F-846

IONOSPHERIC DATA IN JAPAN

FOR JUNE 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

JUN. 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	38	40	38	38	44	46	A	A	A	A	A	A	A	A	A	48	A	129	A	A	61	55	54
2	51	54	52	52	51	51	A	101	A	A	A	43	A	A	A	44	A	A	50	55	64	63	53	55
3	48	46	42	39	40	38	A	54	56	A	48	56	A	37	A	48	47	48	50	58	52	59	58	47
4	44	43	45	45	47	57	49	51	55	A	54	A	47		51	A	46	59	48	58	62	65	64	49
5	43	43	42	41	37	40	A	A	50	A	A	A		39	55	52	52	52	50	A	A	63	62	54
6	52	49	49	49	42	42	52	54	A	A	A	A	52	52	A	49	50	47	44	43	53	51	34	54
7	54	51	50	47	48		A	A	A	A	A	A	A	58		A	40	A	A	62	65	51	50	47
8	47	43	42	42	38	A	A	105	89	59	A	A	A		A		A	A	46	A	58	A	52	52
9	54	A	50	A	A	A	50	A	89	54	A	86	A	A	A	52	48	53	109	86	A	A	A	A
10	A	A	47	A	49	33	42	42	51	A	86	146	164		A		112	85	51	79	A	A	A	A
11	52	48	47	49	30		112	169		A	A	A	A	A	99	A	48	51	52	A	A	64	A	A
12	A	54	50	52	50	52	52	54	104			A	A	A	A	101	A	106	109	51	A	63	59	52
13	52	50	51	50	49	42	A	A	A	A	A	A		A	A	A	47	106	A	55	54	58	50	51
14	49	50	42	42	34	37	A	A	A	A	A	A	A	A	A		A	A	99	51	A	A	A	A
15	A	A	A	A	A	A	100	99	111	110	69	A	A	A	A	A	A	85	52	109	58	58	A	A
16	48	51	51	38	41	45	45	101	109	A	A	A	83	A	A	91	A	A	A	A	59	63	50	44
17	38	42	41	48	40	30	40	52	50	88	A	A	A	A	A	84	A	44	91	A	A	52	A	50
18	44	44	47	41	40	34	34	A	54	A	A	A	A	A	A	A	A	53	51	58	58	52	51	50
19	49	45	42	40	40	A	A	A	A	A	A	A	49	A	A	A	43	46	45	A	54	50	54	54
20	52	52	51		50	47	A	122	A	A	40	A	52	A	48	49	46		50	48	49	50	54	54
21	48	47	40	39	38	42	51	109	139	A	A	51	A	A	A	59	111		A	A	51	50	54	52
22		47	37	40	36	65	A	58	A	48	A		A	A	118	111	39	45	109	55	55	49	50	48
23	44	40	41	34	34	42	51	88	109	86	A	45	A	A	A	53	A	A	A	40	A	A	A	A
24	A	A	A	A	38	44	44		A	52	A	99	A	A	A	A	A	A	A	56	52	A	54	54
25	48	42	39	46	43	42	149	149			A	A	A	A	111	A	A	150	A	A	A	51	A	A
26	A	A	A	42	40		86	151	147		A	A	A	A			132		N	A	55	54	A	A
27	A	A	A	38	34	36	33	A	A	A	A	A	A	A		50	A	A	50	54	55	52	53	49
28	46	42	36	36	36	46	A	A	A	87	A	64	A	A	A	A	50		A	53	50	54	53	50
29	48	40	41		A	A	A	86	A	A	A		A	A	54	N	48	48	48	54	63	63	51	A
30	32	35	35	36	38	29	A	A	A	A	A	42	A	A	50	50	A	43	45	47	54	54	54	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	24	26	24	27	22	17	18	14	8	5	9	6	4	8	14	17	17	21	20	20	24	21	20
MED	48	46	42	42	40	42	50	94	89	72	54	56	52	46	54	52	48	52	50	55	55	54	53	52
U Q	52	50	50	47	47	46	69	109	109	87	77	92	83	55	105	84	51	85	95	58	58	63	54	54
L Q	44	42	41	38	37	37	43	54	54	53	44	44	49	38	50	49	46	46	48	51	52	51	50	49

HOURLY VALUES OF fEs AT Wakkanai

JUN. 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	38	G	25	G	59	36	146	56	73	64	49	56	77	60	42	47	38	110	70	59	107	41	32	32
2	26	G	G	G	G	39	64	93	84	71	56	42	49	41	40	45	59	58	36	32	33	26	24	31
3	G	G	G	G	G	36	49	54	54	109	55	44	45	G	103	41	60	38	33	28	34	35	23	24
4	29	26	26	G	26	36	43	46	48	61	51	58	49		49	64	40	60	59	46	40	41	32	G
5	G	G	G	G	G	36	40	43	53	57	70	41	G	G	44	42	43	146	52	92	82	45	24	G
6	28	G	G	G	26	32	40	56	55	47	46	128	116	G	46	G	105	38	34	34	33	40	32	39
7	43	40	34	30	G		157	126	65	159	61	52	65	94		47	37	84	60	32	29	G	29	G
8	26	G	27	32	37	54	70	91	128	70	92	146	146		107		82	56	47	59	45	61	59	61
9	57	71	46	71	107	114	38	72	60	52	71	82	92	92	84	64	59	50	92	83	58	113	92	69
10	60	56	39	57	34	50	41	84	G	131	80	66	86		131		146	104	39	84	134	115	59	85
11	40	40	35	33	126		105	122		96	72	116	158	136	76	154	G	39	44	112	84	53	125	114
12	115	46	60	36	40	40	135	53	92			72	100	67	92	74	79	57	81	35	92	46	54	39
13	G	38	31	25	32	35	55	60	73	65	87	84		49	73	86	G	107	138	87	49	37	26	49
14	55	26	28	G	54	39	49	54	94	66	84	64	145	45	38	G	40	52	105	40	81	71	82	90
15	71	56	61	60	58	53	70	103	112	104	167	92	113	126	96	72	97	71	58	64	56	46	40	60
16	40	28	G	G	27	59	40	54	154	117	63	60	176	93	40	77	65	70	128	80	39	36	27	38
17	26	26	G	G	32	36	59	56	58	108	100	108	72	49	56	69	55	33	69	107	60	43	69	40
18	59	35	28	G	G	28	34	158	54	94	70	84	97	62	44	69	95	59	39	41	49	45	90	G
19	G	G	26	G	29	53	43	55	60	71	94	59	60	64	76	66	44	40	34	56	30	G	G	45
20	35	40	26		G	33	164	113	87	60	134	66	G	56	41	37	G		39	40	26	29	59	39
21	27	G	28	G	25	117	70	60	105	76	70	44	63	54	68	54	63		69	54	43	43	83	60
22		38	32	32	34	34	49	56	57	44	49	G	71	116	167	109	36	35	151	71	46	90	38	34
23	G	G	G	G	G	60	55	73	90	109	131	64	90	55	57	51	80	60	60	G	60	70	88	110
24	107	81	65	89	G	43	38		46	42	108	108	110	135	90	75	86	89	72	54	44	110	39	25
25	28	24	125	59	44	56	156	127			104	106	64	66	110	142	137	142	97	94	94	59	65	85
26	116	73	69	45	31		71	124	128		92	94	111	129			123		81	66	94	60	113	82
27	126	58	45	29	60	35	160	104	72	152	103	50	64	64		108	61	92	37	45	41	48	46	28
28	90	40	35	41	31	44	61	60	144	74	74	68	76	150	163	66	38		60	57	34	61	G	36
29	G	34	28		49	104	70	90	69	57	106		167	70	44	41	89	33	G	G	G	27	32	38
30	G	G	G	G	23	42	56	106	60	66	100	48	112	44	G	45	55	37	40	29	38	G	29	40
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	28	30	27	30	29	28	27	29	29	29	27	27	27	30	26	30	30	30	30	30	30
MED	35	31	28	13	31	40	58	72	70	71	80	66	86	64	68	64	60	58	60	55	46	45	40	39
U Q	59	40	39	38	44	54	71	105	93	108	101	93	112	94	96	75	86	89	81	80	81	61	69	61
L Q	13	G	G	G	G	36	43	55	56	60	62	51	63	49	44	45	40	39	39	35	34	36	29	31

HOURLY VALUES OF fmin AT Wakkanai

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

HOURLY VALUES OF foF2 AT Kokubunji

JUN. 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	A	A	A	A	A	A		86	A	A	A	111	A		A	N	154	54	146	A	A	A	A	A
2	39	39	A	36		44	56	A	149	89	49	A	A	73	A	146	154	154			A	A	A	A
3	A	A	A	A	A	A	91		A	A	A	51	A	A	A	A	A	73	A	63	66	51	50	A
4	A	34	A	A	A	42	A	56	A	61	A	71	A	72	104	A	109		A	A	66	51	49	37
5	A	35	A	A	A	A	44	A	A	A	A	A	A	A	A	57	A	A	A	A	65	63	52	52
6	47	42	37	36	35	41	49	A	A	A	A	62	A	A	A	A	A	51	88	40	49	47	A	44
7	42	38	37	34	32	41	A	A	72	57	A	A	A	89		57	A	64	A	54	A	51	A	A
8	A	A	A	A	35	39	A	78	121		A	A	112	142	89	143	A	A	A	54	A		A	50
9	A	A	A	A	A	39	54	A	A	136	153	154	144	145		135	N	A	146	129	139	A	A	A
10	A	A	A	A	A	45	51	A	55	A	A	A	A	A	A	A	A	A	54	55	54	47	45	44
11	41	A	39	37	36	44	39	A	A	A	112	A	149			86	89	A	128	A	53	52	A	47
12	44	44	36	36	34	36	72	81	110	134		A		A	82	A	A	A	A	A	55	A	A	A
13	A	A	A	A	A	39	A	A	A	A	A	A	A	A	A	A	72	106	A	A	A	51	A	A
14	41	42	A	40	34	32	A	A	87	A	74	A	A	52	A	A	A	A		53	107	A	A	A
15	A	A	A	27	26	41	A	A	111	A	A	A	A	143	111	A	A	A	64	A	A	A	A	A
16	A	A	35	A	A	36	39	A	A	A	N	A	A	A	A	A	A		49	59	52	54	A	A
17	A	34	A	A	A	32	A	A	A	A	A	A	A	A	A	A	62	45	50	56		49	49	42
18	A	A	A	30	32	A	A	A	A	A	A	A	A	A	136	A	119	101	117	A	67	45	36	A
19	A	32	32	31	32	31	A	A	56	119	52	A	A		A	A	47	51	55	50	49	42	A	A
20	32	36	34	31	31	34	A	38	A	61	49		A		A			49	54	63	54	50	51	48
21	44	42	42	38	34	32	42	48	54	138	54	A	A	A	A	52	79	A	55	58	58	63	54	54
22	A	50	A	46	36	38	49	58	A	51	A	107	130	A		A	A	110	51	50	32	A	34	36
23	34	36	34	A	A	35	A	A	69		A	A			A	A	A	143	A	A	A	43	42	34
24	A	A	32	34	28	36	A	88	A	86	58	N	A	A	A	A	A	48	45	52	63	28	A	A
25	A	28	31	31	31	36	A	47	50	51	A	A	132	53	A	99	A	A	49	58	51	55	A	38
26	A	A	A	A	32	37	A	A	N	114	A	A		79	A		109	A	A	A	49	23	32	42
27	42	34	36	32	31	38	38	48	A	58	54	A	A	A	A	A	A	A	A	54	54	54	49	49
28	42	37	A	A	32	34	A	52	60	57	A	69	A	A	A	A	137	A	A	A	A	49	A	A
29	A	A	31	34	30	A	51	53	A	A	A	A	51	126	124	53	49	47	51	64	78	46	N	N
30	A	A	A	27	26	A	36	A	86	A	A	A	79	138			79	87	43	51	54	50	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	16	13	17	19	24	14	12	13	14	9	7	7	11	6	9	13	15	17	18	21	22	12	14
MED	42	36	35	34	32	38	49	54	72	74	54	71	130	89	108	86	89	64	54	54	54	50	49	44
U Q	44	42	37	36	34	41	54	79	110	119	93	111	144	142	124	139	128	106	102	59	66	52	50	49
L Q	39	34	32	31	31	34	39	48	55	57	50	62	79	72	89	55	67	49	49	52	51	46	39	38

HOURLY VALUES OF fEs AT Kokubunji

JUN. 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	70	58	47	81	60	72		92	61	83	91	100	69		127	148	160	159	159	151	112	60	116	82
2	31	40	38	31		31	63	72	118	84	49	53	59	76	87	122	155	146			148	79	110	148
3	128	87	48	49	49	60	72		110	56	44	46	40	47	42	42	48	67	95	45	84	45	41	48
4	67	34	40	63	38	31	53	49	58	57	65	71	82	70	105	95	81		157	92	40	47	35	55
5	46	24	38	31	27	29	44	57	63	66	71	75	43	55	42	54	114	145	136	71	52	46	41	29
6	29	23	G	25	28	25	42	65	50	50	62	56	84	73	82	116	79	44	84	42	34	42	42	34
7	34	28	26	27	G	32	42	53	69	57	67	55	78	62		42	75	42	78	50	91	40	69	82
8	83	127	57	43	G	34	53	74	109		92	94	111	73	93	84	56	47	53	49	146		71	40
9	70	46	71	82	37	31	39	44	62	94	129	103	125	131		111	70	110	159	159	135	160	136	161
10	104	60	72	80	57	G	40	54	50	81	66	79	77	71	62	55	79	57	63	53	32	37	34	27
11	32	41	29	29	26	29	37	53	82	91	107	159	151			79	92	143	125	143	143	50	70	47
12	37	43	40	34	G	34	62	74	95	159		70		127	138	107	80	104	99	60	45	82	60	71
13	60	116	73	58	82	80	63	117	78	107	64	52	52	55	127	69	65	95	92	93	106	41	72	65
14	40	38	40	27	11	33	59	80	87	73	70	84	74	40	56	142	156	145		132	145	106	70	82
15	49	49	73	32	39	35	42	52	73	55	100	141	158	108	84	56	85	86	62	62	109	59	60	82
16	152	130	106	70	50	26	38	41	48	52	72	65	47	55	52	45	63	G	46	38	55	43	106	79
17	45	40	49	60	40	39	123	44	64	95	84	53	56	63	79	74	64	45	39	44		106	39	49
18	35	55	33	G	37	151	43	43	55	63	80	106	95	149	147	134	130	79	57	149	50	46	58	39
19	41	38	G	G	G	31	42	59	52	84	52	53	46		40	40	G	42	34	G	39	53	48	53
20	59	G	34	G	24	27	41	43	73	40	G		42		55	G		G	32	29	28	G	29	29
21	34	32	32	28	G	28	37	62	G	68	54	53	41	60	41	42	57	62	33	40	84	55	80	57
22	73	47	70	48	34	32	40	52	47	52	41	83	52	50	G	51	60	107	42	59	41	40	35	35
23	30	G	23	38	59	27	58	55	71		62	112			57	55	63	104	106	70	50	G	G	58
24	59	67	37	G	G	29	41	90	92	55	71	74	56	41	60	50	53	39	36	40	33	34	53	47
25	49	33	29	28	33	32	117	49	147	53	90	79	117	82	70	95	139	110	85	47	43	G	141	36
26	41	45	42	36	33	30	59	107	83	92	128	103		52	52	G	83	85	95	60	G	29	G	G
27	27	28	29	27	G	24	G	G	38	G	41	55	43	63	56	70	54	57	60	45	87	69	46	30
28	38	27	41	32	G	30	36	40	47	60	57	63	82	84	42	81	148	151	106	111	91	31	73	104
29	92	106	29	30	29	41	40	51	71	106	117	65	42	112	76	59	49	38	33	29	32	52	G	G
30	55	72	40	G	69	51	35	50	92	41	50	67	84	142			59	80	57	40	53	57	43	31
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	29	30	29	29	30	28	29	29	27	25	26	29	29	29	28	29	29	29	30	30
MED	48	42	40	32	33	31	42	53	70	64	67	71	69	70	61	69	75	80	70	53	53	46	56	48
U Q	70	60	49	49	44	35	59	73	87	87	90	97	84	96	87	101	103	110	102	92	107	59	72	79
L Q	35	32	29	27	G	29	39	46	52	54	53	55	46	55	52	47	58	44	44	41	39	38	39	34

HOURLY VALUES OF fmin AT Kokubunji

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

HOURLY VALUES OF foF2 AT Yamagawa

JUN. 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	A	A	A	A	A	A	49	128	158	A	A	202	A		122	A		A	A	75	72	A	A	A
2	A	A	A	A	28	32	40	53	149	A	A	A	A	50	57	A	A	174	211	A	A	A	A	A
3	A	A	A	A	A	A	A	A	109	A	140	165	A	A	A	A	A	A	A	34	54	66	A	34
4	A	A	A	A	A	34	50	51	A	A	A	A	A	A	A	60	63	50	A	70	A	A	A	A
5	A	A	A	A	A	26	51	A	66	A	89	89	A	A	82	A	108	A	A	A	A	A	42	A
6	A	A	A	34	34	35	A	54	A	A	62	A	A	58	A	A	A	A	A	A	54	44	A	A
7	A	36	34	A	29	31	29	A	A	B	A	A	A	61	71	78	87	B	A	52	A	A	38	A
8	A	A	A	A	A	30	A	A	A	A	N	A	A	54	52	44	A		205	108	54	A	49	A
9	A	A	A	39	A	25	50	A	A	A	A	71	A	A	A	A	70	60	189	A	A	A	A	52
10	A	A	A	A	A	40	43	A	A	A	87	A	A	A	77	A	59	A	66	71	48	51	A	44
11	42	42	A	34	A	A	A	51	A	A	189	105	100	A	A	A	111	A	A	63	53	54	54	52
12	A	A	A	B	99	28	A	A	A	A	A	A	138	100	A	A	A	A	70	67	65	54	51	A
13	A	A	A	A	A	37	39	51	A	88	A	A	A	A	B	67		A	A	A	A	A	48	50
14	A	A	A	A	A	29	A	A	103	73	A	A	106	A	A	A	A	A	A	A	58	45	A	A
15	A	A	A	34	A	A	38	A	A	A	106	A	189	122	A	A	50	103	140	A	52	A	A	A
16	A	A	A	A	A	32	40	A	A	A	A	A	A	86	A	79	A	99	A	50	72	52	A	35
17	A	A	A	A	A	A	A	44	86	A	80	A	A	A	A	54	55	66	49	A	A	54	A	34
18	A	A	A	A	25	A	A	A	54	A	A	A	80	111	A	179	A	109	106	A	A	A	A	32
19	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	51	51	64	50	50	47	44	39
20	A	42	32	29	25	A	A	44	54	A	A	A	A	A	A	A	34	51	51	65	54	54	51	A
21	A	39	40	37	35	32	38	A	A	A	109	A	A	B	A	A	A	186	192	A	64	A	A	42
22	46	39	44	A	34	31	A	48	88	A	110	A	149	A	A	A	A	61	A	67	B	54	54	47
23	39	A	A	28	A	A	A	A	A	76	87	110	A	A	109	A	54	56	54	54	A	52	41	A
24	A	36	34	32	26	29	37	47	47	51	A	A	51	A	A	51	A	50	44	54	54	52	29	36
25	32	32	A	A	A	28	A	189	67	51	A	A	A	A	A	A	A	62	109	48	52	54	A	A
26	A	A	A	A	A	34	39	A	A	50	A	62	A	A	79	102	179	C	C	A	A	50	42	44
27	42	42	40	A	36	32	34	48	54	54	C	C	59	A	C	A	C	A	B	50	84	54	A	A
28	48	A	38	32	31	28	A	48	54	A	A	A	111	N	101	169	66	65	48	A	51	51	43	50
29	40	A	A	31	29	31	46	38	A	A	A	A	A	A	58	106	A	A	64	84	85	36	31	A
30	A	A	A	A	A	A	38	47	A	56	A	A	61	60	54	A	109	54	57	79	69	A	A	26
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	8	7	10	12	20	16	15	13	8	10	7	10	9	11	11	14	16	17	18	19	18	14	15
MED	42	39	38	33	30	31	40	48	67	55	98	105	103	61	77	78	64	62	66	64	54	52	44	42
U Q	46	42	40	34	34	33	47	53	106	74	110	165	138	105	101	106	108	101	164	71	69	54	51	50
L Q	39	36	34	31	27	28	38	47	54	51	87	71	61	56	57	54	54	52	52	50	52	50	41	34

HOURLY VALUES OF fEs AT Yamagawa

JUN. 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	57	48	56	45	59	92	43	107	146	148	140	166	91		100	144		122	167	60	60	108	113	84
2	92	60	110	84	28	G	39	54	111	104	78	54	52	49	51	84	66	116	113	94	152	144	115	83
3	60	92	55	49	110	56	46	57	143	172	103	116	151	102	78	80	56	69	59	50	58	45	77	82
4	60	58	116	71	50	30	48	47	59	70	111	74	61	78	78	48	44	79	111	60	110	116	72	152
5	70	72	69	43	50	26	36	58	71	64	81	92	93	175	125	174	94	110	70	116	110	59	57	56
6	58	59	59	34	32	38	65	84	87	92	111	62	83	57	115	136	144	115	152	79	46	40	70	55
7	69	G	26	27	G	26	36	48	124	B	114	115	111	53	46	56	74	B	105	90	82	41	35	55
8	91	89	57	56	41	G	40	70	60	83	148	116	89	50	46	50	104		128	57	53	169	69	70
9	115	106	69	91	87	G	32	53	61	91	84	69	71	80	94	94	45	48	58	66	90	58	163	58
10	92	106	113	51	45	24	51	78	82	96	67	62	57	91	112	76	50	72	56	40	52	31	45	40
11	30	36	40	35	46	38	59	54	70	149	174	91	86	89	97	86	79	76	62	41	53	49	G	46
12	91	70	79	B	G	G	56	148	126	70	74	61	83	87	115	70	139	67	60	50	38	88	56	56
13	50	58	81	87	70	27	44	58	115	82	127	126	101	84	B	61		142	109	117	40	91	45	48
14	50	91	89	56	54	G	51	65	70	79	81	92	77	115	71	71	57	58	92	60	31	39	84	47
15	55	60	43	48	40	70	35	49	70	77	78	145	110	92	95	72	51	72	149	61	105	50	103	54
16	69	82	58	59	36	G	32	50	60	60	64	62	57	147	78	86	61	79	86	108	48	40	45	71
17	60	84	115	72	69	49	41	56	78	76	102	63	128	69	64	46	41	40	32	56	108	59	116	45
18	126	59	82	58	91	64	59	58	57	78	91	107	91	127	138	147	52	74	88	145	127	180	90	45
19	40	41	54	54	36	30	39	69	112	108	79	80	58	56	50	45	48	53	45	29	39	40	37	34
20	59	35	27	48	G	44	38	43	53	83	88	58	46	49	46	46	39	44	32	28	G	40	46	46
21	70	30	33	38	34	28	31	105	59	87	105	68	51	B	58	64	87	129	144	73	50	81	70	42
22	56	41	56	58	29	G	53	47	79	111	134	142	146	128	63	74	62	41	82	30	B	33	84	35
23	46	41	45	34	51	48	55	61	63	84	88	113	68	88	71	84	G	48	45	113	106	54	31	55
24	79	39	G	45	35	G	49	45	48	44	48	53	47	67	127	54	50	46	39	36	28	29	26	26
25	39	32	35	41	39	26	57	86	48	50	112	79	58	72	65	70	69	58	81	52	71	46	57	40
26	73	103	73	94	72	33	34	70	85	44	49	48	75	79	110	60	148	C	C	78	69	49	34	G
27	38	26	26	82	23	29	31	45	44	44	C	C	47	46	C	52	C	57	B	52	79	59	59	60
28	41	56	G	43	32	27	34	43	60	117	172	122	127	125	88	91	70	51	69	57	24	G	57	41
29	40	50	53	35	33	32	35	40	55	90	54	49	61	56	49	82	126	60	53	44	46	31	26	33
30	50	55	46	48	40	38	35	40	84	60	75	49	57	55	44	45	176	58	53	92	87	38	48	29
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	30	29	29	29	30	28	28	30	27	27	28	30	29	30	30	30
MED	60	58	56	49	40	28	40	56	70	83	88	79	76	80	78	72	62	67	76	60	58	49	57	48
U Q	73	82	79	65	54	38	51	70	87	100	113	115	93	97	105	86	94	79	110	90	97	81	84	58
L Q	50	41	40	42	32	G	35	47	59	67	76	61	57	56	54	54	50	51	54	50	43	40	45	40

HOURLY VALUES OF fmin AT Yamagawa

JUN. 2019

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

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

HOURLY VALUES OF foF2 AT Okinawa

JUN. 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	41	40	A	A	A	30	44	50	A	A	105	N	61	A	57	A	A	70	80	80	72	47	A	A
2	A	A	A	26	28	N	40	A	89	A	205	A	A		A	64	64	51	57	37	78	50	A	A
3	A	A	A	A	A	A	41	51	60	A	A	A	A	A	A	A	A	A	63	63	63	58	53	A
4	A	A	A	26	28	28	30	47	108	A	A	A	A	75	80	77	80	85	80	81	79	52	A	A
5	A	A	A	A	32	N	53	54	53	A	A	A		A	A	A	A	69	62	65	54	54	A	A
6	A	A	49	34	31	59	A	A	A	A	A	A	A	A	A	A	A	A	A	55	63	A	A	A
7	A	A	A	A	A	A	42	A	51	A	108	A	A	62	75	91	74	189	77	A	A	A	A	A
8	38	A	A	A	A	N	39	50	A	109	A	A	125	A	A	79	68	66	67	66	A	A	A	51
9	149	42	A	A	A	A	40	51	A	A	A	104	A	A	A	122	78	74	60	52	66	63	52	A
10	A	A	A	A	A	A	A	A	109	A	A	51	A	A	A	A	A	71	72	75	71	52	46	A
11	40	40	40	32	A	28	A	A	A	A	A	N	A	169	A	205	A	120	110	A	48	A	54	52
12	A	52	53	A	A	A	A	109	A	A	A	A	A	A	A	A	A	A	86	78	A	54	60	48
13	48	A	A	A	A	A	A	A	A	A	A		A	75	85	84	81	80	A	57	A	42	A	A
14	A	A	38	A	A	A	38	A	A	106	106	A	A	A	A	A	A	72	84	86	63	52	30	A
15	A	43	38	A	59	B	37	48	53	64	A	A	A	A	A	A	A	A	A	101	54	A	A	A
16	A	A	A	A	A	26	39	44	A	A	A	198	A	A	A	A	A	60	72	A	A	A	A	A
17	A	A	A	28	A	A	26	40	A	A	A	A	A	A	A	A		A	A	A	A	59	35	A
18	A	A	A	A	A	A	A	54	123	A	145	A	A	A	A	A	A	A	81	75	51	A	54	A
19	A	A	A	30	A	A	36	46	A	A	A	A	A	A	A	A	A	A	A	A		A	39	39
20	34	A	34	A	A	A	A	51	A	A	A	A	A	A	44	42	A	54	58	A	A	A	A	A
21	A	A	A	A	A	A	A	52	A	A	A	A	A	A	A	50	55	A	A	72	61	54	A	A
22	37	A	A	34	32	30	A	A	53	A	139	A	A	A	A	49	54	70	75	81	54	54	51	45
23	44	41	42	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	72	75	72	A	A	37
24	35	35	34	36	A	A	A	47	54	A	A	56	A	A	54	A	A	146	A	56	64	54	47	39
25	A	34	32	30	28	A	A	A	A	A	A	A	A	A	A	A	A	A	N	A	A	A	A	A
26	A	A	A	A	A	26	A	44	A	A	67	A	A	A	119	A	149	A	A	A	A	50	A	A
27	42	42	38	34	29	31	37	A	A	59	53	A	50	A	42	A	57	52	57	A	A	A	50	50
28	A	41	A	A	A	A	37	40	48	A	A	A	109	A		57	72	70	61	64	54	54	48	37
29	A	34	A	59	29	A	30	38	A	A	A	A	A	A	A	68	A	A	85	105	50	A	30	A
30	A	A	A	A	A	A	38	A	A	A	N	53	70	69	51	49	54	51	51	63	A	A	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	11	10	11	9	8	17	18	11	4	8	5	5	5	9	13	12	18	21	21	18	16	14	9
MED	40	41	38	32	29	29	38	49	54	85	107	56	70	75	57	68	70	70	72	72	63	54	49	45
U Q	44	42	42	34	32	30	40	51	108	107	142	151	117	122	82	87	79	80	80	80	71	54	53	50
L Q	37	35	34	28	28	27	36	44	53	61	86	52	55	65	47	49	56	60	60	60	54	51	39	38

HOURLY VALUES OF fEs AT Okinawa

JUN. 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	27	38	54	54	150	29	40	37	126	126	91	162	57	146	96	122	74	34	39	27	42	40	105	90
2	59	59	27	26	G	37	128	69	91	124	154	144	114		144	77	G	46	38	44	41	53	58	60
3	55	40	70	60	65	91	44	43	54	63	152	167	114	107	65	76	60	69	45	38	39	29	77	71
4	54	73	78	67	G	24	54	94	127	116	122	126	142	64	56	53	64	39	59	53	41	56	93	71
5	59	56	50	24	G	G	27	154	46	48	64	160		156	169	111	110	115	144	52	58	46	60	115
6	59	113	44	28	28	58	59	114	112	150	115	104	116	64	93	115	134	128	69	45	45	86	78	90
7	145	136	94	86	90	64	40	160	59	109	130	104	113	48	77	68	81	63	67	43	60	113	134	94
8	90	56	56	43	60	G	59	59	94	89	78	136	116	152	144	116	53	36	56	44	58	114	59	94
9	161	125	92	116	86	64	28	138	48	103	86	104	67	74	93	112	63	58	40	48	35	30	57	112
10	70	60	92	60	48	31	50	116	94	127	56	52	65	53	67	91	75	57	48	58	50	44	34	54
11	36	G	25	55	53	29	50	94	60	92	93	127	158	122	98	152	98	125	67	80	56	70	40	40
12	71	28	115	130	60	102	77	83	130	96	144	144	66	52	65	146	147	78	84	77	92	60	46	26
13	25	58	58	60	73	59	58	73	115	128	122		158	62	76	59	41	50	92	46	60	39	60	59
14	59	112	90	64	59	36	35	56	71	88	170	126	143	91	78	110	78	66	48	55	71	26	35	58
15	71	28	26	28	26	B	34	49	51	65	73	72	56	52	67	70	67	87	90	130	48	59	91	103
16	94	59	73	84	59	43	36	39	84	85	138	106	107	78	61	60	56	43	55	80	82	82	89	60
17	59	45	59	G	28	44	33	44	59	93	116	88	76	58	60	93		146	129	158	155	32	27	55
18	115	105	135	117	59	56	59	57	131	115	106	150	163	55	56	71	91	89	60	32	46	162	91	59
19	65	59	58	39	35	44	34	53	95	153	110	111	87	127	101	65	76	94	134	133		67	33	29
20	G	59	G	39	57	72	38	48	60	59	57	90	66	76	47	45	42	48	67	146	162	74	93	93
21	70	46	43	48	46	56	53	48	82	118	133	108	86	67	56	44	57	61	69	63	46	29	57	57
22	36	69	61	36	26	26	95	112	60	94	135	150	130	56	66	46	43	G	73	60	87	38	28	33
23	G	G	32	54	58	73	50	61	78	72	77	78	81	110	117	70	132	93	46	53	28	60	86	148
24	G	G	37	38	47	25	60	146	43	60	51	51	98	54	52	71	97	115	60	34	38	G	32	34
25	67	35	36	43	G	38	40	58	115	133	128	131	78	64	63	107	96	170	95	91	115	92	53	94
26	93	110	67	60	45	26	40	44	61	62	52	90	60	93	85	92	142	63	108	165	111	57	80	49
27	34	27	26	29	36	34	29	46	59	109	45	85	50	45	45	50	50	60	57	69	115	71	39	56
28	60	35	66	60	67	60	169	89	56	94	166	157	129	79		49	64	46	38	G	G	57	32	30
29	49	28	60	24	G	32	32	40	46	59	86	110	96	59	180	50	86	95	142	57	57	35	G	23
30	25	32	89	73	46	50	35	69	58	67	84	49	51	54	44	45	47	40	46	32	70	35	39	38
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	30	30	29	29	29	29	30	29	30	30	30	29	30	30	30
MED	59	56	58	54	48	43	42	60	66	94	108	110	96	64	67	71	74	63	64	54	57	56	58	59
U Q	71	69	78	64	60	59	59	94	95	118	133	144	122	100	97	110	96	94	90	80	84	71	86	93
L Q	36	32	37	36	28	29	35	48	58	67	77	89	66	54	58	53	54	46	48	44	41	35	35	40

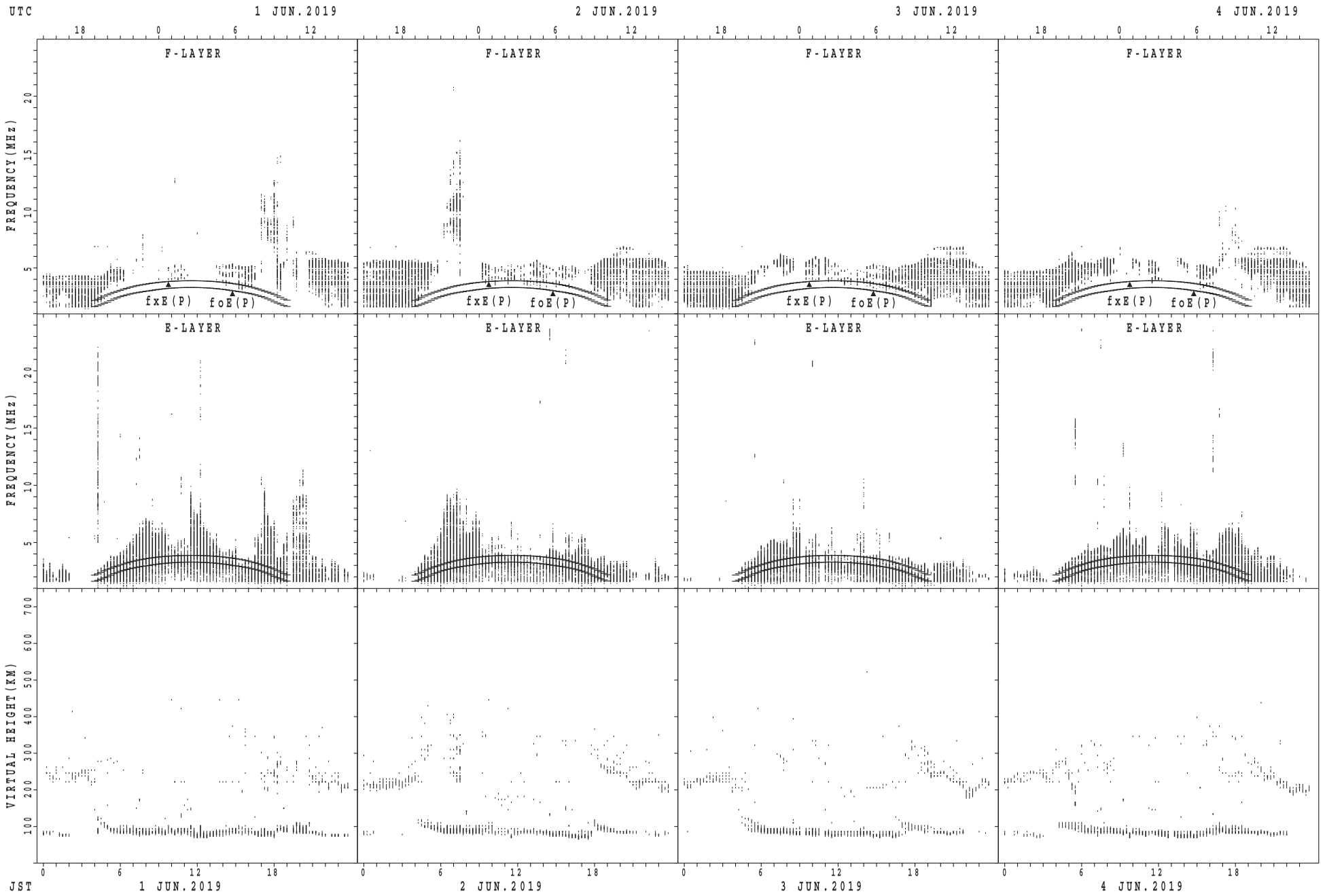
HOURLY VALUES OF fmin AT Okinawa

JUN. 2019

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

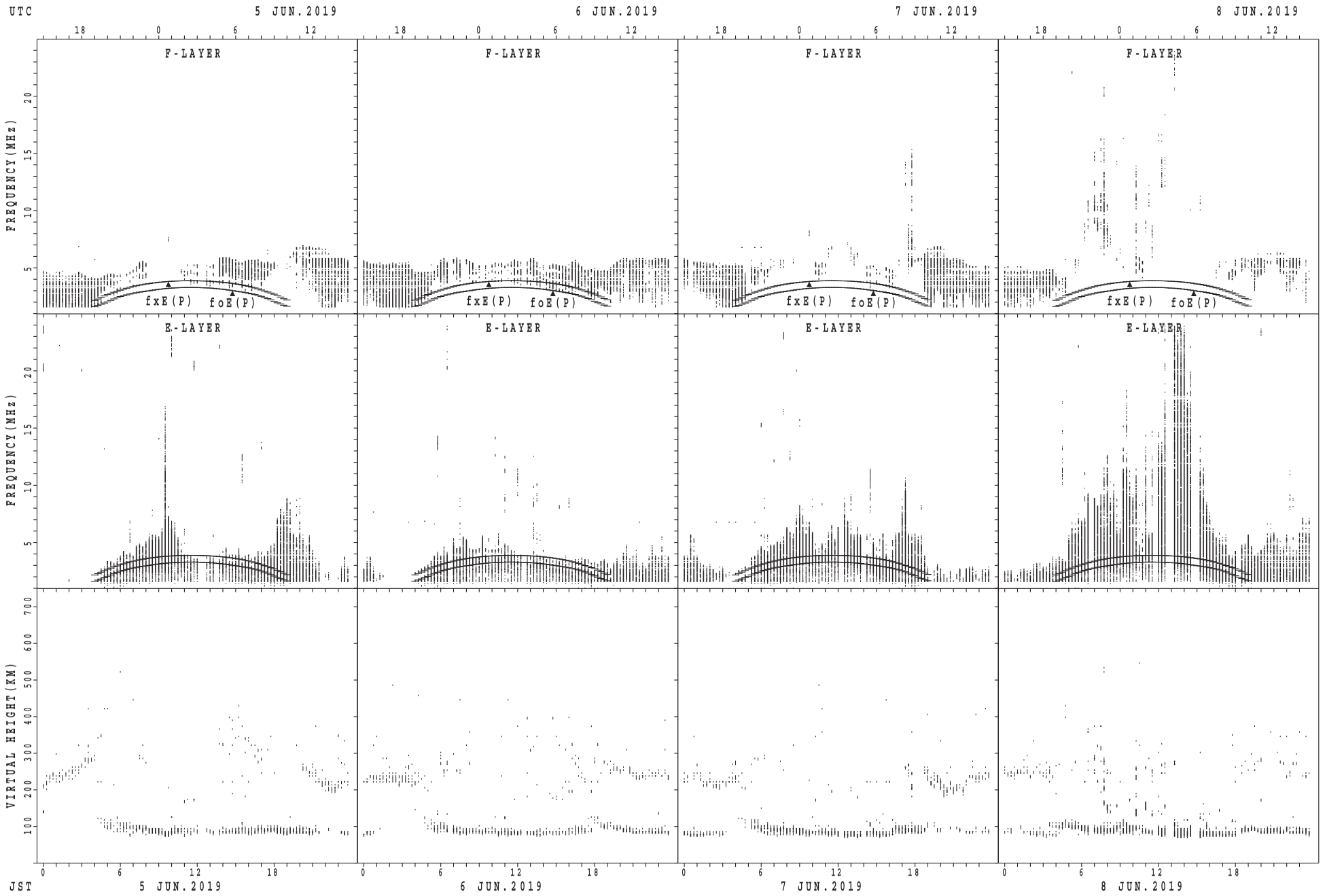
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	14	14	14	14	15	20	21	21	18	21	18	16	14	14	14	14	14	14	14
2	14	14	15	14	14	15	14	14	15	16	20	21	18		18	18	16	14	14	14	14	15	14	14
3	14	15	15	16	15	14	14	14	14	17	18	26	21	22	20	20	17	14	14	14	14	15	14	14
4	14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

SUMMARY PLOTS AT Wakkanai



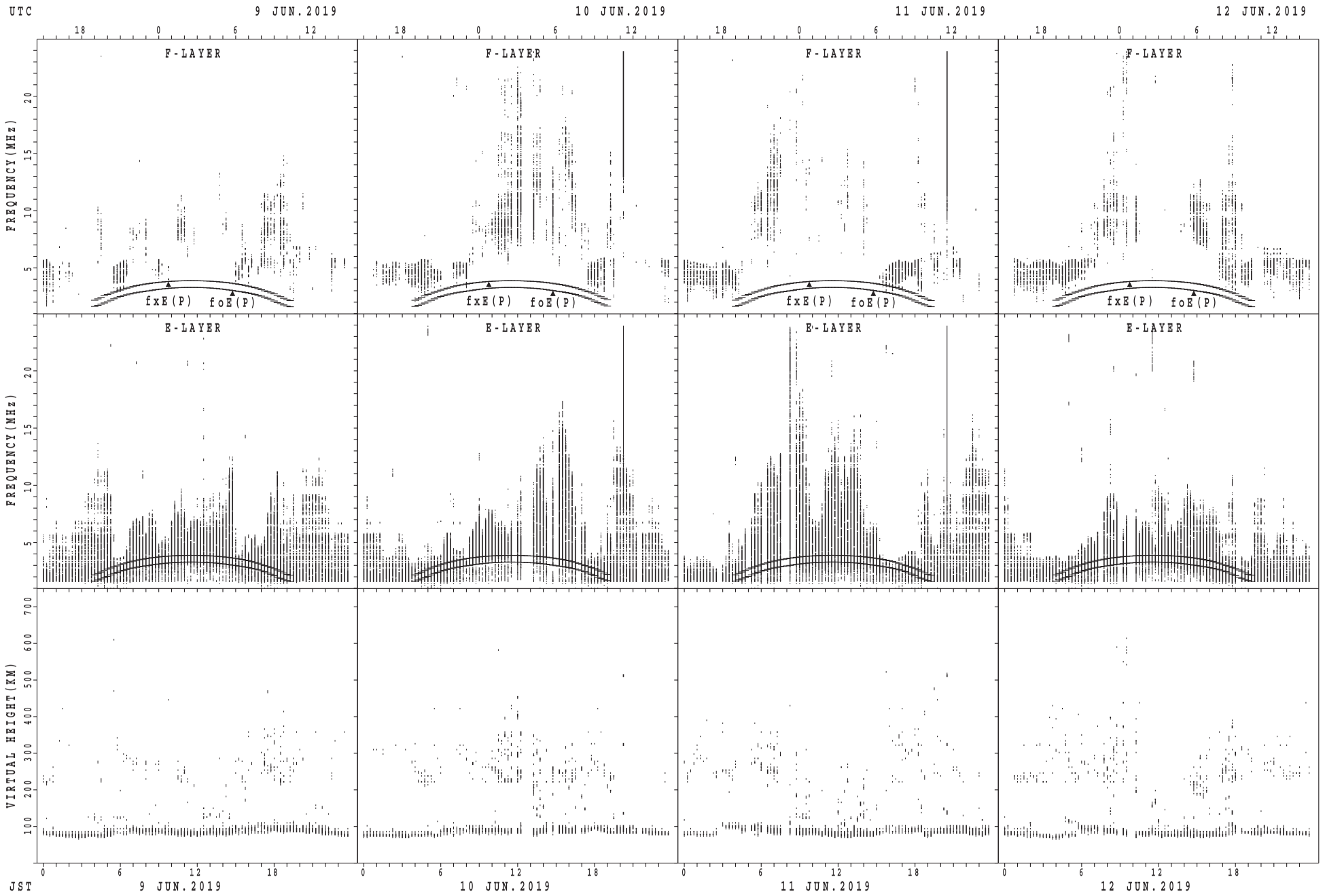
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



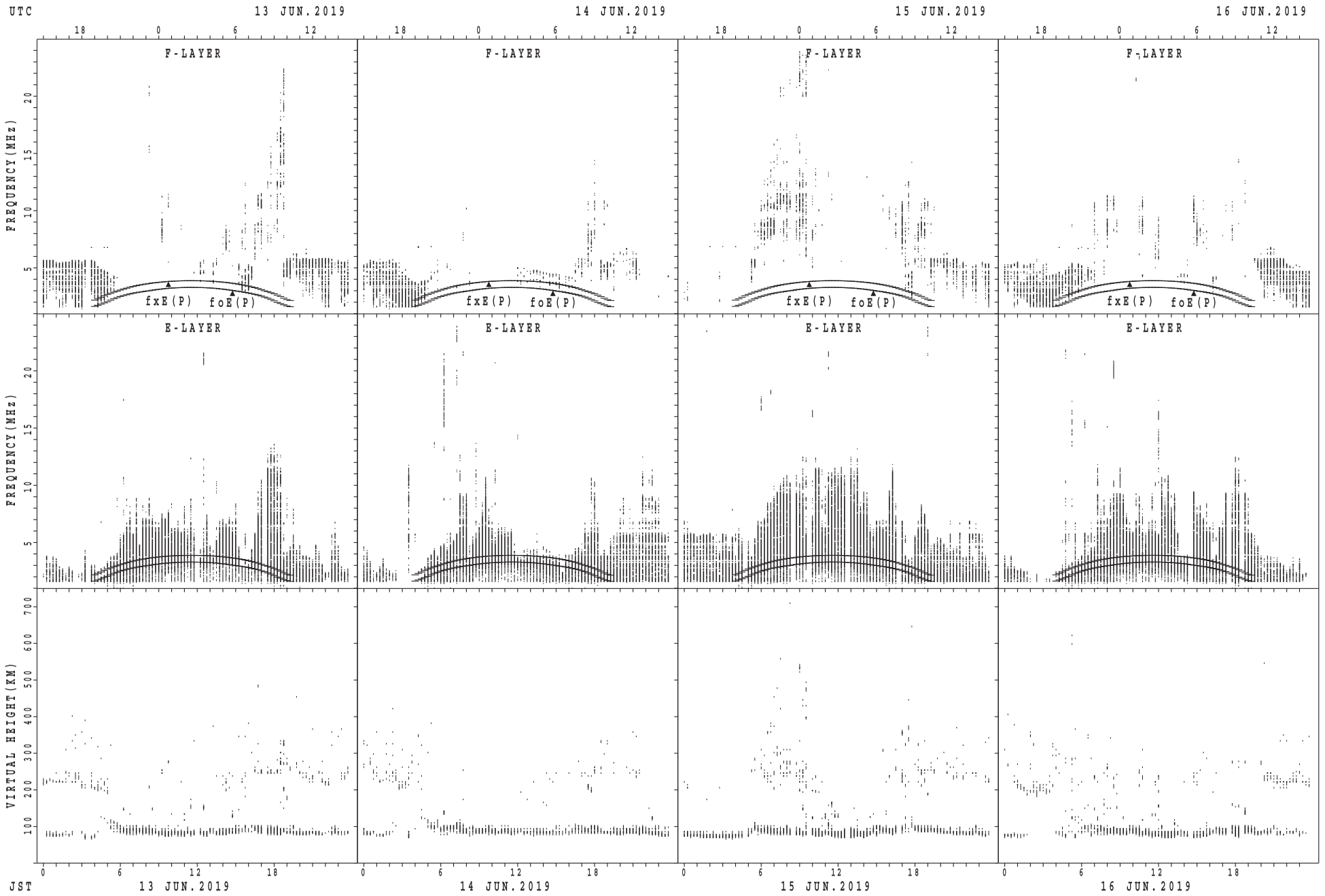
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



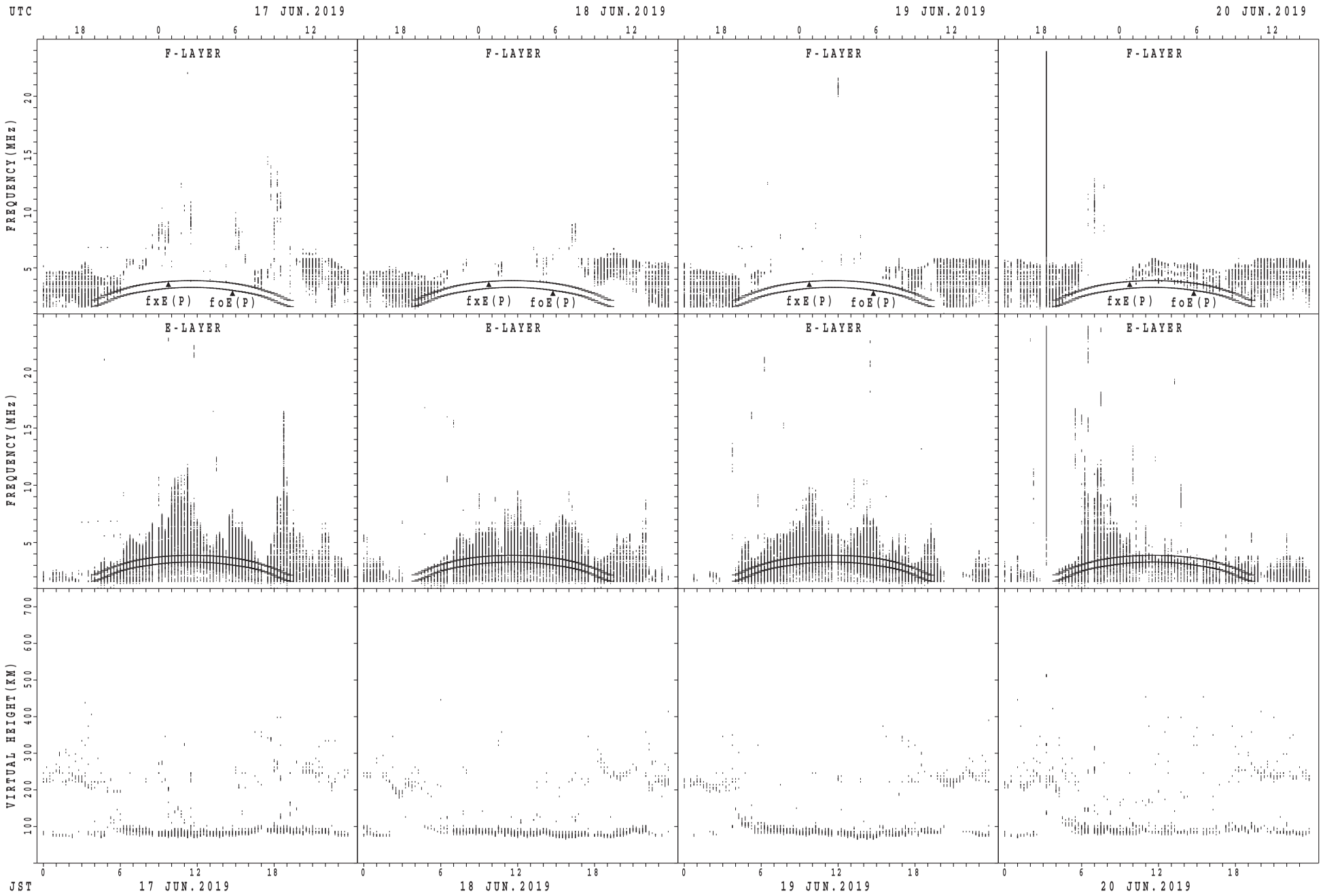
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



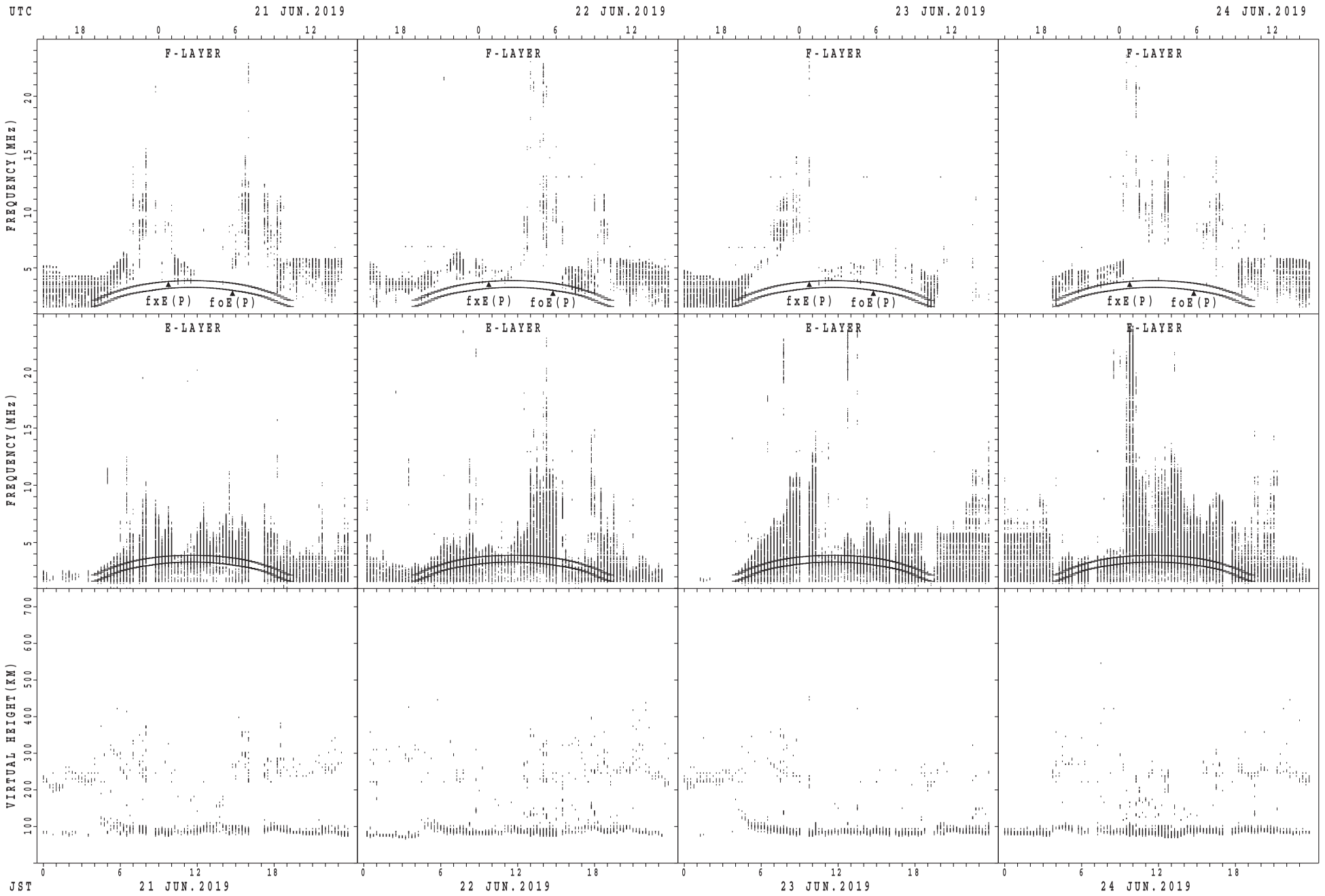
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



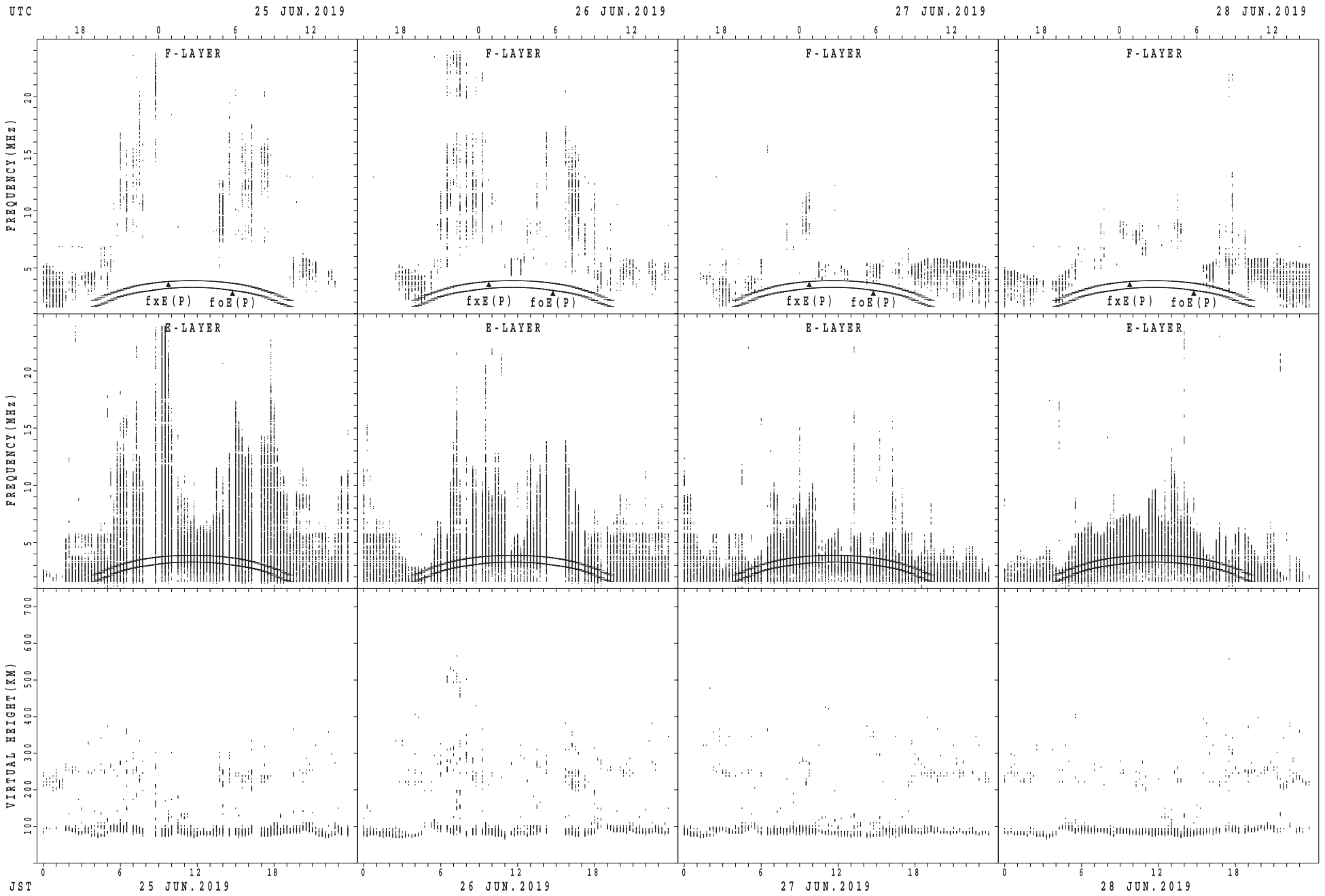
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



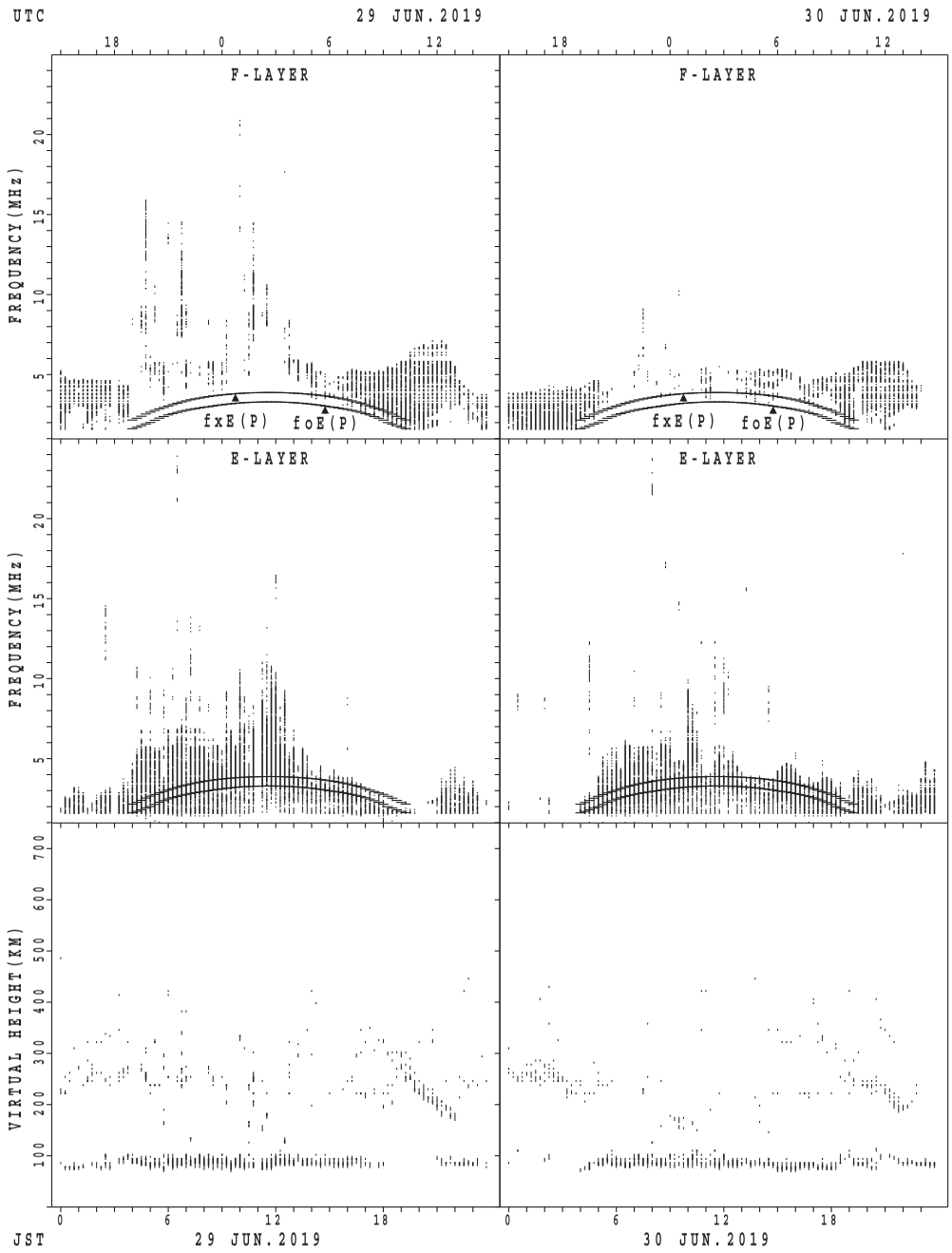
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



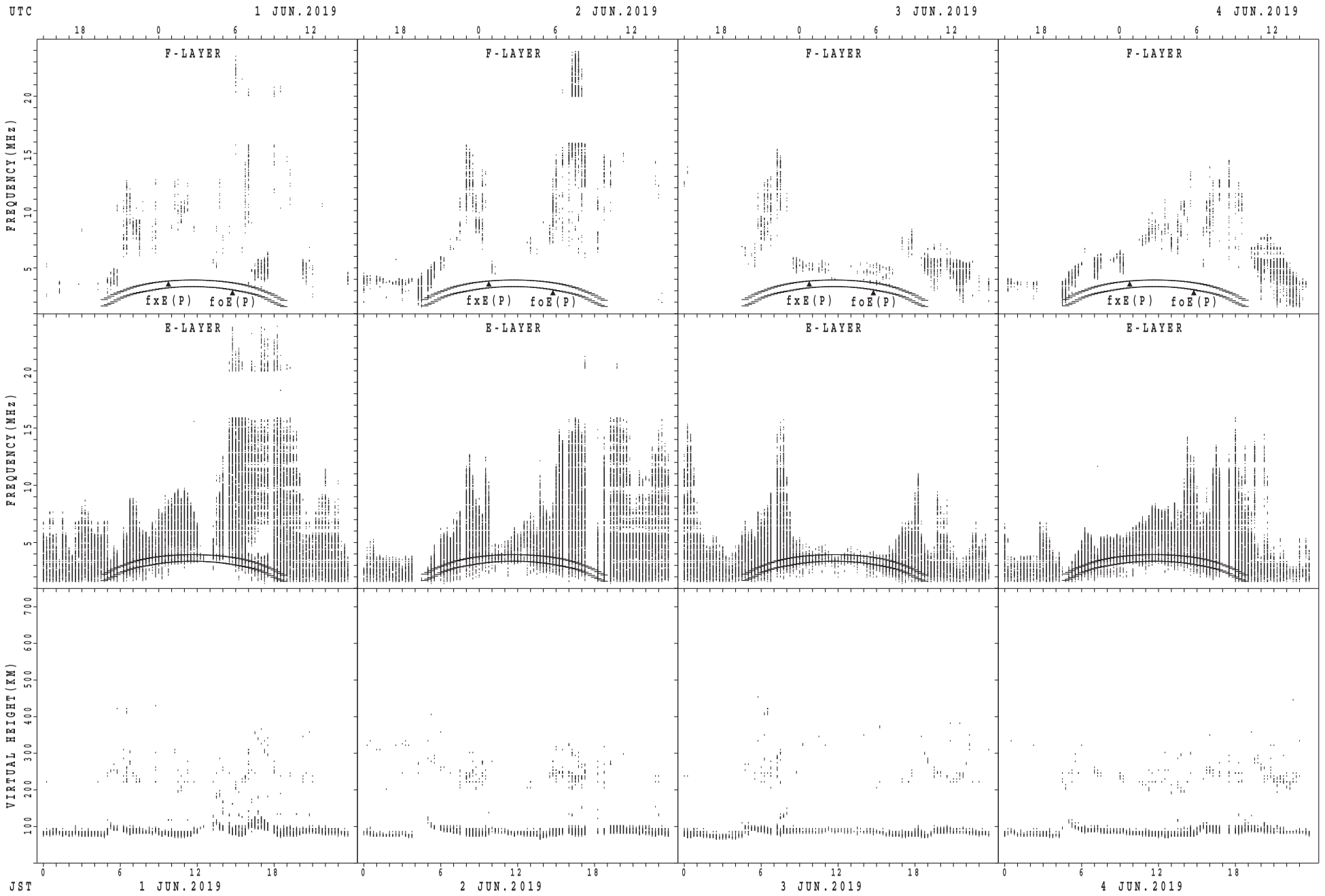
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



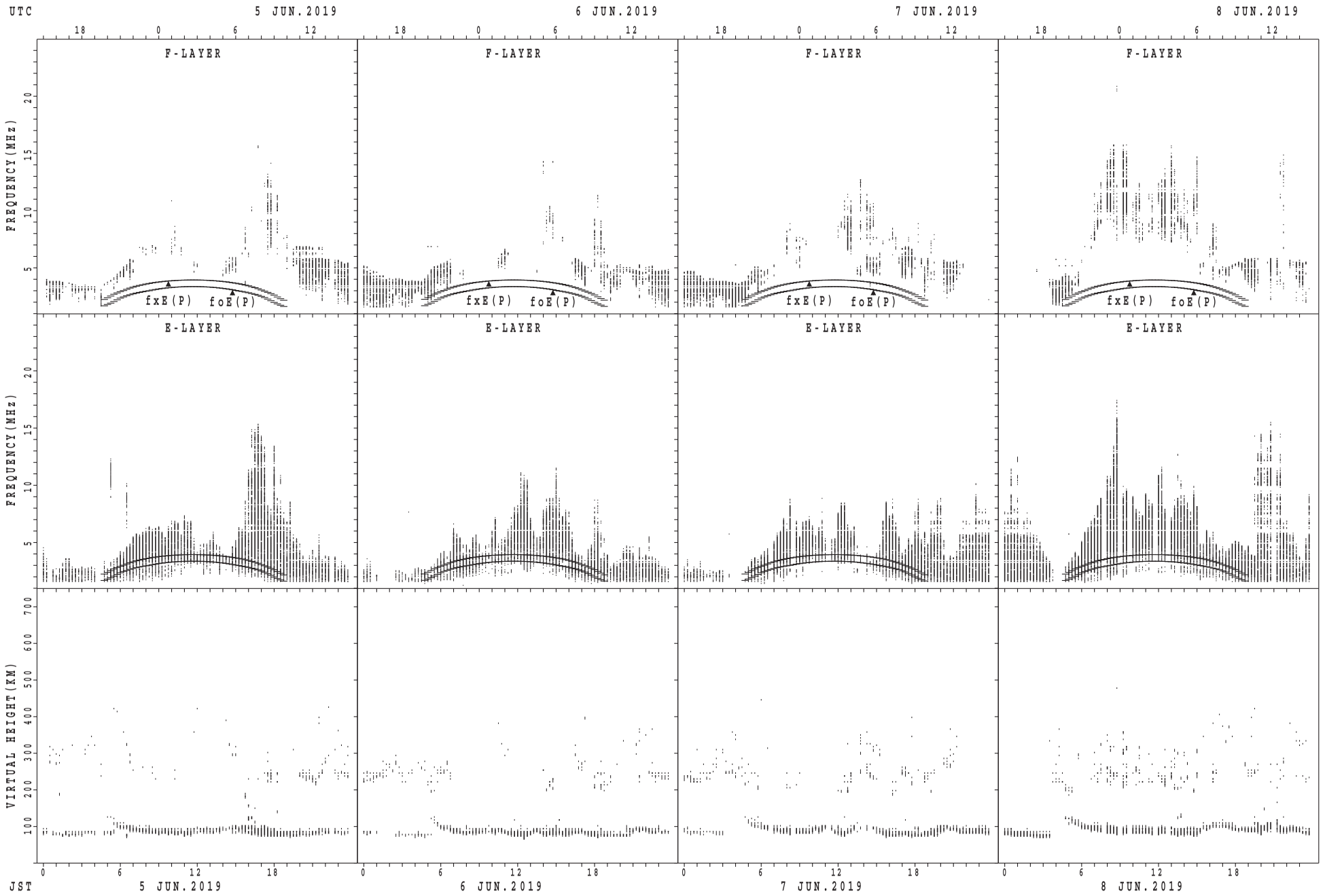
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



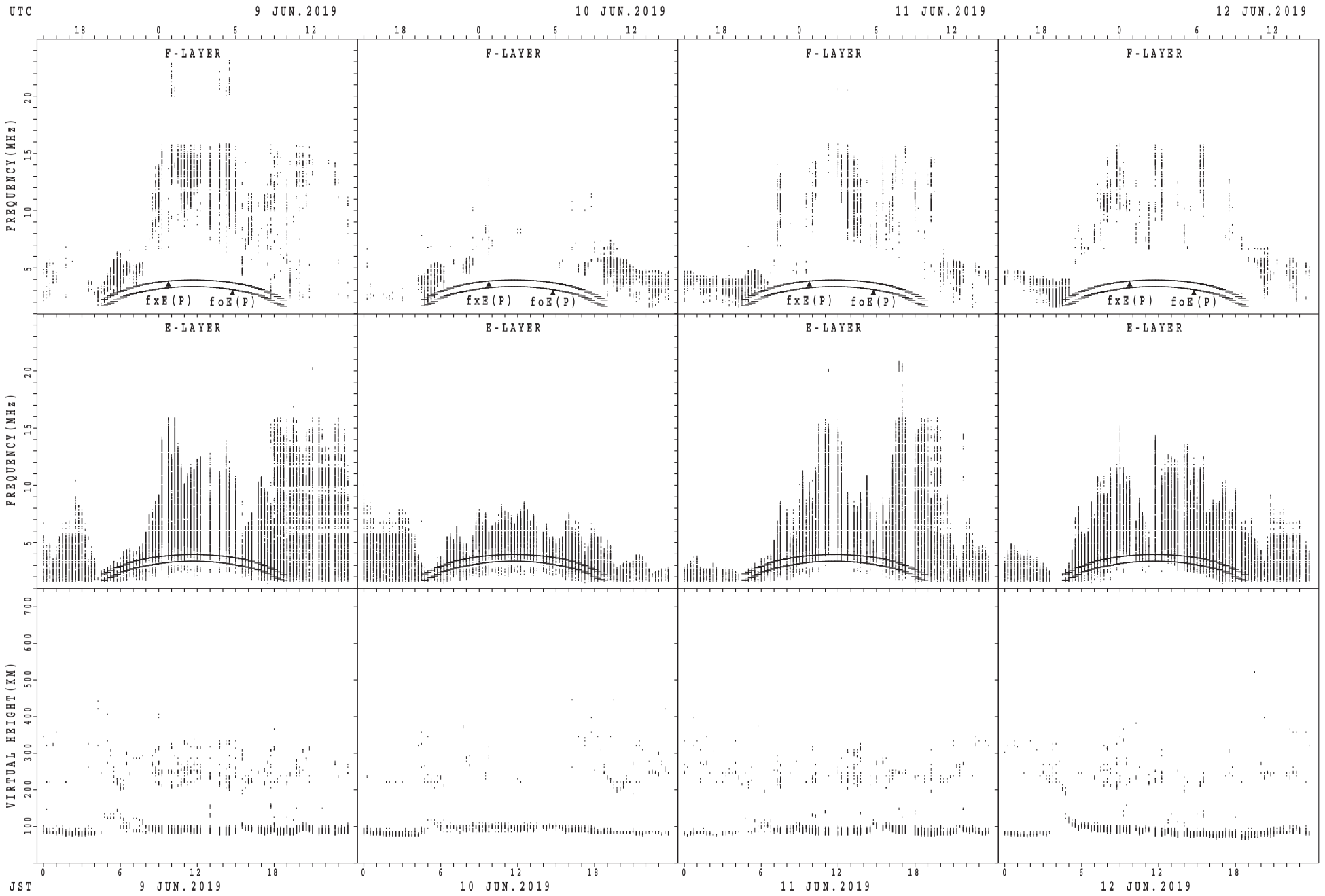
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



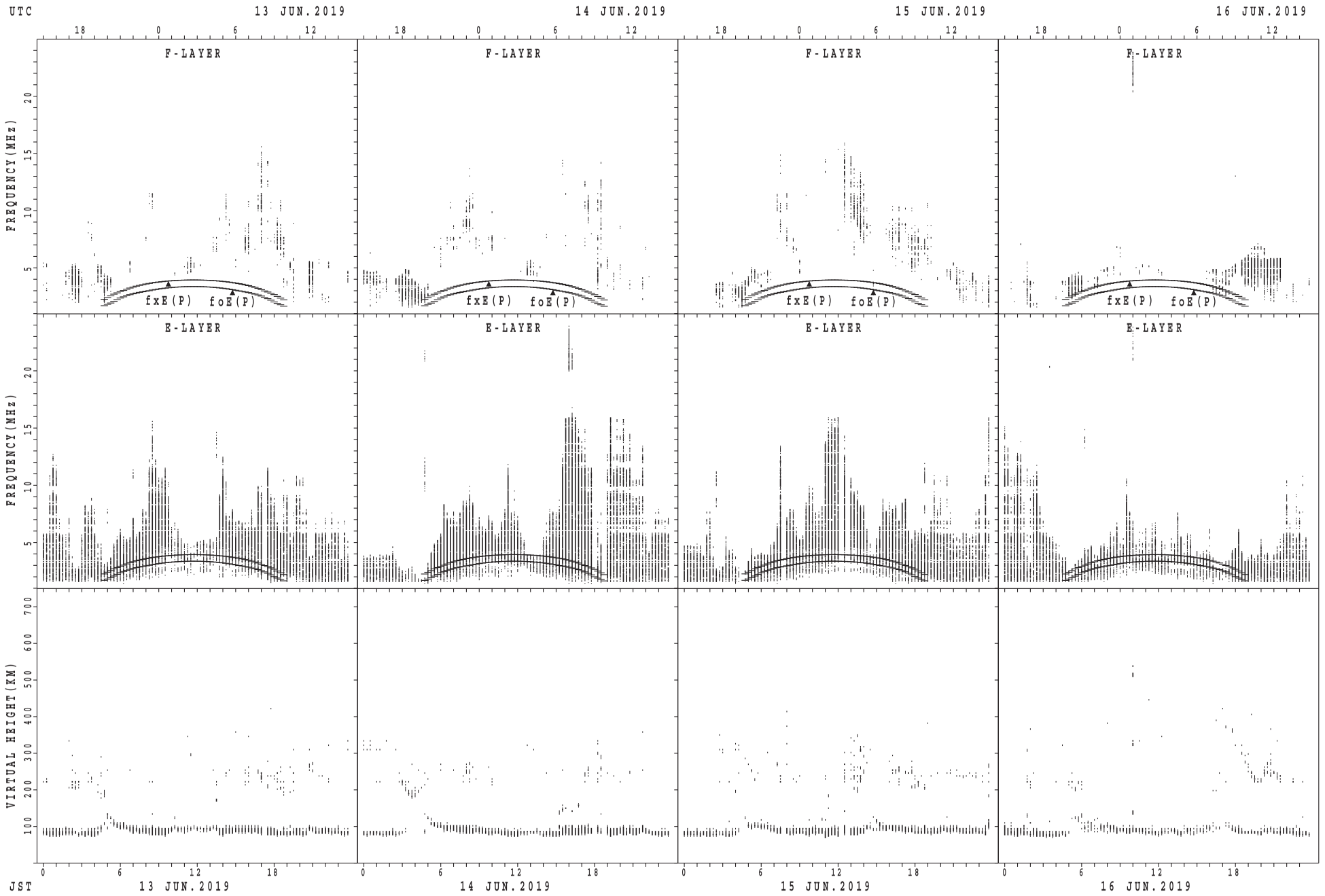
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



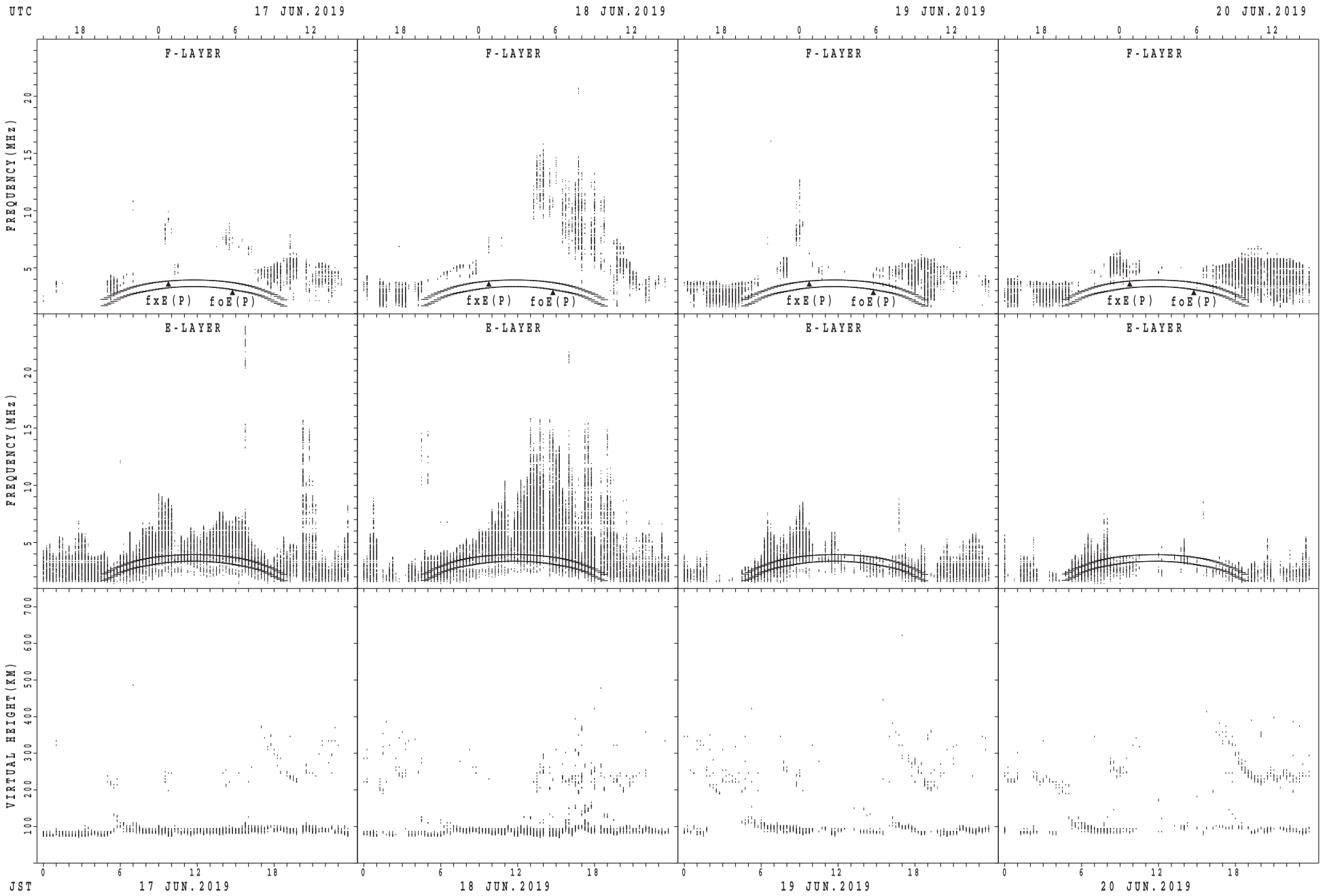
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



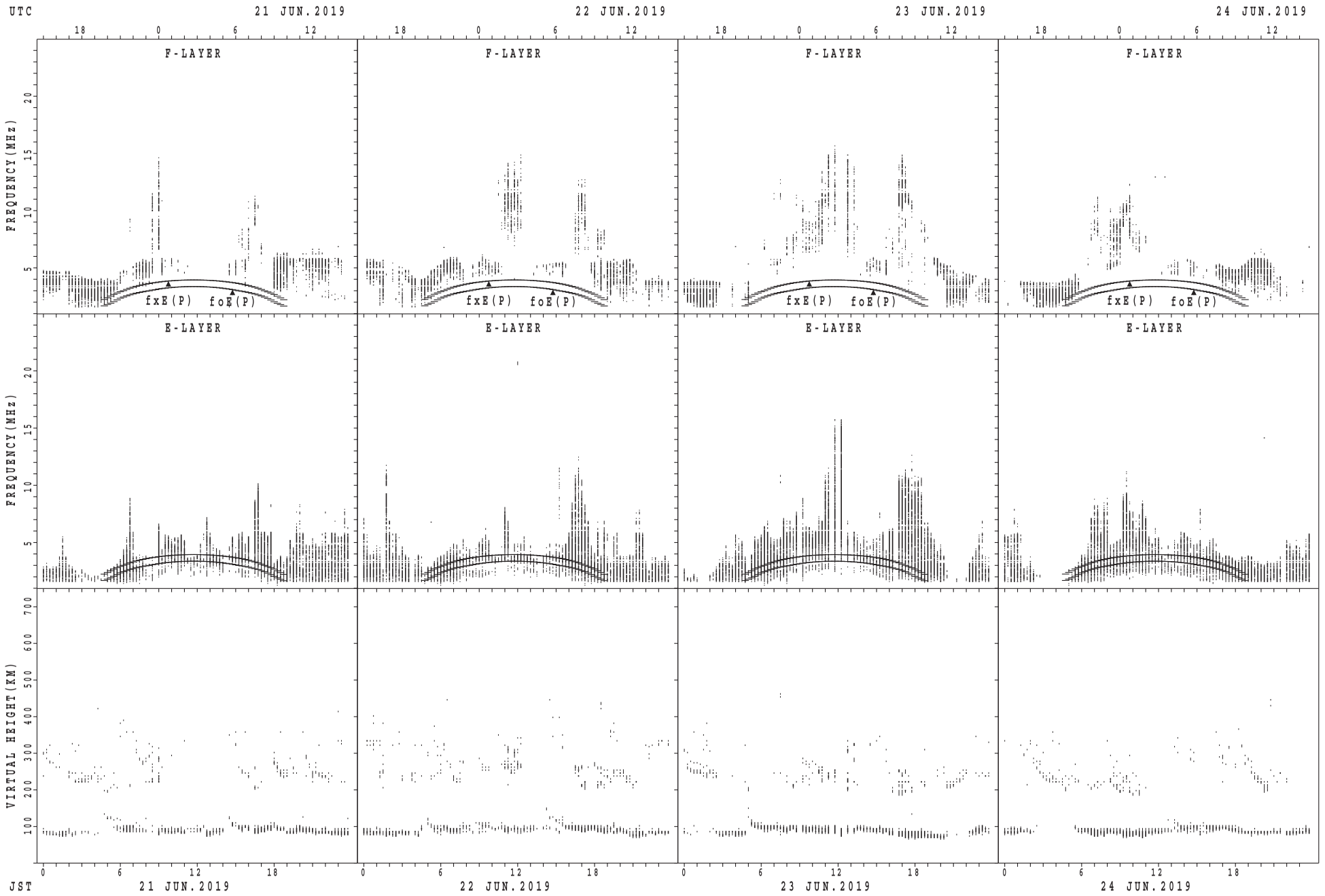
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



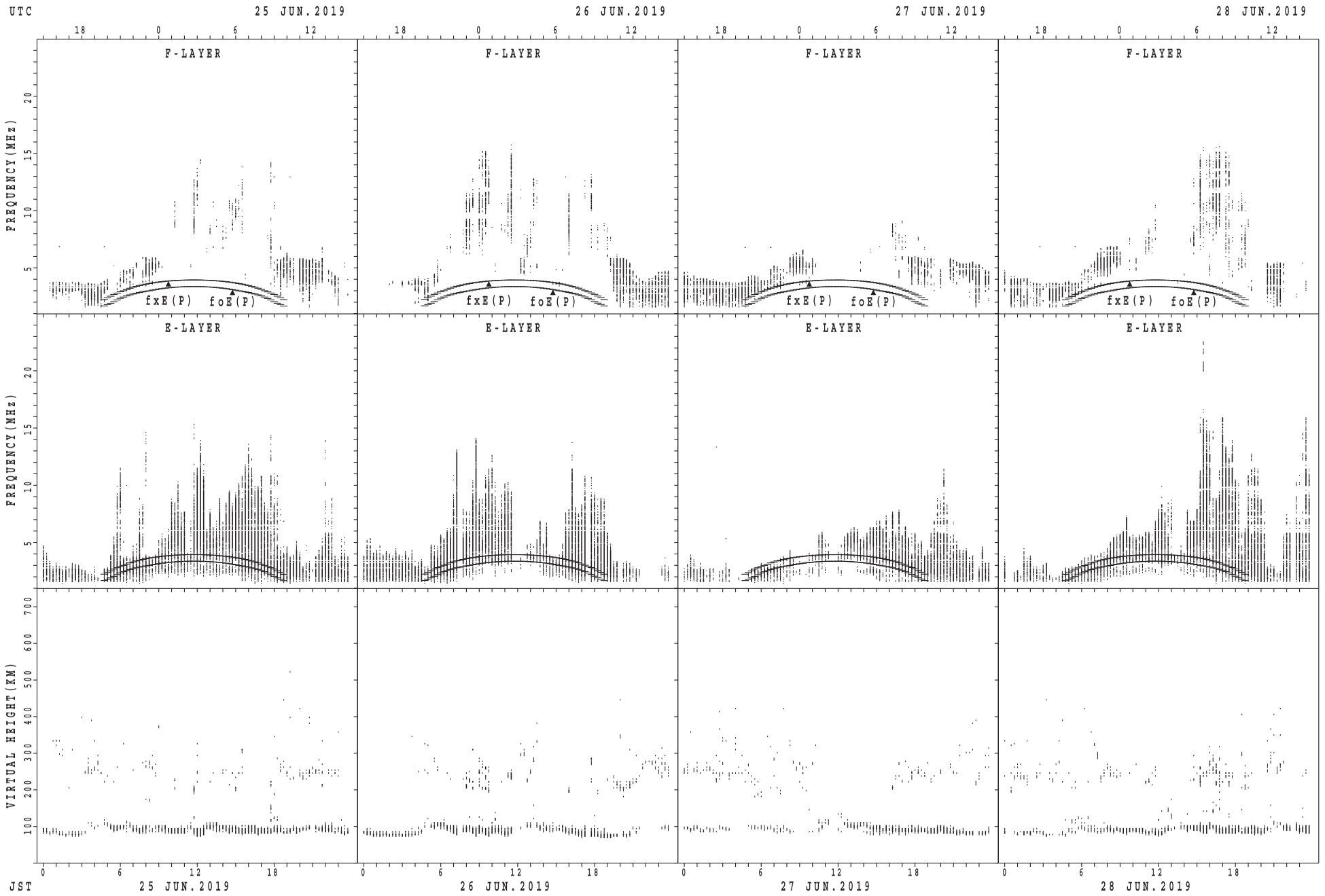
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



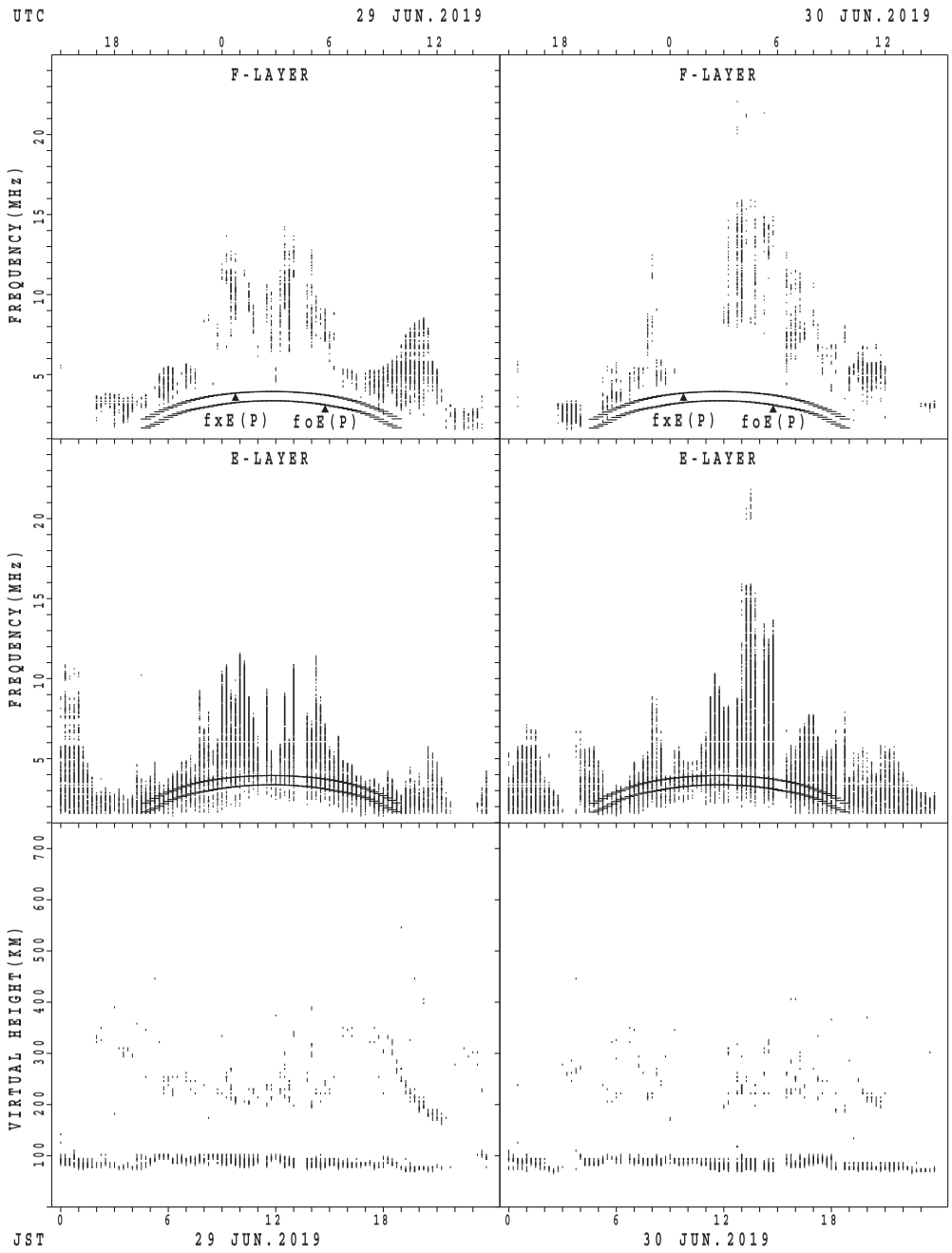
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



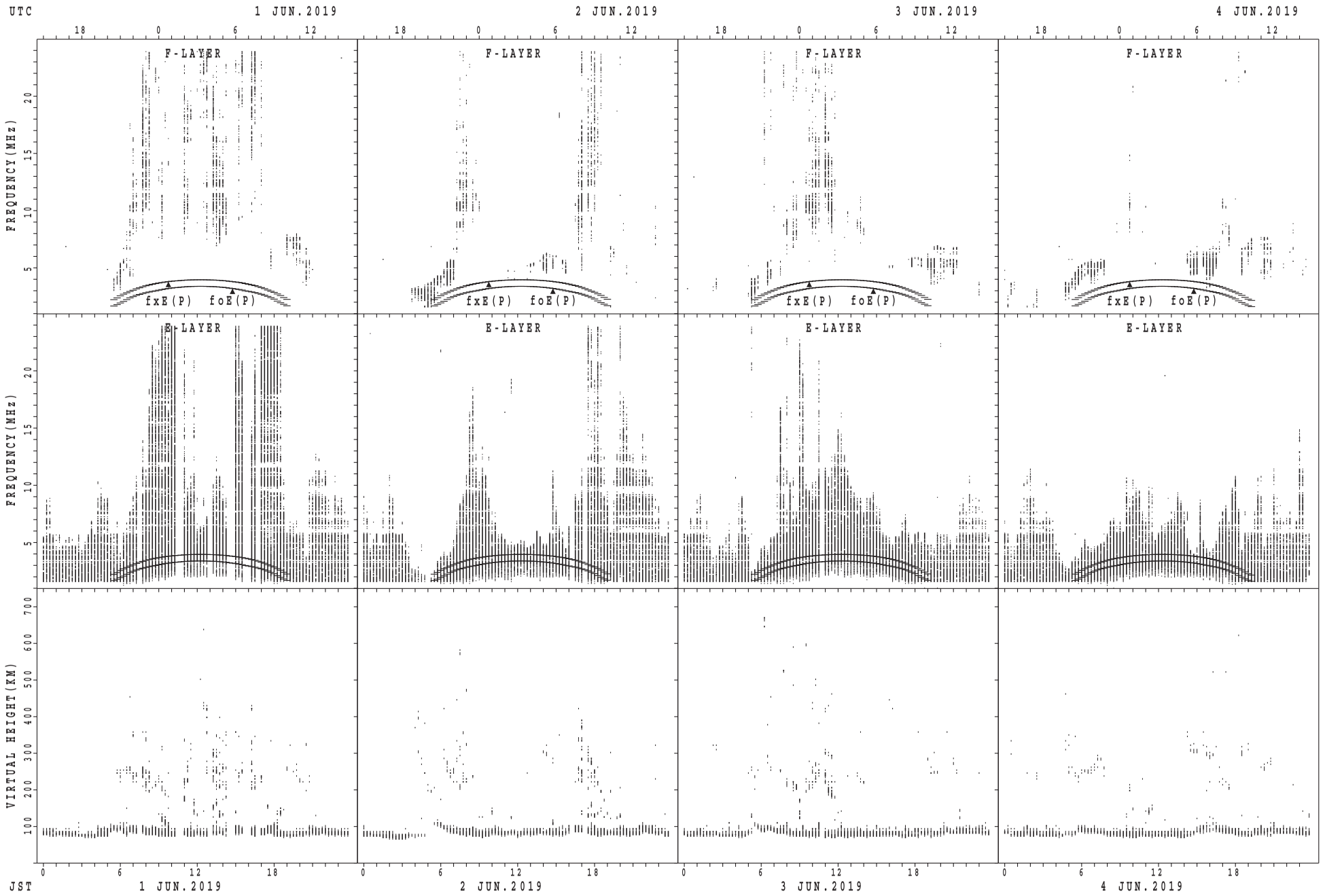
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



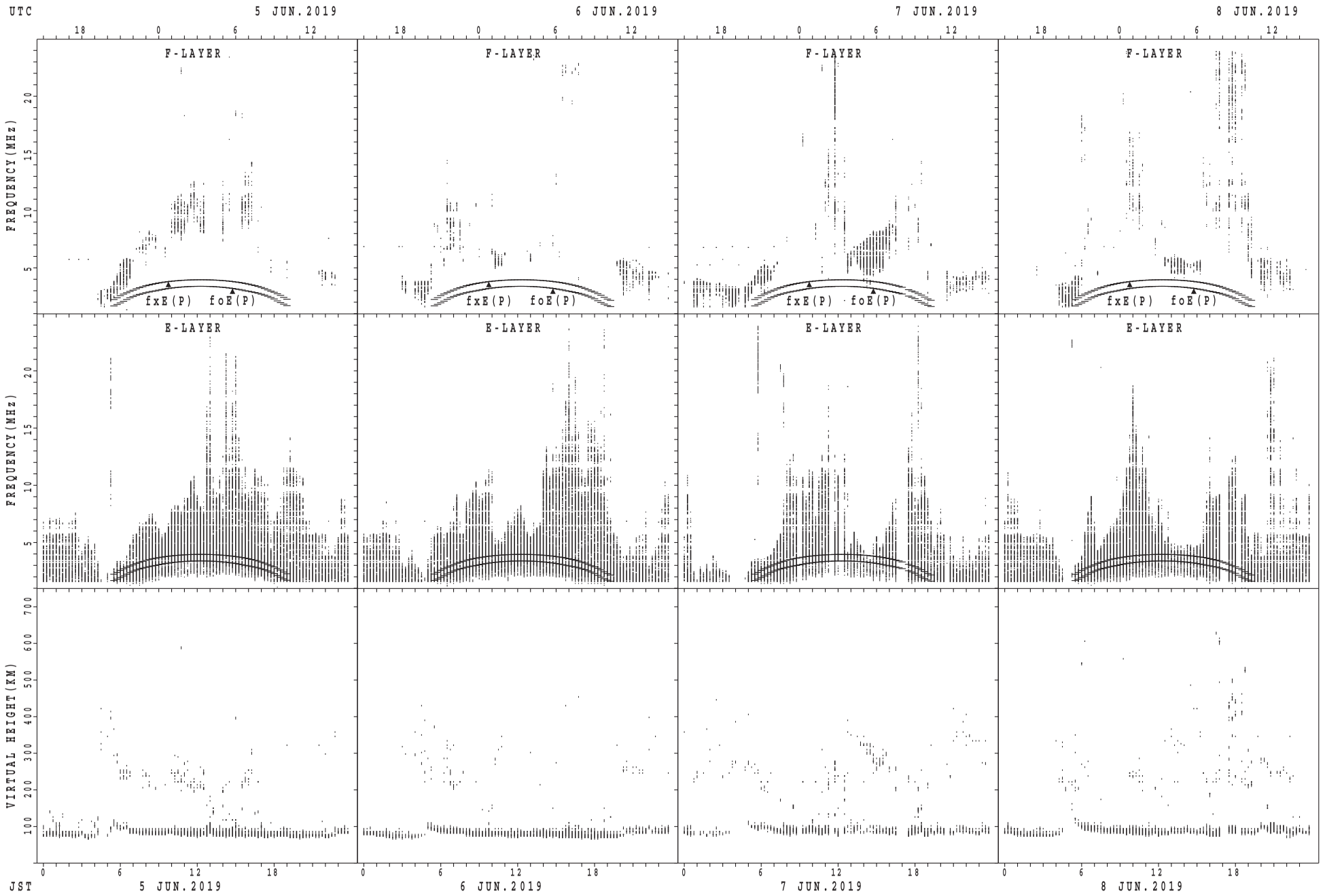
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



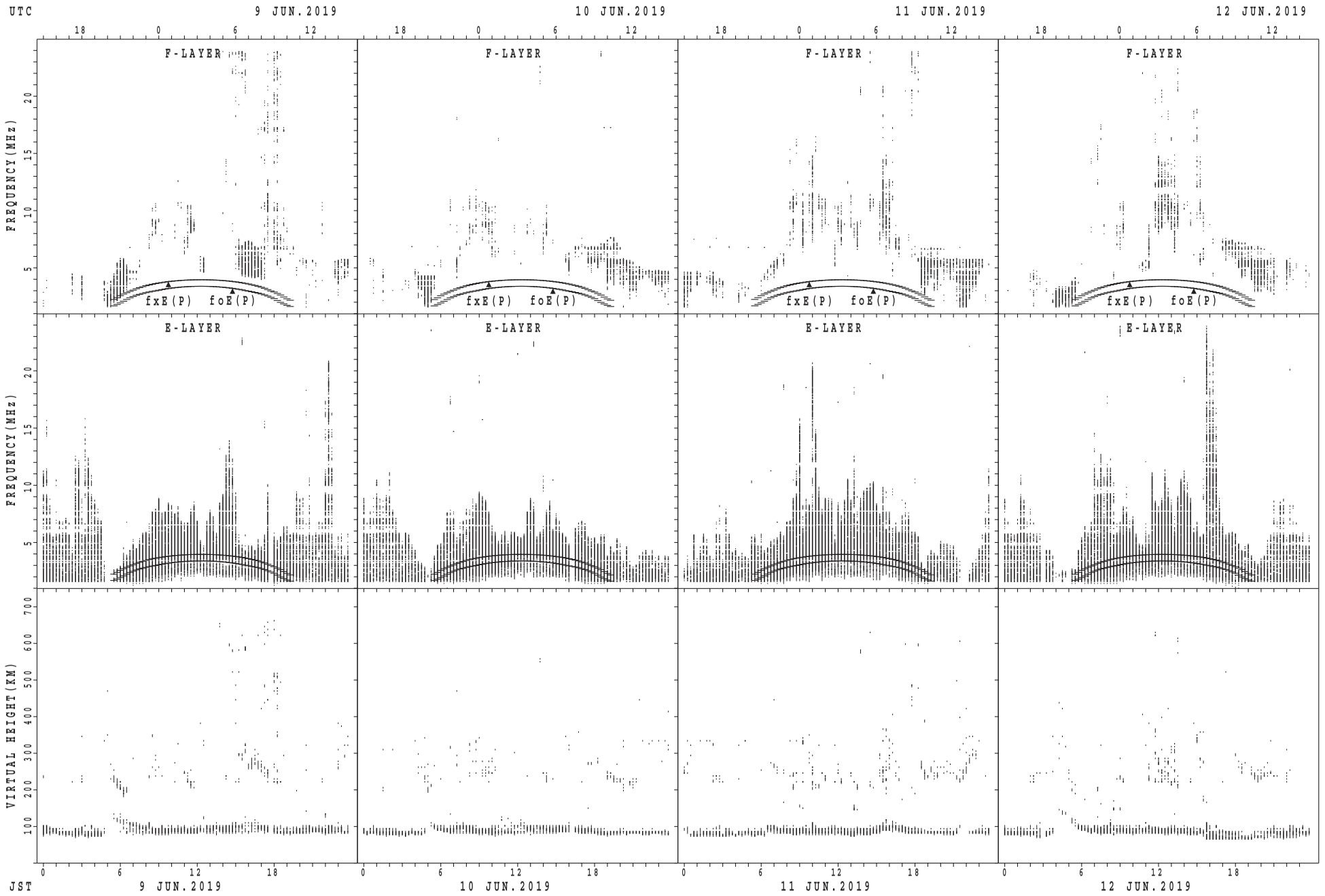
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



