F-834

IONOSPHERIC DATA IN JAPAN

FOR JUNE 2018

VOL. 70 NO. 6

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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. 2018

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	51	A	A	A	A	A	A	87	149	A	A	88	A	A		59	47	189			78		51	50
2	46	50	47	42	40		42	A	A	A	A		A	A	55	51	50	53	54	A	54		54	48
3	43	37	34	31	A	A	45	52	A	A	A	A	A	A	A	50	46	51	104	54	60	51	47	43
4	48	40	38	38	34	34	A	A	A	59	48	A	A		55	54	A	A	A	48		54	52	50
5	43	40	40	A	40	45	64	46	A	A	A	A	A	A	A	A	55	51	48	54	189	55	54	52
6	50	52	47	42	44		A	A	A	133	126	A	A	A		A	84	58	85	52	A	34	A	A
7	A	A	A	44	49	39	A	126		62		A	A	63	89	59	60	58	61	57	58	58	A	53
8	51	52	52	54	54	57	50	56	A	A	A	54	A		A	55	61	65	62	63			54	A
9	48	47	42	39	43	49	50	A	A	A		49	A	57	A	55	A	47	104	A	52	64	65	52
10	47	38	42	42	47	52	55	A	A	A	A	A	A	A	52	55	52	A	52	54	63	54	51	54
11	49	44	43	41	41	47	47	A	51	A	A	A	67	63	A	55	A	A	A	A	54	66	55	A
12	A	A	37	40	40	48	54	65	A	C	C	C	C	C	C	C	C	139	198	A	54	51	52	52
13	47	42	38	37	A	A	55	A	57	84	A	A	64	A	A	48	111		A	A	109	52	A	45
14	42	40	40	40	44	47	52	58	A	99	169	99	A	A	A		56	A	A	63	72	65	64	58
15	50	54	50	49	47	72	55	A	84	C	C	C	C				A	189	45	A	A	A	54	55
16	54	50	47	47	52	50	44		106	A	A		51	A	38	50	51	43	48	52	62	54	54	54
17	A	48	42	42	A	44	A	105	122	162	A	A	A	57	50	A	A	A	84	A		63	58	A
18	A	46	42	47	42	48	51	54	49	A	52		55	A	57	60			A	110	A	A	A	A
19	A	52	A	A	A	A		120	154	A		A	A	A	A	A	46	A	A	A	43	54	54	52
20	52	48	47	A	85	52	51	149	54	46	A	A	A	44	A	A	48	A	54	55	55	51	54	52
21	A	A	52	52	49	52	53	108	54			A	210	A	45	A	A		86	111	A		54	49
22	50	47	A	A	A	A	111		169		109	A	A	142	128	164	140	A	A	57	A	A	A	54
23	A	46	A	A	A	A	80		A	A	A	A	N	A	A		149		85	58	54	54	66	51
24	50	A	A	A	A	86	89	A	A	A	A	A	A	A	A	A	A	104	A	A	67	54	A	A
25	42	47	51	47	47	48	A				A	A	A	A	A	A	A	54	55	84	A	54	A	54
26	52	49	A	47	40	47		167	109	A	A	A	A	A	A	A	A	118	91	57	55	64	58	50
27	51	47	46	52	A	50	52	A	88	85	45	A	A	70	A			143	108		60	A	A	A
28	A	A	A	A	A	40			150	106	146	A		A	A	A	A	43	A	A	A	A	A	48
29	49	A	A	A	A	40	52	89		110	A	102	A	A	A	A	N	105	A	52	54	54	A	54
30	A	A	A	32	A	48	A	156					A	A	67	A		A	A	90	A	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	21	22	20	21	18	22	20	15	14	10	7	5	5	7	10	13	15	17	18	18	19	21	20	22
MED	49	47	42	42	44	48	52	89	97	92	109	88	64	63	55	55	55	58	73	57	58	54	54	52
U Q	51	50	47	47	49	52	55	126	149	110	146	100	138	70	67	59	84	128	91	63	67	60	56	54
L Q	46	42	40	39	40	45	50	56	54	62	48	51	53	57	50	50	48	51	54	54	54	53	53	50

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HOURLY VALUES OF fEs AT Wakkanai

JUN. 2018

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	60	58	59	57	154	44	73	70	105	95	134	94	77	159		34	46	119			116		G	G
2	28	G	G	G	27		178	51	59	61	53		61	92	56	34	47	65	50	43	55		35	38
3	32	G	G	25	34	52	45	61	93	69	56	47	50	66	40	32	34	49	95	35	26	26	G	34
4	G	G	G	G	G	36	52	64	60	55	56	64	114		43	75	127	71	57	48		40	56	41
5	27	54	34	34	G	32	40	44	52	63	65	76	57	74	144	70	38	33	38	59	34	59	34	G
6	G	G	G	G	G		51	112	113	127	131	112	77	81		69	74	56	85	36	54	35	71	65
7	116	74	71	58	35	39	57	108		60		152	97	85	94	46	127	32	34	49	44	50	91	48
8	103	G	G	G	26	32	40	59	69	65	92	116	116		61	57	91	59	45	50			53	65
9	G	34	24	107	35	35	48	60	69	59		52	72	54	60	56	71	38	75	65	58	44	49	29
10	27	32	28	G	27	38	86	69	71	56	69	102	62	146	40	79	51	58	54	29	40	29	28	30
11	29	G	38	127	G	42	46	72	153	60	60	130	59	76	49	57	57	52	70	58	40	40	59	70
12	40	40	33	32	28	41	54	62	116	C	C	C	C	C	C	C	C	84	111	69	51	26	45	32
13	70	G	28	33	79	50	45	157	53	60	61	72	67	84	118	37	78		126	134	85	86	133	59
14	G	24	G	103	28	38	146	49	164	60	141	90	97	61	63		51	74	54	50	58	28	G	G
15	G	G	26	30	38	34	115	60	94	C	C	C	C				70	92	48	58	69	110	32	23
16	27	11	G	26	G	38	48		71	59	54		50	46	40	38	36	43	44	34	32	34	36	32
17	69	33	30	34	43	45	94	106	137	95	64	65	114	57	64	116	53	53	88	128		40	49	107
18	60	25	G	G	26	34	104	56	84	53	40		54	59	92	53			116	94	168	92	113	84
19	72	54	94	94	92	73		83	128	83		107	48	86	53	65	48	90	69	128	69	48	70	39
20	28	30	61	60	94	58	60	112	48	39	94	92	59	34	138	37	29	46	56	40	54	60	28	G
21	44	60	39	69	145	34	55	112	58			142	133	59	32	59	151		87	136	150		87	28
22	G	58	60	118	110	92	90		144		104	133	110	112	128	125	134	143	136	39	58	116	130	69
23	59	43	60	59	44	39	72		72	146	108	116	127	118	69		118		90	56	46	55	25	G
24	34	56	112	112	70	72	89	90	60	57	56	51	40	75	112	115	110	85	93	166	83	40	59	60
25	34	41	43	39	60	70	59				103	114	95	101	71	46	52	41	50	63	85	34	65	59
26	92	30	44	40	111	38		122	68	49	94	79	60	60	69	102	92	113	96	G	G	G	G	26
27	34	40	40	59	40	42	158	58	81	85	64	92	62	70	60			79	117		40	93	111	91
28	108	113	74	60	114	38			97	84	152	144		103	130	109	88	26	92	54	60	88	127	57
29	39	108	57	42	60	33	54	59		116	112	124	65	91	137	110	146	74	54	50	25	38	111	70
30	89	58	54	31	41	54	62	90					95	58	60	153		121	112	94	69	34	49	59
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	28	27	25	26	24	23	24	27	26	26	25	26	26	29	28	27	26	30	30
MED	34	34	36	40	39	39	59	69	76	60	69	98	67	76	64	59	70	62	75	55	55	40	51	40
U Q	69	56	59	60	79	51	90	107	113	84	108	120	97	92	112	105	110	85	95	81	69	60	87	65
L Q	27	G	G	26	27	35	48	59	60	58	56	74	59	59	53	42	48	46	52	41	40	34	32	28

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

JUN. 2018

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	15	14	14	15	14	14	14	14	15	14	15	24	20	15		15	15	14			14		14	14
2	16	14	15	14	14		14	14	15	16	14		17	16	15	15	14	14	14	14	14		14	14
3	14	14	14	15	14	14	14	14	15	14	14	18	26	22	22	17	15	14	14	14	14	15	15	14
4	14	14	14	15	14	15	14	14	14	16	20	24	22		23	17	15	14	14	14		14	14	15
5	15	14	14	14	14	14	14	14	15	15	20	21	21	21	22	17	15	14	14	14	14	16	14	17
6	14	14	14	14	15		15	14	15	14	27	16	18	20		15	14	14	14	14	14	15	14	14
7	14	14	14	14	14	14	14	15		16		20	21	21	21	14	16	14	14	14	14	14	14	14
8	15	14	14	14	14	14	14	14	17	21	18	18	20		16	14	15	14	14	14			14	14
9	16	14	14	14	14	14	14	14	15	16		18	16	21	20	15	14	14	14	14	14	15	15	14
10	14	14	14	14	14	14	14	14	15	17	15	16	16	15	14	17	14	14	14	14	14	14	14	14
11	14	14	14	14	14	15	14	14	14	15	21	21	18	17	21	23	18	15	15	14	14	14	14	14
12	14	14	14	14	17	14	14	16	15	C	C	C	C	C	C	C	C	14	14	14	14	14	14	14
13	14	14	14	14	14	14	14	14	18	16	22	16	17	18	18	15	14		14	14	14	14	14	14
14	14	14	14	14	14	14	14	14	15	20	18	17	15	20	16		17	14	14	14	14	14	15	14
15	15	16	15	14	14	14	14	15	16	C	C	C	C				15	15	14	14	14	14	14	14
16	15	15	14	15	16	15	14		15	15	32		22	18	15	16	15	14	15	14	14	14	14	14
17	14	14	14	14	14	14	14	14	15	20	20	26	20	22	22	17	15	14	15	14		14	14	14
18	14	14	14	14	14	14	14	14	15	15	15		22	15	15	22			15	14	15	14	14	14
19	14	14	14	14	14	15		17	18	17		22	20	29	21	20	20	14	15	14	14	14	14	14
20	15	15	14	14	14	14	14	14	16	20	23	18	24	17	22	21	15	15	14	14	14	14	14	15
21	14	14	14	15	15	14	15	16	15			29	24	16	17	16	15		14	14	14		14	14
22	14	14	14	14	14	14	14		14		20	23	20	18	15	16	14	14	14	14	15	14	14	15
23	15	14	14	14	14	14	15		15	21	23	18	23	22	23		16		17	14	14	14	14	15
24	14	14	14	14	14	14	14	17	15	15	16	23	21	26	23	18	15	14	14	14	14	14	14	21
25	15	14	14	15	14	14	15				18	20	16	17	17	14	14	14	14	14	15	14	14	14
26	14	14	14	14	14	14		15	14	14	17	17	22	23	22	15	15	14	15	17	14	15	15	15
27	14	14	14	14	14	14	14	15	15	15	17	23	23	22	20			15	15		14	15	14	14
28	15	14	14	14	14	15			18	17	21	26		16	18	15	18	15	14	14	14	14	14	14
29	14	14	14	14	14	14	14	17		18	18	20	22	22	17	16	14	14	14	14	15	14	14	14
30	14	14	14	14	14	14	14	16					23	26	22	14		14	14	14	15	14	15	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	28	27	25	26	24	23	24	27	26	26	25	26	26	29	28	27	26	30	30
MED	14	14	14	14	14	14	14	14	15	16	18	20	21	20	20	16	15	14	14	14	14	14	14	14
U Q	15	14	14	14	14	14	14	15	15	17	21	23	22	22	22	17	15	14	15	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	15	15	16	18	18	17	16	15	14	14	14	14	14	14	14	14

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

JUN. 2018

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	37	35	A	51	59	73	A	108	139	58	A	68	71	56	63	73	80	80	A	52	51
2	52	49	44	43	44	A	51	A	A	A	A	A	A	139	A	65	59	51	A	86	A	A	52	52
3	47	A	39	39	28	A	A		58	50	A	A	A	A		56	63	54	62	A	58	A	A	39
4	37	37	36	31	28	36	A	A	A	A	A	A		55	144	64	58	56	56	A	54	38	A	A
5	A	34	37	24	35	A	45	A	56	51	109	A	A	72	54	58	70	129		A	50	46	A	A
6	42	44	42	A	37	41	48	52	53	A	103		110	A	111	A	110	64	A	A	A	A	A	A
7	A	A	A	A	31	39	A	55	65	74	139	139		62	67	72	77	71	66	71	52	52	51	51
8	A	A	49	44	A	49	47	A	78	83	111	108	139	A	127	A	66	75	74	72	119	A	A	109
9	A	A	A	A	A	44	51	A	A	88	141	187		76	108		56	51						
10																55	63	65	66	68	55	52	52	51
11	48	42	34	28	A	39	38	50	65	A	A	55	A	A	A	55	63	73	75	75	52	51	52	51
12	48	A	A	A	36	49	A	57	79	110		99	A	A	52	55	55	56						
13												192		131		177	172	49		67	79	A	111	A
14	A	A	A	A	A	A	A			129	A	A	A	A	A	108	119	68	66	67	68	67	54	52
15	54	51	50	42	36	42	49	54		109	C	128	131			55	109	A	76	49	A	51	54	
16	A	A	A	36	36	47	41	54	48	58	A	58	A	A	A	51	55		58	51	A	52	49	49
17	47	A	A	A	A	A	47												62	A	55	50	52	A
18	52	A	47	A	A	A	A	A	83	A	84	178	N	160	140	109		179						
19										189	189	A	90	182	140	117	A		54	47	54	52	A	51
20	48	45	37	32	A	N	149	A	A			139	A	A	A	71	51	A	48	51	52	A	A	46
21	A	A	A	34	36	42	47	51	A	A		N	157	A	N	91			106	130	A	52	A	A
22	43	36	A	A	32	A	51		A	A	A	109	55	A	A	79		N	100	111	54	47	A	36
23	A	A	A	A	A	40	48	66	A	68	A		A	52		66	110	110	69	63	54	54	52	64
24	46	A	A	A	A	49	103	142	109	A	A	A	A			A	A	55	53	66	51	37	36	32
25	A	32	34	34	31	43				119		A	A	A	A	A	110	A		A	A	A	52	50
26	A	A	A	A	32	38	51		A	109	142	145	136	109	128		54	79	54	49	66	A	55	54
27	48	A	32	54	A	A	50	111	89	49	A	A	A		A	A	A	62	63	55	A	44	42	39
28	51	A	A	30	30	34	A	A	110	148				55	A	51	52	51	48	56	64	A	36	A
29	A	A	A	A	A	39	47	42	83	176	100		A	79	106	A	79	56	56	63	64	52		A
30	A	36	A	31	32	38	46	49		56	A	A		A	A	A	A	A	A	A	47	A	51	65
31																								
	00	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	10	12	15	16	17	19	13	14	17	10	13	8	12	12	20	22	21	21	20	20	16	17	18
MED	48	40	38	34	34	41	48	54	76	88	110	139	120	78	110	66	63	63	63	66	54	52	52	51
U Q	51	45	45	42	36	45	51	62	83	124	141	161	137	135	134	85	109	74	73	73	65	52	53	52
L Q	46	36	35	31	31	38	47	50	58	57	103	103	74	58	67	55	56	54	55	53	52	46	50	46

HOURLY VALUES OF fEs AT Kokubunji

JUN. 2018

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	73	90	59	30	31	33	37	50	50	70	69	65	69	72	29	28	28	50	36	46	60	70	45	40
2	37	30	30	33	34	53	48	57	82	78	95	71	114	150	70	G	G	29	59	70	86	131	129	43
3	43	67	34	33	69	50	43		52	47	74	50	139	59		G	35	45	43	78	83	60	57	50
4	35	34	34	31	28	31	39	74	62	78	71	49		53	146	G	27	26	32	62	38	34	70	41
5	58	40	28	29	G	57	29	48	44	52	103	111	117	72	48	G	70	70		86	34	37	59	71
6	110	33	55	42	G	27	40	44	57	161	71		58	47	74	69	90	64	114	146	69	84	90	113
7	59	55	38	45	34	31	54	51	82	126	104	32		50	45	45	46	38	38	26	G	31	34	29
8	65	91	40	37	59	G	43	60	65	68	107	104	89	75	103	64	53	42	35	53	180	116	148	81
9	86	86	59	57	57	31	45	70	70	72	97	139		64	72		26	46						
10																33	54	51	37	31	35	53	39	57
11	29	34	30	G	33	31	40	43	71	67	71	43	53	56	50	45	53	42	41	37	55	35	57	34
12	38	57	48	43	37	45	52	61	57	117		95	104	117	54	34	37	36						
13												148		166		69	97	71		92	92	109	82	82
14	56	57	57	45	71	46	77			78	70	78	70	53	64	101	87	46	52	35	32	30	34	46
15	42	34	29	G	G	34	36	45		81	C	67	89			35	54	72	54	43	80	71	56	
16	56	60	49	35	G	42	37	43	57	56	69	57	49	64	50	45	54		42	57	72	48	43	40
17	43	55	39	59	43	41	48												72	60	82	56	55	60
18	73	81	60	84	57	35	53	100	71	102	81	144	150	106	130	78		126						
19										179	92	57	98	125	137	95	86		53	32	34	42	72	46
20	34	39	27	36	60	90	117	56	56			110	42	49	59	53	51	60	50	33	33	70	55	55
21	91	60	72	35	39	28	180	41	64	73		135	118	71	114	81			93	53	58	34	113	59
22	41	35	49	52	43	32	52		84	69	103	87	55	71	75	81		61	63	83	53	42	57	59
23	94	70	42	56	70	20	35	54	67	85	77		63	47		57	62	87	54	50	55	53	G	36
24	35	81	90	78	59	60	84	116	84	77	68	67	48			36	37	44	34	32	31	23	G	G
25	33	26	27	G	G	32				79		43	41	50	102	57	89	73		136	149	57	54	53
26	58	49	57	45	31	36	41		72	109	166	181	113	109	67		65	79	43	30	40	60	56	31
27	40	50	29	59	79	117	60	107	91	50	62	75	34		52	93	55	62	51	55	42	72	28	60
28	59	55	50	G	33	30	50	53	63	120				75	78	37	29	G	35	53	37	110	37	84
29	85	86	72	140	66	33	42	38	72	92	80		128	113	64	72	69	39	40	33	34	106		59
30	42	G	35	G	G	36	59	88		56	97	155	G	50	80	129	106	69	61	92	44	60	55	83
31																								
	00	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	27	27	27	27	26	21	22	26	21	24	23	25	23	27	26	26	24	27	27	27	26	26
MED	56	55	42	37	37	34	46	54	66	78	80	76	70	71	70	53	54	50	46	53	53	57	56	54
U Q	73	70	57	56	59	46	54	72	72	102	100	123	114	107	102	78	70	70	56	78	80	72	70	60
L Q	38	34	30	30	28	31	40	44	57	68	70	57	49	51	52	34	37	42	37	33	34	37	39	40

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HOURLY VALUES OF fmin AT Kokubunji

JUN. 2018

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

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HOURLY VALUES OF foF2 AT Yamagawa

JUN. 2018

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	36	31	26	40	74	A	A	A	A	A	54	68	80	80	76	84	86	N	A	A	42
2	A	A	42	48	38	45	A	A	46	86	A	101	A	A	81	80	80	77	68	64	A	A	A	A
3	52	A	A	51	34	34	A	A	A	A	A	A	A	A	52	65	A	67	60	A	54	A	42	A
4	42	40	36	A	A	30	A	53	53	A	A	A	A	A	64	68	78	72	A	A	48	A	37	A
5	A	A	A	31	28	36	42	50	50	A	A	59	56	56	63	72	A	82	A	A	51	53	48	A
6	29	A	A	A	32	23	44	A	50	57	57	A	A	A	54	71	78	78	63	A	51	51	47	A
7	A	38	A	A	32	32	40	A	A	A	149	A	58	65	71	78	85	82	76	73	52	52	48	A
8	43	47	A	A	40	40	51	53	A	A	A	A	140	154	129	59	64	73	76	78	66	47	A	A
9	A	A	A	A	A	36	48	A	A	A	A	A	108	A	52	57	67	74	73	65	63	54	56	A
10	42	47	52	42	42	38	89	A	A	A	A	A	A	A	129	A	A	76	A	A	A	A	34	45
11	47	42	A	A	31	B	40	A	65	A	A	A	A	103	A	60	75	88	A	A	A	51	47	38
12	A	34	40	37	34	34	A	A	A	A	N	108	127	A	A	A	A	64	60	A	56	55	A	A
13	A	A	A	A	A	A	A	A	A	A	A	A	55	62	57	50	52	129	A	A	A	A	A	A
14	A	36	34	31	A	A	A	52	41	A	A	A	N	A	A	104	109	72	A	109	54	55	54	52
15	51	52	54	A	A	A	44	A	A	A	A	A	A	A	85	A	86	A	54	A	A	34	51	A
16	A	A	43	A	32	28	A	A	51	A	A	A	A	57	A	57	66	76	44	50	52	43	A	A
17	A	A	34	A	31	34	A	50	53	A	62	109	A	150	A	A	71	A	69	55	A	52	48	47
18	A	A	A	A	31	30	A	48	54	62	A	A	101	85	A	71	82	66	55	53	A	A	54	A
19	A	47	A	40	A	A	30	A	A	A	A	A	A	A	79	144	A	52	A	A	54	A	42	42
20	42	42	39	34	32	34	42	44	A	A	A	A	A	A	A	A	50	53	A	A	53	A	40	36
21	37	37	34	36	25	29	47	A	A	A	A	49	A	A	A	59	109	A	130	108	A	52	42	42
22	42	42	40	40	35	32	47	51	A	A	A	109	87	A	72	A	A	A	64	55	50	A	A	A
23	A	32	A	32	29	A	A	50	51	A	A	A	A	54	64	73	73	71	66	58	52	A	A	51
24	52	A	A	A	34	28	86	109	A	A	110	A	A	A	A	A	50	A	41	51	48	41	38	40
25	38	41	A	36	30	29	42	46	48	A	55	55	A	A	54	54	59	55	51	52	54	52	A	A
26	A	42	A	A	40	43	A	A	A	A	A	A	A	A	A	149	A	149	146	A	A	A	A	54
27	51	52	54	36	28	A	44	A	A	A	A	A	39	A	A	54	57	66	58	48	39	44	A	A
28	A	A	40	A	A	A	38	A	108	A	A	A	A	A	A	A	A	58	60	32	50	A	A	A
29	A	A	A	A	A	A	44	51	68	A	A	A	A	A	A	A	55	A	109	A	A	A	54	A
30	A	A	42	A	A	A	A	A	A	77	50	A	A	A	A	A	A	50	A	A	A	43	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	13	16	14	14	21	20	18	13	13	4	6	7	9	10	16	20	21	24	21	16	18	16	17	11
MED	42	42	40	36	32	33	44	51	51	70	60	101	87	64	66	70	73	72	64	56	52	52	47	42
U Q	51	47	43	40	34	36	47	53	59	81	110	109	117	103	80	79	81	77	76	75	54	52	52	51
L Q	40	37	36	34	30	29	40	49	49	59	55	55	55	56	55	58	58	65	56	51	50	43	41	40

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HOURLY VALUES OF fEs AT Yamagawa

JUN. 2018

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	58	56	69	26	24	G	34	40	63	70	64	77	68	51	50	33	31	40	62	60	40	60	41	39
2	54	59	29	G	28	37	58	58	50	89	124	125	148	129	47	31	29	27	36	44	82	92	88	107
3	58	92	48	39	32	40	161	58	79	56	92	88	48	48	49	54	67	37	49	63	47	50	30	46
4	55	27	G	35	56	38	45	49	52	56	65	58	92	90	55	48	50	54	78	106	92	72	34	91
5	36	50	45	G	G	G	28	45	91	58	92	82	48	48	47	48	78	66	79	83	74	G	G	53
6	34	69	112	58	G	G	34	45	49	48	58	69	62	90	46	46	46	60	38	76	43	60	41	56
7	92	48	84	40	29	43	42	61	68	80	60	49	40	38	34	G	30	27	33	25	32	G	36	41
8	39	45	54	65	54	56	32	39	66	72	85	109	108	55	115	45	36	32	39	38	24	28	45	52
9	70	53	46	39	40	39	59	59	69	127	124	95	115	80	49	40	46	52	41	56	85	41	71	59
10	32	35	24	G	35	42	70	83	59	95	76	63	98	57	78	142	69	66	83	111	108	93	27	32
11	38	32	43	34	34	B	36	60	55	60	61	96	86	75	67	56	59	84	109	112	59	108	55	35
12	53	26	34	28	G	G	40	60	159	154	124	102	118	136	77	126	76	55	50	84	49	78	83	43
13	91	45	41	54	50	59	49	90	127	69	82	61	50	33	42	46	49	92	146	116	144	69	53	54
14	59	G	26	G	59	110	41	46	51	67	162	152	92	86	91	72	109	67	129	79	38	30	38	55
15	33	38	41	56	57	53	35	53	72	93	78	116	63	82	75	115	106	143	76	96	43	34	39	58
16	57	86	44	69	G	32	58	58	60	70	90	107	80	47	78	59	53	50	78	28	35	38	69	91
17	56	57	G	40	39	33	39	39	47	70	56	111	125	108	140	143	84	86	57	33	75	35	34	39
18	71	58	49	71	G	26	72	45	44	62	76	52	108	91	70	39	36	52	55	85	92	69	G	60
19	40	36	57	46	40	41	32	62	86	160	69	57	145	95	81	124	110	87	90	53	40	60	41	39
20	35	34	26	26	G	26	34	40	123	89	135	150	124	153	55	90	60	61	66	82	50	35	32	38
21	48	46	35	29	G	56	58	50	95	90	88	50	63	72	61	58	95	144	117	127	105	40	34	28
22	G	23	24	G	G	G	33	45	58	88	83	108	72	113	57	169	142	113	35	49	126	116	60	44
23	44	30	46	39	30	54	104	58	55	70	64	56	63	50	40	45	30	34	52	40	33	59	50	44
24	40	56	54	77	73	G	79	90	107	154	126	78	94	52	61	94	31	79	34	35	G	G	G	G
25	G	G	49	G	27	28	26	30	44	66	54	45	51	35	45	53	40	27	29	34	28	38	57	46
26	49	37	69	39	G	G	35	58	91	111	85	161	88	95	115	89	156	116	124	71	51	45	58	35
27	26	45	40	27	38	41	48	116	116	160	158	78	42	49	38	30	28	42	43	39	32	41	85	57
28	83	57	G	39	49	28	39	57	89	102	92	145	77	95	111	96	74	54	53	33	56	41	110	59
29	72	46	38	80	24	25	32	59	84	160	86	88	61	82	153	83	83	84	95	153	71	90	54	88
30	48	40	39	44	39	40	43	74	92	93	51	76	106	61	70	60	60	44	61	89	45	33	83	50
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	48	45	42	39	31	37	40	58	68	84	84	85	83	78	61	57	60	58	59	67	50	43	43	48
U Q	58	56	49	54	40	42	58	60	91	102	92	109	108	95	78	94	83	84	83	89	82	69	60	58
L Q	36	34	29	26	G	13	34	45	55	67	64	61	62	50	47	45	36	42	41	39	38	35	34	39

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

JUN. 2018

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	15	15	15	15	15	17	20	20	20	24	24	23	20	17	17	14	14	14	14	14	14
2	14	15	14	14	15	14	14	15	18	20	21	22	21	21	21	21	20	15	15	14	14	14	15	15
3	14	14	14	14	15	15	15	14	14	15	18	20	20	21	23	18	18	15	16	14	14	14	14	14
4	15	15	15	15	14	14	15	14	15	18	21	21	24	24	20	22	21	14	15	14	14	14	14	14
5	15	14	14	14	15	14	14	14	16	15	18	22	26	23	21	21	17	14	15	14	14	15	15	14
6	14	14	14	15	14	15	15	15	16	18	21	22	23	22	71	23	18	17	14	14	14	14	14	15
7	14	14	14	15	14	14	16	15	15	18	20	22	21	22	23	44	17	16	15	17	14	15	14	14
8	14	14	14	14	14	14	15	14	17	21	18	22	21	32	18	20	17	17	15	15	15	14	14	14
9	15	14	14	14	14	14	15	14	15	18	22	21	23	21	28	44	17	15	14	14	15	15	14	14
10	14	14	14	14	14	14	14	14	15	17	18	22	21	23	22	22	15	15	15	15	14	15	14	15
11	15	15	14	14	15	B	14	14	15	17	21	20	21	22	21	17	20	14	14	15	15	14	14	15
12	14	15	14	14	14	14	14	15	15	15	20	21	22	26	22	20	16	16	15	16	14	15	14	14
13	15	14	14	15	17	15	14	15	14	17	20	21	32	23	21	33	21	15	15	14	15	15	14	14
14	14	15	14	15	15	15	15	15	15	18	18	21	22	21	20	20	16	16	14	14	14	15	15	14
15	14	14	14	14	14	14	14	14	15	18	21	27	21	22	21	20	17	15	18	15	14	14	14	14
16	14	14	14	14	15	14	15	15	15	17	21	20	23	28	22	18	21	15	16	15	14	15	15	14
17	14	15	14	15	15	15	14	14	15	18	20	21	21	20	20	21	18	15	14	14	15	15	15	15
18	14	14	14	15	14	15	14	15	15	15	20	21	24	21	23	21	17	16	14	15	15	15	15	14
19	14	14	15	14	15	18	15	15	17	20	21	22	26	21	21	20	17	17	14	14	14	18	14	14
20	14	14	14	14	15	15	14	14	15	17	18	21	21	22	20	21	17	15	14	14	15	15	14	14
21	14	14	15	14	14	14	16	15	15	18	21	21	26	26	21	20	17	16	14	15	15	14	14	14
22	14	14	15	14	15	17	15	14	15	17	20	20	22	30	22	16	20	18	15	15	15	14	14	14
23	14	14	15	15	15	14	15	15	15	20	20	24	21	34	24	20	21	15	14	14	15	14	14	14
24	14	26	15	14	14	20	15	15	15	20	22	22	21	21	18	21	17	15	14	14	15	15	14	15
25	17	15	14	14	14	15	17	14	16	18	18	20	23	23	21	22	16	15	14	14	14	14	14	14
26	15	15	15	15	14	15	15	15	15	20	20	20	23	22	18	20	20	15	14	14	15	14	15	14
27	14	14	14	15	15	15	14	14	16	20	22	23	22	22	21	23	20	15	15	14	14	22	14	14
28	15	15	15	15	14	15	15	15	15	17	24	22	22	22	23	21	17	17	15	14	16	17	14	16
29	15	28	28	16	15	15	17	14	15	20	21	23	21	22	22	23	18	17	15	14	15	14	14	14
30	14	15	14	15	15	15	16	14	15	21	18	23	26	21	21	21	17	15	15	14	14	14	20	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	14	14	14	15	15	15	14	15	18	20	21	22	22	21	21	17	15	15	14	14	14	14	14
U Q	15	15	15	15	15	15	15	15	16	20	21	22	24	24	23	22	20	16	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	15	17	18	21	21	21	21	20	17	15	14	14	14	14	14	14

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF foF2 AT Okinawa

JUN. 2018

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

HD \ 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	34	A	N	A	77	54	50	A	A	52	A	64	78	81	78	86	104	84	37	36	A
2	A	A	A	A	36	34	52	59	A	104	A	A	75	85	92	97	96	94	101	104	86	A	52	50
3	A	A	A	A	41	34	A	49	75	52	A	A	175	A	A	73	86	76	71	A	54	A	43	42
4	A	A	A	A	A	A	42	65	A	A	A	52	64	85	91	104	110	108	97	A	45	A	A	A
5	A	38	A	A	A	23	41	49	52	A	51	49	61	73	77	87	96	98	86	72	68	A	51	A
6	42	42	A	A	36	34	41	51	A	55	57	A	A	58	62	80	86	81	78	65	A	54	A	47
7	A	A	40	34	34	32	42	53	48	A	A	51	64	72	72	82	88	91	90	80	85	67	48	44
8	40	42	38	38	34	38	48	50	53	51	A	49	A	60	55	62	72	77	84	82	82	53	50	42
9	44	42	40	39	34	A	A	45	A	A	A	A	A	A	59	72	85	89	82	71	68	53	39	41
10	42	42	42	39	34	31	A	89	A	211		164	186	90	85	A	75	86	A	70	54	48	40	A
11	42	42	A	A	28	A	A	54	56	A	A	A	A	A	A	A	86	97	90	84	84	80	48	A
12	A	A	A	30	59	A	41	52	60	120	76	84	51	A	A	55	A	68	75	A	A	86	40	A
13	A	40	39	35	31	31	A	A	A	A	A	A	66	70	A	66	70	77	90	91	77	A	42	42
14	42	40	A	A	A	A	A	54	51	A	79	103	A	208		111	65	72	A	67	64	A	49	58
15	54	52	48	47	34	31	A	60	A	A	84	A	A	85	A	189	129	78	86	58	64	67	A	A
16	A	A	42	A	30	30	48	51	A	104	100	109	A	A	A	72	84	87	81	57	52	51	42	A
17	34	38	32	A	29	28	A	A	A	56	61	A	189	A	57	71	80	78	78	75	29	54	50	42
18	40	35	34	34	29	25	34	54	64	A	54	A	A	A	A	75	85	80	67	54	54	A	52	52
19	42	49	51	41	A	31	37	42	A	A	N	A	A	A	85	96	55	61	55	A	54	54	A	A
20	42	48	47	42	35	30	37	47	54	88	90	A	A	102	111	A	A	115	A	54	A	A	A	38
21	38	36	36	34	26	A	40	A	A	A	A	A	A	110	78	71	67	58	A	A	52	52	A	A
22	50	47	42	40	38	36	41	54	A	A	A	A	A	82	87	94	81	A	A	83	54	A	A	A
23	A	A	A		28	A	42	51	A	56	56	A	A	55	66	84	90	75	70	54	51	51	A	50
24	50	38	32	A	A	A	A	A	108	A	86	A	149	108	89	A	120	56	67	55	50	41	38	38
25	41	38	36	42	A	A	37	46	51	56	57	C	A	56	66	68	62	66	65	54	51	54	48	A
26	A	A	A	34	A	A	39	49	A	149	A	109	A	A	A	74	A	A	67	63	72	68	A	54
27	53	67	52	47	32	A	A	65	48	A	A	A	A	A	51	59	66	72	63	50	49	40	A	40
28	44	42	42	A	A	A	35	47	A	A	60	58	60	A	A	60	72	A	A	A	54	50	48	A
29	A	A		A	A	A	38	A	A	A	A	A	A	A	A	60	A	66	A	A	A	72	54	48
30	A	A	42	41	40	28	A	52	A	149	A	A	A	A	A	A	A	58	55	56	47	A	A	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	19	18	17	20	16	18	25	13	14	13	10	12	16	18	25	25	27	23	23	26	20	19	16
MED	42	42	41	39	34	31	41	52	54	72	61	71	65	84	74	74	84	78	78	67	54	54	48	43
U Q	47	47	42	41	36	34	42	56	62	120	85	109	162	96	87	90	89	89	86	82	72	67	50	50
L Q	40	38	36	34	29	29	37	49	51	55	56	51	60	65	62	67	71	68	67	55	51	50	40	41

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

JUN. 2018

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	56	69	58	25	64	G	46	38	50	46	48	49	52	51	62	47	51	57	43	43	35	34	35	70
2	46	60	44	40	32	45	44	54	109	103	116	108	52	53	49	48	29	26	36	40	50	73	49	56
3	67	70	92	58	110	59	122	135	58	87	91	91	163	133	115	59	45	56	54	58	37	92	26	36
4	93	114	86	100	57	69	42	66	72	57	117	110	55	50	49	46	35	40	43	132	58	116	116	147
5	156	26	116	59	57	34	36	56	173	57	46	51	48	54	56	57	50	57	56	53	46	73	49	69
6	G	39	79	59	50	145	126	53	79	57	69	61	126	50	48	48	49	56	46	48	83	60	83	59
7	58	71	28	G	G	G	33	40	59	62	60	45	59	59	45	38	41	32	28	G	27	24	G	26
8	72	59	G	G	G	G	29	38	43	46	88	48	56	52	46	36	44	41	46	56	27	46	38	37
9	35	37	28	26	52	85	97	41	75	70	92	90	76	79	52	44	42	52	74	46	65	71	34	33
10	26	35	26	G	G	G	81	73	111	131		96	83	93	72	57	52	50	72	86	34	34	27	57
11	28	28	56	59	23	70	54	58	72	133	174	135	142	115	81	148	71	65	65	55	36	26	34	34
12	50	41	40	24	36	56	37	45	128	69	95	68	49	70	96	45	61	53	91	169	124	46	130	80
13	56	32	41	26	72	53	92	84	109	71	92	91	54	74	170	61	44	44	53	36	38	72	40	G
14	28	115	84	49	86	48	60	38	48	94	76	105	126	151		110	60	71	93	50	46	58	46	43
15	32	26	44	45	95	38	52	47	64	80	87	69	132	88	91	105	116	75	163	40	44	46	110	73
16	48	108	56	77	25	G	36	53	73	111	91	96	145	150	66	57	64	61	53	40	30	33	G	105
17	38	45	33	57	80	59	58	60	73	60	76	60	130	69	46	125	61	59	58	60	38	46	28	G
18	24	26	G	G	35	G	32	40	56	72	56	65	73	62	55	47	36	33	32	G	32	60	40	41
19	38	32	34	29	38	33	30	53	78	114	92	88	116	170	77	100	52	54	46	129	58	35	50	60
20	41	32	33	34	30	G	26	35	46	84	96	116	104	116	101	133	136	172	76	61	59	60	48	29
21	28	29	36	26	G	43	35	79	154	175	168	91	90	104	70	61	76	55	62	60	53	40	60	59
22	30	44	38	28	32	59	27	38	77	67	64	80	96	132	53	62	128	115	145	78	32	84	110	78
23	57	39	56		27	33	34	46	91	88	48	64	56	51	53	36	43	41	56	33	40	28	28	45
24	24	26	33	51	60	80	101	103	79	126	78	110	61	135	96	72	95	42	34	39	33	32	25	23
25	G	G	G	G	32	33	28	36	44	50	44	C	47	45	45	43	46	38	32	46	40	29	G	88
26	45	41	46	71	59	60	92	54	94	141	152	105	143	76	58	68	116	78	36	91	88	54	92	54
27	49	40	54	36	G	148	60	174	70	76	68	71	56	69	51	48	46	51	50	40	38	127	45	35
28	92	57	110	73	59	39	32	49	60	70	50	53	50	109	109	51	90	106	91	77	56	33	60	60
29	38	88	G	44	92	130	38	57	89	105	73	93	68	71	93	48	77	62	122	116	137	127	60	45
30	109	57	28	46	29	40	173	134	127	143	131	142	89	69	66	86	50	55	50	51	36	58	36	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	30	30	29	29	30	30	29	30	30	30	30	30	30	30	30	29
MED	43	40	40	40	37	44	43	53	74	78	87	90	74	72	62	57	52	55	54	52	40	50	42	54
U Q	57	60	56	58	60	60	81	66	94	111	95	105	126	115	92	72	76	62	74	77	58	72	60	69
L Q	28	32	28	25	27	33	33	40	59	62	62	62	55	54	50	47	44	42	43	40	35	34	28	34

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

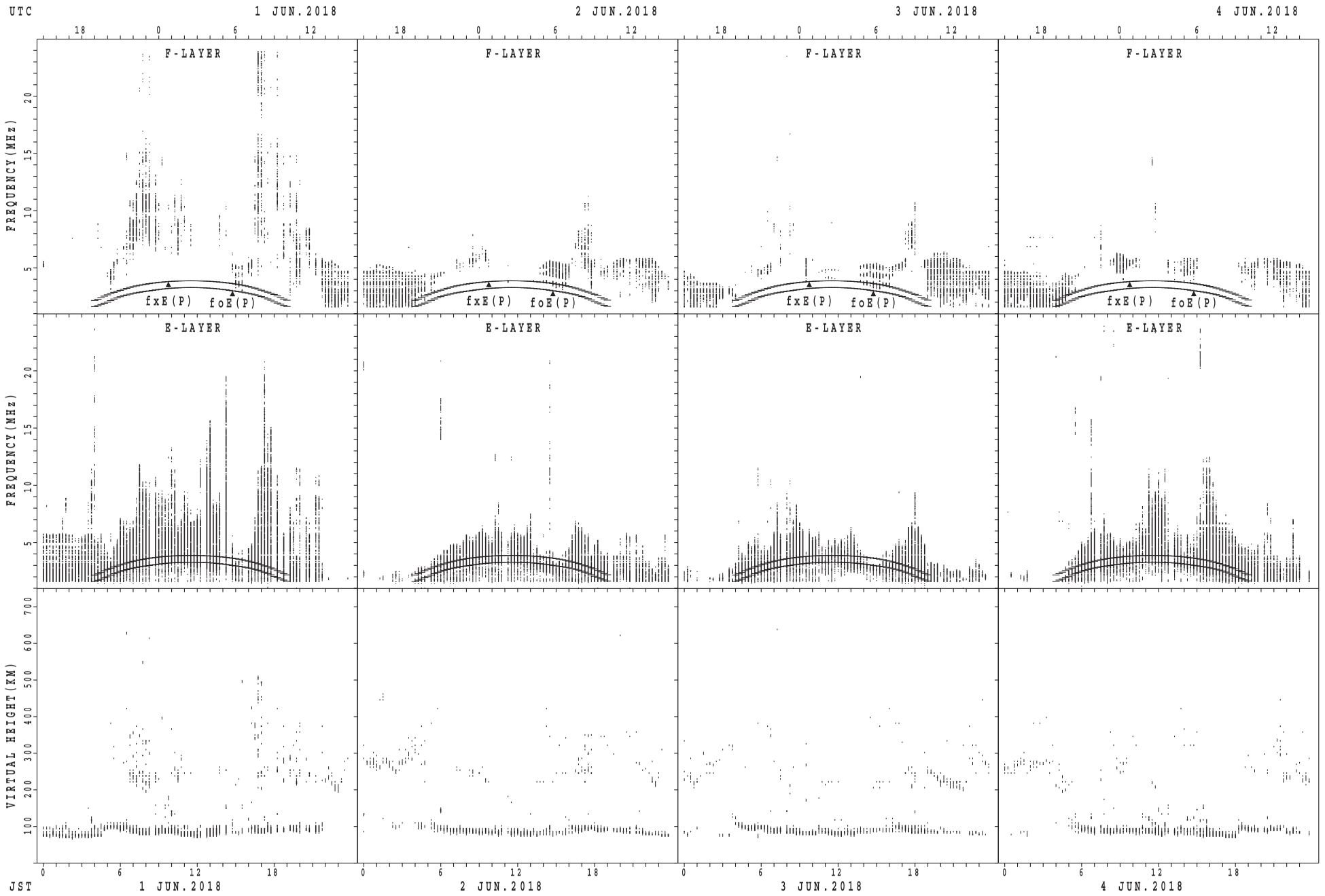
JUN. 2018

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	15	16	16	17	18	14	20	20	22	27	28	38	35	34	21	18	16	15	17	14	15	15	15
2	14	15	14	14	14	14	15	16	15	18	18	20	36	24	35	33	18	16	20	14	14	14	14	14
3	14	14	14	14	14	15	14	14	14	14	17	20	21	22	23	18	14	14	14	14	14	14	14	14
4	14	15	14	14	14	14	14	14	14	15	17	17	18	18	18	18	16	14	14	14	14	14	14	14
5	14	14	14	14	14	15	14	14	14	17	17	17	18	20	18	17	16	14	14	14	14	14	14	15
6	14	14	14	15	14	14	14	14	14	14	17	17	18	18	18	18	16	14	14	14	14	14	14	14
7	14	14	14	14	14	15	15	14	14	15	14	18	18	18	21	16	15	14	14	17	14	14	14	14
8	15	14	15	15	14	14	14	14	14	14	16	15	18	18	18	18	14	14	14	14	14	15	14	14
9	14	14	14	15	14	14	14	14	14	14	16	16	18	18	20	17	14	14	14	14	14	14	14	14
10	15	14	14	14	15	14	14	14	14	14		17	17	18	18	16	14	14	14	14	14	15	14	14
11	14	14	14	15	15	14	14	14	14	14	17	17	18	17	17	15	14	14	14	14	14	14	14	14
12	14	14	14	14	14	14	14	14	14	15	15	17	16	18	17	17	15	14	14	14	14	14	14	14
13	14	15	14	15	14	14	14	14	14	15	14	14	17	17	16	18	14	14	14	14	14	14	14	14
14	14	14	14	14	14	14	15	14	14	14	14	16	17	21		18	15	14	14	14	14	14	14	14
15	14	14	15	14	14	14	14	14	14	15	18	20	20	18	18	16	14	14	14	14	14	15	14	14
16	15	14	14	14	14	15	14	14	14	14	15	18	21	17	17	17	16	14	14	14	14	14	14	14
17	14	14	14	15	14	15	14	14	14	14	16	16	20	20	17	16	14	14	14	14	14	14	14	16
18	14	15	14	14	14	14	14	14	14	14	14	15	17	18	17	15	14	14	14	16	14	14	14	15
19	14	14	14	14	14	15	14	14	14	16	17	18	18	18	18	18	14	14	14	14	14	14	14	14
20	14	14	14	14	14	14	15	14	14	15	14	17	18	18	17	15	16	14	14	14	14	14	14	15
21	14	15	14	14	14	15	14	14	14	17	18	20	20	17	18	17	16	14	14	14	14	15	14	14
22	14	15	14	14	15	15	14	14	14	14	15	17	18	20	18	17	17	14	14	14	14	14	14	14
23	14	15	14		14	15	14	14	14	16	17	17	18	23	22	20	14	14	14	14	16	14	14	14
24	14	14	14	14	14	14	14	14	14	15	15	18	18	20	17	17	16	14	14	14	14	14	14	14
25	14	15	14	15	14	14	15	14	14	16	17	C	20	20	17	20	18	14	14	14	14	14	17	14
26	14	15	15	14	14	14	14	14	14	14	15	16	18	17	21	16	16	14	14	14	14	15	14	14
27	14	14	14	14	14	14	14	14	14	15	17	18	18	18	22	20	16	14	14	14	14	14	14	14
28	14	15	14	15	91	15	14	14	14	14	16	20	20	18	17	17	16	14	14	14	15	14	15	14
29	15	14	18	15	15	15	14	14	14	14	17	20	18	20	18	18	17	14	14	14	14	14	14	14
30	14	14	14	14	14	14	14	14	14	15	15	23	20	18	20	18	17	14	14	14	15	15	15	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	30	30	29	29	30	30	29	30	30	30	30	30	30	30	30	29
MED	14	14	14	14	14	14	14	14	14	15	16	17	18	18	18	17	16	14	14	14	14	14	14	14
U Q	14	15	14	15	14	15	14	14	14	15	17	20	20	20	20	18	16	14	14	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	14	14	15	16	18	18	17	16	14	14	14	14	14	14	14	14

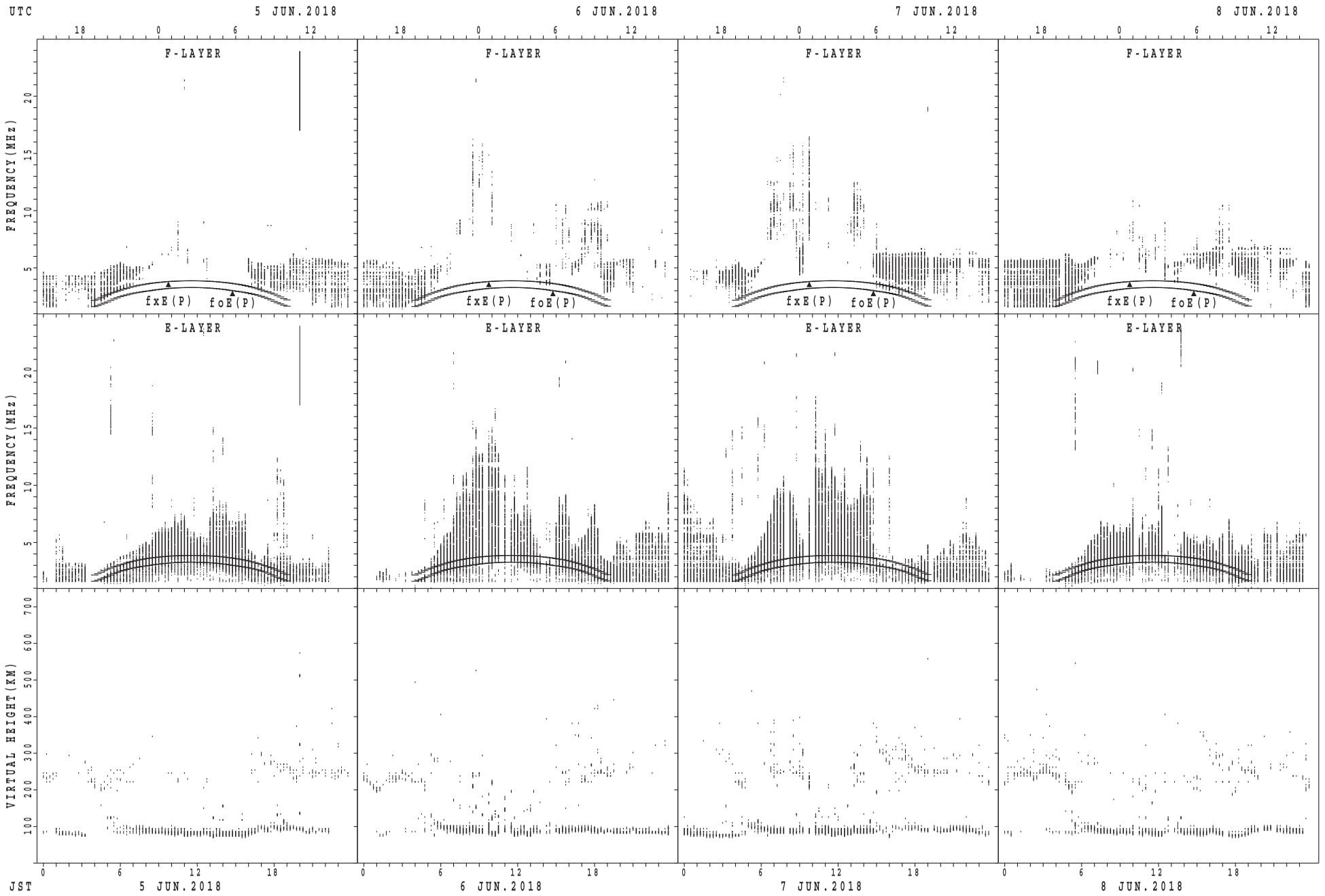
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

SUMMARY PLOTS AT Wakkanai



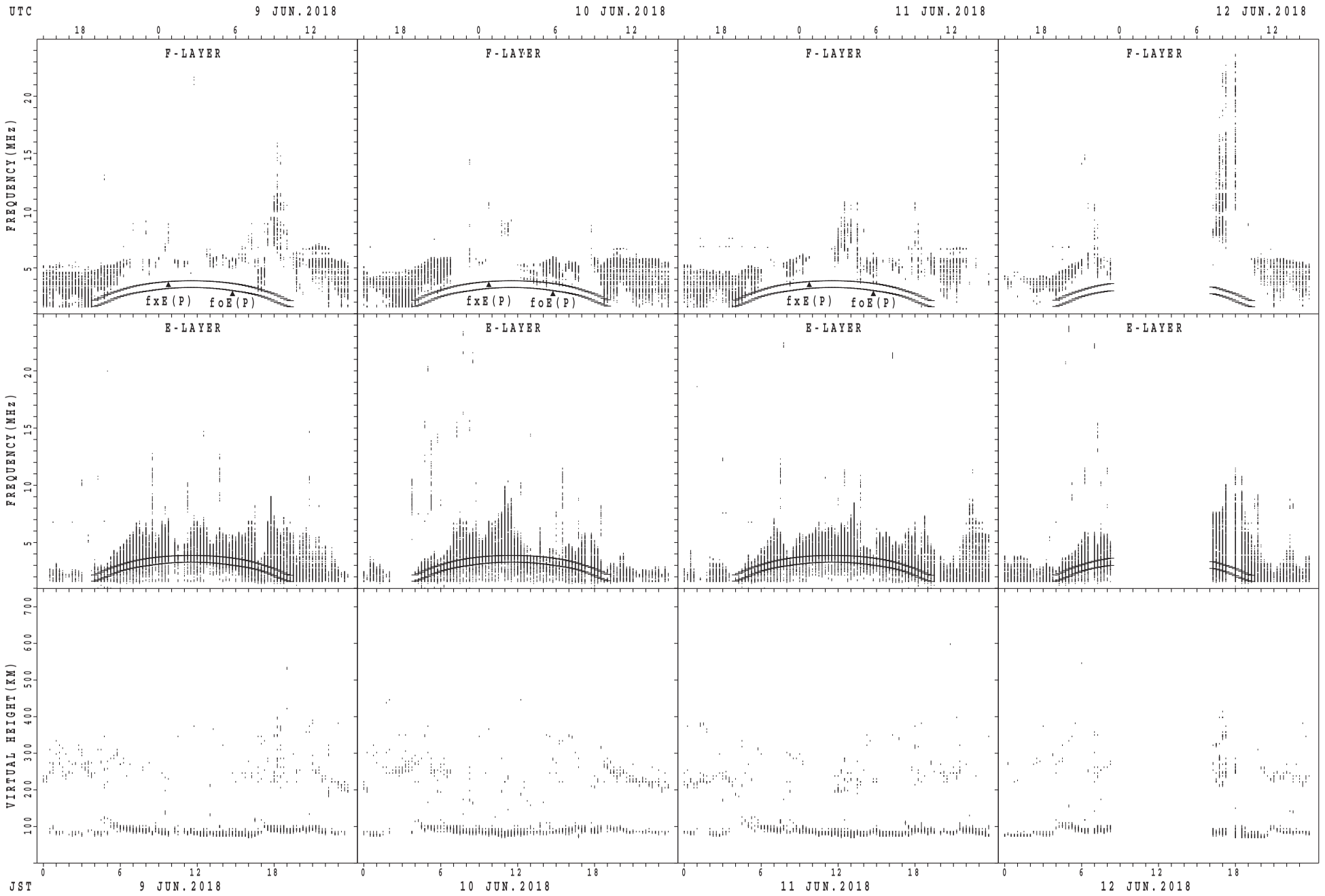
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



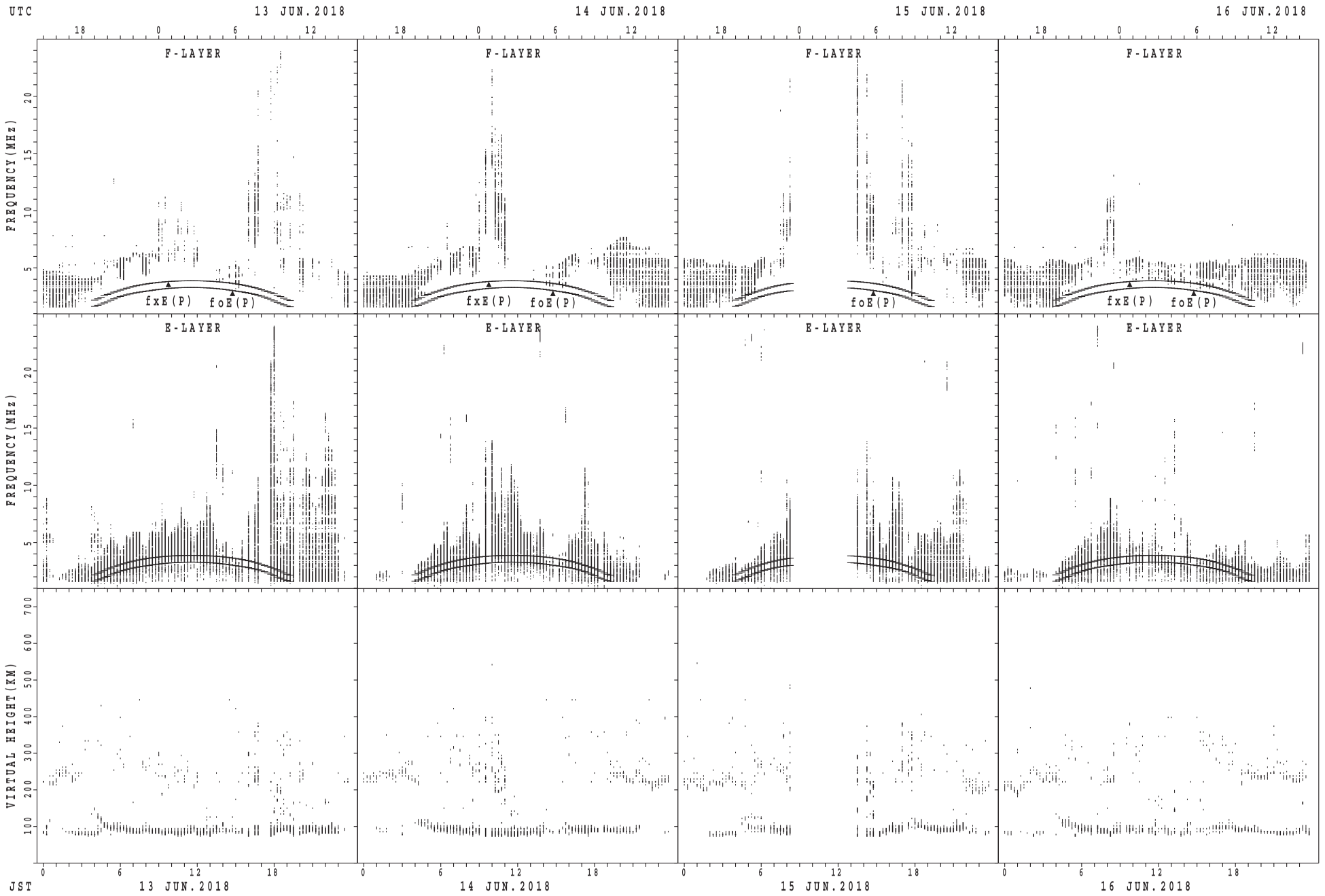
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



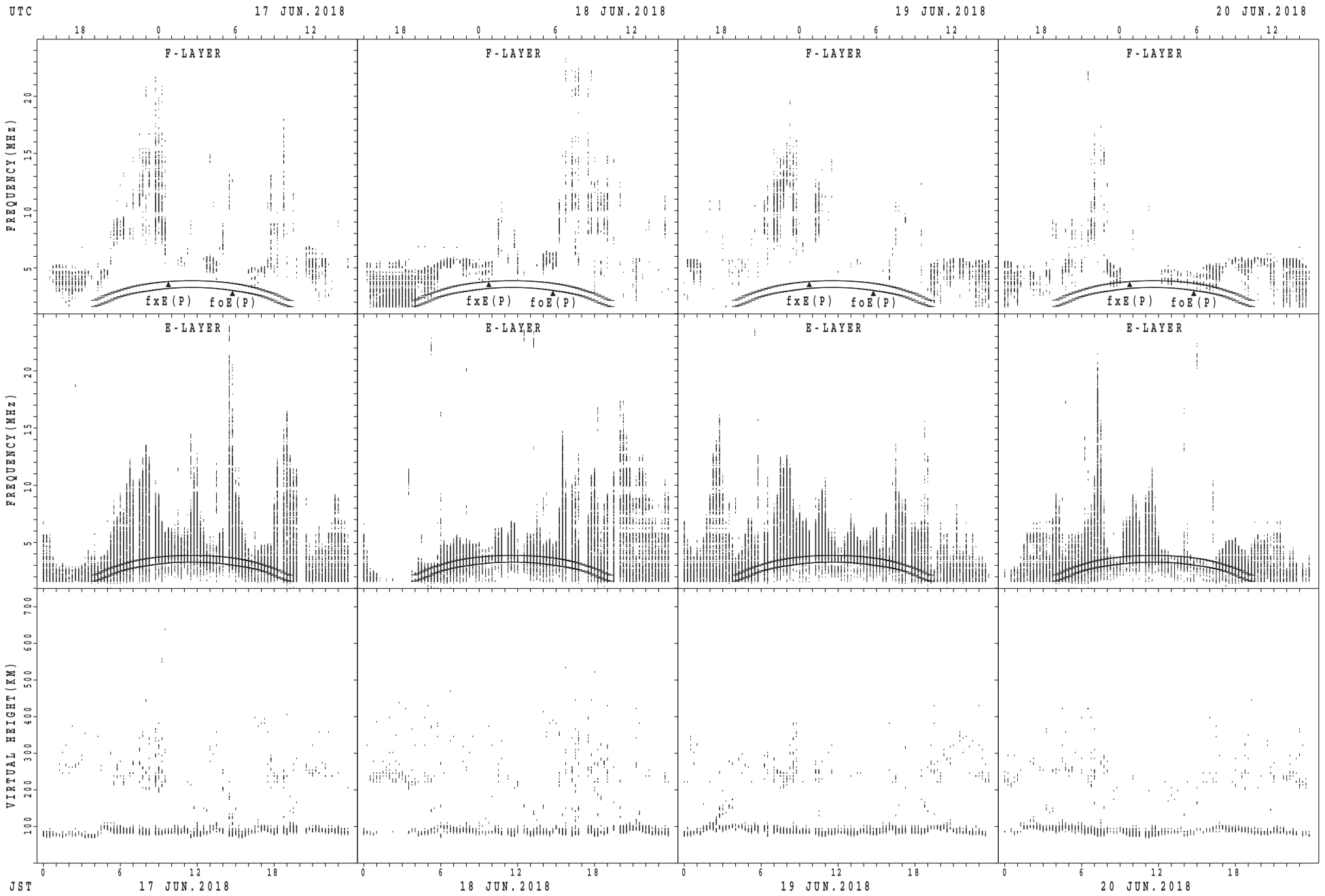
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



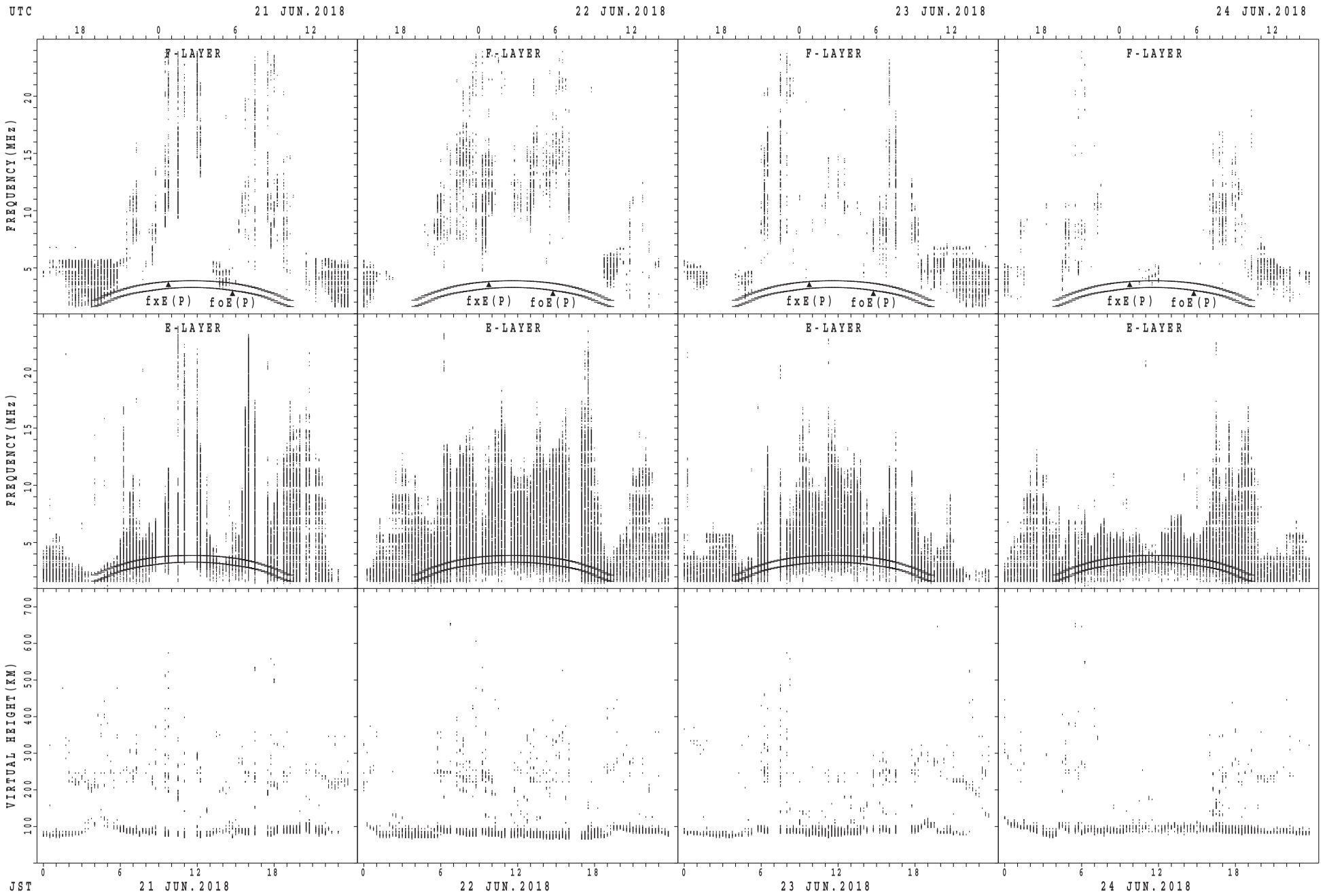
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



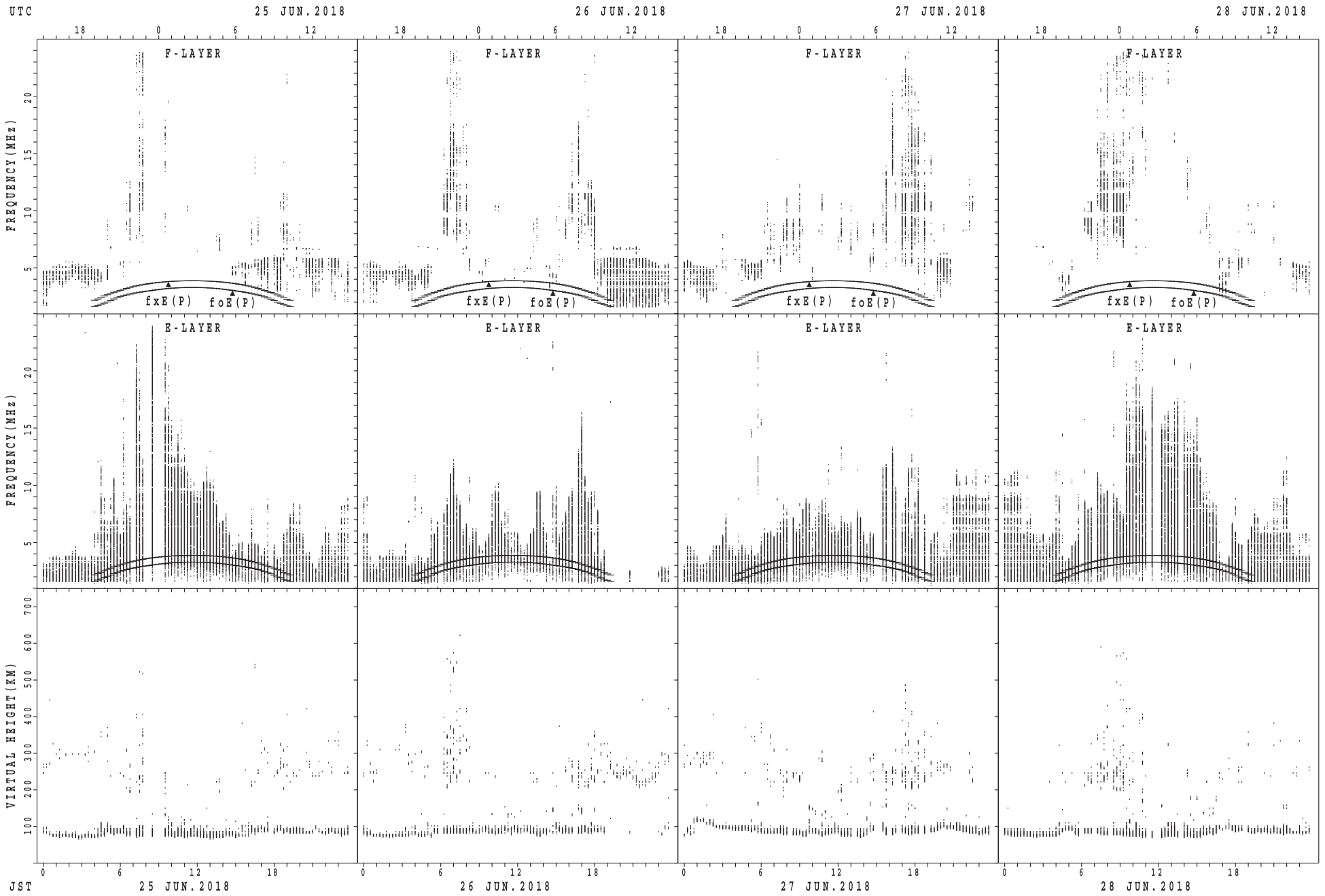
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



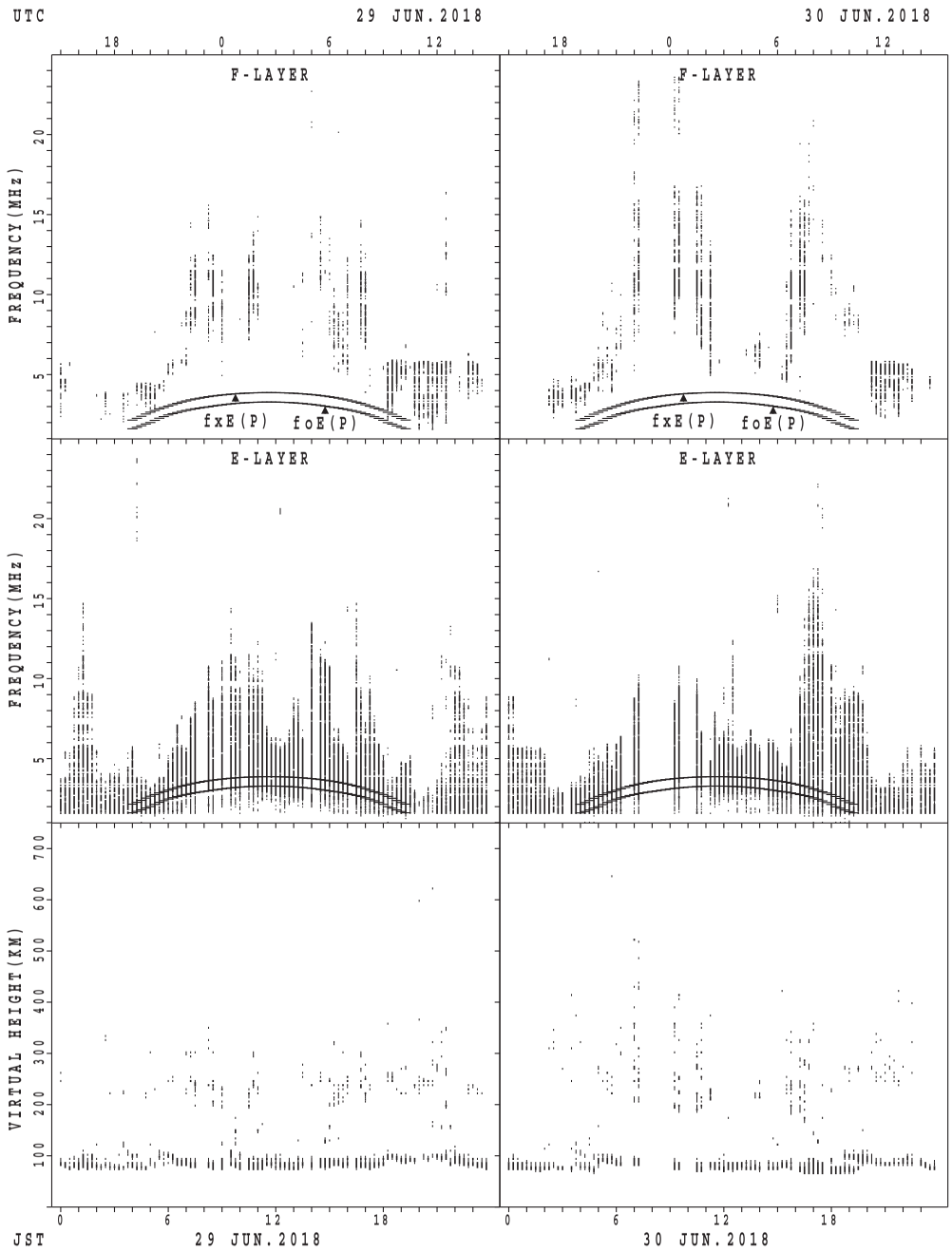
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



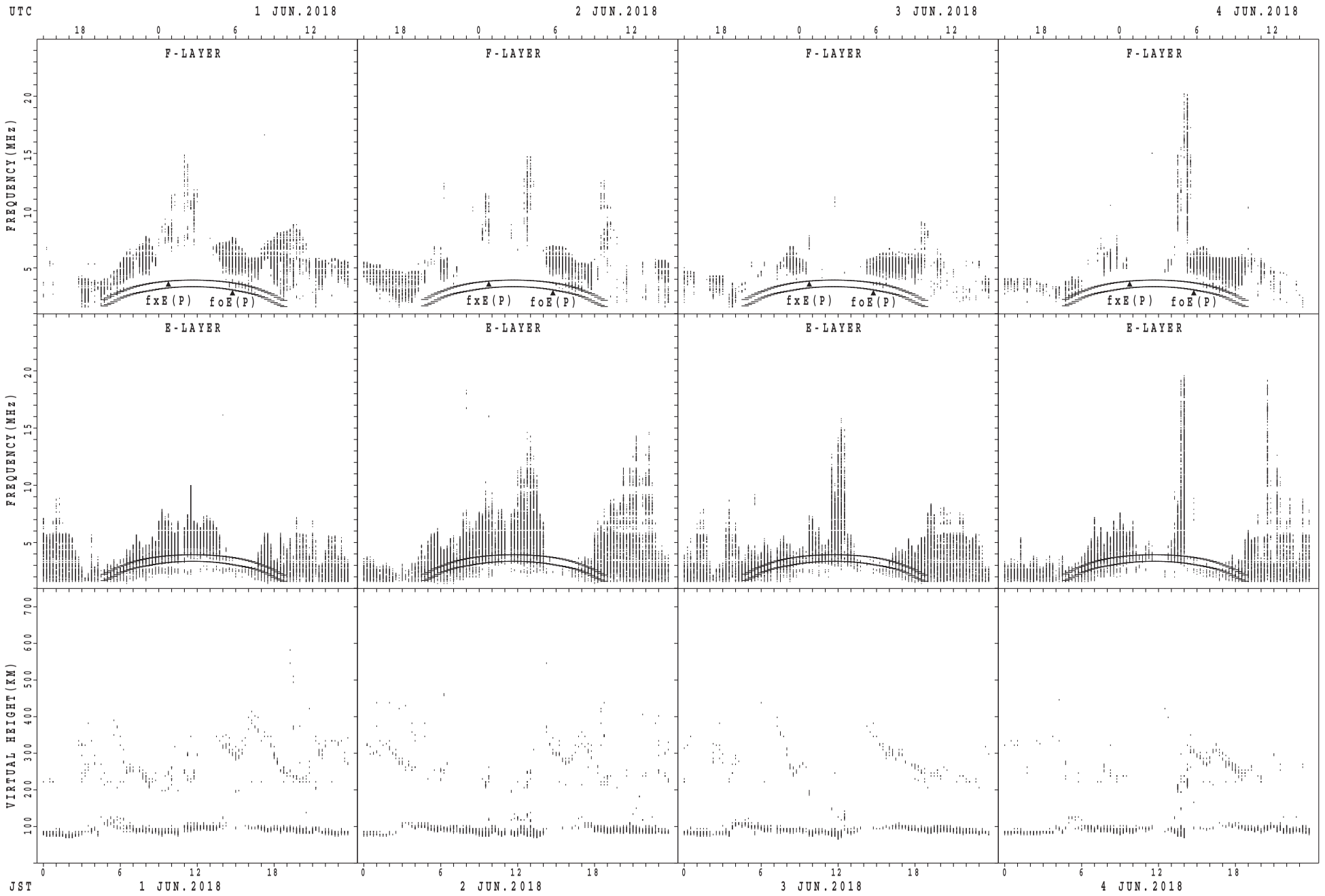
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



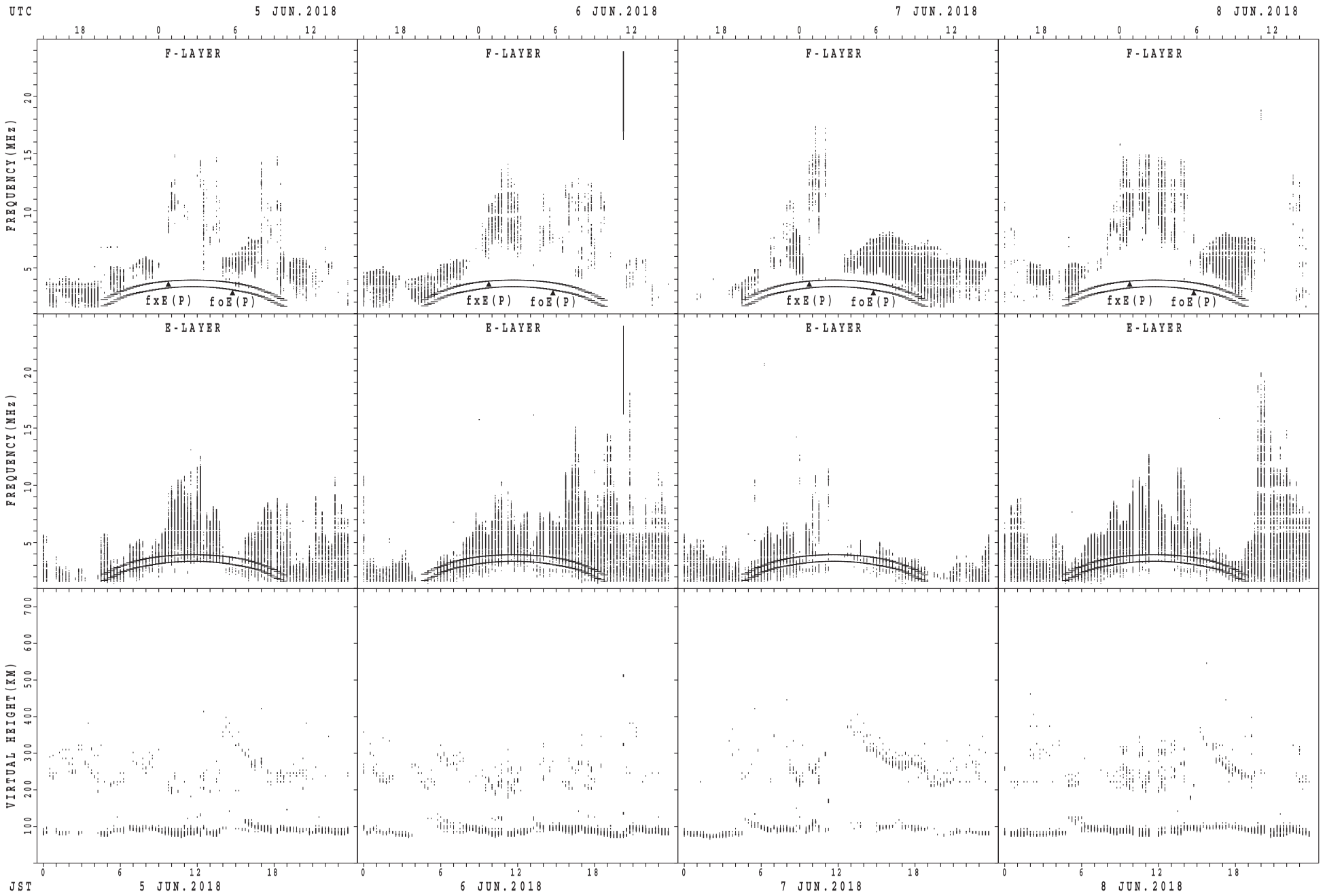
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



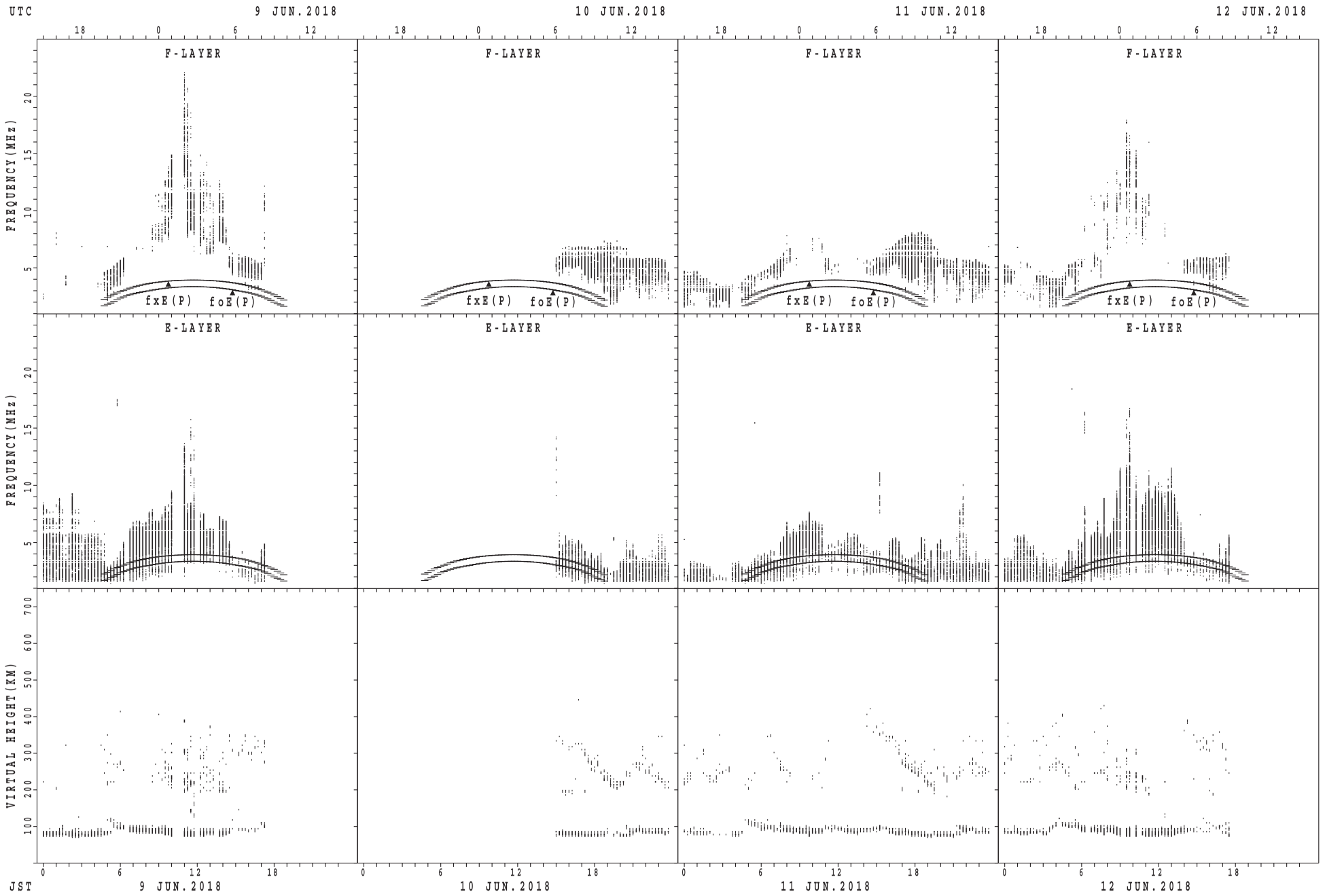
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



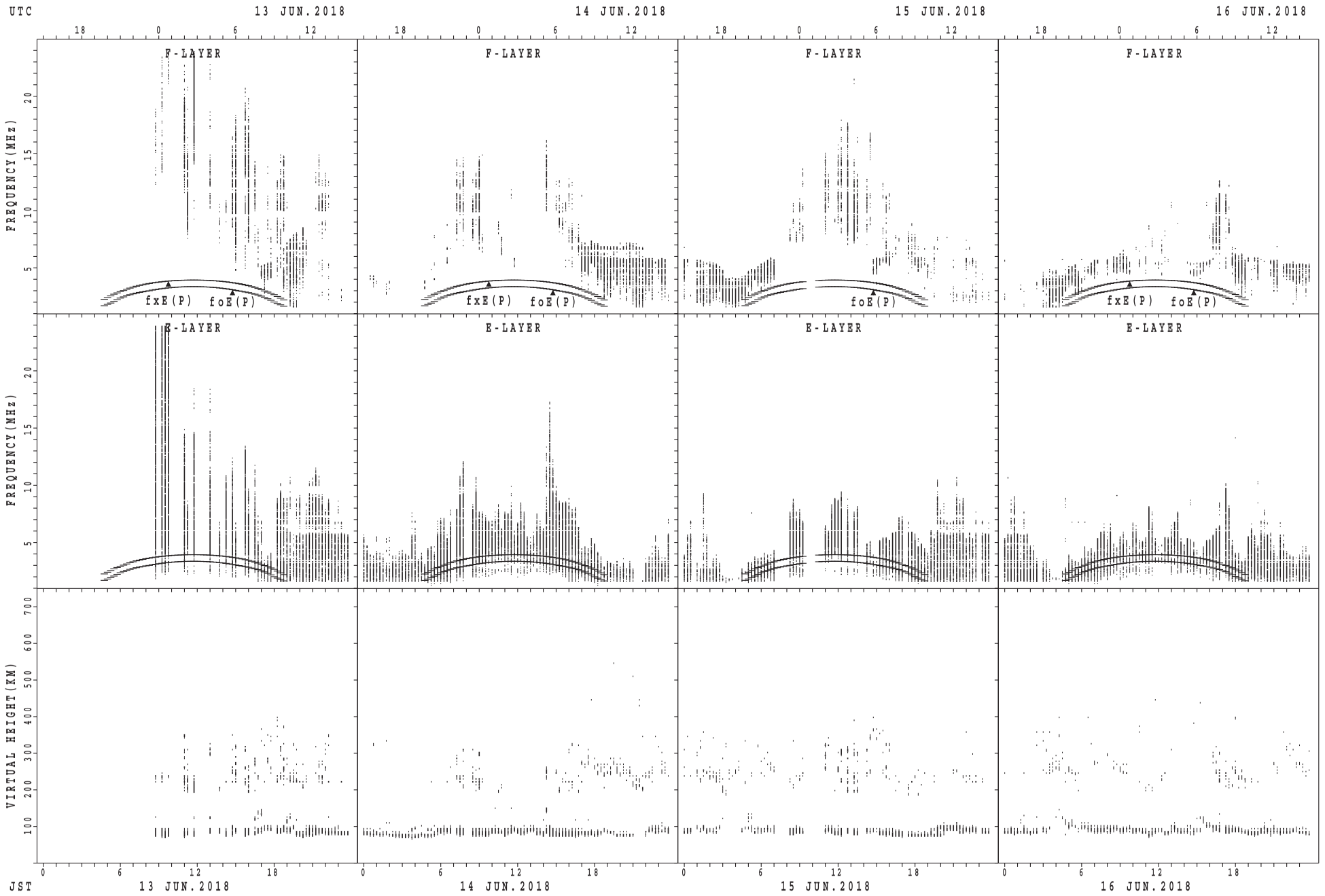
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



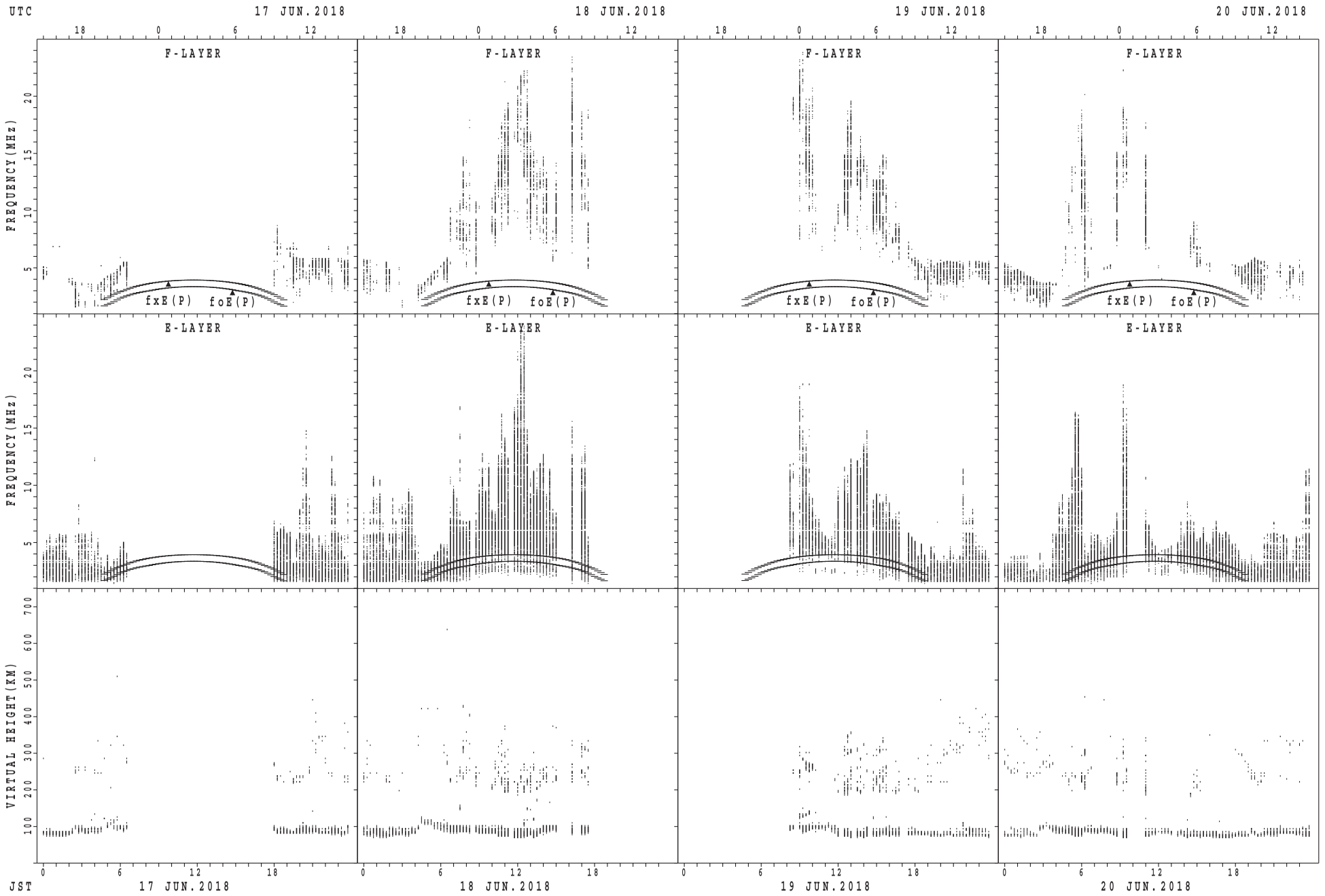
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



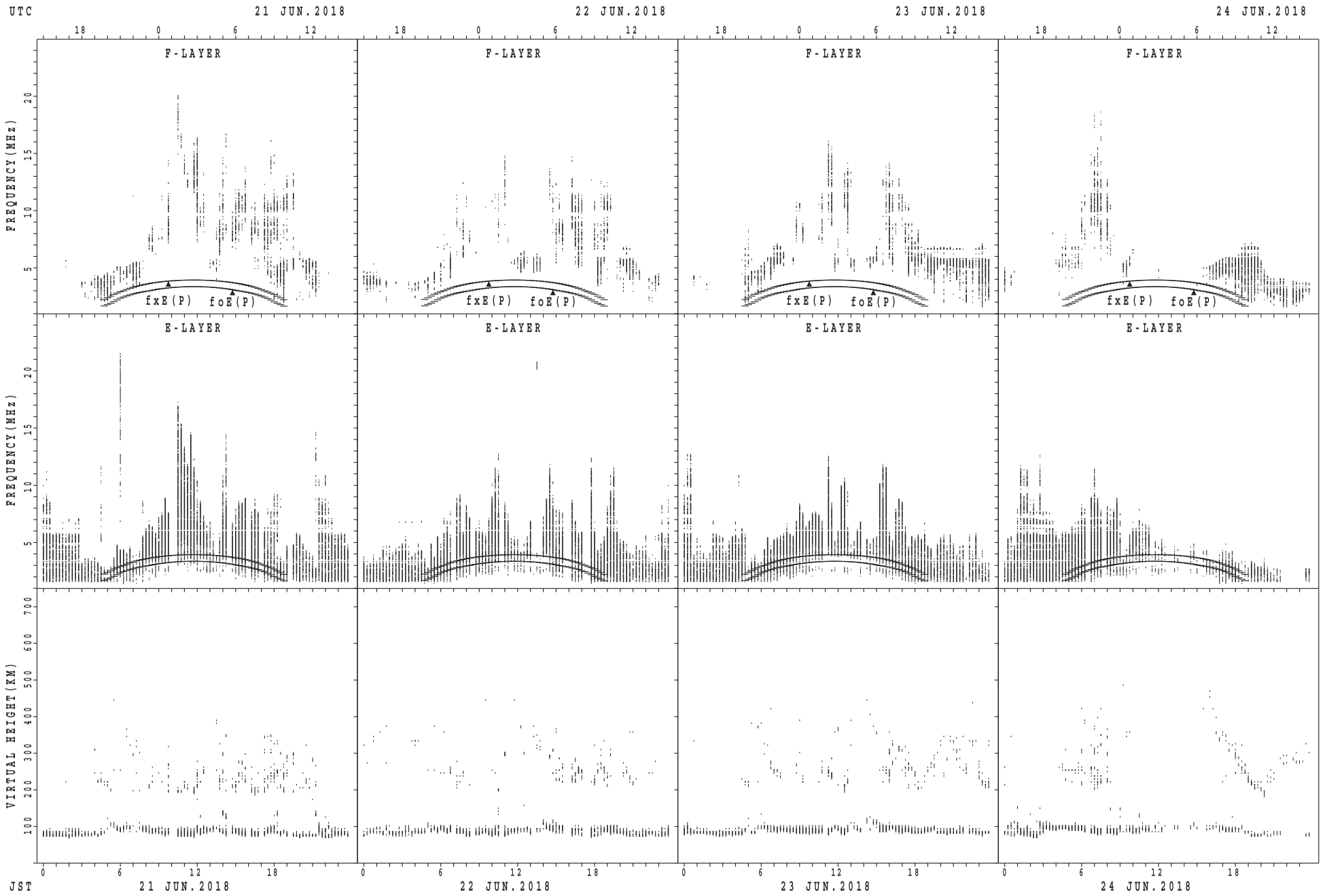
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



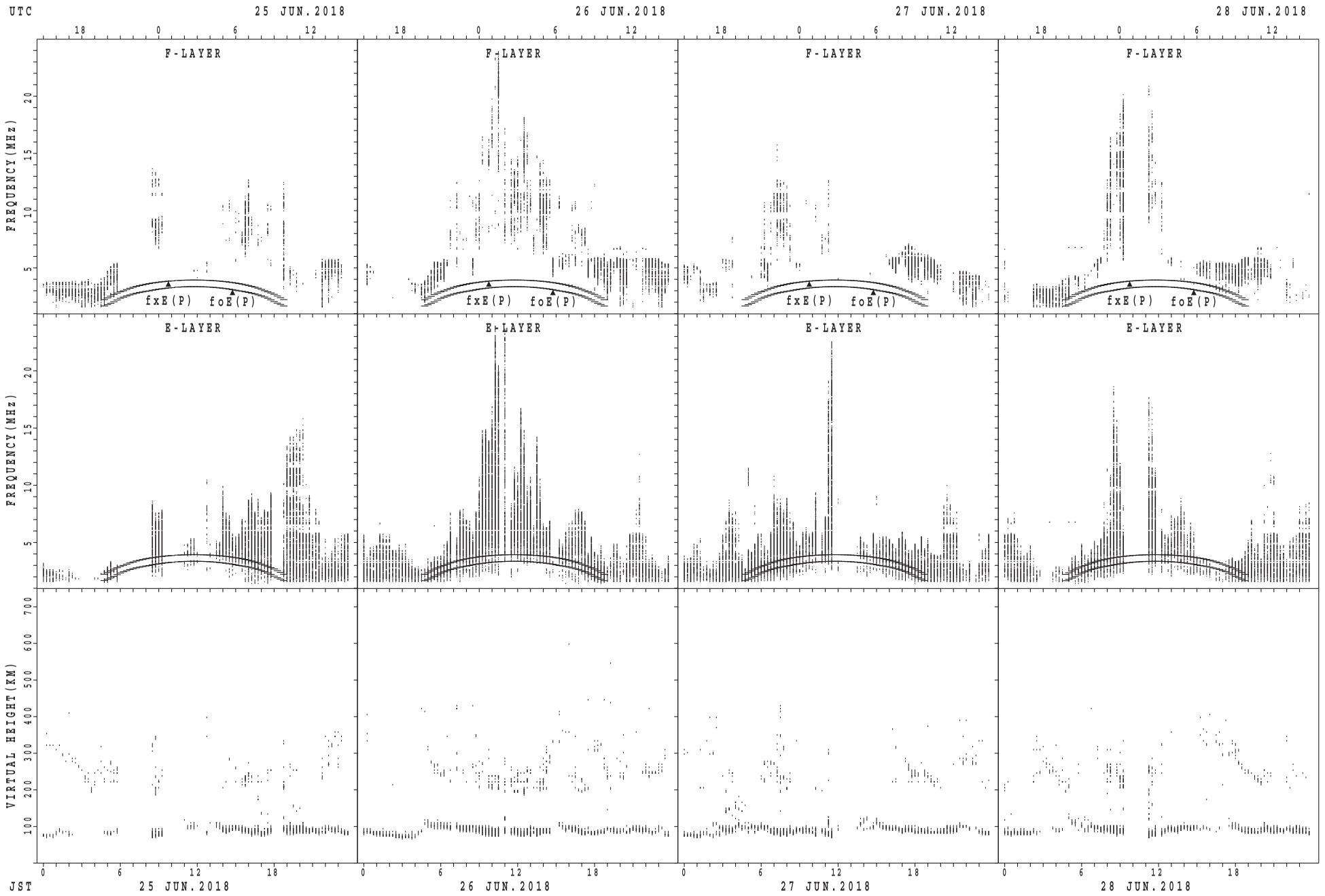
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



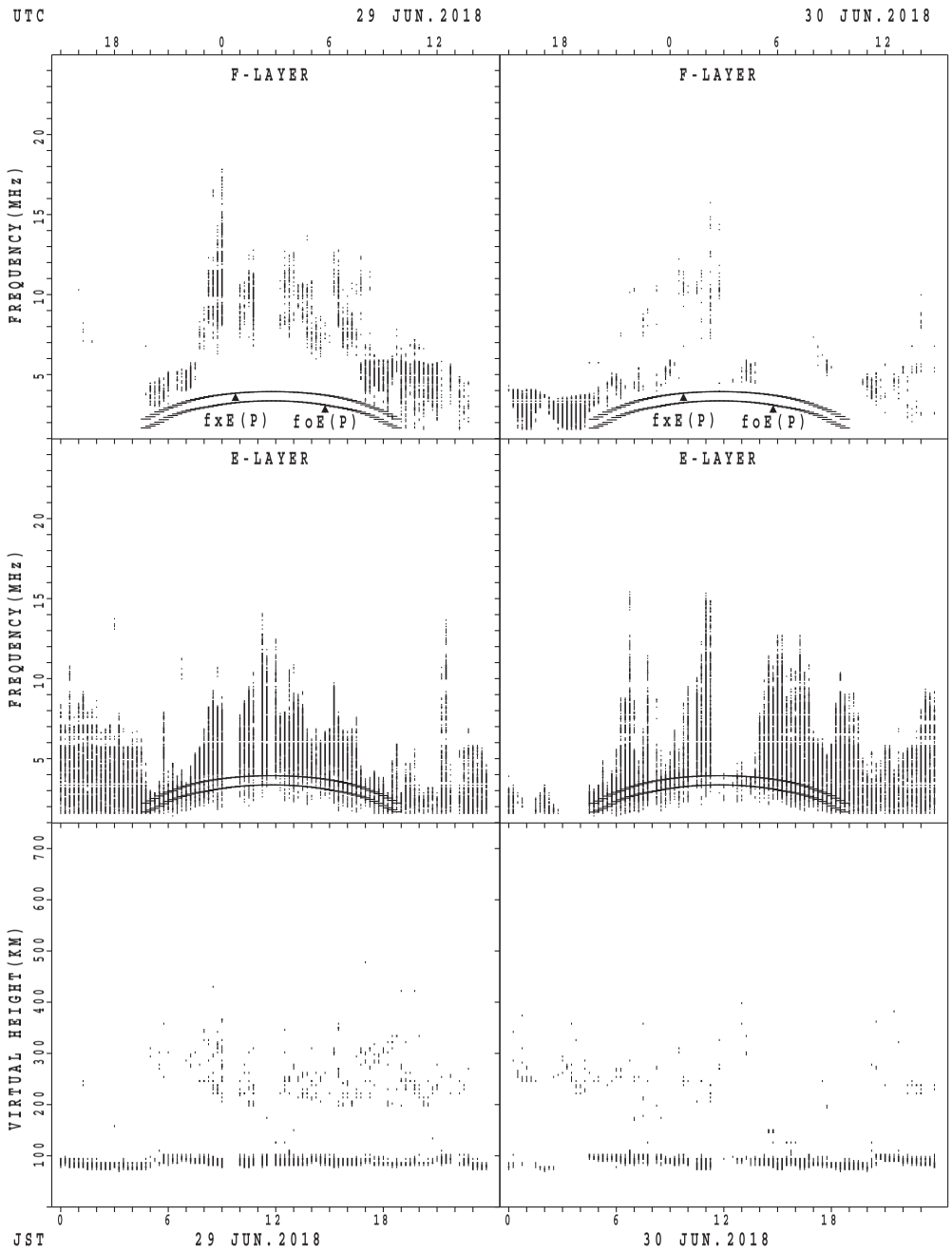
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



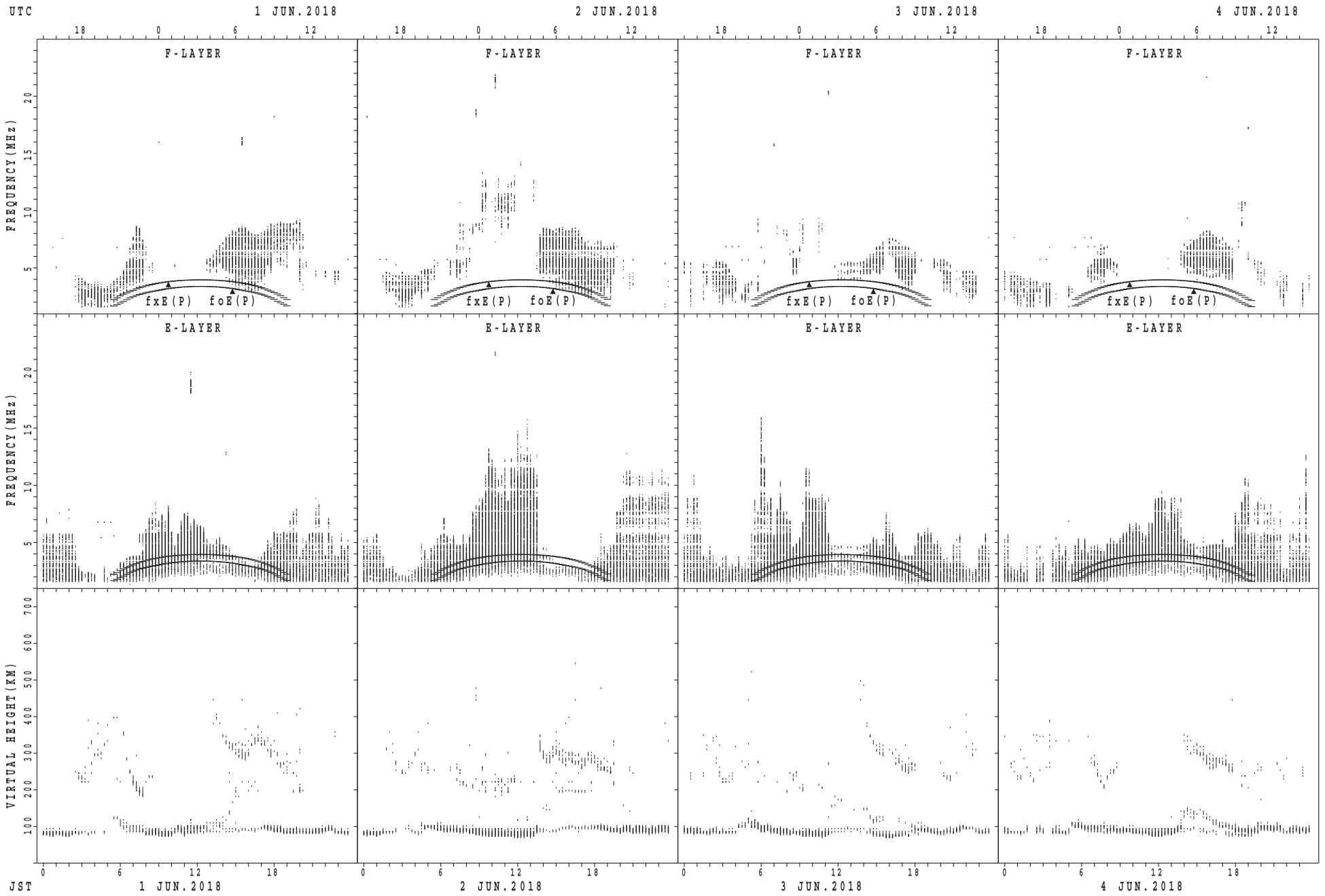
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



