F-835

IONOSPHERIC DATA IN JAPAN

FOR JULY 2018

VOL. 70 NO. 7

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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

JUL. 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	A	A	42	40	39	44	50	53	A	A	A	A	89	A	A	A	46	55	111	86	65	63	54	52
2	36	36	34	34	38	45	A	A	A	A	A	56	52	A	A	A	A	A	A	A	A	52	51	A
3	42	40	36	38	37	40	52	A	A	A	61	55	A	A	49	42	40	41	49	48	55	58	50	47
4	47	41	41	37	42	44	47	46	49	A	50	54	A	A	54	49	50	A	A	A	32	48	48	47
5	51	49	42	43	42	42	44	A	A	A	A	89	A	A	51	56	57	43	44	50	54	54	52	51
6	44	42	43	39	34	44	38	A	A	A	A	106	170		A	106		109	46	A	58	A	54	A
7	52	47	50	50	51	52	55	62	A	110	158	A	A	A	109		A	A	106	86	A	A	54	46
8	42	42	46	44	38	42		104	130	146	153		110	A	134	109	A	A	47	101	A	53	A	A
9	A	A	A	A	39	39	109	102	106		A	A	A	A	57	A	48	46	A	A	51	A	A	51
10	51	47	48	42	42	48	50	A	85	109	A		A	A	A	50	52	54	55	A	A	52	52	
11	A	A	42	A	29	A	A	86			A	A	A	45	46	A	129	A	A	A	N	52	A	58
12	58	46	40	37	29	40	64	A		149	A	A	A	A	A	211	87			A	55	A	A	A
13	44	40	42	40	40	43	106	A	64	A	A	A	A	N	A	122	119	159	46	48	A	54	55	A
14	52	A	A	A	A	A	A		105	A	A	A	A	A	A	A	A	A	85	52	55	85	A	52
15	A	52	A	A	50	40	A	A	104	54	89		141	A	A	A	A	A	85	53	109	A	109	A
16	42	51	52	55	52	44	A	A	A	A	A	A	A	N	A	A	46	52	77	A	63	49	54	47
17	42	38	38	34	34	34	29	89	A	A	106	A	A	169	110	42	A		149		A	A	50	A
18	A	42	40	39	44	48	46	44	A	A	A	A	A	A	A	A	164	A	110	110	A	55	A	A
19	A	A	A	44	A	44	A	A		106	85	90	55	37	A	84	89	A	A	A	55	A	A	A
20	A	A	A	37	37	44	A	A	100	54	85	A	A	A	A	48	40	84	54	55	58	59	A	55
21	54	50	47	42	46	A	52		170		57	A	79	A	51	49	A	119	104	N	104	53	52	49
22	A		A	A	A	A	53	139	147		106	A	A	A	A	A	A	A	51	45	50	50	42	A
23	A	A	A	40	32	44	A	53	A	A	A	A	A	A	A	87	119	102	A	A	61	52	44	36
24	34	36	37	29	A	A	40	A	A	A	A	56	A	A		157	101		A	A	A	64	65	54
25	47	A	43	A	A	A	A	A	A	A	A	A	A	109		A	50	127	84	55	54	54	A	A
26	A	A	A	A	41	A	153	157	111	A	A	A	84	A	A	A	A	A		A	49	52	A	A
27	A	A	A	A	A	44	98		A	A	84	A	A	A	A	87	89	A	A	A	53	54	A	A
28	A	40	41	40	42	42	38	A	79			A	160	82	84	146		A	A	A	A	A	A	A
29	47	A	A	A	A	57	54		A	A	86	A	A	A	A	51	A	49	121	58	67	52		A
30	54	54	52	51		46	34	54	109	77	A	44	A	A	45	A	91	55	48	55	A	64	53	52
31	A	A	36	35	A	A	82	A	A	A	A	A	74	A	A	A	A	A	A	A	A	A	55	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	18	21	22	22	23	21	12	13	8	12	8	10	5	11	17	18	14	19	14	19	22	18	14
MED	47	42	42	40	40	44	52	74	105	108	86	56	86	82	54	84	72	55	77	55	55	54	52	51
U Q	52	49	46	43	42	45	73	103	120	128	106	89	141	139	109	115	101	109	106	86	63	58	54	52
L Q	42	40	39	37	37	42	42	53	82	65	72	54	74	41	49	49	48	49	48	50	53	52	50	47

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HOURLY VALUES OF fEs AT Wakkanai

JUL. 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	59	62	32	30	39	40	44	50	73	61	62	62	66	54	61	52	65	65	84	97	85	26	25	24
2	G	G	28	35	32	128	41	53	108	59	53	50	48	64	78	46	45	59	47	52	45	34	38	60
3	G	27	33	G	G	31	146	65	65	68	52	54	83	56	36	37	58	40	42	39	30	34	27	G
4	27	24	G	G	G	58	41	58	124	49	50	48	50	41	62	43	41	58	47	47	34	35	43	41
5	27	27	25	G	25	60	42	66	64	48	68	72	133	65	41	42	28	24	40	32	32	34	39	29
6	G	G	G	G	G	30	36	56	69	94	86	70	136		95	134		103	163	80	40	69	50	93
7	34	40	29	32	34	33	49	154	71	72	138	142	95	84	104		143	112	82	168	132	71	70	38
8	57	36	37	37	G	40		96	134	135	133		72	84	122	112	57	52	41	82	116	94	61	109
9	82	59	58	43	39	50	74	86	77		58	85	76	66	145	87	59	40	70	60	55	60	70	83
10	81	58	34	G	G	38	50	89	100	89	144		159	134	95	38	39	38	45	56	69	37	75	
11	59	70	39	49	58	39	60	85			110	45	48	48	41	57	101	103	116	139	43	86	92	71
12	43	28	24	32	33	82	74	61		69	92	60	46	103	87	115	69			145	109	86	84	71
13	40	27	30	24	28	160	94	75	90	106	98	72	79	60	58	113	92	164	40	45	63	41	34	60
14	57	84	41	39	39	58	59		86	108	133	84	111	76	83	84	92	72	78	44	46	80	91	43
15	59	41	49	57	46	32	54	68	82	65	68		94	152	109	61	71	61	64	47	92	94	132	113
16	54	54	37	31	G	129	49	55	60	68	77	90	73	48	64	48	42	57	91	92	57	34	26	25
17	G	G	G	G	G	35	39	52	59	55	117	116	134	149	122	93	48		84		60	66	40	106
18	59	58	36	25	G	30	46	54	60	72	65	61	57	65	60	57	91	95	92	113	115	70	86	90
19	66	71	59	46	70	38	61	108		126	80	85	37	43	60	81	88	115	85	43	29	60	110	92
20	115	70	59	35	29	36	49	52	71	57	115	109	97	95	59	41	38	126	40	53	50	45	70	28
21	28	33	38	34	40	46	115		95		55	86	68	160	35	36	100	80	91	150	134	40	56	85
22	90		58	58	46	51	61	102	94		79	115	61	74	59	59	60	59	39	33	30	38	32	41
23	59	40	40	69	82	41	54	72	86	51	180	87	94	112	115	92	86	75	85	59	45	32	29	32
24	27	28	34	33	58	159	38	72	114	82	76	47	45	64		115	101		130	94	84	43	39	39
25	39	45	28	103	94	149	59	60	81	85	52	63	96	81		75	61	106	106	49	90	49	91	83
26	64	89	61	55	39	83	72	142	113	114	101	150	97	117	81	96	144	63		61	31	69	84	91
27	72	80	60	40	59	36	85		134	117	94	66	59	79	65	86	56	67	64	57	41	92	58	60
28	59	29	31	31	31	32	43	72	73			135	126	85	93	96		107	74	111	91	86	60	66
29	59	69	60	59	59	125	49		71	76	88	69	47	102	48	46	81	69	95	44	59	39		69
30	G	26	G	G		32	55	49	61	56	94	49	96	52	44	78	73	62	38	36	61	36	33	50
31	58	46	35	57	71	43	73	61	69	110	130	61	75	60	64	71	69	57	59	144	69	70	45	69
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	30	31	30	27	28	26	30	28	31	30	29	30	29	28	29	30	31	31	30	30
MED	57	40	35	34	36	41	54	66	79	72	87	71	76	75	64	73	69	66	74	58	59	49	57	63
U Q	59	62	49	49	58	82	72	86	97	106	115	88	97	102	95	93	91	103	91	97	90	71	84	85
L Q	27	27	28	24	G	35	44	55	69	59	65	60	57	60	58	46	52	57	43	45	41	36	38	39

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HOURLY VALUES OF fmin AT Wakkanai

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

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

JUL. 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	A	A	55	A	159	A	80	139	A	112	A	A	48	47	A	46	109	A	52	52	A
2	A	A	A	A	31	38	A	54	89	112	108	99	A	A	A	A	45		A	A	51	50	47	42
3	A	A	A	34	A	A	39	A	179		143		130	146		A	A	A	A	A	52	A	A	A
4	A	40	36	27	A	A	46	51	A	116		136	141	A	A	A	A	51	41	A	51	50	42	48
5	A	A	36	31	27	A	A	52	45	A	110	A	109	109	A	69	69	55	A	A	54	52	44	42
6	39	37	A	A	A	39	A	A	A	A	A	A	A	A	A	50	45	55	55	47	A	A	A	N
7	A	35	A	A	A	A	109	129	A		A	A	110	124	A	A	A	52	54	57	78	50	A	A
8	39	A	36	35	34	40	47	40	A	55	A	89	A	A	54	54	A	51	51	A	57	52	A	48
9	A	A	A	A	34	42	49	A	A	109	A	A	99			147	111	109	143		A	54	A	A
10	37	36	32	A	32	A	A	109	72	66	132	189	115	107	104		124	132	A	58	51	63	43	A
11	A	A	31	31	A	A	A	125			A	A	164	110	A	A	A	53	44	51	52	51	A	49
12	47	48	A	A	A	A	A		156	N		206	187	129	A	A	A	A		109	39	52	A	A
13	A	A	A	A	A	A	88		146		N	169	A	A	A	A	63	55	79	57	51	A	A	A
14	A	A	A	A	A	A	111			A	A	A	A	A	51	61	63	A	79	111	43	44	44	43
15	A	A	A	31	32	38	A	47	A	A	N	138		A	A	A	54	51	A	A	A	A	A	A
16	A	A	A	A	A	37	A	A	111	111	110	109	127	A	A	99	129		87	A	67	A	52	50
17	37	A	A	A	31	36	A	A	A	A	A	A	A	A	A	A	A	58	A	A	49	A	A	A
18	A	A	38	39	36	35	44	50	58	61	144		172	189	62	A	52	54	55	58	52	54	48	A
19	A	A	42	A	A	38		146			170	A	111			187			109	109	A	A	A	A
20	A	A	A	A	25	A	46	55	A	A	115	A	136	164	102	A	A		55	A	A	54	51	A
21	A	A	A	A	A	A	A	A	179	N	189	56	A	A	A	55	59	66	63	57	54	A	49	50
22	A	A	A	42	35	34	A	A	N		104		119	A	A	54	A	A	A	53	54	A	A	A
23	A	A	A	A	109	A	46	110	86	N	N	141	A	A	A	A	54		A	63	67	A	A	30
24	A	A	A	A	24	36	A	A	A	A	A	A	126	80	A	56			110	A	A	63	54	A
25	A	A	A	A	A	A	111	64	129	109	A	A	A	A	A	55	54	A	A	A	A	A	A	
26	A	A	A	34	34	A	A	A	A	A		148		140			112	N	A	A	A	A	A	
27	A	A	A	A	A	37	51	108			A		A	151	129	109	51	144	147	A		A	A	A
28	A	A	A	A	25	47	A	85		182	201	A	112	A	N	A	51	169	111	A	A	A	39	A
29	A	A	A	A	A	A	A	110	A			125	A	A	A	A	48	50	52	57	54	54	49	A
30	A	42	42	37	36	A	A	A	A	189	N		A	A	68	A	A	A	A	107	79	52	A	A
31	A	A	A	A	A	36	A	50	99	A	58	66	A	A	A	A	A	A	A	55	58	55	47	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	6	8	10	15	15	12	18	12	11	13	13	16	11	7	13	18	16	18	16	20	17	14	9
MED	39	38	36	34	32	38	48	74	105	109	132	136	122	129	68	56	54	55	59	58	53	52	48	48
U Q	43	42	40	37	35	40	98	110	151	116	157	158	138	151	104	104	69	87	109	108	57	54	51	49
L Q	37	36	34	31	27	36	46	51	79	66	109	94	111	109	54	54	51	51	52	56	51	50	44	42

HOURLY VALUES OF fEs AT Kokubunji

JUL. 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	87	86	110	42	50	42	55	74	59	75	135	96	84	84	42	43	42	76	34	170	165	56	45	49
2	43	73	58	45	28	32	46	60	87	77	146	80	107	68	62	52	45		91	63	34	34	33	50
3	43	47	47	28	39	36	36	48	137		116		105	160		84	78	72	61	84	85	70	49	72
4	53	29	29	35	56	42	41	48	64	105		130	149	50	57	59	71	55	42	94	45	35	57	60
5	56	39	34	G	G	34	43	58	54	70	112	64	83	104	73	29	43	47	55	46	35	29	G	45
6	53	40	57	47	39	29	43	61	71	87	54	52	139	45	34	45	46	41	38	29	116	60	55	50
7	57	58	58	46	43	42	53	90	179		47	42	79	92	60	52	81	78	36	34	46	57	59	40
8	27	58	37	46	G	G	35	42	46	G	62	61	62	43	36	43	50	33	42	55	42	45	58	146
9	58	58	58	43	108	29	46	53	84	154	169	93	94			101	172	114	103		84	54	46	44
10	33	25	G	46	46	31	45	52	46	61	84	148	124	110	110		84	63	62	29	28	28	142	55
11	69	59	56	60	34	88	58	70			142	136	115	79	92	85	116	26	36	40	53	32	116	53
12	42	114	42	59	65	116	142		160	105		140	184	75	156	133	105	142		72	43	57	58	59
13	57	57	70	61	70	51	78		98		110	148	48	53	110	121	57	72	136	27	G	57	65	58
14	55	57	45	31	70	60	74			150	149	156	42	42	42	41	49	86	61	37	28	38	59	29
15	39	42	53	29	G	33	47	46	62	154	117	143		79	53	65	42	31	63	77	78	128	70	79
16	45	55	57	49	45	28	156	50	115	110	107	142	127	112	72	63	112		116	82	60	92	50	43
17	33	38	37	46	30	34	42	142	113	143	57	60	41	79	39	50	34	57	105	93	85	69	78	94
18	162	134	35	31	27	28	32	50	48	77	150		143	149	52	79	43	70	31	27	37	45	32	40
19	79	113	58	85	56	32		73			136	145	163			160			132	111	87	55	60	60
20	104	60	59	42	31	50	34	56	128	117	103	148	136	139	84	76	70		57	59	60	55	55	107
21	86	91	72	57	39	37	51	62	80	155	105	52	55	81	127	G	50	31	50	34	29	60	35	33
22	56	71	56	41	29	29	59	73	104		104		121	142	135	43	75	72	57	78	47	71	70	85
23	53	50	55	94	91	67	59	54	62	94	113	182	55	50	62	59	54		115	129	49	34	34	32
24	85	89	130	90	84	106	138	164	129	154	146	158	104	79	32	55			79	110	92	59	51	72
25	70	43	38	90	79	50	95	60	52	86	51	52	57	66	59	47	53	84	164	81	59	89	59	
26	59	58	43	35	36	39	59	61	56	51		145		152			66	165	131	134	151	108	145	
27	160	125	91	60	45	35	83	104			149		168	102	102	63	50	92	84	92		91	79	116
28	106	43	52	36	G	20	50	86		151	152	112	97	153	58	59	53	44	63	114	91	69	135	43
29	58	70	45	70	82	55	57	93	149			115	84	52	60	76	42	61	43	80	26	29	40	80
30	43	33	27	G	G	35	57	54	106	114	97		62	81	72	88	109	56	66	93	94	59	54	70
31	39	37	45	71	30	31	65	60	147	149	80	64	90	79	96	52	137	62	48	70	32	29	82	59
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	28	26	23	27	26	29	29	27	29	29	25	30	30	30	31	31	29
MED	56	58	53	46	39	35	54	60	86	105	112	122	97	79	62	59	54	63	62	78	51	57	58	58
U Q	79	73	58	60	65	50	65	73	128	150	146	145	131	111	96	81	82	81	103	93	85	69	70	75
L Q	43	42	38	35	29	31	43	52	59	77	84	64	62	59	52	46	45	45	43	40	35	35	46	43

