F-843

IONOSPHERIC DATA IN JAPAN

FOR MARCH 2019

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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

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

HOURLY VALUES OF fEs AT Wakkanai

MAR. 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	32	G	G	G	G	G	G	30	54	55	93	44	44	G	G	34	31	G	G	54	G	G	G	G
2	27	G	31	24	31		33	G	32	35	44	49	38	G	38	G	G	G	32	32	34	33	34	29
3	G	G	21	G	24	G	G	G	G	40	40	44	G	48	G	G	42	G	26	35	G	G	G	G
4	G	G	28	28	29	29	27	G	48	G	43	45	44	50	52	38	35	32	40	G	G	25	G	24
5	28	G	24	G	G	G	G	48	38	44	59	42	G	37	49	G	45	G	G	G	G	G	G	33
6	24	25	G	G	G	G	G	G	33	G	44	38	37	G	G	G	G	28	26	26	G	G	G	G
7	G	G	G		G	G	G	59	G	36	38	104	46	42	38	G	G	G	G	G	G	G	G	G
8	G	G	G	G	G	G	11	G	G	G	126	G	G	45	G	34	G	G	G	G	G	G	G	G
9	32	G	G	G	G	G	G	G	33	37	38	39	46	41		G	G	G	G	26	28	24	G	G
10	G	170	G	G	G	90	G	G	G	G	G	G	46	38	G	108	33	G	G	G	G	24	23	G
11	33	G	G	G	G	G	11	48	34	43	42	39	46	37	37	G	42	G	G	G	G	G	G	G
12	G	G	G	G	G	G	G	29	156	39	38	38	46	47	43	G		G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	34	112	35	39	49	G	G	G	34	N	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	34	38	35	50	46	G	45	G	G	33	G	G	G	G	G	G	G
15	G	G	G	G	G	G	28	100	G	40	90	40	G	43	81	G	32	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G		39	43	40	45	38	G	37	G	G	G	G	G	26	30	G	25
17	28	G	G	G	G	G	G	G	34		38	66	41	40	G	35	31	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	59	G	54		G	37	G	G	G	G	G	G	24	27	25	26
19		G	G	24	G		29	33	35	40	45	42	46	44	G	34	40	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	33	36	G	G	G	G	43	37	34	38	28	G	G	G	G	G	G
21	G	90	G	G		G	29	57	36	39	40	46	45	46	N	34	G	G	G	G	G	G	G	G
22	G	G	G	G	G	G	32	38	40	39	45	39	47	G	G	34	32	41	G	G	G	G	G	G
23	G	G	G	G	G	G	36	116	39	G	G	G	40	40	36	G	G	G	G	G	G	G		G
24	G	G	G	G	G	G	39	34	36	G	41	47	44	G	G	G	G	G	G	G	G	G	G	G
25	G	G	G	G	G	G	N	31	38	G	40	39	49	47	G	41	33	G	G	11	G	G	G	33
26	G	G	G	G	G	G	29	40	34	38	69	G	39	G	G	G	32	G	11	G	G	G	G	G
27	G	G	G	G	G	G	38	32	40	103	39	G	91	G	G	35	35	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	31	43		G	42	38	45	G	113	108	G	G	G	G	G	G	G
29	G	G	G	G	G	117	26	G	35	G	38	45	116	61	38	42	32	G	26	26	35	G	G	28
30	G	24	G	G	G	G	28	31	34		38	66	39	40	G	65	37	37	55	32	G	G	G	G
31	G	G	G	G	G	G	G	36	54	G	G	46	46	44	44	N	G	G	G	G	G	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	30	30	29	30	30	31	28	31	30	31	31	29	30	29	31	31	31	31	31	30	31
MED	G	G	G	G	G	G	G	32	36	36	40	42	41	40	G	18	32	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	29	38	40	40	45	46	46	45	38	35	36	G	G	11	G	G	G	G
L Q	G	G	G	G	G	G	G	G	33	G	38	38	G	G	G	G	G	G	G	G	G	G	G	G

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

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

HOURLY VALUES OF foF2 AT Kokubunji

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

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HOURLY VALUES OF fEs AT Kokubunji

MAR. 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	26	G	G	G	G	33	G	40	42	G	G	G	G	34	26	23	G	G	G	31	G
2	G	G	G	G	G	G	G	G	33	G	44	45	G	G	37	37	G	G	G	G	G	40	60	25
3	39	G	G	G	G	G	G	G	34	54	G	40	G	G	39	38	G	33	26	30	G	24	50	36
4	27	G	G	G	G		G	28	G	37	G	G	47	39	G	36	32	G	11	G	30	25	G	40
5	40	G	G	G	G	G	G	G	G	G	G	G	G	G	G	35	33	G	G	G	G	G	26	G
6	G	G	26	G	G	G	G	G	G	37	G	38	39	38	G	G	G	28	36	32	27	G	25	G
7	G	G	G	G	G	G	G	47	G	G	G	41	40	G	G	G	G	G	11	G	G	G	G	G
8	G	G	G	G	G	G	G	37	G		G	39	G	40	G	43	G	G	G	G	G	G		G
9	G	G	G	G	G	G	G	47	149	G	G	40	39	G	G	G	G	34	28	25	G	G	43	34
10	28	G	G	G	G	G	G	29	G	42	G	41	39	39	G	G	39	35	26	G	30	G	G	G
11	G	G	G	G	G		G	29	G	40	39	40	G	G	50	54	39	52	29	26	28	G	G	34
12	G	G	G	G	G	G	G	49	G	G	38	G	G	G	G	G	33	G	G	G	G	G	G	G
13	G		G		G	G	G	32	G	G	G	G	G	G	G	G	G	G	11	G	G	G	29	G
14	G	G	G	G	G		24	33	49	G	45	G	G	G	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	24	33	108	40	G	G	G	G	37	42	35	28	11	G	G	G	G	G
16	G	G	G	G	G	G	26	34	G	G	G	40	G	40	42	45	37	G	G	32	31	G	G	G
17	G	G	G	G	G	G	G	32	G	41	G	50	53	41	41	G	32	G	26	28	27	G	G	G
18	G	27	28	24			G	G	G	G	G	40	C	G	G	G	G	G	29	G	G	G	G	28
19	G	G	G	26	32	G	26	33	G	G	39	39	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	G	G	G	G	39	G	G	40	36	37	32	27	11	G	G	29	G
21	G	G	G	G	G	G	G	33	G	47	43	41	41	G	G	G	33	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G	36	39	G	40	G	40	40	G	G	G	G	G	G	G	G	G	G
23	G	G	G	G	G	G	41	33	G	G	G	G	41	52	G	G	37	32	29	G	G	G	G	G
24	G	G	G	G	G	G	26	31	G	G	43	43	G	39	G	G	37	32	G	G	G	G	G	G
25	G	G	G	G	G	G	34	G	G	G	G	41	40	41	38	G	G	G	G	11	G	G	G	G
26	G	28	G	G	G	G	35	G	G	37	40	40	40	G	G	G	G	G	G	G	11	G	G	G
27	G	G	G	G	G	G	27	G	G	G	42	G	G	G	40	36	G	G	G	26	34	G	G	G
28	G	G	G		G	G	G	33	34	G	39	G	40	G	G	G	34	29	G	G	11	G	G	G
29	G	G	G	G		G	G	34	G	G	40	40	40	39	G	G	162	35	27	G	G	G	G	G
30	26	G	G	34	23	G	148	G	G	39	39	G	40	G	G	G	G	35	26	31	G	G	G	G
31	G	G	G	G	G	G	29	31	G	G	39	G	G	40	G	G	34	G	G	G	G	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	29	29	27	31	31	31	30	31	31	30	31	31	31	31	31	31	31	31	31	30	31
MED	G	G	G	G	G	G	G	31	G	G	G	39	G	G	G	G	32	G	11	G	G	G	G	G
U Q	G	G	G	G	G	G	26	33	33	37	40	41	40	39	37	36	35	32	26	25	11	G	25	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

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HOURLY VALUES OF fmin AT Kokubunji

MAR. 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	13	15	14	13	14	18	13	17	14	14	18	18	33	34	20	15	17	13	14	14	14	17	14	13
2	14	15	14	14	18	17	13	17	14	18	30	18	21	20	18	17	14	18	14	23	18	14	13	14
3	13	17	14	14	14	17	17	13	14	18	17	17	18	18	15	14	14	13	13	13	15	14	13	13
4	14	13	14	13	14		14	14	14	14	39	23	20	18	21	18	14	18	13	17	14	14	13	14
5	13	14	17	20	14	14	14	22	14	14	20	18	18	17	14	17	14	18	14	13	17	14	14	14
6	14	14	15	14	13	13	14	22	13	14	15	20	42	14	21	17	14	13	14	13	14	15	14	14
7	14	14	13	14	13	14	14	22	18	14	14	14	21	22	33	20	14	20	14	14	14	14	14	14
8	15	17	14	13	14	14	14	18	18		18	18	44	31	21	20	14	20	14	14	14	14		15
9	14	14	14	17	15	15	14	23	13	15	15	22	20	21	20	17	14	14	13	14	17	14	13	14
10	14	18	13	14	14	14	14	14	13	20	28	22	24	42	41	17	14	13	15	14	13	14	20	14
11	13	14	18	14	13		14	14	13	15	15	15	22	22	18	17	14	14	14	14	13	14	15	13
12	15	13	15	15	14	17	13	14	14	15	22	23	25	21	42	18	17	20	15	15	17	15	18	13
13	15		21		14	17	14	14	14	17	14	21	22	14	18	18	15	13	13	14	20	14	14	13
14	14	14	17	14	14		15	20	14	14	17	20	21	15	21	18	15	14	17	14	17	14	18	20
15	14	14	14	13	14	18	17	13	14	15	20	20	18	21	14	15	13	13	14	23	15	15	14	18
16	20	15	14	22	14	17	17	14	13	21	17	24	21	20	18	18	17	25	17	15	13	17	17	14
17	17	17	17	17	17	15	14	14	17	17	20	21	21	21	21	20	14	15	15	17	20	20	17	13
18	14	14	13	17			15	23	15	15	15	18	C	22	22	14	29	20	15	14	14	14	13	13
19	20	14	14	14	14	14	17	17	14	18	17	18	20	42	21	20	14	22	18	14	21	14	17	14
20	14	14	14	14	15	14	15	14	15	18	21	21	22	20	18	18	14	13	20	14	14	13	14	14
21	14	17	17	17	14	20	18	14	14	20	21	18	21	17	34	18	13	14	14	13	14	14	15	17
22	15	17	14	14	14	15	14	13	13	18	21	34	22	21	21	18	20	14	14	14	18	14	18	14
23	14	14	17	14	17	17	15	14	18	20	21	23	22	24	21	17	15	13	13	14	18	17	18	14
24	14	14	14	14	13	18	18	14	15	21	20	21	23	44	20	14	15	15	14	13	14	14	17	18
25	15	14	14	14	14	14	13	14	15	20	20	23	21	25	42	21	17	21	15	14	18	20	14	14
26	14	14	14	14	13	13	20	14	14	18	20	44	45	44	17	18	14	21	14	13	14	17	15	14
27	14	14	14	14	15	14	14	25	14	18	18	22	22	22	20	15	17	21	14	15	13	15	14	14
28	14	21	14		14	14	21	15	18	20	21	44	22	21	20	29	18	14	21	18	14	14	15	14
29	15	14	14	18		18	20	22	14	14	20	23	44	31	17	15	37	14	18	14	14	14	18	15
30	14	14	14	13	14	13	21	20	15	17	23	22	21	18	43	18	14	14	18	17	20	17	21	15
31	14	14	14	14	14	15	13	21	14	18	20	32	22	22	18	14	18	21	20	14	14	14	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	29	29	27	31	31	31	30	31	31	30	31	31	31	31	31	31	31	31	31	30	31
MED	14	14	14	14	14	15	14	14	14	18	20	21	22	21	20	18	14	14	14	14	14	14	15	14
U Q	15	15	15	16	14	17	17	21	15	18	21	23	23	25	21	18	17	20	17	15	18	15	17	15
L Q	14	14	14	14	14	14	14	14	14	15	17	18	21	18	18	15	14	13	14	14	14	14	14	14

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF foF2 AT Yamagawa

MAR. 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	30	N	30	31	32	59	28	52	65	54	52	65	65	54	68	60	52	51	149	47	42	42	28	A
2	32	30	26	31	N	B	26	51	53	53	57	58	71	65	72	58	52	52	58	54	39	B	A	28
3	28	28	29	A	30		B	46	54	50	58	64	67	90	78	64	57	48	50	37	34	34	A	32
4	32	31	30	31	A	26	N	47	51	53	56	57	60	61	77	70	59	51	48	48	47	41	43	30
5	N	26	B	28	31		B	42	51	54	59	54	75	77	65	58	58	52	50	54	42	32	28	189
6	28	32	28	30	32	26	N	44	47	51	54	54	68	69	60	64	55	51	58	54	34	34	34	31
7	30	N	30	30	32	N	N	45	54	51	52	60	74	62	60	58	54	54	54	48	42	28	28	N
8	28	28	28	28	31	23	B	42	47	51	48	57	66	72	63	54	54	52	66	64	43	34	28	28
9	30	35	34	32	37	40	34	47	53	54	54	56	67	72	67	60	59	39	58	47	30	30	34	49
10	30	30	30	32	32	29	B	48	50	50	54	57	68	86	91	86	71	64	64	65	51	36	40	41
11	32	53	42	34	32	B	N	44	54	54	55	60	66	75	70	71	63	54	49	38	34	28	30	31
12	31	34	32	31	30	28	N	42	50	54	52	51	61	69	66	69	58	C	54	53	42	43	38	36
13	30	A	31	32	31	30	30	47	53	48	C	C	C	B	65	74	54	50	51	48	37	31	34	B
14	B	B	32	28		B		43	46	51	66	45	66	66	70	C	C	C	54	54				B
15			30			B	B	42	50	51	58	B	B	C	C	B	57	68	67	36	32	A	31	30
16	30	31	31	30	28	26	28	40	47	54	51	54	64	78	82	72	65	61	58	54	48	29	30	30
17	31	32	30	29	29	29	30	53	54	55	57	82	89	73	78	67	60	60	65	50	51	42	42	34
18	34	34	30	28	29	26	28	45	51	59	66	62	74	86	86	53	52	53	54	51	45	29	30	26
19	29	49	28	A	22	N	N	48	50	51	61	65	78	85	60	60	66	56	48	44	38	32	29	31
20	31	32	30	30	29	N	B	42	51	58	53	67	72	62	71	65	56	54	59	67	50	59	29	30
21	28	B	30	30	31	N	28	23	52	50	57	62	84	86	74	60	50	50	54	64	42	B	49	31
22	31	N	29	28	30	N	26	44	52	55	54	61	72	78	78	70	58	54	54	53	50	33	38	36
23	36	34	29	29	29	25	28	109	50	54	58	54	58	65	74	55	54	A	55	54	42	36	35	32
24	25	31	29	30	30	28	28	44	47	45	55	52	65	74	81	39	52	54	54	52	48	38	29	29
25	30	32	31	30	26	49	31	44	53	51	48	48	61	80	81	64	55	60	66	58	38	A	29	31
26	28	30	30	28	29	N	28	42	46	50	54	55	62	71	70	62	52	55	62	58	36	29	31	32
27	31	31	34	31	B	B	28	51	48	52	51	55	63	75	74	51	54	51	58	54	48	36	37	38
28	37	40	34	49	28	28	30	44	51	52	51	54	62	77	71	52	54	56	54	71	N	38	28	30
29	26	32	30	30	B	B	28	109	51	63	50	58	50	65	59	58	57	67	67	51	50		34	34
30	31	A	29	26	31	26	A	42	47	51	54	51	66	77	66	69	63	62	54	51	39	26	26	28
31	30	32	31	28	N	N	28	28	54	58	62	53	71	72	60	51	56	58	50	45	44	36	34	32
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	23	30	28	24	16	17	31	31	31	30	29	29	29	30	29	30	28	31	31	29	25	28	27
MED	30	32	30	30	30	28	28	44	51	52	54	57	66	73	70	60	56	54	54	53	42	34	31	31
U Q	31	34	31	31	31	29	30	48	53	54	58	61	72	78	78	69	59	59	62	54	48	38	36	34
L Q	28	30	29	28	29	26	28	42	48	51	52	54	62	65	65	56	54	51	54	48	37	29	29	30

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HOURLY VALUES OF fEs AT Yamagawa

MAR. 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	29	G	G	G	G	G	G	G	30	G	G	45	43	39	G	38	36	32	27	25	G	26	G	35
2	29	G	G	G	G	B	G	G	G	G	44	43	46	G	54	G	G	G	G	11	11	B	28	G
3	G	27	34	26	G	G	B	G	G	36	43	44	47	44	G	G	36	30	G	G	G	G	30	G
4	28	G	G	26	39	G	G	G	32	G	44	G	46	45	40	38	36	31	G	11	G	G	G	G
5	G	G	B	G	G	G	B	25	G	G	G	46	45	G	38	38	35	31	G	G	11	G	G	G
6	G	G	G	G	G	G	G	26	32	36	39	43	48	41	G	40	G	32	G	G	11	G	G	G
7	G	G	25	G	G	G	G	40	53	G	G	46	46	46	G	G	G	G	G	G	11	G	G	G
8	G	G	G	G	G	20	B	43	32	39	41	G	46	G	46	38	35	31	24	11	22	G	G	G
9	G	G	G	G	G	11	G	G	33	39	45	47	45	48	45	44	46	47	58	34	G	G	G	G
10	G	G	28	G	26	G	B	48	43	36	46	47	47	G	G	37	36	33	27	G	44	26	G	G
11	G	G	G	27	26	B	G	29	32	39	46	45	43	45	45	38	36	31	G	G	G	G	G	G
12	G	30	G	G	G	G	G	43	G	40	45	48	45	44	45	40	48	C	27	19	G	G	G	G
13	G	34	G	G	G	G	G	29	34	G	C	C	C	B	44	38	G	31	G	G	G	G	G	B
14	B	B	G	G	G	B		G	48	42	G	44	G	40	43	C	C	C	G	G	G	G	G	B
15	G	G	G	G	G	B	B	32	36	35	42	B	B	C	C	B	36	37	27	27	G	35	G	G
16	G	G	G	G	G	G	G	41	40	44	G	48	46	46	43	G	39	58	26	G	11	G	G	G
17	G	G	G	G	G	G	G	28	40	38	40	42	44	50	59	51	50	48	G	38	G	G	G	G
18	G	G	32	27	26	G	G	28	G	G	G	46	48	46	61	42	37	32	28	G	24	G	G	G
19	G	G	G	30	G	24	G	28	40	43	G	44	G	45	40	44	36	G	28	G	36	G	G	G
20	G	G	G	G	G	G	B	28	32	40	G	39	48	49	41	G	38	36	25	G	48	29	G	G
21	G	B	G	27	G	G	G	30	34	36	39	48	47	47	44	G	35	G	G	11	41	B	G	G
22	G	G	G	G	G	11	G	48	32	37	46	48	42	48	39	G	36	32	28	30	11	G	G	G
23	G	G	G	G	G	G	G	31	35	39	38	44	44	48	45	40	G	57	40	G	26	28	G	G
24	G	G	G	G	G	G	G	45	G	G	39	44	42	46	48	45	G	31	26	G	G	20	G	G
25	G	G	G	G	G	G	G	31	32	36	72	49	48	47	44	45	36	33	27	39	34	35	G	G
26	G	31	G	G	G	G	G	28	G	44	G	46	46	47	G	42	G	G	29	21	36	G	G	G
27	G	G	G	G	B	B	G	29	G	40	43	46	44	48	64	40	G	32	26	34	31	26	G	G
28	G	G	G	G	G	G	G	32	157	44	G	48	136	41	G	G	36	35	G	29	48	11	G	G
29	G	G	G	G	B	B	G	32	37	G	46	47	47	G	G	44	36	32	G	11	G	G	G	28
30	G	26	G	G	G	24	41	44	41	G	G	44	47	45	51	48	52	44	40	28	32	G	G	G
31	G	G	G	G	G	G	G	31	G	G	38	49	47	40	44	38	39	32	G	G	G	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	31	29	25	24	31	31	31	30	29	29	29	30	29	30	29	31	31	31	29	31	29
MED	G	G	G	G	G	G	G	29	32	36	39	46	46	45	44	38	36	32	25	11	11	G	G	G
U Q	G	G	G	G	G	G	G	40	40	40	44	47	47	47	45	43	37	35	27	27	32	23	G	G
L Q	G	G	G	G	G	G	G	26	G	G	G	44	44	40	G	G	G	31	G	G	G	G	G	G

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HOURLY VALUES OF fmin AT Yamagawa

MAR. 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	18	18	15	14	15	14	15	14	14	15	17	18	20	18	20	17	15	14	15	14	14	17	14
2	14	15	15	15	16	B	15	15	15	16	15	16	18	18	18	17	15	15	16	14	14	B	15	14
3	15	14	17	16	15	66	B	17	14	14	20	17	20	21	18	16	16	14	17	14	15	15	14	15
4	15	15	14	14	14	14	14	18	15	15	18	16	18	20	18	20	18	14	18	14	14	14	14	14
5	14	15	B	14	15	18	B	17	14	14	17	18	18	18	20	18	15	14	17	14	15	16	15	15
6	14	14	14	14	17	14	15	17	15	15	15	15	18	20	20	18	17	15	17	15	14	14	14	15
7	15	20	14	14	14	15	15	18	14	15	17	17	17	18	15	15	15	15	17	15	14	15	15	15
8	15	14	15	18	15	14	B	16	14	15	18	16	18	24	23	20	15	15	16	14	14	14	17	15
9	14	14	14	15	14	15	14	16	14	15	17	17	20	23	21	17	15	15	14	14	15	15	15	15
10	15	17	16	15	14	14	B	15	14	15	16	18	20	20	20	18	16	14	14	14	15	14	15	14
11	14	14	14	15	15	B	14	14	14	15	15	18	18	20	18	21	16	15	16	14	14	16	17	15
12	14	15	15	15	15	15	16	18	14	15	15	18	22	20	21	21	14	C	14	14	15	15	15	21
13	22	14	17	15	14	17	14	14	14	15	C	C	C	B	26	24	28	15	22	14	28	15	71	B
14	B	B	26	15	15	B		22	14	24	23	32	36	26	24	C	C	C	26	26	71	26	66	B
15	71	27	27	27	26	B	B	26	26	26	26	B	B	C	C	B	15	15	14	14	17	14	15	14
16	15	14	14	14	14	14	14	15	14	14	15	17	15	17	17	17	15	15	17	14	14	16	15	15
17	14	15	16	15	16	14	14	14	14	14	15	15	18	17	17	16	14	15	17	15	14	14	14	14
18	15	15	14	14	14	15	15	15	14	14	15	16	17	18	15	15	17	14	14	14	14	15	14	15
19	14	15	15	14	22	14	15	14	14	14	16	15	16	14	17	17	15	15	14	14	14	14	14	15
20	14	14	15	14	14	14	B	14	14	15	15	18	20	18	17	18	15	14	15	15	14	14	15	14
21	15	B	15	14	14	17	15	14	14	14	15	17	21	18	18	15	14	14	17	14	16	B	14	18
22	14	15	15	15	14	15	14	14	14	14	20	18	20	20	18	17	17	15	14	15	14	15	14	14
23	14	15	15	14	14	15	14	14	14	14	17	17	18	18	20	17	15	14	14	15	14	15	14	15
24	15	14	14	14	14	15	14	15	14	15	16	18	18	20	18	17	14	15	18	14	14	14	14	15
25	17	15	14	15	14	14	14	16	14	15	15	16	21	18	18	18	17	14	14	14	14	14	15	14
26	14	14	14	14	14	15	14	14	14	14	15	18	17	21	20	20	15	14	14	14	14	15	16	14
27	14	14	14	14	B	B	14	14	14	15	15	17	15	18	20	17	17	15	17	14	14	15	15	15
28	16	14	15	15	14	14	14	14	14	14	15	18	18	18	17	15	14	15	17	14	15	14	14	15
29	14	14	14	14	B	B	14	15	14	14	15	18	20	18	16	17	16	14	15	14	14	20	14	14
30	15	14	14	15	15	14	14	14	14	15	15	18	20	18	21	17	16	14	14	15	15	17	66	14
31	14	15	14	14	14	14	14	15	14	15	15	20	20	20	18	17	14	15	18	14	14	14	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	31	29	25	24	31	31	31	30	29	29	29	30	29	30	29	31	31	31	29	31	29
MED	14	15	15	15	14	15	14	15	14	15	15	17	18	18	18	17	15	15	16	14	14	15	15	15
U Q	15	15	15	15	15	15	15	17	14	15	17	18	20	20	20	19	17	15	17	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	14	15	16	18	18	17	17	15	14	14	14	14	14	14	14

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HOURLY VALUES OF foF2 AT Okinawa

MAR. 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	38	26	31	26	29	26	25	50	64	55	55	64	64	71	75	64	54	53	54	54	50	37	B	31
2	28	N	N	29	N	N	B	40	54	63	62	60	61	65	71	70	56	55	57	67	51	31	A	N
3	29	32	31	A	34	31	A	45	54	58	67	76	87	97	107	87	78	64	51	47	47	23	34	41
4	32	32	30	26	28	N	N	43	51	54	64	72	64	77	81	84	67	57	50	53	52	47	37	34
5	N	28	28	N	N	B	B	38	54	58	60	70	67	86	74	67	63	56	55	55	52	34	N	N
6	30	30	29	29	31	N	B	38	50	55	55	54	66	75	72	75	60	50	58	54	54	32	34	28
7	N	26	28	28	29	N	N	41	51	51	55	71	78	78	81	75	60	53	51	65	53	32	30	28
8	26	N	N	N	32	N	B	37	48	52	54	52	65	80	80	64	66	66	66	67	60	30	A	26
9	26		28	28	32	31	N	41	48	64	64	66	87	111	121	120	108	90	84	72	52	41	36	34
10	A	34	30	30	32	N	A	38	47	53	58	56	75	102	121	121	111	110	99	93	96	42	47	42
11	41	42	40	37	44	30	A	44	53	55	60	65	72	87	90	95	86	75	65	44	46	28	28	31
12	30	30	28	59	32		B	40	50	52	51	58	61	78	82	91	92	88	88	82	53	43	44	41
13	26	28	30	A	30		28	44	53	51	56	61	48	72	77	91	96	67	58	51	44	30	31	A
14	49	30	30	28	29	B	N	41	43	51	64	77	70	86	74	71	67	65	60	51	50	34	28	29
15	28	30	29	30	N	B	B	42	48	55	64	79	73	91	91	72	67	80	71	47	32	28	A	31
16	30	31	31	31	29	B	B	41	48	51	44	52	68	91	105	102	102	90	80	72	67	35	28	32
17	30	32	30	28	29	28	N	42	53	55	67	87	82	75	90	92	91	86	86	86	82	54	50	38
18	30	31	31	30	N	N	N	45	63	67	73	72	81	98	98	91	72	68	66	63	72	48	28	30
19	29	A	28	28	A	49	N	44	50	54	63	72	88	106	94	72	75	67	63	46	41	32	29	28
20	29	34	29	29	N	B	B	46	48	58	61	77	82	91	92	85	78	65	66	80	76	37	31	30
21	34	32	37	34	B	B	N	50	47	59	68	81	101	130	115	101	86	86	86	79	54	A	A	40
22	41	B	38	38	41	34	N	42	49	52	66	75	78	88	105	102	91	90	88	71	53	47	34	36
23	49	32	30	31	29	N	N	44	50	60	66	71	72	74	78	75	64	66	66	71	49	31	30	34
24	32	40	41	29	32	B	N	42	74	52	46	57	67	81	85	82	70	71	73	72	51	29	28	B
25	26	26	26	N	N	N	N	47	50	51	55	50	56	87	97	88	77	75	80	63	44	A	A	30
26	31	32	34	30	29	A	N	48	47	51	55	58	67	71	80	75	72	72	86	71	34	N	N	28
27	30	31	34	28	B	B	N	50	54	55	54	51	70	75	86	70	55	54	63	67	47	34	34	38
28	36	34	34	N	B	N	N	49	53	54	56	58	64	77	91	74	60	67	72	82	71	47	30	32
29		30	31	42	28	N	25	45	54	64	67	50	61	78	75	72	67	74	82	60	48	32	30	32
30	31	28	28	40	40		N	42	49	59	64	75	78	100	96	87	80	72	80	67	54	A	N	N
31	28	31	32	31	N	B	N	48	54	67	61	64	70	86	90	66	58	65	60	45	44	40	36	34
	00	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	25	20	7	3	31	31	31	31	31	31	31	31	31	31	31	31	31	31	27	22	26
MED	30	31	30	30	30	31	25	43	50	55	61	65	70	86	90	82	72	67	66	67	52	34	31	32
U Q	34	32	33	32	32	34	28	46	54	59	64	75	78	91	97	91	86	80	82	72	54	42	36	36
L Q	28	30	28	28	29	28	25	41	48	52	55	57	64	75	78	72	63	64	58	53	47	31	29	30

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HOURLY VALUES OF fEs AT Okinawa

MAR. 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	33	24	G	G	G	G	90	35	31	34	42	45	G	43	G	G	G	32	28	26	G	140	B	G
2	G	G	G	G	25	G	B	24	30	G	70	G	G	44	46	G	37	32	G	G	48	33	27	G
3	G	24	G	38	24	27	27	26	32	35	45	48	46	47	61	G	36	32	26	G	G	27	G	23
4	24	G	G	G	G	G	G	95	30	42	44	G	46	47	46	48	38	G	G	24	11	G	G	G
5	G	G	G	G	G	B	B	G	32	38	46	47	46	46	G	G	37	33	G	G	11	33	G	G
6	G	G	25	G	G	G	B	G	32	40	42	45	61	48	45	40	36	G	27	G	20	G	G	G
7	G	G	G	G	G	G	G	G	32	39	41	41	47	46	44	48	44	41	52	33	21	G	G	G
8	G	G	G	G	G	25	B	38	31	40	44	47	47	46	47	46	46	80	33	41	28	29	28	G
9	G		G	G	G	11	G	26	G	39	47	53	50	45	50	45	42	42	36	21	21	G	34	34
10	34	26	G	G	G	G	32	24	32	36	46	47	51	48	44	41	36	32	28	11	48	36	G	G
11	G	G	G	26	G	29	25	26	33	39	41	57	48	48	46	41	36	32	G	21	G	G	G	G
12	G	G	G	28	11	G	B	37	45	43	41	45	47	45	46	48	46	48	53	38	24	G	G	11
13	G	G	G	136	G		G	27	32	35	G	G	47	46	45	42	40	32	G	G	11	G	G	28
14	94	G	G	G	G	B	G	40	46	42	G	G	46	42	45	39	43	35	G	G	11	G	G	G
15	G	G	G	G	19	B	B	29	35	35	G	G	G	46	44	43	36	41	29	20	G	G	26	G
16	G	G	G	G	G	B	B	159	39	39	G	G	46	48	42	44	38	34	34	11	48	G	G	G
17	G	G	G	G	G	G	G	34	164	36	G	44	46	42	45	51	44	G	32	27	11	G	G	G
18	G	G	G	G	G	G	G	28	34	35	39	40	50	45	42	40	G	34	28	G	24	G	G	G
19	G	23	G	G	28	G	G	28	41	G	44	43	46	G	G	38	42	G	27	11	G	24	G	G
20	G	G	G	G	G	B	B	28	33	38	G	46	47	46	43	41	38	35	28	G	72	G	G	G
21	G	G	G	G	B	B	G	30	36	40	G	G	48	47	46	G	42	37	36	40	49	38	35	43
22	G	B	G	G	11	11	G	28	G	37	38	G	46	49	45	41	37	36	G	23	23	G	G	24
23	G	G	G	G	G	G	G	29	36	39	G	G	48	48	46	40	44	39	28	24	11	G	G	G
24	G	G	G	G	G	B	G	30	36	36	38	48	48	47	G	44	36	G	35	45	24	29	G	B
25	G	G	G	G	G	G	G	27	44	44	G	47	50	48	46	G	G	G	G	21	23	28	26	G
26	G	40	G	G	G	28	G	44	42	41	G	G	46	46	40	40	37	G	G	11	35	G	G	G
27	G	G	G	G	B	B	G	26	G	36	41	45	45	40	45	40	42	36	33	28	28	G	G	G
28	G	G	G	G	B	G	G	31	38	60	45	45	48	47	49	43	G	34	G	70	28	29	G	28
29	G	G	G	11	G	G	G	G	40	G	G	48	52	51	48	43	41	37	G	23	11	G	G	24
30	26	G	G	G	G	G	G	46	40	G	40	47	47	48	52	44	40	37	38	25	26	34	G	G
31	24	G	G	G	G	B	G	28	G	36	45	48	47	46	G	45	42	34	G	26	26	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	29	31	31	28	21	23	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30
MED	G	G	G	G	G	G	G	28	33	38	41	45	47	46	45	41	38	34	28	21	23	G	G	G
U Q	G	G	G	G	G	11	G	35	40	40	44	47	48	48	46	44	42	37	33	27	28	29	G	11
L Q	G	G	G	G	G	G	G	26	31	35	G	G	46	45	42	39	36	32	G	G	11	G	G	G

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HOURLY VALUES OF fmin AT Okinawa

MAR. 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
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2	15	14	14	14	14	14	B	14	14	14	14	14	18	17	17	14	14	14	16	14	14	14	14	14
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8	14	14	15	14	14	14	B	15	14	14	14	15	17	18	17	20	14	14	14	14	14	15	14	15
9	15		14	14	14	14	14	15	14	14	14	15	15	17	15	14	14	14	14	14	14	15	14	14
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12	14	18	15	14	14	66	B	14	14	14	14	17	17	21	17	16	15	14	14	14	14	14	16	15
13	14	14	14	15	14		14	14	14	15	15	16	17	17	17	14	14	14	16	14	14	14	14	15
14	14	14	14	14	14	B	15	14	14	14	14	15	15	18	15	14	15	14	17	17	14	14	14	14
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16	14	14	14	14	14	B	B	17	14	14	14	17	18	17	15	15	14	14	14	14	14	14	14	15
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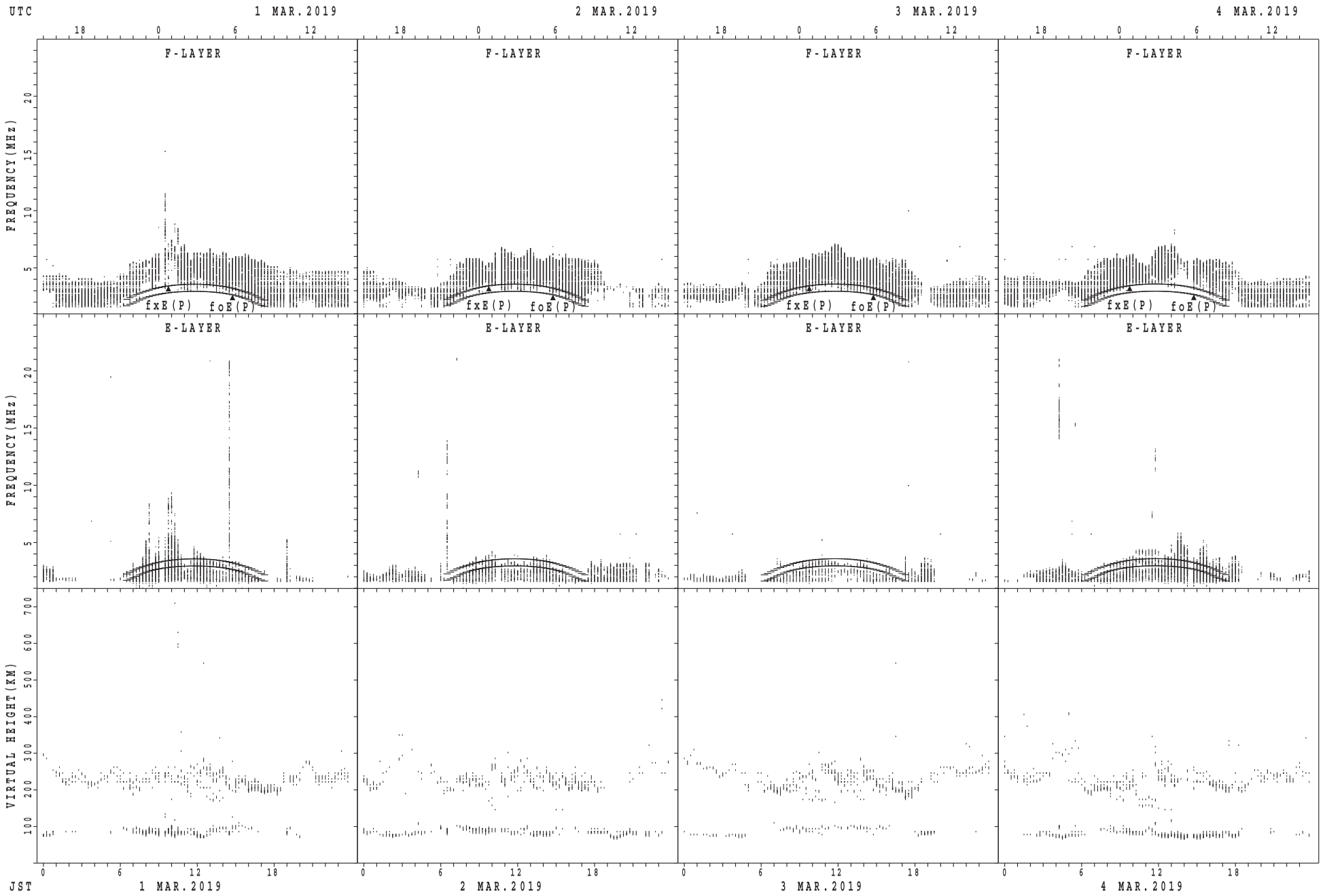
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	29	31	31	28	21	23	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30
MED	14	14	14	14	14	14	14	15	14	14	15	16	17	17	17	16	14	14	14	14	14	14	14	14
U Q	15	14	15	14	15	15	15	15	14	14	16	17	18	18	18	17	15	14	15	14	14	14	15	15
L Q	14	14	14	14	14	14	14	14	14	14	14	15	15	16	15	15	14	14	14	14	14	14	14	14

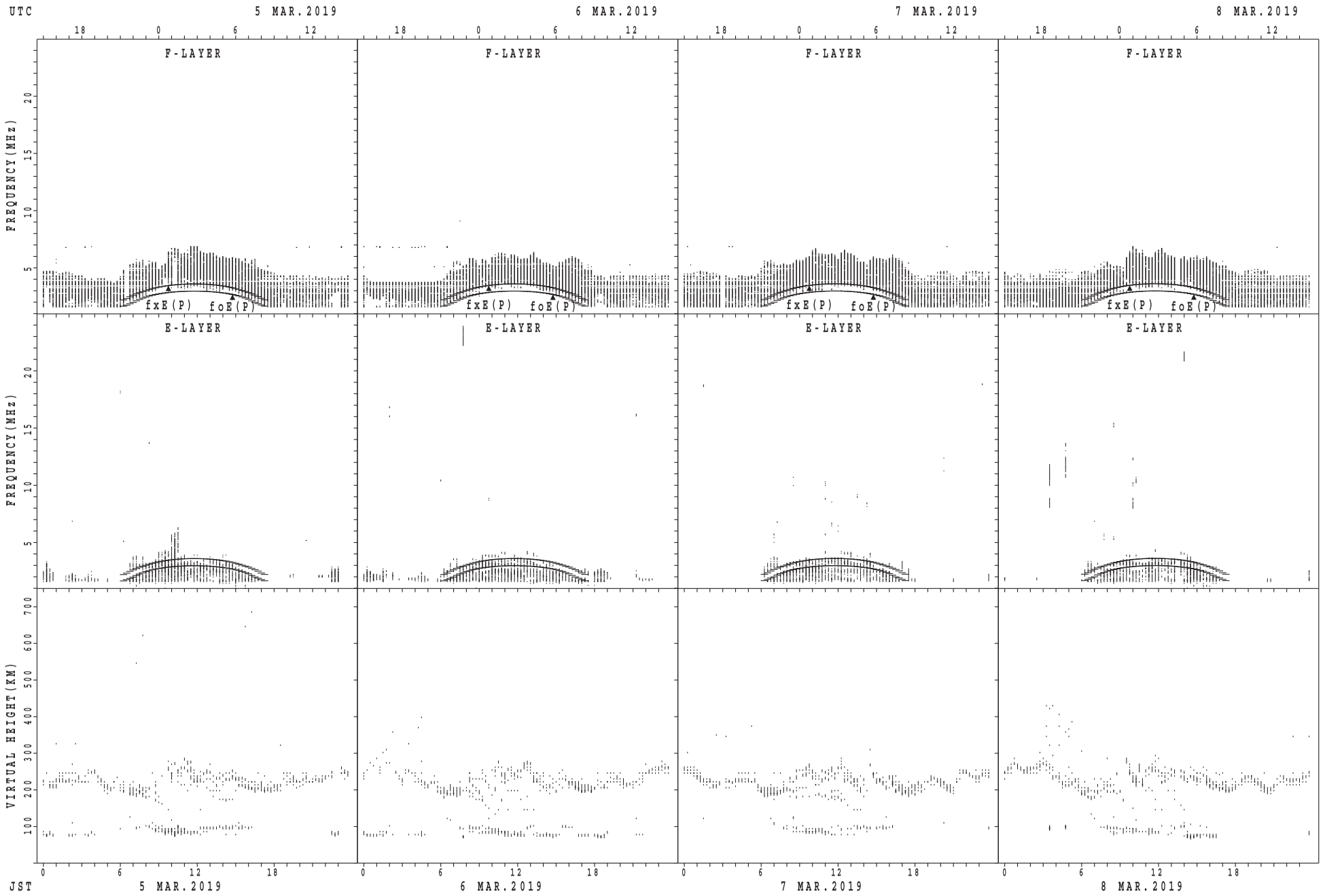
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

SUMMARY PLOTS AT Wakkanai



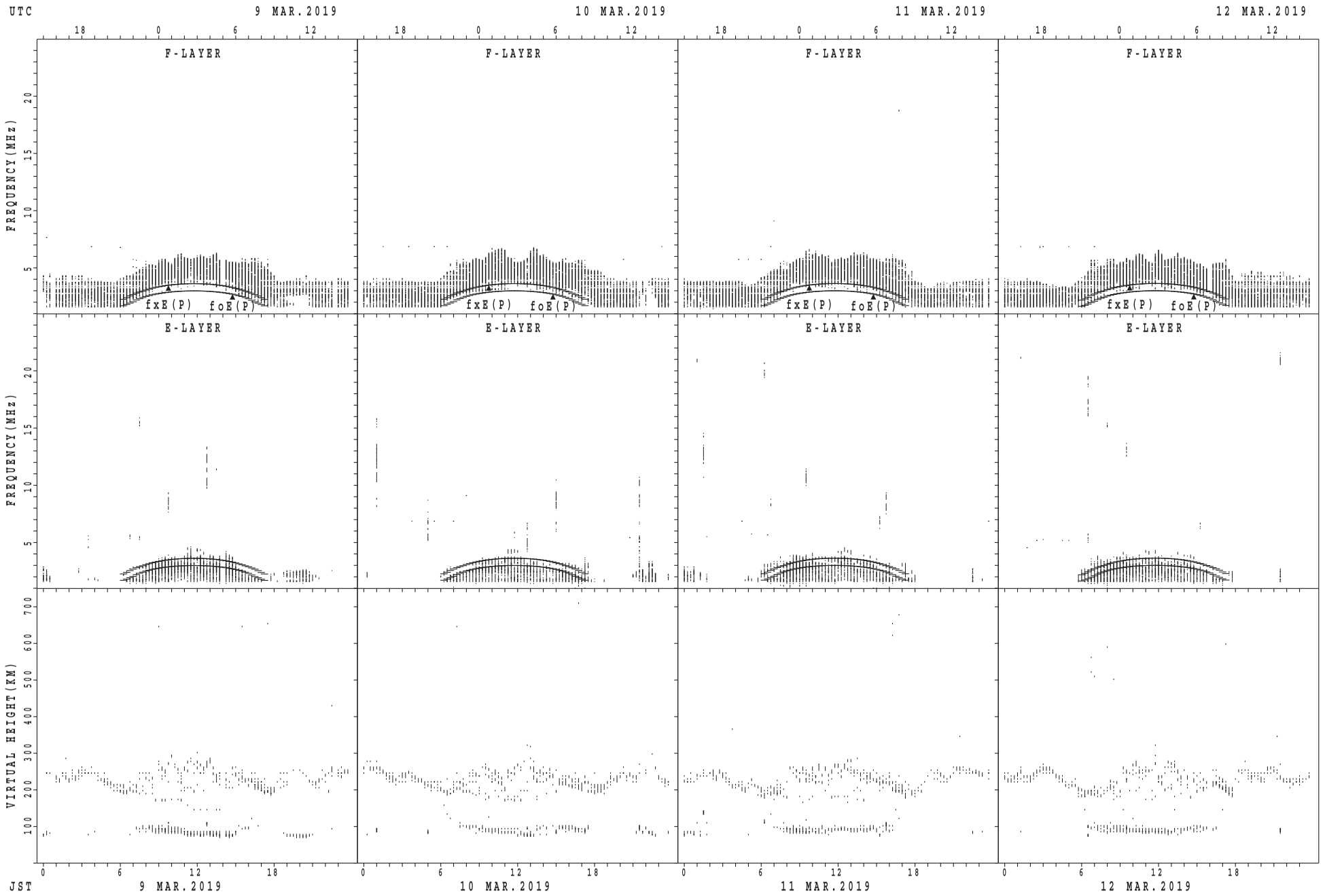
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



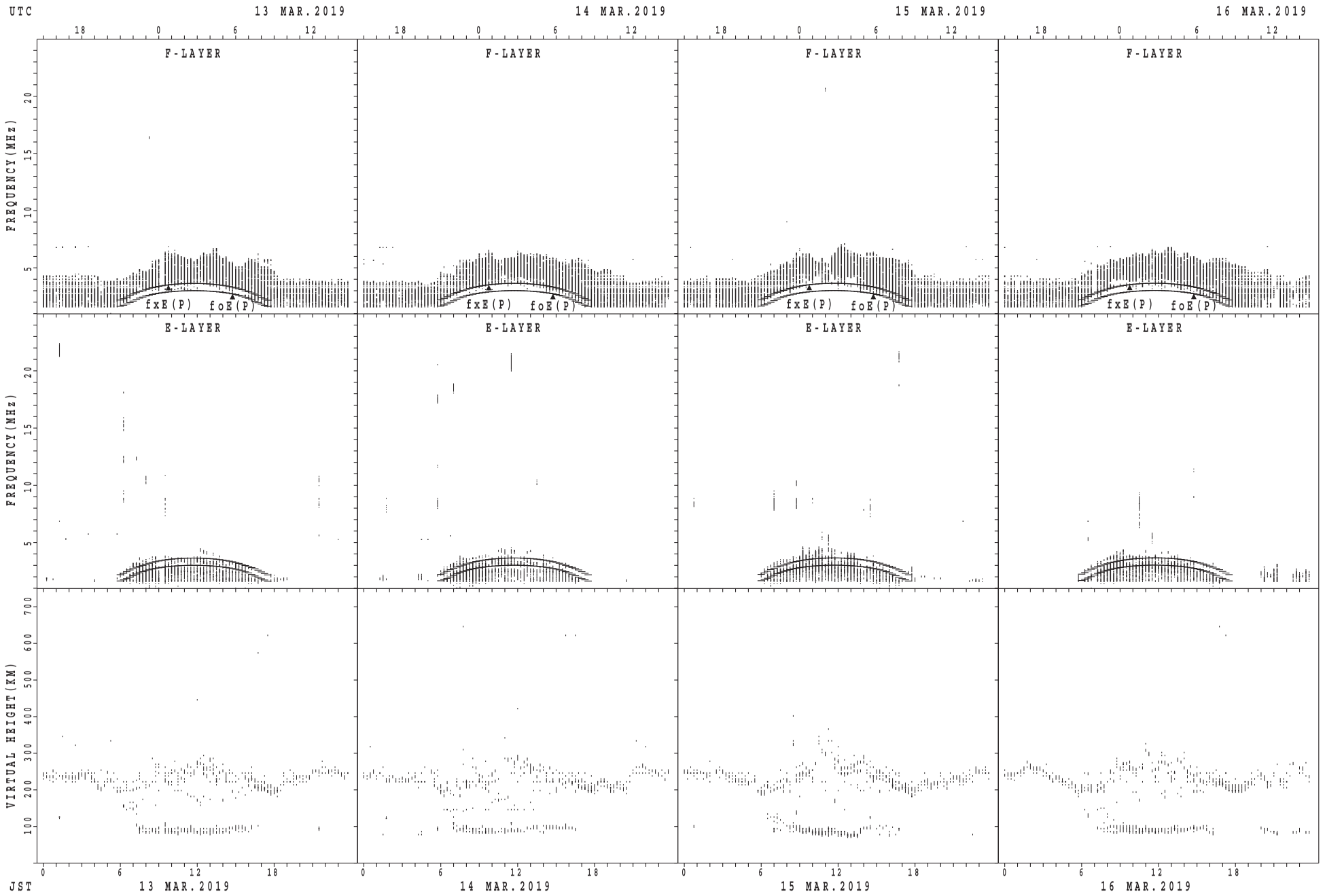
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



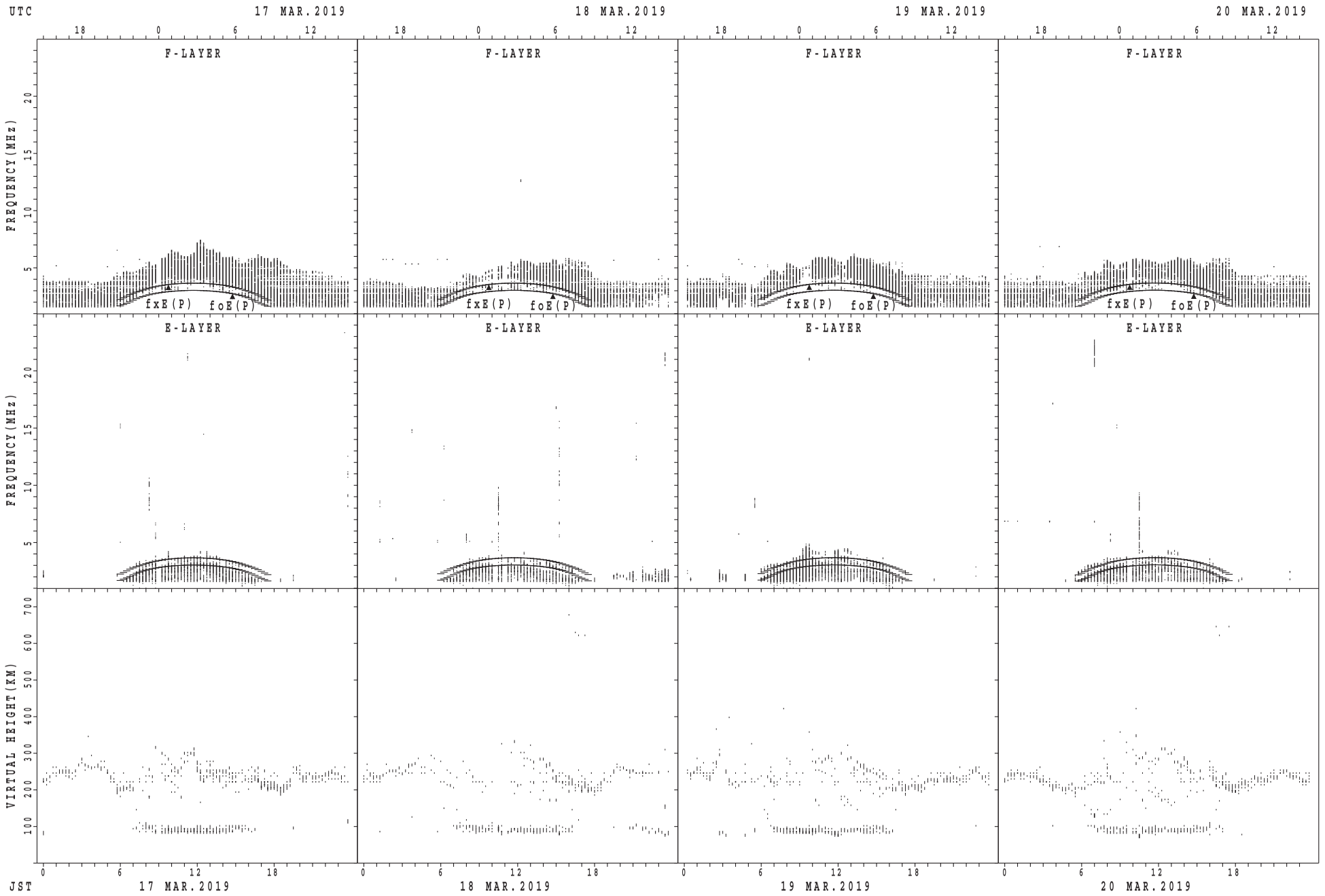
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



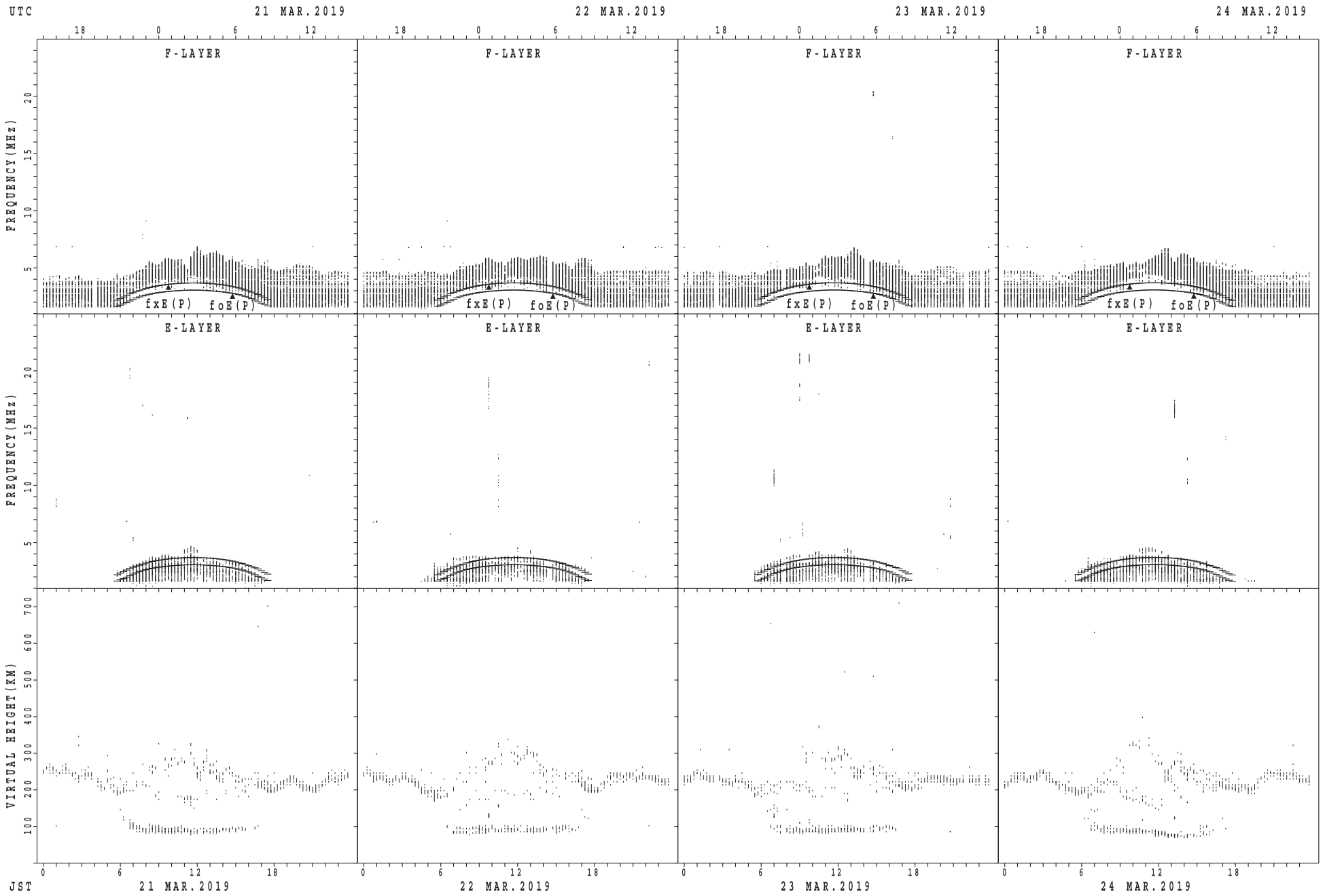
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



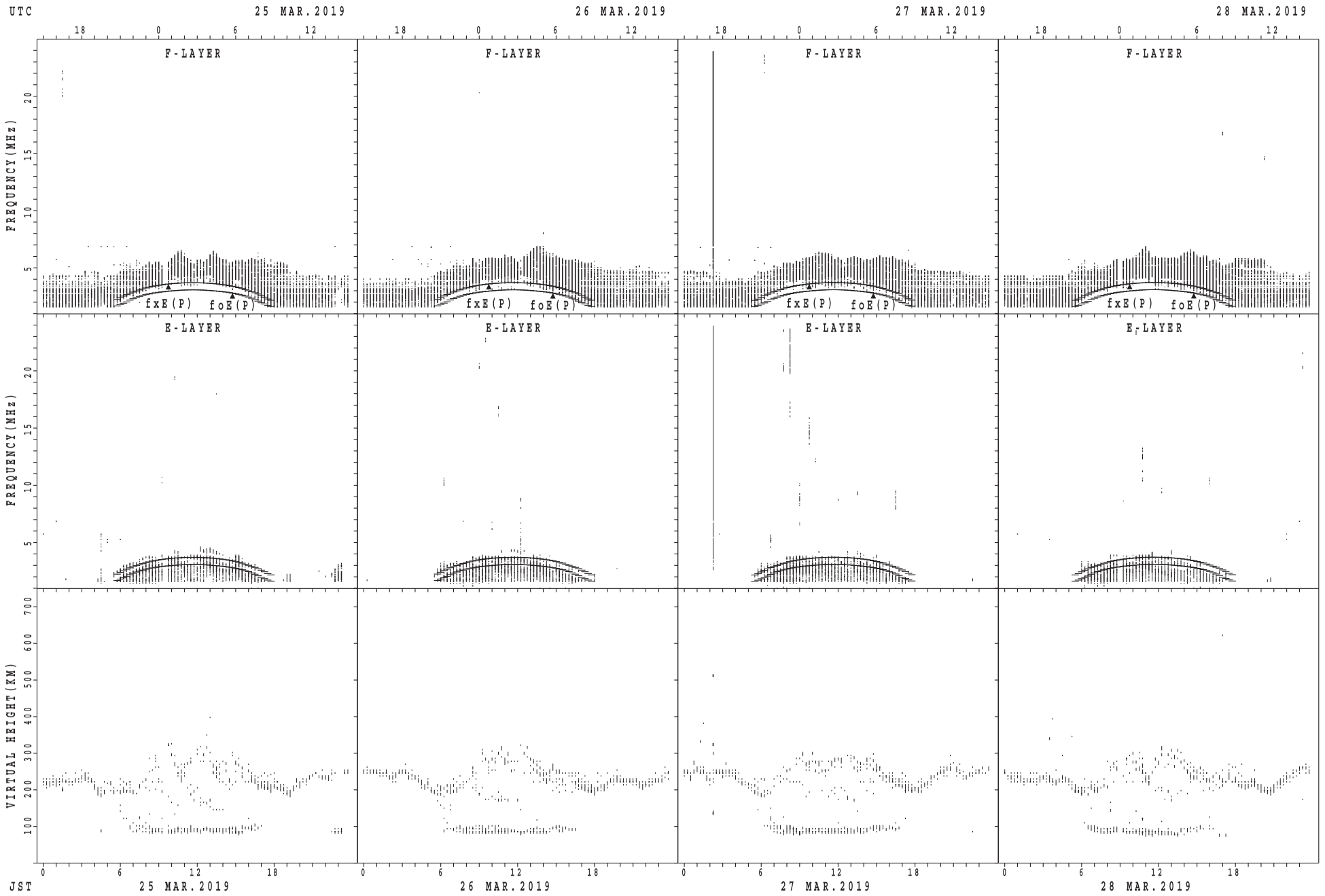
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



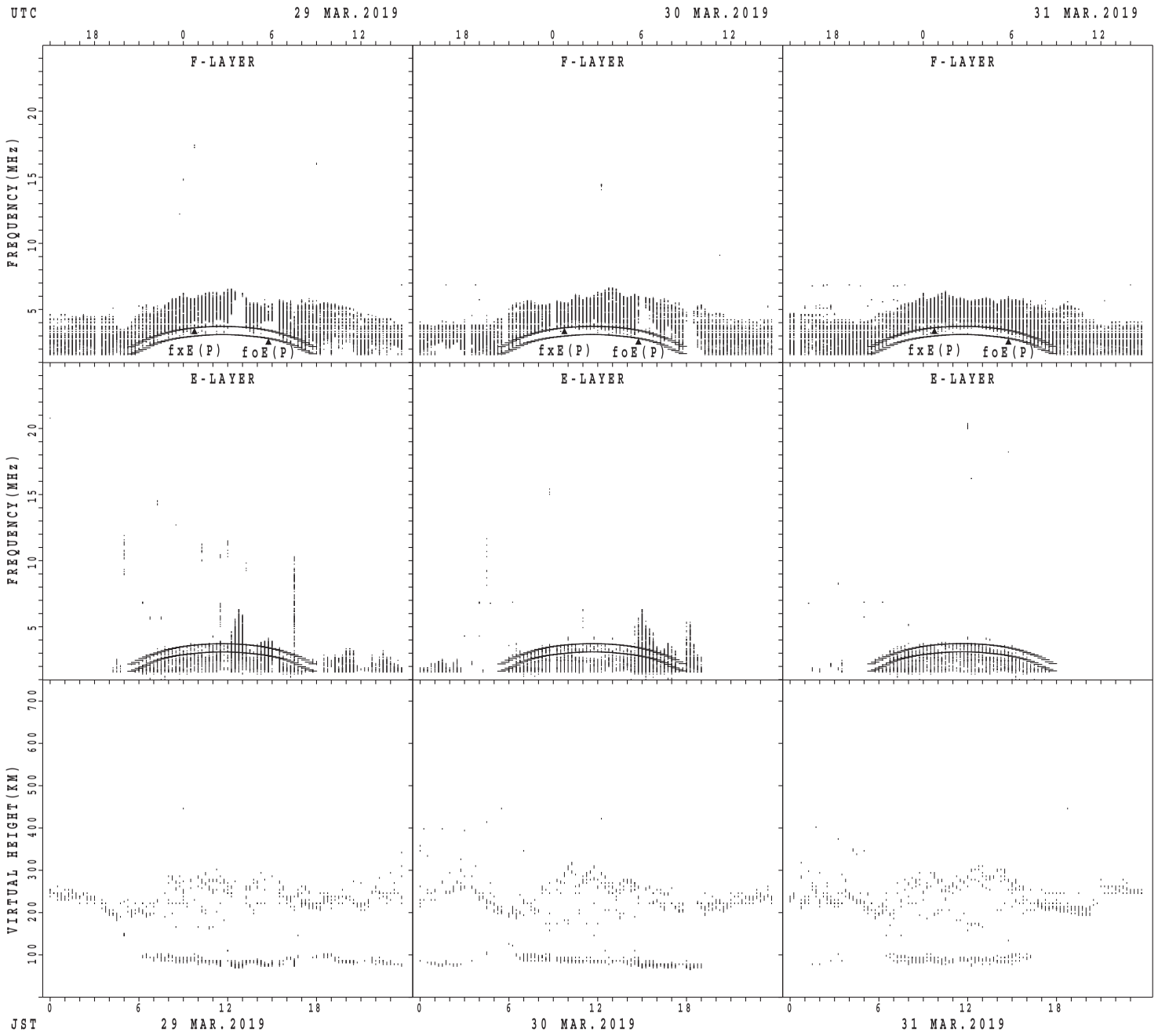
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



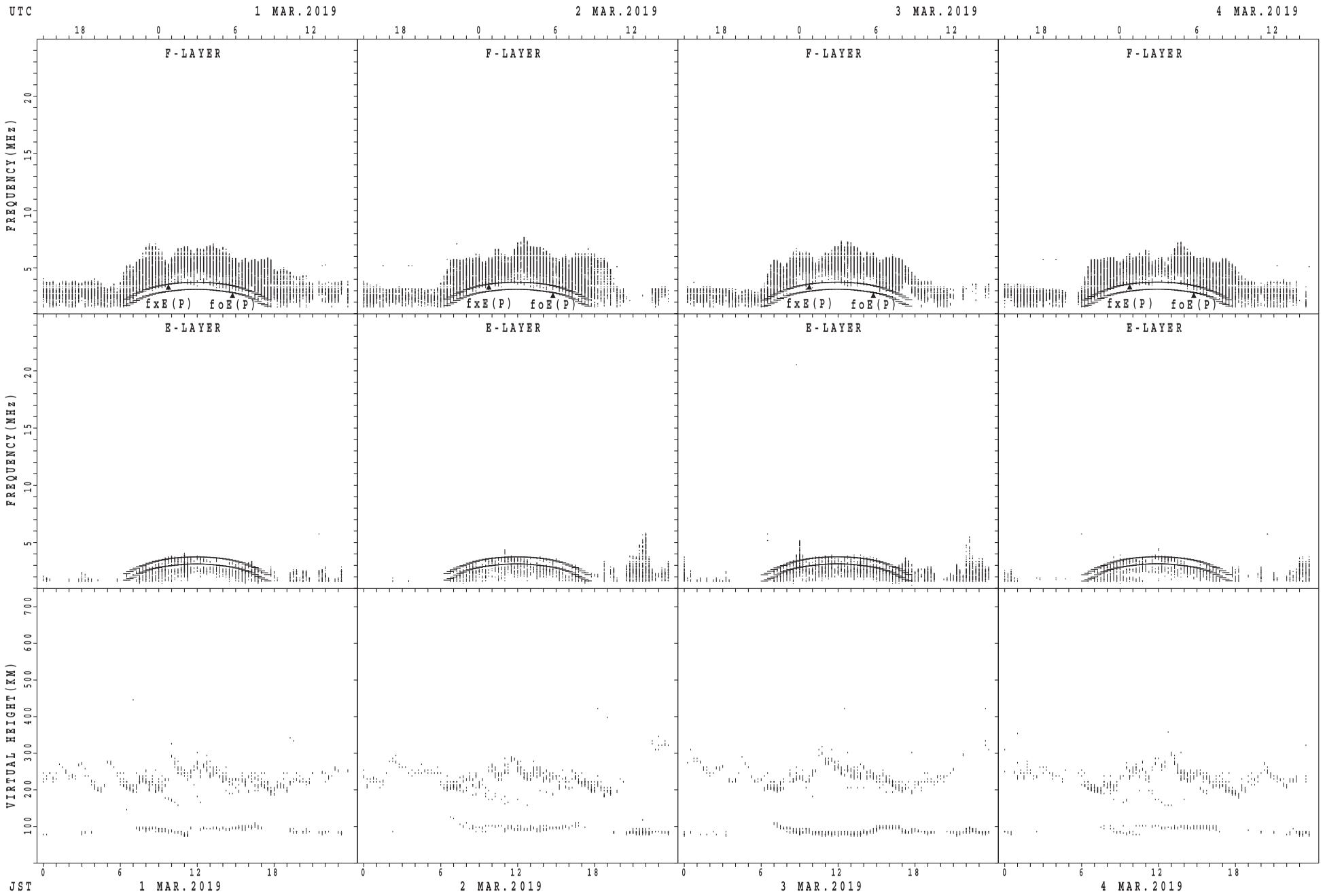
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



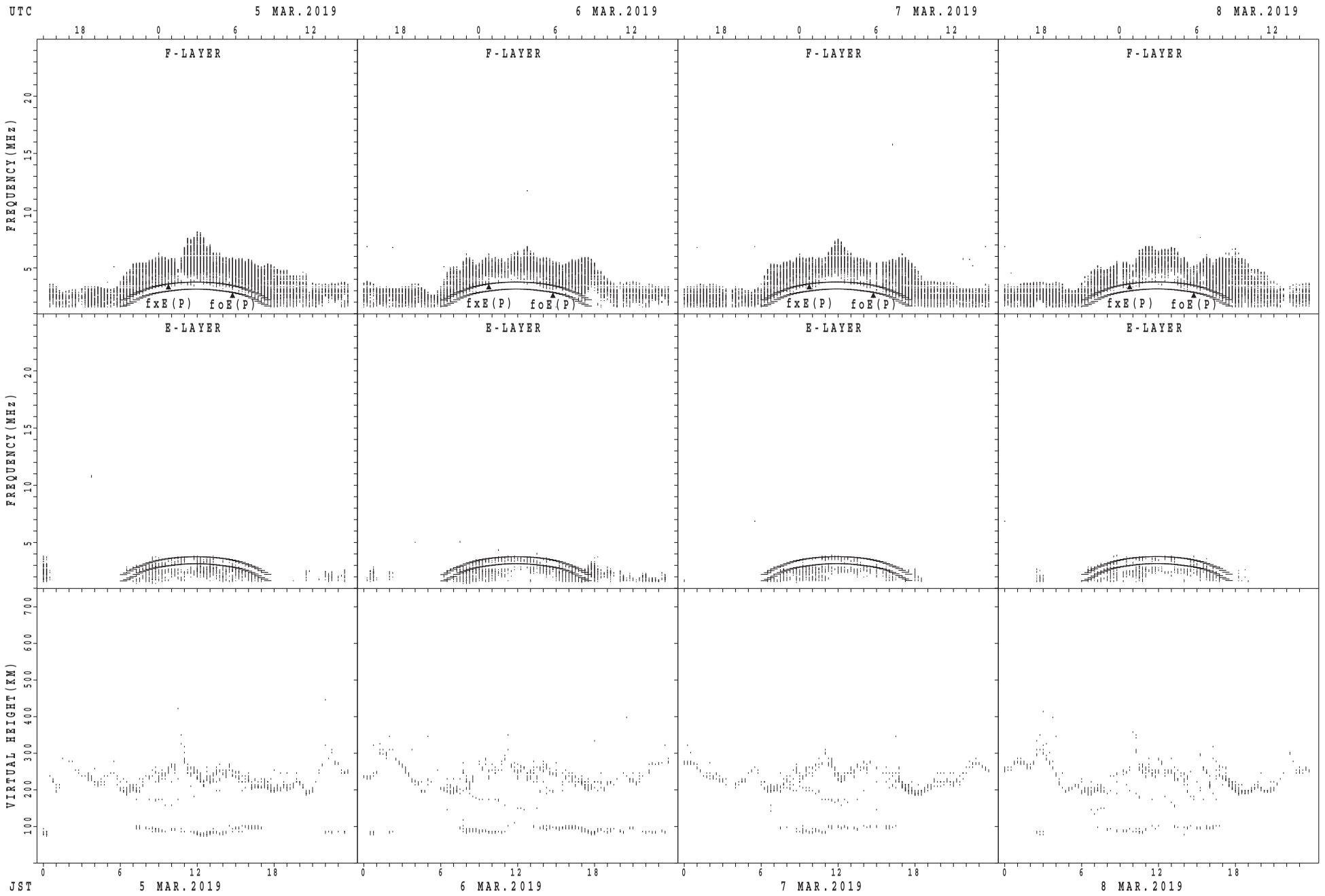
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



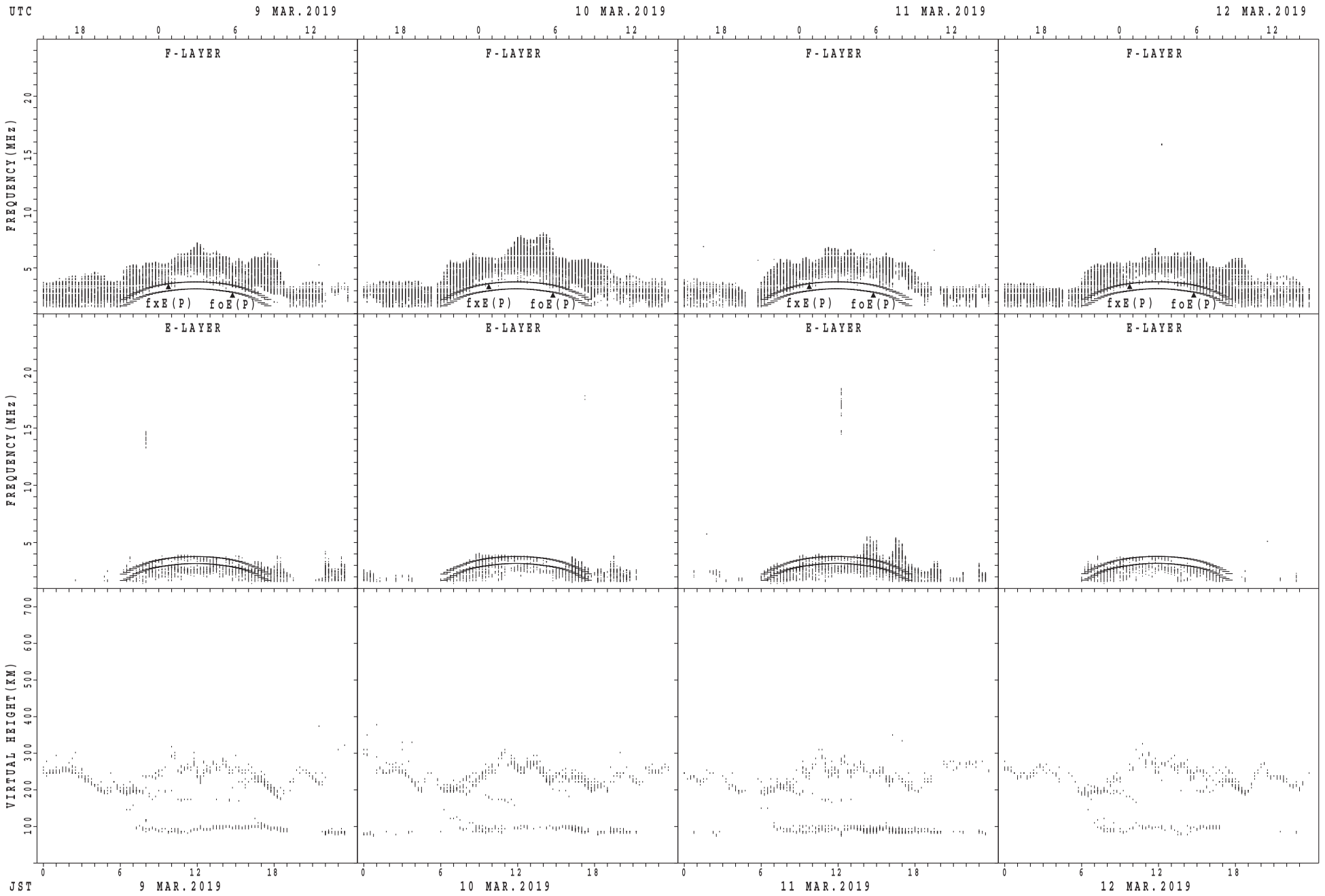
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



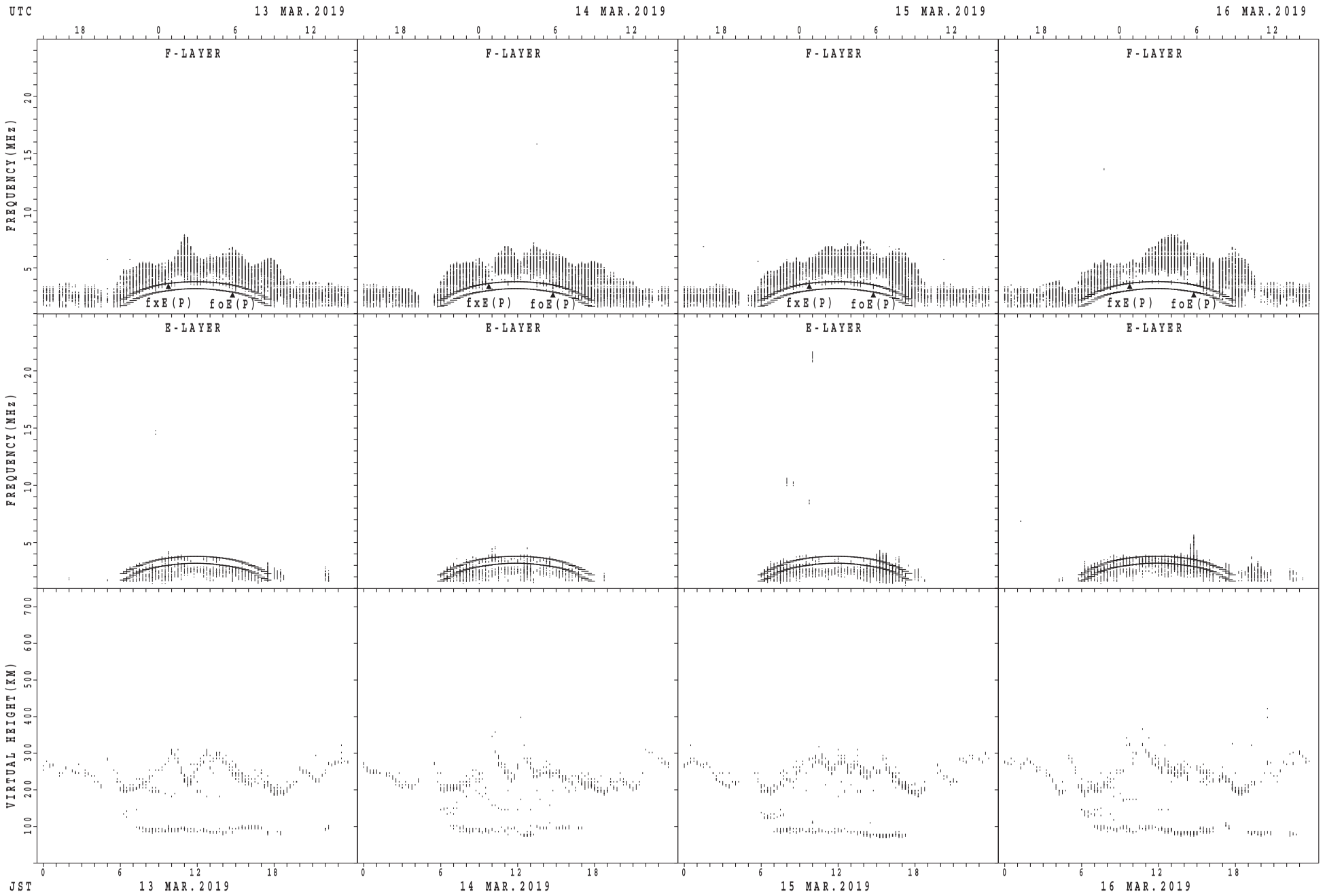
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



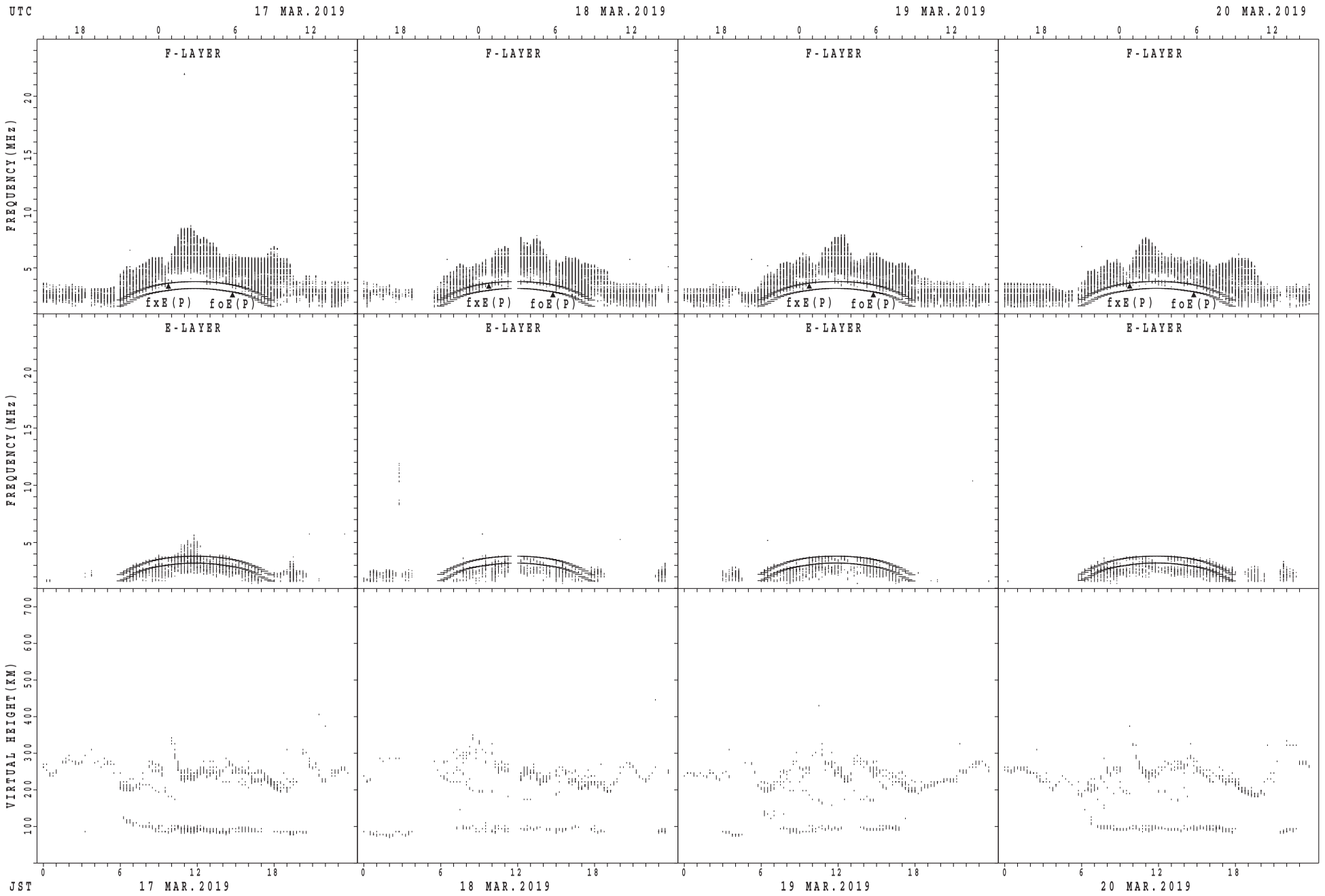
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



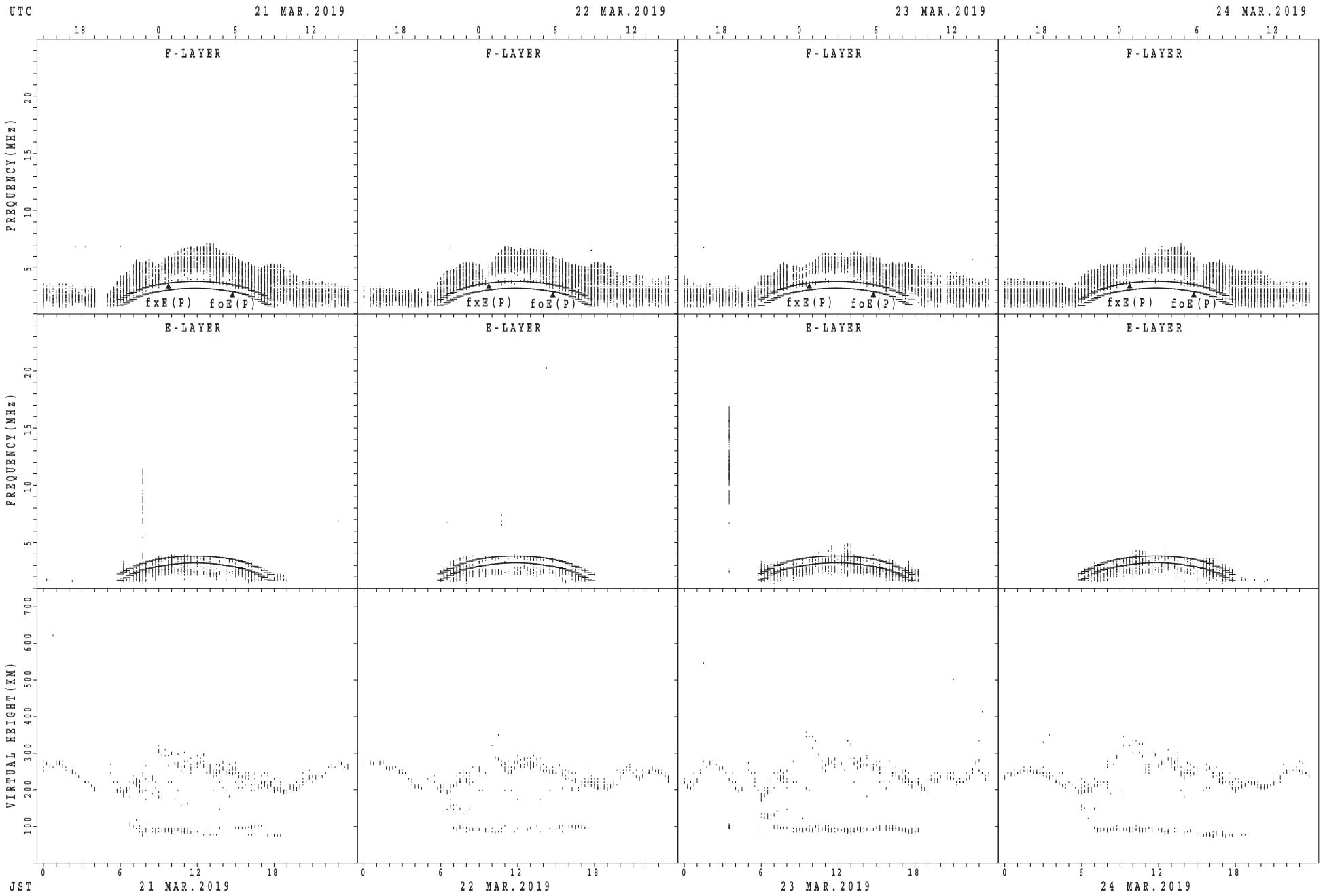
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



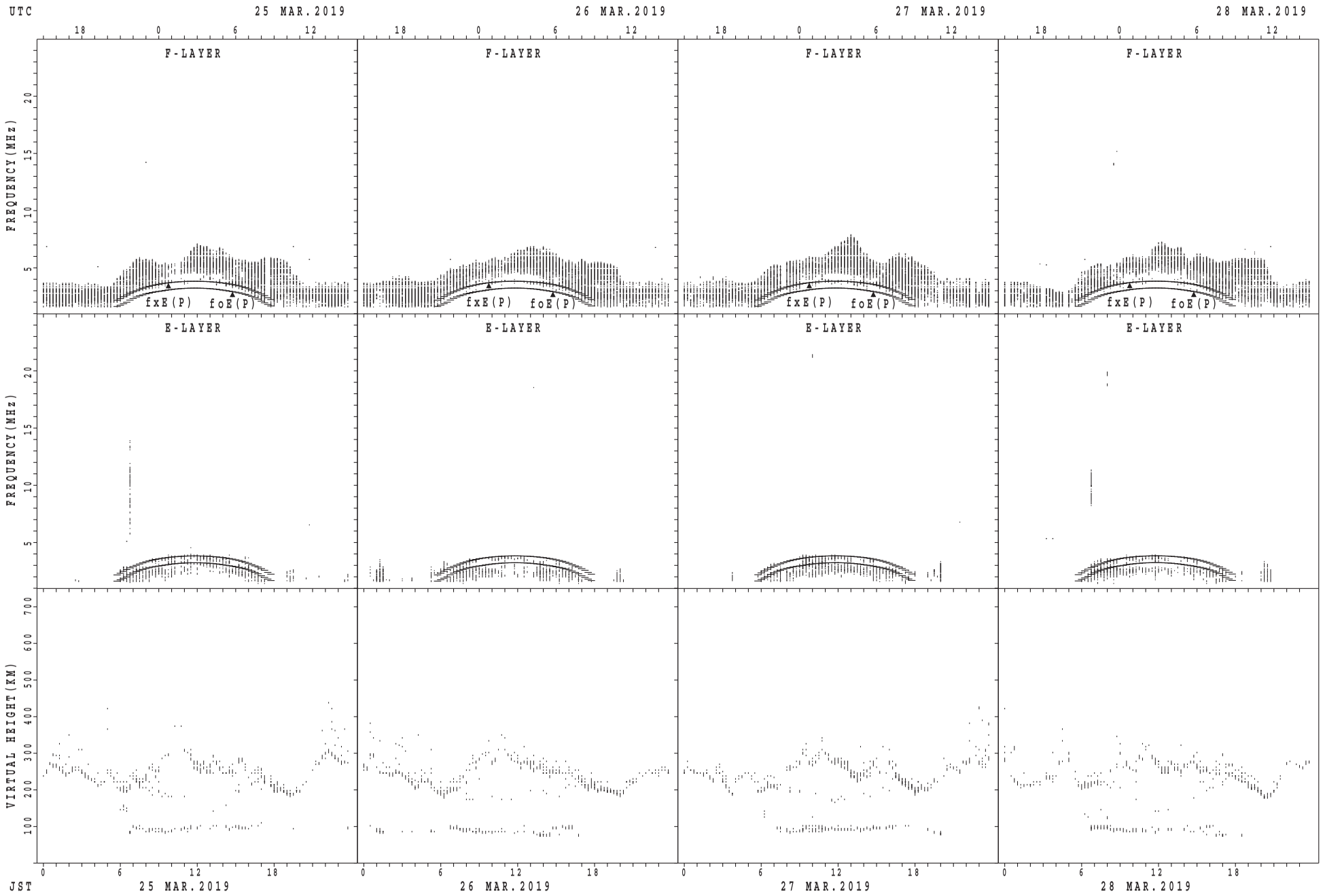
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



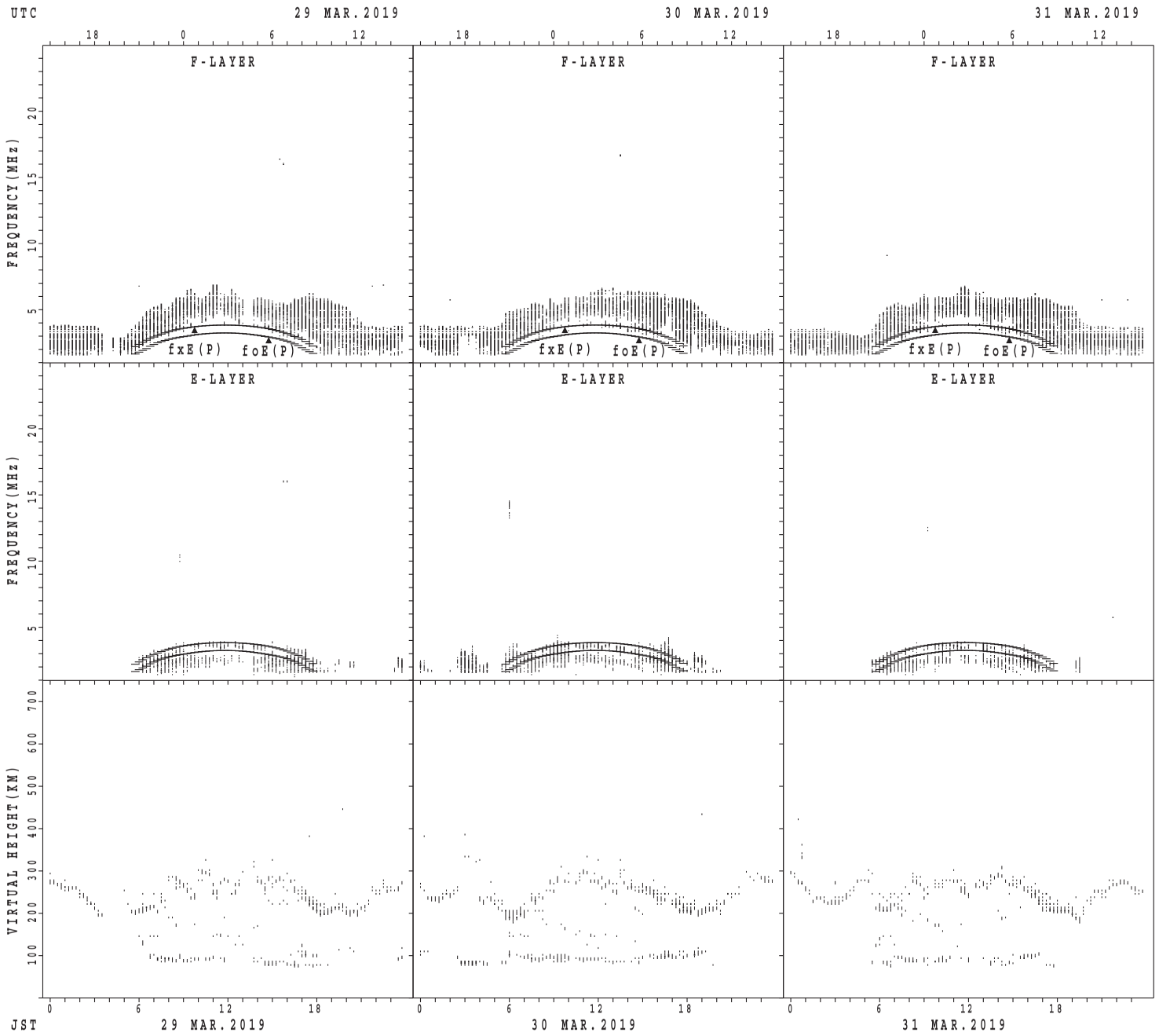
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



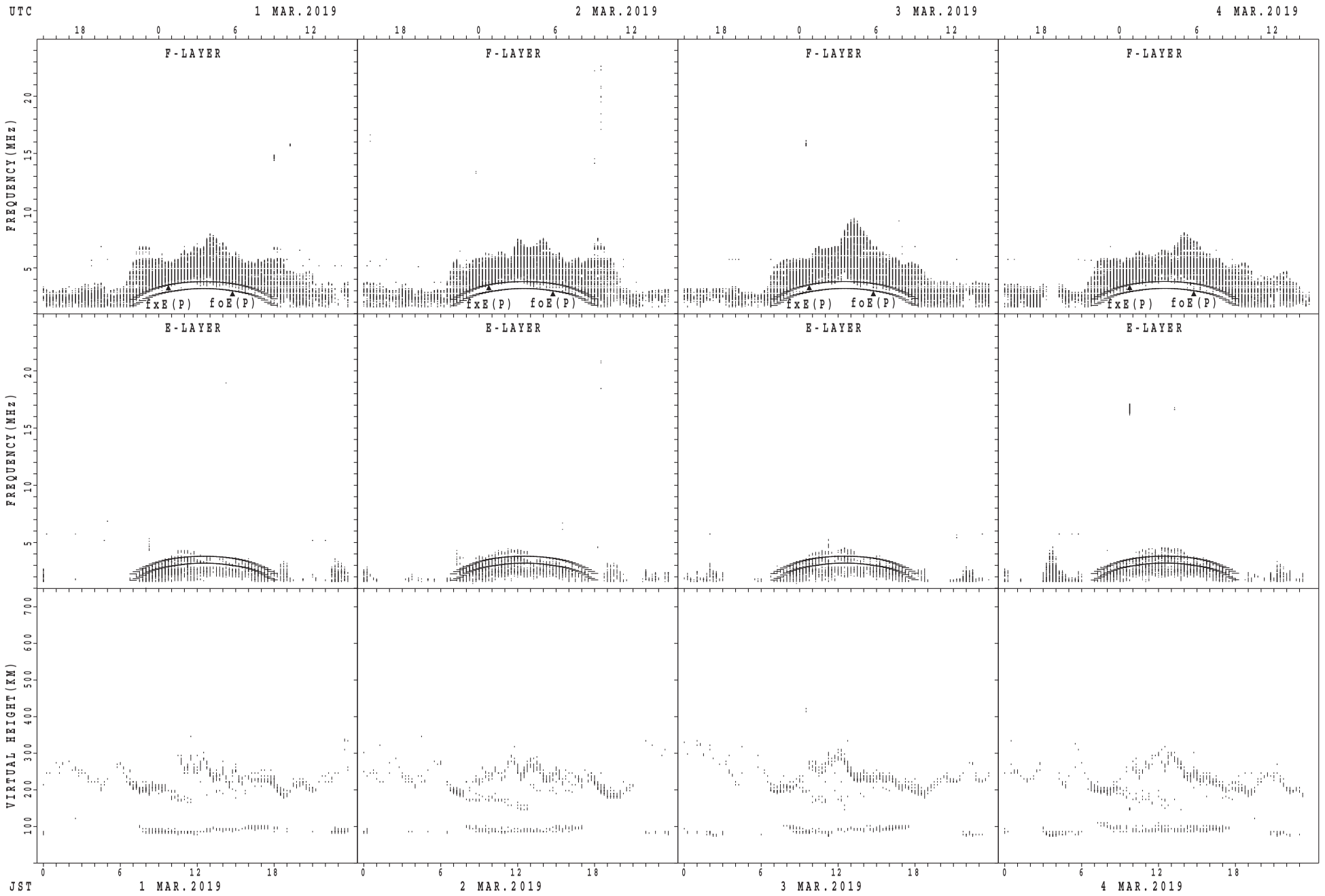
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