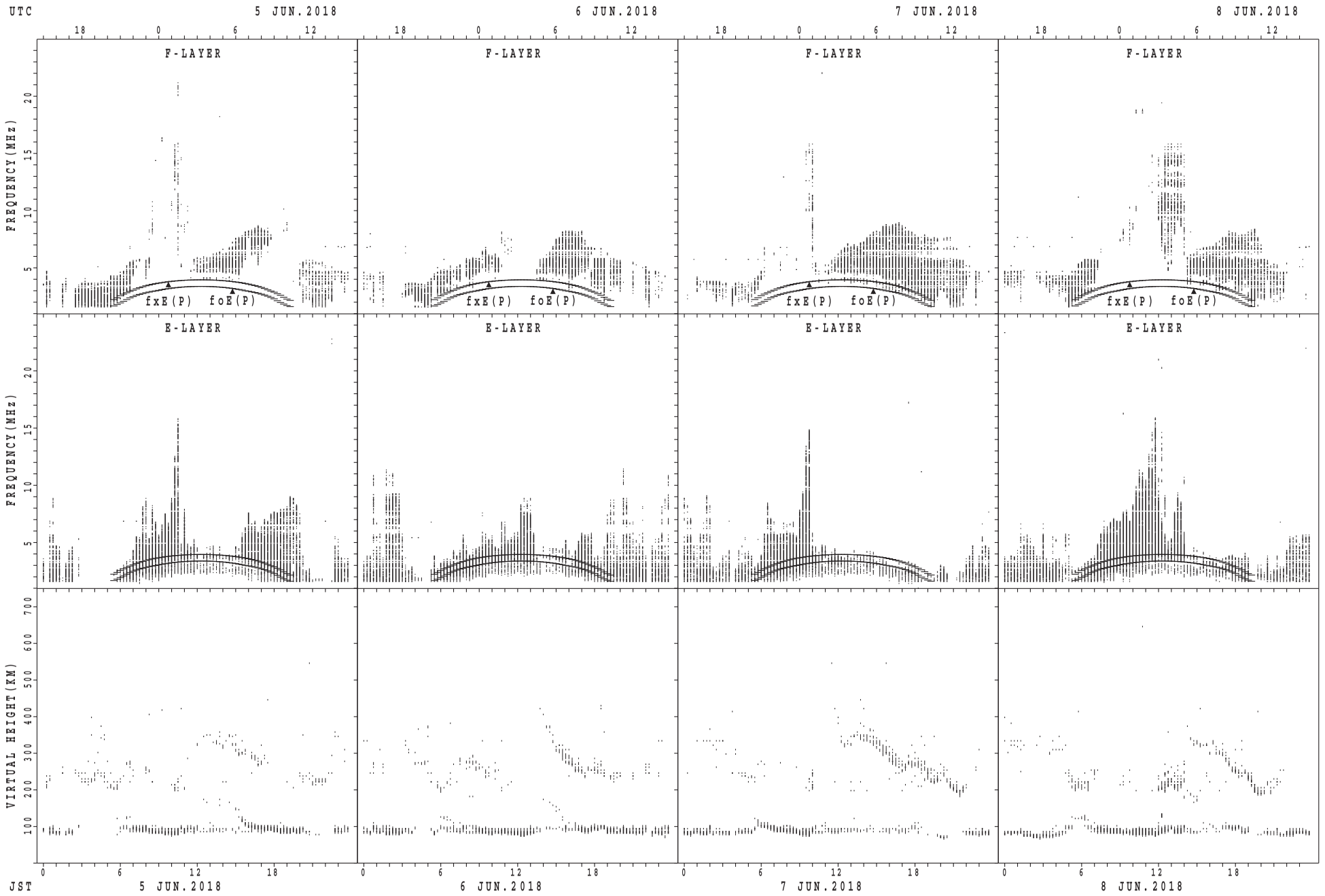
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



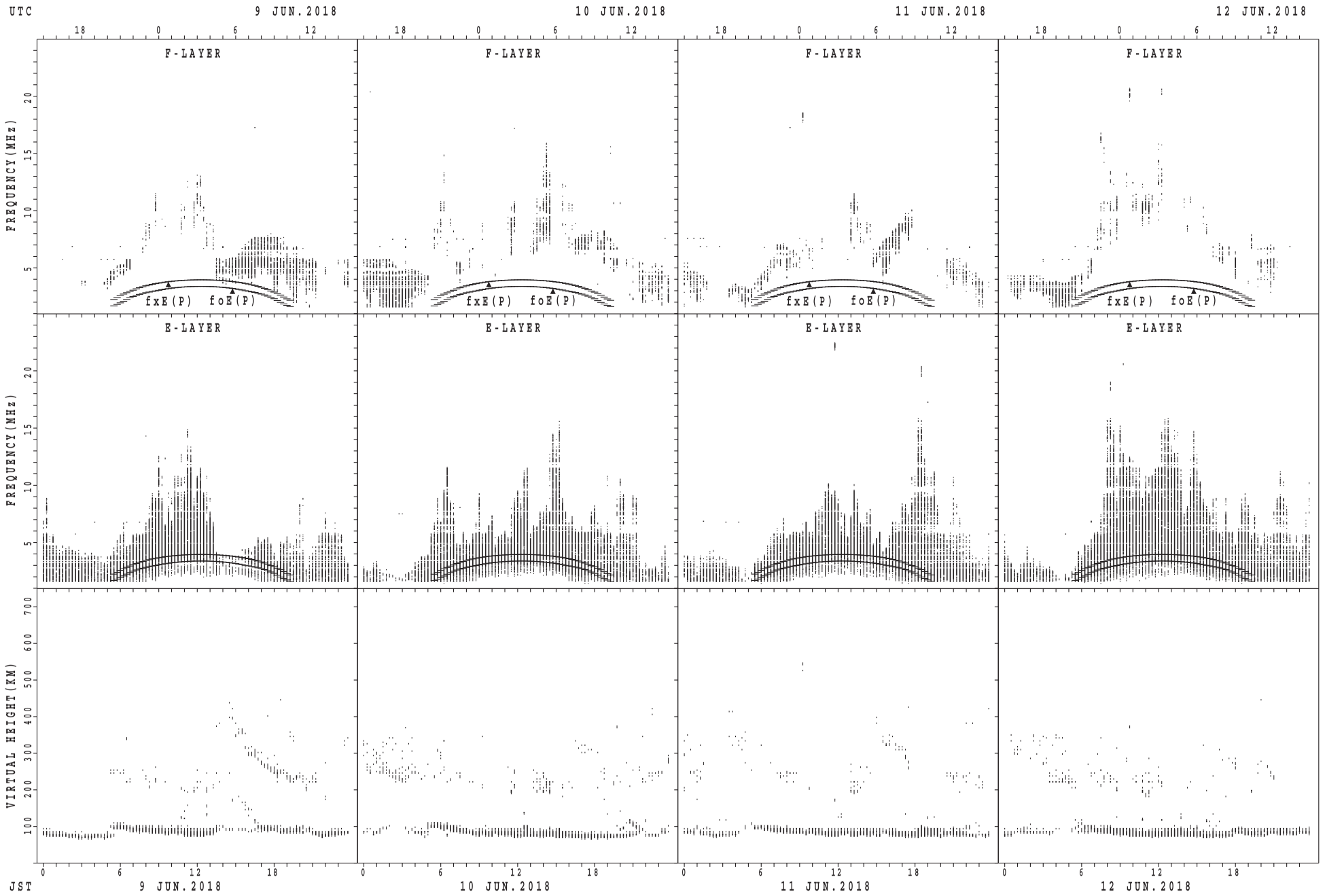
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



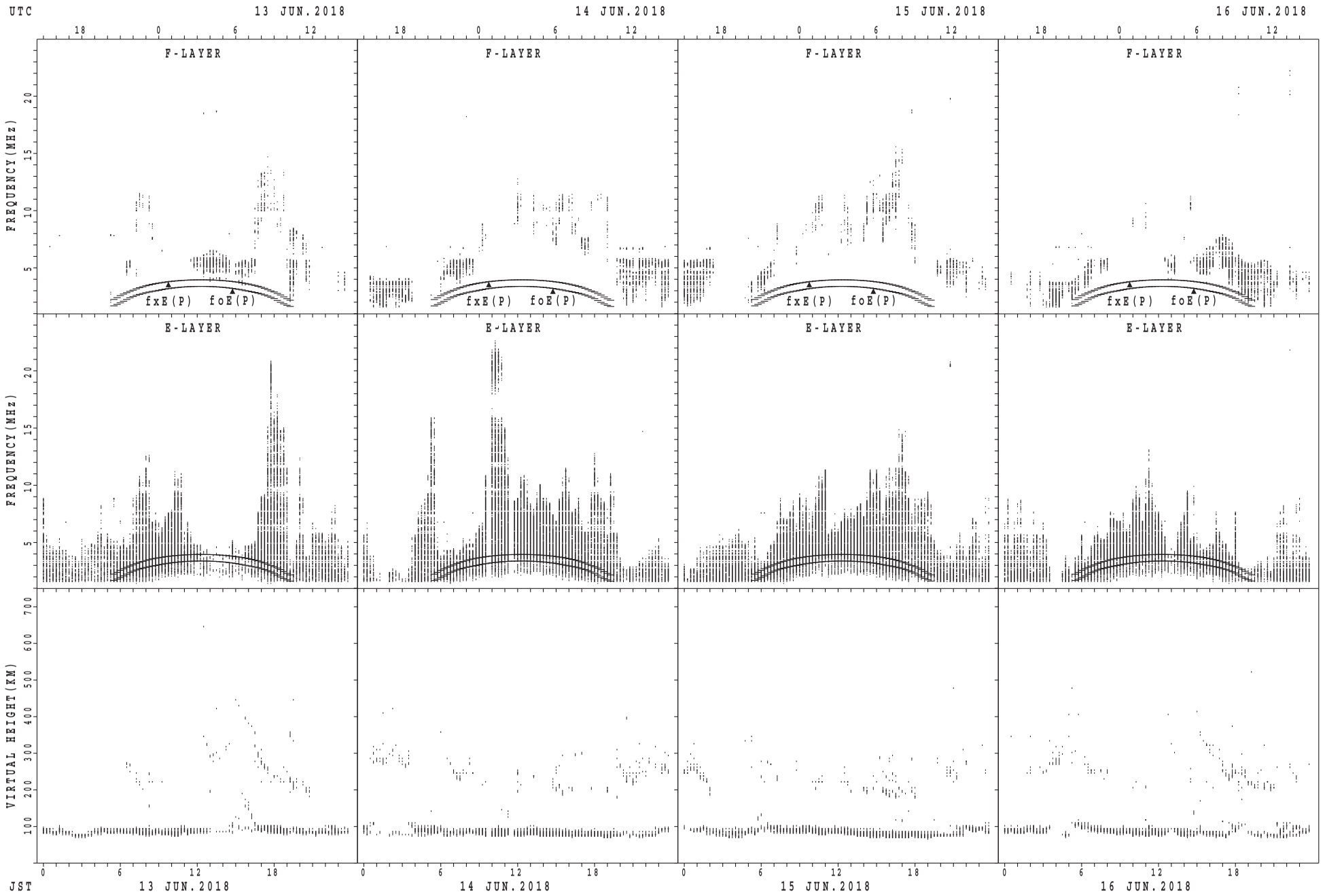
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



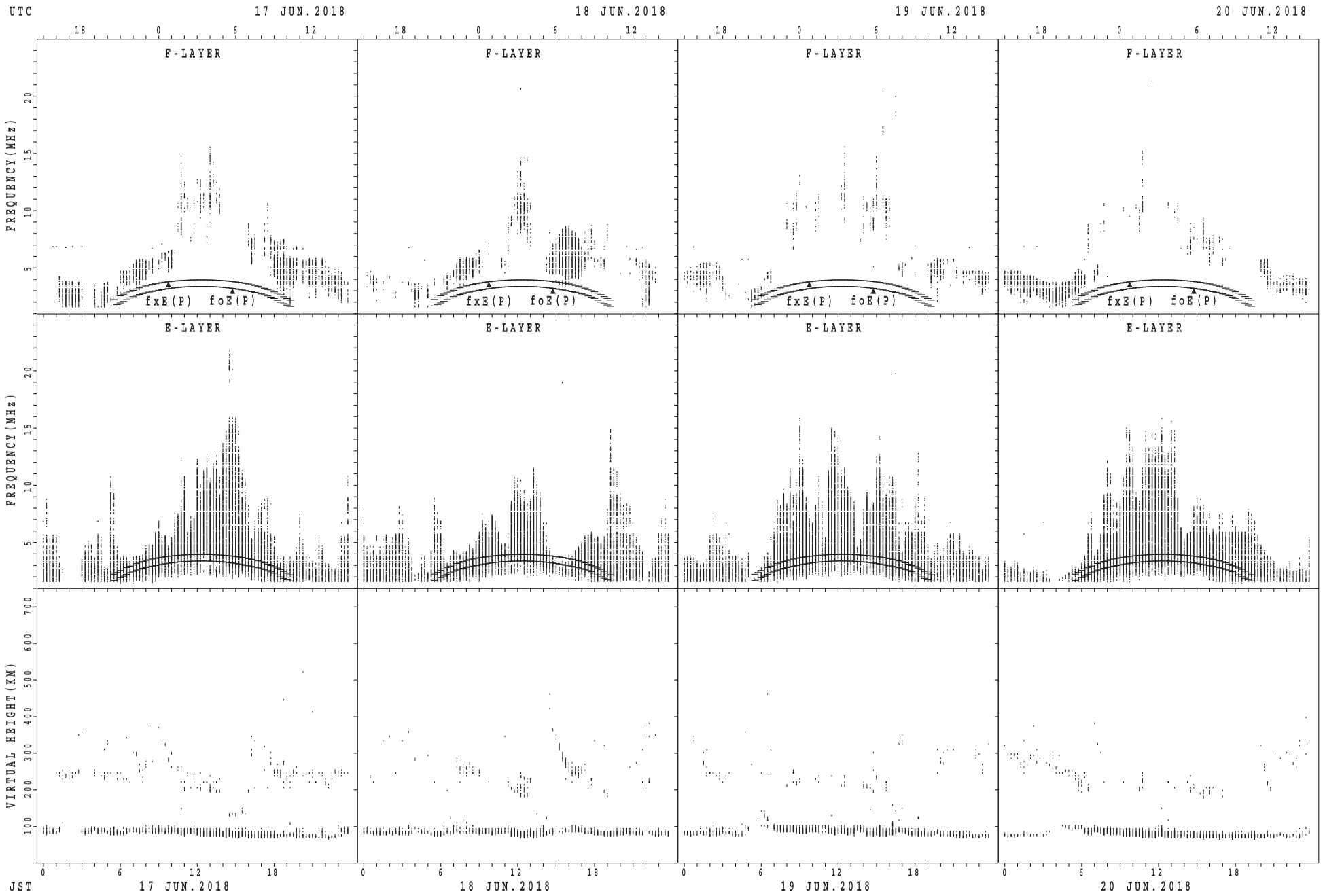
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



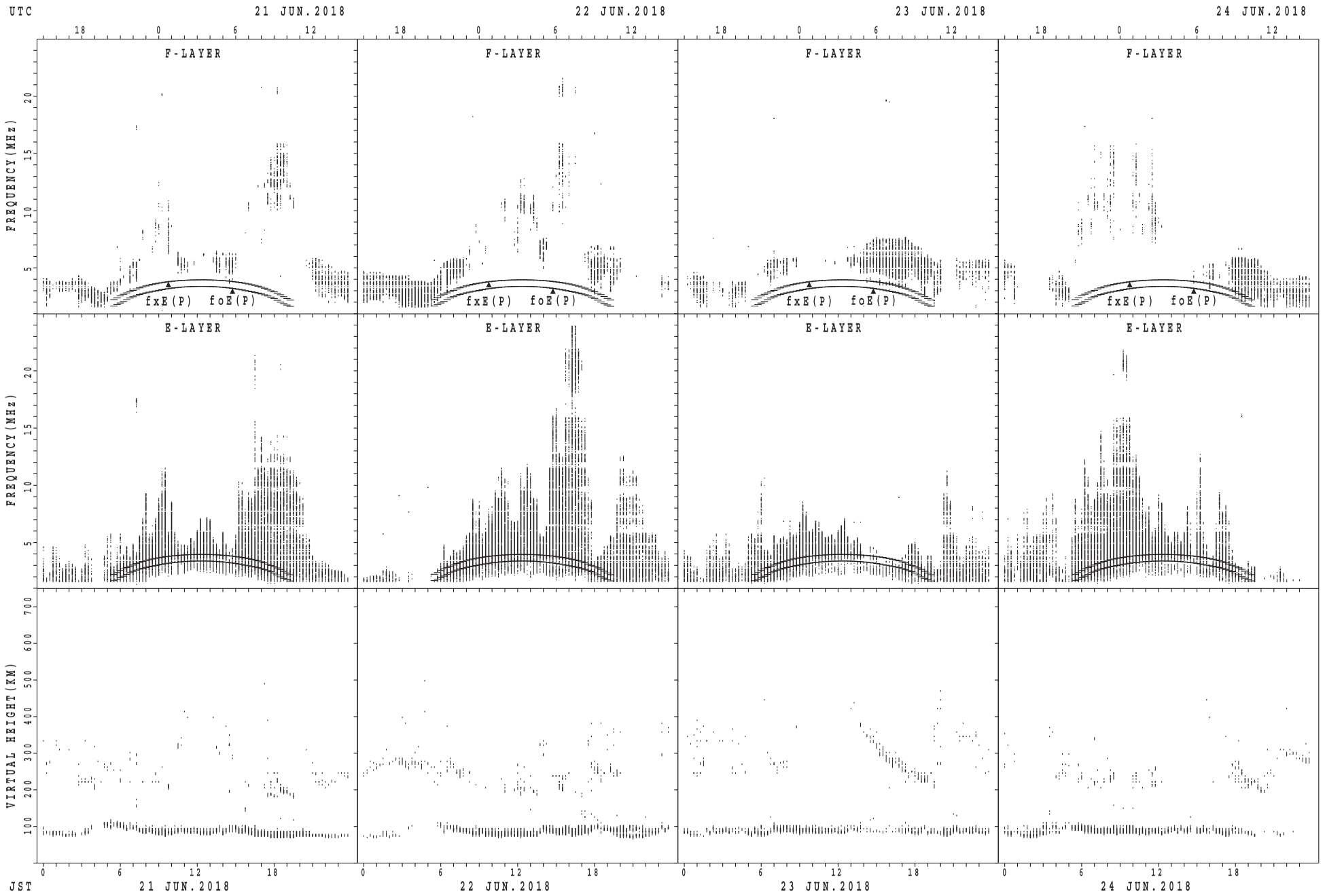
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



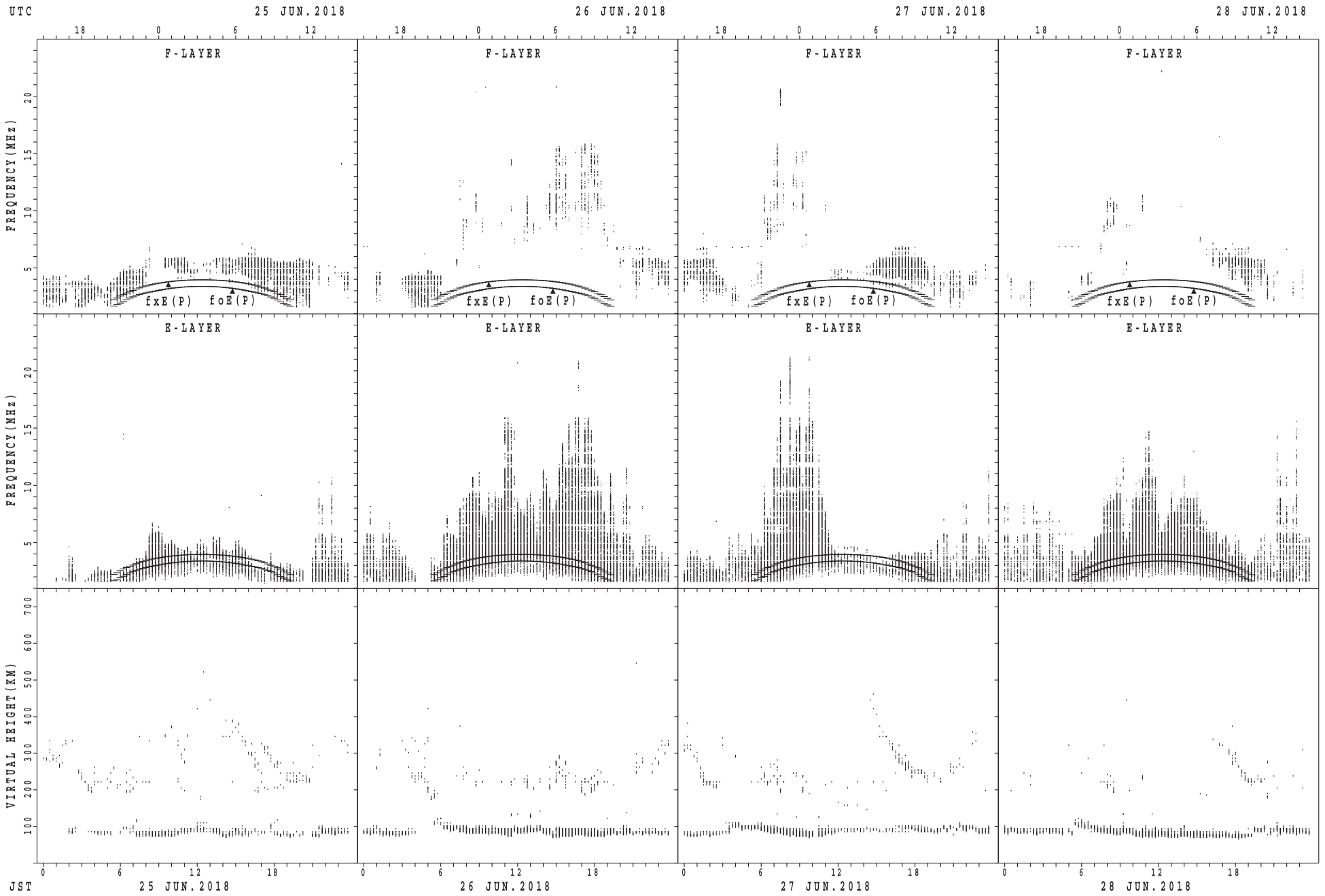
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



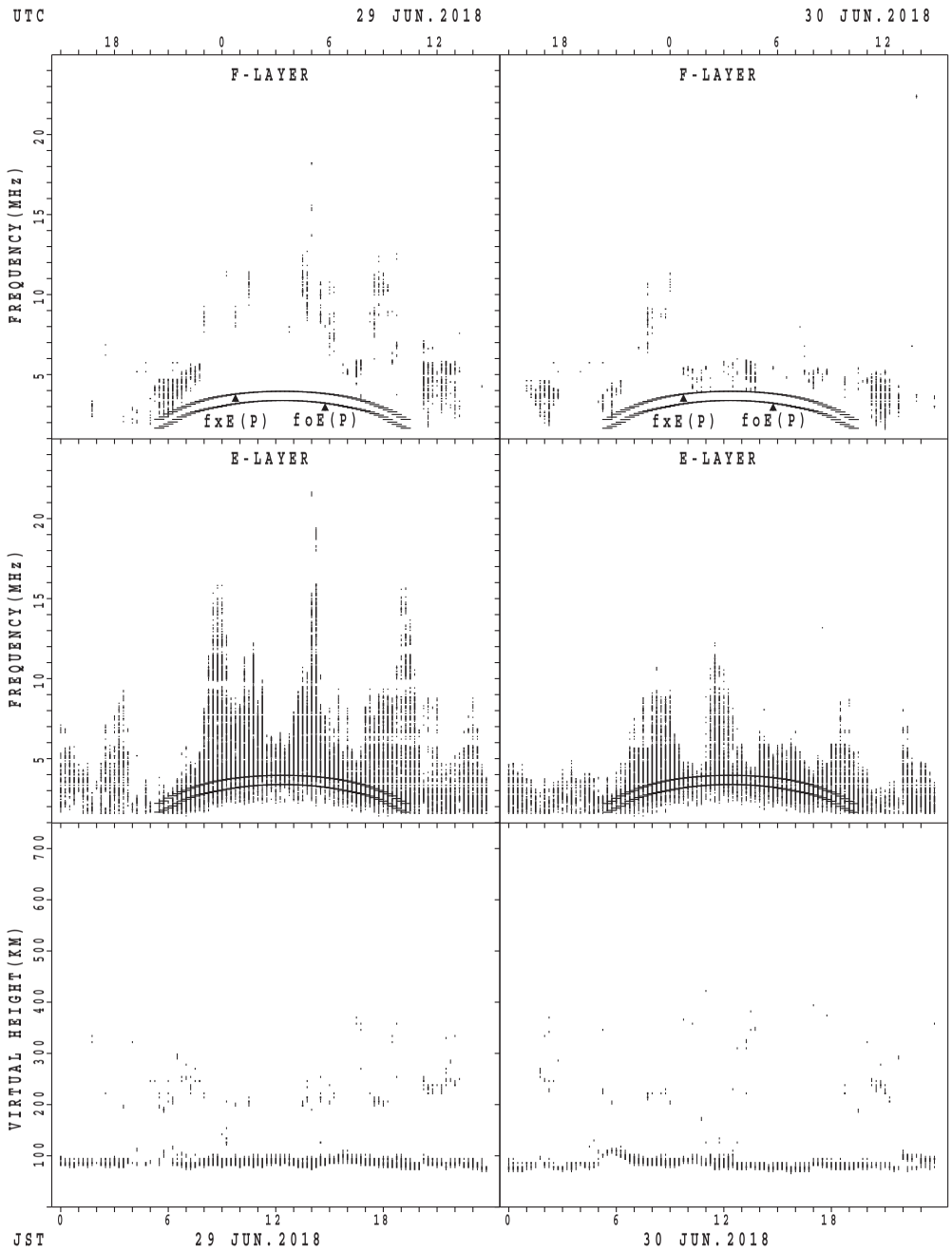
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



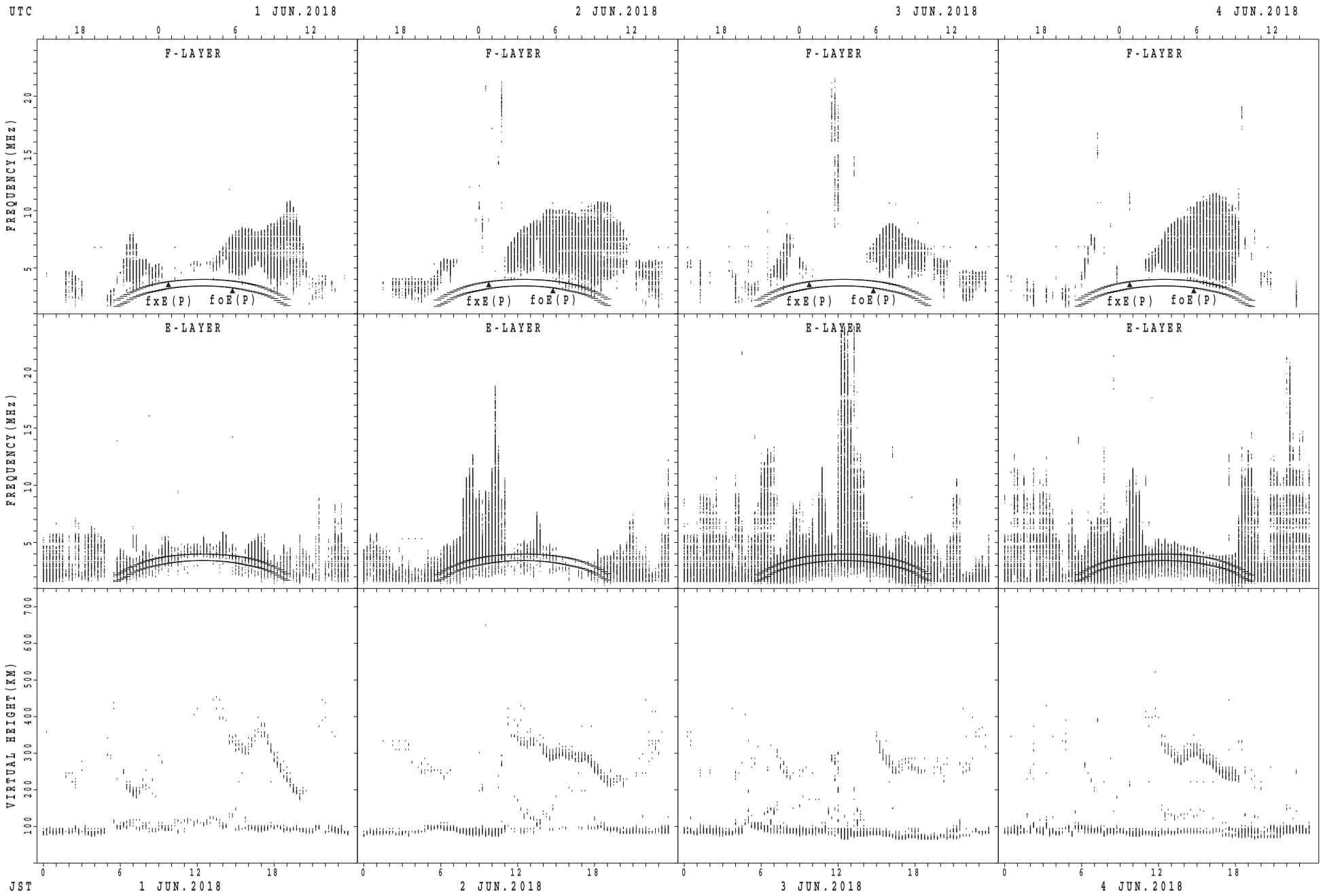
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



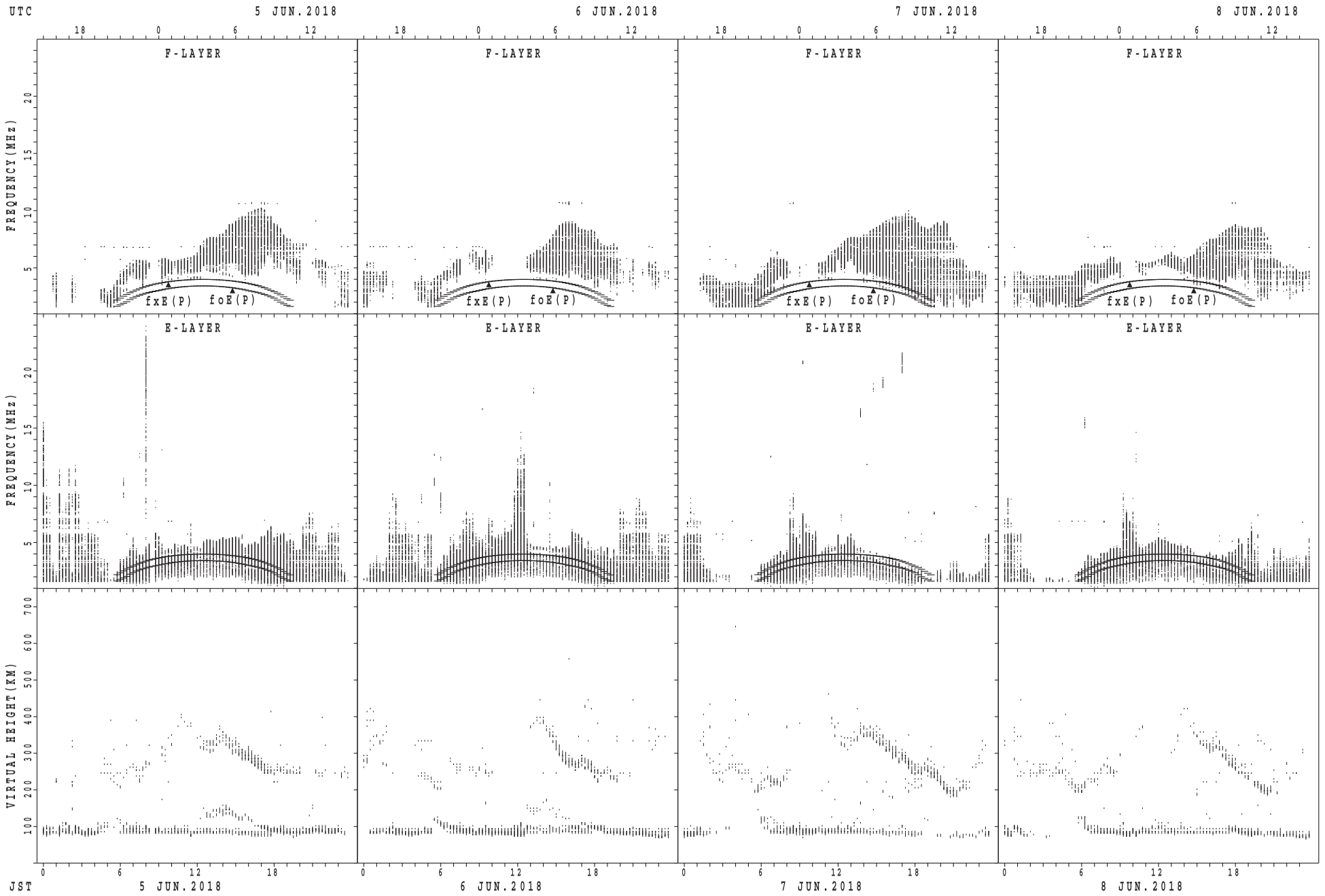
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



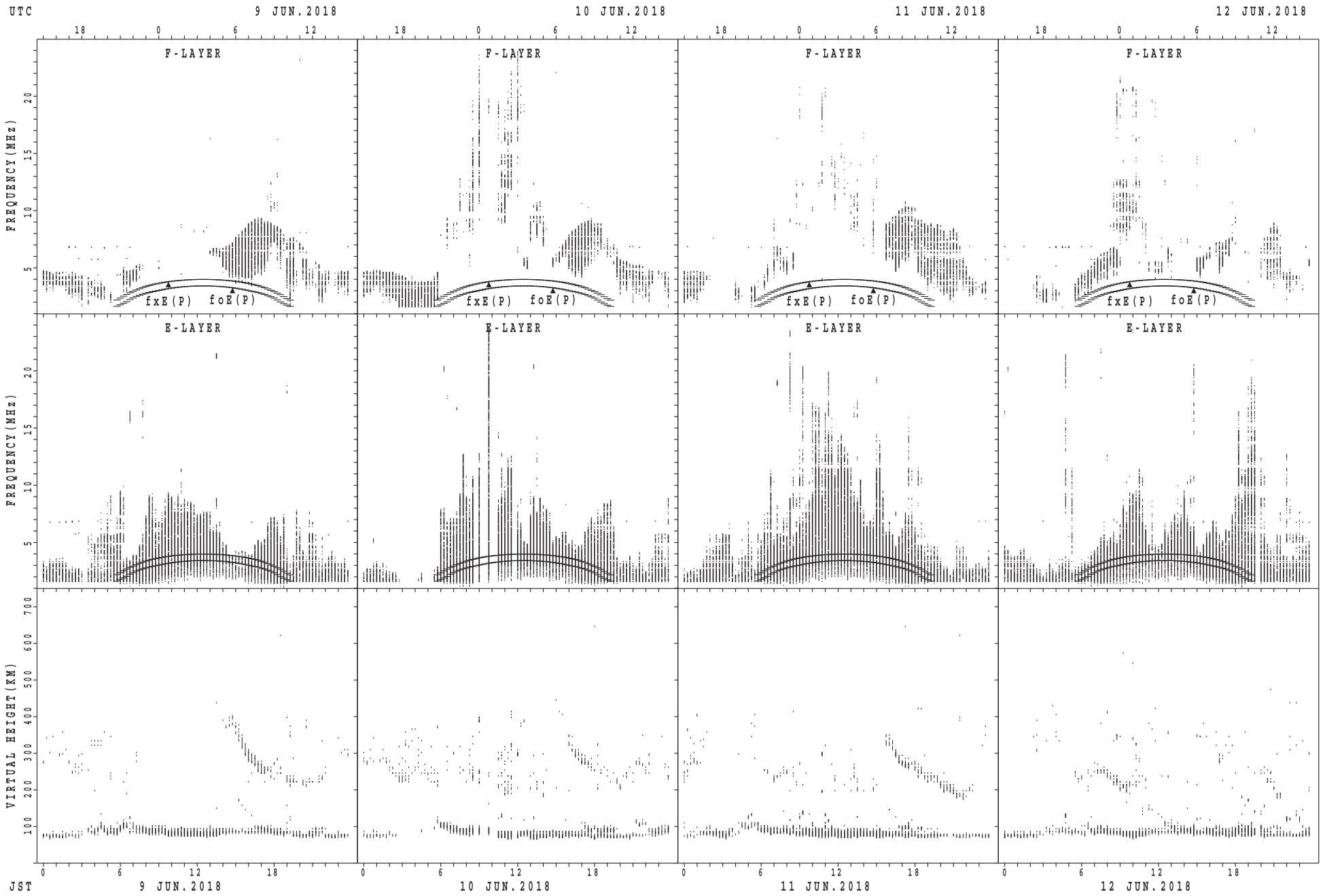
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



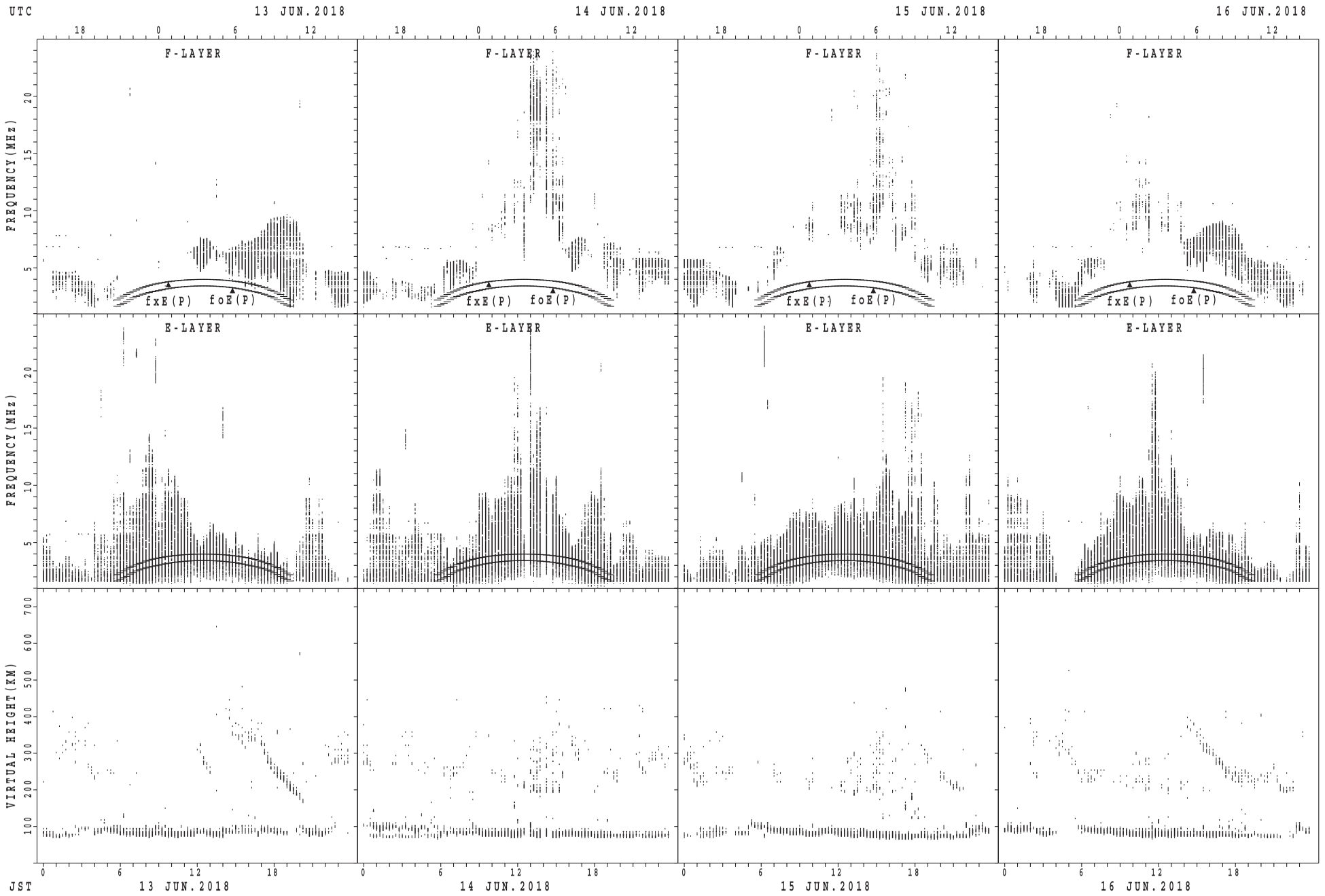
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



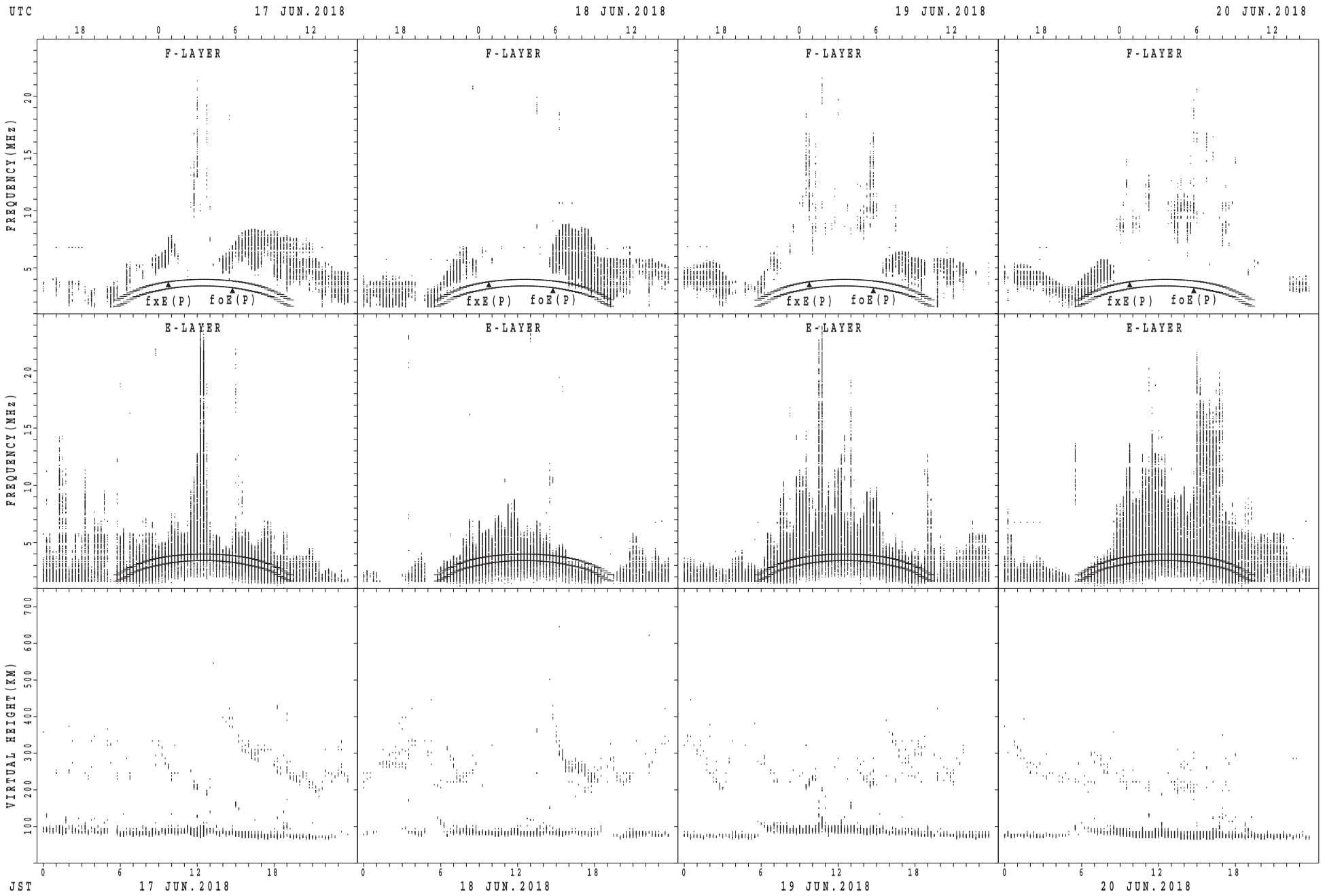
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



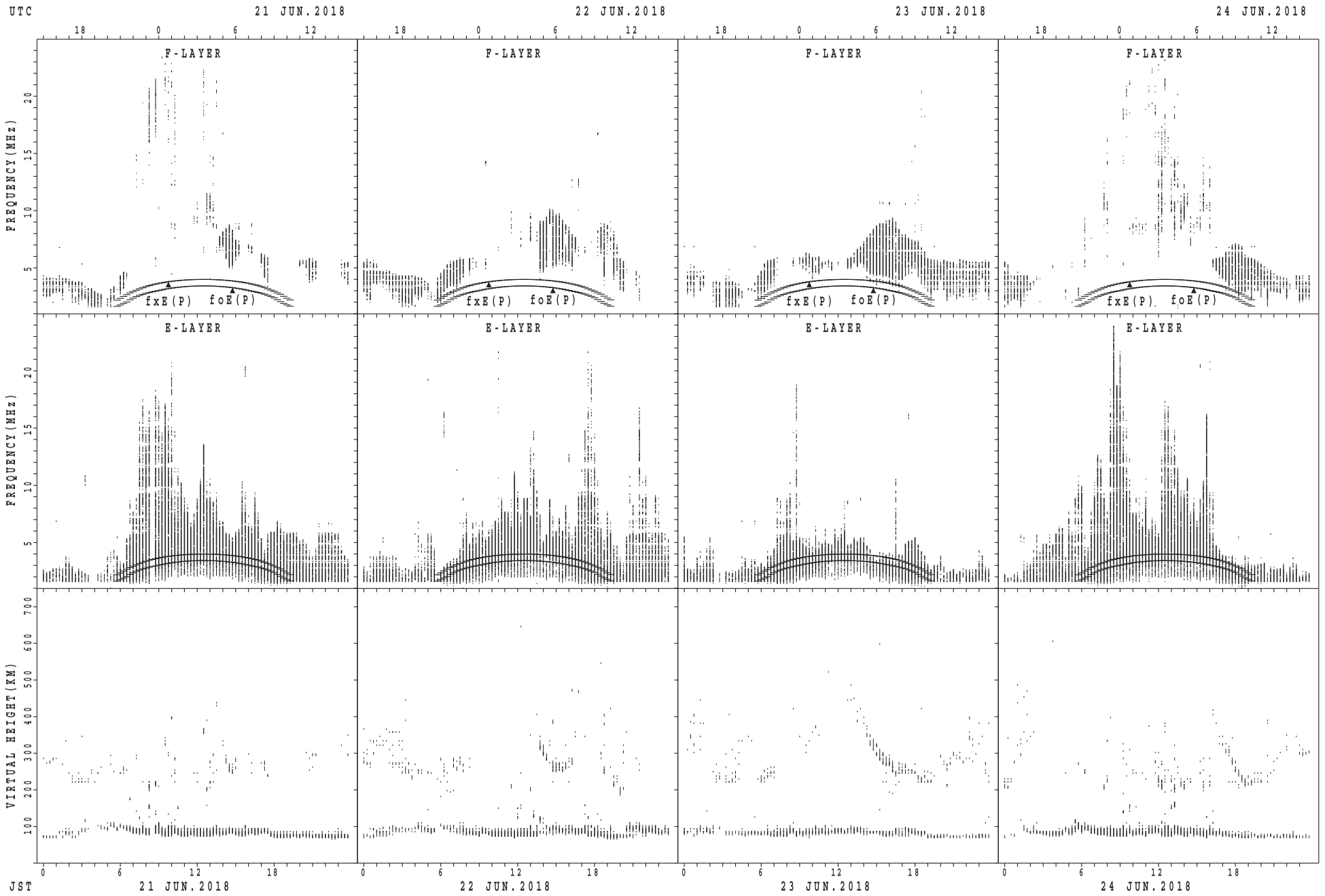
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



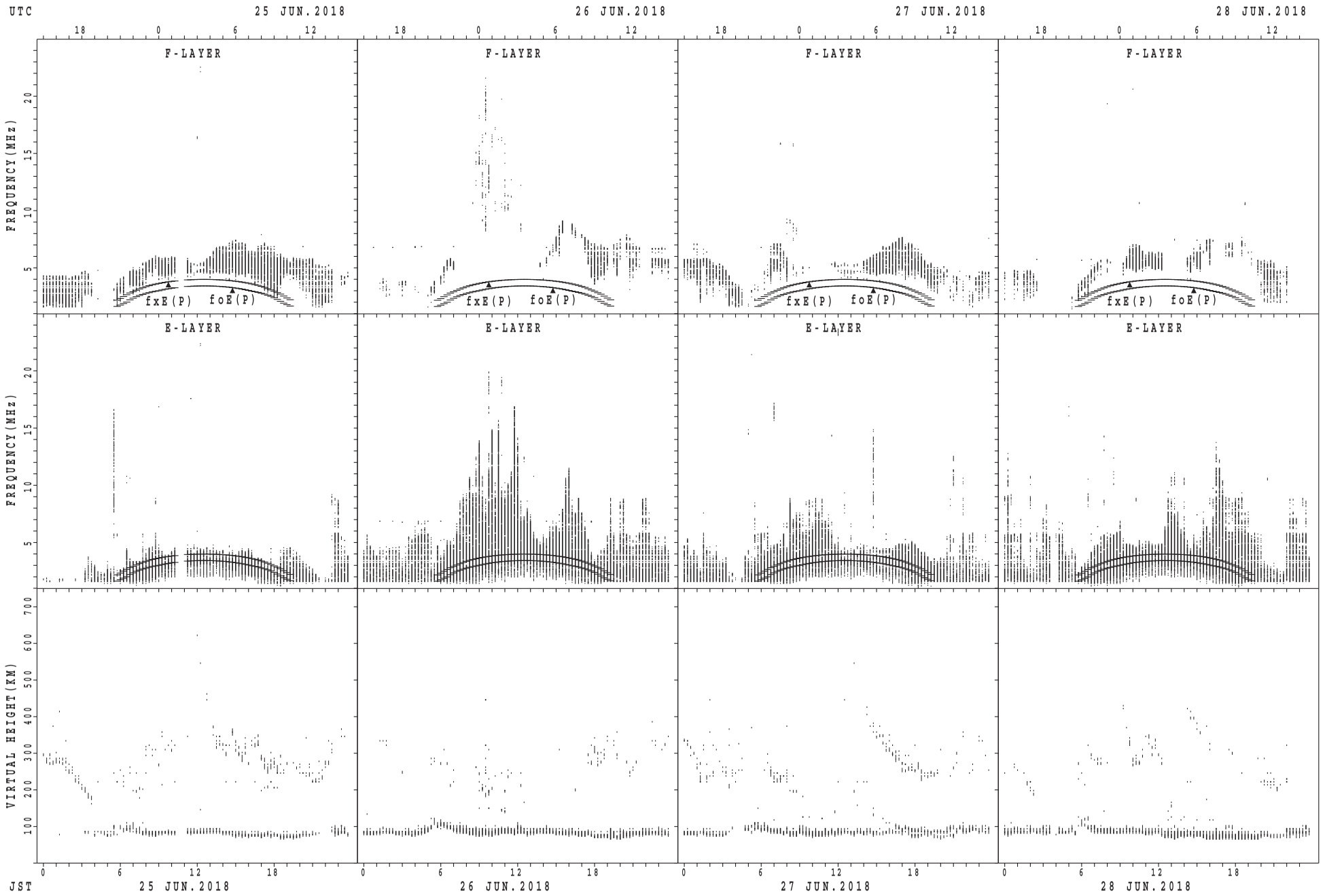
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



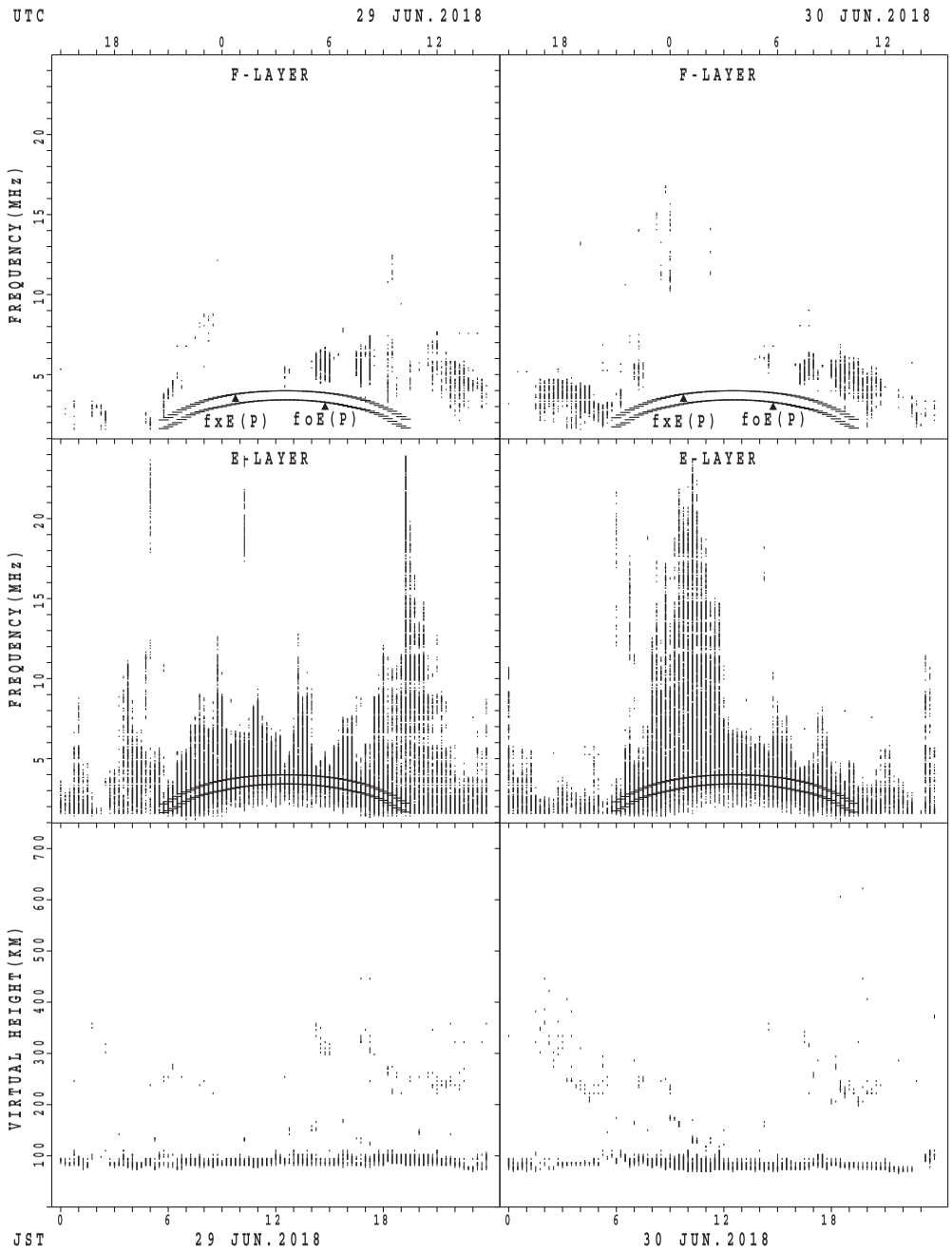
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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.2018 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45°10.0'N LON. 141°45.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	1	2	11	11	9	4	4	5	5	4	3	6	10	11	5	6	1		
MED					210	210	243	206	198	224	190	208	220	216	211	208	215	216	206	222	265	330		
U Q					105	105	280	218	210	257	191	220	235	226	219	222	240	254	214	271	274	165		
L Q					105	105	206	198	192	195	190	198	199	204	205	194	202	206	202	204	256	165		

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	24	21	22	24	25	28	27	25	26	24	23	24	27	26	26	25	26	26	28	27	26	25	26	25
MED	89	89	83	83	99	100	97	95	90	90	91	95	89	89	89	89	95	95	93	93	95	95	90	89
U Q	95	99	105	99	105	107	105	101	97	97	105	116	95	107	101	104	107	97	99	97	101	103	99	95
L Q	86	82	81	81	90	95	91	89	87	87	87	87	83	81	83	83	87	89	89	89	89	89	87	87

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	3	3	11	12	10	12	8	9	9	11	12	8	8	7	4		1	2
MED						207	214	198	218	200	195	191	203	200	214	224	254	266	240	248	215		262	256
U Q						220	234	254	226	206	216	213	257	272	221	324	298	291	268	280	224		131	312
L Q						194	190	192	214	191	192	190	190	194	200	198	202	202	217	208	204		131	200

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	26	27	22	21	26	26	21	22	25	21	24	22	25	23	23	25	25	24	27	26	27	24	25
MED	85	89	85	87	91	103	99	95	91	89	87	89	93	95	93	95	97	95	90	89	87	91	94	89
U Q	89	89	91	97	97	109	105	98	95	93	90	98	103	102	99	105	101	100	96	93	89	97	99	93
L Q	81	83	81	83	83	89	95	91	91	86	84	84	83	88	87	91	88	85	82	85	81	83	89	87

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			1				2	2	3	2	4	5	6	5	7	9	12	14	9	5	2		1	
MED			210				261	213	206	195	205	196	191	224	264	308	284	274	258	250	209		282	
U Q			105				288	224	216	198	257	290	196	292	352	328	296	290	279	275	210		141	
L Q			105				234	202	194	192	196	191	190	190	212	206	229	230	202	195	208		141	

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	28	28	27	24	21	22	30	30	30	30	30	30	30	30	30	29	30	30	30	30	29	27	27	29
MED	89	88	87	89	89	90	102	97	90	88	86	87	89	90	91	97	95	89	92	89	89	89	91	89
U Q	95	92	91	89	101	99	107	101	93	89	89	95	97	107	149	114	105	95	95	95	91	95	99	95
L Q	85	82	83	83	87	89	95	93	89	83	81	85	83	87	83	82	83	81	83	81	81	81	83	87

MONTHLY MEDIANS OF h'F AND h'Es

JUN.2018 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

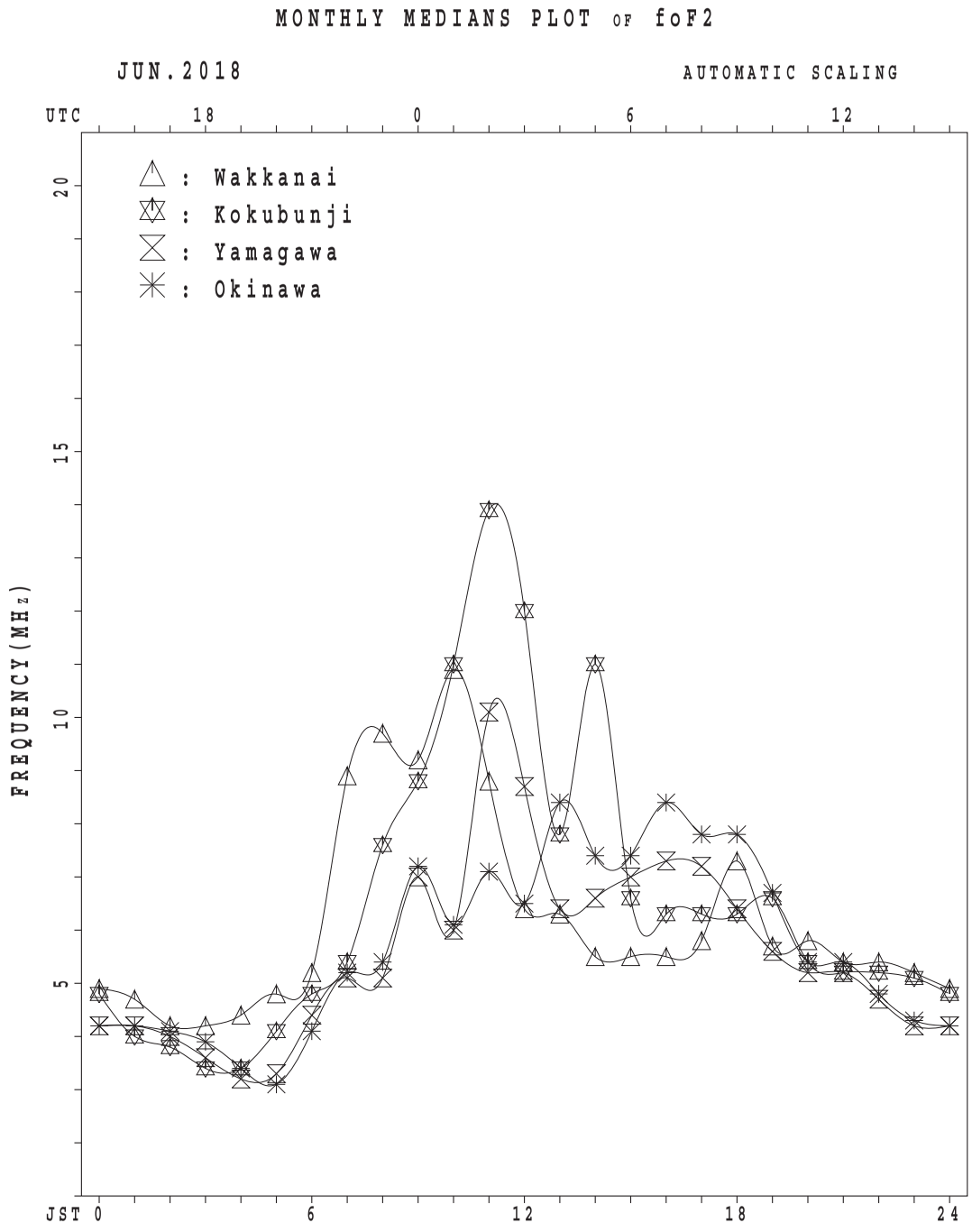
h'F

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								7	5	8	9	5	8	11	10	16	20	23	19	9	6	4		
MED								224	240	196	216	194	262	270	289	301	278	278	258	240	226	221		
U Q								234	280	206	240	197	334	294	302	329	304	298	282	266	242	234		
L Q								204	224	190	193	190	195	192	220	236	239	256	232	229	210	215		

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	28	29	26	24	25	23	30	30	30	30	29	28	30	30	29	30	30	30	30	28	29	30	27	27
MED	86	87	88	87	85	99	100	95	96	97	89	89	98	101	93	92	94	94	87	87	81	83	85	89
U Q	91	94	91	91	94	107	109	105	101	103	101	102	119	129	118	125	113	101	95	95	89	89	93	97
L Q	79	79	83	84	82	89	95	89	91	89	83	83	89	93	85	85	83	83	81	79	77	79	77	79


MONTHLY MEDIANS PLOT OF foF2
JUN.2018
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. 2018 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 59	X 52	X 45																			X 79	X 56	X 55
2	X 52	X 53	X 51	54																		X 59	X 59	X 54
3	X 48	X 43	X 39																			X 62	56	X 49
4	57	52	44	47																		X 58	X 56	X 54
5	X 48	X 45	X 45																			X 63	X 60	X 59
6	X 58	X 58	X 52																			X 61	A	A
7	A	X 55	X 48																			X 65	X 65	X 64
8	X 56	59	58		58																	X 68	69	A
9	X 50	56	53	50																		X 69	X 71	X 56
10	X 51	X 44	X 43	58																		X 66	X 64	X 59
11	X 54	X 50	X 49																			X 71	X 66	A
12	X 45	X 43	X 43							C	C	C	C	C	C	C	C		59			X 66	X 55	X 57
13	X 51	52	X 43																			X 59	A	X 52
14	X 44	X 44	X 44																			X 70	X 67	X 64
15	X 62	X 61	X 54							C	C	C	C									X 66	X 67	X 59
16	X 59	X 55	X 51																			X 67	X 59	X 59
17	A	55	55	53																		X 66	X 60	X 58
18	A	57	57	56																		X 64	A	X 58
19	A	X 58	X 37																			X 61	59	59
20	X 57	X 51	53																			X 63	X 59	X 57
21	X 50	59	71	59		58																X 67	X 60	56
22	58	58	53																			A	A	58
23	59	57	57	53			53															X 72	X 72	X 55
24	X 54	X 51	A																			X 58	X 52	X 49
25	X 49	X 51	X 52		53																	X 65	X 64	X 58
26	X 57	X 52	X 49																			X 70	X 66	X 54
27	X 55	X 49	53																			X 60	A	A
28	A	A	A																			X 59	A	X 54
29	X 56	A	X 38																			X 59	X 59	60
30	A	A	X 43	47																		X 58	X 58	X 51
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	27	28	9	2	1	1												1			29	24	26
MED	X 54	X 52	X 50	53	56	58	53												59			X 65	X 60	X 57
U Q	X 58	57	53	57																		X 68	X 66	X 59
L Q	X 50	X 50	X 44	48																		X 60	X 58	X 54

JUN. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 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	52	45	38	F 33	A	47	52	A	A	52	51	A	A	A	A	48	48	A	A	65	80	72	49	48
2	45	46	44	F 38	38	40	42	A	A	A	A	47	47	46	48	50	48	A	43	45	52	52	52	47
3	41	36	32	30	31	A	44	50	A	55	A	R	45	A	48	47	46	50	A	53	59	55	F 42	42
4	F 42	F 36	F 31	F 29	31	38	A	A	48	56	52	48	A	52	53	51	49	46	46	46	54	51	49	47
5	41	38	38	36	38	44	50	45	46	A	A	A	51	50	51	52	52	49	47	51	57	56	53	52
6	51	51	45	44	38	43	48	A	A	46	A	50	57	48	48	A	49	50	A	49	56	54	A	A
7	A	48	41	41	46	47	A	A	50	62	A	50	A	50	A	57	60	57	59	55	58	58	58	57
8	49	F 47	F 47	51	F 47	55	47	54	R 54	A	A	53	A	47	52	54	58	63	60	60	64	61	F 55	A
9	44	F 39	F 39	F 34	41	45	48	A	52	A	A	50	A	50	55	A	A	44	A	A	59	62	64	49
10	44	37	36	F 38	42	49	52	51	A	49	49	A	48	47	51	52	50	45	44	53	62	59	57	53
11	47	43	42	40	38	46	44	A	50	56	53	54	A	A	50	48	50	46	47	54	60	64	59	A
12	38	36	36	36	38	42	51	A	51	C	C	C	C	C	C	C	C	A	F 47	51	59	58	48	50
13	44	F 39	36	34	34	A	51	57	55	54	52	A	A	A	A	46	A	A	A	56	56	52	A	44
14	37	37	37	37	42	44	51	56	62	53	A	49	A	A	46	48	54	53	51	60	71	63	60	57
15	55	54	47	48	44	44	53	47	A	C	C	C	C	A	A	48	48	44	42	49	56	59	60	52
16	52	48	44	44	49	48	47	A	A	50	54	51	50	48	46	48	48	46	46	52	60	60	52	52
17	A	F 40	F 38	F 37	37	41	A	A	A	A	49	51	A	54	48	48	44	46	A	A	65	59	53	51
18	A	F 38	F 38	F 38	37	44	49	51	53	47	51	A	49	47	56	56	A	48	54	56	A	57	A	51
19	A	51	30	A	A	A	36	A	A	A	A	A	R	A	A	A	45	43	50	54	A	54	F 48	F 44
20	50	44	F 38	R 52	50	R 51	52	A	52	E G 43	A	A	E G 43	E G 43	E G 42	E G 40	47	44	46	50	54	56	52	50
21	43	F 45	F 49	F 47	44	F 45	52	A	A	A	A	A	A	A	E G 42	E G 42	A	47	A	A	A	R 60	53	F 44
22	F 38	F 38	F 38	38	A	48	A	A	A	A	A	A	A	A	A	A	A	A	A	58	60	A	A	F 48
23	F 47	F 39	F 37	F 37	38	41	58	A	53	53	55	51	53	53	50	A	A	48	45	56	60	65	65	48
24	47	44	A	A	36	A	A	A	A	A	E G 41	E G 42	47	A	A	A	A	49	55	62	66	51	45	42
25	42	44	45	44	F 36	50	52	56	A	A	A	A	A	A	A	45	48	51	54	56	63	58	57	51
26	50	45	42	39	36	42	A	A	50	E G 41	A	46	E G 42	A	47	49	A	A	49	56	60	63	59	47
27	48	42	F 39	A	38	47	50	49	A	46	46	A	A	A	A	A	A	47	A	50	58	53	A	A
28	A	A	A	36	37	40	A	A	A	A	A	A	A	A	A	A	A	39	A	A	53	52	A	47
29	48	A	31	33	44	38	38	A	A	A	A	A	44	A	A	43	50	51	51	51	53	52	52	F 44
30	A	A	36	F 31	35	46	A	A	A	A	A	51	A	47	E G 49	A	A	A	A	A	51	51	51	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	24	27	28	27	27	26	22	10	13	15	11	14	12	14	18	20	18	23	19	25	27	29	24	26
MED	46	43	38	38	38	44	50	51	52	52	51	50	48	48	48	48	48	47	47	54	59	58	53	48
U Q	50	46	43	44	44	47	52	56	54	55	53	51	50	50	51	52	50	50	54	56	62	60	58	51
L Q	42	38	36	F 34	36	42	47	49	50	46	49	48	44	47	47	46	48	45	46	50	56	52	50	44

JUN. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 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					A	L	A	A	A	L	432	A	A	A	A	L	L	A	A	A				
2					L	308	L	A	A	A	A	L	L	416	L	408	L	A	A					
3					L	A	L		A	A	A	432	L	L	L	L	396	L	A					
4						L	A	A	392	L	L	L	A	432	L	416	A	L	A	L	L			
5						L	L	420	A	A	A	A	L	A	424	A	L	376	L		L			
6						368	A	A	A	A	A	L	A	L	L	A	A	A	A					
7						376	A	A	A	L	A	L	A	A	A	L	L	L	328					
8					L	L	392	A	A	A	A	L	A	436	A	L	L		L					
9					L	340		A	A	A	A	A	A	L	A	A	A	368	A	A				
10					260	324	368	A	A	L	L	A	L	L	L	L	L	L	A	L				
11							A	A	L	A	492	A	A	A	L	428	A	L	A	A				
12					L	340	L	A	A	C	C	C	C	C	C	C	C	A	A	A				
13						A	L	L	L	A	A	A	A	A	A	L	A	A	A					
14				L	L	L	A	L	L	A	A	L	A	A	L	388	A	A	L					
15						L	A	A	A	C	C	C	C	A	A	A	A	400	A	A				
16						344	A	A	A	L	L	L	L	L	L	L	L	388	A	L				
17						A	A	A	A	A	A	L	A	L	L	L	L	L	A	A				
18						L	A	A	A	L	420	A	L	A	L	A	A	A	A	A	A			
19				A	A	A		A	A	A	A	A	420	A	A	A	L	L	A	A	A			
20					A	A	424	A	L	432	A	A	L	L	420	400	400	A	A					
21					L	L	L	A	A	A	A	A	A	A	420	L	A	A	A	A	A			
22					A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	L				
23						352		A	A	L	A	A	A	A	432	A	A	A	L					
24				A		A	A	A	A	A	412	416	L	A	A	A	A	A	L	332				
25						L	A	A	A	A	A	A	A	A	A	L	L	L	L					
26					L	L	A	A		412	A	L	420	A	L	L	A	A		L				
27				A	L	A	L	A	A	A	A	A	A	A	A	A	A	A	A					
28				276		L	A	A	A	A	A	A	A	A	A	A	A	L	A	A	A			
29					368	L	A	A	A	A	A	A	L	A	A	A	396	368	L					
30					L	A	A	A	A	A	A	L	A	L	488	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				1	2	8	3	1	1	2	4	2	2	3	5	5	3	5	1	1				
MED				276	314	342	392	420	392	422	426	424	420	432	424	408	396	376	328	332				
U Q						360	424				462			436	460	422	400	394						
L Q						332	368				416			416	420	394	396	368						

JUN. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				A	A	200	248	280	300	312	312	312	288	256	332	300	276	248	196	A	A			
2				B	228	204	240	276	292	308	308	308	308	A	252	328	272	248	204	A	A			
3				B	232	208	240	272	292	312	312	312	300	A	320	312	292	252	188	A	A			
4				B	B	188	252	276	304	304	328	328	328	308	272	248	A	A	A	A	A			
5				B	R 168	212	256	284	308	328	328	328	308	308	276	A	A	252	216	180	A			
6				B	A	204	252	276	296	316	316	316	316	296	320	304	300	256	200	A	A			
7				A	A	196	256	288	300	308	328	328	312	A	312	300	300	244	200	A	A			
8				B	184	212	240	284	304	304	336	312	312	312	312	280	280	A	A	A	A			
9				B	A	220	248	284	308	320	320	328	328	312	268	A	A	236	224	A	A			
10				B	184	200	228	280	296	324	316	316	324	336	336	304	284	260	188	A	B			
11				B	R 160	220	260	288	308	320	340	336	332	324	A	A	A	A	212	A	A			
12				B	232	204	248	284	312	C	C	C	C	C	C	C	C	A	A	A	B			
13				B	A	228	260	292	300	316	320	328	332	328	316	304	272	256	U A 216	A	B			
14				U A 220	172	200	252	296	308	320	348	332	A	296	A	308	272	248	180	A	A			
15				B	A	244	264	280	296	C	C	C	C	304	A	A	300	256	216	A	A			
16				B	R 208	208	260	288	296	316	336	336	336	336	312	312	292	256	216	B	B			
17				B	A	204	268	268	304	316	316	316	A	352	324	312	296	260	208	A	A			
18				B	A	A 256	280	312	316	320	320	324	324	324	284	304	268	268	A	232	A			
19				B	A	208	252	280	288	324	324	A	324	324	308	292	280	244	200	A	A			
20				B	A	208	248	264	264	304	316	296	296	A	308	300	300	248	220	A	A			
21				B	220	204	248	292	308	316	316	316	A	A	324	300	284	256	A	A	A			
22				B	A	A 276	308	308	312	316	316		A	A	A	A	A	A	A	A	A			
23				B	A	228	264	288	296	324	324	304	324	324	324	324	288	272	228	184	A			
24				B	A	200	252	276	300	308	A	332	324	340	324	312	280	256	188	A	A			
25				B	A	200	252	264	288	304	308	A	A	A	288	312	284	252	196	A	A			
26				B	A	192	252	268	296	320	324	324	324	324	A	312	288	252	208	172	316			
27				B	A	208	244	272	292	296	304	300	268	A	A	316	284	256	204	A	B			
28				B	A	196	U R 260	292	292	316	316	308	308	316	280	A	280	256	224	A	B			
29				B	A	208	240	272	300	300	300	300	A	A	332	312	280	256	204	A	B			
30				B	A	204	244	280	300	300	312	300	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				1	10	28	30	30	30	28	27	26	21	19	22	22	23	24	23	4	1			
MED				U A 220	196	204	252	280	300	316	316	316	324	324	312	306	284	256	204	182	316			
U Q					228	210	260	288	308	320	328	328	326	328	324	312	292	256	216	208				
L Q					R 172	200	248	276	296	306	312	308	308	308	284	300	280	248	196	176				

JUN. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	JA 51	JA 51	58	JA 49	JA 255	JA 38	JA 66	JA 66	JA 105	JA 87	JA 67	JA 88	JA 76	JA 150	JA 130	34	JA 51	JA 113	JA 151	JA 85	JA 109	JA 87	EB 16	EB 16
2	JA 26	EB 16	24	JA 23	29	JA 26	33	JA 44	JA 52	JA 53	JA 46	JA 43	JA 57	JA 105	JA 60	G	JA 40	JA 63	JA 43	JA 36	JA 49	JA 52	JA 31	JA 32
3	JA 33	JA 20	JA 20	25	JA 27	JA 44	JA 41	JA 52	JA 87	JA 62	JA 48	JA 41	JA 45	JA 61	JA 37	33	34	JA 43	JA 96	JA 35	JA 21	JA 20	20	JA 27
4	EB 16	20	24	EB 16	EB 16	28	JA 45	JA 56	JA 56	JA 49	JA 55	JA 58	JA 107	JA 48	JA 42	JA 39	JA 120	JA 66	JA 48	JA 50	JA 41	JA 32	JA 83	JA 37
5	27	JA 48	JA 27	JA 30	JA 30	25	32	37	JA 47	JA 55	JA 57	JA 67	JA 49	JA 66	JA 67	JA 63	JA 41	31	JA 53	JA 84	35	JA 60	JA 31	EB 16
6	EB 16	27	25	EB 15	28	26	JA 45	JA 71	JA 106	JA 123	JA 81	JA 58	JA 69	JA 65	40	68	JA 67	56	JA 78	JA 29	JA 51	JA 33	JA 65	JA 63
7	JA 121	JA 81	JA 66	JA 33	JA 33	JA 32	JA 49	JA 91	JA 86	JA 60	JA 88	JA 153	JA 89	JA 79	JA 89	JA 52	JA 121	JA 29	JA 27	JA 42	JA 42	JA 45	JA 64	50
8	JA 109	23	24	JA 20	JA 20	24	33	53	JA 61	JA 61	JA 85	JA 60	JA 108	36	JA 54	58	JA 51	JA 51	JA 45	49	JA 42	JA 52	61	JA 63
9	EB 16	JA 29	25	JA 24	JA 33	27	JA 40	JA 52	JA 61	JA 53	JA 64	JA 45	JA 67	JA 57	JA 57	JA 47	JA 68	31	JA 77	JA 61	JA 53	JA 41	JA 52	JA 23
10	JA 19	34	JA 24	JA 24	JA 20	JA 30	JA 33	JA 61	JA 63	JA 53	JA 62	JA 94	JA 57	JA 42	40	JA 71	51	JA 50	53	JA 31	JA 33	JA 22	JA 20	JA 26
11	JA 23	JA 24	JA 40	JA 31	18	JA 35	JA 77	JA 65	38	JA 51	JA 56	JA 63	JA 84	78	JA 41	JA 64	JA 51	48	JA 67	JA 51	39	JA 35	JA 82	JA 62
12	JA 33	JA 33	JA 25	JA 27	27	JA 33	JA 47	JA 52	JA 111	C	C	C	C	C	C	C	C	JA 75	JA 87	JA 61	JA 49	JA 22	JA 40	32
13	JA 87	26	28	JA 30	JA 41	JA 43	JA 39	JA 53	JA 49	JA 59	JA 53	JA 65	JA 61	JA 76	JA 113	34	JA 74	JA 98	JA 158	JA 66	JA 78	90	JA 140	JA 84
14	JA 20	24	22	JA 99	JA 21	JA 31	50	JA 42	JA 78	JA 54	JA 135	JA 61	JA 97	JA 50	JA 56	35	JA 44	JA 68	JA 46	JA 52	JA 52	29	EB 16	EB 16
15	EB 16	EB 16	JA 25	32	JA 32	33	48	JA 51	JA 87	C	C	C	C	JA 73	JA 106	JA 63	JA 65	JA 97	JA 41	JA 53	JA 62	60	JA 32	22
16	28	28	JA 23	27	JA 163	30	JA 49	57	JA 65	JA 55	JA 46	53	JA 54	40	JA 53	36	36	JA 37	JA 37	JA 26	JA 24	36	JA 35	34
17	JA 81	JA 29	JA 25	33	JA 42	JA 37	JA 88	JA 101	139	94	JA 57	JA 58	JA 124	JA 61	JA 58	JA 89	JA 45	JA 45	JA 84	JA 159	JA 127	39	JA 42	JA 103
18	JA 62	26	23	JA 17	JA 21	JA 26	JA 97	53	JA 77	JA 46	40	70	54	JA 52	JA 45	JA 45	JA 95	JA 65	117	94	JA 175	JA 87	JA 87	JA 54
19	71	JA 49	JA 109	JA 52	JA 32	JA 66	JA 63	JA 78	JA 121	78	60	JA 107	JA 40	JA 81	JA 46	JA 57	JA 43	JA 83	JA 67	JA 63	JA 63	JA 49	JA 65	JA 33
20	28	JA 31	JA 63	JA 53	JA 86	JA 51	JA 64	JA 108	JA 39	JA 44	JA 88	JA 85	JA 55	38	JA 59	JA 31	JA 29	JA 39	55	JA 41	JA 52	68	28	JA 30
21	46	JA 64	JA 33	JA 63	JA 230	27	JA 47	111	JA 51	JA 79	JA 122	JA 181	JA 227	JA 51	G	JA 53	JA 226	JA 151	86	JA 142	JA 137	JA 233	JA 83	28
22	21	JA 51	JA 62	JA 137	JA 106	JA 65	JA 87	JA 121	JA 141	JA 76	JA 108	JA 152	JA 105	JA 105	JA 127	JA 127	JA 119	JA 167	JA 87	JA 27	JA 51	JA 109	JA 119	JA 63
23	JA 52	JA 40	JA 65	JA 51	JA 39	JA 32	JA 66	JA 168	JA 76	JA 139	JA 100	JA 119	JA 128	JA 113	JA 40	JA 76	JA 111	JA 200	JA 78	JA 51	JA 48	JA 36	JA 24	EB 16
24	JA 31	JA 56	JA 91	JA 106	JA 62	JA 65	JA 64	JA 52	JA 52	JA 51	JA 51	JA 45	JA 46	JA 67	JA 53	JA 49	JA 72	JA 82	JA 84	JA 166	JA 30	JA 35	JA 50	JA 51
25	JA 32	JA 41	JA 38	JA 33	JA 33	JA 65	JA 52	JA 171	JA 81	JA 176	JA 118	JA 133	JA 90	JA 107	JA 63	JA 43	JA 45	JA 36	JA 51	JA 63	JA 77	JA 26	JA 57	JA 62
26	JA 86	JA 32	JA 38	JA 34	JA 141	JA 32	JA 61	JA 117	JA 62	JA 45	JA 88	JA 53	JA 53	JA 53	JA 63	JA 96	JA 84	JA 159	JA 55	JA 22	JA 29	20	EB 16	26
27	31	JA 33	JA 35	JA 52	JA 33	JA 38	JA 52	JA 56	JA 83	JA 62	JA 42	JA 76	JA 68	JA 63	JA 54	JA 61	JA 190	JA 73	JA 84	JA 47	JA 37	JA 98	JA 104	JA 84
28	JA 108	JA 117	JA 65	JA 52	JA 111	JA 30	JA 52	JA 100	JA 88	JA 95	JA 121	JA 143	JA 143	JA 129	JA 167	JA 156	JA 73	G	JA 85	JA 49	JA 60	JA 84	JA 86	JA 52
29	JA 33	JA 87	JA 31	JA 40	JA 51	JA 26	JA 48	JA 52	JA 95	JA 107	JA 105	JA 94	JA 58	JA 75	JA 131	JA 101	JA 55	JA 68	JA 52	JA 49	JA 17	JA 32	JA 107	JA 64
30	JA 85	JA 52	JA 48	JA 25	JA 34	JA 47	JA 54	JA 87	JA 237	JA 89	JA 139	JA 56	JA 65	JA 53	JA 55	JA 50	JA 70	JA 166	JA 108	JA 89	JA 65	JA 34	JA 41	JA 52
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	28	28	28	28	29	29	29	29	30	30	30	30	30	30	30
MED	JA 32	JA 32	JA 30	JA 32	JA 33	JA 32	JA 50	JA 59	JA 78	JA 60	JA 66	JA 66	JA 68	JA 65	JA 56	JA 53	JA 65	JA 66	JA 72	JA 51	JA 50	JA 40	JA 51	JA 36
U Q	JA 71	JA 51	JA 58	JA 52	JA 62	JA 43	JA 64	JA 100	JA 95	JA 88	JA 102	JA 100	JA 101	JA 80	JA 78	JA 70	JA 90	JA 97	JA 86	JA 66	JA 63	JA 68	JA 83	JA 62
L Q	23	26	24	JA 25	JA 27	27	JA 45	JA 52	JA 56	JA 53	JA 54	JA 57	JA 54	JA 52	44	38	JA 44	JA 43	JA 51	JA 41	JA 37	JA 32	31	26

JUN. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 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	30	22	22	16	A A 255	G 20	44	A A 66	A A 105	36	38	A A 88	A A 76	A A 150	A A 130	33	E A 34	A A 113	A A 151	24	21	28	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	G 17	22	29	A A 44	A A 52	A A 53	A A 46	36	36	36	34	G	E A 34	A A 63	31	32	22	24	24	24
3	16	E B 16	E B 16	E B 16	G 20	A A 44	32	A	A A 87	E A 46	A A 48	36	36	36	35	G 31	31	34	A A 96	23	E B 16	17	E B 17	E B 16
4	E B 16	E B 16	E B 15	E B 16	E B 16	26	A A 45	A A 56	34	36	38	38	A A 107	36	34	32	43	26	E A 43	24	24	24	18	23
5	16	16	16	E B 17	G 16	23	30	34	42	A A 55	A A 57	A A 67	E A 39	45	36	38	32	28	G 22	G 18	20	17	18	E B 16
6	E B 16	E B 16	E B 16	E B 15	16	24	A 35	A A 71	A A 106	A	A A 81	36	38	38	38	A A 68	36	E A 41	A A 78	22	22	22	A A 65	A A 63
7	A A 121	21	E B 16	E B 16	22	25	A A 49	A A 91	40	37	A A 88	38	A A 89	A	A A 89	31	G 30	26	24	22	21	21	26	18
8	E B 16	E B 16	E B 16	E B 16	E B 16	G 20	30	36	37	A A 61	A A 85	37	A A 108	34	A	37	A	35	22	25	26	26	20	A A 63
9	E B 16	E B 14	E B 16	E B 16	22	24	33	A A 52	46	A A 53	A A 64	A	A A 67	E A 43	E A 43	A A 47	A A 68	28	A A 77	A A 61	22	18	19	16
10	16	16	E B 16	E B 16	G 16	24	29	46	A A 63	37	38	A A 94	37	40	34	33	35	34	36	18	22	19	18	18
11	16	E B 16	E B 16	17	G 16	32	36	A A 65	35	44	46	45	A A 84	A A 78	36	34	30	35	A 21	21	17	21	A A 62	
12	21	18	16	20	G 20	28	34	A A 52	A	C	C	C	C	C	C	C	C	A A 75	A 23	A	25	15	21	16
13	E B 16	E B 16	E B 16	16	20	A A 43	28	37	35	A	42	A A 65	A A 61	A A 76	A A 113	31	A A 74	A A 98	A A 158	28	20	19	A A 140	17
14	E B 16	E B 16	E B 16	E B 16	G 17	29	32	34	36	E A 46	A A 135	41	A A 97	A A 50	35	34	A	29	24	20	18	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	16	16	G 24	E A 36	A	A A 87	C	C	C	C	A A 73	A A 106	36	A	26	26	26	24	22	E B 16	E B 16
16	16	E B 16	E B 16	E B 16	G 16	28	34	A A 57	A A 65	36	37	36	36	36	36	32	34	29	A	22	19	21	18	E B 18
17	A A 81	18	E B 16	18	24	28	A A 88	A A 101	A A 139	A A 94	A	38	A A 124	38	38	34	32	30	A A 84	A A 159	16	20	20	22
18	A A 62	E B 17	E B 17	E B 16	17	22	A	E A 43	A	38	36	A A 70	36	E A	32	A	A A 95	36	45	36	A A 175	22	A A 87	22
19	A A 71	20	24	A A 52	A A 32	A A 66	28	A A 78	A A 121	A A 78	A A 60	A A 107	37	A A 81	A A 46	A A 57	32	26	A	19	A A 63	24	A	E B 16
20	E B 17	E B 17	17	22	25	E A 35	36	A A 108	36	35	A A 88	A A 85	36	36	36	30	G 26	A	A	25	23	18	16	E B 16
21	28	25	16	E B 16	G 16	24	30	A A 111	A A 51	A A 79	A A 122	A A 181	A A 227	A A 51	G	35	A A 226	A	A A 86	A A 142	A A 137	16	16	16
22	E B 16	21	18	22	A A 106	31	A 87	A A 121	A A 141	A A 76	A A 108	A A 152	A A 105	A A 105	A A 127	A A 127	A A 119	A A 167	A A 87	23	23	A A 109	A A 119	28
23	22	20	20	20	20	24	35	A A 168	A	38	37	A	A	A	37	A A 76	A A 111	A	A 29	21	25	19	17	E B 16
24	E B 16	19	A A 91	A A 106	E A 26	A A 65	A A 64	A A 52	A A 52	A A 51	35	35	38	A A 67	A A 53	A A 49	A A 72	E A 44	26	29	17	22	22	27
25	E B 16	20	28	21	22	22	31	A	A A 81	A A 176	A A 118	A A 133	A A 90	A A 107	A A 63	34	E A 36	29	28	25	24	23	18	19
26	16	16	20	27	17	26	A A 61	A A 117	42	35	A A 88	37	35	A A 53	35	36	A A 84	A A 159	36	G 17	G 16	E B 16	E B 16	E B 17
27	20	16	16	A A 52	18	A	A 25	A	A A 83	A	E A 37	A A 76	A A 68	A A 63	A A 54	A A 61	A A 190	42	A A 84	E B 16	22	22	A A 104	A A 84
28	A A 108	A A 117	A A 65	E A 24	21	26	A A 52	A A 100	A A 88	A A 95	A A 121	A A 143	A A 143	A A 129	A A 167	A A 156	A A 73	G	A A 85	A A 49	A	A	A A 86	E A 24
29	18	A A 87	19	25	18	26	32	A A 52	A A 95	A A 107	A A 105	A A 94	37	A A 75	A A 131	A	E A 34	30	23	26	E B 16	E B 19	20	17
30	A A 85	A A 52	23	16	17	A	A A 54	A A 87	A A 237	A A 89	A A 139	36	A A 65	39	44	A A 50	A A 70	A A 166	A A 108	A A 89	20	18	22	22
31																								
	00	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	28	29	26	27	25	27	26	27	26	28	27	26	27	25	30	29	29	29	30
MED	16	16	16	16	18	26	34	A A 61	A A 63	A A 51	A A 60	55	A A 65	A A 50	38	35	A 36	32	A 43	24	22	20	20	18
U Q	A A 28	20	20	22	22	A 30	A A 47	A A 100	A A 95	A A 78	A A 105	A A 94	A A 97	A A 76	A A 76	A A 50	A A 74	A A 63	A A 86	A A 29	24	22	A A 25	A 24
L Q	E B 16	E B 16	E B 16	E B 16	G 16	24	30	46	40	37	38	37	37	38	35	32	32	28	26	21	20	18	E B 17	E B 16

JUN. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUN. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 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	287	281	328	F 299	A	282	322	A	A	351	343	A	A	A	A	261	278	A	A	309	322	352	297	344
2	290	292	283	F 292	284	295	305	A	A	A	A	259	268	251	274	300	318	A	318	300	299	298	296	327
3	316	321	298	307	292	A	283	221	A	344	A	R	270	A	293	323	274	306	A	314	326	321	F 295	295
4	F 304	F 277	F 296	F 284	313	356	A	A	301	363	333	298	A	302	318	297	307	326	327	319	316	279	303	294
5	318	315	310	319	351	336	364	332	294	A	A	A	303	289	296	310	337	329	317	317	320	308	301	299
6	311	335	321	299	304	256	288	A	A	267	A	292	335	254	302	A	318	321	A	329	318	314	A	A
7	A	294	314	307	336	245	A	A	299	348	A	307	A	274	A	300	319	304	313	336	301	301	299	321
8	305	F 300	F 296	287	F 304	345	326	346	R 272	A	A	334	A	251	299	295	305	324	314	321	312	328	F 298	A
9	327	F 285	F 285	F 276	316	334	359	A	233	A	A	294	A	295	348	A	A	326	A	A	321	307	322	319
10	329	295	295	F 270	284	320	346	217	A	325	294	A	315	262	302	339	316	322	219	312	319	324	330	343
11	325	331	341	327	339	339	326	A	330	345	353	256	A	A	293	272	312	301	234	325	319	316	342	A
12	319	310	310	329	309	309	339	A	351	C	C	C	C	C	C	C	C	A	F 242	319	315	327	340	326
13	310	F 289	305	322	319	A	326	325	336	341	278	A	A	A	A	302	A	A	A	318	330	334	A	324
14	317	318	310	311	340	294	316	311	348	347	A	325	A	A	269	278	327	329	312	315	317	320	327	320
15	319	339	328	317	342	339	332	331	A	C	C	C	C	A	A	323	312	317	311	293	323	310	340	315
16	336	338	321	317	333	311	341	A	A	329	329	350	305	297	269	300	325	314	311	323	322	310	327	324
17	A	F 304	F 300	F 311	343	285	A	A	A	A	325	317	A	337	289	287	256	294	A	A	327	325	322	316
18	A	F 316	F 316	F 293	316	306	312	314	366	304	326	A	290	248	287	300	A	297	242	230	A	299	A	275
19	A	312	298	A	A	A	396	A	A	A	A	A	R	A	A	A	290	290	294	319	A	299	F 305	F 323
20	304	304	F 299	R 286	304	R 253	274	A	339	G	A	A	G	G	G	G	291	307	309	307	321	316	297	297
21	315	F 321	F 321	F 323	345	F 316	295	A	A	A	A	A	A	A	G	G	A	219	A	A	A	R 256	332	F 302
22	F 324	F 325	F 325	282	A	324	A	A	A	A	A	A	A	A	A	A	A	A	A	325	315	A	A	F 281
23	F 279	F 294	F 289	F 293	355	283	343	A	268	311	363	292	311	279	297	A	A	236	217	305	329	310	317	299
24	288	307	A	A	263	A	A	A	A	A	G	G	291	A	A	A	A	294	227	309	336	326	300	303
25	301	317	310	287	F 288	288	320	201	A	A	A	A	A	A	A	284	295	314	322	311	326	313	320	301
26	298	301	278	301	325	358	A	A	400	G	A	268	G	A	309	272	A	A	298	288	312	301	326	296
27	327	308	F 316	A	275	304	287	304	A	319	252	A	A	A	A	A	A	303	A	321	318	319	A	A
28	A	A	A	313	303	322	A	A	A	A	A	A	A	A	A	A	A	343	A	A	318	302	A	287
29	323	A	277	321	270	334	283	A	A	A	A	A	351	A	A	278	326	343	325	330	313	282	305	F 369
30	A	A	308	F 333	302	348	A	A	A	A	A	331	A	256	G	A	A	A	A	A	306	305	323	324
31																								
	00	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	27	28	27	27	26	22	10	13	15	11	14	12	14	18	20	18	23	19	25	27	29	24	26
MED	316	308	309	307	313	314	324	312	330	329	326	296	297	268	293	296	312	314	311	317	319	310	318	316
U Q	324	321	318	319	339	336	341	331	350	347	343	325	313	295	302	301	319	326	317	322	323	322	327	324
L Q	302	F 294	296	287	292	288	295	221	283	304	278	268	269	251	G 269	275	291	297	242	308	315	301	300	297

JUN. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 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					A	L	A	A	A	L	410	A	A	A	A	L	L	A	A	A				
2					L	365	L	A	A	A	A	L	L	407	L	373	L	A	A					
3					L	A	L		A	A	A	420	L	L	L	L	378	L	A					
4						L	A	A	423	L	L	L	A	384	L	366	A	L	A	L	L			
5						L	L	361	A	A	A	A	L	A	382	A	L	379	L		L			
6						385	A	A	A	A	A	L	A	L	L	A	A	A	A					
7						349	A	A	A	L	A	L	A	A	A	L	L	L	367					
8					L	L	372	A	A	A	A	L	A	406	A	L	L		L					
9					L	371		A	A	A	A	A	A	L	A	A	A	360	A	A				
10					351	372	385	A	A	L	L	A	L	L	L	L	L	L	A	L				
11							A	A	L	A	408	A	A	A	L	363	A	L	A	A				
12					L	336	L	A	A	C	C	C	C	C	C	C	C	A	A	A				
13						A	L	L	L	A	A	A	A	A	A	L	A	A	A					
14				L	L	L	A	L	L	A	A	L	A	A	L	394	A	A	L					
15						L	A	A	A	C	C	C	C	A	A	A	A	336	A	A				
16						381	A	A	A	L	L	L	L	L	L	L	L	338	A	L				
17						A	A	A	A	A	A	L	A	L	L	L	L	L	A	A				
18						L	A	A	A	L	433	A	L	A	L	A	A	A	A	A	A			
19				A	A	A		A	A	A	A	A	430	A	A	A	L	L	A	A	A			
20					A	A	A	A	L	388	A	A	L	L	401	420	367	A	A					
21					L	L	L	A	A	A	A	A	A	A	407	L	A	A	A	A	A			
22					A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	L				
23						354		A	A	L	A	A	A	A	375	A	A	A	L					
24				A		A	A	A	A	A	387	417	L	A	A	A	A	A	L	381				
25						L	A	A	A	A	A	A	A	A	A	L	L	L	L					
26					L	L	A	A		384	A	L	413	A	L	L	A	A		L				
27				A	L	A	L	A	A	A	A	A	A	A	A	A	A	A	A					
28				E A 357		L	A	A	A	A	A	A	A	A	A	A	A	L	A	A	A			
29					327	L	A	A	A	A	A	A	L	A	A	A	358	382	L					
30					L	A	A	A	A	A	A	L	A	L	321	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				1	2	8	2	1	1	2	4	2	2	3	5	5	3	5	1	1				
MED				E A 357	339	368	378	361	423	386	409	418	422	406	382	373	367	360	367	381				
U Q						376					422			407	404	407	378	380						
L Q						352					398			384	348	364	358	337						

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JUN. 2018 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					A			A	A			A	A	A	A			A	A	A				
					400	290				288	288					432	442							
2								A	A	A	A							A						
					328	350	368					436	454	490	444	348	348		294					
3						A			A		A	A		A						A				
					312		378			280			400		416	356	430	322						
4							A	A						A					E A					
						248			370	274	324	382		376	334	344	344	268	316	296	268			
5										A	A	A												
						274	252	312	392				354	384	386	322	296	296	276		252			
6								A	A		A					A				A				
						410	360			478		376	304	428	370		318	280						
7							A	A			A		A		A									
						494			330	262		334		436		342	294	294	272					
8									A	A	A		A											
					258	220	282	282	282			306		492	338	370	310		268					
9								A	A	A	A		A			A				A				
					294	286						388		394	294			336						
10								A	A			A								A				
					288	294	262			314	380		358	468	366	298	318	334		278				
11								A				E A	A	A										
							298		312	286	292	296			386	434	322	358	474	266				
12								A		C	C	C	C	C	C	C	C	A	A					
					306	336	284		272											258				
13						A					E A	A	A	A	A		A	A	A					
						300	306	280	288		382					356								
14											A		A	A										
				270	270	354	310	310	280	254		324			446	428	308	262	296					
15									A	C	C	C	C	A	A					A				
						244	274	300								336	336	342	318					
16								A	A															
						282	302			318	308	308	346	402	448	382	336	340	312	262				
17						A	A	A	A	A			A											
											322	322		304	380	380	412	378		A	A			
18												A		A			A				A			
						350	330	320	262	358	320		398		370	338			500	460				
19				A	A	A		A	A	A	A	A	R	A	A	A					A			
																	394	384	360	326				
20								A		G	A	A	G	G	G	G			A					
					304	448	322		296								396	358	348					
21								A	A	A	A	A	A	A	G	G	A		A	A	A			
					240	274	350											576						
22					A		A	A	A	A	A	A	A	A	A	A	A	A	A					
					284															250				
23								A								A	A							
						332			374	328	258	376	290	388	372			504	588					
24				A			A	A	A	A	G	G					A	A						
													408		A	A		366	526	270				
25								A	A	A	A	A	A	A	A									
						322	284	734								416	376	320	278					
26							A	A		G	A			G	A			A	A					
					292	256						428			388	402				310				
27				A					A	E A		A	A	A	A	A	A			A				
					366	334	350	346		346	378							330						
28							A	A	A	A	A	A	A	A	A	A	A		A	A				
				282		324												226			314			
29							A	A	A	A	A	A		A	A									
					200	288							280			400	326	276	276					
30							A	A	A	A	A			A		G	A	A	A	A				
					284	272						314		404										
31																								
	00	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	13	24	18	8	11	15	11	14	12	13	18	20	18	21	16	10	3			
MED				276	292	308	301	311	296	U 301	321	355	378	404	386	375	336	334	309	274	268			
U Q					309	350	350	333	370	358	380	388	431	479	G 446	422	394	362	417	310	314			
L Q					264	274	284	303	280	280	292	314	325	386	370	343	318	287	277	262	252			

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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	262	270	270	262	A	226	A	A	A	190	206	A	A	A	A	190	A	A	A	A	226	220	230	214
2	276	284	Q 270	Q 280	246	206	206	A	A	A	A	196	196	196	192	204	224	A	A	E A 284	A	248	248	248
3	258	232	266	278	A 252	A	220	A	A	A	A	194	194	194	194	200	224	224	A	250	226	228	228	282
4	Q 260	Q 272	264	Q 278	222	198	A	A	198	198	198	194	A	184	194	198	A	198	A	230	210	282	222	244
5	244	244	270	230	236	206	200	212	A	A	A	A	A	A	200	A	200	200	198	238	208	254	256	252
6	238	200	240	250	212	202	A	A	A	A	A	186	A	216	194	A	A	A	A	242	244	244	A	A
7	A	244	248	252	234	222	A	A	A	214	A	202	A	A	A	202	202	202	224	248	252	282	230	230
8	222	Q 250	Q 248	Q 258	222	204	204	A	A	A	A	204	A	194	A	198	206	272	204	252	250	254	254	A
9	234	Q 278	Q 242	Q 266	238	218	252	A	A	A	A	A	A	A	A	A	A	204	A	A	246	254	234	212
10	Q 202	258	Q 258	Q 258	212	218	202	A	A	198	198	A	198	180	186	204	216	216	A	220	232	220	224	224
11	218	226	218	238	198	258	A	A	198	A	212	A	A	A	212	198	A	202	A	A	248	232	248	A
12	208	A 292	E A 264	244	224	228	228	A	A	C	C	C	C	C	C	C	C	A	A	A	254	238	238	236
13	224	Q 228	266	226	226	A	226	222	214	A	A	A	A	A	A	192	A	A	A	256	220	262	A	230
14	232	234	242	232	222	222	A	210	210	A	A	E A 240	A	A	192	198	A	A	222	242	242	224	234	222
15	230	230	230	212	216	196	A	A	A	C	C	C	C	A	A	A	A	222	A	A	248	264	220	210
16	206	206	244	238	242	228	A	A	A	192	196	196	182	194	194	194	206	214	A	228	250	250	234	234
17	A	244	260	272	214	A	A	A	A	A	A	198	A	198	200	200	208	226	A	A	244	244	230	230
18	A	254	Q 248	Q 250	220	210	A	A	A	194	184	A	190	A	196	A	A	A	A	A	A	266	A	298
19	A	264	258	A	A	A	204	A	A	A	A	A	202	A	A	A	224	204	A	A	A	258	258	258
20	Q 230	240	254	260	A	A	A	A	202	202	A	A	202	196	196	196	222	A	A	248	236	228	230	230
21	262	250	244	244	208	204	230	A	A	A	A	A	A	A	202	202	A	A	A	A	A	202	210	210
22	216	280	218	278	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	204	264	A	A	284
23	262	272	242	252	240	206	230	A	A	206	A	A	A	A	202	A	A	A	A	256	238	228	228	184
24	286	272	A	A	A 328	A	A	A	A	A	194	202	198	A	A	A	A	A	A	214	232	214	262	274
25	254	270	254	264	274	208	A	A	A	A	A	A	A	A	A	198	232	204	208	228	248	236	214	268
26	238	248	288	272	232	214	A	A	214	206	A	200	196	A	238	248	A	A	306	228	242	242	230	264
27	290	270	256	A	226	A	A 220	A	A	A	A	A	A	A	A	A	A	A	A	216	250	250	A	A
28	A	A	A	A	236	222	A	A	A	A	A	A	A	A	A	A	A	H 186	A	A	A	A	A	252
29	252	A	A	254	200	198	A	A	A	A	A	A	194	A	A	A	A	194	212	248	242	262	236	210
30	A	A	286	256	250	A	A	A	A	A	A	A 246	A	A	324	A	A	A	A	A	260	260	260	246
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	27	27	26	26	21	12	3	6	9	7	12	10	9	16	16	11	15	7	19	25	28	24	26
MED	238	250	254	255	226	210	220	212	206	198	198	198	196	194	196	198	216	204	212	240	244	246	232	235
U Q	261	272	266	266	240	222	229	222	214	206	206	203	198	197	202	202	224	222	224	250	250	259	248	258
L Q	223	234	242	244	216	204	204	210	198	193	194	195	194	189	194	197	206	200	204	228	232	228	228	222