HOURLY VALUES OF fmin AT Kokubunji

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

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF foF2 AT Yamagawa

JUL. 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	26	A	A	37	A	111	A	111	A	A	A	51	55	50	51	52	52	52	A	A	32
2	42	43	42	37	A	A	A	A	A	A	108	A	A	A	A	A	A	A	44	A	54	A	40	36
3	34	A	A	A	A	28	37	A	A	A	A	A	A	A	A	54	58	51	50	A	A	A	A	A
4	A	A	A	32	A	A	A	A	A	A	A	A	A	A	A	A	A	50	54	A	59	33	52	A
5	42	A	A	31	A	A	38	A	A	A	A	A	49	52	52	A	A	A	A	52	53	42	38	A
6	37	A	A	31	32	N	38	A	54	54	A	A	A	A	A	58	58	56	A	47	A	A	A	42
7	A	A	A	A	A	29	A	A	A	A	159	N	58	A	A	A	40	51	A	53	72	51	40	38
8	34	40	38	36	32	28	35	41	A	A	A	A	A	50	53	50	49	48	55	53	50	A	42	A
9	A	A	A	34	30	49	40	A	A	A	A	109	A	A	A	A	58	67	A	75	78	A	54	42
10	A	A	A	34	30	A	40	48	54	A	A	A	A	104	77	A	106	68	A	A	51	58	50	32
11	A	A	A	28	26	A	A	52	A	A	A	A	A	A	A	A	A	A	A	54	52	78	A	A
12	38	41	38	38	32	31	40	46	53	51	59	64	A	A	A	52	A	66	A	72	78	52	28	38
13	35	34	31	31	31	30	38	A	A	155	144	A	A	A	55	55	58	A	A	A	52	40	42	A
14	A	32	31	30	28	28	40	54	79	A	A	51	45	A	51	60	57	54	42	28	A	A	A	47
15	A	34	A	30	26	28	A	A	62	A	78	A	A	A	A	A	100	70	48	43	47	A	A	A
16	A	A	A	A	A	29	A	54	A	54	110	108	A	A	A	90	121	104	A	A	A	A	A	A
17	A	A	A	A	A	A	A	A	55	A	84	71	105	A	A	51	51	A	A	A	49	A	A	A
18	A	A	A	A	A	A	40	A	84	A	A	A	A	A	A	102	A	64	66	54	64	52	37	A
19	42	42	A	32	32	29	36	54	A	149	84	147	79	A	N	A	A	A	N		50	54	A	A
20	A	A	A	A	A	A	43	A	A	A	A	A	A	A	A	A	A	107	A	33	A	A	A	A
21	A	A	A	34	30	26	A	42	54	A	A	A	A	50	189	56	A	56	55	40	67	48	47	43
22	A	A	40	A	37	59	A	38	A	A	A	A	A	51	62	A	A	109	74	78	50	A	34	A
23	A	42	34	A	A	30	23	51	48	49	A	A	A	A	A	56	A	48	51	66	52	A	A	A
24	A	A	A	A	A	A	38	38	A	A	A	38	A	A	A	60	A	A	56	58	52	54	48	42
25	43	40	A	32	34	32	41	A	52	A	A	A	A	55	60	63	56	71	56	51	48	52	51	A
26	50	A	A	A	A	A	50	A	A	A	A	A	126	A	A	A	N	A	67	A	A	A	A	A
27	A	A	A	A	A	A	34	A	A	88	79	A	A	153	102	58	A	55	A	A	55	30	A	A
28	A	A	A	N	B	B	34	48	103	N	A	101	A	A	A	A	A	67	A	A	A	A	A	A
29	A	A	A	A	28	A	A	A	A	A	A	A	98	A	A	A	86	A	51	A	48	53	A	30
30	42	44	42	40	30	28	37	50	50	A	52	A	55	A	A	A	A	A	54	66	A	53	40	36
31	A	A	34	A	A	32	47	A	A	A	A	A	143	A	109	A	A	84	A	55	A	A	42	42
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	10	9	17	15	16	21	13	13	7	11	8	9	7	11	15	14	21	16	19	22	15	16	13
MED	42	40	38	32	30	29	38	48	54	54	84	86	79	52	60	56	58	64	54	53	52	52	42	38
U Q	42	42	41	35	32	31	40	53	81	149	111	108	115	104	102	60	86	70	56	66	59	54	49	42
L Q	35	34	32	30	28	28	36	41	52	51	78	57	52	50	52	54	51	51	50	47	50	42	39	34

HOURLY VALUES OF fEs AT Yamagawa

JUL. 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	36	84	40	39	57	71	36	58	115	93	85	60	71	41	46	39	33	38	36	28	27	84	84	27
2	40	39	39	33	58	57	55	46	60	70	91	156	113	105	85	60	64	74	32	61	43	35	30	37
3	28	40	70	60	26	25	34	40	56	90	95	151	70	161	62	50	35	39	40	55	45	56	58	45
4	49	41	58	28	39	37	58	60	60	53	55	61	91	74	48	44	44	40	48	60	40	40	41	48
5	25	59	39	59	33	28	31	43	58	83	106	72	54	46	48	105	114	125	92	45	32	25	30	43
6	36	41	56	40	30	32	34	44	54	53	124	55	56	111	124	146	34	48	61	33	85	110	59	G
7	57	71	49	37	40	G	40	71	107	137	111	64	149	49	51	46	29	49	49	50	27	23	28	G
8	25	G	G	G	G	G	33	29	54	60	77	62	56	50	40	37	30	28	30	27	32	36	49	56
9	46	40	43	30	39	G	33	56	58	58	85	79	94	147	64	84	75	57	106	108	80	56	46	38
10	39	35	40	32	32	32	29	92	54	60	52	46	56	90	65	85	115	62	132	71	52	39	G	26
11	57	91	55	32	G	30	35	53	157	130	74	73	61	104	62	64	67	88	143	29	41	39	48	47
12	39	36	34	28	G	26	34	74	45	36	48	46	54	63	56	44	64	76	67	28	58	46	29	28
13	G	G	G	G	G	45	36	87	143	154	61	56	54	37	33	54	40	72	70	106	27	G	26	58
14	49	G	G	G	G	G	32	40	67	112	48	45	45	48	45	40	39	41	34	36	84	104	49	59
15	73	35	45	26	29	G	40	50	66	72	60	66	83	92	109	70	75	61	50	26	38	41	43	111
16	91	124	58	54	60	30	47	43	67	58	96	105	126	145	74	81	102	95	88	103	128	110	83	50
17	69	111	55	56	87	56	54	60	103	50	76	67	101	126	56	45	36	46	48	60	51	56	60	58
18	87	59	58	49	33	84	38	60	93	126	113	124	95	161	126	75	75	42	32	G	24	27	29	39
19	35	36	39	57	G	27	33	44	117	110	79	144	66	126	79	150	78	157	111		45	44	39	45
20	49	70	57	49	57	71	34	70	108	56	66	58	72	106	93	108	84	91	133	39	113	92	91	70
21	70	54	39	36	G	G	45	45	52	133	76	90	89	62	35	50	96	50	54	46	40	34	28	35
22	72	92	40	59	58	40	34	35	49	48	52	55	64	48	48	112	111	61	59	79	59	54	32	46
23	55	70	G	41	39	43	34	39	44	46	58	48	85	56	51	49	62	40	55	46	49	59	41	46
24	46	43	41	70	59	41	34	40	55	160	156	42	86	113	63	55	61	45	47	41	41	35	26	28
25	25	G	39	32	G	G	44	94	85	97	76	54	50	37	55	58	46	48	46	34	49	56	40	57
26	38	57	38	43	35	39	43	79	70	69	59	126	114	133	55	60	108	115	75	85	38	57	109	71
27	57	59	70	59	36	32	38	45	73	85	79	127	150	155	60	53	60	40	71	116	57	G	48	37
28	39	32	27	G	B	B	28	44	85	86	84	79	164	112	159	117	69	62	67	61	92	70	151	48
29	59	141	72	70	G	41	40	66	113	160	136	110	106	150	82	58	114	70	69	78	54	49	49	G
30	G	G	26	G	G	G	20	34	49	110	69	54	68	67	81	75	72	88	95	57	49	45	40	30
31	40	46	36	37	40	49	35	44	70	144	74	154	142	122	74	67	59	64	59	49	72	60	32	24
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31
MED	46	43	40	37	33	32	35	46	67	85	76	66	83	104	62	60	64	61	59	50	49	46	41	45
U Q	57	70	56	56	40	43	40	66	103	126	95	110	106	126	81	84	84	76	88	71	59	59	58	56
L Q	36	35	36	28	G	G	33	43	54	58	60	55	56	50	48	49	40	42	47	34	38	35	30	28

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

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

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF foF2 AT Okinawa

JUL. 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	A	31	A	A	A	A	A	A	A	51	A	A	A	A	A	60	61	55	38	63	66	50	34	A
2	36	28	38	A	A	A	A	A	A	N	77	86	85	183	A	158	152	85	51	149	64	54	A	A
3	A	30	A	A	A	A	36	A	48	148	108	N	199	A	58	70	83	85	73	72	59	38	A	A
4	A	A	A	A	N	N	40	A	86	85	A	A	A	139	A	A	A	A	62	A	66	59	A	A
5	A	A	A	A	A	A	A	A	A	A	104	A	A	A	A	A	71	A	78	73	A	34	34	34
6	34	32	A	31	A	A	40	53	47	48	A	104	139	159	45	A	66	52	A	A	48	41	42	A
7	38	A	34	30	28	A	34	47	A	A	A	A	A	43	A	A	A	50	55	67	67	46	A	47
8	42	42	42	42	29	29	38	38	A	A	55	52	60	54	59	52	49	54	56	66	51	48	34	34
9	A	A	A	A	A	A	A	49	A	A	105	189	A	A			67	71	71	76	85	A	75	39
10	42	42	39	37	28	29	42	52	45	A	A	57	A	80	A	108	A	A	A	85	78	65	40	A
11	38	34	A	28	A	A	A	47	52	55	54	139	A	52	A	58	57	56	A	67	85	51	30	38
12	38	40	39	32	31	28	34	A	A	51	52	55	A	A	A	A	71	77	80	87	85	54	A	A
13	A	31	N	26	25	N	36	A	64	A	50	55	A	60	A	59	60	71	74	A	67	66	A	A
14	31	30	28	26	49	A	40	50	52	50	57	53	50		55	60	62	67	54	28	36	A	42	A
15	35	A	A	N	26	A	A	52	64	50	A	A	A	A	A	N	A	A	62	A	48	A	A	A
16	A	A	A	A	A	A	A	A	50	A	A	A	56	62	62	58	60	A	65	54	78	A	A	A
17	A	A	A	A	A	A	A	A	A	110	A	A	A	A	A	55	55	51	55	75	60	A	A	A
18	A	A	A	A	A	A	42	A	A	A	A	A	A	62	86	75	A	A	85	71	71	54	42	44
19	42	32	34	A	30	25	40	44	47	A	A	A	A	A	168	A	A	71	60	54	52	51	A	41
20	A	A	A	A	28	29	40	52	A	111	A	A	A	A	A	89	65	56	50	54	A	A	54	50
21	52	47	42	A	A	A	37	67	A	A	A	A	A	A	A	58	65	59	76	84	52	42	39	42
22	40	40	A	38	34	29	A	A	A	A	A	A	A	A	67	52	64	80	91	86	43	38	42	A
23	A	A	A	32	31	27	41	44	49	A	A	A	A	A	58	A	A		52	A	A	A	A	A
24	A	A	39	A	A	A	31	54	A	54	54	A	A	A	54	64	60	A	67	82	A	A	48	45
25	43	40	36	32	A	A	40	A	54	A	A	60	A	60	62	67	82	80	60	54	60	68	42	50
26	A	36	34	A	28	29	A	A	A	A	A	59	A	A	49	A	A	A	76	A	A	A	N	A
27	A	A	A	A	A	B	A	A	53	A	A	A	A	A	68	A	82	A	189	80	A	A	A	29
28	A	A	23	49	N	N	35	44	53	51	A	A	49	A	A	A	66	72	66	A	54	46	42	A
29	A	A	31	A	A	A	35	A	A	A	A	A	A	A	196	A	A	A	A	A	A	54	47	50
30	48	53	52	40	36	31	47	42	A	A	A	A	A	A	68	66	67	65	72	87	82	A	A	A
31	A	42	A	A	35	A	30	A	A	A	N	A	190	A	82	A	A	A	A	A	A	A	A	47
	00	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	17	14	13	14	9	20	15	14	12	10	11	8	11	16	17	21	19	26	22	23	19	16	14
MED	39	36	37	32	30	29	39	49	52	52	56	59	72	62	62	60	65	67	66	72	64	51	42	43
U Q	42	42	39	39	34	29	40	52	54	97	104	104	164	139	75	72	71	77	76	84	78	54	44	47
L Q	36	31	34	29	28	27	35	44	48	50	54	55	53	54	56	58	60	55	55	63	52	42	36	38

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

JUL.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	86	49	58	41	44	56	58	60	70	151	144	144	112	77	65	50	47	34	46	34	34	45	G	32
2	34	32	54	46	28	53	116	59	91	86	74	92	86	91	93	135	144	96	61	130	85	36	53	60
3	57	31	58	35	40	35	93	44	46	90	133	97	150	115	67	46	36	34	41	52	35	34	60	54
4	53	59	59	40	25	G	G	96	86	110	79	92	62	81	88	103	116	116	57	106	54	44	37	59
5	86	112	115	147	89	30	46	43	58	103	102	77	60	82	73	74	70	91	92	59	85	29	30	33
6	58	93	33	67	59	59	36	108	132	46	115	97	176	109	55	83	63	50	72	79	G	40	57	114
7	58	48	103	25	26	116	38	165	103	79	58	75	104	44	51	60	69	46	42	36	41	40	46	25
8	28	38	32	G	G	G	28	44	55	55	48	48	47	48	49	47	38	28	29	26	G	G	24	35
9	59	57	70	40	100	72	56	60	110	114	125	150	119	130			50	42	36	32	166	86	47	35
10	29	36	30	26	G	G	26	36	45	103	47	47	62	117	161	89	124	153	109	92	58	35	28	49
11	G	G	67	26	40	91	45	38	46	44	50	138	103	82	57	52	43	55	72	50	79	57	G	107
12	G	G	G	69	G	G	26	91	106	80	41	41	50	56	60	78	53	62	54	58	56	32	56	38
13	29	G	G	G	G	25	26	49	45	62	45	57	85	50	46	47	44	38	78	90	49	50	54	36
14	26	G	G	G	G	29	27	33	40	43	50	47	47		52	57	41	88	47	38	27	112	43	60
15	59	26	56	28	32	50	32	170	49	163	61	70	91	67	170	140	150	110	43	67	24	57	70	60
16	110	69	56	69	91	62	95	66	42	150	90	88	53	44	44	38	48	78	78	63	150	112	92	92
17	92	73	115	109	118	113	124	126	137	118	130	112	126	97	61	50	57	36	50	84	56	57	73	73
18	94	165	126	38	49	28	40	57	150	68	151	151	168	144	116	64	93	92	86	79	39	46	34	34
19	30	29	28	56	G	G	30	50	59	86	96	91	97	143	90	152	121	48	36	34	42	45	132	36
20	43	59	91	92	G	60	31	45	72	92	126	74	96	78	93	93	59	45	35	38	179	166	58	45
21	36	58	40	65	55	59	34	45	85	68	54	101	122	72	62	56	56	41	54	50	128	27	28	24
22	58	25	94	56	28	44	39	49	110	86	55	51	64	68	64	49	45	40	34	33	34	26	30	94
23	107	106	46	27	39	62	26	44	57	68	59	66	69	62	54	88	65		38	134	70	60	113	126
24	90	115	48	59	90	86	25	44	60	43	91	51	63	160	66	55	58	70	61	135	63	112	132	G
25	G	G	G	26	39	28	28	92	67	58	78	87	68	53	147	52	71	56	32	106	24	21	31	57
26	59	41	31	35	94	G	29	69	95	65	144	70	75	72	47	75	76	92	69	63	126	39	23	72
27	41	73	91	84	31	B	53	61	56	56	102	74	65	63	89	95	60	80	143	163	170	84	46	G
28	34	36	24	G	G	G	24	29	43	47	47	52	48	46	59	66	62	56	62	108	49	33	49	129
29	55	72	33	40	55	52	55	84	147	111	88	164	138	164	142	62	77	105	85	67	115	58	44	60
30	26	26	G	G	G	G	32	48	55	60	106	143	96	126	50	49	50	66	92	61	60	67	91	88
31	66	69	72	72	29	58	94	43	73	68	124	137	144	151	106	92	77	88	98	88	132	132	92	45
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	31	31	31	30	30	30	31	30	31	31	31	31	31	31
MED	55	48	54	40	32	47	34	50	67	79	88	87	86	80	64	63	60	59	57	63	56	45	47	54
U Q	66	72	72	67	55	60	55	84	103	103	124	112	119	117	93	89	77	91	78	92	115	67	70	73
L Q	29	26	30	26	G	G	27	44	49	58	54	57	62	62	54	50	48	42	41	38	35	34	30	35