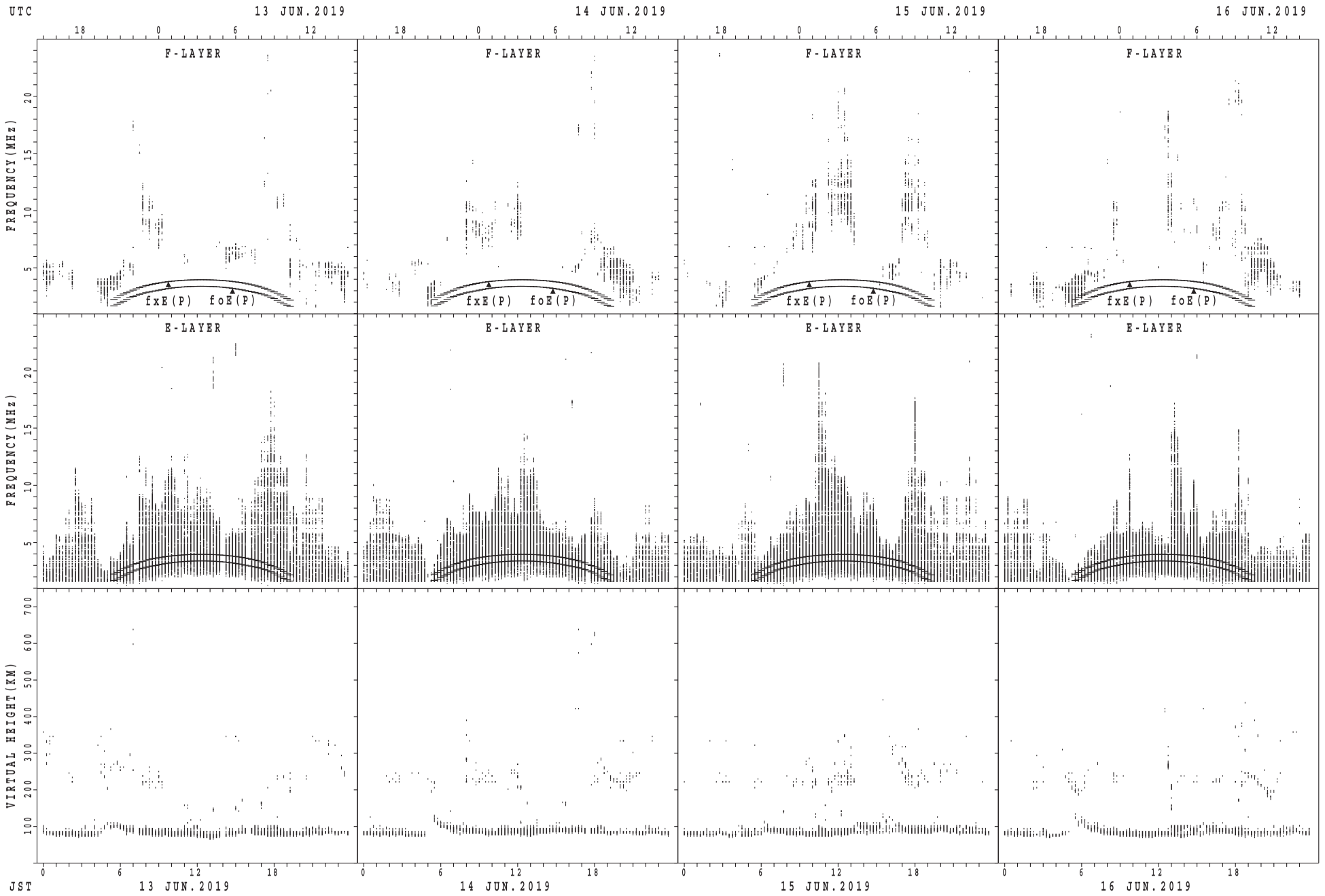
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



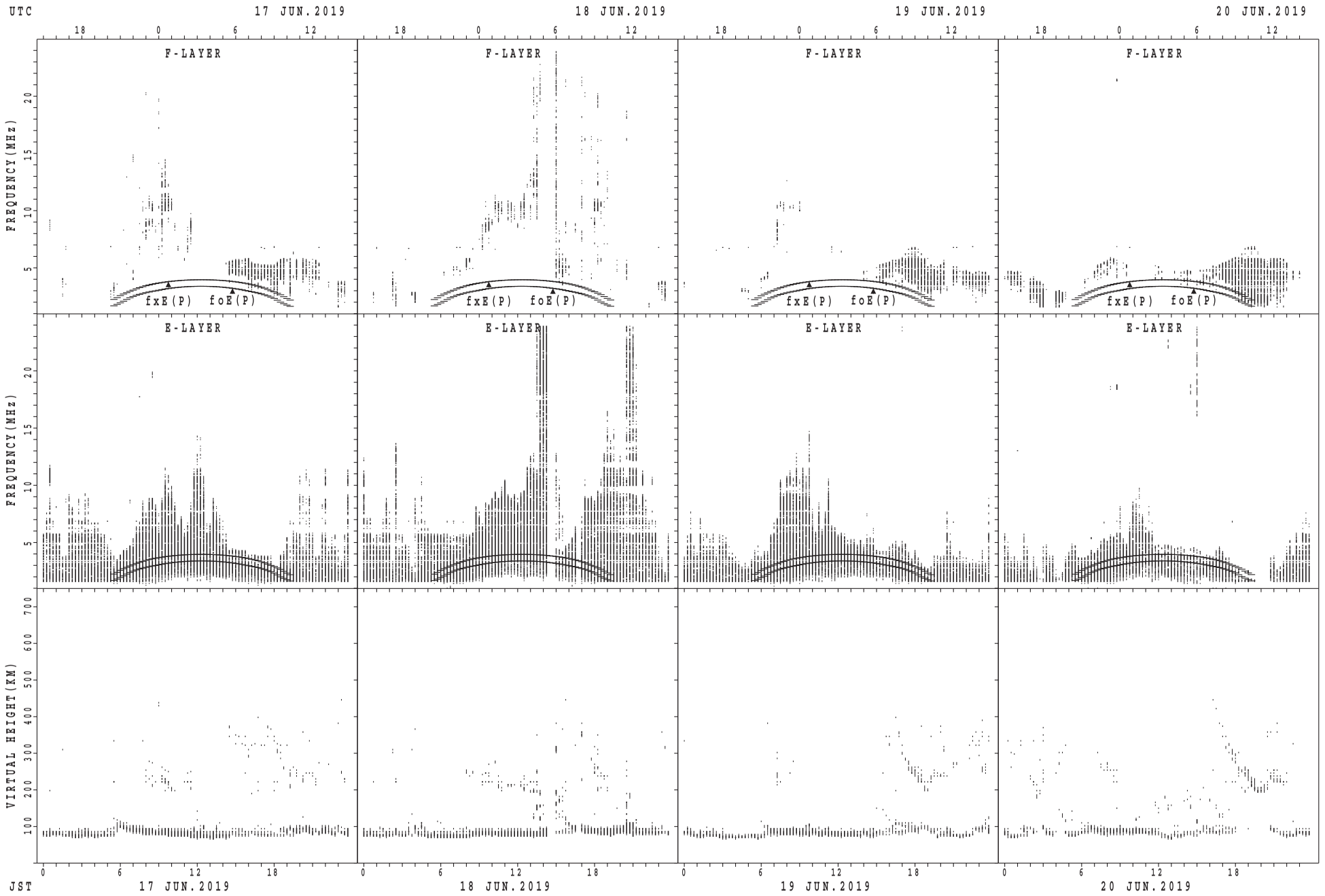
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



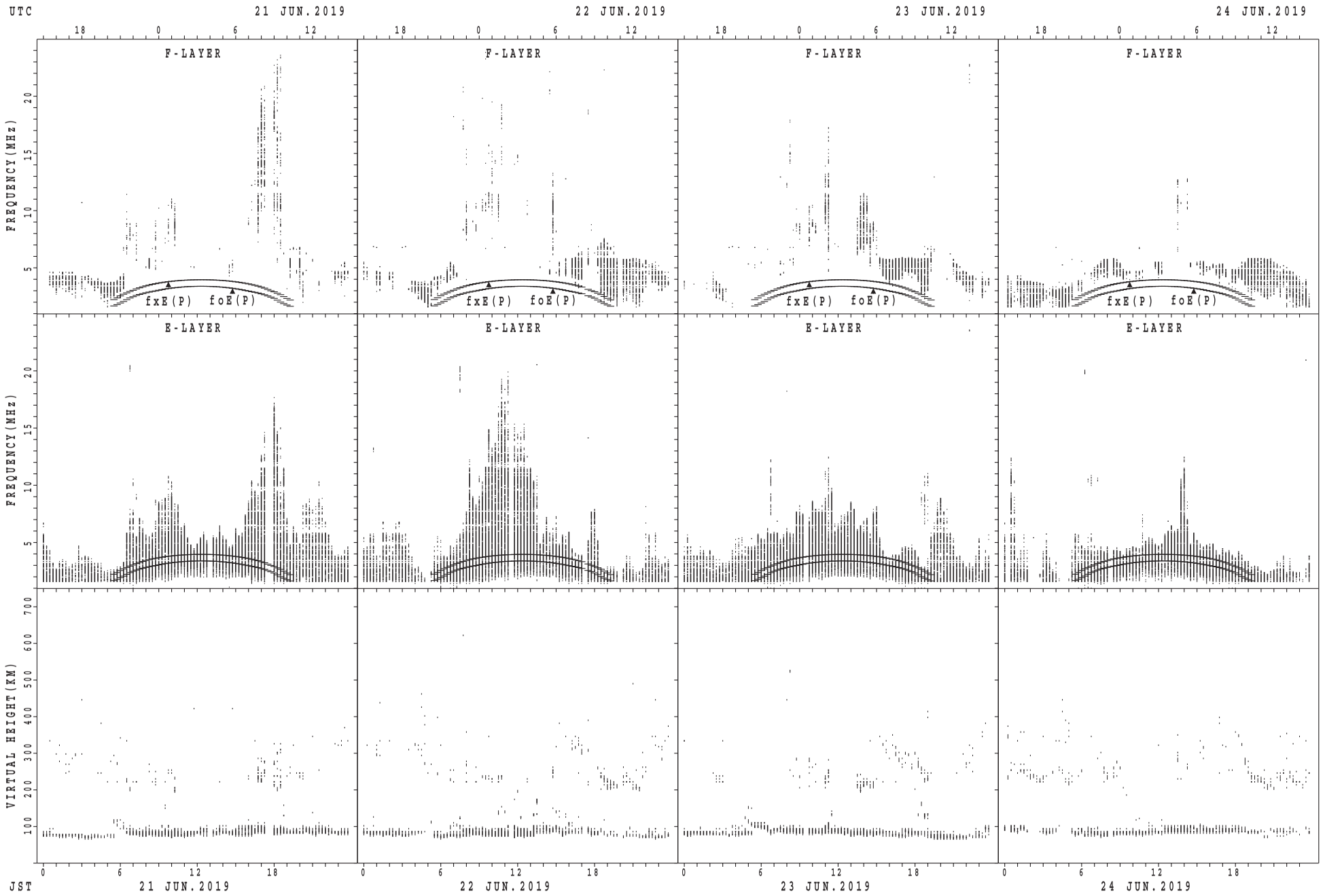
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



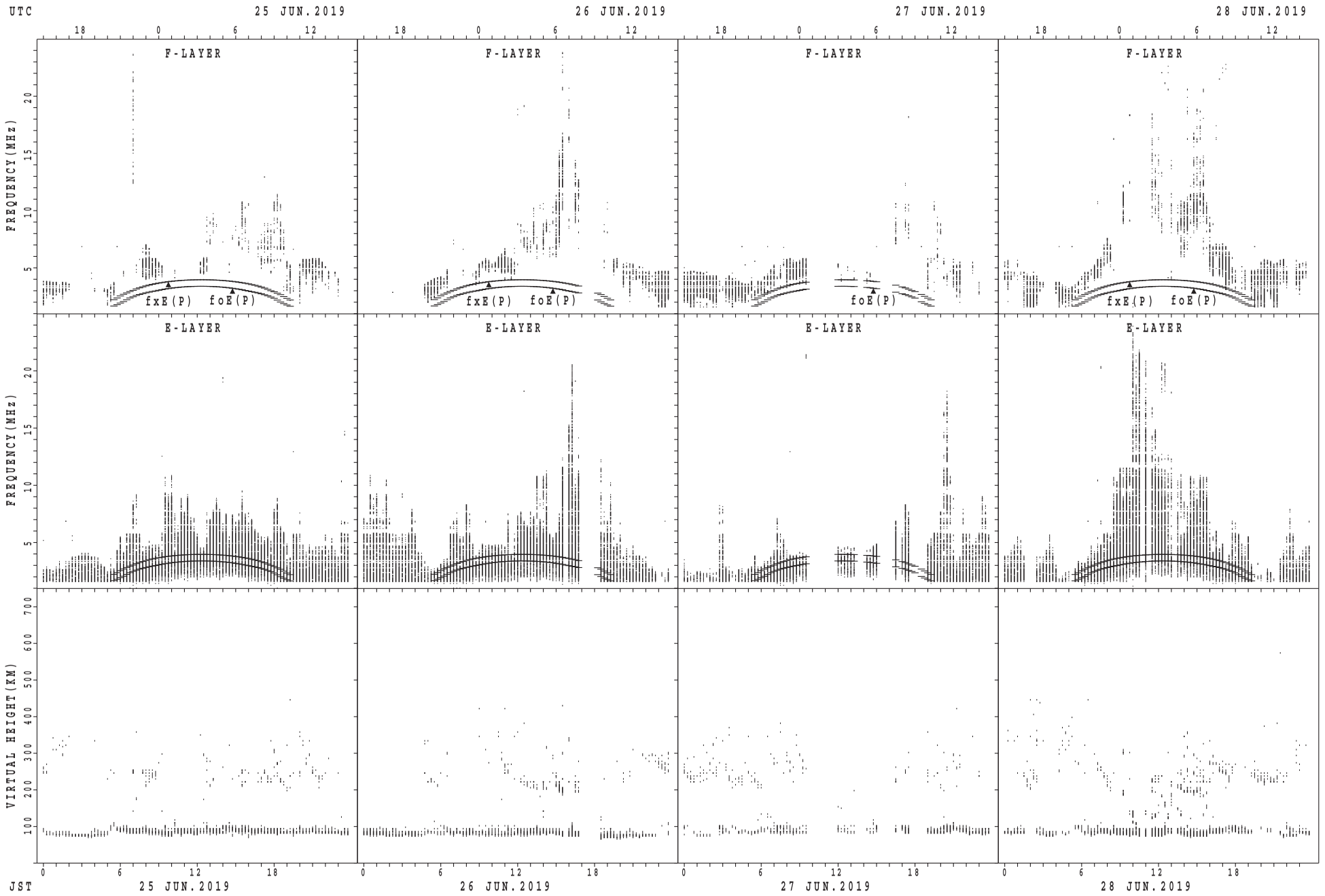
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



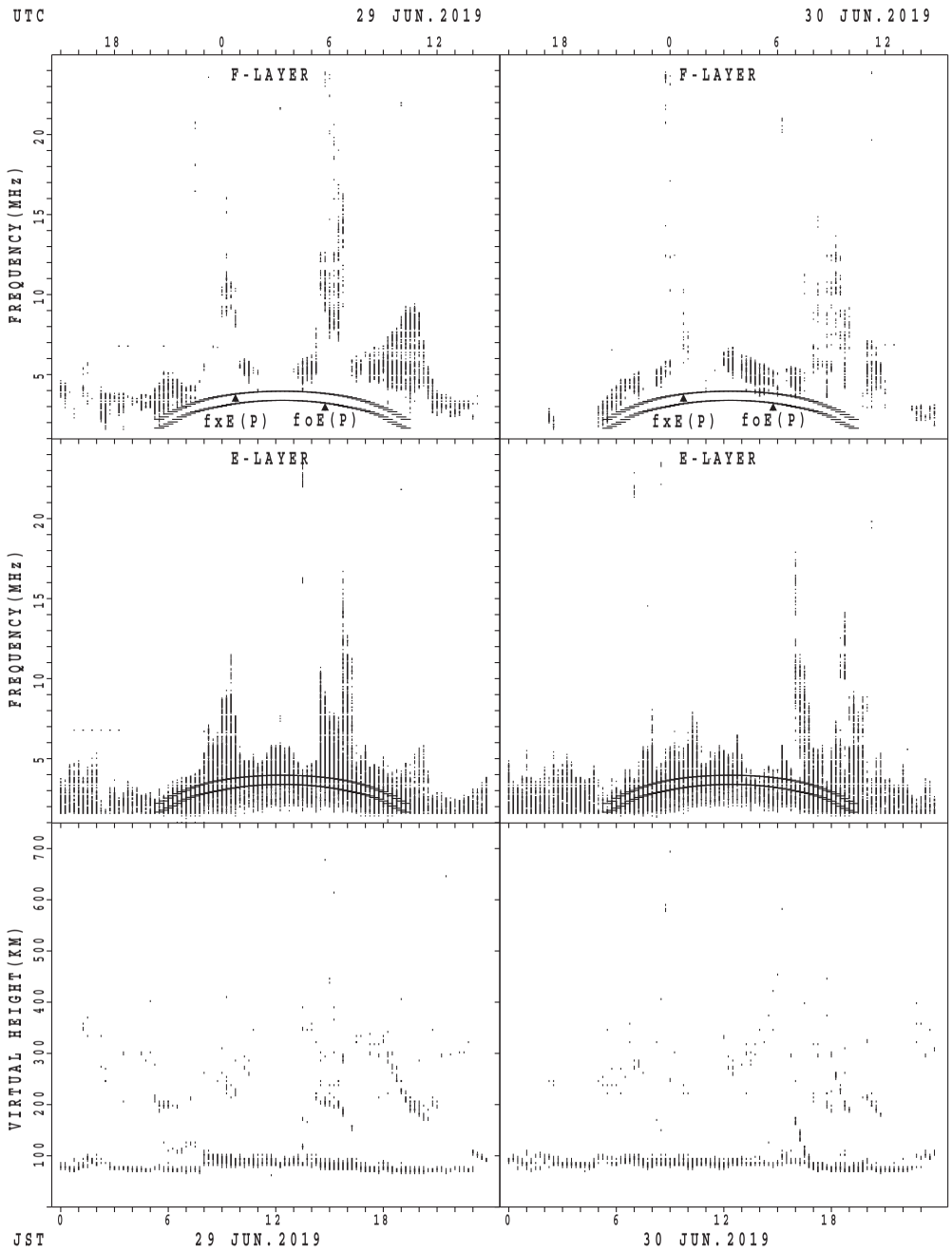
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



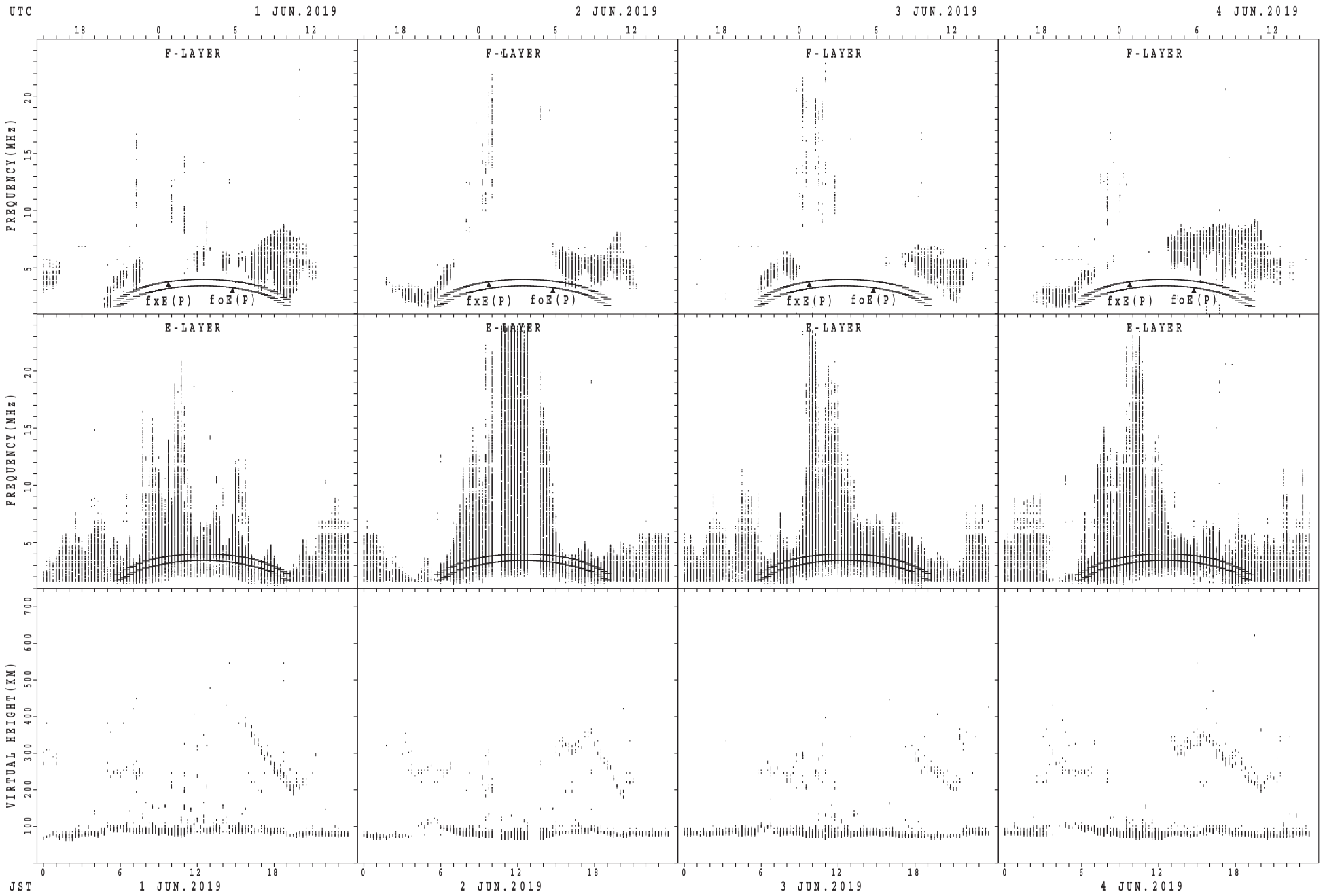
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



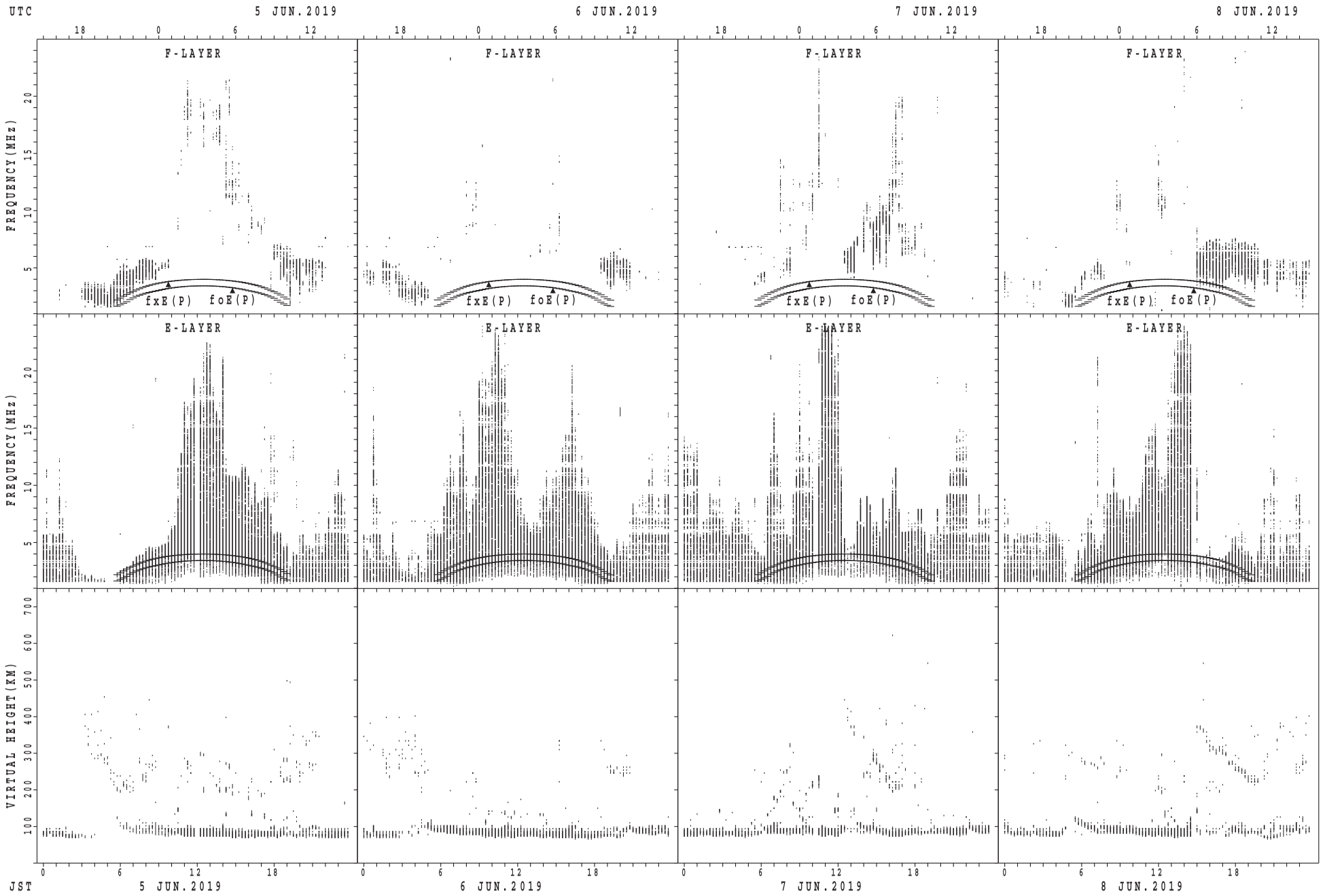
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



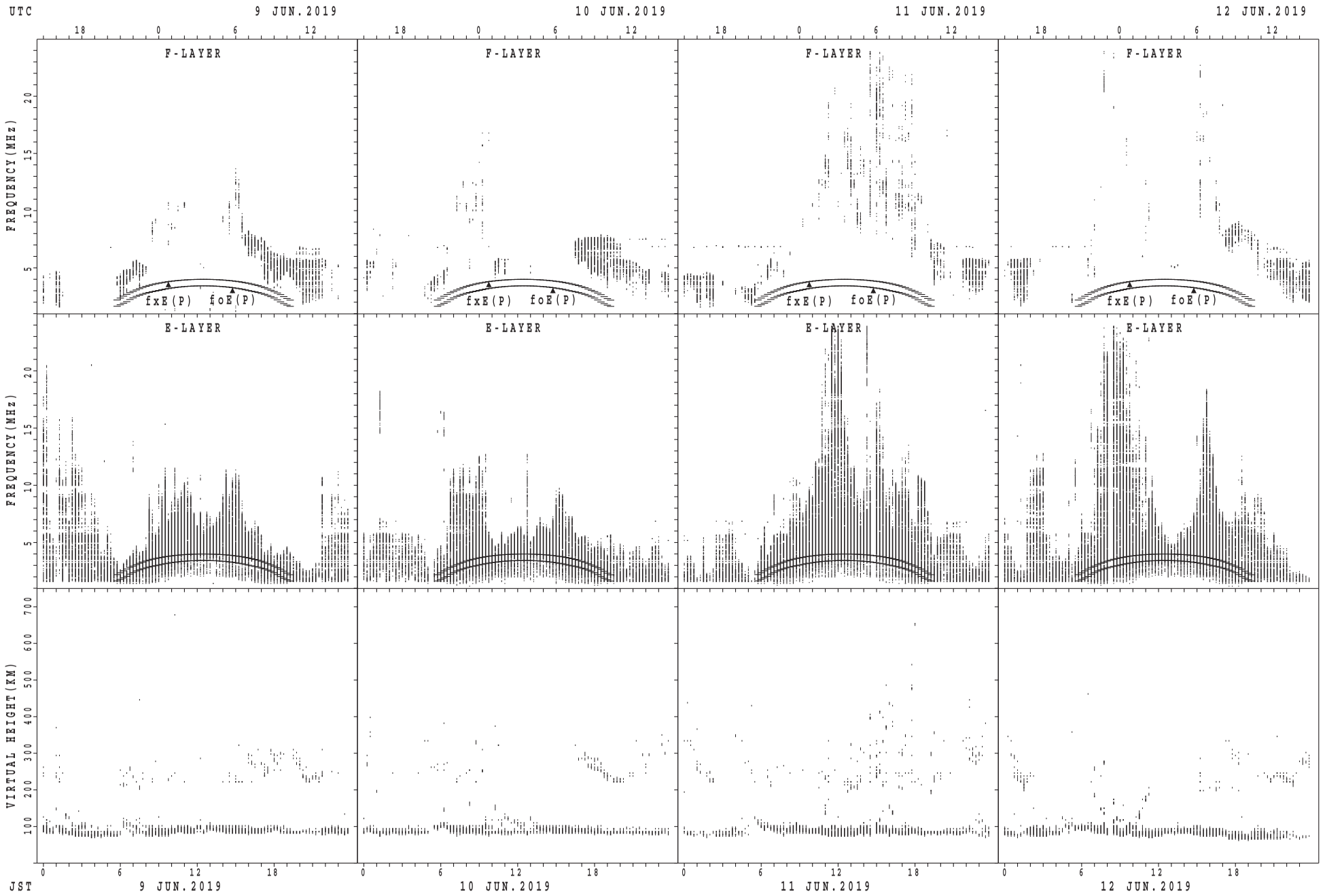
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



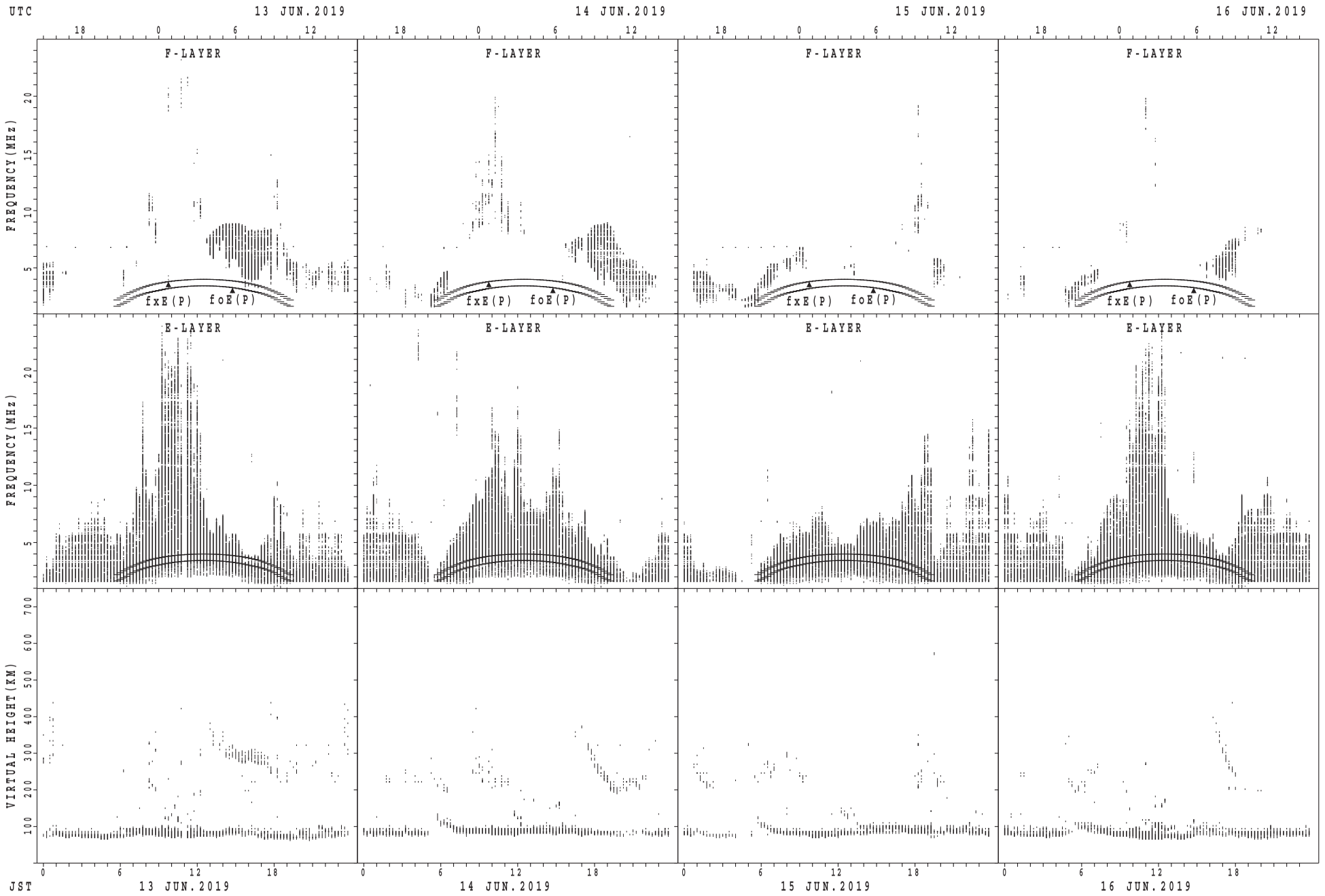
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



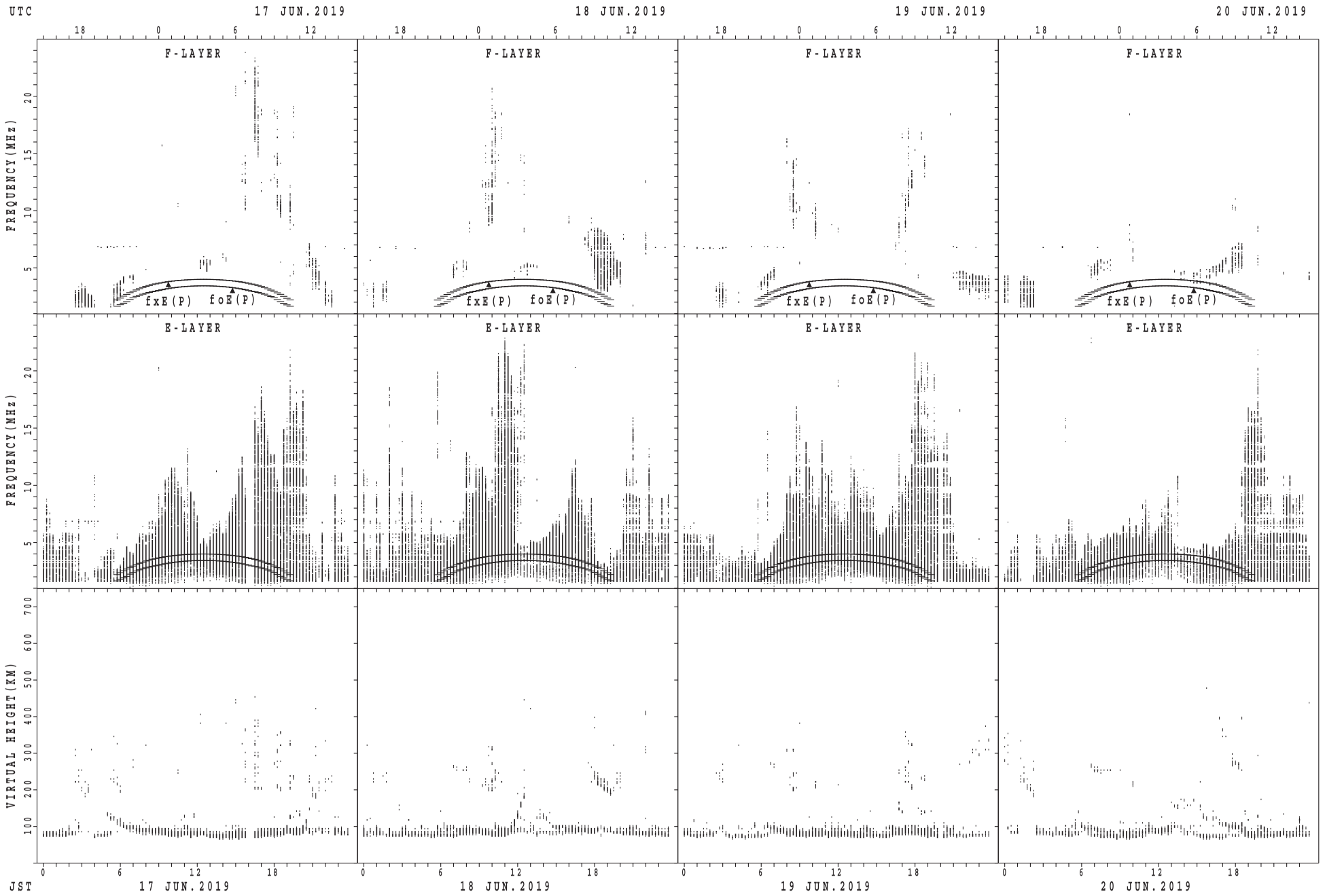
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



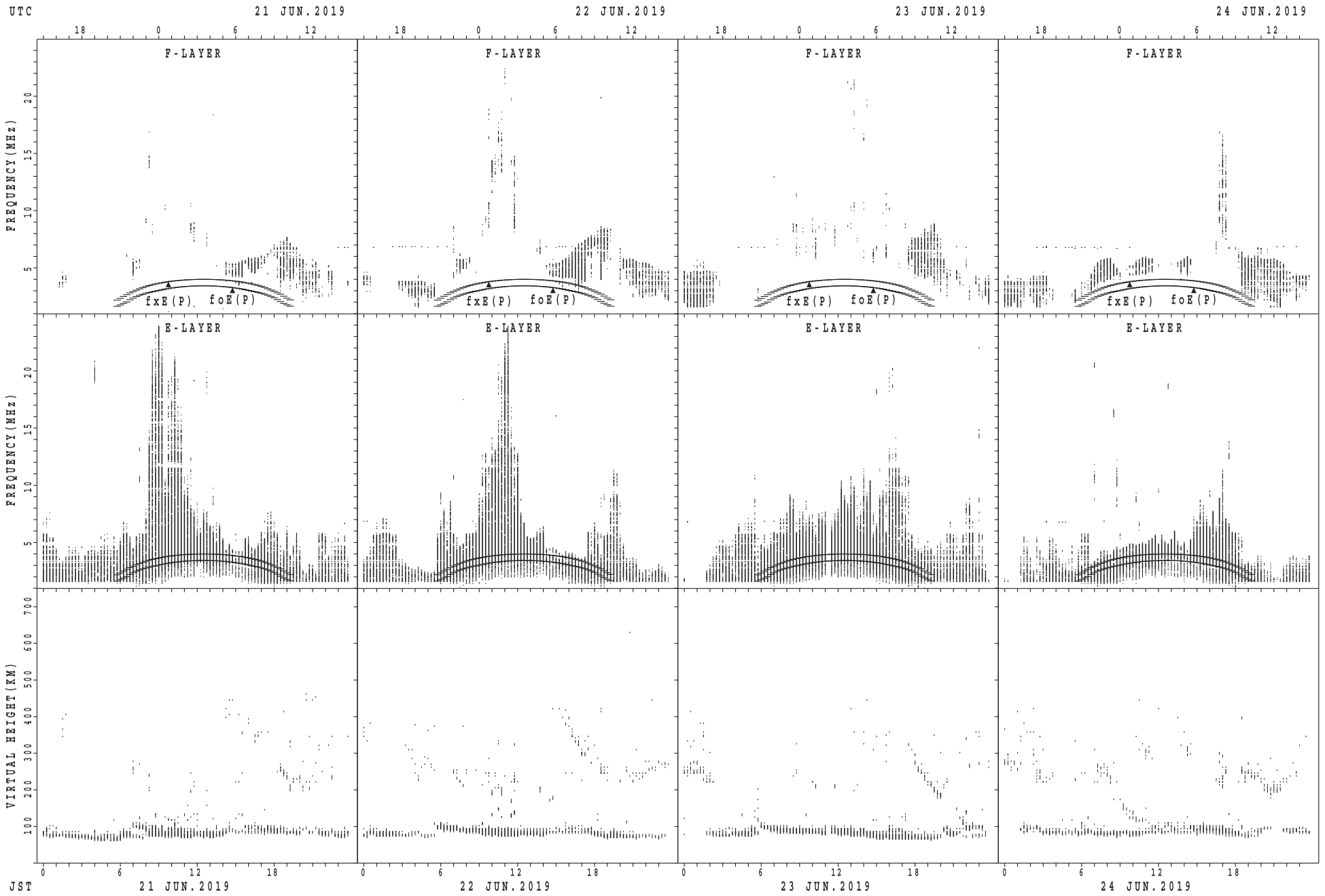
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



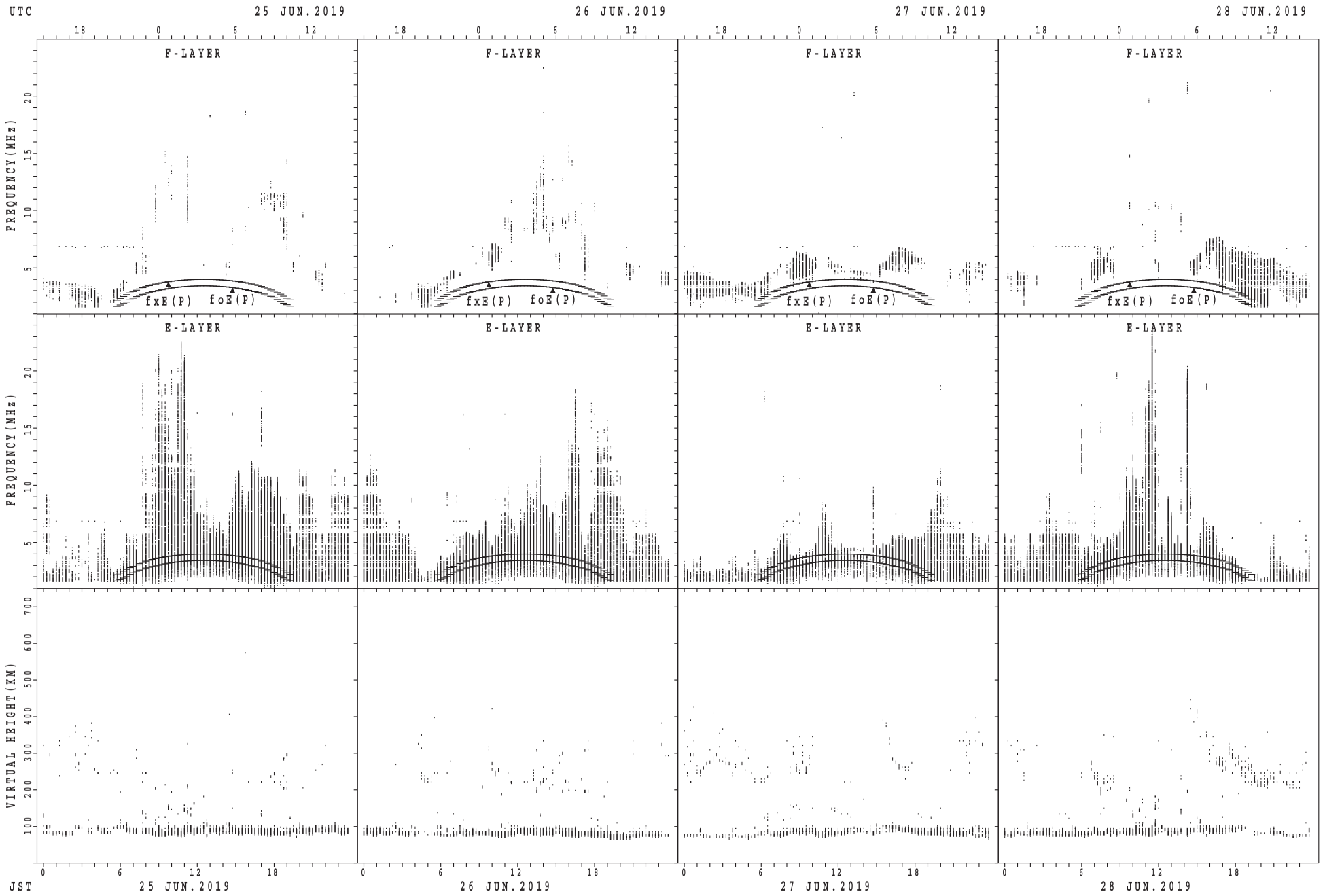
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



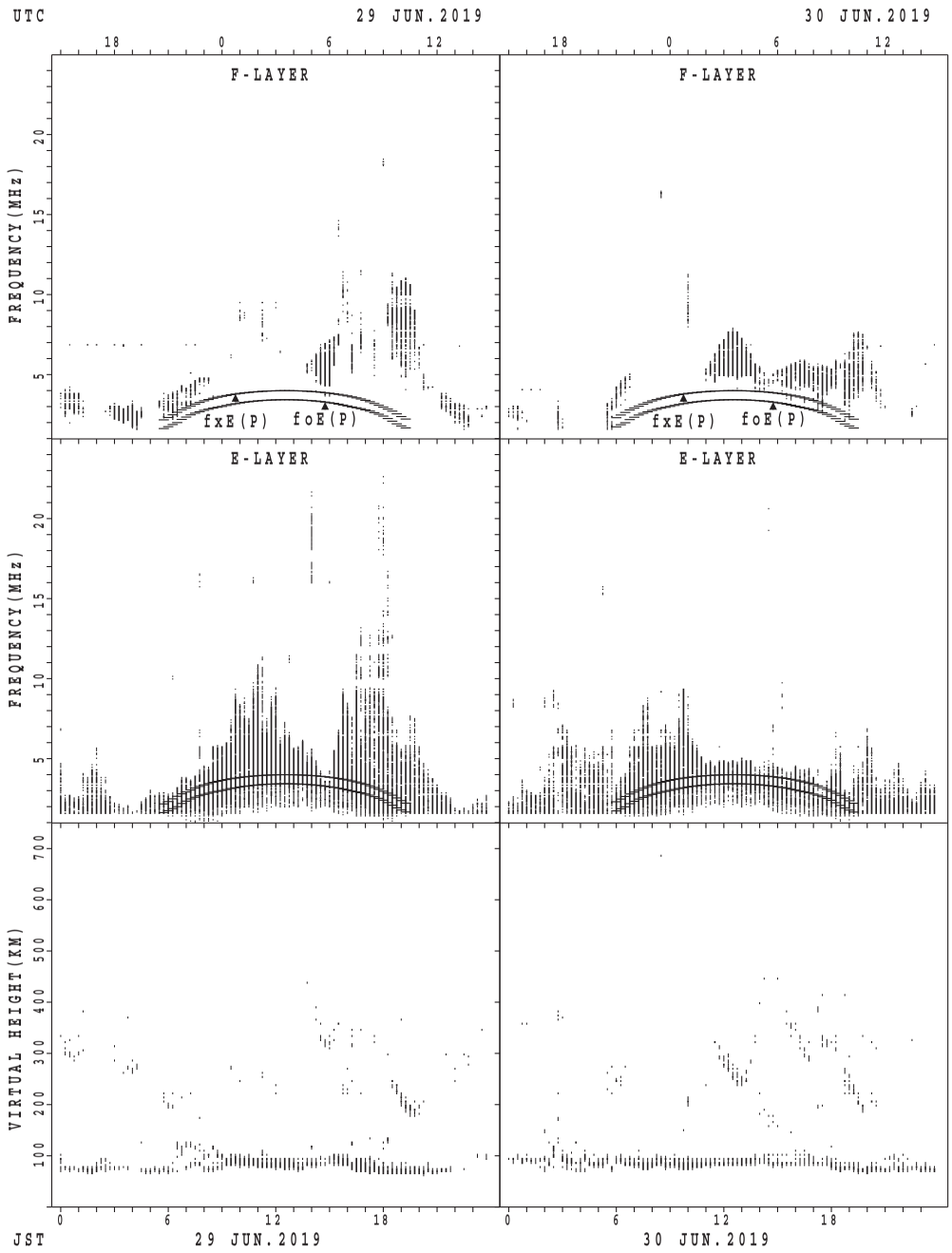
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

JUN.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							4											7	8	5		1		
MED							214											242	235	208		258		
U Q							229											284	253	248		129		
L Q							212											204	209	195		129		

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	22	20	22	14	22	27	30	29	26	27	29	28	26	24	26	25	27	26	29	28	29	27	28	26
MED	87	82	83	82	91	105	99	95	91	91	93	95	99	89	95	89	89	95	97	92	91	93	89	87
U Q	99	88	87	89	105	113	107	109	97	97	102	127	119	101	129	110	107	113	102	99	98	97	98	93
L Q	83	79	79	77	77	95	95	92	89	89	87	87	83	87	85	82	85	85	90	89	87	87	88	81

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							2	5										7	7	1	6	1		
MED							219	222										206	208	218	216	312		
U Q							232	231										216	210	109	252	156		
L Q							206	194										194	196	109	208	156		

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	28	25	20	29	28	28	29	27	28	29	27	25	25	27	28	27	28	28	28	26	27	28
MED	88	87	84	83	83	113	102	95	89	89	89	89	87	95	95	95	95	91	91	87	91	91	93	89
U Q	95	89	89	87	87	119	106	100	97	97	96	93	93	102	104	105	100	93	97	94	95	97	97	91
L Q	85	82	81	80	81	93	96	93	89	87	87	86	83	85	89	87	88	87	89	82	86	89	89	88

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	8									8	9	6	4			
MED								208	202									209	202	241	213			
U Q								248	216									224	214	266	221			
L Q								206	200									207	198	208	205			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	27	29	27	22	30	30	29	29	29	29	30	28	28	30	26	27	28	30	28	29	29	29
MED	89	85	87	83	83	87	97	95	89	89	89	89	88	93	96	93	98	91	89	89	89	89	89	89
U Q	95	89	91	98	91	97	103	97	97	95	105	103	95	104	105	103	107	103	95	91	96	96	97	93
L Q	87	81	81	82	79	83	91	91	87	83	83	82	83	85	87	87	89	89	86	85	84	83	88	87

MONTHLY MEDIANS OF h'F AND h'Es

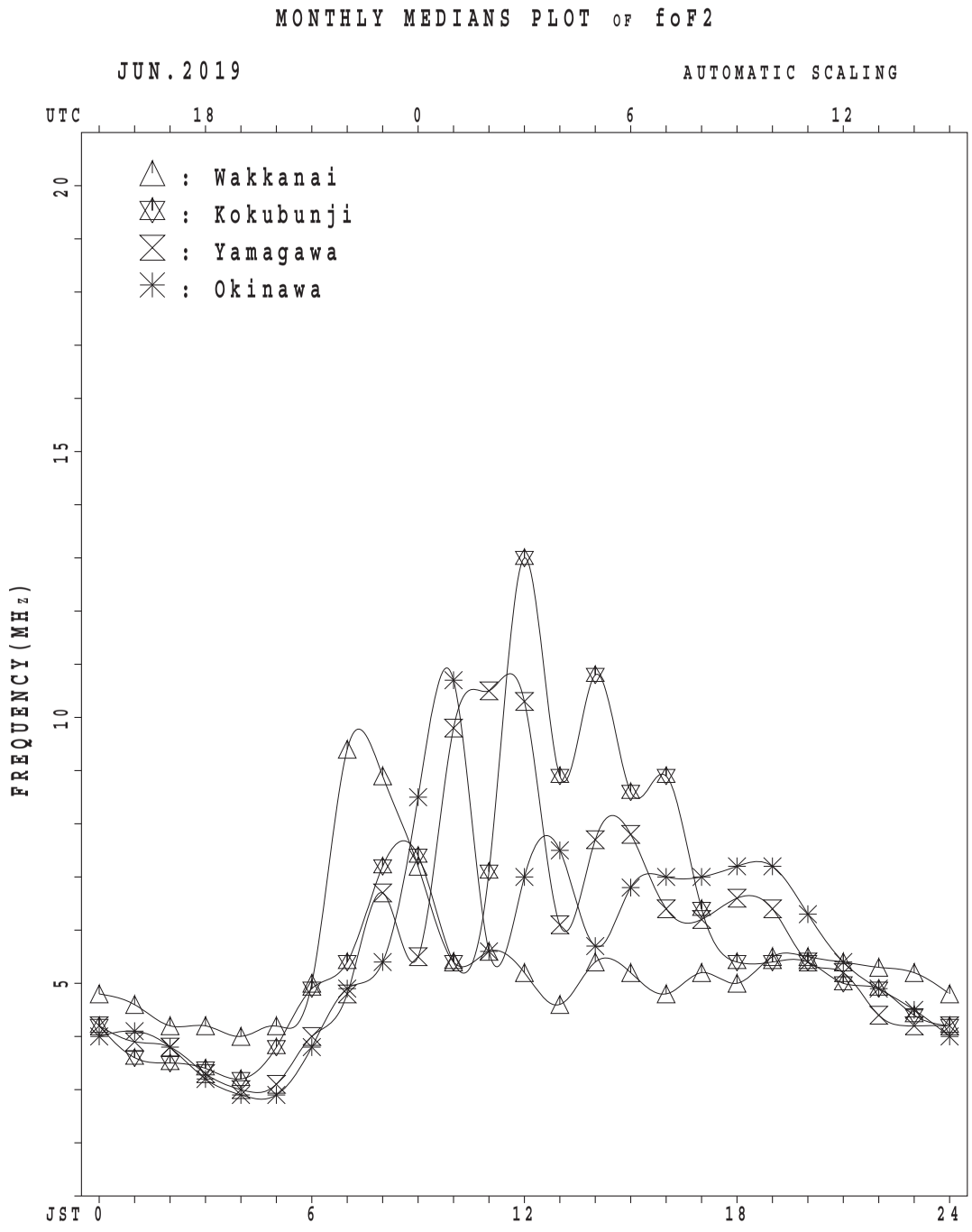
JUN.2019 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1		1					1	4									9	15	12	5		1	
MED	206		202					190	207									276	272	239	218		192	
U Q	103		101					95	215									291	286	257	227		96	
L Q	103		101					95	196									200	206	225	201		96	

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	27	27	29	29	25	27	30	30	30	30	30	29	29	29	28	30	28	29	30	29	28	29	28	30
MED	91	87	87	87	85	89	98	97	95	93	91	89	89	95	95	96	94	95	89	87	89	89	90	89
U Q	101	95	100	95	90	101	105	105	105	107	97	113	102	105	113	107	99	107	93	89	96	93	96	95
L Q	87	83	81	81	81	87	91	95	89	89	85	86	85	88	85	89	89	86	85	79	84	84	84	81


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

IONOSPHERIC DATA STATION Wakkanai

JUN. 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 46	X 44	X 44																			X 63	X 59	X 59
2	X 54	X 55	59																			X 65	X 64	X 60
3	X 52	53	53	53																		X 70	X 66	X 52
4	X 49	X 48	X 49																			X 70	X 69	X 59
5	X 50	X 48	X 47																			X 66	X 65	X 59
6	X 56	X 54	X 54	58																		X 64	X 59	X 59
7	X 61	X 55	X 55																			X 64	X 56	X 52
8	X 51	X 50	X 49	51																		X 65	X 60	X 59
9	58	X 54	57																		X 71	A	A	A
10	59	X 54	X 51																			A	X 58	A
11	59	56	56	58																		X 67	A	X 59
12	A	X 58	X 57	58	55																	X 67	X 64	X 56
13	X 58	X 54	X 54	57	57																X 66	X 65	X 63	58
14	58	56	58	54																X 53		X 58	A	A
15	X 43	A	A																			X 62	X 54	X 54
16	104	X 54	X 53																			X 66	X 55	X 51
17	X 45	X 45	X 48	53	44																	67	X 59	X 53
18	X 51	X 49	X 51															A				X 56	X 56	58
19	X 56	X 49	X 48																			X 63	X 59	X 59
20	X 58	X 58	X 55	54																X 53	X 61	X 62	X 58	X 58
21	X 52	X 51	X 45																			X 62	60	60
22	60	56	X 41	44																A		X 55	59	X 52
23	X 49	X 44	47																			A	A	X 46
24	X 44	X 44	X 44																			X 59	X 59	X 58
25	X 52	51	X 50	X 51																		58	X 47	X 48
26	A	A	48	54																		X 58	A	X 53
27	A	X 45	X 43																			X 56	X 56	X 55
28	X 50	X 47	X 43																			X 61	X 57	X 55
29	X 52	54	49	46		58																X 76	X 57	X 41
30	39	42	42		X 43																	X 63	X 58	X 44
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	29	13	4	1														2	3	27	25	27
MED	X 52	X 52	X 49	54	50	58														X 53	X 66	X 63	X 59	X 56
U Q	58	X 54	54	58	56																X 71	X 66	X 62	X 59
L Q	X 49	X 48	X 46	51	44																X 61	X 59	X 56	X 52

JUN. 2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

JUN. 2019 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2019 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L	L	L	L	L	L	L	A	L	L	L	L	L	A	A	A			
2					L	L	A	A	A	L	L	L	L	L	L	L	L	L	L	L				
3						L	L	A	A	L	L	L	L	L	L	L	L	L	332	L				
4					L	332	396	L	L	A	L	L	L	L	420	L	392	A	A	372				
5					L	L	L	L	A	A	A	L	L	412	L	L	L	L	L					
6							L	L	L	L	L	L	L	L	L	L	L	L	L	L				
7					L	L	A	A	A	L	A	L	A	A	L	L	L	A	A	L				
8						L	A	A	A	A	L	L	A	A	A	A	L	368	L	A	L			
9				L	A	A	L	A	A	L	A	A	A	A	A	L	404	A	A					
10				L	L	A	A	L	L	A	A	A	A	A	A	A	A	312	L	A	A			
11						A	A	A	A	A	A	A	A	A	A	L	380	L		A	L			
12						L	A	464	A	A	A	A	L	A	L	400	L	L	L	L				
13					L	L	A	L	A	A	A	A	L	L	A	L	L	A	A					
14					L	340	A	A	A	L	A	L	L	L	A	392	L	L	A		A			
15				A	L	A	A	A	A	A	440	400	A	A	A	L	L	A	A	A	L			
16				L	L	L	L	L	A	A	L	A	A	A	L	A	A	A	A					
17						L	L	A	A	A	L	A	A	L	A	A	L	L	L					
18						L	L	L	A	L	432	L	L	408	L	A	A		L					
19						L	L	L	A	A	L	420	L	L	L	L	L	L	L	392				
20					L	L	L	380	L	L	436	L	L	L	L	L	L	L	L					
21						L	L	L	A	A	A	L	A	A	A	A	A	L	L					
22					L	L	L	L	L	L	424	420	L	A	A	L	L	L	L					
23						L	A	A	A	A	A	428	L	L	L	L	A	L	L	L				
24					L	L	L	L	L	L	L	A	428	A	L	A	L	A	L					
25						L	A	A	A	A	L	A	L	L	A	A	A	A	A	L				
26					L	L	A	A	A	A	A	A	A	L	A	A	A	A	L	A				
27					L	L	A	L	A	L	A	A	A	L	L	L	A	L	L					
28					L	L	A	A	A	A	A	A	A	A	A	L	L	L	A	L				
29					A	A	A	A	A	L	A	A	A	A	L	L	L	L	L	L				
30						L	A	L	392	L	A	L	L	L	L	L	L	L	L	L				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	1	2	1		4	4	1	2	1	2	3	2	1	2				
MED						336	396	422	392		434	420	428	410	420	396	392	340	332	382				
U Q											438	424					404							
L Q											428	410					380							

JUN. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 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 192	200	244	292	316	316	316	300	284		A	A	292	252	300		A	A	A		
2				216	224	204	252	288	300	328	316	U A 304	A 308	308	308	A 244	A	A	200	A 228	A			
3				B	B 212	260	280	300	316	292	292		A	328	328	304	264	240	184	A	A			
4				192	184	216	256	280	304	320	320	320	324	348	A	144	236	260	184	A	A			
5				B	B	200	244	284	316	316	328	336	332	316	320	288	240	240	212	A	A			
6				B	164	188	244	284	304	316	316	340	292	292	320	300	288	248	192	A	B			
7				A	240	184	244	272	300	308	308	324	324	A	A	308	284	244	196	180	A			
8				A	A	216	248	280	312	312	324	324	328	312	292	244	A	A	228	172	A			
9				A	A	A 236	284	304	312	312	312	312	288	312	312	272	248	192	A					
10				A	A	212	244	288	292	316	316	320	324	320	320	300	300	248	212	156	A			
11				180	196	224	248	276	316	316	316	316	308	232	304	316	284	256	180	A	A			
12				A	A	232	260	292	292	316	316	320	348	A	296	A	4 182	252	188	A	A			
13				A	A	208	244	280	280	324	324	296	A	324	312	312	288	256	200	A				
14					A	192	256	284	284	316	324	324	344	300	324	320	292	244	196		A			
15				A 220	A	248	268	292	300	300	316	288		A	A	308	268	248	192	A	A			
16				B	156	248	248	284	292	312	312	312	284	256	304	A	236	244	220	A	A			
17				B	200	224	252	276	304	320	316	300	A	268	A	312	280	256	196	A	A			
18				B	B	196	252	268	284	316	316	316	280	A	280	A	A		A	256	288			
19				B	164	204	244	288	304	324	324	324	304	A	A	A	244	A	188	0 158	156			
20				B	B	192	244	276	308	300	300	348	340	324	304	300	272	244	204					
21				B	204	204	260	300	304	308	308	324	316	316	316	304	288	256	200	164	B			
22				B	156	168	252	268	284	300	304	332	328	308	276	240	292	256	216		B			
23				B	176	188	248	280	304	304	320	308	308	324	324	292	260	220	A	172	264			
24				A	168	196	240	268	320	308	308	304	A	276	A	312	276	252	200	A	A			
25				B	200	228	248	272	288	296	296	A	A	A	320	300	284	236	A	A	B			
26				B	A	204	248	272	308	308	308	272	332	284	312	296	276	232	A	A	B			
27				B	A	228	228	260	324	324	324	340	332	316	316	300	280	240	188	A	B			
28				B	A	212	252	280	312	324	324	324	324	300	300	300	280	244	204	A	B			
29				B	A	184	240	276	300	308	312	332	332	332	320	272	272	244	200	168	B			
30				B		A 244	276	308	308	308	312	312	312	312		A	A	A	A	184	184			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				3	15	27	30	30	30	30	30	29	25	23	23	25	26	25	24	10	4			
MED				192	192	204	248	280	304	316	316	320	324	312	312	300	276	248	198	172	224			
U Q				216	204	216	252	284	308	316	320	324	332	324	320	310	284	256	204	184	276			
L Q				180	164	192	244	272	292	308	308	306	306	288	304	290	260	242	190	164	170			

IONOSPHERIC DATA STATION Wakkanai

JUN. 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	J A 34	24	25	22	J A 62	35	J A 37	J A 51	72	J A 64	50	J A 48	J A 70	J A 54	43	J A 43	J A 32	J A 103	J A 63	J A 63	J A 103	J A 37	31	J A 24
2	27	21	E B 16	32	25	J A 32	58	J A 86	J A 54	J A 65	J A 50	36	43	J A 59	39	J A 37	J A 37	J A 48	27	J A 25	J A 27	26	22	32
3	22	E B 16	E B 16	E B 15	E B 16	27	J A 41	J A 48	J A 47	J A 85	J A 51	46	J A 38	40	J A 106	J A 64	J A 53	30	J A 26	29	J A 27	J A 28	23	24
4	27	26	J A 26	J A 23	J A 18	J A 29	J A 37	38	40	58	51	J A 50	J A 41	J A 47	J A 43	J A 76	35	57	59	J A 39	40	40	30	22
5	E B 16	E B 16	J A 51	E B 16	E B 16	28	33	J A 41	J A 45	J A 49	J A 63	J A 57	J A 57	36	42	J A 37	J A 37	J A 37	J A 45	J A 84	J A 83	58	26	22
6	30	25	23	J A 30	28	23	32	J A 49	J A 47	J A 40	J A 39	J A 43	35	34	40	35	J A 119	J A 31	28	J A 27	34	J A 35	J A 43	J A 49
7	J A 39	J A 40	J A 29	28	25	J A 44	J A 42	J A 42	J A 57	J A 76	60	J A 50	65	J A 125	J A 43	40	38	J A 83	58	J A 35	29	E B 16	28	28
8	28	J A 26	33	J A 29	J A 32	J A 47	J A 63	90	94	J A 74	J A 88	J A 54	J A 144	J A 241	J A 257	J A 118	J A 69	J A 51	J A 44	J A 51	45	59	J A 53	J A 61
9	J A 61	J A 65	J A 49	J A 64	61	J A 109	J A 31	J A 65	62	J A 48	71	76	72	J A 65	72	J A 57	J A 57	J A 45	J A 99	J A 87	J A 61	116	J A 87	J A 61
10	J A 53	J A 52	J A 36	J A 52	33	J A 51	34	J A 41	36	J A 77	J A 73	J A 62	70	117	J A 129	117	J A 147	J A 61	J A 32	J A 86	J A 136	J A 109	59	J A 63
11	38	J A 33	J A 33	35	J A 33	J A 65	J A 98	J A 118	J A 128	J A 175	J A 66	J A 107	J A 107	J A 119	62	J A 60	34	32	J A 38	J A 109	J A 77	J A 51	J A 123	J A 127
12	J A 85	58	J A 52	J A 33	39	33	J A 47	47	92	J A 88	J A 101	J A 63	J A 101	J A 61	J A 87	75	J A 74	J A 52	J A 76	J A 30	J A 87	J A 41	J A 50	J A 35
13	25	J A 32	J A 29	J A 30	J A 31	26	J A 51	J A 53	J A 71	69	J A 62	60	46	J A 42	73	J A 83	34	108	J A 130	42	J A 49	38	26	J A 48
14	J A 51	28	29	E B 15	E B J A 53	31	J A 41	J A 46	J A 87	J A 59	72	J A 57	J A 40	47	41	35	35	J A 46	J A 97	J A 37	J A 82	J A 84	90	J A 87
15	J A 65	59	J A 63	J A 50	J A 85	J A 45	J A 64	J A 99	J A 105	J A 99	74	48	J A 94	J A 119	J A 92	J A 65	96	71	57	J A 56	J A 48	J A 47	J A 49	J A 61
16	J A 35	28	20	E B 16	E B J A 23	J A 28	32	J A 42	72	J A J A 110	J A 56	J A J A 55	J A 57	J A 82	34	J A 70	59	J A 62	J A J A 120	J A 85	J A J A 31	J A 48	26	37
17	26	30	J A 52	25	30	27	30	56	J A 53	69	J A J A 93	J A 106	J A 66	J A 51	J A 51	J A 63	54	35	J A 61	90	59	J A 49	J A J A 63	J A 50
18	J A 78	37	J A 21	25	E B 15	24	28	39	J A 48	J A J A 65	J A 64	J A 82	J A 89	J A 57	J A 37	J A 59	J A 60	J A 55	39	43	49	J A 43	J A 84	19
19	21	20	26	E B 16	20	J A 46	34	J A 47	J A 52	J A J A 62	J A 93	J A J A 53	J A 52	J A 57	J A 68	J A 58	J A 37	40	25	J A 50	29	E B 16	24	J A 38
20	38	40	J A 21	23	E B 16	J A 25	58	94	J A 62	61	J A 133	J A 84	55	J A 48	36	34	31	34	J A 33	40	J A 35	32	59	J A 42
21	28	23	27	33	26	26	J A 65	58	J A J A 99	68	J A J A 63	J A 37	J A 58	J A 49	J A 60	J A 47	62	96	J A J A 63	J A 48	J A J A 35	J A 41	J A 51	59
22	40	J A 33	32	31	J A 29	J A 28	J A 41	J A 51	J A 51	38	J A 41	40	J A 63	J A 109	J A 96	J A 91	J A 42	29	J A 30	J A 66	J A 49	J A 27	J A 35	34
23	20	20	22	E B 16	J A J A 49	85	56	72	J A 83	J A 102	J A J A 124	J A 60	42	J A 48	J A 55	J A 48	J A 73	60	60	J A 20	J A J A 62	J A 65	J A J A 84	J A 84
24	J A 86	J A 74	J A 61	J A 83	J A 125	42	34	33	36	36	J A 247	J A 84	95	J A 130	J A 77	J A 67	J A 80	87	J A 64	56	J A 45	J A 119	J A 41	24
25	28	26	J A 51	40	J A 46	J A 52	J A 178	J A 112	72	J A 260	J A 143	60	62	J A 59	J A 97	J A 167	J A 131	146	J A 165	J A 89	J A 87	J A 51	J A 51	J A 86
26	J A 160	J A 64	J A 63	J A 42	32	J A 56	J A 66	J A 116	J A 63	J A 107	J A 83	90	J A 52	J A 121	J A 121	J A 162	J A 118	75	J A 76	J A 61	J A 86	J A 53	J A 53	J A 77
27	J A 127	J A 51	J A 38	34	J A 53	J A 27	J A 38	J A 99	J A 67	J A 153	J A 95	43	J A 56	J A 62	40	39	J A 57	J A 71	J A 34	J A 45	42	J A 48	J A 53	28
28	40	40	40	40	32	J A 38	J A 53	J A 53	J A 61	J A 67	74	J A 68	J A 68	70	J A 95	56	34	85	J A 53	J A 53	J A 29	J A 57	J A J A 52	J A 33
29	22	39	27	37	45	J A 88	J A 63	J A 83	J A 62	J A 49	J A 101	117	J A 99	J A 87	37	41	39	J A 27	J A 23	J A 26	25	J A 21	34	J A 31
30	30	22	28	20	J A 26	J A 34	J A 49	J A 49	J A 61	J A 61	J A 94	37	J A 109	J A 37	34	J A 38	J A 38	38	38	J A 27	J A 30	J A 25	28	38
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	34	31	J A 29	30	32	J A 34	J A 42	J A 52	J A 62	J A 68	J A 72	J A 57	J A 62	J A 59	J A 58	J A 58	J A 54	54	J A 55	J A 49	J A 46	J A 45	J A 50	J A 38
U Q	J A 53	J A 40	J A 49	J A 37	J A 46	J A 47	J A 58	J A 86	J A 72	J A 88	J A 94	J A 76	J A 89	J A 109	J A 92	J A 75	J A 73	75	J A 64	J A 66	J A 77	J A 57	J A 59	J A 61
L Q	27	24	25	E B 22	25	27	34	J A 46	J A 51	J A 59	J A 60	48	52	48	40	40	37	37	J A 33	J A 35	J A 31	32	28	28

JUN. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 18	E B 17	16	E B 16	E B 16	20	G 24	A	A	36	36	36	A A 70	36	32	32	29	G 25	23	28	19	E B 16	E B 17	17
2	E B 17	E B 16	E B 16	E B 16	G 16	27	28	A A 86	43	38	37	34	37	37	33	33	28	23	24	G 17	21	E B 16	E B 16	16
3	E B 16	E B 16	E B 16	E B 15	E B 16	G 16	30	33	35	35	35	35	36	35	36	32	33	28	24	17	21	17	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	G 16	25	30	A 37	37	A A 58	40	34	35	36	32	32	32	A A 57	A	18	21	21	16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	23	30	31	39	A A 49	37	35	36	34	G 31	31	29	28	28	24	23	17	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 13	17	22	26	37	34	37	37	39	33	32	G 32	G 30	G 28	G 25	21	21	19	19	16	16
7	18	17	18	E B 16	G 16	26	26	30	A A 57	35	E A 42	36	41	37	28	G 30	30	A	22	G 17	E B 16	E B 16	16	E B 16
8	16	E B 16	16	E B 16	20	28	A A 63	A A 90	A A 94	E A 39	39	39	E A 46	A A 241	A A 257	A A 118	30	23	G 20	A A 51	19	23	18	18
9	E B 17	17	24	18	A A 61	A	30	A A 65	A A 62	37	A A 71	A A 76	A A 72	E A 45	A	G 29	30	A	A A 99	22	19	A A 116	A A 87	A A 61
10	27	18	17	17	E B 17	E B 22	E B 28	30	35	A A 77	A A 73	A A 62	A A 70	A A 117	A A 129	A A 117	A A 147	29	27	22	A A 136	A A 109	E B 16	A A 63
11	19	22	16	G 16	20	A A 65	A A 98	A A 118	A A 128	A A 175	A A 66	A	A A 107	A A 119	A A 62	32	32	30	33	22	20	17	A A 123	17
12	A A 85	17	16	16	17	G 18	29	34	A A 92	A A 88	A A 101	A A 63	38	43	36	31	G 31	G 25	25	20	19	19	19	19
13	E B 16	16	16	E B 16	16	24	27	30	34	A A 69	A A 62	A A 60	A	38	A A 73	36	31	A A 108	A A 130	22	22	20	16	18
14	E B 16	E B 16	E B 16	E B 15	16	28	A A 41	A A 46	A A 87	A	A A 72	36	35	35	39	33	33	30	23	20	20	21	A A 90	A A 87
15	22	A A 59	A A 63	A A 50	22	24	A A 36	A A 99	A A 105	A A 99	E A 36	35	A A 94	A A 119	A A 92	36	34	A A 71	A A 57	A A 56	23	20	17	17
16	17	16	E B 16	E B 16	16	G 24	29	31	A A 72	A A 110	36	A A 55	A A 57	A A 82	31	A A 70	A A 59	A A 62	22	21	30	E B 16	16	E B 16
17	16	E B 16	E B 16	E B 16	E B 15	26	28	A A 56	E A 43	A A 69	38	A	38	35	A A 51	A A 63	34	G 25	26	25	23	17	22	16
18	E B 16	17	E B 16	E B 16	E B 15	20	G 25	33	A A 48	36	36	36	36	30	30	A A 59	A A 60	A A 55	22	G 23	G 23	21	18	E B 16
19	E B 16	E B 16	E B 16	E B 16	G 16	G 16	27	G 21	A	A A 62	37	G 31	34	35	30	31	32	26	23	G 27	20	E B 16	E B 16	16
20	E B 16	16	E B 16	E B 16	E B 16	23	E A 37	30	G 30	32	37	G 34	36	33	34	32	29	29	G 20	22	16	E B 16	16	16
21	E B 16	E B 16	E B 16	E B 16	G 15	24	30	G 30	A A 99	E A 39	42	36	A A 58	A A 49	A A 60	A A 47	A A 62	30	26	24	26	23	20	20
22	22	16	16	16	17	25	26	A 35	32	34	36	36	36	A A 109	A A 96	31	34	26	22	A A 66	16	E B 16	E B 16	E B 16
23	E B 16	E B 16	E B 16	E B 16	G 17	28	A A 56	A A 72	A A 83	A A 102	A A 124	35	34	38	34	34	A A 73	31	24	G 16	G 22	A A 65	A A 84	21
24	E B 16	18	17	17	G 16	24	27	28	G 32	34	37	A A 84	36	A A 130	37	A A 67	32	A A 87	23	23	18	22	16	16
25	E B 16	E B 16	17	19	G 17	G 20	A A 178	A A 112	A A 72	A A 260	36	A A 60	37	36	A A 97	A A 167	A A 131	A A 146	A A 165	16	20	20	19	19
26	A A 160	A A 64	17	20	17	24	A A 66	A A 116	A A 63	A A 107	A A 83	A A 90	43	42	A A 121	A A 162	A A 118	A A 75	25	A 22	16	24	A A 53	20
27	A A 127	16	16	E B 16	16	G 21	A	28	A A 67	A	A	39	A A 56	37	35	35	A 33	26	25	21	17	20	20	18
28	E B 16	18	E B 16	E B 16	18	25	A A 53	A A 53	A A 61	A A 67	A A 74	A A 68	A A 68	A A 70	A A 95	A	32	A	A	25	21	17	E B 16	16
29	16	E B 16	E B 16	16	E B 16	23	A	A	A	38	A A 101	A A 117	A	A	36	33	30	26	21	G 16	E B 16	16	16	17
30	E B 17	E B 16	E B 16	E B 16	E B 16	22	A	31	36	36	A	36	36	35	33	28	28	28	22	G 17	E B 17	E B 17	E B 17	E B 17
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	27	28	27	28	28	28	28	29	29	29	30	27	28	30	30	30	30	30
MED	E B 16	16	E B 16	E B 16	16	24	30	34	A A 57	A 44	38	36	38	37	36	33	32	29	24	22	20	19	16	17
U Q	18	17	16	16	17	26	A A 41	A A 68	A A 83	A A 82	A A 72	A A 61	A A 58	A A 76	A A 82	A A 61	A A 34	A A 57	26	24	22	21	A A 20	19
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	G 22	27	30	35	36	36	35	36	35	32	31	30	G 26	22	G 18	18	E B 16	E B 16	E B 16

JUN. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

IONOSPHERIC DATA STATION Wakkanai

JUN. 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	321	306	327	304	319	330	356	318	338	329	310	322	A	258	312	334	297	316	314	311	311	324	316	316
2	346	349	F 320	316	320	309	330	A	338	351	333	279	281	288	285	G	307	302	329	309	330	337	317	341
3	333	F 322	F 314	F 310	340	336	295	326	351	317	320	349	U R 290	G	U R 263	317	324	327	306	312	313	338	357	333
4	328	328	320	324	319	355	320	333	344	A	320	276	G	297	321	301	294	A	308	307	316	321	344	337
5	324	322	320	297	309	278	264	279	356	A	R 268	265	295	261	312	327	318	318	316	298	308	325	334	319
6	338	320	311	F 307	327	317	349	343	315	321	297	291	317	330	300	313	289	349	326	308	302	311	316	333
7	346	343	341	329	326	336	337	281	A	345	330	296	323	298	303	G	312	311	308	323	350	330	328	312
8	318	307	317	F 304	384	226	A	A	A	222	330	301	326	A	A	A	331	306	301	A	305	305	323	302
9	F 347	303	F 317	326	A	334	357	A	A	370	A	A	A	317	285	344	304	313	A	305	312	A	A	A
10	F 310	326	305	340	310	364	349	326	356	A	A	A	A	A	A	A	A	227	319	334	A	A	315	A
11	F 303	F 312	F 317	316	317	A	A	A	A	A	A	311	A	A	A	287	298	327	314	314	318	311	A	326
12	A	337	323	334	F 302	331	346	G	A	A	A	A	260	330	330	332	314	343	321	304	322	312	325	319
13	306	325	321	F 309	F 347	376	343	399	353	A	A	A	318	290	A	284	297	A	A	315	323	328	311	F 314
14	F 307	F 305	F 299	F 326	322	G	A	A	A	267	A	297	302	G	283	G	297	289	303	303	323	372	A	A
15	230	A	A	A	275	364	272	A	A	A	260	356	A	A	A	G	303	A	A	199	319	334	310	308
16	348	352	307	310	330	344	356	318	A	A	306	A	A	A	G	A	A	A	309	302	315	355	332	313
17	336	310	316	F 275	F 309	341	246	A	344	A	322	332	R 309	G	A	A	290	309	307	330	320	F 281	304	312
18	320	333	336	338	333	349	313	300	A	329	351	334	289	281	299	A	A	A	314	320	346	305	344	F 309
19	321	320	347	320	339	372	310	307	338	A	365	282	G	270	360	241	305	318	322	330	320	321	314	315
20	339	322	324	F 319	352	319	255	279	G	G	302	285	338	293	308	323	295	304	318	320	316	331	322	322
21	326	331	309	306	313	325	348	334	A	323	342	346	A	A	A	A	A	229	214	311	325	322	F 314	F 309
22	F 331	F 344	321	F 305	326	350	287	329	237	374	G	G	296	A	A	283	322	341	304	A	320	287	F 287	302
23	309	319	F 307	300	313	314	A	A	A	A	A	G	R 281	307	322	342	A	342	345	346	315	A	A	331
24	320	320	324	332	302	338	326	333	317	331	292	A	G	A	R 225	A	213	A	329	342	334	306	301	309
25	338	F 300	330	361	331	318	A	A	A	A	256	A	320	323	A	A	A	A	A	313	343	F 317	313	337
26	A	A	F 323	F 308	341	376	A	A	A	A	A	A	337	251	A	A	A	A	320	218	364	327	A	306
27	A	300	311	301	323	326	298	327	A	336	305	312	A	305	300	322	283	294	310	327	315	323	320	325
28	325	344	341	298	317	338	A	A	A	A	A	A	A	A	A	299	330	337	308	337	315	307	337	318
29	332	F 277	F 310	F 310	338	F 332	385	368	345	348	A	A	295	332	333	274	311	316	316	302	320	367	387	325
30	F 301	F 298	F 292	301	322	348	275	345	G	344	293	294	G	G	305	307	311	311	302	318	324	310	373	325
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	29	29	29	29	23	19	15	16	20	20	21	21	19	21	23	22	26	28	29	27	25	27
MED	325	321	320	310	322	336	326	326	338	330	308	296	295	290	303	301	304	314	314	312	320	322	320	318
U Q	338	332	324	326	336	350	349	334	351	346	330	327	319	312	321	325	314	327	320	325	324	331	336	326
L Q	F 310	306	310	304	313	318	287	300	315	319	292	280	G 270	G 254	285	G 258	295	304	307	304	315	310	314	309

JUN. 2019 M(3000)F2 (0.01)

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L	L	L	L	L	L	L	A	L	L	L	L	L	A	A	A			
2					L	L	A	A	A	L	L	L	L	L	L	L	L	L	L	L				
3						L	L	A	A	L	L	L	L	L	L	L	L	L	364	L				
4					L	365	377	L	L	A	L	L	L	L	387	L	380	A	A	342				
5					L	L	L	L	A	A	A	L	L	417	L	L	L	L	L					
6							L	L	L	L	L	L	L	L	L	L	L	L	L	L				
7					L	L	A	A	A	L	A	L	A	A	L	L	L	A	A	L				
8						L	A	A	A	A	L	L	A	A	A	A	L	361	L	A	L			
9				L	A	A	L	A	A	L	A	A	A	A	A	L	347	A	A					
10				L	L	A	A	L	L	A	A	A	A	A	A	A	A	427	L	A	A			
11						A	A	A	A	A	A	A	A	A	A	L	373	L		A	L			
12						L	A	318	A	A	A	A	L	A	L	385	L	L	L	L				
13					L	L	A	L	A	A	A	A	L	L	A	L	L	A	A					
14					L	350	A	A	A	L	A	L	L	L	A	392	L	L	A		A			
15				A	L	A	A	A	A	A	338	420	A	A	A	L	L	A	A	A	L			
16				L	L	L	L	L	A	A	L	A	A	A	L	A	A	A	A					
17						L	L	A	A	A	L	A	A	L	A	A	L	L	L					
18						L	L	L	A	L	388	L	L	441	L	A	A		L					
19						L	L	L	A	A	L	363	L	L	L	L	L	L	L	A				
20					L	L	L	398	L	L	417	L	L	L	L	L	L	L	L					
21						L	L	L	A	A	A	L	A	A	A	A	A	L	L					
22					L	L	L	L	L	L	439	412	L	A	A	L	L	L	L					
23						L	A	A	A	A	A	415	L	L	L	L	A	L	L	L				
24					L	L	L	L	L	L	L	A	420	A	L	A	L	A	L					
25						L	A	A	A	A	L	A	L	L	A	A	A	A	A	L				
26					L	L	A	A	A	A	A	A	A	L	A	A	A	A	L	A				
27					L	L	A	L	A	L	A	A	A	L	L	L	A	L	L					
28					L	L	A	A	A	A	A	A	A	A	A	L	L	L	A	L				
29					A	A	A	A	A	L	A	A	A	A	L	L	L	L	L	L				
30						L	A	L	427	L	A	L	L	L	L	L	L	L	L	L				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	1	2	1		4	4	1	2	1	2	3	2	1	1				
MED						358	377	358	427		402	414	420	429	387	388	373	394	364	342				
U Q											428	418					380							
L Q											363	388					347							

JUN. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 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						274	260	262	294	322	358	358	A 456	368	312	354	308	290	314	278				
2					278	316	342	A 324	280	288	G 332	416	386	378	G	352	332	312	272					
3						222	392	314	276	310	326	294	390	G	G 392	370	338	314	314	278				
4					292	250	312	312	264	A	316	410	G	374	336	380	372	A	318	280				
5					310	400	424	400	292	A	E A 442	390	390	458	340	326	334	302	326					
6							288	290	294	348	418	422	326	326	380	358	372	272	284	284				
7					278	280	288	344	A 286	308	388	364	384	368	G	354	A 352	314	260					
8						A	A	A	A	E A 290	352	358	326	A	A	A	320	338	310	A	282			
9				282	A	A 284	278	A	A	266	A	A	A	340	E A 324	294	358	320	A					
10				246	268	220	238	330	304	A	A	A	A	A	A	A	A	442	294	286	A			
11						A	A	A	A	A	A	A 336	A	A	A	402	394	308		288	294			
12						276	274	G	A	A	A	A	482	290	312	324	346	312	298	298				
13					226	238	246	220	282	A	A	A	352	376	A	410	352	A	A					
14					284	G	A	A	A	A	A	378	378	G	364	G	350	390	336		284			
15				A 326	A	244	A	A	A	A	A 350	274	A	A	A	G	A	A	A	A	290			
16				244	288	264	292	324	A	A	362	A	A	A	G	A	A	A	306					
17						224	390	A	286	A	312	322	290	G	A	A	362	348	312					
18						216	414	G 356	A	338	290	316	416	434	396	A	A		304					
19						246	346	236	A	A	272	374	G	A	364	364	352	344	314	314				
20					226	256	468	402	G	G	402	428	314	368	358	338	352	352	304					
21						296	278	288	A	346	300	302	A	A	A	A	A	A	346					
22					284	260	A	292	412	266	G	G	274	A	A	430	332	292	330					
23						312	A	A	A	A	A	G	394	336	342	G 330	A	294	280	240				
24					254	272	330	338	338	320	386	A	G	A	A	A	A	A	278					
25						336	A	A	A	A	416	A	326	326	A	A	A	A	A	274				
26					252	262	A	A	A	A	A	A	302	512	A	A	A	A	302	A				
27					276	326	306	306	A	294	356	370	A	376	370	314	314	356	290					
28					290	304	A	A	A	A	A	A	A	A	A	352	300	280	312	266				
29					290	A	A	224	282	272	A	A	368	290	308	G 312	338	338	324	298				
30						254	A	306	G	306	A	384	G	G	370	346	300	366	302	280				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				3	16	25	20	19	14	15	19	20	21	20	18	21	21	21	25	15	5			
MED				246	281	272	299	312	294	306	351	372	378	380	366	358	352	332	310	280	284			
U Q				282	290	308	368	344	338	338	402	400	G 449	G 485	378	G 420	356	352	316	298	292			
L Q				244	261	248	276	288	282	280	308	327	326	338	340	325	333	305	296	272	280			

JUN. 2019 h'F2 (KM)

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IONOSPHERIC DATA STATION Wakkanai

JUN. 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	254	240	246	254	248	210	200	A	A	196	196	192	A	206	200	200	200	200	A	A	A	224	226	226
2	230	218	228	216	226	238	A	A	A	202	194	196	186	186	196	216	206	A	226	226	254	220	236	216
3	226	Q 224	216	Q 238	226	222	A	A	A	190	188	184	180	188	202	194	194	198	198	222	246	232	208	208
4	230	238	246	246	218	200	216	A	206	A	208	A	196	196	196	188	200	A	A	A	236	210	210	208
5	214	238	254	274	218	218	218	206	A	A	A	184	186	190	210	206	206	228	244	276	276	252	234	226
6	226	234	Q 240	Q 236	242	206	206	210	210	186	192	228	184	192	178	192	196	196	196	228	252	244	236	236
7	214	238	226	224	218	196	A	A	A	242	A	200	A	A	198	198	198	A	A	210	210	210	210	244
8	248	Q 256	Q 238	238	208	246	A	A	A	A	260	242	A	A	A	A	210	210	210	A	220	242	238	276
9	Q 204	254	248	182	A	A	200	A	A	200	A	A	A	A	A	200	216	A	A	264	264	A	A	A
10	A 284	248	264	208	220	A	A	220	198	A	A	A	A	A	A	A	A	216	226	A	A	A	206	A
11	Q 246	Q 258	262	244	234	A	A	A	A	A	A	A	A	A	A	188	216	206	308	A	230	240	A	216
12	A	216	216	204	254	226	A	240	A	A	A	A	190	A	194	208	194	A	212	210	214	254	230	254
13	226	226	226	226	198	198	A	196	A	A	A	A	A	204	A	A	204	A	A	236	246	228	228	262
14	Q 262	248	Q 242	Q 208	208	238	A	A	A	A	A	198	198	186	A	196	210	234	A	234	A	234	A	A
15	206	A	A	A	A	A	A	A	A	A	A	186	A	A	A	206	A	A	A	A	230	230	230	230
16	250	212	196	210	204	204	206	246	A	A	230	A	A	A	186	A	A	A	A	222	244	206	206	258
17	226	256	236	Q 234	216	194	212	A	A	A	194	A	A	190	A	A	210	202	A	236	222	Q 244	230	220
18	236	248	230	194	248	186	210	220	A	202	198	198	198	200	186	A	A	A	216	222	222	262	222	Q 236
19	Q 218	226	208	210	224	234	216	208	A	A	190	A	184	180	180	188	210	210	202	A	232	218	244	232
20	222	244	226	236	198	198	A	198	198	192	192	184	194	188	194	194	194	200	226	236	240	232	232	232
21	234	208	256	Q 236	254	216	216	202	A	A	A	188	A	A	A	A	A	232	212	242	232	244	234	236
22	218	Q 224	264	266	194	204	218	A	234	192	182	196	200	A	A	200	200	200	200	A	236	254	Q 254	236
23	232	232	232	Q 232	256	218	A	A	A	A	A	190	172	192	204	204	A	204	216	200	254	A	A	216
24	238	216	216	232	206	230	206	206	182	182	A	A	182	A	208	A	A	A	218	234	248	256	246	244
25	Q 206	Q 214	236	250	220	198	A	A	A	A	182	A	198	202	A	A	A	A	A	228	228	228	188	230
26	A	A	214	Q 234	210	200	A	A	A	A	A	A	A	A	A	A	A	A	206	A	230	230	A	250
27	A	200	260	Q 244	200	200	A	206	A	A	A	A	A	196	192	210	A	194	194	224	238	252	252	236
28	236	236	236	252	222	222	A	A	A	A	A	A	A	A	A	A	222	A	A	228	236	236	222	222
29	236	Q 260	Q 266	252	A	A	A	A	A	194	A	A	A	A	202	H 180	180	218	202	212	244	208	196	228
30	Q 254	E B 258	Q 258	Q 244	238	200	A	A	200	200	A	190	182	204	182	190	A	186	200	210	236	236	206	214
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	29	29	27	25	12	12	7	12	13	15	15	16	17	19	19	17	19	21	27	27	25	27
MED	230	236	236	236	220	206	211	207	200	195	194	192	186	192	196	198	204	204	212	228	236	234	230	232
U Q	246	248	255	245	238	224	216	220	210	201	203	198	198	201	202	206	210	217	226	236	246	244	236	244
L Q	218	221	226	213	208	199	206	204	198	191	189	186	182	188	186	190	196	199	200	217	230	224	209	220

IONOSPHERIC DATA STATION Wakkanai

JUN. 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		98	112	112	112	112	98	98	98	98	A	A	98	98	104	A	A	A			
2				102	130	108	100	100	100	100	100	100	100	106	106	106	94	A	A	108	108	A			
3				B	B	110	110	98	106	106	106	106	A	102	102	108	98	102	112	A	A				
4				100	116	102	102	102	106	106	106	102	102	106	A	A	104	104	104	A	A				
5				B	B	108	108	108	108	108	108	108	100	96	116	106	106	106	106	A	A				
6				B	128	102	102	102	102	102	102	102	102	92	100	100	112	112	110	A	B				
7				A	150	108	108	108	108	108	108	100	100	A	A	100	104	104	104	110	A				
8				A	A	126	108	108	108	108	108	108	108	108	108	106	A	A	96	114	A				
9				A	A	A	114	110	110	110	110	110	110	110	110	110	110	110	110	A					
10				A	A	110	110	110	110	110	110	102	102	102	102	102	102	102	116	116	A				
11				114	126	120	108	108	108	108	104	104	104	104	100	104	112	102	102	A	A				
12				A	A	104	110	110	110	106	96	96	110	A	108	A	A	108	104	A	A				
13				A	A	116	112	112	112	112	112	106	A	106	106	106	106	106	106	A					
14					A	106	106	106	106	106	106	106	106	106	106	106	106	106	106		A				
15				A	106	A	108	108	108	108	108	104	104	A	A	104	104	104	114	A	A				
16				B	E A 140	108	100	100	114	112	112	112	96	96	104	A	104	104	100	A	A				
17				B	104	108	108	108	102	102	102	102	A	A	A	102	102	102	110	A	A				
18				B	B	116	116	116	106	106	106	106	106	A	106	A	A		A	106	106				
19				B	122	122	108	106	106	106	106	106	106	A	A	A	94	A	94	B	102				
20				B	B	104	104	104	110	110	110	106	106	106	100	104	104	104	104						
21				B	126	90	106	116	104	104	104	104	96	102	108	108	108	108	108	108	B				
22				B	94	98	92	100	100	100	102	102	102	102	102	102	102	118	104		B				
23				B	128	112	112	108	108	108	108	98	98	98	112	108	108	108	A	106	106				
24				A	106	118	108	108	108	108	100	100	A	92	A	100	100	100	96	A	A				
25				B	96	104	104	104	104	104	104	A	A	A	104	104	104	104	A	A	B				
26				B	A	104	104	104	104	104	104	92	94	94	104	100	110	110	A	A	B				
27				B	A	96	96	96	96	96	96	96	96	102	102	102	102	102	102	A	B				
28				B	A	124	106	106	106	106	106	106	106	106	106	106	106	106	90	A	B				
29				B	A	110	102	102	102	102	102	102	102	102	102	102	102	102	102	102	B				
30				B		A	102	94	94	102	102	102	100	100	100	A	A	A	A	100	98				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				3	15	27	30	30	30	30	30	29	25	22	23	24	25	25	24	9	4			
MED				102	119	108	108	107	106	106	106	102	102	102	104	104	104	104	104	108	104			
U Q				114	128	116	110	108	108	108	108	106	106	106	108	106	107	108	109	112	106			
L Q				100	104	104	102	102	104	102	102	100	99	98	102	101	102	102	102	104	100			

JUN. 2019 h'E (KM)

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IONOSPHERIC DATA STATION Wakkanai

JUN. 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	100	100	90	96	92	114	106	112	98	102	102	102	92	92	92	100	100	122	102	102	120	98	92	92
2	92	92	B	86	140	118	112	102	104	104	106	106	102	102	98	98	90	90	108	108	104	92	92	92
3	92	B	B	B	B	120	110	106	104	104	104	92	92	92	92	86	92	104	112	104	100	100	100	96
4	96	96	94	88	120	114	114	114	104	104	104	96	96	96	90	96	122	116	104	104	102	100	100	100
5	B	B	92	B	B	112	116	120	106	106	106	84	92	102	104	104	100	106	106	98	108	106	106	104
6	90	102	92	98	92	122	106	106	98	96	106	102	98	102	176	104	96	106	118	118	108	108	108	108
7	98	98	98	98	158	104	112	112	110	104	104	104	96	96	96	96	96	106	106	114	104	B	104	104
8	100	126	98	98	114	118	112	112	112	112	112	104	108	108	100	92	98	98	98	98	102	102	102	102
9	102	98	96	96	96	96	114	114	110	116	104	104	102	102	102	108	112	118	118	110	110	110	106	96
10	92	92	96	96	96	94	118	114	114	114	108	108	106	106	106	106	106	106	110	110	110	104	104	104
11	98	98	98	116	116	116	116	110	108	114	108	108	104	104	100	102	174	112	104	104	100	112	106	104
12	104	98	98	96	88	120	114	112	108	104	100	100	114	96	100	98	96	106	106	106	100	100	100	100
13	100	94	94	94	82	122	102	112	108	98	98	96	96	104	100	100	136	106	106	106	106	106	98	98
14	98	90	90	B	96	122	110	110	102	102	102	106	106	102	102	130	120	114	102	102	102	102	102	102
15	96	96	94	94	82	96	110	110	106	106	92	90	94	106	90	112	110	110	116	106	106	100	100	100
16	92	92	92	B	96	96	118	118	106	100	112	100	98	98	156	94	100	106	104	106	100	112	100	100
17	92	92	92	92	92	192	126	108	108	98	100	106	98	98	98	98	98	106	114	114	106	106	108	96
18	100	92	92	100	B	110	140	110	100	100	100	100	100	100	100	100	90	94	94	94	94	104	104	100
19	92	92	92	B	140	116	116	108	108	108	108	102	102	100	90	90	94	96	106	106	100	B	100	98
20	98	90	90	100	B	122	112	112	112	112	112	96	108	108	132	152	136	112	112	112	112	112	110	94
21	102	96	96	82	142	124	88	120	108	102	102	102	112	118	118	112	108	108	116	104	98	98	110	110
22	92	92	92	86	88	126	108	108	106	102	102	108	106	96	98	98	114	130	114	100	110	110	98	100
23	88	88	88	B	108	118	118	106	106	106	96	94	94	106	106	106	98	98	102	102	106	106	106	106
24	106	100	100	96	104	112	106	118	102	102	108	102	104	100	98	108	108	104	104	106	110	106	106	98
25	98	98	104	98	98	120	120	108	108	108	110	114	98	100	104	104	104	104	112	112	112	112	90	110
26	112	100	98	98	88	88	118	104	106	106	106	96	110	110	110	110	102	102	118	114	104	104	104	104
27	104	104	104	104	104	110	102	102	110	110	104	118	118	82	118	118	118	102	102	102	102	102	102	102
28	102	98	98	94	94	116	108	108	108	108	108	100	100	100	100	100	118	104	104	112	116	106	124	106
29	96	96	96	100	110	90	108	108	108	108	108	104	106	102	102	102	102	102	130	84	98	98	104	104
30	94	94	110	90	90	104	104	104	104	110	96	96	104	98	146	94	94	94	94	112	100	108	104	104
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	28	24	26	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30
MED	98	96	95	96	96	116	112	110	107	105	104	102	102	101	100	101	102	106	106	106	104	105	104	101
U Q	101	98	98	98	114	120	116	112	108	108	108	106	106	104	106	108	114	110	114	112	110	108	106	104
L Q	92	92	92	93	92	104	108	108	104	102	102	96	96	98	98	98	96	102	104	102	100	100	100	98