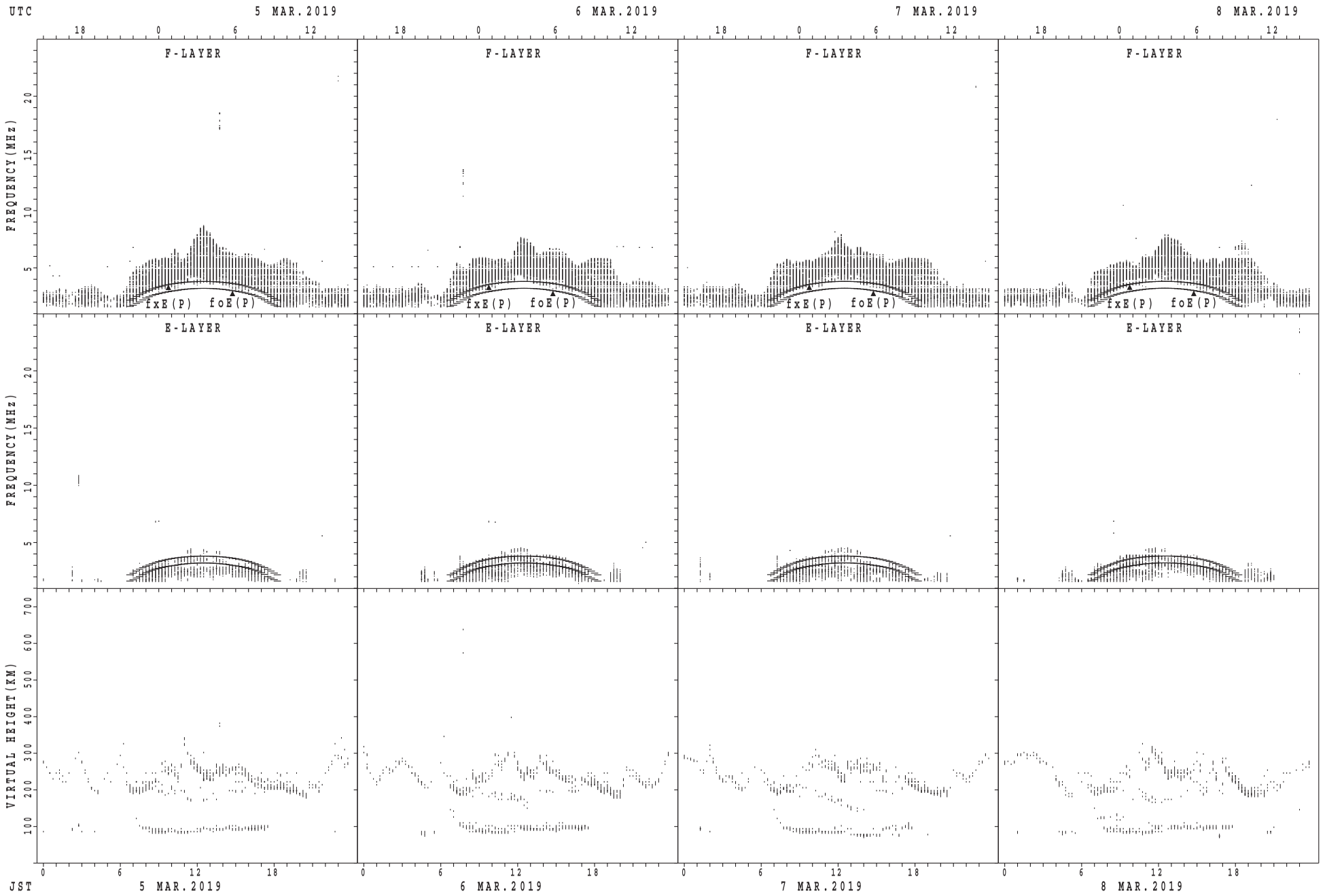
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



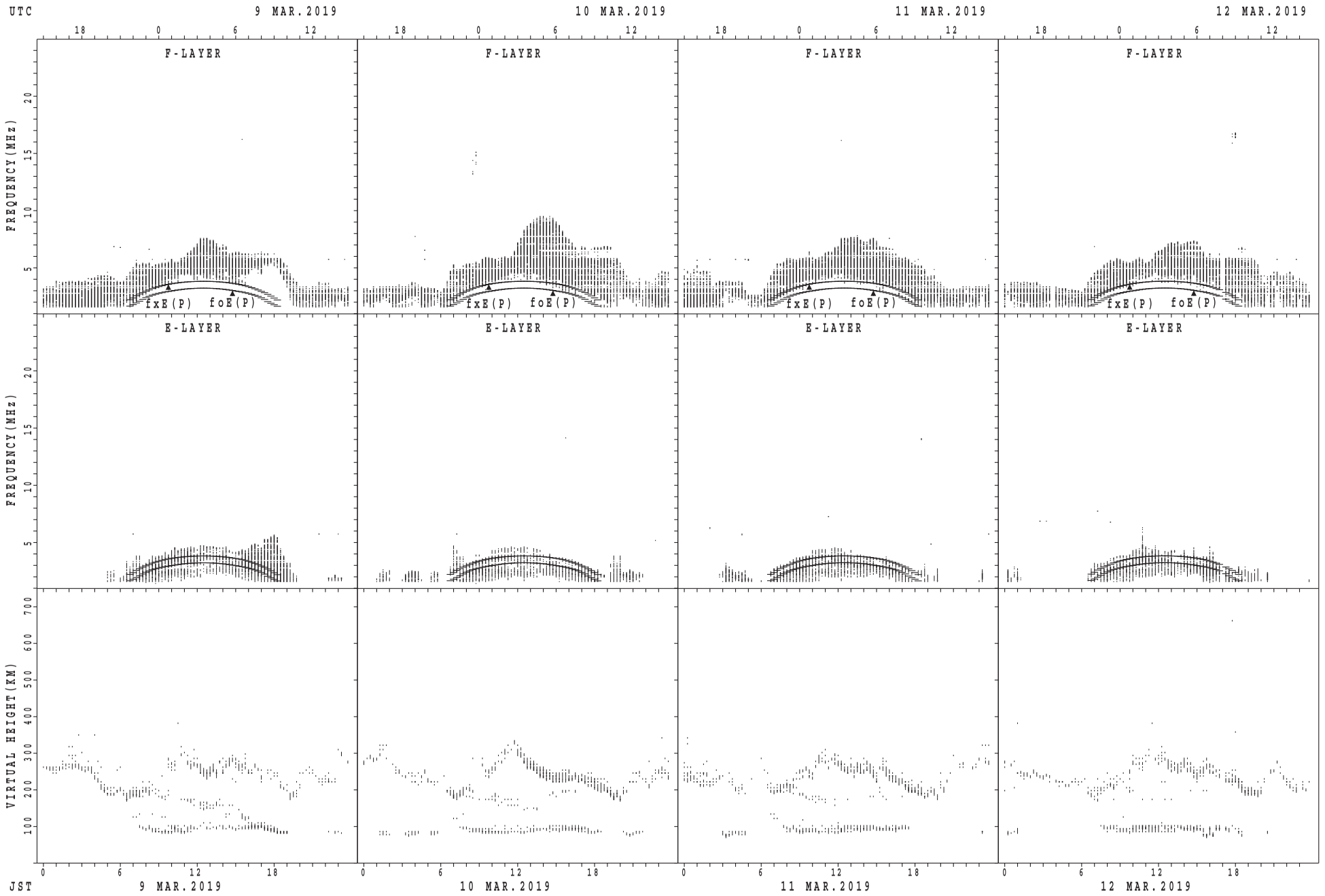
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



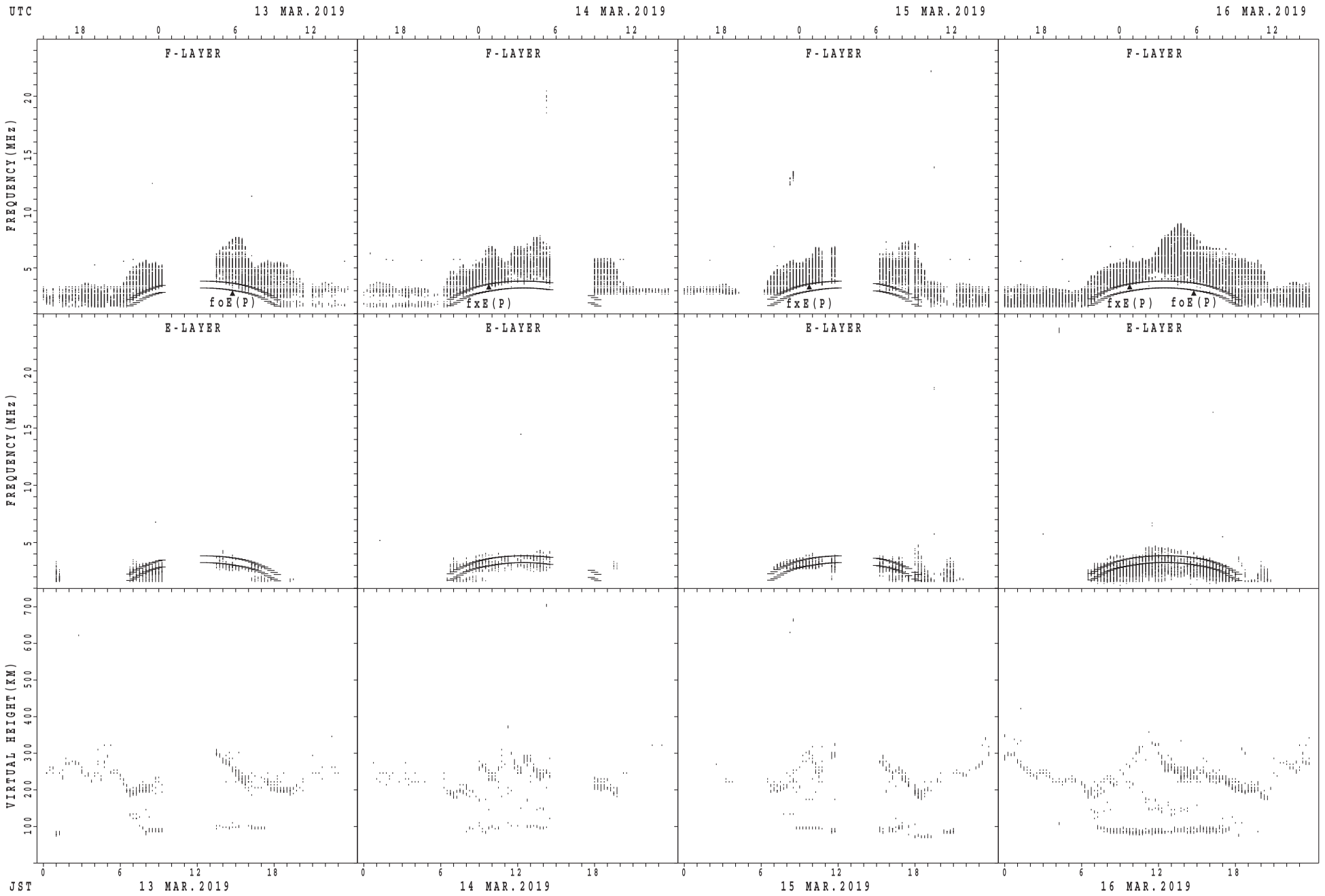
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



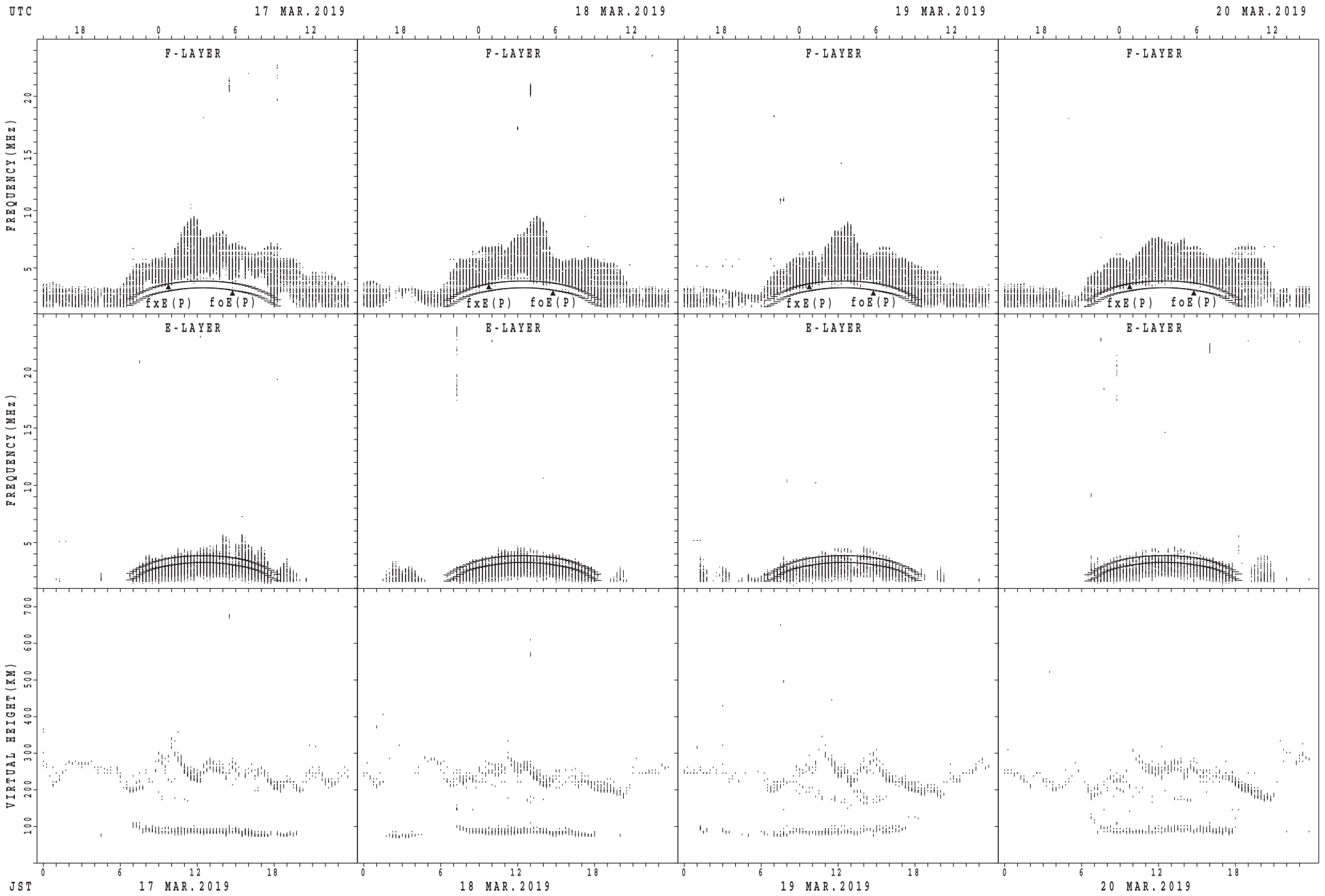
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



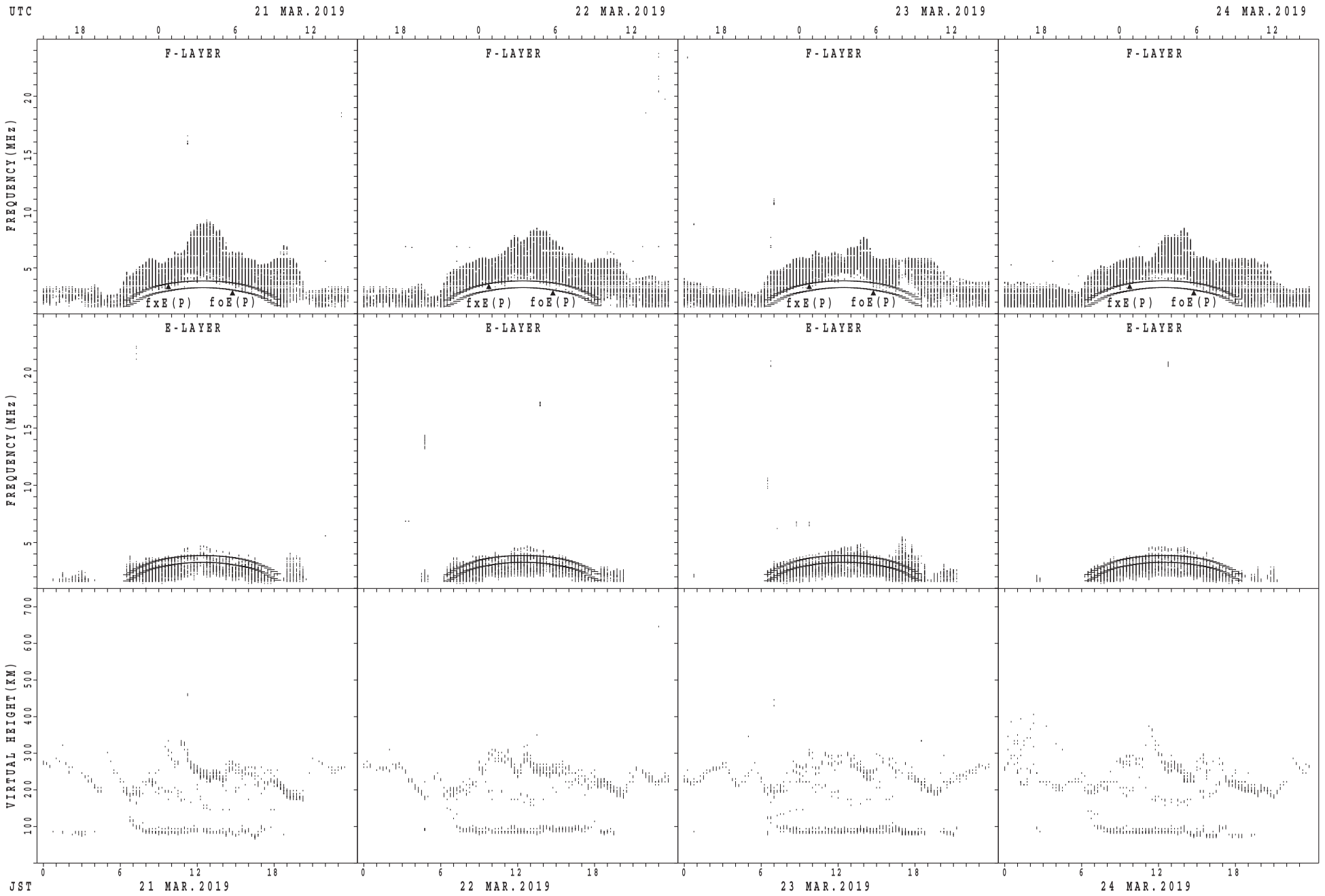
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

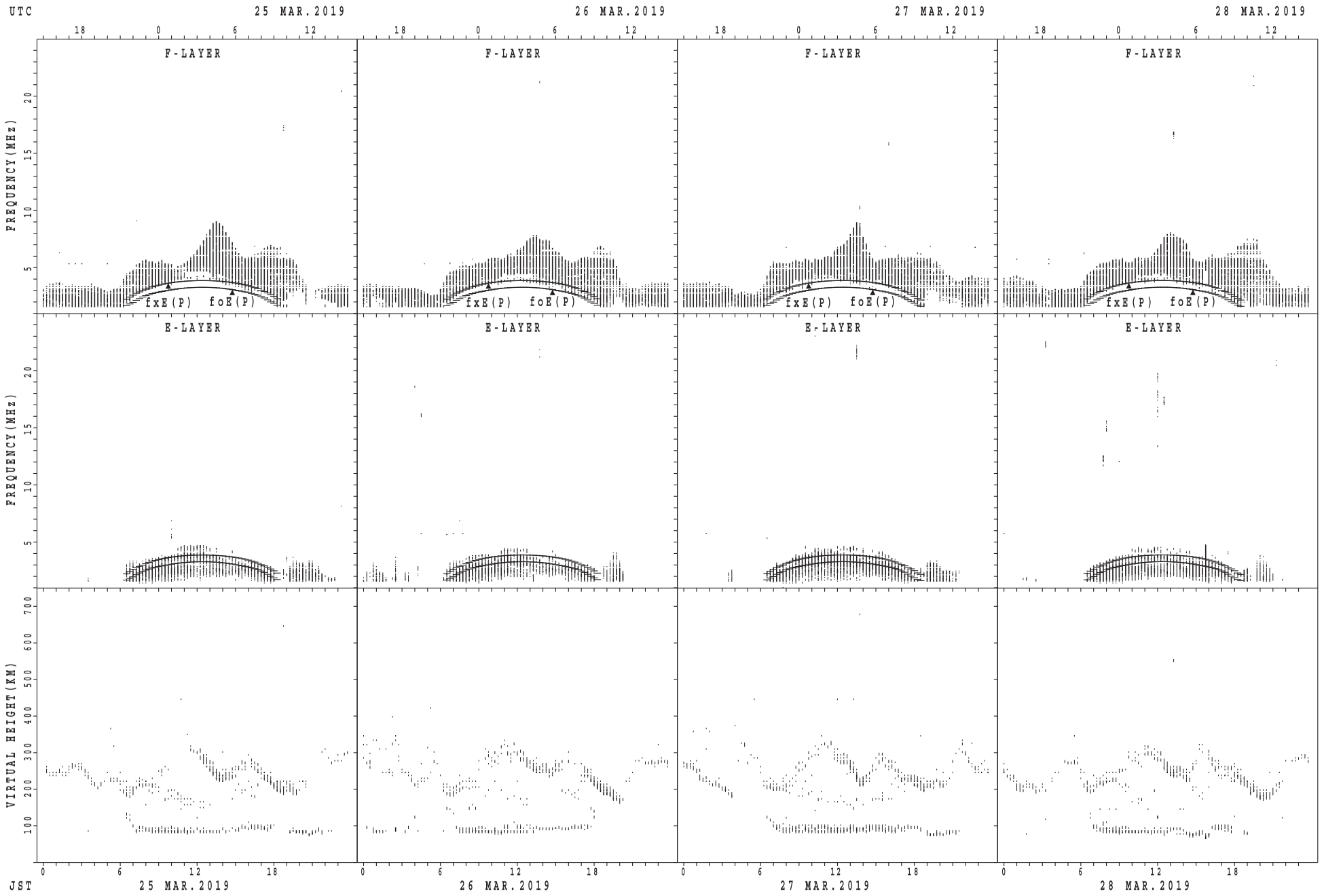


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

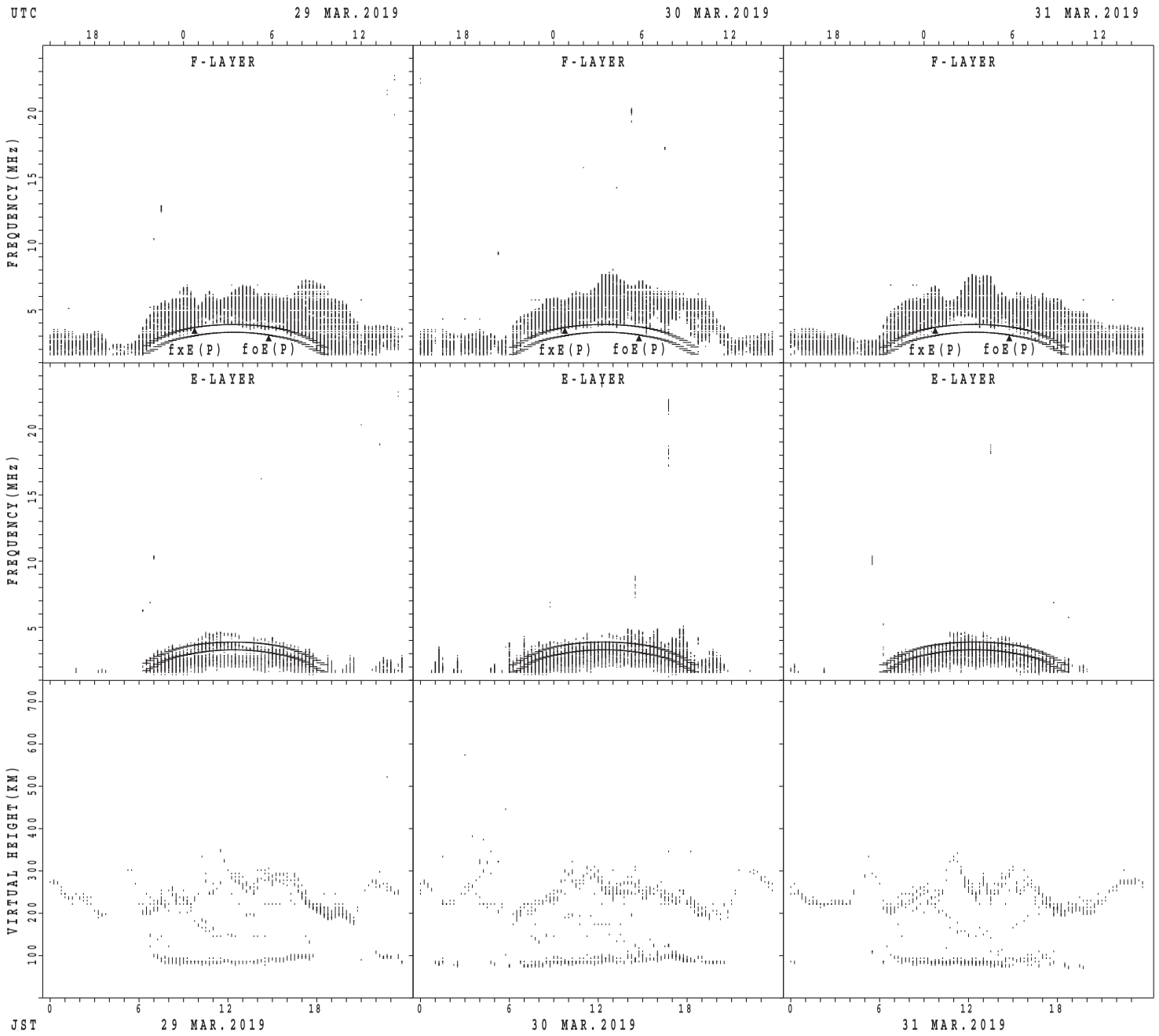
SUMMARY PLOTS AT Yamagawa



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

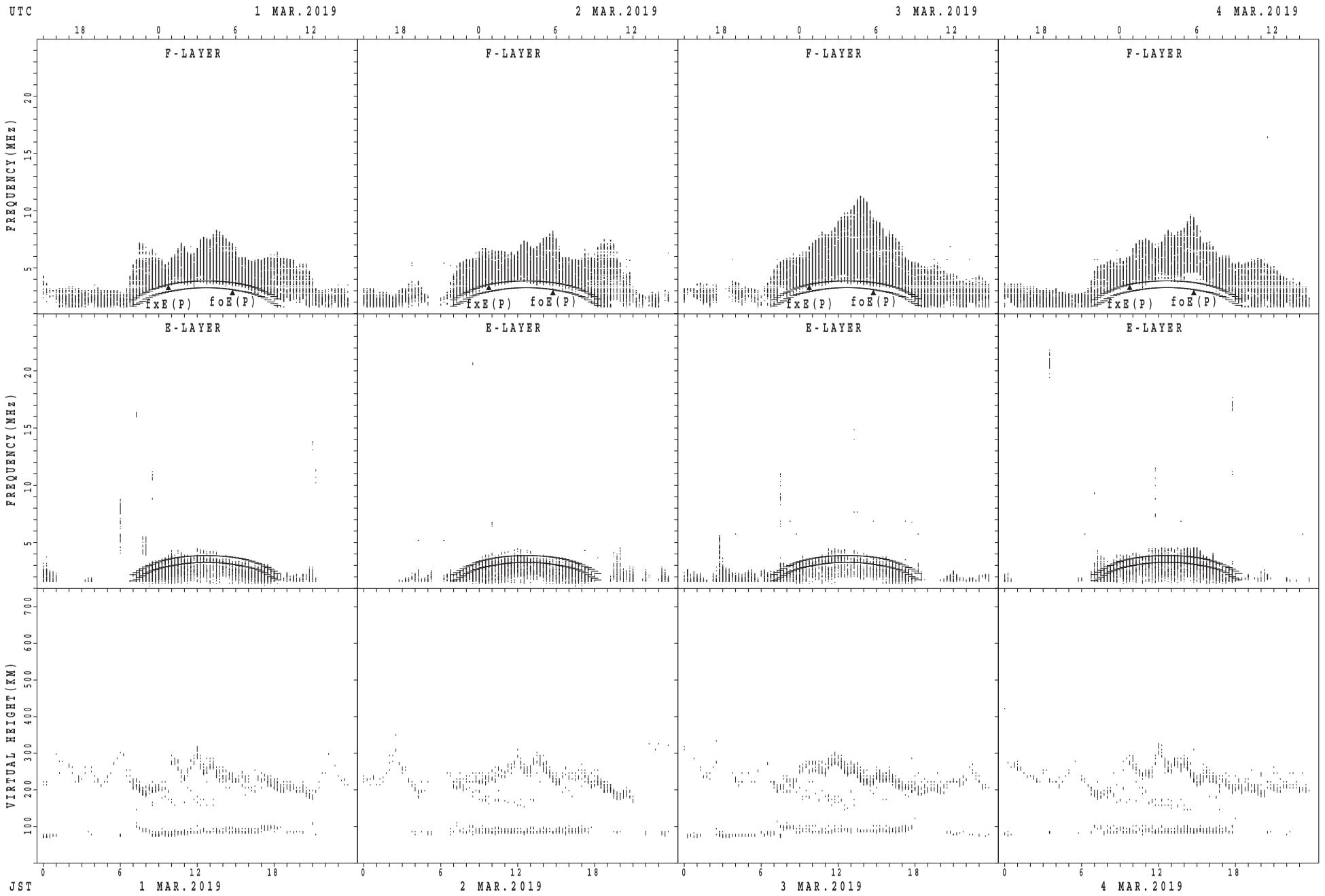

SUMMARY PLOTS AT Yamagawa
UTC
25 MAR.2019
26 MAR.2019
27 MAR.2019
28 MAR.2019
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



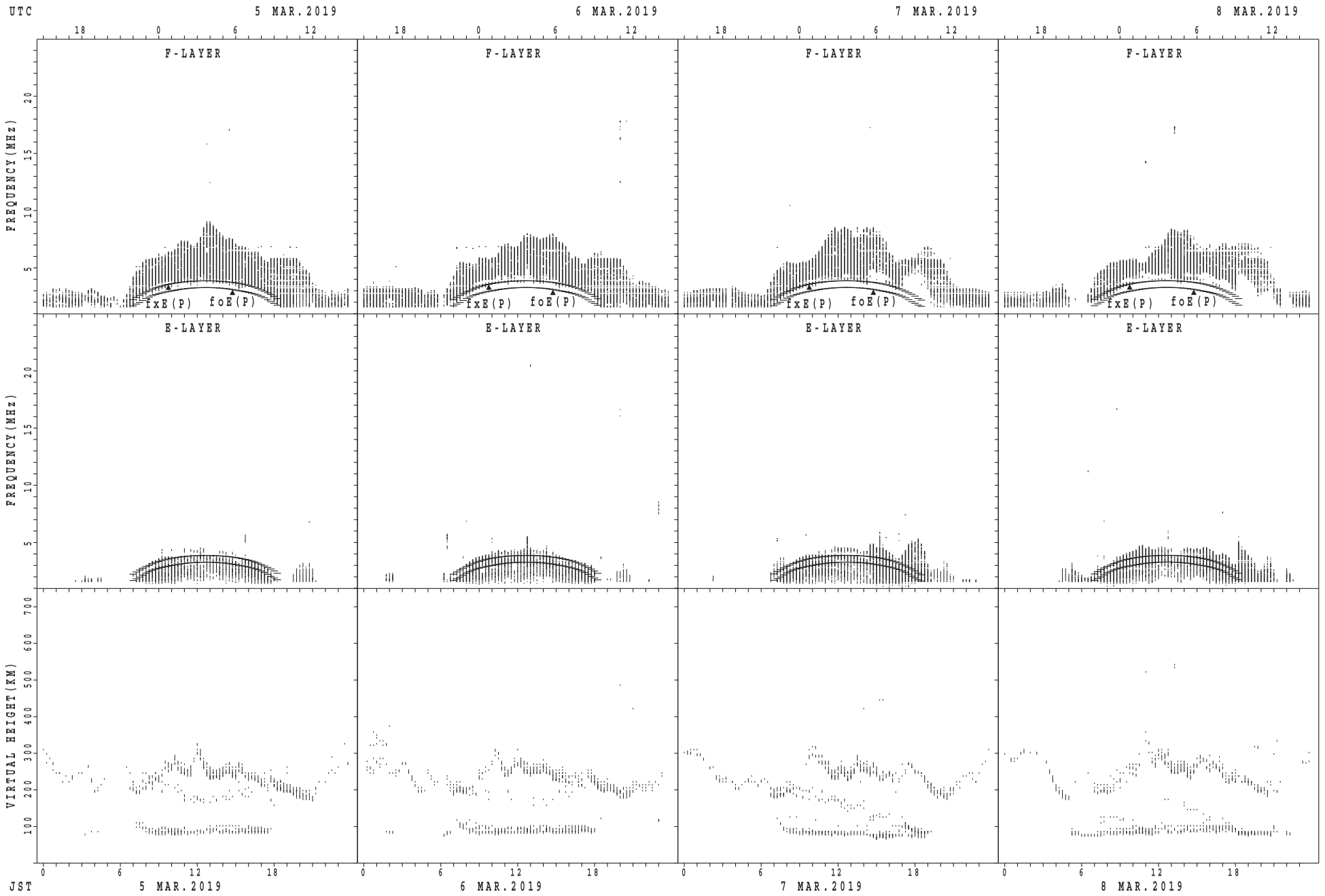
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



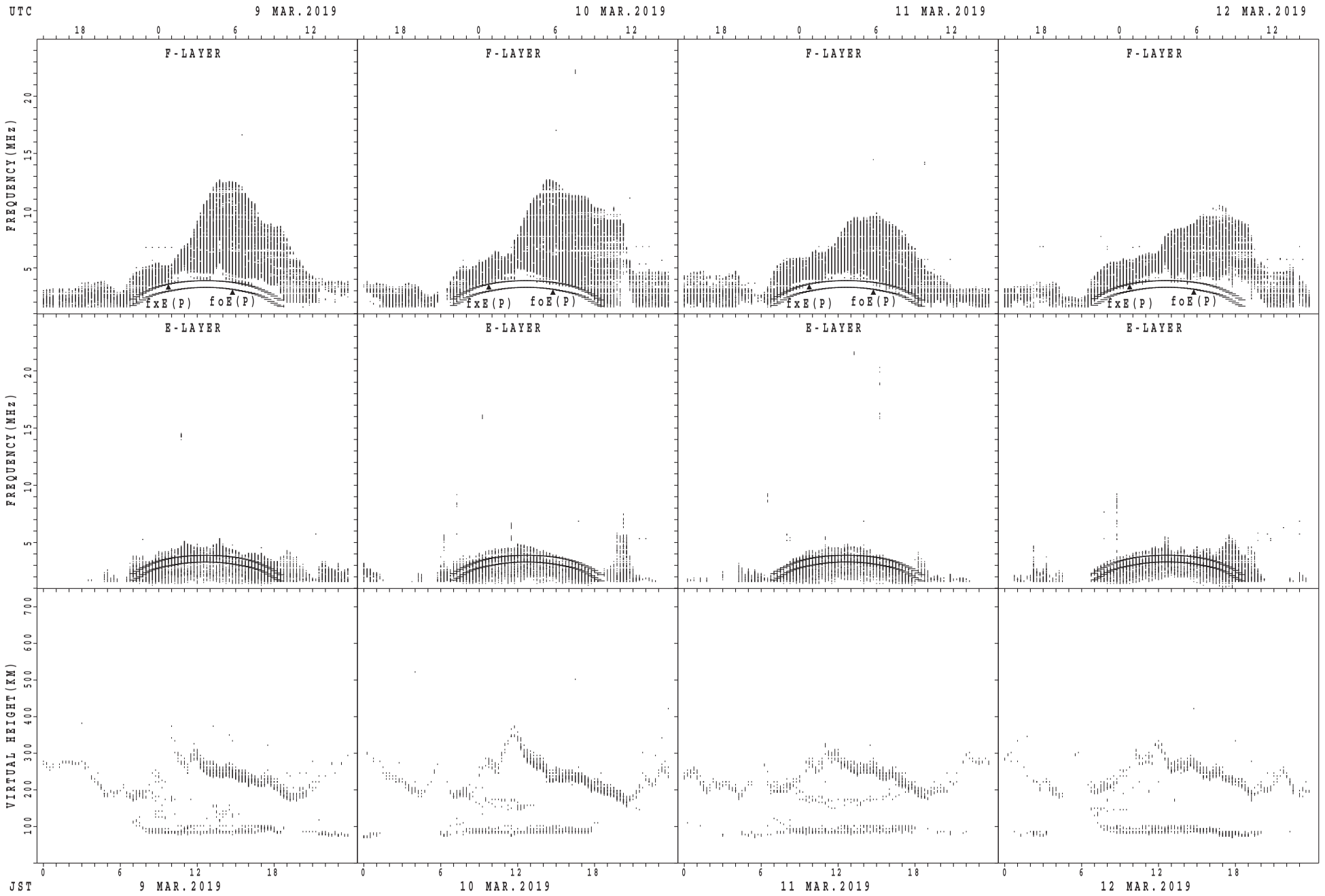
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



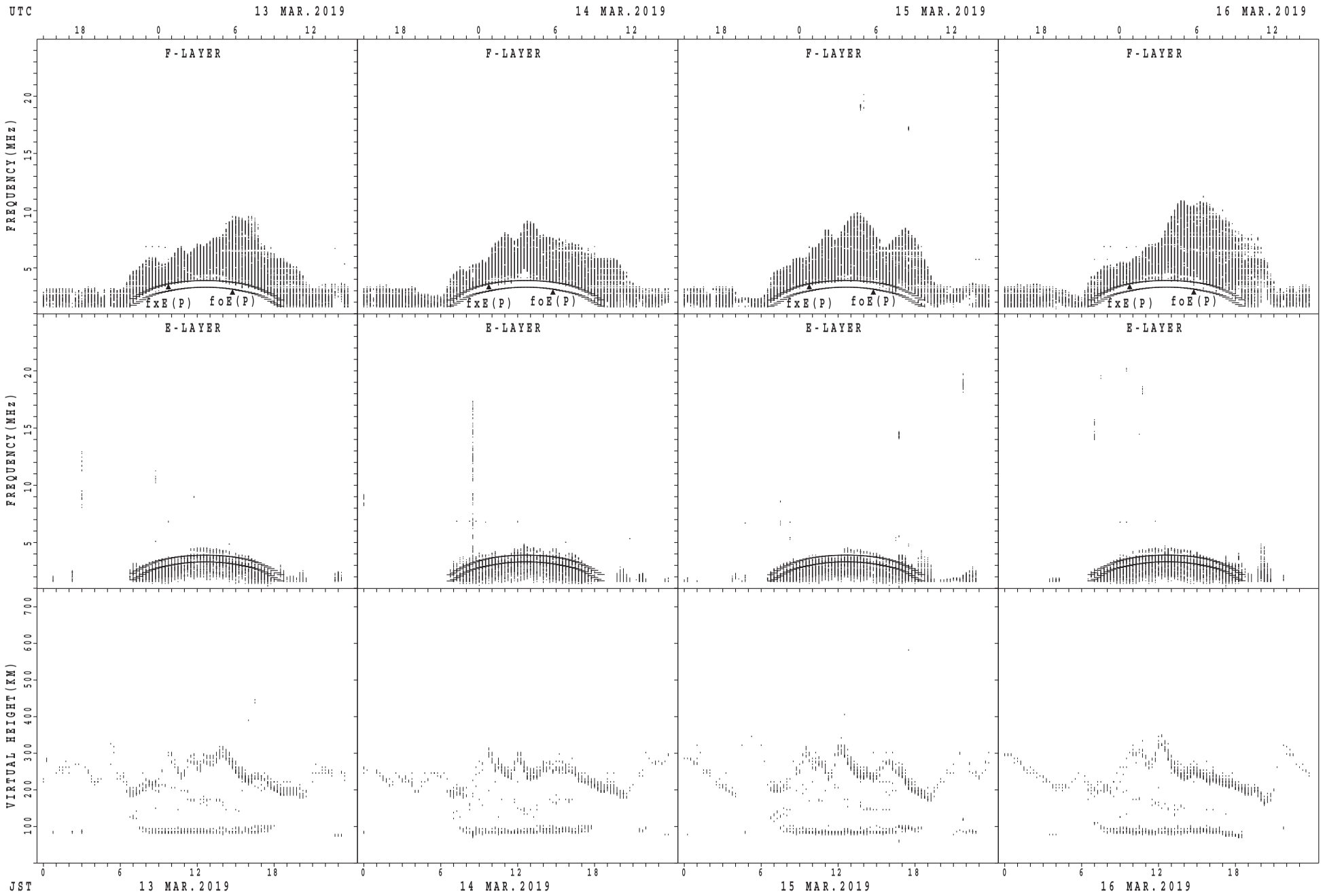
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



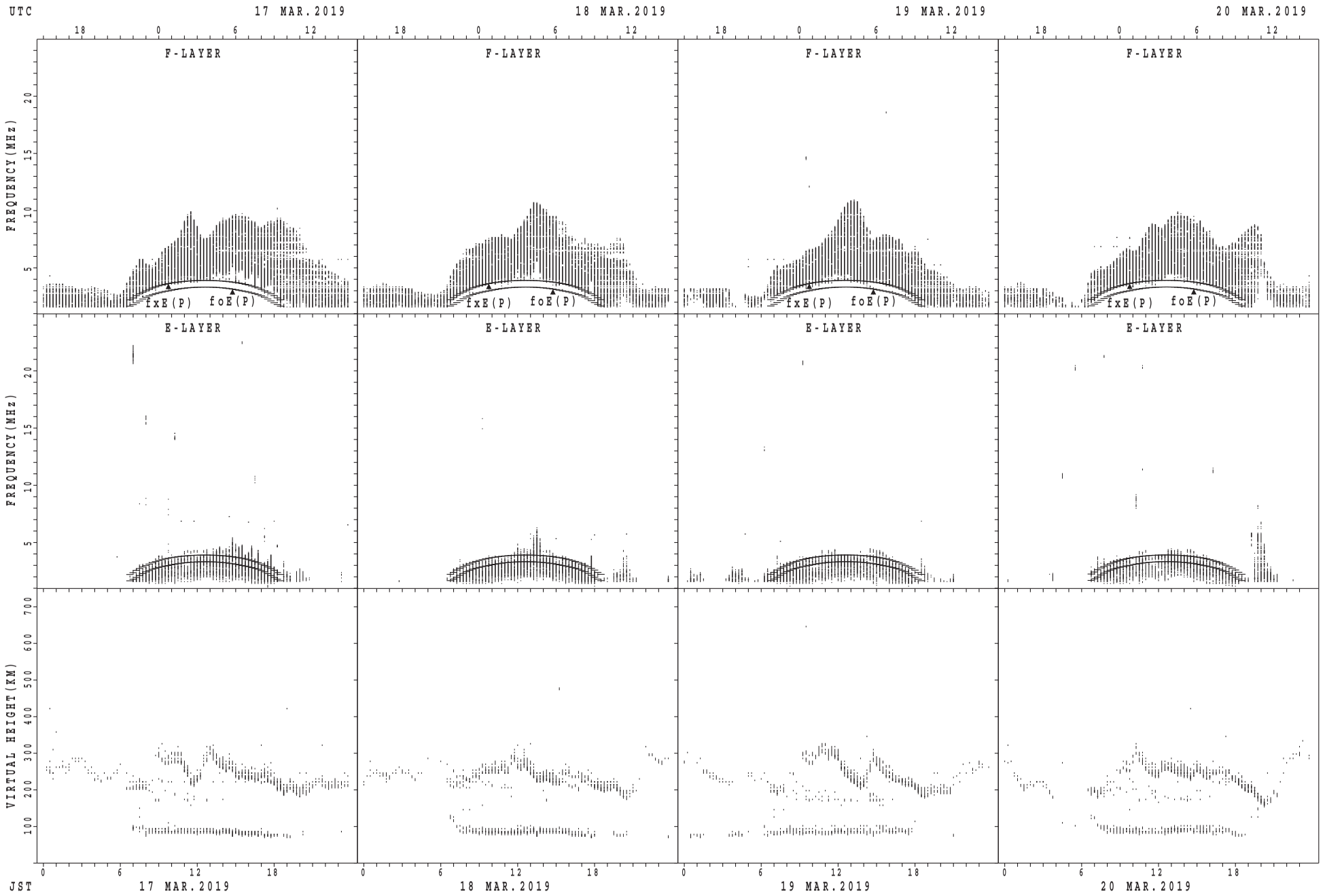
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



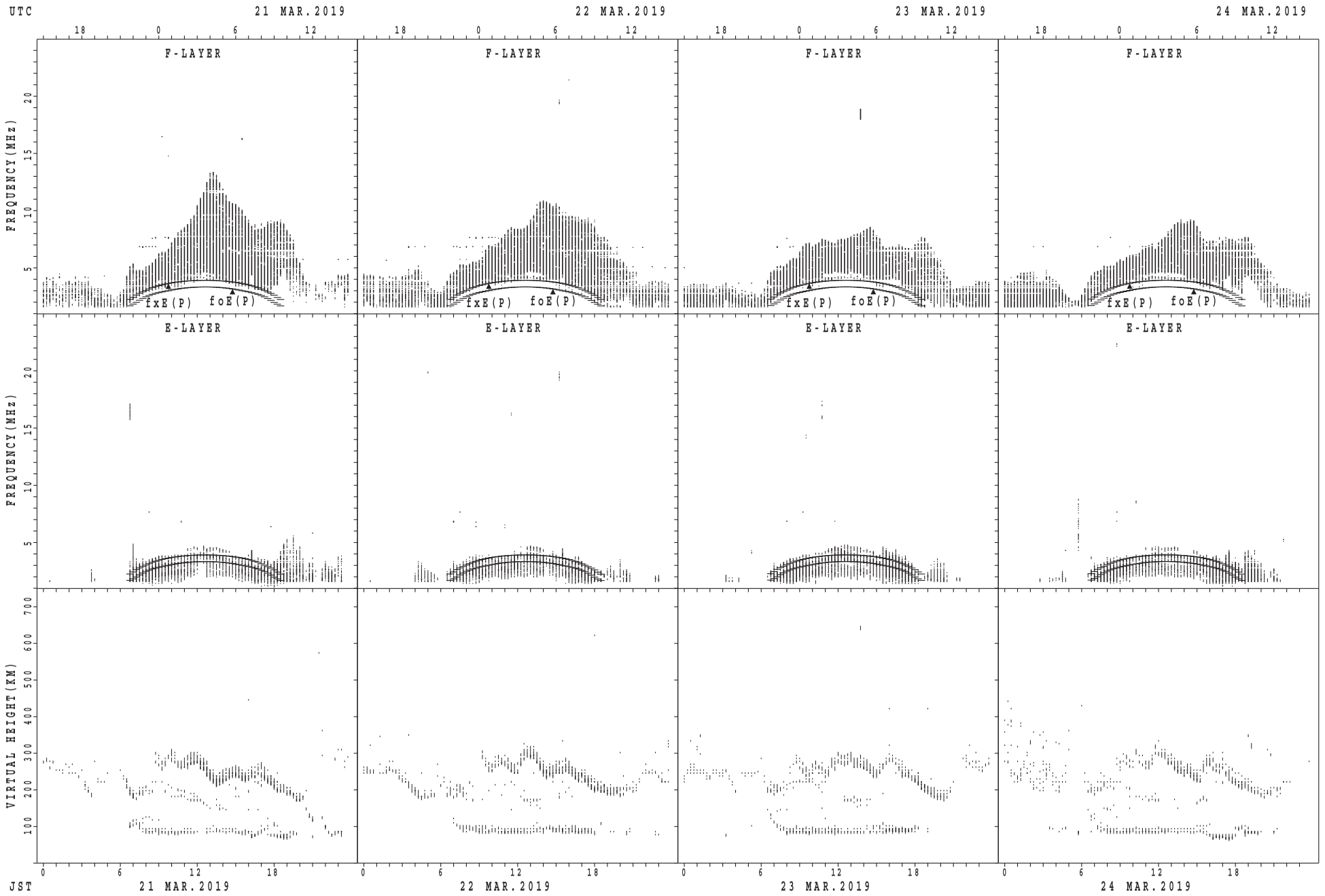
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



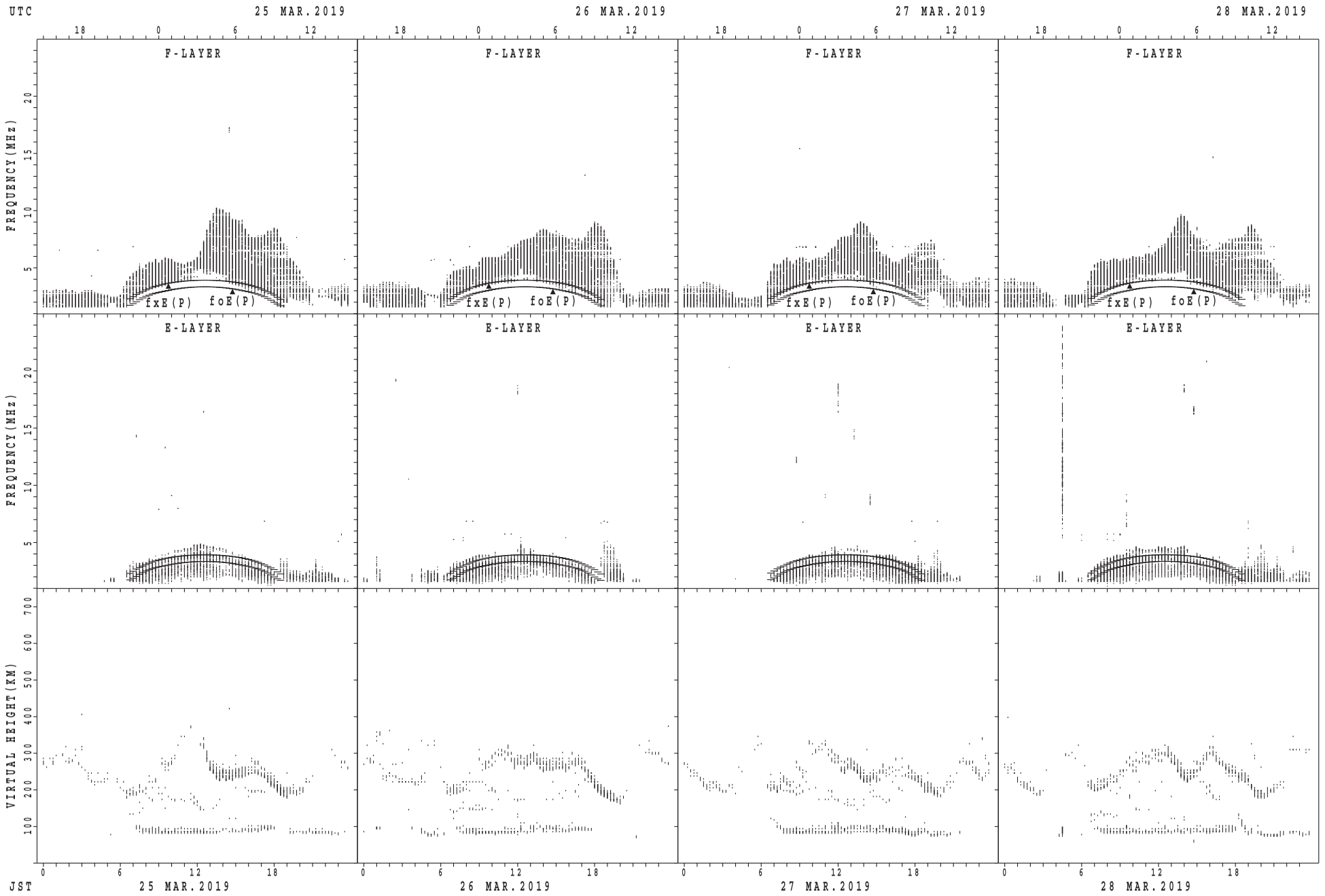
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



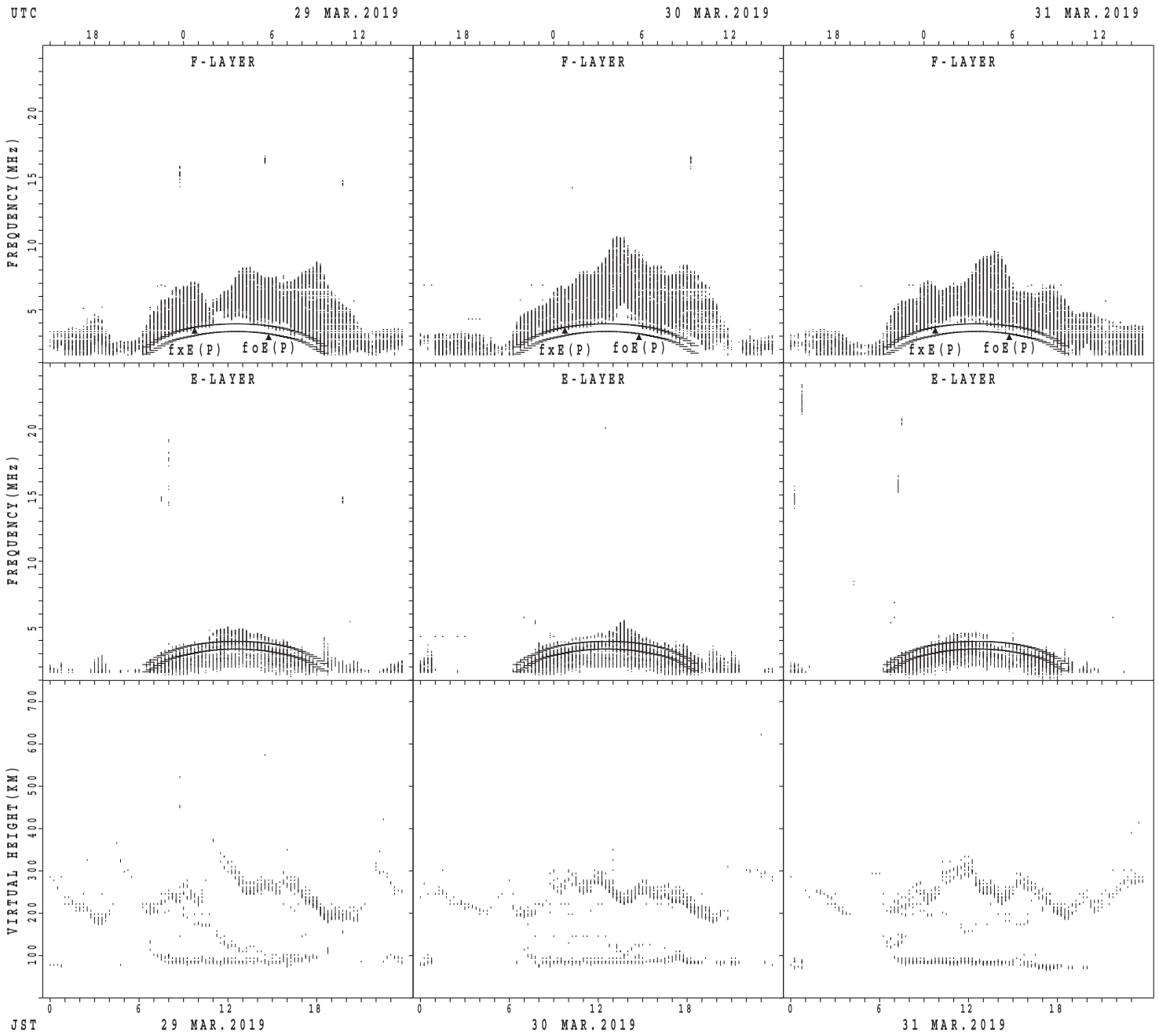
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

MAR.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								
MED																256								
U Q																128								
L Q																128								

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	4	4	3	3	3	12	20	26	17	26	24	23	22	11	15	18	5	6	7	5	6	3	7
MED	85	89	131	87	79	93	147	127	110	95	95	137	159	165	95	89	101	77	84	87	87	88	93	83
U Q	87	101	182	185	81	151	153	149	143	139	155	169	169	171	171	95	137	125	87	89	103	89	97	89
L Q	79	81	81	83	77	79	117	101	95	91	89	88	91	91	83	81	95	75	79	81	80	83	81	83

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						1	2							
MED									242	224						258	264							
U Q									121	112						129	268							
L Q									121	112						129	260							

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	5	2	2	4	2		11	20	8	10	15	18	13	11	9	10	16	13	12	8	7	3	8	6
MED	83	86	81	84	85		147	141	117	105	171	167	157	163	97	97	97	91	91	90	89	87	89	89
U Q	97	91	89	87	91		155	154	169	171	177	175	172	171	173	97	104	97	97	94	89	87	90	89
L Q	81	81	73	82	79		131	128	92	95	95	93	129	91	87	87	90	85	89	88	83	87	87	85

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										5							6	2	2	2				
MED										264							254	244	226	226				
U Q										276							258	250	234	234				
L Q										245							248	238	218	218				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	5	4	6	4	3	1	25	22	20	19	27	26	24	22	21	22	23	17	10	12	8	2	2
MED	87	87	84	84	83	83	81	133	116	116	101	165	161	155	146	101	95	97	93	86	132	88	84	94
U Q	89	89	88	89	85	91	40	144	137	145	171	171	167	164	167	160	101	101	113	89	178	96	87	99
L Q	83	84	80	81	82	81	40	125	107	101	95	99	95	137	97	96	89	91	87	81	86	83	81	89

MONTHLY MEDIANS OF h'F AND h'Es

MAR.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									2	5							18	19	14	12	4			
MED									226	262							241	242	224	232	196			
U Q									256	280							256	262	234	242	209			
L Q									196	245							232	232	220	216	192			

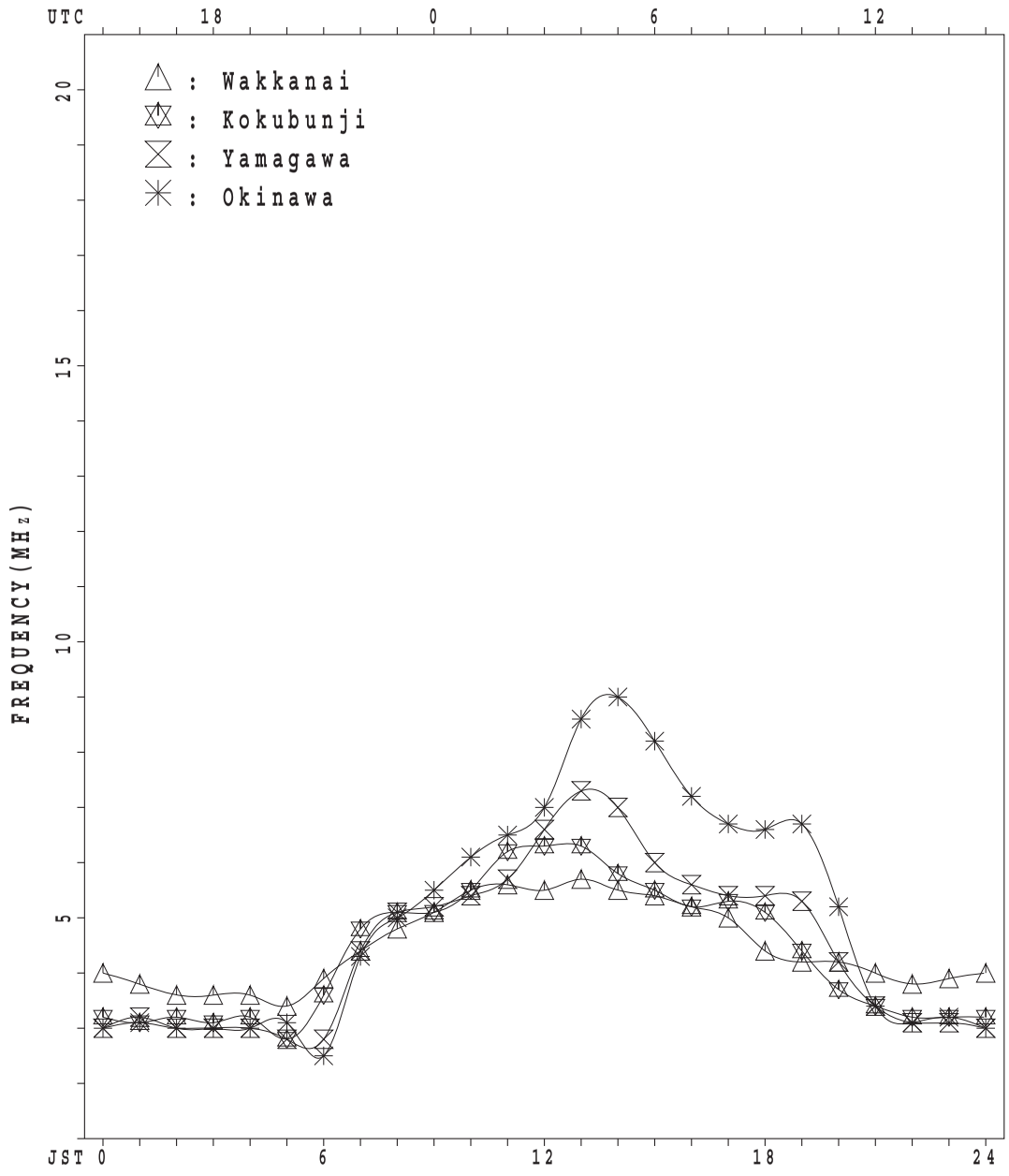
h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	5	1	4	3	4	4	27	27	27	20	21	28	30	26	25	27	23	19	17	18	12	6	7
MED	81	81	89	79	81	81	82	125	125	107	104	143	164	161	146	101	101	93	91	89	89	90	86	81
U Q	83	89	44	85	83	131	86	143	143	125	167	169	170	167	161	128	125	119	107	94	175	146	87	87
L Q	73	78	44	75	79	79	80	111	101	95	92	95	129	107	95	95	95	87	83	77	85	83	85	79

MONTHLY MEDIANS PLOT OF foF2

MAR.2019

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Wakkanai

MAR. 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 45	X 44	X 41	X 42	X 42	X 42														X 50	X 47	X 51	X 48	X 48
2	X 51	X 45	X 44	X 39	X 36	X 33														X 37	X 37	X 35	X 35	X 37
3	X 36	X 38	X 35	X 35	X 36	X 34														X 35	X 37	X 39	X 40	X 44
4	44	X 41	48	39	40	X 38														X 40	X 41	X 41	X 42	X 42
5	49	47	47	X 43	X 39	X 40														X 45	X 44	X 43	X 42	X 41
6	X 43	X 39	X 38	X 39	X 39	39														X 45	X 47	X 47	X 45	X 47
7	X 46	X 46	X 46	X 43	X 43															X 44	X 48	X 44	X 47	X 47
8	X 46	X 46	X 45	47	52	54	49													X 50	X 51	X 44	X 46	X 45
9	X 44	X 43	X 45	X 43	X 40															X 41	X 43	X 43	X 41	X 41
10	X 40	X 42	X 44	X 41	X 40															X 43	X 41	X 42	X 40	X 42
11	X 41	X 39	X 39	X 39	X 39															X 35	X 39	X 39	X 40	X 41
12	X 42	X 41	X 40	X 38	X 35															X 48	X 48	X 45	X 45	X 44
13	X 45	X 45	X 45	X 45	X 43															X 44	X 43	X 41	X 41	X 41
14	X 40	X 40	X 40	X 39	X 39															X 52	X 45	X 39	X 41	X 43
15	X 43	X 43	X 43	X 43	X 43															X 46	X 44	X 44	X 43	X 45
16	X 45	X 45	X 43	X 43	X 42															X 50	X 48	X 45	X 43	X 44
17	X 44	X 42	X 43	X 41	X 38															X 54	X 53	X 50	X 45	X 45
18	X 43	X 42	X 39	X 37	X 35															X 40	X 41	X 40	X 39	X 40
19	45	X 39	45	47	X 37															X 45	X 45	X 45	X 44	X 44
20	X 43	X 41	X 43	X 44	X 40															X 45	X 45	X 45	X 45	X 45
21	X 43	X 44	X 43	X 41	X 40															X 51	X 55	X 52	X 48	X 48
22	X 45	X 47	X 47	X 46	X 46															X 48	X 46	X 51	X 51	X 51
23	X 49	X 46	X 47	X 47	X 44															X 50	X 53	X 52	X 51	X 51
24	X 51	X 48	X 49	X 47	X 45															X 51	X 45	X 46	X 47	X 47
25	X 46	X 46	X 46	X 46	X 48															X 54	X 48	X 45	X 45	X 44
26	X 44	X 43	X 43	X 42	X 42															X 50	X 52	X 52	X 50	X 46
27	X 48	X 47	X 46	44	X 41															X 49	X 49	X 49	X 45	X 43
28	X 45	X 45	X 42	X 42	44																X 60	X 49	X 46	X 47
29	X 47	X 46	X 46	X 45	X 45																X 53	X 48	X 45	X 44
30	X 39	X 41	X 41	44	X 40																X 49	X 45	X 45	X 44
31	X 48	X 47	55	55	44																X 47	X 42	X 42	X 42
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	7	1													27	31	31	31	31
MED	X 45	X 44	X 44	X 43	X 40	X 39	49													X 46	X 47	X 45	X 45	X 44
U Q	X 46	X 46	X 46	X 45	X 44	42														X 50	X 49	X 49	X 46	X 47
L Q	X 43	X 41	X 41	X 39	X 39	X 34														X 43	X 43	X 42	X 41	X 42

MAR. 2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	412	392	388	L	L							
2									L	L	L	404	L	L	L	L	L							
3										L	L	404	L	L	384	L	L							
4									L	L	L	L	L	L		L	L							
5									L		412	L	L	408	L	L	L							
6									L	L	L	L	L	412	L		L							
7								L	L	L	408	L	L	L	400	L	L							
8										348	L	L	L	L	L	L	L	L						
9						L		L	L	392	L	L	416	L	L	L	L							
10									L	L	400	412	L	L	L	L	L							
11								L	L	L	L	L	L	408	400	376	L							
12								L	L		L	L	392	L	396	L	L							
13										388	L	L	L	L	L	L	L							
14								L	L	372	L	420	L	416	412	L	L	L						
15									L	L	416	L	L	416	404	L	L	L						
16							L		L	L	L	412	412	412	L	L	L							
17								L	352		L	412	L	L	L	L	L							
18											L	L	396	L	L	L	L	L						
19									L	L	380	L	L	L	L	L	L	L						
20								L	L	384	L	L	L	412	L	L	L	L						
21									384	400	416	L	L	L	L	L	L							
22								L	L	L	L	L	L	L	L	L	L							
23										L	L	L	L	L	L	L	L							
24									L	L	L	L	L	L	L	L	L							
25						L			L	L	L	L	L	L	L	L	L	L						
26								L	L	L	L	L	L	L	L	268	248							
27									L	400	L	L	L	L	292	L	L							
28									L	L	L	L	L	L	L	L	L							
29						L		L	L	L	L	L	L	A	L	L	L							
30								L	L	L	L	L	L	L	L	A	L		A					
31									L	404	L	L	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	8	6	6	5	8	8	2	1							
MED									368	390	410	412	412	412	398	322	248							
U Q										400	416	412	414	414	402									
L Q										378	400	404	394	408	386									

MAR. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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							B	A	A	276	A	288	A	268	268	236	216	B	B					
2							A	192	204	228	280	272	316	288	264	240	208	A	A					
3							B	188	244	264	280	288	300	292	268	244	204	B	B					
4							220	216	248	272	268	288	288	292	A	A	A	A	A					
5							B	192	244	240	304	292	304	296	276	260	220	180	B					
6						A	B	212	248	260	280	284	292	292	280	264	232	184	A					
7						B	B	212	260	260	296	296	304	304	280	296	220	B	B					
8						B	B	208	248	248	296	296	296	300	260	264	216	192	272					
9						200	B	204	240	284	292	300	320	300	300	264	224	A	192					
10						B	B	212	240	280	300	304	304	308	296	272	260	A	A					
11						A	B	208	268	248	304	304	308	308	300	276	248	A	A					
12						B	B	220	256	284	300	296	304	308	284	268	224	168	B					
13						B	B	192	252	276	280	308	316	308	288	272	236	188	224					
14						B	168	196	260	264	296	296	292	300	288	272	244	164	B					
15						B	B	188	252	288	A	A	316	A	276	276	224	188	B					
16						B	B	252	252	284	304	320	320	320	288	272	224	200	B					
17						B	B	220	256	256	256	308	320	300	292	268	A	172	B					
18						B	B	212	248	280	292	308	308	308	284	256	228	196	B					
19						A	204	216	256	A	292	312	280	304	288	264	216	168	B					
20						B	200	240	240	264	288	304	304	304	300	264	216	188	B					
21						B	172	224	272	296	308	308	324	300	316	268	236	180	B					
22						B	180	216	260	292	300	308	328	308	308	284	244	188	B					
23						B	188	228	264	284	304	316	324	308	300	284	244	200	B					
24						B	200	236	272	284	288	316	A	296	296	268	240	196	B					
25						B	204	224	276	296	296	292	308	308	292	268	264	196	B					
26						B	192	220	272	304	316	316	308	284	316	268	244	188	B					
27						B	188	248	276	300	328	328	328	316	288	288	232	192	B					
28						B	192	220	264	264	296	A	304	300	284	284	252	188	B	B				
29						B	172	228	280	296	A	312	312	A	308	A	236	204	A	A				
30						B	188	228	256	A	A	316	304	304	296	A	A	A	A	A				
31						B	180	232	268	264	308	316	312	304	292	260	244	196	B	B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	15	30	30	29	27	29	29	29	30	28	28	22	3					
MED						200	188	216	256	276	296	304	308	304	288	268	232	188	224					
U Q							200	228	268	286	304	314	318	308	300	274	244	196	272					
L Q							180	208	248	262	288	294	304	296	280	264	220	180	192					

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	JA 25	26	22	20	EB 15	19	20	JA 23	53	JA 53	JA 87	32	JA 44	JA 33	G	31	JA 42	EB 16	EB 16	JA 45	JA 25	JA 37	22	JA 21
2	JA 21	22	30	25	JA 26	23	JA 29	JA 20	JA 25	JA 31	34	34	34	G 22	JA 31	28	G	19	33	34	JA 31	32	33	28
3	22	22	JA 49	21	26	JA 47	EB 16	22	30	JA 26	G	G	34	32	G	G	23	EB 20	JA 21	JA 37	24	JA 19	19	19
4	19	22	JA 24	30	JA 28	JA 29	26	G	G	30	JA 36	G	33	JA 54	JA 45	39	JA 29	JA 26	JA 40	EB 16	28	25	19	24
5	EB 16	22	25	27	27	EB 16	EB 16	22	G	JA 29	JA 52	JA 45	36	32	32	G 19	G	G	EB 16	EB 16	EB 16	18	22	JA 26
6	25	25	JA 22	23	JA 17	JA 20	EB 16	JA 24	26	28	34	JA 55	38	32	32	27	G	JA 20	25	32	JA 23	JA 33	20	20
7	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	JA 51	G 26	29	JA 32	JA 104	G	34	32	G	26	EB 17	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16
8	22	EB 16	20	EB 16	EB 16	EB 16	EB 16	G	G	28	JA 100	33	34	G	35	34	JA 25	JA 23	G 23	EB 16	EB 16	EB 16	EB 16	24
9	34	22	20	EB 16	22	G 21	EB 16	22	JA 26	JA 33	JA 40	34	G 32	JA 34	JA 32	JA 31	25	JA 20	26	JA 19	JA 21	JA 23	EB 16	EB 16
10	25	JA 171	EB 16	EB 16	EB 16	JA 91	EB 16	24	27	JA 32	35	JA 33	35	JA 32	G	G	34	JA 25	JA 21	22	19	22	24	20
11	JA 27	24	22	EB 16	EB 16	22	EB 16	G	JA 28	JA 32	33	33	32	34	JA 45	30	27	22	20	EB 16	EB 16	EB 16	24	21
12	EB 16	20	20	EB 16	EB 16	JA 104	EB 16	JA 22	29	JA 33	34	JA 32	JA 36	33	31	29	26	19	EB 15	EB 16	EB 16	EB 16	EB 16	18
13	20	EB 16	EB 16	EB 16	19	EB 16	EB 16	25	30	32	31	32	32	32	34	34	24	G	G 20	26	EB 16	EB 16	EB 16	EB 16
14	EB 16	EB 16	EB 16	EB 17	24	18	JA 19	JA 27	30	31	31	30	35	37	JA 52	33	G	18	EB 16	EB 15	EB 16	EB 16	EB 16	20
15	EB 16	19	24	29	EB 16	EB 16	EB 17	26	29	JA 53	40	JA 34	JA 32	43	31	35	26	JA 20	EB 16	22	22	EB 16	19	20
16	24	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	G	31	34	JA 51	JA 39	34	JA 89	33	34	24	G	EB 16	EB 16	26	30	EB 16	BJA 25
17	28	EB 16	20	EB 16	EB 16	EB 16	EB 16	JA 22	28	32	JA 31	JA 60	JA 41	35	38	G	JA 25	20	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16
18	EB 16	EB 16	EB 15	EB 12	EB 13	EB 16	EB 16	G	JA 51	31	JA 52	JA 33	G	JA 49	G	30	G	G	EB 16	21	23	26	31	JA 24
19	31	22	EB 16	27	EB 15	20	JA 22	26	28	JA 41	39	34	JA 44	36	G 29	G 26	25	18	EB 16	EB 16	24	EB 16	EB 16	EB 16
20	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	G	27	29	32	32	35	G	G	G	G	JA 33	JA 21	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16
21	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	JA 19	JA 51	JA 29	39	JA 39	EB 17	38	JA 45	G	29	G	G	EB 16	JA 30	EB 16	EB 16	EB 16	EB 16
22	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	JA 23	JA 32	32	JA 34	JA 56	35	37	34	JA 31	G	JA 25	22	EB 16	EB 16	EB 16	EB 16	22	20
23	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	JA 45	27	31	34	34	36	40	JA 33	38	G	JA 27	G	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16
24	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	G	27	29	32	JA 34	JA 34	JA 34	36	33	30	JA 27	JA 21	28	20	EB 15	EB 15	EB 15	EB 15
25	EB 15	EB 15	EB 15	EB 15	EB 15	EB 16	G	G	32	33	33	32	35	JA 33	34	JA 33	G 24	G	EB 16	EB 16	EB 16	EB 16	22	32
26	18	EB 16	EB 16	EB 16	EB 16	EB 16	G	26	G	JA 32	JA 64	G 33	G	36	JA 33	G	G	JA 19	EB 15	EB 15	EB 15	EB 15	EB 15	EB 16
27	EB 16	EB 16	EB 16	EB 16	EB 16	EB 15	G	JA 47	JA 37	41	JA 53	JA 41	G	34	G	32	29	JA 21	EB 15	EB 15	EB 15	EB 17	EB 17	EB 17
28	EB 16	EB 15	EB 15	EB 16	EB 17	EB 16	21	26	31	34	JA 39	JA 39	35	30	G	G	G	G	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16
29	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	21	26	G 22	34	JA 31	G	34	JA 55	JA 31	JA 36	26	22	JA 19	JA 27	36	21	28	JA 24
30	21	24	24	20	EB 15	EB 16	22	26	28	JA 34	JA 48	35	34	34	G 30	JA 61	JA 31	JA 31	JA 48	JA 25	EB 15	EB 16	EB 16	EB 16
31	EB 16	EB 16	19	EB 16	EB 16	EB 16	JA 52	29	JA 53	32	33	40	JA 33	JA 31	32	35	32	G	EB 16	EB 16	EB 16	EB 16	EB 16	21
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	G	25	29	32	JA 35	34	34	34	32	30	25	19	EB 16	EB 16	EB 16	EB 16	EB 16	20
U Q	24	22	22	20	17	JA 20	JA 21	JA 27	31	JA 34	JA 51	JA 39	36	36	34	34	JA 27	JA 21	21	JA 25	23	22	22	24
L Q	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	G 22	G 26	31	33	G	G 32	32	G	G	G	G	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16

MAR. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	20	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	18	36	29	29	G 28	29	30	G	26	23	E B 16	E B 16	17	E B 16	E B 16	E B 16	E B 16
2	E B 16	E B 16	18	16	E B 16	E B 16	E B 16	G 18	21	27	G 28	G 27	G 31	G 21	29	27	G	18	22	17	19	16	16	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	16	E B 16	20	G 24	G 25	G	G	32	30	G	G	G 20	E B 20	16	17	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	E B 16	E B 16	E B 16	G	G	29	31	G	29	30	35	26	24	20	28	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	20	G	28	G 30	31	33	30	30	G 18	G	G	E B 16	E B 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 16	E B 16	E B 16	G 20	G 24	27	31	30	30	30	30	G 24	G	G 17	E B 17	E B 17	E B 16	E B 17	E B 17	E B 17
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	G 24	27	30	32	G	32	31	G	23	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	26	32	32	33	G	30	29	23	G 17	G 16	E B 16	E B 16	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 20	G 20	G 26	31	32	G 29	32	G 30	G 26	24	18	G 17	E B 17	17	E 17	E B 16	E B 16
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	26	28	31	31	34	G 30	G	G	G 26	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 26	29	32	32	31	G 30	G 29	28	G 24	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 20	28	30	32	G 29	34	31	30	27	24	19	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	27	29	30	G 30	G 31	G 30	33	G 25	G 21	G	G 16	E B 16	E B 16	E B 16	E B 16	E B 16
14	E B 16	E B 16	E B 16	E B 17	E B 16	E B 16	G 16	25	29	28	30	30	34	35	32	G 27	G	17	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	25	27	30	34	30	G 30	32	30	G 27	23	G 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	29	33	33	G 32	33	33	31	28	24	G	E B 16	E B 16	E B 16	20	E B 16	16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 20	27	30	31	32	G 31	31	G 29	G	20	G 17	E B 16	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 12	E B 13	E B 16	E B 16	G	27	29	G 29	G 30	G	G 30	G	28	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 17	E B 16	E B 16	E B 16	E B 15	E B 16	G 20	23	G 25	28	33	33	32	36	G 25	G 25	22	17	E B 16	E B 16	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	E B 16	G	G 23	26	29	31	32	G	G	G	G	26	G 18	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	E B 16	G 17	26	G 26	31	G E 31	B 17	G 31	30	G	28	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	24	30	30	32	34	34	32	G 28	G	G 24	20	E B 16	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	21	25	28	31	32	33	34	G 30	30	G	G 24	G	E B 16	E B 16	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	G	25	28	30	31	G 31	31	31	31	29	G 24	G 18	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15
25	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G	G	30	32	31	30	33	G 30	32	29	G 22	G	E B 16	E B 16	E B 16	E B 16	E B 16	22
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	24	G	G 30	35	G 31	G	31	G 31	G	G	19	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	G	25	G 28	31	G 31	35	G	32	G	32	24	20	E B 15	E B 15	E B 15	E B 17	E B 17	E B 17
28	E B 16	E B 15	E B 15	E B 16	E B 17	E B 16	20	23	29	29	34	35	33	G 29	G	G	G	G	E B 16	E B 16	E B 16	E B 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	19	G 22	G 20	31	30	G	32	40	G 30	34	24	21	16	E B 17	24	E B 16	E B 16	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G 18	23	28	29	33	33	32	32	G 28	42	23	E A 27	E A 30	E A 20	E B 15	E B 16	E B 16	E B 16
31	E B 16	E B 16	E B 17	E B 16	E B 16	E B 16	21	28	29	29	32	32	G 30	G 28	30	G 26	G 24	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	29	31	G	31	30	G 31	G	G 24	G	E B 16	E B 16	E B 16	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	E B 16	G	24	28	30	32	32	33	32	G	28	G	19	E 16	E 16	E B 16	E B 16	E B 16	E B 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 20	G 26	28	30	G 30	G 31	G 30	G 30	G 26	23	17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

MAR. 2019 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Wakkanai

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

MAR. 2019 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	309	331	327	320	326	323	333	375	363	365	367	366	370	343	348	364	367	358	352	319	331	297	330	310
2	320	359	307	299	328	314	376	343	368	383	340	360	356	369	350	351	347	357	359	330	346	333	300	307
3	307	291	319	337	324	350	363	391	393	361	364	345	367	364	353	382	353	377	359	332	305	312	299	301
4	F 298	319	F 314	F 323	F 306	332	346	382	383	384	378	383	361	369	345	365	377	367	356	336	324	324	319	315
5	F 336	F 320	F 287	328	309	366	341	393	374	358	355	348	356	365	355	358	374	363	355	344	324	331	319	306
6	310	313	302	329	326	F 359	373	391	358	355	360	375	364	365	368	329	352	372	350	309	330	331	341	303
7	313	319	320	344	333	335	362	386	380	342	358	379	341	369	379	343	351	390	348	328	323	352	318	318
8	320	303	319	F 281	F 287	F 319	F 357	395	363	364	370	360	354	359	347	365	355	355	345	327	342	330	325	332
9	328	331	352	320	316	323	370	384	360	349	343	357	349	329	364	355	351	358	359	333	321	334	332	322
10	326	312	336	337	334	343	362	362	361	365	372	384	340	345	345	341	361	363	343	331	329	329	328	323
11	331	322	323	323	329	360	363	384	388	352	371	368	347	350	344	364	363	376	366	334	326	318	317	323
12	336	331	333	314	330	345	368	401	366	362	343	365	380	349	349	363	348	369	345	316	321	310	342	330
13	310	310	317	317	328	317	372	376	355	352	349	366	336	350	332	372	337	369	365	351	323	314	314	319
14	329	334	336	342	328	320	386	372	381	379	367	327	327	357	353	358	354	365	346	334	335	315	298	316
15	317	317	327	316	327	341	384	359	347	367	378	333	327	350	333	358	355	356	349	339	320	320	335	310
16	327	322	310	311	335	343	369	361	346	358	344	320	341	367	349	359	346	359	353	335	332	324	328	313
17	333	305	311	307	312	312	355	359	339	330	349	321	349	330	351	358	336	347	342	327	311	321	325	317
18	327	337	313	330	304	295	325	374	347	400	294	329	337	350	336	373	371	361	353	314	307	314	318	311
19	F 314	318	F 325	F 302	354	347	310	379	337	376	335	339	346	341	362	372	369	369	352	328	328	331	320	318
20	314	325	333	323	358	352	362	353	360	313	332	353	341	332	346	337	343	362	360	333	334	334	322	322
21	317	314	320	324	336	285	394	383	344	322	354	355	365	354	374	365	352	354	349	337	341	348	314	331
22	335	326	326	323	323	356	388	378	330	297	365	302	350	328	367	351	354	358	361	324	341	318	316	317
23	336	322	334	328	330	319	395	373	351	339	319	352	322	341	361	349	368	377	333	319	326	325	328	329
24	331	331	322	318	352	344	385	374	337	372	311	317	340	359	357	376	364	369	359	357	331	318	318	333
25	343	331	331	331	355	325	384	396	346	361	328	365	330	341	357	361	358	357	343	360	343	325	326	333
26	322	333	333	336	324	356	397	380	358	341	348	353	321	331	355	367	351	363	346	333	318	333	339	336
27	309	305	318	F 323	308	319	401	359	361	341	325	369	347	347	338	347	348	382	375	325	300	300	325	326
28	315	306	331	312	F 307	331	389	393	324	349	339	357	352	326	344	354	351	340	330	323	343	343	333	313
29	320	323	323	333	353	357	364	363	343	366	355	350	346	353	358	342	342	358	350	338	332	338	303	335
30	343	312	305	F 272	340	328	382	376	360	358	319	337	351	346	342	352	357	361	349	340	341	316	334	327
31	308	320	F 298	F 326	F 295	311	380	370	344	376	354	365	348	355	321	346	359	359	343	342	340	313	304	302
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	320	320	322	323	328	332	370	376	358	358	349	355	347	350	350	358	354	362	350	333	329	324	322	318
U Q	331	331	331	330	335	350	385	386	366	367	365	366	356	359	358	365	363	369	359	338	340	333	330	329
L Q	313	312	313	314	312	319	362	363	344	342	335	337	340	341	344	349	348	358	345	325	321	315	316	311

MAR. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	381	410	372	L	L							
2									L	L	L	384	L	L	L	L	L							
3										L	L	385	L	L	377	L	L							
4									L	L	L	L	L	L		L	L							
5									L		369	L	L	386	L	L	L							
6									L	L	L	L	L	380	L		L							
7								L	L	L	381	L	L	L	386	L	L							
8										445	L	L	L	L	L	L	L	L						
9						L		L	L	379	L	L	437	L	L	L	L							
10									L	L	383	406	L	L	L	L	L							
11								L	L	L	L	L	L	393	372	390	L							
12								L	L		L	L	411	L	389	L	L							
13										383	L	L	L	L	L	L	L							
14								L	L	399	L	414	L	375	376	L	L	L						
15									L	L	392	L	L	392	393	L	L	L						
16							L		L	L	L	389	386	369	L	L	L							
17								L	397		L	404	L	L	L	L	L							
18											L	L	376	L	L	L	L	L						
19									L	L	420	L	L	L	L	L	L	L						
20								L	L	383	L	L	L	387	L	L	L	L						
21									375	382	383	L	L	L	L	L	L							
22								L	L	L	L	L	L	L	L	L	L							
23										L	L	L	L	L	L	L	L							
24									L	L	L	L	L	L	L	L	L							
25						L			L	L	L	L	L	L	L	L	L	L						
26								L	L	L	L	L	L	L	L	550	565							
27									L	382	L	L	L	L	520	L	L							
28									L	L	L	L	L	L	L	L	L							
29						L		L	L	L	L	L	L	A	L	L	L							
30								L	L	L	L	L	L	L	L	A	L		A					
31									L	375	L	L	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	8	6	6	5	8	8	2	1							
MED									386	382	383	396	386	386	382	470	565							
U Q										391	392	406	424	392	391									
L Q										380	381	385	378	378	374									

MAR. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR.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								210		244	234	238	244	262	262	232	212							
2									240	238	278	236	254	246	242	242	222							
3										248	248	272	242	258	260	230	248							
4									224	228	232	246	252	244		252	238							
5									228		254	280	242	256	246	254	240							
6									240	248	272	242	252	268	248		248							
7								216	228	256	256	256	262	246	234	250	250							
8										208	240	252	256	266	248	250	242	242						
9						242		216	250	272	298	264	282	294	270	270	246							
10									246	246	246	222	284	288	268	262	248							
11								214	214	244	260	260	262	284	252	252	252							
12								220	234		262	262	240	272	282	244	272							
13										274	252	246	274	284	278	244	256							
14								238	224	242	246	330	334	268	260	254	256	230						
15									256	250	250	304	300	268	288	250	250	232						
16							218		218	260	268	318	280	254	284	264	248							
17								242	254	320	272	296	276	274	262	250	260							
18											384	308	308	304	282	242	242	224						
19									288	212	304	286	292	280	262	250	238	230						
20								252	262	314	300	296	296	302	288	256	268	246						
21									292	332	290	288	262	274	244	244	244							
22								238	312	328	272	320	290	306	268	268	240							
23										316	332	280	318	284	266	266	240							
24									242	280	336	362	296	258	258	242	250							
25						234			282	262	318	260	312	304	272	272	272	252						
26								234	244	290	280	280	280	282	250	250	258							
27									258	280	296	258	284	290	282	278	254							
28									294	262	296	246	262	312	286	256	254							
29						238		238	290	254	280	280	264	262	280	288	256							
30								236	258	266	308	278	278	266	282	270	254		254					
31									270	246	268	266	284	286	300	272	254							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	1	12	25	28	31	31	31	31	30	30	31	7	1					
MED						238	218	235	250	258	272	272	278	274	267	252	250	232	254					
U Q						242		238	276	280	298	296	292	288	282	266	256	246						
L Q						234		216	231	245	252	252	256	262	252	244	242	230						

MAR.2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	278	258	226	228	218	242	240	196	220	184	216	198	200	184	188	196	208	218	214	260	230	268	244	244
2	236	206	262	282	248	248	202	230	210	200	180	196	196	194	186	198	198	216	220	220	A	224	248	248
3	252	252	242	222	222	208	208	216	226	196	192	186	222	200	188	218	196	222	204	220	252	268	250	256
4	260	232	234	228	270	222	236	220	208	198	180	170	170	222	246	188	218	220	222	220	238	250	234	Q 258
5	90	Q 216	Q 228	228	258	204	224	212	186	186	H 176	192	220	194	196	198	188	222	222	238	226	226	248	268
6	248	270	276	230	242	214	210	210	190	190	190	190	190	172	198	210	210	210	210	226	234	224	254	264
7	244	240	220	228	232	232	220	202	196	192	194	190	190	182	186	214	200	210	206	224	232	204	256	232
8	254	276	260	Q 272	Q 236	Q 216	Q 200	206	218	188	242	196	196	194	176	214	214	208	230	236	212	212	228	232
9	250	236	236	256	256	210	218	186	192	192	192	192	182	182	192	200	208	218	210	238	248	224	244	244
10	258	258	230	240	232	216	224	212	198	192	192	186	186	180	194	200	216	222	214	230	244	238	258	246
11	224	242	250	238	214	218	202	196	186	198	198	198	178	178	188	204	216	216	206	222	248	264	274	250
12	236	244	Q 236	Q 256	246	222	202	192	192	194	200	186	194	202	192	202	214	230	224	250	248	256	234	232
13	248	246	248	246	230	230	210	222	220	200	190	192	192	200	194	194	214	222	214	226	232	248	260	252
14	248	242	238	232	242	250	210	202	212	194	184	184	206	210	192	200	200	200	212	214	214	252	264	248
15	254	248	240	250	232	230	220	222	194	202	202	202	198	198	202	196	198	198	212	226	232	232	232	256
16	252	248	262	262	234	232	198	224	180	216	202	190	190	208	192	198	212	234	224	224	260	240	232	270
17	240	234	258	278	264	Q 254	228	198	198	204	200	188	194	200	200	200	202	230	238	230	254	254	254	254
18	244	244	236	246	268	274	224	198	258	212	218	206	196	208	198	208	200	194	208	246	254	234	246	248
19	254	Q 254	Q 236	Q 256	216	224	264	226	202	186	298	240	196	212	196	196	190	194	228	228	242	234	244	258
20	240	254	244	228	208	212	212	210	198	306	208	208	186	176	202	196	208	192	206	222	240	242	250	240
21	256	E 240	B 246	242	Q 234	Q 230	220	232	208	198	198	184	196	192	204	188	188	236	224	232	220	212	230	236
22	258	248	232	238	230	214	208	188	216	192	202	198	178	186	204	198	188	240	222	240	254	254	254	228
23	230	252	234	226	Q 228	Q 214	214	212	222	202	200	200	198	176	198	198	204	228	244	238	248	236	236	236
24	226	238	238	256	224	218	216	226	192	200	192	184	166	190	190	212	200	234	230	216	242	250	250	250
25	226	226	226	238	216	196	218	218	210	210	186	200	192	176	206	200	218	206	240	210	222	240	240	200
26	256	248	242	246	246	228	206	198	190	190	190	190	172	214	200	210	210	226	212	228	236	236	236	230
27	260	Q 260	234	Q 252	238	216	216	216	216	206	194	194	188	196	200	250	226	226	226	226	Q 246	266	244	260
28	252	224	Q 236	242	Q 226	228	208	208	198	208	208	208	200	184	194	194	204	244	260	236	208	210	240	262
29	256	254	240	240	Q 212	200	230	200	200	208	196	176	188	A	196	220	220	244	230	244	246	226	252	224
30	Q 234	258	Q 258	Q 270	240	Q 220	220	202	194	178	184	198	192	194	194	A	196	254	A	234	234	234	240	248
31	Q 248	230	Q 230	Q 220	Q 234	230	212	212	216	196	208	190	190	182	200	200	200	238	228	216	216	260	260	260
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	30	31	31	30	31	30	31	31	31
MED	248	246	238	242	234	222	216	210	200	198	196	192	192	194	196	200	204	222	222	228	239	238	246	248
U Q	256	254	248	256	246	230	224	220	216	204	202	198	196	200	200	210	214	234	228	238	248	254	254	258
L Q	236	236	234	228	224	214	208	198	192	192	190	186	186	182	192	196	198	210	212	222	230	226	236	236

MAR. 2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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							B	A	A		A		A					B	B					
										100		100		106	106	106	100							
2							A											A	A					
								110	106	106	106	106	106	106	106	102	110							
3							B											B	B					
								110	110	110	110	94	110	102	110	112	112							
4															A	A	A	A	A					
							98	114	152	102	102	106	98	98										
5							B						E B					E B	B					
								106	108	108	108	108	110	110	92	98	102	148						
6						A	B												A					
								128	116	104	110	110	110	102	102	102	110	98						
7						B	B											B	B					
								140	116	100	110	110	106	106	110	116	116							
8						B	B																	
								98	118	104	106	106	106	106	92	96	96	80	94					
9							B											A						
						94		122	114	114	114	114	108	108	106	104	112		92					
10						B	B											A	A					
								116	116	116	112	112	106	94	102	116	116							
11						A	B											A	A					
								110	110	110	112	112	112	112	112	112	112							
12						B	B												B					
								116	116	118	118	114	114	114	102	106	108	116						
13						B	B																	
								112	106	106	114	110	110	104	104	104	114	130	94					
14						B													B					
							142	114	114	114	110	106	106	112	108	114	112	112						
15						B	B				A	A		A					B					
								102	116	104			104		104	104	100	100						
16						B	B												B					
								120	110	110	110	110	110	110	114	108	108	108						
17						B	B												B					
								118	110	110	110	108	110	108	108	108		108						
18						B	B												B					
								114	114	114	114	114	112	112	104	108	108	122						
19						A	B				A								B					
								116	116		108	108	108	108	108	108	108	120						
20						B	A												B					
							124	106	102	106	110	104	108	108	110	110	102	108						
21						B	B												B					
								120	112	112	112	112	110	110	110	110	110	110						
22						B													B					
							112	108	108	114	114	106	116	116	116	116	116	116						
23						B	E B												B					
							128	116	110	110	110	110	118	110	110	110	110	122						
24						B							A						B					
							126	114	114	114	102	108		98	98	98	106	106						
25						B	E B												B					
							136	112	110	110	110	110	110	110	110	110	110	114						
26						B	B												B					
								102	102	110	110	110	110	110	110	116	116	116						
27						B													B					
							116	116	116	116	116	116	116	116	116	116	118	118						
28						B						A							B	B				
							118	118	106	106	106		106	102	98	112	112	118						
29						B					A				A	A	A		A	A				
							106	106	106	106		106	106				120	120						
30						B				A	A					A	A	A	A	A				
							118	108	108			104	104	104	106									
31						B													B	B				
							102	102	110	104	110	110	110	96	112	112	112	106						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	12	30	30	29	27	29	29	29	29	28	28	22	3					
MED						94	116	114	110	110	110	110	110	108	108	109	110	114	94					
U Q							127	116	116	114	112	111	110	110	110	112	113	120	94					
L Q							109	108	108	105	108	106	106	103	103	104	108	108	92					

MAR. 2019 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	90	98	98	94	B	112	112	102	98	98	100	156	90	100	G	112	90	B	B	94	86	86	92	100
2	100	94	90	90	90	90	106	124	102	102	102	106	96	84	94	144	G	100	100	100	94	94	94	94
3	94	94	88	88	88	90	B	122	100	100	G	G	146	160	G	G	186	B	96	96	102	98	94	96
4	86	90	94	98	94	94	90	G	G	98	98	G	86	118	88	88	88	92	88	B	100	100	100	88
5	B	88	88	90	90	B	B	146	G	104	98	98	144	142	164	88	G	G	B	B	B	92	98	98
6	92	90	98	90	90	92	B	144	112	106	144	96	86	136	146	168	G	90	90	90	90	90	90	90
7	B	B	B	B	B	B	B	116	120	110	118	88	G	154	154	G	130	B	B	B	B	B	B	B
8	102	B	90	B	B	B	B	G	G	104	96	142	148	G	84	84	84	84	82	B	B	B	B	92
9	92	100	88	B	88	88	B	156	110	110	110	152	118	90	90	90	134	118	86	86	86	86	B	B
10	88	94	B	B	B	94	B	148	132	106	176	108	146	88	G	G	108	104	104	90	102	98	98	98
11	92	98	98	B	B	90	B	G	102	112	172	158	118	156	96	174	154	88	78	B	B	B	94	94
12	B	94	92	B	B	116	B	114	136	124	110	104	100	146	142	166	166	156	B	B	B	B	B	98
13	98	B	B	B	86	B	B	154	152	152	142	108	106	92	104	110	140	G	86	86	B	B	B	B
14	B	B	B	B	94	88	154	154	140	134	144	94	144	168	90	112	G	102	B	B	B	B	B	86
15	B	86	94	96	B	B	B	122	116	110	102	92	92	92	176	114	122	88	B	88	88	B	84	84
16	90	B	B	B	B	B	B	G	130	102	106	106	164	104	154	110	128	G	B	B	102	102	B	102
17	90	B	90	B	B	B	B	106	120	110	106	102	106	106	106	G	108	176	B	B	B	B	B	B
18	B	B	B	B	B	B	B	G	120	120	114	98	G	98	G	170	G	G	B	106	106	106	106	100
19	100	96	B	96	B	98	166	156	158	100	168	154	94	166	120	112	118	146	B	B	90	B	B	B
20	B	B	B	B	B	B	G	138	140	124	138	154	G	G	G	G	110	100	B	B	B	B	B	B
21	B	B	B	B	B	B	140	104	114	106	106	B	106	100	G	142	G	G	B	90	B	B	B	B
22	B	B	B	B	B	B	108	96	148	104	100	146	168	130	118	G	108	158	B	B	B	B	102	102
23	B	B	B	B	B	B	94	138	138	122	106	106	104	104	104	G	104	G	B	B	B	B	B	B
24	B	B	B	B	B	B	G	142	138	110	98	110	92	88	144	146	92	112	88	86	B	B	B	B
25	B	B	B	B	B	B	G	G	146	136	104	104	142	96	160	98	98	G	B	B	B	B	98	98
26	88	B	B	B	B	B	G	148	G	106	84	100	G	142	100	G	G	122	B	B	B	B	B	B
27	B	B	B	B	B	B	G	122	106	106	106	94	G	158	G	158	134	128	B	B	B	B	B	B
28	B	B	B	B	B	B	150	140	140	140	96	96	176	114	G	G	G	G	B	B	B	B	B	B
29	B	B	B	B	B	B	164	162	102	166	98	G	140	90	92	92	128	132	100	106	106	88	96	96
30	96	96	96	96	B	B	152	146	122	108	104	144	162	152	108	90	90	90	90	90	B	B	B	B
31	B	B	90	B	B	B	98	144	88	112	112	102	102	106	152	112	100	G	B	B	B	B	B	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	13	14	9	8	11	12	25	27	31	30	27	26	29	23	22	23	19	12	13	12	11	13	18
MED	92	94	91	94	90	92	126	140	120	110	106	106	112	106	108	112	110	104	89	90	97	94	96	97
U Q	98	97	96	96	92	98	153	148	140	122	118	144	146	149	152	146	134	132	98	98	102	100	99	100
L Q	90	90	90	90	88	90	102	119	106	104	100	98	96	94	94	92	98	90	86	87	89	88	93	92