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JUN. 2018 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				A	A	108	108	100	100	100	100	100	96	96	96	108	108	108	108	A	A			
2				B	108	108	108	108	108	100	100	100	100	A	100	98	106	106	106	A	A			
3				B	122	110	110	110	98	98	98	98	84	A	102	104	108	108	100	A	A			
4				B	B	100	108	108	100	100	100	100	100	100	98	98	A	A	A	A	A			
5				B	B	98	106	106	106	106	106	102	98	98	98	A	A	104	104	104	A			
6				B	A	104	104	104	104	104	104	104	98	98	106	106	106	106	96	A	A			
7				A	A	104	102	102	102	102	102	100	100	A	106	106	106	106	106	A	A			
8				B	106	106	106	106	106	96	96	96	96	96	106	102	102	A	A	A	A			
9				B	A	102	102	102	102	102	102	102	102	102	102	A	A	102	110	A	A			
10				B	110	104	104	104	104	104	104	104	104	104	104	104	104	108	108	A	B			
11				B	118	118	114	108	100	100	100	100	92	92	A	A	A	A	96	A	A			
12				B	102	102	102	102	102	C	C	C	C	C	C	C	C	A	A	A	B			
13				B	A	112	106	106	104	104	94	94	94	104	104	104	104	100	106	A	B			
14				108	120	106	106	106	106	106	104	104	A	104	A	104	104	104	90	A	A			
15				B	A	104	104	104	104	C	C	C	C	104	A	A	104	104	106	A	A			
16				B	108	98	98	108	108	108	108	96	106	106	106	106	106	106	106	B	B			
17				B	A	106	106	106	106	106	106	106	A	106	106	106	106	106	106	A	A			
18				B	A	A	104	104	98	98	102	102	102	102	102	102	102	102	A	118	A			
19				B	A	118	104	104	110	104	104	A	104	104	104	104	104	104	104	A	A			
20				B	A	98	98	106	106	106	96	96	96	A	96	108	108	108	106	A	A			
21				B	120	112	112	98	98	98	98	92	A	A	102	102	102	102	A	A	A			
22				B	A	A	104	104	104	100	100	100	A	A	A	A	A	A	A	A	A			
23				B	A	104	104	104	104	104	104	96	90	108	102	102	102	102	102	112	A			
24				B	A	102	102	102	102	102	100	100	100	104	104	104	102	102	98	A	A			
25				B	A	88	104	104	104	104	104	A	A	A	90	90	90	104	102	A	A			
26				B	A	102	102	102	102	102	102	102	102	102	A	98	98	102	110	110	34			
27				B	A	102	104	98	98	98	98	98	98	A	A	98	100	110	102	A	B			
28				B	A	102	102	102	102	102	102	96	96	96	96	A	100	106	106	A	B			
29				B	A	106	106	106	104	104	104	104	A	A	104	102	102	102	102	A	B			
30				B	A	106	106	102	108	100	100	96	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				1	9	28	30	30	30	28	28	26	21	19	22	22	23	24	23	4	1			
MED				108	110	104	104	104	104	102	102	100	98	102	102	104	104	104	106	111	34			
U Q					120	107	106	106	106	104	104	102	102	104	104	106	106	106	106	115				
L Q					107	102	102	102	102	100	100	96	96	98	98	102	102	102	102	107				

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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	106	94	94	94	104	106	110	104	104	104	104	104	104	104	114	132	98	100	108	110	108	110	B	B
2	96	B	136	114	108	122	108	108	108	100	100	100	100	92	98	G	122	106	106	106	106	106	96	96
3	96	100	94	94	130	112	112	104	110	106	100	100	98	98	98	142	120	116	110	106	102	102	102	92
4	B	96	108	B	B	110	110	106	106	106	106	106	106	94	98	98	98	98	96	110	106	106	106	102
5	94	98	98	96	100	138	116	106	106	106	106	98	98	98	98	98	102	114	114	114	110	110	104	B
6	B	92	92	B	92	130	120	112	108	108	104	104	98	98	102	108	108	108	106	106	106	106	106	102
7	102	102	92	92	92	118	110	110	110	110	102	110	110	98	104	104	86	118	108	108	108	108	108	96
8	96	96	96	108	88	134	114	114	108	108	104	104	96	104	100	100	112	96	96	100	108	108	108	108
9	B	100	88	88	94	118	116	106	106	106	106	100	100	100	100	100	94	122	108	108	108	108	104	92
10	94	94	94	94	118	116	88	108	102	106	106	96	98	102	192	94	110	110	110	110	110	104	98	98
11	98	102	96	96	138	116	98	108	108	108	108	98	96	92	92	98	98	98	102	102	102	102	106	102
12	92	92	92	92	116	116	108	108	108	C	C	C	C	C	C	C	C	102	102	96	100	104	102	94
13	104	104	94	96	96	116	116	C 104	106	106	96	96	96	96	106	118	104	104	110	110	100	108	108	108
14	108	100	98	90	130	118	110	110	110	106	92	98	98	98	100	120	116	110	104	106	106	102	B	B
15	B	B	90	90	90	114	114	114	104	C	C	C	C	98	104	104	114	114	132	116	110	108	108	96
16	96	106	94	92	84	114	110	110	112	112	100	100	100	114	94	124	124	114	102	102	102	102	102	102
17	92	92	94	94	94	108	108	108	104	104	104	104	104	104	104	96	102	110	100	100	102	102	102	110
18	104	98	98	112	98	98	82	108	114	114	112	106	106	94	102	108	108	108	94	108	108	108	102	102
19	98	102	120	112	118	114	112	112	108	106	106	92	104	104	104	104	112	108	108	108	108	108	108	102
20	94	100	122	110	110	110	112	106	106	106	96	96	96	96	86	102	102	110	110	104	98	108	98	98
21	98	98	98	98	112	118	108	108	108	98	98	98	114	96	G	96	104	100	104	104	104	118	112	96
22	96	104	104	104	100	98	110	104	104	104	98	106	106	100	92	92	94	94	100	92	110	108	102	102
23	102	100	96	96	96	96	110	102	108	118	106	100	100	112	112	106	106	106	106	122	102	94	94	B
24	138	118	108	102	100	106	106	102	102	102	120	108	122	116	116	116	108	108	108	108	104	104	104	104
25	104	96	96	88	88	106	96	96	96	102	102	112	100	98	88	88	112	112	106	106	100	106	104	104
26	104	92	92	92	98	110	110	110	110	110	98	112	102	102	102	112	110	112	112	120	236	106	B	100
27	90	128	128	112	112	112	104	104	104	98	108	100	110	102	94	114	100	114	104	104	114	114	106	106
28	100	100	96	96	96	110	110	102	102	102	102	92	92	114	106	92	100	G	110	106	106	106	108	108
29	100	100	96	96	112	116	116	108	102	102	102	98	98	98	98	98	102	102	102	110	110	110	110	110
30	98	98	90	90	112	112	108	108	108	96	96	96	96	96	96	96	96	96	96	112	112	98	96	96
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	28	30	28	29	30	30	30	30	28	28	28	28	29	28	28	29	29	30	30	30	30	27	26
MED	98	100	96	96	100	114	110	108	107	106	103	100	100	98	100	103	104	108	106	107	106	106	104	102
U Q	104	102	98	103	112	118	112	110	108	108	106	105	105	104	104	113	112	113	110	110	110	108	108	104
L Q	96	96	94	92	94	110	108	104	104	102	99	98	98	96	97	97	99	101	102	104	102	104	102	96

JUN. 2018 h'Es (KM)

IONOSPHERIC DATA STATION Wakkanai

JUN. 2018 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	FQ 31	FQ 31	FQ 31	LQ 21	LQ 31	C 3	C 4	C 4	CQ 61	CQ 21	CQ 21	CQ 41	CQ 21	CQ 31	CQ 31	C 1	LC 12	C 8	C 8	L 6	L 3	F 8		
2	F 1		F 1	L 1	C 2	C 2	C 2	C 4	C 3	C 2	C 2	C 1	C 2	C 2	C 2		C 2	C 7	C 7	L 7	L 4	F 3	F 4	F 4
3	F 2	F 1	F 1	L 2	C 4	C 5	C 3	C 4	C 3	C 4	C 2	C 1	C 2	L 1	C 1	CL 11	C 2	C 3	C 7	L 4	L 2	F 1	F 1	F 4
4		F 1	F 1			F 2	C 3	C 3	C 3	C 2	C 2	C 2	C 3	C 1	C 2	C 2	C 3	L 3	L 3	L 4	L 4	F 8	F 3	F 2
5	F 3	F 2	F 3	L 3	LC 11	CL 11	C 2	C 2	C 3	C 3	C 3	C 3	C 2	C 3	C 2	L 4	L 2	C 3	C 2	C 2	L 3	F 3	F 2	
6		F 1	F 1		F 1	C 2	C 3	C 6	C 3	C 3	C 3	C 1	C 2	C 2	C 2	C 3	C 4	C 6	C 8	L 3	L 5	F 3	F 8	F 9
7	F 9	F 5	F 4	F 2	F 2	C 2	C 5	C 5	C 5	C 3	C 4	C 2	C 3	C 2	C 4	C 1	LC 11	C 2	C 2	L 4	L 3	F 8	F 7	F 3
8	F 2	F 2	F 1	L 1	L 1	CL 11	C 2	C 3	C 3	C 3	C 5	C 2	C 3	C 2	C 3	C 2	C 3	L 5	L 4	L 4	L 3	F 7	F 8	F 8
9		F 3	F 1	F 2	F 2	CL 22	C 3	C 4	C 4	C 3	C 3	C 2	C 2	C 3	C 2	L 3	L 4	CL 21	C 8	L 8	L 8	L 8	F 5	F 4
10	F 1	F 3	F 2	L 1	C 1	C 3	C 3	C 4	C 3	C 3	C 2	C 4	C 2	C 1	C 1	LC 12	C 3	C 4	C 4	L 3	L 4	F 3	F 3	F 3
11	F 2	F 3	F 3	L 3	CL 11	C 3	LC 13	C 4	C 1	C 4	C 3	C 3	C 3	C 5	L 3	L 3	L 4	L 4	C 4	L 4	L 4	L 5	F 7	F 6
12	F 5	F 6	F 7	L 5	F 2	C 4	C 5	C 6	C 5									L 8	LQ 22	LQ 22	LQ 22	F 1	F 4	F 2
13	FF 12	F 1	F 3	F 2	L 2	C 8	C 3	C 5	C 2	C 3	C 3	C 2	C 3	C 2	C 2	C 1	C 4	C 7	CQ 52	LQ 71	L 7	F 7	F 6	F 4
14	F 1	F 1	F 1	C 1	C 2	C 4	C 3	C 3	C 2	C 2	C 5	C 2	LQ 22	LQ 21	LQ 11	C 1	C 3	C 3	C 4	L 6	L 4	F 3		
15			F 2	L 2	L 2	L 2	C 3	C 3	C 4					CQ 31	CQ 31	CQ 31	CQ 31	CQ 31	CQ 41	L 4	L 5	F 7	F 1	F 1
16	F 3	F 3	F 2	L 2	LC 11	C 3	C 4	C 4	C 6	C 2	C 2	C 1	C 1	C 1	LC 11	C 1	C 1	C 1	C 2	L 2	L 3	F 3	F 3	F 2
17	F 3	F 2	F 2	L 3	L 2	C 5	C 4	C 5	C 6	C 5	C 2	C 2	LQ 21	LC 21	C 3	LC 21	LC 21	C 3	C 4	LL 84	LL 21	FL 51	F 8	F 8
18	F 7	F 2	F 1	L 1	L 2	L 2	LC 13	C 4	C 4	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 8	C 5	L 4	L 4	LL 74	FL 84	F 9	F 7
19	F 9	F 7	F 4	L 6	L 6	C 8	C 5	C 6	C 8	C 3	C 3	L 4	C 2	C 3	C 2	C 3	C 2	C 5	C 6	L 3	L 8	F 3	F 3	F 3
20	F 1	F 2	F 7	L 4	L 4	C 3	C 3	C 5	C 2	C 2	C 3	C 3	C 2	L 1	LC 11	L 1	L 1	C 5	C 4	L 5	L 7	F 2	F 3	F 1
21	F 4	F 3	F 3	L 2	LC 11	C 2	C 3	C 6	C 3	C 4	C 6	C 5	LL 35	L 3		C 2	C 6	C 6	LQ 72	L 7	L 6	F 1	FF 12	F 1
22	F 1	F 3	F 3	LL 14	L 4	L 5	C 6	CQ 81	CQ 91	CQ 41	CQ 52	CQ 52	LQ 31	LQ 51	LQ 51	LQ 71	LQ 72	LQ 52	LQ 42	LL 41	L 8	F 8	F 9	F 8
23	F 7	F 4	F 3	L 3	L 3	LC 21	CQ 41	CQ 81	CQ 31	CCQ 32	CQ 41	CQ 31	CQ 31	CCQ 22	C 2	C 4	C 5	C 5	C 3	C 5	C 4	F 3	F 2	
24	FF 21	F 7	F 6	L 6	L 3	L 5	C 4	C 3	C 2	C 2	C 1	C 1	C 1	C 3	C 2	C 2	C 2	CQ 42	CQ 42	L 7	L 4	F 5	F 4	F 7
25	F 2	F 3	F 4	L 3	L 3	C 3	C 3	C 7	C 4	C 4	C 3	CQ 32	CQ 21	CQ 32	CQ 42	C 2	C 3	C 3	C 3	L 3	L 7	F 3	F 5	F 4
26	F 3	F 3	F 6	LQ 41	LQ 21	CL 31	CL 31	CL 51	CQ 31	C 1	CQ 41	C 1	C 1	C 2	L 2	C 2	C 6	C 4	C 4	C 1	C 1	F 1		F 2
27	LL 22	F 6	FQ 62	LQ 82	LQ 41	CQ 11	C 3	C 4	C 6	C 2	C 2	C 2	C 2	L 3	L 3	C 3	CHQ 42	C 6	CQ 72	C 6	L 4	F 7	F 8	FQ 51
28	FQ 61	FQ 61	FQ 51	L 6	L 4	C 4	C 4	C 7	C 7	C 4	C 4	C 6	C 6	C 4	C 4	CQ 42	CQ 42		CQ 51	L 6	L 8	F 9	F 6	F 6
29	F 5	F 6	F 3	L 5	L 2	CL 22	C 4	C 4	C 4	C 4	C 4	C 4	L 2	LQ 21	LQ 41	CQ 31	CQ 31	CQ 31	CQ 31	L 3	L 1	F 5	F 6	F 4
30	F 6	F 6	F 5	L 4	LL 33	C 4	C 5	C 7	C 8	C 5	C 6	C 2	L 3	L 3	L 3	C 2	L 5	L 8	L 7	CL 85	L 6	F 5	F 4	F 5
31																								
	00	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. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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	A	X 39	44	42																X 84	65	61	60
2	X 54	X 51	X 50	X 47	X 47																A	63	59	59
3	52	A	X 44	50	X 33																X 66	54	A	A
4	X 42	X 42	X 41	X 37	X 33							C	C								X 62	54	X 48	50
5	46	45	45	44	42																X 64	X 58	X 54	A
6	52	X 49	X 46	X 42	X 40																X 62	59	56	X 47
7	54	X 41	X 40	X 40	X 35																X 68	X 65	X 61	X 56
8	A	X 54	56	X 49	X 46																X 75	A	A	A
9	A	A	X 43	X 39	X 40														C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						X 75	X 62	65	X 63
11	X 48	49	X 42	X 36	X 35																X 66	X 61	59	59
12	59	58	53	X 42	X 41														C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C												85	59	A	57
14	X 43	X 42	45	X 35	X 37																X 74	X 74	X 63	60
15	X 59	X 54	X 54	X 48	44				C		C										X 62	A	X 58	A
16	A	X 36	41	48	53																60	58	58	X 54
17	54	X 43	X 42	X 38	39			C	C	C	C	C	C	C	C	C	C	C			X 69	59	70	69
18	72	63	55	X 37	X 36														C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C												X 57	X 55	57	60
20	X 51	X 49	X 42	X 38	X 38																X 58	59	56	55
21		50	A	X 39	42																X 67	X 57	54	53
22	X 47	48	44	44	39	X 42															X 66	X 66	X 44	X 41
23	49	52	41	X 41	A																X 67	X 66	X 66	X 67
24	X 50	A	55	52	A			A													X 63	X 44	X 43	X 41
25	X 40	X 38	X 39	X 40	X 36		C	C	C		C										X 59	60	58	58
26	X 50	55	X 43	X 40	43																X 70	X 65	X 68	X 59
27	X 54	X 52	X 38	A	A									C							X 52	X 48	X 46	47
28	A	X 37	X 36	X 33	X 34																X 68	X 49	44	A
29	A	A	A	A	36									A							X 69	X 58	X 56	X 48
30	51	42	X 38	X 35	X 36																X 53	X 49	X 48	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	20	22	25	25	24	1															26	25	24	21
MED	X 51	X 49	X 43	X 40	X 39	X 42															X 66	X 59	58	57
U Q	54	52	48	46	42																X 69	X 64	X 61	60
L Q	X 48	X 42	X 40	X 38	X 36																X 62	X 54	X 51	X 49

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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	A	33	F	F	38	50	58	72	A	A	A	A	60	67	69	56	63	74	78	78	F	F	F
2	48	45	44	41	41	A	57	47	A	A	A	A	A	55	59	63	59	49	53	A	A	F	F	F
3	F	A	38	F	27	A	42	44	59	56	A	A	A	A	51	57	60	58	60	A	59	F	A	A
4	36	36	35	31	27	35	38	A	59	A	A	C	C	53	58	62	58	55	56	58	56	F	42	F
5	F	F	F	F	F	43	44	48	54	50	A	A	50	54	55	59	69	72	61	58	58	52	47	A
6	F	43	40	36	34	40	47	52	53	A	A	A	A	49	A	58	64	62	59	59	56	F	F	41
7	F	33	34	34	29	37	A	51	62	73	49	A	50	60	68	72	76	70	64	69	62	59	55	50
8	A	48	F	43	40	48	46	A	A	A	A	A	A	A	50	56	66	74	72	70	68	A	A	A
9	A	A	37	34	35	41	47	A	A	A	A	A	A	57	A	57	55	50	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	55	63	61	63	68	68	56	F	57
11	42	F	35	30	29	39	42	50	63	A	A	55	56	A	52	55	62	72	76	76	60	55	F	F
12	F	F	F	36	35	47	49	58	A	A	A	A	A	A	52	54	55	56	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	50	A	48	54	66	F	F	A	F
14	37	36	F	29	31	36	A	54	A	A	A	A	50	51	A	A	A	66	68	66	68	68	58	F
15	53	48	48	42	F	41	48	53	C	60	C	A	A	A	A	54	59	A	A	48	56	A	52	A
16	A	30	F	F	F	43	42	51	52	59	A	50	52	A	A	50	53	A	60	57	F	F	F	48
17	F	37	36	32	F	38	46	C	C	C	C	C	C	C	C	C	C	C	66	66	63	F	F	F
18	F	F	F	31	30	36	47	A	A	A	A	A	A	A	A	68	75	A	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	A	48	47	50	49	F	F
20	45	43	36	32	32	A	A	A	49	A	A	A	47	A	A	48	53	52	48	49	52	F	F	F
21	A	F	A	33	F	41	48	49	54	A	A	A	A	54	A	A	A	A	48	55	61	51	F	F
22	41	F	F	F	F	36	49	62	A	56	A	A	55	57	55	57	A	62	57	A	60	60	38	35
23	F	F	F	35	A	40	46	64	56	A	A	A	56	54	53	64	60	61	67	62	61	60	60	61
24	44	A	F	F	A	A	A	A	A	A	58	45	A	A	A	46	47	54	58	68	57	38	37	35
25	34	32	33	34	30	42	C	C	C	A	C	A	52	48	A	47	A	A	A	54	53	F	F	F
26	44	F	37	34	F	37	49	51	A	A	A	A	A	A	53	53	58	A	55	58	64	59	62	53
27	48	46	32	A	A	A	50	A	A	50	A	A	51	C	A	A	53	61	62	60	46	42	40	F
28	A	31	30	27	28	38	A	48	53	59	56	53	A	56	50	50	51	52	50	57	62	43	F	A
29	A	A	A	A	F	38	45	48	A	A	A	A	A	A	48	A	A	56	55	60	63	52	50	42
30	F	F	32	29	30	37	46	50	50	54	A	A	49	52	A	A	48	49	A	42	47	43	42	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	13	16	19	15	22	21	18	13	9	3	4	11	14	14	23	22	22	24	24	24	15	12	9
MED	44	37	36	34	30	38	47	51	54	56	56	52	51	54	53	56	58	60	60	60	60	52	48	48
U Q	48	46	38	36	35	41	49	54	60	60	58	54	55	57	58	62	63	63	65	67	63	59	56	55
L Q	37	32	33	31	29	37	44	48	52	52	49	48	50	52	51	50	53	52	54	56	56	43	41	38

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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							356	A	A	A	A	A	A	A	UL 444	416	396	A	A				
2						A	A 388		A	A	A	A	A	A	A	UL 416	388	376	A	A				
3						A	A	UL 384	404	UL 416	A	A	A	A	432	412	396	A	A	A				
4								A	A	A	A	C	C	A	A	UL 404	408	368	L	A				
5						A		A	UL 412	A	A	A	UL 444	A	420	UL 424	A	A	A	A				
6							A	UL 400	A	A	A	A	A	A	A	A	A	UL 360	A	A				
7							A	A	A	420	A	A	UL 444	A	428	UL 416	UL 388	368	A					
8								A	A	A	A	A	A	A	A	A	A	UL 372						
9							A	A	A	A	A	A	A	A	A	A	396	A	C	C				
10						C	C	C	C	C	C	C	C	C	C	UL 384	A	A						
11							UL 380	388	A	A	A	444	A	A	UL 436	UL 428	UL 460	A	A					
12							UL 448	A	A	A	A	A	A	A	UL 440	UL 396	392	A	C	C				
13						C	C	C	C	A	A	A	A	A	A	A	A	UL 376	A					
14						A	A	A	A	A	A	A	A	UL 440	A	A	A	372	A					
15							L	A	C	A	C	A	A	A	A	UL 420	A	A	A	A				
16								396	408	A	A	A	436	A	A	412	A	A	A	A				
17						A	A	C	C	C	C	C	C	C	C	C	C	C	A	A				
18						304	A	A	A	A	A	A	A	A	A	A	A	A	C	C				
19						C	C	C	C	A	A	A	A	A	A	A	A	A	A					
20						A	A	A	396	A	A	A	UL 444	A	A	A	A	A	A					
21	A						A	400	A	A	A	A	A	UL 444	A	A	A	A	L					
22							372	A	A	A	A	A	A	A	A	A	A	A	L	A				
23						UL 320	356	A	A	A	A	A	A	UL 440	A	A	A	A	A					
24						A	A		A	A	A	UL 428	A	A	A	UL 384	UL 396	UL 364	332					
25							C	C	C	A	C	A	440	444	A	A	A	A	A	A				
26						UL 272	A	A	A	A	A	A	A	A	A	416	A	A	316	A				
27						A	UL 348	A	A	A	A	A	432	C	A	A	A	A	A	A				
28							A	A	A	A	A	A	A	A	UL 440	UL 424	404	388	UL 324					
29							344	384	A	A	A	A	A		A	A	A	UL 396	L	A				
30							A	A	412	420	A	A	UL 428	UL 432	A	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	7	7	5	3		2	7	5	7	14	10	10	3					
MED						UL 304	356	388	408	420		436	UL 440	UL 440	UL 436	UL 416	396	372	324					
U Q						UL 320	UL 380	400	412	420			UL 444	444	UL 440	UL 420	404	UL 376	332					
L Q						UL 272	348	384	400	UL 416			432	UL 436	428	UL 404	392	UL 368	316					

JUN. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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						A	A	A	A	A	A	A	A	A	A	R	U R 296	A	A	B				
2						B	A	A	A	A	A	A	A	A	A	R	A	A	A	B				
3						A	A	A	A	A	A	A	A	A	U A 324	A	A	A	A	B				
4						A	A	A	A	A	A	C	C	A	A	U A 312	280	A	A	B				
5						A	U R 264	A	A	A	A	A	A	A	A	U A 308	A	A	B	B				
6						B	A	A	A	A	A	A	A	A	A	A	A	A	B	B				
7						B	A	A	A	A	A	A	U A 336	A	A	A	A	U A 240	A	B				
8						B	U A 232	A	A	A	A	A	A	A	A	A	A	A	A	B				
9						B	A	A	A	A	A	A	A	A	A	A	U A 276	A	C	C				
10						C	C	C	C	C	C	C	C	C	C	A	A	A	B	B				
11						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
12						B	A	A	A	A	A	A	A	A	A	U R 324	A	A	C	C				
13						C	C	C	C	A	A	A	A	A	A	A	A	A	B	B				
14						A	A	A	A	A	A	A	A	A	A	A	A	A	B	A				
15						A	A	A	C	A	C	A	A	A	A	A	A	A	B	B				
16						B	A	A	A	A	A	A	A	A	A	A	U A 288	A	A	B				
17						B	A	C	C	C	C	C	C	C	C	C	C	C	A	B				
18						U A 176	U A 248	A	A	A	A	A	A	A	A	A	A	A	C	C				
19						C	C	C	C	A	A	A	A	A	A	A	A	A	A	B				
20						B	A	A	A	A	A	A	A	A	A	A	A	A	B	B				
21	A					B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
22							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
23						U R 212	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
24						A	A		A	A	A	A	A	A	A	A	A	A	A	B				
25						A	C	C	C	A	C	A	A	A	A	A	A	A	A	B				
26						A	A	A	A	A	A	A	A	A	A	A	A	A	B	A				
27						B	A	A	A	A	A	A	U R 360	C	A	A	A	A	A	B				
28						B	A	A	A	A	A	A	A	A	A	A	U R 296	U R 248	A	B				
29						A	A	A	A	A	A	A	A		A	A	A	A	B	B				
30						A	A	A	A	A	A	A	R	A	A	A	A	A	A	B				
31																								

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	3						2		1	3	5	2						
MED						U 194	U A 248						U 348		U A 324	U A 312	U 288	U 244						
U Q							U R 264									U R 324	U R 296							
L Q							U A 232									U A 308	278							

JUN. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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	JA 80	JA 87	JA 52	JA 27	JA 32	JA 27	30	JA 47	JA 47	JA 65	JA 64	JA 59	JA 63	JA 66	40	G	G	JA 45	JA 32	JA 45	JA 65	JA 67	JA 53	JA 36
2	JA 35	JA 28	JA 27	JA 28	JA 30	JA 48	JA 46	JA 52	JA 83	JA 74	JA 83	JA 69	JA 77	JA 68	JA 72	G	33	32	JA 58	JA 73	JA 87	JA 143	JA 110	JA 52
3	JA 42	JA 67	JA 41	JA 40	JA 66	JA 50	JA 41	JA 42	JA 48	JA 44	JA 74	JA 50	JA 140	JA 66	40	36	37	JA 43	JA 41	JA 72	JA 79	JA 64	JA 53	JA 55
4	JA 32	JA 35	JA 32	28	27	JA 28	31	JA 71	JA 60	JA 75	JA 67	C	C	JA 52	JA 194	38	35	30	28	JA 60	JA 51	JA 36	JA 85	JA 43
5	JA 64	JA 36	25	JA 28	23	JA 54	JA 32	JA 43	JA 46	JA 50	JA 100	JA 109	JA 111	JA 72	55	37	JA 72	JA 66	JA 79	JA 80	JA 38	JA 49	JA 55	JA 78
6	JA 106	JA 33	JA 49	JA 41	22	21	JA 38	38	JA 54	JA 68	JA 66	JA 77	JA 58	JA 44	JA 74	JA 66	JA 84	JA 75	JA 59	JA 142	JA 56	JA 99	JA 89	JA 88
7	JA 54	JA 53	JA 38	JA 50	JA 39	JA 26	JA 50	JA 50	JA 65	39	JA 102	JA 80	40	43	41	JA 40	JA 41	33	JA 36	JA 24	23	JA 26	JA 36	JA 27
8	JA 55	JA 86	JA 36	JA 31	JA 54	23	JA 39	JA 56	JA 66	JA 64	JA 103	JA 104	JA 84	JA 70	JA 105	JA 59	JA 52	JA 39	JA 30	JA 47	JA 224	JA 113	JA 114	JA 73
9	JA 86	JA 70	JA 68	JA 68	JA 58	JA 28	JA 42	JA 69	JA 68	JA 67	JA 91	JA 134	JA 84	JA 67	JA 70	43	32	JA 42	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	36	JA 52	JA 49	JA 34	26	JA 30	JA 51	JA 41	JA 53
11	JA 30	JA 32	JA 29	23	JA 31	JA 26	JA 40	36	JA 65	JA 63	JA 67	JA 46	JA 50	JA 53	JA 48	JA 40	JA 52	JA 40	JA 37	JA 32	JA 49	JA 34	JA 53	JA 37
12	JA 35	JA 53	JA 51	JA 40	JA 34	JA 41	JA 46	JA 56	56	JA 111	JA 160	JA 89	JA 98	JA 113	JA 53	36	37	39	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	JA 259	JA 257	JA 145	JA 251	JA 74	JA 104	JA 67	JA 86	JA 38	JA 64	JA 41	JA 91	JA 108	JA 81	JA 65
14	JA 53	JA 39	JA 31	JA 39	JA 32	JA 28	JA 66	JA 66	JA 118	JA 76	JA 68	JA 75	JA 65	JA 49	JA 58	JA 100	JA 84	JA 49	JA 47	JA 30	JA 30	JA 28	JA 32	JA 53
15	JA 39	JA 39	JA 26	24	EB 15	26	31	JA 40	C	JA 76	C	JA 62	JA 84	JA 74	JA 68	36	JA 50	JA 66	JA 49	JA 41	JA 72	JA 65	JA 54	JA 66
16	JA 62	JA 55	JA 48	JA 37	22	JA 36	30	JA 44	JA 61	JA 56	JA 63	JA 54	JA 49	JA 62	JA 47	39	JA 50	JA 103	JA 38	JA 54	JA 70	JA 48	JA 41	JA 48
17	JA 47	JA 51	JA 37	JA 54	JA 47	JA 37	JA 45	C	C	C	C	C	C	C	C	C	C	C	JA 69	JA 54	JA 76	JA 52	JA 53	JA 65
18	JA 88	JA 86	JA 52	JA 80	JA 52	JA 30	JA 49	JA 94	JA 68	JA 100	JA 80	JA 141	JA 190	JA 104	JA 129	JA 72	JA 138	JA 122	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	JA 56	JA 89	JA 56	JA 102	JA 120	JA 133	JA 94	JA 80	JA 70	JA 48	JA 27	JA 32	JA 42	JA 54	JA 51
20	JA 29	JA 46	JA 22	JA 36	JA 54	JA 89	JA 122	JA 52	JA 51	JA 138	JA 169	JA 80	41	JA 46	JA 55	JA 50	JA 48	JA 56	JA 49	JA 34	JA 27	JA 65	JA 52	JA 53
21	JA 82	JA 65	JA 67	JA 34	JA 32	22	JA 40	35	JA 64	JA 69	JA 80	JA 130	JA 104	JA 67	JA 73	JA 77	JA 83	JA 72	JA 88	JA 52	JA 60	JA 37	JA 88	JA 54
22	JA 49	JA 40	JA 46	JA 52	JA 41	JA 28	JA 48	JA 53	JA 80	JA 64	JA 86	JA 84	JA 51	JA 64	JA 70	JA 87	JA 83	JA 57	JA 76	JA 84	JA 48	JA 43	JA 54	JA 32
23	JA 102	JA 66	JA 42	JA 54	JA 63	G	30	JA 50	JA 60	JA 82	JA 73	JA 74	JA 64	JA 43	JA 51	JA 52	JA 56	JA 83	JA 50	JA 46	JA 50	JA 54	JA 37	JA 36
24	JA 34	JA 76	JA 88	JA 68	JA 55	JA 54	JA 84	JA 118	JA 77	JA 56	JA 66	JA 62	42	JA 44	JA 44	37	38	JA 42	JA 30	JA 28	JA 28	JA 24	22	20
25	JA 27	JA 23	JA 24	21	21	JA 29	C	C	C	JA 80	C	JA 49	42	42	JA 99	JA 55	JA 84	JA 70	JA 105	JA 138	JA 140	JA 54	JA 54	JA 52
26	JA 54	JA 49	JA 61	JA 47	JA 32	JA 34	JA 38	JA 60	JA 75	JA 102	JA 166	JA 82	JA 110	JA 83	JA 72	39	JA 63	JA 75	JA 38	JA 25	JA 36	JA 54	JA 54	JA 26
27	JA 39	JA 63	JA 30	JA 53	JA 83	JA 39	JA 55	JA 88	JA 85	JA 43	JA 60	JA 70	G	C	JA 48	JA 47	JA 54	JA 58	JA 47	JA 49	JA 38	JA 79	JA 26	JA 29
28	JA 54	JA 52	JA 52	EB 15	JA 32	24	JA 47	JA 49	JA 59	JA 117	JA 53	JA 85	JA 71	JA 71	JA 77	38	34	30	JA 32	JA 48	JA 36	JA 86	JA 42	JA 80
29	JA 85	JA 84	JA 78	JA 67	JA 74	JA 30	JA 38	JA 37	JA 68	JA 99	JA 75	JA 122	JA 127	JA 90	JA 60	JA 66	JA 63	JA 42	JA 38	JA 31	JA 45	JA 33	EB 16	JA 55
30	JA 51	20	JA 31	EB 16	EB 16	JA 31	JA 54	JA 82	JA 84	JA 50	JA 90	JA 151	G	JA 45	JA 78	JA 134	JA 85	JA 63	JA 55	JA 100	JA 48	JA 54	JA 51	JA 77
31																								
	00	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	27	27	27	27	26	25	24	28	26	27	27	27	28	29	29	29	27	27	27	27	27	27
MED	JA 53	JA 52	JA 41	JA 39	JA 32	JA 29	JA 42	JA 52	JA 65	JA 68	JA 80	JA 80	JA 71	JA 66	JA 69	JA 43	JA 52	JA 49	JA 47	JA 47	JA 49	JA 54	JA 53	JA 53
U Q	JA 80	JA 67	JA 52	JA 53	JA 54	JA 39	JA 49	JA 68	JA 76	JA 90	JA 100	JA 109	JA 104	JA 74	JA 78	JA 66	JA 83	JA 70	JA 59	JA 72	JA 72	JA 67	JA 55	JA 65
L Q	JA 35	JA 36	JA 30	28	27	26	38	JA 42	JA 58	JA 56	JA 67	JA 62	49	JA 46	JA 50	37	38	40	JA 36	JA 31	JA 36	JA 37	JA 41	JA 36

JUN. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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 80	A A 87	E B 16	E B 15	E B 16	24	27	39	40	A A 65	A A 64	A A 59	A A 63	55	38	G	G	42	27	23	42	38	29	34
2	E A 24	20	16	E B 16	22	A A 48	38	33	A A 83	A A 74	A A 83	A A 69	A A 77	50	44	G	31	28	46	A A 73	A A 87	20	19	E B 15
3	E B 16	A A 67	20	E B 16	E B 16	A A 50	30	32	35	33	A A 74	A A 50	A A 140	A A 66	37	34	34	35	34	A A 72	20	21	A A 53	A A 55
4	E B 16	E B 15	20	19	E B 17	23	29	A A 71	48	A A 75	A A 67	C	C	43	48	37	32	28	25	51	29	18	21	21
5	E B 16	E B 16	E B 15	E B 15	E B 16	30	G 25	39	35	40	A A 100	A A 109	38	48	38	35	47	46	41	37	20	21	40	A A 78
6	16	E B 15	E B 15	23	E B 16	19	33	34	47	A A 68	A A 66	A A 77	A A 58	38	A A 74	50	52	26	41	38	46	24	20	16
7	24	18	22	23	16	21	A A 50	44	45	38	44	A A 80	37	41	38	36	A	30	28	19	E B 15	20	23	20
8	A A 55	38	24	23	23	20	34	A A 56	A A 66	A A 64	A A 103	A A 104	A A 84	A A 70	E A 43	44	42	32	27	38	47	A A 113	A A 114	A A 73
9	A A 86	A A 70	22	22	21	18	34	A A 69	A A 68	A A 67	A A 91	A A 134	A A 84	52	A A 70	39	30	36	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	33	39	41	30	24	22	23	26	24
11	E B 16	20	E B 16	E B 16	22	21	29	33	46	A A 63	A A 67	40	43	A A 53	38	36	40	36	29	25	44	25	23	20
12	24	38	23	19	16	35	39	46	A A 56	A A 111	A A 160	A A 89	A A 98	A A 113	38	35	31	38	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	A A 259	A A 257	A A 145	A A 251	A A 74	A A 104	46	A A 86	32	39	27	24	25	A A 81	26
14	26	21	20	23	23	25	A A 66	49	A A 118	A A 76	A A 68	A A 75	44	39	A A 58	A A 100	A A 84	26	39	24	18	18	19	20
15	22	E B 16	E B 17	E B 16	E B 15	24	29	34	C	56	C	A A 62	A A 84	A A 74	A A 68	34	46	A A 66	A A 49	32	46	A A 65	39	A A 66
16	A A 62	17	19	E B 16	E B 15	27	27	35	36	43	A A 63	43	38	A A 62	A A 47	37	41	A A 103	33	46	24	22	24	22
17	22	21	23	E B 16	E B 16	32	38	C	C	C	C	C	C	C	C	C	C	C	32	51	41	36	22	21
18	18	20	22	E B 15	E B 16	23	42	A A 94	A A 68	A A 100	A A 80	A A 141	A A 190	A A 104	A A 129	47	63	A A 122	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	A A 56	A A 89	A A 56	A A 102	A A 120	A A 133	A A 94	A A 80	A A 70	43	22	26	24	22	24
20	20	20	17	E B 16	17	A A 89	A A 122	A A 52	36	A A 138	A A 169	A A 80	38	A A 46	A A 55	42	40	40	32	22	20	24	30	E B 16
21	A A 82	22	A A 67	20	19	19	37	32	49	A A 69	A A 80	A A 130	A A 104	39	A A 73	A A 77	A A 83	A A 72	23	22	46	34	24	23
22	21	E B 16	E B 16	20	E B 16	23	28	38	A A 80	51	A A 86	A A 84	45	51	46	44	A A 83	51	26	A A 84	35	21	23	22
23	24	20	19	25	A A 63	G	26	47	51	A A 82	A A 73	A A 74	45	41	46	47	46	56	43	38	37	21	16	19
24	23	A A 76	23	23	A A 55	A A 54	A A 84	A A 118	A A 77	A A 56	48	39	A A 42	A A 44	A A 44	34	34	32	22	18	21	17	16	E B 16
25	19	17	E B 16	E B 16	E B 16	21	C	C	C	A A 80	C	A A 49	40	39	A A 99	43	A A 84	A A 70	A A 105	35	23	36	18	20
26	24	24	29	25	18	22	26	44	A A 75	A A 102	A A 166	A A 82	A A 110	A A 83	47	36	46	A A 75	26	20	E B 16	29	21	E B 16
27	26	22	E B 15	A A 53	A A 83	A A 39	29	A A 88	A A 85	41	A A 60	A A 70	G	C	A A 48	A A 47	41	46	41	38	34	E B 16	18	E B 16
28	A A 54	21	19	E B 15	E B 16	20	A A 47	42	45	52	44	48	A A 71	45	38	36	33	28	25	28	21	22	21	A A 80
29	A A 85	A A 84	A A 78	A A 67	21	21	30	31	A A 68	A A 99	A A 75	A A 122	A A 127	A A 90	46	A A 66	A A 63	32	21	20	18	18	E B 16	19
30	20	E B 16	18	E B 16	E B 16	23	34	39	33	38	A A 90	A A 151	G	38	A A 78	A A 134	38	42	A A 55	27	27	37	33	A A 77
31																								
	00	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	27	27	27	27	26	25	24	28	26	27	27	27	28	29	28	29	27	27	27	27	27	27
MED	24	20	19	19	16	23	34	42	50	A A 66	A A 78	A A 77	A A 63	51	A 47	39	42	40	32	28	26	23	23	21
U Q	A A 54	A A 38	23	23	22	A A 32	A A 39	A A 54	A A 72	A A 81	A A 91	A A 109	A A 102	A A 74	A A 72	A A 47	A A 63	A A 61	41	38	42	34	30	A A 34
L Q	E B 19	E B 17	E B 16	E B 16	E B 16	21	29	34	42	52	A A 66	56	40	41	40	35	34	32	26	22	20	20	19	E B 19

JUN. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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	15	15	16	15	16	16	16	16	16	17	19	24	28	22	22	17	15	14	15	15	15	16	16	15
2	16	16	15	16	16	15	14	14	15	17	20	21	22	18	21	22	16	17	15	14	16	15	16	15
3	16	16	15	16	16	12	14	13	15	14	19	16	21	26	24	14	17	15	13	14	16	16	15	14
4	16	15	16	15	17	14	14	15	17	20	19	C	C	20	22	23	16	16	14	16	15	15	16	15
5	16	16	15	15	16	14	13	15	21	16	17	25	18	25	20	16	13	14	14	14	15	15	15	15
6	16	15	15	15	16	15	14	15	17	18	20	21	24	21	17	16	18	13	15	15	16	15	16	16
7	16	15	15	15	16	14	14	14	14	20	19	23	21	22	20	17	15	13	14	14	15	16	16	14
8	16	16	16	16	15	15	15	14	14	18	24	24	23	24	22	21	17	16	16	15	16	16	15	15
9	16	15	16	16	16	14	13	15	16	16	20	22	22	23	21	15	14	14	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	16	18	15	16	15	16	16	16
11	16	16	16	16	14	15	14	15	15	17	18	21	17	18	20	19	16	16	14	14	16	16	16	16
12	16	15	16	15	16	15	13	17	16	17	17	23	26	23	28	18	16	16	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	16	19	20	20	20	19	17	15	16	14	15	16	16	15	16
14	16	15	16	15	15	14	15	16	16	16	17	16	18	20	19	21	16	15	14	15	15	15	16	15
15	16	16	17	16	15	15	15	15	C	17	C	22	23	22	22	18	16	15	16	15	15	16	15	16
16	16	16	15	16	16	16	14	14	15	17	17	20	17	18	19	16	14	13	14	15	16	16	16	16
17	16	16	16	16	16	16	15	C	C	C	C	C	C	C	C	C	C	C	16	15	16	16	17	16
18	16	16	16	15	16	15	16	16	15	15	20	18	21	17	15	15	16	14	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	23	22	22	27	18	21	21	16	14	15	14	16	15	16	16
20	16	16	16	16	16	14	16	17	17	15	21	18	20	20	20	20	17	15	15	15	16	15	16	16
21	16	16	15	15	15	15	13	16	16	18	22	24	24	21	20	15	16	16	14	15	15	15	16	16
22	16	16	16	16	16	16	13	16	16	16	17	23	21	19	18	16	16	16	14	15	16	16	16	16
23	15	16	16	15	15	14	14	14	16	21	20	21	21	18	19	21	20	15	15	16	16	16	16	15
24	16	16	16	16	16	15	16	16	16	19	19	22	21	21	20	20	16	15	15	15	15	16	16	16
25	15	16	16	16	16	14	C	C	C	21	C	26	22	21	22	20	16	12	15	17	16	16	15	16
26	15	15	15	16	15	15	14	16	22	19	21	23	23	23	21	18	16	16	16	14	16	16	16	16
27	16	16	15	16	16	16	15	15	15	17	20	20	22	C	20	19	17	14	14	15	15	16	16	16
28	16	16	16	15	16	15	15	15	16	22	19	20	19	17	21	20	19	15	14	14	14	16	16	15
29	16	15	16	15	15	15	14	15	16	16	20	19	22	20	20	20	17	14	15	15	16	15	16	16
30	16	16	16	16	16	15	14	14	14	15	15	21	19	17	17	18	16	16	14	15	15	15	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	26	25	24	28	26	27	27	27	28	29	29	29	27	27	27	27	27	27
MED	16	16	16	16	16	15	14	15	16	17	19	21	21	20	20	18	16	15	15	15	16	16	16	16
U Q	16	16	16	16	16	15	15	16	16	19	20	23	23	22	22	20	17	16	15	15	16	16	16	16
L Q	16	15	15	15	15	14	14	14	15	16	18	20	20	18	19	16	16	14	14	14	15	15	15	15

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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	A	303	F	F	321	316	346	371	A	A	A	A	306	301	313	284	290	300	316	355	F	F	F
2	308	284	289	291	318	A	362	337	A	A	A	A	A	316	308	326	331	306	342	A	A	F	F	F
3	F	A	310	F	318	A	289	288	333	367	A	A	A	A	292	299	312	322	335	A	351	F	A	A
4	300	307	341	309	314	332	349	A	368	A	A	C	C	304	306	331	333	334	337	338	350	F	287	F
5	F	F	F	F	F	395	361	353	375	351	A	A	287	317	314	314	334	333	257	330	321	344	327	A
6	F	323	330	326	331	353	344	346	379	A	A	A	A	299	A	302	313	329	324	278	343	F	F	328
7	F	337	329	350	326	343	A	318	337	375	336	A	257	287	296	306	319	330	312	328	314	328	314	305
8	A	318	F	307	305	375	353	A	A	A	A	A	A	A	284	299	290	314	328	338	352	A	A	A
9	A	A	319	324	306	358	357	A	A	A	A	A	A	323	A	330	316	332	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	305	312	303	313	333	346	316	F	347
11	351	F	330	314	336	366	312	335	373	A	A	355	285	A	298	299	307	320	326	340	334	330	F	F
12	F	F	F	301	305	367	279	372	A	A	A	A	A	A	305	317	323	322	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	335	A	311	314	322	F	F	A	F
14	316	312	F	315	320	313	A	331	A	A	A	A	308	292	A	A	A	324	324	305	313	317	315	F
15	314	330	328	362	F	322	330	352	C	347	C	A	A	A	A	315	325	A	A	324	310	A	316	A
16	A	337	F	F	F	367	342	342	354	365	A	320	328	A	A	304	306	A	339	332	F	F	F	298
17	F	309	326	307	F	351	328	C	C	C	C	C	C	C	C	C	C	C	315	325	340	F	F	F
18	F	F	F	331	301	302	313	A	A	A	A	A	A	A	A	295	319	A	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	A	323	322	307	287	F	F
20	303	326	317	308	317	A	A	A	343	A	A	A	266	A	A	287	307	334	335	327	326	F	F	F
21	A	F	A	335	F	377	342	337	332	A	A	A	A	321	A	A	A	A	315	310	325	327	F	F
22	296	F	F	F	F	319	338	352	A	368	A	A	303	305	317	316	A	356	330	A	328	355	321	309
23	F	F	F	340	A	303	299	357	352	A	A	A	314	303	283	288	303	305	334	330	293	282	297	323
24	343	A	F	F	A	A	A	A	A	A	328	278	A	A	A	R 240	279	306	321	338	376	312	292	308
25	306	287	320	329	367	350	C	C	C	A	C	A	285	313	A	275	A	A	A	331	318	F	F	F
26	291	F	292	287	F	319	378	338	A	A	A	A	A	A	282	274	308	A	304	342	301	294	324	307
27	302	350	286	A	A	A	330	A	A	333	A	A	281	C	A	A	307	313	338	331	330	318	283	F
28	A	311	323	297	324	351	A	325	277	322	329	312	A	328	285	292	286	331	328	324	353	326	F	A
29	A	A	A	A	F	343	348	350	A	A	A	A	A	A	301	A	A	323	313	328	347	328	338	320
30	F	F	328	308	338	360	376	377	360	336	A	A	285	301	A	A	314	330	A	311	324	316	323	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	13	16	19	15	22	21	18	13	9	3	4	11	14	14	23	22	22	24	24	24	15	12	9
MED	306	318	322	314	318	350	342	344	354	351	329	316	285	306	300	304	312	322	324	328	329	318	316	309
U Q	316	334	328	331	331	366	355	352	372	368	336	338	308	317	306	316	319	331	334	332	348	328	324	326
L Q	300	308	306	307	306	321	314	335	335	334	328	295	281	301	285	292	306	311	314	322	316	312	294	306

JUN. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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							373	A	A	A	A	A	A	A	UL 383	395	372	A	A					
2						A	A 392		A	A	A	A	A	A	A	UL 383	391	373	A	A				
3						A	A	UL 383	410	UL 423	A	A	A	A	395	380	370	A	A	A				
4								A	A	A	A	C	C	A	A	UL 376	388	387	L	A				
5						A		A	UL 396	A	A	A	UL 441	A	381	UL 393	A	A	A	A				
6							A	UL 390	A	A	A	A	A	A	A	A	A	UL 399	A	A				
7							A	A	A	418	A	A	UL 414	A	386	UL 376	UL 367	368	A					
8								A	A	A	A	A	A	A	A	A	A	UL 376						
9							A	A	A	A	A	A	A	A	A	A	389	A	C	C				
10						C	C	C	C	C	C	C	C	C	C	UL 379	A	A						
11							UL 380	384	A	A	A	416	A	A	UL 396	UL 374	UL 379	A	A					
12							UL 381	A	A	A	A	A	A	A	UL 368	UL 431	408	A	C	C				
13						C	C	C	C	A	A	A	A	A	A	A	A	UL 382	A					
14						A	A	A	A	A	A	A	A	UL 428	A	A	A	390	A					
15							L	A	C	A	C	A	A	A	A	UL 403	A	A	A	A				
16								382	401	A	A	A	434	A	A	344	A	A	A	A				
17						A	A	C	C	C	C	C	C	C	C	C	C	C	A	A				
18						350	A	A	A	A	A	A	A	A	A	A	A	A	C	C				
19						C	C	C	C	A	A	A	A	A	A	A	A	A	A					
20						A	A	A	414	A	A	A	UL 434	A	A	A	A	A	A					
21	A						A	398	A	A	A	A	A	UL 430	A	A	A	A	L					
22							370	A	A	A	A	A	A	A	A	A	A	A	L	A				
23						UL 362	380	A	A	A	A	A	A	UL 388	A	A	A	A	A					
24						A	A		A	A	A	UL 401	A	A	A	UL 430	UL 382	UL 375	369					
25							C	C	C	A	C	A	446	417	A	A	A	A	A	A				
26						UL 351	A	A	A	A	A	A	A	A	A	353	A	A	374	A				
27						A	UL 365	A	A	A	A	A	422	C	A	A	A	A	A	A				
28							A	A	A	A	A	A	A	A	UL 394	UL 429	370	362	UL 387					
29							392	412	A	A	A	A	A		A	A	A	UL 374	L	A				
30							A	A	414	423	A	A	UL 457	UL 408	A	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	7	7	5	3		2	7	5	7	14	10	10	3					
MED						UL 351	380	390	410	423		408	UL 434	UL 417	UL 386	UL 382	380	376	374					
U Q						UL 362	381	398	414	UL 423			446	UL 429	395	UL 403	389	387	UL 387					
L Q						350	370	383	398	418			422	UL 398	381	376	370	373	369					

JUN. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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							330	246	232	A	A	A	A	E A 360	312	292	358	330	294					
2						A 248		300		A	A	A	A	E A 372	334	302	282	322	E A 288	A				
3						A	382	416	300	278		A	A	A	A		398	340	296	296	258	A				
4								A	E A 254	A	A	C	C	366	E A 338	290	274	294	274	E A 302				
5						226		276	250	284		A	A	408	E A 354	338	320	280	252	E A 390	E A 246			
6							288	282	E A 270	A	A	A	A	E A 334	A	E A 356	E A 292	282	E A 262	E A 288				
7							A	E A 316	284	236	E A 304	A	496	354	336	296	266	260	274					
8								A	A	A	A	A	A	A	E A 360	356	E A 316	278						
9							276	A	A	A	A	A	A	E A 332	A	298	306	298	C	C				
10						C	C	C	C	C	C	C	C	C	C	330	286	E A 294						
11							366	306	242	A	A	290	378	A	380	368	324	278	254					
12							E A 460	240	A	A	A	A	A	A	354	328	306	314	C	C				
13						C	C	C	C	A	A	A	A	A	A	E A 314	A	340	E A 296					
14						E A 320	A	E A 318	A	A	A	A	E A 360	428	A	A	A	274	246					
15							292	252	C	E A 304	C	A	A	A	A	346	284	A	A	E A 288				
16								282	290	254	A	332	338	A	A	368	E A 344	A	248	E A 256				
17						E A 270	314	C	C	C	C	C	C	C	C	C	C	C	266	E A 282				
18						360	E A 350	A	A	A	A	A	A	A	A	338	E A 316	A	C	C				
19						C	C	C	C	A	A	A	A	A	A	A	A	A	E A 320					
20						A	A	A	312	A	A	A	464	A	A	E A 388	324	294	282					
21	A						244	290	E A 326	A	A	A	A	356	A	A	A	A	316					
22							290	248	A	E A 258	A	A	352	E A 340	316	320	A	E A 268	282	A				
23						328	356	232	E A 286	A	A	A	332	360	E A 416	E A 338	E A 318	E A 354	242					
24						A	A		A	A	280	E A 438	A	A	A	E A 496	426	328	294					
25							C	C	C	A	C	A	388	366	A	E A 436	A	A	A	E A 272				
26						324	246	E A 274	A	A	A	A	A	A	E A 400	368	E A 332	A	300	240				
27						A	302	A	A	320	A	A	452	C	A	A	340	E A 294	238	E A 242				
28							A	E A 326	E A 378	E A 310	320	E A 362	A	316	400	396	382	296	294					
29							280	272	A	A	A	A	A		E A 404	A	A	292	280	E A 250				
30							252	244	268	294	A	A	432	358		A	328	E A 300	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						6	17	18	13	9	3	4	11	14	14	23	22	22	22	10				
MED						322	290	270	U 269	U 271	304	347	388	356	U 346	329	308	294	272	E A 264				
U Q						328	353	E A 306	306	E A 307	320	E A 400	452	366	E A 400	368	332	314	294	E A 288				
L Q						270	264	248	252	256	280	311	352	E A 340	336	314	286	278	258	E A 246				

JUN. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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	A	E B 280	E B 222	E B 256	210	214	A	A	A	A	A	A	A	202	192	192	A	A	240	220	E A 296	E A 286	E A 296
2	E A 294	E A 270	E A 286	E B 262	E A 244	A	A	220	A	A	A	A	A	A	A	220	198	212	A	A	A	E A 248	E A 236	230
3	210	A	E A 264	E B 246	210	A	A	224	212	200	A	A	A	A	220	208	236	A	A	A	214	E A 252	A	A
4	E B 278	E B 288	E A 236	E A 254	E B 272	228	E A 238	A	A	A	A	C	C	A	A	E A 258	196	198	218	A	218	E A 274	E A 254	E A 360
5	E B 284	E B 230	E B 252	E B 258	E B 234	A	204	A	212	A	A	A	198	A	E A 254	184	A	A	A	A	228	212	E A 308	A
6	E B 238	E B 232	222	E A 268	E B 246	210	A	218	A	A	A	A	A	A	A	A	A	196	A	A	E A 250	E A 246	E A 264	234
7	E A 290	E A 326	224	E A 260	E A 258	234	A	A	A	206	A	A	194	A	E A 234	E A 250	E A 246	212	A	E A 234	210	222	226	224
8	A	E A 294	E A 262	E A 258	E A 258	212	232	A	A	A	A	A	A	A	A	A	A	226	E A 252	218	218	A	A	A
9	A	A	E A 258	E A 282	E A 270	212	A	A	A	A	A	A	A	A	A	A	188	A	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	208	A	A	E A 242	222	200	222	E A 246	220
11	220	E A 238	E B 224	E B 236	E A 260	210	216	214	A	A	A	202	A	A	202	204	228	A	A	222	E A 254	226	E A 254	E A 236
12	228	E A 300	E A 302	E A 276	E A 240	228	E A 250	A	A	A	A	A	A	A	E A 244	190	212	A	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	202	A	E A 248	216	202	A	E A 234
14	E A 304	E A 286	E A 284	E A 296	E A 282	A	A	A	A	A	A	A	A	192	A	A	A	196	A	230	E A 236	218	210	232
15	232	204	232	206	226	220	228	A	C	A	C	A	A	A	A	210	A	A	A	A	E A 328	A	E A 286	A
16	A	E A 242	E A 282	E B 246	E B 250	E A 238	208	216	216	A	A	A	198	A	A	E A 278	A	A	A	A	228	E A 250	E A 262	E A 252
17	224	218	E B 254	E B 254	E B 246	A	A	C	C	C	C	C	C	C	C	C	C	C	A	A	226	E A 288	E A 244	E A 238
18	200	232	222	228	E B 274	E A 242	A	A	A	A	A	A	A	A	A	A	A	A	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	A	A	228	E A 260	E A 290	E A 270	E A 286
20	E A 258	E A 240	228	E B 244	E A 256	A	A	A	208	A	A	A	192	A	A	A	A	A	E A 236	218	E A 304	E A 296	E B 266	
21	A	E A 288	A	232	228	210	A	198	A	A	A	A	A	198	A	A	A	A	208	E A 274	E A 270	204	E A 266	E A 282
22	E A 270	E B 258	E B 260	E A 290	E B 254	220	214	A	A	A	A	A	A	A	A	A	A	A	220	A	E A 242	202	E A 242	E A 256
23	E A 286	E A 286	E A 308	E A 246	A	216	216	A	A	A	A	A	A	230	A	A	A	A	A	E A 238	E A 286	E A 250	E A 238	E A 244
24	210	A	E A 300	E A 274	A	A	A	A	A	A	A	224	A	A	A	204	216	E A 238	214	220	196	E B 222	E A 266	E B 266
25	E A 280	E A 296	E B 262	E B 238	200	232	C	C	C	A	C	A	190	200	A	A	A	A	A	A	E A 252	E A 314	E A 258	E A 264
26	E A 304	E A 322	E A 338	E A 338	E A 248	E A 256	A	A	A	A	A	A	A	A	A	E A 264	A	A	230	A	E B 240	E A 284	E A 234	E B 242
27	E A 276	222	E B 238	A	A	A	242	A	A	A	A	A	190	C	A	A	A	A	A	A	E A 236	226	E A 272	E B 274
28	A	E A 292	E A 248	E B 260	E B 242	204	A	A	A	A	A	A	A	A	206	188	226	206	222	222	212	208	E B 318	A
29	A	A	A	A	E A 278	218	228	200	A	A	A	A	A	A	A	A	A	198	206	A	206	212	204	220
30	E A 284	E B 246	E A 246	E B 244	E B 214	224	A	A	188	190	A	A	196	210	A	A	A	A	A	E A 250	E A 244	E A 320	E A 292	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	20	22	25	25	24	19	12	7	5	3		2	7	5	7	14	10	10	9	14	26	25	24	21
MED	E 273	E A 264	E A 258	E 254	E 249	216	218	216	212	200		213	194	200	211	200	210	202	217	226	U 213	E A 246	E A 260	E A 244
U Q	E A 285	E A 292	E A 283	E A 271	E A 259	E A 232	235	220	214	206			198	220	E A 244	E A 250	228	212	E A 236	E A 240	E A 250	E A 286	E A 279	E A 270
L Q	226	232	234	E B 241	237	210	214	200	198	190			190	195	202	192	196	198	211	222	216	215	E A 240	233

JUN. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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						A		A	A	A	A	A	A	A				A	A	B				
							108								112	110	110							
2						B	A	A	A	A	A	A	A	A	A				A	B				
																114	118	116						
3						A	A		A	A	A	A	A	A				A	A	B				
								110							108	110	110							
4						A		A	A	A	A	C	C	A	A				A	B				
							110									108	110	98						
5						A		A	A	A	A	A	A	A	A			A	B	B				
							110									110	110							
6						B			A	A	A	A	A	A	A	A	A	A	B	B				
							114	110																
7						B	A	A	A	A	A	A				A	A		A	B				
													108	110	110			108						
8						B		A	A	A	A	A	A	A	A	A	A	A	A	B				
							116																	
9						B	A	A	A	A	A	A	A	A	A				C	C				
																110	110	108						
10						C	C	C	C	C	C	C	C	C	C	A	A	A	B	B				
11						B			A	A	A	A	A	A	A	A	A	A	A	B				
							112	112																
12						B	A	A	A	A	A	A	A	A	A				C	C				
																112	110	110						
13						C	C	C	C	A	A	A	A	A	A	A	A	A	B	B				
14						A	A	A	A	A	A	A	A	A	A	A	A	A	B	A				
15									C	A	C	A	A	A	A	A	A	A	B	B				
						108	110	110																
16						B			A	A	A	A	A	A	A			A	A	B				
							112	108								116	112							
17						B	A	C	C	C	C	C	C	C	C	C	C	C	A	B				
18								A	A	A	A	A	A	A	A	A	A	A	C	C				
						118	114																	
19						C	C	C	C	A	A		A	A	A	A	A	A	A	B				
												108												
20						B	A	A	A	A	A	A	A	A	A	A	A	A	B	B				
21	A					B	A		A	A	A	A	A	A	A	A	A	A	A	B				
								110																
22							A	A	A	A	A	A	A	A		A	A	A	A	B				
															110									
23								A	A	A	A	A	A	A			A	A	A	B				
						122	116								108	108								
24						A	A		A	A	A	A	A	A	A			A	A	B				
																108	108							
25						A	C	C	C	A	C	A				A	A	A	A	B				
													110	110										
26						A	A	A	A	A	A	A	A	A	A			A	A	B	A			
																112								
27						B	A	A	A	A	A	A		C		A	A	A	A	B				
													112		112									
28								A	A	A	A	A	A	A	A	A			A	B				
						122	110										108	110						
29						A		A	A	A	A	A	A			A	A	A	B	B				
							112																	
30						A	A	A	A	A	A	A		A	A	A	A	A	A	B				
													112											
31																								
	00	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	12	6				1	4	2	6	11	10	6						
MED						120	112	110				108	111	110	110	110	110	109						
U Q						122	114	110					112		112	112	110	110						
L Q						113	110	110					109		108	108	110	108						

JUN. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	84	82	88	88	96	114	116	94	92	98	98	102	102	106	114	G	G	98	98	98	98	98	98	92
2	94	92	88	108	106	106	98	98	98	92	90	92	88	86	86	G	122	122	100	98	96	96	96	96
3	86	84	84	84	108	104	100	110	94	94	92	92	78	94	158	126	118	102	102	100	100	98	88	86
4	82	88	86	82	100	104	120	104	102	98	96	C	C	94	88	162	140	112	106	98	98	106	100	98
5	84	88	94	90	90	90	104	100	98	96	92	88	86	92	92	128	118	102	88	100	96	96	96	96
6	98	92	98	88	88	120	126	118	98	88	90	86	86	98	96	102	100	100	100	92	82	92	92	92
7	90	90	82	80	86	122	104	102	100	96	104	106	116	110	110	96	100	114	98	100	84	82	88	88
8	88	86	86	82	82	128	118	102	100	96	92	92	84	94	96	98	98	100	104	94	94	94	94	94
9	88	88	88	88	86	86	104	100	100	94	94	82	82	90	88	114	142	120	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	96	92	90	80	80	82	84	92	90
11	90	90	90	92	92	114	114	112	96	96	94	92	96	96	94	94	92	92	90	84	84	84	96	96
12	96	96	90	90	102	112	104	98	94	94	88	86	88	92	92	112	116	110	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	90	84	88	90	98	92	92	92	92	100	96	88	92	92	92
14	92	92	88	82	82	80	94	92	92	90	90	92	92	100	92	92	82	86	86	94	92	86	86	92
15	90	96	94	102	B	132	126	112	C	92	C	94	92	92	92	92	88	88	88	86	100	100	100	96
16	96	88	92	92	126	114	116	114	98	98	98	96	94	96	92	114	110	96	96	96	92	92	92	92
17	92	92	92	96	96	114	102	C	C	C	C	C	C	C	C	C	C	C	102	96	96	96	96	96
18	96	88	88	88	94	116	114	100	100	98	96	90	86	86	92	106	96	96	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	106	106	112	90	90	88	92	92	94	94	84	84	84	86	86
20	84	84	90	104	100	96	88	96	96	84	88	88	88	90	90	86	86	86	86	86	88	88	88	88
21	88	88	86	84	84	120	104	114	100	98	92	88	92	92	96	94	90	90	90	88	84	86	90	90
22	88	92	98	84	84	98	96	98	88	92	90	88	94	96	114	104	102	98	98	98	96	88	86	84
23	92	94	96	92	90	G	126	100	100	98	96	96	102	104	116	118	100	102	98	96	90	90	90	90
24	92	94	90	98	106	100	100	98	96	98	98	96	102	102	102	114	110	98	96	96	88	86	86	86
25	84	84	88	88	96	94	C	C	C	88	C	106	112	112	96	100	96	96	96	98	98	98	94	98
26	94	92	86	82	80	112	110	106	102	98	94	98	88	90	92	110	100	92	90	94	94	96	96	94
27	90	86	86	92	98	106	106	96	92	94	98	88	G	C	114	106	106	104	102	98	96	96	104	100
28	88	88	88	B	92	126	116	104	100	92	92	92	88	94	98	102	152	138	106	100	96	96	96	96
29	92	92	92	88	88	88	100	98	98	98	96	94	94	98	98	96	96	94	94	94	94	96	B	90
30	90	96	86	B	B	102	98	98	98	96	96	90	G	100	96	96	96	96	96	86	90	100	98	92
31																								
	00	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	27	25	25	26	26	25	24	28	26	27	25	27	28	27	28	29	27	27	27	27	26	27
MED	90	90	88	88	92	109	104	100	98	96	94	92	90	94	95	102	100	98	96	96	94	94	93	92
U Q	92	92	92	92	100	116	116	108	100	98	96	96	95	100	100	114	113	103	100	98	96	96	96	96
L Q	88	88	86	84	86	98	100	98	95	92	90	88	87	92	92	94	92	92	90	88	88	86	88	90

IONOSPHERIC DATA STATION Kokubunji

JUN. 2018 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	F6	F8	F4	F2	F3	L2	C2	L3	L2	L3	L3	L3	L3	L3	C1			L2	L6	L4	F6	F6	F7	F6
2	L2	F4	F2	F4	F5	L5	L4	L3	L3	L3	L3	L2	L3	L3	L2		C1	C1	L3	L6	F6	F5	F4	F2
3	F5	F7	F5	F3	F6	L6	L3	C2	L2	L2	L3	L3	L4	L2	H1	C1	C2	L3	L4	L7	F3	F5	F7	F8
4	F2	F2	F2	F5	F2	L2	C2	L4	L3	L3	L2			L2	L3	H1	H1	C1	L2	L4	F5	F4	F3	F6
5	F2	F2	F2	F2	F1	L3	L3	L2	L2	L2	L3	L3	L2	L3	L1	C1	C2	L4	L4	L4	F4	F5	F6	F8
6	F2	F3	F3	F2	F2	C2	C2	C2	L2	L3	L4	L3	L3	L2	L3	L2	L4	L2	L4	L4	F4	F5	F3	F3
7	F3	F6	F4	F3	F2	C1	L3	L2	L3	L2	L2	L2	C1	C2	C2	L1	L2	C2	L3	L3	F2	F4	F4	F4
8	F6	F6	F7	F6	F5	C2	C3	L4	L3	L4	L4	L4	L4	L3	L3	L2	L2	L3	L2	L5	F5	F5	F6	F8
9	F7	F5	F5	F4	F4	L2	L3	L5	L4	L4	L4	L4	L4	L3	L4	C1	H1	C3						
10																L C 2 1	L4	L2	L2	L2	F7	F4	F6	F5
11	F3	F4	F2	F2	F2	C2	C2	C2	L3	L3	L3	L1	L2	L2	L2	L2	L2	L2	L4	L6	F6	F4	F5	F4
12	F4	F7	F8	F5	F2	C4	L3	L3	L3	L4	L4	L3	L3	L2	L2	C1	C1	C3						
13										L5	L5	L4	L5	L3	L4	L2	L5	L2	L4	L6	F3	F5	F9	F7
14	F6	F5	F5	F4	F4	L4	L4	L4	L4	L5	L2	L3	L2	L1	L3	L4	L5	L3	L5	L3	F3	F4	F3	F6
15	F8	F2	F3	F1		C L 2 1	C L 4 2	C2		L3		L3	L4	L3	L3	L1	L3	L4	L5	L5	F F 2 6	F7	F8	F7
16	F6	F4	F5	F3	F1	C3	C2	C2	L2	L2	L2	L3	L2	L3	L2	C L 1 1	C5	L5	L4	L4	F5	F5	F5	F6
17	F6	F5	F4	F3	F3	C5	L3												L5	L8	F5	F6	F3	F4
18	F5	F3	F5	F3	F4	C4	C4	L4	L3	L3	L4	L4	L4	L3	L3	L2	L4	L4						
19										L2	L3	C2	L4	L4	L4	L4	L4	L3	L5	L5	F5	F6	F6	F4
20	F4	F4	F3	F2	F3	L6	L5	L3	L2	L4	L4	L4	L2	L2	L3	L4	L2	L3	L4	L3	F4	F4	F7	F3
21	F6	F5	F4	F5	F4	C L 2 2	L4	C2	L3	L3	L3	L5	L3	L2	L3	L4	L4	L5	L4	L2	F7	F8	F6	F4
22	F2	F4	F2	F4	F3	L3	L3	L3	L4	L2	L3	L3	L2	L2	C2	L3	L4	L5	L4	L8	F4	F3	F5	F5
23	F6	F5	F6	F3	F5		C2	C3	L3	L3	L3	L3	L2	L2	C2	C2	L2	L3	L5	L6	F5	F3	F3	F4
24	F3	F5	F4	F4	F7	L5	L4	L5	L4	L3	L2	L2	L1	L2	L1	C1	C2	L2	L3	L2	F3	F2	F1	F2
25	F4	F2	F2	F2	F2	L3				L3		L2	C1	C1	L3	L2	L3	L3	L5	L3	F3	F8	F3	F7
26	F5	F5	F6	F5	F2	L2	L3	L4	L3	L4	L5	L3	L3	L4	L3	C1	L2	L3	L4	L3	F3	F6	F4	F2
27	F4	F5	F2	F6	F6	L5	L4	L5	L4	L2	L2	L2			C2	L2	L2	L3	L5	L5	F6	F4	F4	F2
28	F6	F4	F3		F2	C2	C3	L3	L2	L3	L2	L3	L3	L2	L2	L2	H1	H2	L4	L6	F4	F4	F2	F6
29	F5	F5	F5	F5	F3	L3	L4	L2	L4	L4	L4	L3	L3	L3	L3	L3	L3	L3	L4	L3	F3	F2		F5
30	F3	F2	F3			L3	L4	L3	L2	L2	L3	L3		L2	L2	L3	L2	L3	L4	L3	F4	F5	F8	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. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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	A	X 48	46	46	41	36															X 100	A	58	56
2	X 50	A	X 47	X 47	X 43																A	A	64	60
3	X 56	A	60	X 54	X 36																X 62	X 51	56	X 48
4	51	48	X 42	X 38	36																59	X 52	X 47	A
5	55	43	A	42	42	42															X 67	X 62	X 58	X 50
6	49	49	A	41	X 36	41															X 65	X 57	X 52	X 50
7	X 48	X 44	46	X 38	X 37																X 75	X 78	X 54	X 47
8	50	56	55	55	50	49															X 75	X 59	53	A
9	A	X 44	A	42	X 40																X 70	X 60	A	A
10	60	68	58	58	53																A	A	X 54	X 52
11	59	50	X 38	35	38																A	X 64	X 59	X 44
12	44	48	48	48	44	39														A	X 69	X 74	A	49
13	A	A	A	A	38	A														X 88	X 87	A	X 47	50
14	52	47	49	44	44	X 32														X 64	X 69	X 69	X 67	X 66
15	X 68	69	75	X 37	X 32	X 35														A	X 66	X 67	58	A
16	X 37	56	55	48	42	41															X 61	X 51	X 54	56
17	X 44	X 43	X 40	41	40	41														X 74		X 66	X 60	X 54
18	55	X 41	X 45		42	38															A	X 66	X 58	X 48
19	58	59	56	X 44	X 35	X 31															X 58	X 60	X 50	56
20	54	53	X 44	45	X 38	X 39															X 58	X 48	X 46	X 44
21	X 42	X 42	X 39	42	36	36															A	X 64	X 57	X 52
22	X 50	X 47	X 44	X 44	45	41														X 66	78	A	A	46
23	X 44	48	43	X 36	42	X 36	X 50													X 65	X 58	A	57	59
24	59	X 48	X 48	44	49	38														X 62	X 57	X 47	X 43	X 46
25	X 46	X 46	X 45	44	X 34	X 34														X 58	X 60	X 58	X 54	58
26	53	53	A	44	X 44	X 48														A	X 72	X 70	A	X 65
27	61	X 58	67	X 39	X 34	37														X 55	X 52	X 48	48	A
28	X 45	X 44	X 44	A	A	X 31														X 72	X 65	X 47	A	A
29	43	A	A	A	X 30	X 36															A	X 67	62	A
30	48	50	48	40	X 35	X 34														X 50	X 50	X 48	A	X 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	27	26	24	26	29	22	1													10	23	24	24	23
MED	50	48	46	44	40	38	X 50													X 64	X 65	X 60	X 55	X 50
U Q	56	53	55	46	44	41														X 72	X 72	X 66	X 58	56
L Q	X 45	X 44	X 44	X 40	X 36	X 35														X 58	X 58	X 51	X 51	X 47

JUN. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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	A	42	F	F	F	F	41	71	60	A	A	A	A	57	68	79	79	78	84	87	94	A	F	F
2	44	A	41	41	37	42	A	50	47	A	A	A	A	A	80	77	78	74	68	68	A	A	F	F
3	50	A	F	48	30	30	A	A	A	50	A	A	49	50	53	63	70	69	61	A	56	45	F	42
4	F	F	36	32	F	28	A	54	59	A	A	A	A	A	63	73	77	69	A	A	F	46	41	A
5	F	F	A	F	F	F	41	54	56	A	A	A	56	56	62	72	78	81	A	A	61	56	52	44
6	F	F	A	F	30	F	46	46	54	57	56	A	A	A	56	70	77	77	62	62	59	51	46	44
7	42	38	F	32	31	30	43	A	A	A	50	50	58	66	69	78	84	83	77	72	69	72	48	41
8	F	F	F	F	F	F	47	55	A	A	A	A	A	52	53	61	63	72	77	77	69	53	F	A
9	A	38	A	F	34	34	48	50	A	A	A	A	A	A	53	57	66	71	72	71	64	54	A	A
10	F	F	F	F	F	36	A	A	47	A	A	A	A	A	A	A	66	76	A	76	A	A	48	46
11	F	F	32	F	F	24	40	58	64	56	54	A	A	A	A	61	74	90	90	A	A	58	53	38
12	F	F	F	F	F	F	42	A	A	A	A	A	A	A	52	A	A	65	61	A	62	68	A	F
13	A	A	A	A	F	A	42	A	A	A	A	52	54	60	57	49	52	A	A	82	81	A	41	F
14	F	F	F	F	F	26	38	55	55	A	A	A	A	A	A	A	A	74	A	58	63	63	61	60
15	62	F	F	31	26	29	41	48	A	A	58	A	A	A	A	A	A	A	A	A	60	61	F	A
16	31	F	F	F	F	F	A	58	57	A	A	A	A	58	A	56	65	76	A	50	55	45	48	F
17	38	37	34	F	F	F	42	49	49	54	59	A	A	A	A	A	70	70	73	68	A	60	54	48
18	F	35	38	31	F	F	43	46	55	61	A	52	A	A	A	71	82	66	54	A	A	60	52	42
19	F	F	F	38	29	25	31	48	A	A	A	A	A	A	A	A	52	51	49	50	52	54	44	F
20	F	F	38	F	32	33	43	44	A	48	A	A	A	A	53	A	54	54	A	A	52	42	40	38
21	36	36	33	F	F	F	38	49	A	A	A	55	A	A	58	59	A	A	A	A	A	58	51	46
22	44	41	38	38	F	F	45	55	54	A	A	A	57	A	72	A	A	A	66	60	F	A	A	F
23	38	F	F	30	F	30	44	56	56	55	56	50	A	56	64	68	71	71	65	59	52	A	F	F
24	F	42	42	F	F	F	A	A	A	A	A	A	A	A	A	A	49	A	61	56	51	40	37	40
25	40	40	39	F	28	28	42	45	48	A	55	55	51	50	55	54	60	55	53	51	54	52	48	F
26	F	F	A	F	38	42	39	A	A	A	A	A	A	A	A	A	A	A	A	A	66	64	A	59
27	F	52	F	33	28	F	45	A	A	A	A	48	46	52	46	53	58	64	59	49	46	42	F	A
28	39	38	38	A	A	25	39	A	A	53	A	67	A	A	49	A	57	60	62	66	59	41	A	A
29	F	A	A	A	24	30	42	48	A	A	A	A	A	A	A	53	55	56	A	65	A	61	F	A
30	F	F	F	F	25	28	42	A	A	A	51	49	52	55	53	51	51	48	A	44	44	42	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	11	11	11	10	13	17	24	20	14	8	8	9	8	11	19	19	24	24	18	20	21	24	16	14
MED	40	38	38	32	30	30	42	50	55	54	56	52	53	56	56	61	66	70	64	64	59	54	48	43
U Q	44	42	39	38	33	34	44	55	57	56	57	55	56	58	64	72	77	76	73	72	65	60	52	46
L Q	38	37	34	31	27	27	40	48	49	52	52	50	50	52	53	54	56	62	61	54	52	45	42	40

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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							UL 328	UL 376		A	A	A	A	A	A	428	408	UL 380	A	A				
2							A	A	A	A	A	A	A	A	432	424	420	384	L	A				
3							A	A	A	A	A	A	428	444	A	A	A	380	A	A				
4							A	A	A	A	A	A	A	A	A	424	A	A	A	A				
5									A	A	A	A	436	440	428	420	A	A	A	A				
6									404	412	UL 432	A	A	A	UL 432	A	408	A	UL 348	A				
7								A	A	A	436	452	440	436	436	424	392	384	356					
8								L	A	A	A	A	A	UL 440	UL 428	412	404	392	L					
9								A	A	A	A	A	A	A	444	424	A	A	L					
10							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
11							UL 348	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					
13								A	A	A	A	432	440	448	UL 448	428	408	A	A					
14							UL 356	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					
16							A		A	A	A	A	A	432	A	428	A	A	A					
17								380	408	A	UL 452	A	A	A	A	A	A	A	UL 344		A			
18								A	396	A	A	A	A	A	A	420	416	A	A	A				
19							A	A	A	A	A	A	A	A	A	A	A	396	352	A				
20								348	A	A	A	A	A	A	A	A	A	A	A	A				
21							A	A	A	A	A	UL 452	A	A	A	A	A	A	A	A				
22							L	392	A	A	A	A	A	A	A	A	A	A	L					
23								A	A	A	A	A	A	A	UL 444	444	408	396						
24							A	A	A	A	A	A	A	A	A	A	404	A	356					
25								L	400	A	A	428	448	436	436	436	412	UL 408	UL 352					
26								A	A	A	A	A	A	A	A	A	A	A	A					
27								A	A	A	A	432	432	440	UL 420	420	404	388	A					
28								A	A	UL 428	A	A	A	A	A	A	A	A	A					
29								L	A	A	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	436	436	436	A	A	A	A	396	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	4	4	2	4	6	7	8	10	13	11	10	6					
MED							UL 348	378	402	420	436	434	436	440	434	424	408	390	352					
U Q							UL 356	386	406		444	452	440	442	UL 444	428	412	396	356					
L Q							UL 328	362	398		434	432	432	436	UL 428	420	404	384	UL 348					

JUN. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	A	A	A	A	A	A	A	A	U A 356	A	U R 312	U A 272	A	B				
2						B	A	A	A	A	A	A	A	A	348	U R 328	U R 308	U R 268	A	B				
3						B	A	A	A	A	A	A	364	352	344	A	A	A	A	B				
4						B	A	A	A	A	A	A	A	A	U A 336	324	304	A	A	B				
5						B	U A 212	A	A	A	A	A	A	A	U A 380	U A 328	U A 296	A	A	B				
6						B	U A 192	A	A	A	A	A	A	A	U R 352	U A 340	A	A	A	B				
7						B	A	A	A	A	A	A	A	A	A	A	U R 316	U R 272	A	B				
8						B	B	A	A	A	A	A	A	A	A	U A 328	292	U A 272	A	B				
9						B	B	A	A	A	A	A	A	A	A	R	312	A	A	A				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
11						B	B	A	A	A	A	A	A	A	A	A	A	A	B	A				
12						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
13							B	A	A	A	A	A	A	U A 348	A	A	320	A	A					
14							A	A	A	A	A	A	A	A	A	A	A	A	B					
15							A	A	A	A	A	A	A	A	A	A	A	A	B					
16							B	A	A	A	A	A	A	A	A	A	A	A	A	B				
17							B	A	A	A	A	A	A	A	A	A	A	A	B		A			
18				A			B	A	A	A	A	A	A	A	A	U R 332	U A 304	A	B	B				
19							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
20							B	A	A	A	A	A	A	A	A	A	A	A	B	B				
21							A	U A 256	A	A	A	A	A	A	A	A	A	A	A	A				
22							A	A	A	A	A	A	A	A	A	A	A	A	A					
23								A	A	A	A	A	A	A	A	U A 336	U R 316	U A 268	A					
24							B	A	A	A	A	A	A	A	A	A	U R 320	A	B					
25							B	U A 252	A	A	A	A	A	A	A	A	A	U R 272	U A 228					
26							U A 192	A	A	A	A	A	A	A	A	A	A	A	A					
27							A	A	A	A	A	A	A	A	U A 340	U A 348	U A 300	A	A					
28							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	A				
30							B	A	A	A	A	A	A	A	A	A	A	A	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	2					1	2	7	8	12	6	1					
MED							U A 192	U A 254					364	350	U A 348	U A 330	U 310	U 272	U A 228					
U Q							U A 212								U A 356	U A 338	U R 316	U R 272						
L Q							U A 192								U A 340	U A 328	302	U 268						

JUN. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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 53	J A 88	J A 25	22	J A 24	J A 29	34	J A 58	J A 66	J A 58	J A 72	J A 63	J A 46	J A 48	38	G	33	J A 57	J A 56	J A 36	J A 68	J A 38	J A 36
2	J A 52	J A 53	J A 25	23	J A 28	J A 32	J A 52	J A 52	J A 49	J A 84	J A 119	J A 119	J A 105	J A 130	40	G	G	G	J A 30	J A 42	J A 81	J A 86	J A 86	J A 87
3	J A 52	J A 85	J A 53	J A 36	J A 31	J A 44	J A 154	J A 52	J A 77	J A 54	J A 86	J A 83	40	41	43	J A 54	J A 63	33	48	J A 58	J A 43	J A 45	J A 27	J A 42
4	J A 51	J A 27	J A 20	J A 33	J A 54	J A 34	J A 43	J A 46	J A 46	J A 50	J A 60	J A 51	J A 89	J A 81	48	44	J A 46	J A 49	J A 72	J A 108	J A 110	J A 77	J A 34	J A 86
5	J A 36	J A 48	J A 42	21	20	E B 16	G	J A 41	J A 87	J A 53	J A 85	J A 77	J A 44	J A 44	41	42	J A 72	J A 64	J A 74	J A 77	J A 73	21	E B 16	J A 56
6	J A 33	J A 85	J A 107	J A 54	J A 26	E B 16	28	J A 40	J A 46	J A 43	J A 53	J A 64	J A 63	J A 84	G	40	J A 48	J A 55	J A 35	J A 70	J A 42	J A 84	J A 54	J A 54
7	J A 88	J A 67	J A 82	J A 35	J A 29	J A 38	J A 37	J A 58	J A 62	J A 74	J A 55	J A 46	40	39	38	38	G	31	26	24	J A 29	24	J A 37	J A 43
8	J A 34	J A 47	J A 52	J A 62	J A 54	J A 53	28	32	J A 59	J A 65	J A 81	J A 110	J A 88	J A 52	J A 55	39	36	30	J A 34	J A 35	24	J A 25	J A 44	J A 50
9	J A 67	J A 52	J A 46	J A 34	J A 34	J A 34	J A 57	J A 52	J A 65	J A 121	J A 67	J A 95	J A 109	J A 76	J A 36	G	40	J A 48	J A 40	J A 53	J A 78	J A 78	J A 78	J A 66
10	J A 28	J A 32	23	23	J A 34	J A 37	J A 66	J A 85	J A 54	J A 88	J A 72	J A 58	J A 91	J A 58	J A 73	J A 131	J A 63	J A 66	J A 78	J A 64	J A 101	J A 88	J A 51	J A 32
11	J A 41	J A 30	J A 41	J A 33	J A 33	24	J A 33	J A 58	J A 51	J A 62	J A 59	J A 92	J A 83	J A 73	J A 63	J A 51	J A 54	J A 78	J A 106	J A 109	J A 54	J A 110	J A 76	J A 35
12	J A 64	26	J A 26	J A 26	23	J A 23	J A 36	J A 55	J A 154	J A 150	J A 118	J A 103	J A 113	J A 138	J A 72	J A 127	J A 58	J A 52	J A 51	J A 78	J A 51	J A 103	J A 85	J A 43
13	J A 86	J A 39	J A 43	J A 49	J A 44	J A 54	J A 44	J A 66	J A 123	J A 71	J A 78	J A 62	J A 50	40	40	40	42	J A 87	J A 162	J A 118	J A 150	J A 64	J A 56	J A 84
14	J A 60	J A 24	J A 28	20	J A 57	J A 110	J A 37	J A 42	J A 48	J A 65	J A 215	J A 146	J A 89	J A 82	J A 86	J A 72	J A 110	J A 65	J A 122	J A 78	J A 36	J A 28	J A 40	J A 51
15	J A 32	J A 33	J A 49	J A 55	J A 62	J A 48	J A 33	J A 50	J A 67	J A 88	J A 73	J A 110	J A 61	J A 79	J A 69	J A 111	J A 108	J A 138	J A 78	J A 89	J A 39	J A 38	J A 38	J A 51
16	J A 65	J A 85	J A 40	J A 63	E B 15	J A 35	J A 53	J A 55	J A 55	J A 64	J A 84	J A 80	J A 80	42	J A 73	J A 63	J A 51	J A 48	J A 72	J A 28	J A 30	J A 34	J A 61	J A 103
17	J A 52	J A 52	E B 16	J A 39	J A 56	J A 28	J A 33	J A 34	J A 44	J A 64	J A 51	J A 108	J A 121	J A 107	J A 136	J A 154	J A 66	J A 73	J A 52	J A 44	J A 72	J A 30	J A 32	J A 38
18	J A 84	J A 52	J A 53	J A 73	22	J A 26	J A 64	J A 41	38	J A 58	J A 70	J A 49	J A 105	J A 88	J A 73	G	35	J A 50	J A 51	J A 85	J A 88	J A 66	J A 39	J A 79
19	J A 40	J A 33	J A 52	J A 52	J A 36	J A 37	29	J A 60	J A 81	J A 154	J A 64	J A 54	J A 139	J A 94	J A 76	J A 124	J A 90	J A 40	J A 89	J A 54	J A 46	J A 53	J A 53	J A 32
20	J A 34	J A 34	J A 24	J A 24	21	J A 22	J A 32	J A 34	J A 114	J A 84	J A 132	J A 146	J A 130	J A 152	J A 50	J A 83	J A 56	J A 55	J A 60	J A 75	J A 44	J A 34	J A 28	J A 37
21	J A 48	J A 48	J A 31	J A 26	J A 26	J A 52	J A 53	J A 48	J A 90	J A 87	J A 84	J A 45	J A 57	J A 67	J A 56	J A 57	J A 89	J A 138	J A 113	J A 126	J A 112	J A 42	J A 30	26
22	21	22	22	21	E B 16	E B 16	J A 34	J A 41	J A 53	J A 86	J A 82	J A 110	J A 72	J A 109	J A 53	J A 164	J A 159	J A 156	J A 30	J A 47	J A 124	J A 123	J A 56	J A 47
23	J A 44	J A 26	J A 50	J A 42	J A 45	J A 51	J A 98	J A 54	J A 53	J A 66	J A 62	J A 52	J A 60	J A 46	40	40	G	35	J A 49	40	J A 44	J A 54	J A 56	J A 44
24	J A 42	J A 73	J A 54	J A 80	J A 71	J A 29	J A 75	J A 83	J A 101	J A 154	J A 125	J A 75	J A 95	J A 48	J A 55	J A 90	G	J A 72	J A 31	J A 29	E B 16	J A 22	22	22
25	20	20	J A 53	19	J A 25	J A 24	J A 23	29	J A 39	J A 58	J A 50	J A 40	J A 45	43	J A 45	J A 50	J A 40	G	27	J A 31	J A 31	J A 36	J A 52	J A 52
26	J A 52	J A 32	J A 65	J A 34	J A 24	E B 16	28	J A 54	J A 85	J A 111	J A 80	J A 156	J A 86	J A 92	J A 109	J A 85	J A 152	J A 113	J A 118	J A 73	J A 55	J A 43	J A 78	J A 32
27	J A 32	J A 43	J A 40	J A 23	J A 34	J A 41	J A 45	J A 117	J A 116	J A 156	J A 155	J A 78	37	38	40	38	35	35	J A 39	J A 35	J A 28	J A 36	J A 84	J A 53
28	J A 78	J A 85	J A 53	J A 42	J A 47	J A 29	J A 38	J A 51	J A 84	J A 99	J A 94	J A 155	J A 73	J A 90	J A 108	J A 92	J A 72	J A 50	J A 55	28	J A 54	J A 39	J A 106	J A 66
29	J A 66	J A 47	J A 33	J A 78	J A 51	J A 33	26	J A 64	J A 80	J A 157	J A 82	J A 83	J A 56	J A 77	J A 150	J A 78	J A 78	J A 79	J A 89	J A 156	J A 80	J A 86	J A 58	J A 87
30	J A 44	J A 42	J A 34	J A 41	J A 33	J A 46	J A 40	J A 72	J A 91	J A 89	J A 48	J A 47	J A 100	J A 56	J A 65	J A 55	J A 53	J A 44	J A 56	J A 54	J A 42	J A 29	J A 86	J A 50
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 50	J A 45	J A 42	J A 34	J A 33	J A 34	J A 37	J A 52	J A 64	J A 79	J A 79	J A 79	J A 82	J A 74	J A 55	J A 54	J A 54	J A 51	J A 56	J A 57	J A 48	J A 44	J A 52	J A 50
U Q	J A 64	J A 53	J A 53	J A 52	J A 47	J A 44	J A 53	J A 58	J A 87	J A 99	J A 86	J A 110	J A 100	J A 90	J A 73	J A 90	J A 72	J A 73	J A 78	J A 78	J A 80	J A 78	J A 76	J A 66
L Q	J A 34	J A 32	J A 28	24	24	24	29	J A 41	J A 51	J A 64	J A 60	J A 54	J A 57	46	41	40	G 36	35	J A 39	J A 40	J A 36	J A 34	J A 37	J A 37

JUN. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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	A A 53	35	28	E B 16	E B 16	E B 16	25	30	40	A A 66	A A 58	A A 72	A A 63	42	41	36	G	30	40	40	27	A A 68	26	28
2	30	A A 53	20	E B 15	19	26	A A 52	42	39	A A 84	A A 119	A A 119	A A 105	A A 130	39	G	G	G	26	28	A A 81	A A 86	26	18
3	37	A A 85	24	15	18	18	A A 154	A A 52	A A 77	44	A A 86	A A 83	40	39	42	44	54	31	44	A A 58	38	32	20	34
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	A A 43	35	33	A A 50	A A 60	A A 51	A A 89	A A 81	46	39	38	44	A A 72	A A 108	23	26	20	A A 86
5	20	21	A A 42	E B 16	E B 16	E B 16	G	36	40	A A 53	A A 85	A A 77	40	38	39	39	67	55	A A 74	A A 77	33	E B 16	E B 16	18
6	E B 16	27	A A 107	19	E B 16	E B 16	24	32	36	36	40	A A 64	A A 63	A A 84	G	39	34	42	28	45	28	E B 16	E B 16	21
7	18	E B 16	19	E B 16	E B 16	E B 16	27	A A 58	A A 62	A A 74	36	38	38	37	37	35	G	29	24	18	22	E B 16	30	23
8	26	E B 16	30	18	19	E B 16	23	28	A A 59	A A 65	A A 81	A A 110	A A 88	40	39	37	33	29	28	28	E B 15	E B 15	36	A A 50
9	A A 67	34	A A 46	21	24	24	36	43	A A 65	A A 121	A A 67	A A 95	A A 109	A A 76	36	G	39	43	27	34	34	21	A A 78	A A 66
10	19	16	E B 15	E B 16	18	17	A A 66	A A 85	44	A A 88	A A 72	A A 58	A A 91	A A 58	A A 73	A A 131	58	58	A A 78	58	A A 101	A A 88	E B 16	E B 16
11	23	E B 16	20	18	19	17	25	50	40	43	46	A A 92	A A 83	A A 73	A A 63	45	45	68	72	A A 109	A A 54	20	18	18
12	20	E B 16	20	E B 16	E B 16	E B 16	28	A A 55	A A 154	A A 150	A A 118	A A 103	A A 113	A A 138	50	A A 127	A A 58	48	38	A A 78	33	34	A A 85	18
13	A A 86	A A 39	A A 43	A A 49	17	A A 54	24	A A 66	A A 123	A A 71	A A 78	35	39	39	37	38	38	A A 87	A A 162	46	47	A A 64	25	22
14	28	16	E B 16	E B 16	16	19	28	36	40	A A 65	A A 215	A A 146	A A 89	A A 82	A A 86	A A 72	A A 110	58	A A 122	44	29	18	18	21
15	E B 16	20	41	23	21	E B 16	24	41	A A 67	A A 88	51	A A 110	A A 61	A A 79	A A 69	A A 111	A A 108	A A 138	A A 78	A A 89	25	20	22	A A 51
16	20	23	E B 16	E B 16	E B 15	E B 16	A A 53	47	46	A A 64	A A 84	A A 80	A A 80	39	A A 73	34	38	41	A A 72	20	20	20	22	22
17	22	21	E B 16	E B 16	E B 16	18	25	30	35	43	39	A A 108	A A 121	A A 107	A A 136	A A 154	57	50	28	28	A A 72	19	20	E B 16
18	28	20	20	22	E B 16	E B 16	30	35	35	44	A A 70	44	A A 105	A A 88	A A 73	G	33	40	42	A A 85	A A 88	42	E B 16	22
19	28	21	20	23	23	22	25	43	A A 81	A A 154	A A 64	A A 54	A A 139	A A 94	A A 76	A A 124	46	33	29	30	24	30	29	25
20	23	20	E B 16	E B 16	E B 16	18	21	27	A A 114	42	A A 132	A A 146	A A 130	A A 152	42	A A 83	47	45	A A 60	A A 75	41	25	22	E B 15
21	22	E B 16	E B 16	18	E B 16	20	30	41	A A 90	A A 87	A A 84	41	A A 57	A A 67	48	44	A A 89	A A 138	A A 113	A A 126	A A 112	32	23	19
22	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	24	32	37	A A 86	A A 82	A A 110	52	A A 109	46	A A 164	A A 159	A A 156	26	39	36	A A 123	A A 56	20
23	22	E B 16	17	E B 16	E B 16	22	36	39	43	47	54	45	A A 60	42	37	37	G	30	41	36	25	A A 54	23	19
24	21	21	28	18	E B 16	20	A A 75	A A 83	A A 101	A A 154	A A 125	75	A A 95	A A 48	A A 55	A A 90	G	A A 72	24	24	E B 16	E B 16	16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	34	A A 58	43	36	36	36	36	40	34	G	24	20	E B 15	21	38	24
26	24	18	A A 65	19	E B 16	E B 16	26	A A 54	A A 85	A A 111	A A 80	A A 156	A A 86	A A 92	A A 109	A A 85	A A 152	A A 113	A A 118	A A 73	49	36	A A 78	24
27	23	23	21	22	18	E B 16	31	A A 117	A A 116	A A 156	A A 155	39	34	34	38	37	33	33	33	25	21	22	18	A A 53
28	26	19	17	A A 42	A A 47	17	26	A A 51	A A 84	35	A A 94	59	A A 73	A A 90	46	A A 92	44	44	33	22	28	22	A A 106	A A 66
29	20	A A 47	A A 33	A A 78	E B 17	E B 16	24	26	A A 80	A A 157	A A 82	A A 83	A A 56	A A 77	A A 150	41	41	51	A A 89	29	A A 80	25	19	A A 87
30	25	34	18	22	22	22	30	A A 72	A A 91	A A 89	40	37	37	43	43	41	40	32	A A 56	28	24	E B 16	A A 86	24
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	22	20	20	17	E B 16	16	26	42	A A 60	A A 68	A A 79	A A 76	A A 76	A A 74	46	41	40	44	42	40	31	24	22	22
U Q	28	27	A A 30	22	19	20	A A 36	A A 54	A A 85	A A 89	A A 86	A A 108	A A 95	A A 90	A A 73	A A 90	A A 58	A A 58	A A 74	A A 75	A A 49	A A 36	A A 36	A A 34
L Q	E B 20	E B 16	E B 16	E B 16	E B 16	E B 16	24	32	40	47	54	45	52	40	39	37	G 33	32	28	28	24	E B 19	18	18

JUN. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUN. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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	A	314	F	F	F	F	304	372	407	A	A	A	A	276	279	296	298	279	306	327	386	A	F	F
2	302	A	300	302	304	334	A	340	346	A	A	A	A	A	318	299	307	326	296	315	A	A	F	F
3	294	A	F	314	328	323	A	A	A	321	A	A	242	285	268	323	328	330	333	A	324	341	F	295
4	F	F	318	290	F	310	A	343	377	A	A	A	A	A	305	300	324	308	A	A	F	311	308	A
5	F	F	A	F	F	F	364	369	376	A	A	A	327	308	313	295	322	327	A	A	316	332	315	313
6	F	F	A	F	327	F	378	363	361	366	352	A	A	A	283	305	314	332	330	333	342	331	318	314
7	313	298	F	305	313	347	362	A	A	A	298	249	283	297	288	291	309	319	304	325	293	342	344	301
8	F	F	F	F	F	F	359	359	A	A	A	A	A	324	281	306	310	306	319	333	348	349	F	A
9	A	340	A	F	294	358	385	287	A	A	A	A	A	A	275	298	312	318	333	331	332	342	A	A
10	F	F	F	F	F	389	A	A	357	A	A	A	A	A	A	A	309	310	A	355	A	A	335	310
11	F	F	336	F	F	336	324	353	380	367	360	A	A	A	A	297	294	319	326	A	A	331	345	375
12	F	F	F	F	F	F	352	A	A	A	A	A	A	A	291	A	A	324	329	A	336	336	A	F
13	A	A	A	A	F	A	327	A	A	A	A	287	307	335	328	279	297	A	A	321	349	A	308	F
14	F	F	F	F	F	342	311	370	373	A	A	A	A	A	A	A	A	323	A	310	315	307	320	306
15	303	F	F	312	327	315	339	349	A	A	357	A	A	A	A	A	A	A	A	A	324	343	F	A
16	335	F	F	F	F	F	A	375	375	A	A	A	A	315	A	282	314	343	A	333	345	327	309	F
17	349	346	321	F	F	F	352	339	360	305	354	A	A	A	A	A	301	308	334	322	A	319	370	325
18	F	314	321	333	F	F	371	330	373	386	A	321	A	A	A	284	334	342	333	A	A	334	336	291
19	F	F	F	367	333	309	330	335	A	A	A	A	A	A	A	A	321	318	316	311	318	333	293	F
20	F	F	310	F	313	357	379	298	A	330	A	A	A	A	304	A	303	299	A	A	312	341	318	288
21	308	312	321	F	F	F	371	347	A	A	A	289	A	A	326	328	A	A	A	A	A	327	330	314
22	299	311	315	289	F	F	345	350	337	A	A	A	319	A	299	A	A	A	320	301	F	A	A	F
23	306	F		305	F	350	337	353	353	316	296	315	A	283	293	307	319	340	345	351	296	A	F	F
24	F	300	307	F	F	F	A	A	A	A	A	A	A	A	A	A	288	A	329	353	352	307	297	300
25	300	301	297	F	379	373	344	378	309	A	316	357	289	277	310	302	320	314	327	338	316	325	306	F
26	F	F	A	F	329	357	338	A	A	A	A	A	A	A	A	A	A	A	A	A	301	294	A	296
27	F	336	F	312	313	F	348	A	A	A	A	279	255	251	258	294	308	323	336	356	334	312	F	A
28	300	303	333	A	A	355	356	A	A	314	A	365	A	A	284	A	297	314	332	347	358	343	A	A
29	F	A	A	A	342	326	373	361	A	A	A	A	A	A	A	333	302	308	A	302	A	324	F	A
30	F	F	F	F	394	377	368	A	A	A	341	309	318	316	330	317	323	289	A	308	315	312	A	294
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	11	11	10	13	17	24	20	14	8	8	9	8	11	19	19	24	24	18	20	21	24	16	14
MED	303	312	318	308	327	347	352	352	367	326	346	309	298	297	293	299	310	318	329	329	324	331	318	304
U Q	313	336	321	314	338	358	370	366	376	366	356	339	318	316	313	307	320	326	333	342	346	341	336	314
L Q	300	301	307	302	313	324	338	340	353	315	307	283	269	277	281	294	302	308	319	313	315	316	308	295

JUN. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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							UL 369	UL 392		A	A	A	A	A	A	403	388	UL 375	A	A				
2							A	A	A	A	A	A	A	A	398	408	394	386	L	A				
3							A	A	A	A	A	A	416	401	A	A	A	383	A	A				
4							A	A	A	A	A	A	A	A	A	356	A	A	A	A				
5									A	A	A	A	431	427	432	382	A	A	A	A				
6									390	441	UL 418	A	A	A	UL 420	A	391	A	UL 389	A				
7								A	A	A	434	420	413	417	418	393	394	393	371					
8								L	A	A	A	A	A	UL 437	UL 419	326	385	376	L					
9								A	A	A	A	A	A	A	417	410	A	A	L					
10							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
11							UL 363	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					
13								A	A	A	A	442	416	411	UL 435	390	357	A	A					
14							UL 367	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					
16							A		A	A	A	A	A	438	A	434	A	A	A					
17								379	414	A	UL 433	A	A	A	A	A	A	A	UL 403		A			
18								A	414	A	A	A	A	A	A	389	400	A	A	A				
19							A	A	A	A	A	A	A	A	A	A	A	394	392	A				
20								429	A	A	A	A	A	A	A	A	A	A	A	A				
21							A	A	A	A	A	UL 417	A	A	A	A	A	A	A	A				
22							L	397	A	A	A	A	A	A	A	A	A	A	L					
23								A	A	A	A	A	A	A	UL 419	397	417	394						
24							A	A	A	A	A	A	A	A	A	A	384	A	366					
25								L	404	A	A	442	426	439	400	376	407	UL 363	UL 378					
26								A	A	A	A	A	A	A	A	A	A	A	A					
27								A	A	A	A	425	439	432	UL 421	389	404	389	A					
28								A	A	UL 380	A	A	A	A	A	A	A	A	A					
29								L	A	A	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	406	452	453	A	A	A	A	390	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	4	4	2	4	6	7	8	10	13	11	10	6					
MED							UL 367	394	409	410	426	434	426	430	419	390	394	388	384					
U Q							UL 369	413	414		434	442	439	438	UL 421	406	404	393	392					
L Q							UL 363	386	397		412	420	416	414	417	379	385	UL 376	371					

JUN. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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							352	234		A	A	A	A	400	350	314	304	324	284	E A 244				
2							A	E A 282	E A 282	A	A	A	A	A	292	304	292	266	290	258				
3							A	A	A	E A 308	A	A	538	420	422	314	E A 302	264	264	A				
4							A	262	222	A	A	A	A	A	324	310	278	278	A	A				
5									246	A	A	A	324	354	326	310	E A 324	266	A	A				
6									266	266	288	A	A	A	394	316	286	258	256	E A 268				
7								A	A	A	378	518	384	334	334	326	284	268	272					
8								254	A	A	A	A	A	324	414	330	308	308	258					
9								E A 348	A	A	A	A	A	A	426	352	298	274	256					
10							A	A	E A 284	A	A	A	A	A	A	A	E A 348	E A 292	A	E A 238				
11							318	E A 258	226	252	E A 258	A	A	A	A	348	322	E A 300	E A 258	A				
12								A	A	A	A	A	A	A	E A 400	A	A	E A 280	262					
13								A	A	A	A	386	360	306	286	438	362	A	A					
14							348	246	246	A	A	A	A	A	A	A	A	E A 272	A					
15								E A 266	A	A	E A 274	A	A	A	A	A	A	A	A					
16							A		258	A	A	A	A	328	A	378	306	268	A					
17								288	272	332	276	A	A	A	A	A	E A 324	E A 308	256		A			
18								296	248	242	A	320	A	A	A	342	262	254	E A 272	A				
19							244	E A 296	A	A	A	A	A	A	A	A	E A 332	338	336	E A 296				
20								392	A	336	A	A	A	A	360	A	372	370	A	A				
21							E A 244	E A 272	A	A	A	394	A	A	E A 310	294	A	A	A	A				
22							278	278	272	A	A	A	E A 330	A	298	A	A	A	262					
23								262	262	E A 346	E A 416	E A 362	A	402	362	316	278	258						
24							A	A	A	A	A	A	A	A	A	A	378	A	270					
25								260	352	A	330	284	416	426	340	370	308	306	278					
26								A	A	A	A	A	A	A	A	A	A	A	A					
27								A	A	A	A	432	492	534	508	370	338	274	250					
28								A	A	310	A	278	A	A	E A 436	A	330	290	278					
29								278	A	A	A	A	A	A	A	320	334	E A 352	A					
30							224		A	A	A	314	416	358	318	306	328	328	376	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	17	13	8	8	9	8	11	19	19	24	24	17	5				
MED							278	267	255	U 298	292	386	372	354	342	326	309	274	263	E A 258				
U Q							348	292	277	334	354	424	454	420	414	352	333	308	278	E A 282				
L Q							244	259	246	259	E A 275	302	344	324	310	314	295	267	257	E A 241				