IONOSPHERIC DATA STATION Wakkanai

JUN. 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	F2	F4	L1	LC11	CQ11	CL21	C3	C3	C2	C2	C2	C3	L2	L2	C2	C2	C2	L5	L7	L7	F3	F4	F4
2	F2	F1		C1	C1	C4	C5	C7	C2	C2	C2	C1	C2	C1	LC11	L3	L3	L3	C2	C5	L3	F3	F2	F4
3	F2					F3	C4	C3	C3	C3	C2	C2	L2	C2	LC11	LC21	LC32	C3	C2	C2	L6	F5	FF11	F1
4	F2	F2	F2	C1	C1	C3	C3	C3	C3	C3	C3	C3	C2	L3	L3	L3	CL22	C5	C5	L6	LL41	F4	F3	F1
5			F1			C3	C3	C4	C3	C3	C2	C1	C1	C1	C1	C2	C2	C2	C5	L4	L4	F4	F1	F1
6	F2	F1	F1	C1	LC11	C2	C4	C3	C3	C2	C1	C2	C2	C2	C2	C1	C2	C4	C2	C4	C3	F4	F3	F3
7	F4	FF41	F4	L2	HH11	LC13	C3	C4	C3	C2	C3	C2	C3	L3	L3	LC21	LC21	C6	C6	C3	L3		F3	F1
8	F3	FF11	FQ11	LQ21	L2	C4	C7	C7	CQ41	C2	C2	C2	C3	C4	Q2	C4	LQ31	LQ31	LQ31	C5	L4	F8	FF42	F7
9	FQ31	FQ41	FQ41	LQ41	L5	L3	C2	C8	C5	C2	C2	C3	C3	C3	C3	C1	C2	C3	C3	L7	L8	F8	FQ52	F7
10	F6	F4	FQ31	LQ32	LQ31	CQ21	CQ21	C2	C2	C3	C3	C4	C2	C3	C3	C6	C4	C3	C3	C8	L8	F8	F9	F9
11	FF82	F5	FQ31	LC11	LC41	C4	C7	C8	C7	CQ62	CQ21	CQ21	CQ41	CQ31	CQ31	L1	HL11	C3	C3	L4	L4	F9	F8	F6
12	F7	F4	F2	F3	L4	C2	C3	C3	C4	C4	C6	C3	C2	C3	L2	L4	L3	C3	C5	L5	L5	F4	F8	F3
13	F3	F4	F4	L1	L2	C3	C5	C4	C2	C2	C3	C2	L2	C2	C3	C3	C2	C8	C7	L4	L6	F8	F2	F6
14	F2	F2	FF21		L1	C4	C3	C3	C3	C3	C2	C2	C1	C2	C1	C1	C3	C3	C5	L5	L6	F4	FQ41	FQ51
15	F9	F7	F8	L9	C2	C4	C4	C5	C3	C4	C2	C2	C4	C4	C2	CL21	C3	C5	C5	L7	L8	F5	F6	F5
16	F5	F3	F1		LC11	LH11	C2	C2	C3	C3	C2	C2	C2	C2	HL12	L4	C3	C5	C4	L5	L4	F1	F2	F3
17	FF21	FQ21	F2	LQ11	L2	H1	C2	C3	C3	C4	C3	C3	L3	L2	L3	C4	C3	C2	C4	C3	C3	FQ32	F8	F3
18	F3	F2	F3	L1		CL21	HL21	C2	C3	C2	C2	C2	C2	L2	L2	L4	L4	L4	L2	LC42	LC42	F7	F3	F2
19	F1	F1	F2		C1	C5	C3	C4	C3	C3	C3	C2	C2	L2	L3	L3	C4	C3	C3	L6	L2		F2	F3
20	F3	F4	F2	L1		C2	C5	C3	C1	C2	C2	C1	C1	LC11	C2	H1	C1	C2	C3	L4	L1	F1	FQ21	FQ31
21	FQ21	F1	F2	L1	H1	C2	LC12	C2	C5	C3	C2	C2	C2	C2	C4	C3	C3	C5	C4	C8	C7	F7	F5	F4
22	F8	F3	F2	F4	L3	C4	C5	C3	CQ31	C2	C2	C1	C2	C3	C6	C3	C2	C2	C2	C8	L7	F2	F3	F3
23	F1	F1	F1		LC11	CC14	C4	C5	C5	C3	C4	C2	C1	C2	C2	C2	C3	C4	L5	C1	C4	F8	F8	F7
24	F4	F6	F7	L4	L1	CL42	C2	C2	C2	C2	C2	C2	L2	CQ31	LQ31	C5	C4	C6	C3	L4	L4	F4	F2	F3
25	F3	F2	F5	LL41	L2	CL32	C4	C4	C5	C4	C2	CL22	L2	L2	C4	C5	C5	C6	LQ31	LQ31	LQ51	F5	F4	F3
26	F5	F8	F6	L3	L3	LC12	C4	C3	C3	C7	C3	C4	C2	C3	C4	C7	C6	C7	L2	L6	L3	F5	F5	F5
27	F7	F3	FF22	L2	L2	C5	C3	C2	C3	C3	C3	C2	C2	LC11	C2	C2	C3	C3	C3	L4	L7	F4	F5	F3
28	F4	F5	F2	L4	L4	C5	C5	C5	C6	C5	C4	C3	C3	C3	C4	C3	CL31	C5	C6	L5	L3	F4	F1	F3
29	F2	F2	F2	L2	L7	C7	C4	C4	C3	C3	C2	C4	C2	C2	C2	C2	C2	LC21	HC11	LC11	L1	F3	F3	F4
30	F1	F1	F1	L1	L1	L3	C4	C3	C3	C2	C3	C1	C2	C3	CL11	L3	L2	L4	L3	C2	C2	FF12	F2	F8
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUN. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	A	X 42	X 38	A	A															X 78	A	56	A	X 49
2	X 44	45	46	45	45	50														A	A	A	A	A
3	A	A	A	A	A															X 67	X 74	X 62	X 55	54
4	X 39	43	43	A	X 33															X 63	78	79	X 52	X 41
5	43	X 39	X 38	X 36	X 34															X 66	X 72	X 68	69	60
6	54	X 47	X 43	X 42	X 38															X 49	X 54	X 51	X 53	X 49
7	X 50	X 45	X 43	42	40															X 61	65	58	56	58
8	58	60	X 49	X 45	42															X 60	61	66	A	60
9	X 44	60	A	43	38															X 64	A	A	62	A
10	60	X 54	A	A	X 45															X 72	X 66	X 52	X 51	X 49
11	X 49	X 45	46	X 42	44															A	X 70	60	X 54	X 50
12	X 48	54	48	X 41	43															X 62	X 67	X 66	61	X 54
13	X 52	A	55	X 44	X 50															X 62	X 58	X 54	59	X 53
14	X 49	48	45	X 46	42															X 59	X 64	X 47	A	X 38
15	42	X 36	40	X 32	38															A	61	X 54	X 53	X 46
16	41	X 46	43	X 37	X 38															X 64	X 74	68	A	46
17	46	42	40	40	39															X 63	69	X 54	59	55
18	44	43	39	40	40															X 70	73	X 51	45	X 44
19	46	42	44	38	X 36															X 62	X 53	X 50	50	52
20	46	48	41	X 34	40															X 68	X 69	X 61	X 59	X 56
21	X 50	X 48	50	X 43	X 39															X 66	X 66	X 67	66	61
22	62	59	58	54	X 42															X 59	X 57	X 55	52	45
23	X 37	43	43	X 37	X 30															A	X 57	X 51	X 47	X 45
24	X 41	42	41	X 36	40															X 60	X 69	X 54	A	44
25	40	40	39	38	X 35															X 65	X 62	X 59	X 56	X 44
26	X 42	43	X 39	41	46															X 64	X 66	X 50	X 44	X 46
27	X 47	X 44	44	X 37	X 36															X 59	X 61	X 60	X 54	X 52
28	X 53	X 43	X 37	X 36	39															A	X 54	X 54	X 54	A
29	X 44	X 35	X 36	41	X 35	X 43														X 70	X 84	X 56	X 31	X 30
30	X 32	A	X 32	X 32	38															X 58	X 68	X 54	X 33	X 34
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	27	26	28	2														25	27	28	24	27
MED	X 46	44	43	X 40	39	46														X 63	X 66	X 56	X 54	X 49
U Q	50	48	46	X 43	42															X 66	X 70	X 62	59	54
L Q	X 42	42	X 39	X 37	X 37															X 60	X 61	X 53	X 50	X 44

IONOSPHERIC DATA STATION Kokubunji

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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						A	A	A	A	A	A	A	A	A	A	A	UL 416	360	A					
2							A	A	A	A	428	A	A	A	A	A	A	A	A					
3						A	A	A	A	420	UL 448	UL 440	UL 440	UL 424	UL 432	UL 416	396	A	A					
4							A	A	A	A	A	A	A	A	A	A	A	A	A					
5						276	A	A	L	A	A	A	UL 428	A	A	A	A	A	A					
6							A	A	A	A	A	A	A	A	A	A	A	UL 368	A					
7						L	A	A	A	A	A	UL 440	A	A	UL 424	UL 416	A	364	A					
8							A	A	A	A	A	A	A	A	A	A	A	UL 380	A					
9						UL 308	L	UL 416	A	A	A	A	A	A	A	A	A	A	A					
10							A	A	A	A	A	A	A	A	A	A	A	A	A					
11								A	420	A	A	A	A	A	A	A	A	A	A					
12							A	A	A	A	A	A	A	A	A	A	A	A	A					
13							A	A	A	A	A	A	A	A	A	A	A	A	A					
14						UL 304	A	A	A	A	A	A	A	420	UL 424	A	A	A	A					
15							A	A	A	A	A	A	A	A	A	A	A	A	A					
16									A	A	A	A	A	A	UL 412	380	384	364	A					
17									A	A	A	A	A	A	A	A	A	A	A					
18						A	A	372	A	A	A	A	A	A	A	A	A	A	A					
19							UL 372	A	400	A	A	A	UL 436	UL 420	A	384	384	A	324					
20							340	396	UL 408	UL 416	UL 444	440	440	UL 436	A	UL 400	384	360	UL 312					
21						L	352	396	416	A	A	A	UL 436	A	UL 316	A	A	A	312					
22						UL 328	364	380	UL 428	A	A	A	A	UL 432	UL 404	A	A	A	A					
23							A	A	A	A	A	A	A	A	A	A	A	A	A					
24								A	400	A	A	A	A	A	A	UL 416	A	368	L					
25							352	UL 388	A	416	A	A	A	A	A	A	UL 408	A	324					
26						UL 304	A	A	A	A	A	A	A	A	UL 424	UL 408	A	A	A					
27						L	UL 348	UL 388	UL 392	UL 424	420	A	A	A	A	A	A	A	A					
28							356	372	UL 412	A	A	A	A	A	UL 428	A	UL 448	A	A					
29							344	UL 388	A	A	A	A	UL 440	A	A	A	A	UL 356	320					
30							UL 348	A	A	UL 436	A	A	A	A	A	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						5	9	9	8	5	4	3	6	5	8	7	7	8	5					
MED						UL 304	352	388	410	UL 420	436	UL 440	UL 438	UL 424	UL 424	UL 408	396	364	320					
U Q						UL 318	360	396	418	UL 430	UL 446	UL 440	UL 440	UL 434	UL 426	UL 416	UL 416	UL 368	324					
L Q						290	346	376	400	416	424	440	UL 436	420	UL 408	384	384	360	312					

JUN. 2019 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

JUN. 2019 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	A	A	A	A	A	A	A	U A 348	A	A	A	A	B					
2						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
3						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
4						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
5						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
6						U R 184	A	A	A	A	A	A	A	A	A	A	A	A	B					
7						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
8						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
9						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
10						B	A	U A 272	A	A	A	A	A	A	A	A	A	A	A					
11						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
12						A	A	A	A	A	A	A	A	A	A	A	A	A	B					
13						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
14						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
15						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
16						U R 200	U A 244	A	A	A	A	A	A	A	A	A	A	A	A					
17						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
18						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
19						A	A	A	A	A	A	A	A	R	A	A	A	A	A					
20						A	A	A	A	U R 332	A	356	380	A	A	U R 312	U R 284	248	A					
21						B	A	A	R	A	A	A	A	A	A	A	A	A	A					
22						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
23						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
24						U A 184	A	A	A	A	A	A	A	U A 328	A	A	A	A	A					
25						B	U A 268	A	U A 336	A	A	A	A	A	A	A	A	A	A					
26						U A 192	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						B	U R 252	U R 304	A	U R 348	A	A	U A 348	A	U A 336	A	A	A	A					
28						U R 208	A	A	A	A	A	A	A	A	A	A	A	A	A					
29							A	A	A	A	A	A	A	A	A	A	A	A	A					
30						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						5	3	2	1	2		1	2	2	1	1	1	1						
MED						U R 192	U A 252	U 288	U A 336	U R 340		356	364	U A 338	U A 336	U R 312	U R 284	248						
U Q						U R 204	U A 268																	
L Q						U 184	U A 244																	

JUN. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	J A 64	J A 64	J A 43	J A 82	J A 55	J A 67	J A 50	J A 85	J A 56	J A 79	J A 94	J A 94	J A 67	44	J A 98	J A 155	J A 156	J A 38	J A 155	J A 156	J A 112	J A 53	J A 130	J A 107
2	J A 35	J A 42	J A 35	J A 36	J A 32	25	J A 62	J A 66	J A 122	J A 87	J A 44	J A 49	J A 57	J A 75	J A 91	J A 120	J A 144	J A 148	J A 122	J A 136	J A 156	J A 104	J A 112	J A 148
3	J A 130	J A 88	J A 49	J A 45	J A 45	J A 56	J A 76	J A 102	J A 90	J A 52	J A 44	J A 48	42	J A 44	J A 42	J A 39	J A 45	J A 63	J A 92	J A 44	J A 87	J A 52	J A 37	J A 54
4	J A 66	J A 33	J A 36	J A 62	J A 38	25	J A 51	J A 44	J A 56	J A 56	J A 60	J A 66	J A 76	J A 68	J A 104	J A 98	J A 84	J A 115	J A 155	J A 92	J A 34	J A 50	J A 35	J A 51
5	J A 44	24	J A 33	J A 27	J A 27	26	J A 38	J A 54	J A 61	J A 64	J A 69	J A 73	42	J A 53	44	J A 50	J A 58	J A 142	J A 130	J A 74	J A 51	J A 44	J A 37	J A 29
6	J A 29	22	E B 14	J A 26	J A 31	G	J A 38	J A 65	J A 45	J A 50	J A 60	J A 53	J A 80	J A 69	J A 77	J A 112	J A 79	J A 41	J A 85	J A 37	J A 37	J A 45	J A 43	J A 37
7	J A 38	J A 33	J A 23	J A 23	E B 16	J A 29	J A 38	54	J A 69	J A 52	J A 62	J A 52	J A 64	J A 60	38	J A 39	J A 71	J A 38	J A 55	J A 44	J A 88	J A 36	J A 52	J A 85
8	J A 85	J A 124	J A 66	J A 54	23	28	J A 52	J A 71	J A 106	J A 130	J A 87	J A 88	J A 106	J A 70	J A 88	J A 78	J A 51	J A 46	J A 48	J A 45	J A 147	J A 153	J A 67	J A 36
9	J A 65	J A 42	J A 67	J A 79	J A 34	J A 26	31	37	J A 56	J A 89	J A 130	J A 98	J A 119	J A 94	J A 143	J A 106	J A 64	J A 104	J A 89	J A 88	J A 131	J A 155	J A 134	J A 155
10	J A 102	J A 55	J A 79	J A 74	J A 54	22	J A 34	J A 54	J A 47	J A 81	J A 61	J A 75	J A 73	J A 65	J A 57	J A 53	J A 72	J A 53	J A 58	J A 52	J A 30	J A 36	J A 31	J A 24
11	J A 27	J A 38	J A 26	J A 27	J A 26	22	30	J A 54	J A 77	J A 87	J A 86	J A 154	J A 154	J A 94	J A 98	J A 74	J A 91	J A 201	J A 142	J A 155	J A 146	J A 50	J A 66	J A 46
12	J A 34	J A 43	J A 37	J A 35	E B 16	28	J A 60	J A 74	J A 91	J A 156	J A 86	J A 68	J A 141	J A 122	J A 77	J A 104	J A 76	J A 100	J A 94	J A 56	J A 44	J A 86	J A 56	J A 68
13	J A 53	J A 120	J A 66	J A 53	J A 79	30	J A 60	J A 68	J A 77	J A 110	J A 64	J A 52	J A 47	J A 50	J A 122	J A 64	J A 60	J A 98	J A 88	J A 87	J A 106	J A 39	J A 67	J A 65
14	J A 48	J A 34	J A 38	J A 29	E B 15	J A 30	J A 54	J A 77	J A 82	J A 68	J A 66	J A 82	J A 72	J A 39	J A 49	J A 74	J A 155	J A 140	J A 86	J A 122	J A 122	J A 110	J A 53	J A 86
15	J A 52	J A 49	J A 74	J A 33	J A 34	J A 36	J A 37	J A 48	J A 70	J A 52	J A 97	J A 140	J A 160	J A 103	J A 80	J A 53	J A 84	J A 80	J A 57	J A 62	J A 110	J A 54	J A 54	J A 80
16	J A 156	J A 124	J A 35	J A 74	J A 49	G	32	35	J A 48	J A 62	J A 73	J A 66	J A 49	J A 56	J A 58	37	J A 58	30	J A 45	J A 36	J A 53	J A 43	J A 106	J A 78
17	J A 46	J A 36	J A 46	J A 66	J A 38	J A 34	35	J A 44	J A 65	J A 91	J A 79	J A 52	J A 58	J A 59	J A 76	J A 70	J A 65	J A 42	J A 39	J A 49	J A 52	J A 106	J A 46	J A 48
18	J A 34	J A 49	J A 36	23	J A 34	J A 35	36	J A 40	J A 52	J A 60	J A 75	J A 104	J A 95	J A 122	J A 112	J A 128	J A 99	J A 44	J A 55	J A 120	J A 53	J A 47	J A 54	J A 49
19	J A 46	J A 34	J A 26	E B 16	E B 14	24	34	J A 57	J A 49	J A 78	J A 52	J A 49	J A 43	G	40	J A 36	34	35	J A 34	J A 33	J A 52	J A 52	J A 45	J A 50
20	J A 52	22	J A 34	J A 26	J A 24	25	J A 37	J A 41	J A 70	G	34	40	43	38	J A 51	G	G	31	26	J A 25	J A 25	J A 27	J A 30	J A 33
21	J A 31	J A 29	J A 36	J A 24	23	J A 24	30	J A 61	G	J A 64	J A 52	J A 51	40	J A 57	J A 37	J A 50	J A 55	J A 63	28	J A 34	J A 87	J A 53	J A 79	J A 55
22	J A 72	J A 51	J A 66	J A 44	J A 34	25	J A 35	J A 46	J A 44	J A 47	42	J A 82	J A 54	J A 46	37	J A 48	J A 58	J A 103	J A 40	J A 53	J A 43	J A 37	J A 31	J A 33
23	J A 29	21	23	J A 36	J A 54	23	J A 52	J A 51	J A 67	J A 78	J A 61	J A 111	J A 146	J A 95	J A 54	J A 54	J A 58	J A 99	J A 100	J A 68	J A 50	E B 16	21	J A 52
24	J A 53	J A 86	J A 34	J A 29	E B 15	21	32	J A 89	J A 87	J A 56	J A 76	J A 80	J A 54	42	J A 58	J A 47	J A 51	32	J A 32	J A 35	J A 30	J A 33	J A 48	J A 43
25	J A 50	J A 29	J A 27	J A 24	J A 32	24	35	J A 47	40	J A 47	J A 85	J A 72	J A 111	J A 80	J A 69	J A 96	J A 133	J A 104	J A 82	J A 42	J A 42	30	J A 87	J A 36
26	J A 36	J A 42	J A 37	J A 34	J A 30	26	J A 54	J A 90	J A 87	J A 88	J A 120	J A 99	J A 47	J A 48	J A 47	37	J A 86	J A 82	J A 93	J A 57	22	J A 30	E B 15	J A 22
27	J A 28	J A 29	J A 26	J A 27	25	J A 22	G	G	38	G	40	J A 53	44	J A 59	J A 53	J A 68	J A 50	J A 54	J A 54	J A 40	J A 101	J A 64	J A 41	J A 28
28	J A 38	J A 23	J A 36	J A 28	22	J A 28	30	33	J A 46	J A 57	J A 56	J A 61	J A 83	J A 53	41	J A 76	J A 144	J A 154	J A 100	J A 87	J A 84	J A 29	J A 78	J A 66
29	J A 86	J A 110	J A 28	J A 25	J A 28	J A 36	J A 37	J A 47	J A 65	J A 103	J A 111	J A 67	41	J A 107	J A 80	J A 57	J A 44	J A 33	26	J A 30	J A 36	J A 22	25	E B 16
30	J A 51	J A 73	J A 49	J A 28	J A 67	J A 48	J A 32	J A 45	J A 90	38	J A 49	J A 63	J A 79	J A 156	J A 123	J A 127	J A 47	J A 74	J A 52	J A 50	J A 54	J A 53	J A 46	J A 26
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 49	J A 42	J A 36	J A 31	J A 32	26	J A 37	J A 54	J A 65	J A 64	J A 65	J A 68	J A 66	J A 60	J A 64	J A 66	J A 64	J A 68	J A 70	J A 52	J A 53	J A 48	J A 50	J A 50
U Q	J A 65	J A 64	J A 49	J A 53	J A 38	J A 30	J A 52	J A 68	J A 82	J A 87	J A 86	J A 88	J A 95	J A 94	J A 91	J A 98	J A 86	J A 104	J A 94	J A 87	J A 106	J A 54	J A 67	J A 68
L Q	J A 35	29	J A 28	J A 26	E B 23	24	32	44	J A 48	J A 52	J A 52	J A 52	47	48	47	J A 48	J A 51	41	J A 45	J A 40	J A 42	J A 36	J A 37	J A 33

JUN. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	A A 64	20	26	A A 82	A A 55	25	31	A A 85	A A 56	A A 79	A A 94	A A 94	A A 67	42	A A 98	A A 155	33	30	50	46	A A 112	24	A A 130	23
2	21	23	23	E B 15	18	23	44	47	A A 122	A A 87	38	A A 49	A A 57	A A 75	A A 91	A A 120	A A 144	A A 148	A A 122	A A 136	A A 156	A A 104	A A 112	A A 148
3	A A 130	A A 88	A A 49	A A 45	A A 45	A A 56	A A 76	A A 102	46	38	36	37	36	38	38	34	32	A A 63	44	30	23	33	22	22
4	22	22	21	A A 62	22	22	43	39	46	45	A A 60	A A 66	A A 76	A A 68	A A 104	46	A A 84	A A 115	A A 155	23	23	22	19	E B 16
5	E B 16	E B 16	20	20	17	24	34	45	45	A A 64	A A 69	A A 73	36	A A 53	41	46	48	A A 142	A A 130	30	28	29	29	E B 16
6	E B 16	E B 16	E B 14	E B 15	20	G	31	A A 65	39	A A 50	A A 60	44	A A 80	A A 69	A A 77	A A 112	A A 79	26	33	31	22	28	29	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	22	30	43	A A 69	48	A A 62	38	A A 64	A A 60	36	34	45	31	44	30	40	20	21	26
8	30	28	23	22	16	25	A A 52	A A 71	A A 106	A A 130	A A 87	A A 88	A A 106	A A 70	A A 88	A A 78	A A 51	32	42	31	21	E B 17	A A 67	23
9	32	22	A A 67	17	E B 15	23	28	35	A A 56	A A 89	A A 130	A A 98	A A 119	A A 94	A A 143	A A 106	A A 64	A A 104	34	35	A A 131	A A 155	20	A A 155
10	43	40	A A 79	A A 74	34	19	28	37	40	A A 81	A A 61	A A 75	A A 73	A A 65	A A 57	41	A A 72	39	47	36	24	23	22	18
11	E B 16	21	19	18	17	21	28	A A 54	35	44	A A 86	A A 154	A A 154	A A 94	A A 98	A A 74	A A 91	A A 201	A A 142	A A 155	30	E B 16	24	29
12	25	23	21	E B 17	E B 16	26	A A 60	A A 74	A A 91	A A 156	A A 86	A A 68	A A 141	A A 122	A A 77	A A 104	A A 76	A A 100	A A 94	40	30	24	42	25
13	40	A A 120	21	20	22	25	A A 60	A A 68	A A 77	A A 110	44	47	42	42	A A 122	47	45	A A 98	A A 88	51	24	21	40	24
14	22	24	22	16	E B 15	23	A A 54	A A 77	A A 82	A A 68	A A 66	A A 82	A A 72	36	35	A A 74	A A 155	A A 140	40	22	34	21	A A 53	22
15	20	22	22	E B 16	18	22	30	A A 48	A A 70	45	A A 97	A A 140	A A 160	A A 103	A A 80	36	A A 84	A A 80	A A 57	A A 62	24	24	22	20
16	18	E B 16	E B 16	20	20	G	29	32	42	43	A A 73	41	42	A A 56	34	34	30	27	38	27	41	19	A A 106	20
17	20	18	21	20	E B 16	24	32	33	A A 65	A A 91	A A 79	A A 52	A A 58	A A 59	A A 76	A A 70	A A 65	36	30	33	28	20	22	20
18	20	21	20	16	19	28	32	34	43	52	A A 75	A A 104	A A 95	A A 122	A A 112	A A 128	A A 99	34	47	44	22	E B 16	16	16
19	E B 16	E B 16	E B 16	E B 16	E B 14	22	31	37	34	A A 78	44	39	39	G	A A 40	32	33	34	22	E B 16	21	22	21	22
20	19	E B 16	22	E B 16	E B 15	21	30	32	33	G	32	37	41	37	A A 51	G	G	29	22	19	20	E B 17	19	20
21	20	21	E B 16	E B 16	E B 16	19	28	32	G	A A 64	44	44	37	A A 57	27	41	48	A A 63	24	22	22	26	31	39
22	24	22	32	E B 16	E B 15	23	27	33	35	40	42	A A 82	A A 54	38	35	41	A A 58	A A 103	31	24	18	19	19	19
23	E B 16	E B 16	E B 16	20	20	19	A A 52	40	A A 67	A A 78	A A 61	A A 111	A A 146	A A 95	44	43	A A 58	A A 99	A A 100	A A 68	29	E B 16	E B 16	E B 16
24	25	18	19	E B 16	E B 15	20	29	A A 89	35	42	A A 76	A A 80	44	40	49	37	42	30	25	28	23	23	A A 48	28
25	20	19	20	18	E B 16	23	27	32	39	35	A A 85	A A 72	A A 111	47	A A 69	A A 96	32	48	23	24	21	23	26	20
26	20	22	18	22	17	20	38	A A 90	46	A A 88	45	A A 99	42	42	38	33	A A 86	41	33	39	E B 16	18	E B 15	E B 15
27	E B 16	E B 16	E B 16	E B 16	E B 16	16	G	G	34	G	38	A A 53	42	A A 59	45	A A 68	42	48	45	31	23	34	32	21
28	23	E B 16	18	E B 16	E B 16	G 20	28	32	35	49	46	A A 61	A A 83	A A 53	37	A A 76	36	51	A A 100	A A 87	24	E B 16	36	A A 66
29	21	22	18	17	E B 15	26	29	33	A A 65	A A 103	A A 111	A A 67	39	A A 107	55	47	41	30	20	22	22	E B 17	E B 17	E B 16
30	19	A A 73	22	E B 16	E B 16	28	26	38	A A 90	34	A A 49	A A 63	A A 79	A A 156	A A 123	A A 127	40	A A 74	32	30	24	35	22	20
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	20	21	20	17	16	22	30	40	46	A A 58	A A 62	A A 68	A A 66	A A 59	A A 56	47	50	50	43	31	24	22	23	20
U Q	25	23	22	20	20	25	A A 43	A A 68	A A 69	A A 87	A A 85	A A 88	A A 95	A A 94	A A 91	A A 96	A A 79	A A 100	A A 88	A A 44	30	26	A A 40	25
L Q	E B 18	E B 16	E B 18	E B 16	E B 16	20	28	33	35	43	44	47	42	42	38	37	40	32	31	24	22	E B 18	20	E B 18

JUN. 2019 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Kokubunji

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	A	321	320	A	A	360	360	A	A	A	A	A	A	332	A	A	292	302	321	343	A	F	A	320
2	324	F	F	F	F	F	348	332	A	A	370	A	A	A	A	A	A	A	A	A	A	A	A	A
3	A	A	A	A	A	A	A	A	338	345	309	329	F	275	301	313	303	A	326	326	318	355	310	F
4	330	F	F	A	334	356	364	366	341	388	A	A	A	A	A	342	A	A	A	297	F	F	380	324
5	F	320	308	315	320	309	322	365	366	A	A	A	294	A	298	339	315	A	A	310	334	344	F	F
6	F	323	317	349	346	357	359	A	343	A	A	353	A	A	A	A	A	354	341	331	317	304	314	320
7	327	312	320	F	F	356	340	353	A	369	A	276	A	A	309	316	324	343	360	344	F	F	F	F
8	F	F	345	372	F	394	A	A	A	A	A	A	A	A	A	A	A	312	329	330	F	F	A	F
9	F	F	A	F	F	335	399	340	A	A	A	A	A	A	A	A	A	A	294	313	A	A	F	A
10	F	327	A	A	332	371	381	353	356	A	A	A	A	A	A	295	A	312	321	342	353	325	311	325
11	319	314	F	321	F	355	355	A	350	349	A	A	A	A	A	A	A	A	A	A	349	F	335	310
12	314	F	F	340	F	382	A	A	A	A	A	A	A	A	A	A	A	A	A	228	330	343	F	341
13	324	A	F	324	373	324	A	A	A	A	318	316	352	284	A	330	324	A	A	324	329	331	F	300
14	317	F	F	344	F	355	A	A	A	A	A	A	A	340	311	A	A	A	287	326	342	319	A	321
15	F	304	F	323	F	372	347	A	A	380	A	A	A	A	A	303	A	A	A	A	F	325	350	327
16	F	320	F	324	337	372	385	395	310	331	A	313	331	A	R	296	275	278	322	310	343	F	A	F
17	F	F	F	F	F	378	384	368	A	A	A	A	A	A	A	A	A	303	321	338	F	339	F	F
18	F	F	F	F	F	357	314	330	351	389	A	A	A	A	A	A	A	291	308	306	F	353	F	339
19	F	F	F	F	299	349	312	311	360	A	347	359	R	R	A	294	324	331	339	347	322	288	F	F
20	F	F	F	335	F	381	304	321	349	371	335	342	324	309	A	291	294	303	314	332	328	312	325	333
21	306	309	F	328	335	339	310	321	336	A	358	337	R 273	A	256	324	311	A	325	330	311	320	F	F
22	F	F	F	F	320	328	335	381	R 279	361	351	A	A	297	291	300	A	A	335	351	321	362	F	F
23	292	F	F	331	351	388	A	348	A	A	A	A	A	A	305	333	A	A	A	A	332	341	327	328
24	318	F	F	320	F	366	311	A	332	365	A	A	329	300	340	306	275	354	320	316	343	349	A	F
25	F	F	F	F	330	349	336	301	354	339	A	A	A	352	A	A	282	340	331	340	330	325	341	320
26	329	F	322	F	F	305	343	A	326	A	306	A	351	316	277	264	A	323	335	334	343	353	302	316
27	313	318	F	294	300	355	241	350	274	335	349	A	296	A	328	A	281	342	351	323	306	321	315	334
28	335	343	354	332	F	338	277	330	352	378	297	A	A	A	294	A		349	A	A	328	291	318	A
29	332	315	289	F	310	328	376	378	A	A	A	A	296	A	315	344	326	307	309	330	384	398	321	328
30	337	A	347	325	F	333	344	324	A	279	A	A	A	A	A	A		A	315	313	355	393	343	323
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	12	9	16	13	28	24	19	17	14	10	8	9	9	12	16	13	16	21	25	21	22	14	17
MED	324	319	320	326	332	356	344	348	343	363	341	333	324	309	303	310	303	318	322	330	330	335	323	324
U Q	330	322	346	338	342	372	362	366	353	378	351	348	341	336	313	332	324	342	335	339	343	353	341	330
L Q	314	313	312	322	315	336	313	324	329	339	309	314	295	290	292	296	282	303	314	313	322	320	314	320

IONOSPHERIC DATA STATION Kokubunji

JUN. 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						A	A	A	A	A	A	A	A	A	A	A	UL 377	380	A					
2							A	A	A	A	421	A	A	A	A	A	A	A	A					
3						A	A	A	A	420	UL 415	UL 428	UL 422	UL 415	UL 431	UL 396	394	A	A					
4							A	A	A	A	A	A	A	A	A	A	A	A	A					
5						352	A	A	L	A	A	A	UL 415	A	A	A	A	A	A					
6							A	A	A	A	A	A	A	A	A	A	A	UL 370	A					
7						L	A	A	A	A	A	UL 417	A	A	UL 422	UL 379	A	399	A					
8							A	A	A	A	A	A	A	A	A	A	A	UL 364	A					
9						UL 358	L	UL 386	A	A	A	A	A	A	A	A	A	A	A					
10							A	A	A	A	A	A	A	A	A	A	A	A	A					
11								A	402	A	A	A	A	A	A	A	A	A	A					
12							A	A	A	A	A	A	A	A	A	A	A	A	A					
13							A	A	A	A	A	A	A	A	A	A	A	A	A					
14						UL 407	A	A	A	A	A	A	A	414	UL 408	A	A	A	A					
15							A	A	A	A	A	A	A	A	A	A	A	A	A					
16									A	A	A	A	A	A	UL 431	430	386	382	A					
17									A	A	A	A	A	A	A	A	A	A	A					
18						A	A	387	A	A	A	A	A	A	A	A	A	A	A					
19							UL 347	A	400	A	A	A	UL 446	UL 428	A	436	378	A	382					
20							370	366	UL 416	UL 425	UL 416	420	397	UL 395	A	UL 428	395	368	UL 368					
21						L	370	389	391	A	A	A	UL 388	A	UL 472	A	A	A	373					
22						UL 347	364	408	UL 400	A	A	A	A	UL 453	UL 454	A	A	A	A					
23							A	A	A	A	A	A	A	A	A	A	A	A	A					
24								A	420	A	A	A	A	A	A	UL 388	A	388	L					
25							404	UL 408	A	430	A	A	A	A	A	A	UL 396	A	378					
26						UL 350	A	A	A	A	A	A	A	A	UL 436	UL 405	A	A	A					
27						L	UL 431	UL 378	UL 436	UL 405	453	A	A	A	A	A	A	A	A					
28							359	402	UL 389	A	A	A	A	A	UL 416	A	UL 340	A	A					
29							408	UL 391	A	A	A	A	UL 454	A	A	A	A	UL 400	386					
30							UL 395	A	A	UL 424	A	A	A	A	A	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						5	9	9	8	5	4	3	6	5	8	7	7	8	5					
MED						UL 352	370	389	401	UL 424	418	UL 420	UL 418	UL 415	UL 431	UL 405	386	381	378					
U Q						UL 382	406	405	UL 418	428	437	UL 428	UL 446	UL 440	UL 445	430	395	394	384					
L Q						UL 348	362	UL 382	396	412	UL 416	UL 417	397	404	UL 419	UL 388	UL 377	UL 369	370					

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JUN. 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						230	252	A	A	A	A	A	A	312	A	A	406	334	E A 282					
2							E A 234	E A 340	A	A	274	A	A	A	A	A	A	A	A					
3						A	A	A	E A 282	286	344	316	R	454	340	342	360	A	E A 306					
4							E A 280	254	E A 298	230	A	A	A	A	A	268	A	A	A					
5						406	330	E A 252	278	A	A	A	366	A	374	286	E A 354	A	A					
6							242	A	E A 274	A	A	276	A	A	A	A	A	262	E A 278					
7						268	E A 250	E A 282	A	E A 238	A	E A 414	A	A	336	320	E A 314	252	E A 242					
8							A	A	A	A	A	A	A	A	A	A	A	346	E A 320					
9						334	220	320	A	A	A	A	A	A	A	A	A	A	E A 318					
10							240	E A 286	274	A	A	A	A	A	A	E A 374	A	E A 310	E A 326					
11								A	272	276	A	A	A	A	A	A	A	A	A					
12							A	A	A	A	A	A	A	A	A	A	A	A	A					
13							A	A	A	A	322	E A 332	288	418	A	320	E A 322	A	A					
14						424	A	A	A	A	A	A	A	298	396	A	A	A	E A 396					
15							232	A	A	236	A	A	A	A	A	380	A	A	A					
16									E A 358	314	A	354	312	A	R	400	412	398	E A 298					
17									A	A	A	A	A	A	A	A	A	330	284					
18						E A 260	E A 352	324	E A 308	E A 264	A	A	A	A	A	A	A	362	E A 356					
19							374	354	256	A	288	292	R 424	456	A	372	346	292	272					
20							386	346	282	242	314	310	332	366	A	382	384	336	304					
21						270	344	330	288	A	268	322	392	A	438	320	E A 366	A	276					
22						320	286	232	400	280	266	A	A	E A 398	378	360	A	A	270					
23							A	E A 286	A	A	A	A	A	A	352	304	A	A	A					
24								A	300	274	A	A	E A 330	378	E A 316	350	432	284	292					
25							292	362	264	314	A	A	A	E A 282	A	A	E A 408	E A 322	272					
26						328	E A 316	A	E A 320	A	386	A	270	360	E A 442	434	A	294	248					
27						270	E A 408	274	340	274	274	A	E A 404	A	E A 334	A	E A 410	E A 270	E A 248					
28							428	306	256	238	E A 366	A	A	A	424	A	310	E A 266	A					
29							246	246	A	A	A	A	362	A	E A 372	E A 278	306	342	312					
30							294	312	A	376	A	A	A	A	A	A	E A 336	A	326					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						10	20	17	17	14	10	8	10	10	12	16	15	16	21					
MED						295	U 270	296	278	274	291	310	339	368	368	338	U 348	309	E A 292					
U Q						334	348	335	E A 314	286	344	E A 343	392	418	410	377	408	339	E A 319					
L Q						268	244	264	273	238	274	301	312	312	338	312	322	277	272					

JUN. 2019 h'F2 (KM)

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	A	E A 254	E A 310	A	A	A	A	A	A	A	A	A	A	A	A	A	208	E A 244	A	E A 238	A	E A 242	A	E A 244
2	E A 254	E A 276	E A 232	E B 238	E A 238	214	A	A	A	A	208	A	A	A	A	A	A	A	A	A	A	A	A	A
3	A	A	A	A	A	A	A	A	A	196	194	174	184	210	182	194	204	A	A	E A 254	216	206	E A 236	202
4	E A 248	E A 280	E A 264	A	E A 284	208	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 282	E A 256	218	202	210
5	E B 264	E B 256	E A 292	E A 282	E A 280	E A 246	A	A	222	A	A	A	204	A	A	A	A	A	A	E A 252	E A 248	222	E A 256	224
6	222	222	E B 236	E B 234	226	198	A	A	A	A	A	A	A	A	A	A	A	206	A	E A 256	E A 250	E A 292	E A 252	224
7	224	210	222	E B 252	E B 230	214	A	A	A	A	A	208	A	A	194	218	A	208	A	220	E A 326	E A 272	E A 248	E A 290
8	E A 282	E A 290	220	216	220	198	A	A	A	A	A	A	A	A	A	A	A	222	A	232	226	200	A	E A 302
9	E A 286	E A 308	A	224	E B 282	220	192	208	A	A	A	A	A	A	A	A	A	A	A	E A 268	A	A	E A 248	A
10	E A 306	E A 314	A	A	E A 290	214	A	A	A	A	A	A	A	A	A	A	A	A	A	232	194	222	E A 272	E A 234
11	E B 236	E A 264	226	218	E A 246	204	200	A	204	A	A	A	A	A	A	A	A	A	A	A	202	212	E A 240	E A 270
12	E A 284	E A 286	E A 238	214	214	192	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 284	E A 240	220	E A 238	E A 260
13	E A 312	A	E A 244	E A 234	212	220	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 338	232	E A 248	E A 292	E A 234
14	E A 262	E A 260	E A 296	214	190	208	A	A	A	A	A	A	A	200	194	A	A	A	A	E A 246	222	E A 252	A	202
15	E A 242	E A 294	E A 300	230	E A 254	220	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 244	E A 242	218	E A 236
16	E A 342	E B 240	202	E A 272	206	196	202	210	A	A	A	A	A	A	194	190	214	202	A	E A 256	218	E A 242	A	E A 306
17	E A 274	E A 258	E A 250	E A 304	E B 244	206	226	212	A	A	A	A	A	A	A	A	A	A	A	232	222	204	E A 274	E A 274
18	224	228	E A 272	224	E A 240	A	A	E A 238	A	A	A	A	A	A	A	A	A	A	A	E A 246	202	190	224	E B 242
19	E B 288	E B 260	214	E B 208	214	206	E A 244	A	206	A	A	A	190	188	A	176	210	A	210	196	208	E A 238	E A 238	E A 308
20	E A 236	218	E A 238	E B 218	194	194	E A 256	224	190	178	176	192	216	196	A	186	194	224	202	E A 236	216	230	238	222
21	216	E A 252	236	216	230	200	214	218	210	A	A	A	196	A	196	A	A	A	226	230	E A 234	232	222	E A 280
22	228	E A 268	E A 314	226	224	220	218	200	196	A	A	A	A	184	180	A	A	A	A	226	216	204	E A 282	E A 292
23	E B 276	E B 236	E B 234	E A 272	E A 292	202	A	A	A	A	A	A	A	A	A	A	A	A	A	A	216	208	216	226
24	E A 258	E A 280	E A 274	E B 236	216	208	210	A	204	A	A	A	A	A	A	222	A	220	206	E A 260	218	208	A	E A 270
25	E A 304	E A 286	E A 246	E A 242	E B 240	210	204	220	A	192	A	A	A	A	A	A	186	A	194	226	226	226	E A 240	216
26	E A 250	E A 294	E A 238	E A 278	224	216	A	A	A	A	A	A	A	A	194	190	A	A	A	E A 252	208	208	E B 258	E B 244
27	E B 248	E B 244	E B 246	232	224	204	194	208	188	202	194	A	A	A	A	A	A	A	A	230	218	E A 236	E A 278	228
28	E A 234	E B 236	222	232	220	216	204	204	212	A	A	A	A	A	198	A	216	A	A	A	E A 230	E B 258	E A 274	A
29	E A 244	E A 296	E A 288	E A 278	E B 254	230	194	214	A	A	A	A	184	A	A	A	A	200	216	E A 240	190	174	E B 264	E B 266
30	E A 294	A	E A 294	E B 256	E B 254	E A 270	206	A	A	190	A	A	A	A	A	A	A	A	A	E A 272	212	206	E A 280	E A 288
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	27	26	28	27	14	11	9	5	4	3	6	5	8	7	7	8	6	25	27	28	24	27
MED	E A 256	E A 260	E A 244	E 233	U 211	208	204	211	204	192	194	192	193	196	194	190	208	210	208	E A 246	213	213	E A 248	E A 244
U Q	E A 285	E A 286	E A 288	E A 256	E A 254	220	218	220	211	199	201	208	204	205	195	218	214	223	216	E A 258	E A 234	E A 242	E A 273	E A 280
L Q	236	240	232	218	218	202	200	208	193	184	185	174	184	186	188	186	194	204	202	231	212	207	237	224

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JUN. 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		A	A	A	A	A	A	110	A	A	A	A	B					
2						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
3						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
4						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
5						B	108	A	A	A	A	A	A	A	A	A	A	A	B					
6						114	A	A	A	A	A	A	A	A	A	A	A	A	B					
7						B	120	A	A	A	A	A	A	A	A	A	A	A	A					
8						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
9						B	110	108	102	A	A	A	A	A	A	A	A	A	A					
10						B	A	114	A	A	A	A	A	A	A	A	A	A	A					
11						110	110	A	A	A	A	A	A	A	A	A	A	A	A					
12						114	A	A	A	A	A	A	A	A	A	A	A	A	B					
13						126	A	A	A	A	A	A	A	A	A	A	A	A	A					
14						118	A	A	A	A	A	A	A	A	A	A	A	A	A					
15						112	A	A	A	A	A	A	A	A	A	110	A	A	A					
16						108	110	110	A	A	A	A	A	A	A	A	A	108	A					
17						A	114	A	A	A	A	A	A	A	A	A	A	A	A					
18						A	114	112	A	A	A	A	A	A	A	A	A	110	A					
19						112	114	A	A	A	A	A	A	110	A	A	114	112	A					
20						114	112	A	A	108	A	108	112	110	A	112	112	112	108					
21						B	112	A	108	A	A	A	A	A	A	108	A	A	108					
22						110	A	A	A	110	A	A	A	A	A	108	108	A	A					
23						108	A	A	A	A	A	A	A	A	A	A	A	A	A					
24						108	108	A	A	A	A	A	A	108	108	A	A	108	A					
25						B	108	A	108	A	A	A	A	A	A	A	A	A	A					
26						118	A	A	A	A	A	A	A	114	110	112	A	A	A					
27						B	112	112	108	110	110	A	112	110	110	A	A	A	A					
28						112	108	108	A	A	A	A	A	A	A	A	A	A	A					
29							A	A	A	A	A	A	108	A	A	A	A	A	A					
30						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						14	14	6	4	3	1	1	3	6	3	5	3	5	2					
MED						112	111	111	108	110	110	108	112	110	110	110	112	110	108					
U Q						114	114	112	108	110			112	110	110	112	114	112						
L Q						110	108	108	105	108			108	110	108	108	108	108						

JUN. 2019 h'E (KM)

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	92	88	88	88	88	88	100	96	96	96	90	88	88	118	98	92	98	102	98	86	84	94	94	94
2	90	90	86	88	86	114	100	102	96	92	92	90	92	88	86	86	92	94	92	96	96	96	92	88
3	86	88	86	78	74	94	98	94	92	92	92	92	92	88	90	90	88	86	86	86	94	94	96	94
4	90	90	84	82	82	102	102	98	96	96	92	86	86	84	84	86	98	92	92	92	90	94	94	88
5	88	88	88	88	88	124	112	98	96	94	94	90	92	92	98	96	92	94	88	86	84	84	92	86
6	90	90	B	82	80	G	106	102	92	90	92	92	92	82	88	84	86	88	82	84	80	88	96	90
7	92	92	86	86	B	122	114	102	100	92	92	98	90	92	98	98	92	88	88	88	96	102	92	92
8	92	88	86	86	86	124	104	100	98	94	98	98	94	92	90	90	98	102	102	98	96	100	96	94
9	94	94	94	90	90	128	126	120	114	98	96	100	96	92	88	92	100	96	96	92	96	98	96	90
10	90	90	86	90	86	128	104	112	96	102	98	98	100	100	100	102	100	98	94	92	90	92	90	88
11	88	86	88	86	86	122	120	104	98	102	96	90	88	88	90	104	100	90	90	88	90	90	90	90
12	86	84	82	80	B	118	100	100	98	94	94	92	92	92	86	86	82	84	82	88	82	96	94	94
13	88	86	84	84	84	128	102	100	94	94	90	94	96	96	94	96	96	96	92	88	88	96	96	94
14	92	92	88	88	B	128	102	102	96	94	96	90	86	96	90	86	90	90	92	92	88	90	94	90
15	86	84	90	84	92	112	106	96	92	92	84	88	86	88	88	116	102	98	94	92	92	94	96	96
16	90	90	90	84	82	G	120	108	98	98	98	92	92	96	90	92	98	114	92	90	90	94	94	90
17	88	84	84	84	84	86	114	100	96	94	94	92	92	94	90	96	94	94	96	96	96	96	94	98
18	92	88	88	86	84	90	108	110	98	100	100	94	94	94	92	88	100	108	98	96	96	94	98	96
19	92	94	108	B	B	118	120	102	96	92	92	92	96	G	142	96	120	114	96	90	88	88	98	96
20	92	92	82	92	86	116	116	96	94	G	96	134	142	114	104	G	G	156	120	96	90	96	94	92
21	88	86	86	86	86	124	124	98	G	98	98	96	114	94	96	120	102	96	110	98	96	96	96	94
22	88	88	88	86	90	118	94	94	102	114	100	98	102	98	102	126	110	98	98	94	92	84	88	94
23	88	100	94	92	88	124	106	102	102	100	96	94	92	94	94	94	92	88	80	80	78	B	78	92
24	90	90	90	98	B	150	124	94	94	94	88	88	88	114	112	104	100	108	104	98	96	94	94	94
25	96	94	86	82	104	124	116	96	168	104	98	92	90	100	102	98	94	94	92	98	98	100	96	96
26	92	92	80	88	82	128	106	94	94	94	88	92	98	108	114	110	94	90	88	82	80	88	B	100
27	100	104	92	98	94	100	G	G	114	G	120	104	134	116	116	98	94	92	96	94	98	94	94	94
28	94	92	90	88	88	90	124	116	104	100	96	96	92	98	100	100	98	100	96	94	96	112	106	104
29	98	98	96	92	90	96	98	98	96	100	100	96	112	94	94	94	94	94	98	98	86	86	86	B
30	104	102	94	86	92	90	94	98	94	96	100	92	90	86	86	86	88	90	96	84	84	84	86	84
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	29	25	28	29	29	29	28	30	30	30	29	30	29	29	30	30	30	30	29	29	29
MED	90	90	88	86	86	118	106	100	96	95	96	92	92	94	94	96	96	94	94	92	90	94	94	94
U Q	92	92	90	89	90	124	118	102	99	100	98	96	96	99	100	101	100	100	98	96	96	96	96	95
L Q	88	88	86	84	84	98	101	96	94	94	92	90	90	90	90	89	92	90	90	88	86	89	92	90

JUN. 2019 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	F8	F5	F5	F8	F8	L4	L3	L4	L3	L2	L3	L3	L2	C1	L4	L4	L3	L2	L3	F5	F4	F5	F5	F4
2	F6	F5	F6	F3	F2	C2	L3	L3	L4	L4	L1	L2	L2	L3	L3	L3	L6	L6	L5	F6	F5	F4	F4	F6
3	F5	F4	F4	F3	F3	L3	L4	L5	L2	L2	L2	L1	L1	L2	L2	L2	LC22	L3	L5	F4	F5	F4	F6	F5
4	F4	F4	F5	F6	F3	L2	L4	L3	L3	L3	L3	L3	L3	L3	L4	L2	L4	L6	L5	F4	F7	F6	F3	F2
5	F3	F2	F5	F3	F2	CL11	C3	L4	L3	L3	L3	L3	L1	L3	L2	L3	L3	L4	L3	F3	F4	F4	F6	F2
6	F3	F2		F2	F2		L3	L4	L2	L2	L2	L2	L3	L2	L3	L3	L3	L2	L4	F3	F4	F4	F5	F2
7	F2	F2	F2	F2		C5	C3	L3	L4	L3	L3	L2	L3	L2	L1	L2	L4	L3	L4	F4	F6	F2	F4	F5
8	F5	F4	F3	F4	F1	C2	L3	L4	L5	L5	L3	L3	L4	L4	L4	L3	L2	L2	L4	F6	F3	F3	F7	F6
9	F9	F8	F7	F4	F3	C3	C2	C2	C3	L5	L5	L4	L4	L4	L4	L4	L4	L5	L3	F4	F6	F6	F4	F5
10	F7	F6	F5	F6	F4	CL22	L2	C5	L2	L3	L2	L2	L3	L2	L3	L2	L3	L4	L6	F4	F8	F4	F7	F2
11	F4	F7	F5	F4	F2	C2	C2	L4	L3	L2	L3	L4	L5	L4	L3	L4	L5	L4	L4	F5	F5	F2	F5	F5
12	F6	F7	F3	F2		C3	L4	L5	L4	L4	L3	L3	L3	L3	L4	L3	L4	L3	L4	F4	F5	F6	F5	F6
13	F9	F5	F6	F3	F4	C4	L3	L4	L3	L3	L2	LL11	L1	L2	L3	L3	L2	L4	L5	F4	F5	F7	F7	F5
14	F4	F7	F6	F4		C3	L6	L3	L3	L4	L3	L3	L2	L1	L2	L2	L3	L4	L4	F4	F5	F4	F8	F4
15	F4	F6	F4	F2	F5	C4	L2	L3	L4	L2	L2	L4	L4	L4	L3	C2	L4	L5	L6	F5	F4	F7	F4	F5
16	F6	F5	F2	F6	F5		C3	C2	L2	L2	L3	LC21	L2	L2	L1	L2	L2	C2	L4	F6	F5	F5	F7	F5
17	F6	F5	F5	F3	F2	L4	C2	L2	L4	L3	L3	L2	L2	L2	L3	L3	L3	L3	L4	F6	F4	F4	F6	F5
18	F5	F4	F3	F1	F2	L3	CL32	C2	L2	L3	L4	L2	L2	L3	L4	L4	L3	C3	L6	F5	F3	F2	F2	F4
19	F2	F2	F1			C2	C3	L2	L2	L4	L2	L2	L2		HL12	L2	C1	C2	L3	F3	F3	F3	F4	F7
20	F7	F2	F4	F1	F1	C2	C3	L2	L1		L1	H1	H1	C1	L2			H1	C2	F3	F2	F3	F3	F3
21	F2	F4	F3	F2	F2	C2	C3	L2		L4	L2	L2	L1	L2	L2	C2	L2	L3	C2	F6	F4	F8	F8	F6
22	F4	F4	F7	F5	F1	C2	L3	L2	L2	C2	L1	L3	L2	L2	L2	C2	C2	L4	L4	F6	F4	F5	F2	F8
23	F2	F2	F2	F5	F4	C2	L4	L3	L3	L3	L2	L2	L3	L3	L1	L2	L4	L5	L4	F3	F4		F1	F3
24	F3	F3	F2	F2		H2	C3	L3	L3	L2	L3	L3	L2	C1	C2	L3	L3	C2	L3	F6	F3	F4	F6	F5
25	F5	F2	F4	F4	F2	C5	CL32	L2	H1	L1	L2	L2	L3	L2	L2	L3	L2	L4	L3	F4	F7	F2	F4	F3
26	F6	F6	F5	F5	F5	C2	L3	L3	L3	L3	L2	L3	L2	C1	C1	C1	L3	L3	L4	F5	F2	F2		F1
27	F2	F3	F3	F2	F2	L1			C1		C1	L2	H2	C2	C2	L3	L2	L3	L4	F5	F4	F6	F6	F3
28	F6	F3	F4	F3	F2	L2	C3	C1	L2	L2	L2	L3	L3	L2	L2	L3	L2	L4	L4	F6	F4	F2	F5	F8
29	F5	F6	F2	F5	F2	L3	L3	L3	L2	L3	L4	L3	C1	L3	L4	L3	L3	L2	L2	F3	F5	F3	F3	
30	F6	F5	F2	F2	F2	L3	L3	L3	L3	L1	L2	L2	L3	L4	L4	L4	L3	L3	L4	F5	F5	F4	F4	F5
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUN. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

JUN. 2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

IONOSPHERIC DATA STATION Yamagawa

JUN. 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								A	A	A	A	A	A	A		A	A	A	UL 344					
2								L	A	A 428		A	A	436	UL 420	424	420	A	A					
3								A	A	A	A	A	A	A	A	A	UL 404	A	A					
4								A	A	A	A	UL 452	A	A	A	408	396	A	A					
5							L	A	A	A	A	A	A	A	A	A	A 380		A					
6							A	A	A	A	A	A	A	A	A	A	A	A	A					
7								A	A	C	UL 428	A	A	A	444	A	A	C	A					
8							A	A	A	A	A	A	A	UL 436	UL 436	416	A	A	A					
9							A	A	A	A	A	A	A	A	A	UL 408	388	A	A					
10							A	A	A	A	A	A	A	A	A	A	400	A	A					
11								A	A	A	A	A	A	A	A	A	416	A	A					
12							A	A	UL 400	UL 420	A	424	A	A	A	A	A	A	A					
13							A	A	A	A	A	A	A	A	C	A	UL 396	A	A					
14							A	A	A	A	A	A	A	A	UL 428	UL 408	UL 408	A	A					
15								A	A	A	A	A	A	A	A	A	384	A	A					
16								L	A	A	A	A	428	A	A	A	A	A	A					
17							A	A	A	A	A	A	A	A	416	404	392	364	336					
18								UL 360	A	A	A	A	A	A	A	404	392	A	A					
19								A	A	A	A	A	A	UL 416		400	400	UL 372	344					
20								L	A	UL 408	408	UL 420	424	416		412	UL 380	A	340					
21							UL 328	A	UL 400	A	A	A	A	C	A	A	A	A	A					
22									A	A	A	A	A	A	A	A	A	UL 364	A					
23							A	A	A	A	A	A	A	A	A	A	392	356	A					
24								368	L	408	424	A	436	A	A	A	A	372	356					
25							A	A	376	UL 416	A	A	432	A	A	A	A	A	A					
26								A	A	412	424	424	UL 444	A	A	A	A	C	C					
27								A	372	400	C	C	UL 420	432	C	A	C	A	C					
28								UL 376		A	A	A	A	UL 432	A	A	A	A	A					
29								UL 372	A	A	A	440	A	UL 420	428	A	A	A	A					
30								UL 384	A	A	A	UL 404	A	A	432	416	408	UL 392	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	5	4	6	5	6	6	7	7	10	15	7	5					
MED							UL 328	UL 372	388	410	424	424	430	UL 432	428	408	396	372	344					
U Q								UL 380	UL 400	UL 416	428	440	436	436	436	416	408	380	350					
L Q								364	374	408	416	UL 420	424	416	420	404	392	364	338					

JUN. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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							A	A	A	A	A	A	A	A		A	A	A	A					
2							A	A	A	A	A	A	A	A	A	A	A	A	A					
3							A	A	A	A	A	A	A	A	A	A	A	A	A					
4							A	A	A	A	A	A	A	A	A	A	A	A	A					
5							A	A	A	A	A	A	A	A	A	A	A	A	A					
6							A	A	A	A	A	A	A	A	A	A	A	A	A					
7							A	A	A	C	A	A	A	A	A 300	A	A	C	A					
8							A	A	A	A	A	A	A	A	A	A	A	A	A					
9							A	A	A	A	A	A	A	A	A	A	U A 300	A	A					
10							A	A	A	A	A	A	A	A	A	A	A	A	A					
11							A	A	A	A	A	A	A	A	A	A	A	A	A					
12							A	A	A	A	A	A	A	A	A	A	A	A	A					
13							A	A	A	A	A	A	A	A	C	A	A	A	A					
14							A	A	A	A	A	A	A	A	A	A	A	A	A					
15							U A 212	A	A	A	A	A	A	A	A	A	U A 300	A	A					
16							U R 236	A	A	A	A	A	A	A	A	A	A	A	A					
17							A	A	A	A	A	A	A	A	A	A	A	A	A					
18							A	A	A	A	A	A	A	A	A	U A 316	A	A	A					
19							A	A	A	A	A	A	A	A	U A 324	324	U A 300	A	A					
20							A	A	A	A	A	A	U A 344	356	U A 344	360	A	264	U A 228					
21							A	A	A	A	A	A	A	C	A	A	A	A	A					
22							A		A	A	A	A	A	A	A	U A 348	U A 312	A	A					
23							A	A	A	A	A	A	A	A	A	A	U R 292	A	A					
24							A	U R 268	A	A	A	A	A	A	A	A	A	A	A					
25							A	A	A	A	A	A	A	A	A	A	A	A	A					
26							A	A	A	A	A	A	A	A	A	A	A	C	C					
27							U R 240	U A 252	A	U A 316	C	C	A	U A 340	C	U A 324	C	A	C					
28							A	A	A	A	A	A	A	A	A	A	A	A	A					
29							A	A	U A 296	A	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	A	A	A	A	U R 356	A	U A 300	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	2	1	1			1	2	4	5	6	1	1					
MED							U R 236	U 260	U A 296	U A 316			U A 344	348	U A 334	U A 324	U A 300	264	U A 228					
U Q							U R 240								U 350	354	U A 300							
L Q							U A 212								A 312	320	U 300							

JUN. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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 53	J A 51	J A 52	J A 40	J A 54	J A 85	J A 52	J A 86	J A 111	J A 230	299	J A 79	J A 62	J A 73	J A 85	J A 250	J A 116	J A 292	J A 256	J A 56	J A 61	J A 110	J A 110	J A 90
2	J A 86	J A 54	J A 106	J A 78	J A 35	J A 44	J A 38	J A 49	J A 109	J A 100	J A 55	J A 50	J A 52	J A 43	J A 47	J A 80	J A 60	J A 93	J A 190	J A 78	J A 206	J A 129	J A 122	J A 87
3	J A 66	J A 89	J A 53	J A 44	J A 48	J A 64	J A 41	J A 53	J A 57	J A 128	J A 100	J A 110	J A 153	J A 99	J A 78	J A 84	J A 50	J A 63	J A 56	J A 46	J A 54	J A 50	J A 77	J A 85
4	J A 61	J A 65	J A 121	J A 84	J A 49	J A 30	J A 43	J A 45	J A 54	J A 64	J A 106	J A 48	J A 59	J A 66	J A 74	J A 48	39	J A 76	J A 105	J A 73	J A 116	J A 120	J A 74	J A 143
5	J A 86	J A 86	J A 66	J A 42	J A 47	J A 35	J A 34	J A 54	J A 65	J A 61	J A 76	J A 87	J A 92	J A 226	J A 80	J A 232	J A 92	J A 106	J A 70	J A 112	J A 110	J A 63	J A 52	J A 52
6	J A 54	J A 54	J A 54	J A 35	J A 34	J A 34	J A 60	J A 80	J A 83	J A 90	J A 61	J A 58	J A 78	J A 52	J A 119	J A 120	J A 234	J A 111	J A 159	J A 74	J A 48	J A 46	J A 77	J A 52
7	J A 86	J A 35	J A 35	J A 30	J A 22	J A 24	J A 34	J A 45	J A 118	C	J A 109	J A 110	J A 105	J A 46	41	J A 54	J A 71	C	J A 108	J A 105	J A 77	J A 38	J A 38	J A 52
8	J A 65	J A 89	J A 55	J A 54	J A 40	E B 16	J A 35	J A 68	J A 56	J A 76	J A 184	J A 113	J A 85	J A 47	J A 44	J A 48	J A 100	J A 91	J A 127	J A 54	J A 64	J A 224	J A 54	J A 54
9	J A 108	J A 52	J A 67	J A 91	J A 88	E B 15	27	J A 46	J A 58	J A 85	J A 85	J A 65	J A 65	J A 77	J A 89	J A 90	J A 46	J A 49	J A 56	J A 64	J A 84	J A 52	J A 126	J A 54
10	J A 90	J A 105	J A 112	J A 54	J A 40	24	J A 48	J A 74	J A 78	J A 92	J A 66	J A 59	J A 54	J A 87	J A 64	J A 74	J A 46	J A 69	J A 53	J A 38	J A 48	J A 28	J A 44	J A 35
11	J A 29	J A 36	J A 50	J A 31	J A 44	J A 40	J A 53	J A 50	J A 66	J A 153	J A 205	J A 84	J A 85	J A 83	J A 90	J A 80	J A 75	J A 74	J A 58	J A 38	J A 52	J A 52	J A 28	J A 48
12	J A 111	J A 80	J A 80	C	J A 33	23	J A 52	J A 146	J A 122	J A 65	J A 70	J A 61	J A 80	J A 85	J A 110	J A 63	J A 218	J A 67	J A 55	J A 46	36	J A 88	J A 54	J A 52
13	J A 54	J A 54	J A 78	J A 88	J A 105	J A 25	J A 41	J A 53	J A 111	J A 78	J A 121	J A 68	J A 95	J A 81	C	J A 58	J A 128	J A 65	J A 150	J A 110	J A 38	J A 88	J A 44	J A 49
14	J A 50	J A 87	J A 87	J A 57	J A 51	J A 21	J A 45	J A 61	J A 74	J A 74	J A 77	J A 93	J A 74	J A 109	J A 66	J A 68	J A 53	J A 54	J A 86	J A 62	J A 30	J A 39	J A 80	J A 52
15	J A 54	J A 61	J A 42	J A 45	J A 45	J A 67	28	J A 44	J A 62	J A 74	J A 75	J A 132	J A 111	J A 92	J A 92	J A 71	41	J A 67	J A 175	J A 56	J A 50	J A 50	J A 106	J A 53
16	J A 76	J A 83	J A 54	J A 65	J A 36	23	G	J A 44	J A 54	J A 54	J A 59	J A 61	J A 52	J A 85	J A 83	J A 84	J A 58	J A 75	J A 82	J A 63	J A 44	J A 44	J A 41	J A 40
17	J A 56	J A 83	J A 109	J A 86	J A 80	J A 56	J A 36	J A 52	J A 75	J A 71	J A 99	J A 64	J A 124	J A 68	J A 73	J A 41	34	34	27	J A 50	J A 109	J A 66	J A 122	J A 45
18	J A 123	J A 53	J A 86	J A 74	J A 101	J A 68	J A 54	J A 48	J A 51	J A 79	J A 85	J A 100	J A 88	J A 122	J A 261	40	J A 48	J A 69	J A 83	J A 160	J A 124	J A 237	J A 109	J A 51
19	J A 34	J A 45	J A 50	J A 52	J A 39	J A 34	J A 35	J A 64	J A 110	J A 105	J A 77	J A 79	J A 52	J A 55	37	37	40	J A 45	J A 40	23	J A 40	J A 40	J A 38	J A 35
20	J A 54	J A 34	J A 27	J A 50	J A 30	J A 45	J A 36	J A 39	J A 49	J A 78	J A 88	J A 61	40	41	40	40	33	36	25	21	E B 15	J A 44	J A 48	J A 52
21	J A 65	J A 32	J A 32	J A 37	J A 33	J A 34	24	J A 76	J A 56	J A 83	J A 102	J A 66	46	C	J A 58	J A 60	J A 85	J A 135	J A 170	J A 68	J A 50	J A 86	J A 72	J A 37
22	J A 53	J A 40	J A 54	J A 54	J A 32	22	J A 48	J A 45	J A 77	J A 87	J A 128	J A 172	J A 144	J A 120	J A 62	46	J A 58	35	J A 78	20	C	J A 34	J A 62	J A 34
23	J A 50	J A 45	J A 45	J A 30	J A 47	J A 43	J A 50	J A 65	J A 64	J A 79	J A 84	J A 109	J A 63	J A 82	J A 63	J A 78	32	J A 45	J A 43	J A 41	J A 110	J A 55	J A 28	J A 54
24	J A 78	J A 39	J A 30	J A 42	J A 30	J A 32	J A 44	J A 44	J A 44	J A 42	42	46	41	J A 62	J A 121	J A 52	J A 46	J A 41	J A 38	J A 34	J A 24	J A 28	23	J A 33
25	J A 50	J A 37	J A 33	J A 39	J A 39	25	J A 51	J A 89	J A 45	J A 49	J A 88	J A 78	J A 54	J A 66	J A 60	J A 66	J A 64	J A 58	J A 77	J A 52	J A 68	J A 51	J A 54	J A 54
26	J A 75	J A 104	J A 88	J A 54	J A 79	J A 33	28	J A 64	J A 81	J A 47	J A 46	J A 44	J A 70	J A 79	J A 75	J A 60	J A 150	C	C	J A 72	J A 52	J A 49	J A 36	25
27	J A 37	J A 30	J A 26	J A 85	J A 22	J A 29	G	J A 35	J A 46	J A 37	C	C	J A 42	J A 43	C	J A 47	C	J A 66	C	J A 47	J A 74	J A 86	J A 66	J A 54
28	J A 39	J A 52	E B 16	J A 43	J A 31	J A 26	J A 32	J A 42	J A 59	J A 111	J A 88	J A 160	J A 123	J A 46	J A 86	J A 88	J A 71	J A 47	J A 65	J A 51	J A 40	23	J A 54	J A 38
29	J A 36	J A 53	J A 53	J A 34	J A 30	J A 27	23	33	J A 51	J A 85	J A 56	J A 45	J A 54	J A 50	42	J A 78	J A 119	J A 58	J A 50	J A 44	J A 44	J A 28	24	J A 32
30	J A 49	J A 52	J A 42	J A 52	J A 36	J A 36	J A 36	J A 44	J A 80	J A 61	J A 71	J A 49	J A 55	J A 50	G	39	34	J A 55	J A 48	J A 54	J A 84	J A 35	J A 32	J A 32
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	30	29	29	29	30	29	28	30	29	28	28	30	29	30	30	30
MED	J A 55	J A 53	J A 54	J A 52	J A 40	J A 32	J A 37	J A 51	J A 64	J A 78	J A 85	J A 68	J A 68	J A 73	J A 74	J A 64	J A 58	J A 66	J A 74	J A 54	J A 52	J A 50	J A 54	J A 52
U Q	J A 78	J A 83	J A 80	J A 70	J A 49	J A 43	J A 48	J A 65	J A 81	J A 91	J A 104	J A 104	J A 92	J A 86	J A 88	J A 80	J A 96	J A 76	J A 118	J A 72	J A 84	J A 86	J A 77	J A 54
L Q	J A 50	J A 40	J A 42	J A 40	J A 33	24	32	J A 44	J A 54	J A 62	J A 68	J A 58	J A 54	J A 50	52	48	44	J A 48	J A 52	J A 44	J A 42	J A 39	J A 38	J A 37

JUN. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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	20	21	18	22	A A 54	A A 85	26	A A 86	A A 111	A A 230	A A 299	A A 79	44	A A 73	A A 85	A A 250	A A 116	39	27	41	50	A A 110	A A 110	A A 90
2	A A 86	A A 54	A A 106	A A 78	E B 16	E B 16	28	25	A A 109	A A 100	37	A A 50	A A 52	36	38	38	34	A A 93	A A 190	41	A A 206	A A 129	A A 122	A A 87
3	A A 66	A A 89	20	17	20	20	27	43	52	A A 128	A A 100	A A 110	A A 153	A A 99	A A 78	44	34	34	34	39	27	33	A A 77	E B 16
4	A A 61	E B 16	E B 16	E B 16	E B 16	15	37	35	46	A A 64	A A 106	37	42	44	44	36	35	A A 76	A A 105	36	34	A A 120	31	18
5	30	18	24	E B 16	E B 16	E B 16	20	45	A A 65	A A 61	A A 76	A A 87	A A 92	A A 226	A A 80	A A 232	A A 92	32	A A 70	32	A A 110	31	24	24
6	32	32	20	20	19	18	A A 60	A A 80	A A 83	44	42	42	A A 78	46	A A 119	A A 120	A A 234	A A 111	A A 159	A A 74	28	20	28	27
7	28	E B 16	E B 15	E B 15	E B 15	E B 16	16	36	46	C	37	A A 110	A A 105	43	38	41	49	C	A A 108	A A 105	20	E B 16	E B 16	18
8	27	A A 89	A A 55	20	20	E B 16	30	A A 68	A A 56	53	A A 184	A A 113	A A 85	37	37	36	A A 100	A A 91	A A 127	46	19	36	19	A A 54
9	20	A A 52	24	E B 15	22	E B 15	24	34	A A 58	A A 85	A A 85	48	A A 65	A A 77	A A 89	34	34	36	41	A A 64	28	35	A A 126	23
10	31	A A 105	A A 112	34	22	E B 16	A A 48	A A 74	A A 78	A A 92	A A 66	A A 59	A A 54	A A 87	A A 64	A A 74	34	50	45	29	33	20	30	21
11	E B 16	23	18	18	17	17	22	38	A A 66	A A 153	A A 205	A A 84	A A 85	A A 83	A A 90	A A 80	34	40	52	32	43	31	E B 16	24
12	36	39	21	C	E B 16	E B 16	A A 52	A A 146	33	36	A A 70	37	A A 80	A A 85	A A 110	48	A A 218	44	46	39	28	E B 16	21	28
13	23	34	19	20	20	E B 16	30	40	A A 111	A A 78	50	45	47	A A 81	C	47	35	36	A A 150	A A 110	23	20	28	33
14	33	A A 87	A A 87	21	A A 51	E B 16	A A 45	A A 61	A A 74	A A 74	A A 77	A A 93	42	A A 109	40	35	30	45	42	46	E B 16	19	A A 80	20
15	20	20	21	E B 16	20	A A 67	25	36	46	42	A A 75	A A 132	A A 111	A A 92	A A 92	A A 71	35	A A 67	A A 175	33	25	27	19	28
16	A A 76	A A 83	20	17	20	E B 16	G	17	A A 54	A A 54	41	41	39	A A 85	A A 83	A A 84	A A 58	A A 75	51	24	22	22	21	E B 16
17	23	A A 83	E B 16	20	A A 80	A A 56	A A 36	38	A A 75	A A 71	A A 99	A A 64	A A 124	A A 68	34	33	32	31	22	36	24	24	21	E B 16
18	20	22	A A 86	20	E B 16	A A 68	26	26	39	A A 79	A A 85	A A 100	A A 88	A A 122	A A 261	38	33	42	A A 83	A A 160	38	A A 237	A A 109	19
19	E B 16	18	A A 50	A A 52	18	18	23	A A 64	A A 110	A A 105	41	40	A A 52	36	35	36	36	31	28	19	19	22	24	19
20	E B 16	21	E B 16	17	E B 16	20	19	19	41	35	35	36	38	40	38	38	31	35	24	20	E B 15	E B 16	20	27
21	27	19	18	20	22	17	22	A A 76	35	A A 83	A A 102	A A 66	43	C	41	A A 60	A A 85	A A 135	A A 170	A A 68	30	34	A A 72	30
22	32	27	20	19	19	E B 15	20	24	A A 77	A A 87	A A 128	A A 172	A A 144	A A 120	42	43	40	31	28	18	C	E B 16	22	E B 16
23	18	27	22	16	17	A A 43	A A 50	A A 65	A A 64	A A 79	A A 84	A A 109	A A 63	A A 82	50	A A 78	30	26	34	25	48	28	21	19
24	E B 16	20	E B 16	17	E B 15	E B 16	20	G 22	33	32	38	A A 46	38	A A 62	A A 121	41	40	30	29	26	19	19	19	E B 16
25	E B 16	E B 16	E B 16	23	18	16	A A 51	34	31	33	A A 88	42	38	45	A A 60	A A 66	A A 64	44	A A 77	30	E B 16	22	27	21
26	A A 75	A A 104	A A 88	A A 54	22	18	20	A A 64	39	32	32	38	38	A A 79	A A 75	A A 60	A A 150	C	C	29	27	24	22	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	17	G	32	33	35	C	C	35	40	C	40	C	A A 66	C	25	A A 74	22	35	20
28	20	26	E B 16	19	E B 15	E B 16	22	24	51	A A 111	A A 88	A A 160	A A 123	37	A A 86	A A 88	40	41	30	A A 51	E B 16	E B 16	18	20
29	20	E B 15	E B 15	E B 15	20	20	20	31	A A 51	A A 85	45	36	A A 54	38	38	A A 78	A A 119	47	35	32	28	21	E B 16	20
30	A A 49	20	E B 16	A A 52	A A 36	17	26	26	41	41	A A 71	37	48	44	G	36	33	33	A A 48	46	21	21	21	E B 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	30	29	29	29	30	29	28	30	29	28	28	30	29	30	30	30
MED	25	24	20	19	19	16	26	37	A A 53	A A 74	A A 76	A A 59	A A 54	A A 73	A A 62	46	36	42	47	36	27	22	23	20
U Q	A A 33	A A 54	A A 24	22	22	A A 20	A A 36	A A 64	A A 75	A A 90	A A 100	A A 104	A A 88	A A 86	A A 88	A A 78	A A 88	A A 66	A A 106	A A 46	36	33	A A 35	27
L Q	E B 20	E B 19	E B 16	E B 16	E B 16	E B 16	20	26	41	42	42	40	42	42	38	38	34	34	32	29	20	E B 20	20	E B 18

JUN. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

IONOSPHERIC DATA STATION Yamagawa

JUN. 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	F	F	F	F	A	A	383	A	A	A	A	A	312	A	A	A	A	316	314	346	371	A	A	A
2	A	A	A	A	316	F	342	365	A	A	367	A	A	279	322	325	248	A	A	315	A	A	A	A
3	A	A	323	327	F	F	351	359	380	A	A	A	A	A	A	324	290	321	325	318	323	F	A	F
4	A	F	F	309	324	F	374	359	361	A	A	294	302	302	316	319	315	A	A	313	309	A	F	F
5	F	F	322	F	312	288	363	380	A	A	A	A	A	A	A	A	A	289	A	312	A	317	301	F
6	310	F	371	F	F	327	A	A	A	319	359	357	A	355	A	A	A	A	A	A	321	321	311	290
7	F	311	F	371	F	F	383	324	370	C	297	A	A	299	304	325	326	C	A	A	335	F	F	F
8	317	A	A	F	F	330	366	A	A	338	A	A	A	307	319	288	A	A	A	316	304	342	321	A
9	F	A	F	334	326	F	386	364	A	A	A	324	A	A	A	309	344	338	306	A	310	316	A	F
10	F	A	A	322	322	329	A	A	A	A	A	A	A	A	A	A	309	327	330	332	349	336	310	317
11	297	F	F	357	349	336	355	375	A	A	A	A	A	A	A	A	287	312	326	333	334	337	302	F
12	F	F	F	C	F	360	A	A	357	309	A	330	A	A	A	288	A	302	317	325	330	335	F	F
13	F	F	F	F	F	F	362	372	A	A	334	327	286	A	C	303	319	328	A	A	316	311	304	319
14	333	A	A	377	A	381	A	A	A	A	A	A	323	A	252	284	284	283	323	343	344	325	A	F
15	F	F	335	F	339	A	364	310	351	354	A	A	A	A	A	A	320	A	A	238	330	F	F	F
16	A	A	F	F	F	349	379	371	A	A	346	332	283	A	A	A	A	A	316	331	364	377	350	F
17	F	A	F	F	A	A	A	356	A	A	A	A	A	A	308	324	329	300	301	322	343	339	F	F
18	F	F	A	F	F	A	340	364		A	A	A	A	A	A	298	283	314		A	A	F	A	A	F
19	F	F	A	A	F	350	354	A	A	A	373	386	A	300	352	279	314	310	340		344	332	327	F
20	F	327		F	F	F	375	309	397	373	379	345	348	331	295	409	252	285	314	327	337	336	330	330	325
21	327	301	301	312		F	332	306	A	340	A	A	A	292	C	279	A	A	A	A	A	338	F	A	F
22	F	F	F	F	F	F	360	380	A	A	A	A	A	A	271	285	307	299	319	358	C	342	327	301
23	F	F	F	F	333	A	A	A	A	A	A	A	A	A	323	A	340	341	317	355	334	333	317	F
24	F	F	F	369	F	F	359	326	381	390	277	A	324	A	A	316	281	330	313	328	340	355	335	344
25	341	314	300	310	333	354	A	328	370	364	A	345	306	342	A	A	A	325	A	336	305	322	342	345
26	A	A	A	A	329	F	363	A	331	328	320	374	334	A	A	A	A	C	C	326	349	312	315	298
27	F	311	325	F	F	328	389	343	347	348	C	C	301	269	C	273	C	A	C	346	A	F	294	F
28	F	F	308	F	F	F	342	327	393	A	A	A	A	322	A	A	331	335	344	A	328	336	367	F
29	F	F	F	F	F	350	403	281	A	A	353	327	A	281	304	A	A	301	307	336	397	332	315	330
30	A	317	F	A	A	332	352	334	334	374	A	270	319	336	331	294	309	314	A	330	390	395	334	316
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	6	8	10	10	15	23	20	13	10	10	12	12	12	13	17	19	20	16	22	25	21	18	10
MED	322	312	322	330	328	336	362	359	361	351	346	331	309	301	316	298	309	314	318	330	335	333	319	318
U Q	333	317	330	369	333	354	379	372	376	374	359	352	324	329	327	322	326	328	326	337	346	340	334	330
L Q	310	311	304	312	322	329	351	328	344	328	320	326	296	288	292	284	285	302	314	318	322	322	310	301

IONOSPHERIC DATA STATION Yamagawa

JUN. 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								A	A	A	A	A	A	A		A	A	A	UL 362					
2								L	A	A 381		A	A	406	UL 420	393	397	A	A					
3								A	A	A	A	A	A	A	A	A	UL 388	A	A					
4								A	A	A	A	UL 427	A	A	A	424	402	A	A					
5							L	A	A	A	A	A	A	A	A	A	A	395	A					
6							A	A	A	A	A	A	A	A	A	A	A	A	A					
7								A	A	C	UL 450	A	A	A	399	A	A	C	A					
8							A	A	A	A	A	A	A	UL 407	UL 423	444	A	A	A					
9							A	A	A	A	A	A	A	A	A	UL 415	420	A	A					
10							A	A	A	A	A	A	A	A	A	A	383	A	A					
11								A	A	A	A	A	A	A	A	A	384	A	A					
12							A	A	UL 410	UL 424	A	447	A	A	A	A	A	A	A					
13							A	A	A	A	A	A	A	A	C	A	UL 419	A	A					
14							A	A	A	A	A	A	A	A	UL 387	UL 406	UL 311	A	A					
15								A	A	A	A	A	A	A	A	A	359	A	A					
16								L	A	A	A	A	442	A	A	A	A	A	A					
17							A	A	A	A	A	A	A	A	435	407	420	412	410					
18								UL 385	A	A	A	A	A	A	A	420	411	A	A					
19								A	A	A	A	A	A	UL 438		445	426	UL 426	402					
20								L	A	UL 420	443	UL 436	401	423		394	UL 426	A	389					
21							UL 356	A	UL 403	A	A	A	A	C	A	A	A	A	A					
22									A	A	A	A	A	A	A	A	A	UL 381	A					
23							A	A	A	A	A	A	A	A	A	A	413	409	A					
24								393	L	419	378	A	470	A	A	A	A	396	369					
25							A	A	406	UL 405	A	A	435	A	A	A	A	A	A					
26								A	A	439	428	422	UL 429	A	A	A	A	C	C					
27								A	449	419	C	C	UL 439	427	C	A	C	A	C					
28								UL 374		A	A	A	A	UL 433	A	A	A	A	A					
29								UL 385	A	A	A	423	A	UL 445	459	A	A	A	A					
30								UL 380	A	A	A	UL 463	A	A	434	435	395	UL 381	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	5	4	6	5	6	6	7	7	10	15	7	5					
MED							UL 356	UL 385	408	420	428	432	437	UL 427	423	418	402	396	389					
U Q								389	430	424	446	447	442	UL 438	435	435	420	412	406					
L Q								UL 377	404	419	380	423	429	407	399	406	384	UL 381	366					

JUN. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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								A	A	A	A	A	340	A		A	A	300	300					
2								256	A	A	294	A	A	434	308	308	326	A	A					
3								E A 266	E A 260	A	A	A	A	A	A	338	394	E A 316	282					
4								258	E A 282	A	A	408	372	358	336	314	298	A	A					
5							260	E A 246	A	A	A	A	A	A	A	A	A	376	A					
6							A	A	A	E A 376	260	272	A	282	A	A	A	A	A					
7								E A 274	E A 274	C	328	A	A	348	326	268	260	C	A					
8							E A 246	A	A	E A 308	A	A	A	342	324	404	A	A	A					
9							214	238	A	A	A	E A 332	A	A	A	312	268	258	E A 354					
10							A	A	A	A	A	A	A	A	A	A	310	E A 278	E A 272					
11								260	A	A	A	A	A	A	A	A	362	E A 332	E A 312					
12							A	A	288	378	A	318	A	A	A	E A 384	A	E A 336	262					
13							250	E A 240	A	A	E A 294	304	E A 352	A	C	E A 314	288	260	A					
14							A	A	A	A	A	A	332	A	452	438	432	E A 400	E A 284					
15								344	E A 290	256	A	A	A	A	A	A	336	A	A					
16								238	A	A	312	324	420	A	A	A	A	A	E A 332					
17							A	262	A	A	A	A	A	A	358	332	292	320	330					
18								272	238	A	A	A	A	A	A	378	406	316	A					
19								A	A	A	264	236	A	390		424	330	300	252					
20								244	E A 254	244	326	314	338	402		528	420	346	280					
21							350	A	302	A	A	A	394	C	468	A	A	A	A					
22									A	A	A	A	A	A	452	E A 400	322	308	268					
23							A	A	A	A	A	A	A	A	E A 316	A	294	264	284					
24								324	250	250	458	A	324	A	A	324	410	292	320					
25							A	308	222	268	A	300	352	E A 330	A	A	A	E A 332	A					
26								A	E A 350	338	326	262	324	A	A	A	A	C	C					
27								274	276	290	C	C	362	482	C	442	C	A	C					
28								310		A	A	A	A	364	A	A	276	250	268					
29								388	A	A	286	356	A	440	336	A	A	E A 336	306					
30								320	E A 326	244	A	270	E A 306	276	312	406	334	346	A	E A 338				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	19	13	10	10	12	12	12	11	17	19	20	16	1				
MED							250	264	E A 276	U 266	303	306	342	361	336	U 355	326	U 300	280	E A 338				
U Q							305	310	E A 296	338	326	328	367	418	452	415	394	336	E A 316					
L Q							230	246	252	250	286	271	328	336	316	314	292	285	270					

JUN. 2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E A 330	E A 280	E A 312	E A 300	A	A	228	A	A	A	A	A	A	A	A	A	A	A	222	E A 236	222	A	A	A
2	A	A	A	A	254	192	216	216	A	A	234	A	A	200	200	200	200	A	A	E A 290	A	A	A	A
3	A	A	E A 252	E A 276	E A 270	E A 236	234	A	A	A	A	A	A	A	A	A	220	A	A	E A 260	222	E A 248	A	198
4	A	E B 242	E B 260	E B 248	E B 260	218	218	A	A	A	A	192	A	A	A	190	188	A	A	E A 262	E A 262	A	E A 308	212
5	E A 304	E A 298	E A 296	E B 288	E B 288	E B 266	E A 242	A	A	A	A	A	A	A	A	A	A	214	A	E A 242	A	226	E A 242	E A 326
6	E A 324	E A 304	212	E A 270	E A 250	224	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 248	232	E A 290	E A 320
7	E A 318	E B 236	E B 240	E B 224	E B 254	E B 236	218	A	A	C	192	A	A	A	202	A	A	C	A	A	226	E B 302	E B 302	E A 244
8	E A 274	A	A	E A 274	E A 264	E B 212	A	A	A	A	A	A	A	200	190	180	A	A	A	E A 296	E A 262	E A 238	220	A
9	212	A	E A 244	204	E A 264	E B 264	A	A	A	A	A	A	A	A	A	180	188	A	A	A	E A 244	E A 280	A	E A 262
10	E A 318	A	A	E A 310	E A 242	206	A	A	A	A	A	A	A	A	A	A	206	A	A	232	224	204	E A 264	E A 260
11	E B 250	E A 254	E A 236	204	220	E A 242	220	A	A	A	A	A	A	A	A	A	216	A	A	230	E A 246	E A 238	E B 248	E A 272
12	E A 272	E A 308	224	C	E B 250	226	A	A	204	204	A	190	A	A	A	A	A	A	A	E A 244	226	222	220	E A 298
13	E A 280	E A 292	222	E A 290	E A 282	204	A	A	A	A	A	A	A	A	C	A	196	A	A	A	E A 234	E A 252	E A 258	E A 292
14	E A 290	A	A	204	A	204	A	A	A	A	A	A	A	A	224	214	E A 316	A	A	E A 244	214	214	A	E A 274
15	228	228	E A 254	212	E A 282	A	202	A	A	A	A	A	A	A	A	A	208	A	A	E A 462	E A 246	234	234	E A 306
16	A	A	206	E B 194	E A 256	210	200	200	A	A	A	A	200	A	A	A	A	A	A	234	204	198	E A 254	E B 268
17	E A 304	A	226	E A 272	A	A	A	A	A	A	A	A	A	A	186	198	192	192	194	E A 240	E A 240	E A 230	230	E B 276
18	216	E A 232	A	E A 302	E B 232	A	220	202	A	A	A	A	A	A	A	214	206	A	A	A	232	A	A	E A 250
19	E B 252	E A 242	A	A	E A 256	E A 240	204	A	A	A	A	A	A	204	186	192	202	202	194	206	216	234	E A 254	E A 274
20	E B 240	E A 246	E B 246	204	E B 232	232	232	198	A	192	184	184	200	210	208	E A 238	194	A	194	218	204	204	212	E A 286
21	E A 298	E A 262	E A 236	E A 268	E A 236	216	212	A	218	A	A	A	A	C	A	A	A	A	A	A	232	232	A	E A 276
22	E A 288	E A 266	E A 256	E A 316	E A 258	E B 244	200	200	A	A	A	A	A	A	A	A	A	232	A	224	C	202	224	E B 254
23	E A 270	E A 316	232	202	E A 292	A	A	A	A	A	A	A	A	A	A	A	176	196	A	224	E A 280	222	E A 246	E A 250
24	E B 250	E A 250	232	222	E B 252	198	202	202	212	212	E A 246	A	186	A	A	A	A	204	212	E A 242	222	206	206	206
25	232	E B 264	E B 280	E A 298	E A 246	232	A	A	202	202	A	A	196	A	A	A	A	A	A	E A 230	218	E A 242	E A 230	E A 230
26	A	A	A	A	E A 300	210	194	A	A	192	206	206	192	A	A	A	A	C	C	232	220	E A 248	E A 260	E B 260
27	E B 254	228	E B 240	E B 258	204	218	190	A	188	188	C	C	180	200	C	A	C	A	C	230	A	E A 252	E A 286	226
28	E A 270	E A 296	200	E A 268	E B 250	E B 274	200	210	212	A	A	A	A	208	A	A	A	A	A	A	208	208	208	E A 236
29	E A 248	E B 268	E B 282	E B 282	E A 258	E A 242	202	196	A	A	A	196	A	196	196	A	A	A	A	220	202	196	222	E A 274
30	A	E A 310	E B 306	A	A	E A 256	216	194	A	A	A	176	A	A	194	194	194	226	A	A	212	200	E A 292	E B 292
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	21	23	25	26	25	20	9	6	6	5	6	6	7	9	10	15	7	5	22	26	26	23	27
MED	E A 271	E A 264	E 240	E 268	E A 255	U 215	211	200	208	197	199	191	194	200	196	194	198	204	194	E A 235	218	U 217	E A 246	E A 268
U Q	E A 301	E A 297	E B 260	E A 289	E A 264	E B 242	220	206	212	204	240	196	200	208	205	214	208	226	217	E A 244	E A 244	E A 242	E A 264	E A 286
L Q	249	E 242	226	208	E 246	210	201	197	202	192	188	184	186	200	188	190	192	196	194	230	216	206	222	244

JUN. 2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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							A	A	A	A	A	A	A	A		A	A	A	A					
2							112	A	A	A	A	A	A	A	A	A	A	A	A					
3							A	A	A	A	A	A	A	A	A	A	A	A	A					
4							A	A	A	A	A	A	A	A	A	114	114	A	A					
5							114	A	A	A	A	A	A	A	A	A	A	A	A					
6							A	A	A	A	A	A	A	A	A	A	A	A	A					
7							A	A	A	C	A	A	A	114	114	A	A	C	A					
8							A	A	A	A	A	A	A	A	A	A	A	A	A					
9							116	118	104	A	A	A	A	A	A	A	114	114	A					
10							A	A	A	A	A	108	108	A	A	A	112	A	A					
11							A	A	A	A	A	A	A	A	A	A	A	A	A					
12							A	A	A	A	A	A	A	A	A	A	A	A	A					
13							A	A	A	A	A	A	A	A	C	A	A	A	A					
14							A	A	A	A	A	A	A	A	A	A	A	A	A					
15							112	112	A	A	A	A	A	A	A	A	112	A	A					
16							122	A	A	A	A	A	120	A	A	A	A	A	A					
17							A	A	A	A	A	A	A	A	A	A	A	A	A					
18							A	A	A	A	A	A	A	A	A	112	112	A	A					
19							A	A	A	A	A	A	A	A	112	110	110	110	A					
20							A	110	A	A	A	A	108	108	108	114	A	114	114					
21							114	A	A	A	A	A	A	C	A	A	A	A	A					
22							A		A	A	A	A	A	A	A	114	114	114	A					
23							A	A	A	A	A	A	A	A	A	A	110	A	A					
24							A	120	A	A	120	120	118	A	A	A	A	A	A					
25							A	A	A	A	A	A	A	A	A	A	A	A	A					
26							A	A	A	A	A	A	A	A	A	A	A	C	C					
27							116	116	A	116	C	C	A	114	C	114	C	A	C					
28							A	A	A	A	A	A	A	A	A	A	A	A	A					
29							A	114	114	A	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	A	A	A	A	114	114	114	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	6	2	1	1	2	4	3	4	7	9	4	1					
MED							114	115	109	116	120	114	113	114	113	114	112	114	114					
U Q							116	118					119	114	114	114	114	114						
L Q							112	112					108	108	110	112	111	112						

JUN. 2019 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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	94	92	92	88	88	88	104	104	94	88	88	88	88	88	88	94	94	88	88	88	88	88	88	88
2	88	88	86	86	88	114	114	94	88	88	88	88	88	88	90	88	100	100	90	90	90	88	94	92
3	92	92	92	86	86	86	98	98	98	90	90	88	86	86	86	86	86	86	86	86	86	86	88	92
4	92	92	92	86	86	86	90	94	94	94	94	94	94	92	92	110	120	96	96	90	90	92	92	92
5	90	90	90	90	90	90	108	96	96	96	96	96	96	96	86	90	90	90	90	90	84	84	84	84
6	84	84	84	84	82	100	100	98	98	96	96	96	92	92	92	92	86	86	86	86	86	92	92	92
7	92	98	96	96	96	108	108	102	102	C	102	100	90	108	106	100	98	C	100	88	88	88	92	92
8	96	90	86	86	86	B	106	104	104	102	92	92	92	90	90	90	90	90	90	90	108	108	102	102
9	94	94	94	94	92	B	120	118	112	90	96	96	96	96	96	100	114	114	98	100	100	100	94	104
10	88	88	88	88	88	114	104	100	98	94	94	118	114	98	98	98	110	100	94	92	92	92	90	90
11	92	90	90	88	88	88	92	102	102	94	100	100	94	94	94	94	98	98	98	98	90	90	90	90
12	90	90	90	C	90	136	104	104	98	98	92	96	92	92	92	92	80	80	78	78	84	84	84	84
13	92	88	88	88	88	104	96	96	96	94	90	90	90	84	C	84	98	94	94	86	84	88	88	84
14	84	84	84	84	84	88	102	102	102	92	90	90	90	88	88	88	88	88	88	88	88	88	88	88
15	88	88	88	88	88	88	114	112	100	92	92	92	92	92	100	100	126	98	98	96	102	98	98	92
16	90	90	90	90	88	88	G	96	94	92	92	92	112	96	96	96	96	96	92	92	92	92	92	98
17	88	88	86	86	86	86	102	102	92	90	88	88	86	84	84	88	88	92	98	98	98	98	98	98
18	94	88	88	88	100	92	90	90	88	88	88	88	88	86	86	122	114	104	94	94	94	94	94	94
19	94	86	86	86	86	86	86	86	86	92	92	92	92	92	140	140	130	118	102	102	100	92	90	90
20	90	86	86	100	100	88	88	114	102	102	102	96	142	138	138	150	98	126	134	100	B	100	92	92
21	90	90	90	88	88	88	120	92	92	92	90	90	94	C	94	90	92	98	92	92	92	92	100	94
22	94	94	94	90	90	90	84	84	90	90	90	88	88	88	94	130	122	116	96	96	C	96	88	88
23	88	88	88	88	88	88	102	102	102	102	102	96	96	96	96	94	128	90	90	90	84	84	84	84
24	96	96	106	100	100	100	100	100	94	94	118	116	116	100	100	100	100	100	100	100	100	100	98	98
25	98	94	94	88	88	88	88	88	88	88	88	88	88	88	102	102	98	98	98	98	98	98	98	98
26	92	84	88	88	88	88	98	96	94	94	92	92	92	92	96	96	88	C	C	88	88	88	88	88
27	90	90	90	90	90	90	G	116	104	142	C	C	96	112	C	112	C	106	C	100	100	100	100	100
28	90	90	B	92	92	92	102	96	94	92	92	90	90	94	94	90	90	90	96	96	106	96	96	96
29	90	88	88	88	86	80	100	120	116	100	100	98	96	96	96	92	90	90	90	90	86	86	86	104
30	104	104	104	104	98	98	98	98	96	96	96	96	96	96	G	116	120	92	86	86	86	86	86	86
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	29	30	28	28	30	30	29	29	29	30	29	27	30	29	28	28	30	28	30	30	30
MED	91	90	90	88	88	88	101	99	96	94	92	92	92	92	94	95	98	96	94	91	90	92	92	92
U Q	94	92	92	90	90	99	105	104	102	96	96	96	96	96	98	102	114	100	98	98	99	98	96	98
L Q	90	88	87	86	86	88	94	96	94	90	90	89	90	88	90	90	90	90	90	88	86	88	88	88

IONOSPHERIC DATA STATION Yamagawa

JUN. 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	F9	F7	F7	F6	F6	F6	L3	L5	L7	L5	L7	L6	L3	L4	L5	L6	L6	L4	L8	L9	F7	F8	F8	F8
2	F7	F9	F5	F5	F3	F1	C5	L7	L9	L8	L3	L3	L3	L2	L2	L2	L6	L7	L9	L9	L6	L8	F6	F6
3	F8	F8	F6	F5	F2	F3	L7	L7	L5	L7	L5	L8	L5	L6	L5	L4	L3	L5	L4	F6	F5	F8	F9	F5
4	F9	F6	F8	F8	F3	F5	L7	L5	L6	L6	L5	L2	L3	L3	L3	C1	C1	L7	L7	F6	F5	F8	F8	F4
5	F7	F4	F5	F3	F2	F2	C3	L8	L8	L5	L5	L6	L5	L3	L5	L5	L7	L7	L8	F7	F8	F6	F6	F7
6	F8	F6	F6	F3	F4	F3	L8	L8	L8	L5	L3	L3	L4	L4	L4	L4	L7	L7	L7	F7	F5	F4	F5	F9
7	F9	F3	F2	F3	F2	F1	L2	L5	L6		L3	L4	L5	C2	C2	L3	L3		L8	F7	F7	F4	F3	F8
8	F8	F7	F9	F6	F6		L6	L8	L5	L6	L6	L7	L5	L4	L2	L3	L4	L7	L8	F9	F4	F5	F3	F8
9	F4	F9	F7	F3	F9		C3	C3	C5	L4	L6	L4	L3	L4	L5	L3	C2	L3	L8	L7	F9	F7	F9	F9
10	F9	F9	F9	F9	F9	F3	L8	L7	L8	L6	L4	C3	C3	L4	L4	L5	C2	L7	L6	F6	F8	F2	F8	F7
11	F2	F5	F4	F7	F8	F3	L5	L4	L6	L5	L5	L4	L4	L5	L4	L7	L4	L6	L8	F9	F9	F7	F2	F7
12	F6	F9	F8		F2	F1	L8	L7	L5	L6	L3	L2	L4	L6	L7	L5	L6	L6	L7	F8	F6	F3	F4	F8
13	F4	F9	F7	F9	F4	F3	L7	L6	L5	L5	L4	L4	L3	L5		L3	L2	L4	L6	F8	F9	F4	F8	F8
14	F9	F9	F8	F9	F9	F1	L7	L8	L7	L7	L7	L3	L3	L4	L3	L2	L3	L6	L7	F6	F4	F4	F6	F8
15	F6	F6	F5	F3	F5	F4	C4	C5	L4	L6	L4	L5	L5	L5	L5	L6	C2	L8	L8	F8	F3	F3	F3	F9
16	F8	F8	F8	F3	F9	F2		L2	L6	L5	L3	L3	C2	L2	L3	L5	L4	L8	L9	F5	F3	F5	F8	F2
17	F9	F9	F5	F5	F7	F7	L7	L6	L7	L5	L7	L4	L6	L5	L3	L1	L2	L2	L2	F4	F4	F4	F3	F2
18	F7	F5	F8	F8	F2	F5	L5	L5	L4	L6	L6	L5	L5	L8	L6	C2	C2	L8	L9	F9	F6	F6	F7	F6
19	F2	F3	F5	F6	F3	F3	L3	L7	L7	L7	L4	L3	L4	LF32	CL11	CL12	CL22	CL22	L4	F5	F3	F6	F5	F3
20	F2	F6	F6	F2	F2	F4	L6	C4	L6	L4	L2	L2	H1	HL12	H1	H1	L2	C4	H2	F3		F3	F3	F6
21	F4	F6	F6	F4	F8	F2	C3	L7	L6	L4	L5	L4	L2		L2	L3	L5	L6	L8	F8	F9	F7	F9	F9
22	F9	F8	F6	F8	F9	F1	F5	L5	L6	L6	L7	L7	L6	L5	L4	H2	C4	C3	L6	F1		F3	F9	F7
23	F6	F7	F9	F6	F8	F8	L8	L7	L5	L8	L6	L4	L4	L4	L4	L5	C2	L5	L9	F7	F9	F6	F5	F4
24	F4	F5	F1	F3	F2	F2	L5	L3	L4	L3	C2	C3	C2	L3	L5	L2	L4	L4	L7	F6	F4	F7	F7	F3
25	F3	F2	F2	F8	F6	F3	L8	L6	L4	L3	L5	L4	L2	L4	L4	L5	L5	L8	L7	F9	F4	F8	F9	F8
26	F8	F8	F7	F8	F7	F3	L3	L6	L4	L2	L2	L2	L2	L4	L4	L3	L7			F9	F7	F5	F4	F1
27	F3	F3	F2	F2	F1	F5		C5	L4	H2			L2	C2		C3		L2		F7	F9	F5	F8	F7
28	F7	F8		F7	F2	F2	L4	L3	L5	L5	L4	L4	L4	L2	L4	L8	L3	L3	L4	F9	F4	F1	F6	F7
29	F9	F2	F3	F5	F7	F3	L3	CL23	C5	L7	L4	L2	L3	L2	L2	L4	L6	L8	L7	F7	F6	F3	F2	F4
30	F8	F5	F3	F7	F6	F3	L3	L3	L5	L3	L5	L3	L3	L2		C1	C2	L4	L5	F9	F6	F3	F7	F2
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

IONOSPHERIC DATA STATION Okinawa

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

IONOSPHERIC DATA STATION Okinawa

JUN. 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	F 42	38	39	30	26	27	41	49	51	A	A	A	60	61	59	A	59	69	78	80	72	52	A	A
2	A	A	F 27	F 26	25	F 23	39	50	A	A	A	A	A	A	A	63	59	54	54	63	79	48	35	32
3	33	33	A	27	24	24	39	49	60	49	A	A	A	A	50	52	50	58	62	63	63	58	F	F 50
4	A	A	F 28	F 31	F 28	26	42	45	55	A	54	56	A	74	78	76	80	84	77	80	78	59	F	A
5	A	32	A	26	F 26	F 24	46	44	57	46	52	A	A	A	A	A	A	A	62	64	53	52	47	A
6	F 39	F 42	F 39	F 29	F 28	25	A	A	A	A	66	A	52	53	65	71	62	A	52	53	59	51	48	F 41
7	38	A	33	32	A	26	41	A	56	48	A	A	55	64	76	90	92	63	A	39	A	A	40	F 42
8	F 38	F 38	A	27	26	20	38	48	A	60	A	A	A	60	A	59	67	66	68	65	60	F 49	F 48	F 47
9	43	F 40	A	A	A	A	40	48	47	A	A	A	58	A	A	A	78	73	59	58	64	62	53	F 54
10	F 58	A	F	F	A	25	40	A	A	A	48	50	A	48	A	A	62	71	72	75	68	51	45	42
11	38	38	38	F 32	F 28	26	39	54	A	A	A	A	A	A	A	A	A	A	67	68	68	A	F 50	F 49
12	F 48	F 48	F 53	A	F 23	A	A	48	A	45	55	56	A	48	49	A	A	76	85	79	74	63	58	47
13	47	F 47	F 44	37	A	A	A	A	A	A	A	A	A	75	84	84	80	78	79	60	49	48	43	48
14	F	F	F 39	27	30	A	37	A	A	A	A	A	50	60	56	60	66	72	82	85	62	54	44	38
15	F 42	F 39	37	F 24	26	18	36	49	52	64	A	A	46	48	49	A	50	A	A	A	54	F 39	A	F 31
16	A	38	A	A	20	F 24	39	44	A	A	A	A	A	A	A	48	52	60	71	A	A	A	A	A
17	A	A	A	F 25	18	A	34	39	46	A	A	45	50	53	56	A	A	A	A	A	A	62	34	F
18	A	27	A	26	A	A	35	47	51	A	A	A	45	48	A	A	A	67	80	74	50	A	A	F
19	A	A	31	F 26	F 24	21	33	45	A	A	A	47	A	A	O R 46	46	A	A	A	A	A	45	40	39
20	F 33	F 33	F 33	F 23	F 19	A	A	48	52	50	A	A	A	E G 43	E G 42	43	45	52	65	A	53	A	A	F 39
21	F 38	F	F	A	A	A	A	51	48	A	A	A	A	A	50	49	54	57	62	72	61	48	46	F 39
22	F 32	A	A	31	F 26	F 26	A	49	54	A	A	A	A	A	A	50	57	69	75	80	65	54	48	45
23	42	39	F 39	34	A	A	A	A	A	A	54	A	A	A	61	66	A	65	71	75	71	44	40	F 36
24	33	F 32	F 30	F 32	23	F 20	33	45	55	42	47	54	48	49	53	53	A	A	A	59	63	57	46	39
25	35	F 32	30	F 28	24	24	34	42	58	50	A	52	50	50	47	A	A	A	A	A	A	A	F 50	A
26	A	A	A	F 23	F 24	24	33	42	44	53	65	A	46	A	A	57	A	53	54	60	A	50	41	41
27	42	39	38	34	F 30	28	36	41	48	58	51	52	48	45	E G 42	46	56	63	58	A	53	49	F 47	F 48
28	42	F 40	F 35	32	A	26	36	57	58	A	A	A	51	A	A	56	72	70	61	60	56	54	47	34
29	F 32	F 32	28	F 26	F 24	23	34	36	44	51	A	A	A	A	56	67	72	75	85	104	70	35	30	24
30	26	24	21	20	19	22	37	46	46	49	A	49	68	68	50	48	52	50	49	63	65	29	A	24
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	20	19	25	22	21	23	24	19	13	9	9	14	17	19	20	20	22	24	23	24	24	22	23
MED	38	F 38	F 35	27	24	24	37	48	52	50	54	52	50	53	53	56	60	66	68	65	63	51	46	41
U Q	F 42	F 40	F 39	32	F 26	26	40	49	56	56	60	55	55	62	61	66	72	72	78	79	69	56	48	F 47
L Q	33	32	30	F 26	23	22	34	44	47	47	50	48	48	48	49	48	53	58	60	60	55	48	40	36