HOURLY VALUES OF fmin AT Okinawa

JUL. 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	14	15	14	14	14	14	14	14	14	15	17	17	18	18	16	14	14	14	14	14	14	16	14
2	14	14	15	14	14	15	14	14	14	14	17	17	21	18	18	17	15	14	14	14	16	15	15	15
3	14	14	14	14	14	15	14	14	14	14	14	17	21	20	17	18	15	14	14	16	15	14	15	14
4	14	14	14	15	14	15	14	17	15	14	16	21	20	18	21	15	15	14	14	14	14	15	14	14
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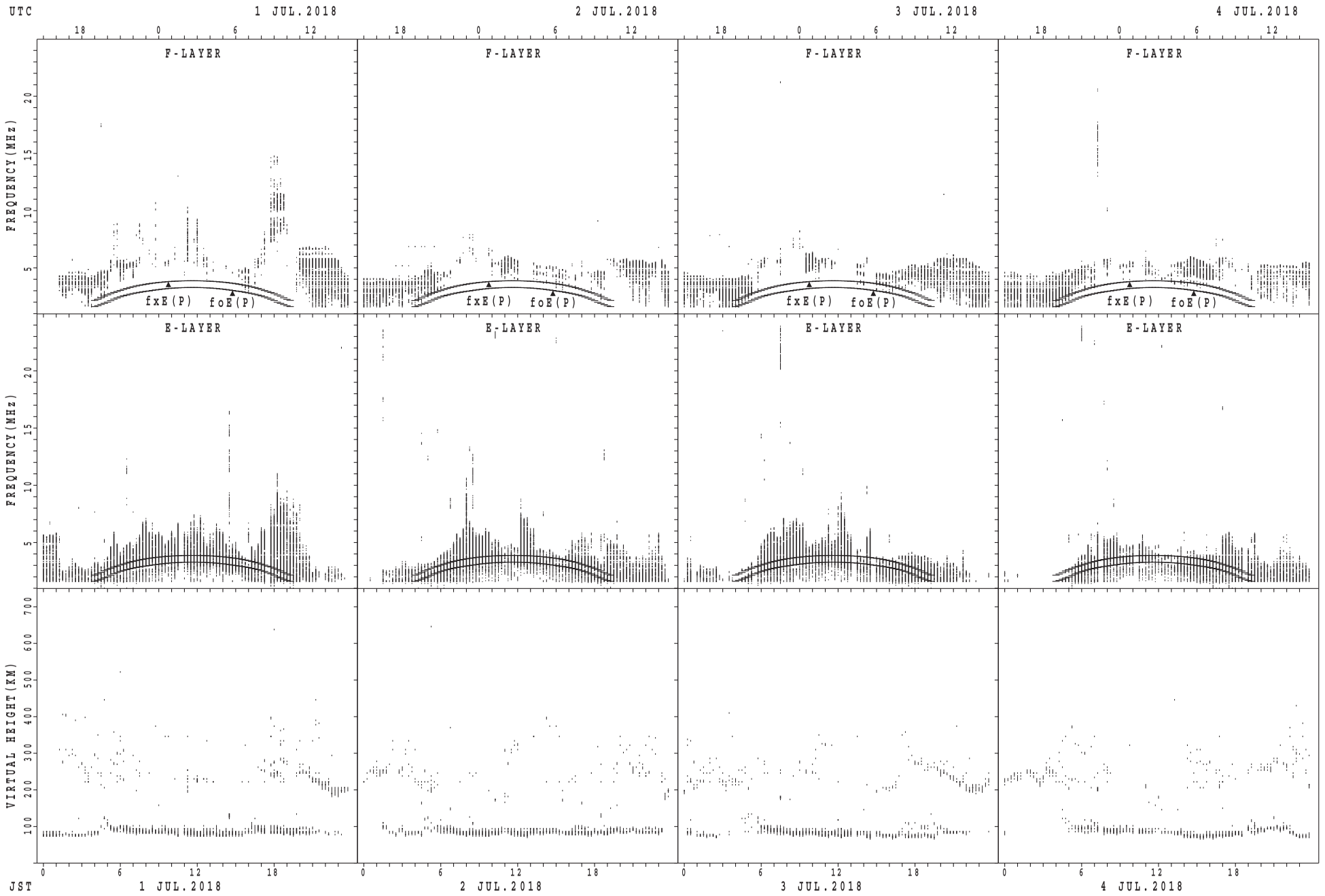
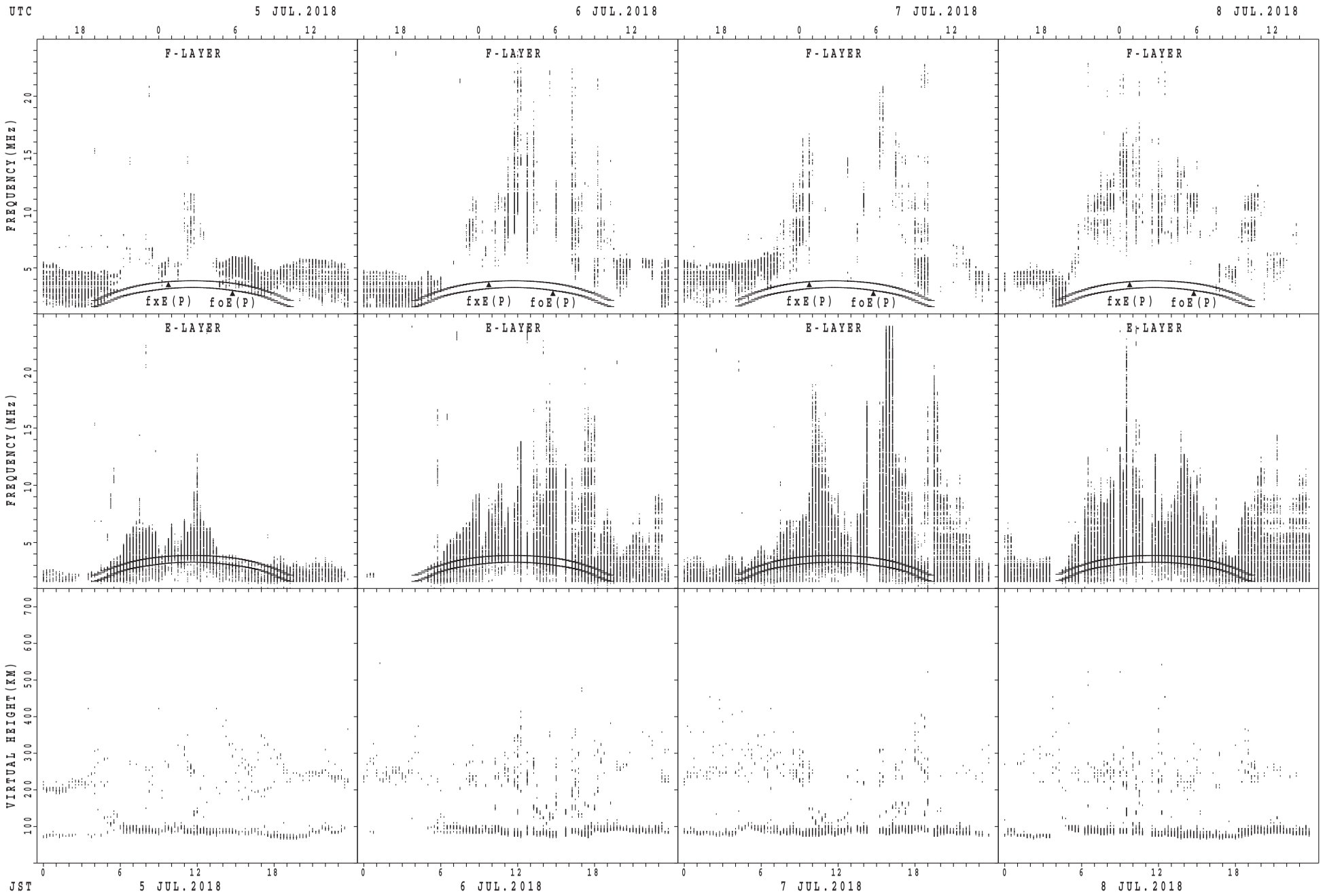
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	31	31	31	30	30	30	31	30	31	31	31	31	31	31
MED	14	14	14	14	14	14	14	14	14	14	16	18	18	19	18	17	15	14	14	14	14	14	14	14
U Q	14	14	14	14	14	15	14	14	14	15	17	20	20	20	20	18	15	14	14	14	14	14	15	14
L Q	14	14	14	14	14	14	14	14	14	14	15	17	18	18	18	16	14	14	14	14	14	14	14	14

SUMMARY PLOTS AT Wakkanai



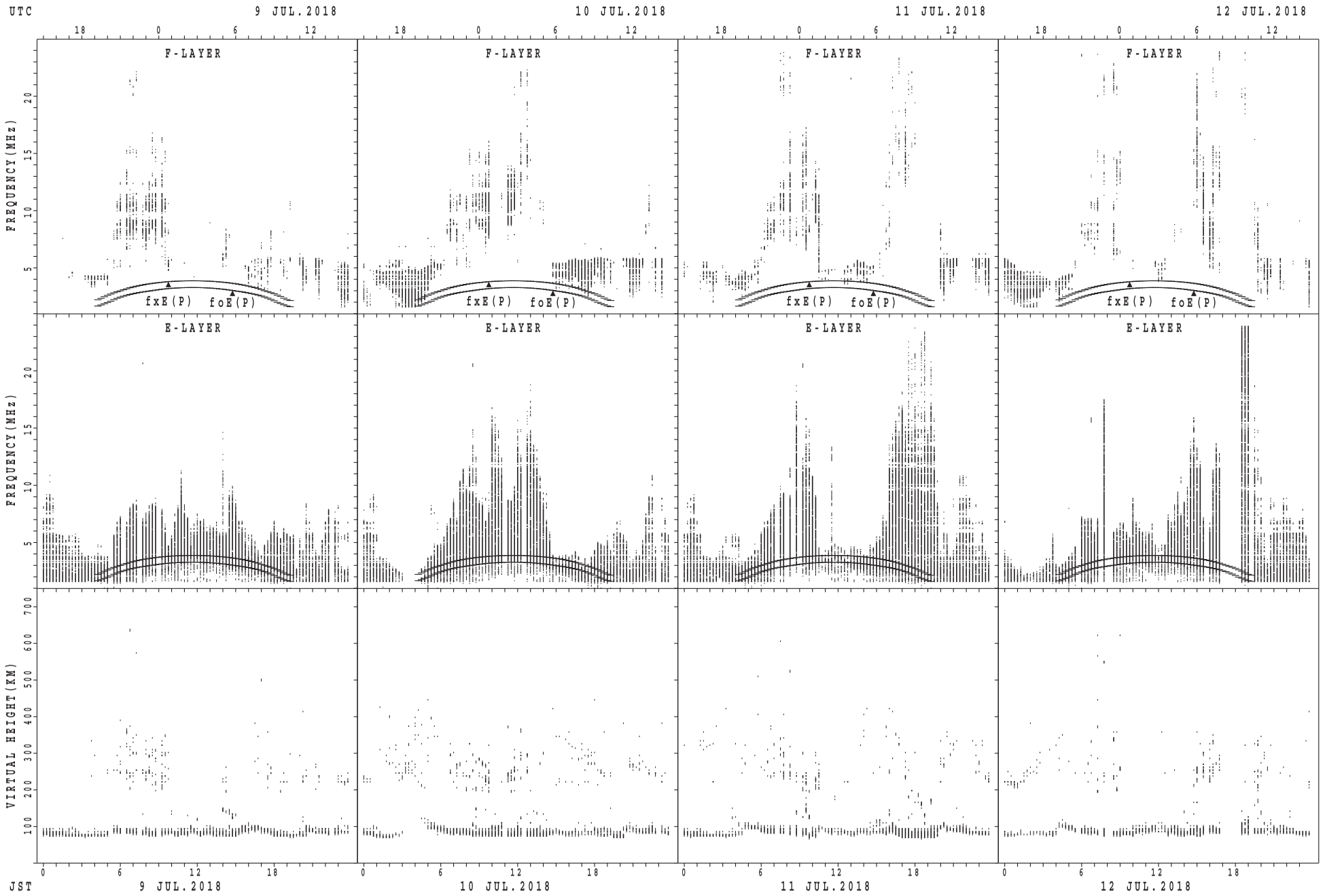
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



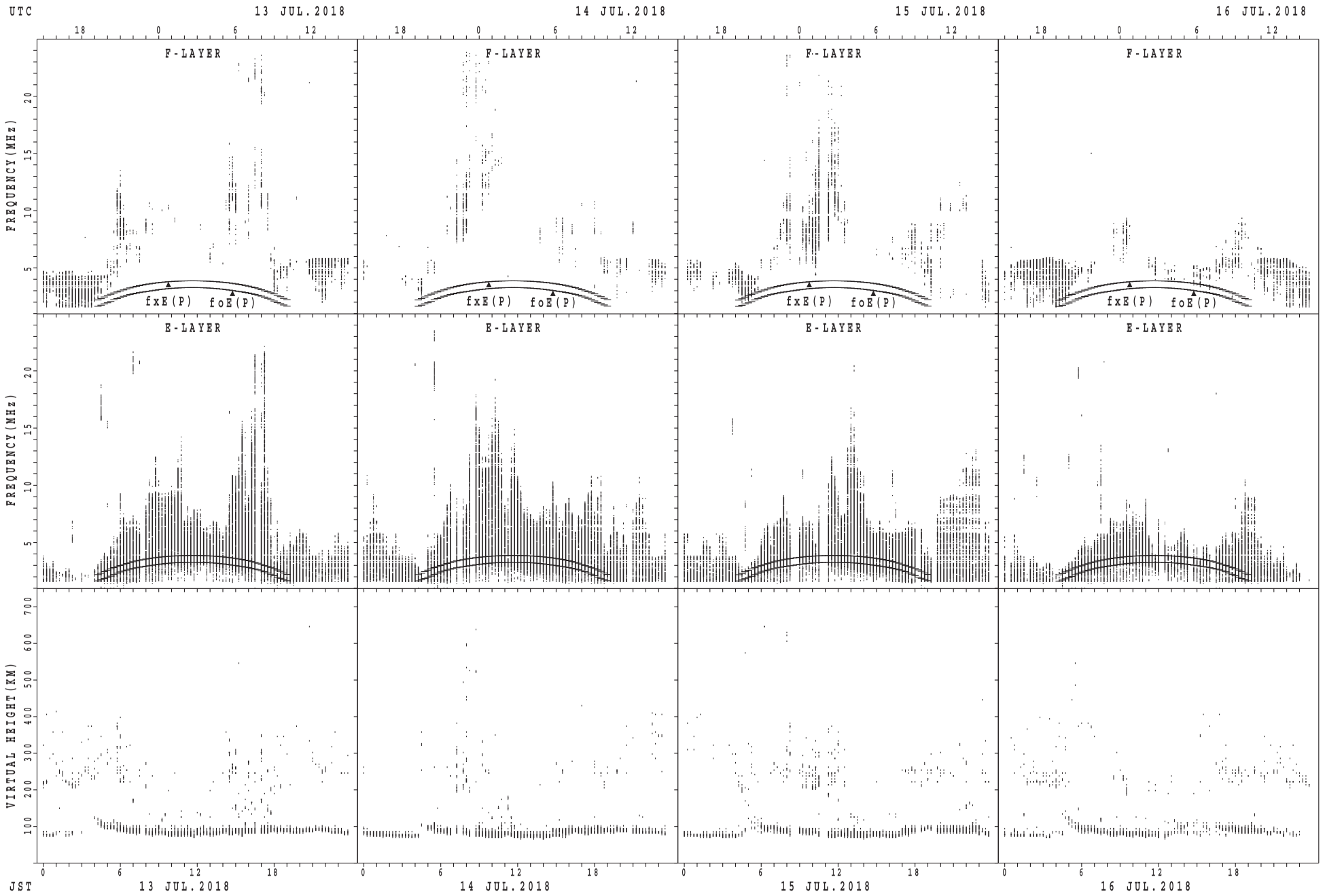
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



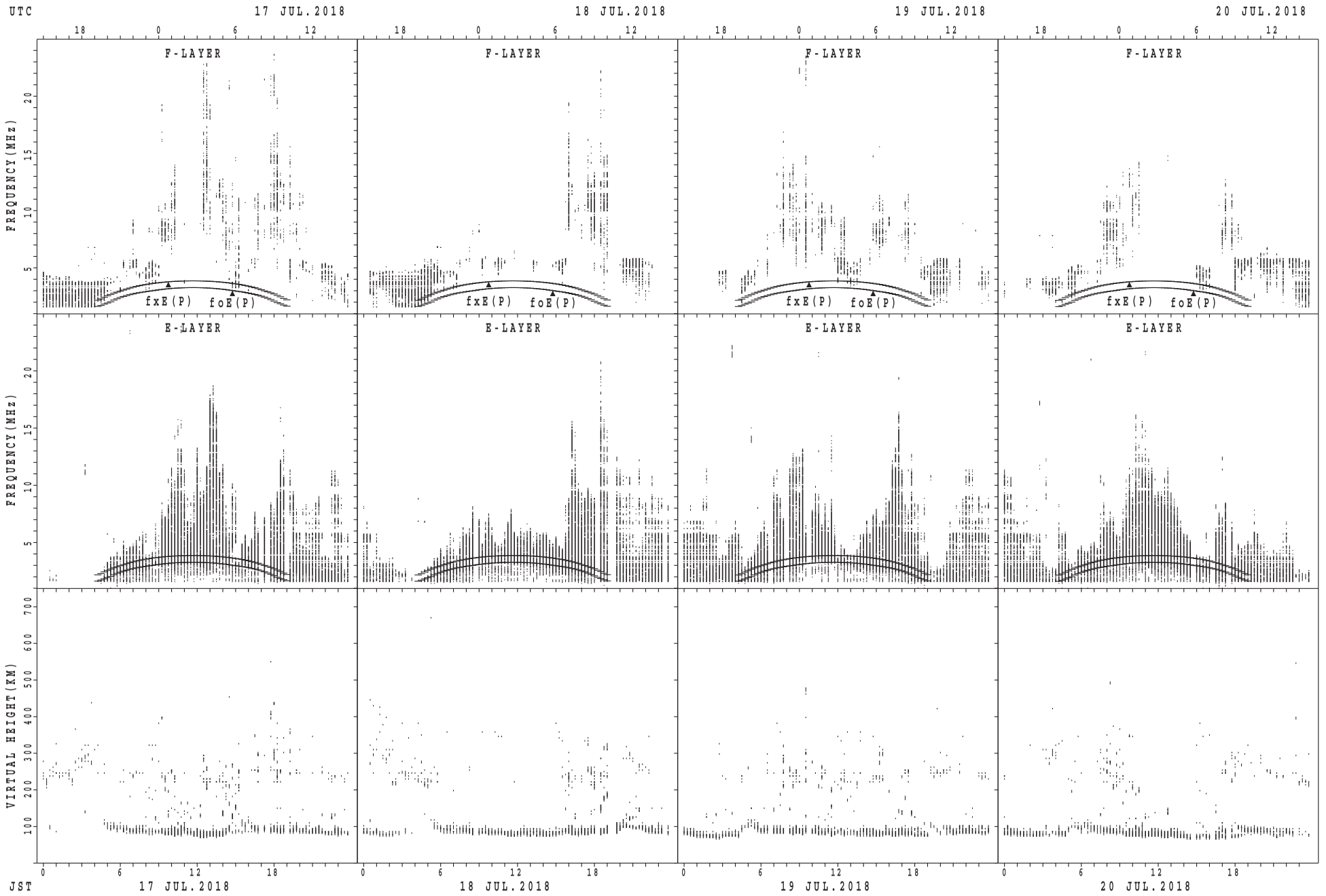
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