JUN. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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	A	E A 324	E A 274	214	E B 278	E B 272	222	218	206		A	A	A	A	A	206	206	204		A	A		E A 314	E A 334
2	E A 332	A	E A 270	E B 240	E A 272	E A 242	A	A	A	A	A	A	A	A	E A 240	210	198	194	230	A	A	A	E A 306	E A 268
3	E A 318	A	E A 250	234	234	236	A	A	A	A	A	A	214	214	A	A	A	206	A	A	E A 252	E A 248	E A 298	E A 316
4	220	220	E B 238	E B 246	E B 272	E B 250	A	A	A	A	A	A	A	A	A	E A 274	A	A	A	A	E A 242	E A 270	E A 250	A
5	E A 250	E A 280	A	214	E B 226	210	210	E A 238	A	A	A	A	192	186	200	E A 256	A	A	A	A	E A 242	214	214	E A 270
6	E B 308	E A 288	A	E A 280	E B 268	230	208	230	224	188	192	A	A	A	184	A	190	A	188	A	224	208	230	230
7	E A 248	E B 256	E A 256	E B 244	E B 244	208	234	A	A	A	188	188	194	194	194	194	192	198	198	236	222	210	200	E A 260
8	E A 296	E B 254	E A 248	E A 266	E A 266	222	212	208	A	A	A	A	A	196	202	E A 310	212	198	212	234	196	196	E A 330	A
9	A	E A 302	A	E A 282	E A 328	E A 246	212	A	A	A	A	A	A	A	200	186	A	A	220	234	230	208	A	A
10	E A 268	E A 252	E B 238	222	E A 246	206	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	212	234
11	E A 252	192	E A 242	E A 288	E A 294	E A 254	216	A	A	A	A	A	A	A	A	A	A	A	A	A	A	216	208	208
12	E A 286	E B 286	E A 274	E B 262	230	206	204	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 236	226	A	E A 266
13	A	A	A	A	E A 248	A	E A 246	A	A	A	A	190	198	198	192	E A 238	E A 296	A	A	E A 248	228	A	E A 308	E A 266
14	E A 266	E B 268	E B 268	E B 254	E B 254	E A 268	214	A	A	A	A	A	A	A	A	A	A	A	A	E A 280	E A 254	222	222	E A 242
15	232	E A 244	212	E A 274	E A 274	E B 250	222	A	A	A	A	A	A	A	A	A	A	A	A	A	232	222	E A 242	A
16	E A 252	234	234	E B 246	E B 254	E B 268	A	222	A	A	A	A	A	212	A	196	A	A	A	206	210	210	218	218
17	218	220	222	E B 256	E B 242	E A 242	230	218	206	A	186	A	A	A	A	A	A	A	216	224	A	224	216	216
18	E A 272	E A 238	E A 264	280	E B 280	E B 242	212	A	202	A	A	A	A	A	A	200	192	A	A	A	A	E A 260	210	E A 286
19	E A 324	E A 294	206	206	E A 282	E A 300	A	A	A	A	A	A	A	A	A	A	A	216	212	A	E A 250	E A 240	E A 270	E A 266
20	E A 268	E A 266	E B 256	E B 256	E B 246	E B 236	208	200	A	A	A	A	A	A	A	A	A	A	A	A	E A 276	214	E A 254	E B 270
21	E A 262	E B 250	E B 250	216	206	E A 246	A	A	A	A	A	210	A	A	A	A	A	A	A	A	A	E A 232	208	214
22	220	E B 252	E B 252	E B 266	E B 266	E B 246	196	204	A	A	A	A	A	A	A	A	A	A	204	E A 286	E A 238	A	A	E A 308
23	E A 296	230	E B 264	E B 268	E B 240	E A 240	E A 284	A	A	A	A	A	A	A	176	196	186	196	E A 238	228	E A 248	A	E A 300	E A 278
24	232	E A 300	E A 300	232	232	E A 254	A	A	A	A	A	A	A	A	A	A	198	A	218	218	202	230	E B 282	E B 274
25	E B 274	E B 274	E B 256	230	196	196	210	192	196	A	A	196	188	180	186	E A 234	206	196	192	222	222	224	E A 310	E A 282
26	E A 312	E A 240	A	E A 280	226	202	202	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 300	E A 286	A	E A 256
27	E A 292	E A 244	210	E A 252	E A 252	E B 252	252	A	A	A	A	210	200	190	198	200	200	218	A	218	216	E A 242	E A 282	A
28	E A 306	E A 260	214	A	A	224	212	A	A	212	A	A	A	A	A	A	A	A	A	220	212	218	A	A
29	218	A	A	A	E B 250	E B 238	206	206	A	A	A	A	A	A	A	A	A	A	A	E A 234	A	222	222	A
30	E A 270	E A 302	E A 250	250	E A 250	E A 238	A	A	A	A	210	186	180	A	A	A	A	208	A	208	E A 250	214	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	27	26	24	27	29	29	21	10	5	2	4	6	7	8	10	13	11	10	11	15	23	24	24	23
MED	E A 268	E A 255	E 250	E 252	E 250	E 242	212	210	206	200	190	193	194	195	194	200	198	201	212	223	U 214	217	E 246	E A 266
U Q	E A 296	E A 286	E A 264	E A 268	E A 272	E 251	226	222	215		201	210	200	205	200	E A 247	206	208	220	E A 236	E A 250	E A 236	E A 299	E A 282
L Q	248	240	236	232	237	223	208	204	199		187	188	188	188	186	196	192	196	198	218	216	214	215	234

JUN. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUN. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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	90	90	90	90	90	90	122	110	94	94	94	94	100	110	118	118	G	118	106	100	100	100	100	94
2	88	90	90	90	90	108	108	100	100	94	90	90	90	90	142	G	G	G	102	102	98	98	98	98
3	98	98	98	98	98	114	102	102	92	92	88	88	154	138	138	130	86	114	98	98	98	98	98	98
4	98	98	98	98	88	90	104	104	104	104	102	98	92	92	130	136	124	114	104	98	106	106	102	96
5	96	96	96	96	96	B	G	102	102	102	96	96	98	100	134	130	110	100	100	100	100	90	B	90
6	90	92	92	92	92	B	128	124	116	96	96	96	96	96	G	140	106	102	102	102	102	102	102	98
7	90	92	92	92	92	92	104	104	102	96	96	110	118	118	118	118	G	124	118	84	84	84	90	90
8	90	90	86	86	86	96	130	124	100	100	92	92	92	100	100	162	112	110	100	100	94	94	94	94
9	90	90	86	86	86	86	102	102	96	96	96	96	88	88	92	G	142	102	102	98	98	98	86	86
10	94	94	104	100	92	92	104	102	94	94	86	86	86	90	90	82	86	86	80	80	98	106	112	112
11	86	102	102	96	96	90	102	102	102	102	98	94	94	94	96	90	90	90	90	90	90	90	90	90
12	90	90	90	90	90	90	114	100	96	96	92	92	84	84	90	90	90	90	90	90	90	90	90	92
13	88	88	88	88	88	88	94	94	94	94	94	94	94	114	114	114	150	104	96	96	96	96	96	96
14	96	112	98	88	88	88	92	92	92	86	86	90	90	90	90	92	80	86	86	86	86	86	86	90
15	102	102	102	102	98	98	106	106	106	100	100	94	94	94	94	86	86	86	86	86	86	86	98	98
16	98	98	98	98	B	98	98	100	100	100	94	92	92	114	96	96	96	88	94	94	94	94	94	94
17	94	94	B	94	94	94	94	94	94	94	94	94	94	92	92	92	88	88	88	88	88	88	88	88
18	88	88	92	92	92	92	92	112	118	96	96	96	90	90	90	G	110	102	96	92	92	92	92	92
19	92	88	88	88	88	98	132	100	100	100	100	100	100	100	100	100	96	96	96	90	90	84	84	84
20	88	88	88	84	84	100	104	104	100	100	86	86	90	84	84	84	84	84	84	84	84	84	84	84
21	90	90	86	86	100	104	104	110	92	92	92	92	90	90	90	96	96	86	84	84	82	82	82	82
22	80	80	80	80	B	B	110	110	96	92	92	92	92	90	96	92	92	92	114	108	98	94	94	94
23	94	94	94	94	94	94	94	98	98	98	98	94	94	94	94	120	G	120	96	96	96	96	96	96
24	96	90	80	90	104	104	104	100	98	98	98	96	96	96	96	96	G	96	96	92	B	92	92	92
25	92	92	92	92	92	92	92	114	92	90	90	90	92	106	98	98	98	G	118	92	92	92	92	92
26	92	92	92	92	92	B	122	100	98	98	98	94	94	126	102	102	94	94	94	94	94	94	94	94
27	94	86	86	86	108	108	108	96	96	92	92	92	92	94	148	138	124	114	100	100	98	98	100	94
28	94	94	94	94	94	94	108	106	100	98	94	94	92	92	92	92	92	86	86	86	92	92	92	92
29	92	92	92	92	112	98	108	108	92	92	92	92	98	98	92	96	96	96	96	90	90	90	90	90
30	84	84	90	90	90	90	104	104	104	94	94	94	94	92	92	92	92	92	90	90	90	90	98	98
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	30	28	26	29	30	30	30	30	30	30	30	29	27	25	28	30	30	29	30	29	30
MED	92	92	92	92	92	94	104	102	98	96	94	94	93	94	96	96	96	96	96	92	94	92	94	93
U Q	94	94	97	94	96	98	109	108	102	100	96	96	96	100	116	120	110	107	102	98	98	98	98	96
L Q	90	90	88	88	89	90	100	100	94	94	92	92	90	90	92	92	89	88	90	88	90	90	90	90

JUN. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2018 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	F9	F5	F5	F2	L2	C4	C3	L3	L5	L3	L3	L4	C2	C2	C1		C2	L6	L8	F8	F9	F5	F9
2	F9	F9	F5	F2	F6	L8	L5	L4	L4	L5	L7	L5	L5	L5	H1				L2	L5	F8	F7	F5	F5
3	F8	F6	F6	F7	F7	C2	L4	L4	L4	L4	L4	L4	H1	H1	H2	CL22	L5	CL22	L6	L7	F8	F8	F8	F8
4	F3	F6	F1	F6	F4	L2	L6	L4	L3	L4	L3	L3	L4	L3	H2	H2	C2	C2	L8	L8	F5	F5	F5	F5
5	F9	F7	F7	F1	F1			L2	L4	L4	L5	L3	L2	L2	H1	H1	C5	L5	L6	L8	F5	F1		F3
6	F5	F6	F4	F3	F2		CL32	CL32	C3	L2	L2	L3	L3	L2		H2	L2	L4	L4	L4	F7	F3	F2	F5
7	F6	F4	F5	F6	F2	L3	L3	L6	L4	L4	L2	C1	CL22	C1	C1	C1		C1	C4	L1	F6	F1	F5	F5
8	F8	F2	F6	F4	F4	L1	C1	C2	L6	L5	L5	L5	L6	L3	L3	HL11	CL12	C2	L2	L2	F2	F3	F5	F9
9	F8	F5	F6	F7	F5	L4	L6	L5	L5	L5	L5	L4	L8	L4	L2		H1	L3	L6	L4	F6	F5	F7	F9
10	F4	F3	F2	F2	F6	L7	L8	L8	L7	L5	L4	L4	L6	L4	L6	L8	L6	L6	L6	L7	FF69	FF69	FF25	FF12
11	F6	F2	F2	F4	F3	F1	L3	L5	L5	L4	L3	L6	L3	L4	L4	L4	L4	L9	L5	L7	F5	F5	F6	F4
12	F6	F2	F7	F2	F2	L2	C5	L7	L6	L7	L5	L7	L7	L5	L3	L6	L6	L6	L6	F5	F7	F7	F5	F6
13	F4	F5	F4	F5	F3	F7	L5	L5	L6	L3	L4	L3	L2	C2	C2	C1	H1	L4	L8	F6	F6	F9	F7	F9
14	F5	F2	F2	F2	F5	F8	L7	L3	L4	L5	L5	L6	L4	L4	L5	L5	L8	L8	L7	F8	F6	F4	F3	F3
15	F6	F7	F4	F4	F4	F2	L2	L6	L5	L4	L4	L4	L3	L3	L4	L8	L8	L9	L5	F6	F4	F5	F8	F8
16	F4	F6	F6	F6		F2	L7	L4	L6	L4	L6	L3	L3	C1	L4	L2	L3	L4	L4	L2	F3	F3	F4	F3
17	F3	F4		F4	F4	F3	L6	L2	L2	L3	L2	L5	L4	L6	L4	L4	L5	L4	L5	F4	F8	F4	F4	F4
18	F4	F4	F7	F7	F2	F4	L6	C3	C3	L4	L4	L2	L4	L4	L3		C2	L6	L7	L8	F9	F8	F3	F4
19	F6	F4	F4	F6	F6	F2	C2	L6	L5	L4	L3	L3	L3	L3	L3	L3	L3	L4	L4	F6	F6	F9	F7	F8
20	F5	F3	F2	F2	F1	F3	F2	L3	L4	L3	L6	L4	L3	L6	L3	L5	L3	L5	L7	L6	F9	F9	F6	F5
21	F3	F2	F2	F5	F2	F4	L3	C5	L5	L6	L4	L2	L2	L3	L4	L3	L4	L9	L8	L8	F9	F9	F7	F4
22	F4	F4	F2	F2			L2	C3	L5	L5	L4	L6	L4	L6	L2	L7	L6	L4	C2	F7	F7	F4	F6	F8
23	F6	F2	F6	F3	F3	F5	F5	L4	L4	L4	L3	L3	L3	L2	L1	C1		C2	L3	F6	F3	F3	F5	F4
24	F6	F2	F5	F4	F3	F4	L6	L8	L8	L4	L4	L3	L3	L3	L3	L3		L3	L3	F2		F2	F1	F2
25	F1	F2	F2	F2	F2	F4	L2	C1	L3	L4	L2	L2	L2	C1	L2	L2	L2		C2	F3	F4	F4	F8	F8
26	F9	F5	F7	F5	F3		C2	L5	L7	L5	L5	L5	L3	CL22	L4	L6	L6	L7	L6	F6	F7	F4	F5	F6
27	F6	F6	F3	F4	F3	F3	L6	L8	L7	L7	L4	L3	L2	L2	H1	H1	C1	C2	L5	F5	F5	F2	F2	F7
28	F4	F5	F3	F7	F4	F3	L2	L5	L5	L4	L3	L3	L4	L3	L3	L6	L5	L5	L4	F3	F3	F2	F5	F8
29	F3	F3	F3	F6	F2	F2	C1	L2	L6	L4	L4	L4	L2	L3	L7	L3	L2	L4	L7	L6	F5	F4	F4	F5
30	F3	F2	F2	F2	F2	F2	L5	L7	L5	L4	L2	L2	L2	L2	L3	L3	L3	L3	L4	F4	F6	F2	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. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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	53	53	49	X 40	A	X 32															X 89	X 46	48	X 44
2	X 44	X 45	45	44	44	40															X 92	X 69	X 56	59
3	58	X 61	X 59	X 54	50																X 65	X 57	X 49	49
4	56	A	X 39	X 37	A	35															X 51	X 45	A	49
5	X 38	48	X 47	A	X 34																X 76	X 69	58	X 56
6	56	58	49	X 43	47	42															X 69	X 58	59	56
7	54	X 43	48	42	40																X 91	X 76	X 54	X 48
8	48	57	48	48	45	49															X 87	X 64	X 56	X 50
9	X 48	X 47	X 45	X 44	40																X 77	X 60	X 52	X 49
10	X 48	X 50	X 47	48	X 39	39															X 66	X 56	X 52	X 50
11	52	54	46	A	X 37																X 88	X 84	X 55	X 39
12	44	44	44	38	39	31															X 78	X 90	49	55
13	48	53	54	49	X 39																X 83	X 53	50	51
14	X 48	X 45	48	48	42	36															X 68	X 65	X 68	X 66
15	65	64	X 50	X 45	X 39	X 36															X 70	X 73	X 46	52
16	59	58	58	54	55	38	56														X 58	X 56	X 50	X 38
17	44	X 44	52	X 39	38	38															X 75	X 74	X 57	X 49
18	X 44	X 39	48	45	44	36															X 68	X 65	X 59	X 57
19	X 50	58	58	49	X 38																X 65	X 60	X 54	X 47
20	58	55	X 52	48	X 39																X 54		X 44	X 44
21	X 44	X 42	X 41	X 39	X 31																X 58	X 58	58	56
22	58	54	49	48	46	42															X 66	X 54	49	A
23	54	58	A	52	44	36															X 59	X 56	X 58	X 55
24	X 56	48	46	X 45	A	A															X 56	X 47	X 44	X 45
25	X 45	X 44	X 42	X 47	A							C									X 63	X 60	X 53	X 48
26	48	47	45	45	48																X 76	X 72	X 68	71
27	67	73	61	54	X 36																X 52	X 46	48	52
28	54	55	55	A	A																X 59	X 57	X 54	41
29	A	X 33	35	O X 32	A																O X 84	X 78	X 68	58
30	47	48	51	48	48	34															X 55	X 46	X 42	X 36
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	27	24	15	1														30	29	29	29
MED	50	50	48	45	40	36	56														X 68	X 60	X 54	X 50
U Q	56	58	52	48	46	40															X 78	X 70	X 58	56
L Q	X 46	X 44	45	X 42	X 38	35															X 59	X 55	49	X 46

JUN. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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 43	F 44	F 42	34	A	26	42	76	52	48	R	E G 44	51	53	65	78	80	79	89	104	83	40	F 39	38
2	38	39	F 35	F 35	F 36	F 33	51	53	A	A	A	60	75	83	94	96	96	94	101	103	86	63	50	F 49
3	F 48	55	53	48	F 40	32	36	48	74	56	E G 44	A	49	57	58	71	85	76	70	63	59	51	43	F 41
4	F	A	33	31	A	F 27	41	72	A	46	A	53	65	83	92	102	109	107	96	74	45	39	A	F 40
5	32	F 37	F 39	A	28	27	41	50	52	52	52	53	59	73	77	87	95	99	85	72	70	63	F 50	50
6	F 45	F 43	F 39	37	F 33	F 32	40	49	55	54	57	46	A	59	65	79	86	80	78	65	63	52	F 50	F 44
7	F 43	37	F 36	F 32	F 32	28	40	58	51	48	47	53	64	72	75	81	89	92	90	80	85	70	48	43
8	38	F 39	F 38	F 35	F 31	F 33	47	49	53	50	50	48	52	59	52	62	71	77	83	82	81	58	50	44
9	44	41	39	38	F 33	26	44	45	A	52	A	A	63	62	64	72	84	89	82	72	71	54	46	43
10	42	44	41	F 38	33	F 32	A	A	A	A	A	A	52	A	A	58	75	85	88	74	60	50	46	44
11	F 42	F	F	A	31	28	39	61	57	58	A	A	A	A	54	A	86	97	96	83	82	78	49	33
12	F 35	F 32	F 26	F 25	F 27	F 20	39	51	59	54	A	A	51	58	A	55	62	69	70	69	72	84	F 42	F 38
13	F 37	F 42	F 38	F 35	33	30	41	57	A	52	56	61	64	69	57	65	70	76	92	93	77	47	F 43	F 39
14	42	39	F 36	F 35	F 31	F 29	R 34	52	50	50	54	A	A	A	A	A	64	73	70	66	62	59	62	60
15	F	F 54	44	39	33	30	A	58	57	55	A	53	A	A	58	A	A	78	64	57	64	67	40	F 36
16	F 46	F 42	F 39	F 32	F	F 27	F 46	56	A	A	A	A	A	A	68	74	83	86	80	58	52	50	44	32
17	F 33	38	F 40	33	F 29	F 26	38	50	51	55	74	51	A	48	56	69	79	78	78	74	69	68	51	43
18	38	33	F 33	F	F 26	F 23	35	52	62	A	54	A	R	48	51	74	84	80	66	55	62	59	53	51
19	44	F 48	F 50	F 41	32	30	38	61	A	A	A	A	A	A	A	A	55	61	55	54	59	54	48	41
20	F 46	F 48	46	39	33	28	37	47	53	A	A	A	A	A	A	A	A	A	A	52	48	A	38	38
21	38	36	35	33	25	22	39	A	52	56	56	56	62	A	76	70	66	58	A	A	52	52	F 50	F 42
22	F 48	F 44	F 38	F 38	F 37	F 33	40	52	56	50	53	57	67	80	87	93	80	74	82	82	60	48	F 40	A
23	F 44	F 44	A	F	F	F 27	44	55	53	56	55	52	51	56	68	82	88	76	70	56	53	50	52	49
24	50	F 38	F 37	39	A	A	A	A	60	A	A	A	A	A	A	A	54	57	67	56	50	41	38	39
25	39	38	36	41	A	A	36	45	50	54	56	C	48	56	66	70	63	65	61	54	57	54	47	42
26	F 38	F	F 33	F 34	F 39	22	37	53	A	A	A	A	A	A	52	73	85	75	68	63	70	66	62	F 58
27	F 54	F 61	F 52	F 45	30	25	A	66	56	48	48	47	47	47	50	58	65	72	60	48	46	40	F 39	F 39
28	F 44	F 44	F 48	A	A	17	34	47	53	48	66	58	60	A	54	61	71	69	70	62	53	51	48	F 32
29	A	27	F 27	26	A	20	38	45	A	A	A	A	46	49	56	60	58	66	70	70	78	72	F 60	F 48
30	F 36	F 38	F 43	F 38	F 37	24	34	52	52	A	A	A	58	57	57	54	52	60	55	54	49	40	36	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	27	27	28	25	22	28	26	27	21	20	15	15	19	19	24	24	28	29	28	29	30	29	29	29
MED	F 42	F 41	F 38	F 35	F 32	27	39	52	53	52	54	53	58	58	61	72	80	76	74	66	62	54	48	42
U Q	F 45	F 44	F 42	39	F 33	F 30	41	58	57	55	56	57	64	72	72	80	86	86	86	77	72	64	50	46
L Q	F 38	38	F 36	33	30	24	37	49	52	49	50	48	51	53	55	62	64	69	68	56	53	49	41	38

JUN. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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							A	L	L 400	U L 436	460	436	A	A	A	420	408	A	360					
2								A	A	A	A	444	U A 448	444	440	428	432	400	356					
3								L 372	384	A	440	A	U A 436	444	432	416	408	A	A					
4									A	A	A	440	440	432	432	424	408	392	A					
5								A	U L 412	424	L 436	436	452	A	A	A	A	A	A					
6								A	A	420	A	U L 440	A	436	428	424	404	A	L 348					
7								L	U L 368	U L 420	A	432	A	A	436	420	408	404	L 352	L				
8								L	U L 412	L 416	428	440	A	U A 436	428	412	408	380	A					
9									A	416	A	A	A	A	440	420	396	A						
10							A	A	A	A	A	A	U A 444	A	A	A	U A 408	380	A					
11							A	L	A	A	A	A	A	A	A	A	A	A	A					
12								348	400	A	A	A	432	436	A	428	A	A	A					
13								A	A	420	A	A	440	A	A	416	408	380	A					
14								U L 380	U L 400	L 424	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									A	A	A	A	A	A	U A 464	U A 424	A	A	L 356					
17							A	A	L 420	416	A	A	A	436	428	420	U A 408	A	360	L				
18								U L 388	400	A	A	A	468	436	U A 428	404	396	400	L	L				
19								L	A	A	A	A	A	A	A	A	400	384	356					
20								L 368	404	A	A	A	A	A	A	A	A	A	A			A		
21								A	L 408	424	A	A	A	A	A	A	A	A	A	A				
22							L	L 376	A	A	A	A	A	A	A	A	A	A	U L 388					
23								U L 380	A	432	U L 440	452	A	A	A	424	412	396	A					
24							A	A	A	A	A	A	A	A	A	A	A	380	356					
25						A		L	404	424	428	C	440	440	432	424	404	380	364					
26							A		A	A	A	A	A	A	424	A	A	A	U L 392					
27							A	A	L 388	U L 432	A	436	444	436	428	A	404	A	A					
28								A	A	408	420	436	444	A	A	424	A	A	A					
29								A	A	A	A	A	436	A	424	A	A	380	A					
30								A	L	A	A	A	A	436	432	A	404	376	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	13	14	7	10	12	11	15	16	17	13	11					
MED								L 376	L 400	422	436	438	442	436	432	422	408	380	356					
U Q								U L 380	L 410	L 424	440	440	446	440	436	424	408	398	U L 364					
L Q								368	394	416	428	436	438	436	428	418	404	380	L 356					

JUN. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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							A	252	A	316	A	U R 348	U R 356	356	348	336	316	268	A	A				
2						A	A	A	276	A	A	A	A	356	360	332	300	276	236	A				
3						B	A	236	272	A	A	336	A	A	A	A	A	A	A	A				
4						B	A	A	A	316	A	A	A	A	352	340	304	276	A	A				
5						B	184	A	A	A	340	352	360	360	340	348	320	272	220	A				
6						B	A	U A 256	A	A	A	A	A	352	344	328	308	264	240	A				
7						B	A	240	A	A	U A 332	A	352	348	344	320	A	268	220	A				
8						B	A	A	A	A	A	A	344	348	332	324	300	272	A	A				
9						B	A	U A 268	A	A	A	A	A	A	A	324	304	272	228	A				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
11						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
12						B	A	A	A	A	A	A	348	344	340	A	A	A	A	A				
13						B	A	A	A	A	A	A	A	A	A	A	316	276	A	A				
14						B	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						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
17						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
18						B	A	A	A	A	A	A	A	A	A	A	A	272	A	A				
19						B	196	240	U A 276	A	A	A	A	352	A	A	A	A	A	A				
20						B	A	A	288	A	A	A	A	A	A	A	A	A	A	A		A		
21						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
22						B	A	A	A	A	A	A	A	A	344	336	308	A	A	A				
23						B	A	A	A	A	A	A	A	A	340	332	308	268	224	A				
24							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
25						A	A	A	A	A	A	C	A	A	A	A	A	A	232	A				
26						B	A	A	A	A	A	A	A	336	A	320	296	A	A	A				
27						A	A	A	A	A	A	A	A	A	A	344	304	264	A	A				
28						B	A	A	A	A	A	A	344	A	A	A	A	A	A	A				
29						B	A	A	A	A	A	A	A	A	A	A	A	A	228	A				
30						B	A	A	A	A	A	A	A	A	A	A	A	U R	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	6	4	2	2	3	6	9	10	12	12	12	8					
MED							190	246	276	316	336	348	350	352	344	332	306	272	228					
U Q								U A 256	282			352	356	356	348	338	312	274	234					
L Q								240	274			336	344	346	340	324	302	268	222					

JUN. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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 48	J A 64	J A 52	J A 22	J A 57	J A 21	J A 40	30	J A 44	38	J A 42	43	46	44	J A 56	42	44	56	J A 38	J A 36	J A 38	J A 28	J A 32	J A 67
2	J A 40	J A 55	J A 42	J A 33	J A 28	J A 41	J A 39	J A 50	J A 103	J A 101	J A 110	J A 102	45	46	43	41	G	G	30	J A 34	J A 46	J A 70	J A 52	J A 53
3	J A 86	J A 63	J A 102	J A 50	J A 112	J A 53	J A 125	J A 134	J A 66	J A 59	J A 67	J A 88	J A 121	J A 168	J A 110	J A 54	J A 38	J A 54	J A 47	J A 53	J A 34	J A 103	J A 52	J A 33
4	J A 66	J A 130	J A 87	J A 98	J A 52	J A 65	J A 34	J A 62	J A 63	J A 46	J A 110	J A 43	J A 54	44	42	41	34	33	J A 36	J A 128	J A 51	J A 218	J A 219	J A 160
5	J A 153	J A 26	J A 109	J A 63	J A 59	J A 38	J A 30	J A 49	J A 44	J A 51	40	43	39	48	50	50	44	J A 50	J A 51	J A 46	J A 40	J A 71	J A 44	J A 66
6	20	J A 42	J A 87	J A 53	J A 46	J A 56	J A 28	J A 48	J A 64	J A 53	J A 64	J A 54	J A 119	43	J A 52	41	42	J A 50	J A 42	J A 41	J A 86	J A 64	J A 79	J A 54
7	J A 54	J A 66	J A 24	J A 20	E B 16	19	J A 26	32	J A 41	J A 59	J A 52	J A 39	J A 53	J A 53	40	38	J A 39	G	G 21	J A 32	J A 23	J A 18	J A 18	J A 22
8	J A 84	J A 84	J A 20	E B 16	19	J A 15	24	31	J A 37	J A 39	J A 81	42	J A 48	J A 46	41	35	37	34	J A 39	J A 51	J A 24	J A 41	J A 35	J A 32
9	J A 32	J A 33	J A 24	J A 22	J A 46	J A 118	J A 92	33	J A 70	J A 55	J A 85	J A 84	J A 69	J A 72	J A 47	G	36	J A 46	J A 70	J A 46	J A 62	J A 65	J A 40	47
10	J A 20	J A 33	J A 23	E B 16	E B 16	J A 16	J A 74	J A 66	J A 88	J A 126	J A 210	J A 96	J A 80	J A 71	J A 67	J A 50	J A 49	J A 45	J A 67	J A 79	J A 27	J A 29	J A 20	J A 53
11	J A 18	J A 25	J A 61	J A 61	J A 26	J A 63	J A 47	J A 52	J A 66	J A 127	J A 175	J A 160	J A 144	J A 106	J A 82	J A 110	J A 70	J A 59	J A 61	J A 52	J A 32	J A 22	J A 30	J A 28
12	J A 48	J A 39	J A 39	J A 17	J A 31	J A 51	J A 38	J A 40	J A 51	J A 66	J A 88	J A 62	45	J A 64	J A 90	J A 42	J A 60	J A 53	J A 83	J A 124	J A 85	J A 52	J A 140	J A 79
13	J A 52	J A 27	J A 36	J A 22	J A 66	J A 50	J A 59	J A 77	J A 123	J A 64	J A 83	J A 87	J A 48	J A 69	J A 54	J A 62	38	36	J A 48	J A 34	J A 51	J A 71	J A 40	J A 20
14	J A 22	J A 110	J A 78	J A 51	J A 87	J A 43	J A 53	J A 33	J A 41	J A 88	J A 70	J A 90	J A 188	J A 293	J A 138	J A 102	J A 54	J A 72	J A 94	J A 52	J A 43	J A 53	J A 42	J A 39
15	J A 28	J A 21	J A 49	J A 42	J A 26	J A 35	J A 46	J A 43	J A 57	J A 74	J A 87	J A 61	J A 76	J A 84	J A 84	J A 101	J A 108	J A 69	J A 50	J A 39	J A 45	J A 44	J A 104	J A 67
16	J A 42	J A 87	J A 66	J A 75	J A 19	E B 16	B J 31	J A 49	J A 66	J A 105	J A 84	J A 90	J A 141	J A 144	J A 60	J A 51	J A 57	J A 54	J A 50	J A 34	J A 26	J A 26	J A 17	J A 98
17	J A 32	J A 38	J A 30	J A 52	J A 77	J A 53	J A 52	J A 53	J A 66	J A 54	J A 71	J A 53	J A 125	J A 60	J A 40	J A 64	J A 56	J A 57	J A 51	J A 62	J A 35	J A 38	J A 25	J A 20
18	J A 21	J A 20	J A 15	J A 22	J A 30	J A 21	J A 26	J A 34	J A 52	J A 65	J A 51	J A 60	J A 67	J A 57	J A 50	J A 43	34	G 26	26	22	J A 27	J A 65	J A 33	J A 42
19	J A 33	J A 30	J A 30	J A 22	J A 33	J A 28	25	J A 45	J A 71	J A 108	J A 84	J A 76	J A 110	J A 75	J A 71	J A 95	J A 45	J A 47	J A 36	J A 129	J A 52	J A 33	J A 49	J A 54
20	J A 37	J A 30	J A 32	J A 32	J A 25	J A 18	19	J A 28	J A 40	J A 83	J A 81	J A 110	J A 123	J A 84	J A 94	J A 218	J A 172	J A 69	J A 70	J A 86	J A 53	J A 58	J A 47	J A 24
21	J A 24	J A 26	J A 31	J A 21	18	J A 37	J A 30	J A 73	J A 152	J A 173	J A 203	J A 84	J A 86	J A 96	J A 65	J A 56	J A 63	J A 51	J A 57	J A 54	J A 47	J A 50	J A 62	J A 53
22	J A 30	J A 38	J A 38	J A 32	J A 45	J A 56	J A 26	J A 31	J A 71	J A 60	J A 56	J A 75	J A 76	J A 80	47	J A 56	J A 62	J A 90	J A 127	J A 79	J A 32	J A 79	J A 107	J A 85
23	J A 52	J A 46	J A 50	J A 22	J A 24	J A 27	J A 28	J A 44	J A 86	J A 50	J A 42	J A 60	J A 52	J A 46	J A 45	G 29	35	34	J A 50	J A 27	J A 36	J A 22	J A 21	J A 39
24	J A 18	J A 20	J A 26	J A 44	J A 54	J A 78	J A 94	J A 100	J A 80	J A 217	J A 71	J A 90	J A 57	J A 103	J A 90	J A 64	J A 98	J A 35	J A 28	J A 32	J A 31	J A 26	J A 20	J A 20
25	J A 16	E B 16	19	20	J A 26	J A 30	22	28	J A 36	J A 49	J A 38	C	J A 42	J A 38	39	J A 36	J A 39	34	24	J A 39	J A 34	J A 22	20	J A 82
26	J A 41	J A 41	J A 44	J A 46	J A 56	J A 56	J A 35	J A 50	J A 88	J A 135	J A 146	J A 82	J A 139	J A 70	J A 53	J A 62	J A 110	J A 72	J A 30	J A 50	J A 86	J A 52	J A 85	J A 54
27	J A 48	J A 36	J A 52	J A 32	19	J A 40	J A 54	J A 50	J A 63	J A 76	J A 60	J A 64	J A 50	J A 64	J A 48	J A 41	40	J A 44	J A 44	J A 33	38	J A 129	J A 40	J A 36
28	J A 52	J A 52	J A 104	J A 84	J A 84	J A 36	J A 26	J A 42	J A 52	J A 63	J A 43	J A 48	43	J A 65	J A 60	42	J A 70	J A 100	J A 84	J A 78	J A 53	J A 29	J A 53	J A 53
29	J A 33	J A 87	J A 25	J A 42	J A 110	J A 52	J A 31	J A 51	J A 86	J A 86	J A 66	J A 88	J A 61	J A 70	J A 55	J A 43	J A 71	J A 56	J A 116	J A 110	J A 130	J A 122	J A 61	J A 46
30	J A 103	J A 52	J A 29	J A 46	J A 27	J A 37	J A 38	J A 51	J A 120	J A 110	J A 203	J A 182	J A 70	J A 62	J A 60	J A 85	J A 50	J A 51	J A 46	J A 47	J A 31	J A 61	J A 31	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	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 38	J A 38	J A 38	J A 32	J A 32	J A 39	J A 34	J A 48	J A 66	J A 66	J A 76	J A 76	J A 68	J A 67	J A 54	J A 50	J A 47	J A 50	J A 49	J A 48	J A 39	J A 52	J A 41	J A 50
U Q	J A 52	J A 63	J A 61	J A 51	J A 57	J A 53	J A 52	J A 52	J A 86	J A 105	J A 88	J A 90	J A 119	J A 84	J A 71	J A 64	J A 63	J A 57	J A 67	J A 78	J A 52	J A 70	J A 61	J A 66
L Q	J A 24	J A 27	J A 26	J A 22	25	J A 27	26	33	J A 51	J A 54	J A 56	J A 54	48	48	47	41	38	35	36	J A 34	J A 32	J A 29	J A 30	J A 32

JUN. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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	30	30	18	E B 16	A A 57	E B 16	34	30	36	37	40	41	45	44	50	38	37	45	31	35	20	22	30	20
2	35	32	19	21	21	26	33	41	A A 103	A A 101	A A 110	40	45	43	42	40	G	G	30	32	37	42	E B 16	E B 16
3	E B 16	29	20	40	E B 16	E B 16	26	32	36	42	38	A A 88	44	40	41	38	35	42	43	43	30	32	E B 16	20
4	28	A A 130	E B 16	E B 16	A A 52	E B 16	31	54	A A 63	43	A A 110	40	42	42	42	38	34	32	34	64	24	24	A A 219	E B 16
5	E B 16	E B 16	22	A A 63	E B 16	E B 16	24	36	36	41	38	38	37	47	49	48	42	46	48	45	39	53	29	E B 16
6	E B 16	E B 16	E B 16	22	20	E B 16	25	40	47	38	44	40	A A 119	42	40	40	38	41	29	24	28	E B 16	E B 16	E B 16
7	E B 16	17	E B 16	E B 16	E B 16	E B 16	23	29	32	36	44	36	47	45	37	35	32	G	G 17	18	18	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	34	33	36	38	45	44	38	34	35	31	36	30	E B 16	38	22	22
9	E B 16	E B 16	20	E B 16	E B 16	E B 16	24	30	A A 70	34	A A 85	A A 84	55	47	37	G	35	40	64	23	46	29	E B 16	21
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	A A 74	A A 66	A A 88	A A 126	A A 210	A A 96	44	A A 71	A A 67	48	41	30	47	52	21	E B 16	E B 16	18
11	E B 16	E B 16	E B 16	A A 61	E B 16	E B 16	30	29	40	47	A A 175	A A 160	A A 144	A A 106	49	A A 110	47	49	40	21	E B 16	E B 16	18	22
12	23	21	E B 16	E B 16	E B 16	E B 16	22	30	35	44	A A 88	A A 62	40	40	A A 90	36	50	44	61	28	18	18	18	24
13	28	20	22	E B 16	E B 16	E B 16	24	45	A A 123	36	48	50	40	45	45	37	35	34	43	24	E B 16	E B 16	25	E B 16
14	E B 16	18	E B 16	E B 16	E B 16	E B 16	19	26	32	40	49	A A 90	A A 188	A A 293	A A 138	A A 102	51	46	62	24	24	35	24	24
15	21	E B 16	E B 16	17	18	17	A A 46	37	50	46	A A 87	47	A A 76	A A 84	45	A A 101	A A 108	63	44	26	21	27	24	20
16	25	E B 16	E B 16	20	E B 16	E B 16	23	34	A A 66	A A 105	A A 84	A A 90	A A 141	A A 144	46	42	52	50	30	27	E B 16	23	E B 16	E B 16
17	E B 16	17	E B 16	E B 16	E B 16	E B 16	31	34	35	37	51	47	A A 125	40	38	39	41	41	27	24	26	25	18	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	31	36	A A 65	44	A A 60	42	39	43	34	32	G 23	24	17	E B 15	34	22	21
19	E B 16	20	E B 16	E B 16	20	E B 16	23	29	A A 71	A A 108	A A 84	A A 76	A A 110	A A 75	A A 71	A A 95	34	31	27	35	32	22	29	20
20	E B 16	E B 16	20	18	E B 16	E B 16	18	26	30	A A 83	A A 81	A A 110	A A 123	A A 84	A A 94	A A 218	A A 172	A A 69	A A 70	33	36	A A 58	24	E B 16
21	E B 16	20	19	E B 16	E B 16	E B 16	20	A A 73	33	38	50	51	56	A A 96	49	44	56	41	A A 57	A A 54	40	21	36	29
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	52	42	48	50	62	61	46	46	44	41	34	44	21	23	E B 16	A A 85
23	20	25	A A 50	E B 16	E B 16	E B 16	22	28	41	40	37	42	46	44	44	G 26	35	33	48	26	29	E B 16	20	E B 16
24	E B 16	E B 16	E B 16	35	A A 54	A A 78	A A 94	A A 100	48	A A 217	A A 71	A A 90	A A 57	A A 103	A A 90	A A 64	42	33	23	24	24	20	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	A A 26	A A 30	20	26	30	31	35	C 37	36	38	36	36	33	G 20	34	21	E B 16	E B 16	E B 16
26	30	30	E B 16	18	31	E B 16	28	39	A A 88	A A 135	A A 146	A A 82	A A 139	A A 70	39	54	83	66	25	30	42	38	54	30
27	35	E B 16	22	22	E B 16	18	A A 54	35	31	32	44	36	35	36	39	41	38	41	40	30	38	E B 16	26	E B 16
28	E B 16	E B 16	E B 16	A A 84	A A 84	E B 16	21	35	43	34	35	40	40	A A 65	44	40	41	66	43	44	E B 16	20	E B 16	E B 16
29	A A 33	E B 16	E B 16	20	A A 110	E B 16	26	42	A A 86	A A 86	A A 66	A A 88	42	47	39	40	44	30	42	40	21	17	22	17
30	E B 16	E B 16	E B 16	17	E B 16	E B 16	28	40	36	A A 110	A A 203	A A 182	44	40	38	44	34	34	40	30	E B 16	23	19	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	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	34	40	42	50	51	46	46	44	40	40	41	40	30	22	22	20	16
U Q	25	20	19	21	A A 21	16	31	40	A A 66	A A 86	A A 87	A A 89	A A 110	A A 75	A A 49	A A 48	47	46	47	40	32	32	25	21
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	29	35	37	44	40	42	42	39	37	35	32	29	24	E B 18	E B 16	E B 16	E B 16

JUN. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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	17	20	21	26	22	29	31	26	22	18	16	14	14	14	14	16	16
2	16	16	16	16	16	16	14	14	16	20	20	20	24	21	24	22	17	16	16	14	16	16	16	16
3	16	16	16	16	16	16	14	14	14	14	16	18	20	19	22	20	15	14	12	14	16	16	16	16
4	16	16	16	16	16	16	16	12	15	16	18	16	21	19	18	17	17	14	12	10	16	16	16	16
5	16	16	16	16	16	16	16	14	14	18	19	18	19	21	20	19	17	14	13	14	16	16	16	16
6	16	16	16	16	16	16	16	14	14	14	18	18	18	20	17	20	17	15	13	14	16	16	16	16
7	16	16	16	16	16	16	16	14	14	14	15	20	20	20	20	17	16	16	12	14	16	16	16	16
8	16	16	16	16	16	16	16	14	14	14	17	17	17	19	16	19	15	14	13	13	16	16	16	16
9	16	16	16	16	16	16	15	14	13	14	15	17	19	20	19	18	15	14	14	14	16	16	16	16
10	16	16	16	16	16	16	16	14	14	14	16	16	18	20	20	17	15	14	13	15	16	16	16	16
11	16	16	16	16	16	16	16	13	16	14	15	18	18	17	18	16	16	14	14	15	16	16	16	16
12	16	16	16	16	16	16	14	14	14	15	15	15	14	18	20	18	16	14	13	15	16	16	16	16
13	16	16	16	16	16	16	16	14	14	16	15	16	18	18	17	19	15	14	14	14	16	16	16	16
14	16	16	16	16	16	16	16	12	14	14	15	16	18	22	18	20	14	14	13	14	16	16	16	16
15	16	16	16	16	16	16	16	14	14	16	19	18	22	19	19	18	15	14	14	13	14	16	16	16
16	16	16	16	16	16	16	16	15	14	15	18	20	22	17	18	15	17	14	14	14	16	16	16	16
17	16	16	16	16	16	16	16	14	14	14	15	17	19	20	19	18	14	14	13	16	16	16	16	16
18	16	16	16	16	16	16	16	14	14	15	16	16	18	17	17	16	15	13	13	16	15	16	16	16
19	16	16	16	16	16	16	16	13	14	15	18	18	18	19	20	20	16	15	13	16	16	16	16	16
20	16	16	16	16	16	16	16	12	14	14	14	17	20	19	16	17	18	14	14	15	16	16	16	16
21	16	16	16	16	16	16	16	14	16	17	17	19	18	18	19	18	16	15	13	14	16	16	16	16
22	16	16	16	16	16	16	16	14	14	14	17	19	19	18	21	17	17	14	13	14	16	16	16	16
23	16	16	16	16	16	16	16	16	15	18	18	18	18	22	23	20	14	14	13	13	16	16	16	16
24	16	16	16	16	16	16	15	14	14	16	15	16	21	21	18	18	16	14	14	12	16	16	16	16
25	16	16	16	16	16	16	16	14	14	16	18	C	20	20	17	20	17	14	14	14	16	16	16	16
26	16	16	16	16	16	16	16	15	14	14	15	16	18	18	20	17	18	15	13	16	16	16	16	16
27	16	16	16	16	16	16	16	14	14	17	17	17	20	18	19	20	16	14	14	12	16	16	16	16
28	16	16	16	16	16	16	14	12	14	14	16	20	21	20	18	18	18	15	13	14	16	16	16	16
29	16	16	16	16	16	16	16	13	15	14	18	20	20	21	20	19	17	14	14	14	16	16	16	16
30	16	16	16	16	16	16	16	14	14	16	17	19	21	20	21	19	20	14	14	14	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	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	14	14	15	17	18	19	20	19	18	16	14	13	14	16	16	16	16
U Q	16	16	16	16	16	16	16	14	14	16	18	19	21	20	20	20	17	15	14	15	16	16	16	16
L Q	16	16	16	16	16	16	16	14	14	14	15	16	18	18	18	17	15	14	13	14	16	16	16	16

JUN. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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 299	F 316	F 334	323	A	317	331	415	405	348	R	G	295	260	275	292	295	277	304	337	385	305	F 274	288
2	311	305	F 275	F 293	F 329	F 343	358	344	A	A	A	274	288	285	299	306	304	310	324	332	341	328	301	F 296
3	F 307	337	334	324	F 326	320	318	310	351	384	G	A	263	278	276	291	325	328	323	332	323	320	319	F 291
4	F	A 345	322		A	F 319	334	407	A	327	A	287	284	299	298	293	314	330	326	376	353	322	A	F 314
5	343	F 354	F 317	A	315	345	368	354	346	325	316	299	302	292	282	294	309	324	345	327	320	351	F 328	311
6	F 293	F 288	F 327	345	F 327	F 338	364	363	351	359	375	363	A	287	272	294	315	317	341	323	336	320	F 327	F 303
7	F 282	313	F 319	F 348	F 295	328	374	376	380	310	277	269	288	295	280	284	294	308	321	310	336	365	329	297
8	297	F 346	F 308	F 308	F 316	F 327	380	371	347	353	311	290	296	327	271	292	299	301	319	337	362	357	318	323
9	316	310	319	317	F 296	344	389	341	A	306	A	A	312	267	270	279	312	334	334	332	341	342	326	316
10	309	323	325	F 344	333	F 330	A	A	A	A	A	A	299	A	A	273	294	317	346	367	342	321	323	318
11	F 331	F	F	A	321	328	345	374	369	370	A	A	A	A	261	A	296	324	332	318	329	361	373	315
12	F 295	F 296	F 321	F 293	F 302	F 360	377	358	370	392	A	A	284	312	A	296	305	309	320	315	331	375	F 289	F 301
13	F 306	F 285	F 311	F 307	341	333	339	357	A	310	317	334	319	352	272	299	280	283	330	348	374	321	F 298	F 306
14	304	336	F 302	F 295	F 325	F 348	R 357	358	343	328	322	A	A	A	A	A	292	305	322	323	318	295	308	305
15	F	F 336	323	337	314	306	A	368	365	362	A	345	A	A	285	A	A	329	326	311	339	374	305	F 301
16	F 307	F 260	F 317	F 313	F	F 285	F 377	385	A	A	A	A	A	A	278	279	303	327	329	346	329	323	356	297
17	F 300	351	F 333	334	F 320	F 317	322	371	322	321	377	342	A	243	283	290	301	302	316	324	336	367	329	318
18	350	323	F 311	F	F 330	F 307	345	348	387	A	339	A	R	236	235	286	325	331	350	302	311	336	307	302
19	292	F 304	F 332	F 339	308	284	334	367	A	A	A	A	A	A	A	A	300	331	316	316	321	336	313	272
20	F 312	F 297	330	337	337	344	339	335	363	A	A	A	A	A	A	A	A	A	A	345	319	A	309	309
21	308	310	345	358	344	333	347	A	318	315	313	273	288	A	316	335	349	348	A	A	329	307	F 305	F 289
22	F 304	F 306	F 321	F 313	F 331	F 349	346	345	365	315	290	285	282	285	299	328	308	R 273	288	326	378	309	F 335	A
23	F 308	F 321	A	F	F	F 313	357	347	323	318	301	256	270	261	272	300	314	328	340	336	313	293	304	290
24	355	F 284	F 292	323	A	A	A	A	362	A	A	A	A	A	A	A	298	300	337	339	339	309	284	290
25	296	302	313	358	A	A	355	339	332	348	325	C	242	293	301	294	317	321	332	316	311	328	304	302
26	F 312	F	F 314	F 350	F 394	346	360	379	A	A	A	A	A	A	256	282	327	315	297	290	301	319	309	F 307
27	F 298	F 334	F 319	F 334	335	321	A	379	380	300	255	249	255	258	271	302	307	339	340	347	318	319	F 326	F 297
28	F 320	F 347	F 369	A	A	321	353	342	353	292	342	309	330	A	287	292	309	U A 305	327	344	335	360	371	F 301
29	A	326	F 316	324	A	372	373	352	A	A	A	A	242	266	290	318	273	301	320	302	341	356	F 327	F 301
30	F 313	F 299	F 315	F 315	F 347	384	330	353	363	A	A	A	298	302	313	315	273	345	310	349	343	329	356	319
31																								
	00	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	28	25	22	28	26	27	21	20	15	15	19	19	24	24	28	29	28	29	30	29	29	29
MED	F 307	F 313	F 319	F 324	F 326	329	354	358	362	326	316	287	288	285	279	294	304	317	326	332	336	328	318	302
U Q	313	F 336	331	F 342	335	344	368	374	370	356	339	334	299	299	294	301	314	330	336	344	341	356	328	312
L Q	F 298	F 299	F 314	F 313	315	F 318	339	345	344	312	290	269	270	261	272	288	296	304	320	316	320	319	304	296

JUN. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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							A	L	L 416	U L 402	392	414	A	A	A	392	A	A	361					
2								A	A	A	A	430	A	A	A	A	370	372	363					
3								L 384	A	A	432	A	A	A 380	A 396	390	391	A	A					
4									A	A	A	416	A 397	A	A 397	419	395	375	A					
5								A	U L 389	A	L 417	438	430	A	A	A	A	A	A					
6								A	A	421	A	U L 425	A	A	398	405	400	A	L 369					
7								L	U L 419	U L 383	A	435	A	A	403	387	407	355	L 368	L				
8								L	U L 385	L 410	435	420	A	A	425	436	378	375	A					
9									A	428	A	A	A	A	427	418	399	A						
10							A	A	A	A	A	A	A	A	A	A	A	376	A					
11							A	L	A	A	A	A	A	A	A	A	A	A	A					
12								404	389	A	A	A	457	390	A	405	A	A	A					
13								A	A	438	A	A	441	A	A	420	385	398	A					
14								U L 389	U L 401	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									A	A	A	A	A	A	A	A	A	A	L 390					
17							A	A	L 377	412	A	A	A	444	435	416	A	A	350	L				
18								U L 373	399	A	A	A	354	427	A	437	415	383	L	L				
19								L	A	A	A	A	A	A	A	A	412	382	374					
20								L 375	378	A	A	A	A	A	A	A	A	A	A			A		
21								A	L 383	420	A	A	A	A	A	A	A	A	A	A				
22							L	L 378	A	A	A	A	A	A	A	A	A	A	U L 385					
23								U L 385	A	A	U L 405	429	A	A	A	397	412	379	A					
24							A	A	A	A	A	A	A	A	A	A	A	370	358					
25						A		L	384	381	415	C	433	426	419	404	421	380	372					
26							A		A	A	A	A	A	A	418	A	A	A	U L 351					
27							A	A	L 390	U L 393	A	421	419	431	420	A	370	A	A					
28								A	A	398	405	405	418	A	A	A	A	A	A					
29								A	A	A	A	A	422	A	394	A	A	381	A					
30								A	L	A	A	A	A	454	413	A	401	405	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	12	11	7	10	9	7	12	13	14	13	11					
MED								L 384	L 389	410	415	423	422	427	416	405	400	379	368					
U Q								389	L 400	421	432	430	437	444	422	420	412	382	L 374					
L Q								L 375	384	U L 393	405	416	408	390	398	394	385	374	358					

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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							282	200	214	294	R	G	396	478	392	318	316	348	290					
2								270	A	A	A	406	348	338	316	298	296	288	264					
3								346	254	236	G	A	490	404	400	344	280	268	266					
4									A	A 344	A	402	362	304	292	308	280	248	244					
5								252	272	316	330	384	356	320	348	314	296	268	238					
6								260	272	258	246	L 284	A	378	398	326	280	280	246					
7								228	246	348	442	442	360	328	358	346	326	300	254	264				
8								236	278	270	360	420	390	316	420	356	318	304	272					
9									A	344	A	A	E A 330	416	402	368	296	268						
10							A	A	A	A	A	A	394	A	A	416	338	288	250					
11							256	224	244	258	A	A	A	A	466	A	326	280	254					
12								262	244	220	A	A	420	336	A	360	320	292	E A 318					
13								262	A	346	342	302	322	260	410	334	348	334	260					
14								258	272	324	334	A	A	A	A	A	334	278	A 314					
15							A	252	238	264	A	302	A	A	388	A	A	A 274	262	272					
16									A	A	A	A	A	A	366	360	294	266	254					
17							280	244	318	314	236	E A 304	A	568	396	350	308	302	278	258				
18								280	228	A	300	A	R	596	566	346	264	264	238	276				
19								226	A	A	A	A	A	A	A	A 354	288	304						
20								286	256	A	A	A	A	A	A	A	A	A	A			A		
21								A	330	334	E A 336	442	A 390	A	306	272	274	272	A	A				
22							288	278	268	352	E A 400	388	E A 422	340	308	266	276	338	296					
23								262	316	318	310	496	460	452	392	312	280	262	254					
24							A	A	260	A	A	A	A	A	A	A	362	336	268					
25						A		284	308	282	324	C	572	394	328	322	278	296	274					
26							254		A	A	A	A	A	A	486	362	A 308	E A 318	316					
27							A	230	232	382	524	554	480	512	452	348	318	268	244					
28								286	268	406	280	318	302	A	396	348	308	E A 390	270					
29								290	A	A	A	A	584	478	378	314	402	310	272					
30								272	258	A	A	A	356	352	334	330	388	268	282					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	23	21	20	15	15	19	19	24	24	28	29	27	4				
MED							280	262	260	317	329	402	390	378	392	339	308	284	265	268				
U Q							285	280	275	345	400	442	460	478	406	353	330	307	282	274				
L Q							255	236	244	267	300	304	356	328	341	314	280	268	254	261				

JUN. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUN. 2018 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	328	A 284	226	230	A	292	A	196	206	198	A 220	222	A	A	A	230	A	A	A 252	232	182	A 250	A 382	302
2	E A 340	E A 328	320	298	252	Q 260	230	A	A	A	A	192	A	A	A	A	206	200	250	226	224	E A 250	250	276
3	294	266	226	E A 296	224	260	A 268	A 226	A	A	182	A	A	E A 238	A 242	A 236	216	A	A	A 252	244	A 252	252	306
4	Q 328	A	226	264	A	276	A 278	202	A	A	A	208	E A 248	A	E A 252	208	194	216	A	A 244	194	A 268	A	Q 264
5	264	230	254	A	252	234	216	A	220	E A 298	190	176	172	A	A	A	A	A	A	248	252	252	A 230	252
6	Q 262	Q 298	234	234	280	Q 232	216	A	A	198	A	198	A	A	232	246	240	A	224	236	228	228	228	268
7	Q 286	242	Q 268	224	Q 254	232	214	212	200	222	A	178	A	A	208	214	194	192	210	234	222	190	208	262
8	262	Q 242	Q 238	Q 248	Q 246	Q 218	208	206	212	194	182	190	A	A	194	202	E A 234	218	A	234	204	204	228	256
9	250	266	266	244	262	256	210	198	A	182	A	A	A	A	170	166	220	A	262	228	238	210	232	270
10	258	244	Q 250	Q 228	Q 252	Q 236	A	A	A	A	A	A	A	A	A	A	A	214	A	228	210	226	238	244
11	Q 220	Q 264	Q 254	A	266	276	A	206	A	A	A	A	A	A	A	A	A	A	A	228	206	194	174	E A 272
12	E A 320	A 300	276	Q 282	Q 270	268	204	200	212	A	A	A	178	246	A	200	A	A	A	276	234	198	208	Q 296
13	328	Q 272	Q 272	Q 274	228	226	234	A	A	182	A	A	190	A	A	200	224	222	A	224	182	206	274	Q 276
14	270	238	292	266	252	238	232	188	188	E A 252	A	A	A	A	A	A	A	A	A	240	248	288	234	268
15	268	Q 218	206	222	256	262	A	A	A	A	A	A	A	A	A	A	A	A	A	A	234	210	A 268	296
16	290	272	256	298	Q 264	Q 286	206	224	A	A	A	A	A	A	A	A	A	A	218	222	228	246	198	266
17	268	230	Q 240	254	238	266	A	A	222	202	A	A	A	190	196	236	A	A	236	246	218	202	234	234
18	218	260	Q 260	Q 262	Q 296	Q 278	212	210	214	A	A	A	A 260	194	A	192	208	204	210	220	216	A 228	250	264
19	308	274	234	204	286	282	228	220	A	A	A	A	A	A	A	A	190	200	204	A 284	252	218	A 262	328
20	Q 260	274	234	230	230	226	210	200	196	A	A	A	A	A	A	A	A	A	A	244	E A 250	A	A 288	250
21	262	260	218	208	212	256	220	A	202	214	A	A	A	A	A	A	A	A	A	A	E A 286	238	E A 262	E A 302
22	268	264	258	250	Q 230	228	194	202	A	A	A	A	A	A	A	A	A	A	220	238	192	244	272	A
23	Q 304	Q 288	A	Q 216	Q 224	246	220	204	A	A	182	204	A	A	A	218	208	218	A	226	260	270	264	288
24	212	280	308	E A 338	A	A	A	A	A	A	A	A	A	A	A	A	A	244	214	220	228	232	296	292
25	280	274	Q 252	206	A	A	206	206	190	204	186	C	174	180	206	212	200	230	210	244	232	226	254	282
26	Q 328	Q 318	280	232	226	260	A	206	A	A	A	A	A	A	210	A	A	A	212	254	298	254	334	Q 288
27	Q 334	244	206	226	226	272	A	A	202	182	A	172	194	182	210	A	A 278	A	A	226	E A 298	236	A 282	Q 308
28	250	230	200	A	A	E B 356	236	A	A	194	220	216	204	A	A	E A 294	A	A	A	238	212	218	208	Q 272
29	A	242	Q 318	302	A	224	218	A	A	A	A	A	218	A	232	A	A	218	A	284	234	202	238	Q 226
30	240	262	Q 268	264	230	200	286	A	A 236	A	A	A	A	180	198	A	212	218	A	212	226	A 232	216	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	29	29	29	27	24	28	22	17	13	13	7	10	9	7	12	14	14	13	13	28	30	29	29	29
MED	268	264	254	241	252	257	217	206	206	196	186	195	192	186	208	212	209	218	218	235	226	228	244	271
U Q	314	277	270	274	263	274	232	211	217	218	220	208	A 233	238	232	236	224	220	243	245	248	250	270	294
L Q	259	242	230	226	229	232	210	200	198	188	182	178	176	180	197	200	200	202	210	226	212	208	228	259

JUN. 2018 h'F (KM)

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IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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							A 102		A 102		A 102		102	108	108	108	102	100	A	A				
2						A	A	A 100		A	A	A	A 104		102	102	100	100	106	A				
3						B	A 110		102	A	A	100	A	A	A	A	A	A	A	A				
4						B	A	A	A 100		A	A	A	A	100	100	100	104	A	A				
5						B	122	A	A	A	104	102	100	100	100	100	100	100	100	A				
6						B	A 100		A	A	A	A	A 100	100	100	100	102	102	102	A				
7						B	A 102		A	A 102		A	102	102	102	102	A	102	102	A				
8						B	A	A	A	A	A	A	102	102	102	102	106	106	A	A				
9						B	A 100		A	A	A	A	A	A	A	102	102	102	106	A				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
11						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
12						B	A	A	A	B	A	A	106	100	100	A	A	A	A	A				
13						B	A	A	A	A	A	A	A	A	A	A	102	102	A	A				
14						B		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					
16						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
17						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
18						B	A	A	A	A	A	A	A	A	A	A	A	100		A				
19						B	122	110	106	A	A	A	A 100		A	A	A	A	A	A				
20						B	A	A 100		A	A	A	A	A	A	A	A	A	A	A		A		
21						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
22						B	A	A	A	A	A	A	A	A	104	102	102	A	A	A				
23						B	A	A	A	A	A	A	A	A	100	110	104	106	106	A				
24							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
25						A	A	A	A	A	A	C	A	A	A	A	A	A	114	A				
26						B	A	A	A	A	A	A	A 100		A	100	98	A	A	A				
27						A	A	A	A	A	A	A	A	A	A	98	98	102	A	A				
28						B	A	A	A	A	A	A	102	A	A	A	A	A	A	A				
29						B	A	A	A	A	A	A	A	A	A	A	A	A	102	A				
30						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	6	4	2	2	3	6	9	10	12	12	12	8					
MED							122	102	101	101	103	102	102	100	101	102	102	102	104					
U Q								110	104			102	102	103	102	102	102	103	106					
L Q								100	100			100	102	100	100	100	100	100	102					

JUN. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 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	96	96	96	96	98	102	106	118	112	112	112	120	116	120	110	148	108	104	104	100	100	96	96	94
2	90	94	96	92	92	108	108	104	98	98	96	106	160	128	132	172	G	G	122	104	100	100	96	96
3	102	100	100	96	120	148	132	150	104	104	102	110	96	96	128	98	92	84	104	84	84	102	108	96
4	96	98	98	96	96	108	114	104	108	106	96	96	90	134	134	130	132	114	104	102	106	134	150	102
5	96	96	102	94	94	110	122	110	110	106	116	112	130	134	146	136	124	114	104	102	98	100	100	100
6	96	96	100	94	90	98	118	112	106	104	100	100	100	140	88	140	128	122	112	102	96	96	96	104
7	90	92	94	102	B	102	122	122	106	108	104	96	110	110	120	126	104	G	88	116	88	84	84	92
8	106	98	88	B	90	90	132	106	104	102	108	150	114	114	114	138	120	112	106	98	92	92	92	86
9	86	86	86	88	94	94	106	114	100	106	96	96	96	96	98	G	146	112	102	110	88	88	96	102
10	88	88	88	B	B	102	114	106	102	102	102	90	82	90	90	90	90	124	108	102	86	86	112	98
11	90	100	100	96	104	132	104	102	102	132	112	106	94	94	94	94	96	112	90	86	90	88	86	86
12	86	86	90	90	90	98	110	92	104	96	92	94	134	112	104	122	110	106	98	104	104	110	126	126
13	94	84	84	100	92	100	98	98	94	106	92	92	100	100	92	110	124	106	100	94	98	94	94	136
14	112	112	104	104	106	100	100	100	96	98	96	92	120	114	92	92	90	94	90	90	88	88	88	88
15	88	86	92	96	94	100	110	102	104	100	108	104	98	98	98	92	90	88	88	84	86	88	112	104
16	100	100	118	96	96	B	108	108	100	100	96	96	122	94	94	94	90	110	90	86	86	82	88	106
17	100	100	104	102	94	118	94	94	94	94	100	100	96	120	100	98	90	86	86	108	82	80	80	82
18	100	94	116	98	96	114	122	114	106	96	96	96	104	124	118	94	94	90	102	102	84	98	92	88
19	88	86	86	86	86	84	118	116	106	104	96	112	104	108	104	100	94	98	96	104	90	88	88	86
20	86	86	86	86	86	86	122	126	112	98	94	92	94	90	88	112	88	90	90	122	86	86	86	86
21	82	96	96	96	112	112	108	100	118	114	102	94	98	96	96	98	100	100	94	90	88	90	86	90
22	84	94	94	122	112	100	116	112	98	94	96	90	92	96	122	110	108	102	94	88	90	104	100	98
23	96	100	100	96	96	94	94	96	90	96	96	108	102	102	104	92	130	114	102	84	84	84	84	82
24	84	96	96	94	94	98	106	100	98	96	96	96	102	96	100	100	98	92	90	86	86	86	86	86
25	86	B	100	98	92	92	108	110	100	112	96	C	96	100	96	90	90	186	88	88	88	88	88	96
26	94	94	94	94	94	98	118	106	100	94	96	104	100	100	102	100	98	94	88	88	100	94	94	96
27	92	92	92	90	98	102	106	102	102	108	92	98	98	92	96	130	118	112	104	102	98	102	98	98
28	96	96	98	98	84	96	116	110	104	104	104	98	108	90	90	174	90	90	86	86	84	84	96	94
29	100	100	98	92	94	98	110	104	102	100	100	98	114	116	108	120	112	110	104	104	100	106	96	96
30	92	92	92	92	92	94	108	104	100	96	98	118	94	92	96	94	96	96	100	94	90	90	82	82
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	28	28	29	30	30	30	30	30	29	30	30	30	29	29	28	30	30	30	30	30	30
MED	93	96	96	96	94	100	110	106	102	102	96	98	100	100	100	100	98	105	99	99	89	90	94	96
U Q	96	99	100	98	97	108	118	112	106	106	102	107	114	116	114	130	119	112	104	104	98	100	98	100
L Q	88	90	92	92	92	95	106	102	100	96	96	95	96	96	94	94	90	93	90	88	86	86	86	86

IONOSPHERIC DATA STATION Okinawa

JUN. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 9	FQ 41	FQ 11	F 1	FQ 61	F 1	C 2	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 2	C 2	C 1	L 2	F 3	F 3	F 2	F 2
2	F 7	F 7	F 5	F 6	F 2	C 5	C 5	C 2	C 6	C 5	L 8	C 1	HL 11	C 1	C 1	H 1			C 2	C 2	F 5	F 3	F 3	FQ 21
3	FQ 41	FQ 41	FQ 41	FQ 91	FF 13	HCQ 11	HC 13	HC 13	C 3	C 3	C 3	C 2	LHQ 21	LQ 51	CLQ 13	L 2	L 3	LQ 61	CLQ 65	L 7	F 2	FFQ 35	FF 12	F 7
4	FQ 51	FQ 41	FQ 31	FQ 31	FQ 51	CL 41	C 6	C 8	CQ 71	CQ 31	LQ 61	L 1	LH 11	HL 11	HL 11	H 1	H 1	CL 11	CL 53	CL 75	FF 14	FFF 12	FFQ 18	FFQ 32
5	FQ 41	F 2	F 4	FQ 51	FQ 31	CQ 11	CL 31	C 3	C 3	C 2	C 1	C 1	H 1	H 2	H 2	H 2	CL 21	CL 31	CL 81	C 8	FF 52	FF 91	FQ 71	F 2
6	F 1	FQ 21	FQ 41	FQ 41	FQ 41	L 3	C 3	C 6	CQ 51	CQ 21	CQ 21	C 2	CQ 31	HL 11	LH 11	H 2	C 2	C 3	C 3	C 8	F 3	FQ 21	FQ 31	FF 13
7	F 2	FQ 51	F 2	F 1		C 1	C 2	C 2	C 2	C 1	C 2	L 1	C 2	C 2	C 1	C 1	C 1		L 1	C 1	F 3	F 1	F 1	F 2
8	FF 12	F 1	F 2		F 1	L 1	H 1	C 3	CQ 21	CQ 11	CQ 21	HC 11	C 2	C 1	C 1	H 1	C 1	C 2	C 5	L 6	F 3	F 6	F 5	F 6
9	F 4	FQ 41	FQ 21	F 2	F 3	LQ 31	CQ 31	CQ 21	CQ 51	CQ 21	LQ 51	LQ 41	LQ 41	L 6	L 2		HC 11	C 4	C 8	CLQ 14	F 7	F 5	FQ 41	FF 14
10	F 2	FQ 41	FQ 21			C 1	C 7	CQ 81	CQ 81	C 8	CQ 71	L 9	LL 13	L 5	L 7	L 3	L 3	CLQ 12	CLQ 83	CLQ 65	F 6	FQ 51	FF 23	FQ 41
11	FQ 21	FQ 11	FQ 21	FFQ 34	FFQ 11	HC 13	C 4	CQ 31	CQ 41	HCL 11	CL 24	CLQ 14	LQ 81	LQ 41	L 4	L 9	LQ 41	CL 54	LQ 71	LQ 31	FQ 31	F 4	F 5	F 7
12	F 6	FQ 61	FQ 31	FQ 21	FQ 11	LQ 41	CL 22	LC 42	C 2	L 5	L 6	L 5	HL 11	C 2	C 5	CL 11	CL 41	CL 43	LL 84	C 4	FQ 41	FFQ 15	FF 15	FF 19
13	F 3	FQ 41	FQ 31	FQ 21	FQ 21	LQ 11	LQ 41	LQ 51	LQ 71	CQ 31	LQ 51	LQ 41	L 2	L 3	L 3	CQ 11	C 1	C 3	C 7	L 4	F 3	FQ 21	FQ 31	FF 11
14	FF 21	FF 23	FF 25	FFQ 24	FFQ 22	CLQ 22	CLQ 42	C 5	L 2	L 4	L 4	LQ 61	CLQ 24	CL 28	LQ 81	L 8	L 4	L 6	LQ 61	L 9	F 6	FQ 51	F 5	F 3
15	FQ 31	FQ 21	FQ 31	FQ 31	F 4	FQ 31	CQ 71	CQ 41	CQ 61	CQ 31	CLQ 33	CQ 21	LQ 41	L 4	LQ 31	LQ 81	LQ 81	L 9	LQ 51	LQ 51	FQ 51	FQ 61	FFQ 25	FQ 31
16	FQ 61	FQ 61	FQ 51	FQ 41	F 3		C 5	CQ 31	CQ 41	CQ 61	LQ 51	LQ 61	CLQ 13	LQ 41	LQ 51	LQ 31	L 4	CLQ 32	LQ 41	LQ 31	FF 32	F 5	F 3	F 2
17	FQ 41	FQ 51	FQ 21	FQ 31	FQ 21	CL 12	L 6	LQ 41	LQ 31	LQ 21	CQ 41	CQ 31	LCH 61	CLH 11	CLH 11	LQ 21	L 3	LQ 51	LCQ 42	CLQ 34	F 8	FQ 41	F 4	F 3
18	FF 11	F 2	F 1	F 1	F 3	C 1	C 2	CLQ 33	CQ 31	LQ 61	LQ 31	L 4	CH 21	CL 11	CL 21	L 2	L 1	L 1	C 1	CH 11	F 3	FF 35	FQ 51	F 3
19	F 3	FQ 31	FQ 21	F 3	FQ 21	LQ 31	C 3	CQ 31	C 3	CQ 61	LC 12	CQ 31	CQ 51	CQ 21	CQ 51	CQ 31	LQ 21	LQ 31	L 4	CL 14	F 7	F 6	F 4	F 6
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21	F 5	FF 22	FF 52	F 2	F 1	C 2	C 1	C 5	CLQ 13	CQ 31	CQ 41	LQ 41	LQ 31	LQ 41	LQ 31	LQ 21	CQ 61	CQ 31	LQ 91	L 8	F 9	FQ 51	FQ 61	FQ 51
22	FQ 51	FQ 21	FQ 21	FFQ 11	FQ 11	LQ 11	CQ 11	CQ 11	LQ 51	LQ 31	LQ 51	LQ 41	LQ 41	LQ 41	C 3	C 2	C 2	C 6	LQQ 51	LQ 61	FQ 51	FFQ 22	FQ 21	FQ 41
23	FQ 31	FQ 21	FQ 41	FQ 11	FQ 21	LQ 41	L 4	LQ 31	LQ 31	LQ 21	LQ 21	C 2	C 3	C 1	C 1	L 1	HL 11	CL 11	C 7	L 2	F 3	F 2	F 4	F 4
24	F 4	FF 12	FF 72	F 8	F 9	FQ 41	C 6	CQ 91	CQ 41	LQ 51	LQ 51	LQ 41	CQ 21	LQ 31	C 8	C 4	L 5	LQ 31	L 3	L 5	F 6	F 4	F 4	F 2
25	F 1		F 1	F 1	F 2	L 5	C 2	C 3	L 1	CL 11	L 1		L 1	L 1	L 1	L 2	L 2	HL 12	L 2	L 5	FQ 31	FQ 21	F 2	FQ 21
26	F 4	FQ 61	FQ 71	FQ 61	FQ 51	LQ 21	CQ 41	CQ 61	CQ 81	LQ 81	LQ 41	CQ 51	CQ 71	C 4	C 2	C 4	L 5	L 6	L 2	LQ 31	FFQ 27	FF 93	FQ 61	FQ 51
27	F 9	FQ 41	FQ 51	FQ 51	F 1	C 3	C 6	C 3	CQ 21	CQ 11	LQ 41	LQ 21	L 1	L 1	LH 11	HL 11	CL 11	C 2	CL 31	CL 61	FF 33	FF 22	F 6	FQ 21
28	F 3	FQ 21	FQ 41	FQ 31	FFF 11	LQ 21	CQ 31	CQ 51	CQ 51	CQ 31	CQ 11	LQ 21	C 1	L 4	L 4	HL 11	L 4	LQ 51	LQ 41	LQ 51	FQ 21	FQ 21	FF 22	FQ 21
29	F 4	FQ 21	F 1	FQ 31	FQ 51	LQ 21	CL 31	C 6	CQ 51	CQ 51	CQ 31	LQ 41	C 2	CH 12	CQ 11	C 1	C 3	C 2	C 5	C 6	FF 63	FQ 41	FQ 21	FQ 31
30	FQ 21	FQ 21	FQ 21	F 2	FQ 31	FQ 21	C 3	C 3	CQ 31	LQ 71	LQ 51	CLQ 17	LQ 31	LQ 21	LQ 21	LQ 31	LQ 21	LQ 31	LQ 51	L 5	FQ 31	FQ 31	F 2	F 1
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUN. 2018 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

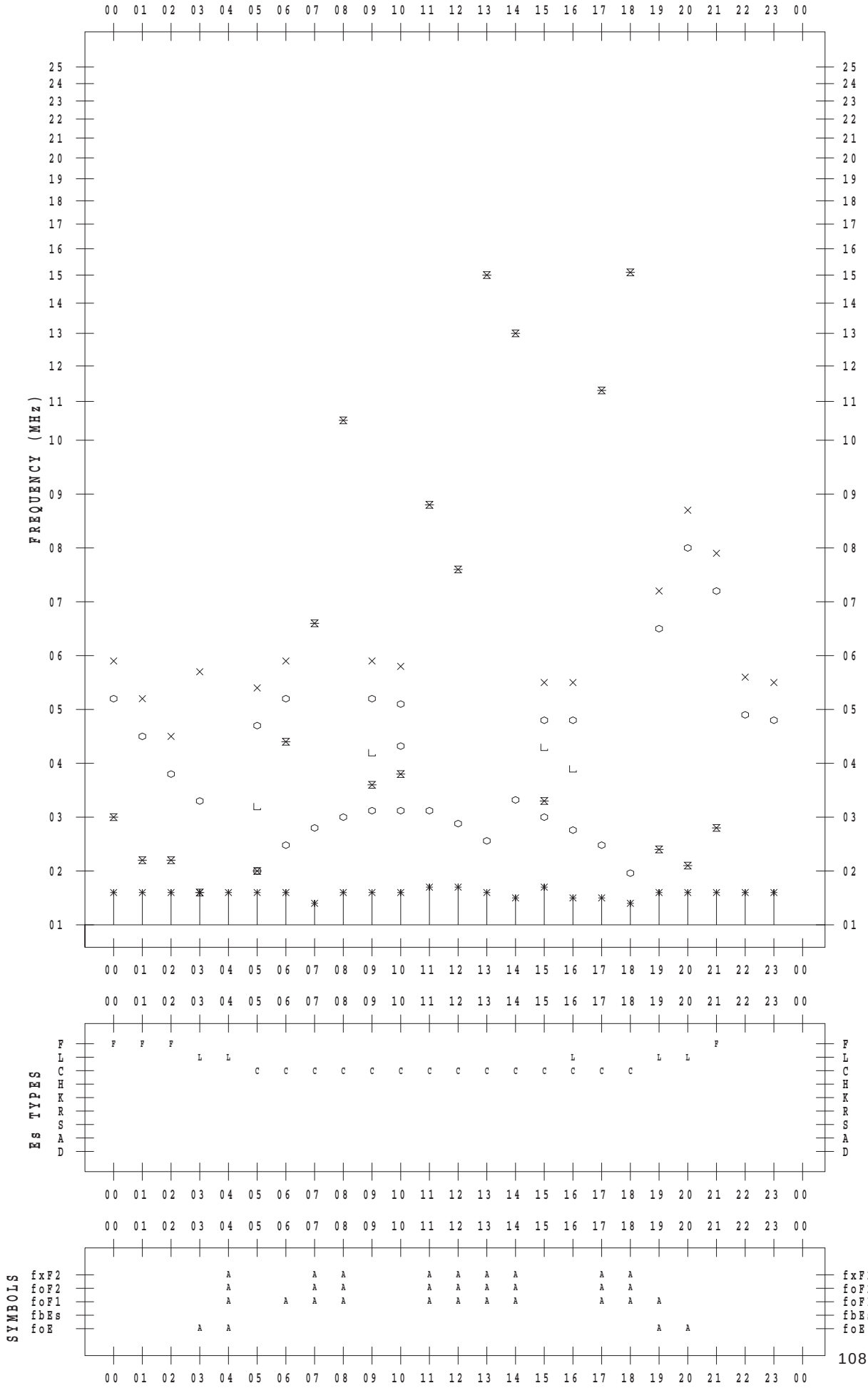
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 1

135 °E MEAN TIME



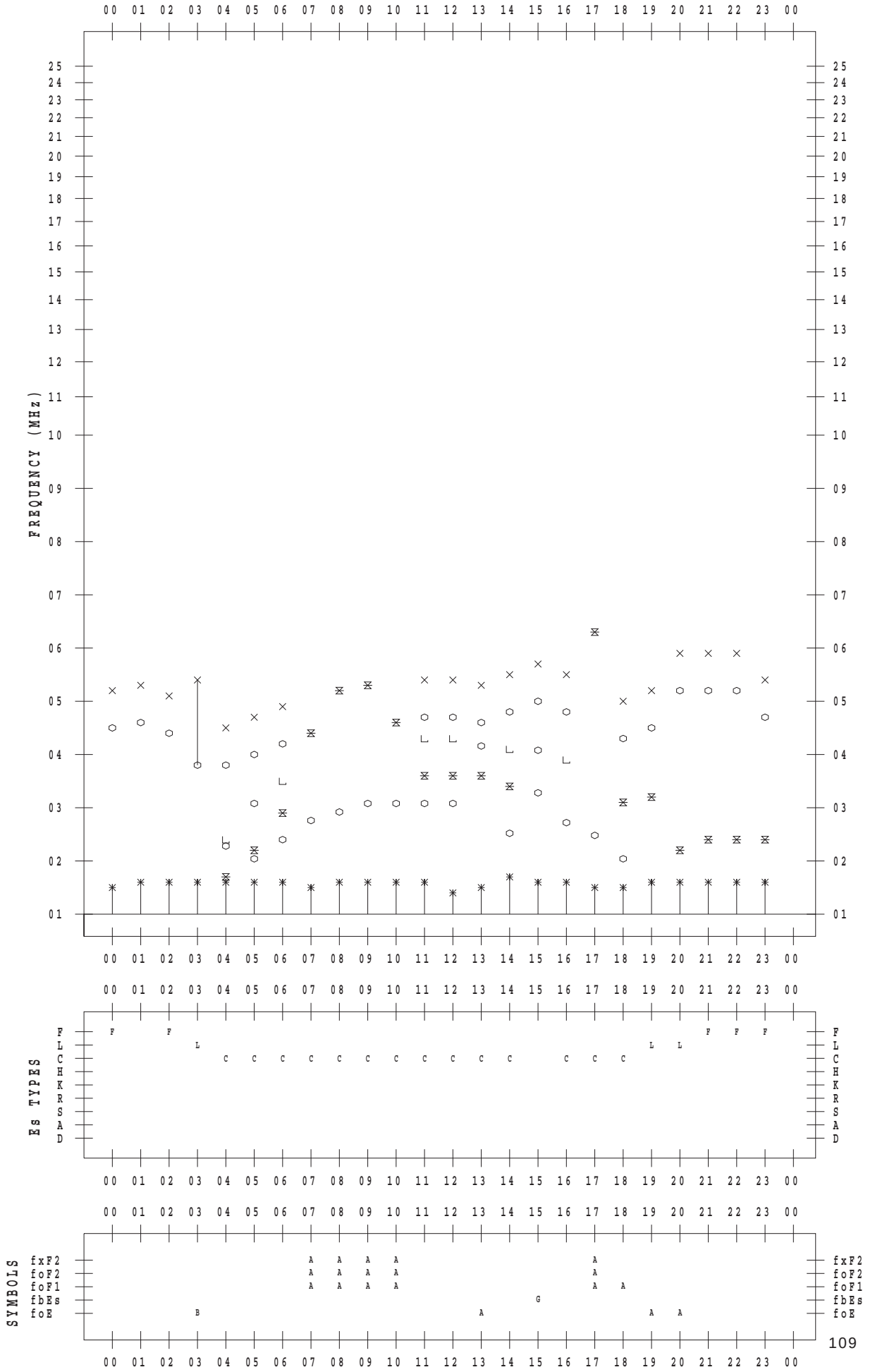
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 2

135 °E MEAN TIME



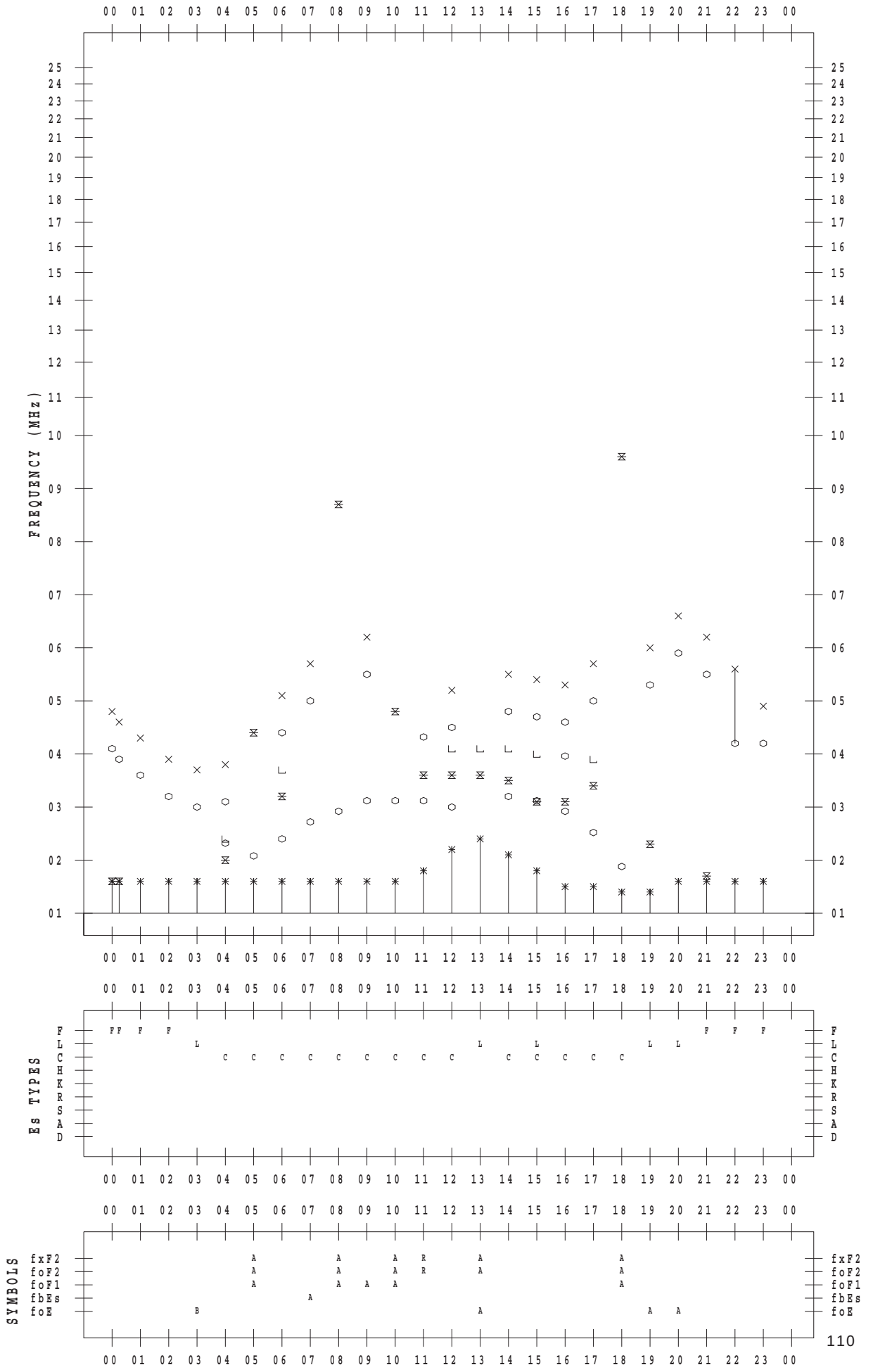
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 3

135 °E MEAN TIME



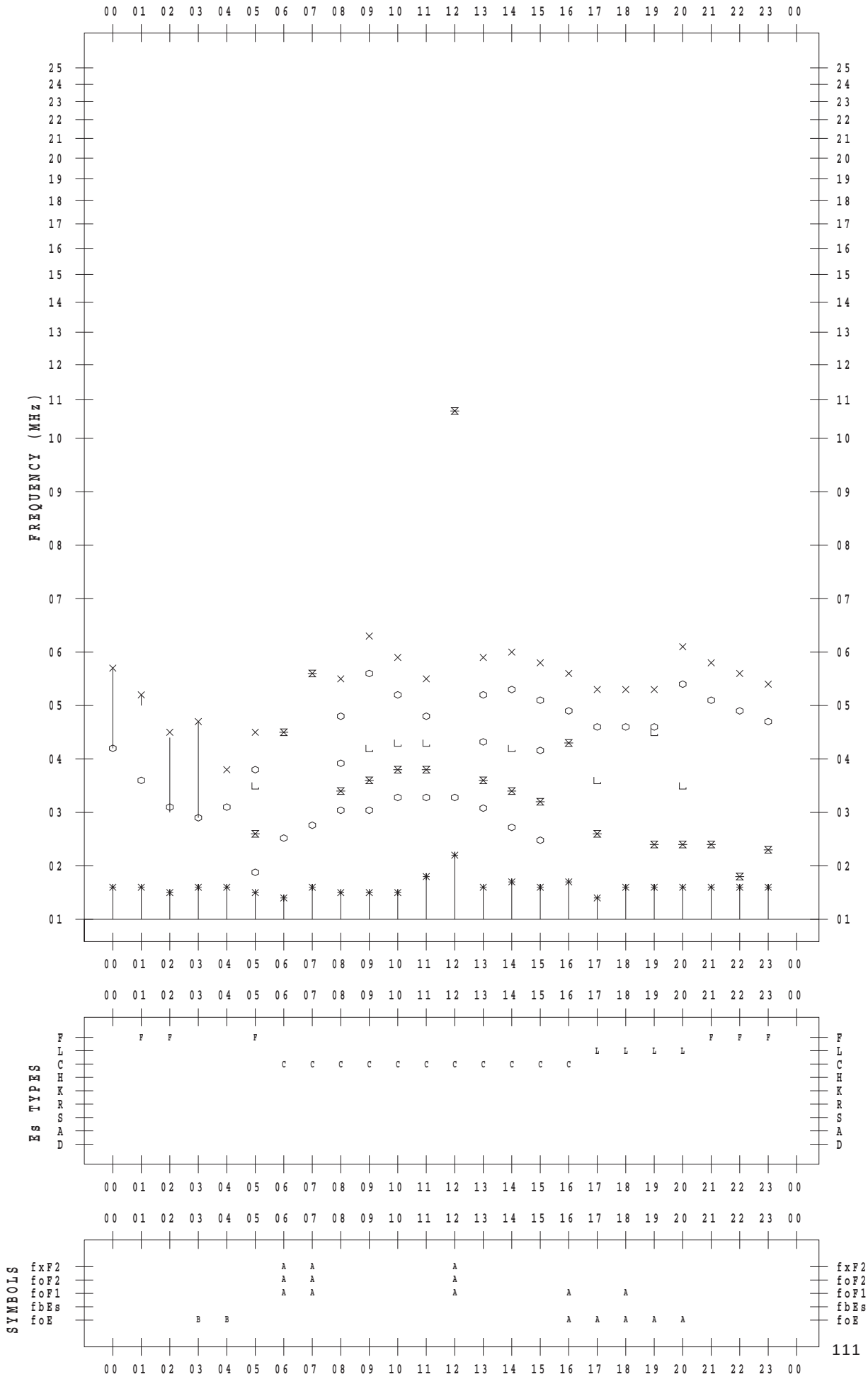
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 4

135 °E MEAN TIME



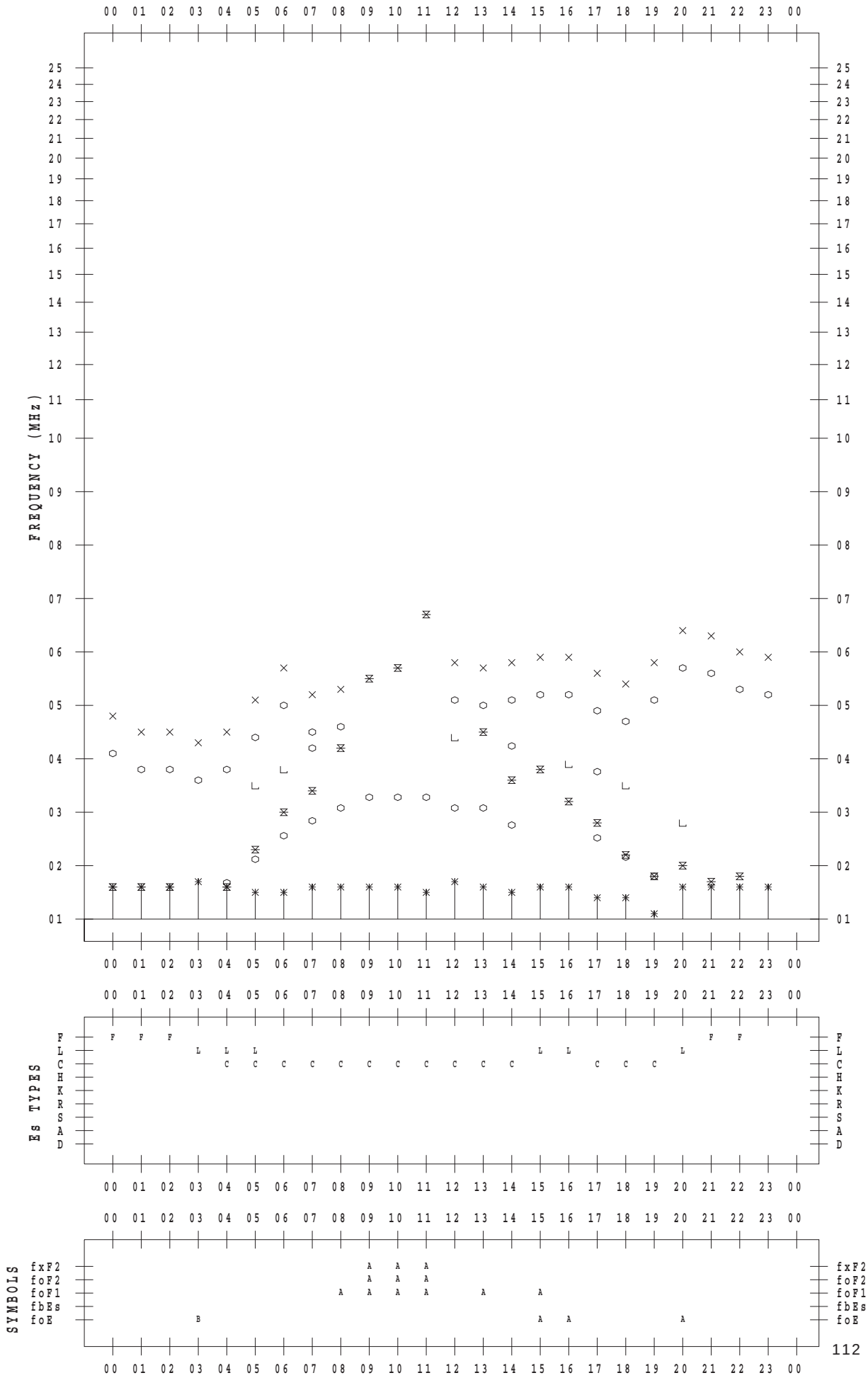
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 5

135 °E MEAN TIME



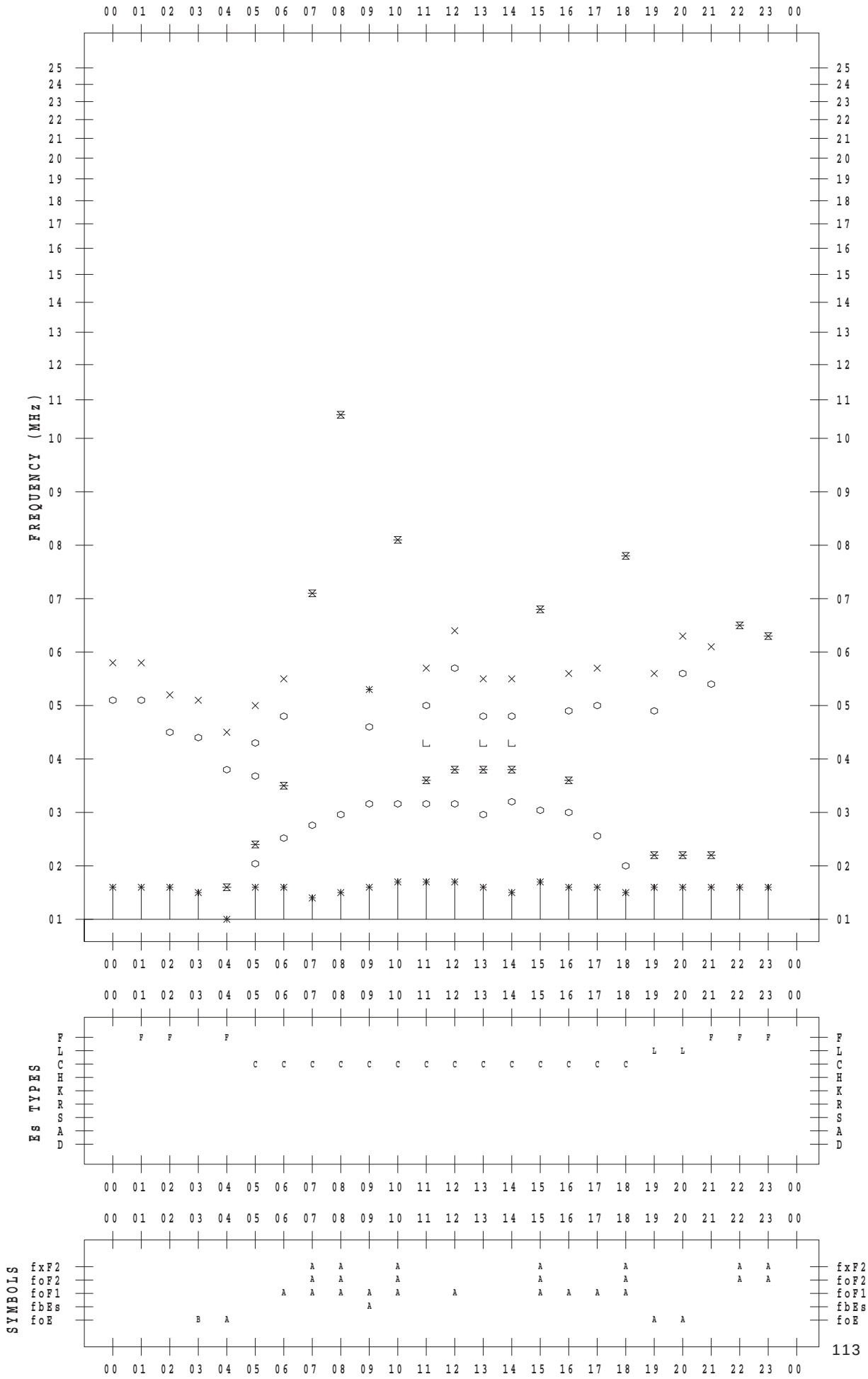
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 6

135 °E MEAN TIME



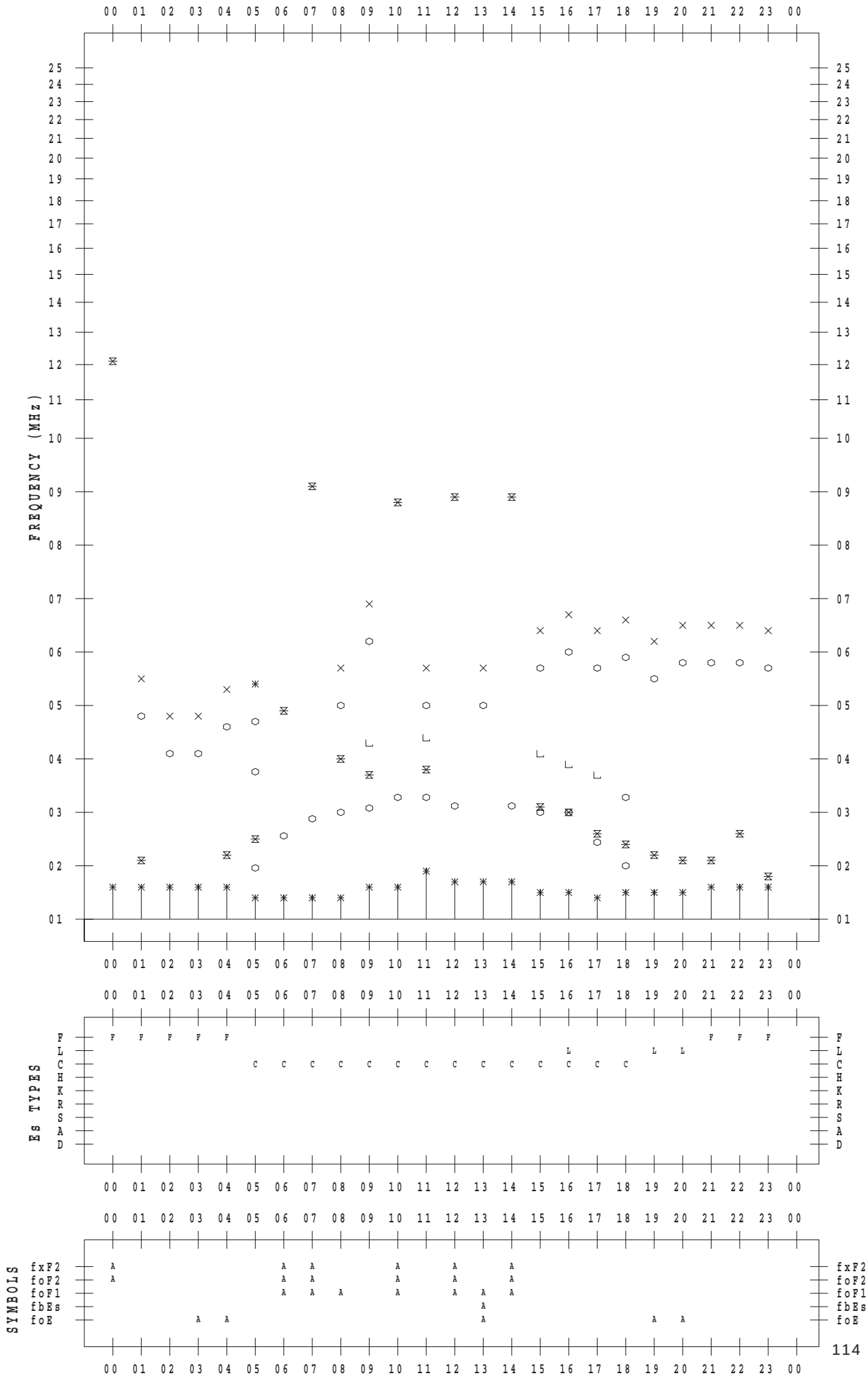
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 7

135 °E MEAN TIME



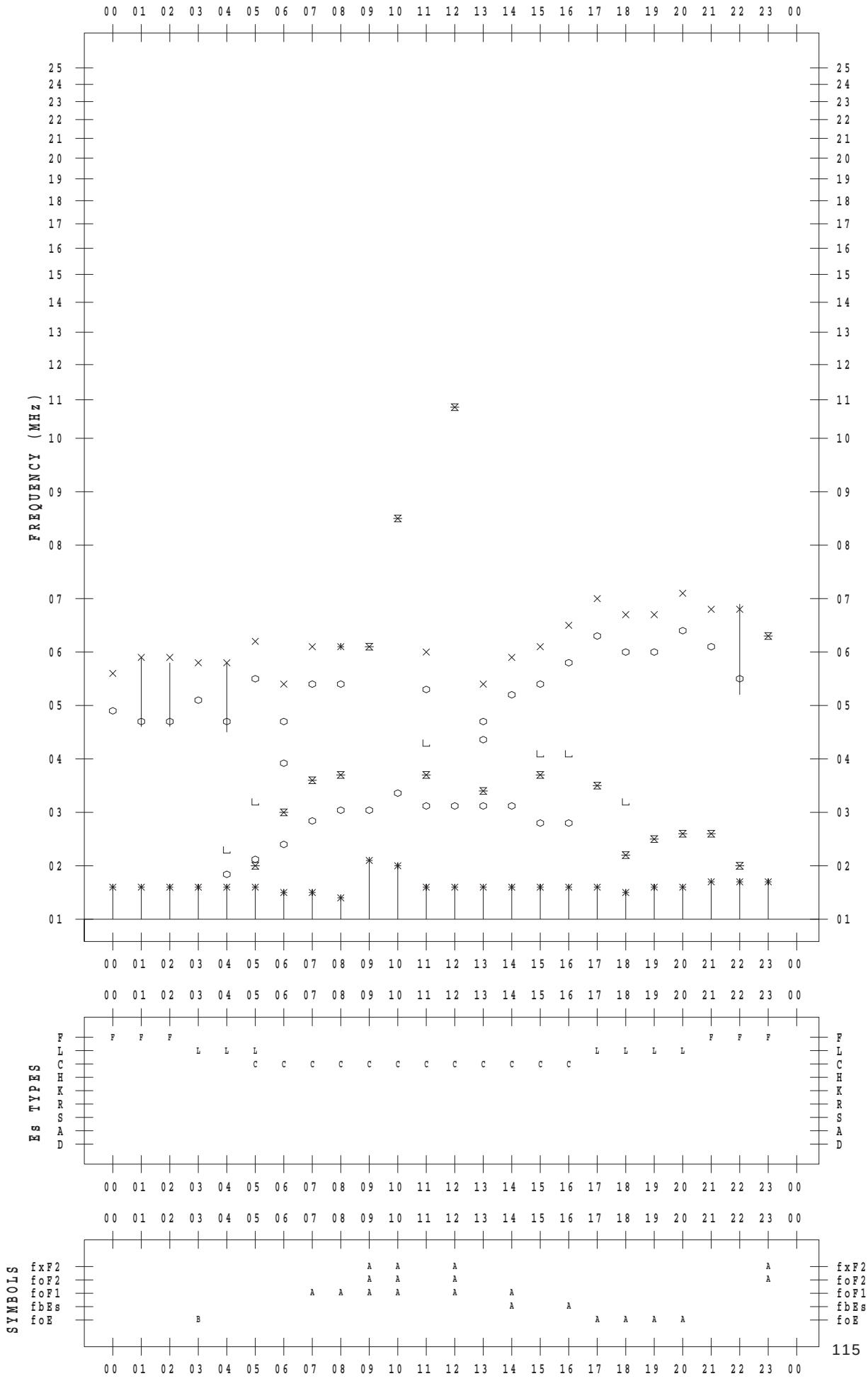
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 8

