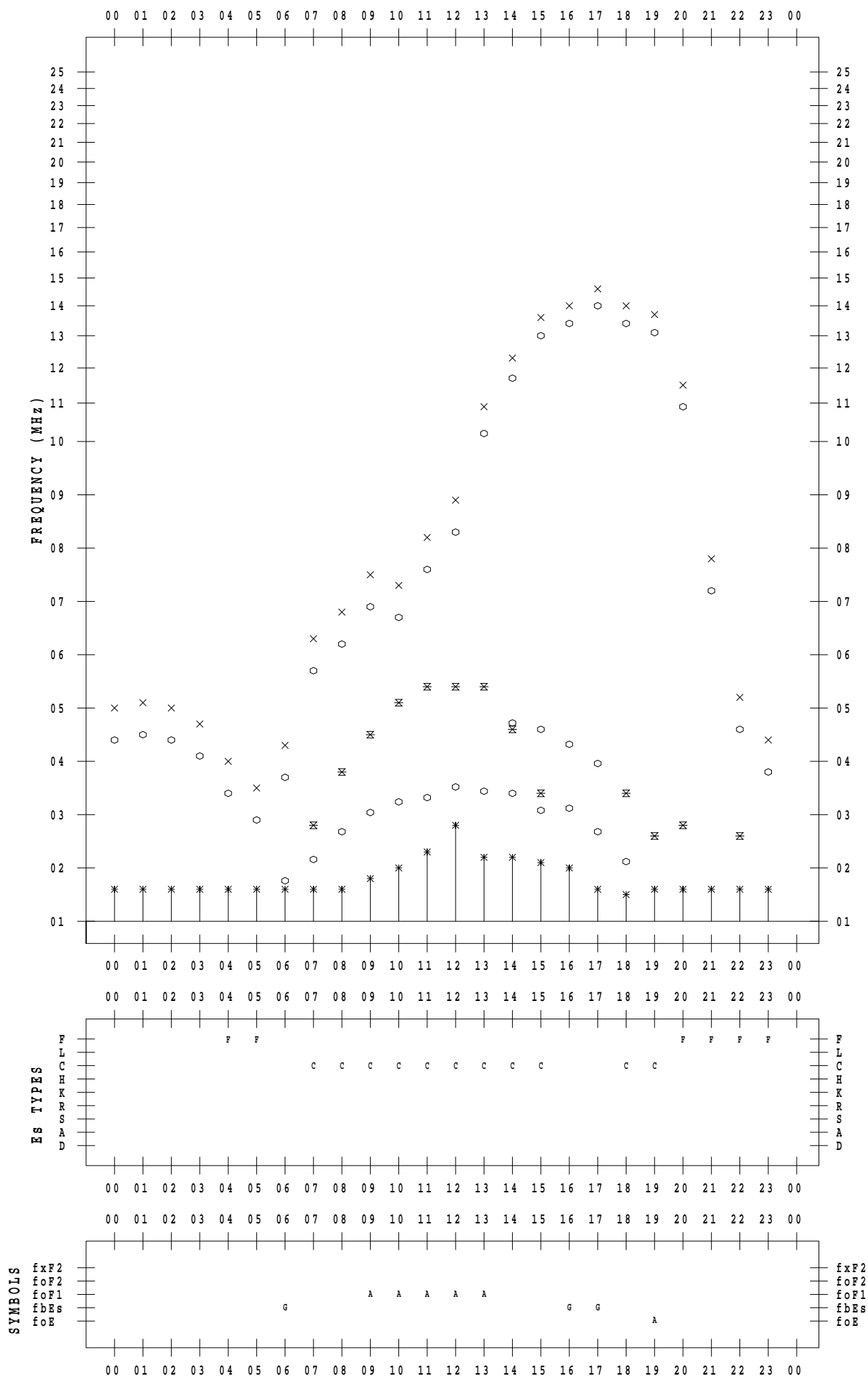
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 23

