F-844

IONOSPHERIC DATA IN JAPAN

FOR APRIL 2019

VOL. 71 NO. 4

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≪Real Time Ionograms on the Web ・・・・・・・・・・・・http://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

fxI	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 replaced 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 atmospherics.

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

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km as-sociated 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. 2019

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

DAY \ HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	37	34	34	28	29	42	42	47	51	58	44	50	57	59	54	53	50	50	50	47	43	41	40
2	N	34	34	34	34	30	37		50	52	55	56	53	55	57	36	49	45	44	44	40	40	25	34
3	34	34	34	34	34	34	41	42	47	51	54	53	52	58	59	58	53	54	46	40	40	41	40	
4	40	29	40	31	32	34	43	43	44	58	58	52	56	58	54	51	54	47	45	46	43	43	40	38
5	34	30	28	A	A	29	40	45	46	51	53	54	58	64	59	55	50	44	50	51	47	44	43	40
6	40	36	36	38	N	31	41	47	A	A	59	55	56	61	64	61	55	51	44	48	44	42	42	40
7	37	32	34	34	32	36	49	51	52	56	58	A	56	61	58	58	84	58	58	54	51	34	48	43
8	42	40	40	36	30	31	36	42	40	51	52	49	49	55	54	55	54	54	52	45	43	43	43	40
9	37	36	40	34	32	34	40	46	51	59	56	59	59	59	57	57	53	A	A	55	50	52	47	40
10	41	34	40	40	34	40	47	48	51	54	64	62	64	58	65	A	54	55	54	A	A	A	A	A
11	34	42	40	36	34	38	47	53	54	124	93	A	62	65	59	60	58	54	52		51	54	42	42
12	41	41	38	40	A	45	50	53	53	60	56	57	51	64	64	62	54	58	54	61	54	53		A
13	A	A	40	37	A		54	50	54	A	51	56	49	67	63	60	59	60	58	58	54	51	50	40
14	38	40	40	40	40	46	50	48	62	62	61	60	57	58	61	64	59	54	51	57	51	48	42	40
15	41	41	40	36	37	45	47	48	54	59	57	60	55	58	60	56	56	55	54	54	54	60	50	47
16	43	40	42	40	38	46	50	48	58	70	60	47	55	57	60	60	58	187	55	65	67	54	49	46
17	48	47	48	48	44	42	48	47	50	55	65	55	58	60	58	57	57	54	54	58	51	52	52	46
18	46	44	43	42	42	50	48	47	50	54	61	55	56	55	54	38	54	52	50	49	54	54	52	47
19	42	48	47	48	48	48	50	48	59	64	59	56	58	56	55	52	54	48	47	55	51	58	54	43
20	43	42	40	36	36	41	52	45	48	59	56	52	A	A	48	48	50	52	50	58	54	58	49	51
21	47	45	42	40	38	40	48	48	50	52	55	54	A	55	58	59	59	51	50	55	54	54	54	54
22	50	50	50	51	50	51	52	50	60	56	59	54	A	A	56	54	54	54	50	58	58	58	54	51
23	A	50	50	51	45	52	46	A	49	48		55	57	55	C	C	C		48	53	53	52	42	42
24	42	43	43	42	45	53	42	38	50	52	52	53	A	51	50	54	57	A	54	52	54	52	51	46
25	47	48	47	43	44	50	48	42	44	50	44	A	A	A	A	47	49	34	46	54	52	54	51	52
26	51	42	42	189	40	38	40	47	A	53	A	51	50	49	46	50	48	50	50	52	54	51	38	41
27	43	40	43	43	40	42	44	45	A	52	52	56	50	51	51	51	54	47	47	54	54	52	50	40
28	37	36	36	34	34	38	41	46	51	53		51	50	48	51	56	A	52	A	48	51	44	50	51
29	50	47	48	47	47	44	42	A	A		42	54	56	51	51	51	50	44	45	55	52	51	48	47
30	43	42	41	48	42	44	52	45	47	55	55	54	100	A		88	51	50	55	64	60	50	54	47
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	30	29	26	29	30	27	26	27	27	27	25	26	27	28	28	27	28	28	29	29	28	27
MED	42	41	40	40	38	41	47	47	50	54	56	54	56	58	58	56	54	52	50	54	52	52	48	43
U Q	46	44	43	45	44	46	50	48	54	59	59	56	58	60	60	59	57	54	54	57	54	54	51	47
L Q	37	36	38	35	34	34	41	45	47	52	53	52	50	55	54	51	52	48	47	49	48	43	42	40

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HOURLY VALUES OF fEs AT Wakkanai

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	32	G	G	G	68	G	45	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	56		37	G	G	46	G	43	42	G	G	28	G	G	G	G	G	G
3	G	G	G	G	G	G	26	32	35	40	40	170	40	44	40	G	33	G	G	G	G	G	G	
4	G	G	G	G	24	32	29	34	G	46	46	46	43	40	42	37	33	28	31	G	G	G	27	G
5	G	G	25	30	28	28	28	32	G	43	G	G	G	86	38	35	G	29	29	G	G	G	G	G
6	G	G	G	G	G	G	32	159	113	115	46	46	160	43	G	110	32	G	33	29	25	G	G	G
7	G	G	G	G	G	G	G	31	G	44	46	114	49	41	116	35	70	45	41	30	G	35	G	G
8	G	G	G	G	G	G	G	G	36	46	49	41	39	58	G	36	33	G	G	G	G	G	G	G
9	G	G	G	G	26	92	111	40	G	55	146	46	54	G	39	64	33	76	80	32	29	27	28	G
10	G	G	G	G	G	G	G	32	G	41	44	46	90	50	53	69	41	61	59	69	50	50	50	60
11	G	29	G	G	G	G	28	33	39	68	45	76	44	46	124	38	56	58	70		30	32	26	G
12	G	G	G	25	93	37	91	50	146	52	45	46	44	G	G	G	44	G	38	50	55	37		60
13	59	59	29	G	40		32	70	35	60	43	43	41	44	G	G	G	35	29	G	G	G	28	34
14	G	G	28	27	29	27	30	G	35	153	112	44	G	45	G	G	G	28	28	28	G	G	G	G
15	G	G	G	G	G	G	G	106	G	38	G	G	44	71	G	G	G	32	G	G	28	G	G	G
16	G	G	G	G	G	24	32	34	84	46	81	G	50	G	G	G	G	33	G	G	G	11	G	G
17	27	40	32	G	G	24	G	G	58	44	G	G	125	G	45	35	40	36	28	G	G	G	G	G
18	G	G	G	G	G	G	G	33	G	39	107	40	42	39	44	39	33	G	29	G	G	G	G	G
19	G	G	G	G	G	G	151	34	40	39	48	45	46	46	G	G	G	34	G	28	G	24	24	G
20	G	G	G	G	G	G	30	58	39	43	164	90	41	61	G	G	53	37	34	25	G	G	G	G
21	G	G	G	G	G	26	32	38	41	42	G	41	46	46	G	G	G	G	30	G	G	G	G	36
22	G	G	G	G	G	G	G	34	90	46	43	41	61	74	59	46	G	G	30	24	G	G	29	39
23	60	39	34	27	G	G	34	87	40	G	G	42	40	39	C	C	C		39	35	31	23	G	G
24	G	G	G	G	G	G	33	G	36	49	44	G	128	39	38	40	G	72	60	84	27	G	G	G
25	G	G	G	G	G	25	39	43	40	132	44	61	57	46	56	38	40	60	G	G	29	G	26	33
26	G	G	G	235	G	G	34	40	49	45	73	46	46	G	G	G	G	33	G	G	G	G	G	G
27	G	G	G	G	G	28	147	39	40	G	44	48	46	127	45	G	33	G	31	G	G	24	G	G
28	G	G	G	G	G	G	32	39	G	G		45	46	G	G	G	64	60	57	G	G	29	30	31
29	32	G	G	G	24	29	56	34	46	G	G	51	52	48	48	G	63	48	32	38	40	32	27	G
30	G	G	G	G	G	26	G	69	43	45	45	42	68	111		113	51	60	30	G	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	30	30	30	30	30	29	30	29	30	30	29	30	30	30	28	29	29	29	30	29	30	30	29	29
MED	G	G	G	G	G	G	31	34	38	44	44	46	46	44	38	G	33	33	30	G	G	G	G	G
U Q	G	G	G	G	G	26	34	46	43	49	48	48	54	50	45	38	42	53	38	29	28	24	26	16
L Q	G	G	G	G	G	G	G	32	G	39	G	41	41	39	G	G	G	G	G	G	G	G	G	G

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HOURLY VALUES OF fmin AT Wakkanai

APR. 2019

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

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

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	31	34	31	27	N		44	46	51	51	53	59	66	55	61	56	59	54	50	54	42	38	36	38
2	37	34	34	31	32	27	44	46	54	65	68	58	70	56	52	62	54	51	47	53	50	32	32	30
3	31	30	28	28	26	N	38	47	50	52	61	61	59	64	68	78	62	55	49	47	39	36	34	34
4	34	34	N	27	A	A	44	52	54	56	51	69	61	59	57	63	56	55	49	N	43	39	38	38
5	38	34	28	27	27	27	26	47	51	54	59	67	77	70	58	59	52	51	50	55	47	44	42	36
6	37	36	34	32	30	27	44	59	56	64	58	63	65	62	61	68	59	58	65	58	54	39	36	35
7	36	31	31	30	27	27	45	51	56	62	56	56	66	62	N	69	66	69	67	65	47	35	34	A
8	A	34	A	A	34	A	A	53	A	64	64	66	65	65	72	68	63	59	66	65	47	A	34	38
9	34	32	34	34	31	30	34	58	60	A	64	69	73	63	68	63	59	56	57	52	53	47	A	A
10	43	42	39	36	34	37	47	52	55	61	62	67	74	77	67	72	63	63	66	63	54	A	A	A
11	38	34	36	34	35	34	49	54	52	55	59	65	N	78	75	66	65	58	59	54	63	A	A	A
12	37	36	34	31	37	39	54	48	51	58	66	72	72	78	82	77	66	62	67	54	51	48	38	36
13	A	36	34	34	32	32	59	48	51	55	58	68	70	81	78	69	65	63	69	72	75	49	43	34
14	34	34	32	31	34	34	49	55	58	64	59	69	68	65	71	69	71	65	58	58	64	47	39	43
15	41	38	34	34	30	30	45	51	52	59	64	69	67	65	59	68	58	56	58	67	66	54	43	42
16	42	38	38	35	30	31	54	64	52	57	56	58	59	59	A	70	67	58	66	71	76	34	A	A
17	A	31	32	34	32	34	49	50	57	59	61	61	61	67	65	68	68	65	63	51	54	49	45	43
18	38	37	34	34	34	34	43	54	52	64	67	53		61	65	A	51	49	57	66	62	49	A	36
19	34	32	34	35	32	32	43	52	51	62	63	56	66	74	67	56	55	55	58	52	54	50	A	34
20	34	34	32	30	27	26		54	72	64	56	56	52		56	54	55	50	54	58	58	51	43	41
21	39	39	36	34	38	38	45	52	55	57	59	47	52	55	69	71	56	54	51	51	48	34	41	43
22	189	34	38	35	34	32	44	49	59	65	61	57			48	59	60	39	49	52	52	48	45	40
23	41	32	36	32		32	44	49	55		56	62	A	66	55	A	52	52	54	50	45	38	34	34
24	32	34	32	32	27	30	41	35	55	61	55	A	98	56	51		A	56	59	55	52	49	47	44
25	42	47	47	39	A	32	42	41	46	A		56	A	56		41	49	50	50	56	52	51	34	A
26	34	36	34	34	30	32	44	51	49	54	A			51	49	A	56	46	46	51	24	41	39	36
27	34	34	23	32	27	35	42	43	48	51	55	58	49		A	A	62	65	51	51	51	48	42	44
28	39	38	36	34	31	34	53	46	47	48	51	A	48	56	56	54	55	56	57	44	A	43	38	42
29	38	36	34	31		34	42	44	A	A	48	54	59	61	56	48	56	54	51	52	47	38	A	A
30	A	38	38	36	32	39	50	51	A	A	A	68	61	69	71	63	58	56	63	72	66	43	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	26	30	28	29	25	26	28	30	27	25	27	27	24	27	26	25	29	30	30	29	29	27	22	22
MED	37	34	34	34	32	32	44	51	52	59	59	61	66	63	63	66	59	56	57	54	52	44	38	38
U Q	39	37	36	34	34	34	49	53	56	64	63	68	70	69	69	69	64	59	63	64	60	49	43	42
L Q	34	34	32	31	28	30	42	47	51	54	56	56	59	56	56	57	55	52	50	51	47	38	34	35

HOURLY VALUES OF fEs AT Kokubunji

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G		29	G	G	G	G	G	G	G	G	G	G	41	G	G	G	G	G	G
2	G	G	G	G	G	G	G	31	G	G	G	40	G	G	40	G	G	32	G	G	11	G	G	G
3	G	G	G	G	G	G	30	31	35	37	G	G	G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	G	26	29	26	28	G	36	G	G	G	41	40	G	36	38	G	G	G	G	G	G	G
5	G	G	G	G	G	G	27	G	G	42	G	G	40	G	39	G	G	33	31	28	G	25	G	G
6	G	G	G	G	G	G	29	37	39	41	39	G	57	55	G	G	33	G	27	26	23	28	G	G
7	G	G	G	G	G	G	32	33	40	G	42	50	55	56	102	43	47	37	26	46	24	49	57	40
8	40	33	40	41	40	39	43	46	63	39	40	40	G	40	41	40	40	31	47	50	70	65	34	31
9	26	G	29	G	G	G	140	45	61	58	G	45	45	43	52	49	G	G	42	35	43	57	57	40
10	40	30	G	29	G	G	32	G	G	G	G	65	G	40	50	G	G	31	29	29	41	54	54	69
11	33	36	G	G	G	G	G	G	G	40	41	49	110	72	39	G	G	G	29	60	60	40	94	38
12	29	G	G	G	23	28	G	33	G	38	G	G	G	G	G	G	37	31	28	41	26	30	G	G
13	27	G	G	G	G	G	G	36	39	42	47	40	55	73	39	G	35	30	33	34	11	G	G	G
14	G	G	G	G	G	G	27	G	43	45	G	59	41	G	G	42	38	33	G	46	39	38	G	G
15	G	G	G	37	33	G	33	33	45	46	40	51	G	50	40	41	42	32	26	28	G	41	28	G
16	G	G	G	G	G	G	29	G	G	G	G	G	G	50	66	G	G	35	G	G	49	33	28	39
17	40	G	G	G	G	G	29	39	37	42	41	42	49	41	39	G	G	G	29	42	45	29	G	24
18	G	G	G	G	G	G	G	G	N	G	G	G	G	G	53	79	39	35	G	G	37	45	55	G
19	G	G	G	G	G	G	G	42	G	40	G	57	51	G	41	G	G	G	G	37	34	11	42	G
20	G	G	G	G	G	G		33	G	G	42	G	107	G	G	G	40	42	36	42	39	39	27	G
21	G	G	G	G	G	G	G	G	G	42	G	G	G	G	G	G	G	34	G	26	27	G	G	G
22	205	G	G	G	G	G	36	G	G	G	39	G			40	G	G	37	28	G	G	34	23	28
23	87	G	G	G		G	33	G	37		41	45	73	G	39	55	53	60	G	G	33	G	G	G
24	G	G	G	24	G	G	34	G	G	44	40	56	56	G	G	G	74	53	41	72	46	40	47	G
25	34	29	G	29	36	24	33	40	G	53		G	40	G		G	40	32	G	G	29	26	G	36
26	28	26	G	G	G	G	40	70	G	46	53		G	G	43	51	37	30	G	G	G	G	G	G
27	G	G	G	G	G	G	32	38	G	G	G	G	G	G	55	70	56	37	34	G	G	G	G	G
28	G	G	G	G	G	G	34	39	G	G	G	40	G	G	55	65	G	G	G	36	40	28	32	26
29	G	G	26	G		G	39	56	95	97	50	40	41	G	G	42	37	37	51	36	56	50	36	54
30	39	28	G	G	G	32	35	45	57	57	88	76	55	52	164	55	37	35	27	54	45	39	72	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	30	30	30	30	28	29	29	30	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	30	33	G	40	G	40	40	G	39	G	36	32	26	28	31	30	12	G
U Q	33	G	G	G	G	G	34	39	39	44	41	49	55	46	51	43	40	37	31	42	43	40	42	36
L Q	G	G	G	G	G	G	14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	17		14	14	18	18	21	44	22	34	18	17	20	20	17	18	14	18	17	14
2	14	14	15	20	14	18	18	15	15	33	22	18	44	33	22	34	14	13	14	14	13	14	17	20
3	14	18	14	14	18	15	14	13	13	17	20	21	23	33	22	21	28	13	17	14	14	14	18	15
4	14	20	22	13	14	14	14	14	14	18	22	25	21	20	17	17	15	13	14	21	14	14	14	14
5	15	14	15	15	18	18	21	14	18	21	21	45	22	23	20	18	14	17	13	13	14	14	15	13
6	17	17	15	14	14	18	15	17	14	22	21	20	21	18	18	20	15	21	14	15	14	13	14	15
7	14	14	18	15	13	15	14	13	17	20	23	26	29	30	30	17	17	14	18	15	14	13	14	14
8	13	13	14	14	14	13	17	14	17	18	22	24	21	43	24	20	18	14	13	13	14	13	13	14
9	14	13	13	14	14	14	18	14	15	21	46	31	24	22	18	21	23	13	13	14	13	13	13	14
10	13	14	14	14	17	14	17	13	14	20	18	24	21	18	21	21	14	13	13	14	14	14	14	14
11	13	14	14	14	14	13	22	14	20	20	26	24	23	18	21	18	18	14	13	13	14	13	14	14
12	14	13	14	13	15	17	21	14	17	21	22	45	46	23	22	18	15	13	15	14	14	14	17	14
13	14	15	21	18	17	14	21	15	18	18	24	22	22	21	14	13	13	13	17	13	14	14	18	15
14	13	20	17	17	13	14	13	17	13	21	21	26	31	26	22	20	18	13	17	14	13	13	14	14
15	14	14	14	13	13	17	18	15	13	21	22	23	24	23	31	28	18	15	18	14	14	14	13	14
16	18	21	15	14	14	15	21	14	14	20	43	21	24	18	29	14	18	18	18	17	14	18	14	15
17	13	14	14	14	14	13	14	13	17	20	22	24	26	26	21	22	18	26	15	13	14	14	14	13
18	13	14	14	14	14	13	23	14	20	20	44	26	26	29	21	21	18	14	20	13	14	13	14	14
19	14	13	14	13	14	17	22	15	17	25	24	31	23	45	28	20	18	14	18	18	14	13	14	14
20	14	20	20	18	14	22		14	20	23	34	45	43	23	22	21	20	14	14	13	14	13	14	18
21	14	15	14	14	17	18	18	15	21	20	44	34	23	44	44	20	17	15	18	14	14	21	14	14
22	21	21	15	14	14	20	23	14	20	20	29	44			48	42	15	14	13	14	14	13	15	13
23	14	14	15	14		14	20	15	17		21	22	29	26	28	30	24	13	18	15	14	14	14	15
24	14	14	14	14	14	14	15	14	13	21	21	23	21	44	22	22	20	13	14	14	14	13	13	14
25	13	13	13	14	13	15	17	14	18	18		33	30	44		20	14	13	25	14	13	14	13	13
26	14	14	14	14	14	14	14	13	18	20	21		23	28	21	22	18	13	18	13	14	14	14	14
27	14	13	14	13	14	15	15	14	15	18	17	23	21	22	18	15	18	14	15	14	15	15	17	14
28	14	15	14	17	13	17	20	14	14	17	43	21	21	23	20	21	25	25	18	14	14	13	13	13
29	13	14	14	20		18	15	14	14	21	23	24	20	21	20	18	20	18	13	13	14	14	14	13
30	13	13	14	13	13	14	15	15	15	20	23	31	31	21	22	22	14	14	13	13	14	14	13	13
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	28	29	29	30	30	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30
MED	14	14	14	14	14	15	17	14	17	20	22	24	23	23	22	20	18	14	15	14	14	14	14	14
U Q	14	15	15	15	14	17	21	15	18	21	27	32	29	33	26	22	20	15	18	14	14	14	15	14
L Q	13	14	14	14	14	14	14	14	14	18	21	22	21	21	20	18	15	13	13	13	14	13	14	14

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HOURLY VALUES OF foF2 AT Yamagawa

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	32	31	34	31		B	29	48	55	54	52	60	72	65	62	64	60	60	58	52	40	40	38	36
2	34	34	34	34	31	28	34	28	54	64	70	63	82	72	67	60		63	64	51	49	31	30	31
3	28	30	30	28	A	B	30	44	54	55	56	57	58	77	75	75	77	65	51	45	42	37	37	36
4	36	37	34	35	N	N	32	54	54	55	58	67	72	71	71	67	64	55	51	48	50	40	45	43
5	40	42	26	28	28	26	34	44	54	57	66	50	82	81	66	58	60	56	55	50	47	44	A	34
6	37	A	34	34	28	25	35	54	55	56	64	65	81	85	66	62	65	56	68	67	50	34	30	30
7	30	29	28	28	B	N	34	48	B	60	60	60	72	A	104	A	A	50	A	81	66	A	A	A
8	31	A	30	35	A	N	36	53	42	A	A	62	71	76	78	75	70	72	78	78	A	A	A	38
9	36	34	31	34	22	N	37	54	55	60	61	70	88	103	A	189	A	A	56	A	A	51	52	52
10	51	47	44	41	35	32	40	50	54	62	65	77	84	87	80	82	82	67	64	54	54	A	40	40
11	41	42	38	34	34	29	40	51	52	54	B	72	87	98	80	71	72	72	72	79	77	A	34	A
12	A	A	A	30	34	29	40	48	54	58	50	74	81	86	100	96	77	66	74	77	54	52	40	38
13	41	40	40	42	42	34	46	54	44	55	67	77	88	94	86	73	72	72	70	83	82	42	32	34
14	34	34	34	34	32	B	38	54	66	57	62	49	80	A	78	85	90	67	67	71	74	50	36	40
15	37	34	38	46	23	N	37	50	54	61	60	78	78	63	68	78	67	51	63	78	67	51	37	41
16	41	A	34	34	A	30	44	53	53	55	61	60	64	72	169	75	66	64	72	75	80	37	A	26
17	28	29	29	31	30	N	38	54	54	45	59	70	75	78	84	90	79	67	63	70	55	50	43	36
18	40	38	36	36	34	N	39	50	52	71	66	50	61	72	82	80	66	A	58	70	54	47	A	40
19	36	31	34	34	59	N	37	50	52	A	52	57	76	73	78	77	69	69	76	67	71	59	32	32
20	34	34	32	32	28	N	34	44	64	50	54	51	45	54	64	65	58	39	58	63	54	39	40	36
21	34	34	34	31	29	26	38	50	51	58	58	55	62	78	80	78	68	60	54	52	44	41	38	38
22	37	36	34	32	30	28	39	48	54	59	65	59	51	50	55	62	65	56	54	52	52	34	43	44
23	40	38	35	35	34	A	39	50	52	51	59	54	64	101	64	66	A	54	51	A	40	40	36	33
24	37	32	34	32	B	B	34	42	54	64	60	N	A	58	60	52	60	67	70	60	51	49	40	42
25	A	40	42	37	30	31	40	29	40	A	60	60	60	66	A	72	70	60	40	72	78	A	A	39
26	38	40	29	34	30	28	42	53	139	54	52	49	56	63	58	58	58	58	55	48	47	40	42	44
27	42	41	40	37	31	B	38	51	51	53	55	52	A	58	60	71	76	66	58	54	51	51	48	48
28	48	43	40	38	34	30	42	53	48	55	54	51	48	52	60	59	44	54	55	51	47	46	42	42
29	40	38	37	34	29	30	45	47	48	56	A	52	56	64	57	58	63	149	A	A	51	34	37	35
30	A	32	31	A	34	31	48	48	A	A	A	57	67	A	72	75	77	85	82	81	53	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	27	26	29	29	23	15	30	30	28	26	26	29	28	27	28	29	26	28	28	27	28	24	23	27
MED	37	35	34	34	31	29	38	50	54	56	60	60	72	72	72	72	68	64	60	67	52	42	38	38
U Q	40	40	37	35	34	31	40	53	54	60	64	68	81	85	80	78	76	67	70	77	66	50	42	42
L Q	34	32	31	31	29	28	34	48	51	54	55	52	60	63	63	62	63	56	55	52	48	38	36	34

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HOURLY VALUES OF fEs AT Yamagawa

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G		B	G	32	34	G	G	G	44	46	G	G	G	33	26	11	G	G	G	G
2	G	G	G	G	G	G	G	33	35	40	38	40	G	47	44	G		G	G	G	11	G	G	G
3	G	G	G	G	34	B	G	39	34	104	43	G	48	G	40	43	38	G	G	11	G	G	G	G
4	G	G	G	G	G	G	G	32	38	42	40	47	45	42	44	G	36	G	G	G	G	G	G	G
5	G	G	G	G	G	G	G	35	42	45	48	G	44	46	41	71	53	52	34	39	55	29	38	G
6	35	36	G	G	G	G	25	137	38	41	43	44	57	44	39	40	42	52	36	34	11	G	G	G
7	G	G	G	G	B	G	G	30	B	38	46	47	47	95	110	80	94	59	70	54	50	53	40	34
8	29	44	29	46	45	29	28	36	49	73	74	47	56	74	65	64	48	44	28	39	57	73	69	34
9	25	34	G	G	G	G	27	40	39	47	48	57	103	86	148	134	117	79	59	65	129	46	39	34
10	24	G	G	G	G	29	24	42	39	43	49	47	46	60	70	44	40	35	27	35	55	48	72	36
11	G	32	58	59	31	G	28	31	42	42	B	50	58	G	70	G	G	34	54	54	56	58	G	34
12	49	48	32	25	G	G	G	30	35	42	46	48	46	46	39	G	41	G	29	28	35	26	34	28
13	G	G	G	G	G	G	G	40	78	41	47	47	40	45	G	43	36	G	G	G	48	40	G	G
14	G	G	G	G	36	B	95	34	40	46	55	51	53	103	115	78	52	51	47	30	43	34	41	30
15	32	G	G	G	28	G	30	39	45	57	51	50	56	63	79	56	91	50	53	48	40	30	G	G
16	25	29	G	G	54	G	25	G	43	37	41	G	42	48	46	G	51	41	57	28	25	24	34	G
17	G	G	G	G	32	G	24	37	39	43	43	47	G	45	G	48	G	35	28	33	29	29	28	27
18	32	35	25	G	20	G	32	35	39	43	44	43	45	45	46	71	53	59	52	39	37	25	35	28
19	28	108	94	46	156	G	28	38	39	78	45	49	46	47	49	39	G	36	44	26	34	60	G	G
20	G	G	G	G	G	G	26	30	34	38	39	48	48	41	44	38	57	47	39	41	G	11	32	G
21	G	G	G	G	G	G	28	179	G	42	48	113	48	41	G	45	41	36	28	20	G	G	G	G
22	G	G	G	G	G	G	31	33	40	39	40	40	41	44	G	G	40	G	33	35	33	G	28	G
23	G	G	G	G	G	26	28	36	40	42	44	48	52	95	58	59	78	60	47	59	30	25	G	G
24	25	24	G	G	B	B	26	39	44	42	46	51	62	49	53	52	44	49	46	40	54	41	40	35
25	49	G	28	35	28	27	37	38	42	46	49	47	44	43	126	51	58	49	50	48	25	108	44	29
26	32	G	G	G	G	G	29	35	G	G	47	46	47	44	50	G	G	159	30	G	27	G	G	G
27	G	G	G	G	G	B	30	39	42	46	48	48	44	45	49	40	45	37	G	27	29	G	G	G
28	G	G	G	G	G	G	34	36	G	42	G	45	G	48	48	44	41	G	G	26	36	G	G	39
29	29	G	G	G	G	G	32	42	44	50	54	57	53	61	45	47	45	111	128	106	46	35	25	33
30	57	G	45	39	G	G	28	40	54	61	57	53	50	97	45	52	48	56	45	61	40	38	59	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	30	30	30	30	27	25	30	30	29	30	29	30	30	30	30	30	29	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	28	36	39	42	46	47	46	46	46	44	44	42	35	34	34	28	26	G
U Q	29	29	G	G	31	G	30	39	42	46	48	50	53	61	65	56	53	52	50	48	48	41	39	34
L Q	G	G	G	G	G	G	G	33	35	41	42	44	44	44	40	G	37	33	27	26	25	G	G	G

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HOURLY VALUES OF fmin AT Yamagawa

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	15		B	15	14	14	14	16	17	20	18	18	17	16	15	16	14	15	14	14	14
2	14	14	15	15	14	14	14	14	14	15	16	20	18	18	21	18		14	20	14	15	15	14	14
3	15	14	15	14	14	B	14	15	14	14	15	21	18	20	22	18	15	15	16	14	14	15	14	15
4	14	14	14	14	14	15	14	14	14	15	15	16	17	16	18	20	20	15	18	15	14	15	14	15
5	14	15	15	14	14	14	14	14	14	14	15	17	20	18	18	14	15	14	14	14	14	14	15	15
6	14	14	15	15	14	14	14	14	14	14	15	15	15	20	18	14	14	14	14	14	14	14	15	15
7	14	14	14	14	B	16	15	14	B	15	15	17	20	18	21	17	15	14	14	14	15	14	14	14
8	14	14	15	14	14	16	14	14	15	17	15	20	20	17	20	20	17	15	15	14	15	14	15	14
9	15	14	14	14	15	15	15	14	14	15	18	18	18	20	18	17	17	15	15	14	14	14	14	14
10	14	18	15	14	15	14	15	14	14	15	18	20	18	18	20	17	16	14	14	14	14	14	14	14
11	15	15	14	15	14	15	14	14	14	15	B	21	20	20	18	18	16	15	14	14	14	14	18	15
12	15	14	14	14	14	14	14	14	14	18	15	16	18	21	18	21	15	14	15	14	14	14	14	14
13	15	14	14	14	14	14	14	14	14	15	18	20	18	18	18	18	16	14	15	14	14	14	14	14
14	14	15	15	14	14	B	14	14	14	15	15	20	20	20	15	18	17	14	14	14	15	14	15	14
15	15	14	14	14	15	16	14	14	14	15	17	18	20	18	18	18	15	14	14	15	14	14	14	14
16	14	15	14	14	14	14	15	14	14	14	17	18	22	22	18	17	15	15	14	14	14	14	14	14
17	14	14	15	14	14	66	17	14	14	15	17	21	15	22	21	17	15	14	14	14	14	14	14	14
18	14	14	14	14	14	15	14	14	14	15	16	18	23	22	22	20	17	15	15	14	14	14	14	14
19	14	14	14	14	15	15	14	14	15	16	15	20	18	18	18	18	18	15	14	14	14	14	14	14
20	14	14	14	14	14	15	17	14	14	15	17	18	20	18	20	16	16	14	14	14	14	14	14	14
21	15	14	14	14	15	14	14	14	14	15	16	18	21	22	21	17	17	14	14	14	14	14	16	14
22	15	14	14	14	14	16	15	14	14	15	18	18	18	22	21	18	17	15	14	14	14	14	14	14
23	14	14	14	15	14	15	14	14	14	15	18	18	22	20	18	18	15	16	14	15	14	15	15	15
24	14	14	14	15	B	B	14	14	14	15	16	20	20	18	20	17	16	14	14	14	14	14	14	14
25	14	14	14	14	16	14	14	14	14	15	18	22	18	18	20	22	15	15	14	14	14	15	14	14
26	14	14	15	14	14	14	15	14	14	15	17	18	21	17	18	18	14	14	15	15	14	14	15	15
27	14	14	14	14	15	B	14	14	14	15	17	17	17	20	20	15	15	15	21	14	14	14	15	14
28	15	14	14	15	14	14	14	14	14	15	15	18	17	24	18	15	15	15	20	14	14	14	14	14
29	15	14	14	15	14	14	14	14	14	15	15	17	20	20	17	15	15	15	14	14	14	14	14	14
30	14	14	14	14	15	15	14	14	14	15	20	17	18	18	18	18	17	14	14	14	14	14	14	14
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	25	30	30	29	30	29	30	30	30	30	30	29	30	30	30	30	30	30	30
MED	14	14	14	14	14	15	14	14	14	15	16	18	19	19	18	18	16	14	14	14	14	14	14	14
U Q	15	14	15	15	15	15	15	14	14	15	17	20	20	20	20	18	17	15	15	14	14	14	15	14
L Q	14	14	14	14	14	14	14	14	14	15	15	17	18	18	18	17	15	14	14	14	14	14	14	14

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HOURLY VALUES OF foF2 AT Okinawa

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	32	34	31	31	B	B	B	44	54	44	57	60	78	75	47	78	60	58	66	56	47	42	34	32
2	34	34	34	34	29	N	29	47	54	62	84	82	87	88	80	70	64	72	74	60	44	28	A	31
3	32	B	31	31	34	B	A	44	54	58	58	70	80	91	91	189	84	75	56	50	43	41	37	40
4	36	36	35	34		B	28	51	65	64	62	72	86	98	104	101	74	58	55	51	54	43	42	42
5	40	40	34	28	N	N	28	45	55	65	71	87	91	94	91	70	71	67	64	54	45	43	43	A
6	A	36	34	32	N	B	30	51	54	65	72	78	87	97	90	74	74	72	86	82	64	A	N	26
7	26	B	B	26		N		51	53	61	57	64	76	87	97	92	78	68	72	86	A	A	A	28
8	29	30	34	39	23	A	30	54	53	65	65	A	77	86	96	85	77	80	86	102	50	A	A	A
9	A	28	26	37	A	A	34	52	54	64	66	76	87	97	107	106	84	80	77	84	A	A	A	46
10	47	42	A	49	34	30	34	51	54	62	66	85	94	100	91	95	98	72	67	A	54	A	38	44
11	46	39	47	49	N	N	34	50	55	56	61	80	96	110	105	78	82	100	111	108	63	A	A	38
12	40	38	A	A	32	26	35	48	54	57	66	80	97	110	126	118	101	90	91	98	87	52	61	63
13	65	67	60	67	48	34	40	48	54	58	71	86	100	106	111	104	85	82	87	100	107	34	30	30
14	31	31	34	34	28	A	34	53	51	57	64	72	87	101	98	104	97	95	96	106	89	52	50	42
15	42	42	52	50	B	A	32	50	54	60	70	76	82	72	85	95	74	64	72	88	72	47	44	42
16	42	42	41	39		25	A	A	54	58	71	66	73	169	91	87	86	85	84	90	78	23	36	34
17	32	34	34	39		A	30	51	54	64	65	78	86	96	102	110	87	70	70	84	80	49	44	36
18	40	37	34	34	28	A	35	50	58	72	56	A	66	87	95	100	94	74	65	67	65	47	A	36
19	36	36	31	36	A	A	A	50	54	55	58	67	82	85	91	105	91	90	90	78	46	38	34	29
20	34	32	59	49	B	B	29	65	57	54	51	54	54	64	77	77	80	42	60	A	52	51	38	40
21	38	31	34	32	B	N	32	50	59	64	65	62	84	101	101	98	91	75	63	58	53	43	34	37
22	40	40	32	32	30	28	37	49	51	64	72	57	54	61	67	67	68	60	55	54	54	47	43	41
23	37	36	37	37	B	B	34	47	53	60	57	64	70	78	90	104	106	72	54	44	40	38	36	34
24	A	32	29	A	B	A	34	47	50	68	60	55	62	70	72	77	78	78	75	70	58	50	64	A
25	41	A	42	59	N	B	35	43	50	55	57	A	A	A	84	90	98	94	88	96	88	47	35	36
26	A	34	35	31	N	B	37	52	55	55	48	58	71	87	81	72	62	57	66	50	51	48	47	40
27	42	38	36	32	28	B	35	47	54	54	54	54	57	61	80	90	87	78	63	52	51	44	48	49
28	48	42	42	40	40	30	37	65	51	60	64	52	55	56	64	68	68	62	57	52	45	48	59	40
29	37	37	34	31	31	29	38	46	42	51	54	55	56	69	68	71	80	72	62	63	A	A	A	A
30	A	31	A	30	B	26	41	47	A	A	A	A	77	90	101	111	118	123	111	91	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	25	27	26	28	12	8	25	29	29	29	29	26	29	29	30	30	30	30	30	28	26	22	21	25
MED	38	36	34	34	30	28	34	50	54	60	64	68	80	88	91	91	83	73	71	74	54	46	42	38
U Q	42	40	41	39	34	30	36	51	54	64	68	78	87	99	101	104	91	82	86	90	72	48	47	42
L Q	33	32	34	31	28	26	30	47	53	55	57	58	68	73	80	77	74	67	63	54	47	41	35	33

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HOURLY VALUES OF fEs AT Okinawa

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	B	B	B	29	35	40	G	G	G	46	G	44	43	38	28	G	G	G	G	G
2	G	G	G	G	G	G	G	32	38	37	44	G	47	44	44	41	42	35	48	11	11	24	24	G
3	G	B	G	G	11	B	24	31	34	36	47	41	46	49	47	46	G	G	G	21	G	26	G	G
4	G	G	G	G	G	B	G	60	116	36	45	G	48	52	46	G	G	33	48	G	24	G	G	G
5	G	G	G	G	G	G	G	34	43	44	48	45	G	G	G	43	G	G	G	30	25	G	25	44
6	46	G	G	G	G	B	25	36	42	41	156	G	53	46	54	43	49	47	56	55	46	30	G	G
7	131	B	B	G	G	G		30	38	43	51	46	59	53	59	70	67	59	42	37	89	57	26	25
8	29	25	35	29	41	58	28	33	45	145	76	72	65	54	53	60	38	39	G	23	58	32	49	40
9	69	G	28	32	31	119	G	38	38	43	44	54	78	61	52	38	45	42	30	56	81	144	55	26
10	34	35	56	G	G	G	G	32	39	42	48	47	53	54	52	52	44	43	46	76	42	59	29	G
11	24	33	90	29	G	G	28	33	36	40	44	G	51	57	64	53	G	G	40	46	40	41	60	28
12	26	28	50	38	G	G	G	G	35	38	48	48	49	52	54	G	G	G	G	27	45	28	G	29
13	26	G	34	26	23	G	G	32	40	41	47	48	47	45	42	40	45	48	50	33	25	29	G	G
14	110	G	27	G	32	54	113	48	38	37	109	46	59	66	59	55	47	40	109	34	33	35	G	G
15	35	35	46	47	B	105	24	30	38	46	50	52	57	52	61	74	84	36	38	39	24	34	49	G
16	27	G	29	25	G	G	113	72	37	47	40	44	48	50	46	44	G	G	60	59	46	33	G	28
17	25	25	G	G		32	G	33	35	47	44	46	46	49	53	46	56	69	53	46	50	34	G	26
18	25	G	25	24	26	45	25	40	35	46	45	56	48	74	47	46	39	35	36	24	22	G	28	40
19	27	27	G	43	36	35	36	40	65	41	56	49	53	46	52	43	G	43	33	32	45	46	G	G
20	G	G	G	G	B	B	G	G	34	49	47	50	49	50	54	53	50	50	37	64	34	25	G	G
21	G	25	G	G	B	G	25	35	39	44	49	50	47	46	41	G	G	G	G	24	31	G	G	G
22	G	G	G	G	G	G	G	G	40	42	39	46	64	49	44	44	41	38	G	24	28	28	24	G
23	26	G	G	G	B	B	G	42	46	44	52	50	44	48	G	G	40	34	34	30	32	G	G	G
24	34	24	26	26	B	37	25	36	40	50	48	67	48	47	44	G	G	38	40	25	24	G	59	36
25	30	35	G	G	35	B	23	34	40	50	114	110	83	95	49	44	50	42	36	G	19	G	G	30
26	57	27	26	G	G	B	G	31	41	G	44	47	48	G	44	48	46	45	34	35	26	G	G	G
27	G	G	G	G	G	B	24	38	41	52	46	46	46	44	49	46	59	42	71	46	29	39	G	G
28	G	G	G	G	G	G	28	34	38	51	78	G	48	47	G	45	G	34	G	32	29	35	25	25
29	30	25	G	G	G	G	26	60	46	161	51	52	52	48	G	46	44	48	43	37	109	60	116	69
30	39	24	54	G	B	G	24	41	57	69	68	71	70	61	51	52	54	44	56	60	156	59	60	38
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	30	22	21	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	26	G	G	G	G	G	24	34	39	44	48	47	48	49	48	44	42	38	38	32	32	30	G	G
U Q	34	26	31	26	26	41	25	40	42	49	52	52	57	54	53	52	49	44	48	46	46	39	29	29
L Q	G	G	G	G	G	G	G	31	37	40	44	44	47	46	44	41	G	34	28	24	24	G	G	G

HOURLY VALUES OF fmin AT Okinawa

APR. 2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	B	B	B	14	14	14	18	20	20	21	17	18	17	14	14	15	14	14	14	14
2	14	14	14	14	14	15	14	14	14	14	15	18	23	23	21	21	14	14	16	14	14	16	14	14
3	15	B	14	15	14	B	15	14	14	14	15	16	18	18	16	22	16	14	18	17	14	14	15	14
4	15	14	14	14	66	B	14	14	15	14	16	20	17	18	16	14	15	14	14	14	14	14	14	14
5	14	14	15	14	14	16	18	14	14	14	15	20	20	20	20	17	14	14	14	14	14	14	14	14
6	14	15	14	14	14	B	14	14	14	14	17	18	18	18	15	16	14	14	14	15	14	14	17	15
7	14	B	B	14	17	14		15	14	14	16	17	17	18	20	17	14	14	14	14	14	14	14	15
8	14	14	14	14	15	14	15	14	14	14	17	21	21	18	23	17	17	14	14	14	14	14	14	14
9	14	15	15	14	14	112	16	15	14	14	18	18	20	18	17	18	14	14	14	14	14	15	14	14
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12	14	15	14	14	15	14	14	14	14	14	17	18	18	21	20	34	15	14	14	14	14	14	14	14
13	14	14	14	14	15	14	15	14	14	15	17	17	20	23	21	18	16	14	14	14	14	15	14	14
14	16	14	15	15	14	16	14	14	14	16	18	21	21	20	23	22	15	15	14	14	14	14	16	15
15	14	14	15	14	B	56	15	14	14	14	17	18	23	21	22	16	15	14	14	14	14	14	14	14
16	14	15	14	15	20	15	14	14	14	14	17	17	21	20	18	17	15	14	14	14	14	14	18	14
17	14	15	14	15		14	14	14	14	15	18	18	20	22	18	17	14	14	14	14	14	15	17	14
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19	14	14	15	14	14	15	14	14	14	14	16	18	21	18	18	16	16	14	14	14	14	14	15	17
20	18	14	18	14	B	B	15	14	14	17	21	21	20	20	21	21	17	14	14	14	14	15	14	16
21	14	15	14	15	B	15	15	14	15	15	17	20	20	20	18	18	14	14	14	14	14	14	15	14
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23	14	14	14	14	B	B	15	14	14	14	20	17	18	20	17	17	18	14	14	14	16	15	20	14
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25	14	14	17	15	15	B	16	15	14	14	14	20	18	17	21	20	14	14	14	15	14	38	15	14
26	14	14	17	14	15	B	15	14	14	17	17	20	20	23	21	17	16	14	14	14	14	14	15	26
27	14	15	15	15	15	B	15	14	14	14	17	18	18	17	20	18	17	14	14	14	14	14	14	17
28	14	15	14	15	15	14	17	14	14	17	16	23	20	18	20	20	17	15	14	14	14	14	14	15
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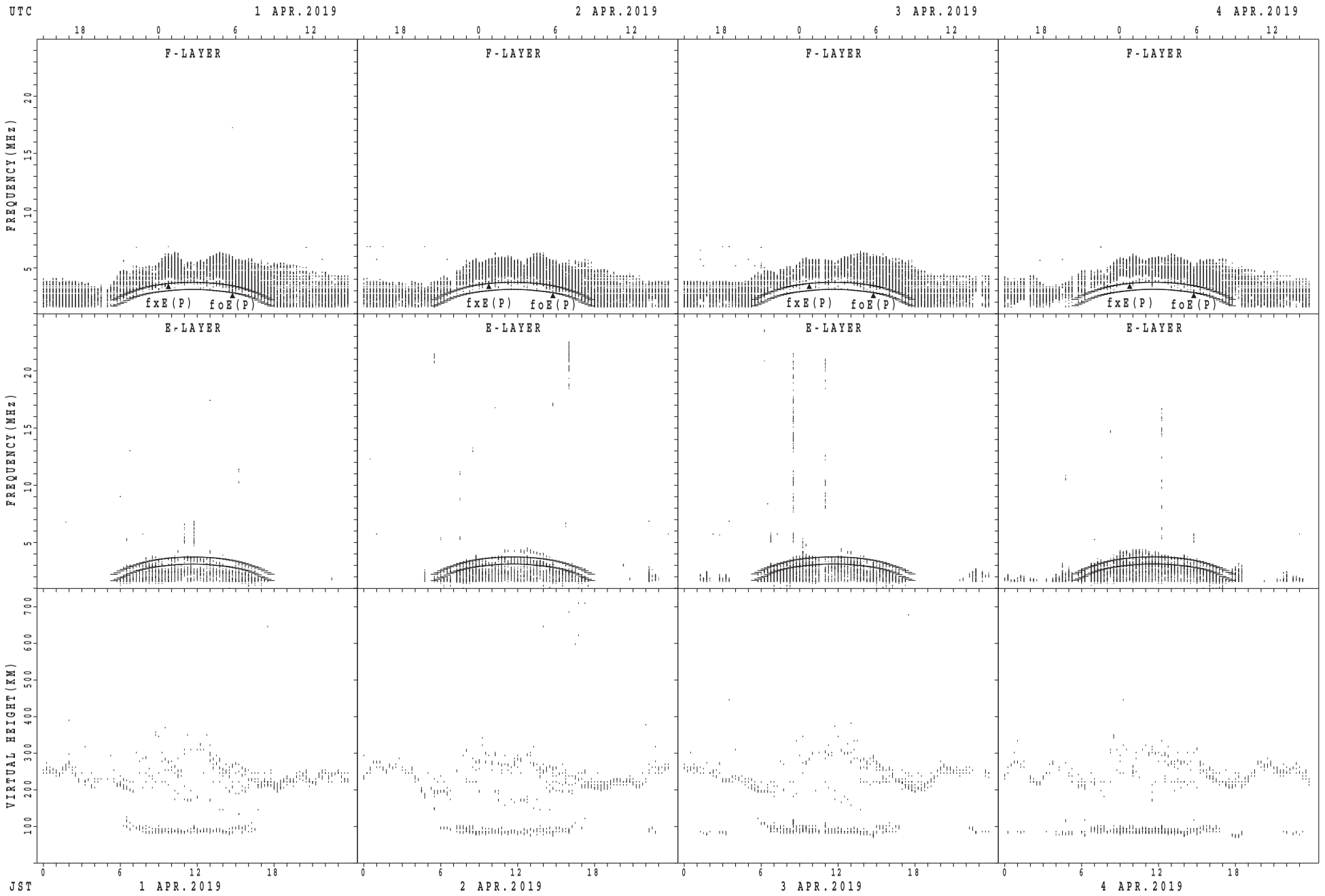
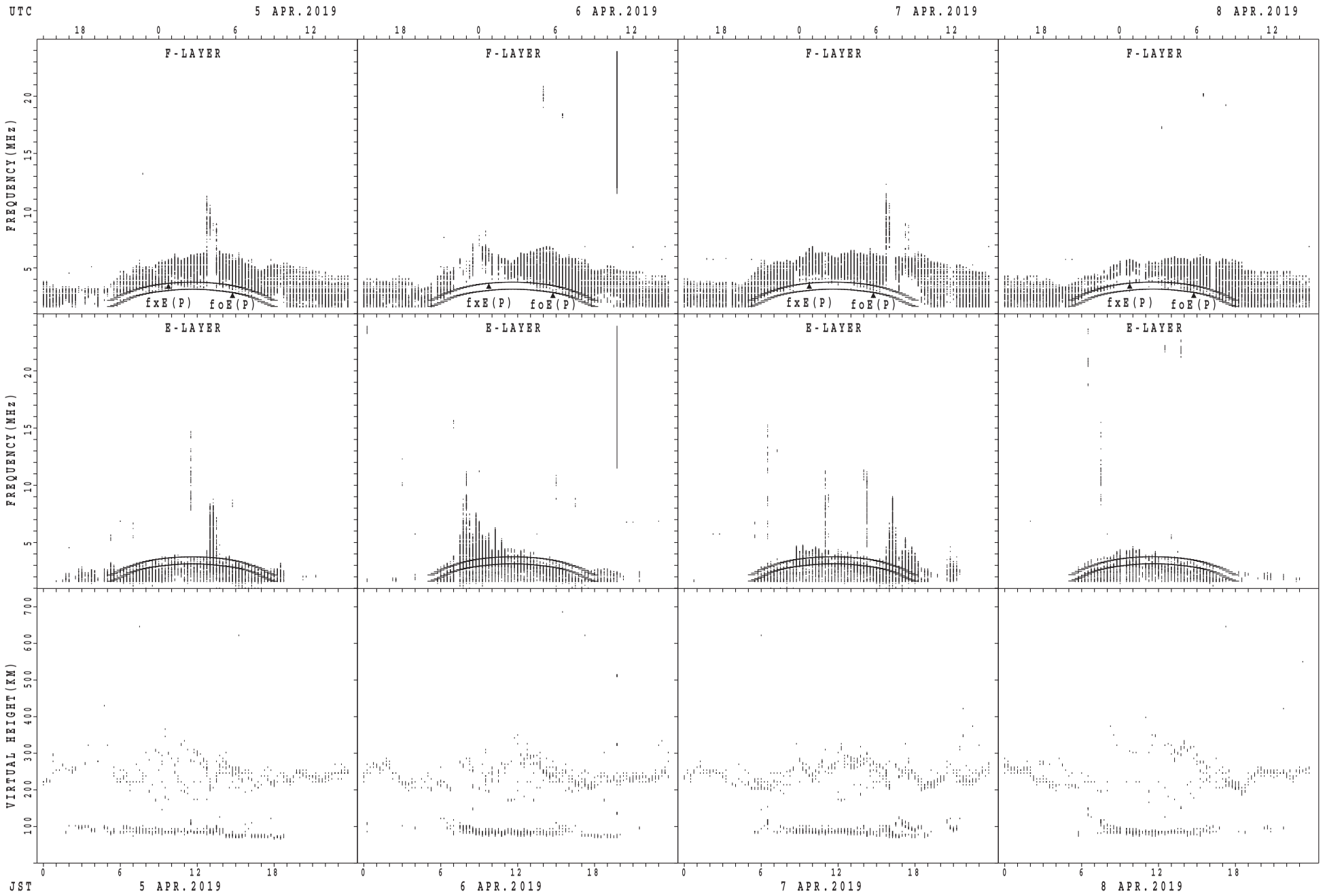
30	14	15	14	14	B	14	15	14	14	15	17	17	20	21	18	29	18	14	14	14	15	14	14	14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	30	22	21	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	14	14	14	15	14	15	14	14	14	17	19	20	20	20	18	15	14	14	14	14	14	14	14
U Q	14	15	15	15	15	15	15	14	14	15	18	20	20	21	21	20	17	14	14	14	14	15	15	15
L Q	14	14	14	14	14	14	14	14	14	14	16	18	18	18	18	17	14	14	14	14	14	14	14	14

SUMMARY PLOTS AT Wakkanai



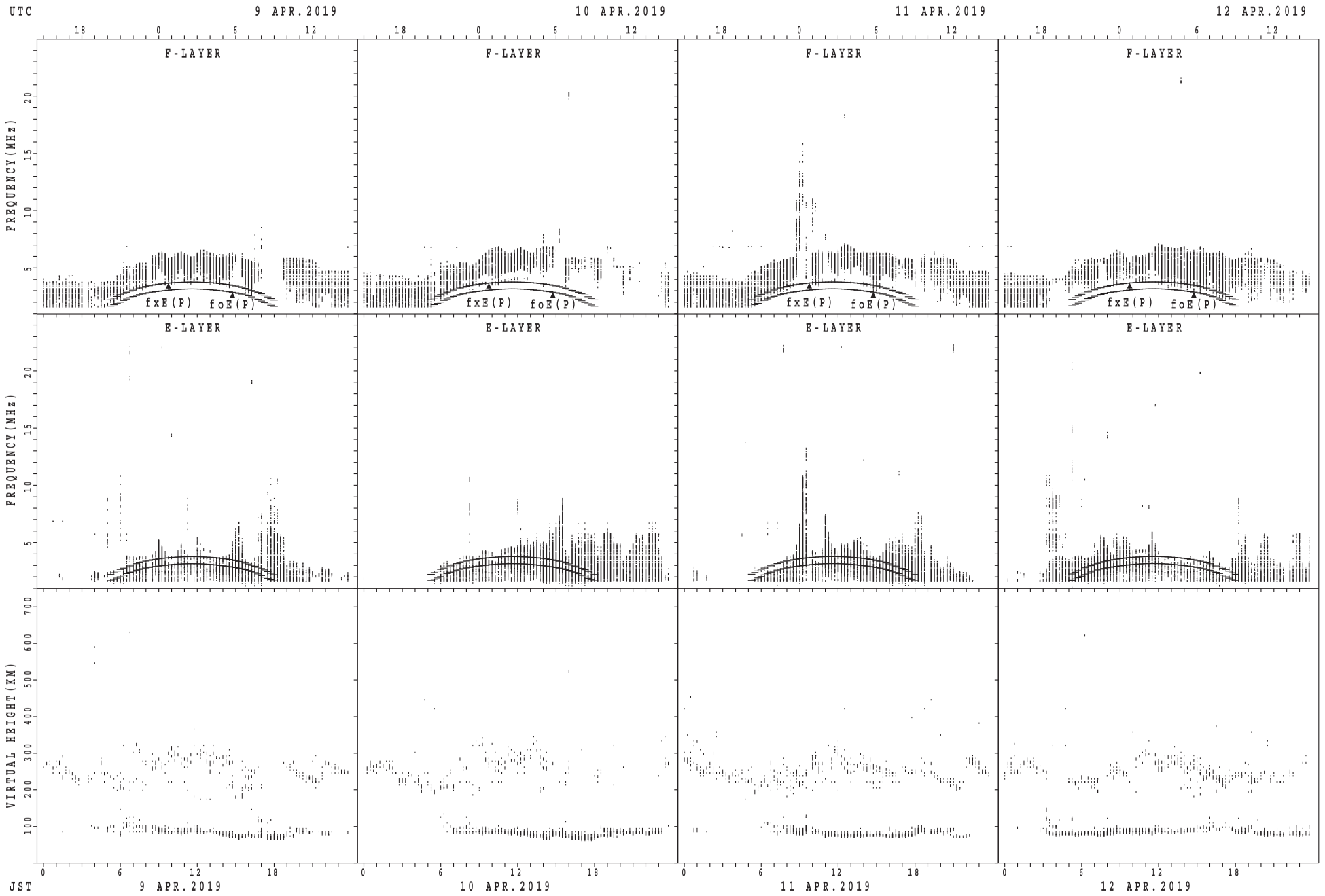
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



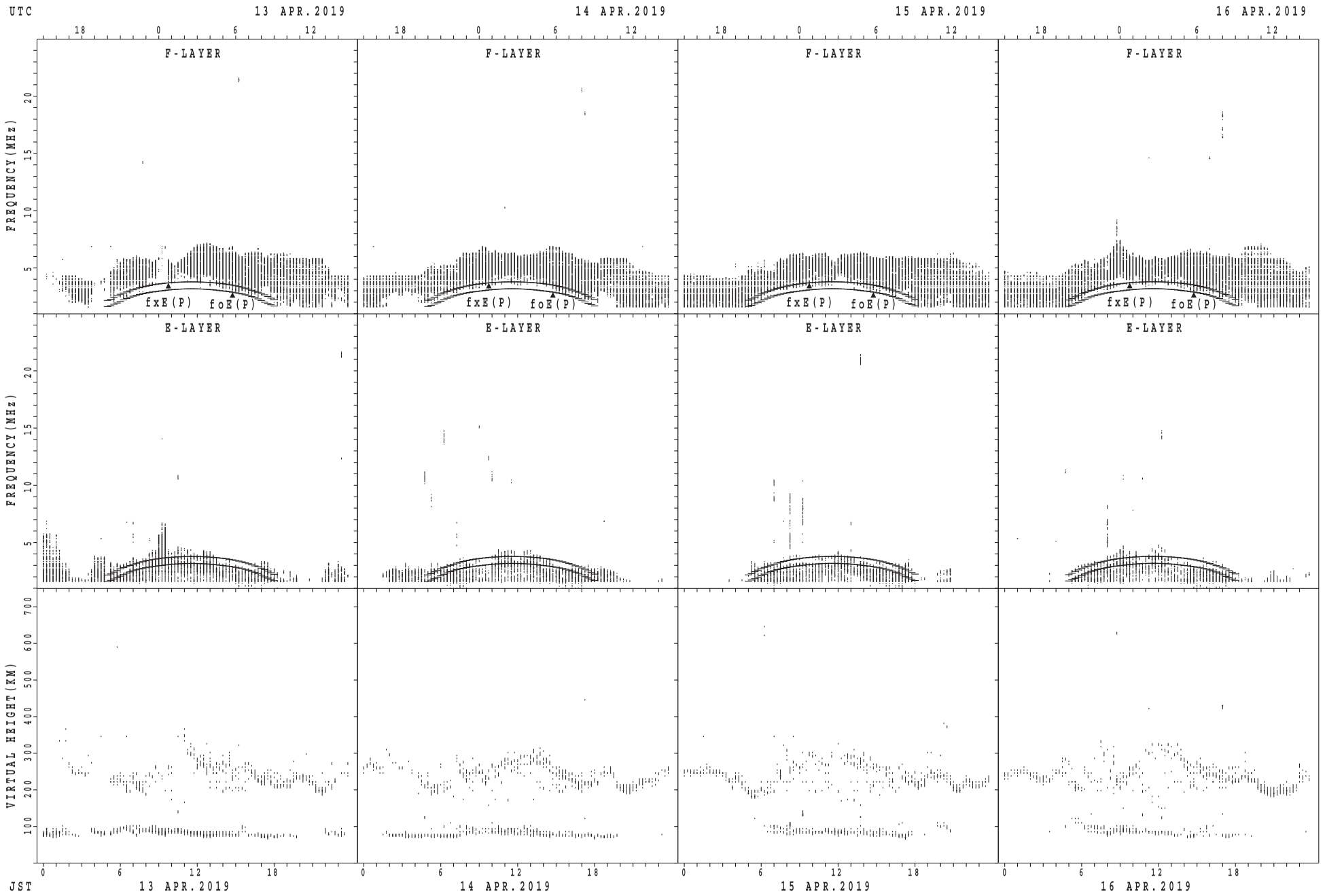
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



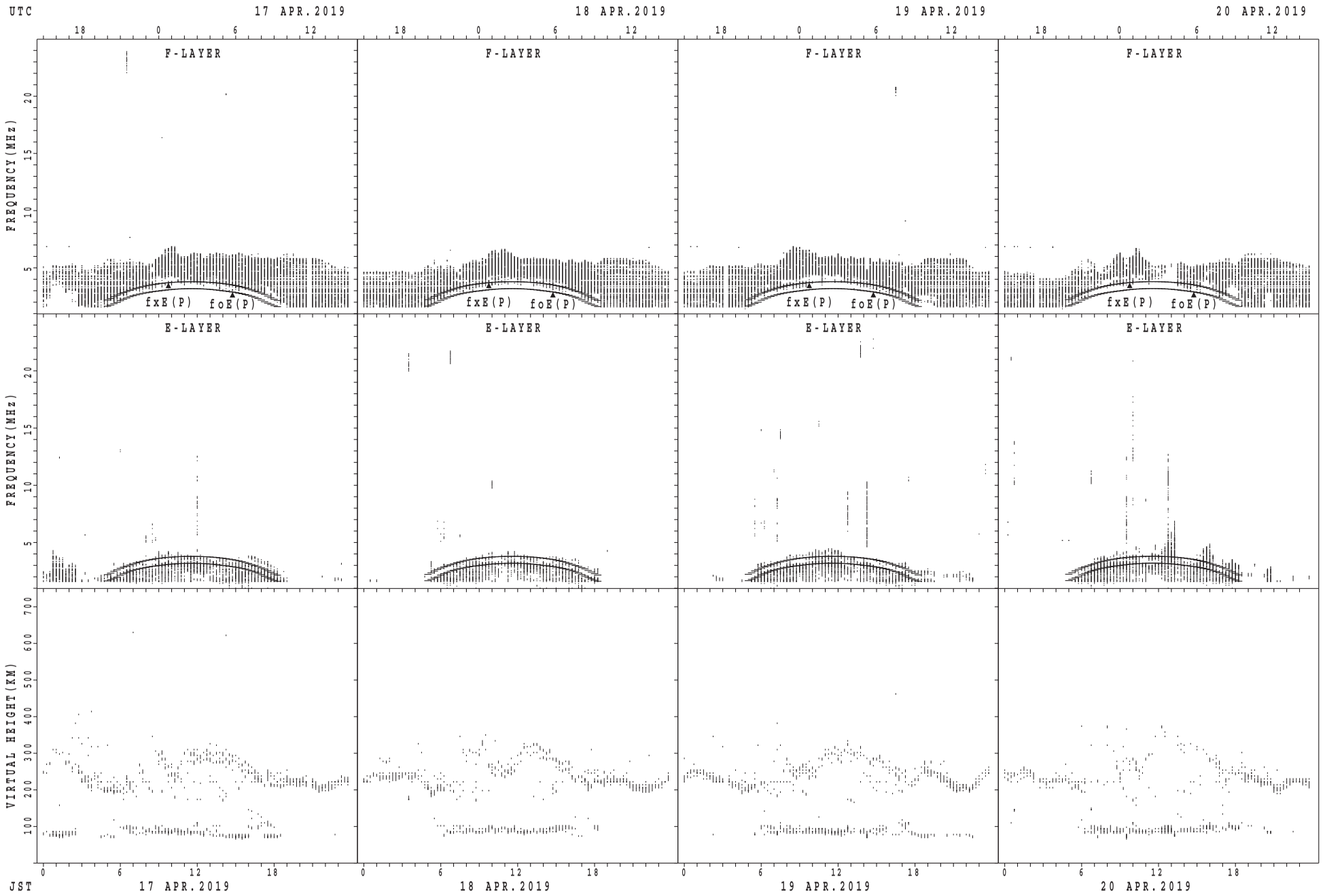
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



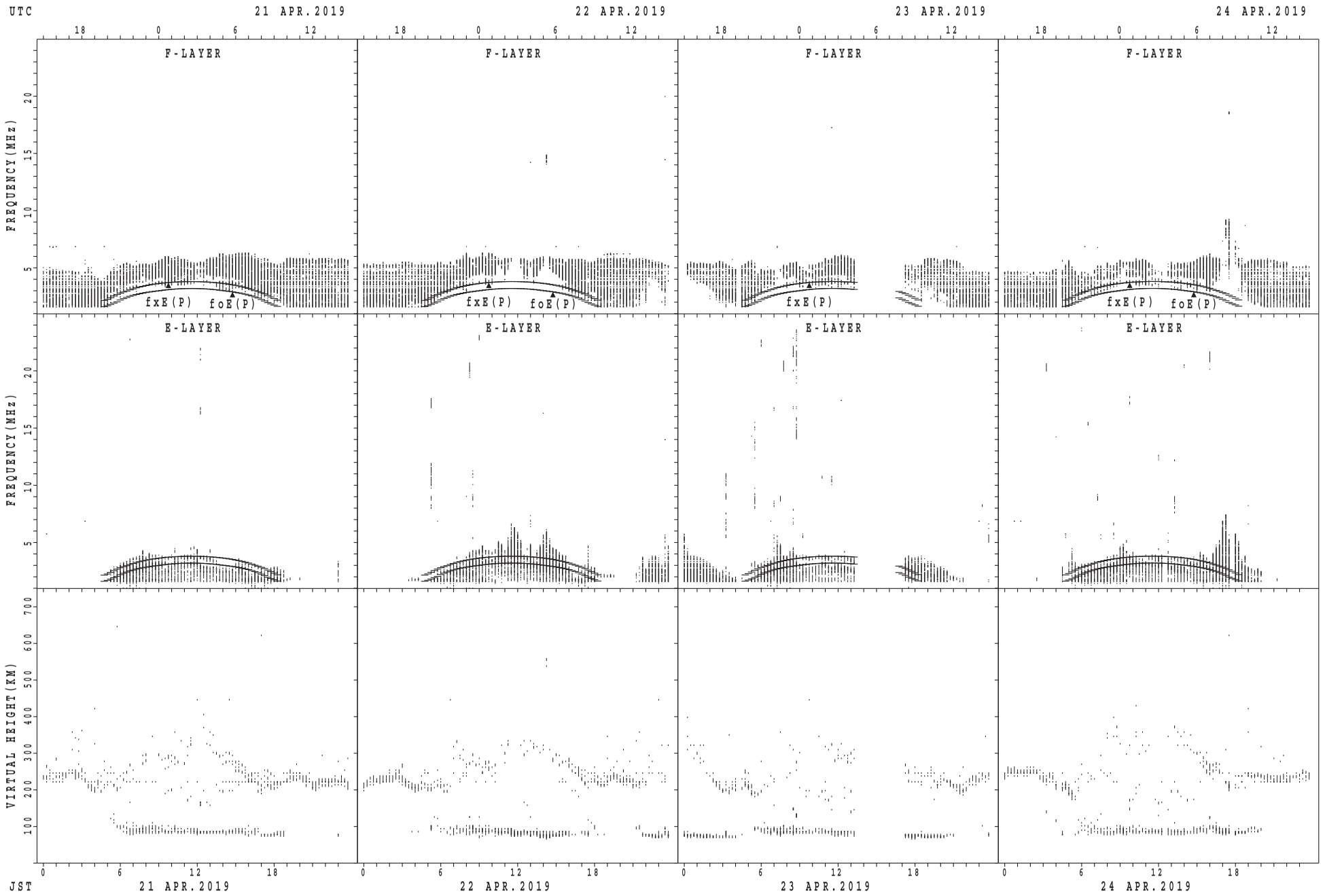
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



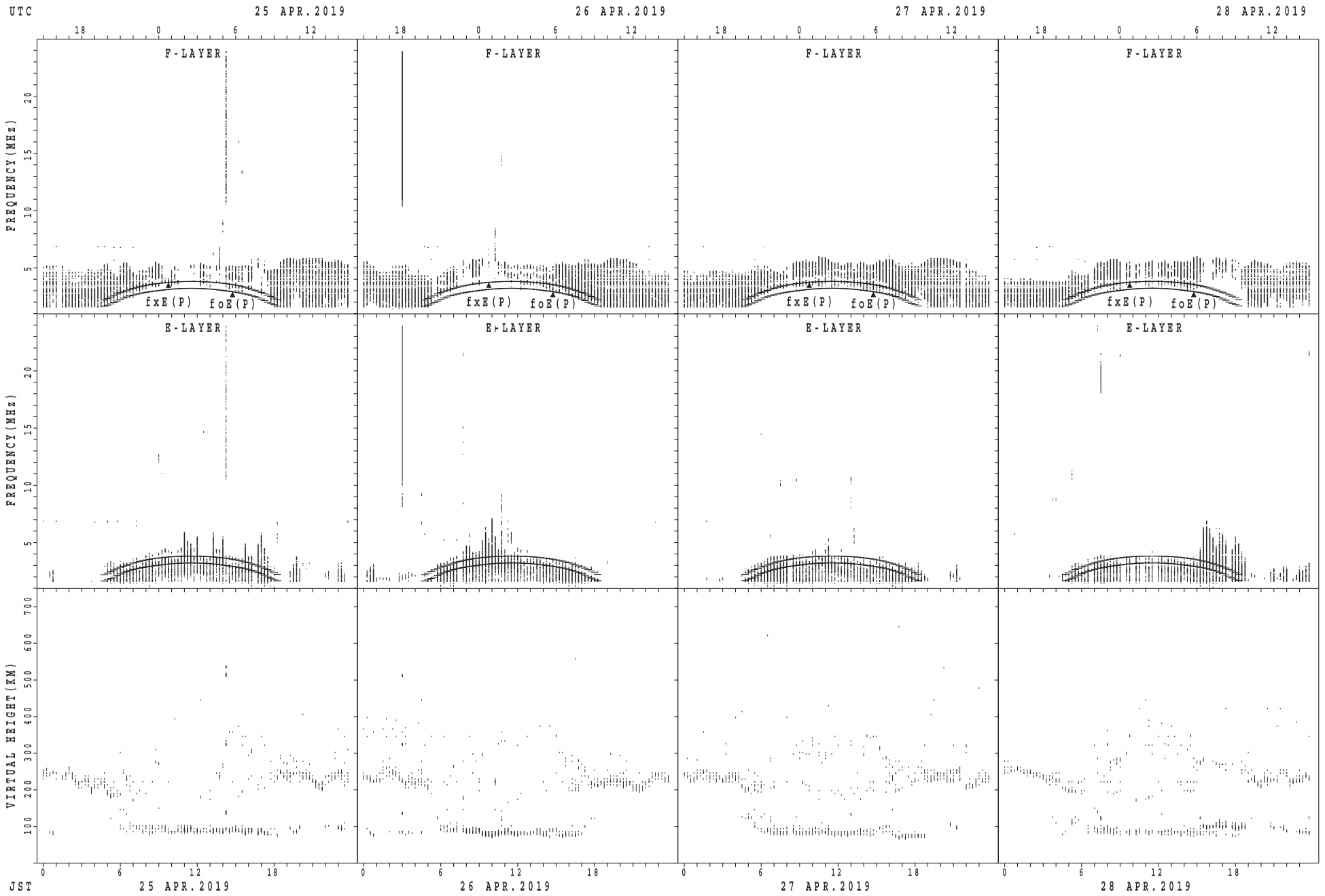
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



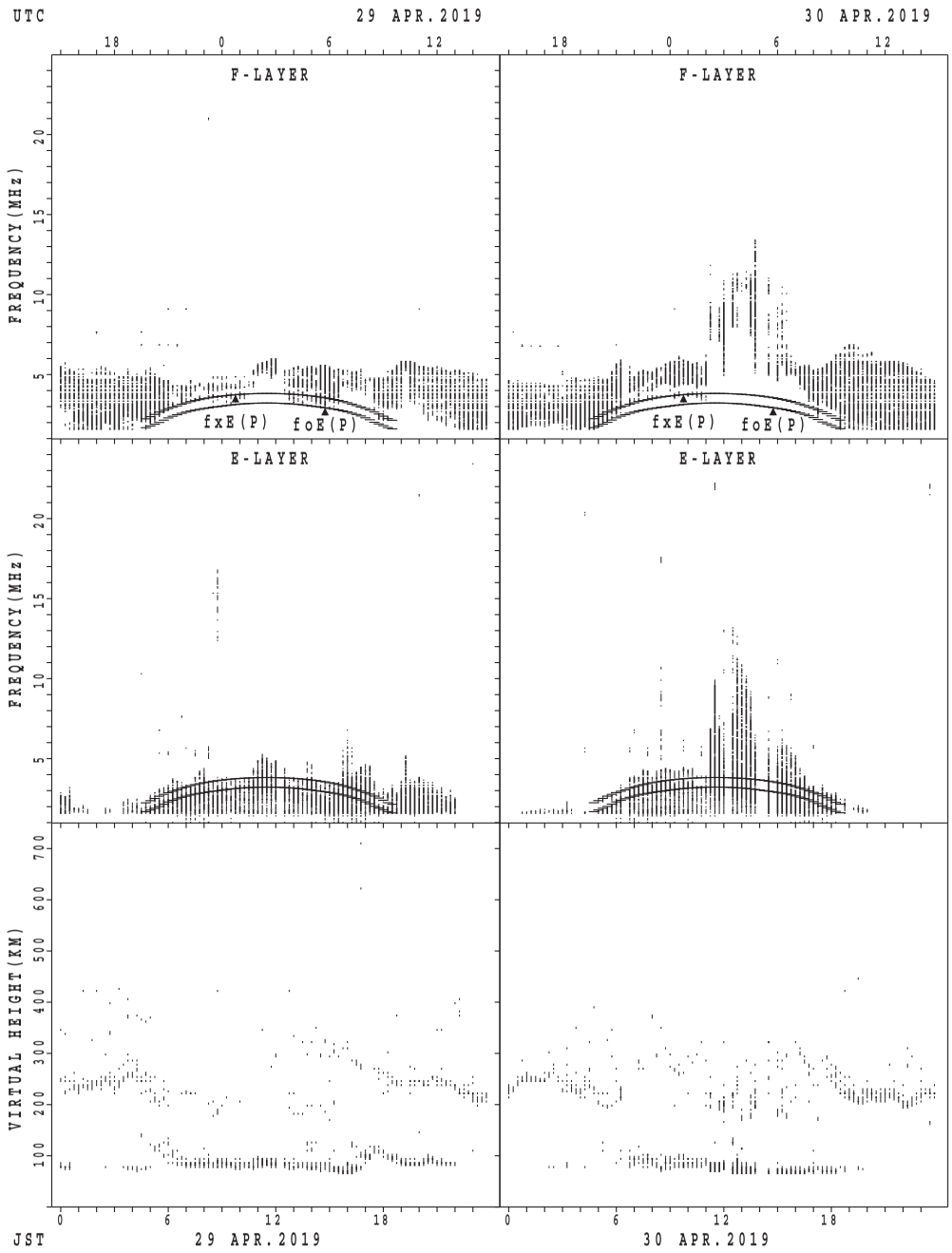
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



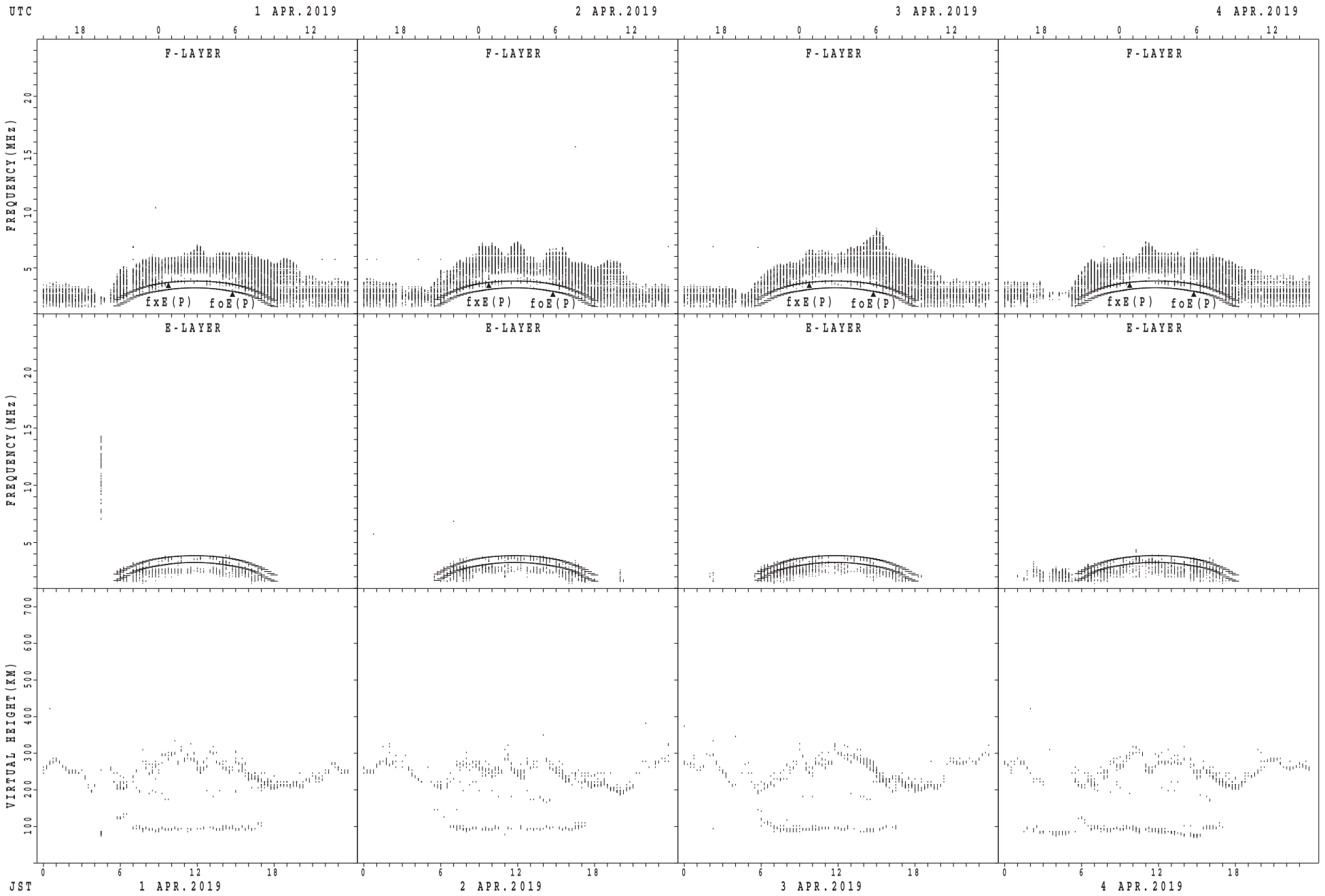
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



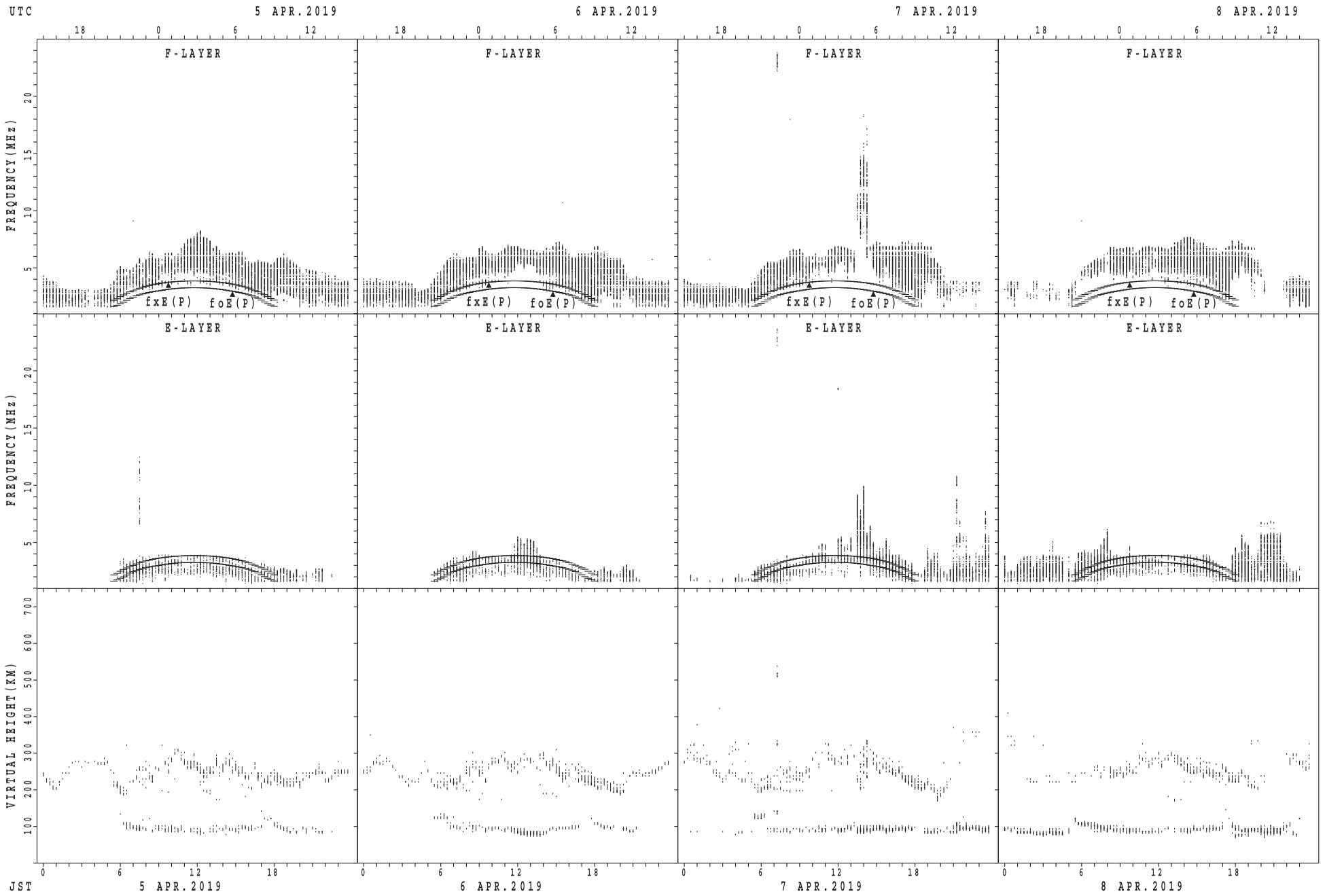
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



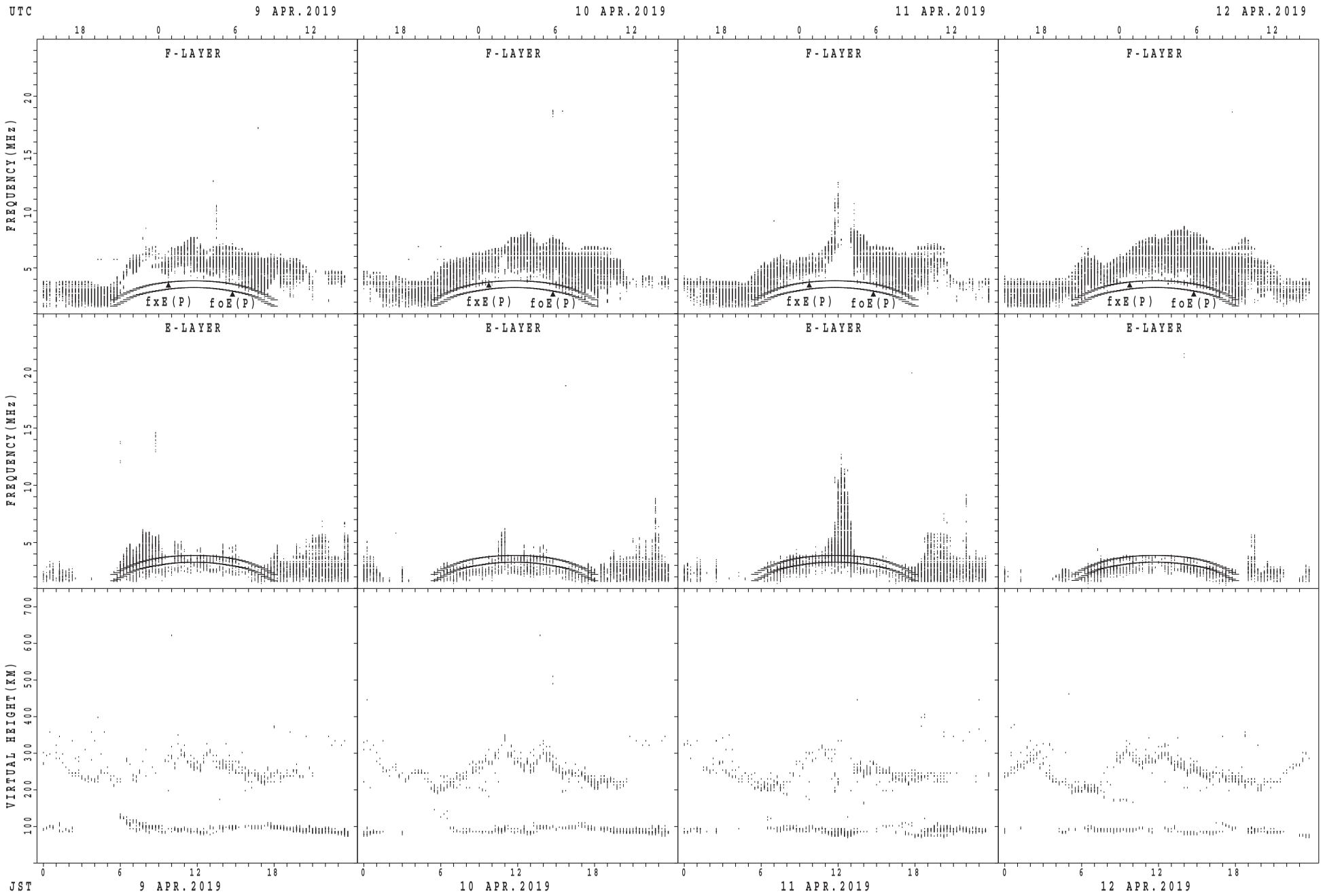
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



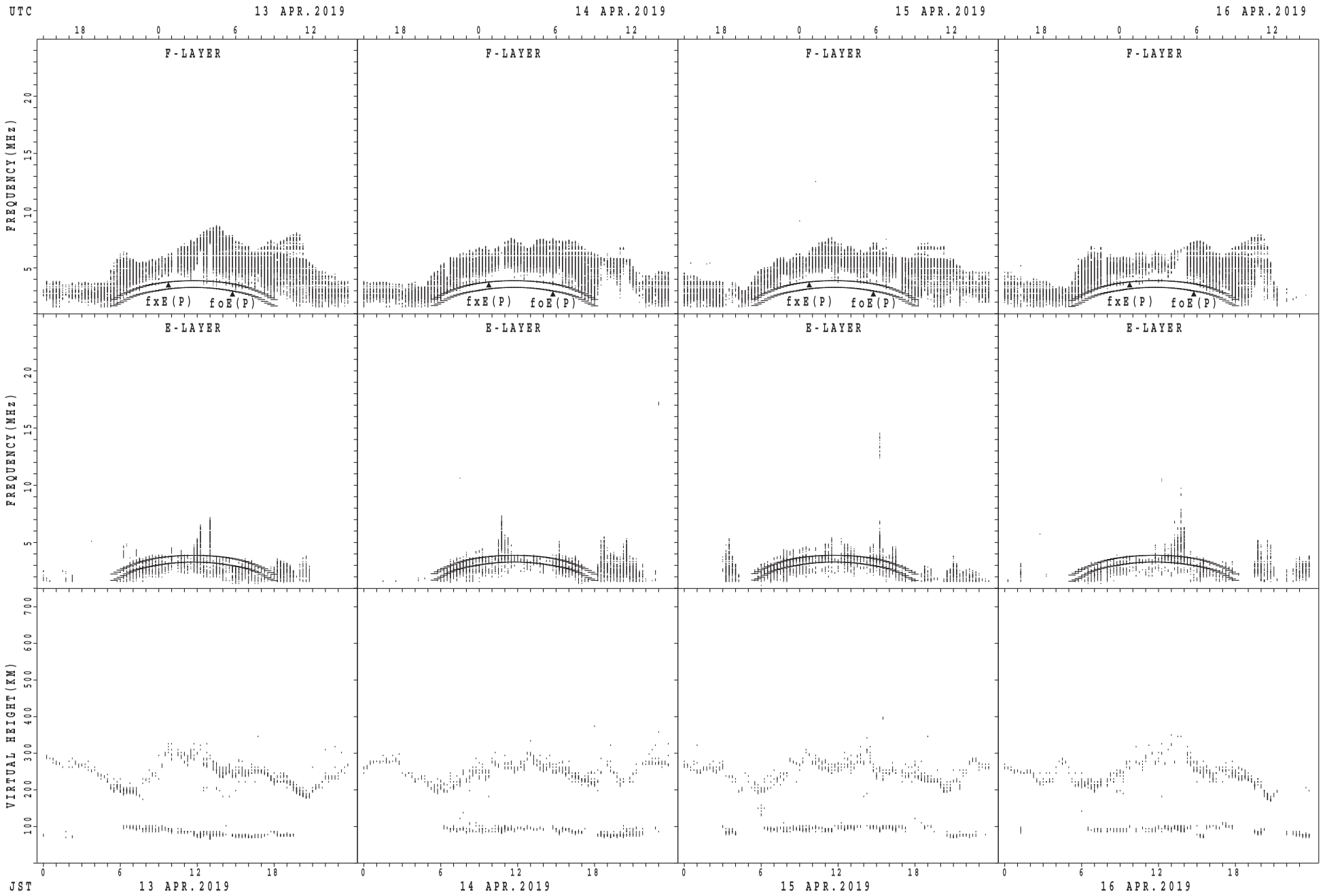
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



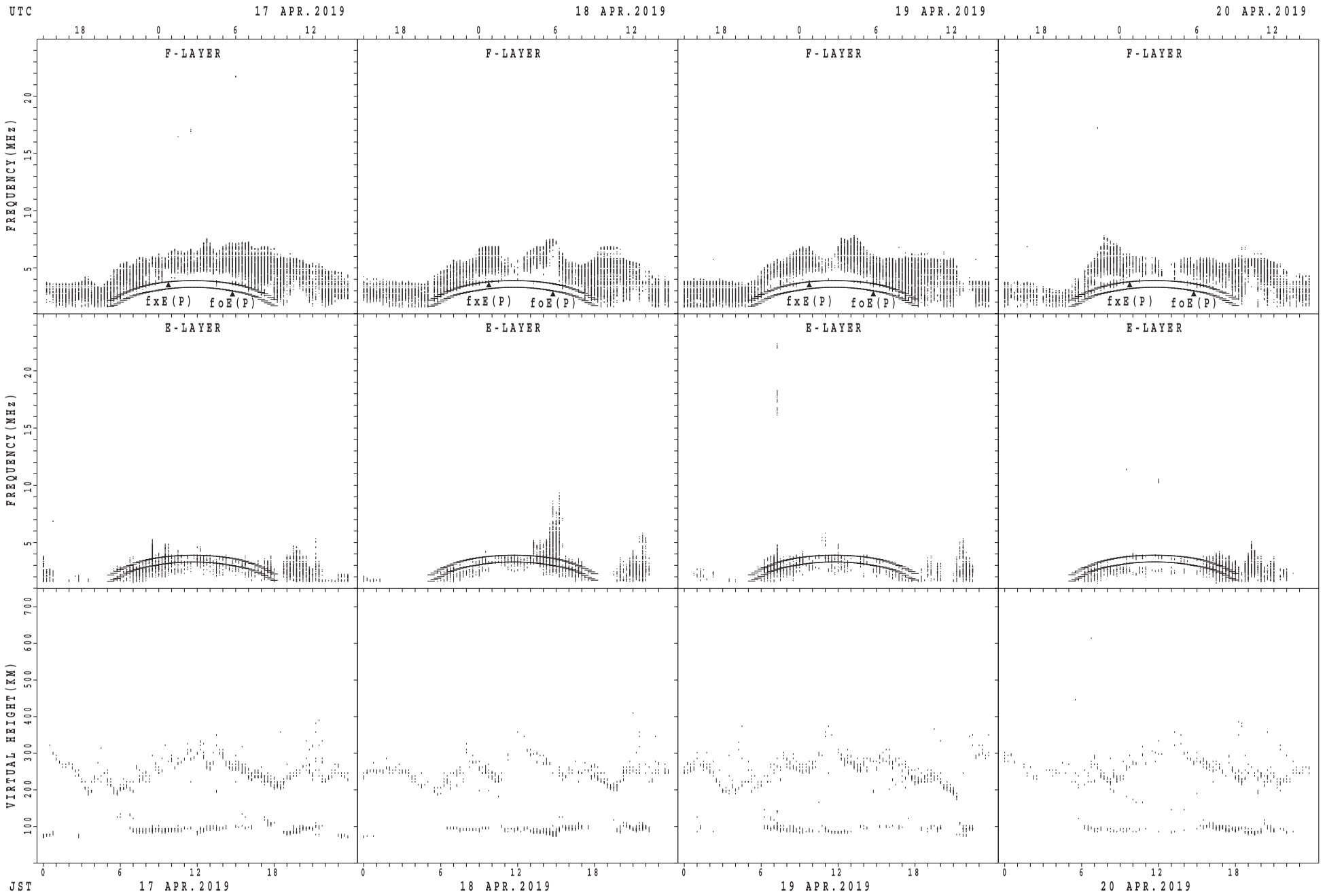
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



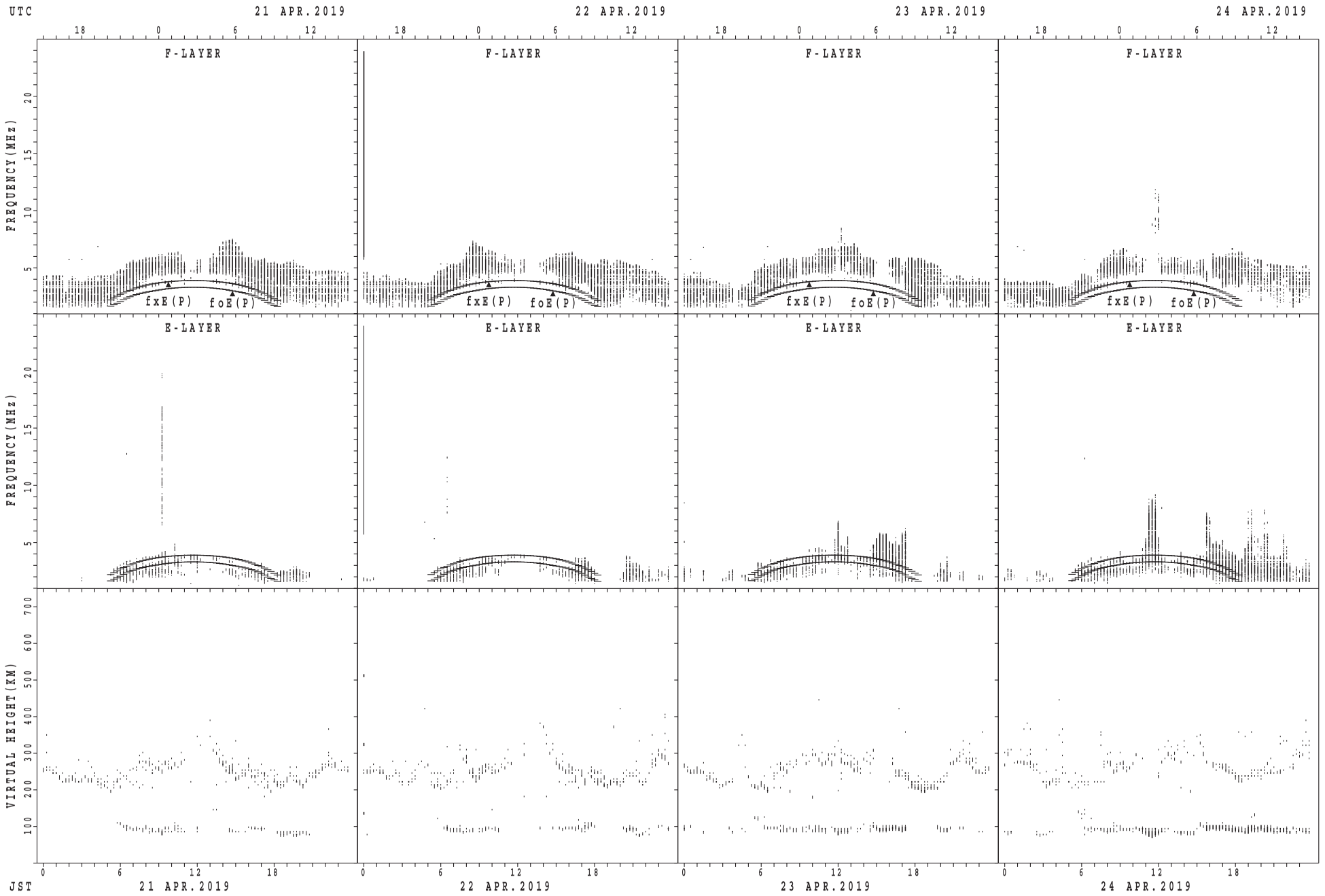
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



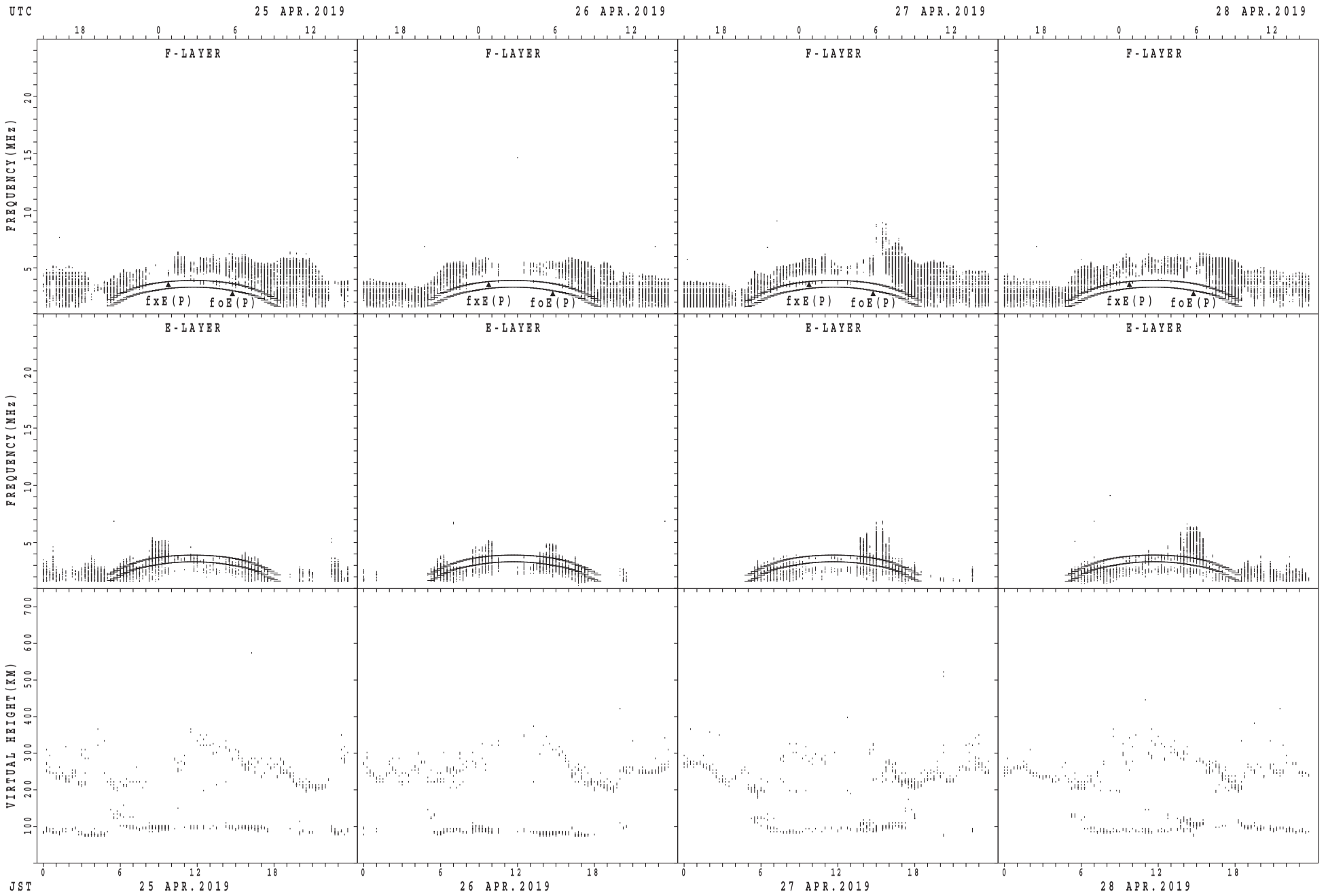
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



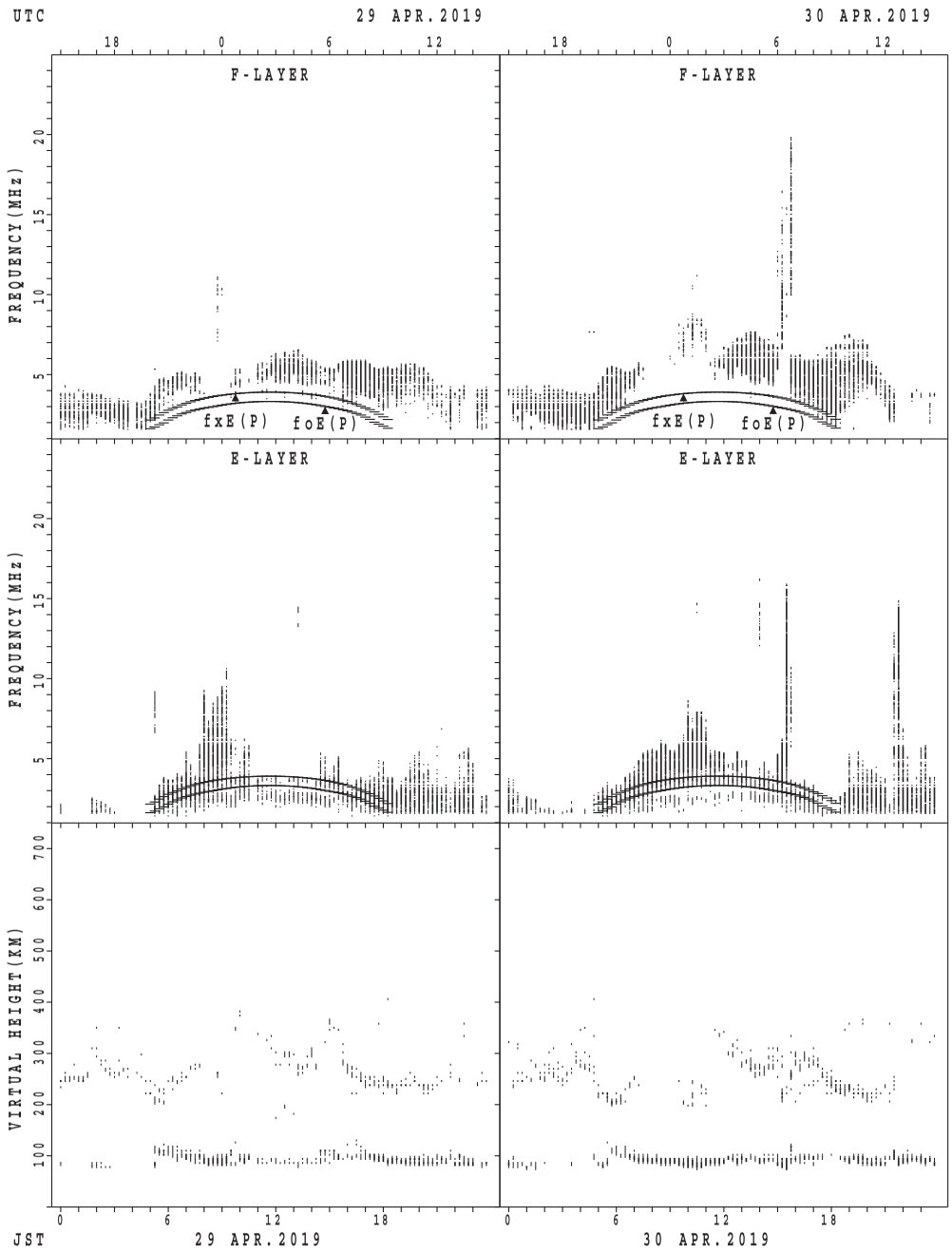
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