135 °E MEAN TIME



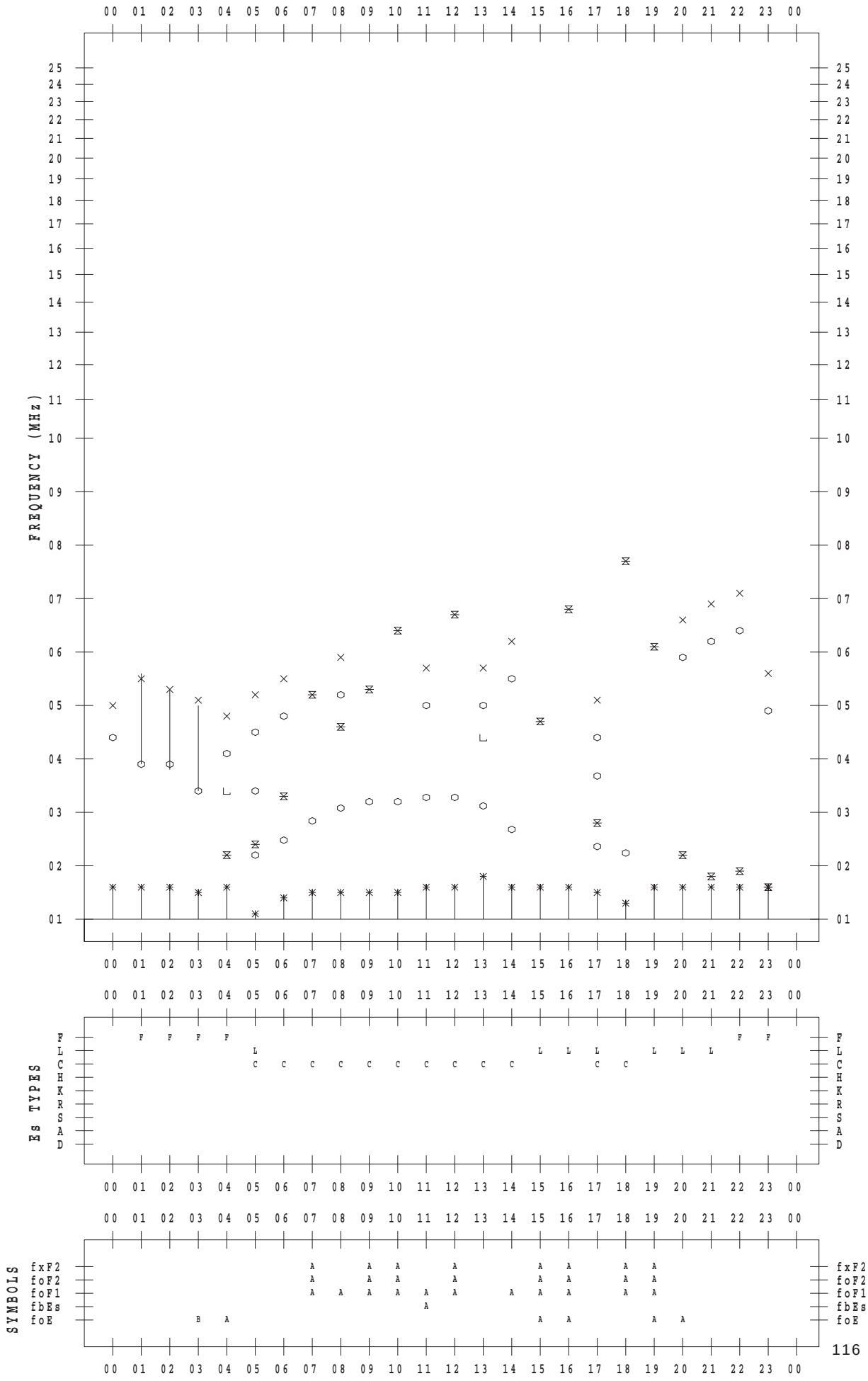
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/ 9

135 °E MEAN TIME



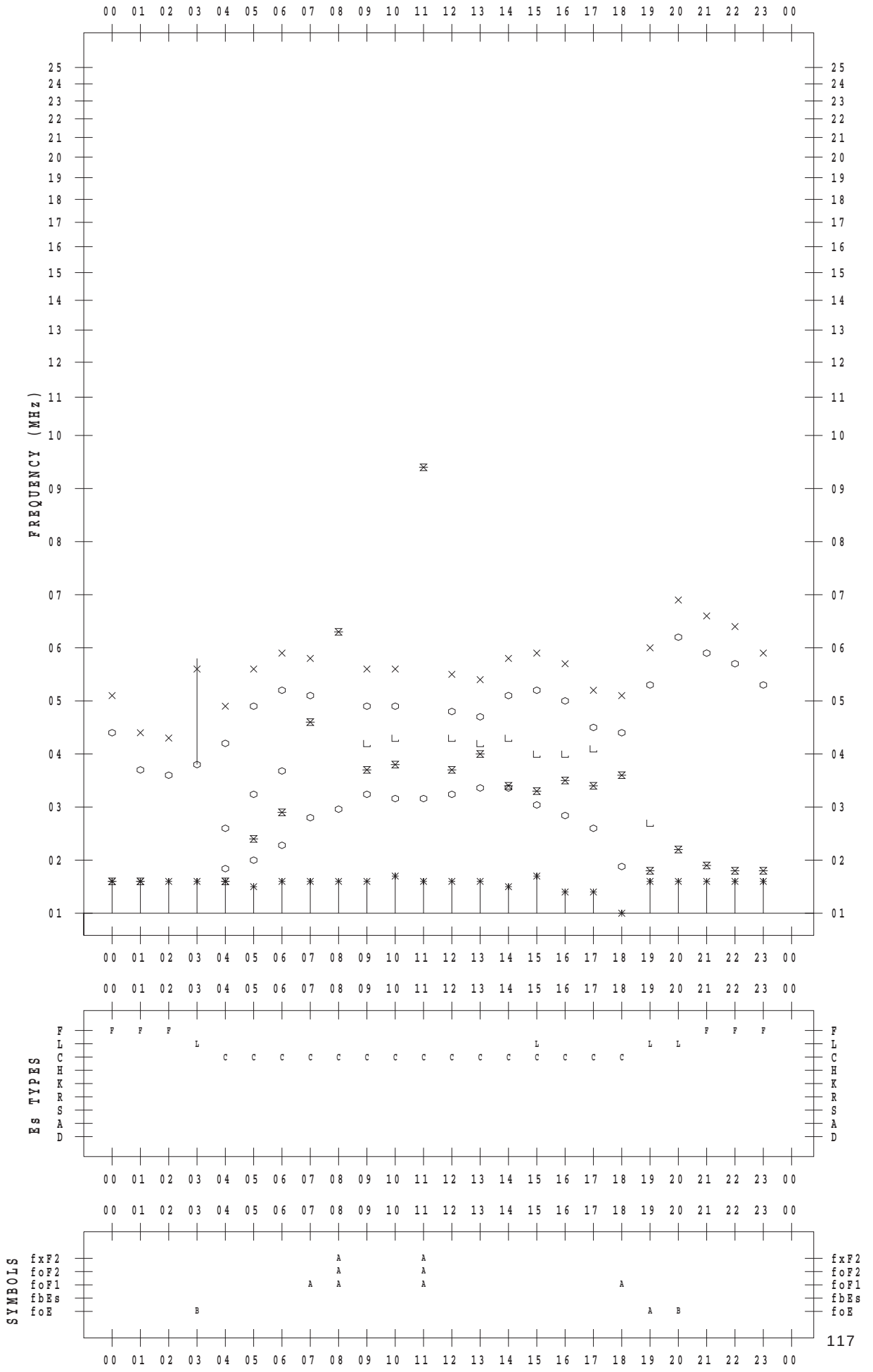
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/10

135 °E MEAN TIME



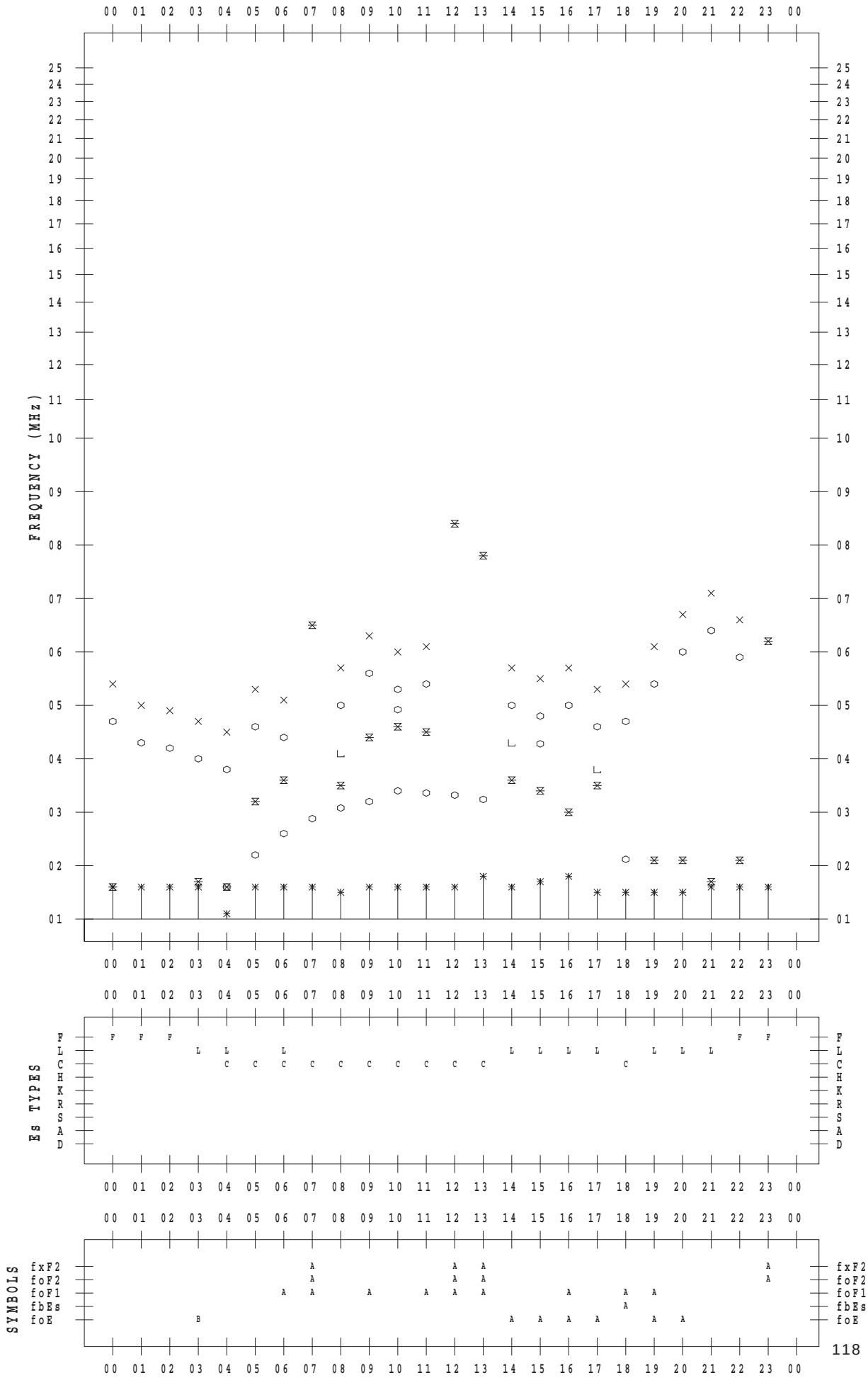
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/11

135 °E MEAN TIME



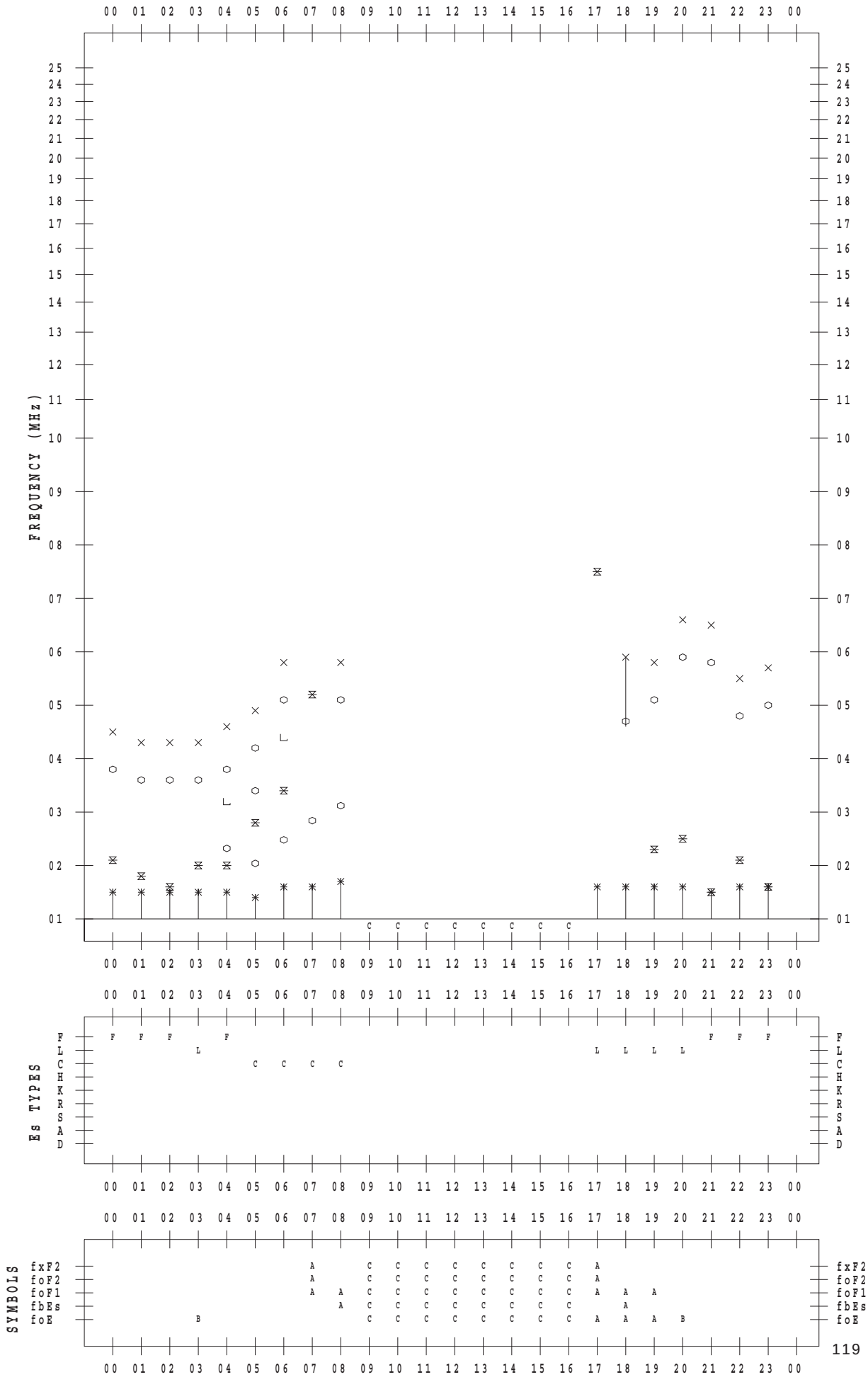
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/12

135 °E MEAN TIME



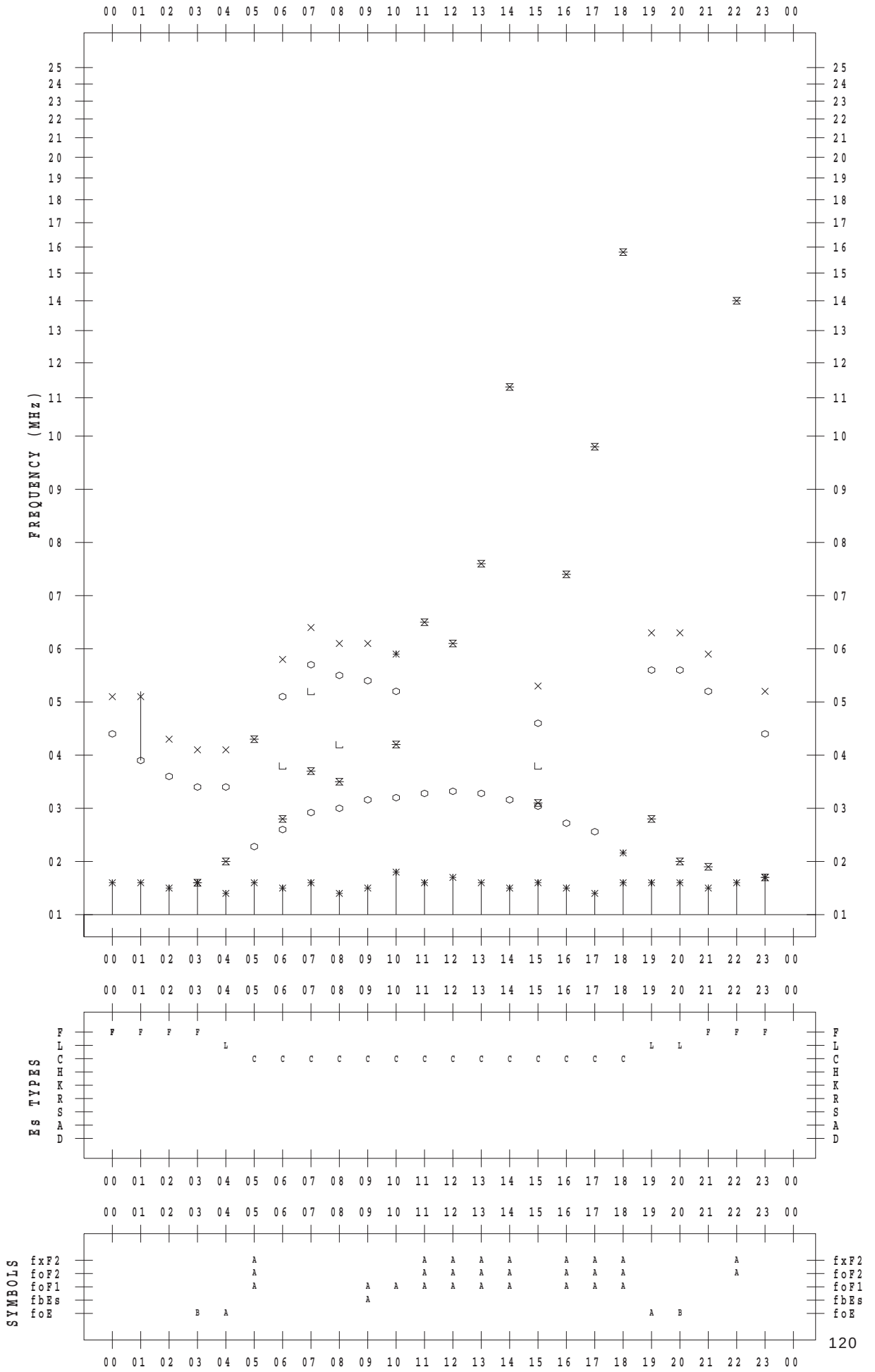
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/13

135 °E MEAN TIME



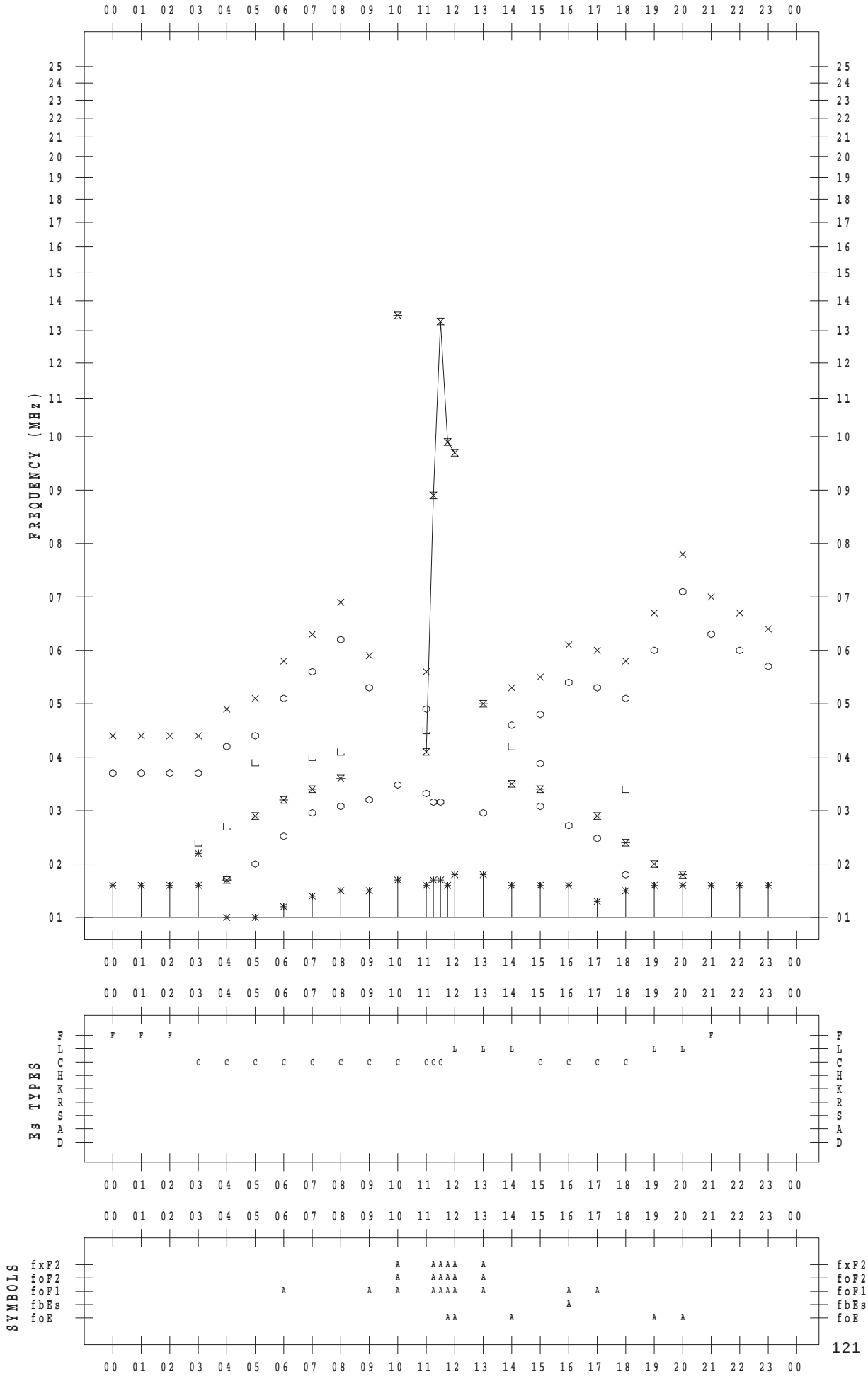
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/14

135 °E MEAN TIME



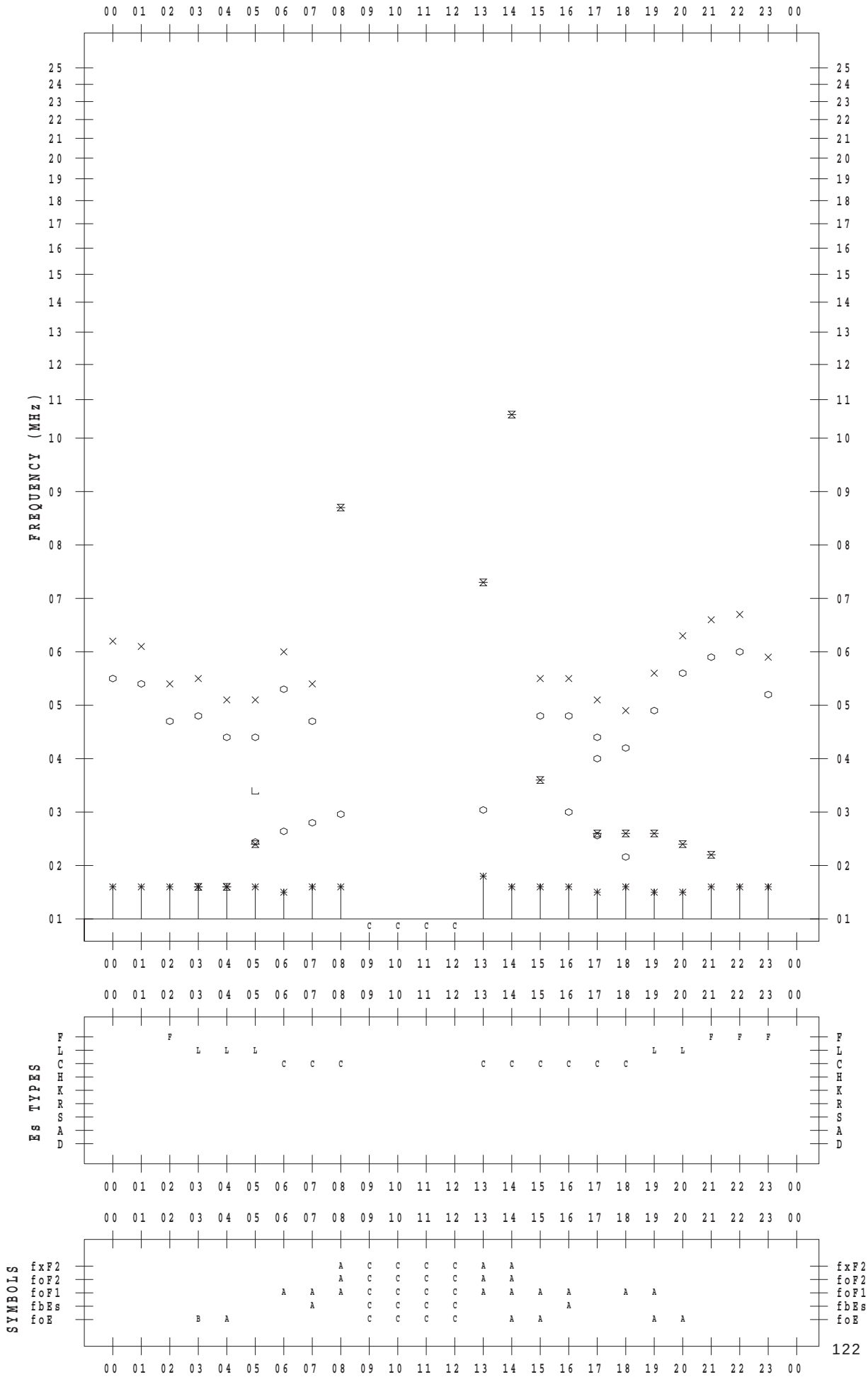
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/15

135 °E MEAN TIME



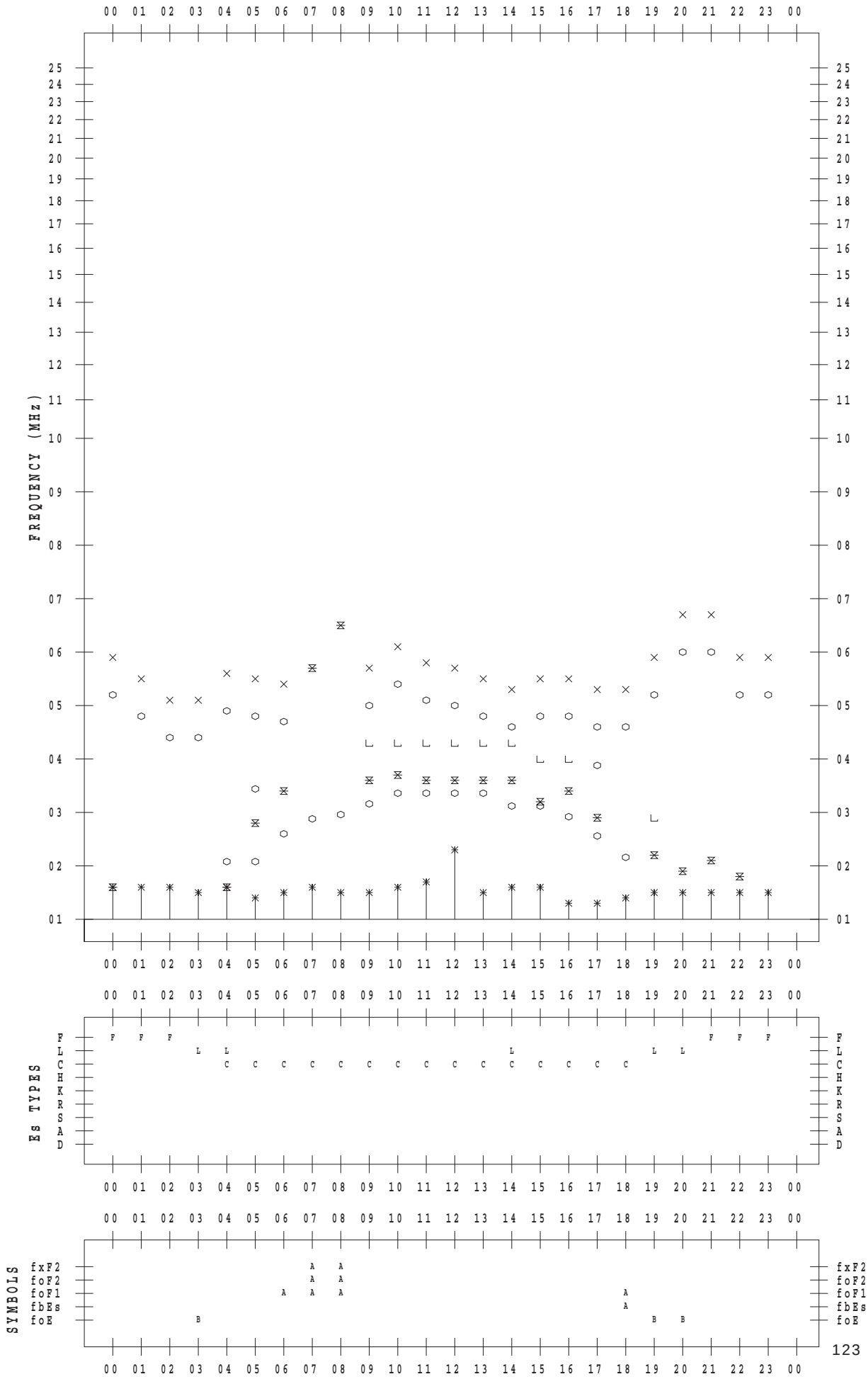
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/16

135 °E MEAN TIME



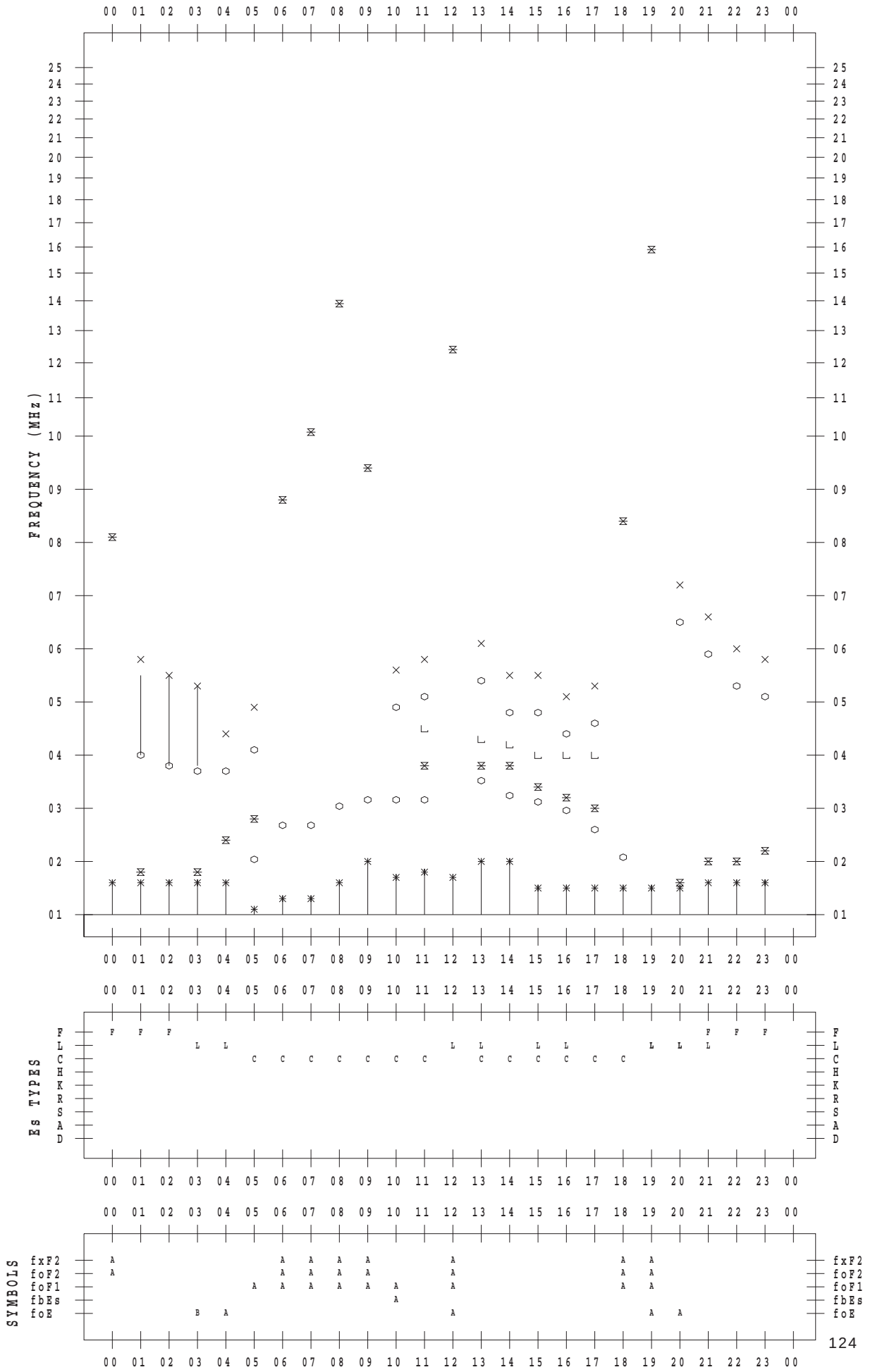
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/17

135 °E MEAN TIME



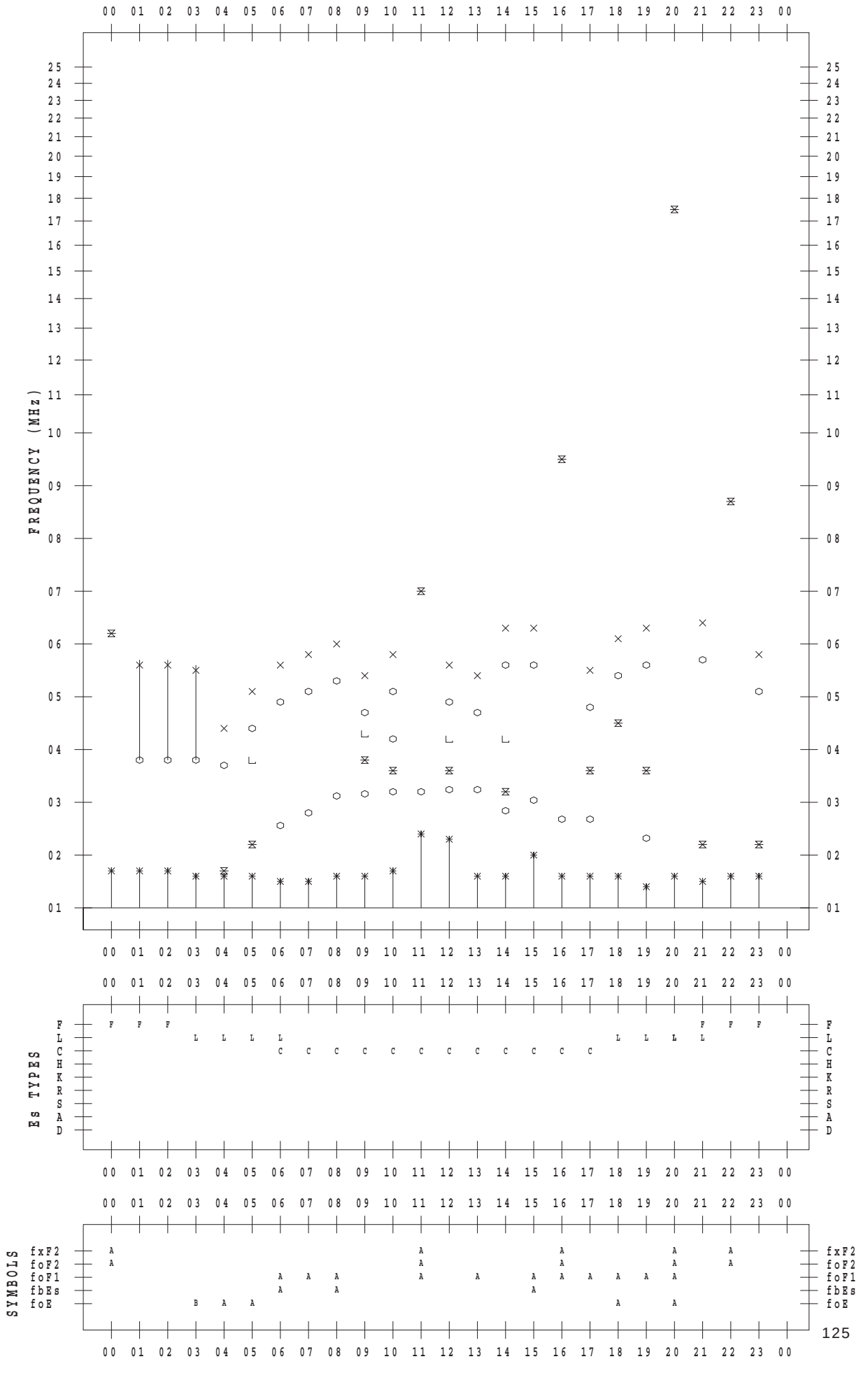
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/18

135 °E MEAN TIME



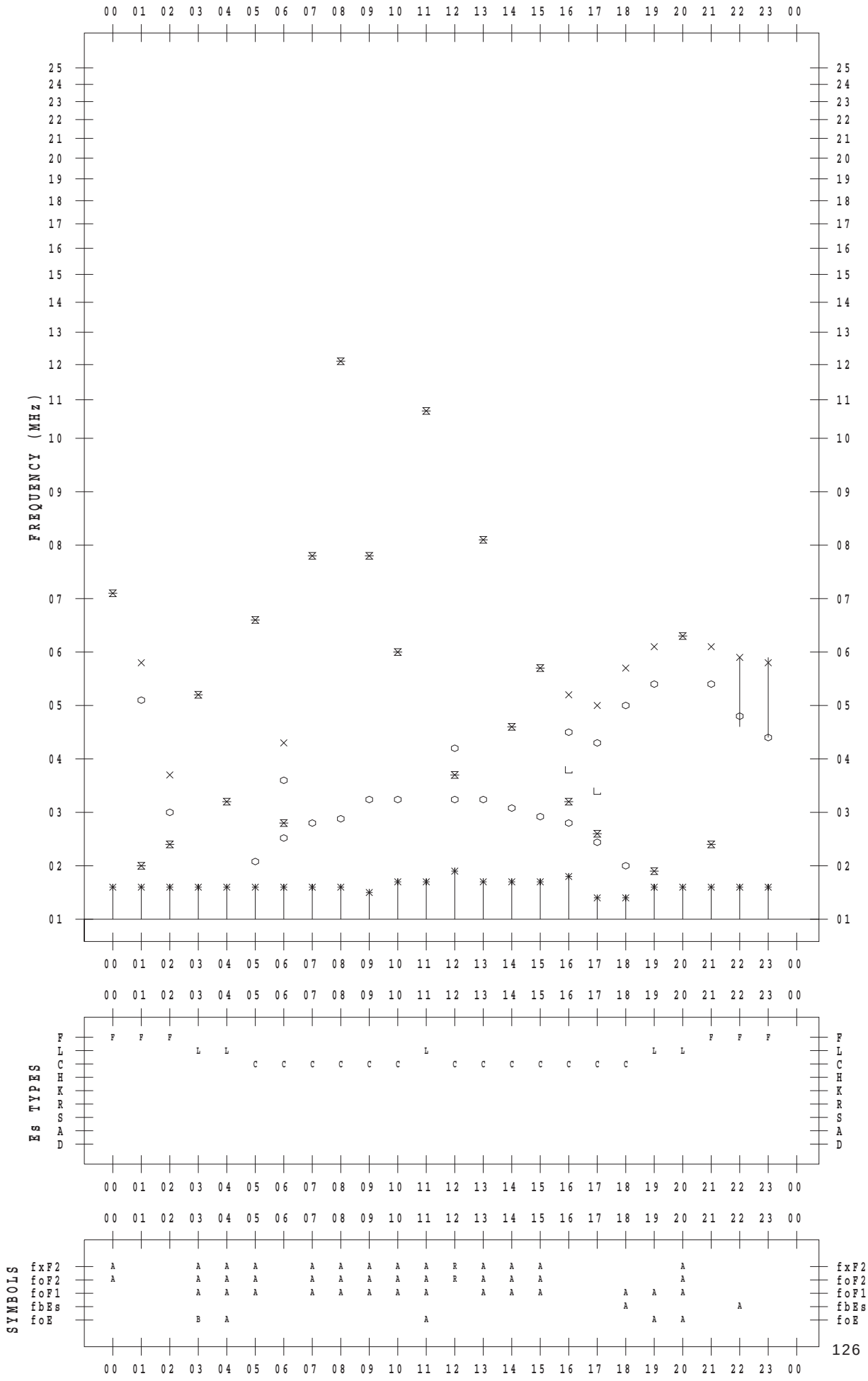
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/19

135 °E MEAN TIME



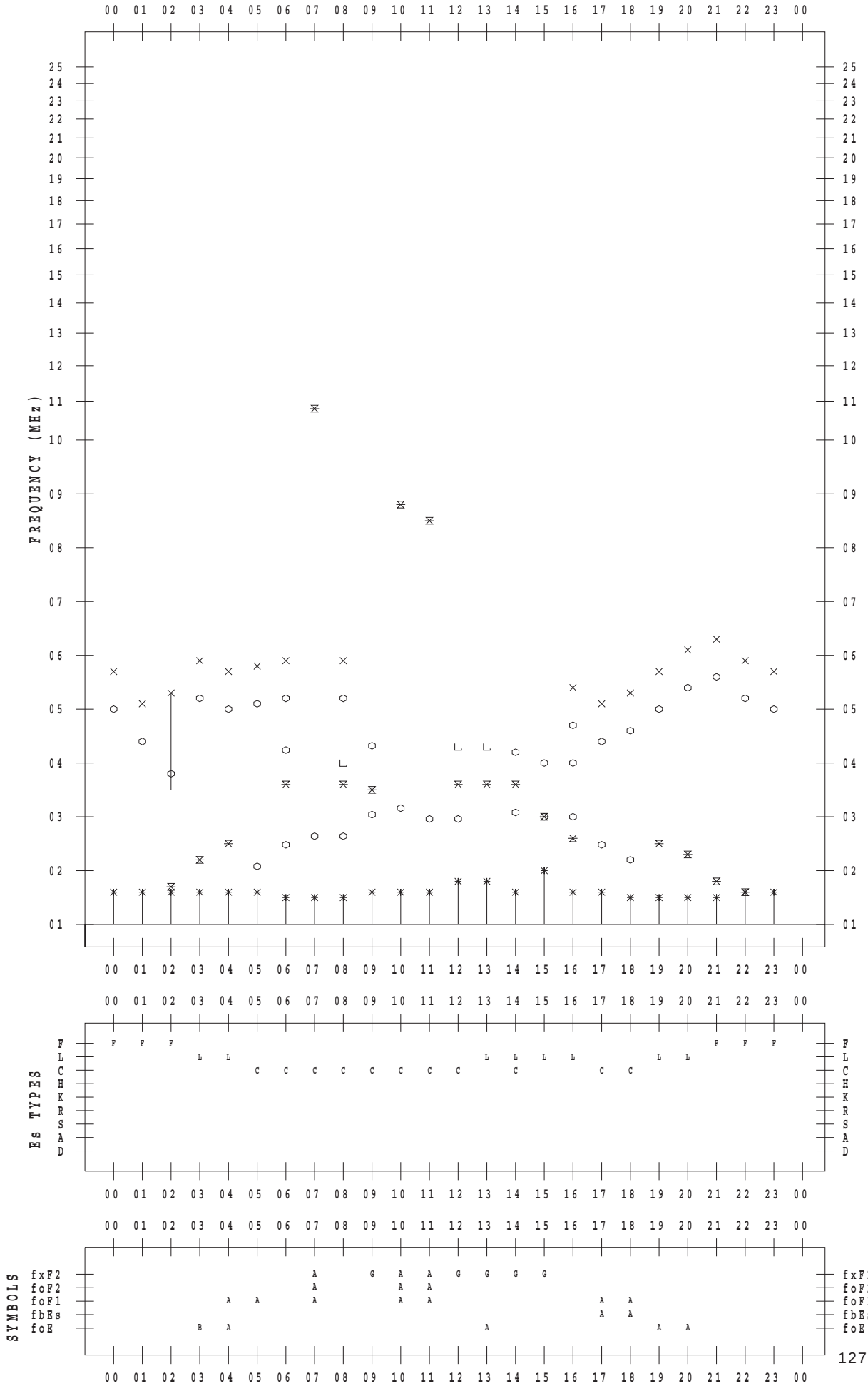
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/20

135 °E MEAN TIME



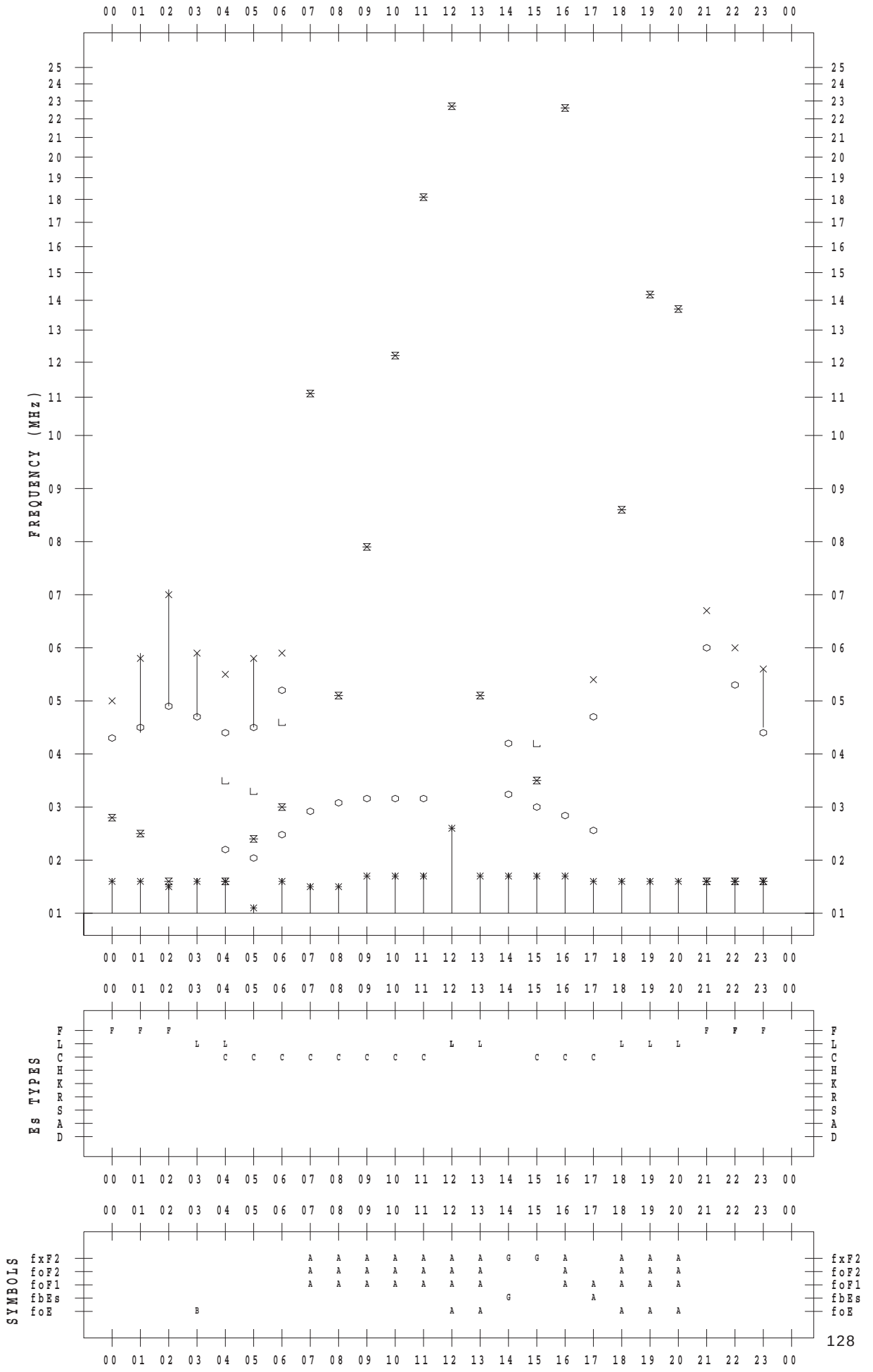
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/21

135 °E MEAN TIME



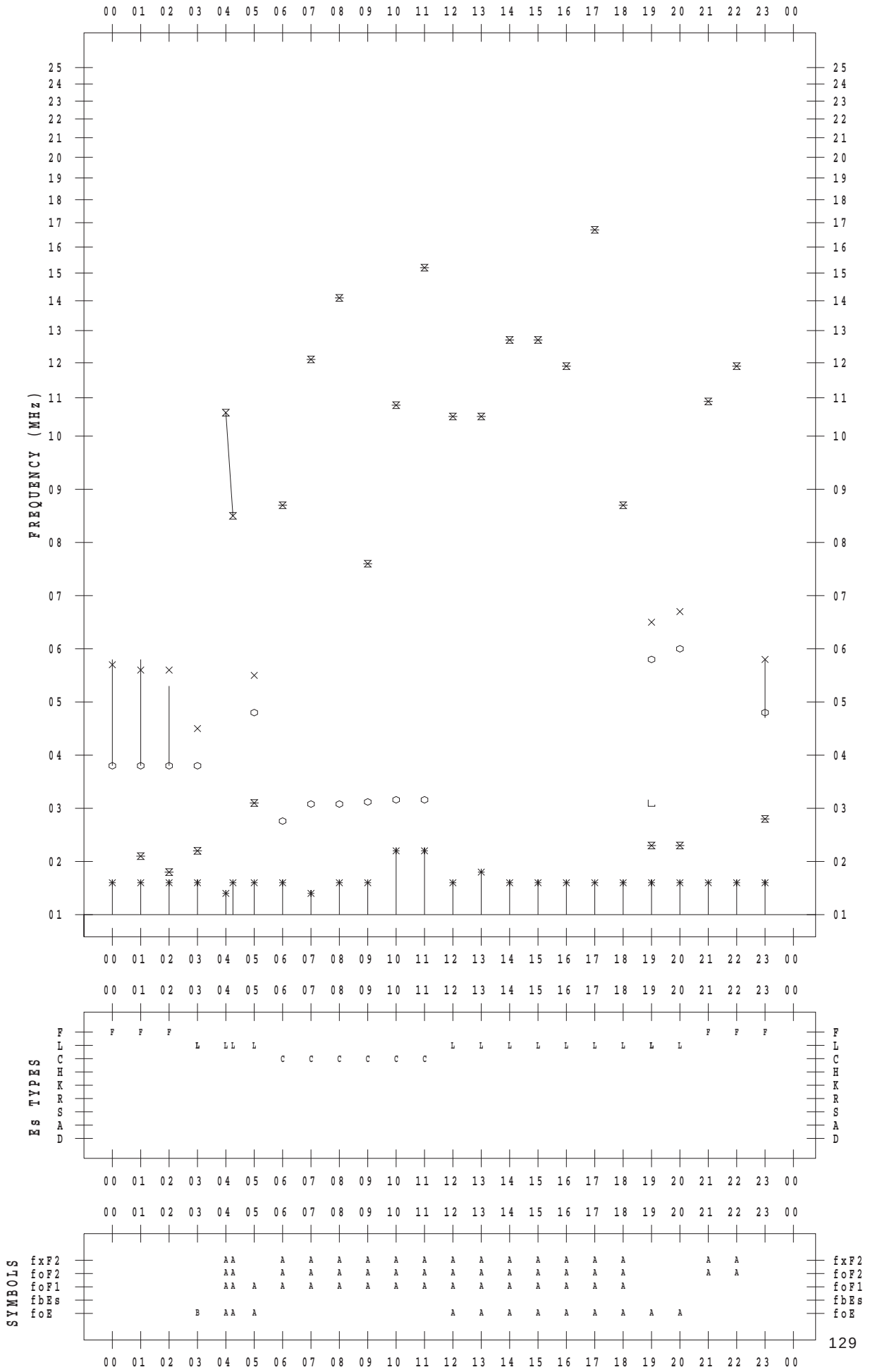
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/22

135 °E MEAN TIME



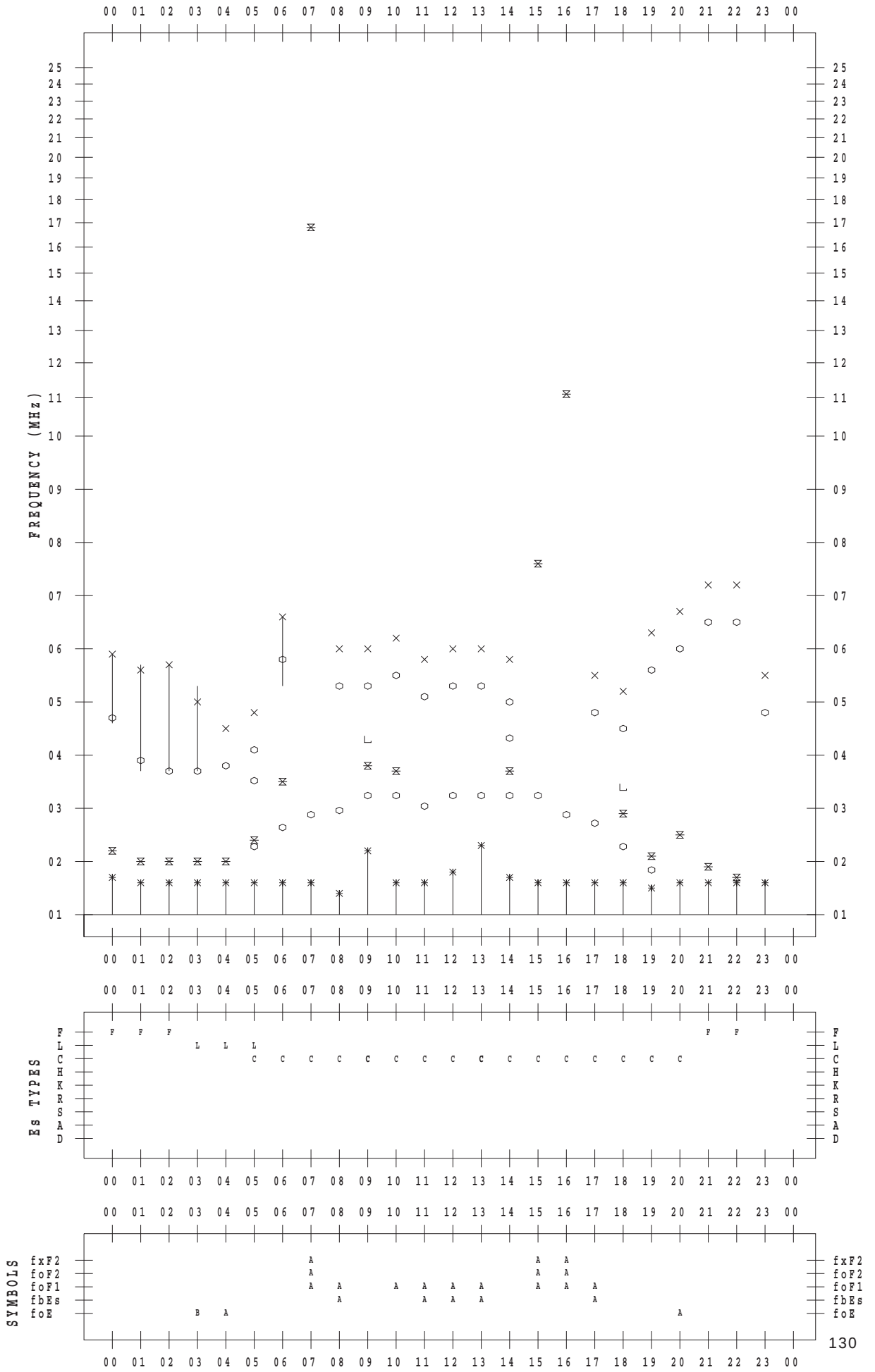
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/23

135 °E MEAN TIME



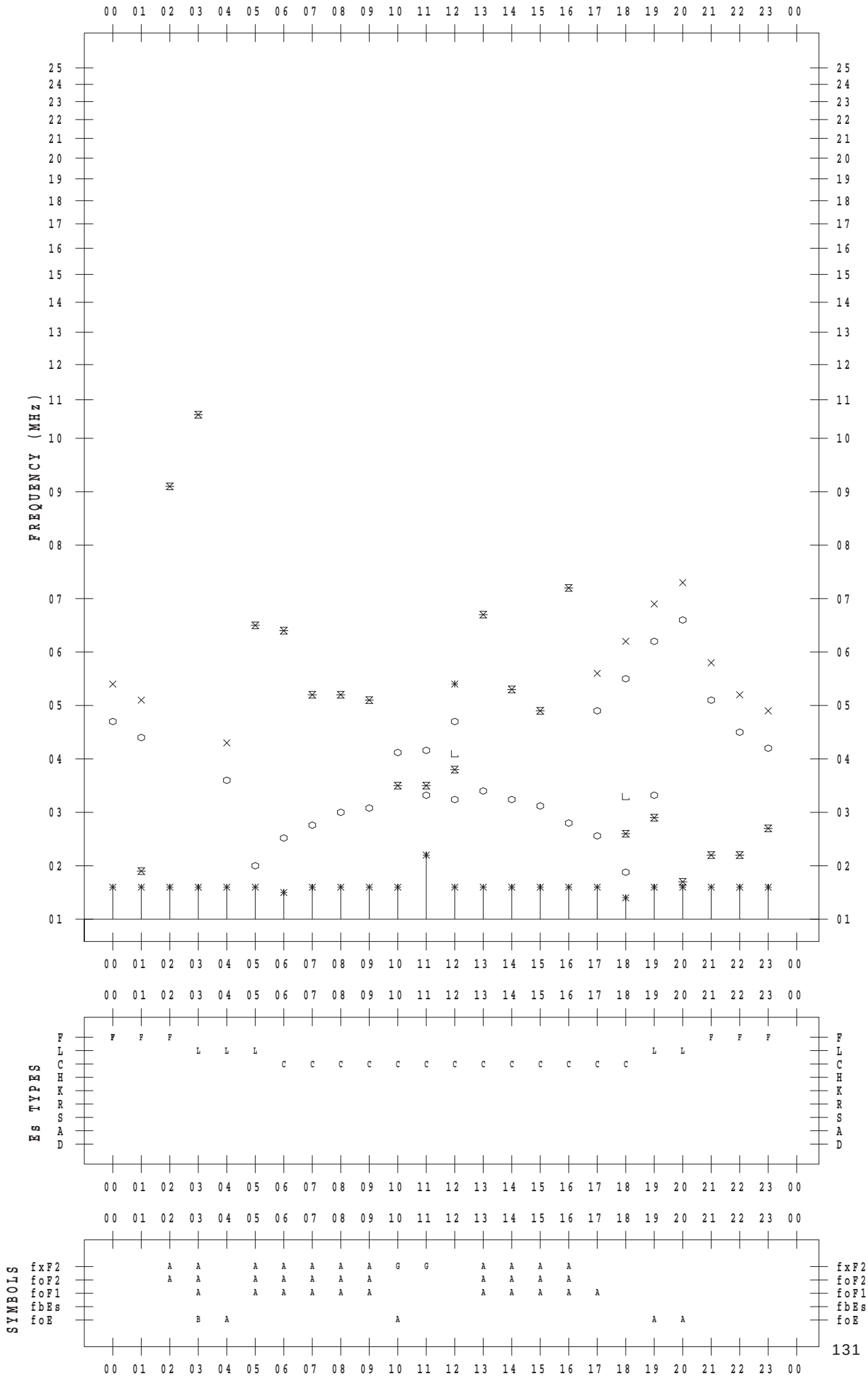
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/24

135 °E MEAN TIME



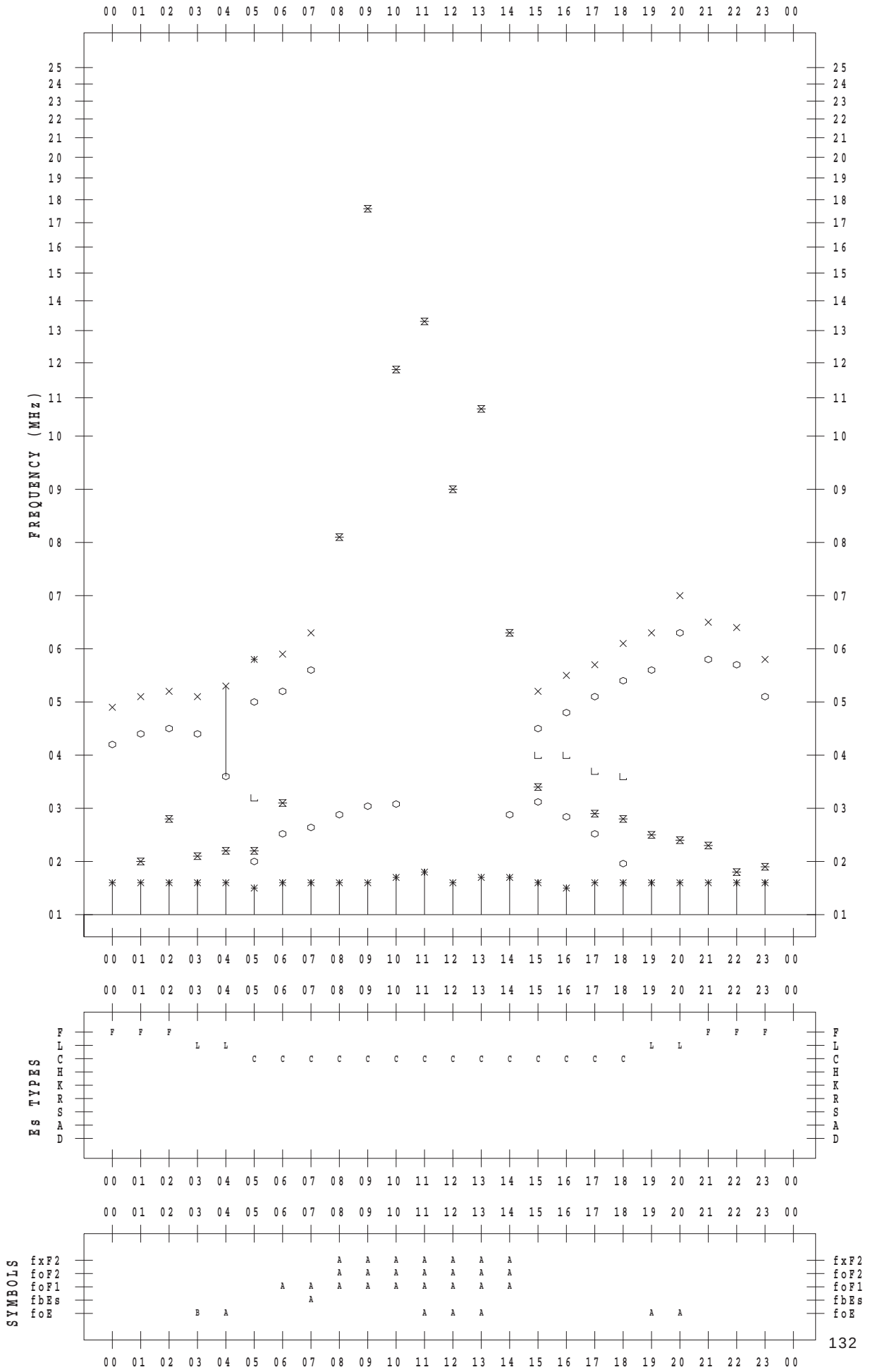
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/25

135 °E MEAN TIME



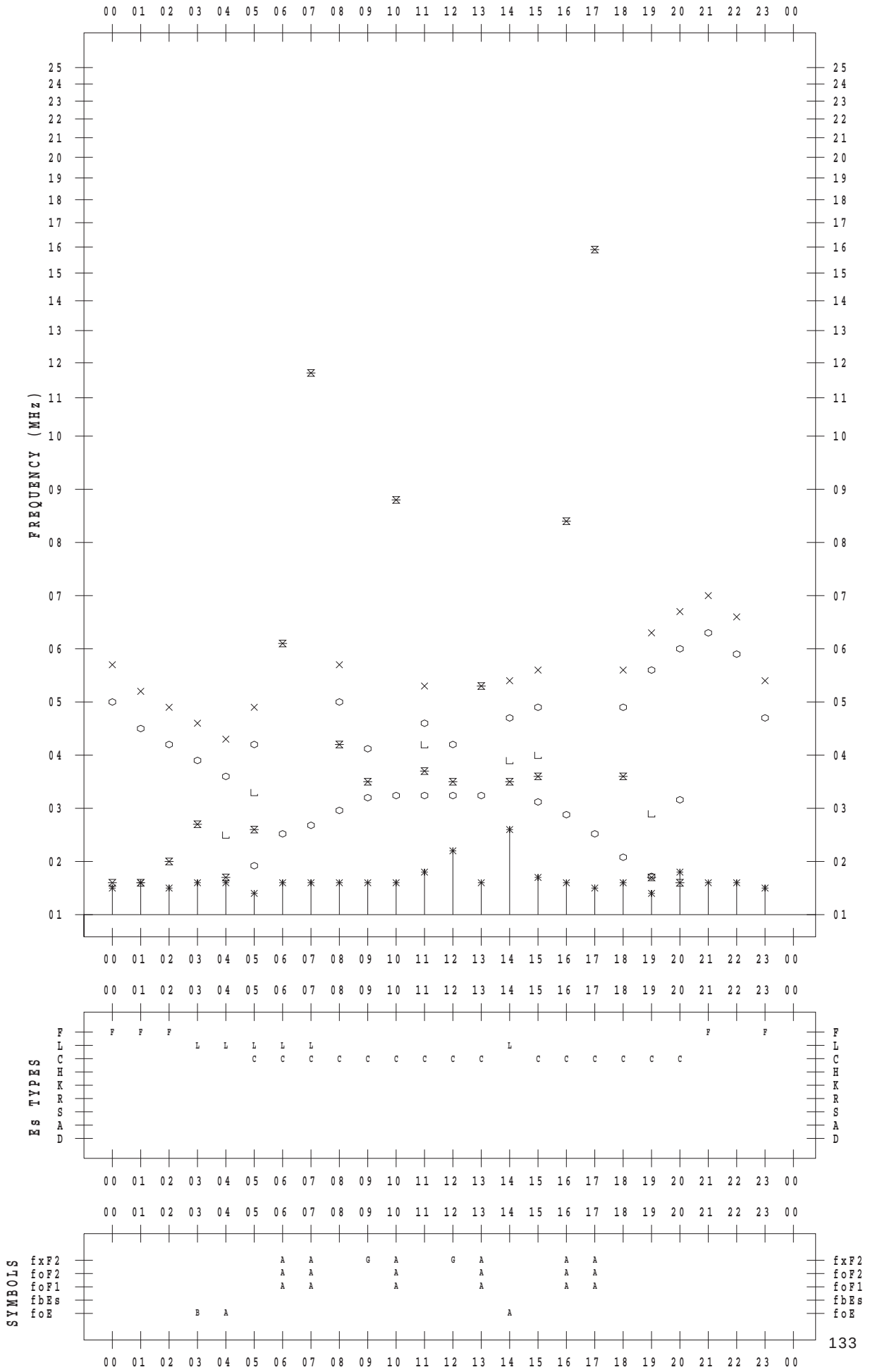
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/26

135 °E MEAN TIME



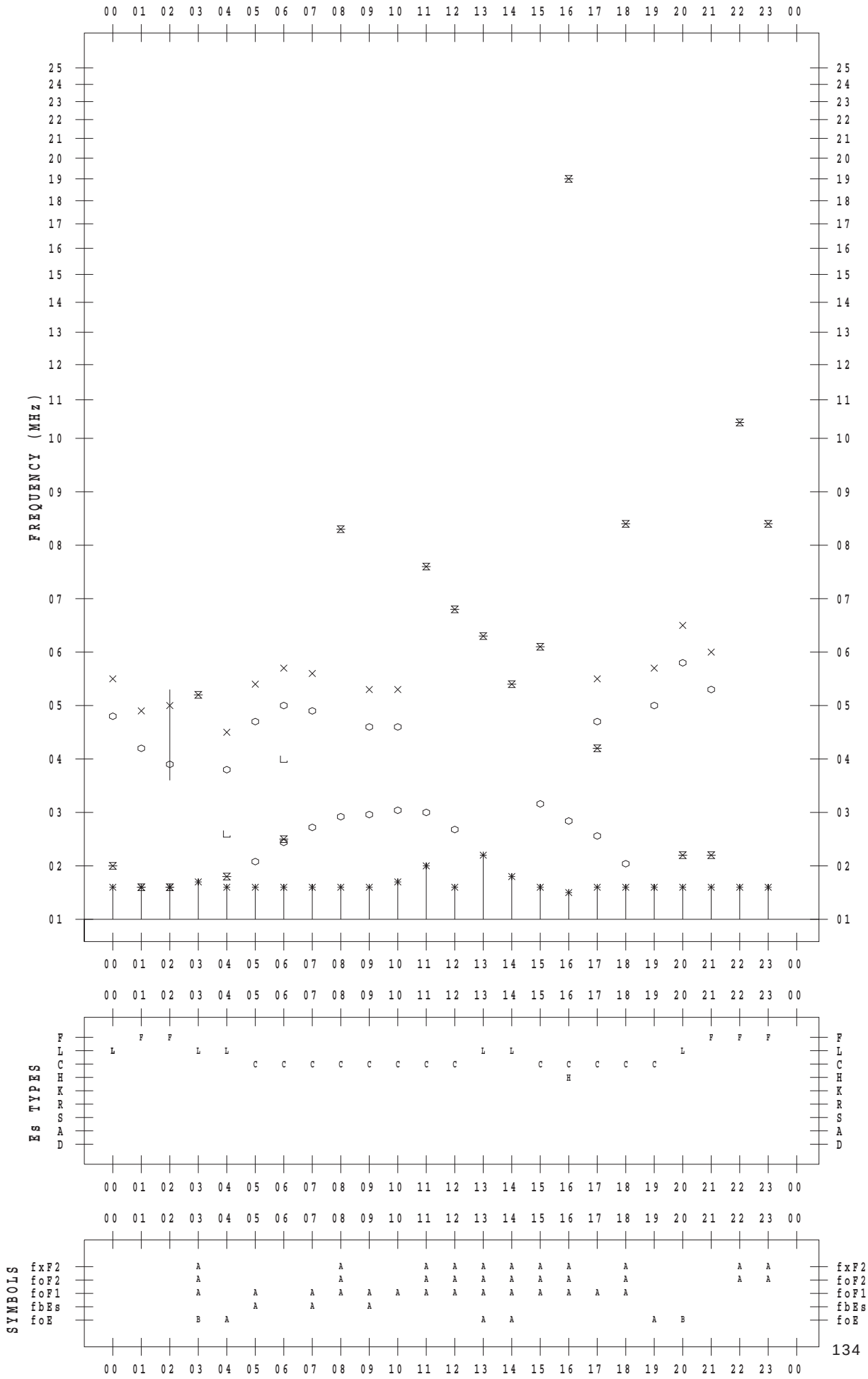
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/27

135 °E MEAN TIME



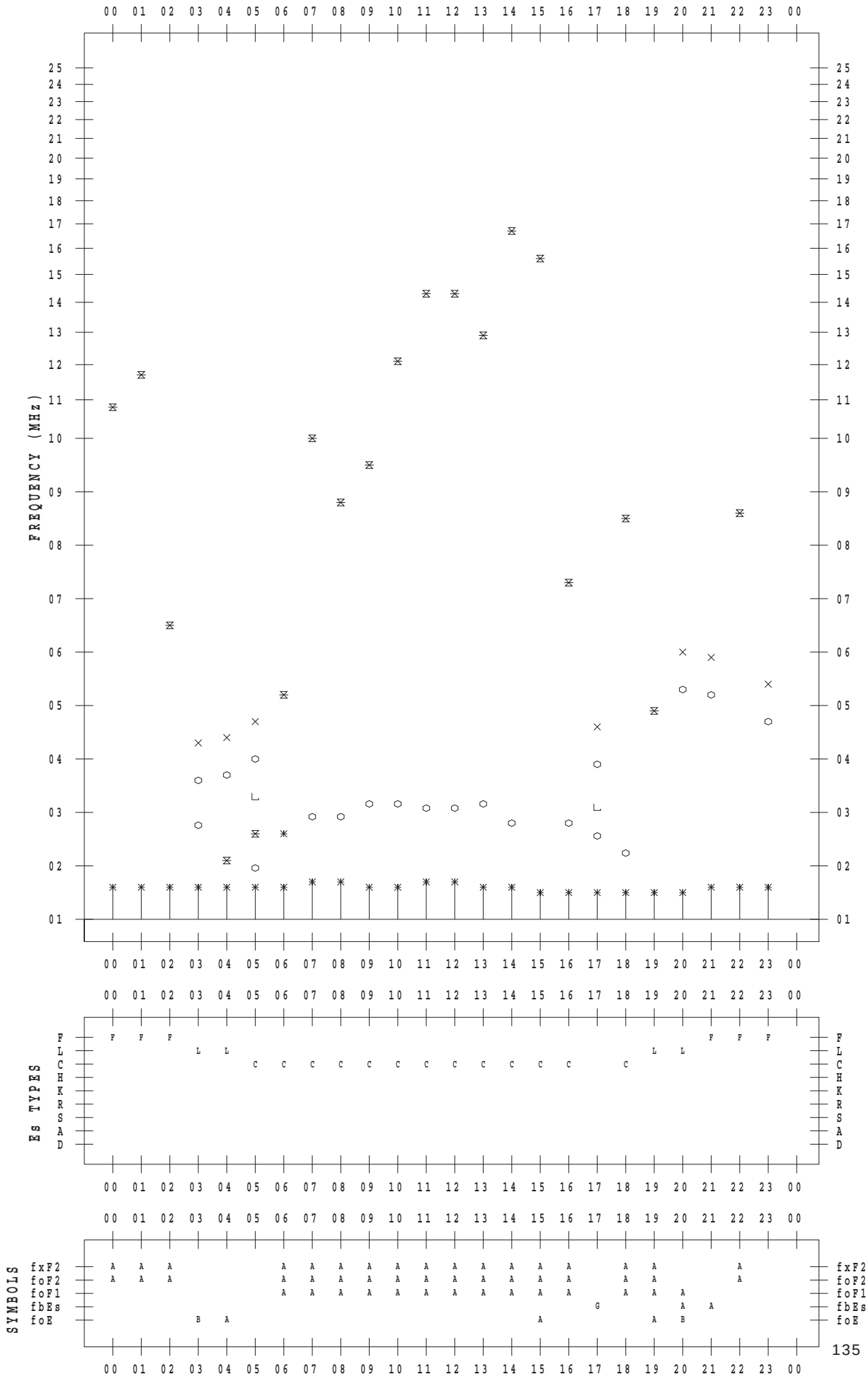
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/28

135 °E MEAN TIME



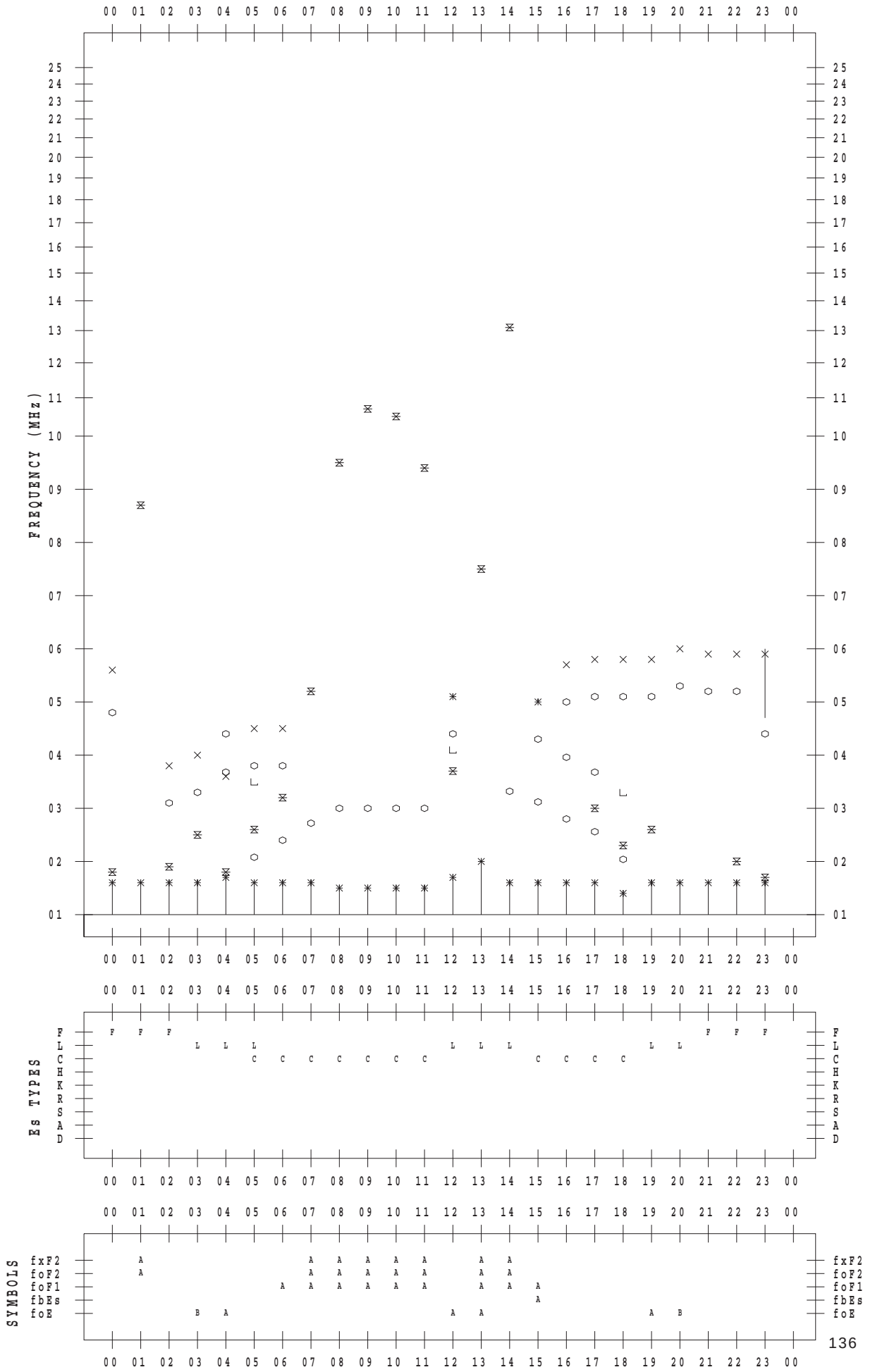
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/29

135 °E MEAN TIME



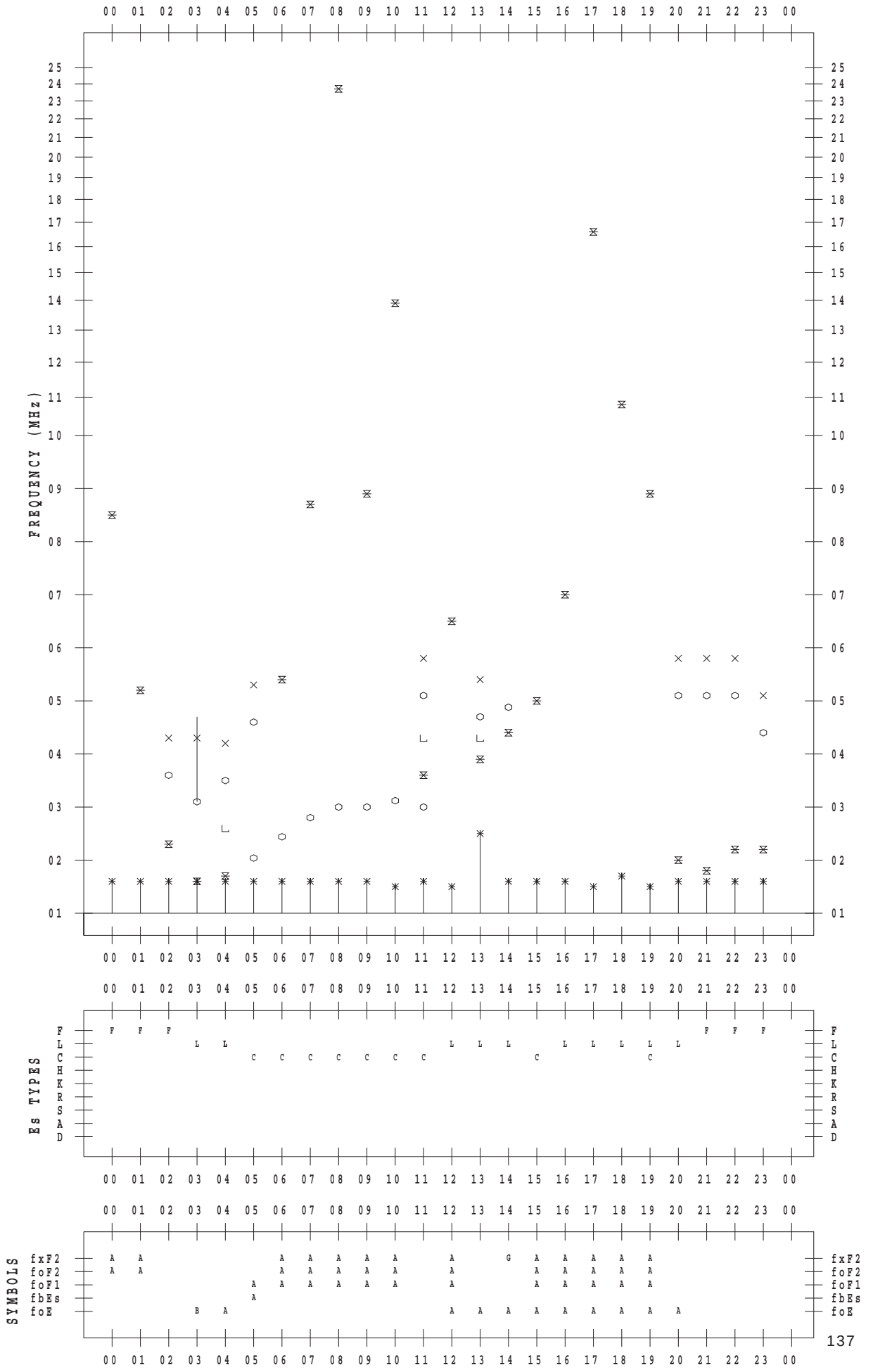
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 6/30

135 °E MEAN TIME



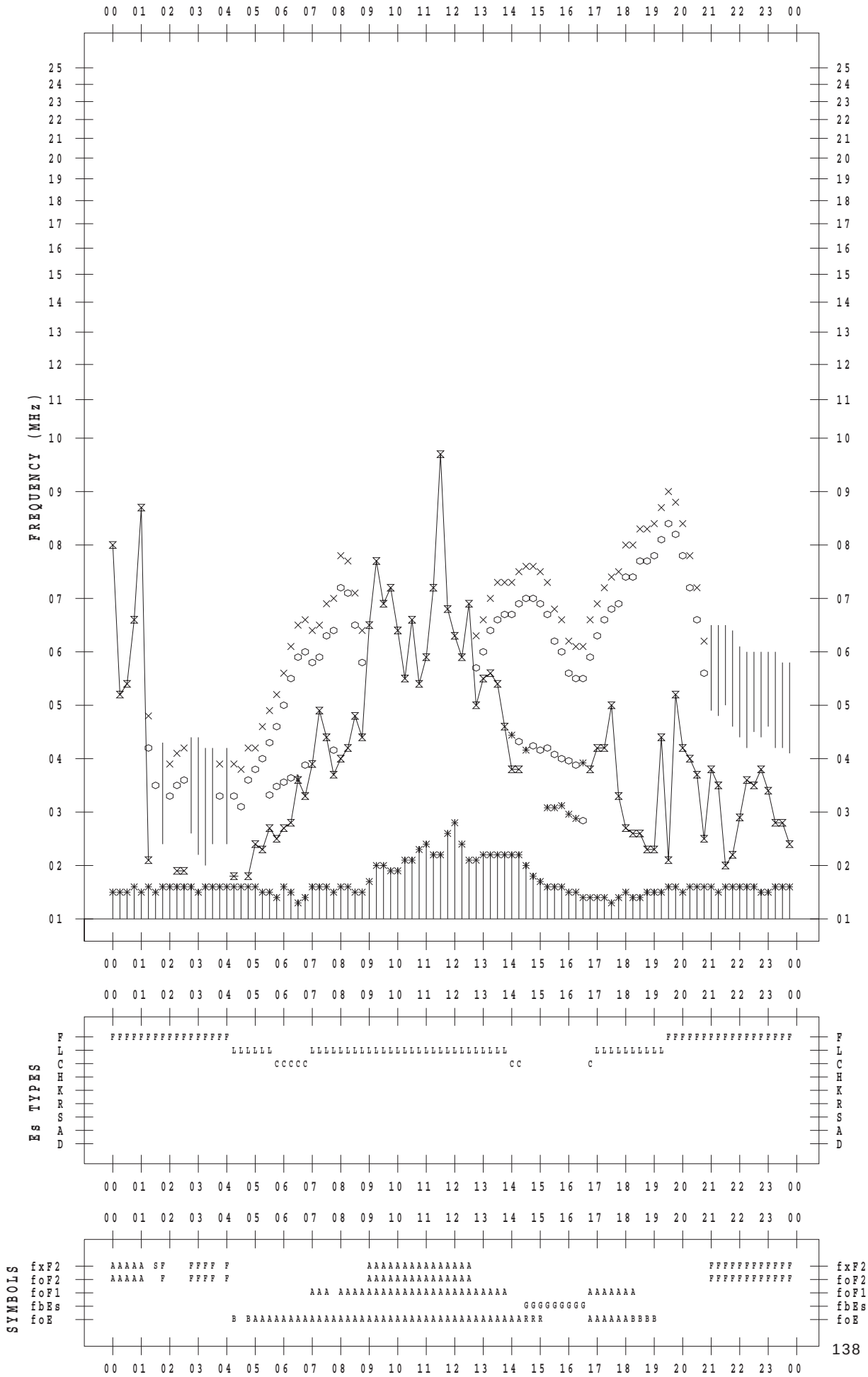
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 1

135 °E MEAN TIME



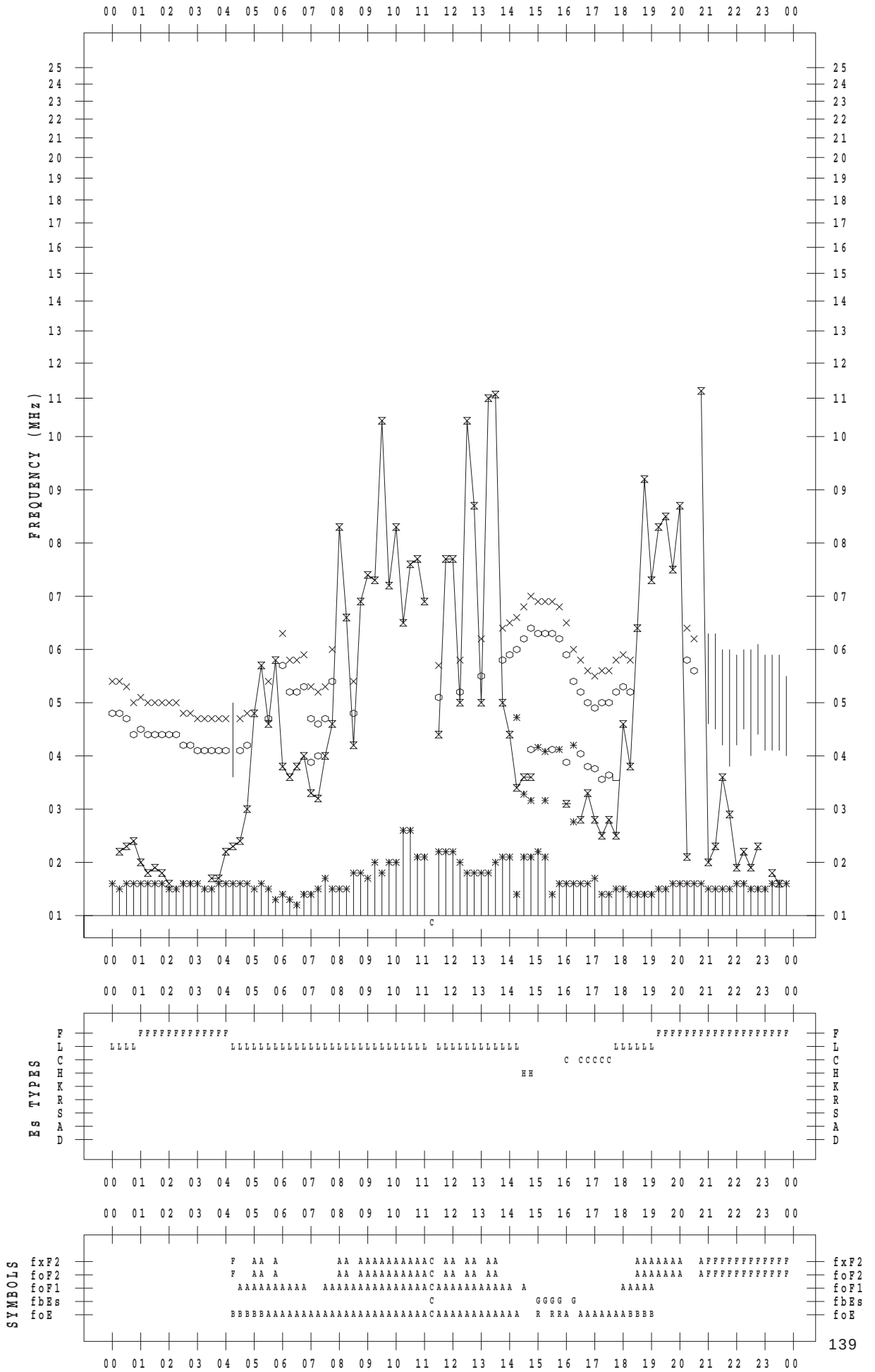
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 2

135 °E MEAN TIME



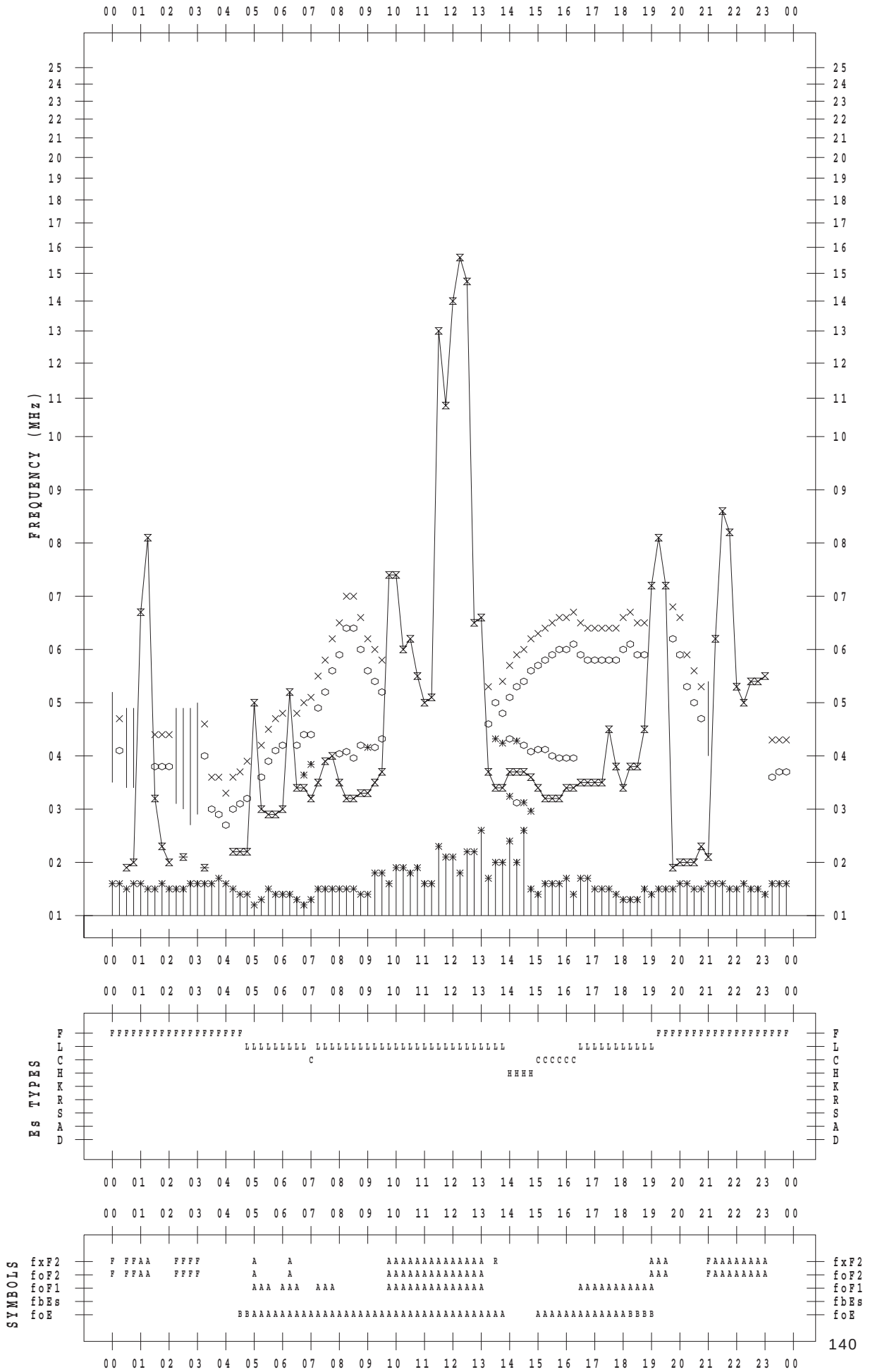
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 3

135 °E MEAN TIME



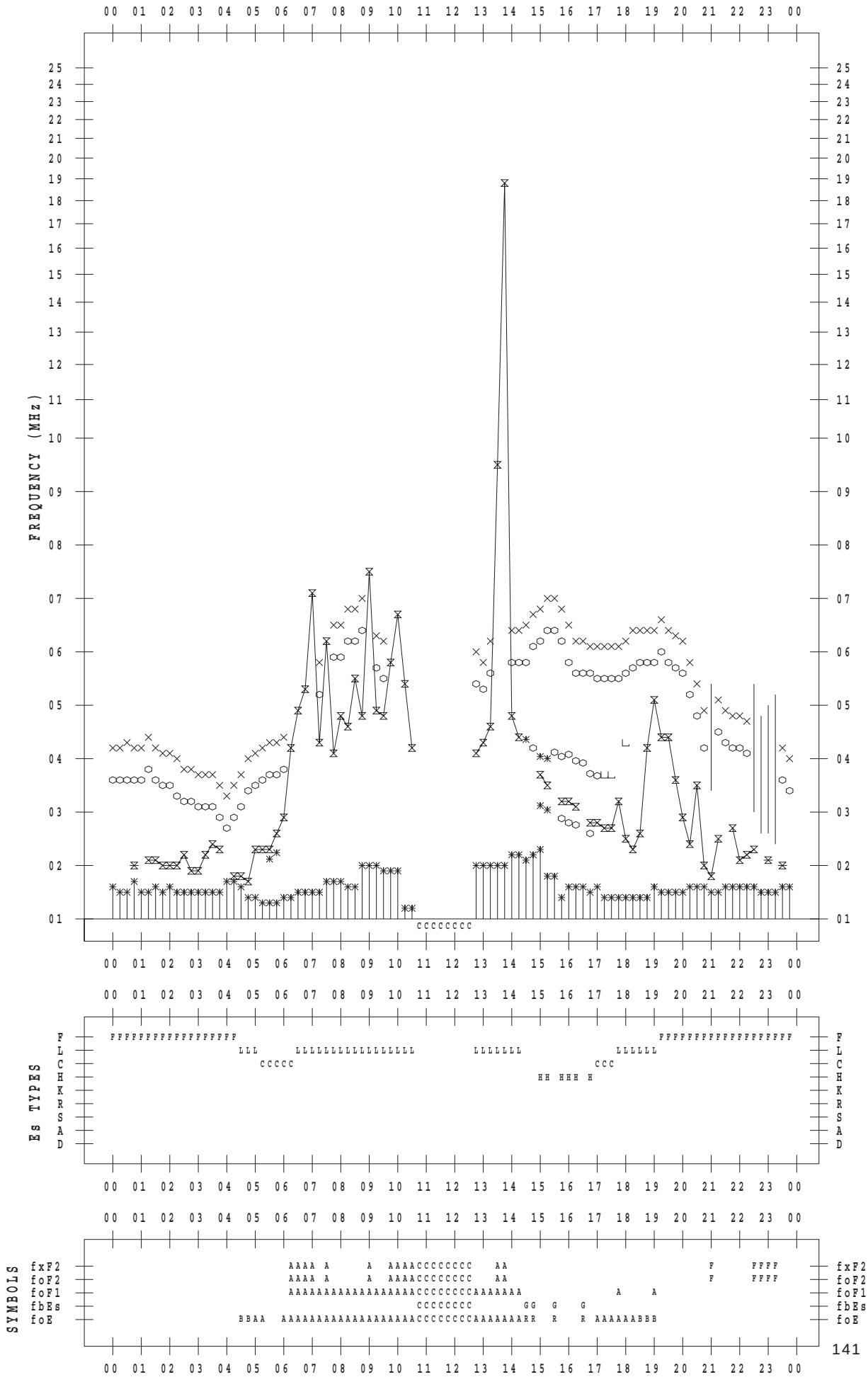
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 4

135 °E MEAN TIME



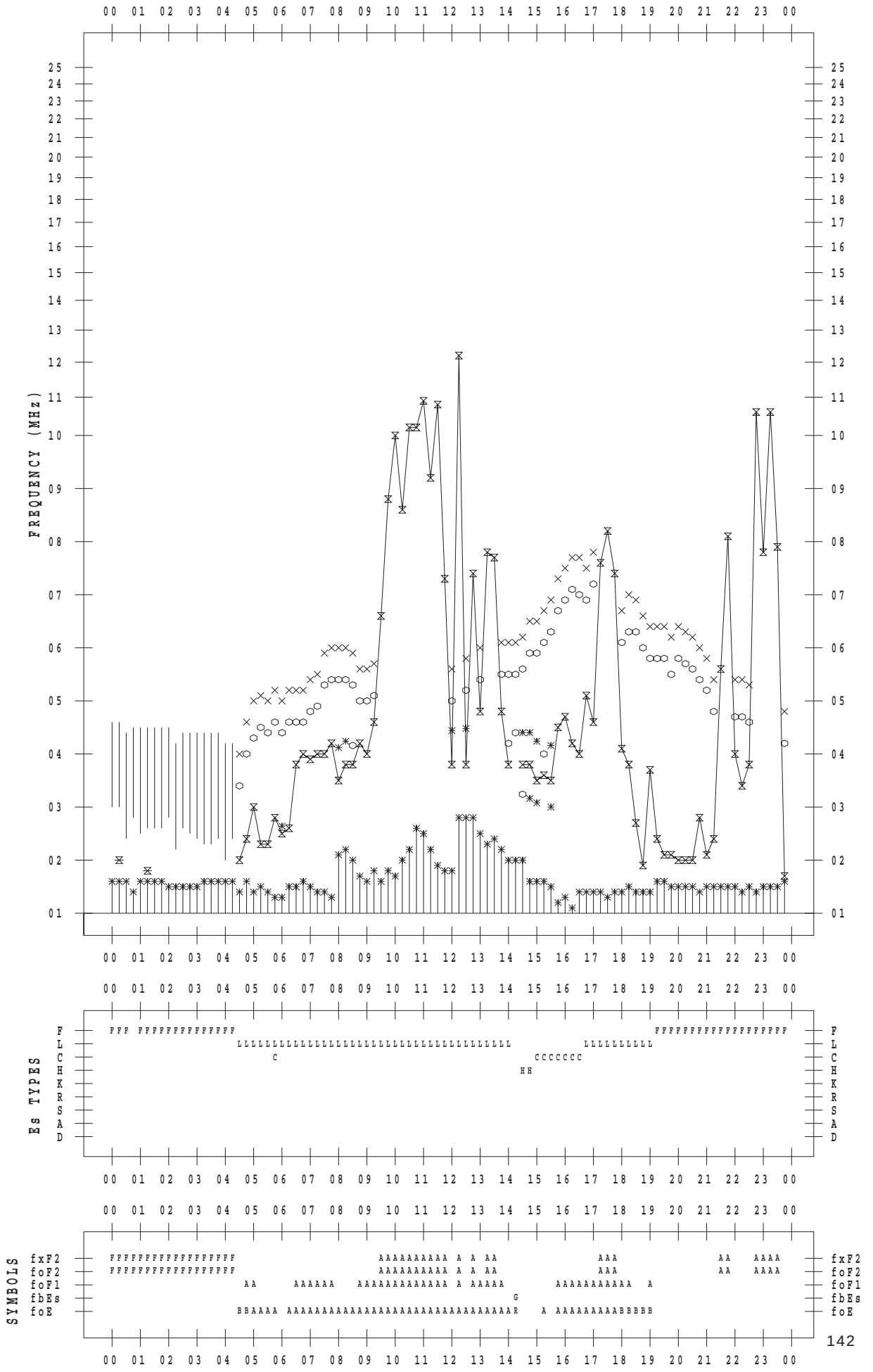
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 5

135 °E MEAN TIME



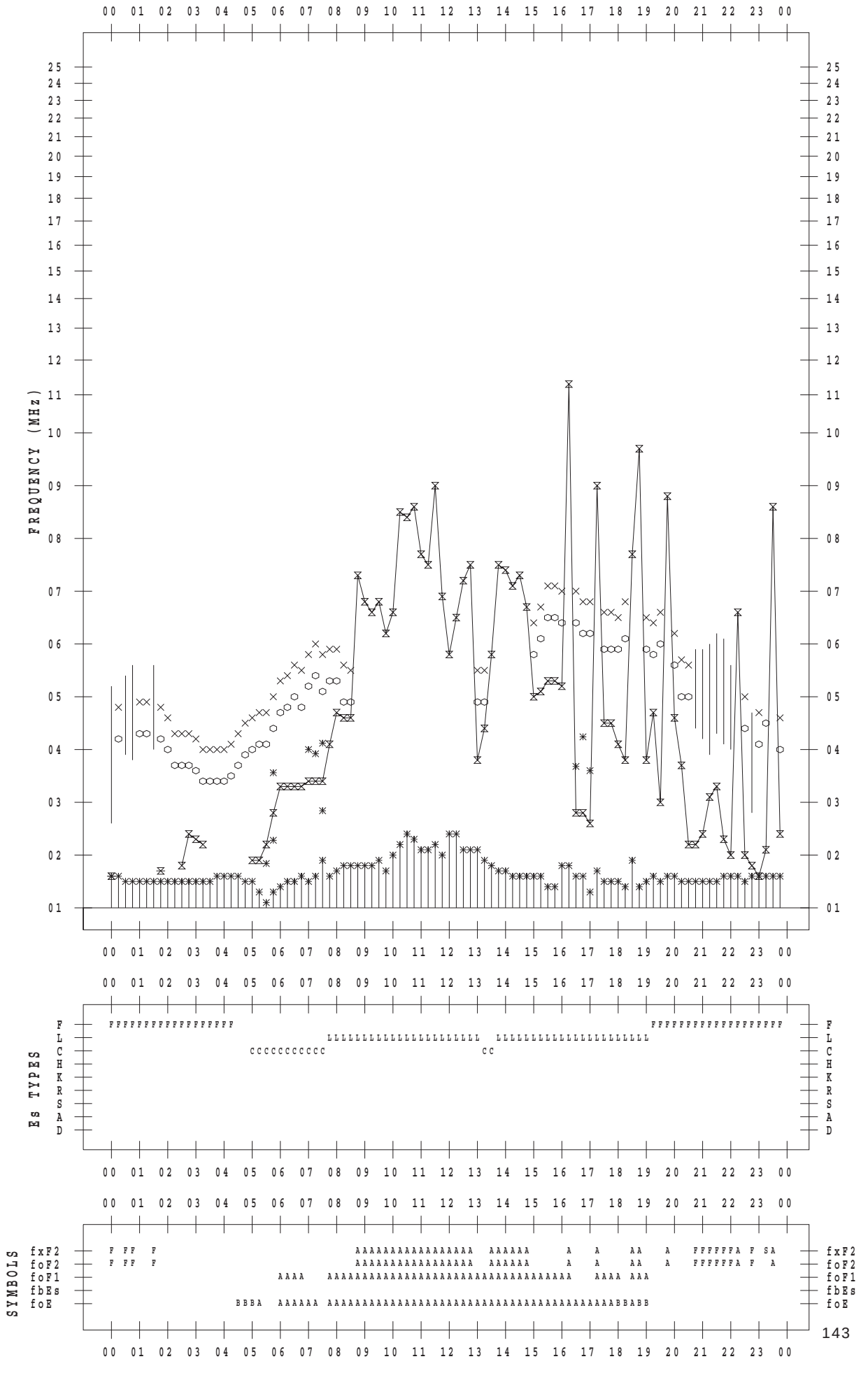
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 6