135 ° E MEAN TIME



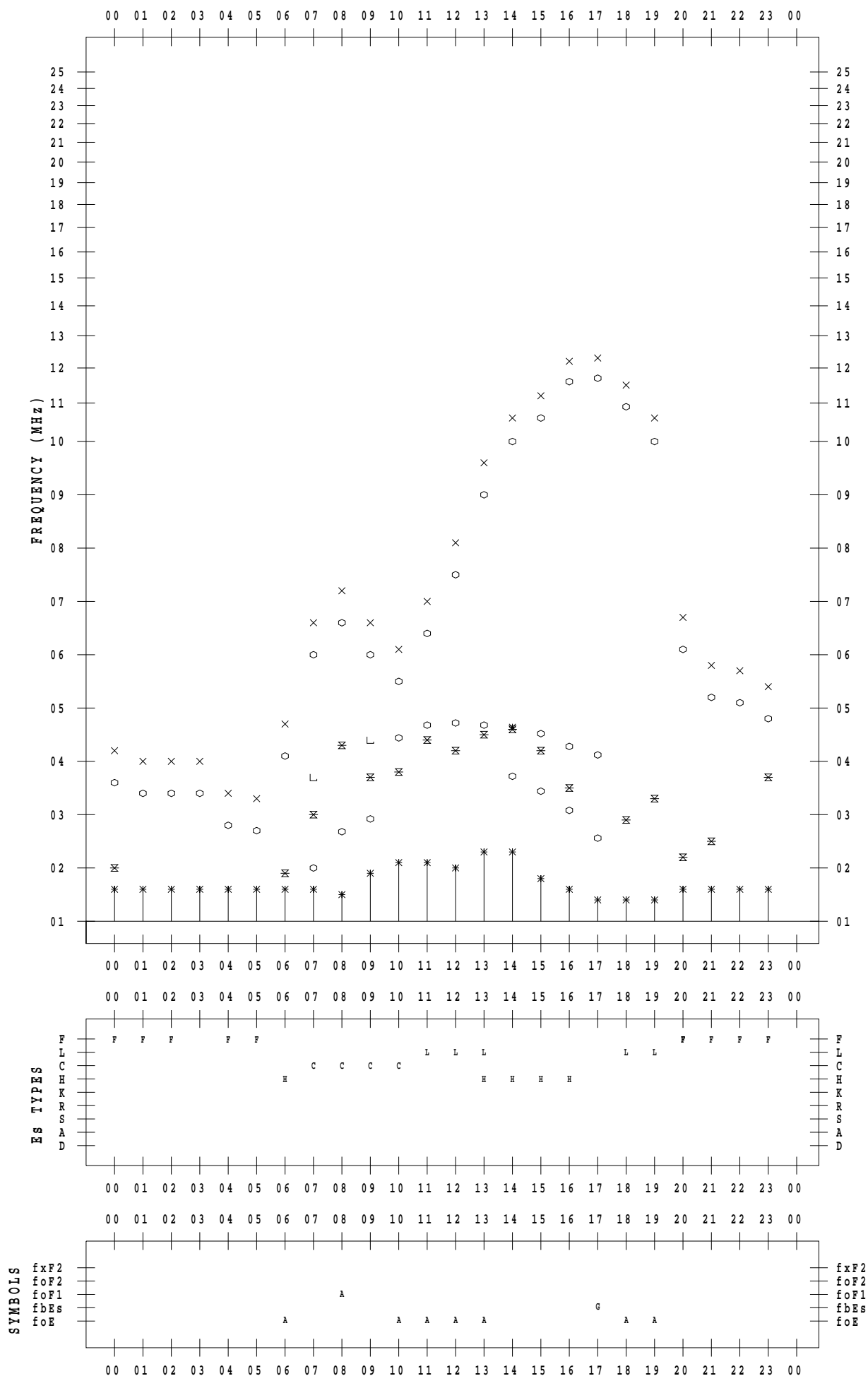
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 24