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	F3	FQ11	F1	F1		F1	L1	L2	L3	L2	LQ21	CL11	L2	LC11		C1	LC11			F2	F1	F1	F1	F1
2	F1	F1	F3	F2	F2	F1	L1	C1	C2	C3	C1	C1	LC21	LC11	L2	H1		L2	L2	F3	F4	F2	F2	F3
3	F1	F1	F2	F3	F2	F1		C1	LC11	LC21			C1	C1			C1		L1	F3	F1	F1	F1	F1
4	F1	F1	F1	FQ21	FQ21	FQ21	LQ21			CL11	LC21		LC21	CL11	L3	L2	L2	L3	L5		FQ11	FQ21	F1	F2
5		F1	F2	F1	F1			H1		C1	C2	C2	C2	C2	HL12	LC11						F1	F1	F4
6	F2	F2	F2	F1	F1	L1		C1	C2	C2	C2	LC21	LC21	CL21	CL12	CL12		L2	L2	F1	F1	F1	F1	F1
7								C2	C1	C1	C1	C1		C1	C1		C1							
8	L1		F1							C2	C1	C1	C1		LC11	LC11	LC11	LC11	CL11					F1
9	F3	F1	F1		F1	L1		H1	L1	LC11	LC11	HL11	CL11	LC21	L2	LC11	C1	L2	LC11	F2	F2	F1		
10	F1	F1				L1		C1	C1	C1	HL11	LC21	C1	L2			C2	L2	L1	F1	F1	F2	F2	F2
11	F2	F1	F1			L2			LC12	CL22	CL11	H1	C1	HL11	LC11	HL11	HL12	L1	L1				F1	F1
12		F1	F1			L1		C1	CL21	C2	C1	C2	LC21	H1	H1	H2	H2	H1						F1
13	F1				F1			H1	H2	H1	HL21	CL11	CL11	LC11	C2	C1	H1		L1	F1				
14					F1	L1	H1	H2	H2	H1	H1	LC11	H1	H1	LC11	C1		L1						F1
15		F1	F1	F1				C2	C2	C2	L2	L2	L2	L2	H1	C2	C2	L1		F1	F1		F1	F2
16	F1								C2	C2	LC11	LC11	C1	C1	C1	C1	C2				F1	F2		F1
17	F1		F1					C1	C2	C2	C1	LC11	C1	C1	C1		L2	H1						
18									C2	CL11	C1	C1		L1		H2				F1	F1	F1	F1	F1
19	F2	F1		F2		L1	H1	H2	H2	L1	HL11	HL11	H1	H1	C1	C2	C2	C1			F1			
20								H2	H2	C2	C1	H1					C2	L2						
21							H1	LC12	C2	C2	C2		C1	C2		C1				F1				
22							LC11	LC21	CL11	LC11	L1	CL11	H1	CL11	C1		C2	H2					F1	F1
23							LC11	H2	C2	C2	C2	C2	C2	C2	C2		C1							
24								C2	C1	C2	L2	C1	L2	L2	HL11	HL11	C2	C1	L1	F1				
25									H1	CL21	C1	C1	H1	C2	H1	L2	L2						F2	F5
26	F1							H2		C1	C1	C1		H1	LC11			C1						
27								C2	C2	C2	C1	LC11		H1		H1	C2	C2						
28							H2	C2	H2	H2	LC21	L2	L2	CL11										
29							HL21	HL21	CL21	HL21	L2		HL11	L3	LC21	L3	C2	C2	L2	L1	F4	F1	F2	F2
30	F2	F2	F2	F1			H1	H2	CL21	L1	L1	HL11	HL11	HL11	C1	L3	L3	L3	L3	L2				
31			F1				LC11	C2	LC11	C2	C1	C2	L1	C1	H1	C2	C2							F1
	00	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																								

MAR. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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 41	X 38	X 40	X 38	X 42	X 36													X 52	X 50	X 45	X 40	X 43	X 41
2	X 41	X 37	X 33	X 35	X 34	X 33													X 65	X 56	X 36	X 32	X 32	X 34
3	X 34	X 34	X 35	X 33	X 32	X 32													X 45	X 40	X 38	X 36	X 36	X 37
4	X 37	X 36	X 35	X 34	X 33	X 30													X 52	X 41	X 39	X 41	X 41	X 42
5	X 36	X 36	X 32	X 35	X 36	X 33													X 52	X 50	X 48	X 38	X 38	X 39
6	X 39	X 35	X 34	X 36	X 36	X 30												X 61	X 55	X 44	X 39	X 42	X 38	X 38
7	X 37	X 37	X 37	X 36	X 36	X 32													X 53	X 42	X 40	X 40	X 35	X 36
8	X 37	X 37	X 37	39	39	35													X 68	X 55	X 50	X 40	X 34	X 38
9	X 38	44	46	47	X 47	43													X 64	X 38	X 38	X 41	X 39	X 36
10	X 36	X 38	42	X 36	43	X 36													X 56	X 53	X 44	X 46	X 41	X 42
11	X 42	X 43	X 39	X 40	X 39	X 29													X 48	X 39	X 36	X 37	X 38	X 37
12	X 38	X 38	X 38	X 36	X 34	X 32	X 41												X 62	X 50	X 46	X 46	X 46	X 40
13	X 36	X 38	X 38	X 37	X 38	X 34													X 58	X 44	X 40	X 41	X 38	X 38
14	X 38	X 37	X 36	X 35	X 32	X 29													X 58	X 48	X 44	X 41	X 34	X 36
15	X 37	X 36	X 36	X 37	X 33	X 28													X 57	X 36	X 39	X 37	X 36	X 36
16	X 37	X 36	X 35	X 36	X 41	X 31													X 67	X 55	X 40	X 40	X 38	X 37
17	X 38	X 36	X 36	X 36	X 34	X 34													X 71	X 60	X 42	X 46	X 43	X 41
18	X 43	X 38	X 37	X 35	X 33	X 33							C						X 54	X 48	X 38	X 39	X 38	X 36
19	X 37	X 35	X 36	X 35	X 34	X 30													X 49	X 44	X 42	X 41	X 39	X 38
20	X 38	X 38	X 37	X 37	X 34	X 30														X 61	X 45	X 37	X 36	X 37
21	X 38	X 38	X 37	X 36	X 34	X 30													X 56	X 51	X 44	X 43	X 40	X 38
22	X 37	X 36	X 34	X 34	X 34	X 29													X 57	X 55	X 46	X 46	X 45	X 44
23	X 45	X 39	X 37	X 36	X 38	X 33													X 53	X 50	X 48	X 48	X 44	42
24	X 42	X 41	X 40	X 39	X 38	X 34													X 52	X 49	X 50	X 42	X 40	X 40
25	X 39	X 38	40	X 36	X 38	X 33													X 64	X 55	X 42	X 37	40	41
26	38	39	45	48	46	40													X 57	X 56	X 44	X 42	X 40	X 43
27	X 43	X 44	X 45	X 45	X 39	X 38													X 58	X 52	X 45	X 44	X 42	X 37
28	42	X 40	X 37	X 34	X 29	X 30													X 61	X 66	X 63	X 44	X 38	X 40
29	X 41	X 39	X 37	X 38	X 30	X 29														X 58	X 54	X 44	X 39	X 38
30	X 39	X 38	X 38	X 36	39	38													X 59	X 51	X 46	X 38	X 37	X 37
31	X 35	X 33	X 35	X 36	X 32	X 31													X 56	X 55	X 41	X 39	X 38	X 38
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	1											1	29	31	31	31	31	31
MED	X 38	X 38	X 37	X 36	X 36	X 32	X 41											X 61	X 57	X 50	X 44	X 41	X 38	X 38
U Q	X 41	X 39	39	X 38	X 39	34													X 62	X 55	X 46	X 44	X 41	X 41
L Q	X 37	X 36	X 35	X 35	X 33	X 30													X 52	X 44	X 39	X 38	X 37	X 37

MAR. 2019 fxI (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

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

MAR. 2019 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

MAR. 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									L	U L 388	U L 436	U L 428	428	U L 424	U L 408	L								
2									L	L	U L 416	416	420	L	L	L	L							
3										A	L	U L 428	U L 440	L	L	L	L							
4									L	L	U L 428	U L 420	U L 440	416	U L 412	L	L							
5									L	U L 416	U L 444	420	A	U L 428	L	L	L	L						
6									L	U L 424	U L 424	U L 436	U L 420	U L 420	L	L	L							
7										L	L	U L 436	420	L	L	U L 396	L							
8										L	U L 436	U L 424	U L 416	U L 428	L			L						
9									L	L	428	428	428	U L 428	L	L	L							
10									L	L	U L 424	448	444	A	U L 416	L								
11										L	L	U L 424	436	U L 428	U L 420	U L 400	L							
12										L	U L 408	U L 436	U L 428	U L 424	U L 428	L								
13										L	U L 416	416	436	420	U L 424	L	L							
14									L	L	U L 440	U L 416	U L 436	U L 420	U L 416	L	L							
15									L	U L 416	U L 412	436	440	436	U L 400	A	L							
16									A	U L 424	U L 424	428	424	436	416	U L 404	L	L						
17									L	412	428		432	L	L	L	L							
18								U L 344	U L 376	U L 408	420	432	C	U L 440	A	L	L							
19									L	U L 408	U L 424	U L 404	440	432	U L 420	U L 416	L							
20									L	L	428	U L 432	436	424	U L 428	L								
21								L	L	408	432	444	U L 432	432	428	L	L							
22									L	U L 416	U L 424	U L 424	U L 440	432	U L 428	L	L							
23									L	U L 432	416	436	U L 432	U L 424	420	U L 408	L							
24									L	U L 420	U L 440	U L 436	432	428	U L 416	L	U L 396							
25								L	L	L	432	436	436	A	420	U L 404	U L 384	L						
26									L	U L 424	416	436	U L 432	U L 420	416	U L 400	L	L						
27									L	L	416	432	444	428	420	U L 424	U L 376	L						
28								L		408	U L 420	U L 444	A	L	U L 416	U L 384	L							
29									U L 412	U L 400	U L 412	A	432	U L 428	U L 420	U L 388	L	L						
30										412	416	U L 432	U L 440	416	U L 388	U L 396	L							
31								L	L	412	412	U L 428	436	428	U L 416	U L 404	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	2	17	28	29	28	24	22	12	3							
MED								U L 344	U L 394	U L 412	U L 424	U L 432	434	428	U L 418	U L 402	U L 384							
U Q										U L 422	U L 430	U L 436	440	430	U L 420	U L 406	U L 396							
L Q										408	416	U L 424	428	422	U L 416	U L 396	U L 376							

MAR. 2019 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

MAR. 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							R	U R 184	A	U R 280	U R 296	A	U R 332	U R 308	U R 296	U R 268	A	R						
2							B	U R 216	U R 260	U R 288	R	U R 328	U R 320	U R 332	R	A	R 240	B						
3							B	U R 184	U R 260	A	U R 304	A	U R 312	A	A	A	U R 240	A						
4							B	A	A	U R 272	U R 308	A	R	R	R	U R 296	A	U R 180						
5							B	192	256	R	R	320	U R 340	316	316	R	R	B						
6							B	200	U R 268	U R 300	U R 320	A	U R 328	R	R	U R 276	U R 252							
7							B	U A 212	260	R	A	U R 332	R	R	R	U A 284	240	A						
8							B	192	260	U R 308	A	R	R	R	R	U R 280	U R 240	U R 188						
9							B	U R 196	U R 256	R	A	R	U R 328	R	R	U R 284	256	A						
10							B	U R 236	A	A	A	U R 332	R	U A 368	U A 316	U R 304	U R 268	268						
11							B	U A 216	U R 280	A	A	A	R	A	A	A	A	B						
12								208	U R 264	A	332	A	R	R	R	R	U R 256	U R 188						
13							B	U A 208	U A 256	A	R	R	R	R	R	U R 292	U R 268	U R 200						
14							B	U A 208	U A 264	R	U A 312	336	348	A	R	U A 288	U A 252	R						
15							B	U R 240	U R 296	A	A	R	R	R	R	A	A	A						
16							B	U R 264	A	A	A	A	A	U A 320	A	A	A	U A 184						
17							B	U R 244	U R 284	A	U R 320	A	A	A	A	U R 284	U R 248	U R 192						
18							B	208	U R 272	R	A	A	C	R	U R 316	U R 296	U R 248	U R 196						
19							B	220	256	A	R	R	336	R	U R 320	R	U R 256	U R 200						
20							B	220	U R 280	A	U R 356	A	U R 348	U R 336	R	A	A	A	A					
21							B	224	U R 284	A	A	A	U R 344	U A 332	U A 308	R	U R 268	R						
22							B	U A 224	284	U A 308	U R 352	A	R	R	R	U R 308	U R 276	R						
23							B	A	A	A	A	A	A	A	U R 324	U R 300	A	A						
24							B	U R 236	U R 284	A	A	A	R	R	R	U R 312	A	U R 192						
25							B	240	284	R	A	A	A	U A 332	332	R	A	U R 208						
26							B	U R 248	U R 288	320	R	U A 336	R	R	U A 312	U R 284	U R 268	U R 200						
27							B	U A 236	U R 292	A	A	A	R	336	U R 328	U R 312	U R 272	U R 196						
28							B	U R 260	U R 300	R	U R 332	R	U A 352	R	U A 332	U R 304	U A 256	A						
29							B	U A 240	U R 272	U A 296	U A 336	344	344	A	R	U A 300	A	A	A					
30							B	A	A	A	A	U A 344	A	R	R	A	U R 268	A							
31							B	U A 236	U A 284	R	R	U A 340	U R 360	A	R	R	U R 260	U R 204						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								28	25	8	11	9	13	9	11	18	20	14						
MED								U 220	U R 272	U R 298	U R 320	U 336	U R 340	U 332	U 316	U R 294	U R 256	U R 196						
U Q								U R 238	U R 284	U 308	U R 336	U A 342	U 348	U 336	U 328	U R 304	U R 268	U R 200						
L Q								208	260	U R 284	U R 308	U R 330	U R 328	U 318	U A 312	U R 284	U R 248	U R 188						

MAR. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	23	20	20	JA 22	21	EB 15	EB 16	G	JA 28	G	G	JA 38	G	G	G	G	27	G	23	EB 16	JA 24	23	JA 28	22
2	18	21	EB 16	EB 16	22	20	20	G	G	G	G	G	G	G	G	32	G	20	24	21	EB 16	JA 52	JA 56	JA 25
3	JA 34	20	EB 16	20	EB 16	EB 16	EB 16	G	G	JA 50	JG 32	JA 37	G	JA 36	JA 35	JA 35	G	JA 30	JA 23	JA 26	21	23	JA 49	JA 36
4	JA 29	21	EB 15	JA 23	22	21	20	22	28	G	G	36	G	G	G	G	26	G	EB 15	JA 20	JA 27	JA 21	23	JA 42
5	JA 34	22	20	EB 16	EB 16	EB 16	EB 16	23	G	G	G	37	41	36	G	G	G	20	EB 16	JA 23	22	EB 16	JA 24	24
6	EB 15	JA 27	JA 24	EB 15	EB 16	EB 15	EB 16	24	G	G	G	G	G	G	G	G	G	JA 24	JA 34	JA 28	JA 23	JA 24	JA 24	19
7	20	EB 16	EB 16	EB 15	EB 15	EB 15	EB 16	24	30	G	34	G	G	G	G	34	28	24	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16
8	EB 16	EB 16	EB 15	JA 22	EB 16	EB 16	EB 16	24	30	G	33	G	G	G	G	G	28	22	EB 16	EB 15	EB 15	EB 16	EB 16	EB 15
9	EB 17	EB 15	EB 15	EB 16	EB 15	EB 16	EB 16	24	G	G	JA 36	G	G	G	G	35	29	JA 30	JA 25	24	21	EB 16	JA 40	JA 29
10	JA 23	21	EB 15	24	20	EB 16	20	G	31	JA 40	38	G	G	39	35	G	32	JA 30	JA 22	22	JA 28	JA 22	EB 16	JA 25
11	EB 16	EB 16	JA 24	JA 22	JA 23	EB 16	EB 16	26	G	JA 37	JA 38	36	G	JA 37	JA 48	JA 48	JA 34	JA 45	JA 25	JA 23	JA 26	23	22	JA 30
12	EB 16	EB 15	EB 16	EB 16	EB 15	EB 15	EB 16	25	G	34	G	34	G	G	G	G	G	G	23	EB 15	EB 14	21	EB 15	20
13	EB 16	EB 15	22	EB 16	EB 16	20	EB 16	26	29	32	G	G	G	G	G	G	G	G	EB 15	EB 16	EB 15	EB 15	JA 30	EB 15
14	EB 17	EB 16	EB 16	EB 16	EB 16	EB 15	EB 16	26	30	G	40	38	38	JA 39	G	34	29	G	EB 16	EB 16	EB 16	EB 16	EB 15	EB 15
15	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	18	G 20	JG 27	34	35	G	G	G	G	JA 38	JA 32	JA 25	EB 16	JA 24	EB 16	EB 16	EB 15	EB 16
16	EB 16	EB 16	EB 16	EB 15	EB 16	EB 16	20	G	30	35	34	JA 43	JA 39	37	JA 38	JA 46	JA 34	23	EB 16	BJ 28	JA 28	EB 15	EB 16	BJ 22
17	20	JA 20	EB 16	EB 16	JA 22	EB 15	EB 16	G	G	JA 36	G	JA 46	JA 53	JA 37	JA 36	G	G	G	JA 22	JA 23	JA 23	19	EB 16	21
18	23	JA 23	JA 22	23	JA 24	EB 16	EB 16	25	G	G	35	JA 38	C	G	36	G	G	G	JA 27	JA 22	EB 16	20	EB 16	BJ 25
19	EB 16	EB 16	EB 16	JA 24	JA 28	20	20	26	29	33	G	G	37	G	G	G	G	G	EB 15	EB 15	EB 15	19	EB 15	EB 15
20	19	EB 16	EB 16	EB 16	EB 15	EB 15	EB 16	25	32	34	G	38	G	G	G	JA 34	JA 33	JA 27	JA 23	EB 16	EB 15	23	JA 26	EB 16
21	EB 16	EB 16	19	EB 16	EB 15	EB 16	18	26	G	33	JA 40	JA 38	G	38	36	G	G	G	23	20	EB 16	EB 16	EB 15	EB 15
22	EB 16	EB 16	EB 16	EB 16	EB 16	EB 15	20	29	32	36	G	41	G	G	G	G	G	G	JA 20	EB 16	EB 15	EB 15	EB 16	EB 16
23	EB 16	22	EB 16	EB 16	EB 16	EB 16	21	28	32	34	38	38	JA 43	JA 48	G	G	JA 33	JA 29	JA 24	22	EB 15	EB 16	EB 16	EB 16
24	EB 16	EB 16	EB 16	EB 16	EB 16	EB 15	21	G	31	33	38	JA 40	G 29	G	G	G	JA 36	JA 30	EB 16	20	20	EB 16	EB 15	EB 16
25	EB 16	EB 15	EB 16	EB 15	EB 16	EB 15	22	28	32	G	36	36	35	41	38	G	30	G	EB 16	BJ 22	EB 16	22	EB 16	EB 16
26	EB 16	JA 31	20	21	23	EB 15	19	G	G	37	G	39	G	G	35	G	G	G	EB 14	20	EB 15	EB 16	EB 16	EB 16
27	EB 16	EB 15	EB 15	EB 16	EB 14	EB 15	20	28	G	35	JA 39	JA 36	G	37	G	G	G	24	EB 16	BJ 21	JA 31	AE 16	EB 16	EB 16
28	EB 16	EB 17	EB 16	EB 17	EB 16	EB 14	19	G	G	G	G	G	41	G	G	36	30	JA 25	24	EB 16	EB 16	EB 16	EB 16	19
29	EB 15	EB 15	EB 15	EB 16	EB 15	EB 15	22	27	G	36	38	41	40	40	G	35	31	29	JA 28	20	EB 16	EB 16	EB 17	20
30	JA 24	EB 16	JA 23	JA 31	23	EB 16	21	27	31	JA 36	JA 36	40	39	G 29	G	35	G	JA 31	JA 23	JA 26	20	EB 16	EB 16	EB 16
31	EB 15	EB 15	EB 15	EB 14	EB 15	EB 16	23	30	32	G	G	38	G	38	G	G	G	G	EB 13	EB 15	EB 16	EB 15	EB 15	EB 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31
MED	EB 16	EB 16	EB 16	EB 16	EB 16	EB 16	18	24	28	33	33	37	G	G	G	G	26	22	22	20	EB 16	EB 16	EB 16	EB 16
U Q	JA 20	21	20	JA 22	22	16	20	26	31	JA 36	38	38	38	37	35	35	JA 31	JA 29	JA 24	JA 23	JA 23	22	JA 24	JA 24
L Q	EB 16	EB 16	EB 16	EB 16	EB 15	EB 15	EB 16	G	G	G	G	G	G	G	G	G	G	G	EB 16	EB 16	EB 15	EB 16	EB 16	EB 16

MAR. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

MAR. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

MAR. 2019 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	341	343	334	323	362	320	361	351	377	396	333	369	352	367	379	374	343	361	343	359	334	316	336	328
2	332	358	307	331	326	339	345	387	371	387	342	366	352	366	369	360	V 324	356	361	371	357	299	336	282
3	318	319	333	332	353	330	345	383	352	377	353	352	342	347	333	384	375	404	363	352	328	327	306	287
4	315	319	329	327	360	338	339	388	380	369	366	372	350	331	363	362	374	370	376	342	312	338	354	337
5	321	365	332	340	357	331	370	400	362	384	349	334	362	381	349	359	370	367	353	355	342	358	312	320
6	340	334	290	303	353	353	351	394	391	342	349	343	378	359	366	373	357	365	368	352	323	358	320	320
7	315	319	344	340	350 F	341 F	357	393	381	385	379	322	363	374	349	336	340	364	377	343	341	345	326	316
8	330	313	316	F	F	F	377	379	377	371	321	361	350	362	393	345	383	338	361	341	347	352	330	321
9	330	F	F	F	337	F	379	407	378	381	349	357	373	354	344	348	349	367	385	364	322	332	337	326
10	301	316	F	294	F	304	367	392	386	384	360	326	358	327	350	366	353	366	353	351	327	332	316	324
11	325	348	342	339	384	360	355	392	387	342	359	355	363	364	352	355	381	385	369	357	325	328	309	317
12	322	342	345	308	334	337	380	387	389	388	364	342	364	353	352	344	356	342	355	339	299	328	354	344
13	324	332	324	323	339	313	368	391	382	355	321	375	344	355	321	373	374	353	376	358	325	330	324	299
14	321	331	332	367	345	329	365	398	376	385	336	368	365	341	353	354	379	378	362	328	325	351	310	313
15	320	319	326	350	366	325	378	397	376	365	343	352	330	352	362	363	350	369	374	335	330	338	311	303
16	306	320	310	326	349	333	381	393	390	378	346	323	337	341	352	353	353	357	366	376	321	339	325	300
17	326	325	310	310	315	311	370	367	359	364	311	352	340	355	344	359	356	352	355	370	292	313	320	306
18	333	328	335	307	326	312	350	318	349	319	338	349	C	358	374	356	369	366	358	359	321	315	333	326
19	330	339	330	333	334	355	370	385	378	354	341	346	354	387	354	368	363	382	385	352	346	339	327	302
20	327	324	333	361	375	380	370	400	360	362	317	364	361	370	349	368	367	354	363	371	349	314	307	308
21	330	306	308	334	376	331	388	376	373	335	333	340	331	355	348	353	360	359	364	354	340	331	325	312
22	318	316	332	326	363	342	397	389	374	373	324	359	331	358	350	356	362	360	352	343	304	324	319	318
23	352	333	328	323	377	322	413	365	378	341	336	354	345	340	336	338	340	351	356	333	324	335	342	F
24	328	318	316	324	312	354	376	385	362	336	343	361	346	338	367	353	341	372	352	349	340	343	334	325
25	309	322	F	306	331	310	380	362	382	377	320	332	352	351	361	337	344	355	365	382	344	327	F	F
26	F	F	F	F	F	F	409	386	360	348	356	337	339	350	361	357	366	354	364	355	374	335	326	318
27	327	327	336	310	340	322	375	390	361	345	347	326	331	357	363	351	343	371	374	351	320	301	292	299
28	F	350	367	375	334	314	371	386	363	341	357	331	351	339	354	338	346	327	335	339	367	349	314	311
29	308	321	320	362	307	346	375	367	340	353	342	368	351	347	361	348	345	357	369	354	367	330	327	310
30	330	345	311	314	F	F	410	396	372	369	342	341	354	358	352	345	363	369	357	364	369	335	297	313
31	291	315	351	342	345	334	374	386	372	366	361	338	355	339	333	351	345	363	360	355	345	327	318	323
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	27	28	27	27	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	30	29
MED	325	325	330	326	345	331	371	387	376	366	343	352	352	355	352	355	356	363	363	354	330	332	324	316
U Q	330	340	335	340	362	342	380	393	381	381	356	361	361	362	363	363	369	369	369	359	346	339	333	324
L Q	316	319	316	312	334	320	361	379	362	345	333	337	342	341	349	348	345	354	355	343	322	327	312	304

MAR. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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									L	U L 413	U L 408	U L 400	421	U L 379	U L 389	L								
2									L	L	U L 412	431	414	L	L	L	L							
3										A	L	U L 419	U L 397	L	L	L	L							
4									L	L	U L 398	U L 401	U L 422	426	U L 396	L	L							
5									L	U L 377	U L 382	431	A	U L 390	L	L	L	L						
6									L	U L 388	U L 412	U L 423	U L 456	U L 427	L	L	L							
7										L	L	U L 417	433	L	L	U L 395	L							
8										L	U L 400	U L 420	U L 404	U L 426	L			L					
9									L	L	393	438	420	U L 404	L	L	L							
10									L	L	U L 422	413	411	A	U L 372	L								
11										L	L	U L 435	413	U L 411	U L 390	U L 405	L							
12										L	U L 427	U L 402	U L 426	U L 404	U L 396	L								
13										L	U L 411	425	398	408	U L 389	L	L							
14									L	L	U L 435	U L 417	U L 408	U L 434	U L 407	L	L							
15									L	U L 380	U L 415	388	401	394	U L 434	A	L							
16									A	U L 411	U L 410	415	441	380	403	U L 391	L	L						
17									L	396	407		409	L	L	L	L							
18								U L 362	U L 381	U L 381	402	401	C	U L 396	A	L	L							
19									L	U L 390	U L 403	U L 450	398	411	U L 404	U L 382	L							
20									L	L	409	U L 395	402	418	U L 395	L								
21								L	L	427	388	401	U L 425	381	402	L	L							
22									L	U L 421	U L 412	U L 417	U L 418	408	U L 395	L	L							
23									L	U L 396	408	398	U L 432	U L 403	400	U L 387	L							
24									L	U L 404	U L 399	U L 421	417	419	U L 418	L	U L 372							
25								L	L	L	401	412	433	A	424	U L 406	U L 390	L						
26									L	U L 398	408	416	U L 419	U L 416	404	U L 406	L	L						
27									L	L	411	408	400	400	404	U L 365	U L 385	L						
28								L		410	U L 423	U L 388	A	L	U L 437	U L 427	L							
29									U L 391	400	U L 417	A	392	U L 413	U L 405	U L 390	L	L						
30										410	424	U L 423	U L 407	426	U L 435	U L 398	L							
31								L	L	387	428	U L 423	405	416	U L 395	U L 372	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	2	17	28	29	28	24	22	12	3							
MED								U L 362	U L 386	U L 398	U L 410	U L 417	414	410	U L 402	U L 393	U L 385							
U Q										U L 410	U L 416	423	U L 424	418	U L 407	U L 406	U L 390							
L Q										U L 388	402	401	403	398	U L 395	U L 384	U L 372							

MAR. 2019 M(3000)F1 (0.01)

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MAR. 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									236	220	290	248	266	246	234	238								
2									244	226	256	248	266	238	240	242	234							
3										244	246	270	268	248	260	240	240							
4									218	228	240	234	270	290	246	256	240							
5									238	236	274	290	240	220	248	256	248	232						
6									234	278	254	280	242	240	258	250	254							
7										240	248	306	240	244	262	272	258							
8										246	356	242	250	256	238			272						
9									240	240	288	254	250	248	278	266	272							
10									238	228	252	300	262	262	258	240								
11										272	266	272	248	246	266	254	236							
12										240	264	266	256	270	270	264								
13										266	300	236	254	272	282	246	246							
14									240	228	330	246	258	276	240	240	240							
15									246	260	276	272	272	256	250	256	260							
16									220	258	272	314	262	256	248	266	256	258						
17									266	256	326		244	254	254	260	260							
18								310	288	330	298	260	C	240	232	258	242							
19									252	274	280	274	252	230	264	246	242							
20									262	254	328	246	244	264	264	260								
21								244	246	312	294	264	264	256	260	256	248							
22									252	256	316	262	274	272	260	254	254							
23									250	304	318	264	276	292	268	272	280							
24									268	306	302	260	278	278	246	258	268							
25								252	238	246	340	306	264	256	254	270	262	266						
26									252	292	268	318	288	272	258	254	274	252						
27									260	272	272	302	282	246	246	264	272	234						
28								252		294	264	294	272	266	260	268	262							
29									290	274	266	254	282	282	282	270	286	266						
30										262	278	294	280	262	268	260	254							
31								246	260	252	266	272	248	270	280	274	266							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								5	23	31	31	30	30	31	31	30	26	7						
MED								252	246	256	276	268	263	256	258	257	255	258						
U Q								281	260	274	302	294	272	272	266	266	266	266						
L Q								245	238	240	264	254	250	246	246	250	242	234						

MAR. 2019 h'F2 (KM)

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MAR. 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	214	E B 220	230	E B 248	210	E B 254	216	204	204	194	186	176	196	194	190	184	202	214	194	200	216	226	E A 232	E B 244
2	230	214	E B 250	E B 250	230	230	218	210	192	190	184	184	180	196	202	202	198	218	200	190	198	E B 248	E A 306	E B 288
3	E B 302	E B 264	E B 236	E B 238	216	E B 242	206	206	206	A	194	176	176	196	200	210	200	204	194	208	216	232	E B 268	E B 282
4	E B 250	E B 238	E B 228	E B 230	E B 230	E B 234	216	208	180	164	178	190	186	176	168	202	188	204	196	206	E B 236	228	210	224
5	E A 268	200	E B 246	228	216	220	206	200	186	174	186	190	A	192	194	184	192	194	208	206	214	196	E B 250	E B 258
6	E B 234	E B 238	E B 282	E B 260	216	204	204	198	196	184	182	168	164	164	200	192	206	216	204	192	E A 250	210	224	248
7	E B 262	E B 262	E B 234	224	214	214	220	202	202	204	200	190	182	194	188	194	200	218	204	196	204	E B 206	228	E B 254
8	E B 246	E B 254	E B 254	E B 280	240	194	192	198	196	192	198	182	182	180	208	190	216	224	208	200	204	206	222	E B 244
9	E B 244	E B 234	E B 246	230	206	190	202	202	190	186	188	178	170	170	188	204	212	218	196	188	228	228	218	E A 272
10	E B 262	E B 248	E B 242	E B 242	210	228	212	202	194	194	182	180	174	A	228	196	220	218	200	200	226	224	228	E B 242
11	E B 238	216	222	226	202	E B 204	196	196	210	194	190	190	178	178	192	192	196	200	192	202	E A 246	E B 248	E B 254	E A 276
12	E B 244	E B 236	232	240	E B 228	E B 228	200	198	198	186	186	182	174	174	188	190	204	210	214	202	248	232	224	204
13	E B 240	E B 252	E B 238	E B 230	220	E B 252	210	200	210	196	194	188	188	188	186	196	204	204	194	200	E B 214	226	E B 236	E B 256
14	E B 256	E B 246	E B 232	208	206	E B 254	200	208	192	180	196	198	188	170	186	190	192	218	206	186	202	208	E B 268	E B 278
15	E B 258	E B 264	E B 258	214	208	E B 258	208	196	204	198	186	198	190	208	188	A	196	208	198	194	232	218	E B 246	E B 276
16	E B 270	E B 258	E B 260	E B 250	210	E B 272	202	198	A	188	188	174	174	206	192	202	202	206	202	194	202	226	E B 252	E B 284
17	E B 252	E B 232	E B 264	E B 264	E B 264	E B 252	212	208	208	202	196	230	202	198	190	184	198	216	210	198	E B 230	E B 246	218	E B 236
18	E B 232	E B 242	E A 256	E B 262	E B 238	E B 272	228	220	214	210	200	198	C	182	A	188	188	210	208	204	E B 232	252	218	E A 258
19	226	E B 222	228	232	E A 242	E B 244	212	206	202	198	194	184	188	194	182	178	198	218	202	198	206	214	E B 234	E B 268
20	E B 248	E B 250	E B 242	218	206	218	192	206	208	200	198	198	196	188	182	186	210	222	214	196	188	214	E A 302	E B 266
21	E B 252	E B 262	E B 244	E B 230	206	E B 262	204	208	188	184	182	196	184	218	212	182	206	206	208	198	196	220	E B 230	E B 260
22	E B 260	E B 262	E B 248	E B 244	208	214	198	210	210	196	190	190	184	184	184	196	204	208	214	206	E B 216	E B 240	E B 230	E B 242
23	222	212	E B 252	252	208	E B 242	186	192	202	194	192	192	198	190	190	190	208	214	214	202	220	220	E B 212	E B 242
24	E B 228	E B 228	E B 244	E B 244	216	208	202	200	198	190	188	188	188	186	188	192	192	222	202	200	210	210	222	E B 240
25	E B 234	E B 260	E B 238	E B 238	216	222	212	204	198	190	188	188	170	A	194	194	162	194	206	194	184	E B 226	E B 272	E B 266
26	E B 250	E B 248	E B 236	E B 236	204	212	192	202	188	208	192	180	166	178	188	188	204	202	204	194	192	206	E B 218	E B 232
27	E B 234	E B 244	230	216	196	228	204	206	196	196	196	186	182	194	194	200	196	198	200	200	E A 238	E B 242	E B 264	E B 258
28	E B 268	216	210	218	230	E B 266	212	212	206	194	180	186	A	214	188	194	202	210	230	214	200	188	E B 246	E B 248
29	E B 264	E B 260	E B 242	208	E B 238	E B 232	208	212	206	208	198	A	220	198	222	208	216	206	218	202	202	202	E B 228	236
30	E A 248	224	E B 236	E A 280	224	220	198	200	202	190	190	170	180	186	190	198	204	228	210	206	200	218	E B 276	E B 276
31	E B 272	E B 248	222	222	E B 224	E B 256	214	200	192	188	180	194	186	186	192	186	206	206	208	204	208	E B 230	E B 252	E B 258
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	30	30	31	30	28	29	30	30	31	31	31	31	31	31	31	31
MED	E B 248	E B 244	E B 242	E B 236	212	E B 230	206	202	200	194	190	188	183	188	190	192	202	210	204	200	208	217	E B 232	E B 258
U Q	E B 262	E B 258	E B 250	E B 250	E 230	E B 254	212	208	206	198	196	192	188	196	194	198	206	218	210	204	E 230	E B 232	E B 254	E B 272
L Q	234	224	232	224	208	214	200	200	192	188	186	180	175	179	188	188	196	204	200	194	202	210	222	E B 242

MAR. 2019 h'F (KM)

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MAR. 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	126	A	116	114	A	112	112	118	116	118	118						
2							B	118	122	116	114	114	114	118	114	A	114	B						
3							B	112	112	A	108	A	108	A	A	A	110	A						
4							B	110	114	108	108	114	114	116	116	114	A	112						
5							B	114	110	114	114	106	108	106	102	112	112	B						
6							B	114	108	108	110	110	110	106	108	108	108							
7							B	112	112	112	A	112	120	114	110	114	114	116						
8							B	118	110	106	108	110	110	110	110	110	110	110						
9							B	122	112	112	A	110	108	116	118	118	114	114						
10							B	124	112	A	A	110	108	118	118	112	116	B						
11							B	114	118	A	A	A	114	A	A	A	A	B						
12								114	106	110	110	A	110	112	100	110	110	110						
13							B	122	108	108	108	108	108	108	108	108	108	108						
14							B	108	114	110	112	112	114	A	108	108	110	110						
15							B	118	122	108	108	108	108	108	110	A	A	A						
16							B	128	116	112	110	A	A	110	A	A	A	112						
17							B	114	114	A	112	A	A	A	A	112	112	108						
18							B	108	108	108	108	A	C	108	108	108	108	108						
19							B	126	108	110	108	108	114	118	112	112	112	114						
20							B	118	122	122	112	116	116	116	116	A	A	A	A					
21							B	112	110	A	A	A	110	108	110	110	112	114						
22							B	114	108	108	116	A	116	114	112	114	114	118						
23							B	110	112	110	110	A	A	A	110	110	A	A						
24							B	120	114	A	A	A	110	110	110	110	A	110						
25							B	118	112	108	106	A	A	120	116	116	118	118						
26							B	116	112	108	110	110	110	110	106	110	110	110						
27							B	112	114	114	A	A	114	114	114	114	114	116						
28							B	116	118	110	108	106	108	112	112	112	114	A						
29							B	112	112	106	106	108	108	114	114	104	108	108	A					
30							B	108	108	A	A	110	110	110	110	110	112	A						
31							B	110	108	108	108	108	108	108	108	110	110	112						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								31	30	24	23	18	26	26	27	25	24	20						
MED								114	112	110	110	110	110	112	110	110	112	112						
U Q								118	114	112	112	112	114	116	114	114	114	115						
L Q								112	108	108	108	108	108	108	108	110	110	110						

MAR. 2019 h'E (KM)

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	90	98	96	94	92	B	B	G	100	G	G	90	G	G	G	G	124	G	102	B	96	92	90	86
2	94	94	B	B	94	104	98	G	G	G	G	G	G	G	G	100	G	102	102	102	B	92	92	88
3	88	84	B	84	B	B	B	G	G	94	94	94	G	90	88	94	G	100	98	96	96	92	90	90
4	94	94	B	94	96	96	90	124	136	G	G	134	G	G	G	G	100	G	B	100	100	92	92	92
5	90	90	90	B	B	B	B	154	G	G	G	146	164	136	G	G	G	100	B	100	100	B	96	96
6	B	90	90	B	B	B	B	154	G	G	G	G	G	G	G	G	G	102	92	88	88	88	86	86
7	96	B	B	B	B	B	B	154	146	G	100	G	G	G	G	142	136	124	B	B	B	B	B	B
8	B	B	B	90	B	B	B	136	138	G	120	G	G	G	G	G	160	160	B	B	B	B	B	B
9	B	B	B	B	B	B	B	158	G	G	102	G	G	G	G	164	140	112	104	100	100	B	90	90
10	90	90	B	88	88	B	88	G	112	102	100	G	G	150	152	G	168	94	94	92	90	94	B	92
11	B	B	94	90	90	B	B	150	G	104	102	100	G	96	96	96	96	94	92	94	92	92	92	92
12	B	B	B	B	B	B	B	142	G	126	G	104	G	G	G	G	G	G	80	B	B	88	B	94
13	B	B	94	B	B	88	B	122	128	128	G	G	G	G	G	G	G	G	B	B	B	B	98	B
14	B	B	B	B	B	B	B	138	156	G	156	144	142	82	G	118	140	G	B	B	B	B	B	B
15	B	B	B	B	B	B	140	90	92	126	108	G	G	G	G	82	80	80	B	90	B	B	B	B
16	B	B	B	B	B	B	136	G	120	116	110	102	102	132	88	86	94	130	B	94	92	B	B	90
17	86	86	B	B	84	B	B	G	G	100	G	94	94	98	98	G	G	G	90	90	90	90	B	98
18	94	92	90	86	86	B	B	134	G	G	112	100	C	G	154	G	G	G	98	98	B	96	B	96
19	B	B	B	90	84	86	140	138	136	122	G	G	146	G	G	G	G	G	B	B	B	92	B	B
20	92	B	B	B	B	B	B	132	138	130	G	114	G	G	G	104	108	104	102	B	B	102	94	B
21	B	B	92	B	B	B	122	148	G	98	100	102	G	146	140	G	G	G	88	88	B	B	B	B
22	B	B	B	B	B	B	128	154	142	136	G	102	G	G	G	G	G	G	100	B	B	B	B	B
23	B	96	B	B	B	B	130	124	132	118	110	100	98	98	G	G	98	98	98	94	B	B	B	B
24	B	B	B	B	B	B	138	G	150	102	94	94	94	G	G	G	86	94	B	88	88	B	B	B
25	B	B	B	B	B	B	140	148	146	G	110	102	102	150	148	G	126	G	B	102	B	96	B	B
26	B	100	96	96	94	B	138	G	G	154	G	126	G	G	128	G	G	G	B	86	B	B	B	B
27	B	B	B	B	B	B	122	132	G	122	104	104	G	154	G	G	G	136	B	102	92	B	B	B
28	B	B	B	B	B	B	120	G	G	G	G	G	142	G	G	168	160	88	86	B	B	B	B	114
29	B	B	B	B	B	B	136	146	G	154	154	144	132	138	G	154	130	112	106	78	B	B	B	122
30	104	B	106	94	92	B	138	132	130	100	98	120	114	104	G	122	G	104	114	112	86	B	B	B
31	B	B	B	B	B	B	130	128	144	G	G	132	G	126	G	G	G	G	B	B	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	11	9	10	10	4	17	22	17	18	17	21	11	14	9	12	16	18	17	20	13	13	10	15
MED	92	92	94	90	91	92	130	138	136	120	104	102	114	129	128	111	125	102	98	94	92	92	92	92
U Q	94	96	96	94	94	100	138	150	145	128	111	129	142	146	150	148	140	112	102	100	98	95	94	96
L Q	90	90	90	88	86	87	121	132	124	102	100	100	98	98	92	95	97	94	91	89	89	91	90	90

MAR. 2019 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	F3	F1	F2	F2	F1				L2			L2					C1		F1		F3	F3	F6	F3
2	F1	F1			F2	F1	F1									L2		L2	F1	F1		F3	F4	F2
3	F5	F2		F2						L3	L2	L2		L2	L2	L2		L3	F1	F4	F1	F2	F2	F2
4	F2	F2		F1	F1	F1	L1	C2	C1			C1					L2			F1	F2	F2	F2	F2
5	F3	F1	F1					H1				H1	H1	CL12				L1		F1	F1		F2	F2
6		F1	F2					H2										L3	F4	F2	F2	F2	F4	F3
7	F1							H2	H2		L1					H1	H2	C1						
8				F2				H2	H1		C1						H2	H2						
9								H2			L1					H1	H2	C3	F3	F2	F1		F5	F3
10	F2	F2		F2	F2		F1		C2	L2	L2			H1	H1		H1	L3	F1	F3	F4	F2		F1
11			F1	F1	F1			H2		L2	L2	L1		L1	L2	L2	L2	L3	F3	F4	F5	F3	F2	F5
12								H1		C1		L2							F1			F1		F1
13			F2			F2		C2	C1	C1													F2	
14								H2	H1		H2	H1	H1	L2		C1	H2							
15							H2	L2	L2	CL22	C1					L3	L2	L3		F1				
16							H2		C2	C1	C1	L2	L1	CL12	L2	L2	L3	H1		F3	F3			F1
17	F2	F1			F1					L2		L2	L2	L1	L2				F3	F2	F2	F1		F2
18	F2	F4	F2	F2	F2			C2			C1	L3			H1				F2	F3		F1		F4
19				F2	F4	F2	H2	H2	H2	C1			H1									F1		
20	F2							C2	H2	C1		C1				L2	L2	L4	L3			F3	F4	
21			F1				C2	H2		L1	L2	L1		H1	H1				F1	F1				
22							C3	H2	H1	H1		L2							F1					
23		F1					C2	C2	C1	C1	C1	L2	L2	L2			L2	L2	F3	F1				
24							H2		H1	L1	L2	L1	L1				L1	L1		F1	F1			
25							H3	H3	H1		C1	L1	L1	H1	H1		C1			F3		F1		
26		F2	F2	F2	F2		H3			H1		C1			CL12					F1				
27							H2	H2		C1	L1	L1		H1				H1		F3	F3			
28							C2						H1			H1	H2	L2	F1					F1
29							H2	H2		H1	H1	H1	H2	H2		H1	H2	C3	F3	F1				F1
30	F3		F3	F4	F3		H2	H2	C1	L1	L1	C1	C1	L1		C1		L2	F2	F4	F1			
31							C3	CL22	H2			H1		C1										
	00	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																								

MAR. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

MAR. 2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	30	29	29	30	32	26	29	52	63	59	52	61	63	75	68	57	52	52	63	47	41	41	34	30
2	33	32	26	31	27	23	25	50	48	56	57	57	70	65	70	58	52	51	68	60	38	24	25	26
3	26	26	28	28	29	24	24	45	58	56	58	62	68	89	78	64	58	48	48	38	34	34	32	33
4	30	31	28	28	30	25	24	45	54	52	56	56	58	60	76	69	59	51	48	47	39	39	41	30
5	25	27	24	27	30	22	22	42	50	52	59	54	75	76	64	57	58	51	49	54	48	36	28	29
6	F	32	29	29	31	24	22	46	47	58	53	53	68	66	60	62	54	50	57	55	36	35	34	31
7	30	30	29	30	32	24	24	46	53	50	52	58	74	61	60	57	50	54	56	55	41	30	32	29
8	29	29	28	28	31	28	18	42	46	51	48	57	66	71	62	54	53	52	66	62	44	33	27	28
9	30	32	F	F	F	F	F	47	50	49	53	56	68	71	64	60	62	61	60	48	32	33	32	29
10	30	30	30	30	32	28	24	49	49	49	54	56	68	86	92	86	70	63	63	66	52	37	39	40
11	46	46	F	33	34	24	24	44	56	55	55	58	67	72	70	68	62	55	49	40	33	28	31	30
12	31	F	31	31	30	26	25	41	49	53	52	51	60	68	66	66	58	C	59	58	42	42	41	37
13	30	31	31	32	30	29	29	47	51	48	C	C	C	C	65	73	55	50	50	49	38	33	33	30
14	31	33	33	30	29	26	26	44	44	52	64	51	66	66	68	C	C	C	54	55	35	30	29	28
15	30	30	30	32	34	C	C	42	49	51	59	C	C	C	C	C	62	68	68	38	33	31	32	31
16	31	31	31	30	28	27	27	40	46	51	51	52	64	78	82	69	64	60	59	51	49	31	31	31
17	F	33	30	29	29	28	30	45	48	55	58	82	88	72	78	68	60	60	65	57	50	43	42	36
18	34	34	29	29	29	26	28	46	57	60	66	60	75	86	86	54	52	53	53	52	46	30	31	30
19	29	31	28	27	26	23	24	42	49	58	60	64	80	84	61	61	62	56	48	43	39	33	31	31
20	32	32	30	30	29	24	24	42	50	58	54	67	71	68	70	64	57	54	62	66	56	30	28	28
21	31	29	30	29	31	23	28	42	51	50	56	62	83	85	74	60	55	49	53	64	42	27	29	31
22	30	30	30	28	30	22	26	45	50	55	54	59	72	77	77	69	60	53	53	60	50	36	39	36
23	36	32	29	28	28	24	27	43	48	56	56	56	57	62	72	53	53	53	55	53	45	38	35	33
24	F	F	F	F	F	F	26	44	46	51	55	50	63	72	80	57	52	54	54	54	50	38	28	28
25	31	32	30	30	29	26	29	44	52	50	48	49	61	78	81	62	55	62	65	59	41	28	29	29
26	F	F	F	F	27	22	26	43	46	49	54	54	59	72	70	62	51	55	62	60	38	31	31	31
27	F	F	32	31	24	24	26	51	50	52	52	55	62	75	73	51	54	58	58	58	48	36	36	37
28	37	38	34	30	26	26	28	46	50	52	52	53	62	76	70	52	55	56	60	70	62	39	29	30
29	30	31	30	30	20	20	27	47	51	61	49	57	57	64	58	58	56	68	66	58	50	34	34	34
30	31	32	29	29	30	26	28	41	47	56	55	57	66	74	65	68	62	61	56	56	42	26	26	28
31	30	32	30	28	25	23	26	46	54	57	61	53	70	69	59	56	55	58	54	45	44	37	34	33
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	27	28	29	28	29	31	31	31	30	29	29	29	30	29	30	29	31	31	31	31	31	31
MED	30	31	30	30	29	24	26	45	50	52	54	56	67	72	70	61	56	54	57	55	42	33	32	30
U Q	31	32	30	30	31	26	28	46	52	56	58	60	72	78	77	68	60	60	63	60	49	37	34	33
L Q	30	30	29	28	28	23	24	42	48	51	52	53	62	67	64	57	53	52	53	48	38	30	29	29

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	L		424	420	408	UL 428	UL 428	L	L						
2									L	L	L	UL 420	UL 416	UL 428	UL 428	L	L							
3										L	UL 432	428	436	A	416	UL 400	L							
4											UL 420	424	UL 440	UL 440	416	UL 416	L	L						
5										L	424	UL 448	420	UL 436	UL 424	L	L	L						
6										L	L	440	424	440	UL 440	408	L	L						
7										L	UL 428	432	420	436	436	UL 420	L							
8										L	L	428	UL 428	432	L	L	L	L						
9									L		UL 420	428	444	A	A	UL 424	A	A	A					
10										L	UL 436	448	UL 464	436	UL 436	UL 416	L	L						
11									L	L	L	432	428	432	428	L	UL 392	L						
12								L	L	L	UL 424	UL 432	432	424	UL 424	UL 420	L	C						
13										L	C	C	C	C	428	412	L	L						
14										UL 404	UL 428	UL 432	440	436		C	C	C						
15										L	424	C	C	C	C	C	L	L						
16									L	L	L	428	428	UL 428	UL 436	L	L	L	L					
17										UL 420	UL 428	428	428	UL 440	UL 440	UL 424	A	A						
18										L	UL 436	432	440	440	UL 424	L	L	L						
19									L	L	424	428	432	448	436	432	L	L						
20									L	L	UL 420	436	440	436	UL 428	UL 428	L							
21										L	436	UL 432	432	UL 440	432	UL 432	UL 416	L						
22										L	432	436	436	440	444	416	L	L						
23										L	428	UL 436	440	440	UL 432	UL 440	UL 404	A						
24										UL 416	428	440	440	428	408	424	L	L						
25									L	L	UL 428	432	432	420	UL 428	420	UL 412	L						
26									L	L	420	436	428	428	424	UL 408	L	L						
27										L	UL 440	432	432	424	420	UL 424	L	L						
28										L	UL 420	424	420	432	UL 432	L	L	L						
29										UL 412	420	424	432	432	UL 420	416	UL 404	L						
30										L	424	432	428	UL 428	A	A	A	A						
31									L	UL 408	420	436	UL 432	432	432	420	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										5	24	29	29	27	26	21	5							
MED										UL 412	UL 426	432	432	432	UL 428	UL 420	UL 404							
U Q										UL 418	UL 430	436	440	440	UL 436	UL 426	UL 414							
L Q										UL 406	UL 420	428	428	428	424	416	UL 398							

MAR. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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								B	U R 220	U R 268	U R 288	U R 312	320	U R 336	U R 316	U A 284	U R 272	U R 232	B				
2								B	U R 228	U R 272	U R 300	A	A	300	A	U R 284	U R 264	A	B				
3								B	U R 232	U R 272	U R 300	U R 320	U R 344	U A 320	U R 312	296	A	U R 220	B				
4								B	U R 232	U R 276	U R 308	U R 328	U A 352	U R 328	A	U R 308	U R 292	A	B				
5								B	U R 248	U R 292	R	U R 332	U R 332	R	U R 312	U R 304	U R 276	U R 228	B				
6								B	U R 240	A	A	A	U R 340	R	A	A	U R 284	U R 248	B				
7								B	236	U R 296	A	U R 320	A	R	U A 312	U R 312	U R 288	224	B				
8								B	A	A	A	A	A	R	U R	A	U R 280	U R 236	B				
9								B	A	A	A	A	A	U R 336	320	312	A	A	B				
10								B	U R 248	U R 292	A	U R 340	A	A 340	320	A	A 320	A	B				
11								B	U R 256	U R 300	A	A	A	A	U R 344	U R 316	A	U R 236	B				
12								B	U R 252	U A 292	A	A	A	A	A	U R 320	A	C	B				
13								B	U R 256	U R 296	C	C	C	C	U R 332	U R 320	R	R	B				
14								B	U R 224	U R 288	U R 308	U R 336	U R 340	U R 360	344	C	C	C	B 344				
15								B	B	284	U R 320	C	C	C	C	C	A	A	B				
16								B	U R 260	292	A	A	U R 332	U A 328	U R 320	U A 300	A	U R 252	U R 184				
17								B		A	A	A	A	A	A	A	A	A	B				
18								B	U R 248	U A 276	A	A	A	A	A	A	A	A	B				
19								U R 196	U R 268	U A 280	A	A	U R 352	340	U R 324	U R 308	U R 276	U R 228	B				
20							B	U R 204	U R 256	U A 284	U A 304	A	U R 352	336	U R 328	U R 316	A	A	B				
21							B	U R 212	U A 276	U R 308	U R 336	U R 332	348	U A 340	U R 324	312	U R 292	U R 244	U R 196				
22							B	U R 216	U R 268	A	U R 316	U R 316	356	340	336	U R 316	U R 284	U R 256	U R 204				
23							B	A	U R 244	U A 292	U A 316	A	A	A	A	U R 332	U R 296	A	B				
24							B	U R 232	U R 264	U R 300	U R 332	336	A	A	R	U R 316	U R 296	U R 244	B				
25							B	U A 176	U A 256	U R 284	U R 316	332	A	336	328	U R 320	U R 296	U R 240	B				
26								B	264	296	324	A	A	U R 340	U R 348	U R 316	U R 292	U R 244	B				
27							B	U R 216	U R 272	A	A	A	A	A	A	U R 316	U R 288	U R 248	U R 192				
28							B	U A 192	U A 252	U R 288	U A 312	340	A	A	336	U R 320	292	A	U R 192				
29							B	U A 192	U A 248	284	U R 312	U A 340	U A 344	336	320	304	280	248	U A 176				
30								B	U A 248	292	320	332	U A 340	336	A	A	U A 284	A	B				
31							B	U A 204	U R 280	A	U A 324	A	A	A	A	U R 312	A	240	U R 176				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	27	24	17	14	13	16	18	23	19	17	8					
MED								U R 204	U R 252	U R 290	U R 316	U R 332	U R 344	336	U R 324	U R 312	U R 288	U R 240	U R 192					
U Q								U R 216	U R 264	U R 294	U R 322	336	352	340	336	U R 316	U R 292	U R 248	U R 200					
L Q								U A 192	U R 240	U R 282	U R 306	U R 320	U 336	U 332	U R 320	U 304	U R 280	U R 230	U R 180					

MAR. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	J A 24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	G	38	G	G	33	G	G	21	23	20	J A 20	22	J A 37
2	J A 40	24	20	J A 22	21	J A 26	22	18	G	G	G	33	37	34	35	G	G	25	E B 16	E B 16	E B 16	E B 17	J A 26	J A 26
3	J A 26	J A 28	J A 36	J A 25	21	E B 16	21	19	G	G	G	G	G	40	G	32	J A 31	G	E B 16	E B 16	E B 15	18	J A 28	23
4	J A 36	E B 16	E B 16	J A 24	J A 33	J A 27	J A 28	E B 16	G	G	G	G	G	G	37	G	G	J A 29	E B 16	E B 16	19	22	22	22
5	J A 24	E B 16	20	20	18	E B 16	E B 16	E B 15	G	G	G	G	G	G	G	G	G	G	E B 16	E B 16	E B 16	18	E B 16	E B 16
6	E B 15	20	E B 16	E B 16	E B 16	20	20	20	G	31	33	J A 40	G	G	36	34	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
7	E B 16	E B 16	J A 22	E B 16	E B 16	E B 16	E B 16	21	28	G	33	G	37	G	37	G	G	25	20	22	E B 16	E B 16	E B 16	E B 16
8	J A 22	23	E B 16	E B 16	E B 16	22	21	21	25	32	34	35	J A 40	G	G	33	G	G	24	20	22	J A 24	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	28	32	J A 42	36	36	40	40	37	J A 43	J A 44	J A 54	J A 30	E B 16	E B 17	E B 15	23
10	E B 16	21	J A 30	J A 24	J A 24	J A 22	J A 22	21	G	G	35	G	J A 42	36	39	33	G 32	J A 31	J A 26	E B 16	21	J A 23	21	E B 16
11	E B 16	21	E B 17	J A 26	J A 26	J A 26	20	24	G	G	35	36	J A 44	J A 40	G	G	J A 34	G	E B 14	E B 16	E B 15	E B 16	E B 15	J A 27
12	J A 26	J A 34	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	36	J A 41	J A 45	J A 44	J A 40	J A 42	G	J A 44	C	22	22	E B 16	22	E B 16	E B 19
13	E B 16	J A 30	E B 16	E B 16	E B 16	E B 16	E B 16	22	G	G	C	C	C	C	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
14	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	19	22	G	G	G	G	39	G	39	C	C	C	E B 26	E B 25	E B 25	E B 26	E B 26	E B 26
15	E B 26	E B 26	E B 26	E B 27	E B 27	C	C	E B 26	J A 34	J A 36	G	C	C	C	C	C	32	J A 38	J A 28	J A 28	24	J A 30	E B 16	E B 16
16	E B 16	E B 16	23	E B 16	E B 16	E B 16	E B 16	23	G	34	33	J A 40	G	40	37	35	J A 38	G	G	21	22	E B 16	22	E B 16
17	E B 17	19	19	E B 16	E B 16	E B 16	E B 16	21	J A 34	32	33	J A 40	J A 43	J A 44	J A 54	J A 46	J A 46	J A 44	J A 23	J A 33	22	23	22	22
18	E B 16	E B 16	J A 32	J A 28	J A 34	J A 24	E B 16	22	27	31	36	J A 44	J A 45	38	36	J A 37	J A 33	J A 29	J A 23	21	J A 28	21	E B 16	E B 16
19	E B 16	J A 50	22	J A 26	E B 21	24	23	J A 26	G	32	34	J A 45	G	38	G	G	G	27	22	20	20	E B 16	E B 16	20
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	33	34	36	38	38	G	G	J A 41	J A 32	20	23	E B 16	E B 16	23	E B 16
21	20	E B 16	20	J A 28	21	E B 15	E B 16	G	30	G	G	G	38	40	38	34	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	34	G	G	G	G	G	G	G	G	G	J A 28	E B 16	E B 16	E B 16	E B 16
23	E B 16	21	E B 16	E B 16	E B 16	E B 16	E B 16	23	29	32	35	38	J A 41	37	J A 46	G	G	J A 54	J A 36	J A 22	J A 24	J A 24	E B 16	E B 16
24	E B 16	22	E B 16	E B 16	E B 16	E B 14	E B 16	G	G	G	G	38	J A 38	36	G	35	G	G	J A 25	J A 25	22	22	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	22	E B 16	22	24	30	32	G	37	37	40	38	G	G	G	20	22	J A 28	J A 31	23	E B 16
26	J A 22	J A 28	21	J A 28	21	21	18	26	31	34	36	J A 42	J A 46	G	G	G	G	G	24	20	E B 15	20	E B 16	E B 16
27	E B 17	E B 16	E B 15	E B 15	E B 15	E B 15	E B 16	G	G	J A 40	J A 43	J A 43	J A 39	J A 40	J A 40	G	G	G	G	J A 32	J A 28	26	E B 16	E B 16
28	E B 16	21	21	E B 16	E B 16	E B 16	E B 16	25	30	33	35	38	38	38	37	G	36	J A 30	G	J A 26	E B 15	E B 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	E B 16	26	30	32	G	41	42	38	36	37	32	29	21	E B 15	E B 15	E B 15	22	J A 23
30	E B 17	J A 23	E B 16	E B 16	E B 16	J A 21	J A 36	J A 40	35	34	36	39	38	G	J A 46	J A 46	J A 46	J A 40	J A 37	J A 24	J A 30	E B 16	E B 16	E B 16
31	22	E B 16	E B 15	20	E B 16	E B 16	E B 16	24	G	G	36	J A 41	J A 41	42	J A 45	33	J A 38	G	G	J A 20	20	E B 16	E B 16	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	30	31	31	31	30	29	29	29	30	29	30	29	31	31	31	31	31	31
MED	E B 16	E B 19	E B 16	E B 16	E B 16	E B 16	E B 16	21	G	32	33	37	38	38	36	G	G	G	20	21	E B 19	E B 18	E B 16	E B 16
U Q	J A 22	J A 23	21	J A 24	21	J A 21	21	24	30	33	35	J A 40	J A 42	40	J A 39	34	J A 36	J A 30	J A 24	J A 25	J A 22	23	22	22
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	G	G	G	G	G	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16

MAR. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	E B 16	G	G	G	G	36	G	G	32	G	G	18	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	E B 16	G	G	G	32	32	32	31	G	G	22	E B 16	E B 16	E B 16	E B 17	E B 17	E B 17
3	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 14	G	G	G	G	G	37	G	31	27	G	E B 16	E B 16	E B 15	E B 15	18	E B 15
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	G	G	G	35	G	G	22	E B 16	E B 16	E B 16	E B 16	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	E B 15	G	G	G	G	G	G	G	G	G	G	E B 16	E B 16	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 16	E B 16	E B 16	19	G	28	31	31	G	G	34	32	G	G	E B 16	E B 16	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	E B 16	18	27	G	31	G	34	G	34	G	G	24	18	E B 16	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	24	30	32	33	33	G	G	32	G	G	E B 17	E B 17	E B 16	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	17	25	31	37	34	34	40	39	35	35	33	50	26	E B 16	E B 17	E B 15	E B 16
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	G	G	32	G	33	G 34	36	30	G 30	24	18	E B 16	E B 16	16	E B 16	E B 16
11	E B 16	16	E 17	B E 16	B E 17	B E 16	B E 16	20	G	G	32	34	34	34	G	G	29	G	E B 14	E B 16	E B 15	E B 16	E B 15	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	32	34	34	34	34	34	G	29	C	20	E B 16	E B 16	E B 16	E B 16	E B 19
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	G	G	C	C	C	C	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
14	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	20	G	G	G	G	37	G	37	C	C	C	E B 26	E B 25	E B 25	E B 26	E B 26	E B 26
15	E B 26	E B 26	E B 26	E B 27	E B 27	C	C	E B 26	28	30	G	C	C	C	C	C	29	25	19	18	E B 16	18	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	G	32	32	32	G	38	35	33	29	G	G	E B 16	E B 16	E B 16	16	E B 16
17	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	27	30	31	34	34	34	34	34	35	36	17	22	16	E 17	B E 16	B E 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	30	32	32	34	33	32	32	28	23	17	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 15	E B 16	E B 16	E B 21	E B 16	E B 16	E B 16	G	30	32	34	G	37	G	G	G	25	19	16	E B 16	E B 16	E B 16	E B 17
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	32	32	34	36	36	G	G	29	22	18	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	E B 15	E B 16	G	30	G	G	G	37	38	36	33	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	32	G	G	G	G	G	G	G	G	G	18	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	23	27	31	34	35	35	35	33	G	G	34	24	E B 16	E B 16	19	E B 16	E B 16
24	E B 16	16	E 16	B E 16	B E 16	B E 14	B E 16	G	G	G	G	36	35	34	G	33	G	G	18	E B 16	E B 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	E B 16	E B 16	22	28	31	G	35	35	39	36	G	G	G	18	E B 16	E B 16	16	E B 16	E B 16
26	16	E 17	B E 16	B E 16	B E 16	B E 16	B E 15	22	30	33	34	36	35	G	G	G	G	G	20	E B 16	E B 15	E B 16	E B 16	E B 16
27	E B 17	E B 16	E B 15	E B 15	E B 15	E B 15	E B 16	G	G	32	32	34	35	35	32	G	G	G	G	20	20	E 16	B E 16	B E 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	29	31	33	37	36	37	35	G	35	25	G	19	E B 15	E B 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	E B 16	23	29	31	G	38	38	36	35	35	31	27	20	E B 15	E B 15	E B 15	E B 16	19
30	E B 17	19	E 16	B E 16	B E 16	B E 16	B 21	23	32	32	35	36	36	G	41	37	43	34	34	19	25	E 16	B E 16	B E 16
31	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	23	G	G	34	34	36	36	36	32	30	G	G	E B 15	E B 15	E B 16	E B 16	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	30	31	31	31	30	29	29	29	30	29	30	29	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	G	30	32	34	34	34	34	G	G	G	17	E B 16	E B 16	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	E B 16	E B 16	22	27	31	32	34	36	36	35	32	G	25	19	18	E B 16	16	E B 16	E B 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	G	G	G	G	G	G	G	G	30	G	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16

MAR. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	349	319	320	318	314	314	318	357	405	391	357	358	366	363	346	357	360	355	355	354	333	395	313	314
2	303	339	327	329	379	323	305	406	386	395	372	372	371	333	376	357	366	356	358	362	355	349	308	309
3	309	290	302	323	358	296	323	398	390	362	351	348	307	344	359	369	369	388	386	361	329	339	318	339
4	321	288	324	339	347	324	347	389	417	377	362	347	333	324	354	354	385	384	355	365	338	339	388	368
5	324	338	323	316	366	355	312	386	375	364	357	309	344	369	353	345	367	384	343	369	365	345	331	326
6	F	331	336	315	339	375	306	389	378	371	367	357	352	366	346	363	366	359	361	352	370	311	357	336
7	301	309	317	351	363	341	338	382	391	374	347	346	356	353	357	358	335	347	357	358	372	315	333	303
8	325	311	308	330	344	398	369	396	380	370	367	353	336	356	357	326	331	325	341	362	352	352	336	319
9	304	327	F	F	F	F	F	392	401	372	361	345	336	332	351	349	358	365	373	369	340	316	337	298
10	315	315	315	350	374	338	342	409	387	366	366	340	312	326	344	345	357	335	359	349	364	330	342	324
11	322	320	F	337	395	331	318	388	375	369	377	355	342	341	348	358	363	367	366	359	357	311	306	315
12	310	F	323	329	342	355	340	398	377	375	348	334	334	352	331	362	345	C	362	359	342	317	340	360
13	321	322	322	318	322	301	340	389	405	363	C	C	C	C	333	356	379	345	376	352	356	315	353	318
14	306	344	345	336	352	343	325	412	403	355	372	348	359	320	350	C	C	C	350	368	365	340	321	307
15	310	329	329	354	372	C	C	394	380	339	340	C	C	C	C	C	343	359	381	352	330	316	329	316
16	293	301	335	322	352	348	357	401	377	368	341	350	308	326	334	341	356	363	351	356	371	298	326	300
17	F	340	309	314	314	323	340	369	350	331	298	338	363	324	352	341	346	346	354	337	341	309	341	334
18	319	347	313	301	327	309	333	359	354	347	356	353	340	348	366	363	342	358	375	352	376	309	336	311
19	316	341	326	328	331	346	330	401	366	351	361	324	341	349	342	342	373	372	386	351	371	340	322	310
20	321	330	348	338	370	342	348	394	359	374	328	349	359	341	363	357	347	335	358	374	380	364	309	307
21	311	316	342	339	366	303	342	398	370	358	338	312	339	348	372	354	354	351	349	373	405	318	321	304
22	312	315	320	315	371	366	355	380	359	343	338	342	353	332	344	356	342	344	337	361	373	326	323	337
23	339	348	329	323	354	335	347	387	354	368	364	336	354	349	352	335	347	338	367	364	349	328	320	304
24	F	F	F	F	F	F	326	393	373	348	341	333	324	332	363	350	349	343	352	354	350	381	354	330
25	301	333	310	306	341	328	351	368	394	347	357	302	317	346	357	350	326	342	364	357	382	320	303	286
26	F	F	F	F	357	358	354	392	379	357	368	331	330	340	352	338	342	333	357	372	386	301	303	303
27	F	F	361	376	313	313	323	391	379	359	324	325	332	340	375	358	352	353	356	356	364	315	283	323
28	323	362	346	364	336	303	355	369	373	373	327	338	332	354	351	336	332	328	330	349	363	353	308	311
29	320	329	321	368	330	324	351	380	353	365	387	363	324	349	348	349	342	348	358	347	369	313	315	332
30	320	324	346	321	343	367	381	391	378	371	330	351	333	349	348	369	347	371	353	372	366	352	304	310
31	328	340	352	332	336	302	336	373	357	354	371	322	342	323	359	327	332	348	374	340	347	318	311	295
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	27	28	29	28	29	31	31	31	30	29	29	29	30	29	30	29	31	31	31	31	31	31
MED	318	329	324	329	347	333	340	391	378	365	357	345	339	344	352	354	348	351	358	358	364	320	322	314
U Q	322	340	342	339	366	352	351	398	390	372	367	352	354	350	359	358	363	364	367	365	371	345	337	330
L Q	309	315	317	318	334	314	324	380	366	354	340	332	331	332	346	342	342	342	352	352	347	315	309	304

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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MAR. 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	L		417	408	419	UL 400	UL 401	L	L						
2									L	L	L	UL 430	UL 435	UL 393	UL 372	L	L							
3										L	UL 393	416	416	A	414	UL 400	L							
4											UL 419	454	UL 409	UL 423	399	UL 386	L	L						
5										L	394	UL 397	402	UL 409	UL 399	L	L	L						
6										L	L	406	440	423	UL 379	409	L	L						
7										L	UL 390	411	439	437	398	UL 393	L							
8										L	L	424	UL 436	409	L	L	L	L						
9									L		UL 421	443	429	A	A	UL 394	A	A	A					
10										L	UL 413	414	UL 399	425	UL 382	UL 401	L	L						
11									L	L	L	426	427	424	405	L	UL 381	L						
12								L	L	L	UL 414	UL 422	422	420	UL 401	UL 388	L	C						
13										L	C	C	C	C	410	383	L	L						
14										UL 416	UL 393	UL 432	414	418		C	C	C						
15										L	396	C	C	C	C	C	L	L						
16									L	L	L	449	448	UL 387	UL 380	L	L	L	L					
17										UL 375	UL 390	405	406	UL 407	UL 378	UL 387	A	A						
18										L	UL 375	405	397	425	UL 395	L	L	L						
19									L	L	395	405	424	388	430	393	L	L						
20									L	L	UL 411	391	404	423	UL 426	UL 412	L							
21										L	405	UL 418	420	UL 403	401	UL 385	UL 384	L						
22										L	412	409	410	430	400	427	L	L						
23										L	396	UL 404	412	425	UL 412	UL 378	UL 397	A						
24										UL 388	390	409	425	438	459	414	L	L						
25									L	L	UL 411	436	434	447	UL 421	399	UL 376	L						
26									L	L	410	409	436	428	434	UL 415	L	L						
27										L	UL 386	416	416	454	421	UL 417	L	L						
28										L	UL 441	434	451	438	UL 407	L	L	L						
29										UL 391	429	425	399	389	UL 432	396	UL 374	L						
30										L	383	407	411	UL 440	A	A	A	A						
31									L	UL 404	420	423	UL 449	450	408	412	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										5	24	29	29	27	26	21	5							
MED										UL 391	UL 400	416	420	423	UL 403	UL 399	UL 381							
U Q										UL 410	UL 414	428	436	437	421	412	UL 390							
L Q										UL 382	UL 392	406	408	UL 409	UL 398	UL 388	UL 375							

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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									202	220		244	244	244	248	260	242	252						
2									224	224	244	244	244	266	236	250	250							
3										250	262	262	288	250	240	236	252							
4											260	260	292	294	244	244	232	226						
5										250	252	328	260	234	244	252	252	234						
6										248	248	260	260	250	272	256	254	254						
7										248	268	270	252	262	262	262	276							
8										246	258	258	274	254	252	280	282	282						
9									224		256	280	280	256	256	268	252	240	E 240	A				
10										252	258	300	306	278	240	240	248	252						
11									234	248	242	274	274	268	262	242	242	244						
12								210	226	242	280	300	284	266	276	246	260	C						
13										252	C	C	C	C	282	252	240	262						
14										262	232	268	250	278		C	C	C						
15										278	278	C	C	C	C	C	268	238						
16									242	250	280	288	306	270	238	238	244	244	242					
17										294	318	256	240	268	250	254	254	254						
18										270	260	252	260	260	220	264	266	254						
19									254	254	254	296	254	232	270	270	240	240						
20									256	246	296	260	250	262	246	252	258							
21										262	290	320	268	240	238	248	256	270						
22										270	284	284	250	280	256	252	252	252						
23										252	262	284	278	276	250	292	292	E A 258						
24										278	278	312	312	270	242	254	264	266						
25									228	278	278	382	310	264	232	248	290	262						
26									240	274	274	310	304	272	258	258	286	278						
27										266	288	300	300	280	226	264	266	248						
28										254	288	290	290	254	240	280	292	278						
29										244	246	250	310	268	270	270	270	254						
30										246	292	292	294	252	256	248	258	244						
31									244	258	248	334	266	266	254	290	292	250						
	00	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	11	29	29	29	29	29	29	29	30	25	2					
MED								210	234	252	262	284	274	266	250	254	257	252	241					
U Q									244	268	282	300	297	271	260	266	270	262						
L Q									224	247	253	260	253	253	240	248	250	244						

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MAR. 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	192	E B 248	E B 250	E B 240	E B 216	226	E B 246	210	178	190	190	190	200	190	190	180	180	202	218	180	208	196	224	224
2	E B 252	220	E B 238	E B 238	202	E B 238	E B 256	202	186	178	178	178	174	194	194	192	200	200	218	194	188	210	E B 276	E B 276
3	E B 276	E B 288	E B 266	E B 266	216	E B 258	E B 248	206	206	206	178	174	174	A	194	192	200	214	190	190	214	214	E A 242	214
4	E B 246	222	222	E B 248	218	218	E B 260	200	200	202	182	178	178	178	210	180	180	180	202	194	212	218	202	202
5	E B 246	E B 246	E B 230	E B 252	202	218	E B 260	196	212	194	202	188	188	188	188	188	188	180	208	208	192	204	E B 224	E B 282
6	E B 264	222	E B 236	E B 256	E B 236	196	E B 252	208	200	198	198	190	184	184	184	184	196	196	214	202	188	E B 232	220	220
7	E B 274	E B 264	E B 270	224	220	220	E B 242	210	208	190	190	182	180	168	176	190	192	204	216	198	198	E B 224	224	E B 246
8	E B 252	E B 266	E B 276	E B 270	224	196	204	204	204	196	188	188	182	182	182	182	188	192	220	198	192	192	214	E B 242
9	E B 246	E B 246	E B 256	E B 256	E B 224	192	E B 192	192	186	186	186	182	170	A	A	212	A	A	A	204	204	E B 224	222	E B 278
10	E B 262	E B 268	E B 268	E B 232	216	216	216	198	198	180	180	168	170	170	216	184	198	202	210	204	182	196	212	228
11	228	218	212	E B 232	200	200	E B 254	198	202	202	184	184	174	174	180	186	188	188	194	E B 192	198	E B 246	E B 256	E B 266
12	E B 266	E B 246	E B 232	E B 232	E B 222	E B 214	E B 220	164	168	190	190	188	188	188	188	190	190	C	224	192	E B 194	E B 234	220	E B 212
13	E B 228	E B 242	E B 256	E B 248	228	E B 234	E B 230	194	206	198	C	C	C	C	176	208	200	192	202	202	E B 202	E B 244	E B 220	E B 232
14	E B 258	E B 230	212	E B 218	218	224	E B 236	198	196	188	186	176	200	180	E A 240	C	C	C	208	204	186	E B 254	E B 266	E B 306
15	E B 300	E B 288	E B 270	E B 234	E B 208	C	C	208	206	190	176	C	C	C	C	C	192	198	196	196	210	E A 230	E B 230	E B 246
16	E B 280	E B 272	E B 242	E B 242	210	220	216	188	178	190	192	190	166	E A 244	198	202	200	204	198	196	192	224	E B 262	E B 252
17	E B 262	206	E B 256	E B 256	E B 256	E B 250	E B 228	208	204	198	196	188	188	188	188	206	A	A	206	206	202	E B 230	218	216
18	E B 234	210	E B 258	E B 270	E B 232	E B 262	E B 256	222	220	198	198	198	192	180	180	188	186	190	210	204	196	E B 232	E B 232	E B 240
19	E B 240	E B 240	E B 240	E B 240	E B 240	E B 240	E B 230	202	202	196	186	186	180	204	176	170	170	194	204	204	190	E B 216	224	E B 262
20	E B 246	E B 236	212	E B 212	200	206	E B 238	190	188	198	182	182	188	188	178	176	192	204	216	210	188	188	E B 274	E B 270
21	E B 268	E B 268	E B 240	E B 240	210	E B 272	218	204	204	200	186	186	190	206	210	202	190	192	208	196	184	E B 232	E B 246	E B 246
22	E B 252	E B 252	E B 252	E B 258	204	192	208	198	198	194	182	186	184	184	182	182	188	192	214	210	186	214	E B 224	216
23	E B 220	220	E B 250	E B 266	214	E B 214	212	198	208	208	208	200	198	190	184	192	184	A	216	202	194	208	224	E B 244
24	E B 250	E B 236	E B 236	224	204	206	218	208	208	202	196	196	190	184	184	182	182	196	208	202	202	188	208	E B 246
25	E B 246	E B 244	E B 244	E B 250	214	220	206	204	190	206	206	194	186	186	186	186	196	196	204	206	200	220	E B 268	E B 268
26	E B 270	E B 248	E B 238	E B 240	214	230	216	196	188	188	188	188	176	176	182	182	186	186	214	198	184	E B 238	E B 262	E B 262
27	E B 262	E B 242	214	208	192	E B 260	234	210	208	198	198	182	182	182	182	182	172	172	220	204	204	228	E B 284	E B 244
28	E B 244	202	202	E B 202	E B 232	E B 248	230	204	218	198	186	186	178	176	180	194	232	206	222	210	188	E B 188	E B 238	E B 264
29	E B 264	E B 240	E B 232	212	212	E B 284	224	220	214	202	188	210	216	196	176	202	202	212	212	196	E B 196	210	E B 250	E A 250
30	E B 244	E A 254	216	E B 236	228	200	216	210	220	212	202	198	188	172	A	A	A	A	212	202	202	E B 202	E B 270	E B 276
31	E B 246	E B 232	218	218	218	E B 264	232	216	202	190	190	186	168	168	188	188	194	202	202	202	202	E B 214	E B 250	E B 264
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	30	31	31	31	30	29	29	27	28	28	27	25	30	31	31	31	31	31
MED	E B 252	E B 242	E B 240	E B 240	213	U 209	E B 230	204	202	198	188	186	184	184	184	188	190	196	210	202	195	E 218	E B 230	E B 246
U Q	E B 264	E B 254	E B 256	E B 256	E B 224	E B 248	E B 246	208	208	202	196	190	189	190	192	193	198	203	216	204	202	E B 232	E B 262	E B 266
L Q	E B 244	222	222	224	208	206	216	198	190	190	184	182	175	176	180	182	186	191	204	196	188	204	220	228

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

MAR. 2019 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	86	B	B	B	B	B	B	B	G	G	G	G	144	G	G	134	G	G	96	94	94	94	94	94
2	94	94	94	94	94	94	94	120	G	G	G	116	112	112	108	G	G	108	B	B	B	B	102	100
3	92	92	92	94	94	B	94	118	G	G	G	G	G	146	G	164	104	G	B	B	B	96	92	92
4	90	B	B	90	88	86	84	B	G	G	G	G	G	G	126	G	G	104	B	B	100	98	92	92
5	92	B	92	92	92	B	B	B	G	G	G	G	G	G	G	G	G	G	B	B	B	92	B	B
6	B	90	B	B	B	90	90	132	G	116	110	104	G	G	112	112	G	G	B	B	B	B	B	B
7	B	B	100	B	B	B	B	138	150	G	120	G	118	G	132	G	G	140	132	84	B	B	B	B
8	84	84	B	B	B	84	82	136	130	126	118	112	102	G	G	116	G	G	110	102	100	98	B	B
9	B	B	B	B	B	B	B	116	122	122	112	102	108	150	144	144	118	102	102	102	B	B	B	98
10	B	92	92	92	92	92	96	122	G	G	102	G	104	110	142	108	108	108	102	B	100	98	98	B
11	B	114	B	94	94	94	94	124	G	G	106	100	100	98	G	G	98	G	B	B	B	B	B	98
12	98	98	B	B	B	B	B	B	G	138	106	106	106	104	104	G	104	C	100	92	B	92	B	B
13	B	92	B	B	B	B	B	124	G	G	C	C	C	C	G	G	G	G	B	B	B	B	B	B
14	B	B	B	B	B	B	94	126	G	G	G	G	148	G	148	C	C	C	B	B	B	B	B	B
15	B	B	B	B	B	C	C	B	142	130	G	C	C	C	C	C	130	122	98	90	92	92	B	B
16	B	B	88	B	B	B	B	124	G	146	130	100	G	136	136	152	104	G	G	92	92	B	92	B
17	B	106	112	B	B	B	B	112	106	100	100	100	100	96	96	94	90	90	90	88	86	86	86	86
18	B	B	86	86	86	86	B	130	156	156	98	98	96	100	98	98	98	98	98	96	94	94	B	B
19	B	120	106	102	B	92	90	90	G	136	128	94	G	132	G	G	G	152	130	90	88	B	B	88
20	B	B	B	B	B	B	B	G	G	142	142	112	160	154	G	G	100	100	122	108	B	B	100	B
21	100	B	98	98	98	B	B	G	156	G	G	G	148	142	132	136	G	G	G	B	B	B	B	B
22	B	B	B	B	B	B	B	G	G	106	G	G	G	G	G	G	G	G	G	98	B	B	B	B
23	B	98	B	B	B	B	B	112	138	130	130	114	104	102	102	G	G	98	98	98	98	92	B	B
24	B	92	B	B	B	B	B	G	G	G	G	148	100	94	G	152	G	G	88	86	86	90	B	B
25	B	B	B	B	90	B	90	128	160	160	G	126	126	144	144	G	G	G	122	102	100	98	98	B
26	98	98	98	98	98	98	98	114	154	148	148	110	104	G	G	G	G	G	124	112	B	102	B	B
27	B	B	B	B	B	B	B	G	G	112	106	106	104	104	104	G	G	G	G	96	96	96	B	B
28	B	96	96	B	B	B	B	136	136	136	136	146	122	114	126	G	160	100	G	96	B	B	B	B
29	B	B	B	B	B	B	B	114	116	142	G	142	142	128	138	128	138	138	130	B	B	B	118	118
30	B	94	B	B	B	90	90	90	132	142	142	132	130	G	114	118	118	118	106	106	98	B	B	B
31	90	B	B	90	B	B	B	130	G	G	156	98	98	118	116	116	116	G	G	88	88	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	15	12	11	10	10	12	21	13	18	18	20	22	19	19	14	14	14	17	20	15	15	10	9
MED	92	94	95	94	93	91	92	124	138	136	119	108	107	114	126	123	106	106	102	96	94	94	96	94
U Q	98	98	99	98	94	94	94	130	155	142	136	121	130	142	138	144	118	122	123	102	100	98	100	99
L Q	90	92	92	90	90	86	90	114	126	122	106	100	102	102	104	112	100	100	98	90	88	92	92	90

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	F2												H1			H1			L3	F1	F1	F3	F2	F2
2	F2	F2	F1	F1	F1	F1	F1	C1				C1	C1	C1	C1			L1					F2	F2
3	F2	F2	F2	F2	F1		F2	C1						H2		H1	L2					F2	F4	F3
4	F2			F2	F4	F2	F2								C1			L2			F1	F1	F2	F1
5	F2		F1	F1	F1																	F1		
6		F1				F1	F1	C2		C1	C2	L1			C1	C1								
7			F1					H2	H2		C2		C1		H1			H1	H1	F1				
8	F1	F1				F2	F1	H2	C2	C1	C1	C1	L1			C1			C1	F1	F1	F1		
9								C1	C2	C1	C2	L2	C1	H1	H1	H2	C3	L4	L8	F7				F2
10		F2	F2	F2	F2	F1	F1	C3			L1		L2	C2	H1	L1	L2	L3	L2		F2	F4	F1	
11		F1		F2	F3	F2	F1	C2			L1	L1	L1	L1			L2							F2
12	F3	F2								H2	L2	L2	L2	L2	L1		L2		L1	F1		F2		
13		F3						C2																
14							F1	C2					H1		H1									
15									H2	H2							C1	C2	L2	F3	F1	F3		
16			F1					C2		H2	C1	L2		H2	H1	H1	L2			F1	F1		F1	
17		F1	F1					C5	L4	L2	L2	L2	L2	L2	L2	L2	L4	L4	L1	F7	F2	F1	F3	F1
18			F3	F2	F3	F1		C2	H2	H2	L2	L2	L1	L1	L3	L3	L2	L3	L2	F1	F1	F1		
19		F1	F1	F3		F3	F3	F2		H2	C1	L2		C1				H2	H3	F1	F1			F2
20										H2	H1	C2	H1	H1			L3	L3	L3	F1			F1	
21	F2		F2	F2	F1				H2				H1	H2	H1	H2								
22										H2										F2				
23		F1						C2	H2	C1	C1	C2	L2	L1	L1			L5	L6	F1	F1	F3		
24		F2										H1	L1	L1		H1			L2	F2	F1	F1		
25					F1		L1	C2	H2	H1		C1	C1	H1	H2				C1	F3	F3	F4	F2	
26	F2	F2	F2	F2	F1	F1	F1	C2	H2	H2	H1	C2	L1						C3	F1		F2		
27										C1	L2	L1	L1	L1	L1					F3	F4	F3		
28		F1	F1					H2	H2	H1	H1	H1	C2	C1	C1		H1	L2		F4				
29								C2	C2	H1		H2	H1	H1	H1	C2	H1	H2	H2				F3	F3
30		F9				F4	F5	L5	H2	H1	H2	H1	H1		C4	C4	C2	C3	L8	F3	F9			
31	F2			F1				H2			H1	L2	L2	C1	C2	C1	C1			F2	F2			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

MAR. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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 44	X 34	X 36	X 33	X 34	X 32	X 31														X 55	X 44	X 34	X 37
2	X 35	X 33	X 29	X 34	X 44	X 28	X 27														X 56	X 37	X 29	X 31
3	X 34	X 37	X 36	X 37	X 41	X 36	X 30														X 52	X 47	X 40	X 45
4	X 37	X 38	X 35	X 33	X 33	X 28	X 28														X 59	X 51	X 43	X 38
5	X 30	X 34	X 33	X 30	X 34	X 26	X 25														X 58	X 39	X 32	X 32
6	X 35	X 34	X 35	X 33	X 36	X 30	X 28														X 59	X 40	X 40	X 34
7	X 32	X 33	X 34	X 34	X 34	X 29	X 28														X 59	X 40	X 35	X 33
8	X 32	X 32	X 31	X 31	X 37	X 27	X 21														X 66	X 42	X 33	X 32
9	X 33	X 34	X 34	X 35	X 38	X 37	X 29														X 58	X 45	X 43	X 42
10	X 40	X 38	X 36	X 36	X 38	X 28	X 28														X 102	X 51	X 51	X 49
11	X 47	X 49	X 44	X 43	X 48	X 34	X 29														X 44	X 35	X 34	X 36
12	X 35	X 35	X 38	X 37	X 38	X 27	X 26														X 57	X 48	X 50	X 46
13	X 33	X 34	X 35	X 34	X 35	X 32	X 33														X 48	X 36	X 38	X 38
14	X 37	X 36	X 35	X 34	X 34	X 29	X 27														X 56	X 40	X 34	X 34
15	X 34	X 35	X 36	X 36	X 31	X 25	X 25														X 39	X 35	X 37	X 38
16	X 36	X 37	X 37	X 37	X 34	X 30	X 28														X 72	X 38	X 34	X 38
17	X 37	X 36	X 35	X 34	X 35	X 33	X 31														X 91	X 61	X 55	X 45
18	X 37	X 37	X 36	X 35	X 32	X 30	X 30														X 82	X 58	X 34	X 35
19	X 35	X 35	X 35	X 34	X 29	X 28	X 26														X 46	X 38	X 36	X 36
20	X 36	X 38	X 36	X 34	X 26	X 26	X 26														X 83	X 44	X 38	X 36
21	X 41	X 44	X 41	X 44	X 35	X 29	X 30														X 58	A	X 40	X 46
22	X 46	X 44	X 43	X 44	X 51	X 38															X 60	X 48	X 40	X 42
23	X 37	X 38	X 36	X 35	X 33	X 30															X 58	X 36	X 36	X 37
24	41	48	48	46	39	X 24	27														X 58	X 45	X 34	X 30
25	X 32	X 33	X 33	X 31	X 30	X 28															X 50	X 36	X 35	X 36
26	X 37	X 36	41	X 36	X 34	X 29															X 40	X 31	X 32	X 34
27	X 36	X 37	X 38	X 34	X 28	X 26															X 53	X 42	X 41	X 44
28	X 42	X 41	X 41	X 32	X 28	X 29															X 78	X 52	X 36	X 38
29	X 38	X 36	X 37	X 44	X 32	X 30															X 55	X 38	X 36	X 38
30	X 37	X 34	X 34	X 34	X 33	X 27															X 56	X 33	X 31	X 31
31	X 34	X 36	X 37	X 36	X 28	X 27															X 51	X 45	X 42	X 40
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	22														31	30	31	31
MED	X 36	X 36	X 36	X 34	X 34	X 29	X 28														X 58	X 41	X 36	X 37
U Q	X 38	X 38	X 38	X 37	X 38	X 30	X 30														X 60	X 47	X 40	X 42
L Q	X 34	X 34	X 35	X 34	X 32	X 27	X 26														X 52	X 37	X 34	X 34

MAR. 2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	38	28	30	27	28	26	25	48	61	54	54	63	63	71	74	61	52	52	59	54	49	38	28	31
2	29	27	23	28	38	22	21	41	53	62	60	59	61	64	71	71	55	54	59	69	50	31	23	25
3	28	31	30	31	34	30	24	44	55	58	67	76	86	96	107	86	77	63	51	46	46	41	34	38
4	31	32	29	27	27	22	22	42	51	53	62	71	63	76	82	83	66	57	49	51	53	45	37	32
5	24	28	27	24	28	20	19	38	53	57	60	69	68	86	74	66	62	56	55	57	52	33	26	26
6	29	28	29	27	30	24	22	38	49	56	54	66	65	75	72	73	59	49	59	55	53	34	34	28
7	26	27	28	28	28	23	22	40	51	50	54	70	78	78	J R 80	78	60	52	56	64	53	34	29	27
8	26	26	25	25	32	21	J B 15	37	47	52	53	52	62	80	78	63	62	66	65	69	60	36	27	26
9	27	28	28	29	32	31	23	40	46	49	49	64	86	114	121	120	108	88	84	72	52	39	37	36
10	34	32	30	30	32	22	22	38	46	51	57	56	76	102	120	122	112	109	99	95	96	45	45	43
11	41	43	38	37	42	28	23	42	54	55	60	59	72	86	90	95	84	74	64	43	38	29	28	30
12	29	29	32	31	32	21	20	39	49	51	51	57	60	78	83	90	95	100	94	R 84	51	42	44	40
13	27	28	29	28	29	26	27	43	52	50	56	60	66	71	77	93	86	J R 72	58	51	42	30	32	32
14	31	30	29	28	28	23	21	40	42	50	64	76	71	86	73	70	66	63	59	56	50	34	28	28
15	28	29	30	30	25	19	19	42	48	54	63	78	72	91	91	73	68	79	71	46	33	29	31	32
16	30	31	31	31	28	24	22	39	47	50	54	64	68	91	104	J R 102	100	88	78	71	66	32	28	32
17	31	30	29	28	29	27	25	42	49	55	66	87	82	75	90	92	92	J R 88	85	85	J R 85	55	49	39
18	31	31	30	29	26	24	24	45	62	66	72	72	80	96	97	95	J R 79	68	66	64	J R 76	R 52	28	29
19	29	29	29	28	23	22	20	43	47	53	62	71	88	104	J R 94	73	74	66	61	46	40	32	30	30
20	30	32	30	28	20	20	20	45	47	58	60	76	81	90	92	84	H 78	64	69	79	77	38	32	30
21	35	38	35	38	29	23	24	49	46	58	68	80	101	129	115	101	87	84	86	79	52	A	34	40
22	40	38	37	38	45	32	23	42	48	52	65	74	80	88	104	101	93	94	87	70	54	42	34	36
23	31	32	30	29	27	24	23	45	49	60	65	71	70	73	78	74	62	64	66	70	52	30	30	31
24	F 28	F 38	F 34	F 33	F 30	18	F 19	41	47	52	56	62	65	80	84	82	69	70	71	72	52	39	28	24
25	26	27	27	25	24	22	22	42	48	50	53	49	56	87	98	88	78	76	81	62	44	30	29	30
26	31	30	F 31	30	28	23	23	42	46	51	54	58	66	71	79	76	72	71	86	71	34	25	26	28
27	28	31	32	28	22	20	21	48	54	54	53	56	70	74	84	69	54	54	63	69	47	36	35	38
28	36	35	35	26	22	23	23	48	50	53	56	58	62	76	91	J R 81	J R 68	70	72	82	72	46	30	32
29	32	30	31	V 39	26	24	24	46	56	64	65	52	61	77	75	70	67	73	81	61	49	32	30	32
30	31	28	28	28	27	21	23	42	48	59	63	75	78	J R 101	96	J R 89	79	72	80	68	50	27	25	25
31	28	30	31	30	22	21	22	46	54	66	60	63	69	86	90	63	58	62	59	45	45	39	36	34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31
MED	30	30	30	28	28	23	22	42	49	54	60	64	70	86	90	82	72	70	66	68	52	35	30	31
U Q	31	32	31	31	32	24	23	45	53	58	64	74	80	91	97	93	86	79	81	72	54	41	34	36
L Q	28	28	29	28	26	21	21	40	47	51	54	58	63	75	78	71	62	62	59	54	46	31	28	28

MAR. 2019 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	UL 416	420	440	436	432	L 420	L							
2										L 396	408	432	448	L 436	436	412	L							
3										UL 408	432	432	432	440	428	408	404	L						
4									L	UL 360	424	432	436	432	436	L 424	400	L						
5										L	432	440	456	444	432	424	L 400	L						
6										L 404	432	428	436	436	428	420	392	L	L					
7									L		UL 428	424	432	432	432	420	L 408	A						
8								192			L 416	440	444	436	440	424	L	L						
9										UL 388	UL 432	A	A	440	444	424	404	A						
10								184		UL 392	428	444	A	428	440	428	408	L						
11									L	UL 412	L 420	452	432	432	436	420	404		212					
12										UL 396	UL 432	432	436	436	428	424	404	L						
13										L	420	432	432	436	428	424	404	L	L					
14									L	L	416	428	448	432	428	L 424	400	L	L					
15										UL 408	428	432	436	436	436	428	L 396	L 372						
16								192		UL 404	L 428	428	444	432	432	424	404	L 364						
17								196	L	L 420	432	420	440	L 476	440	428	400	L						
18									L	L	436	444	444	440	436	428	L 416	L						
19										UL 428	436	432	436	436	444	424	400	L						
20										UL 412	448	440	440	440	428	428	412	L	L					
21											420	440	440	432	456	428	412	380						
22									L	UL 440	436	436	456	444	436	444	416	UL 404						
23											424	440	440	452	452	436	428	UL 408	L 372	L				
24										UL 416	432	432	440	444	432	428	L 412	L 388						
25								L 244			L	UL 440	A	428	432	428	408	L 388	L					
26										UL 420	420	432	440	432	428	424	408	384						
27									L	L 424	420	432	432	428	428	424	UL 396	UL 376						
28									L	UL 408	420	424	428	424	428	424	412	L	L					
29									L	424	424	440	A	A	436	420	404	L 372	L					
30										L 416	432	436	436	428	UA 436	432	L 404	L						
31									L	412	432	432	428	436	428	420	396	L 376						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								5		23	31	30	27	30	31	31	28	11	1					
MED								192		UL 412	432	432	440	436	432	424	404	L 376	212					
U Q								220		L 420	432	440	444	440	436	428	408	L 388						
L Q								188		UL 404	420	432	432	432	428	420	400	L 372						

MAR. 2019 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Okinawa

MAR. 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	A	272	292	316	324	324	316	300	272	A	A	B				
2								B	228	276	300	316	324	324	316	UA 296	UA 272	A	A	B				
3								B	A	A	304	312	324	336	320	304	284	A	A	B				
4								B	240	276	308	320	A	A	A	A	A	A	180	B				
5								B	244	UA 272	A	324	328	340	328	A	UA 280	A	B	B				
6								B	220	268	UA 300	312	320	A	332	UA 312	288	244	A	B				
7								B	204	264	300	304	UA 296	328	328	332	284	248	160	A				
8								B	UA 200	248	304	UA 320	320	UA 332	320	312	304	248	A	A				
9								A	212	260	292	324	328	328	328	312	288	244	A	B				
10								A	244	272	304	320	328	332	320	304	292	248	A	B				
11								A	224	272	300	312	A	A	A	A	292	248	172	B				
12								A	236	284	316	324	324	UA 324	UA 324	A	A	A	A	A				
13								192	220	264	304	320	332	336	324	316	284	240	A	B				
14								A	216	268	312	316	316	A	A	A	296	256	184	B				
15								A	232	280	300	312	332	344	332	300	A	244	A	B				
16								B	244	280	300	A	332	UA 344	A	B	A	A	A	B				
17								B	236	288	312	328	336	A	A	A	A	A	A	B				
18								A	236	288	A	324	UA 320	A	A	312	284	A	A	B				
19								200	224	288	296	316	A	340	336	316	288	244	A	B				
20								208	236	284	316	340	328	A	A	A	304	252	172	B				
21								A	A	280	308	328	328	348	340	324	288	252	176	A				
22							B	204	232	296	320	332	344	344	340	A	296	A	A	B				
23							B	A	244	288	316	328	336	328	320	A	A	A	A	B				
24							B	A	256	292	320	332	A	320	320	UA 292	288	A	A	A				
25							B	A	232	284	304	324	328	336	324	324	292	260	196	B				
26							B	196	228	284	304	320	332	A	332	324	284	248	172	B				
27							B	196	248	284	304	UA 324	A	A	A	A	A	A	A	B				
28							B	A	244	284	320	332	348	336	324	312	284	A	180	A				
29							B	176	252	284	304	324	332	332	324	308	284	A	172	B				
30							B	184	A	288	316	320	340	332	332	316	288	252	A	B				
31							B	172	248	A	A	A	A	A	A	312	272	A	196	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								9	27	29	28	29	25	21	22	20	24	15	11					
MED								196	236	280	304	320	328	332	324	312	288	248	176					
U Q								202	244	286	314	326	332	340	332	316	292	252	184					
L Q								180	224	272	300	316	324	328	320	304	284	244	172					

MAR. 2019 foE (0.01MHz)