JUN. 2019 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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 376	U L 396	A	A	A	A	A	424	A	392	364	340					
2								A	A	A	A	A	A	A	A	424	400	A	328					
3								A	404	U L 412	A	A	A	A	U A 432	A	396	A	344					
4								U L 380	L 408	A	436	A	A	A	A	416	A	376	356					
5									396	416	A	A	A	A	A	A	A	A	A					
6							A	A	A	A	U A 428	A	U A 452	A	A	A	A	A	A					
7								A	396	412	A	A	A	436	A	A	A	A	A					
8								A	A	A	A	A	A	A	A	420	396	372	A					
9										A	A	A	A	A	A	A	A	A	364					
10								A	A	A	A	U A 428	A	A	A	A	A	A	A					
11								A	A	A	A	A	A	A	A	A	A	A	A					
12						A	A	A	A	A	416	A	A	432	A	A	A	A						
13						A	A	A	A	A	A	A	A	A	A	A	392	A	A					
14						A		A	A	A	A	A	A	A	A	A	A	A	A					
15								A	A	A	A	A	424	A	A	A	A	A	A	A				
16								U L 332	A	A	A	A	A	A	A	A	A	360	A	A				
17						A			A	A	A	420	A	A	A	A	A	A	A	A				
18						A		A	A	A	A	A	A	A	A	A	A	A	A					
19								L	A	A	A	424	A	A	416	A	A	A	A	A				
20						A	A	A	A	A	A	A	A	428	416	408	384	A		A				
21						A		A	U L 392	A	A	A	A	A	A	404	A	356	A					
22							A	A	A	A	A	A	A	A	A	404	388	364	A					
23						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
24								348	L 380	408	A	U A 428	A	A	A	A	A	A	A	L				
25								A	388	L 412	A	432	A	A	424	A	A	A	A	A				
26									388	A	U A 420	A	A	A	A	A	A	A	U L 356					
27								356	U L 400	404	416	A	428	428	416	A	A	A	A	A				
28								356		A	A	A	428	A	A	408	U A 392	384	352	L				
29									384	A	A	A	A	A	A	404	A	A						
30								A	380	A	A	428	U A 428	432	428	408	388	372	348	L				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	12	6	5	6	5	5	7	9	9	8	8					
MED								356	394	412	420	428	428	432	424	408	392	368	350					
U Q								L 376	L 398	412	432	428	U A 440	434	428	418	396	374	356					
L Q								348	386	408	416	424	426	428	416	404	388	362	342					

JUN. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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	228	268	300	324	332	348	328	340	324	308	272	200	A				
2						B	A	232	A	284	A	A	A	A	A	320	292	268	212	A				
3						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
4						B	A	228	252	A	A	A	A	A	348	A	304	A	A	A				
5						B	A	204	280	312	324	344	344	328	A	A	A	A	A	A				
6						B	A	A	256	292	A	A	A	A	312	A	A	A	A	A				
7						A	A	212	268	284	A	A	A	348	340	316	272	A	A	A				
8						B	A	212	280	316	328	336	A	324	A	A	296	264	212	A				
9							A	200	A	A	A	348	344	348	332	320	300	264	220	A				
10						B	A	A	264	304	A	A	A	348	336	308	296	268	224	A				
11						B	A	212	264	304	324	340	A	A	316	328	304	264	228	A				
12						B	A	216	256	A	A	A	A	A	A	304	296	A	A	A				
13						A	A	A	268	296	A	A	A	A	336	328	A	A	A	A				
14						A	188	232	260	296	312	328	A	A	328	304	A	264	A	A				
15						B	A	A	A	A	A	A	A	A	328	316	292	272	216	A				
16						B	A	192	252	276	292	A	A	A	A	A	296	264	208	A				
17						A	A	A	244	288	308	A	A	A	A	A	A	A	A	A				
18						A	A	A	A	292	316	320	348	336	332	316	300	268	A	A				
19						B	A	A	256	272	296	308	308	A	A	A	A	A	A	A				
20						A	A	A	A	A	A	328	324	304	328	332	288	276	236	A				
21						A		208	276	A	A	A	A	A	A	316	292	264	220	A				
22						B	A	236	264	304	A	A	A	A	A	316	288	268	A	A				
23						A	A	192	248	300	312	332	A	340	A	A	A	A	A	A				
24						B	A	A	A	A	A	A	340	344	336	320	296	264	220	A				
25						B	A	212	268	A	A	A	348	344	328	316	292	264	216	A				
26						B	A	A	A	288	A	A	A	332	316	320	288	A	A	A				
27						B	A	A	A	A	A	A	A	A	A	320	296	272	232	A				
28						B	A	A	A	A	328	A	332	332	320	A	300	272	232	A				
29						B	A	A	268	312	328	344	356	336	A	332	A	A	A	A				
30						B	A	A	A	A	A	A	344	336	320	A	296	268	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	15	19	18	12	11	11	15	17	19	21	18	14					
MED							188	212	264	296	320	332	344	336	328	320	296	268	220					
U Q								228	268	304	326	344	348	344	336	324	300	272	228					
L Q								204	256	288	310	328	332	328	320	316	292	264	212					

IONOSPHERIC DATA STATION Okinawa

JUN. 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 20	J A 34	J A 47	J A 52	J A 81	J A 26	J A 33	J A 32	J A 73	J A 109	J A 86	J A 127	J A 57	J A 62	 42	J A 116	J A 69	 31	J A 39	J A 21	J A 35	J A 42	J A 64	J A 85
2	J A 63	J A 53	J A 21	J A 26	 19	J A 31	J A 29	J A 48	J A 84	J A 82	J A 213	D D 300	J A 269	J A 242	J A 173	J A 64	 32	J A 40	J A 33	J A 38	J A 36	J A 53	J A 52	J A 66
3	J A 51	J A 37	J A 84	J A 59	J A 61	J A 79	J A 40	J A 37	J A 50	J A 56	J A 230	J A 108	J A 170	J A 77	J A 47	J A 70	J A 47	J A 56	J A 40	J A 34	J A 33	J A 24	J A 81	J A 66
4	J A 50	J A 67	J A 66	J A 87	J A 30	J A 17	J A 46	J A 87	J A 121	J A 108	J A 218	J A 102	J A 125	J A 61	J A 52	J A 52	J A 58	J A 45	J A 53	J A 50	J A 41	J A 51	J A 88	J A 71
5	J A 62	J A 50	J A 49	J A 22	 21	E B 16	 21	 31	J A 40	J A 42	J A 58	J A 170	J A 206	J A 219	J A 216	J A 105	J A 104	J A 78	J A 54	J A 46	J A 53	J A 42	J A 61	J A 109
6	J A 52	J A 109	J A 43	J A 23	J A 47	J A 52	J A 53	J A 108	J A 88	J A 187	J A 199	J A 201	J A 109	J A 57	J A 66	J A 102	J A 138	J A 110	J A 62	J A 38	J A 52	J A 85	J A 77	J A 86
7	J A 140	J A 143	J A 90	J A 85	J A 85	J A 62	J A 37	J A 66	J A 52	J A 108	J A 86	J A 256	J A 110	 42	J A 76	J A 62	J A 77	J A 57	J A 63	J A 37	J A 52	J A 108	J A 110	J A 87
8	J A 32	J A 52	J A 46	J A 36	J A 52	E B 16	J A 32	J A 52	J A 88	J A 82	J A 71	J A 129	J A 123	J A 153	J A 248	 41	 34	 32	J A 50	J A 38	J A 52	J A 53	J A 52	J A 87
9	J A 158	J A 51	J A 65	J A 66	J A 82	J A 63	 24	J A 38	J A 42	J A 63	J A 81	J A 98	J A 60	J A 67	J A 87	J A 111	J A 58	J A 54	J A 34	J A 42	J A 29	J A 23	J A 52	J A 129
10	J A 63	J A 58	J A 63	J A 54	J A 42	J A 25	J A 46	J A 110	J A 88	J A 121	J A 49	J A 45	J A 59	J A 46	J A 62	J A 82	J A 68	J A 51	J A 42	J A 34	J A 44	J A 42	J A 32	J A 46
11	J A 52	J A 22	J A 21	J A 32	J A 49	J A 28	J A 43	J A 52	J A 54	J A 85	J A 87	J A 122	J A 240	J A 122	J A 93	J A 167	J A 77	J A 102	J A 63	J A 74	J A 50	J A 75	J A 39	J A 28
12	J A 74	J A 21	J A 109	J A 124	J A 42	J A 44	J A 71	J A 79	J A 212	J A 186	J A 122	J A 61	J A 59	J A 45	J A 57	J A 83	J A 142	J A 72	J A 80	J A 76	J A 88	J A 54	J A 50	J A 20
13	J A 22	J A 53	J A 52	J A 62	J A 66	J A 52	J A 52	J A 66	J A 110	J A 123	J A 184	J A 217	J A 155	J A 57	J A 70	J A 54	J A 34	J A 44	J A 87	J A 41	J A 60	J A 38	J A 54	J A 52
14	J A 53	J A 63	J A 87	J A 62	J A 54	J A 27	 28	J A 51	J A 64	J A 82	J A 166	J A 120	J A 162	J A 79	J A 71	J A 102	J A 71	J A 62	J A 42	J A 48	J A 23	J A 19	J A 29	J A 51
15	J A 66	J A 25	J A 21	J A 27	J A 31	E B 16	J A 28	J A 43	J A 50	J A 63	J A 65	J A 68	J A 49	 45	J A 56	J A 63	J A 61	J A 81	J A 85	J A 143	J A 44	J A 53	J A 86	J A 88
16	J A 87	J A 53	J A 80	J A 88	J A 53	J A 42	J A 31	J A 32	J A 78	J A 83	J A 133	J A 163	J A 189	J A 71	J A 54	J A 54	J A 50	 35	J A 50	J A 73	J A 81	J A 64	J A 85	J A 66
17	J A 40	J A 42	J A 63	 20	J A 24	J A 33	 26	J A 37	J A 44	J A 87	J A 110	J A 72	J A 71	J A 52	J A 61	J A 91	J A 100	J A 181	J A 124	J A 164	J A 117	J A 42	J A 22	J A 50
18	J A 108	J A 107	J A 128	J A 134	J A 53	J A 48	J A 52	J A 49	J A 124	J A 100	J A 89	J A 227	J A 47	J A 49	 49	J A 64	J A 85	J A 83	J A 53	J A 26	J A 51	J A 158	J A 64	J A 65
19	J A 59	J A 53	J A 53	J A 38	J A 31	J A 29	J A 27	J A 46	J A 88	J A 88	J A 92	J A 90	J A 80	J A 97	J A 73	J A 59	J A 69	J A 90	J A 219	J A 162	J A 109	J A 63	J A 28	J A 22
20	J A 19	J A 52	E B 16	J A 38	J A 46	J A 66	J A 32	J A 42	J A 52	J A 52	J A 55	J A 82	J A 61	J A 70	 38	 37	 36	J A 45	J A 63	J A 163	J A 158	J A 68	J A 88	J A 87
21	J A 54	J A 50	J A 50	J A 49	J A 43	J A 52	J A 46	J A 41	J A 78	J A 253	J A 128	J A 80	J A 52	J A 60	J A 49	 38	J A 52	J A 62	J A 62	J A 61	J A 51	J A 22	J A 54	J A 52
22	J A 30	J A 66	J A 60	J A 31	J A 20	J A 22	J A 62	J A 52	J A 53	J A 88	J A 128	J A 219	J A 123	J A 49	J A 59	 35	 35	 33	J A 66	J A 55	J A 63	J A 32	J A 22	J A 29
23	J A 14	E B 16	J A 33	J A 47	J A 56	J A 53	J A 43	J A 54	J A 73	J A 63	J A 72	J A 72	J A 74	J A 105	J A 110	J A 62	J A 84	J A 89	J A 39	J A 45	J A 24	J A 53	J A 53	J A 87
24	J A 20	E B 16	J A 32	J A 39	J A 48	J A 28	J A 52	J A 31	J A 33	J A 35	 44	 45	 45	 47	J A 47	J A 64	J A 60	J A 109	J A 53	J A 28	J A 34	J A 17	J A 26	J A 33
25	J A 32	J A 30	J A 33	J A 45	J A 31	J A 33	J A 32	J A 52	J A 97	J A 196	J A 122	J A 210	J A 71	J A 58	J A 56	J A 102	J A 97	J A 102	J A 90	J A 85	J A 108	J A 86	J A 48	J A 106
26	J A 98	J A 120	J A 66	J A 64	J A 38	J A 18	J A 34	J A 42	J A 55	J A 56	J A 48	J A 69	J A 52	J A 86	J A 78	J A 70	J A 136	J A 53	J A 86	J A 106	J A 87	J A 52	J A 74	J A 49
27	J A 32	J A 32	J A 22	J A 28	J A 33	J A 31	J A 25	J A 40	J A 52	J A 41	 38	J A 77	J A 46	J A 40	 39	J A 44	J A 43	J A 53	J A 50	J A 63	J A 110	J A 64	J A 40	J A 50
28	J A 66	J A 31	J A 62	J A 56	J A 62	J A 54	J A 32	J A 59	J A 50	J A 57	J A 105	J A 180	J A 43	J A 72	J A 139	J A 46	J A 63	J A 39	J A 32	 21	 20	J A 53	J A 27	J A 24
29	J A 46	J A 20	J A 53	J A 19	 18	J A 26	J A 29	 31	J A 40	J A 52	J A 79	J A 105	J A 89	J A 52	J A 54	 38	J A 80	J A 87	J A 88	J A 53	J A 53	J A 31	J A 20	J A 17
30	J A 18	J A 26	J A 38	J A 52	J A 42	J A 42	J A 31	J A 65	J A 52	J A 56	J A 64	J A 43	J A 44	J A 46	J A 39	J A 40	 41	 34	J A 47	J A 33	J A 60	J A 29	J A 33	J A 33
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 52	J A 50	J A 52	J A 48	J A 44	J A 32	J A 32	J A 48	J A 60	J A 82	J A 88	J A 106	J A 72	J A 60	J A 60	J A 64	J A 66	J A 56	J A 54	J A 47	J A 52	J A 52	J A 52	J A 58
U Q	J A 66	J A 58	J A 66	J A 62	J A 54	J A 52	J A 46	J A 59	J A 88	J A 108	J A 128	J A 180	J A 125	J A 79	J A 78	J A 91	J A 84	J A 87	J A 80	J A 74	J A 81	J A 64	J A 74	J A 87
L Q	J A 32	J A 30	J A 33	J A 31	J A 31	J A 26	 29	J A 38	J A 50	J A 56	 65	J A 72	J A 52	 49	 49	 46	 47	 44	J A 42	J A 37	J A 36	J A 32	J A 32	J A 33

JUN. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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	22	32	21	E B 16	E B 16	20	27	34	A A 109	A A 86	A A 127	47	54	41	A A 116	33	30	29	18	24	18	A A 64	A A 85
2	A A 63	A A 53	E B 16	E B 16	E B 16	E B 16	25	43	A A 84	A A 82	A A 213	A A 300	A A 269	A A 242	A A 173	35	32	38	25	32	28	20	20	16
3	E B 16	22	A A 84	E B 16	E B 16	E B 16	20	32	34	36	A A 230	A A 108	A A 170	A A 77	43	42	35	44	32	31	25	22	30	33
4	A A 50	A A 67	E B 16	E B 16	E B 16	E B 16	28	32	36	A A 108	38	46	A A 125	45	45	38	43	32	25	22	20	25	23	A A 71
5	A A 62	E B 16	A A 49	E B 16	E B 16	E B 16	20	27	33	38	48	A A 170	A A 206	A A 219	A A 216	A A 105	A A 104	A A 78	37	28	18	E B 16	28	A A 109
6	21	18	21	E B 16	E B 16	E B 16	A A 53	A A 108	A A 88	A A 187	43	A A 201	45	46	54	45	52	A A 110	37	33	24	19	E B 16	E B 16
7	21	A A 143	E B 16	20	A A 85	20	24	A A 66	34	34	A A 86	A A 256	48	41	57	53	65	49	A A 63	35	A A 52	A A 108	22	E B 16
8	21	17	A A 46	17	E B 16	E B 16	22	36	A A 88	56	A A 71	A A 129	A A 123	54	A A 248	35	34	31	40	33	44	29	31	E B 16
9	E B 16	E B 16	A A 65	A A 66	A A 82	A A 63	21	32	36	A A 63	A A 81	A A 98	54	A A 67	A A 87	A A 111	51	43	29	40	26	22	22	E B 16
10	37	A A 58	E B 16	26	A A 42	E B 16	32	A A 110	A A 88	A A 121	44	43	A A 59	44	A A 62	A A 82	52	48	38	29	39	20	21	E B 16
11	E B 16	E B 16	E B 16	25	20	E B 16	34	46	A A 54	A A 85	A A 87	A A 122	A A 240	A A 122	A A 93	A A 167	A A 77	A A 102	48	62	33	A A 75	E B 16	E B 16
12	E B 16	E B 16	E B 16	A A 124	E B 16	A A 44	A A 71	39	A A 212	40	39	49	A A 59	41	44	A A 83	A A 142	64	63	60	42	30	21	E B 16
13	E B 16	22	36	24	A A 66	A A 52	A A 52	A A 66	A A 110	A A 123	A A 184	A A 217	A A 155	53	62	45	32	42	67	37	25	23	18	21
14	29	E B 16	E B 16	E B 16	E B 16	A A 27	26	A A 51	A A 64	A A 82	A A 166	A A 120	43	45	55	48	41	56	38	46	19	E B 16	E B 16	19
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	39	39	46	A A 65	A A 68	40	44	45	A A 63	48	A A 81	A A 85	A A 143	38	21	A A 86	E B 16
16	A A 87	E B 16	A A 80	A A 88	17	E B 16	26	25	A A 78	A A 83	A A 133	A A 163	A A 189	A A 71	A A 54	46	46	33	40	A A 73	A A 81	A A 64	A A 85	A A 66
17	A A 40	A A 42	A A 63	E B 16	E B 16	A A 33	24	31	40	A A 87	A A 110	38	45	44	43	A A 91	A A 100	A A 181	A A 124	A A 164	A A 117	22	17	E B 16
18	A A 108	E B 16	A A 128	E B 16	A A 53	A A 48	22	36	44	A A 100	A A 89	A A 227	44	44	A A 49	A A 64	A A 85	60	38	21	31	A A 158	A A 64	24
19	A A 59	A A 53	E B 16	E B 16	E B 16	E B 16	24	32	A A 88	A A 88	A A 92	39	A A 80	A A 97	38	42	A A 69	A A 90	A A 219	A A 162	A A 109	20	20	17
20	E B 16	20	E B 16	18	E B 16	A A 66	A A 32	36	43	45	A A 55	A A 82	A A 61	37	37	36	35	38	49	A A 163	29	A A 68	A A 88	20
21	E B 16	E B 16	22	A A 49	A A 43	A A 52	A A 46	37	36	A A 253	A A 128	A A 80	A A 52	A A 60	44	37	42	32	36	36	31	19	30	26
22	20	A A 66	A A 60	E B 16	E B 16	E B 16	A A 62	39	43	A A 88	A A 128	A A 219	A A 123	A A 49	A A 59	34	35	31	52	32	29	23	E B 16	21
23	E B 16	E B 16	E B 16	28	A A 56	A A 53	A A 43	A A 54	A A 73	A A 63	50	A A 72	A A 74	A A 105	48	53	A A 84	51	35	34	18	20	31	E B 16
24	E B 16	E B 16	E B 16	20	E B 16	E B 16	19	25	30	30	42	43	43	44	41	51	A A 60	A A 109	A A 53	23	E B 16	E B 16	E B 16	21
25	26	E B 16	E B 16	E B 16	E B 16	E B 16	20	37	34	35	A A 122	40	46	47	39	A A 102	A A 97	A A 102	A A 90	A A 85	A A 108	A A 86	29	A A 106
26	A A 98	A A 120	A A 66	E B 16	E B 16	E B 16	27	32	33	47	42	A A 69	45	A A 86	A A 78	44	A A 136	46	24	28	A A 87	24	34	27
27	22	E B 16	E B 16	E B 16	E B 16	E B 16	18	31	35	36	36	44	39	38	36	41	41	50	47	A A 63	26	19	E B 16	29
28	E B 16	18	23	20	A A 62	E B 16	20	28	40	A A 57	A A 105	A A 180	41	A A 72	A A 139	37	39	30	29	18	E B 16	23	20	E B 16
29	E B 16	E B 16	20	E B 16	E B 16	E B 16	20	29	34	44	A A 79	A A 105	A A 89	A A 52	44	36	68	71	64	40	42	27	E B 16	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	36	33	44	A A 64	40	43	41	36	34	34	32	27	23	43	20	A A 33	E B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	20	16	18	E B 16	E B 16	E B 16	24	36	40	A A 63	A A 84	A A 102	A A 56	50	48	46	50	48	39	34	30	22	22	18
U Q	A A 40	A A 42	A A 49	24	A A 42	A A 33	A A 32	A A 43	A A 78	A A 88	A A 122	A A 170	A A 123	A A 72	A A 62	A A 82	A A 77	A A 78	A A 63	A A 62	A A 43	A A 29	A A 31	A A 27
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	31	34	44	48	46	45	44	43	37	35	33	32	28	24	20	E B 17	E B 16

JUN. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

JUN. 2019 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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	F 302	327	380	308	312	337	381	366	346	A	A	A	317	300	263	A	283	305	326	350	370	361	A	A
2	A	A	F 331	F 320	352	F 330	352	357	A	A	A	A	A	A	A	317	313	304	301	316	378	348	326	291
3	314	334	A	316	340	352	356	350	378	307	A	A	A	A	291	302	291	329	313	317	326	356	F	F 318
4	A	A	F 350	F 342	F 302	348	364	325	359	A	335	298	A	283	292	283	289	305	309	328	362	331	F	A
5	A	298	A	308	F 292	F 308	363	383	375	304	326	A	A	A	A	A	A	A	329	337	332	317	320	A
6	F 317	F 313	F 359	F 325	F 342	384	A	A	A	A	346	A	279	271	288	310	320	A	307	325	332	335	323	F 305
7	300	A	320	296	A	365	395	A	373	309	A	A	272	282	297	325	369	355	A	330	A	A	292	F 328
8	F 333	F 306	A	321	331	358	344	366	A	357	A	A	A	318	A	290	293	298	320	344	343	F 315	F 302	F 341
9	339	F 334	A	A	A	A	358	374	390	A	A	A	311	A	A	A	324	321	311	300	317	321	319	F 328
10	F 295	A	F	F	A	377	363	A	A	A	272	324	A	278	A	A	296	313	322	329	351	316	323	315
11	306	321	331	F 373	F 319	327	370	360	A	A	A	A	A	A	A	A	A	A	323	325	345	A	F 311	F 318
12	F 327	F 337	F 404	A	F 319	A	A	371	A	355	316	343	A	262	264	A	A	299	328	325	335	339	352	302
13	292	F 302	F 333	337	A	A	A	A	A	A	A	A	A	283	302	309	302	315	338	351	306	324	293	372
14	F	F	F 409	364	380	A	380	A	A	A	A	A	284	313	A	292	278	287	308	355	329	329	344	289
15	F 306	F 315	362	F 343	362	317	357	357	343	369	A	A	237	296	296	A	309	A	A	A	384	F 301	A	F 343
16	A	348	A	A	325	F 360	403	372	A	A	A	A	A	A	A	277	283	307	343	A	A	A	A	A
17	A	A	A	F 379	374	A	399	371	348	A	A	263	299	294	279	A	A	A	A	A	A	398	359	F
18	A	309	A	327	A	A	364	365	384	A	A	A	259	298	A	A	A	309	348	376	355	A	A	F
19	A	A	335	F 370	F 359	333	360	371	A	A	A	304	A	A	O R 262	280	A	A	A	A	A	313	319	308
20	F 312	F 329	F 333	F 332	F 337	A	A	378	384	374	A	A	A	G	G	234	273	301	326	A	337	A	A	F 293
21	F 284	F	F	A	A	A	A	372	355	A	A	A	A	A	289	272	298	303	333	350	338	335	338	F 292
22	F 312	A	A	327	F 336	F 324	A	350	382	A	A	A	A	A	A	280	280	303	315	348	335	332	313	320
23	321	313	F 346	333	A	A	A	A	A	A	346	A	A	A	302	313	A	315	318	346	377	315	305	F 323
24	313	F 319	F 295	F 362	384	F 339	354	342	369	251	304	341	305	295	311	U A 314	A	A	A	328	346	362	336	318
25	320	F 342	323	F 297	332	354	338	311	354	358	A	342	313	321	279	A	A	A	A	A	A	A	F 326	A
26	A	A	A	F 326	F 364	360	359	345	305	332	353	A	309	A	A	337	A	325	327	375	A	321	310	305
27	344	338	311	324	F 323	342	338	294	322	361	323	327	310	251	G	276	311	338	352	A	311	349	F 311	F 312
28	338	F 313	F 313	374	A	317	362	383	412	A	A	A	322	A	A	279	315	334	323	317	328	361	352	329
29	F 313	F 317	330	F 319	F 329	360	411	393	320	329	A	A	A	A	285	300	300	300	315	370	403	320	325	343
30	317	311	313	374	357	349	368	360	327	322	A	266	331	361	294	281	304	324	308	328	398	357	A	301
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	20	19	25	22	21	23	24	19	13	9	9	14	17	18	20	20	22	24	23	24	24	22	23
MED	313	F 318	F 333	327	336	348	363	366	359	332	326	324	307	294	288	291	299	308	322	330	340	332	322	318
U Q	324	334	F 359	F 363	359	360	380	372	382	360	346	342	313	306	296	312	312	324	328	350	366	352	336	328
L Q	304	312	320	320	F 323	328	356	350	343	308	310	282	279	274	264	280	286	303	312	325	330	318	311	302

JUN. 2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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 378	U L 396	A	A	A	A	A	430	A	405	404	374					
2								A	A	A	A	A	A	A	A	421	396	A	412					
3								A	405	U L 450	A	A	A	A	A	A	393	A	A					
4								U L 365	L 399	A	441	A	A	A	A	401	A	394	365					
5									385	404	A	A	A	A	A	A	A	A	A					
6							A	A	A	A	A	A	A	A	A	A	A	A	A					
7								A	388	443	A	A	A	421	A	A	A	A	A					
8								A	A	A	A	A	A	A	A	413	414	401	A					
9										A	A	A	A	A	A	A	A	A	360					
10								A	A	A	A	A	A	A	A	A	A	A	A					
11								A	A	A	A	A	A	A	A	A	A	A	A					
12						A	A	A	A	A	422	A	A	452	A	A	A	A						
13						A	A	A	A	A	A	A	A	A	A	A	411	A	A					
14						A		A	A	A	A	A	A	A	A	A	A	A	A					
15								A	A	A	A	A	446	A	A	A	A	A	A	A				
16								U L 413	A	A	A	A	A	A	A	A	A	399	A	A				
17						A			A	A	A	423	A	A	A	A	A	A	A	A				
18						A		A	A	A	A	A	A	A	A	A	A	A	A					
19								L	A	A	A	441	A	A	426	A	A	A	A	A				
20						A	A	A	A	A	A	A	A	461	456	411	423	A		A				
21						A		A	U L 397	A	A	A	A	A	A	402	A	417	A					
22							A	A	A	A	A	A	A	A	A	458	401	384	A					
23						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
24								384	L 410	440	A	A	A	A	A	A	A	A	A	L				
25								A	406	L 422	A	447	A	A	424	A	A	A	A	A				
26									401	A	A	A	A	A	A	A	A	A	U L 391					
27								394	U L 392	400	414	A	412	418	447	A	A	A	A	A				
28								387		A	A	A	431	A	A	422	A	390	387	L				
29									394	A	A	A	A	A	A	421	A	A						
30								A	442	A	A	418	A	428	438	464	428	413	377	L				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	12	6	3	4	3	5	6	9	8	8	7					
MED								386	398	431	422	432	431	428	434	421	408	400	377					
U Q								394	406	443	441	444	446	456	447	440	418	408	391					
L Q								L 378	393	404	414	420	412	420	426	406	398	392	365					

JUN. 2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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								262	270	A	A	A	322	E A 358	402	A	376	312	266					
2								264	A	A	A	A	A	A	A	310	320	326	334					
3								212	238	L 278	A	A	A	A	408	368	396	290	294					
4								324	252	A	318	372	A	340	310	334	322	294	282					
5									234	398	332	A	A	A	A	A	A	A	280					
6							A	A	A	A	272	A	426	448	370	294	298	A	310					
7								A	240	364	A	A	438	384	326	284	232	242	A					
8								266	A	E A 294	A	A	A	E A 334	A	370	322	318	270					
9										A	A	A	E A 356	A	A	A	288	282	292					
10								A	A	A	464	342	A	450	A	A	350	280	272					
11								E A 248	A	A	A	A	A	A	A	A	A	A	280					
12						A	A	248	A	A 266	342	286	A	500	480	A	A	332						
13						A	A	A	A	A	A	A	A	356	312	296	298	288	274					
14						A		A	A	A	A	A	422	326	E A 426	360	362	346	276					
15								262	290	244	A	A	580	410	400	A	E A 380	A	A	A				
16								246	A	A	A	A	A	A	A	E A 456	392	318	252	A				
17						A			300	A	A	500	390	382	382	A	A	A	A	A				
18						A		256	236	A	A	A	526	398	A	A	A	346	240					
19								244	A	A	A	386	A	A	U G 494	442	A	A	A	A				
20						A	A	250	240	258	A	A	A	G	G	618	454	348		A				
21						A		256	272	A	A	A	A	A	406	446	360	354	272					
22							A	278	238	A	A	A	A	A	A	422	388	308	290					
23						A	A	A	A	A	288	A	A	A	344	322	A	300	282					
24								298	252	556	388	298	382	404	354	E A 380	A	A	A	260				
25								368	254	278	A	304	370	348	458	A	A	A	A	A				
26									384	320	272	A	394	A	A	302	A	330	294					
27								394	320	258	336	330	370	536	G	454	334	272	256	A				
28								232		A	A	A	336	A	A	408	294	266	284	274				
29									346	322	A	A	A	A	394	326	E A 388	E A 384						
30								258	314	328	A	470	290	256	400	432	352	330	318	244				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								19	17	13	9	9	14	17	19	20	20	22	21	3				
MED								258	254	294	332	342	386	384	400	U 358	U 340	312	280	260				
U Q								278	307	346	365	428	426	449	G 458	437	384	332	293	274				
L Q								248	239	262	280	301	356	344	354	316	309	288	271	244				

JUN. 2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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	258	262	244	E A 270	278	240	208	202	220	A	A	A	A	A	220	A	184	198	218	220	196	176	A	A
2	A	A	248	258	234	236	214	A	A	A	A	A	A	A	A	194	184	A	204	262	192	198	246	322
3	298	E A 270	A	272	266	232	204	A	204	168	A	A	A	A	A	A	220	A	A	254	234	204	Q 280	A 274
4	A	A	238	210	262	238	232	E A 240	212	A	180	A	A	A	A	A 224	A	198	198	234	198	206	314	A
5	A	282	A	290	286	266	206	192	210	216	A	A	A	A	A	A	A	A	A	236	224	240	282	A
6	286	288	216	260	232	224	A	A	A	A	A	A	A	A	A	A	A	A	A	262	230	228	232	304
7	328	A	260	314	A	224	198	A	A	182	A	A	A	216	A	A	A	A	A	E A 310	A	A	E A 290	236
8	248	282	A	292	296	250	238	A	A	A	A	A	A	A	A	198	204	210	A	224	242	A 274	E A 322	224
9	236	224	A	A	A	A	218	228	224	A	A	A	A	A	A	A	A	A	230	A 276	258	236	258	246
10	304	A	242	256	A	248	244	A	A	A	A	A	A	A	A	A	A	A	A	238	226	226	248	270
11	270	256	230	248	E A 254	248	E A 258	A	A	A	A	A	A	A	A	A	A	A	A	E A 318	232	A	272	268
12	258	232	188	A	298	A	A	A	A	A	202	A	A	188	A	A	A	A	272	264	244	224	224	254
13	262	294	E A 318	270	A	A	A	A	A	A	A	A	A	A	A	A	188	A	A	226	248	256	278	234
14	280	242	184	240	200	A	216	A	A	A	A	A	A	A	A	A	A	A	A	230	198	208	224	E A 282
15	270	230	200	248	206	308	218	A	A	A	A	A	198	A	A	A	A	A	A	A	214	A 274	A	236
16	A	224	A	A	E B 326	208	208	186	A	A	A	A	A	A	A	A	A	E A 238	A	A	A	A	A	A
17	A	A	A	202	232	A	210	224	A	A	A	196	A	A	A	A	A	A	A	A	A	196	196	314
18	A	300	A	246	A	A	202	A	A	A	A	A	A	A	A	A	A	A	A	206	226	A	A	E A 298
19	A	A	254	206	214	260	206	226	A	A	A	190	A	A	208	A	A	A	A	A	A	232	248	276
20	278	246	202	258	294	A	A	A	A	A	A	A	A	166	178	218	202	A	266	A	208	A	A	282
21	304	306	312	A	A	A	A	A	E A 236	A	A	A	A	A	A	226	A	210	A	234	222	196	E A 238	E A 280
22	280	A	A	244	232	264	A	A	A	A	A	A	A	A	A	158	228	226	A	228	216	228	228	250
23	242	250	226	E A 308	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	222	186	244	E A 296	232
24	258	258	278	214	220	286	214	212	184	178	A	A	A	A	A	A	A	A	A	234	226	200	206	256
25	E A 278	250	232	254	258	222	202	A	212	184	A	196	A	A	204	A	A	A	A	A	A	A	260	A
26	A	A	A	268	242	214	A 242	224	198	A	A	A	A	A	A	A	A	A	196	226	A	252	E A 306	E A 298
27	248	240	256	258	242	222	200	226	232	220	202	A	214	206	176	A	A	A	A	A	E A 252	206	254	286
28	226	250	E A 272	220	A	272	210	216	204	A	A	A	214	A	A	204	A	194	216	214	220	210	218	200
29	288	252	284	266	254	230	202	204	220	A	A	A	A	A	A	214	A	A	306	210	186	E A 282	232	268
30	274	306	294	226	270	252	216	A	178	A	A	212	A	212	194	168	200	206	224	228	192	200	A	314
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	22	21	26	22	21	23	12	13	6	3	4	3	5	6	9	8	8	10	23	24	24	24	25
MED	271	252	241	254	251	240	210	217	211	183	202	196	214	206	199	204	201	205	221	231	222	221	243	262
U Q	286	282	275	270	278	262	218	226	222	216	202	204	214	214	208	221	212	218	266	262	233	242	E A 281	292
L Q	258	242	221	240	232	224	204	203	201	178	180	193	198	177	178	181	186	198	204	224	198	202	230	241

JUN. 2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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	106	106	106	104	104	104	102	102	102	102	102	A				
2						B	A	102	A	102	A	A	A	A	A	102	104	104	104	A				
3						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
4						B	A	104	104	A	A	A	A	A	104	A	104	A	A	A				
5						B	A	106	110	110	104	104	104	104	A	A	A	A	A	A				
6						B	A	A	102	104	A	A	A	A	100	A	A	A	A	A				
7						A	A	100	100	100	A	A	A	100	100	100	102	A	A	A				
8						B	A	112	112	110	110	104	A	104	A	A	106	106	106	A				
9							A	104	A	A	A	108	108	108	104	100	100	106	106	A				
10						B	A	A	106	106	A	A	A	106	106	106	106	102	100	A				
11						B	A	108	108	108	108	108	A	A	104	104	104	104	104	A				
12						B	A	104	106	A	A	A	A	A	A	106	106	A	A	A				
13						A	A	A	106	106	A	A	A	A	104	102	A	A	A	A				
14						A	118	112	106	106	106	106	A	A	106	106	A	106	A	A				
15						B	A	A	A	A	A	A	A	A	98	106	106	106	106	A				
16						B	A	102	108	104	104	A	A	A	A	A	104	104	108	A				
17						A	A	A	104	104	104	A	A	A	A	A	A	A	A	A				
18						A	A	A	A	106	106	106	106	106	106	106	110	110	A	A				
19						B	A	A	110	104	104	104	106	A	A	A	A	A	A	A				
20						A	A	A	A	A	A	106	108	108	108	108	104	108	108	A				
21						A		A	104	A	A	A	A	A	A	98	102	108	108	A				
22						B	A	108	108	108	A	A	A	A	A	108	110	110	A	A				
23						A	A	100	106	106	102	102	A	102	A	A	A	A	A	A				
24						B	A	A	A	A	A	A	102	104	104	100	106	106	106	A				
25						B	A	106	106	A	A	A	106	106	106	106	108	110	106	A				
26						B	A	A	A	104	A	A	A	104	102	104	104	A	A	A				
27						B	A	A	A	A	A	A	A	A	A	104	104	106	106	A				
28						B	A	A	A	A	106	A	106	106	106	A	106	106	106	A				
29						B	A	A	112	106	106	106	106	106	A	106	A	A	A	A				
30						B	A	A	A	A	A	A	100	106	106	A	106	108	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	14	19	18	12	11	11	15	17	19	21	18	14					
MED							118	105	106	106	106	106	106	106	104	104	104	106	106					
U Q								108	108	106	106	106	106	106	106	106	106	108	106					
L Q								102	104	104	104	104	104	104	102	102	104	104	104					

JUN. 2019 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

JUN. 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	76	88	92	90	92	112	110	112	100	102	100	98	126	108	118	106	102	114	100	92	92	94	92	90
2	90	84	84	84	84	118	108	102	96	94	92	94	92	92	92	120	152	110	104	96	94	92	92	92
3	92	94	90	94	96	96	110	102	98	104	92	92	96	92	94	96	96	90	110	88	84	84	96	96
4	94	96	94	110	116	106	108	106	100	92	94	94	92	96	112	90	104	102	100	92	88	92	98	92
5	92	92	88	84	80	B	114	126	114	110	102	100	98	96	98	92	92	92	92	134	108	104	98	96
6	98	108	88	92	106	110	104	104	100	98	96	94	94	96	94	94	96	92	90	108	100	102	100	100
7	96	96	94	94	94	94	112	104	104	102	102	102	98	134	116	102	96	96	100	102	98	98	98	102
8	98	96	94	94	92	B	122	108	106	104	106	98	98	96	96	98	138	116	104	100	98	102	102	98
9	100	104	94	94	92	96	126	112	118	106	106	106	116	110	106	102	102	102	106	102	98	96	98	98
10	98	96	96	96	94	94	114	104	104	104	120	132	124	128	114	106	106	102	100	98	96	96	96	96
11	96	92	88	90	94	106	116	108	108	108	104	102	98	98	104	108	104	100	102	98	96	96	98	92
12	96	86	98	98	92	114	108	108	98	96	94	96	96	100	104	102	96	96	88	82	96	96	100	80
13	86	106	90	90	88	86	110	104	100	96	94	94	92	102	102	100	104	100	92	86	94	84	98	94
14	98	94	94	94	94	94	116	114	106	104	100	98	100	102	102	100	100	96	96	96	96	96	94	94
15	94	94	86	86	86	B	116	102	102	96	96	92	92	120	116	110	112	110	104	102	98	100	100	96
16	96	94	92	92	90	92	110	114	100	94	98	90	112	112	86	112	106	110	102	94	96	94	94	94
17	90	94	94	92	92	90	118	112	108	100	96	98	98	90	90	106	100	98	98	98	98	94	96	98
18	96	94	92	92	92	90	96	108	104	102	98	100	122	118	138	114	108	106	102	102	100	98	94	98
19	94	88	92	98	86	88	114	112	102	98	96	108	98	96	92	92	114	106	104	98	92	98	90	90
20	98	98	B	100	100	94	116	110	106	106	104	100	100	106	158	158	148	120	112	118	106	92	90	120
21	96	90	90	86	82	80	100	118	110	96	96	92	94	92	96	134	112	106	102	96	96	96	92	90
22	90	92	92	92	90	84	110	106	106	100	100	96	96	98	96	128	188	142	96	88	88	86	84	84
23	84	B	92	92	92	94	114	110	106	104	102	102	102	100	96	90	90	88	88	84	86	94	110	106
24	84	B	100	94	96	94	94	92	92	94	132	122	114	114	114	106	110	104	102	104	98	102	98	98
25	96	92	92	100	116	98	118	104	98	98	98	102	104	110	110	106	106	104	100	98	100	100	100	104
26	96	94	94	96	98	92	110	92	104	98	92	92	104	100	98	100	94	92	92	92	86	88	106	90
27	88	114	86	84	96	82	96	92	94	146	154	94	94	136	120	114	116	106	102	98	96	96	92	106
28	92	96	96	94	92	92	92	104	102	100	100	128	100	96	96	122	106	122	104	112	92	98	90	86
29	98	86	86	86	86	82	82	124	120	114	106	102	100	98	100	134	104	92	86	84	84	82	82	110
30	100	104	102	100	98	98	104	100	96	100	96	98	96	102	106	106	116	110	94	90	84	108	106	86
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	30	30	27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	96	94	92	93	92	94	110	107	103	100	99	98	98	100	102	106	105	103	100	98	96	96	97	96
U Q	98	96	94	96	96	98	116	112	106	104	104	102	104	110	114	114	112	110	104	102	98	98	100	98
L Q	90	92	89	90	90	90	104	104	100	96	96	94	96	96	96	100	100	96	94	92	92	92	92	90

IONOSPHERIC DATA STATION Okinawa

JUN. 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	FF24	F3	F3	C1	C2	C1	C2	C5	C7	L3	C3	C3	C2	C4	C2	C1	C4	L2	F2	F2	F5	F4
2	F6	F4	F3	F2	F1	C1	C3	C6	L8	L5	L8	L8	LQ61	LQ71	L5	C1	H1	C2	C3	L7	F7	F3	F4	F4
3	F2	F3	F3	F4	F2	L3	C2	C1	C2	CL21	L9	L6	LQ41	LQ21	L2	L3	L2	LQ41	CL24	LC54	F5	F2	F3	F6
4	F7	F7	FQ31	FF12	FF11	C1	C3	C4	C3	L7	LQ41	LQ31	L4	LC11	C2	LC11	C4	C1	C2	L2	F3	FF23	FF33	F6
5	F5	F4	F3	F1	F2		C1	C2	C2	C2	C4	C7	L7	L8	L7	L7	L8	L8	L5	HL12	FF13	FF43	FF45	FF35
6	FF23	FF24	F4	FF22	FF11	C6	C8	C8	C8	L4	LQ51	LQ41	L3	L3	L3	L4	LQ31	L8	L6	CL43	FF25	F4	F3	F2
7	F5	F5	F4	F8	F7	L2	CL41	C6	C3	C3	C3	C5	L3	H1	C3	C3	L4	L4	L8	C8	F9	F8	F4	F3
8	F7	F5	F6	F5	F7		C1	C5	C6	C5	C3	C6	L4	L4	L6	LH11	H1	C2	C4	C4	FF65	FF23	FF72	F2
9	F2	F1	F9	F3	F4	FQ31	CL11	C3	CL21	CL31	C3	C5	C3	C2	C5	C7	C3	C5	C2	C5	F6	F4	F3	F4
10	F6	F9	F2	F6	F4	L2	C5	C6	C5	C5	C2	H1	C3	C1	C3	C6	C5	C4	C4	L5	F3	F5	F9	F3
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13	FF11	FF12	F5	F6	F4	L5	CL34	CL63	C5	L9	LQ51	L8	L8	C2	CL41	C3	C1	C2	LL53	L4	F3	F3	FF22	F2
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17	F5	F4	FQ51	F1	F1	L4	C3	C3	C4	C6	L6	L2	L2	L3	LQ21	CL62	C7	L9	L8	L9	FF43	F3	F2	F2
18	F3	F3	F4	F3	F4	L4	L2	CL32	C5	C6	L7	C6	C1	C2	H2	C5	C6	C7	C4	C5	F7	F5	F9	F3
19	F7	F5	F2	F2	F2	L2	CL23	C4	C9	L8	L5	CL22	L3	LQ31	LQ21	L2	CL51	CL62	C4	LQ51	FQ51	F2	F5	F3
20	F2	F5		F3	F3	L6	C5	CL43	CL45	CL42	CL33	CL41	C3	C1	H1	H1	H2	C2	C6	CL17	FF25	F5	F5	FF12
21	F3	F3	FQ31	FQ31	F6	L4	CL22	C4	C3	L4	LQ51	L4	L3	L4	L2	H1	C2	C2	C4	L3	F7	F3	F4	F3
22	F5	F5	F7	F8	F2	L2	C8	C5	C4	C5	C6	L6	L4	L3	L5	C1	HC11	HC11	L5	L5	F6	F7	F2	F4
23	FF11		F3	F8	F9	L6	C8	C8	C7	C4	C4	C5	C3	C7	L3	L5	L6	L9	L5	L5	F2	F4	FF82	FF12
24	F1		F2	F2	F4	L2	L2	LH21	L1	L2	HL12	CL11	C2	C2	C1	C2	C3	C6	C8	CL31	F2	F1	F1	F5
25	F5	F4	F2	F1	F1	L2	C3	C3	C3	L3	L3	C3	C3	C2	C2	C5	C6	C8	C8	L9	F8	F8	FQ61	F4
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27	F4	FF22	F2	F4	FF12	L2	L2	LC32	LH21	HL11	HL11	L3	LH11	HL11	C1	C2	C2	C5	C5	L9	F4	FQ21	F2	FF42
28	F2	F2	F3	F3	F5	LQ31	L3	C3	CH31	C3	C4	CL24	CH11	L3	L6	C1	C3	C1	C3	C1	F1	F4	F3	F6
29	FF23	F6	F3	F2	F1	L2	L4	CL22	CL21	C3	C6	C5	C4	C3	C2	H1	C6	L8	L7	L7	F6	F4	F2	FF11
30	FF11	F4	FF21	FF11	FF22	L4	C3	C5	L4	C4	L4	L1	L1	C1	CH11	C1	C1	C2	L4	L4	F7	FF14	FF14	F4
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUN. 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

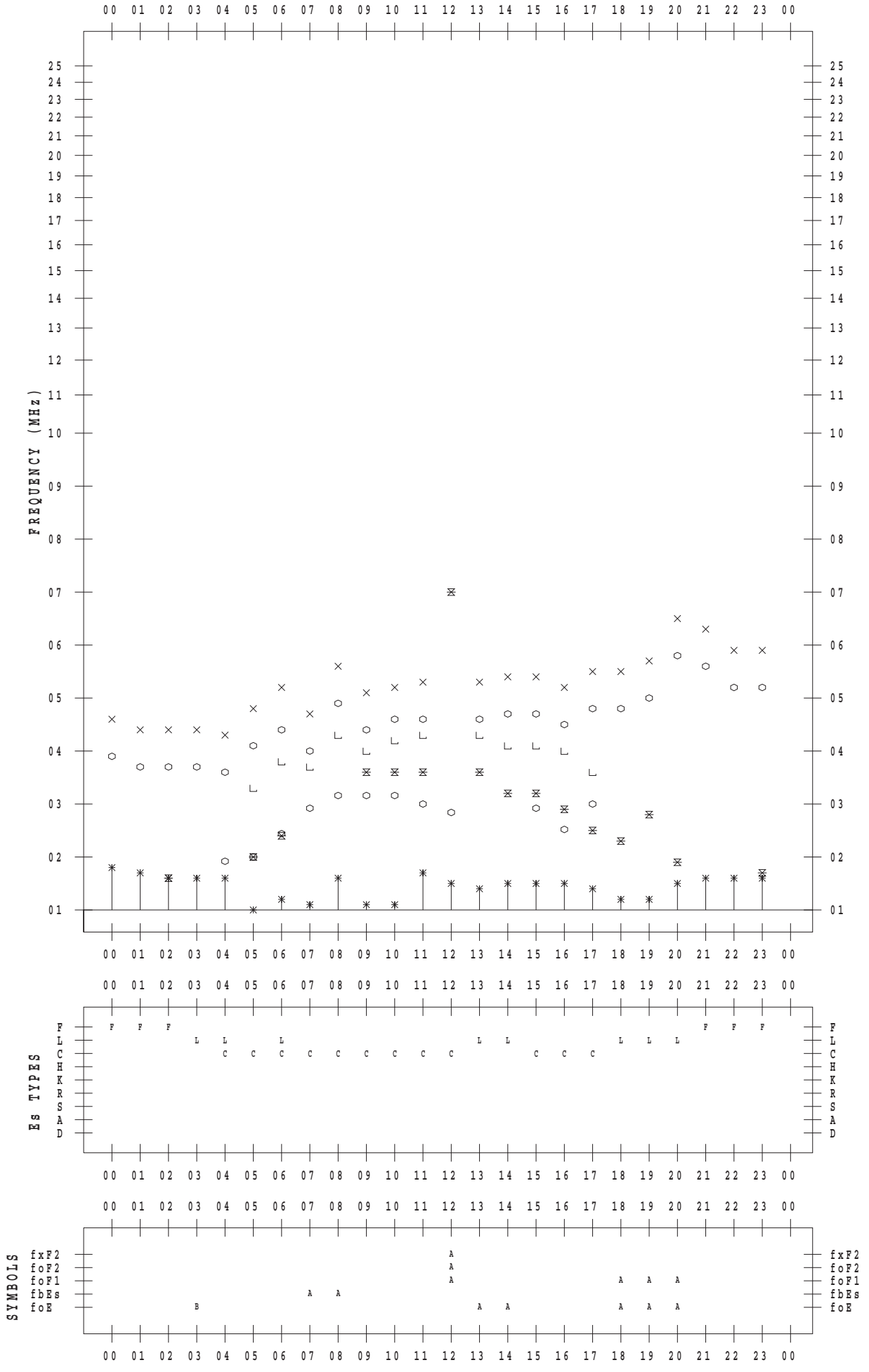
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 1

135 °E MEAN TIME



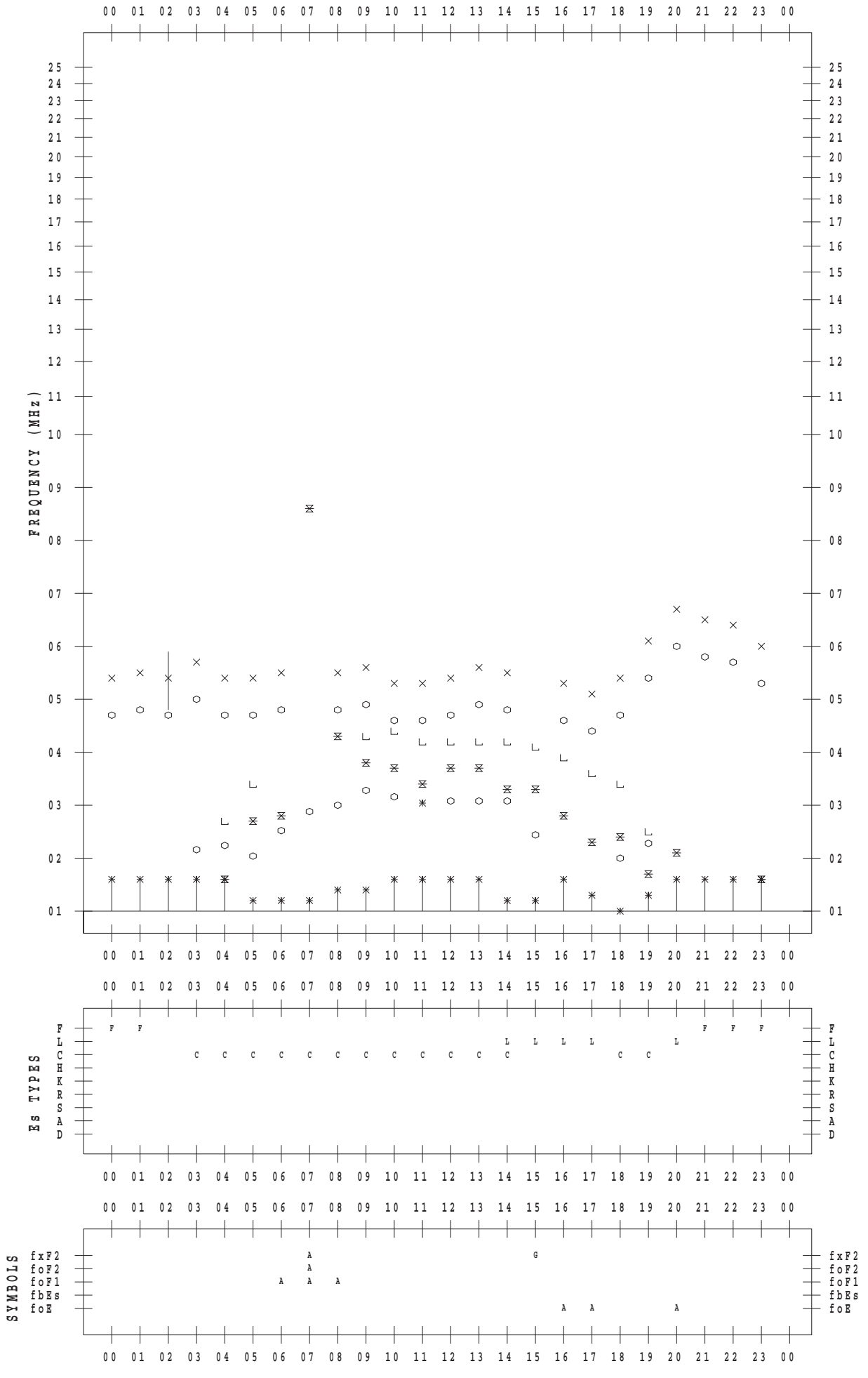
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 2

135 °E MEAN TIME



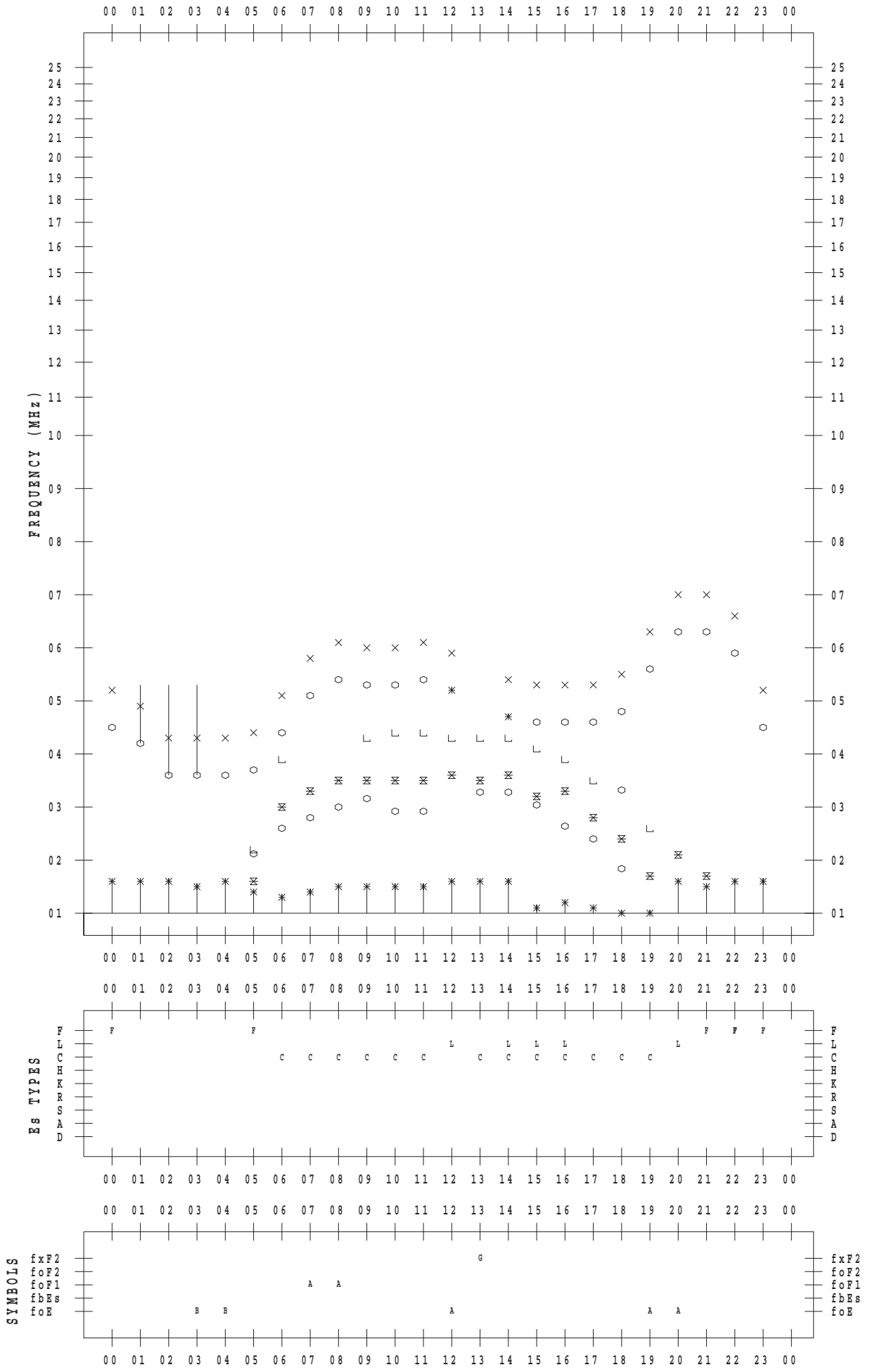
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 3

135 °E MEAN TIME



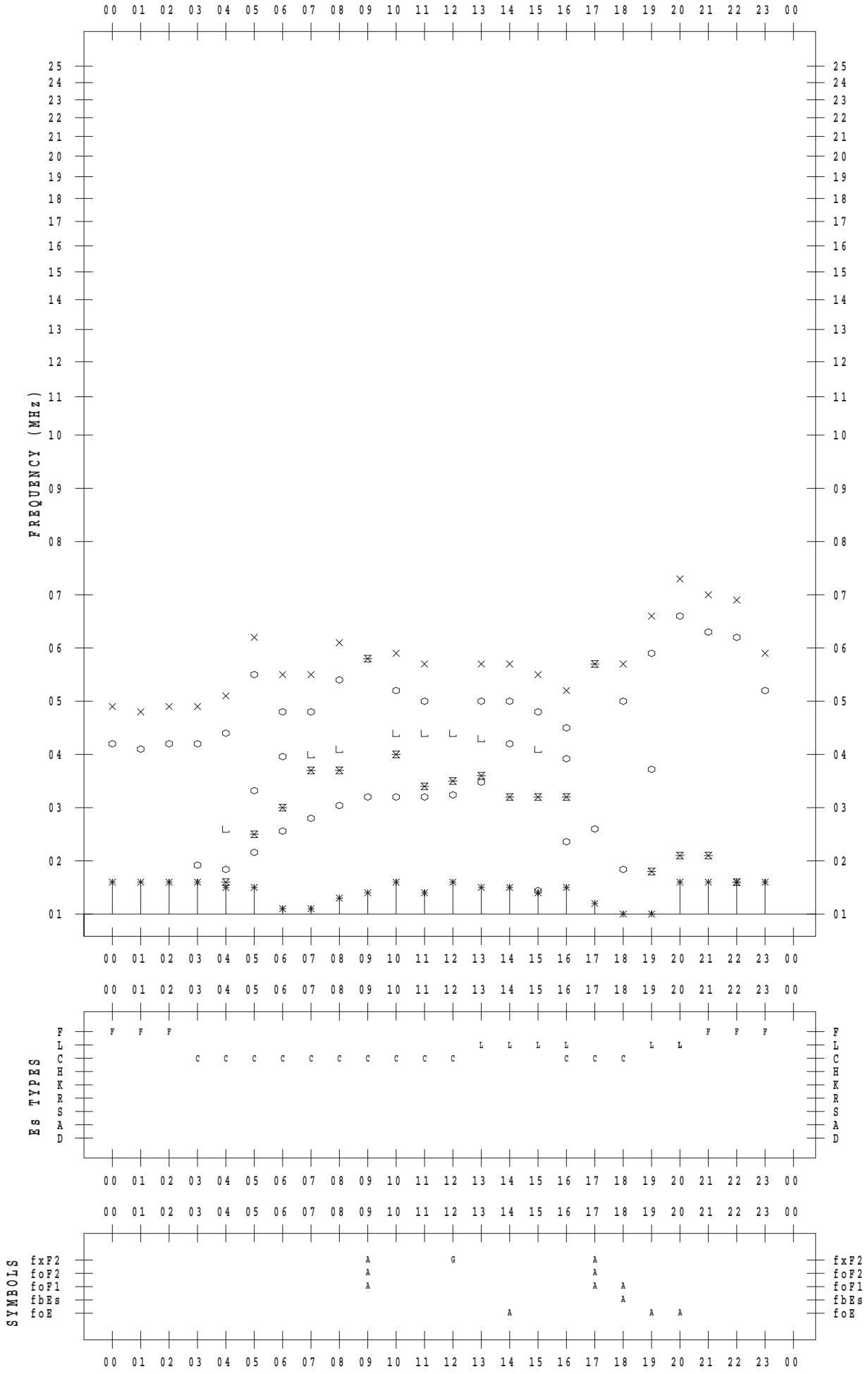
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 4

135 °E MEAN TIME



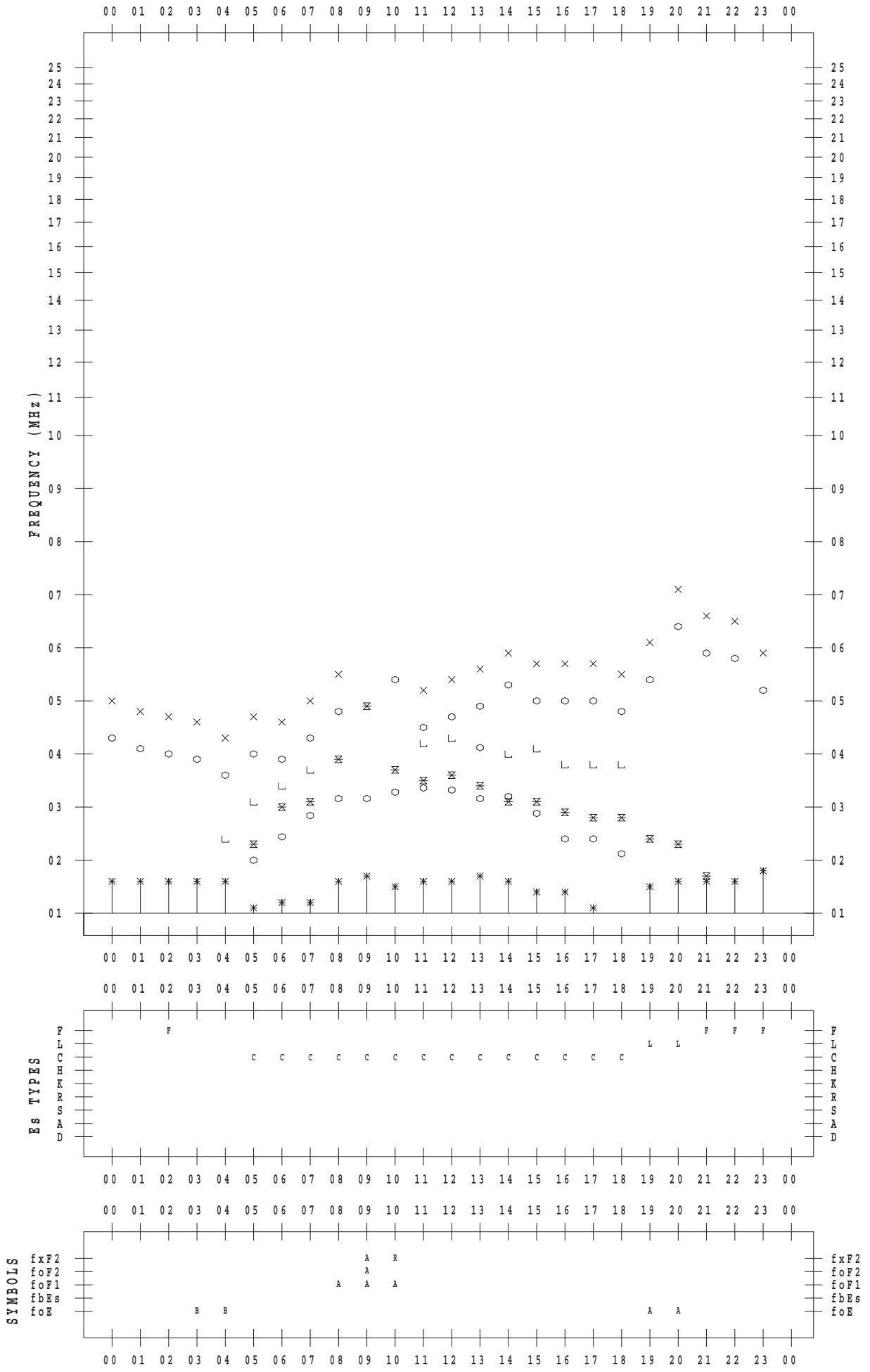
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 5

135 °E MEAN TIME



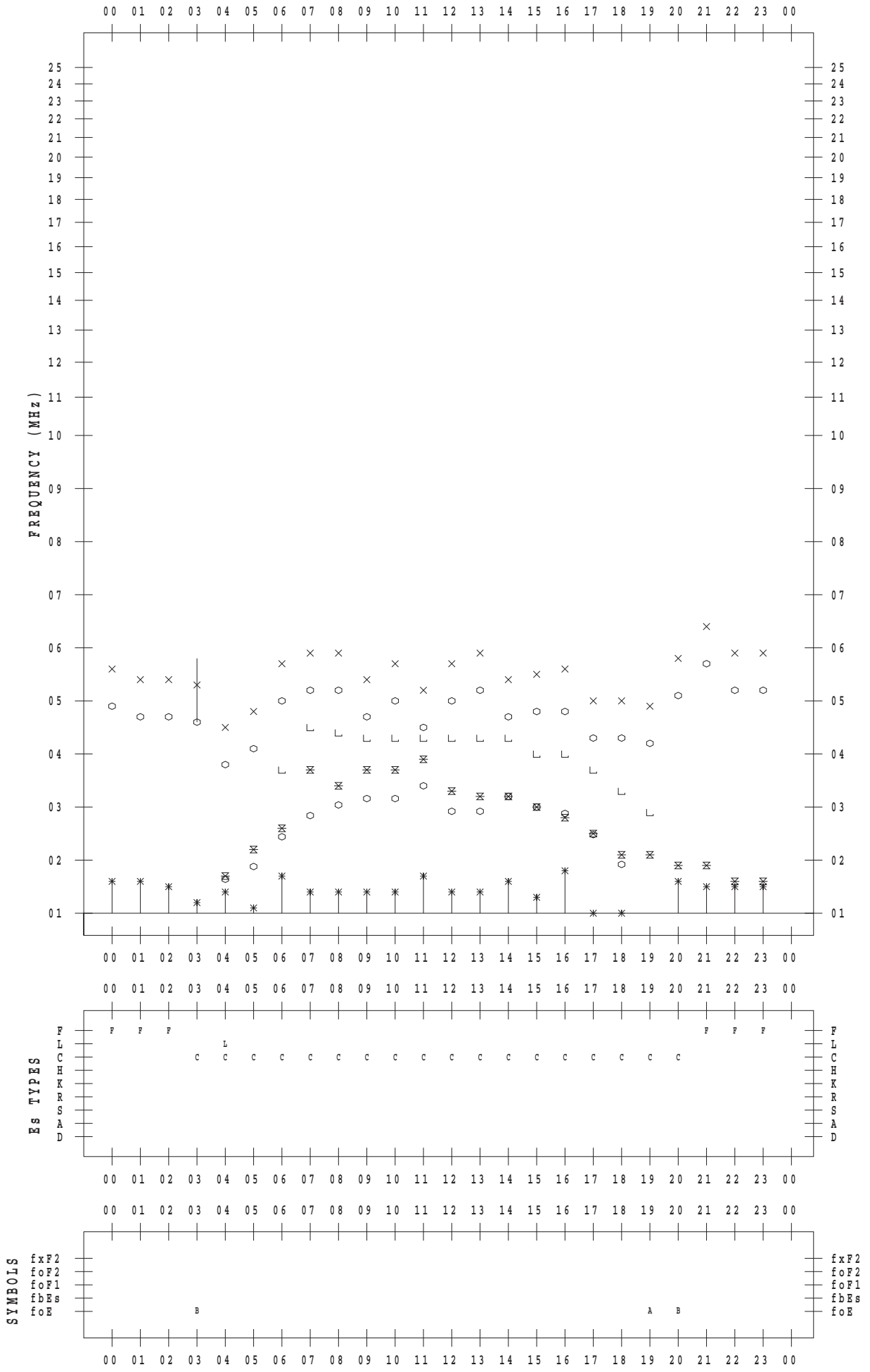
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 6

135 °E MEAN TIME



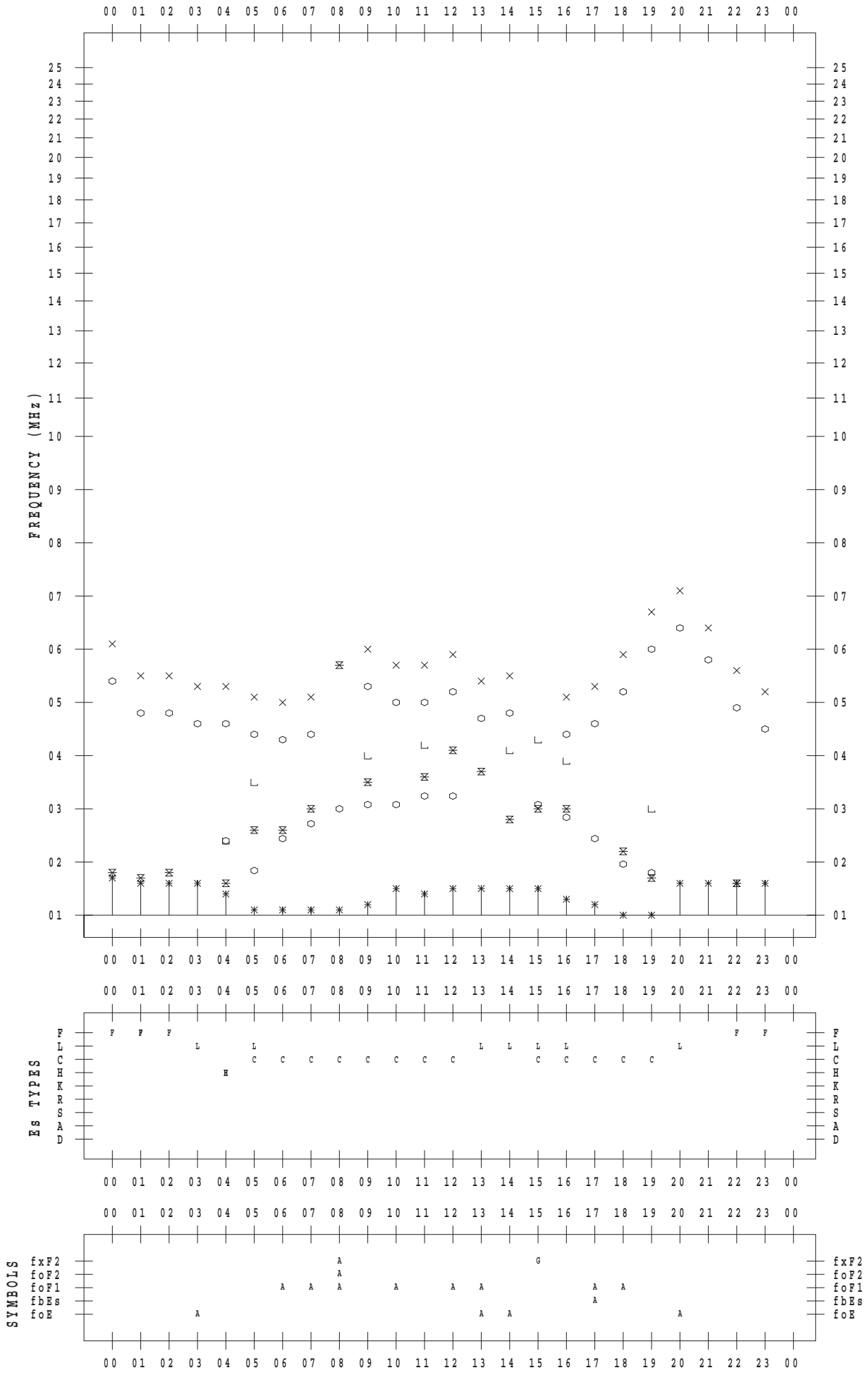
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 7

135 °E MEAN TIME



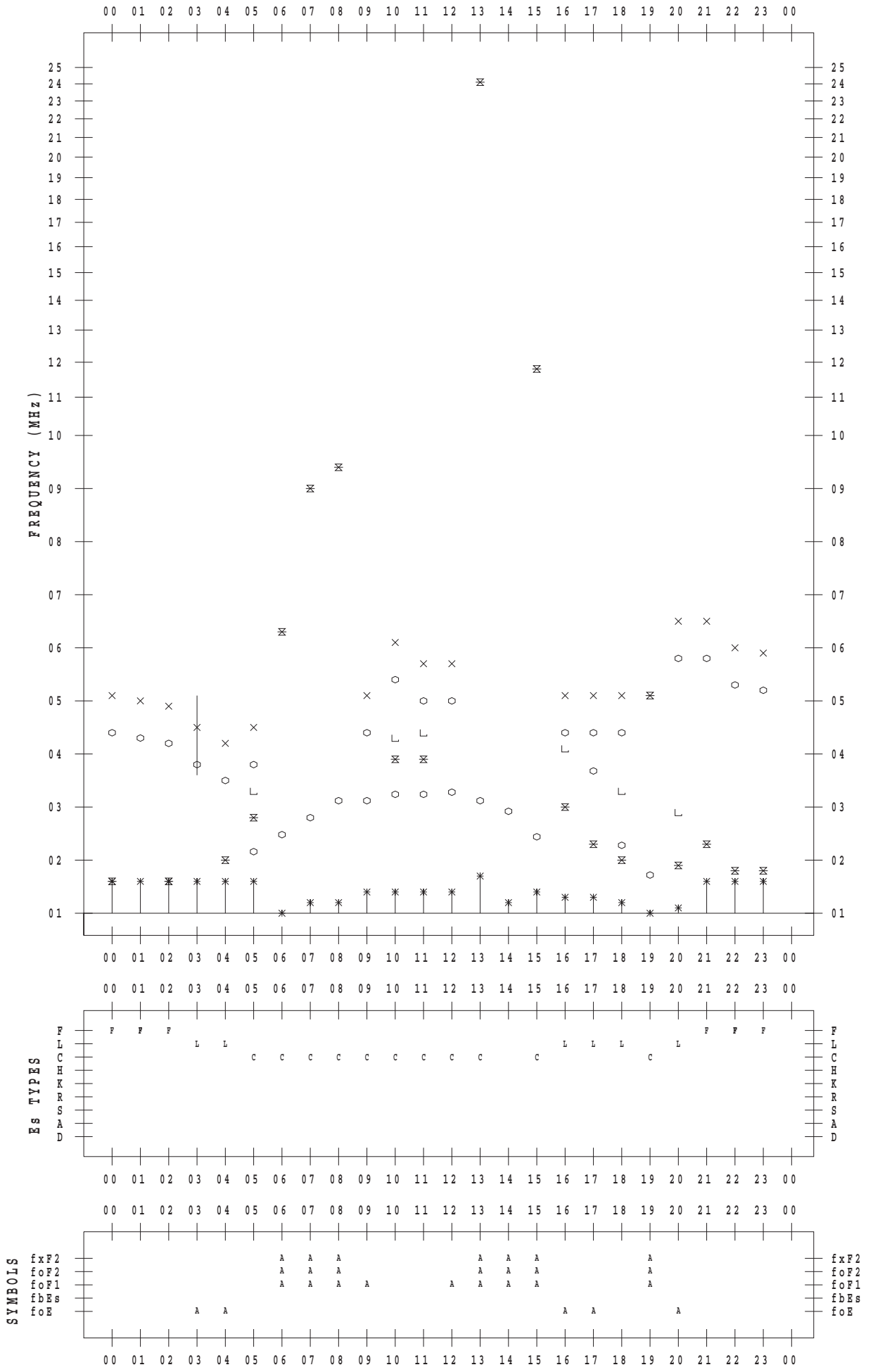
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 8

135 °E MEAN TIME



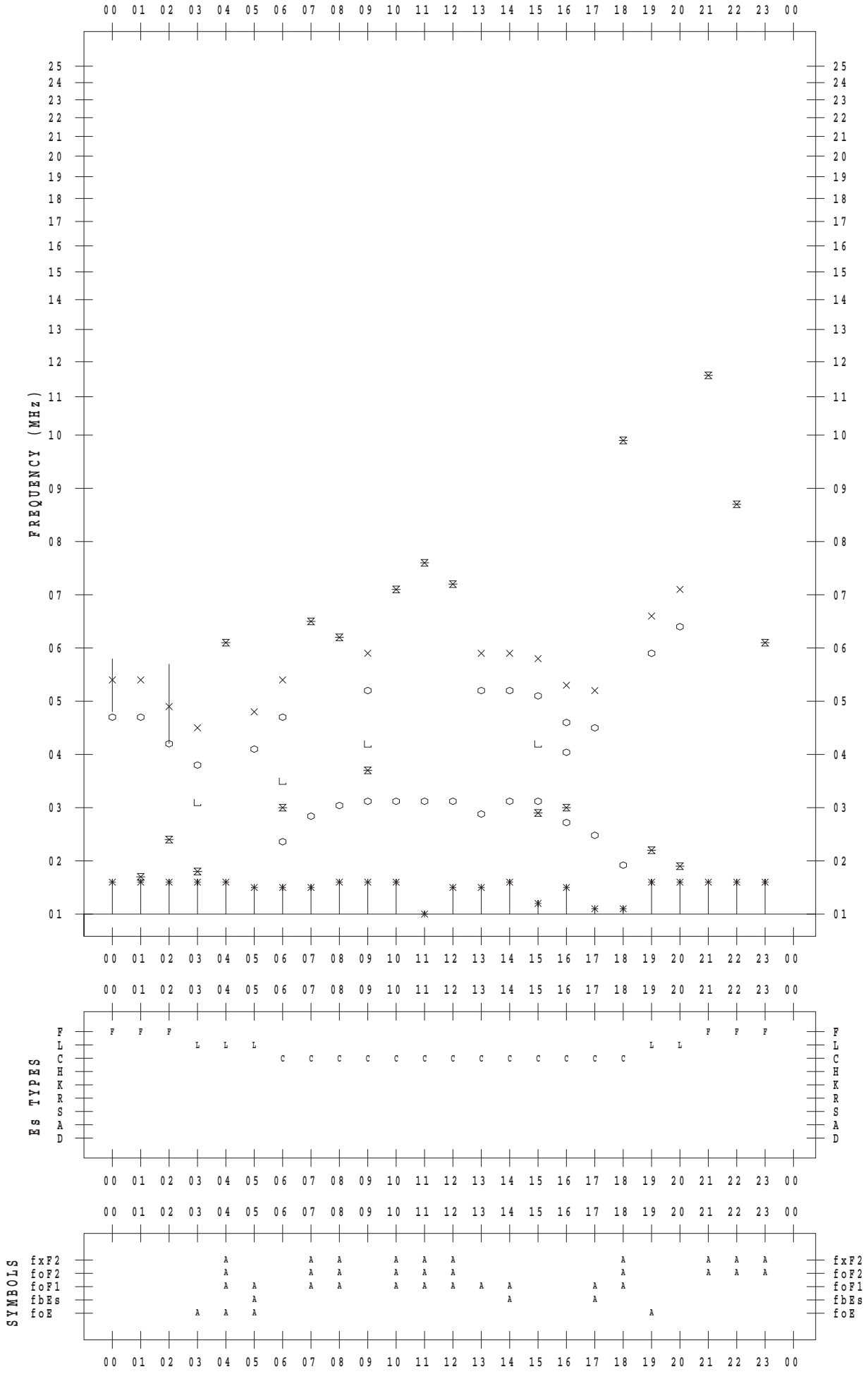
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/ 9

135 °E MEAN TIME



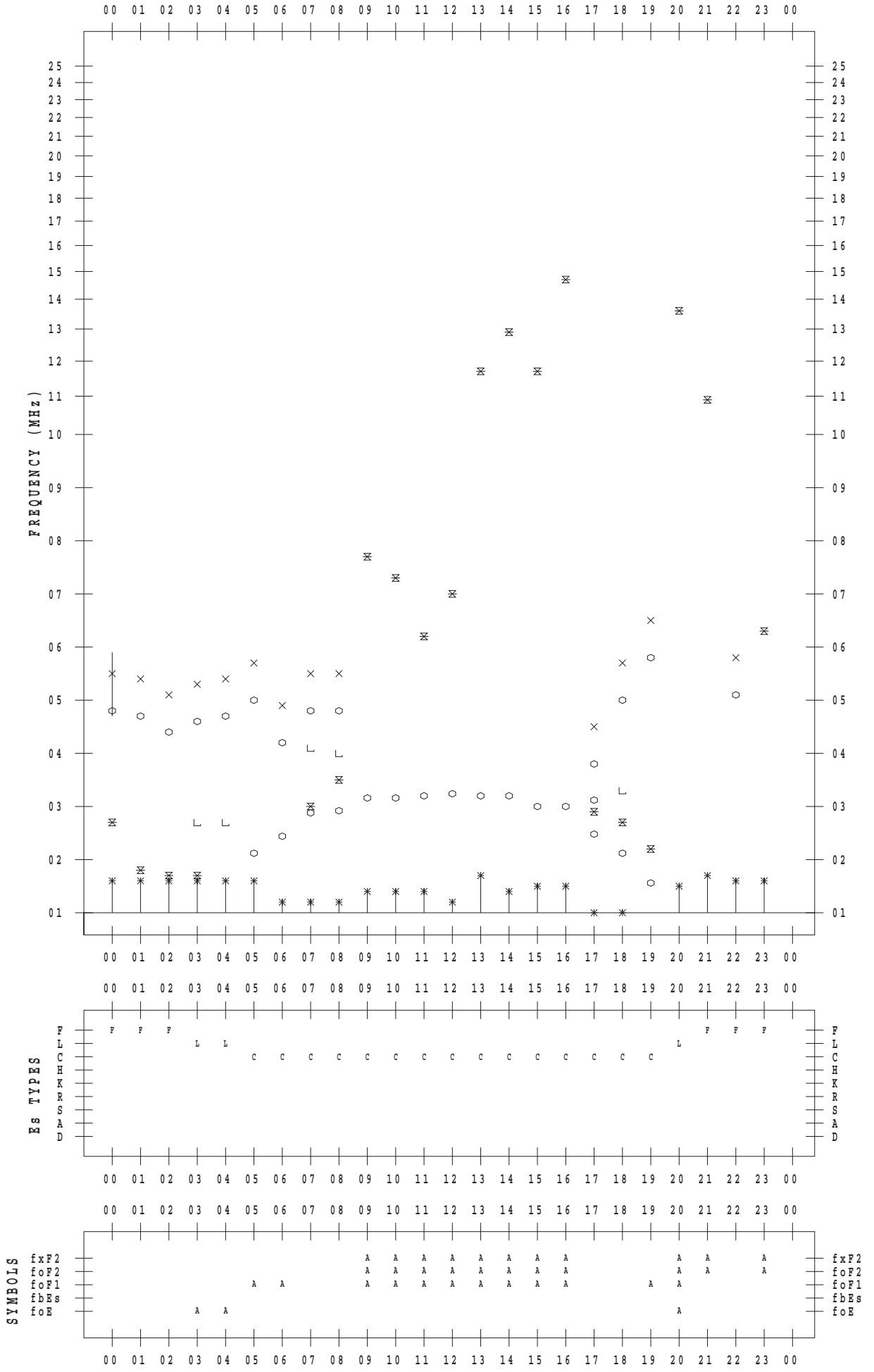
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/10

135 °E MEAN TIME



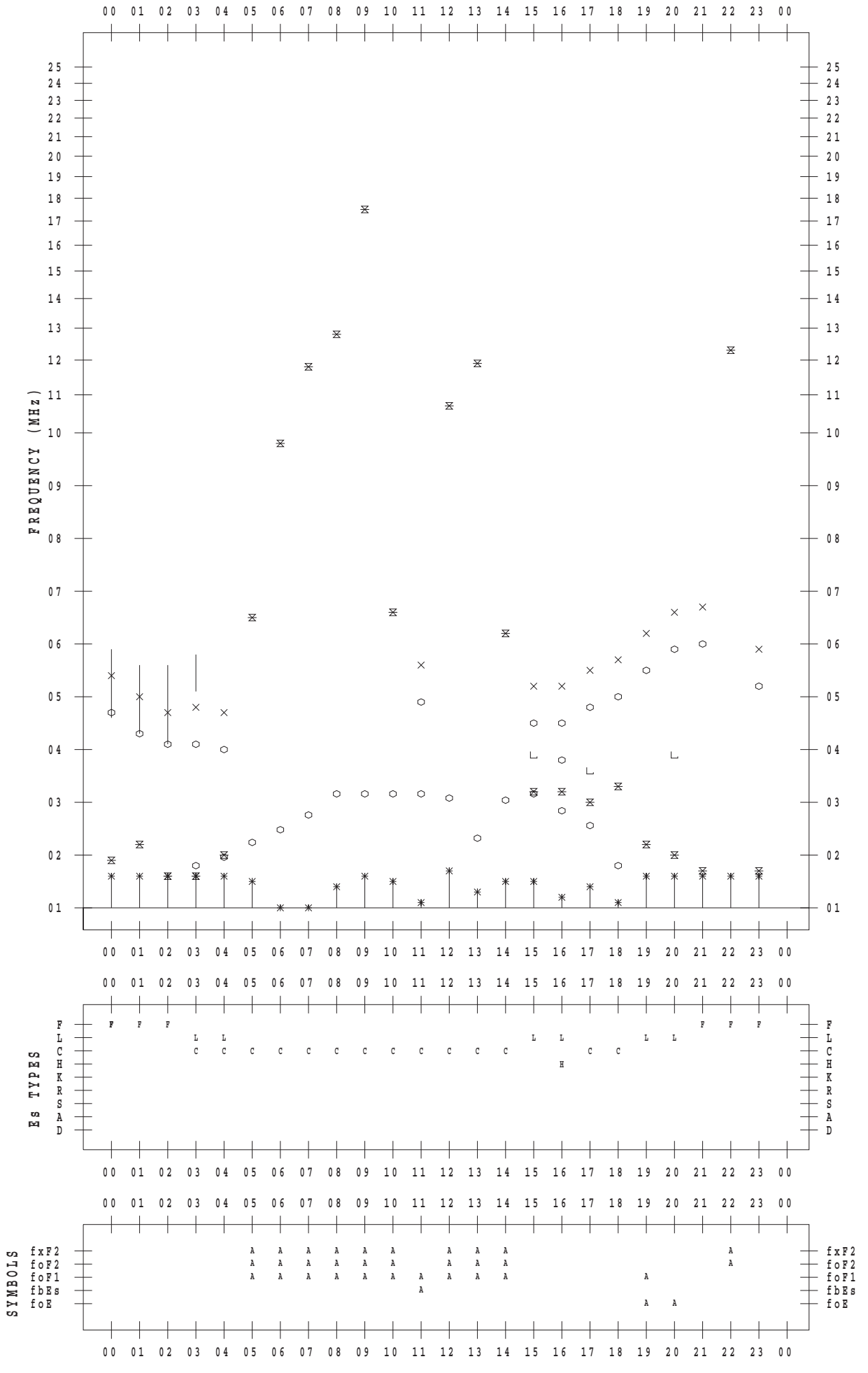
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/11

135 °E MEAN TIME



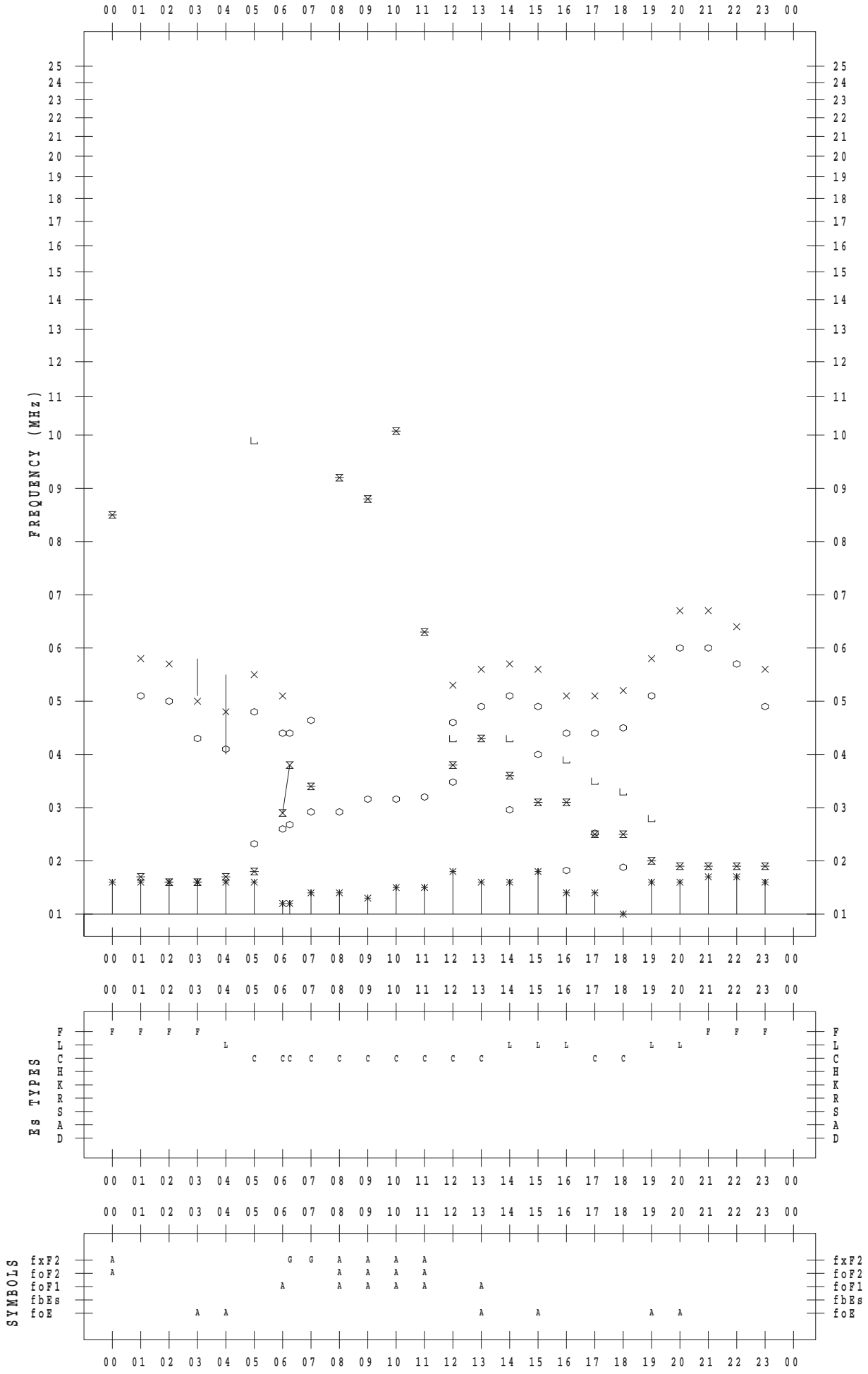
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/12

135 °E MEAN TIME



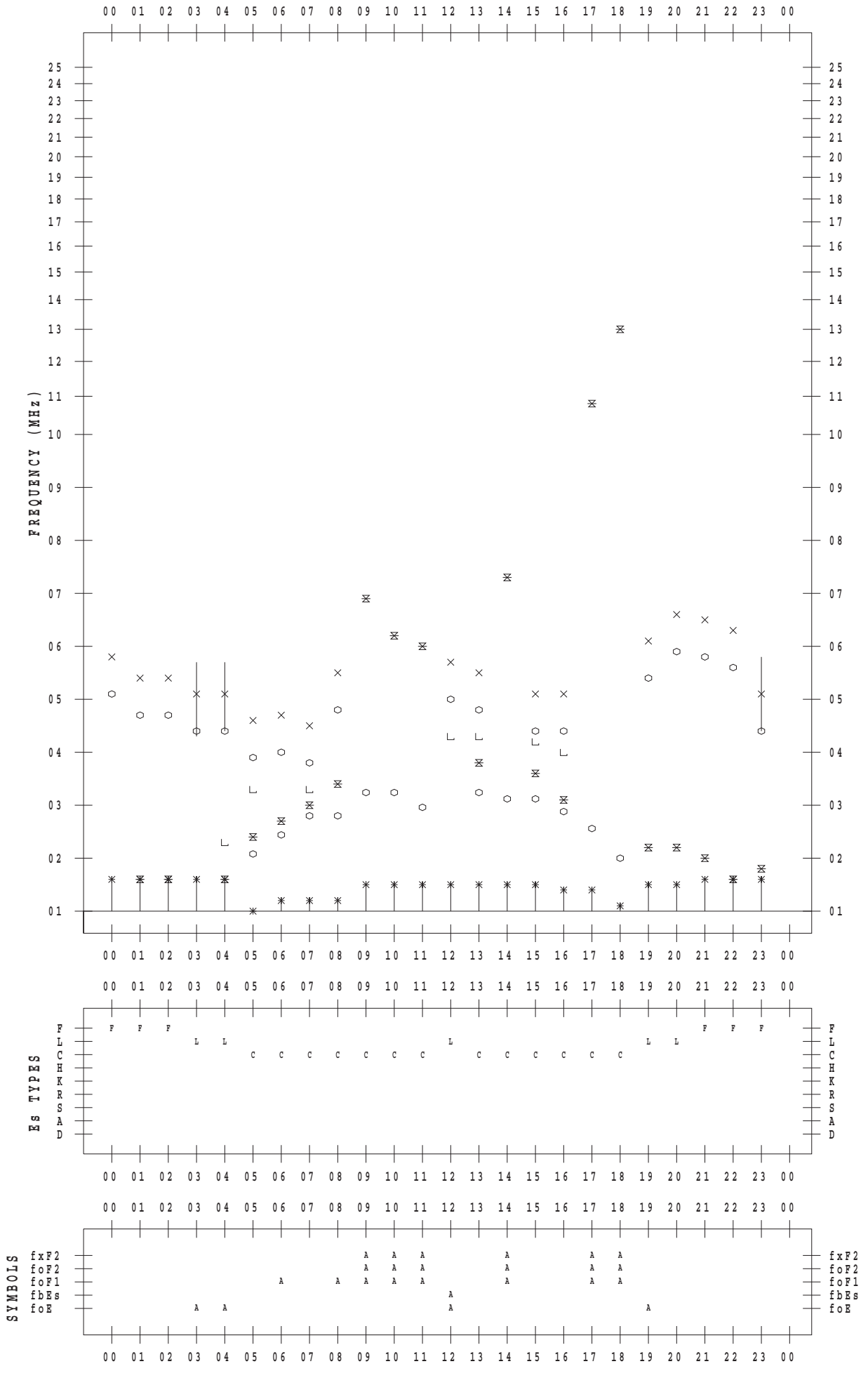
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/13

135 °E MEAN TIME



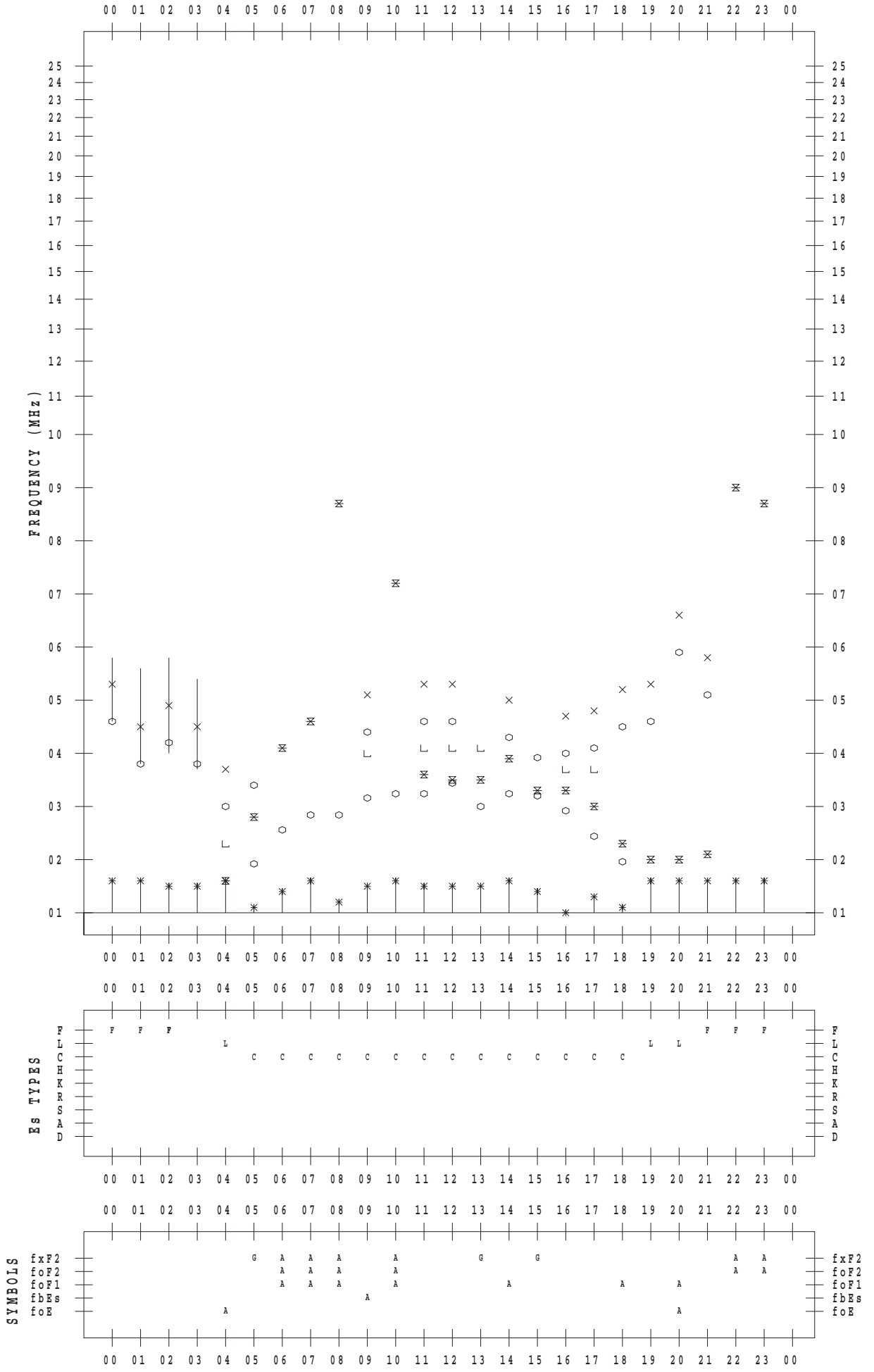
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/14

135 °E MEAN TIME



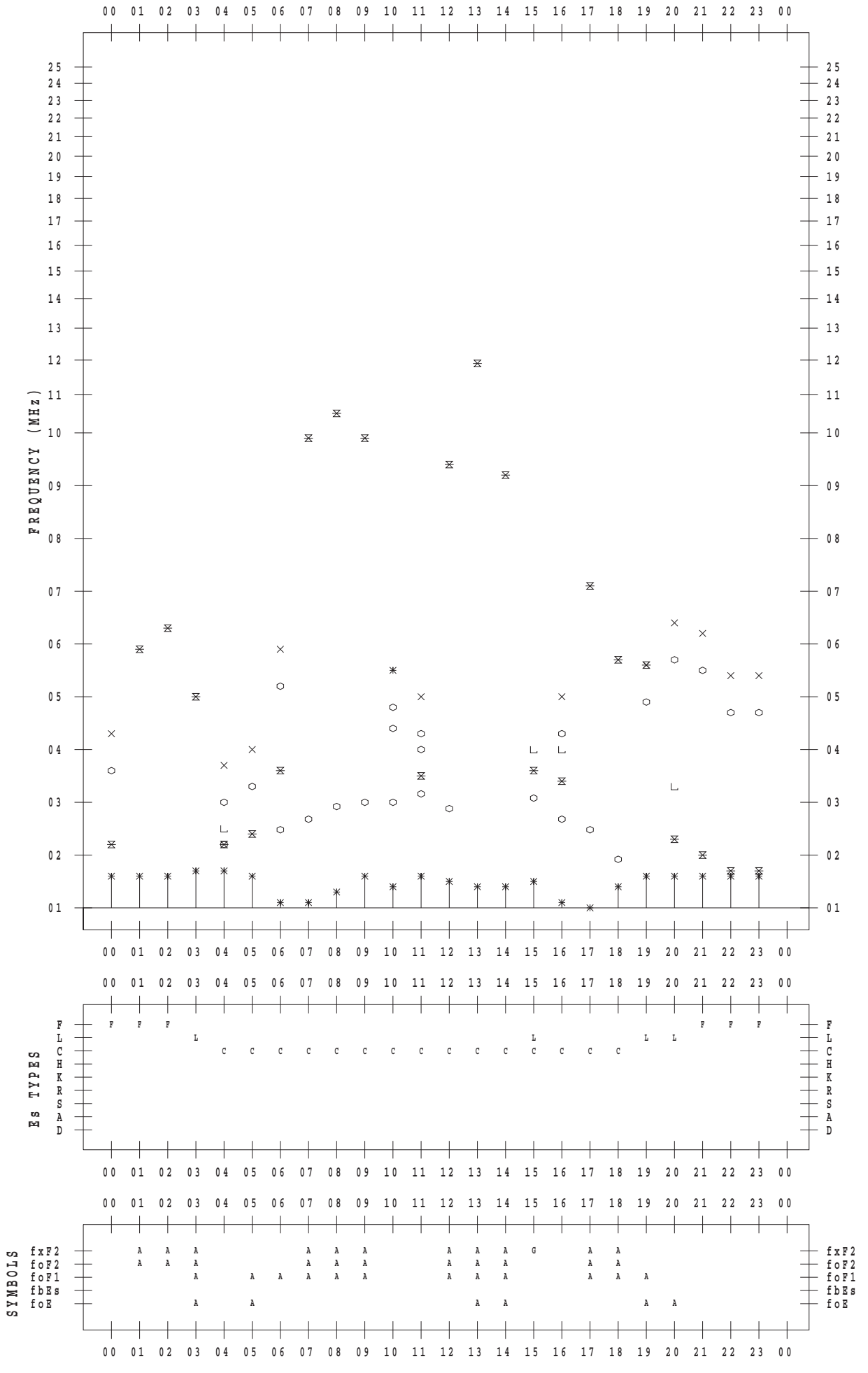
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/15