135 ° E MEAN TIME



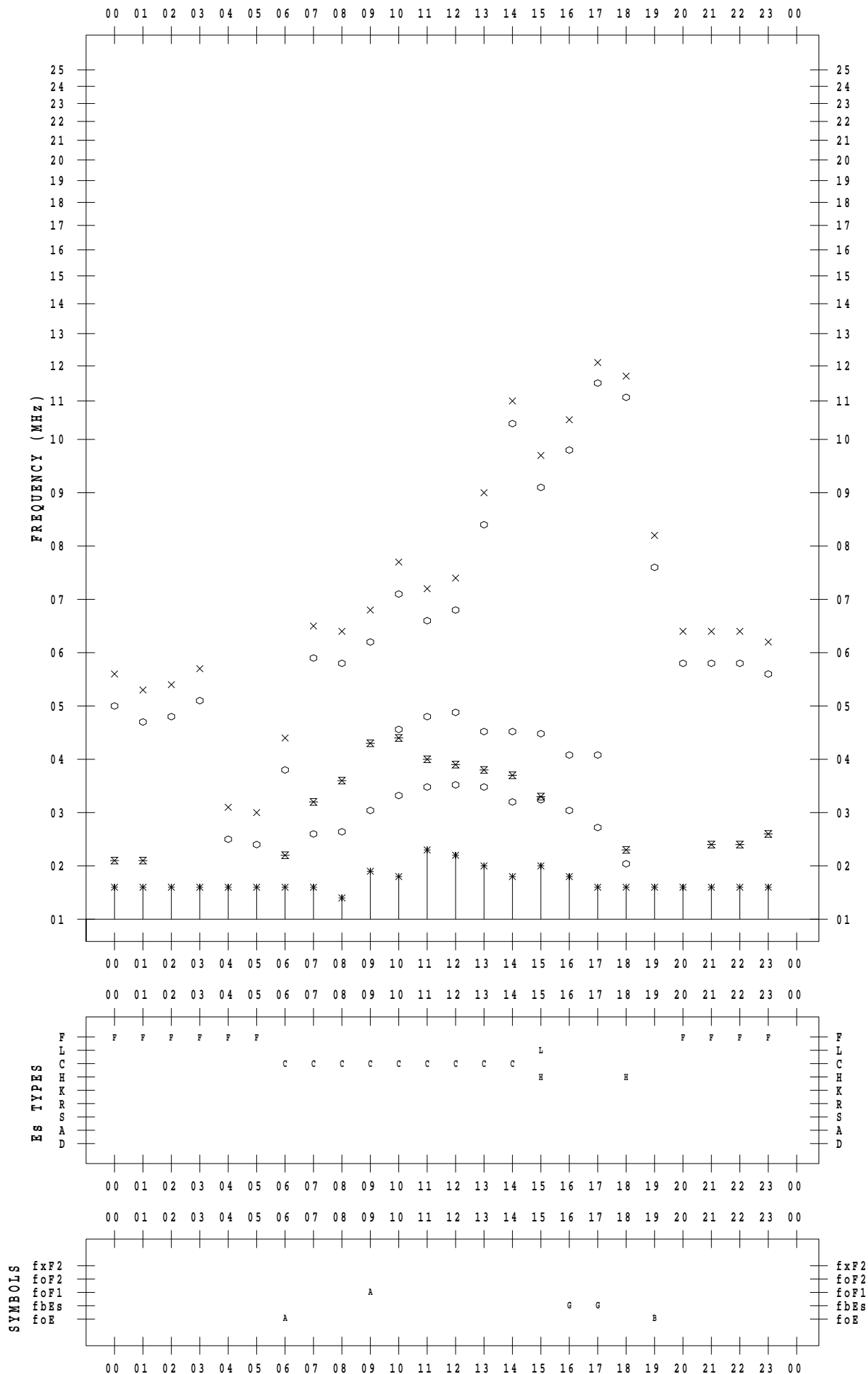
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 25