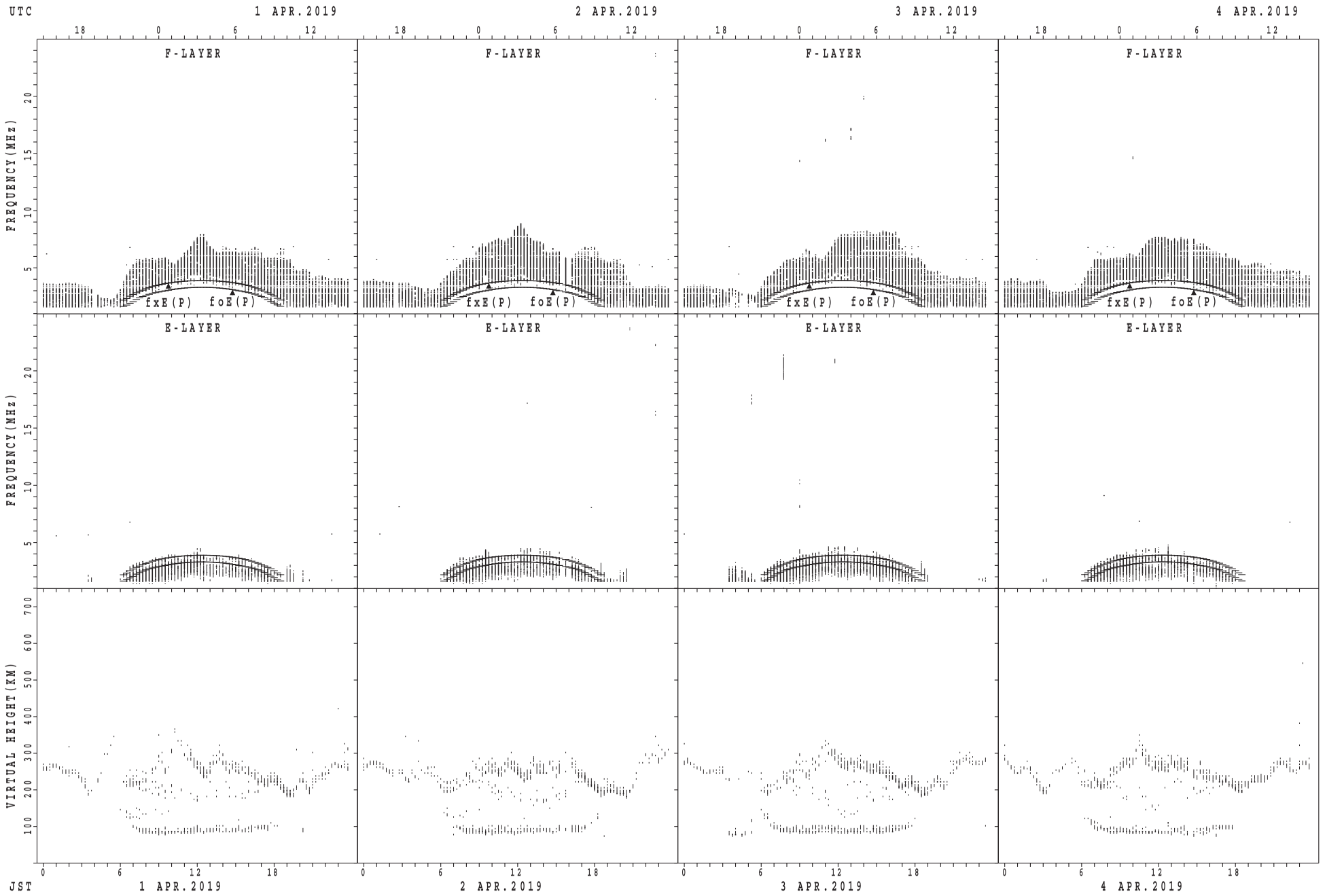
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



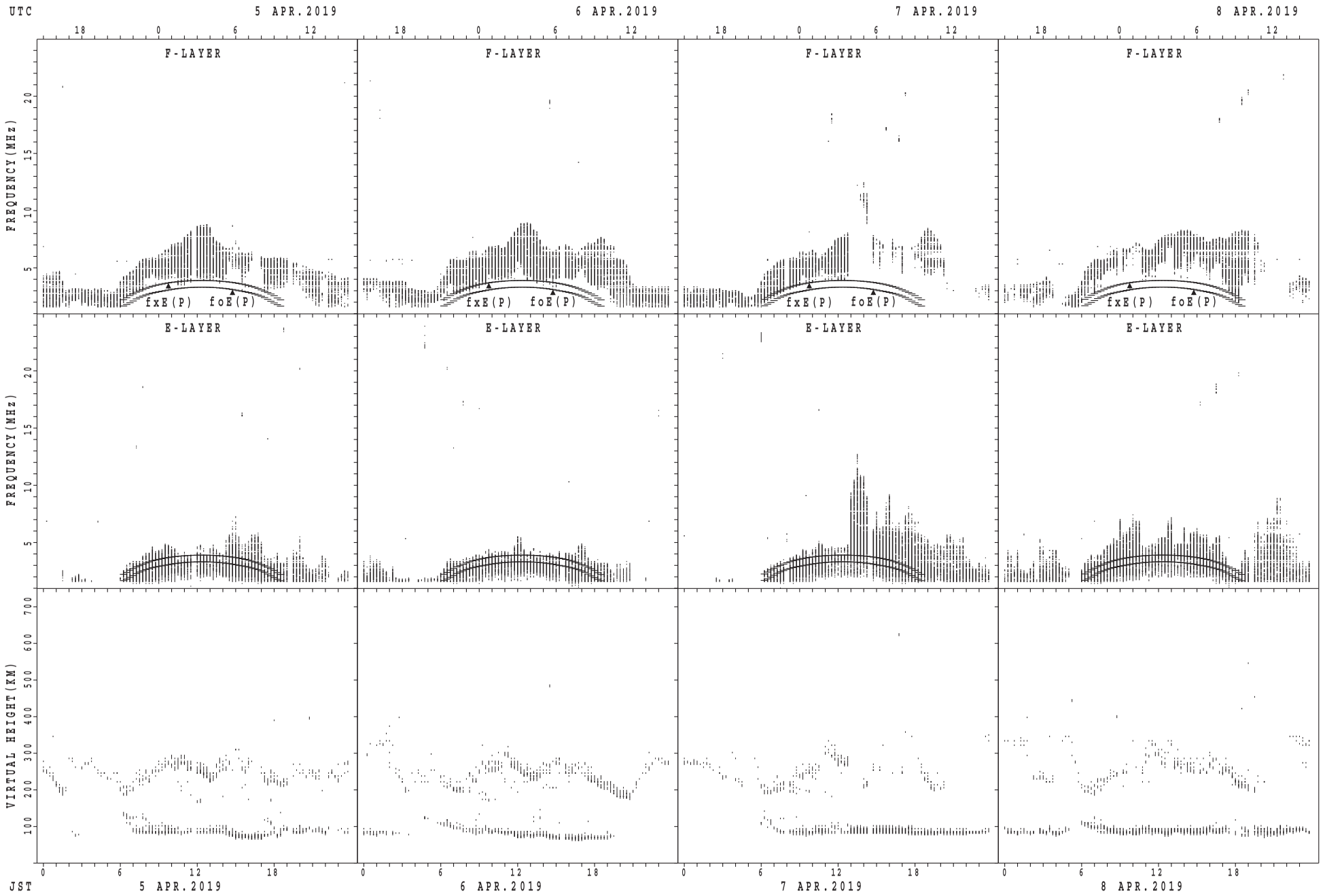
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



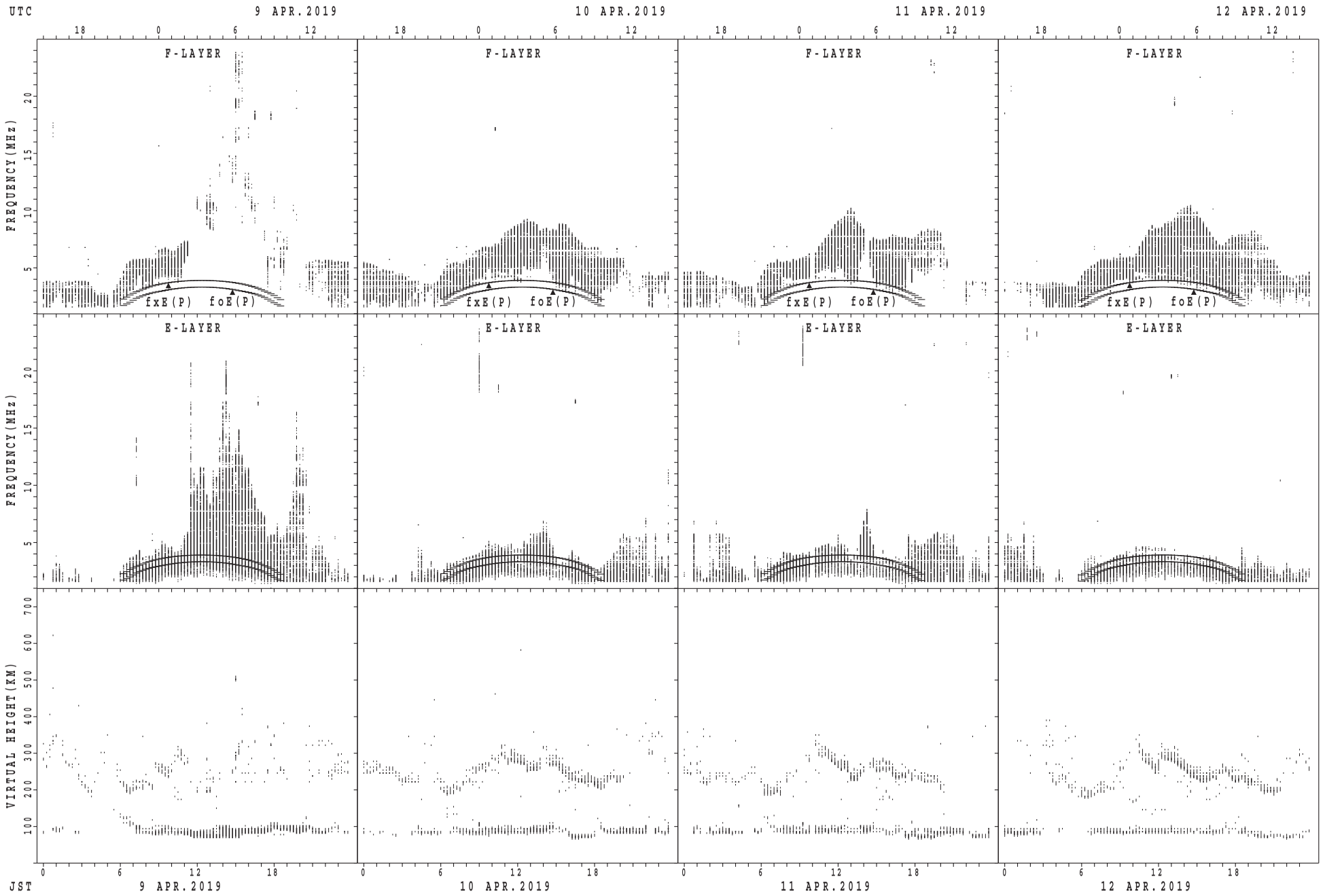
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



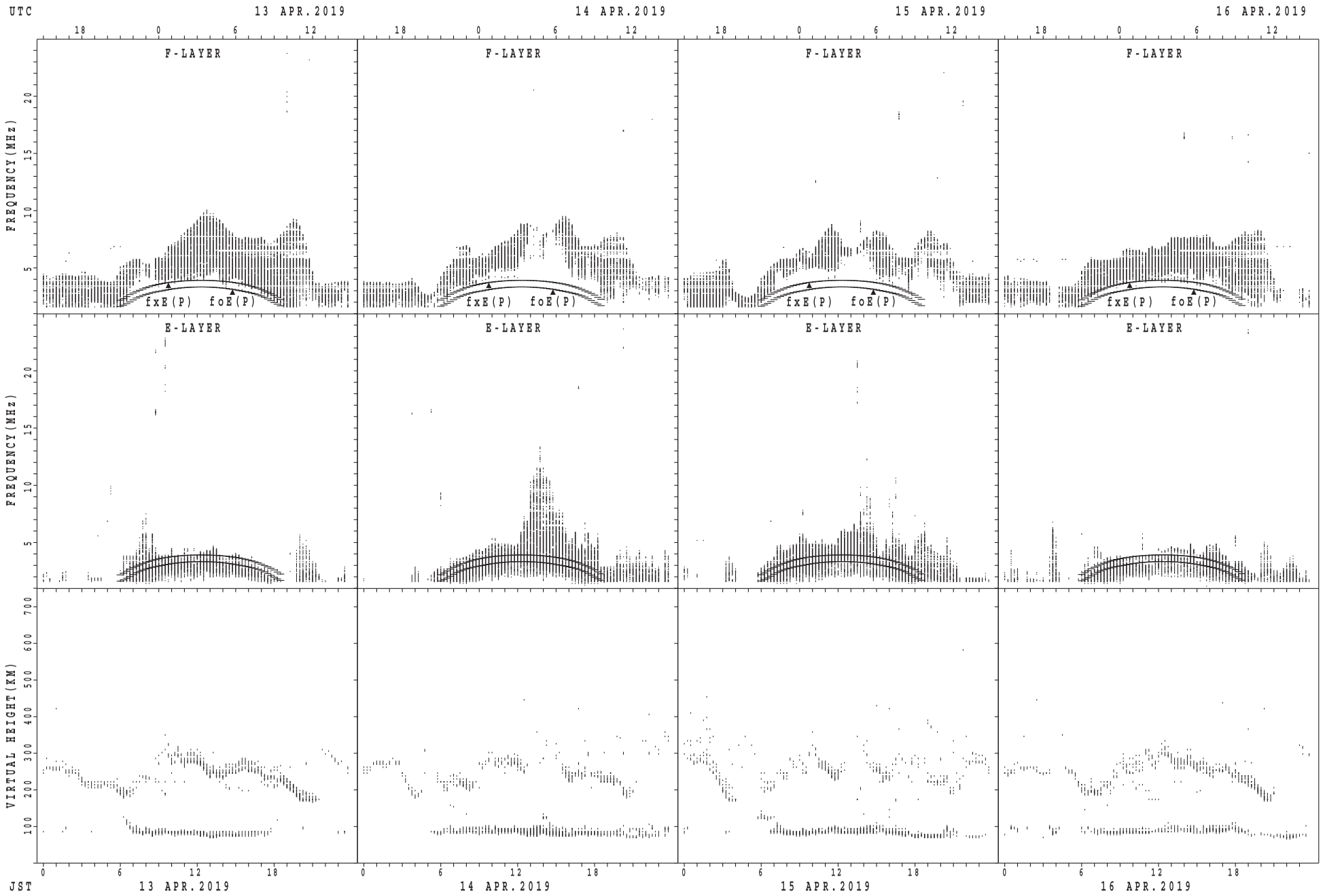
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



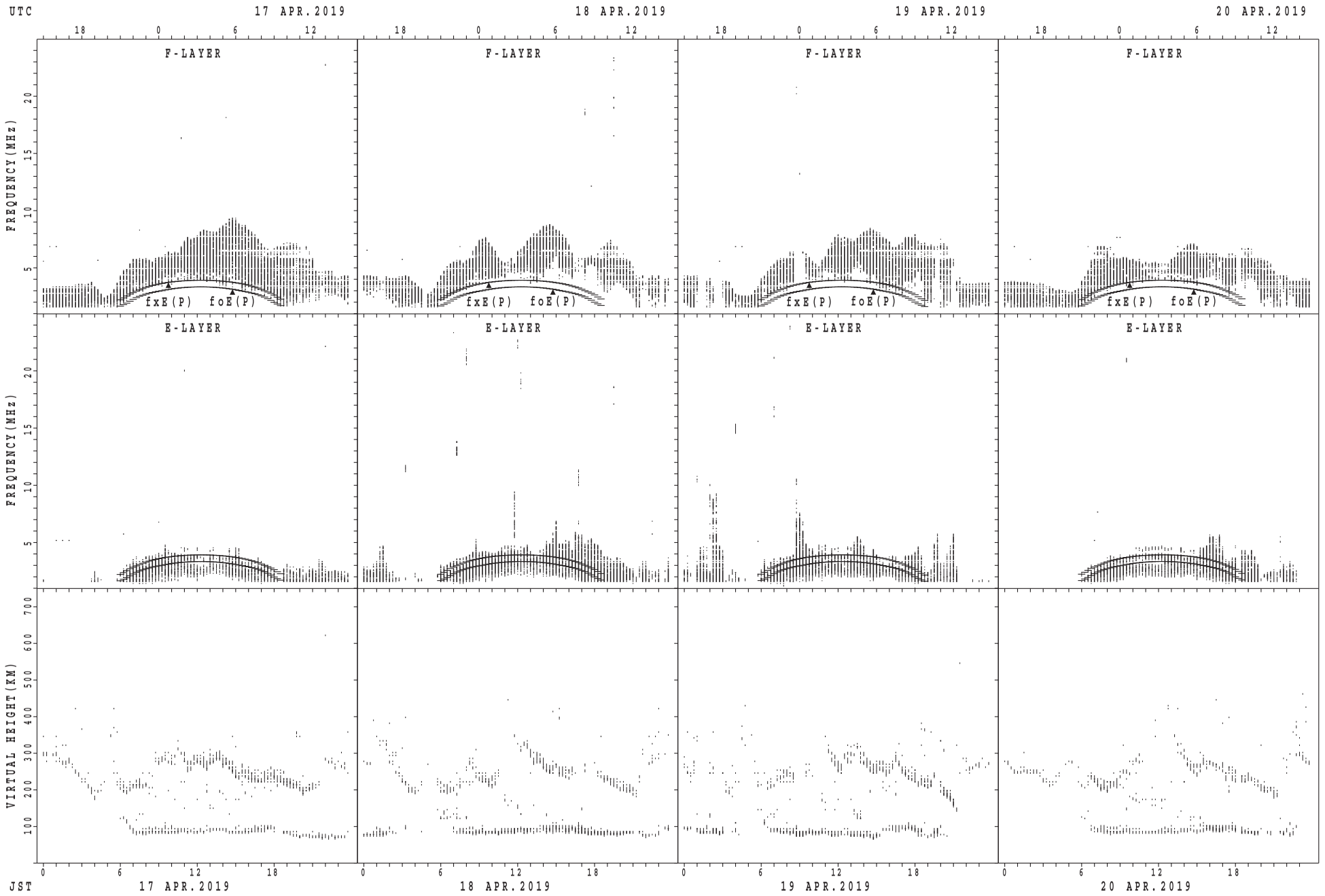
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



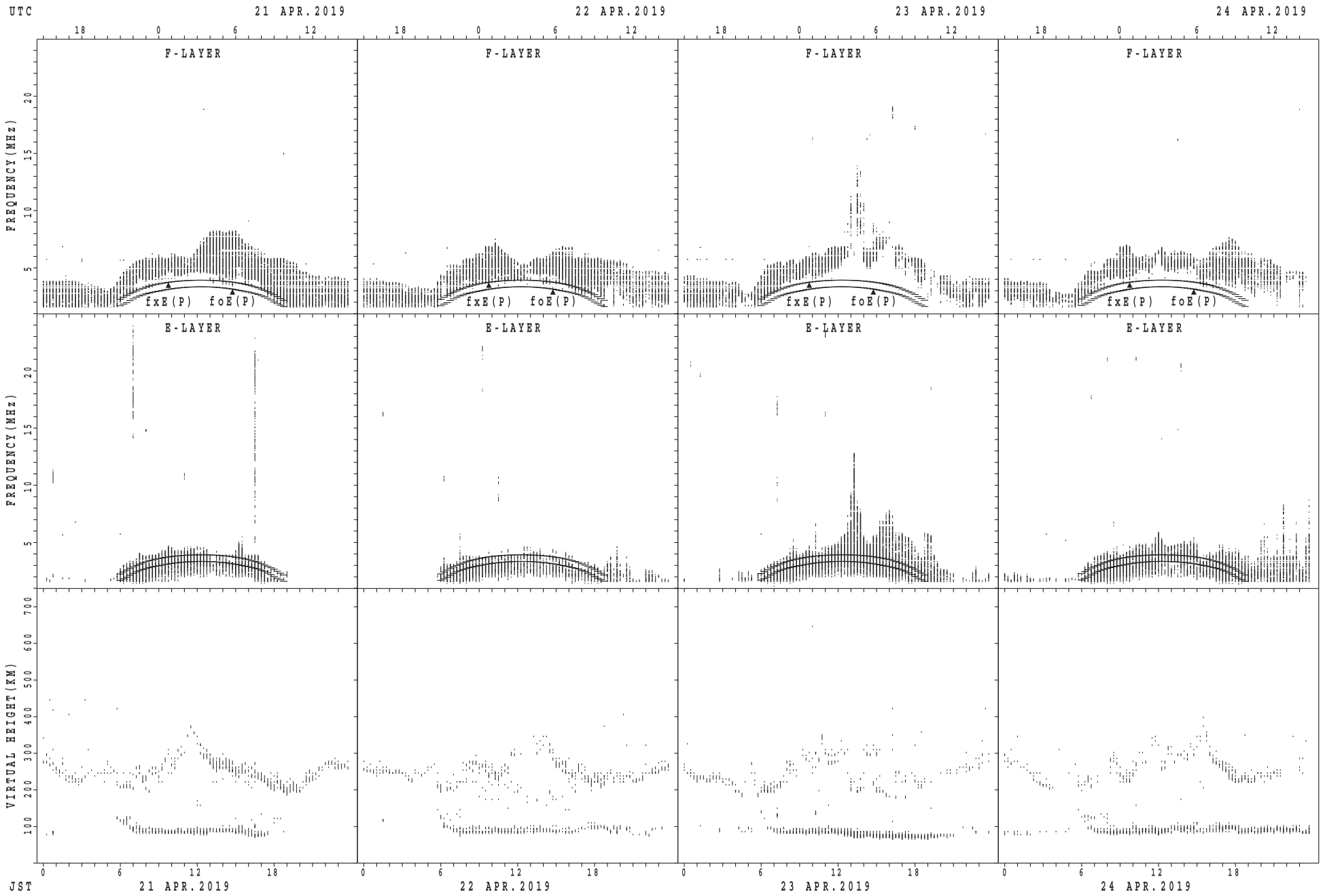
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

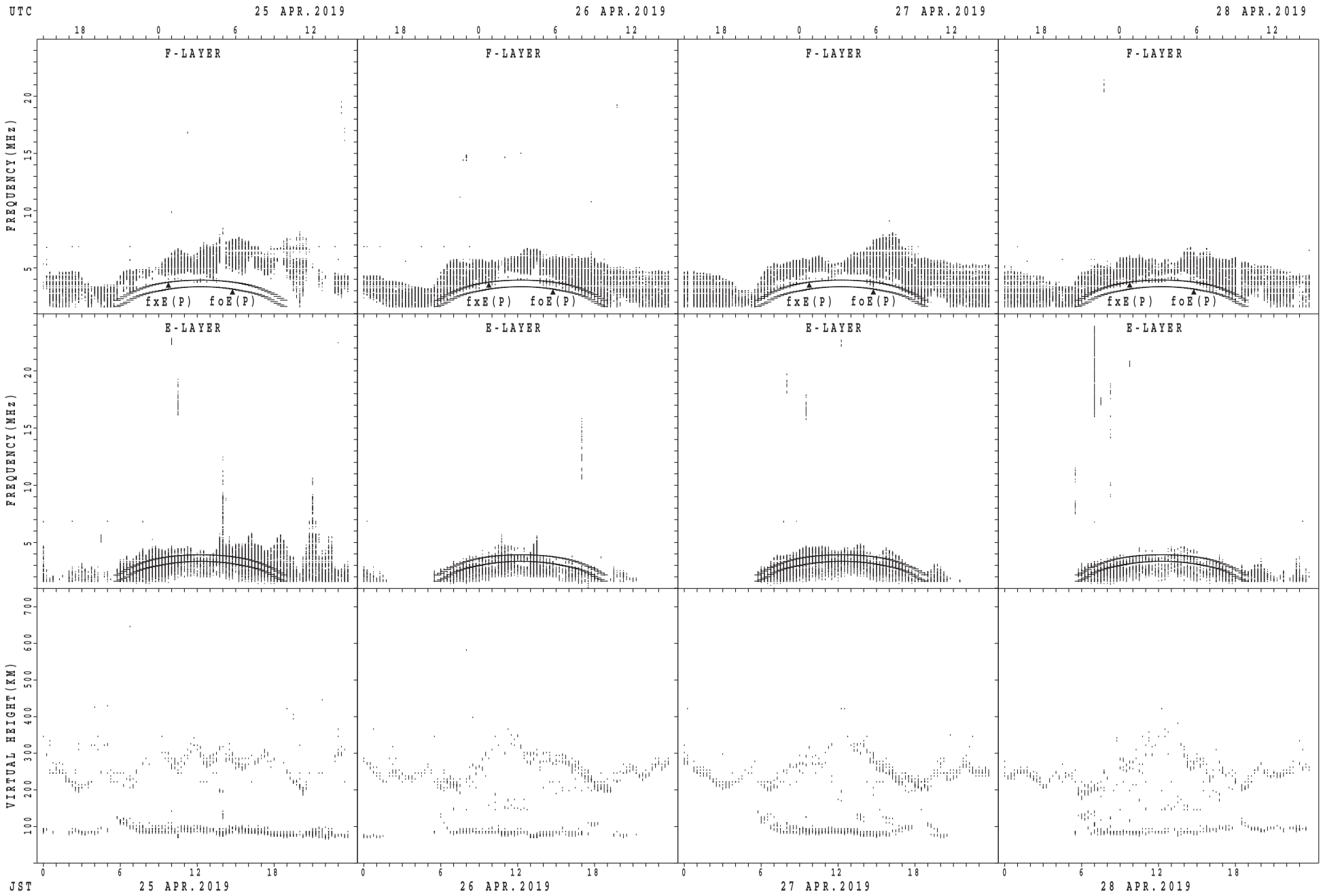


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

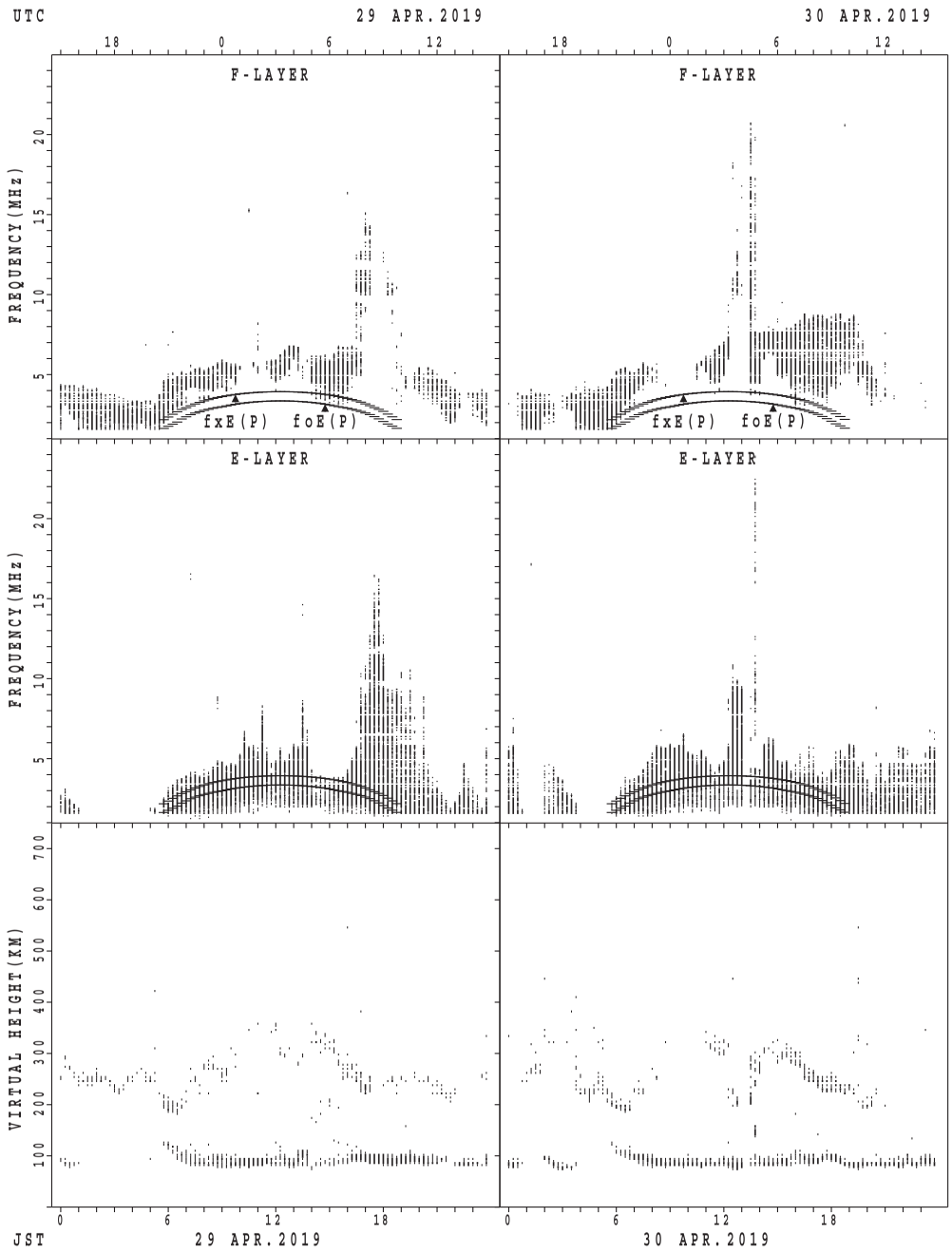
SUMMARY PLOTS AT Yamagawa



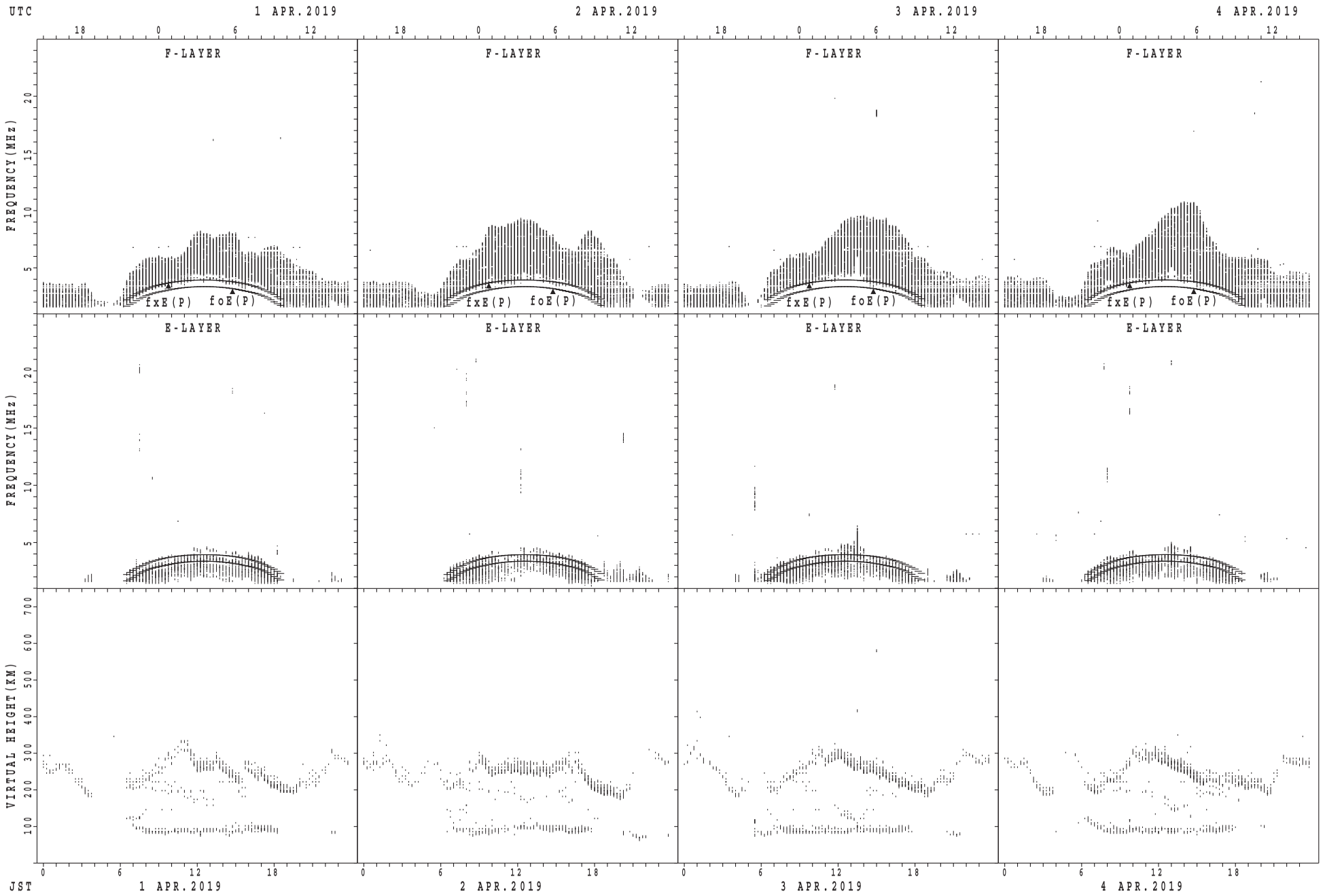
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE



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

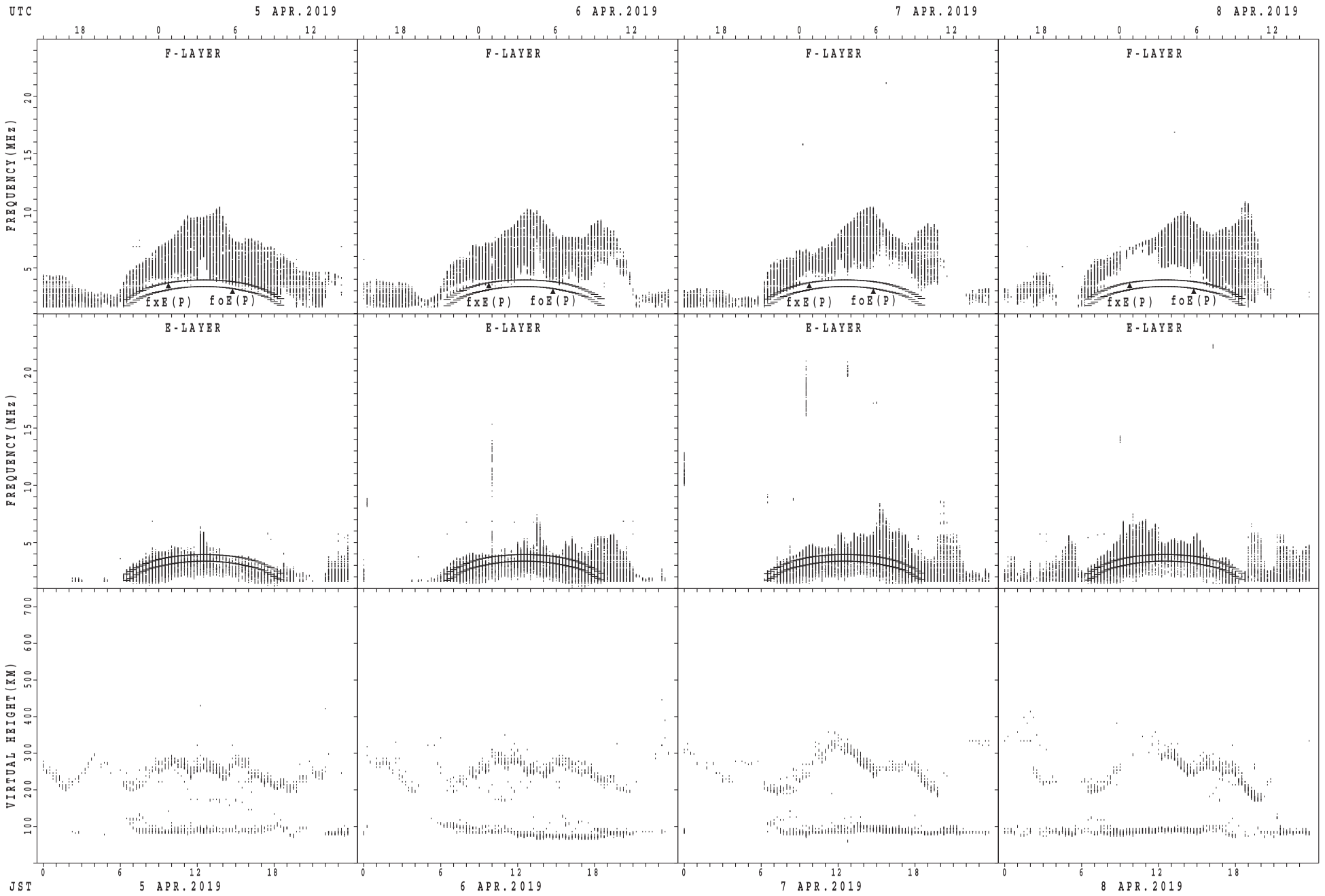

SUMMARY PLOTS AT Yamagawa
UTC
29 APR.2019
30 APR.2019
18
0
6
12
F-LAYER
FREQUENCY(MHz)
5
10
15
20
fxE(P)
foE(P)
E-LAYER
VIRTUAL HEIGHT(KM)
100
200
300
400
500
600
700
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



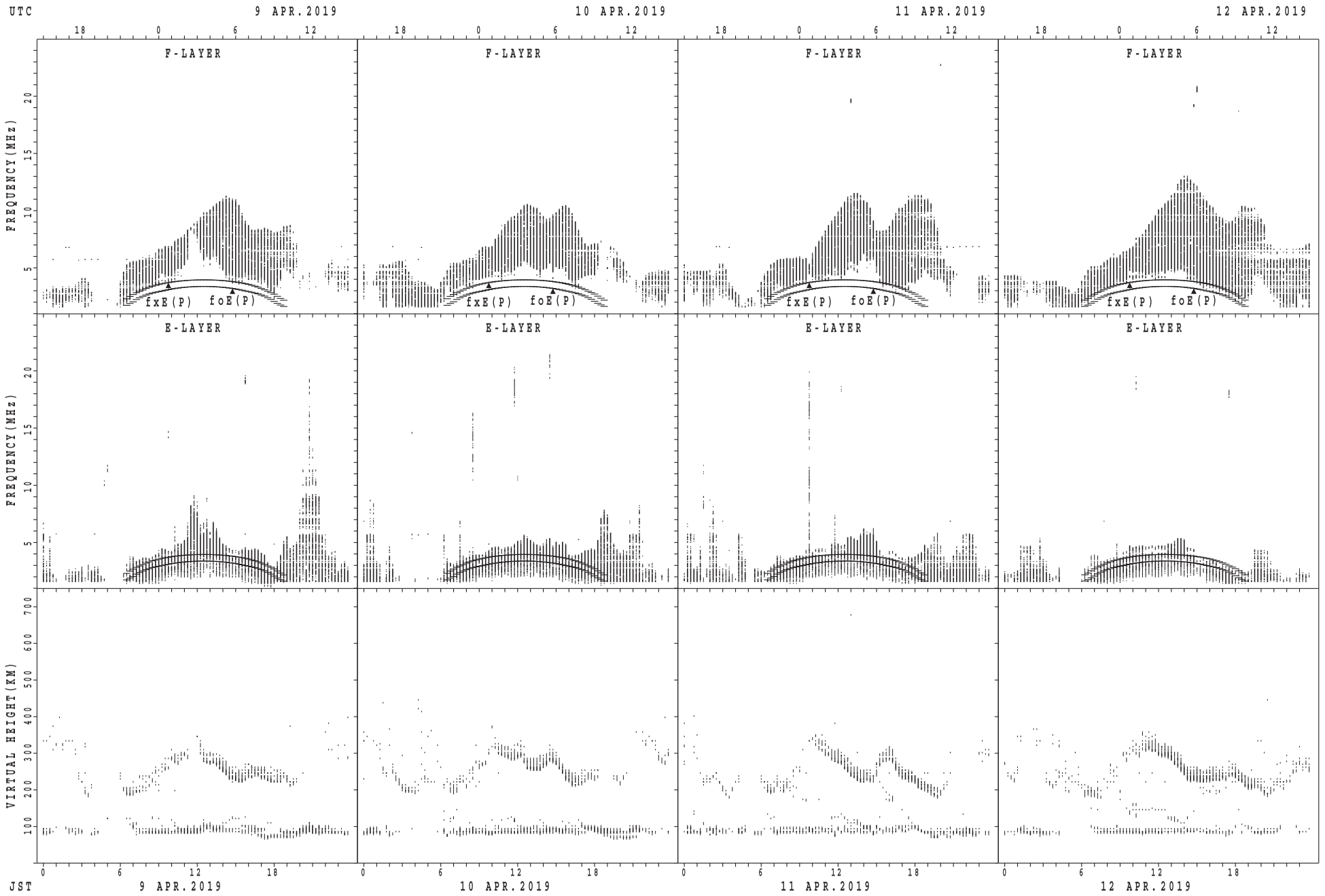
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



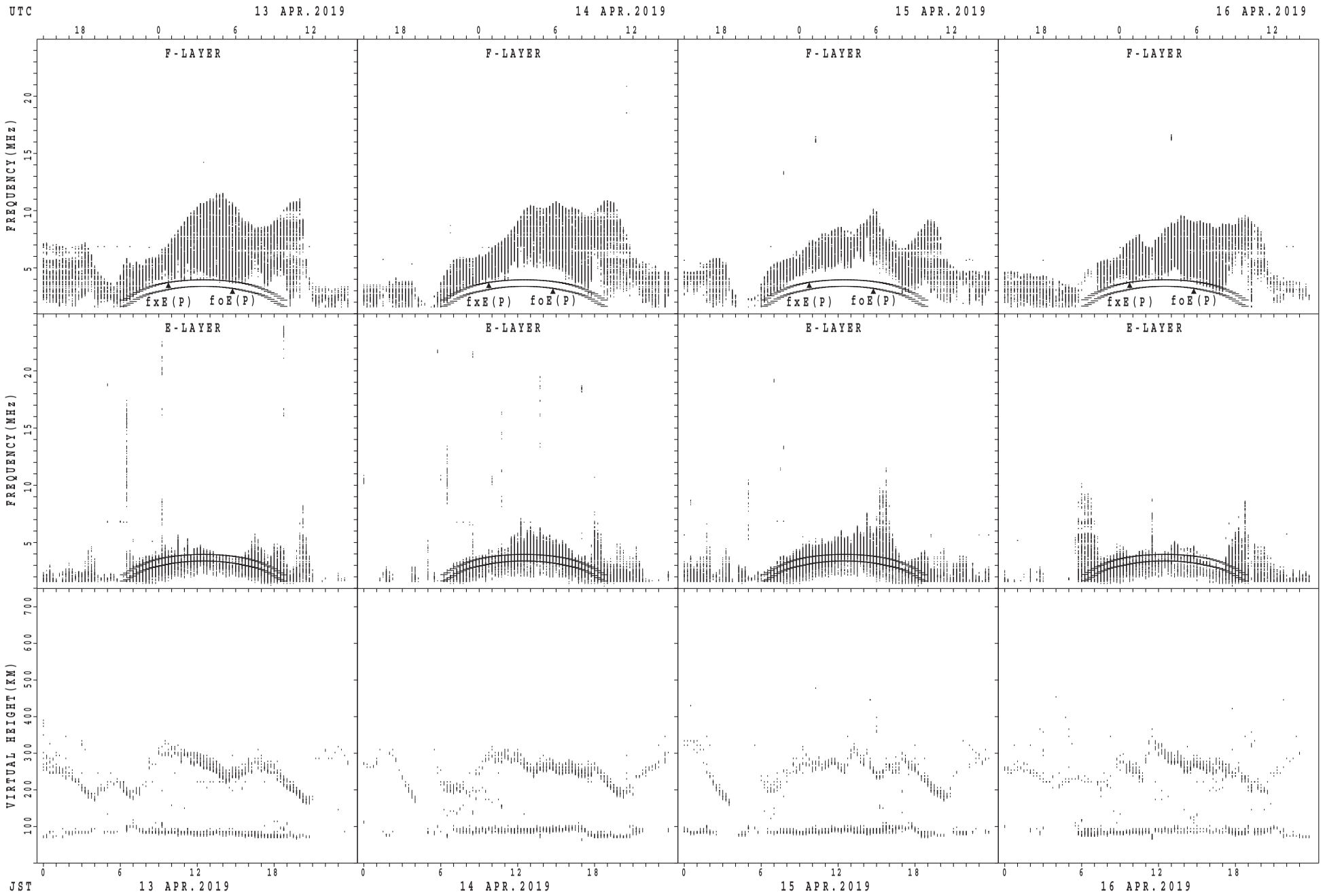
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



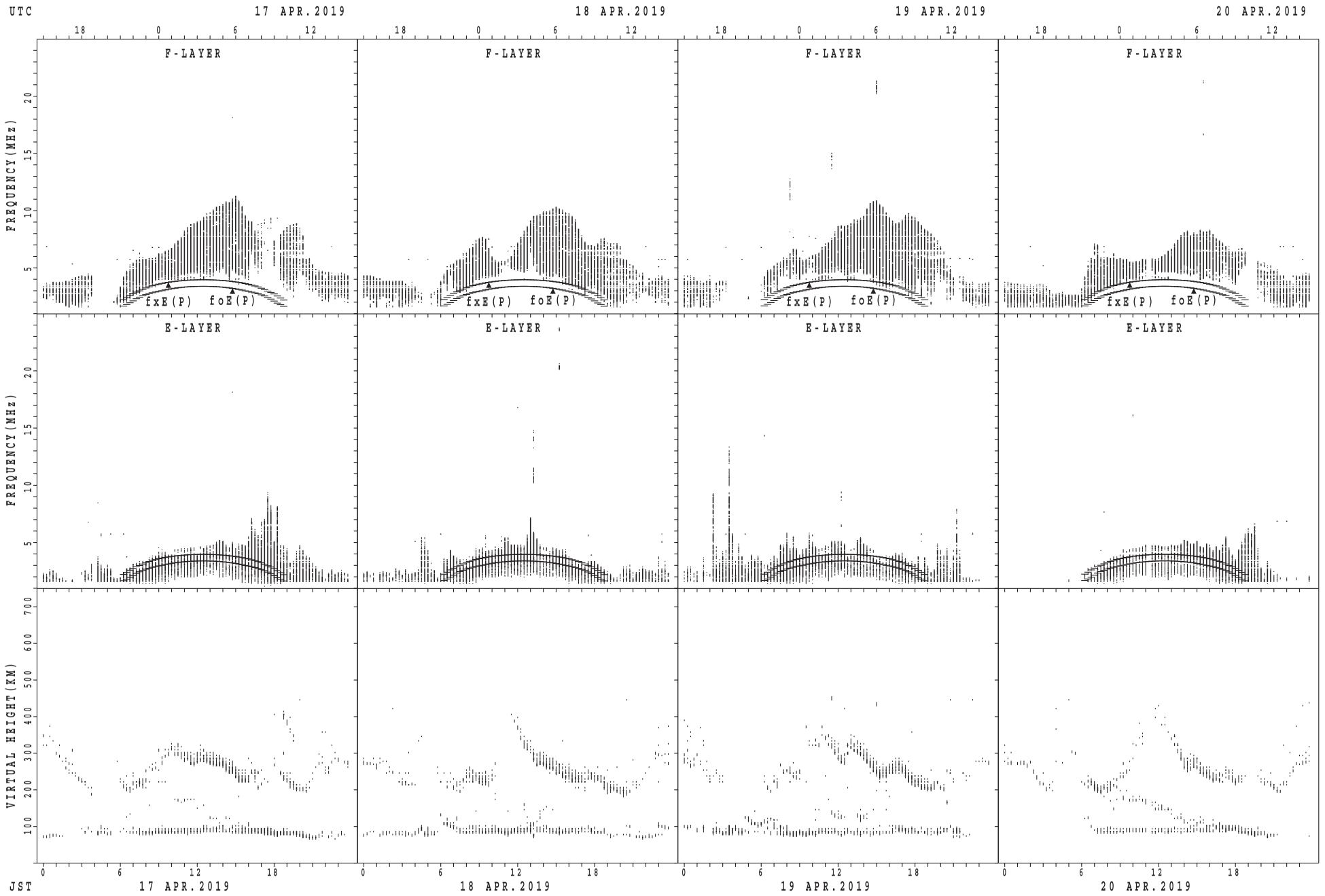
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



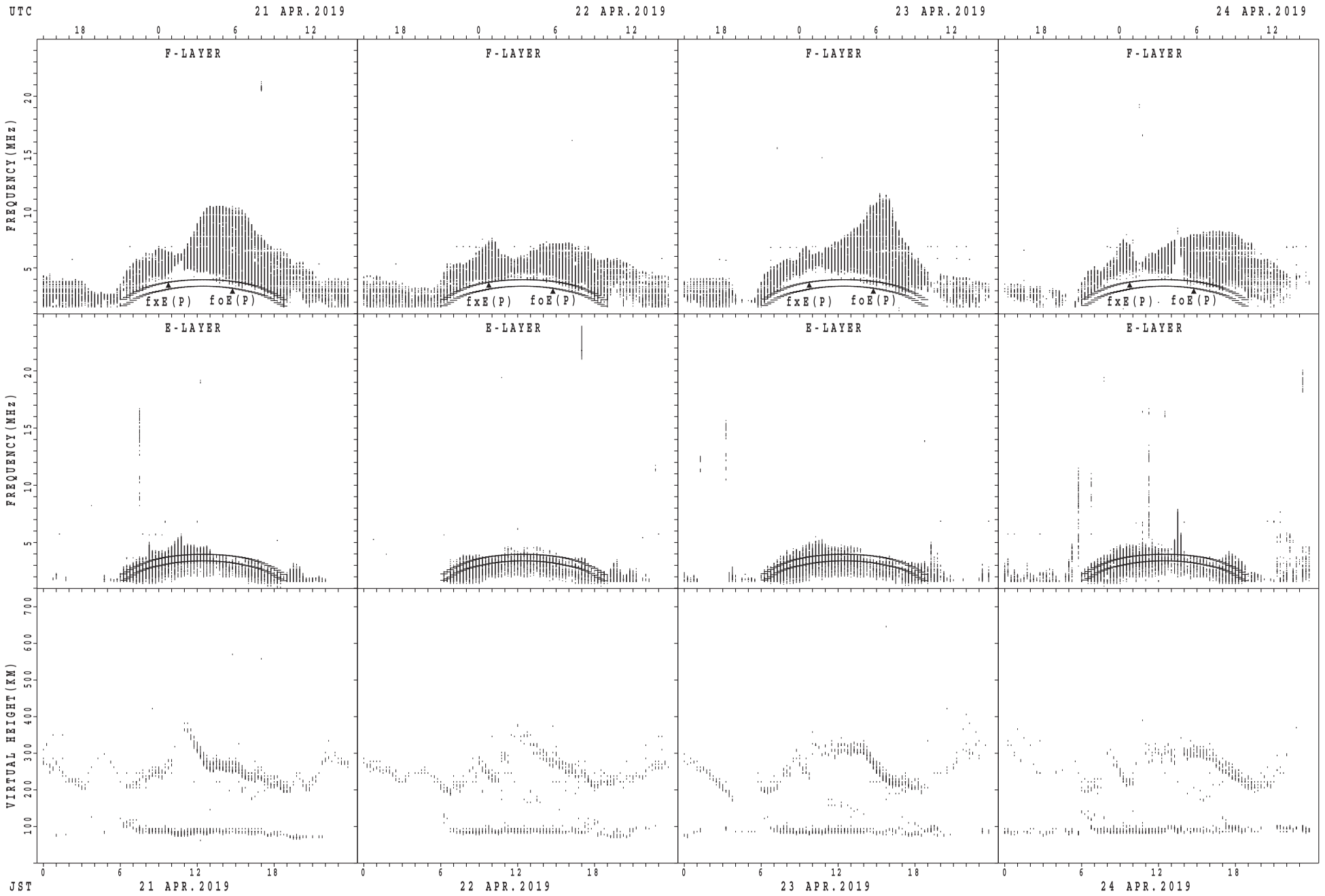
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



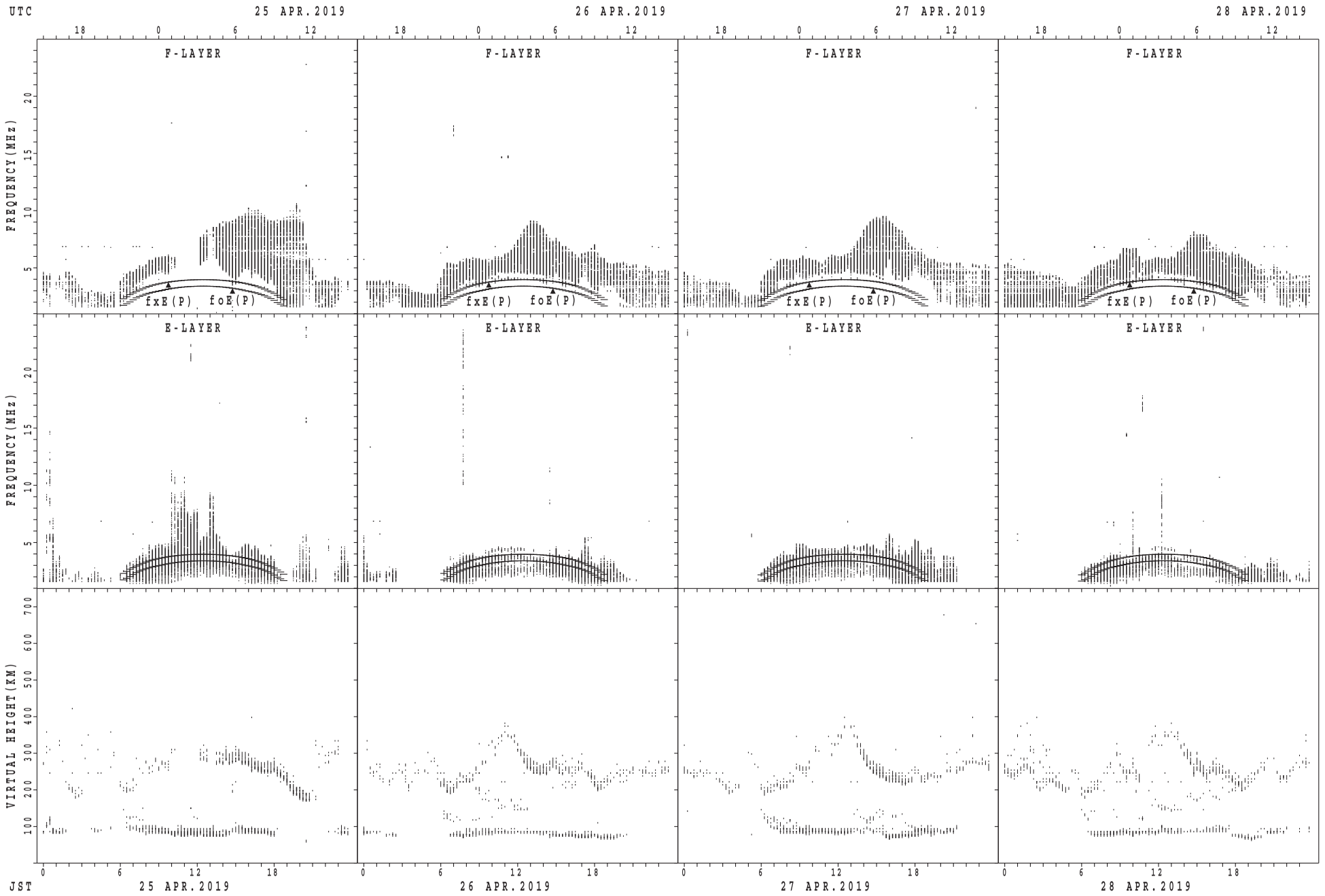
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



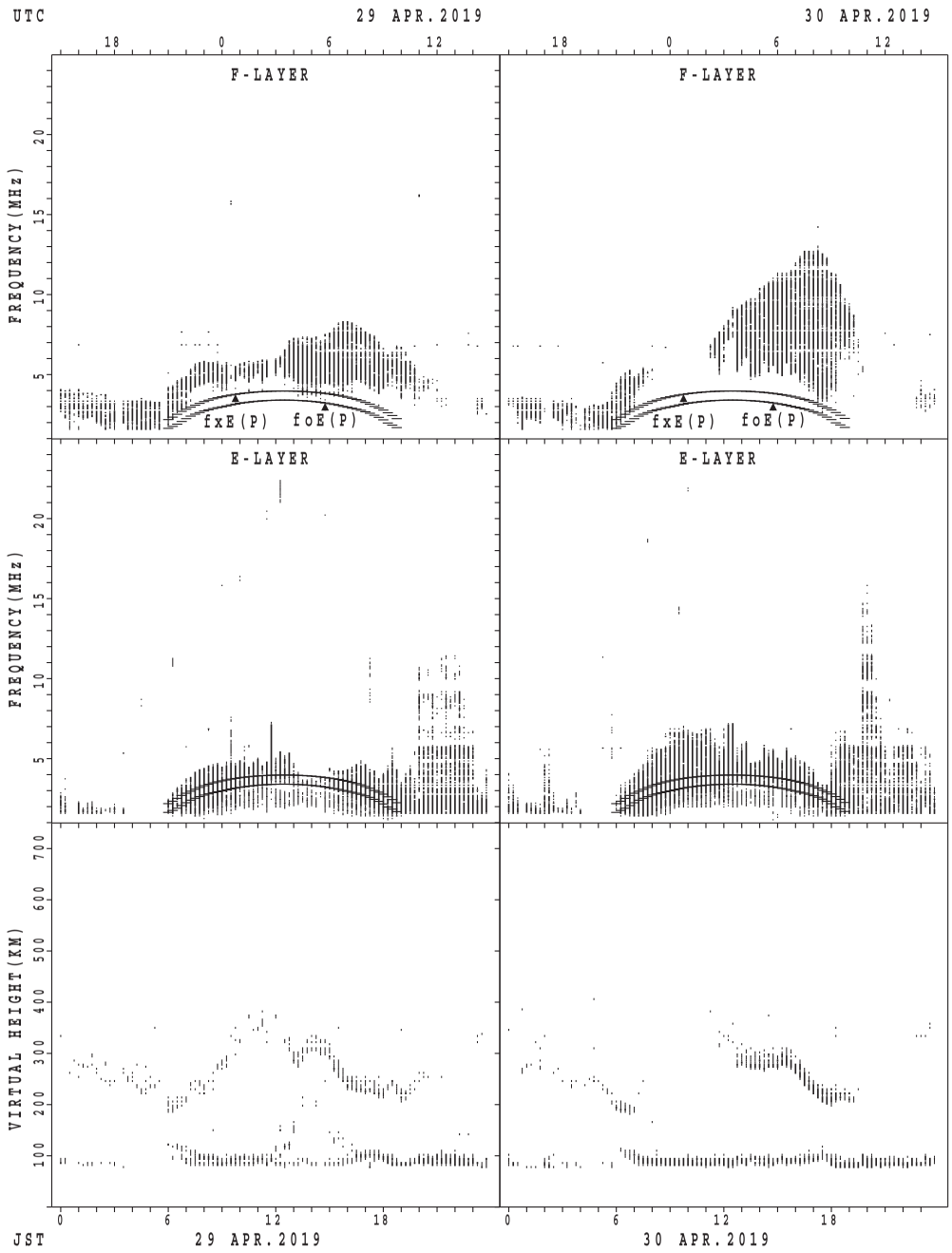
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

APR.2019 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													5	1	2	1				
MED				326													252	428	207	276				
U Q				163													272	214	214	138				
L Q				163													227	214	200	138				

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	4	4	5	5	7	12	21	25	21	24	21	25	26	24	15	14	17	20	21	12	10	10	10	7
MED	83	83	81	97	87	111	107	105	95	94	91	89	89	99	105	94	95	101	89	81	89	87	87	87
U Q	86	89	85	161	97	138	134	119	110	98	116	104	133	167	159	117	102	109	97	90	95	93	87	97
L Q	82	78	77	82	79	85	100	95	89	90	89	84	83	87	79	79	84	81	75	78	87	81	83	79

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								11	6	2	1	3			
MED	326								258								262	254	247	250	224			
U Q	163								129								266	264	252	125	228			
L Q	163								129								244	248	242	125	212			

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	12	6	3	6	5	5	22	18	13	18	14	16	16	12	19	13	17	22	17	19	20	20	15	12
MED	87	89	87	83	83	89	131	107	101	93	96	91	89	89	103	95	97	98	103	89	89	90	91	90
U Q	95	91	89	87	87	95	137	113	107	97	179	95	98	95	177	97	103	101	113	97	94	95	97	98
L Q	82	87	85	81	82	88	119	97	92	91	91	88	86	82	91	85	92	93	96	85	89	89	87	84

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	5								1	11	10	11	7			
MED								240	244								230	260	253	242	228			
U Q								120	257								115	272	260	256	236			
L Q								120	229								115	248	244	232	212			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	9	7	6	10	4	22	29	26	28	27	26	27	28	25	22	24	23	24	23	23	19	16	14
MED	89	85	89	89	95	93	123	113	110	96	89	91	95	92	95	92	94	89	95	87	87	89	85	89
U Q	93	96	97	95	175	95	131	131	119	110	101	139	137	135	130	113	110	101	101	95	93	89	90	89
L Q	83	83	85	85	85	89	113	104	95	89	89	89	87	87	89	89	89	85	85	83	83	83	81	83

MONTHLY MEDIANS OF h'F AND h'Es

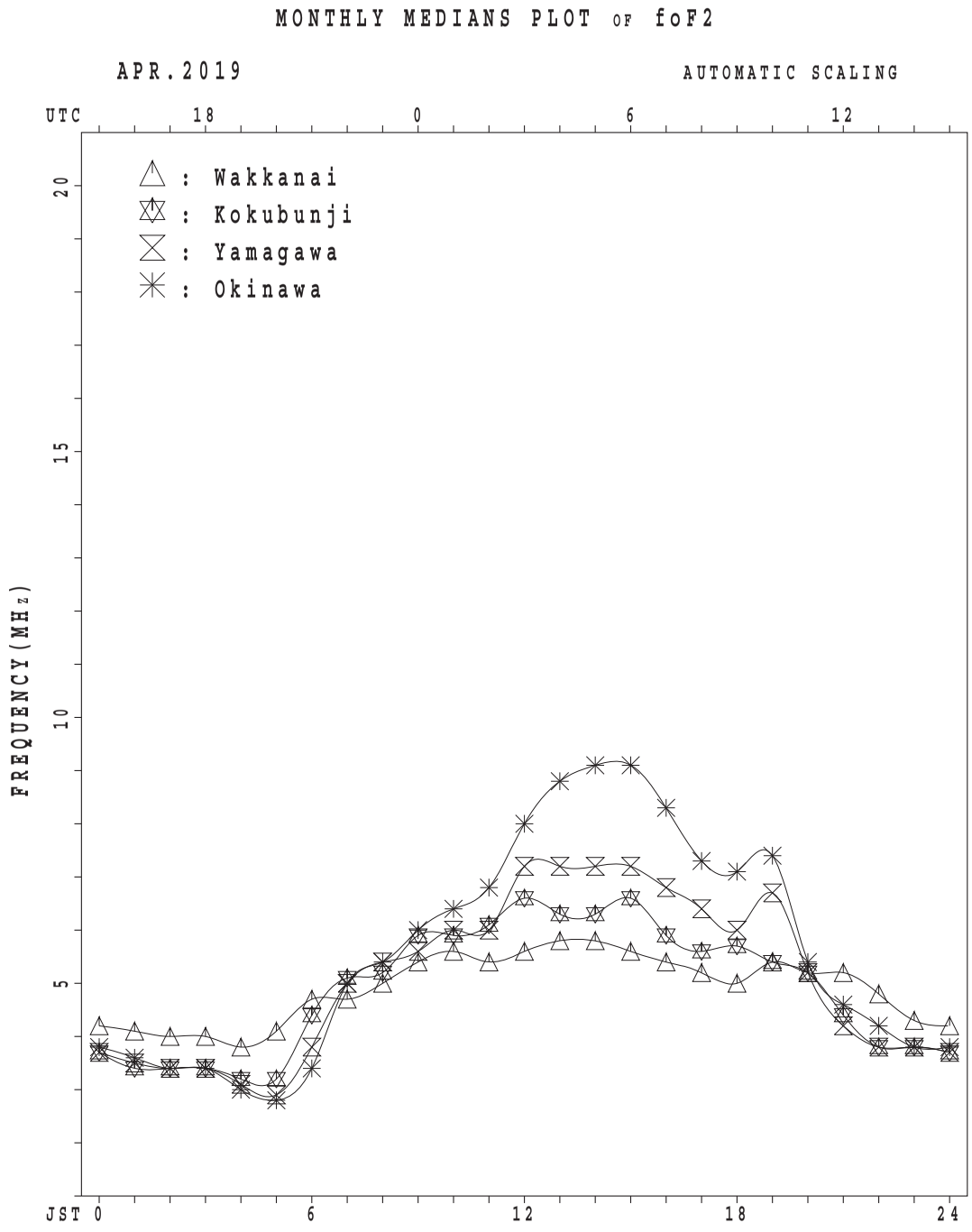
APR.2019 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1									21	19	15	7			
MED								220	242									240	244	224	204			
U Q								110	121									255	258	232	226			
L Q								110	121									233	224	216	200			

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	20	13	13	10	7	8	16	26	30	29	29	24	28	28	25	25	20	24	23	26	26	21	14	14
MED	89	87	87	86	89	93	118	113	104	101	95	98	113	107	101	97	99	97	91	87	87	87	89	89
U Q	89	89	89	87	101	110	136	131	125	113	104	133	152	137	119	138	119	110	101	89	95	93	97	101
L Q	83	84	83	85	83	88	89	103	95	94	89	89	95	93	89	89	92	90	87	83	83	83	85	87


MONTHLY MEDIANS PLOT OF foF2
APR.2019
AUTOMATIC SCALING
UTC
18
0
6
12
△ : Wakkanai
⊠ : Kokubunji
⧖ : Yamagawa
✳ : Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 fxI (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	X 41	X 41	X 39	X 39	X 35																X 52	X 50	X 46	X 45
2	X 42	X 40	X 40	X 37	X 37																X 47	X 45	X 39	X 40
3	X 40	X 40	38	X 39	X 38																X 45	X 46	X 45	X 44
4	X 43	X 41	X 45	X 37	X 37																X 47	X 49	X 46	X 45
5	X 40	X 35	X 35	X 35	X 33																X 52	X 51	X 49	X 46
6	X 44	X 43	X 44	X 44																	X 49	X 49	X 47	X 45
7	X 43	X 40	X 40	X 39																	X 56	X 54	57	X 48
8	X 45	X 45	X 45	41																	X 49	X 48	X 49	X 45
9	X 44	X 42	X 43	X 41																	X 62	X 59	X 51	X 51
10	X 48	X 46	X 45	X 43																	X 52	X 52	X 48	X 46
11	X 44	X 44	X 45	X 43																	X 65	X 59	X 46	X 49
12	X 45	X 45	X 45	X 43																	X 61	X 58	X 51	48
13	X 46	X 43	X 44	X 41																	X 60	X 63	X 54	X 44
14	X 44	X 44	X 44	X 44																	X 64	X 54	X 50	X 45
15	X 46	X 46	X 44	X 41																	X 63	X 65	X 55	X 53
16	X 47	X 45	X 47	X 46																	X 73	X 63	X 57	X 51
17	X 52	X 54	X 53	56	56																X 64	X 63	X 57	X 52
18	X 51	X 49	X 49	X 48																	X 61	X 62	X 59	X 52
19	X 49	X 49	X 51	X 51																	X 64	X 64	X 59	X 48
20	X 49	X 47	X 44	X 45																	X 67	X 65	X 57	X 55
21	X 53	X 50	X 51	X 45																	X 63	X 63	X 60	X 60
22	X 55	X 55	X 55	X 56																	X 66	X 64	X 58	X 55
23	X 53	X 55	X 54	X 57											C	C	C				X 59	X 59	X 51	49
24	X 49	X 49	X 48	X 46																	X 60	X 58	X 56	X 54
25	X 53	X 54	X 51	X 46																	X 63	X 63	X 58	X 59
26	X 56	52	49	53	47																X 60	X 55	X 49	X 48
27	X 48	X 45	X 48	X 48	50																X 58	X 58	X 55	X 46
28	X 42	X 41	X 41	X 39																	X 55	X 52	X 55	X 54
29	58	X 51	58	53	53	54															X 57	X 55	X 53	X 52
30	X 47	X 48	X 47	X 45	52	50															X 65	X 62	X 59	X 51
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	10	2															30	30	30	30
MED	X 46	X 45	X 45	X 44	42	52															X 60	X 58	X 54	X 48
U Q	X 51	X 49	X 49	X 48	52																X 64	X 63	X 57	X 52
L Q	X 44	X 42	X 44	X 41	X 37																X 52	X 52	X 49	X 45

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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	34	35	32	32	28	26	42	44	44	49	56	48	50	56	58	52	50	47	48	48	45	44	39	38
2	36	33	33	31	31	28	37	42	48	50	53	54	52	54	55	50	48	45	42	43	40	38	32	33
3	33	33	F 28	32	31	32	38	38	45	49	51	52	51	55	58	55	51	52	44	41	38	39	38	37
4	37	34	38	30	30	33	42	41	44	53	56	51	54	57	52	50	52	48	44	45	40	42	39	38
5	33	28	28	28	26	27	39	44	45	49	52	54	57	58	57	53	48	42	48	50	45	44	42	39
6	37	36	37	37	29	30	39	44	53	58	57	53	55	59	62	60	55	49	42	47	42	42	40	38
7	36	33	33	32	31	34	48	49	50	54	63	58	54	60	56	56	53	57	57	54	49	47	F 42	41
8	38	38	38	F 31	29	30	36	40	43	50	50	50	49	54	52	53	52	52	50	43	42	42	42	38
9	37	35	36	34	33	33	39	44	49	57	54	57	57	58	55	55	51	50	49	54	55	52	44	44
10	41	39	38	36	36	36	45	46	49	52	60	60	62	57	64	60	53	52	52	50	45	45	41	39
11	37	37	38	36	32	37	47	49	52	R 54	58	57	60	64	59	58	58	51	53	60	58	52	39	42
12	38	38	38	36	34	41	48	52	51	58	54	56	66	62	62	61	58	56	51	60	54	51	44	F 36
13	39	36	37	34	33	39	51	56	53	53	50	55	65	65	62	58	57	58	56	56	53	56	47	37
14	37	37	37	37	37	V 44	Z 49	47	59	60	58	58	56	56	60	63	58	52	48	56	57	47	43	38
15	39	39	37	34	34	41	44	50	52	57	55	58	53	56	59	54	54	54	54	54	56	58	48	46
16	40	38	40	39	39	44	49	47	58	70	56	52	51	55	59	59	56	56	56	63	66	56	50	44
17	45	47	46	F 32	F 33	44	47	44	47	55	63	54	56	56	56	55	55	53	52	58	57	56	50	45
18	44	42	42	41	41	48	46	46	48	50	59	60	54	53	53	52	52	50	48	55	54	55	52	45
19	42	42	44	44	44	45	48	48	58	60	57	54	56	54	53	51	51	45	46	54	57	57	52	41
20	42	40	37	38	36	39	44	44	48	58	55	50	47	50	48	47	48	51	48	58	60	58	50	48
21	46	43	44	38	37	37	46	44	48	51	52	52	50	53	56	57	58	48	48	52	56	56	53	53
22	48	48	48	49	48	48	51	47	56	55	58	53	52	51	54	52	52	52	50	57	59	57	51	48
23	46	48	47	50	41	48	44	42	46	45	48	52	55	52	C	C	C	C	47	55	52	52	44	42
24	42	42	41	39	43	50	38	43	48	48	49	52	E G 42	49	49	52	57	52	46	51	53	52	49	47
25	46	47	44	39	43	48	47	41	E G 39	48	E G 42	A	49	46	45	46	48	44	44	56	56	56	50	52
26	48	F 36	F 34	F 36	F 34	37	34	41	46	51	48	48	47	48	46	47	46	46	47	52	53	48	42	41
27	41	38	41	41	F 38	38	44	43	44	50	50	53	50	48	48	48	52	45	45	51	53	51	48	39
28	35	34	34	32	32	37	38	44	49	50	47	49	48	48	50	54	48	51	53	47	48	45	48	47
29	44	44	F 41	F 38	F 36	F 38	40	E G 38	E G 40	43	E G 40	51	53	49	49	49	47	E G 42	44	51	50	48	46	45
30	40	41	40	38	F 31	F 37	48	U R 47	46	52	52	52	50	A	52	50	48	48	52	61	58	55	52	44
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	29	29	29	29	29	30	30	30	30	30	30
MED	40	38	38	36	34	38	44	44	48	52	54	53	53	55	55	53	52	51	48	54	53	52	45	42
U Q	44	42	41	39	38	44	48	47	52	57	57	56	56	58	59	58	56	52	52	56	57	56	50	45
L Q	37	35	36	32	31	33	39	42	45	50	50	52	50	50	51	50	48	46	46	50	45	45	42	38

APR. 2019 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

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							L	L	L	L	L	L	L	L	L	L	L	L						
2							L	L	L	L	L	424	428	428	L	384	360	L						
3						L	L		396	396	L	L	L	L	L	L	L	L						
4								L	L	L	L	L	L	424	L	400	352	L						
5							L	L	L	L	L	L	L	A	L	392	L							
6								380	L	A	L	L	L	L	L	L	L	L						
7								L	L	L	432	432	432	L	428	L	A							
8								L	388	400	L	432	L	424	420	L	368	L						
9							L	L	L	A	L	L	L	428	L	A	L		A					
10							L	L	384	424	L	432	L	L	L	A	L	A		A				
11							L	L	396	A	L	A	L	436	416	L	L			L				
12							L	L		428	L	L	L	444	428	L	L	L						
13					L	L	L	L	396	A	L	L	440	L	L	L	L	L						
14							384	L	L	L	360	L	428	428	L	408	372	L						
15							L	420	396	L	L	L	428	L	L	408	L	L						
16					L	L	L	L	L	412	428	L	420	L	L	396	L	L						
17						L	L		L	L	L	L	436	L	L	L	L	L						
18								376	L	L	L	L	L	L	L	L	L	L						
19					L		L	380	404	L	L	L	L	L	L	408	L	L	L					
20						L		L	L	L	428	L	L	L	L	400	L	L	L					
21						L	L	L	396	L	L	L	L	L	L	L	L	L						
22						L	L	L	L	L	424	420	436	428	L	L	380	L						
23							356	L	L	L	L	416	L	L	C	C	C	C						
24						L		L	L	L	L	L	L	L	L	L	L	A	A					
25							376	L	388	404	416	A	A	L	380	L	L	L	L					
26						L	L	L	L	L	L	L	L	404	L	L	L	L						
27							L		L	L	L	L	L	416	L	L	L	L						
28							L	L	L	L	412	L	L	L	L	L	A	L	L					
29						L	L	L	400	L	404	L	L	L	L	L	L	L						
30						L	336	420	400	L	L	L	L	A	A	L	A	L	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							4	5	11	6	8	6	8	10	5	8	5							
MED							366	380	396	408	420	428	430	428	420	400	368							
U Q							380	420	400	424	428	432	436	428	428	408	376							
L Q							346	378	388	400	408	420	428	424	398	394	356							

APR. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A 192	252	264	292	292	316	316	292	296	256	220	176	160		B				
2						B 164	224	264	296	308	316	312	316	292	264	256	196		B	A				
3						B 188	252	268	284	308	324	328	300	296	268	252	192		B	B				
4						A 196	248	248	288	312	324	208		A	A	264	232	200		A	184			
5						A 200	252	264	272	300	308	316	312	296	280	240	200		A	244				
6					B	200	200	228	268	284	288	288	252		A	276	256	248	184		A	A			
7					B	A 192	244	268	284	304		A	316		A	316	284		A	200	184		A		
8					B	220	208	240	284	300	280	284	324	324	304	284	252	184		B	B			
9					A	212	208	248	276	304	264	300	324	328		A	A	248		A	A	A		
10					B	B 196	256	276	288	308		A	A	A	A	280		A	A	264		A		
11					B	B 212	268	280	292	304	284		A	A	A	A	A	308	240		A			
12					A	A	A 196	272		A	328	328	312	312	312	284	256	212		A	A			
13					A	A 232	244	300	300	316	304		A	A	260	248	260		A	A	A			
14					A	A 216	264	276	296	340		A	A	280	216	240	256	196	204		A			
15					160	224	224	268	292	292	324	288	A	320	308	284	260	216	180		A			
16					200	240	208	280	284	308	288	324	312	316	316	288	256	232		A	A			
17					A	A 208	240	280	308	288		A	332	320	300	296	264	212		A	A			
18					A	A 212	256	304	328	312	312	304	328	296	280	168	228		A	B				
19					204	236	232	256	284	312	312	312	A	312	308	300	264	236		A	A			
20					B	252	232	280	300	300	A	A	332	320	320	296	264	220		A	A			
21					B	224	252	252	276	312	312	312	A	312	312	292	244	228	188		A			
22					A	B 232	272	300	300	316	316		A	A	A	A	260	224	224		A			
23					A	B 224	292	268	296	328	284	328	324		C	C	C	C	A	A				
24					A	A 240	272	304	312	312	312	276		A	A	284	256	208		A	A			
25					B	180	212	256	284	312	316	320	320	320	300	264	240	176		A	B			
26					A	176	220	264	280	288	A	A	A	312	304	232	264	204	180		B			
27					B	188	216	260	280	292	308	308	308	308	300	272	260	212		A	B			
28					B	192	216	260	284	316	308	308	A	316	316	276	264	236		A	A			
29					B	212	236	264	284	316	316	316	316	316	308	260	A	224	184		B			
30					A	176	224	248	280	288	308	332	288		A	A	A	216		A	A			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	14	29	30	30	29	28	24	20	21	22	25	24	26	10	2				
MED					200	212	212	256	280	296	308	312	316	316	302	280	256	212	186	214				
U Q					204	224	228	264	284	310	316	318	324	320	312	284	260	224	224					
L Q					160	188	200	248	268	288	302	302	306	312	296	262	246	196	180					

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	19	21	G 21	31	32	34	J A 66	38	J A 33	33	30	J A 26	19	J A 21	E B 16	E B 16	E B 16	E B 16	19
2	E B 16	E B 16	E B 16	E B 16	21	E B 16	J A 51	J A 31	J A 29	J A 29	38	J A 33	J A 52	36	34	31	J A 26	J A 26	E B 16	J A 25	E B 16	E B 16	J A 25	20
3	E B 16	E B 16	24	J A 21	J A 18	E B 16	J A 20	J A 25	J A 31	J A 33	J A 36	J A 205	J A 33	J A 31	34	J A 29	J A 26	21	E B 16	E B 16	E B 16	19	26	J A 21
4	22	J A 19	22	18	J A 25	J A 27	J A 21	J A 27	28	J A 39	J A 39	J A 39	J A 39	J A 34	J A 36	38	26	21	J A 26	19	18	19	26	22
5	18	18	25	30	28	28	J A 21	33	32	35	34	36	J A 38	95	38	34	33	29	27	27	21	23	E B 16	25
6	20	18	21	J A 131	24	G	27	32	J A 106	70	46	J A 39	J A 35	J A 36	33	37	J A 25	J A 20	J A 21	J A 20	25	E B 16	E B 16	E B 16
7	E B 16	20	20	21	20	23	J A 27	28	31	J A 39	J A 39	J A 117	J A 62	J A 33	40	29	J A 69	J A 39	43	J A 25	21	J A 36	E B 16	E B 16
8	E B 16	E B 15	E B 10	J A 23	E B 16	J A 87	J A 33	30	31	J A 39	J A 42	J A 34	J A 34	J A 53	34	G 28	27	22	E B 16	24	E B 16	E B 16	E B 97	22
9	E B 16	J A 51	E B 16	E B 16	J A 19	J A 112	J A 103	32	32	54	39	J A 39	J A 56	J A 32	J A 32	J A 59	34	71	J A 83	J A 52	J A 26	26	28	20
10	24	E B 16	E B 15	E B 15	E B 16	E B 16	24	28	32	34	J A 36	J A 39	J A 83	J A 38	J A 53	J A 64	40	J A 53	J A 52	J A 63	49	50	J A 42	49
11	E B 16	28	24	J A 23	E B 16	E B 16	J A 22	28	32	J A 59	37	J A 68	45	44	45	J A 31	J A 37	J A 50	J A 63	J A 41	30	J A 36	J A 21	E B 16
12	E B 16	J A 21	E B 16	26	93	J A 31	40	J A 43	46	56	47	39	38	35	35	33	37	J A 24	J A 32	J A 49	J A 51	39	J A 32	J A 64
13	J A 61	J A 52	J A 26	20	40	35	J A 24	J A 83	35	J A 52	36	J A 38	J A 34	J A 38	33	32	32	J A 39	J A 24	27	25	22	J A 21	J A 28
14	26	22	J A 21	J A 27	29	26	J A 28	28	32	J A 41	G	J A 38	J A 35	J A 39	J A 30	30	28	24	J A 31	J A 21	J A 29	E B 15	E B 15	21
15	E B 16	E B 16	E B 16	E B 16	20	32	G	J A 99	33	33	33	J A 33	J A 39	J A 67	34	31	G 25	32	J A 20	20	J A 22	25	E B 15	21
16	21	E B 16	E B 16	E B 15	G	G	J A 25	29	J A 77	J A 39	J A 35	G	38	G	35	G	29	J A 41	J A 27	J A 31	E B 16	E B 16	E B 16	E B 15
17	27	J A 37	28	20	20	25	G	27	J A 52	36	34	34	J A 125	36	32	J A 58	33	29	J A 30	J A 27	E B 16	E B 16	21	21
18	19	19	E B 15	E B 16	J A 26	23	23	28	38	J A 47	35	34	J A 35	42	39	J A 32	G	25	J A 23	E B 16	E B 16	E B 15	E B 16	24
19	E B 16	E B 16	E B 16	22	J A 24	G	26	30	32	34	J A 35	J A 37	J A 37	34	34	J A 31	29	J A 26	J A 20	30	E B 16	24	J A 27	26
20	J A 23	J A 23	J A 25	E B 16	E B 16	G	J A 38	J A 37	45	J A 36	J A 204	J A 83	40	J A 55	36	34	J A 45	30	J A 31	25	E B 16	E B 16	20	E B 16
21	25	E B 16	E B 16	E B 16	E B 16	J A 26	26	32	35	35	35	35	J A 39	G 37	G	34	28	23	J A 26	20	22	E B 16	21	J A 31
22	E B 16	E B 16	E B 17	E B 16	20	E B 16	G 23	28	J A 97	37	38	J A 45	62	51	58	J A 38	30	24	30	24	E B 16	E B 16	J A 28	33
23	60	39	J A 34	J A 20	J A 21	E B 17	28	J A 49	34	34	J A 79	J A 34	34	39	C	C	C	C	J A 32	34	30	22	23	E B 16
24	J A 19	E B 16	E B 16	J A 24	23	22	26	28	32	J A 46	36	36	J A 34	31	J A 30	31	29	J A 66	60	30	26	20	18	E B 16
25	20	E B 16	E B 16	E B 16	E B 16	20	25	G	34	36	37	J A 55	J A 50	34	54	38	34	J A 52	32	22	32	E B 16	25	35
26	23	32	24	25	25	25	27	34	J A 41	J A 49	J A 65	46	41	34	34	37	J A 33	24	24	E B 16	E B 16	E B 16	E B 16	26
27	E B 16	E B 16	22	J A 23	20	J A 22	27	33	33	36	36	56	35	36	32	32	28	29	J A 29	J A 23	E B 16	23	21	E B 16
28	E B 16	E B 16	E B 16	E B 16	24	24	24	31	32	33	34	35	J A 33	36	36	33	63	58	J A 50	J A 29	E B 16	28	29	34
29	33	22	20	20	24	22	J A 83	36	38	34	35	43	J A 45	35	38	39	J A 61	J A 43	J A 27	38	39	32	26	22
30	34	19	20	19	19	J A 26	J A 49	34	35	37	J A 38	G	J A 63	J A 102	J A 62	J A 49	51	33	29	31	20	22	E B 16	E B 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	29	29	29	29	30	30	30	30	30	30
MED	19	18	18	20	20	22	26	30	33	36	36	J A 38	J A 38	36	34	33	30	29	J A 28	25	20	20	21	21
U Q	24	22	24	J A 23	24	J A 26	J A 28	J A 34	J A 38	J A 46	J A 39	J A 46	J A 50	42	38	J A 38	37	J A 42	J A 32	J A 31	26	25	26	26
L Q	E B 16	E B 16	E B 16	E B 16	G	G	G	28	32	34	35	34	J A 35	34	33	31	26	24	J A 23	20	E B 16	E B 16	E B 16	E B 16

APR. 2019 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	20	G 20	30	32	32	34	G 31	32	32	28	24	G 17	G 16	E B 16	E B 16	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	24	28	G 29	34	G 31	37	32	33	28	G 24	20	E B 16	E B 16	E B 16	E B 16	16	16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 17	G 22	28	29	31	36	G 32	31	32	28	G 25	G 18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	16	E B 16	G 16	G 18	27	G 28	32	G 32	35	29	31	28	25	G 18	21	E B 16	E B 16	E B 16	E B 17	17
5	E B 16	16	E B 16	15	17	17	G 17	26	G 25	29	31	32	32	G 29	32	29	26	23	19	G 16	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 15	G	23	30	32	43	34	35	32	32	30	30	G 23	G 18	18	17	E B 16	E B 16	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	29	34	34	36	32	31	32	G 28	26	26	22	18	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 15	E B 10	E B 16	E B 16	E B 16	23	28	29	34	37	32	G 32	35	32	G 27	G 24	20	E B 16	E B 16	E B 16	E B 16	E B 97	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	G 16	24	29	29	40	36	36	35	G 32	32	42	28	23	26	23	17	17	17	E B 15
10	16	E B 16	E B 15	E B 15	E B 16	E B 16	23	26	30	33	35	37	37	33	32	41	28	18	27	30	25	22	22	20
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	G 26	30	A	35	A	35	36	32	29	30	G 29	G 23	23	20	E B 17	E B 17	E B 16
12	E B 16	E B 16	E B 16	E B 16	20	22	21	24	38	34	34	36	34	34	32	31	30	23	20	17	23	18	17	E B 23
13	19	E B 16	E B 16	E B 15	16	18	G 23	26	G 30	39	34	34	32	34	31	28	G 26	24	18	E B 16	E B 17	E B 17	E B 16	22
14	E B 16	E B 16	E B 16	E B 16	19	19	23	G 24	30	32	G	36	35	35	30	26	27	23	G 19	19	16	E B 15	E B 15	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	30	32	G 32	32	37	32	33	G 28	G 24	G 21	G 16	E B 16	E B 16	E B 16	E B 15	E B 16
16	E B 16	E B 16	E B 16	E B 15	G	G	22	G 28	31	31	34	G	36	G	32	G	27	G 23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15
17	E B 16	22	17	E B 16	E B 16	E B 16	G	25	30	34	34	34	36	35	G 28	30	32	28	17	E B 16	E B 16	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	G 21	26	G 30	34	34	34	35	34	33	29	G	23	23	E B 16	E B 16	E B 15	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	G 16	G	G 23	27	30	G 31	34	36	36	32	32	G 29	G 26	G 23	18	18	E B 16	E B 16	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 23	G 27	31	34	39	38	39	38	34	32	28	24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 16	E B 16	G 16	G 24	28	30	32	33	34	36	G 33	G	30	G 24	G 20	G 18	E B 16	E B 16	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 17	E B 16	E B 16	E B 16	G 22	G 26	30	35	35	35	37	35	41	E A 36	28	G 20	G 16	E B 16	E B 16	E B 16	E B 16	22
23	21	21	17	17	E B 16	E B 17	25	G 28	30	32	36	32	G 31	36	C	C	C	C	24	19	16	E B 16	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	16	24	G 27	31	35	34	34	29	29	28	30	28	A	23	18	16	E B 16	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	19	24	G	31	G 31	34	A A 55	A	33	E A 33	28	30	22	17	E B 17	17	E B 16	E B 17	17
26	E B 17	E B 16	E B 16	E B 16	E B 16	G 16	G 17	G 20	35	34	35	35	32	32	33	29	G 26	22	21	E B 16	E B 16	E B 16	E B 16	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	G 17	25	G 26	29	32	35	32	32	32	31	29	26	22	22	E B 16	E B 16	16	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	G 18	23	28	30	G 31	32	34	31	34	33	31	30	25	21	E B 16	E B 16	E B 16	18	17
29	17	E B 17	E B 16	E B 15	E B 16	G 17	26	G 26	32	G 30	32	34	A	G 32	33	30	27	27	20	20	20	18	16	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	G 16	25	32	34	36	36	G	31	A A 102	31	22	22	24	20	E B 16	E B 16	E B 16	E B 16	E B 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	29	30	29	28	30	29	29	29	28	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	16	23	26	30	32	34	34	34	G	32	29	26	23	19	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	16	E B 16	E B 16	E B 16	16	G	G	28	31	34	35	36	36	35	33	30	28	24	22	18	16	16	17	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 21	G 25	29	G 31	32	32	32	32	31	28	G 24	G 20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

APR. 2019 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

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	16	16	16	16	16	16	14	16	15	12	15	15	15	16	15	16	13	12	16	16	16	16	16	16
2	16	16	16	16	17	16	12	13	14	15	15	16	16	16	14	11	11	13	16	16	16	16	16	16
3	16	16	16	16	16	16	16	12	11	13	14	16	16	17	16	10	12	11	16	16	16	16	16	16
4	16	16	16	16	16	16	14	14	12	15	15	17	14	15	16	14	10	9	13	16	16	16	16	15
5	15	15	16	14	15	16	16	11	10	11	13	12	14	12	15	11	9	10	16	16	16	16	16	16
6	16	16	16	16	15	17	16	12	13	12	15	14	14	14	13	15	12	10	12	16	16	16	16	16
7	16	16	16	15	15	16	16	16	11	14	12	16	16	13	16	14	11	10	11	16	16	16	16	16
8	16	15	10	16	16	16	16	16	16	14	16	16	17	12	16	15	15	15	16	16	16	16	97	16
9	16	17	16	16	16	15	16	16	16	16	16	17	16	14	16	15	12	12	16	16	16	16	15	15
10	16	16	15	15	16	16	16	16	16	15	16	17	16	15	15	15	12	15	16	16	16	16	16	16
11	16	16	16	16	16	16	16	15	12	12	16	15	15	18	13	17	13	11	16	16	16	16	16	16
12	16	16	16	13	16	16	16	16	12	16	16	16	16	17	17	11	13	12	15	15	15	15	15	16
13	16	16	16	15	15	16	16	15	15	16	17	16	15	16	15	14	12	10	15	16	15	16	16	16
14	16	16	16	16	16	16	14	11	11	12	14	14	14	16	16	15	15	10	10	15	15	15	15	15
15	16	16	16	16	16	16	15	15	15	15	17	17	16	16	16	13	10	9	16	16	16	16	15	16
16	16	16	16	15	16	16	16	15	12	16	16	16	16	16	15	11	10	10	16	16	16	16	16	15
17	16	16	16	16	16	16	16	13	16	16	16	16	18	16	10	10	10	12	15	16	16	16	16	16
18	16	16	15	16	16	16	16	16	16	16	16	14	17	16	14	11	10	10	16	16	16	15	16	16
19	16	16	16	16	16	16	14	14	12	16	14	14	16	16	15	15	12	10	10	16	16	16	16	16
20	16	16	16	16	16	16	16	16	14	15	15	15	18	16	18	14	12	16	16	16	16	16	16	16
21	17	16	16	16	16	16	14	9	14	13	15	15	15	15	15	15	15	10	12	16	16	16	16	16
22	16	16	17	16	16	16	13	10	9	13	17	15	14	17	16	14	12	11	14	16	16	16	16	16
23	16	17	14	16	16	17	15	16	15	15	16	16	15	15	C	C	C	C	16	15	15	16	16	16
24	16	16	16	16	16	15	16	12	12	13	15	15	16	16	16	15	15	12	16	15	16	16	16	16
25	16	16	16	16	16	14	14	14	15	17	16	16	16	16	14	16	11	9	11	16	16	16	16	16
26	17	17	17	15	15	15	12	11	12	14	16	16	16	16	15	12	12	10	14	16	16	16	16	16
27	16	16	16	16	16	16	12	11	11	11	10	14	15	15	15	11	15	10	15	16	16	16	16	16
28	16	16	16	16	16	11	15	15	15	15	15	11	15	14	16	15	13	11	16	16	16	16	16	16
29	16	16	16	16	16	16	14	12	12	15	14	14	14	17	13	13	14	12	16	16	16	16	16	16
30	16	16	16	16	16	16	15	12	12	14	12	15	13	16	16	12	12	12	10	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	29	29	29	29	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	14	12	15	15	16	16	16	15	14	12	11	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	15	16	16	16	16	16	16	15	13	12	16	16	16	16	16	16
L Q	16	16	16	16	16	16	14	12	12	13	14	14	15	15	14	11	11	10	13	16	16	16	16	16

APR. 2019 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	315	321	282	301	351	332	386	331	342	319	358	303	323	337	352	349	358	353	341	311	315	331	328	309
2	323	306	306	313	344	331	359	356	313	344	343	339	350	342	357	357	361	348	363	338	331	345	338	313
3	314	314	F 338	340	308	336	376	379	333	340	339	338	311	336	329	337	346	359	346	324	313	304	307	292
4	320	302	341	336	321	345	380	358	309	338	356	326	336	341	339	319	342	356	347	312	303	306	315	314
5	332	335	321	317	337	318	363	333	343	326	342	312	323	339	333	349	352	349	341	322	314	317	317	324
6	313	304	309	343	366	361	362	317	353	224	364	357	309	336	339	349	343	344	335	333	327	328	331	319
7	325	309	309	317	329	341	376	366	364	348	379	348	337	341	334	341	335	350	343	332	319	328	F 297	296
8	294	311	312	F 333	356	348	354	326	267	327	334	287	308	316	322	341	337	350	345	313	302	304	319	319
9	297	311	304	318	329	329	360	322	326	361	334	351	328	345	347	348	345	333	338	305	315	326	295	296
10	316	305	314	326	319	323	366	387	348	315	326	338	332	326	339	350	328	333	346	214	315	307	334	327
11	295	295	311	308	328	343	331	356	353	R 243	339	213	323	345	342	336	346	345	334	313	320	320	314	289
12	313	313	293	304	335	363	376	372	350	352	313	328	343	308	344	334	342	352	339	333	313	330	333	F 276
13	314	307	301	325	291	323	352	354	373	373	355	297	340	328	348	341	330	349	335	322	310	342	361	323
14	297	297	297	300	301	V 350	Z 344	357	371	351	330	347	348	337	331	335	353	355	343	311	332	343	329	311
15	312	313	312	334	306	385	379	301	320	364	333	367	328	345	338	346	347	342	338	306	310	342	318	335
16	322	319	320	333	318	330	335	334	346	362	357	329	304	334	334	347	346	344	325	322	345	351	344	307
17	316	302	307	F 294	F 291	343	343	378	338	338	354	338	326	334	329	330	344	342	332	319	317	324	329	310
18	328	328	328	325	322	365	374	374	341	312	361	357	334	327	327	337	338	346	337	328	320	328	323	334
19	322	322	333	331	329	361	352	333	334	344	357	319	342	342	348	325	348	348	337	312	308	334	348	321
20	306	321	318	331	321	344	363	337	328	372	339	352	272	318	332	332	335	331	313	308	325	337	319	328
21	321	317	322	284	295	321	345	358	332	328	347	352	267	315	338	350	353	347	350	312	305	334	321	321
22	338	325	323	316	344	331	352	330	358	345	345	342	312	332	336	334	334	338	336	321	312	321	312	321
23	299	301	318	327	343	370	344	335	332	346	288	319	338	354	C	C	C	C	343	326	322	327	317	326
24	317	317	311	327	349	366	351	278	338	338	334	342	G	310	307	324	347	231	269	318	307	314	332	305
25	311	314	321	346	331	376	324	370	G	356	G	A	304	269	222	337	331	315	312	308	309	322	316	307
26	317	F 325	F 299	F 300	F 304	355	249	235	299	345	369	351	326	322	299	315	334	331	343	315	320	337	324	325
27	326	312	321	321	F 312	359	371	369	294	339	323	344	316	324	345	327	347	347	345	318	306	317	326	342
28	310	321	321	324	325	357	362	300	290	359	343	328	317	306	328	345	316	358	221	317	326	328	327	328
29	311	308	F 300	F 289	F 246	F 340	375	G	G	304	G	319	335	314	312	335	345	G	328	335	334	299	318	303
30	324	318	312	325	F 294	F 344	348	U R 332	303	343	339	342	322	A	327	331	333	322	311	320	319	315	303	306
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	29	29	29	29	29	30	30	30	30	30	30
MED	316	313	312	324	324	344	360	336	334	344	340	338	324	334	334	337	344	346	338	318	315	328	322	316
U Q	322	321	321	331	337	361	374	366	348	352	356	350	336	341	343	348	347	350	343	324	322	334	331	325
L Q	311	306	306	308	306	331	345	326	309	327	333	319	311	317	328	332	334	333	332	312	310	317	316	306

APR. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	L	L	L	L	L	L	L	L	L	L	L						
2							L	L	L	L	L	398	393	393	L	382	382	L						
3						L	L		372	373	L	L	L	L	L	L	L	L						
4								L	L	L	L	L	L	372	L	377	375	L						
5							L	L	L	L	L	L	L	A	L	373	L							
6								382	L	A	L	L	L	L	L	L	L	L						
7								L	L	L	374	376	392	L	368	L	A							
8								L	382	404	L	403	L	390	375	L	371	L						
9							L	L	L	A	L	L	L	361	L	A	L		A					
10							L	L	400	391	L	369	L	L	L	A	L	A		A				
11							L	L	397	A	L	A	L	369	382	L	L			L				
12							L	L		369	L	L	L	363	372	L	L	L						
13					L	L	L	L	393	A	L	L	363	L	L	L	L	L						
14							386	L	L	L	482	L	384	384	L	379	380	L						
15							L	364	376	L	L	L	419	L	L	370	L	L						
16					L	L	L	L	L	374	380	L	438	L	L	388	L	L						
17						L	L		L	L	L	L	384	L	L	L	L	L						
18								398	L	L	L	L	L	L	L	L	L	L						
19					L		L	369	375	L	L	L	L	L	L	369	L	L	L					
20						L		L	L	L	427	L	L	L	L	384	L	L	L					
21						L	L	L	385	L	L	L	L	L	L	L	L	L						
22						L	L	L	L	L	389	419	403	386	L	L	378	L						
23							381	L	L	L	L	404	L	L	C	C	C	C						
24						L		L	L	L	L	L	L	L	L	L	L	A	A					
25							372	L	391	368	392	A	A	L	290	L	L	L	L					
26						L	L	L	L	L	L	L	L	411	L	L	L	L						
27							L		L	L	L	L	L	396	L	L	L	L						
28							L	L	L	L	414	L	L	L	L	L	A	L	L					
29						L	L	L	386	L	399	L	L	L	L	L	L	L						
30						L	382	355	392	L	L	L	L	A	A	L	A	L	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							4	5	11	6	8	6	8	10	5	8	5							
MED							382	369	386	374	396	400	392	385	372	378	378							
U Q							384	390	393	391	420	404	411	393	378	383	381							
L Q							376	360	376	369	384	376	384	369	329	372	373							

APR. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

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							232	294	280	334	280	304	332	296	258	266	248	248						
2							242	294	326	276	270	292	282	294	272	258	242	232						
3						256	222		308	312	292	304	362	298	282	280	258	244						
4								222	376	292	264	320	298	298	284	312	262	250						
5							250	312	302	300	310	330	306	294	284	254	258							
6								316	264	A	264	264	352	296	274	256	256	250						
7								250	250	282	240	268	300	284	290	278	288							
8								314	446	326	306	398	360	318	324	292	258	260						
9							230	310	286	280	310	280	324	278	296	264	264		262					
10							232	238	264	340	294	280	294	312	282	264	264	260		A				
11							264	258	260	522	288	A	320	268	276	268	252			274				
12							234	234		256	326	318	284	296	268	280	264	236						
13					310	258	252	234	244	264	264	358	274	286	274	262	274	238						
14							270	252	246	266	266	278	278	288	288	254	256	246						
15							230	344	302	260	290	270	320	290	280	260	268	256						
16					262	278	304	274	260	232	262	306	328	306	284	266	254	252						
17						230	218		304	290	256	296	304	296	298	298	272	244						
18								234	294	310	260	254	284	314	310	284	264	264						
19					244		244	276	286	256	260	318	306	300	292	292	268	240	262					
20						256		288	326	244	312	280	432	356	312	324	298	260	256					
21						254	278	254	292	312	292	292	428	340	292	272	242	242						
22						240	230	294	266	290	264	294	300	316	298	298	288	238						
23							242	222	320	302	366	340	306	300	C	C	C	C						
24						222		378	302	326	314	304	G	350	352	322	264	E A 524	E A 362					
25							320	228	G	284	G	A	A	444		314	296	312	292					
26						224	G 410	248	362	288	318	318	318	332	336	340	280	262						
27							226		336	300	332	284	332	332	308	338	262	254						
28							232	338	334	278	318	332	346	386	322	276	314	370	402					
29						250	250	G	G	380	G	348	290	342	338	292	302	G						
30						252	270	280	364	292	292	300	328	A	312	280	288	274	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					3	11	23	27	29	29	30	28	29	29	28	29	29	25	7	1				
MED					262	252	242	276	302	290	292	302	318	300	291	280	264	251	266	274				
U Q					310	256	270	312	335	312	314	319	339	332	311	298	284	263	362					
L Q					244	230	230	238	265	271	264	280	296	294	281	264	257	243	262					

APR. 2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

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	252	252	Q 274	236	230	218	226	198	200	192	192	192	192	190	208	200	206	206	222	240	246	220	Q 250	260
2	240	278	266	266	232	238	192	192	212	182	224	172	206	168	230	198	198	198	228	228	228	228	228	262
3	264	Q 258	246	210	238	204	198	214	200	198	196	188	198	174	226	198	192	218	218	226	272	262	262	282
4	252	262	236	236	244	244	234	204	192	214	202	202	200	198	198	210	222	200	232	242	282	272	260	260
5	230	252	260	258	248	290	194	220	204	190	194	194	188	A	206	196	188	216	234	244	252	242	242	250
6	240	268	270	222	214	234	244	222	204	A	196	188	186	182	196	196	196	196	234	234	242	232	232	242
7	240	264	252	234	218	236	228	208	200	200	200	194	190	194	198	198	A	256	224	224	236	228	Q 226	Q 240
8	264	262	262	252	212	230	246	216	228	208	200	192	186	198	204	204	198	206	228	240	256	258	242	256
9	262	260	256	262	232	238	208	208	190	A	200	194	200	176	200	A	198	248	A	274	260	238	258	258
10	264	262	274	234	242	230	198	200	200	200	200	218	198	190	192	A	200	A	240	A	220	220	226	224
11	282	Q 262	264	244	238	248	208	196	196	A	196	A	182	188	202	202	202	256	252	220	232	230	254	Q 256
12	262	258	Q 282	256	A	224	200	200	256	206	188	192	188	200	200	200	214	206	238	240	240	240	240	Q 274
13	254	264	270	244	222	216	198	214	196	A	186	186	198	198	198	198	198	202	236	226	244	216	204	228
14	268	Q 268	Q 282	254	254	234	264	196	200	196	210	194	200	194	196	210	202	206	238	256	220	220	232	244
15	258	248	260	244	242	222	192	202	202	218	200	200	184	176	198	198	216	216	240	254	244	210	226	214
16	242	252	250	234	222	212	200	202	202	208	190	194	178	194	198	204	194	202	242	242	218	208	208	250
17	242	284	262	Q 226	Q 224	190	190	220	196	198	198	192	194	210	188	200	232	204	238	240	224	236	218	230
18	232	250	242	242	242	226	222	198	198	198	200	188	198	184	196	196	196	212	246	238	236	212	212	220
19	236	254	252	224	204	220	206	204	198	198	198	192	198	186	192	206	206	196	208	266	242	224	216	234
20	254	246	254	232	230	210	222	200	206	216	190	222	244	A	196	206	226	212	212	242	222	204	226	232
21	238	232	240	Q 244	Q 206	204	208	208	208	200	200	200	194	176	198	198	198	194	224	244	244	222	230	230
22	222	240	240	238	210	196	196	196	206	198	198	184	196	202	A	A	202	198	248	240	230	222	222	228
23	284	240	240	196	228	226	196	196	214	214	198	198	198	204	C	C	C	C	246	236	216	226	208	228
24	252	250	252	238	222	196	234	208	206	206	188	198	184	196	186	194	204	A	A	254	254	234	238	238
25	248	248	254	224	216	204	196	194	204	204	198	A	A	190	A	216	204	204	220	258	258	238	222	252
26	Q 232	228	Q 260	Q 224	Q 224	184	200	200	216	206	206	200	172	198	214	224	194	210	240	240	228	222	216	244
27	238	246	242	Q 230	Q 244	220	192	200	200	200	202	202	194	194	196	190	200	178	256	256	242	234	212	234
28	244	262	254	236	226	214	198	198	206	198	198	188	196	198	198	198	A	A	264	242	224	232	254	238
29	246	Q 248	258	Q 232	Q 256	200	200	222	198	198	196	216	A	196	196	200	200	238	258	242	242	242	242	Q 220
30	236	258	254	238	Q 228	204	206	204	194	204	204	188	190	A	A	190	A	210	210	226	218	226	210	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	30	30	30	30	29	30	30	30	30	26	30	28	28	27	26	26	26	26	28	29	30	30	30	30
MED	247	256	255	236	228	220	200	202	201	200	198	194	194	194	198	199	200	206	237	240	241	228	227	239
U Q	262	262	264	244	242	234	222	208	206	206	200	200	198	198	202	204	206	216	244	249	246	238	242	256
L Q	238	248	250	230	220	204	196	198	198	198	196	188	187	184	196	198	198	200	224	235	224	220	216	228