135 °E MEAN TIME



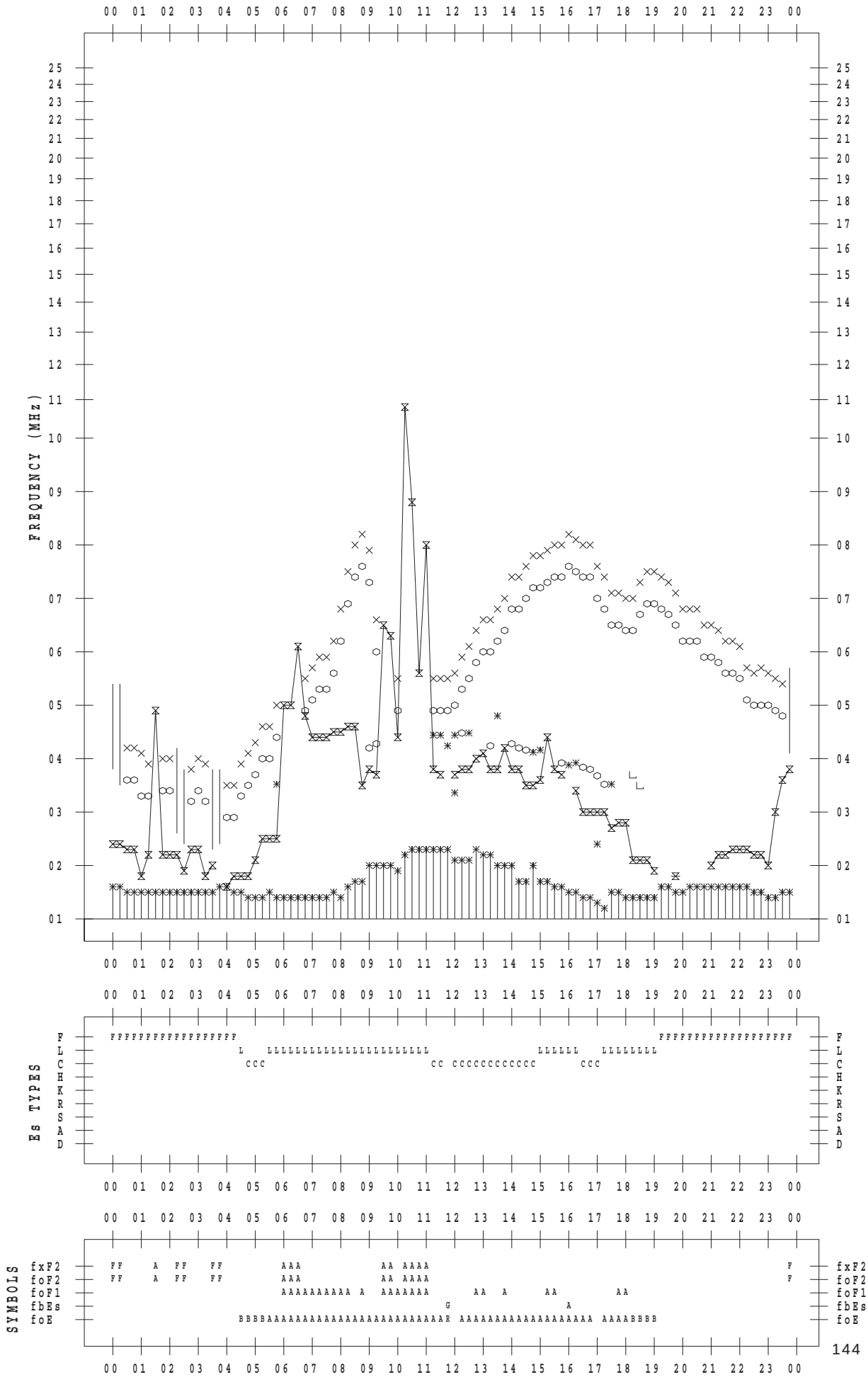
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 7

135 °E MEAN TIME



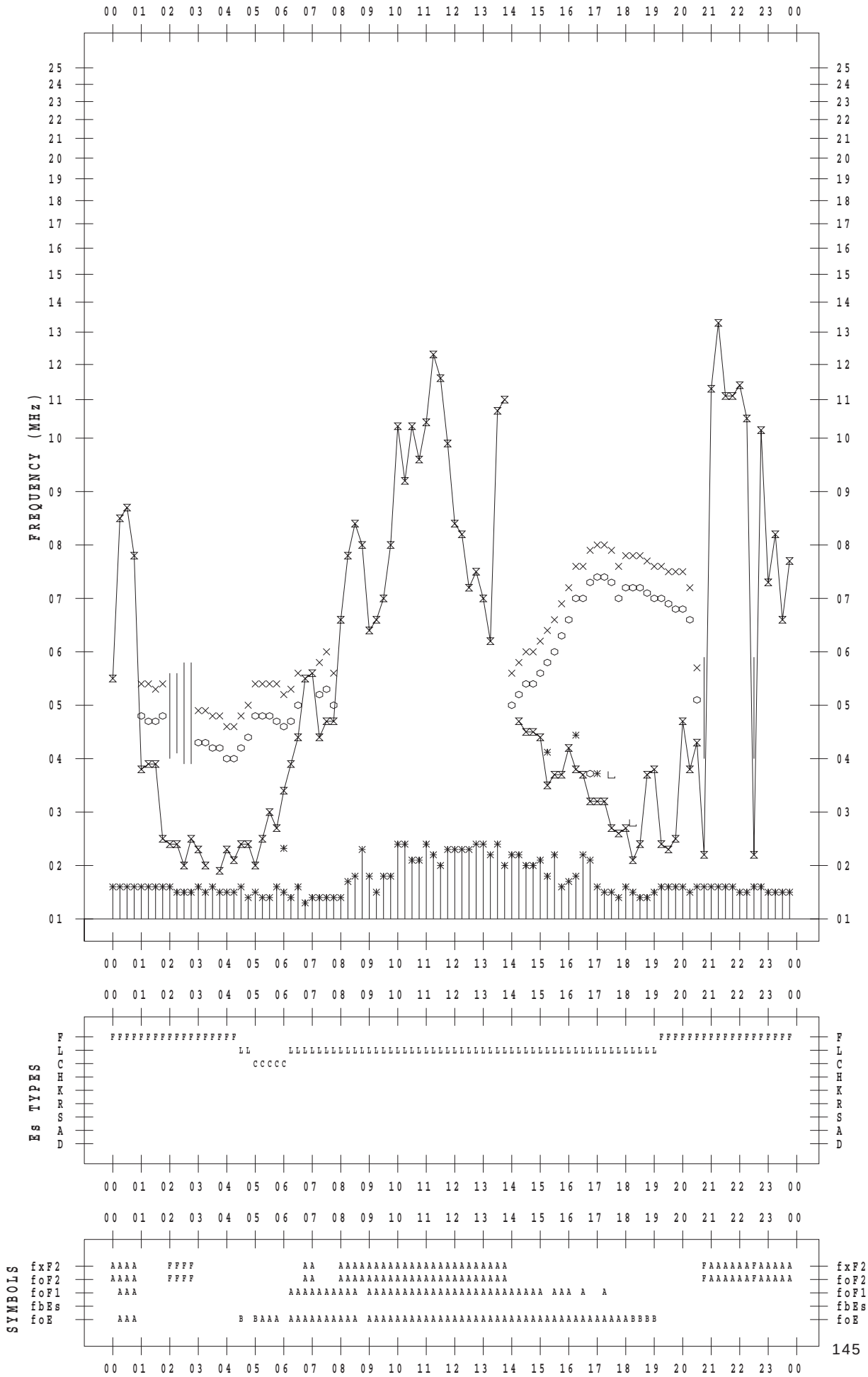
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 8

135 °E MEAN TIME



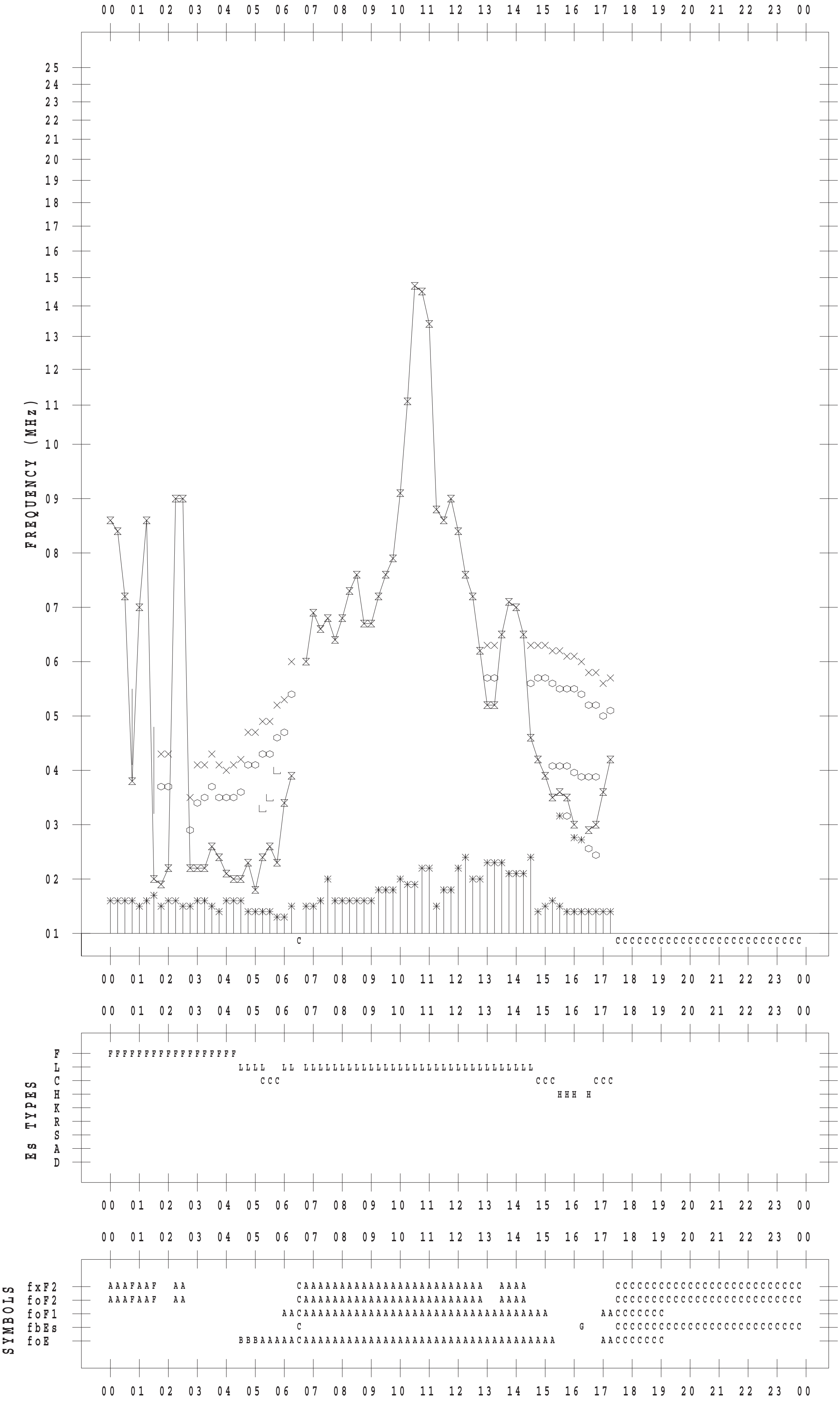
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/ 9

135 °E MEAN TIME



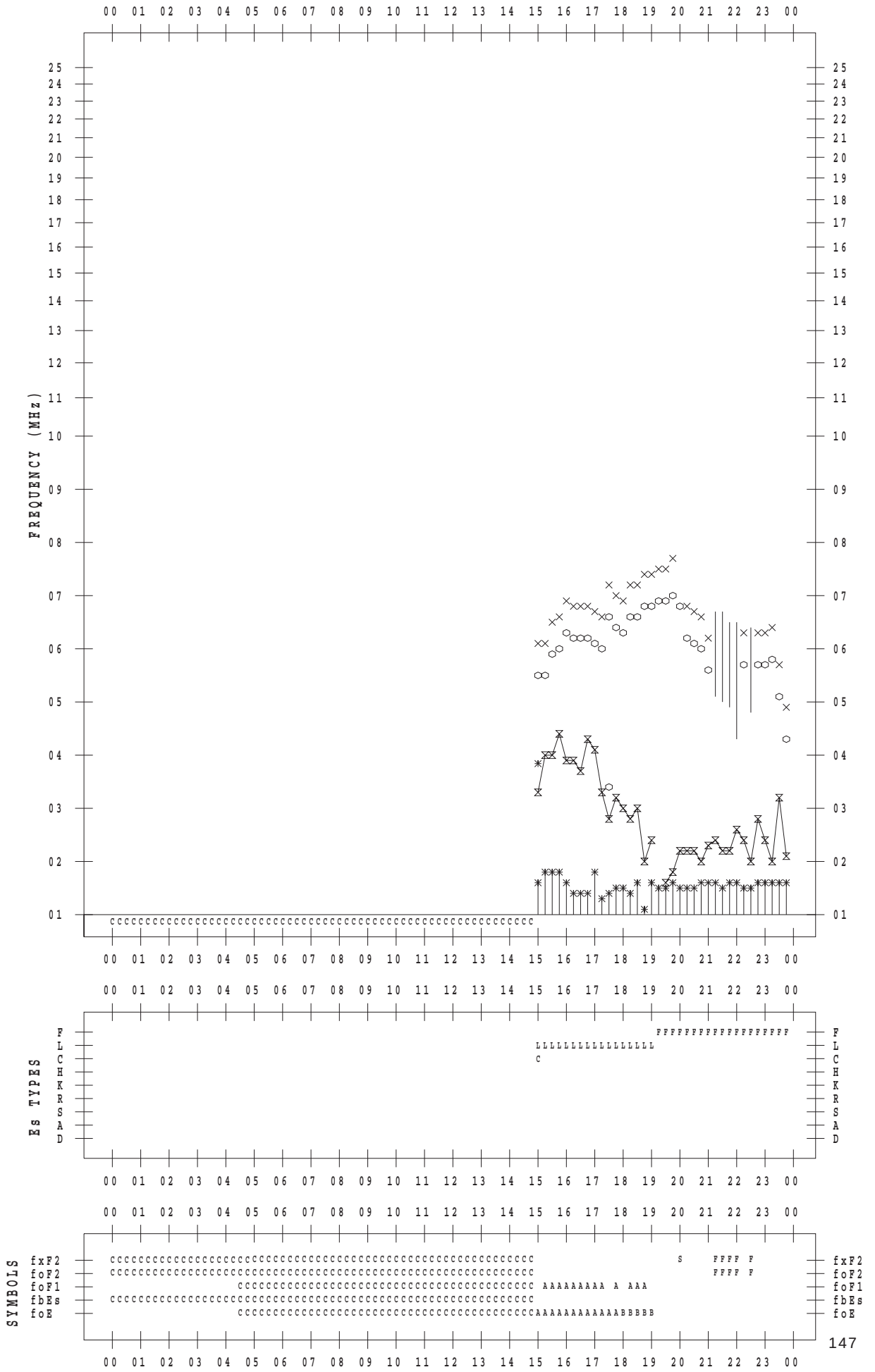
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/10

135 °E MEAN TIME



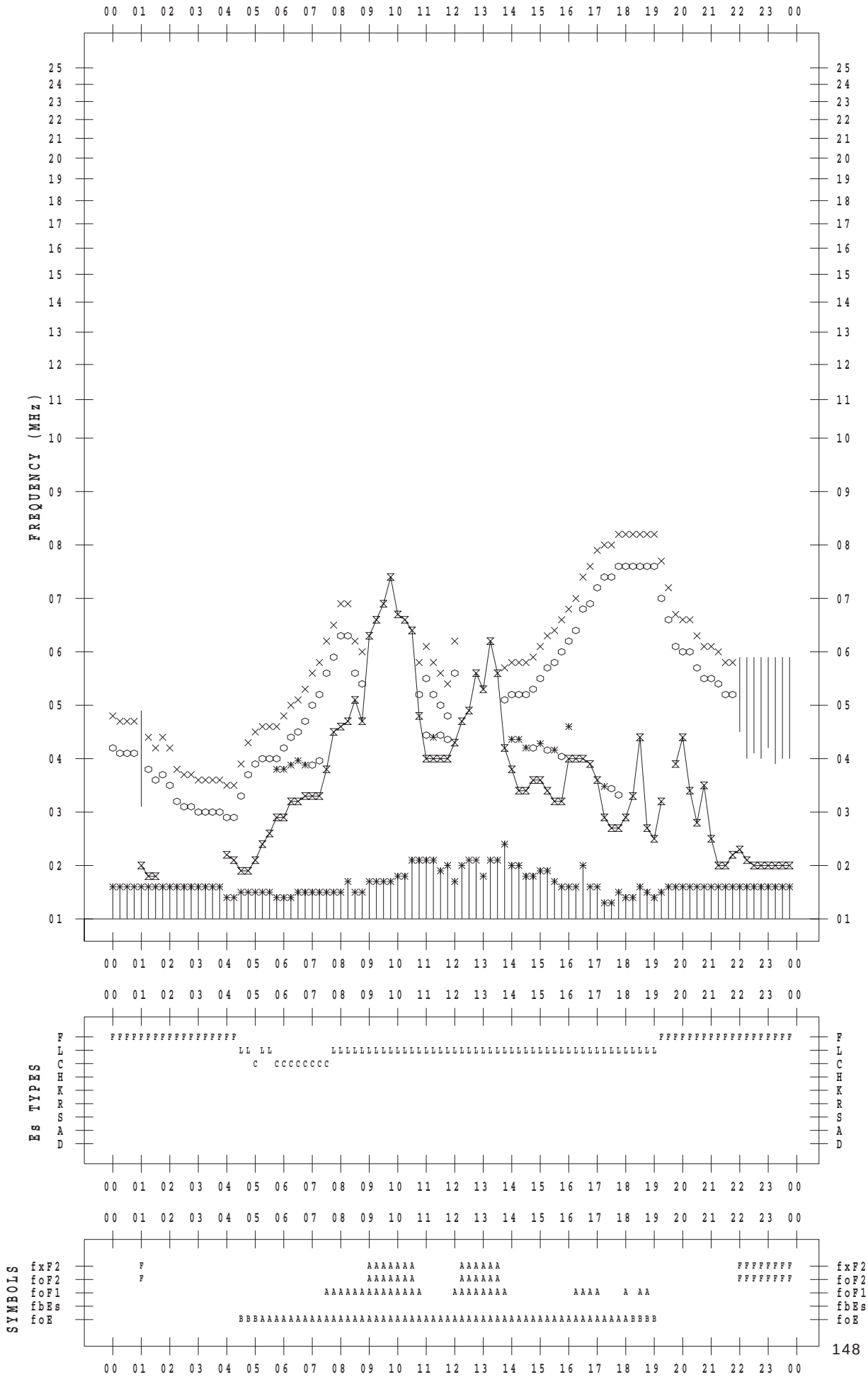
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/11

135 °E MEAN TIME



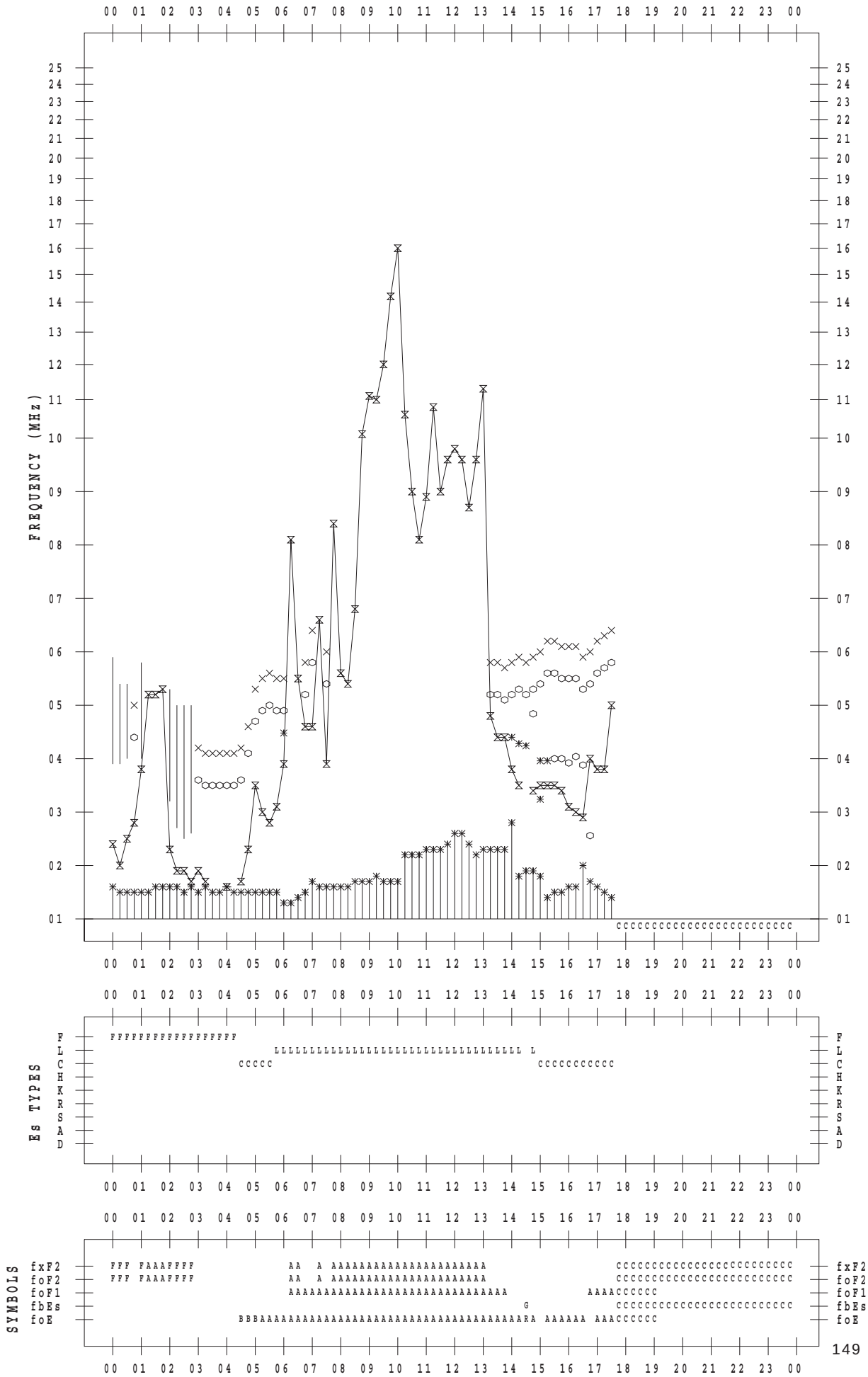
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/12

135 °E MEAN TIME



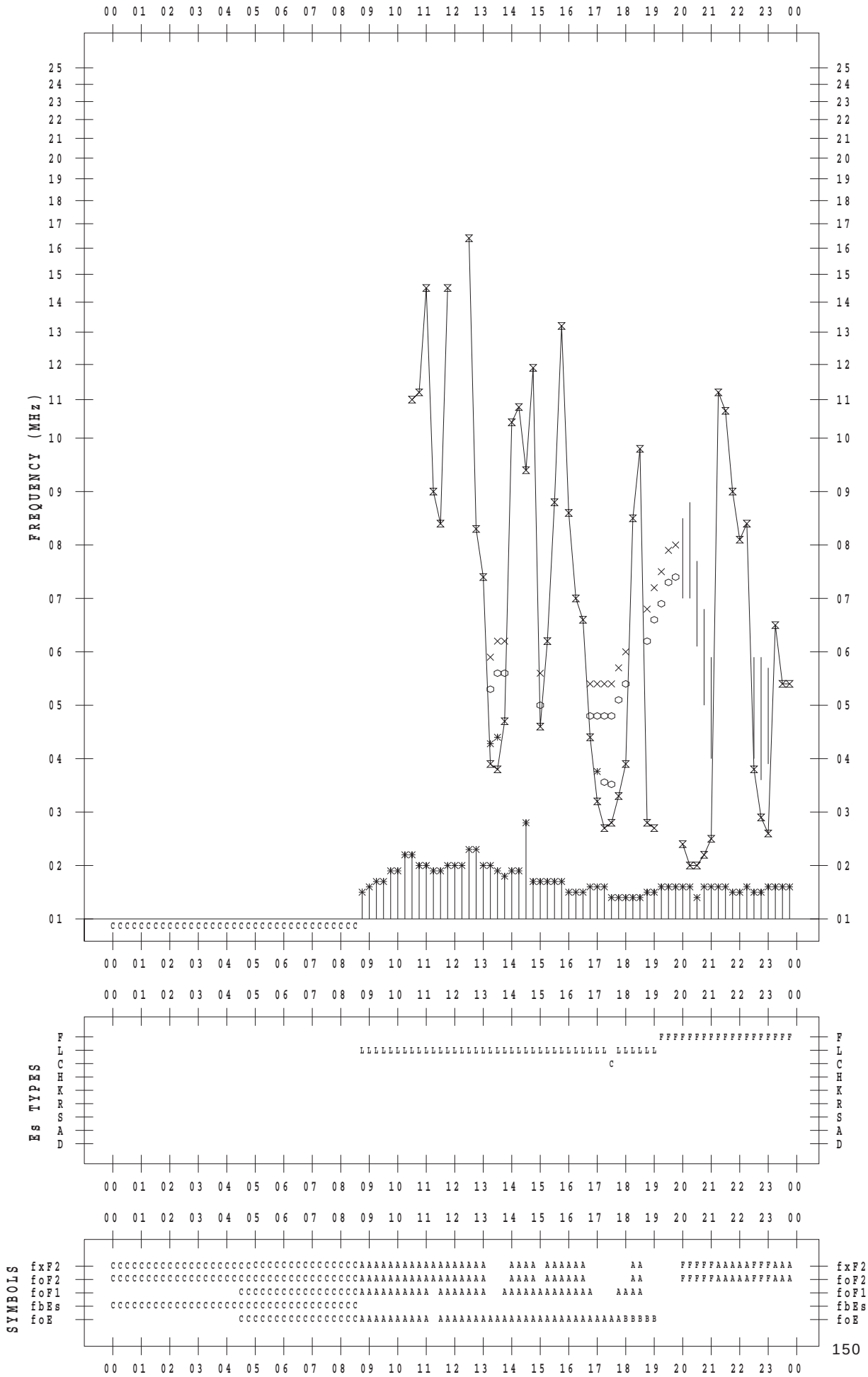
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/13

135 °E MEAN TIME



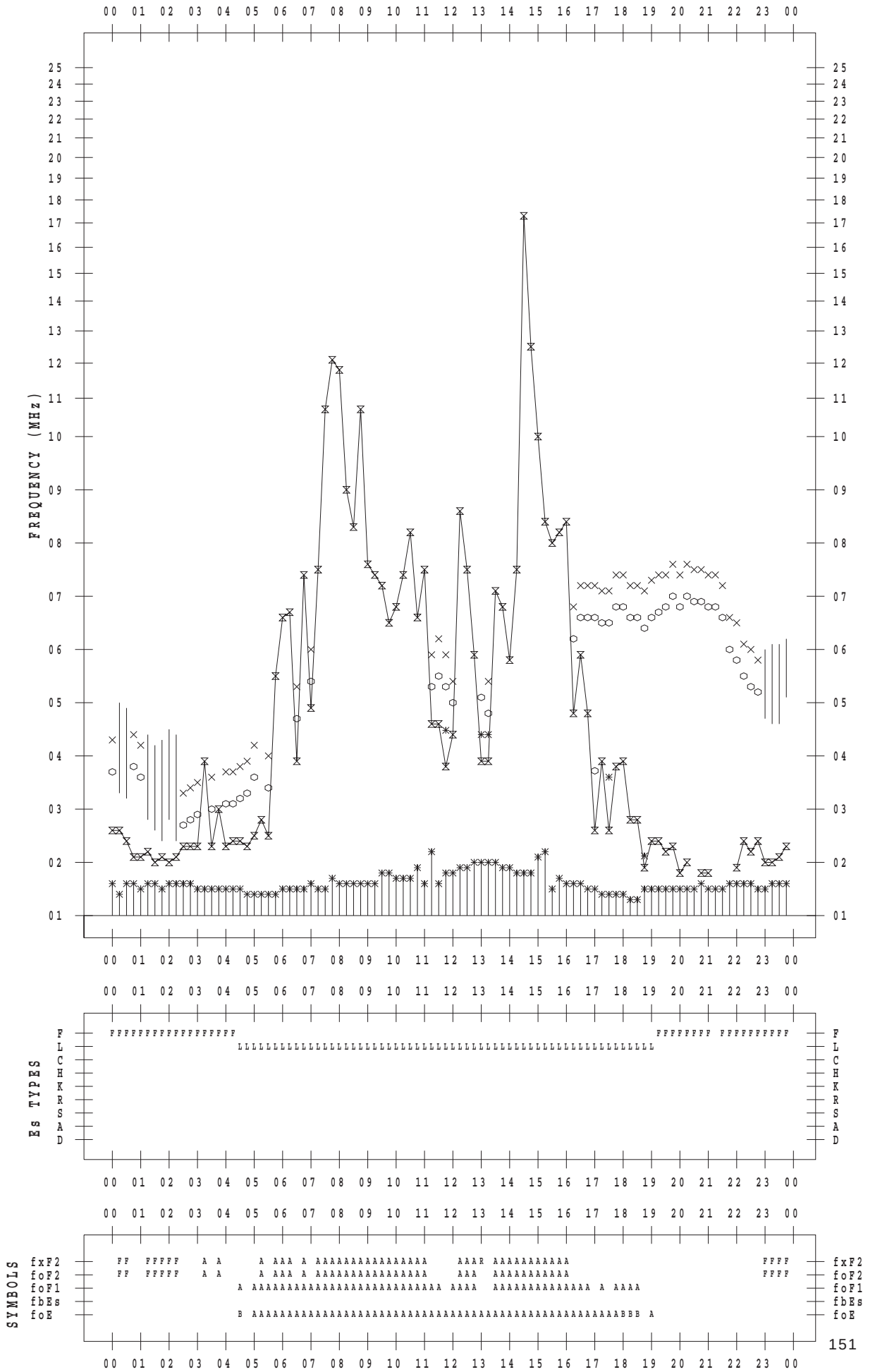
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/14

135 °E MEAN TIME



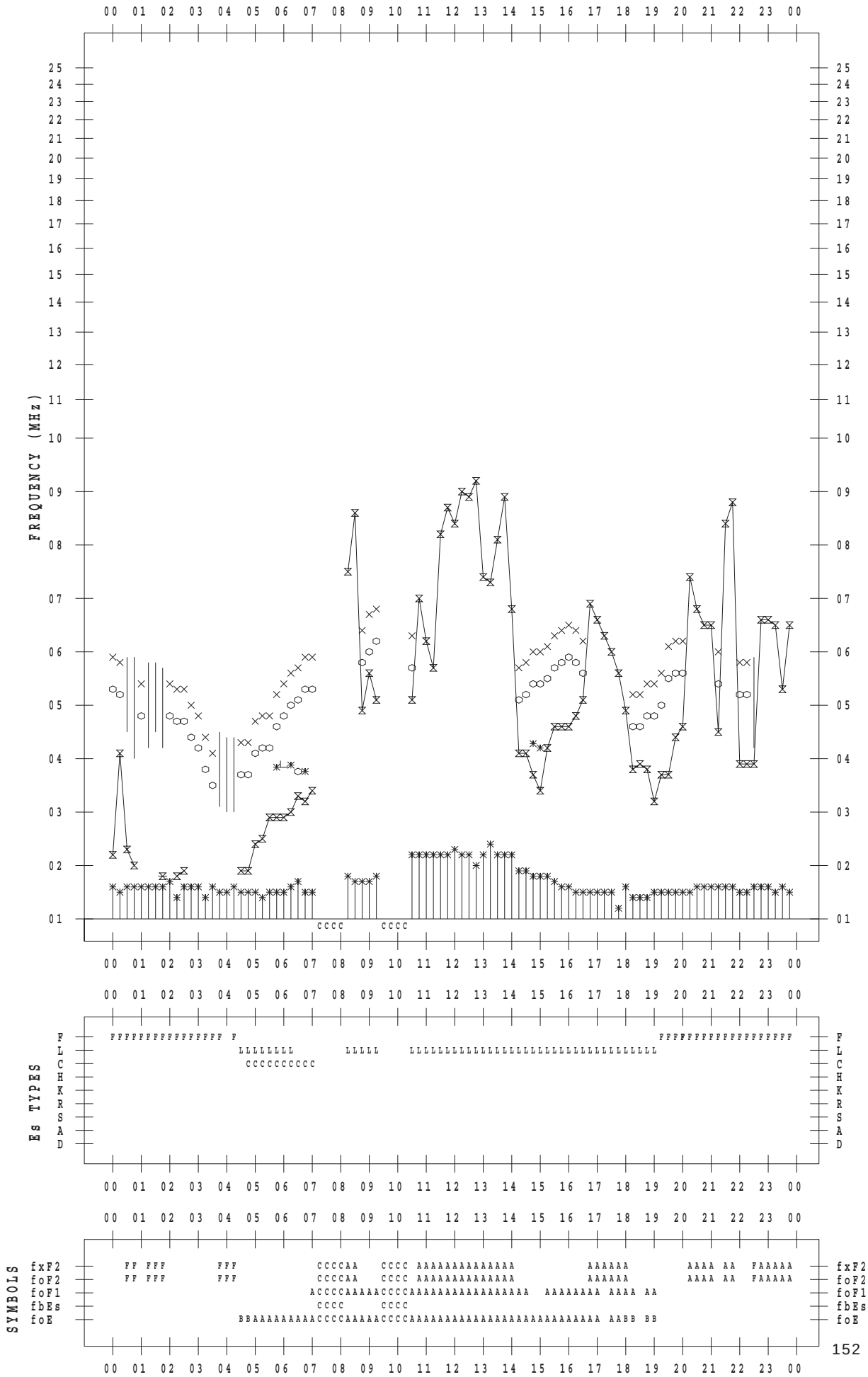
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/15

135 °E MEAN TIME



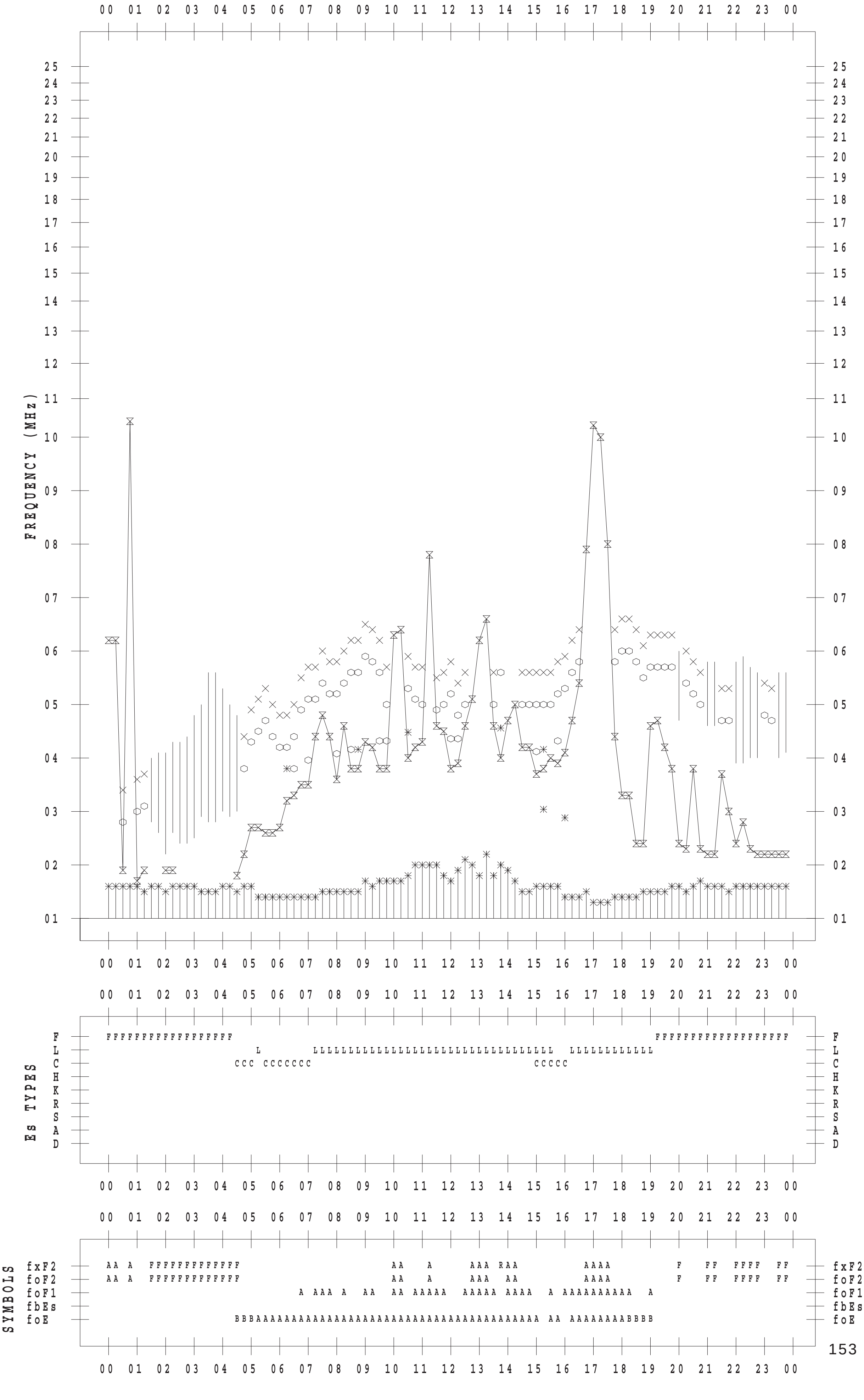
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/16

135 °E MEAN TIME



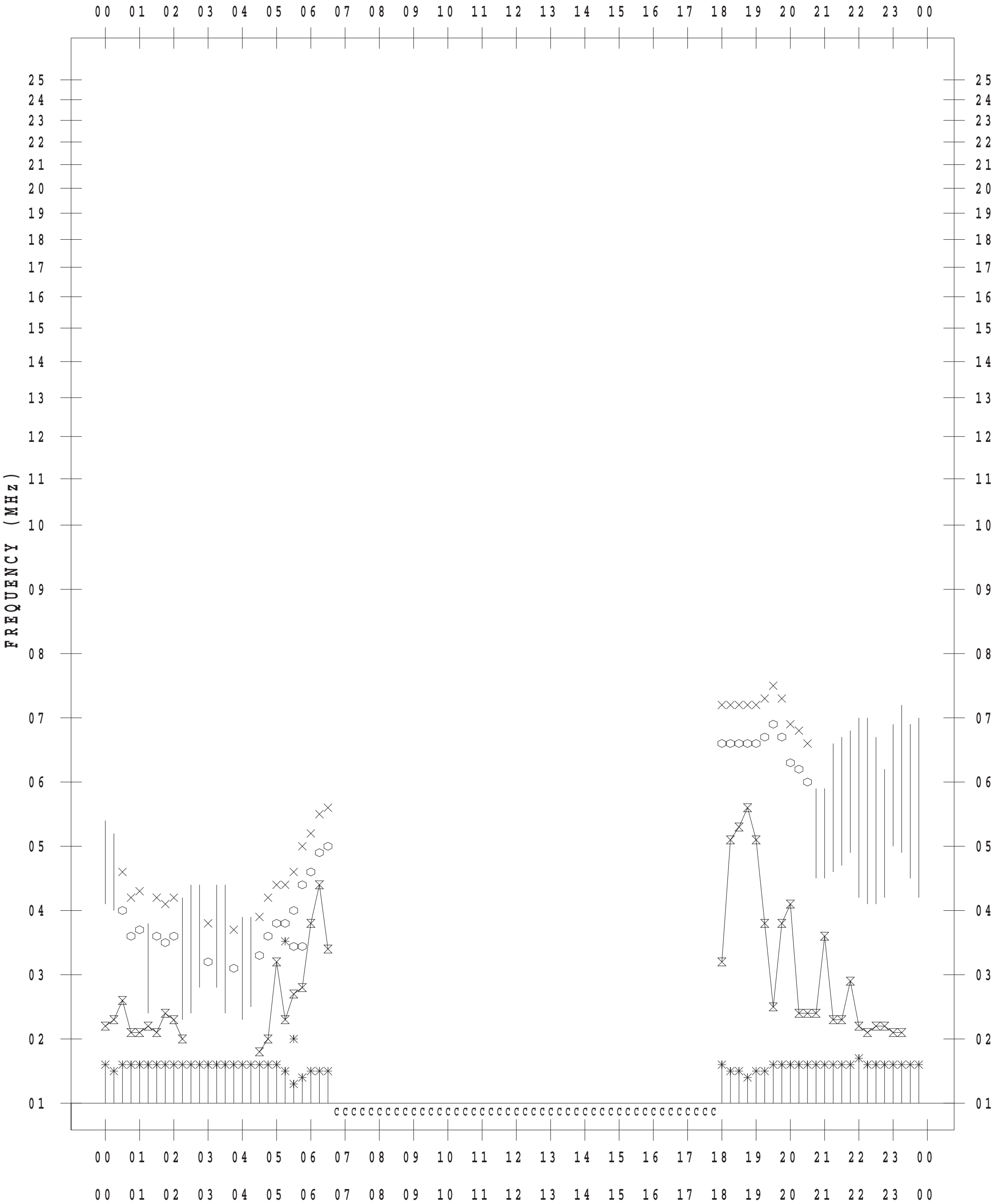
f-PLOT DATA

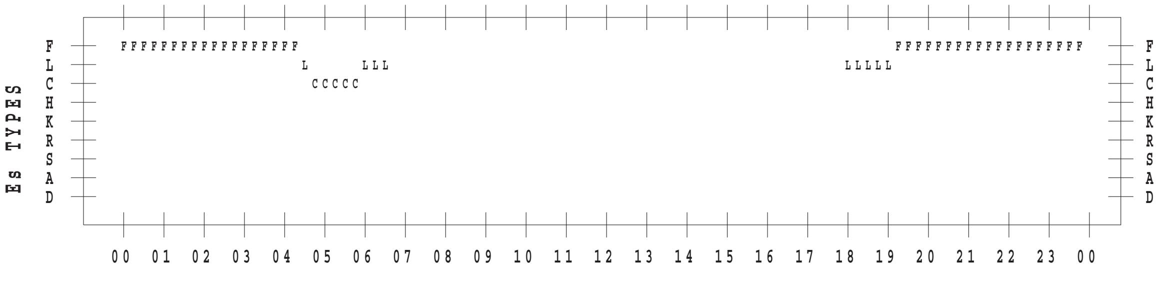
SCALER : I.NISHIMUTA

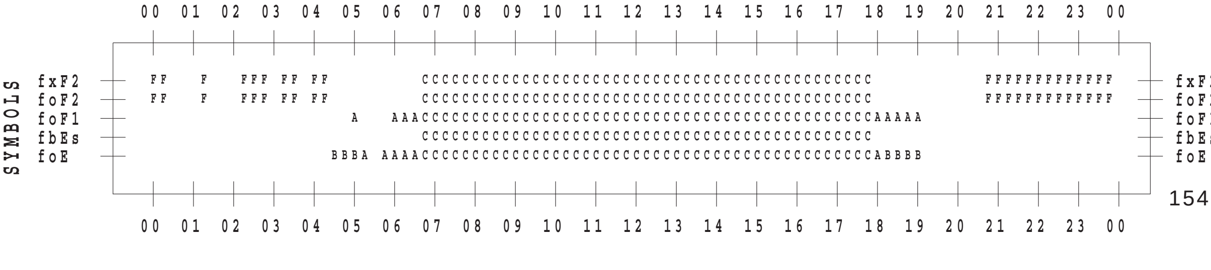
STATION : Kokubunji

DATE : 2018/ 6/17

135 °E MEAN TIME







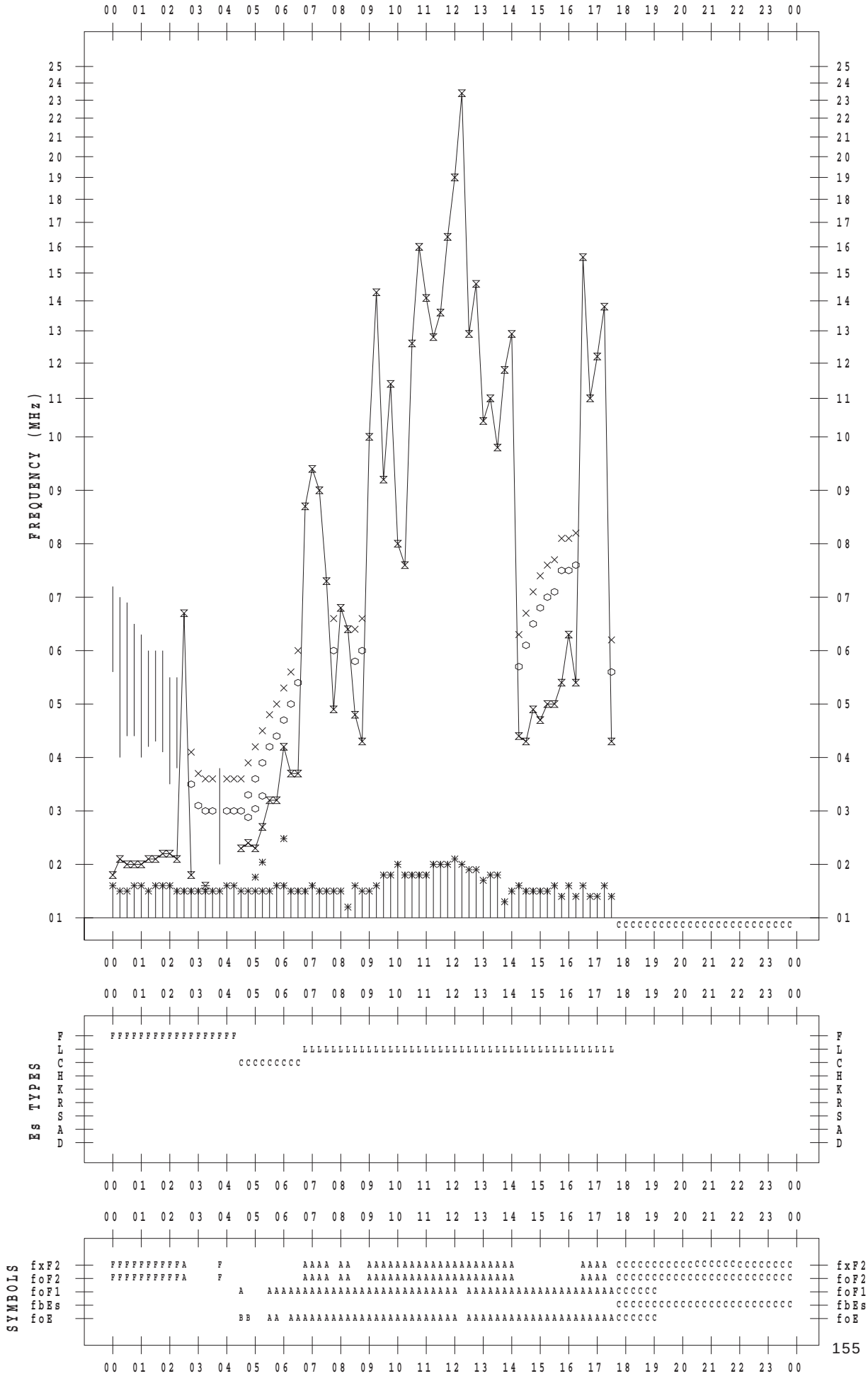
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/18

135 °E MEAN TIME



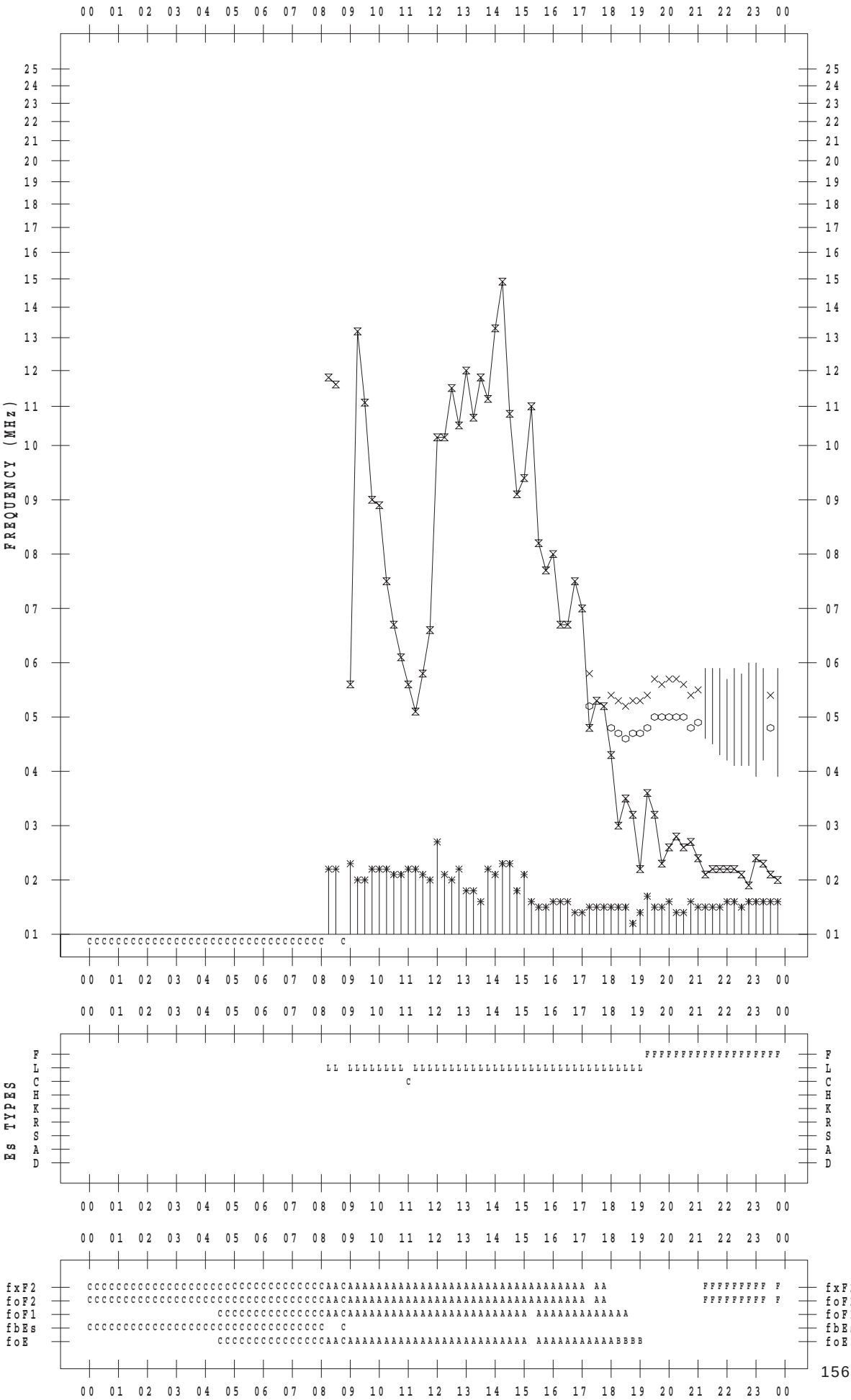
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/19

135 °E MEAN TIME



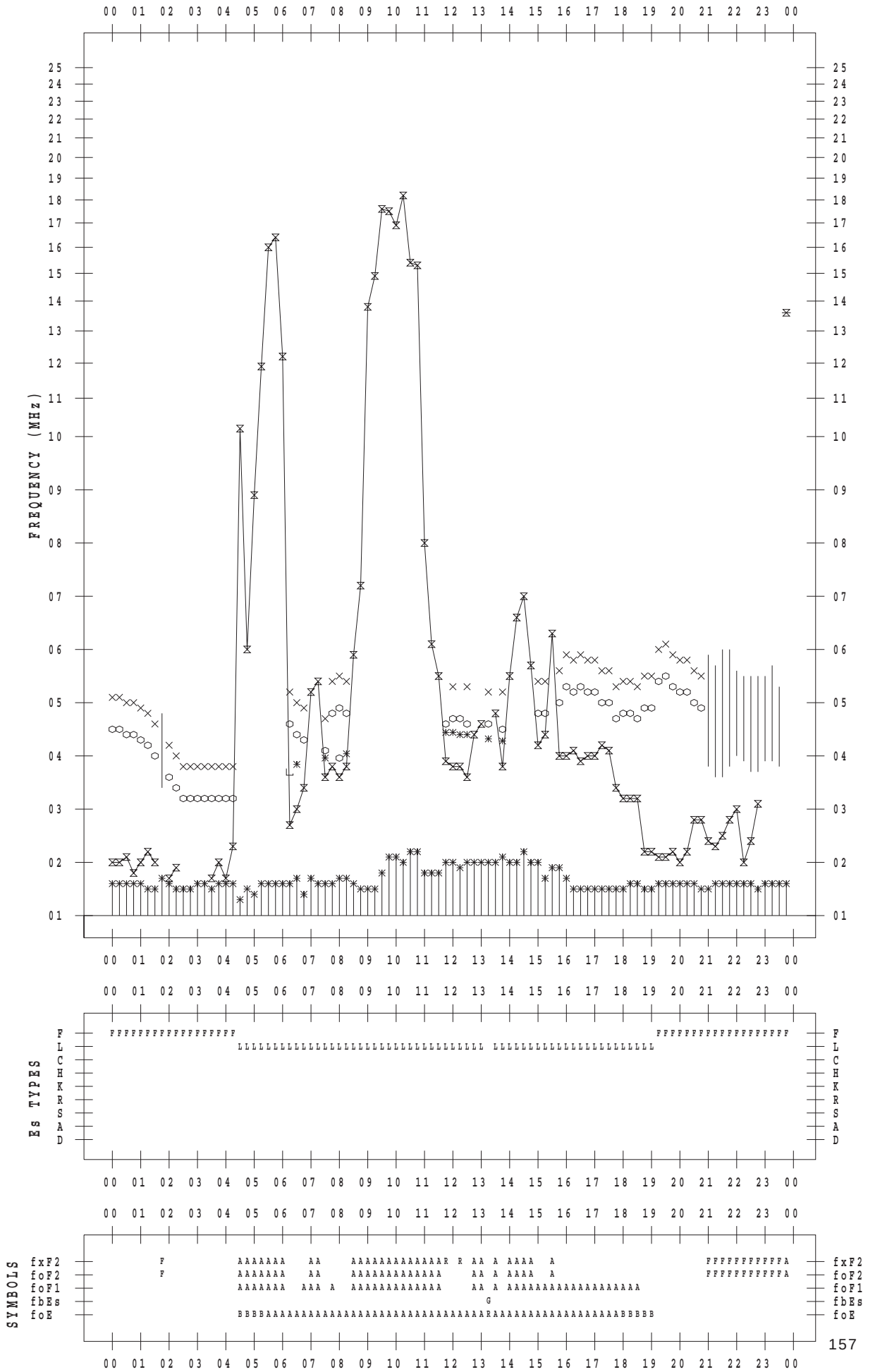
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/20

135 °E MEAN TIME



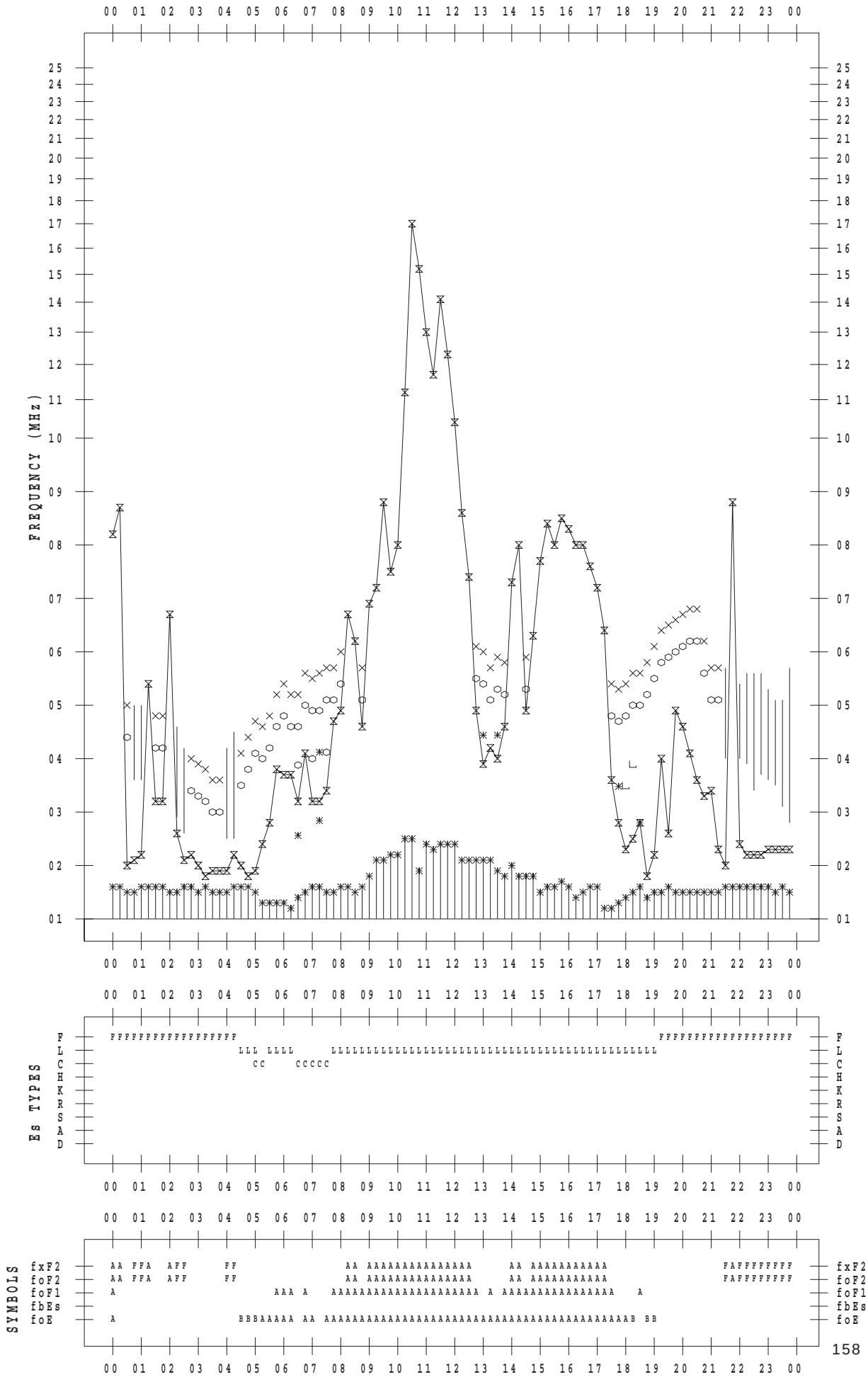
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/21

135 °E MEAN TIME



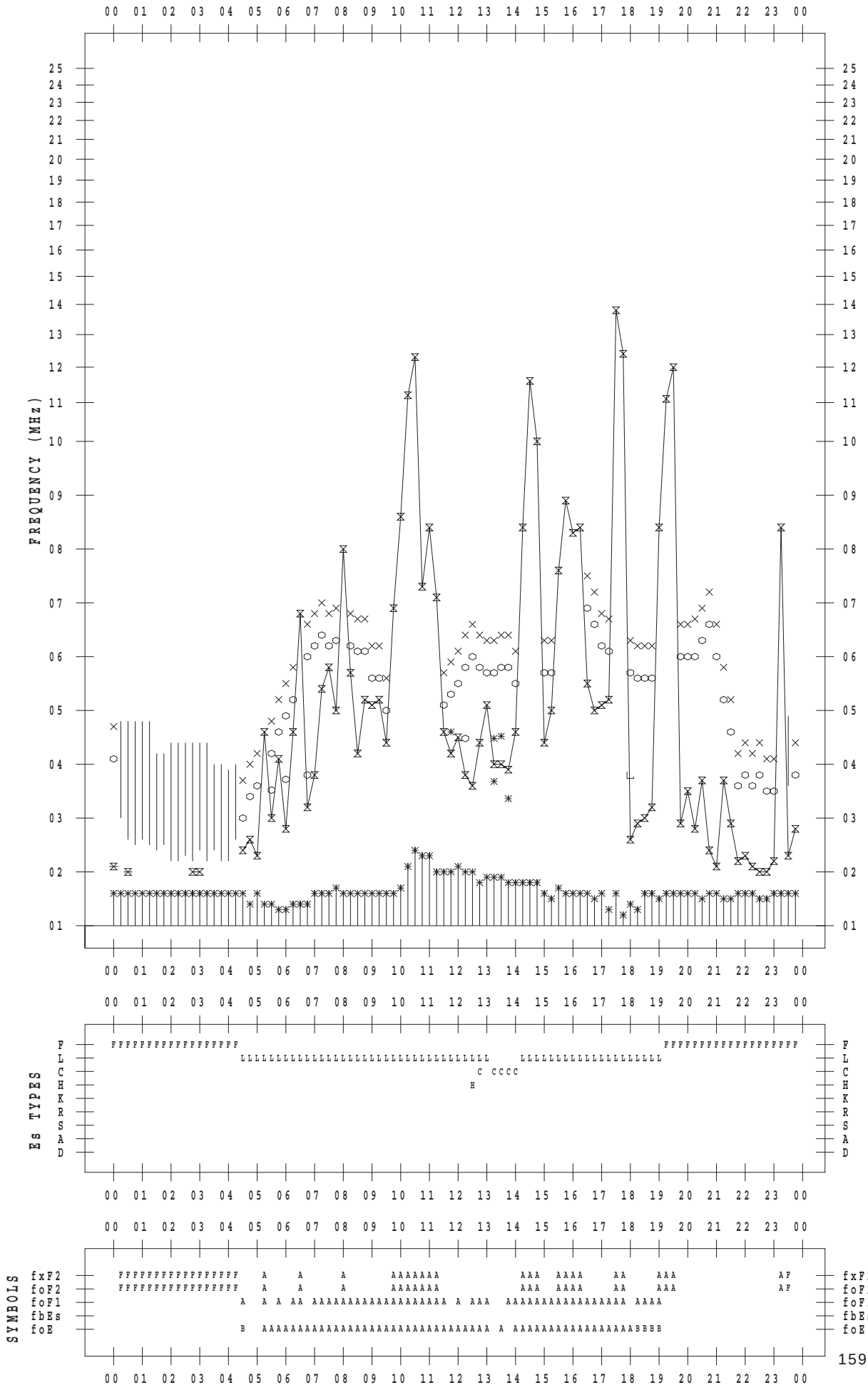
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/22

135 °E MEAN TIME



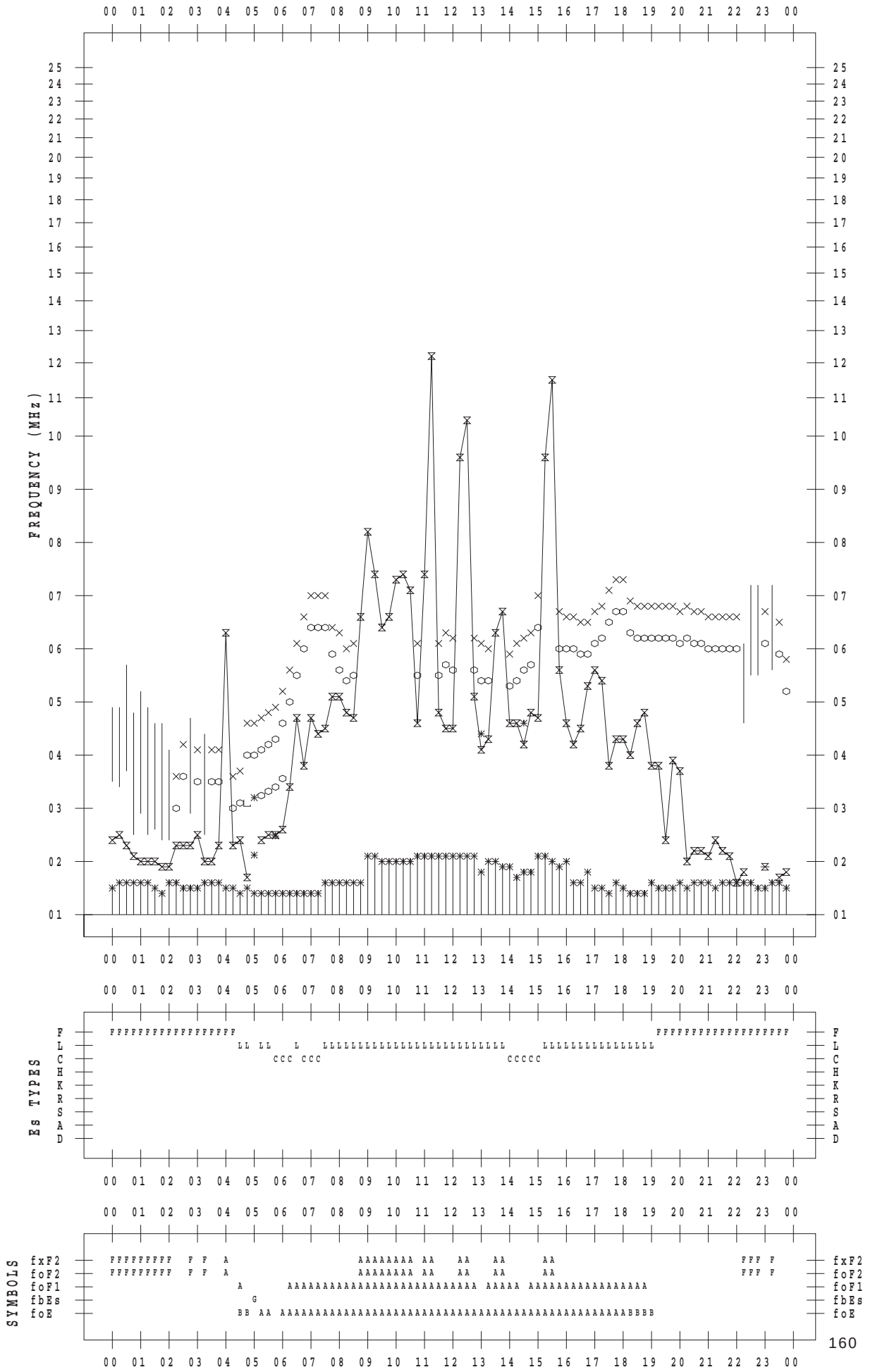
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/23

135 °E MEAN TIME



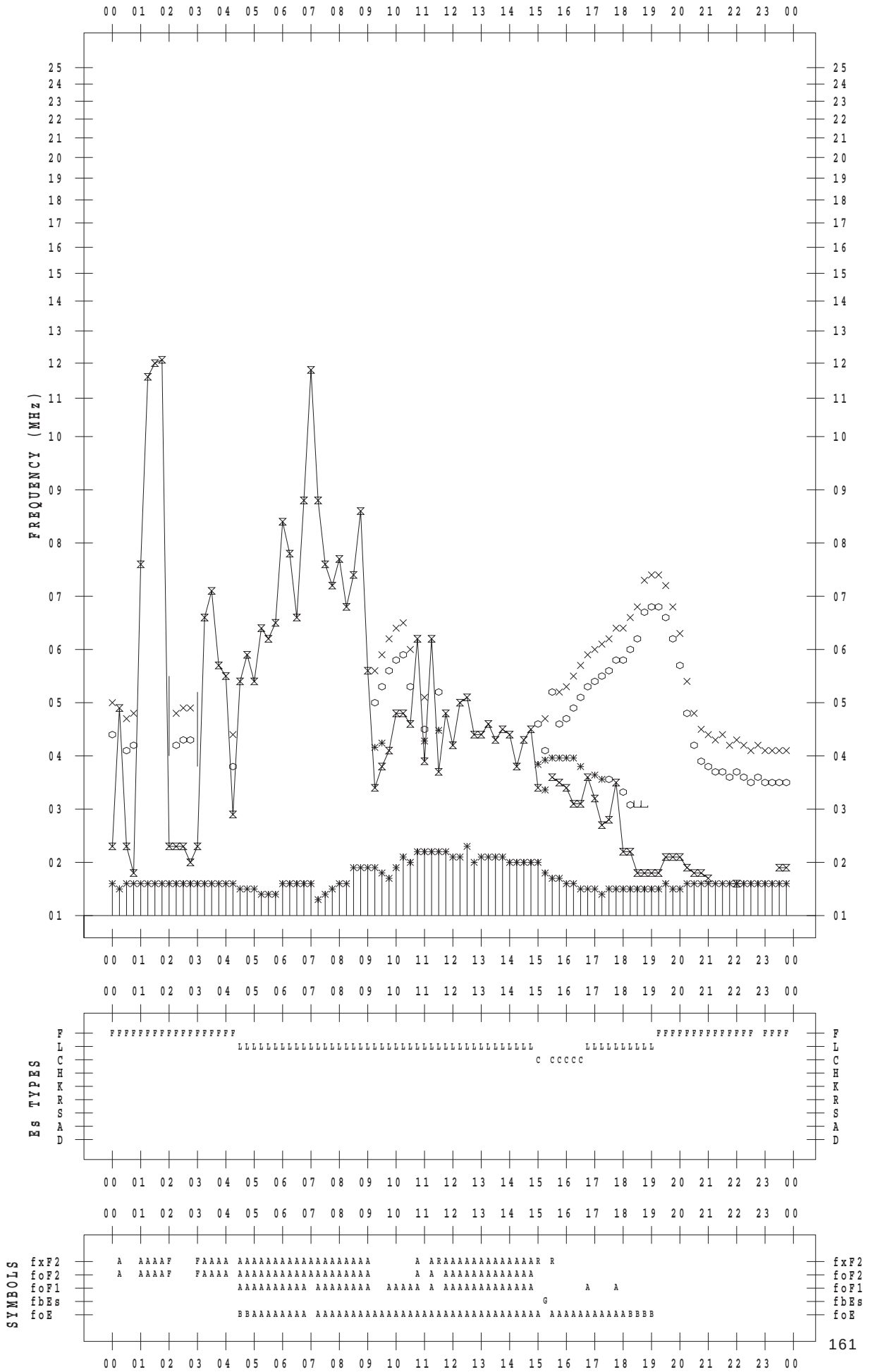
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/24

135 °E MEAN TIME



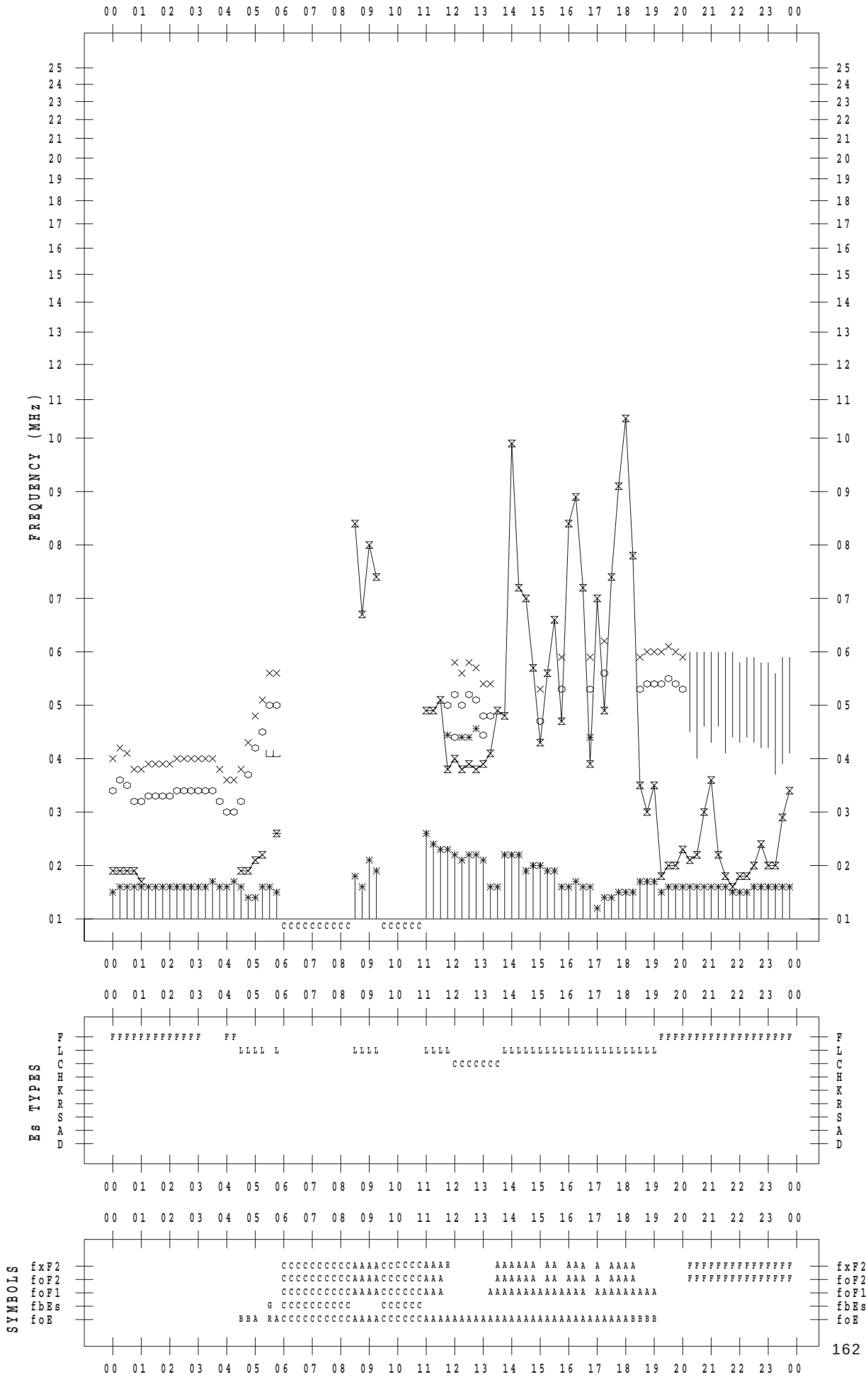
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/25

135 °E MEAN TIME



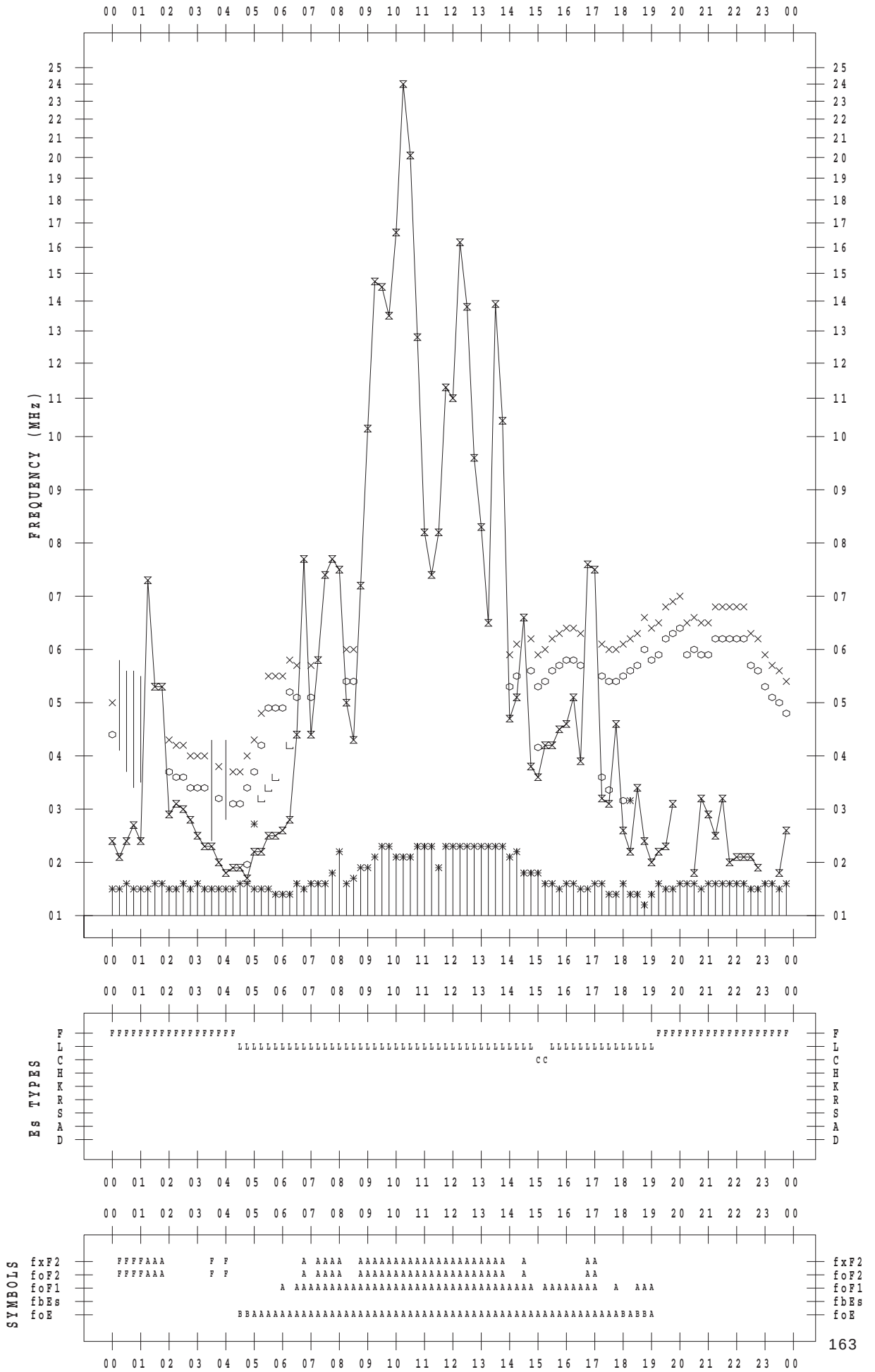
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/26

135 °E MEAN TIME



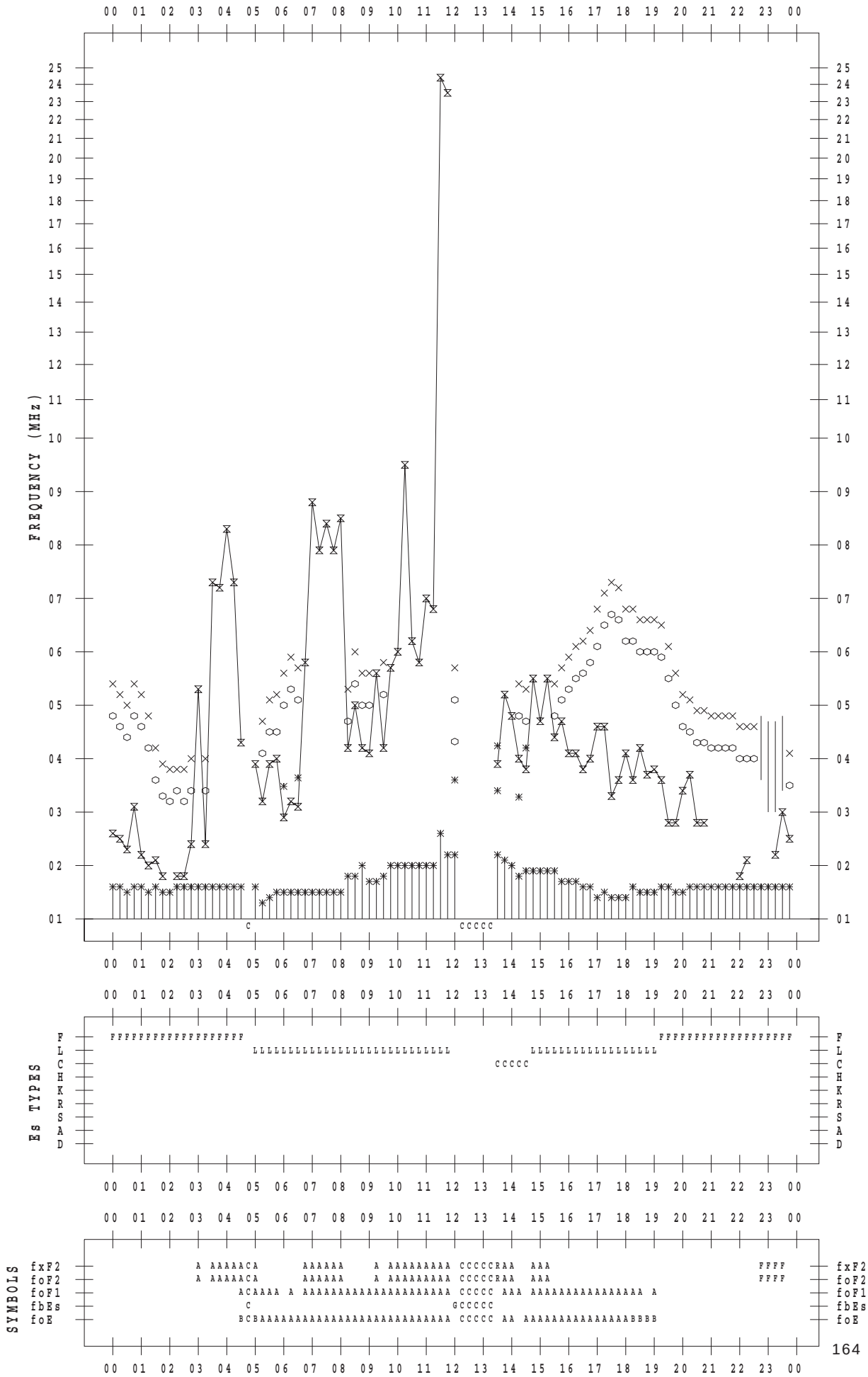
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/27

135 °E MEAN TIME



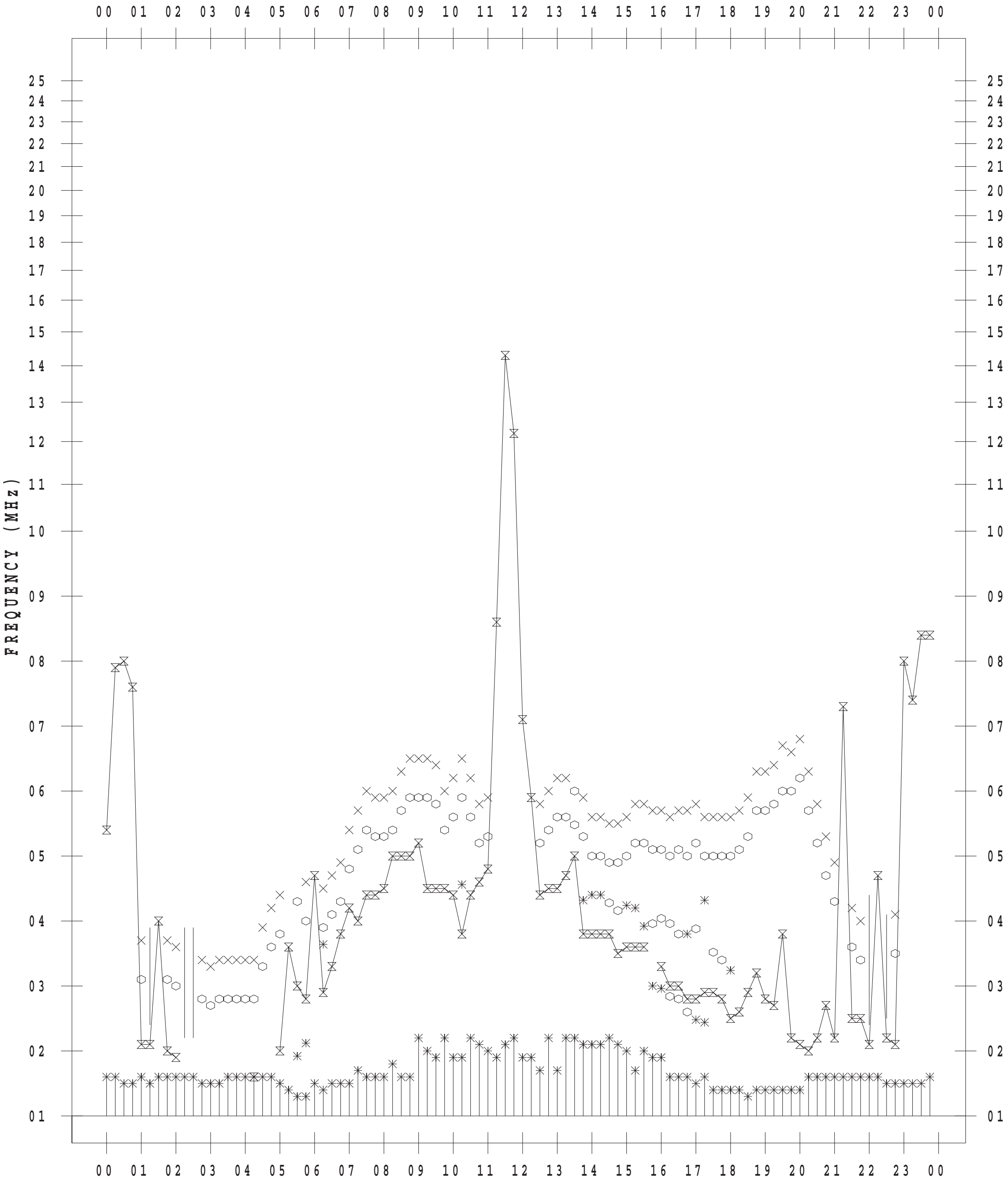
f-PLOT DATA

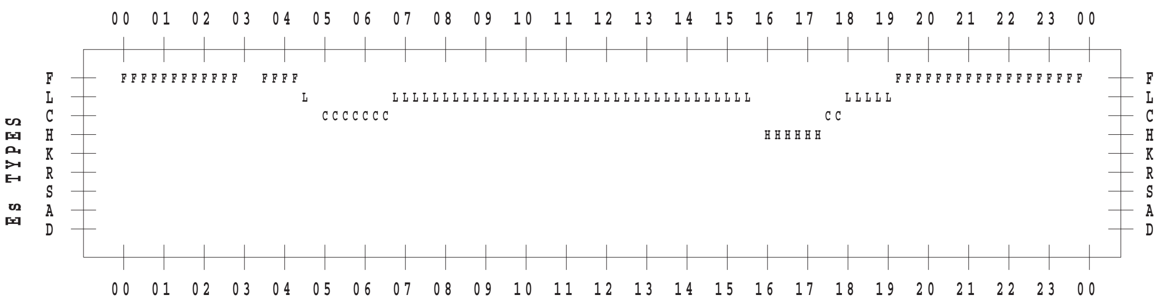
SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/28

135 °E MEAN TIME





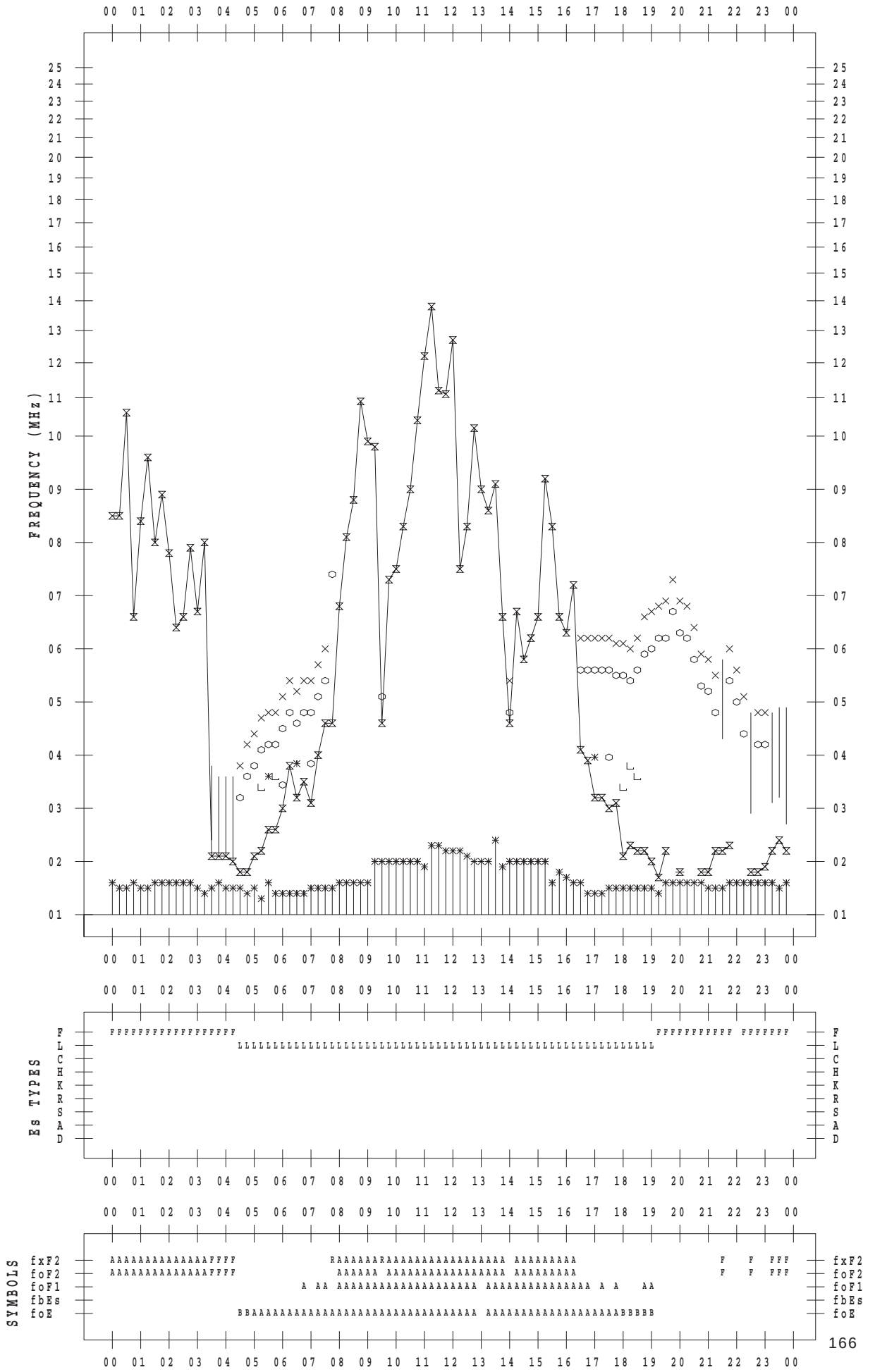
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/29

135 °E MEAN TIME



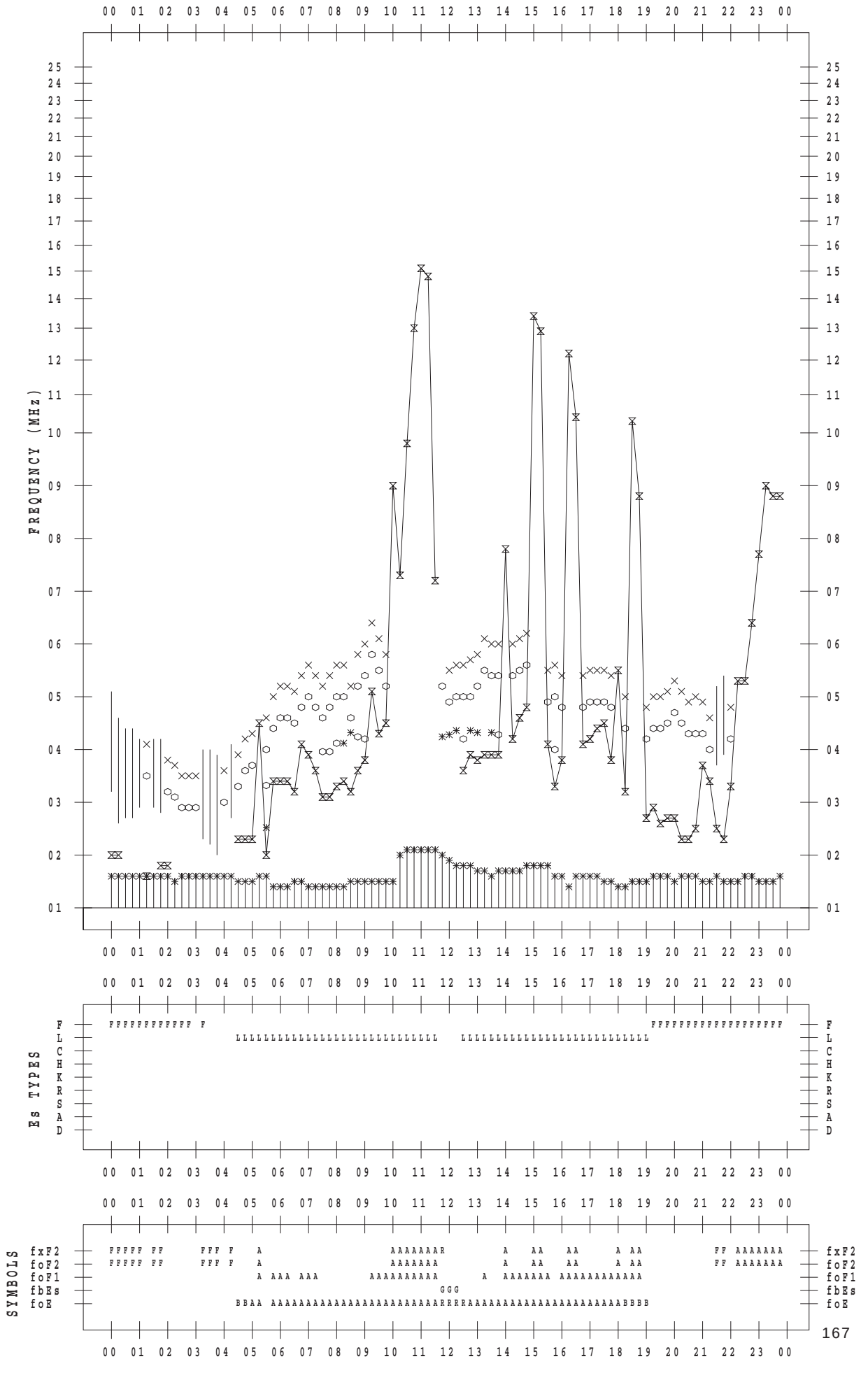
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 6/30

135 °E MEAN TIME



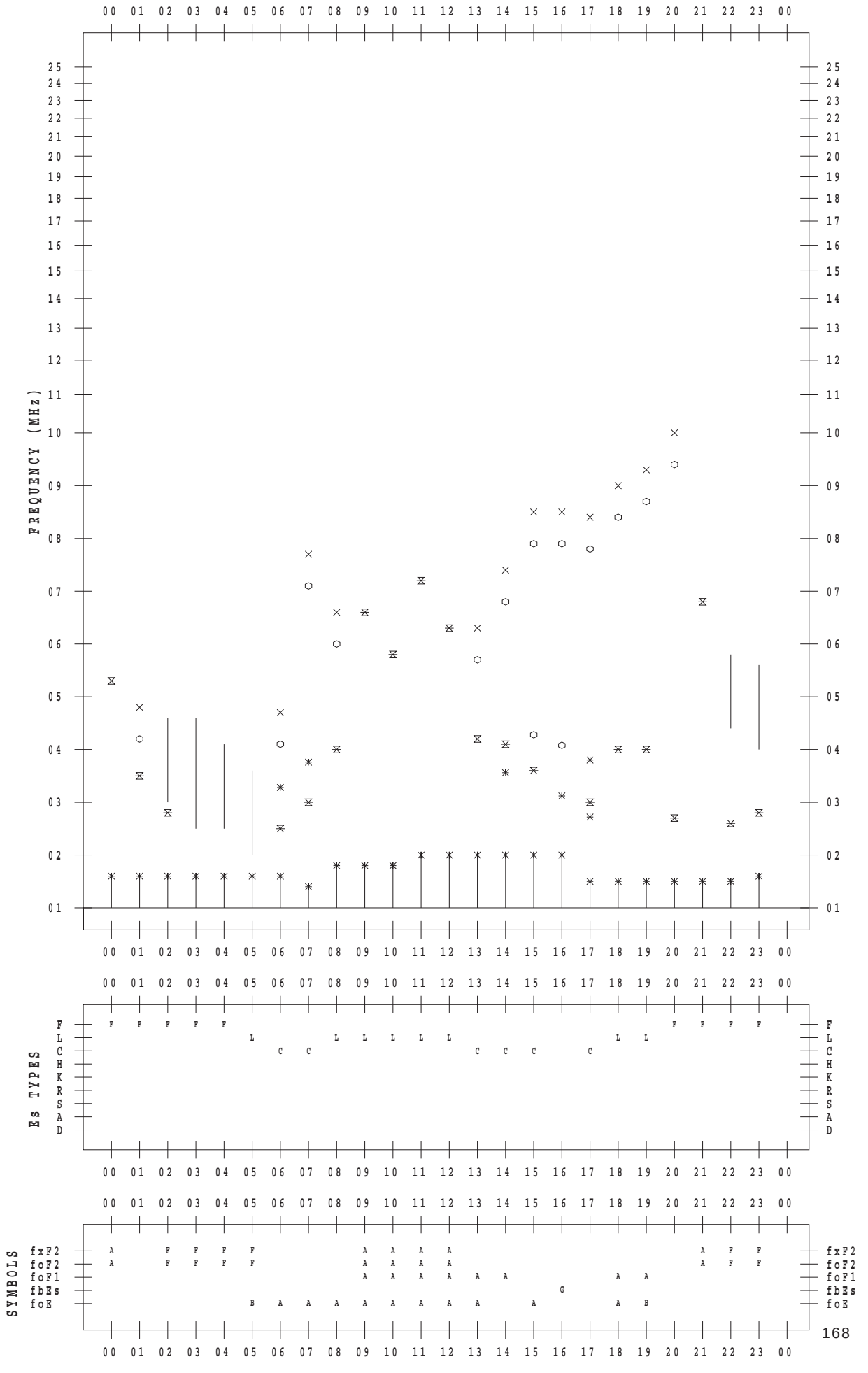
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 1

135 °E MEAN TIME



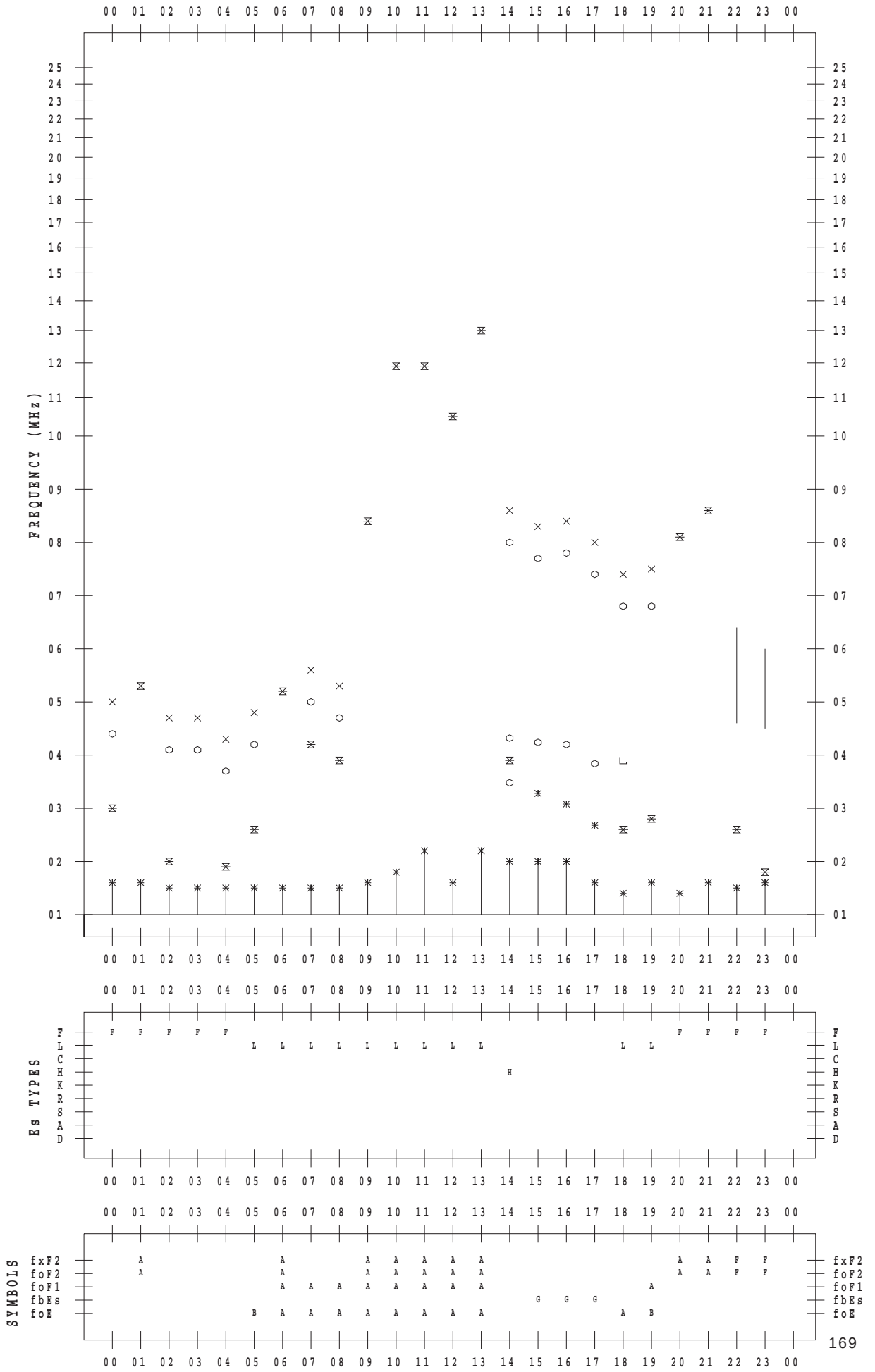
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 2

135 °E MEAN TIME



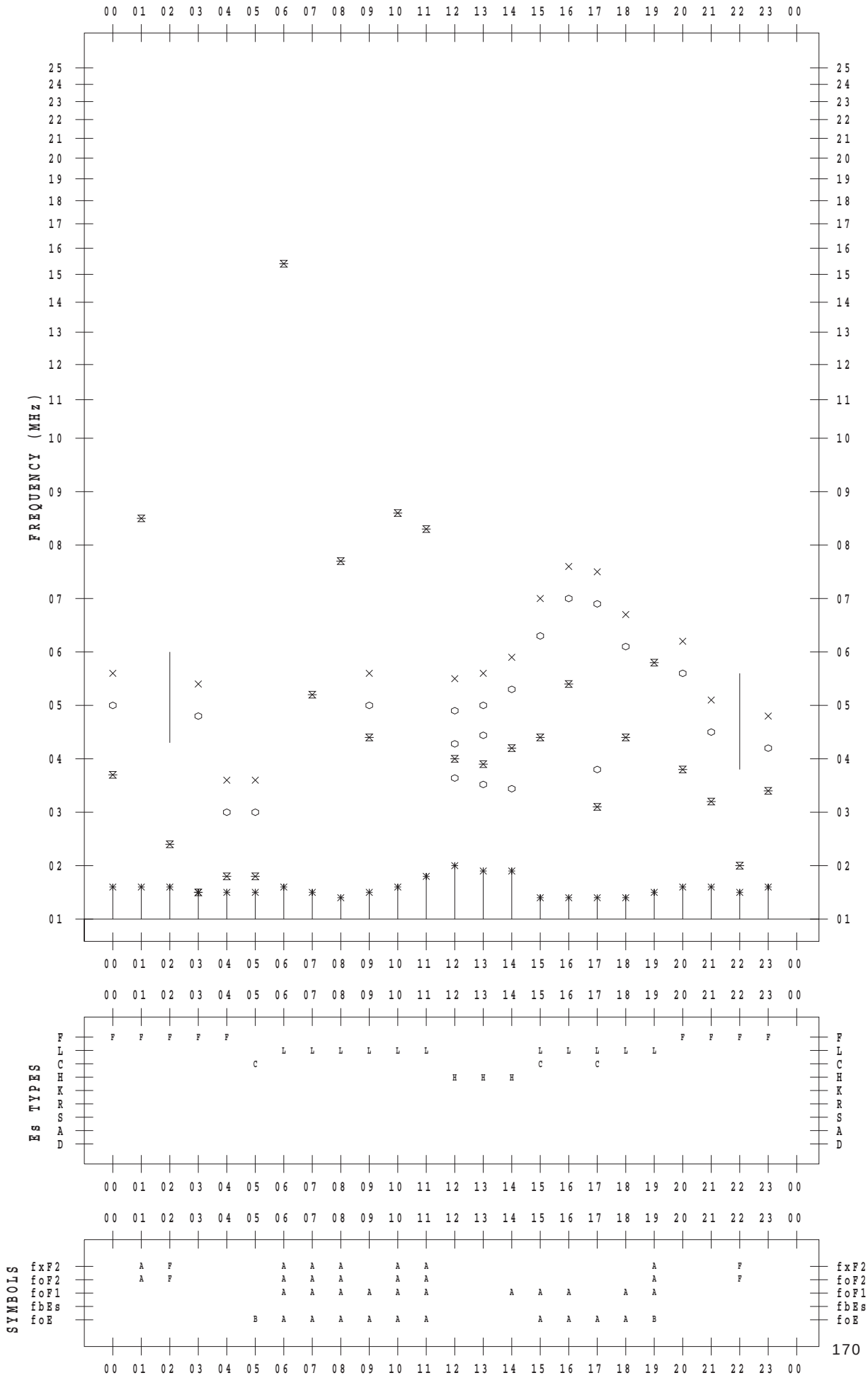
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 3