135 °E MEAN TIME



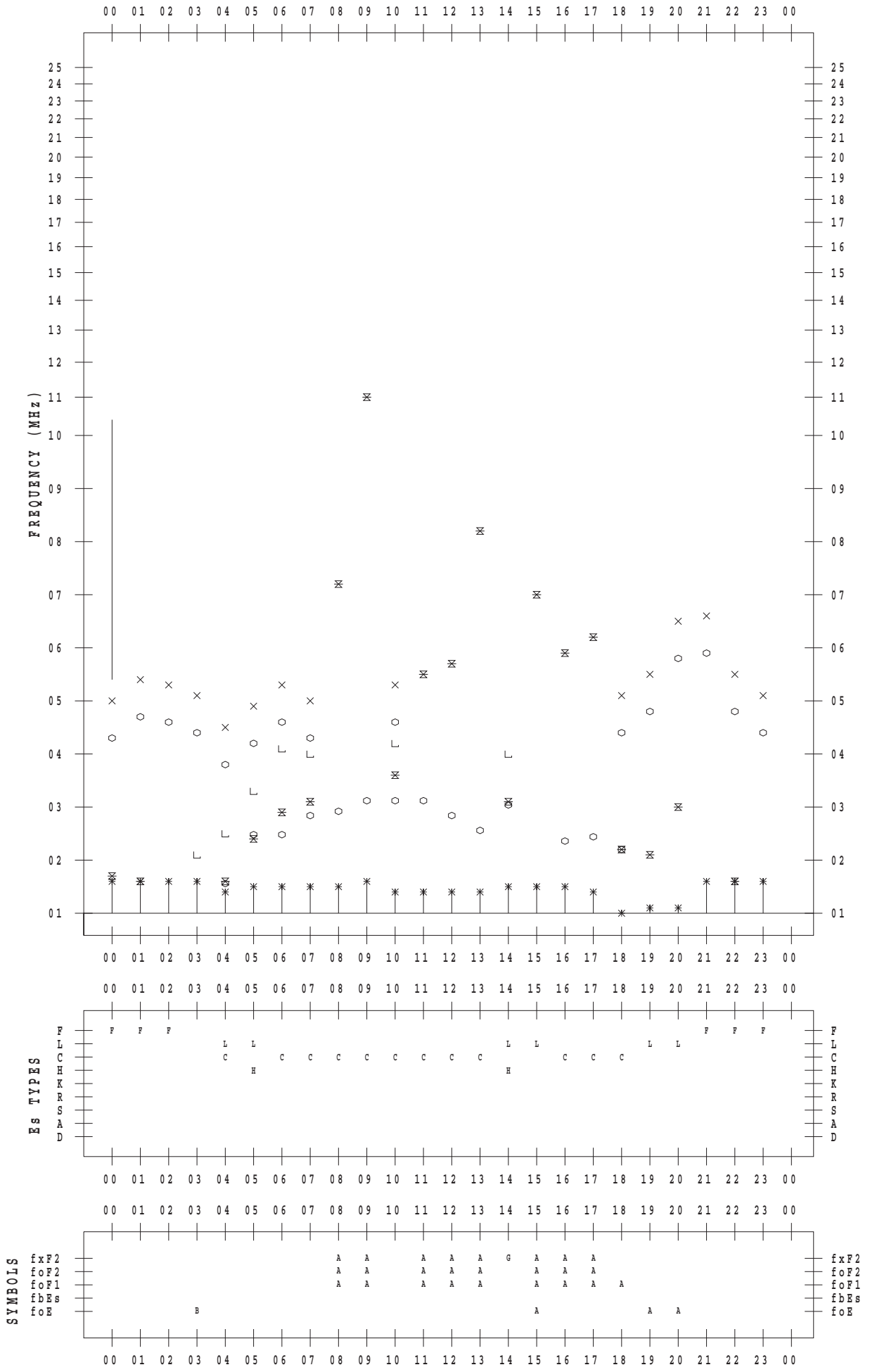
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/16

135 °E MEAN TIME



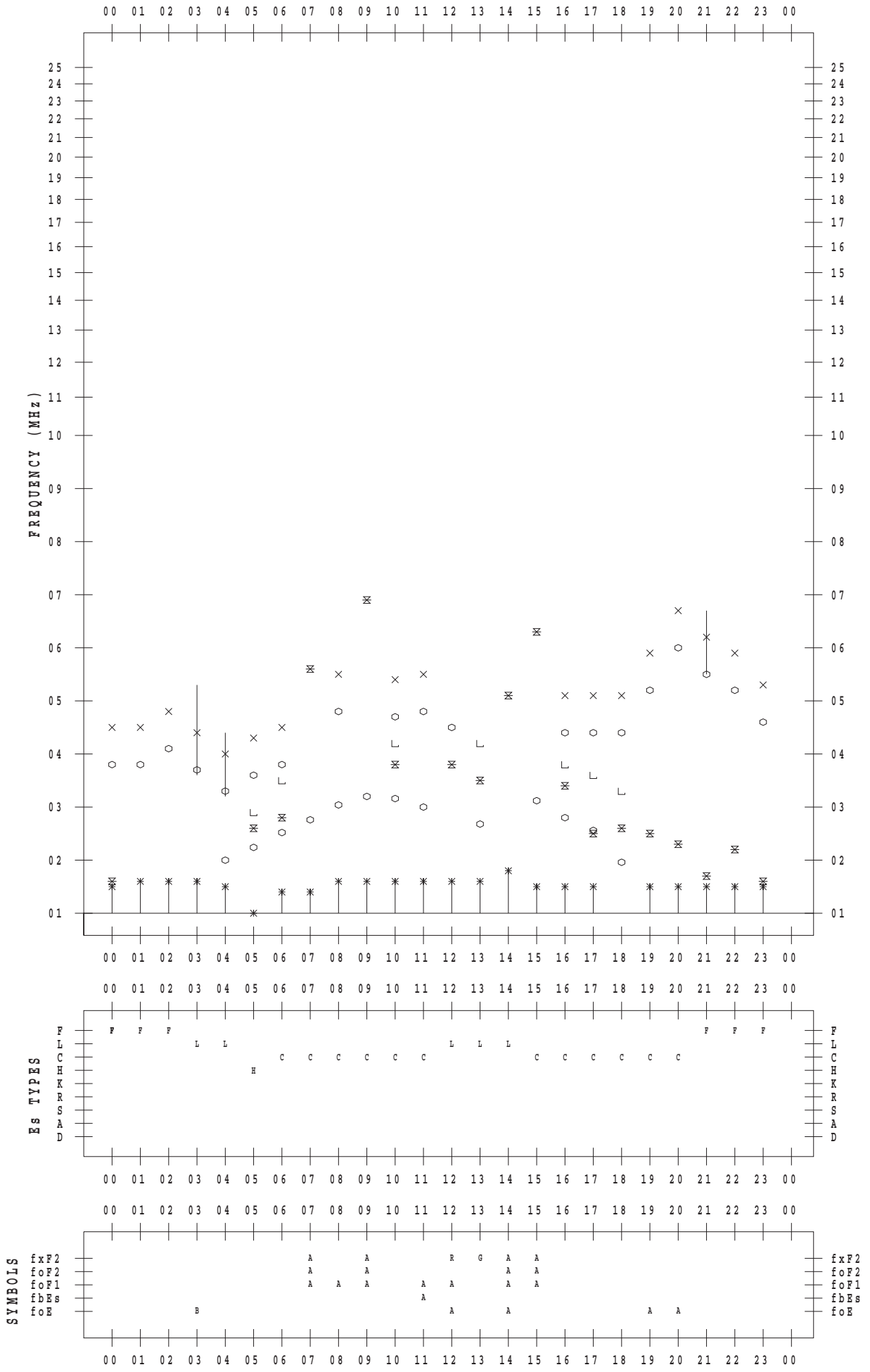
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/17

135 °E MEAN TIME



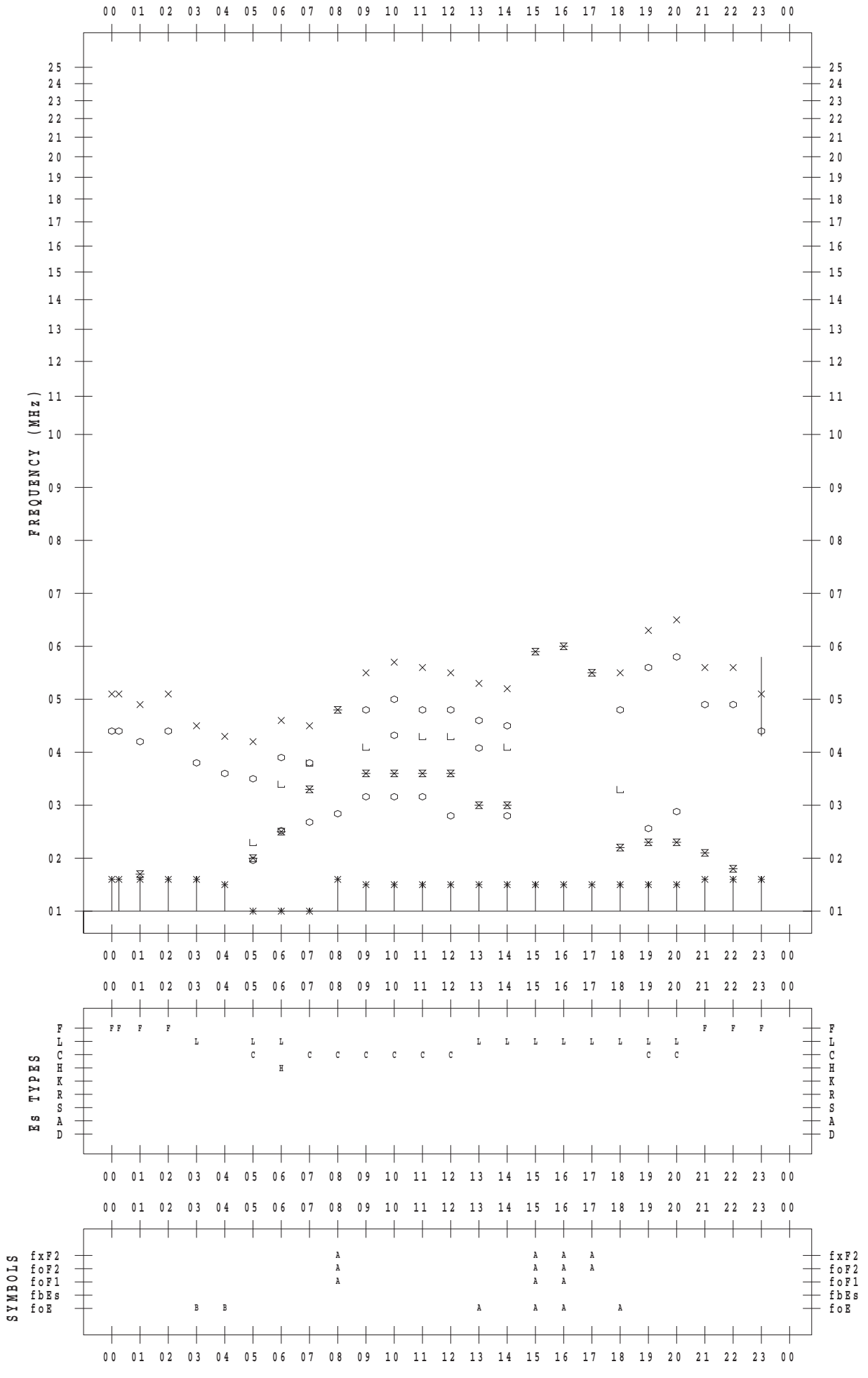
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/18

135 °E MEAN TIME



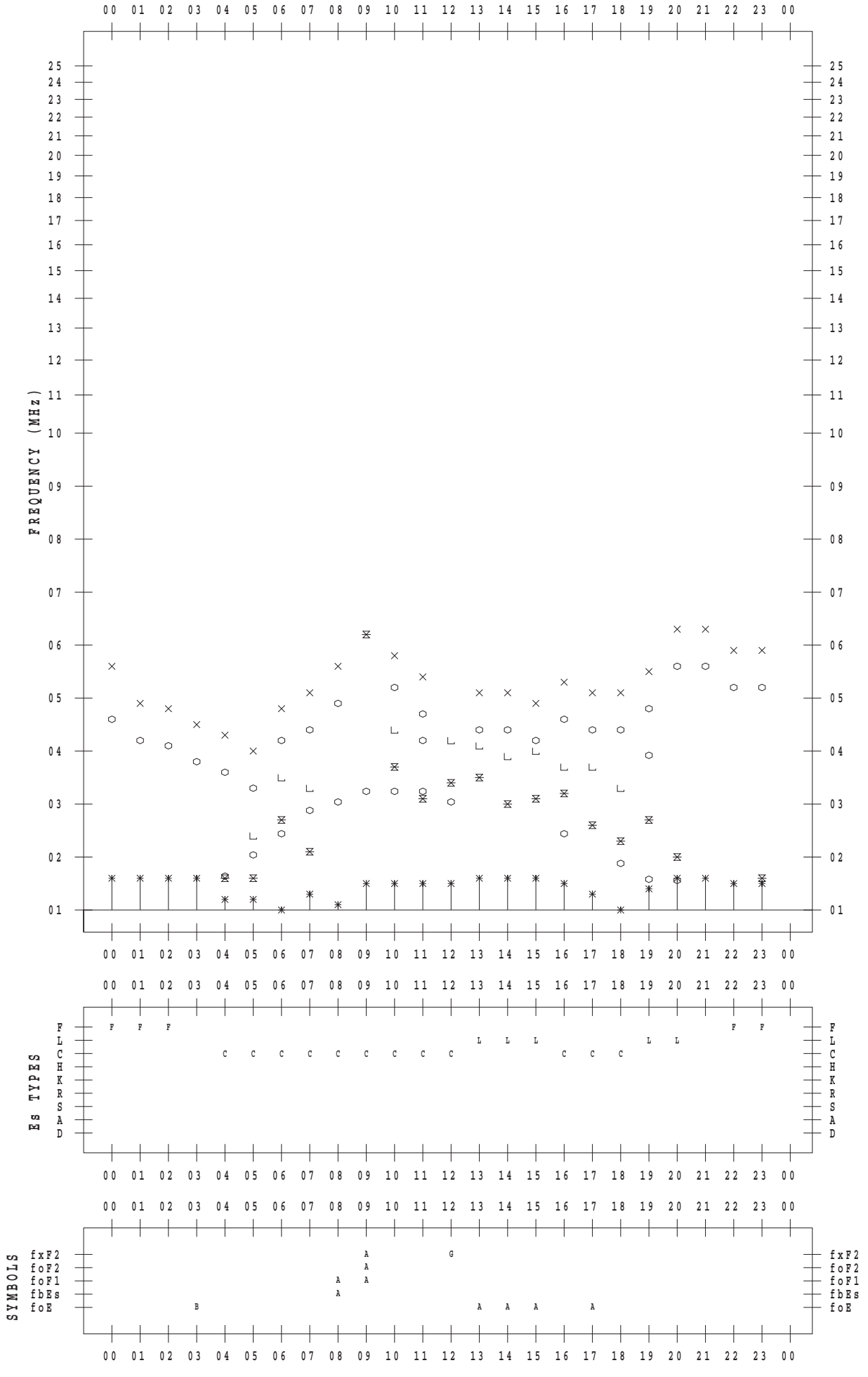
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/19

135 °E MEAN TIME



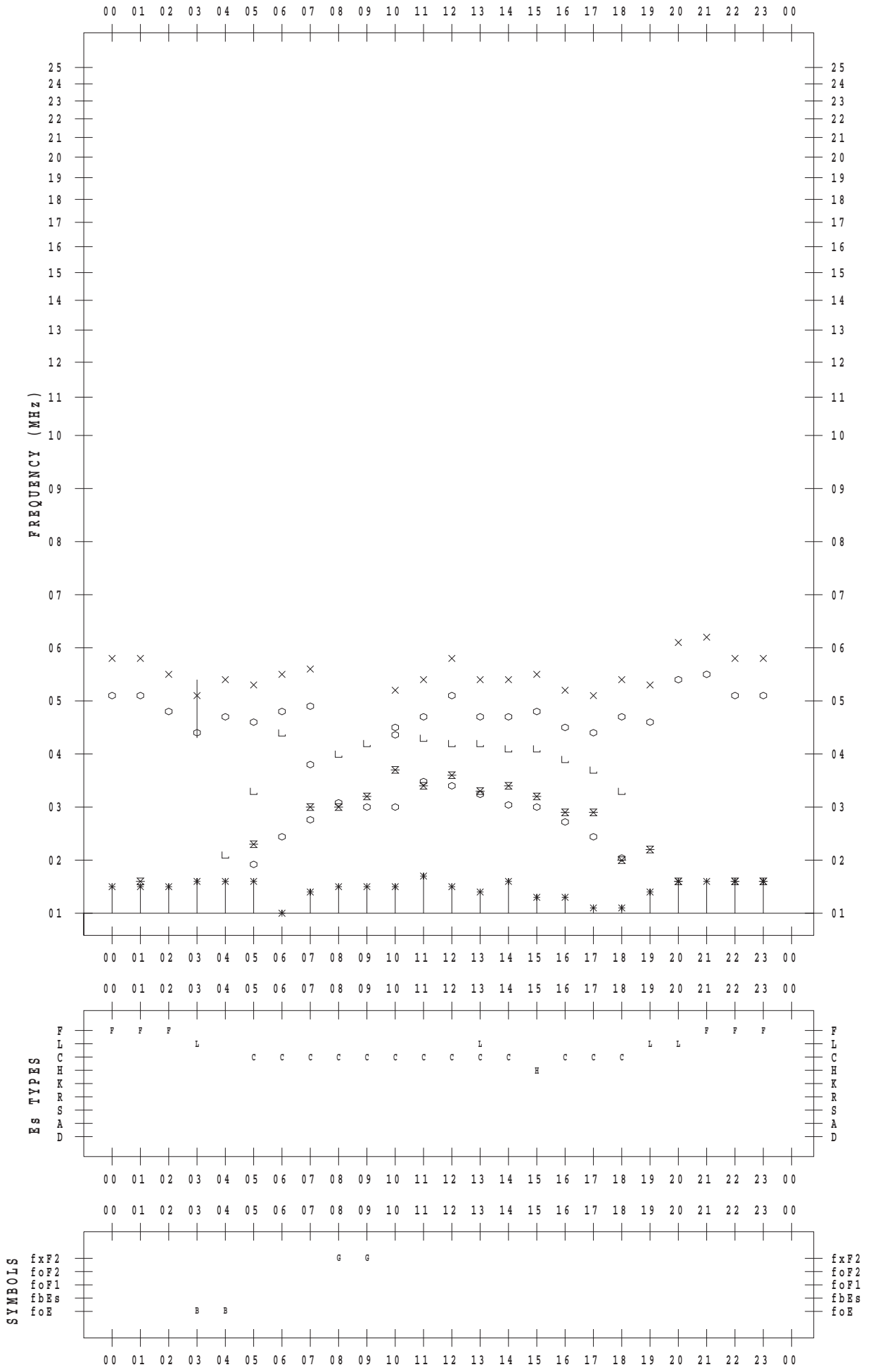
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/20

135 °E MEAN TIME



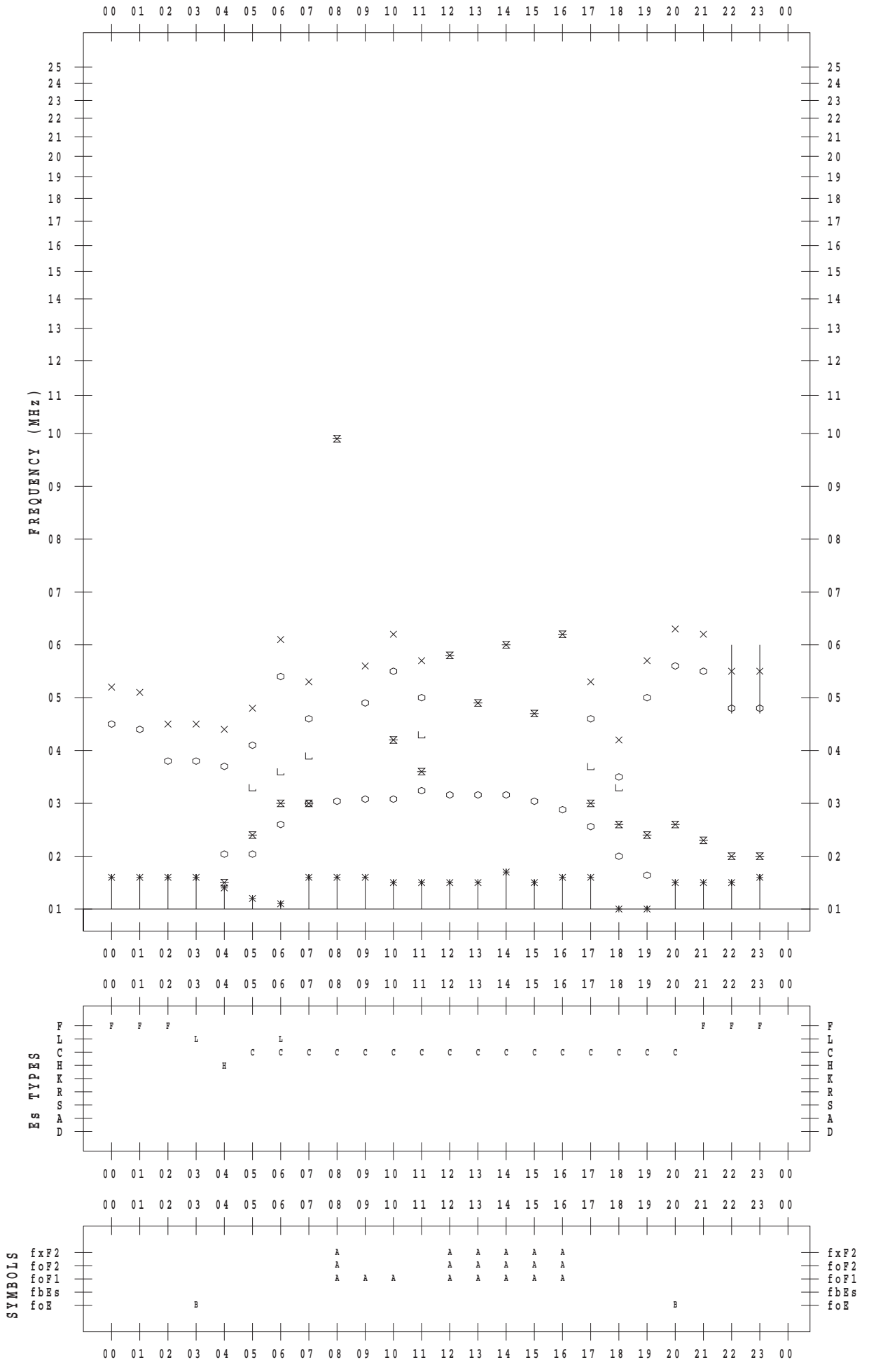
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/21

135 °E MEAN TIME



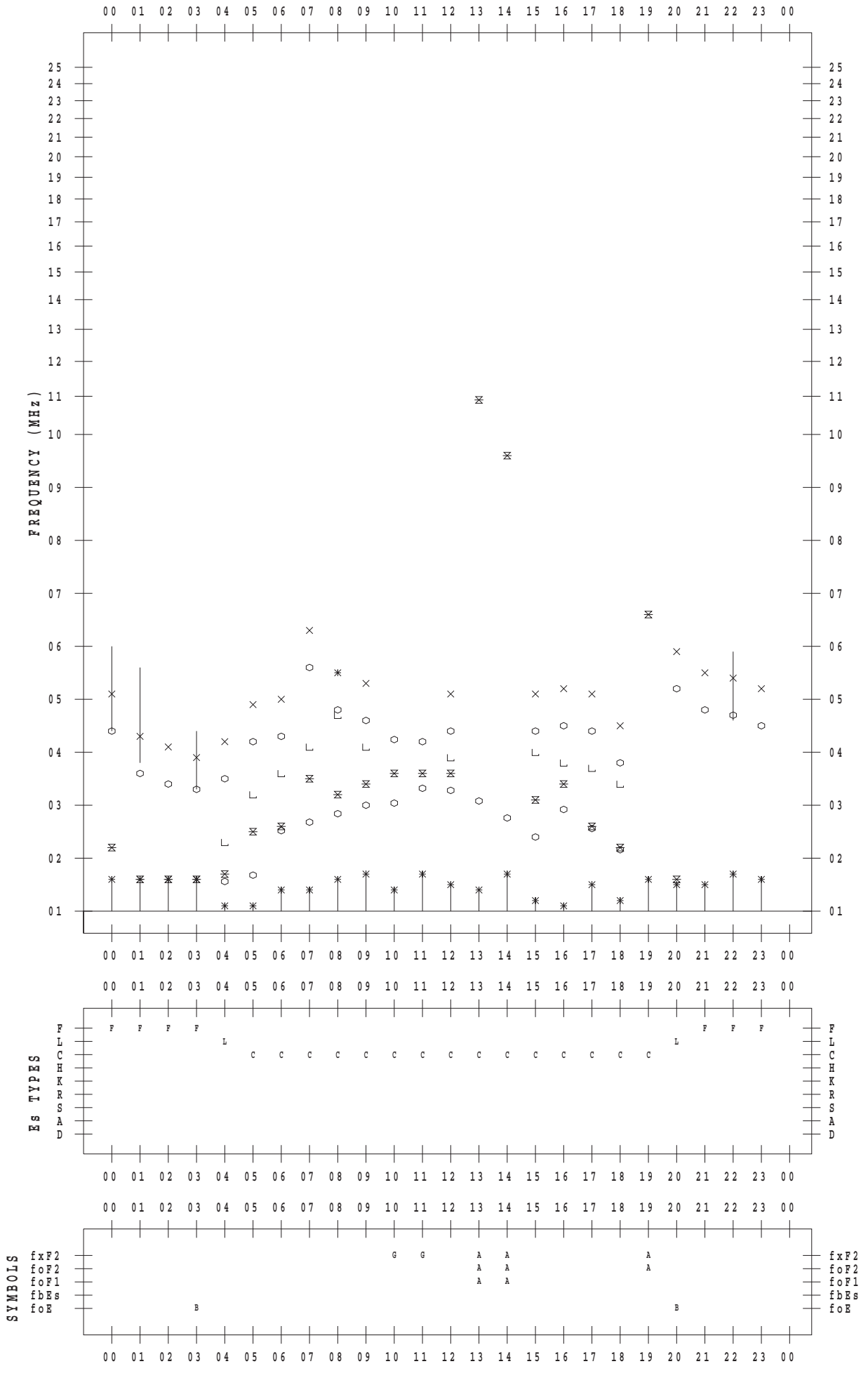
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/22

135 °E MEAN TIME



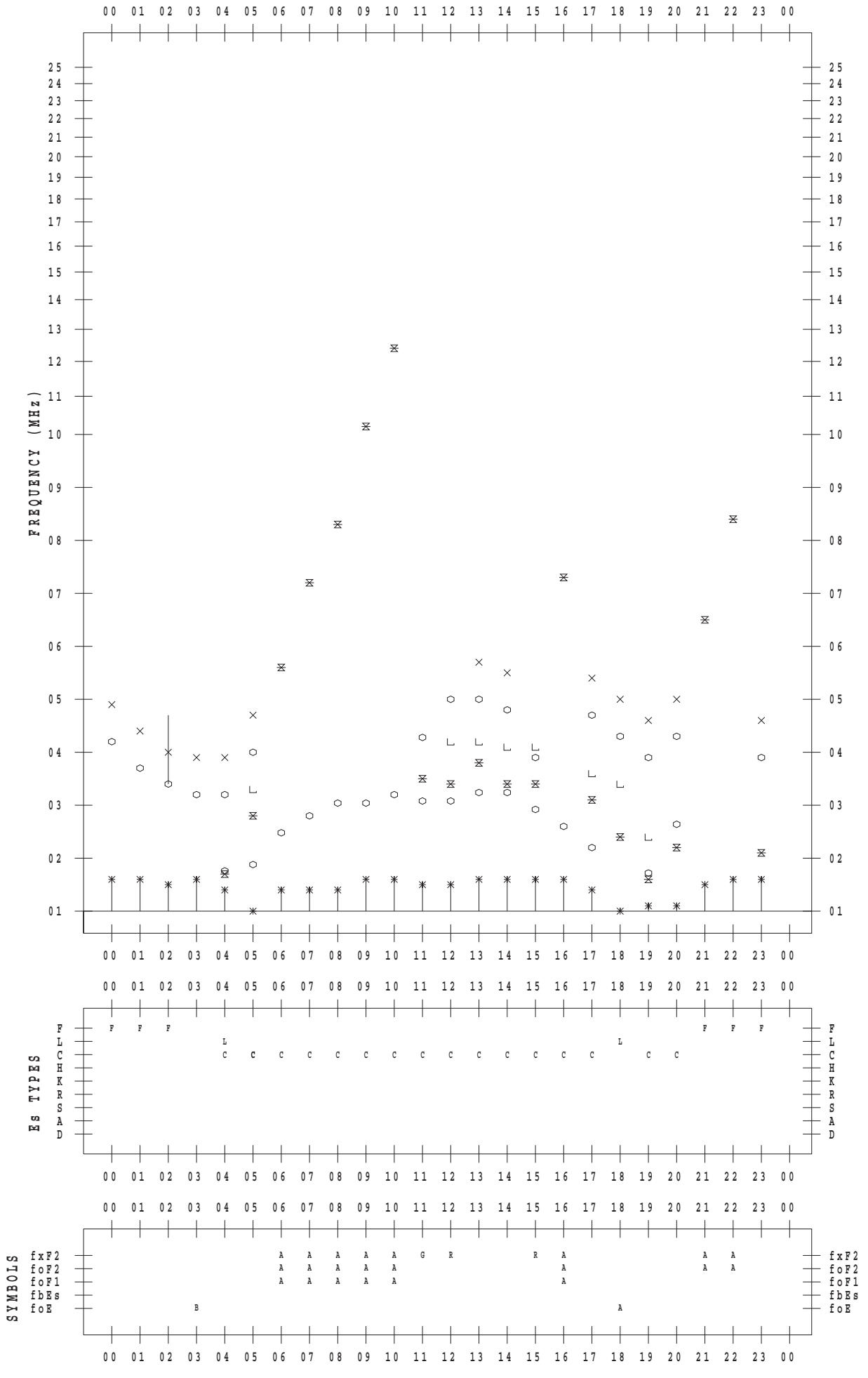
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/23

135 °E MEAN TIME



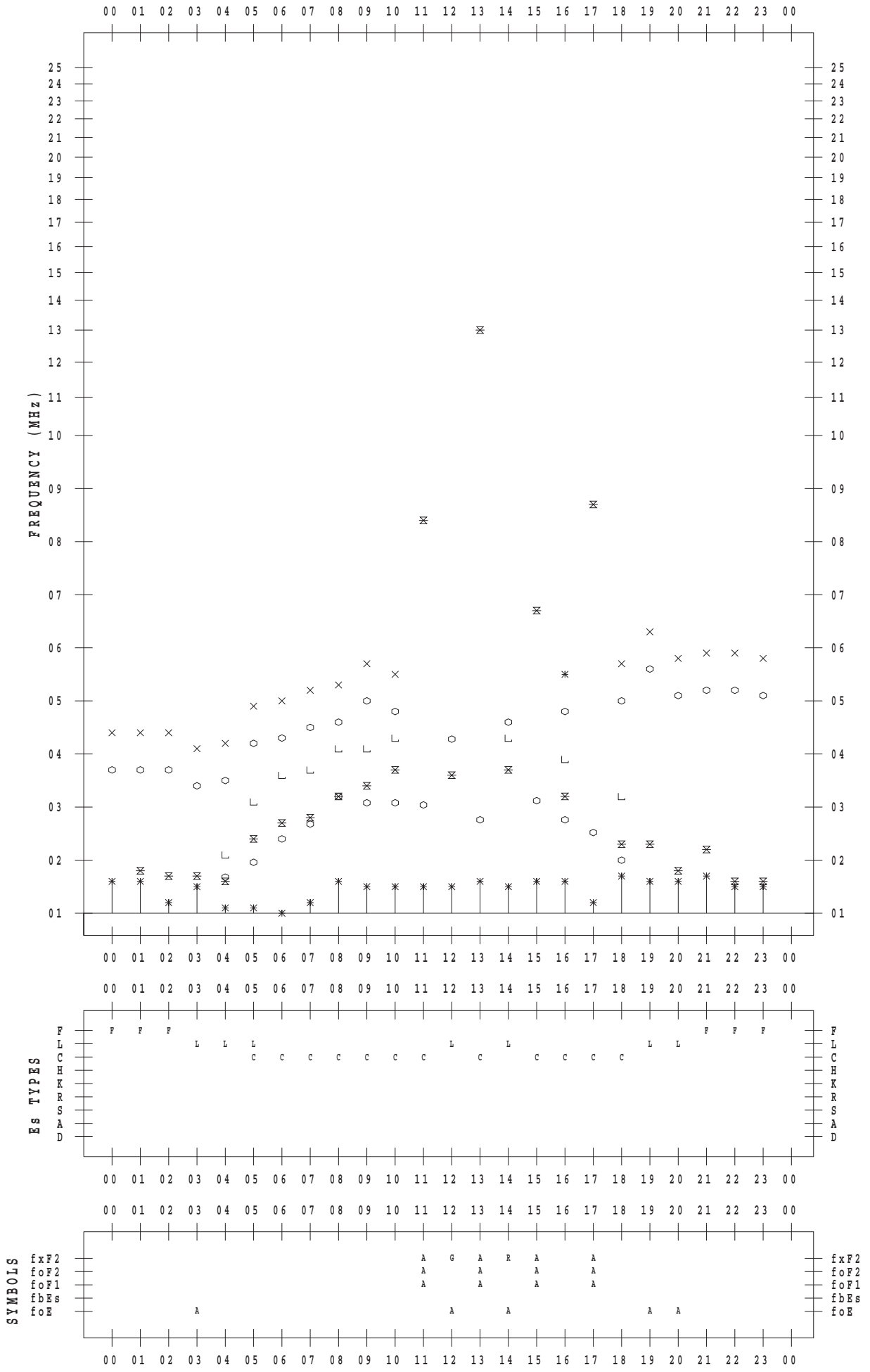
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/24

135 °E MEAN TIME



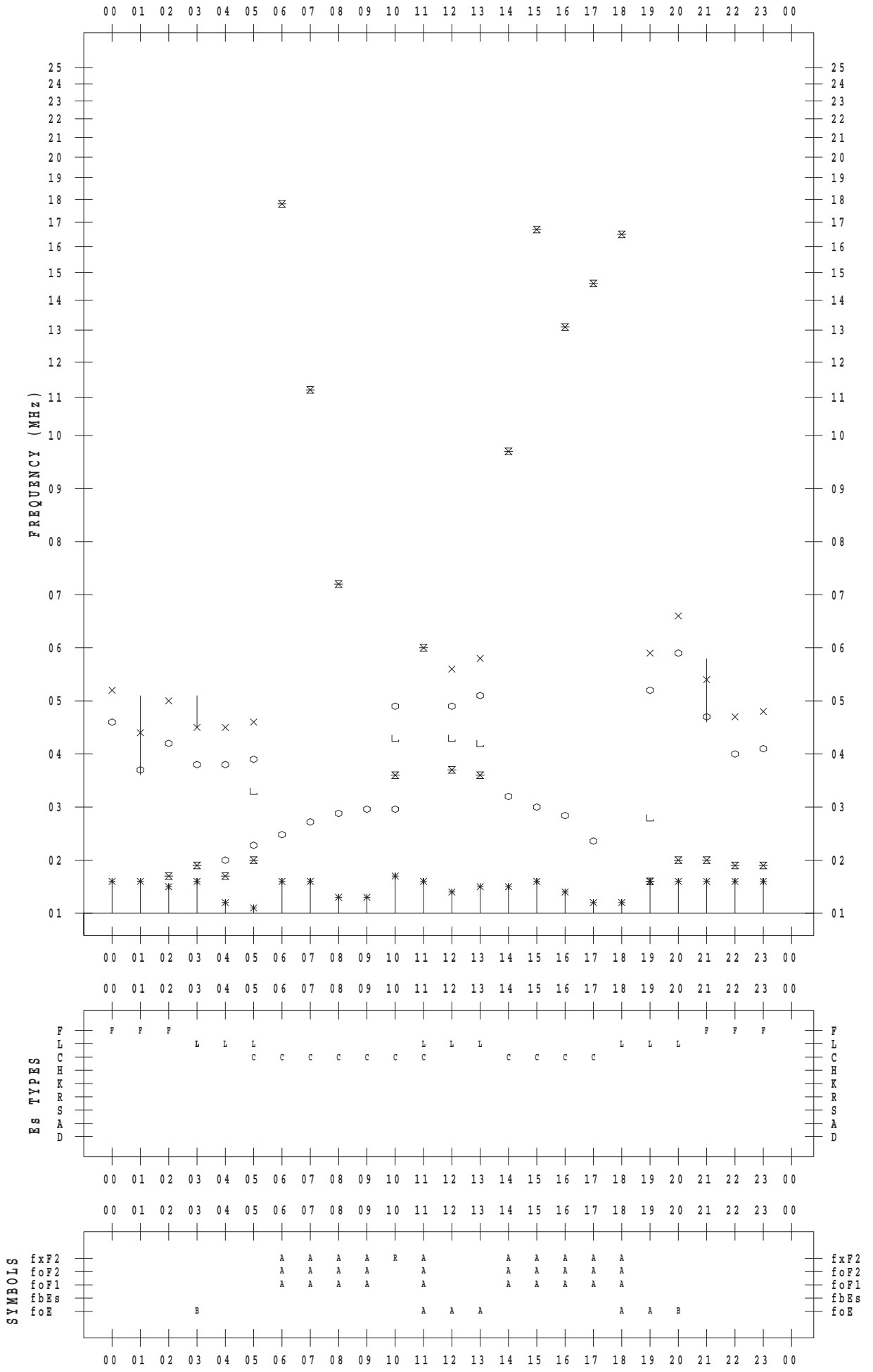
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/25

135 °E MEAN TIME



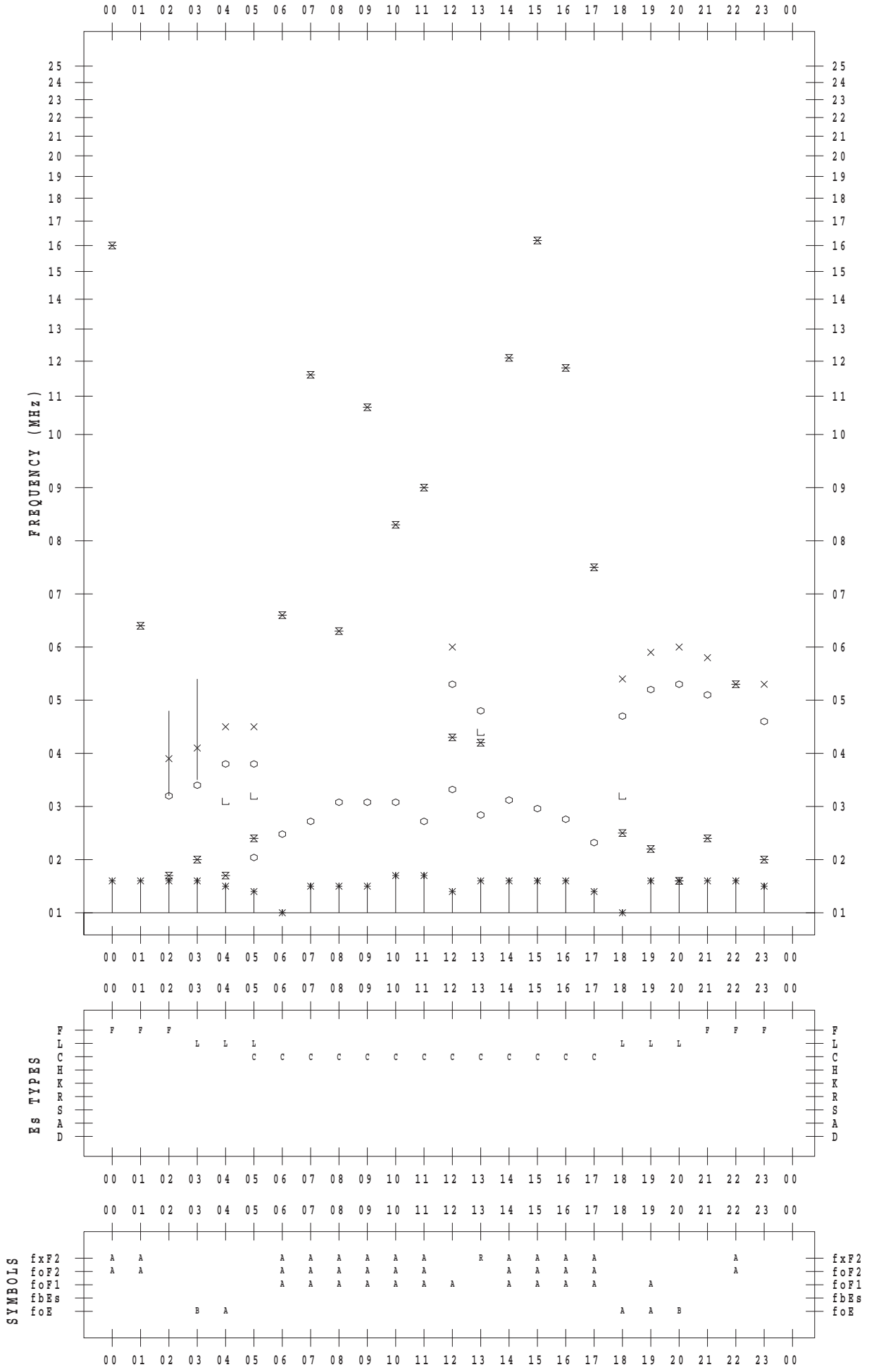
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/26

135 °E MEAN TIME



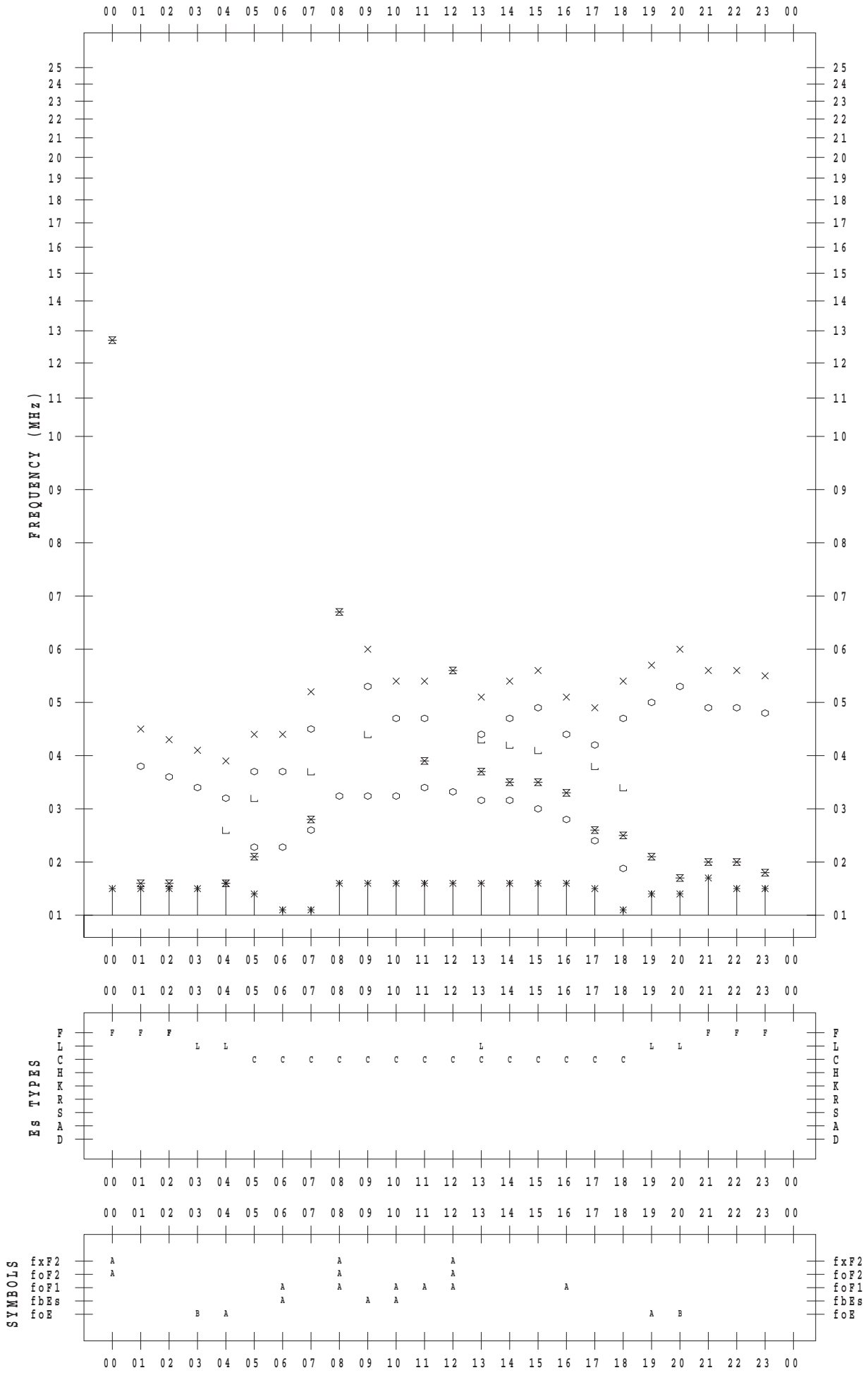
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/27

135 °E MEAN TIME



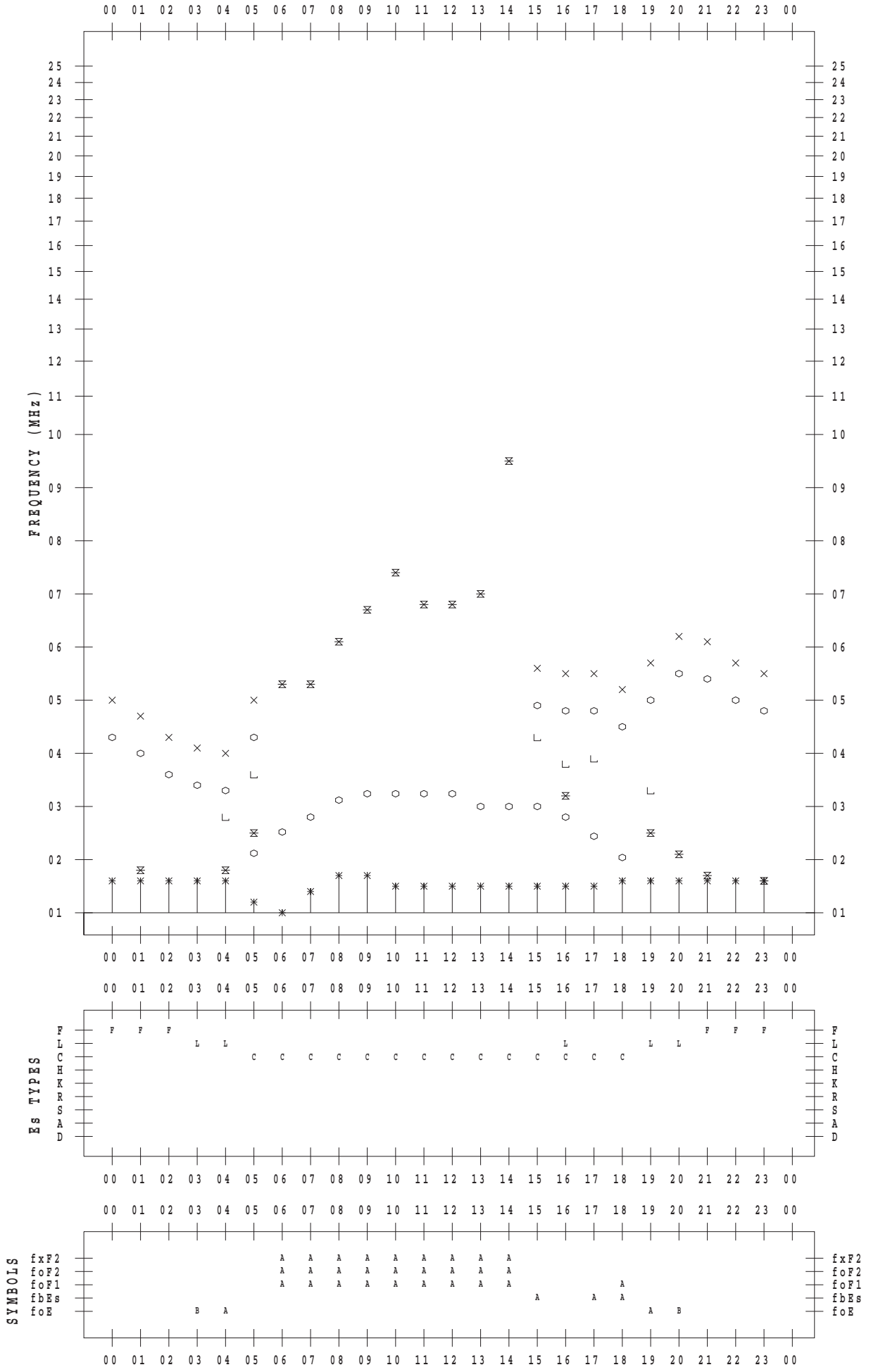
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/28

135 °E MEAN TIME



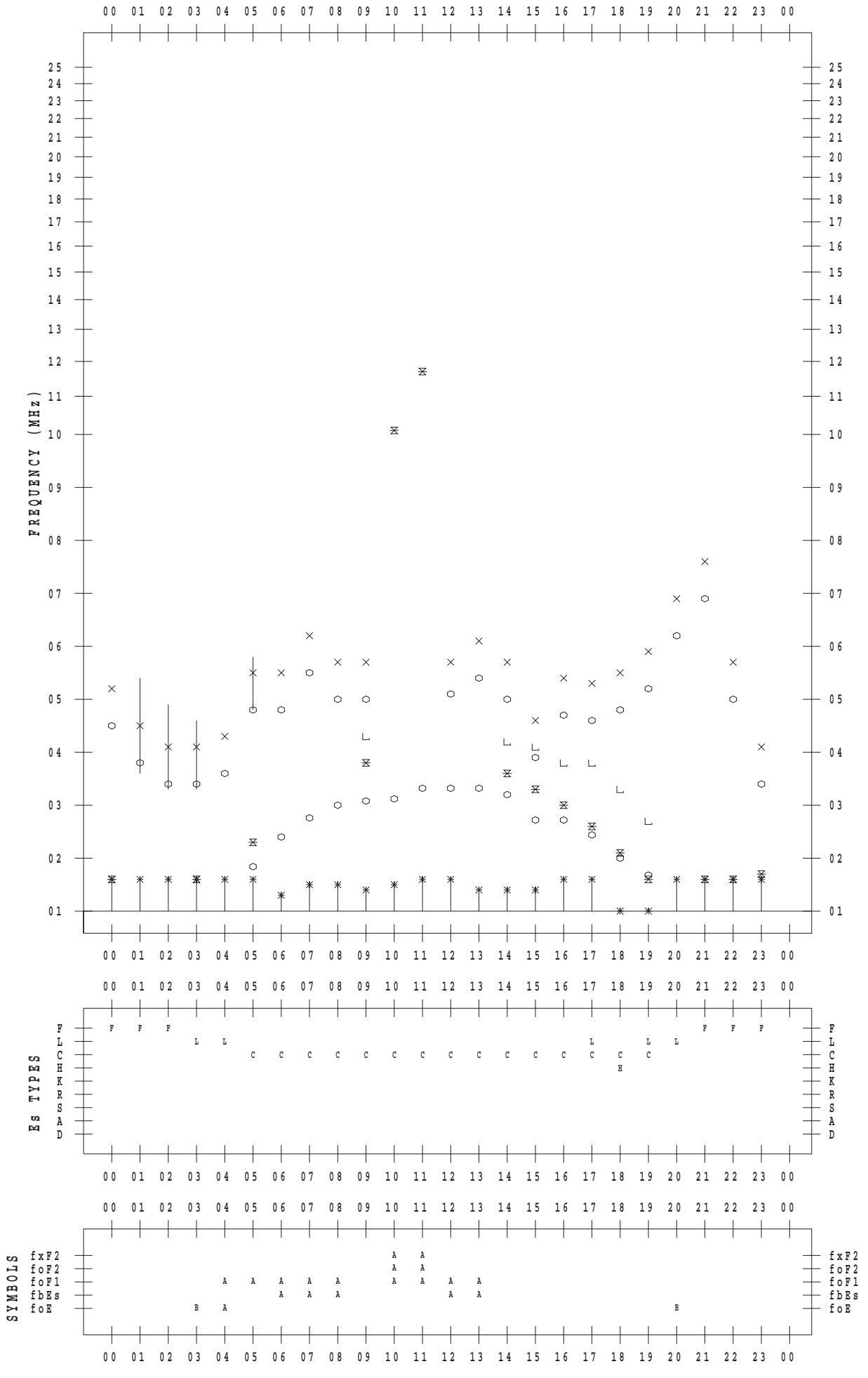
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/29

135 °E MEAN TIME



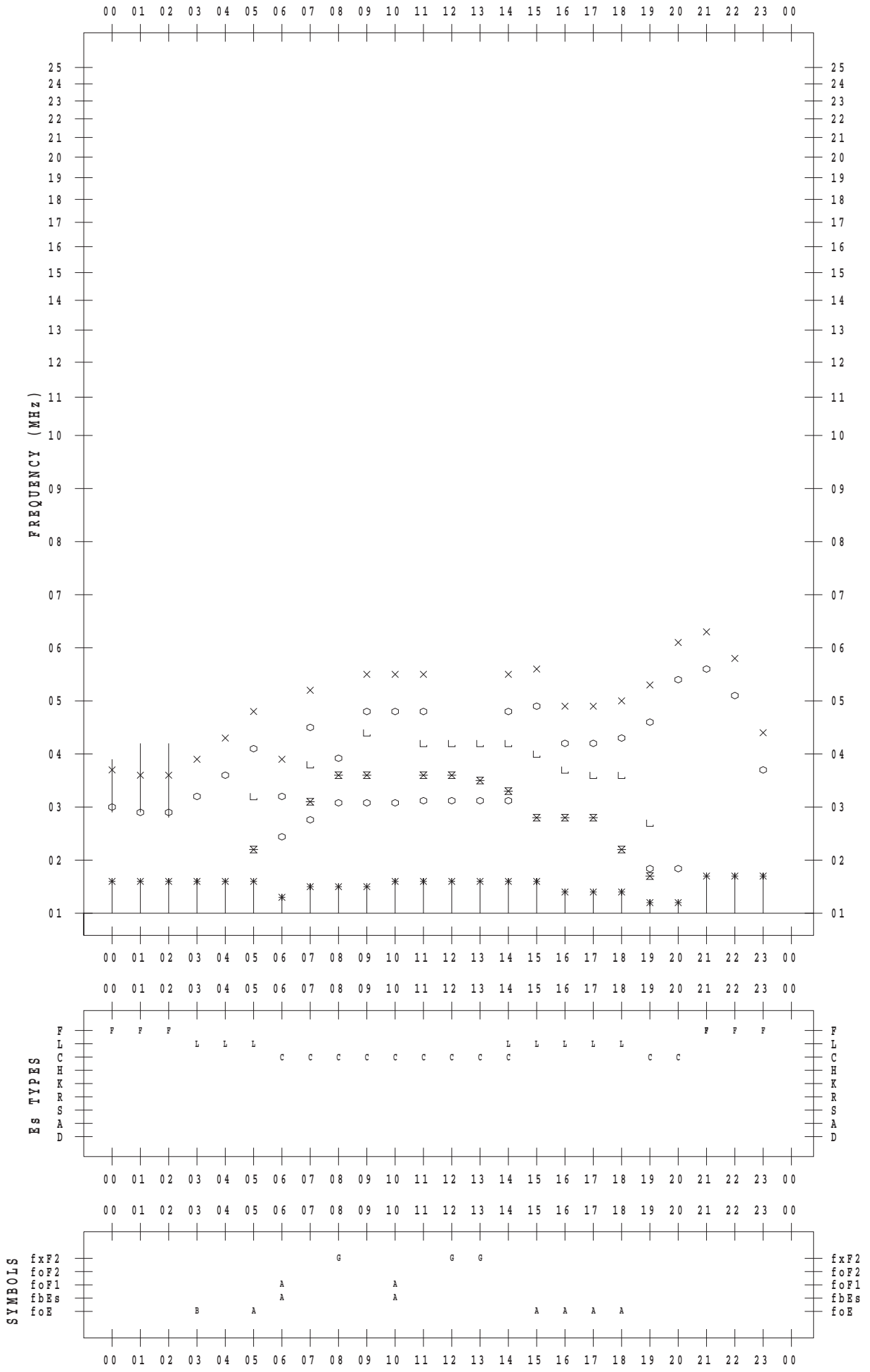
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/ 6/30

135 °E MEAN TIME



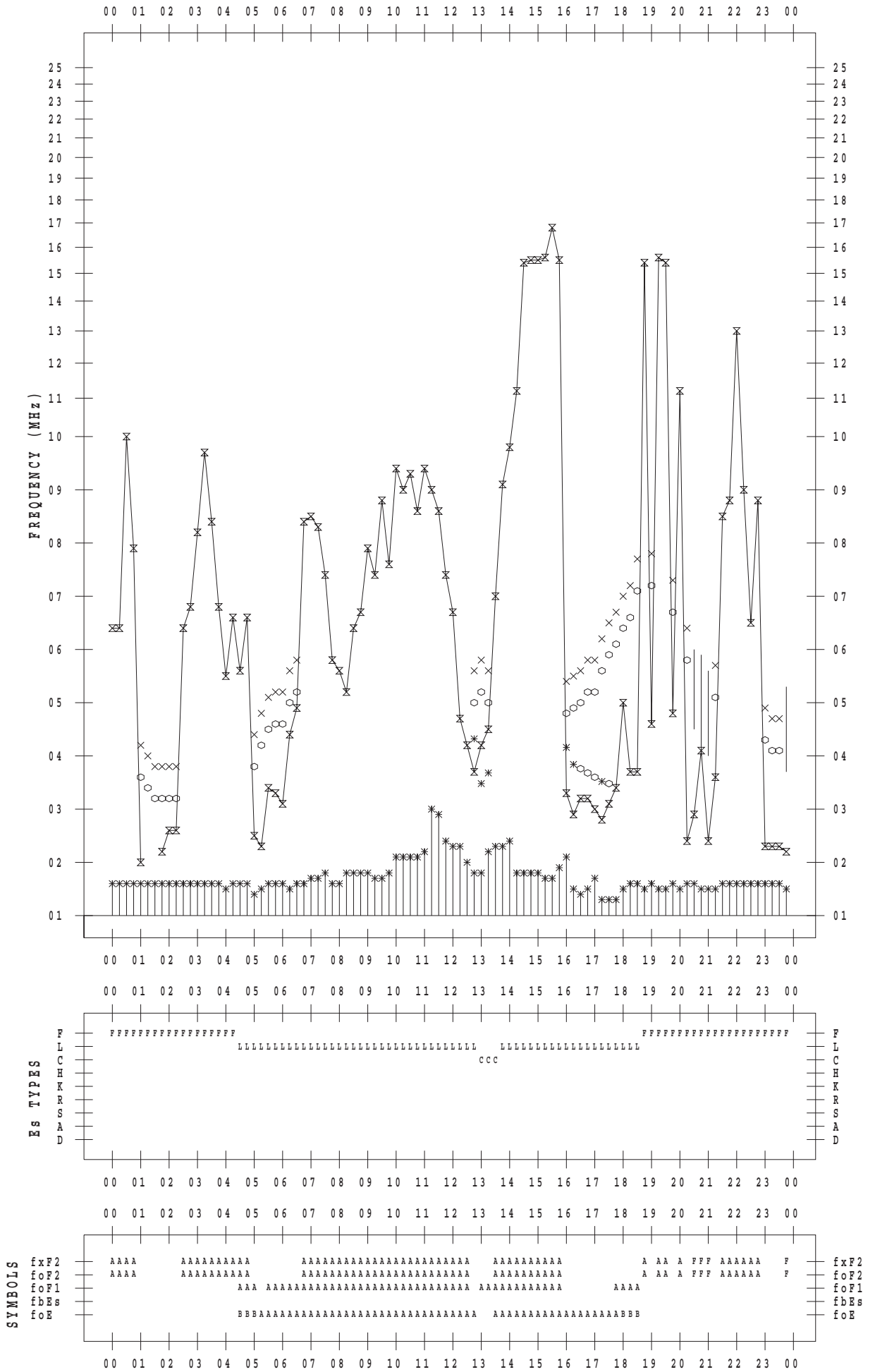
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/ 1

135 °E MEAN TIME



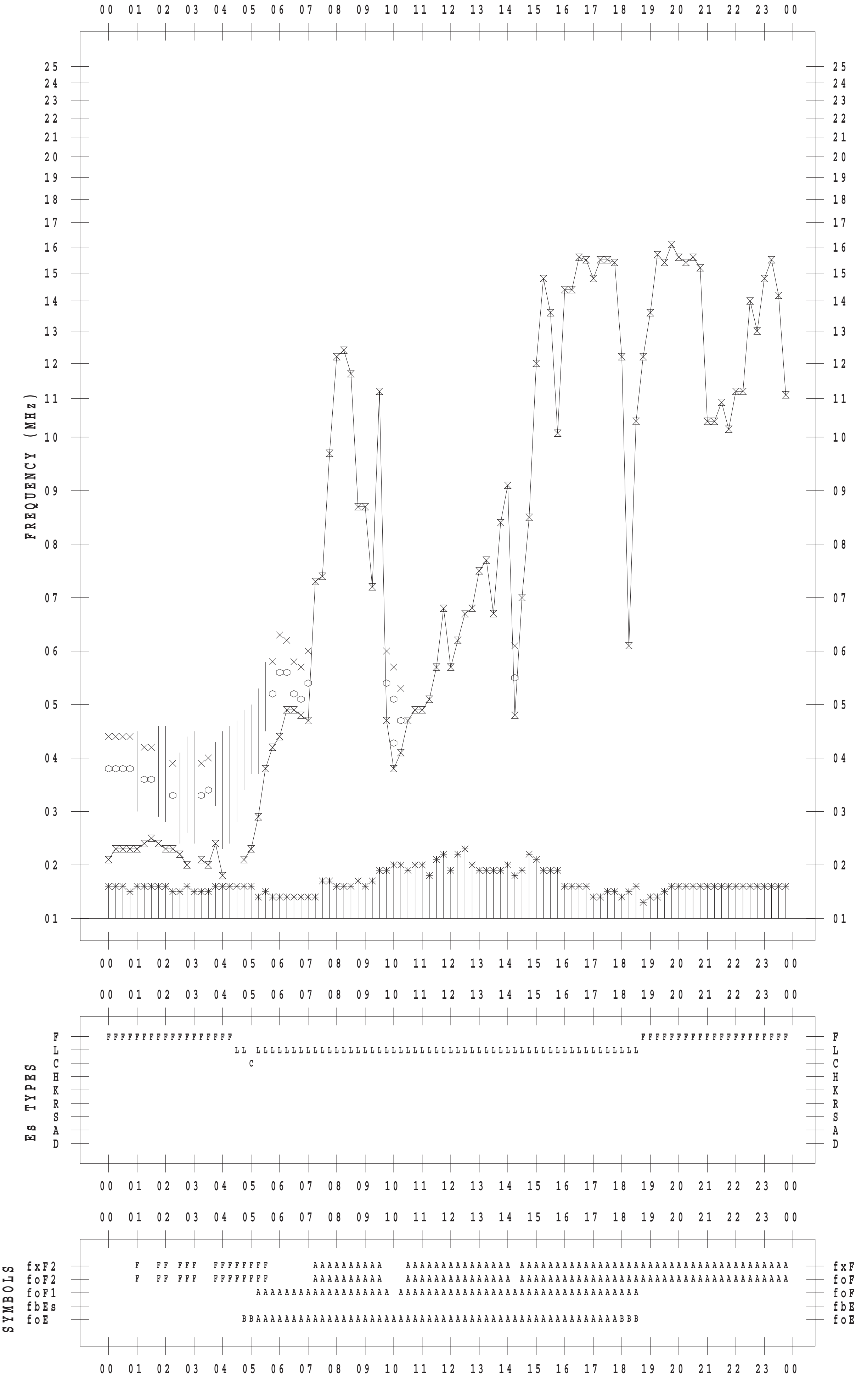
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/ 2

135 °E MEAN TIME



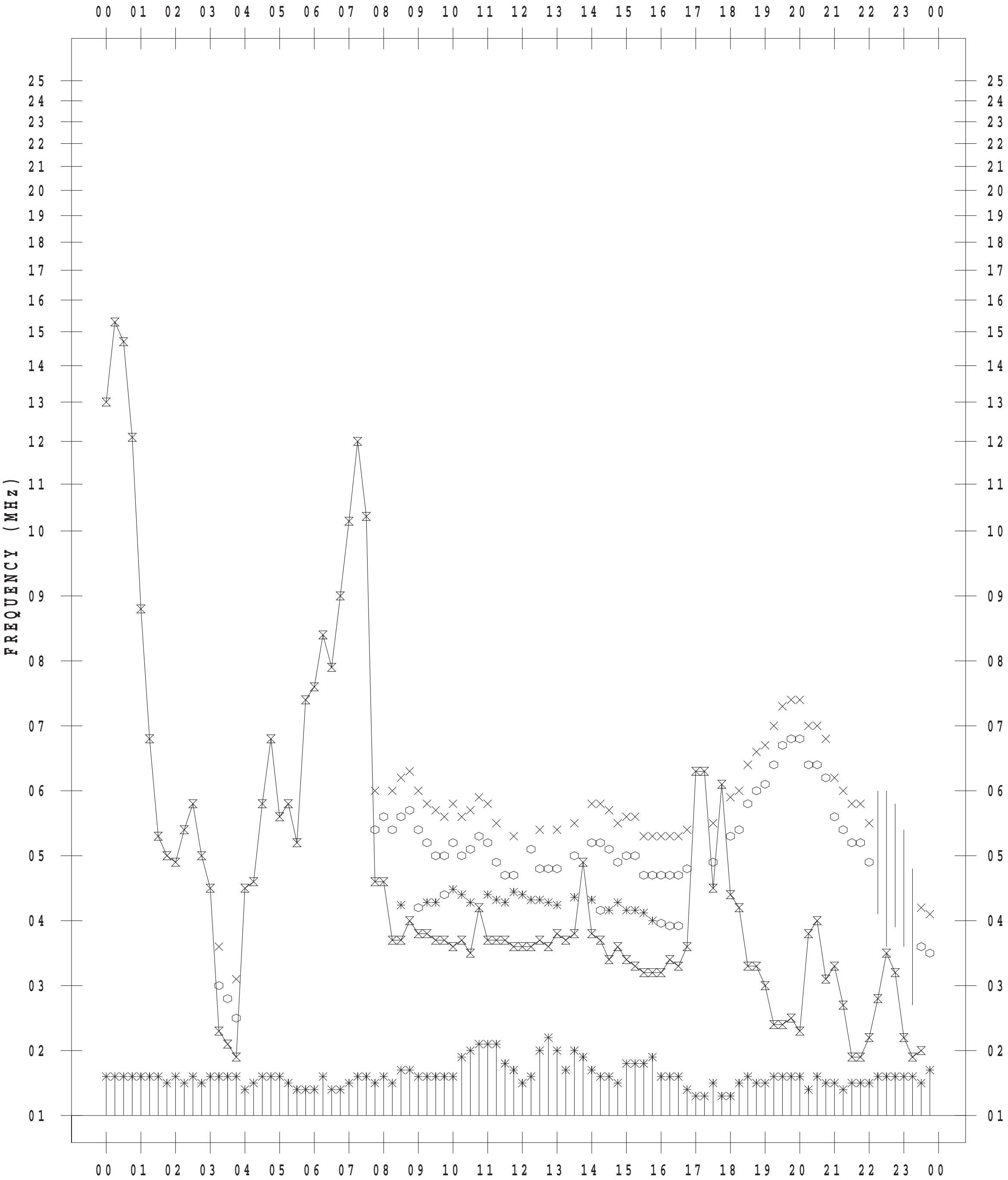
f-PLOT DATA

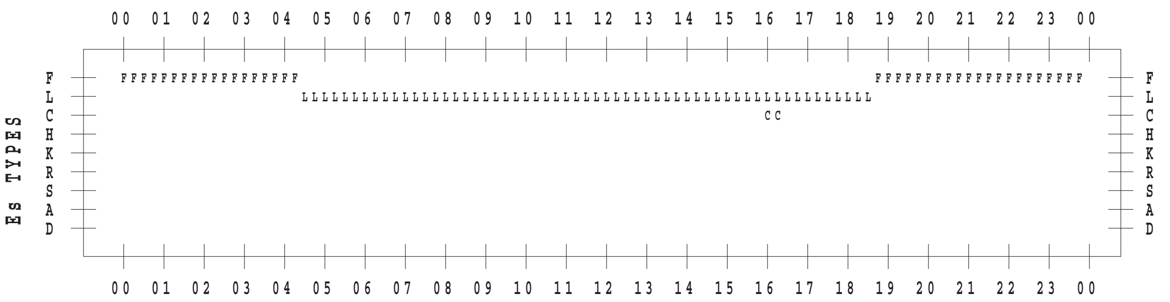
SCALER : I.NISHIMUTA

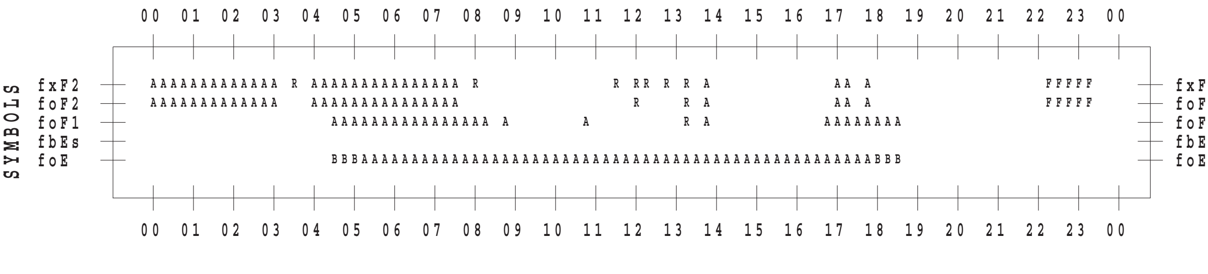
STATION : Kokubunji

DATE : 2019/ 6/ 3

135 °E MEAN TIME





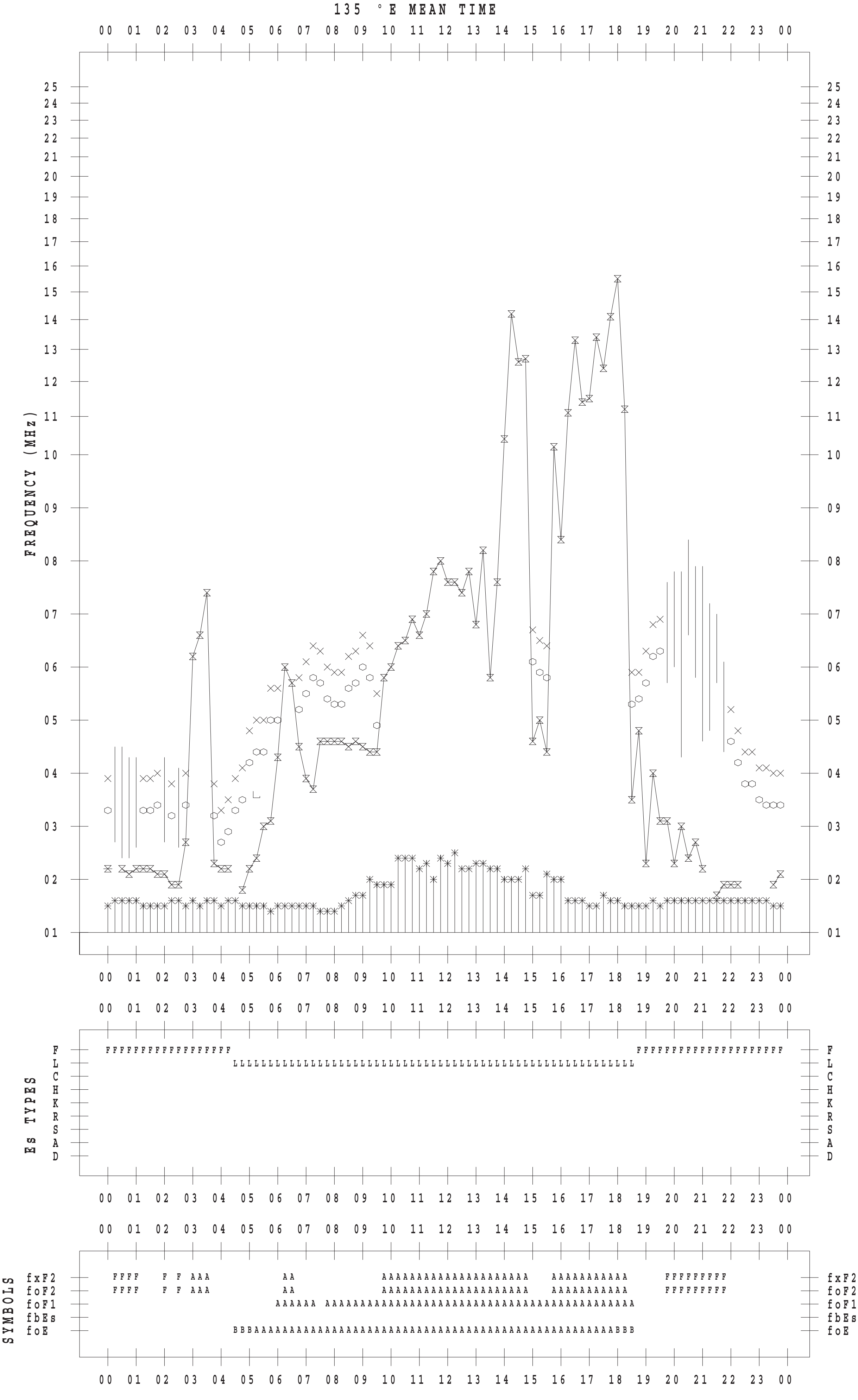


f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/ 4



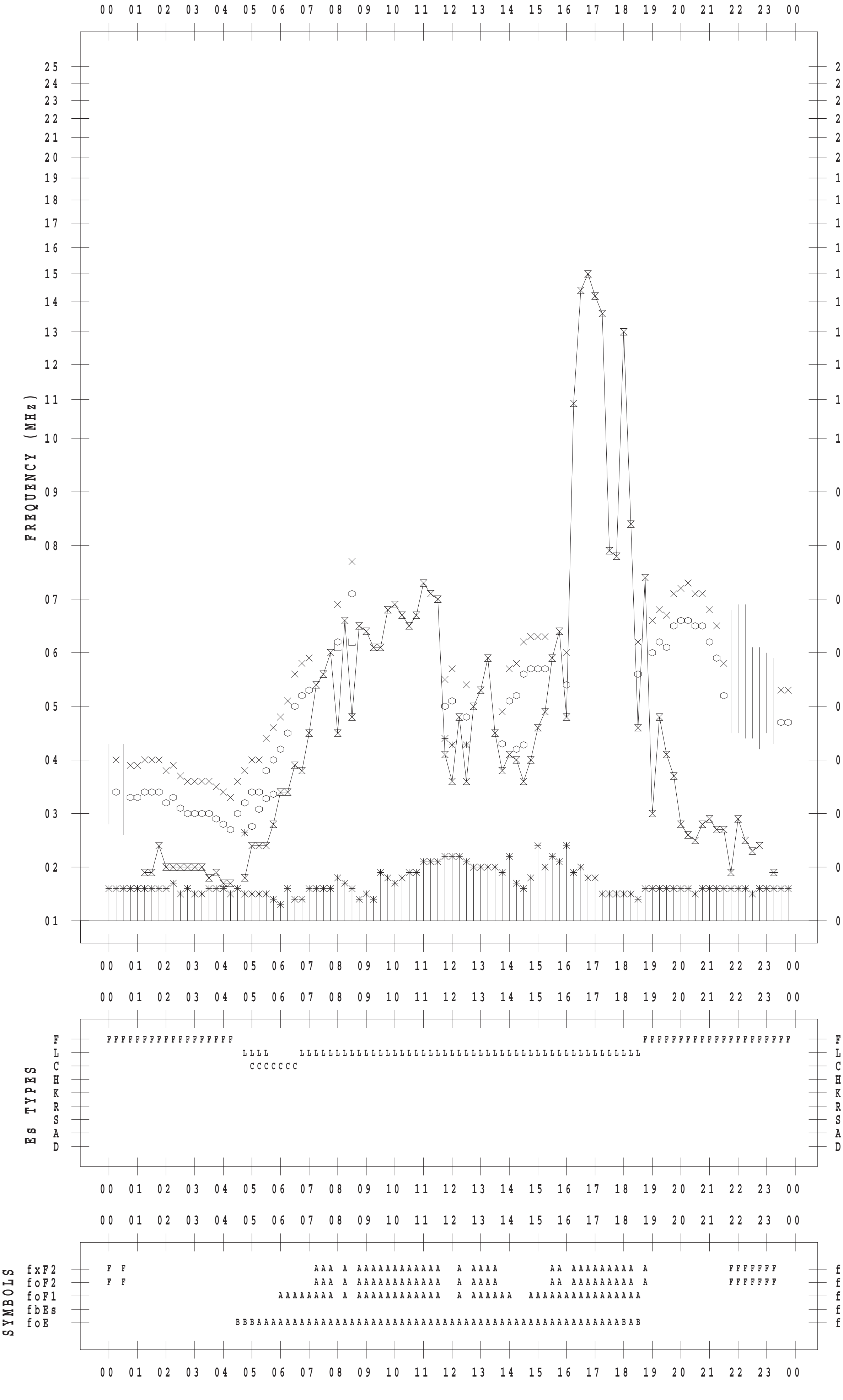
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/ 5

135 °E MEAN TIME



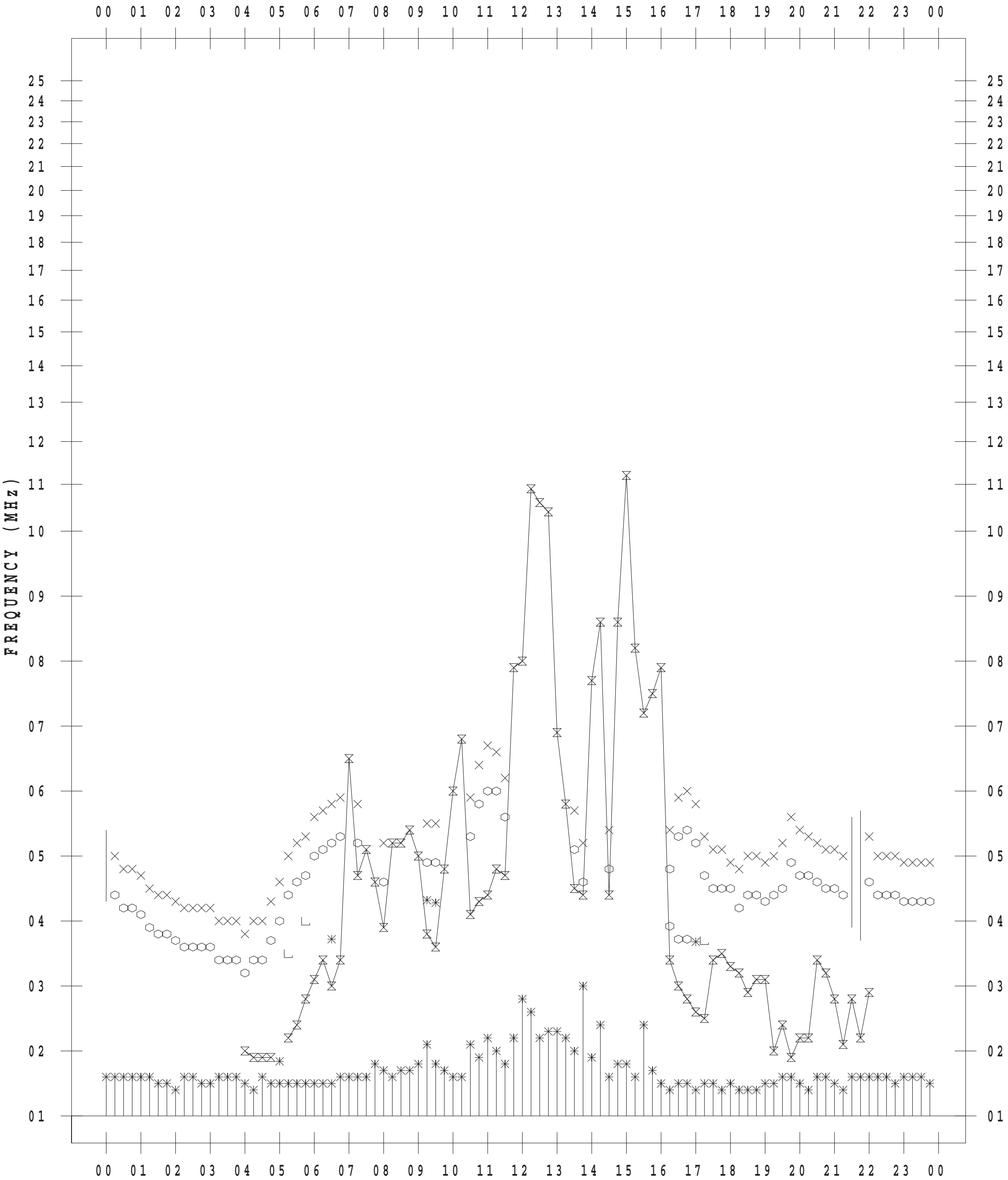
f-PLOT DATA

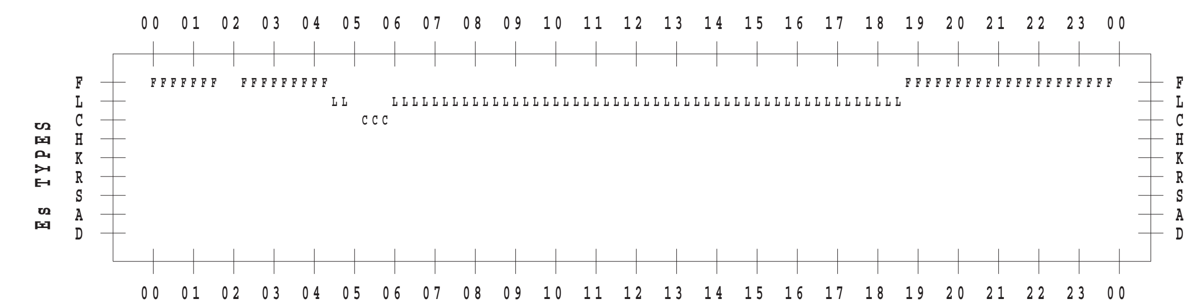
SCALER : I.NISHIMUTA

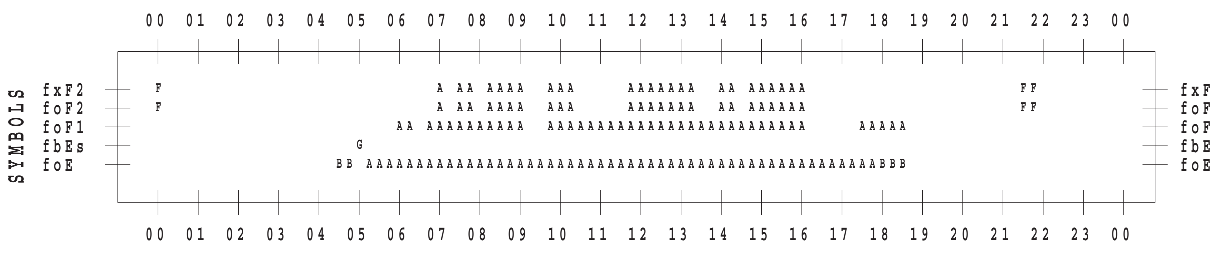
STATION : Kokubunji

DATE : 2019/ 6/ 6

135 °E MEAN TIME





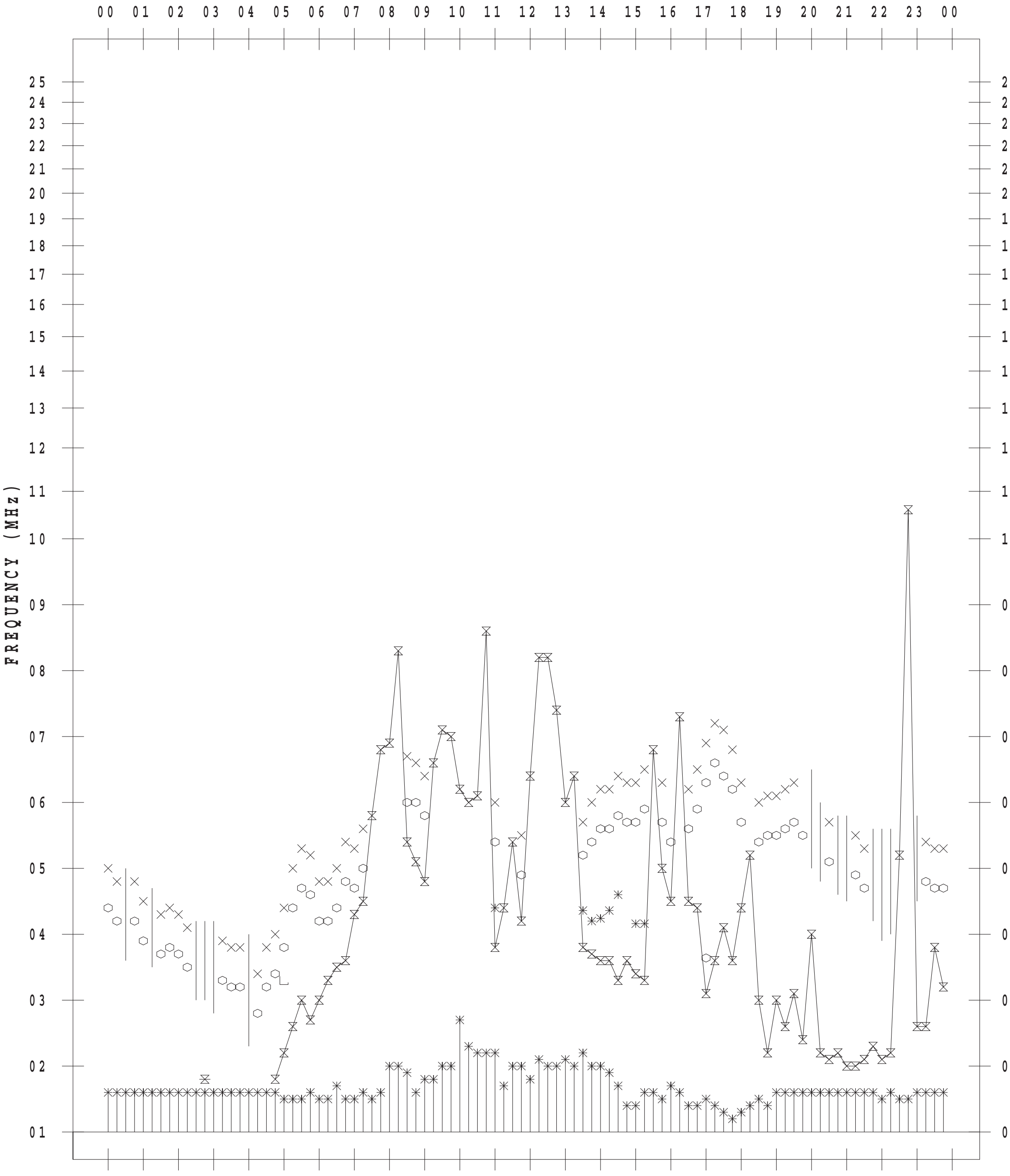


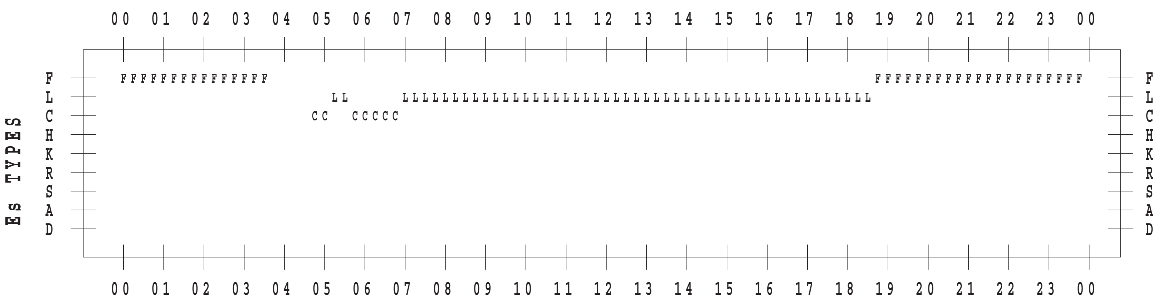
f-PLOT DATA

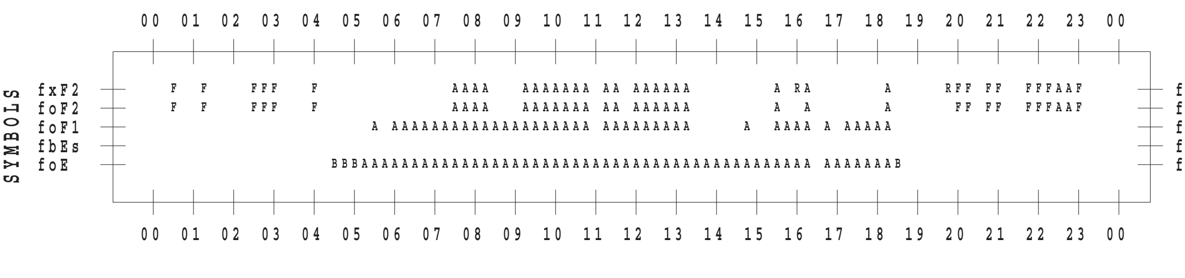
SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/ 7







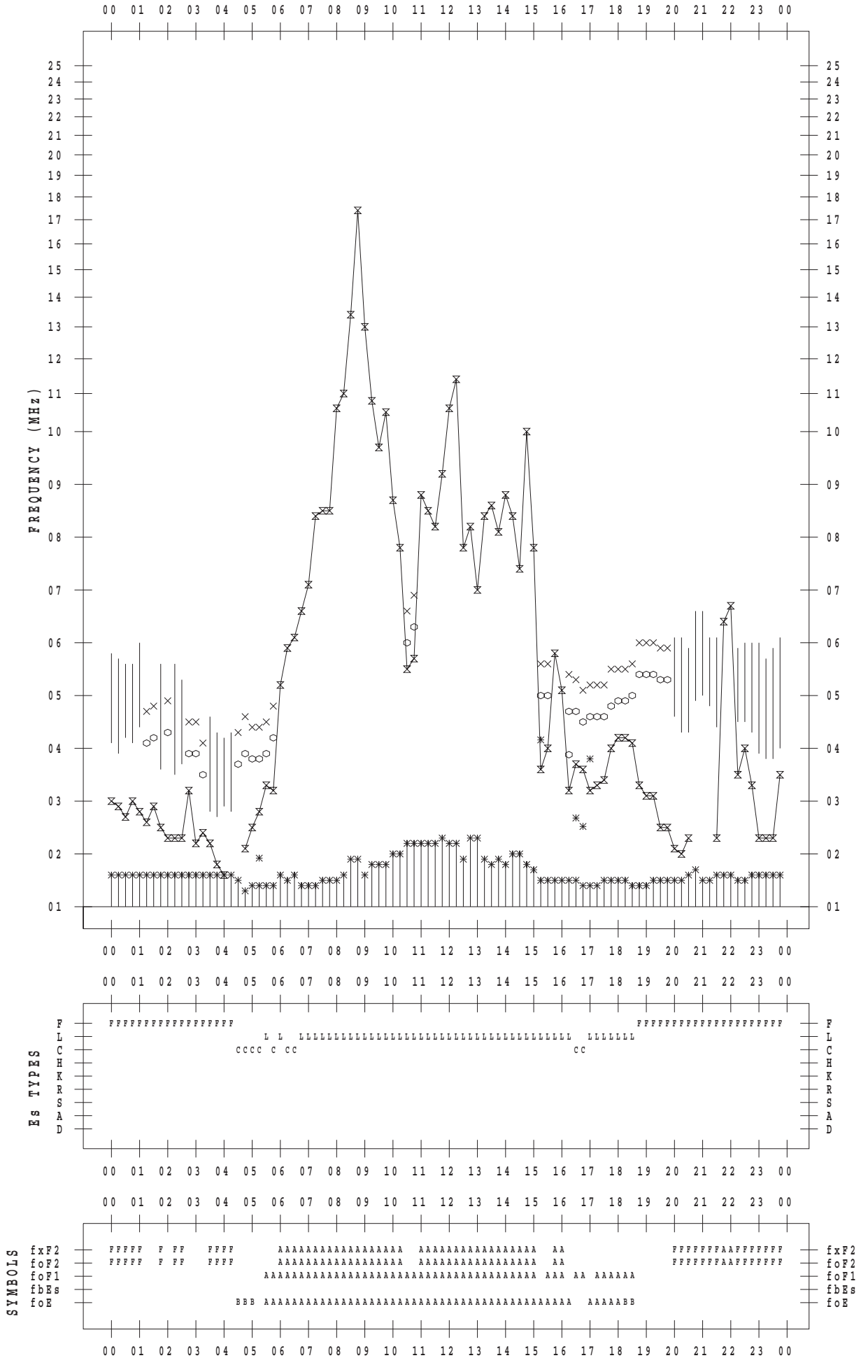
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/ 8

135 °E MEAN TIME



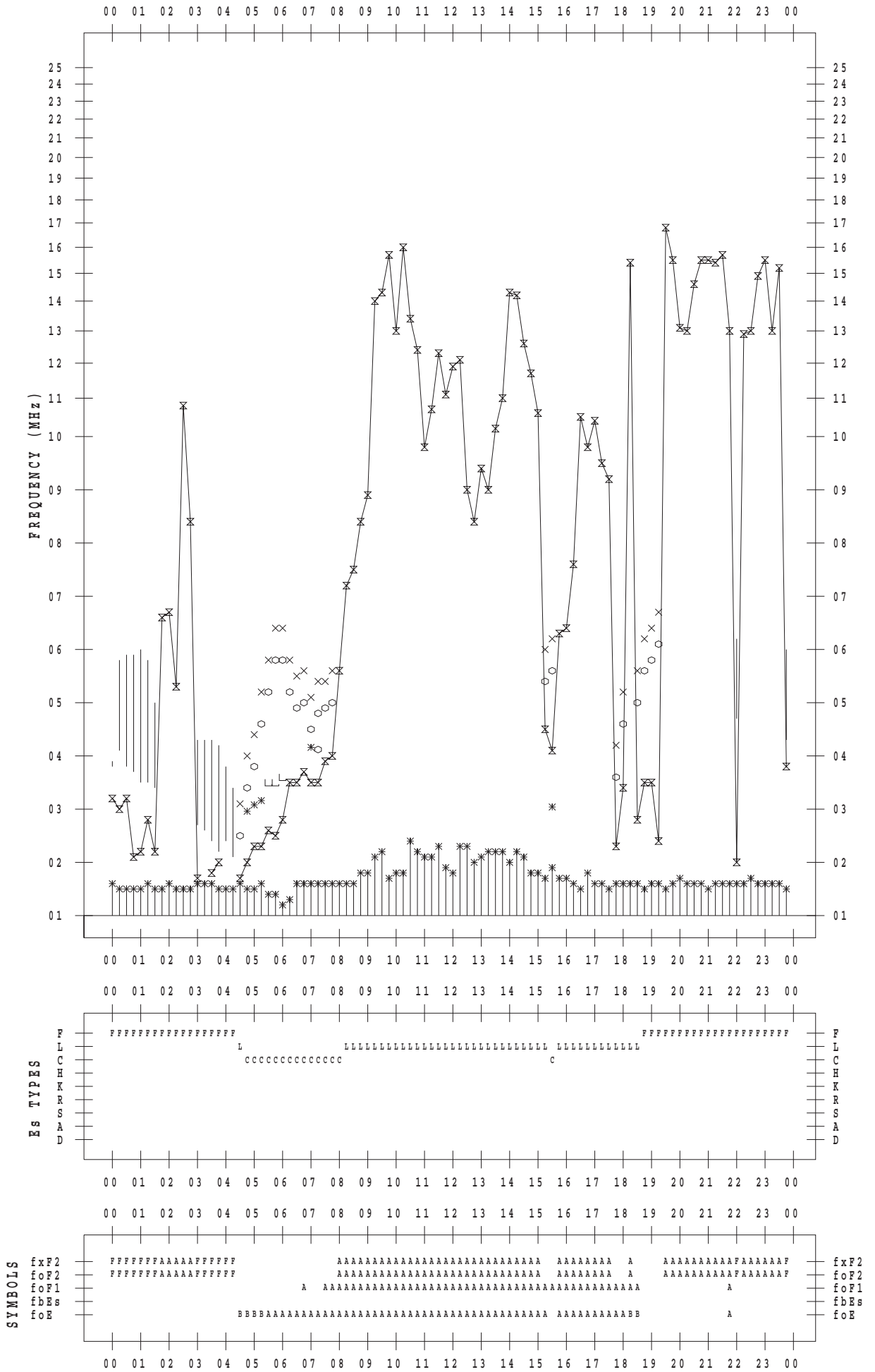
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/ 9

135 °E MEAN TIME



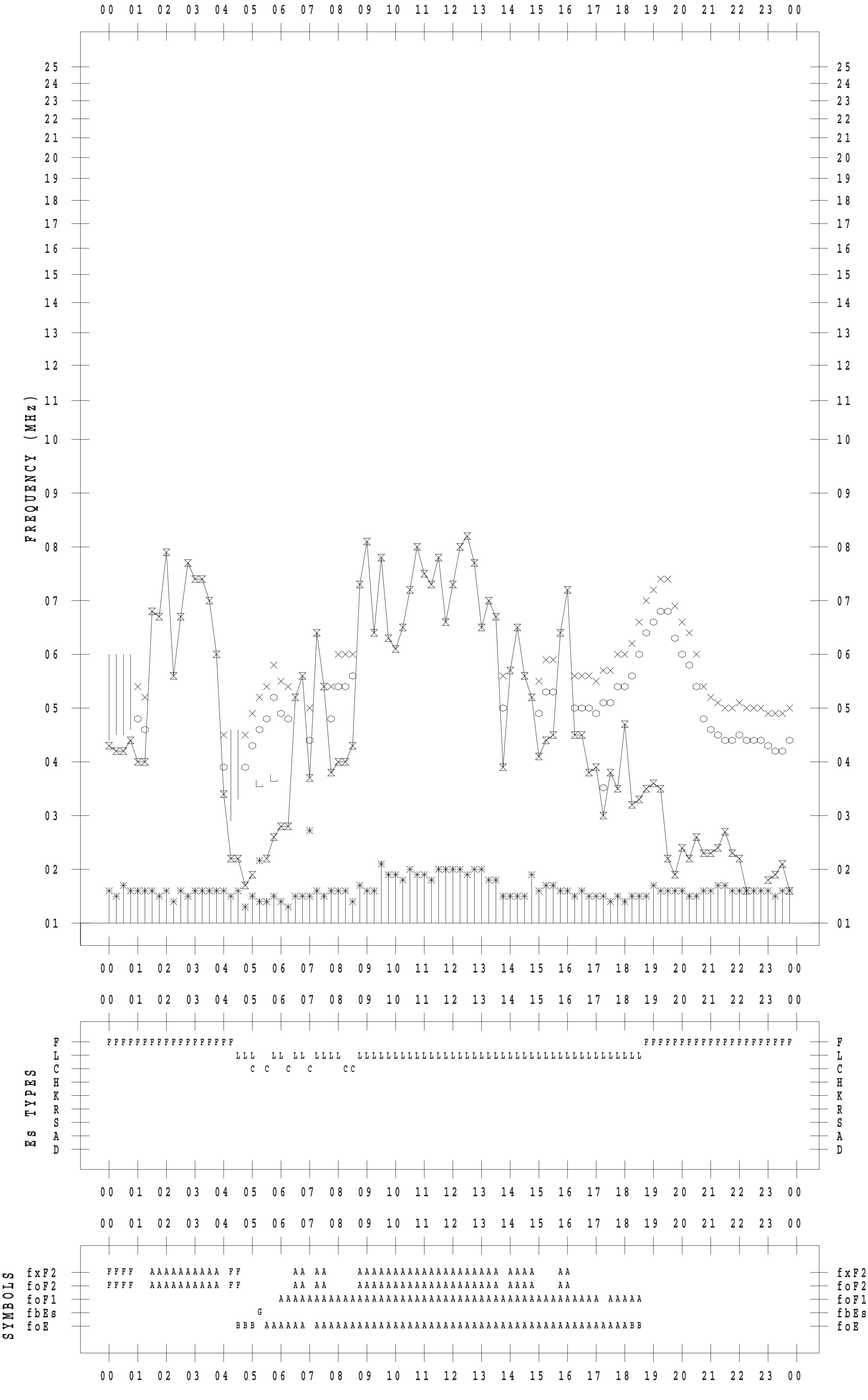
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/10