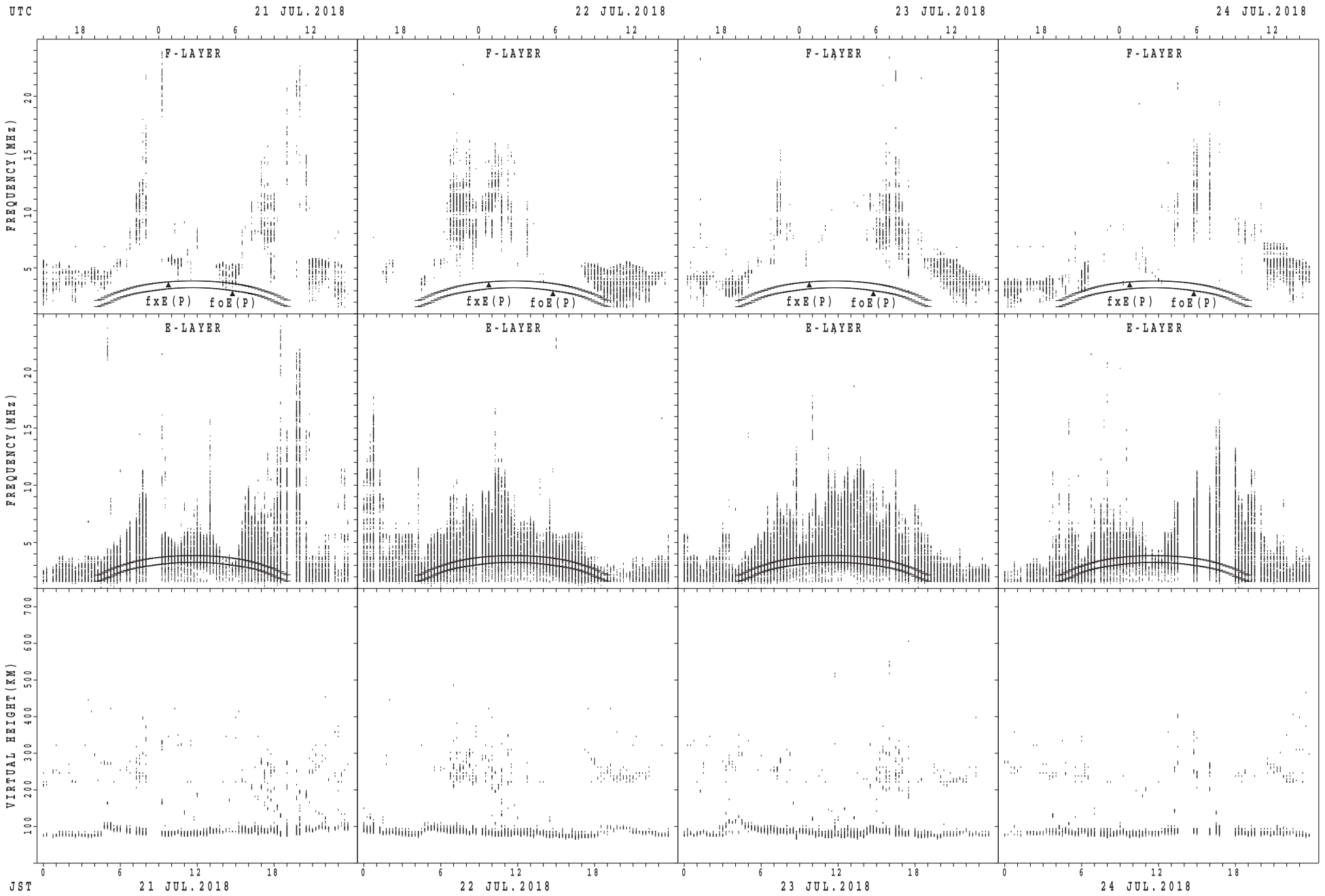
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



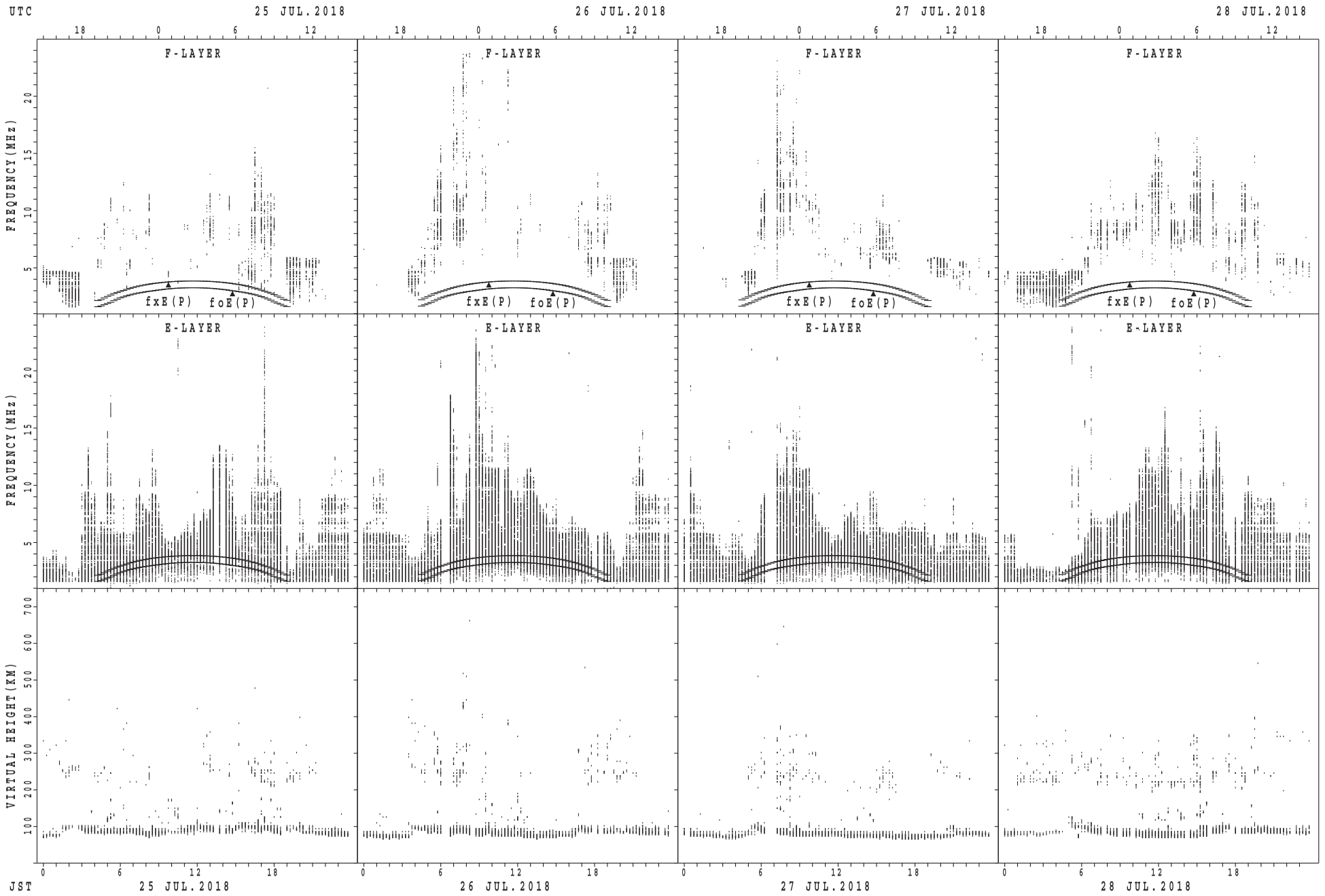
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



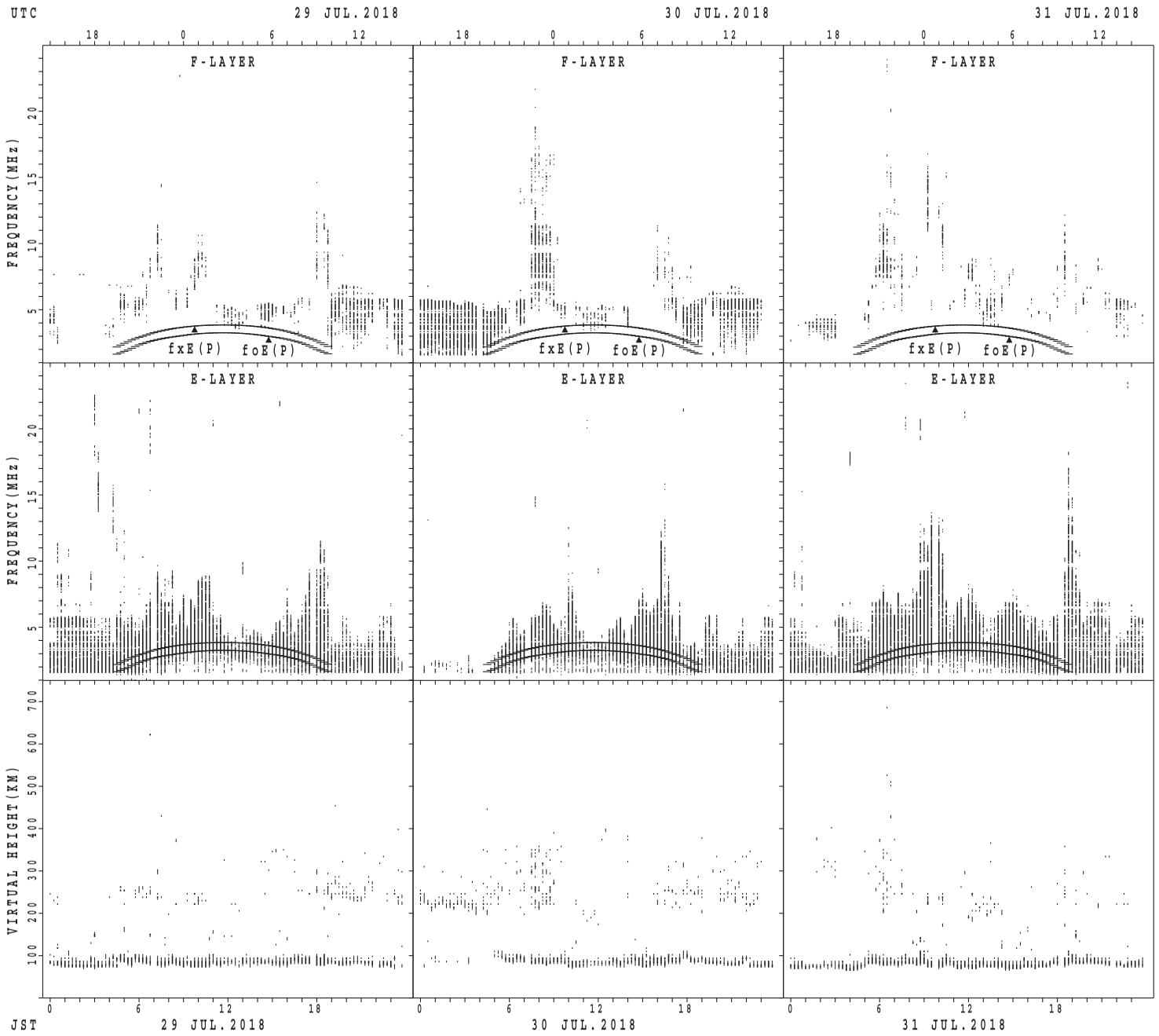
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



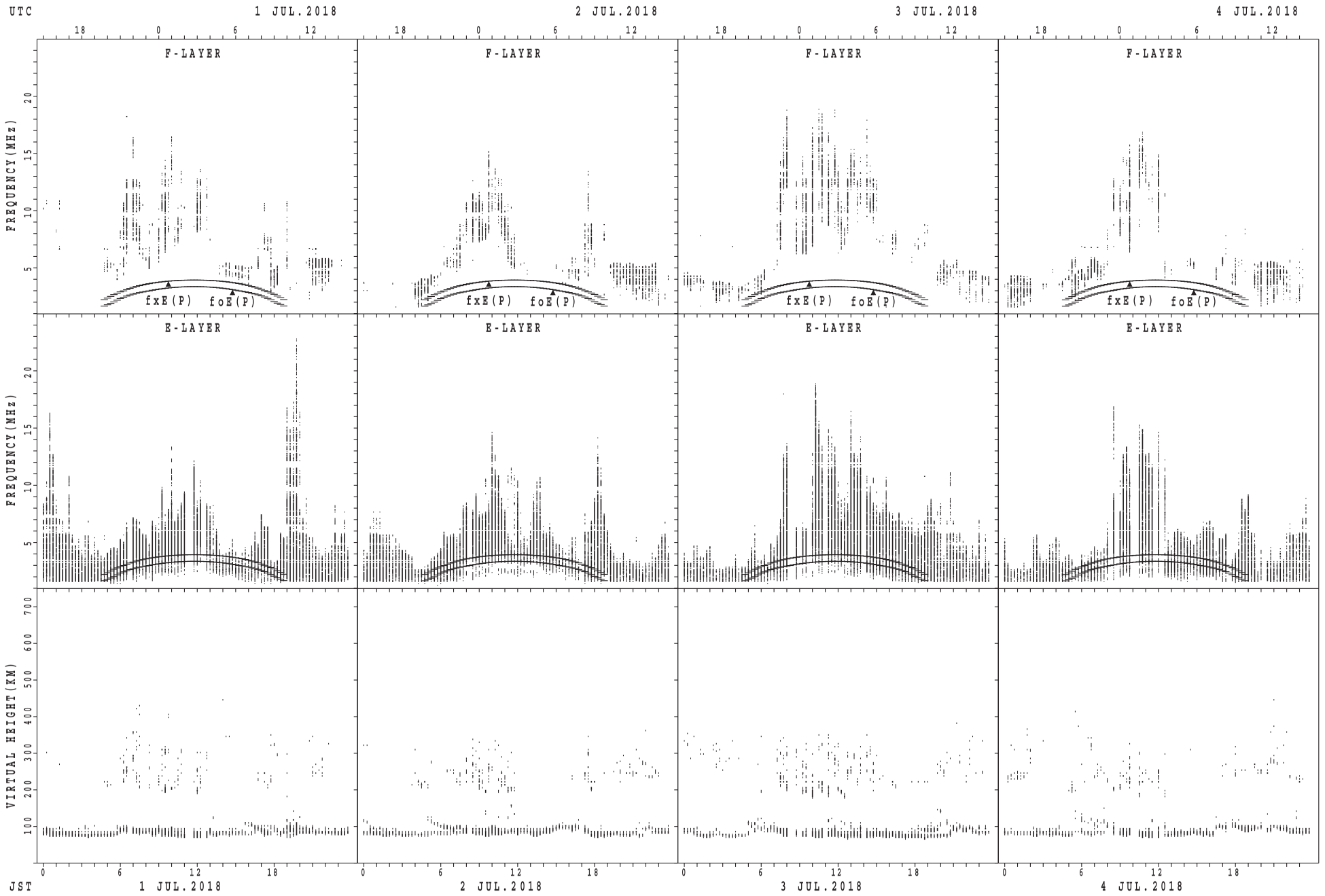
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