APR. 2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A 112	112	106	106	106	106	106	100	102	102	102	102		A	B				
2						B 104	98	100	104	104	102	102	102	102	106	110	116		B	98				
3						B 116	116	116	112	112	114	114	102	102	104	108	122		B	B				
4						A 94	102	102	102	102	102	102	A	A	106	112	98		A	98				
5						A 104	108	108	108	108	108	108	108	114	104	104	104		A	90				
6					B	92	120	100	100	100	100	98	98	A	98	98	106	106	A	A				
7					B	A 106	106	106	106	106	106	A	106	A	106	100	A	100	100	A				
8					B	114	126	110	108	108	100	98	104	104	104	104	110	100	B	B				
9					A	106	106	106	106	106	90	102	102	104	A	A	104	A	A	A				
10					B	B 104	104	110	110	100	A	A	A	A	90	A	A		98	A				
11					B	B 118	116	108	102	102	94	A	A	A	A	A	106		94	A				
12					A	A	A 94	98	A	98	98	98	98	98	98	98	110	102	A	A				
13					A	A 104	104	104	104	96	96	A	A	96	96	96	96	A	A	A				
14					A	A 96	92	104	104	110	A	A	108	88	92	96	96	96	96	A				
15					A	90	102	116	106	106	106	104	A	104	108	108	96	96	96	A				
16					96	122	118	114	106	102	102	108	108	100	98	104	98	100	A	A				
17					A	A 102	102	102	102	102	102	A	102	102	90	90	94	92	A	A				
18					A	A 112	112	112	112	106	106	106	106	106	106	106	92	92	A	B				
19					96	128	116	112	112	112	112	98	A 104	114	114	108	104		A	A				
20					B	122	108	108	108	108	A	A	108	108	106	106	106	100	A	A				
21					B	100	112	112	112	110	110	110	A 110	106	106	106	106	106	106	A				
22					A	B 110	110	110	104	104	104	A	A	A	A	104	100	116		A				
23					A	B 116	116	104	104	104	98	106	106	C	C	C	C	A	A					
24					A	A 108	108	108	108	94	92	102	A	A	112	108	108		A	A				
25					B	124	114	106	110	110	110	110	110	110	110	110	110	110	A	B				
26					A	144	116	116	108	104	A	A	A 104	104	104	104	104	104	100	B				
27					B	124	114	104	104	104	104	104	104	104	104	104	106	106	A	B				
28					B	100	100	100	106	106	106	106	A	106	108	108	108	108	A	A				
29					B	102	116	110	106	106	106	106	106	106	106	106	A	106	106	B				
30					A	A 114	100	100	102	102	102	102	100	A	A	A	A	86	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	14	29	30	30	29	28	24	20	21	22	25	24	26	9	3				
MED					96	114	110	108	106	106	104	103	105	104	104	104	106	103	100	98				
U Q						124	116	112	108	108	106	106	107	107	106	106	108	106	106	98				
L Q						100	104	102	104	104	101	98	102	102	98	99	100	100	96	90				

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	128	146	104	138	156	106	94	108	108	148	128	116	116	88	B	B	B	B	94
2	B	B	B	B	112	B	100	88	102	94	118	118	96	156	156	124	124	108	B	90	B	B	120	94
3	B	B	94	94	94	B	116	102	110	110	110	110	100	100	150	108	108	132	B	B	B	112	112	100
4	100	100	94	94	94	100	116	108	112	106	110	100	104	98	96	108	162	134	86	86	88	96	96	96
5	96	96	102	108	104	104	102	102	102	100	118	108	108	102	98	90	110	88	86	86	92	116	B	110
6	100	100	92	92	92	G	128	128	112	98	98	98	98	94	94	94	102	92	86	86	86	B	B	B
7	B	86	96	96	96	96	96	148	120	100	100	94	90	96	104	104	104	124	110	90	104	104	B	B
8	B	B	B	92	B	110	88	114	114	98	98	92	98	94	152	106	130	122	B	92	B	B	B	84
9	B	92	B	B	108	102	92	118	114	104	104	106	106	106	90	90	90	90	92	100	100	98	98	98
10	98	B	B	B	B	B	138	126	120	102	104	98	98	94	94	102	90	86	90	96	96	96	96	96
11	B	96	96	96	B	B	112	168	116	100	100	90	90	90	90	90	90	94	102	102	102	102	96	B
12	B	102	B	100	110	100	98	98	98	106	100	100	100	112	112	98	120	114	100	106	98	94	94	94
13	94	94	94	84	96	96	106	96	100	100	100	100	92	92	92	90	90	90	78	86	94	94	102	96
14	96	96	96	96	84	84	84	112	150	90	G	96	96	96	96	102	G	130	90	90	92	B	B	92
15	B	B	B	B	90	96	G	108	114	104	148	102	96	96	158	158	108	84	96	88	112	98	B	94
16	82	B	B	B	G	G	120	124	92	102	108	G	98	G	172	G	126	84	86	82	B	B	B	B
17	94	94	94	90	82	82	G	116	96	98	98	98	108	154	82	82	150	122	80	82	B	B	88	88
18	88	84	B	B	94	94	138	138	102	106	106	102	102	102	198	106	G	132	114	B	B	B	B	102
19	B	B	B	90	102	G	130	130	110	110	100	98	98	98	98	106	110	120	88	88	B	88	88	88
20	90	90	90	B	B	G	90	108	102	108	106	100	164	108	120	128	116	130	110	110	B	B	92	B
21	92	B	B	B	B	92	134	106	106	106	98	182	98	98	G	98	162	156	94	94	94	B	94	92
22	B	B	B	B	96	B	120	116	108	106	106	100	96	96	96	96	128	128	108	90	B	B	90	90
23	90	90	90	86	86	B	138	104	110	112	104	104	90	140	C	C	C	C	90	90	90	84	88	B
24	92	B	B	92	92	92	144	124	130	110	106	102	102	94	94	124	112	104	102	100	100	86	86	B
25	92	B	B	B	B	132	132	G	120	120	120	108	108	108	102	102	102	102	102	102	102	B	102	108
26	92	108	96	96	96	136	136	114	102	100	96	96	96	94	94	104	92	136	136	B	B	B	B	90
27	B	B	90	90	90	130	130	114	112	108	108	112	92	92	144	132	130	86	86	86	B	112	112	B
28	B	B	B	B	96	90	124	142	142	134	122	138	98	126	126	130	118	118	112	86	B	110	104	104
29	90	100	100	92	92	84	110	112	112	112	112	106	102	180	120	92	92	120	110	102	102	102	102	102
30	106	90	90	90	88	88	90	112	114	100	110	G	94	94	90	90	90	90	84	84	84	92	B	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	17	16	15	18	22	20	28	29	30	30	29	28	30	29	28	28	27	29	27	26	17	17	19	21
MED	92	95	94	92	94	96	118	114	112	105	106	100	98	98	100	103	110	116	92	90	96	98	96	94
U Q	97	100	96	96	96	107	133	125	116	110	110	107	102	108	146	116	126	129	108	100	102	107	102	101
L Q	90	90	90	90	90	91	99	105	102	100	100	98	96	94	94	93	92	90	86	86	91	93	90	91

IONOSPHERIC DATA STATION Wakkanai

APR. 2019 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L 1	C 1	CL 21	CL 21	C 2	C 1	LC 11	C 1	C 2	H 2	C 1	C 2	C 2	L 1					F 1
2					F 1		L 3	C 2	C 2	C 2	C 2	C 1	LC 11	C 1	C 2	C 2	C 2	C 2		L 1			F 1	F 2
3			F 3	F 4	F 1		C 2	C 2	C 2	C 2	C 2	C 1	C 1	C 1	H 2	C 2	C 2	H 2				F 1	F 1	F 2
4	F 1	F 2	F 2	F 2	F 3	L 2	C 2	C 2	C 2	C 2	C 1	C 2	C 2	L 2	L 3	C 2	C 2	C 2	L 2	C 1	F 1	F 2	F 4	F 3
5	F 1	F 2	F 2	F 4	F 4	L 3	C 2	L 2	C 2	C 1	C 2	C 2	C 2	C 5	C 2	L 3	C 2	C 3	L 4	C 1	F 1	F 1		F 1
6	F 1	F 1	F 1	F 1	L 1		C 2	C 3	C 3	C 5	C 3	C 3	C 2	L 2	C 2	C 2	C 2	C 2	L 4	L 3	F 2			
7		F 1	F 1	F 1	L 1	L 1	LC 11	C 1	CL 21	C 2	C 2	C 2	LC 11	L 2	C 2	C 2	C 5	C 2	C 3	L 2	F 1	F 2		
8				F 1		L 1	LC 11	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 2		L 1				F 1
9		F 1			L 2	C 1	LC 11	C 2	C 2	C 2	C 1	C 2	C 2	CL 21	L 2	L 4	L 3	L 3	LQ 51	LQ 21	F 2	F 2	F 3	F 1
10	F 1						C 2	CL 21	CL 21	C 2	C 2	L 2	L 2	L 3	L 3	C 3	L 2	L 4	C 2	L 6	F 6	F 5	F 5	F 6
11		F 2	F 1	F 1			C 2	H 2	C 2	C 3	C 2	C 4	L 2	L 3	L 2	L 2	L 4	L 3	C 3	L 4	F 2	F 2	F 2	
12		F 2		F 2	LL 34	L 3	L 3	C 3	C 3	L 1	C 2	C 1	C 1	C 1	C 2	C 1	C 2	C 2	L 3	L 4	F 5	F 6	F 3	F 3
13	F 3	F 3	F 3	F 2	L 4	L 7	L 3	C 2	LC 11	C 3	C 2	C 2	C 2	L 3	C 2	LC 21	LC 21	L 2	L 2	L 1	F 1	F 1	F 1	F 4
14	F 1	F 1	F 3	F 3	L 3	L 2	L 3	CL 21	C 2	LC 11		C 2	C 1	C 2	C 2	C 2	C 2	C 2	C 3	L 2	F 1			F 1
15					L 1	LC 11		LC 11	C 2	C 2	H 1	C 1	L 3	L 2	H 1	H 1	C 1	LC 31	LC 11	L 1	F 1	F 1		F 1
16	F 1						C 2	CL 21	LC 11	C 3	C 2		CL 12		HL 12		CL 11	LC 11	L 1	L 1				
17	F 1	F 4	F 2	F 2	L 2	L 2		C 2	C 2	C 2	C 2	L 2	C 1	H 1	L 2	L 2	CL 21	C 2	L 2	L 1			F 1	F 1
18	F 1	F 2			L 1	L 1	C 2	C 2	C 2	C 2	C 2	C 1	C 1	C 2	C 2	C 2		C 2	C 3					F 1
19				F 1	C 1		C 2	C 1	C 2	C 2	C 2	C 2	L 2	L 2	LC 11	C 2	C 2	C 2	L 1	L 2		F 1	F 1	F 1
20	F 1	F 1	F 1				LC 11	C 2	C 2	C 2	C 1	C 2	C 1	C 2	C 1	C 2	C 3	C 2	L 3	L 1			F 1	
21	F 1					LC 11	CL 21	C 2	C 2	C 2	C 1	C 1	L 2	L 2		LC 11	HL 11	HL 11	L 2	L 2	F 1		F 1	F 1
22					L 1		C 2	C 2	C 2	C 2	C 1	C 2	L 3	L 3	L 3	L 3	C 2	C 2	C 3	L 2			L 4	L 4
23	F 5	F 4	F 3	F 3	L 2		C 2	C 3	C 2	C 2	C 1	C 1	LC 21	CL 21					L 3	L 5	F 4	F 1	F 1	
24	F 1			F 1	L 1	C 1	C 2	C 2	C 2	C 2	C 2	C 2	C 2	LC 21	L 2	C 2	C 1	C 6	C 6	L 3	F 2	F 1	F 1	
25	F 1					C 1	C 2		C 2	C 1	C 2	C 2	C 2	C 2	C 3	C 2	C 2	C 3	L 2	C 1	F 3		F 1	F 3
26	FF 11	F 1	F 2	F 2	L 1	L 1	C 3	C 2	C 3	C 2	L 3	L 2	L 2	C 1	L 2	C 1	L 2	HL 11	H 2					F 1
27			F 1	F 1	L 1	C 1	C 2	C 2	C 2	C 1	C 2	C 1	C 2	C 2	H 2	H 1	C 2	L 3	L 2	L 1		F 1	F 1	
28					F 1	LC 11	C 2	C 2	C 2	C 2	C 1	H 1	L 1	C 1	C 1	C 2	C 4	C 2	C 4	L 1		F 3	F 4	F 3
29	F 3	F 1	F 1	F 1	L 2	LC 11	LC 11	C 2	C 2	C 2	C 1	C 2	C 2	H 1	C 2	LC 21	L 4	C 3	C 2	L 5	F 6	F 3	F 3	F 1
30	F 1	F 1	F 2	F 2	L 1	LC 11	LC 11	C 3	C 3	C 3	C 2		C 2	L 6	L 4	L 3	L 5	LC 31	L 3	L 1	F 1	F 1		
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. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 fxI (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	X 37	40	X 37	X 34	X 31	X 28														X 60	X 52	X 46	X 42	X 43
2	X 42	X 40	X 39	X 38	X 37	X 33														X 58	X 56	X 40	X 38	X 37
3	X 37	X 37	X 34	X 34	X 32	X 30													X 56	X 53	X 46	X 42	X 42	X 41
4	X 41	X 39	X 39	X 36	X 31	X 31													X 55	X 51	X 49	X 47	X 48	X 46
5	X 46	X 39	X 33	X 34	X 34	X 32														X 62	X 53	X 50	X 48	X 45
6	X 44	X 43	X 41	X 40	X 35	X 35														X 66	X 62	X 46	X 44	X 42
7	X 42	41	X 36	X 37	X 32	36														X 72	X 52	X 40	40	39
8	40	40	X 36	40	A	X 32														X 72	X 52	A	44	47
9	43	41	X 39	X 40	X 36	X 33														X 65	X 62	X 51	X 50	X 48
10	X 48	X 48	X 46	X 44	X 39	X 42														X 69	X 60	X 43	X 46	X 46
11	X 43	X 45	X 44	X 40	X 38	X 40														X 72	X 71	X 44	X 40	42
12	46	42	48	42	44	X 44														X 77	X 63	X 54	X 45	X 44
13	X 41	X 42	X 39	X 39	X 38	X 45														X 78	X 79	X 55	X 48	X 43
14	X 41	X 40	X 38	X 37	X 38	X 40														X 66	X 68	X 51	X 46	X 47
15	X 46	X 44	X 40	X 37	38	X 36														X 74	X 71	X 60	X 52	X 50
16	X 48	X 46	X 45	X 42	X 37	X 38														X 76	X 80	X 45	X 34	X 35
17	X 39	40	X 37	44	39	X 40														X 63	60	X 55	X 50	X 47
18	X 45	X 44	X 42	X 40	X 39	X 40														X 71	X 68	60	X 47	48
19	46	42	X 40	45	38	X 37														X 66	X 66	X 62	X 42	X 39
20	X 38	X 39	X 38	X 35	X 33	X 36														X 65	X 64	56	X 50	X 47
21	X 45	X 45	X 44	X 39	X 45	X 44														X 57	X 54	X 51	X 49	X 50
22	X 48	X 46	X 46	X 43	X 41	X 37														X 59	X 59	X 54	X 49	53
23	52	48	X 42	X 37	X 30	X 37														X 56	X 51	X 45	48	45
24	43	39	40	42	37	38														X 62	X 57	X 52	X 52	53
25	X 53	55	53	49	40	X 37														X 65	X 68	X 56	X 44	X 43
26	X 42	X 42	X 38	X 38	X 35	X 38														X 57	X 48	X 48	X 44	X 44
27	44	41	39	38	X 33	X 40														X 57	X 57	X 55	X 51	X 49
28	X 48	X 45	X 43	X 41	X 37	X 40														X 50	X 53	X 50	X 48	X 48
29	X 46	X 44	X 39	X 38	X 34	X 42														X 57	X 58	X 45	X 45	X 42
30	45	X 44	47	42	42	47														X 75	X 70	X 48	46	44
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													2	30	30	29	30	30
MED	X 44	X 42	X 40	X 40	X 37	X 38													X 56	X 65	X 60	X 50	X 46	X 45
U Q	X 46	X 45	X 44	42	39	X 40														X 72	X 68	X 55	X 49	X 48
L Q	X 41	40	X 38	X 37	X 34	X 35														X 57	X 53	X 45	X 44	X 42

APR. 2019 fxI (0.1MHz)

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APR. 2019 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	31	F	31	28	25	22	44	46	54	56	54	59	65	55	60	56	60	53	50	54	46	40	36	37
2	36	34	33	32	31	27	44	45	56	66	66	57	69	56	53	61	54	50	46	52	49	34	32	31
3	31	31	28	28	26	24	38	45	50	53	61	60	58	63	68	79	62	57	50	47	39	36	36	35
4	35	33	33	30	25	26	44	52	53	56	56	68	59	59	56	62	56	54	49	45	43	41	42	40
5	40	33	27	28	28	26	47	46	56	52	58	67	76	69	58	59	52	51	50	56	47	44	42	39
6	38	37	35	34	29	28	44	58	56	63	58	62	65	62	60	68	58	58	63	60	56	40	38	36
7	36	F	30	29	26	F	45	50	57	61	56	57	66	62	A	67	66	68	67	66	46	34	F	F
8	F	F	32	F	A	26	42	51	60	63	63	64	64	63	72	66	63	60	69	65	46	A	F	F
9	F	F	33	34	30	27	39	58	59	58	64	68	70	63	67	64	60	57	58	59	56	45	44	42
10	42	42	40	38	33	36	47	52	55	59	62	66	72	76	67	71	62	62	65	63	54	37	40	40
11	37	39	38	34	32	34	48	56	53	55	58	66	76	78	74	66	63	59	60	66	65	38	34	F
12	F	F	F	F	F	38	52	56	50	57	64	69	72	78	81	76	66	62	67	70	57	48	39	38
13	35	36	33	33	32	39	58	53	51	54	58	66	70	80	78	69	64	62	68	71	73	49	42	37
14	34	34	32	31	32	34	48	57	58	63	60	67	68	64	70	69	69	65	58	60	62	45	40	41
15	40	38	34	31	F	30	44	51	52	59	64	68	66	64	61	68	57	55	60	68	65	54	46	44
16	42	40	39	36	30	32	53	62	58	57	58	58	59	59	64	69	66	58	64	70	74	39	28	29
17	33	F	31	F	F	34	49	49	56	56	60	60	60	67	64	66	68	64	60	57	F	49	44	40
18	39	38	36	34	33	34	42	51	52	61	67	55	52	61	66	68	51	49	57	65	62	F	41	F
19	F	F	34	F	F	31	42	51	55	62	62	54	64	72	66	57	54	54	58	60	60	56	36	33
20	32	33	32	29	27	30	42	54	71	64	58	57	52	49	56	53	55	50	54	59	58	F	43	41
21	39	39	37	33	39	38	43	52	54	57	59	53	53	55	68	68	57	53	50	51	48	45	43	44
22	42	40	40	37	35	31	44	49	60	66	60	56	56	57	51	58	59	54	49	53	53	47	43	F
23	F	F	34	31	24	31	45	49	53	51	57	62	63	66	54	51	52	54	53	50	45	39	F	F
24	F	F	F	F	F	F	40	47	55	58	55	53	56	56	52	50	57	56	60	56	50	46	46	F
25	47	F	F	F	F	30	41	41	45	A	53	55	53	54	54	57	55	49	50	59	62	50	38	37
26	36	36	32	32	29	32	44	51	50	53	52	50	54	50	50	50	54	52	46	50	42	42	38	38
27	F	F	F	F	27	34	41	42	47	50	54	58	50	54	53	61	61	64	51	51	51	49	45	43
28	42	39	37	35	31	34	46	46	48	53	51	54	52	55	56	56	57	55	52	44	46	44	42	42
29	40	38	33	31	28	36	42	45	46	48	48	52	60	59	56	49	55	53	50	51	52	39	39	36
30	F	38	F	F	F	F	48	48	A	A	A	A	60	68	70	64	58	56	62	69	64	42	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	19	25	22	22	27	30	30	29	28	29	29	30	30	29	30	30	30	30	30	29	27	26	22
MED	38	38	33	32	30	31	44	51	54	57	58	59	62	62	61	64	58	56	58	59	53	44	40	38
U Q	40	39	36	34	32	34	47	53	56	62	62	66	68	67	68	68	63	60	62	65	62	48	43	41
L Q	35	34	32	30	27	27	42	46	50	54	56	55	56	56	55	57	55	53	50	51	46	39	38	36

APR. 2019 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2019 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

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									400	416	U L 440	436	420	428	416	U L 416	L	L						
2									U L 396	408	424	432	440	428	U L 444	U L 404	L							
3									L	428	432	436	U L 440	U L 432	416	U L 404	L	U L 292						
4								L	L	L	U L 428	420	L	U L 436	U L 432	U L 400								
5								U L 412	L	L	U L 448	424	U L 448	436	U L 420	L	L							
6								L	U L 416	U L 420	U L 432	U L 440	A	A	U L 452	U L 420	L	L						
7									L	L	U L 456	U L 476	A	A	A	U L 428	A	A						
8									A	U L 448	U L 436	U L 444	U L 456	U L 448	U L 436	L	L	L						
9								A	A	A	U L 428	460	U L 436	U L 456	U L 440	U L 404	L							
10									L	L	U L 436	468	456	452	A	L	L	L						
11									L	U L 448	U L 448	440	A	A	A	U L 420	L	L						
12										436	U L 444	U L 444	460	452	U L 424	U L 420	L	L						
13									L	U L 456	U L 464	448	A	A	U L 428	U L 412	L	L						
14								L	L	U L 420	L	U L 440	A	U L 464	U L 440	U L 416	L							
15									A	U L 432	U L 436	A	452	448	U L 420	U L 412	A							
16									L	L	U L 460	A	U L 444	440	A	U L 420	U L 384	L						
17								L	U L 424	A	U L 436	A	444	U L 436	U L 440	412	L	L						
18								L	U L 444	U L 416	U L 428	U L 444	U L 452	U L 424	U L 428	A	A	L						
19								A	U L 420	U L 416	444	U L 448	A	U L 444	416	404	U L 392	L						
20								L	396	420	U L 448	440	436	A	U L 420	400	L	A						
21								L	U L 412	U L 416	U L 428	440	440	432	416	412	L	L						
22								L	396	416	428	U L 448	U L 504	U L 440	U L 420	U L 404	U L 392	L						
23								L	U L 400	U L 416	U L 432	432	A	436	U L 428	A	A	A						
24								U L 376	396	U L 420	U L 428	A	A	U L 432	U L 424	U L 408	A	A	A						
25									U L 420	A	U L 428	432	U L 440	U L 428	U L 388	U L 396	U L 376	L						
26								U L 372	U L 404	U L 396	A	U L 440	U L 420	U L 432	A	A	U L 388	L						
27									U L 408	416	416	U L 428	U L 432	420	A	A	A	L						
28									U L 404	U L 428	U L 408	U L 476	E A 448	U L 432	A	A	A	U L 380						
29								A	U L 428	A	436	U L 440	U L 448	U L 428	U L 432	U L 424	U L 388	L						
30								A	A	A	A	A	A	A	U L 420	A	U L 396	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								3	16	20	27	25	20	24	23	21	7	2						
MED								U L 376	U L 406	U L 420	U L 436	440	U L 444	U L 436	U L 424	U L 412	U L 388	U L 336						
U Q								U L 412	U L 420	U L 430	U L 444	U L 448	452	U L 446	U L 436	U L 420	U L 392							
L Q								U L 372	398	416	U L 428	434	438	430	420	U L 404	U L 384							

APR. 2019 foF1 (0.01MHz)

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APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	UA 236	UR 304	UR 312	R	UA 324	348	R	A	A	UR 264	UR 208	B					
2							UR 192	244	A	R	R	R	R	R	R	A	UR 264	A	B					
3							B	244	UR 292	UR 332	R	A	R	R	R	R	UR 256	UR 212						
4							200	UA 240	A	R	A	A	A	A	R	UR 296	UA 260	UR 208						
5							UA 168	A	A 280	A	A	UR 324	UR 356	A	R	UR 296	260	UA 216	B					
6							B	A	A	A	A	A	A	A	UR 320	UR 300	R	UR 208	B					
7							B	260	UA 284	A	A	A	A	A	A	A	A	A	B					
8							A	A	A	A	A	A	A	R	A	A	A	UR 244	B					
9							UA 208	UA 256	A	A	R	A	A	A	A	A	A	224	B					
10							A	UA 248	A	R	A	A	A	A	A	A	UR 268	UR 244	B					
11							R	A	A	A	A	A	A	A	UA 316	UA 292	UR 276	A	B					
12							UR 192	UR 264	UR 300	UR 320	A	A	R	UR 328	R	UR 300	A	UR 236	B					
13							B	A	A	A	A	A	A	A	UR 320	UR 300	A	A	B					
14							UR 204	A	A	A	A	A	A	A	A	A	A	A	A					
15							UA 212	UA 256	A	A	A	A	A	A	R	A	A	A	B					
16							UA 192	A	A	A	R	A	A	A	A	A	UR 276	A	B					
17							UR 216	260	UA 304	A	A	UA 344	A	A	A	308	A	UA 224	B					
18							UA 184	UA 268	UA 308	A	A	A	A	A	A	A	A	A	B					
19							UA 216	UA 272	A	A	UA 348	344	A	R	A	R	R	UR 228	B					
20							UR 220	UR 276	UR 316	R	R	UA 352	344	UA 340	UA 316	R	A	A	B					
21							UR 228	A	A	A	UR 364	UR 372	A	UA 340	UA 324	R	UR 276	A	B					
22							UA 224	UR 272	UA 304	A	A	R	A	R	A	UR 304	UA 272	A	B					
23							UA 220	UR 276	A	A	A	A	A	A	A	A	A	A	B					
24							A	UA 268	A	A	A	A	A	A	A	A	A 360	A	B					
25							UA 224	A	UA 292	A	A	A	A	UA 344	R	A	A	A	B					
26							A	UA 260	UA 280	A	A	UA 360	A	R	A	A	A	A	B					
27							A	A	A	A	R	R	R	R	A	A	A	A	A					
28							UA 224	A	A	A	UA 324	UA 336	A	A	A	A	A	UR 228	B					
29							A	A	A	A	A	A	A	R	UA 328	A	A	A	B					
30							A	A	A	A	A	A	A	A	A	A	A	A	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							17	17	11	3	3	8	3	4	6	8	11	12						
MED							UA 212	UA 260	UA 300	UR 320	UA 348	UA 344	348	UA 340	UA 320	UR 300	UR 268	UR 224						
U Q							UA 222	UR 270	UR 304	UR 332	UR 364	UA 356	UR 356	UA 342	UA 324	UR 302	UR 276	UR 232						
L Q							UA 192	UA 246	UA 284	UR 312	UA 324	UA 330	344	U 334	UA 316	UR 296	U 260	UR 210						

APR. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 17	19	J A 25	29		G	G	G		36	39	G	36	34	G	24	E B 16	E B 16	20	E B 16	E B 16	E B 16
2	E B 16	E B 15	E B 16	E B 16	E B 16	E B 17	G	29	34		G	G	G	G	G	G	34		G	J A 28	23	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16
3	E B 16	E B 16	J A 23	E B 14	20	E B 16	J A 24	28		G	G	G	37		G	G	G	G	G	G	E B 17	22	E B 16	E B 15	E B 15	E B 15	E B 16
4	E B 15	23	22	J A 24	J A 24	J A 24	G	28	31		G	37	J A 40	J A 37	J A 35	34	J G 32	32		G	E B 15	E B 16	E B 16	E B 15	E B 16	E B 16
5	E B 16	19	E B 16	E B 16	E B 16	E B 16	22	31	32	38	J A 39	G	38	37		G	G	29	26	J A 27	J A 24	22	J A 22	J A 24	E B 16	
6	E B 15	E B 16	E B 16	E B 16	E B 17	19	23	31	32	J A 38	39	38	J A 51	J A 52	J G 30	G	G	G		J A 24	20	22	J A 23	E B 16	E B 16	
7	19	21	20	22	22	21	J A 28	30	34	36	37	J A 46	J A 50	J A 52	J A 96	J A 41	J A 46	J A 34	19	J A 44	J A 21	J A 63	J A 54	J A 48		
8	J A 50	J A 29	J A 35	J A 36	J A 39	J A 34	J A 41	J A 42	J A 59	41	40	J A 42	40	G	J A 36	J A 38	J A 38	G	J A 42	J A 46	J A 74	J A 65	J A 32	J A 27		
9	J A 23	J A 25	J A 28	E B 17	E B 16	E B 16	29	J A 41	J A 58	J A 53	G	J A 42	J A 44	J A 46	J A 48	J A 44	J A 35	26	J A 42	J A 31	J A 53	J A 52	J A 61	J A 34		
10	J A 45	J A 31	22	J A 26	20	E B 17	26	29	34	G	38	J A 62	40	42	J A 46	34	G	G	J A 26	J A 26	J A 36	J A 52	J A 49	J A 67		
11	J A 28	J A 40	E B 16	E B 16	J A 24	E B 16	G	29	34	J A 39	39	J A 49	J A 104	J A 73	40	34	G	28	J A 27	J A 58	J A 62	J A 44	J A 97	J A 41		
12	J A 27	22	E B 16	E B 16	23	J A 25	G	G	G	G	37	37	G	38	G	G	32	G	J A 24	J A 37	J A 22	J A 28	24	22		
13	J A 23	J A 23	21	J A 24	E B 15	23	22	J A 32	J A 35	J A 40	J A 43	J A 42	J A 49	J A 70	G	J G 26	J A 31	J A 32	J A 32	J A 29	22	E B 16	E B 15	E B 16		
14	E B 15	E B 14	20	E B 16	20	21	G	32	J A 40	38	38	J A 56	44	38	34	J A 41	31	J A 30	J A 26	J A 45	J A 38	J A 40	J A 24	E B 15		
15	E B 16	E B 16	J A 24	J A 43	J A 30	J A 25	25	31	J A 39	J A 44	40	J A 47	39	J A 48	G	J A 42	J A 40	J A 28	20	J A 24	20	J A 44	J A 23	J A 25		
16	22	E B 16	E B 16	22	E B 15	E B 16	23	30	32	36	G	40	39	J A 52	J A 62	34	G	29	E B 15	E B 16	J A 52	E B 17	J A 24	J A 34		
17	J A 36	E B 16	20	E B 16	E B 16	E B 16	G	34	35	J A 39	J A 44	44	J A 45	J A 45	J A 38	37	32	28	J A 28	J A 38	J A 44	J A 29	23	J A 25		
18	23	21	E B 16	E B 14	E B 15	E B 16	24	31	34	36	36	J A 41	40	38	J A 51	J A 74	J A 36	J A 32	20	E B 14	J A 42	J A 40	J A 54	E B 15		
19	E B 16	J A 28	21	J A 28	E B 15	E B 15	27	J A 38	J A 37	J A 40	39	41	J A 48	G	37	G	G	G	E B 17	J A 46	J A 36	E B 16	J A 53	E B 16		
20	E B 16	E B 14	E B 14	E B 14	E B 16	E B 16	G	G	G	G	G	42	39	39	37	G	J A 36	J A 35	J A 30	J A 38	J A 34	J A 40	J A 29	E B 15		
21	E B 15	E B 15	E B 15	21	E B 15	E B 17	26	30	34	J A 38	G	G	37	40	38	G	G	J A 29	E B 15	J A 22	J A 26	J A 23	22	20		
22	22	21	E B 16	E B 17	E B 15	E B 15	25	G	35	37	39	G	40	G	J A 37	G	32	J A 32	J A 25	E B 17	20	J A 36	J A 22	J A 24		
23	J A 34	E B 16	E B 16	22	21	23	28	G	33	37	38	J A 41	J A 68	J A 39	39	J A 50	J A 48	J A 55	E B 16	E B 16	J A 30	23	J A 22	23		
24	23	21	21	E B 16	23	E B 15	28	32	34	40	39	J A 57	J A 52	37	38	38	J A 68	J A 50	J A 36	J A 76	J A 53	J A 36	J A 50	J A 28		
25	J A 37	J A 32	J A 23	J A 27	J A 34	J A 24	28	33	36	J A 51	38	39	40	39	G	37	J A 37	J A 34	E B 15	J A 22	J A 28	J A 21	E B 15	J A 32		
26	J A 25	J A 22	E B 16	E B 16	19	21	J A 41	29	33	J A 40	J A 48	G	39	G	42	J A 48	J A 38	J A 26	21	E B 15	J A 32	E B 17	E B 15	E B 16		
27	E B 15	E B 15	E B 16	E B 16	E B 15	J A 20	25	34	35	37	G	G	G	G	J A 52	J A 66	J A 54	J A 34	J A 30	E B 15	20	20	20	E B 16		
28	E B 17	E B 16	E B 16	E B 15	E B 16	E B 16	28	35	32	37	36	41	39	38	J A 57	J A 64	34	G	21	J A 31	J A 36	J A 24	J A 32	J A 26		
29	22	E B 16	J A 23	J A 23	E B 16	E B 16	J A 34	J A 53	J A 94	J A 93	43	41	40	G	37	J A 50	32	J A 37	J A 47	J A 32	J A 51	J A 48	J A 36	J A 52		
30	J A 34	J A 24	22	19	20	J A 27	J A 30	J A 44	J A 54	J A 54	J A 84	J A 74	J A 55	J A 50	J A 45	J A 52	J A 36	J A 33	20	J A 50	J A 42	J A 37	J A 87	J A 54		
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	22	20	18	E B 16	E B 17	E B 17	25	31	34	38	38	41	40	38	37	36	32	J A 28	22	J A 25	J A 31	J A 26	J A 24	22		
U Q	J A 27	J A 23	J A 22	J A 23	J A 22	J A 23	J A 28	J A 34	J A 36	J A 40	J A 39	J A 44	J A 48	J A 46	J A 45	J A 44	J A 37	J A 33	J A 28	J A 38	J A 42	J A 40	J A 49	J A 32		
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 22	29	32	G 36	G	G 37	39	G	G	G	G	G	E B 17	E B 16	21	E B 17	E B 16	E B 16		

APR. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 17	E B 16	21	26	G	G	G	36	37	G	34	31	G	22	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16
2	E B 16	E B 15	E B 16	E B 16	E B 16	E B 17	G	26	32	G	G	G	G	G	G	30	G	23	17	E B 16	E B 16	E B 15	E B 16	E B 16
3	E B 16	E B 16	E B 16	E B 14	E B 16	E B 16	21	28	G	G	G	34	G	G	G	G	G	G	E B 17	E B 16	E B 16	E B 15	E B 15	E B 16
4	E B 15	E B 16	E B 16	19	E B 16	E B 16	G	26	29	G	36	34	34	31	32	G 24	31	G	E B 15	E B 16	E B 16	E B 15	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	30	32	32	G	38	34	G	G	28	25	22	19	E B 16	E B 16	E B 16	E B 16
6	E B 15	E B 16	E B 16	E B 16	E B 17	E B 16	22	28	32	32	37	36	46	44	G 27	G	G	G	19	18	E B 16	19	E B 16	E B 16
7	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	22	28	32	34	36	41	44	47	A A 96	32	36	27	18	30	E B 16	18	E B 16	E B 16
8	18	16	22	21	A A 39	E B 16	32	34	52	37	37	36	36	G	33	32	31	G	32	39	38	A A 65	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 17	E B 16	E B 16	28	37	45	50	G	38	37	38	35	34	29	24	26	22	22	20	22	22
10	24	E B 16	E B 16	18	E B 16	E B 17	24	27	32	G	38	40	37	37	41	32	G	G	20	21	22	E B 16	21	E B 16
11	23	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	31	33	35	38	44	49	38	33	G	25	24	23	22	22	E B 16	19
12	20	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	G	32	34	G	36	G	G	29	G	17	22	E B 17	22	E B 16	E B 16
13	20	E B 16	E B 16	E B 15	E B 15	E B 16	20	26	31	34	37	36	45	64	G	G 23	30	26	20	23	16	E B 16	E B 15	E B 16
14	E B 15	E B 14	E B 16	E B 16	15	E B 16	G	28	35	37	34	38	41	35	33	34	30	23	18	27	23	20	E B 16	E B 15
15	E B 16	E B 16	E B 16	E B 16	18	E B 16	25	30	35	37	38	40	36	38	G	33	34	25	19	E B 16	E B 16	22	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	22	28	31	34	G	37	37	38	44	32	G	27	E B 15	E B 16	36	E B 17	17	24
17	23	E B 16	E B 16	E B 16	E B 16	E B 16	G	30	33	36	35	40	40	35	34	35	30	26	22	19	23	E B 15	E B 17	16
18	E B 16	E B 16	E B 16	E B 14	E B 15	E B 16	22	28	32	35	35	37	38	35	36	44	35	26	18	E B 14	19	24	20	E B 15
19	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	24	34	32	36	39	40	43	G	35	G	G	G	E B 17	18	19	E B 16	20	E B 16
20	E B 16	E B 14	E B 14	E B 14	E B 16	E B 16	G	G	G	G	G	39	38	38	36	G	31	33	25	32	22	18	E B 16	E B 15
21	E B 15	E B 15	E B 15	E B 16	E B 15	E B 17	24	29	32	32	G	G	34	38	37	G	G	24	E B 15	18	18	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 17	E B 15	E B 15	24	G	34	34	35	G	39	G	33	G	31	28	18	E B 17	E B 17	21	E B 16	E B 16
23	E B 16	E B 16	E B 16	E B 16	E B 16	20	25	G	30	35	36	36	57	34	37	46	44	43	E B 16	E B 16	19	E B 15	E B 15	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	26	29	31	36	35	44	43	34	35	36	41	33	31	26	19	22	20	E B 16
25	22	E B 16	E B 16	E B 16	18	18	25	32	34	A A 51	36	36	37	37	G	34	31	24	E B 15	E B 16	21	17	E B 15	24
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	28	30	36	43	G	35	G	37	41	31	22	19	E B 15	E B 16	E B 17	E B 15	E B 16
27	E B 15	E B 15	E B 16	E B 16	E B 15	16	22	31	32	34	G	G	G	G	45	54	43	25	23	E B 15	E B 16	E B 16	E B 16	E B 16
28	E B 17	E B 16	E B 16	E B 15	E B 16	E B 16	26	30	31	36	36	40	37	36	37	45	33	G	19	25	23	18	20	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	30	37	34	43	36	35	36	G	35	34	30	27	30	21	26	21	20	22
30	23	E B 15	E B 17	E B 16	16	E B 16	27	36	A A 54	A A 54	A A 84	A A 74	48	43	38	44	26	24	20	21	22	24	23	18
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	28	32	34	35	36	37	35	35	32	30	24	19	18	19	18	E B 16	E B 16
U Q	18	E B 16	E B 16	E B 16	16	E B 16	25	30	34	36	37	40	43	38	37	35	31	26	22	23	22	21	20	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G 20	26	30	G 32	G	G 34	36	G	G	G	G	G	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16

APR. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 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

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

APR. 2019 fmin (0.1MHz)

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	326	F	328	332	371	316	385	359	353	363	341	344	359	314	348	336	367	365	354	347	345	329	322	320
2	311	320	298	312	328	330	390	341	350	343	369	329	356	356	305	358	373	357	340	341	386	343	298	326
3	320	325	306	331	358	332	372	367	360	326	363	353	323	325	323	347	365	361	360	349	339	297	306	296
4	305	313	346	372	320	339	358	385	378	350	331	353	346	342	339	367	364	366	357	324	299	297	313	293
5	338	348	331	320	310	328	395	333	357	353	330	342	342	350	351	348	357	369	337	358	323	311	330	307
6	321	306	313	319	353	339	362	366	359	367	345	338	355	345	334	346	347	346	361	350	378	319	306	315
7	310	F	304	345	322	F	377	371	366	384	336	312	337	323	A	340	341	349	349	347	382	315	F	F
8	F	F	276	F	A	299	381	356	360	361	372	342	343	330	336	351	350	333	353	360	381	A	F	F
9	F	F	315	321	327	309	366	363	377	350	334	328	329	320	347	343	352	354	348	335	341	318	297	317
10	308	308	320	323	329	343	376	371	371	356	344	317	324	334	313	341	340	337	356	348	369	294	303	300
11	303	305	319	306	335	339	376	380	393	335	334	326	317	335	359	352	354	353	343	331	372	292	314	F
12	F	F	F	F	F	359	372	407	373	338	335	328	305	326	328	341	349	339	332	354	352	333	307	308
13	321	304	333	318	317	353	386	399	372	333	337	335	302	326	345	348	354	335	338	339	370	334	313	322
14	320	313	304	318	343	346	375	382	376	358	330	352	339	319	346	345	348	356	348	329	351	343	301	295
15	311	319	294	326	F	320	384	351	361	351	345	344	359	353	337	357	338	334	321	337	345	338	316	303
16	308	330	319	338	321	326	362	391	370	360	312	326	335	319	337	338	348	339	326	328	363	358	303	313
17	317	F	305	F	F	356	385	349	368	359	340	328	330	343	330	347	351	348	362	340	F	325	309	321
18	317	332	324	325	341	341	364	353	328	352	364	332	328	325	335	355	350	338	334	348	348	F	334	F
19	F	F	322	F	F	356	358	350	350	364	343	316	316	328	324	342	340	333	346	331	350	377	323	304
20	312	324	321	328	337	318	324	328	379	367	357	344	342	304	338	333	360	324	342	330	345	F	320	326
21	319	325	327	332	308	333	359	348	356	358	358	349	320	305	349	366	340	344	361	333	338	318	297	306
22	323	321	335	338	328	322	369	350	335	353	362	362	302	298	310	351	353	361	353	334	329	321	332	F
23	F	F	333	350	347	341	379	371	364	324	340	335	332	350	339	327	345	359	350	350	346	298	F	F
24	F	F	F	F	F	F	369	267	347	348	358	326	336	340	323	337	321	340	339	332	326	318	301	F
25	308	F	F	F	F	337	363	374	355	A	322	349	322	330	320	338	356	322	312	314	333	348	325	311
26	307	326	323	351	318	347	368	364	340	352	347	302	300	327	323	334	346	369	356	356	309	315	332	296
27	F	F	F	F	345	364	403	354	346	337	351	344	326	283	316	312	339	372	351	322	321	325	307	282
28	313	309	319	338	336	356	391	375	365	326	338	310	320	330	330	339	358	355	369	311	318	312	300	313
29	324	321	307	323	316	357	373	377	324	323	306	318	336	336	334	309	338	363	349	339	353	332	299	259
30	F	311	F	F	F	F	386	361	A	A	A	A	320	333	325	336	324	320	331	354	376	345	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	19	25	22	22	27	30	30	29	28	29	29	30	30	29	30	30	30	30	30	29	27	26	22
MED	315	320	319	327	328	339	374	364	360	352	341	335	330	329	334	342	350	348	348	339	346	321	308	308
U Q	321	325	328	338	343	353	385	375	372	360	358	344	342	340	342	351	356	361	356	349	370	338	322	317
L Q	308	309	306	320	320	326	364	350	350	338	334	326	320	320	323	337	340	337	338	331	331	312	301	296

APR. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 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

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									385	400	U L 392	392	405	416	421	U L 383	L	L						
2									U L 393	405	410	409	419	423	U L 407	U L 395	L							
3									L	394	397	404	U L 377	U L 419	414	U L 374	L	U L 398						
4								L	L	L	U L 407	426	L	U L 380	U L 386	U L 382								
5								U L 373	L	L	U L 371	430	U L 388	412	U L 409	L	L							
6								L	U L 377	U L 417	U L 410	U L 406	A	A	U L 366	U L 381	L	L						
7									L	L	U L 407	U L 362	A	A	A	U L 377	A	A						
8									A	U L 391	U L 416	U L 408	U L 402	U L 405	U L 381	L	L	L						
9								A	A	A	U L 444	368	U L 404	U L 405	U L 373	U L 396	L							
10									L	L	U L 407	385	400	392	A	L	L	L						
11									L	U L 395	U L 404	420	A	A	A	U L 388	L	L						
12										409	U L 408	U L 404	379	392	U L 399	U L 387	L	L						
13									L	U L 388	U L 375	393	A	A	U L 402	U L 389	L	L						
14								L	L	U L 418	L	U L 396	A	U L 381	U L 391	U L 404	L							
15									A	U L 397	U L 400	A	403	394	U L 428	U L 397	A							
16									L	L	U L 397	A	U L 407	387	A	U L 372	U L 363	L						
17								L	U L 407	A	U L 410	A	404	U L 409	U L 396	377	L	L						
18								L	U L 369	U L 410	U L 423	U L 408	U L 400	U L 403	U L 398	A	A	L						
19								A	U L 375	U L 418	413	U L 375	A	U L 391	406	388	U L 387	L						
20								L	413	410	U L 427	428	398	A	U L 379	404	L	A						
21								L	U L 383	U L 408	U L 433	421	434	384	396	387	L	L						
22								L	397	399	430	U L 390	U L 338	U L 407	U L 418	U L 402	U L 372	L						
23								L	U L 397	U L 406	U L 415	401	A	399	U L 385	A	A	A						
24								U L 381	388	U L 407	U L 412	A	A	U L 409	U L 399	U L 410	A	A	A						
25									U L 378	A	U L 442	415	U L 404	U L 406	U L 361	U L 413	U L 405	L						
26								U L 372	U L 409	U L 440	A	U L 412	U L 433	U L 407	A	A	U L 350	L						
27									U L 387	398	420	U L 408	U L 399	422	A	A	A	L						
28									U L 396	U L 409	U L 406	U L 344	E A 395	U L 387	A	A	A	U L 337						
29								A	U L 372	A	405	U L 409	U L 417	U L 424	U L 390	U L 372	U L 378	L						
30								A	A	A	A	A	A	A	U L 399	A	U L 371	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								3	16	20	27	25	20	24	23	21	7	2						
MED								U L 373	U L 388	U L 406	U L 410	406	U L 402	U L 405	U L 398	U L 388	U L 372	U L 368						
U Q								U L 381	U L 397	U L 410	U L 420	414	406	410	U L 407	U L 400	U L 387							
L Q								U L 372	U L 378	U L 398	U L 404	U L 391	396	U L 392	U L 385	U L 379	U L 363							

APR. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 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

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									270	254	286	286	264	302	272	280	246	236						
2									274	258	244	276	254	268	358	254	238							
3									268	308	252	270	310	288	284	248	236	236						
4								236	246	264	292	264	274	274	286	254								
5								302	256	278	286	278	262	248	258	258	252							
6								236	250	250	274	288	252	266	292	258	252	258						
7									254	236	284	320	282	294	A	270	258	244						
8									E A 250	250	250	282	280	290	268	258	264	278						
9								232	236	256	288	300	268	308	266	256	254							
10									252	260	274	310	282	262	296	264	252	258						
11									236	280	298	310	292	252	246	246	252	250						
12										282	292	278	292	280	262	258	248	256						
13									232	302	290	280	300	E A 278	242	240	254	268						
14								236	252	240	280	258	262	302	258	252	254							
15									248	260	272	266	260	266	266	242	248							
16									234	244	292	268	274	320	290	264	250	270						
17								270	240	254	280	284	296	266	298	268	240	254						
18								254	306	262	246	272	344	298	282	248	254	270						
19								250	272	256	256	336	302	274	276	262	276	272						
20								280	232	232	258	274	294	282	300	280	264	250						
21								278	268	264	270	284	344	334	270	246	258	266						
22								262	284	242	254	266	378	328	350	278	254	256						
23								250	242	320	286	280	E A 310	272	284	E A 316	E A 266	E A 242						
24								444	274	266	272	E A 326	288	288	314	312	292	260	226					
25									326	A	330	264	330	322	320	292	274	298						
26								256	266	266	294	364	408	306	314	286	276	252						
27									288	310	274	278	342	410	E A 326	E A 342	274	234						
28									258	324	284	342	334	298	284	276	254	258						
29								244	338	E A 308	358	344	292	294	292	354	278	250						
30								252	A	A	A	A	310	278	266	272	284	282	256					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								16	28	28	29	29	30	30	29	30	29	24	2					
MED								253	255	260	280	280	292	288	284	260	254	257	241					
U Q								274	273	281	291	310	310	302	299	280	270	269						
L Q								240	244	252	264	271	274	272	266	254	251	250						

APR. 2019 h'F2 (KM)

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APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 246	E B 278	E B 244	E B 236	196	E B 258	210	208	202	194	178	210	206	198	190	194	204	200	208	208	216	E B 216	E B 230	E B 260
2	E B 244	E B 254	E B 260	E B 258	232	E B 244	208	214	202	210	190	190	178	184	184	180	206	206	214	212	192	206	E B 252	E B 252
3	E B 270	E B 258	E B 282	E B 250	212	E B 242	200	210	210	202	188	188	188	188	192	186	198	184	206	206	206	E B 262	E B 262	E B 268
4	E B 260	E B 268	E B 232	208	E B 264	E B 264	214	210	194	204	204	190	194	194	202	E A 200	226	214	204	218	E B 246	E B 272	E B 258	E B 252
5	E B 242	202	E B 230	E B 252	260	E B 254	206	202	210	202	198	204	196	196	182	182	206	198	218	214	212	228	232	228
6	E B 236	E B 272	E B 270	E B 230	204	E B 238	210	206	196	188	186	180	A	A	200	194	202	204	216	206	200	E B 236	E B 234	E B 246
7	262	E B 274	E B 264	220	228	224	202	208	196	194	190	206	A	A	A	210	A	A	210	206	178	214	E B 294	E B 278
8	E A 290	E B 308	E A 308	E A 272	A	E B 232	216	222	A	204	190	188	192	192	182	196	208	220	214	218	206	A	E B 282	E B 248
9	E B 268	E B 286	E B 242	228	E B 222	E B 230	210	A	A	A	188	226	220	200	214	196	202	216	216	224	224	E B 234	E A 268	E A 268
10	E A 286	E B 262	E B 240	226	E B 230	222	204	214	202	202	190	190	194	200	A	202	190	200	216	210	206	E B 246	E A 276	E B 258
11	E A 298	E B 258	E B 250	E B 242	E B 232	220	210	204	184	186	192	184	A	A	A	216	202	202	220	220	208	208	E B 262	E A 300
12	E B 232	E B 252	E B 272	E B 264	214	200	200	208	190	182	182	182	186	190	190	192	196	206	226	210	200	200	E B 234	E B 248
13	E A 278	E B 264	E B 246	E B 246	E B 242	222	204	200	176	204	196	188	A	A	190	194	216	218	226	212	200	192	214	228
14	E B 240	E B 262	E B 262	E B 240	218	206	206	208	212	198	182	204	A	198	184	196	202	216	214	228	204	204	E B 250	E B 262
15	E B 260	E B 242	E B 240	E B 254	208	206	202	218	A	212	208	A	200	198	184	198	A	212	232	214	214	206	E B 240	E B 248
16	E B 240	E B 240	E B 238	216	228	E B 242	214	202	204	194	190	A	190	224	A	202	194	212	232	232	212	184	E A 270	E A 332
17	E A 290	E B 276	E B 252	E B 210	208	E B 212	198	196	198	A	190	A	206	184	188	214	206	204	212	220	232	214	E B 216	E B 240
18	218	E B 234	E B 246	E B 246	218	212	194	204	206	198	198	190	190	194	204	A	A	208	228	212	206	E A 242	222	E B 232
19	E B 242	E B 256	E B 246	198	196	216	210	A	206	198	204	E A 236	A	190	194	194	206	216	216	220	220	196	E A 250	E B 278
20	E B 274	E B 254	E B 230	220	E B 224	E B 228	214	218	204	200	196	202	220	A	222	192	218	A	224	E A 236	224	208	214	E B 234
21	E B 242	E B 240	222	214	224	204	214	208	202	202	196	192	174	218	214	202	202	202	214	220	216	218	E B 252	E B 252
22	E B 232	E B 246	228	214	212	E B 228	210	202	212	208	190	204	E A 234	194	186	184	204	212	222	218	210	224	214	E B 280
23	E B 264	E B 242	224	208	208	E A 232	208	202	200	192	198	196	A	198	198	A	A	A	204	204	204	E B 258	E B 278	E B 244
24	E B 260	E B 268	E B 260	208	210	222	212	216	212	204	192	A	A	202	202	196	A	A	A	224	210	E A 236	E A 256	E B 284
25	E A 266	E B 230	E B 218	214	E A 236	226	212	212	212	A	194	192	200	218	196	196	198	204	226	E B 238	212	204	204	E A 276
26	E B 256	218	E B 232	212	E B 252	226	216	210	194	190	A	186	188	200	A	A	222	202	210	206	224	E B 244	E B 232	E B 246
27	E B 252	E B 262	E B 262	220	220	208	206	198	204	192	190	196	192	196	A	A	A	206	208	218	222	218	E B 244	E B 242
28	E B 236	E B 254	E B 240	226	218	228	208	208	182	204	196	214	210	218	A	A	A	176	206	E A 238	E A 252	E A 244	E A 256	E B 244
29	E B 236	E B 242	E B 266	E B 248	E B 248	220	208	A	208	A	194	200	186	186	206	206	198	214	230	218	228	210	E A 256	E A 298
30	E A 270	E B 238	E B 250	E B 234	E B 270	206	204	A	A	A	A	A	A	A	206	A	192	212	220	210	206	206	E A 284	E A 276
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	26	26	25	28	25	21	24	23	24	23	26	29	30	30	29	30	30
MED	E B 258	E B 255	E B 246	U 215	215	216	208	208	202	200	191	192	193	197	194	196	202	206	216	216	210	210	E B 251	E B 252
U Q	E A 270	E B 268	E B 262	E B 246	E B 234	E B 232	212	212	208	204	196	204	206	200	204	202	206	214	225	220	222	E B 239	E 262	E 276
L Q	E B 240	E B 242	E B 232	214	211	212	204	202	196	193	190	188	188	191	186	193	198	202	210	210	206	206	232	E B 244

APR. 2019 h'F (KM)

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APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	118	114	108	108	110	108	108	110	110	110	112	B					
2							114	114	114	114	114	114	114	114	110	110	110	110	B					
3							B	112	112	112	112	A	112	112	112	112	112	112						
4							118	122	116	110	A	A	A	A	110	108	108	110						
5							110	114	114	A	A	114	112	112	110	110	110	110	B					
6							B	120	110	A	A	A	A	A	110	110	110	110	B					
7							B	108	116	116	110	A	A	A	A		A	A	B					
8							110	110	A	A	A	A	A	110	A	A	A	110	B					
9							118	116	A	A	108	A	A	A	A	A	A	108	B					
10							114	110	110	110	108	A	A	A	A	108	108	110	B					
11							112	112	112	A	A	A	A	A	108	110	112	112	B					
12							110	114	112	112	A	A	114	114	114	110	110	110	104					
13							B	A	A	A	A	A	A	A	114	110	A	A	B					
14							108	110	112	110	110	A	A	A	A	A	A	A	A					
15							112	116	112	A	A	A	A	A	110	A	A	A	B					
16							114	114	112	112	108	A	A	A	A	108	108	108	B					
17							118	116	116	A	A	116	A	A	A	116	114	114	B					
18							114	114	114	106	A	A	A	124	A	A	A	A	B					
19							114	114	A	A	110	110	A	110	A	114	108	108	B					
20							122	110	108	108	108	114	108	108	108	108	A	A	B					
21							110	110	108	A	110	112	A	110	110	110	110	A	B					
22							114	112	110	A	A	108	108	112	A	114	110	A	B					
23							120	110	108	A	A	A	A	A	114	A	A	A	B					
24							118	110	110	A	A	A	A	110	A	110	A	A	B					
25							110	110	110	A	110	116	A	114	114	A	A	A	B					
26							A	114	116	A	A	108	A	110	A	A	A	A	B					
27							110	112	112	108	108	110	114	110	110	A	A	A	118					
28							110	108	108	108	110	110	110	110	108	108	108	108	B					
29							112	A	A	A	A	A	A	110	108	A	110	A	B					
30							A	A	A	A	A	A	A	A	A	A	A	A	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							23	27	24	13	14	12	9	17	17	18	16	15	2					
MED							114	112	112	110	110	111	112	110	110	110	110	110	111					
U Q							118	114	114	112	110	114	114	113	113	110	110	112						
L Q							110	110	110	108	108	110	108	110	109	108	108	108						

APR. 2019 h'E (KM)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	136	126	124	G	G	G	118	146	G	116	102	G	144	B	B	110	B	B	B
2	B	B	B	B	B	B	G	150	132	G	G	G	G	G	G	114	G	114	82	B	B	B	B	B
3	B	B	104	B	98	B	134	136	G	G	G	102	G	G	G	G	G	G	B	102	B	B	B	B
4	B	96	98	98	92	92	G	130	122	G	98	96	94	94	128	84	156	G	B	B	B	B	B	B
5	B	98	B	B	B	B	122	124	116	106	98	G	164	130	G	G	148	138	114	98	98	94	94	B
6	B	B	B	B	B	134	132	118	118	106	102	102	96	90	90	G	G	G	116	110	110	102	B	B
7	100	94	94	94	92	90	130	130	124	120	114	102	98	102	98	98	96	98	98	96	94	92	98	98
8	98	96	94	90	86	90	116	118	100	100	98	96	96	G	96	94	98	G	108	98	98	98	98	114
9	94	98	98	B	B	B	136	120	102	102	G	102	98	102	100	100	102	148	108	102	102	96	96	96
10	92	88	88	96	96	B	128	122	122	G	114	98	100	96	100	114	G	G	104	98	92	90	90	96
11	92	90	B	B	116	B	G	116	116	98	100	98	90	88	156	142	G	118	82	100	100	100	100	98
12	96	98	B	B	98	94	G	G	G	G	94	110	G	124	G	G	114	G	104	100	96	100	100	88
13	86	84	84	80	B	92	110	102	102	100	98	96	88	86	G	80	80	80	90	88	88	B	B	B
14	B	B	86	B	86	92	G	108	124	110	106	100	94	96	96	102	102	94	98	84	86	90	88	B
15	B	B	92	100	94	94	146	124	112	98	98	102	102	102	G	100	98	104	126	110	86	98	82	82
16	100	B	B	98	B	B	132	128	122	114	G	100	96	100	100	112	G	116	B	B	96	B	92	86
17	84	B	84	B	B	B	G	130	146	100	98	158	94	96	96	140	120	124	104	94	94	100	86	86
18	78	78	B	B	B	B	128	142	136	114	104	102	98	142	96	94	108	104	104	B	102	102	102	B
19	B	120	98	106	B	B	144	116	102	96	152	150	96	G	100	G	G	G	B	106	104	B	102	B
20	B	B	B	B	B	B	G	G	G	G	G	150	154	146	146	G	106	106	98	94	92	108	96	B
21	B	B	B	104	B	B	160	132	110	102	G	G	98	152	138	G	G	104	B	92	92	92	92	92
22	84	84	B	B	B	B	154	G	156	104	96	G	142	G	106	G	140	102	106	B	106	102	86	104
23	98	B	B	88	90	90	124	G	114	102	104	104	96	94	116	106	106	104	B	B	104	104	100	100
24	88	88	88	B	88	B	122	118	124	112	102	102	92	112	94	120	102	102	102	94	98	98	98	98
25	92	88	88	90	90	84	124	122	118	96	112	116	104	158	G	104	100	100	B	100	96	96	B	94
26	98	90	B	B	98	96	94	124	132	98	98	G	92	G	90	92	90	86	86	B	106	B	B	B
27	B	B	B	B	B	134	124	118	116	114	G	G	G	G	114	96	104	106	132	B	82	82	82	B
28	B	B	B	B	B	B	138	122	124	134	146	156	128	124	122	118	152	G	126	108	106	100	100	100
29	98	B	92	90	B	B	112	106	100	100	98	98	98	G	150	106	118	102	102	100	100	96	96	96
30	92	92	86	86	90	94	106	102	102	100	96	96	92	96	96	96	96	96	106	96	96	96	94	94
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	16	15	13	14	14	23	26	26	23	22	24	26	21	23	22	21	22	22	21	27	22	22	17
MED	92	91	92	94	92	93	128	122	118	102	99	102	97	102	100	102	104	104	104	98	98	98	96	96
U Q	98	97	98	99	98	96	136	130	124	112	106	113	102	127	122	114	119	116	108	102	104	100	100	99
L Q	87	88	86	89	90	90	122	118	110	100	98	98	94	95	96	96	98	100	98	94	92	94	90	90

IONOSPHERIC DATA STATION Kokubunji

APR. 2019 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						F1	C2	C2				C1	H1		C1	L1		H1			F1			
2								H2	H2							C1		C2	L1					
3			F2		F1		H2	H2				L2								F1				
4		F1	F2	F3	F3	F2		C2	C2		L1	L1	L1	L2	CL12	L3	H2							
5		F1					C2	C2	C2	L1	L2		H1	C1			H2	H1	C3	F3	F3	F3	F2	
6						F2	C2	C3	C1	L1	L2	L1	L2	L2	L1				C2	F4	F1	F4		
7	F1	F2	F2	F3	F3	F2	C2	C2	C1	C1	C1	L2	L2	L2	L4	L1	L3	L3	L2	F3	F2	F4	F2	F2
8	F5	F5	F6	F7	F7	F3	C5	C3	L4	L1	L2	L2	L1		L2	L2	L2		L4	F8	F4	F3	F2	F1
9	F2	F2	F2				H3	C4	L3	L2		L2	L2	L1	L2	L1	L1	H2	L5	F5	F5	F5	F4	F5
10	F6	F4	F2	F4	F2		C2	C2	C2		C2	L3	L2	L2	L2	C1			L3	F3	F3	F3	F3	F2
11	F4	F2			F2			C1	C1	L1	L1	L1	L2	L3	H1	H1		C2	L3	FF63	FF23	F3	F2	F5
12	F3	F1			F3	F3					L1	L1		C1			CL12		L1	F3	F2	F3	F2	F1
13	F2	F1	F2	F1		F1	C2	L2	L2	L1	L2	L1	L2	L3		L3	L4	L1	L3	F3	F1			
14			F1		F1	L1		C2	C2	C2	C2	L2	L2	L1	L2	L2	L3	L2	L2	F4	F5	F3	F1	
15			F1	F2	F5	F1	H2	C2	C2	L1	L2	L2	L2	L2		L1	L2	L2	C2	FF31	F1	FF25	F3	F2
16	F2			F1			C2	C2	C1	C1		L1	L1	L2	L2	C1		C1			F4		F3	F5
17	F5		F2					H2	H1	L2	L2	H1	L2	L2	L1	H1	C1	C3	L3	F3	F3	F4	F2	F2
18	F2	F2					C2	HL22	HL11	C1	L1	L1	L2	HL11	L2	L3	L2	L3	L1		F3	F4	F3	
19		FF13	F1	F1			H3	C2	L2	L2	HL11	HL11	L1		L1					FF22	F2		F3	
20												H1	H1	H1	H1		L2	L3	L3	F5	F4	F3	F2	
21				F1			H2	C1	C1	L1			L1	H1	H1			L2		F4	F2	F1	F1	F2
22	F2	F1					H1		H1	L2	L2		H1		L1		H1	L2	L3		F1	F4	F2	F2
23	F2			F2	F1	F2	C2		C1	L2	L1	L1	L3	L2	C1	L3	L4	L3			F2	F1	F1	F2
24	F2	F2	F2		F2		C2	C2	C1	L2	L1	L2	L2	C1	L2	CL11	L3	L3	L4	F7	F3	F3	F3	F2
25	F3	F2	F1	F2	F2	F2	C2	C2	C1	L3	C1	C1	L1	H1		L2	L2	L3		F2	F4	F3		F5
26	F2	F3			F2	F1	L3	CL22	HL12	L2	L2		L2		L3	L2	L3	L2	L2		F1			
27						F1	C2	C2	C1	C1					C2	L3	L2	L1	C3		F1	F1	F1	
28							H2	C2	C1	H1	H1	H1	C1	C2	C2	C3	H1		C1	F6	F6	F7	F6	F2
29	F3		F2	F2			C4	L3	L3	L2	L2	L1	L1		H1	L1	C1	L4	L4	F5	F5	F5	F5	F5
30	F4	F5	F2	F2	F2	F3	L3	L2	L3	L3	L4	L3	L2	L2	L2	L2	L2	L2	L2	F4	F5	F4	F5	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. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 38	X 38	X 38	X 36	X 30	X 24	X 34													X 65	X 52	X 45	X 44	X 42
2	X 42	X 42	X 39	X 39	X 36	X 33														X 57	X 57	X 37	X 35	X 35
3	36	X 35	X 35	X 33	X 31	X 28														X 50	X 49	X 44	X 43	X 43
4	X 41	X 41	X 40	X 41	X 30	X 30														X 54	X 56	X 51	X 51	X 49
5	X 47	X 48	X 33	X 33	X 34	X 33														X 62	X 55	X 51	X 47	X 46
6	X 42	X 42	40	X 39	X 33	X 30														X 73	X 61	X 38	X 37	X 37
7	X 37	X 34	X 33	X 32	X 31	X 25			C											X 86	X 71	A	X 35	X 37
8	40	40	38	44	A	30														X 84		A	40	45
9	43	43	42	43	33	30														A	A	59	X 61	X 58
10	X 57	X 53	X 49	X 46	X 41	X 38														X 66	X 66	X 44	X 44	50
11	54	49	X 44	X 44	X 39	X 35					C									X 87	X 83	X 40	X 40	X 38
12	X 40	X 37	X 37	40	39	36														X 84	X 80	X 62	X 46	X 46
13	X 47	X 43	X 45	X 46	X 46	X 39														X 89	X 88	X 48	X 38	X 40
14	X 40	X 40	X 40	X 38	X 39	X 28														X 78	X 79	X 56	X 43	X 43
15	X 43	45	52	60	38	X 24													X 70	X 84	X 74	X 57	X 45	X 45
16	X 46	X 43	X 41	X 40	X 38	X 36														X 81	X 86	X 43	X 33	X 33
17	X 33	X 33	X 33	39	X 33															X 75	X 73	X 62	X 50	X 47
18	X 45	X 44	46	X 42	X 38	X 30														X 75	X 68	X 54	X 45	44
19	47	45	45	43	32	X 25														X 74	X 76	O X 66	X 39	X 39
20	X 39	X 39	X 39	X 37	X 33	X 31														X 67	X 61	X 52	X 44	44
21	44	X 39	X 38	X 36	39	X 32														X 59	X 50	X 47	X 45	X 45
22	X 45	X 44	X 41	X 38	X 36	X 34														X 60	X 59	X 54	X 50	X 50
23	X 46	X 44	X 41	X 41	X 40	X 28														X 54	X 47	X 44	X 44	44
24	43	41	X 39	X 39	X 30	X 29														X 66	X 62	X 56	56	50
25	48	48	X 48	X 42	35	37														X 76	X 84	A	X 40	48
26	X 44	X 44	X 40	X 38	X 35	X 32														X 55	X 53	X 52	X 52	X 50
27	X 48	X 48	X 45	X 42	X 36	X 32														X 61	X 57	X 56	X 54	X 54
28	X 54	X 49	X 46	X 45	X 39	X 37														X 56	X 55	X 52	X 50	X 48
29	X 47	X 45	X 43	X 39	X 35	X 36														A	X 56	X 53	X 42	X 41
30	42	X 39	X 36	39	44	49														X 86	X 65	X 40	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	30	30	30	30	29	29	1												1	28	28	27	29	29
MED	X 44	X 43	X 40	X 40	X 36	X 32	X 34												X 70	X 70	X 62	X 52	X 44	X 45
U Q	X 47	X 45	X 45	43	X 39	X 36														X 82	X 75	X 56	X 50	X 48
L Q	X 40	X 39	X 38	X 38	X 33	X 28														X 60	X 56	X 44	X 40	X 40

APR. 2019 fxI (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 2019 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	32	32	32	30	24	18	28	48	53	53	49	58	72	64	62	62	62	60	58	59	46	39	38	36
2	36	36	33	33	30	27	32	44	56	62	68	68	83	71	66	60	54	61	63	51	51	31	29	29
3	F	29	29	27	25	22	30	42	52	55	55	56	72	76	75	75	75	62	57	44	43	38	37	37
4	35	35	34	34	24	24	32	54	52	54	56	67	72	70	70	66	63	56	56	48	50	45	45	43
5	41	41	27	27	28	27	34	43	56	58	66	72	82	81	64	59	58	56	55	56	49	45	41	40
6	36	36	F	33	27	24	35	54	55	55	63	64	81	84	65	62	64	64	68	67	55	32	31	31
7	31	28	27	26	25	19	34	48	C	59	61	59	72	A	A	71	66	65	66	80	65	A	28	31
8	F	F	F	F	A	F	35	52	58	58	64	62	69	76	78	75	68	71	78	78	A	A	F	F
9	F	F	F	F	F	F	36	54	54	61	60	69	A	83	A	A	A	A	57	A	A	F	55	52
10	51	47	43	40	35	32	40	49	54	61	66	76	84	87	80	82	82	68	64	60	60	38	38	F
11	F	F	38	38	33	29	38	50	51	54	C	73	87	97	79	70	73	73	73	81	77	34	34	32
12	34	31	31	F	F	F	38	49	53	59	55	74	80	88	98	95	76	66	73	78	74	56	40	40
13	41	37	39	40	40	33	46	52	50	56	66	76	88	92	84	74	72	72	70	83	82	44	32	34
14	34	34	34	32	33	22	38	53	64	56	61	69	78	83	76	82	89	67	66	72	73	50	37	37
15	37	F	F	F	F	18	35	49	54	59	59	76	76	63	70	75	66	57	64	78	68	50	39	39
16	40	37	35	34	32	30	43	58	54	56	60	60	63	72	72	74	72	64	72	75	80	37	27	27
17	27	27	27	F	27	19	38	53	55	55	60	70	74	77	83	90	78	67	62	69	67	56	44	41
18	39	38	F	36	32	24	39	52	52	70	66	51	60	72	81	80	66	54	58	69	62	48	38	F
19	F	F	F	F	F	19	36	49	59	60	52	58	75	71	77	77	69	69	76	68	70	60	33	33
20	33	33	33	31	27	25	34	59	63	55	53	50	48	53	62	64	58	58	60	61	55	46	38	F
21	F	33	32	30	F	26	37	49	57	57	58	55	62	77	76	78	68	61	54	53	44	41	39	39
22	39	38	35	32	30	28	40	47	54	59	64	59	50	52	53	61	64	57	54	54	53	48	44	44
23	40	38	35	35	34	22	39	48	50	49	59	59	64	64	62	65	A	63	57	48	41	38	38	F
24	F	F	33	33	24	23	37	43	52	63	58	58	60	58	59	54	60	67	70	60	56	49	F	F
25	F	F	42	36	F	F	37	44	44	47	59	59	59	65	A	71	70	61	62	71	79	A	34	F
26	38	38	34	32	29	26	41	54	50	52	53	55	55	62	59	57	58	58	58	49	47	46	46	44
27	42	42	39	36	30	26	38	50	50	53	55	52	52	58	61	70	75	66	59	55	51	50	48	48
28	48	43	40	38	33	31	42	48	47	55	55	53	50	50	60	57	62	54	56	50	49	46	44	42
29	41	39	37	33	29	30	46	46	48	55	51	52	56	63	57	58	62	A	A	A	50	47	36	35
30	F	33	30	F	F	F	47	47	49	A	A	57	67	73	73	74	77	83	82	80	59	34	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	21	23	24	23	22	25	30	30	29	29	28	30	29	29	27	29	28	28	29	28	28	26	27	22
MED	38	36	34	33	30	25	38	49	53	56	59	59	72	72	70	71	67	64	62	64	56	46	38	38
U Q	41	38	38	36	33	28	40	53	56	59	64	69	79	82	78	76	74	67	70	76	69	49	44	42
L Q	34	33	32	31	27	22	35	47	50	54	55	56	60	63	62	62	62	58	57	54	50	38	34	33

APR. 2019 foF2 (0.1MHz)

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APR. 2019 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

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									L	U L 408	U L 432	420	416	444	U L 428	416		L		L				
2									L	U L 424	428	436	440	432	424	U L 412	U L 412	L						
3										U L 408	428	436	424	U L 440	424	U L 428	U L 396	L						
4								L	L	U L 412	U L 432	U L 444	432	448	432	L	L	L						
5										L	448	440	424	448	448	A	L	A						
6									L	L	444	U L 476	A	U L 444	U L 456	U L 440	L	A						
7									C	L	U L 432	U L 444	U L 440	A	A	A	A	A	A					
8										A	A	U L 448	448	A	A	A	A	A			A			
9										L	L	A	A	A	A	A	A	A	A					
10									L	L	U L 464	464	460	456	468	U L 436	L							
11										L	C	U L 456	428	448	A	428	A	L	A					
12										L	U L 476	A	U L 456	U L 456	448	432	L	L						
13										L	U L 444	436	452	452	448	U L 440	U L 420	L	L					
14										L	U L 448	444	U L 452	452	A	A	A	A						
15									A	A	452	440	A	A	A	424	U L 400	L						
16								L		L	440	U L 456	U L 456	436	436	424	A	L	L					
17									L	424	432	U L 440	A	428	440	U L 376	U L 404	U L 376						
18									L	424	U L 440	U L 476	456	460	428	A	A							
19									L	A	U L 432	444	440	444	U L 424	436	U L 408	U L 380						
20								L	L	L	U L 444	U L 440	U L 436	436	428	408	A	L						
21									L	U L 420	U L 432	436	444	436	436	424	404	L						
22										420	424	436	U L 456	444	428	408	L	L	L					
23									L	U L 436	424	432	A	A	A	A	A	A						
24									L	416	420	436	A	432	A	U L 432	392	A						
25							A	A		U L 420	412	424	432	432	A	A		A						
26									L	U L 424	U L 440	U L 420	436	U L 420	424	416	U L 404	U L 368						
27									L	U L 416	424	U L 440	448	U L 432	432	412	396	U L 372	L					
28									L	420	428	428	440	U L 456	A	416	388	U L 372						
29								A	L	A	A	A	U L 436	444	432	U L 424	U L 408	A	A					
30									A	A	A	A	428	A	428	A	400	376						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										14	25	26	24	24	20	20	13	6						
MED										U L 420	432	440	440	444	432	424	U L 404	U L 374						
U Q										U L 424	U L 444	U L 444	U L 452	450	444	U L 432	U L 408	U L 376						
L Q										U L 416	428	436	432	434	428	414	396	U L 372						

APR. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

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								UA 200	UA 260	UR 292	A	A	A	UR 336	332	UR 316	A	UR 248	UR 196					
2							B	UA 204	UA 264	UA 288	UR 328	UR 336	R	R	UR 324	UR 324	A	UA 244	UR 196					
3							B	UR 228	UR 276	A	A	A	A 328	A	UR 332	UR 320	UR 276	UR 248	UR 180					
4							B	A	A	A	A	336	344	UR 364	R	UR 312	UR 284	UR 252	UR 180					
5							B	A	UA 260	A	A	R	A	A	UA 328	A	A	A	A					
6							B	A	A	A	A	A	A	A	R	A	A	A	B					
7							B	UR 232	C	UR 324	A	A	A	A	A	A	A	A	B					
8							B	A	A	A	A	A	A	A	A	A	A	A	UR 200		A			
9							B	UA 232	UA 276	A	A	A	A	A	A	A	A	A	B					
10							B	A	A	A	A	A	A	A	A	UR 332	UR 300	252	UA 192					
11							B	UR 244	A	A	C	A	A	UR 352	A	UA 312	UA 296	UA 260	B					
12							B	UR 224	UR 292	A	UR 336	336	348	UA 344	UA 332	UR 324	A	UR 260	B					
13							B	A	A	A	A	A	UR 344	A	UR 324	A	UR 292	UR 252	UA 180					
14							B	UA 236	UA 272	A	A	A	A	A	A	A	A	A	B					
15							B	A	A	A	A	A	A	A	A	A	A	A						
16							B	UR 224	UA 272	UR 324	UR 344	A	A	A	A	A	B	A	A					
17							B	UR 180	UA 236	A	UA 300	A	UR 336	UR 360	UR 360	A	UR 328	A	UR 288	UR 256	B				
18							B	UA 224	A	A	A	A	A	A	A	A	A	A	B					
19							B	UA 240	A	A	A	UR 348	UR 360	UR 348	A	A	UR 308	A	B					
20							UR 180	UR 244	UR 288	UA 320	UR 340	UR 348	UR 348	UA 372	UA 340	UA 316	A	A	A					
21							B	A	A	A	A	A	A	UR 352	UR 336	UA 328	A	240	UR 212					
22							B	A 216	A	A 304	UR 336	UR 360	A	R 352	R	R	288	260	A					
23							B	UA 244	A	A	A	A	A	A	A	A	A	A	B					
24							B	UA 244	UR 284	A	A	A	A	A	A	A	UA 284	A	B					
25							B	A	A	A	A	A	UR 356	A	A	A	A	A	B					
26							B	UR 228	UA 276	A	UA 320	A	UA 344	A	A	UR 332	UA 280	UA 252	B					
27							B	A	A	A	A	A	A	A	A	A	UA 292	A 248	UA 208					
28							B	UA 220	A	UA 304	UA 320	UA 340	332	336	332	304	UR 280	UR 256	UR 212					
29							B	A	A	A	A	A	A	A	UA 328	UR 304	UR 288	A	A					
30							UA 168	A	A	A	A	A	A	A	A	A	288	296	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	18	11	8	7	8	10	9	11	12	14	15	10				
MED							UR 180	UA 230	UA 276	UA 304	UR 336	UR 338	U 346	UR 352	U 332	UR 318	UR 288	U 252	UR 196					
U Q							UR 180	UA 240	UR 284	UR 322	UR 340	UR 348	UR 356	UR 358	UR 332	UR 326	UR 292	260	UR 208					
L Q							UA 168	UA 224	UA 264	UA 296	UA 320	336	344	U 340	UR 328	U 312	U 284	248	UR 180					

APR. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	28	G	34	36	37	G	36	G	31	G	G	E B 15	E B 15	20	E B 16	20
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	31	32	G	G	G	G	G	G	J A 39	29	G	21	E B 16	E B 16	E B 15	E B 16
3	E B 16	E B 16	E B 16	E B 16	J A 32	J A 20	E B 16	G	G	32	36	36	36	39	G	J A 42	J A 38	G	G	J A 31	E B 16	E B 16	E B 16	21
4	E B 15	E B 15	E B 15	E B 15	E B 15	21	E B 16	27	31	36	36	38	39	G	G	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16
5	E B 16	E B 16	20	20	E B 16	E B 16	E B 16	J A 32	36	J A 41	J A 45	G	39	40	37	J A 65	J A 45	J A 48	J A 30	J A 34	J A 50	J A 27	J A 37	22
6	J A 36	J A 32	J A 26	19	19	19	J A 24	J A 32	32	36	37	J A 41	J A 54	J A 41	G	J A 38	J A 38	J A 48	J A 32	J A 29	E B 16	21	23	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	G	C	G	38	J A 44	41	J A 90	J A 106	J A 78	J A 89	J A 57	J A 64	J A 52	J A 51	J A 51	J A 50	J A 29
8	J A 27	J A 40	J A 26	J A 54	J A 41	J A 26	19	28	J A 46	J A 70	J A 70	J A 42	J A 52	J A 70	J A 59	J A 62	J A 45	J A 40	G	J A 35	J A 53	J A 76	J A 66	J A 30
9	24	J A 33	23	23	E B 16	E B 16	J A 23	32	32	J A 44	J A 44	J A 54	J A 98	J A 80	J A 171	J A 128	J A 112	J A 73	J A 56	J A 62	J A 143	J A 51	J A 37	J A 42
10	23	22	19	E B 16	23	J A 24	J A 25	30	34	36	J A 47	J A 46	J A 44	J A 54	J A 72	G	34	29	26	J A 31	J A 52	J A 48	J A 80	J A 42
11	J A 32	J A 51	J A 54	J A 52	J A 26	24	J A 27	G	J A 40	J A 41	C	J A 46	J A 65	G	J A 68	36	36	31	J A 52	J A 55	J A 54	J A 54	22	J A 36
12	J A 44	J A 44	J A 34	24	22	20	22	G	G	J A 38	G	43	41	40	38	G	J A 39	G	22	J A 30	J A 33	J A 30	J A 30	J A 32
13	J A 24	23	23	23	23	20	E B 15	J A 35	J A 55	J A 42	J A 46	J A 48	G	J A 42	G	J A 40	G	29	23	E B 16	E B 17	E B 16	21	22
14	22	E B 16	E B 16	E B 16	21	22	J A 28	27	34	J A 41	J A 63	J A 46	J A 48	J A 101	J A 72	J A 77	J A 49	J A 48	J A 43	J A 28	J A 50	J A 36	J A 37	J A 25
15	J A 28	24	E B 16	21	E B 16	E B 15	22	32	J A 43	J A 54	J A 46	J A 46	J A 51	J A 58	J A 60	J A 52	J A 46	J A 52	J A 52	J A 46	J A 34	36	22	22
16	J A 26	J A 32	24	J A 22	J A 54	22	J A 21	G	32	G	G	36	37	J A 44	41	38	J A 47	J A 38	J A 31	J A 24	23	22	J A 33	22
17	22	E B 16	E B 16	E B 16	20	22	G	30	33	37	J A 42	38	39	37	37	34	G	G	22	J A 29	J A 27	J A 26	J A 27	J A 24
18	J A 29	J A 40	J A 23	22	21	E B 16	J A 29	28	34	38	J A 43	J A 42	J A 42	J A 41	J A 45	J A 67	J A 49	J A 55	J A 49	J A 34	J A 34	24	J A 30	J A 26
19	J A 32	J A 39	J A 34	J A 44	J A 22	E B 17	22	31	J A 40	J A 71	J A 42	G	G	G	J A 44	J A 38	G	29	J A 39	25	J A 47	27	J A 28	23
20	20	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	35	G	G	G	J A 46	39	36	J A 52	J A 52	J A 33	J A 39	24	22	J A 32	E B 16
21	E B 16	E B 16	23	21	E B 16	E B 16	J A 23	29	34	J A 39	J A 44	J A 43	J A 40	40	38	38	35	30	G	E B 15	E B 16	E B 16	E B 16	E B 16
22	E B 16	J A 26	E B 16	20	E B 15	E B 15	24	26	34	34	G	G	J A 40	G	G	G	34	30	J A 30	J A 32	J A 28	20	J A 28	24
23	20	E B 16	E B 16	E B 16	22	J A 25	22	30	J A 37	J A 42	J A 43	J A 44	J A 48	J A 103	J A 55	J A 57	J A 73	J A 56	J A 44	J A 55	J A 28	24	22	21
24	24	24	20	20	20	22	21	32	36	J A 46	J A 47	J A 46	J A 56	J A 44	J A 48	J A 49	J A 44	J A 45	J A 42	J A 36	J A 48	J A 70	J A 52	J A 39
25	J A 53	E B 16	J A 22	J A 34	J A 34	J A 32	J A 32	J A 33	36	J A 46	J A 44	J A 44	G	37	J A 75	J A 49	J A 55	J A 46	J A 45	J A 45	J A 26	J A 105	J A 50	J A 29
26	J A 32	22	20	20	E B 16	22	J A 24	28	32	34	36	J A 47	42	J A 43	J A 62	G	31	30	24	E B 18	J A 27	22	E B 16	E B 16
27	E B 16	E B 16	E B 16	24	24	E B 16	24	32	J A 38	J A 42	J A 44	J A 45	38	J A 40	42	J A 34	J A 40	30	26	J A 24	J A 35	21	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 17	E B 16	E B 15	22	30	32	35	35	40	39	43	40	36	32	G	G	J A 22	J A 32	23	E B 16	J A 35
29	J A 25	23	E B 16	19	19	20	J A 28	J A 39	34	J A 46	J A 50	J A 55	J A 52	J A 59	37	35	37	J A 110	J A 126	J A 102	J A 50	J A 38	24	J A 30
30	J A 52	23	J A 41	J A 35	20	E B 16	24	J A 37	J A 50	J A 54	J A 54	J A 51	J A 46	J A 91	J A 42	J A 48	35	33	J A 42	J A 59	J A 45	J A 39	J A 66	J A 50
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	24	22	20	20	20	20	22	30	34	J A 38	J A 43	J A 43	40	J A 42	42	J A 38	J A 38	32	J A 30	J A 31	J A 32	25	J A 28	24
U Q	J A 29	J A 32	J A 23	J A 23	J A 23	22	J A 24	J A 32	J A 38	J A 44	J A 46	J A 46	J A 48	J A 58	J A 60	J A 52	J A 47	J A 48	J A 44	J A 45	J A 50	J A 39	J A 37	J A 30
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 26	32	35	G 36	G 36	G 37	G 37	G 37	G 34	34	G 29	G 22	E B 24	E B 23	E B 21	E B 16	E B 20

APR. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	27	G	33	34	36	G	35	G	30	G	G	E B 15	E B 15	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	28	32	G	G	G	G	G	G	29	28	G	E B 16	E B 16	E B 16	E B 15	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	32	33	33	36	38	G	G 32	G 28	G	G	E B 16	E B 16	E B 16	E B 16	E B 16
4	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	23	30	32	34	36	37	G	G	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	32	36	36	G	35	37	35	39	29	29	20	25	25	E B 15	22	E B 16
6	18	20	E B 16	E B 16	E B 16	E B 16	18	26	28	34	34	35	41	35	G	31	31	32	23	21	E B 16	E B 16	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	G	C	G	35	38	38	A A 90	A A 106	56	62	44	45	44	42	A A 51	20	24
8	E B 16	E B 16	E B 16	E B 16	A A 41	E B 16	19	25	29	46	46	38	39	55	53	38	39	34	G	26	A A 53	A A 76	E B 16	E B 16
9	E B 16	20	E B 16	E B 16	E B 16	E B 16	18	30	31	34	38	44	A A 98	72	A A 171	A A 128	A A 112	A A 73	49	A A 62	A A 143	22	22	E B 16
10	16	E B 16	E B 16	E B 16	E B 16	E B 17	E B 17	25	31	33	35	35	36	38	39	G	32	28	20	20	36	20	E B 16	E B 16
11	17	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	G	33	34	C	40	37	G	60	34	35	29	43	45	42	28	E B 16	26
12	19	20	E B 16	E B 16	E B 16	E B 16	E B 15	G	G	33	G	41	40	38	35	G	31	G	21	E B 16	E B 16	E B 16	21	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	28	28	31	34	36	G	37	G	33	G	28	21	E B 16	E B 17	E B 16	E B 16	16
14	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	22	26	30	35	39	36	37	39	43	45	35	40	34	20	20	19	19	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	18	28	32	42	38	38	44	52	43	34	32	28	45	36	28	20	E B 16	E B 15
16	E B 15	19	E B 16	E B 16	E B 16	E B 16	E B 16	G	30	G	G	35	36	40	37	36	36	32	21	17	E B 16	E B 16	18	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	29	34	34	37	38	36	35	33	G	G	20	E B 16	18	E B 16	18	18
18	18	E B 16	E B 16	E B 15	E B 16	E B 16	21	26	32	34	34	34	37	36	37	59	43	41	42	27	28	E B 16	21	E B 16
19	16	E B 16	E B 16	18	E B 16	E B 17	20	28	29	50	35	G	G	G	38	34	G	26	32	18	E B 15	E B 15	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	34	G	G	G	39	37	35	38	29	28	32	E B 16	E B 16	18	E B 16
21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	31	34	38	36	36	38	37	37	33	28	G	E B 15	E B 16	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15	21	25	31	32	G	G	36	G	G	G	32	28	23	17	E B 15	E B 16	E B 16	E B 16
23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	26	27	31	33	39	42	51	44	44	A A 73	43	32	29	19	E B 15	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	29	31	33	36	39	50	39	43	36	33	33	24	23	20	29	29	E B 16
25	19	E B 16	E B 15	21	18	E B 15	27	26	33	35	37	38	G	34	A A 75	40	48	38	40	37	E B 15	A A 105	20	E B 16
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	30	32	35	35	40	37	34	G	29	28	22	E B 18	E B 16	E B 16	E B 16	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	29	32	36	38	38	35	37	39	32	36	28	22	18	19	E B 16	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 17	E B 16	E B 15	19	27	30	34	34	38	38	38	40	35	30	G	G	E B 16	25	16	E B 16	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	32	32	40	44	42	38	39	36	33	33	A A 110	A A 126	A A 102	E B 16	E B 16	E B 16	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	30	38	A A 54	A A 54	42	40	59	37	42	33	30	32	50	29	20	A A 66	A A 50
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	26	30	34	35	36	37	38	37	34	32	28	22	20	18	E B 16	E B 16	E B 16
U Q	16	16	E B 16	E B 16	E B 16	E B 16	20	28	32	35	38	38	40	39	43	39	36	34	34	32	28	20	20	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 24	28	32	G 33	G 34	G 36	G 35	G 35	G	G 29	G 28	G 20	E B 16	E B 16	E B 16	E B 16	E B 16

APR. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

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

APR. 2019 fmin (0.1MHz)

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

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	317	312	327	342	366	349	326	362	366	357	337	339	336	352	342	348	343	356	347	379	316	339	310	310
2	307	294	326	326	317	331	363	371	354	354	349	342	339	356	357	378	332	363	377	364	377	338	308	300
3	F	304	311	330	352	361	371	381	356	358	358	332	328	322	327	329	363	392	366	362	324	293	299	303
4	296	322	313	387	330	313	345	357	378	355	348	322	337	326	342	359	363	360	370	340	327	302	300	304
5	313	356	325	322	320	330	360	371	368	353	341	333	342	353	342	330	341	365	366	360	333	323	317	327
6	316	288	F	349	346	340	343	385	363	358	350	306	337	356	352	329	362	341	345	360	374	356	308	303
7	302	311	307	330	337	348	356	384	C	365	364	328	328	A	A	337	340	342	341	357	386	A	308	294
8	F	F	F	F	A	F	335	382	371	352	351	337	318	321	331	328	324	346	336	347	A	A	F	F
9	F	F	F	F	F	F	349	374	374	352	334	332	A	325	A	A	A	A	341	A	A	F	303	302
10	302	321	314	336	327	307	361	389	354	355	316	315	313	326	301	309	339	357	355	336	376	309	309	F
11	F	F	309	341	362	325	366	384	379	338	C	308	322	349	343	342	336	330	350	346	375	319	300	311
12	303	330	330	F	F	F	386	383	374	353	299	324	306	313	325	338	353	333	337	336	359	350	306	306
13	317	312	321	352	340	362	388	378	375	333	334	322	320	332	350	343	332	353	324	343	380	377	300	306
14	320	295	313	325	393	320	358	376	399	350	331	340	326	335	321	329	356	353	335	335	362	362	293	295
15	295	F	F	F	F	333	375	376	366	352	326	339	350	329	329	346	353	336	323	348	342	374	309	299
16	323	321	319	327	336	316	380	391	372	328	363	323	311	329	345	340	350	338	335	350	372	401	302	287
17	288	291	304	F	401	336	370	374	367	363	338	324	314	310	325	345	354	352	345	345	348	360	310	325
18	312	299	F	315	377	317	378	366	334	367	381	291	314	309	323	340	355	322	339	348	359	367	322	F
19	F	F	F	F	F	316	359	356	357	369	350	305	342	310	323	326	333	336	350	329	364	407	312	304
20	315	335	315	348	334	311	345	368	391	375	361	334	287	297	322	363	344	346	352	348	341	353	316	F
21	F	303	311	331	F	312	357	360	368	376	354	327	308	322	325	341	337	352	349	355	332	326	299	307
22	307	316	317	332	333	320	390	370	352	364	358	356	342	300	323	339	354	350	357	335	323	313	310	312
23	317	323	336	336	363	338	370	374	348	289	348	334	322	333	322	328	A	367	370	371	303	311	310	F
24	F	F	340	345	310	326	368	353	327	350	378	354	342	335	334	321	315	329	351	346	328	310	F	F
25	F	F	341	379	F	F	366	369	355	308	353	354	324	336	A	331	327	320	323	334	353	A	317	F
26	316	333	313	322	325	332	363	380	373	364	316	339	310	331	329	347	343	356	359	349	315	303	330	299
27	305	298	316	344	341	313	371	379	359	365	354	356	301	326	312	331	346	358	363	343	294	302	311	311
28	312	311	337	351	323	315	384	362	344	358	360	326	322	320	337	334	366	349	359	346	302	311	323	307
29	304	316	307	333	328	331	384	378	364	372	345	313	315	335	310	309	341	A	A	A	331	346	332	309
30	F	309	300	F	F	F	385	380	364	A	A	333	308	321	316	298	311	333	334	353	390	283	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	21	23	24	23	22	25	30	30	29	29	28	30	29	29	27	29	28	28	29	28	28	26	27	22
MED	312	312	316	336	336	326	366	375	366	355	350	332	322	326	327	337	343	350	349	348	345	332	309	305
U Q	316	322	326	348	362	337	378	381	374	364	358	339	337	335	342	344	354	356	359	356	373	360	316	310
L Q	302	299	311	327	327	316	357	368	354	351	336	322	312	320	322	328	334	336	336	342	326	310	302	300

APR. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

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									L	UL 402	UL 393	406	426	399	UL 398	410	L	L	L					
2									L	UL 373	408	401	410	427	439	UL 425	UL 391	L						
3										UL 389	400	393	423	UL 406	423	UL 397	UL 389	L						
4								L	L	UL 401	UL 391	UL 395	407	392	407	L	L	L						
5										L	380	407	450	390	402	A	L	A						
6									L	L	397	UL 381	A	UL 408	UL 390	UL 389	L	A						
7									C	L	UL 401	UL 411	UL 416	A	A	A	A	A	A					
8										A	A	UL 422	404	A	A	A	A	A			A			
9										L	L	A	A	A	A	A	A	A	A					
10									L	L	UL 373	385	411	403	366	UL 393	L							
11										L	C	UL 395	424	401	A	399	A	L	A					
12										L	UL 408	A	UL 403	UL 392	399	400	L	L						
13										L	UL 389	420	406	389	392	UL 393	UL 364	L	L					
14										L	UL 393	415	UL 405	405	A	A	A	A						
15									A	A	398	410	A	A	A	402	UL 406	L						
16								L		L	395	UL 395	UL 418	406	407	418	A	L	L					
17									L	409	422	UL 434	A	449	412	UL 482	UL 378	UL 390						
18									L	398	UL 402	UL 407	432	375	418	A	A							
19									L	A	UL 423	444	449	443	UL 429	383	UL 378	UL 366						
20								L	L	L	UL 421	UL 426	UL 443	415	386	405	A	L						
21									L	UL 407	UL 414	421	433	413	393	404	385	L						
22										407	411	409	UL 404	421	412	432	L	L	L					
23									L	UL 386	423	423	A	A	A	A	A	A						
24									L	372	409	394	A	409	A	UL 386	409	A						
25							A	A		UL 390	397	421	413	414	A	A		A						
26									L	UL 417	UL 414	UL 477	413	UL 417	410	407	UL 396	UL 378						
27									L	UL 408	412	UL 411	408	UL 425	375	393	410	UL 400	L					
28									L	388	415	418	409	UL 405	A	404	410	UL 376						
29								A	L	A	A	A	UL 425	410	422	UL 428	UL 374	A	A					
30									A	A	A	A	405	A	427	A	379	392						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										14	25	26	24	24	20	20	13	6						
MED										UL 400	402	410	413	407	407	403	UL 389	UL 384						
U Q										UL 407	UL 414	UL 421	426	416	420	414	408	392						
L Q										388	UL 394	UL 395	406	400	392	UL 393	UL 378	UL 376						

APR. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

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									244	272	298	298	264	262	274	262	256	238	244					
2									260	256	256	254	252	248	246	246	278	246						
3										266	274	314	284	284	274	268	238	222						
4								246	246	260	272	274	266	274	264	244	242	242						
5										276	276	276	252	240	264	276	276	236						
6									248	248	258	300	262	232	250	270	258	258						
7									C	254	254	306	280	A	A	EA 278	EA 332	252	EA 252					
8										254	264	278	294	EA 286	254	272	270	258			A			
9										262	276	276	A	EA 286	A	A	A	A	EA 286					
10									258	268	294	294	286	264	296	280	244							
11										266	C	300	272	242	248	252	262	262	250					
12										268	334	286	262	290	264	240	240	266						
13										278	278	278	278	254	240	254	260	258	258					
14										278	278	268	268	254	268	278	246	242						
15									242	264	320	268	242	EA 280	280	262	242	270						
16								216		272	258	316	294	274	274	264	254	276	262					
17									246	270	270	282	282	280	270	242	236	248						
18									270	244	230	402	340	308	280	264	248							
19									254	EA 254	276	346	260	288	282	260	260	260						
20								244	232	240	250	280	312	362	300	258	274	264						
21									246	246	270	302	328	286	270	262	254	240						
22										250	250	256	294	374	324	272	256	258	258					
23									274	374	270	312	286	EA 286	298	280	A	228						
24									290	254	246	272	EA 292	302	286	318	308	264						
25							224	224		358	276	276	312	282	A	270		270						
26									262	262	318	310	334	278	278	278	274	254						
27									254	260	274	278	372	312	320	272	246	234	234					
28									260	260	260	290	332	342	294	294	242	256						
29								204	274	254	EA 284	324	336	290	324	316	272	A	A					
30									250	A	A	320	308	EA 298	274	292	292	252						
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	5	18	29	28	30	29	29	27	29	27	26	8					
MED							224	224	254	262	272	288	285	281	274	269	256	255	253					
U Q								245	262	271	278	310	312	294	294	278	274	262	260					
L Q								210	246	254	258	276	265	263	264	259	244	242	247					

APR. 2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 256	E B 256	E B 246	222	206	E B 288	226	214	206	196	196	196	190	188	198	192	192	200	210	198	214	208	224	E B 256
2	E B 256	E B 264	E B 250	E B 244	E B 236	E B 236	206	206	218	212	210	188	188	180	178	184	182	202	206	206	198	E B 198	E B 262	E B 266
3	E B 266	E B 252	E B 250	E B 248	208	222	204	212	218	198	198	198	184	182	182	182	182	180	206	192	208	226	E B 268	E B 266
4	E B 266	E B 244	E B 244	192	226	E B 264	218	214	204	204	192	190	190	200	200	188	188	188	202	210	224	E B 240	E B 256	E B 256
5	E B 254	220	E B 254	E B 246	E B 246	232	208	204	226	226	202	186	186	204	196	A	200	A	224	212	212	222	E A 256	224
6	E B 252	E A 288	E B 266	208	208	216	216	212	196	196	186	192	A	186	186	186	186	A	224	196	192	192	E B 246	E B 258
7	E B 266	E B 266	E B 258	228	228	E B 272	216	206	C	204	194	186	184	A	A	A	A	A	A	220	216	A	E A 322	E A 320
8	E B 284	E B 284	E B 242	222	A	E B 254	204	204	214	A	A	198	212	A	A	A	A	A	220	202	A	A	E B 306	E B 270
9	E B 252	E A 302	E B 256	212	206	E B 264	222	210	210	202	196	A	A	A	A	A	A	A	A	A	A	214	E A 238	E B 244
10	E B 240	E B 240	E B 240	216	216	E B 232	206	198	198	198	194	194	190	190	E A 232	174	206	228	222	216	216	216	E B 270	E B 298
11	E B 232	E B 238	E B 230	220	202	224	216	204	208	190	C	212	194	194	A	194	A	208	A	218	212	E A 300	E B 258	E A 336
12	E A 288	E A 246	E B 246	E B 274	214	210	202	198	198	202	178	A	216	204	204	188	192	194	208	208	202	190	E B 238	E B 264
13	E B 248	E B 248	E B 246	226	210	210	202	198	198	200	186	184	174	208	202	180	172	214	212	210	182	180	E B 280	E B 256
14	E B 242	E B 256	E B 262	E B 236	178	E B 246	210	210	210	200	200	198	192	204	A	A	A	A	230	218	210	194	E A 272	E B 272
15	E B 270	E B 270	E B 262	202	176	E B 290	210	210	A	A	210	202	A	A	A	198	198	188	E A 282	224	218	192	E B 248	E B 262
16	E B 240	E A 258	E B 256	E B 236	E B 236	E B 236	198	170	192	192	192	192	176	200	198	198	A	220	212	212	188	188	E A 286	E B 286
17	E B 280	E B 276	E B 266	216	182	E B 242	212	212	202	184	184	184	A	184	186	186	186	186	198	214	212	204	E A 240	E A 240
18	E A 256	E B 252	E B 254	226	192	E B 240	210	210	200	200	196	182	182	186	186	A	A	E A 250	E A 250	228	210	196	E A 258	E B 274
19	E B 270	E B 254	E B 236	226	212	E B 260	212	212	212	A	184	166	166	166	192	194	198	202	216	214	206	172	E B 248	E B 248
20	E B 258	E B 246	E B 246	E B 222	E B 222	E B 256	216	210	196	186	180	176	176	174	206	206	A	208	218	218	196	194	E A 240	E B 274
21	E B 268	E B 248	E B 222	E B 220	220	228	208	208	204	204	216	186	182	204	228	202	200	198	198	198	198	218	E B 250	E B 250
22	E B 250	E B 250	E B 250	E B 236	E B 236	E B 236	204	204	210	192	188	190	184	164	182	182	220	196	202	206	206	214	232	E B 242
23	E B 258	224	224	218	206	E B 238	208	202	202	198	192	192	A	A	A	A	A	A	210	210	218	E B 236	E B 242	E B 252
24	E B 252	E B 252	E B 240	214	214	E B 232	198	206	208	206	206	206	A	206	A	206	194	A	210	210	210	E B 236	E A 282	E B 242
25	E A 304	E B 252	220	206	E A 236	226	A	A	216	216	216	206	204	188	A	A	E A 258	A	E A 258	E A 244	198	A	E A 242	E B 258
26	E B 256	234	E B 234	224	224	E B 244	210	214	200	180	180	178	224	224	208	194	186	186	204	202	226	240	E B 238	E B 256
27	E B 256	E B 248	E B 232	210	210	E B 230	214	214	206	206	206	204	196	196	E A 262	202	218	196	196	204	E A 236	E B 234	E B 256	E B 242
28	E B 242	E B 242	E B 238	214	E B 224	224	196	206	192	192	192	206	202	202	A	E A 196	194	190	222	214	E A 252	234	E B 232	E B 250
29	E B 250	E B 246	E B 246	228	228	E B 238	200	A	198	A	A	A	196	214	158	198	198	A	A	A	202	202	202	E B 242
30	E B 250	E B 250	E B 272	E B 254	222	E B 228	202	202	A	A	A	A	212	A	202	A	198	210	224	220	200	E A 306	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	30	30	30	30	29	30	29	28	27	25	26	26	24	24	20	21	21	20	26	28	28	27	29	29
MED	E B 256	E B 251	E B 246	218	210	E B 236	208	207	204	200	194	192	190	195	196	193	194	198	211	210	208	204	E B 250	E B 256
U Q	E B 266	E B 258	E B 256	E B 236	E 227	E B 254	215	212	210	204	202	198	199	204	205	198	200	209	224	218	216	E 234	E 269	E B 271
L Q	E B 250	E 246	E B 238	214	206	228	203	204	198	192	186	186	183	185	186	185	186	189	206	205	199	194	E 239	E B 246