135 °E MEAN TIME



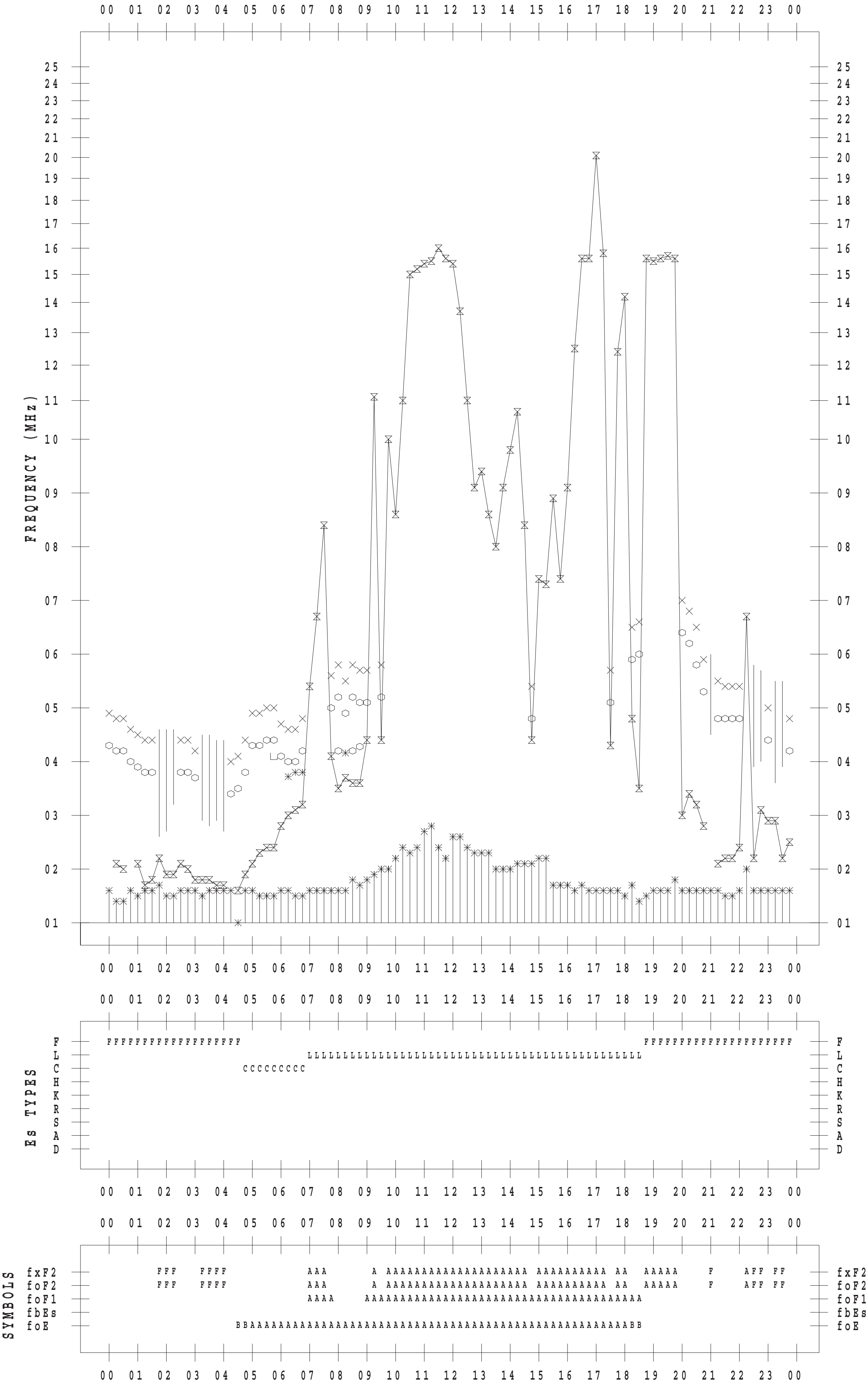
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/11

135 °E MEAN TIME



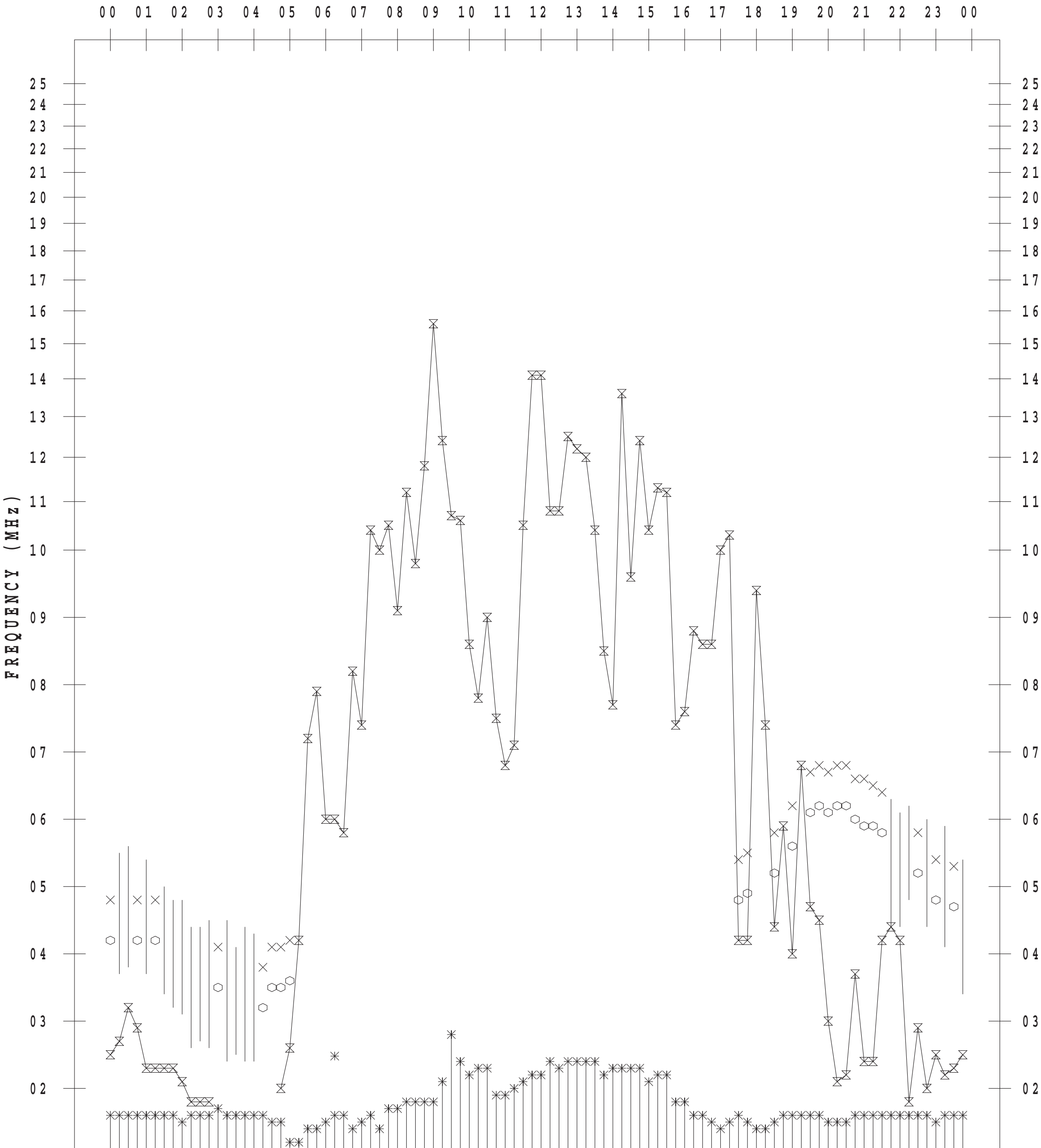
f-PLOT DATA

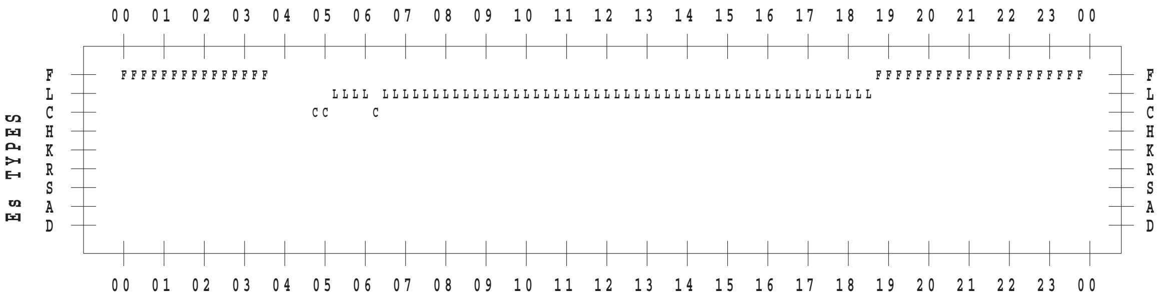
SCALER : I.NISHIMUTA

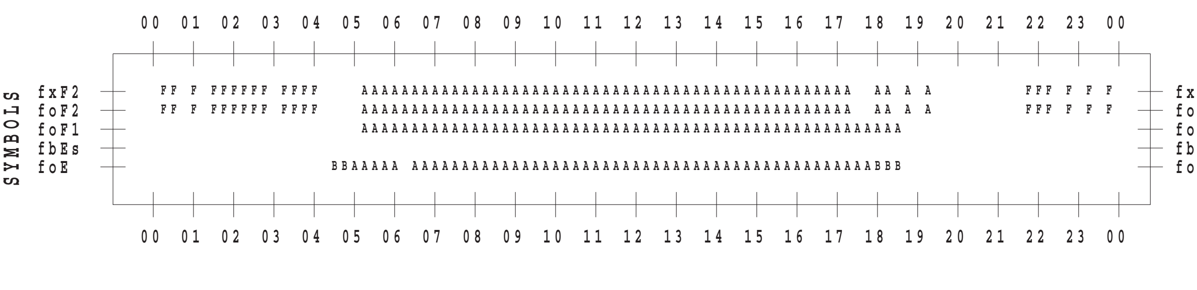
STATION : Kokubunji

DATE : 2019/ 6/12

135 °E MEAN TIME







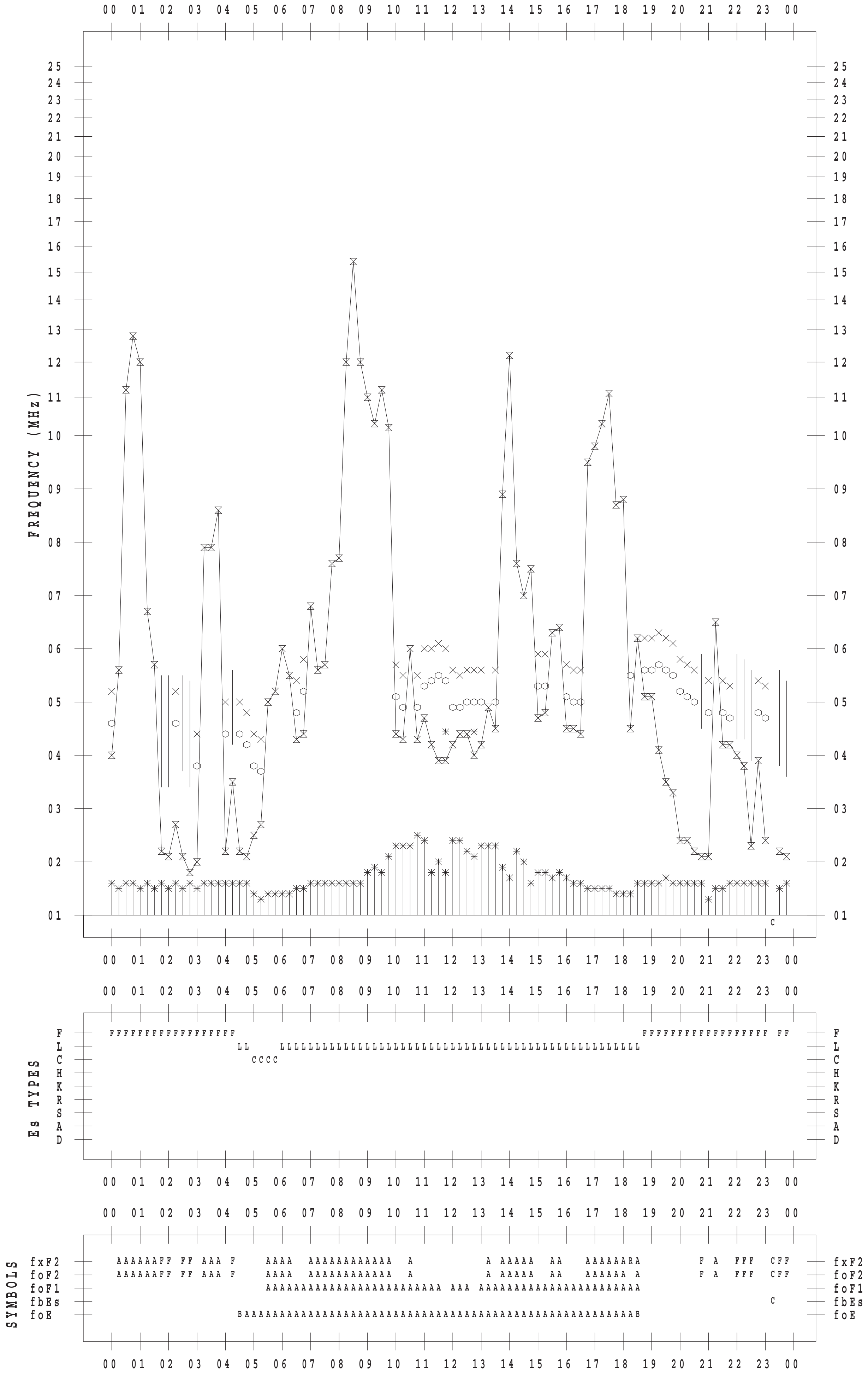
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/13

135 °E MEAN TIME



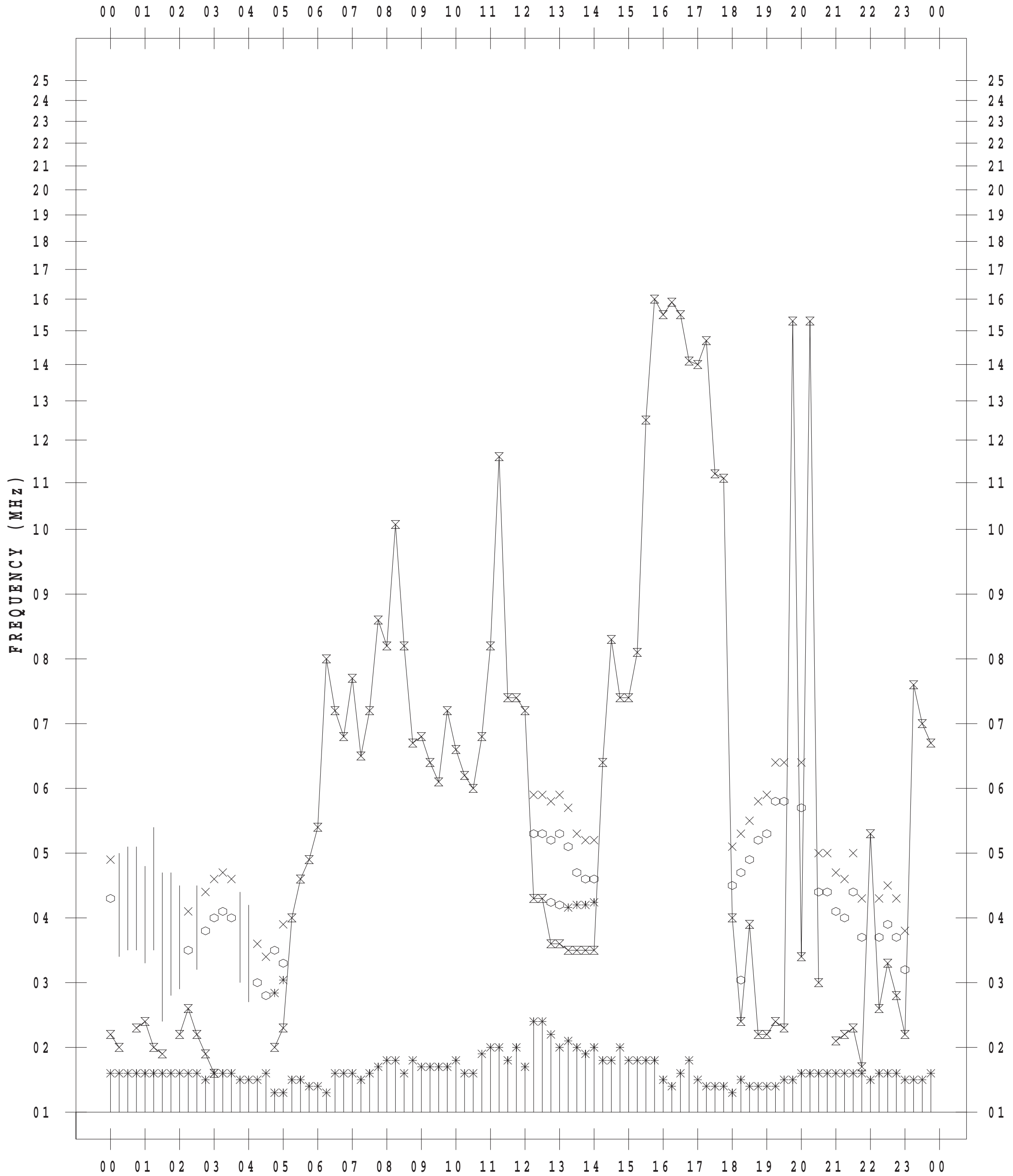
f-PLOT DATA

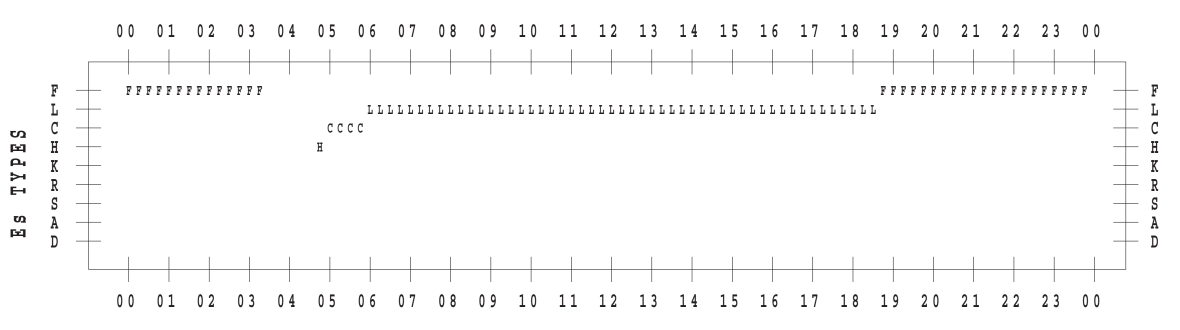
SCALER : I.NISHIMUTA

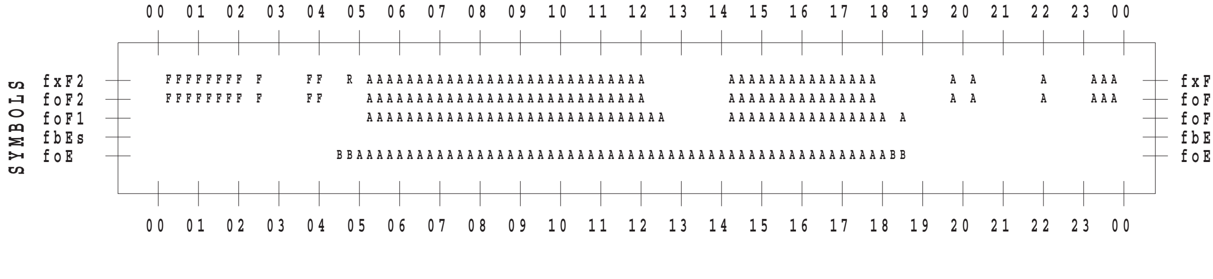
STATION : Kokubunji

DATE : 2019/ 6/14

135 °E MEAN TIME







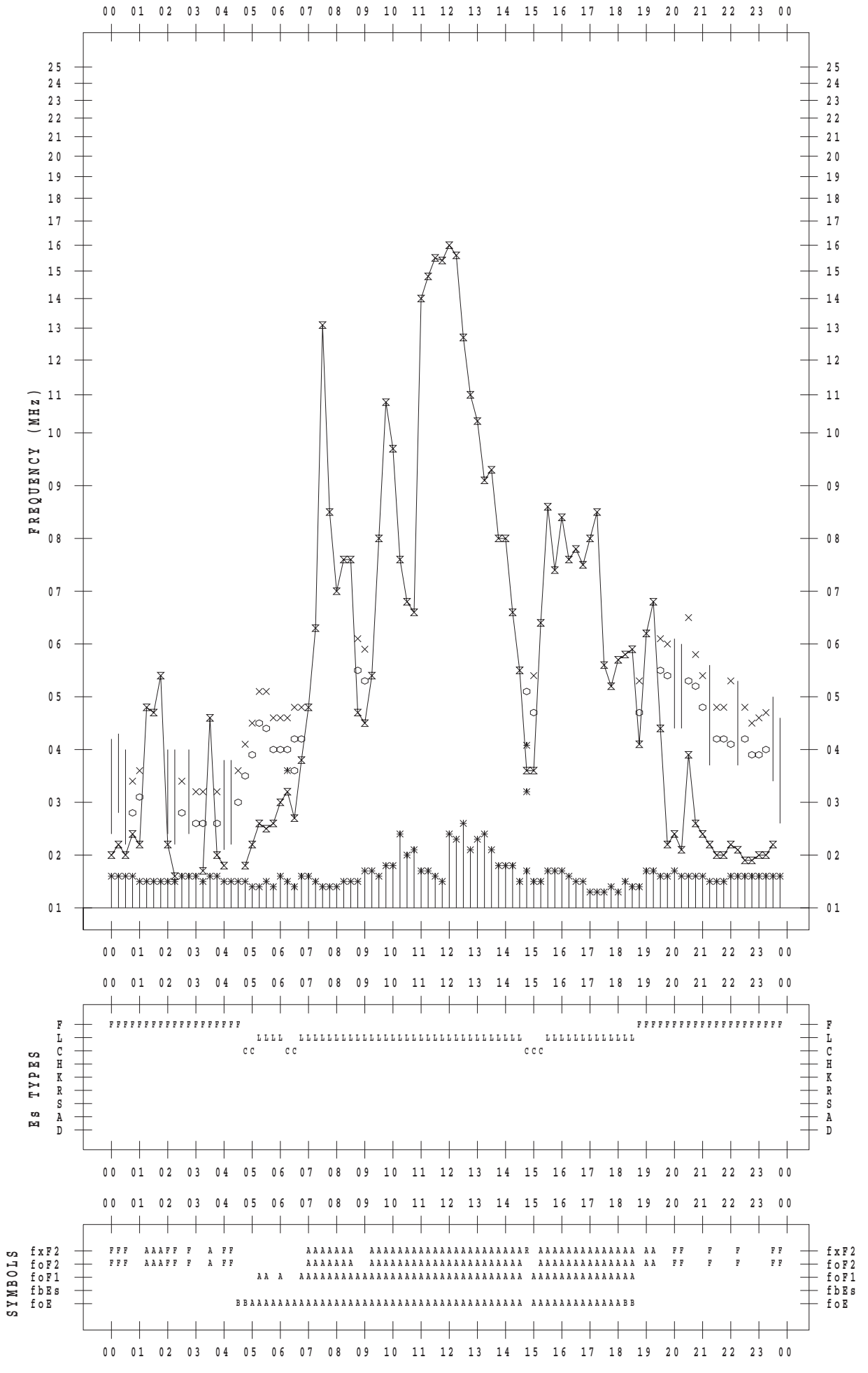
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/15

135 °E MEAN TIME



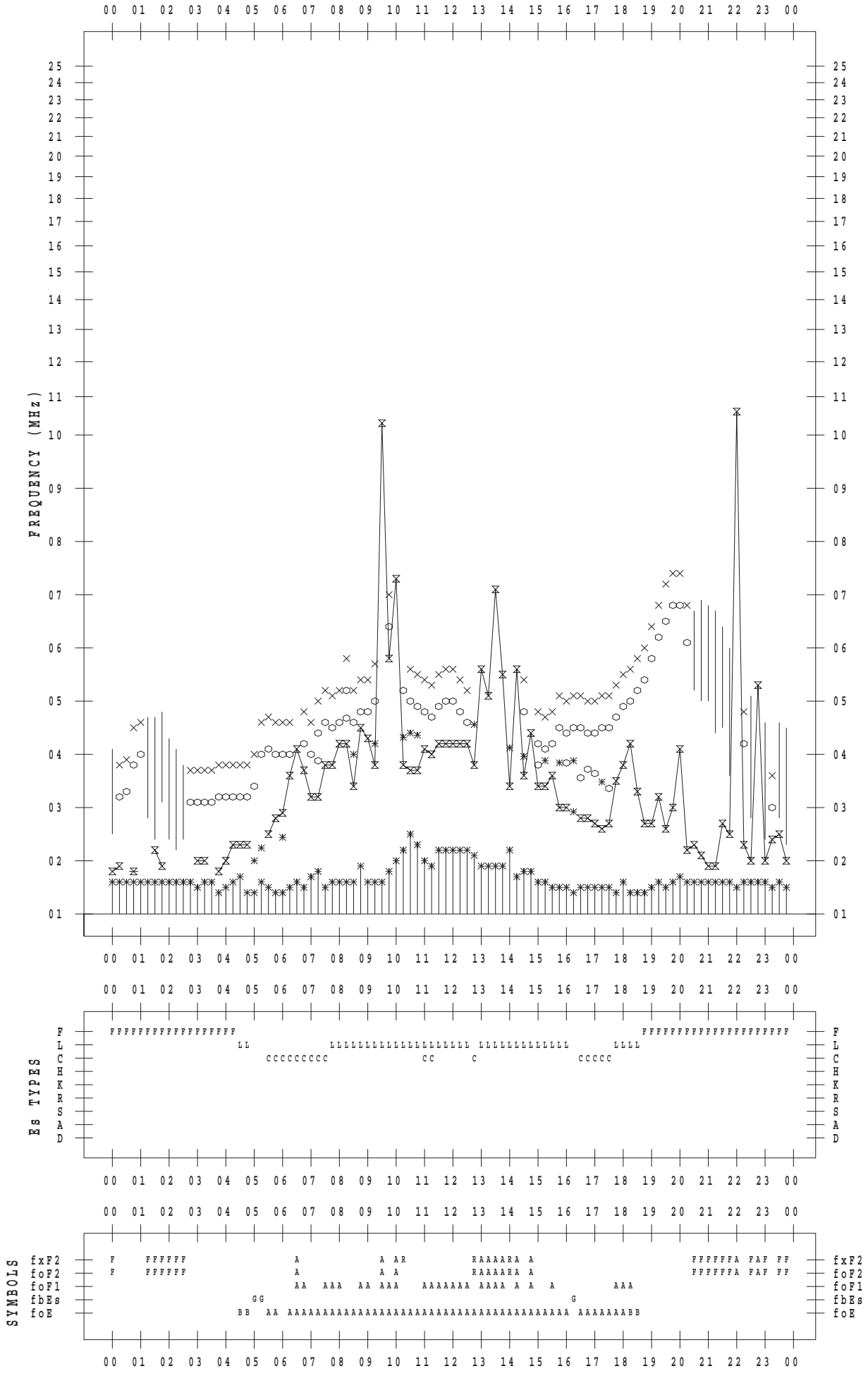
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/16

135 °E MEAN TIME



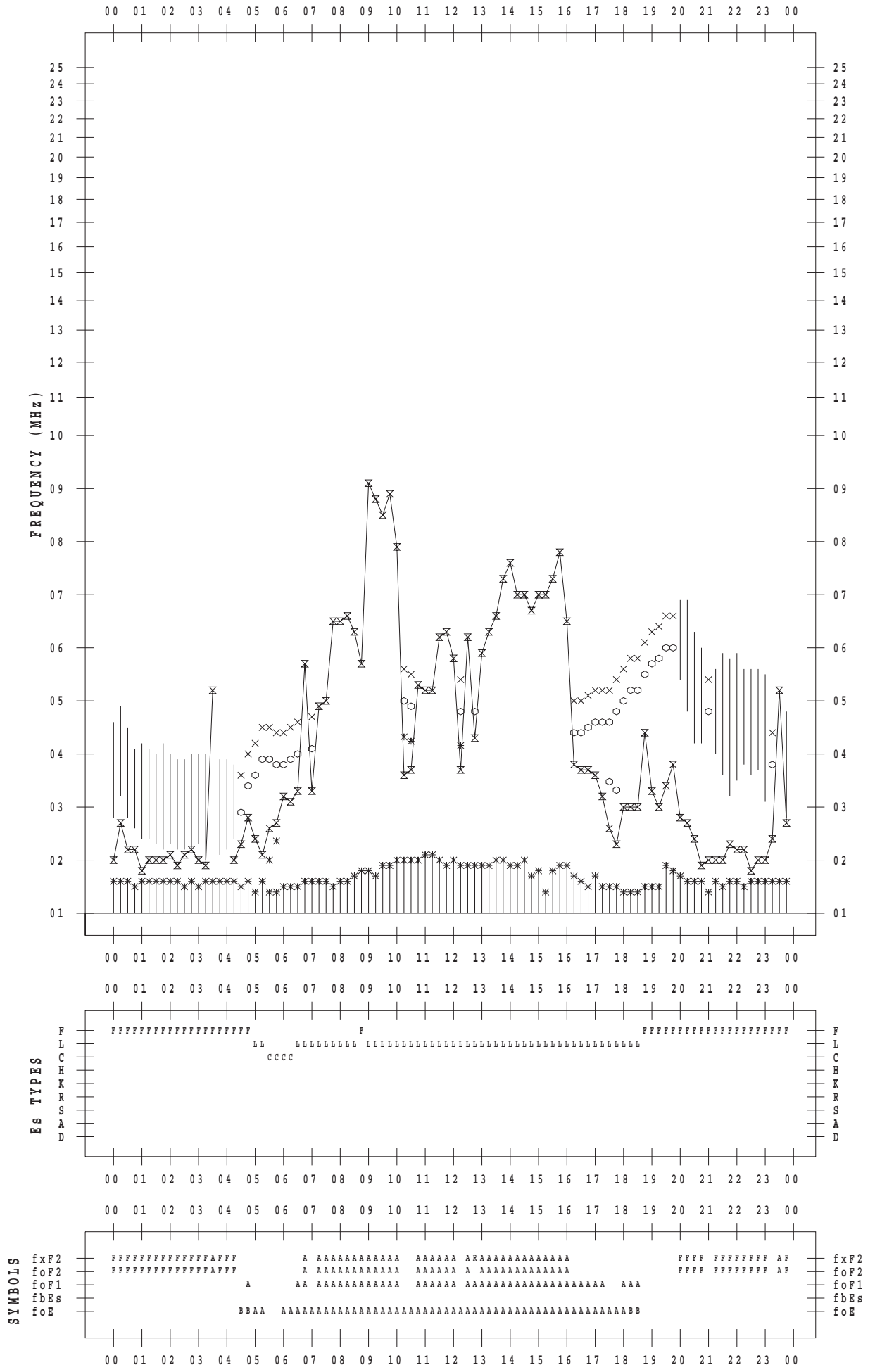
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/17

135 °E MEAN TIME



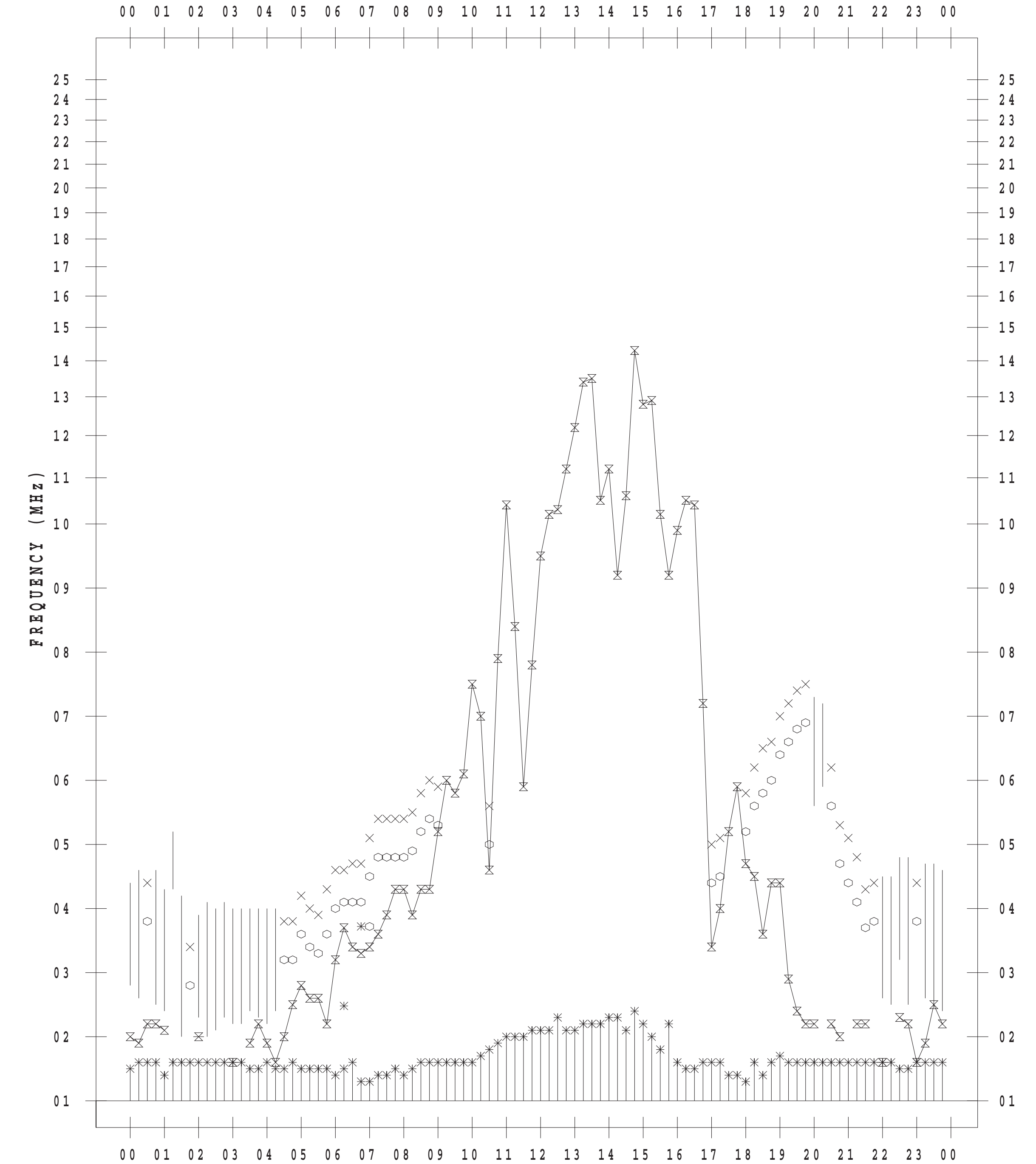
f-PLOT DATA

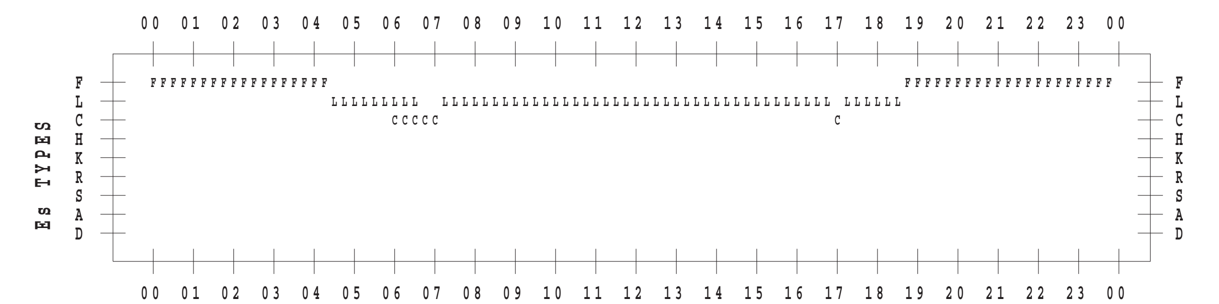
SCALER : I.NISHIMUTA

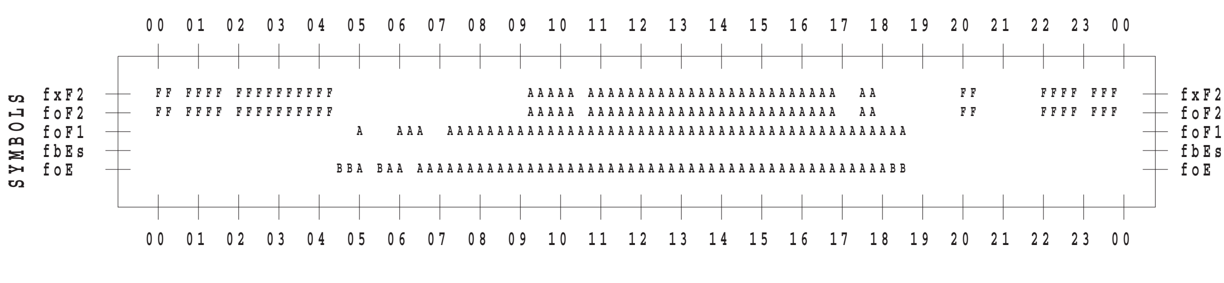
STATION : Kokubunji

DATE : 2019/ 6/18

135 °E MEAN TIME







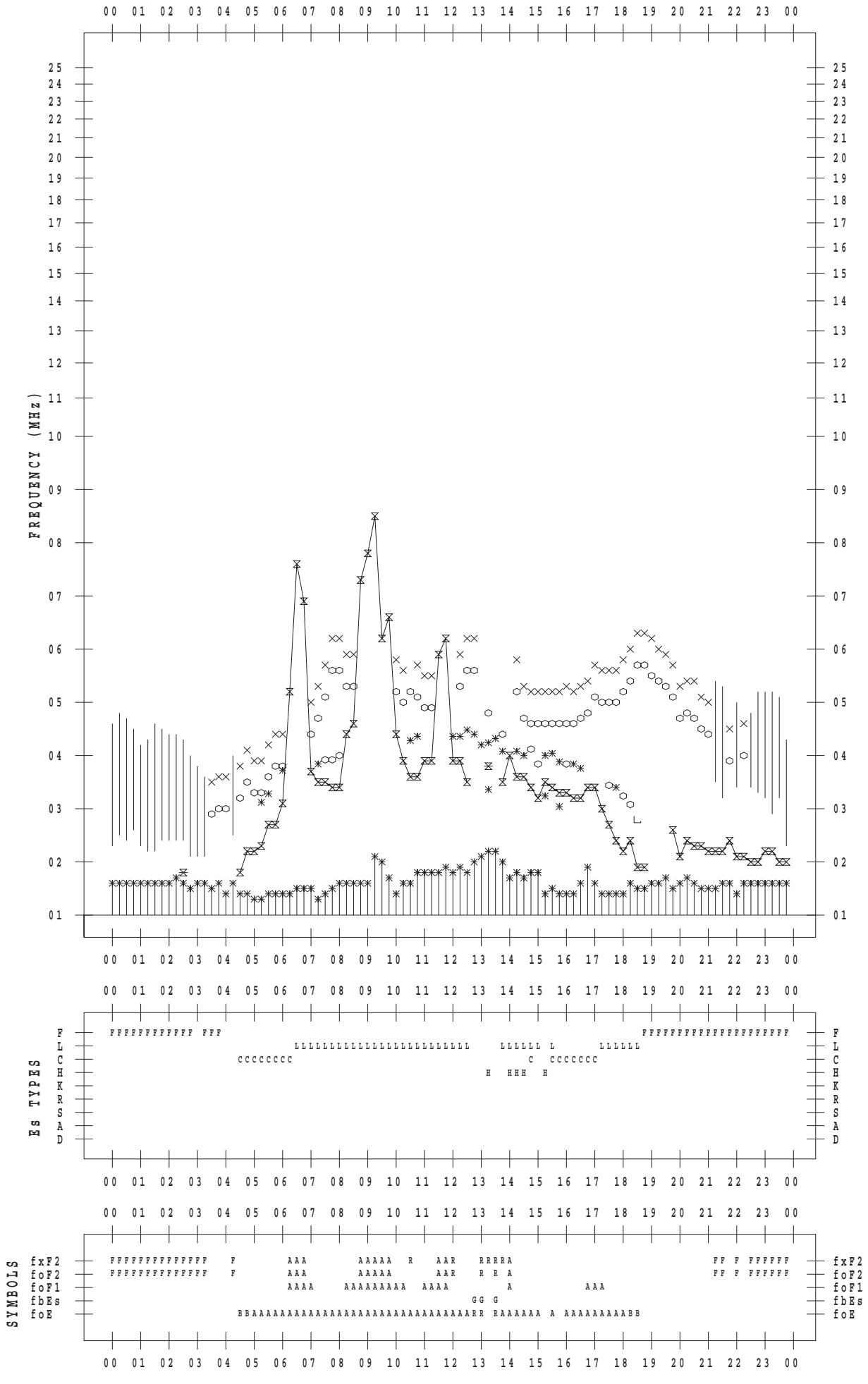
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/19

135 °E MEAN TIME



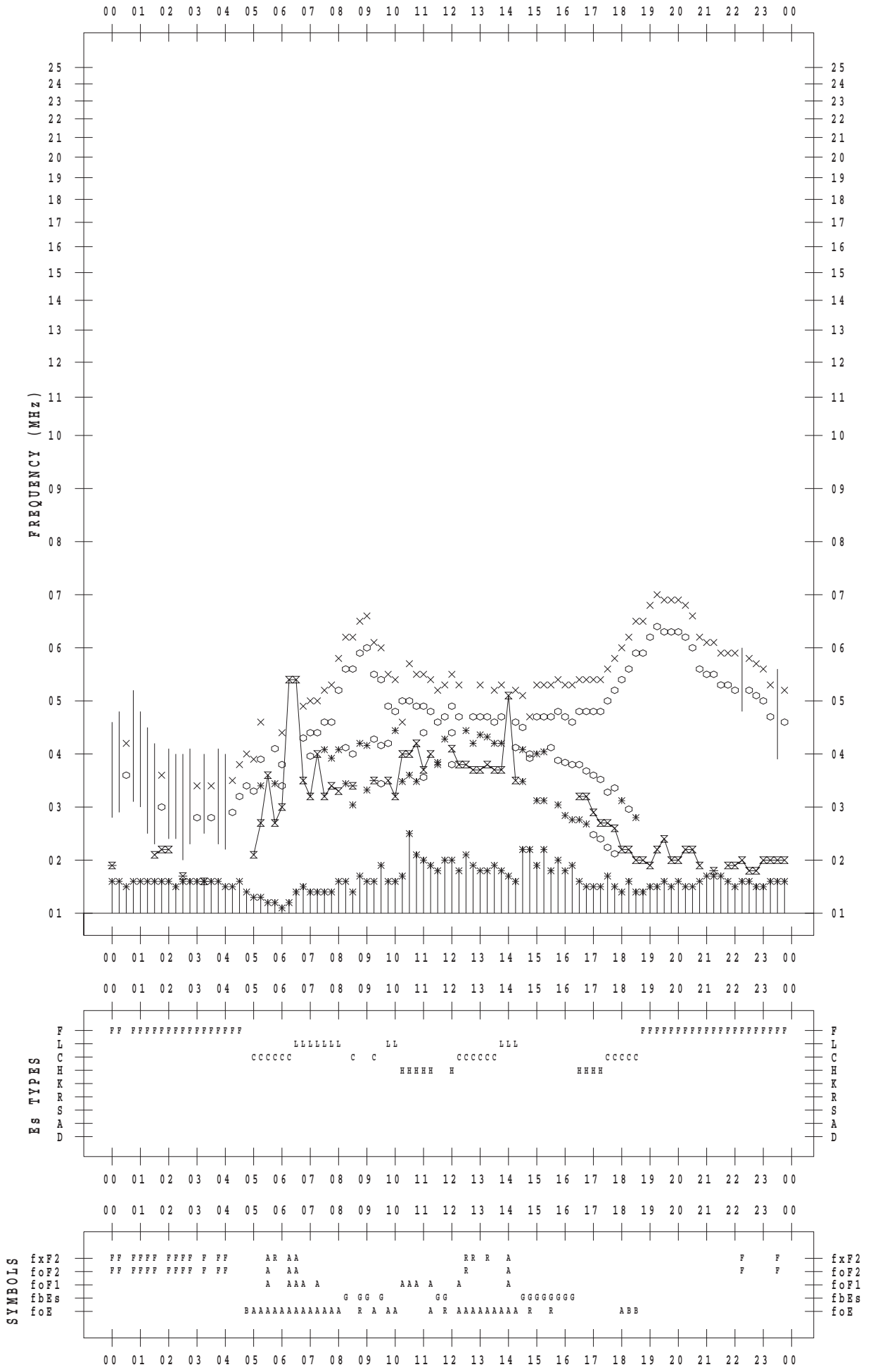
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/20

135 °E MEAN TIME



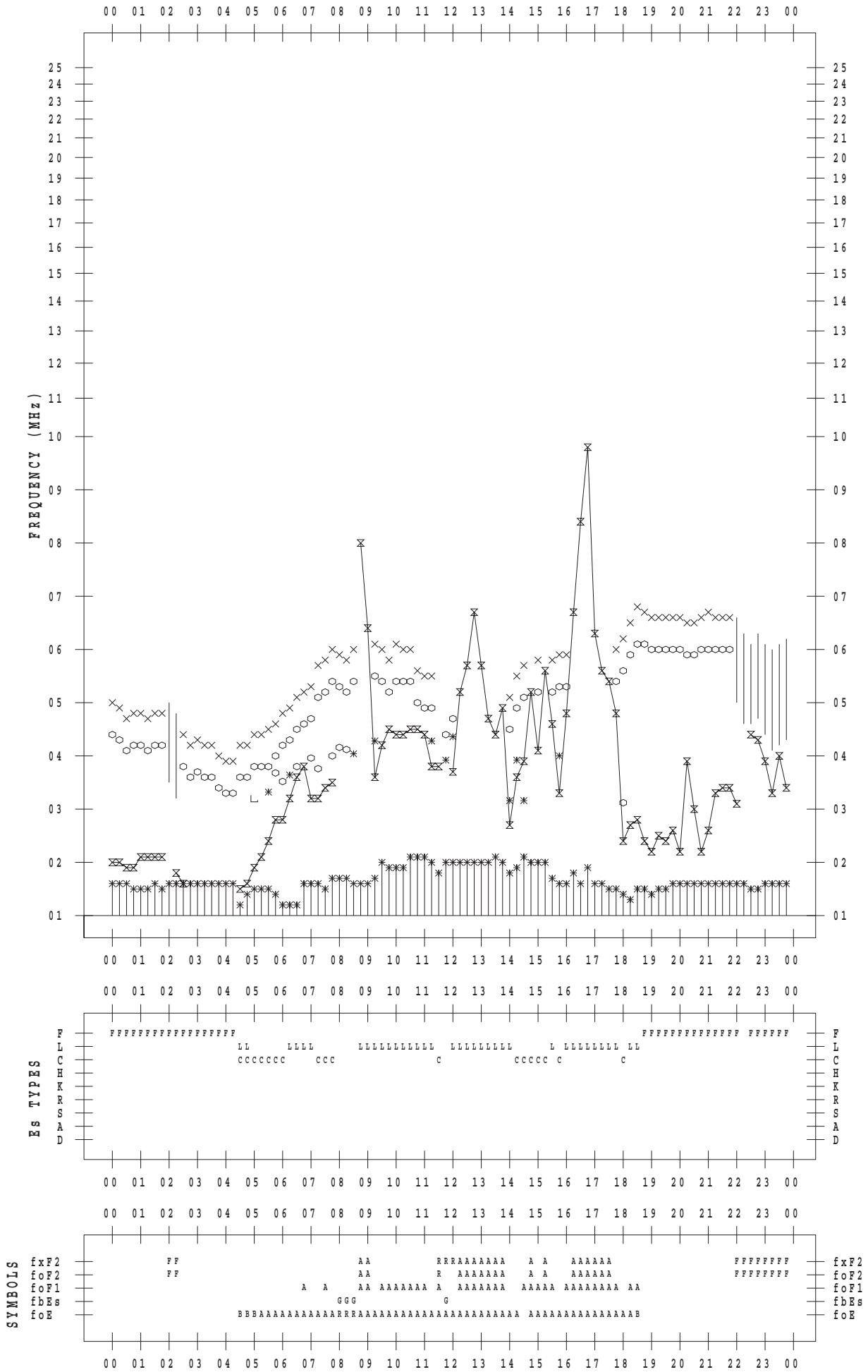
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/21

135 °E MEAN TIME



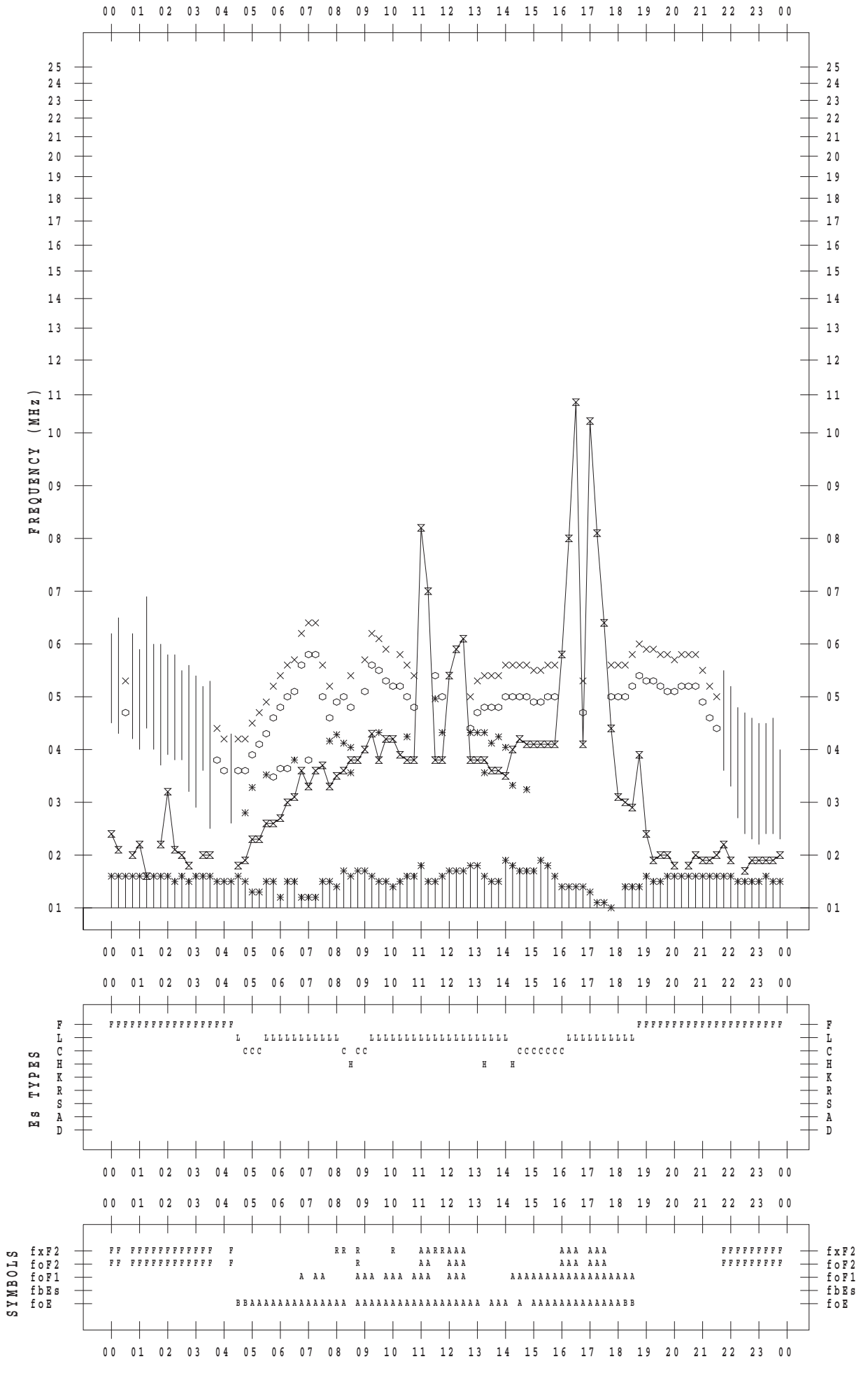
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/22

135 °E MEAN TIME



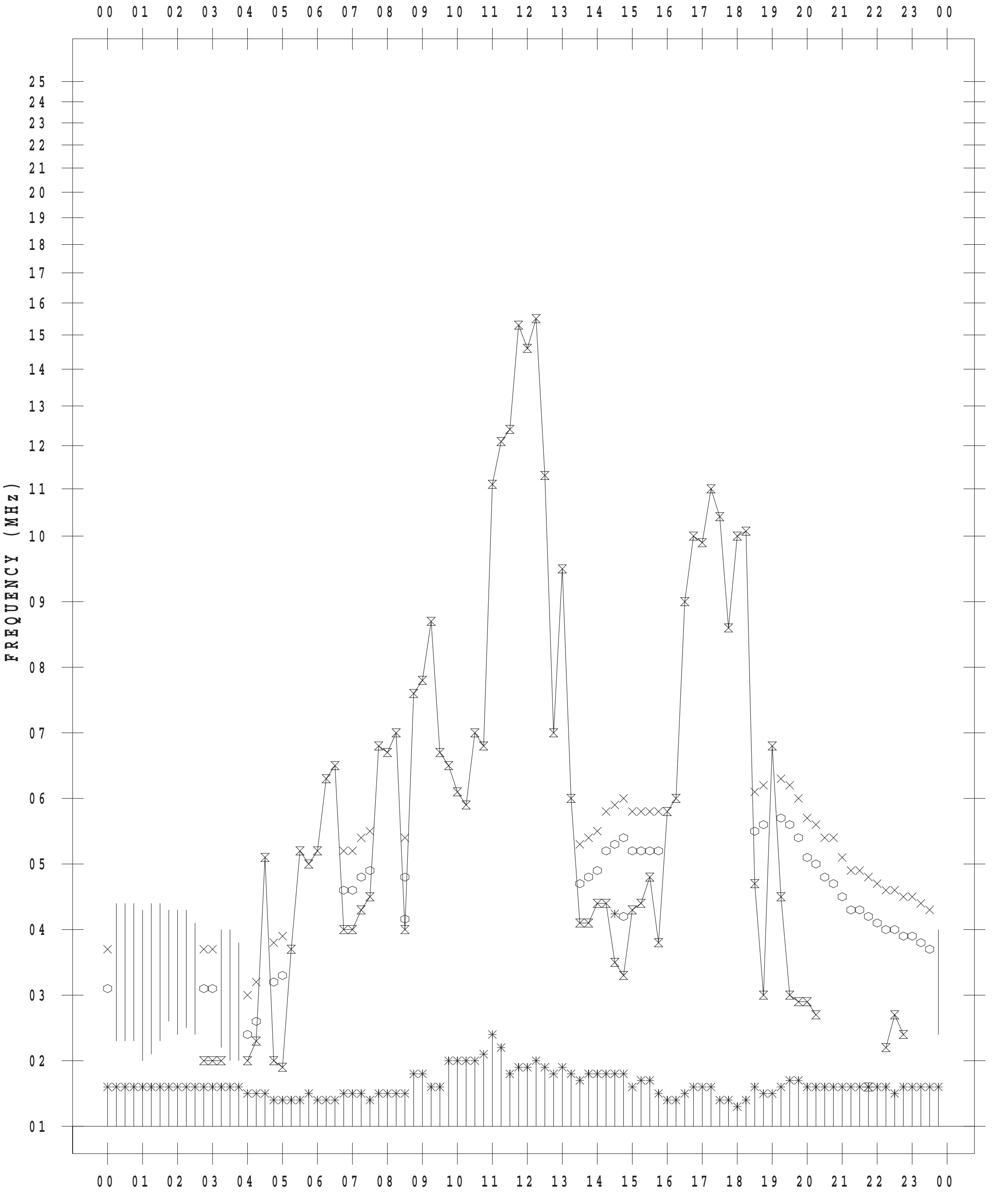
f-PLOT DATA

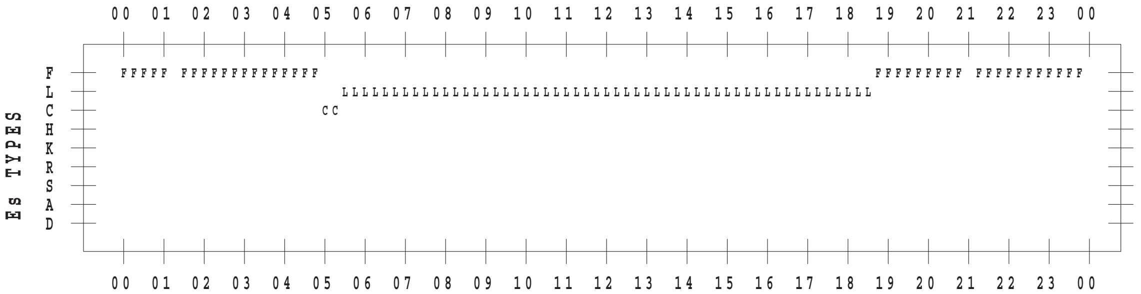
SCALER : I.NISHIMUTA

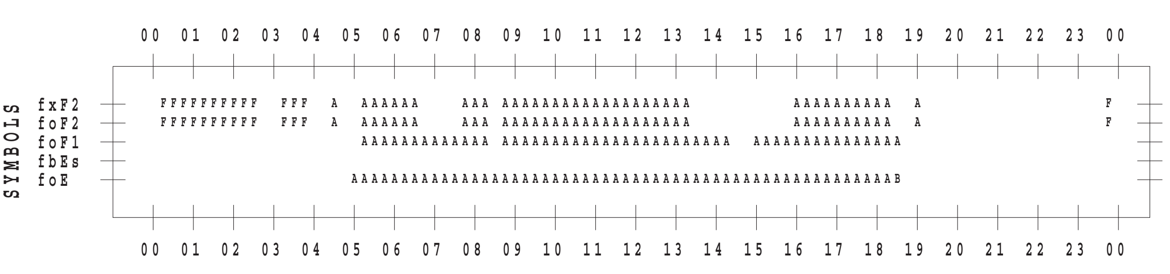
STATION : Kokubunji

DATE : 2019/ 6/23

135 °E MEAN TIME







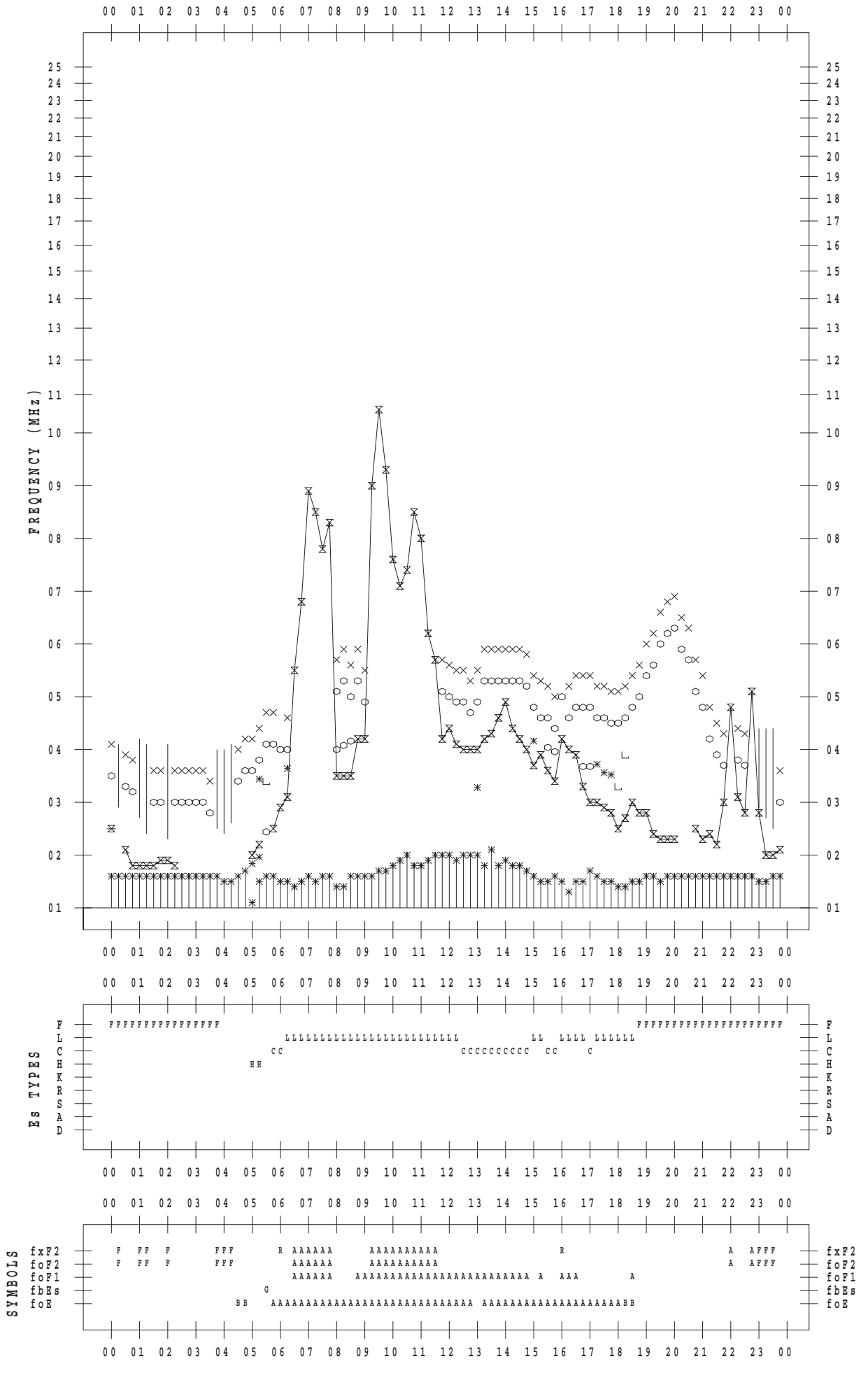
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/24

135 °E MEAN TIME



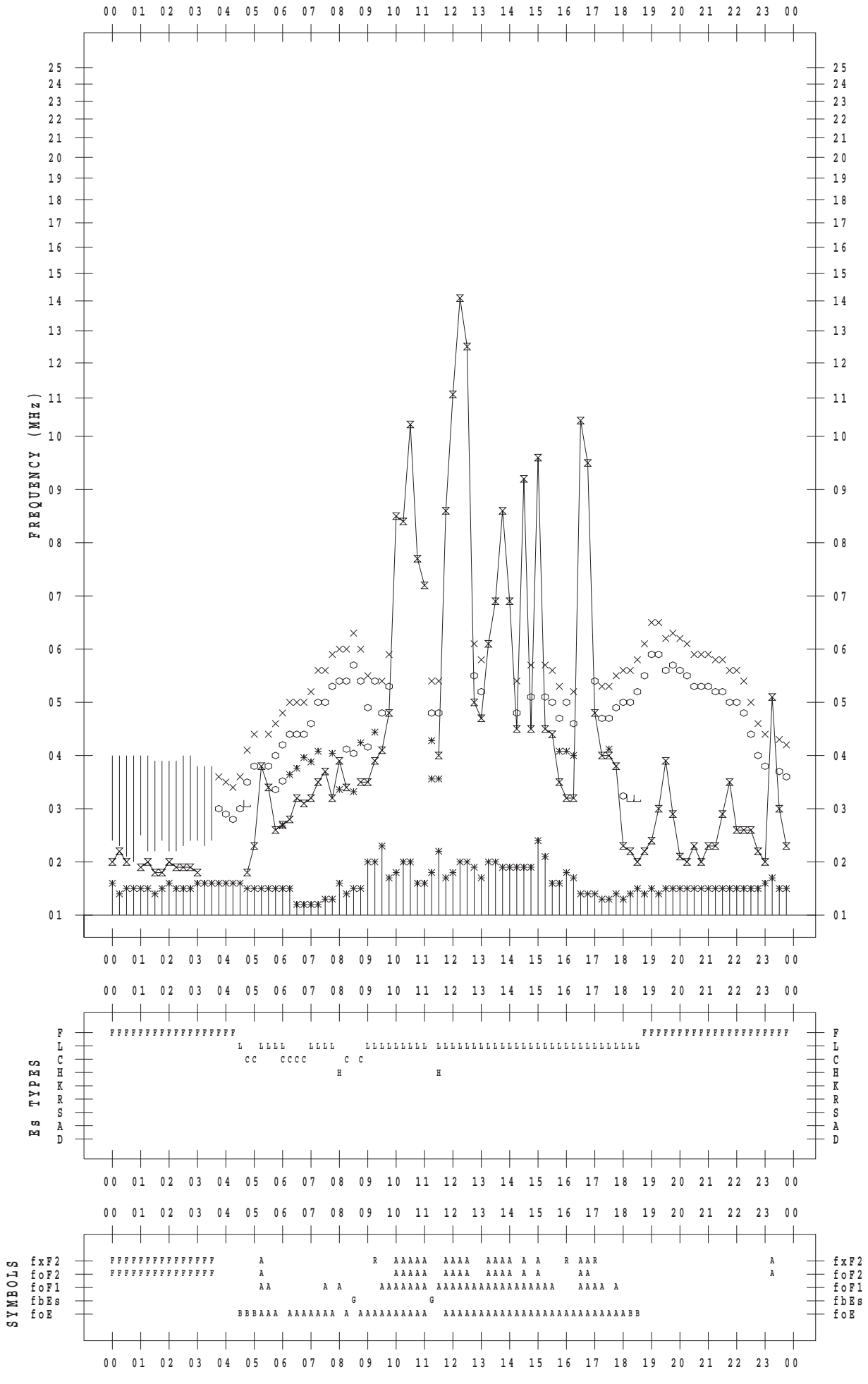
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/25

135 °E MEAN TIME



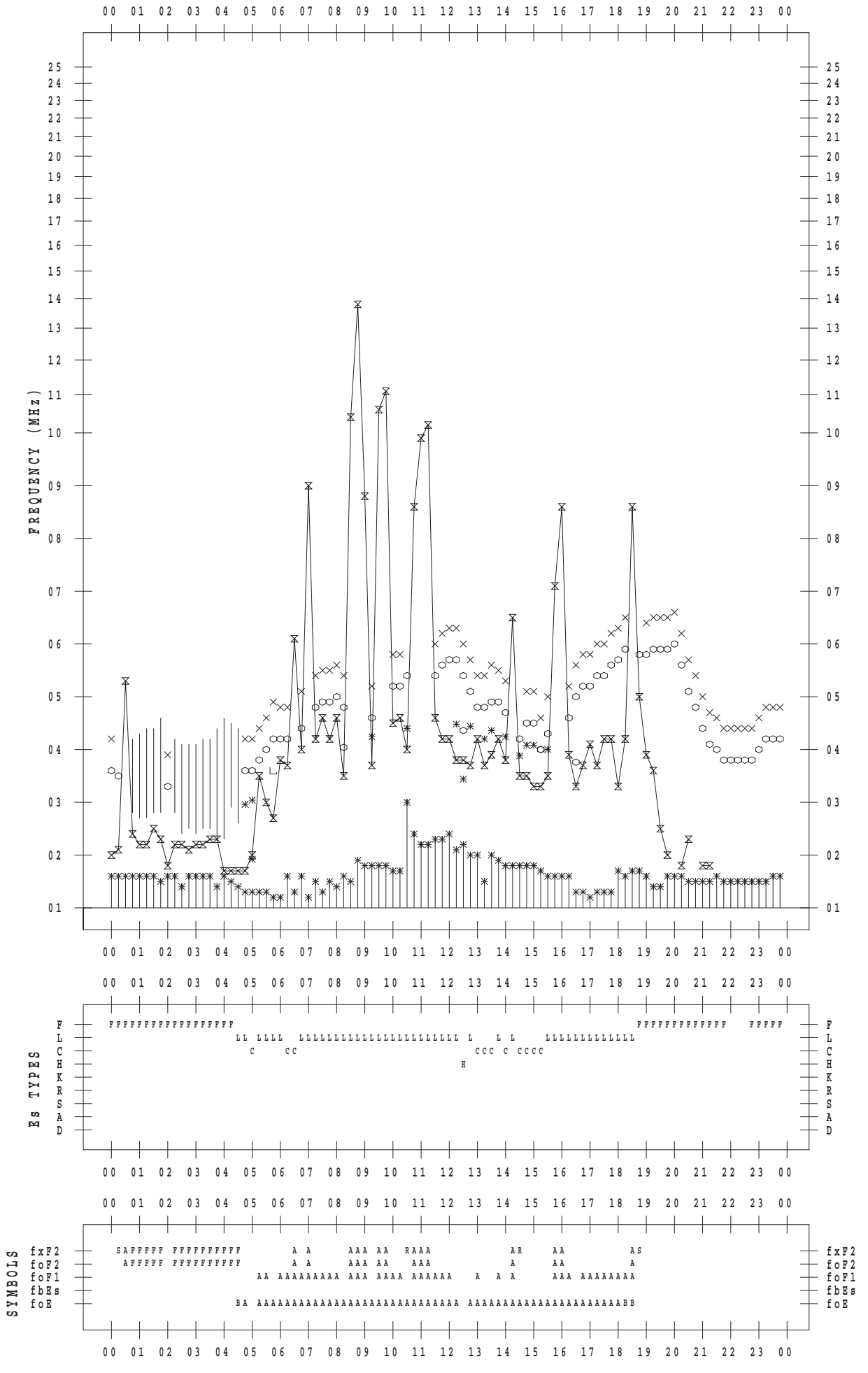
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/26

135 °E MEAN TIME



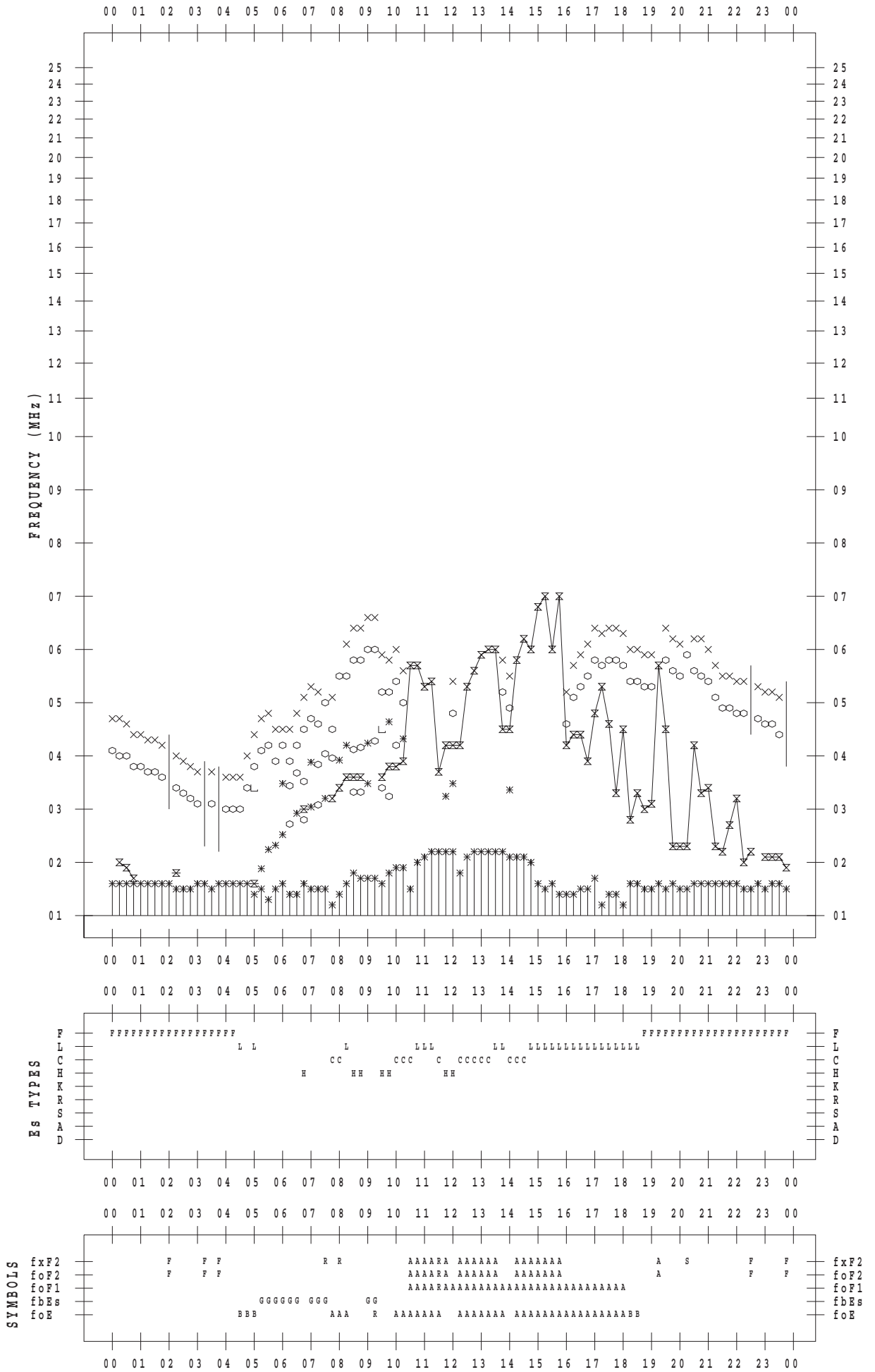
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/27

135 °E MEAN TIME



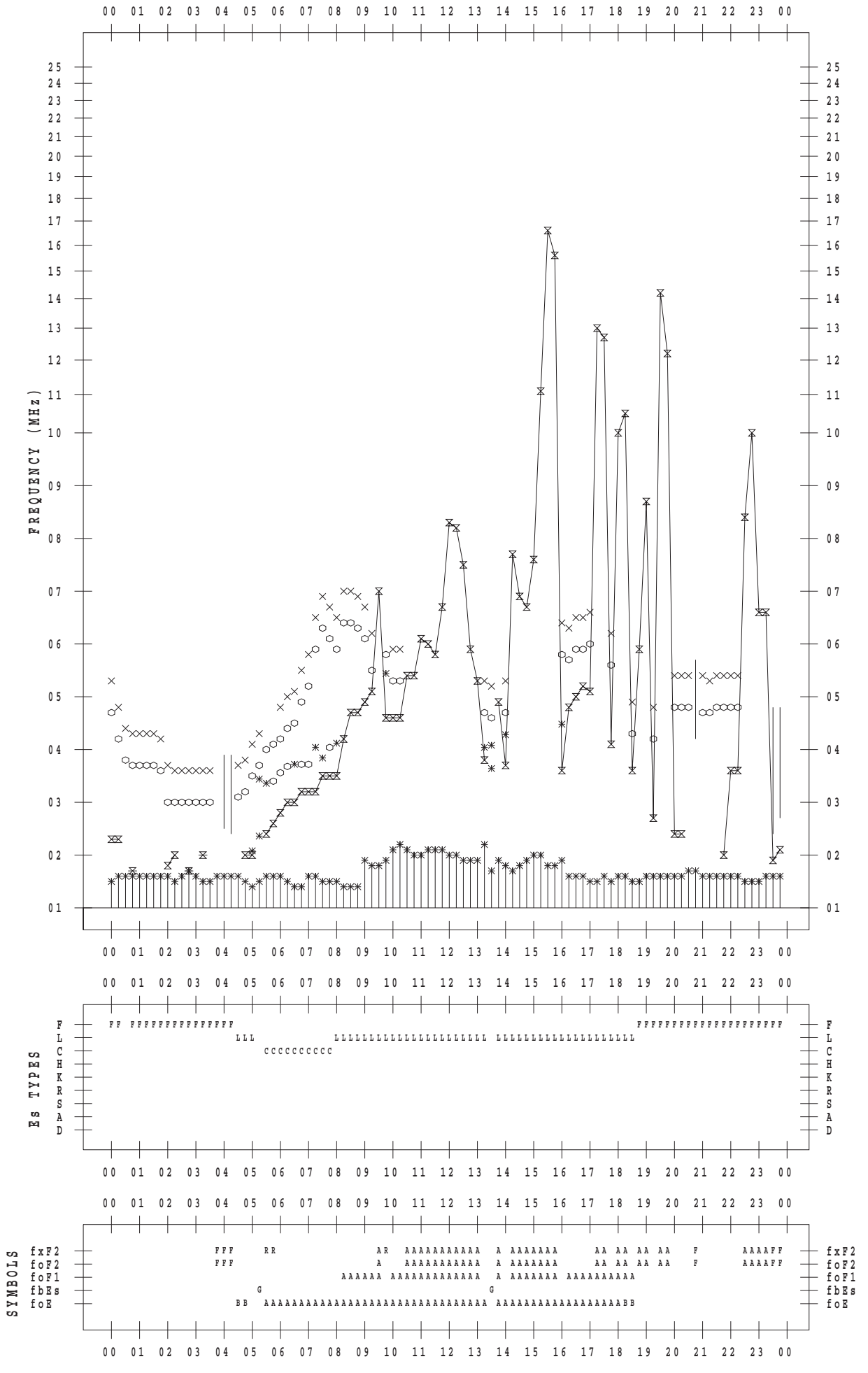
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/28

135 °E MEAN TIME



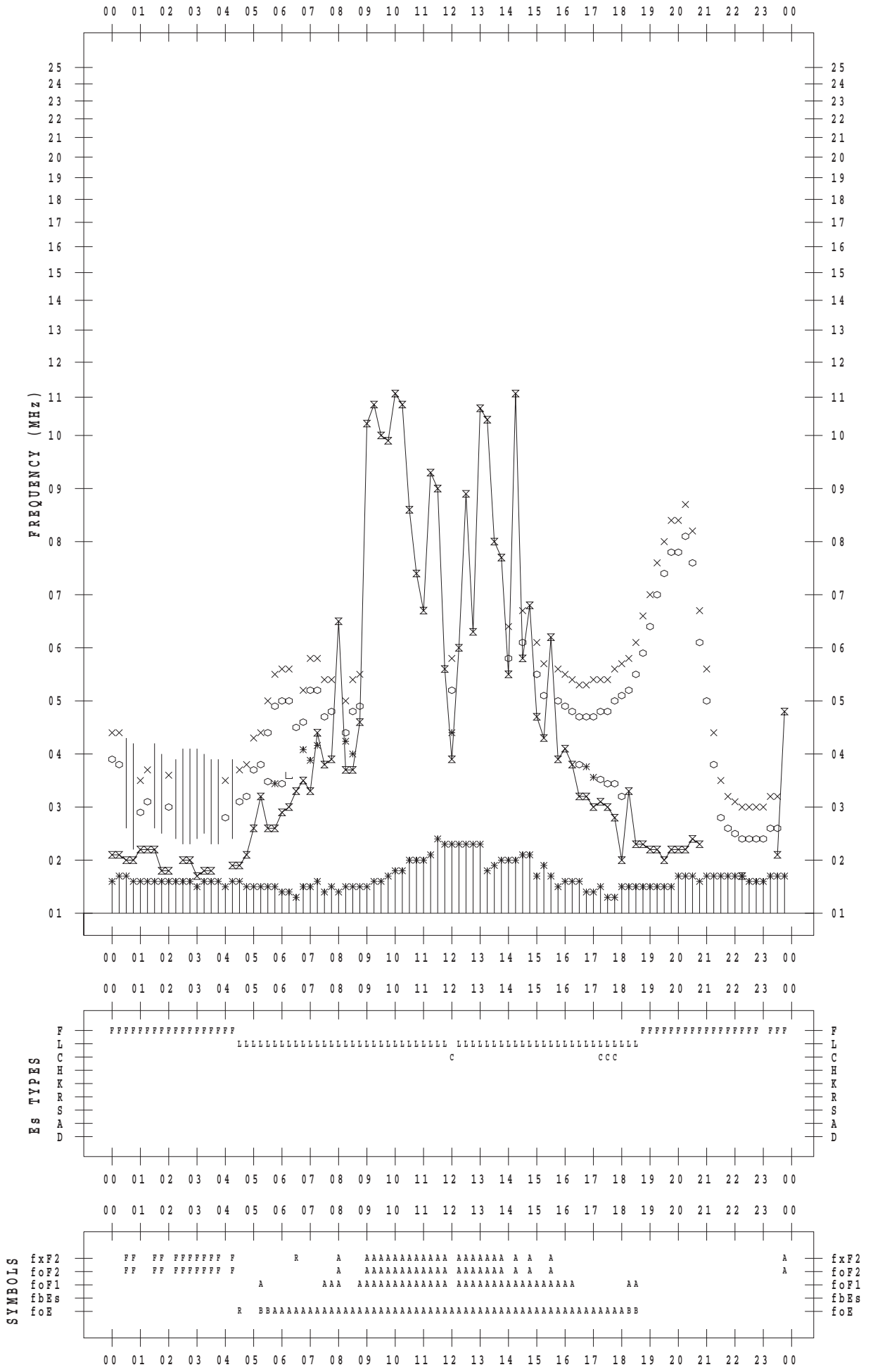
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/29

135 °E MEAN TIME

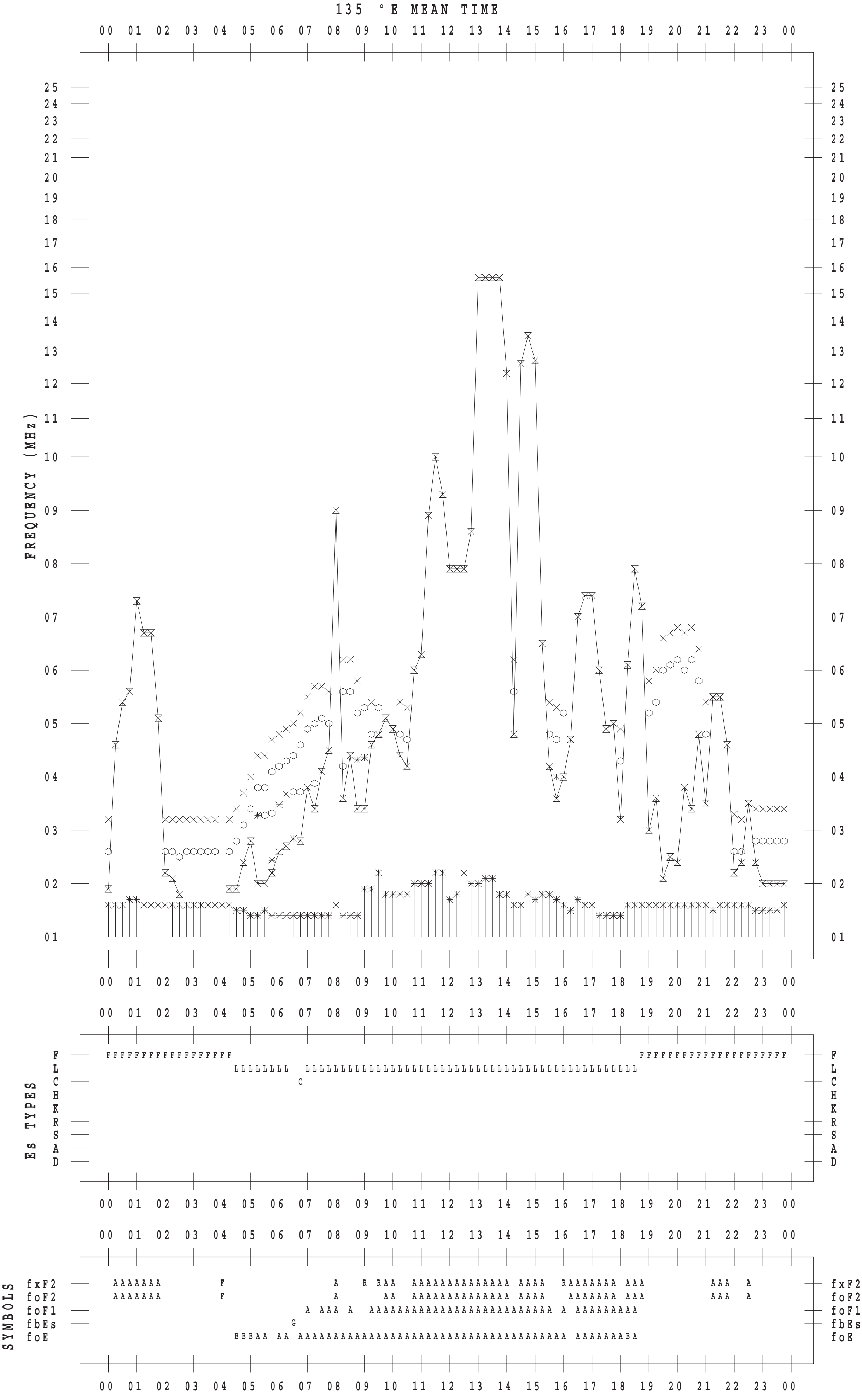


f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/ 6/30



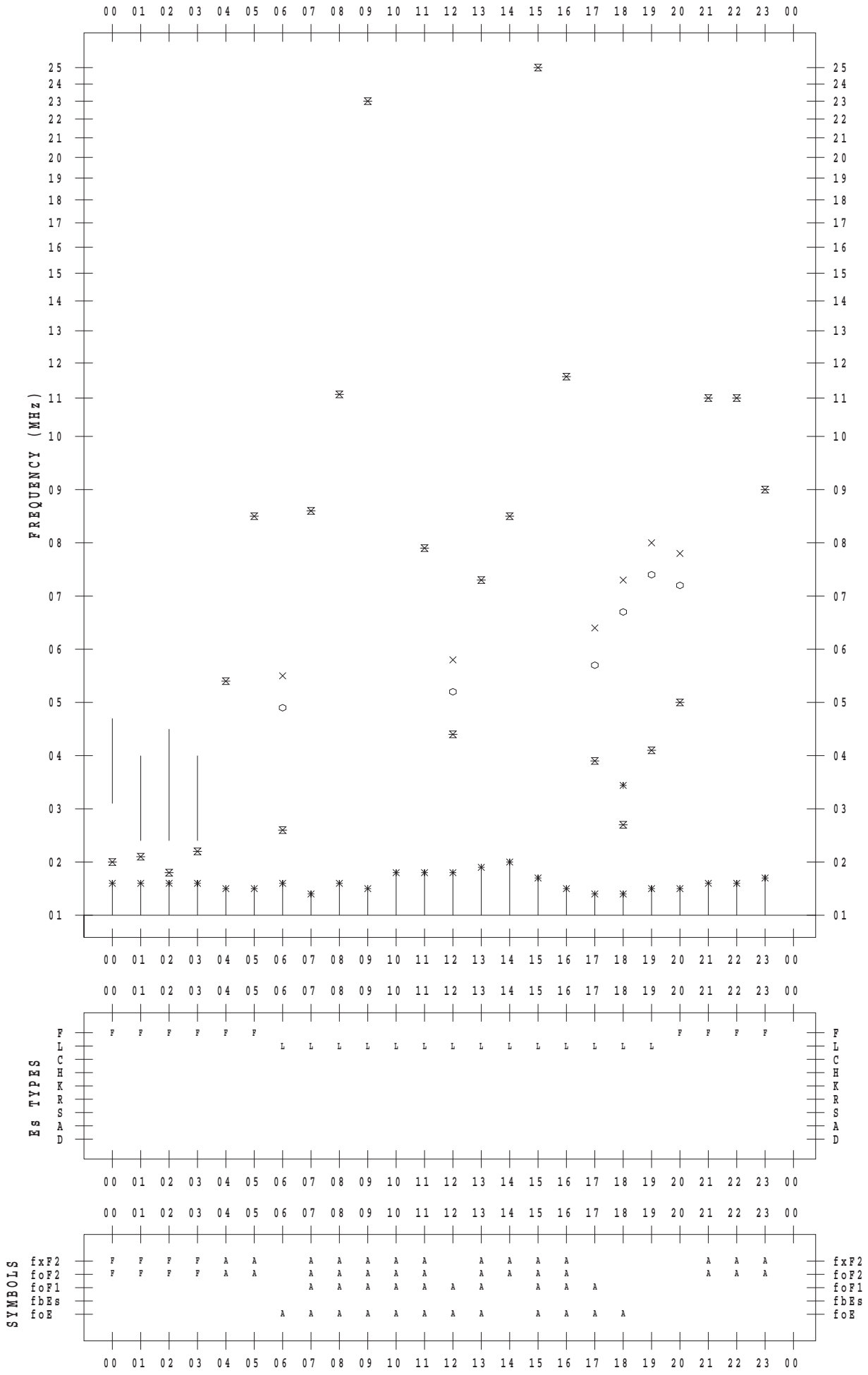
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 1

135 °E MEAN TIME



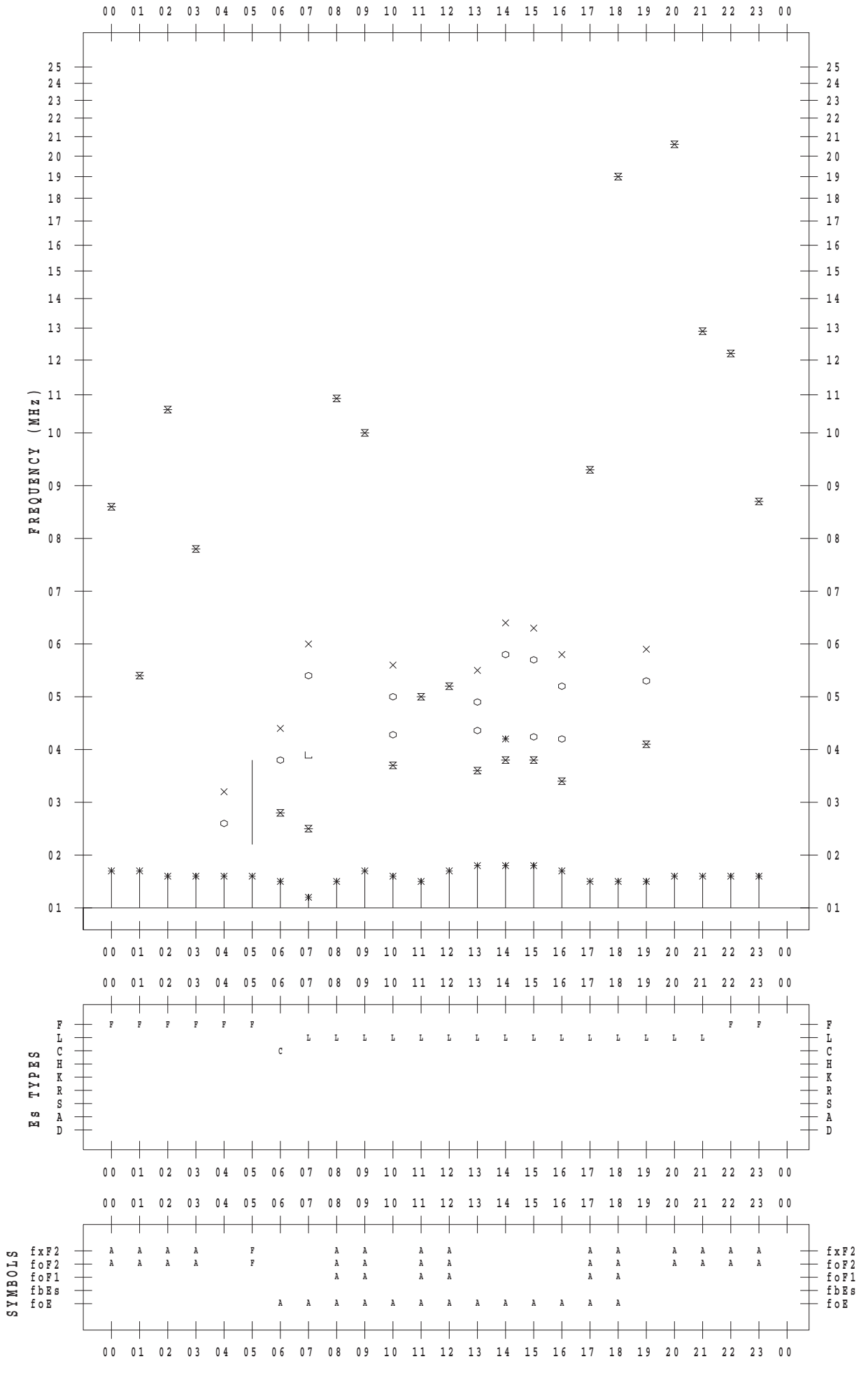
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 2

135 °E MEAN TIME



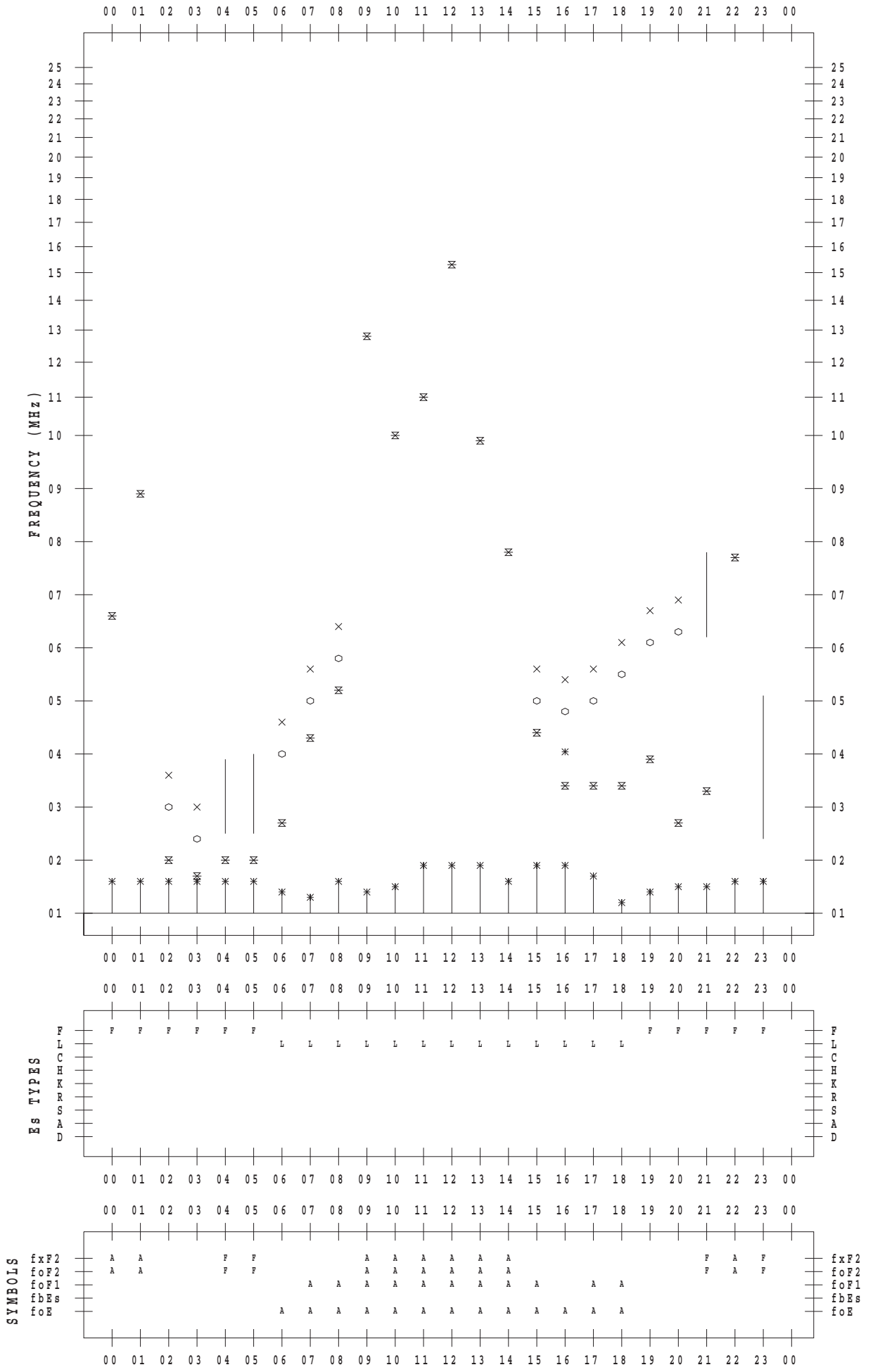
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 3

135 °E MEAN TIME



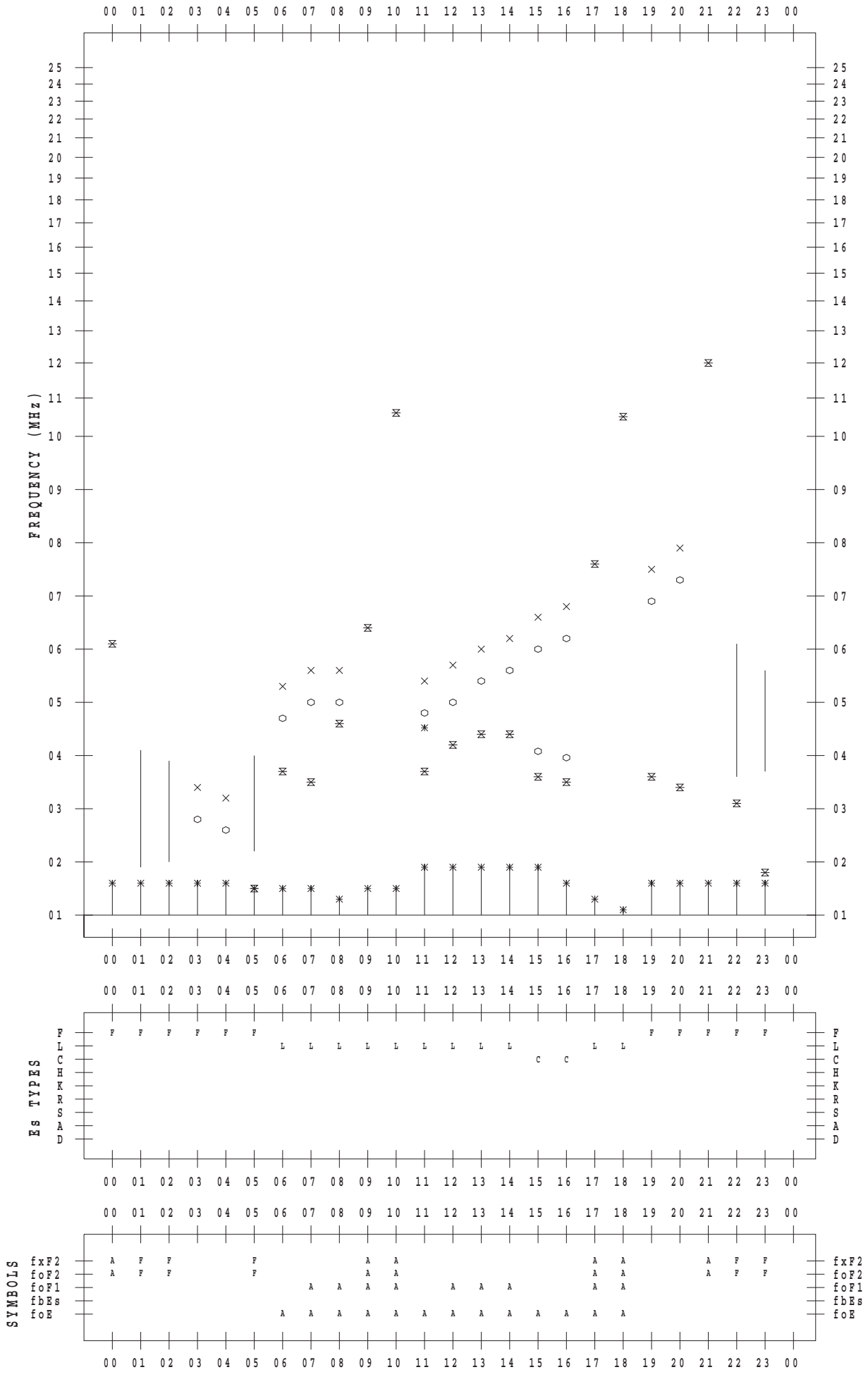
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 4

135 °E MEAN TIME



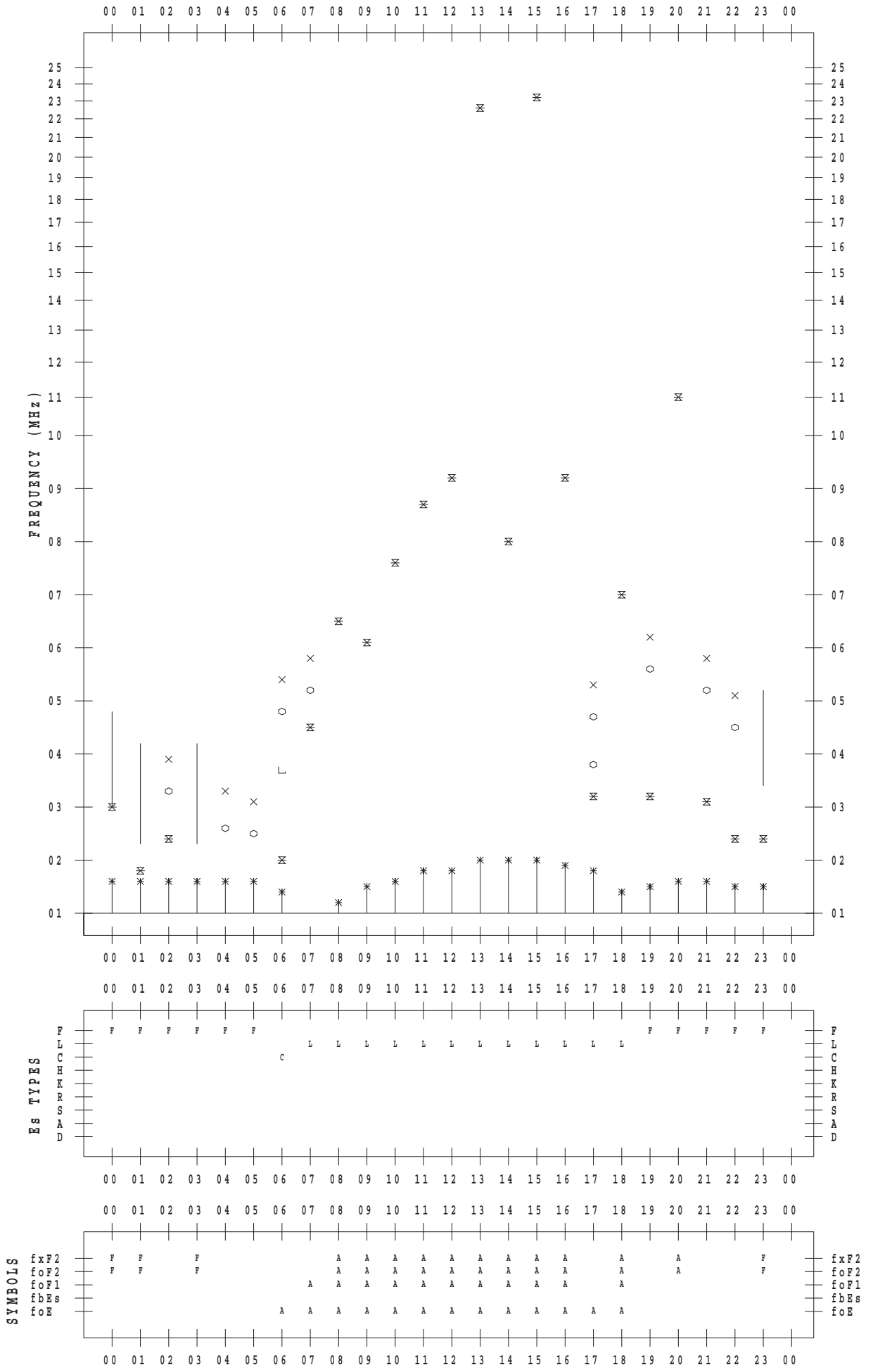
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 5