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MAR. 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	J A 30	J A 20	19	18	20	E B 16	E B 16	E B 16	25	J A 26	G 25	G	G	G	35	32	G	28	20	18	20	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	19	J A 18	J A 18	18	J A 21	G	G	G	G	G	G	G	32	30	25	20	19	20	18	J A 21	J A 18
3	J A 20	J A 20	J A 16	J A 32	J A 24	J A 22	J A 20	J A 20	J A 26	29	G	G	G	38	36	33	G	26	21	E B 16	E B 16	J A 20	19	J A 17
4	J A 19	E B 16	E B 16	E B 16	E B 16	E B 16	J A 17	J A 20	G	G	G	G	36	J A 36	39	40	31	24	22	J A 17	E B 16	E B 16	21	17
5	E B 16	20	E B 16	18	18	19	E B 16	E B 16	G	32	J A 40	G	G	G	G	35	30	26	20	E B 16	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	J A 19	E B 16	E B 16	E B 16	E B 16	J A 18	26	32	36	38	38	J A 40	37	35	31	27	21	20	E B 16	E B 16	18	E B 16
7	E B 16	E B 16	19	E B 16	J A 16	E B 16	E B 16	E B 16	25	32	36	36	35	G 25	37	40	37	36	J A 47	J A 29	20	18	19	18
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	J A 18	25	33	37	40	38	37	39	39	39	35	J A 27	J A 36	J A 21	J A 26	J A 22	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 19	25	32	33	J A 47	44	38	44	38	36	35	J A 30	20	19	20	J A 29	J A 28
10	J A 28	J A 20	E B 16	E B 16	E B 16	E B 16	E B 31	J A 18	G	30	G	G	44	42	37	35	G	G	20	E B 16	E B 16	E B 16	E B 16	E B 16
11	E B 16	18	E B 16	J A 23	E B 16	J A 25	J A 20	19	26	33	35	J A 52	36	36	39	35	G	30	G	20	J A 16	20	J A 16	E B 16
12	E B 16	J A 20	J A 17	J A 22	19	E B 16	E B 16	21	28	32	36	38	40	J A 39	39	J A 46	J A 40	J A 43	J A 48	J A 32	J A 17	E B 16	E B 16	E B 16
13	E B 16	E B 16	19	E B 16	E B 16	E B 16	E B 16	G	27	30	G	G	G	G	G	35	34	26	18	E B 16	E B 16	E B 16	E B 16	J A 27
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	26	36	36	35	39	40	J A 40	40	36	28	G	E B 16	E B 16	E B 16	20	E B 16
15	19	19	E B 16	E B 16	20	E B 16	E B 16	22	28	G	G	G	36	G	37	36	31	34	J A 22	20	19	J A 16	J A 19	E B 16
16	E B 16	E B 16	E B 16	20	J A 17	18	E B 16	G	28	J A 32	32	J A 34	40	38	39	36	31	27	J A 29	J A 20	18	E B 16	E B 16	E B 16
17	E B 16	19	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	34	35	G	G	J A 40	J A 40	J A 50	J A 38	25	J A 26	J A 22	E B 16	19	E B 16	E B 16
18	E B 16	E B 16	E B 16	19	E B 16	E B 16	E B 16	21	27	32	J A 33	G	J A 47	J A 40	J A 40	G	J A 29	J A 28	J A 27	J A 16	J A 19	21	E B 16	E B 16
19	E B 16	J A 19	E B 16	E B 16	J A 22	J A 18	19	J A 22	26	G	G	36	J A 37	G	36	G	32	26	20	18	E B 16	J A 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	26	31	34	38	35	J A 43	J A 37	34	34	28	21	20	E B 16	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 18	E B 16	E B 16	E B 16	23	29	33	G	35	35	G	39	34	33	30	28	J A 38	E B 16	J A 32	J A 32	J A 38
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	28	G	35	39	G	G	G	35	36	28	21	J A 18	J A 17	E B 16	E B 16	J A 17
23	E B 16	E B 16	E B 16	E B 16	18	E B 16	E B 16	24	29	34	34	38	40	38	36	35	J A 40	J A 33	J A 26	J A 18	E B 16	E B 16	E B 16	E B 16
24	E B 16	18	E B 16	E B 16	J A 20	E B 16	G	24	30	32	34	36	J A 40	36	34	32	G 27	28	J A 28	J A 45	J A 18	J A 22	18	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	18	18	22	G	32	38	40	44	44	36	36	G	G	G	20	J A 17	J A 26	J A 22	J A 16
26	20	J A 36	E B 16	E B 16	J A 15	J A 21	E B 16	23	29	34	35	35	36	J A 40	G	G	G	G	G	E B 16	18	19	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	E B 16	G	G	32	36	J A 40	J A 39	36	38	J A 35	J A 38	32	J A 27	J A 23	J A 22	J A 15	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	J A 18	18	J A 15	24	32	34	34	39	41	38	42	36	31	30	22	J A 25	J A 22	J A 25	20	J A 22
29	J A 18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	21	28	33	33	40	45	44	40	36	36	30	21	J A 16	E B 16	20	18	J A 18
30	J A 20	20	E B 17	E B 16	E B 16	E B 16	E B 16	22	J A 34	33	36	37	40	42	44	38	33	30	J A 32	J A 19	J A 20	J A 29	E B 16	E B 16
31	J A 22	J A 18	E B 16	E B 16	E B 16	E B 16	E B 16	23	28	J A 42	J A 40	J A 38	J A 39	41	36	G 25	G 23	33	J A 19	J A 19	J A 20	E B 16	E B 16	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	32	34	36	38	38	37	35	31	28	21	J A 19	17	18	E B 16	E B 16
U Q	J A 19	J A 19	16	18	J A 18	J A 18	17	22	28	33	36	39	40	40	39	38	36	32	J A 27	J A 22	J A 20	J A 20	J A 20	J A 17
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 25	G 30	G	G	G 35	G	G 36	33	G	26	20	E B 16	E B 16	E B 16	E B 16	E B 16

MAR. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	G 24	G 20	G	G	G	34	32	G	24	18	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	E B 16	G	G	G	G	G	G	G	31	30	24	19	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	18	E B 16	E B 16	E B 16	E B 16	25	28	G	G	G	37	36	32	G	25	21	E B 16	E B 16	17	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	E B 16	G	G	G	G	34	34	38	40	31	24	22	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	E B 16	G	30	32	G	G	G	G	35	29	25	20	E B 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 16	E B 16	E B 16	E B 16	25	31	35	37	36	36	37	34	30	26	18	E B 16	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	E B 16	E B 16	25	31	33	34	34	G 24	36	40	36	34	43	19	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	32	36	38	36	35	38	38	38	33	24	34	21	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	25	31	32	45	44	37	43	37	34	32	28	E B 16	E B 16	19	18	24
10	24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	30	G	G	44	41	36	33	G	G	20	E B 16	E B 16	E B 16	E B 16	E B 16
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	26	31	34	G 28	35	35	38	34	G	30	G	E B 16	E B 16	E B 16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	32	36	36	38	36	35	35	30	31	42	29	E B 16	E B 16	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	30	G	G	G	G	G	35	32	26	18	E B 16	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	19	25	35	36	34	39	38	35	38	36	28	G	E B 16	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	27	G	G	G	35	G	36	35	30	32	20	E B 16	E B 16	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	29	32	34	39	37	38	35	31	26	22	E B 16	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	32	34	G	G	34	33	32	32	24	25	E B 16	E B 16	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	27	31	30	G	35	34	34	G	G 23	25	21	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 12	26	G	G	35	35	G	36	G	31	26	20	E B 16	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	E B 16	E B 16	G	26	30	33	38	35	35	35	33	34	26	20	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 18	E B 16	E B 16	E B 16	21	29	32	G	34	35	G	38	34	32	30	28	22	E B 16	A A 32	22	20
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	G	34	38	G	G	G	34	36	28	20	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	22	28	33	34	37	40	37	34	33	32	27	20	E B 16	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	G	23	30	32	34	35	35	35	34	32	G 20	26	28	41	E B 16	20	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	32	37	39	43	40	35	35	G	G	G	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	22	29	33	34	35	35	36	G	G	G	G	G	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	E B 16	E B 16	G	G	31	34	35	36	36	37	33	31	32	24	E B 16	E B 16	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	23	30	33	33	38	40	38	42	36	30	30	22	23	21	20	E B 16	18
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	32	33	40	44	43	40	35	33	28	20	E B 16	E B 16	E B 16	E B 16	E B 16
30	E B 16	E B 16	E B 17	E B 16	E B 16	E B 16	E B 16	21	30	33	35	36	39	40	43	35	33	30	28	E B 16	E B 16	20	E B 16	E B 16
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	28	32	33	35	35	40	35	G 23	G 22	30	G 16	18	E B 16	E B 16	E B 16	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	16	26	31	33	35	35	35	36	34	31	26	20	E B 16	E B 16	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	E B 16	E B 16	21	28	32	34	37	39	37	38	35	33	30	24	16	E B 16	E B 16	E B 16	E B 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 16	G 24	G 29	G	G	G 34	G	G 34	32	G	25	G 18	E B 16	E B 16	E B 16	E B 16	E B 16

MAR. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

MAR. 2019 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	361	309	323	345	343	338	307	371	415	395	345	370	323	329	357	376	374	355	365	358	344	369	300	327
2	341	360	320	325	388	377	287	360	363	370	371	358	329	359	345	381	362	337	333	367	413	391	310	292
3	301	321	319	325	353	349	343	369	365	348	343	341	310	328	353	350	342	358	368	338	343	347	326	347
4	317	312	331	335	369	342	351	392	375	353	353	350	313	327	314	371	367	349	363	347	357	351	352	364
5	310	337	343	346	390	350	345	365	368	376	347	352	311	355	350	357	360	370	363	349	379	386	336	317
6	318	311	331	314	361	332	350	370	388	364	352	364	332	352	334	351	368	375	358	349	368	357	357	356
7	303	297	323	343	369	360	369	390	388	361	320	339	342	336	JR 295	339	344	339	349	366	377	369	326	326
8	309	313	304	316	373	397	B	379	377	375	366	311	322	341	331	330	337	347	347	356	372	361	335	311
9	320	316	314	314	346	395	373	407	386	378	314	342	300	322	326	340	348	337	331	367	369	367	327	321
10	317	313	341	354	370	371	330	397	400	361	353	318	279	314	319	326	329	342	347	354	378	360	320	305
11	329	333	347	341	384	387	336	384	380	366	343	321	318	336	321	332	329	366	371	357	355	346	307	311
12	303	318	346	357	400	300	336	386	386	364	334	343	312	337	325	323	313	311	317	R 358	340	318	331	382
13	317	326	321	322	359	326	332	387	386	391	339	359	352	310	296	322	333	JR 299	371	361	362	317	323	339
14	312	330	356	349	392	345	362	406	401	344	338	352	307	345	342	338	345	358	358	351	356	314	320	317
15	313	312	335	365	414	326	302	374	368	358	342	349	300	326	341	349	309	337	376	392	338	312	312	324
16	296	301	325	342	379	363	337	382	390	366	329	336	298	324	340	JR 324	320	351	353	328	385	289	292	312
17	350	315	318	305	352	328	313	373	393	328	326	338	357	297	332	337	333	JR 299	348	307	JR 290	295	322	352
18	334	332	336	324	332	318	318	353	363	355	345	343	333	343	348	312	JR 281	324	353	334	JR 327	R 285	310	310
19	314	337	342	353	363	354	375	394	371	334	328	304	323	352	JR 311	316	351	358	376	362	357	349	310	321
20	319	355	354	357	356	318	323	397	378	356	327	335	342	326	335	328	H 313	324	339	358	408	329	291	299
21	299	299	315	311	301	334	337	417	365	351	312	321	312	341	341	336	330	306	362	379	399	A	306	318
22	321	322	309	333	378	393	360	381	385	325	353	323	329	304	336	313	311	306	287	366	379	329	316	338
23	333	325	342	330	373	327	334	385	344	348	357	347	309	314	329	348	306	337	347	371	364	328	303	315
24	F 306	F 339	F 312	F 375	F 372	367	F 339	397	372	355	352	349	313	314	341	347	301	309	339	365	371	379	348	327
25	316	308	317	305	352	352	352	394	368	363	362	311	304	332	334	326	315	325	355	372	355	313	312	318
26	318	303	F 334	332	350	333	334	393	375	337	346	338	331	321	333	316	301	305	360	393	391	301	306	298
27	302	329	366	363	366	306	303	380	382	359	334	317	324	329	364	351	362	334	335	358	368	315	304	327
28	308	330	366	341	315	318	319	388	389	373	361	343	327	318	355	JR 275	JR 272	301	321	339	375	370	297	304
29	320	333	352	V 351	375	297	334	378	368	355	381	305	322	333	320	332	326	345	361	361	355	347	297	317
30	349	330	358	367	379	354	339	396	366	351	327	332	310	JR 323	329	JR 292	320	351	353	354	360	353	301	317
31	314	337	331	360	370	333	318	375	364	364	352	316	312	330	343	351	342	352	387	345	329	325	310	296
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31
MED	317	322	331	341	369	342	336	385	377	359	345	339	318	329	334	336	330	337	353	358	364	346	312	318
U Q	321	333	346	354	379	363	350	394	388	366	353	349	329	341	343	350	348	352	363	366	378	361	326	327
L Q	308	312	319	324	352	326	319	374	368	351	329	321	310	321	325	323	313	311	339	349	355	315	304	311

MAR. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	UL 417	399	410	398	383	L 381	L							
2										L 400	403	395	405	L 413	392	377	L							
3										UL 380	380	396	416	391	385	399	367	L						
4									L	UL 453	398	404	435	424	A 400	A	388	L						
5										L	384	402	394	407	399	387	L 394	L						
6										L 392	406	402	419	435	413	384	396	L	L					
7									L		UL 386	425	437	443	393	A	L 379	A						
8								448			L 394	400	423	427	382	373	L	L						
9										UL 434	UL 414	A	A	437	A	375	378	A						
10								442		UL 431	419	426	A	A 394	406	380	374	L						
11									L	UL 402	L 421	405	433	436	383	403	393		410					
12										UL 401	UL 387	407	425	411	404	379	390	L						
13										L	395	405	431	422	423	361	384	L	L					
14									L	L	405	405	387	428	429	L 399	378	L	L					
15										UL 377	388	393	418	433	387	385	L 390	L 376						
16								483		UL 402	L 396	413	414	439	372	381	377	L 376						
17								484	L	L 375	368	423	403	L 376	383	369	377	L						
18									L	L	382	379	393	402	399	379	L 384	L						
19										UL 372	385	409	412	407	395	421	393	L						
20										UL 380	373	372	412	413	415	393	382	L	L					
21											373	386	417	432	451	380	406	390	382					
22									L	UL 372	390	401	415	449	425	379	368	UL 380						
23											369	387	398	424	441	420	390	UL 377	L 381	L				
24										UL 384	407	426	442	435	422	405	L 381	L 378						
25								L 431			L	UL 420	A	431	443	392	380	L 374	L					
26										UL 377	404	405	413	430	420	391	379	361						
27									L	L 386	406	412	425	430	386	400	UL 402	UL 373						
28									L	UL 400	422	428	428	449	A	387	401	L	L					
29									L	376	407	396	A	A	A 382	405	378	L 369	L					
30										L 371	394	402	409	A	A	386	L 388	L						
31									L	379	386	432	443	A 385	404	401	393	L 382						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								5		23	31	30	27	29	28	29	28	11	1					
MED								448		UL 380	394	405	418	428	399	387	383	L 376	410					
U Q								484		UL 401	406	417	431	436	418	400	392	L 381						
L Q								436		L 375	386	399	410	407	384	379	378	L 373						

MAR. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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										216	284	238	304	274	244	232	238							
2										234	242	248	302	254	268	224	244							
3										264	266	254	282	256	232	246	242	214						
4									212	238	274	254	316	262	278	224	236	240						
5										238	268	256	314	246	252	246	240	228						
6										252	282	252	278	254	268	240	232	228	230					
7									214		312	276	246	248	264	254	252	248						
8								208		242	254	348	300	264	266	276	266	250						
9										238	354	276	296	254	250	248	230	226						
10								190		256	274	320	350	288	264	240	248	236						
11									228	238	274	308	294	264	266	254	248		204					
12										250	286	286	326	264	268	268	242	244						
13										228	288	250	270	284	302	258	234	244	212					
14									202	270	292	254	292	246	268	266	264	236	222					
15										268	276	260	310	272	246	246	282	248						
16								196		258	310	284	328	276	242	252	236	226						
17								216	220	306	290	264	238	312	272	254	242	250						
18									246	252	262	262	274	258	244	228	258	248						
19										294 L	286	316	296	240	226	282	246	232						
20										260	288	270	250	264	254	262	246	260	238					
21										278	294	276	286	244	236	254	242	250						
22									208	306	264	278	258	302	254	260	262	250						
23										274	260	252	292	294	272	246	292	254	240					
24										266	278	276	308	284	254	238	284	272						
25								198		248	272	350	366	270	248	250	260	254	224					
26										298	286	300	284	286	266	272	274	274						
27									232	260	312	328	284	276	238	236	260	278						
28									232	250	268	286	298	292	246	268	312	284	264					
29									248	258	230	380	306	266	266	268	278	250	228					
30										268	292	258	286	256	244	262	250	242						
31									246	248	256	298	300	262	244	260	270	248						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								5	11	30	31	31	31	31	31	31	31	28	9					
MED								198	228	257	278	276	296	264	254	254	248	248	228					
U Q								212	246	268	290	300	308	284	268	262	266	252	239					
L Q								193	212	242	266	254	282	254	244	240	242	236	217					

IONOSPHERIC DATA STATION Okinawa

MAR. 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	212	270	258	216	226	226	288	216	196	170	H 166	160	180	170	210	212	198	210	218	206	194	184	248	240
2	220	210	258	246	198	210	318	218	194	188	170	176	170	164	190	192	210	206	218	206	182	176	276	308
3	298	250	232	256	218	220	226	214	200	182	184	182	174	200	218	196	208	202	212	206	200	222	224	224
4	224	256	232	238	218	232	230	190	192	174	164	190	160	164	E A 214	A	194	200	210	208	190	204	208	200
5	272	242	216	238	198	238	270	212	216	210	192	180	188	182	176	228	192	212	224	202	188	180	220	250
6	262	274	248	268	216	242	236	198	202	200	174	198	172	172	200	202	192	206	208	208	190	200	206	212
7	290	298	258	224	210	218	218	192	196	198	192	182	168	158	196	A	A 236	A	A 246	206	194	192	242	238
8	288	286	296	282	206	186	B	158	202	192	214	206	172	166	218	252	A	A	234	220	194	184	226	274
9	270	258	272	268	226	188	198	186	192	182	174	A	A	162	A	232	226	A	218	188	186	204	226	E A 264
10	E A 292	264	236	220	200	200	252	174	192	174	174	170	A	A 242	172	182	204	198	210	198	182	182	230	232
11	238	234	202	208	204	196	232	208	200	188	178	170	164	170	232	198	196	226	186	186	194	204	276	278
12	288	266	228	194	192	288	288	204	218	196	212	194	178	174	190	210	204	230	222	196	192	222	236	190
13	226	240	250	258	216	242	228	196	214	208	198	186	174	172	158	222	208	202	186	198	190	230	244	232
14	242	250	214	228	196	226	244	190	178	228	200	190	228	190	186	A 206	240	224	192	210	186	214	262	270
15	276	260	240	206	188	286	326	208	214	200	182	184	188	160	222	214	198	232	208	186	218	234	270	228
16	276	276	248	226	200	204	242	142	212	188	188	172	216	168	236	216	214	212	216	198	180	196	292	262
17	236	260	252	274	234	232	252	144	208	218	216	172	174	170	180	188	200	206	228	198	188	208	210	210
18	214	240	232	252	224	272	274	220	222	216	204	204	196	180	182	210	200	200	220	212	194	194	280	278
19	274	248	234	216	216	230	222	204	186	182	188	194	172	168	212	182	198	210	216	194	194	198	250	258
20	268	224	214	214	234	296	286	202	204	184	212	240	176	180	184	168	226	216	220	204	176	184	272	292
21	278	250	246	230	204	244	242	190	204	192	196	192	180	164	232	198	208	224	220	194	180	A	E A 292	274
22	248	248	252	230	194	182	204	192	188	186	180	218	184	166	160	190	236	210	210	198	192	200	246	234
23	226	246	236	242	200	242	258	202	202	216	212	206	186	168	172	178	200	204	212	200	186	206	266	260
24	Q 280	216	Q 224	202	194	246	266	202	210	196	186	182	168	164	164	176	198	212	228	216	192	200	208	276
25	268	280	272	272	216	230	214	186	196	200	216	200	A	204	164	208	192	204	216	194	186	240	278	270
26	258	Q 288	242	Q 228	212	244	244	200	212	208	188	178	172	186	182	184	198	186	222	194	174	266	290	298
27	264	236	210	198	194	264	306	212	208	202	182	178	182	168	222	190	176	238	232	202	184	226	272	240
28	264	226	206	204	282	274	276	212	212	198	172	196	202	176	A	224	210	240	230	224	190	194	248	292
29	266	224	208	184	192	286	252	214	220	200	190	226	A	A	E A 242	A 190	218	206	222	196	192	194	282	264
30	228	248	228	220	206	216	246	204	218	212	210	192	212	A	A	212	204	222	230	198	186	E A 222	282	288
31	270	252	240	216	200	262	276	214	202	188	196	178	170	A	194	188	188	210	212	206	230	222	248	270
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	31	31	31	31	30	27	28	28	29	30	28	31	31	31	30	31	31
MED	265	250	236	228	206	232	249	202	202	196	188	188	176	170	190	198	202	210	218	200	190	201	248	261
U Q	276	266	252	252	218	262	276	212	212	208	204	198	188	180	218	213	210	223	224	206	194	222	276	276
L Q	236	240	224	214	198	216	230	190	196	186	178	178	172	165	178	188	198	204	210	196	186	194	226	232

IONOSPHERIC DATA STATION Okinawa

MAR. 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	A	106	102	100	100	100	100	100	100	A	A	B				
2								B	106	102	102	104	104	100	100	102	102	A	A	B				
3								B	A	A	102	102	102	102	102	102	102	A	A	B				
4								B	102	102	102	102	A	A	A	A	A	A	118	B				
5								B	106	106	A	102	100	100	100	A	100	A	B	B				
6								B	100	100	100	100	100	A	102	102	102	104	A	B				
7								B	100	100	100	98	98	104	102	112	102	106	102	A				
8								B	100	100	100	104	104	104	104	112	110	104	A	A				
9								A	100	100	100	100	100	100	100	100	100	104	A	B				
10								A	104	100	100	100	100	100	100	100	100	104	A	B				
11								A	104	106	106	100	A	A	A	A	102	102	102	B				
12								A	102	102	106	104	102	104	104	A	A	A	A	A				
13								124	102	102	102	102	100	100	100	100	100	100	A	B				
14								A	96	100	100	100	100	A	A	A	104	104	112	B				
15								A	102	102	100	100	100	100	100	100	A	102	A	B				
16								B	104	104	102	A	102	102	A	A	A	A	A	B				
17								B	104	104	106	104	102	A	A	A	A	A	A	B				
18								A	100	96	A	98	98	A	A	102	102	A	A	B				
19								126	100	100	100	100	A	102	102	102	102	102	A	B				
20								124	102	102	102	100	100	A	A	A	100	100	102	B				
21								A	A	102	100	100	100	100	100	100	100	102	106	A				
22							B	118	104	104	104	104	104	104	104	A	104	A	A	B				
23							B	A	106	102	100	100	100	100	100	A	A	A	A	B				
24							B	A	100	102	102	102	A	102	102	102	102	A	A	A				
25							B	A	102	102	102	100	100	100	100	100	100	104	104	B				
26							B	124	98	98	98	98	98	A	104	104	104	104	106	B				
27							B	106	100	100	102	100	A	A	A	A	A	A	A	B				
28							B	A	100	100	100	100	100	100	100	102	102	A	102	A				
29							B	110	104	100	100	100	100	104	100	102	102	A	102	B				
30							B	110	A	100	100	100	100	100	102	102	102	102	A	B				
31							B	102	100	A	A	A	A	A	A	104	104	A	110	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								9	27	29	28	29	25	21	22	20	24	15	11					
MED								118	102	102	101	100	100	100	100	102	102	104	104					
U Q								124	104	102	102	102	102	103	102	102	102	104	110					
L Q								108	100	100	100	100	100	100	100	100	100	102	102					

MAR. 2019 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

MAR. 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	82	84	88	94	90	B	B	B	158	92	90	G	G	G	164	176	G	142	104	98	94	B	B	B
2	B	B	B	96	92	92	92	100	G	G	G	G	G	G	G	108	106	102	122	82	94	94	92	92
3	86	88	88	86	86	90	90	90	106	106	G	G	G	160	158	172	G	156	192	B	B	92	90	88
4	88	B	B	B	B	B	90	108	G	G	G	G	108	108	154	130	102	100	188	96	B	B	92	92
5	B	116	B	92	92	92	B	B	G	104	104	G	G	G	G	168	104	100	168	B	B	B	B	B
6	B	B	90	B	B	B	B	94	122	106	106	106	106	106	164	162	156	134	100	98	B	B	96	B
7	B	B	94	B	98	B	B	B	128	120	108	108	104	90	162	136	130	132	100	98	96	96	96	94
8	B	B	B	B	B	B	88	88	128	124	110	106	108	114	166	148	132	126	106	94	94	100	94	B
9	B	B	B	B	B	B	B	120	130	124	136	106	184	116	126	138	124	112	102	100	94	94	94	88
10	86	90	B	B	B	B	98	136	G	120	G	G	160	162	106	106	G	G	122	B	B	B	B	B
11	B	118	B	82	B	88	88	134	118	108	108	96	106	104	160	176	G	194	G	96	96	138	96	B
12	B	82	90	88	88	B	B	144	162	152	176	110	106	110	100	108	102	94	94	92	94	B	B	B
13	B	B	96	B	B	B	B	G	178	120	G	G	G	G	G	156	128	120	108	B	B	B	B	84
14	B	B	B	B	B	B	B	132	148	170	150	116	160	138	104	180	174	160	G	B	B	B	102	B
15	82	82	B	B	88	B	B	132	144	G	G	G	168	G	156	142	140	110	104	102	104	100	98	B
16	B	B	B	94	90	102	B	G	186	134	134	100	156	144	152	142	140	138	88	116	90	B	B	B
17	B	86	B	B	B	B	B	G	170	176	160	G	G	98	100	96	96	104	92	84	B	84	B	B
18	B	B	B	92	B	B	B	128	132	174	104	G	104	104	104	G	96	92	88	88	90	82	B	B
19	B	82	B	B	90	96	96	92	136	G	G	110	102	G	162	G	166	156	122	96	B	86	B	B
20	B	B	B	B	B	B	B	G	128	118	156	184	144	100	112	116	190	140	140	86	B	B	B	B
21	B	B	B	B	B	B	B	118	128	114	G	116	108	G	152	152	152	144	116	90	B	132	108	92
22	B	B	B	B	B	B	B	168	162	G	148	188	G	G	G	100	198	98	128	100	96	B	B	90
23	B	B	B	B	94	B	B	116	142	186	132	116	108	110	116	114	110	108	102	100	B	B	B	B
24	B	90	B	B	100	B	G	136	162	166	138	112	102	110	114	108	88	166	106	102	102	94	98	B
25	B	B	B	B	B	92	92	106	G	166	176	170	162	124	120	164	G	G	G	100	98	98	94	94
26	92	102	B	B	94	94	B	156	164	146	140	124	112	108	G	G	G	G	G	B	84	84	B	B
27	B	B	B	B	B	B	B	G	G	124	106	108	108	110	166	104	104	190	92	94	92	92	B	B
28	B	B	B	B	92	92	92	132	134	132	156	138	118	118	138	118	168	180	172	110	90	90	90	90
29	90	B	B	B	B	B	94	154	154	134	170	168	128	116	120	112	104	138	142	122	B	94	144	114
30	104	98	B	B	B	B	B	154	90	176	142	146	142	126	118	132	132	118	100	96	96	94	B	B
31	84	84	B	B	B	B	B	138	134	98	98	98	98	160	132	90	88	88	86	80	80	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	13	6	8	13	9	10	23	25	26	23	21	24	23	26	28	25	28	27	25	18	18	15	11
MED	86	88	90	92	92	92	92	132	136	124	136	112	108	110	135	134	128	129	106	96	94	94	96	92
U Q	91	100	94	94	94	95	94	138	162	166	156	142	150	126	160	159	154	150	128	100	96	98	98	94
L Q	83	83	88	87	89	91	90	106	128	114	106	106	106	106	114	108	103	103	100	91	90	90	92	88

MAR. 2019 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	F3	F1	F1	F1	F1				HC11	L2	L1				H1	H1		H1	C2	L1	F1			
2				F1	F1	F2	F2	C1								C1	C1	C1	CL11	L1	F1	F1	F2	F1
3	F2	F3	F1	FQ21	F2	FQ11	F1	L1	C1	C1				H1	H1	H1		HC11	HC12			F4	F1	F1
4	F1						F1	C1					C1	C1	HC11	HC11	CH11	C1	HC11	L1			F1	F1
5		F1		F1	F1	F1				C1	C1					HC11	C1	C1	H1					
6			F2					L1	C1	C1	C1	C1	C1	C1	HC11	HC11	H1	H1	L1	L1			F1	
7			F1		F1				C1	C1	C1	C1	C1	L1	H1	HL23	HL22	H2	C8	L3	F1	F1	F2	F1
8							F4	L1	C1	C1	C2	C2	C1	C1	HC11	HC21	HC11	C3	C4	L6	F3	F1	F2	
9								C1	H1	C1	H1	CC21	HC11	C1	C2	H1	C1	C2	C3	C1	F1	F3	F3	F5
10	F8	F2					F1	H1		C1			HC11	HC11	C1	C1			C2					
11		F1		F1		F3	F2	H2	C1	C2	C1	LC11	C1	C1	HC11	HC11		H1		L1	F1	FF11	F1	
12		F2	F1	F2	F1			H1	H2	H1	HC11	C1	C1	C1	C1	CQ11	C2	L3	L3	L8	F3			
13			F1						H1	C1						H1	C1	C1	C1					F1
14								H1	H1	H1	H1	C1	HC11	HC11	C1	HC11	H1	H1					F1	
15	F1	F1			F1			H4	H2				H1		H1	HC11	HC11	C3	C4	C1	F1	FF11	F3	
16				F1	F1	F1			H1	H1	H1	C1	H1	HC11	HC11	HC11	HC11	HL12	LH31	C1	F1			
17		F1							H1	H1	H1			L1	L1	L2	L2	CL12	L6	L1		F1		
18				F1				C1	C1	H1	C1		C1	C1	C1		L2	L2	L3	L1	F1	F1		
19		F1			F3	F1	F1	L1	H1			C1	C1		H1		H1	H1	C1	L1		F1		
20									C1	C1	H1	H1	H1	L1	C1	C1	H1	H1	H1	L1				
21								C2	C2	C1		C1	C1		H1	H1	HL11	H2	CL31	L3		FF42	F2	F2
22								H1	HC11		H1	H1				C1	H1	L1	CL11	L1	F3			F2
23					F1			C2	HL11	HH11	H1	C1	C1	C1	C1	C1	C2	C2	CH21	C1				
24		F1			F1			H1	H1	H1	H1	C1	C1	C1	C1	C1	L1	HL12	CL21	CL71	FF11	F2	F1	
25						F1	L1	C1		H1	H1	H1	H1	C1	C1	H1				L1	F1	F3	F2	F1
26	F1	F1			F1	F2		H2	H1	H1	H1	C1	C1	C1							F1	F2		
27										C1	C1	C1	C1	C1	HC11	C1	C1	HC12	L4	L3	F3	F1		
28					F2	F1	L1	H2	H1	H1	H1	H1	C1	C1	HC21	C2	H1	HC21	H1	CL53	F5	F3	F1	F3
29	F3						L1	H1	H1	H1	H1	H1	C1	C1	C1	C1	C2	HC11	H1	HC11		F1	F1	FF22
30	F4	F1						H1	LH21	HH11	H1	H1	H1	CC11	C2	H1	H1	C1	C5	L3	F1	F5		
31	F1	F1						H1	H1	L1	L1	L1	L1	HL11	HL11	L1	L1	L3	L1	L2	F1			
	00	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																								

MAR. 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

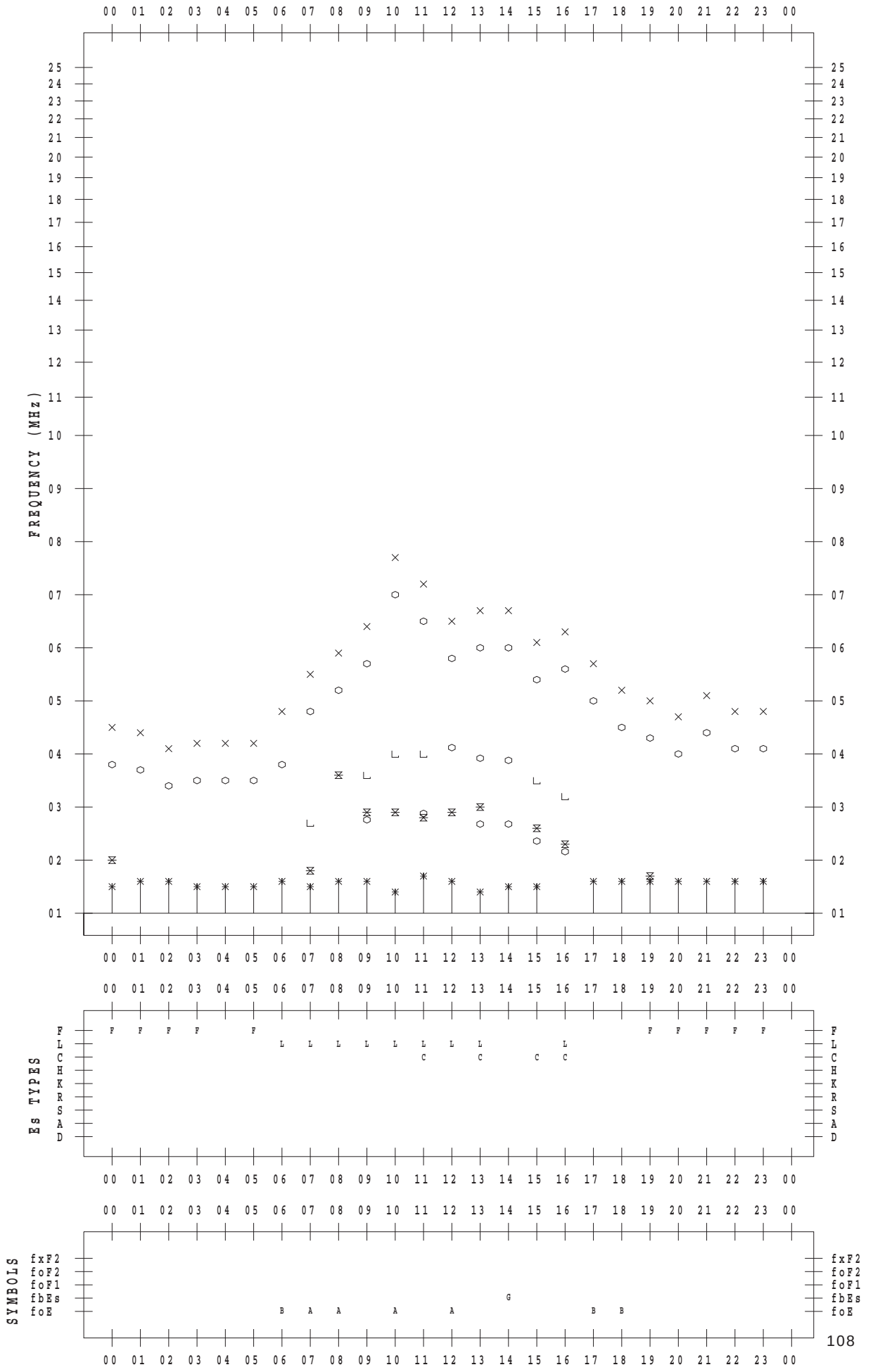
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 1

135 °E MEAN TIME



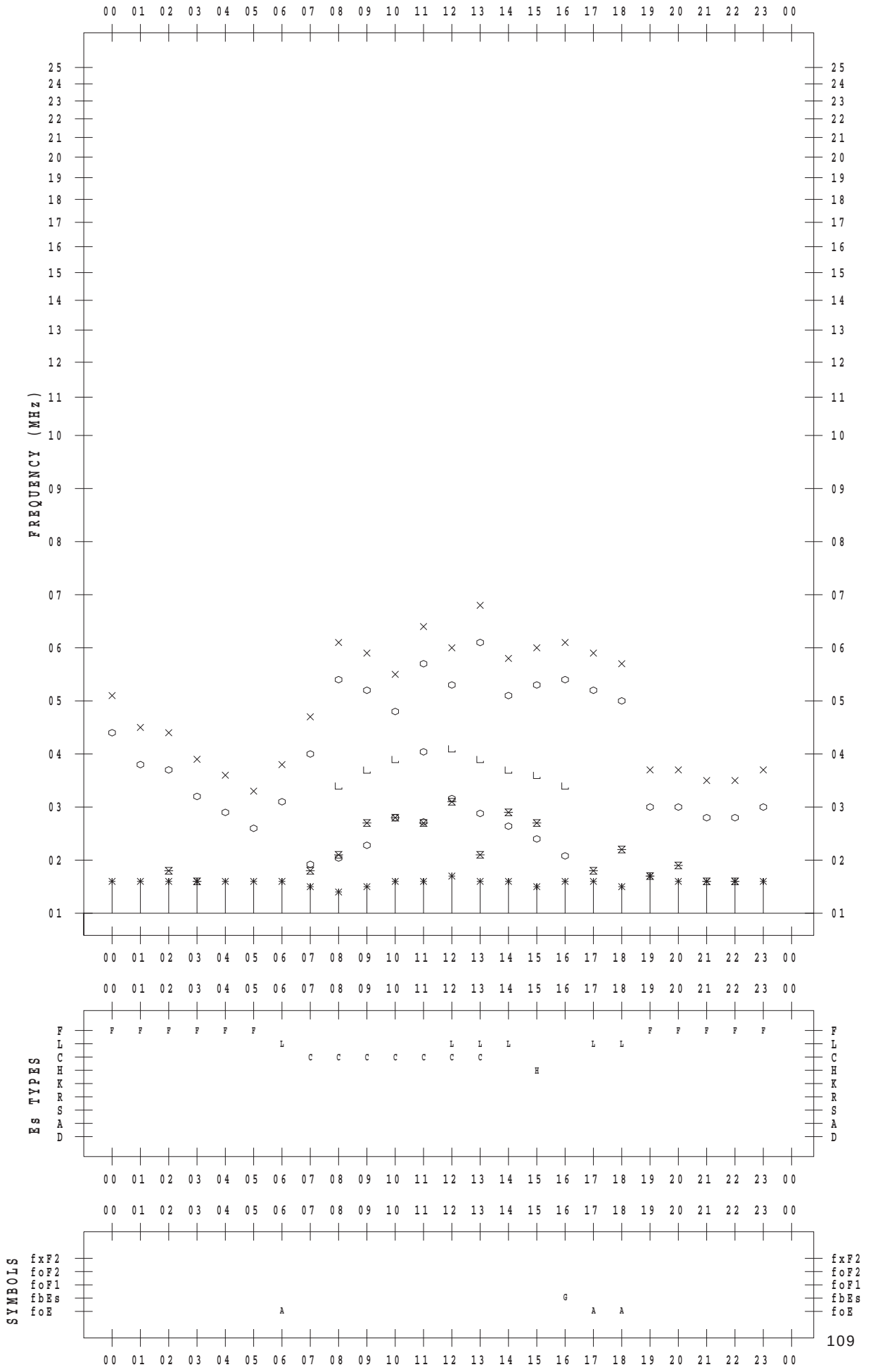
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 2

135 °E MEAN TIME



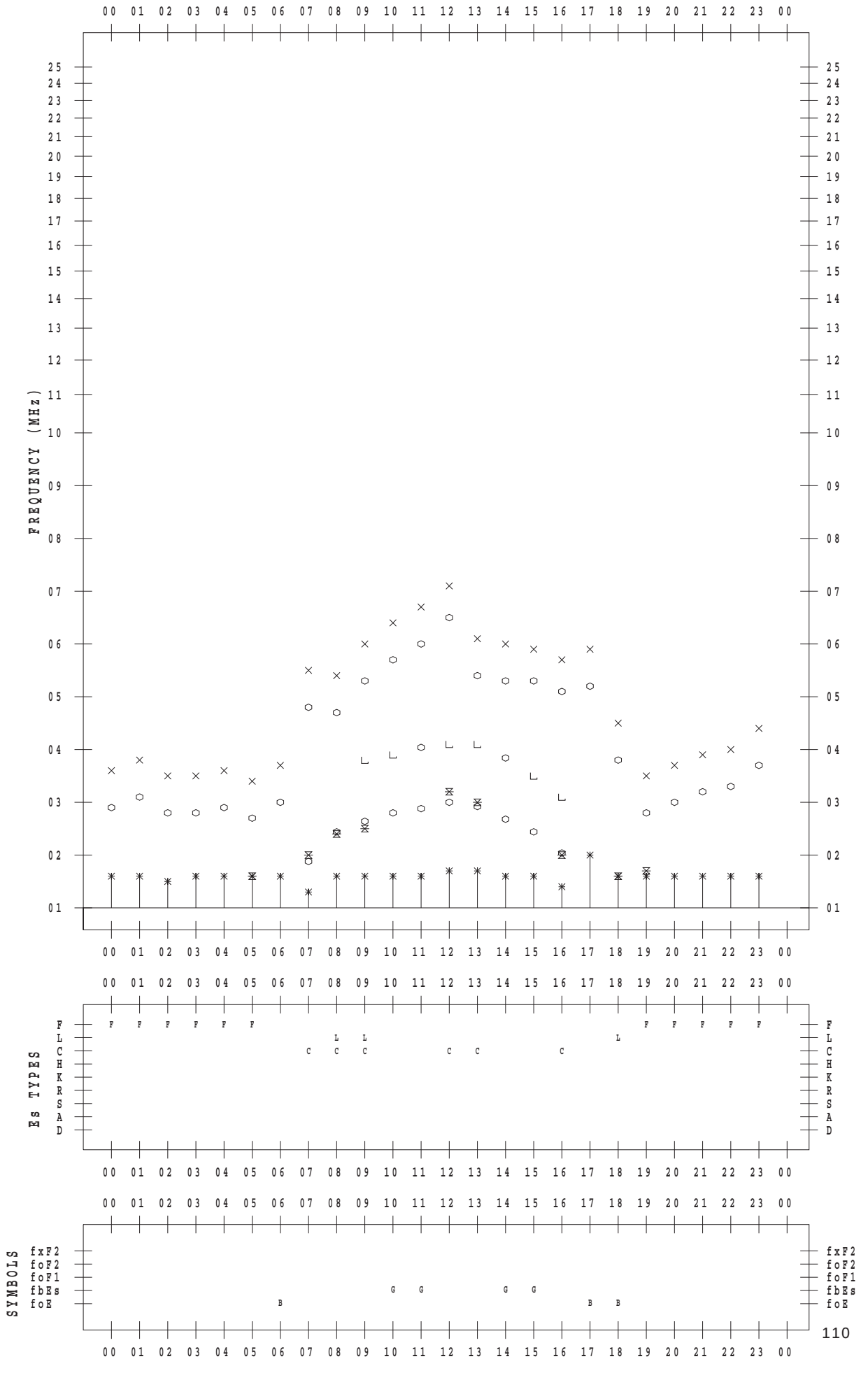
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 3

135 °E MEAN TIME



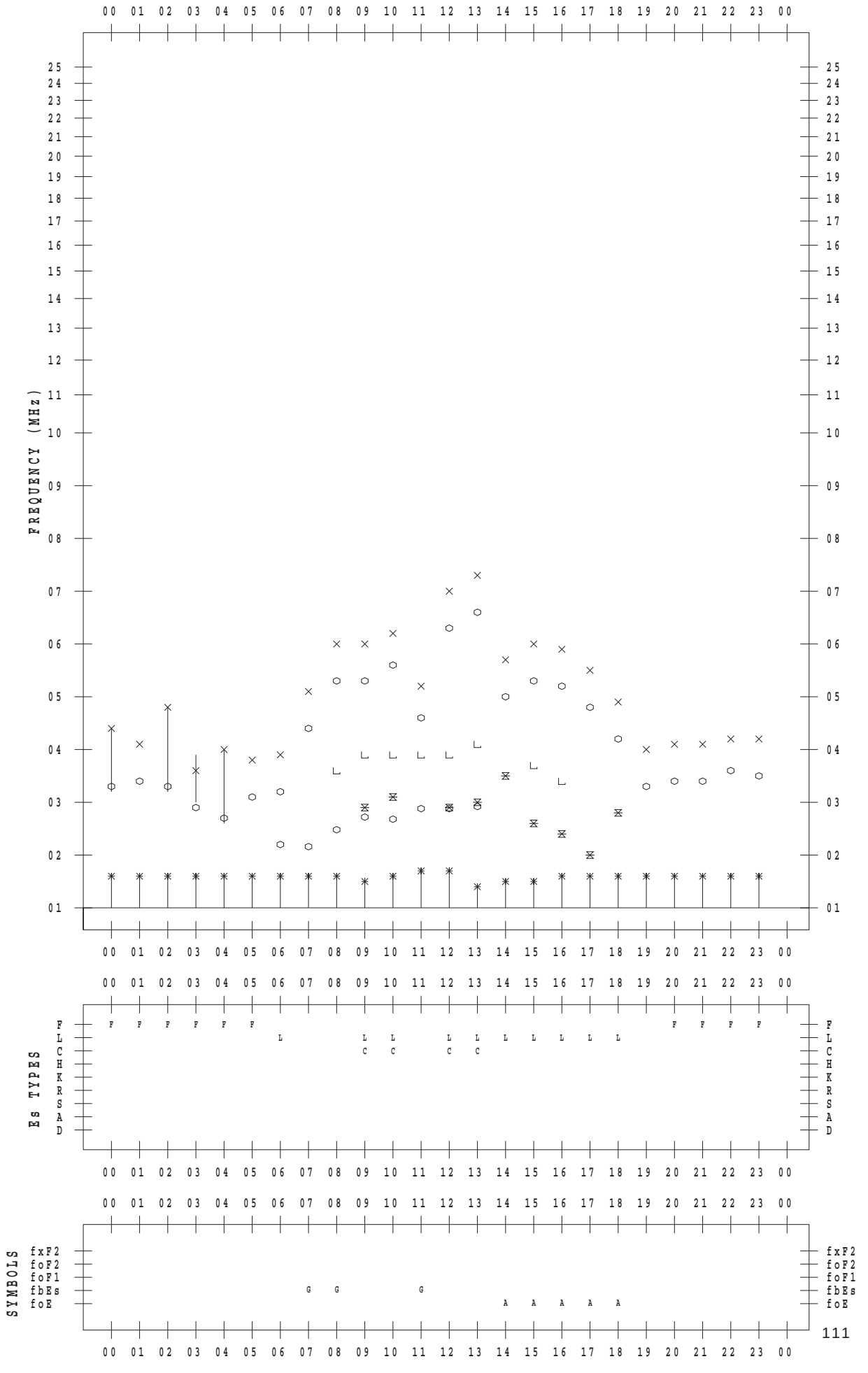
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 4

135 °E MEAN TIME



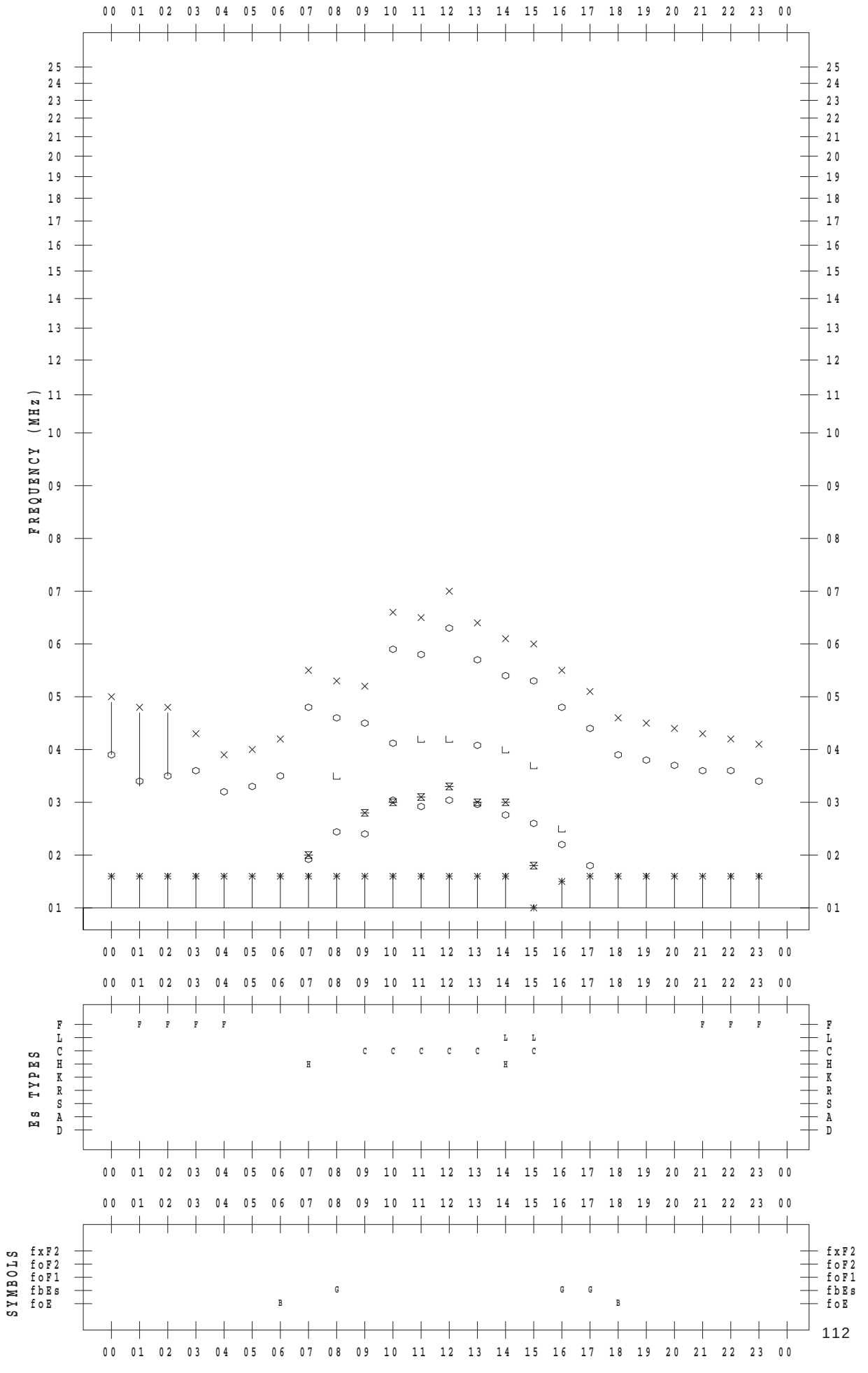
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 5

135 °E MEAN TIME



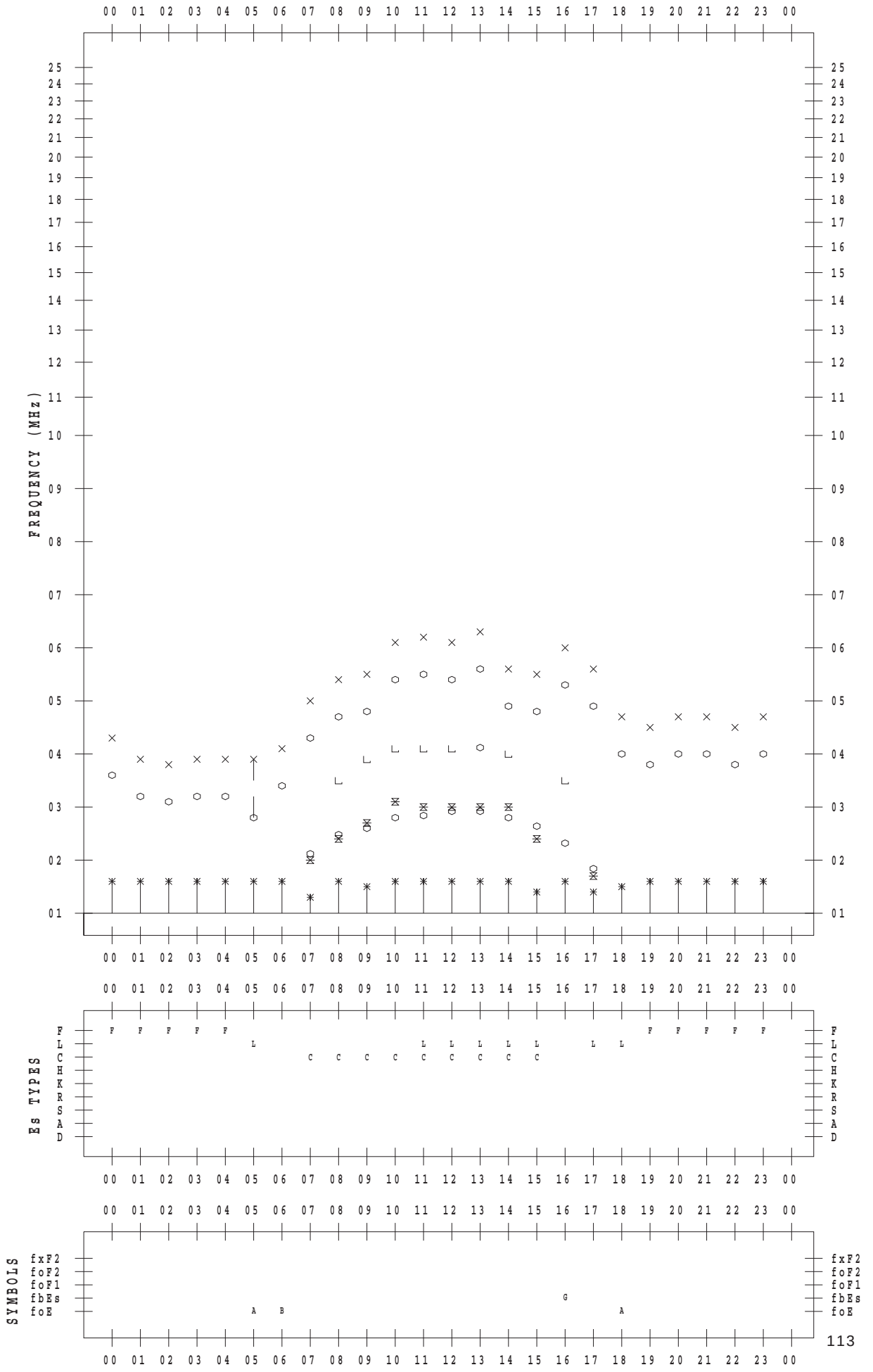
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 6

135 °E MEAN TIME



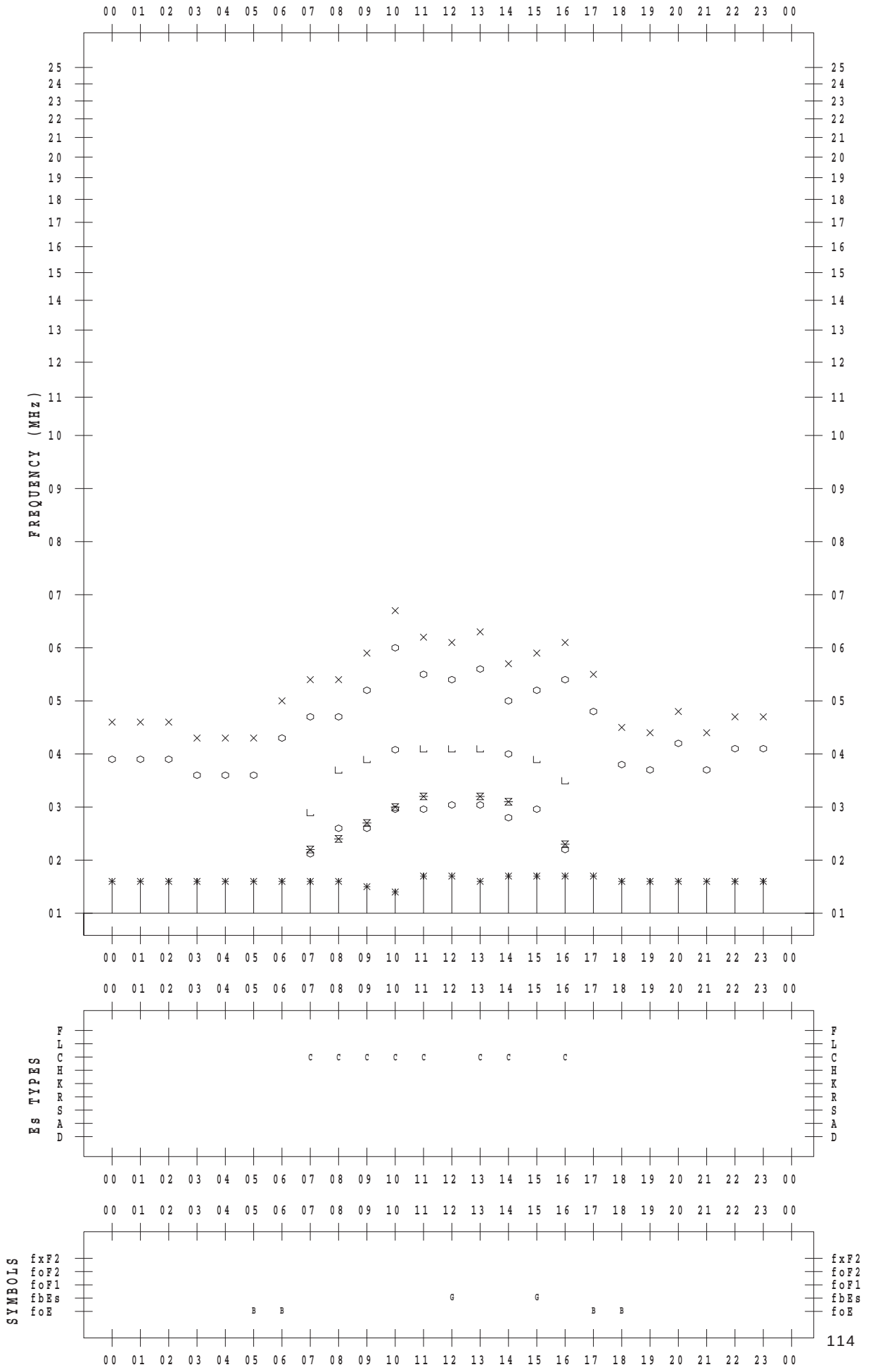
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 7

135 °E MEAN TIME



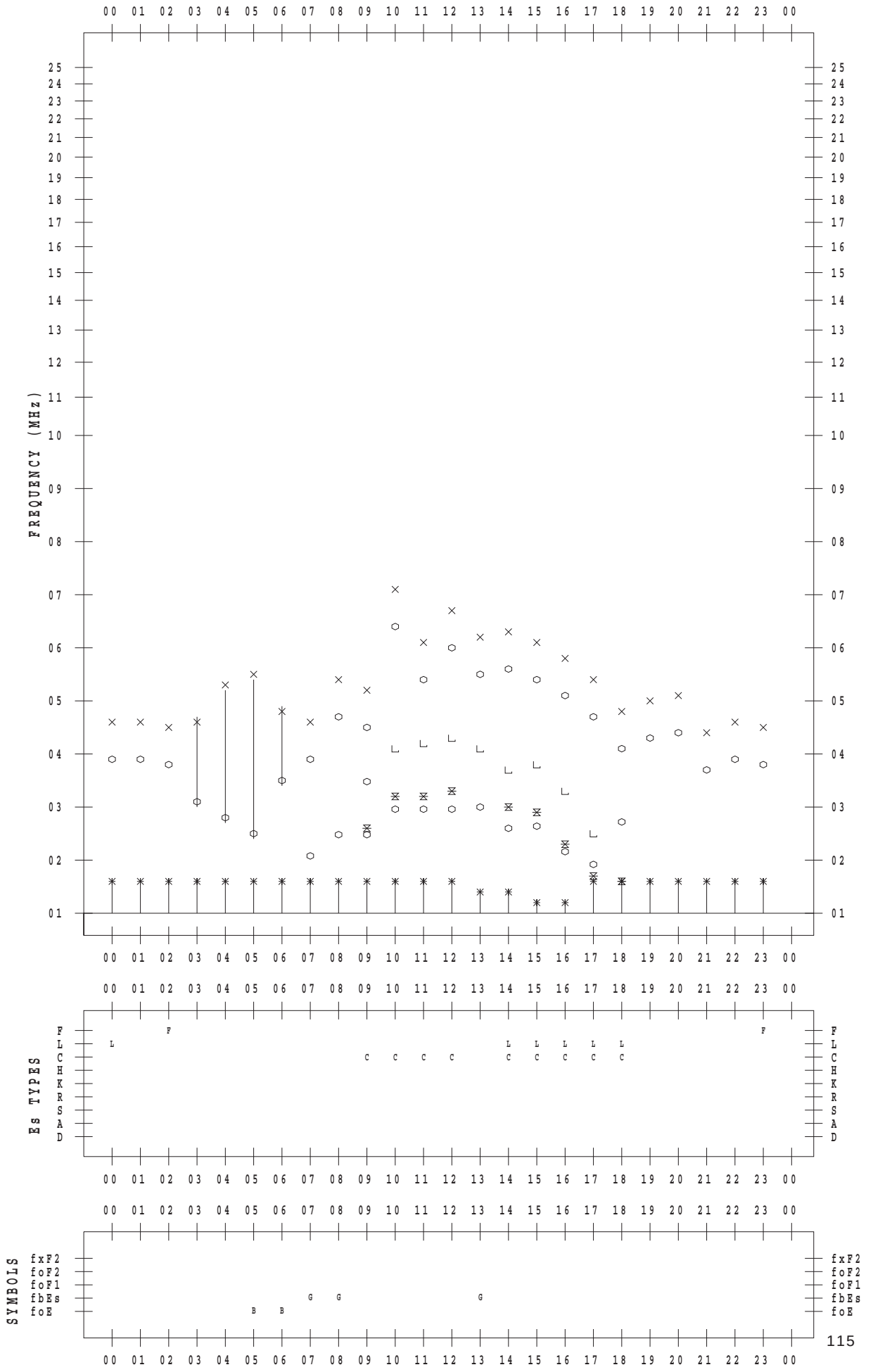
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 8

135 °E MEAN TIME



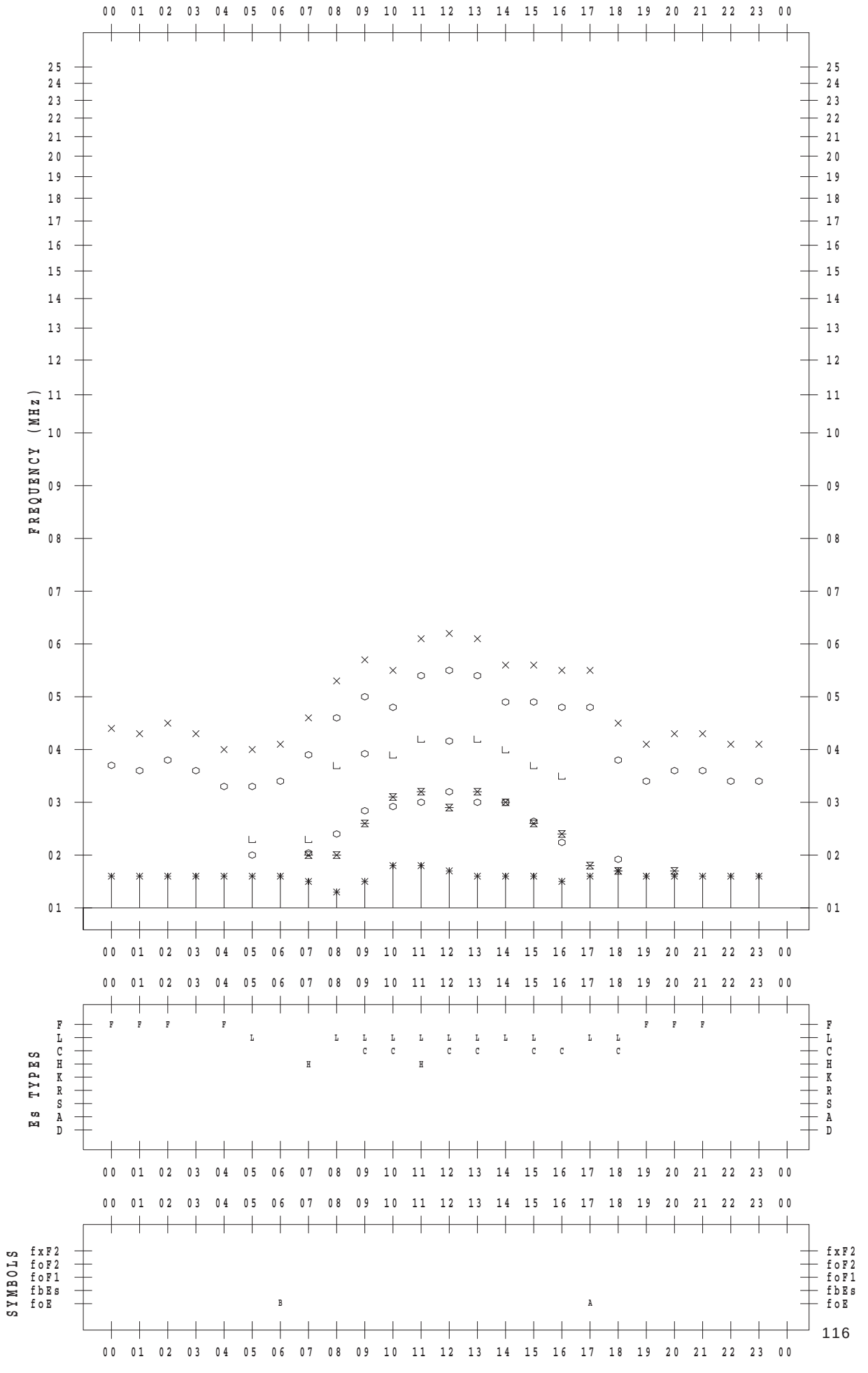
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/ 9

135 °E MEAN TIME



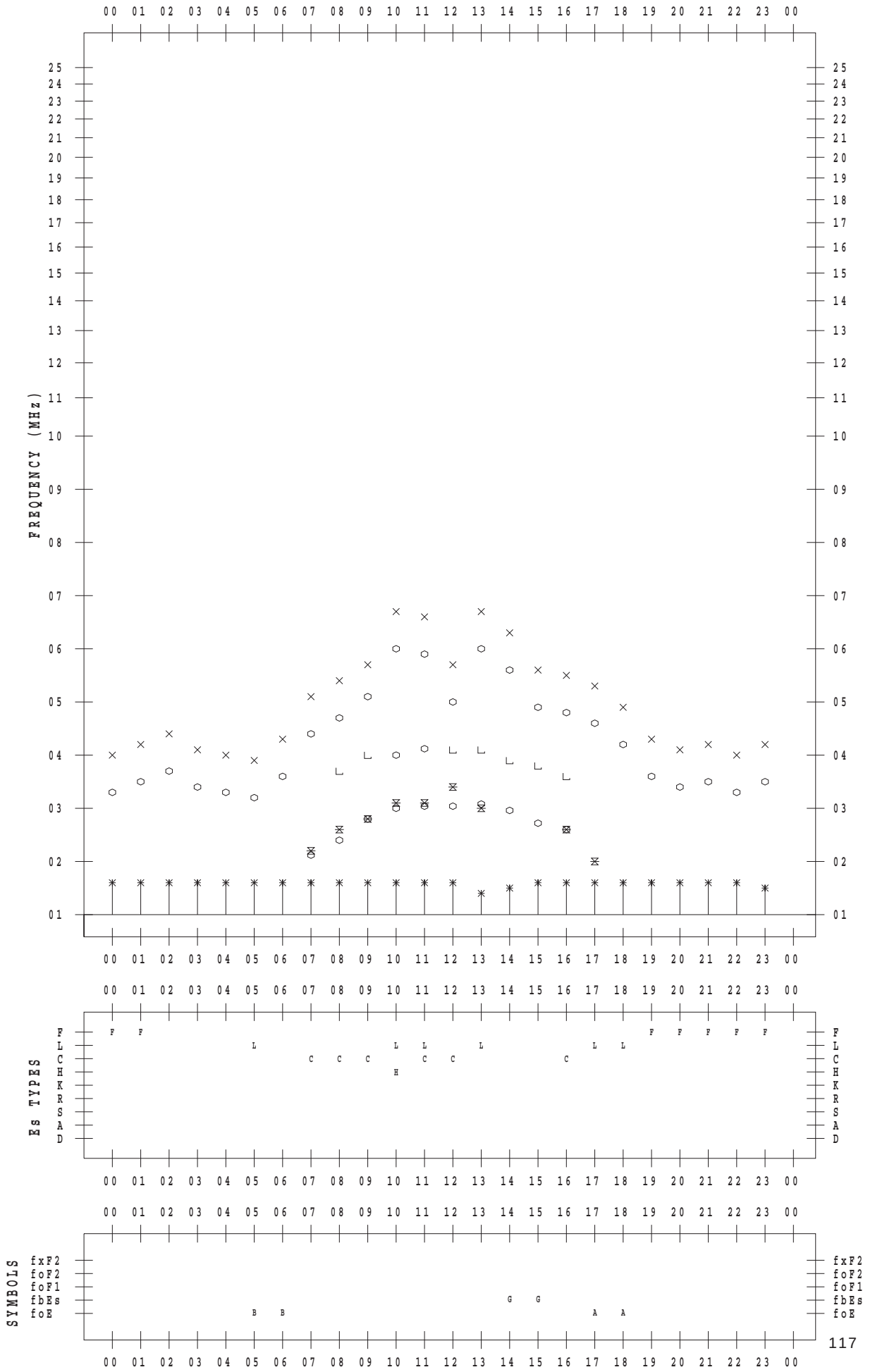
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/10

135 °E MEAN TIME



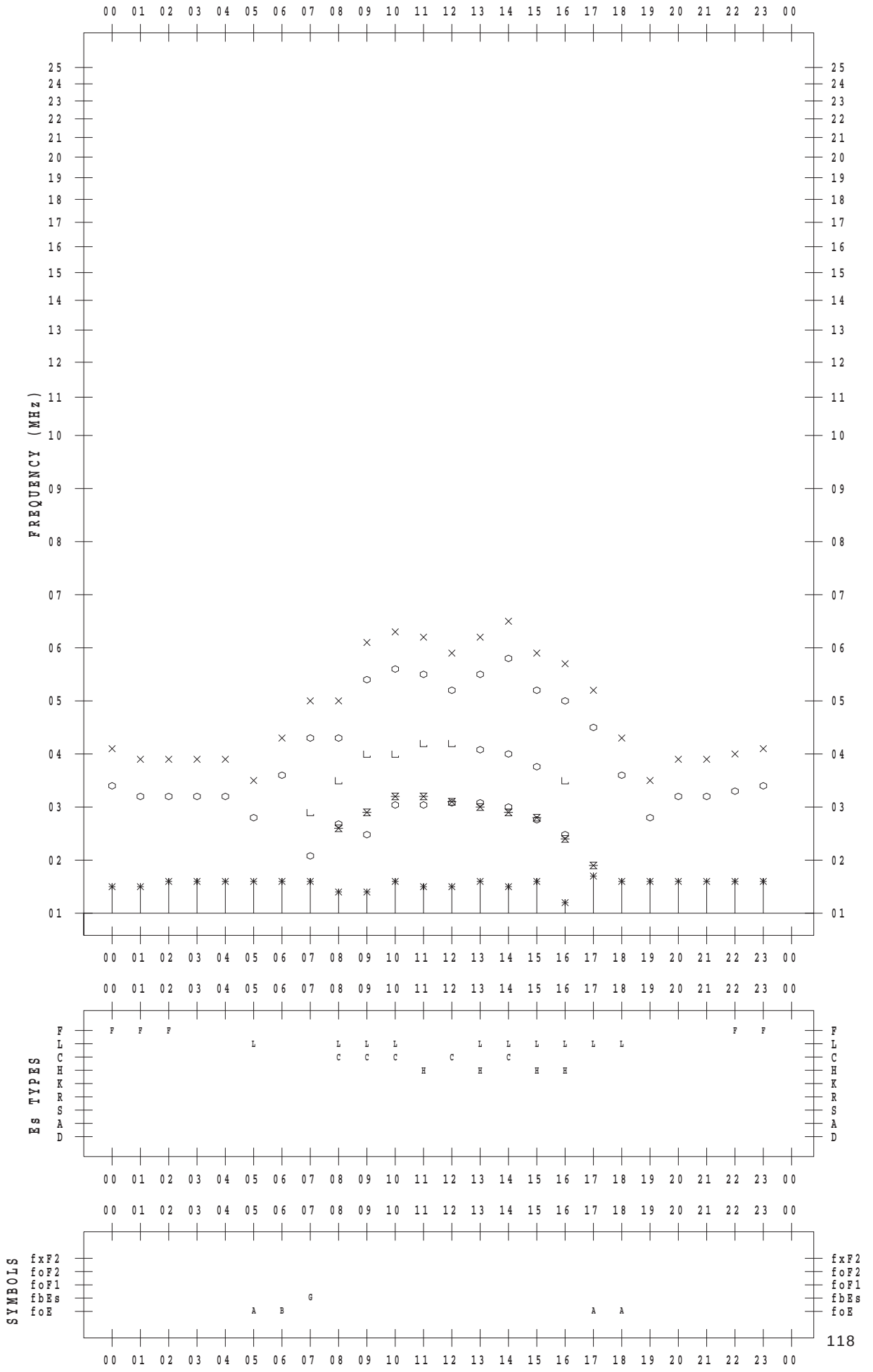
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/11

135 °E MEAN TIME



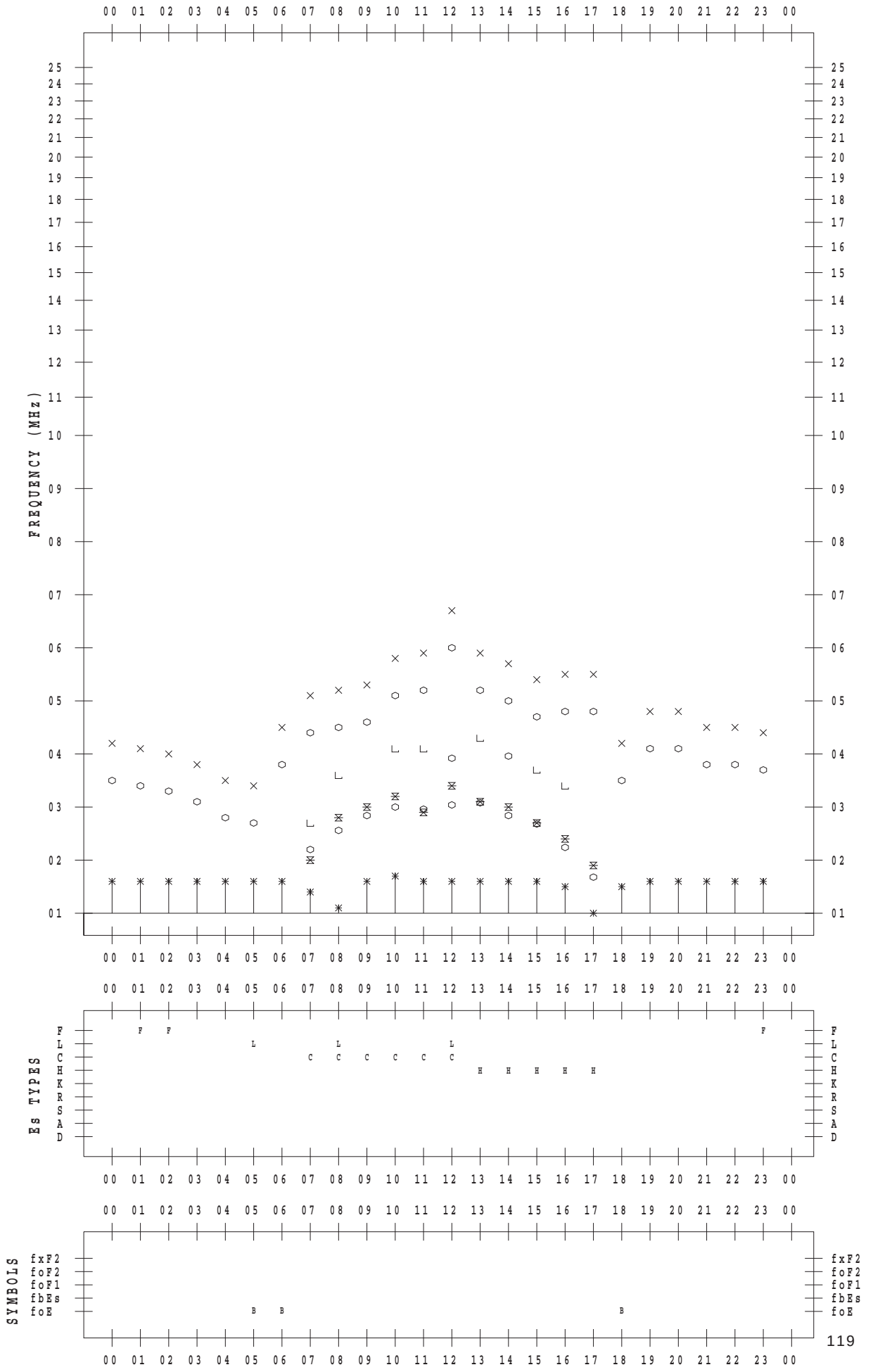
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/12

135 °E MEAN TIME



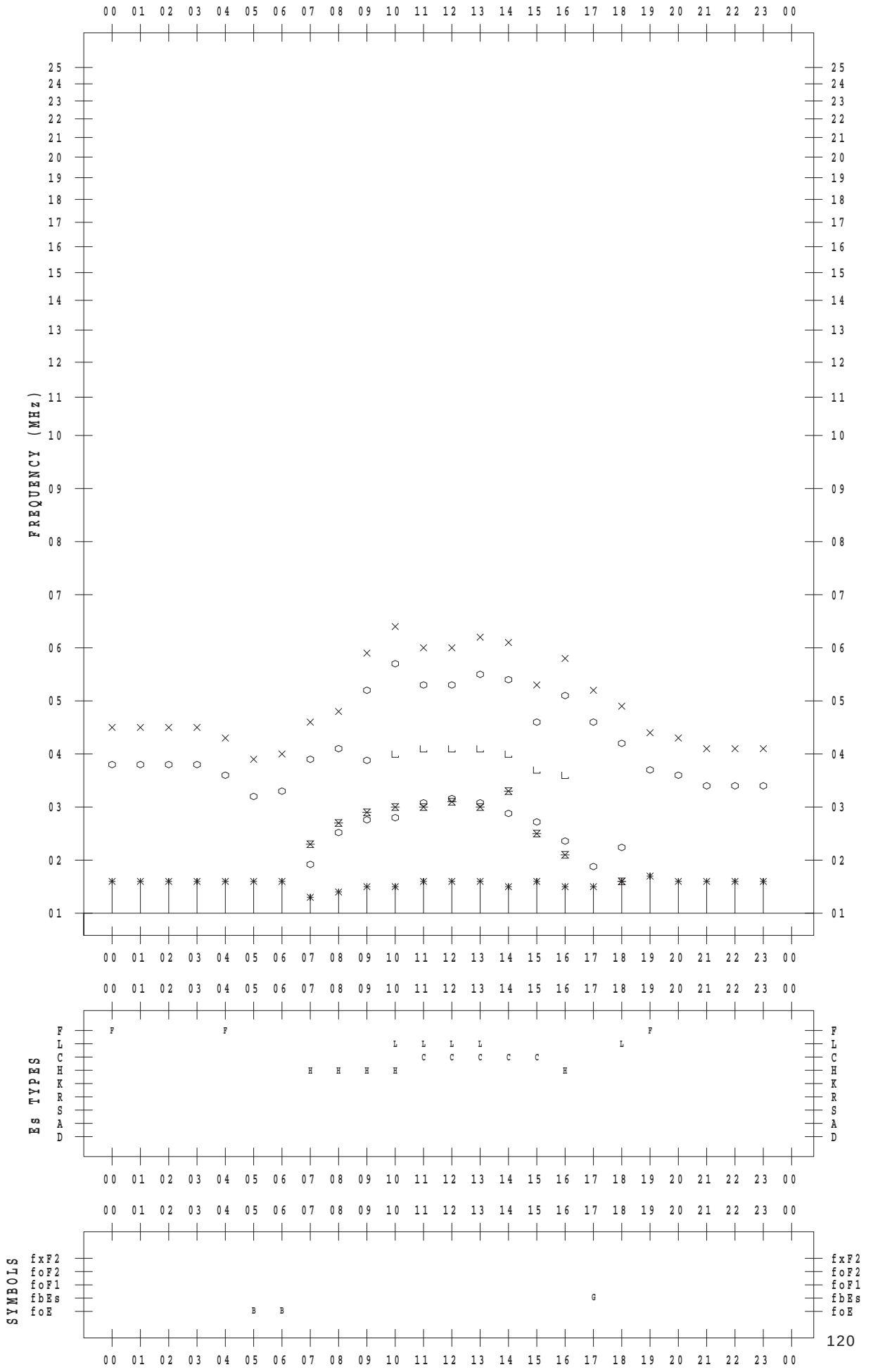
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/13

135 °E MEAN TIME



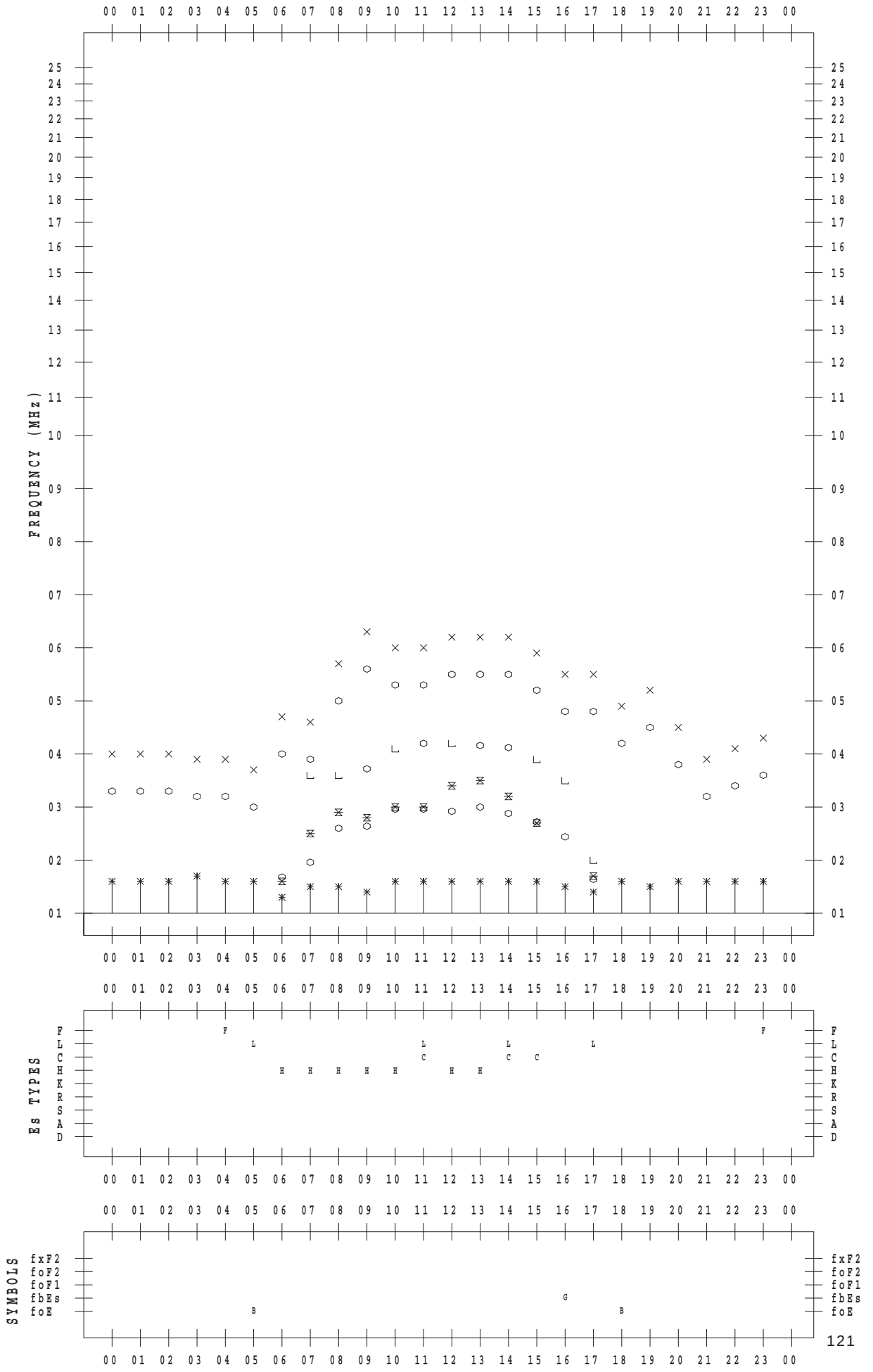
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/14

135 °E MEAN TIME



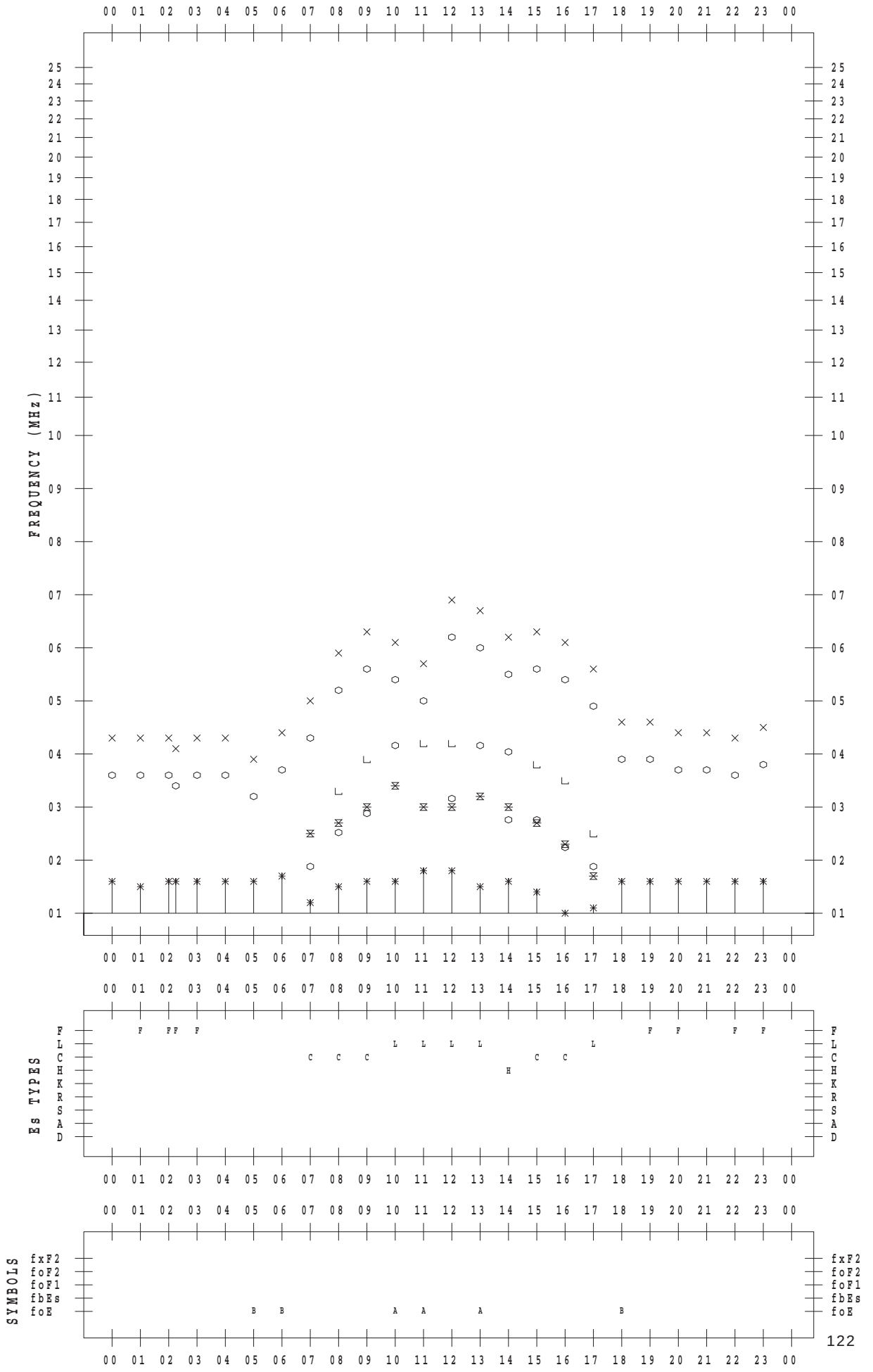
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/15

135 °E MEAN TIME



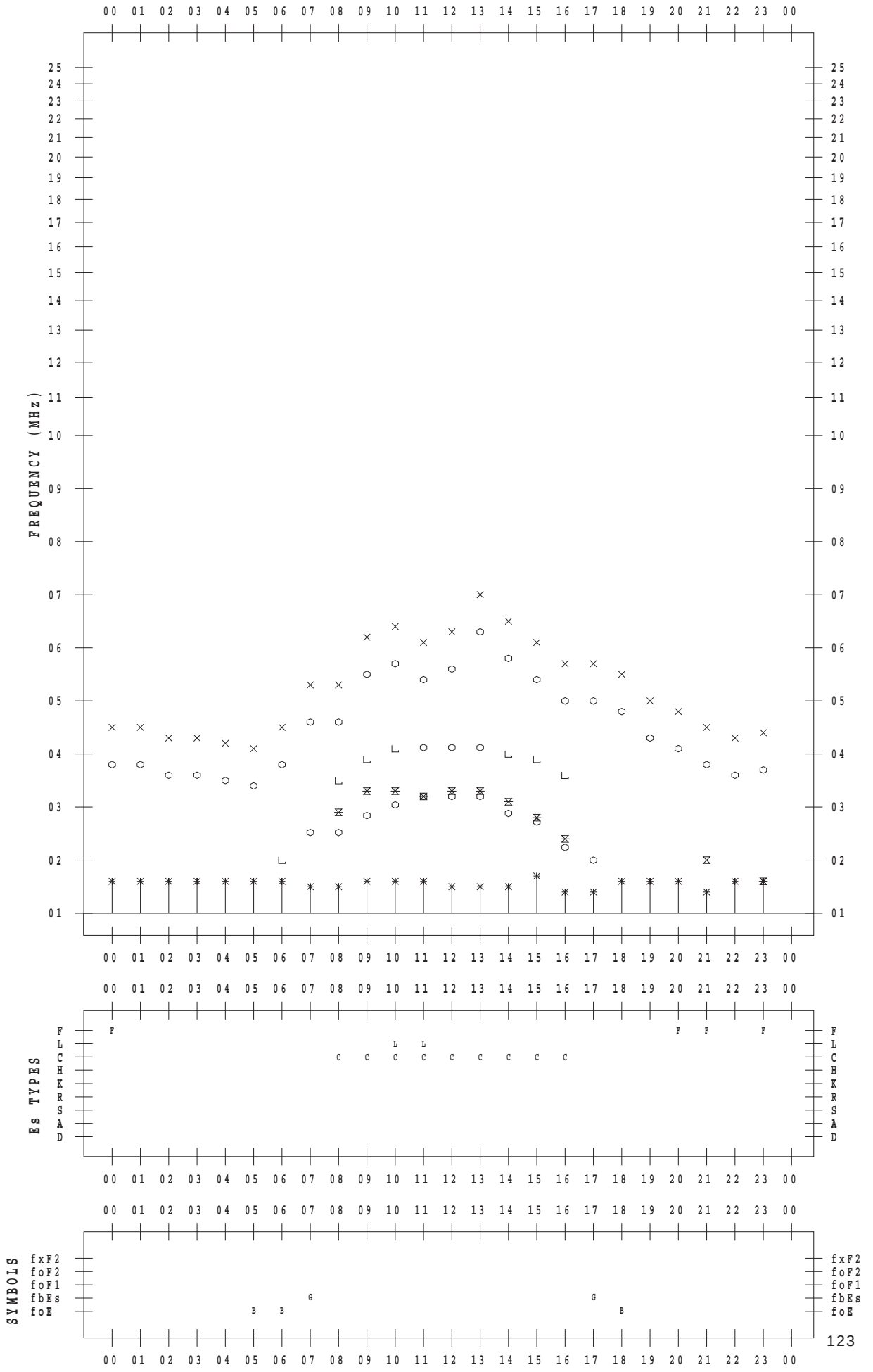
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/16

135 °E MEAN TIME



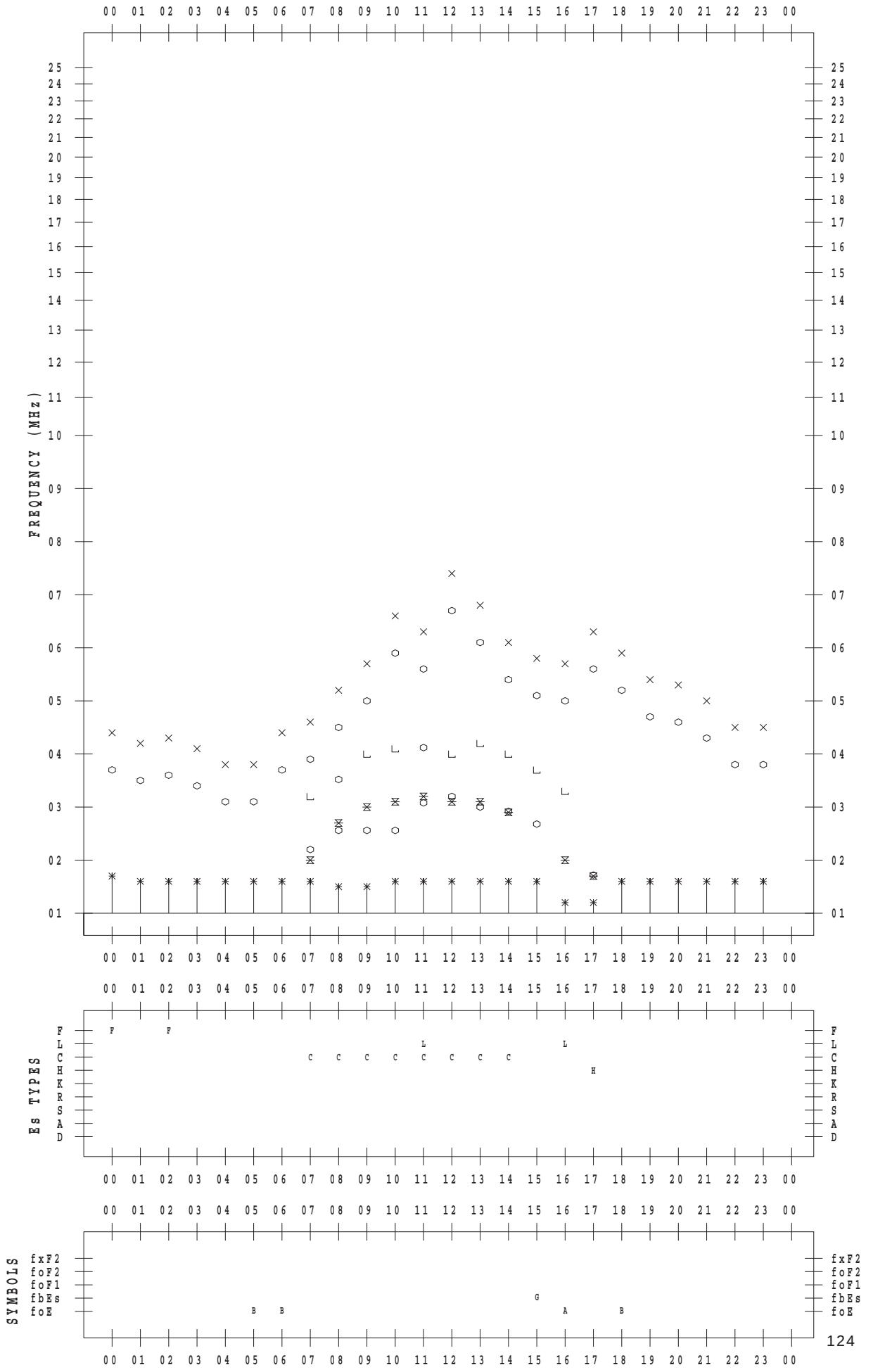
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/17

135 °E MEAN TIME



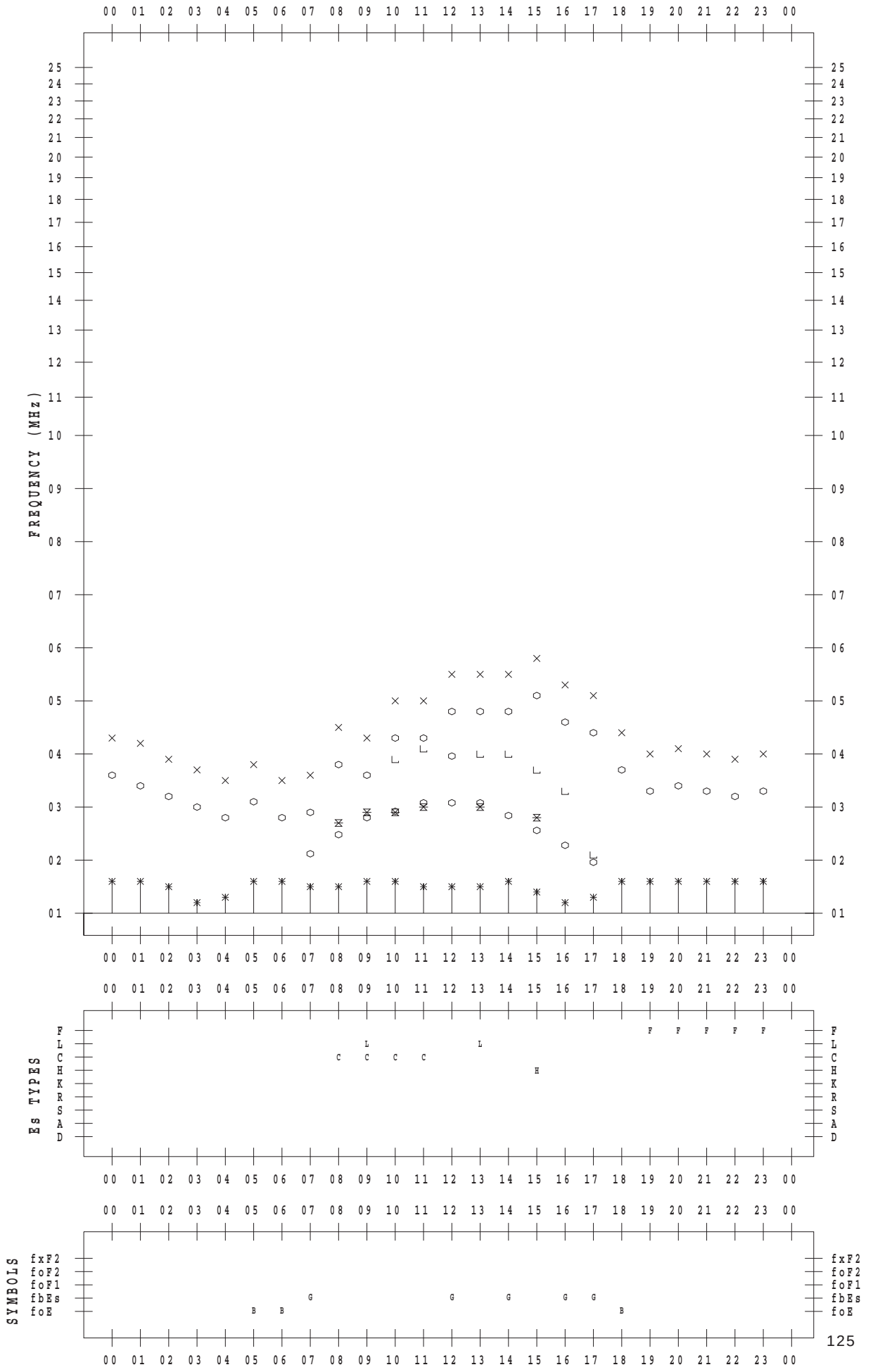
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/18