APR. 2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

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								118	118	114	110	110	110	108	108	108	108	108	114					
2							B	114	114	114	114	114	114	114	112	112	A	112	112					
3							B	112	112	112	112	112	110	110	108	108	108	108	108					
4							B	108	108	108	108	108	108	112	112	110	110	110	110					
5							B	110	110	110	A	110	110	A	110	A	A	A	A					
6							B	110	110	110	A	A	A	A	110	A	A	A	B					
7							B	110	C	108	A	A	A	A	A	A	A	A	B					
8							B	108	A	A	A	A	A	A	A	A	A	A	110		A			
9							B	110	108	A	A	A	A	A	A	A	A	A	B					
10							B	108	108	108	A	A	A	A	A	108	108	108	108					
11							B	110	A	A	C	A	A	110	A	108	104	104	B					
12							B	112	108	A	110	110	108	110	112	112	112	112	B					
13							B	A	A	A	A	A	112	A	112	A	108	108	108					
14							B	116	116	116	A	A	A	A	A	A	A	A	B					
15							B	116	A	A	A	A	A	A	A	A	A	A						
16							B	116	116	116	114	114	114	A	108	108	B	A	A					
17						B	114	114	114	110	A	110	110	110	110	110	110	110	B					
18							B	114	114	110	A	A	A	A	A	A	A	A	B					
19							B	114	A	A	A	114	114	114	A	A	114	A	B					
20							114	114	114	110	110	108	108	108	108	108	A	A	A					
21							B	108	108	A	A	A	A	108	108	108	108	108	108					
22							B	108	108	108	108	108	A	108	108	110	110	110	A					
23							B	110	A	A	A	A	A	A	A	A	A	A	B					
24							B	110	110	A	112	A	A	112	A	110	110	110	B					
25							B	110	110	110	110	A	106	A	A	A	A	A	B					
26							B	114	114	114	112	A	108	A	A	102	102	102	B					
27							B	114	114	114	A	A	A	A	A	A	116	114	114					
28							B	114	114	116	118	110	106	104	104	104	104	110	110					
29							B	110	110	110	A	A	110	A	110	110	110	A	A					
30							114	114	A	A	A	A	A	A	A	A	106	106	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	29	22	19	12	12	15	13	15	16	17	16	10					
MED							114	112	111	110	111	110	110	110	110	108	108	109	110					
U Q							114	114	114	114	113	113	112	112	112	110	110	110	112					
L Q							114	110	108	110	110	109	108	108	108	108	107	108	108					

APR. 2019 h'E (KM)

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IONOSPHERIC DATA STATION Yamagawa

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	140	132	128	G	120	120	120	G	164	G	120	G	G	B	B	88	B	88
2	B	B	B	B	B	B	B	114	114	140	G	G	G	G	G	G	100	138	G	74	B	B	B	B
3	B	B	B	B	88	88	B	G	G	108	112	110	124	128	G	114	114	G	G	96	B	B	B	100
4	B	B	B	B	B	98	B	116	116	114	118	140	140	G	G	G	G	G	G	B	B	B	B	B
5	B	B	90	90	B	B	B	120	116	116	104	G	114	104	136	88	84	84	98	98	98	98	98	98
6	98	96	96	94	94	114	114	114	110	106	100	100	84	84	G	84	84	82	82	82	B	82	88	B
7	B	B	B	B	B	B	B	G	C	G	94	94	104	104	100	100	98	98	96	92	92	92	92	92
8	90	90	90	90	90	90	112	118	112	108	98	96	96	96	96	96	96	96	G	96	96	96	96	96
9	88	92	90	90	B	B	122	118	116	100	96	96	88	86	88	90	94	94	106	104	104	96	96	96
10	92	92	92	B	92	92	92	122	122	114	102	102	98	98	98	G	170	158	134	102	102	102	102	102
11	104	104	98	96	94	94	94	G	96	96	C	94	94	G	100	140	172	154	100	100	100	100	100	92
12	92	92	94	98	98	98	98	G	G	98	G	132	132	124	134	G	116	G	114	100	92	90	84	84
13	84	94	94	94	94	94	B	98	96	96	94	94	G	94	G	92	G	172	138	B	B	B	92	86
14	96	B	B	B	92	98	98	124	128	122	94	94	96	96	96	98	96	96	96	96	96	94	94	94
15	94	94	B	94	B	B	124	122	98	96	96	96	96	96	96	96	96	96	88	88	88	88	88	88
16	88	88	88	84	88	88	90	G	134	G	G	126	120	102	106	106	106	106	106	106	96	94	90	90
17	94	B	B	B	94	94	G	118	118	116	108	144	144	120	150	122	G	G	186	90	86	86	86	84
18	84	88	94	98	98	B	128	126	122	110	94	94	94	94	98	98	98	98	98	98	98	98	90	90
19	98	98	98	98	96	B	130	128	102	96	96	G	G	G	88	88	G	98	98	88	88	88	88	88
20	88	B	B	B	B	B	G	G	G	150	G	G	G	128	128	128	104	104	102	100	100	94	94	B
21	B	B	94	84	B	B	116	116	116	104	98	98	98	158	158	130	118	118	G	B	B	B	B	B
22	B	104	B	84	B	B	118	118	118	118	G	G	102	G	G	G	142	142	98	96	96	92	92	92
23	92	B	B	B	92	92	126	118	96	96	96	96	94	94	92	92	90	84	84	82	82	82	88	88
24	88	88	86	86	86	86	126	126	126	102	110	98	98	108	100	110	116	116	108	104	96	96	96	98
25	98	B	96	94	92	92	114	124	118	118	118	100	G	96	92	100	100	100	94	92	90	90	90	88
26	86	86	86	86	B	100	128	128	134	124	146	90	148	84	84	G	132	132	118	B	90	84	B	B
27	B	B	B	84	84	B	120	120	120	114	104	98	98	98	118	82	126	120	138	112	104	98	B	B
28	B	B	B	B	B	B	118	128	128	138	130	144	142	132	138	138	138	G	G	118	104	102	B	102
29	102	102	B	102	98	98	124	124	124	120	104	104	110	96	140	132	132	106	98	98	96	96	96	96
30	100	100	100	88	86	B	120	120	100	100	100	100	100	100	102	100	166	148	100	98	98	98	94	94
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	16	16	19	18	16	22	24	26	27	24	25	25	24	24	23	26	24	23	25	23	25	22	23
MED	92	93	94	90	92	94	119	120	117	110	101	98	100	98	100	100	110	105	100	98	96	94	92	92
U Q	98	99	96	96	94	98	126	125	124	118	111	115	122	114	135	122	132	135	114	101	100	98	96	96
L Q	88	89	90	86	88	91	112	118	110	100	96	95	96	95	96	92	96	96	96	91	90	88	88	88

APR. 2019 h'Es (KM)

IONOSPHERIC DATA STATION Yamagawa

APR. 2019 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							F1	H2	C3		C3	C1	C1		H1		C2					F1		F1
2								C2	C2	H2							L2	H2		F3				
3					F2	F2				C1	C2	C2	C2	C1		C1	C1			L1				F1
4						F1		C3	C2	C2	C2	H1	H3											
5			F2	F2				C3	C3	C2	L2		C1	L2	H1	L3	L5	L4	L5	F6	F3	F3	F9	F2
6	F3	F3	F2	F4	F4	F3	C5	C4	C2	C2	L2	L2	L4	L2		L4	L4	L4	L5	F3		F1	F2	
7											L2	L2	L2	L5	L6	L4	L6	L7	L8	F9	F9	F9	F9	F9
8	F2	F3	F2	F3	F6	F2	C2	C4	C4	C4	L5	L2	L3	L3	L3	L3	L3	L4		F8	F5	F5	F3	F2
9	F2	F8	F2	F1			C2	C4	C2	L2	L2	L3	L6	L8	L5	L8	L8	L5	L7	F8	F7	F3	F6	F2
10	F2	F2	F1		F2	F3	L3	C3	C3	C2	L2	L2	L1	L2	L2		HL22	HL24	HL13	F8	F4	F3	F2	F2
11	F1	F2	F4	F4	F3	F2	L2		L3	L2		L3	L2		L4	H2	H2	H2	L6	FF97	F9	F5	F1	F4
12	F2	F5	F2	F2	F1	F1	L1			L2		H2	H1	C1	H1		C2		C3	F3	F4	F3	F6	F2
13	F2	F1	F1	F1	F1	F1		L2	L3	L2	L2	L2		L3		L2		H2	H1				L1	F4
14	F1				F1	F2	L5	C3	C2	C2	L3	L2	L2	L3	L3	L3	L4	L4	L6	F6	F3	F6	F4	F2
15	F2	F1		F1			C4	C3	L4	L4	L2	L2	L3	L3	L3	L2	L3	L3	L7	F9	F9	F5	F2	F2
16	F2	F2	F1	F2	F6	F1	L2		CL13			C1	C1	L2	C1	C1	L3	L2	L2	F3	F1	F3	F6	F2
17	F1				F3	L2		C2	C2	C2	L1	H1	H1	C1	H1	C1			L4	F6	F4	F3	F2	F6
18	F6	F6	F2	F2	F1		C2	C2	C2	C2	L1	L1	L2	L2	L1	L3	L2	L7	L8	F9	F9	F2	F4	F2
19	F2	F2	F2	F3	F2		C5	C2	L3	L5	L2				L2	L2		L1	L5	F4	F2	F1	F2	F1
20	F2									H1				C1	C2	C2	L4	L3	L7	F9	F2	F1	F4	
21			F1	F1			C4	C4	C3	L2	L3	L2	L1	H1	H1	H1	C2	CL23						
22		F1		F1			C2	C3	C2	C2			L2				H2	H1	L2	F2	F1	F1	F2	F3
23	F2				F2	F2	C2	C2	L3	L2	L2	L2	L3	L4	L5	L6	L9	L6	L6	F5	F3	F2	F1	F2
24	F2	F2	F2	F1	F2	F2	C2	C2	C2	L2	C1	L2	L4	C2	L2	C2	C2	C3	C3	F3	F5	F6	F6	F3
25	F4		F4	F3	F2	F2	C5	C5	C3	C2	C3	L2		L2	L6	L3	L5	L4	L9	F5	F3	F9	F5	F2
26	F2	F2	F1	F1		F1	C4	C4	H2	C1	C2	L2	H1	L2	L2		H1	H2	C2		F2	F2		
27				F1	F1		C4	C5	C3	C3	L3	L2	L2	L2	CL23	LC21	CL22	C3	H2	F4	F4	F2		
28							C3	C4	C2	C2	H1	H1	H3	H2	H2	H1	H1			F1	F8	F2		F2
29	F2	F3		F1	F1	F2	C3	C6	C3	C4	L3	L3	C1	L2	H1	H1	C2	L7	L8	F6	F3	F2	F3	F3
30	F3	F2	F2	F3	F1		C2	C3	L3	L5	L3	L5	L2	L5	L1	L2	H3	H3	L6	F8	F9	F7	F7	F9
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. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 39	X 38	X 37	X 37	X 25	X 21															X 53	X 48	X 42	X 39
2	X 40	X 38	X 38	X 39	X 34	X 30															X 50	X 36	X 36	X 36
3	X 37	X 34	X 34	X 37	40	X 22															X 49	X 47	X 44	X 45
4	X 43	X 43	X 42	X 42	X 26	X 27															X 67	X 50	X 48	X 48
5	X 46	X 45	X 40	X 33	X 31	X 30															X 52	X 48	X 48	X 44
6	X 39	X 42	X 39	X 38	X 32	X 25															X 71	X 36	X 30	X 32
7	32	X 32	X 31	X 32	X 26	X 26															X 69	X 34	X 32	X 33
8	X 33	35	41	49	X 28	A															X 61	X 34	X 33	A
9	X 36	X 34	X 33	X 42	A	X 24															X 62	A	A	52
10	55	54	58	58	44	37															X 62	X 45	X 44	X 50
11	56	52	X 51	X 54	X 31	X 28															X 71	X 49	X 43	X 44
12	X 45	X 44	X 39	43	X 39	X 32															X 99	X 67	X 68	X 69
13	X 73	X 72	X 67	X 72	X 54	X 41															X 112	X 39	X 36	X 36
14	X 37	X 38	X 38	X 41	X 34	X 24															X 97	X 64	X 54	X 54
15	X 48	56	58	58	X 28	X 24															X 79	X 53	X 51	X 49
16	X 49	X 47	X 45	X 45	X 40	X 36															X 84	X 48	X 42	X 40
17	X 37	X 38	X 39	X 43	X 38	A															X 87	X 53	X 50	X 46
18	X 45	X 43	X 40	X 39	X 35	X 30															X 70	X 53	X 45	X 43
19	44	44	45	X 41	X 28	A															X 72	X 44	X 40	X 39
20	X 40	X 37	X 36	X 36	X 29	X 28															X 58	X 55	X 44	X 44
21	47	42	42	X 40	X 30	X 28															X 58	X 49	X 44	X 44
22	X 44	X 44	X 42	X 39	X 35	X 34															X 58	X 53	X 48	X 46
23	X 44	X 43	X 43	X 43	X 31	X 24															X 47	X 44	X 43	44
24	X 39	39	X 36	X 27	X 31	X 26															X 64	X 56	X 47	48
25	48	47	X 48	X 33	32	33															X 102	X 53	X 40	X 42
26	44	X 40	X 40	38	X 30	X 28															X 56	X 54	X 53	X 50
27	X 48	X 44	X 41	X 39	X 33	X 28															X 57	X 56	X 53	54
28	X 53	X 51	X 48	X 44	X 43	X 35															X 52	X 52	X 49	X 45
29	44	X 42	X 40	X 37	X 36	X 34															X 55	54	A	37
30	38	X 36	X 36	X 35	X 30	X 31															A	X 46	X 45	X 42
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															29	29	28	29
MED	X 44	X 42	X 40	X 40	X 32	X 28															X 62	X 49	X 44	X 44
U Q	X 48	45	X 45	X 43	X 37	X 33															X 76	X 54	X 48	X 48
L Q	X 39	X 38	X 38	X 37	X 30	X 25															X 56	X 44	X 41	X 40

APR. 2019 fxI (0.1MHz)

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IONOSPHERIC DATA STATION Okinawa

APR. 2019 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	33	32	31	31	19	J B 15	21	44	53	56	56	60	77	76	75	77	59	59	65	57	47	42	36	33
2	34	32	32	33	28	24	27	46	53	62	82	81	87	88	80	70	62	70	73	60	44	30	30	30
3	31	28	28	31	F 30	J B 16	22	44	54	58	58	69	80	90	91	88	83	75	57	50	43	41	38	39
4	37	37	36	36	20	21	27	50	62	63	61	73	86	98	103	100	73	58	55	57	61	44	42	42
5	40	39	34	27	25	24	28	45	55	64	70	87	90	93	92	70	70	67	62	58	46	42	42	38
6	33	36	33	32	26	19	29	51	57	64	68	78	87	96	88	74	73	71	85	81	65	30	25	26
7	F 25	26	25	26	20	20	26	50	56	60	56	63	76	86	96	92	77	68	72	84	63	28	26	27
8	27	F 27	F 33	F 37	21	A	28	52	58	59	65	69	76	85	95	84	76	80	85	101	55	28	27	A
9	30	28	27	36	A	18	32	51	54	62	65	76	86	96	107	104	83	79	77	82	56	A	A	F 44
10	F 42	F 41	F 44	F 44	F 31	F 29	32	49	52	61	66	83	93	100	92	94	98	72	67	A	56	39	38	44
11	F	F 42	45	48	25	22	32	50	54	55	60	79	94	108	105	78	84	R 101	110	108	65	43	37	38
12	39	38	33	F 32	33	26	V 33	47	53	57	66	79	97	109	126	117	102	89	92	99	93	61	62	63
13	67	66	61	66	48	35	40	48	52	58	72	86	99	107	113	J R 102	86	81	87	98	106	34	30	30
14	31	32	32	35	28	18	32	52	55	57	62	71	86	100	J R 99	103	98	95	96	106	91	58	48	48
15	42	F 44	F 49	F 50	22	18	30	48	53	59	68	74	81	74	84	94	73	63	72	88	73	47	45	43
16	43	41	39	39	34	30	38	48	53	58	71	65	73	84	92	87	85	85	84	89	78	42	36	34
17	31	32	33	37	32	A	30	51	54	57	63	77	86	96	102	108	87	69	70	82	81	47	44	40
18	39	37	34	33	29	24	33	50	59	71	56	52	67	86	94	99	93	75	65	69	64	47	39	37
19	F 35	F 35	F 36	35	22	A	31	47	56	57	55	66	82	84	92	104	90	89	90	78	66	38	34	33
20	34	31	30	30	23	22	28	66	56	54	50	52	55	63	76	76	77	67	62	A	52	49	38	38
21	F 38	F 31	F 34	34	24	22	32	50	58	62	59	63	84	100	101	96	91	74	62	58	52	43	38	38
22	38	38	36	33	29	28	36	48	50	60	69	56	54	60	67	66	68	60	54	56	52	47	42	40
23	38	37	37	37	25	18	35	47	53	58	56	62	69	77	88	104	106	72	53	43	41	38	37	F 33
24	33	F 30	30	21	25	20	34	46	48	66	58	56	61	69	73	77	77	77	74	69	58	50	41	38
25	F 40	F 36	42	27	F 24	F 22	35	42	49	54	57	A	68	80	83	89	96	96	88	96	96	47	34	36
26	F 32	34	34	29	24	22	36	49	54	54	53	57	70	86	80	70	62	58	66	52	50	48	47	44
27	42	38	35	33	27	22	34	47	53	54	54	52	56	61	79	90	86	77	62	58	51	50	47	F 48
28	47	45	42	38	37	29	37	45	50	59	62	52	54	55	65	V 74	68	61	57	52	46	46	43	39
29	F 37	36	34	31	30	28	38	45	55	51	53	54	56	69	69	72	78	72	63	63	49	F 47	A	F 30
30	F 29	30	31	29	24	25	41	45	48	49	51	61	76	90	99	109	116	126	110	91	A	40	39	36
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	29	27	30	30	30	30	30	29	30	30	30	30	30	30	30	28	29	29	28	29
MED	37	36	34	33	25	22	32	48	54	58	60	66	78	86	92	90	83	73	71	74	56	43	38	38
U Q	40	38	37	37	30	26	35	50	56	62	66	78	86	96	99	102	91	81	85	90	70	47	42	42
L Q	32	31	32	31	24	19	28	46	53	56	56	56	68	76	80	76	73	67	62	58	50	38	35	33

APR. 2019 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

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									L 412	420	428	432	436	432	420	404	380	L						
2										L 428	424	432	440	440	452	440	412	L						
3									L 420	440	432	448	444	440	424	412	L							
4									L	L 460	L 452	448	A	448	420	396	U L 324							
5									L	L 416	444	444	448	440	444	440	424	L						
6									L	L 424	448	L 444	444	448	444	U L 444	A	L						
7									L	L	U L 432	L 456	A	464	A	A	A	A						
8									L	A	A	A	444	452	448	A	416	L 396	L					
9										L	U L 464	L 484	A	A	L 448	440	440			A				
10										U L 428	U L 476	452	460	A	448	448	424							
11									L	U L 424	448	448	460	A	A	A	432	L						
12										U L 492	460	L 452	468	A	A	444	424	L	L					
13										U L 432	440	448	L 448	452	448	436	424	L 400						
14										U L 432	448	452	452	L 456	456	436	432	L						
15										428	432	448	A	A	A	428	L 412	U L 400						
16									L	U L 444	444	452	452	436	436	432	424	392						
17									L	U L 448	L 448	440	436	448	A	428	408	A						
18									L	424	L 432	452	440	A	436	428	416	L	L					
19									A	L 420	432	444		448	U A 440	420	408	384	L					
20									L	412	U L 444	452	444	436	A	A	404	A		A				
21									L	428	436	456	440	432	428	428	420	L	L					
22								L	U L 388	L 428	432	L 436	456	432	424	420	404	L	L					
23									L	408	436	436	432	436	432	416	404	L	L					
24									U L 408	404	424	424	444	436	440	416	412	380						
25									U L 384	408	416	A	A	U A 436	432	440	A	368	U L 344					
26									L	420	432	448	432	428	428	416	404	U L 388						
27									L	L 412	L 440	444	436	432	420	408	A	376						
28									U L 368	408	424	432	432	436	424	424	408	L 380	L					
29									A	L 416	A	A	436	436	428	420	400	A						
30										A	A	A	A	A	U A 436	A	A	376						
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	25	27	26	24	22	24	25	25	13	1					
MED									U L 386	L 424	440	448	444	436	438	428	412	380	U L 344					
U Q									U L 398	U L 428	L 448	452	450	448	448	440	424	L 394						
L Q									U L 376	412	432	436	436	436	430	420	404	376						

APR. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	208	272	280	308	324	332	332	320	320	292	244	A	B				
2							B	188	A	300	312	344	356	344	328	A	A	A	A	B				
3							B	184	256	292	328	336	344	348	336	316	288	252	184	B				
4							B	192	256	296	324	328	344	A	U A 332	316	288	252	184	B				
5							B	A	A	292	A	316	336	336	300	304	288	248	188	B				
6							B	U A 212	260	296	U A 316	U A 328	A	U A 348	A	A	296	A	A	A				
7							B	A	272	288	U A 332	336	352	356	340	328	292	A	A	A				
8							B	A	A	A	A	A	344	340	340	316	296	272	192	B				
9							B	180	252	296	324	336	A	344	344	320	300	264	A	A				
10							B	A	268	A	A	U A 352	A	344	336	316	A	264	204	A				
11							B	A	A	292	A	A	360	352	336	324	300	264	204	A				
12							B	204	260	304	336	A	356	348	344	320	280	256	188	A				
13							B	200	A	A	A	A	A	A	A	A	A	A	A	A				
14							B	200	260	312	324	336	A	U A 344	332	316	A	264	A	A				
15							B	A	A	A	A	A	A	344	336	308	A	U A 256	204	A				
16							A	A	A	A	A	A	A	A	344	316	296	264	A	A				
17							B	196	A	A	A	340	336	356	328	320	292	252	A	A				
18							B	224	A	A	A	A	A	372	A	A	300	260	A	A				
19							A	208	A	A	A	A	332	348	336	320	300	A	A	A				
20							B	224	268	308	328	352	348	A	340	324	300	272	200	A				
21							B	A	276	U A 304	A	A	A	A	A	A	A	264	196	B				
22							B	188	A	304	324	A	352	344	332	320	280	260	204	B				
23							B	200	280	A	A	A	A	348	336	316	292	260	196	A				
24							A	200	A	A	A	A	A	356	332	316	292	256	A	B				
25							B	228	A	A	A	A	A	A	A	312	296	A	A	B				
26							B	A	268	296	328	A	U R 344	332	R 328	A	A	A	204	A				
27							B	216	A	U A 304	316	A	A	A	336	320	A	A	A	A				
28							B	A	A	A	A	A	A	A	A	316	300	260	A	A				
29							184	200	260	300	A	A	U A 344	328	324	308	284	U A 256	U A 212	A				
30							B	U A 220	A	A	A	A	A	340	324	312	296	272	U A 220	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	20	14	17	13	12	15	22	24	24	22	22	15					
MED							184	200	264	296	324	336	344	344	336	316	294	260	200					
U Q								214	272	304	328	342	352	348	338	320	300	264	204					
L Q								194	260	292	316	328	336	340	328	316	288	256	188					

APR. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 24	32	34	36	36	35	38	37	36	32	J A 22	18	E B 16	E B 16	E B 16	19
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	29	34	38	38	G	36	37	35	30	29	22	E B 16	E B 16	J A 17	J A 17	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 20	23	30	34	36	36	41	42	39	G	G	G	21	20	E B 16	J A 20	18	18
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	32	33	38	36	38	46	38	34	G	G	25	E B 16	J A 17	20	E B 16	E B 16
5	E B 16	E B 16	E B 16	19	E B 16	18	E B 18	26	J A 38	37	J A 46	39	37	38	36	36	33	G	22	J A 24	J A 20	18	J A 21	J A 50
6	J A 41	E B 16	E B 16	E B 16	18	18	J A 20	30	33	35	36	37	J A 48	J A 40	J A 50	J A 38	J A 43	44	J A 50	J A 52	J A 40	J A 24	19	19
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	31	36	J A 43	40	J A 52	J A 46	J A 54	J A 65	J A 56	J A 55	J A 37	J A 31	J A 85	J A 52	J A 22	J A 18
8	J A 26	J A 32	J A 31	J A 25	J A 46	J A 53	J A 21	27	J A 38	58	J A 57	J A 66	J A 59	J A 47	J A 46	J A 53	32	32	J A 22	J A 16	J A 21	J A 26	J A 46	J A 36
9	J A 64	J A 25	J A 24	J A 28	J A 26	20	E B 16	J A 32	J A 33	37	38	J A 47	J A 72	J A 60	J A 46	38	38	J A 36	J A 24	J A 52	J A 79	J A 143	J A 52	J A 38
10	J A 29	J A 29	J A 50	20	E B 16	20	E B 16	25	32	J A 36	J A 42	J A 42	J A 47	J A 47	J A 46	J A 46	J A 43	36	J A 39	J A 70	J A 36	J A 64	J A 22	E B 16
11	J A 28	J A 30	J A 62	J A 26	J A 15	J A 20	J A 22	J A 27	J A 30	34	J A 38	36	44	J A 51	J A 58	J A 47	38	31	J A 33	J A 40	J A 33	J A 41	J A 52	J A 23
12	J A 21	J A 31	J A 52	J A 42	J A 16	E B 16	J A 20	23	30	32	40	41	42	45	48	38	G 27	G	21	J A 20	J A 38	J A 21	J A 18	J A 22
13	J A 22	J A 19	J A 27	J A 21	J A 19	J A 16	E B 16	25	J A 35	J A 40	J A 44	J A 40	J A 41	39	38	36	J A 37	J A 41	J A 48	J A 28	J A 19	20	J A 16	J A 25
14	E B 16	E B 16	J A 22	E B 16	E B 16	J A 33	E B 16	25	31	34	35	40	J A 45	J A 60	J A 53	J A 48	J A 40	33	J A 64	J A 28	J A 29	J A 32	J A 19	20
15	J A 29	J A 30	J A 48	E B 16	E B 16	J A 17	J A 18	25	J A 34	J A 41	J A 46	J A 44	J A 51	J A 47	J A 58	J A 72	J A 77	J A 30	J A 32	J A 33	J A 19	J A 31	J A 42	J A 20
16	J A 27	18	J A 22	J A 24	E B 16	21	J A 57	J A 64	32	J A 35	37	J A 39	37	41	40	37	34	G	J A 54	J A 82	J A 44	J A 27	J A 16	J A 21
17	J A 21	J A 22	18	J A 20	J A 27	J A 25	J A 17	26	31	J A 41	J A 38	37	37	42	J A 47	40	J A 50	J A 64	J A 48	J A 39	J A 48	J A 28	24	J A 19
18	J A 18	J A 18	J A 19	J A 22	25	J A 40	J A 18	J A 34	30	J A 39	J A 43	J A 47	J A 40	J A 68	40	J A 40	J A 34	30	J A 29	18	J A 16	J A 20	J A 20	J A 50
19	J A 21	J A 26	J A 20	J A 41	J A 28	J A 28	J A 30	33	J A 53	J A 34	58	J A 46	46	40	45	36	33	J A 37	J A 28	J A 28	J A 41	J A 47	J A 18	19
20	E B 16	E B 16	E B 16	E B 16	E B 16	20	E B 16	G 20	30	34	36	42	42	42	47	46	42	J A 43	J A 31	J A 57	J A 31	J A 21	J A 18	18
21	19	J A 18	J A 19	19	E B 16	19	J A 18	J A 28	33	38	J A 44	J A 43	J A 40	38	36	34	30	G	22	J A 21	J A 25	J A 15	J A 13	E B 16
22	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	34	G	37	J A 40	G	G	37	37	32	31	24	J A 17	J A 21	J A 21	J A 24	E B 16
23	J A 23	20	18	E B 16	20	J A 19	E B 16	26	32	J A 36	J A 45	J A 43	J A 40	40	38	36	32	29	27	J A 26	J A 28	19	E B 16	J A 17
24	J A 31	J A 20	J A 21	J A 20	J A 17	J A 31	J A 19	J A 29	34	J A 44	J A 47	J A 42	J A 42	42	38	G	34	31	J A 33	J A 19	J A 17	20	J A 52	J A 41
25	J A 25	J A 40	J A 21	E B 16	J A 29	E B 16	E B 16	30	35	J A 52	J A 109	J A 103	J A 77	J A 90	J A 43	37	J A 44	J A 38	E B 30	16	20	E B 16	E B 16	J A 26
26	J A 52	J A 21	J A 25	19	E B 16	E B 16	E B 16	26	34	34	G	38	40	G	38	J A 42	J A 41	J A 38	27	J A 30	J A 21	18	E B 16	E B 17
27	J A 20	E B 16	E B 16	E B 16	E B 16	E B 16	22	30	34	J A 46	J A 39	J A 40	J A 42	38	42	39	J A 53	J A 39	J A 48	J A 39	J A 23	J A 34	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	28	J A 34	J A 48	J A 71	36	42	40	35	G	35	G	23	J A 26	J A 22	J A 30	J A 18	J A 18
29	J A 25	J A 19	20	J A 18	E B 16	E B 16	G	J A 49	J A 40	J A 42	J A 44	J A 46	J A 47	41	35	40	39	J A 42	J A 36	J A 31	J A 102	J A 86	J A 110	J A 86
30	J A 53	J A 18	J A 52	20	20	E B 16	20	J A 32	J A 43	J A 62	J A 60	J A 64	J A 63	J A 59	J A 45	J A 46	J A 48	J A 38	J A 54	J A 56	J A 156	J A 53	J A 62	J A 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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 21	J A 18	J A 20	18	E B 16	18	G	26	33	36	J A 41	40	J A 42	42	41	38	36	32	J A 30	J A 28	J A 24	J A 22	J A 18	J A 19
U Q	J A 28	J A 25	J A 25	J A 21	J A 20	J A 20	J A 20	J A 30	J A 34	J A 41	J A 46	J A 44	J A 47	J A 47	J A 47	J A 46	J A 43	J A 38	J A 39	J A 39	J A 40	J A 34	J A 24	J A 26
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	31	34	37	38	40	39	38	36	32	G 29	23	19	J A 19	20	E B 16	E B 17

APR. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 22	31	34	35	35	35	37	36	35	29	20	E B 16	E B 16	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	29	32	36	37	G	35	36	34	29	28	22	E B 16	E B 16	E B 16	E B 16	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	29	33	35	36	41	40	38	G	G	G	20	18	E B 16	18	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	31	32	35	35	37	44	37	33	G	G	25	E B 16	E B 16	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 18	25	31	35	35	38	35	35	34	36	32	G	20	E B 16	E B 16	E B 16	18	18
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	28	32	33	34	36	39	G 28	37	33	40	31	36	44	38	22	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	30	35	40	38	46	45	48	51	52	46	35	28	32	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	18	E B 16	A A 53	E B 16	25	36	46	46	55	41	41	43	48	32	31	20	E B 16	19	24	E B 16	A A 36
9	E B 16	E B 16	E B 16	E B 16	A A 26	E B 16	E B 16	29	30	35	37	44	52	52	43	37	37	35	22	46	47	A A 143	A A 52	E B 16
10	18	18	24	E B 16	E B 16	E B 16	E B 16	24	30	33	38	40	44	46	40	44	33	34	36	A A 70	20	18	E B 16	E B 16
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	28	33	35	35	42	50	52	46	38	30	30	37	31	20	20	E B 16
12	E B 16	E B 16	20	E B 16	E B 16	E B 16	E B 16	23	29	32	40	40	41	45	46	36	G 24	G	21	17	18	E B 16	E B 16	E B 16
13	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	31	32	34	37	39	38	38	36	32	29	31	25	E B 16	E B 16	E B 16	E B 16
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	30	33	34	38	42	42	41	43	34	30	50	22	23	21	E B 16	E B 16
15	22	22	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	34	36	40	47	45	50	40	33	27	31	30	E B 16	E B 16	26	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	44	31	32	36	36	36	39	39	35	32	G	52	26	18	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	18	A A 25	E B 16	25	31	31	35	36	36	40	46	40	35	46	43	29	32	21	21	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	20	E B 16	32	30	33	35	38	36	62	40	36	G 24	29	26	16	E B 16	E B 16	20	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	A A 28	26	31	39	34	34	39	45	38	44	36	32	29	24	20	21	19	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 16	29	34	35	42	42	42	46	46	39	38	25	A A 57	20	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	27	32	34	39	40	38	38	35	34	30	G	21	E B 16	22	E B 16	E B 16	E B 16
22	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	31	G	37	36	G	G	37	37	32	30	22	E B 16	E B 16	E B 16	E B 16	E B 16
23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	30	33	35	36	36	40	36	34	31	28	24	22	E B 16	E B 16	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	26	30	34	35	37	38	39	37	G	33	30	30	E B 16	E B 16	E B 16	E B 16	29
25	E B 16	22	E B 16	E B 16	E B 16	E B 16	E B 16	26	33	37	38	A A 103	64	44	39	35	40	35	28	E B 16	E B 16	E B 16	E B 16	E B 16
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	G 21	G 20	G	34	40	G	38	36	32	32	25	26	E B 16	E B 16	E B 16	E B 17
27	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	28	32	34	37	37	35	38	41	39	45	32	44	32	20	E B 16	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	30	33	37	36	41	39	35	G	33	G	22	22	20	25	E B 16	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	29	38	38	42	44	38	40	35	38	36	36	31	29	22	E B 16	A A 110	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	29	37	44	48	49	47	48	44	46	43	31	33	40	A A 156	20	24	20
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 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	30	33	36	38	40	40	39	36	33	30	26	22	18	E B 16	E B 16	E B 16
U Q	E B 16	E B 16	E B 16	E B 16	E B 16	16	16	28	32	34	38	40	42	45	44	40	37	32	33	30	22	20	18	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	32	35	36	36	38	37	34	32	G 27	22	E B 16	E B 16	E B 16	E B 16	E B 16

APR. 2019 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

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

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

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	307	319	323	365	365	B	327	362	361	363	349	311	339	327	337	360	353	356	373	358	308	329	308	307
2	311	310	299	336	356	317	338	368	353	328	348	331	333	336	334	331	335	338	379	379	382	327	304	308
3	312	303	320	336	F 388	B	330	383	364	359	338	330	309	324	328	333	351	379	368	367	319	325	292	297
4	299	299	328	371	362	326	339	385	372	355	318	306	317	324	336	349	355	355	355	343	351	307	296	304
5	317	337	362	340	313	330	334	370	356	349	330	332	327	329	341	319	351	367	382	364	330	314	323	330
6	308	306	315	341	370	300	340	368	359	354	326	319	317	333	341	306	333	326	357	362	379	385	295	308
7	F 304	308	330	352	339	338	348	395	377	376	346	323	292	306	325	342	335	345	325	358	382	350	297	298
8	308	F 308	F 306	F 354	385	A	353	373	372	352	336	320	306	309	329	330	331	331	333	389	410	330	290	A
9	294	291	306	371	A	318	353	389	366	348	321	309	298	316	323	341	338	341	332	352	347	A	A	F 310
10	F 316	F 323	F 325	F 367	F 365	F 340	339	385	370	341	289	304	304	315	311	315	349	357	350	A	362	302	292	293
11	F	F 323	330	373	339	293	343	371	377	352	302	303	316	339	351	327	295	R 326	345	352	377	315	287	301
12	320	318	306	F 340	340	362	V 364	402	339	311	305	298	307	312	336	341	332	325	325	340	357	325	308	295
13	295	301	317	365	378	340	365	390	340	324	309	304	316	333	338	J R 320	320	317	322	354	394	302	295	300
14	317	315	303	320	425	298	347	370	372	354	331	312	316	336	J R 314	330	323	329	319	342	364	342	308	301
15	292	F 300	F 319	F 386	350	306	338	377	355	347	345	339	335	308	319	351	338	307	319	356	380	324	295	292
16	313	313	330	330	356	343	377	399	382	335	353	317	294	308	332	315	334	318	340	355	376	308	315	303
17	284	292	329	339	395	A	348	361	366	315	305	309	313	312	319	351	355	342	321	341	384	332	326	311
18	320	316	320	353	378	321	342	379	354	372	368	283	278	308	321	340	341	356	330	358	367	338	325	300
19	F 319	F 310	F 354	385	348	A	350	373	362	360	329	282	315	292	310	339	322	329	355	360	377	347	340	303
20	306	317	330	366	329	305	343	400	388	378	342	313	278	289	334	335	345	379	357	A	331	353	314	307
21	F 285	F 318	F 333	361	316	333	347	369	376	371	348	275	300	327	321	324	334	335	347	362	330	329	303	301
22	307	317	321	344	333	337	368	385	340	343	369	338	298	309	315	320	346	348	354	337	337	326	317	306
23	311	321	330	371	355	358	382	384	364	353	326	317	310	300	297	321	346	357	372	357	319	307	289	F 312
24	330	F 309	315	377	331	359	375	383	341	367	390	333	323	323	312	294	289	332	342	335	349	328	308	307
25	F 319	F 310	359	367	F 324	F 340	357	371	342	362	347	A	312	313	313	310	309	315	316	338	381	381	297	286
26	F 324	325	370	318	327	330	361	383	381	373	315	294	305	330	332	326	350	340	375	348	317	310	318	320
27	317	316	326	360	349	312	369	370	384	362	344	301	307	279	315	341	355	361	351	351	306	308	293	F 303
28	304	318	316	351	355	338	373	379	339	344	353	313	324	299	317	V 323	332	344	356	354	305	313	322	307
29	F 294	310	320	328	321	342	374	373	383	349	334	321	298	326	288	310	348	357	358	367	330	F 317	A	F 307
30	F 321	323	316	331	362	338	392	391	373	331	303	299	308	313	306	309	312	337	365	374	A	313	292	291
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	25	30	30	30	30	30	29	30	30	30	30	30	30	30	28	29	29	28	29
MED	311	314	322	354	355	333	349	379	365	352	335	312	310	314	322	328	336	340	350	356	357	325	304	303
U Q	318	318	330	367	368	340	368	385	376	362	348	322	317	327	334	341	349	356	358	362	380	335	316	308
L Q	302	308	316	339	332	314	340	370	354	343	318	302	300	308	314	319	331	329	330	346	330	312	294	299

APR. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

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									L	381	397	428	432	389	390	402	389	385	L					
2										L 384	407	410	412	413	397	384	388	L						
3									L	380	396	421	A	368	405	411	369	L						
4									L	L	L 375	394	407	A	364	405	440	U L 441						
5									L	L 382	375	401	410	429	396	383	367	L						
6									L	L 386	393	L 405	415	408	399	U L 372	A	L						
7									L	L	U L 410	L 413	A	A	A	A	A	A						
8									L	A	A	A	425	410	A	A	392	L 375	L						
9										L	U L 385	A	A	A	A	395	374							
10										U L 387	U L 371	404	A	A	391	A	373			A				
11									L	U L 396	392	408	A	A	A	A	358	L						
12										U L 346	382	L 398	381	A	A	384	386	L	L					
13										U L 386	402	417	L 397	396	398	389	390	L 363						
14										U L 387	399	401	A 395	A 386	A 394	A	365	L						
15										387	403	A 382	A	A	A	A 364	L 402	U L 367						
16									L	U L 374	367	393	402	427	384	382	371	358						
17									L	U L 375	L 386	418	448	A 383	A	A	399	A						
18									L	385	L 420	427	443	A	408	395	376	L	L					
19									A	L 400	441	408		415	A	403	402	368	L					
20									L	426	U L 419	A 385	400	408	A	A	A	A		A				
21									L	379	396	415	441	422	397	395	383	L	L					
22								L	U L 404	L 398	407	L 430	400	434	420	392	387	L	L					
23									L	407	401	435	446	A 393	398	399	394	L	L					
24									U L 367	391	399	431	422	416	423	416	365	373						
25									U L 375	383	427	A	A	A	391	379	A	A	U L 367					
26									L	406	427	425	407	422	397	408	395	U L 376						
27									L	L 406	L 395	422	428	403	A	A	A	380						
28									U L 408	387	401	422	A 387	401	417	408	394	L 378	L					
29									A	A 400	A	A	417	A	411	389	A 385	A						
30										A	A	A	A	A	A	A	A	370						
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	25	27	25	21	19	19	21	24	12	1					
MED									U L 390	L 387	399	413	412	408	397	395	386	374	U L 367					
U Q									U L 406	399	407	424	430	422	408	404	394	379						
L Q									U L 371	L 382	L 386	401	400	A 393	391	384	372	368						

APR. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

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									264	256	284	324	264	272	266	238	266	254	222					
2										290	250	262	264	262	266	264	276	260						
3									246	254	294	278	302	278	264	256	234	222						
4									238	250	312	296	294	278	258	236	238	228						
5									252	260	282	272	264	266	242	288	260	234						
6									224	258	278	272	286	256	250	280	276	254						
7									226	236	268	298	334	312	276	250	258	254						
8									232	260	284	292	312	300	266	262	272	256	256					
9										252	298	306	308	286	264	242	252							
10										274	340	300	302	272	276	284	240			A				
11									228	268	354	310	290	254	238	256	298	250						
12										L 338	320	322	308	300	256	244	238	246	252					
13										306	304	300	290	268	244	250	270	268						
14										262	302	302	292	266	270	258	260	250						
15										270	266	270	272	302	284	246	258	300						
16									228	294	258	286	312	282	264	278	266	264						
17									242	318	324	294	292	284	280	252	236	250						
18									252	232	240	408	380	314	284	258	248	236	244					
19									252	246	320	354		326	302	254	258	264	226					
20									220	240	300	350	420	352	276	276	244	234		A				
21									236	248	280	376	320	268	270	264	246	240	234					
22								224	264	284	240	298	384	336	296	286	264	250	228					
23									256	278	312	314	312	314	312	260	230	228	216					
24									298	250	230	312	310	294	308	306	296	262						
25									284	256	270	A	E A 366	286	284	294	282	264	266					
26									238	244	340	368	322	270	258	278	260	272						
27									222	256	276	368	338	382	298	256	240	232						
28									254	280	262	350	326	368	312	272	256	256	234					
29									236	274	310	334	354	298	324	306	248	240						
30										A 310	A 378	356	314	294	286	288	278	234						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	22	30	30	29	29	30	30	30	30	28	10					
MED								224	240	260	289	306	309	286	273	261	258	250	234					
U Q									254	280	312	350	330	312	286	280	270	261	252					
L Q									228	250	268	293	291	270	264	252	244	235	226					

APR. 2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	250	252	208	228	B	264	214	218	206	200	192	178	236	222	202	202	198	208	204	216	222	250	282
2	266	278	276	226	206	254	232	216	214	216	188	208	188	176	168	204	178	222	212	202	186	214	278	286
3	266	282	260	232	190	B	244	210	218	212	200	176	A	E A 258	194	180	188	212	208	198	230	232	284	270
4	280	258	246	196	226	276	236	206	228	216	190	200	202	A	220	200	200	200	224	214	212	216	278	270
5	260	228	210	234	280	252	244	210	220	222	220	204	184	184	168	218	222	210	218	204	214	244	246	228
6	272	268	262	222	192	336	224	210	212	196	202	174	210	182	208	190	A	226	236	224	202	182	288	286
7	306	278	254	228	268	250	226	206	196	200	216	186	A	A	A	A	A	A	262	212	186	210	308	310
8	290	298	268	204	192	A	228	210	218	A	A	A	204	220	A	A	186	216	228	198	178	E A 286	304	A
9	290	312	292	204	A	342	214	202	206	206	186	A	A	A	A	208	234	248	228	228	E A 250	A	A	250
10	290	278	266	206	196	224	228	202	214	198	192	202	A	A	222	A	216	230	238	A	208	256	300	280
11	Q 252	256	228	198	194	276	228	202	198	188	186	166	E A 258	A	A	A	254	238	232	208	188	224	280	272
12	254	236	292	242	214	196	206	196	190	180	E A 224	208	A 230	A	A	208	202	198	228	216	202	192	218	264
13	270	252	240	202	180	196	218	190	210	188	170	200	222	200	200	224	186	196	254	214	188	174	282	286
14	268	270	282	230	174	386	220	206	196	186	184	196	E A 232	E A 240	E A 234	A	208	208	256	218	194	192	234	264
15	304	284	Q 238	184	210	312	234	206	202	210	188	E A 236	A	A	A	A	198	206	268	222	188	210	A 282	276
16	250	254	242	224	204	210	212	E A 230	214	192	228	186	174	184	236	208	210	216	246	220	192	206	256	270
17	300	286	248	222	186	A	218	214	206	196	192	168	162	A 236	A	A	216	A	262	228	200	230	250	264
18	260	264	254	216	190	E A 286	224	220	216	200	186	174	168	A	222	216	208	216	220	206	198	202	222	278
19	278	262	218	196	238	A	E A 264	220	A	204	158	218	300	186	A	206	190	206	220	210	200	198	218	278
20	266	266	260	210	246	278	228	210	204	208	178	E A 242	246	A 238	A	A	A	A	226	A	216	206	216	258
21	272	Q 258	228	204	252	252	226	216	216	208	216	192	172	192	206	194	190	218	204	206	228	214	272	278
22	272	260	254	224	232	240	208	192	196	194	208	178	216	176	198	220	196	212	210	228	204	216	246	272
23	268	260	240	208	178	278	212	214	220	204	188	176	168	E A 232	204	214	190	208	210	198	234	260	304	Q 284
24	258	260	276	230	242	266	210	218	220	200	196	192	180	208	184	182	220	234	240	216	200	222	254	A 290
25	262	292	202	190	250	256	216	210	E A 234	230	204	A	A	A	E A 238	202	A	A	230	232	192	180	272	278
26	264	246	214	244	248	242	222	210	212	200	178	164	228	168	220	200	206	208	226	212	228	250	242	254
27	256	244	236	216	206	286	212	208	216	198	196	172	162	210	A	A	A	222	234	222	232	252	270	266
28	248	242	254	210	214	198	196	206	190	212	212	176	E A 254	222	192	182	198	186	208	216	254	268	228	266
29	284	258	258	238	244	238	200	220	A	E A 220	A	A	186	A	184	242	E A 232	A	230	216	234	224	A	270
30	262	260	264	250	236	236	202	204	232	A	A	A	A	A	A	A	A	228	214	208	A	252	E A 278	A 284
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	25	30	30	28	28	27	25	23	19	19	20	24	25	30	28	29	29	28	29
MED	267	260	254	216	214	253	222	210	214	201	192	189	193	U 197	203	205	202	212	228	214	202	216	267	272
U Q	280	278	264	230	243	282	228	214	218	211	208	203	A 230	A 236	222	215	216	224	238	221	228	247	282	283
L Q	260	254	238	204	192	237	212	206	203	196	186	175	174	184	192	197	190	206	214	206	192	204	244	265

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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

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

APR. 2019 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	G	98	152	140	122	118	120	134	114	112	104	100	80	B	B	B	90
2	B	B	B	B	B	B	B	128	154	158	114	174	G	124	104	164	102	166	142	B	B	84	80	B
3	B	B	B	B	B	B	90	136	144	140	168	140	146	128	122	G	G	G	154	84	B	92	92	106
4	B	B	B	B	B	B	B	122	114	126	112	106	166	140	162	152	G	G	176	B	116	102	B	B
5	B	B	B	92	B	92	B	126	120	110	108	106	108	120	104	164	146	G	128	104	104	82	92	96
6	102	B	B	B	96	130	116	110	110	110	106	106	94	90	102	88	114	122	110	104	94	94	94	94
7	B	B	B	B	B	B	B	116	118	114	110	114	116	122	112	104	102	102	100	94	100	100	94	96
8	94	104	94	94	98	94	94	124	112	106	104	102	102	102	102	100	120	140	88	86	98	94	94	94
9	94	94	96	96	96	96	B	110	118	120	114	102	102	118	118	120	110	102	86	100	98	104	100	100
10	94	98	94	98	B	94	B	132	116	124	120	118	112	104	114	104	118	114	108	100	100	102	94	B
11	98	96	96	96	96	96	94	96	130	116	96	136	122	118	114	112	184	154	112	98	98	98	98	96
12	90	98	96	94	94	B	100	180	130	134	146	140	140	126	118	138	96	G	164	106	96	96	94	96
13	96	82	92	92	100	94	B	114	116	110	110	98	94	152	166	164	90	90	88	90	86	86	96	144
14	B	B	84	B	B	92	B	156	130	124	128	114	106	102	104	104	108	106	90	90	84	100	88	86
15	98	96	94	B	B	94	98	148	130	94	102	100	102	106	108	100	110	110	106	96	86	100	96	96
16	106	82	96	96	B	98	90	94	172	98	178	96	130	110	142	132	154	G	96	110	96	98	82	86
17	82	86	82	98	90	94	94	128	168	98	98	124	118	128	116	110	120	100	96	94	92	86	96	92
18	88	92	92	92	92	92	134	118	124	108	104	96	102	122	140	98	98	182	96	150	88	88	84	110
19	102	98	98	90	96	130	118	120	102	96	96	104	130	124	134	140	132	104	100	98	98	98	82	82
20	B	B	B	B	B	92	B	100	156	136	130	172	150	138	118	116	114	110	110	96	90	88	88	88
21	88	86	90	82	B	98	124	132	116	102	100	94	98	150	148	148	108	G	134	104	84	84	80	B
22	B	B	B	B	B	B	B	138	136	G	172	106	G	G	166	150	166	112	120	90	100	100	106	B
23	86	94	98	B	98	96	B	174	136	102	102	100	108	138	140	158	168	120	114	98	98	90	B	96
24	94	94	94	88	96	94	138	142	128	128	116	102	110	110	120	G	184	122	104	104	100	100	100	100
25	98	98	96	B	96	B	B	118	118	98	90	96	92	98	96	112	104	100	94	B	86	B	B	98
26	98	94	88	92	B	B	B	142	126	114	G	96	154	G	180	90	90	88	110	82	84	86	B	B
27	106	B	B	B	B	B	122	122	114	106	106	106	96	164	130	140	88	88	106	104	100	98	B	B
28	B	B	B	B	B	B	B	138	94	94	82	146	154	142	158	G	118	G	122	84	102	100	100	98
29	98	96	96	94	B	B	G	94	110	110	106	106	118	152	144	142	130	116	110	102	100	100	100	100
30	100	90	94	92	90	B	126	116	108	108	102	102	102	102	104	104	104	108	100	96	96	100	98	96
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	18	19	16	13	17	14	29	30	29	29	30	28	28	30	27	28	23	30	27	27	28	24	23
MED	97	94	94	93	96	94	108	124	119	110	108	106	111	122	119	116	113	110	107	98	98	98	94	96
U Q	99	98	96	96	97	97	124	138	130	125	124	122	130	138	142	148	131	122	120	104	100	100	98	100
L Q	92	90	92	92	93	93	94	115	114	102	102	100	102	108	108	104	103	102	96	90	88	88	88	92

APR. 2019 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2019 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									L 1	H 1	H 1	C 1	C 1	C 1	H 1	C 1	C 1	C 1	C 2	L 1				F 1
2								C 2	HC 11	HC 11	C 1	H 1		C 1	C 1	HC 11	C 1	HC 11	HC 11			F 1	F 2	
3							L 1	H 1	H 1	H 1	H 1	H 1	H 1	C 1	C 1				H 1	L 1		F 4	F 1	F 1
4								C 1	C 3	C 1	C 1	C 1	HL 11	HL 11	H 1	H 1			H 1		F 2	F 1		
5				F 2		F 1		C 2	C 2	C 1	C 1	C 1	C 1	C 1	C 1	H 1	H 1		C 1	C 7	F 7	F 1	F 3	F 4
6	F 2				F 1	F 1	C 1	C 3	C 2	C 1	C 1	C 1	L 2	L 2	CL 13	L 2	CL 22	CL 13	CL 43	CL 93	FF 92	F 5	F 1	F 1
7								C 1	CL 11	CL 11	C 2	C 1	C 2	C 2	C 3	C 4	C 4	C 5	C 6	L 8	F 6	F 4	F 4	F 1
8	F 2	F 2	F 2	F 3	F 2	F 5	L 2	CL 23	CL 22	CL 42	C 4	C 3	C 2	C 2	C 2	C 4	C 1	H 2	LC 11	L 1	F 4	FF 32	F 3	F 6
9	F 3	FF 11	F 2	F 1	F 2	F 1		C 2	C 1	C 1	C 1	C 2	C 3	C 2	C 2	C 1	C 1	C 2	L 1	CL 93	FF 31	F 5	F 8	F 3
10	F 7	F 5	F 2	F 1		FF 11		HL 22	CL 12	CL 11	CL 11	CL 21	C 1	C 2	C 1	C 2	C 1	C 2	C 3	CL 91	FF 94	FF 34	F 2	
11	F 1	F 3	FF 13	F 3	F 1	F 1	L 2	LC 12	HL 11	C 1	LC 11	HL 11	C 1	C 2	C 3	C 2	H 1	H 2	C 6	L 9	F 4	F 4	F 2	F 1
12	F 2	F 2	F 4	F 4	F 2		L 1	H 1	H 1	H 1	H 1	HL 11	HL 11	C 1	C 2	H 1	L 1		H 1	C 2	F 7	F 1	F 1	F 1
13	FF 14	F 2	F 2	F 3	F 3	F 1		C 2	C 2	C 1	C 1	L 1	L 1	HL 11	HL 11	HL 11	L 1	L 2	LC 32	LC 31	F 1	F 1	F 1	FF 11
14			F 1			F 1		H 1	H 1	C 1	C 1	C 1	C 1	C 2	C 2	C 2	C 1	C 1	L 6	L 4	F 3	F 3	F 2	F 1
15	F 4	F 4	F 2			F 1	L 1	HL 22	HL 22	LQ 21	CQ 11	C 1	C 2	C 2	C 2	C 2	C 1	C 1	C 5	CL 22	F 2	F 2	F 6	F 2
16	FF 22	F 1	FF 11	F 1		F 1	L 4	L 5	HL 11	LQ 11	HL 11	L 1	CL 11	C 1	H 1	H 1	H 1		L 6	CL 45	F 3	F 2	F 1	F 2
17	F 3	F 2	F 1	F 1	F 4	F 3	L 1	C 2	HL 11	LQ 11	L 1	C 1	C 1	C 1	C 1	C 1	C 2	C 6	L 8	L 7	F 7	F 4	F 1	F 1
18	F 1	F 1	F 2	F 2	F 3	F 4	HL 11	C 2	C 1	CQ 11	CQ 11	LQ 21	CQ 11	CL 31	H 1	LH 21	LH 11	H 1	L 2	HL 11	F 1	F 2	F 3	FF 31
19	F 1	F 2	F 1	F 3	F 2	FF 42	C 5	C 3	C 3	L 2	L 2	CH 11	HL 21	C 1	H 2	HL 11	H 1	C 1	C 2	L 3	FQ 41	FF 21	F 2	F 1
20						F 1		C 1	H 1	H 1	H 1	H 1	H 1	H 1	C 2	C 1	C 2	C 3	C 2	L 6	F 6	F 2	F 1	F 1
21	F 1	F 1	F 1	F 1		FF 11	C 1	H 1	C 1	C 1	C 2	L 2	L 1	HL 11	HL 11	HL 11	CL 11		HL 11	CL 11	F 6	F 2	F 2	
22								H 1	H 1		H 1	CH 11			H 1	H 1	H 1	C 1	C 1	L 2	FF 11	F 2	FF 12	
23	F 2	F 2	F 1		F 1	F 2		HC 11	H 1	C 2	C 1	C 1	C 1	H 1	H 1	HL 11	H 1	C 1	CL 23	L 2	F 1	F 1		F 2
24	F 2	F 2	F 2	F 2	F 1	F 2	H 2	H 2	C 1	CQ 11	CQ 11	CQ 11	C 1	C 1	C 1		H 1	C 2	C 3	C 1	F 1	F 1	F 3	F 1
25	F 2	F 3	F 1		F 2			C 1	C 1	LCQ 12	LCQ 11	L 4	L 4	L 2	L 2	C 1	C 2	C 2	L 6		F 1			F 1
26	F 3	F 2	F 1	F 1				HL 12	CL 22	CL 11		L 1	H 1		HHL 11	LH 11	L 2	L 3	CL 12	L 6	F 2	F 1		
27	F 1						C 1	CL 21	C 1	C 1	C 1	C 1	L 1	HL 11	H 1	H 1	L 5	LH 21	C 5	C 3	F 2	F 3		
28								HL 11	L 2	LH 11	LC 11	HL 11	HL 11	HL 11	HL 11		C 1		CL 11	L 5	FF 11	F 6	F 1	F 1
29	F 4	F 1	F 2	F 2				LC 11	C 3	C 2	C 1	C 1	C 1	H 1	H 1	H 1	H 1	C 3	C 4	C 4	F 3	FQ 31	FQ 41	F 3
30	F 3	F 2	F 2	F 2	FF 11		C 1	C 1	CQ 21	CQ 41	CQ 31	C 3	C 2	C 2	C 2	C 2	C 2	C 1	C 5	L 3	F 5	F 3	F 4	F 3
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. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

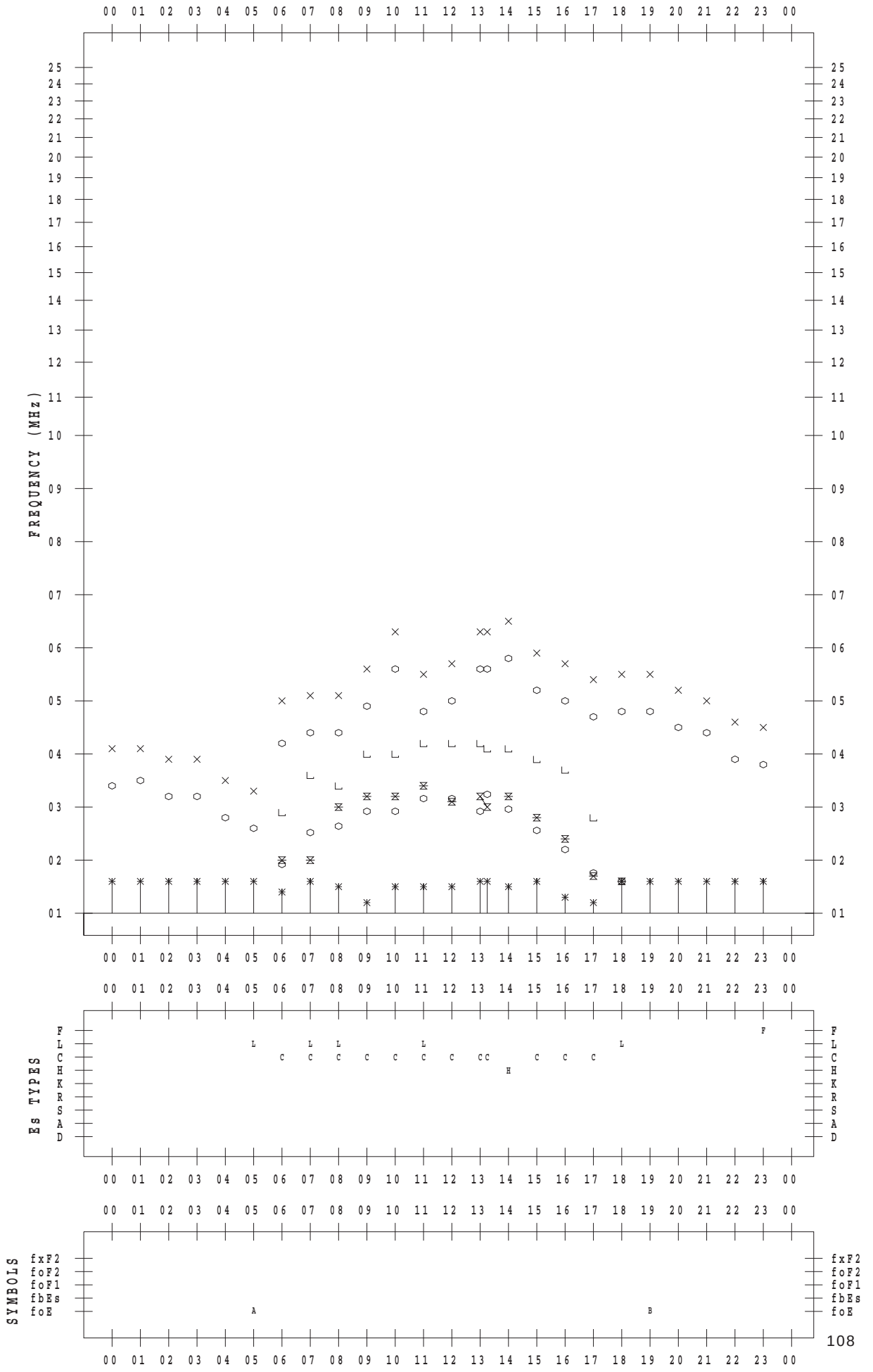
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 1

135 °E MEAN TIME



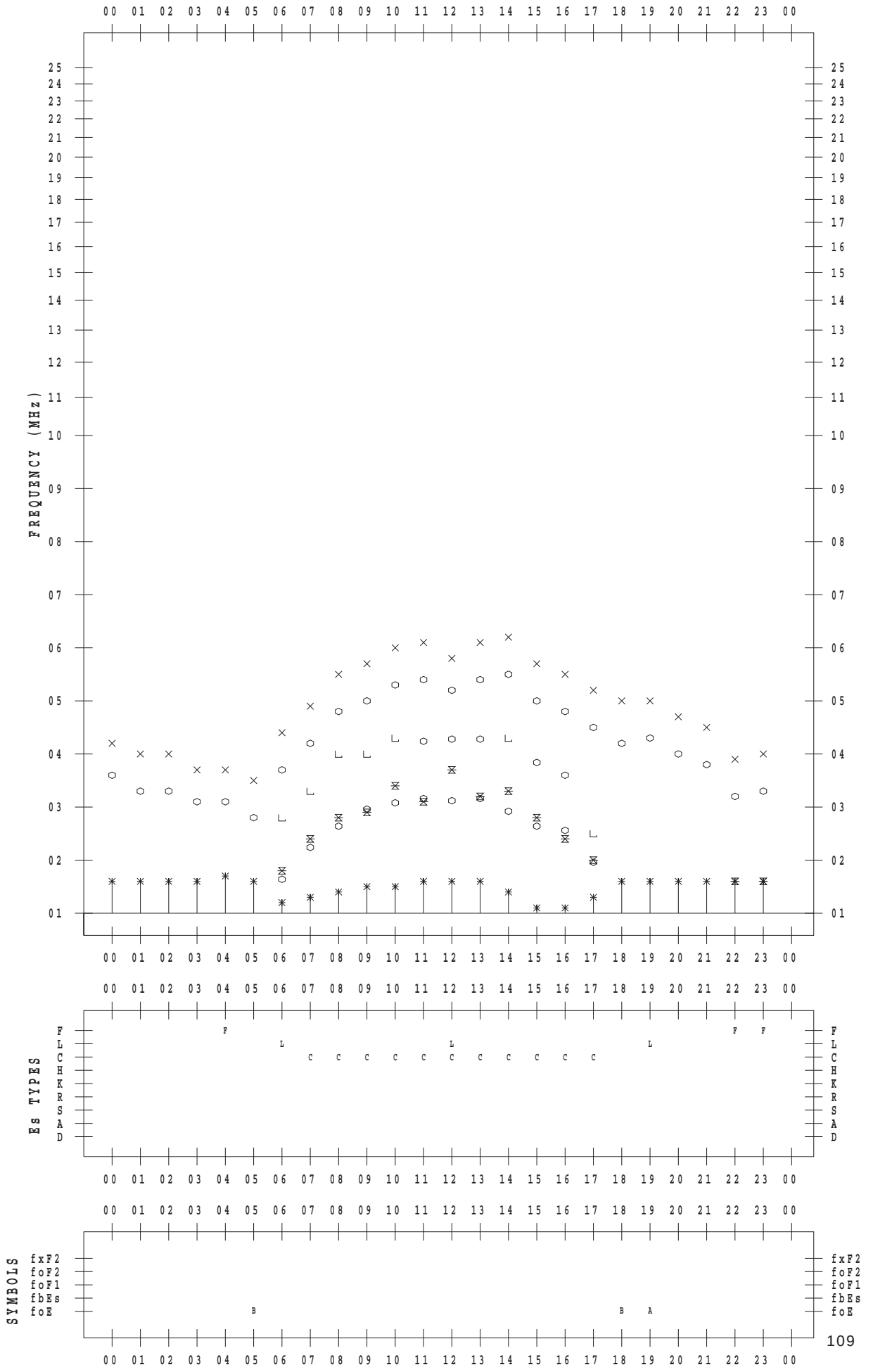
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 2

135 °E MEAN TIME



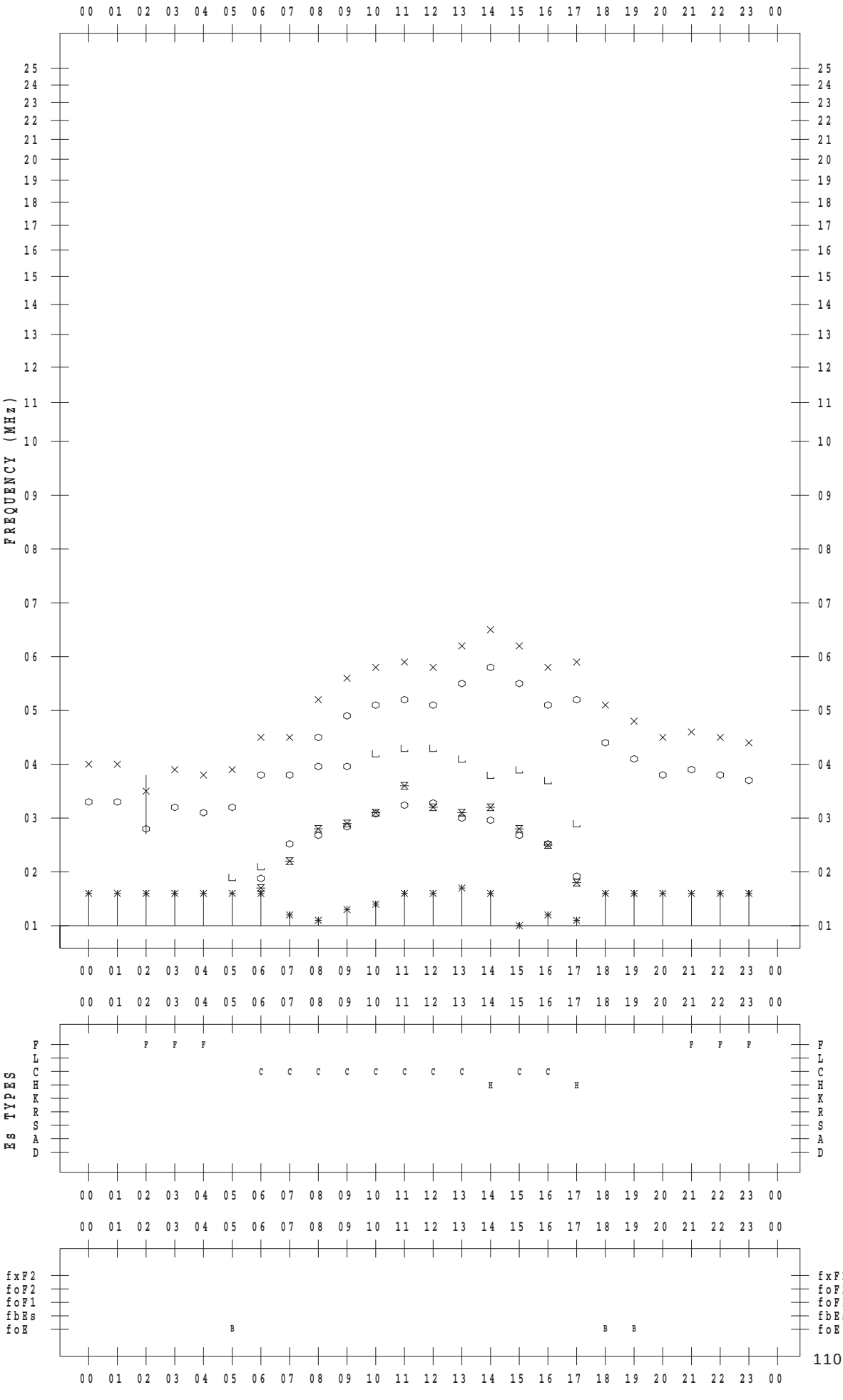
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 3

135 °E MEAN TIME



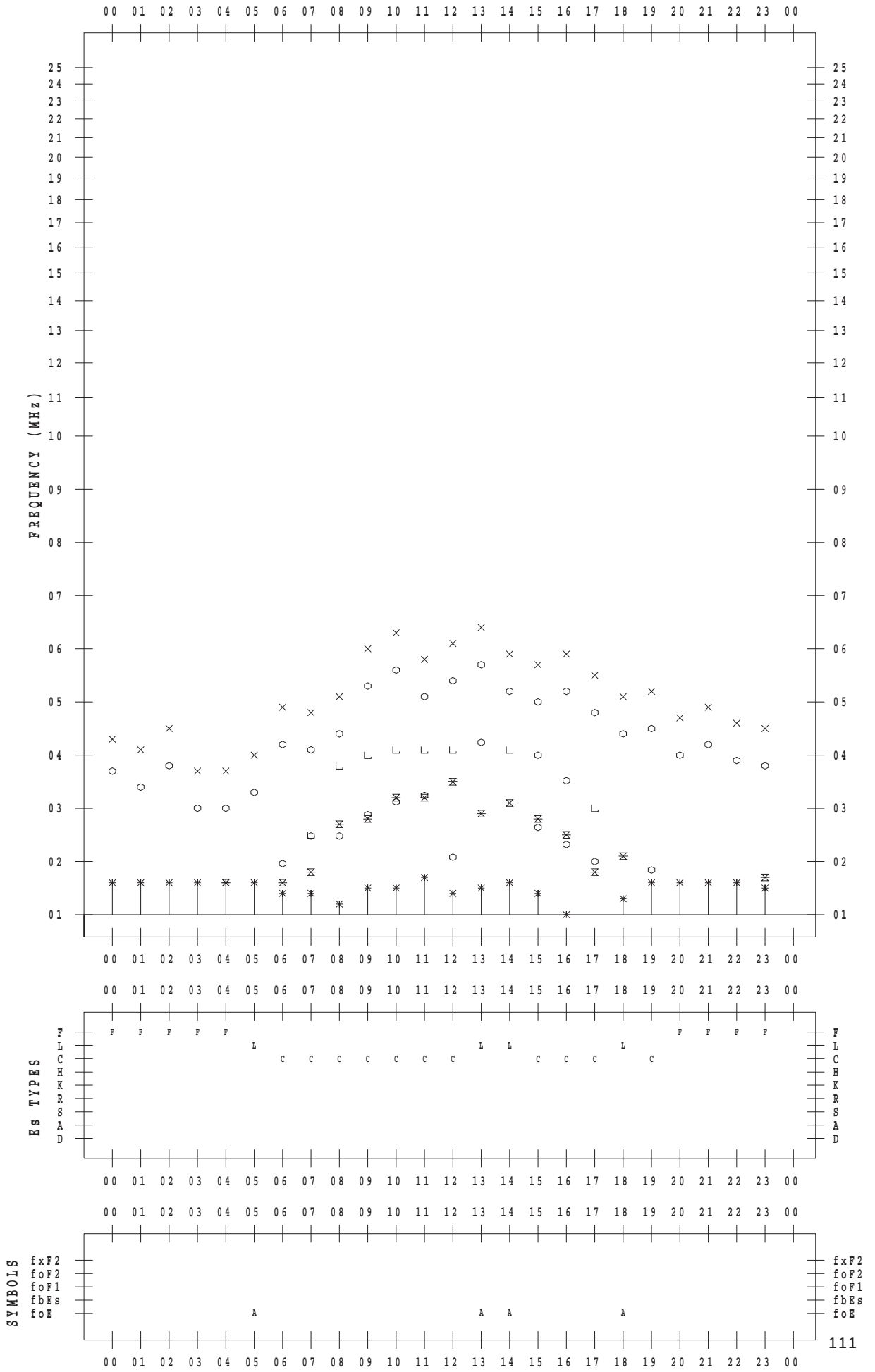
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 4

135 °E MEAN TIME



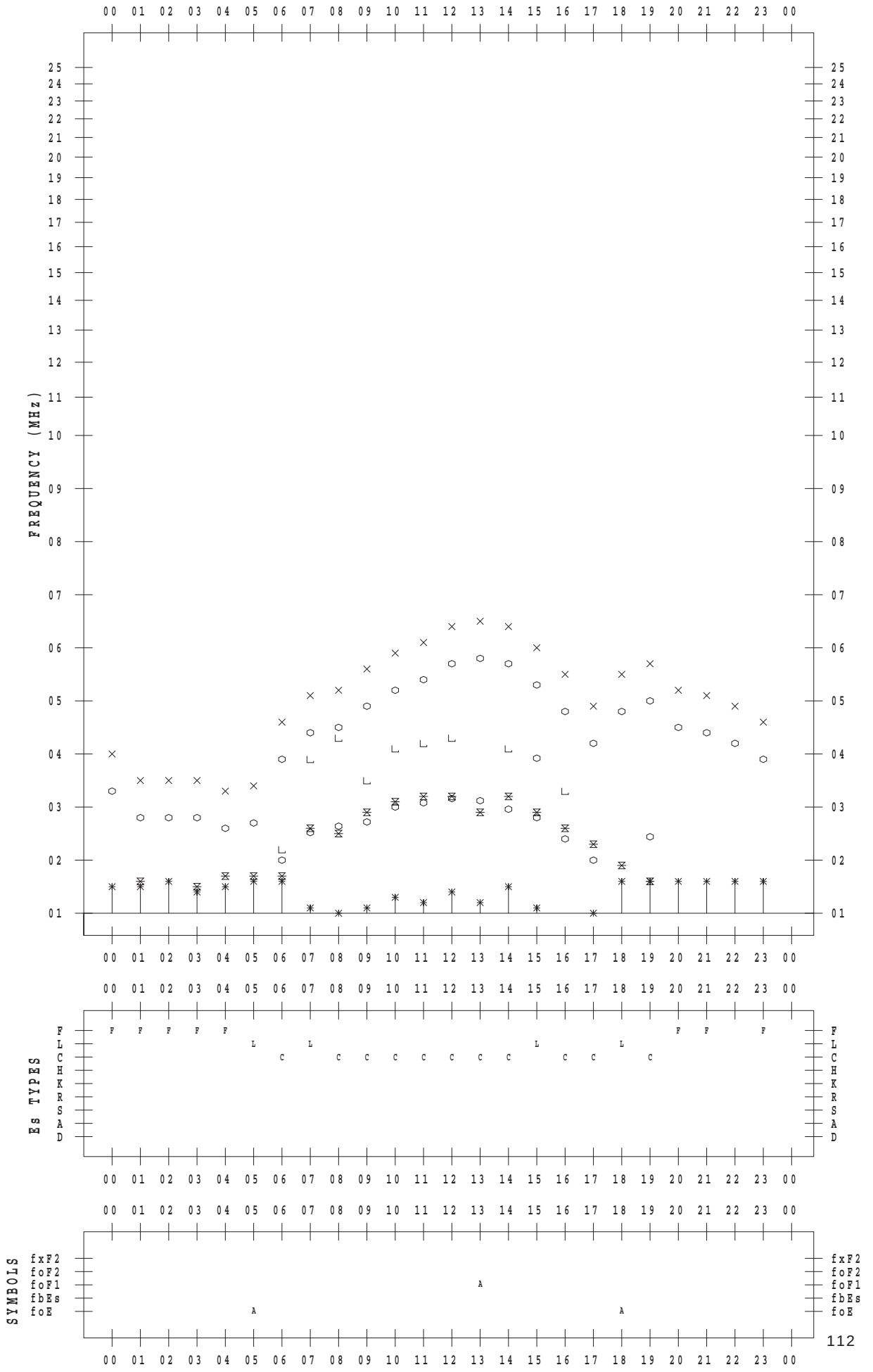
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 5

135 °E MEAN TIME



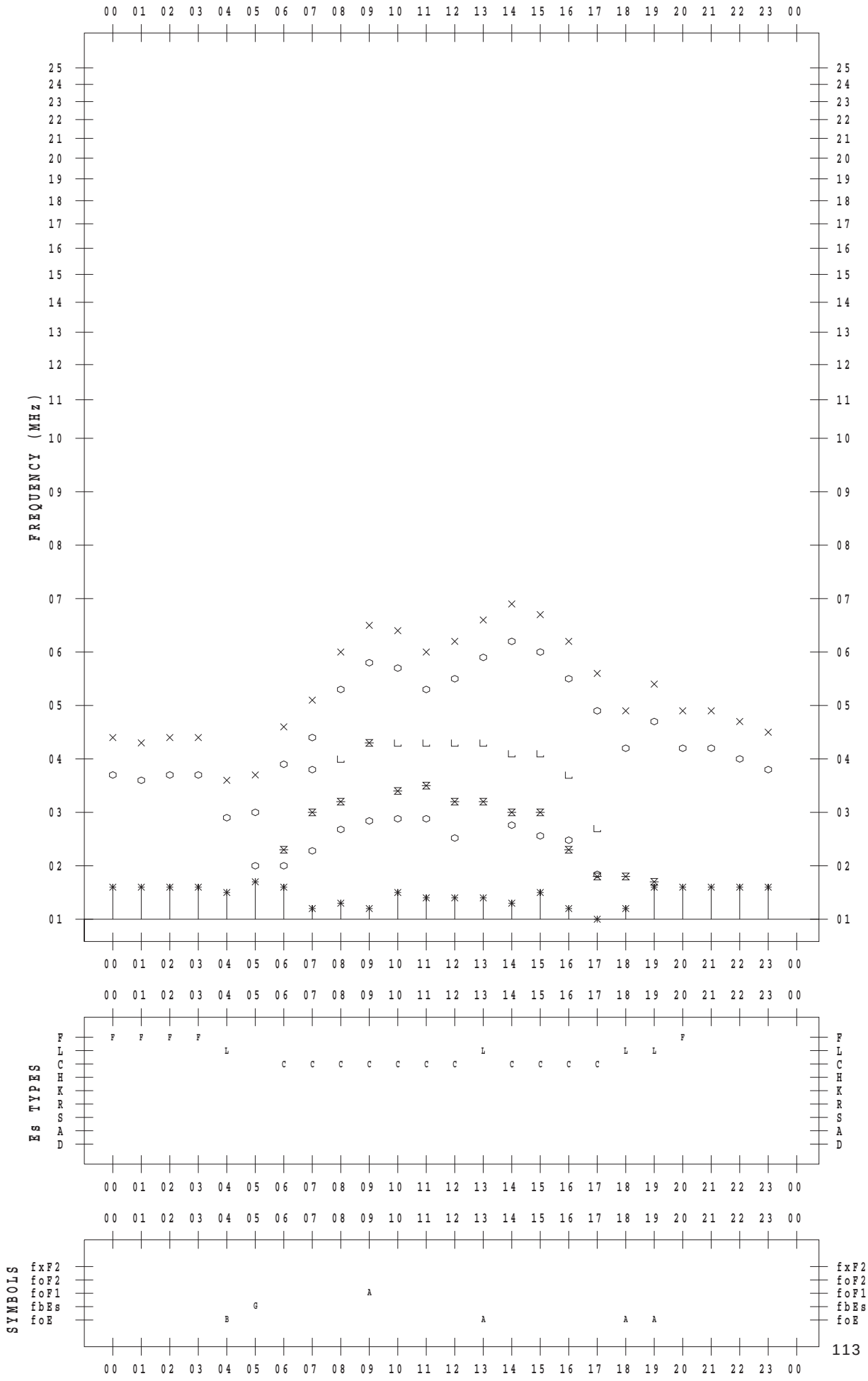
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 6

135 °E MEAN TIME



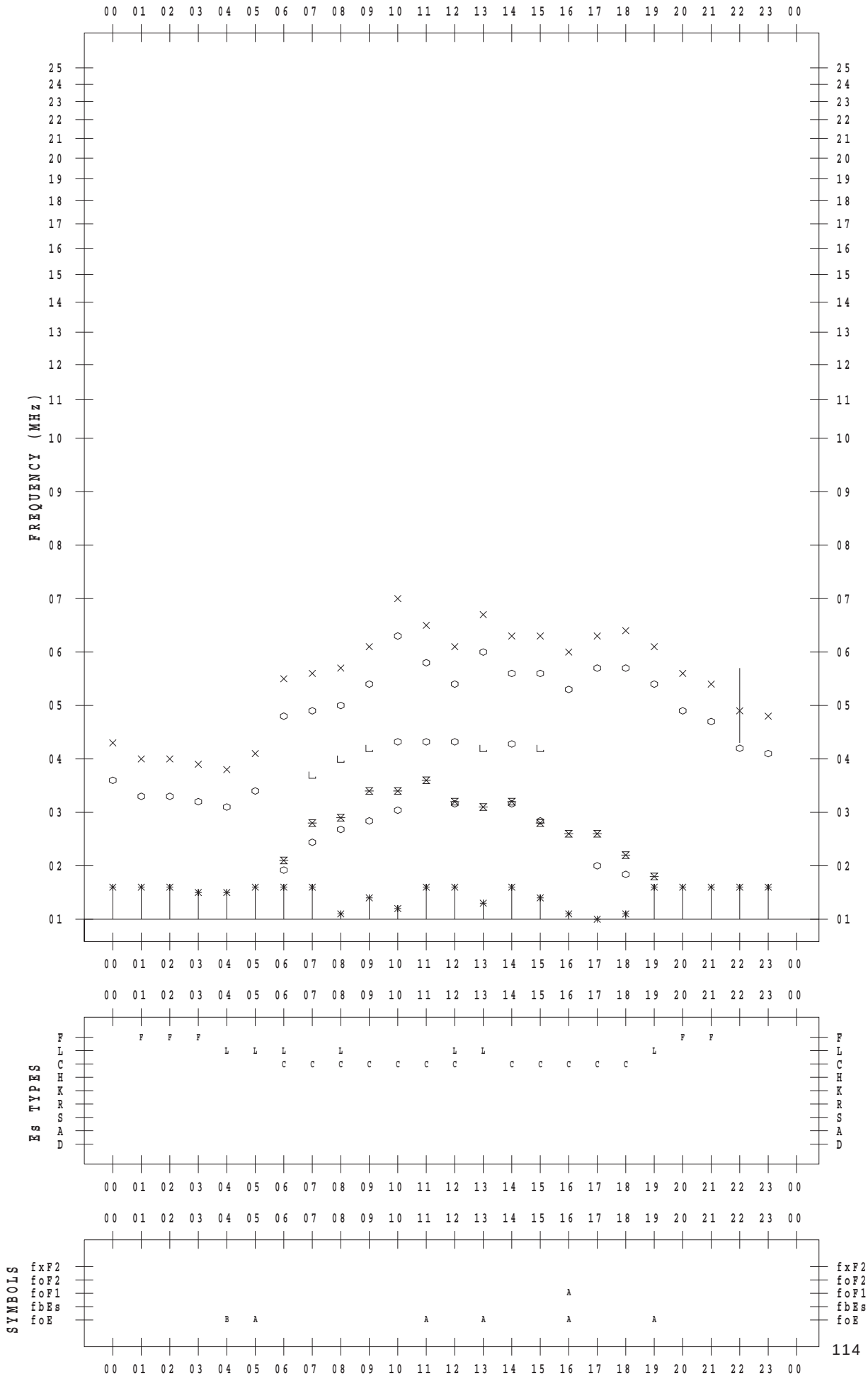
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 7

135 °E MEAN TIME



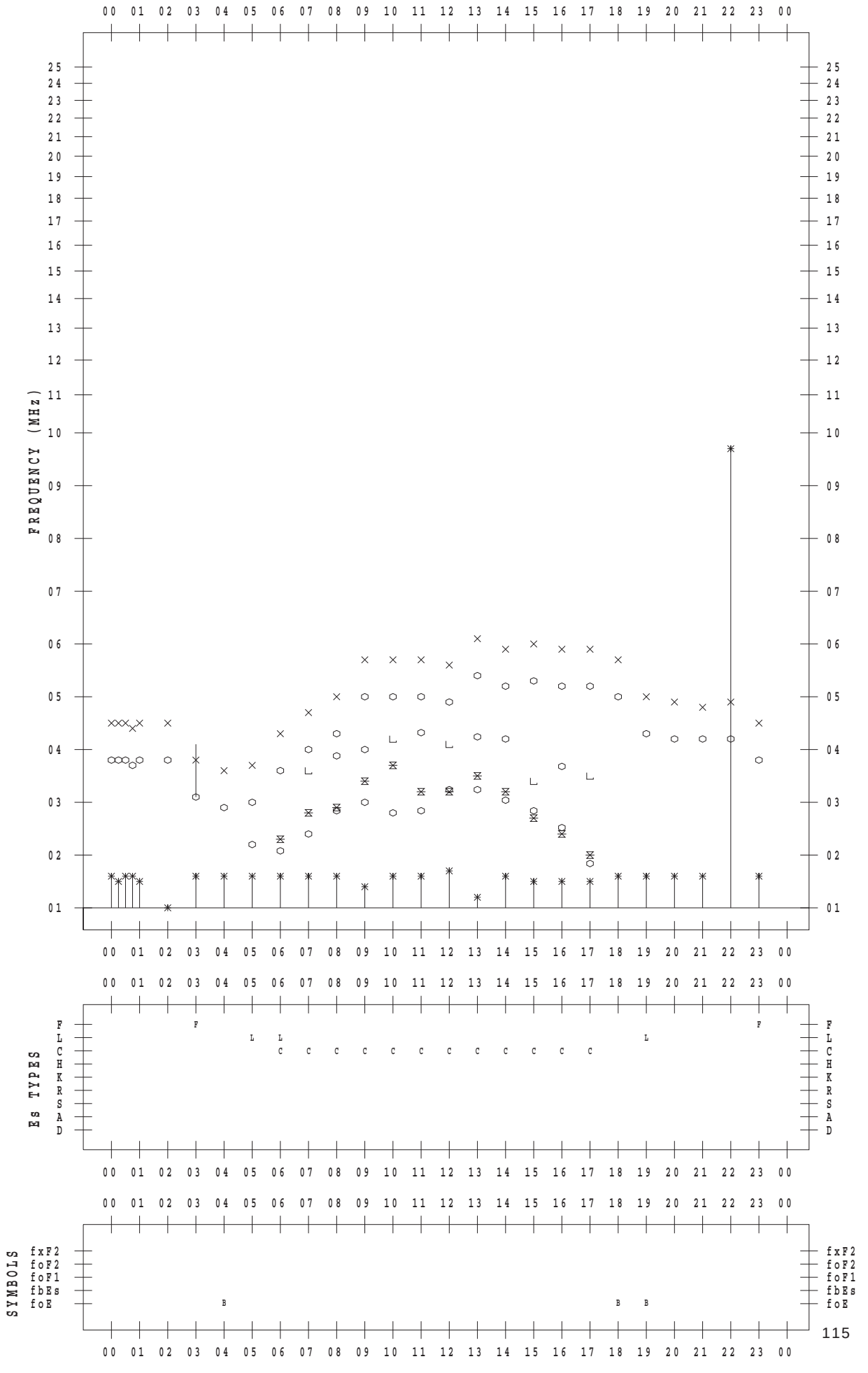
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 8

135 °E MEAN TIME



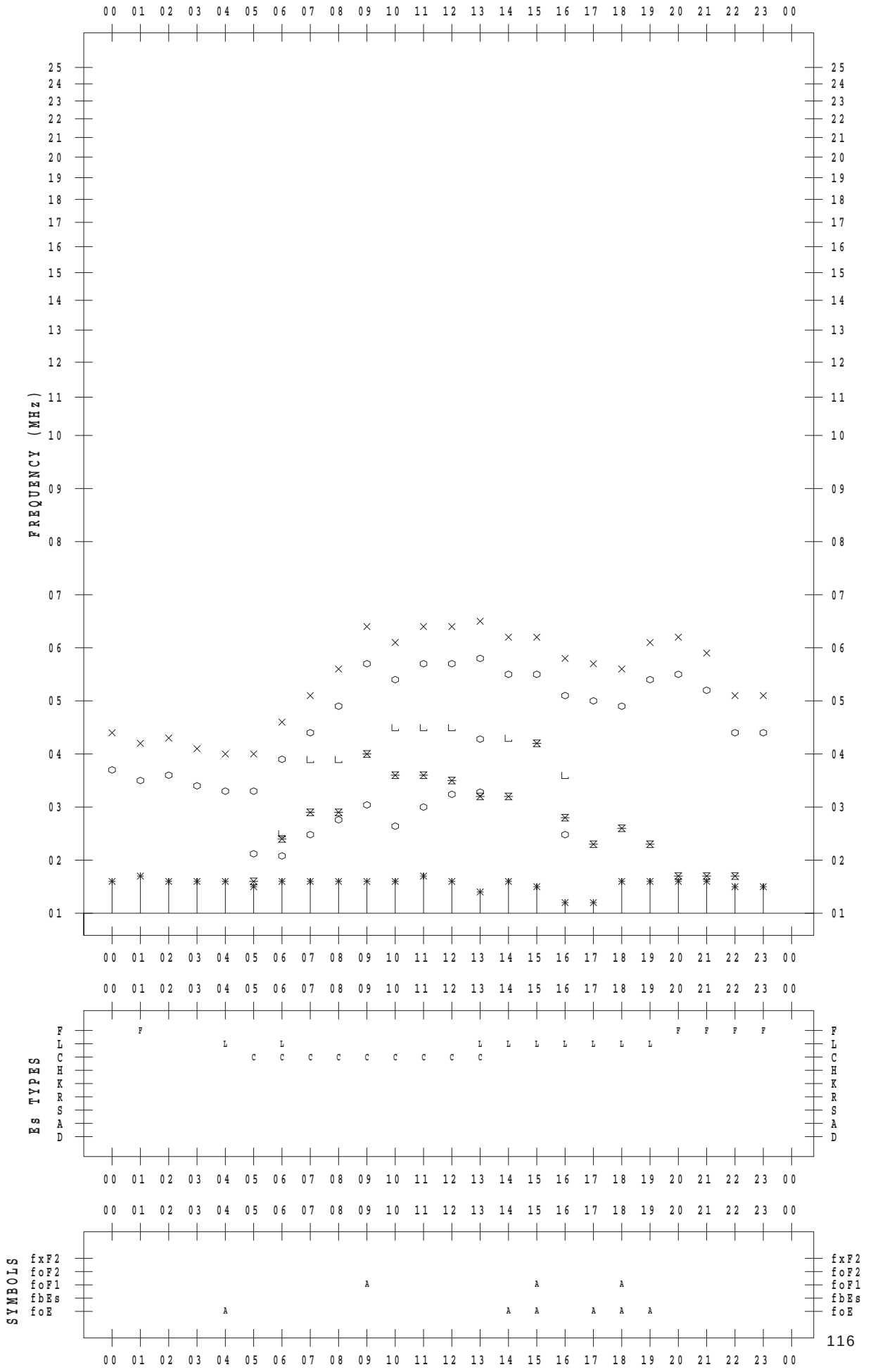
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/ 9

135 °E MEAN TIME



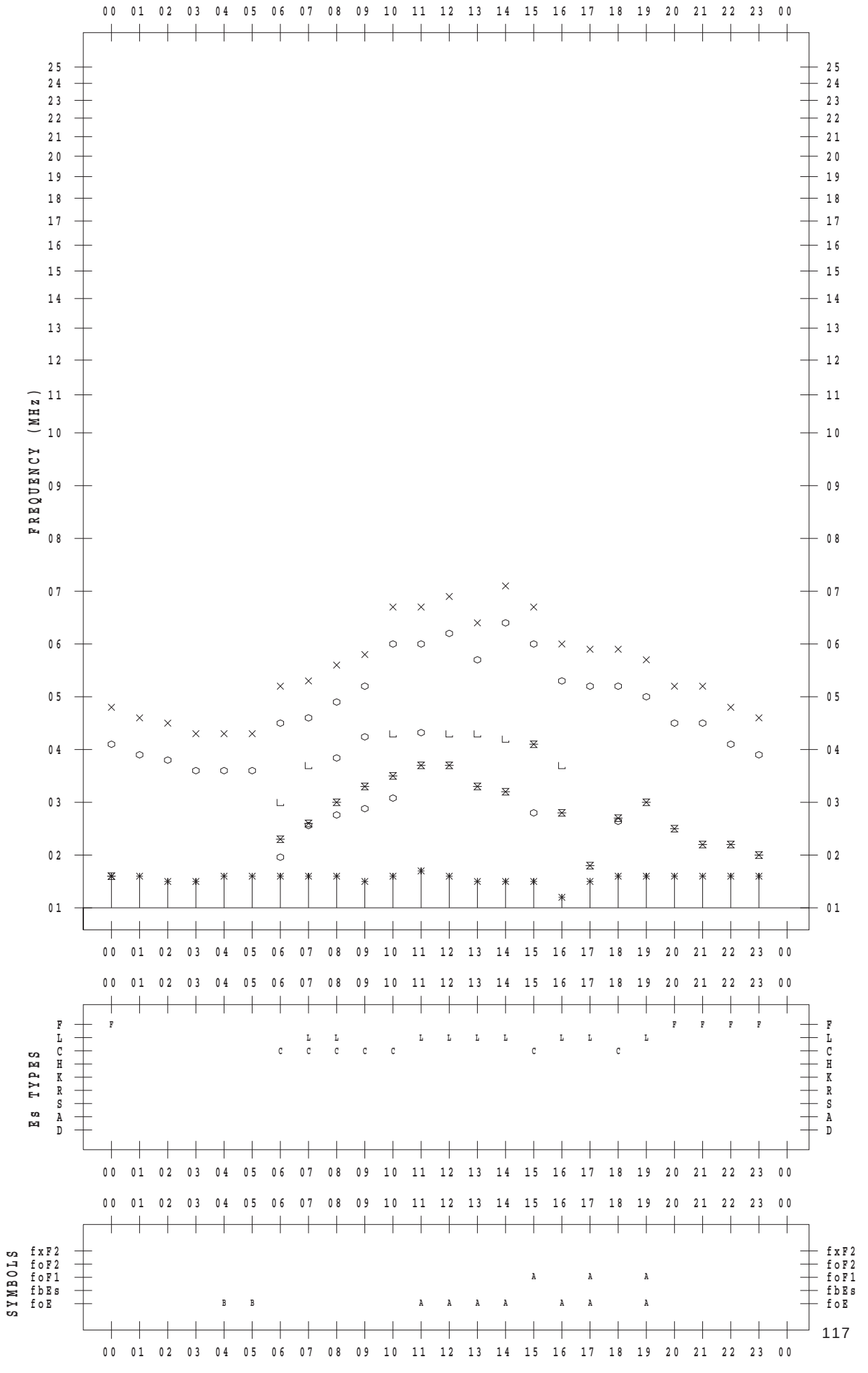
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/10

135 °E MEAN TIME



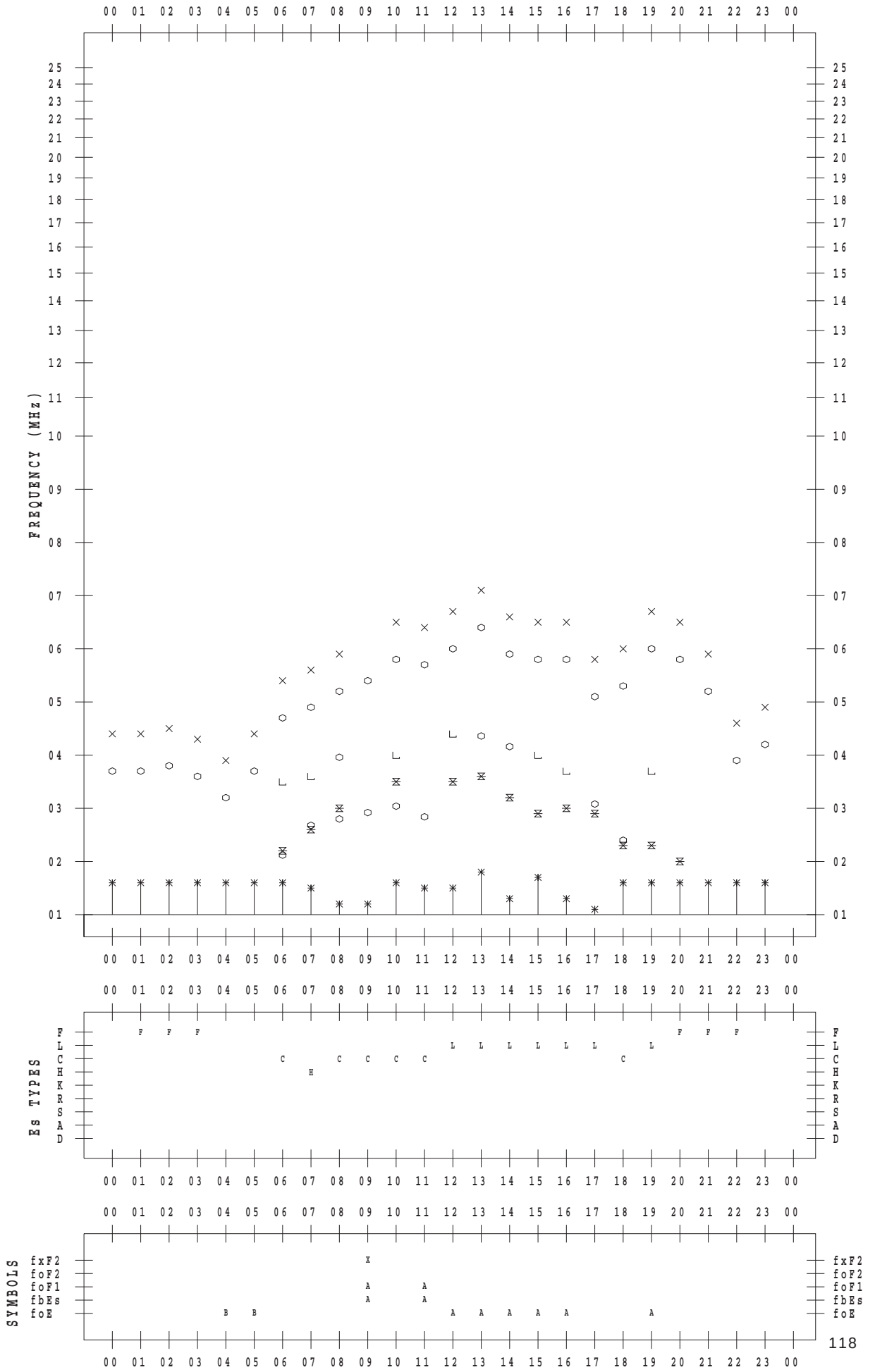
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/11

135 °E MEAN TIME



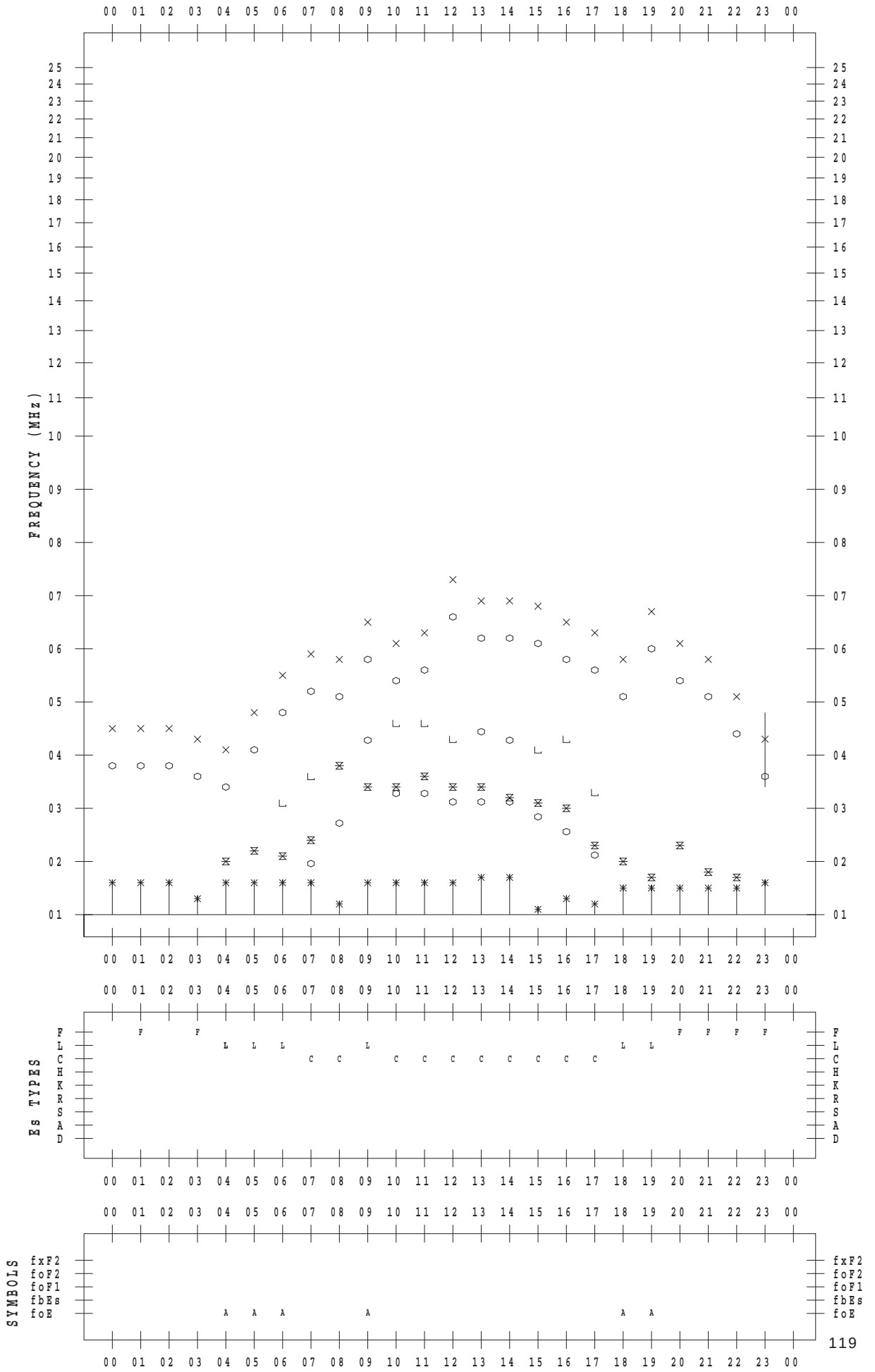
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/12