135 ° E MEAN TIME



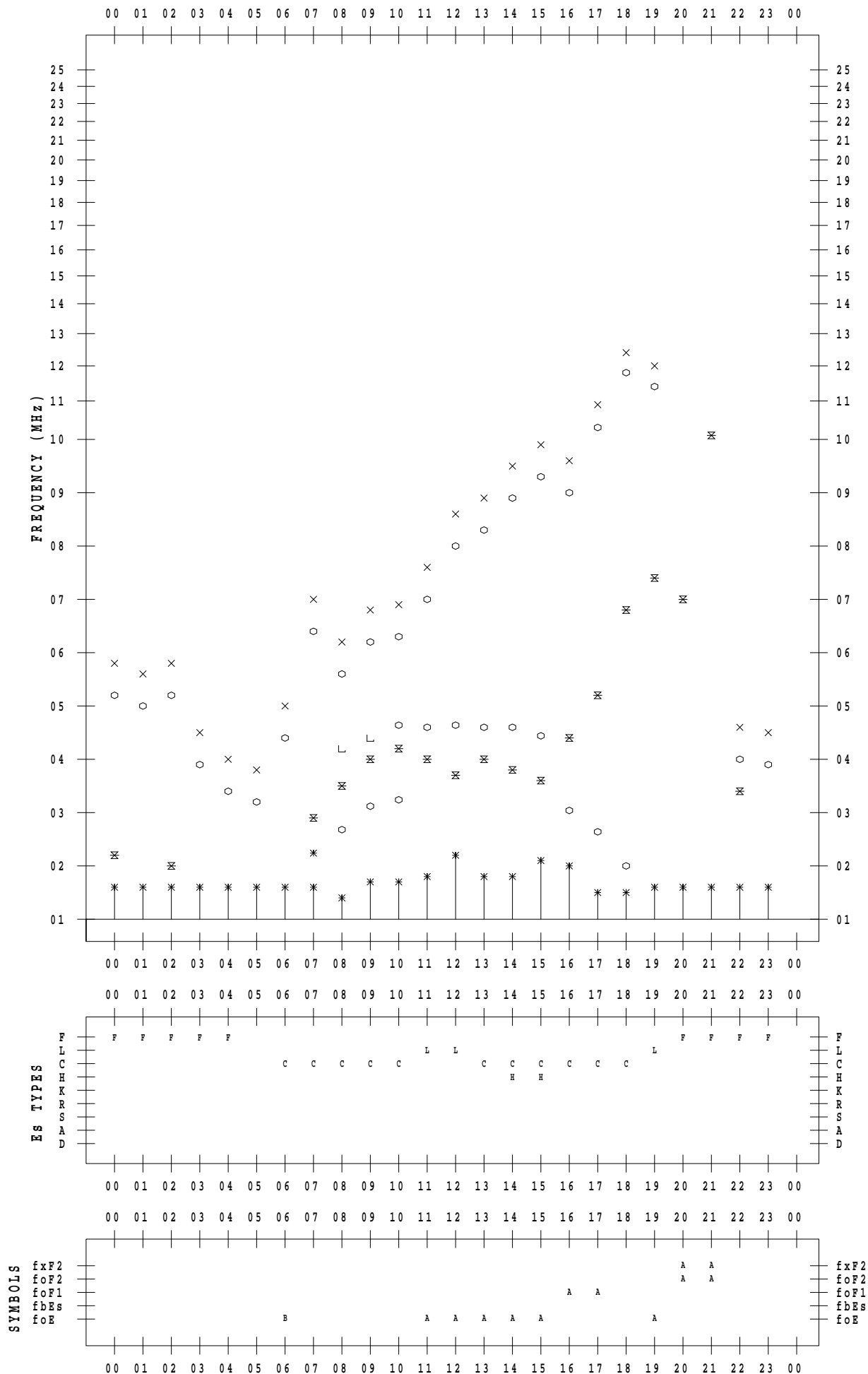
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 26