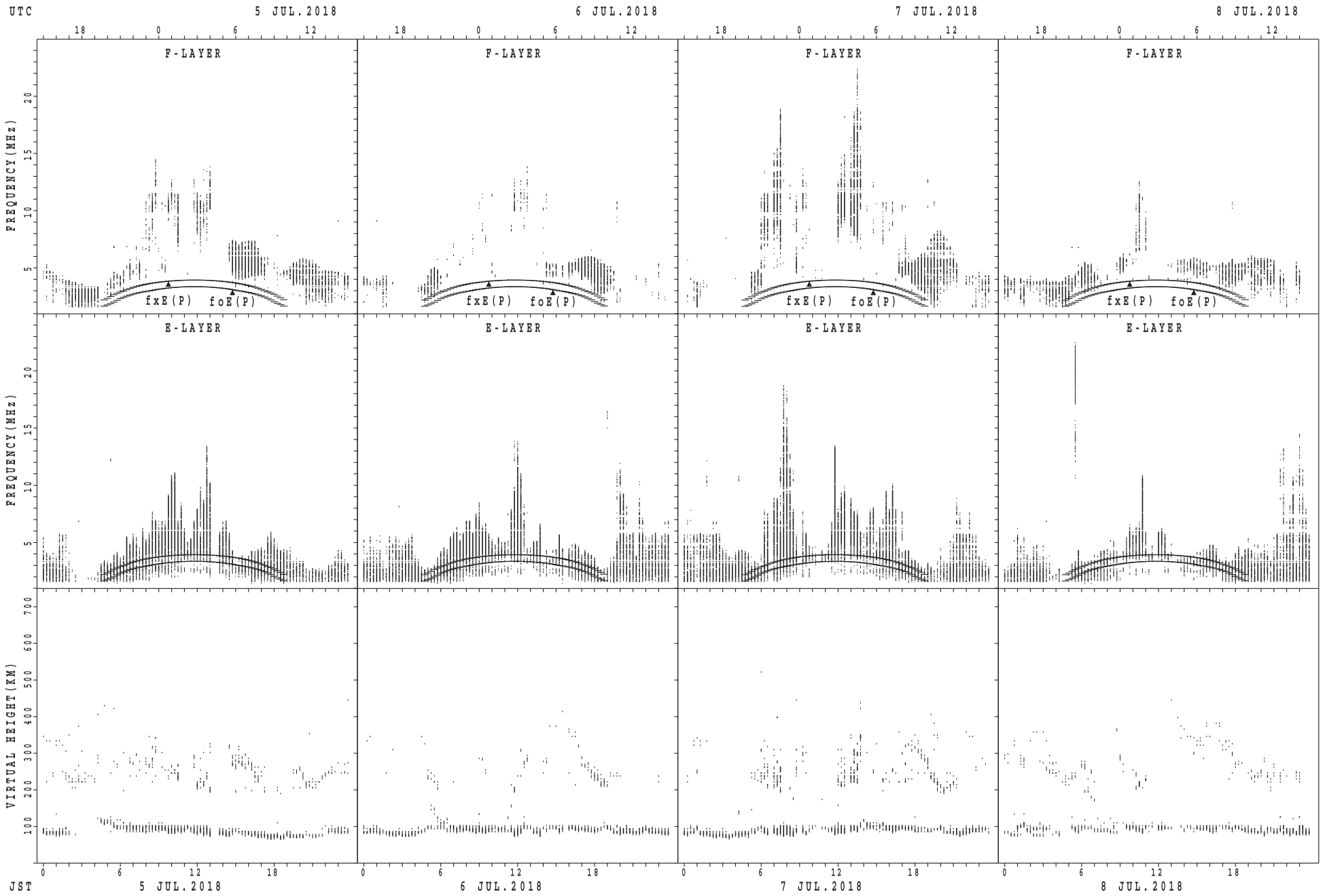
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



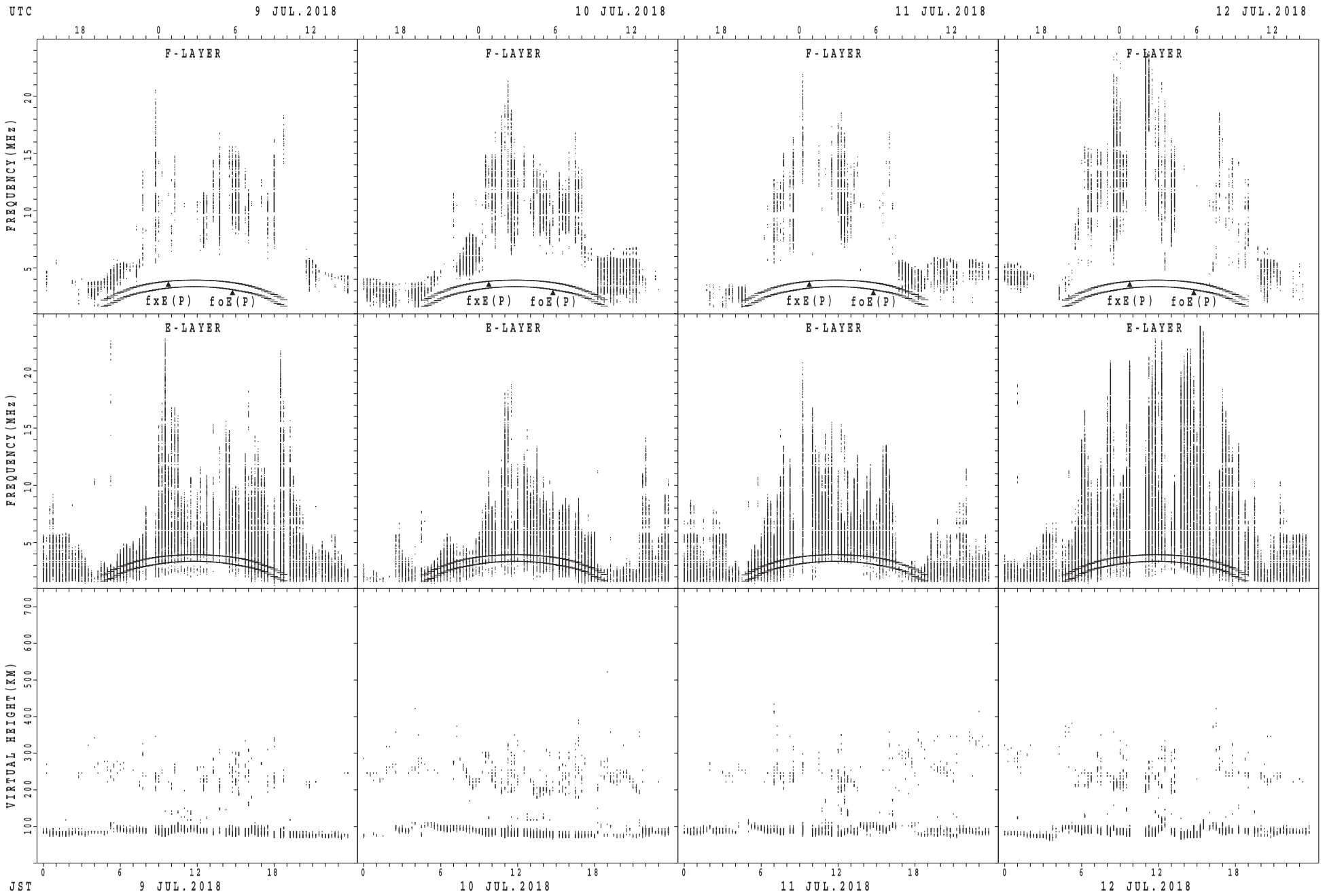
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



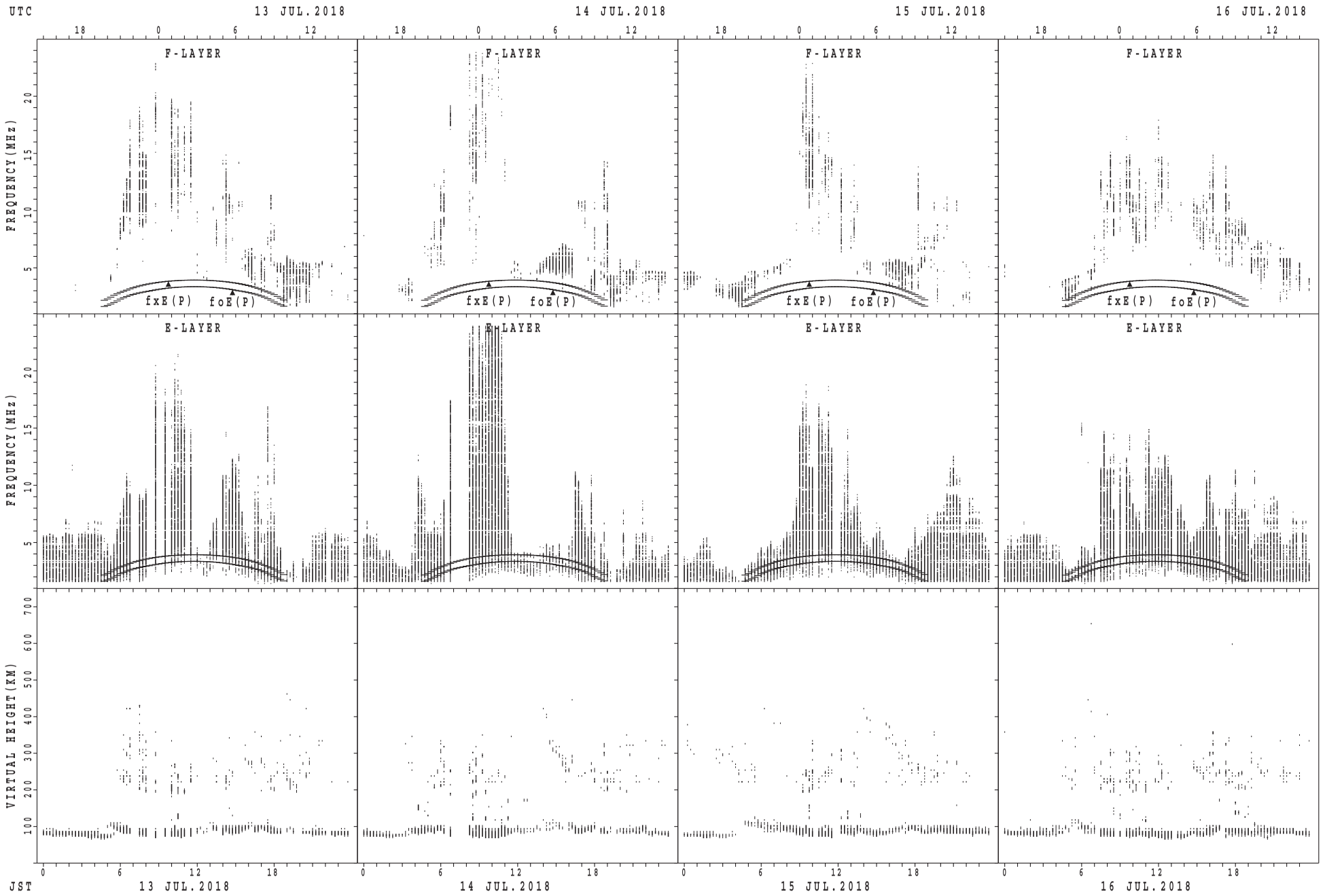
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



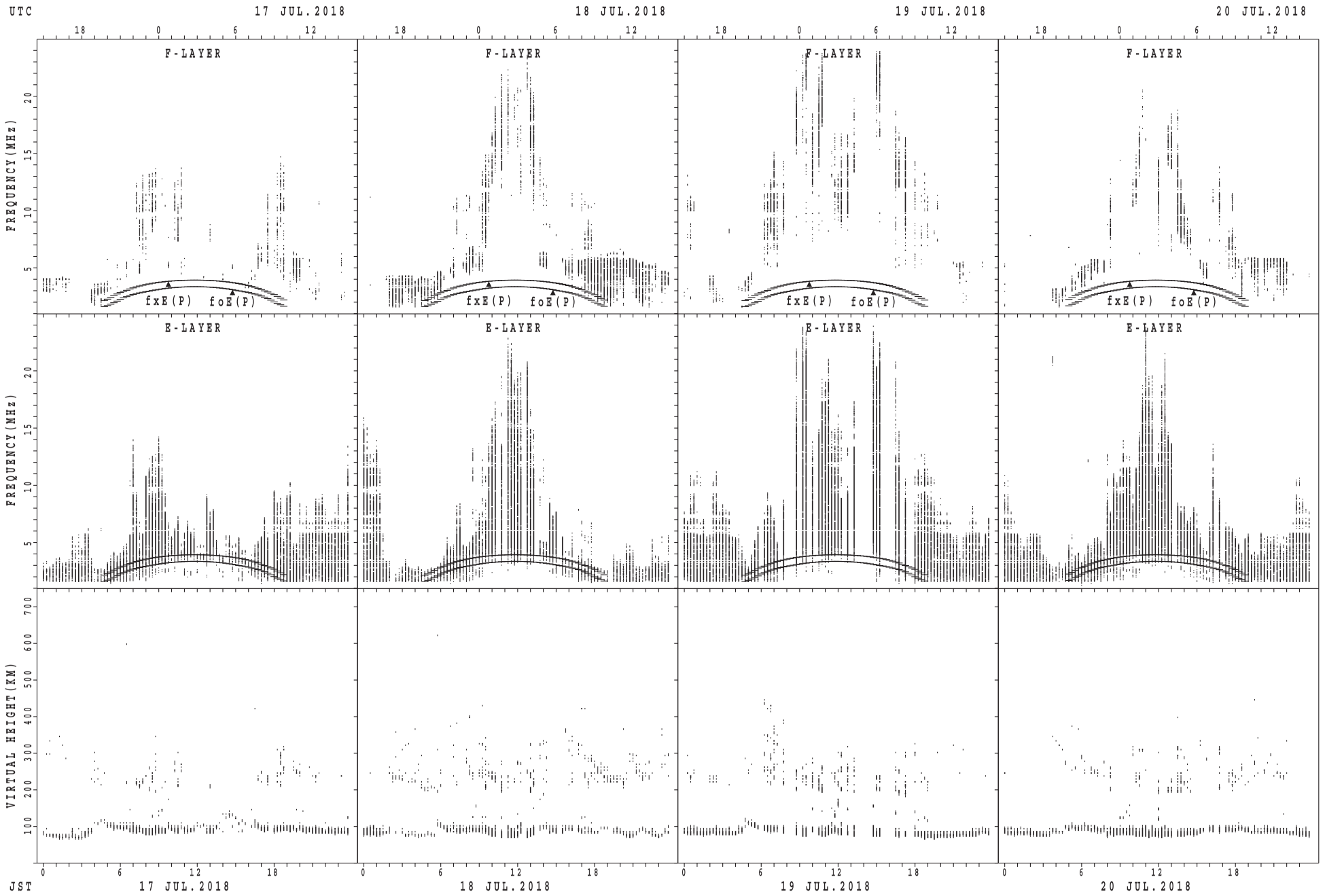
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



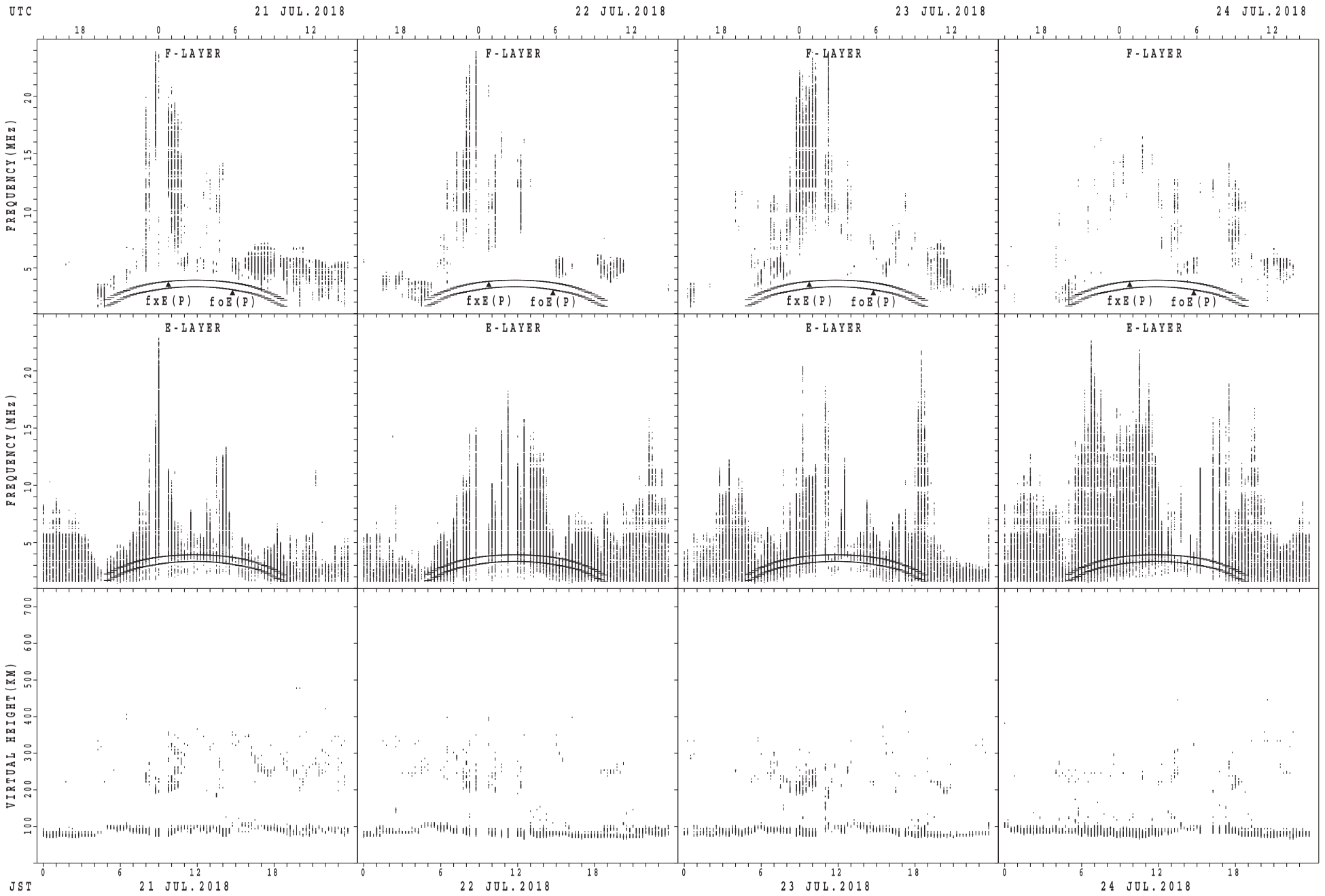
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