135 °E MEAN TIME



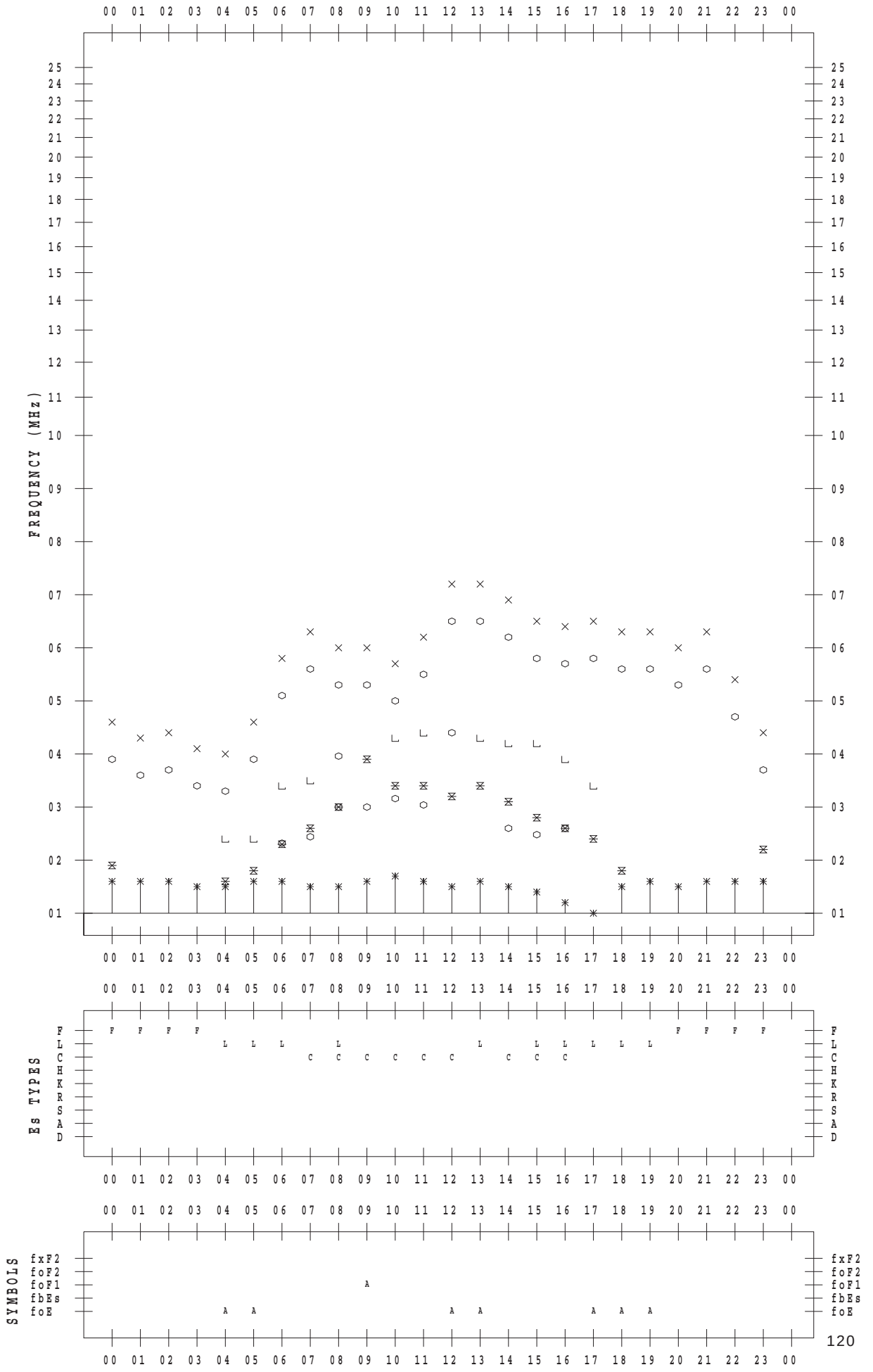
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/13

135 °E MEAN TIME



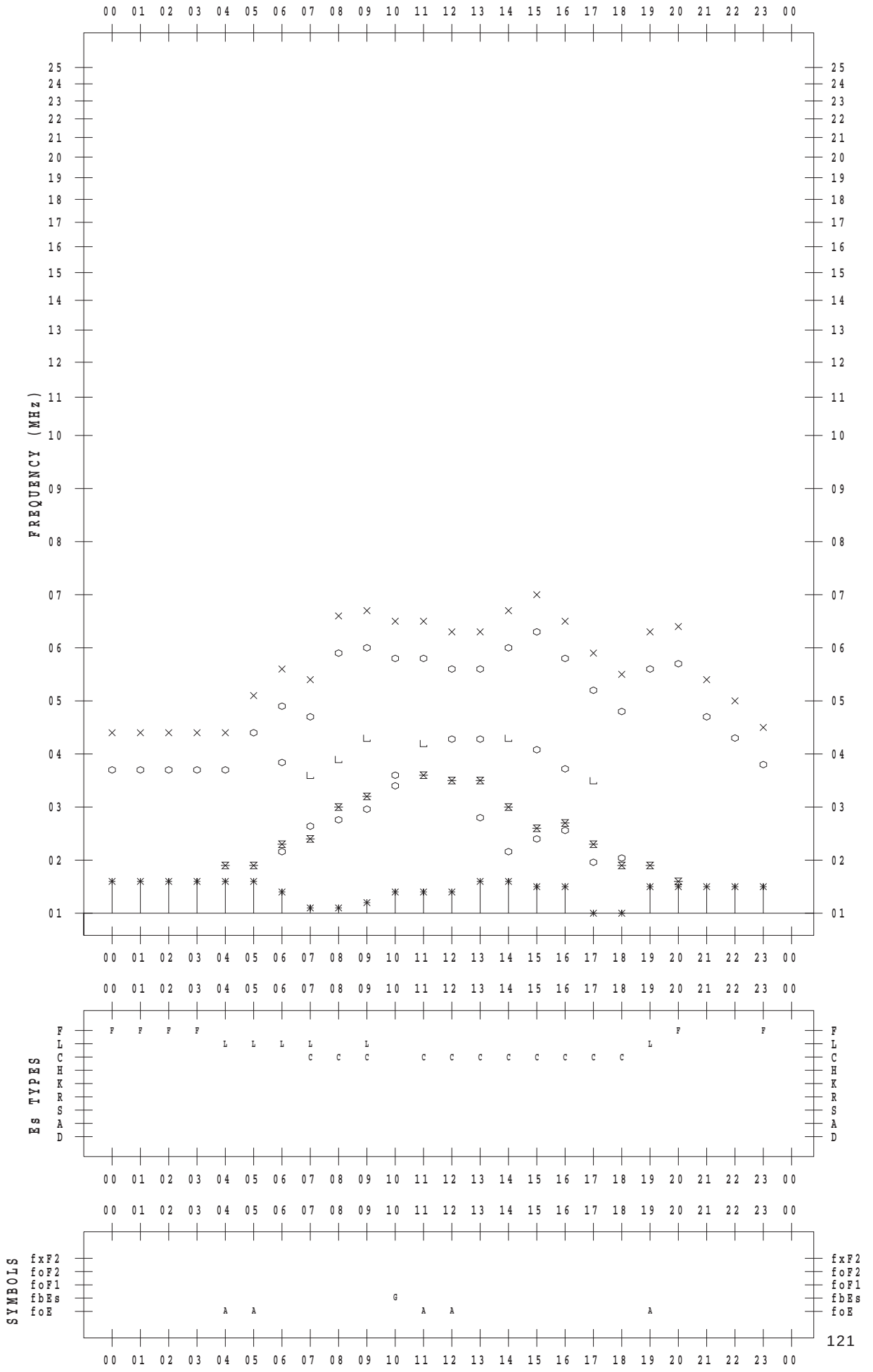
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/14

135 °E MEAN TIME



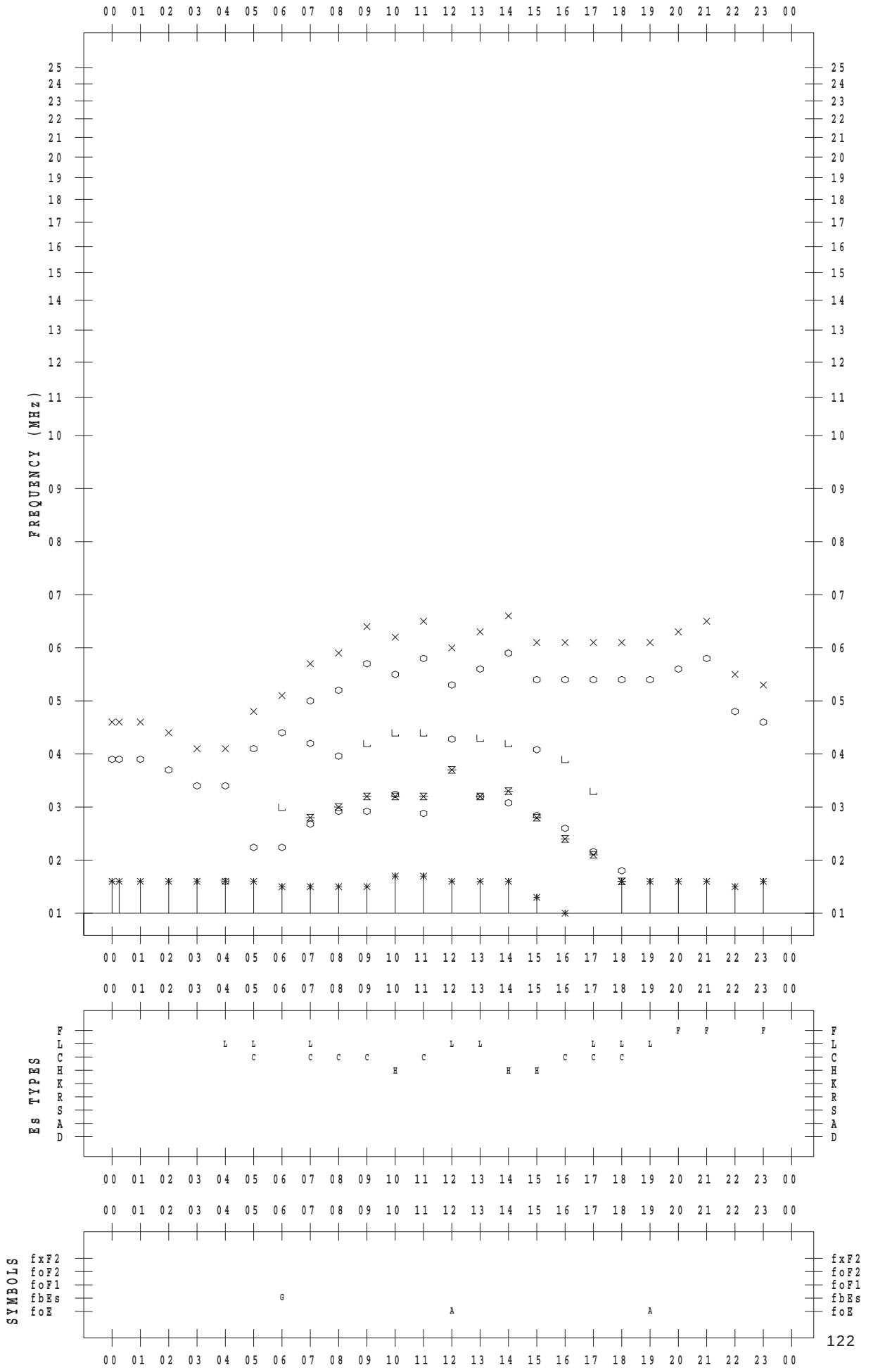
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/15

135 °E MEAN TIME



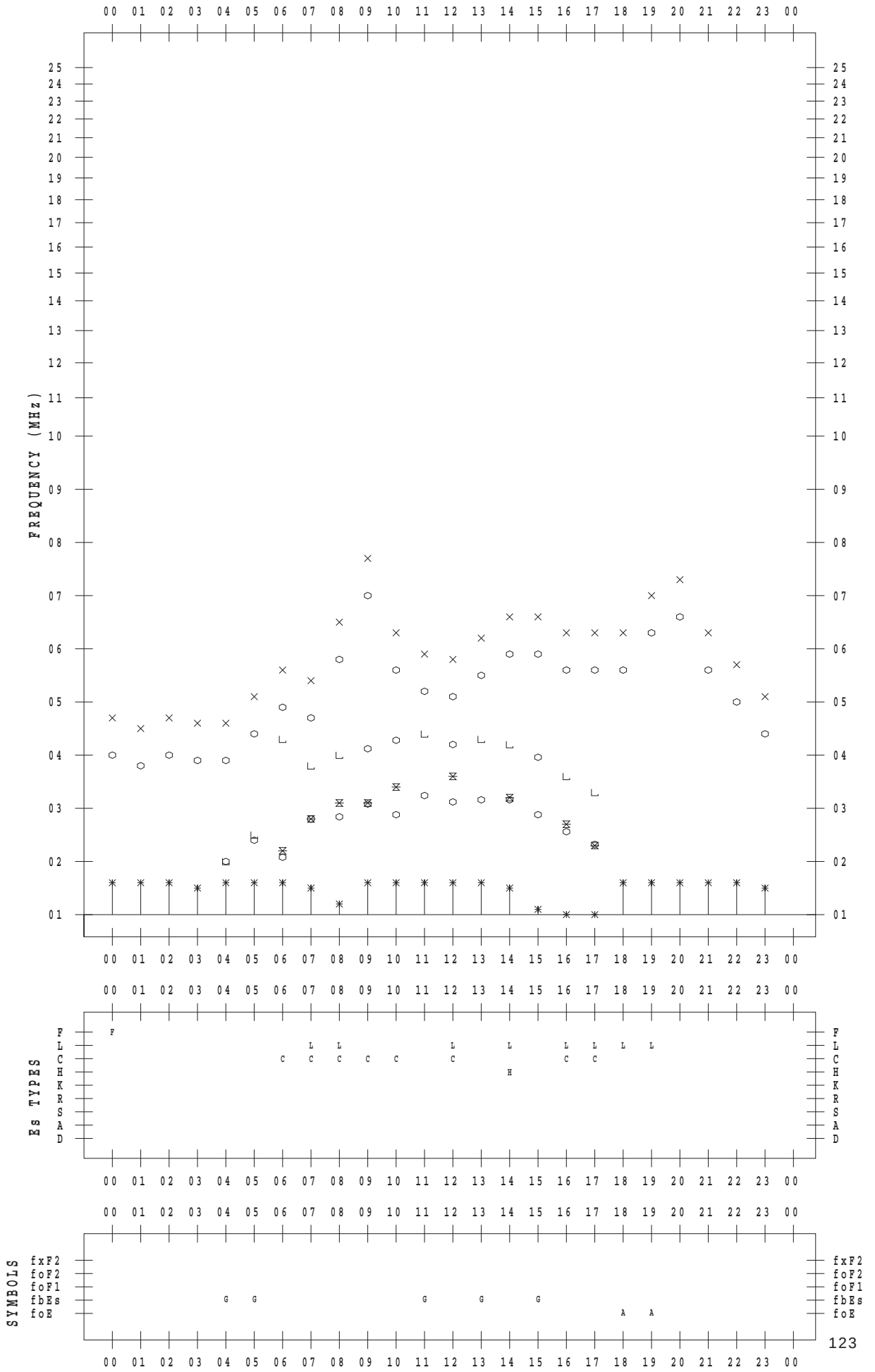
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/16

135 °E MEAN TIME



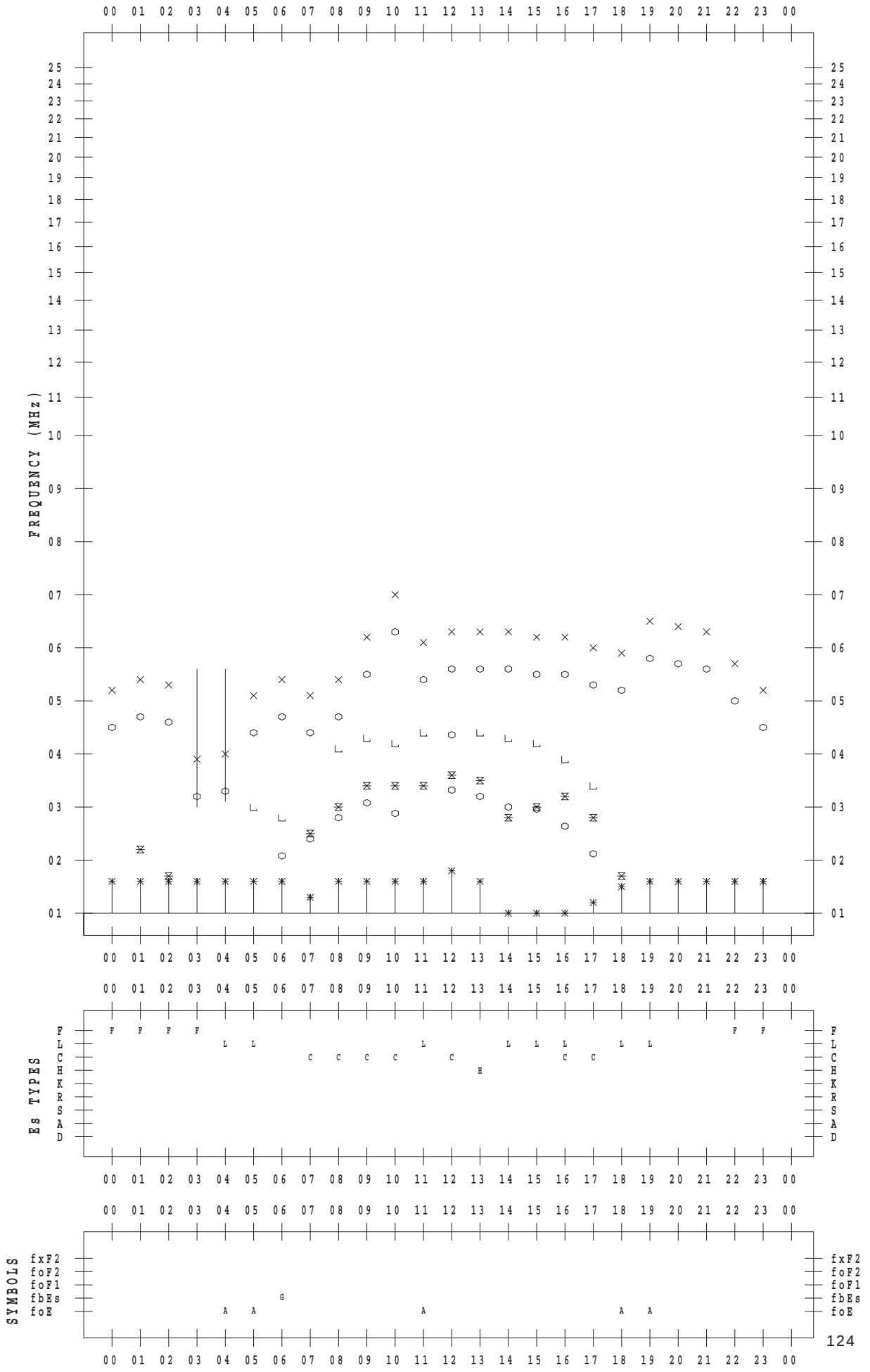
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/17

135 °E MEAN TIME



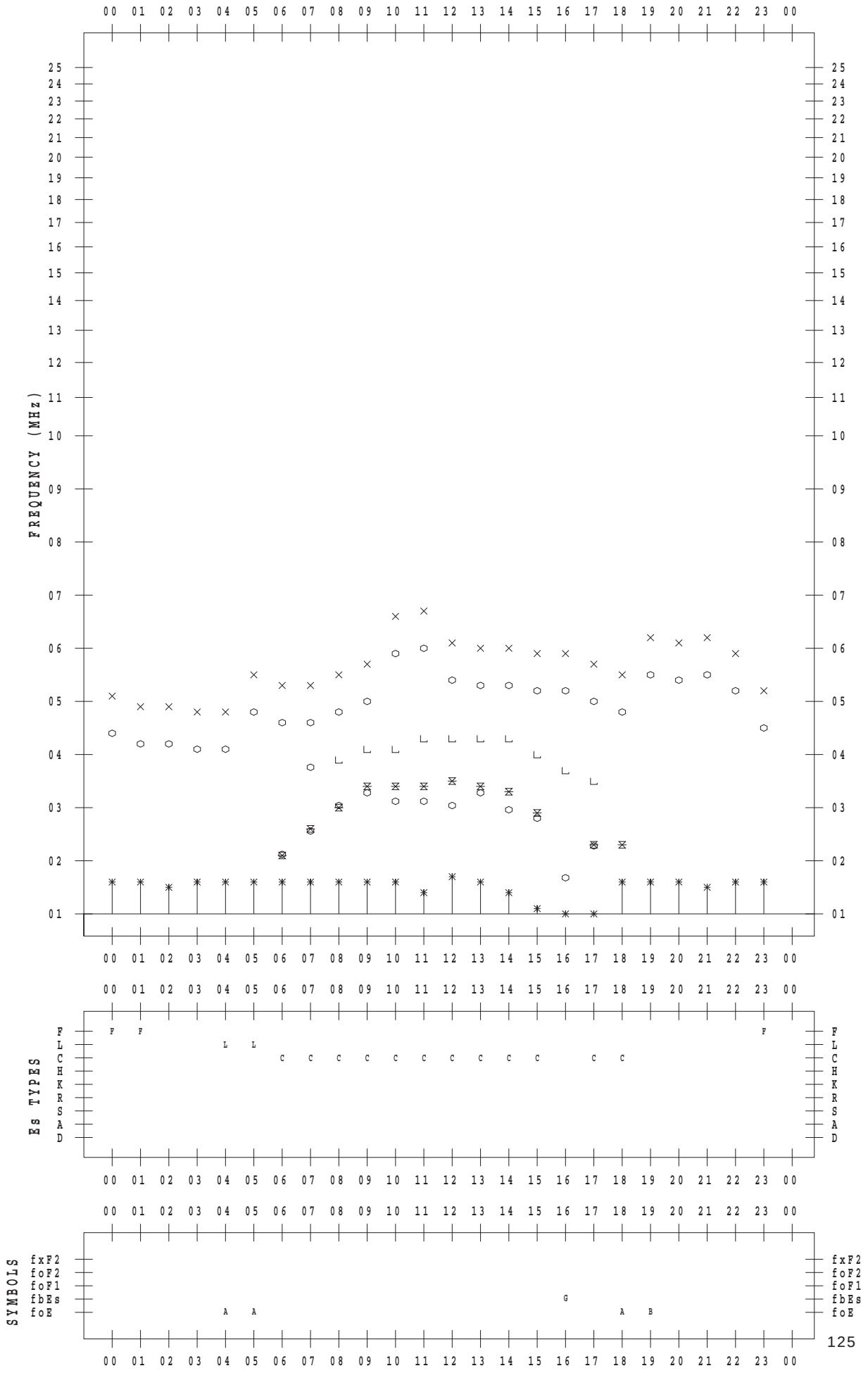
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/18

135 °E MEAN TIME



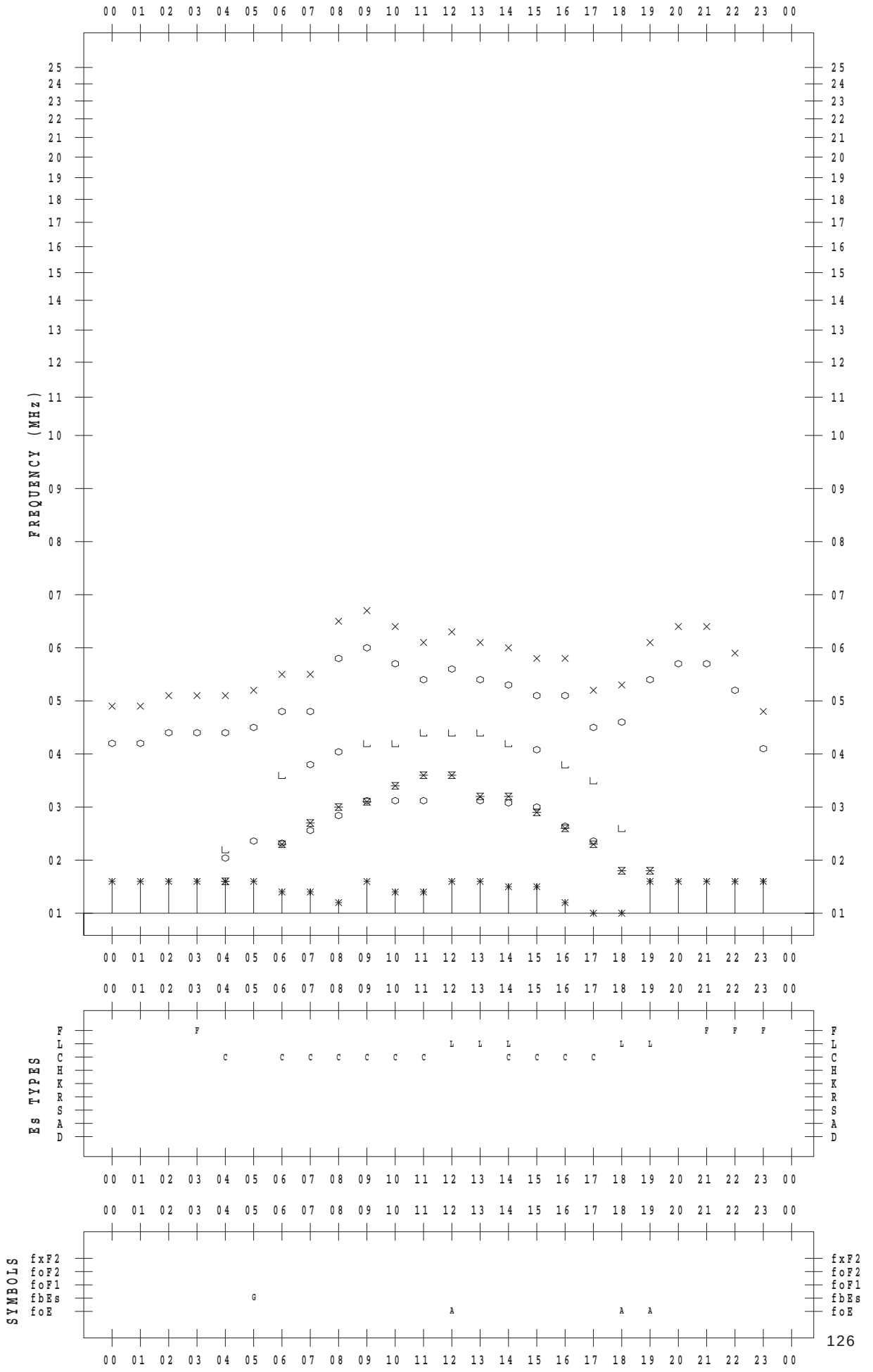
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/19

135 °E MEAN TIME



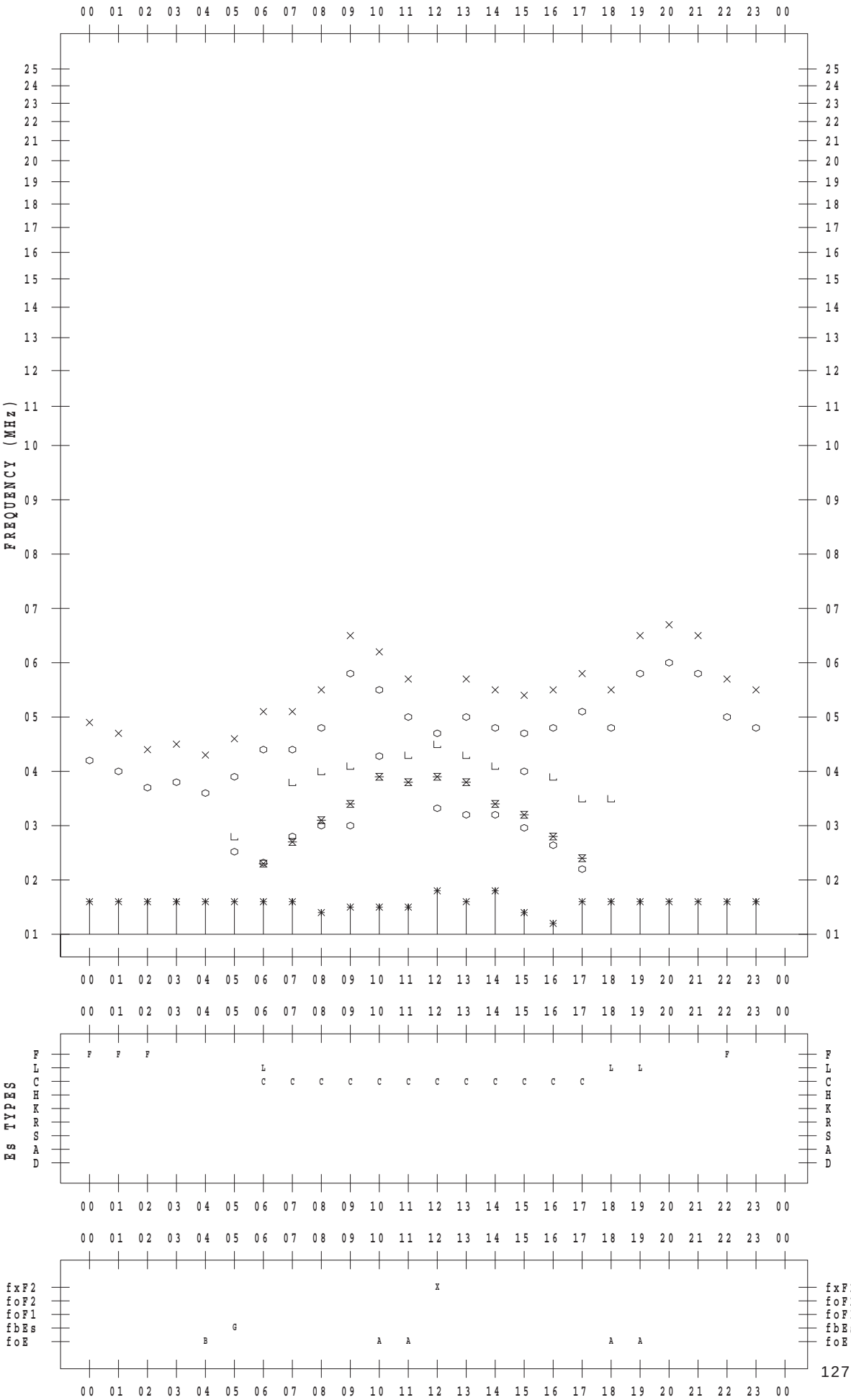
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/20

135 °E MEAN TIME



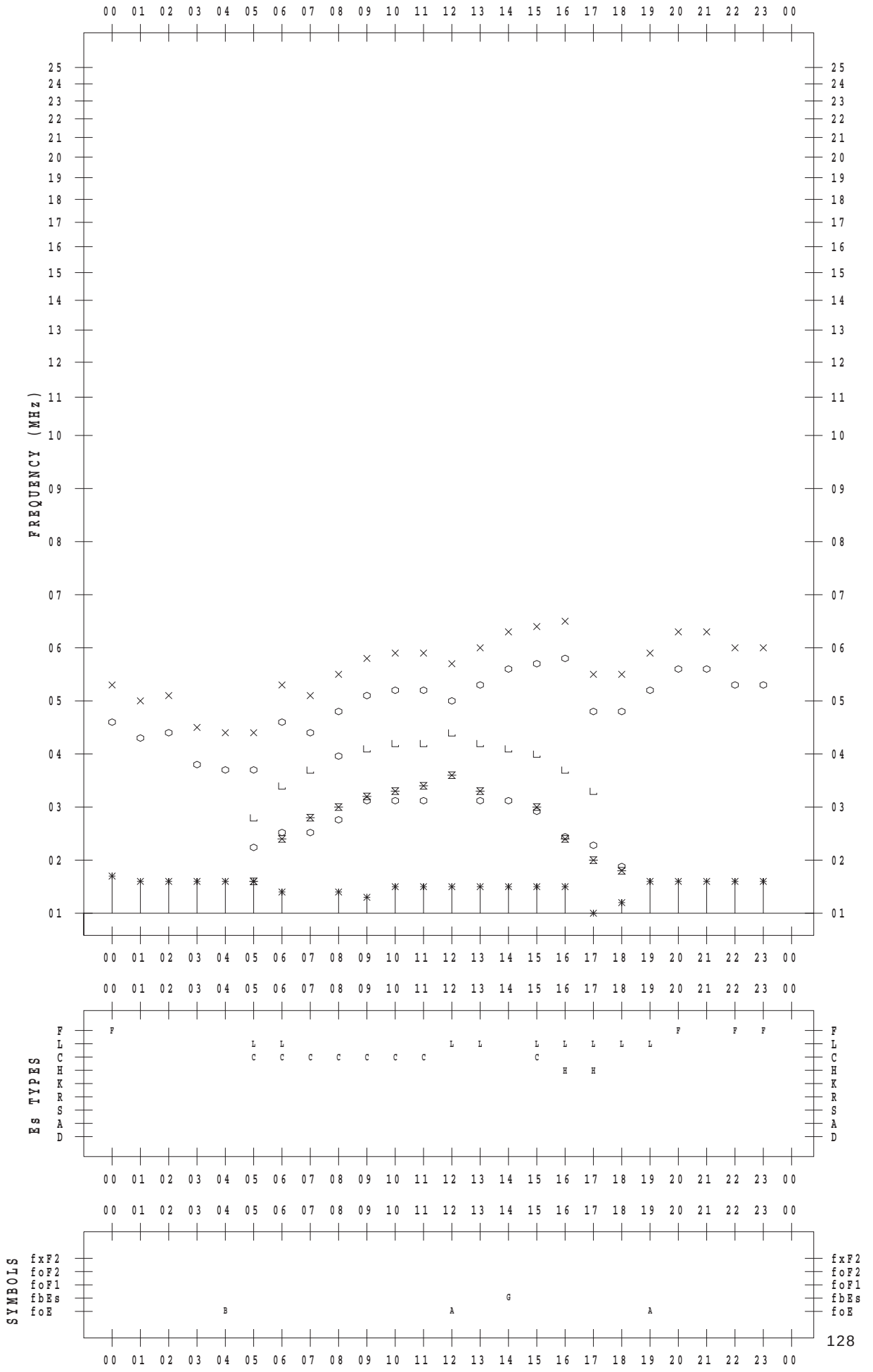
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/21

135 °E MEAN TIME



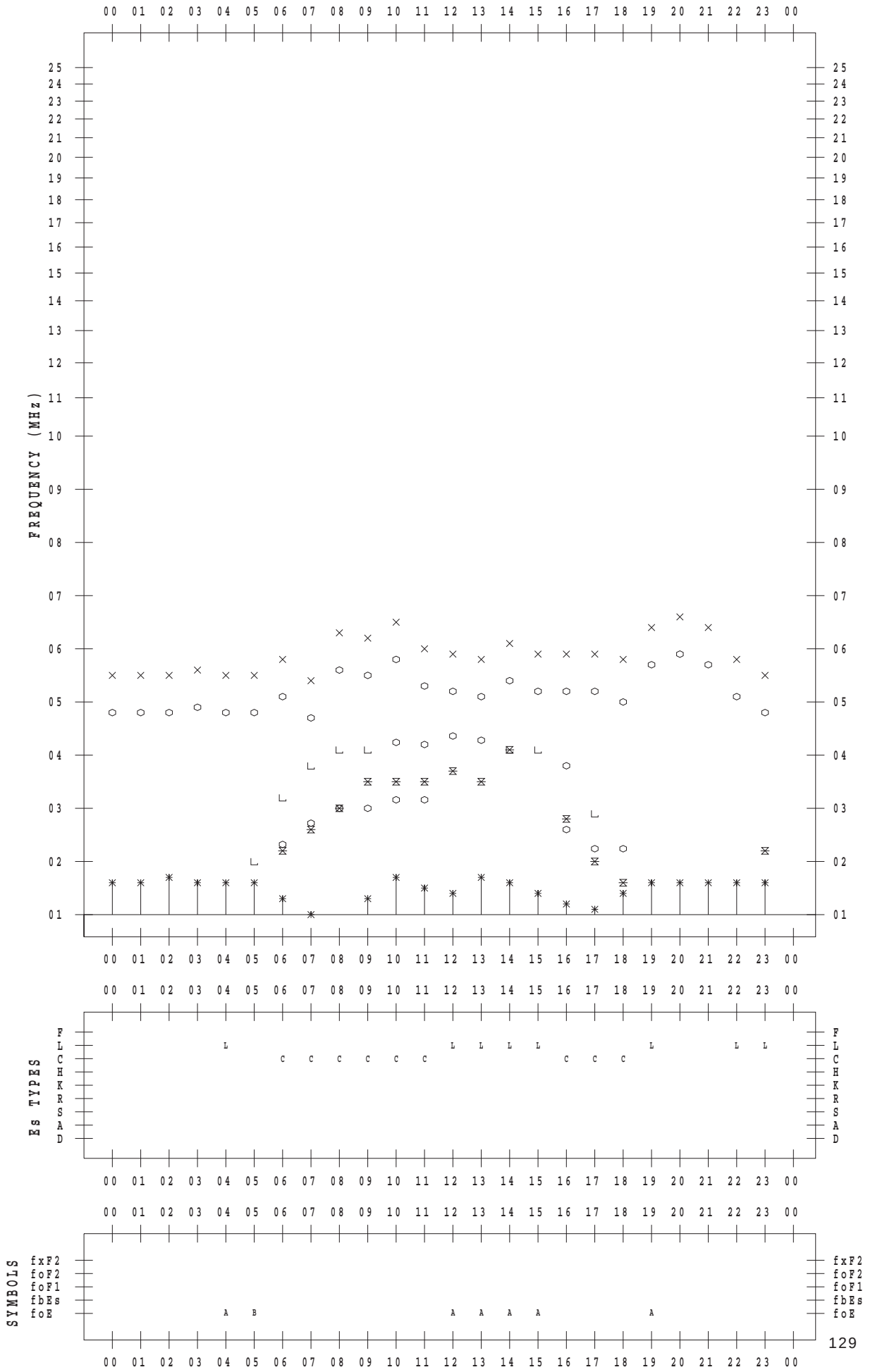
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/22

135 °E MEAN TIME



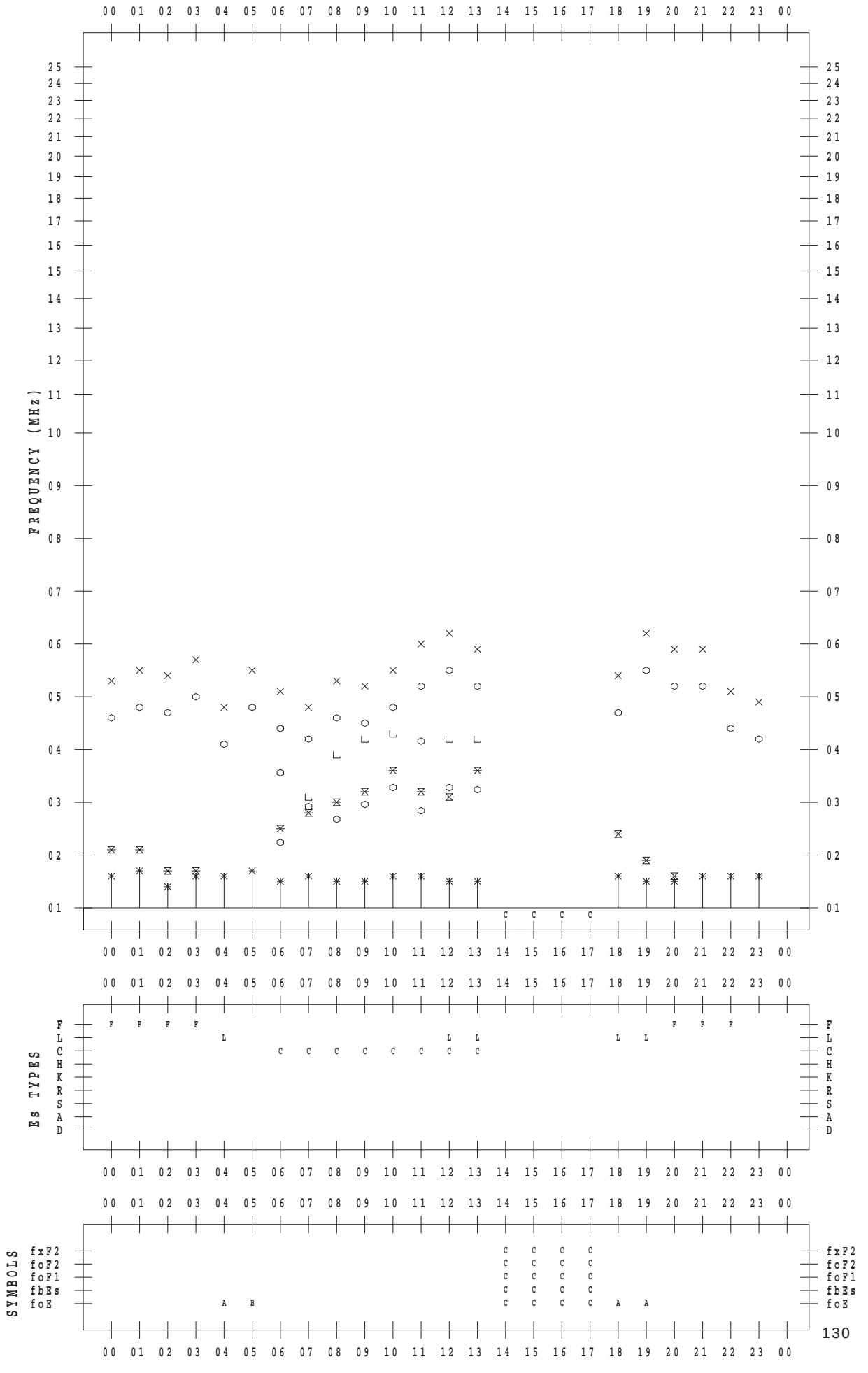
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/23

135 °E MEAN TIME



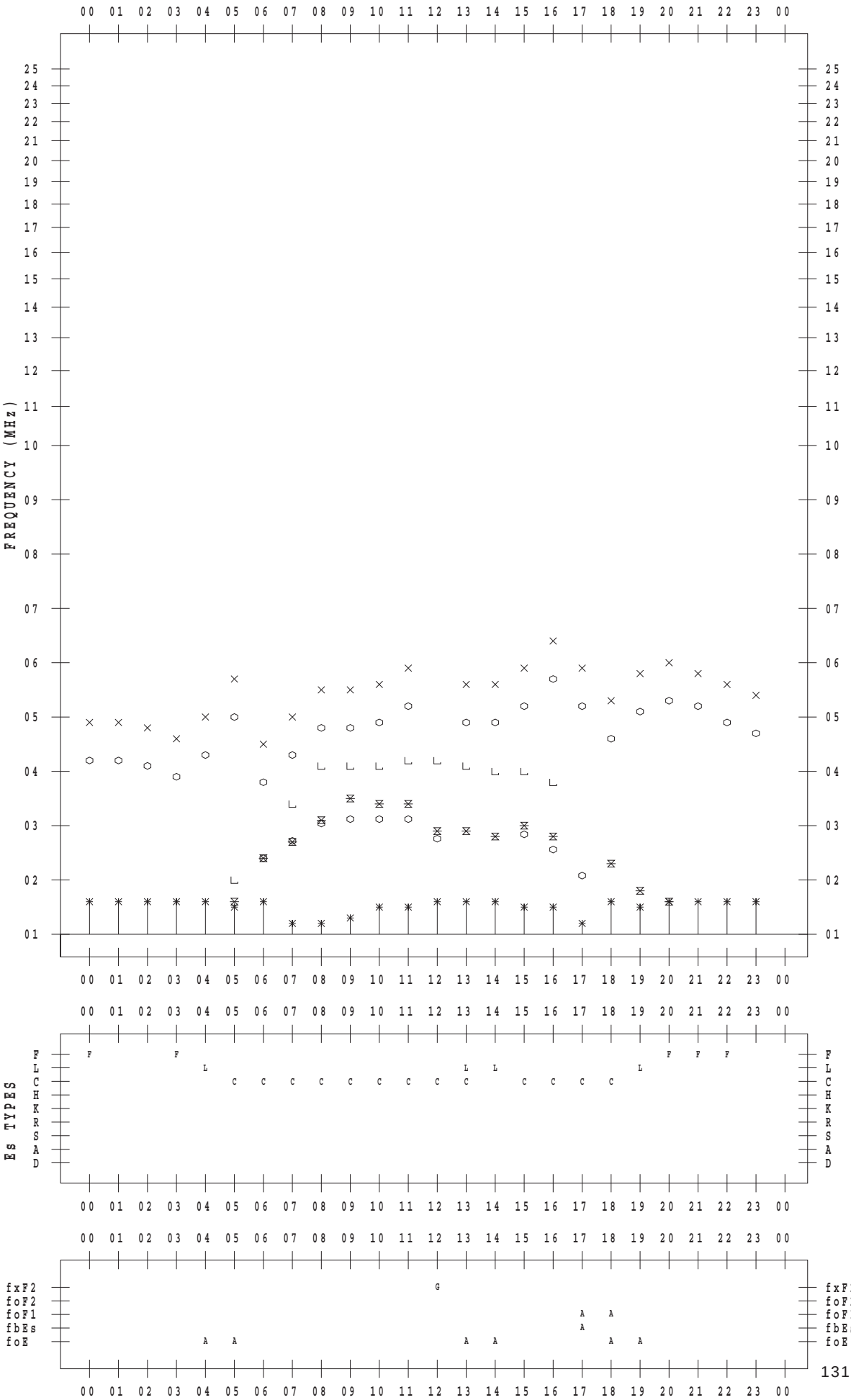
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/24

135 °E MEAN TIME



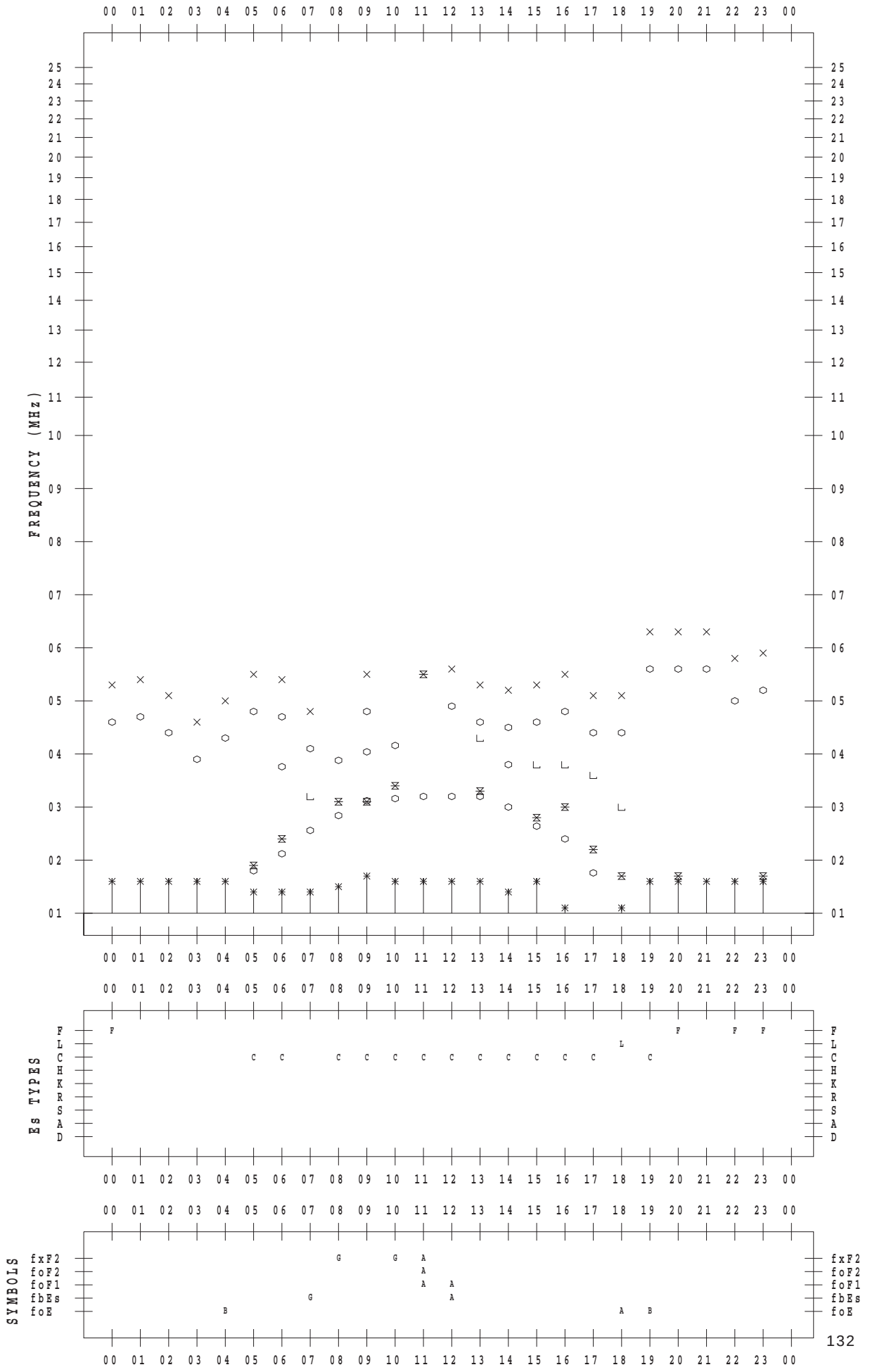
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/25

135 °E MEAN TIME



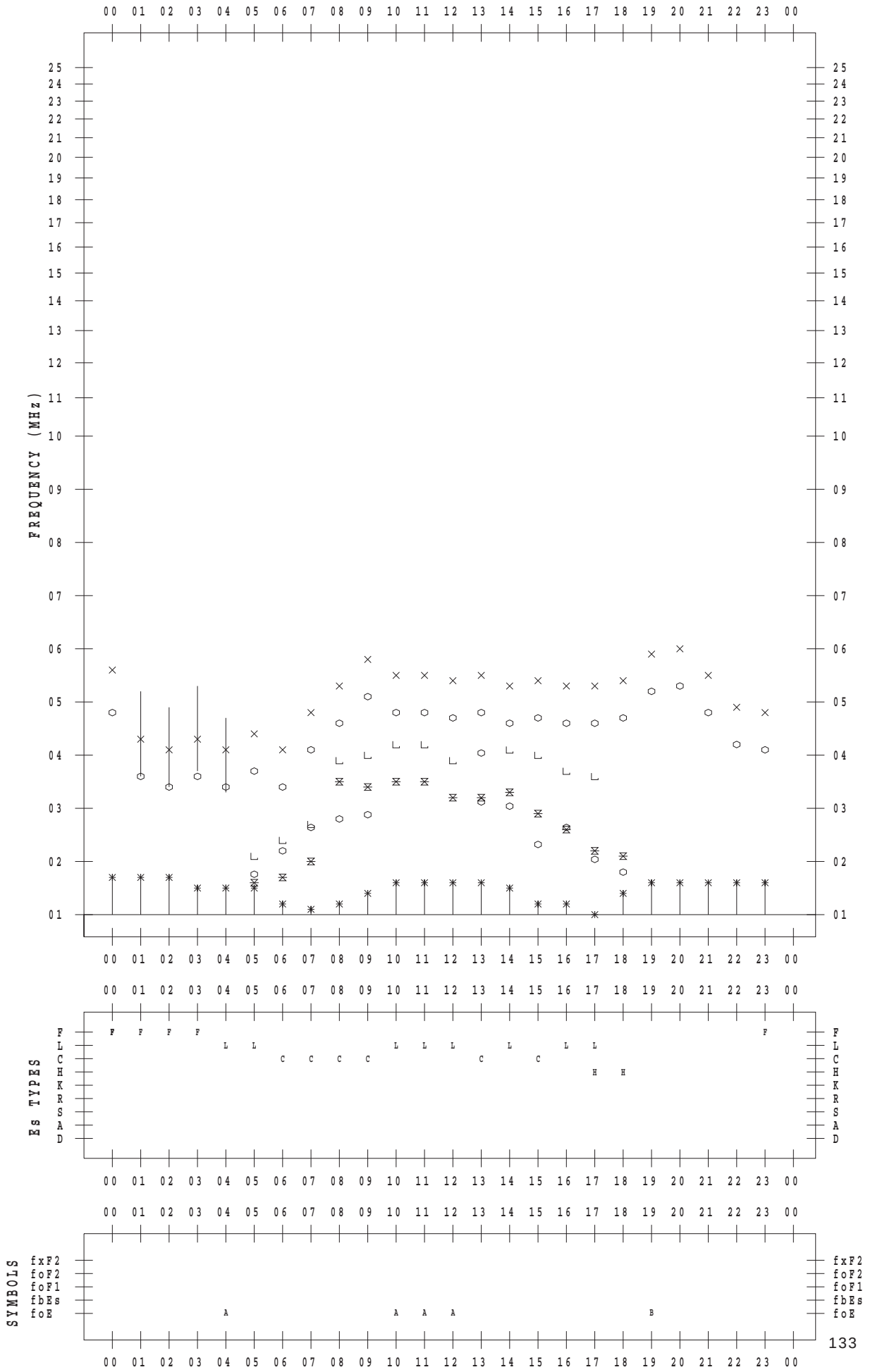
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/26

135 °E MEAN TIME



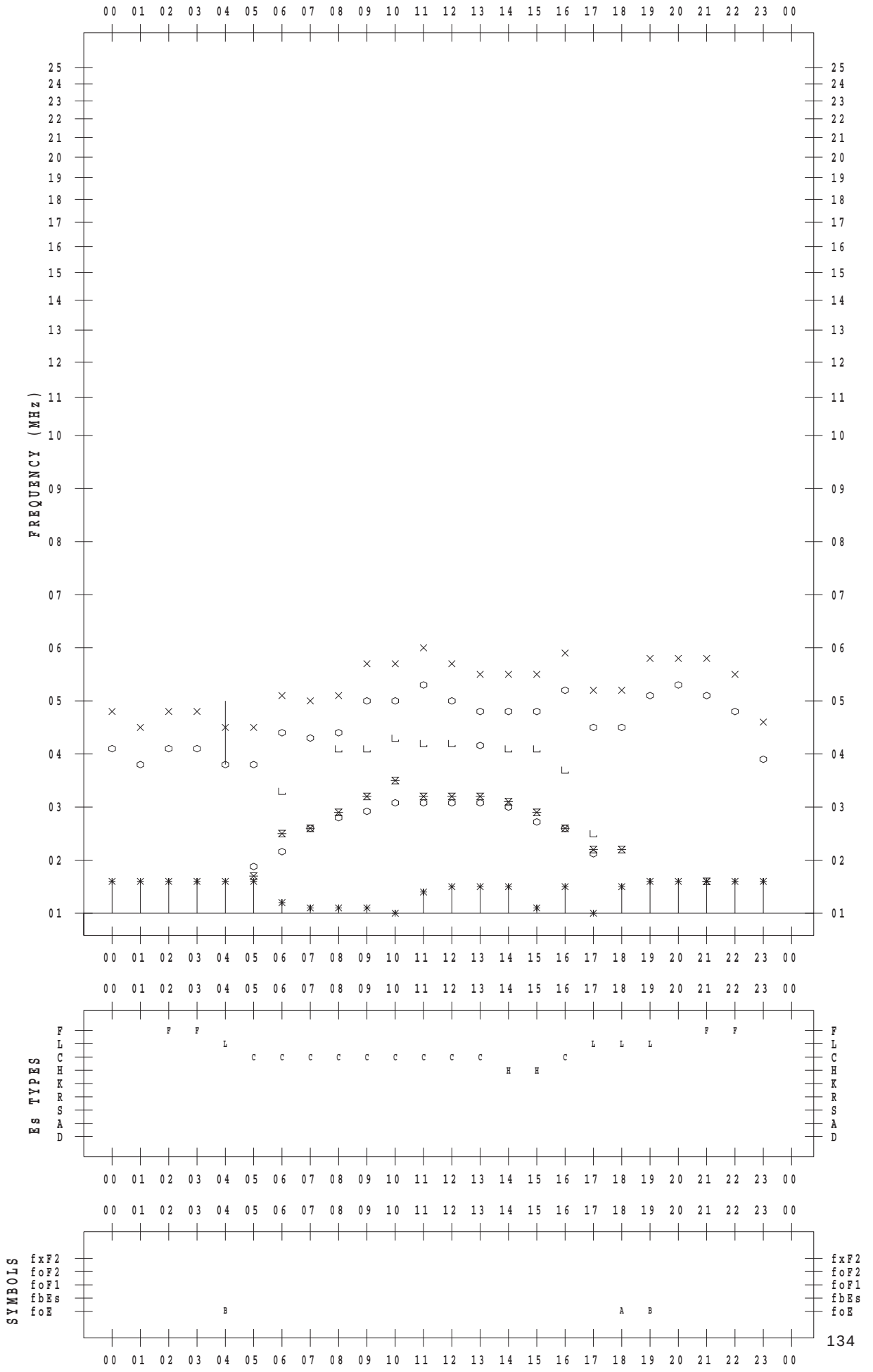
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/27

135 °E MEAN TIME



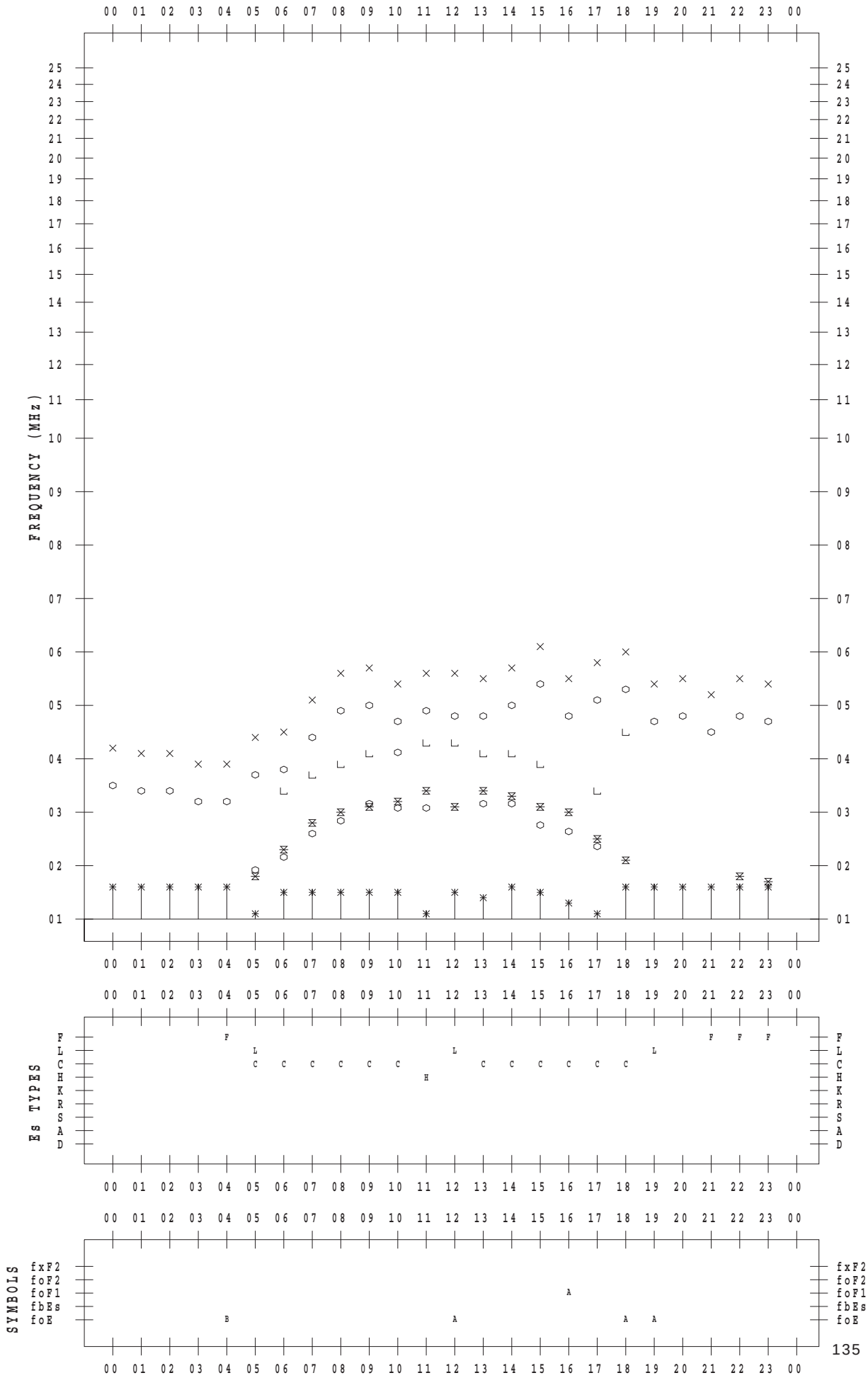
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/28

135 °E MEAN TIME



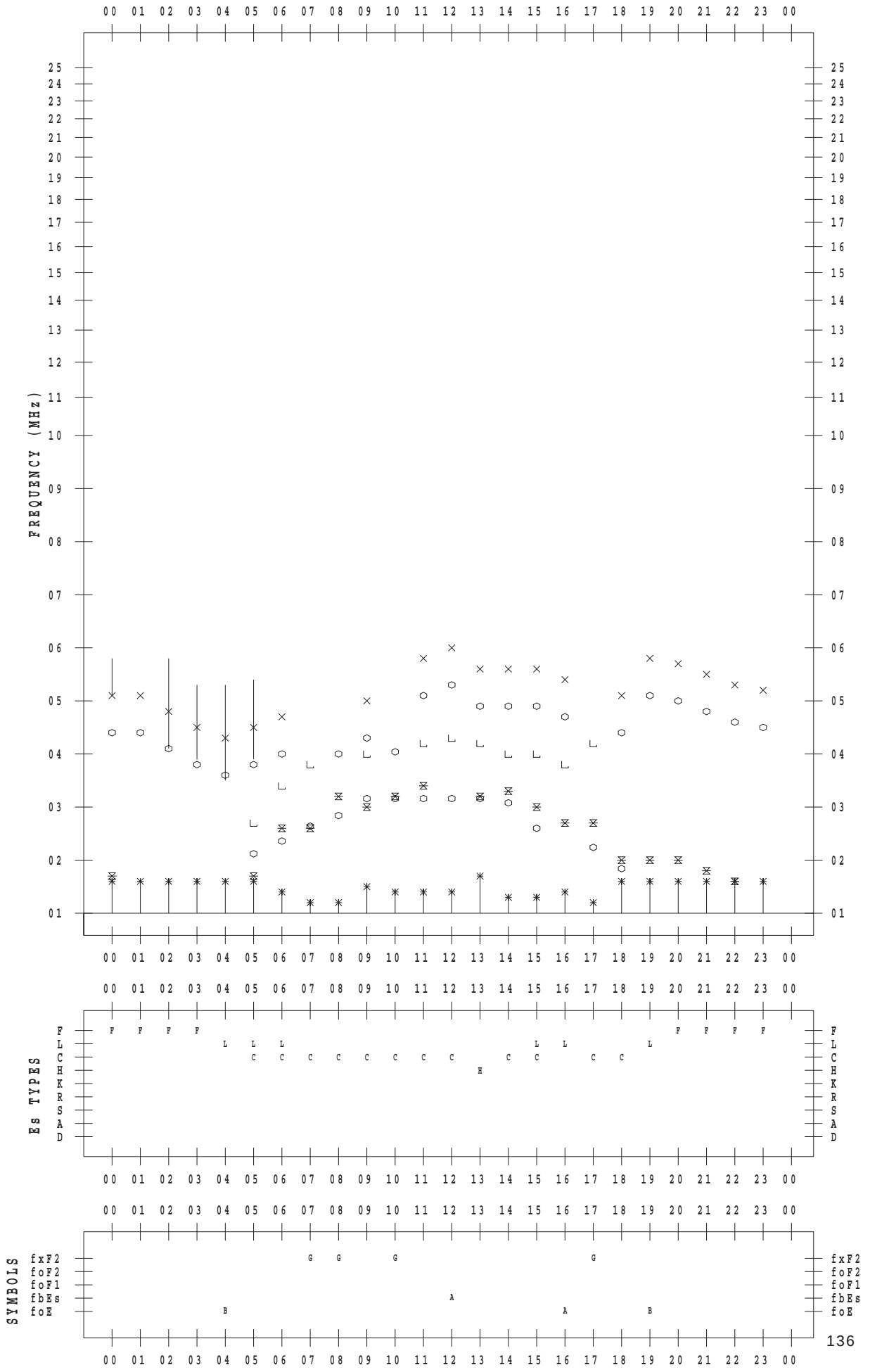
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/29

135 °E MEAN TIME



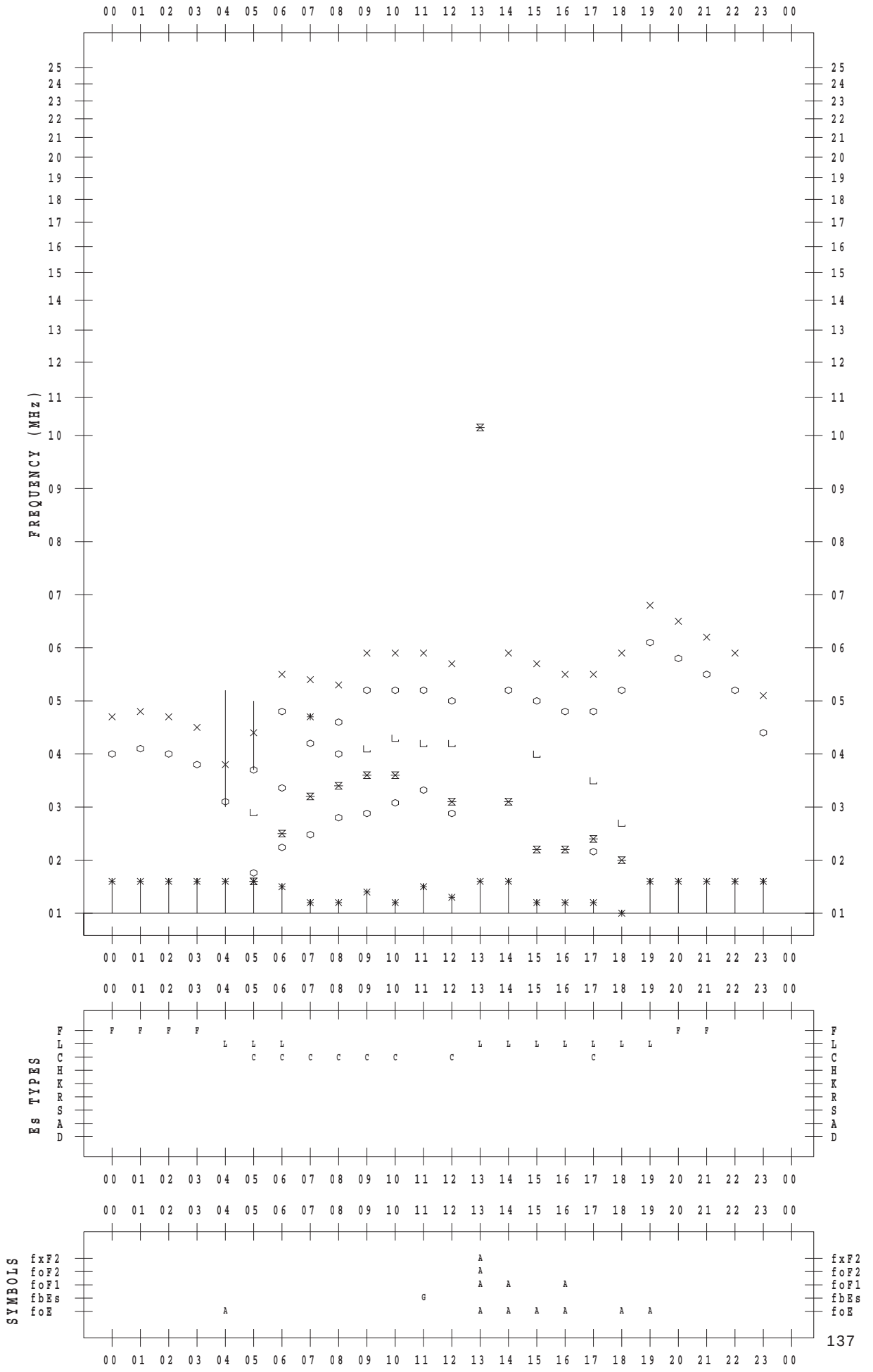
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 4/30

135 °E MEAN TIME



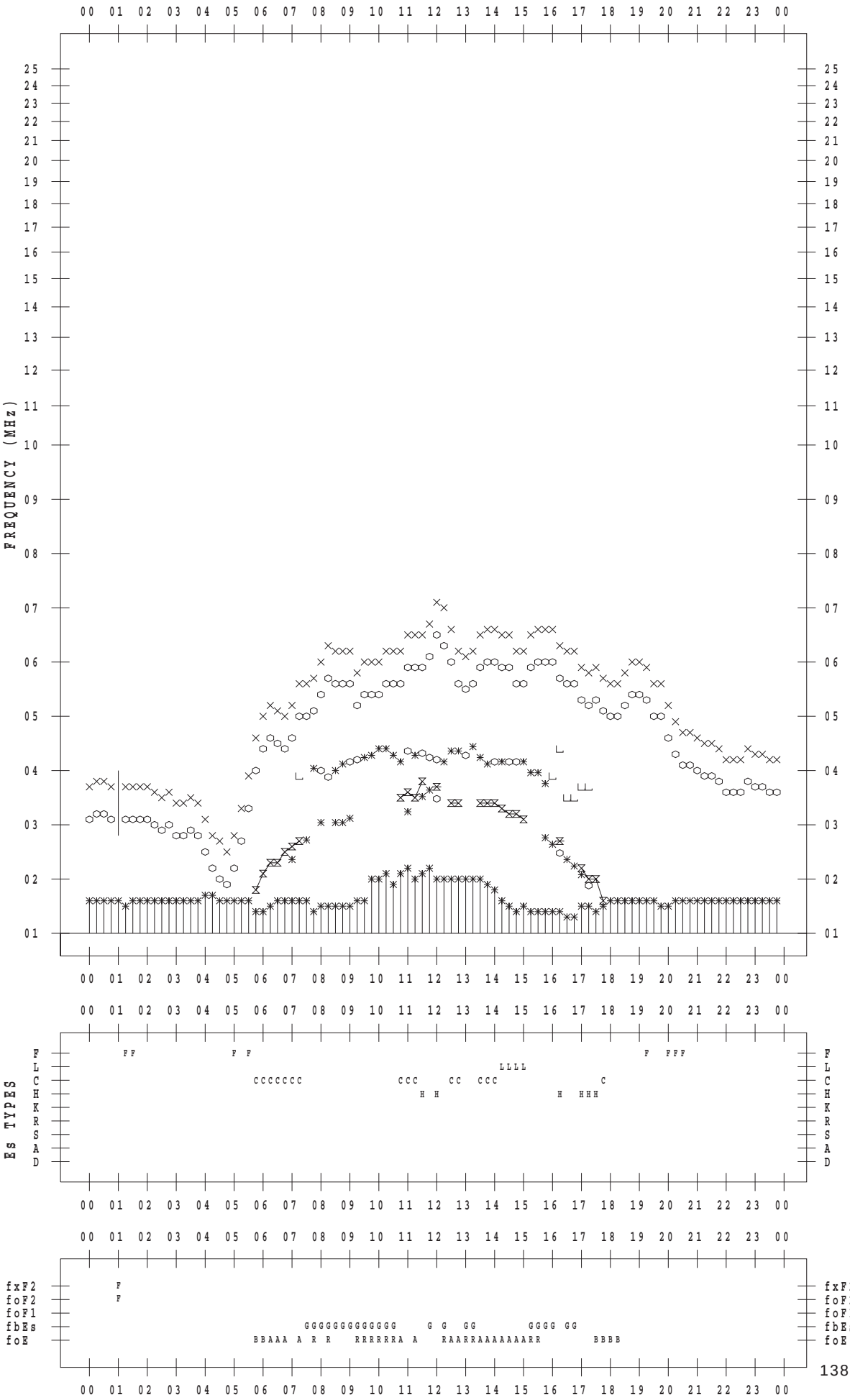
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 1

135 °E MEAN TIME



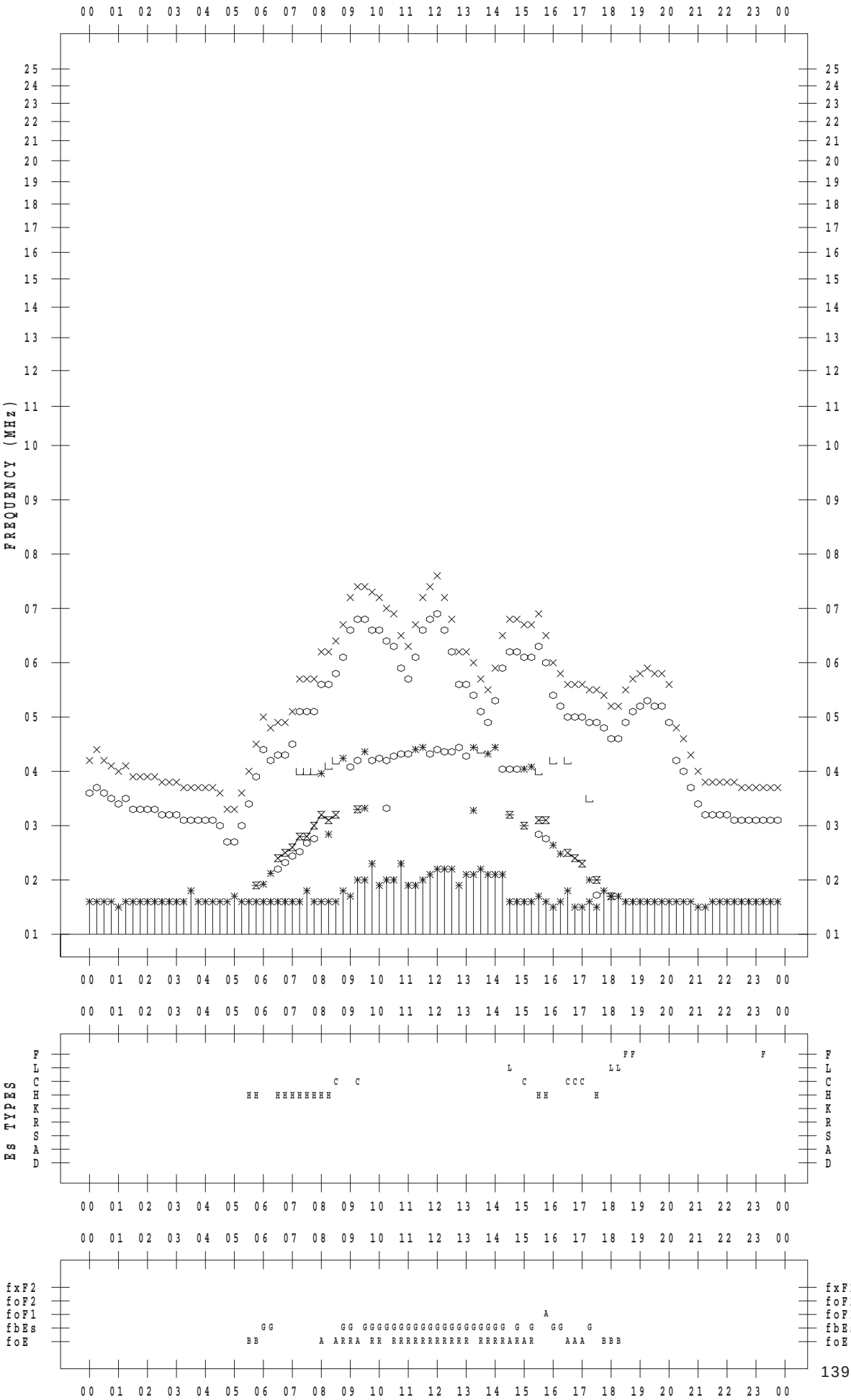
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 2

135 °E MEAN TIME



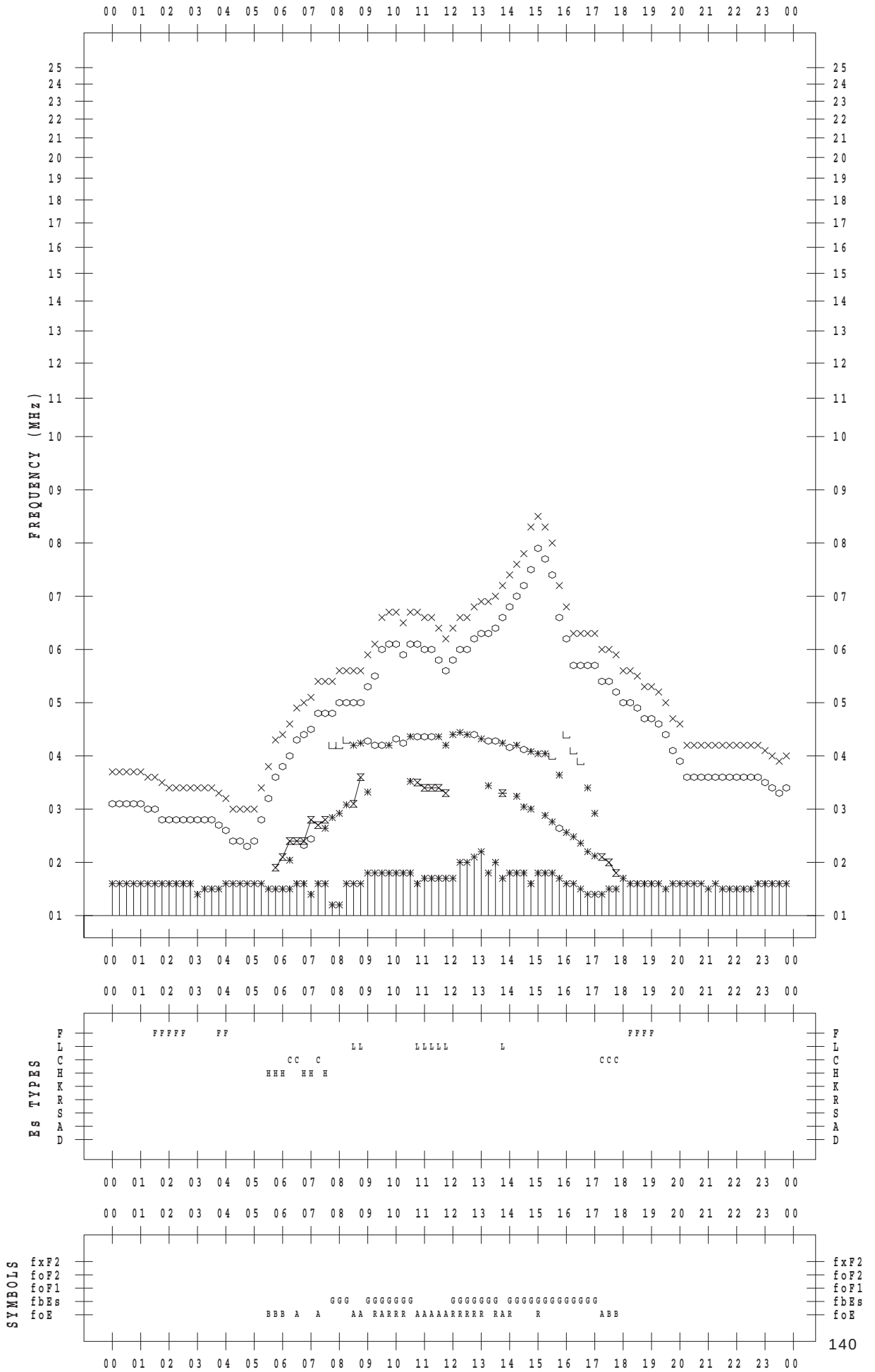
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 3

135 °E MEAN TIME



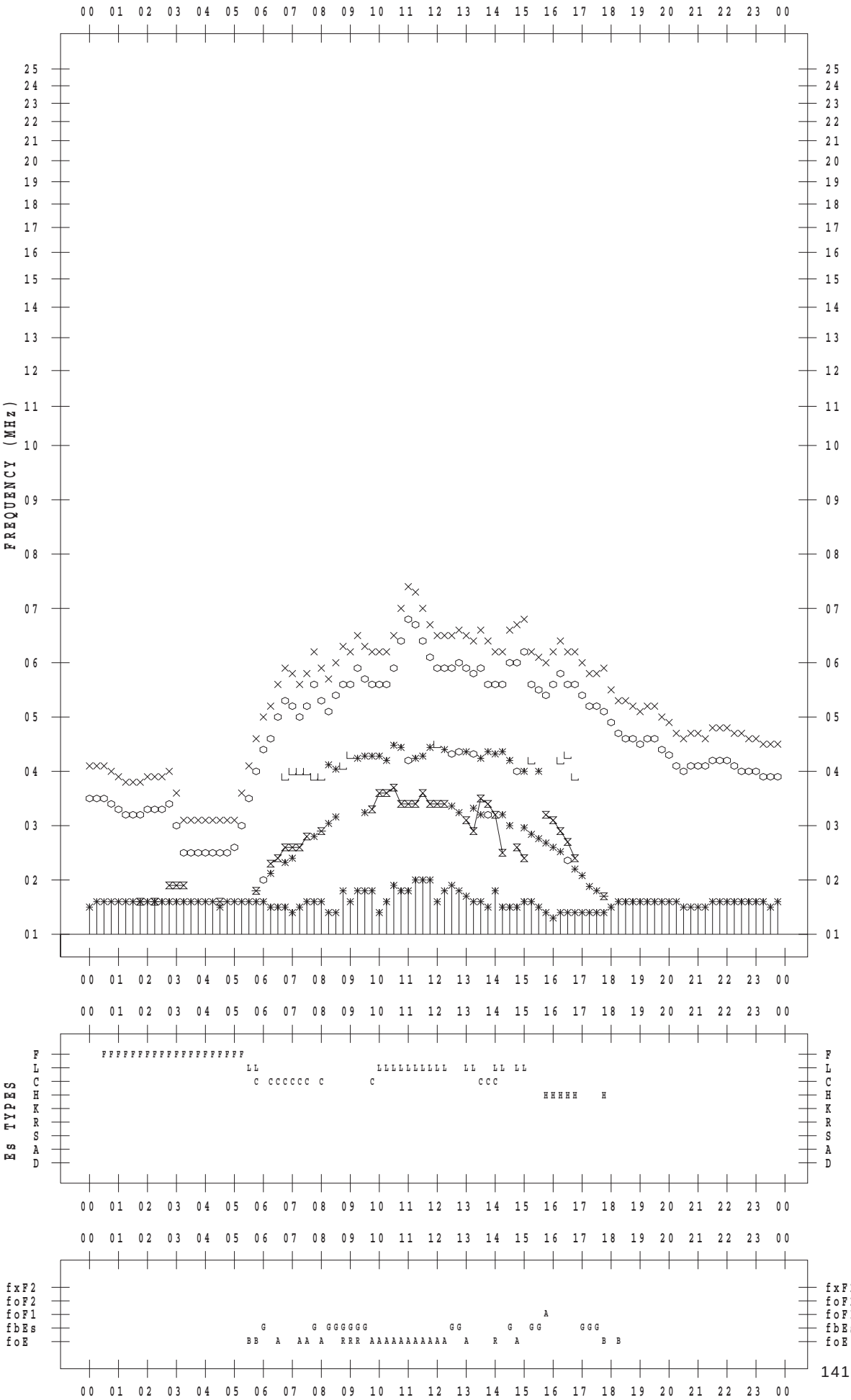
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 4

135 °E MEAN TIME



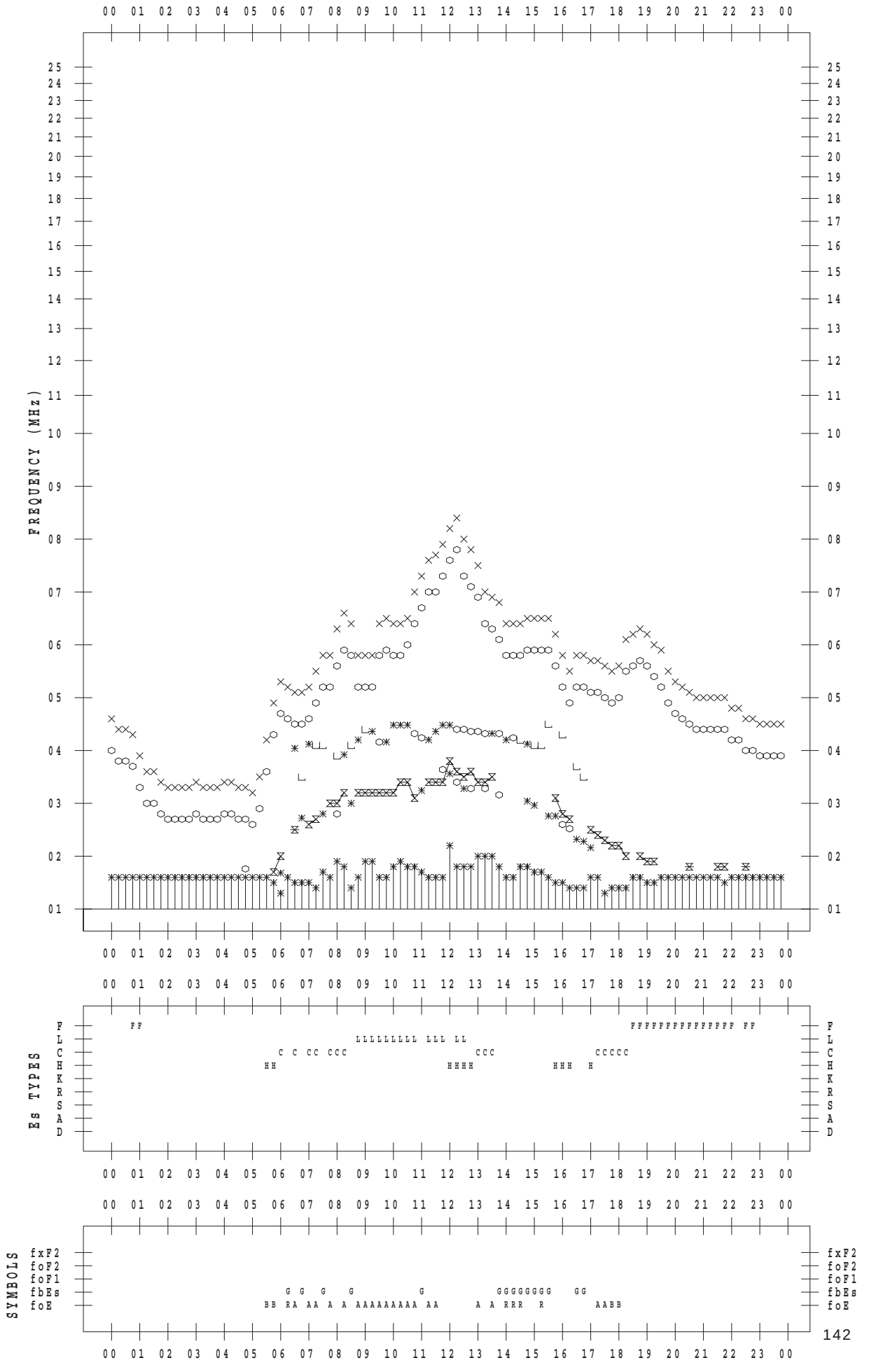
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 5

135 °E MEAN TIME



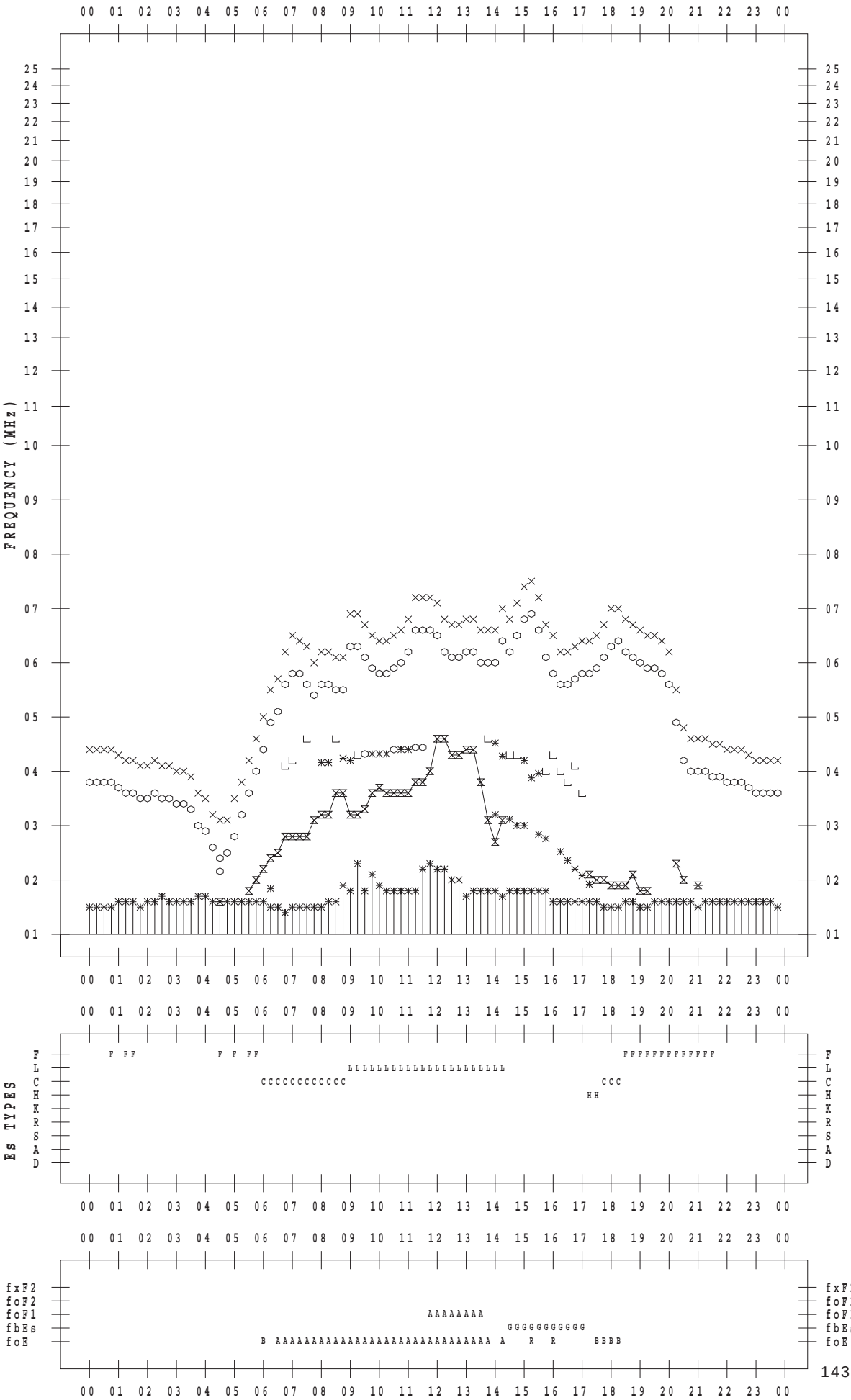
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 6

135 °E MEAN TIME

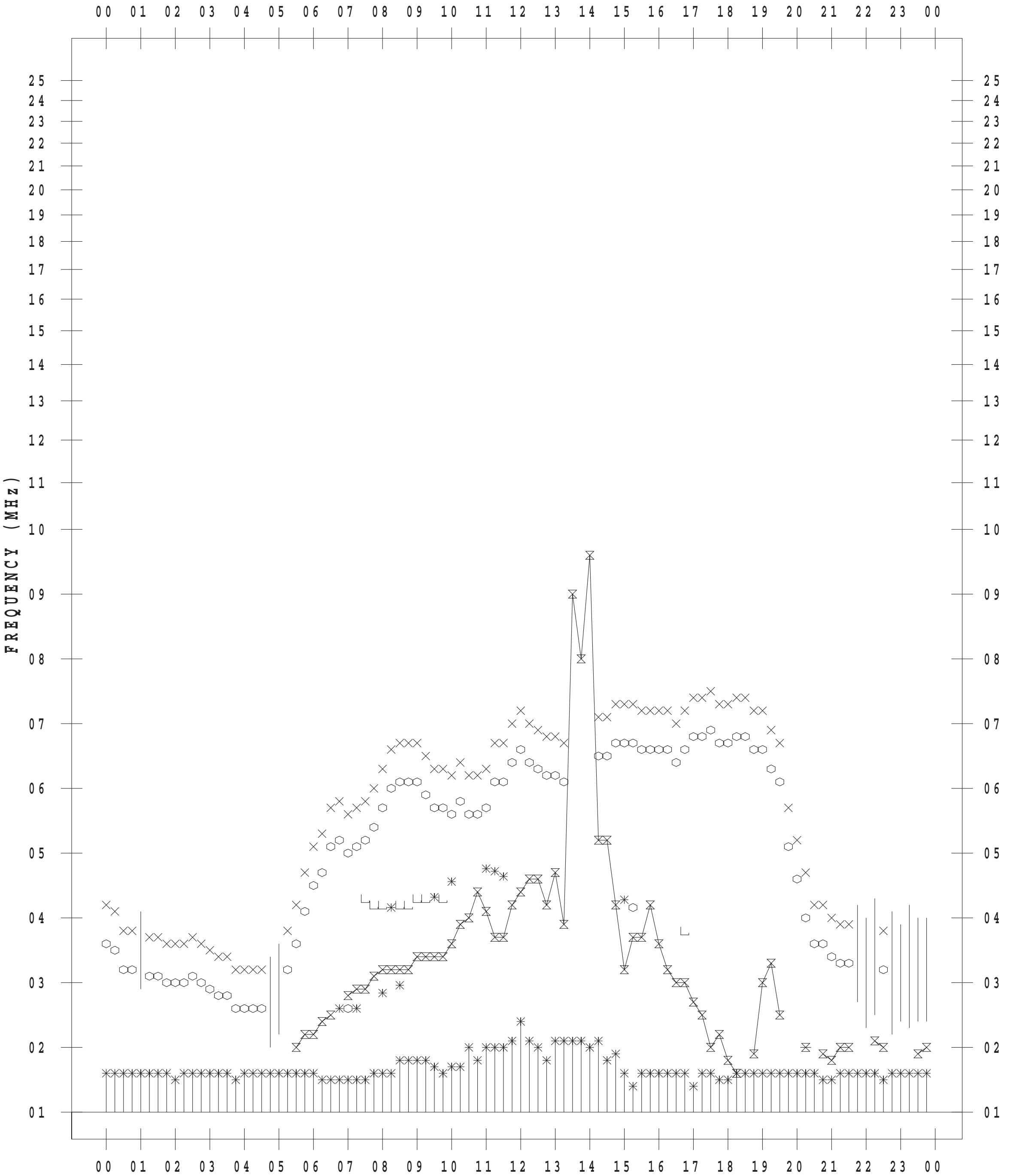


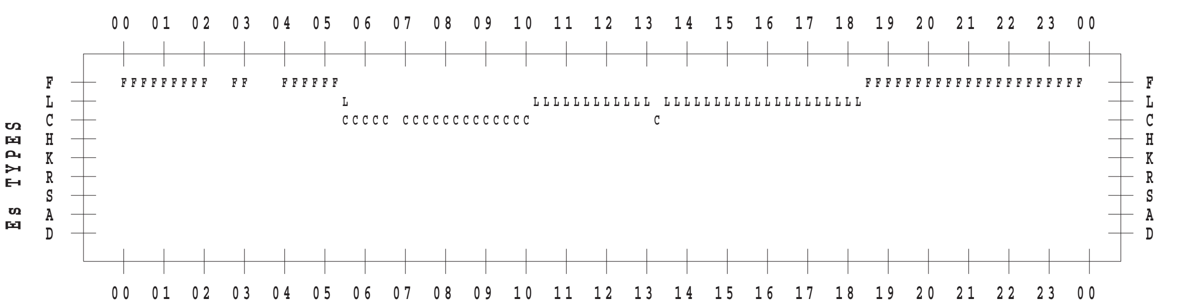
f-PLOT DATA

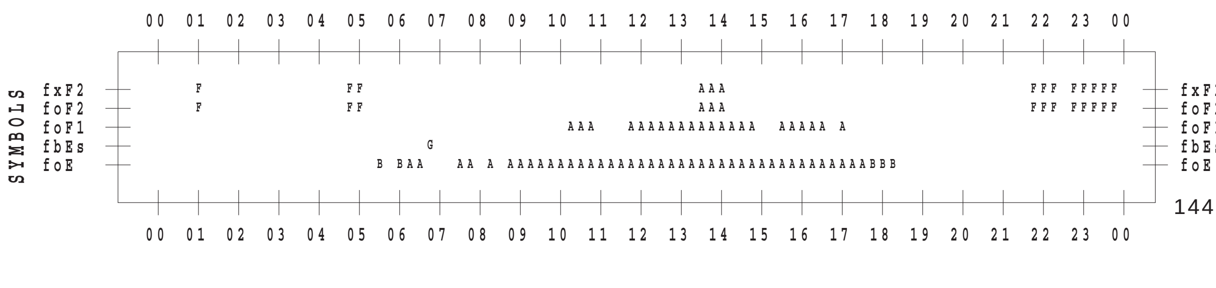
SCALER : I.NISHIMUTA

STATION : Kokubunji DATE : 2019/ 4/ 7

135 °E MEAN TIME







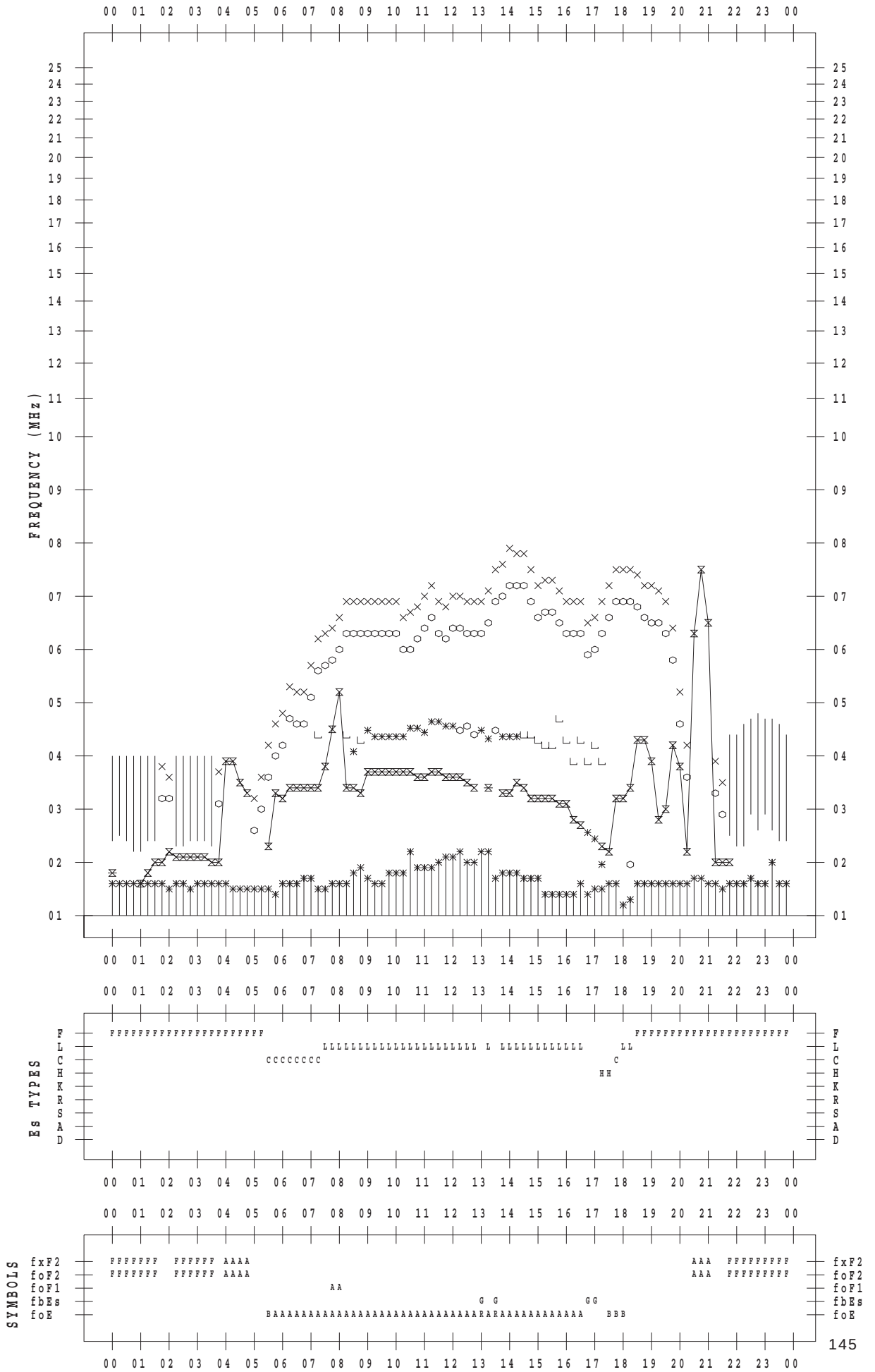
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 8

135 °E MEAN TIME



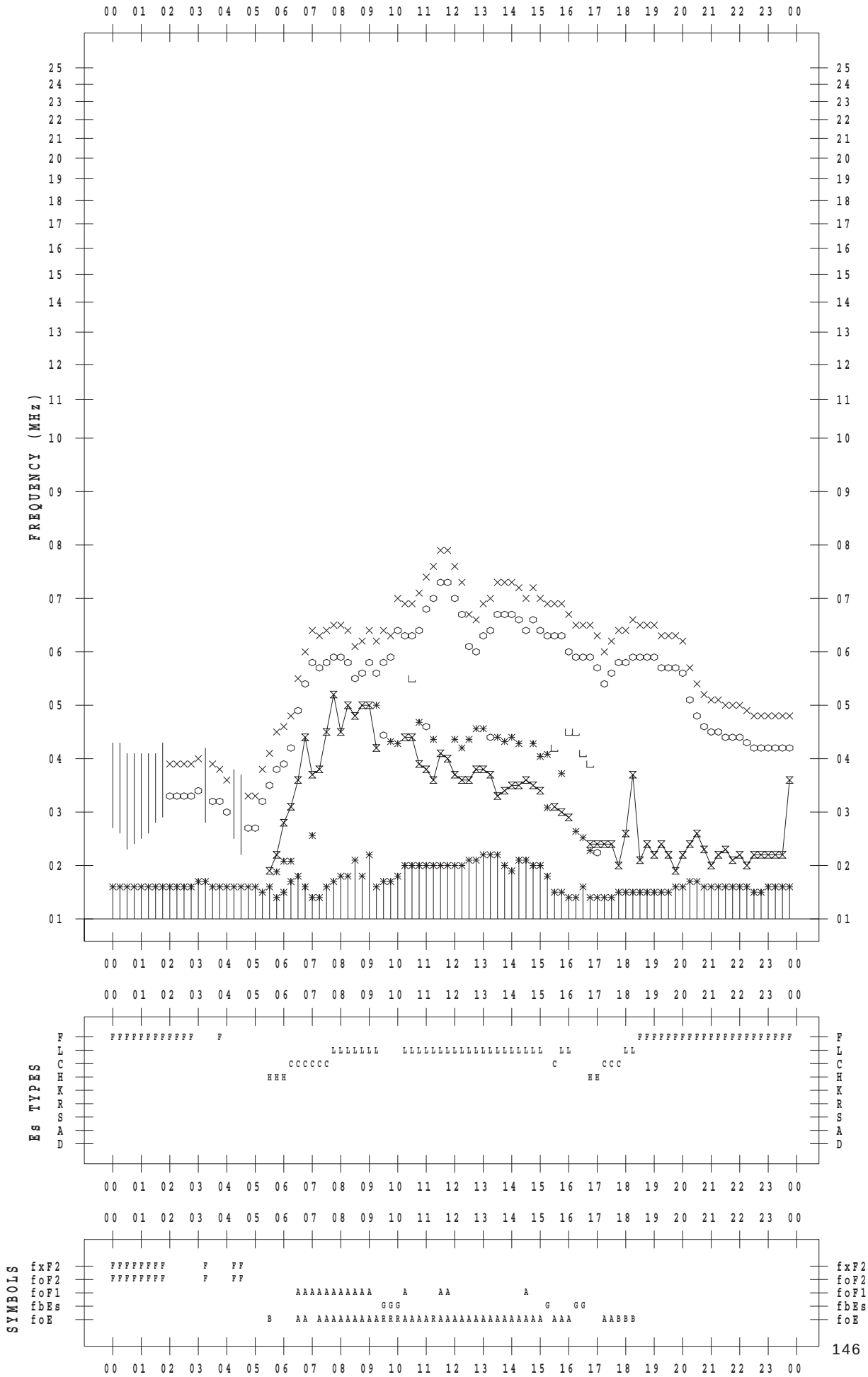
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/ 9