135 °E MEAN TIME



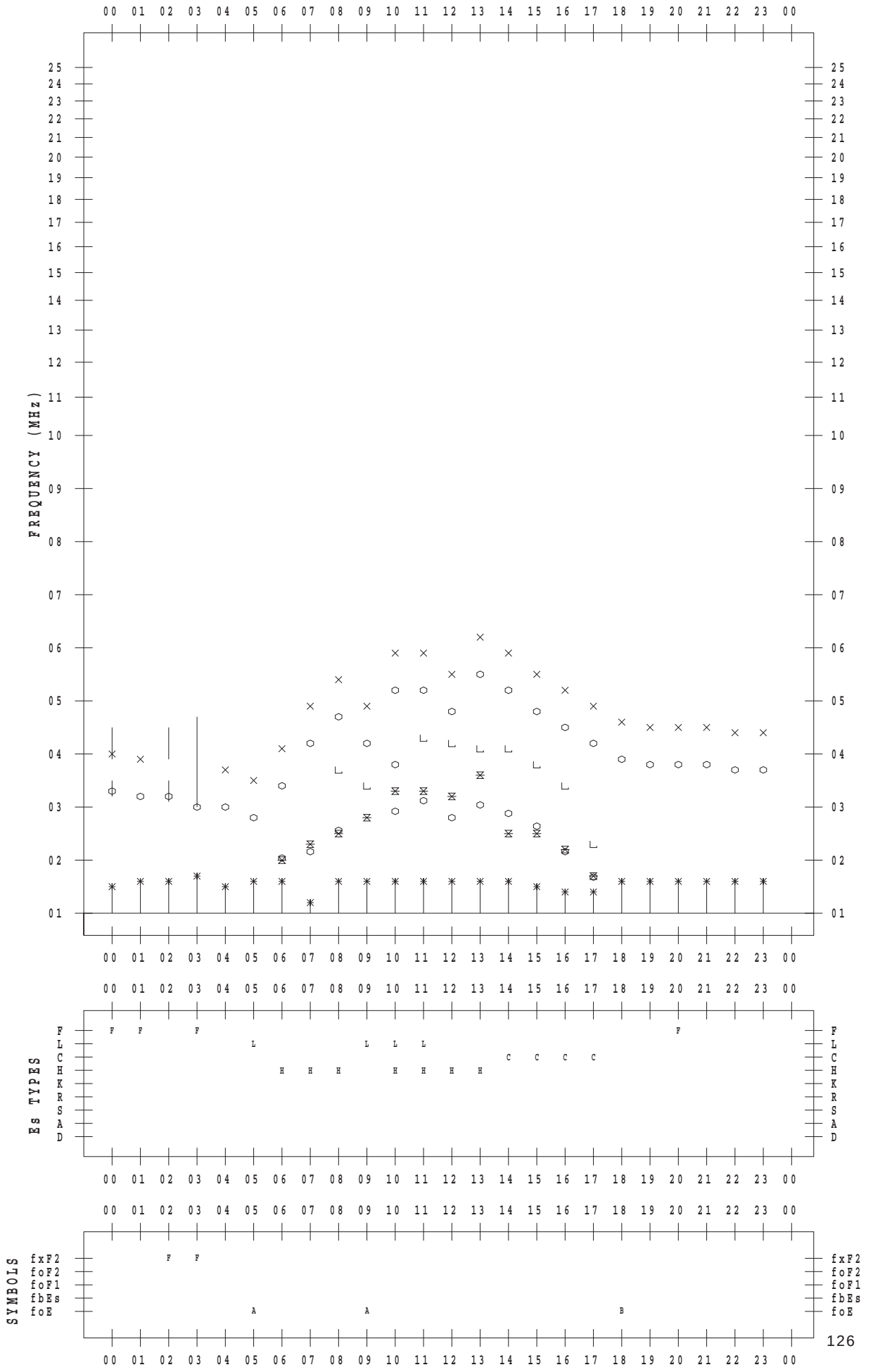
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/19

135 °E MEAN TIME



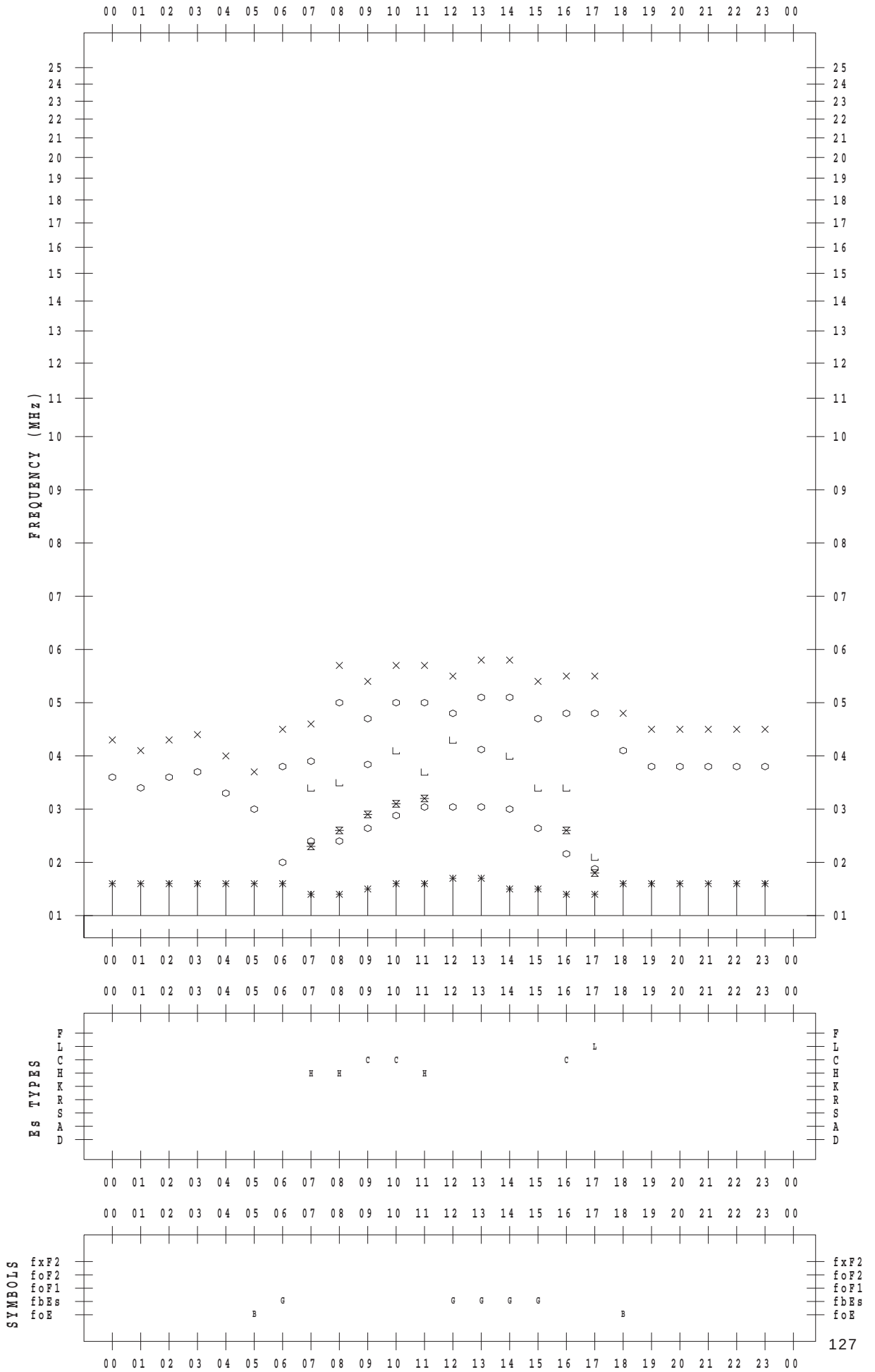
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/20

135 °E MEAN TIME



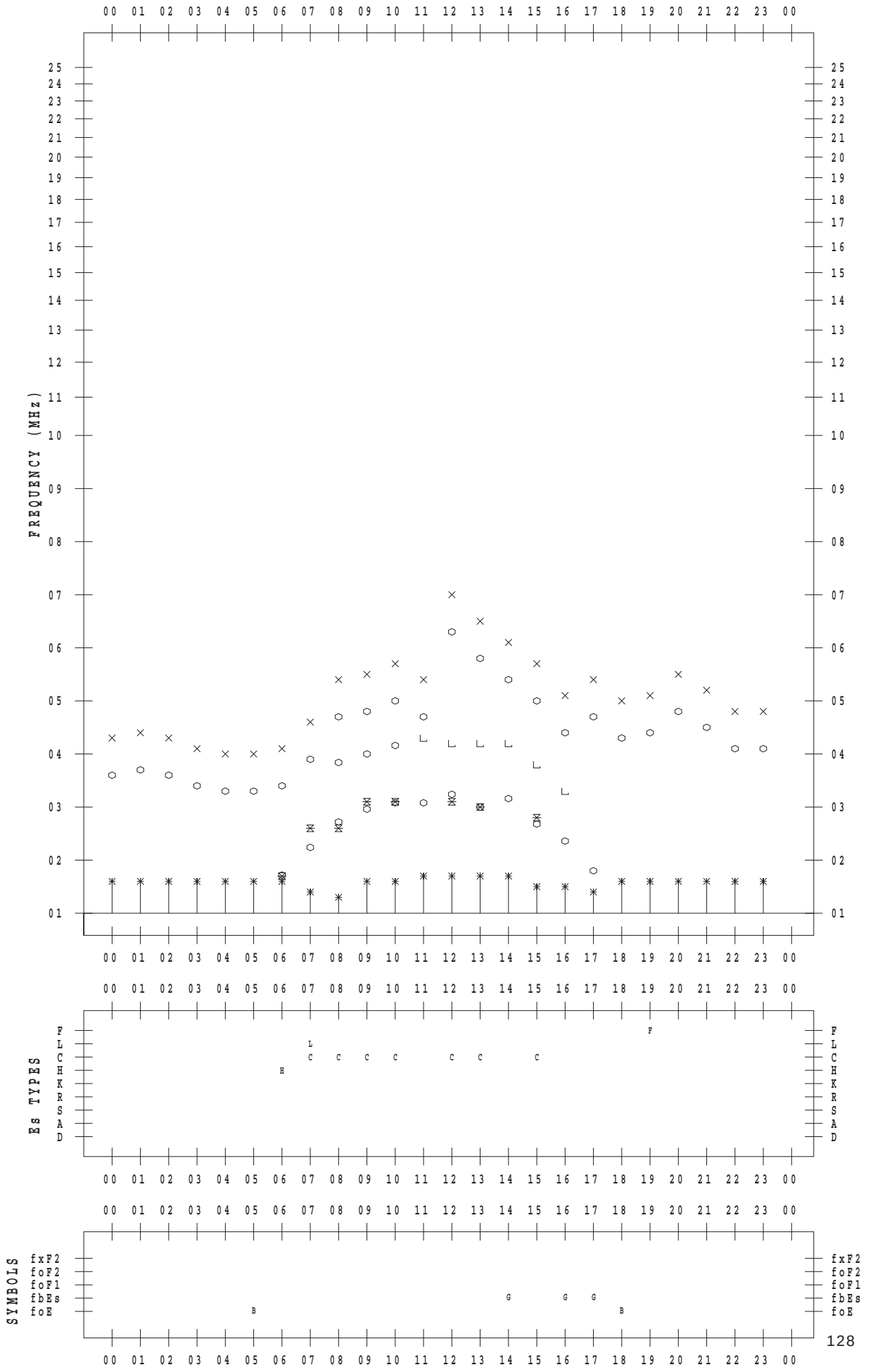
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/21

135 °E MEAN TIME



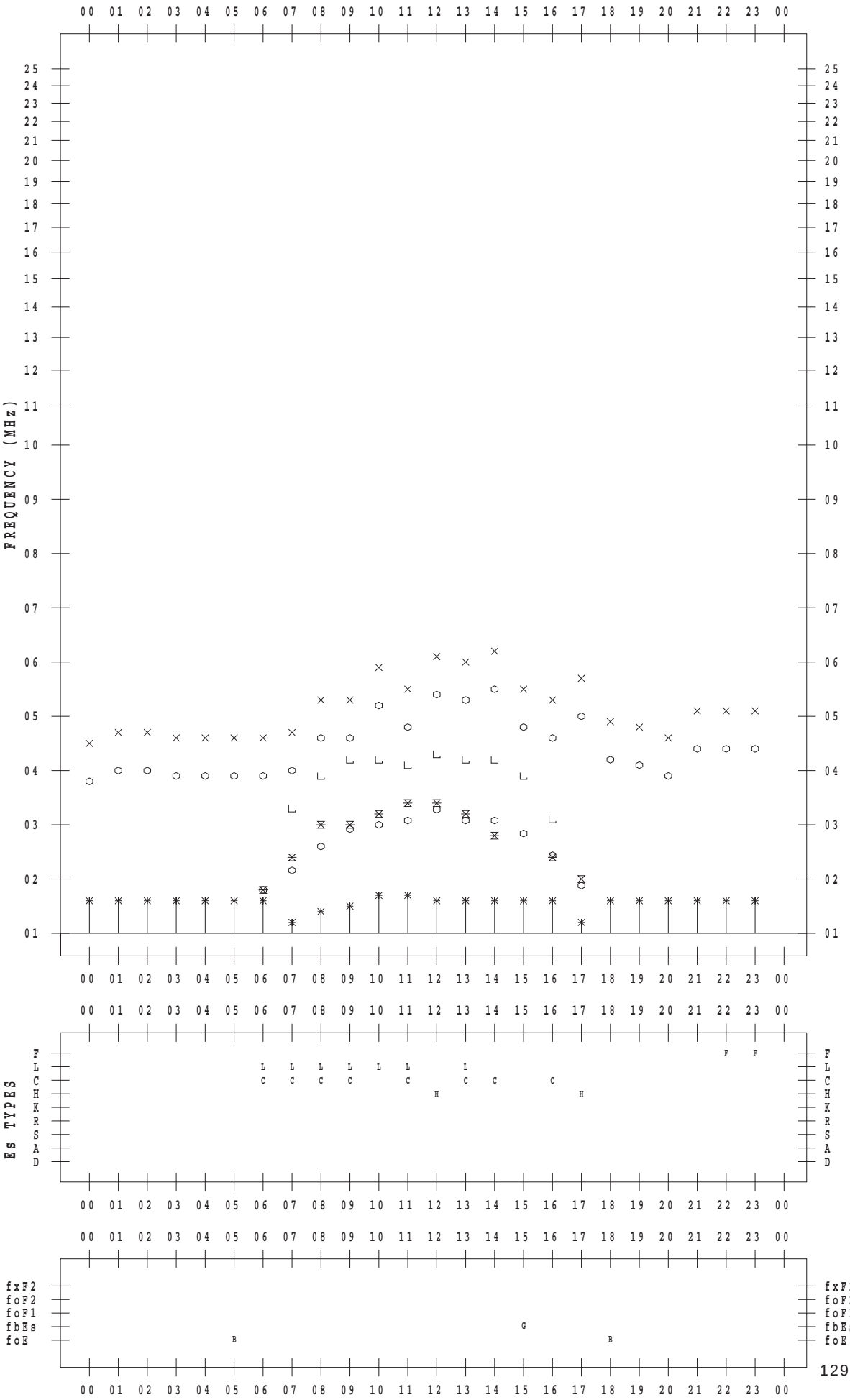
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/22

135 °E MEAN TIME



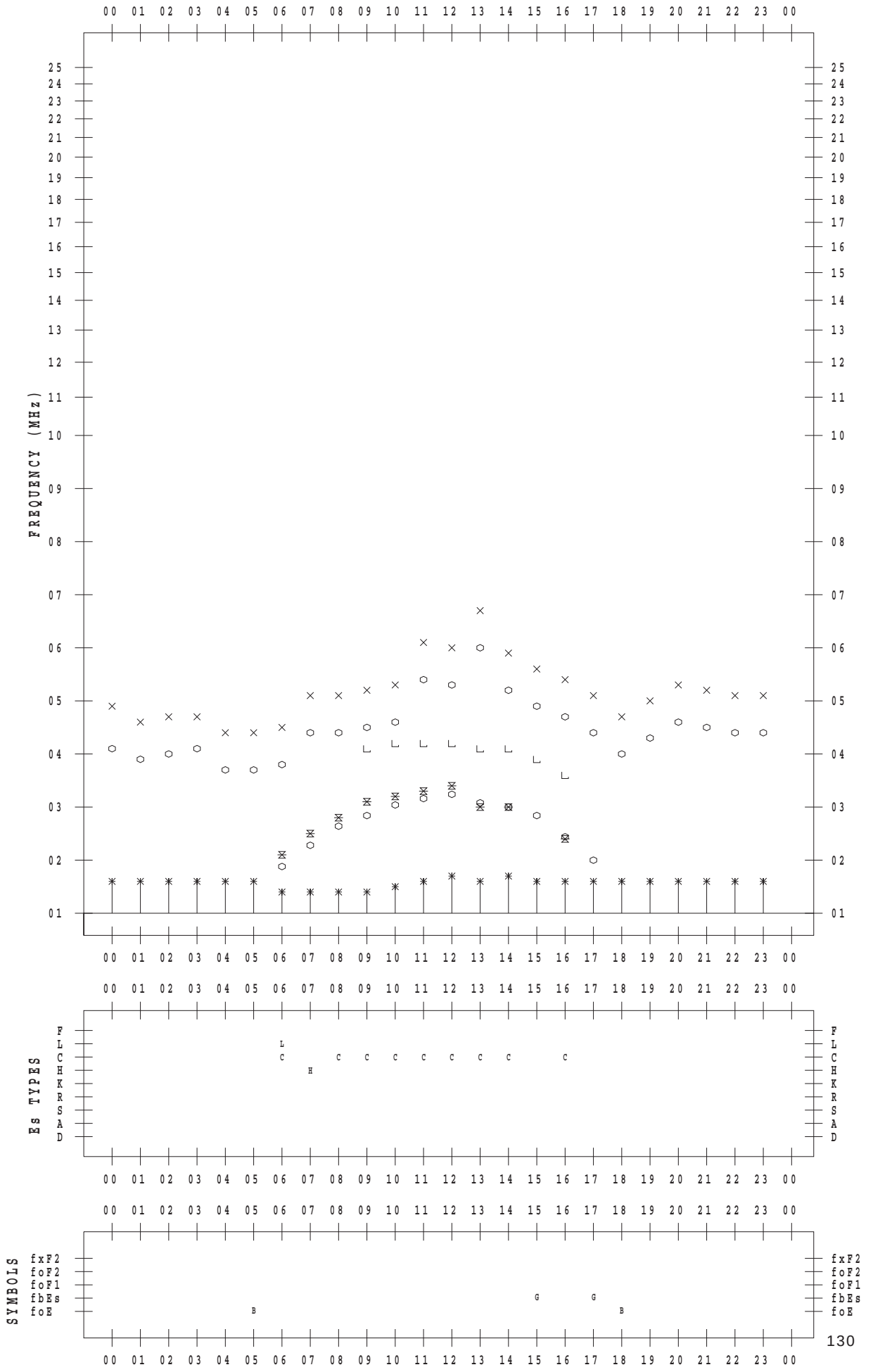
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/23

135 °E MEAN TIME



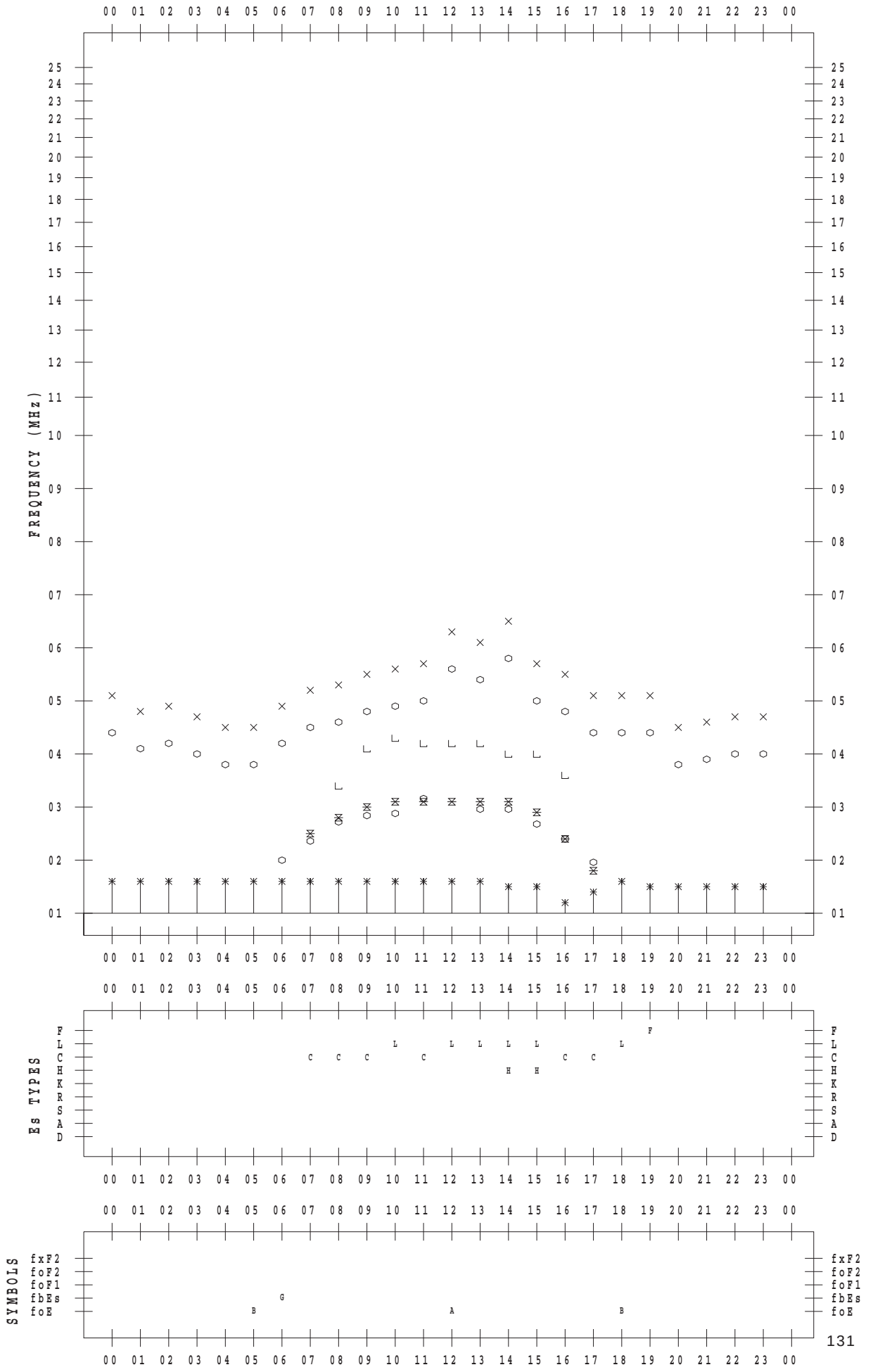
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/24

135 °E MEAN TIME



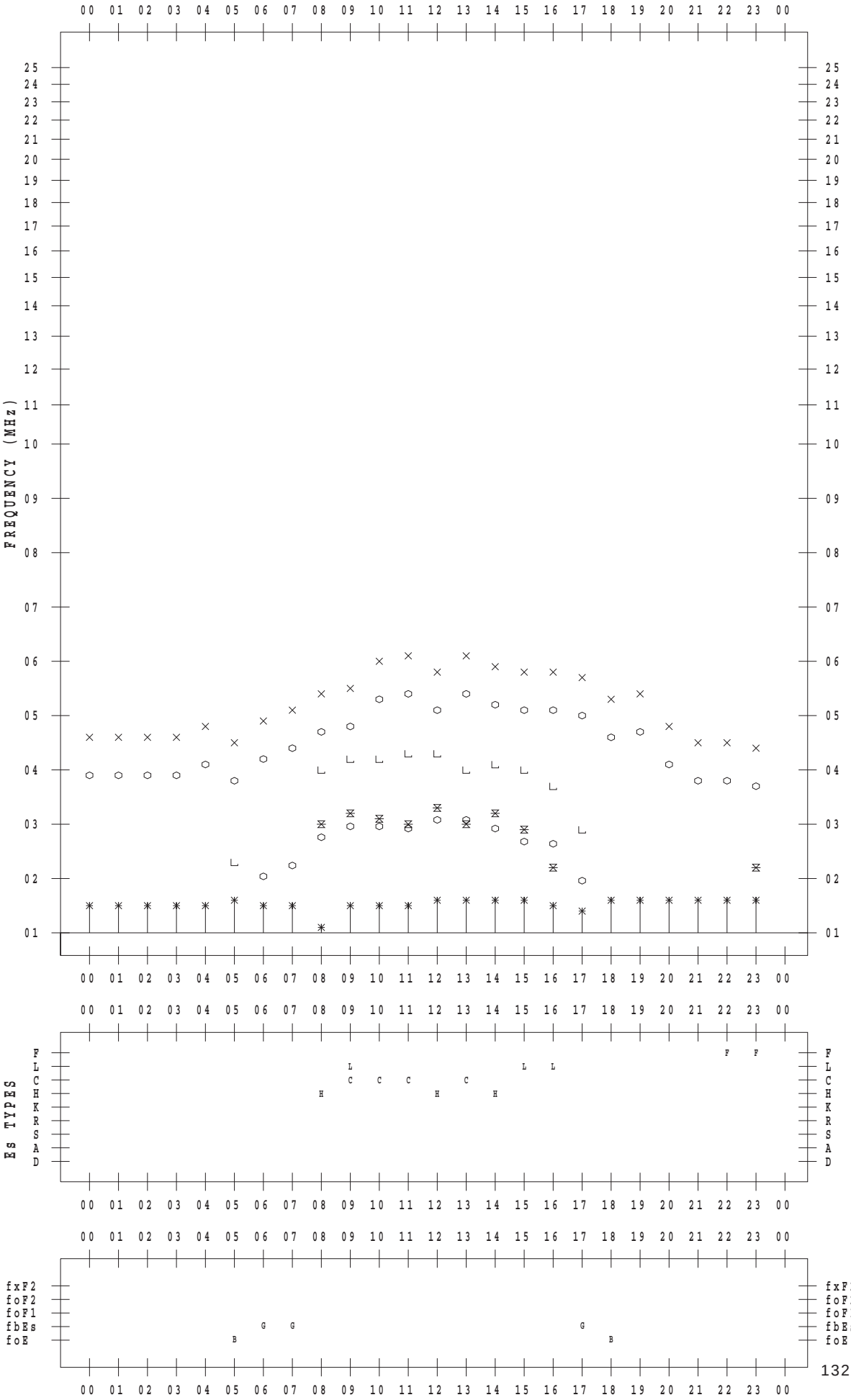
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/25

135 °E MEAN TIME



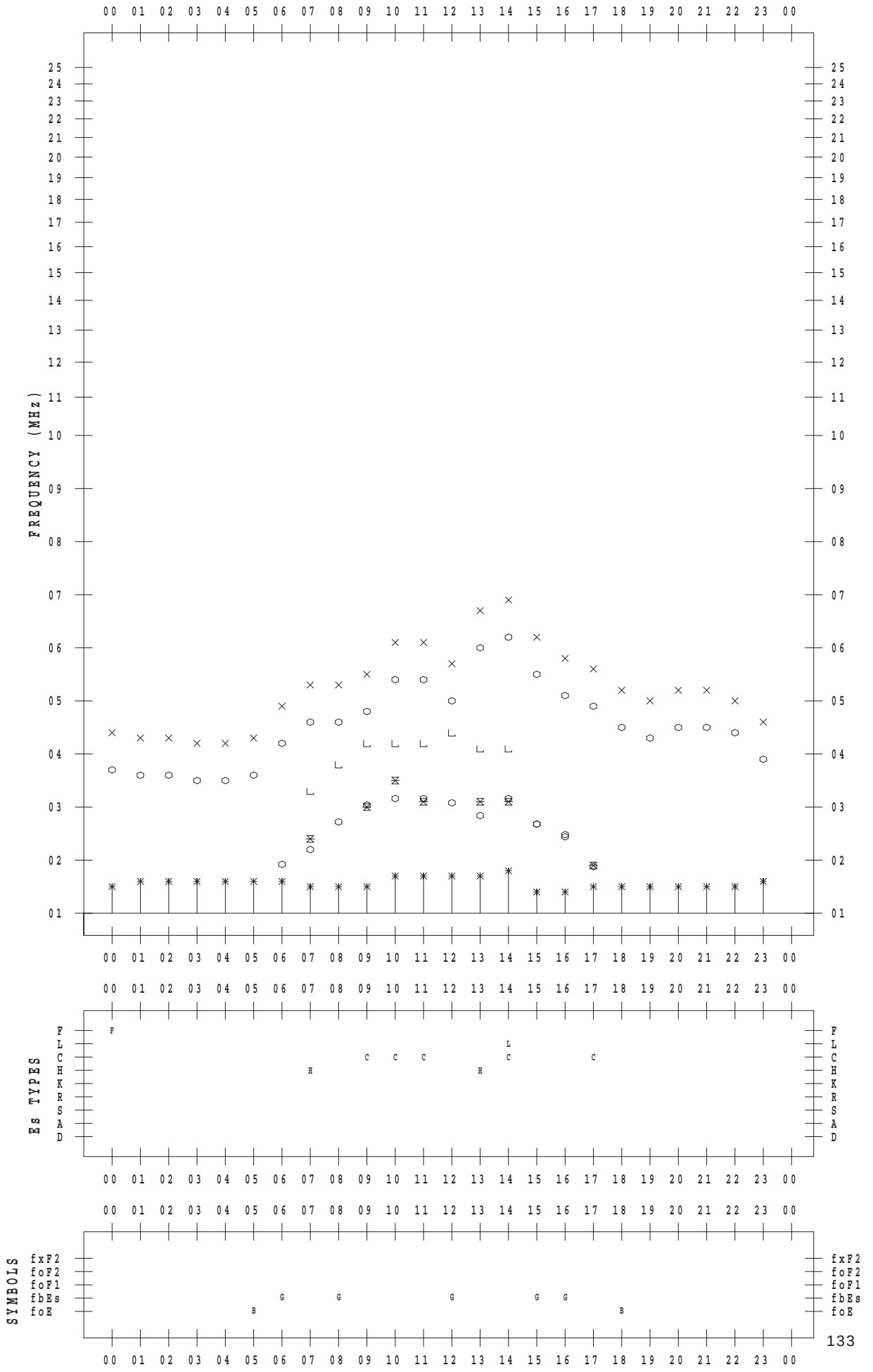
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/26

135 °E MEAN TIME



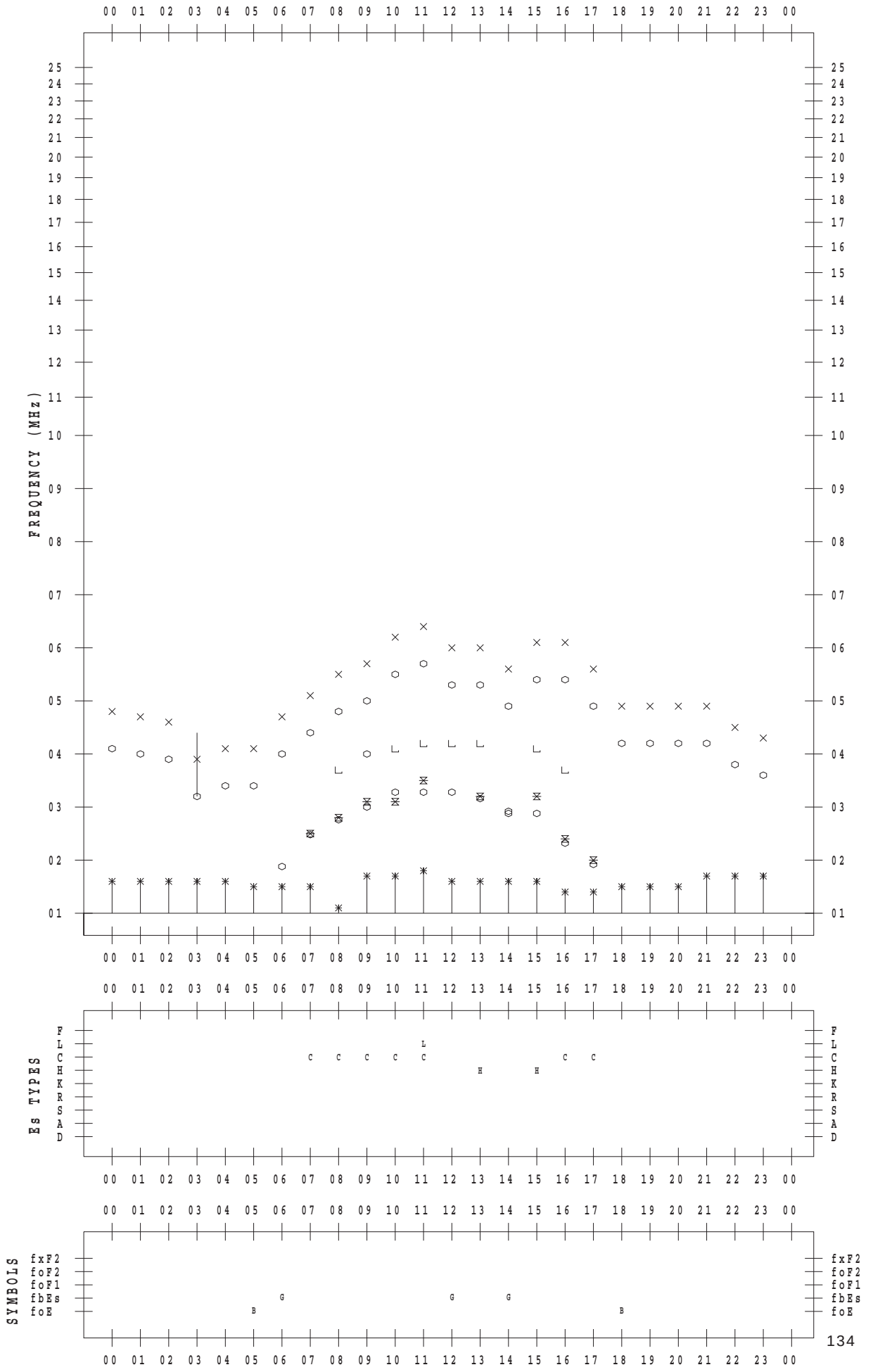
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/27

135 °E MEAN TIME



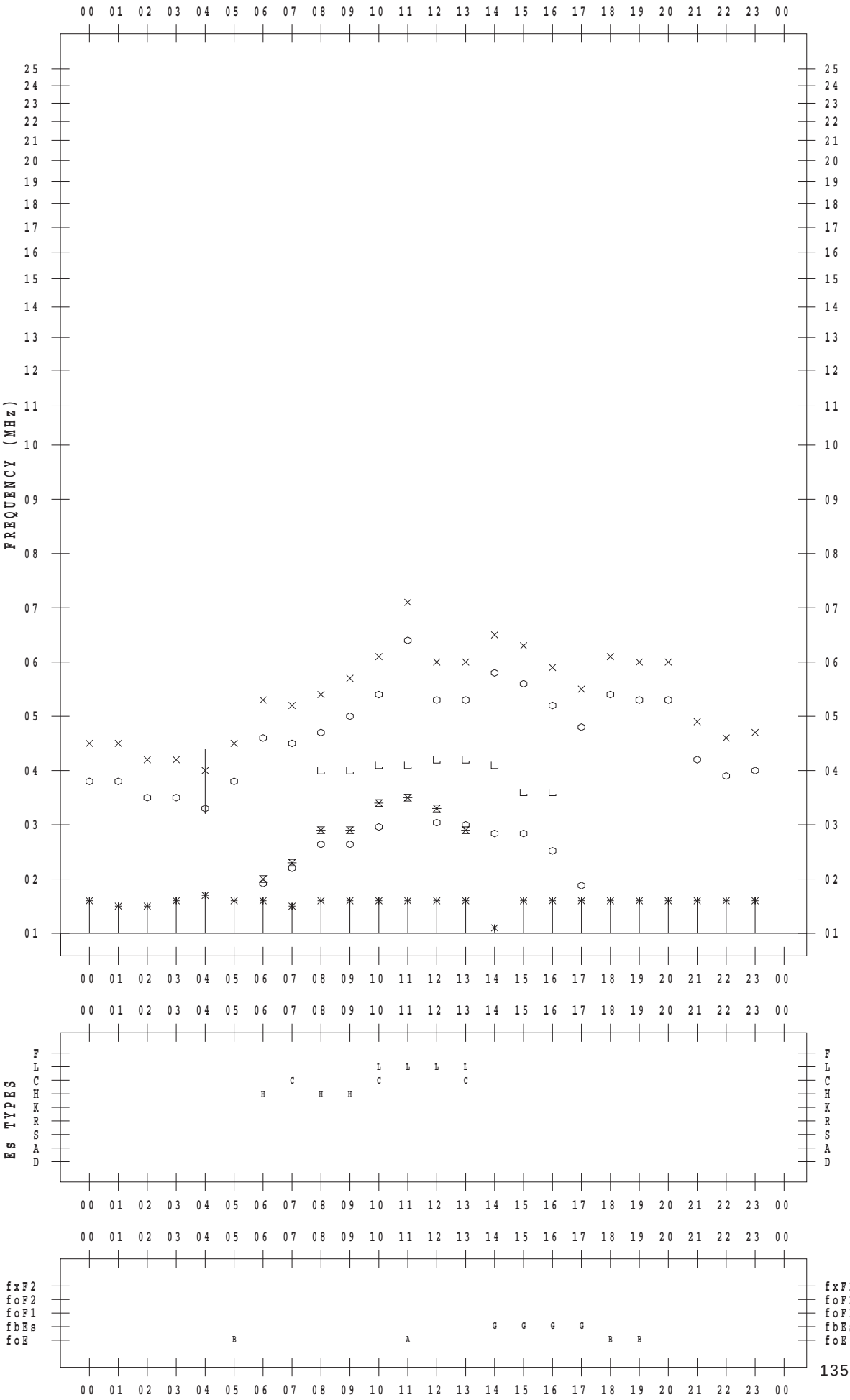
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/28

135 °E MEAN TIME



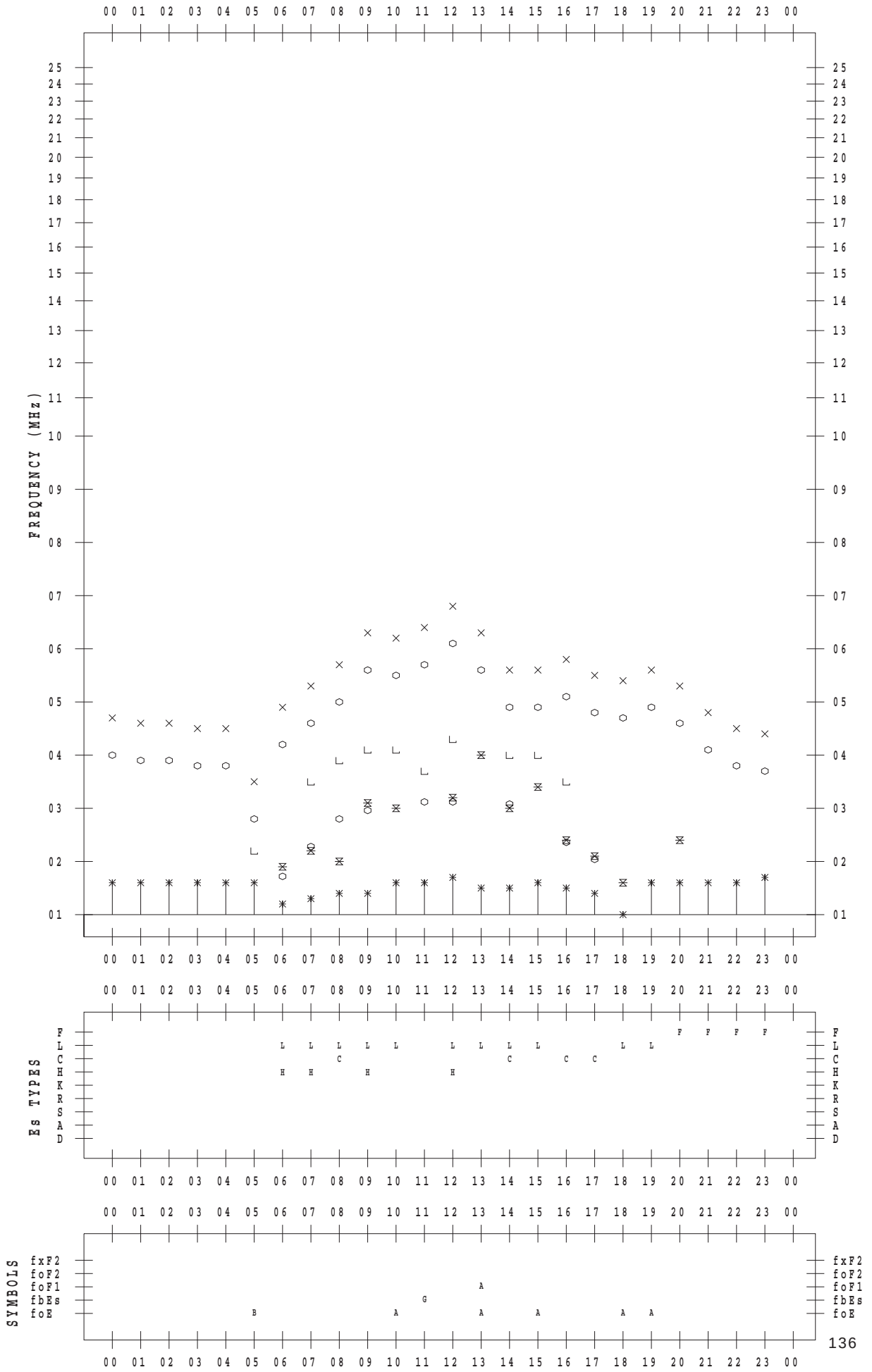
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/29

135 °E MEAN TIME



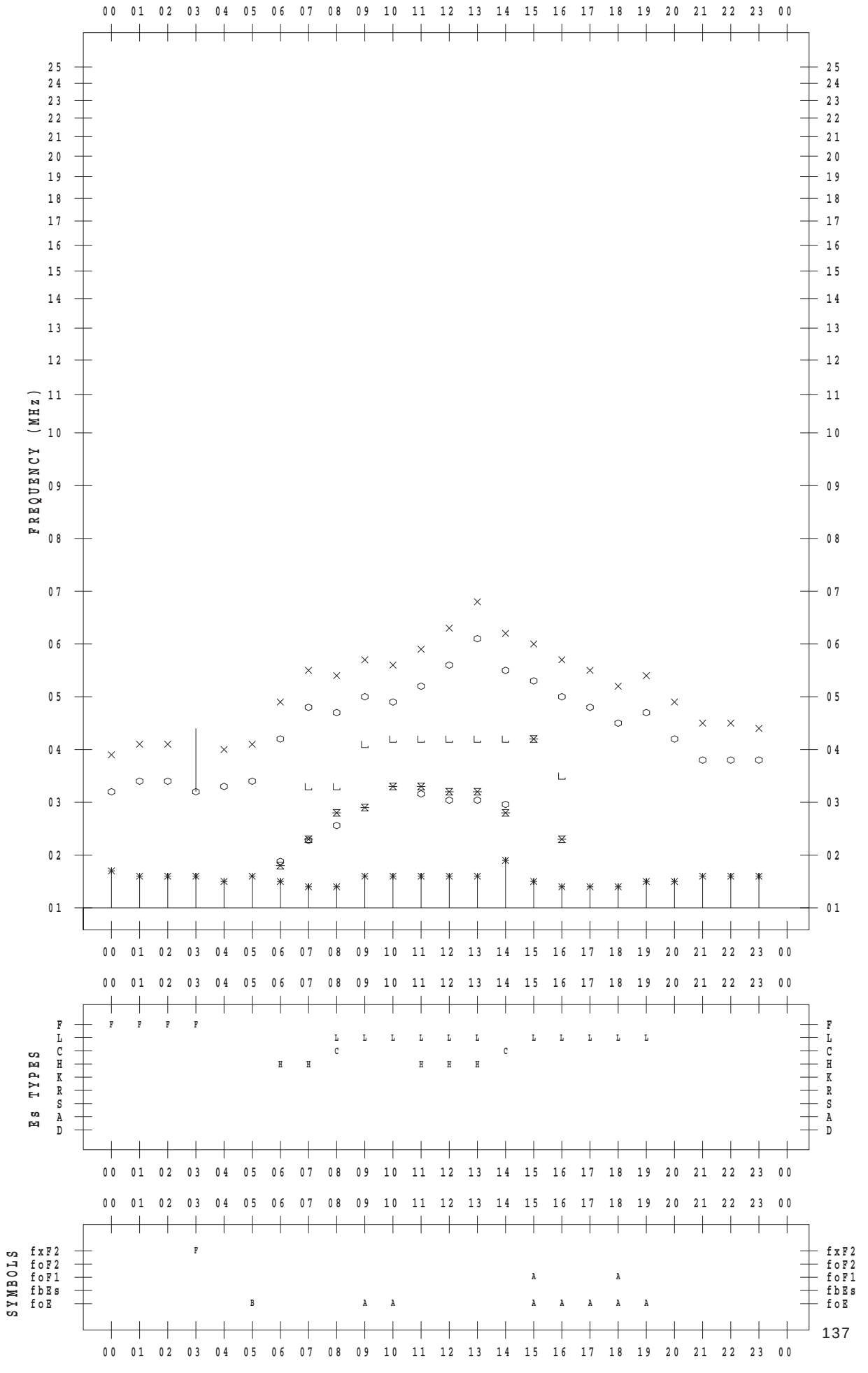
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/30

135 °E MEAN TIME



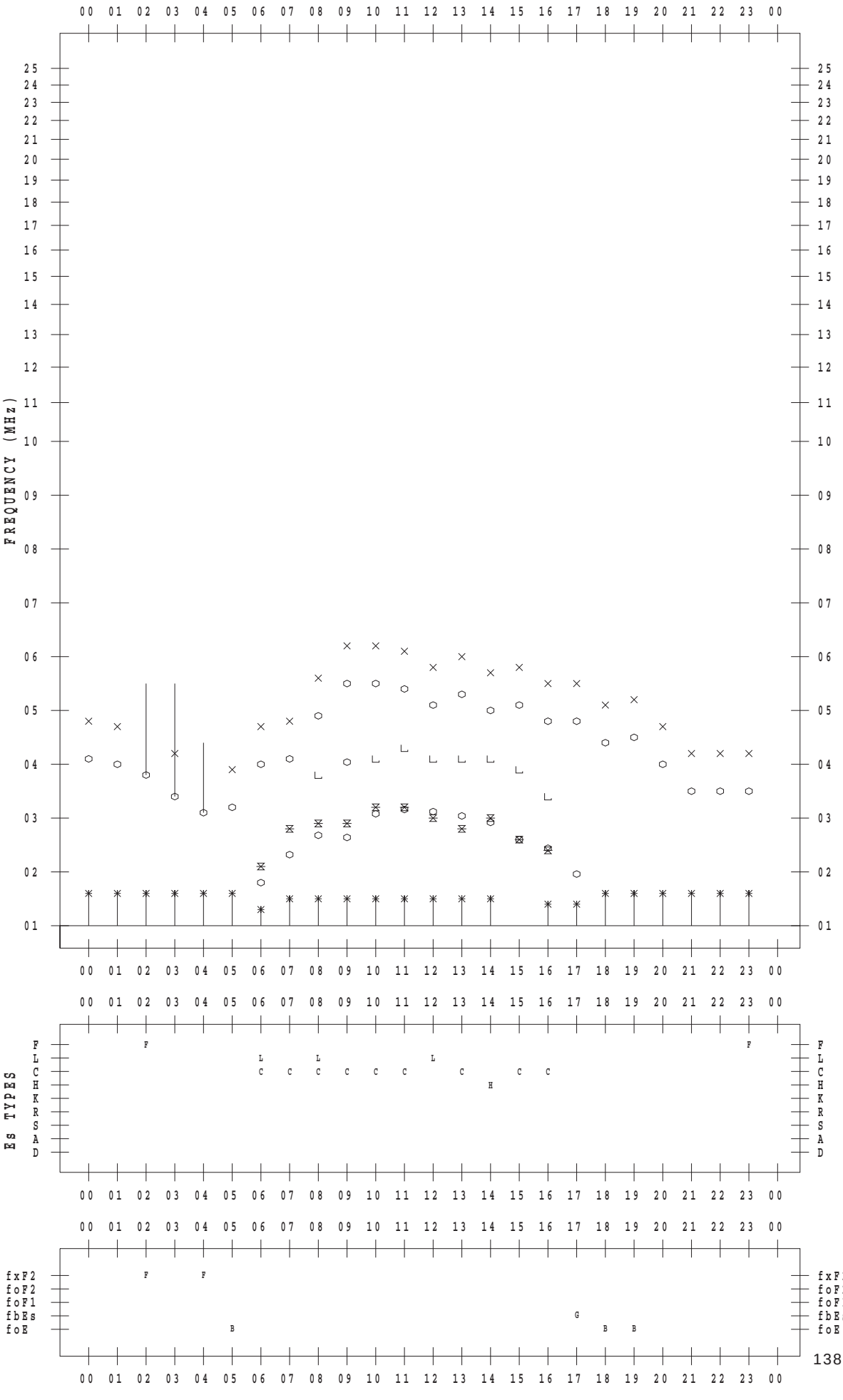
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 3/31

135 °E MEAN TIME



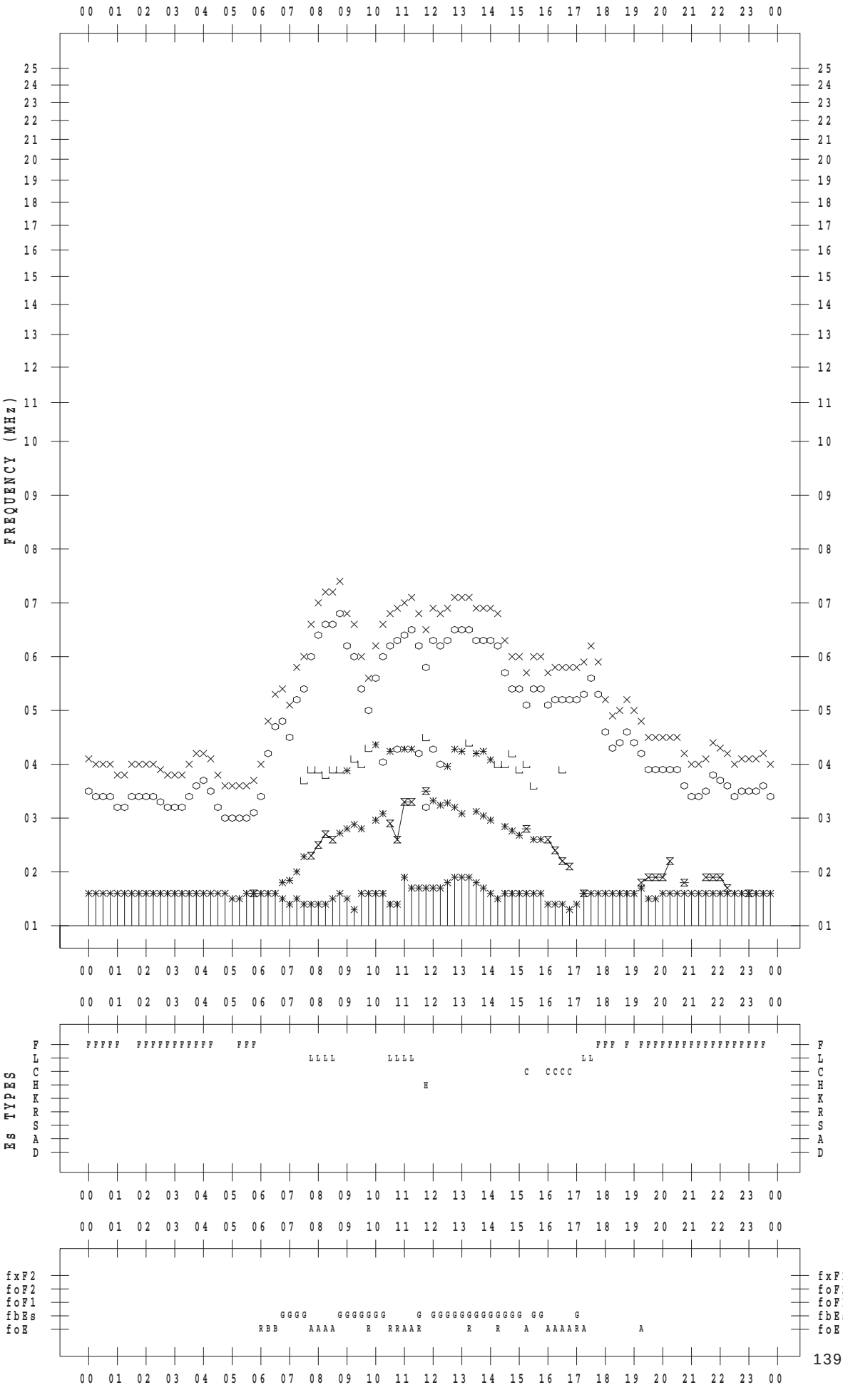
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 1

135 °E MEAN TIME



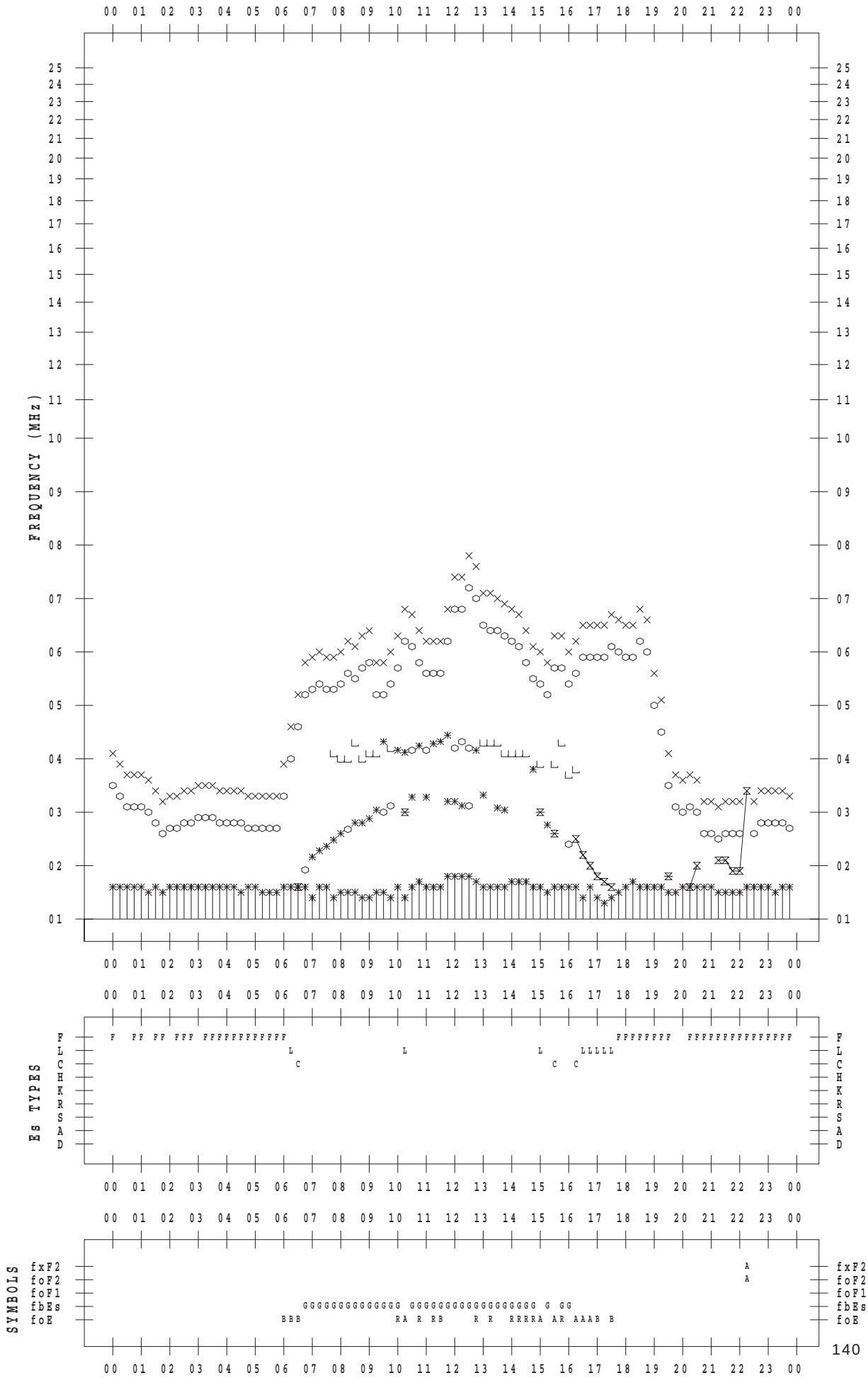
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 2

135 °E MEAN TIME



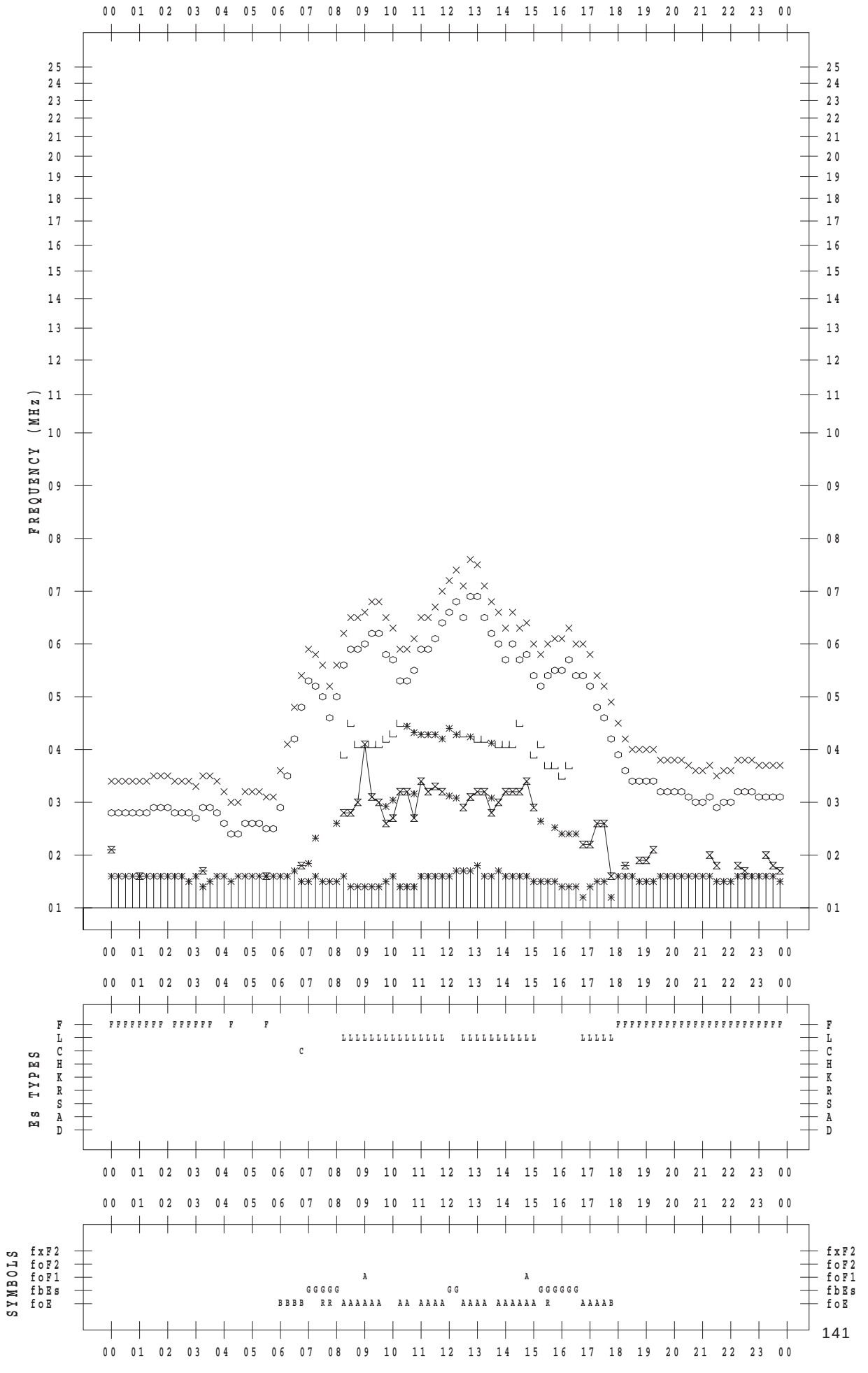
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 3

135 °E MEAN TIME



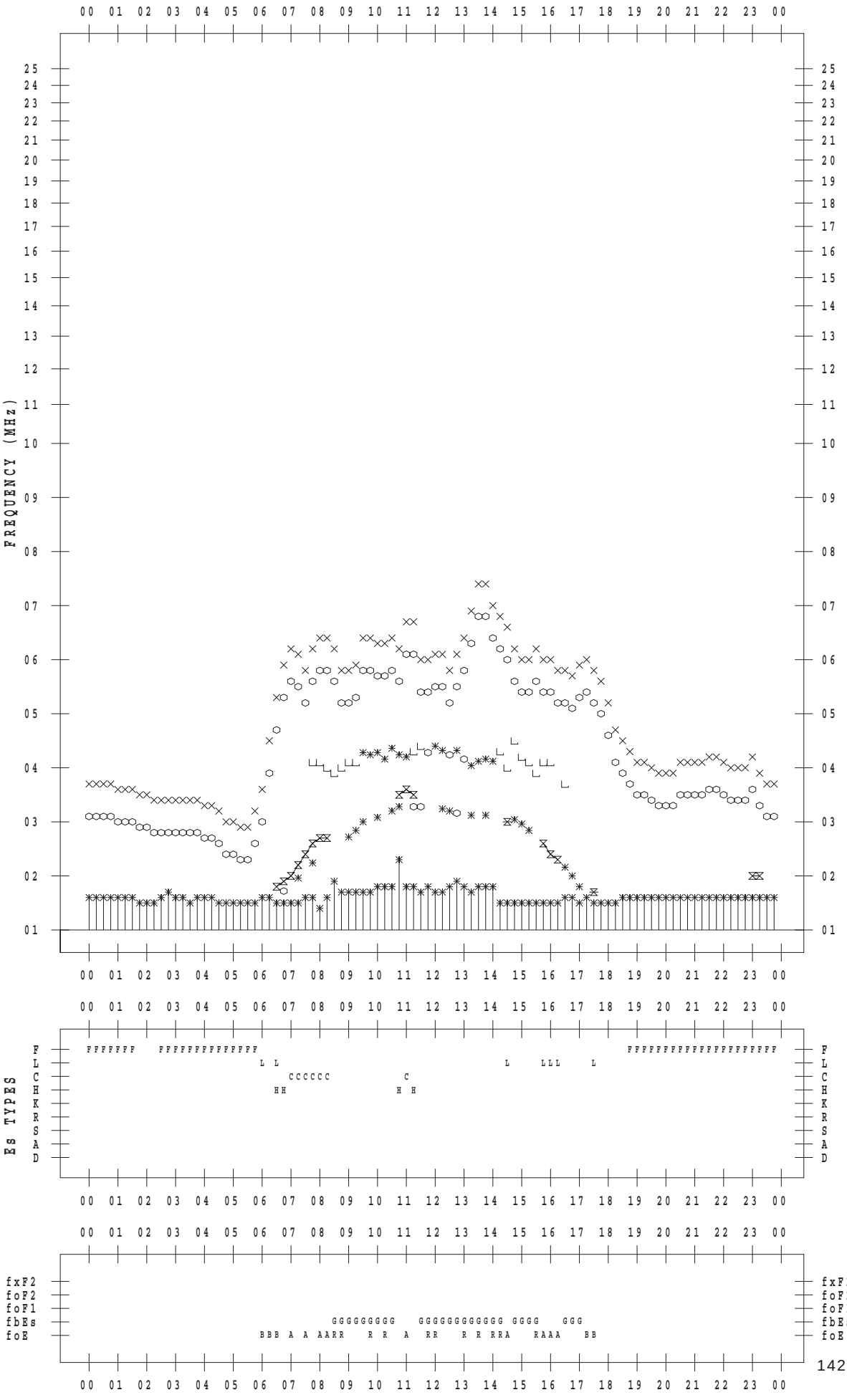
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 4

135 °E MEAN TIME



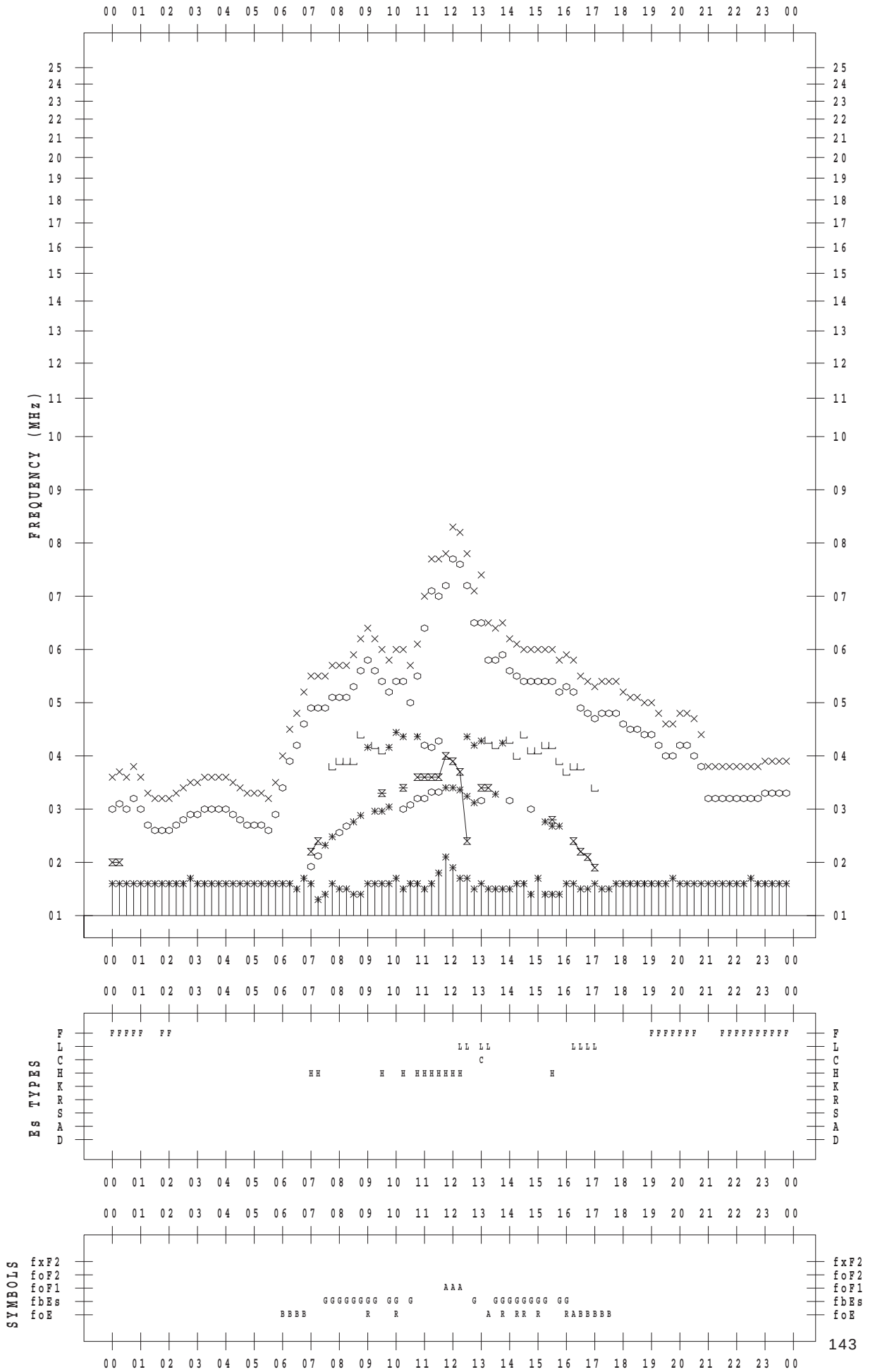
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 5

135 °E MEAN TIME



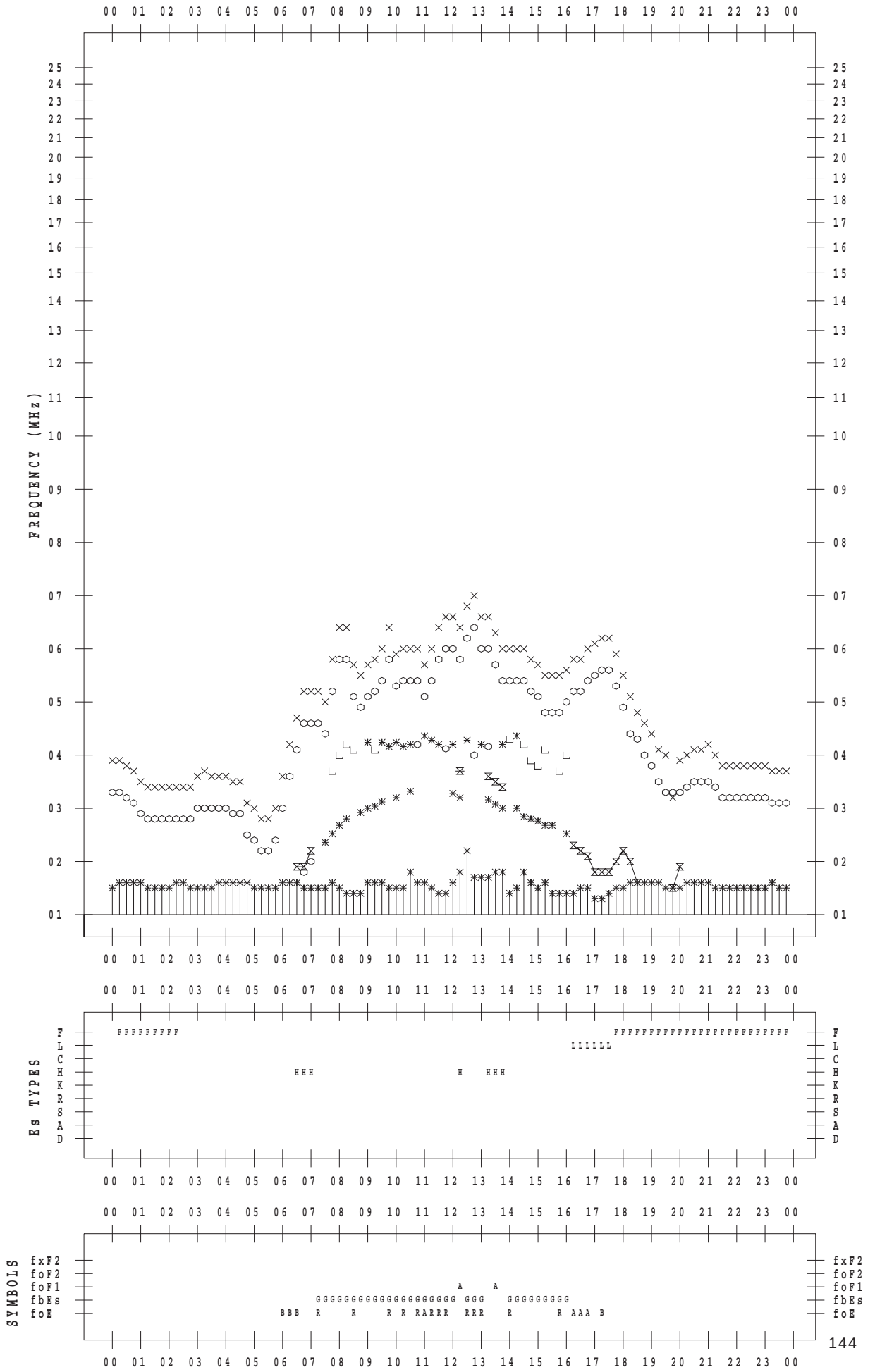
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 6

135 °E MEAN TIME



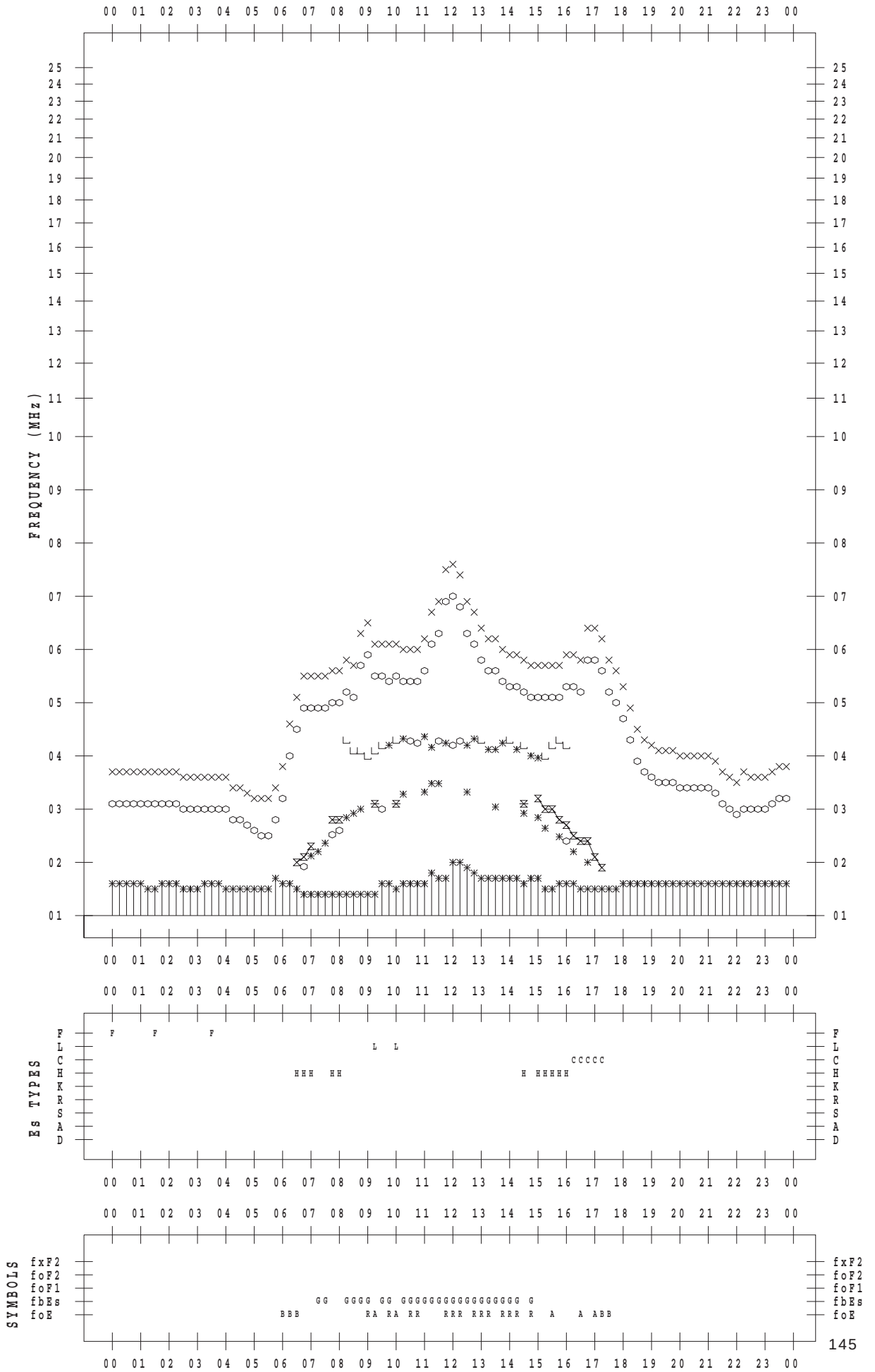
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 7

135 °E MEAN TIME



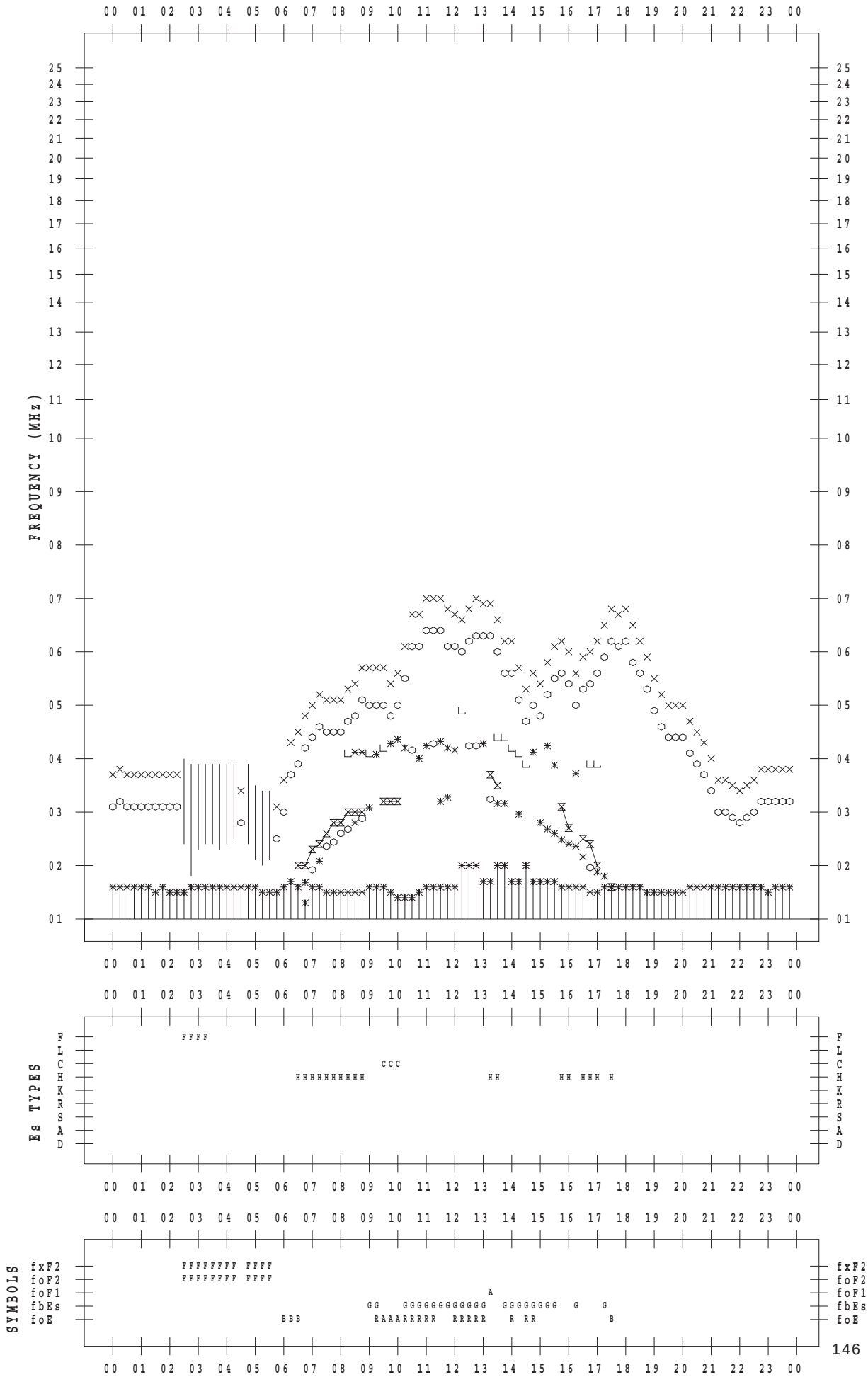
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 8

135 °E MEAN TIME



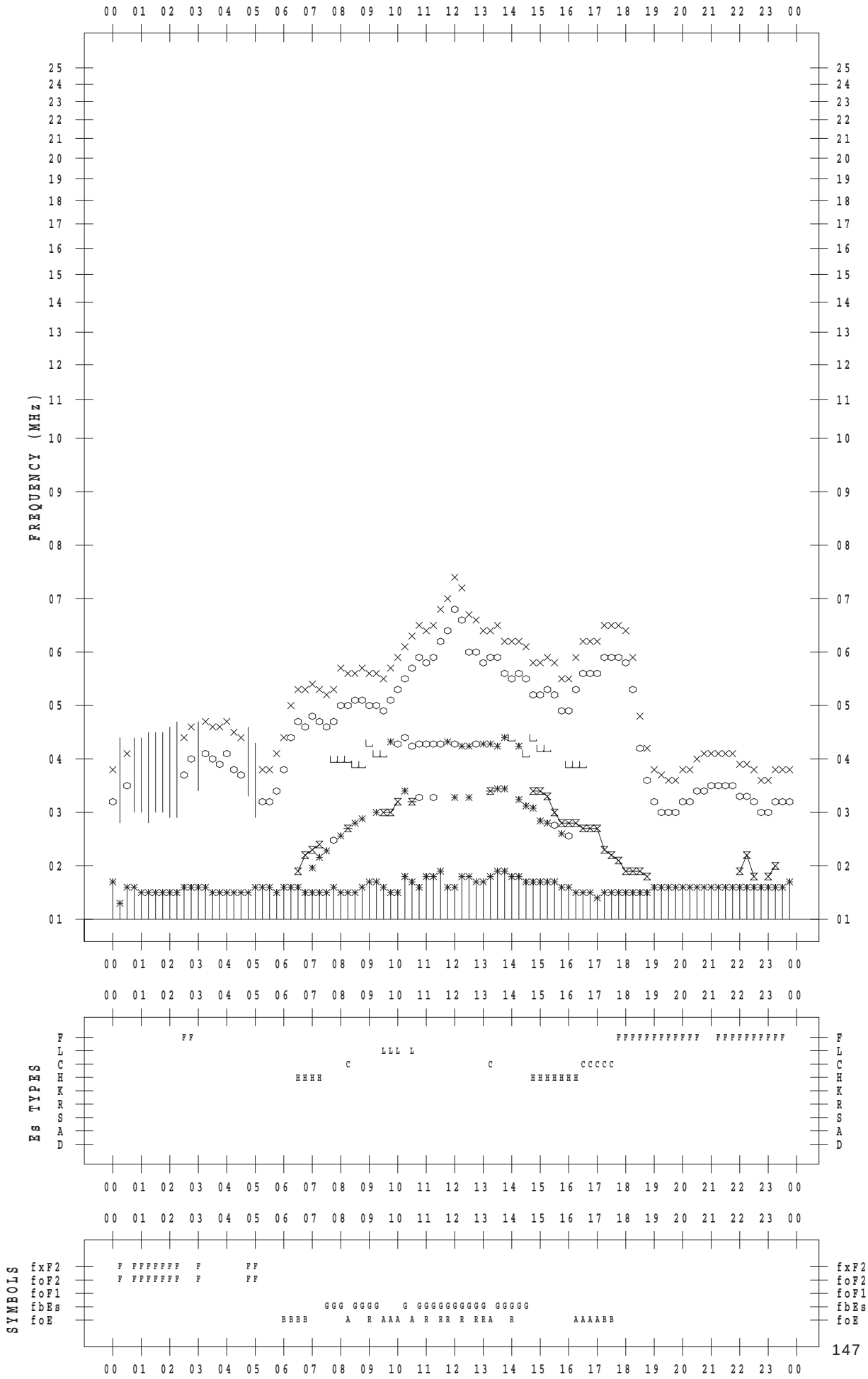
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/ 9

135 °E MEAN TIME



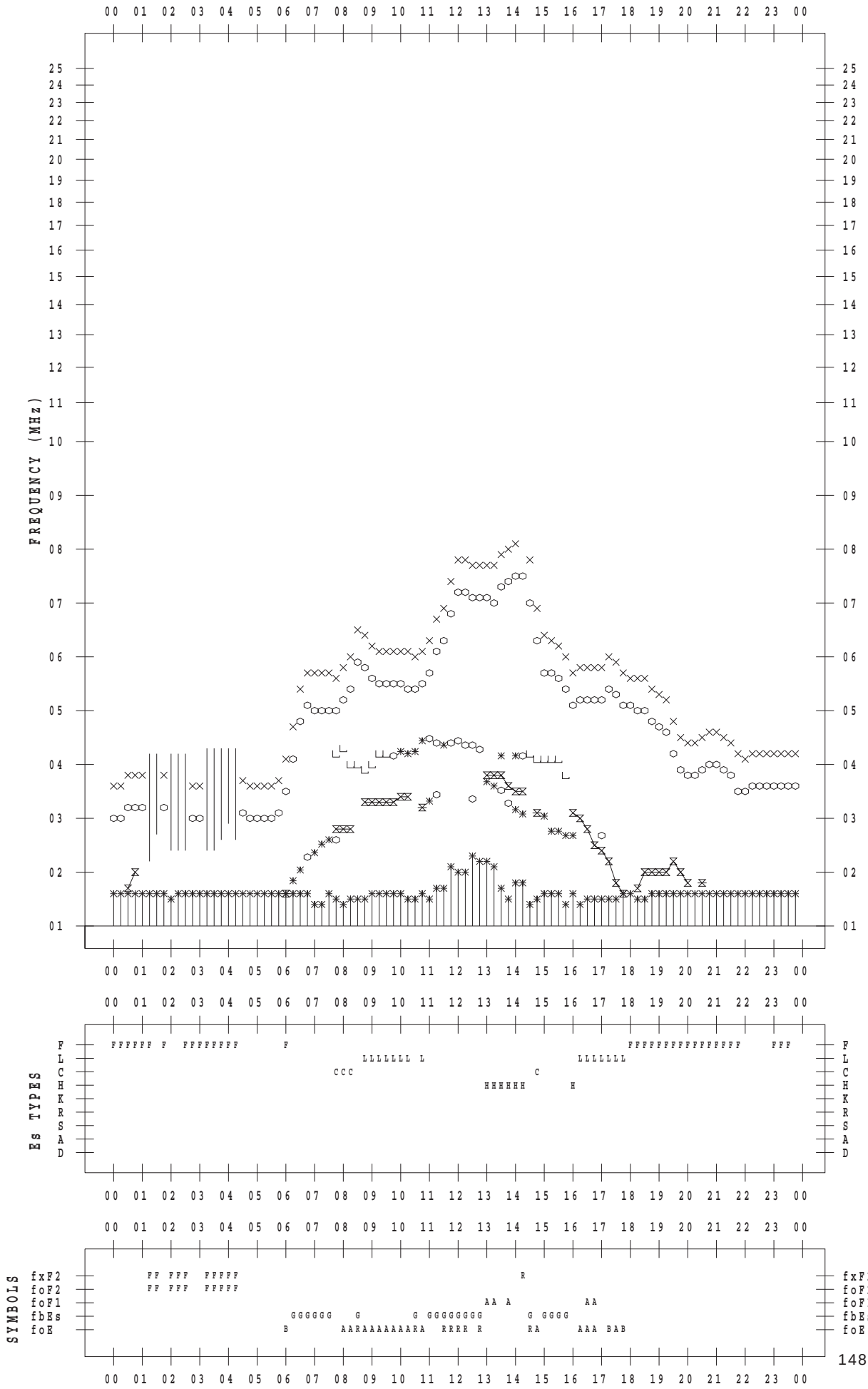
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/10

135 °E MEAN TIME



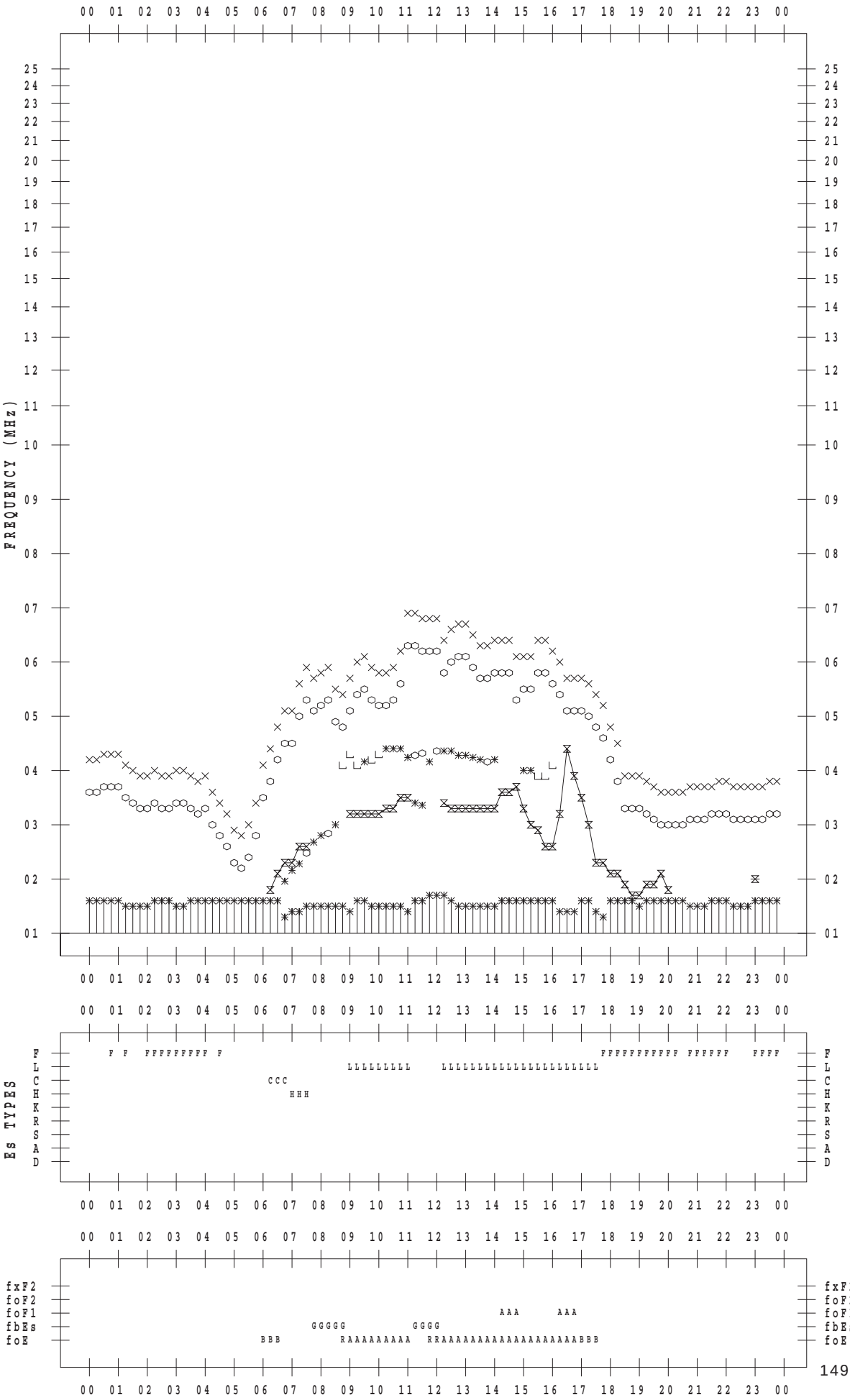
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/11

135 °E MEAN TIME



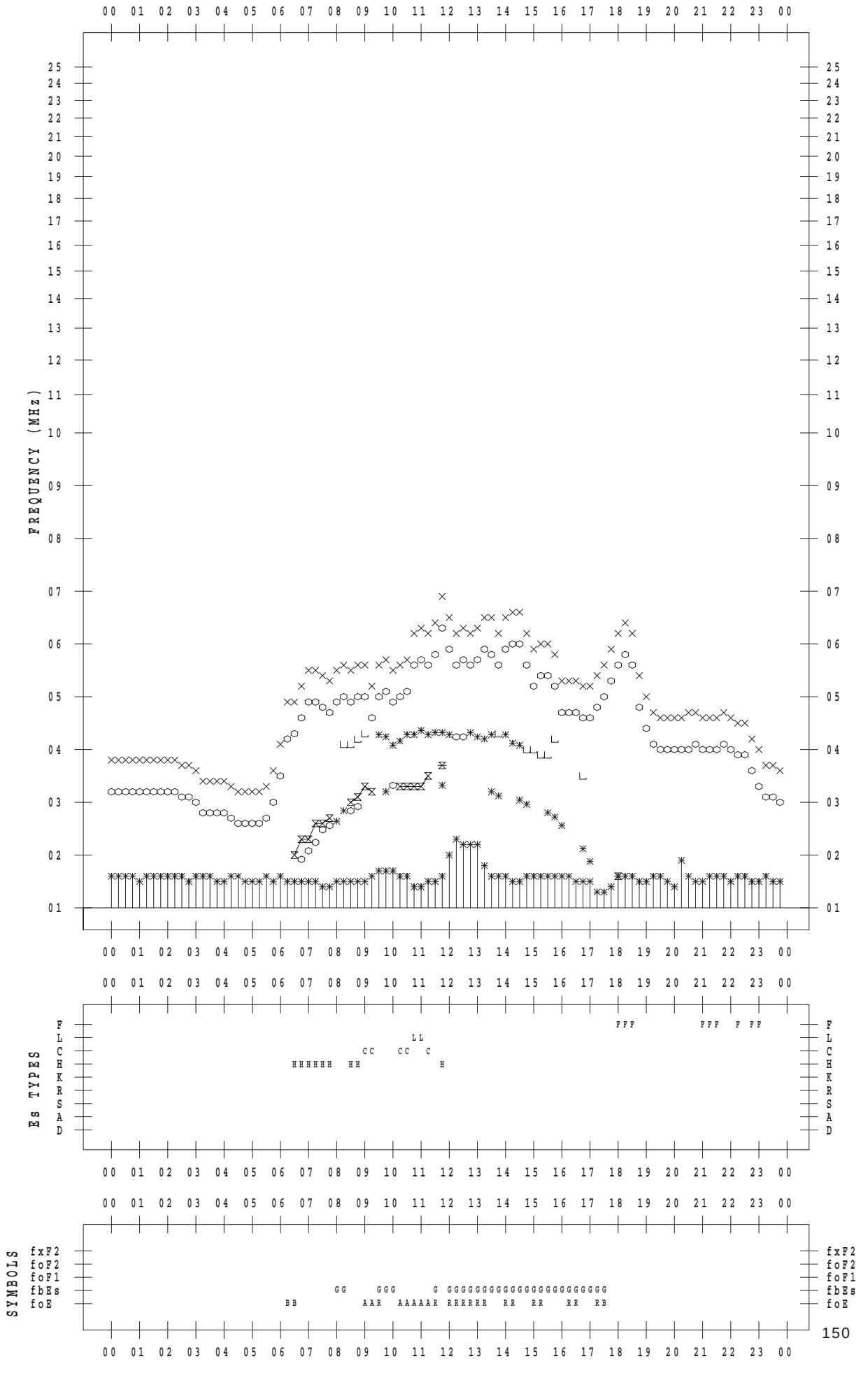
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/12

135 °E MEAN TIME



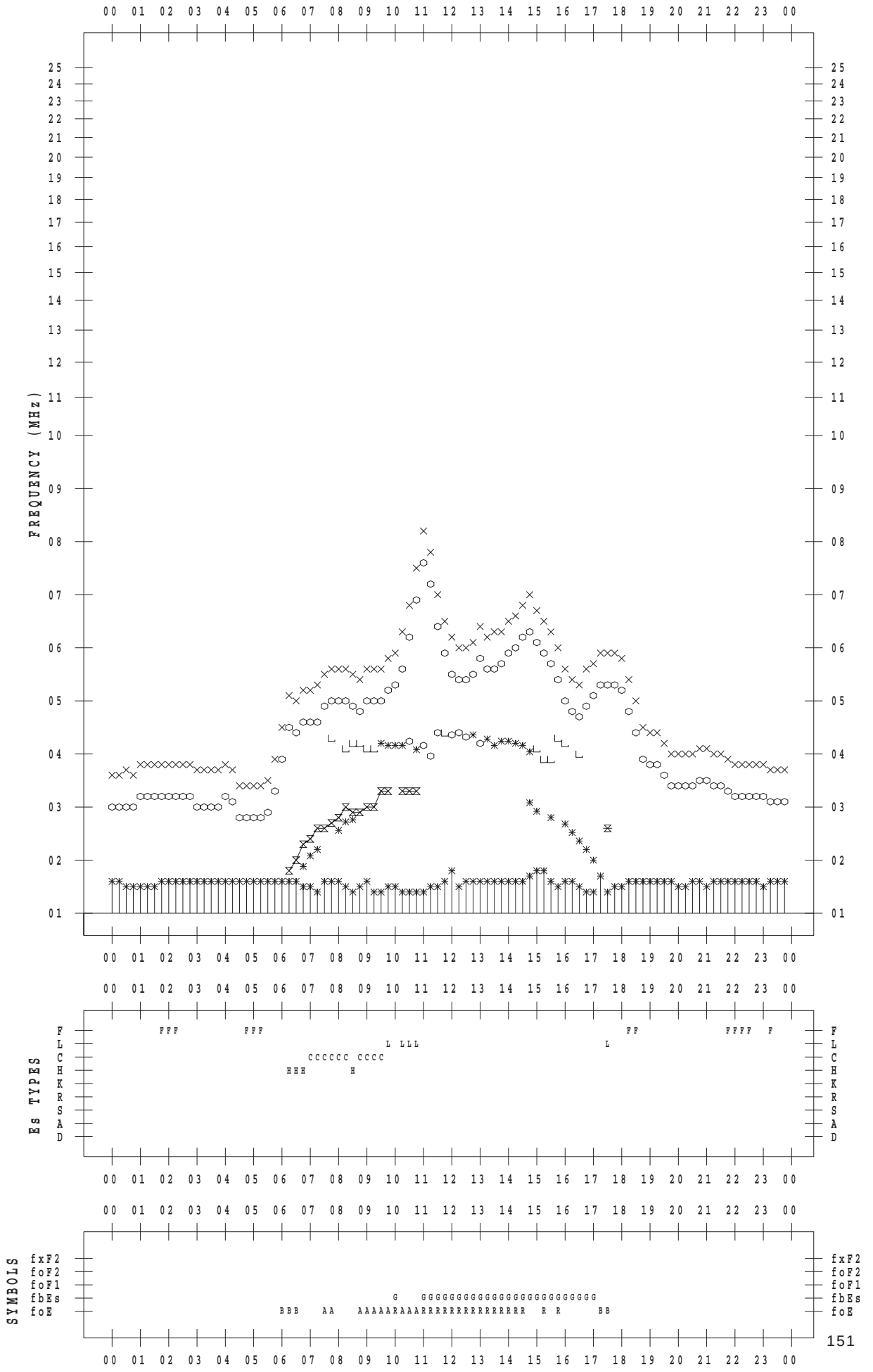
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/13