135 °E MEAN TIME



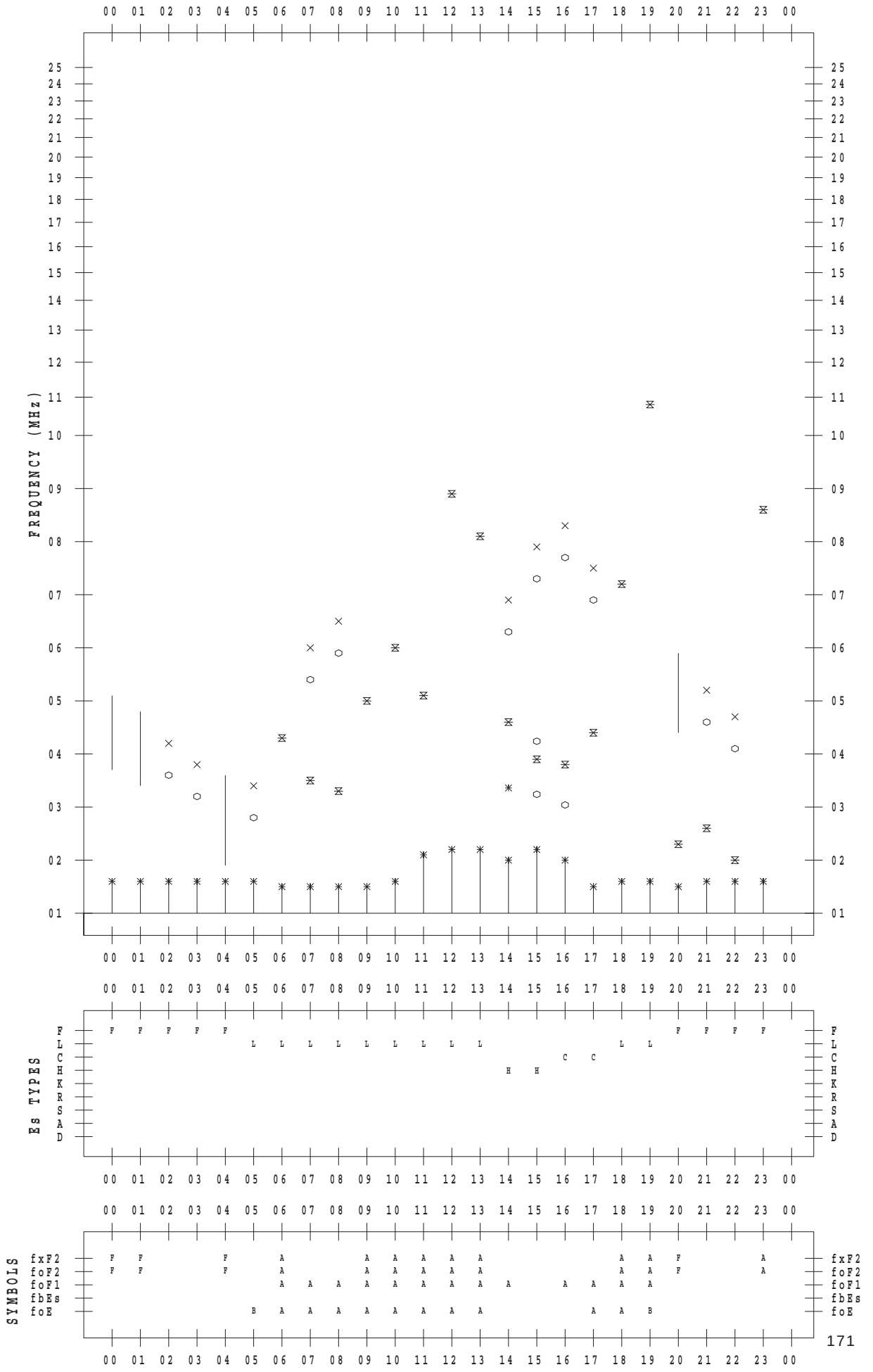
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 4

135 °E MEAN TIME



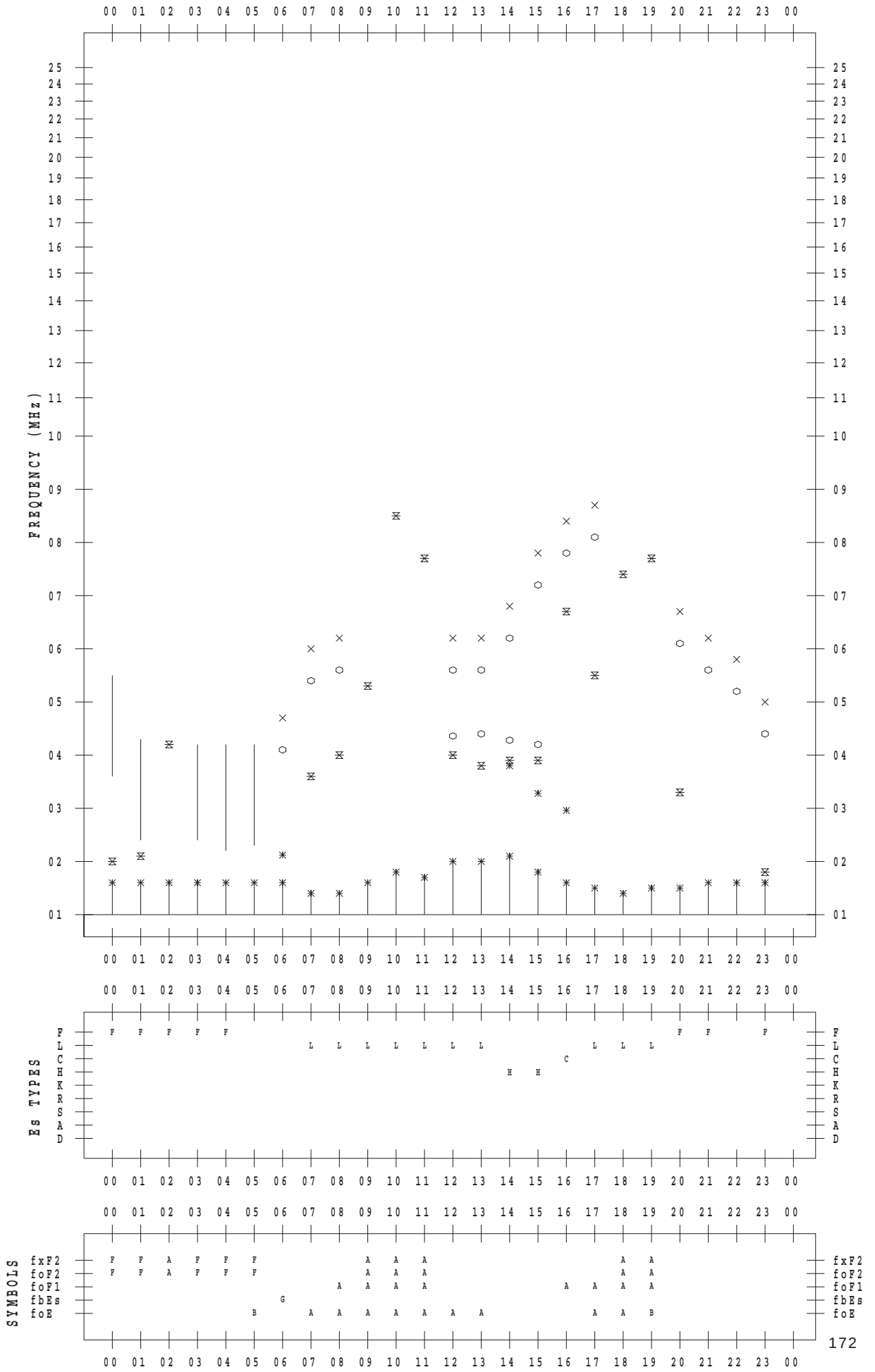
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 5

135 °E MEAN TIME



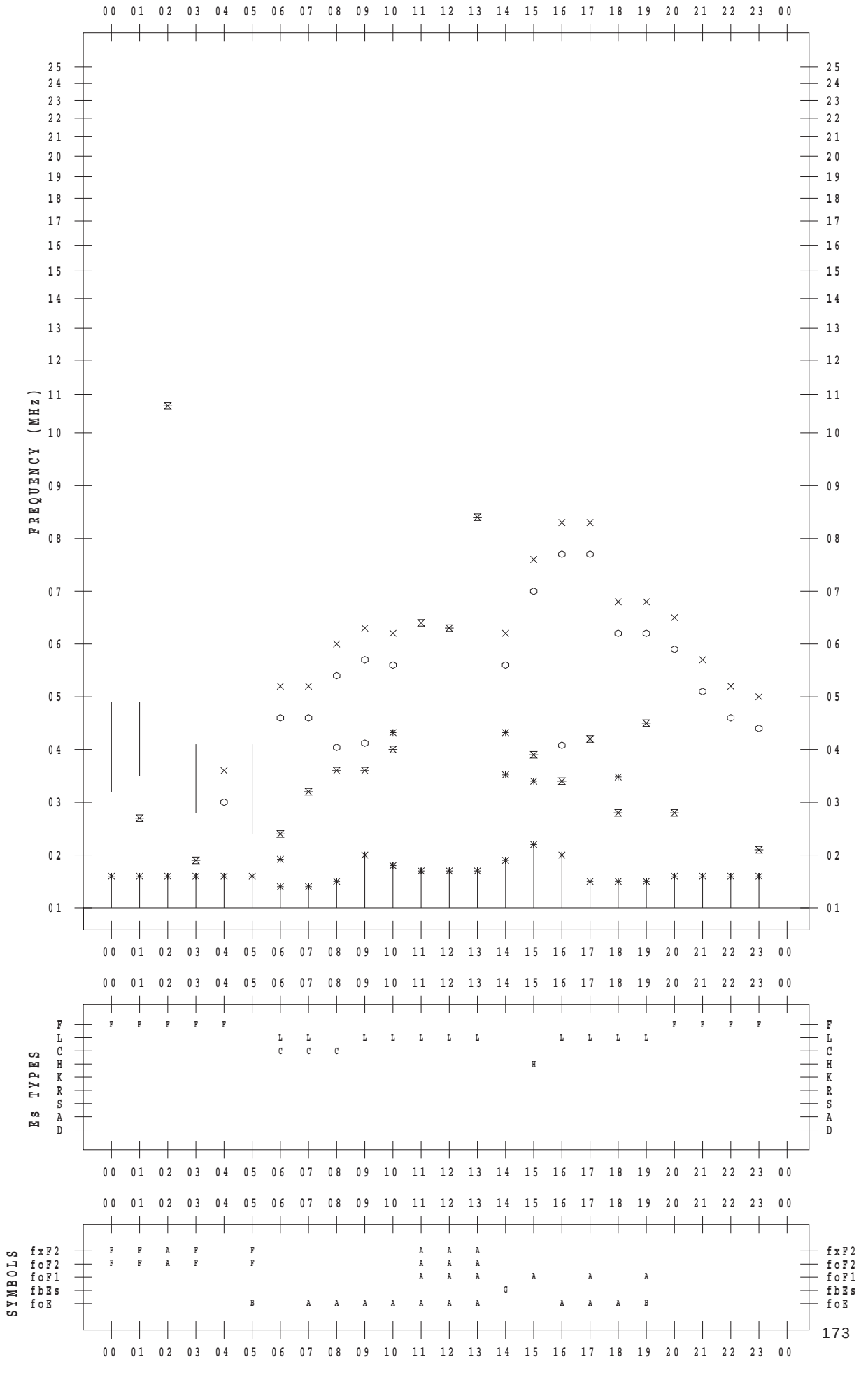
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 6

135 °E MEAN TIME



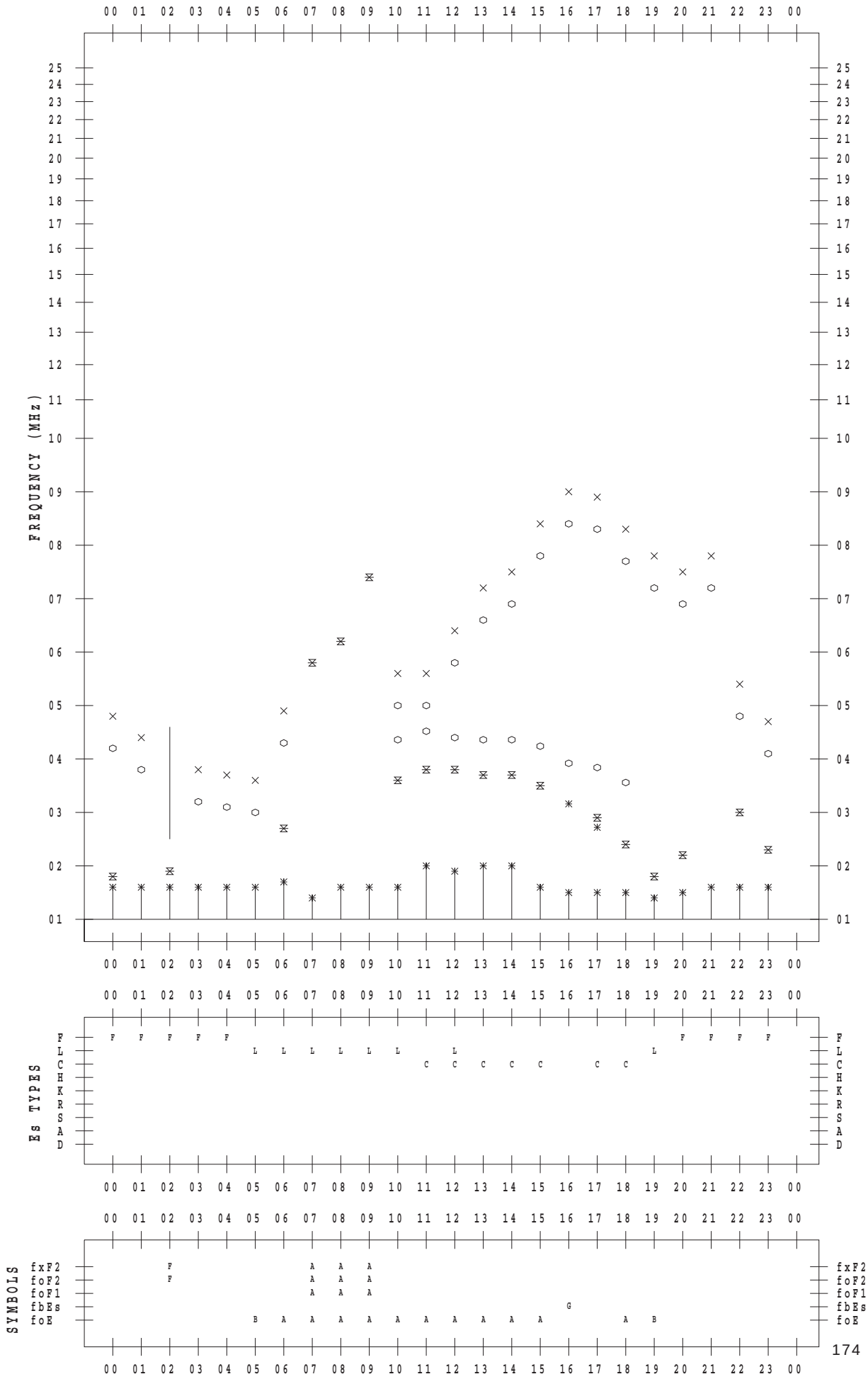
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 7

135 °E MEAN TIME



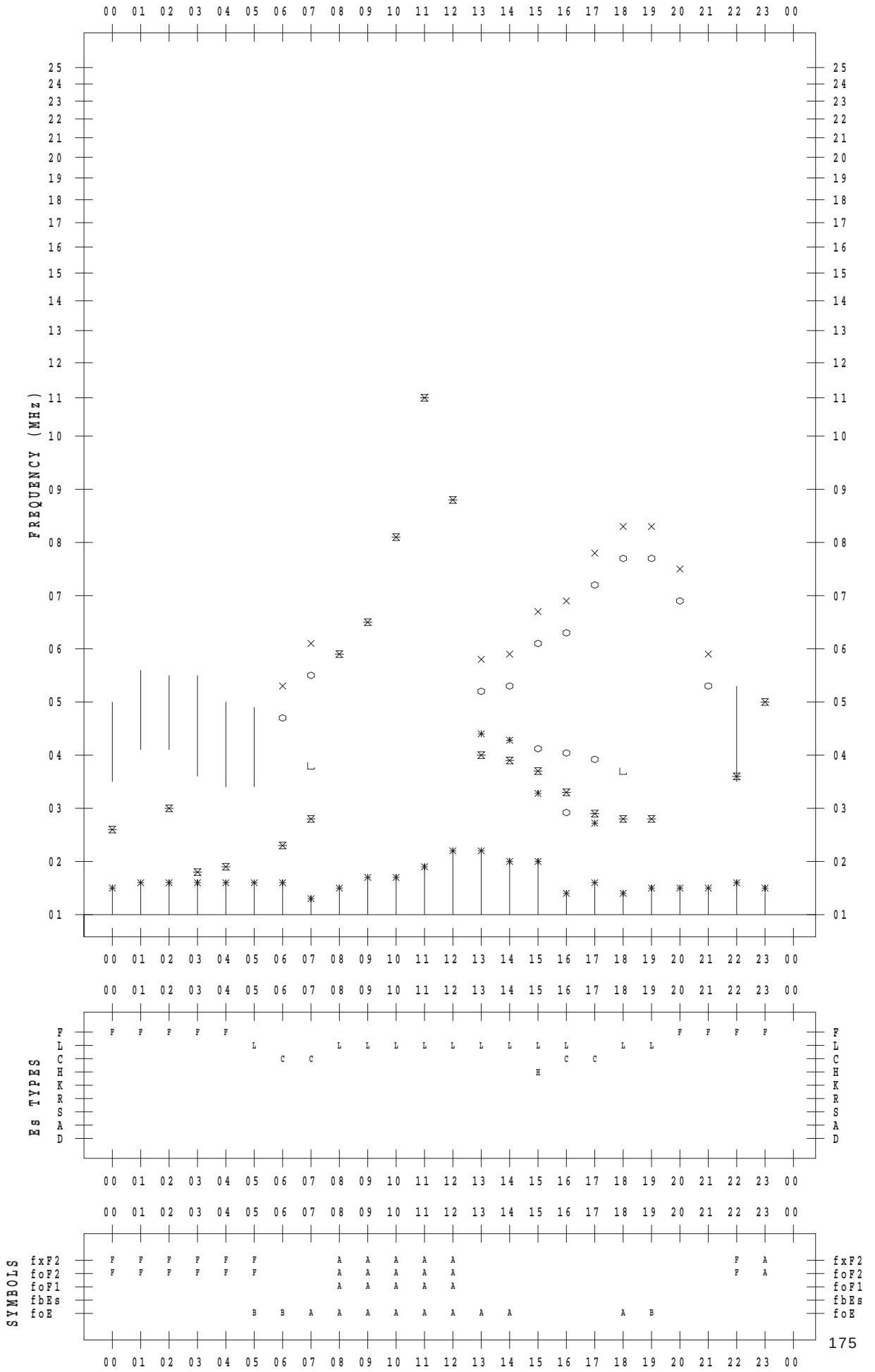
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 8

135 °E MEAN TIME



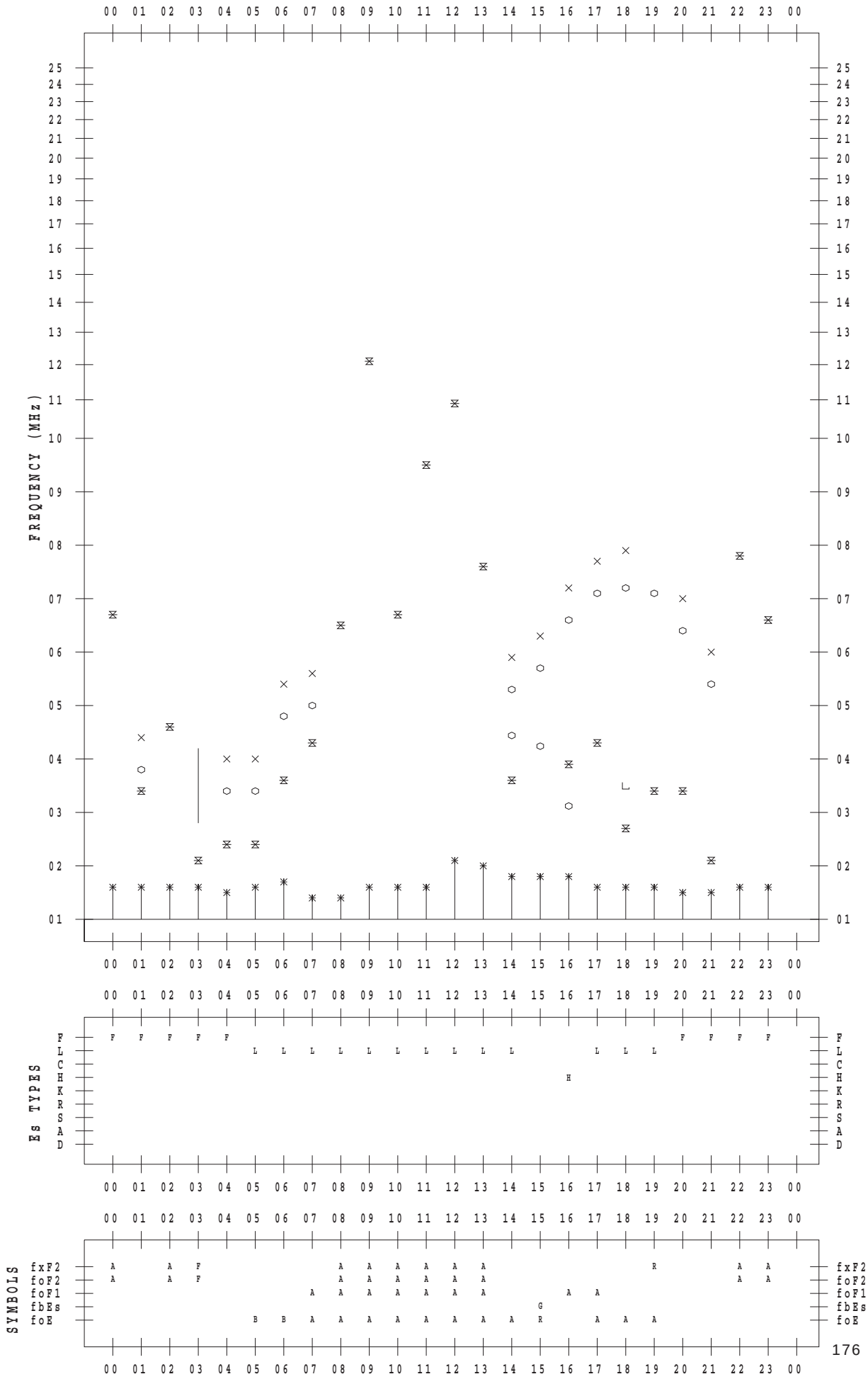
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/ 9

135 °E MEAN TIME



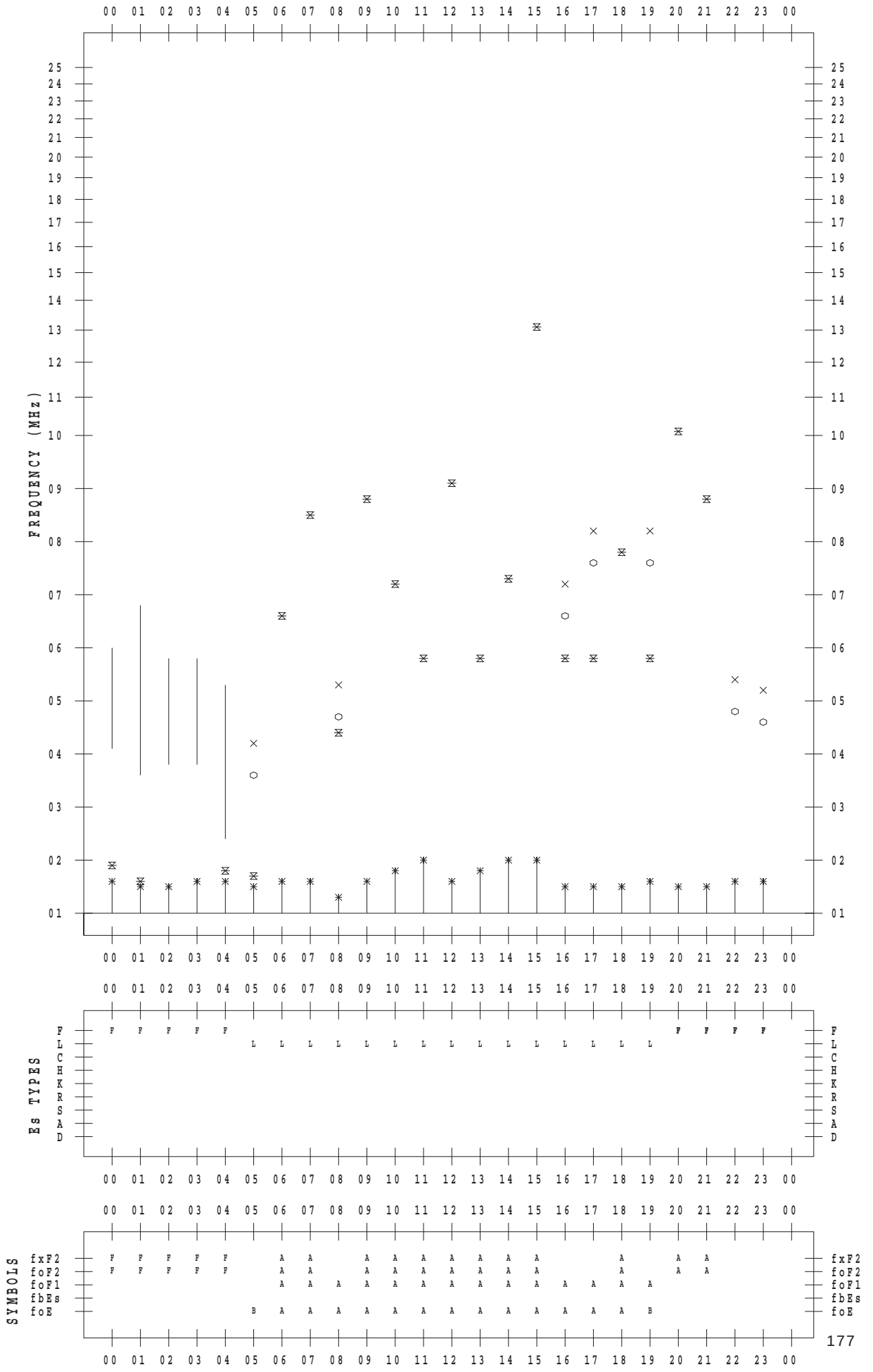
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/10

135 °E MEAN TIME



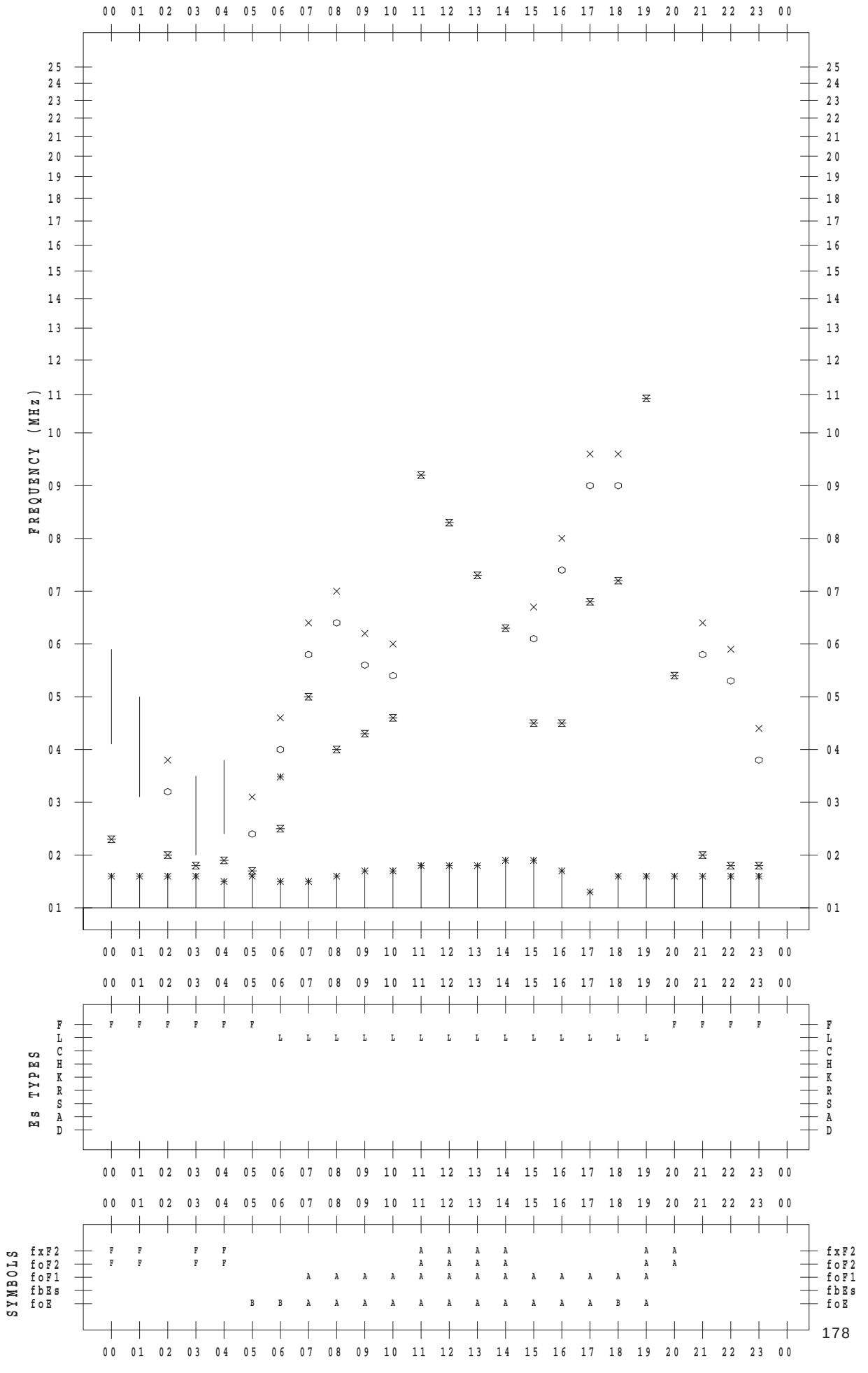
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/11

135 °E MEAN TIME



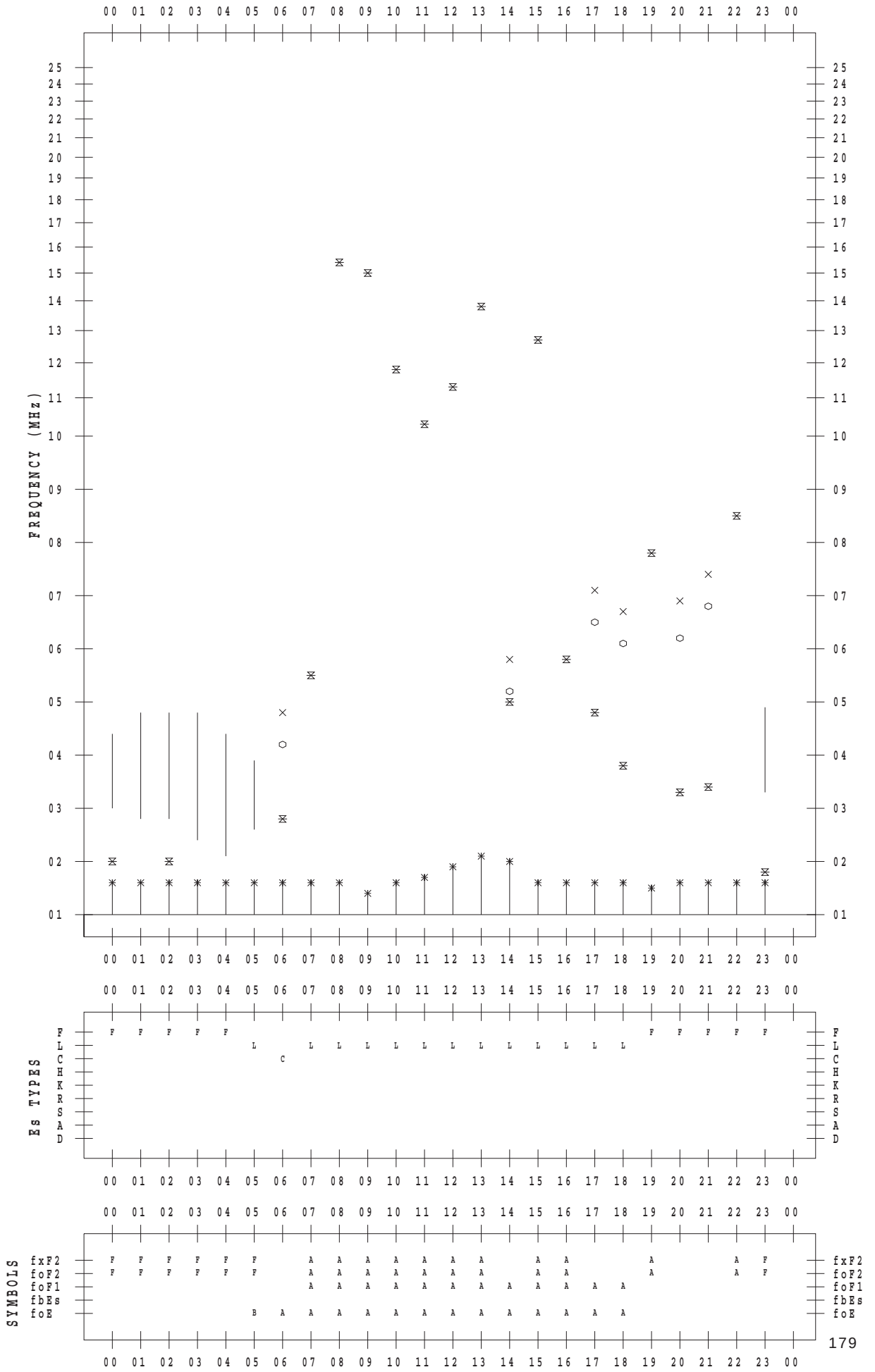
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/12

135 °E MEAN TIME



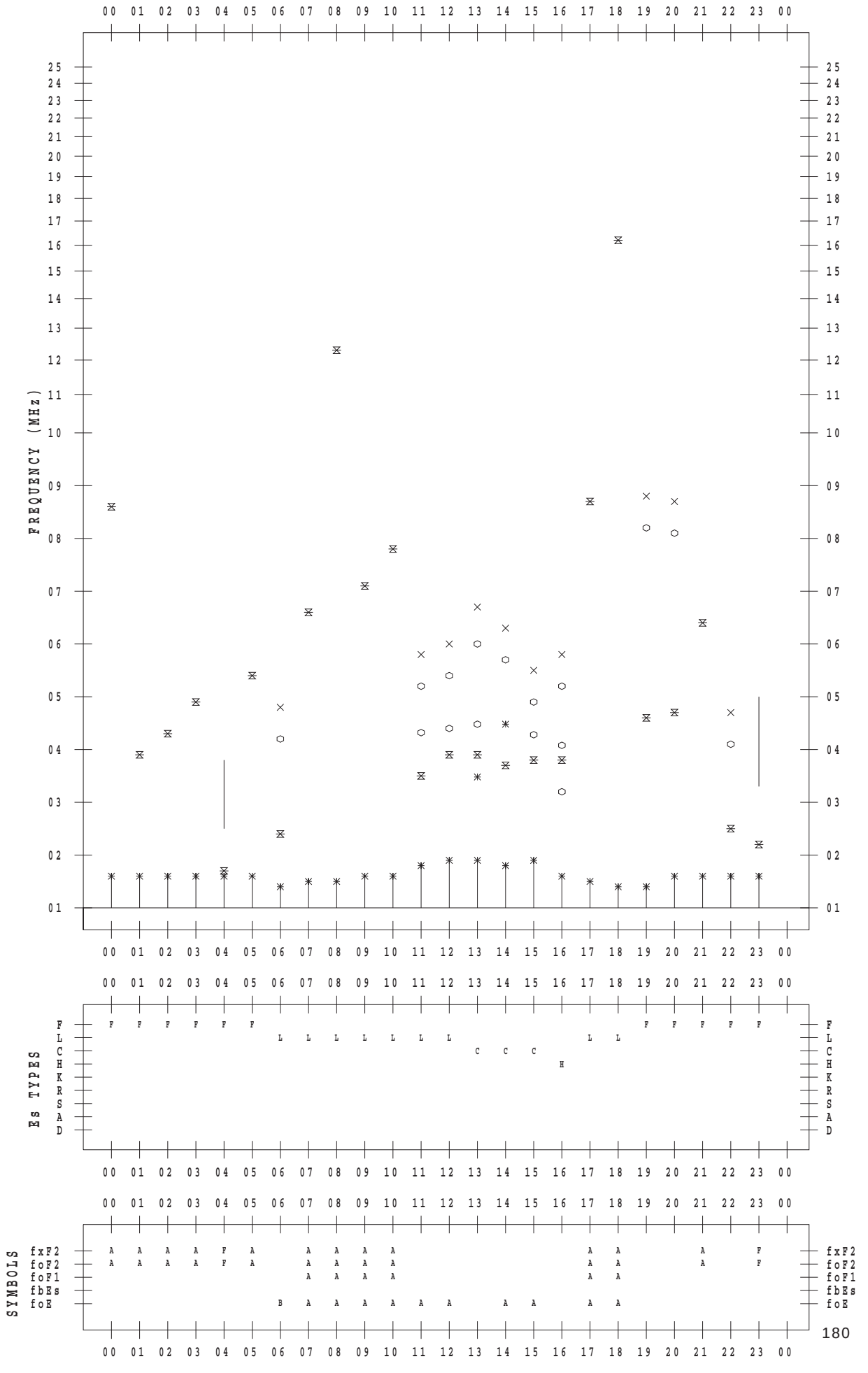
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/13

135 °E MEAN TIME



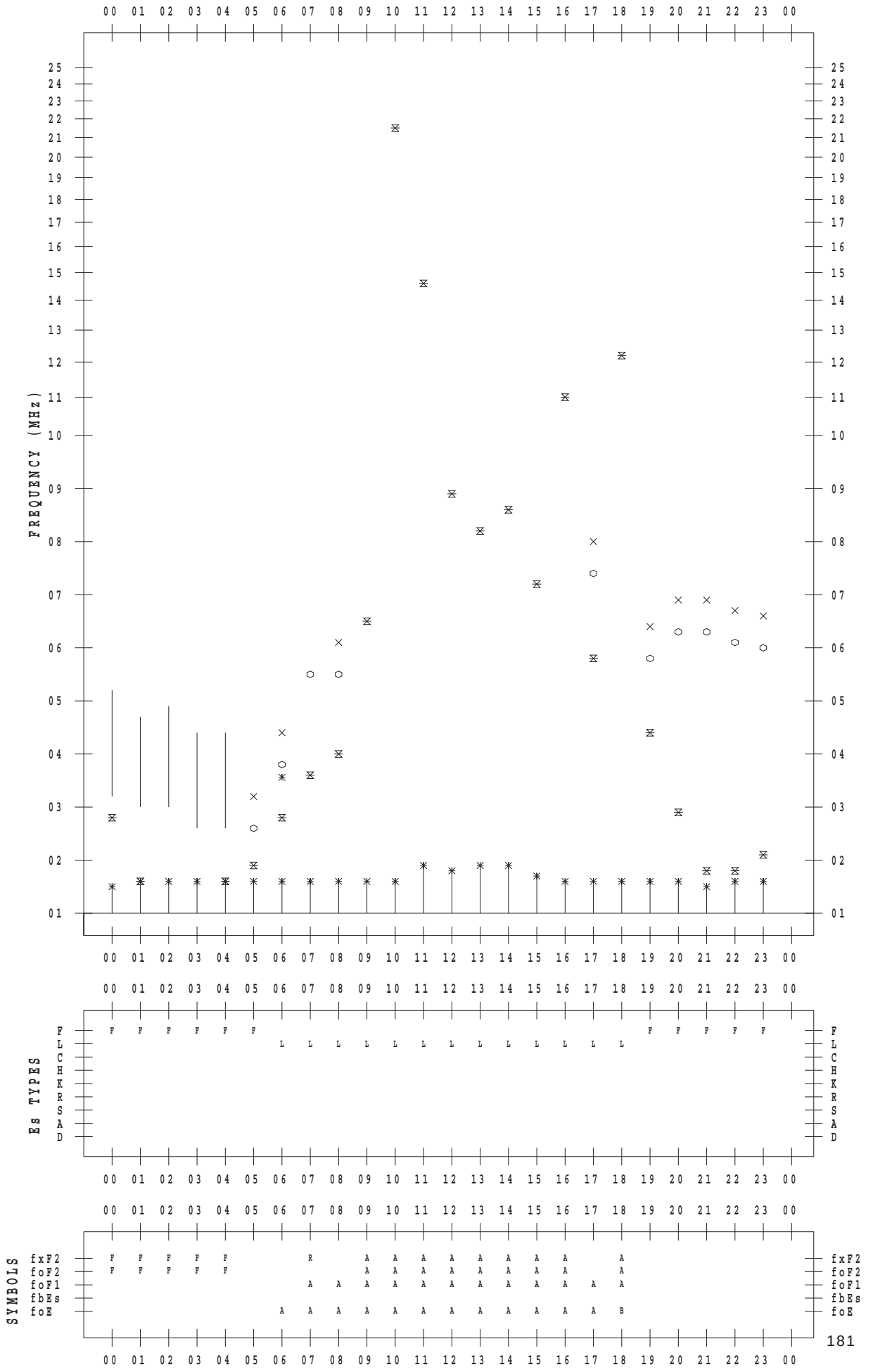
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/14

135 °E MEAN TIME



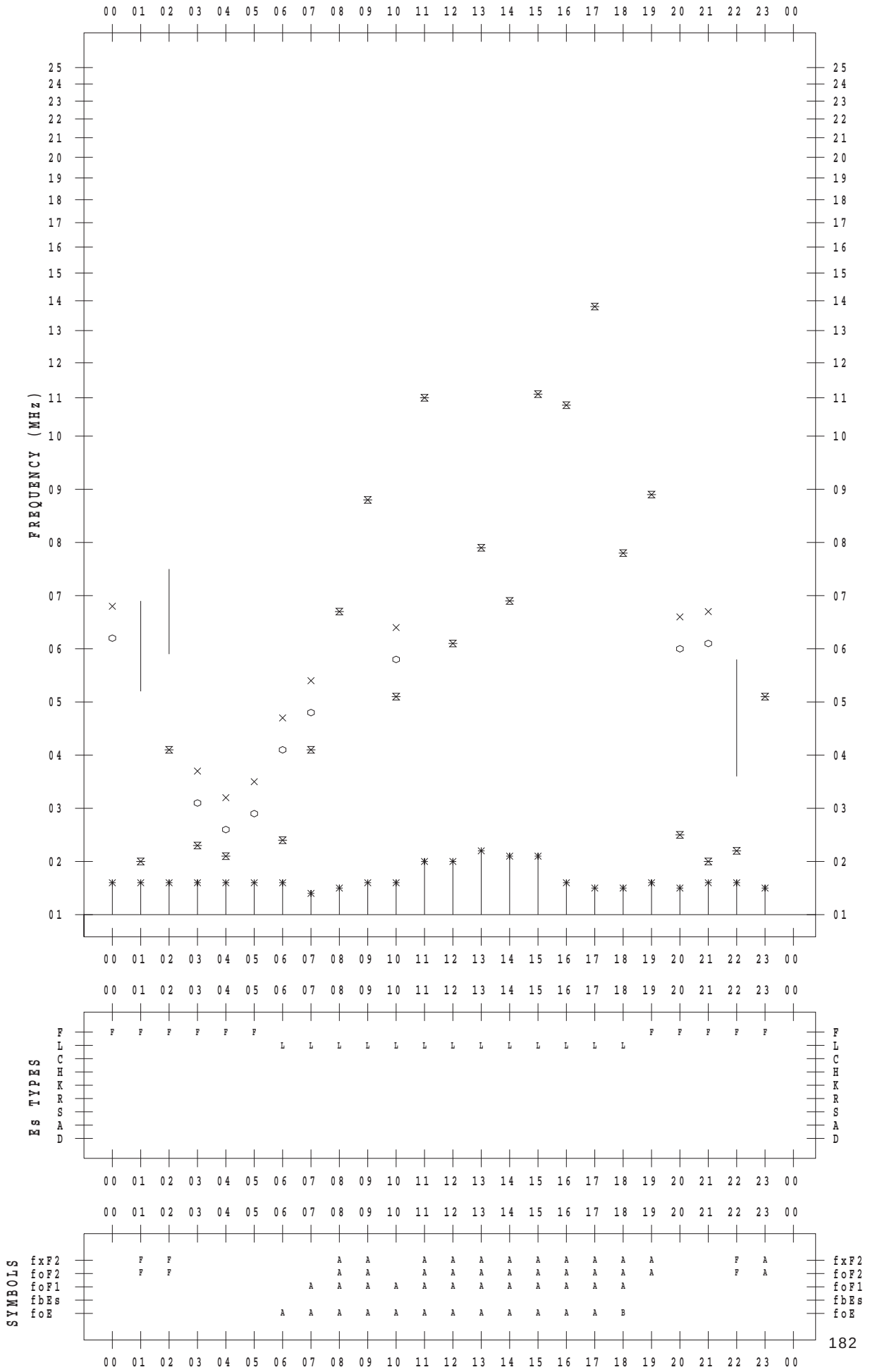
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/15

135 °E MEAN TIME



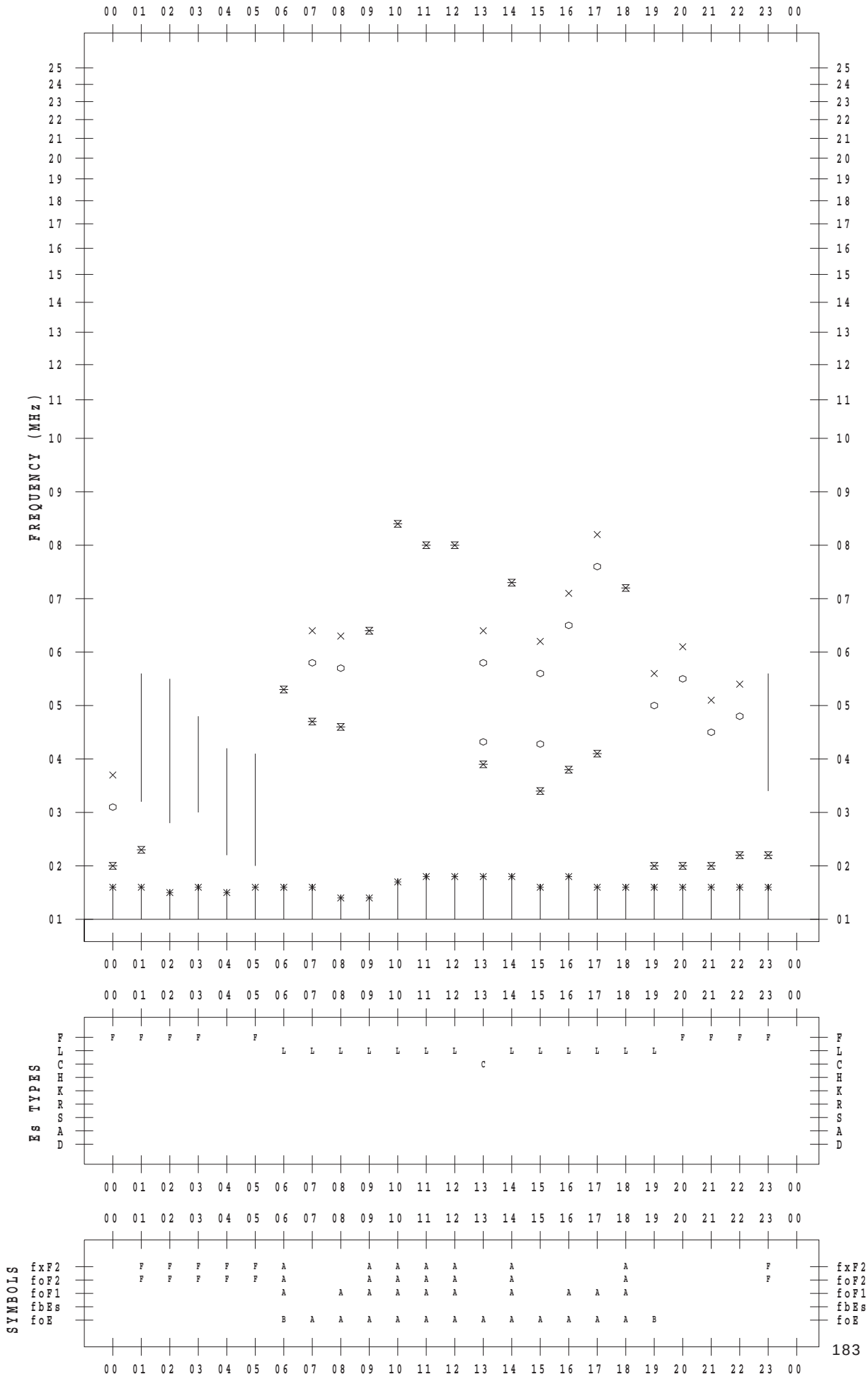
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/16

135 °E MEAN TIME



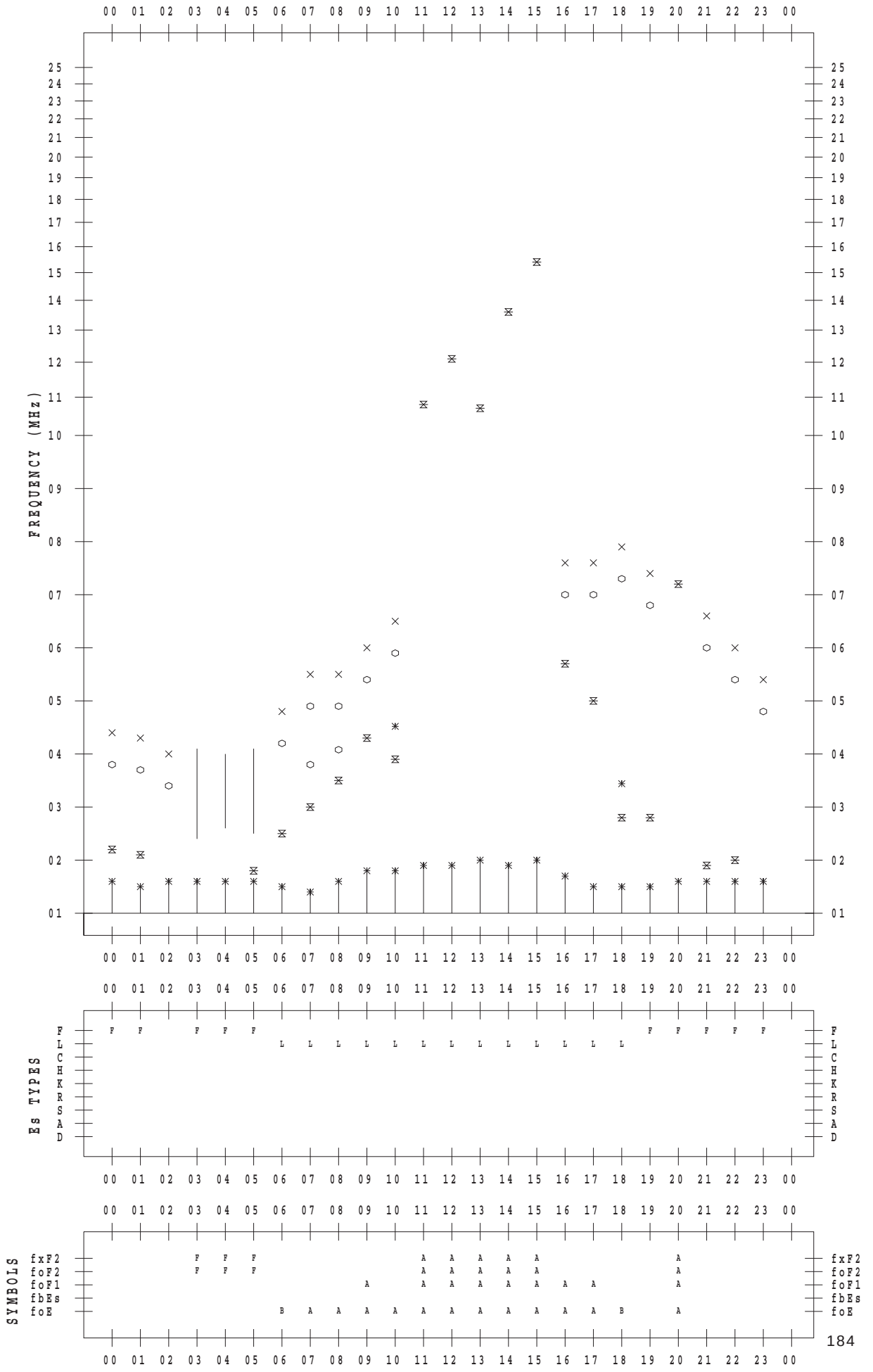
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/17

135 °E MEAN TIME



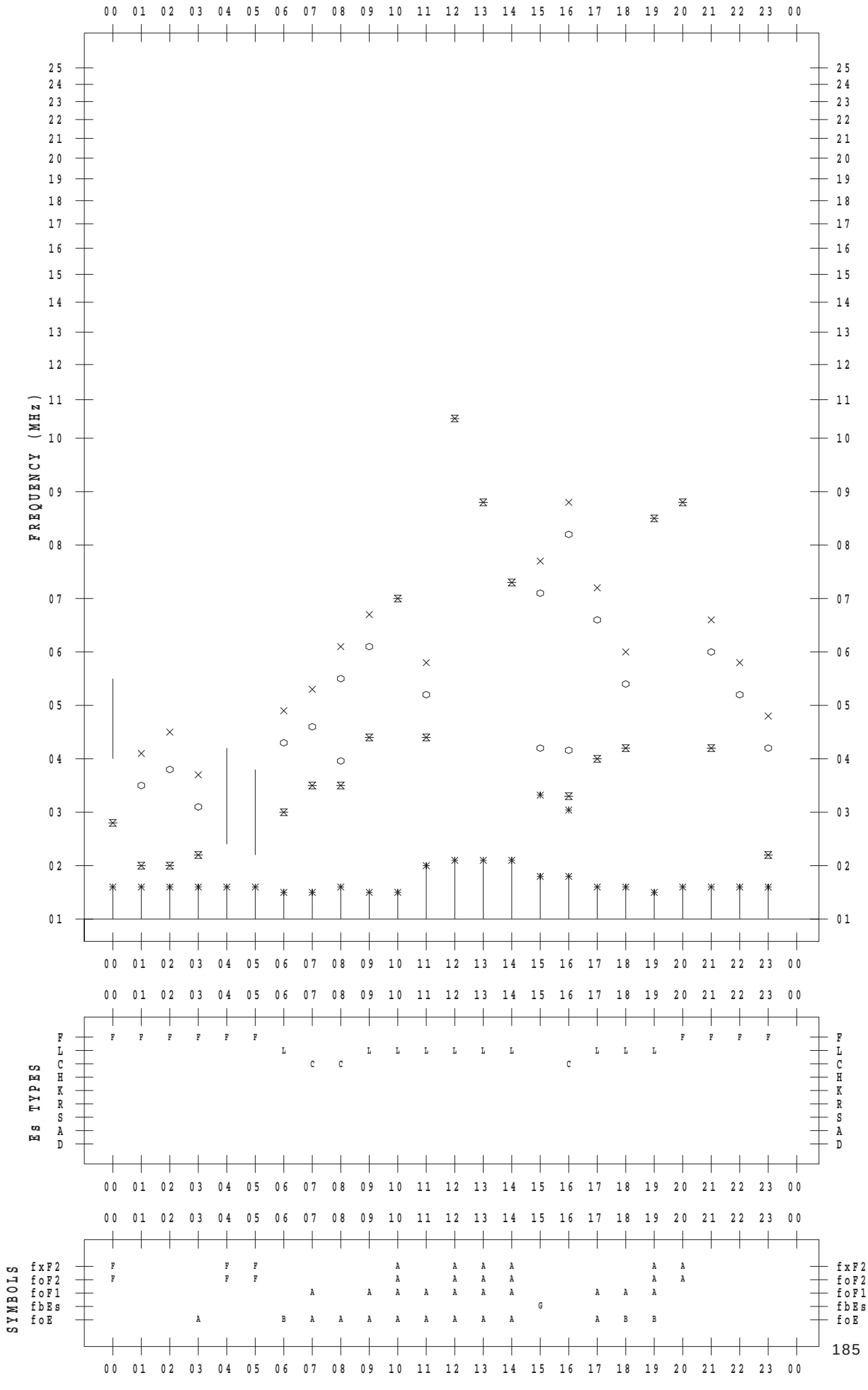
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/18

135 °E MEAN TIME



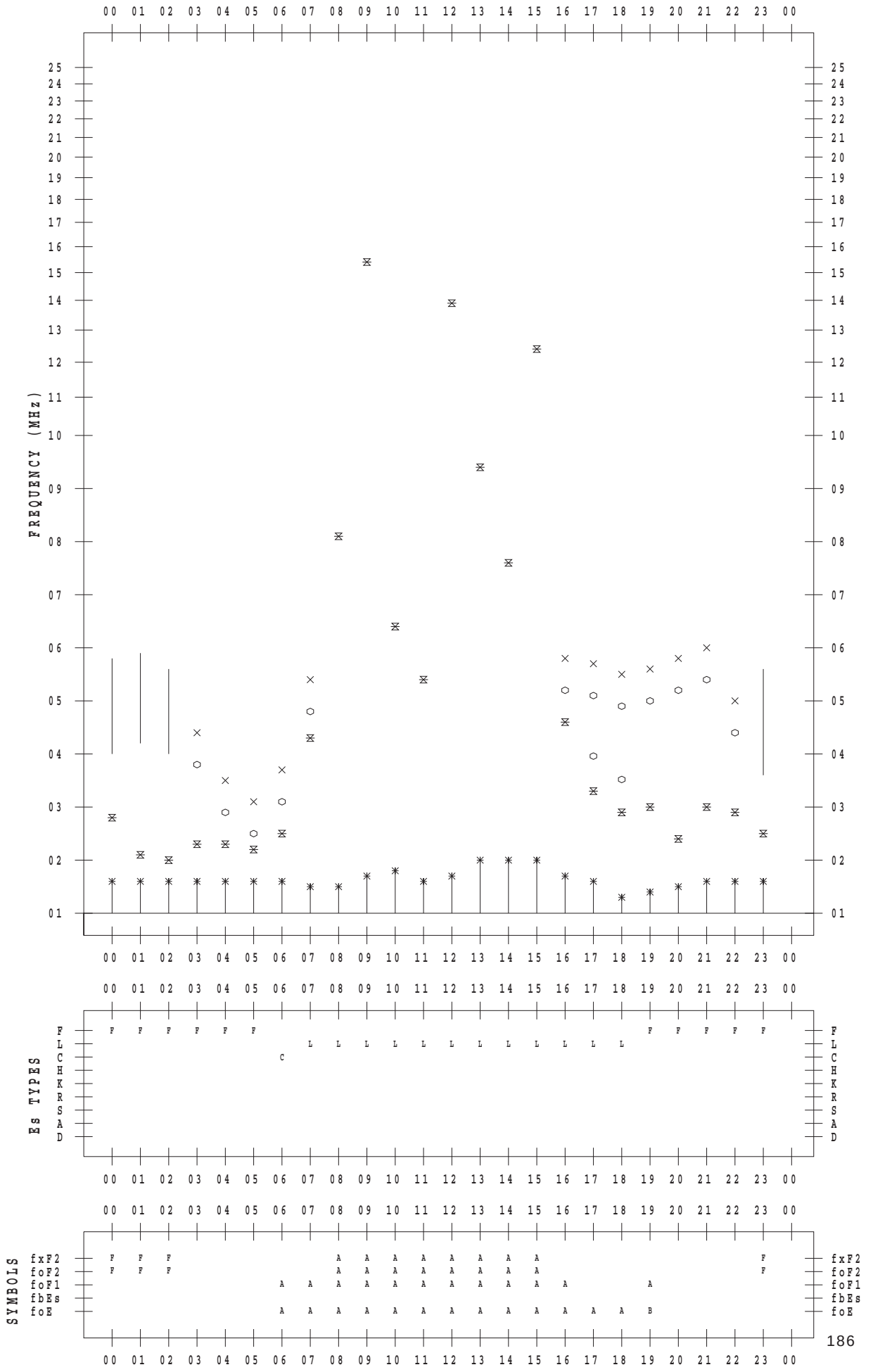
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/19

135 °E MEAN TIME



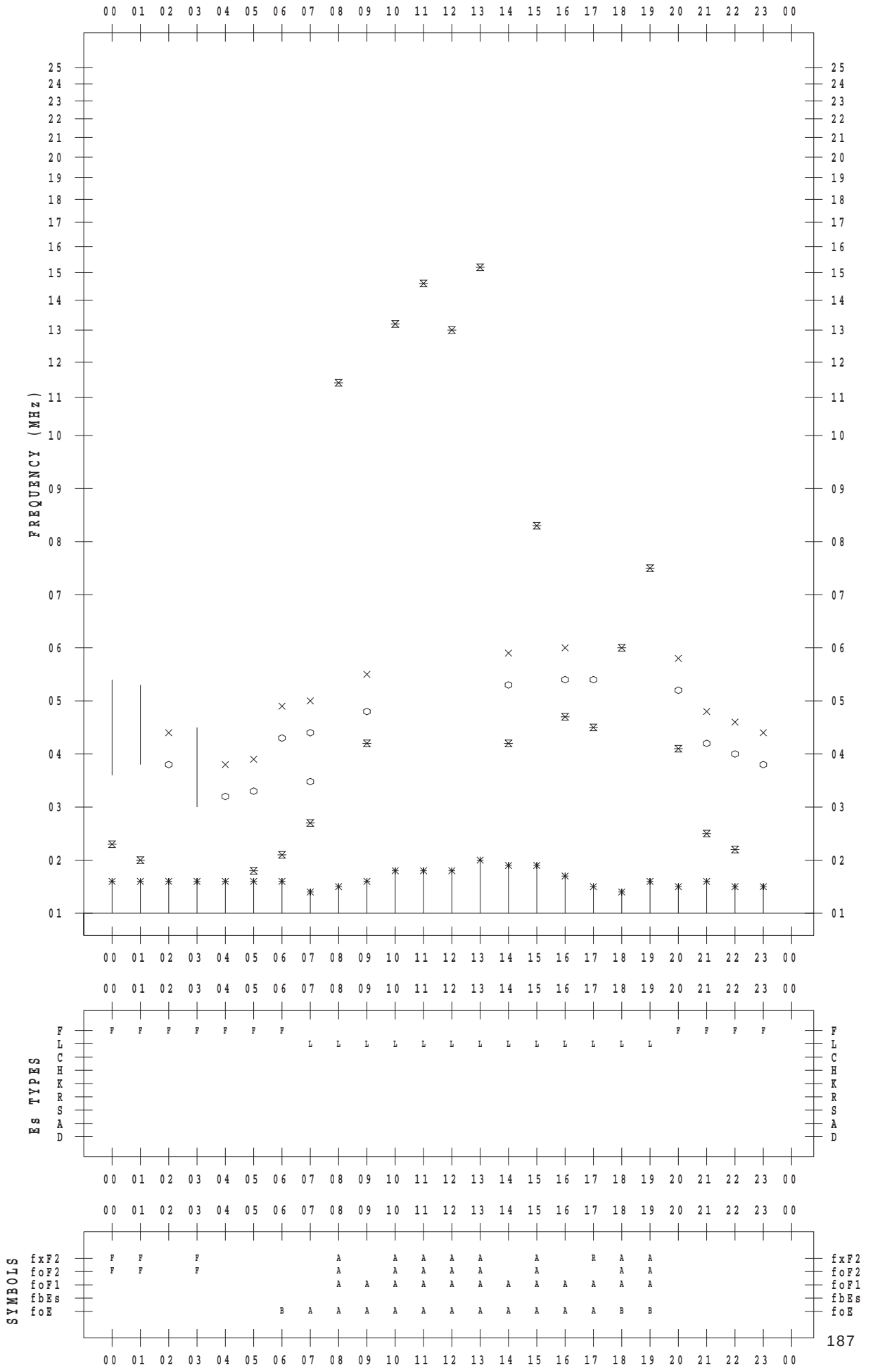
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/20

135 °E MEAN TIME



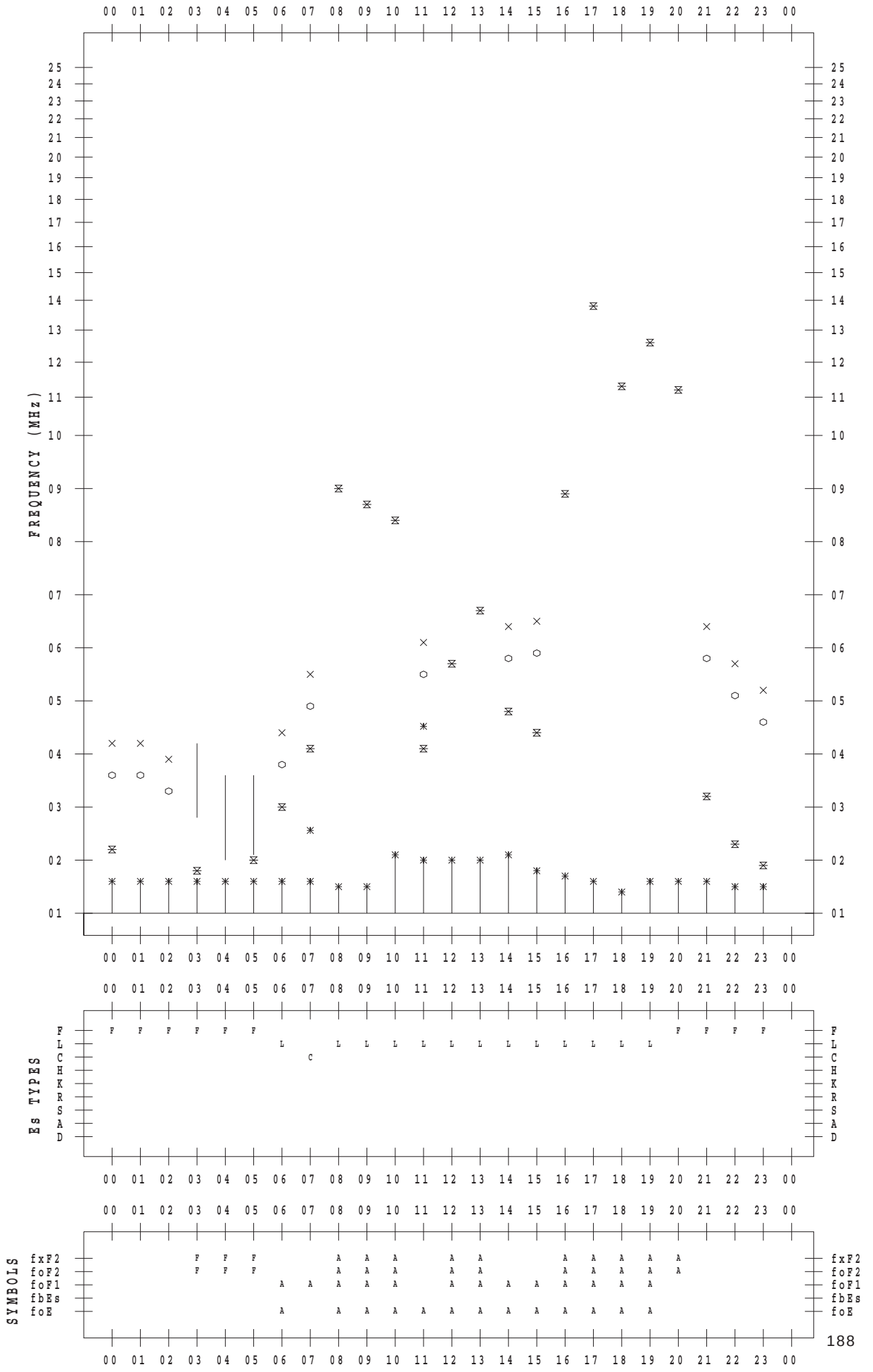
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/21

135 °E MEAN TIME



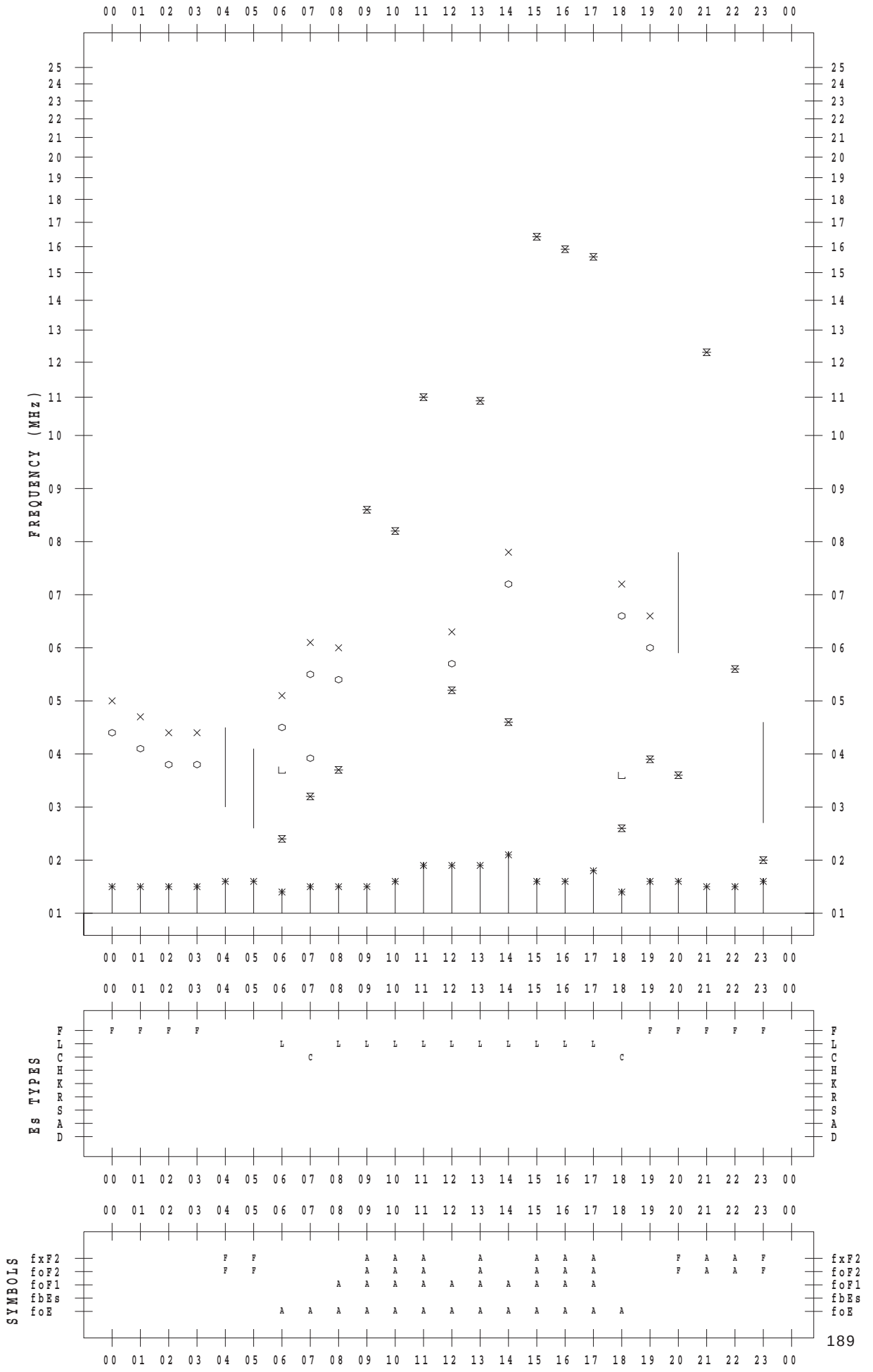
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/22

135 °E MEAN TIME



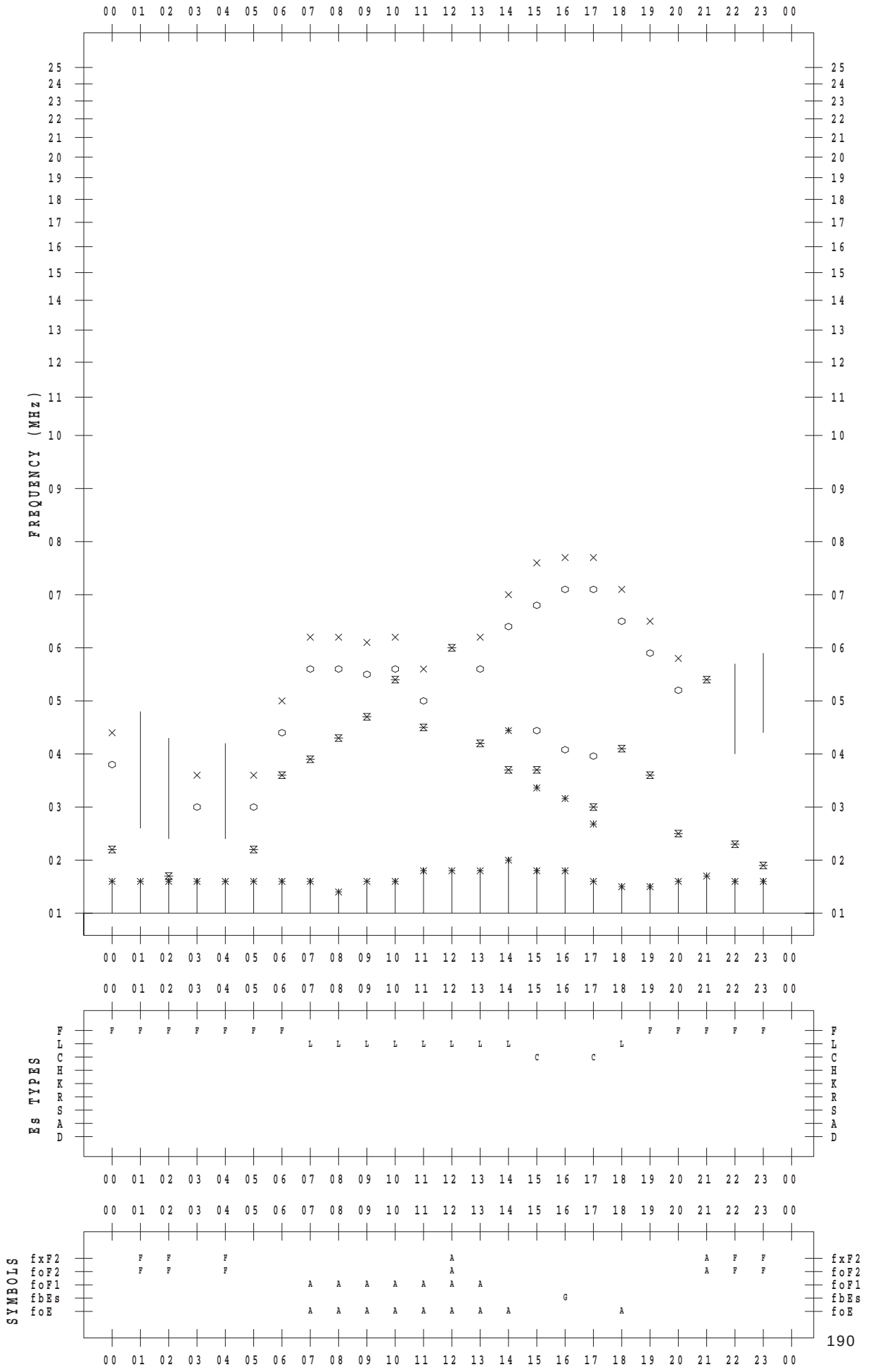
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/23

135 °E MEAN TIME



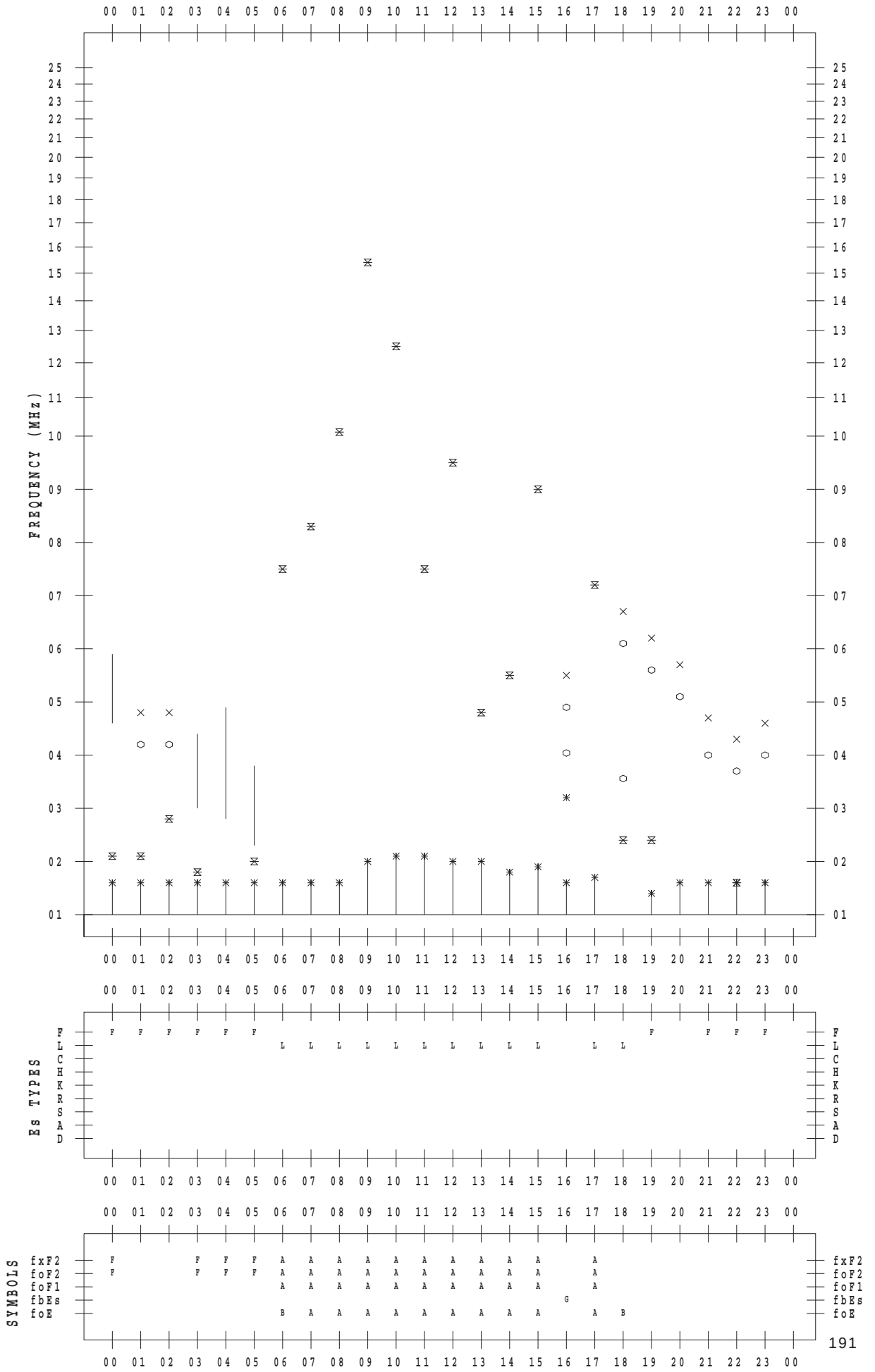
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/24

135 °E MEAN TIME



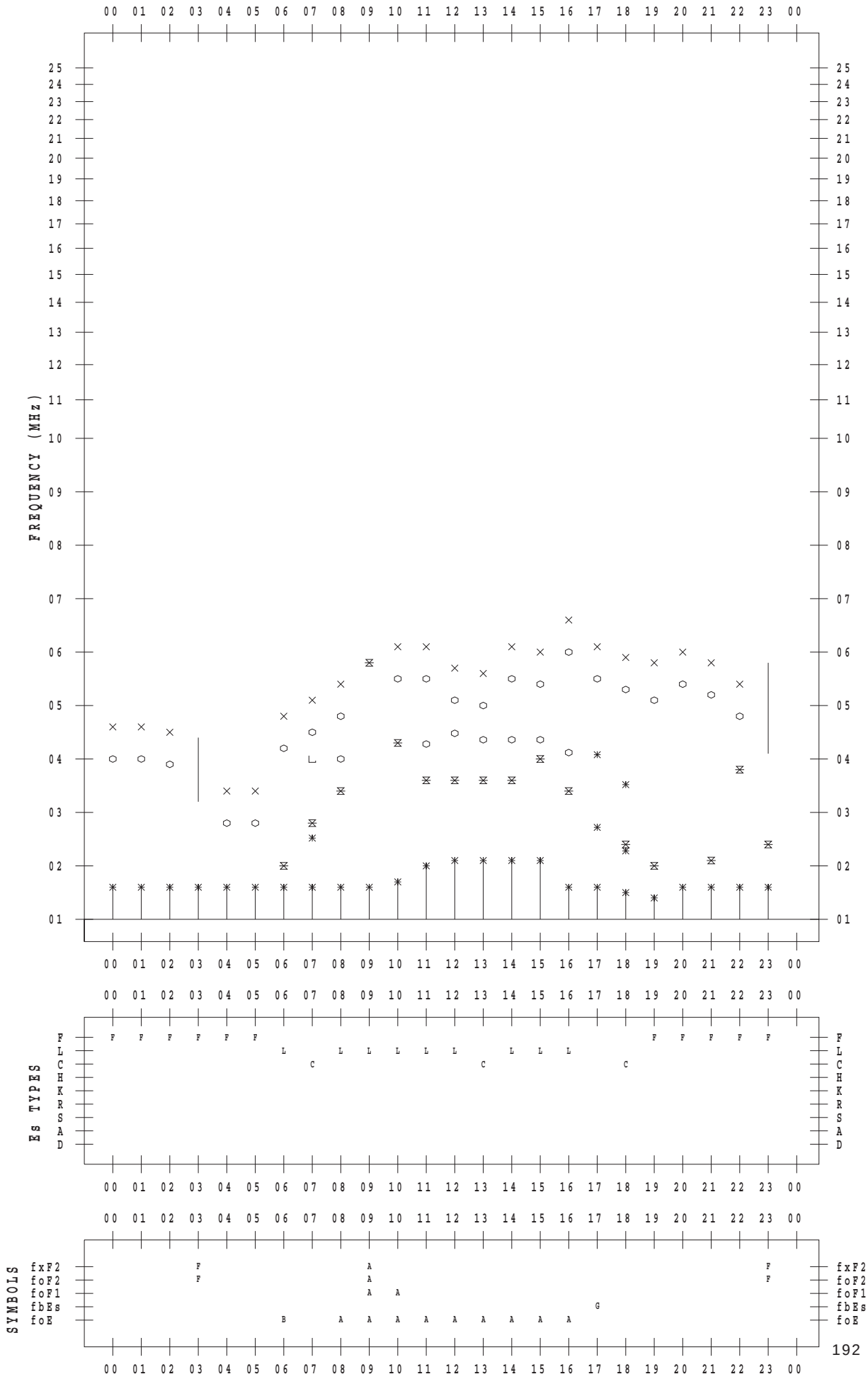
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/25

135 °E MEAN TIME



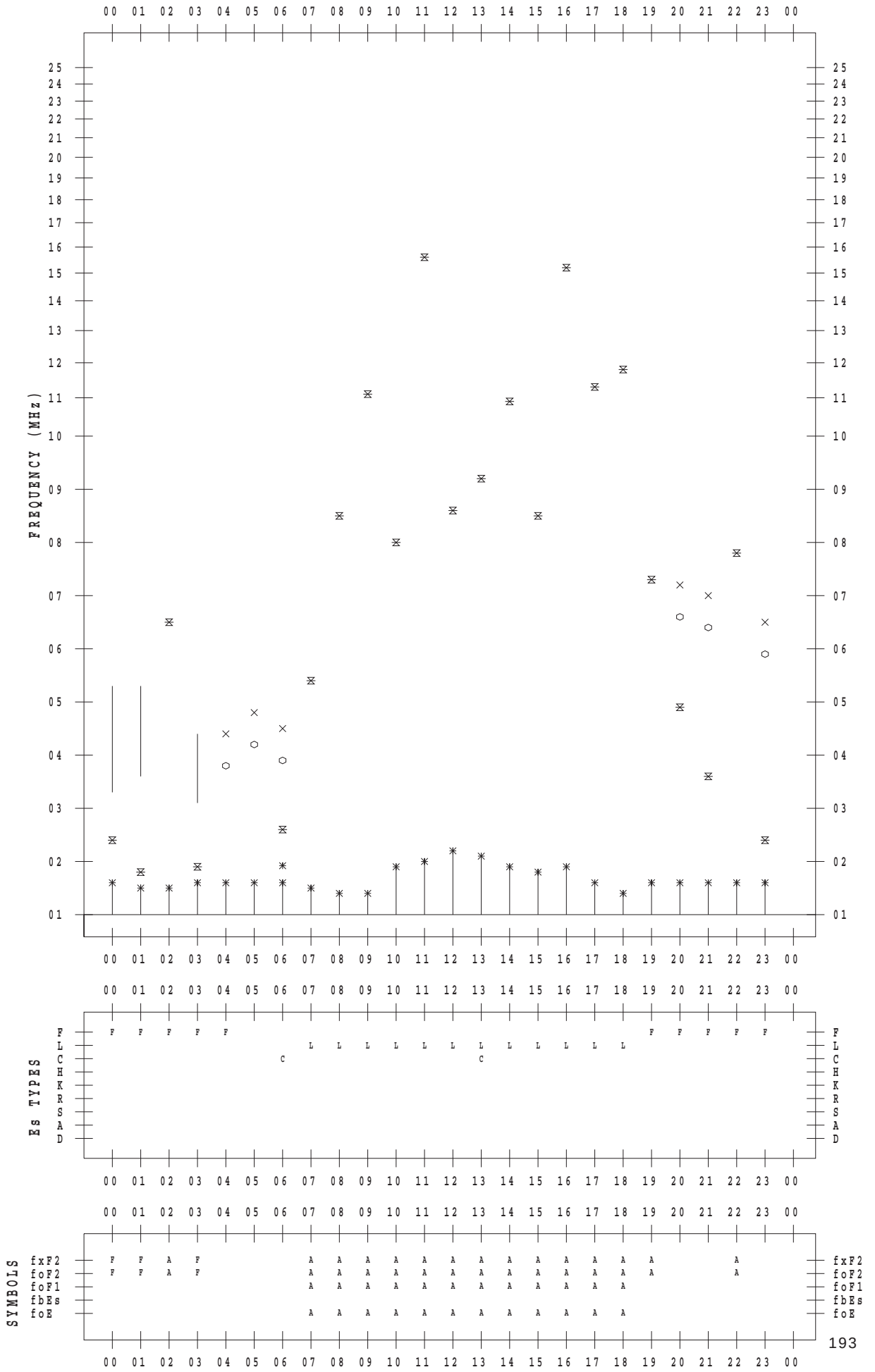
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/26

135 °E MEAN TIME



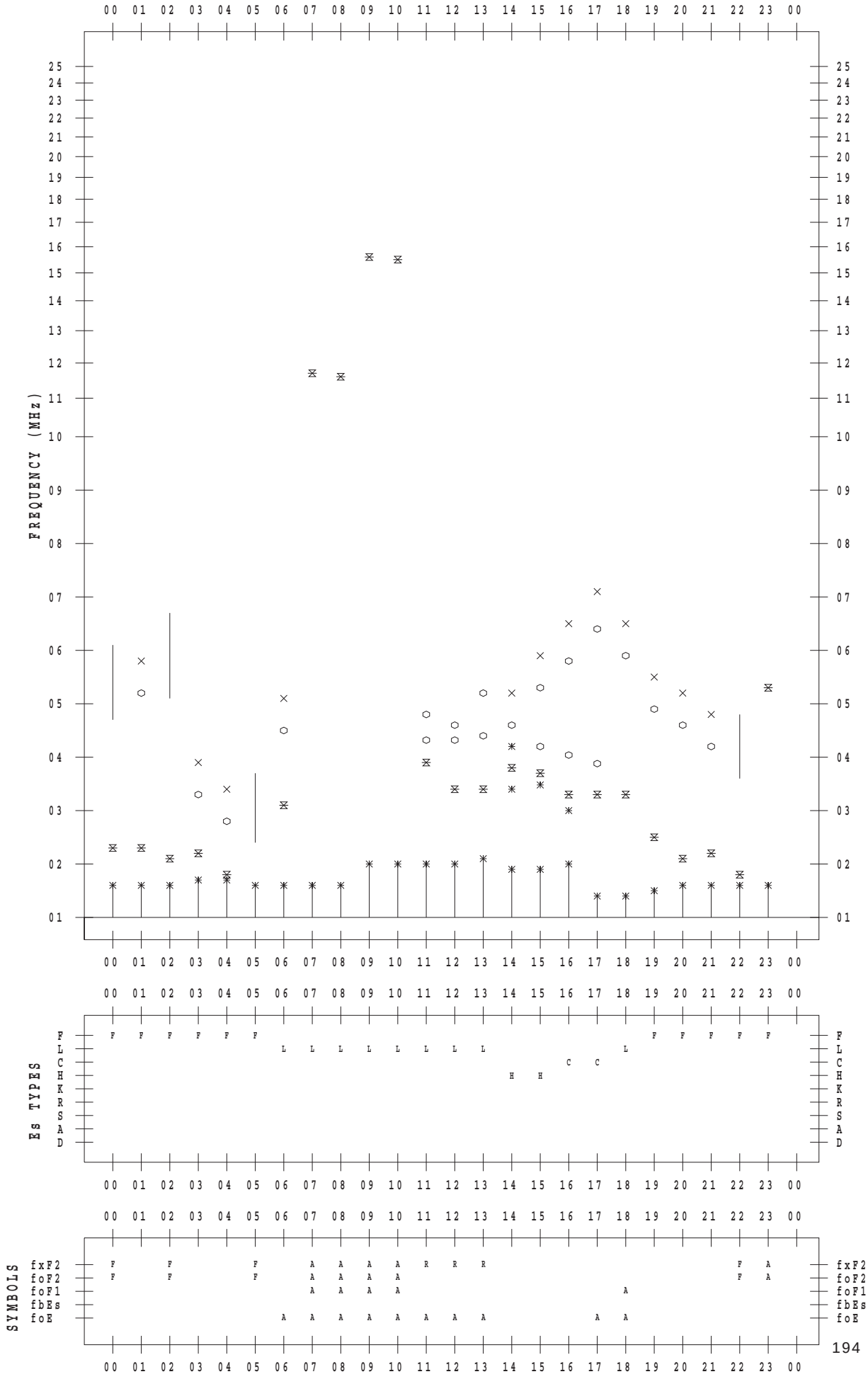
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/27

135 °E MEAN TIME



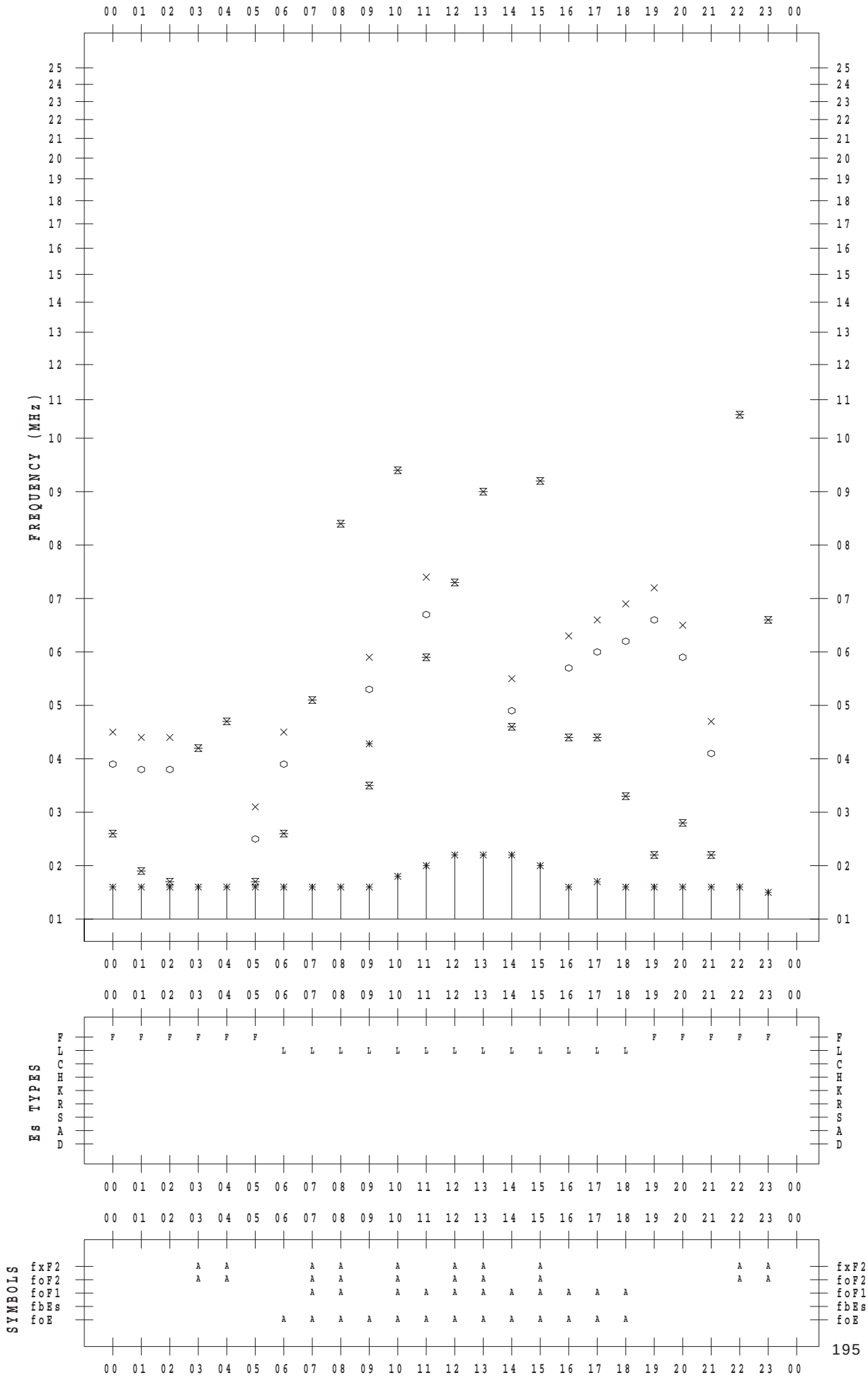
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/28

135 °E MEAN TIME



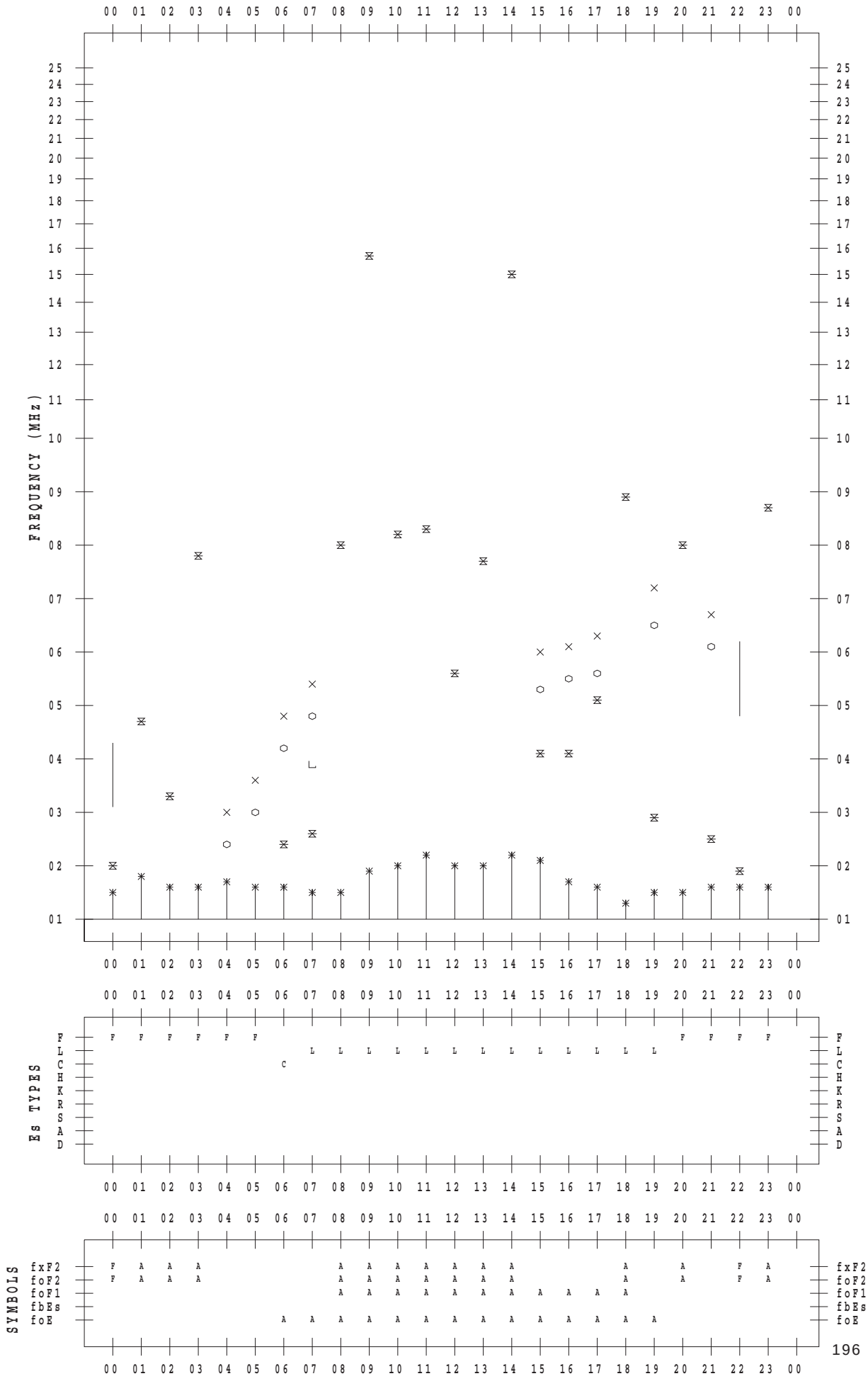
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/29

135 °E MEAN TIME



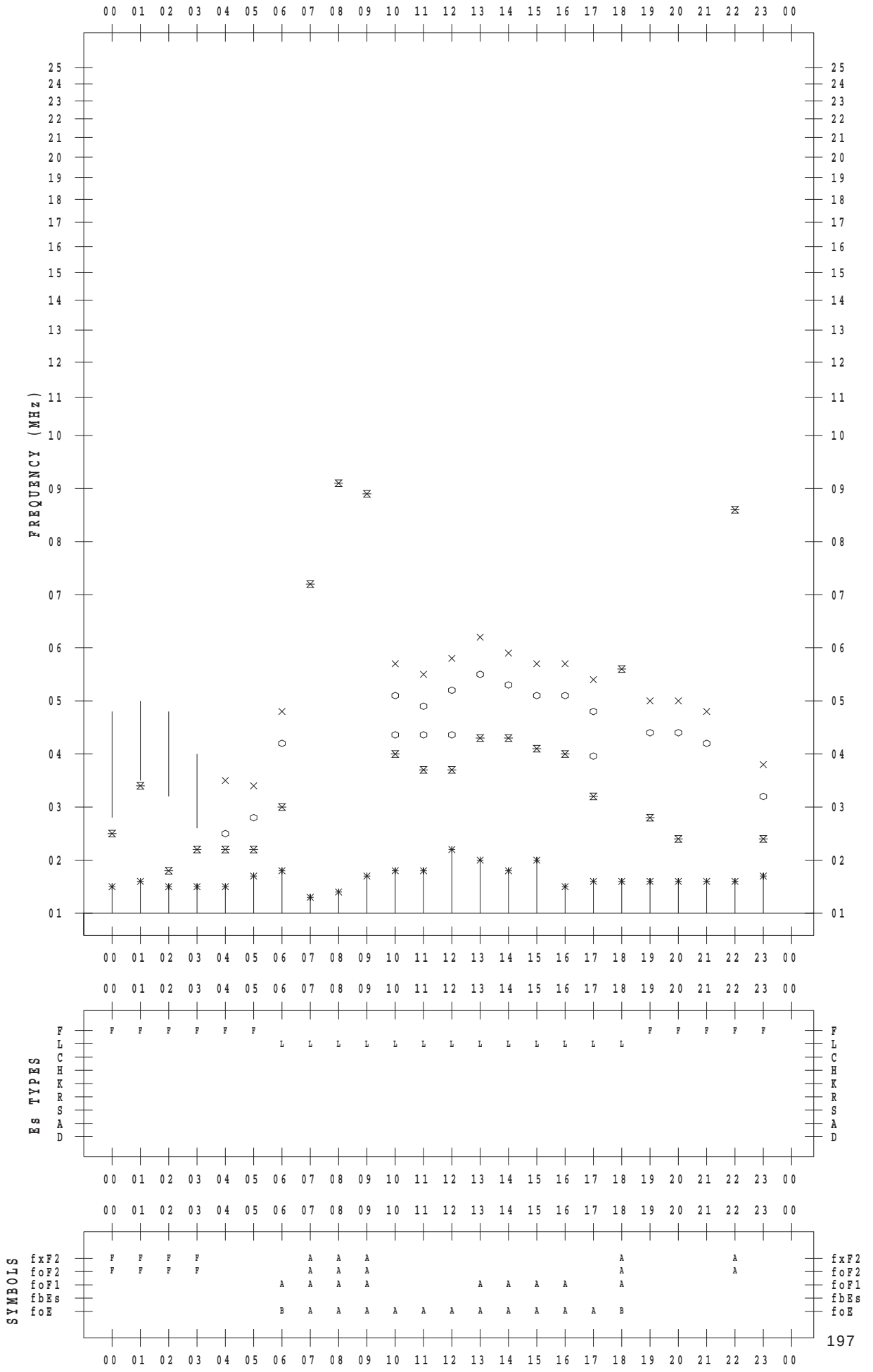
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 6/30

135 °E MEAN TIME



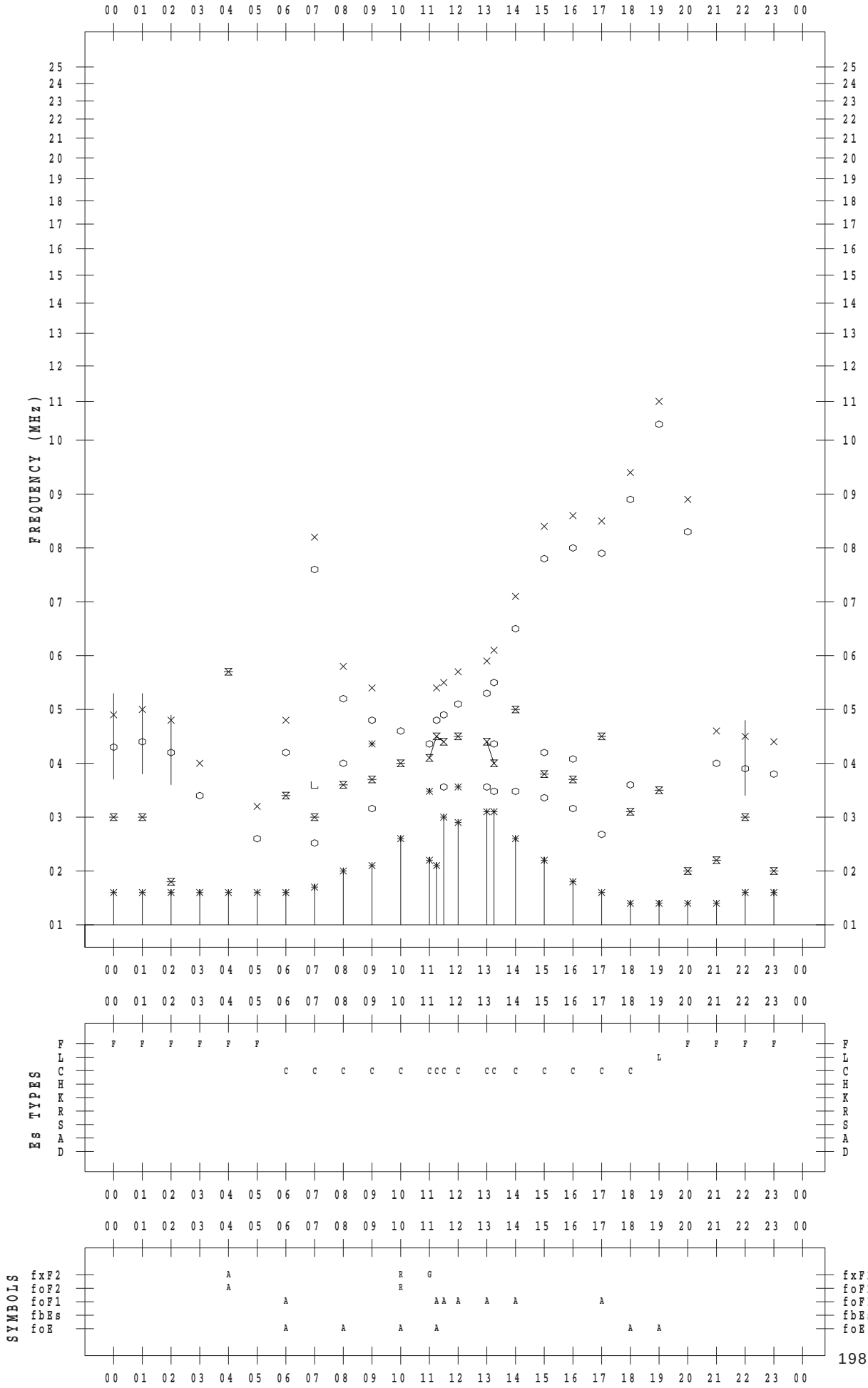
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 1