135 °E MEAN TIME



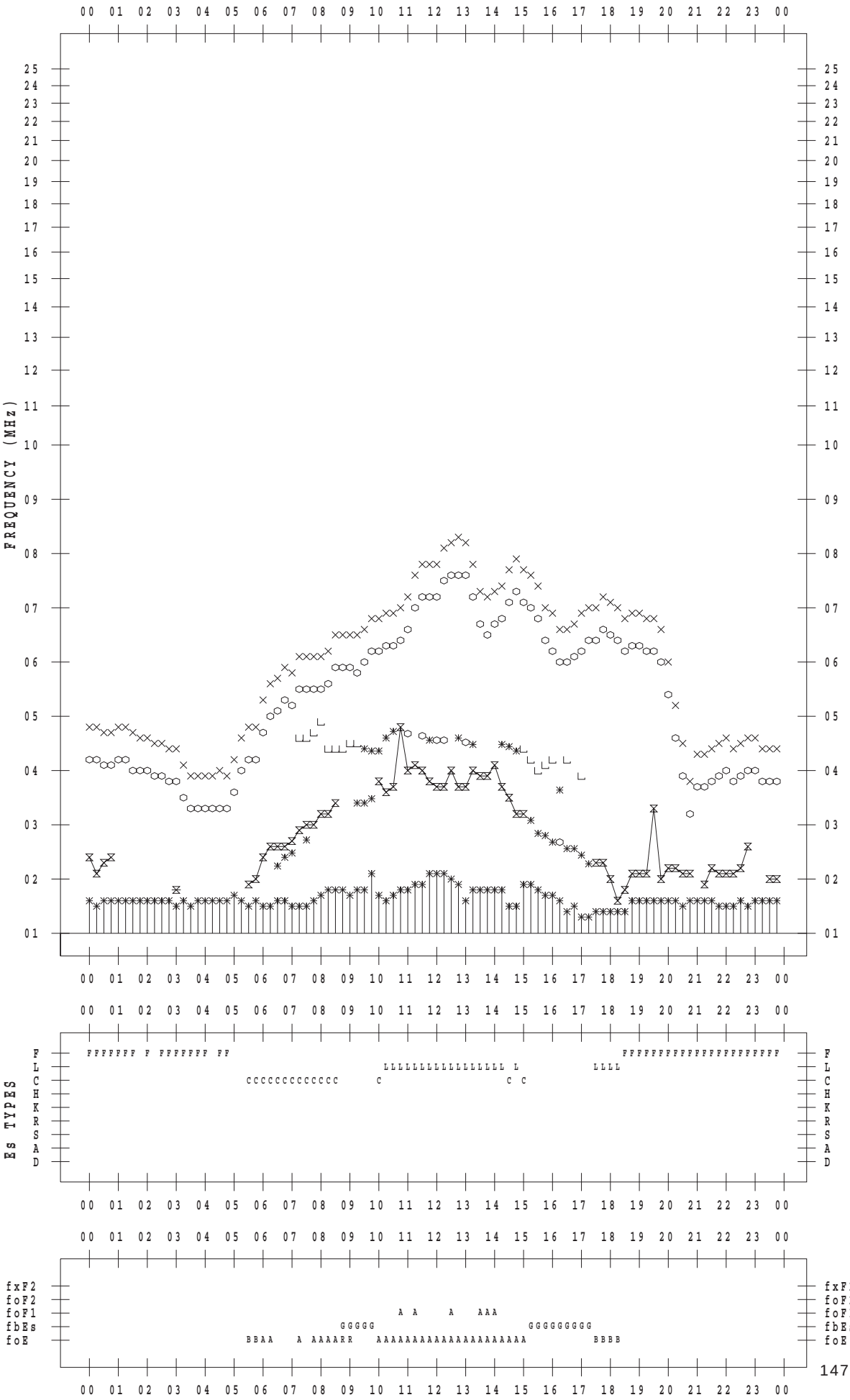
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/10

135 °E MEAN TIME



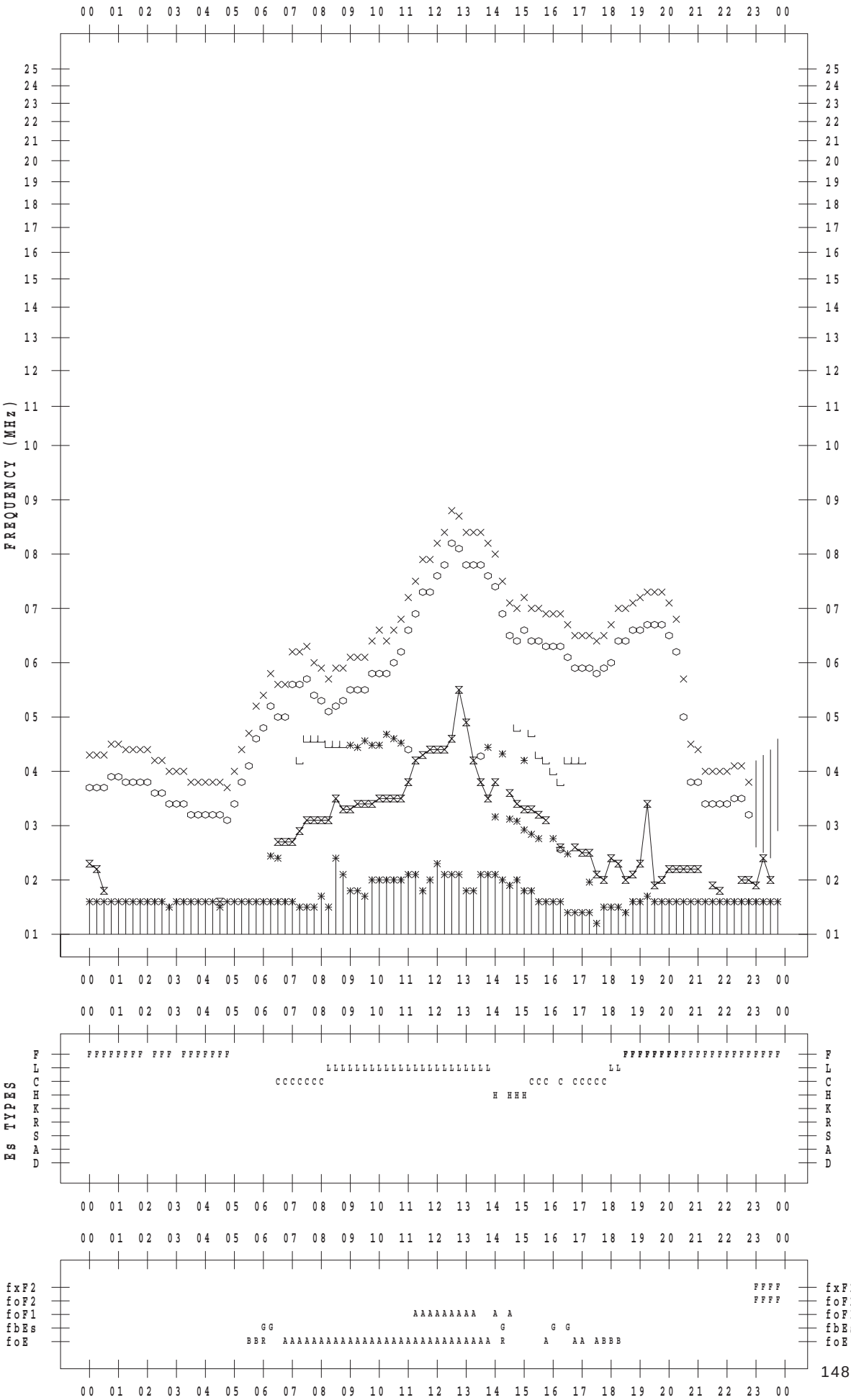
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/11

135 °E MEAN TIME



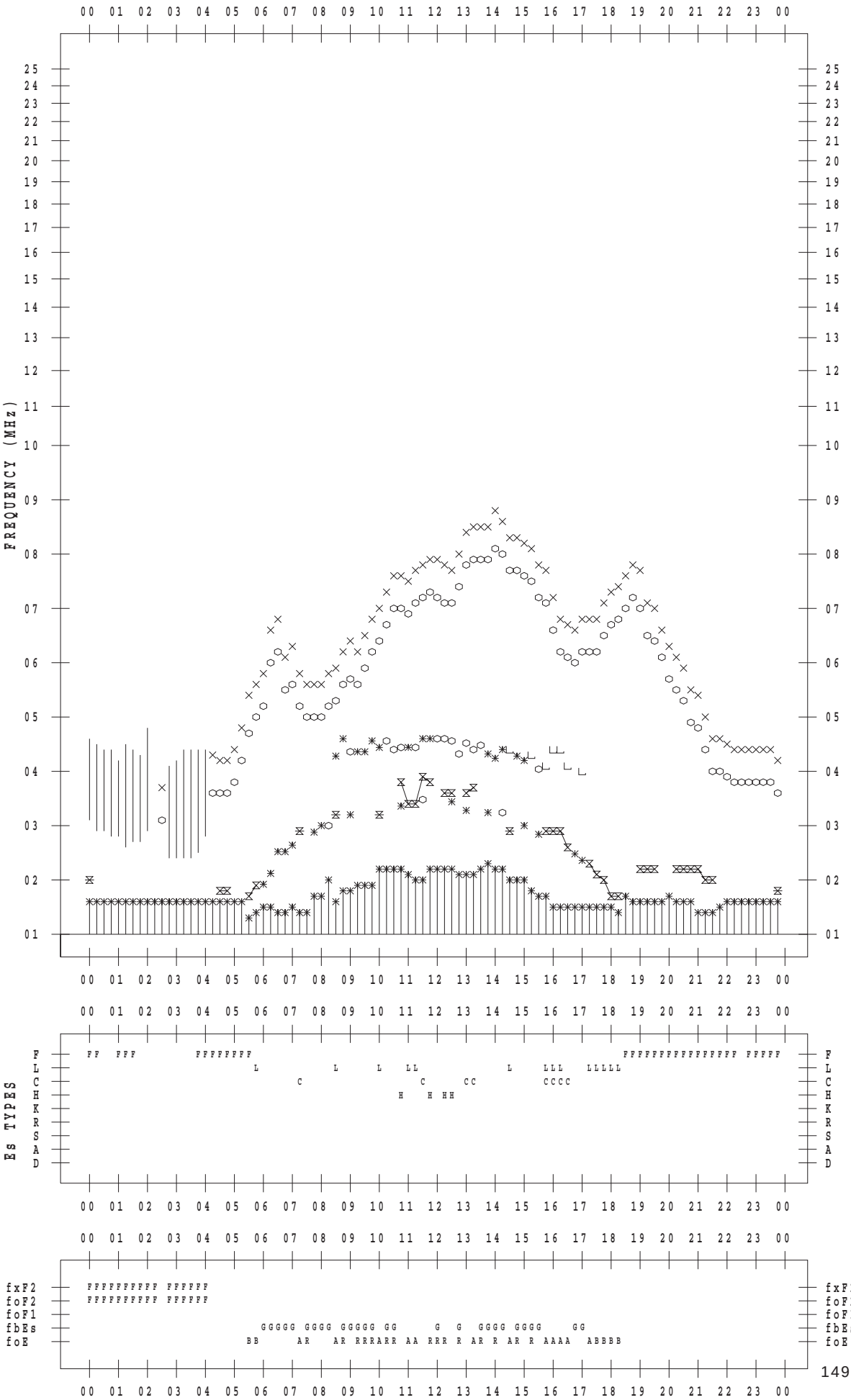
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/12

135 °E MEAN TIME



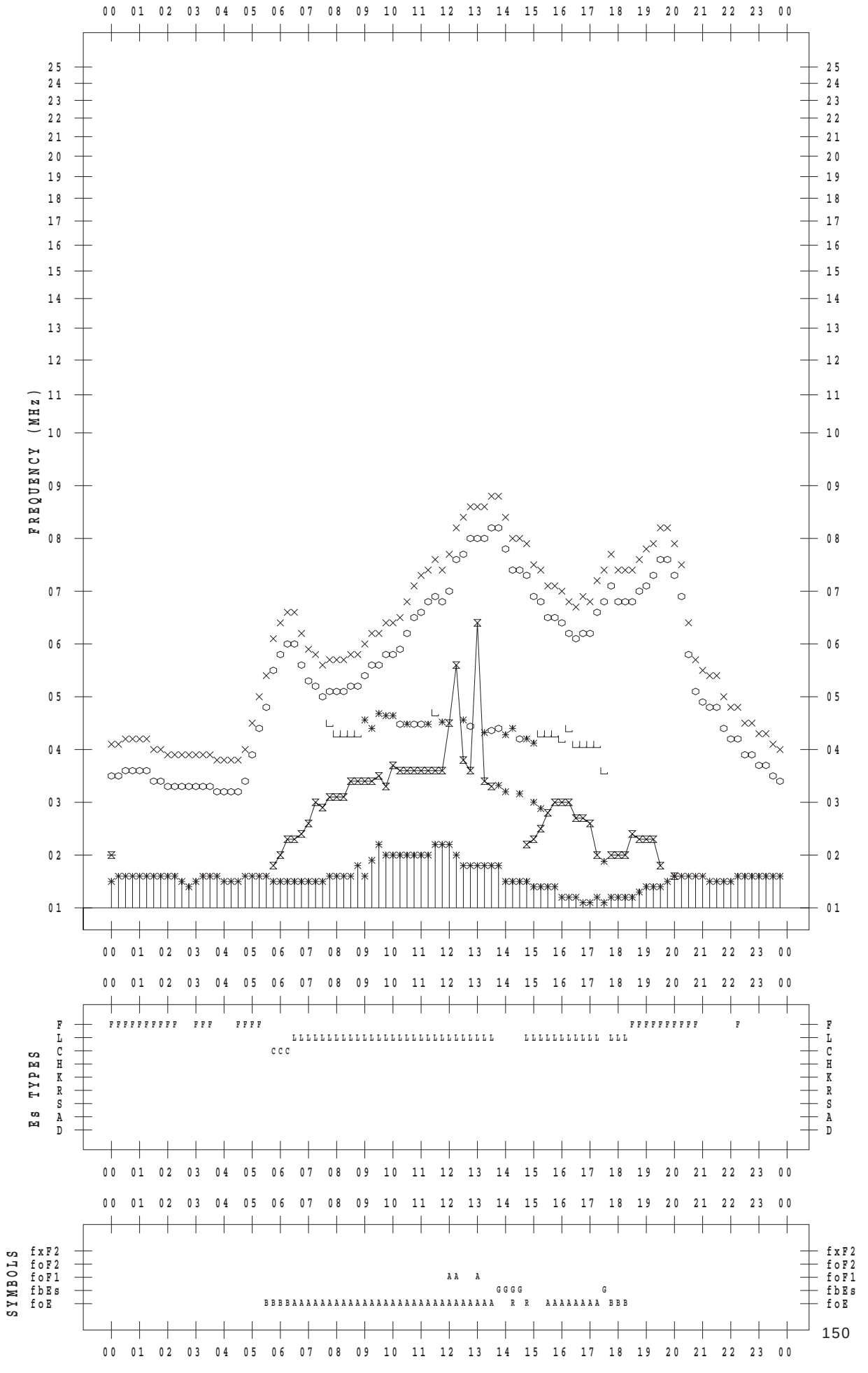
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/13

135 °E MEAN TIME



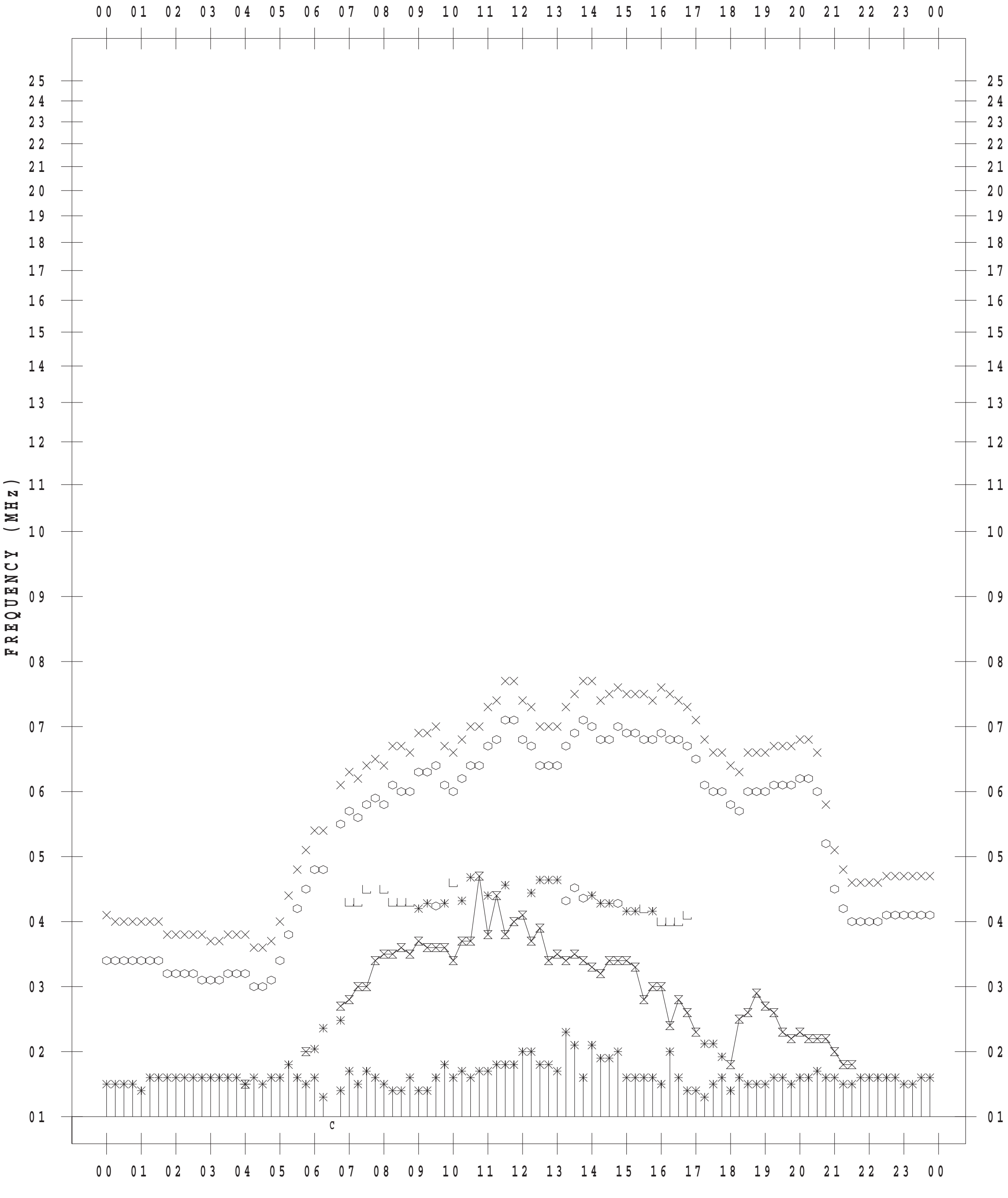
f-PLOT DATA

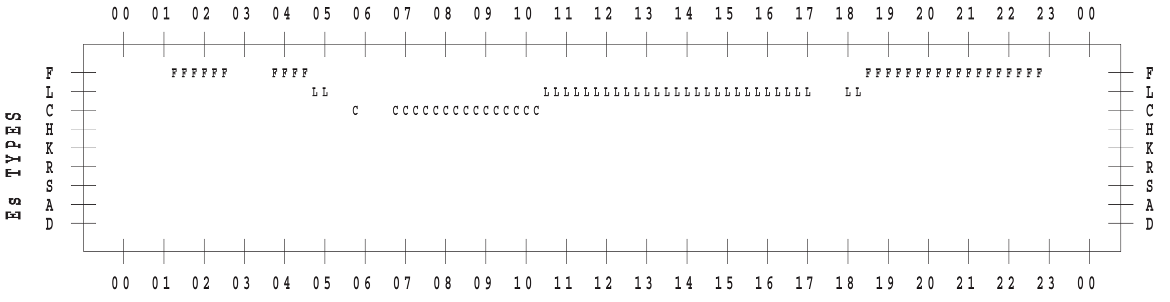
SCALER : I.NISHIMUTA

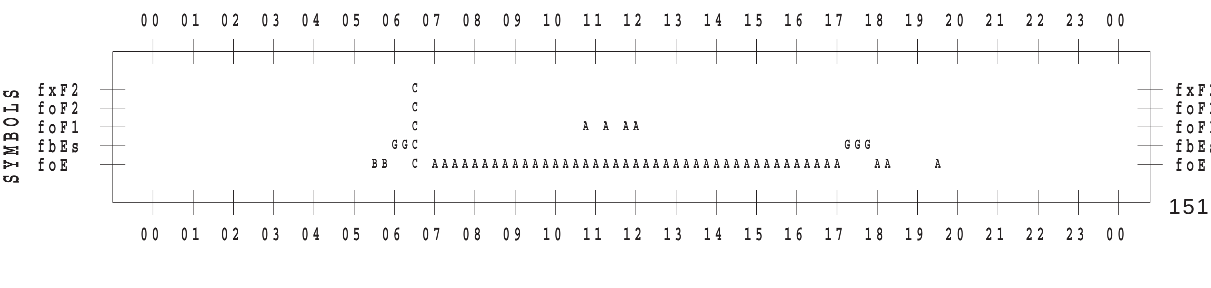
STATION : Kokubunji

DATE : 2019/ 4/14

135 °E MEAN TIME







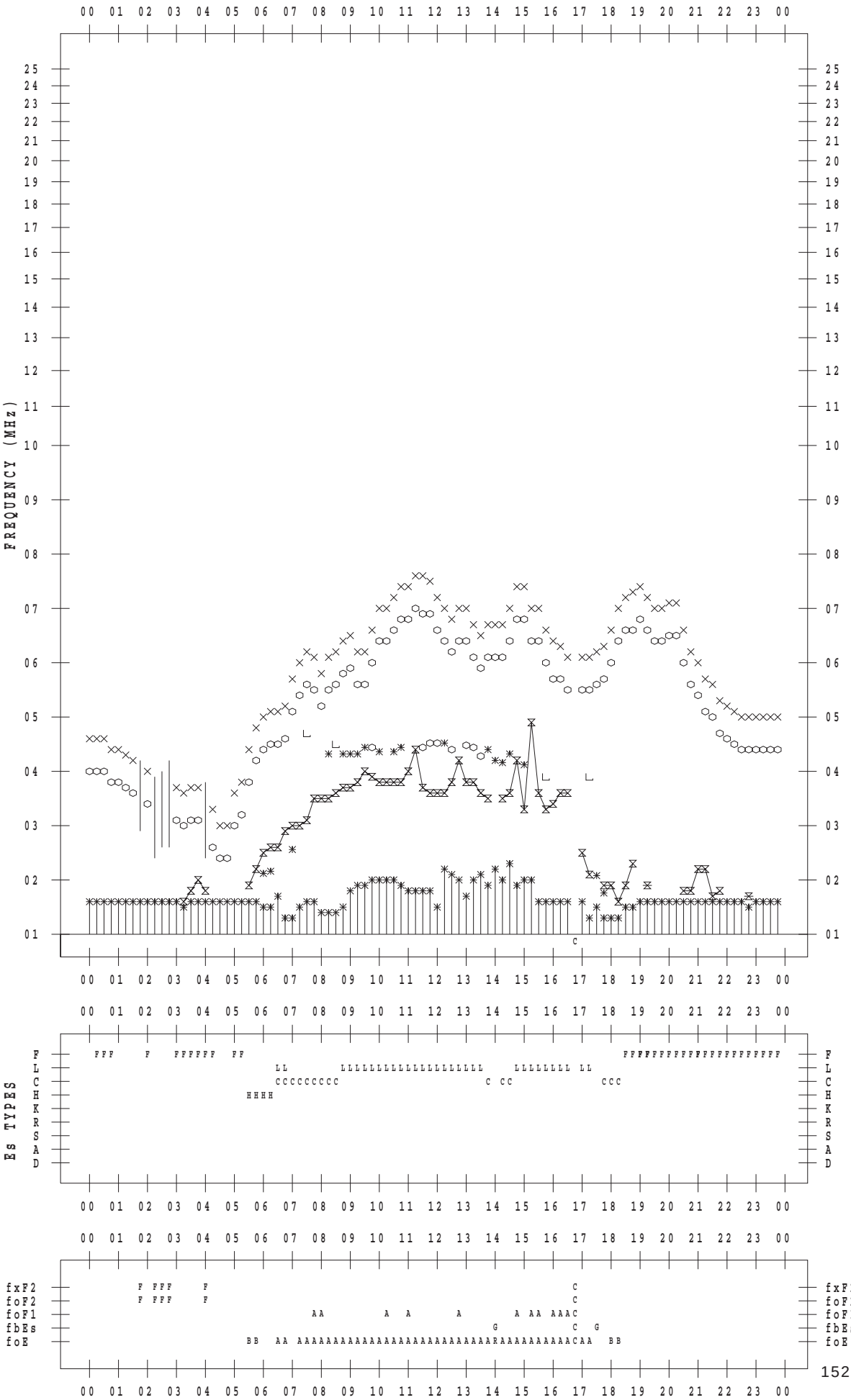
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/15

135 °E MEAN TIME



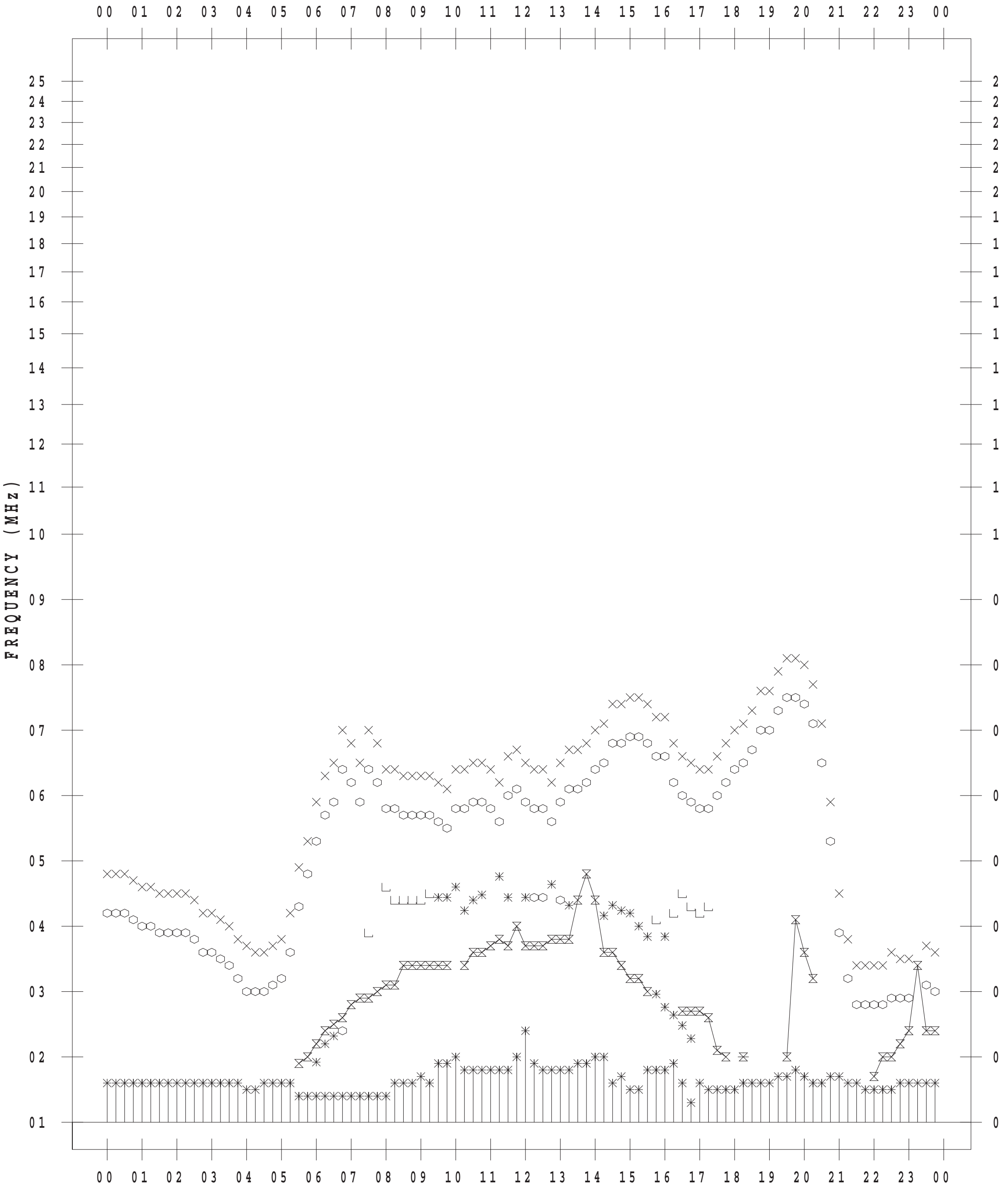
f-PLOT DATA

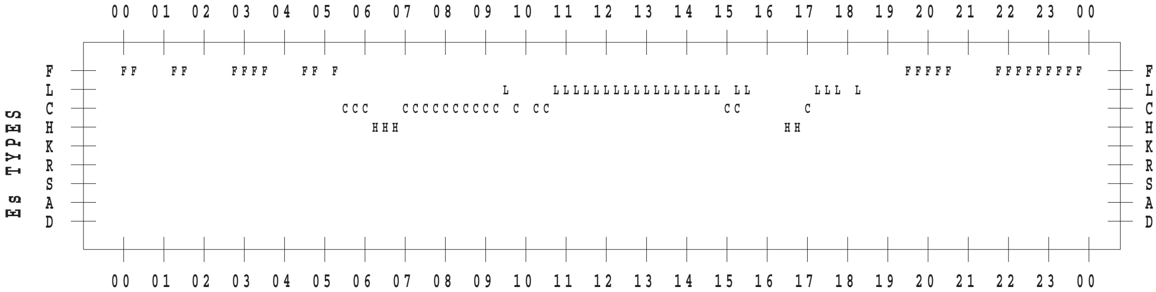
SCALER : I.NISHIMUTA

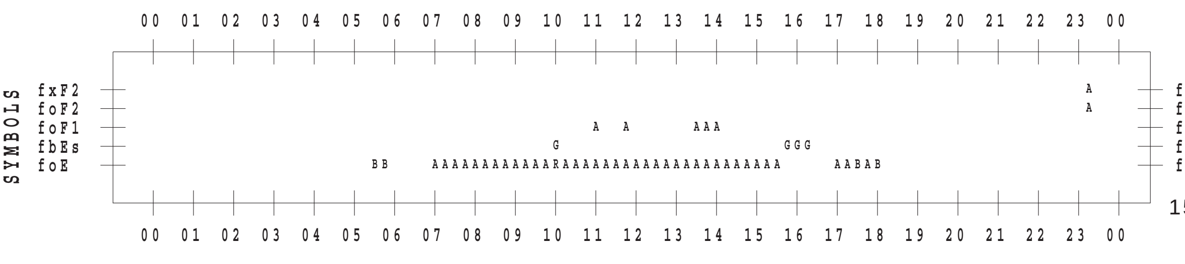
STATION : Kokubunji

DATE : 2019/ 4/16

135 °E MEAN TIME







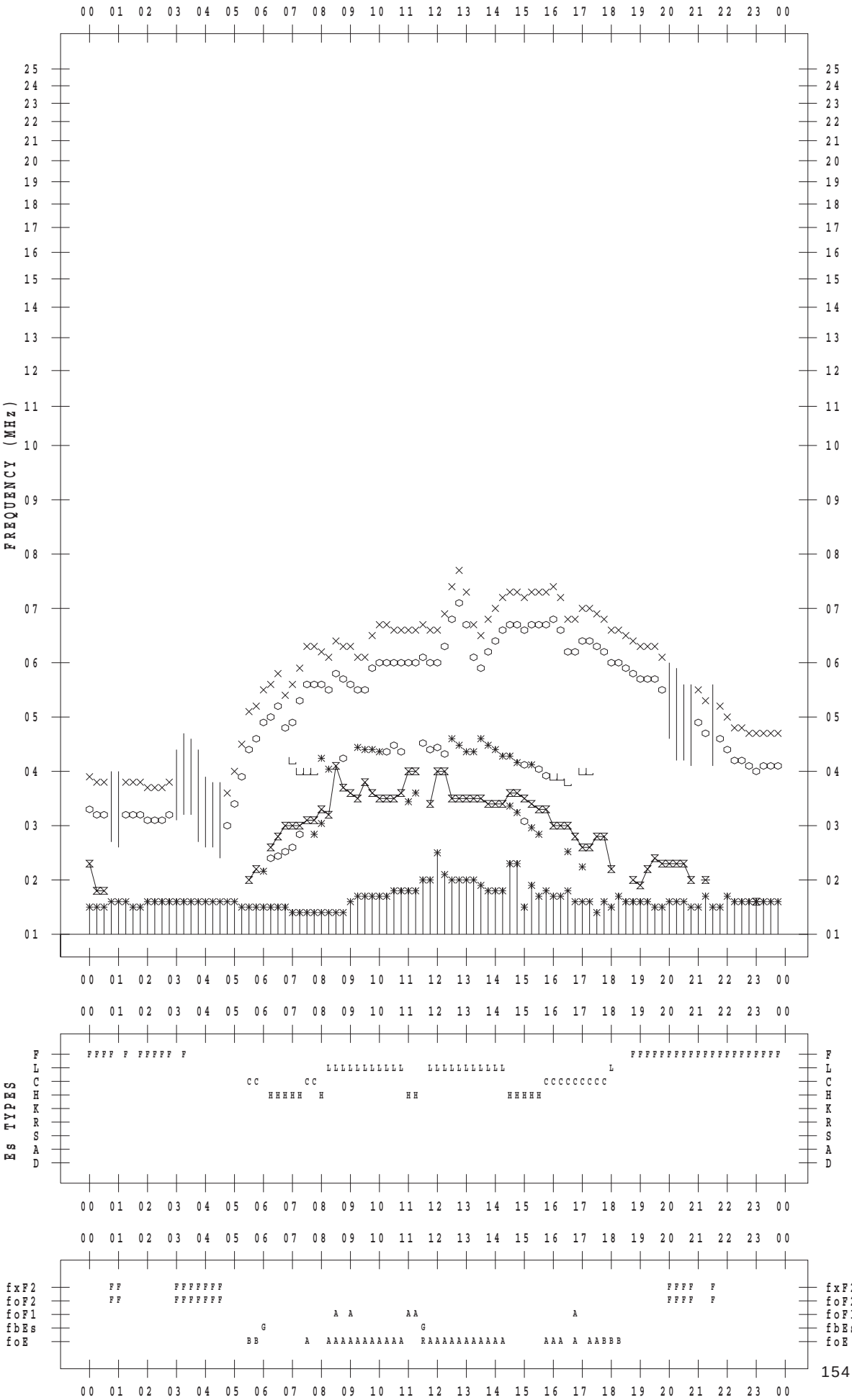
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/17

135 °E MEAN TIME



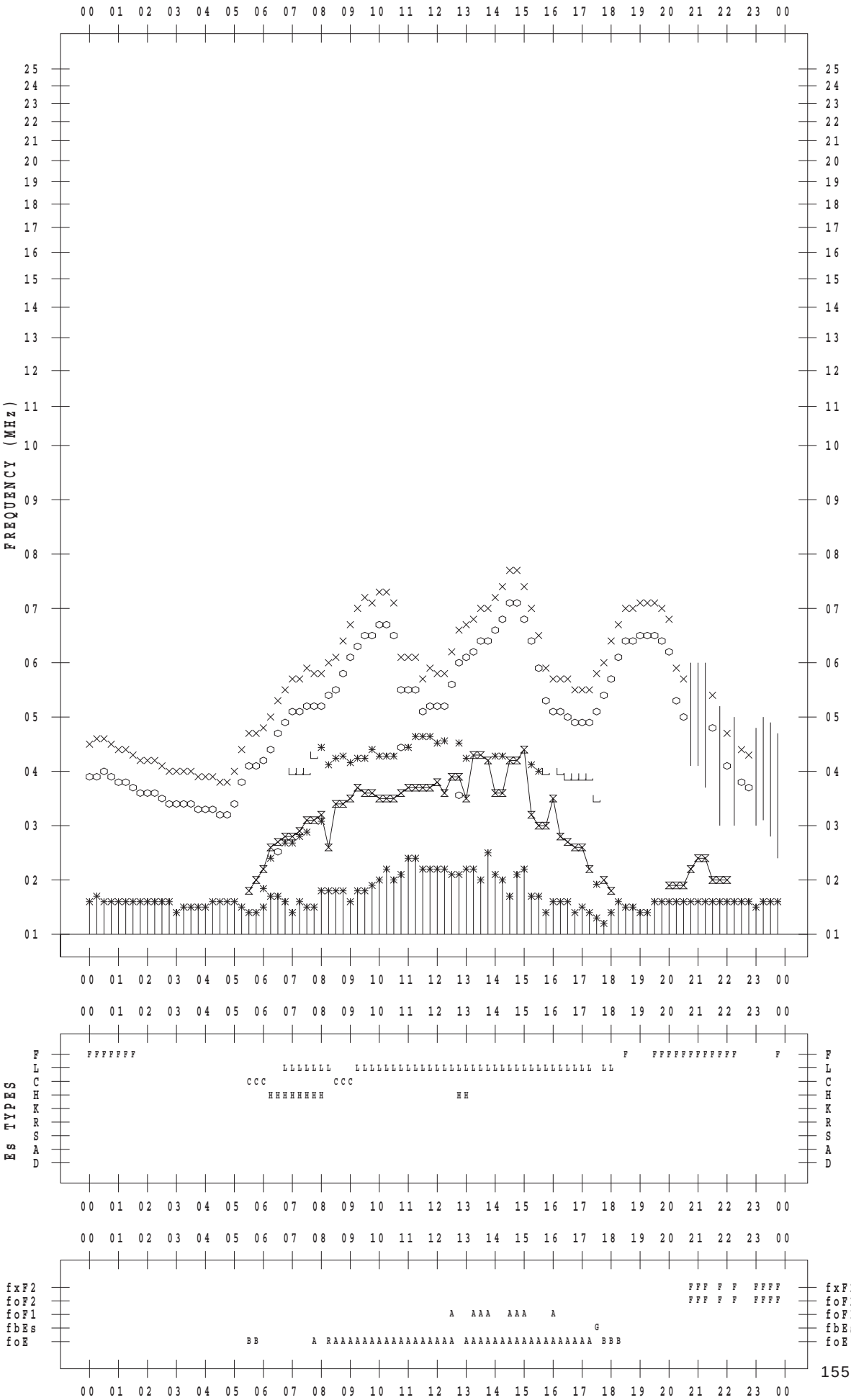
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/18

135 °E MEAN TIME



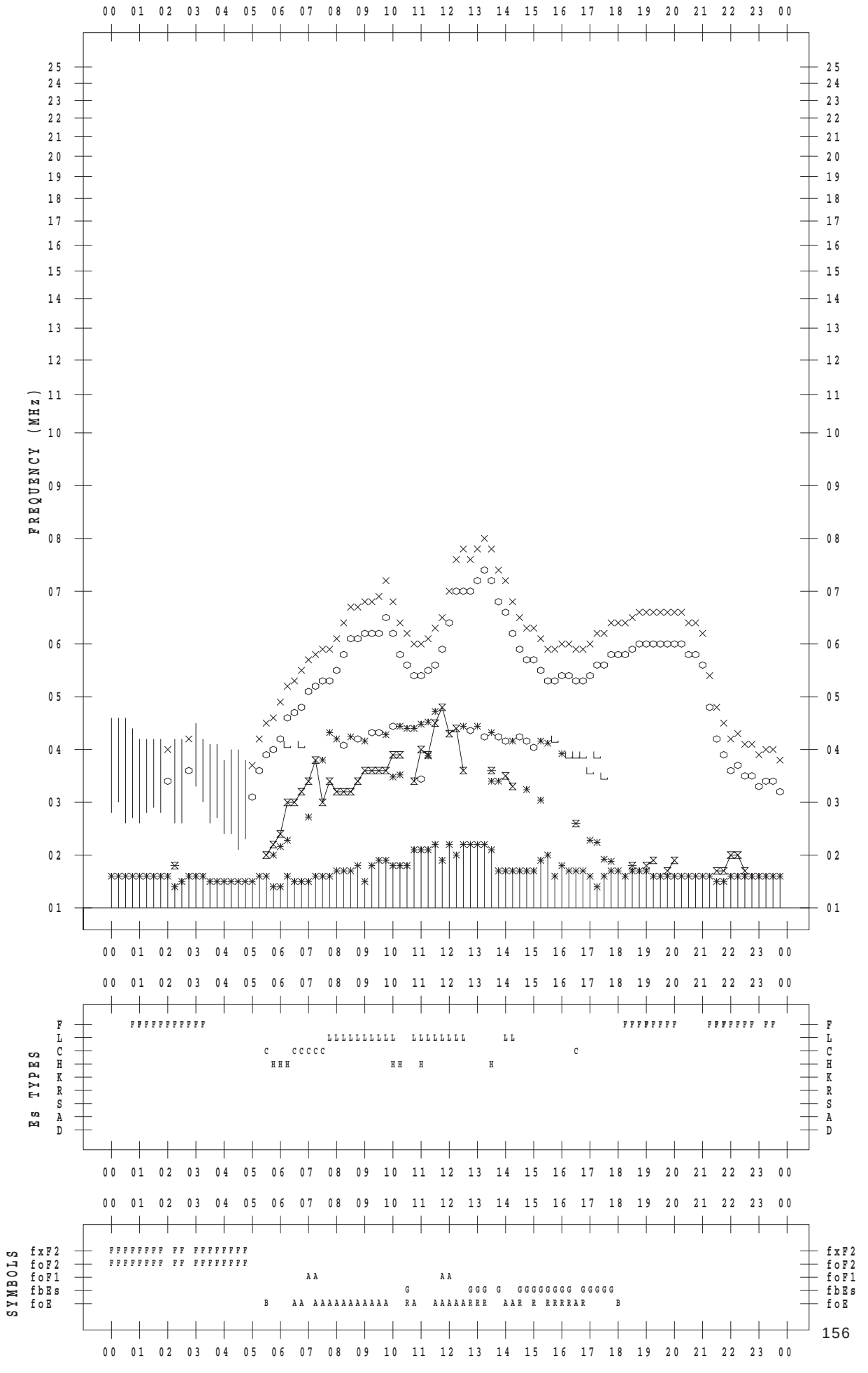
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/19

135 °E MEAN TIME



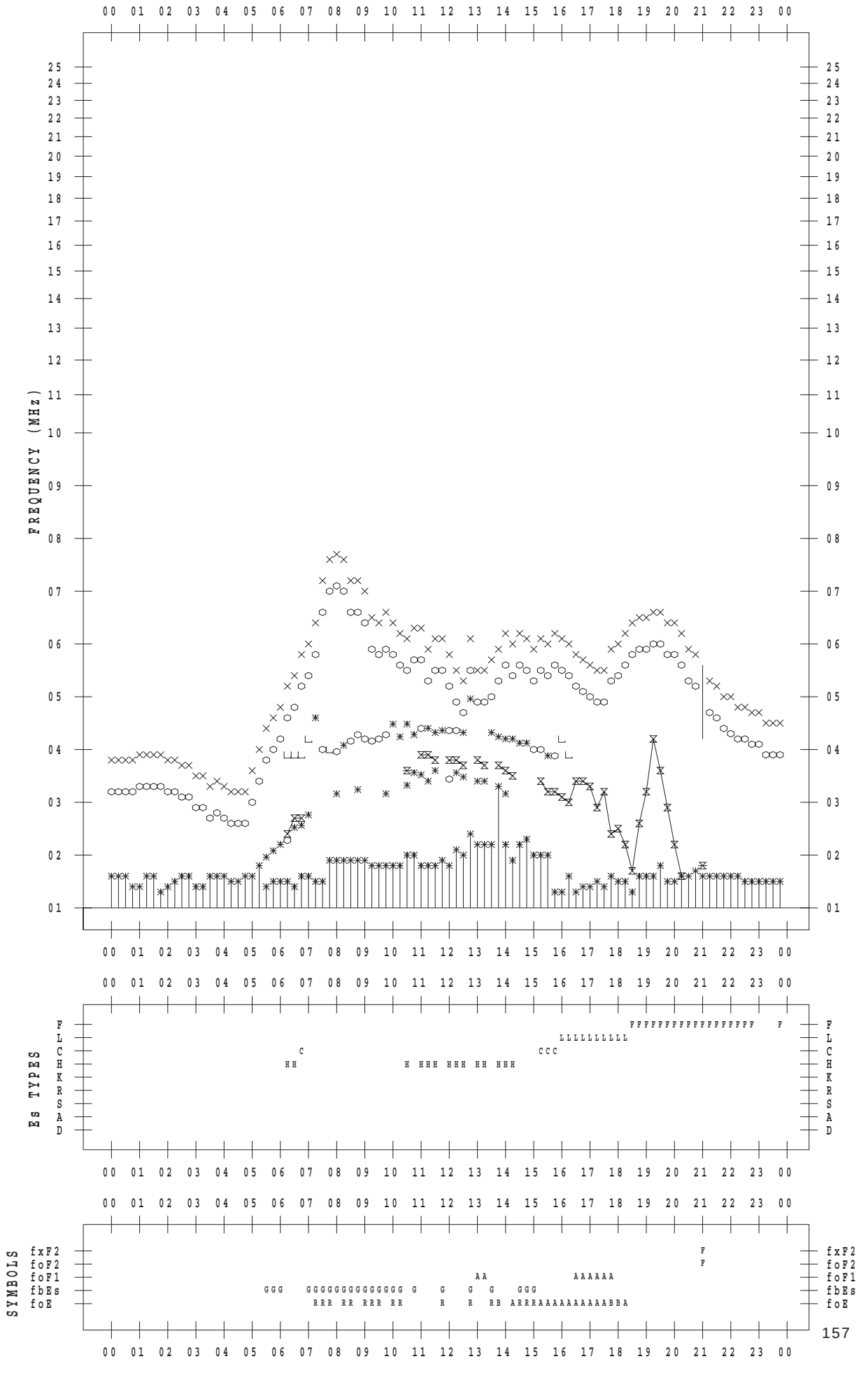
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/20

135 °E MEAN TIME



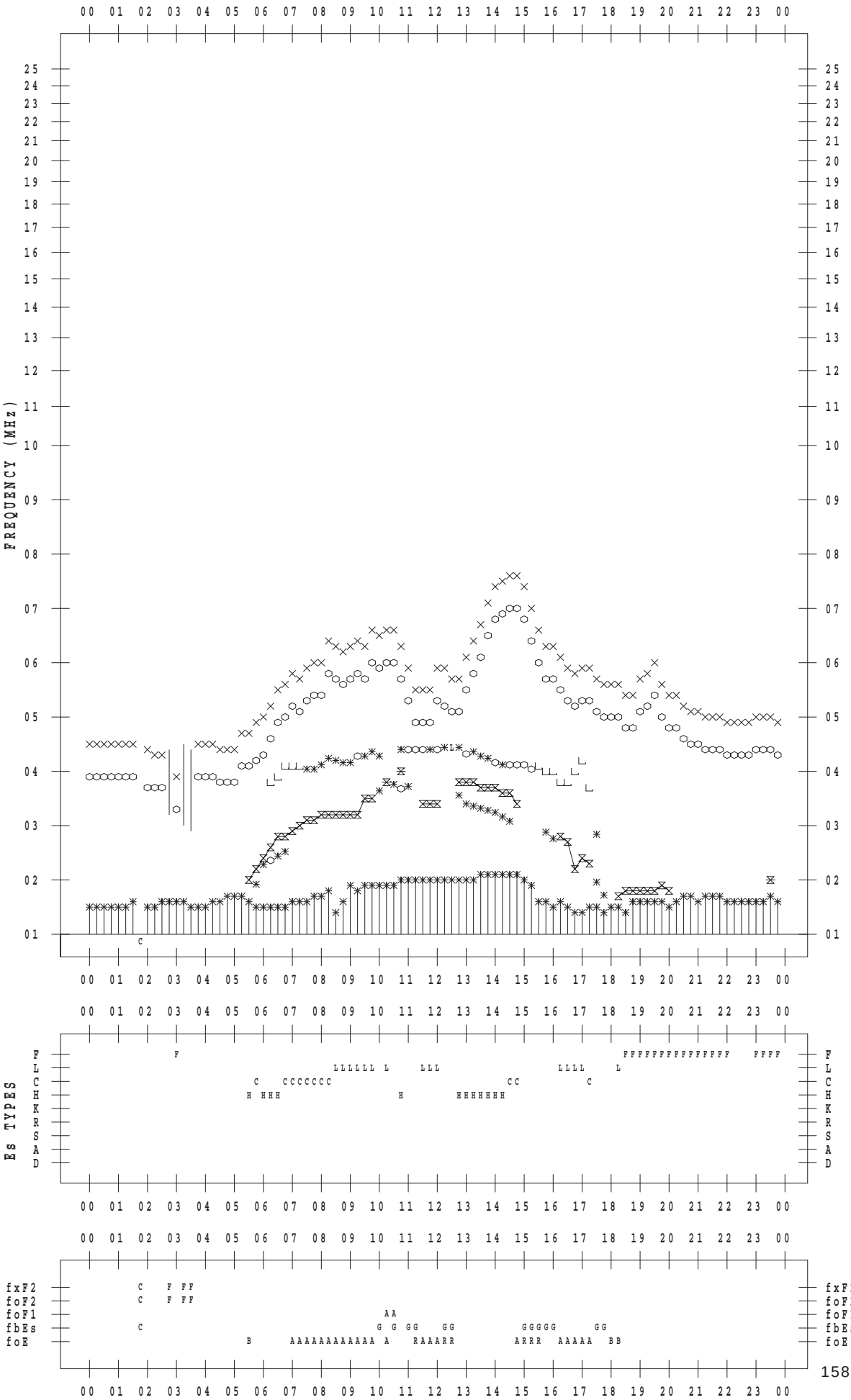
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/21

135 °E MEAN TIME



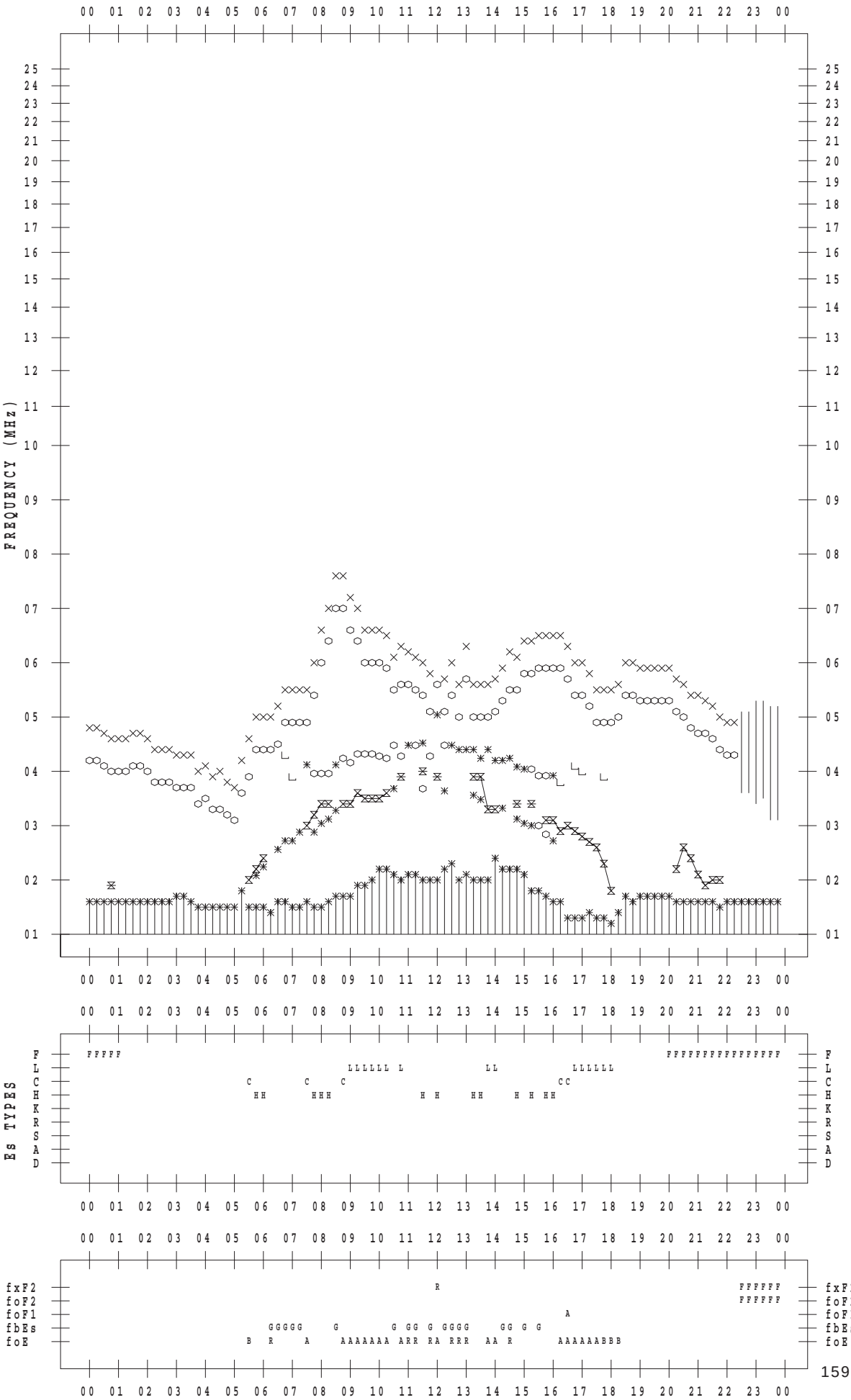
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/22

135 °E MEAN TIME



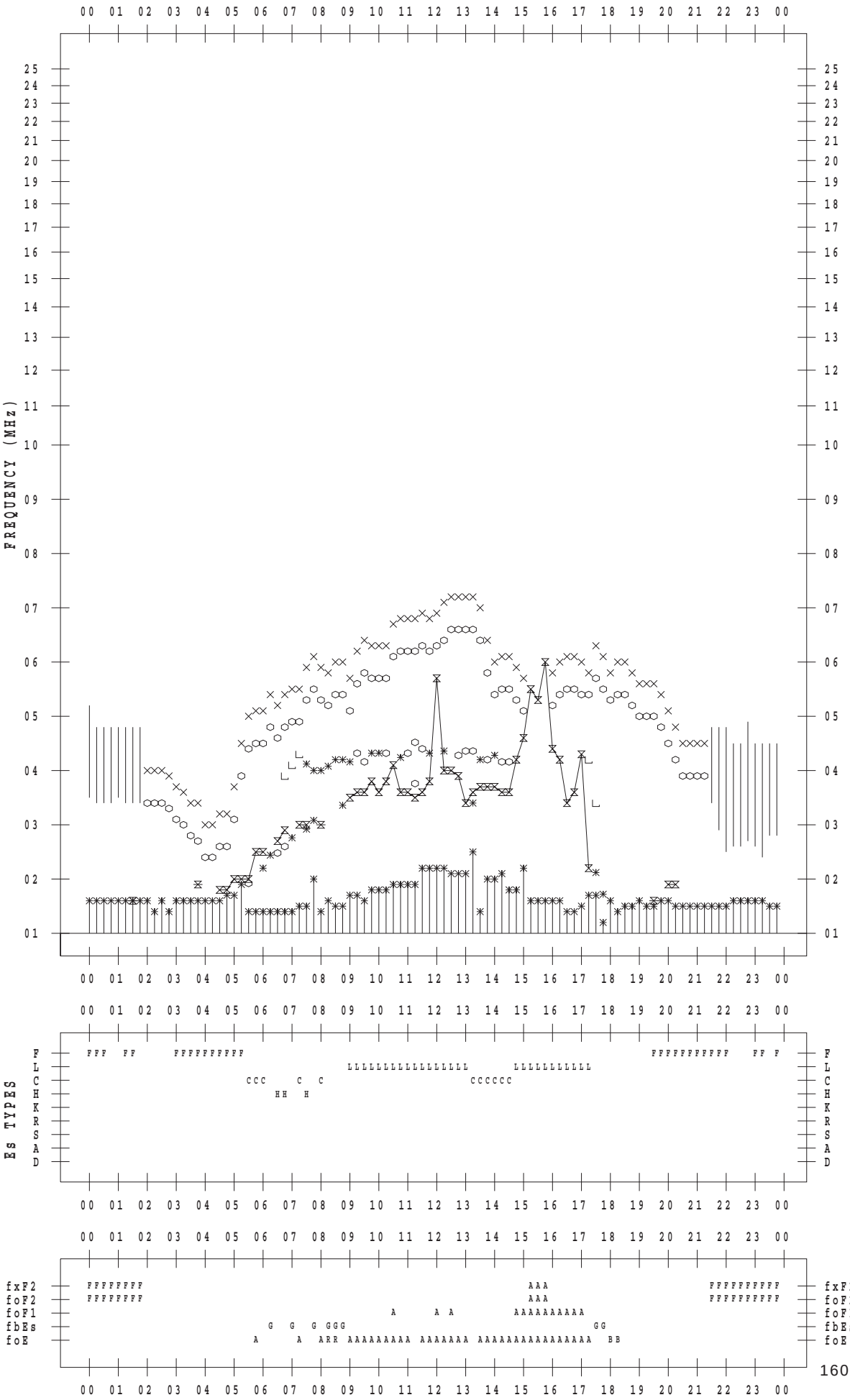
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/23

135 °E MEAN TIME



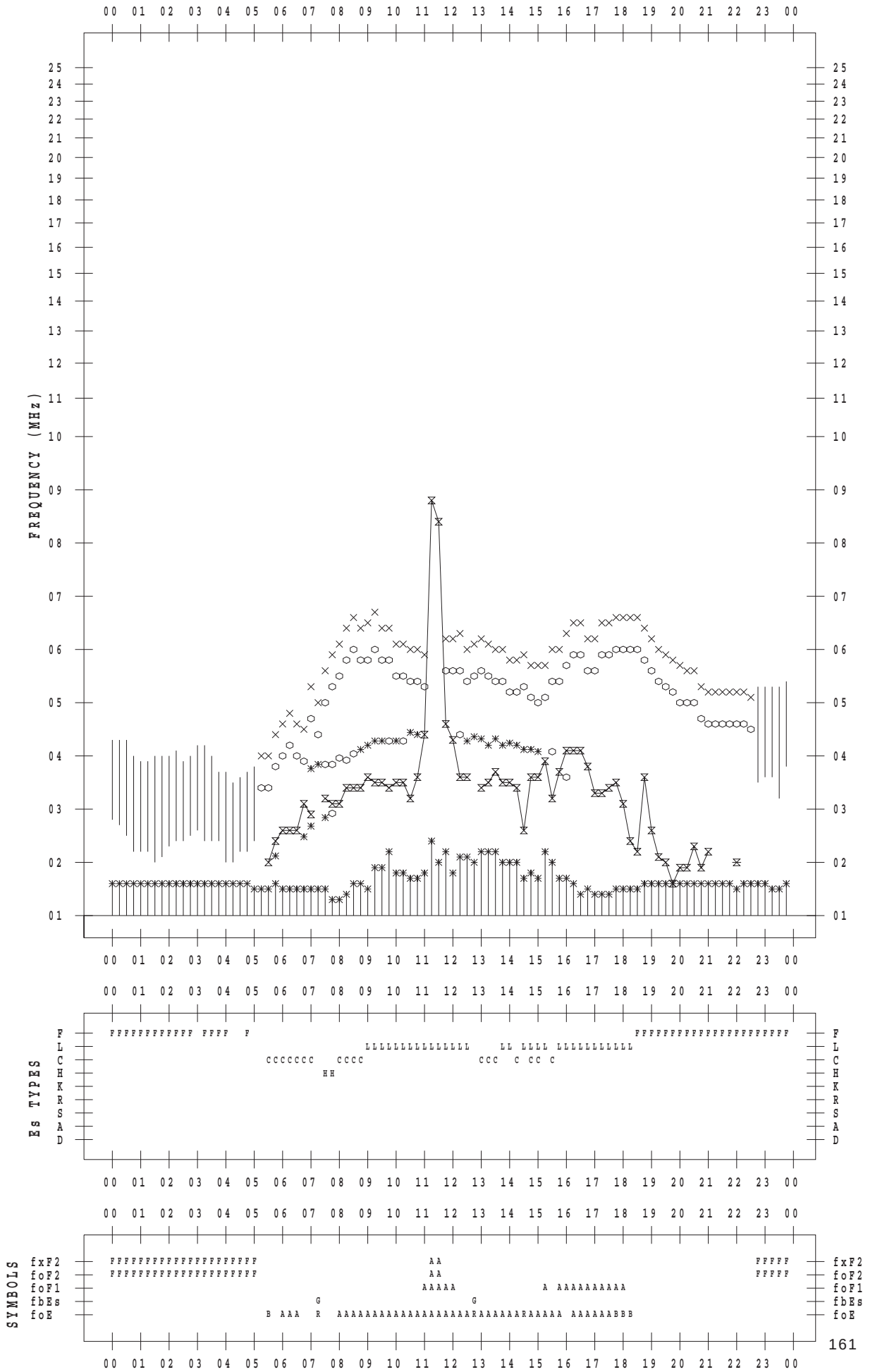
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/24

135 °E MEAN TIME



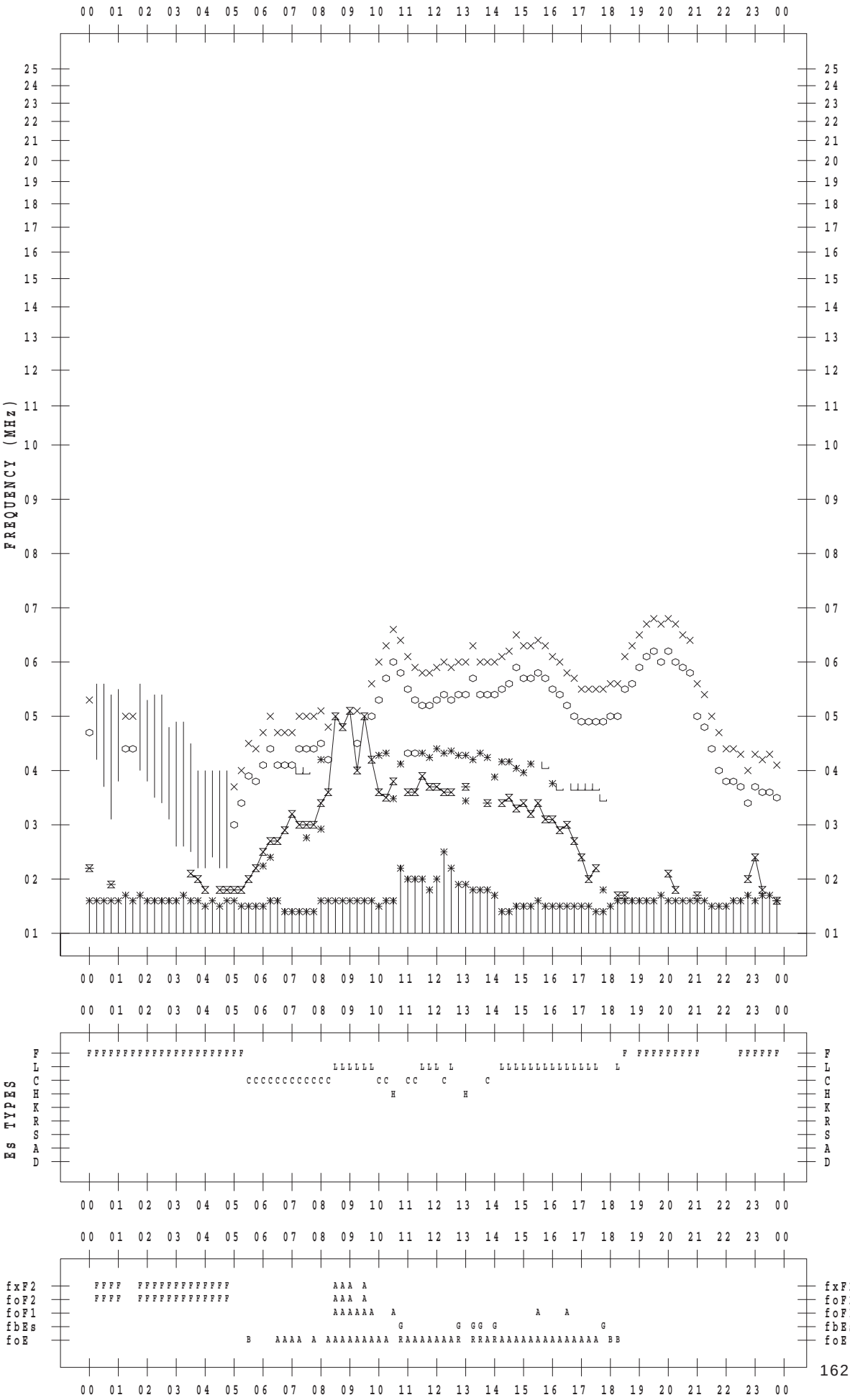
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/25

135 °E MEAN TIME



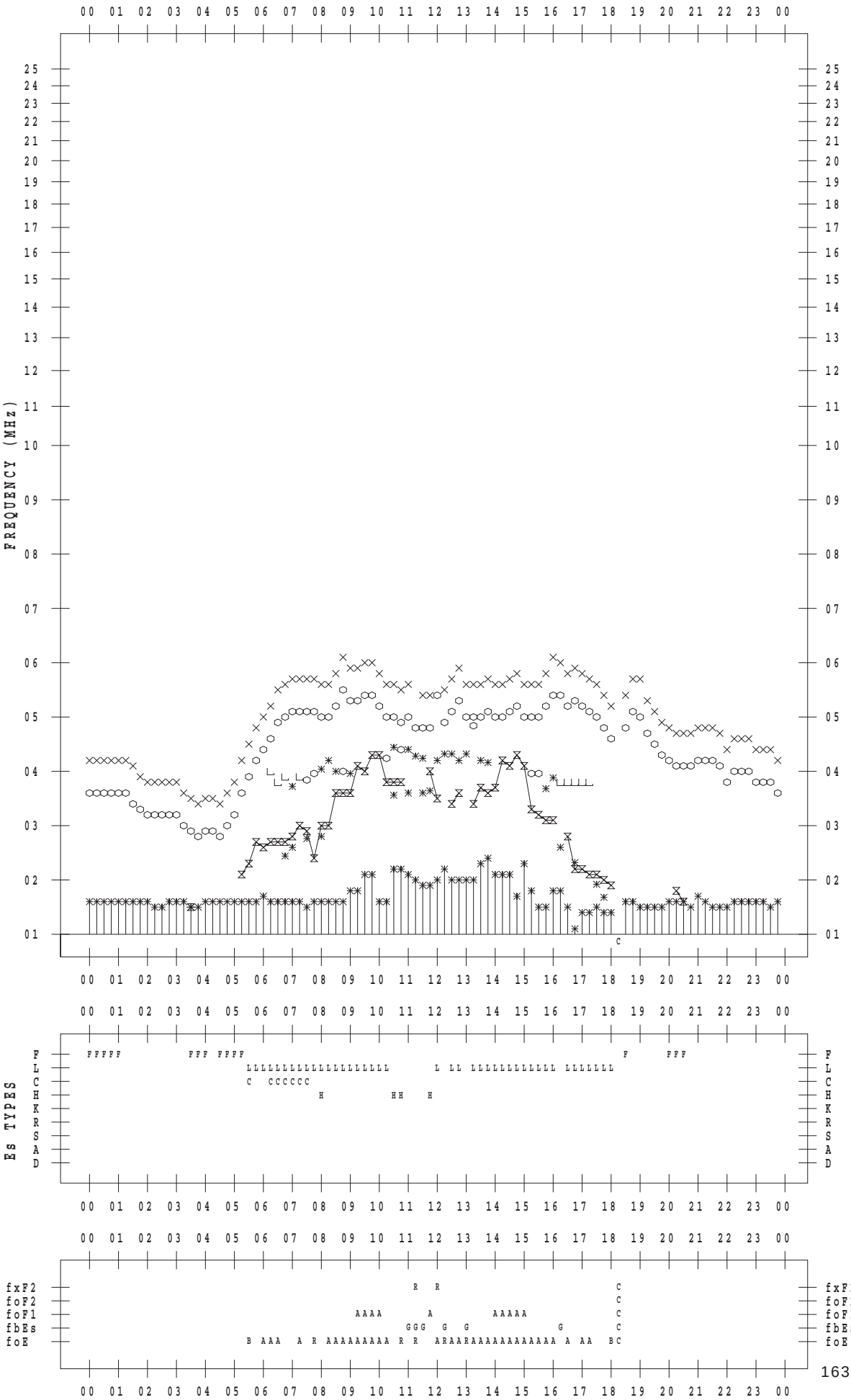
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/26

135 °E MEAN TIME



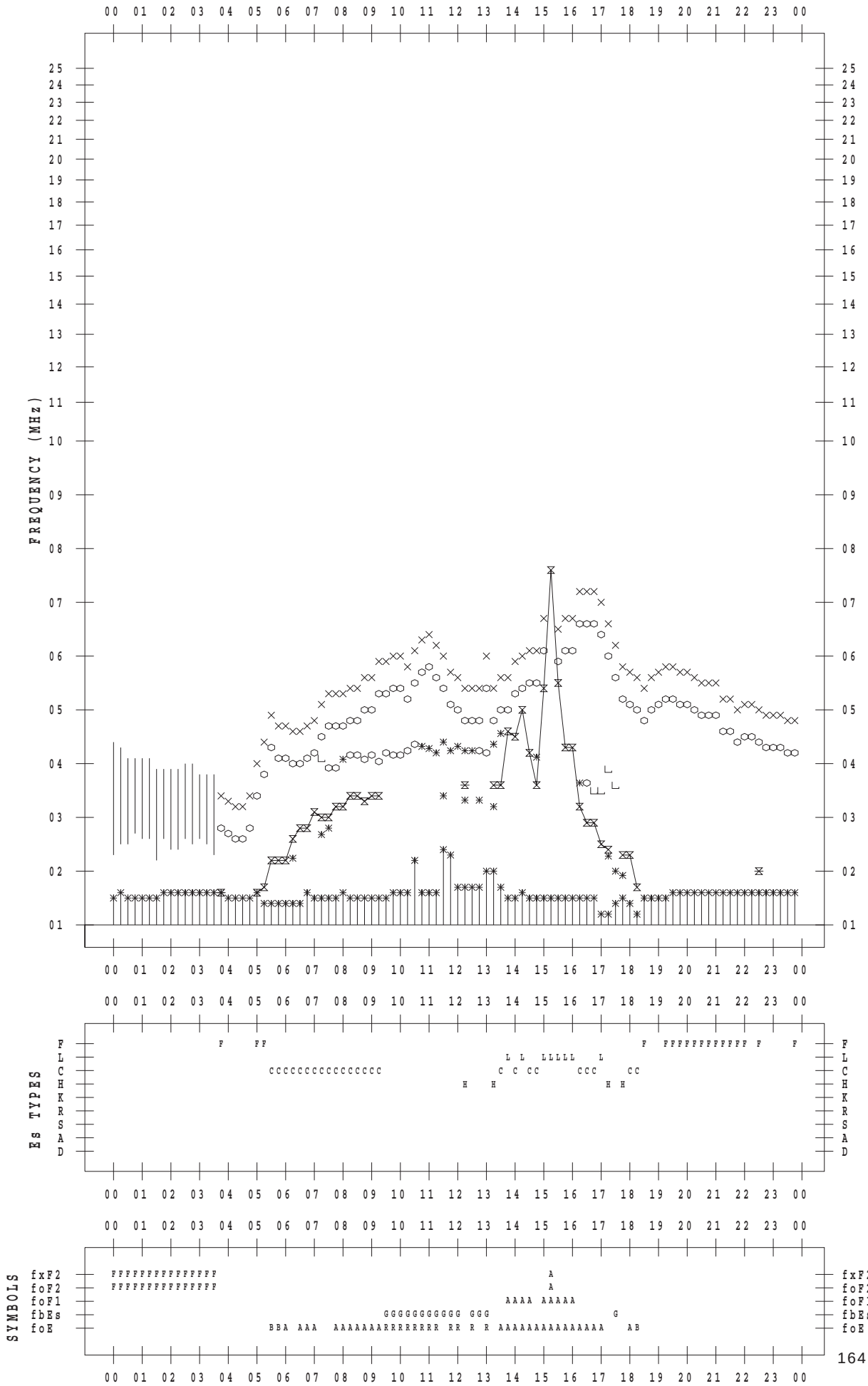
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/27

135 °E MEAN TIME



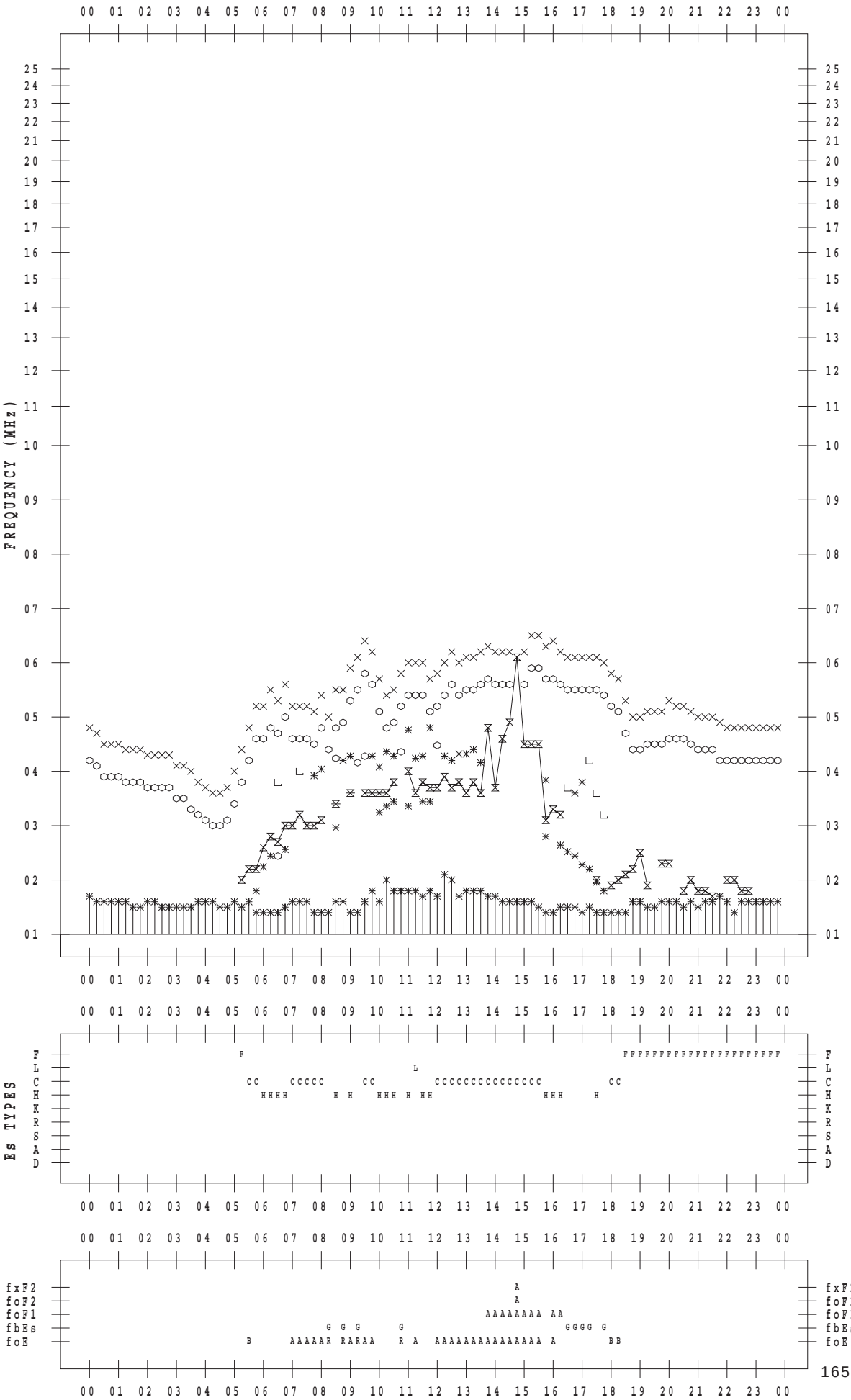
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/28

135 °E MEAN TIME



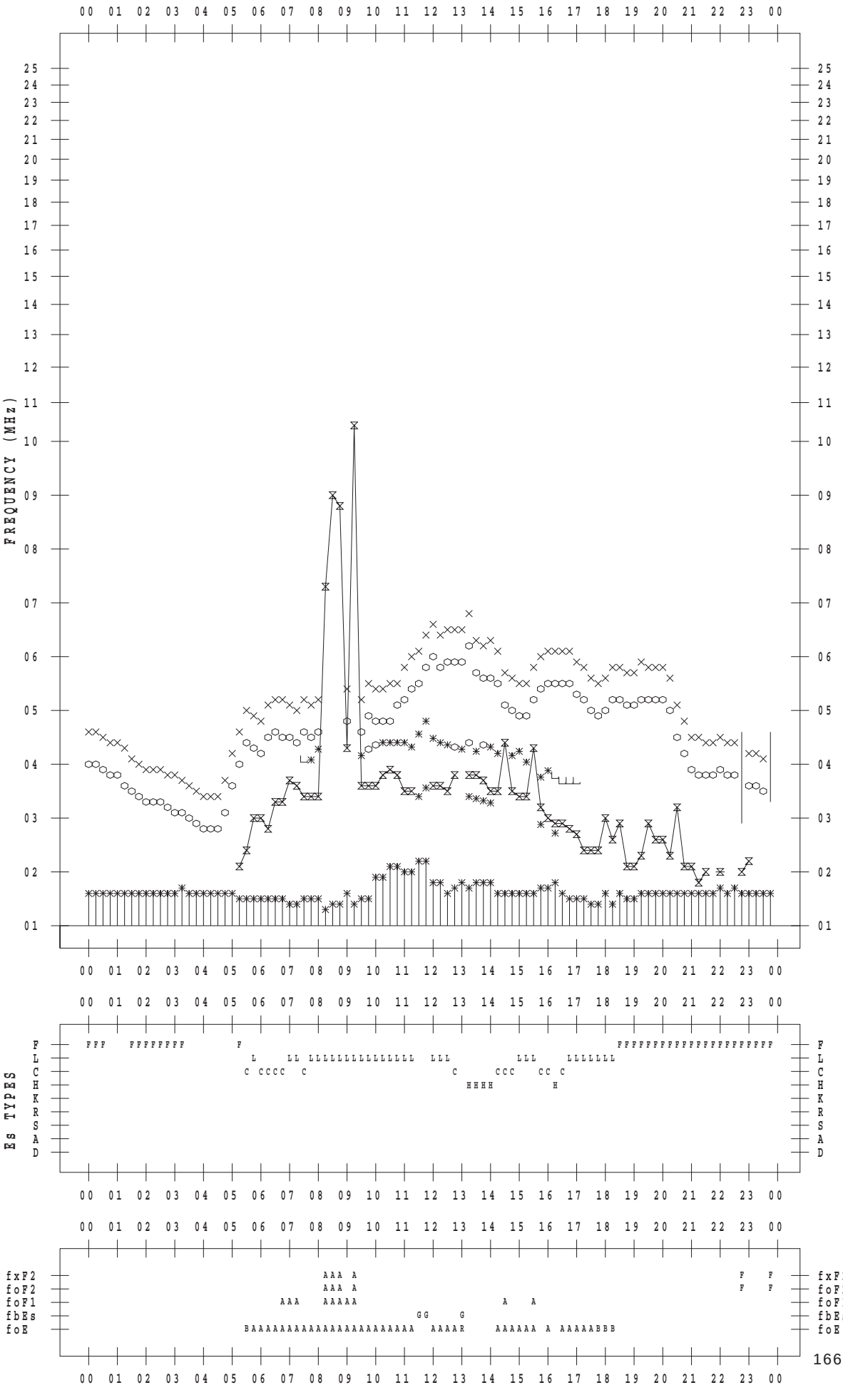
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 4/29

135 °E MEAN TIME



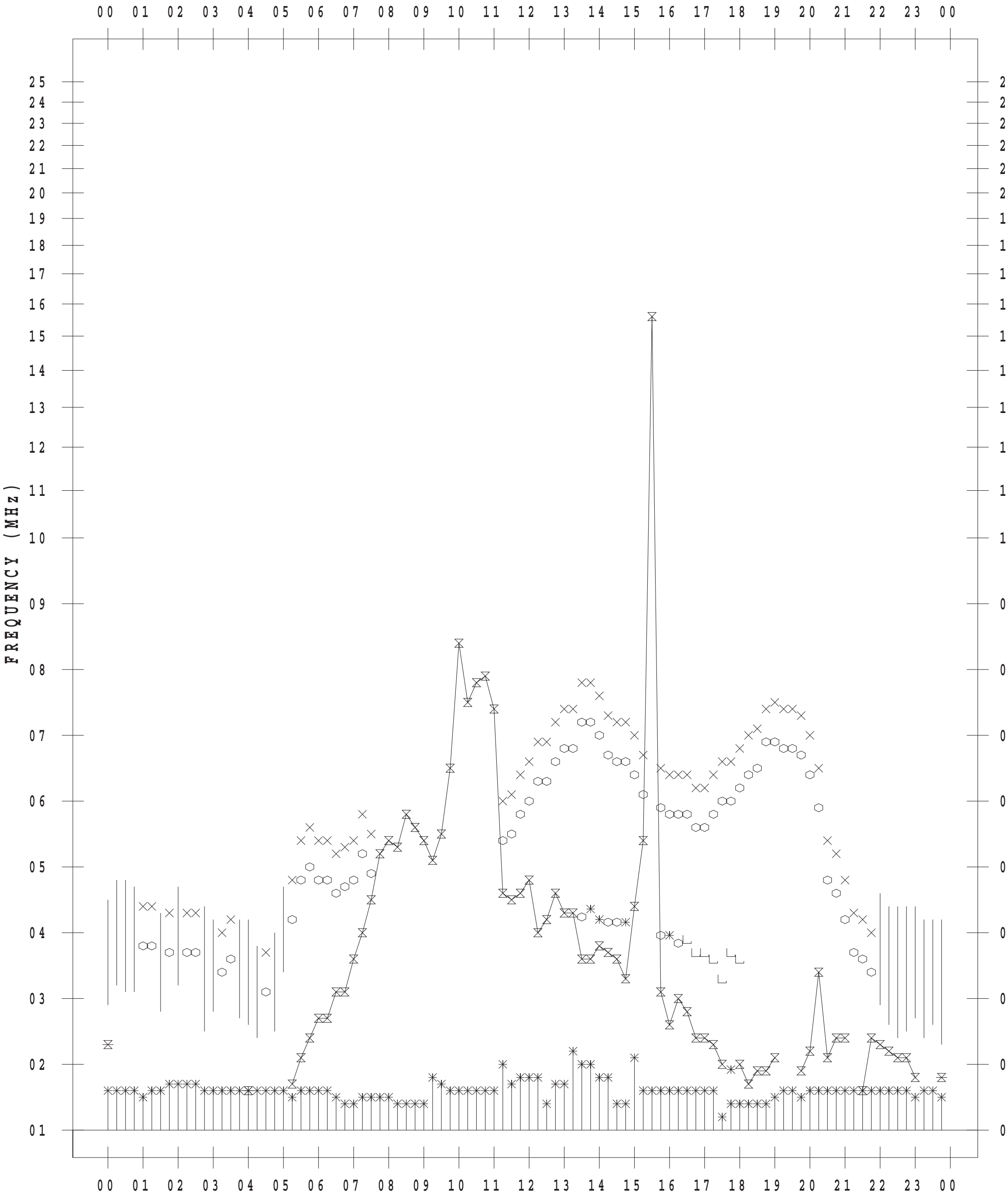
f-PLOT DATA

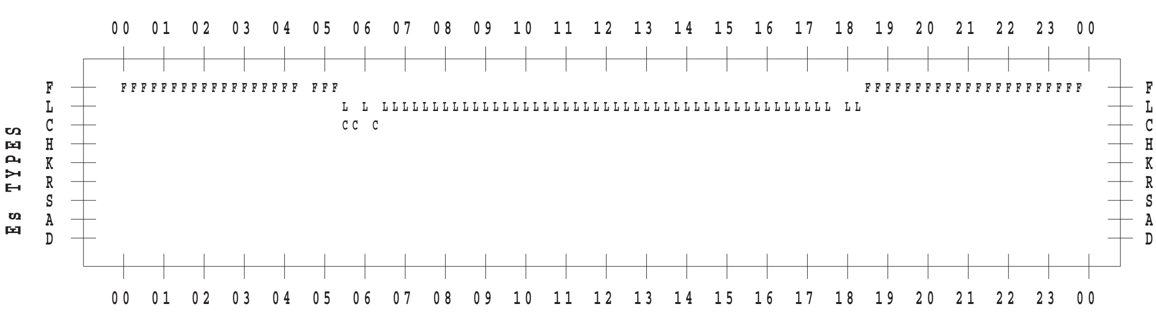
SCALER : I.NISHIMUTA

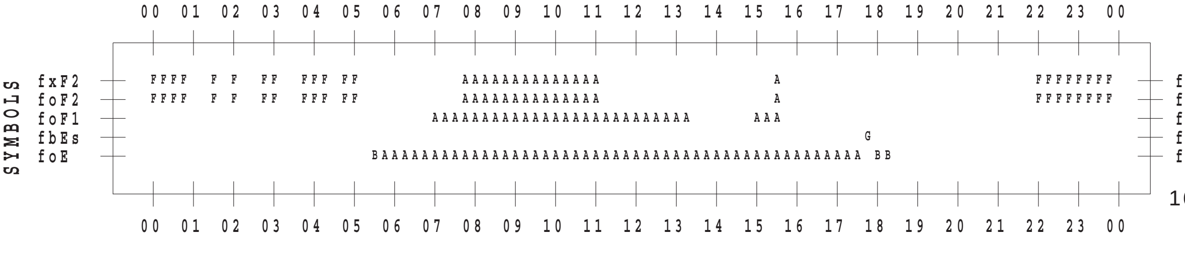
STATION : Kokubunji

DATE : 2019/ 4/30

135 °E MEAN TIME







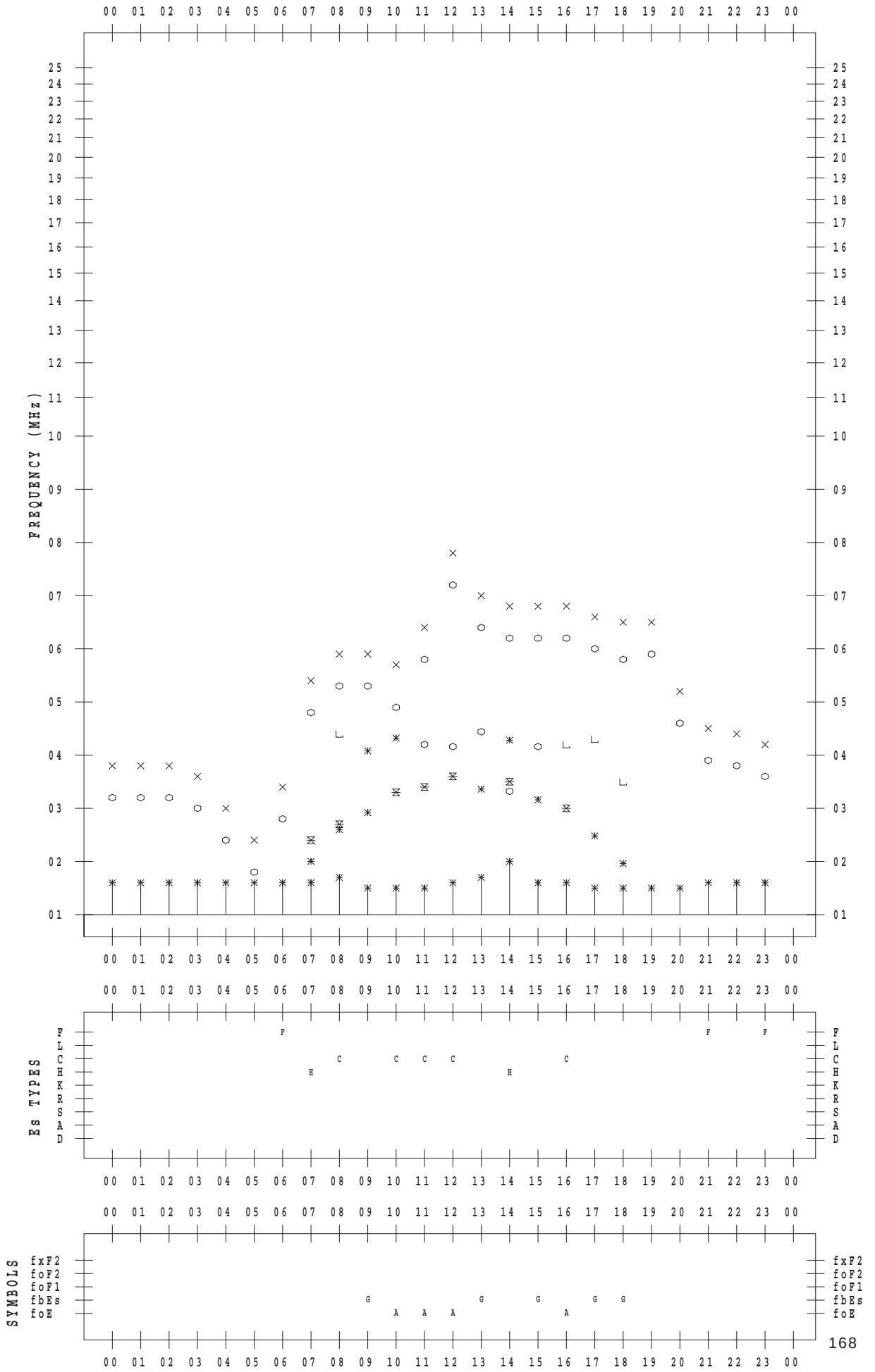
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 1

135 °E MEAN TIME



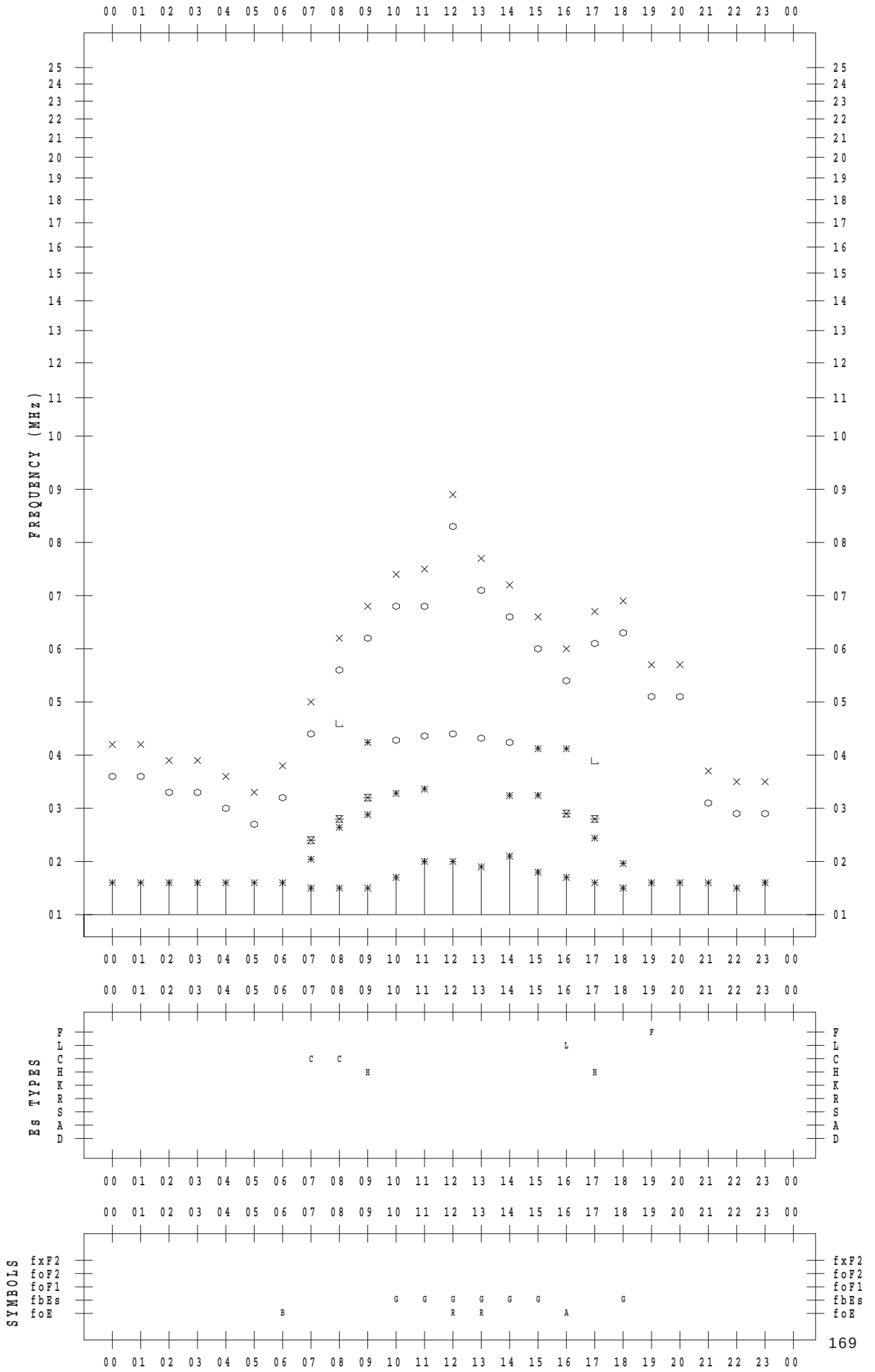
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 2

135 °E MEAN TIME



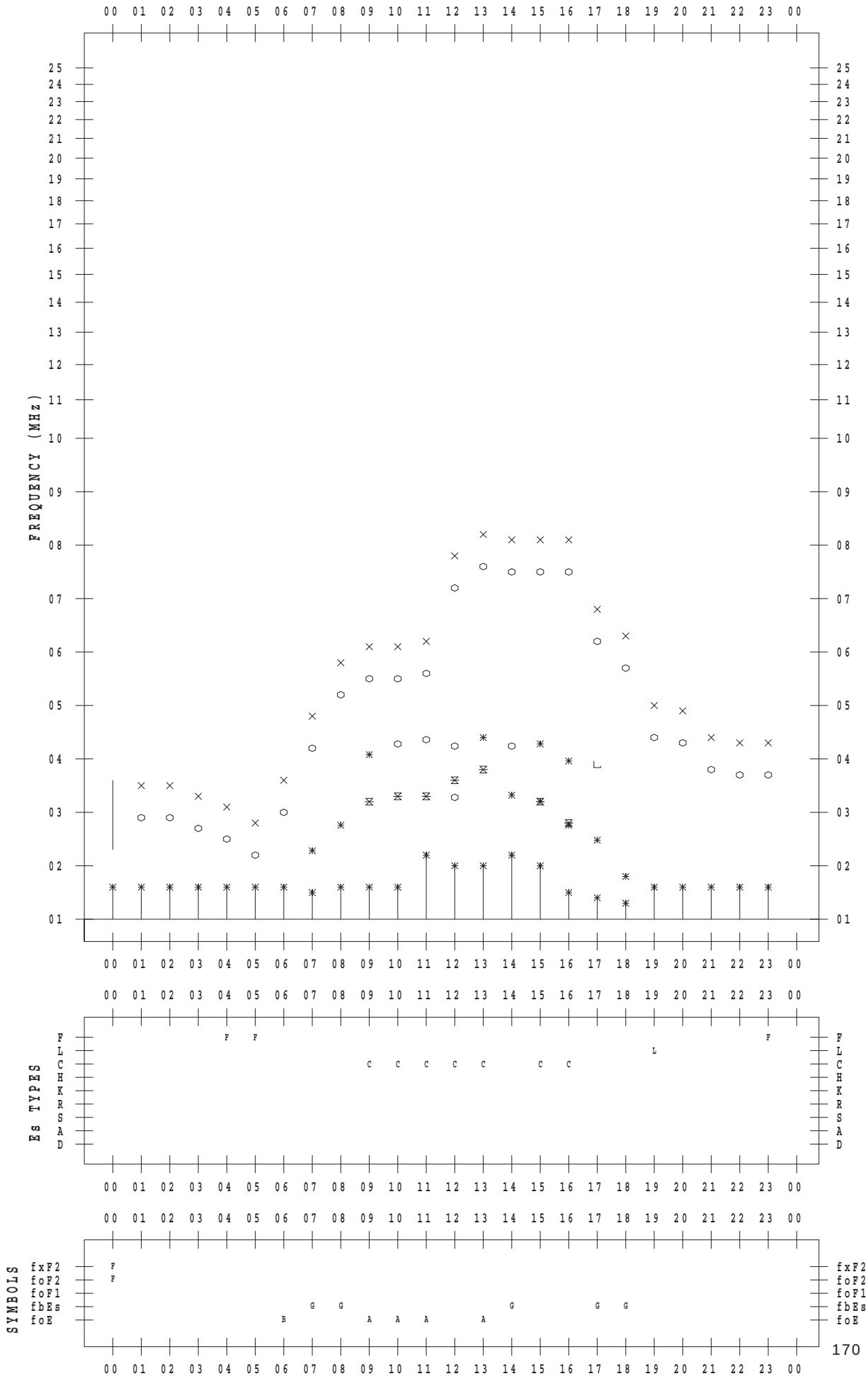
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 3

135 °E MEAN TIME



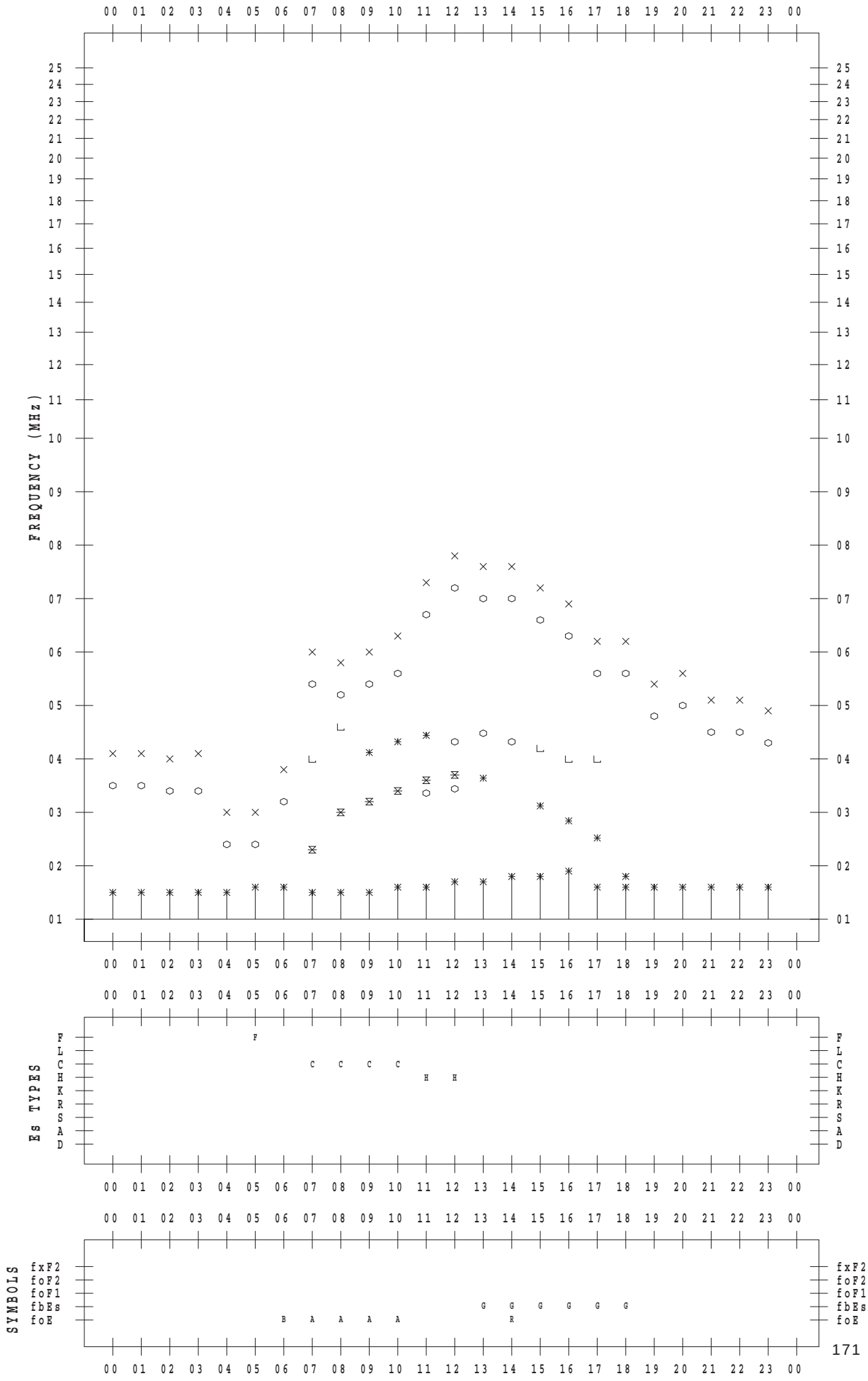
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 4