135 ° E MEAN TIME



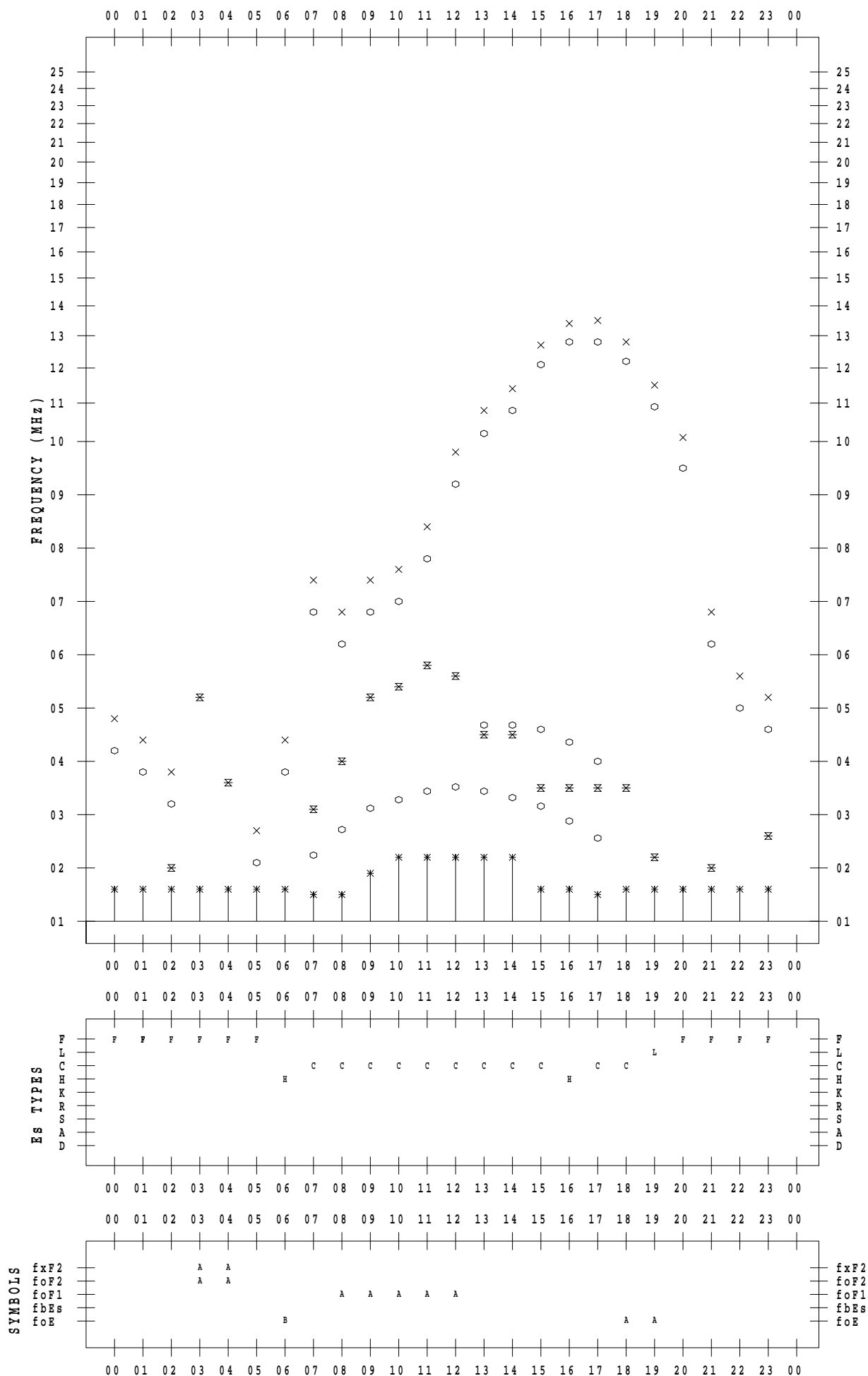
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 27