135 °E MEAN TIME



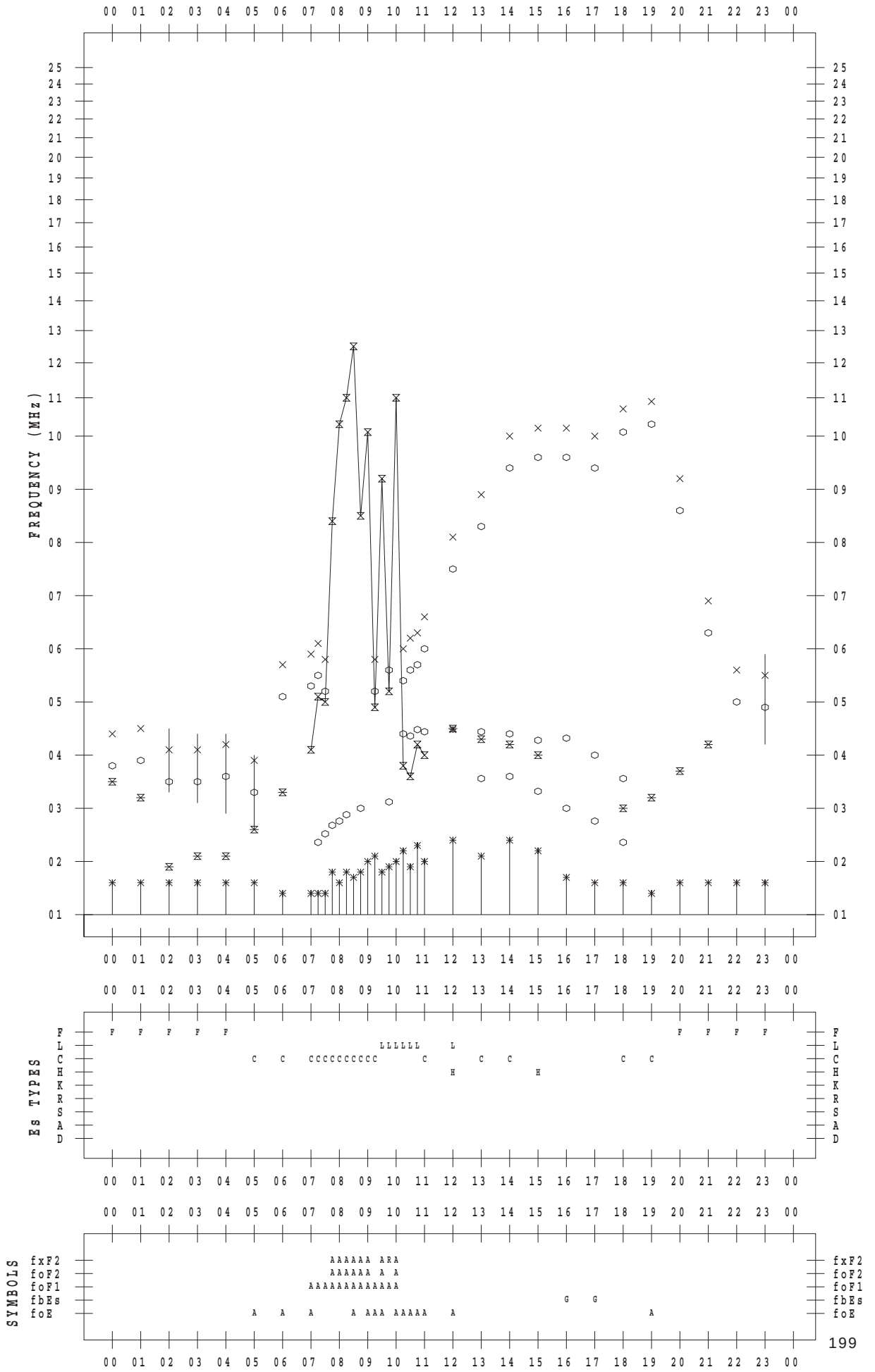
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 2

135 °E MEAN TIME



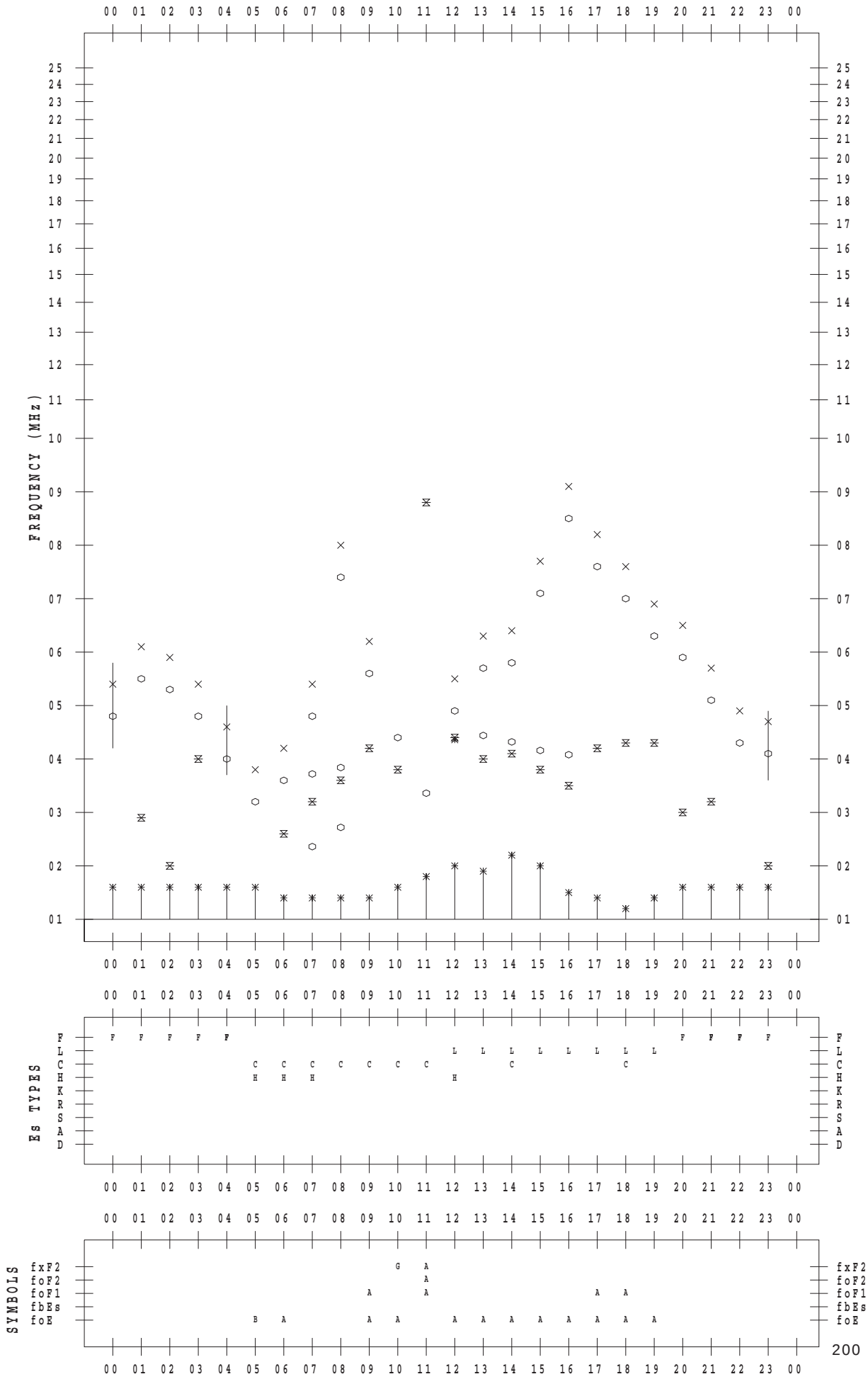
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 3

135 °E MEAN TIME



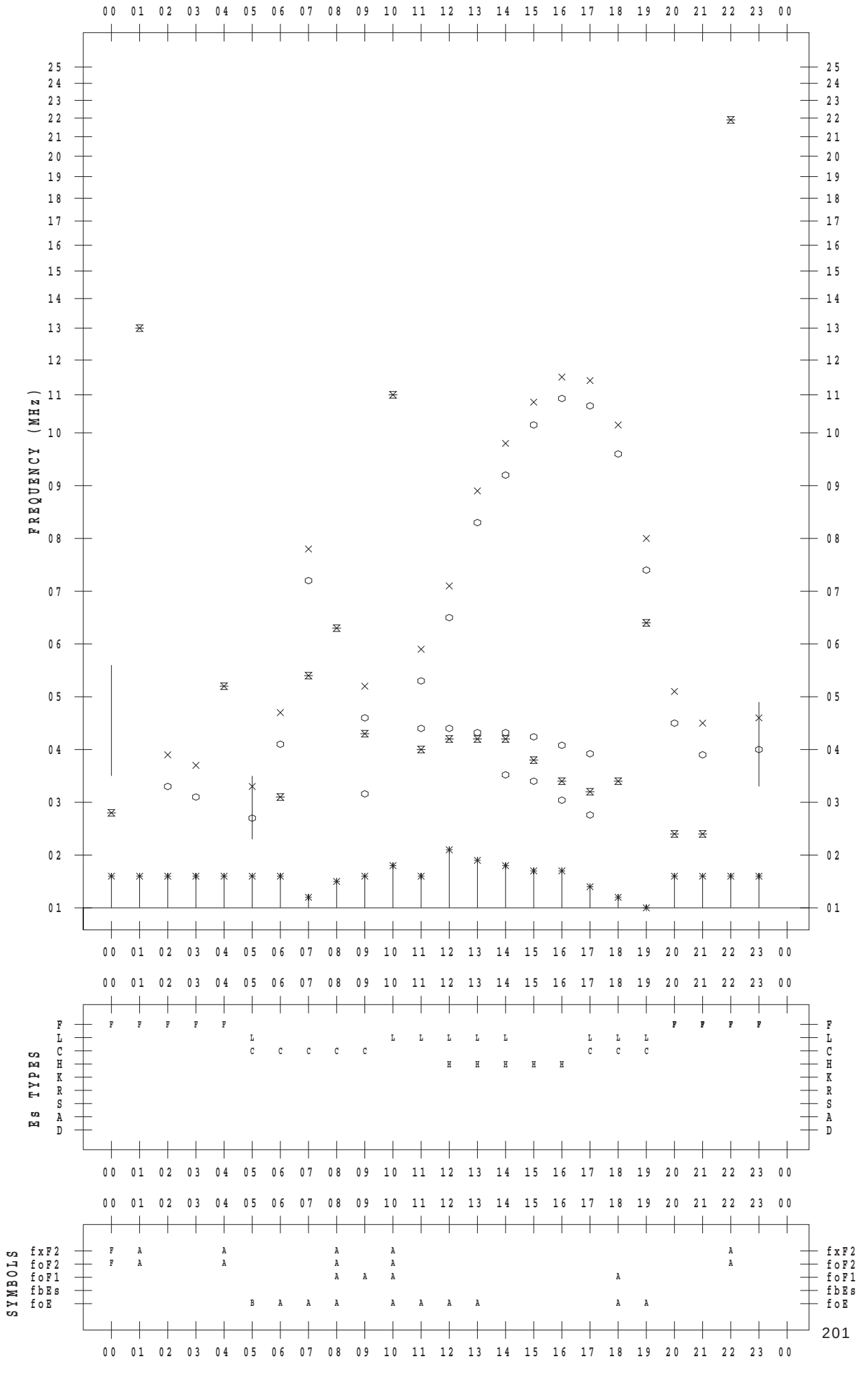
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 4

135 °E MEAN TIME



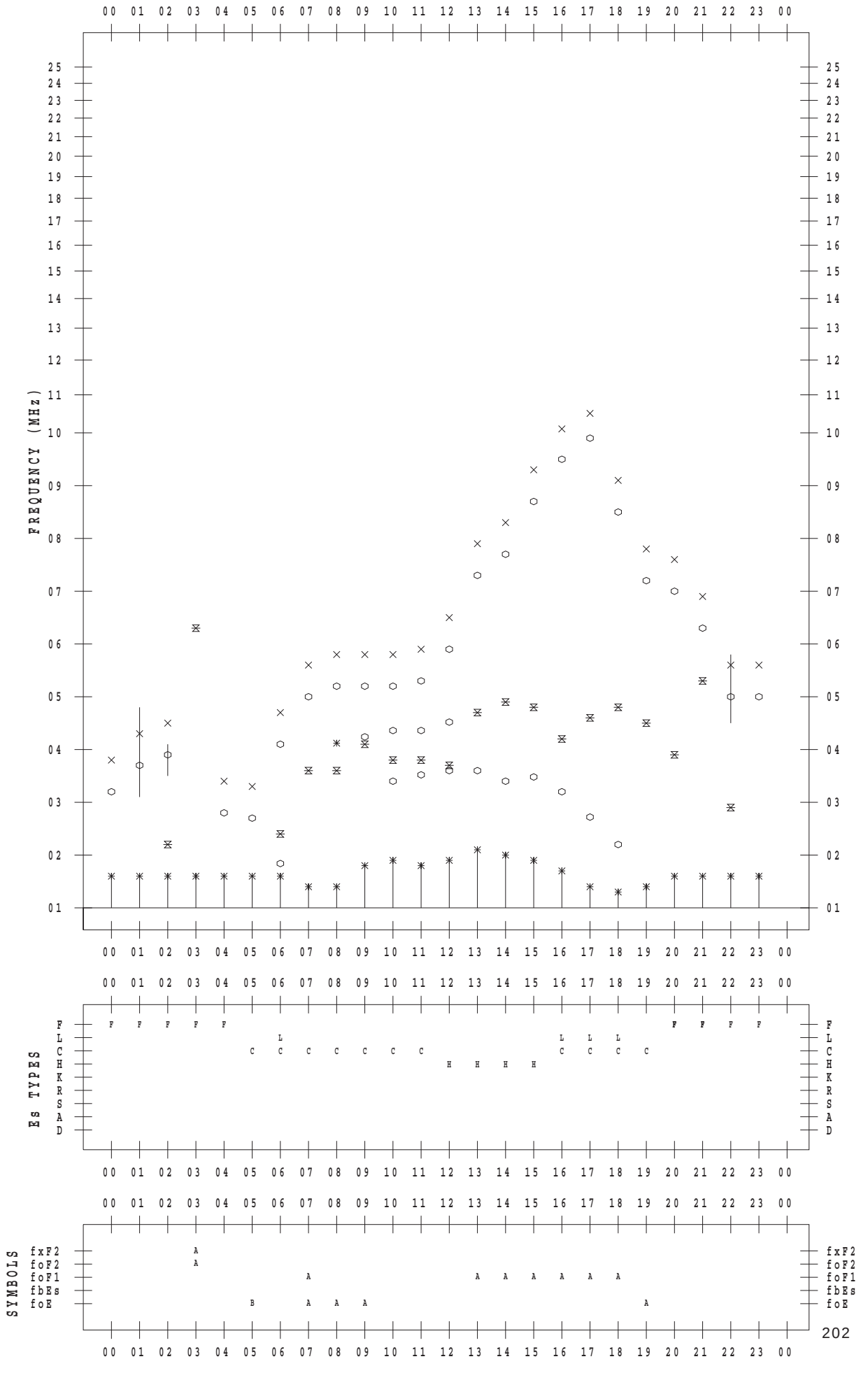
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 5

135 °E MEAN TIME



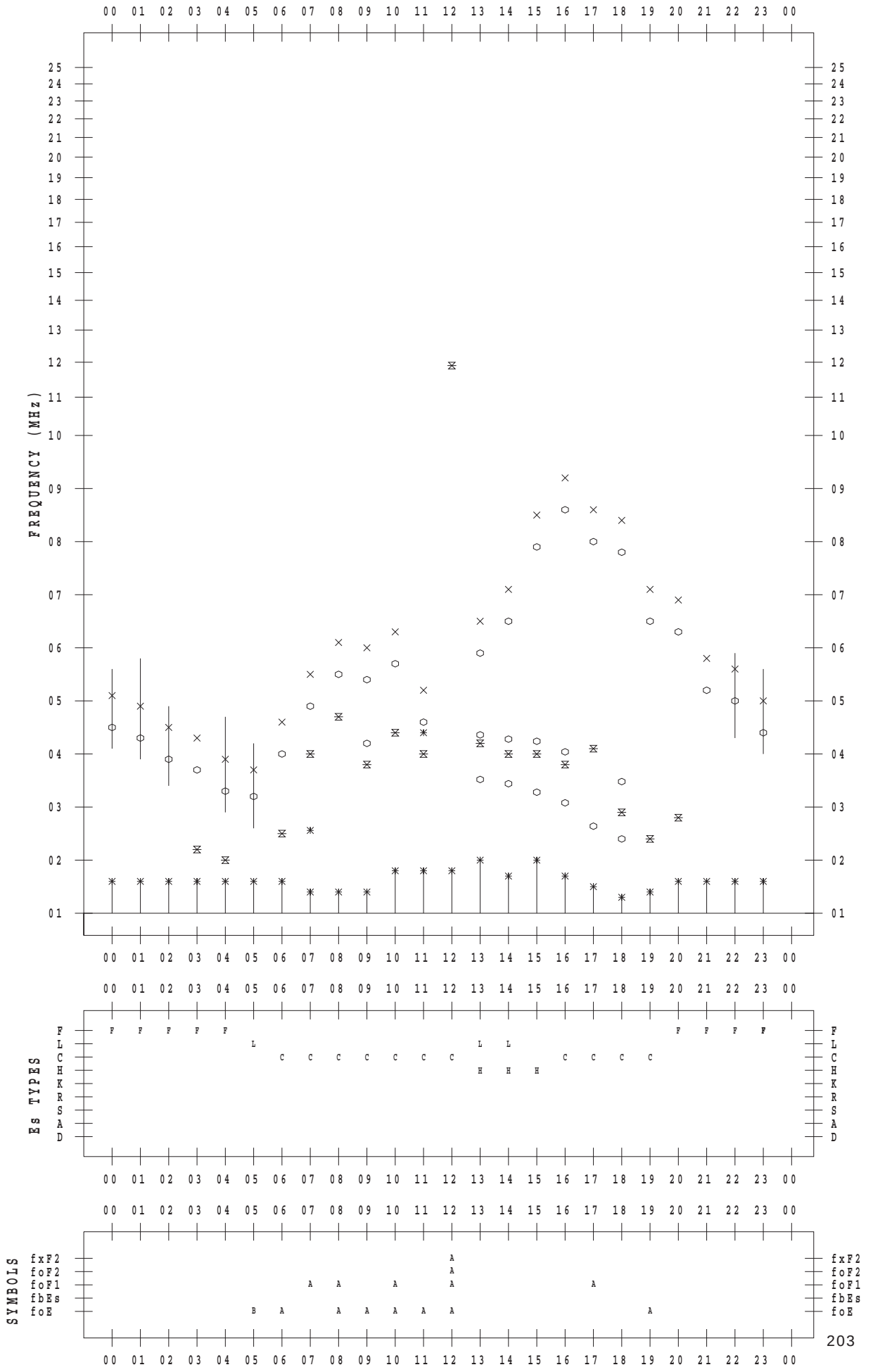
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 6

135 °E MEAN TIME



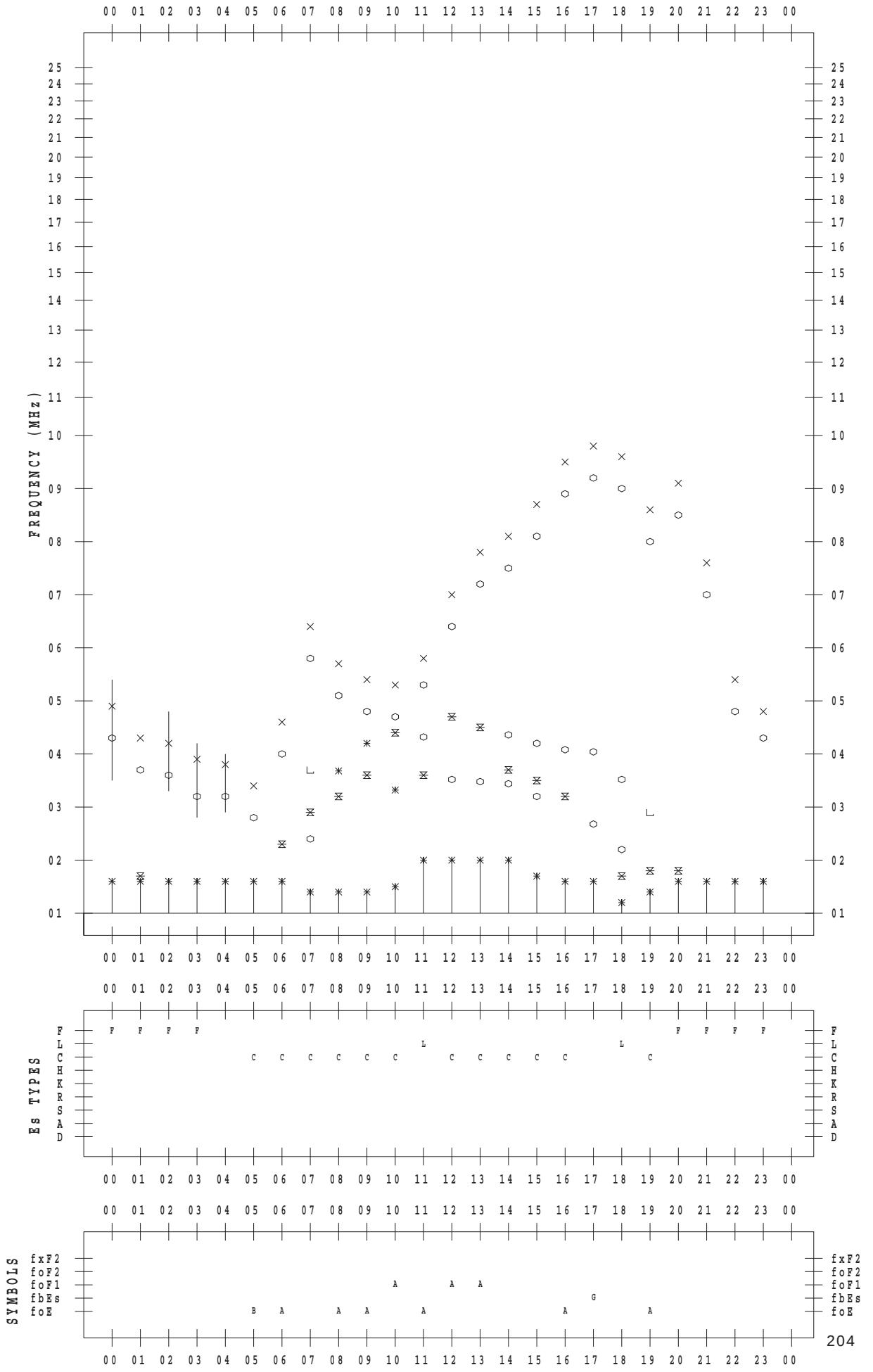
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 7

135 °E MEAN TIME



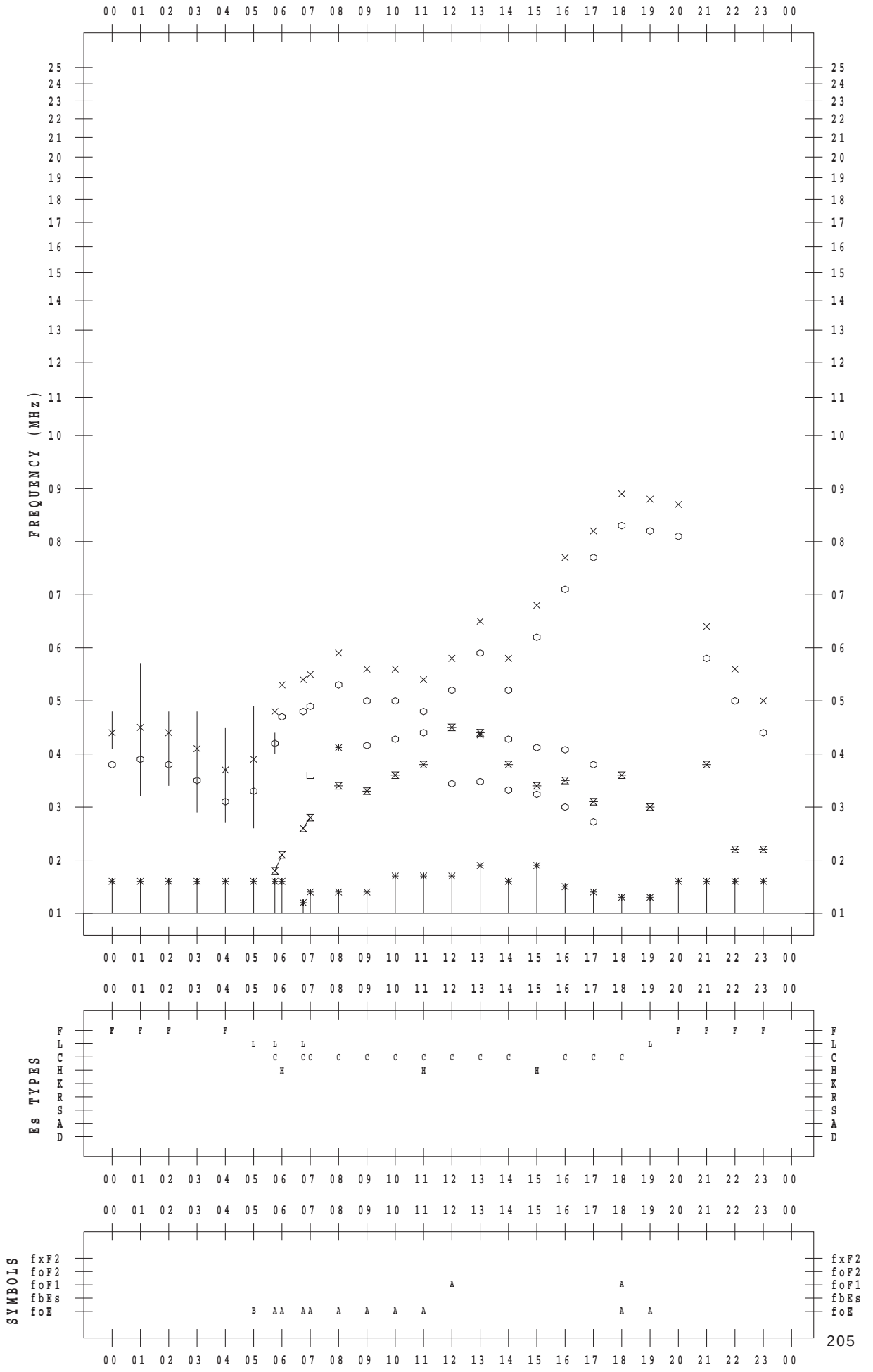
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 8

135 °E MEAN TIME



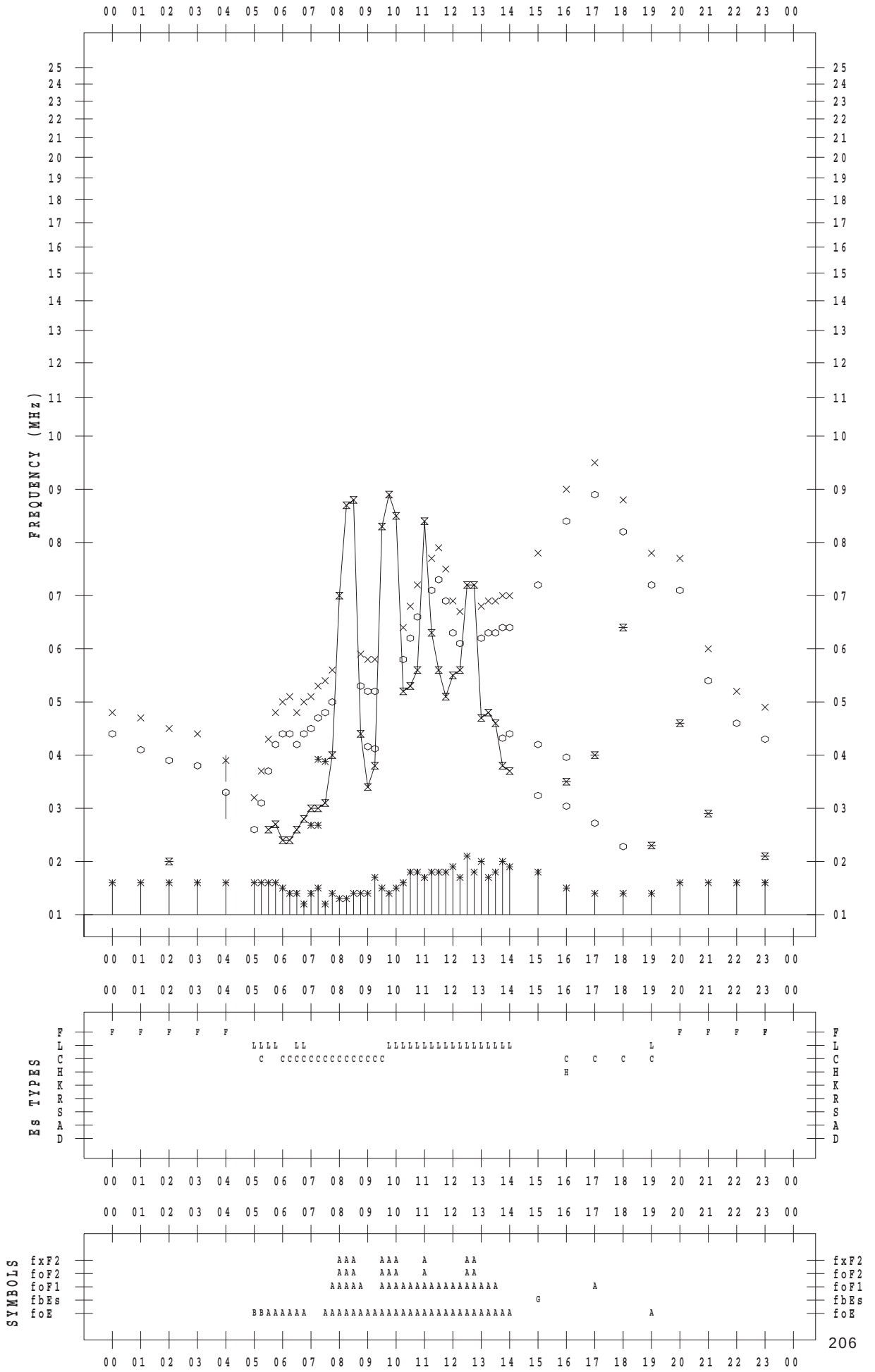
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/ 9

135 °E MEAN TIME



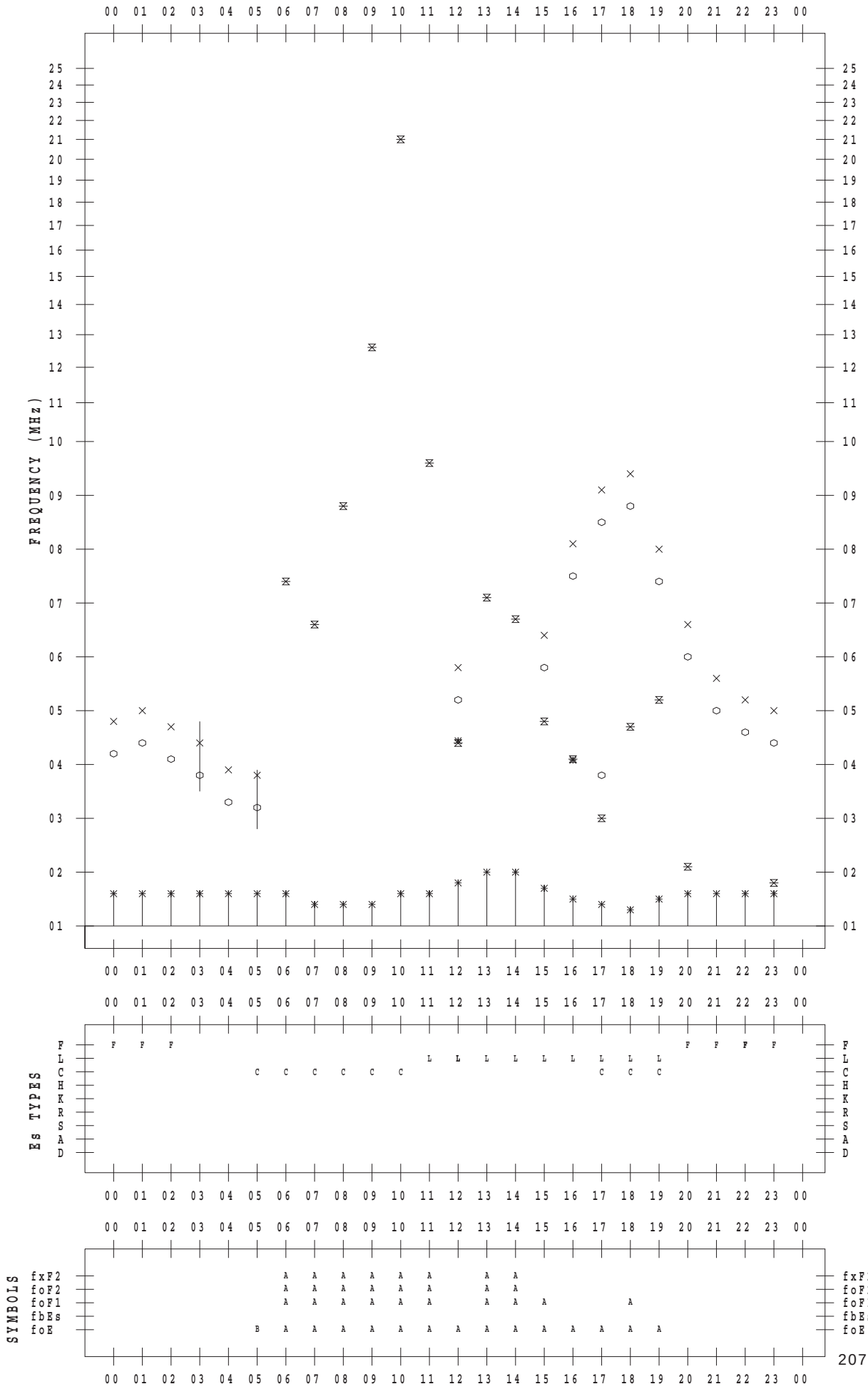
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/10

135 °E MEAN TIME



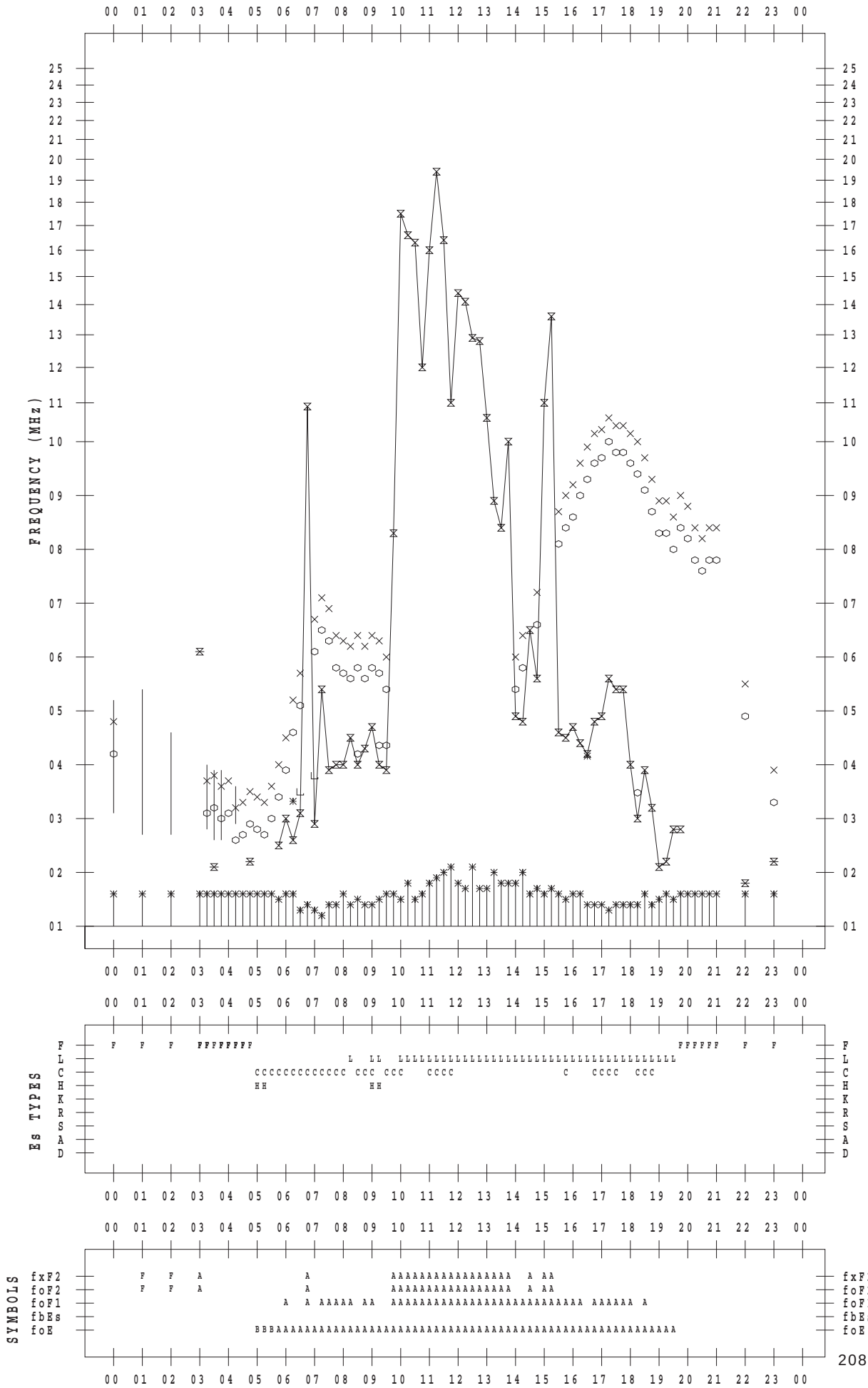
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/11

135 °E MEAN TIME



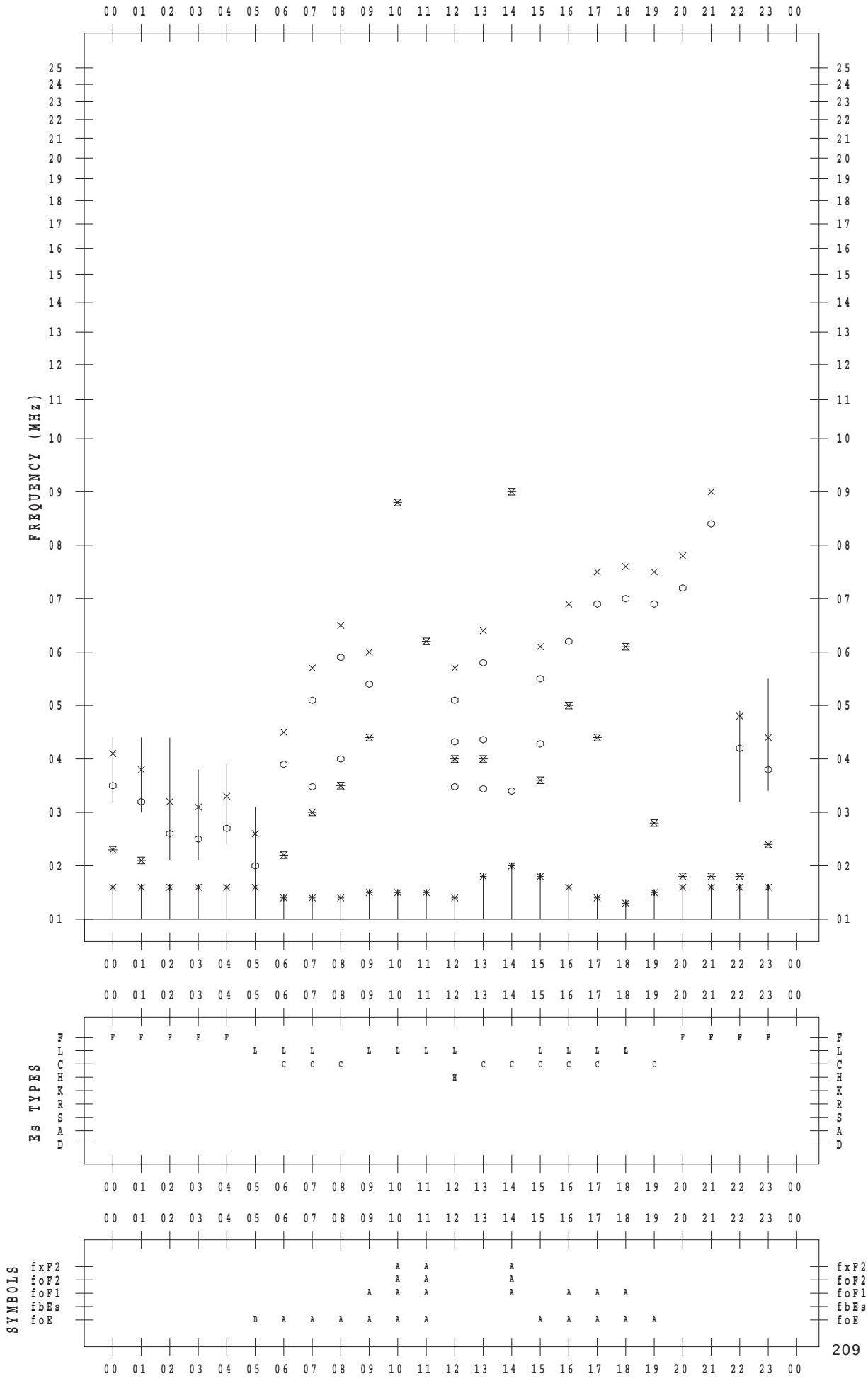
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/12

135 °E MEAN TIME



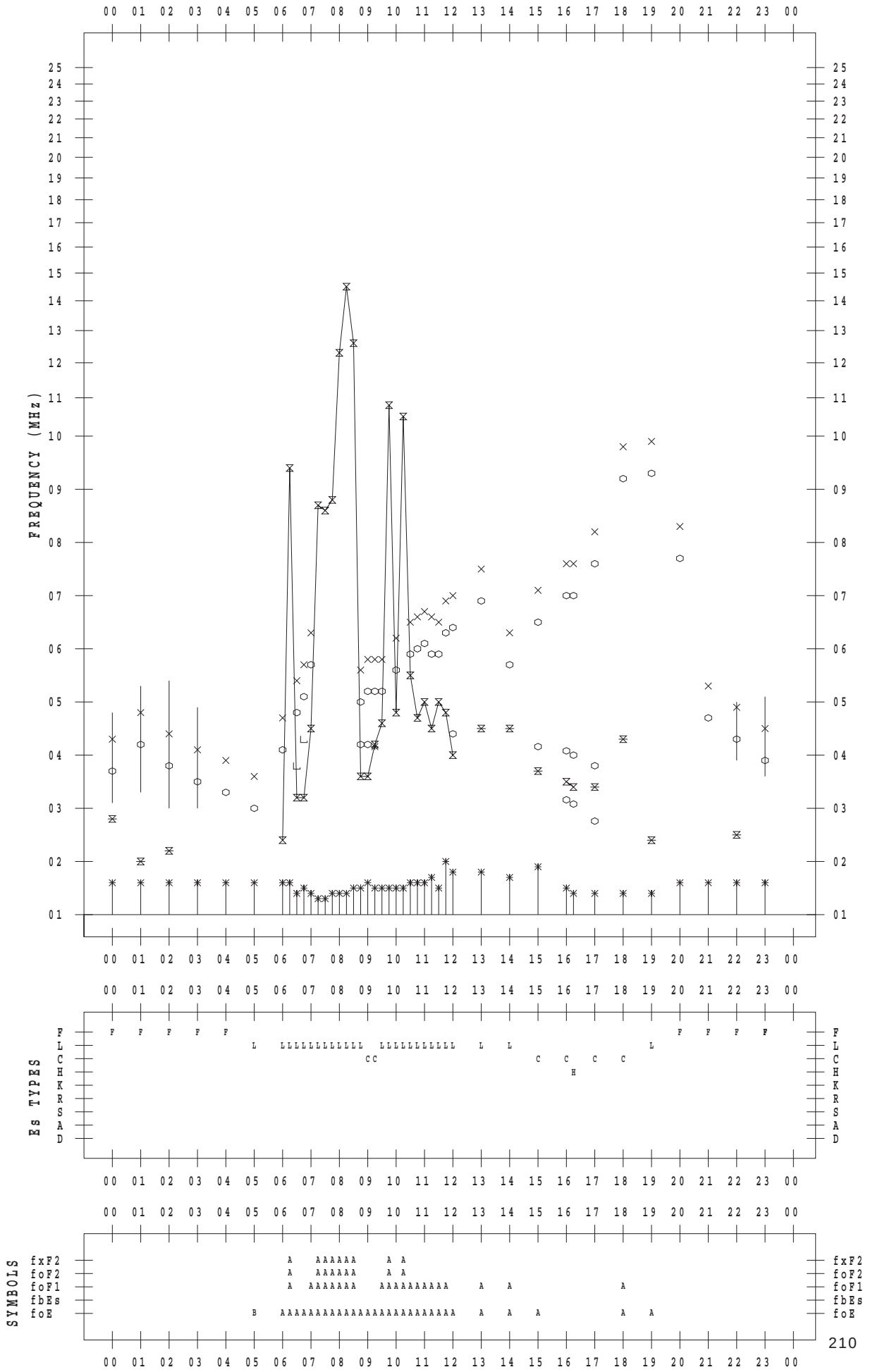
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/13

135 °E MEAN TIME



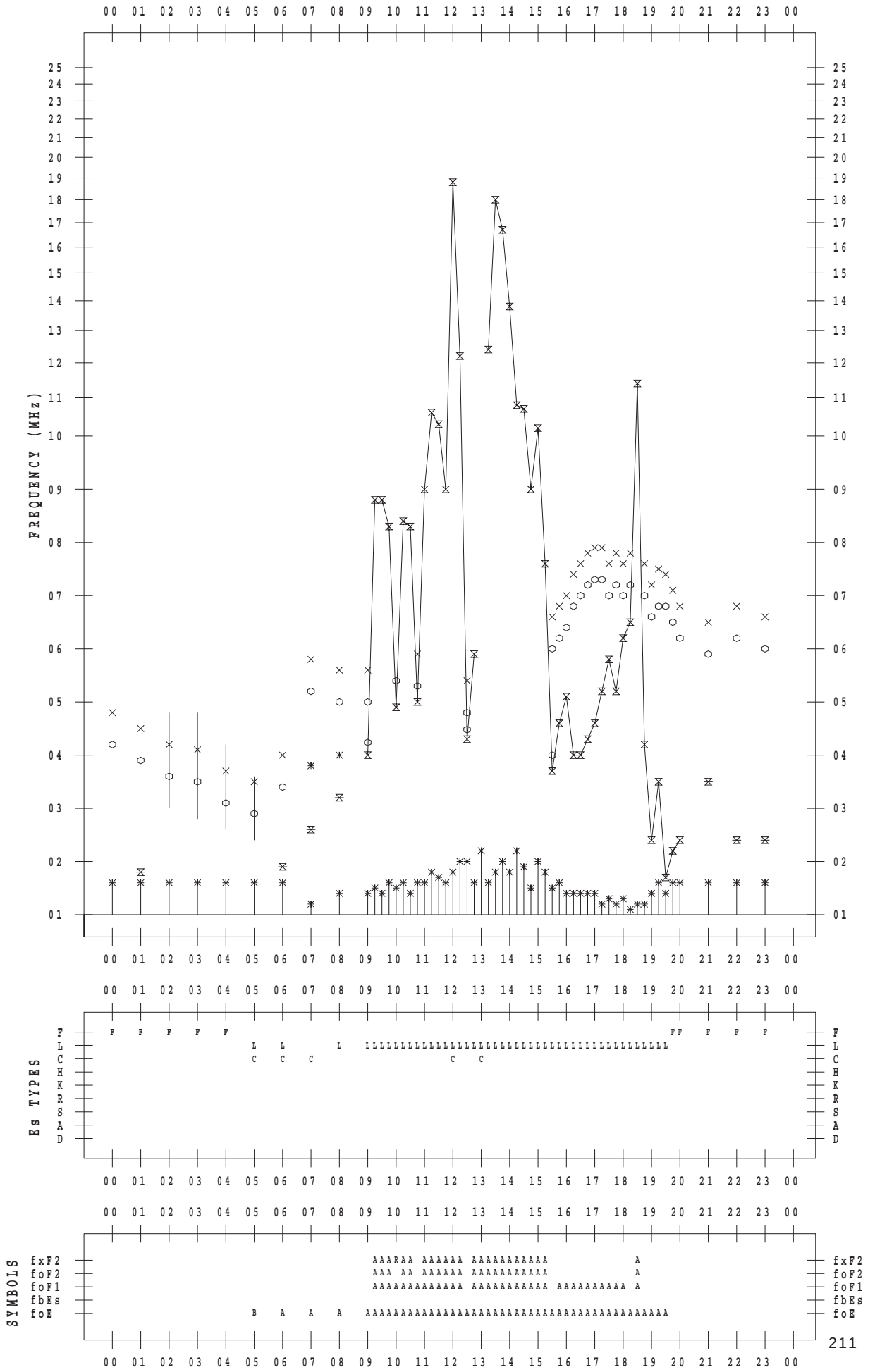
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/14

135 °E MEAN TIME



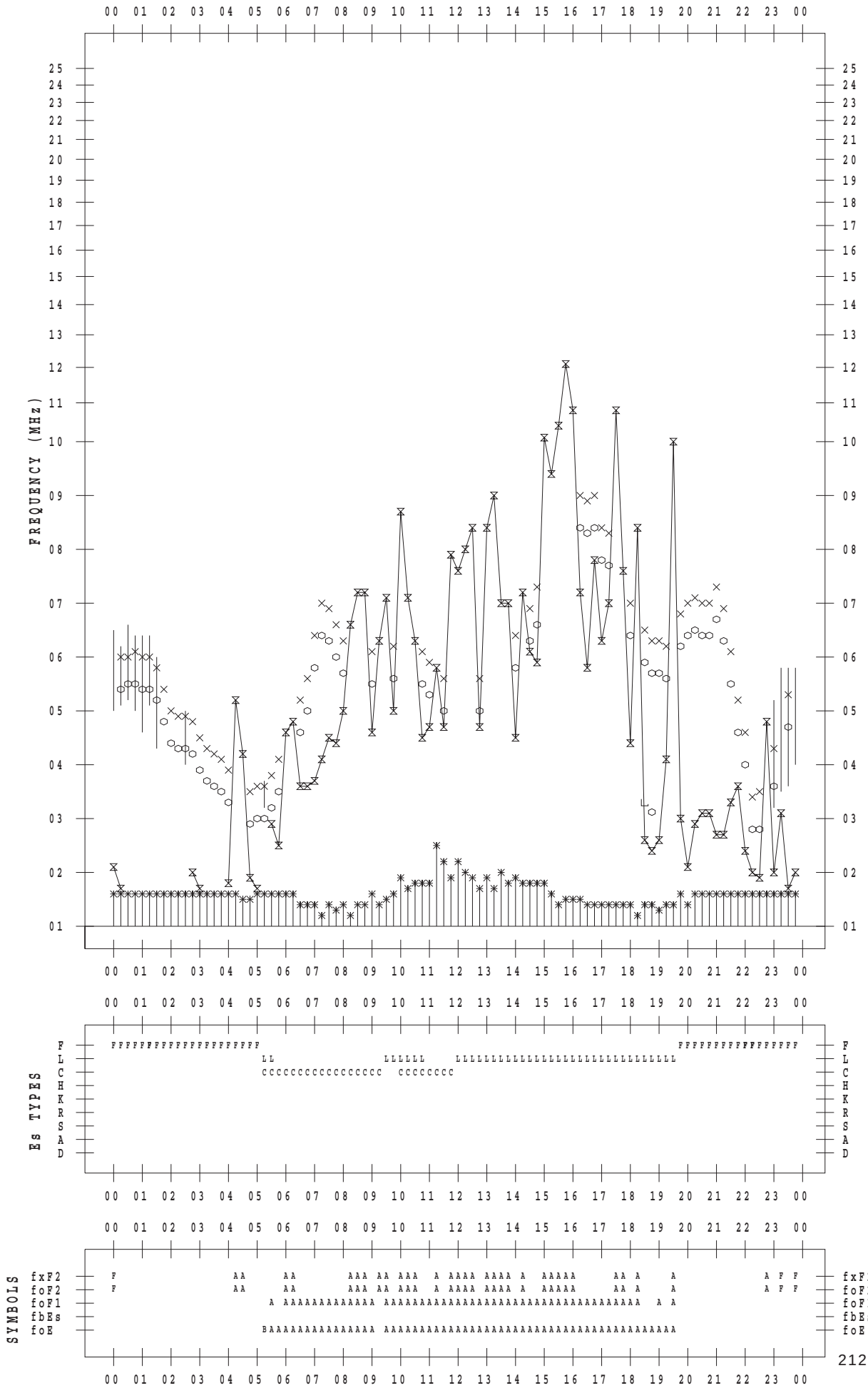
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/15

135 °E MEAN TIME



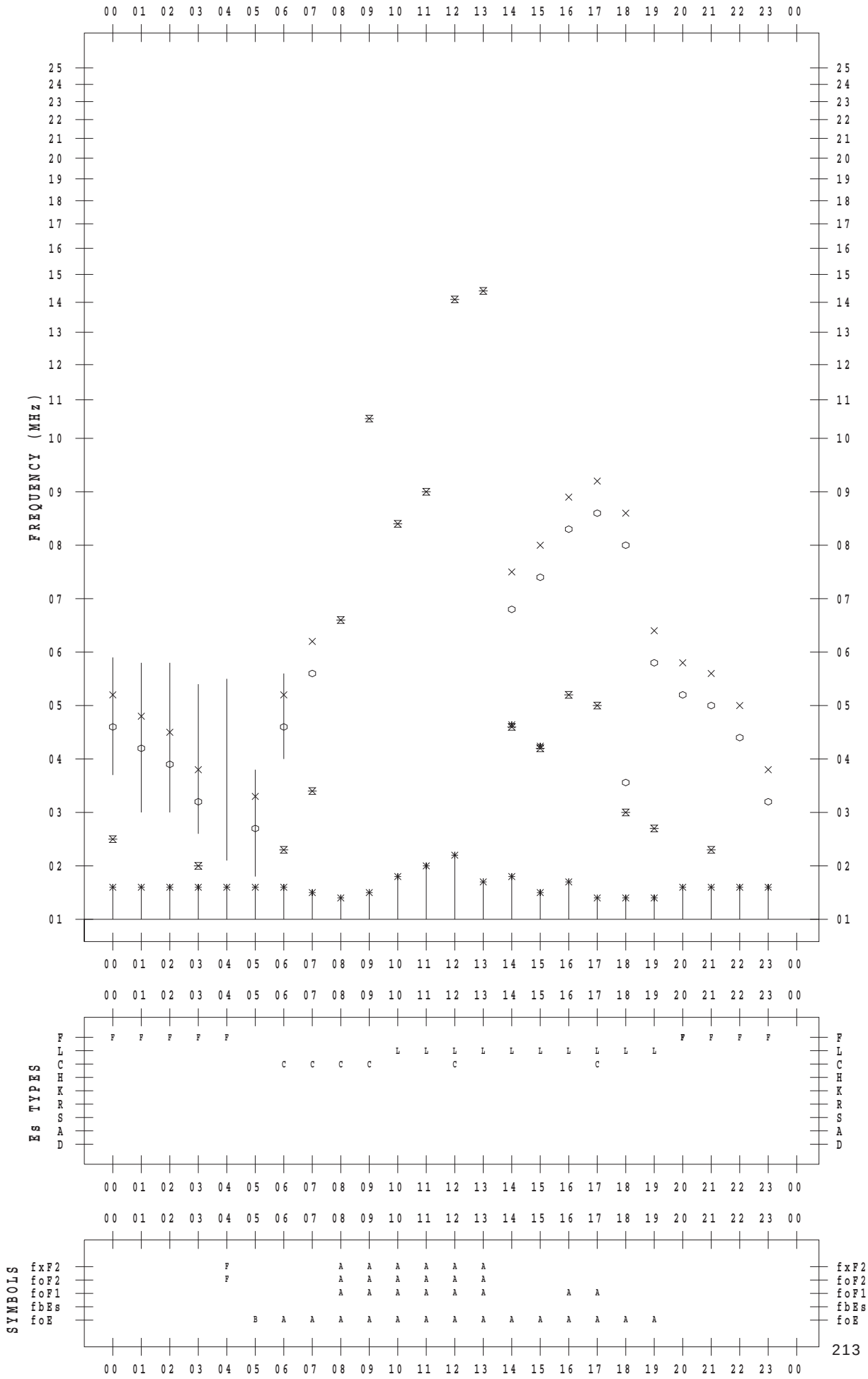
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/16

135 °E MEAN TIME



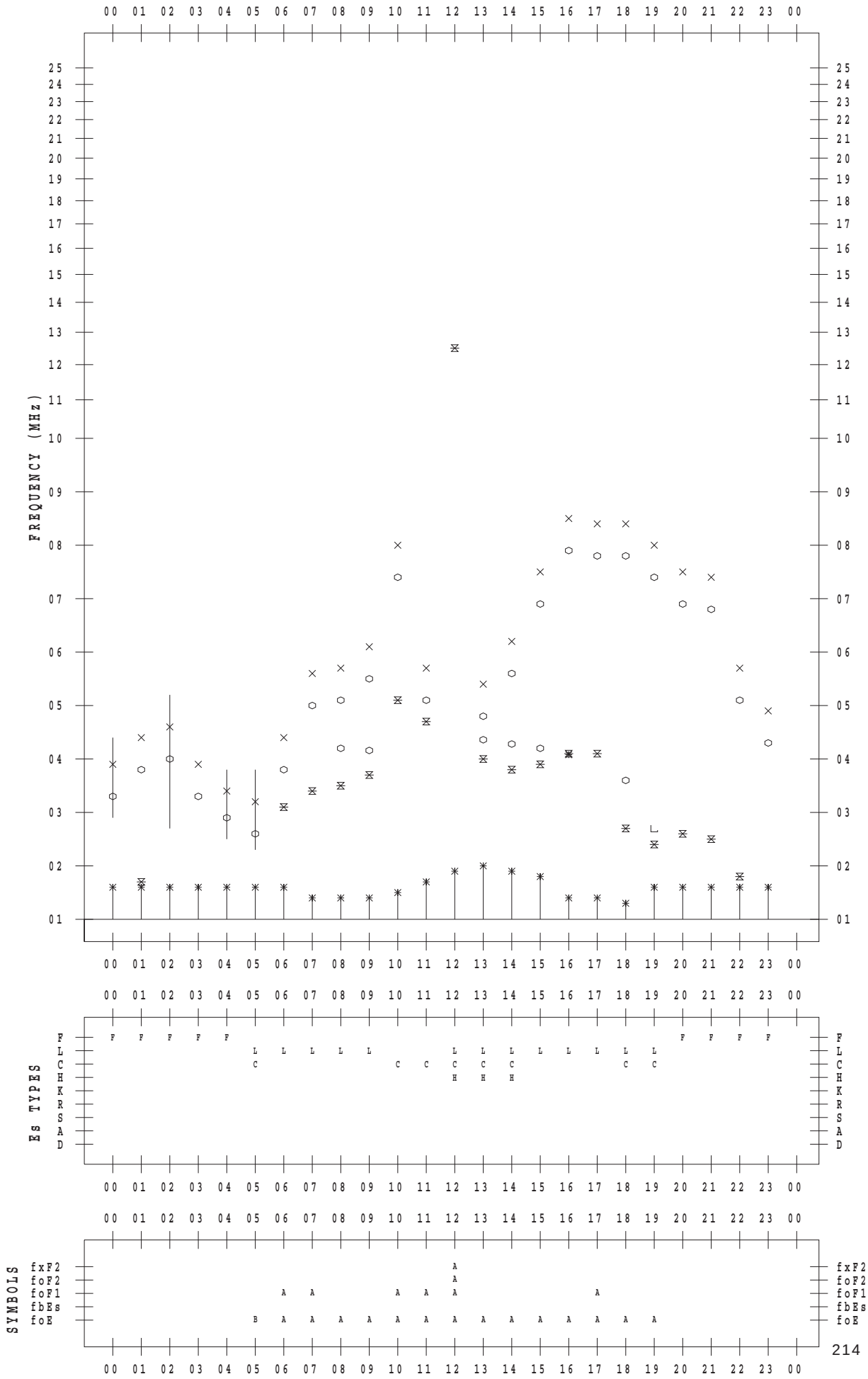
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/17

135 °E MEAN TIME



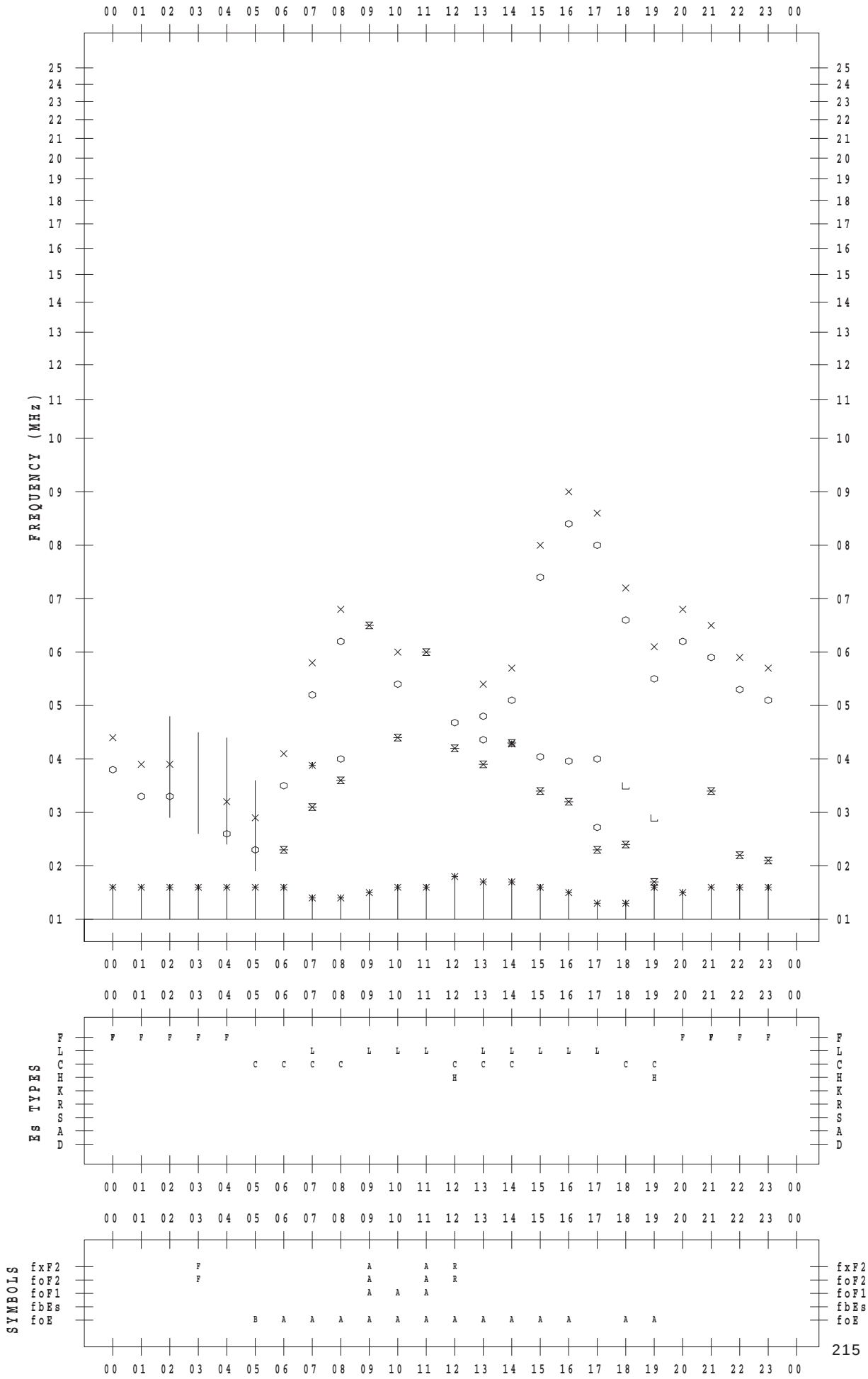
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/18

135 °E MEAN TIME



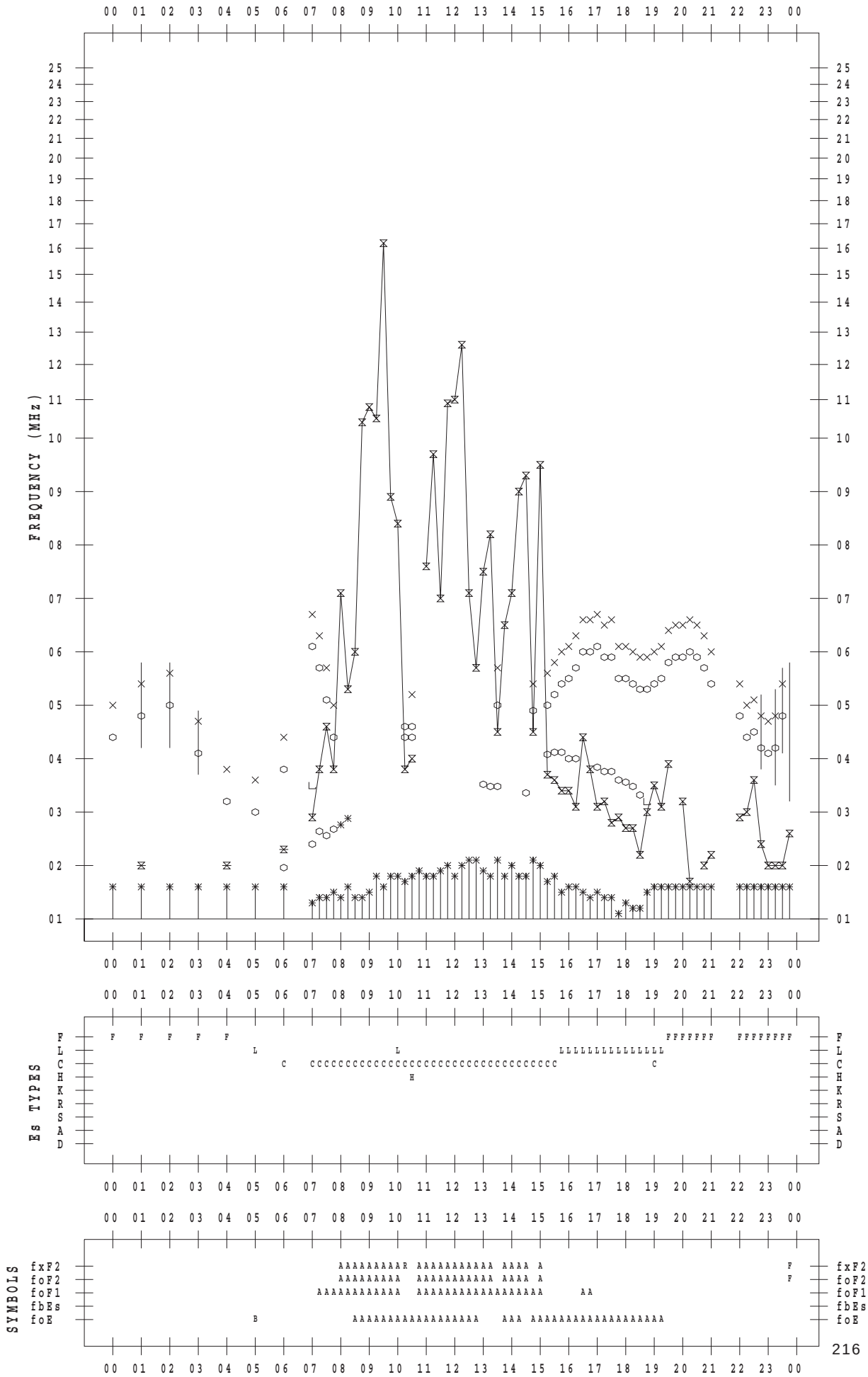
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/19

135 °E MEAN TIME



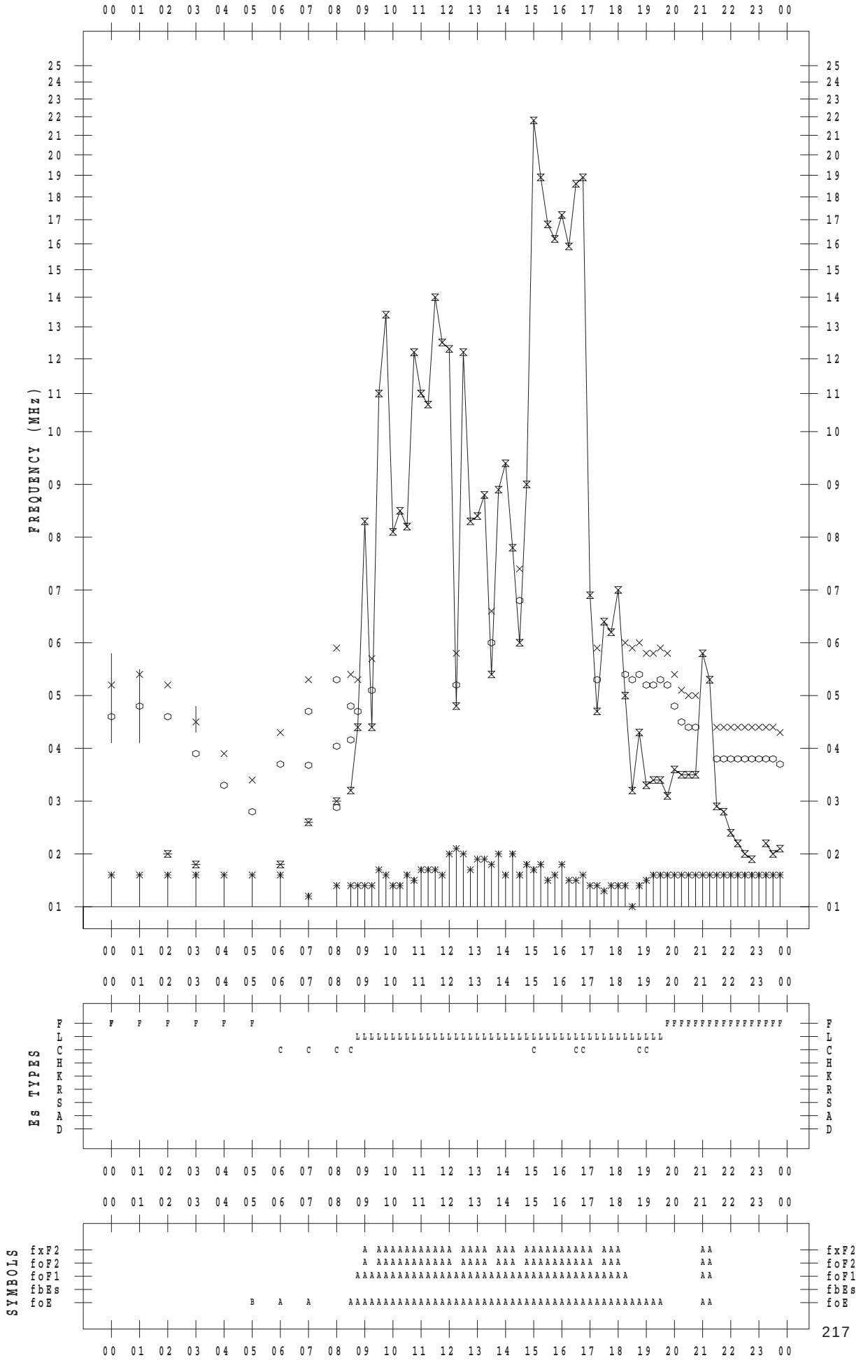
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/20

135 °E MEAN TIME



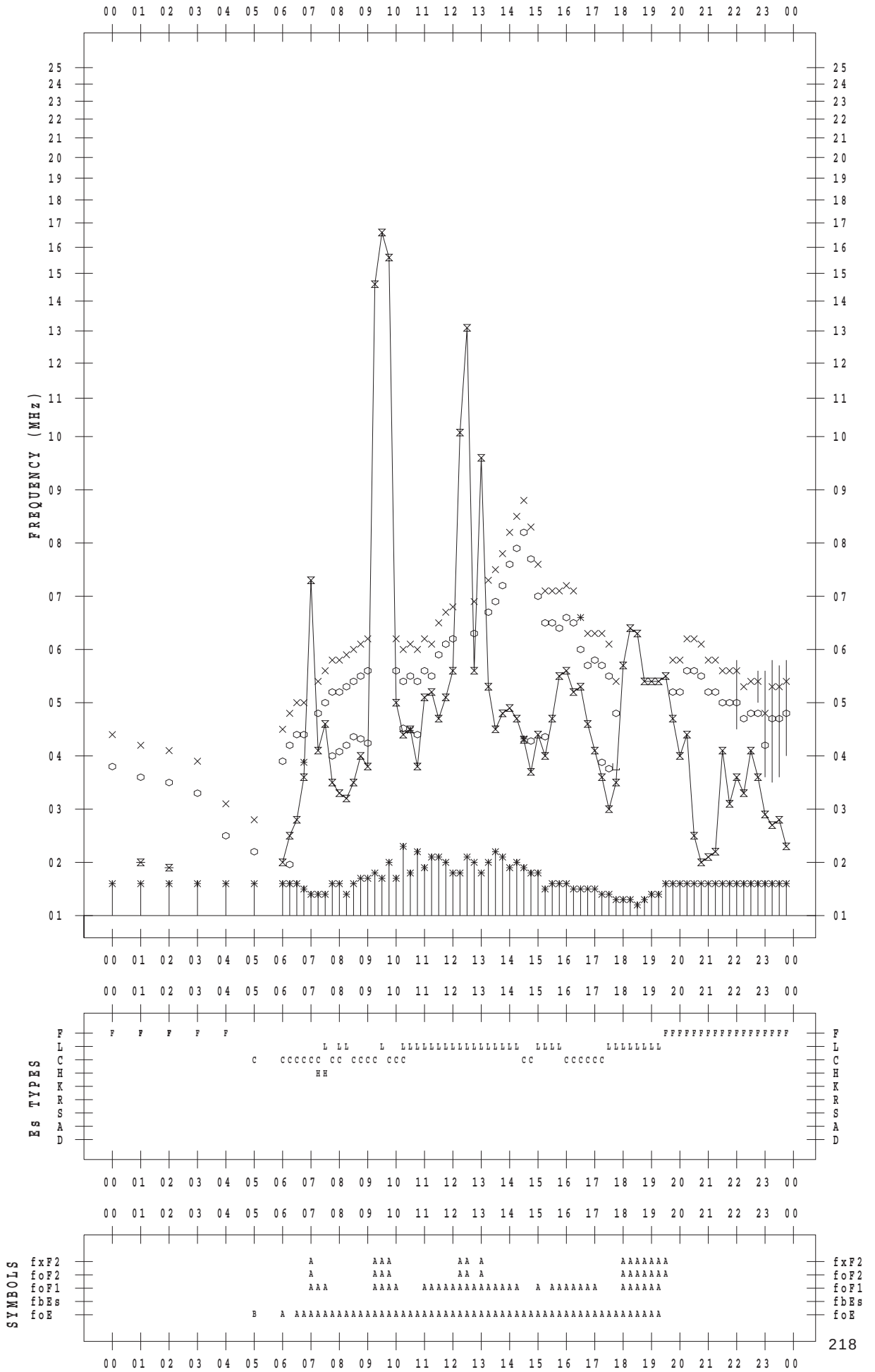
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/21

135 °E MEAN TIME



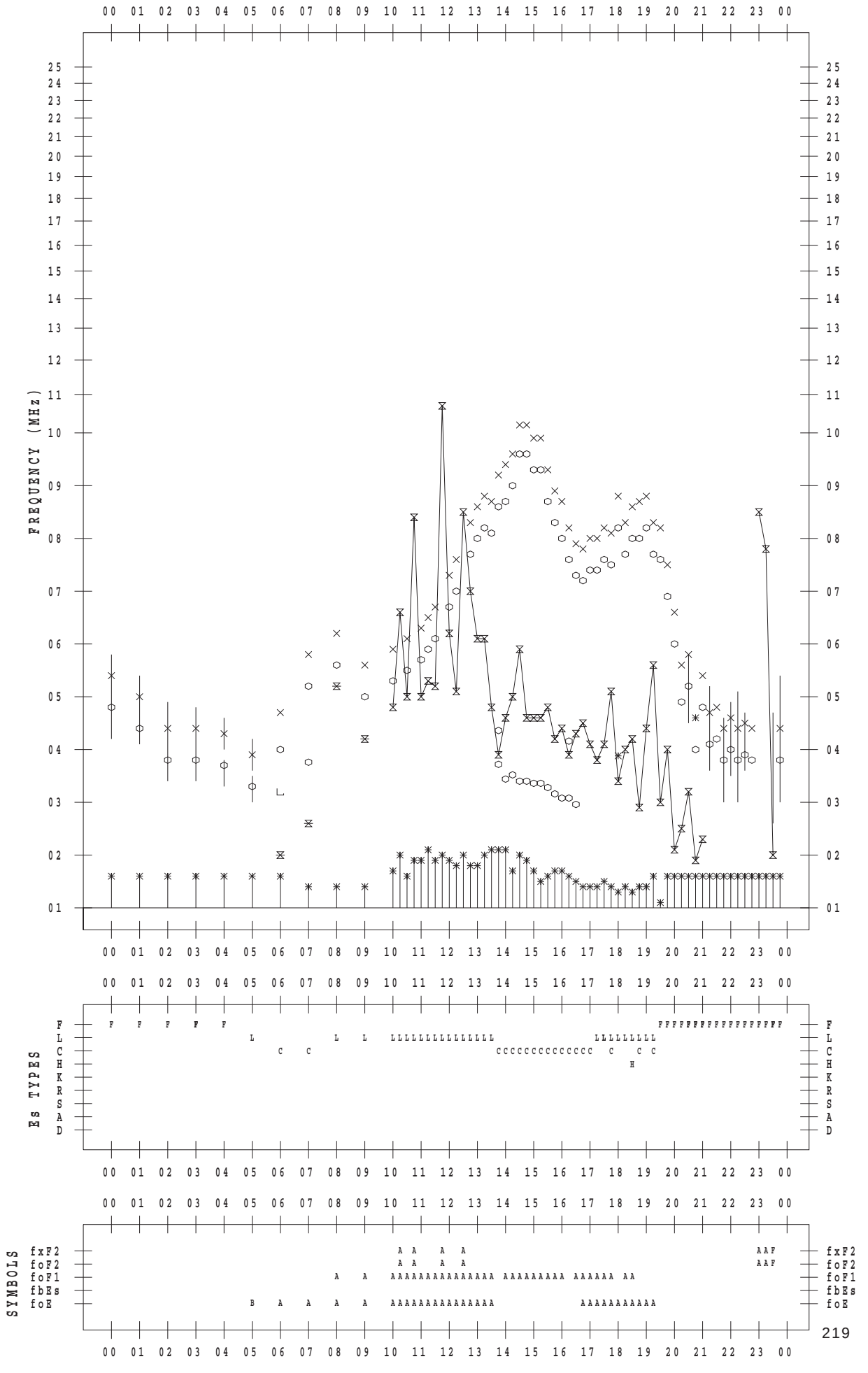
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/22

135 °E MEAN TIME



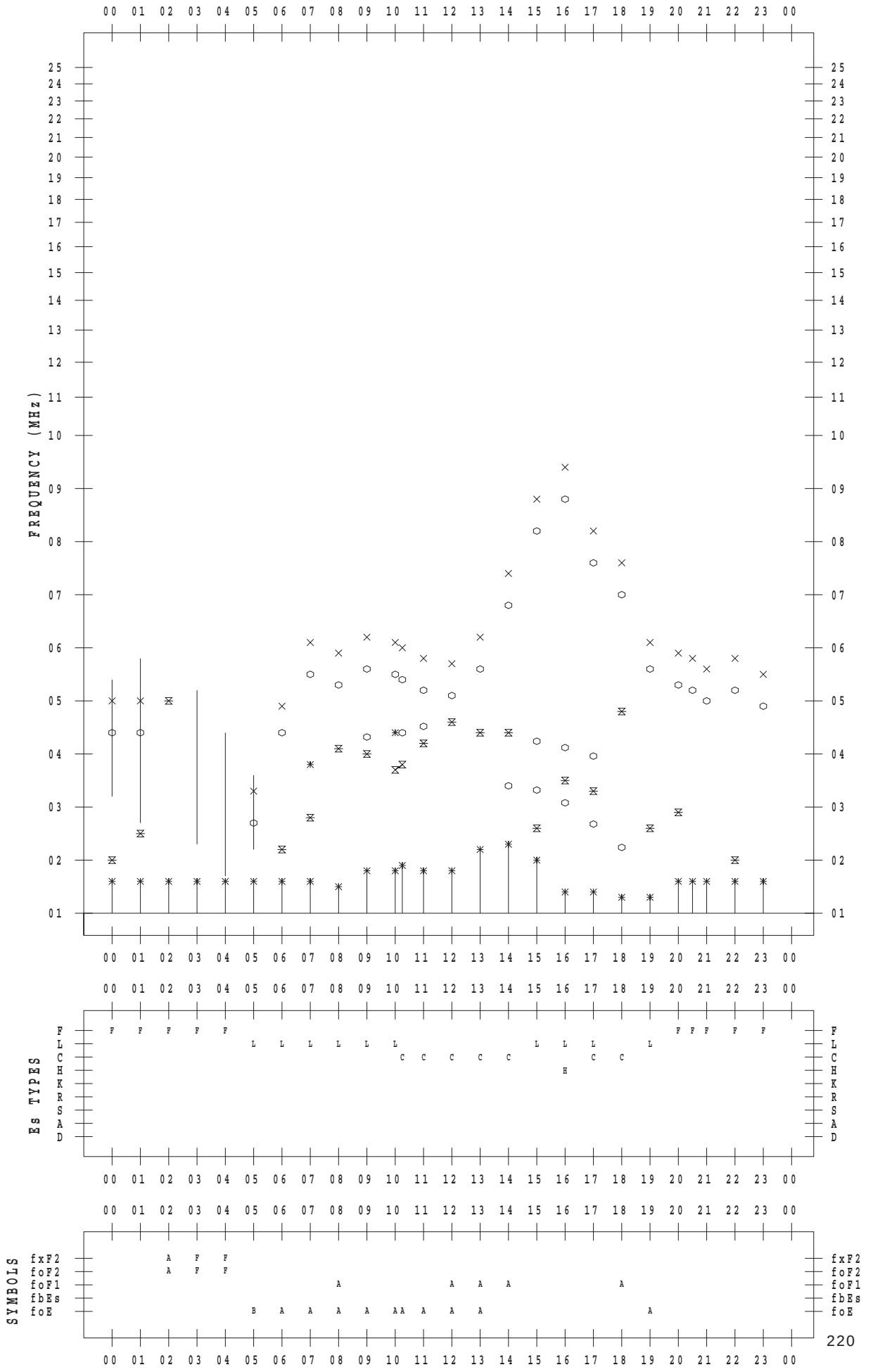
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/23

135 °E MEAN TIME



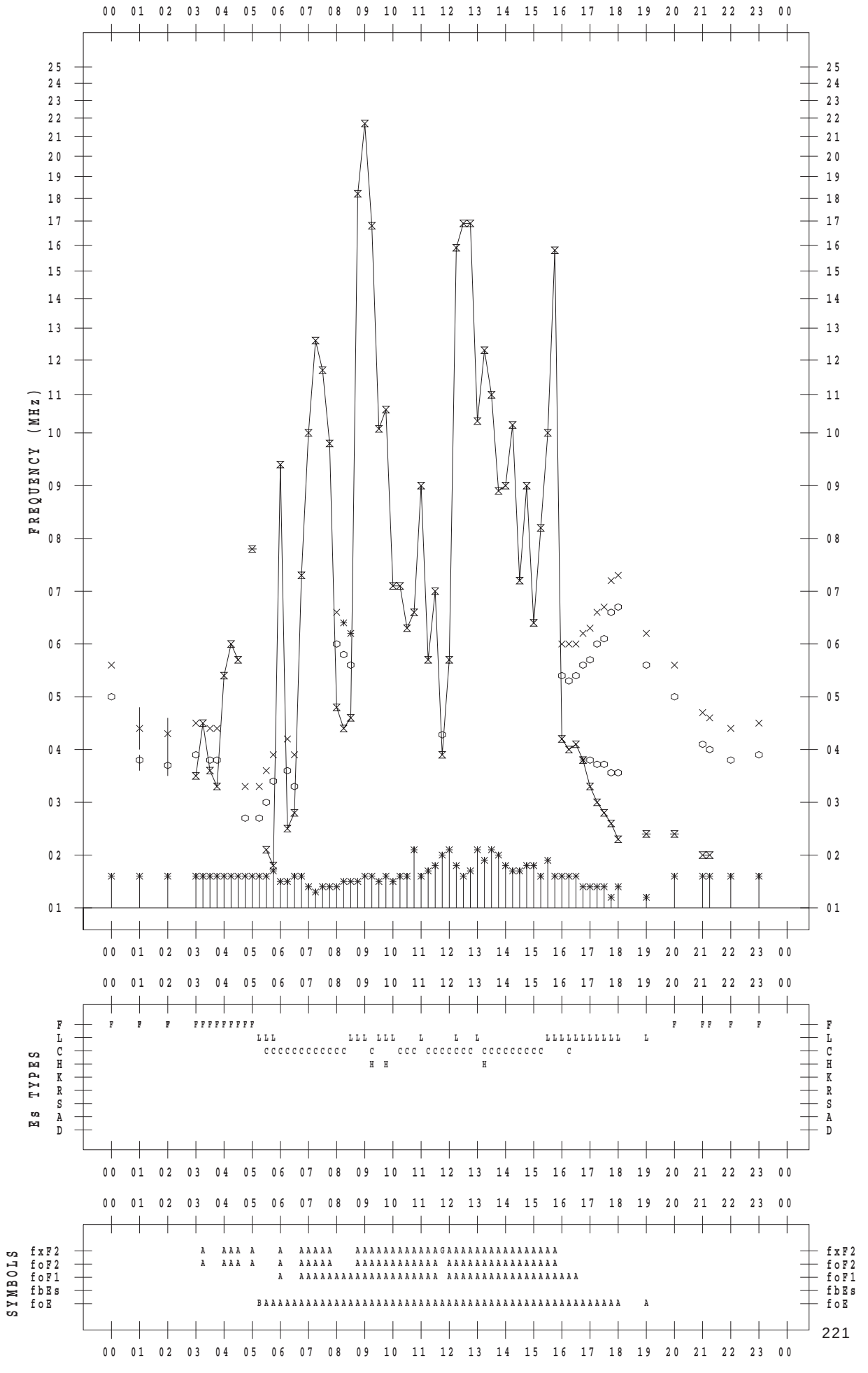
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/24

135 °E MEAN TIME



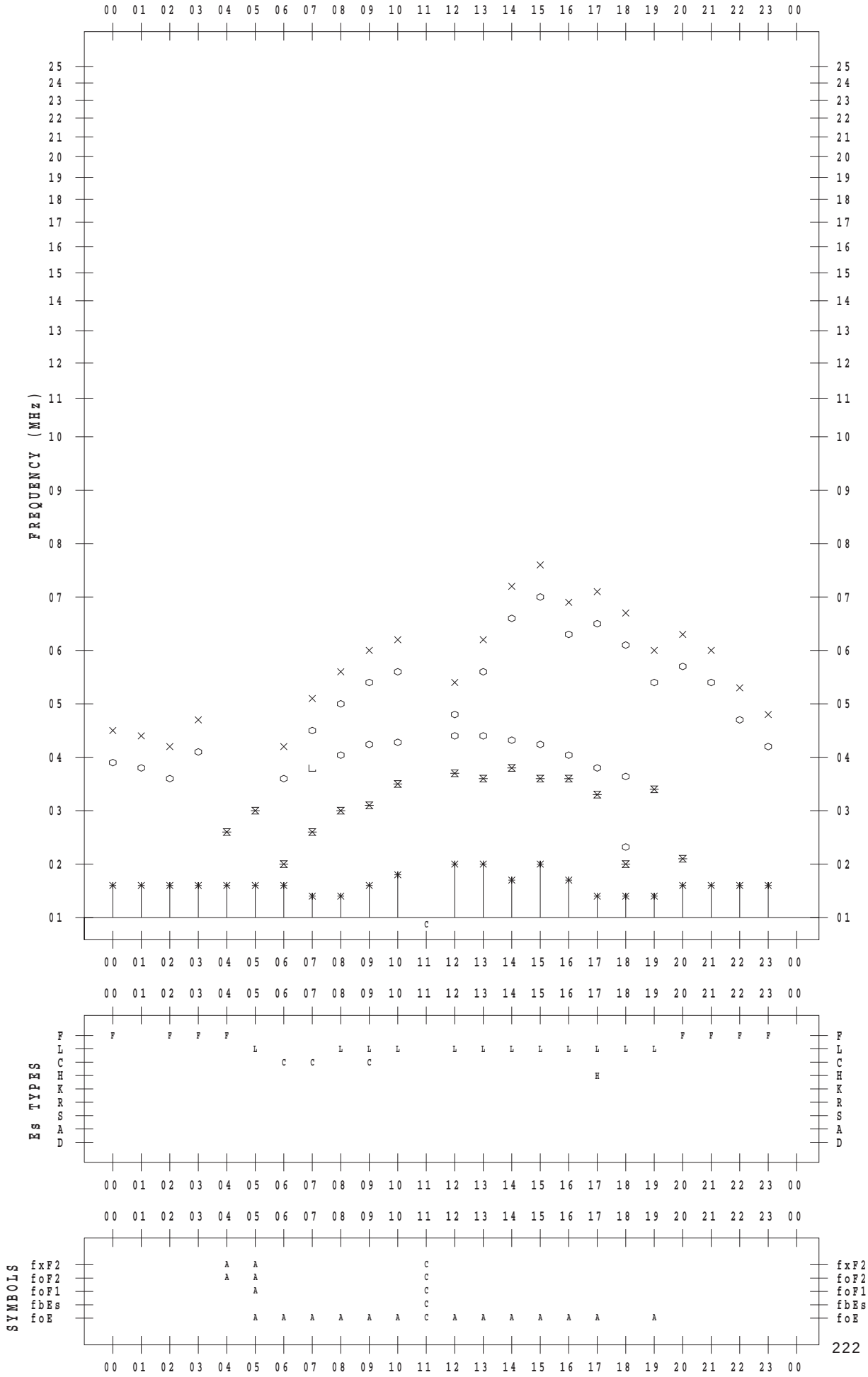
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/25

135 °E MEAN TIME



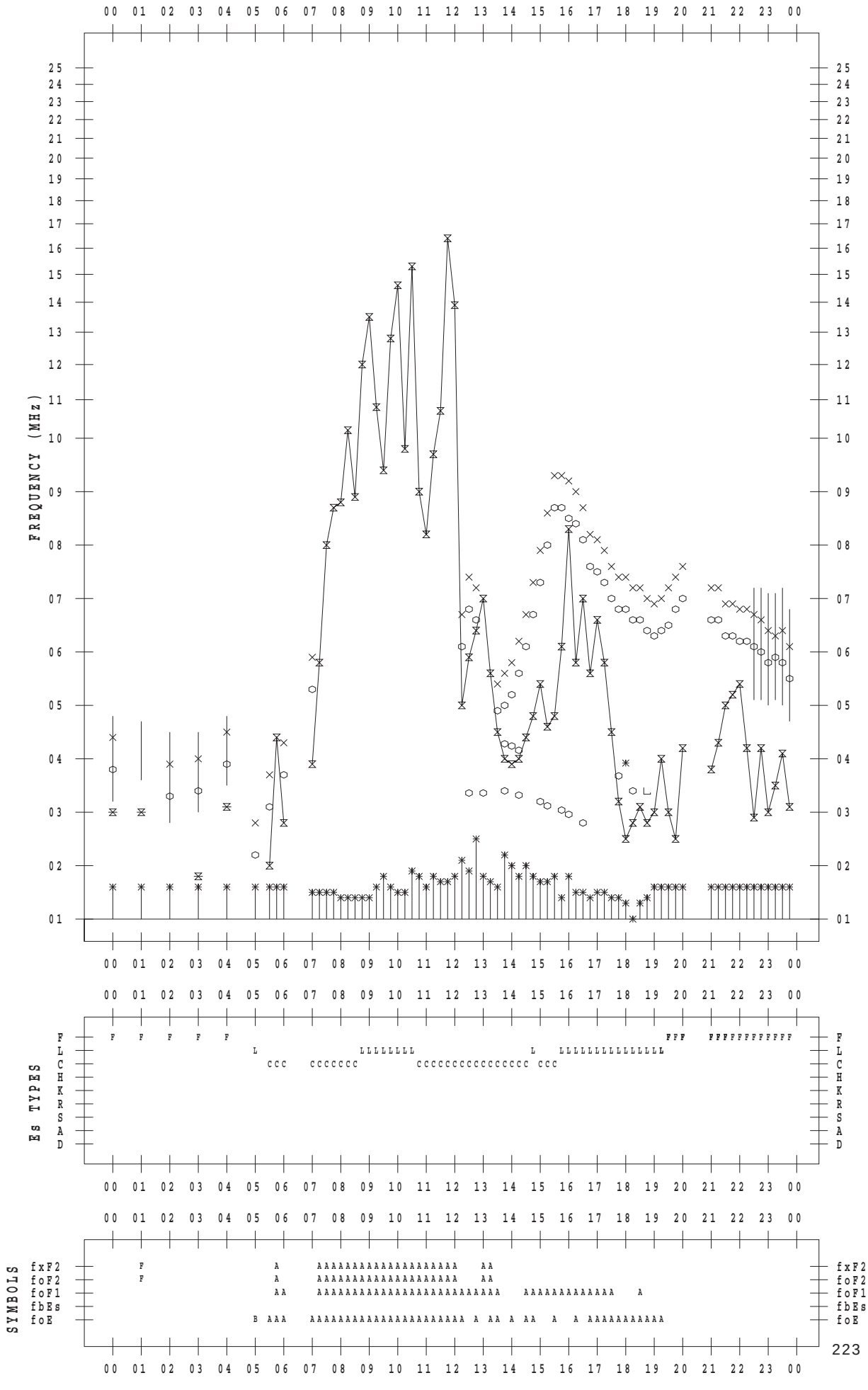
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/26

135 °E MEAN TIME



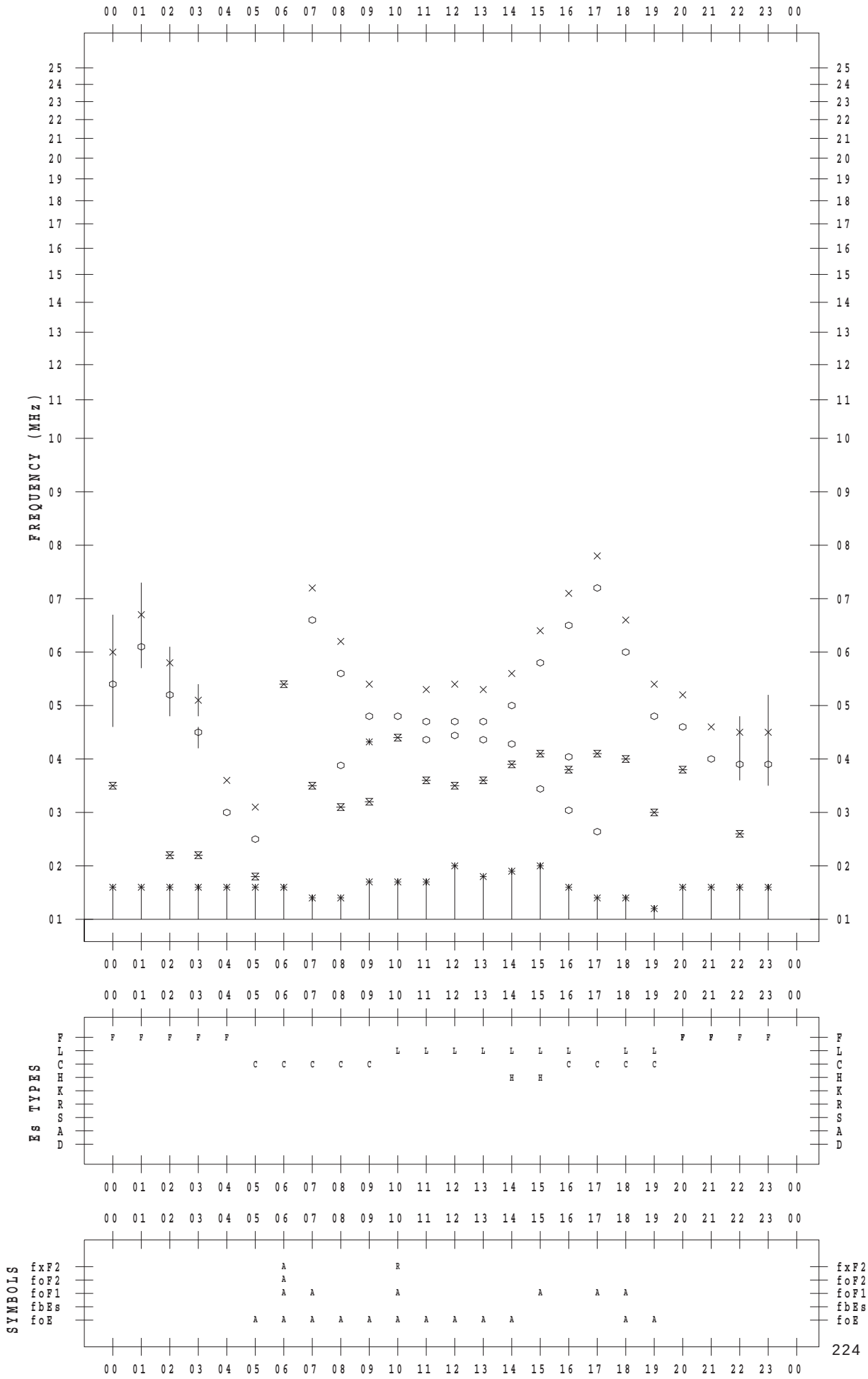
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/27

135 °E MEAN TIME



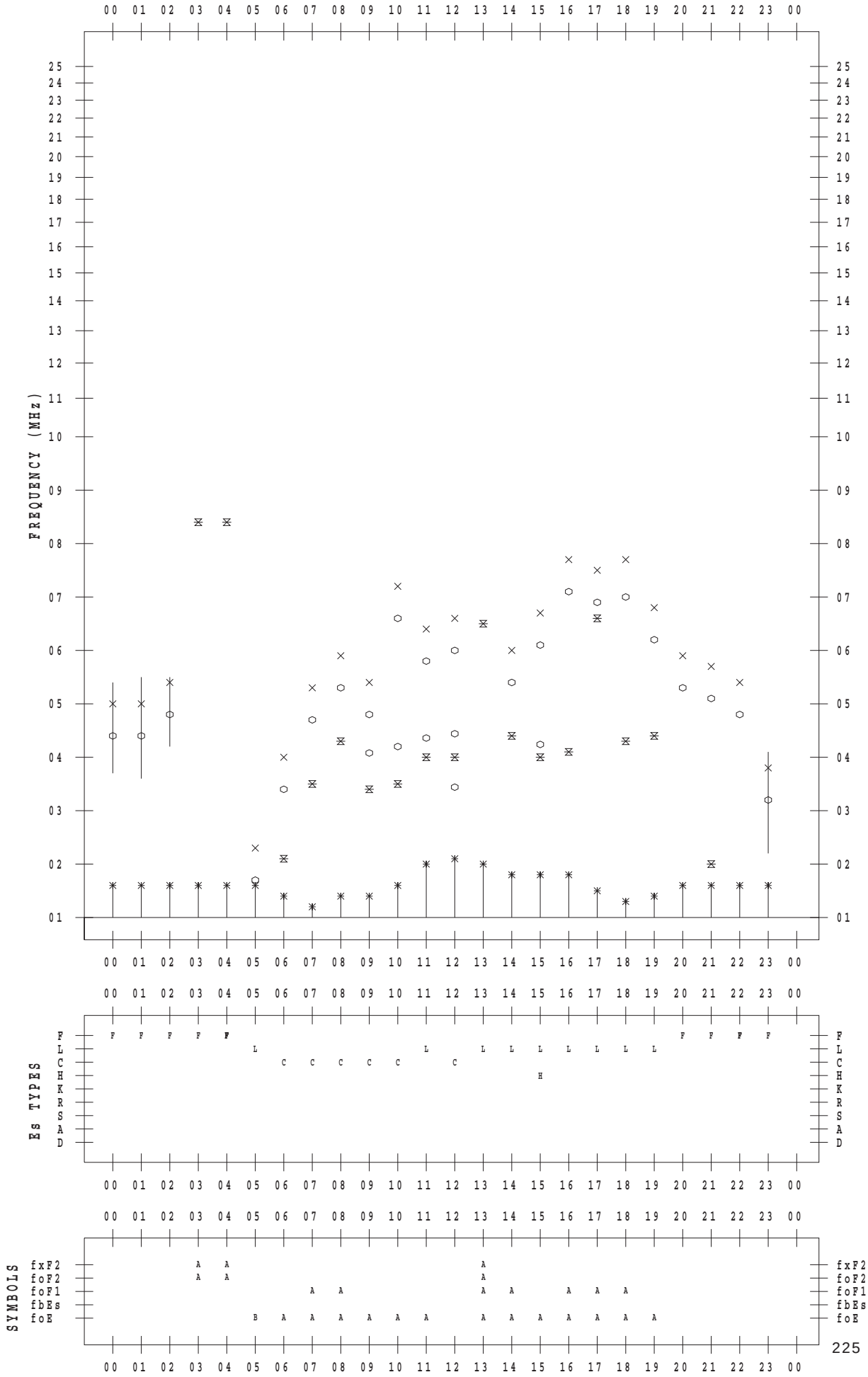
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/28

135 °E MEAN TIME



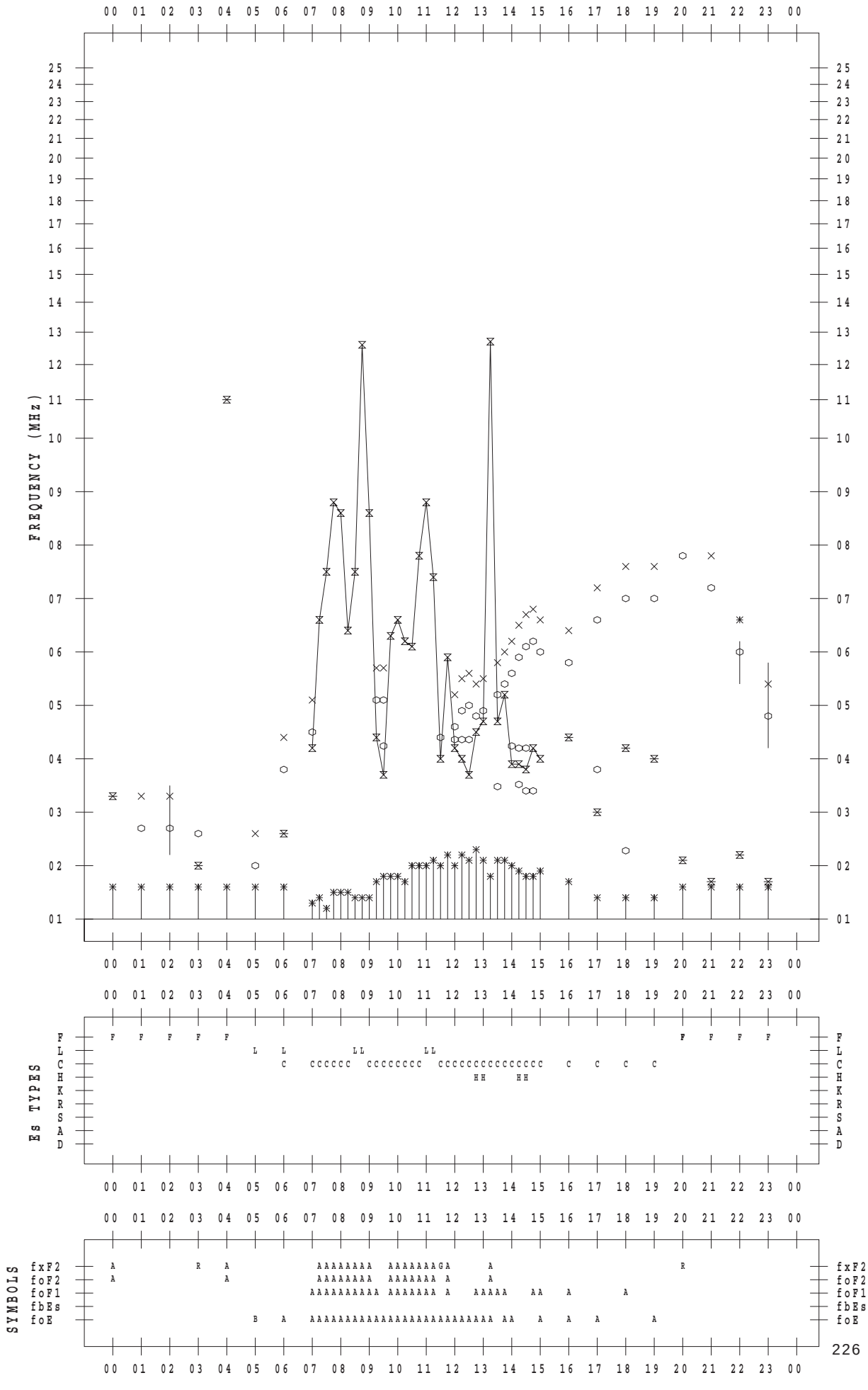
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/29

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 6/30

135 °E MEAN TIME