135 °E MEAN TIME



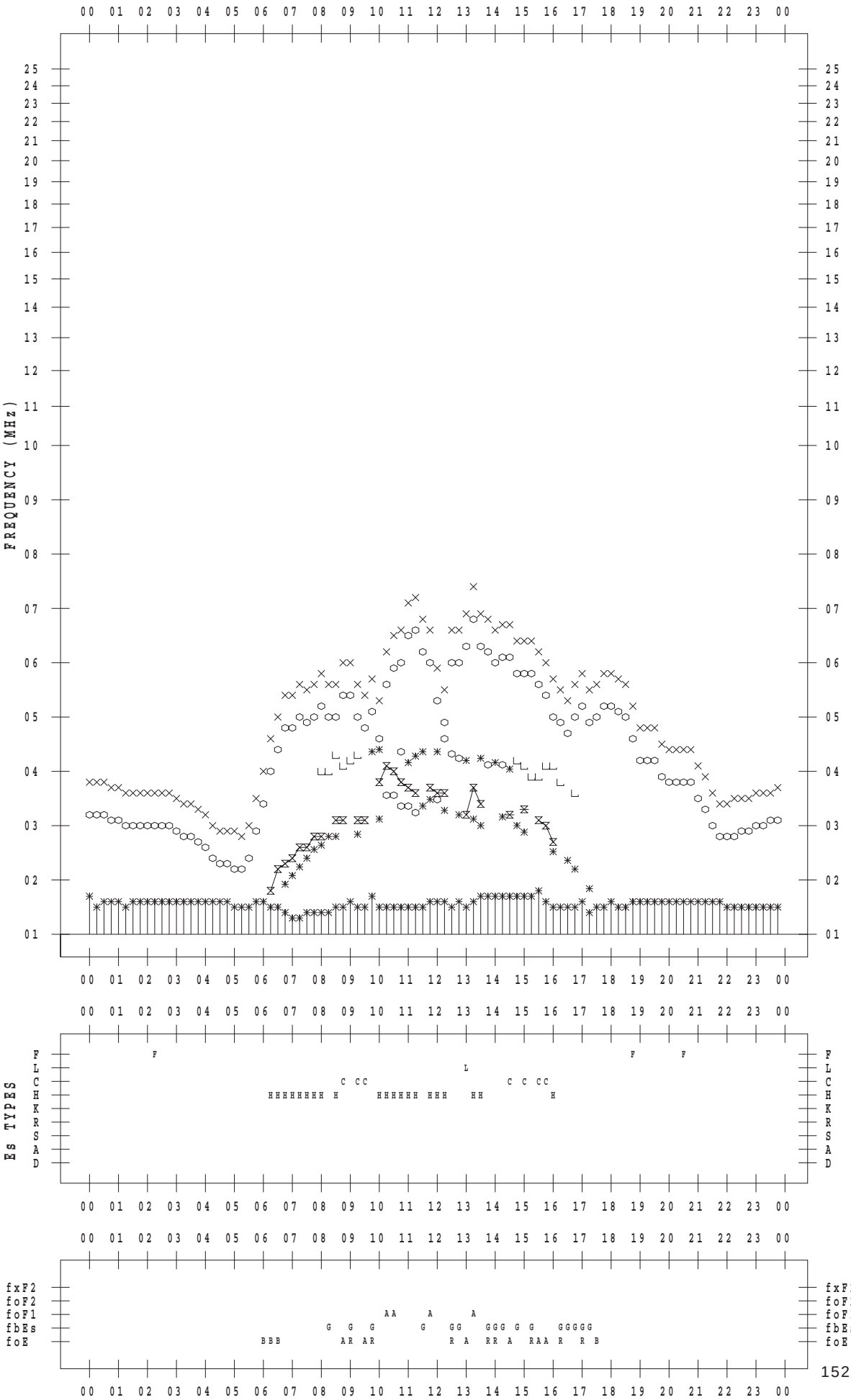
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/14

135 °E MEAN TIME



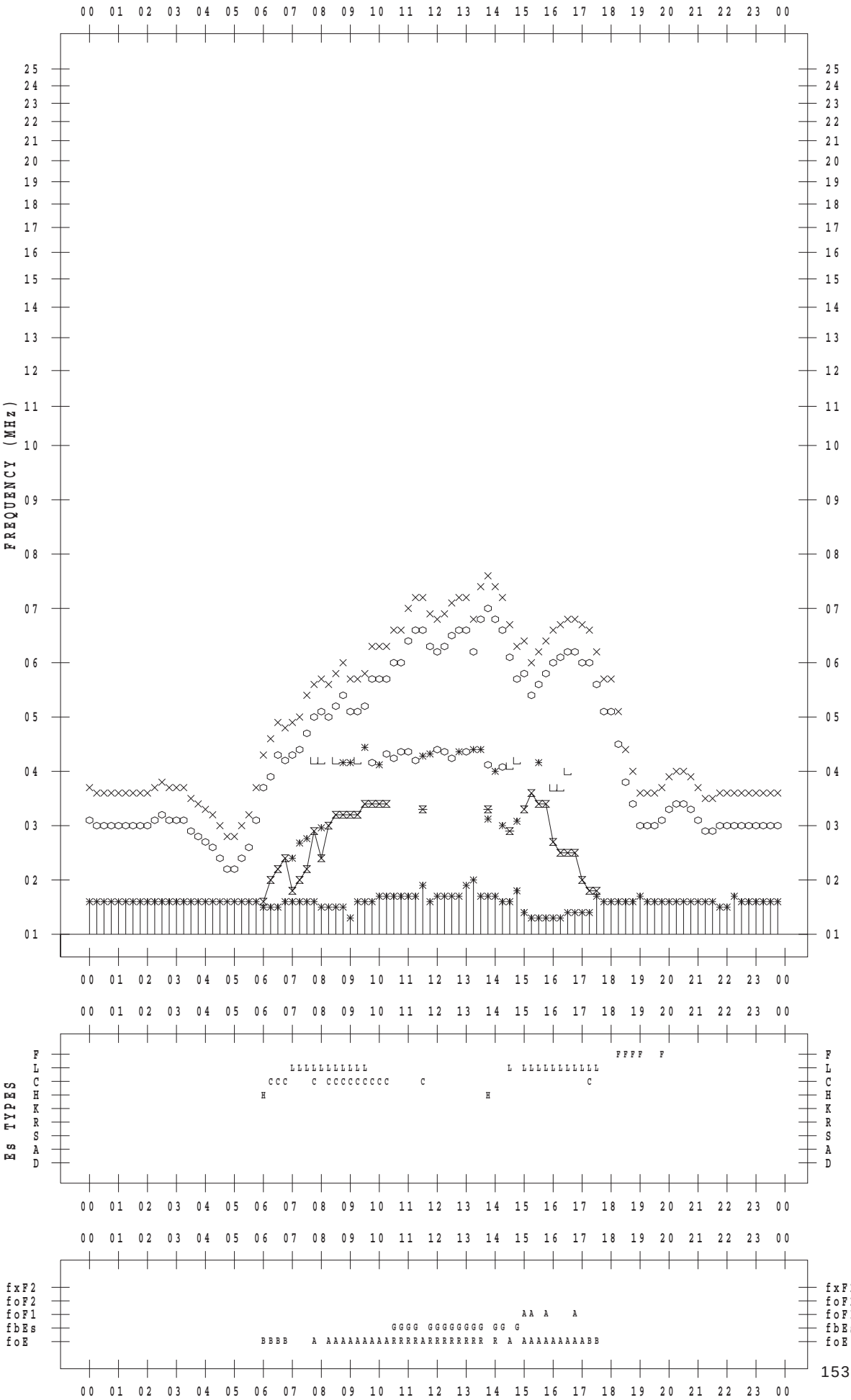
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/15

135 °E MEAN TIME



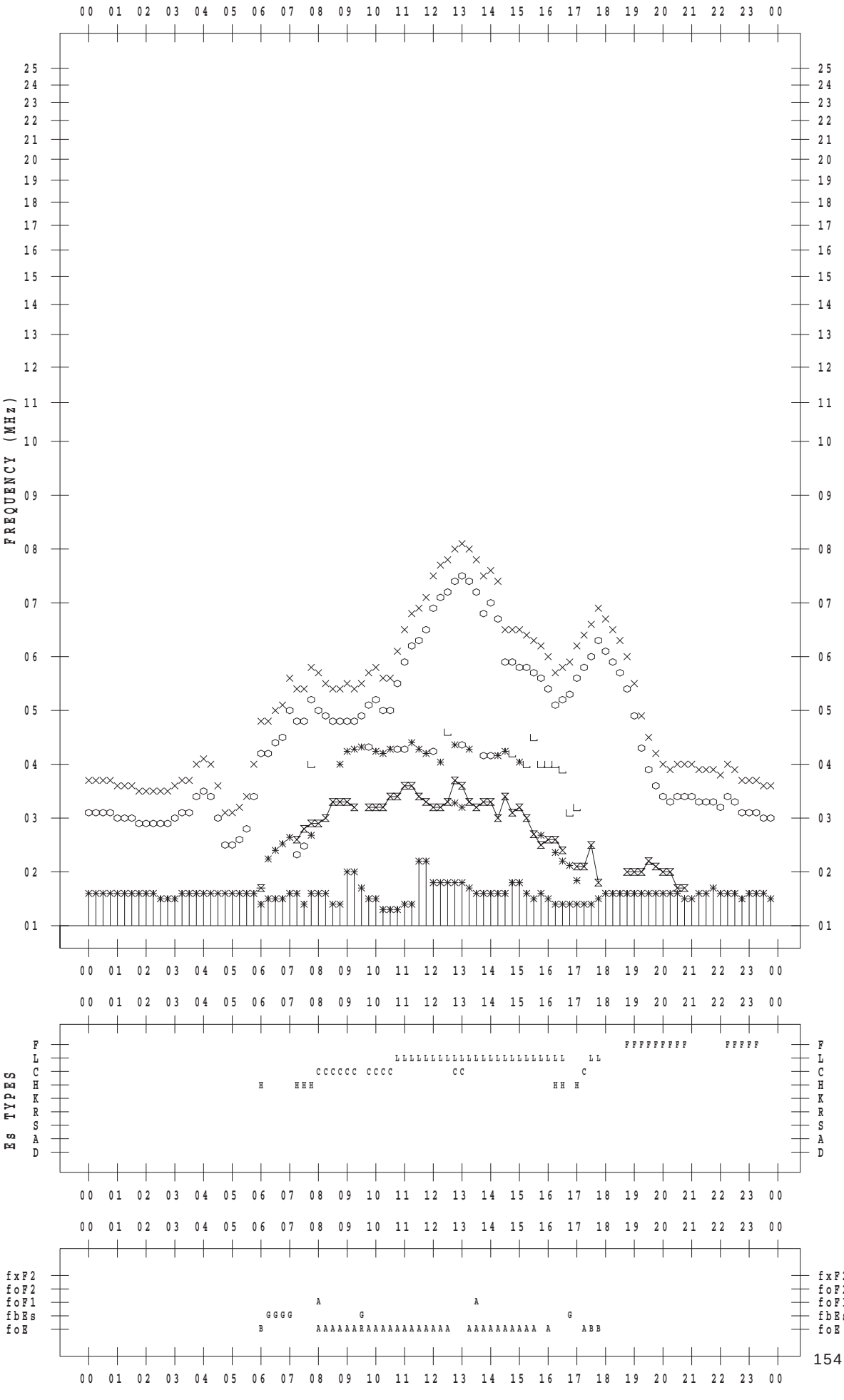
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/16

135 °E MEAN TIME



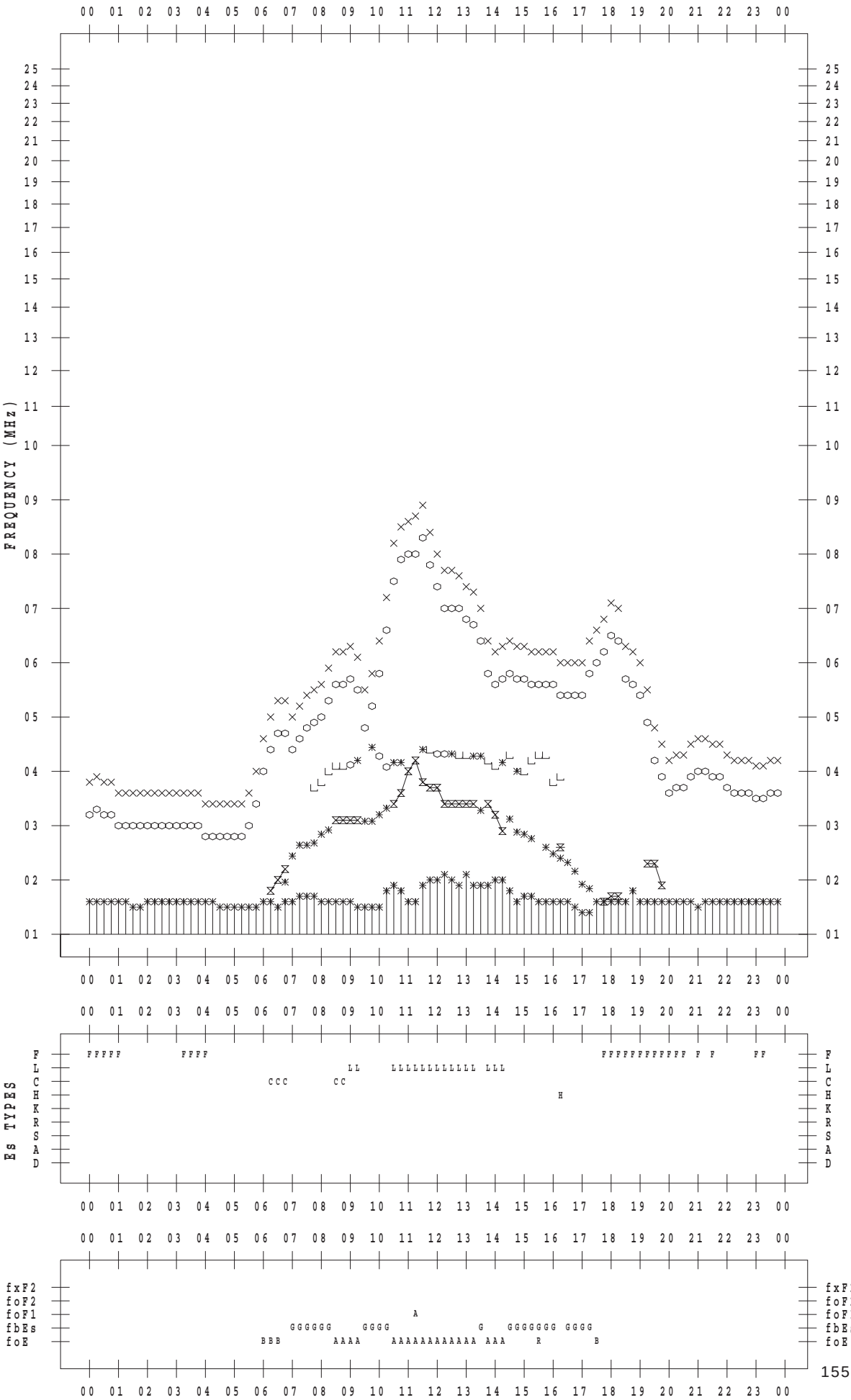
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/17

135 °E MEAN TIME



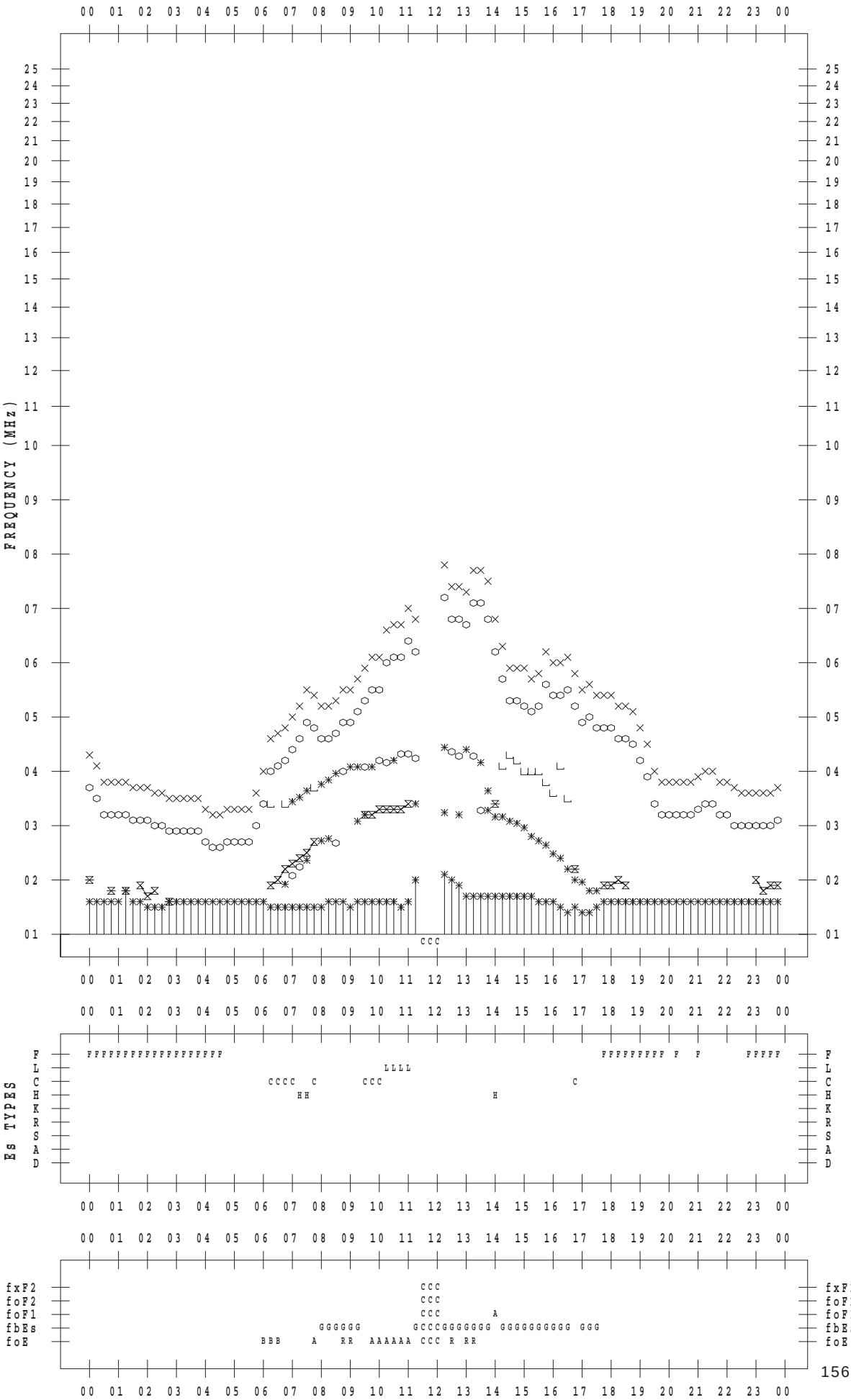
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/18

135 °E MEAN TIME



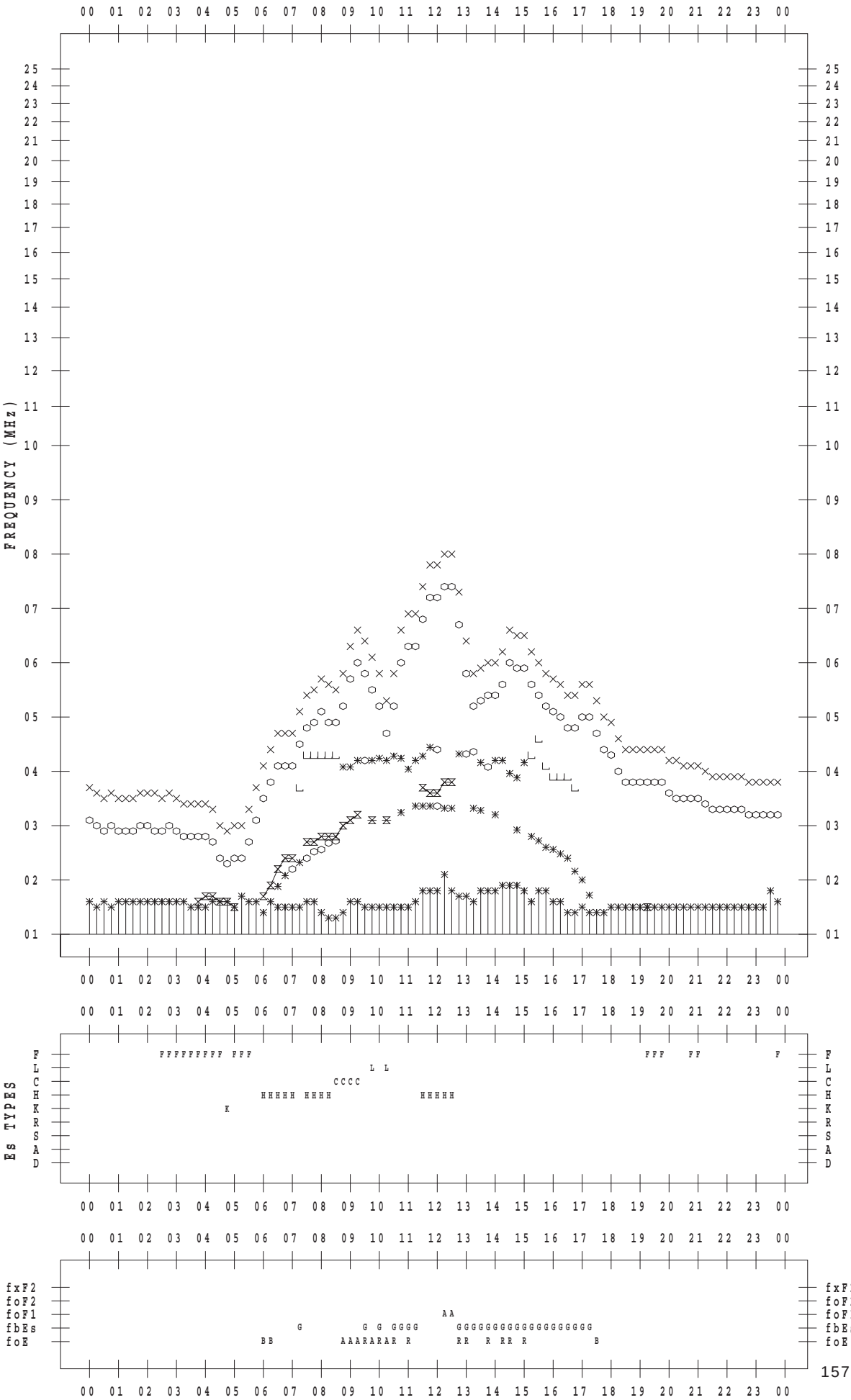
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/19

135 °E MEAN TIME



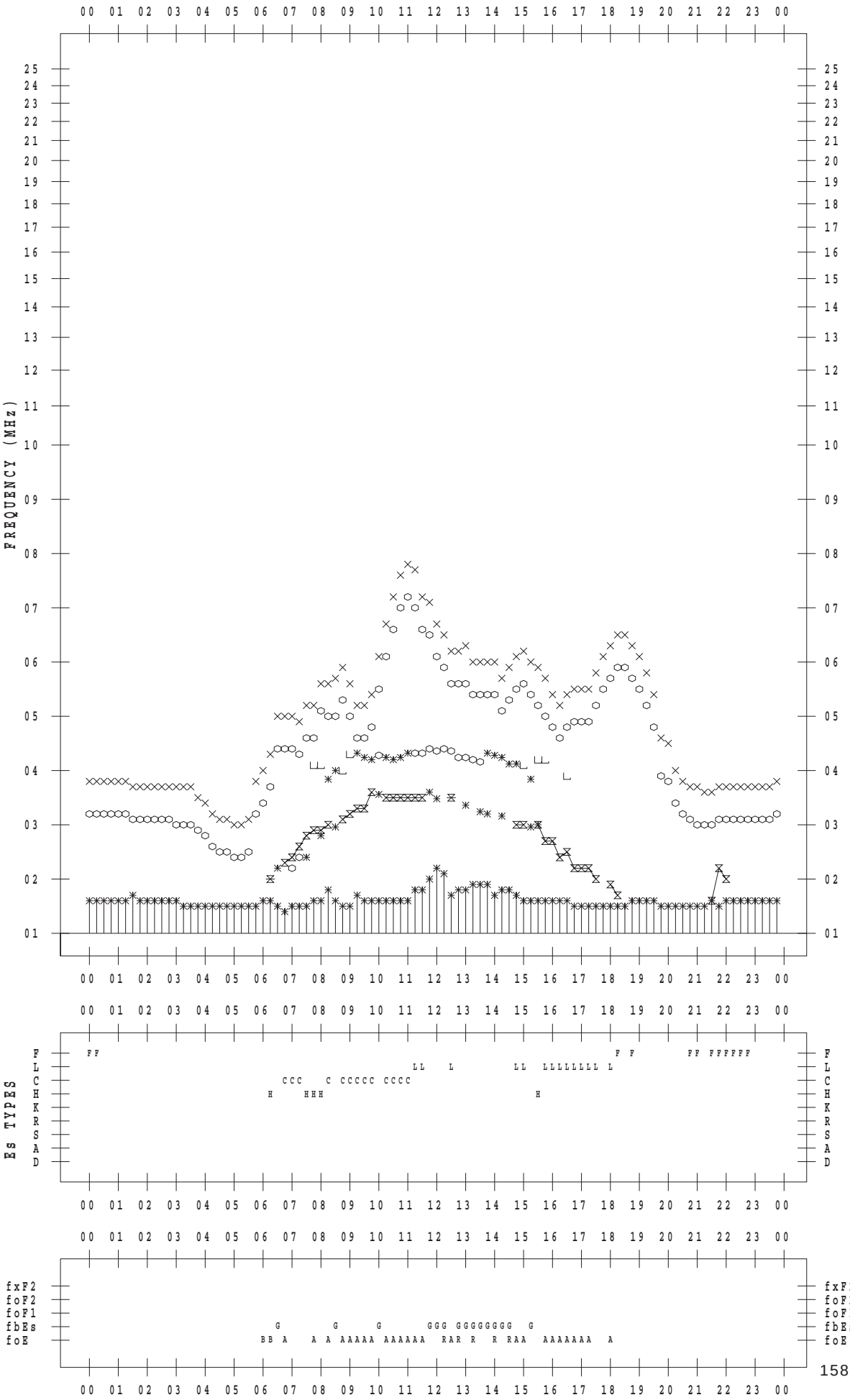
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/20

135 °E MEAN TIME



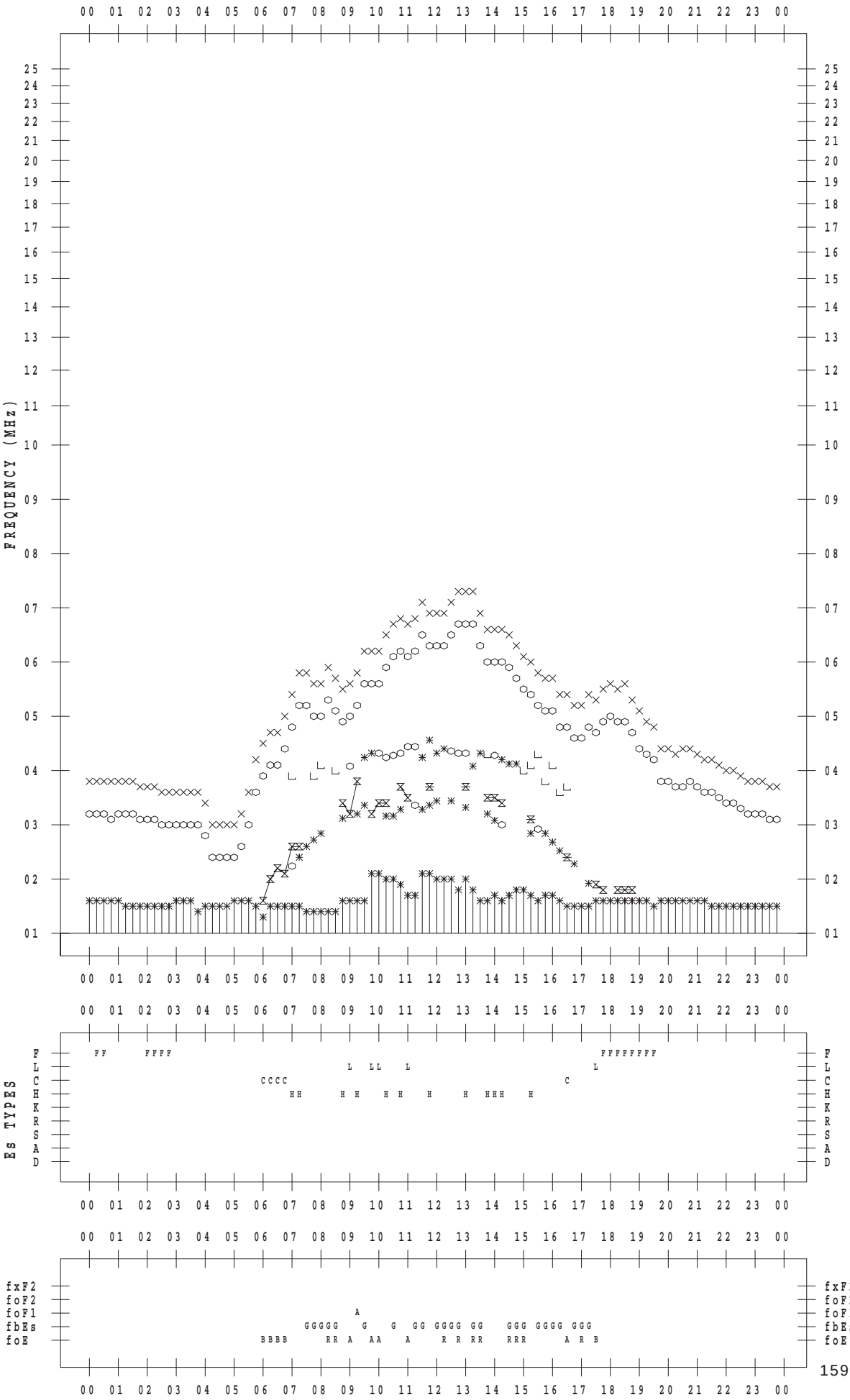
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/21

135 °E MEAN TIME



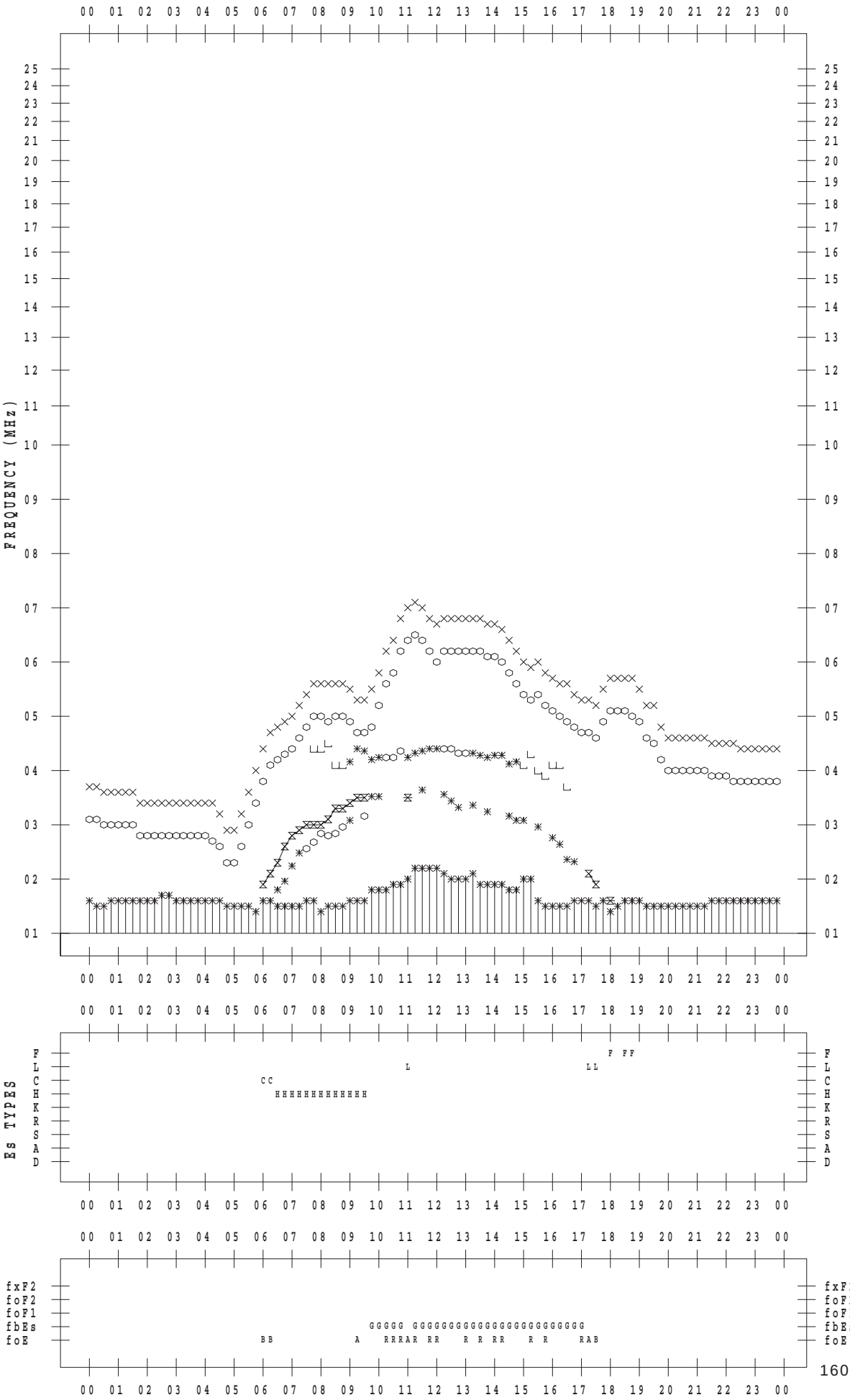
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/22

135 °E MEAN TIME



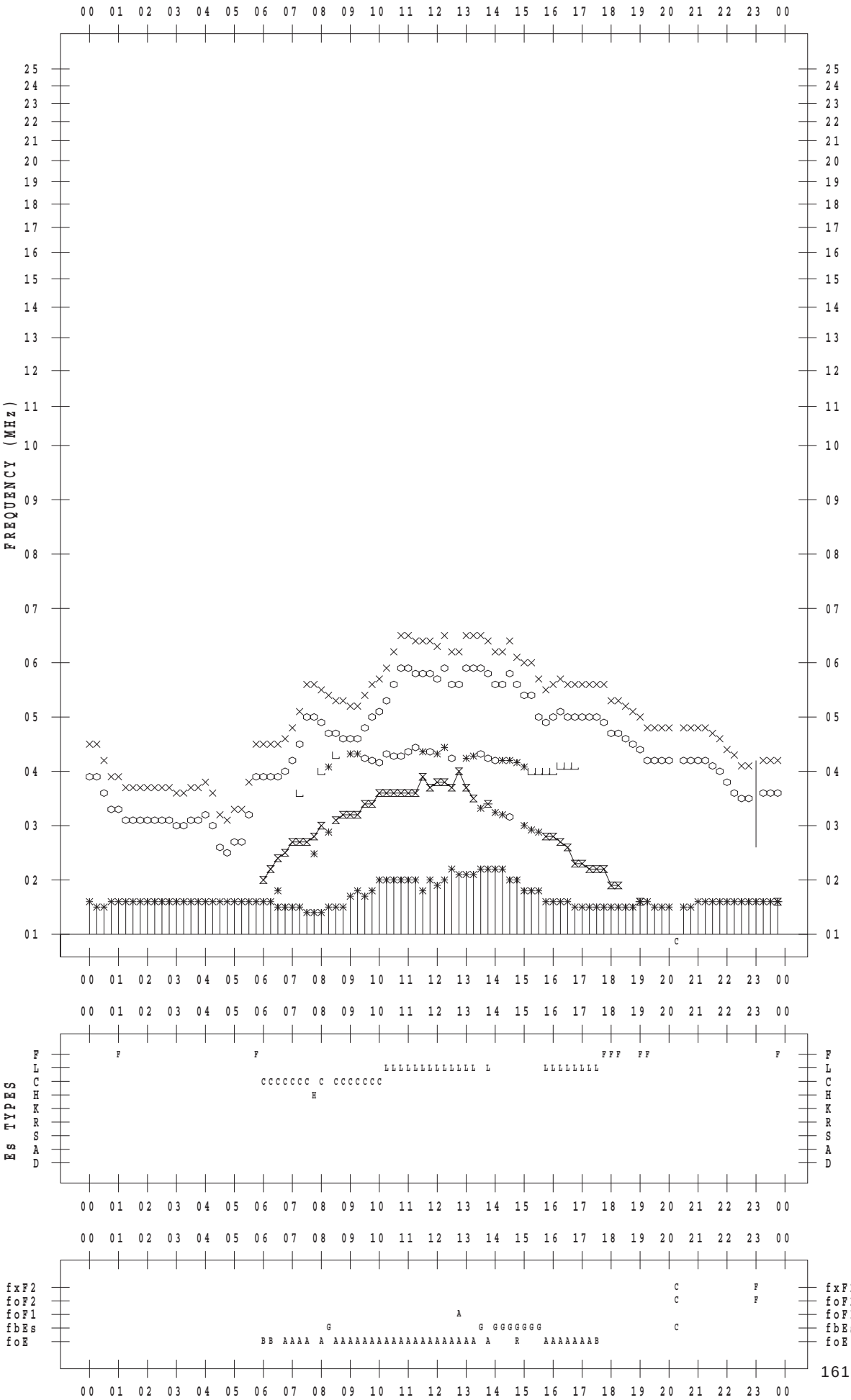
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/23

135 °E MEAN TIME



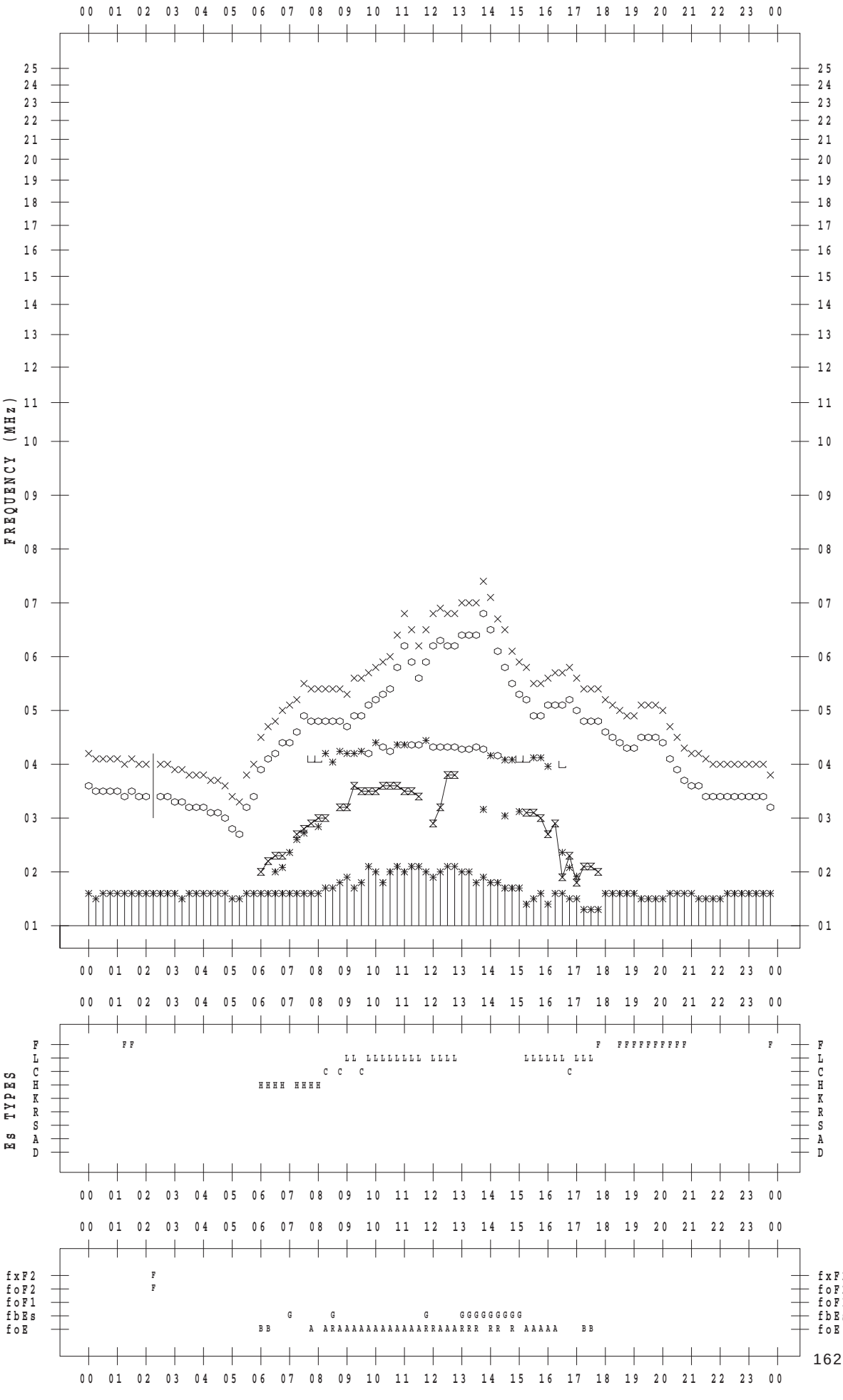
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/24

135 °E MEAN TIME



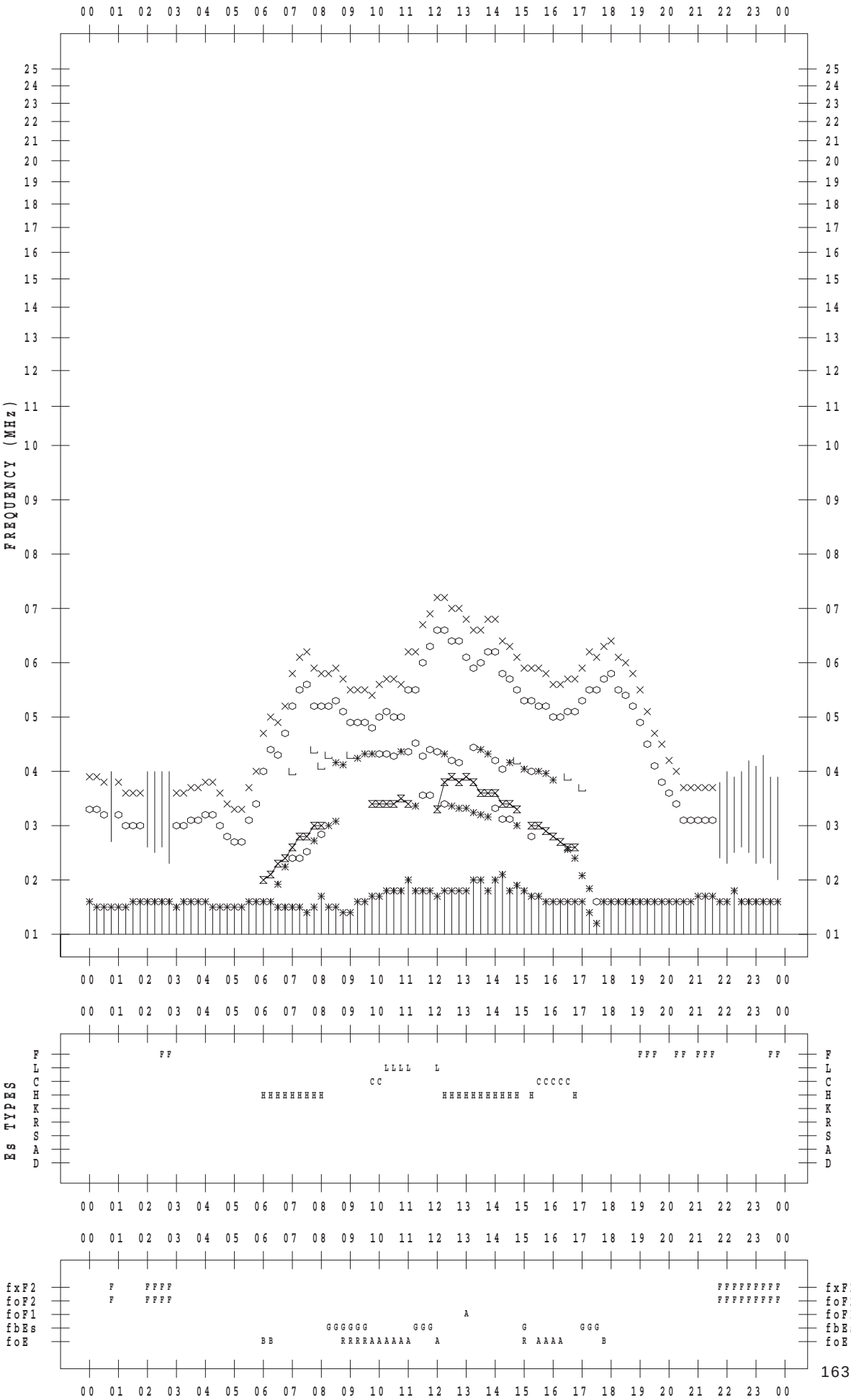
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/25

135 °E MEAN TIME



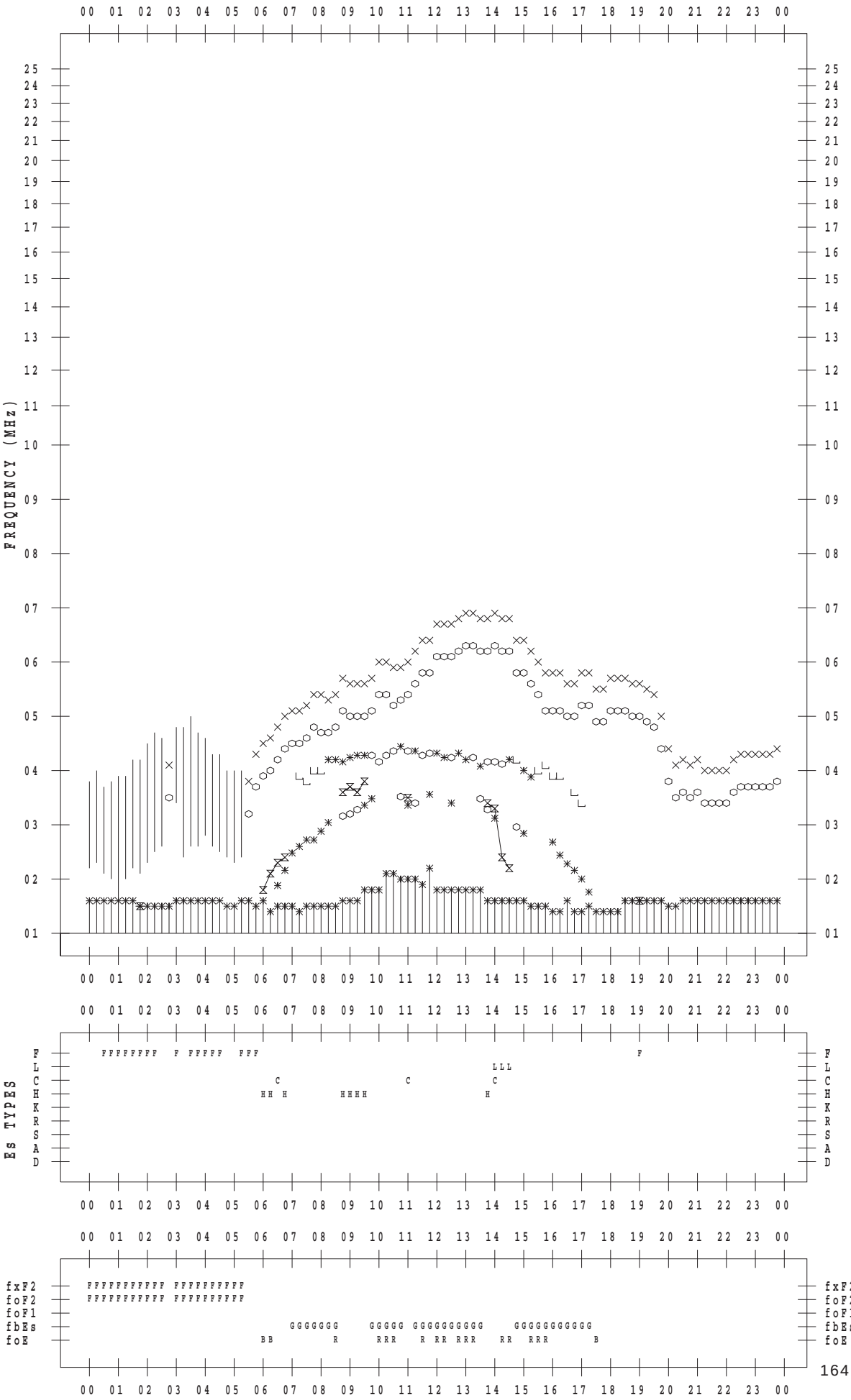
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/26

135 °E MEAN TIME



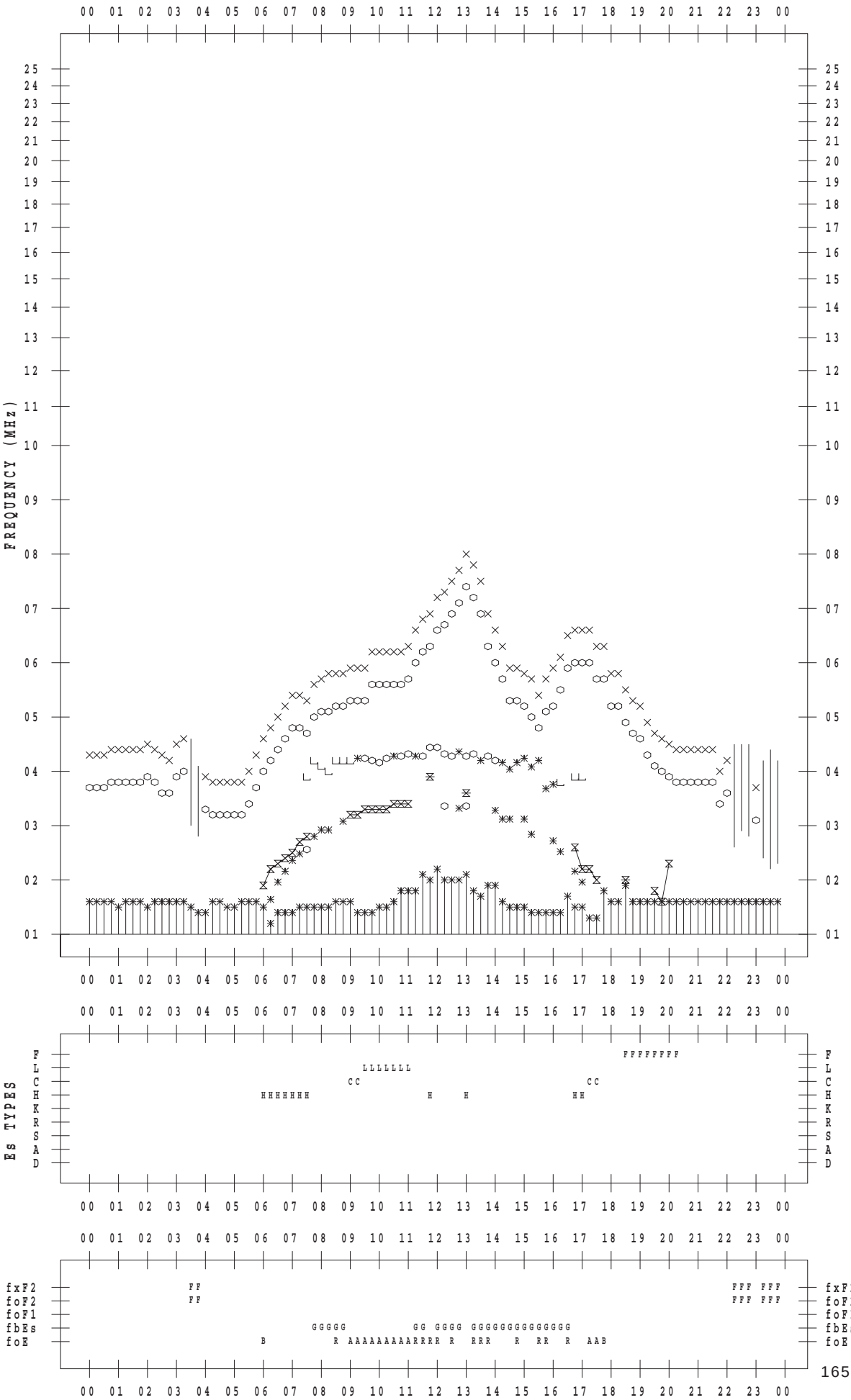
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/27

135 °E MEAN TIME



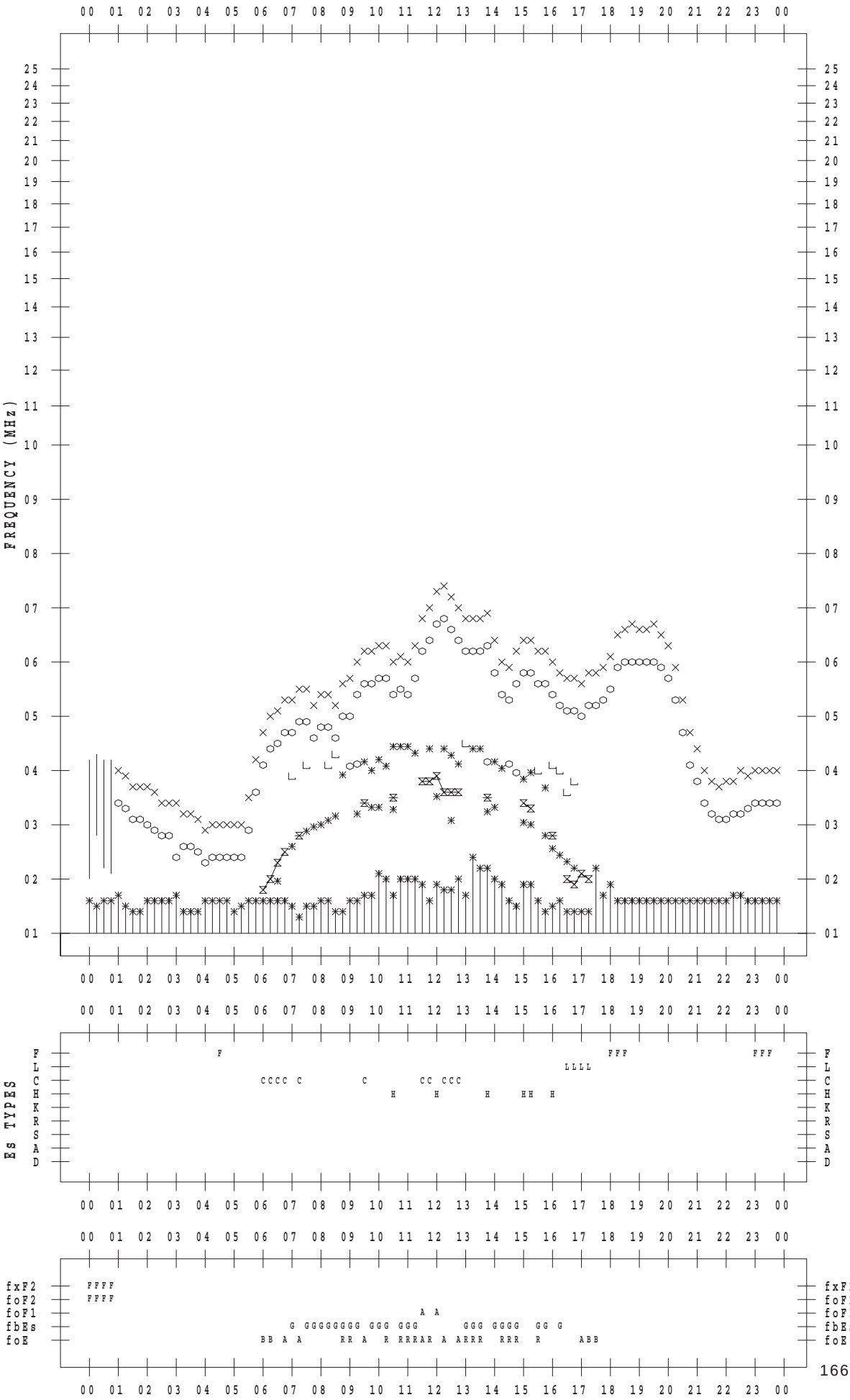
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/28

135 °E MEAN TIME



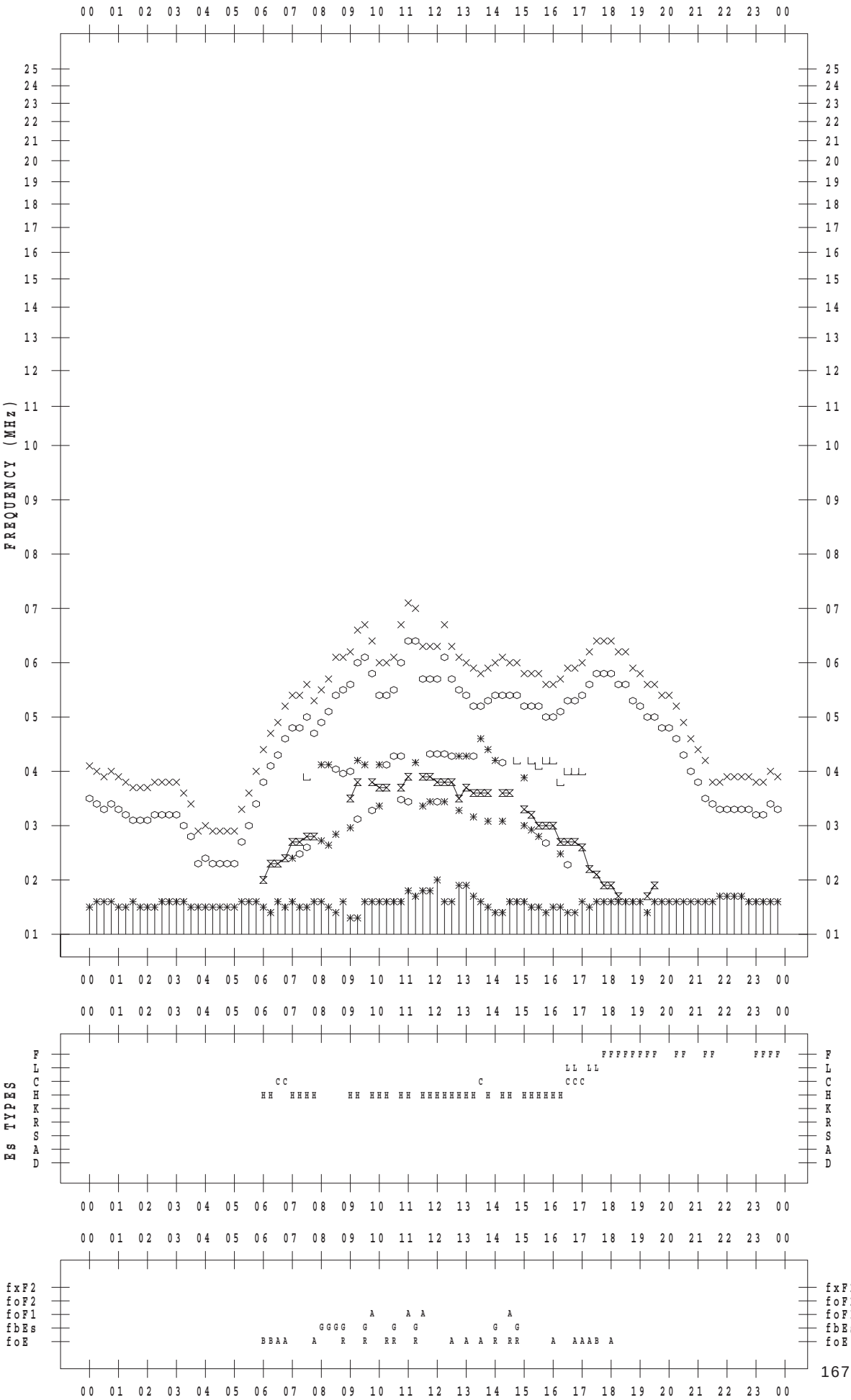
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/29

135 °E MEAN TIME



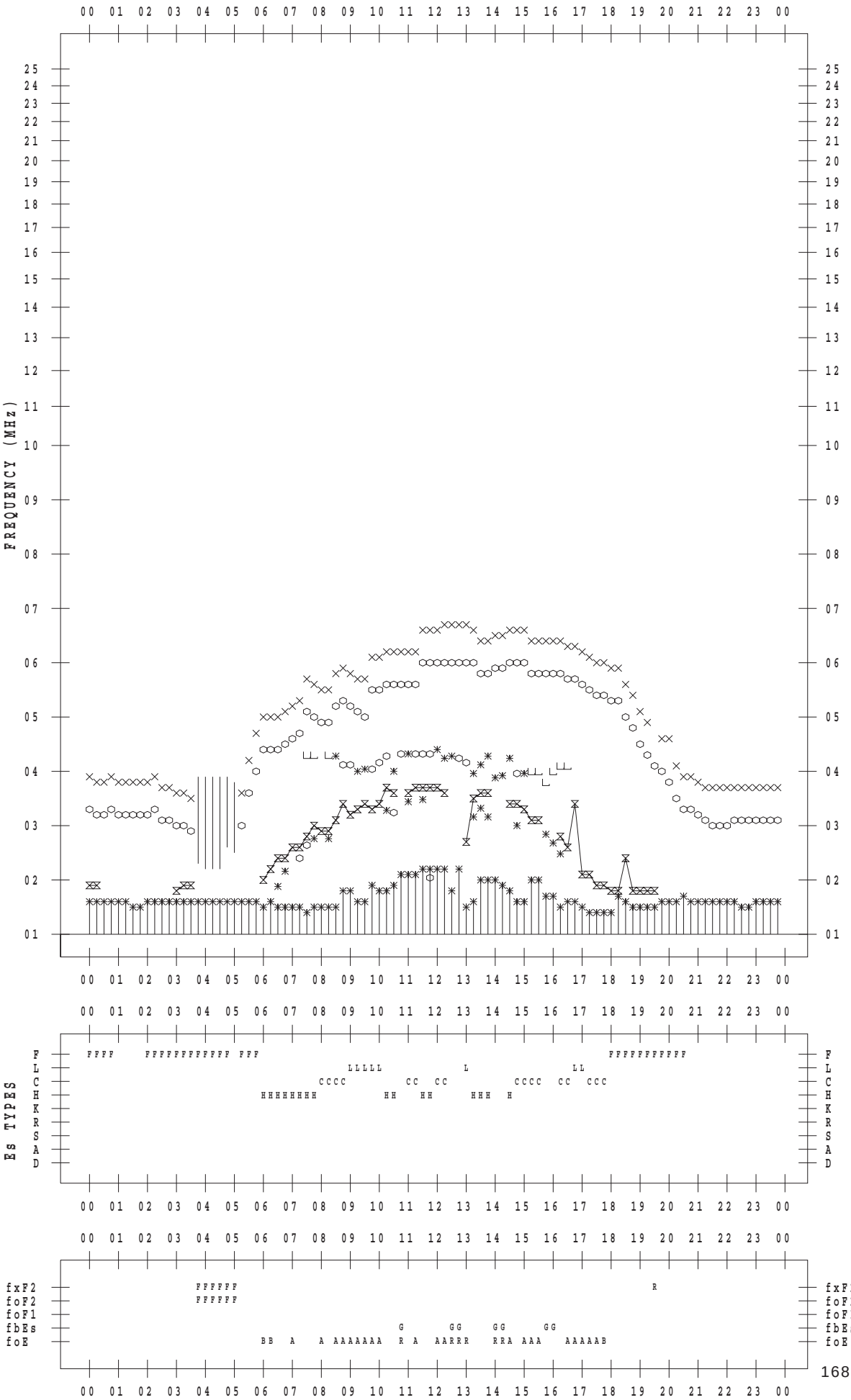
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/30

135 °E MEAN TIME



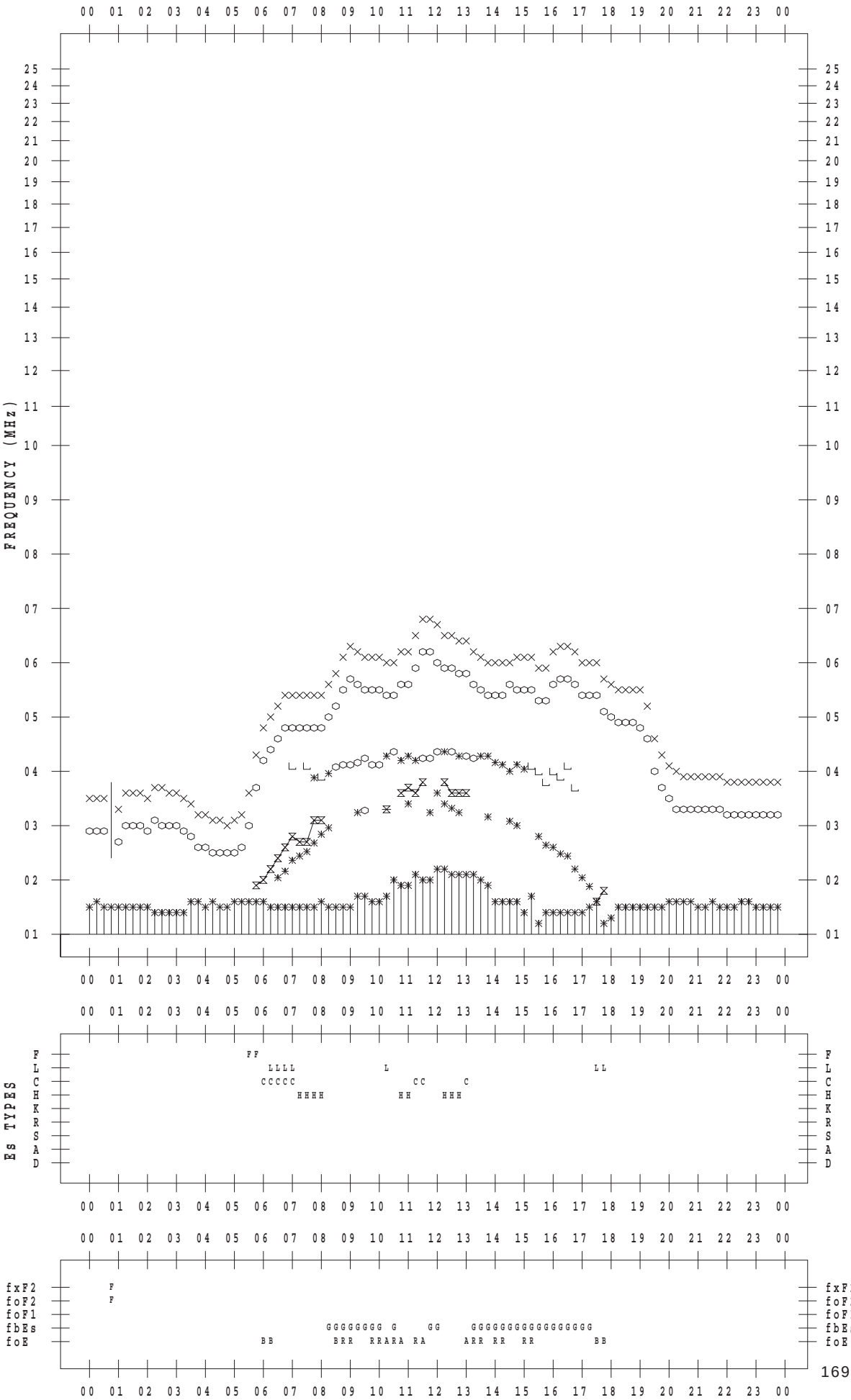
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 3/31

135 °E MEAN TIME



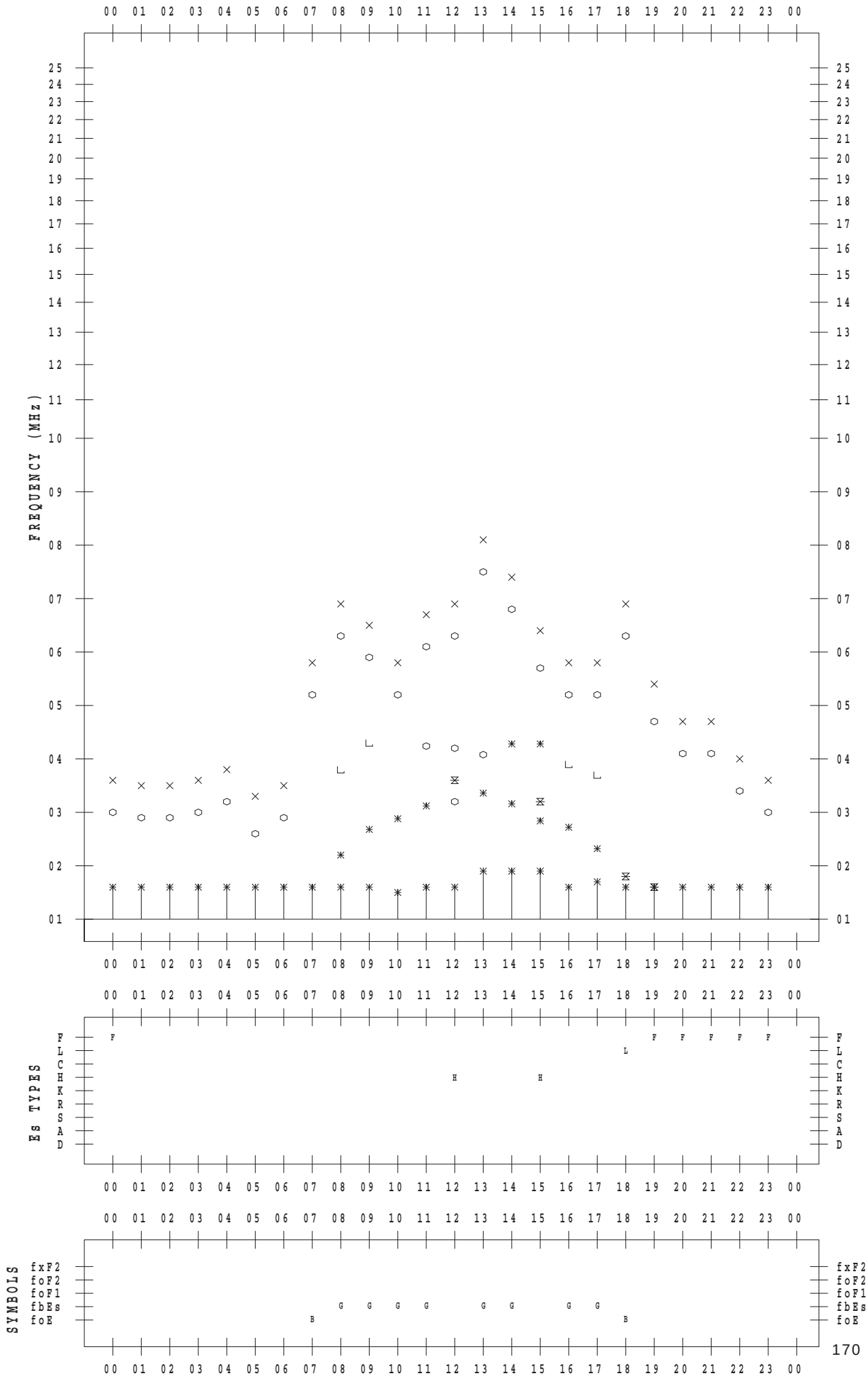
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 1

135 °E MEAN TIME



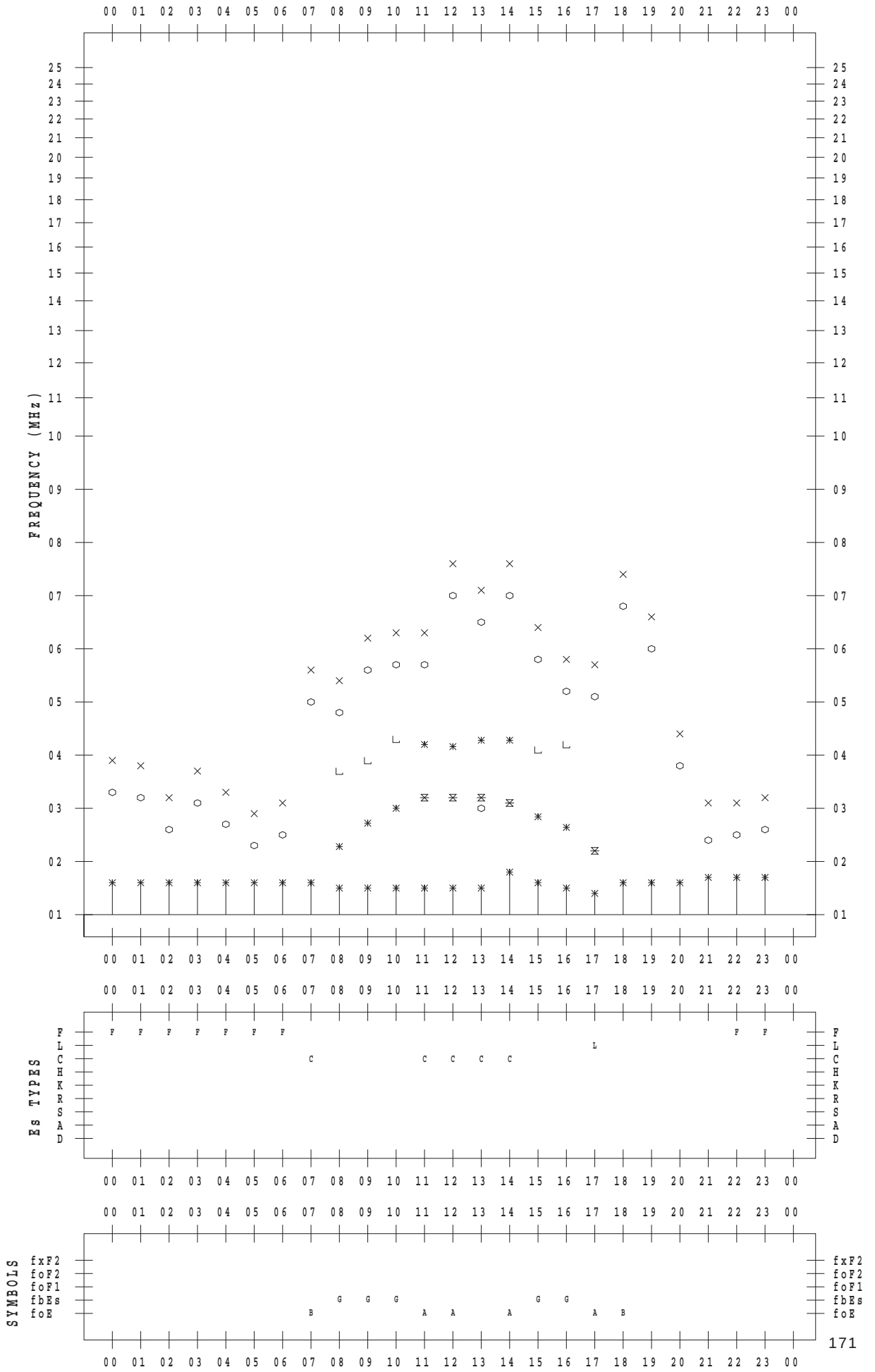
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 2

135 °E MEAN TIME



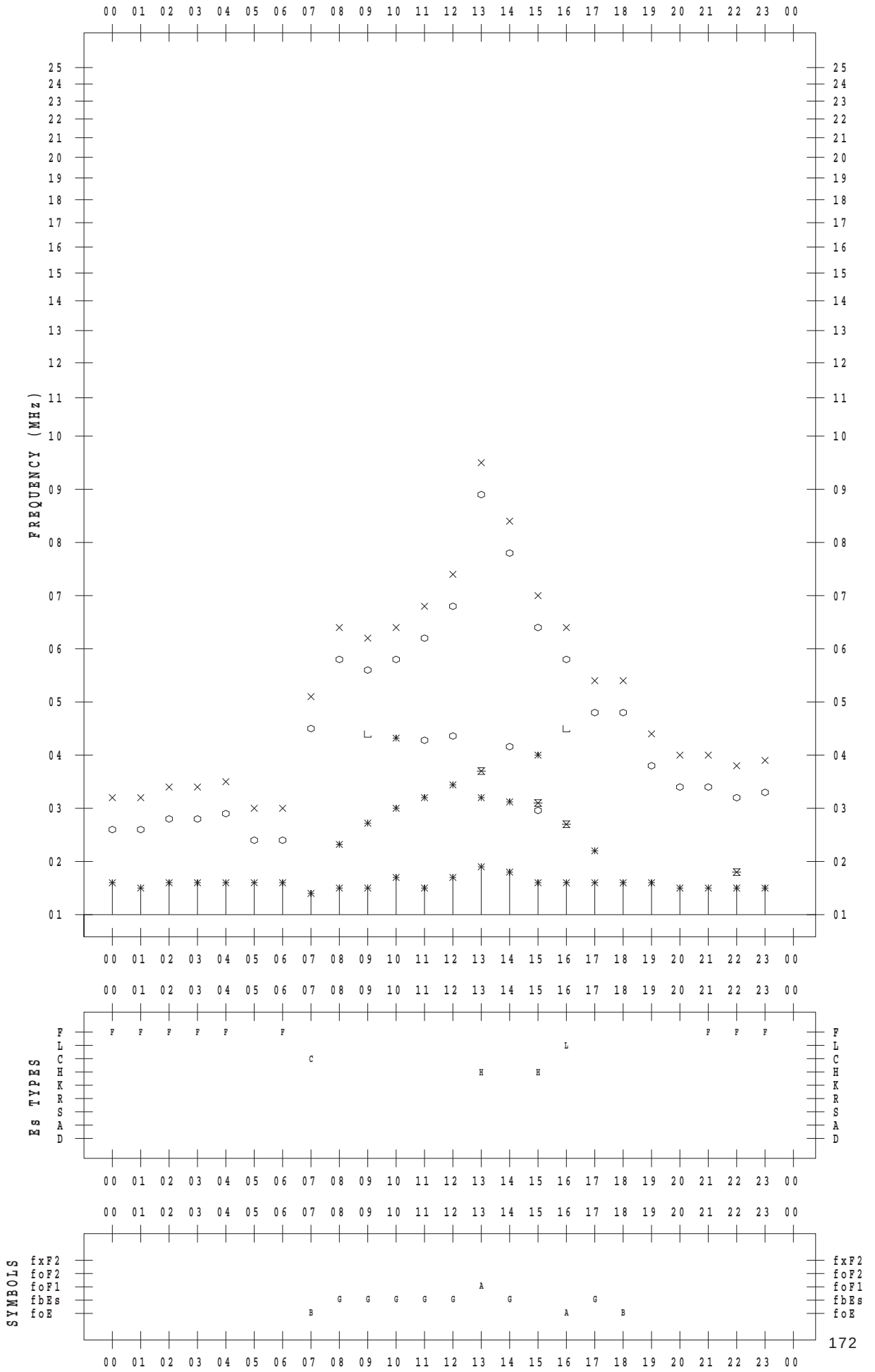
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 3

135 °E MEAN TIME



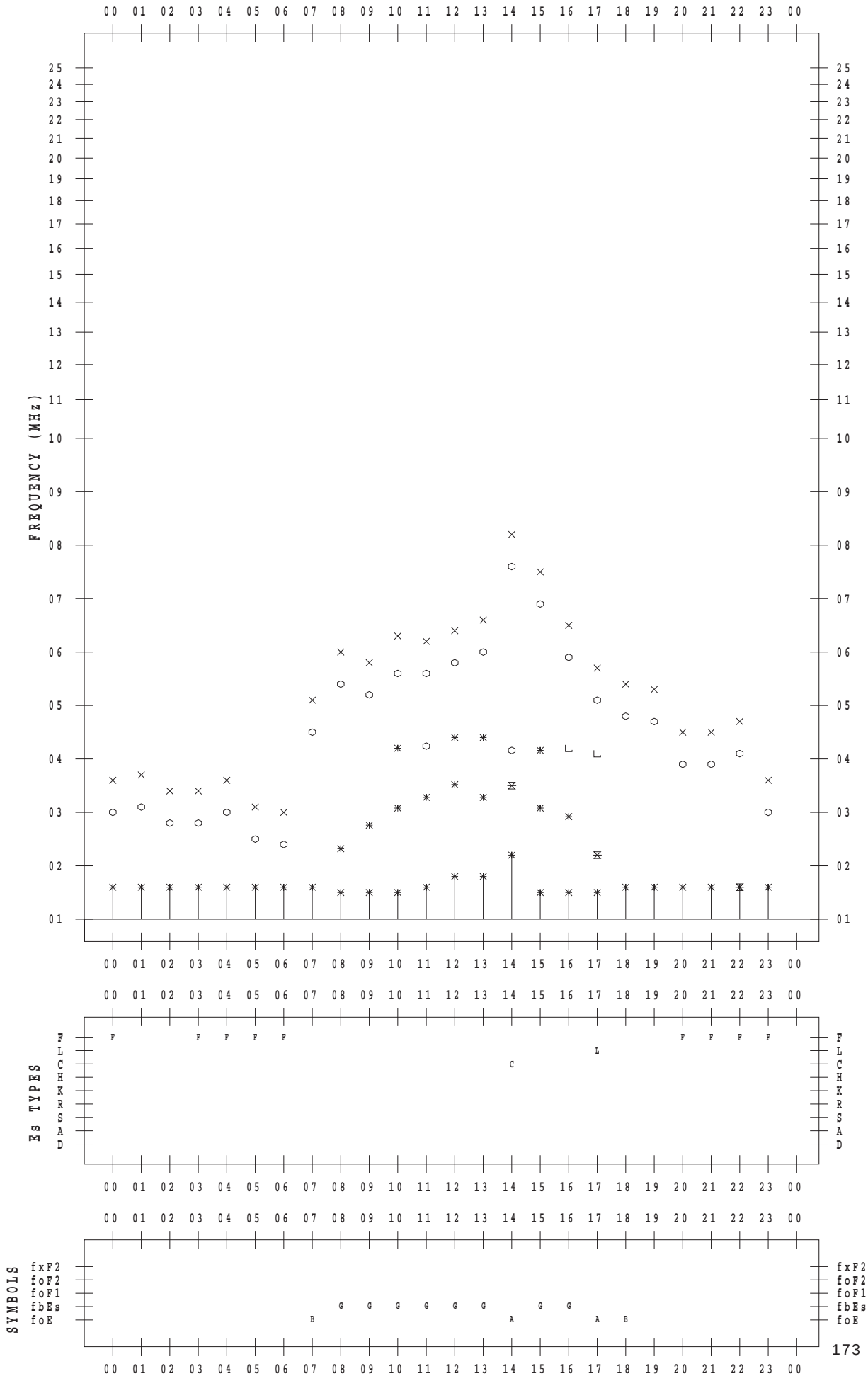
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 4

135 °E MEAN TIME



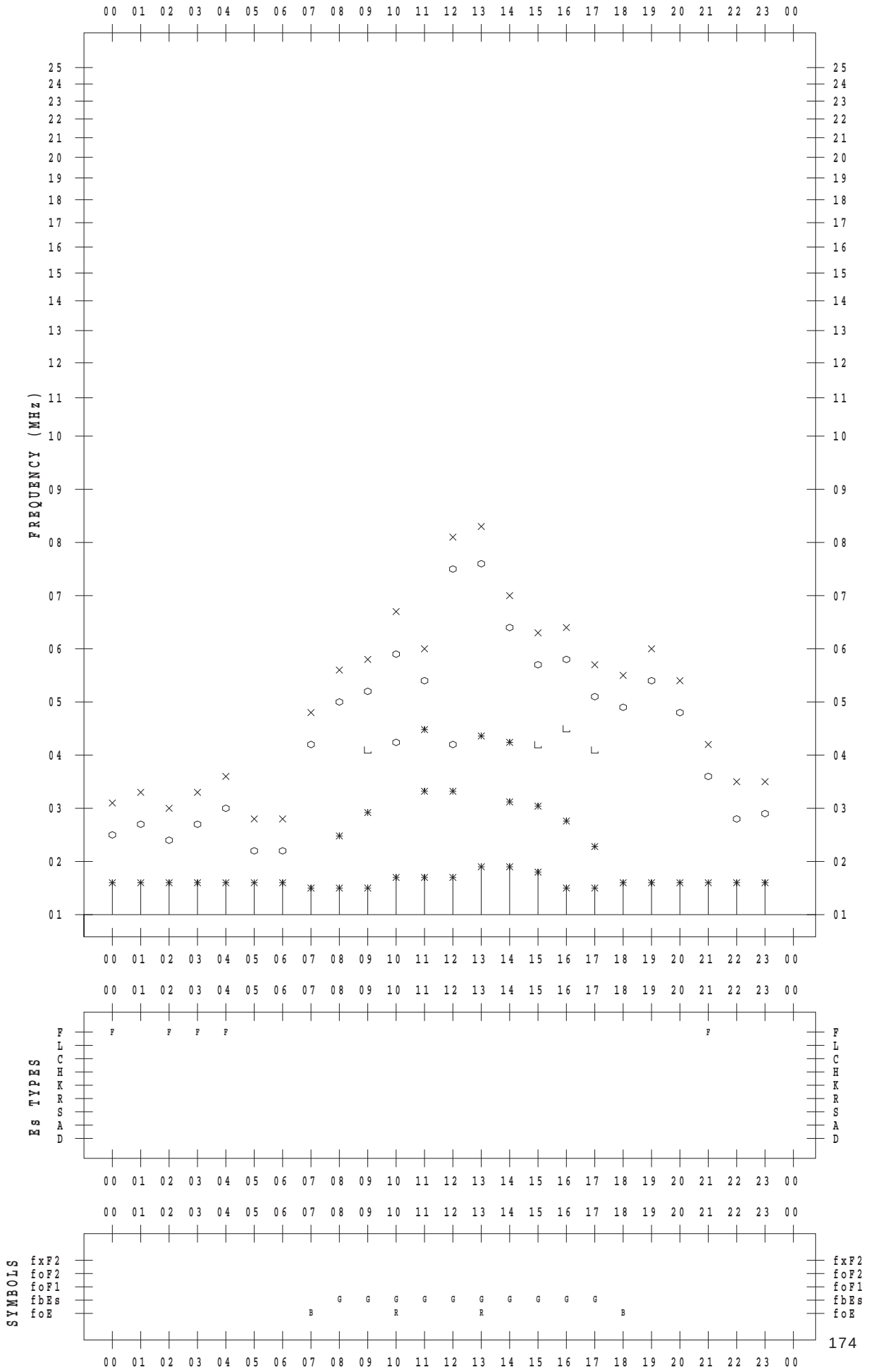
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 5

135 °E MEAN TIME



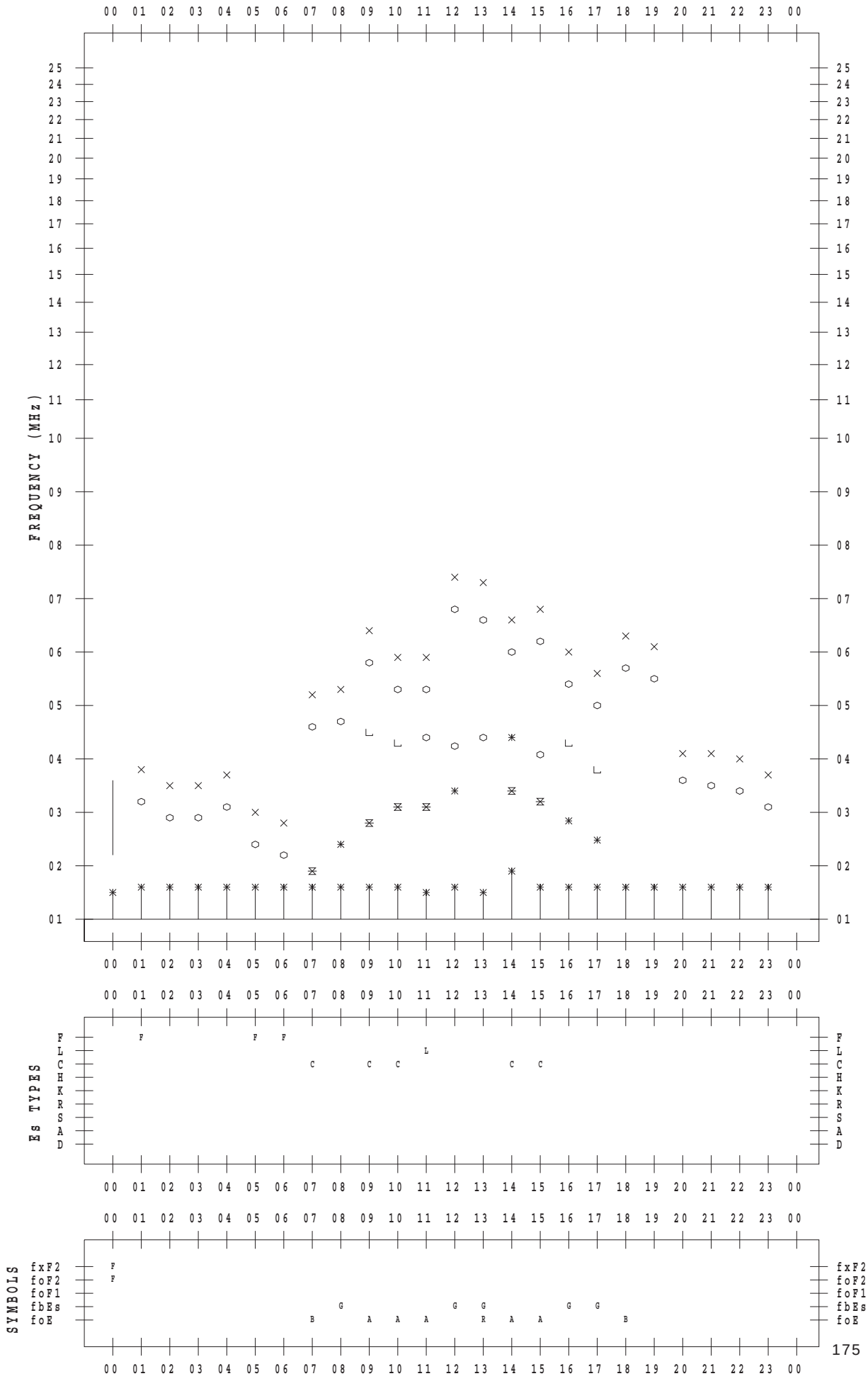
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 6

135 °E MEAN TIME



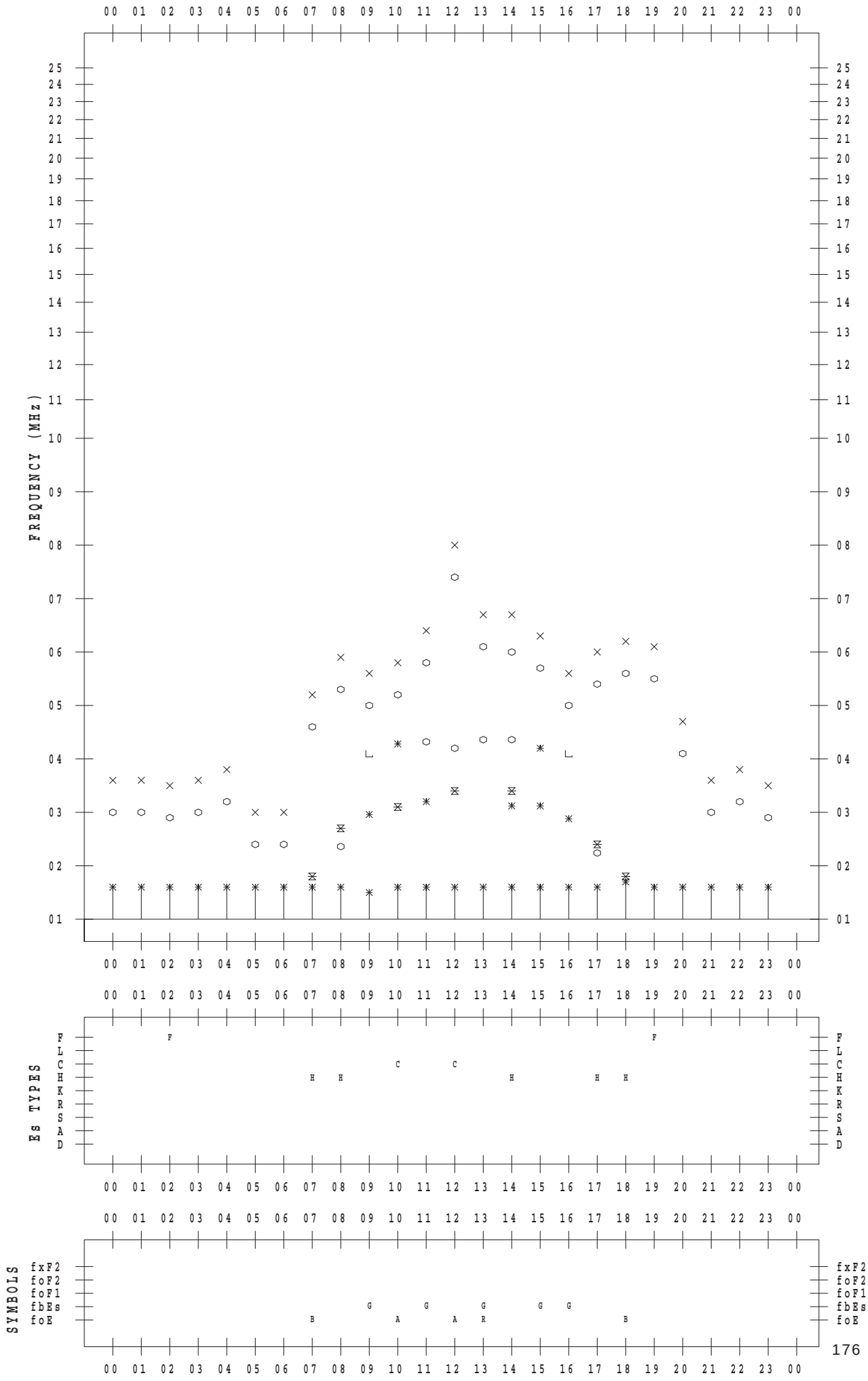
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 7

135 °E MEAN TIME



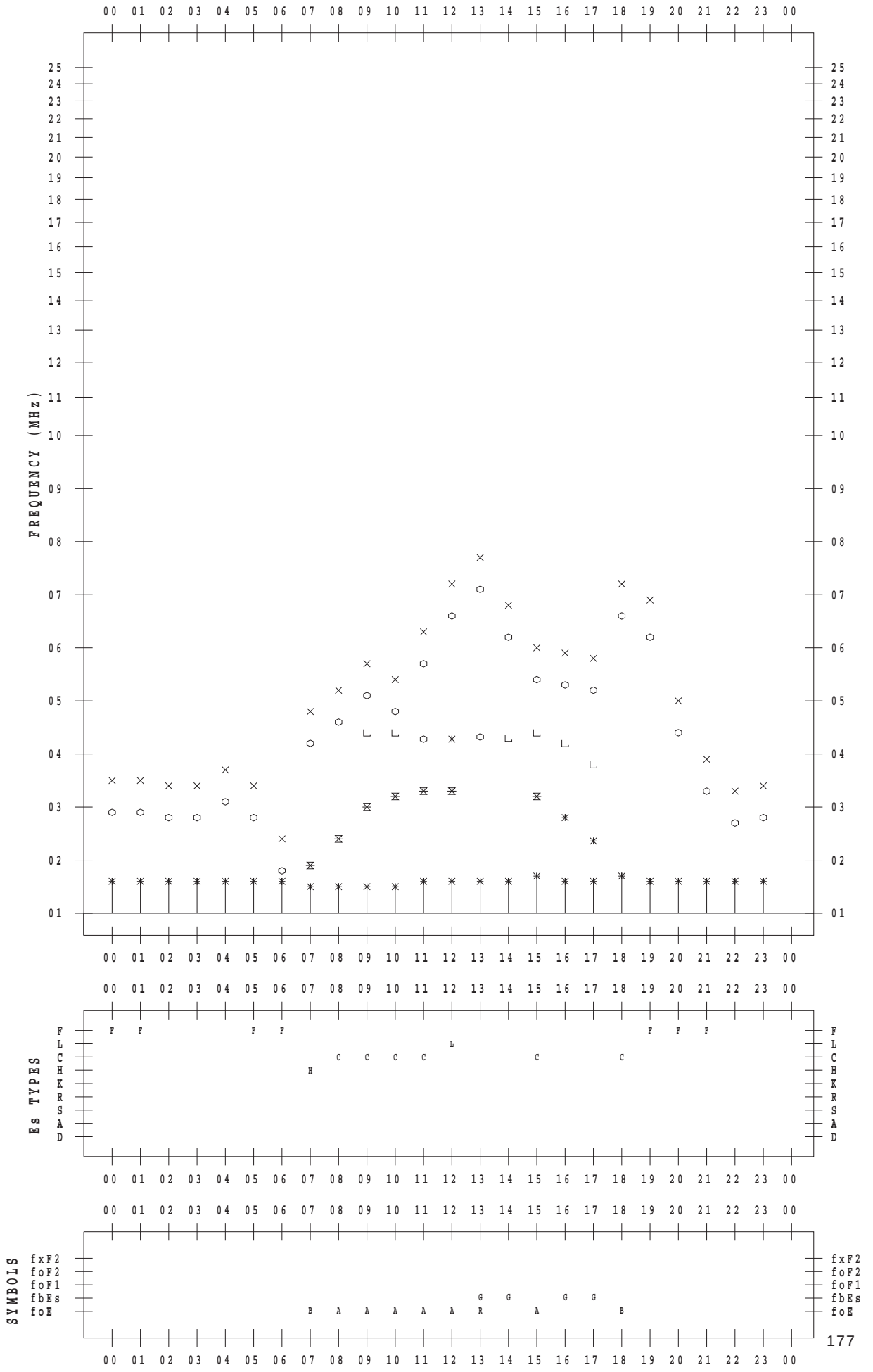
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 8

135 °E MEAN TIME



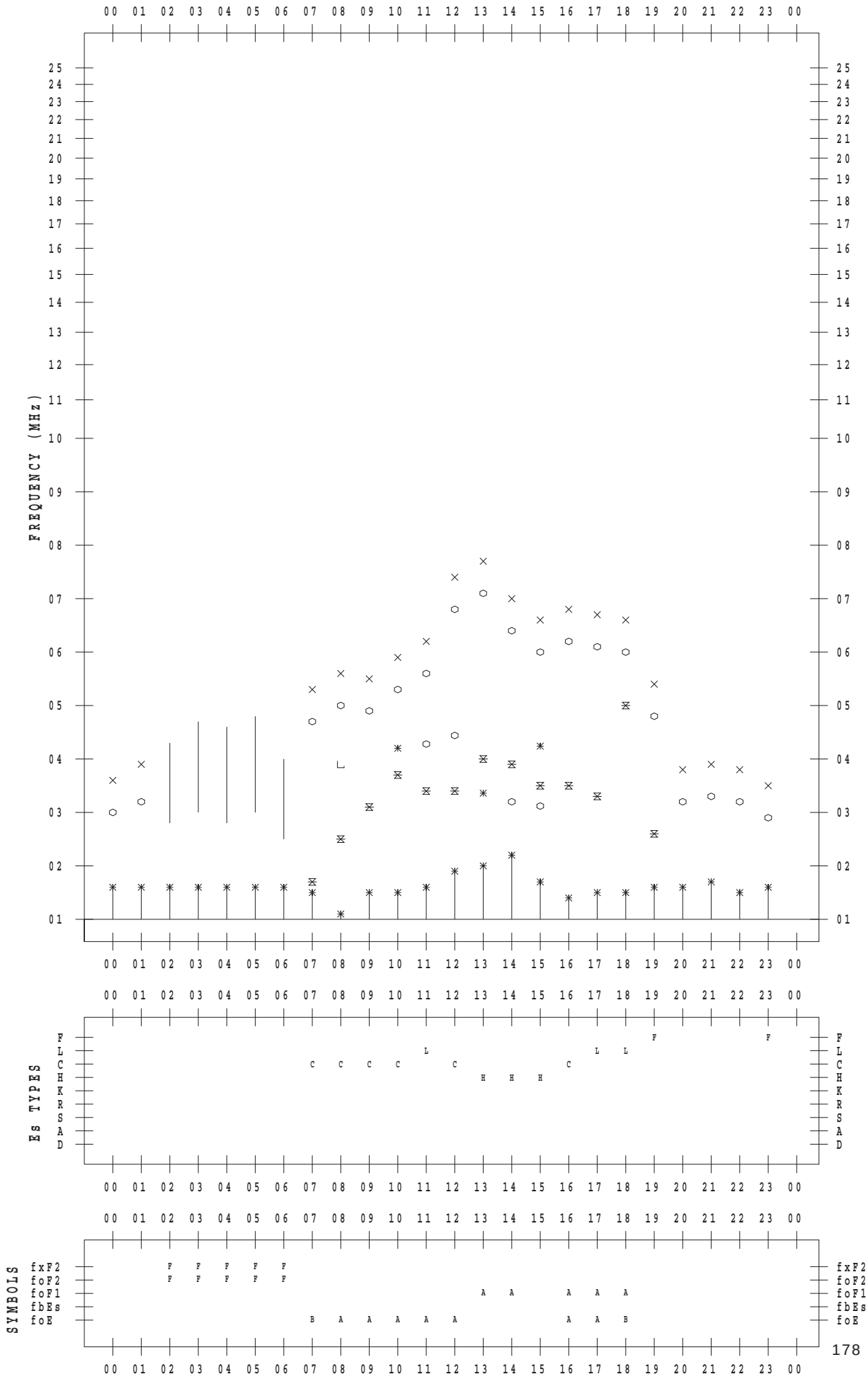
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/ 9