135 ° E MEAN TIME



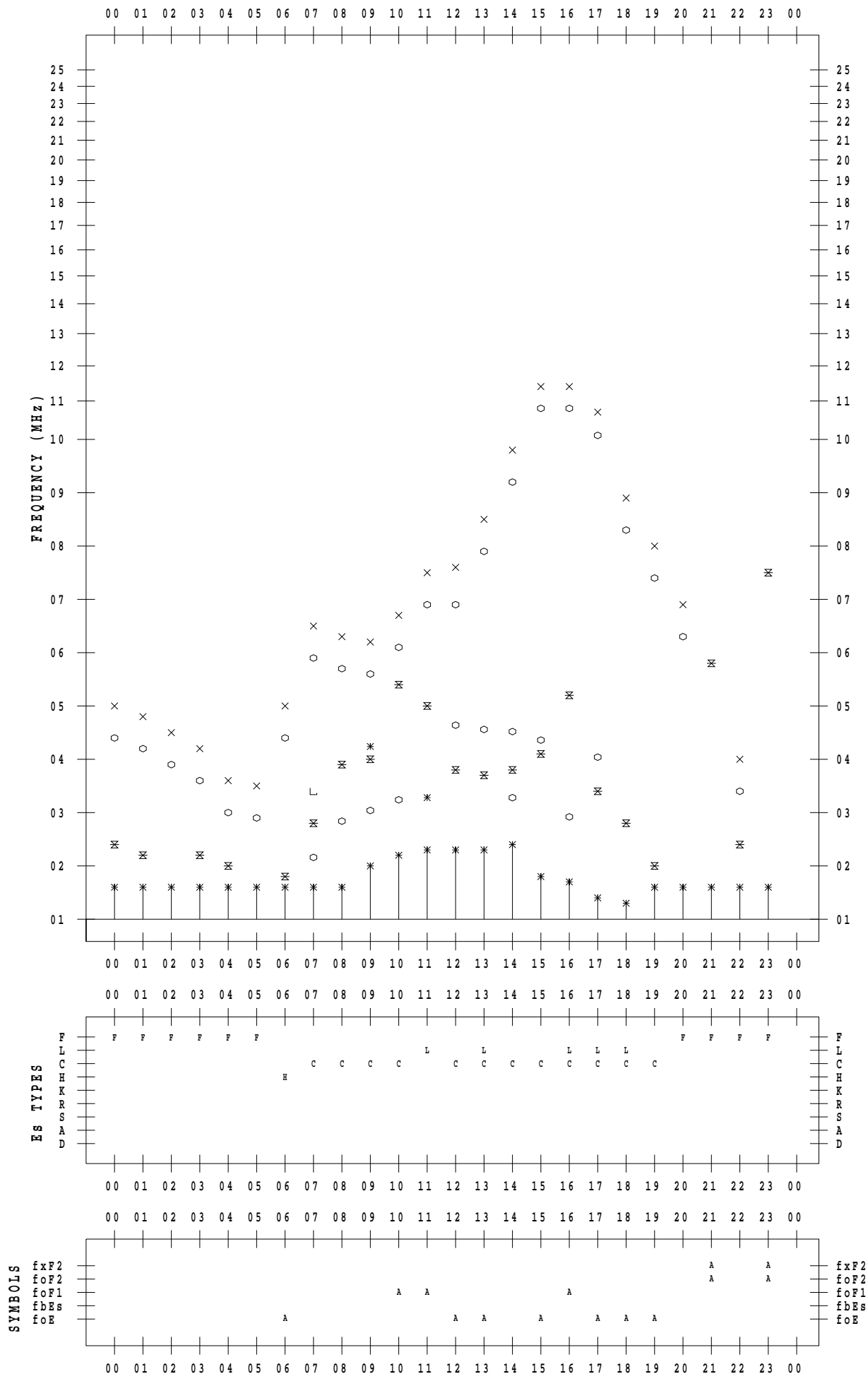
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/28