135 °E MEAN TIME



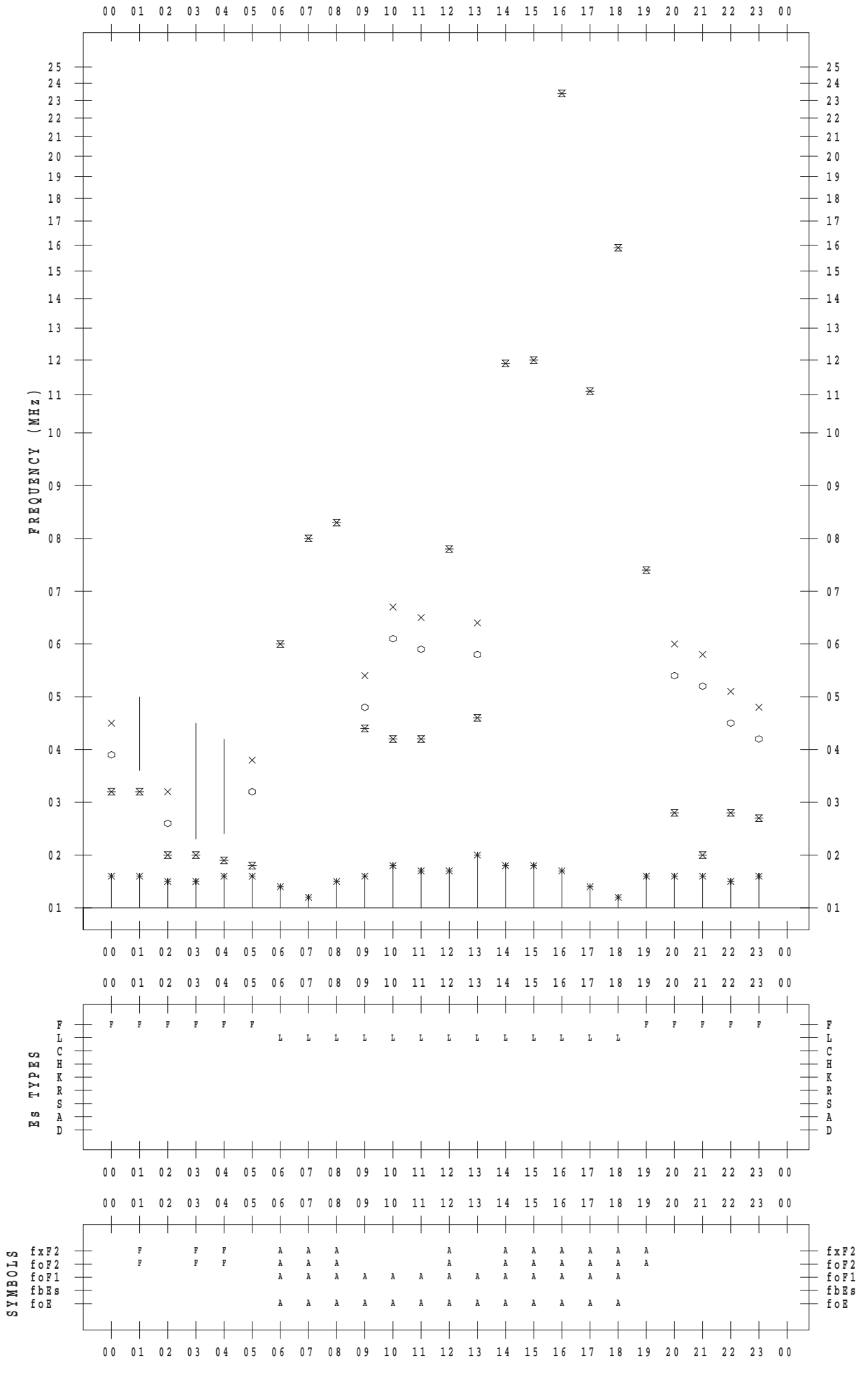
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 6

135 °E MEAN TIME



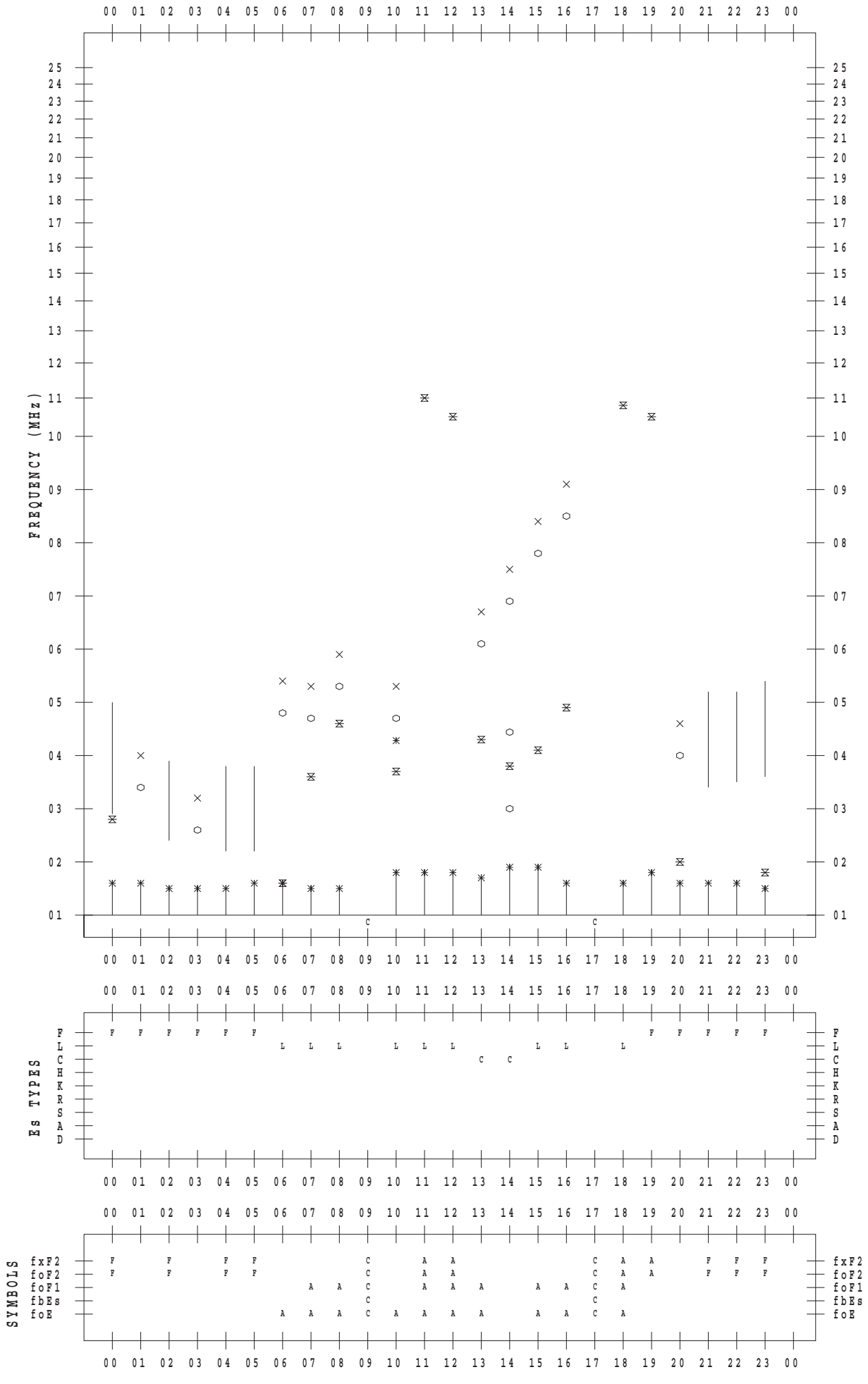
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 7

135 °E MEAN TIME



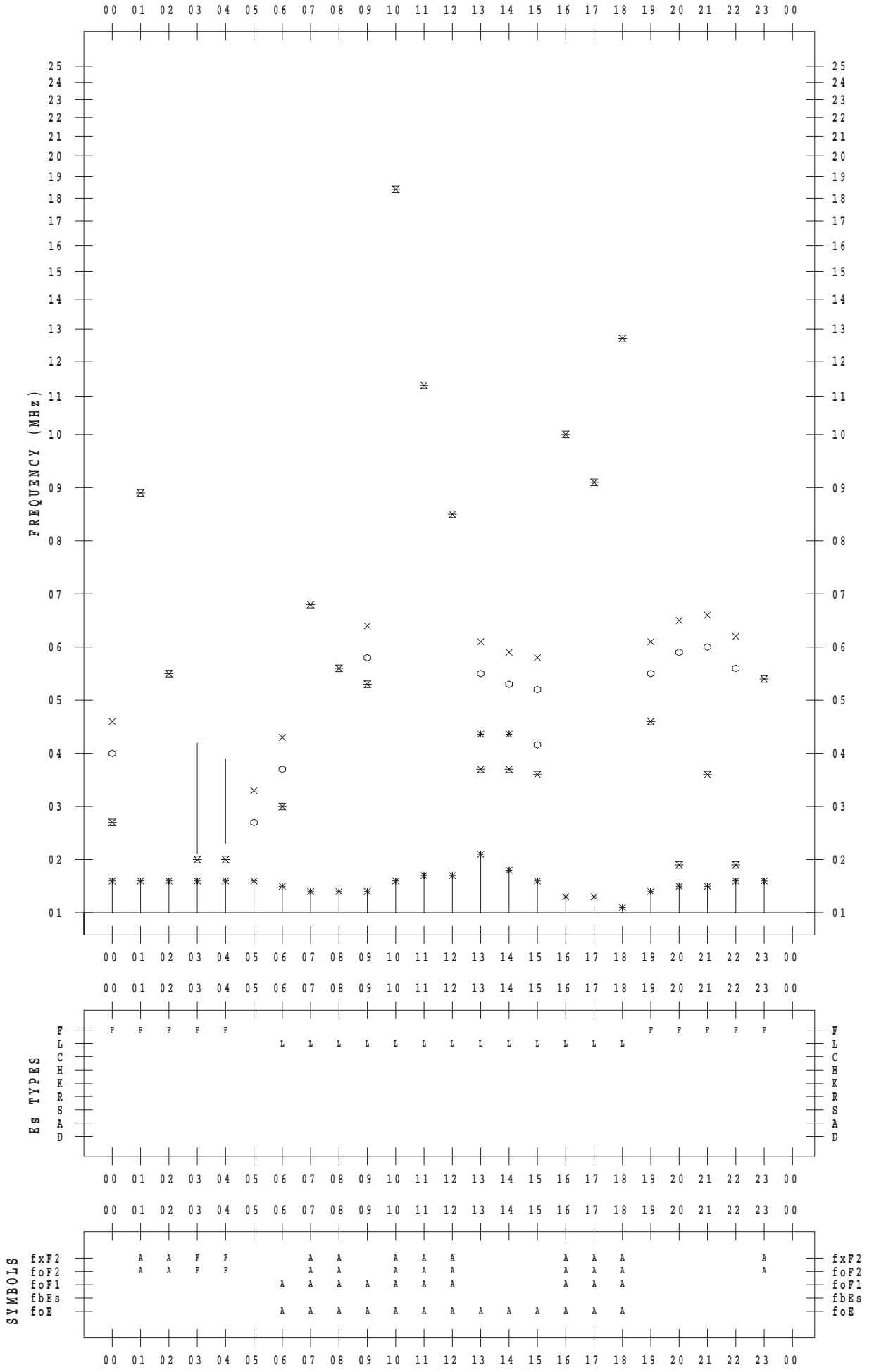
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 8

135 °E MEAN TIME



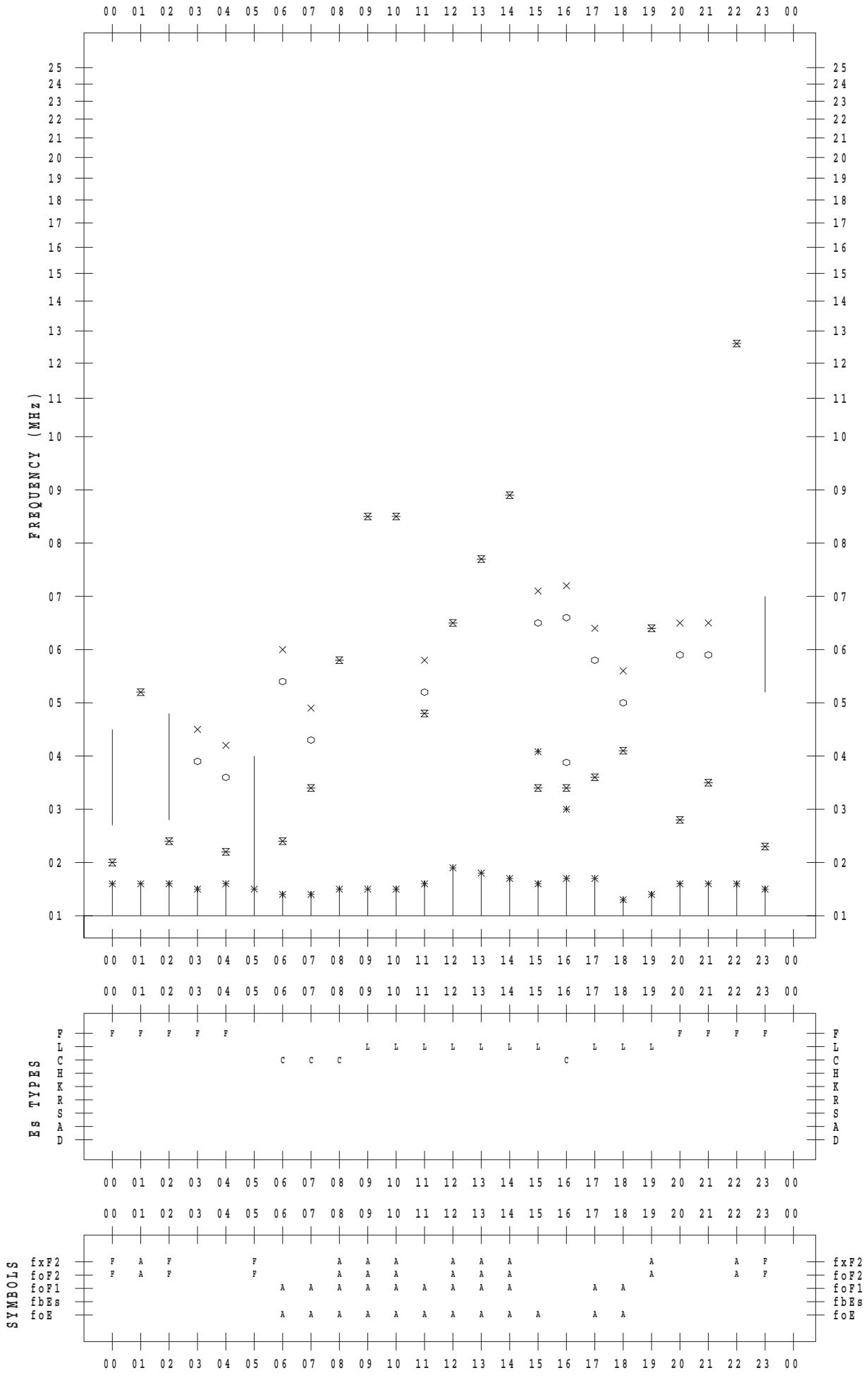
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/ 9

135 °E MEAN TIME



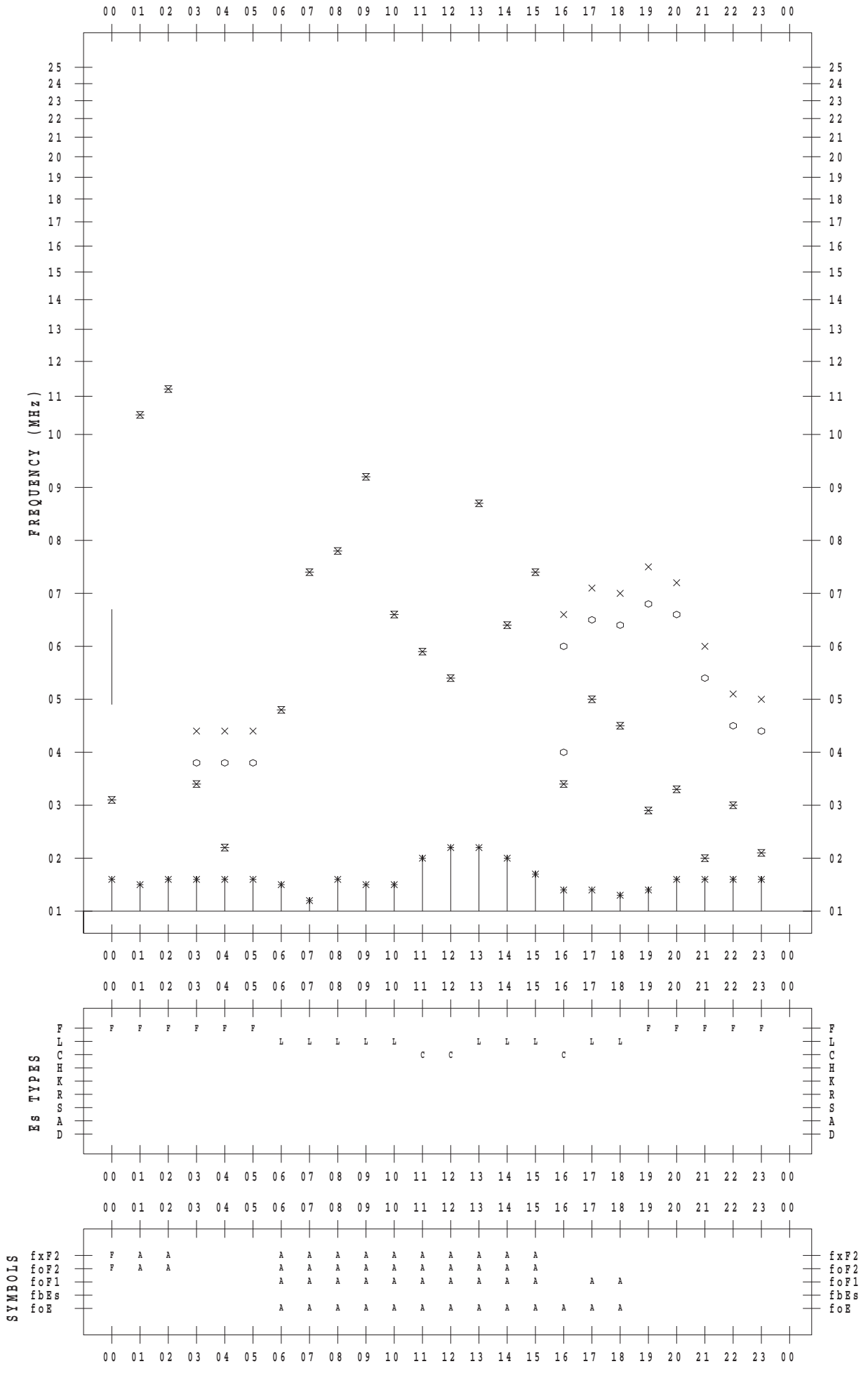
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/10

135 °E MEAN TIME



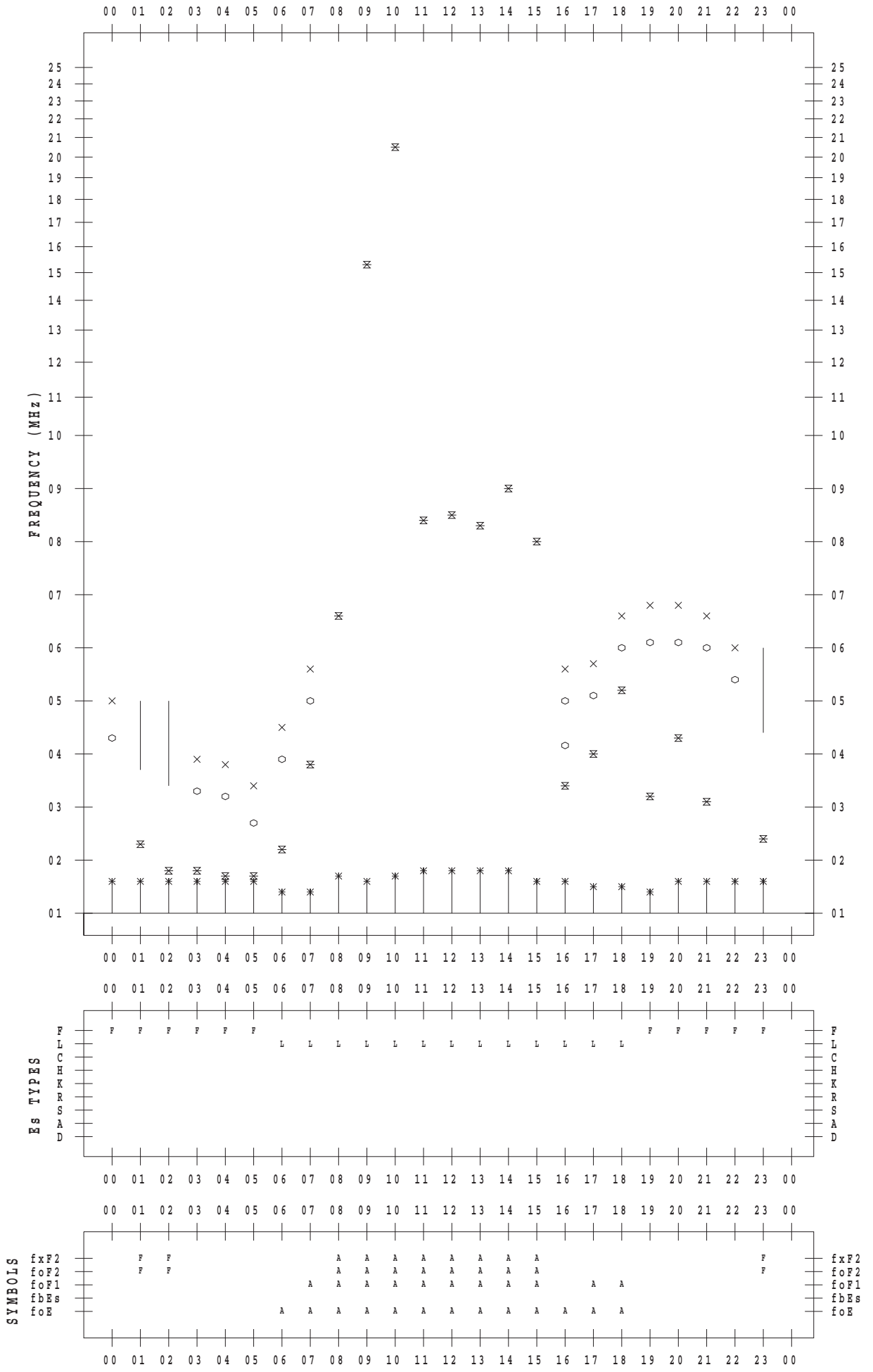
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/11

135 °E MEAN TIME



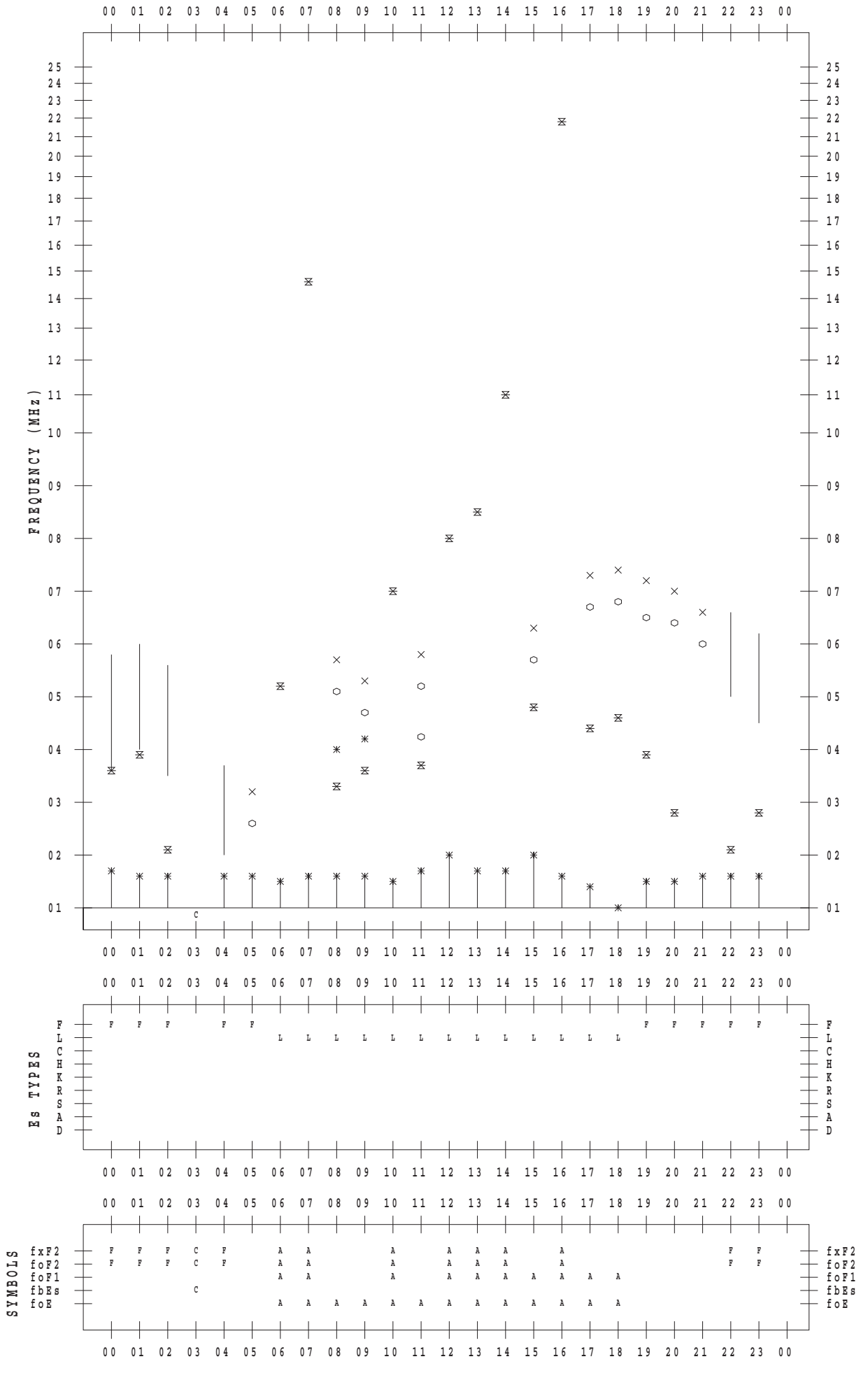
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/12

135 °E MEAN TIME



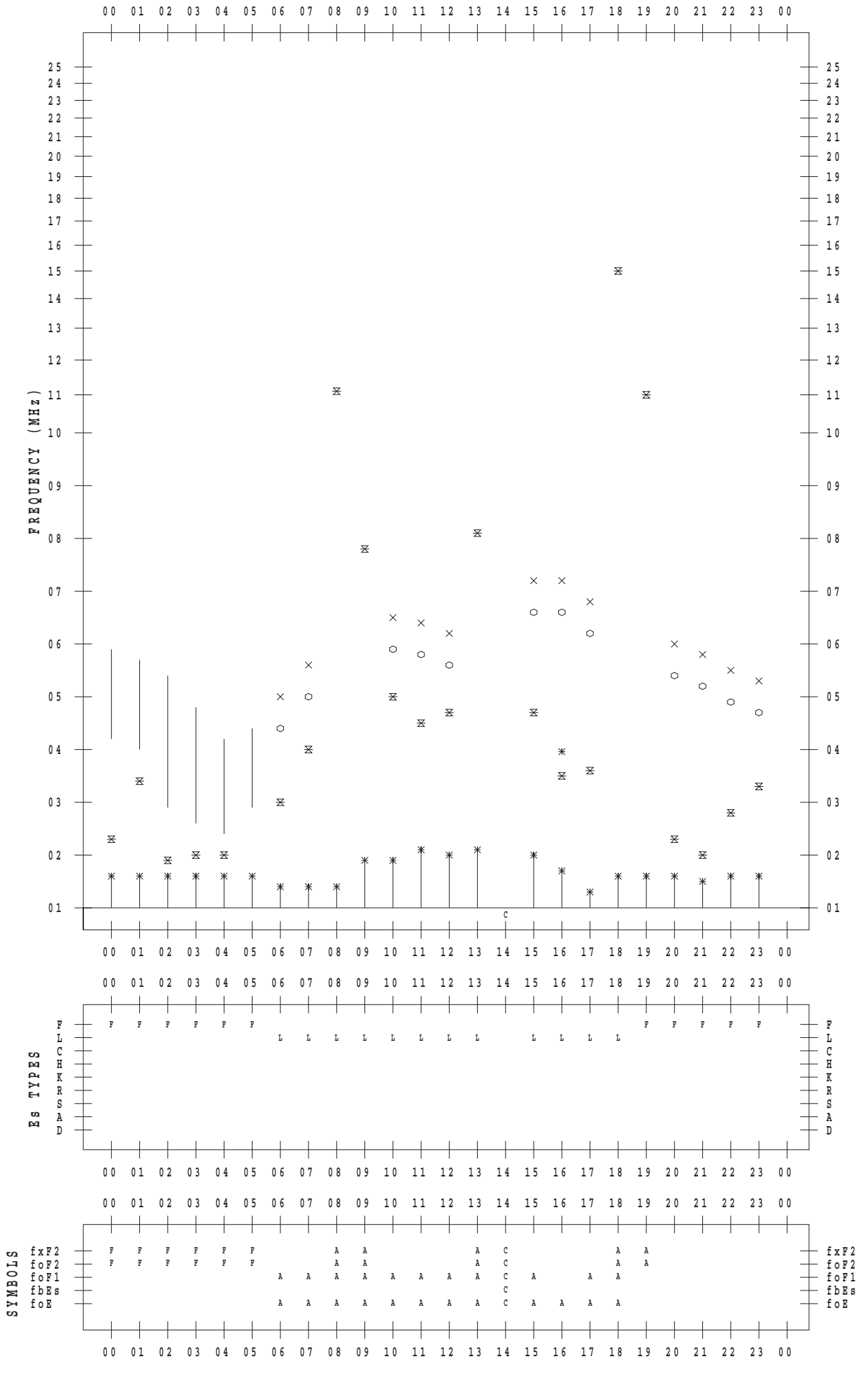
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/13

135 °E MEAN TIME



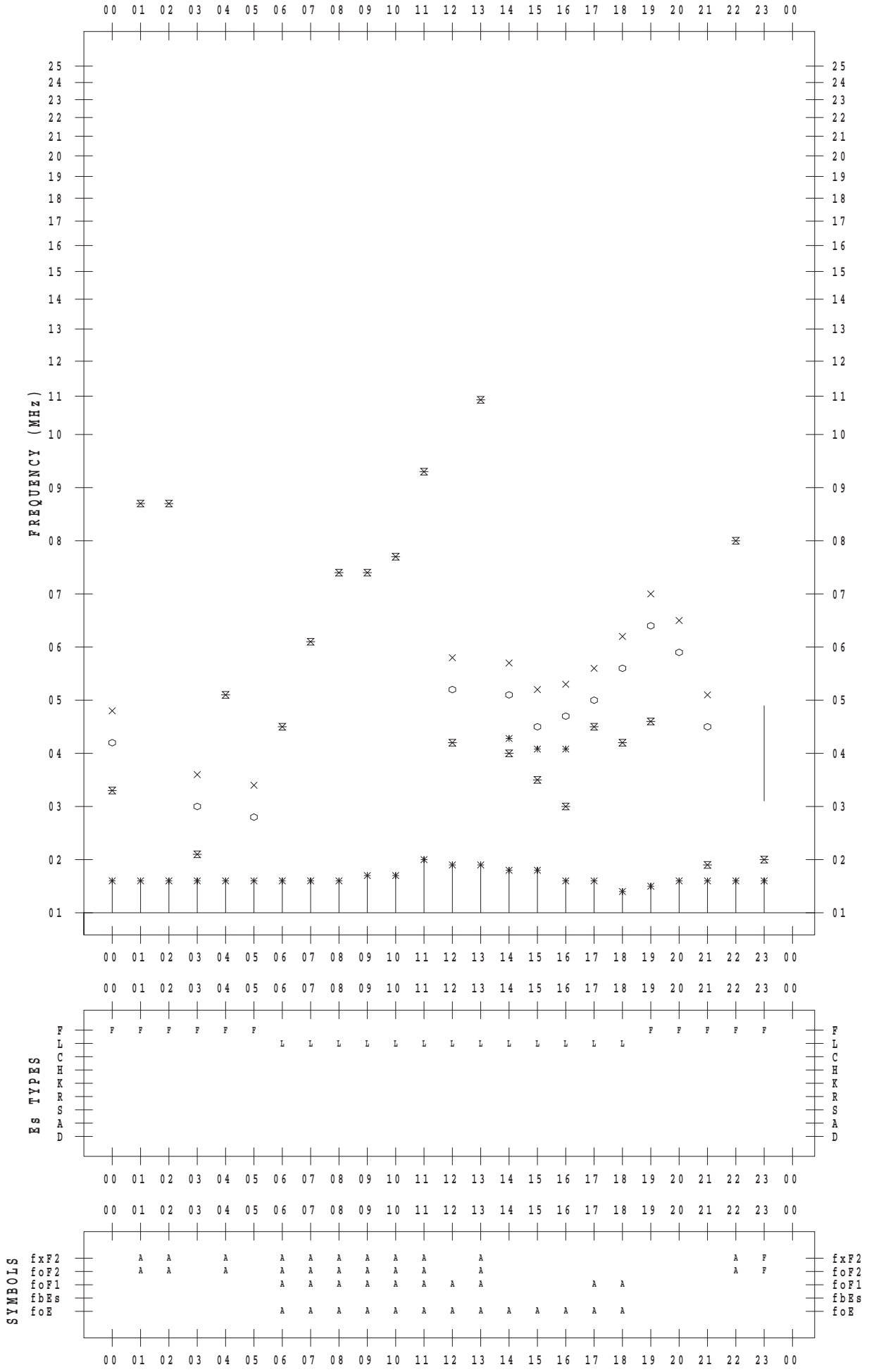
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/14

135 °E MEAN TIME



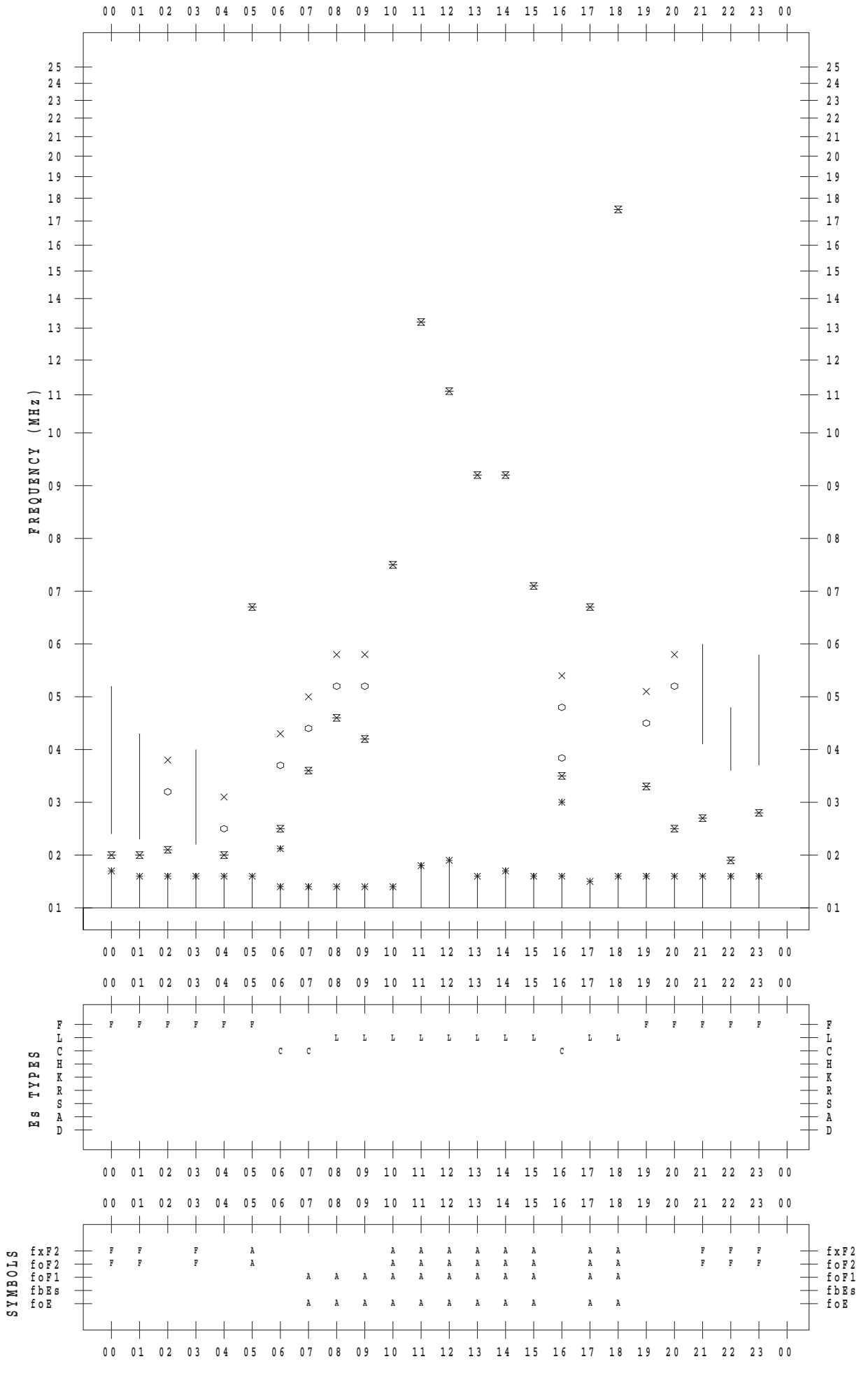
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/15

135 °E MEAN TIME



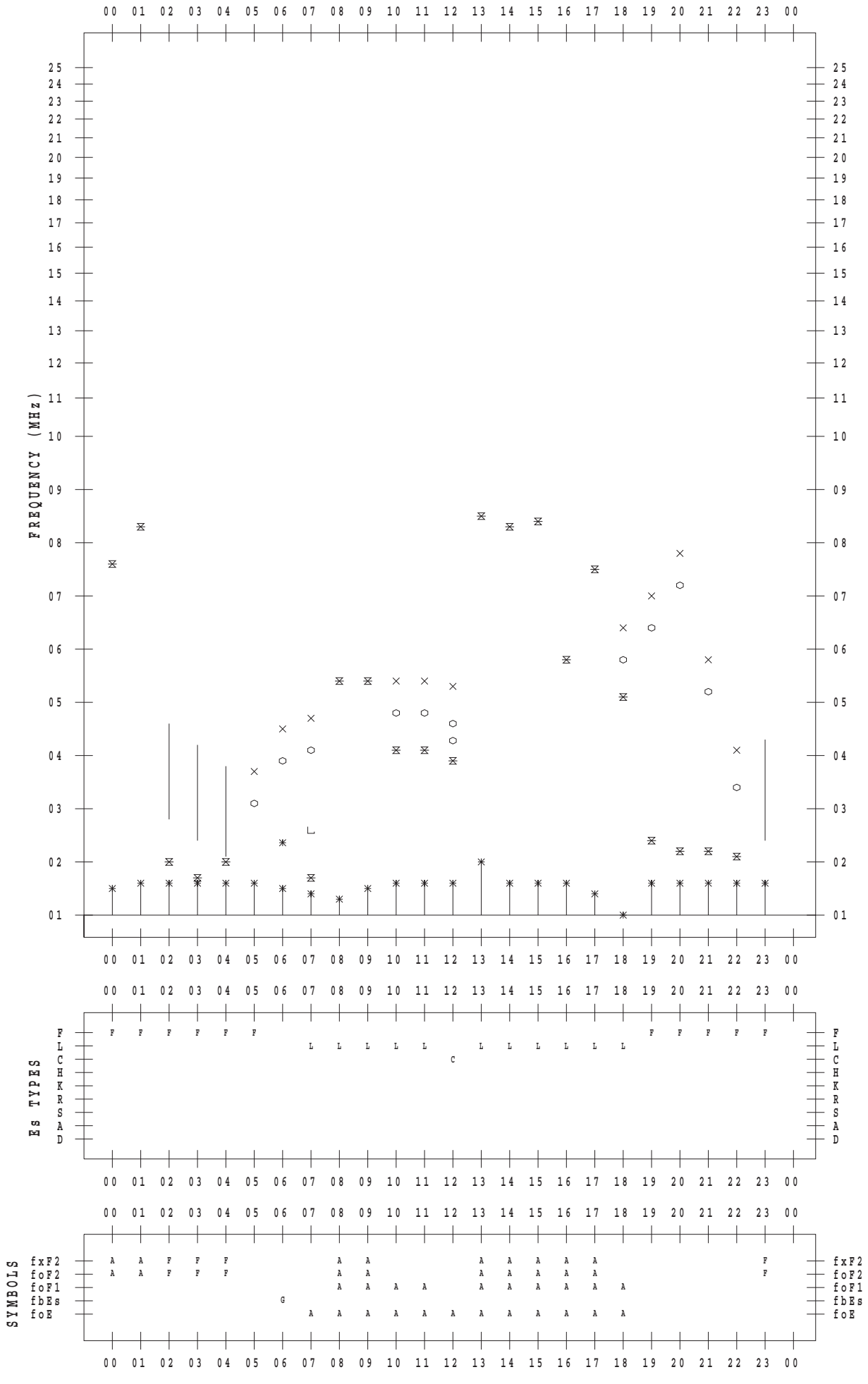
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/16

135 °E MEAN TIME



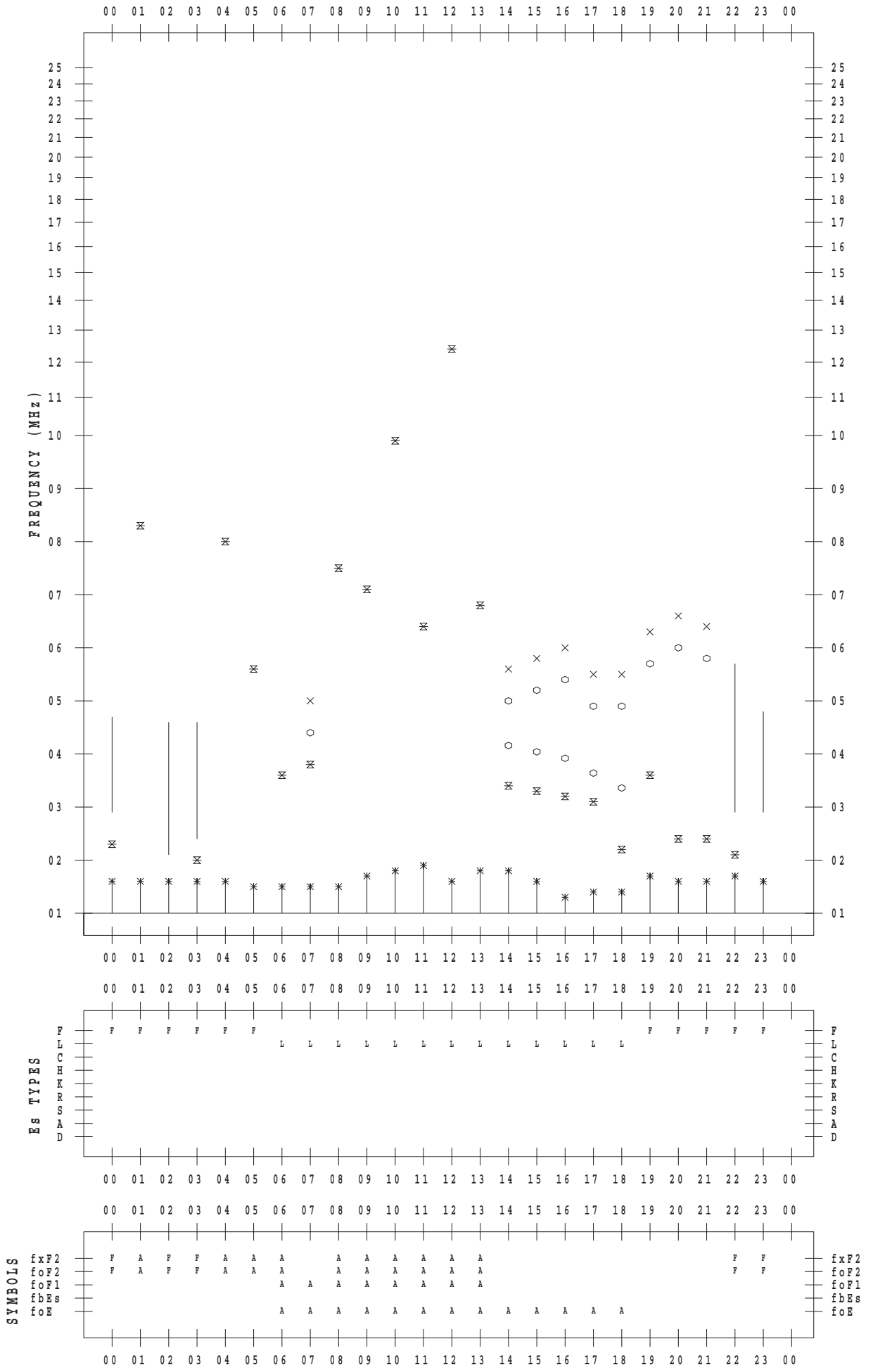
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/17

135 °E MEAN TIME



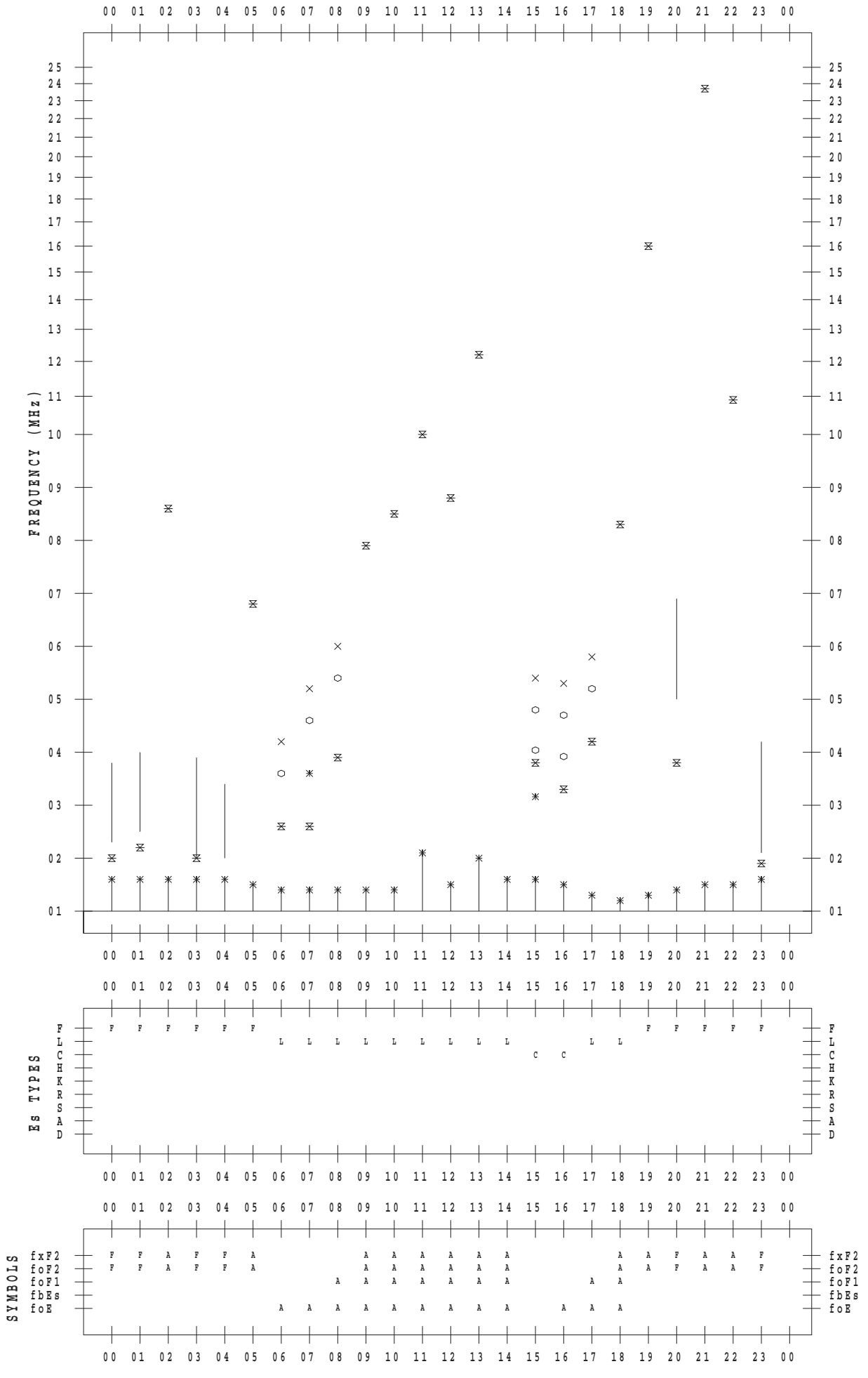
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/18

135 °E MEAN TIME



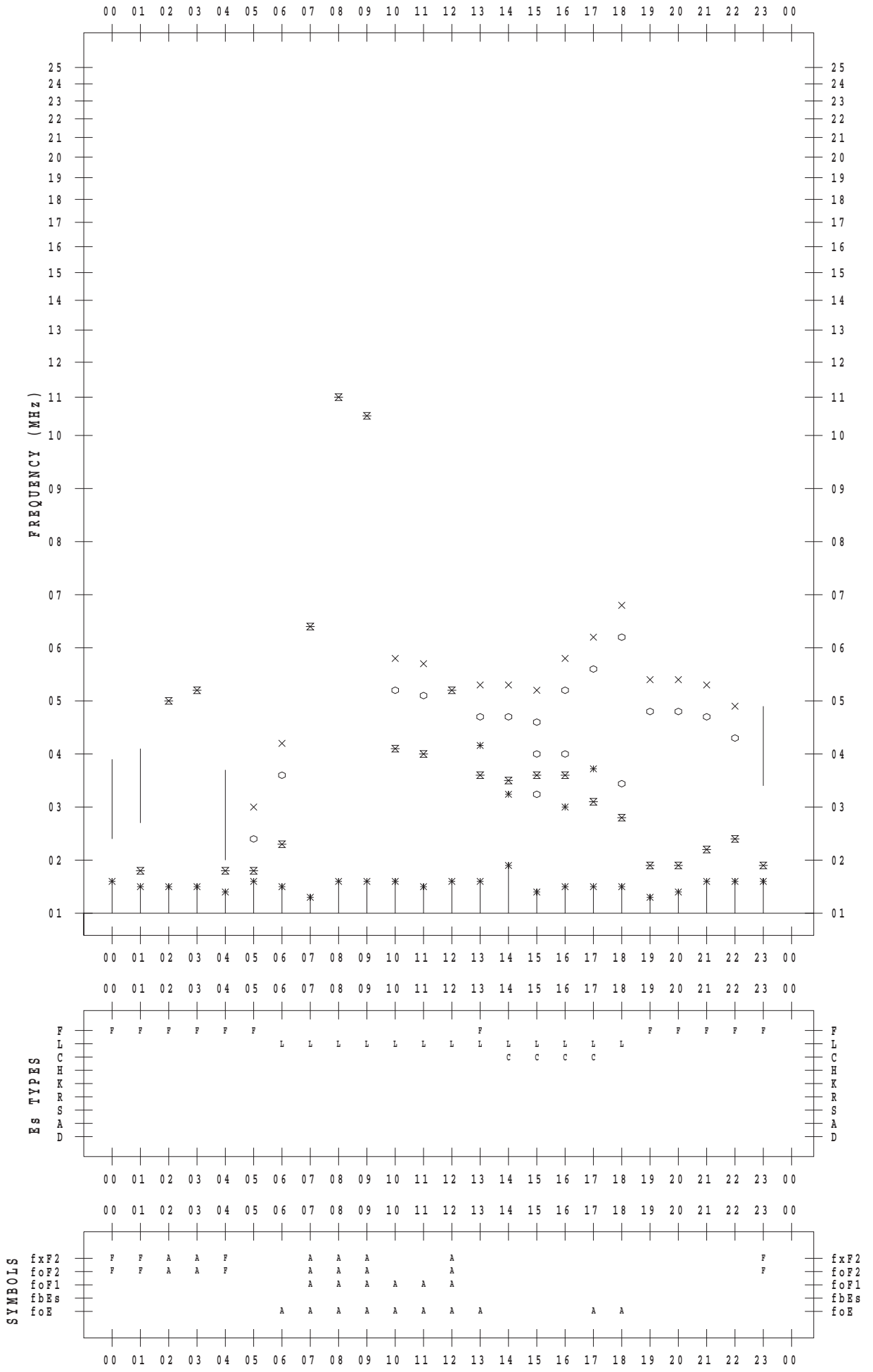
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/19

135 °E MEAN TIME



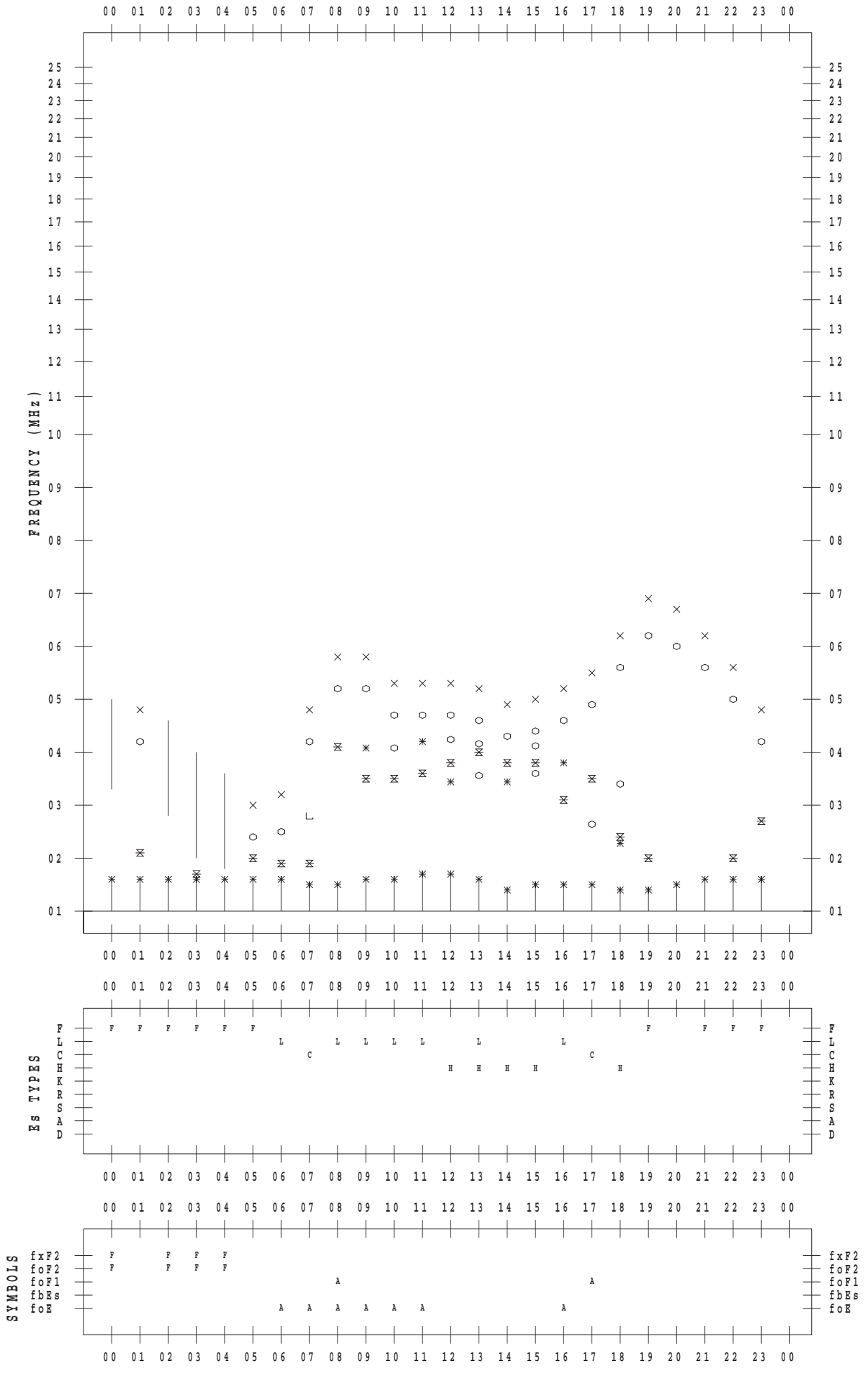
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/20

135 °E MEAN TIME



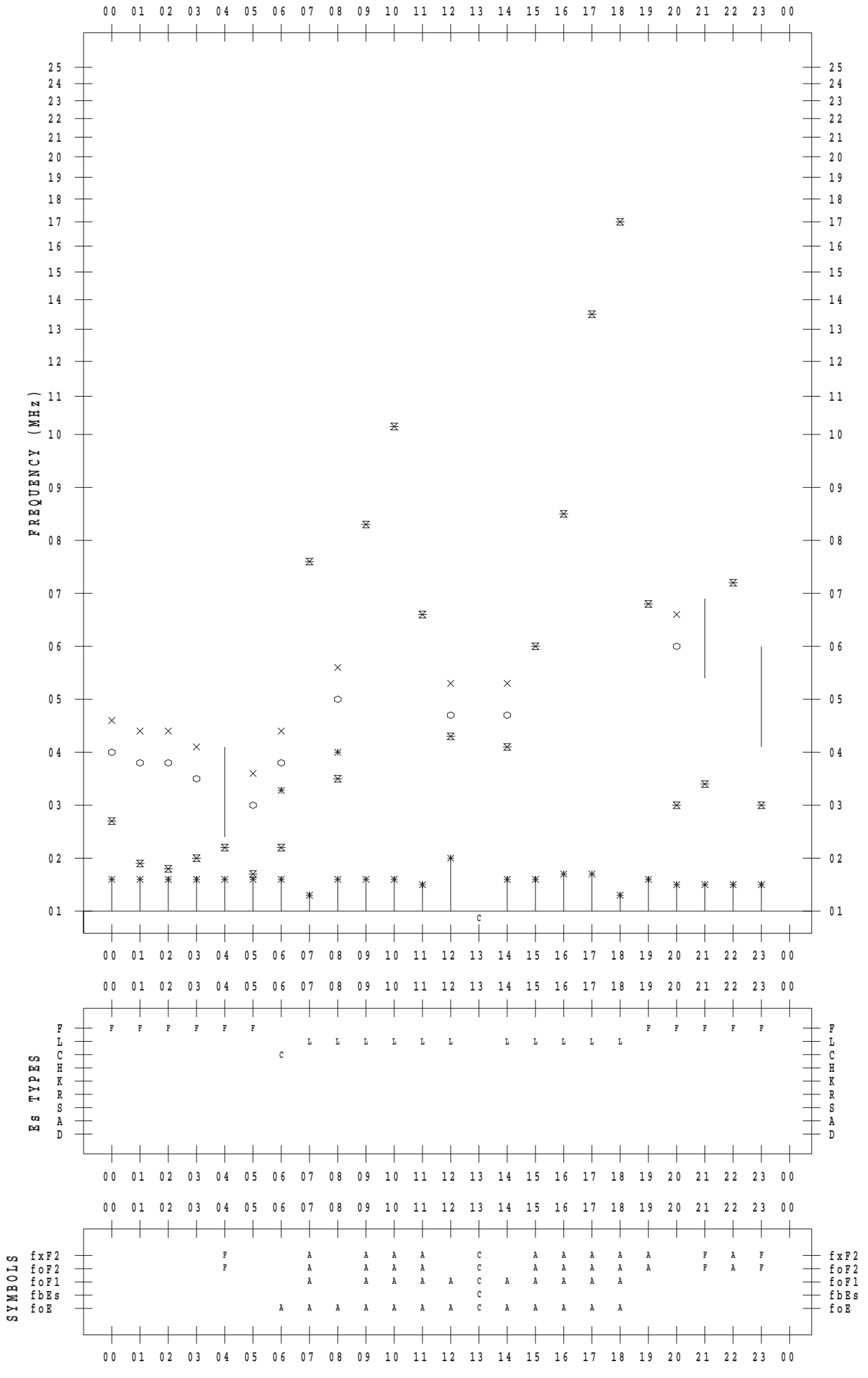
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/21

135 °E MEAN TIME



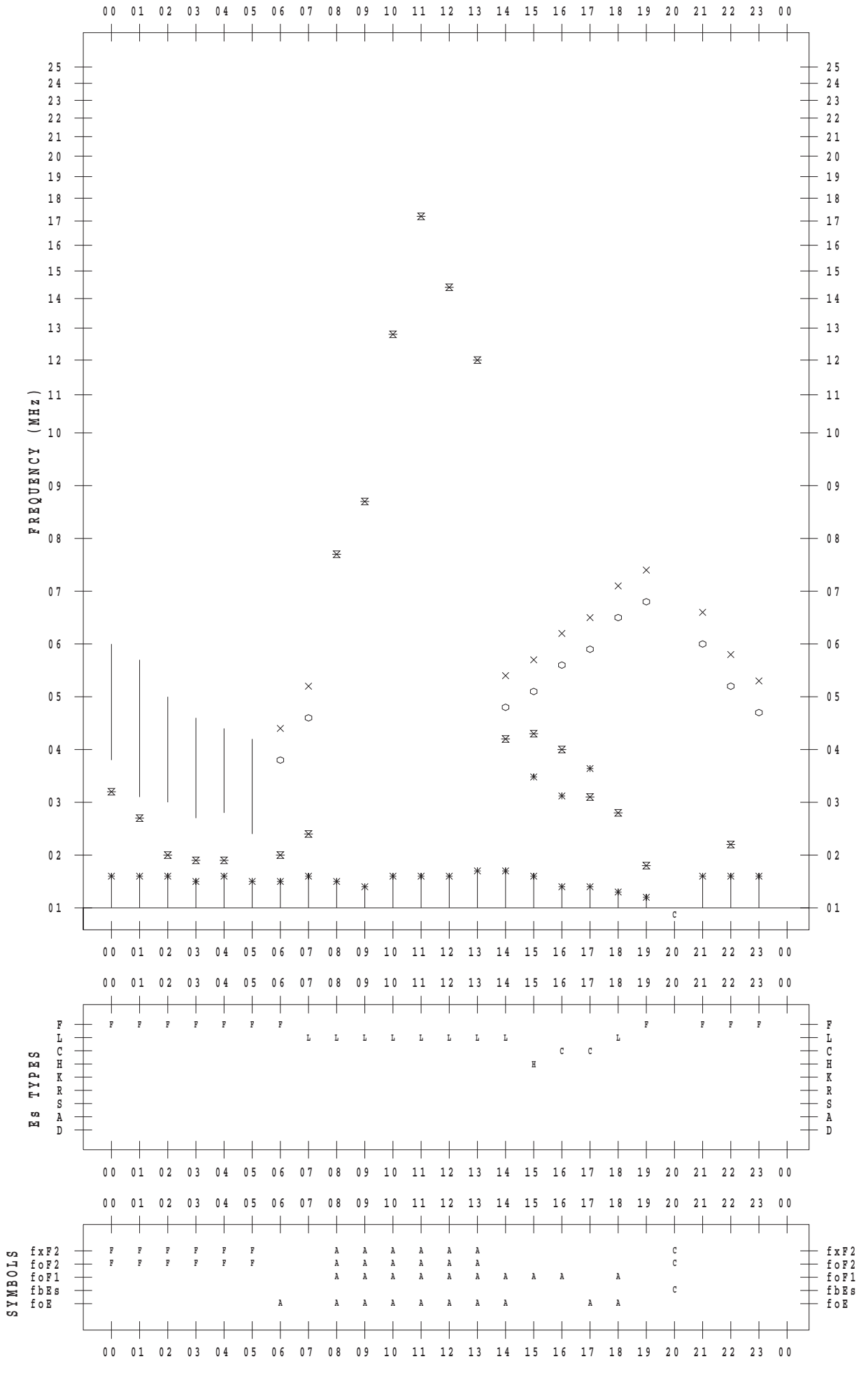
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/22

135 °E MEAN TIME



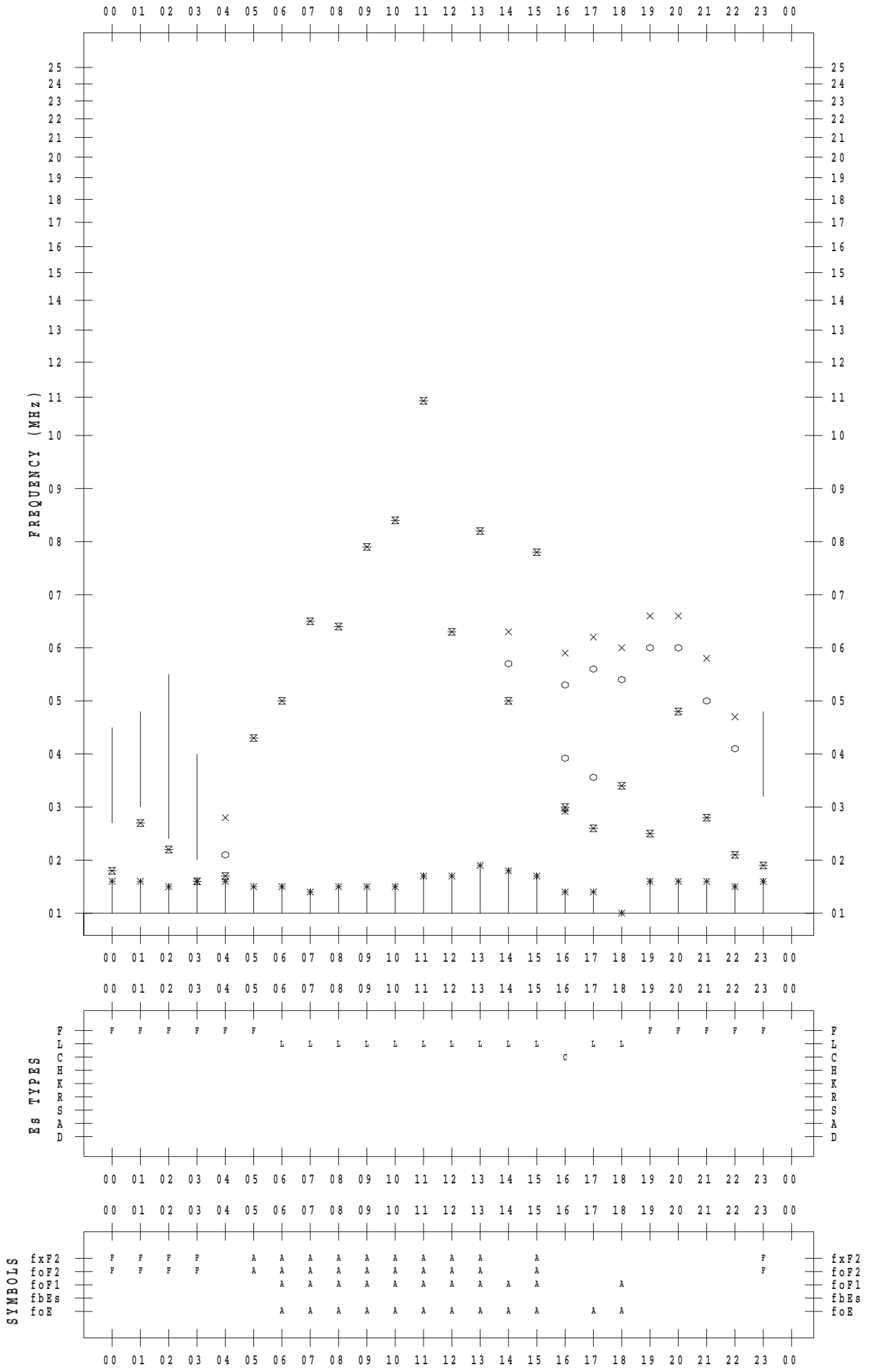
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/23

135 °E MEAN TIME



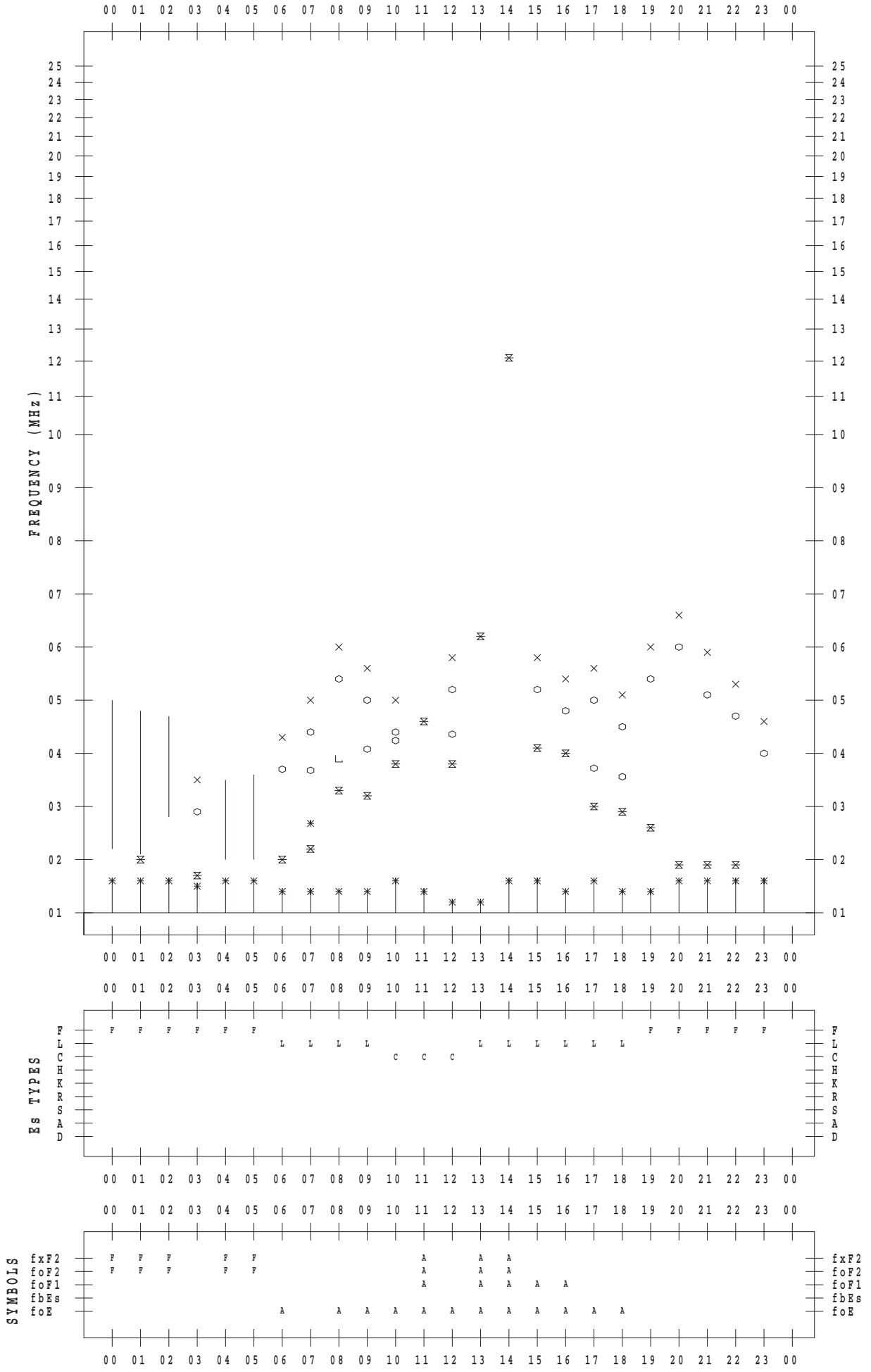
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/24

135 °E MEAN TIME



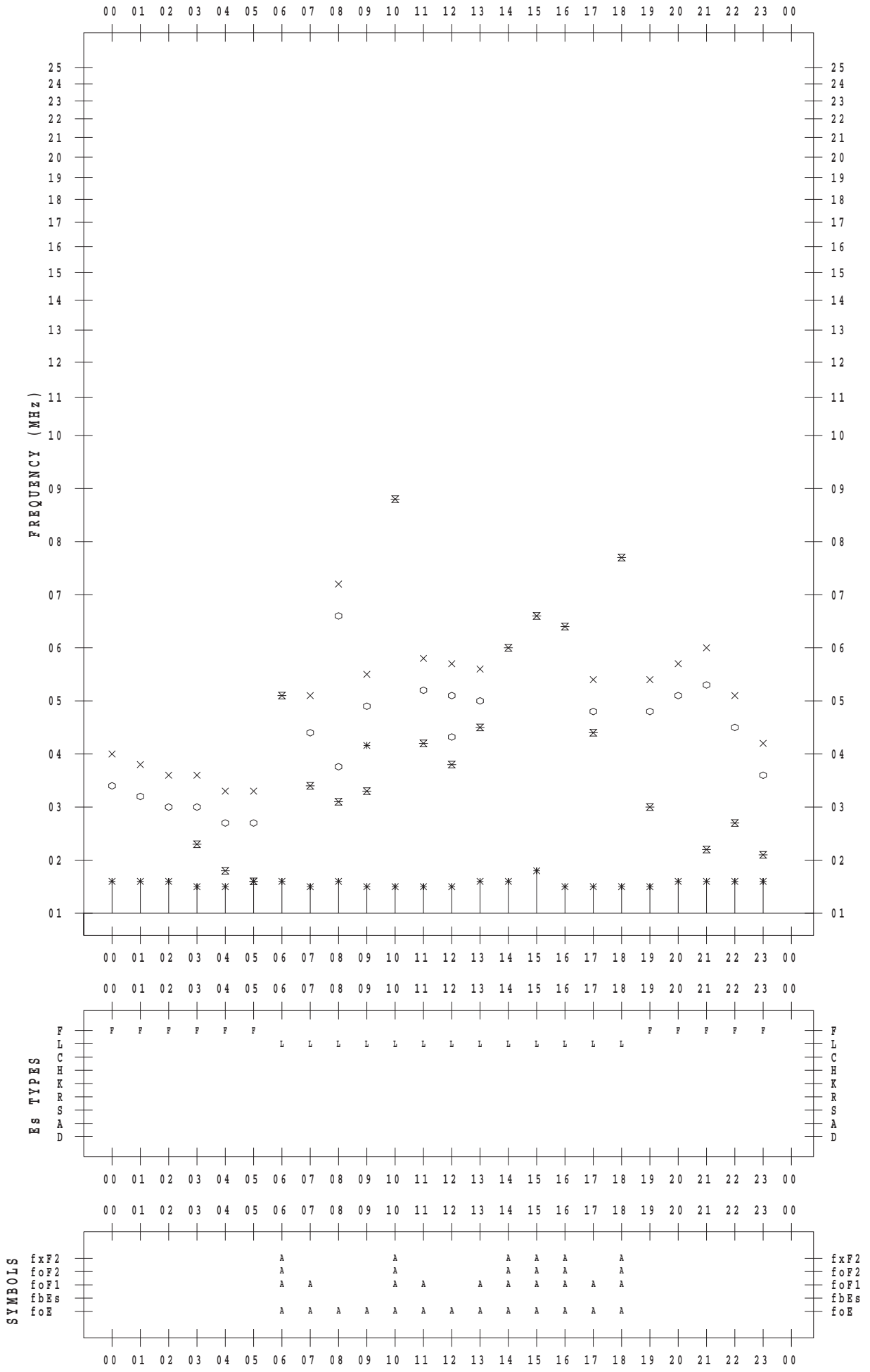
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/25

135 °E MEAN TIME



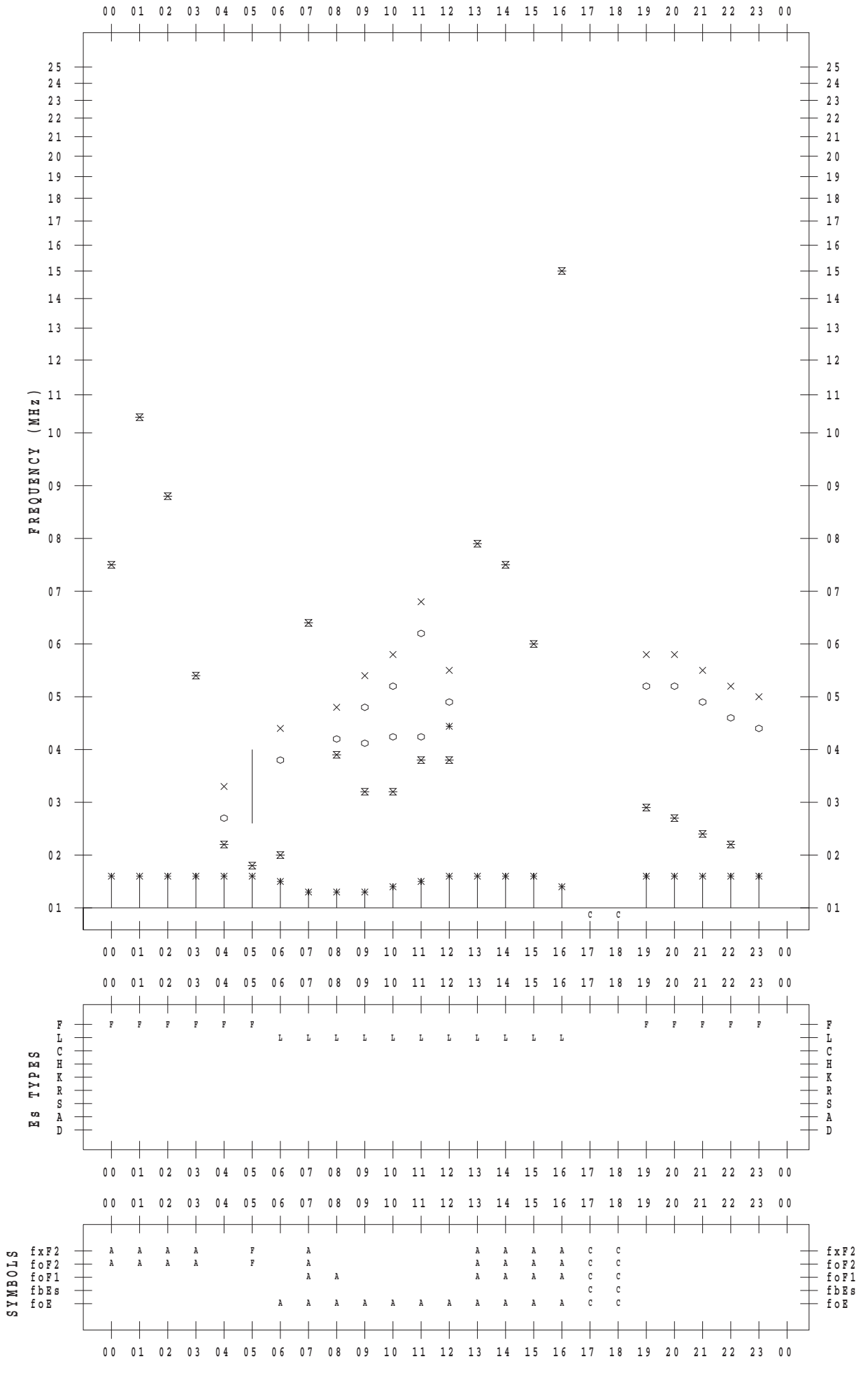
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/26

135 °E MEAN TIME



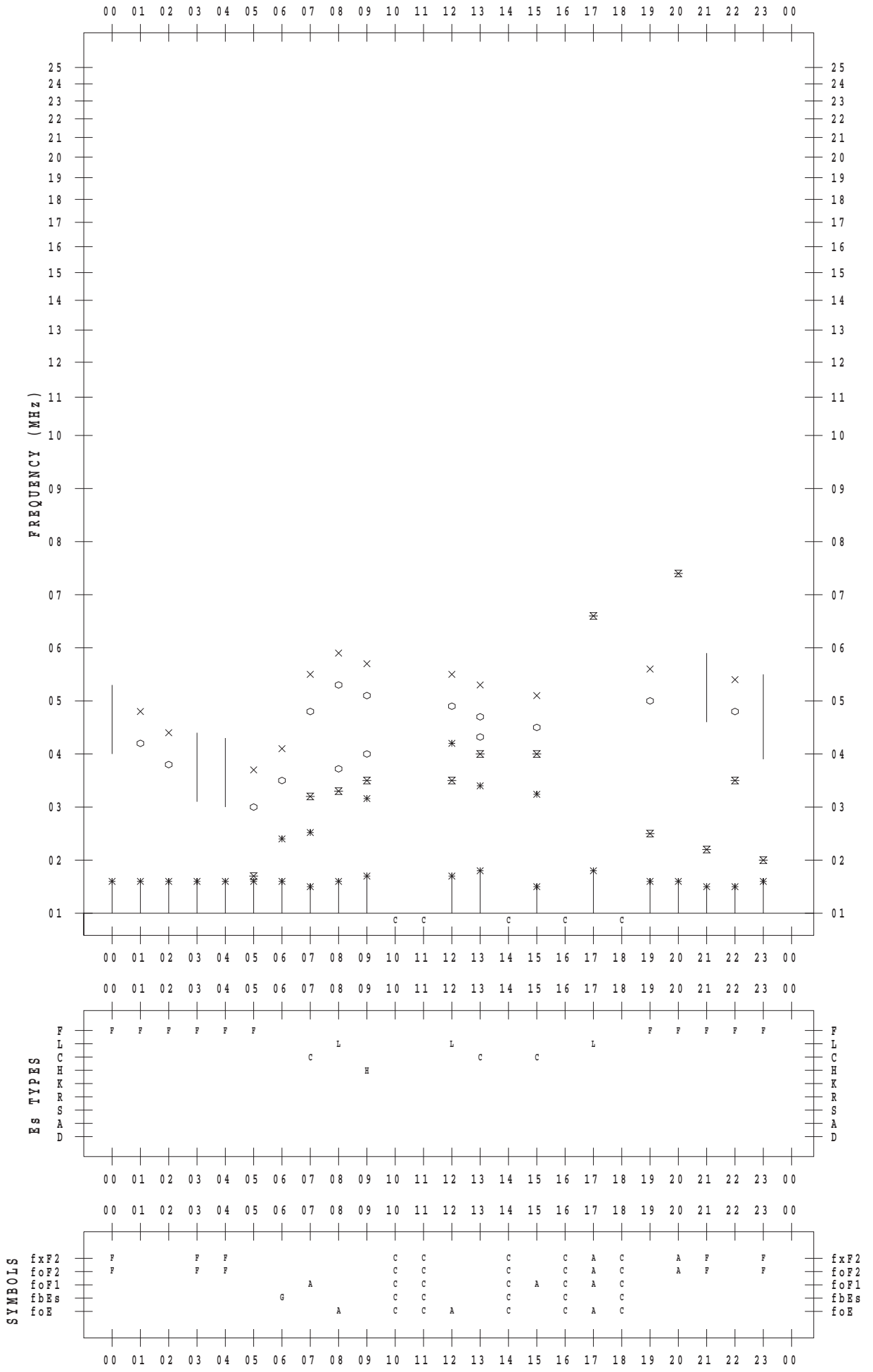
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/27

135 °E MEAN TIME



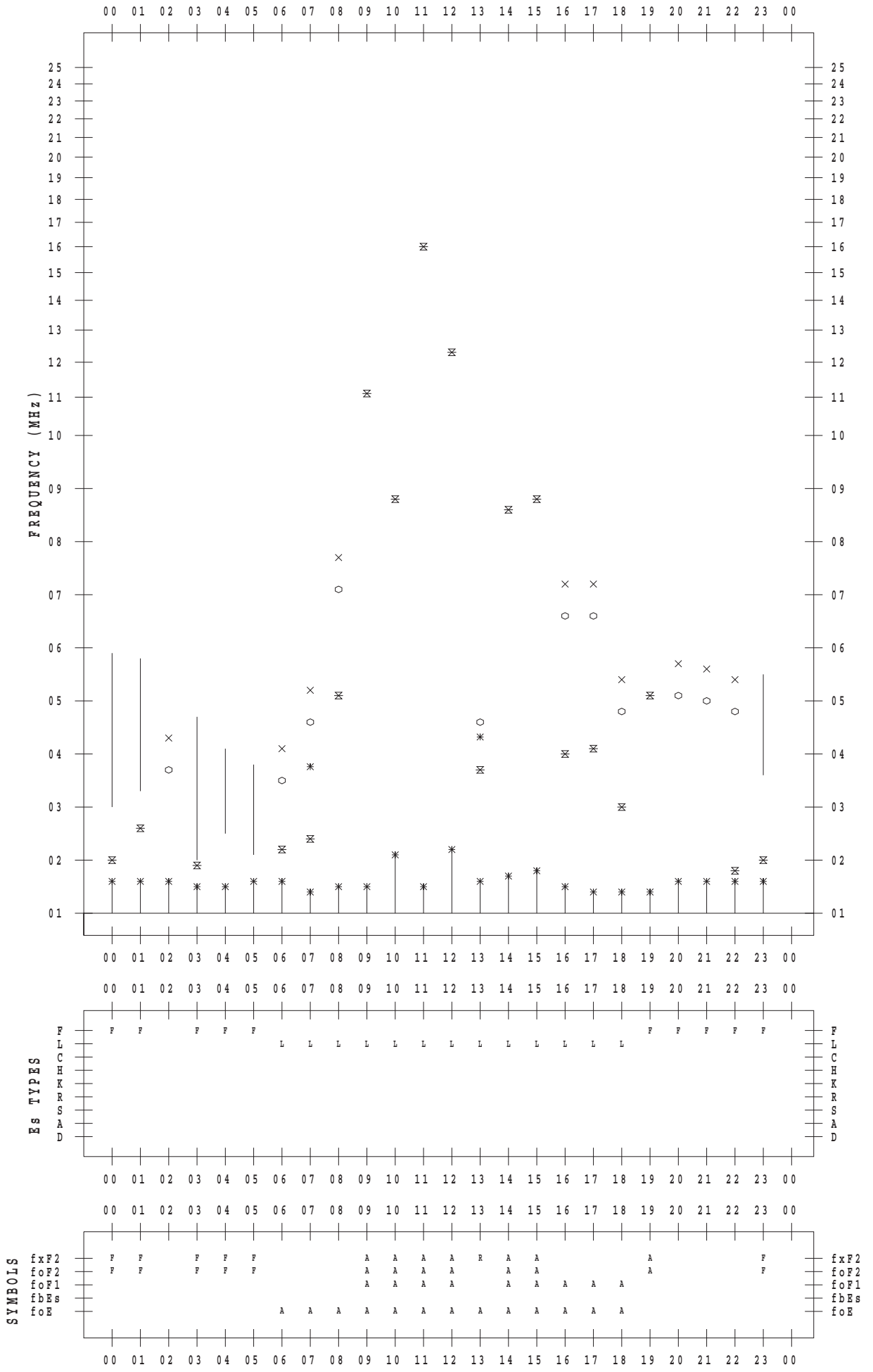
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/28

135 °E MEAN TIME



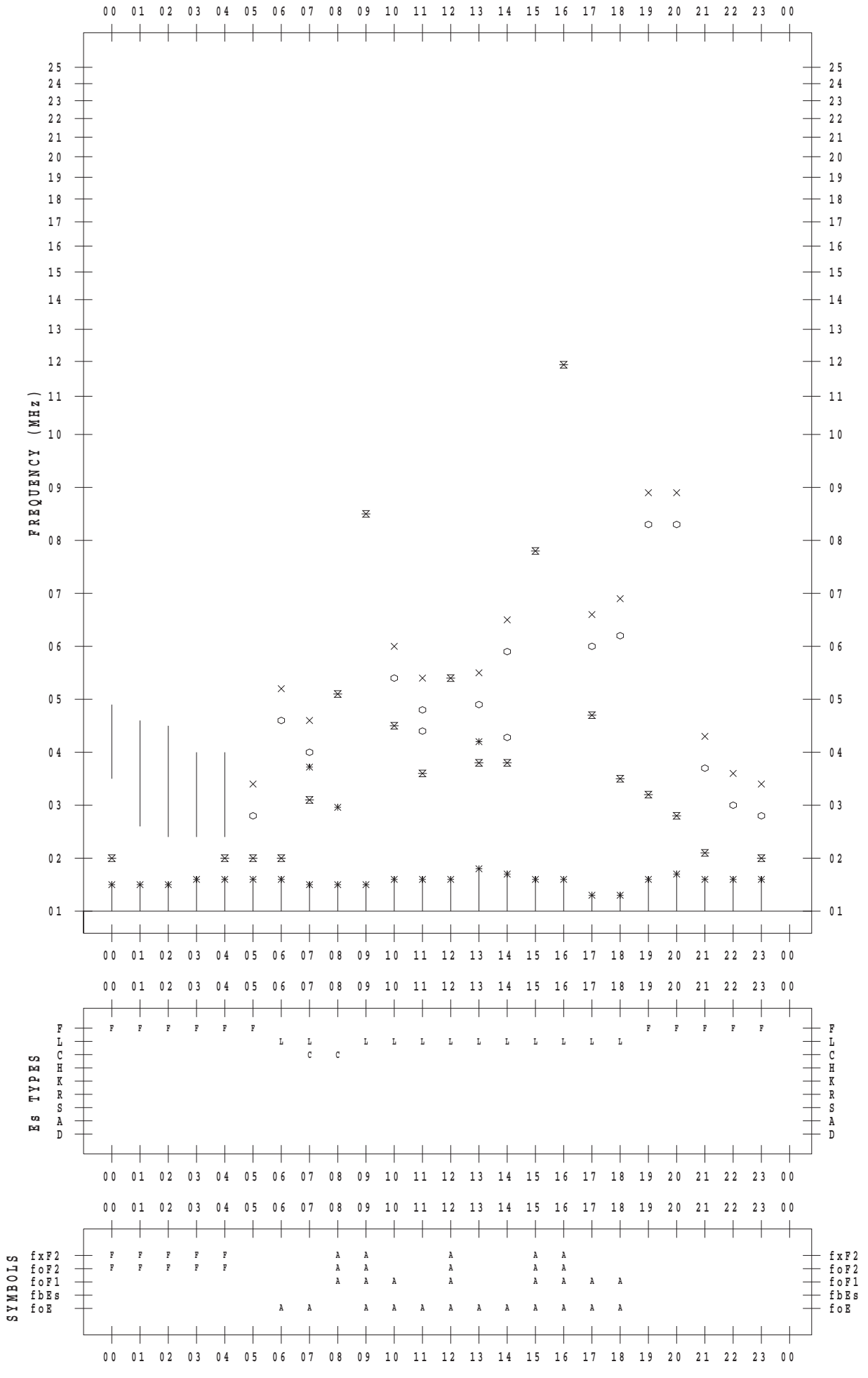
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/29

135 °E MEAN TIME



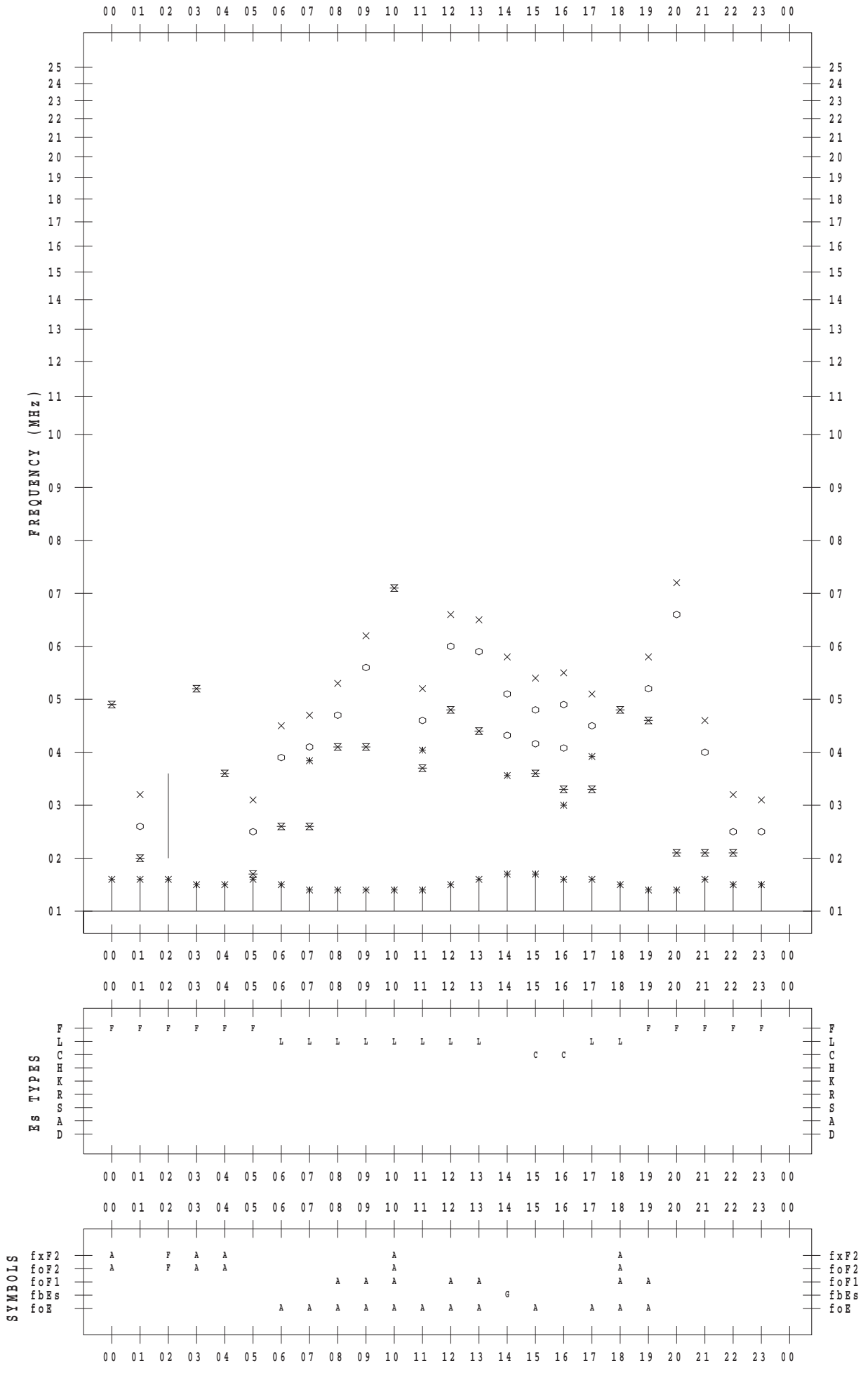
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/ 6/30

135 °E MEAN TIME



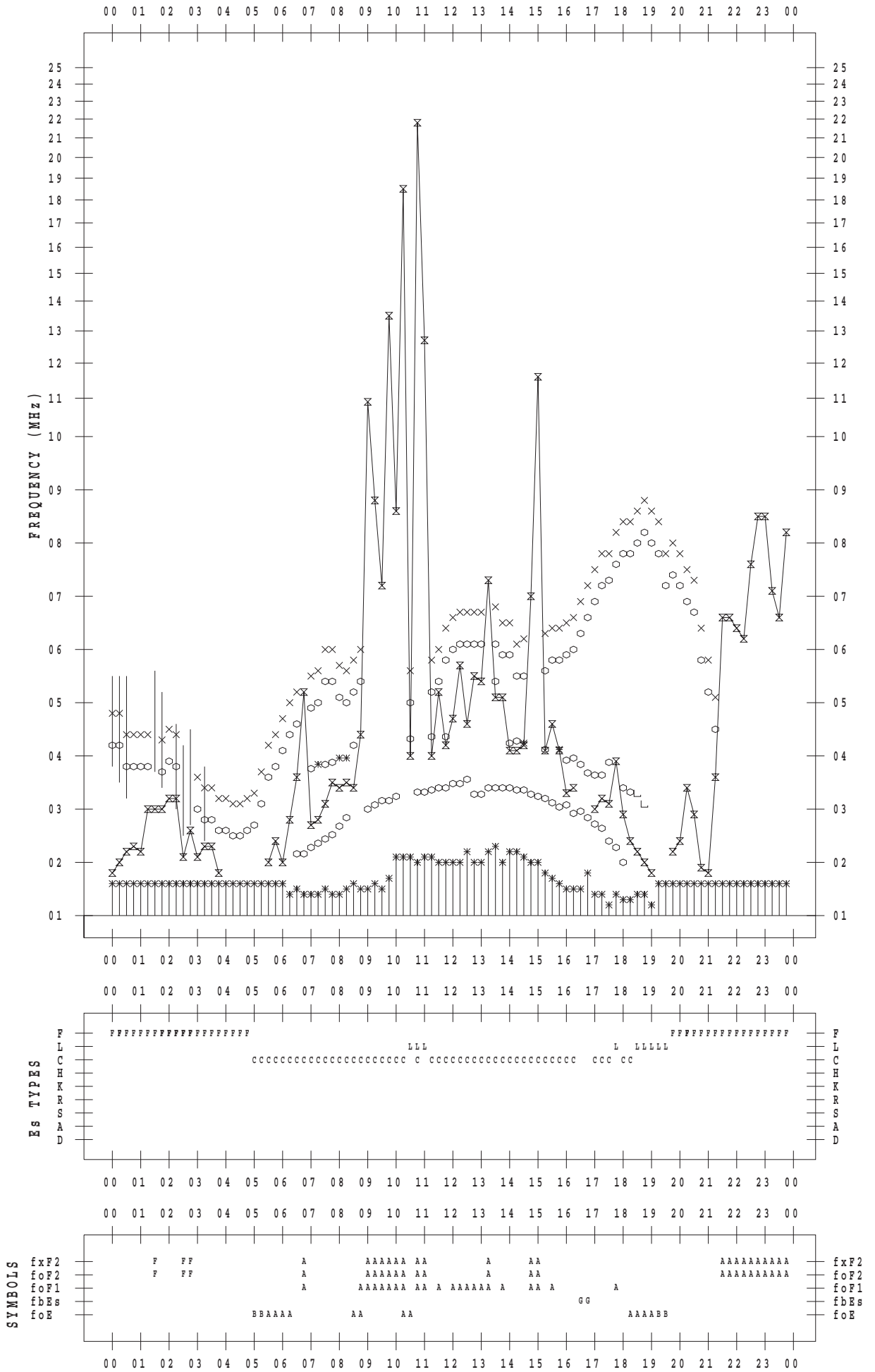
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 1

135 °E MEAN TIME



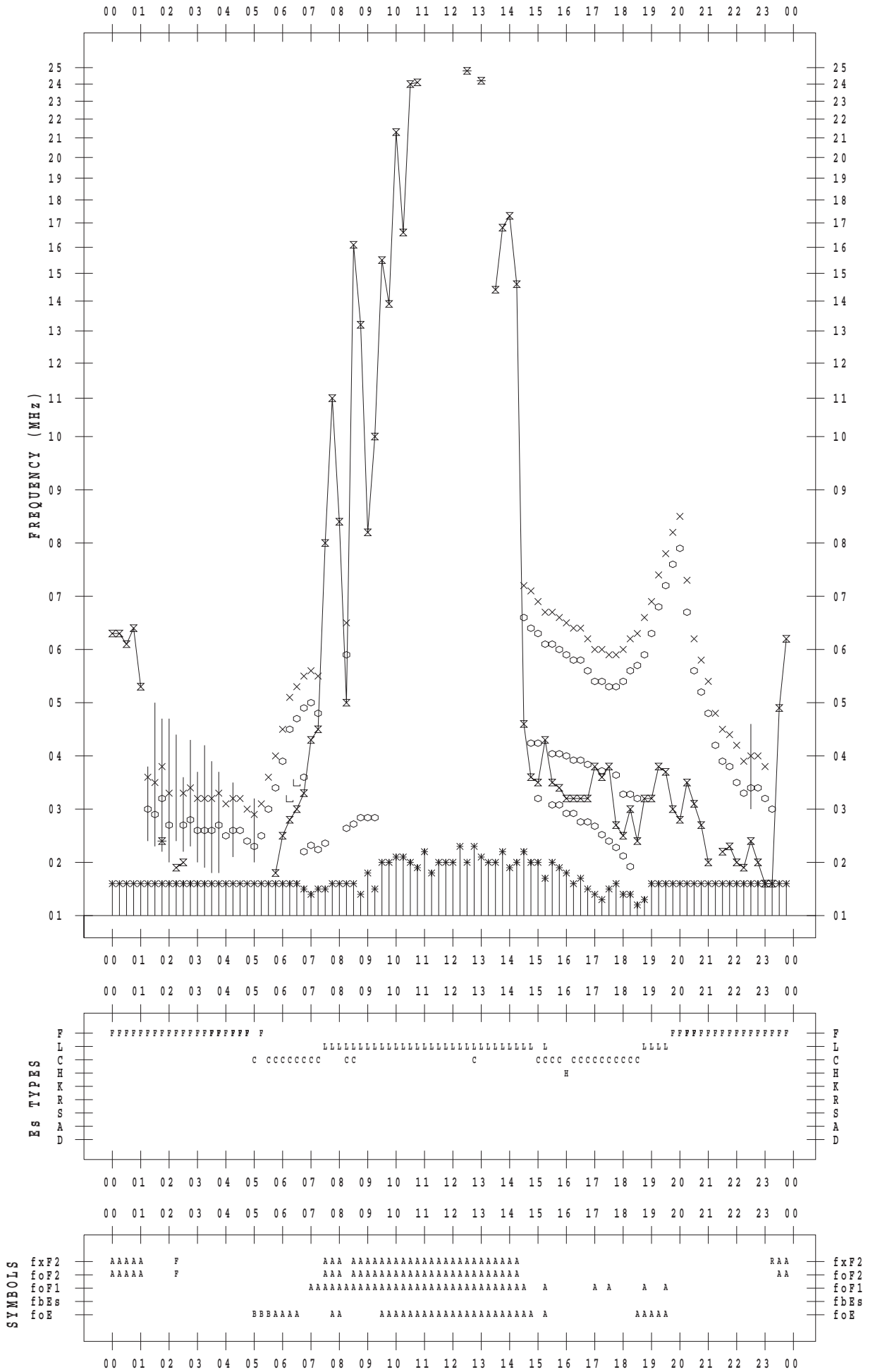
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 2