135 °E MEAN TIME



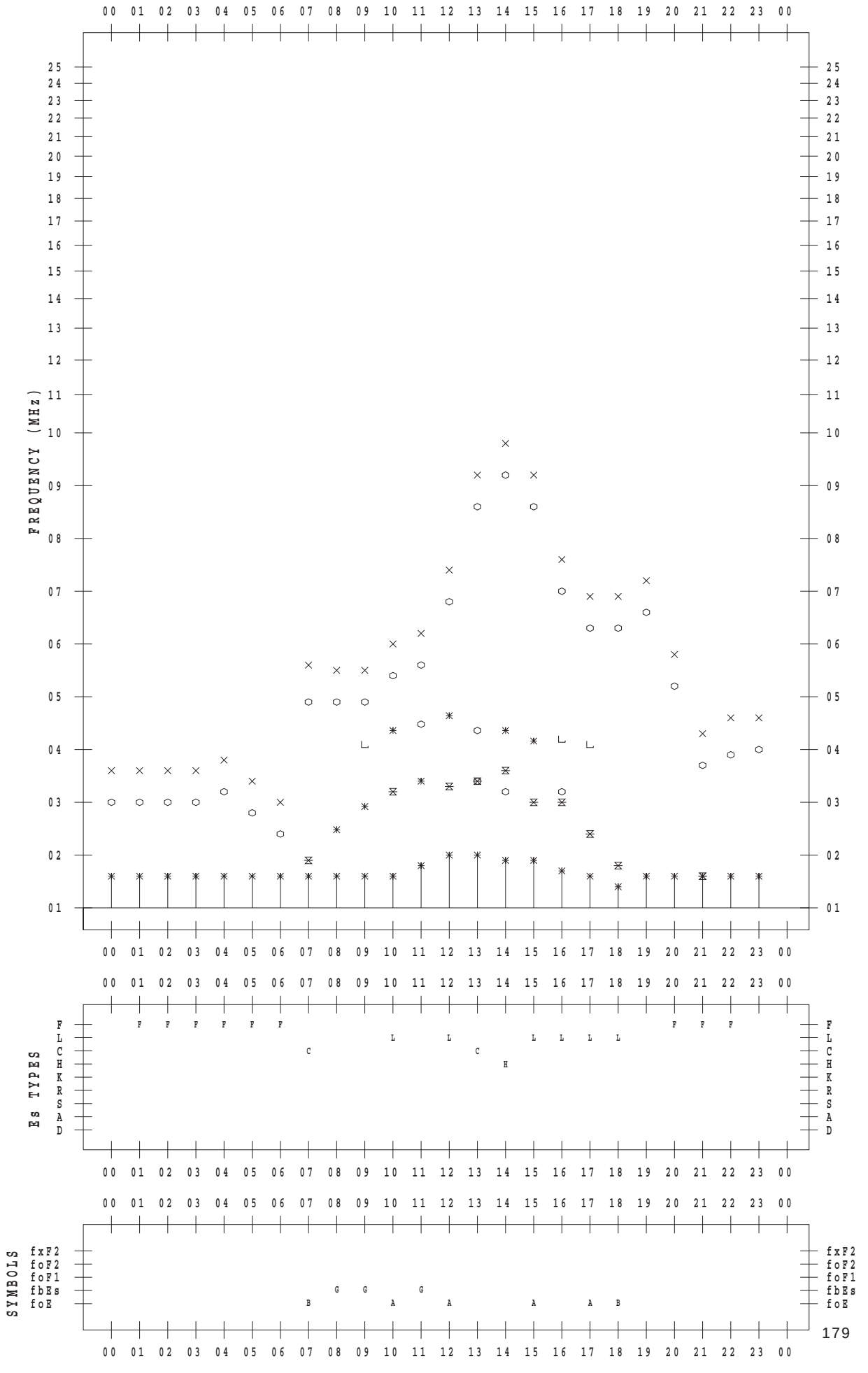
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/10

135 °E MEAN TIME



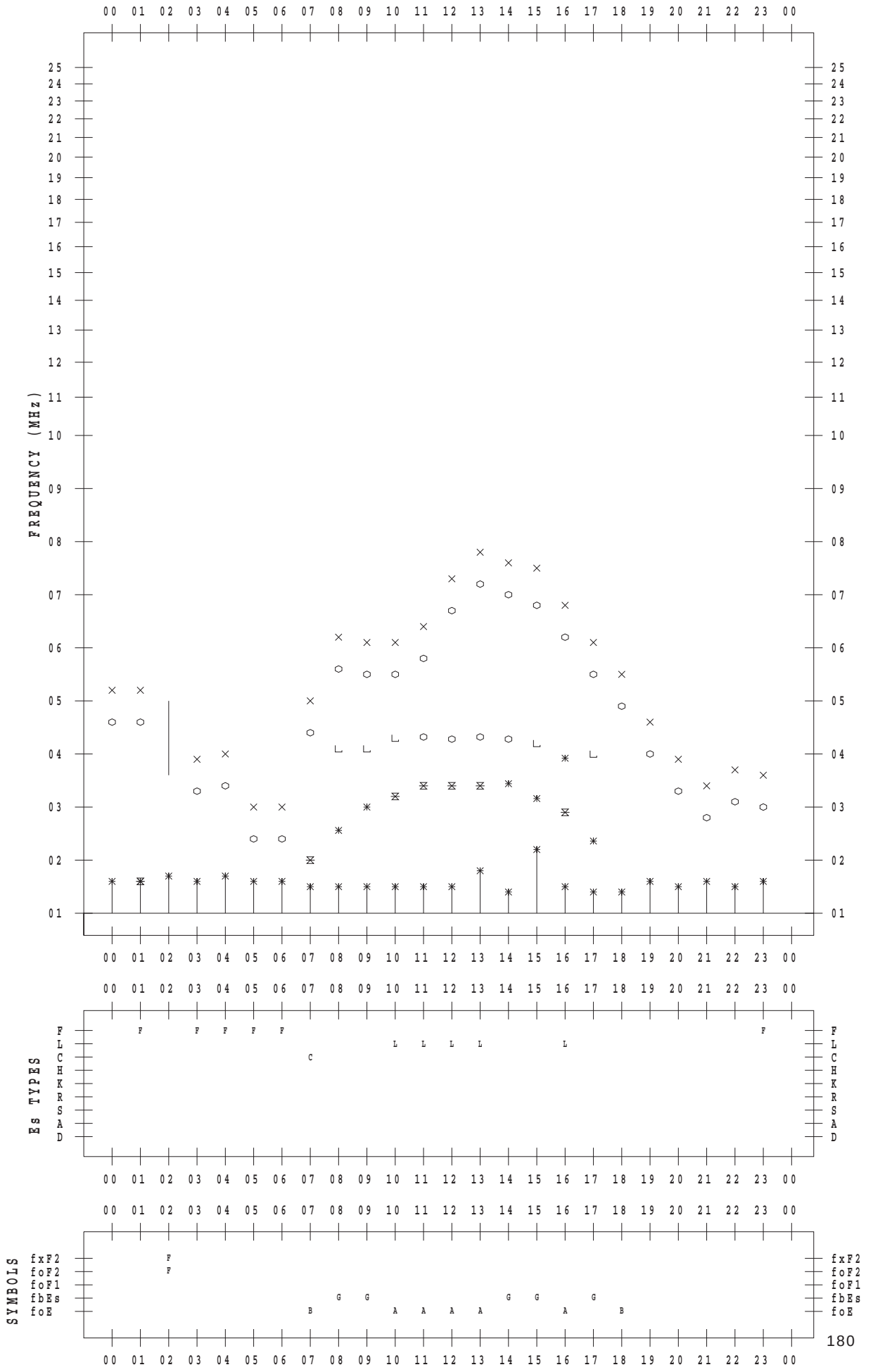
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/11

135 °E MEAN TIME



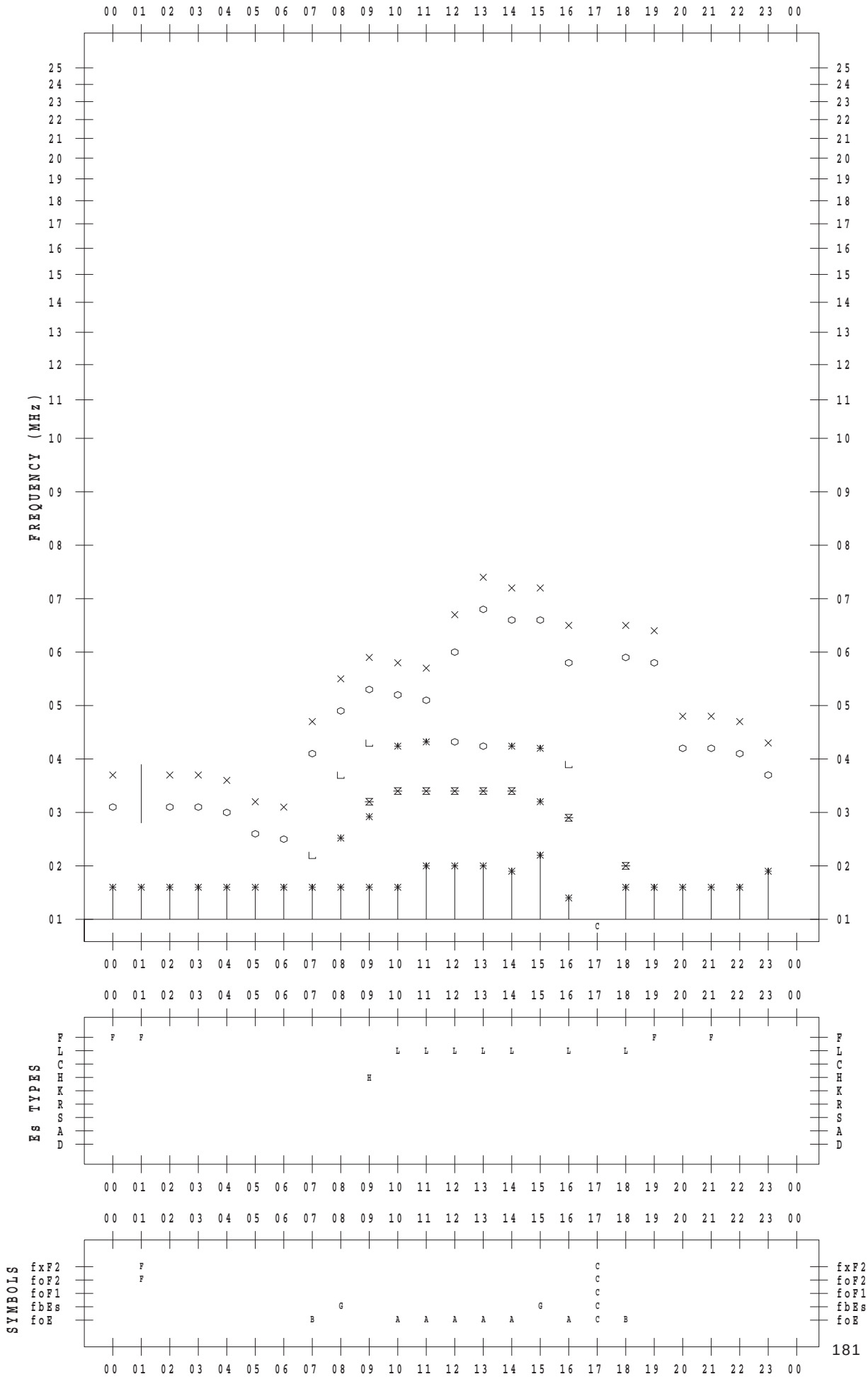
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/12

135 °E MEAN TIME



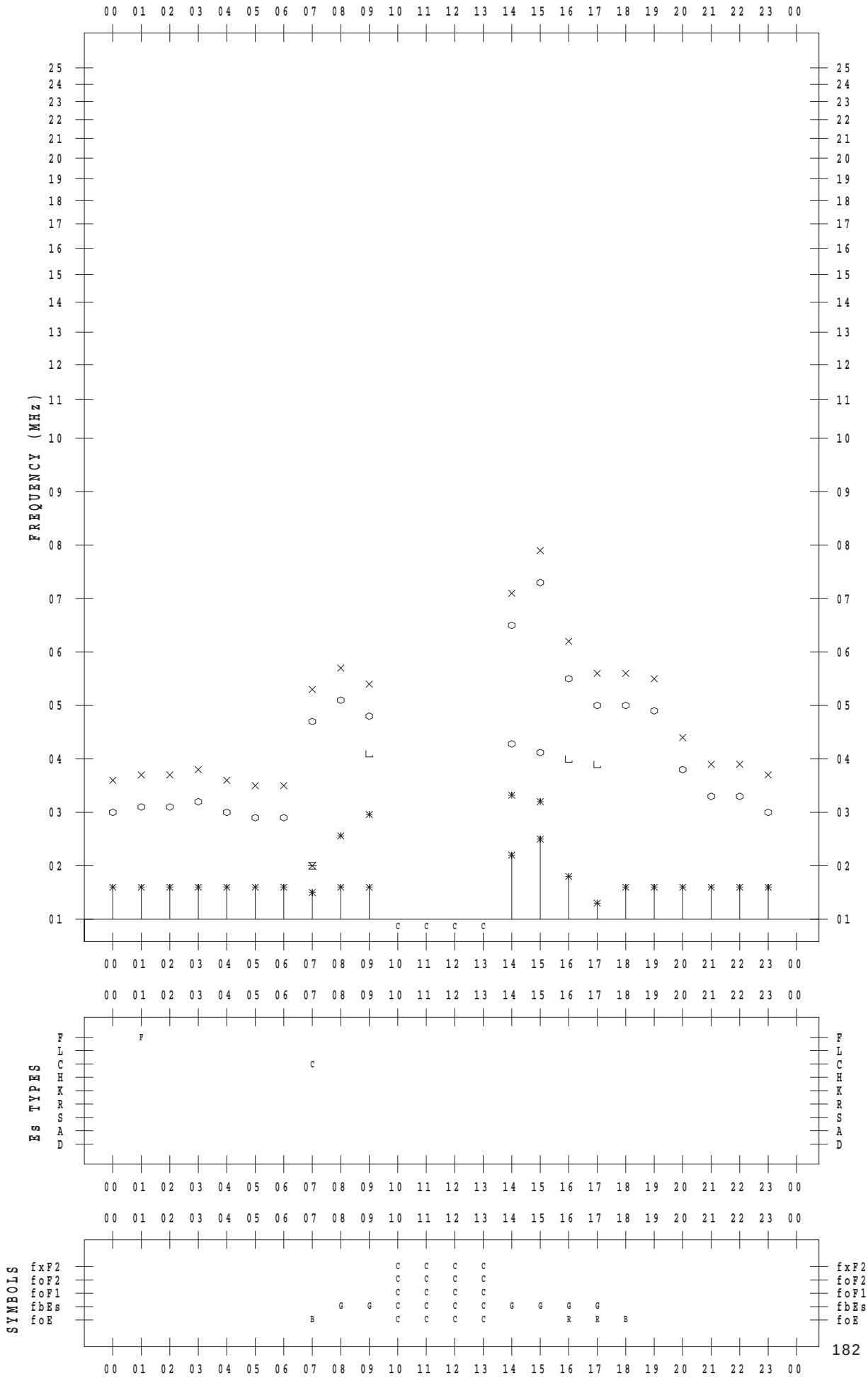
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/13

135 °E MEAN TIME



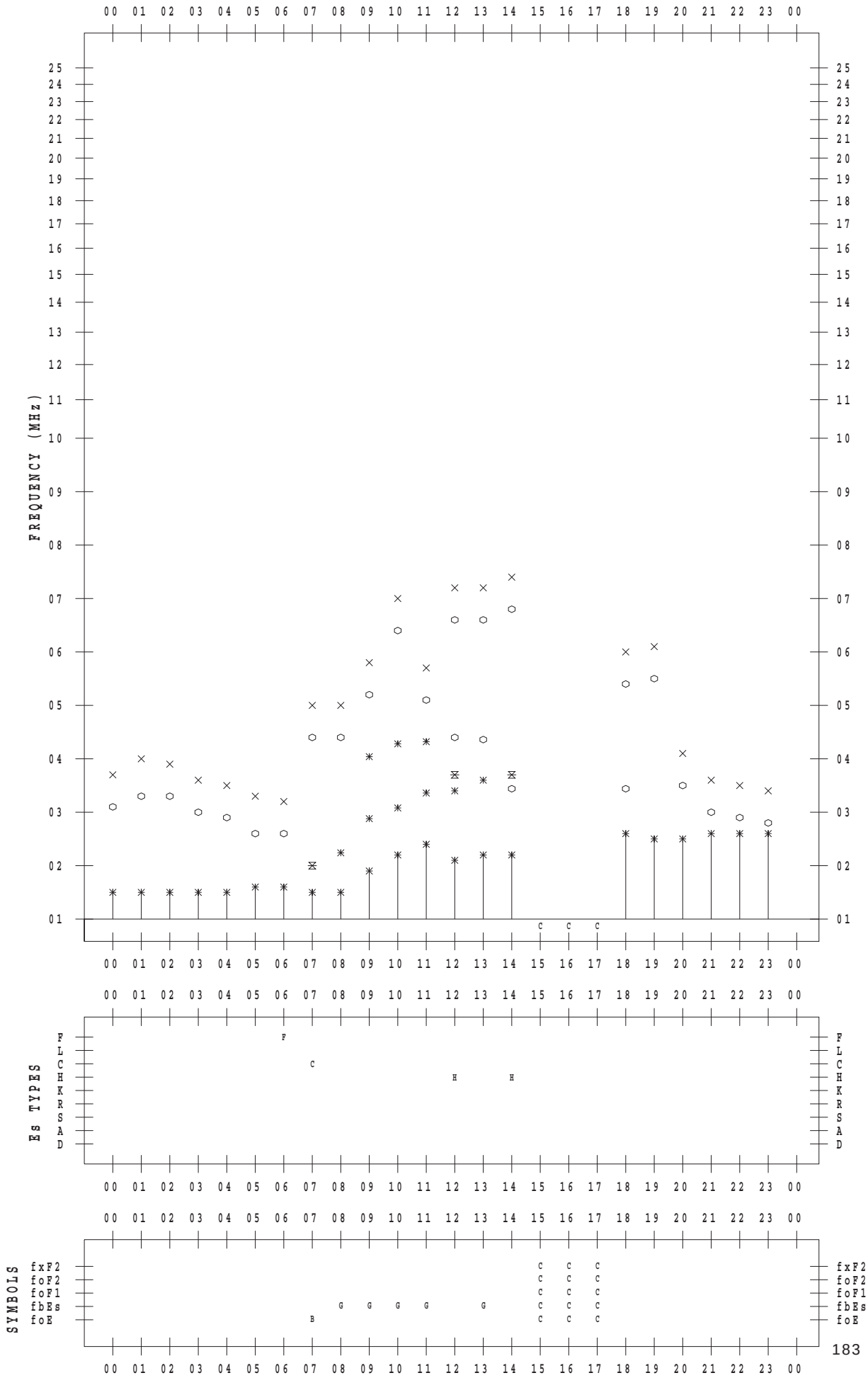
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/14

135 °E MEAN TIME



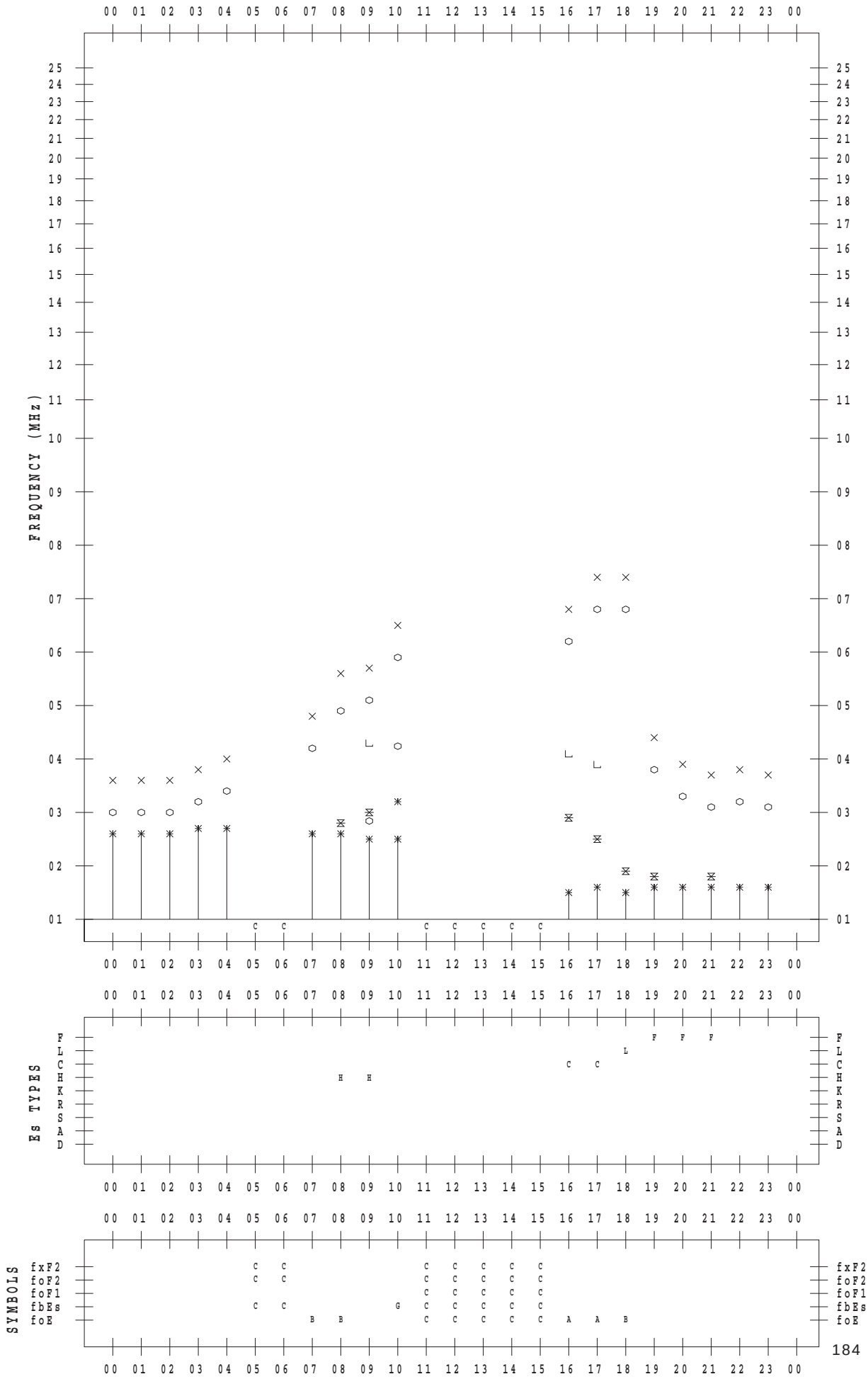
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/15

135 °E MEAN TIME



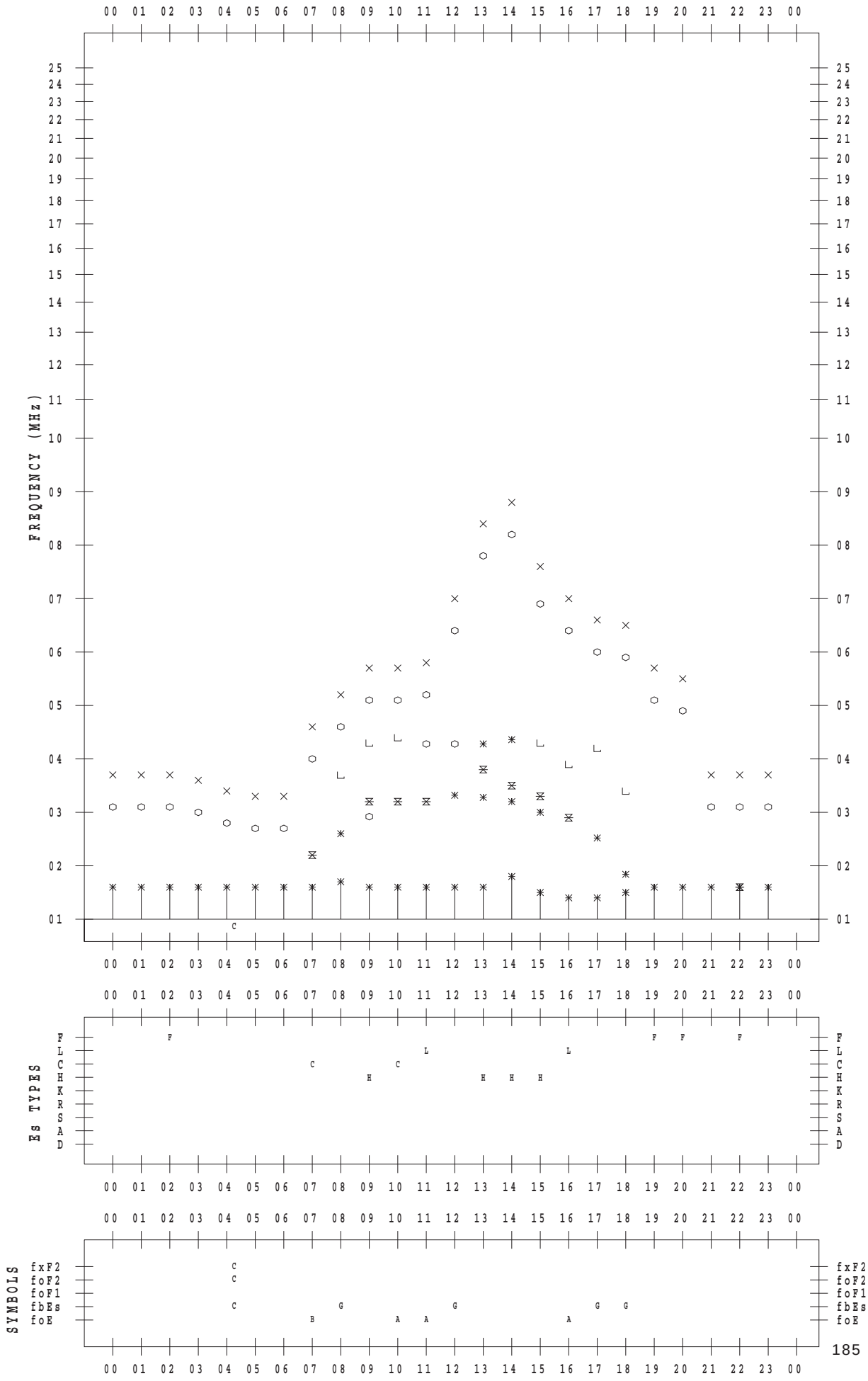
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/16

135 °E MEAN TIME



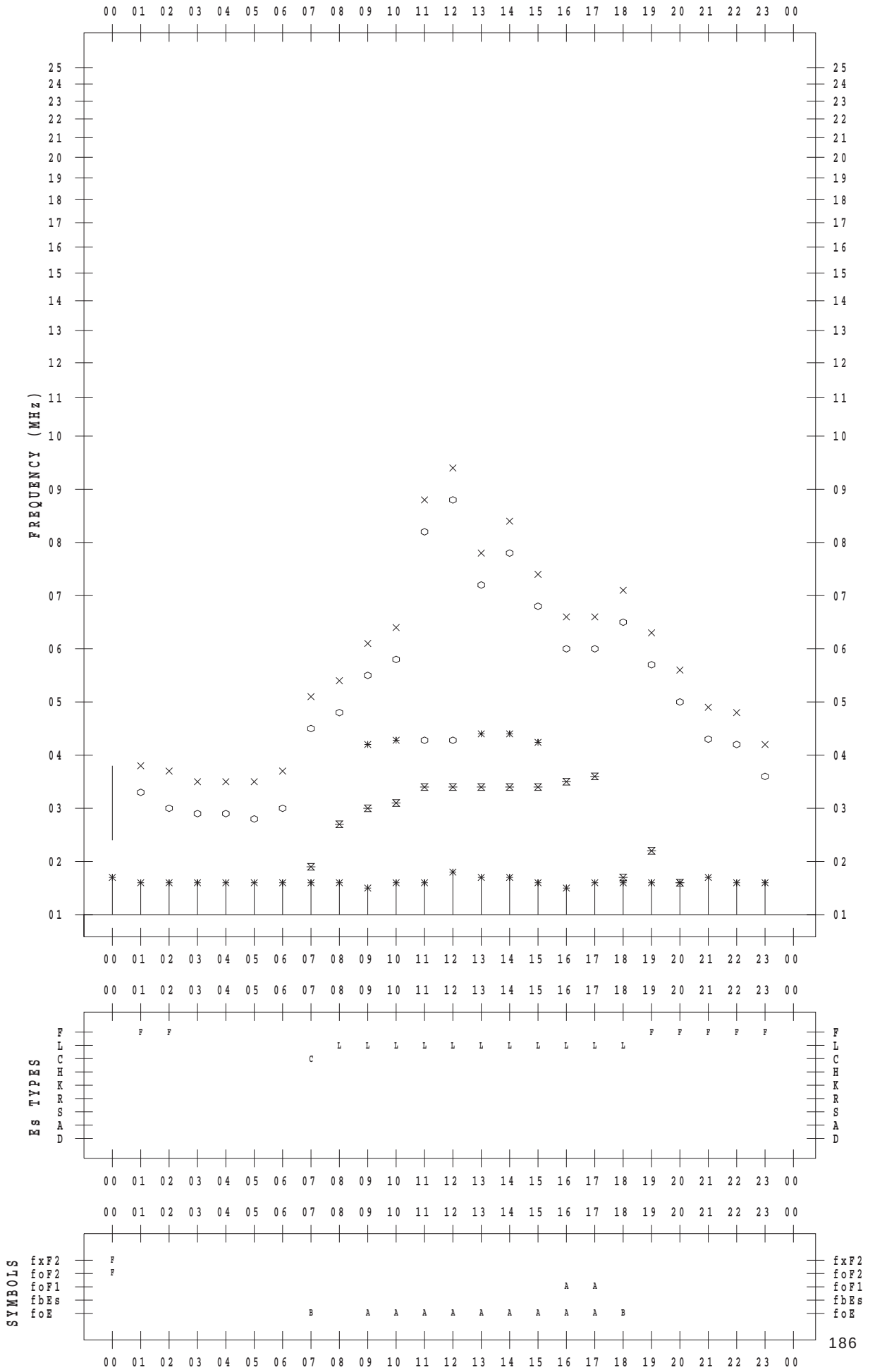
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/17

135 °E MEAN TIME



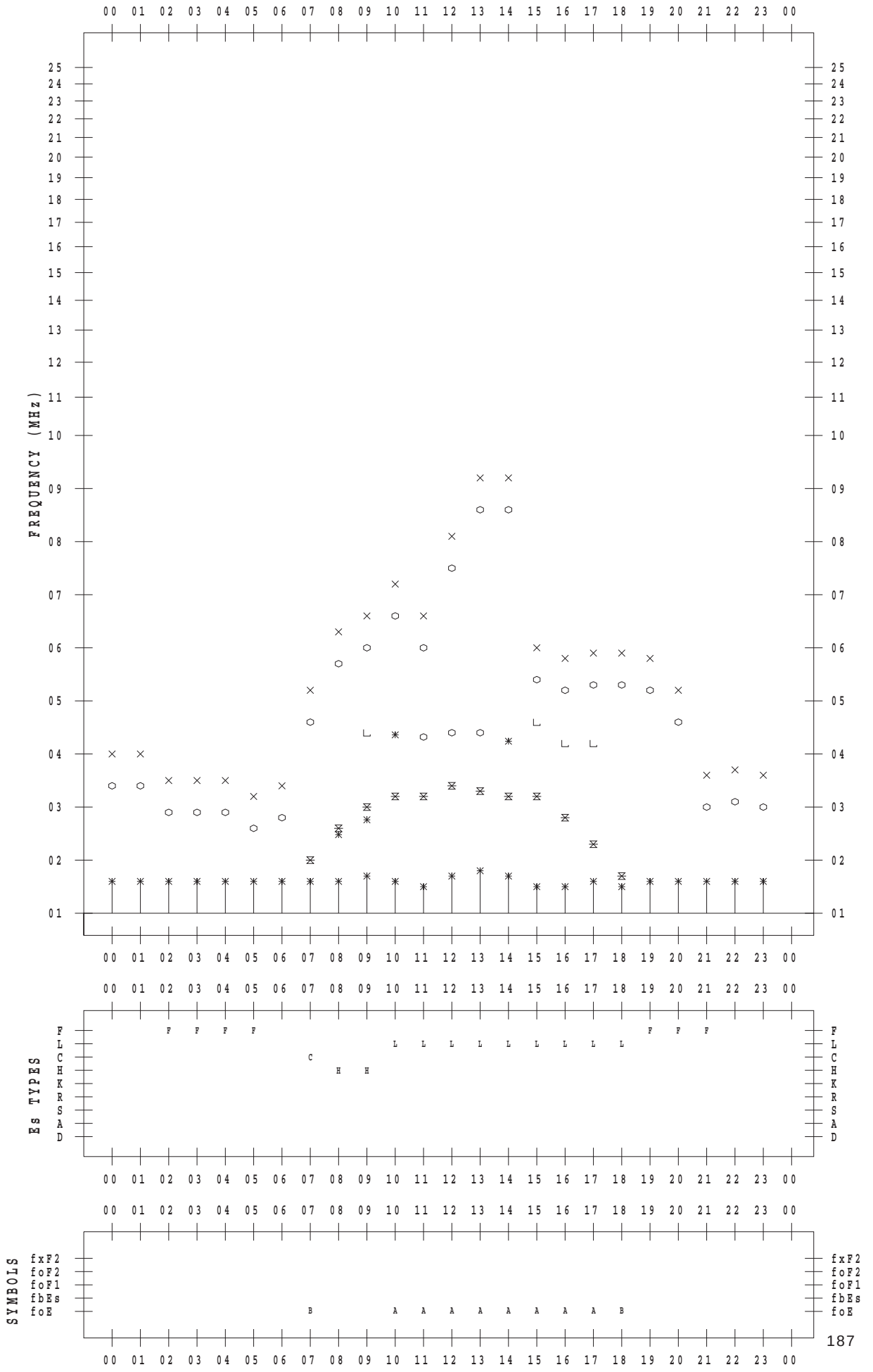
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/18

135 °E MEAN TIME



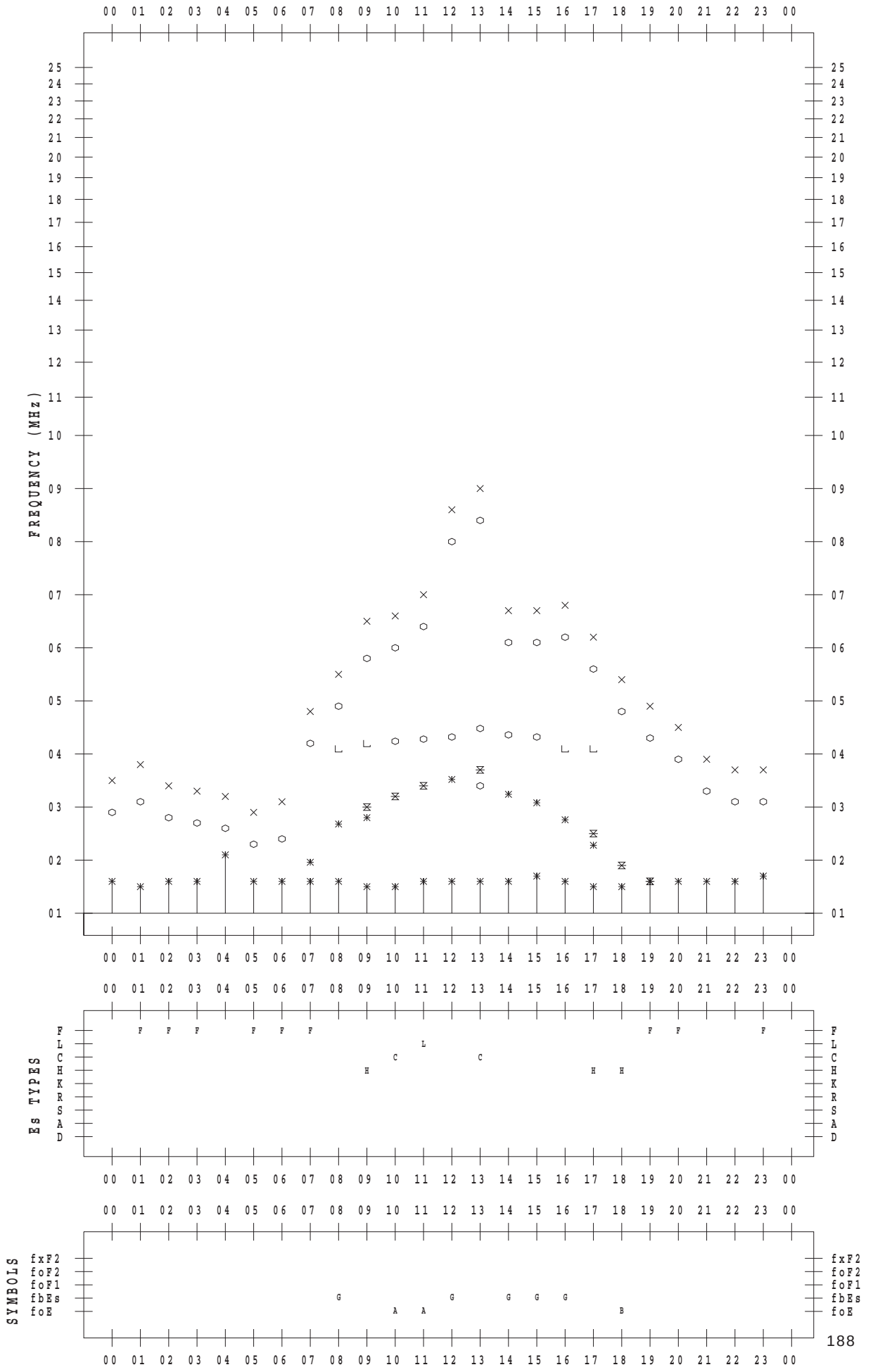
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/19

135 °E MEAN TIME



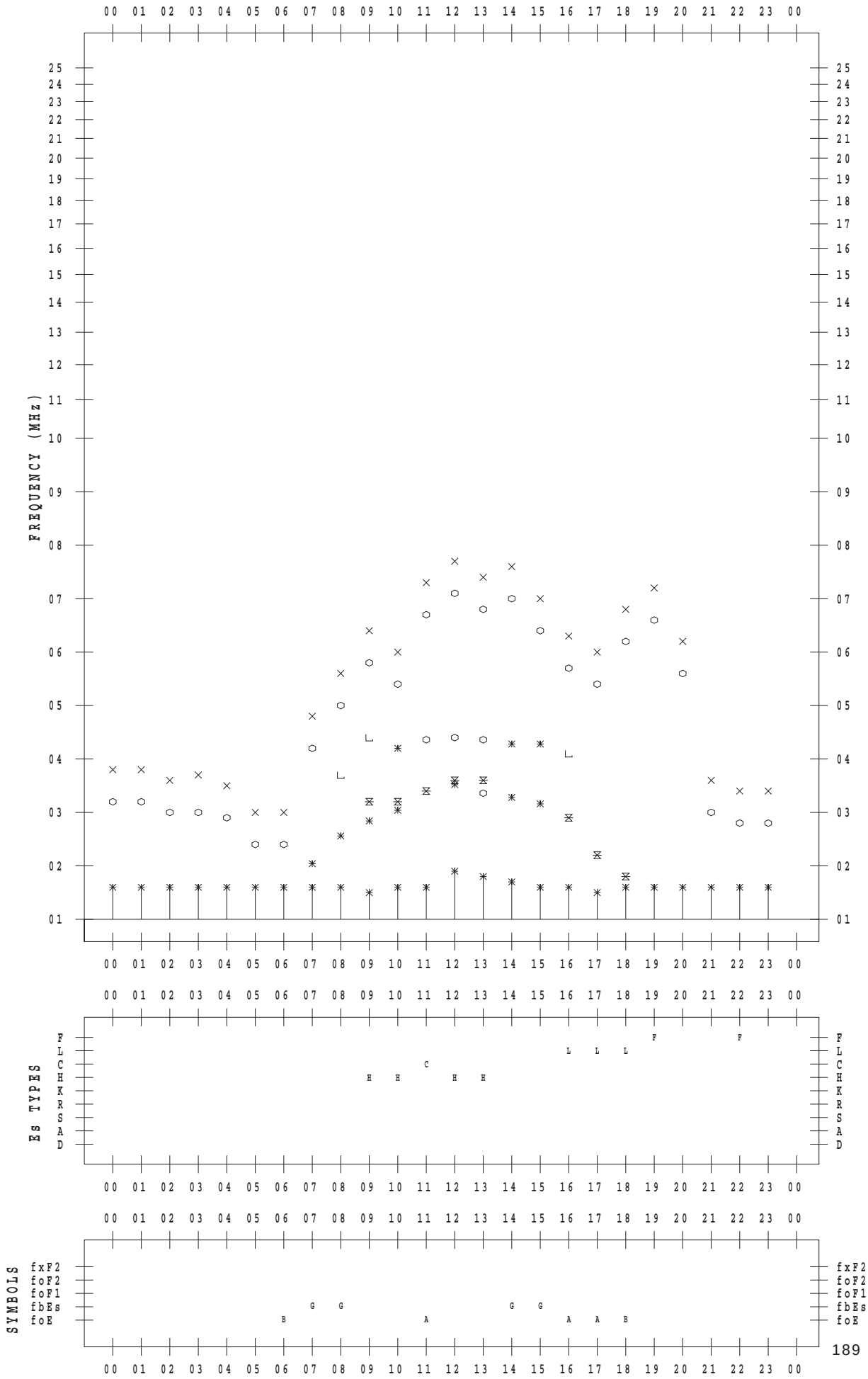
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/20

135 °E MEAN TIME



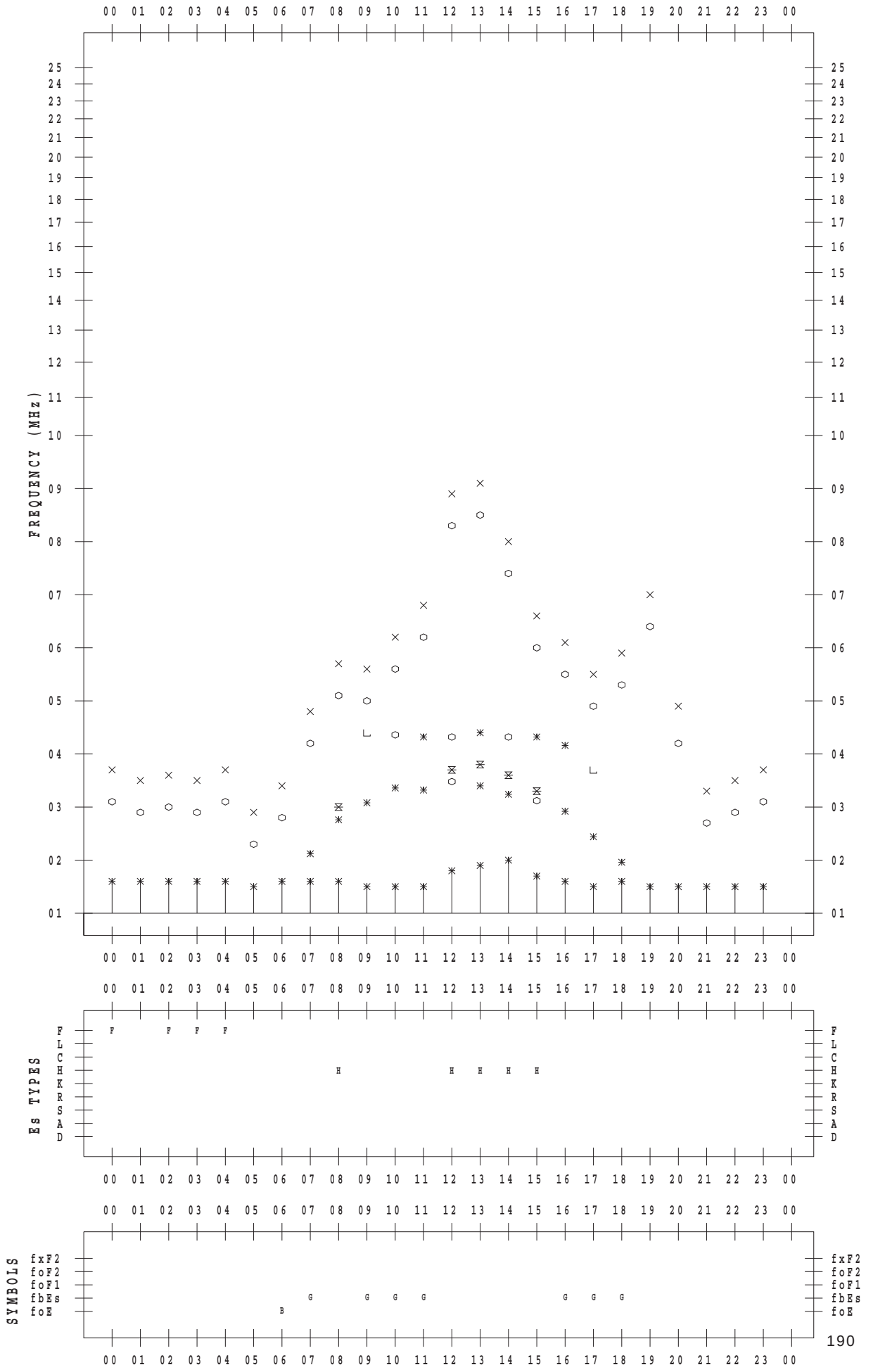
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/21

135 °E MEAN TIME



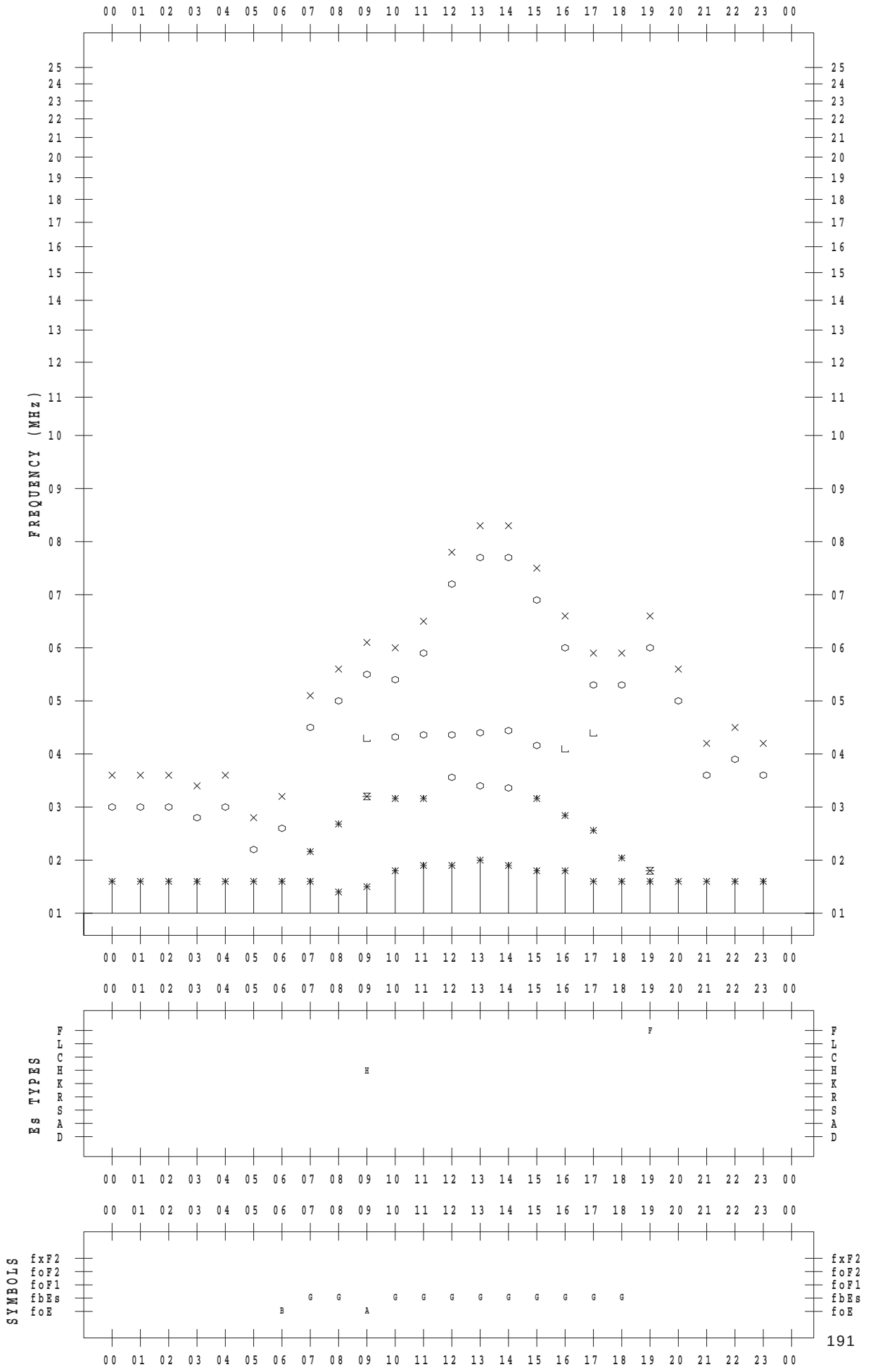
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/22

135 °E MEAN TIME



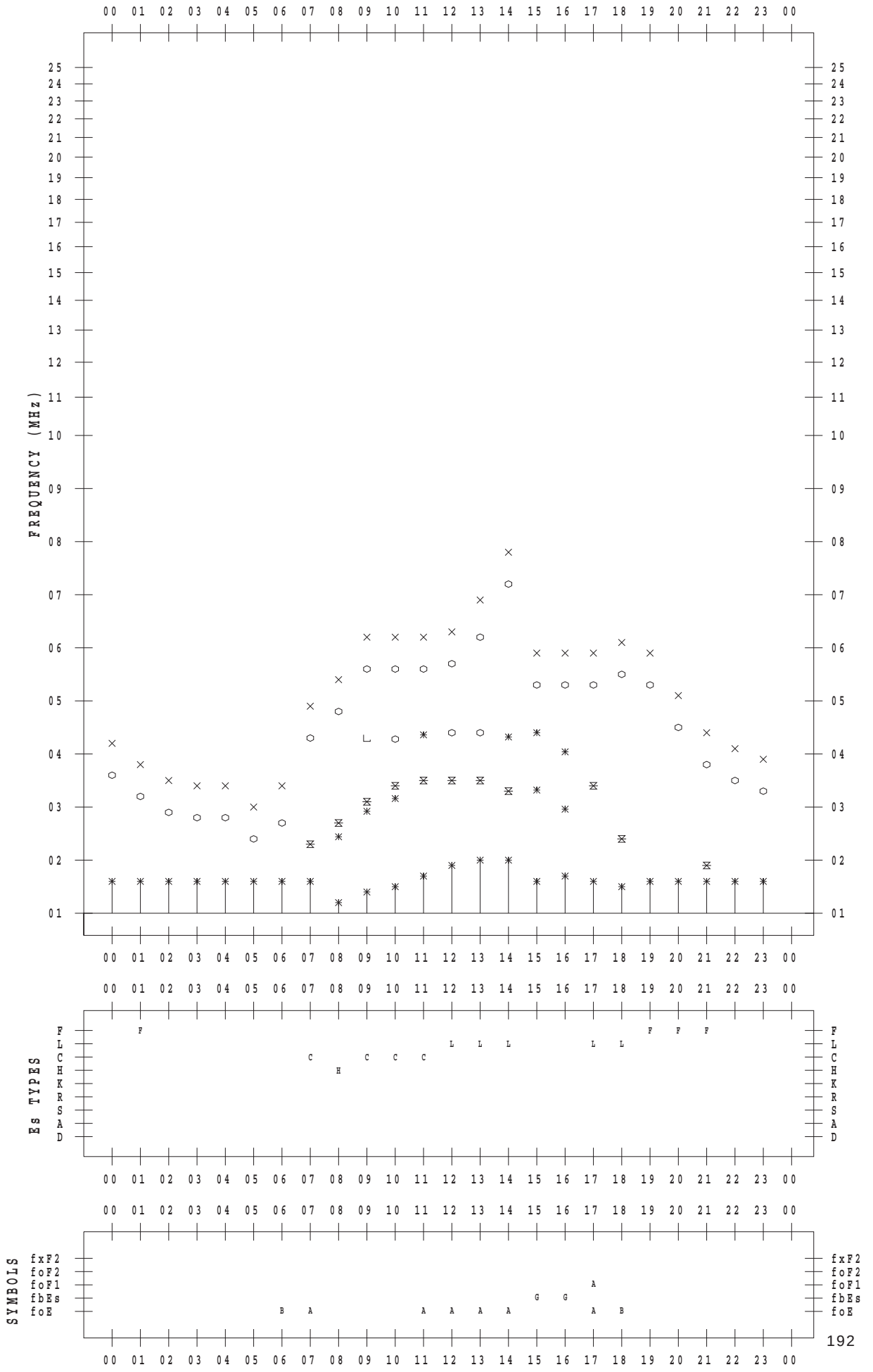
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/23

135 °E MEAN TIME



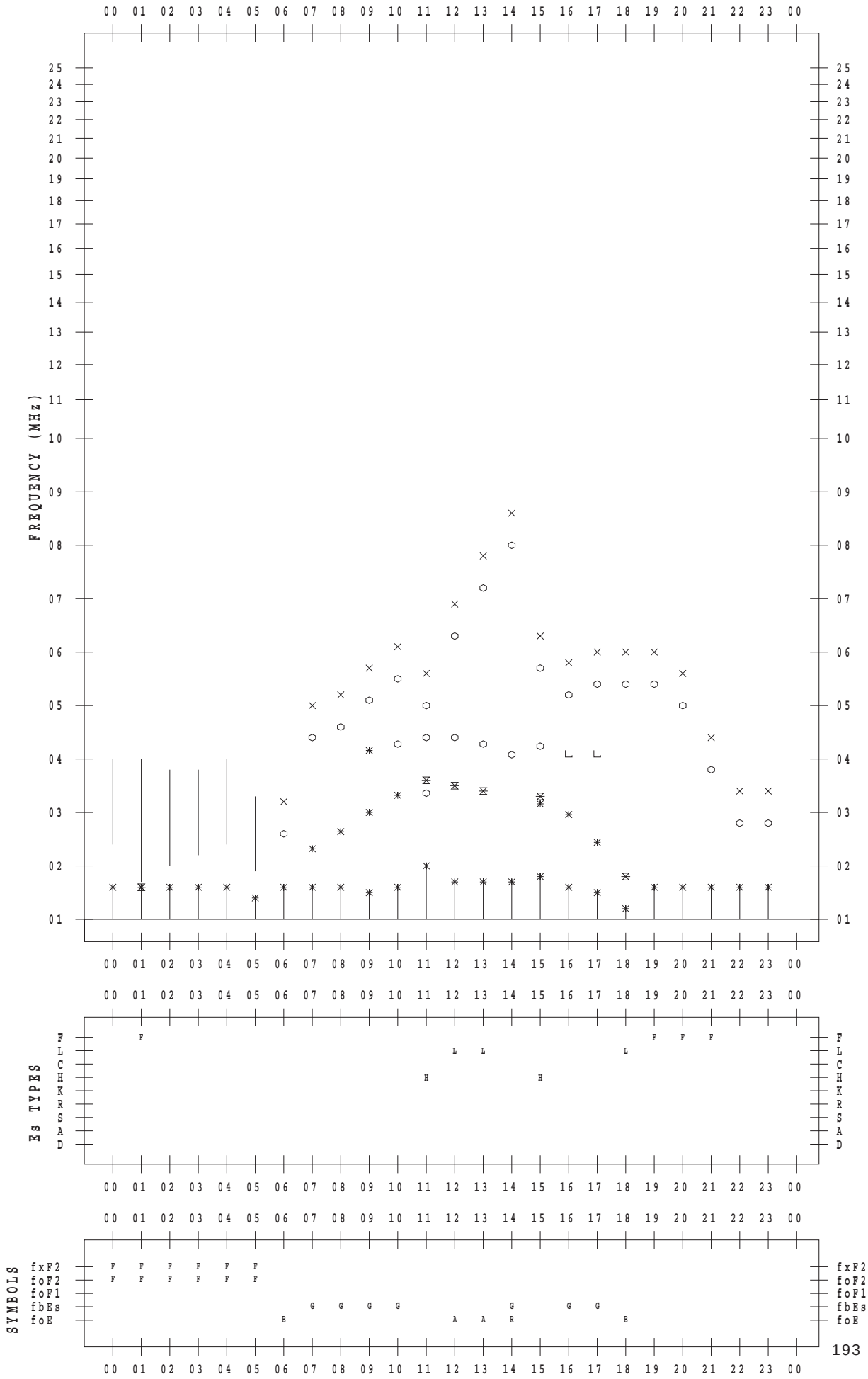
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/24

135 °E MEAN TIME



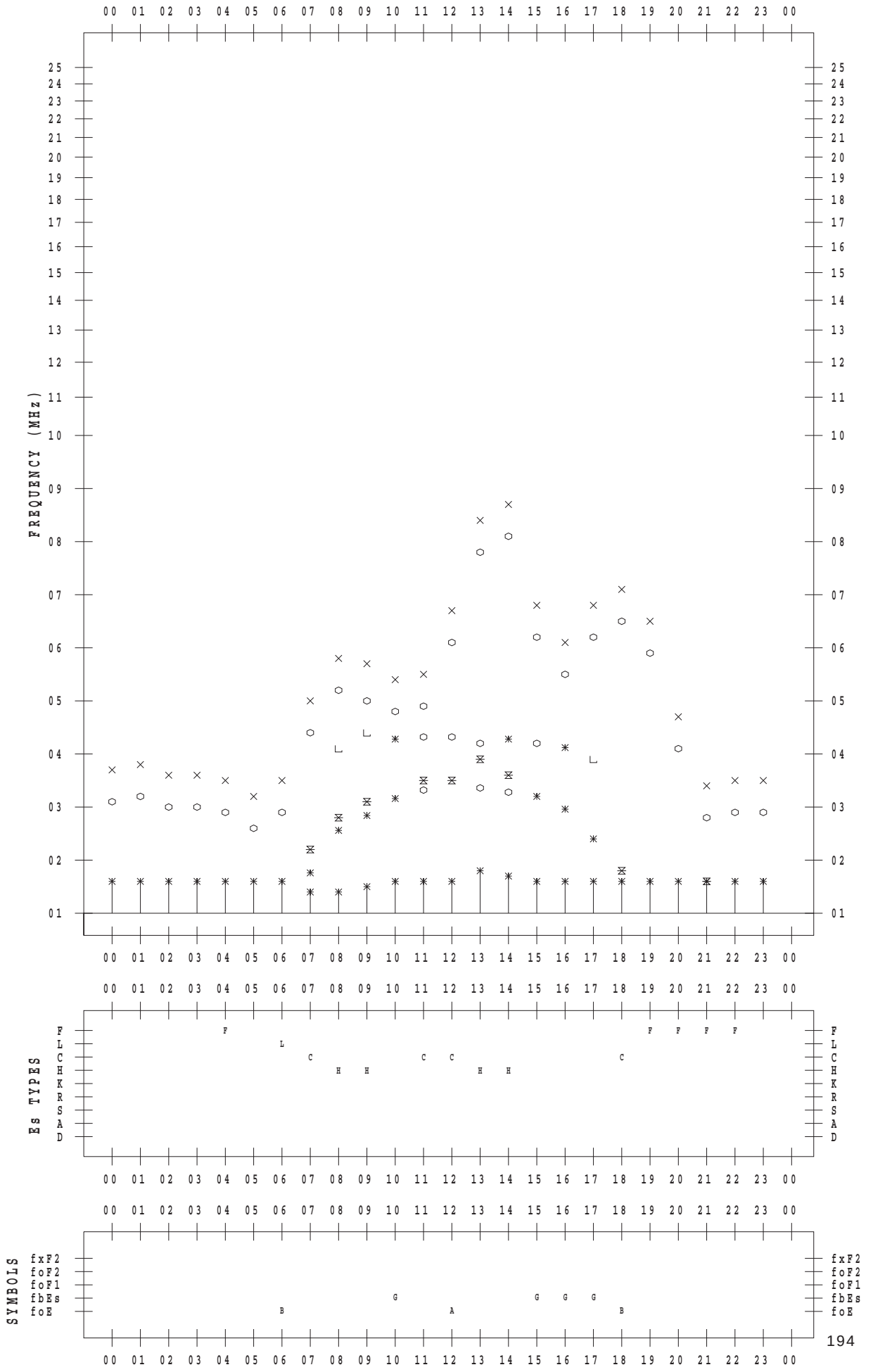
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/25

135 °E MEAN TIME



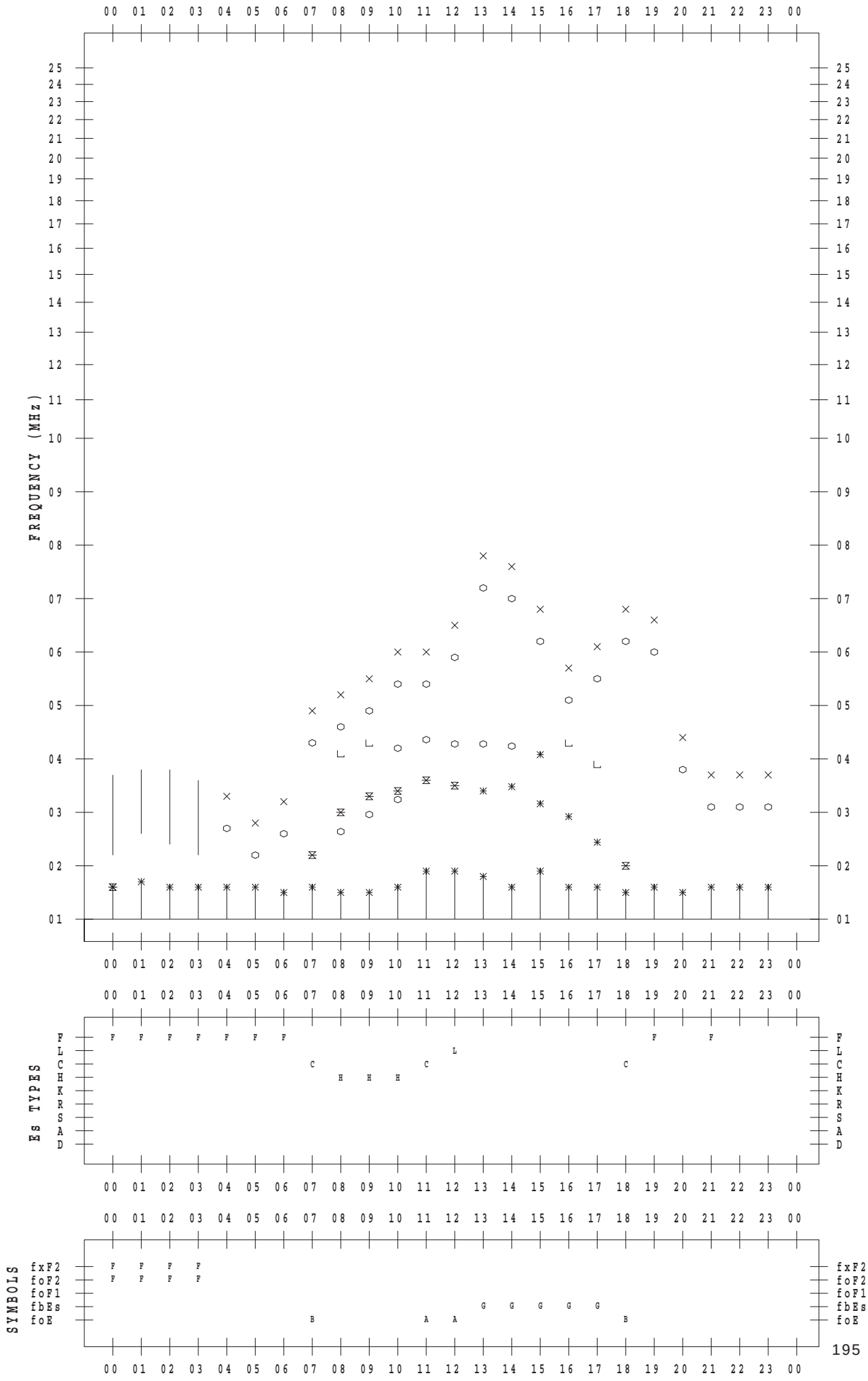
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/26

135 °E MEAN TIME



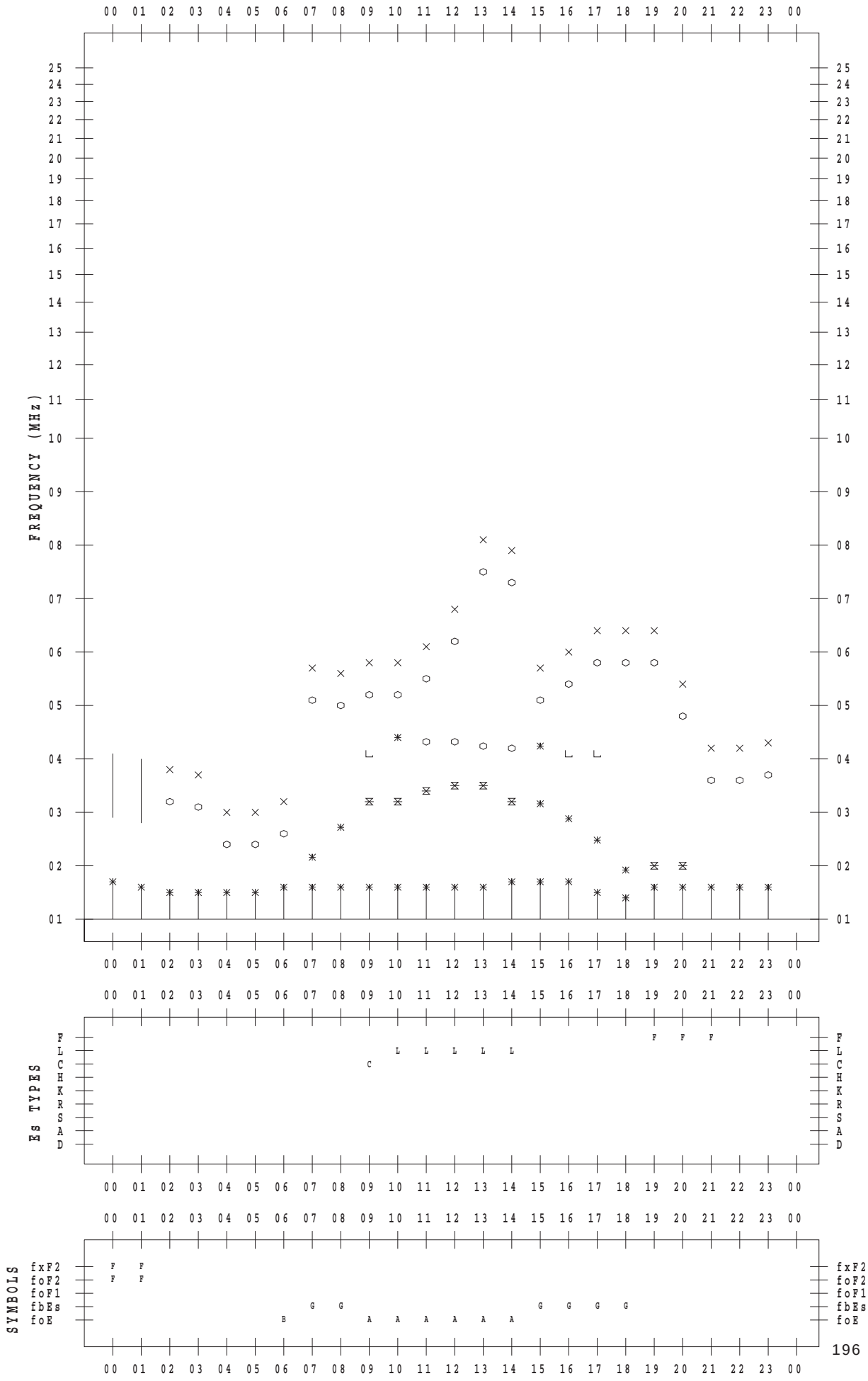
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/27

135 °E MEAN TIME



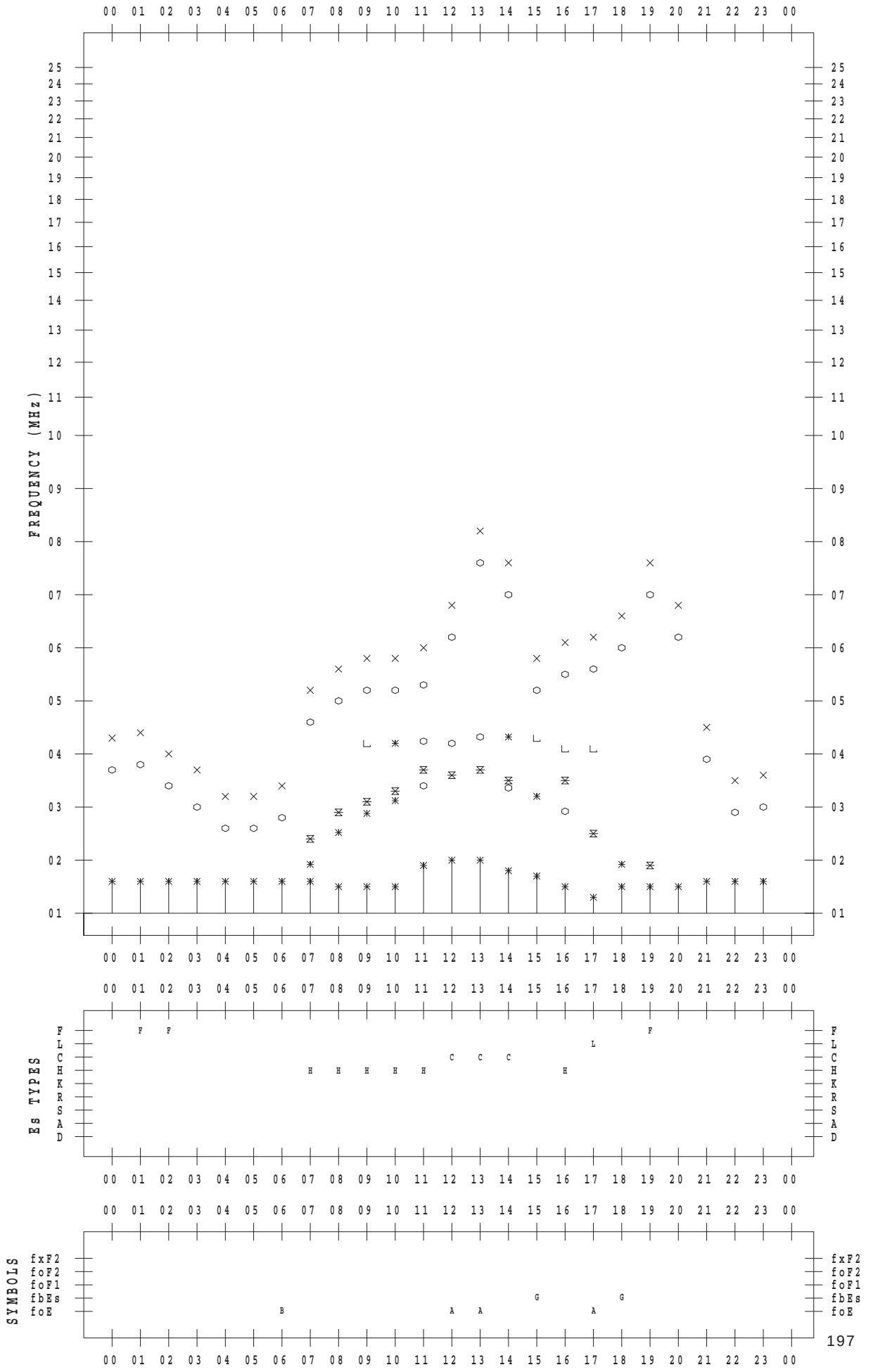
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/28

135 °E MEAN TIME



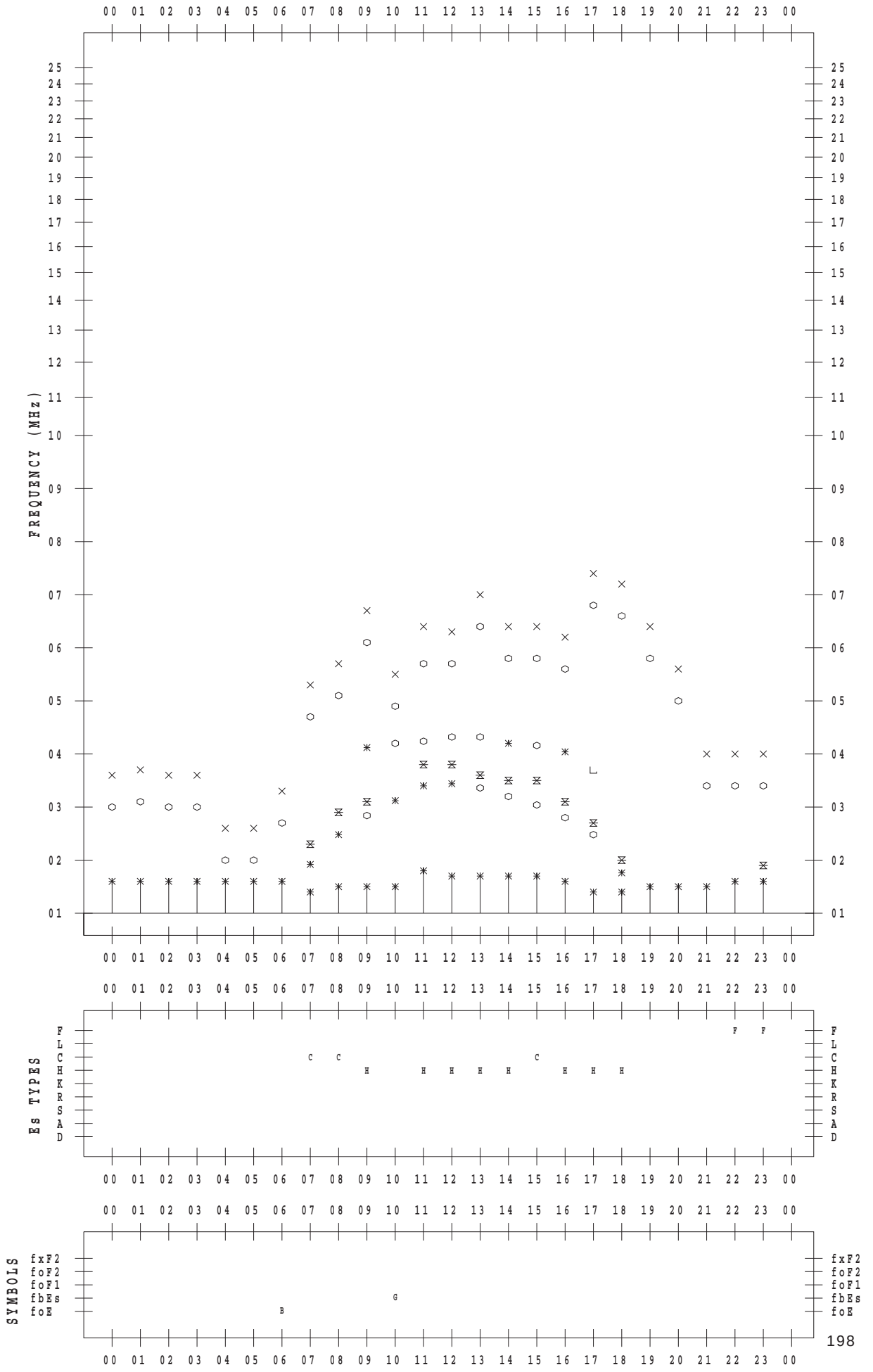
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/29

135 °E MEAN TIME



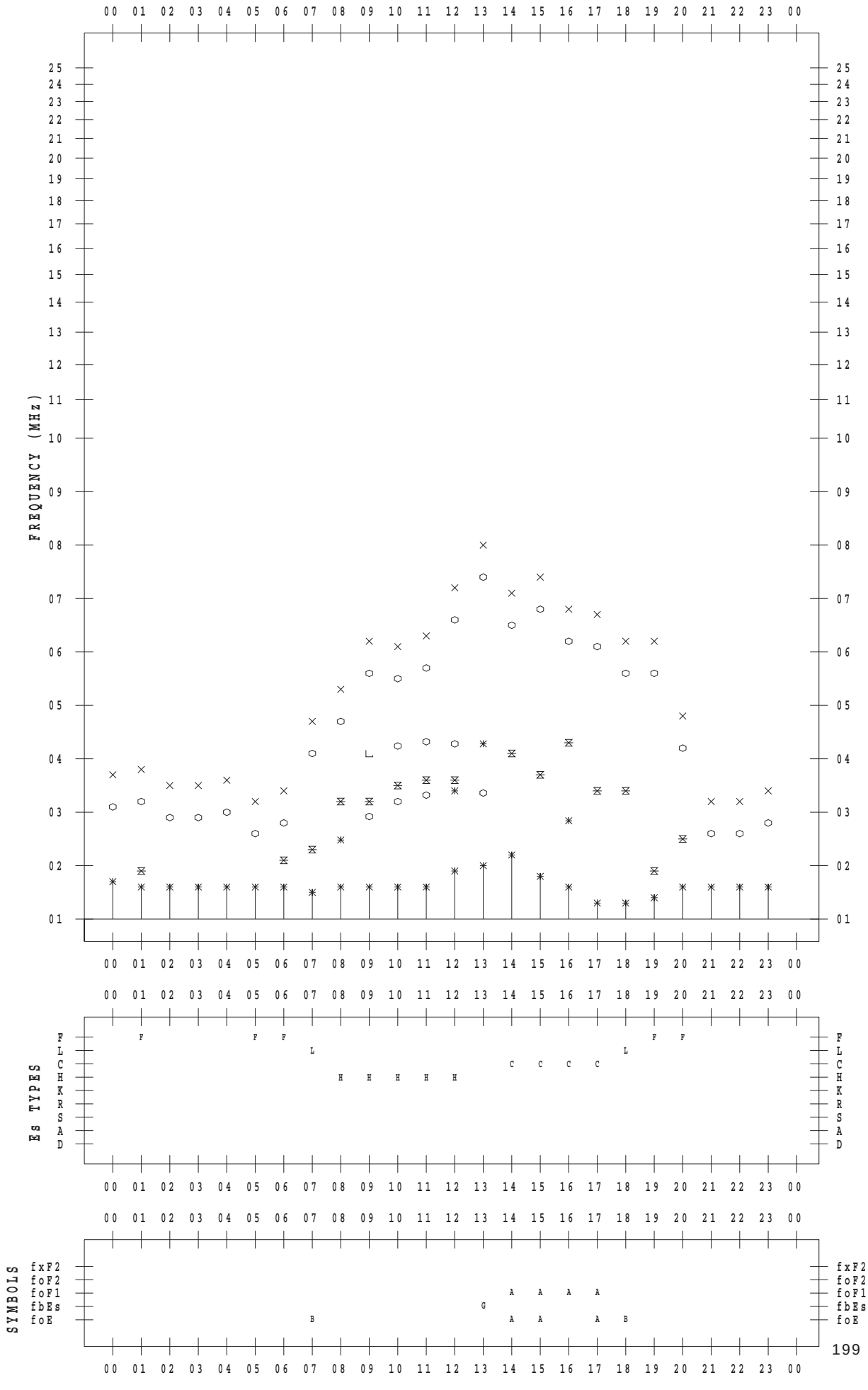
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/30

135 °E MEAN TIME



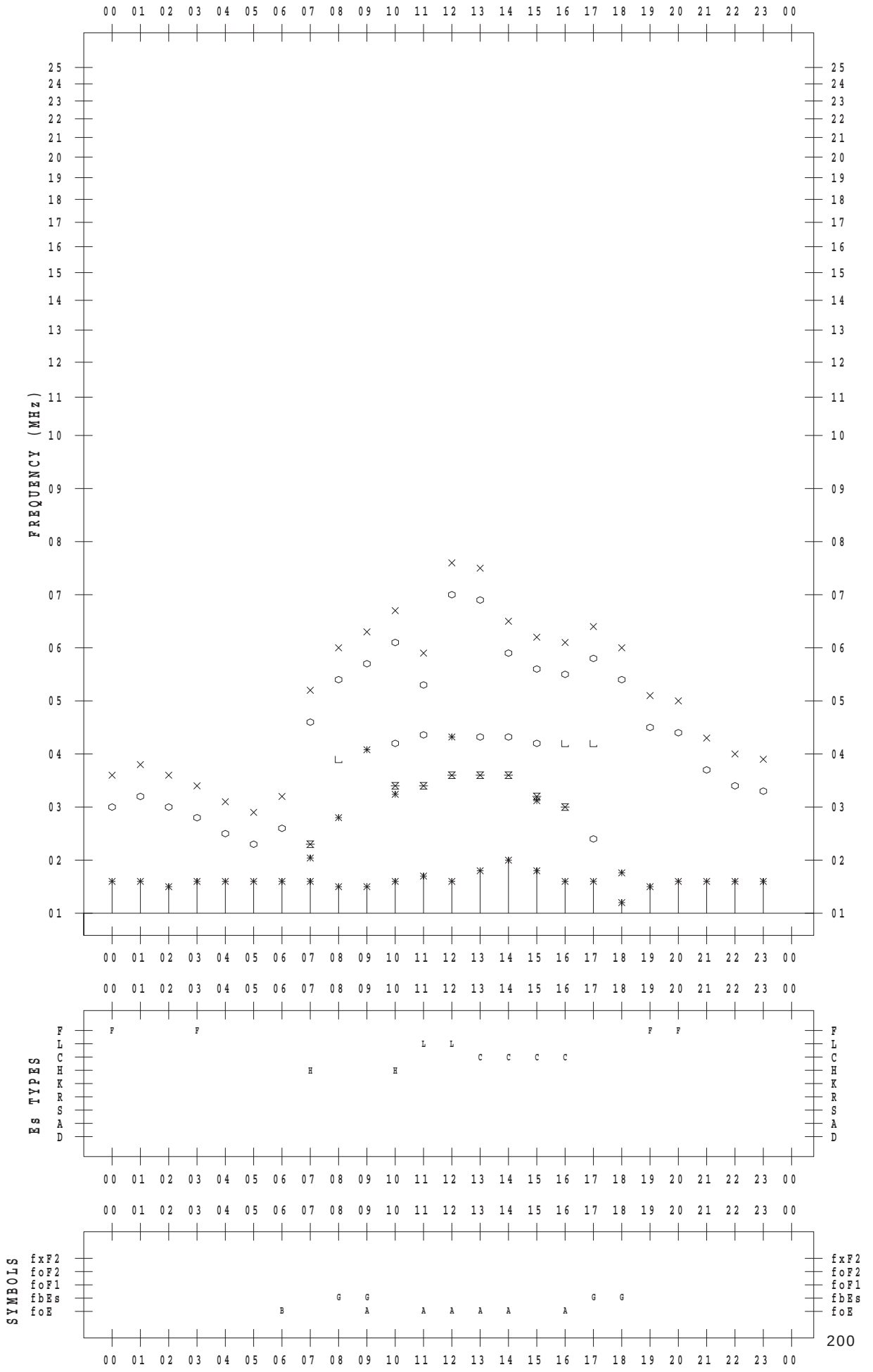
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 3/31

135 °E MEAN TIME



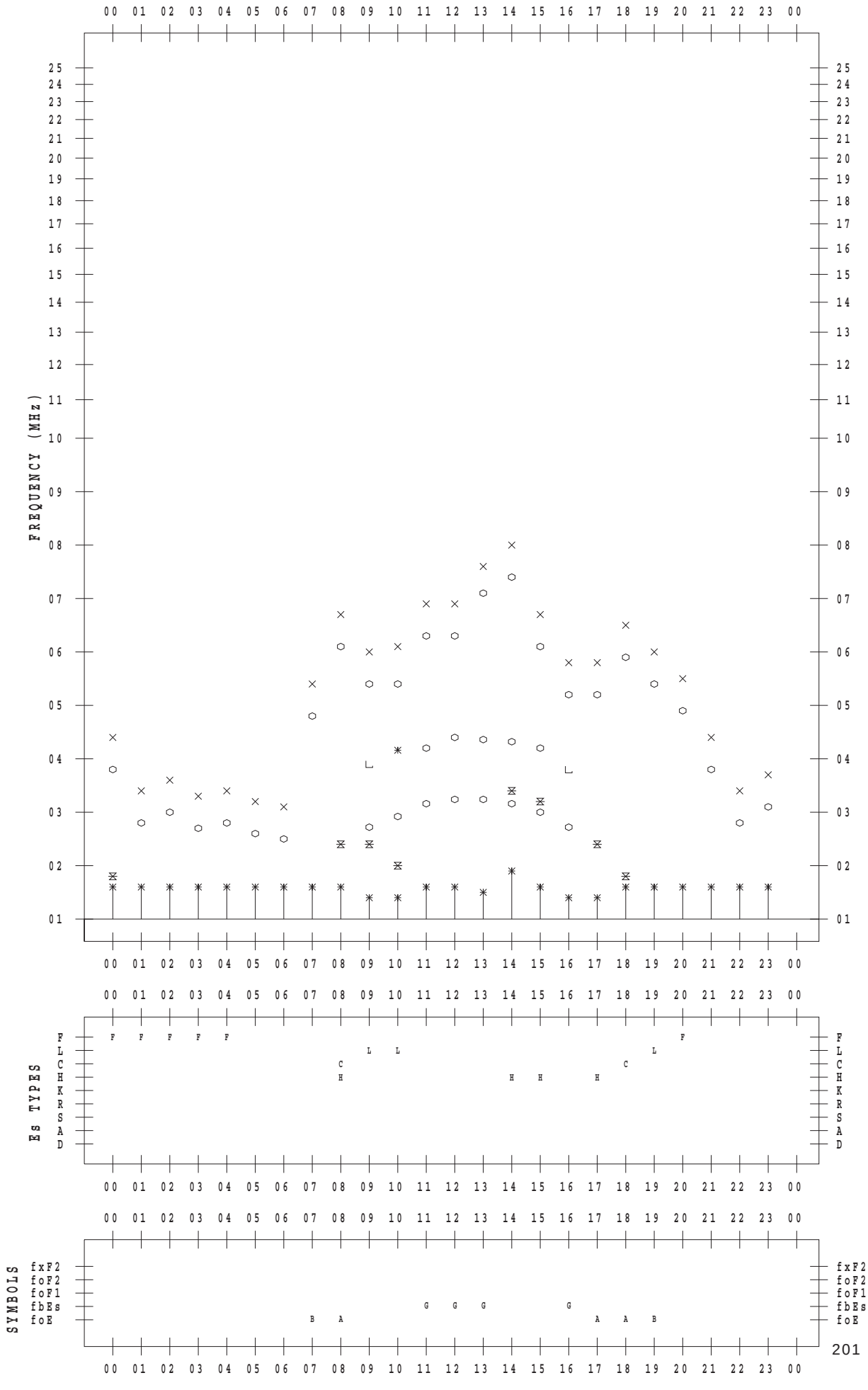
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 1

135 °E MEAN TIME



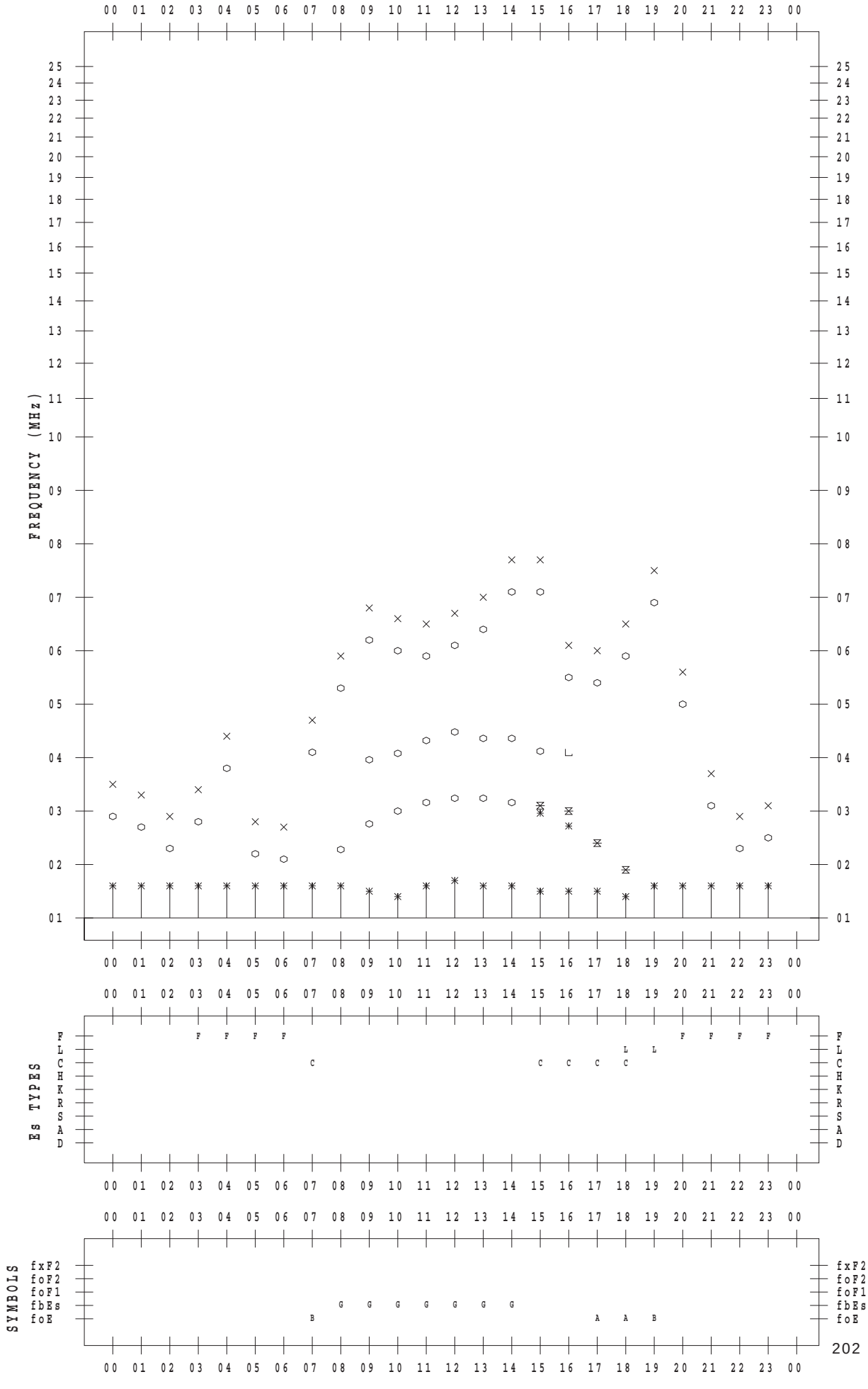
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 2

135 °E MEAN TIME



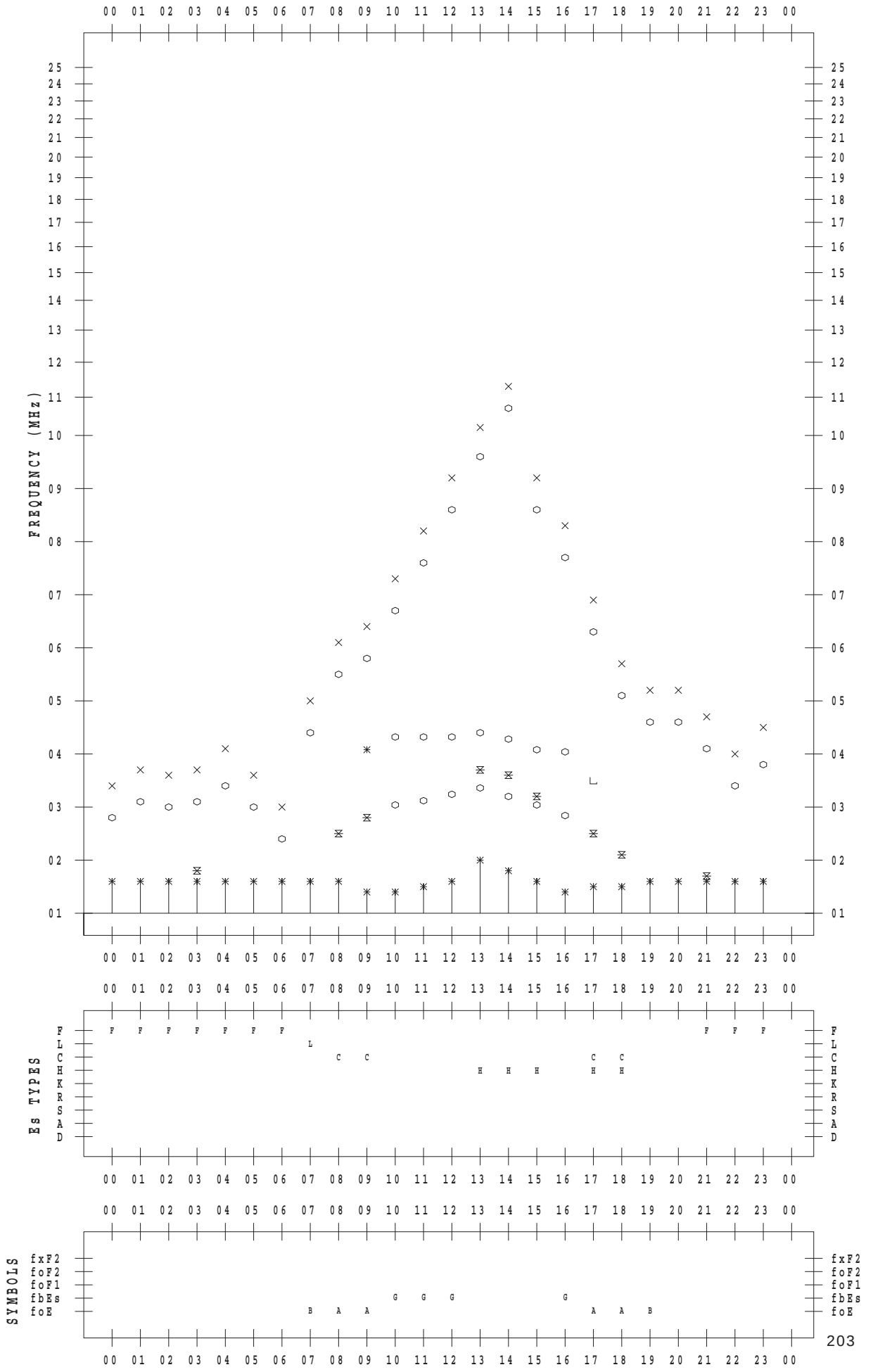
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 3

135 °E MEAN TIME



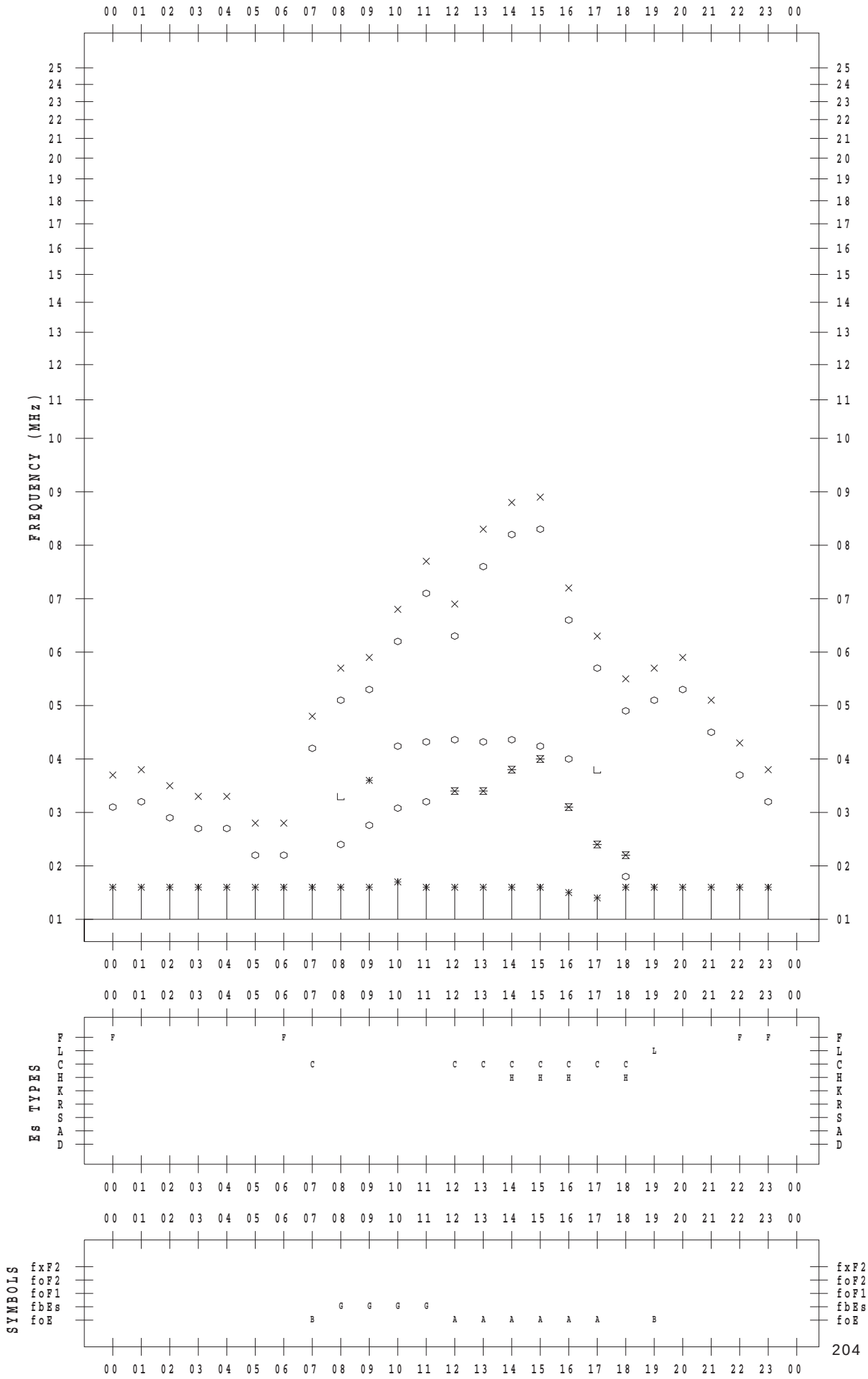
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 4