135 ° E MEAN TIME



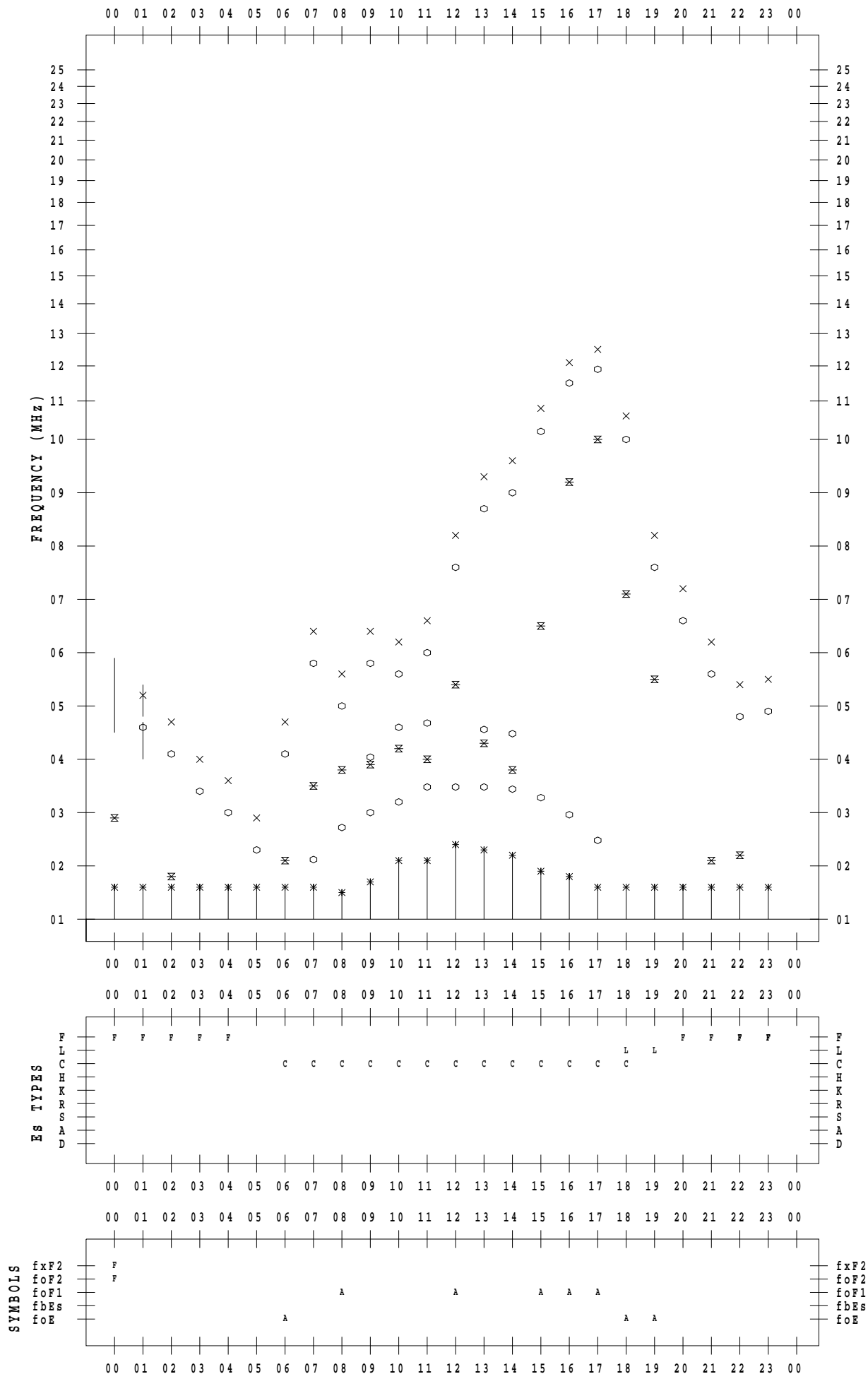
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 4/29

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021 / 4 / 30

135 ° E MEAN TIME