135 °E MEAN TIME



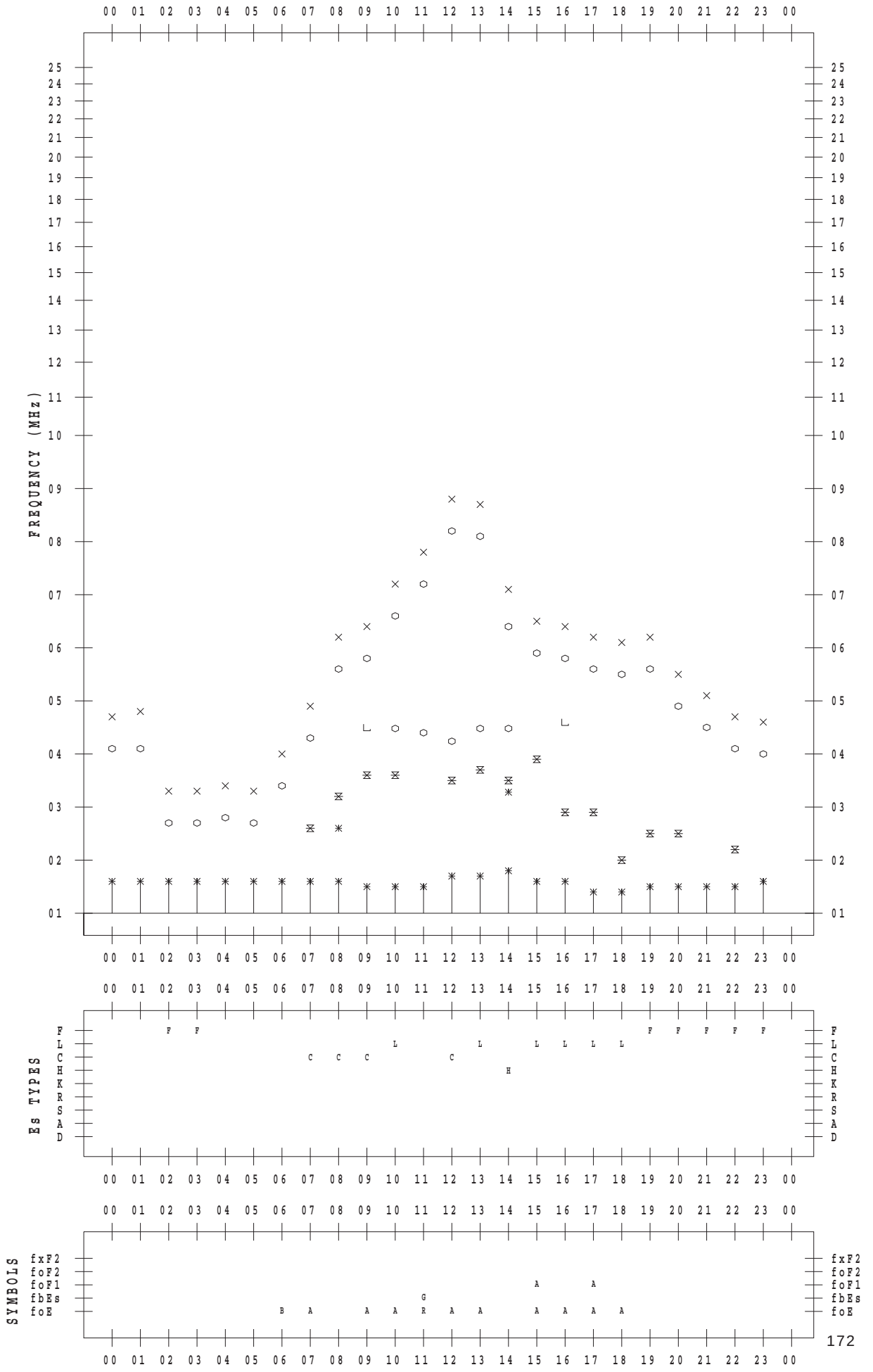
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 5

135 °E MEAN TIME



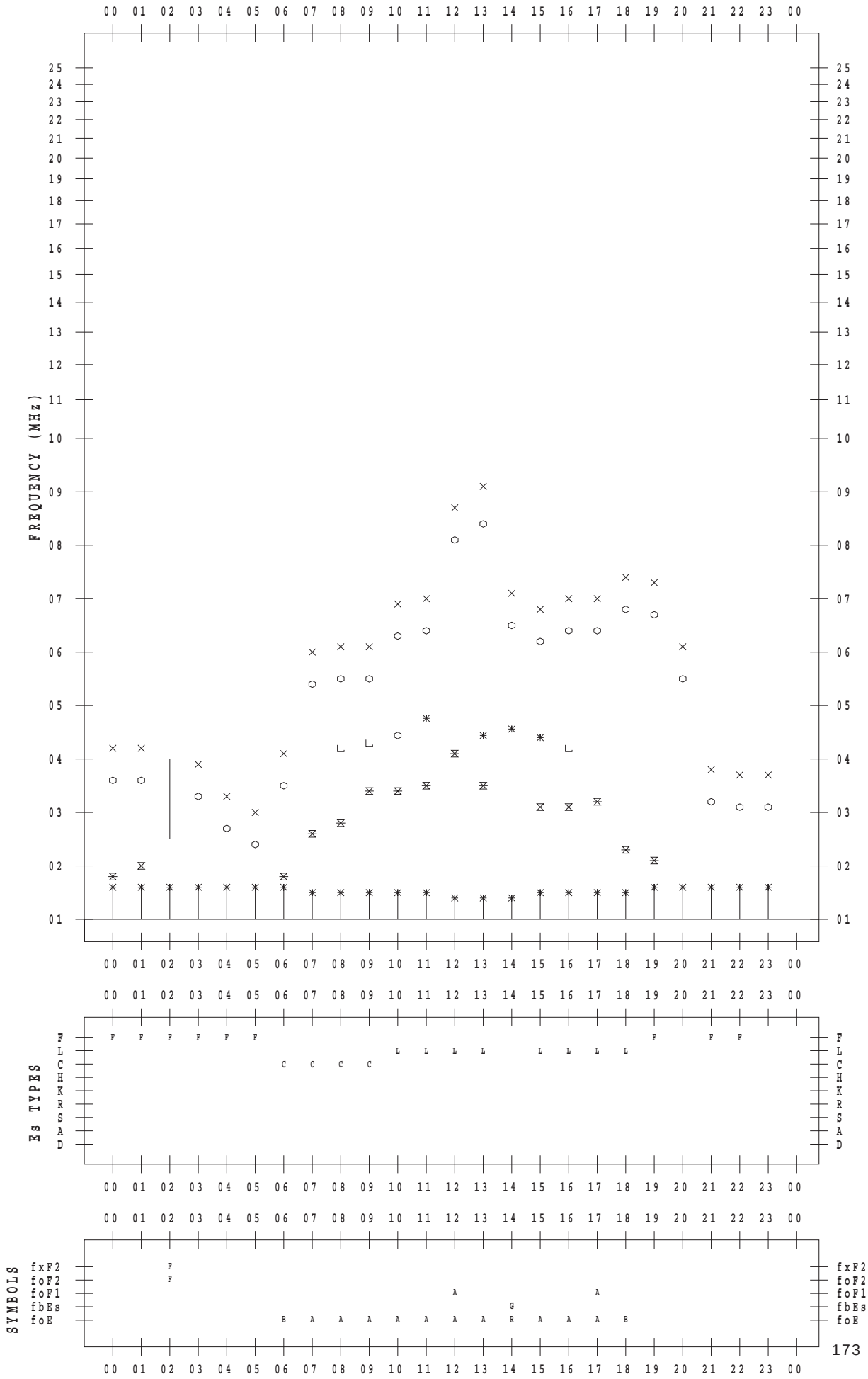
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 6

135 °E MEAN TIME



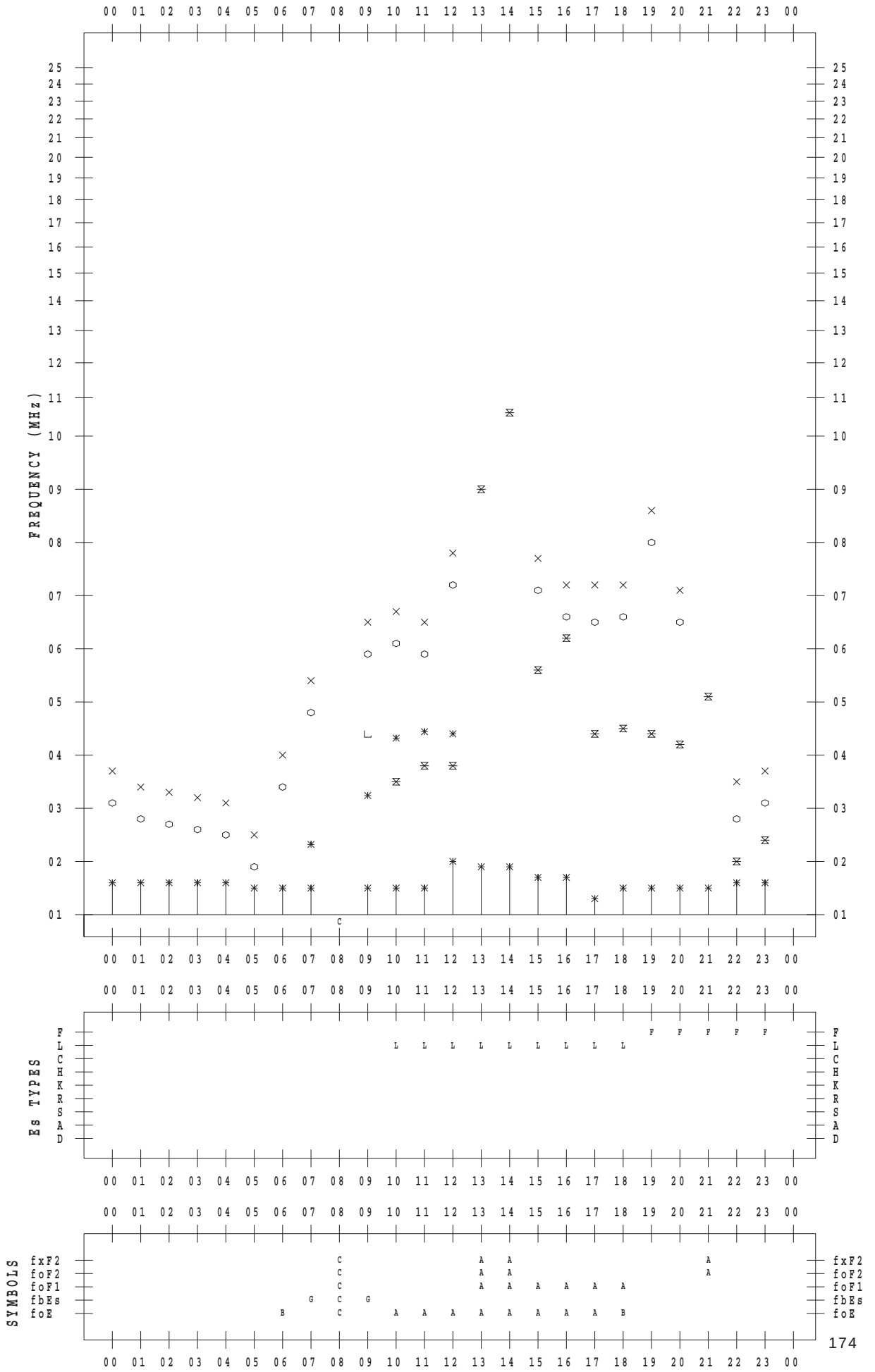
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 7

135 °E MEAN TIME



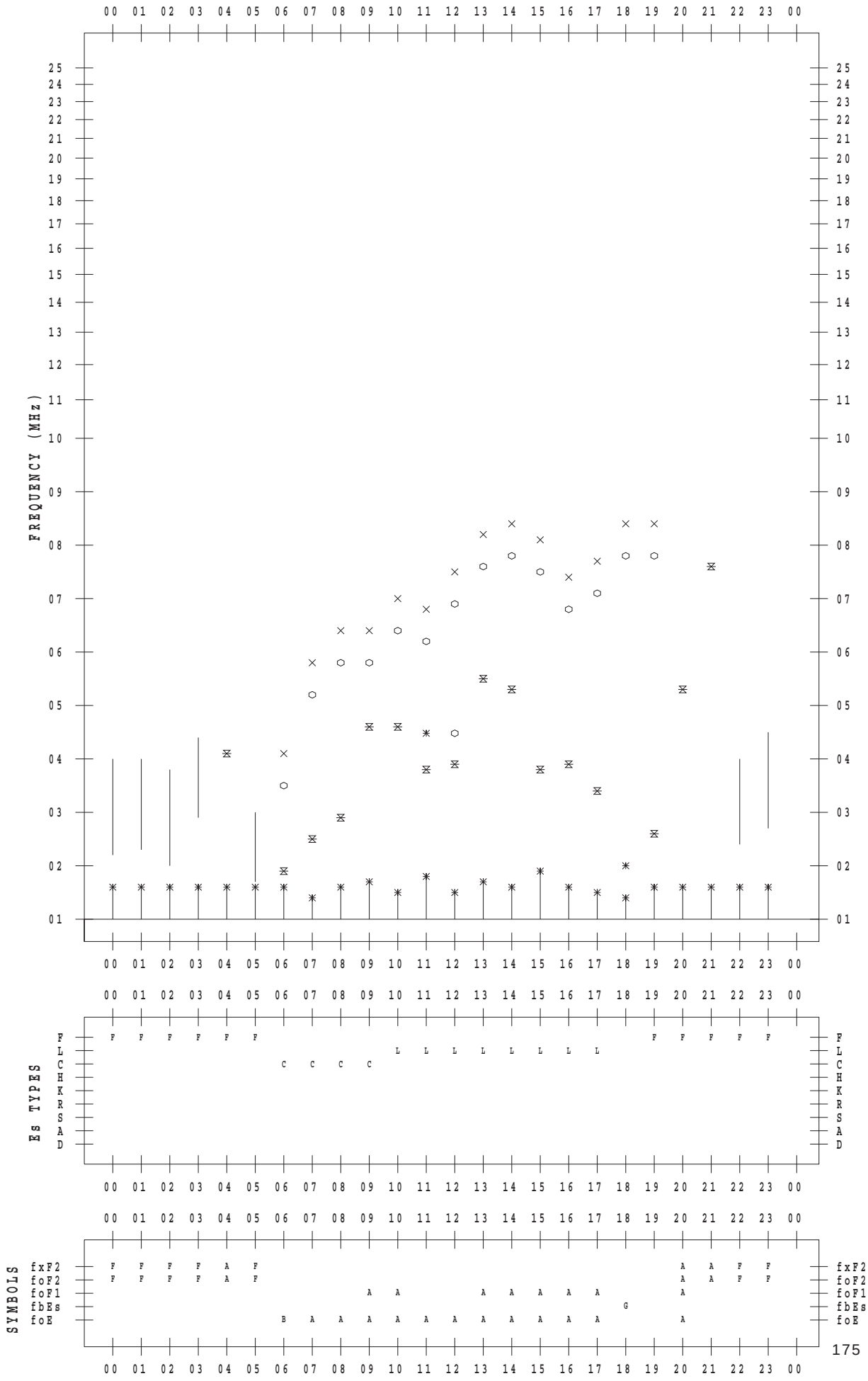
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 8

135 °E MEAN TIME



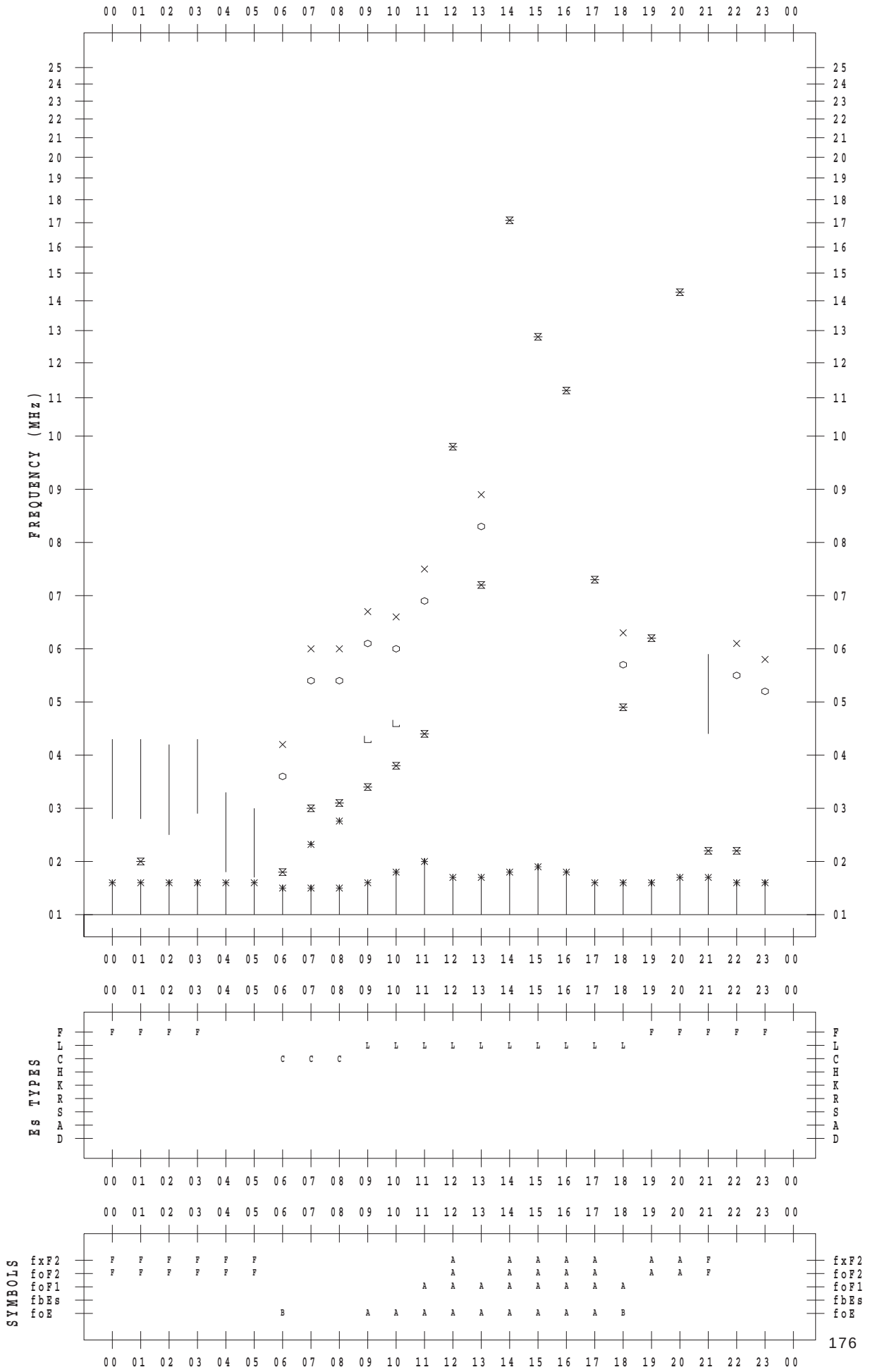
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/ 9

135 °E MEAN TIME



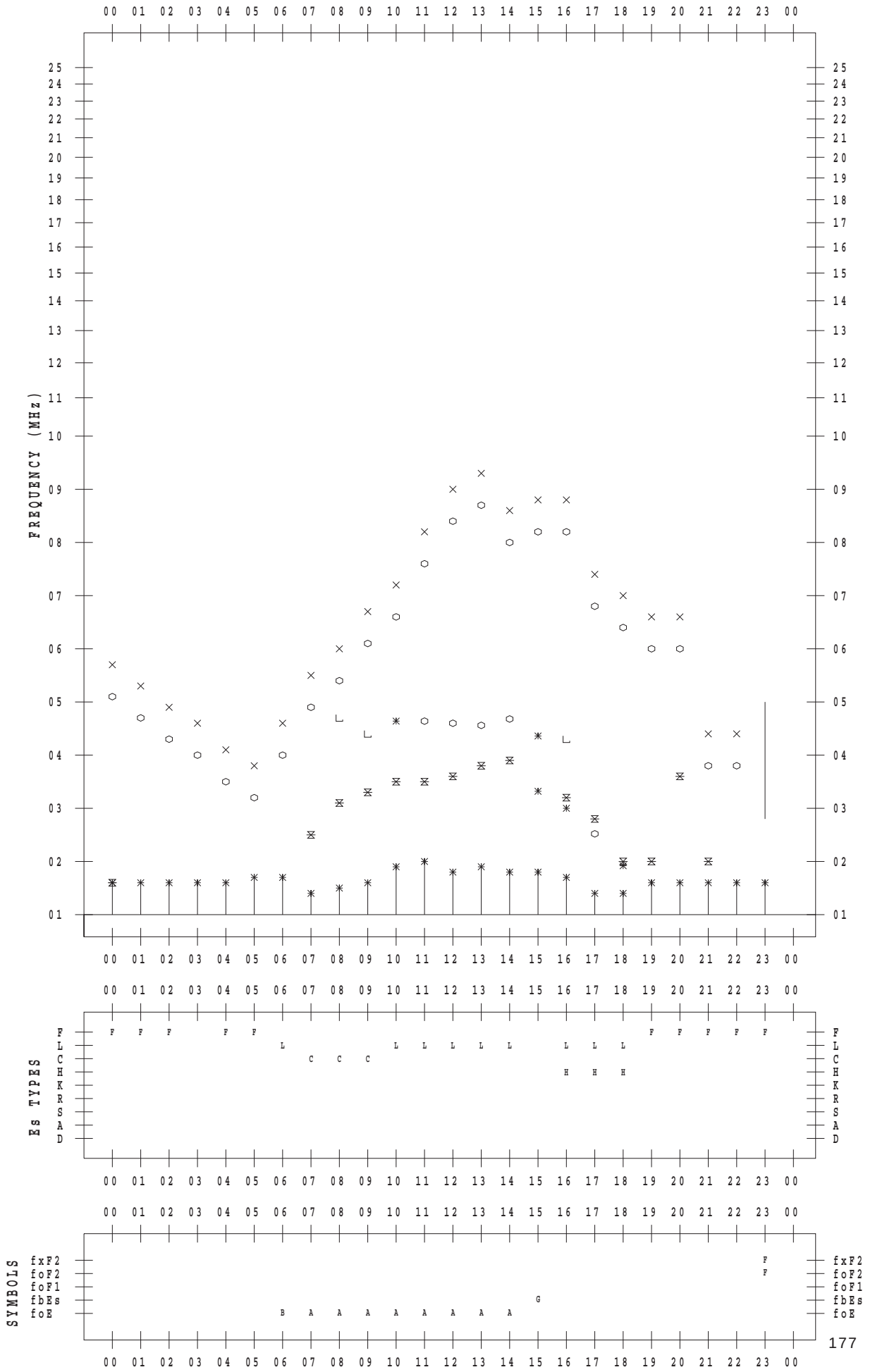
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/10

135 °E MEAN TIME



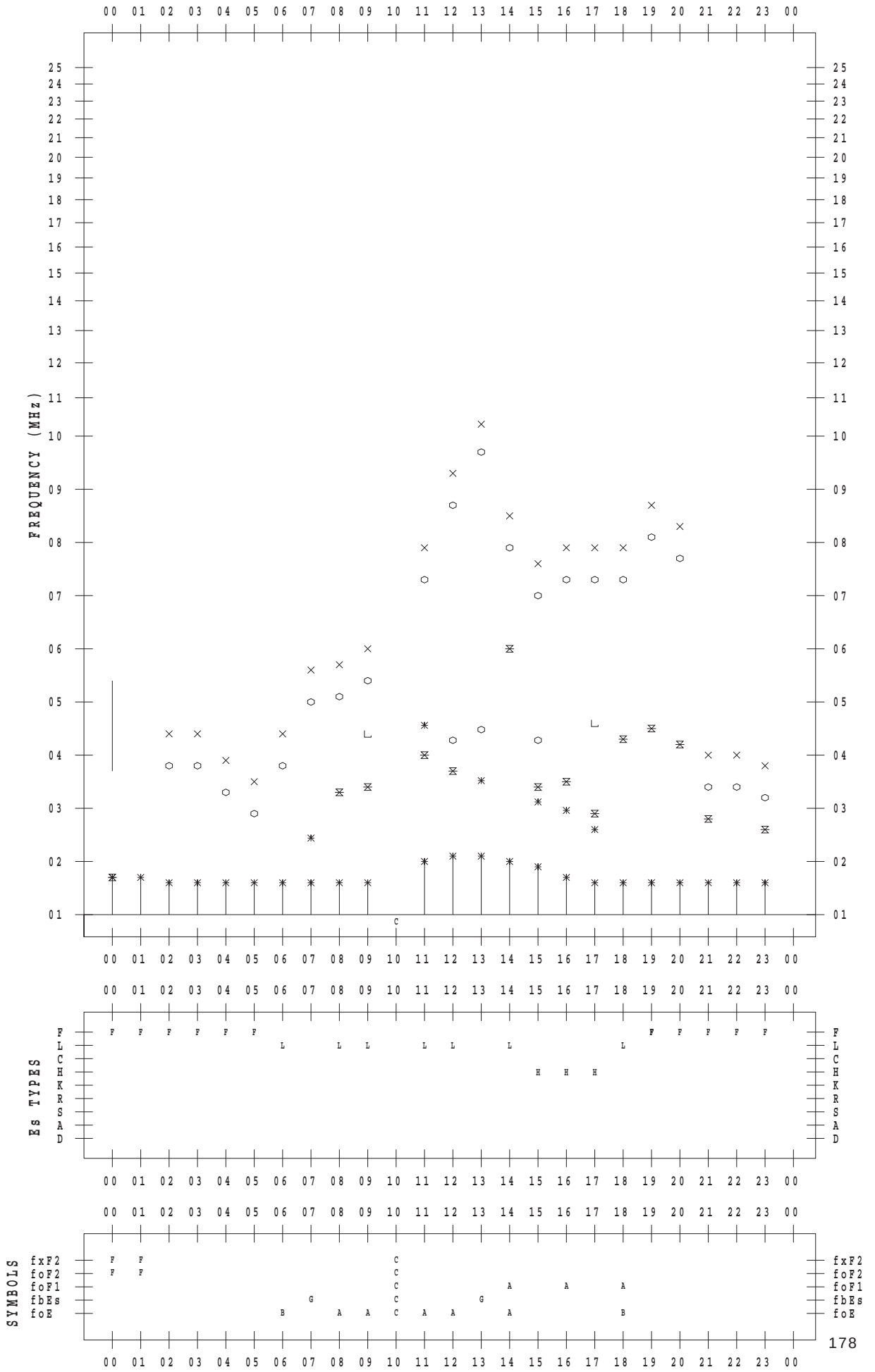
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/11

135 °E MEAN TIME



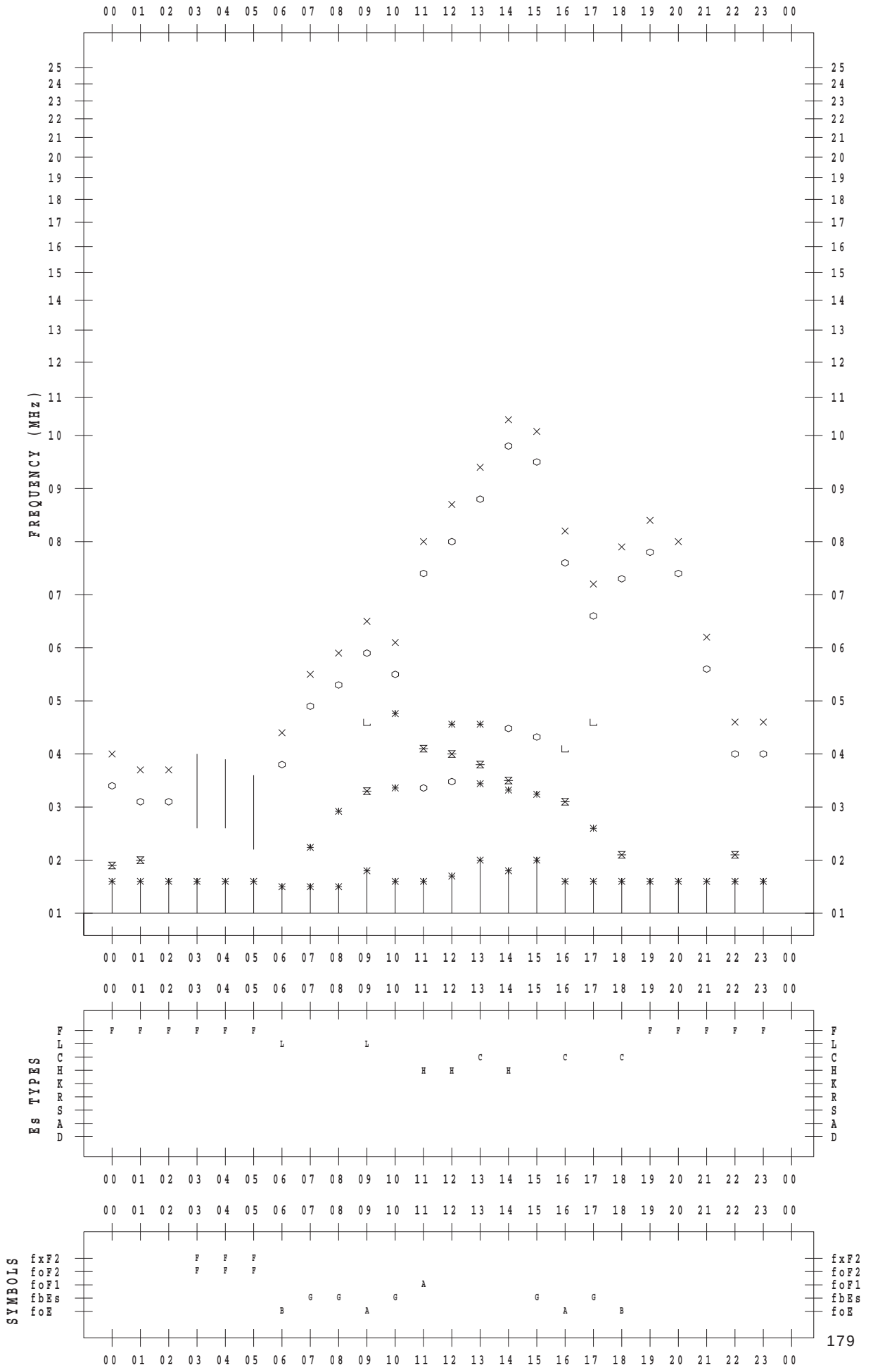
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/12

135 °E MEAN TIME



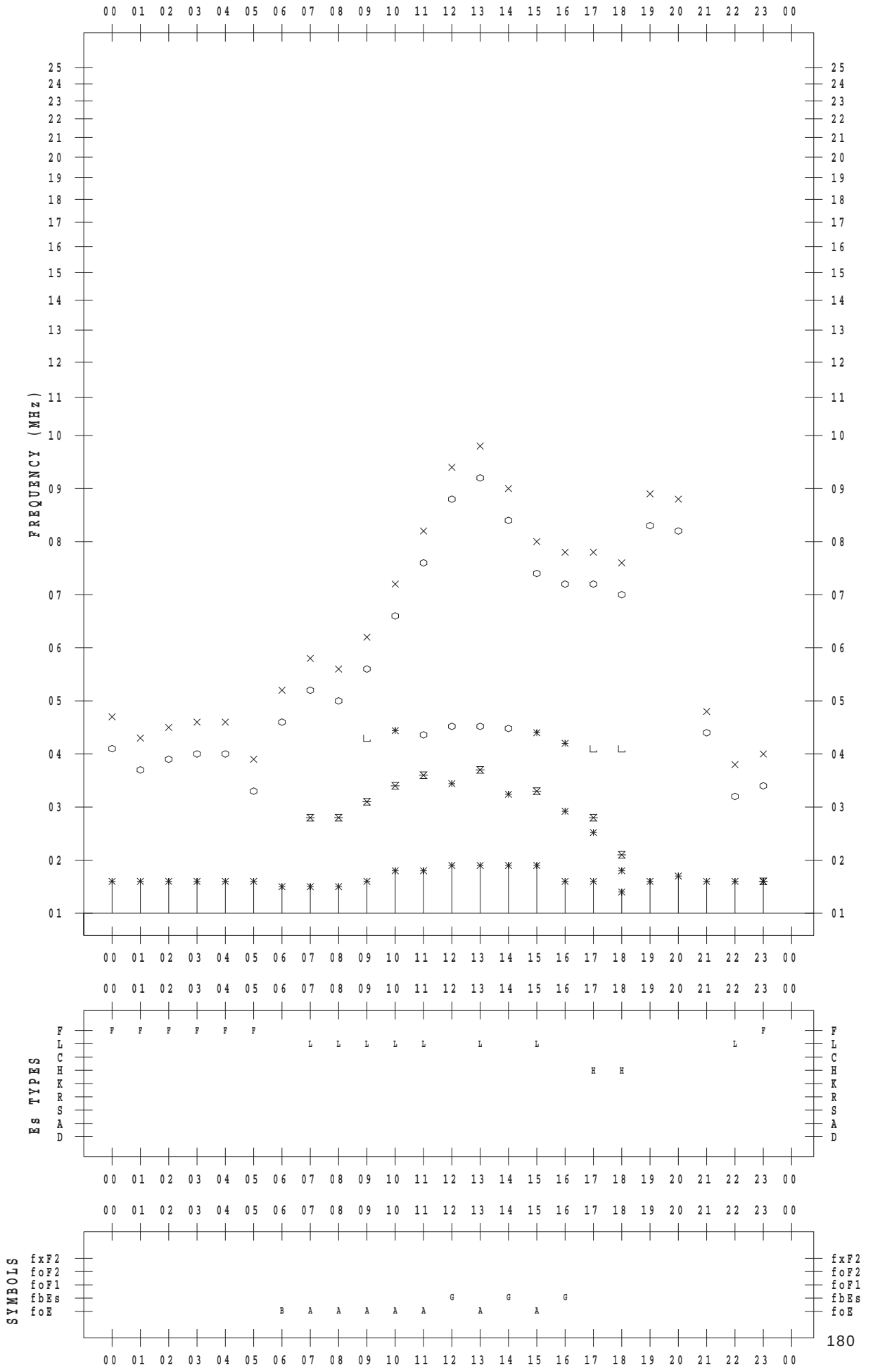
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/13

135 °E MEAN TIME



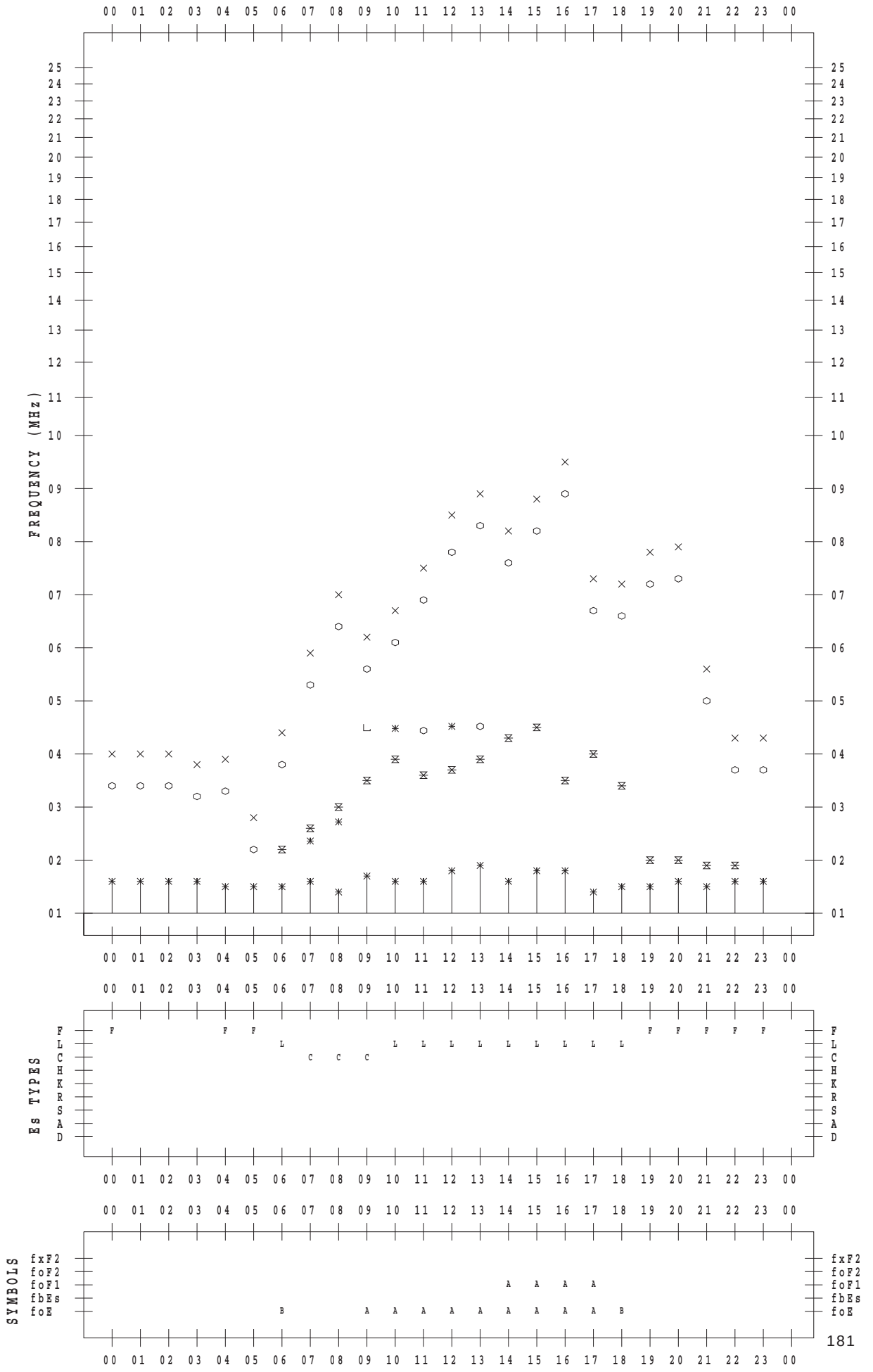
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/14

135 °E MEAN TIME



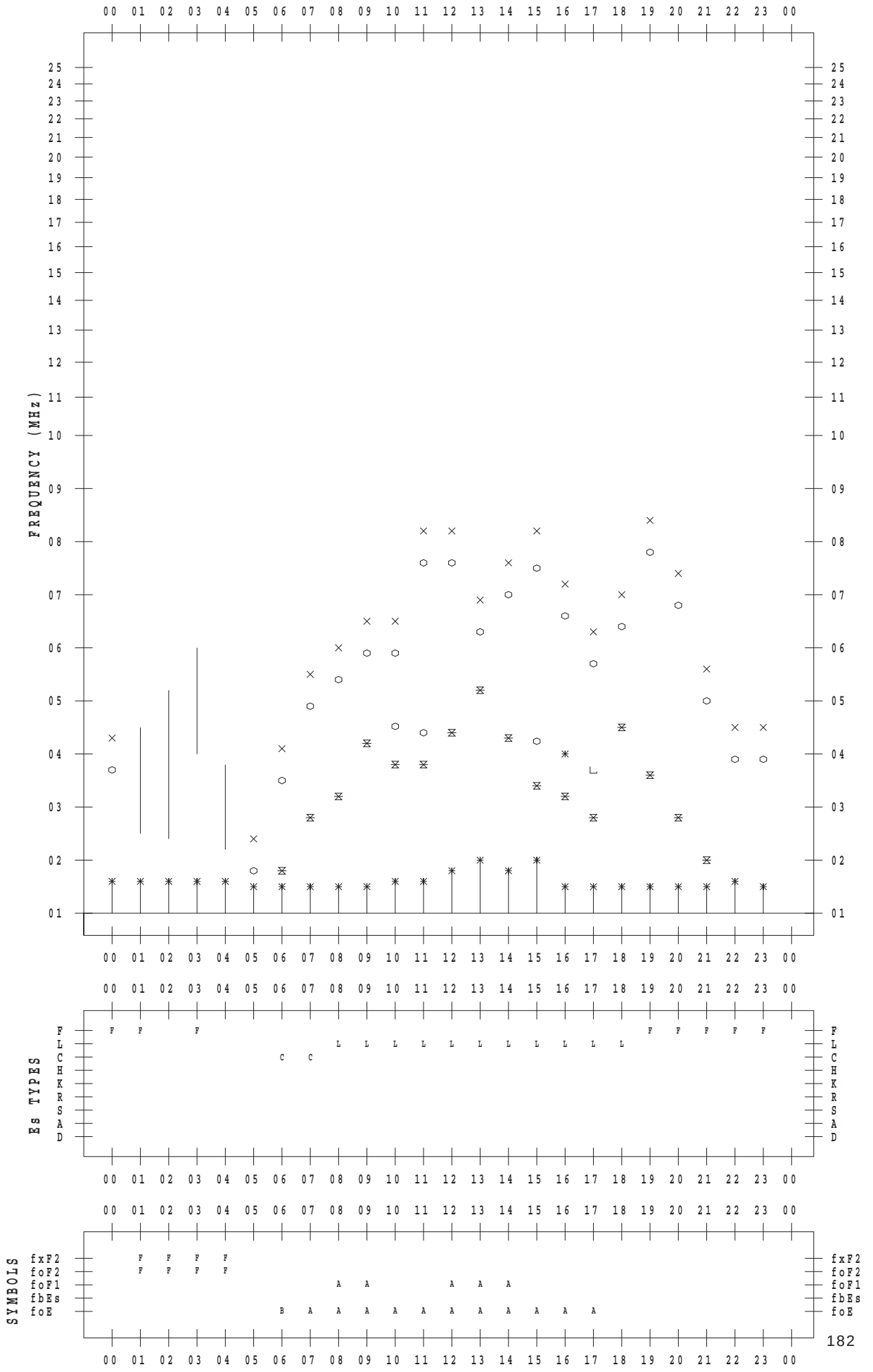
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/15

135 °E MEAN TIME



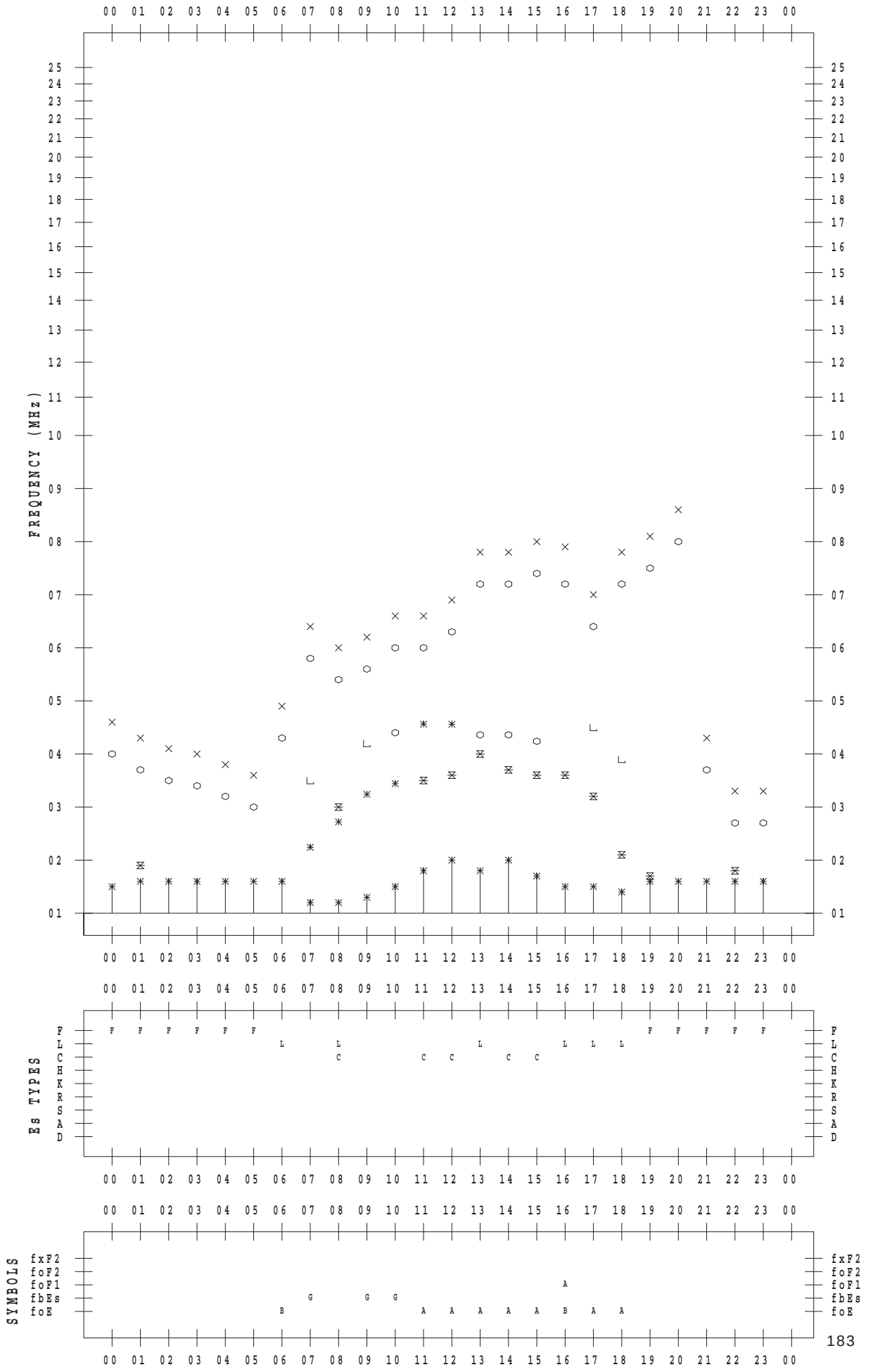
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/16

135 °E MEAN TIME



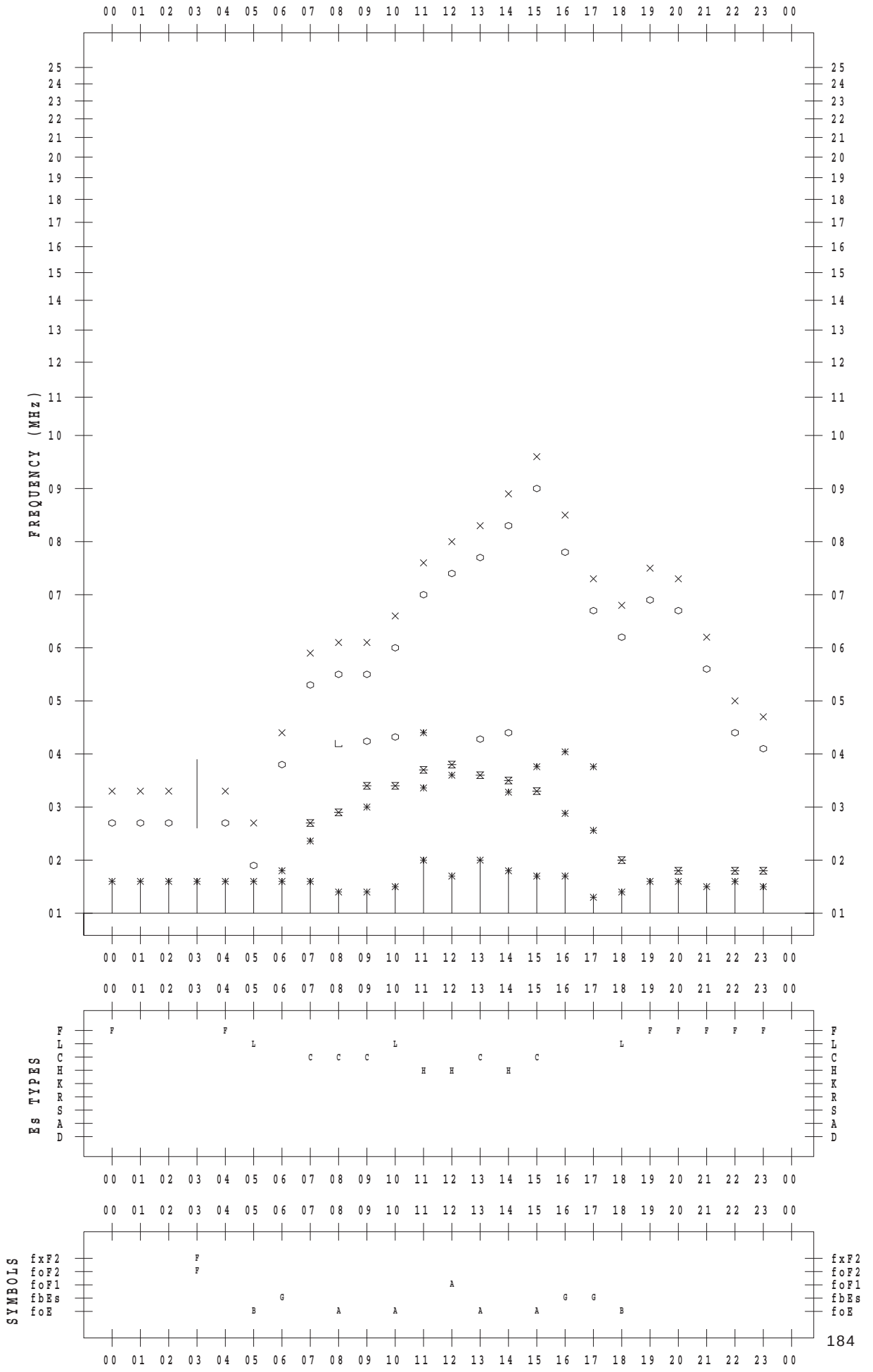
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/17

135 °E MEAN TIME



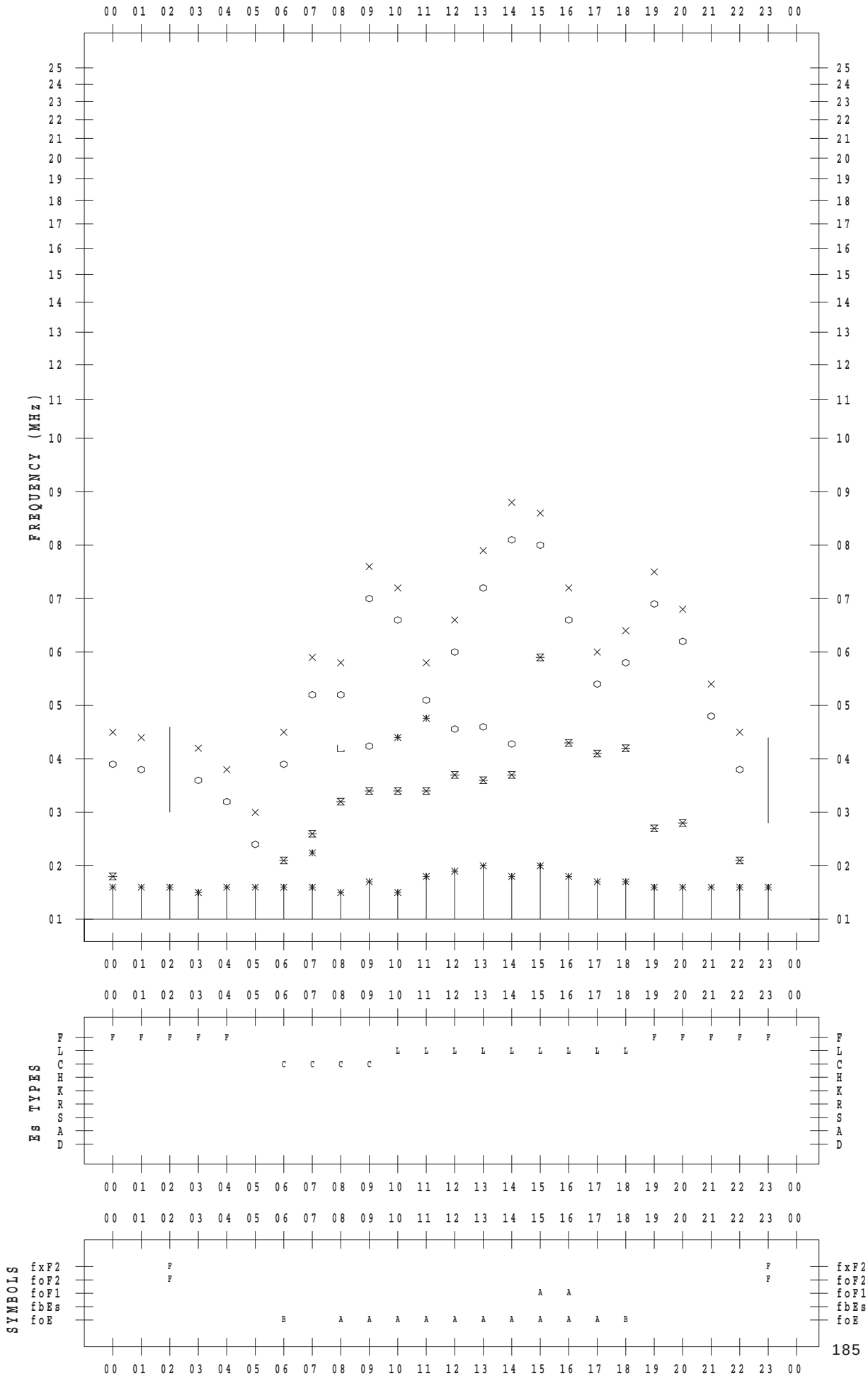
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/18

135 °E MEAN TIME



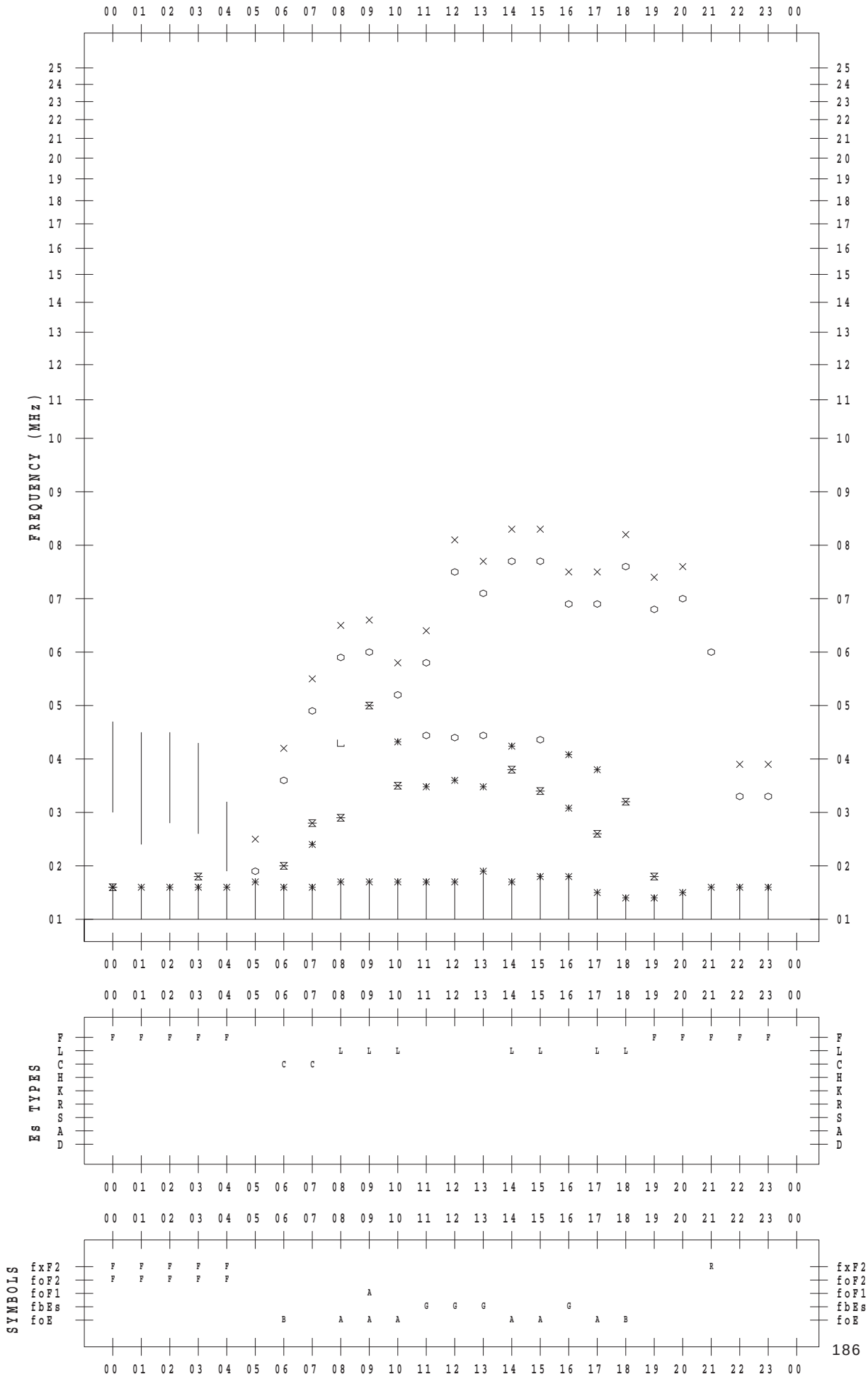
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/19

135 °E MEAN TIME



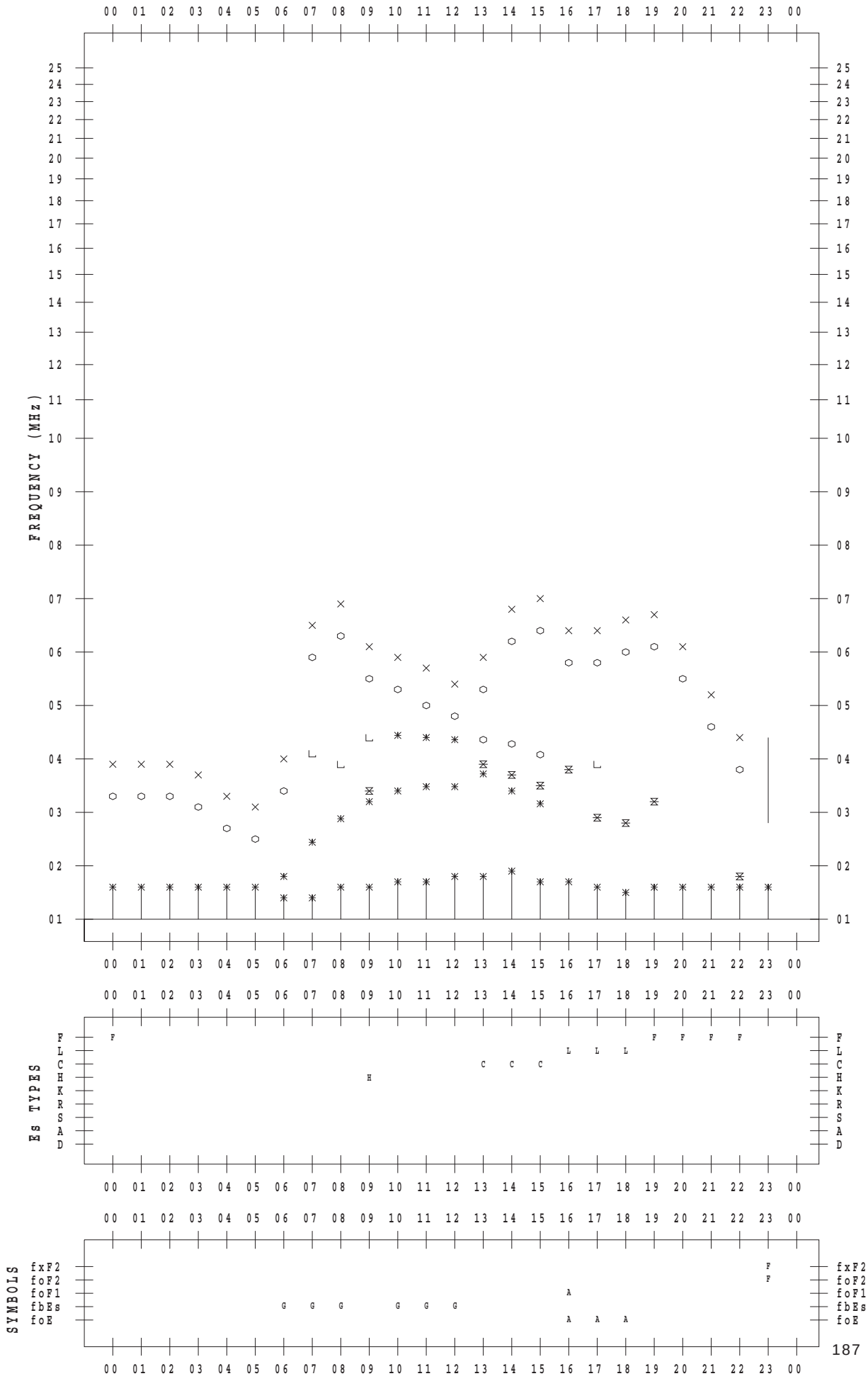
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/20

135 °E MEAN TIME



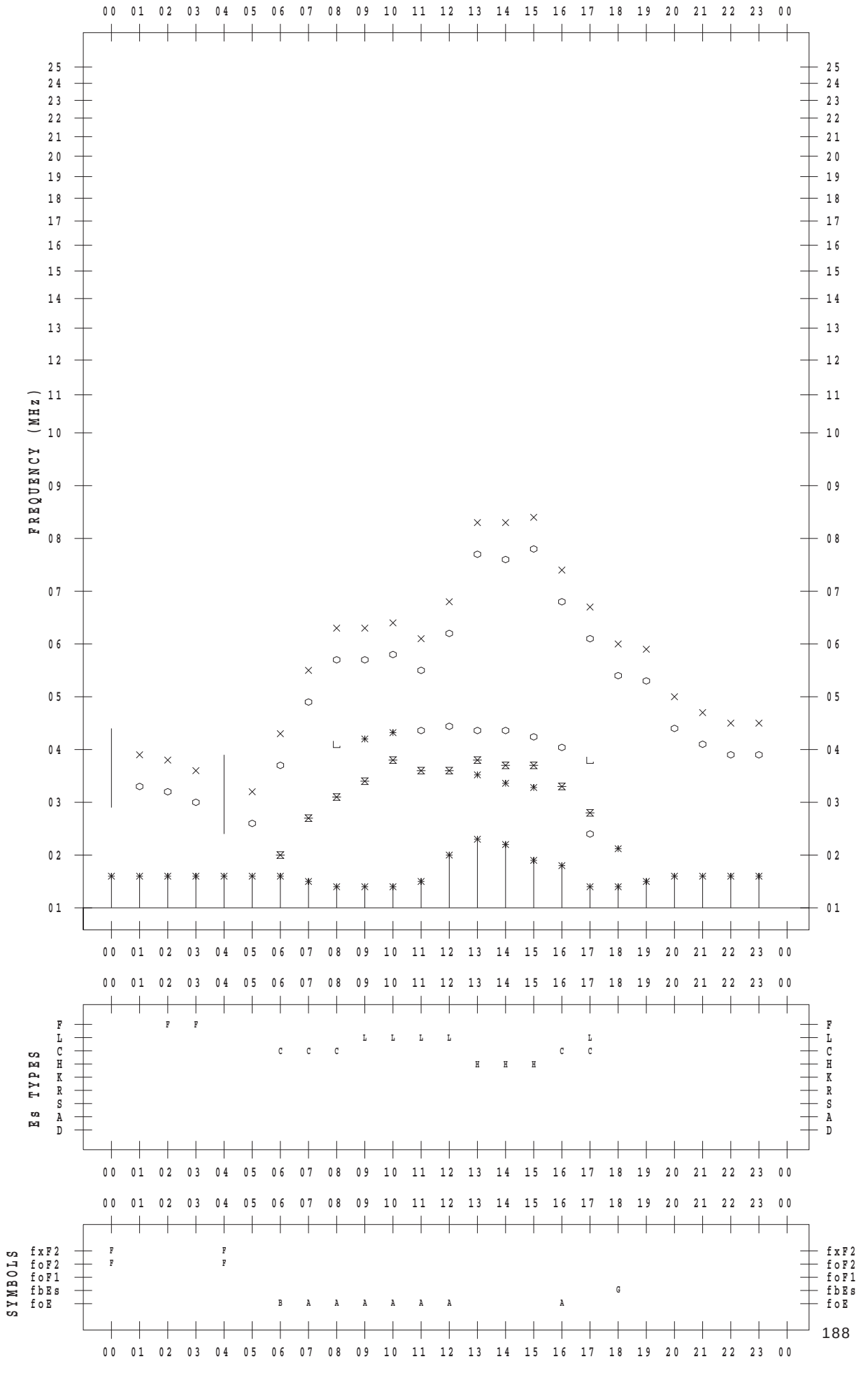
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/21

135 °E MEAN TIME



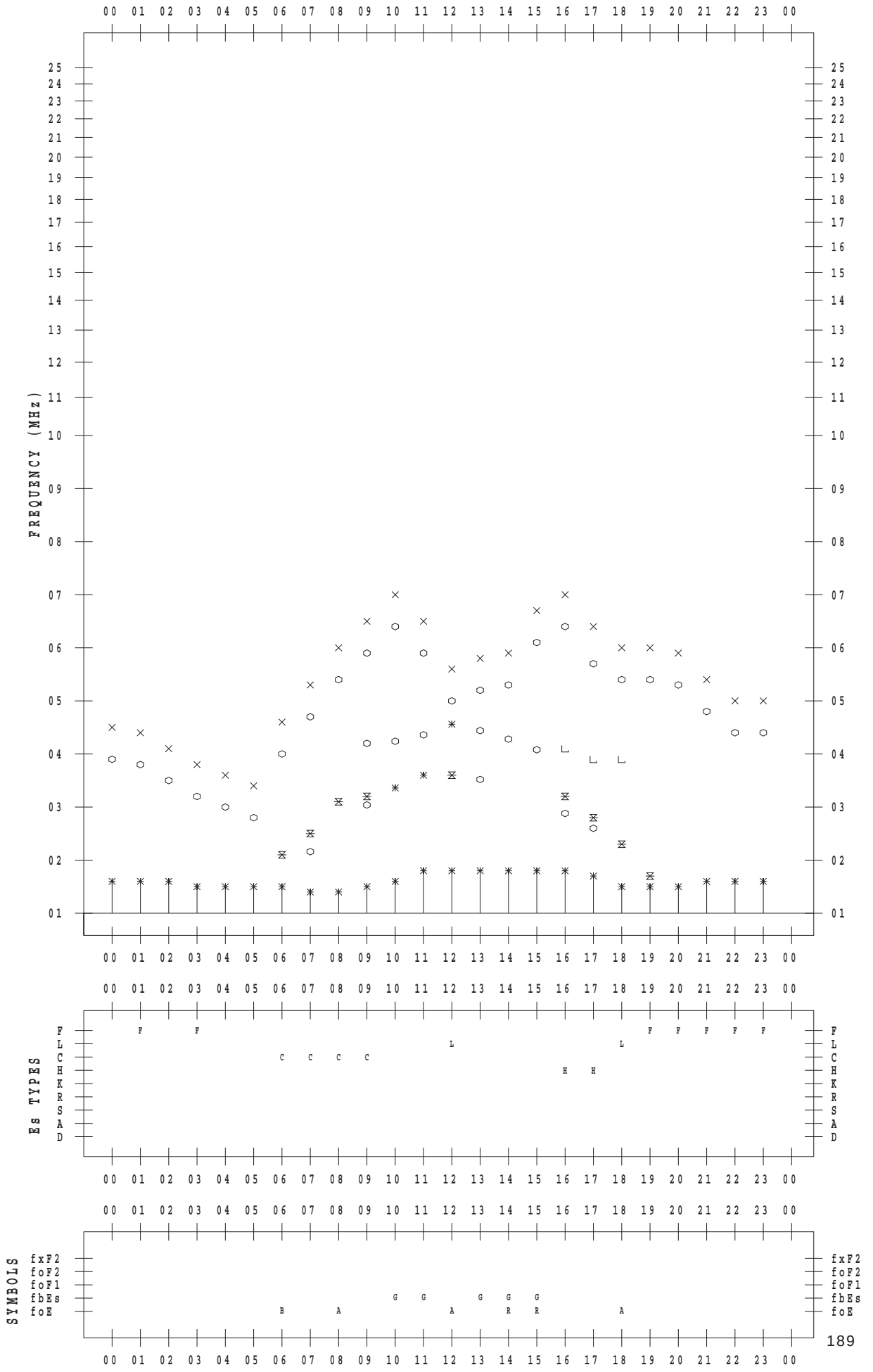
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/22

135 °E MEAN TIME



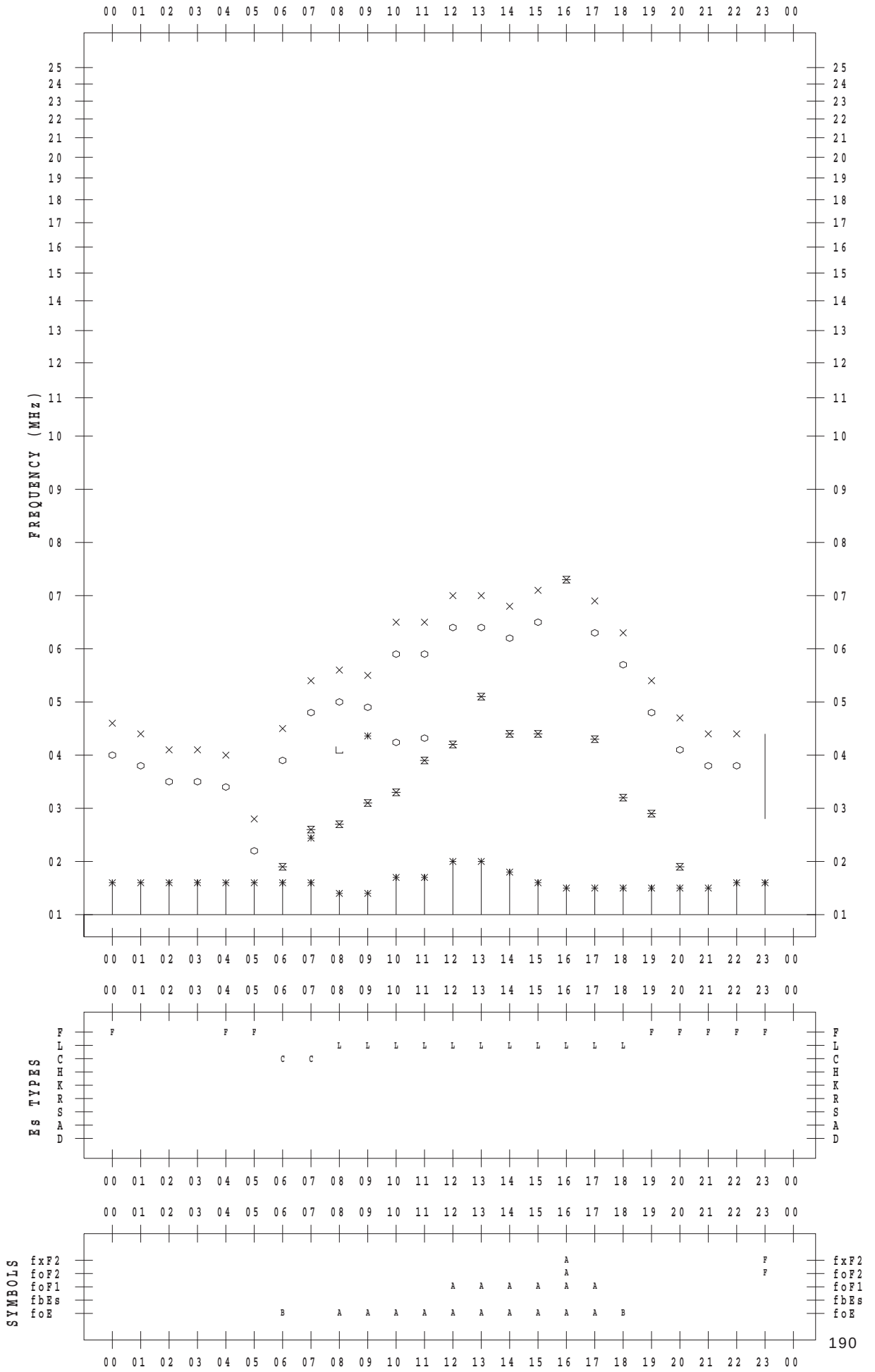
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/23

135 °E MEAN TIME



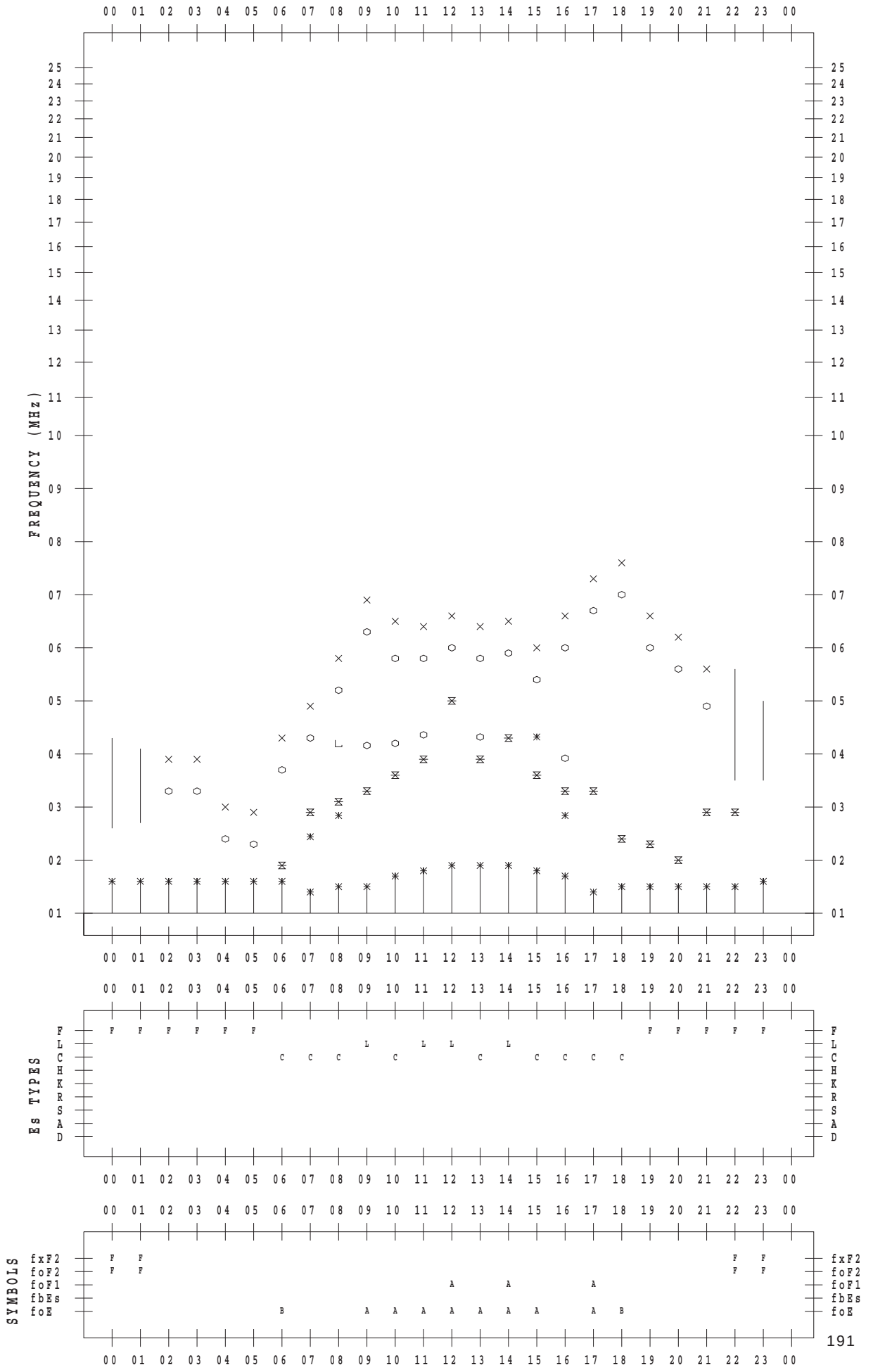
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/24

135 °E MEAN TIME



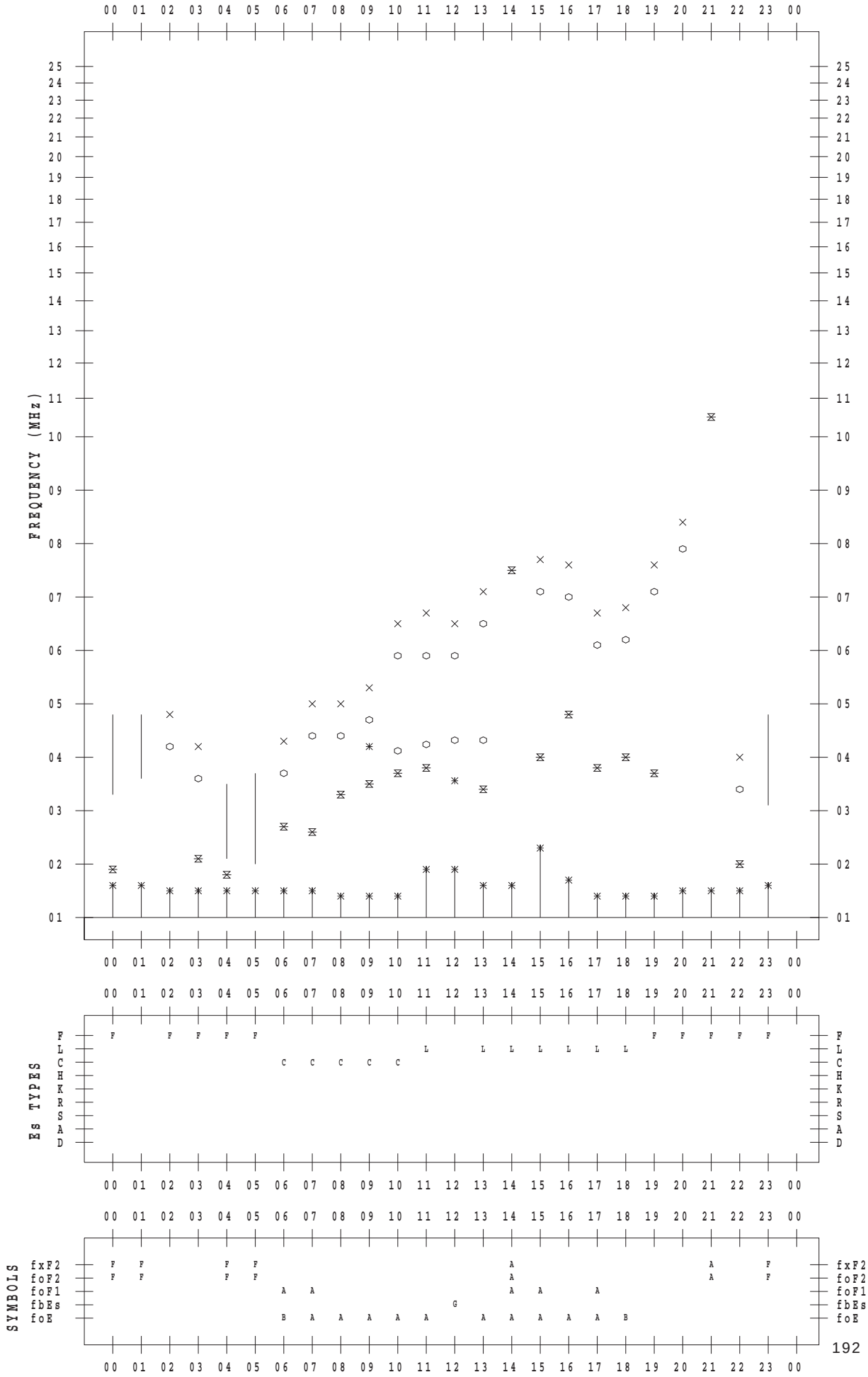
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/25

135 °E MEAN TIME



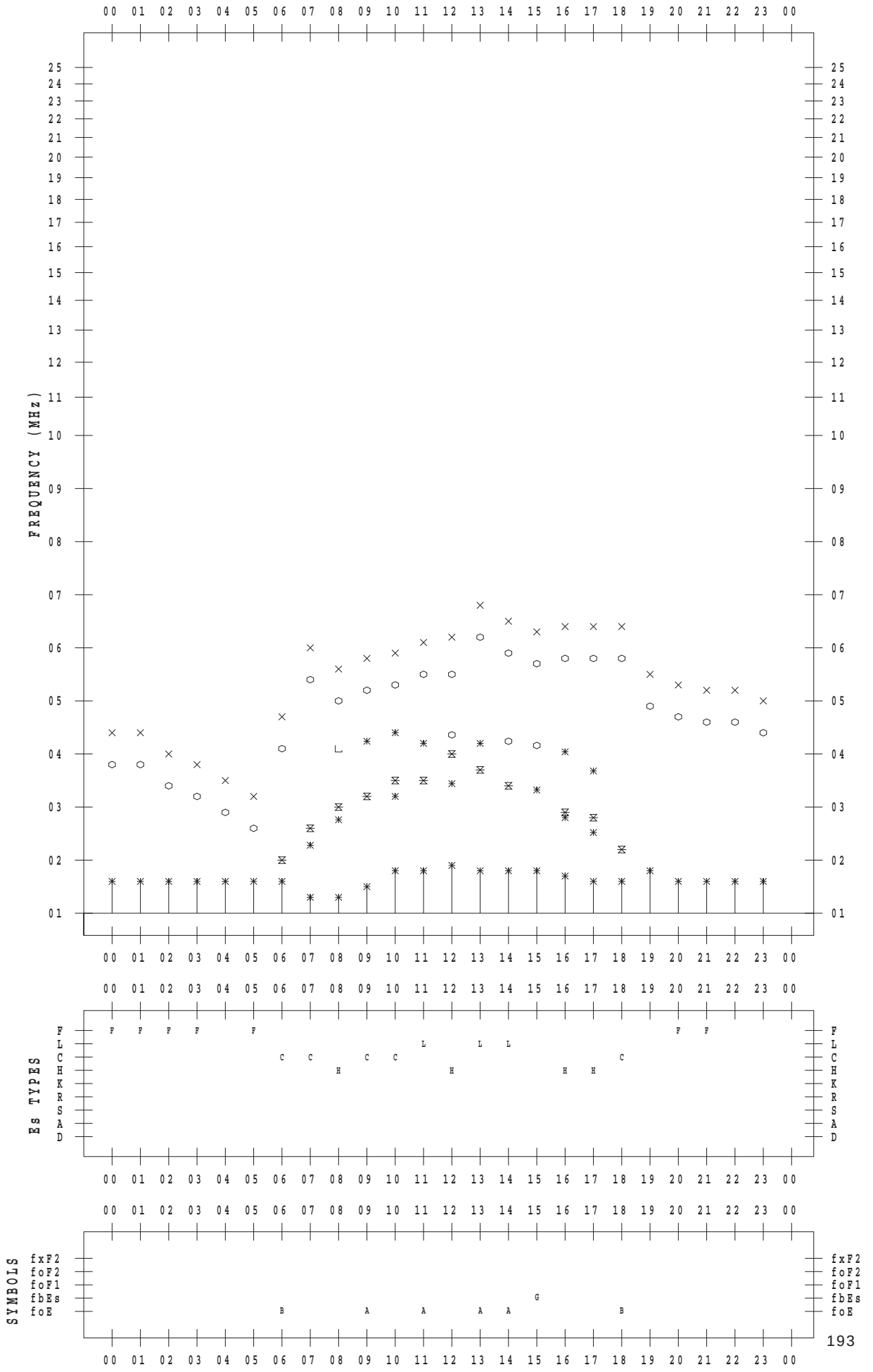
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/26

135 °E MEAN TIME



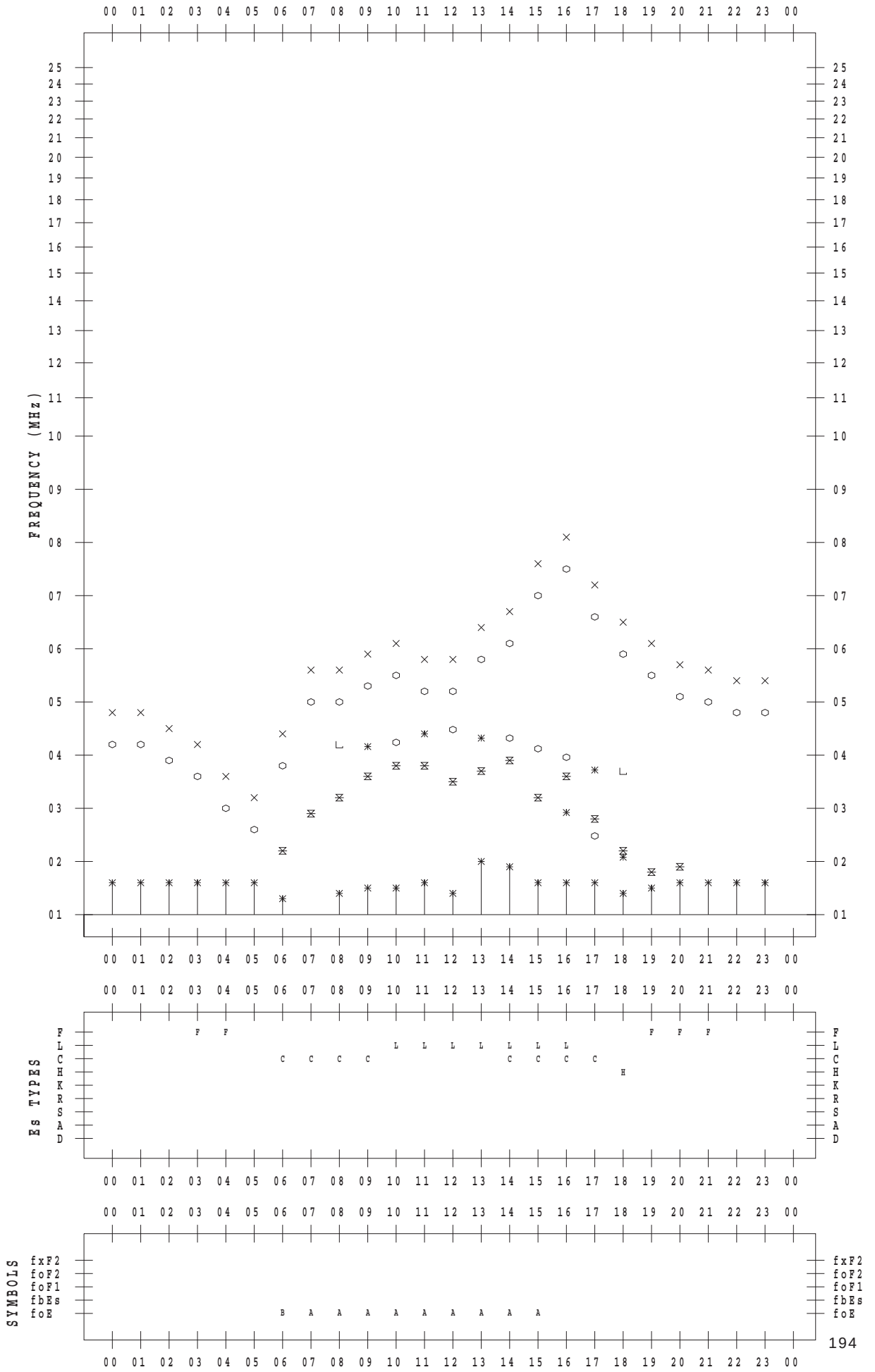
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/27

135 °E MEAN TIME



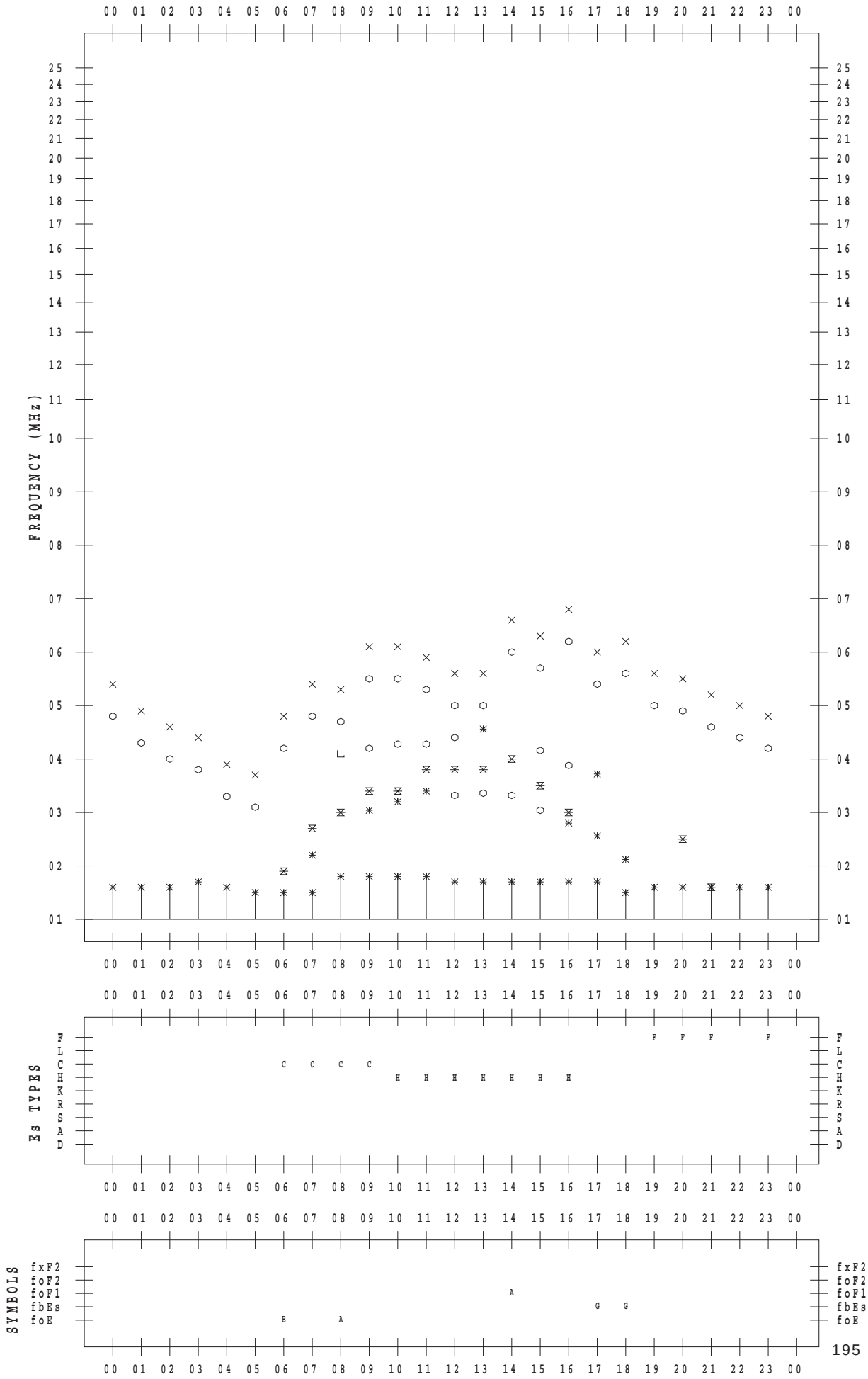
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/28

135 °E MEAN TIME



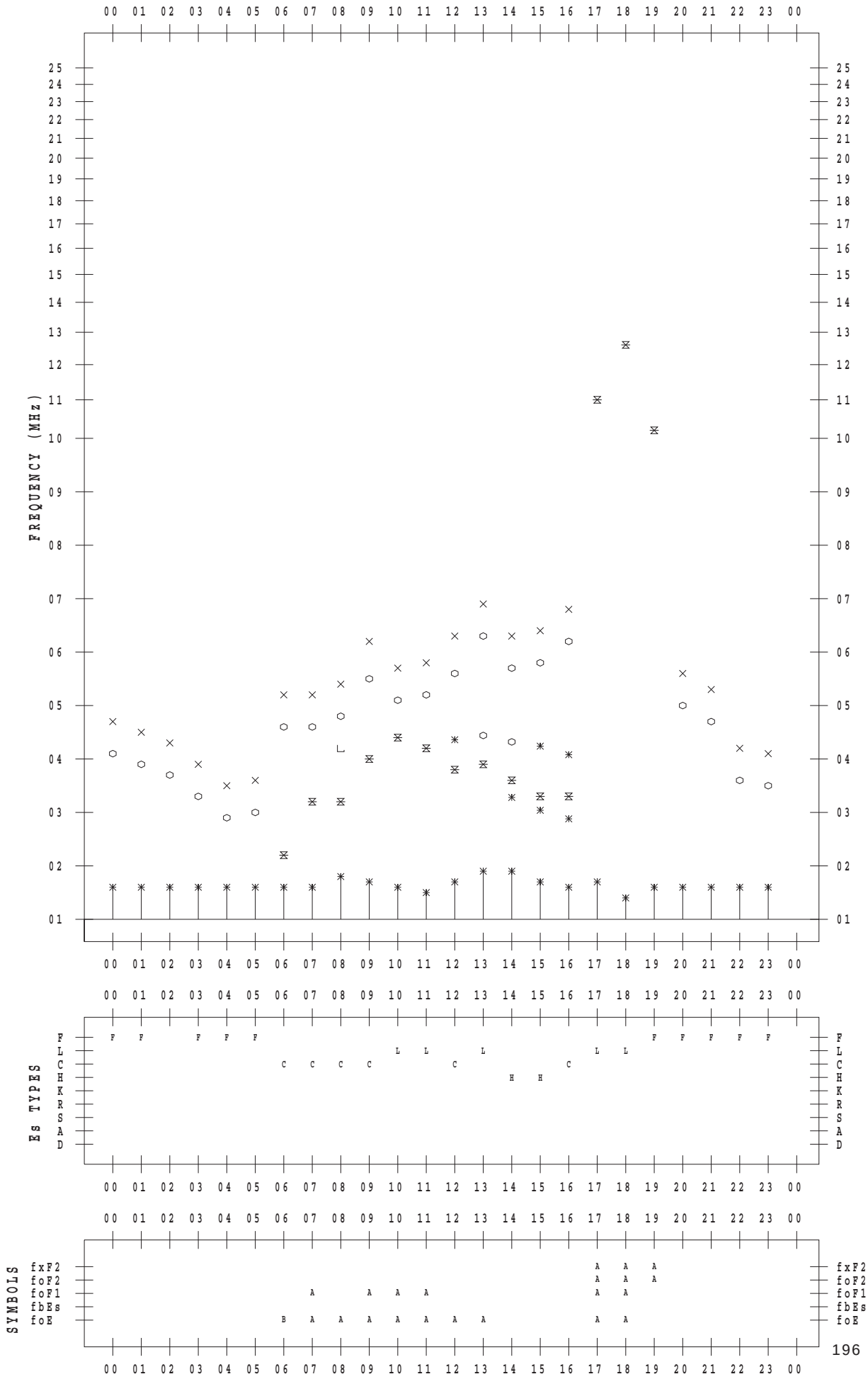
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/29

135 °E MEAN TIME



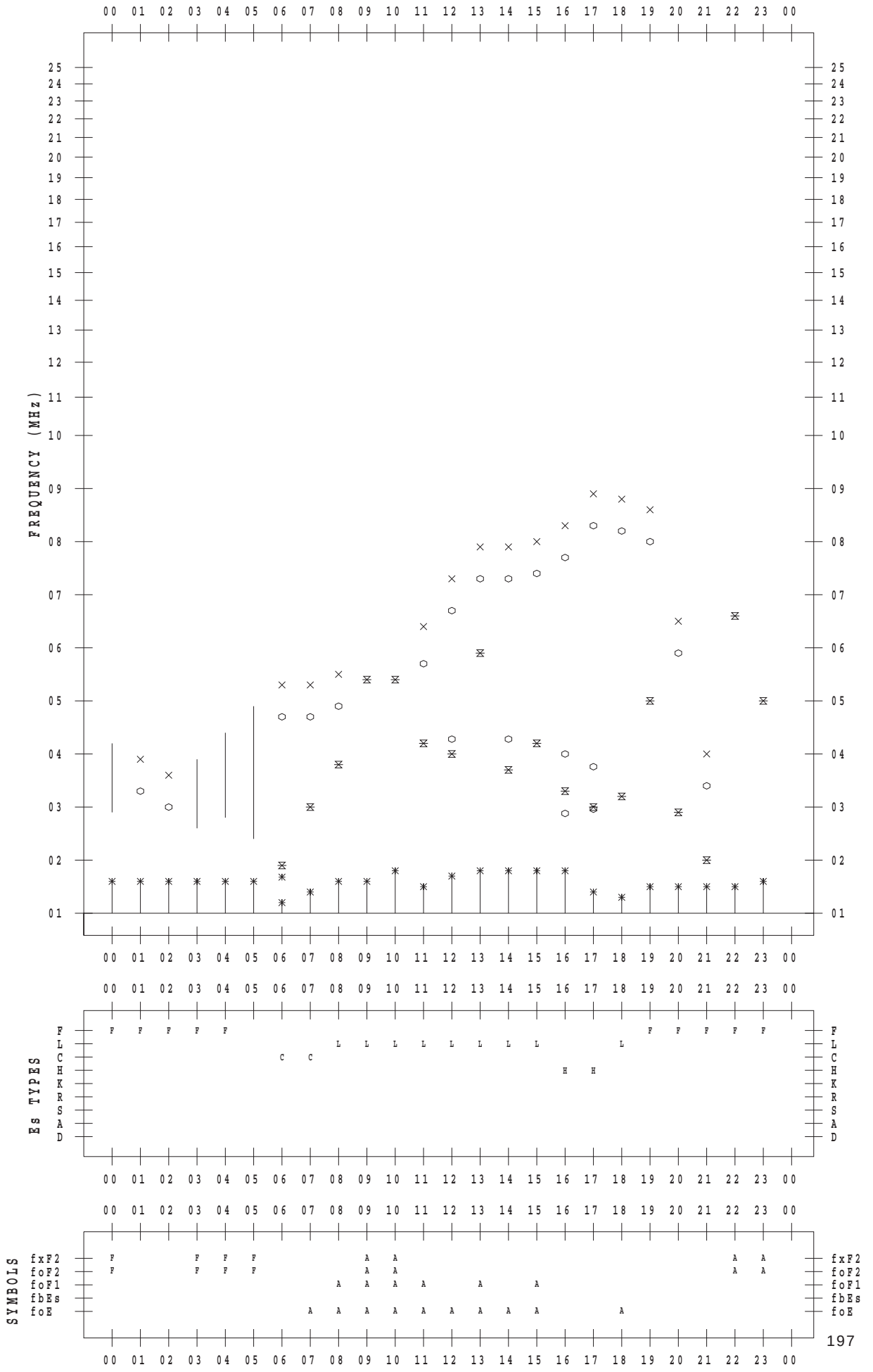
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 4/30

135 °E MEAN TIME



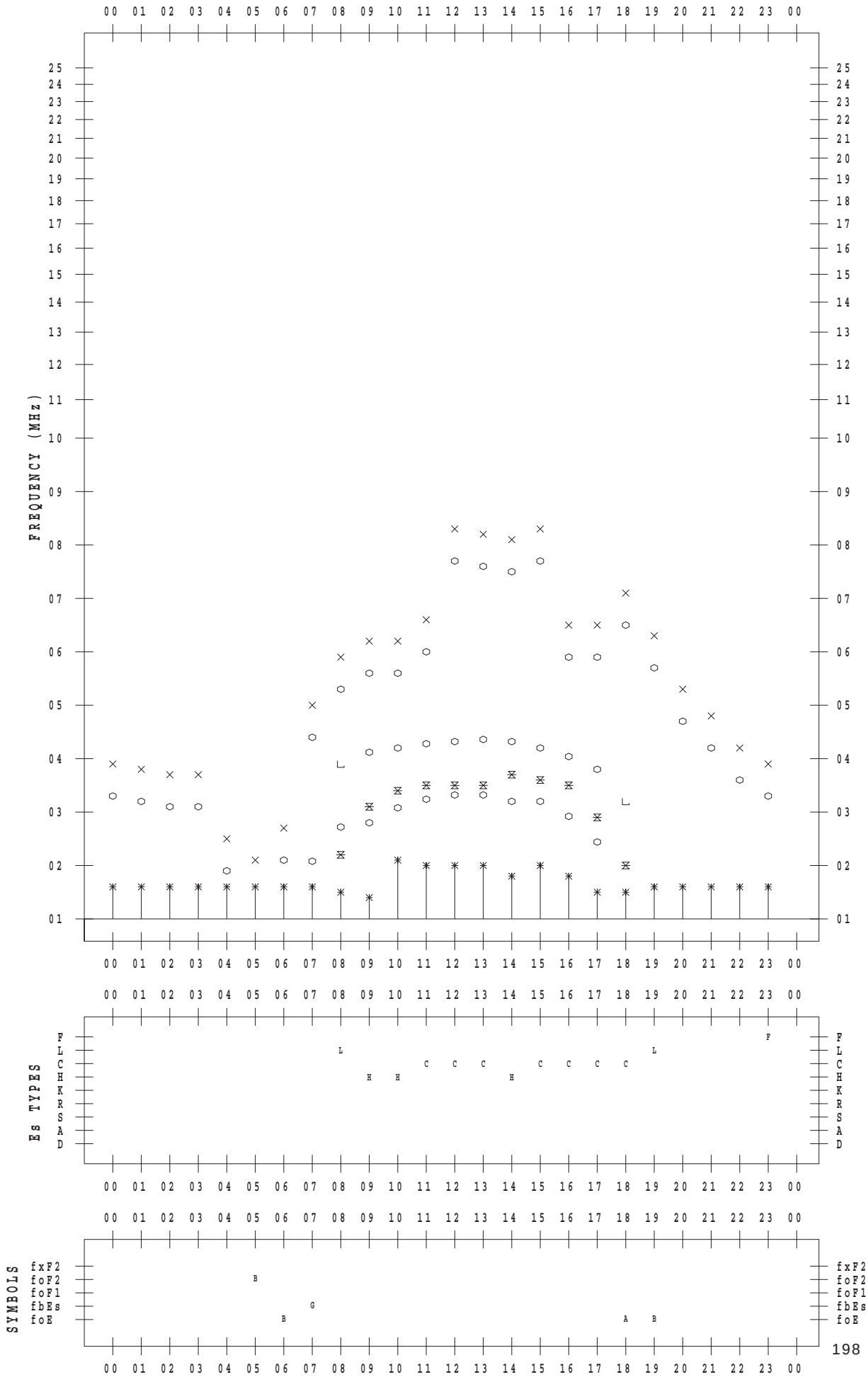
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 1

135 °E MEAN TIME



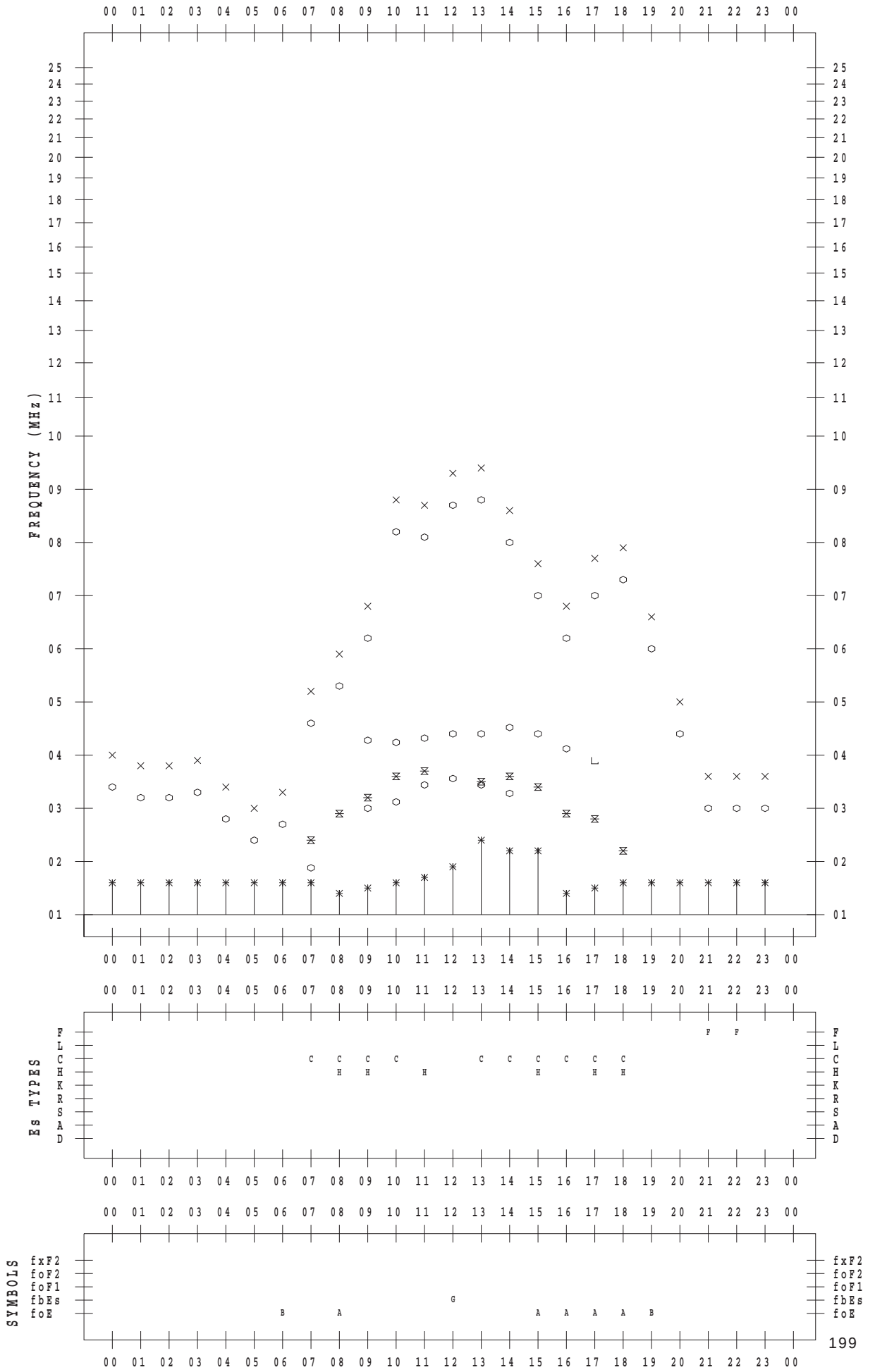
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 2