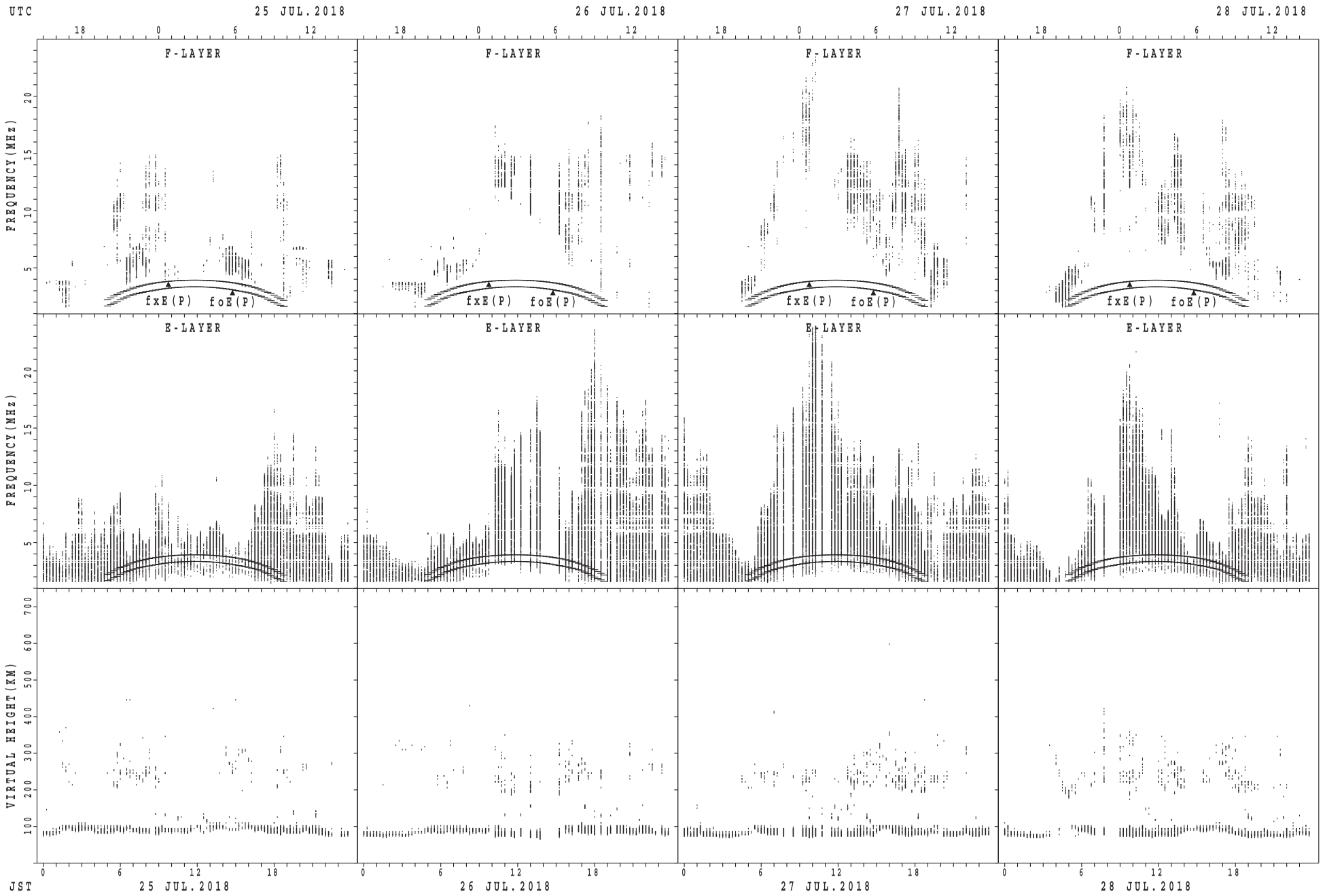
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



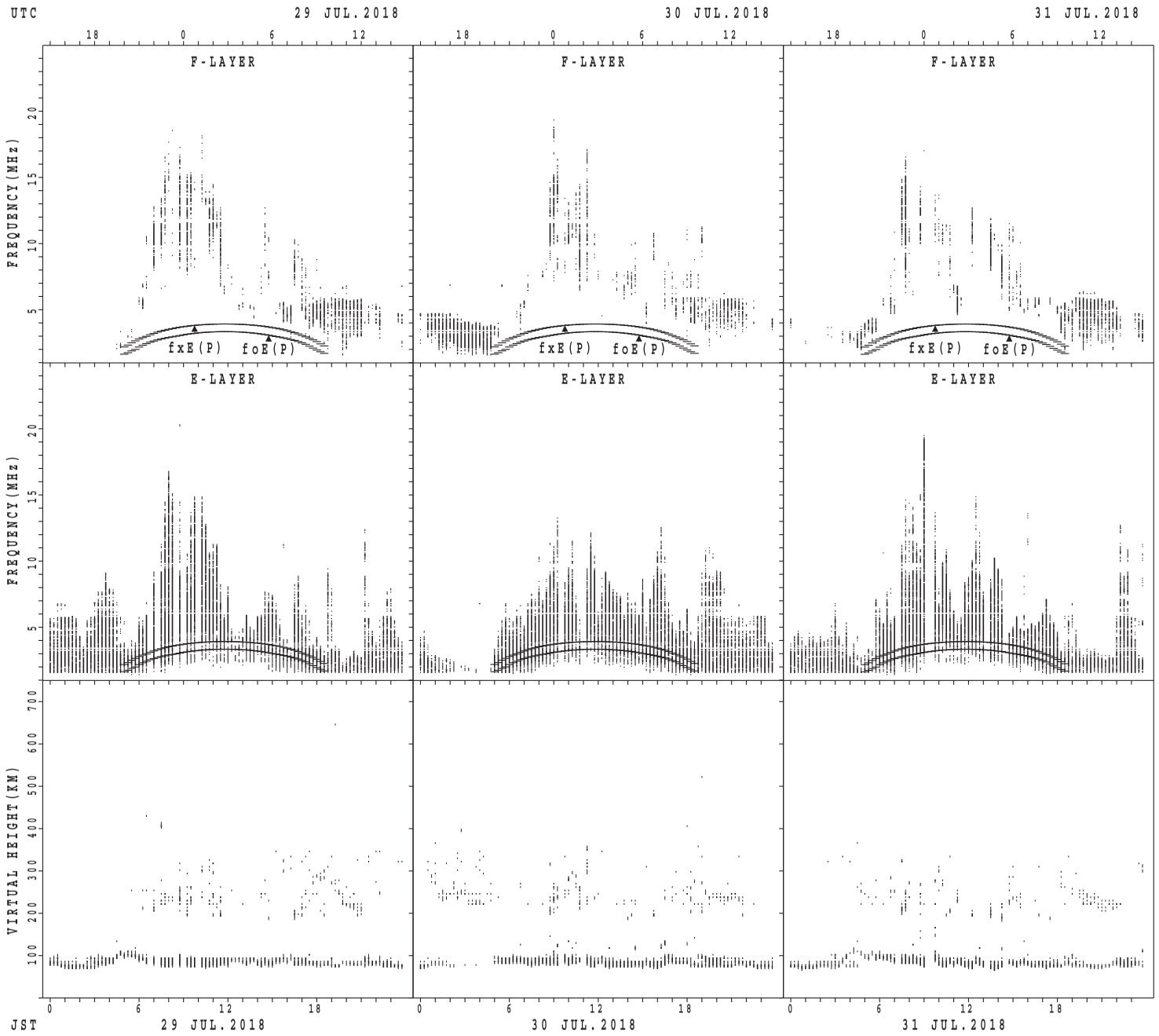
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



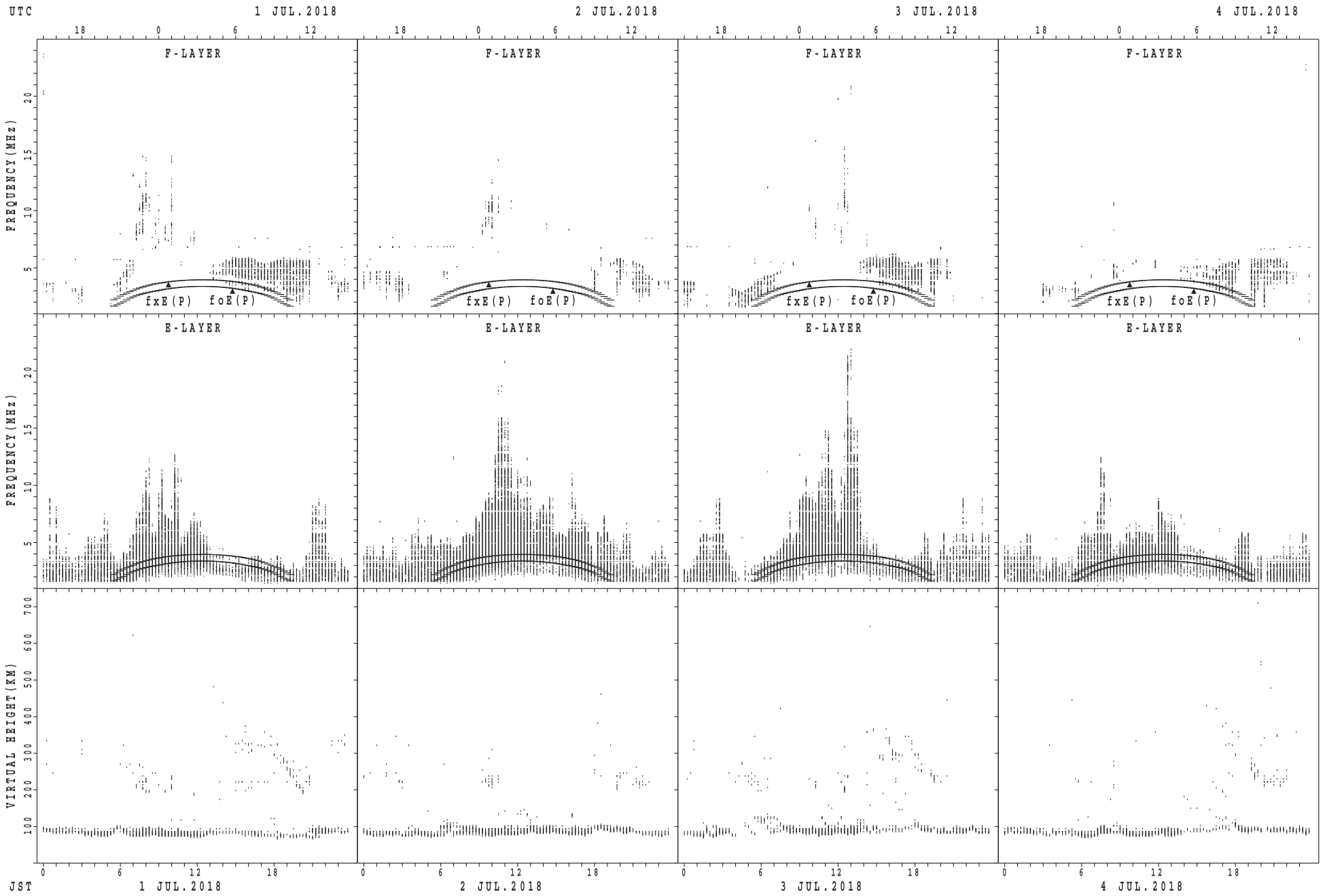
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



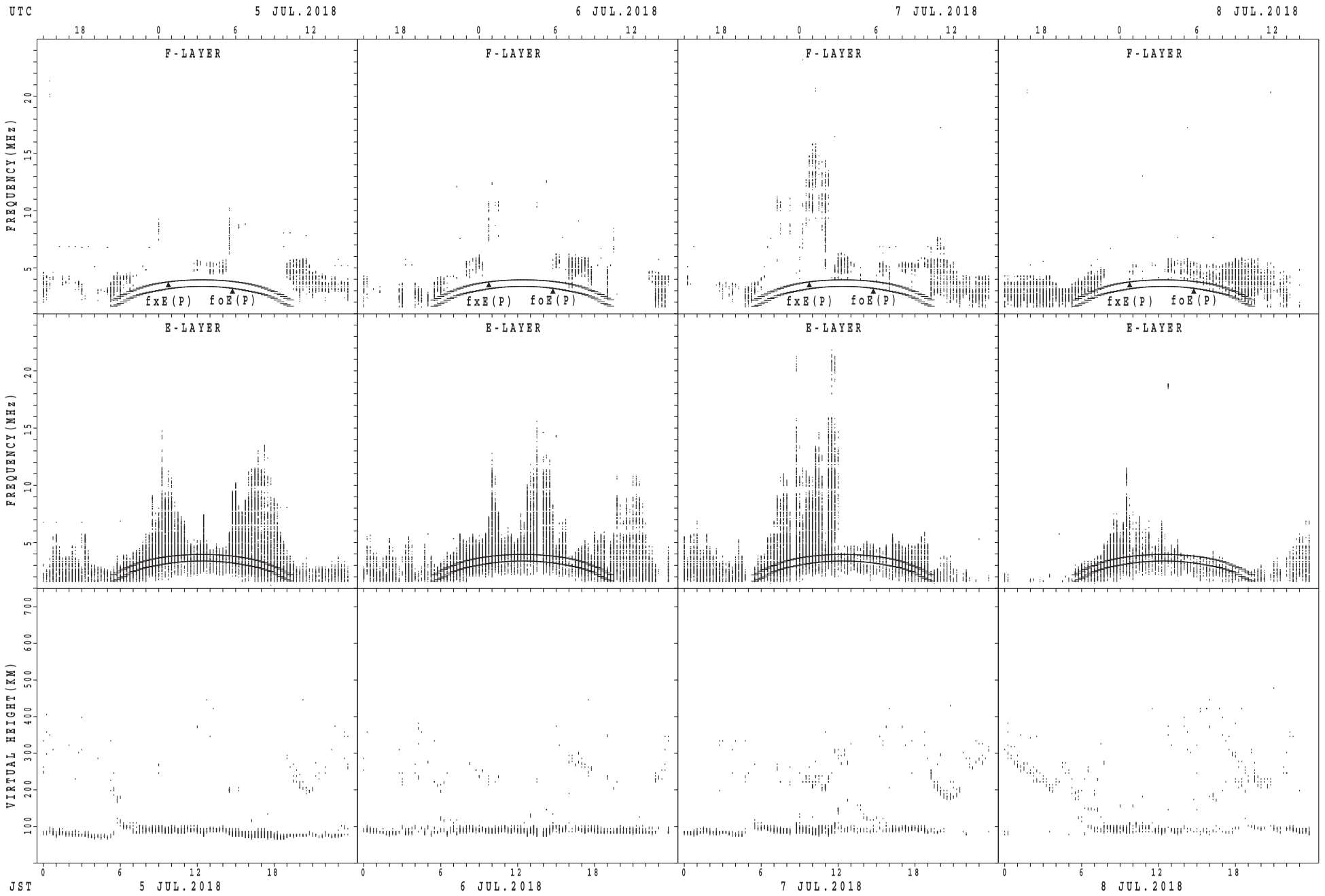
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



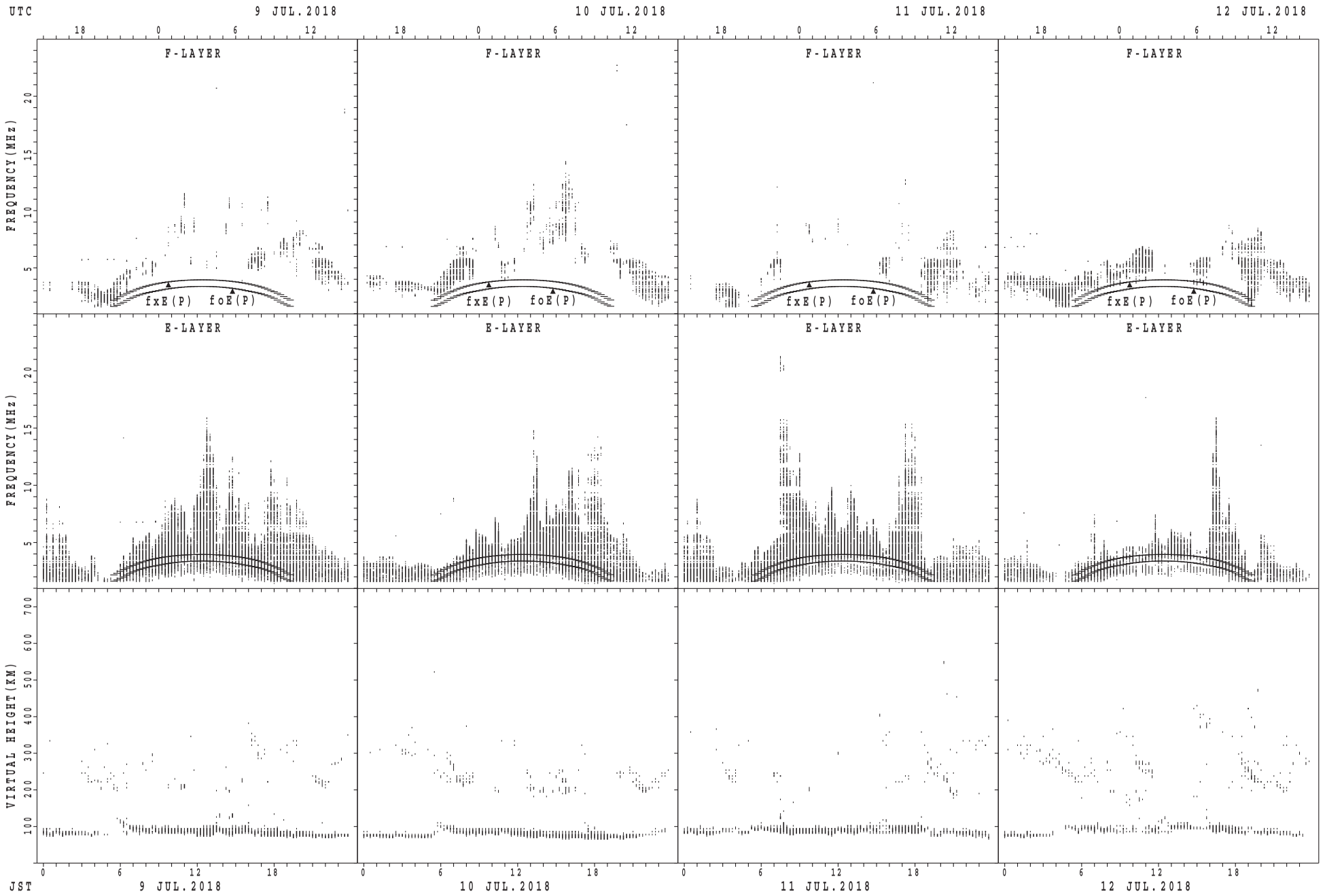
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