135 °E MEAN TIME



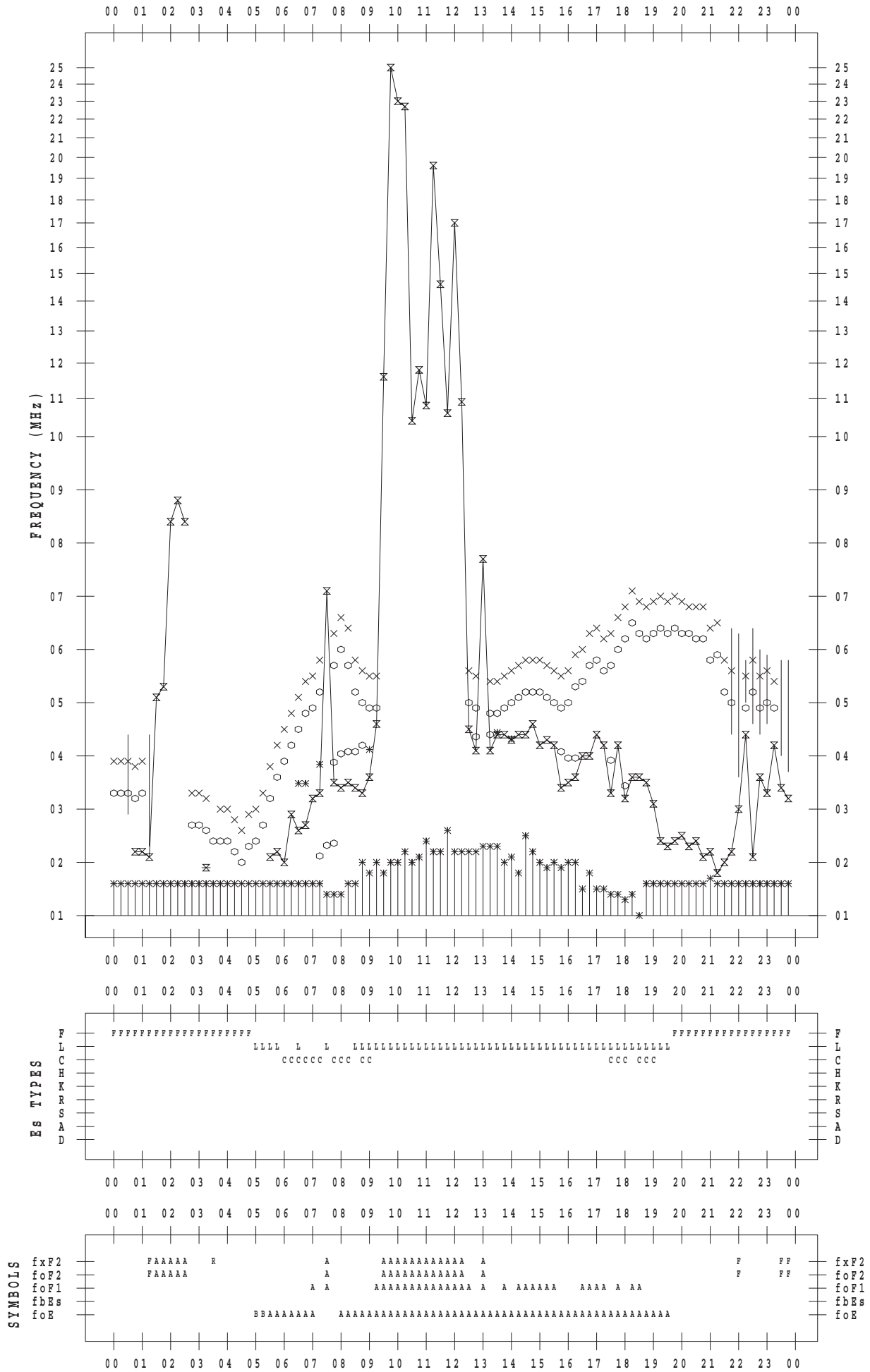
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 3

135 °E MEAN TIME



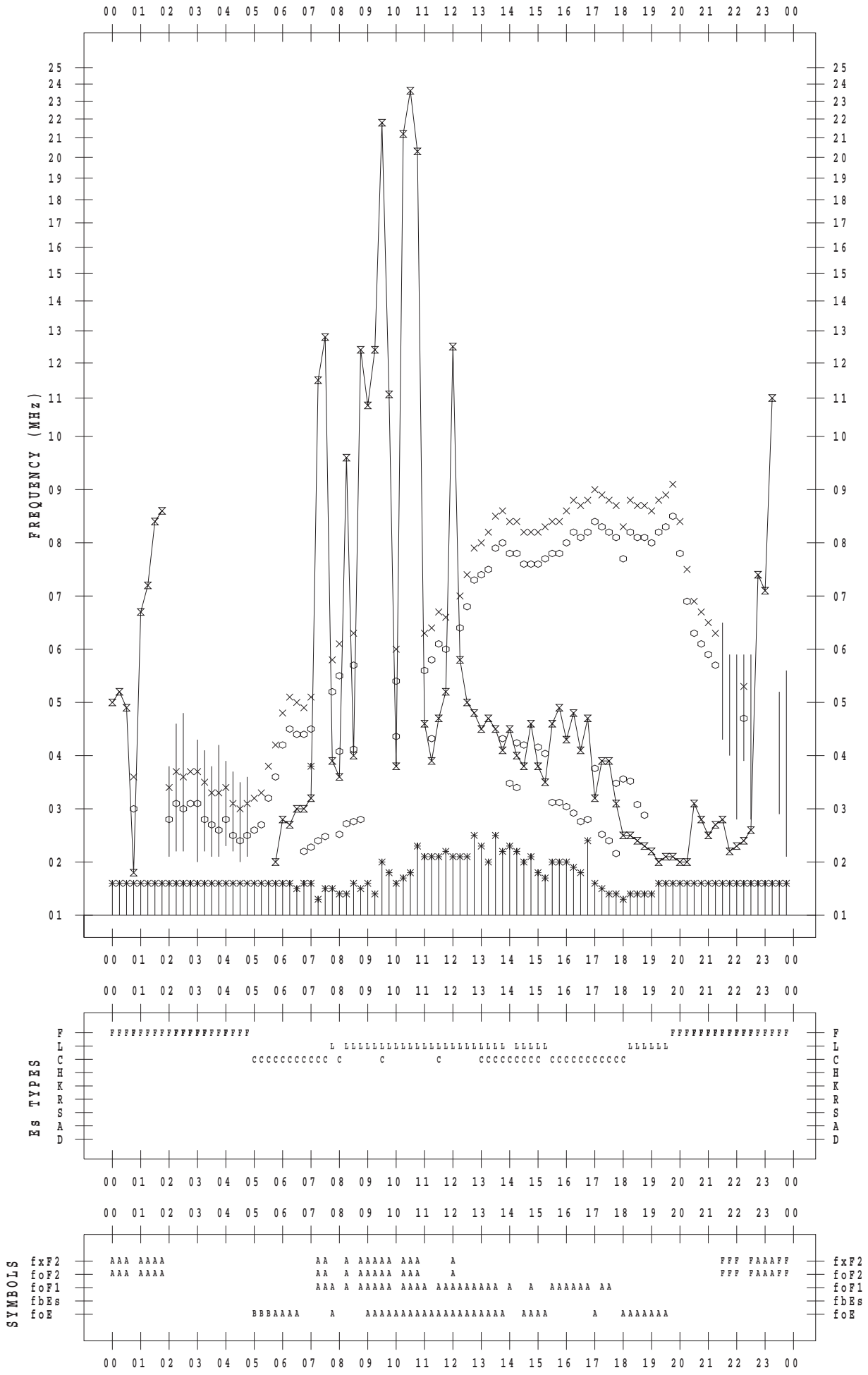
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 4

135 °E MEAN TIME



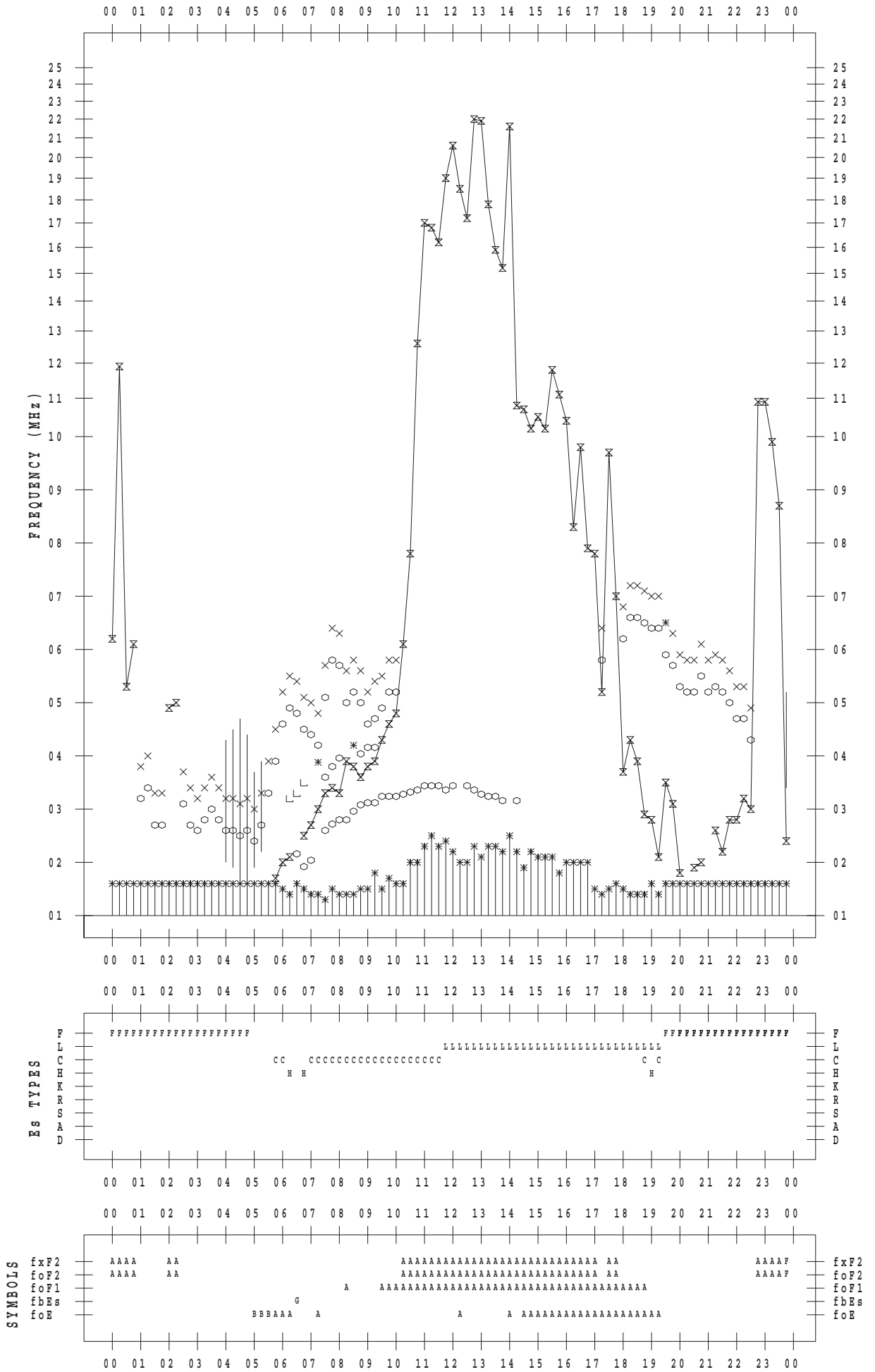
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 5

135 °E MEAN TIME



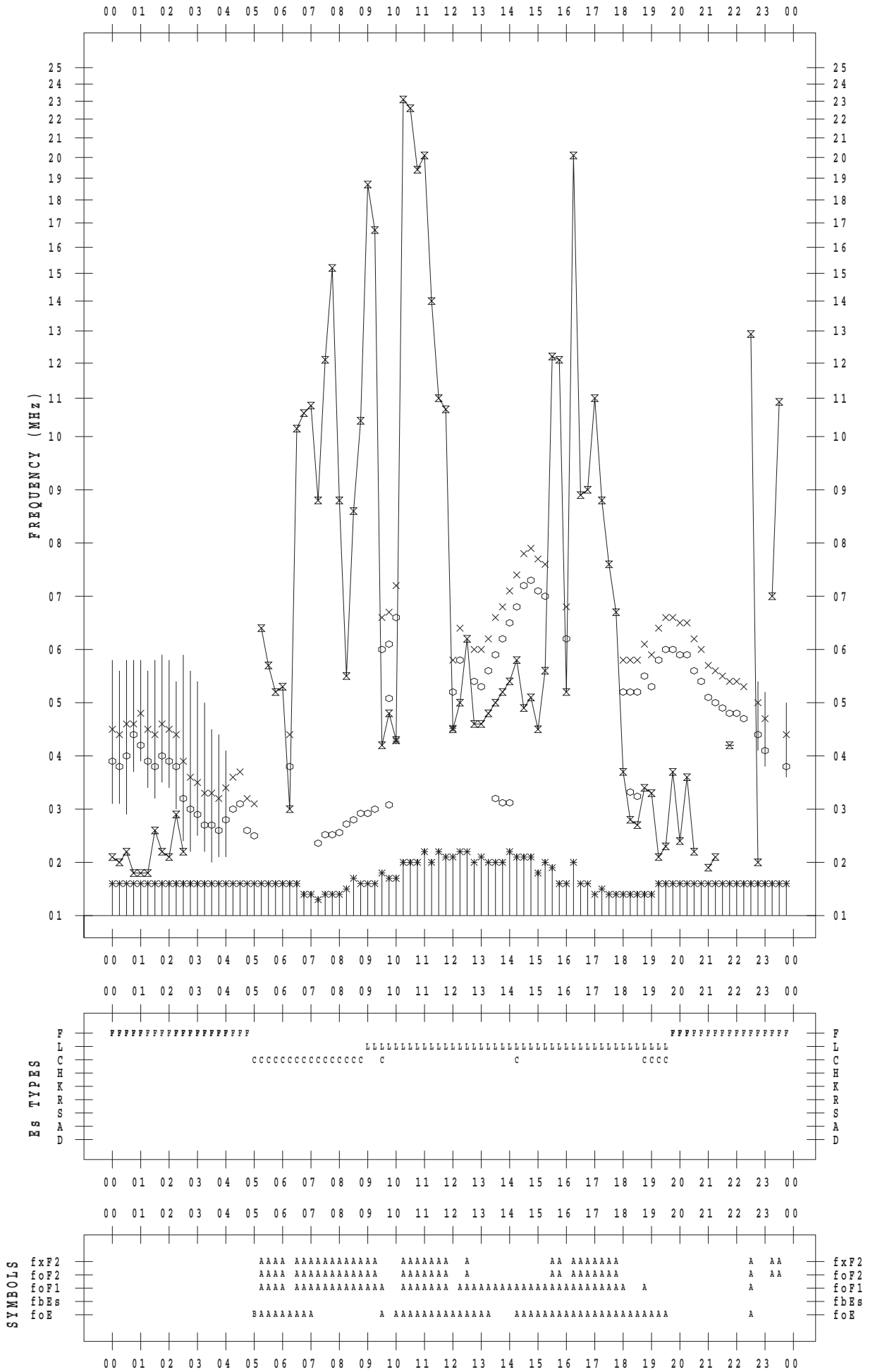
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 6

135 °E MEAN TIME



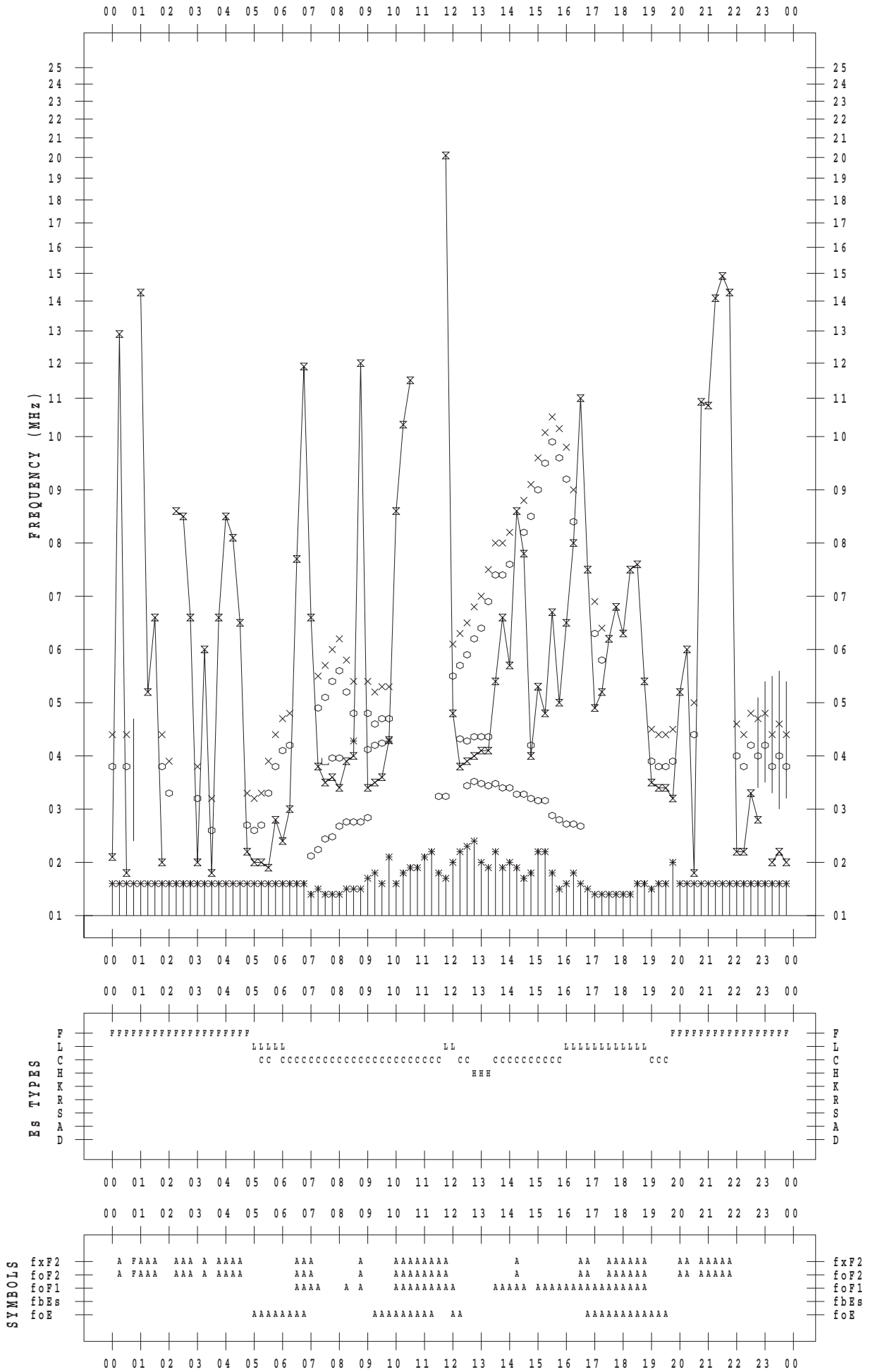
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 7

135 °E MEAN TIME



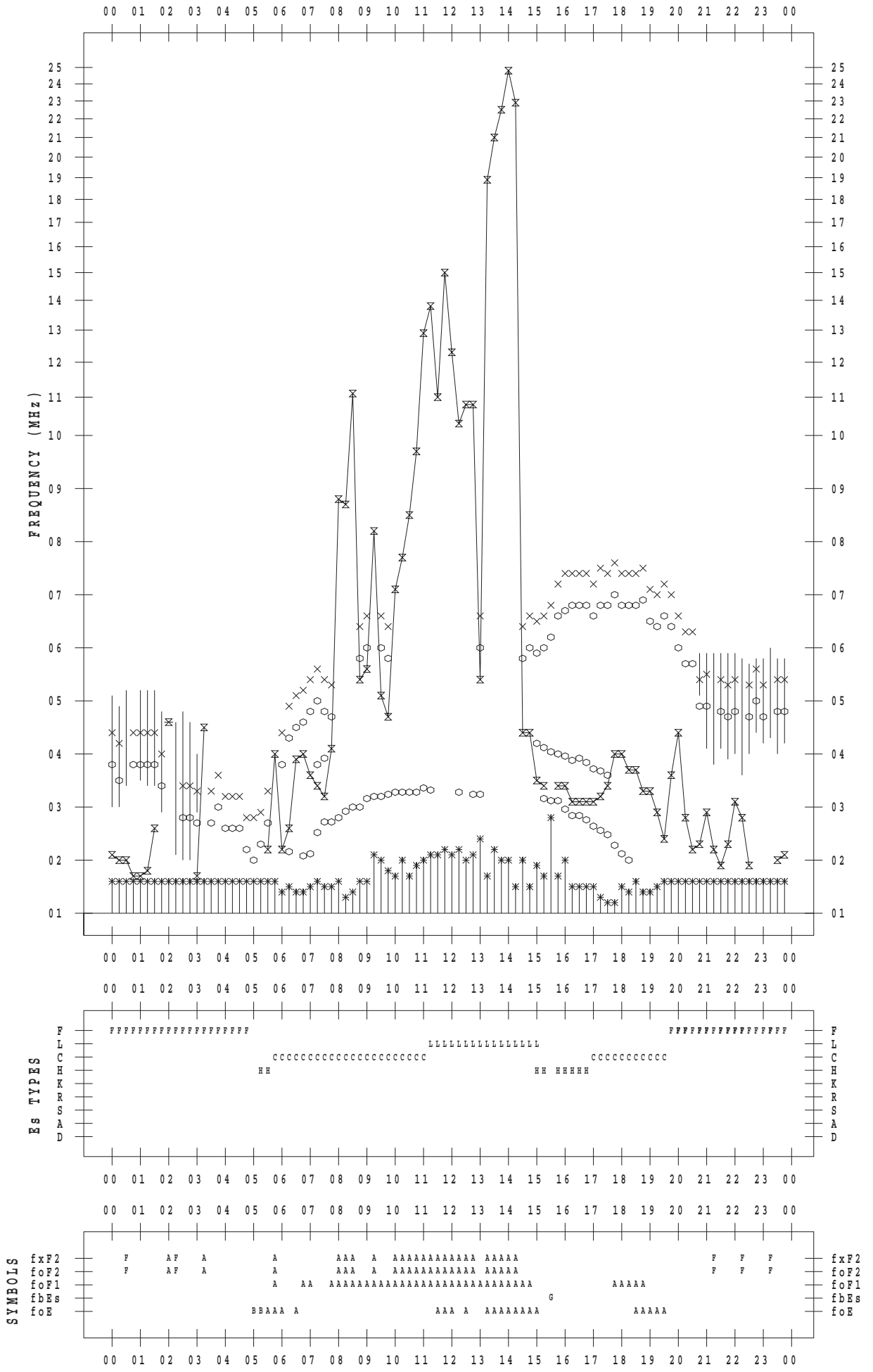
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 8

135 °E MEAN TIME



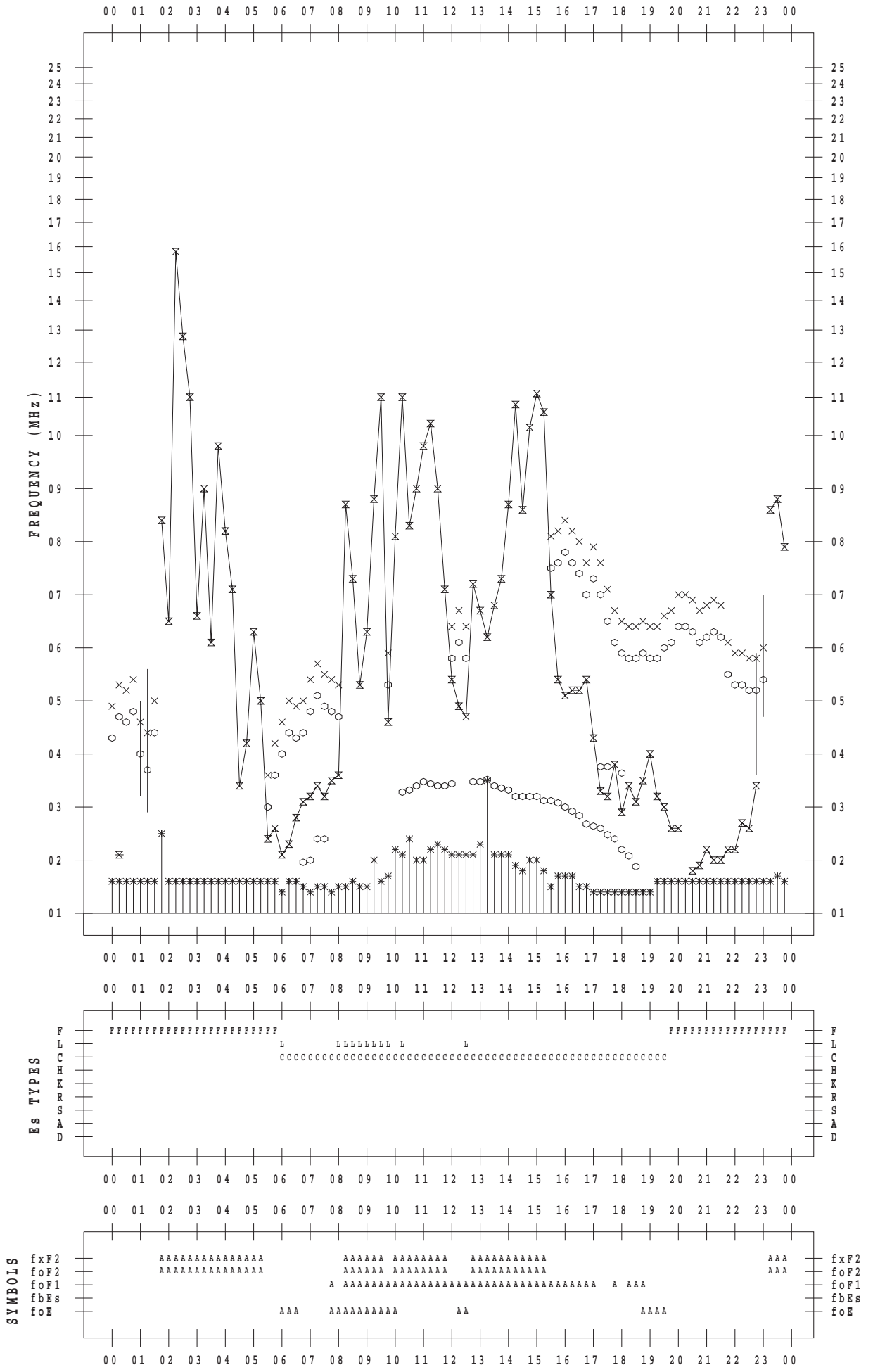
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/ 9

135 °E MEAN TIME



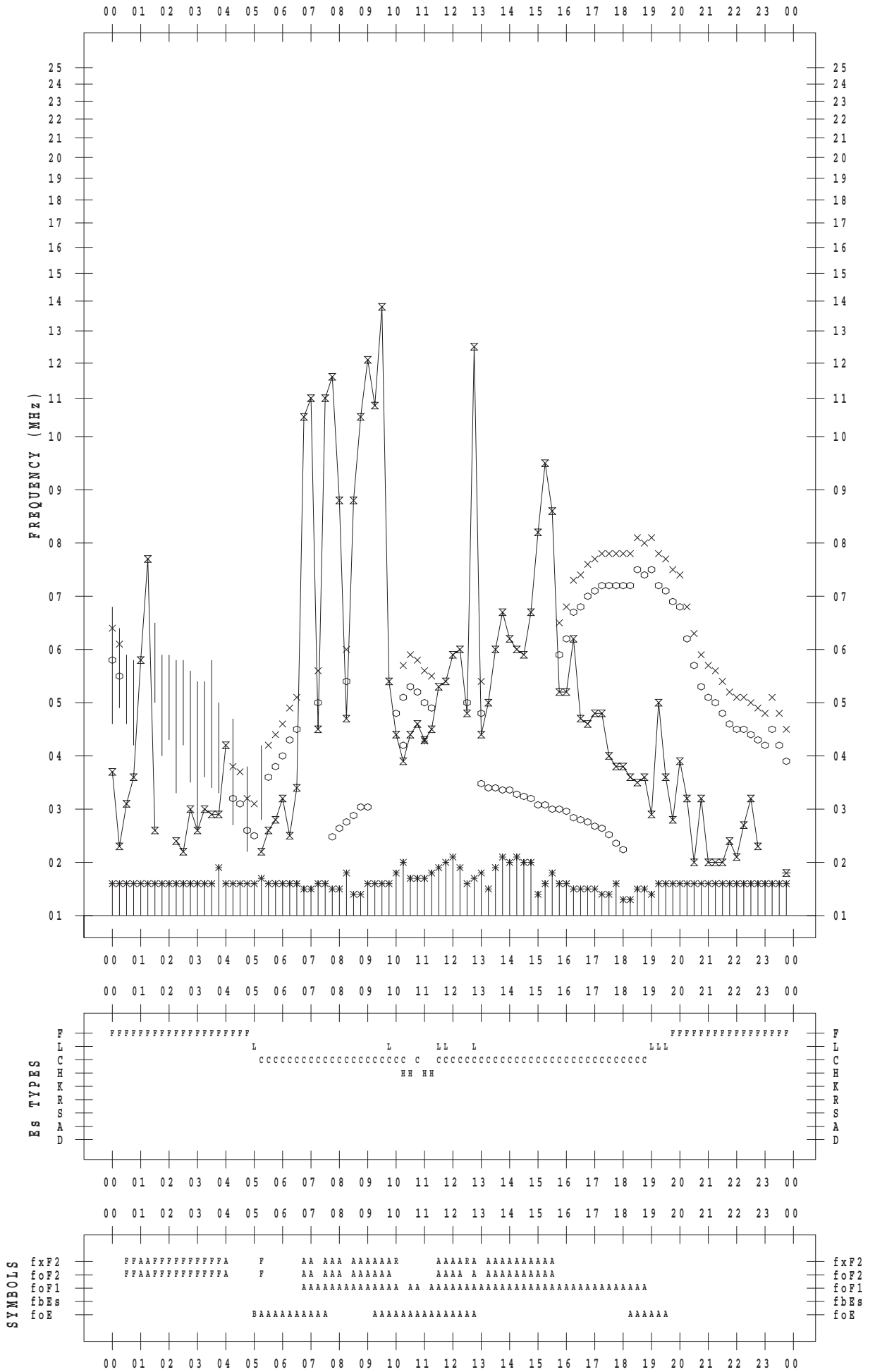
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/10

135 °E MEAN TIME



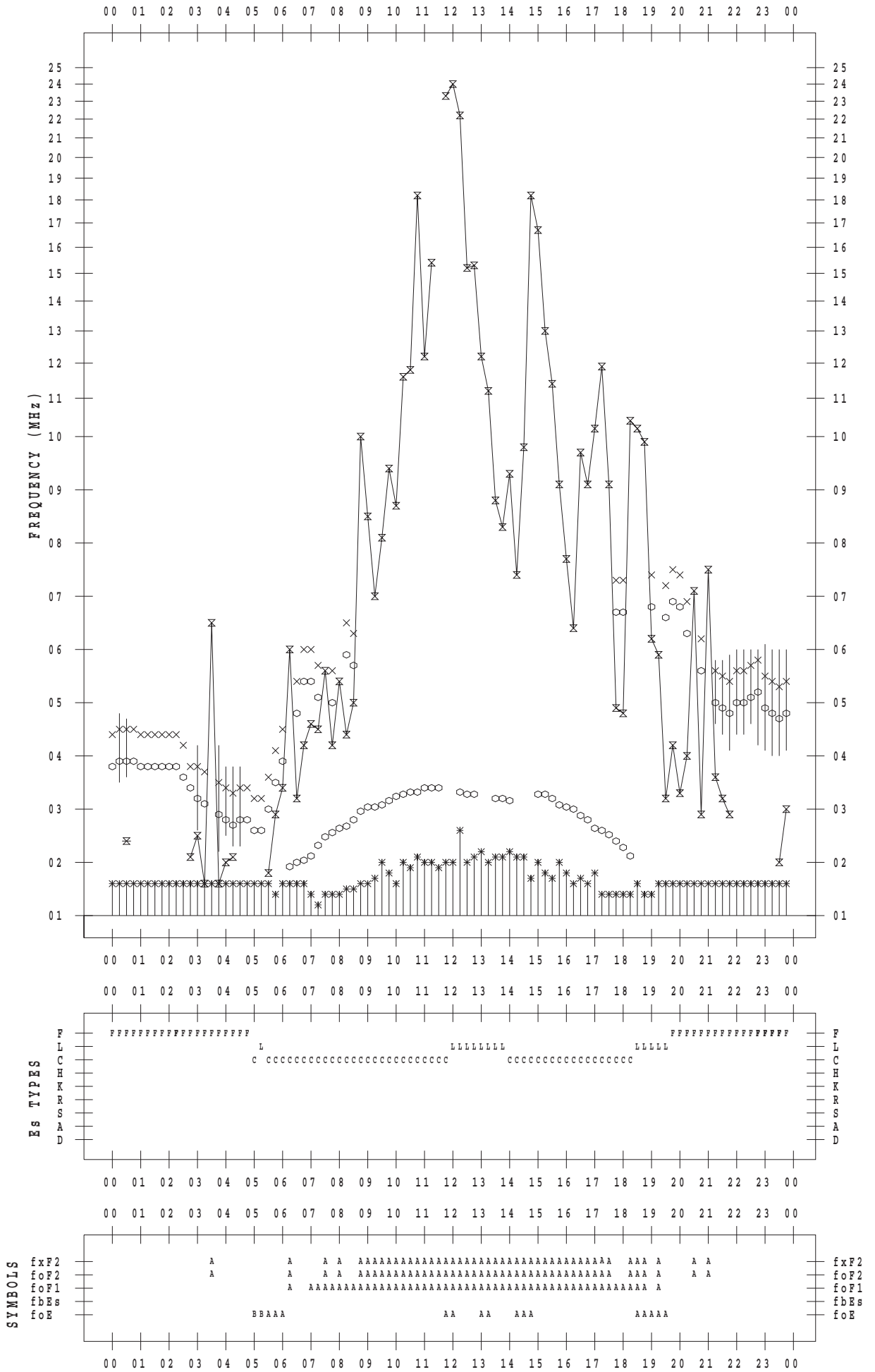
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/11

135 °E MEAN TIME



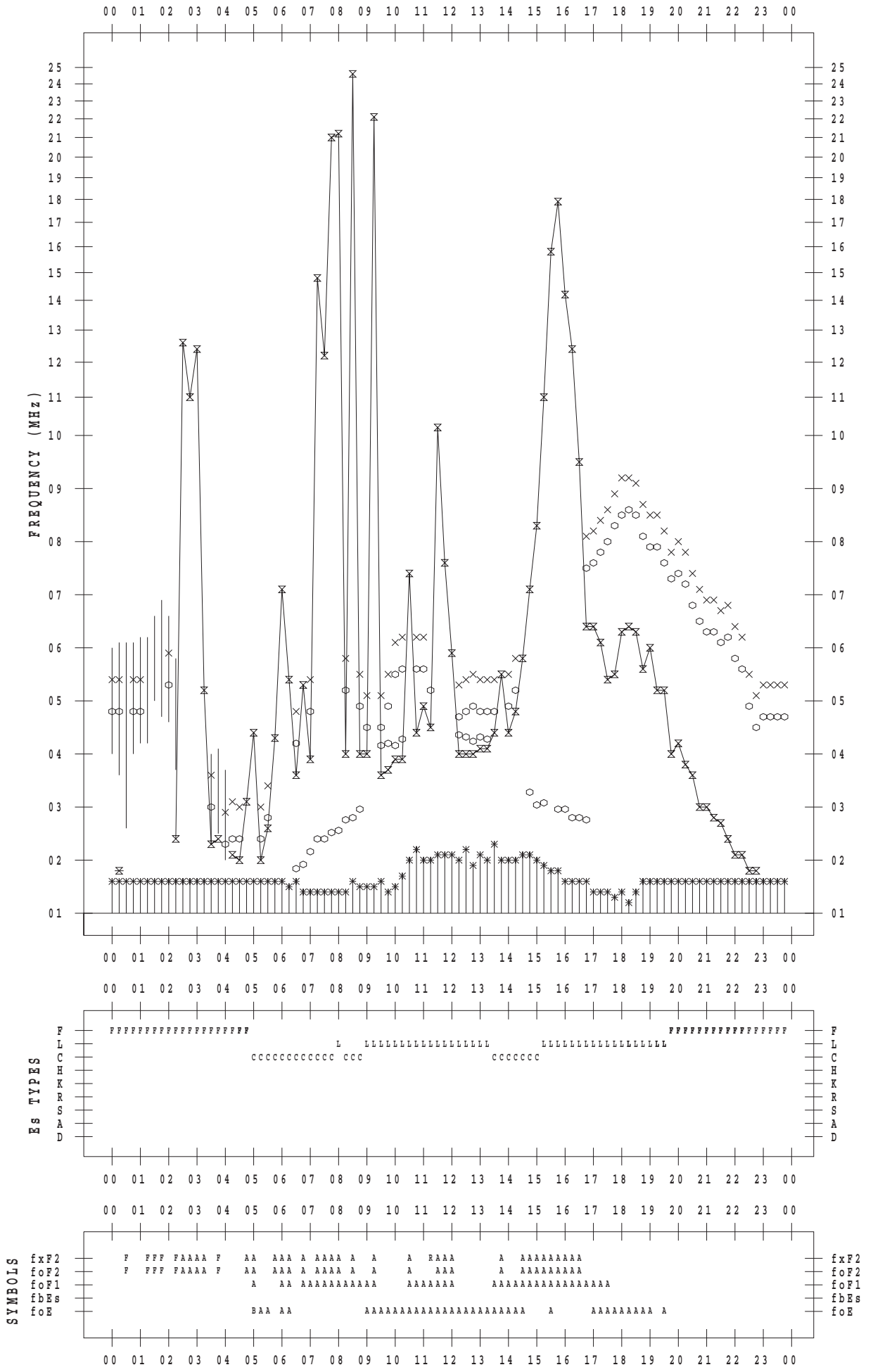
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/12

135 °E MEAN TIME



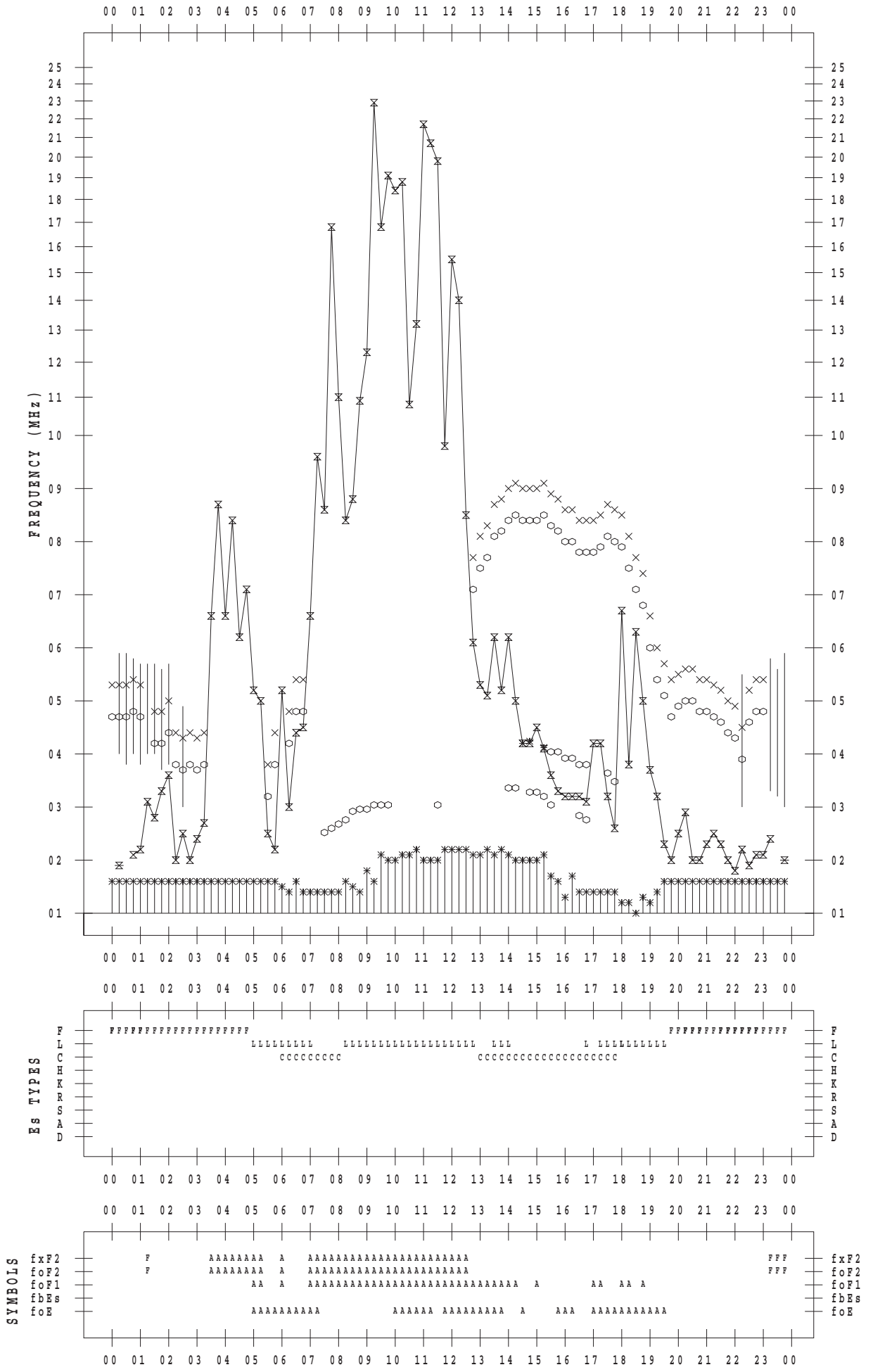
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/13

135 °E MEAN TIME



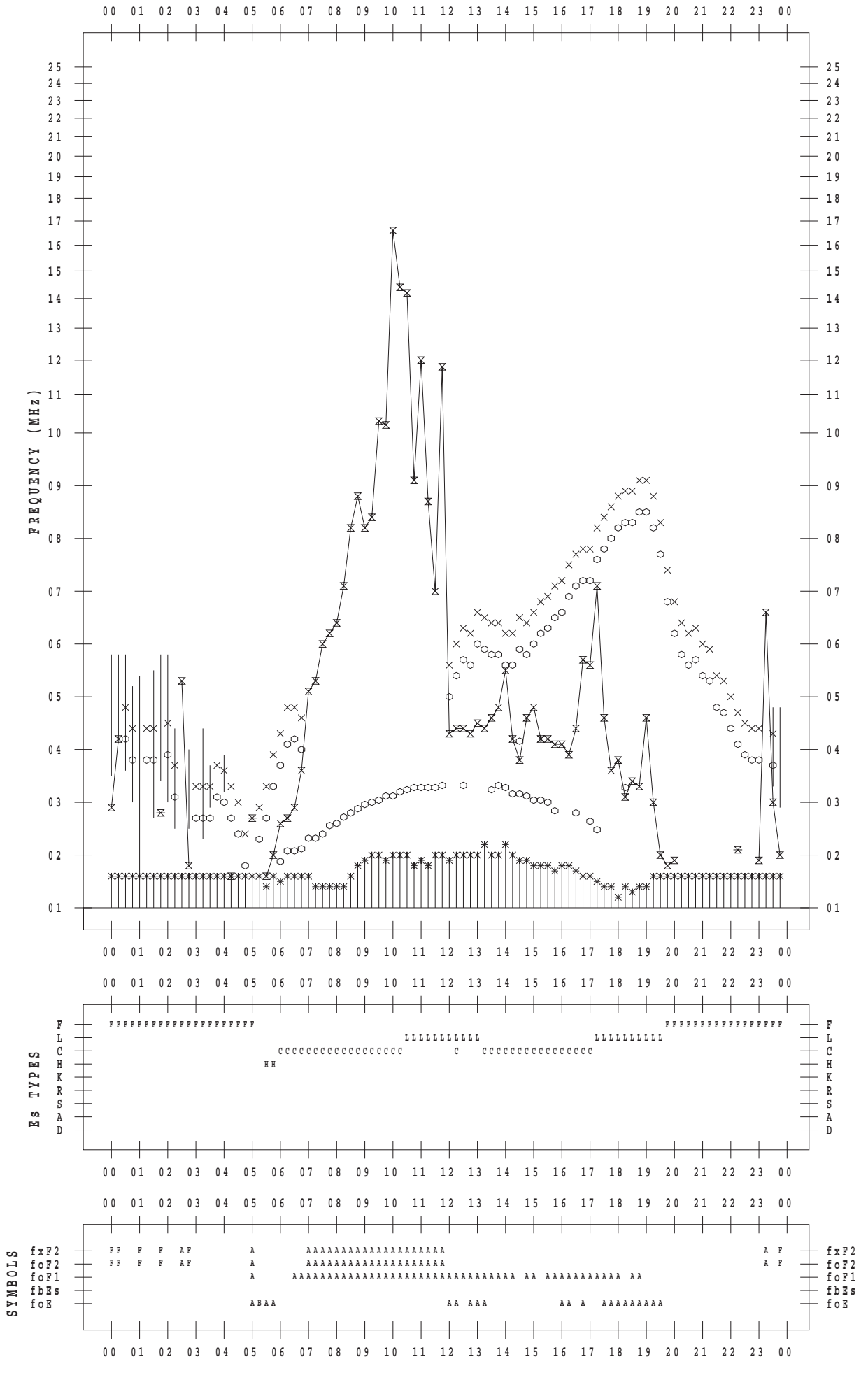
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/14

135 °E MEAN TIME



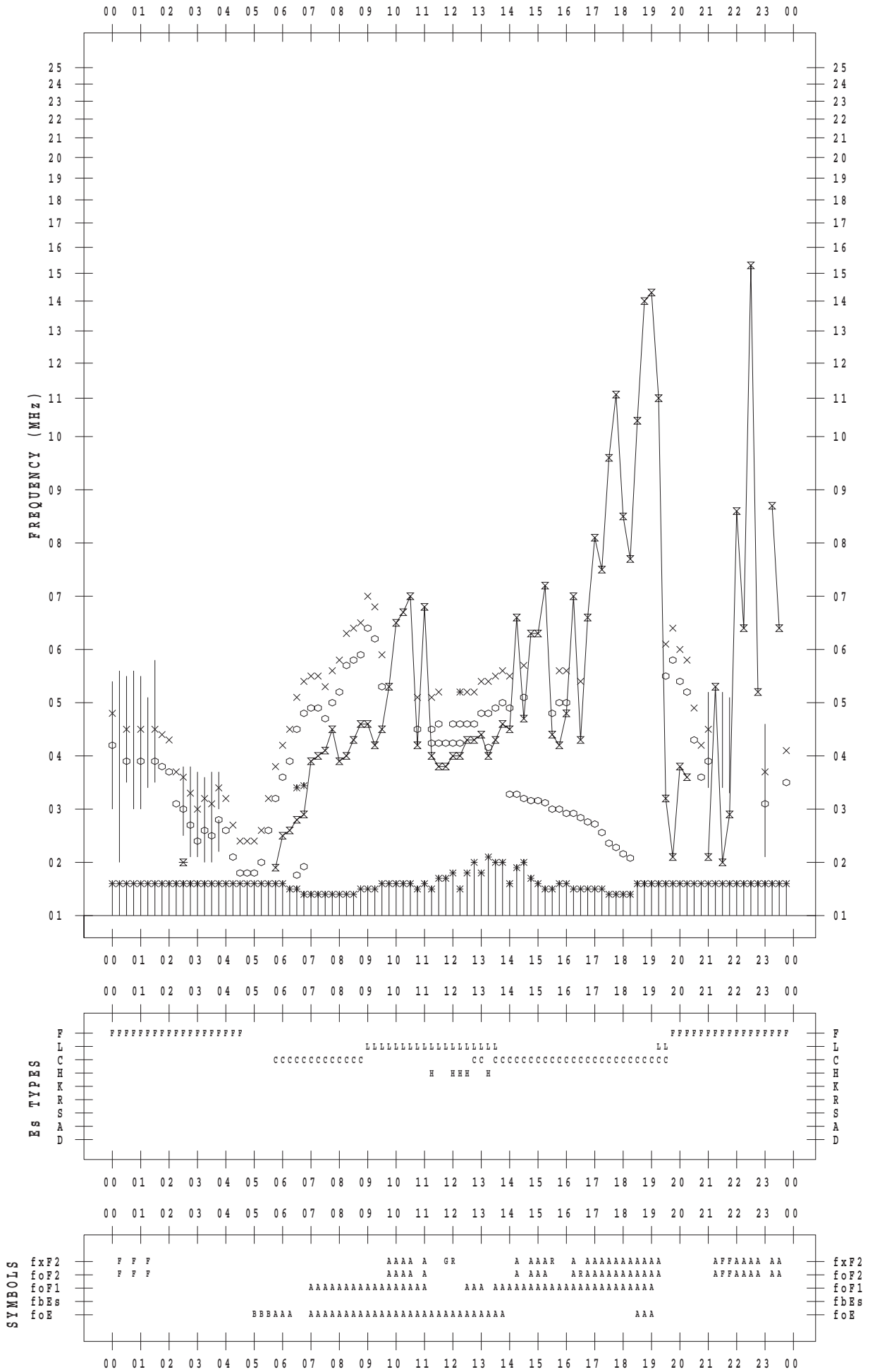
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/15

135 °E MEAN TIME



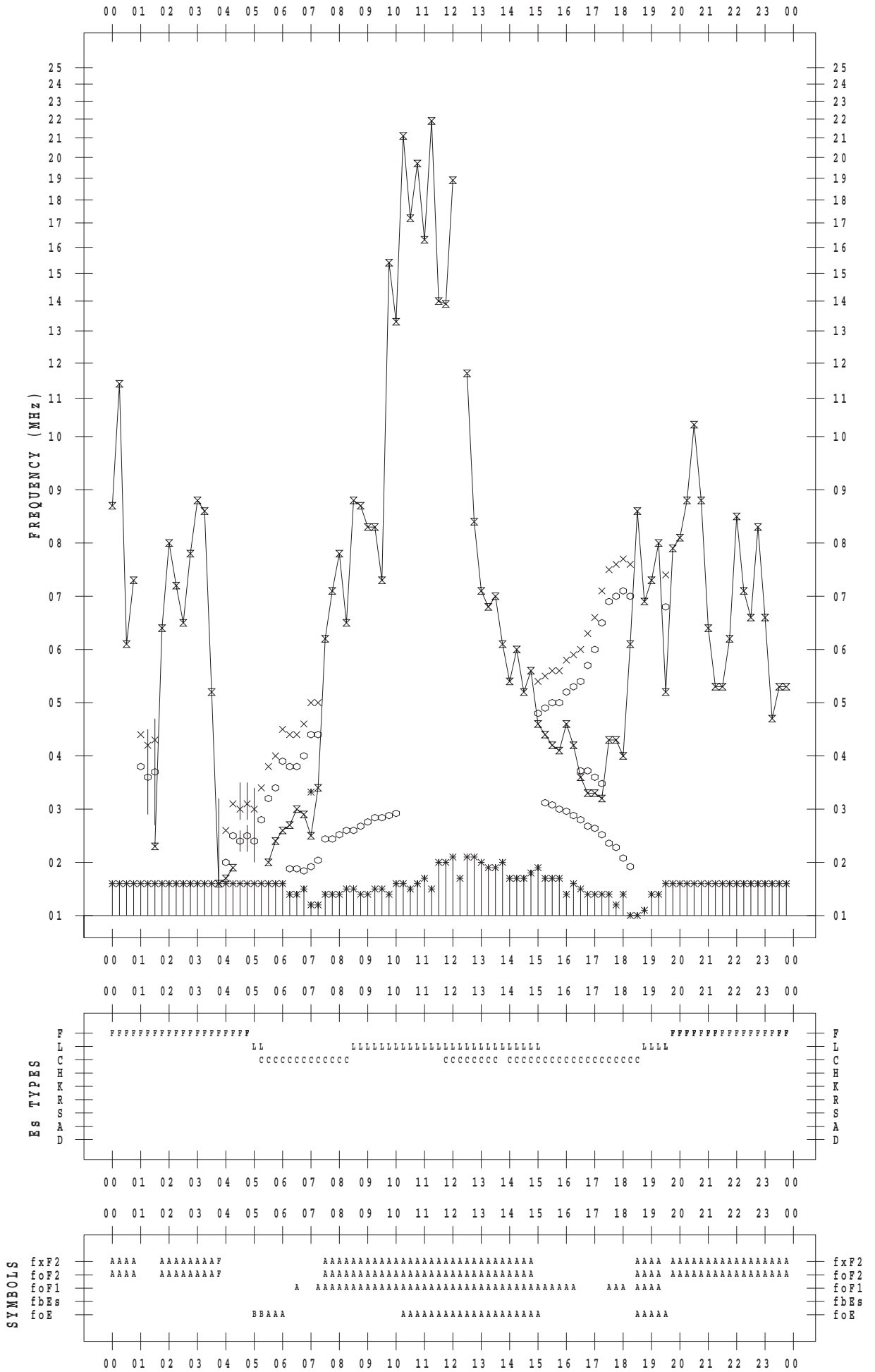
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/16

135 °E MEAN TIME



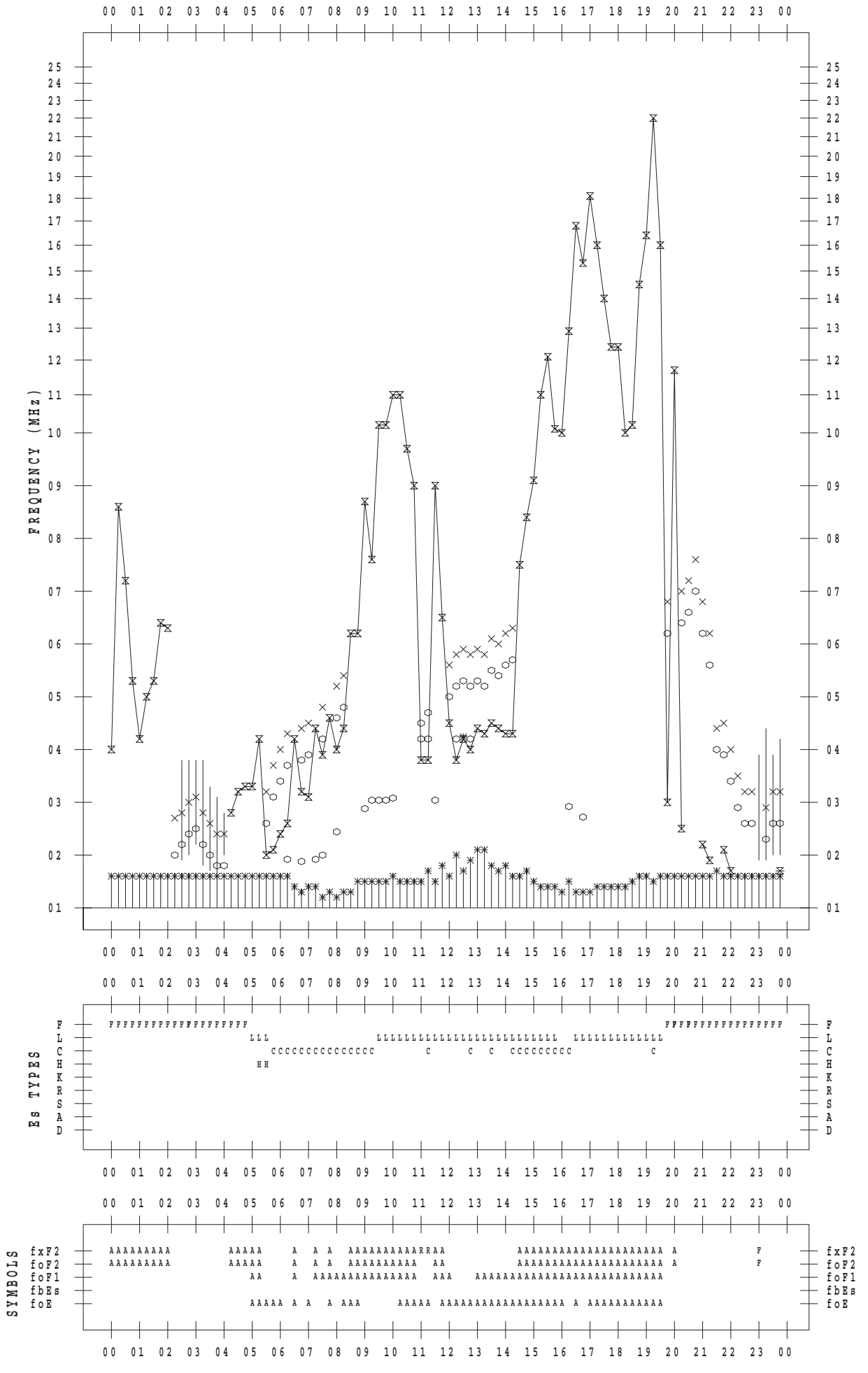
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/17

135 °E MEAN TIME



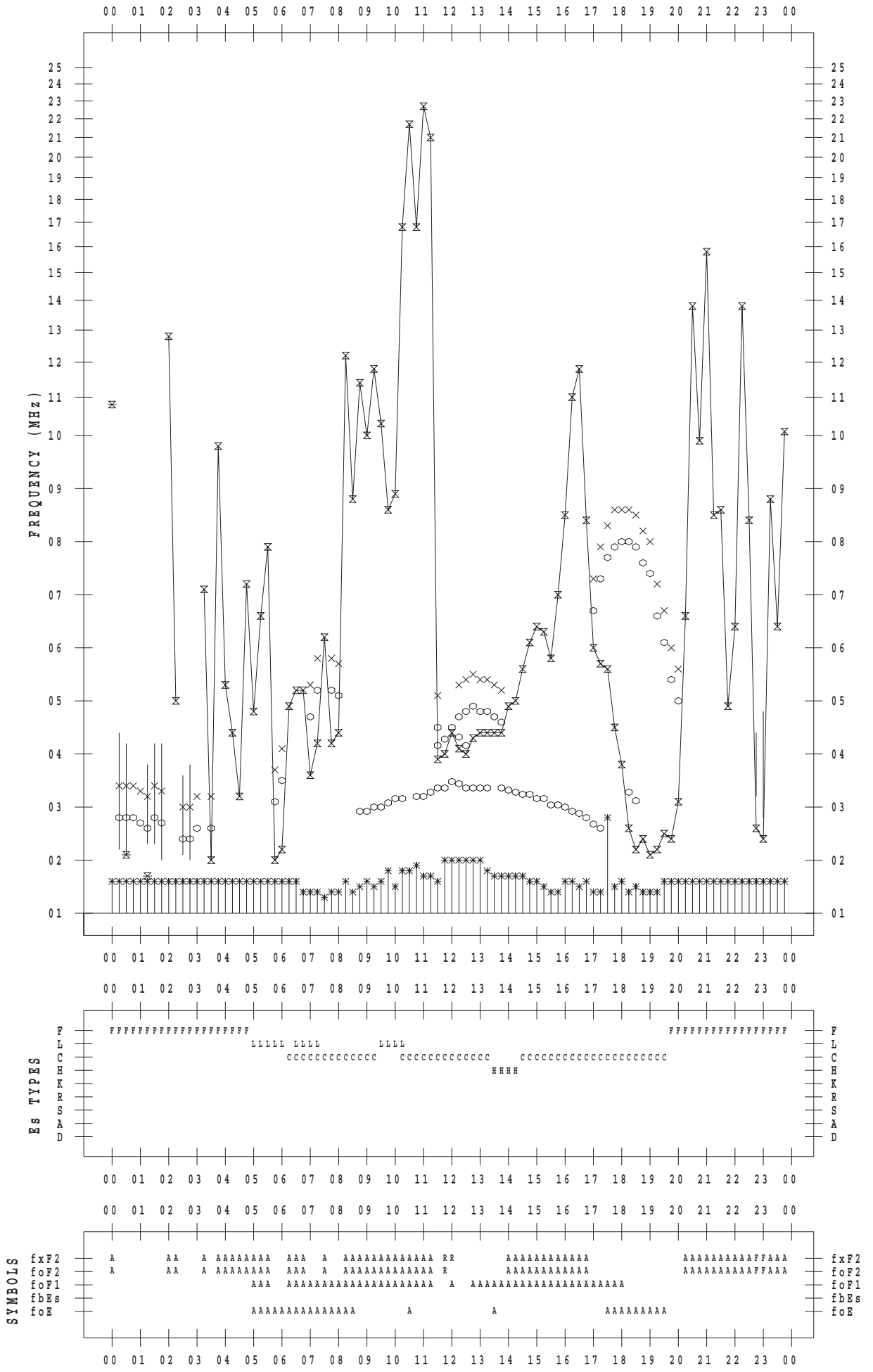
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/18

135 °E MEAN TIME



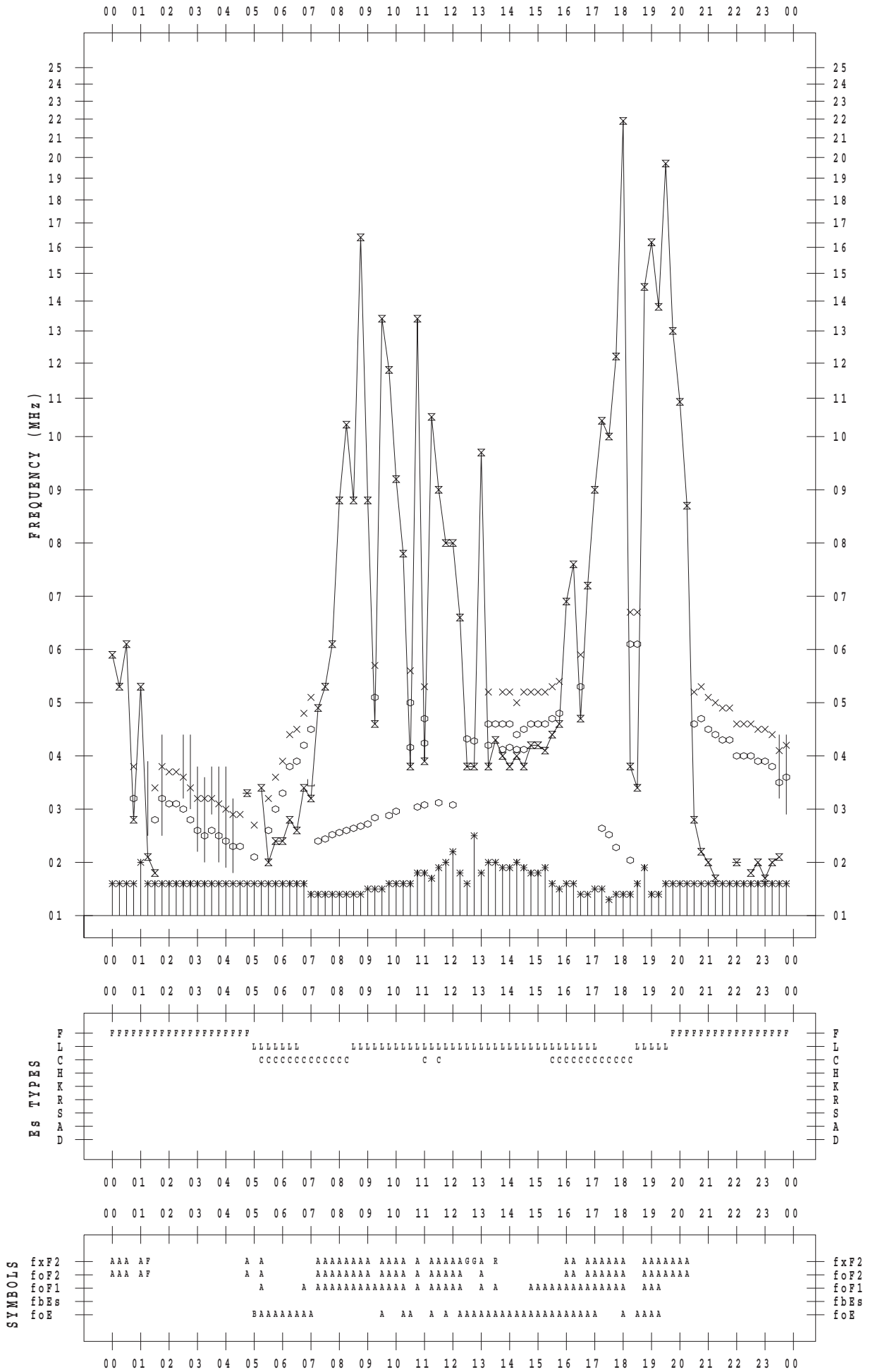
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/19

135 °E MEAN TIME



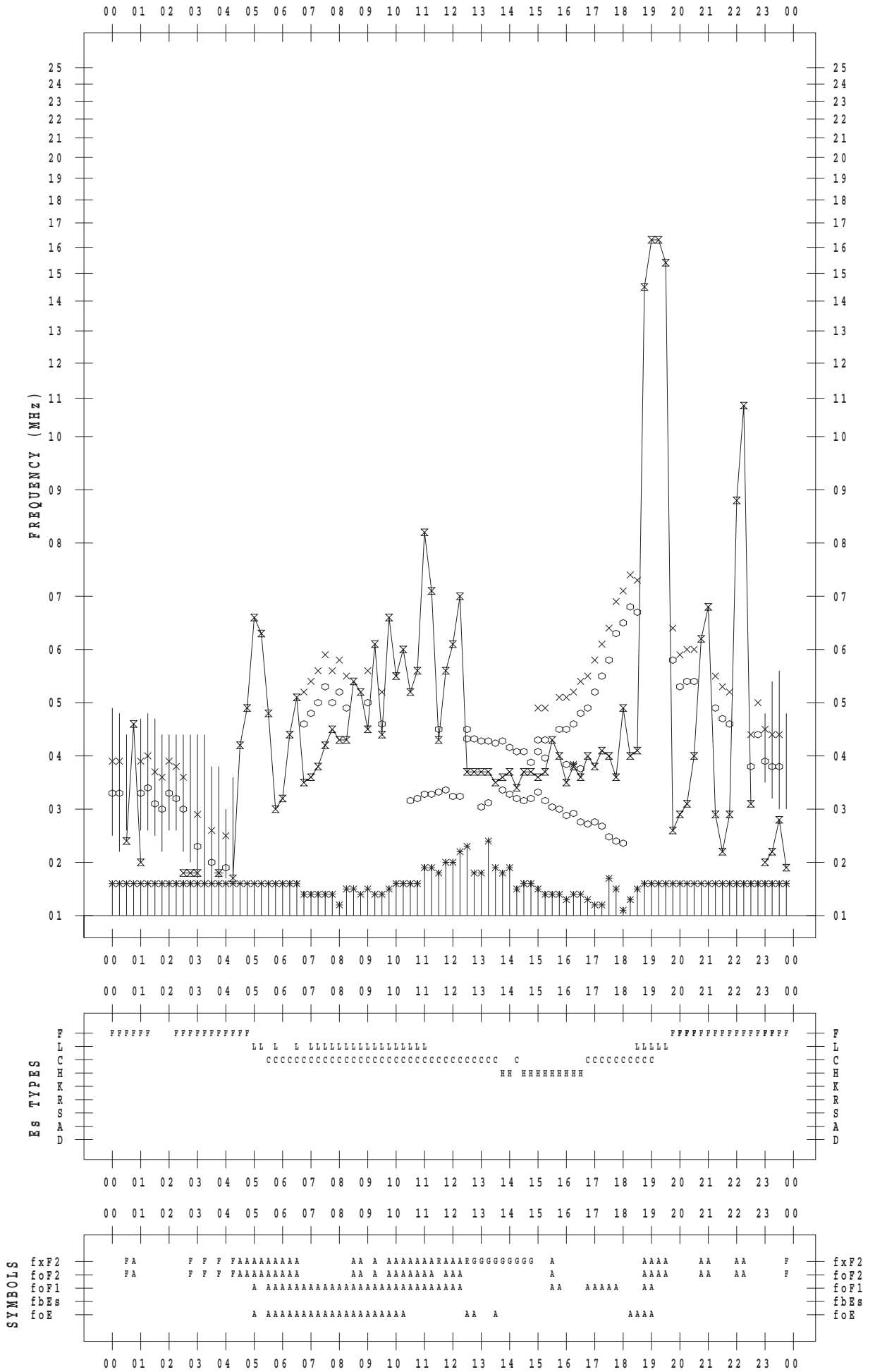
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/20

135 °E MEAN TIME



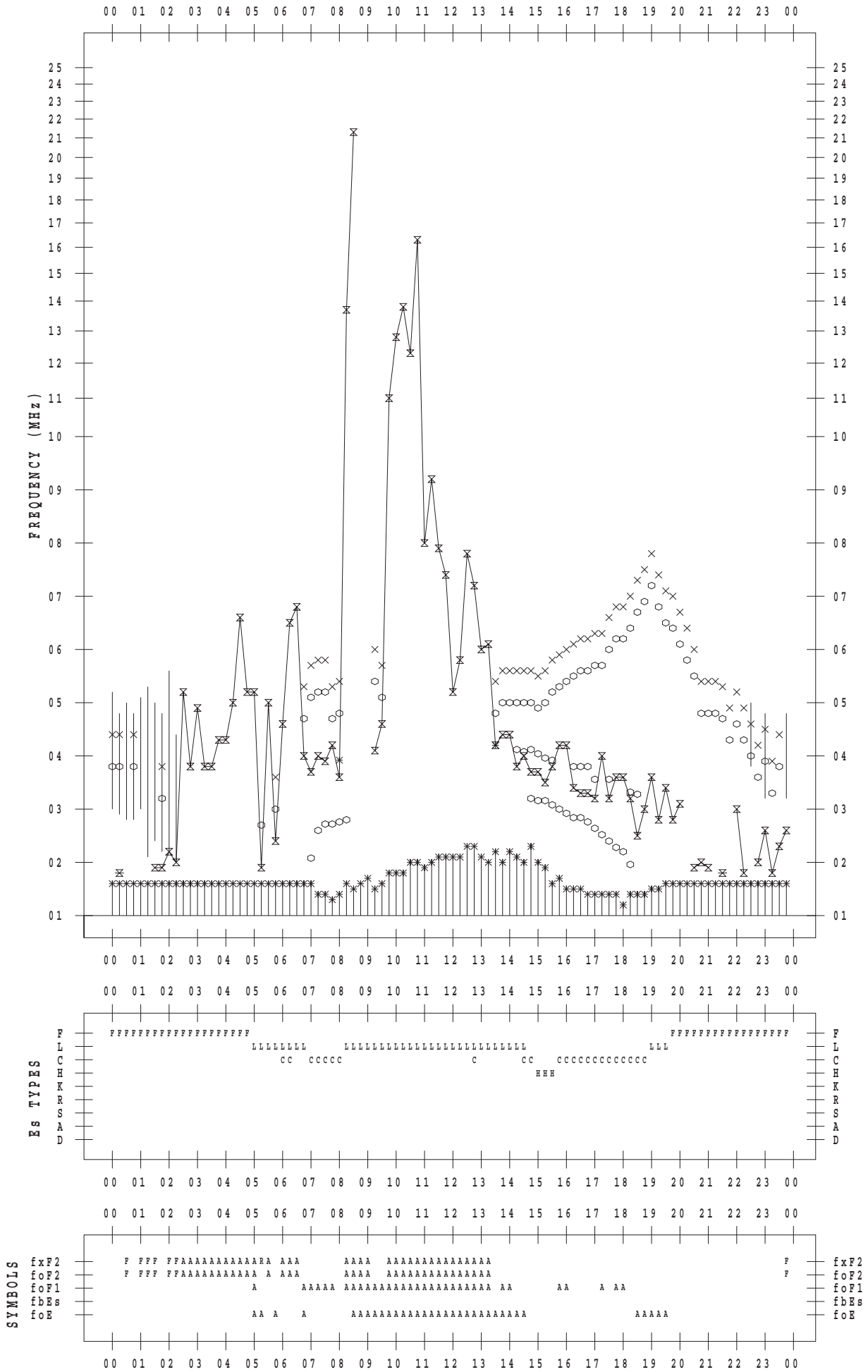
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/21

135 °E MEAN TIME



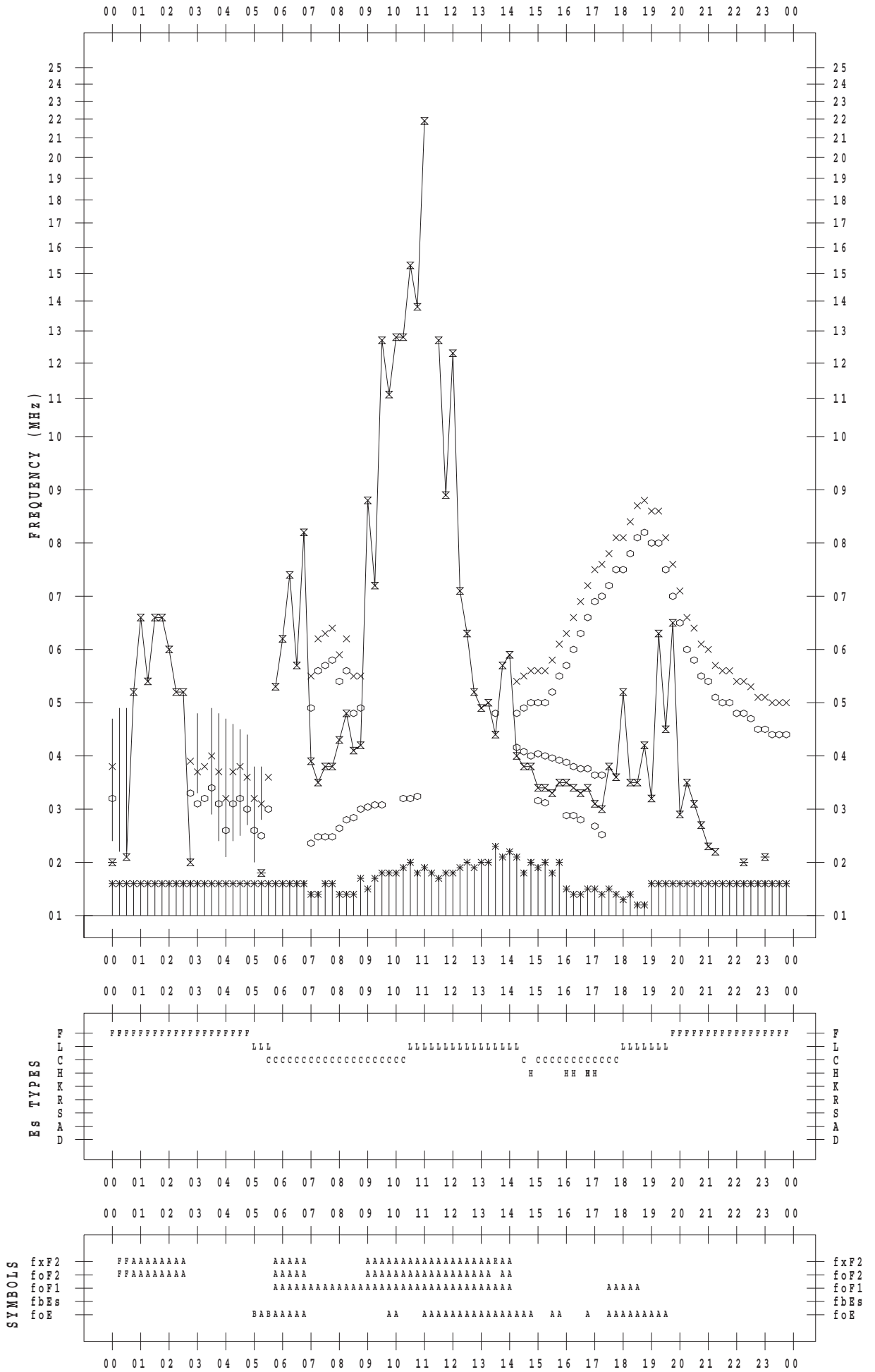
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/22

135 °E MEAN TIME



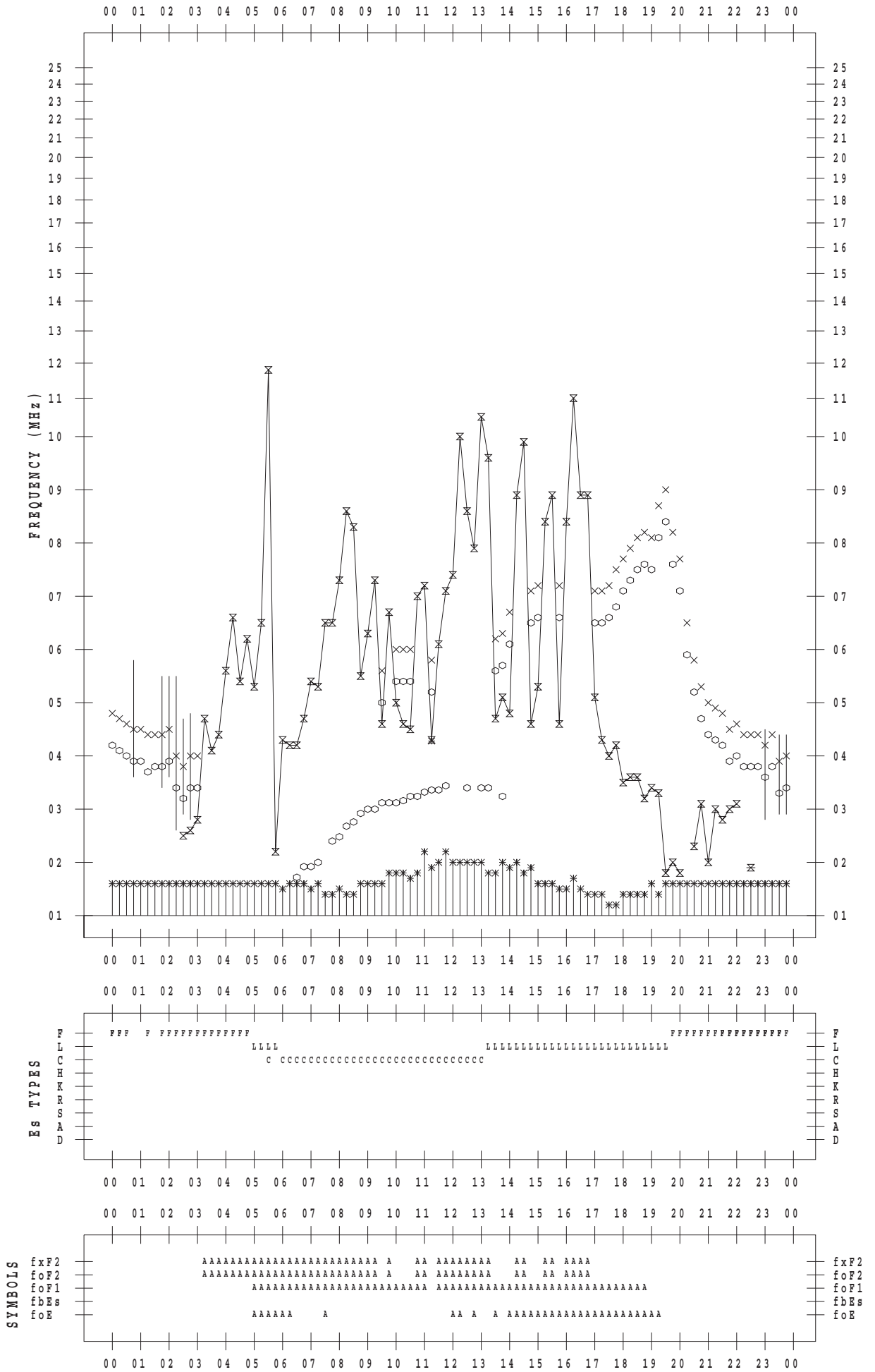
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/23

135 °E MEAN TIME



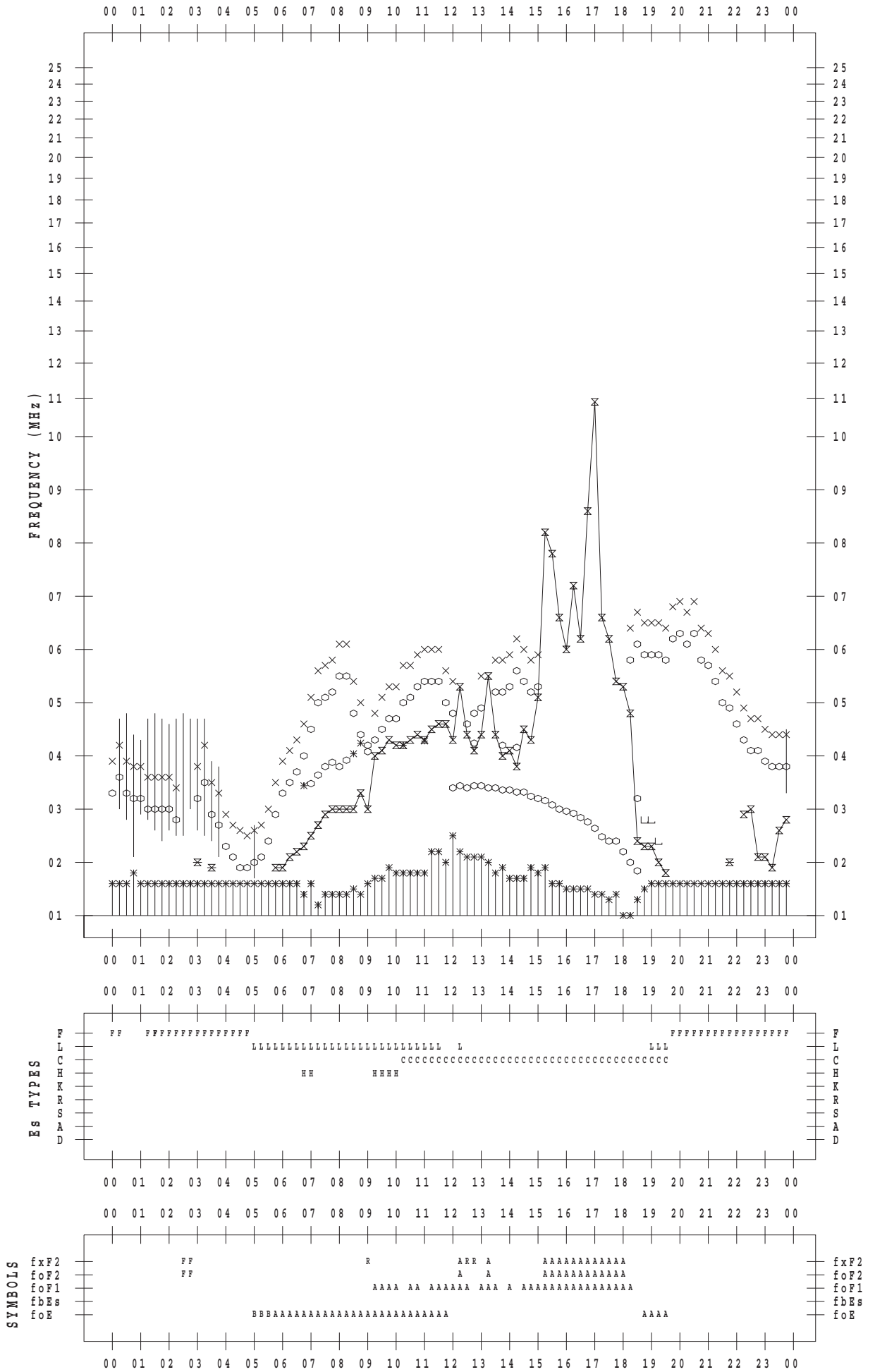
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/24

135 °E MEAN TIME



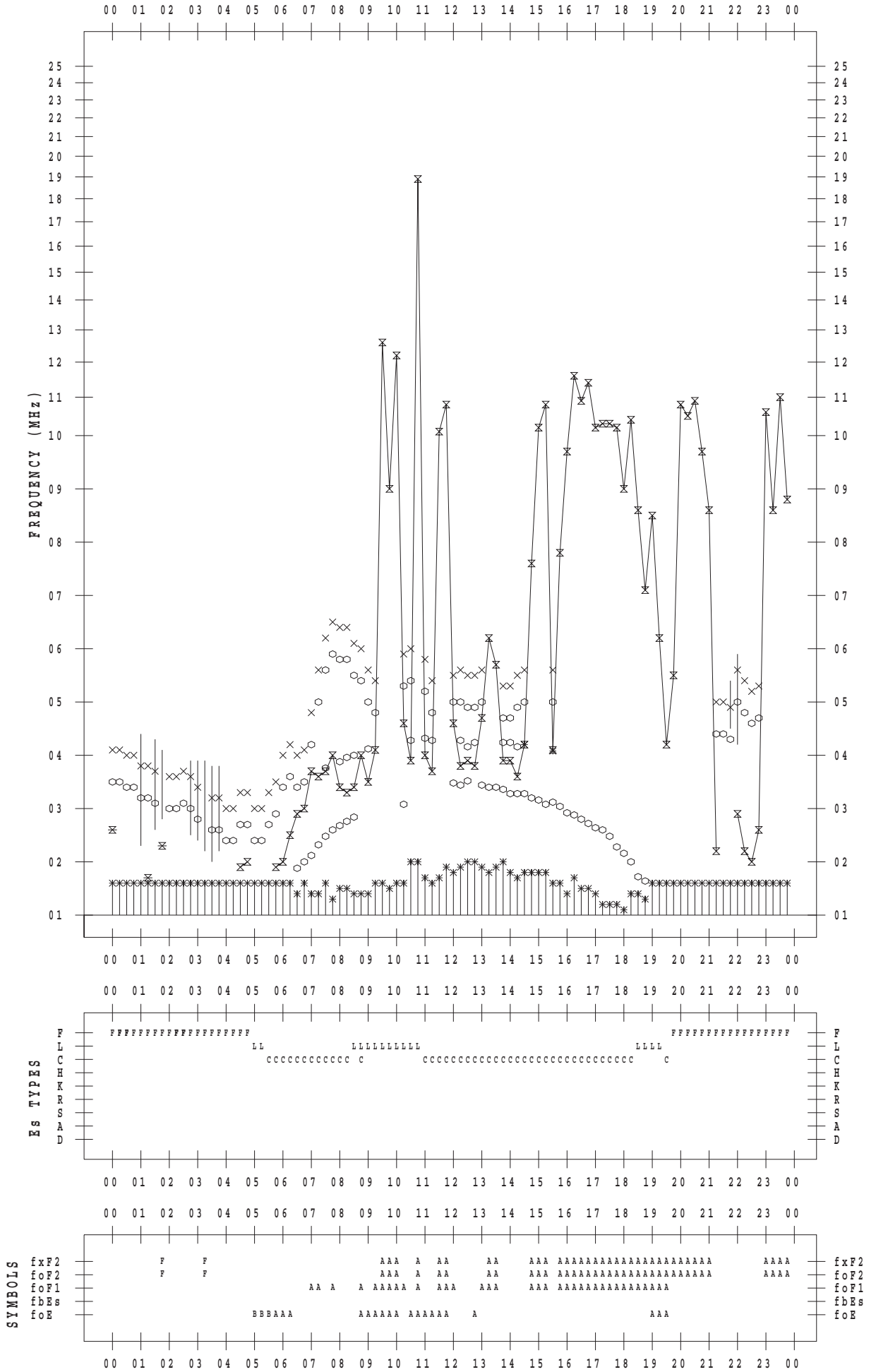
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/25

135 °E MEAN TIME



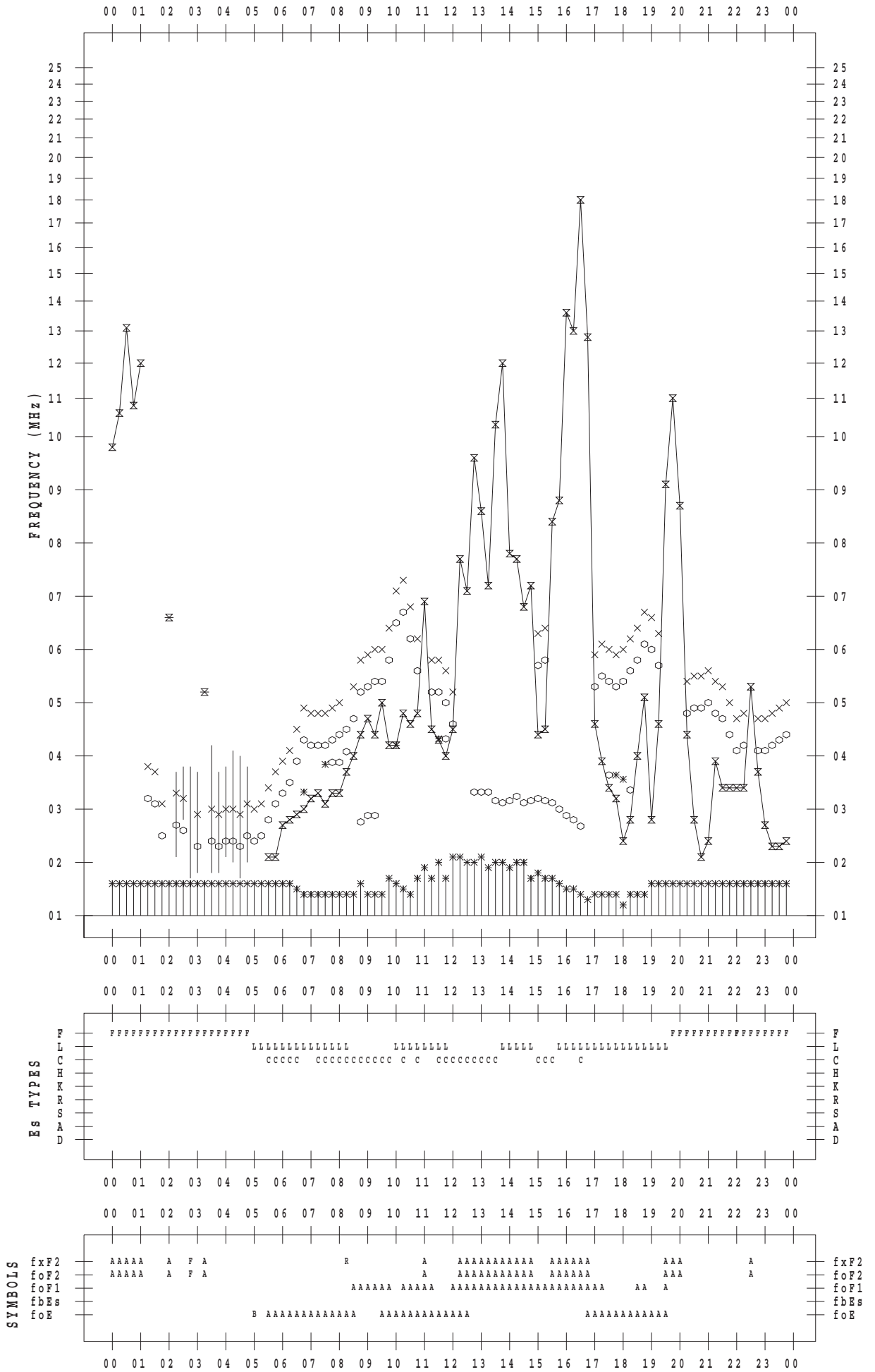
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/26

135 °E MEAN TIME



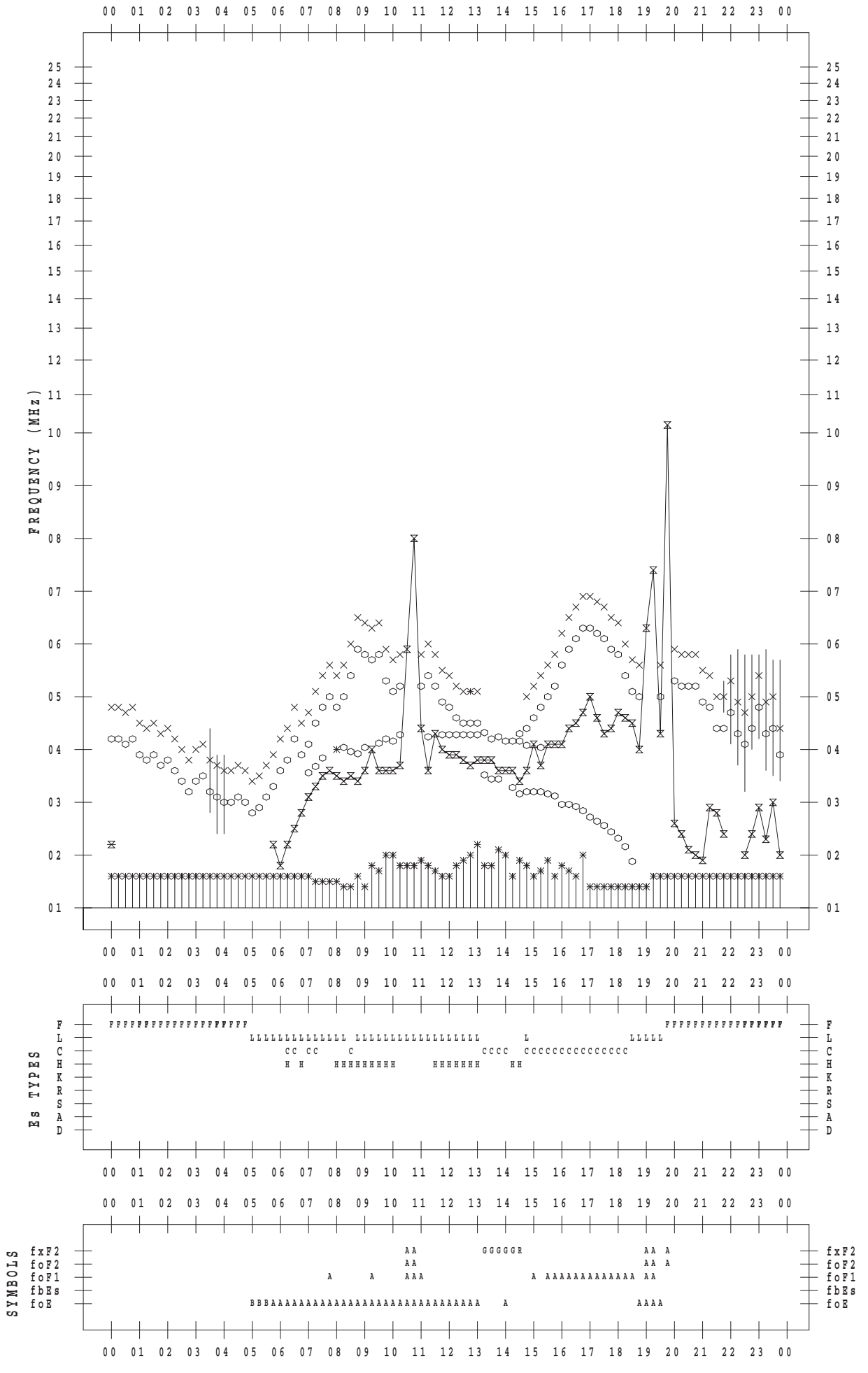
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/27

135 °E MEAN TIME



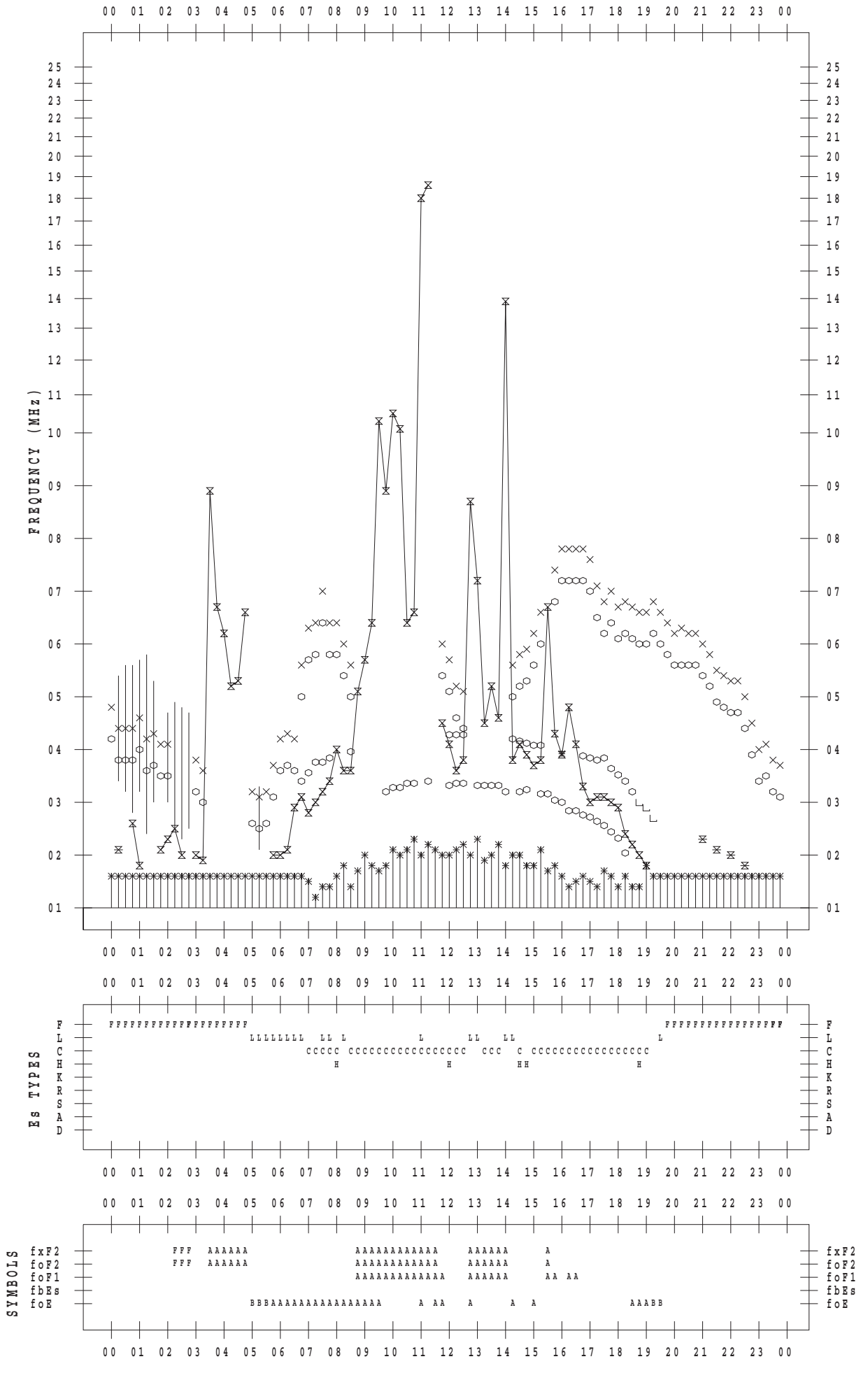
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/28

135 °E MEAN TIME



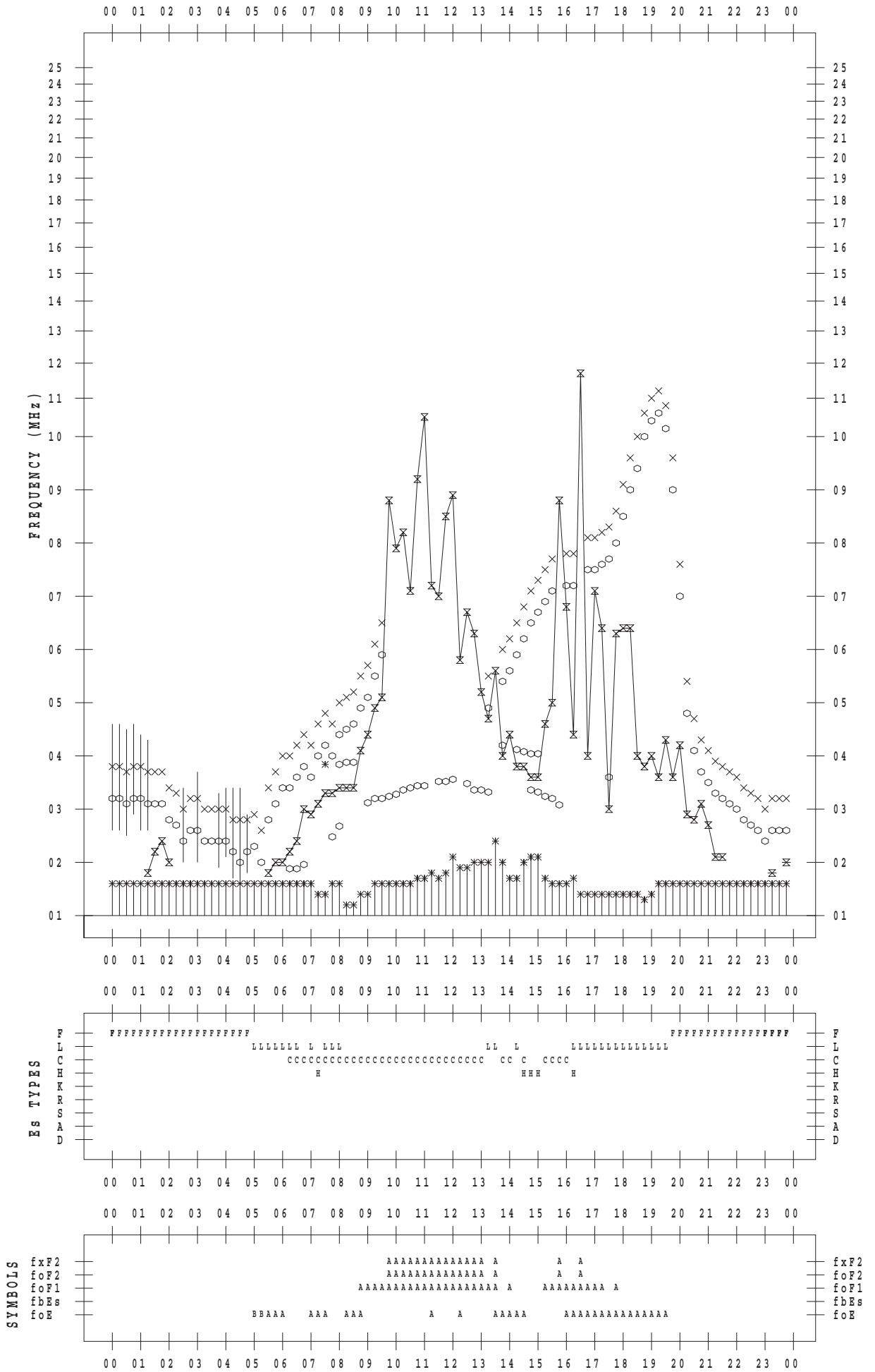
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/29

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/ 6/30

135 °E MEAN TIME