135 °E MEAN TIME



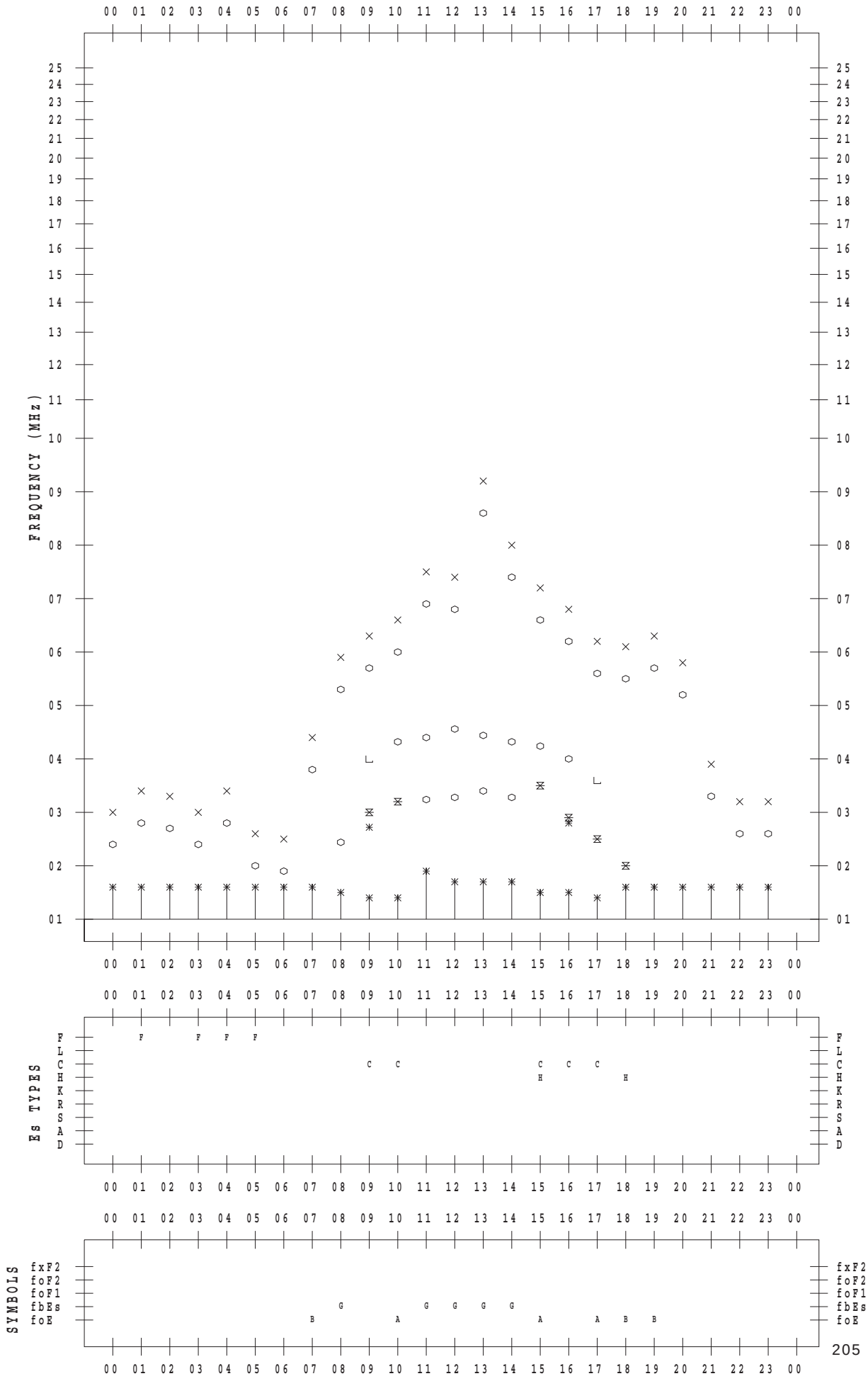
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 5

135 °E MEAN TIME



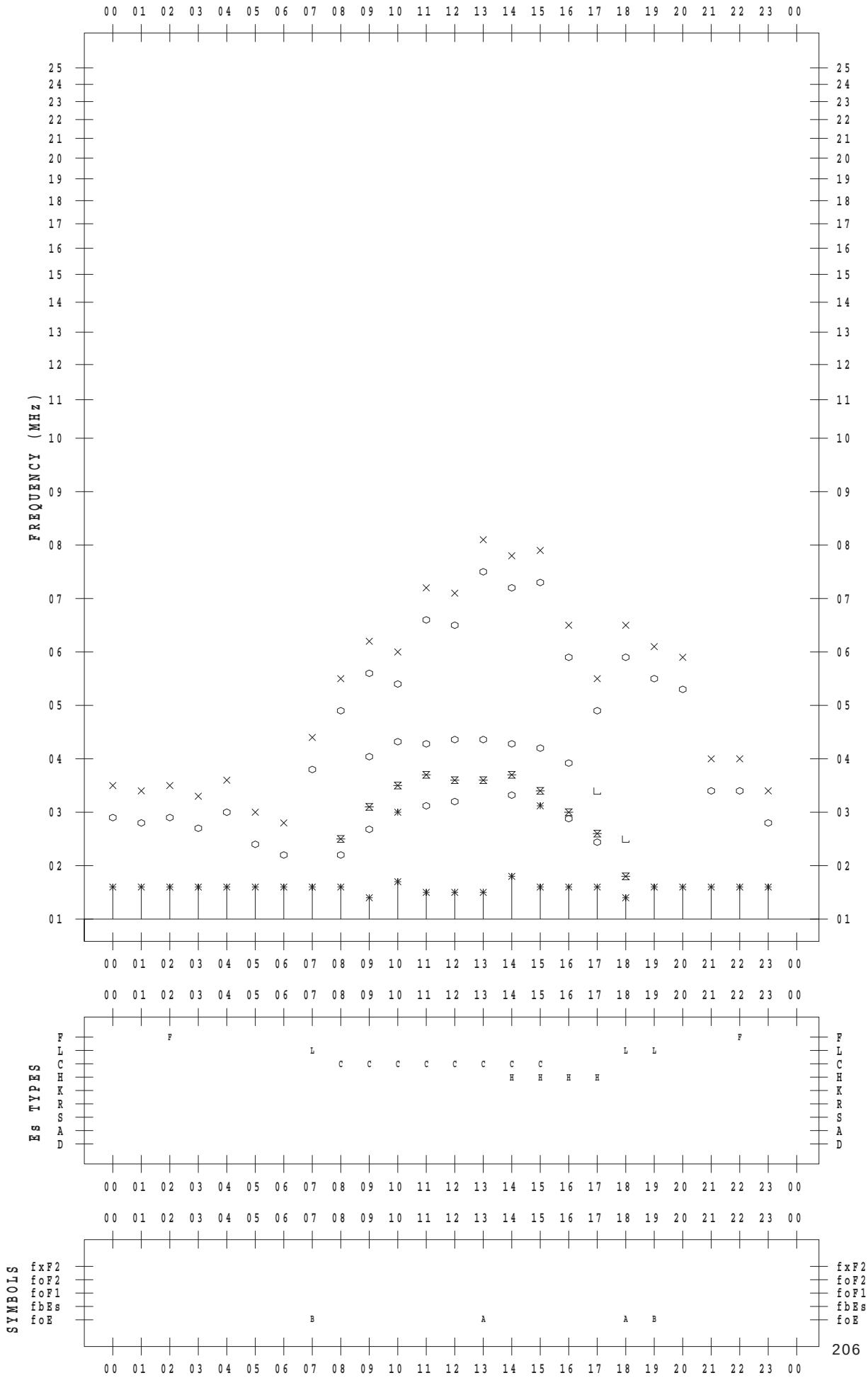
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 6

135 °E MEAN TIME



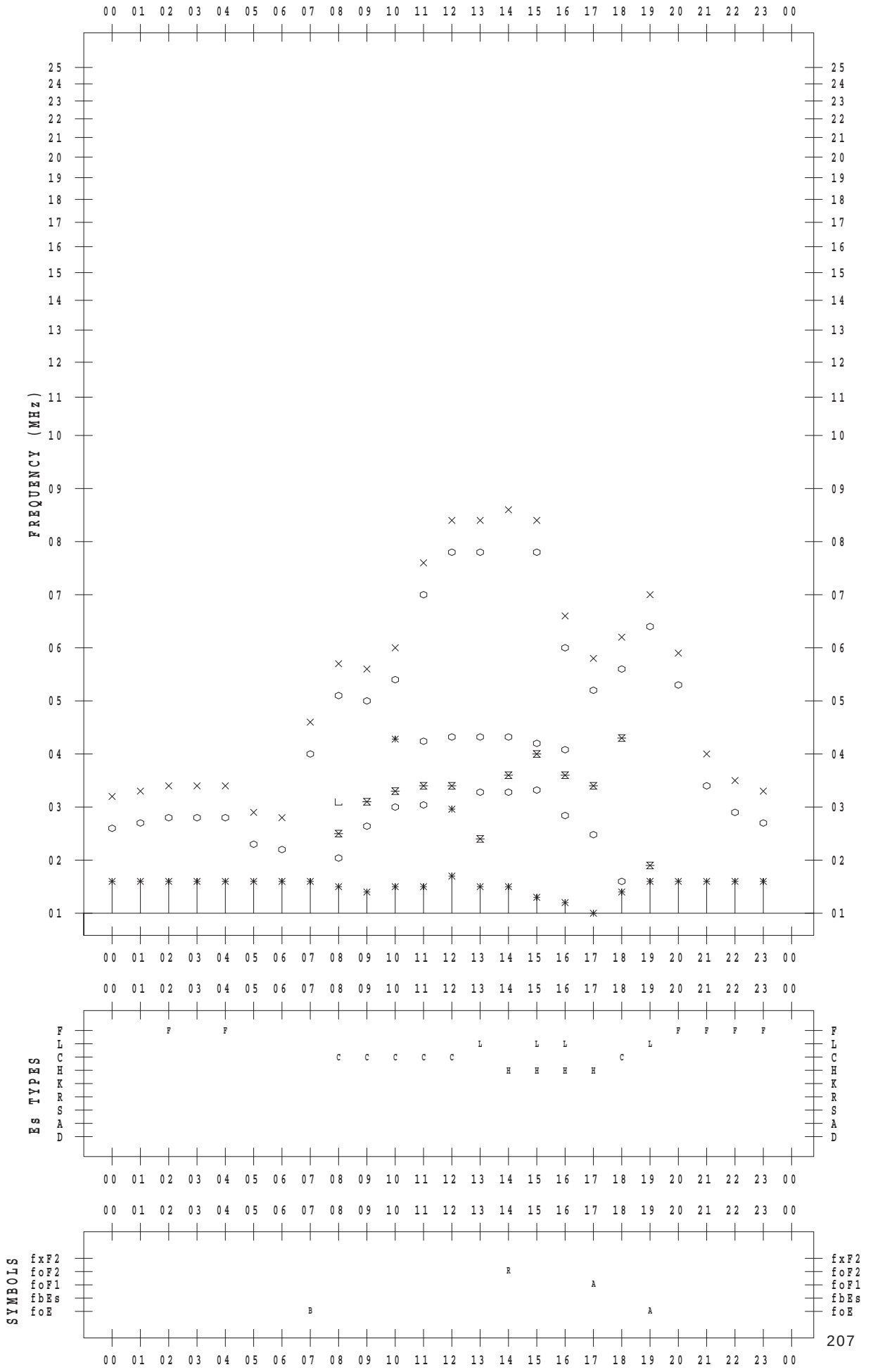
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 7

135 °E MEAN TIME



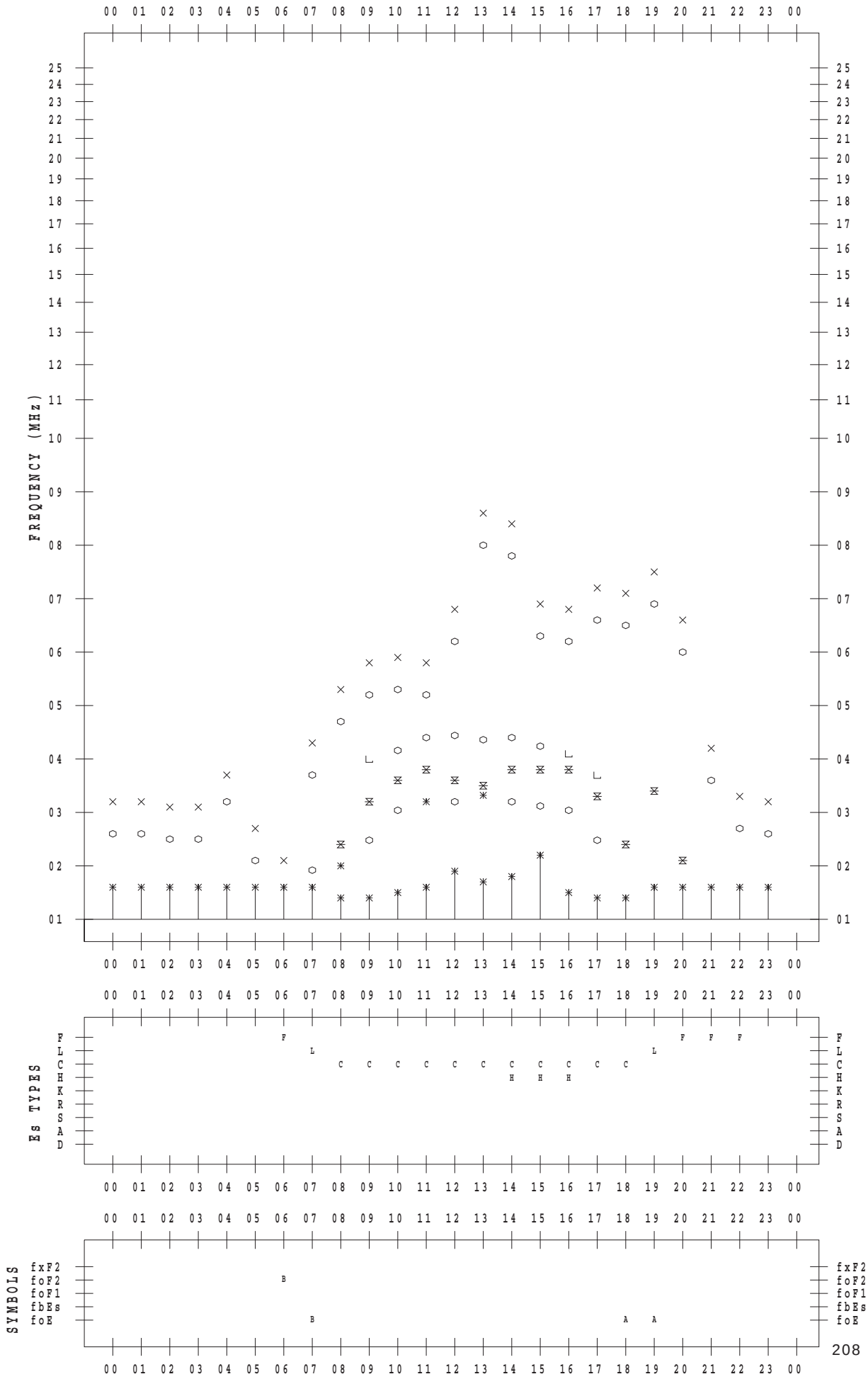
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 8

135 °E MEAN TIME



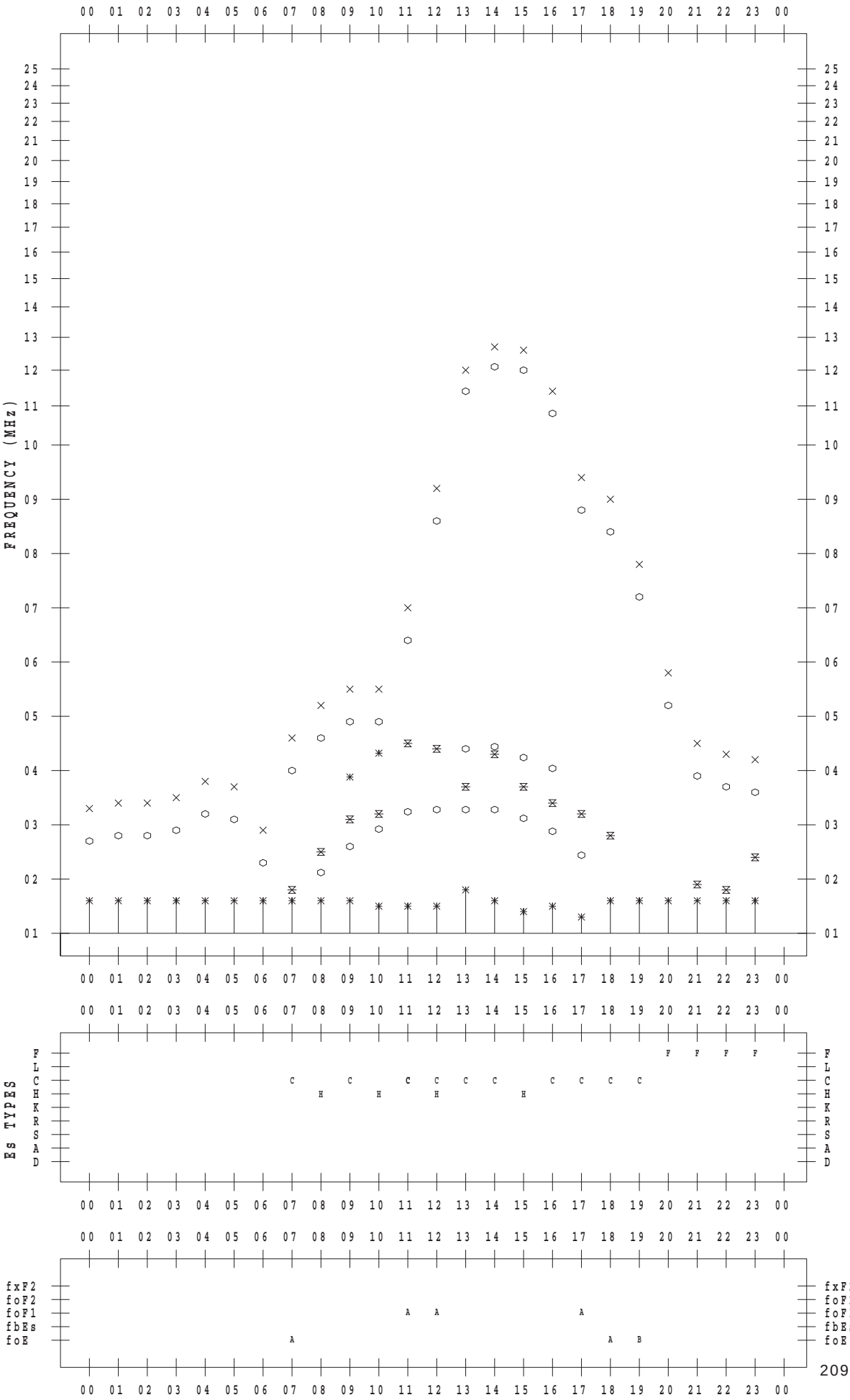
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/ 9

135 °E MEAN TIME



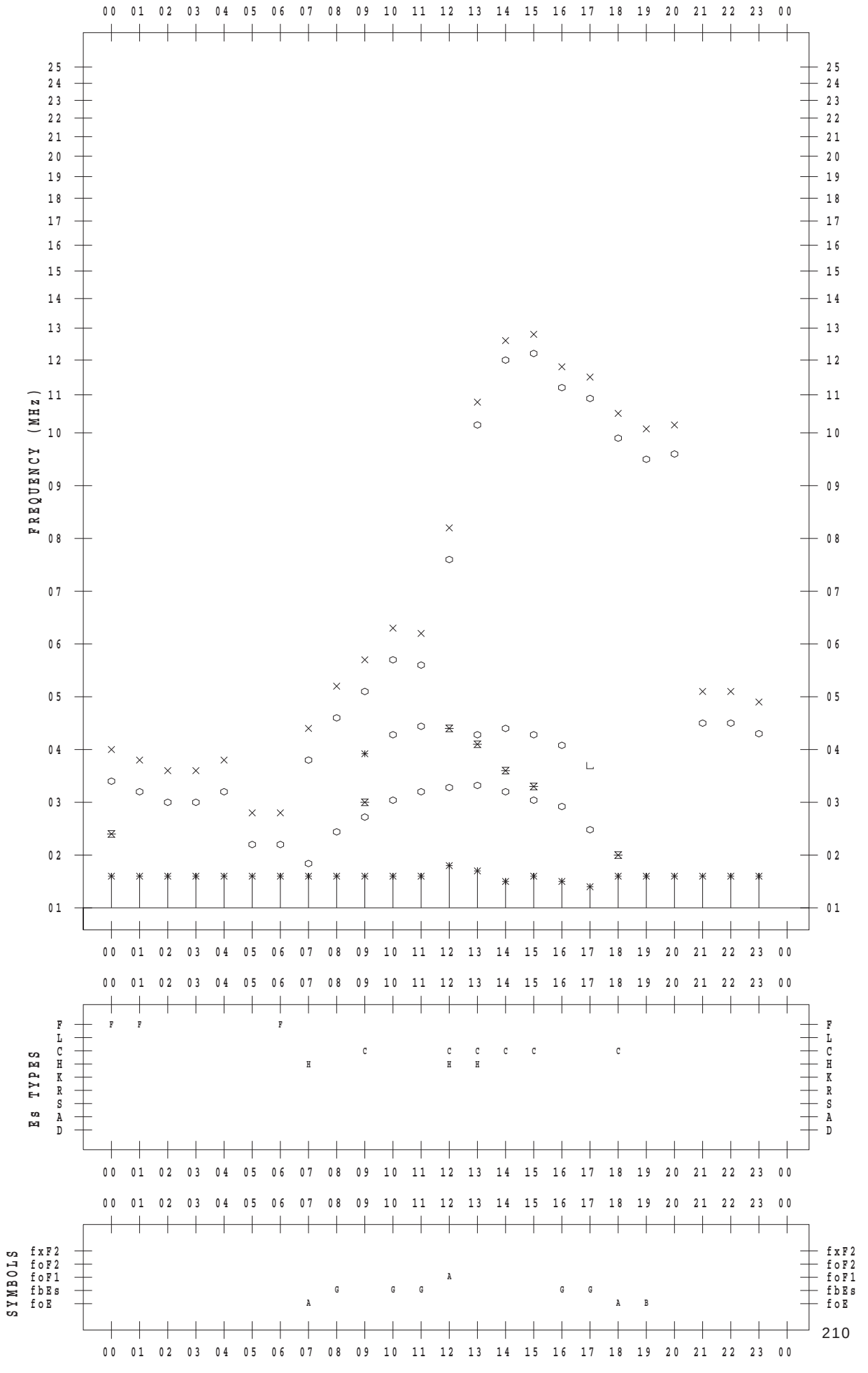
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/10

135 °E MEAN TIME



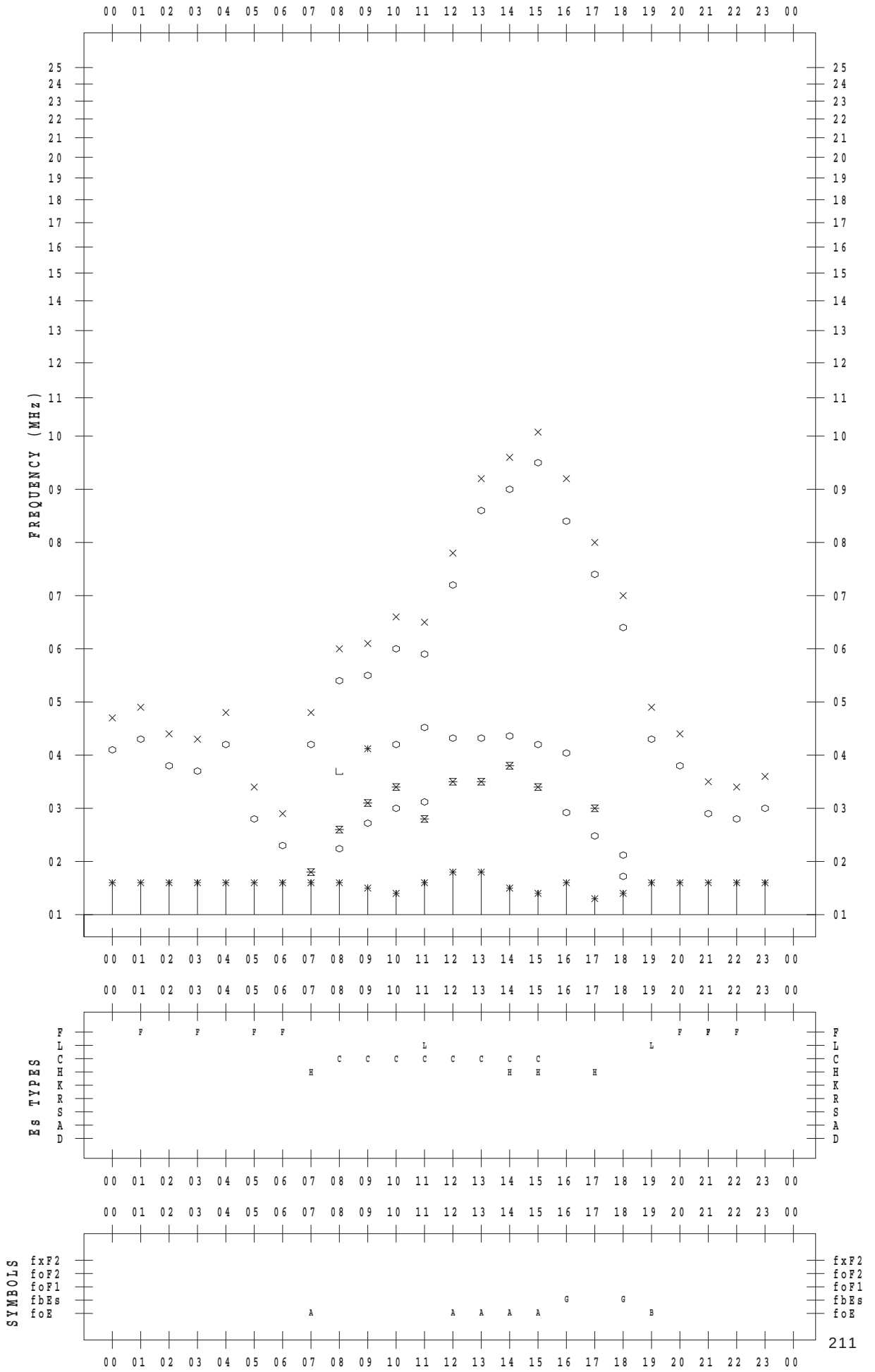
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/11

135 °E MEAN TIME



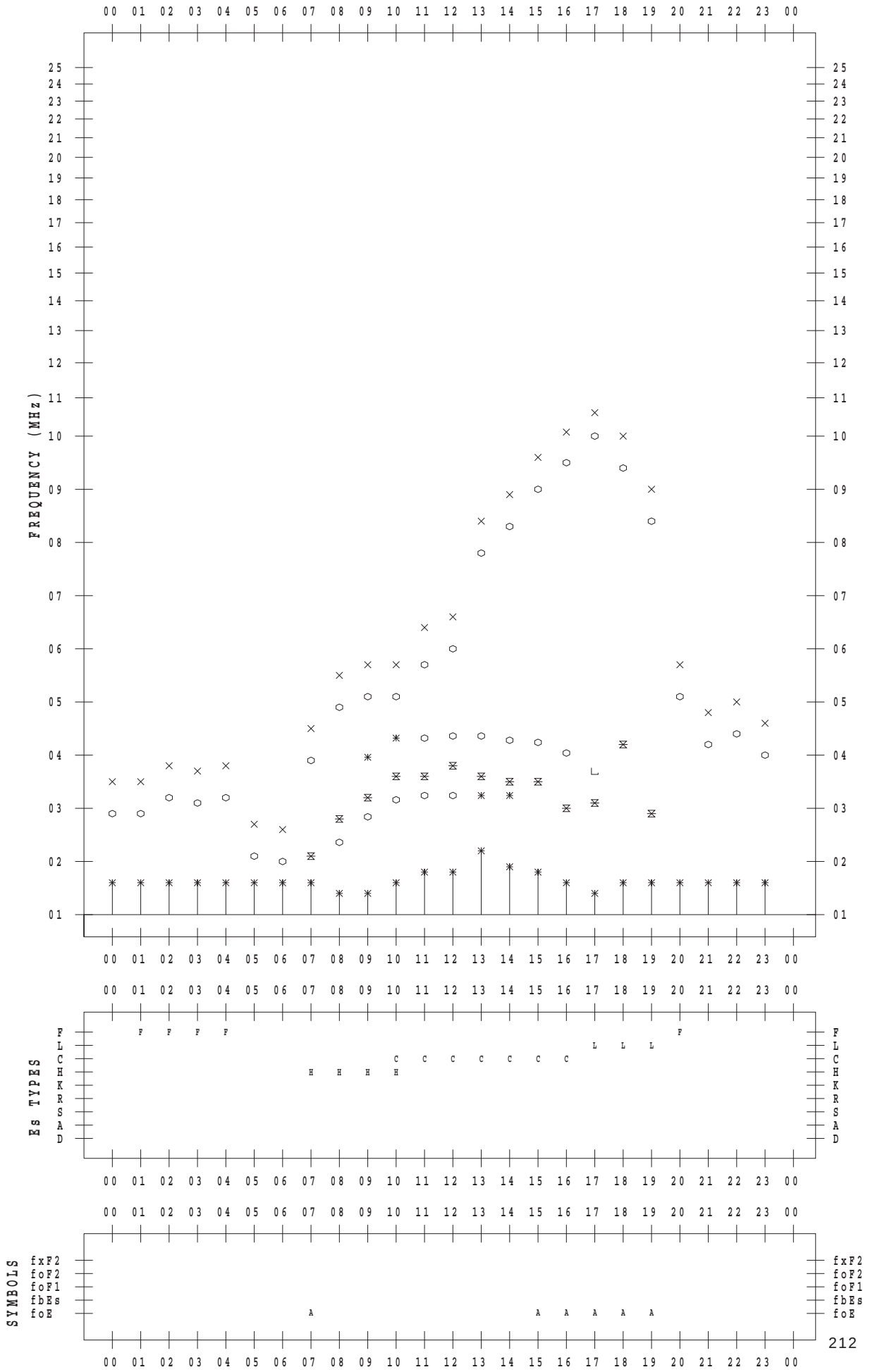
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/12

135 °E MEAN TIME



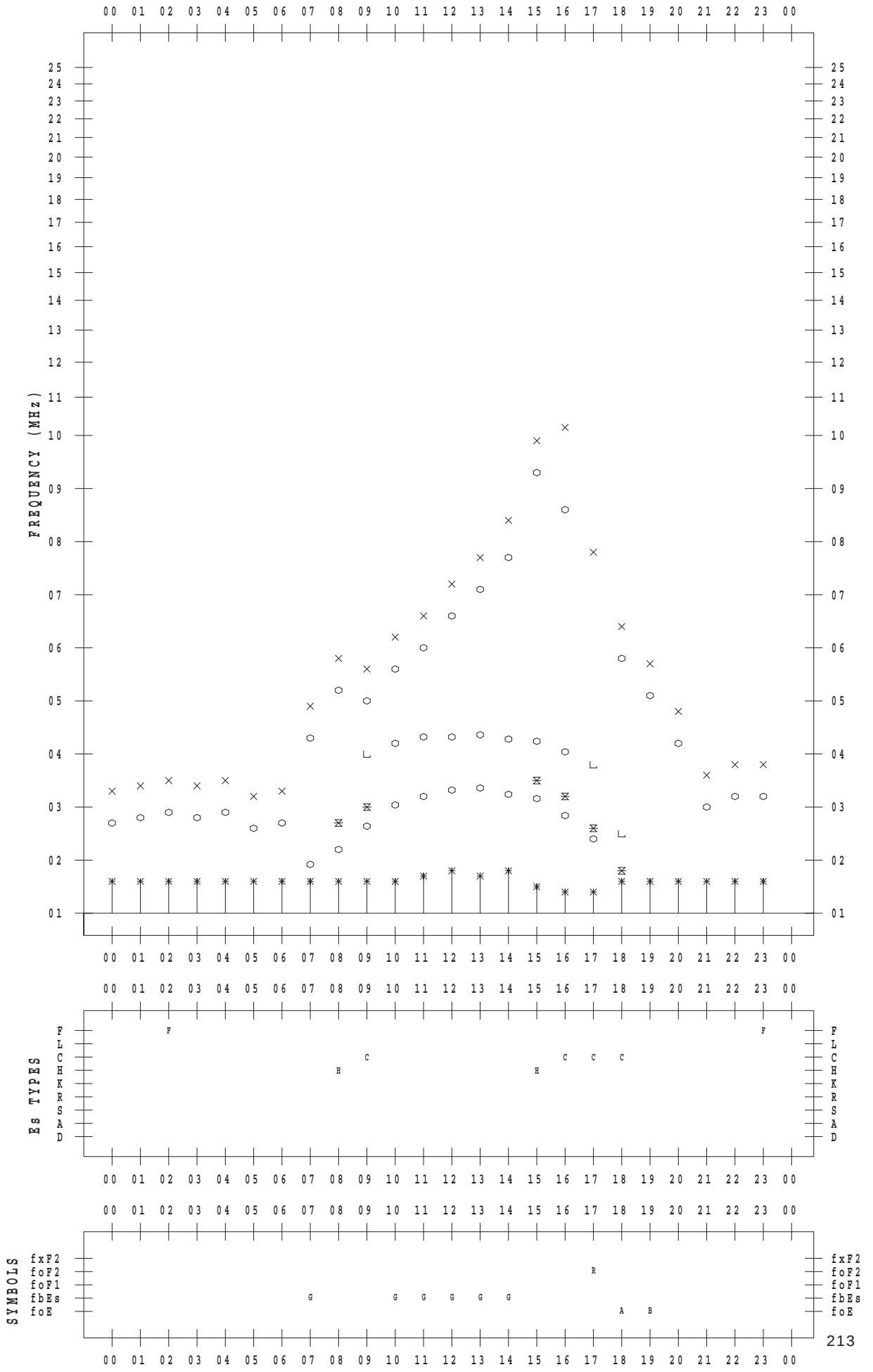
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/13

135 °E MEAN TIME



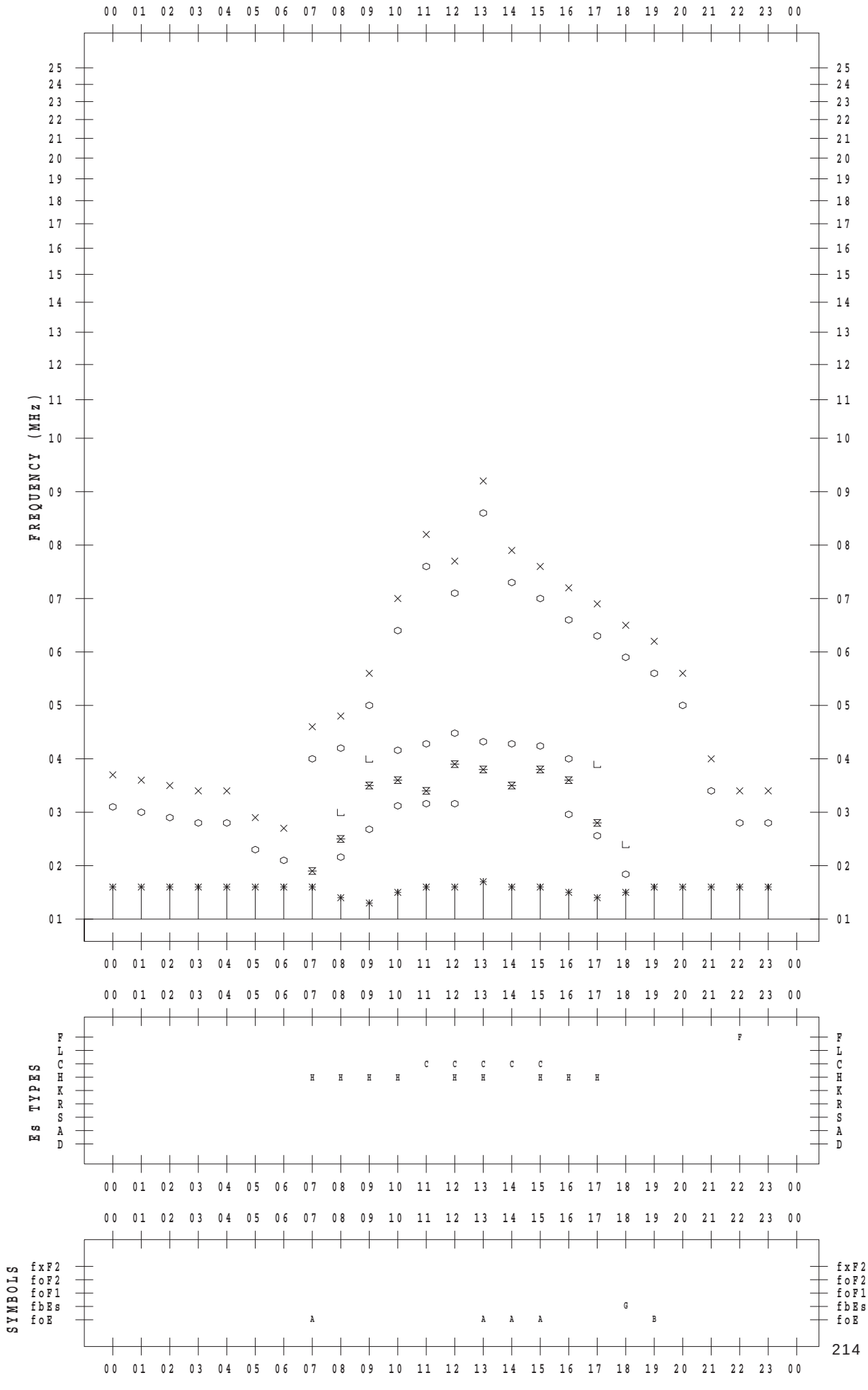
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/14

135 °E MEAN TIME



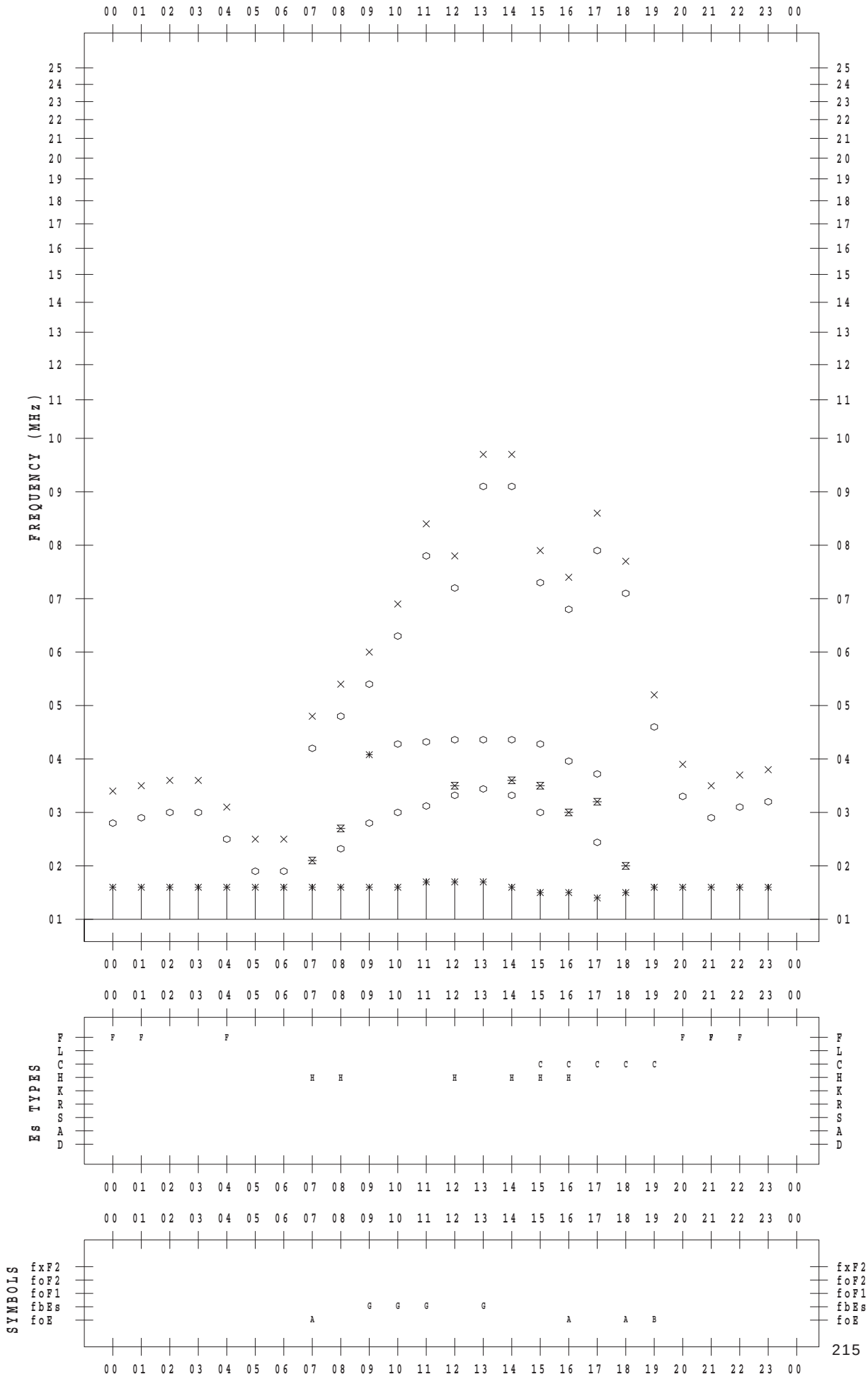
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/15

135 °E MEAN TIME



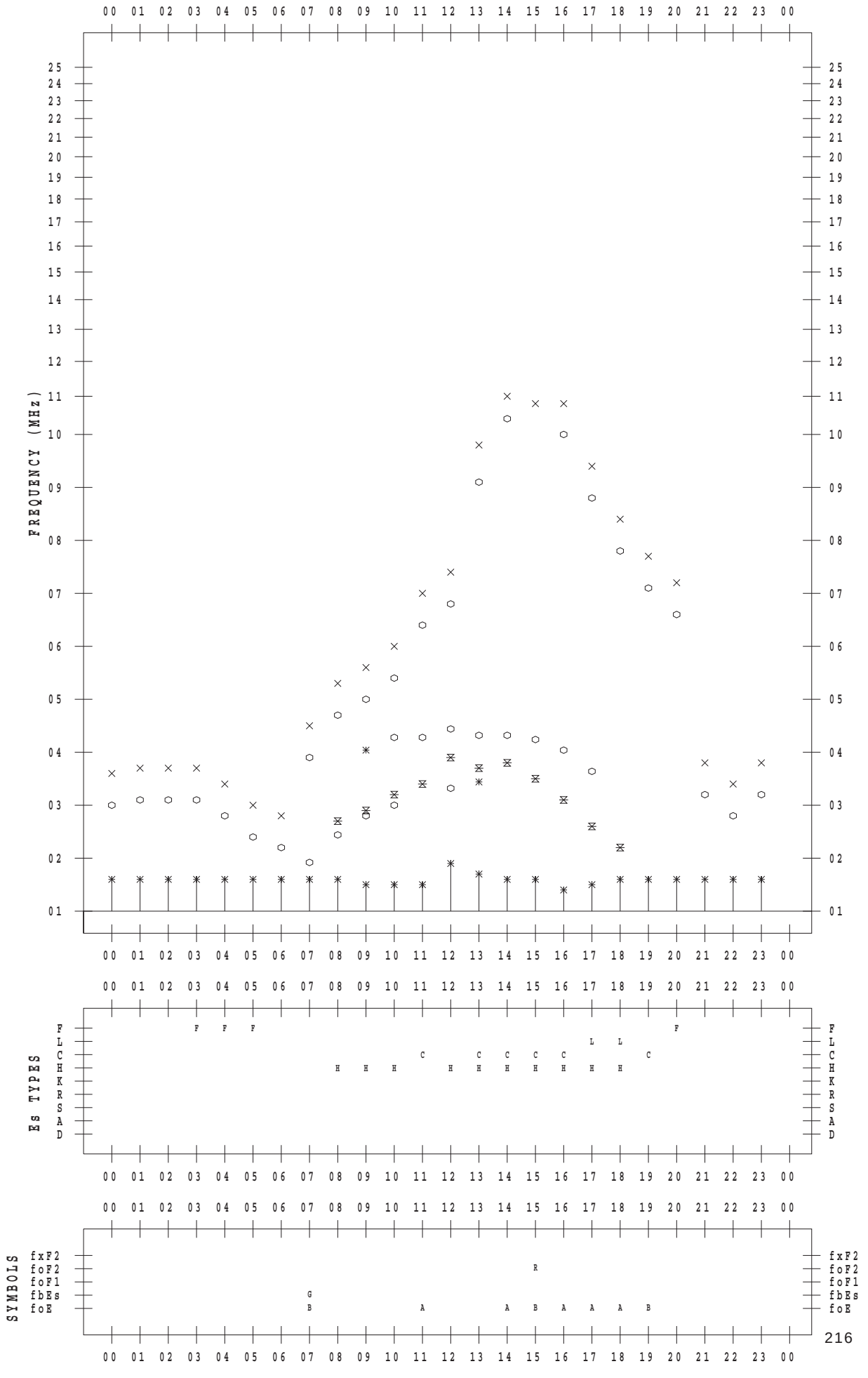
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/16

135 °E MEAN TIME



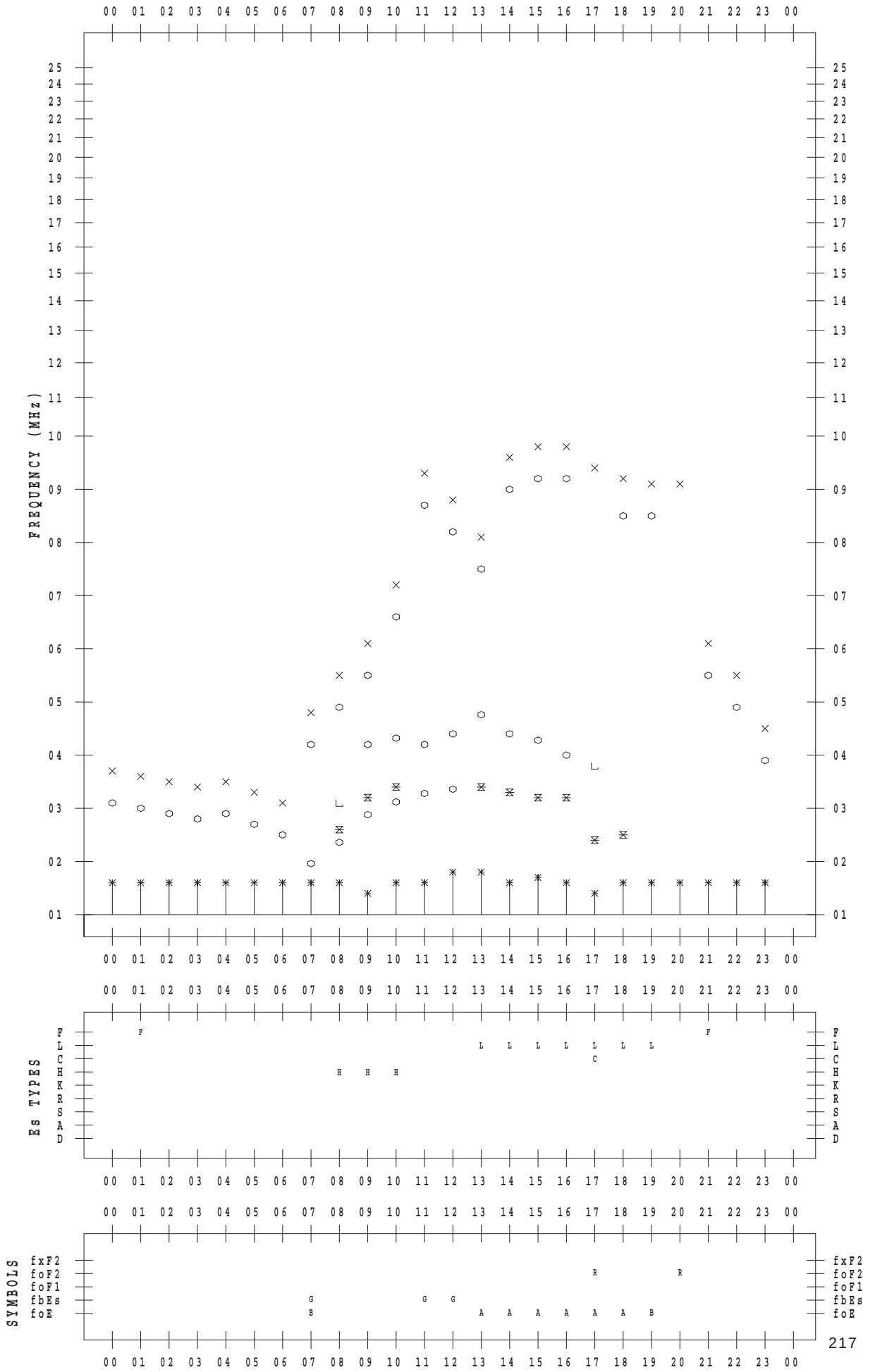
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/17

135 °E MEAN TIME



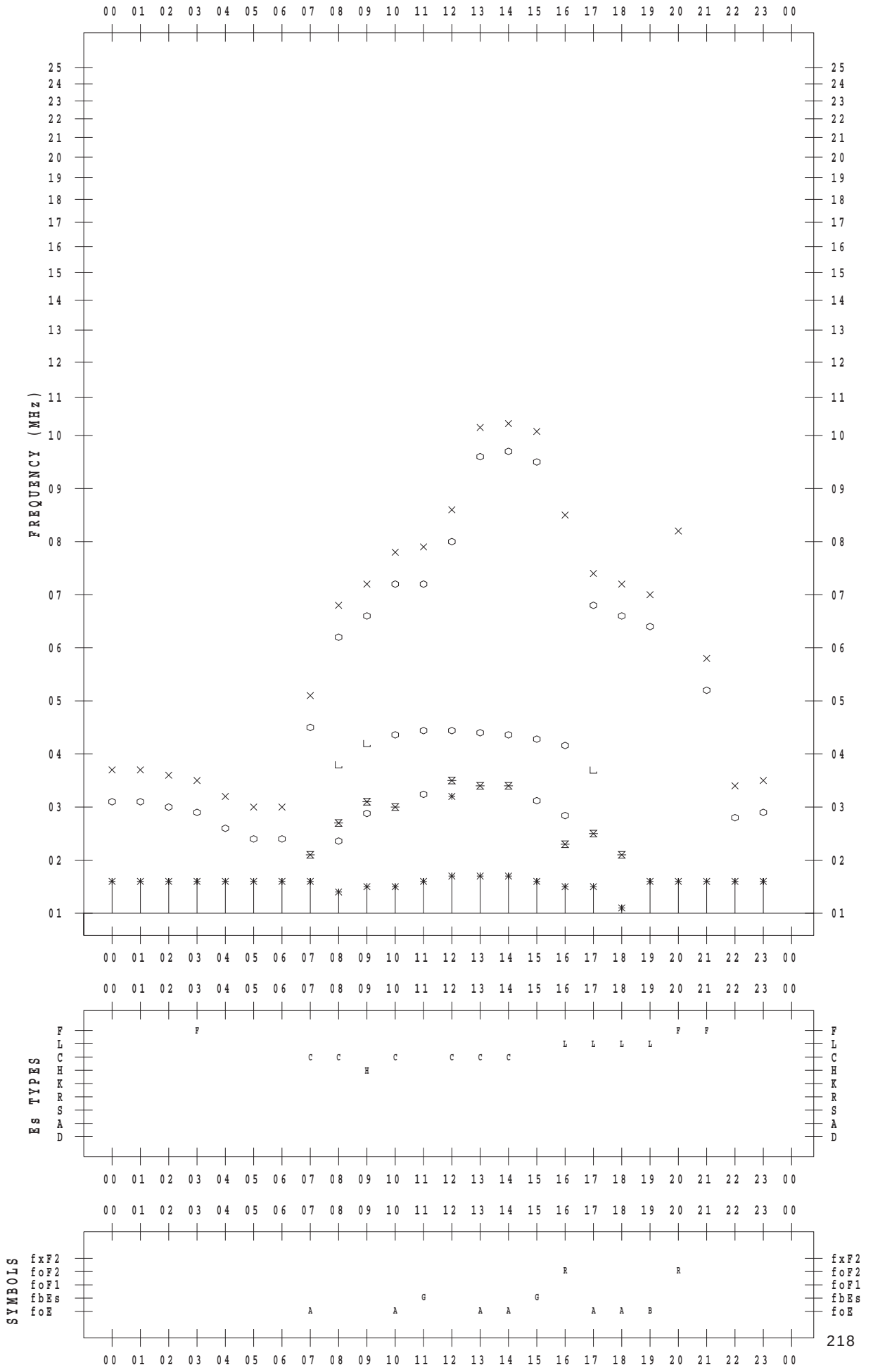
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/18

135 °E MEAN TIME



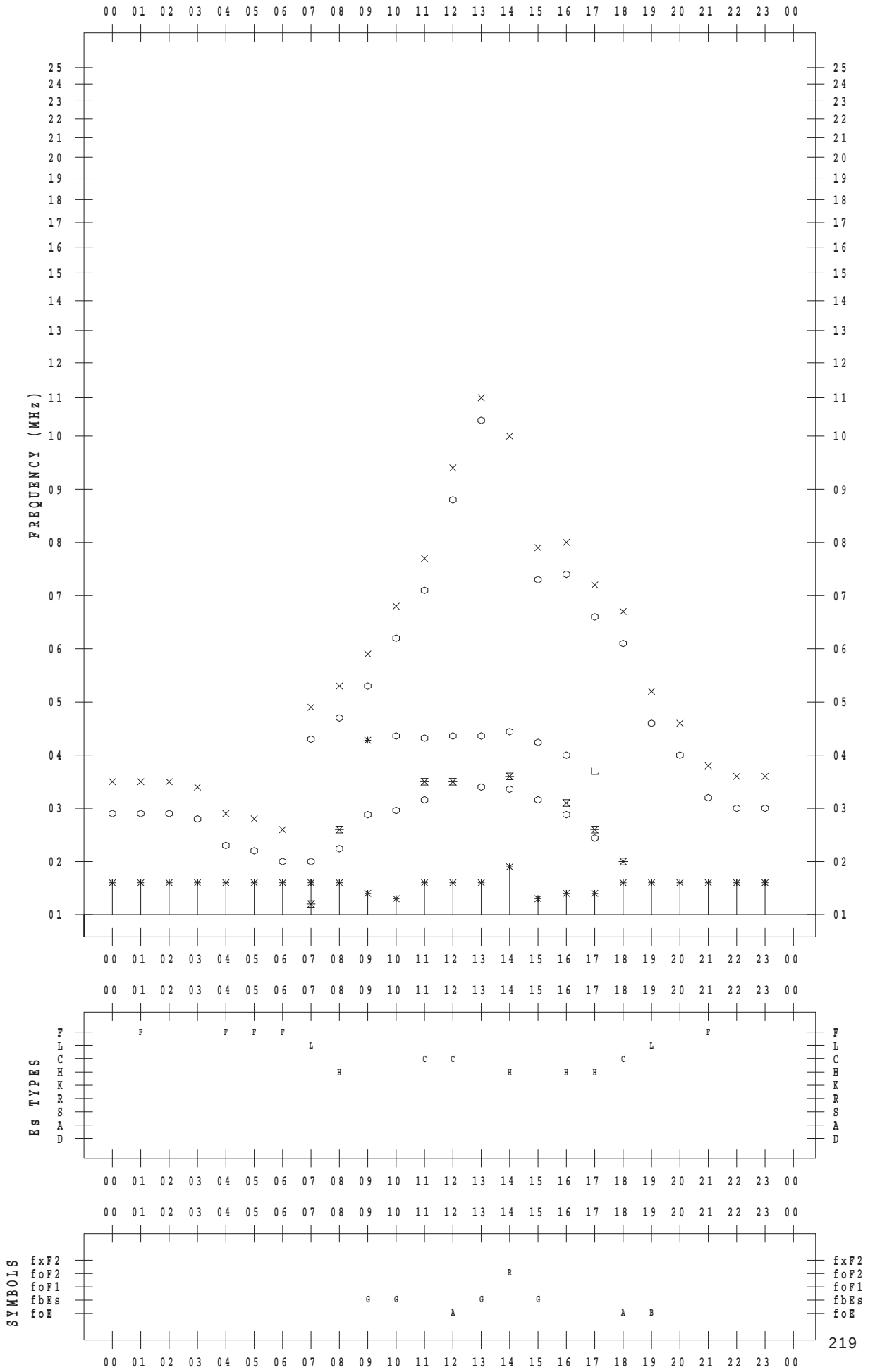
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/19

135 °E MEAN TIME



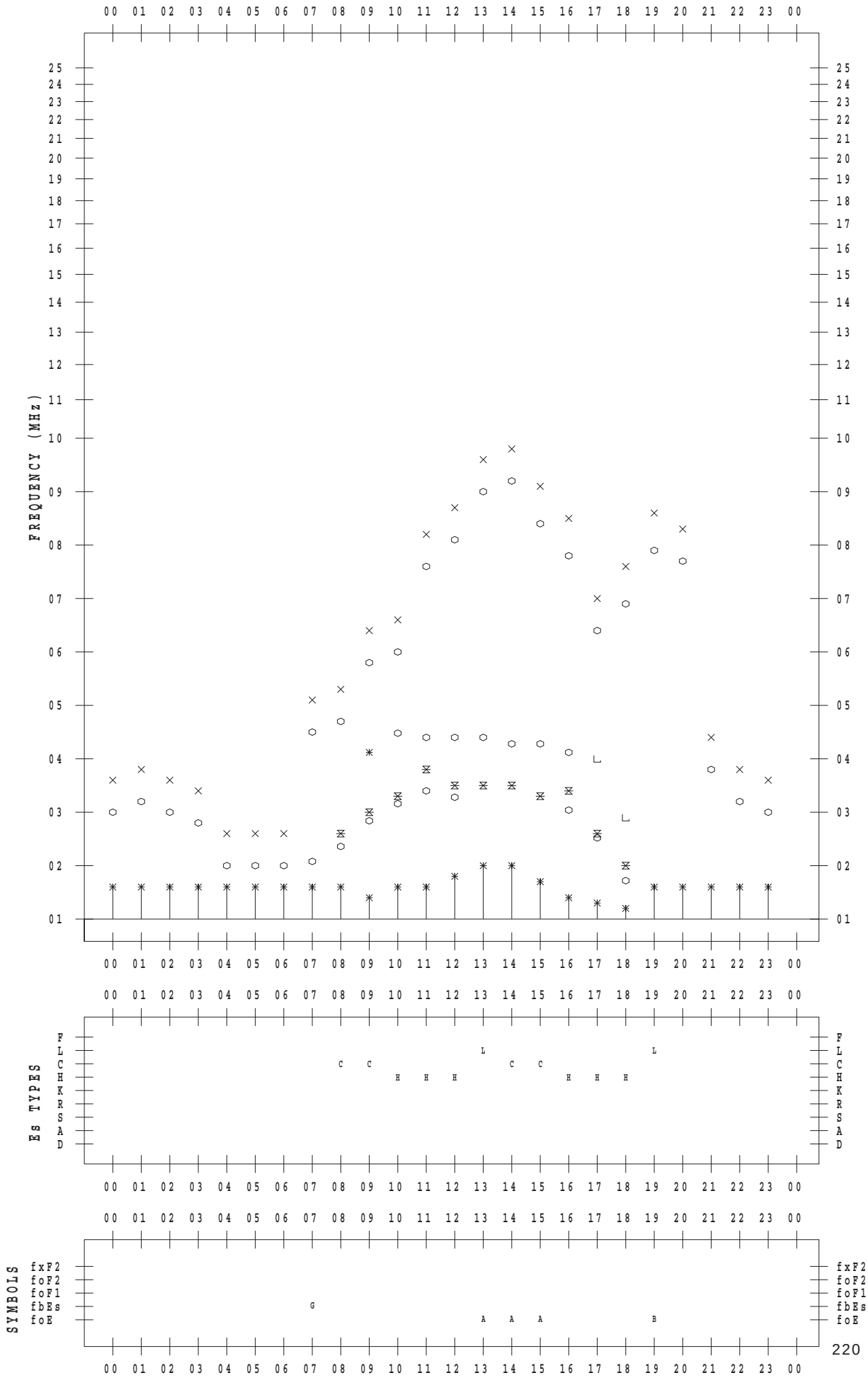
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/20

135 °E MEAN TIME



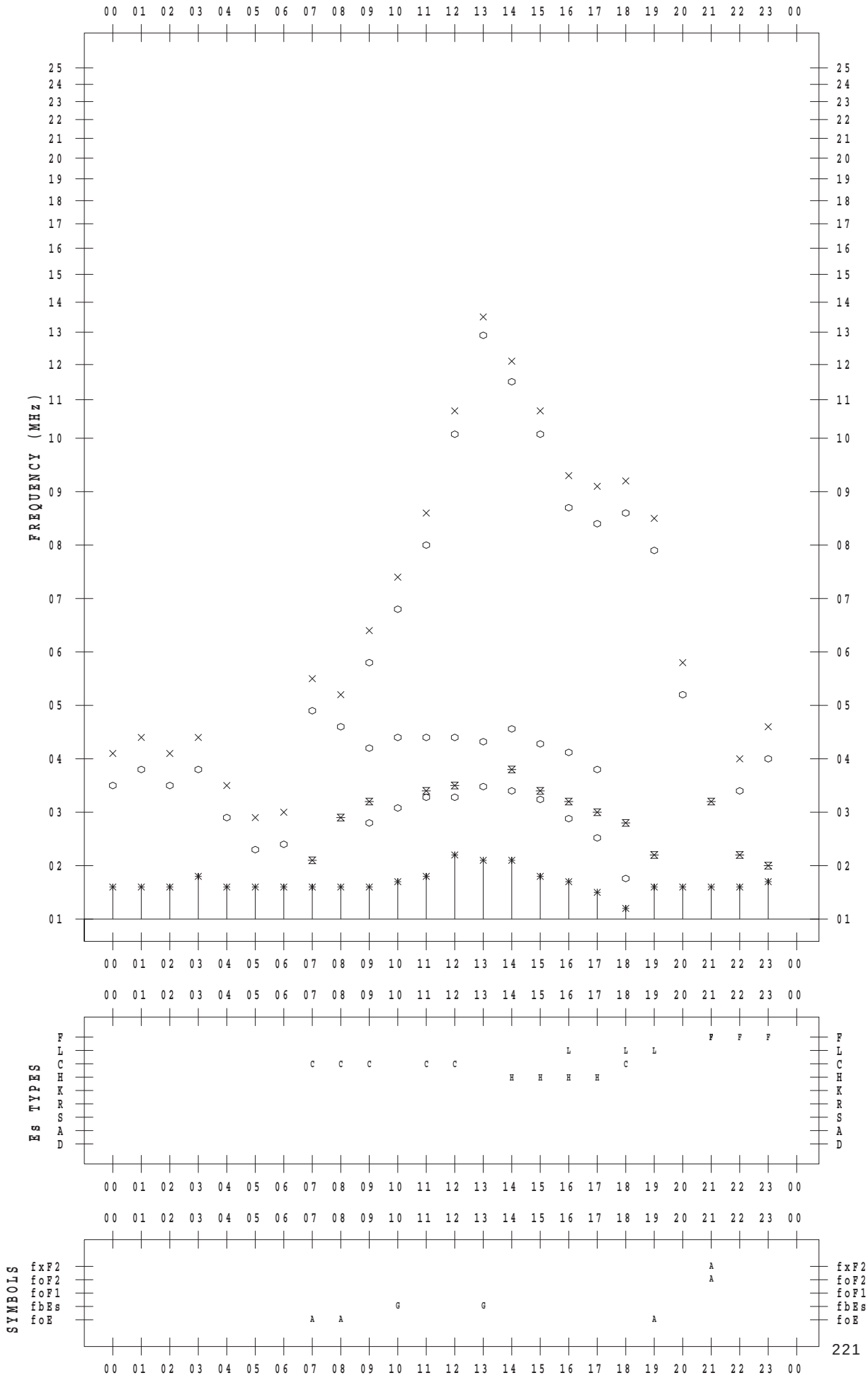
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/21

135 °E MEAN TIME



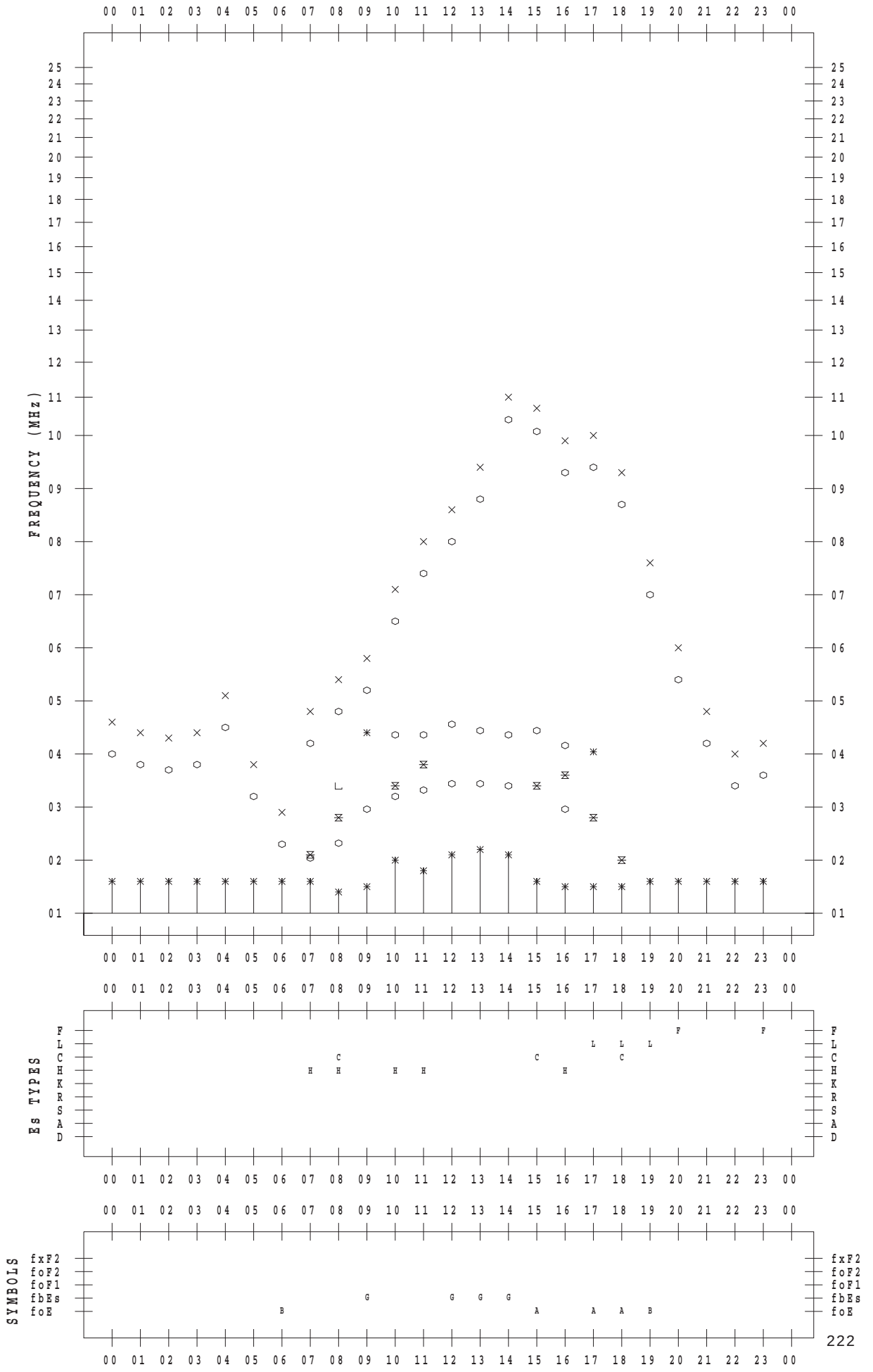
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/22

135 °E MEAN TIME



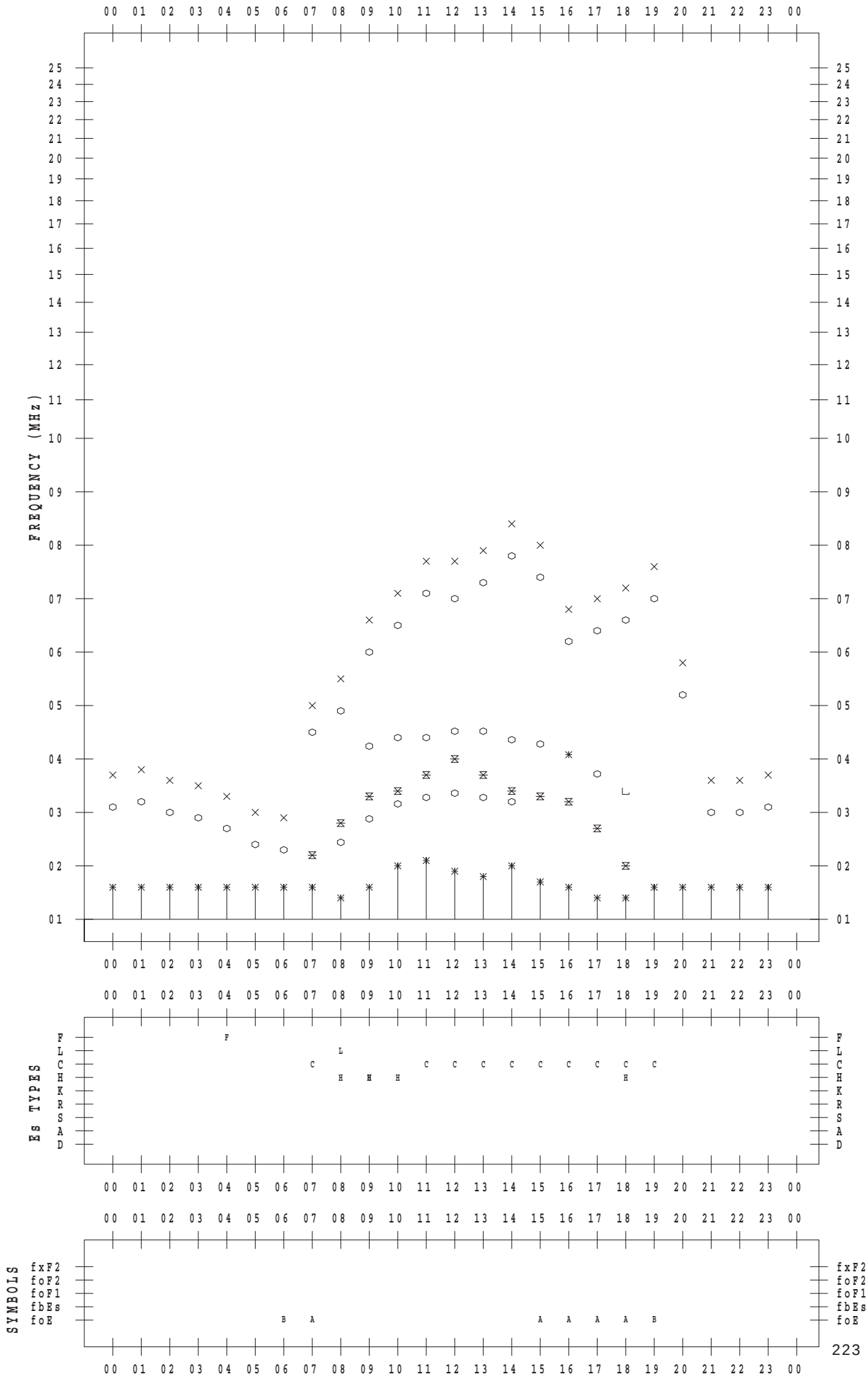
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/23

135 °E MEAN TIME



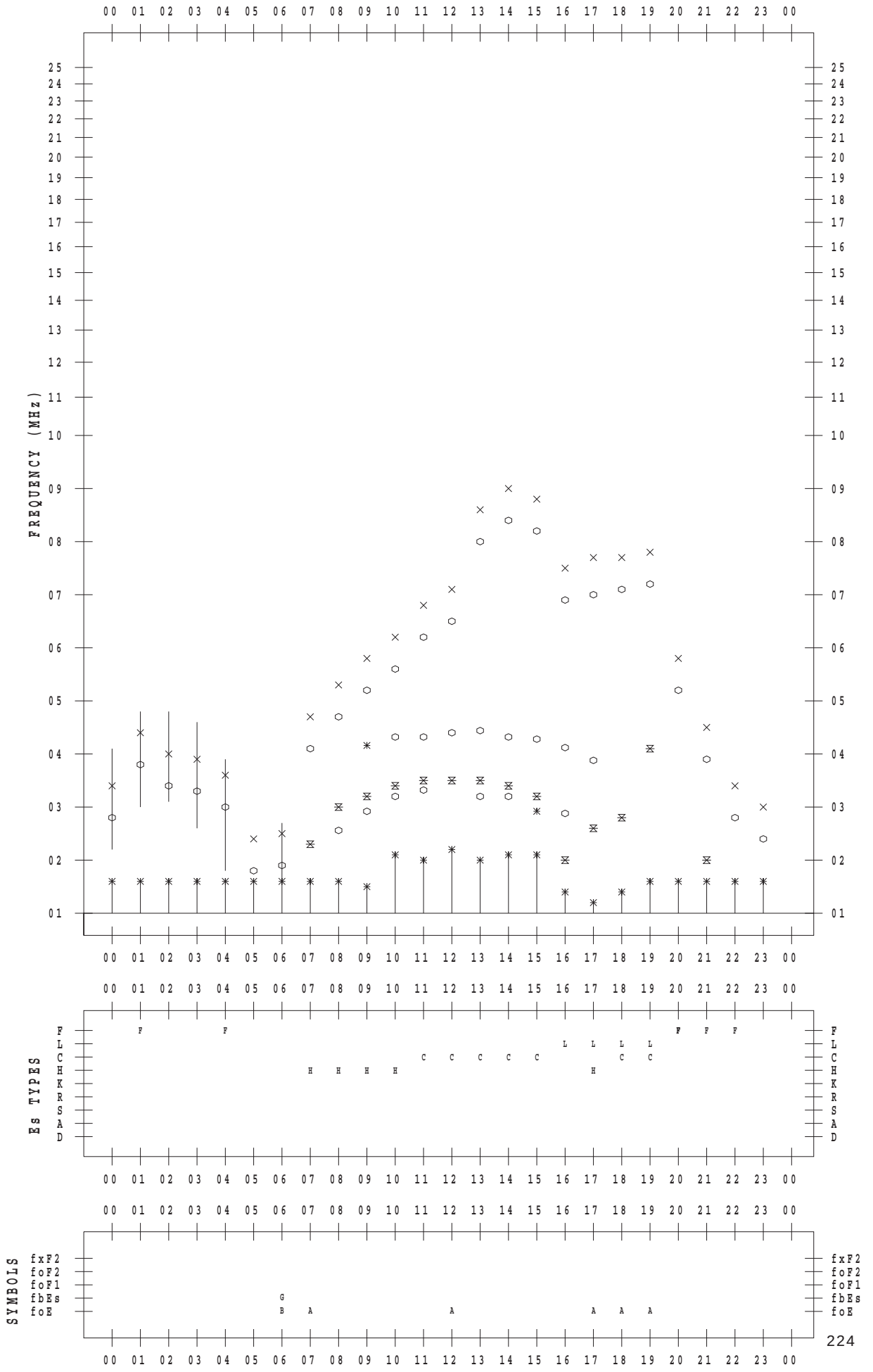
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/24

135 °E MEAN TIME



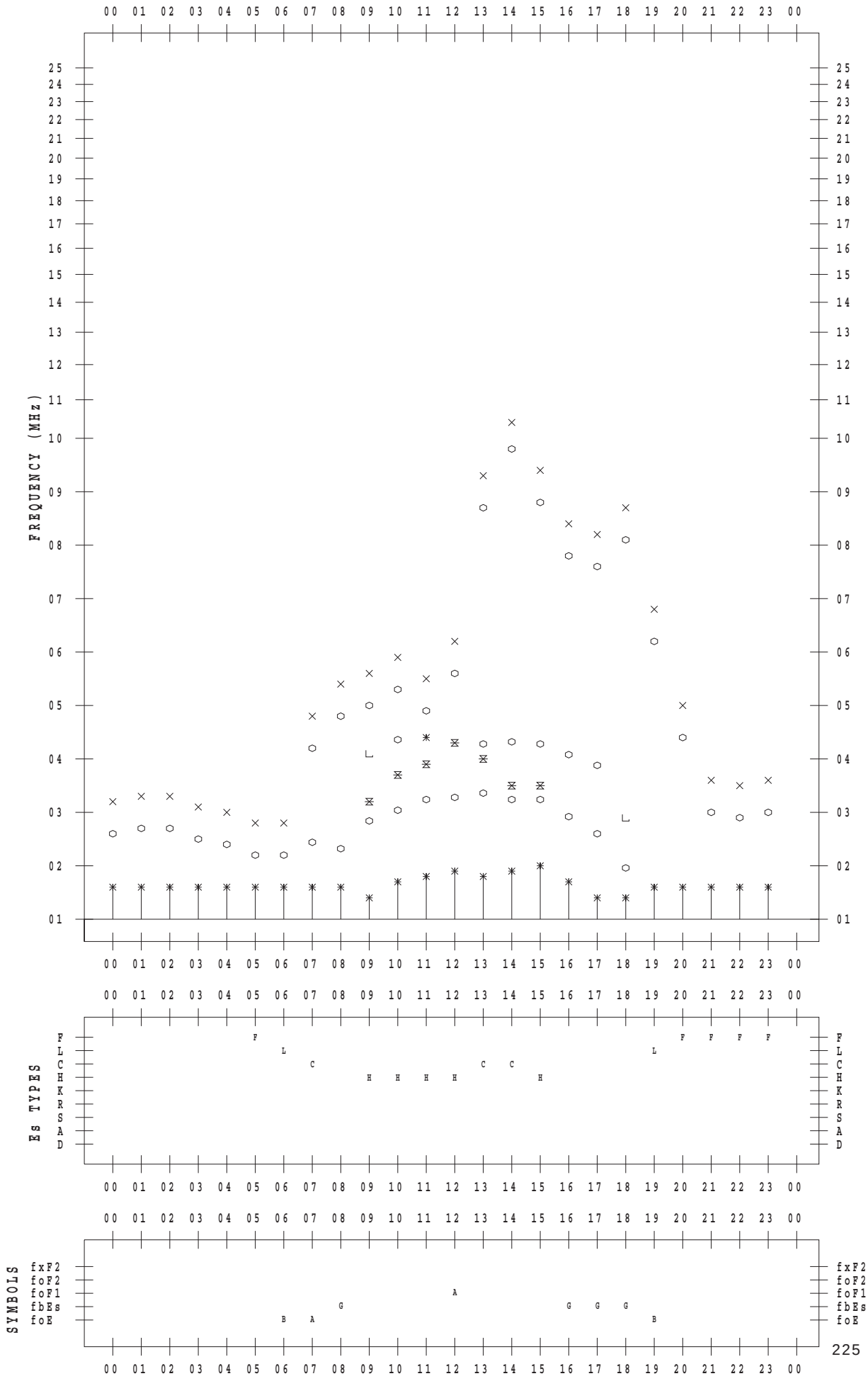
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/25

135 °E MEAN TIME



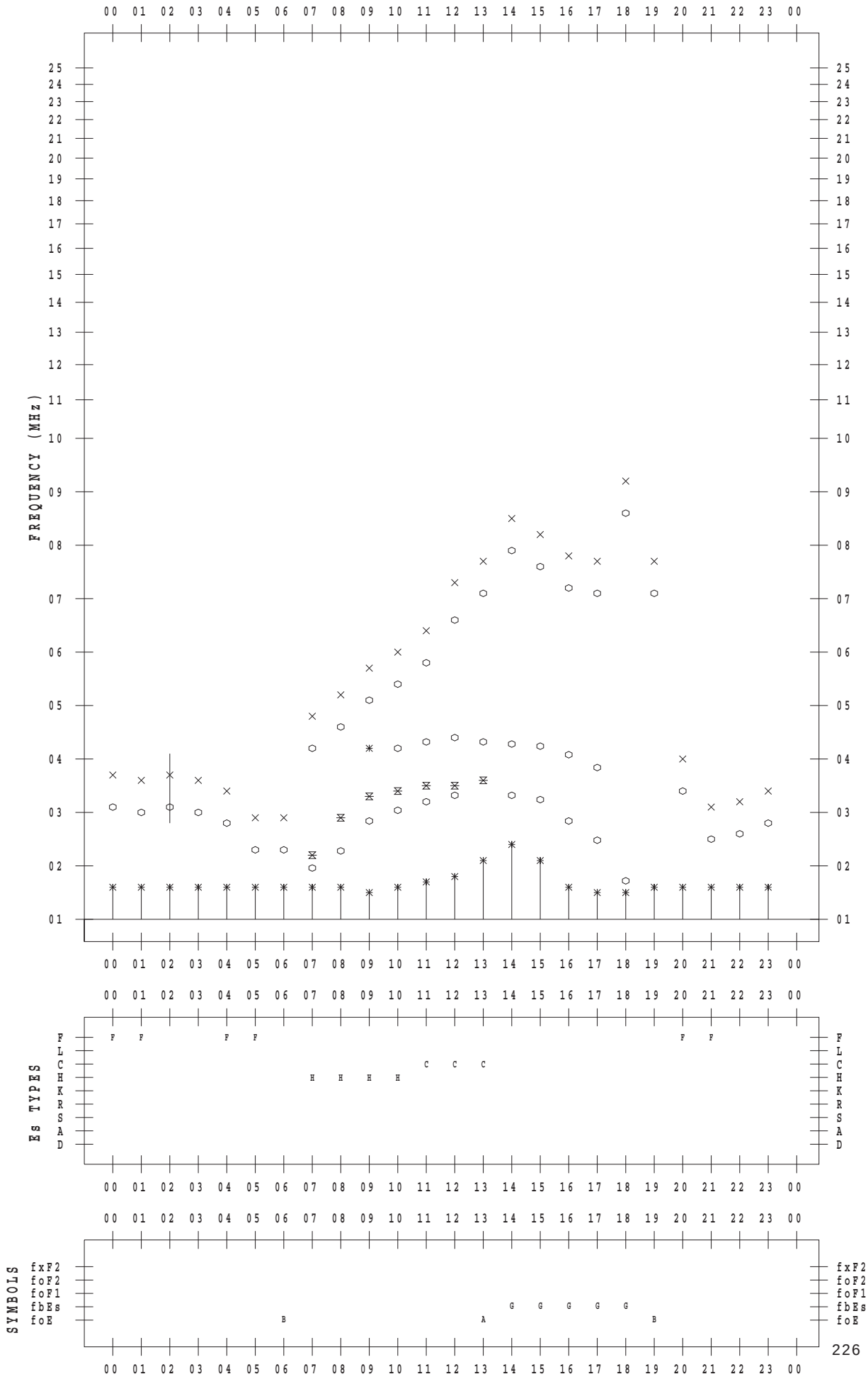
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/26

135 °E MEAN TIME



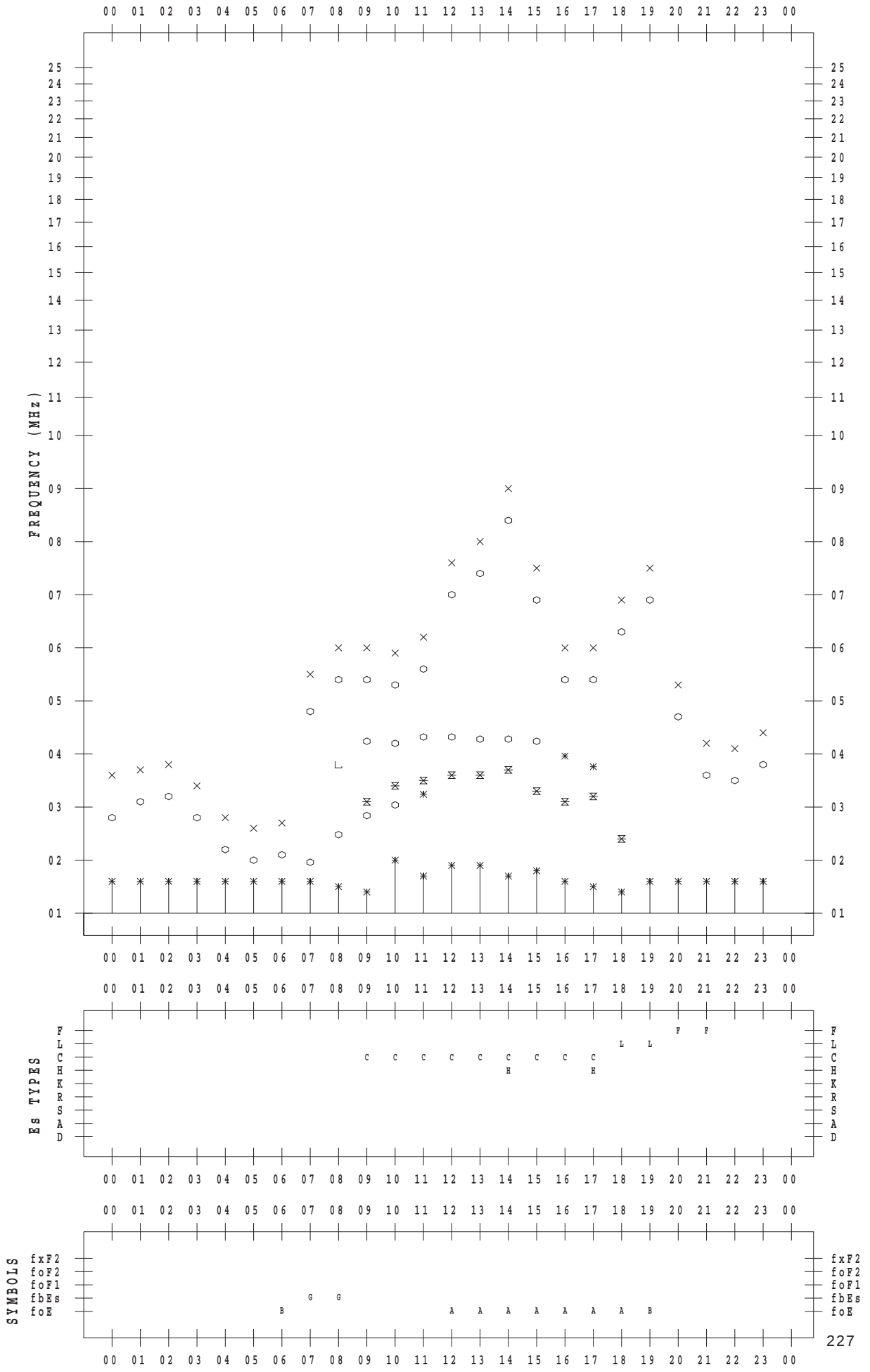
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/27

135 °E MEAN TIME



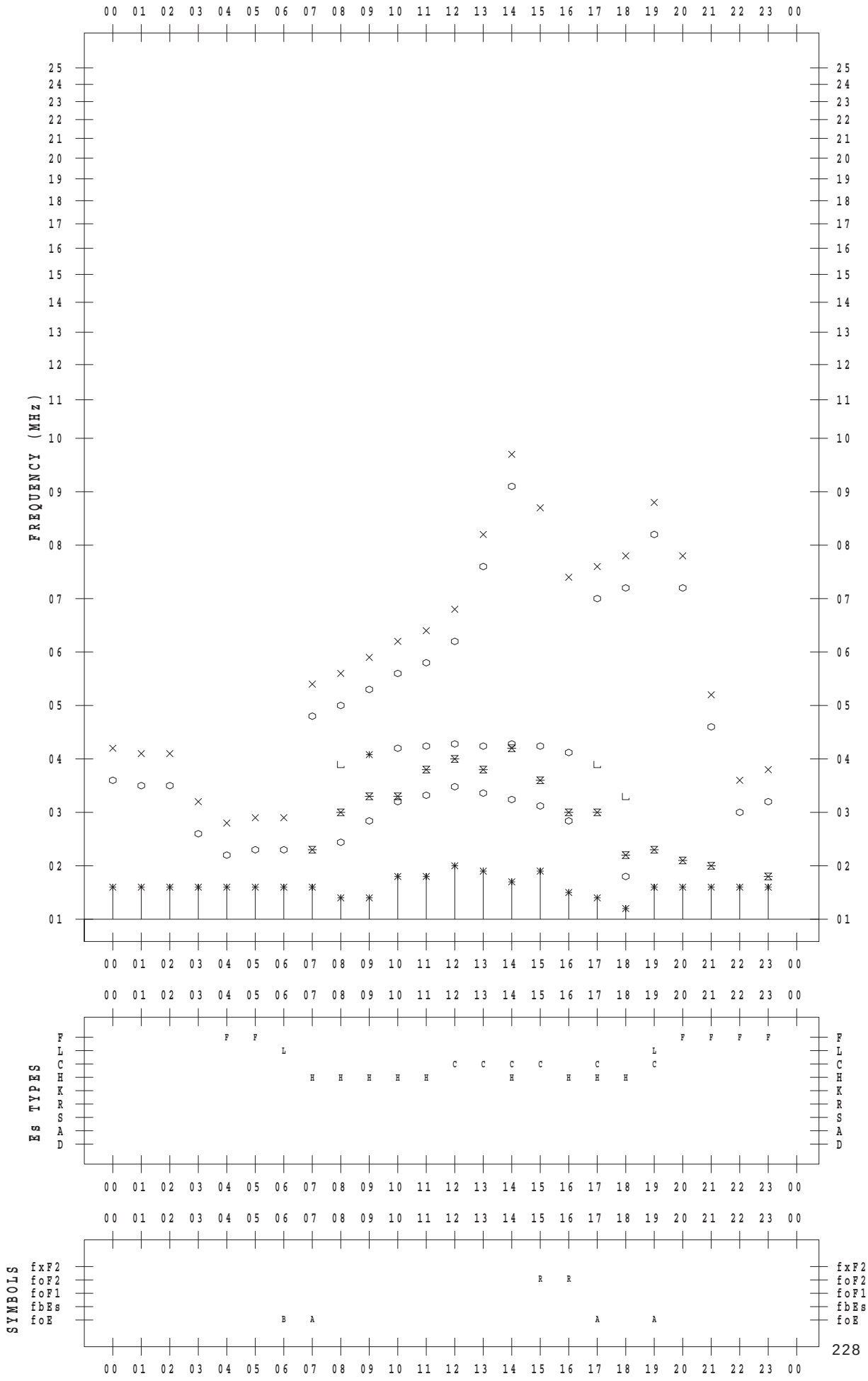
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/28

135 °E MEAN TIME



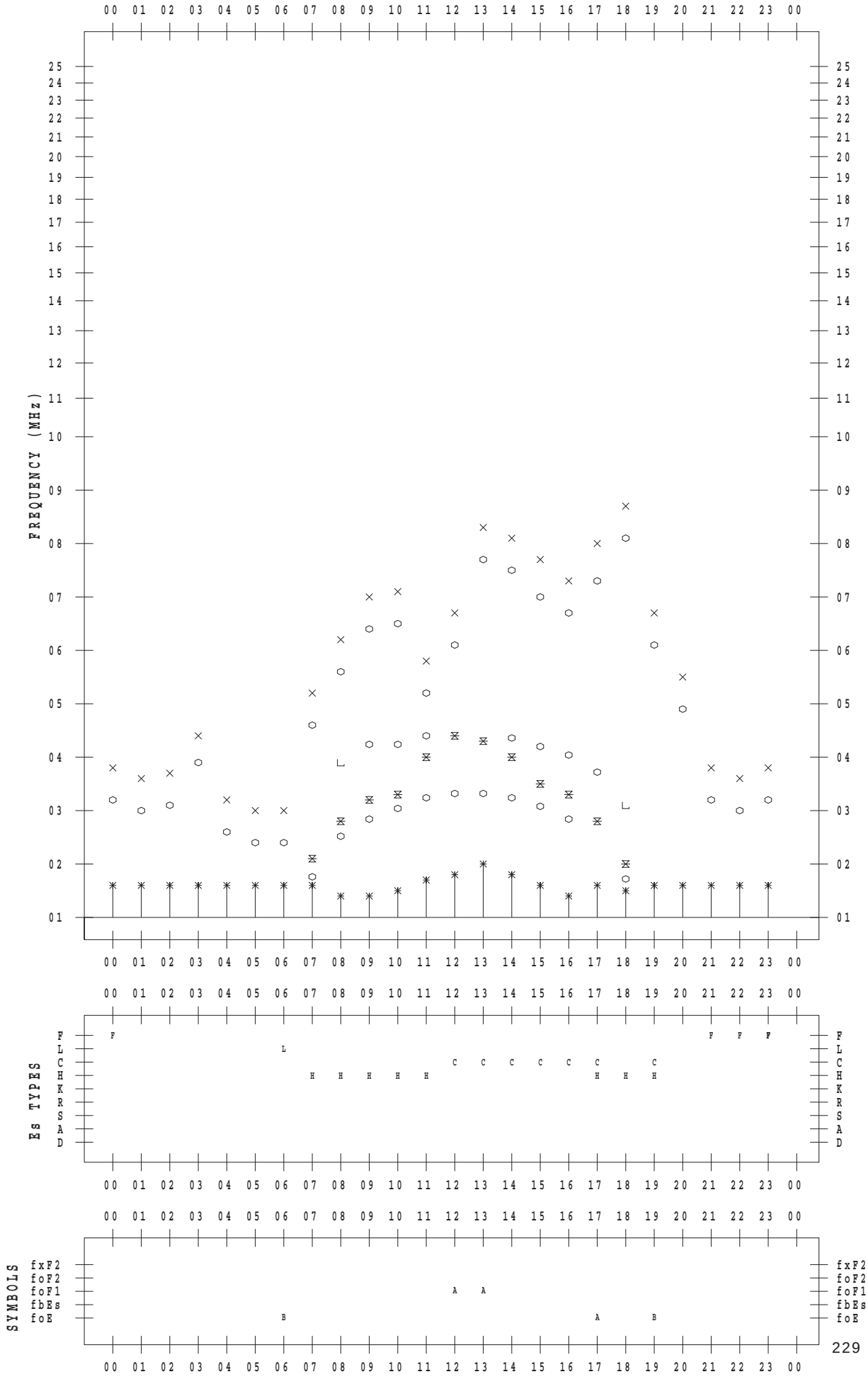
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/29

135 °E MEAN TIME



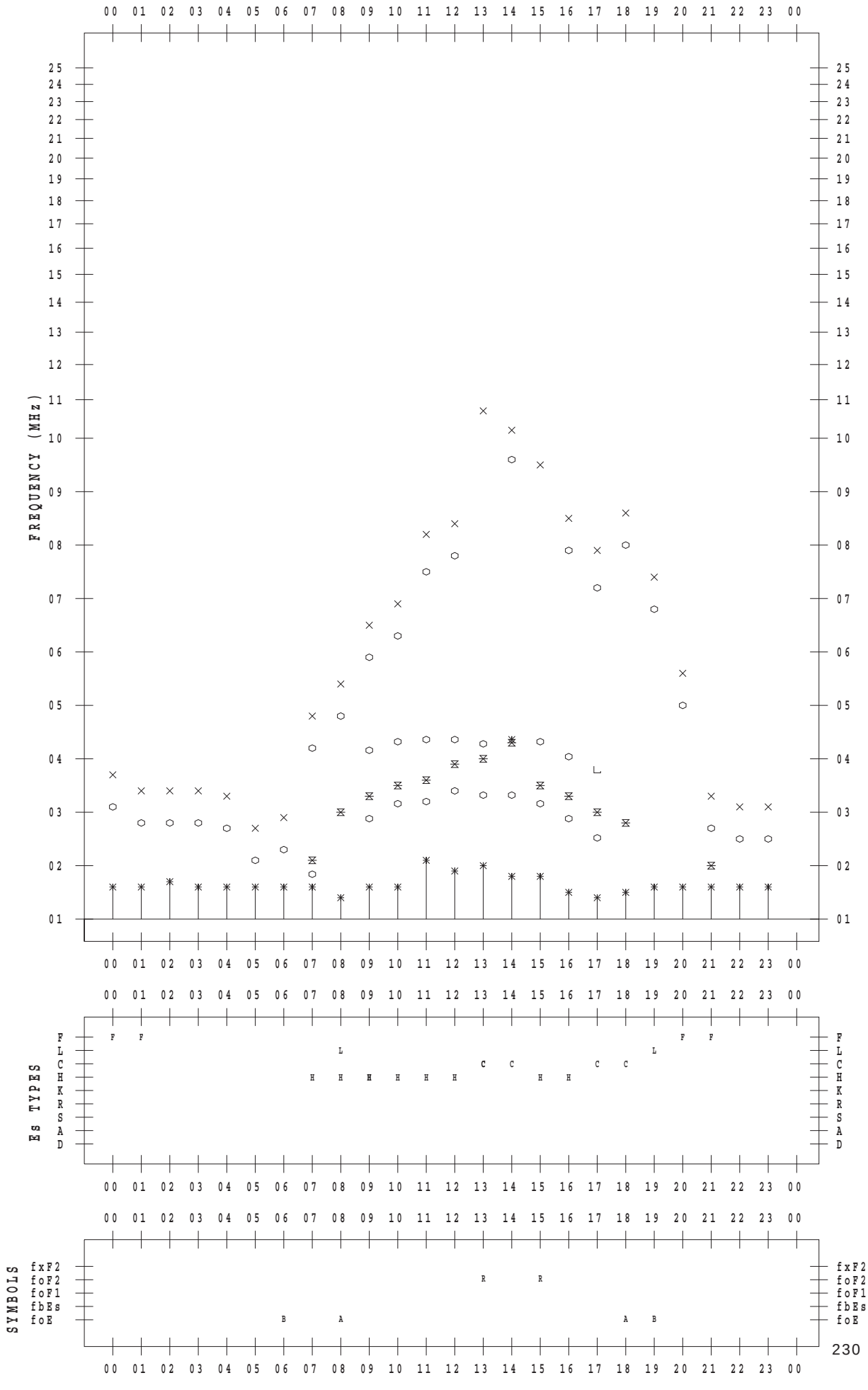
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 3/31

135 °E MEAN TIME