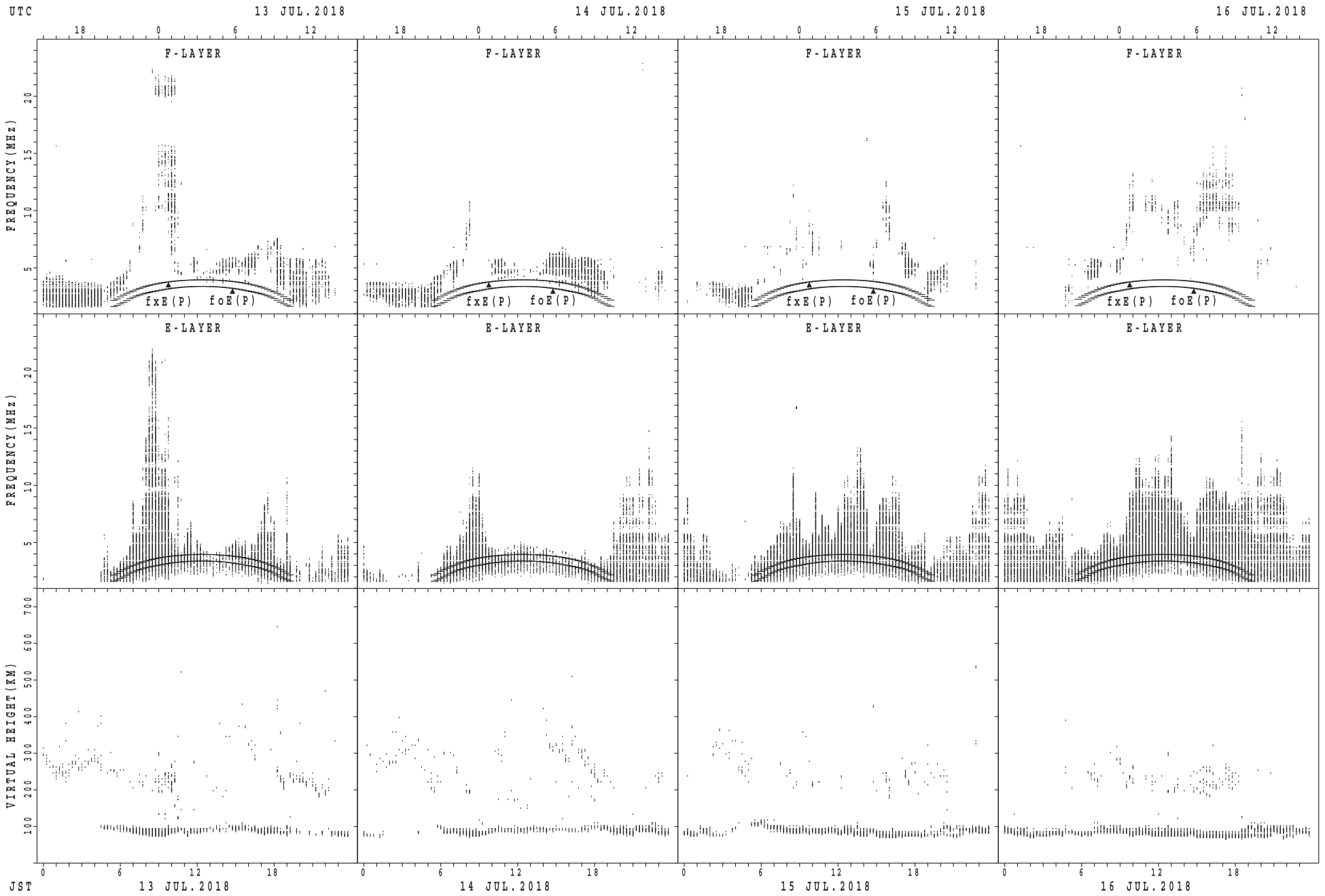
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



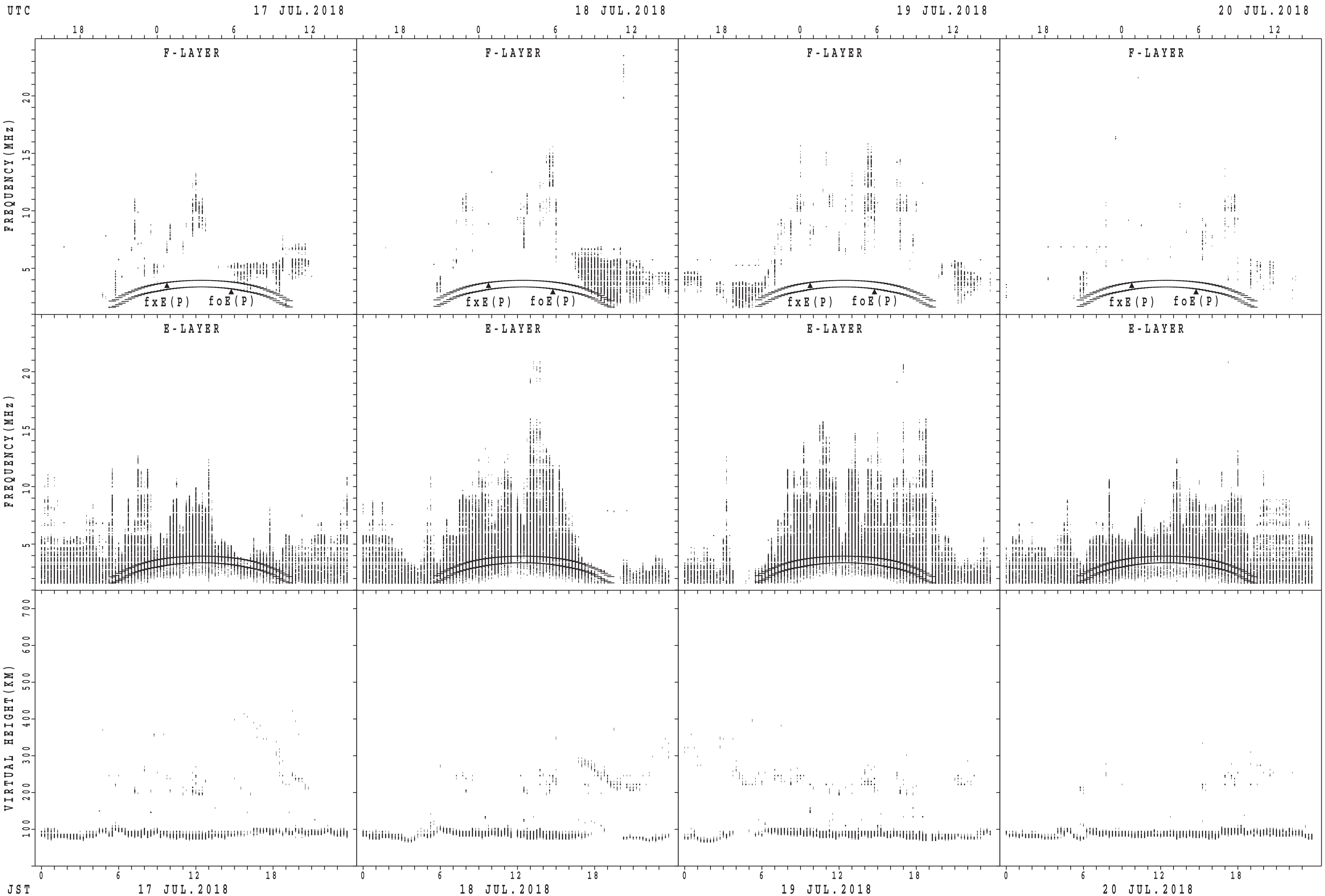
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



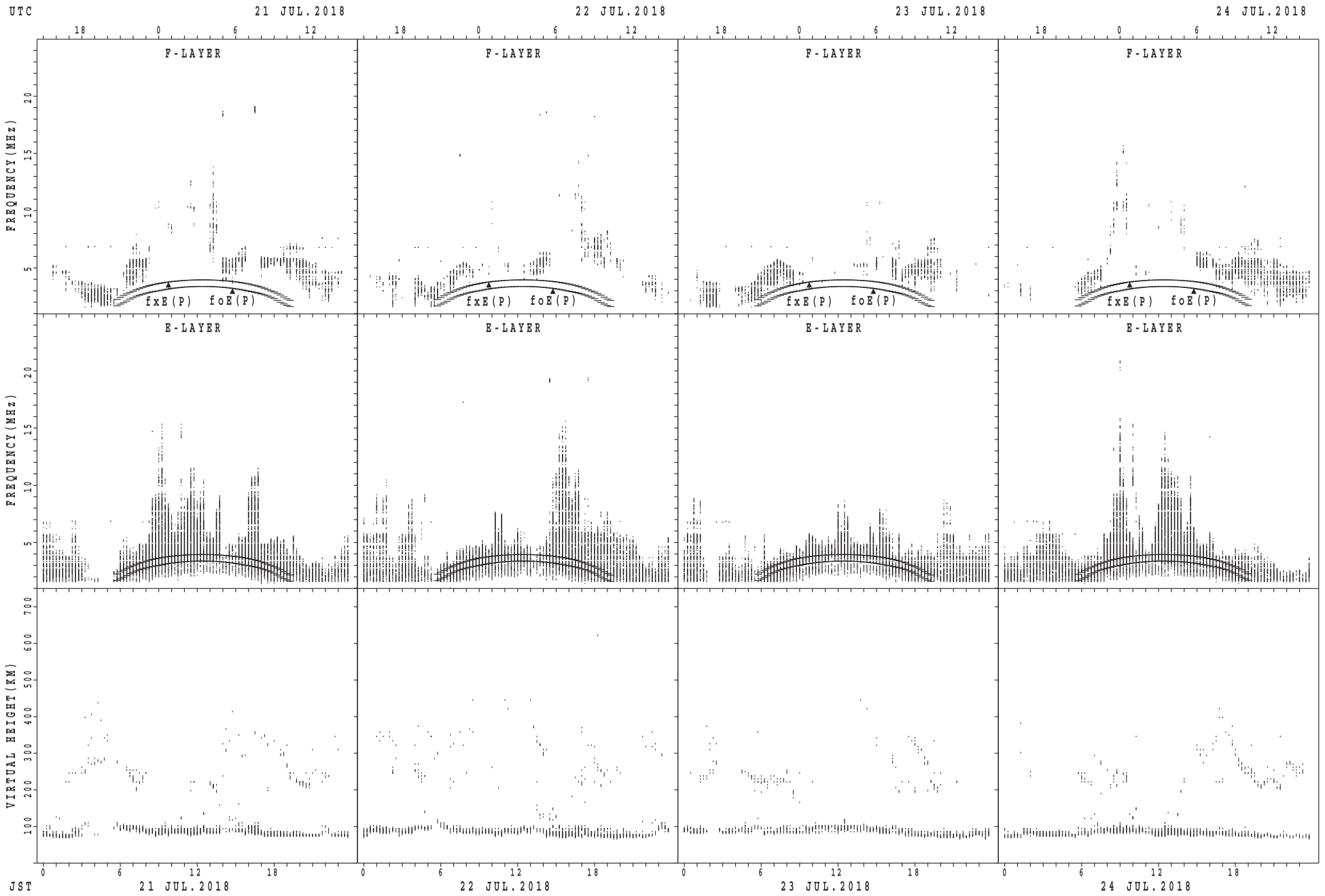
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



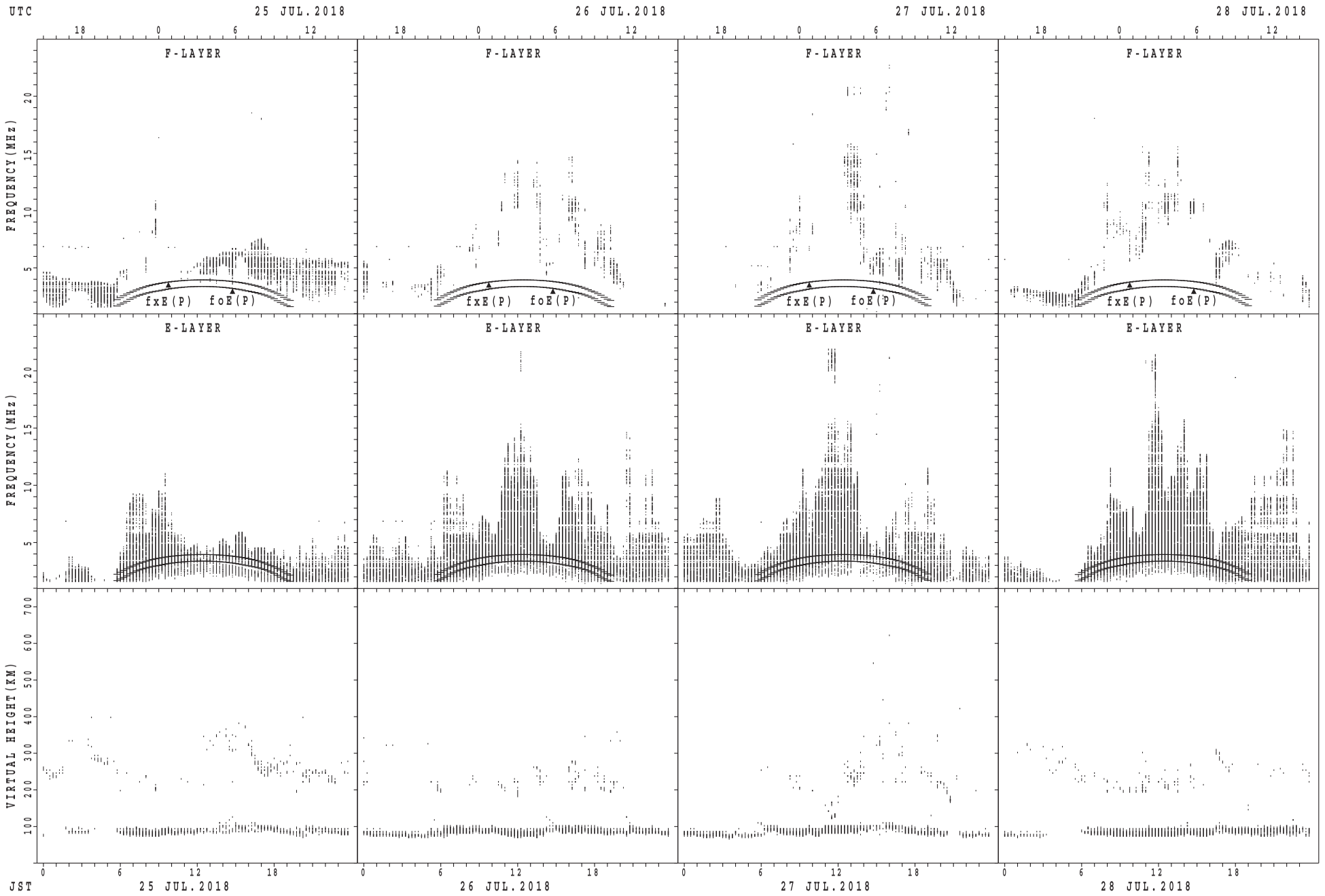
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