135 °E MEAN TIME



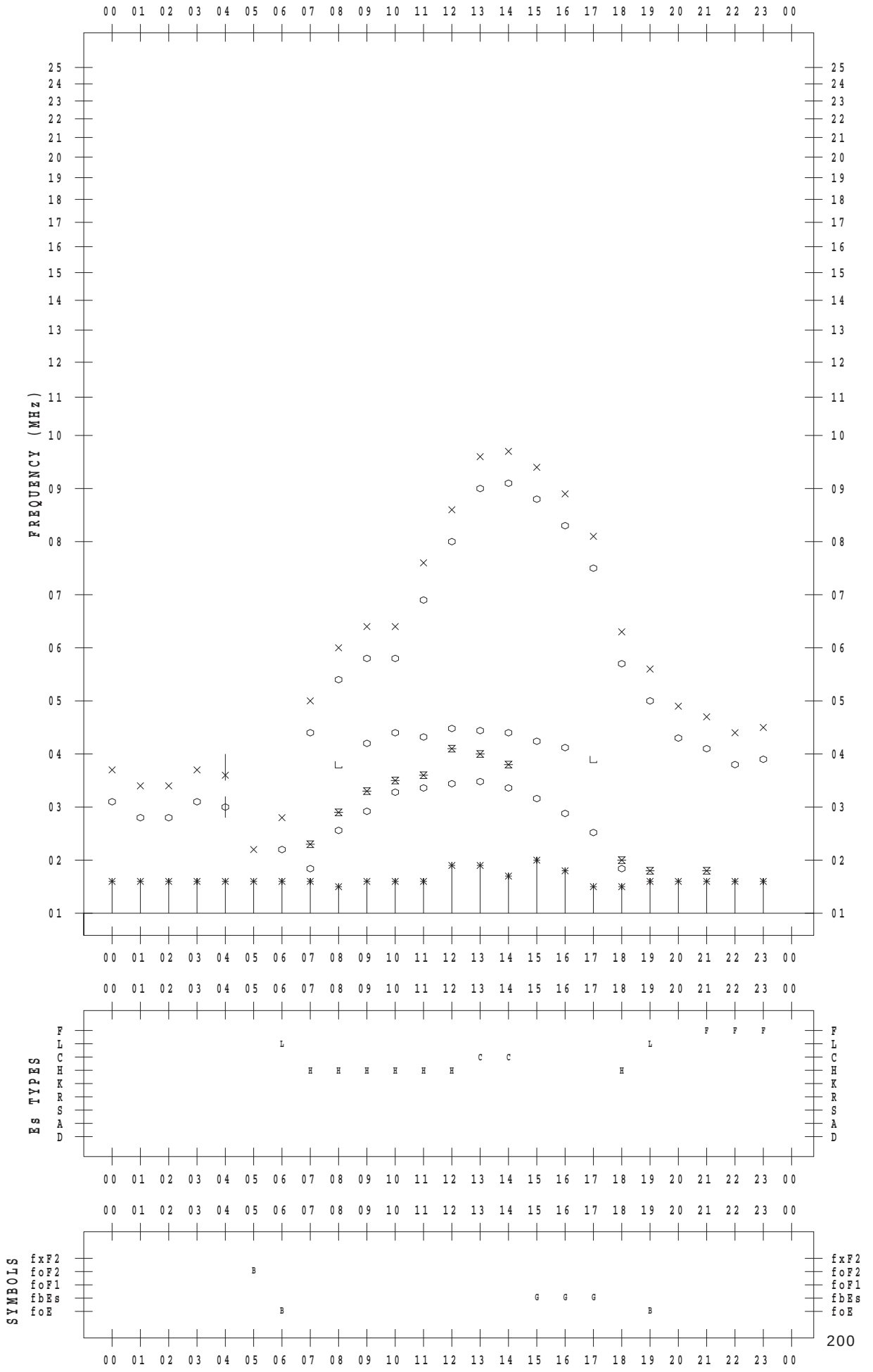
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 3

135 °E MEAN TIME



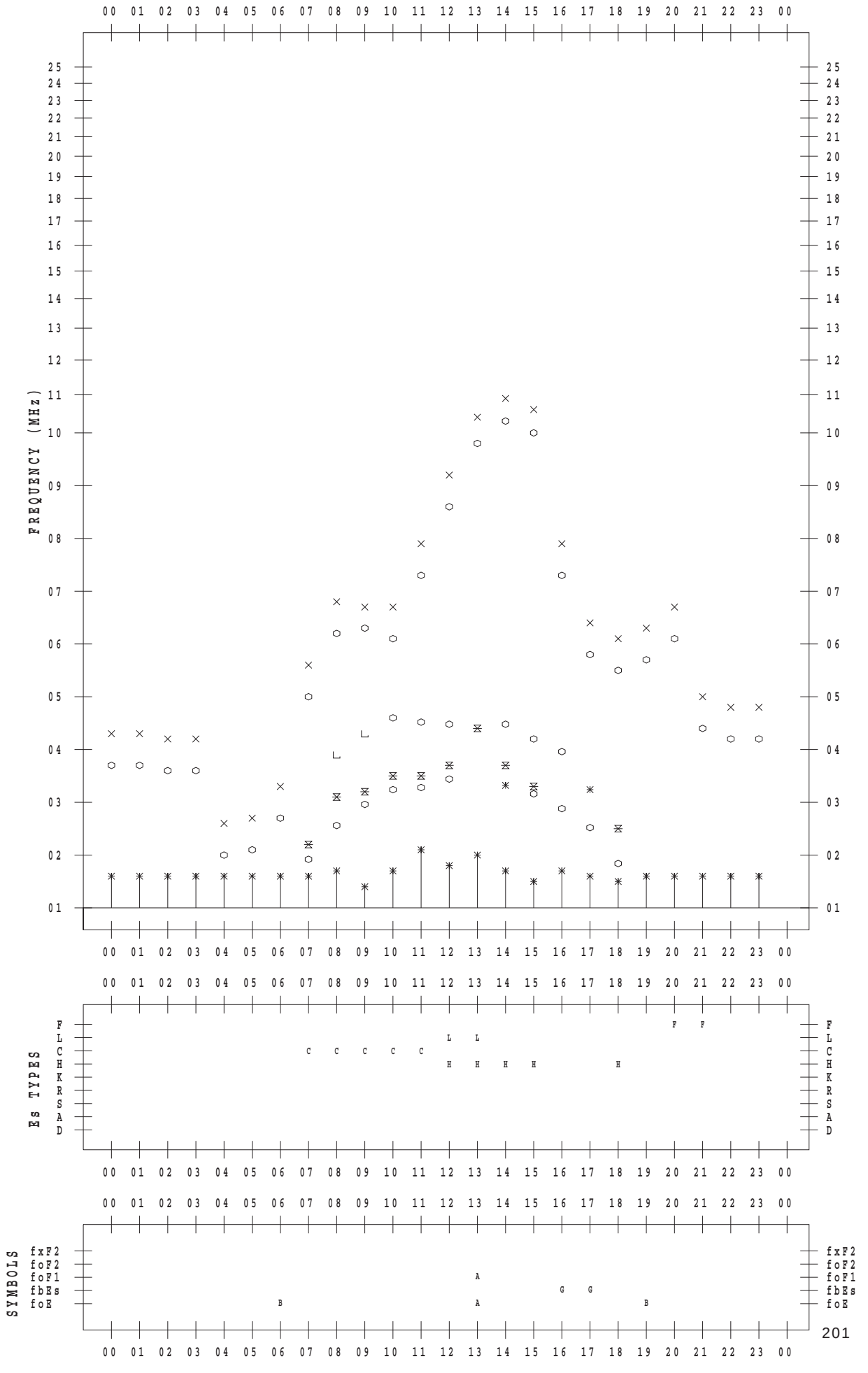
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 4

135 °E MEAN TIME



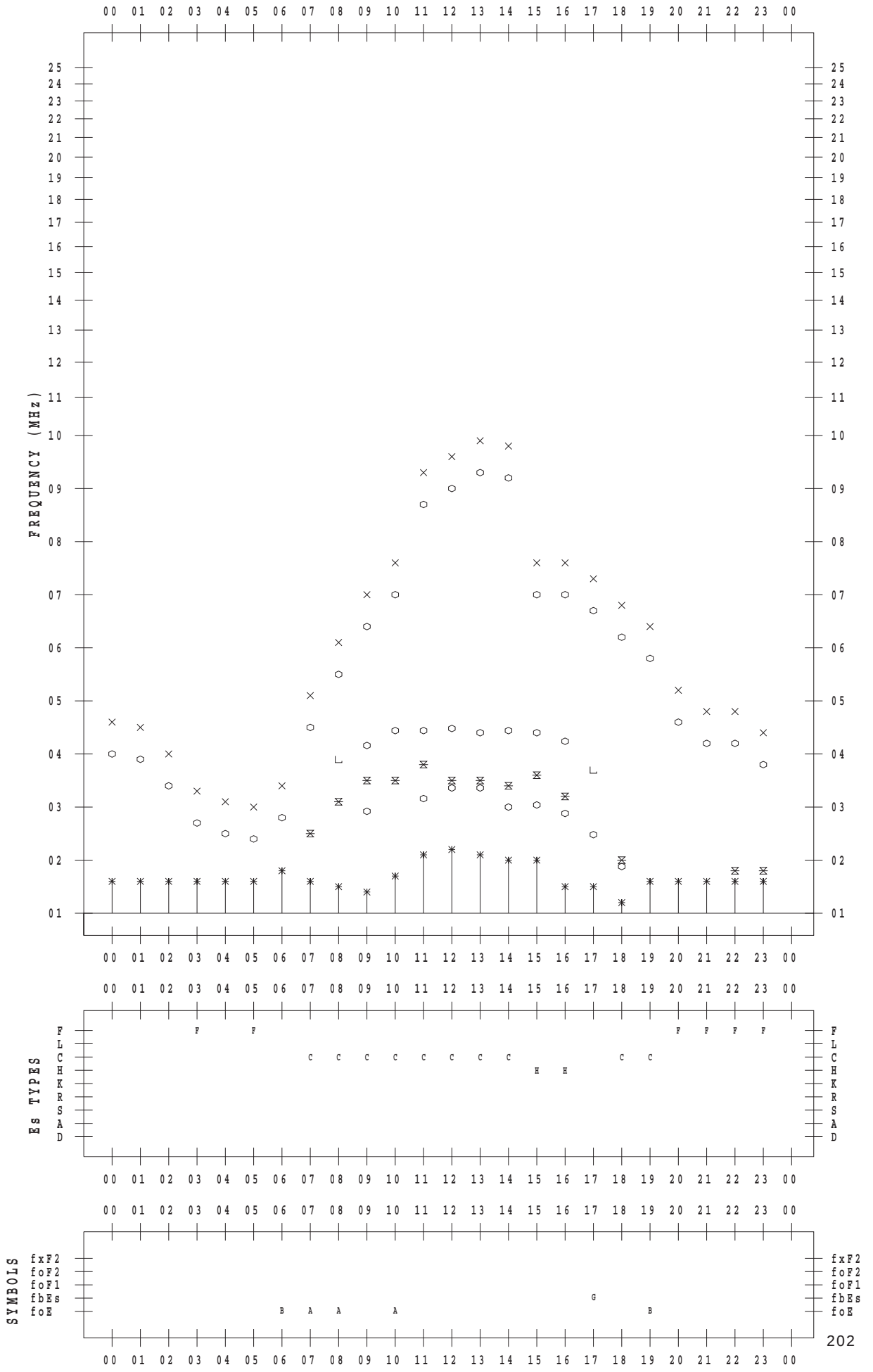
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 5

135 °E MEAN TIME



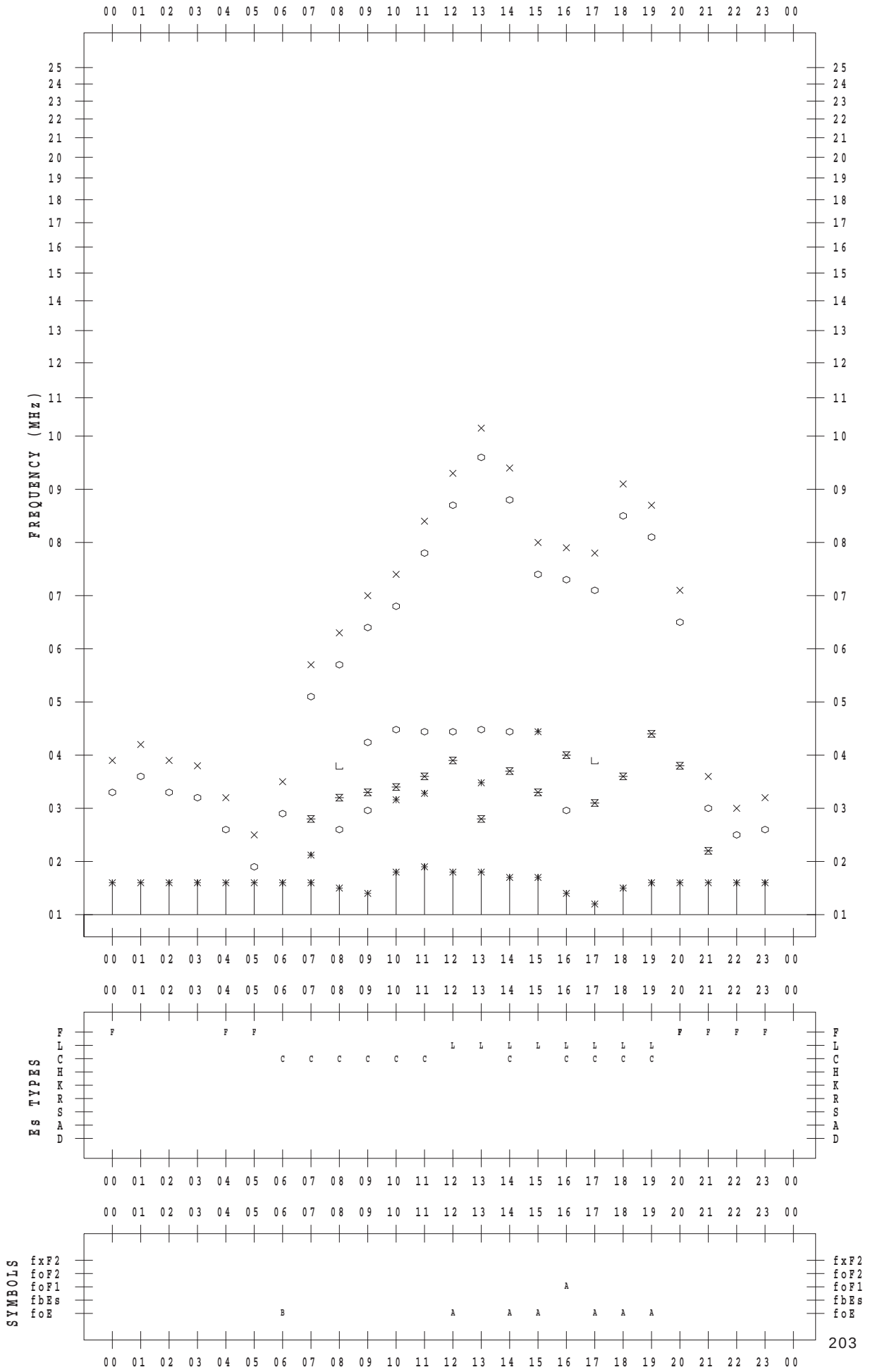
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 6

135 °E MEAN TIME



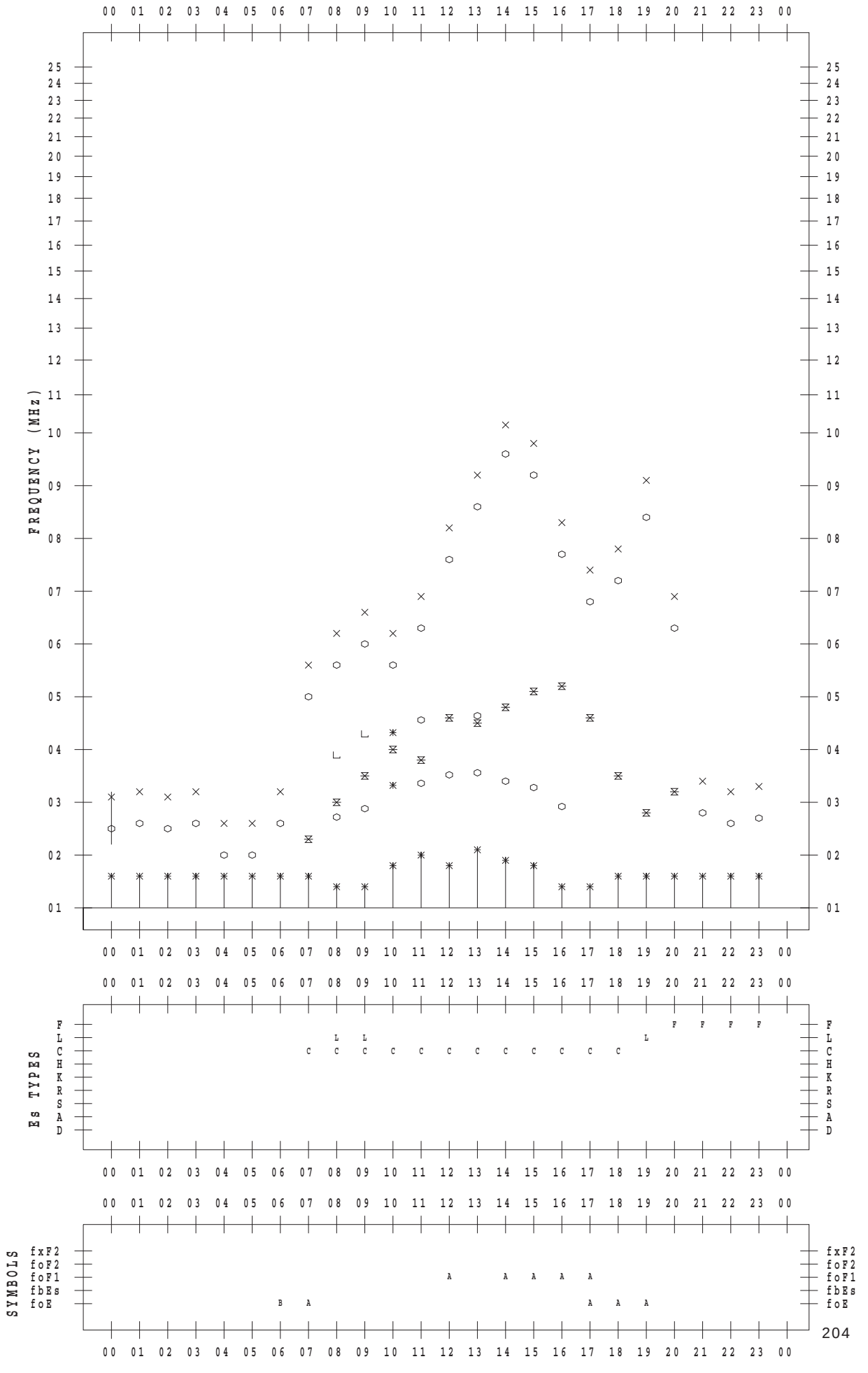
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 7

135 °E MEAN TIME



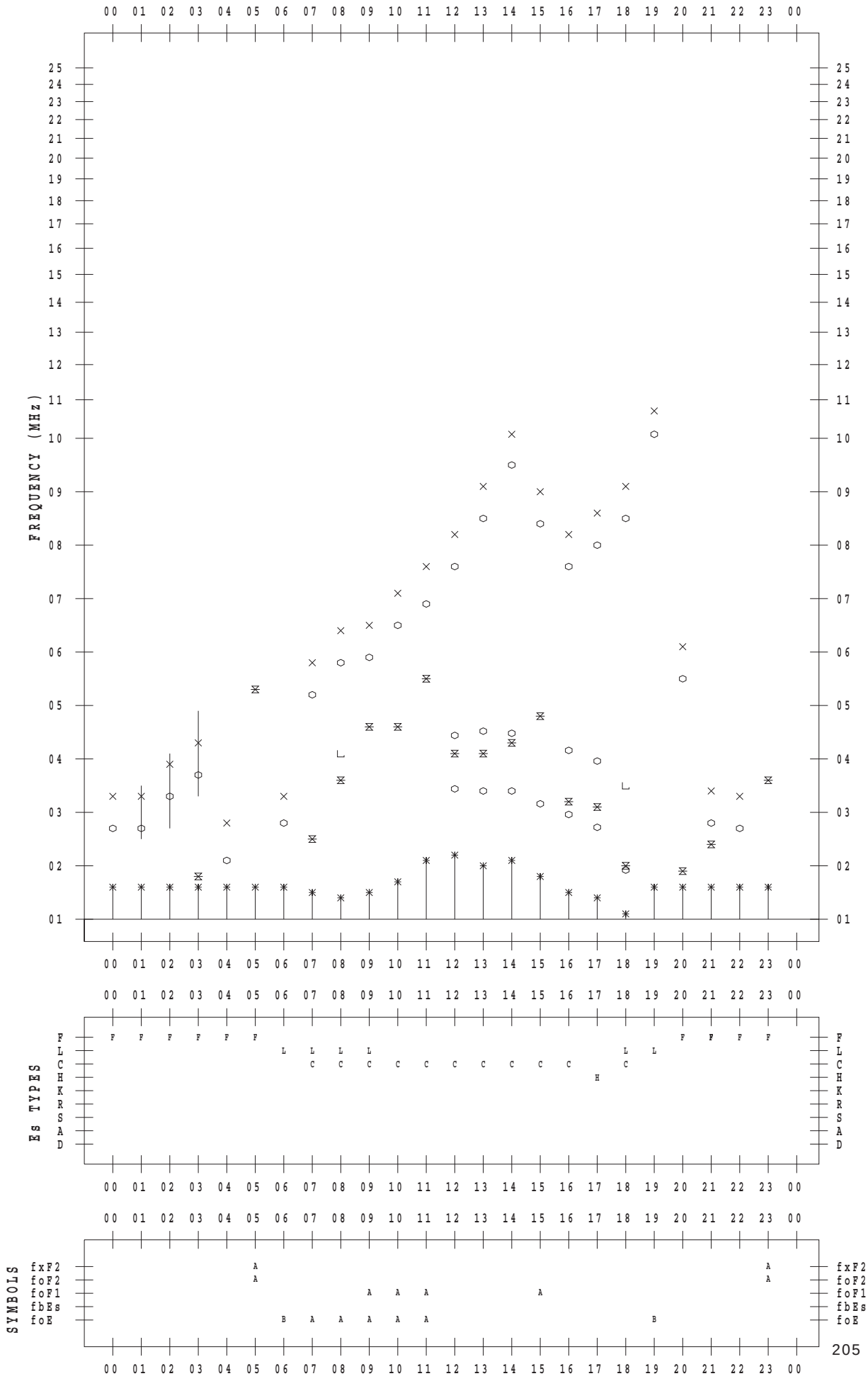
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 8

135 °E MEAN TIME



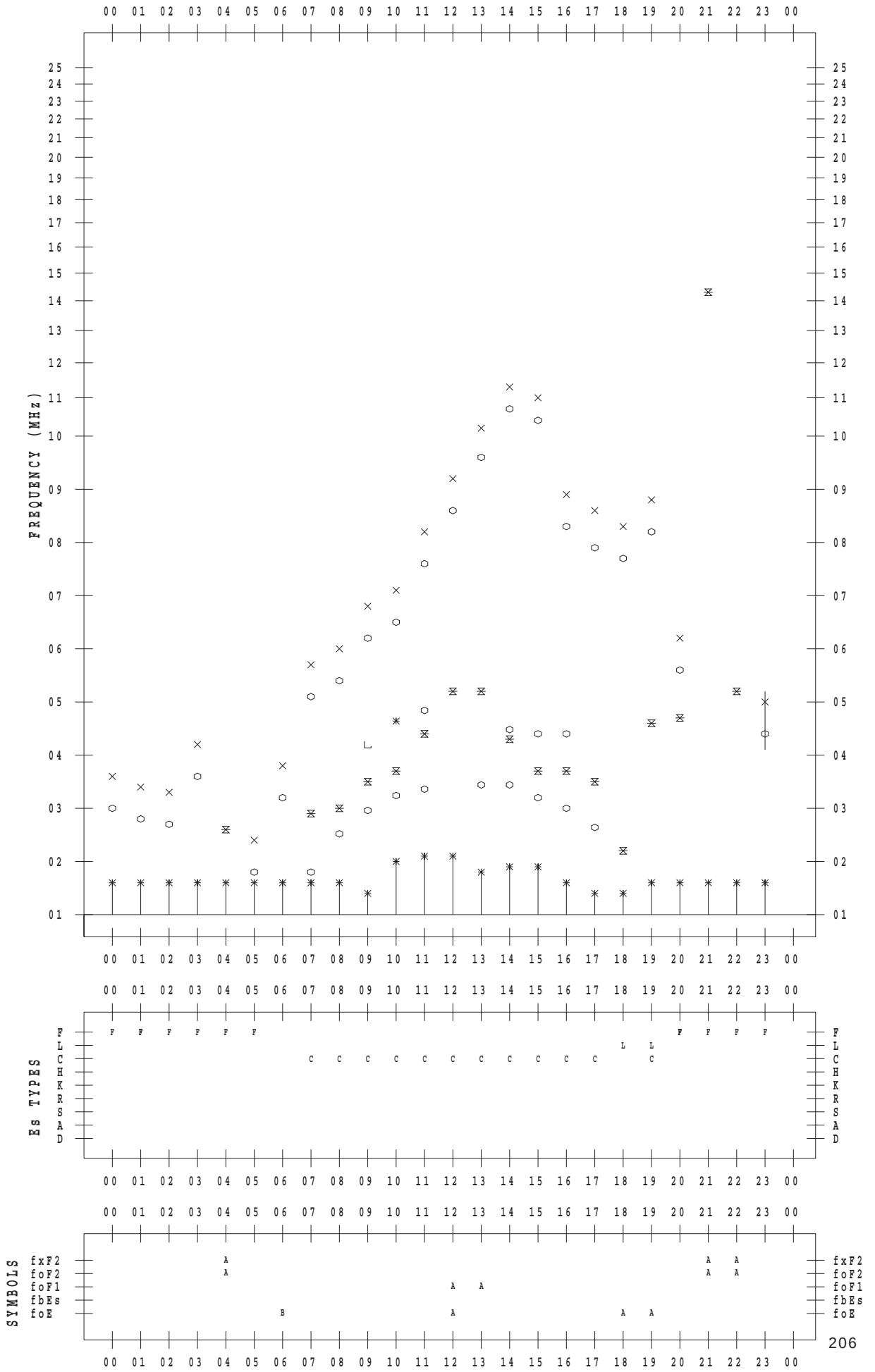
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/ 9

135 °E MEAN TIME



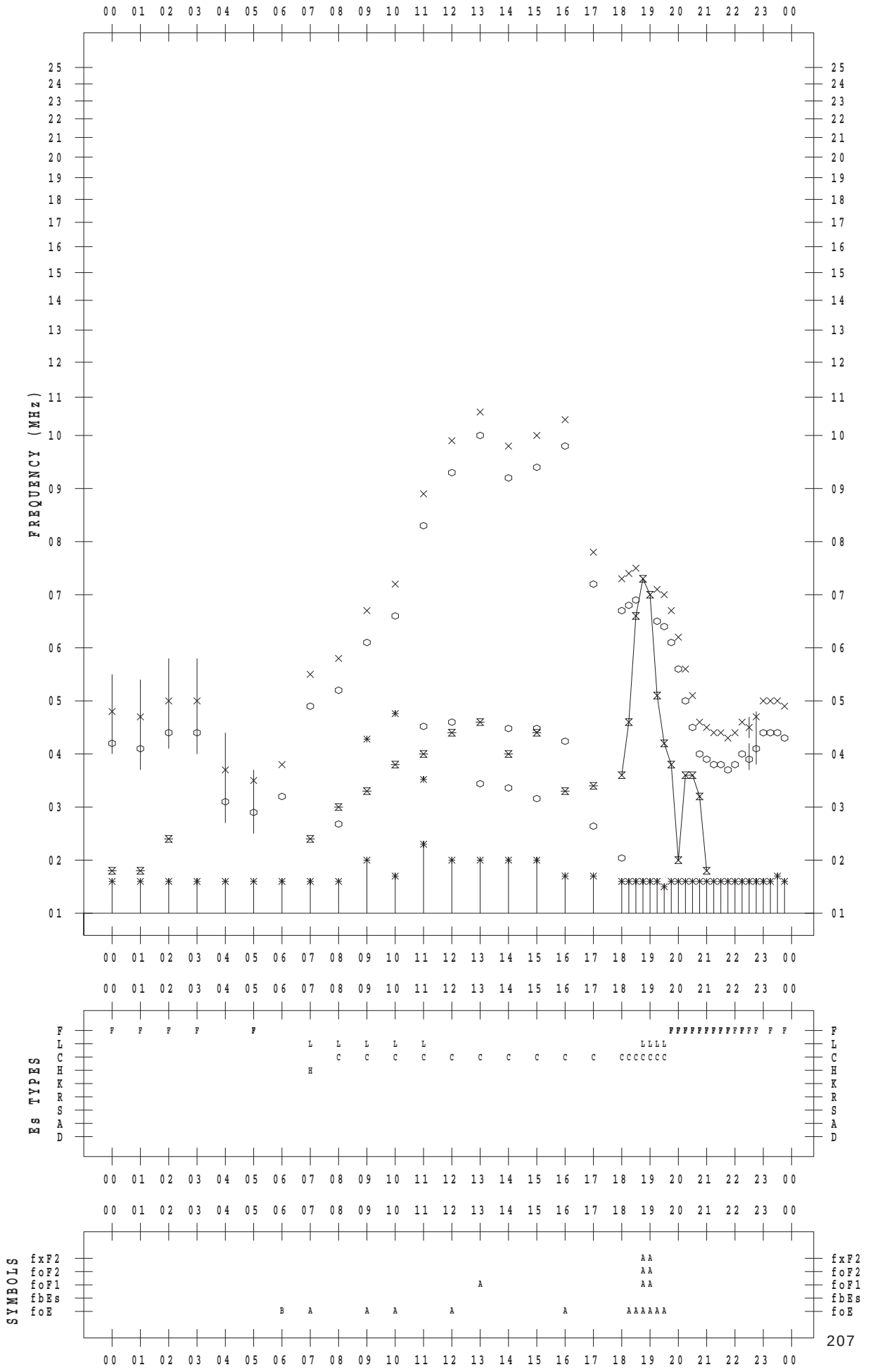
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/10

135 °E MEAN TIME



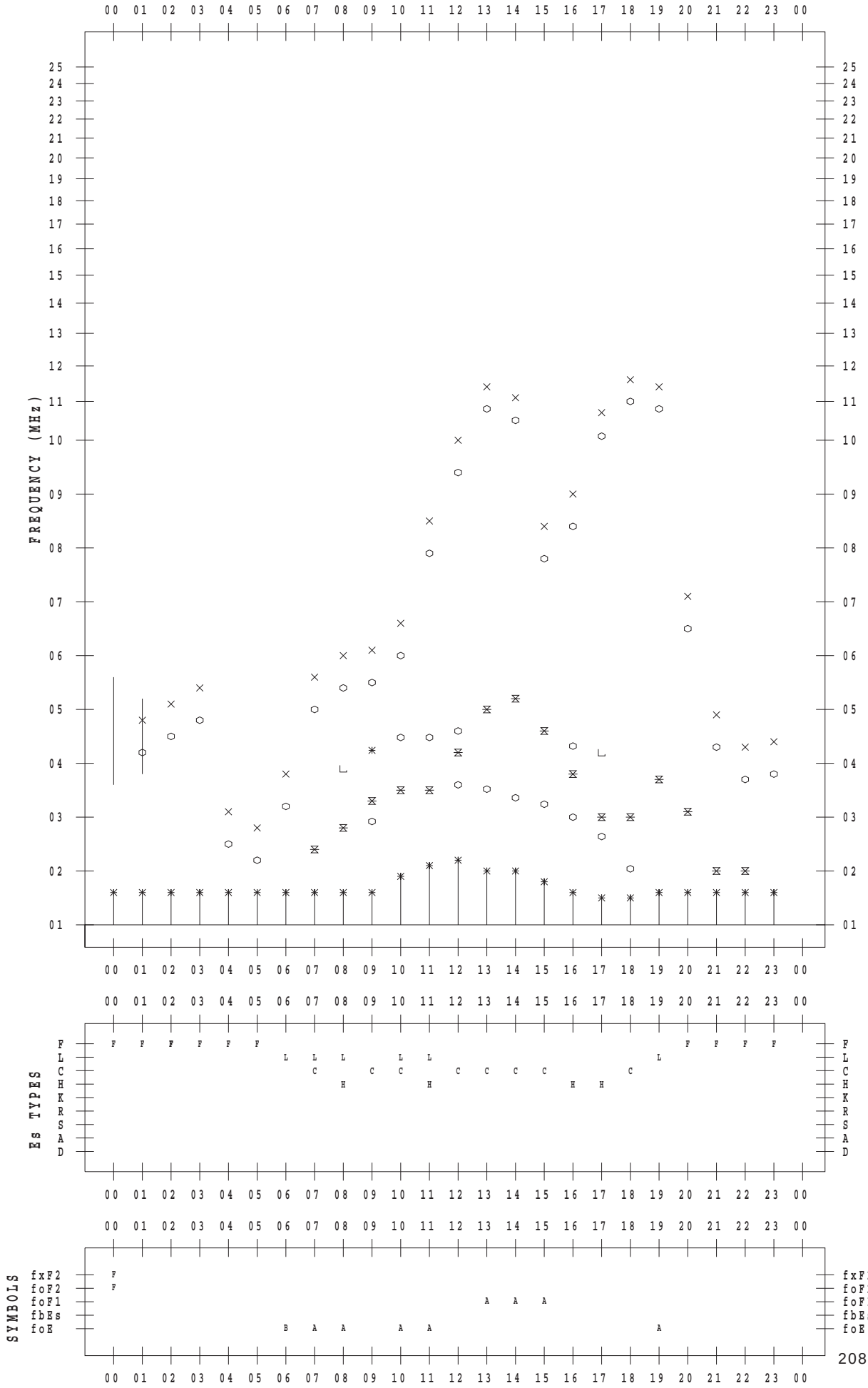
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/11

135 °E MEAN TIME



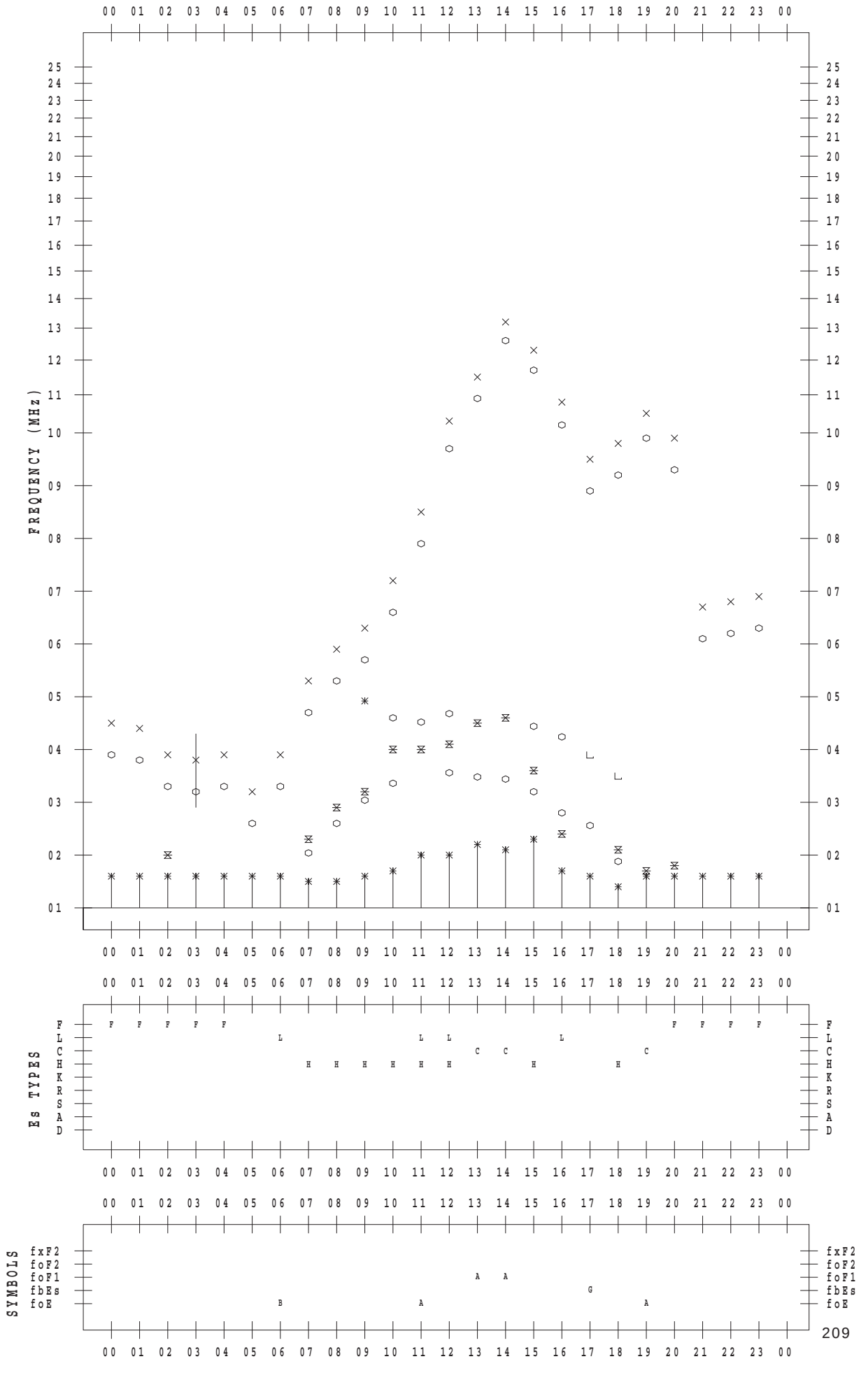
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/12

135 °E MEAN TIME



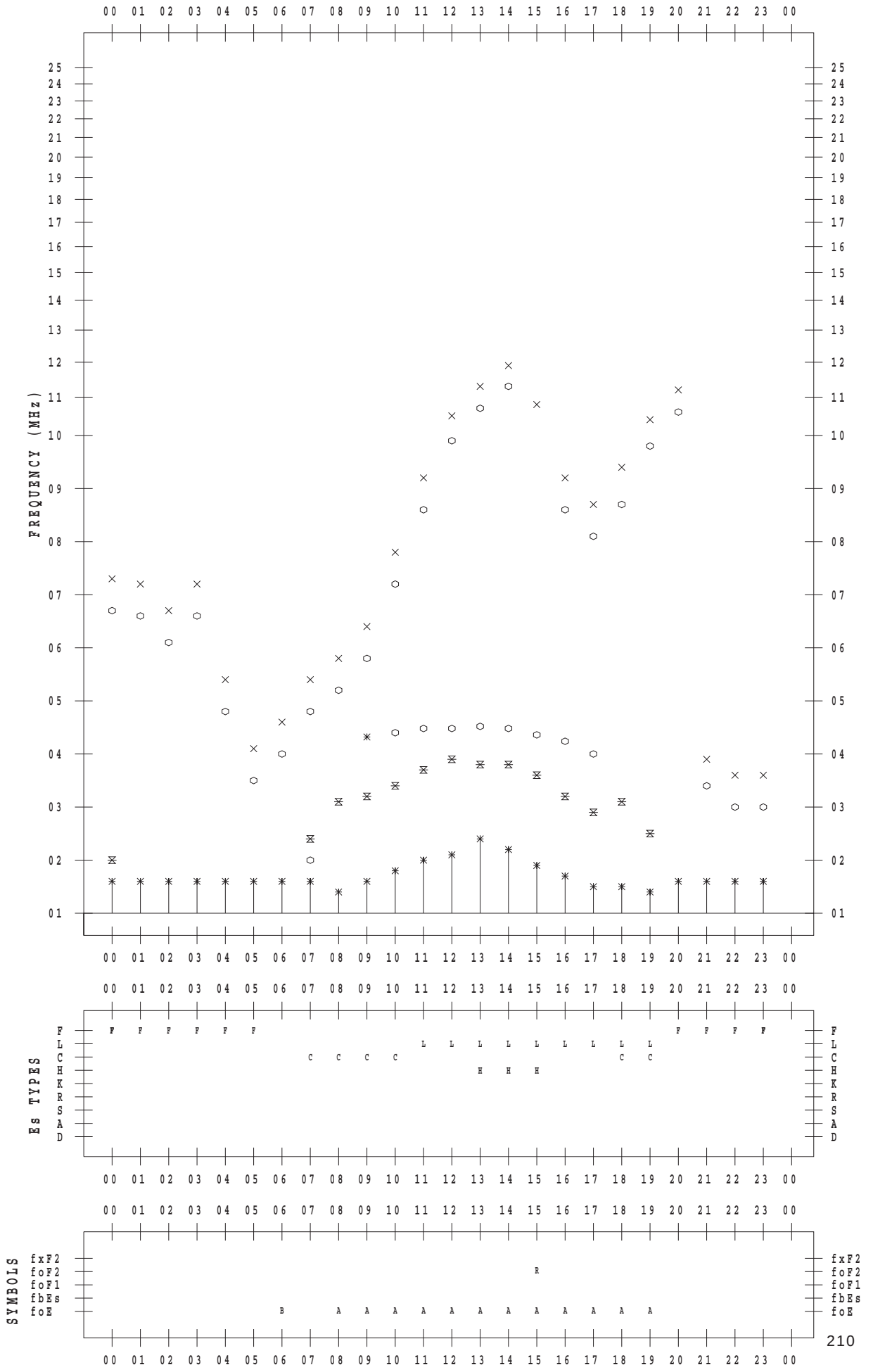
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/13

135 °E MEAN TIME



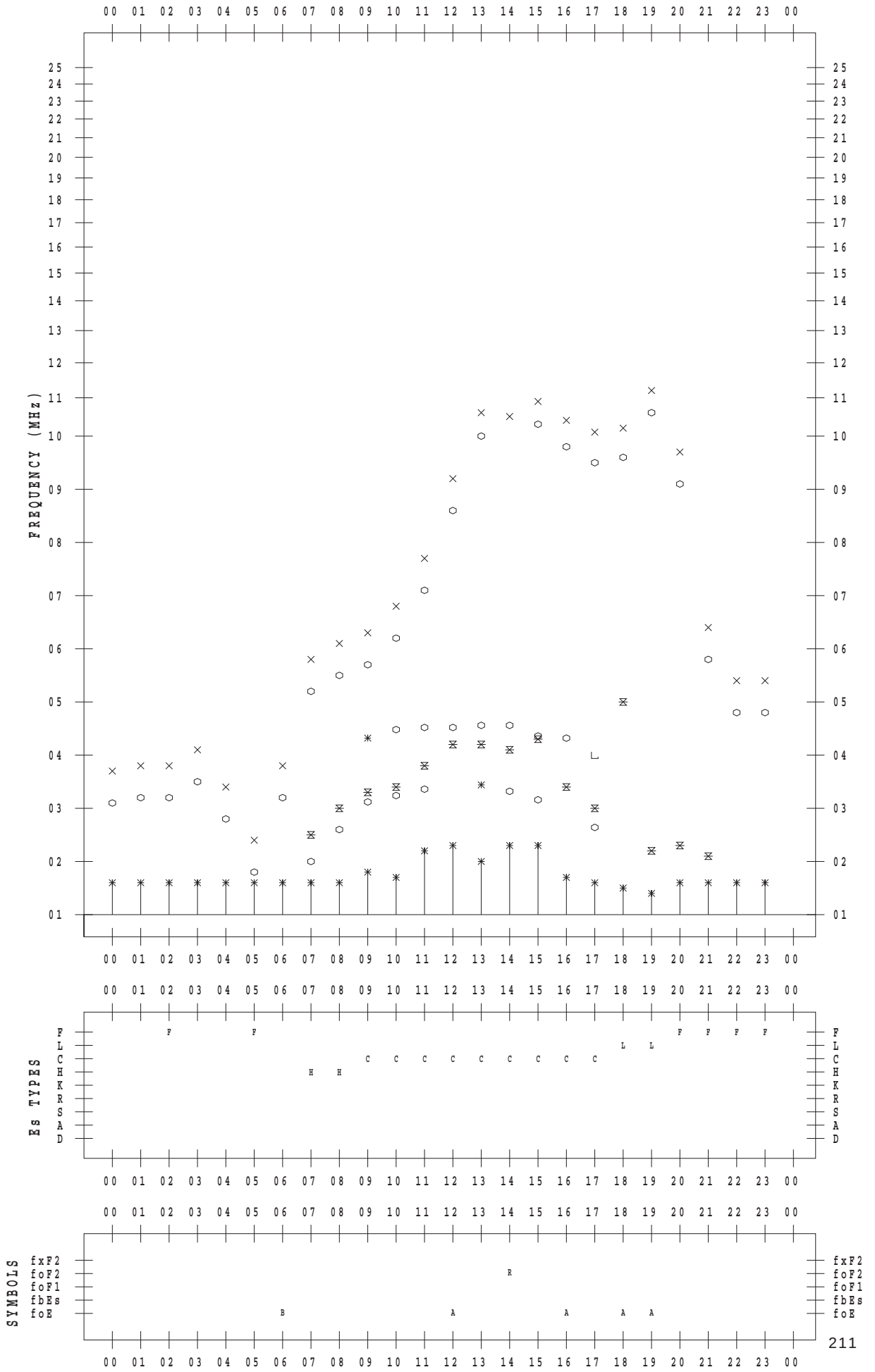
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/14

135 °E MEAN TIME



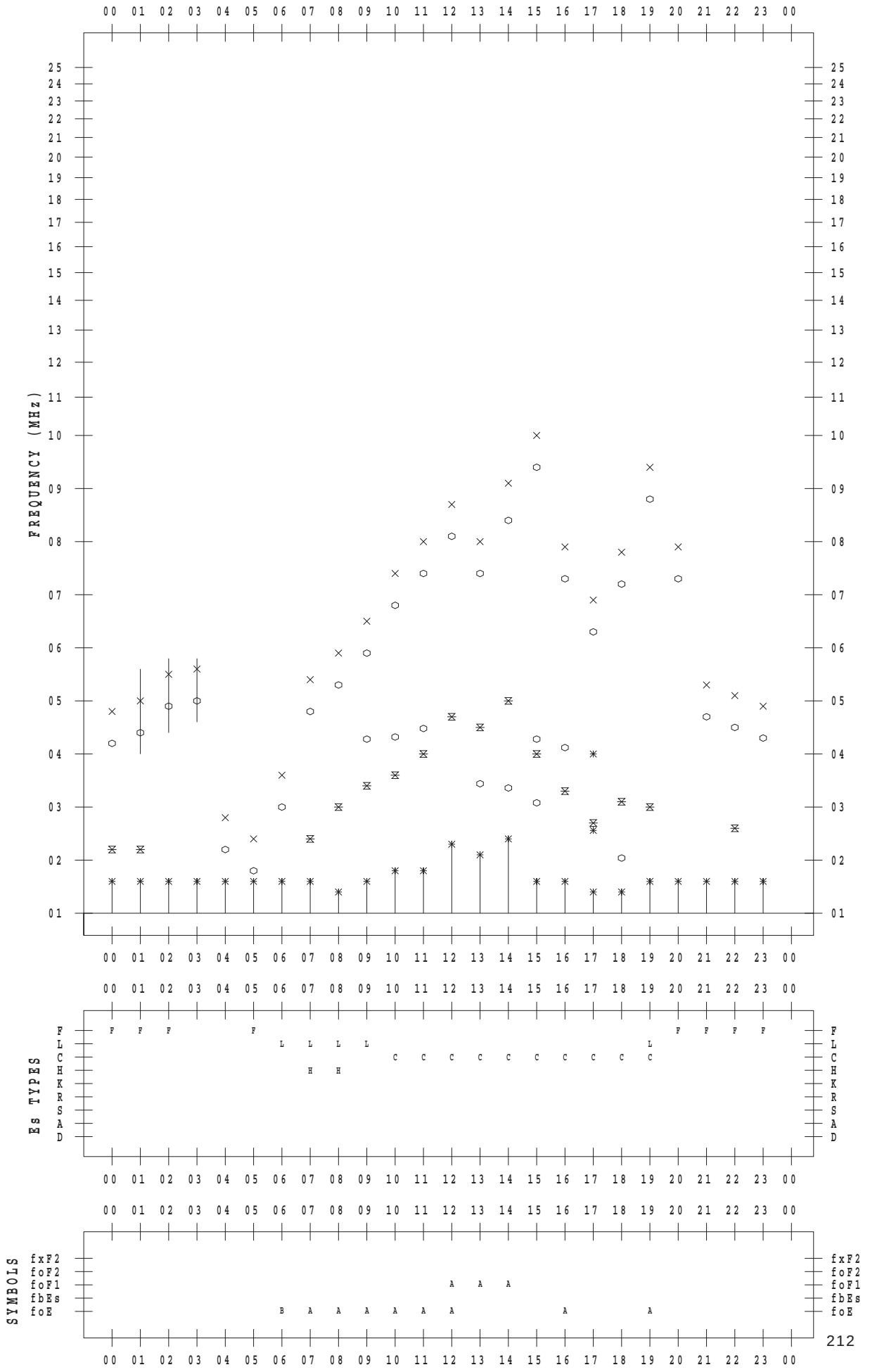
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/15

135 °E MEAN TIME



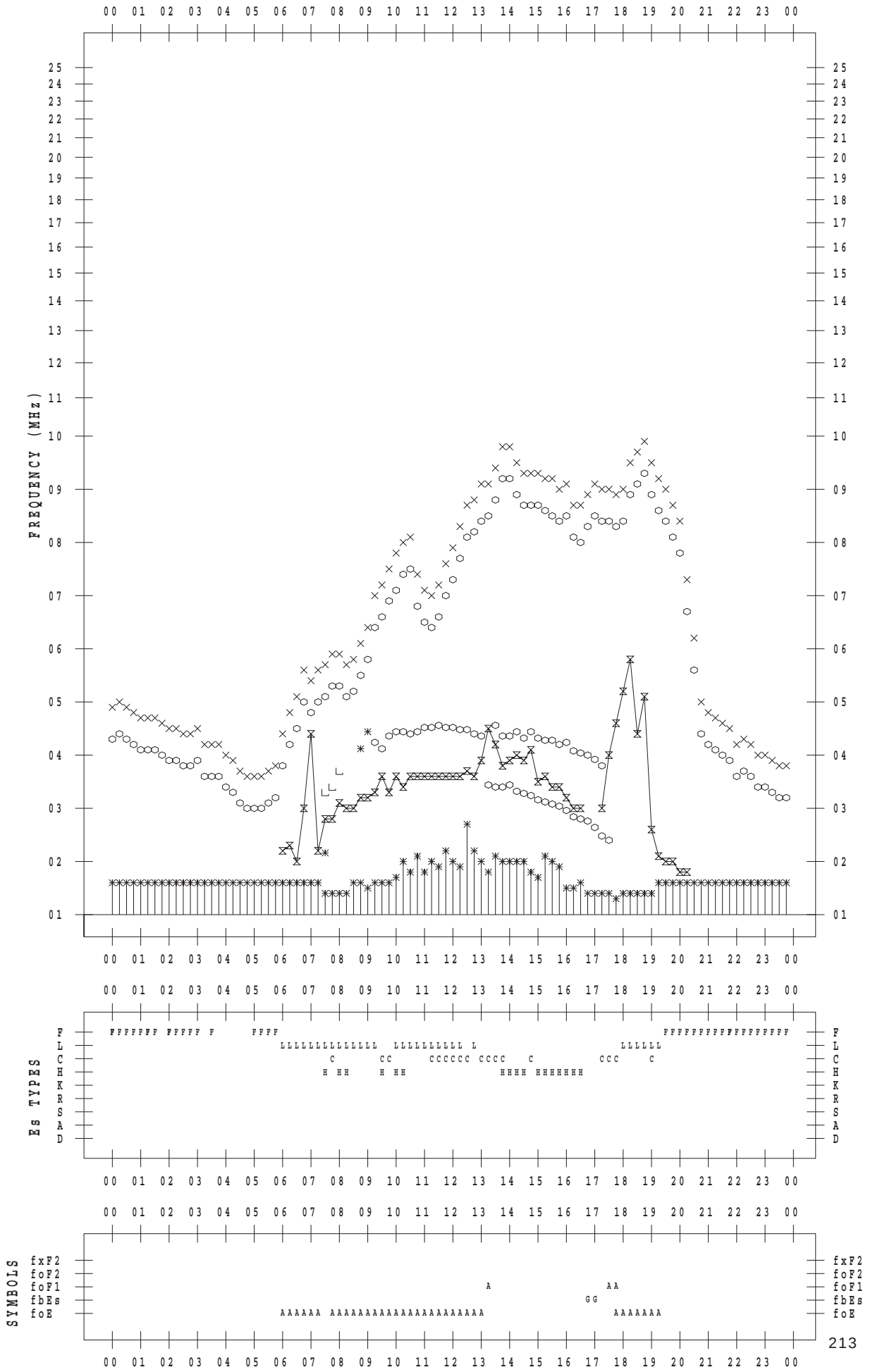
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/16

135 °E MEAN TIME



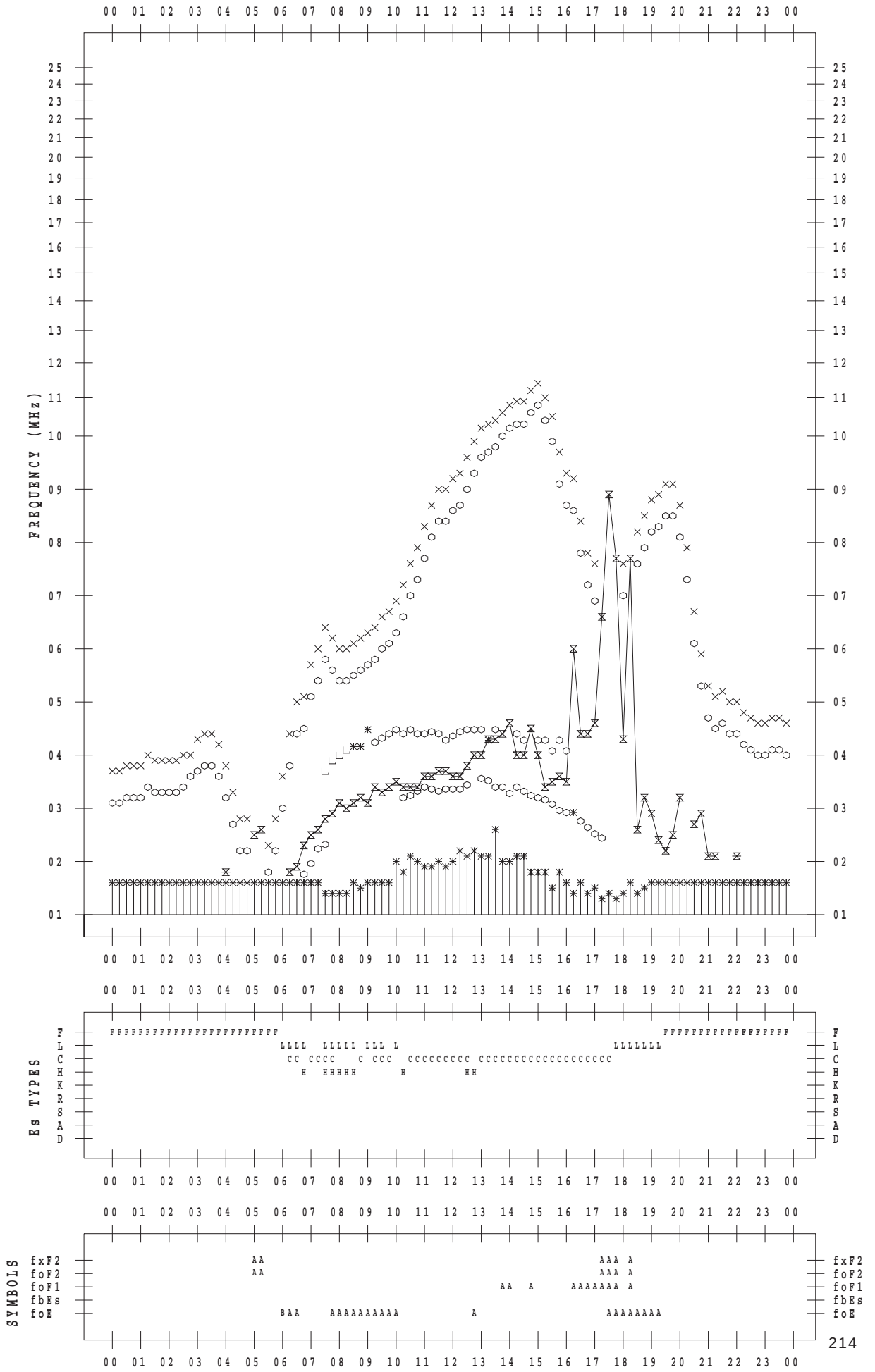
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/17

135 °E MEAN TIME



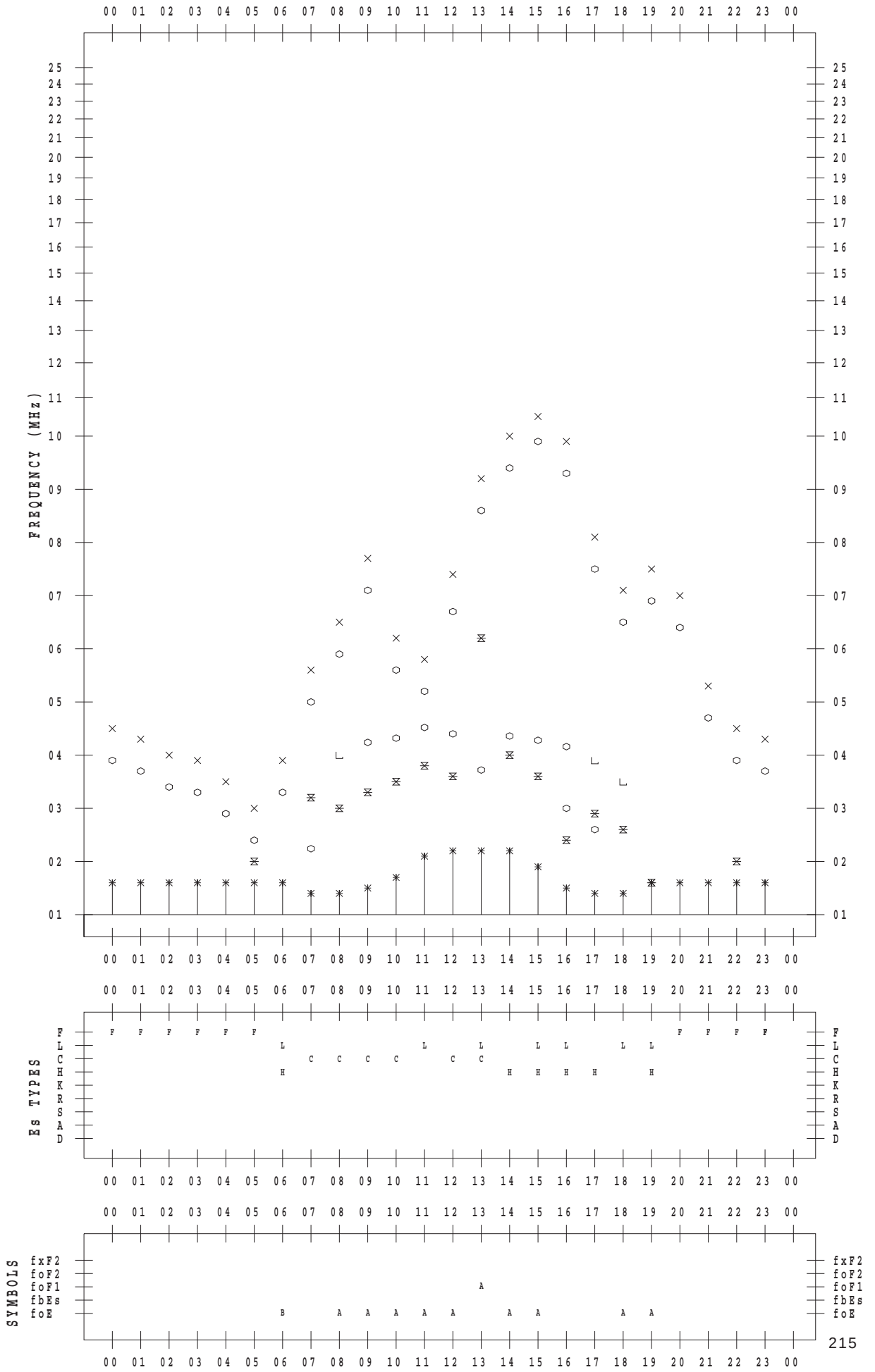
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/18

135 °E MEAN TIME



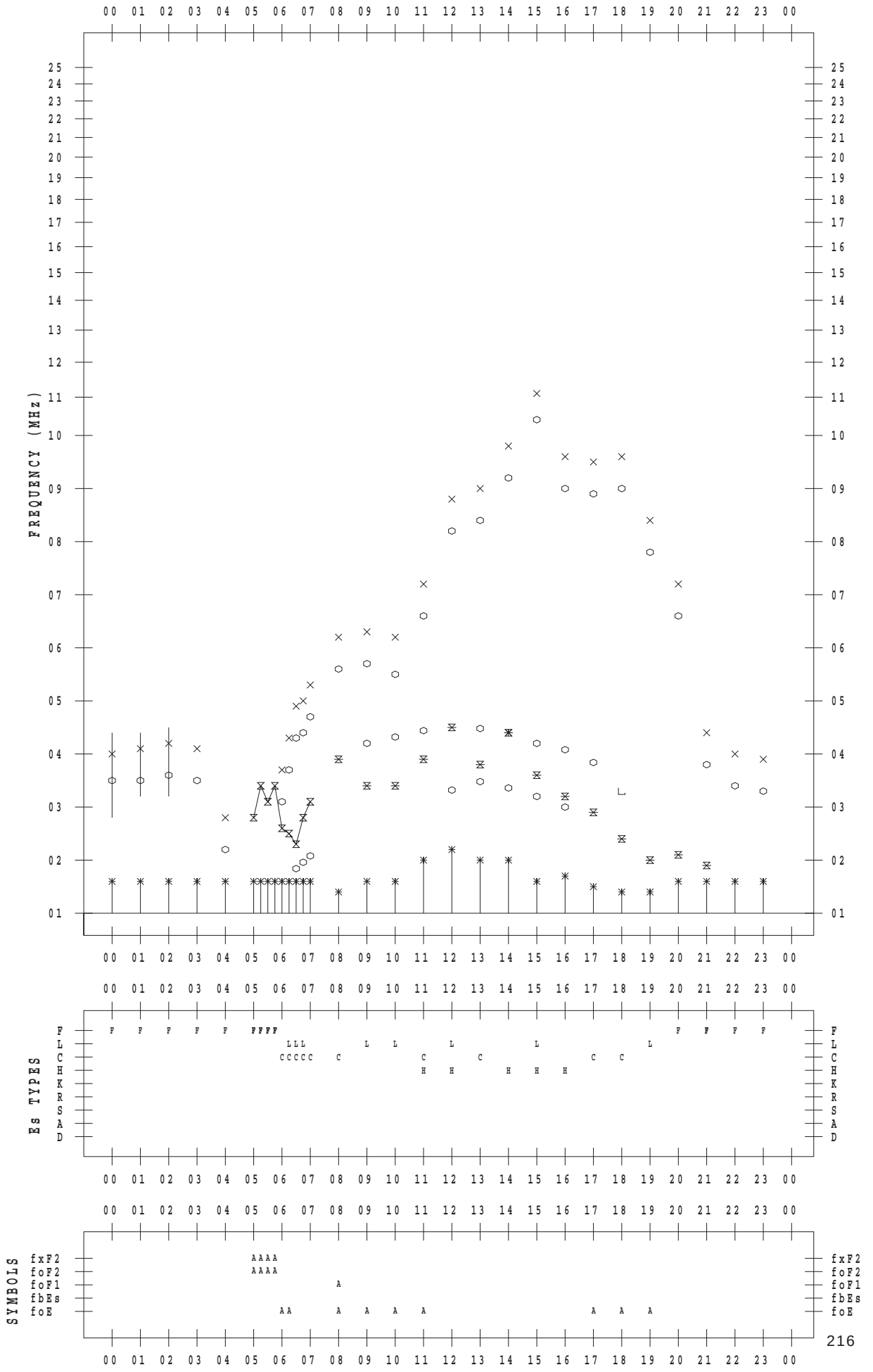
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/19

135 °E MEAN TIME



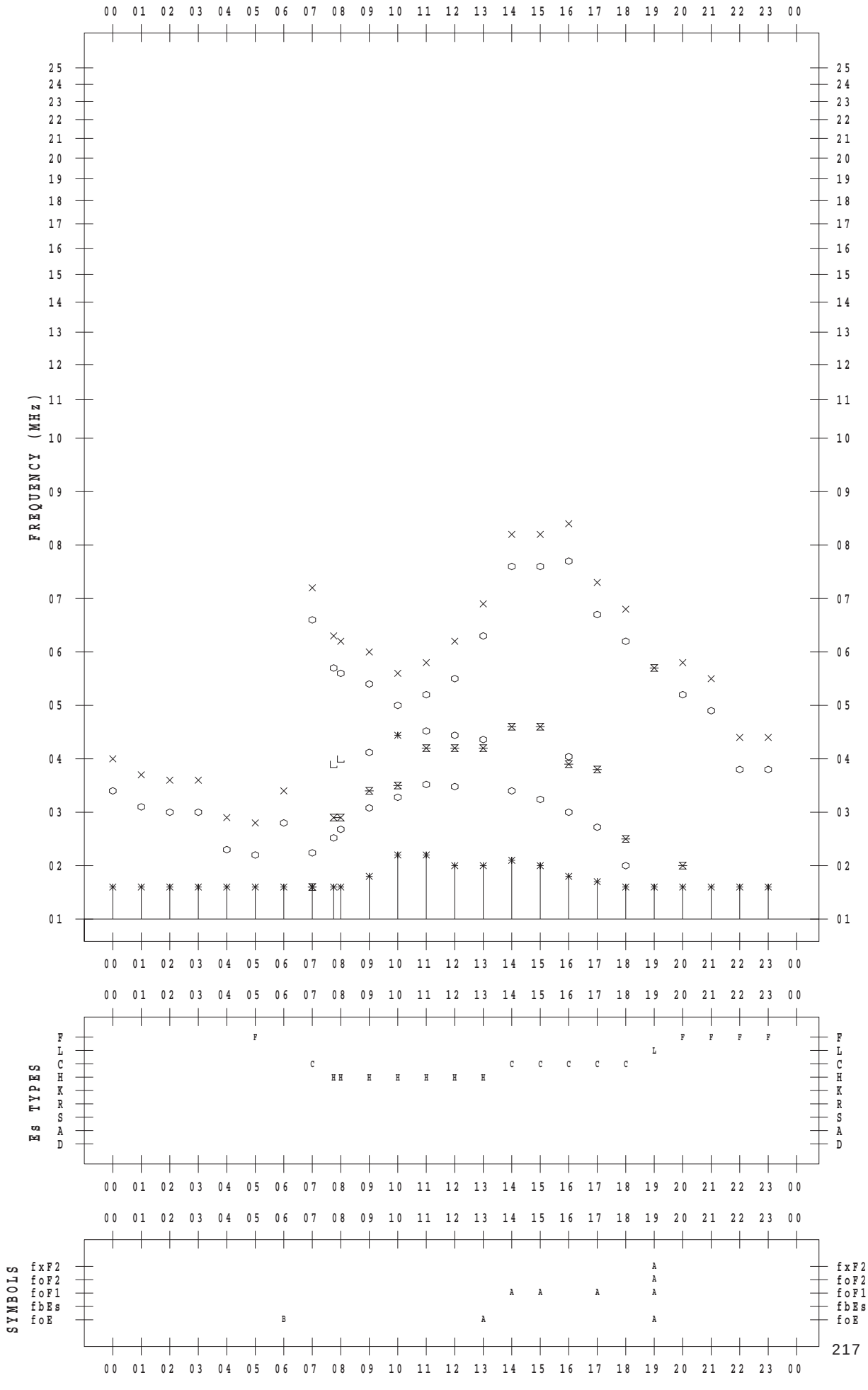
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/20

135 °E MEAN TIME



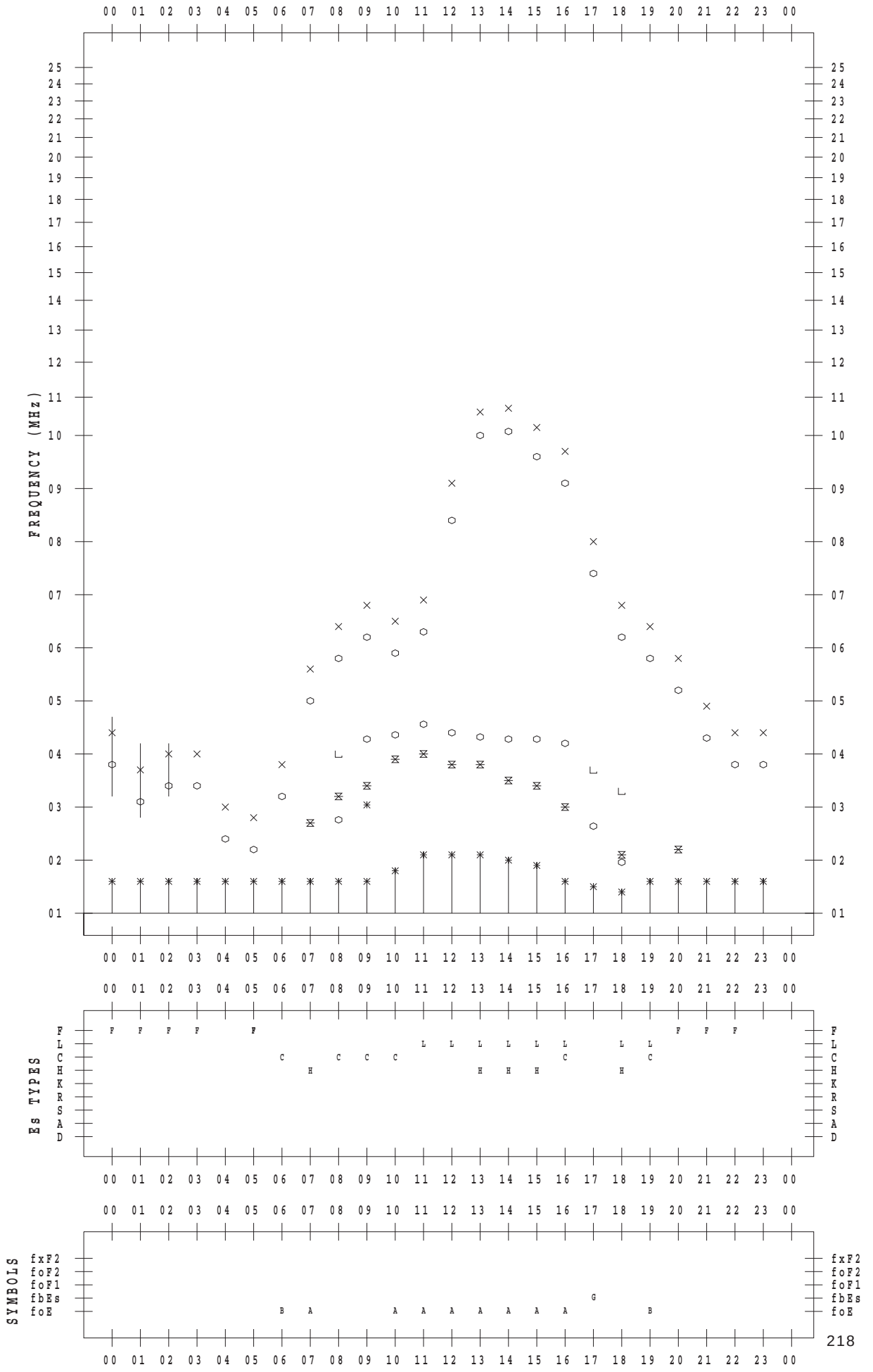
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/21

135 °E MEAN TIME



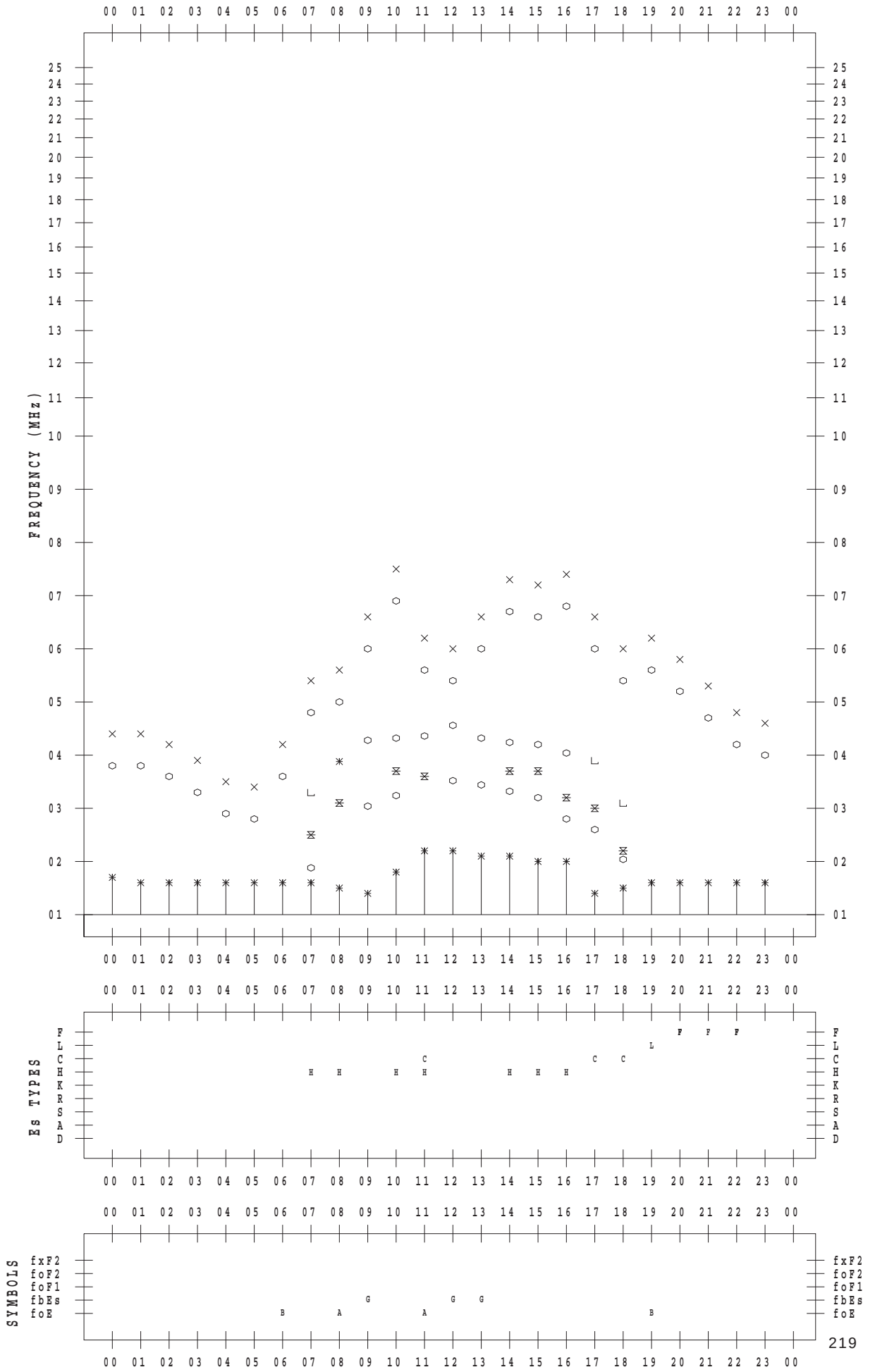
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/22

135 °E MEAN TIME



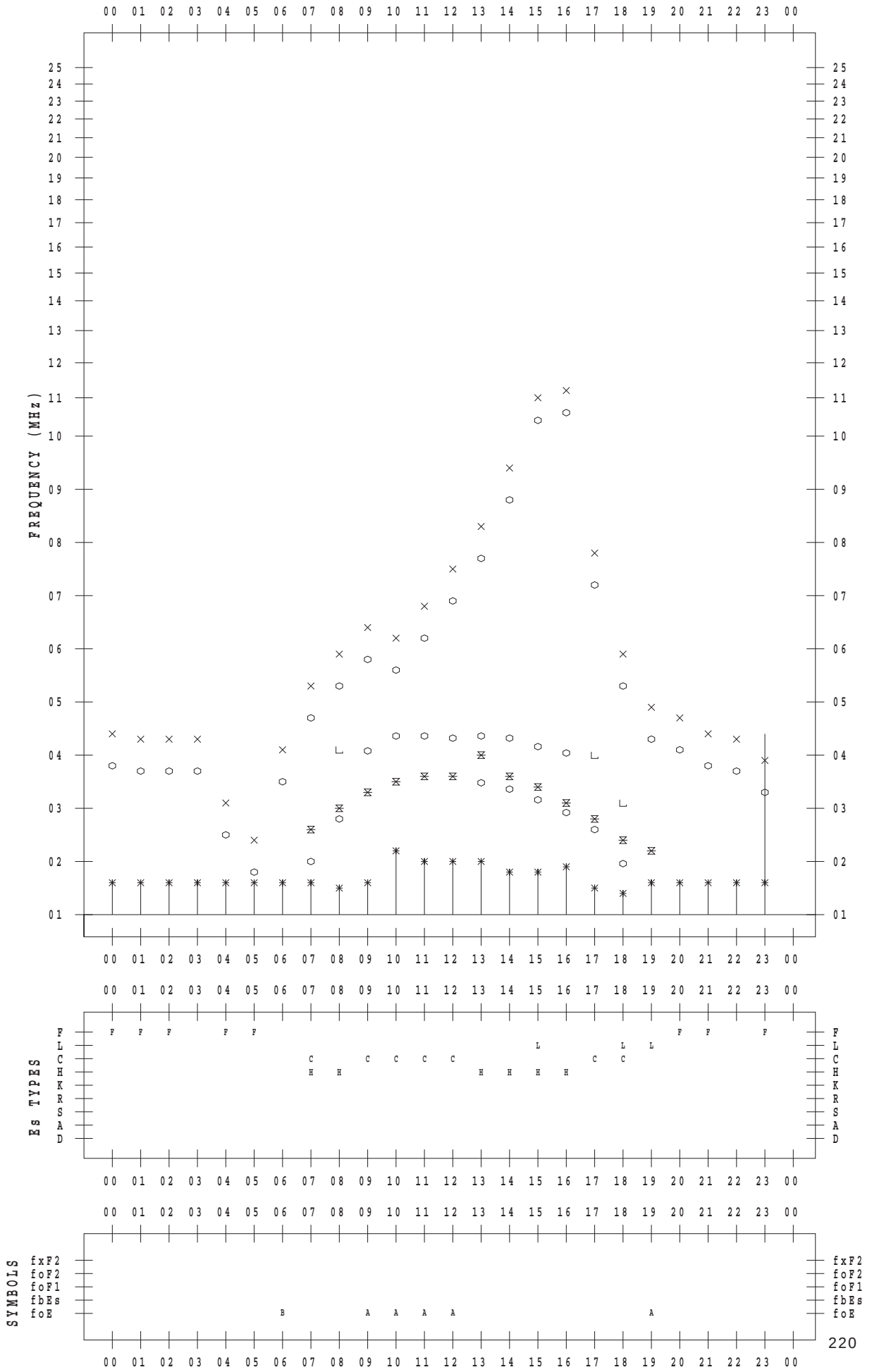
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/23

135 °E MEAN TIME



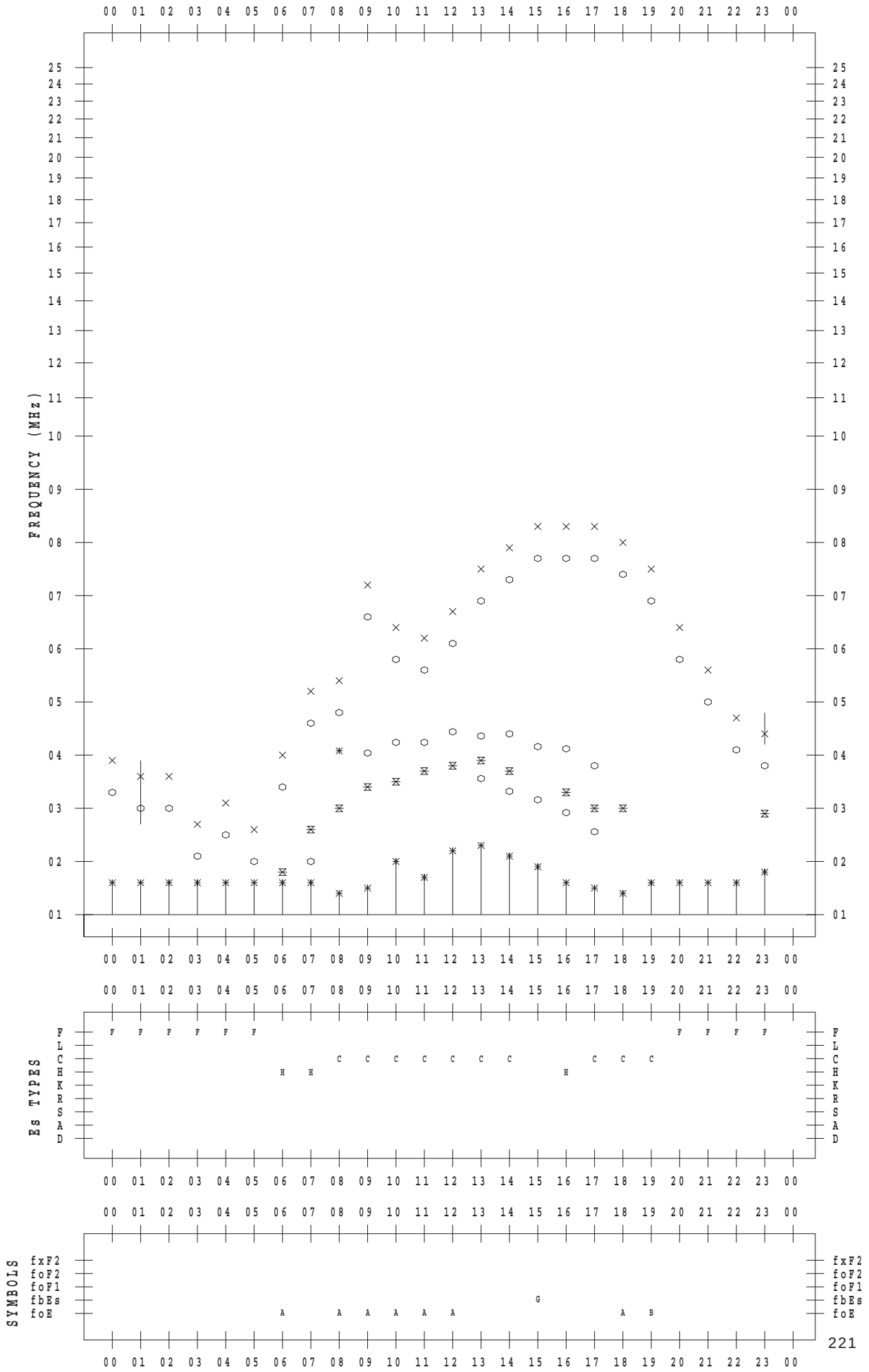
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/24

135 °E MEAN TIME



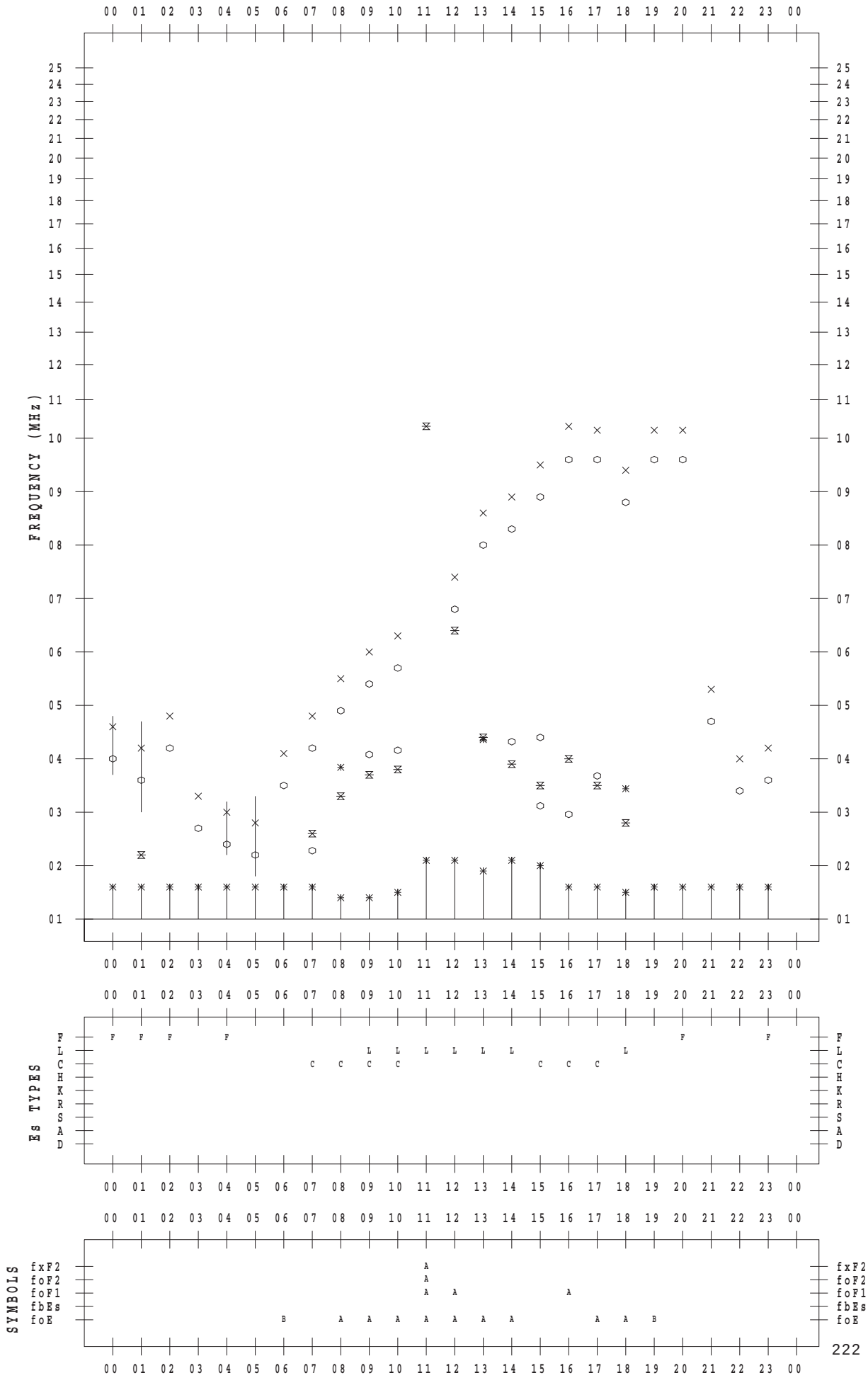
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/25

135 °E MEAN TIME



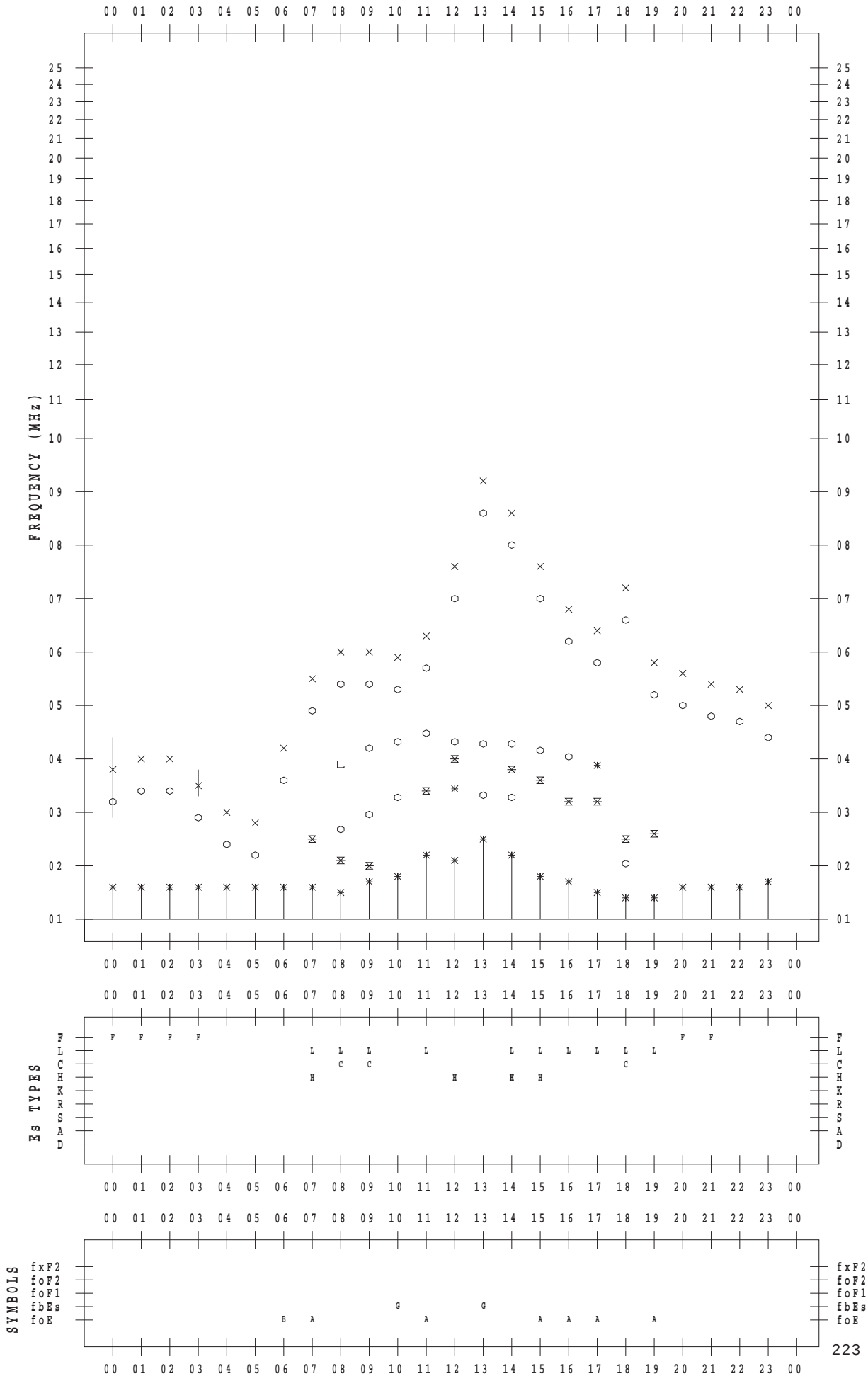
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/26

135 °E MEAN TIME



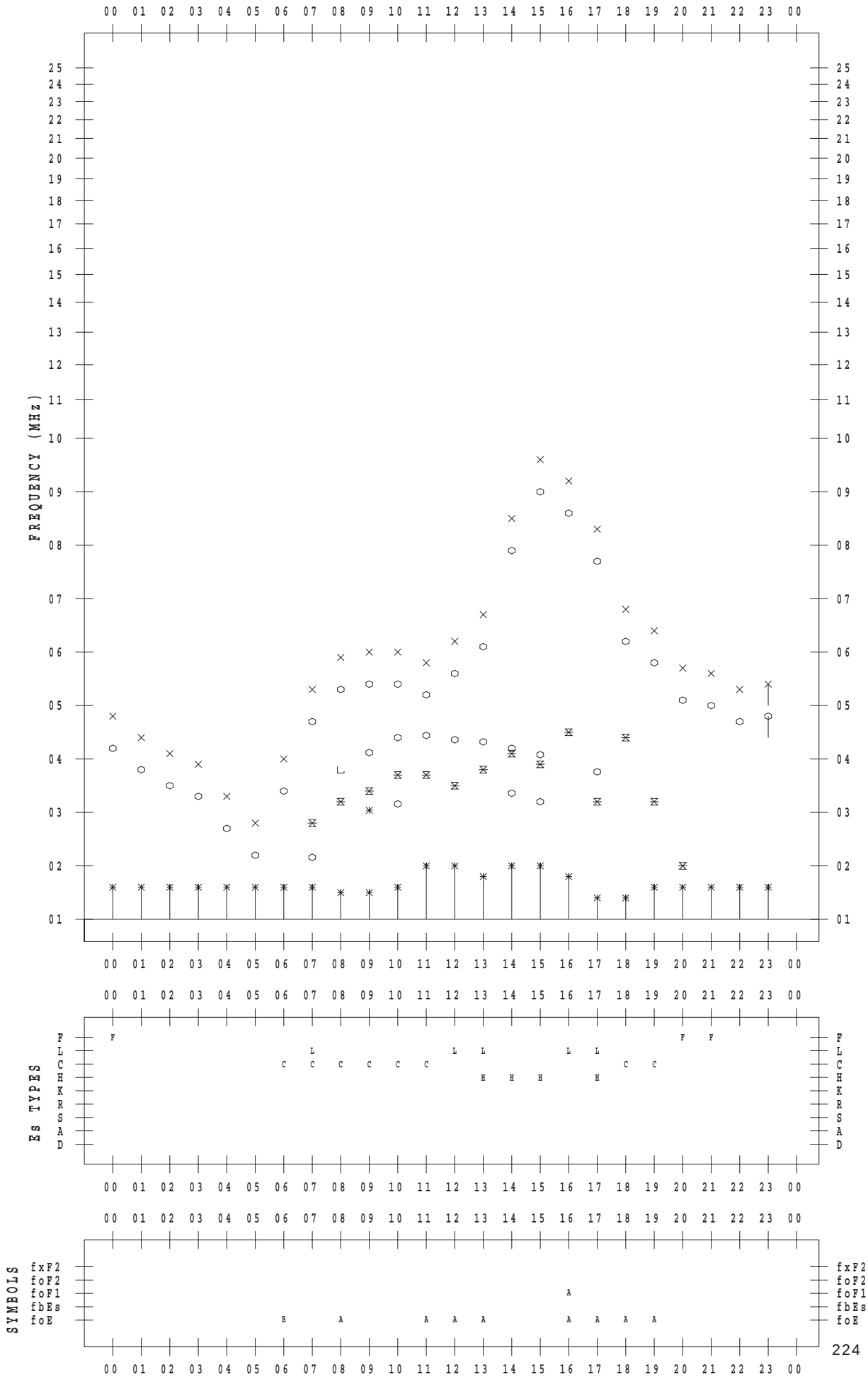
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/27

135 °E MEAN TIME



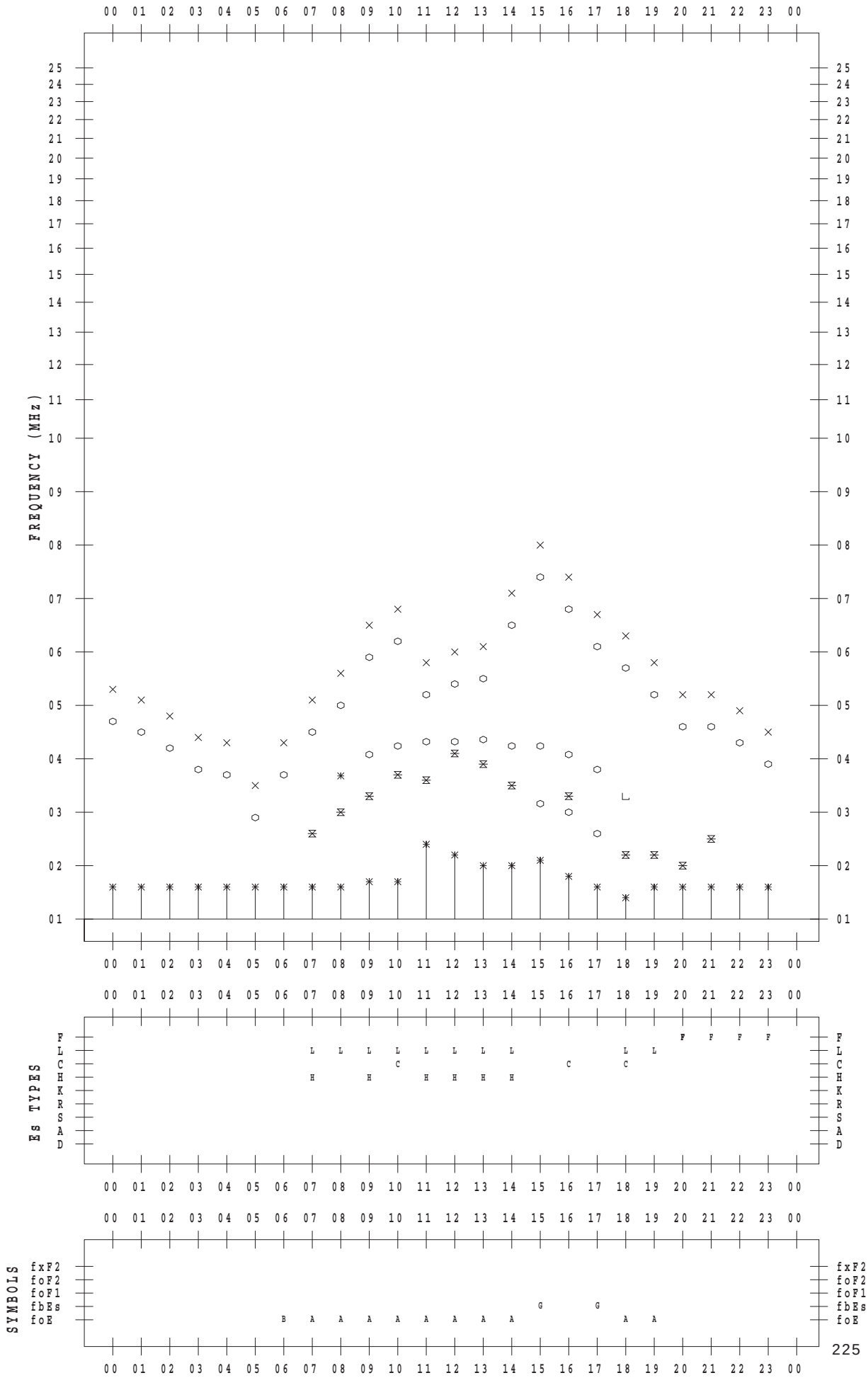
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/28

135 °E MEAN TIME



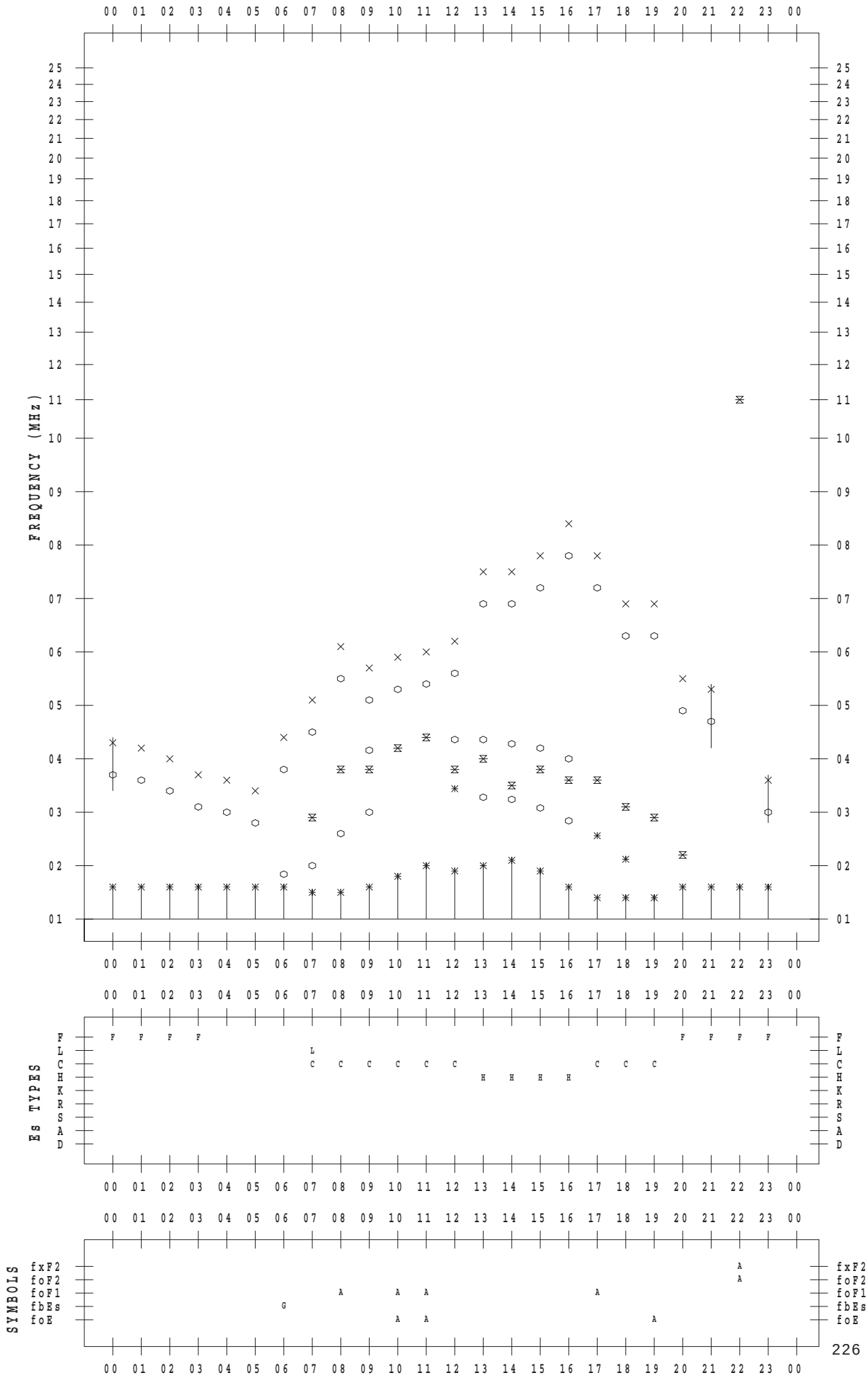
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/29

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 4/30

135 °E MEAN TIME