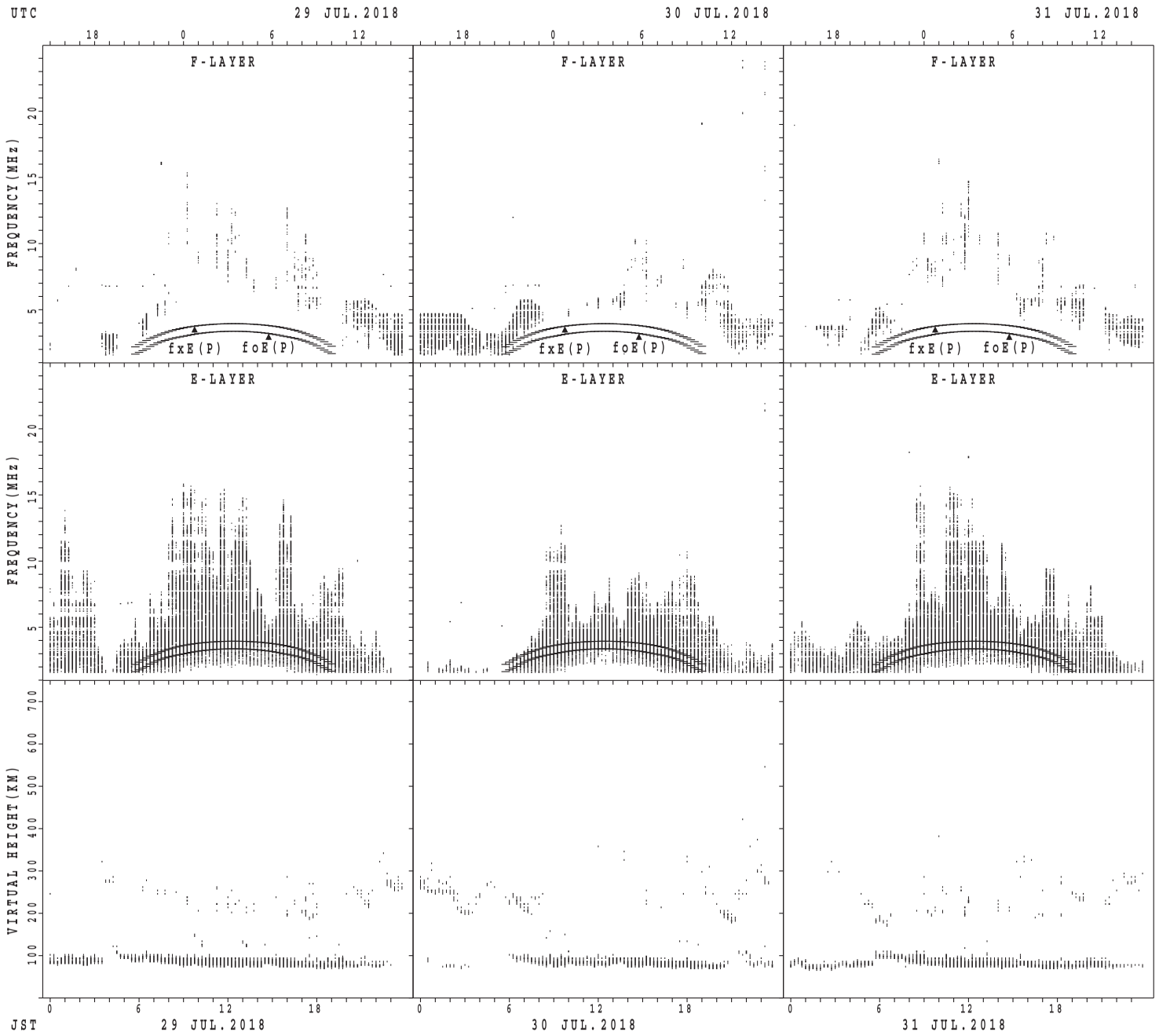
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



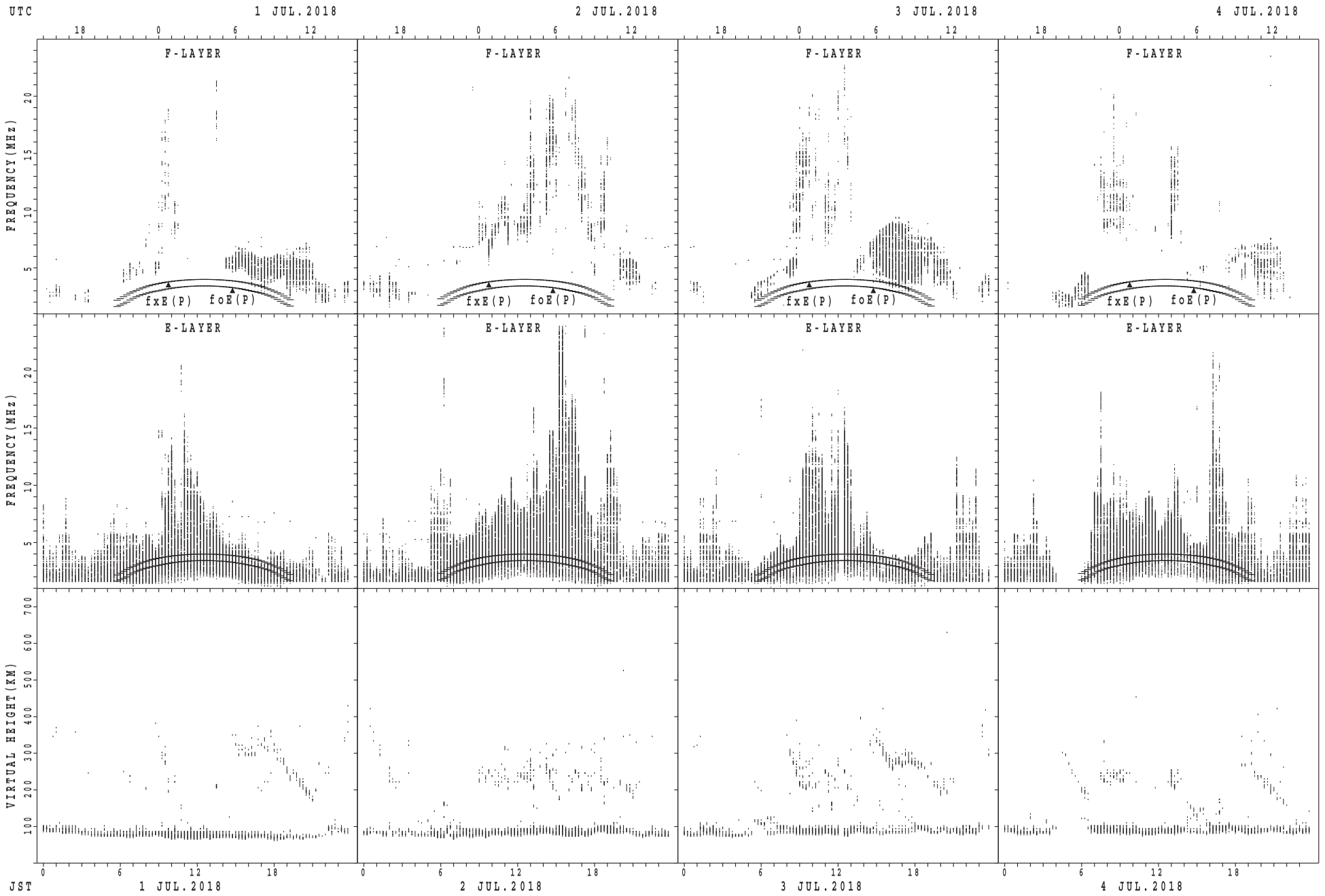
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



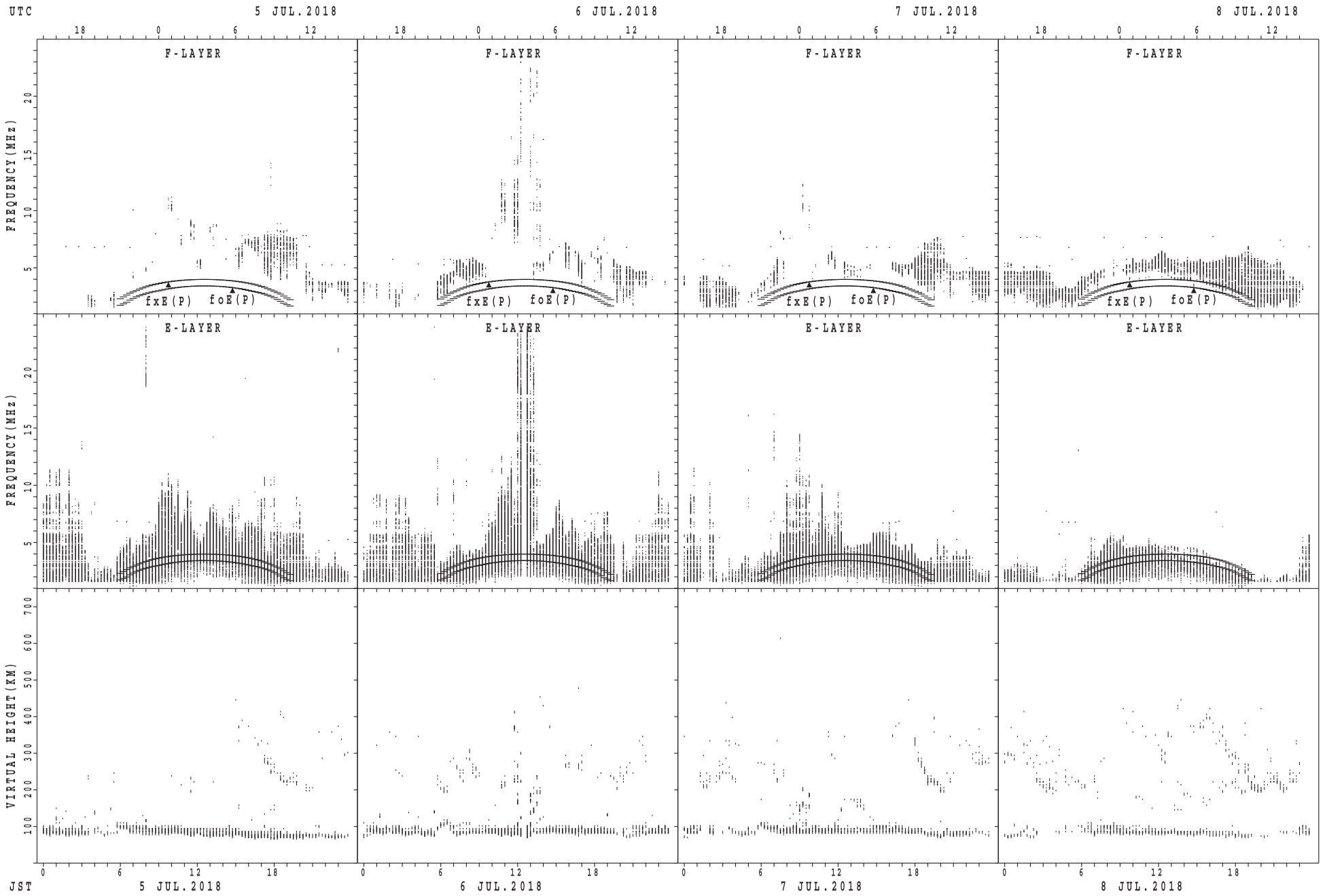
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



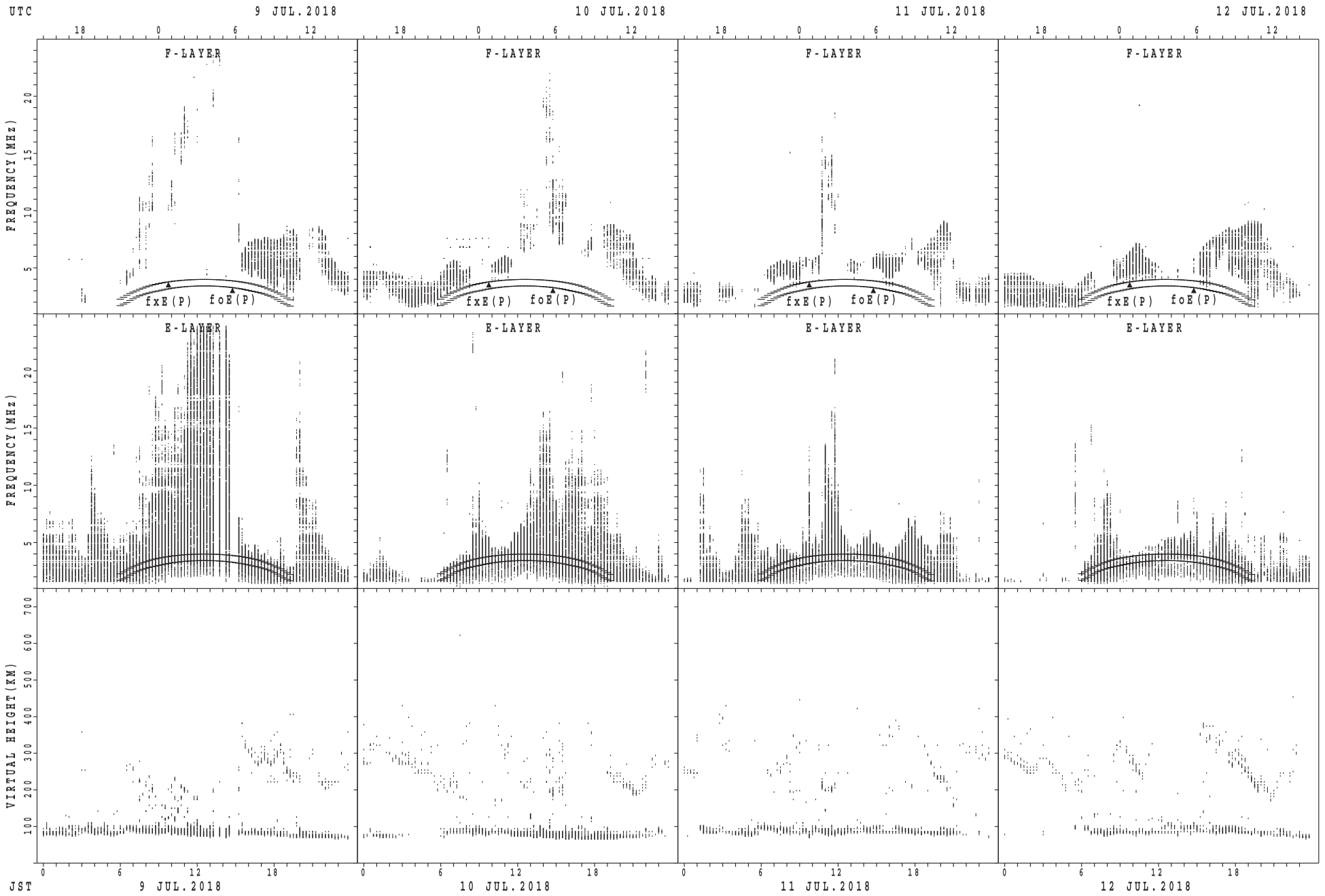
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



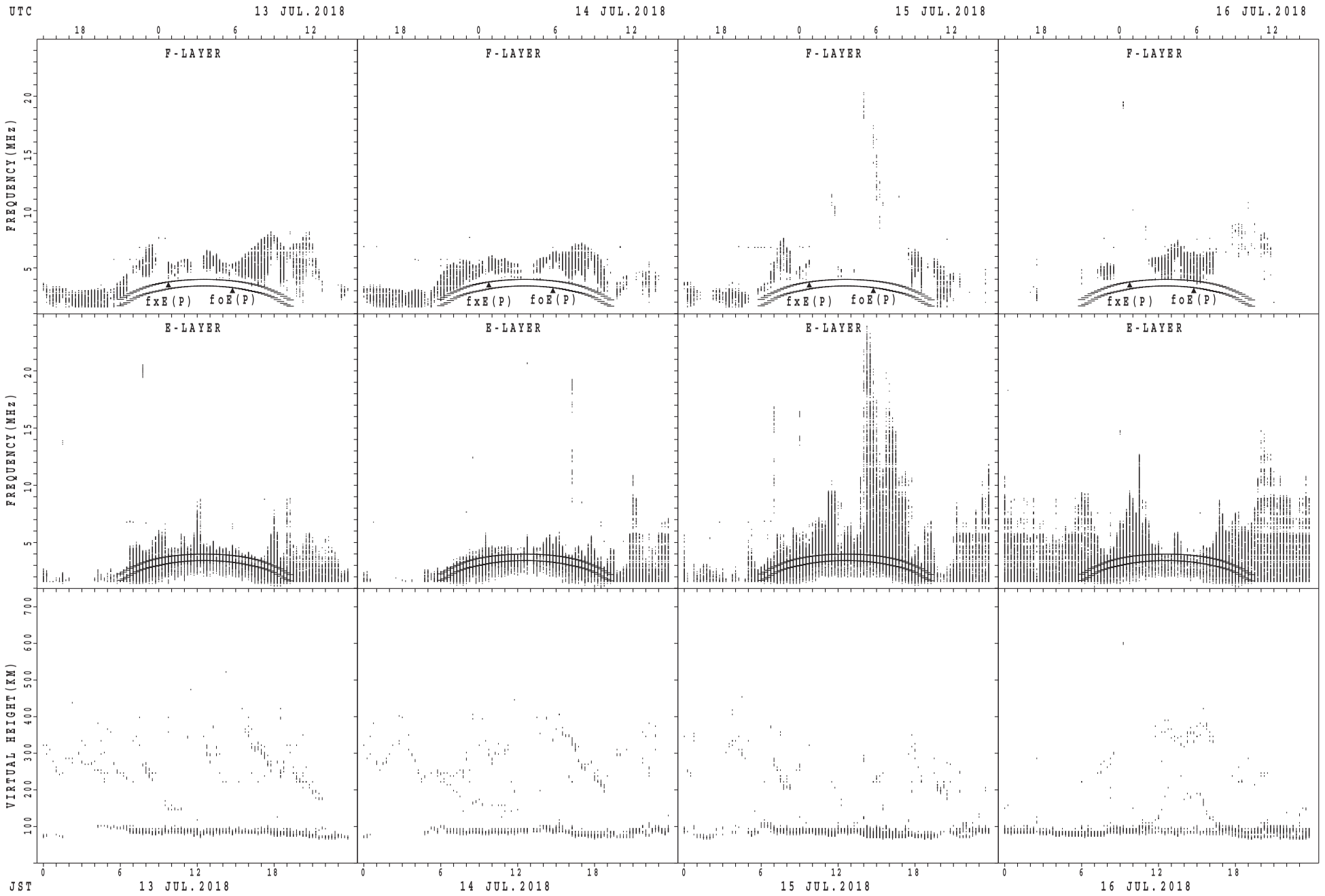
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



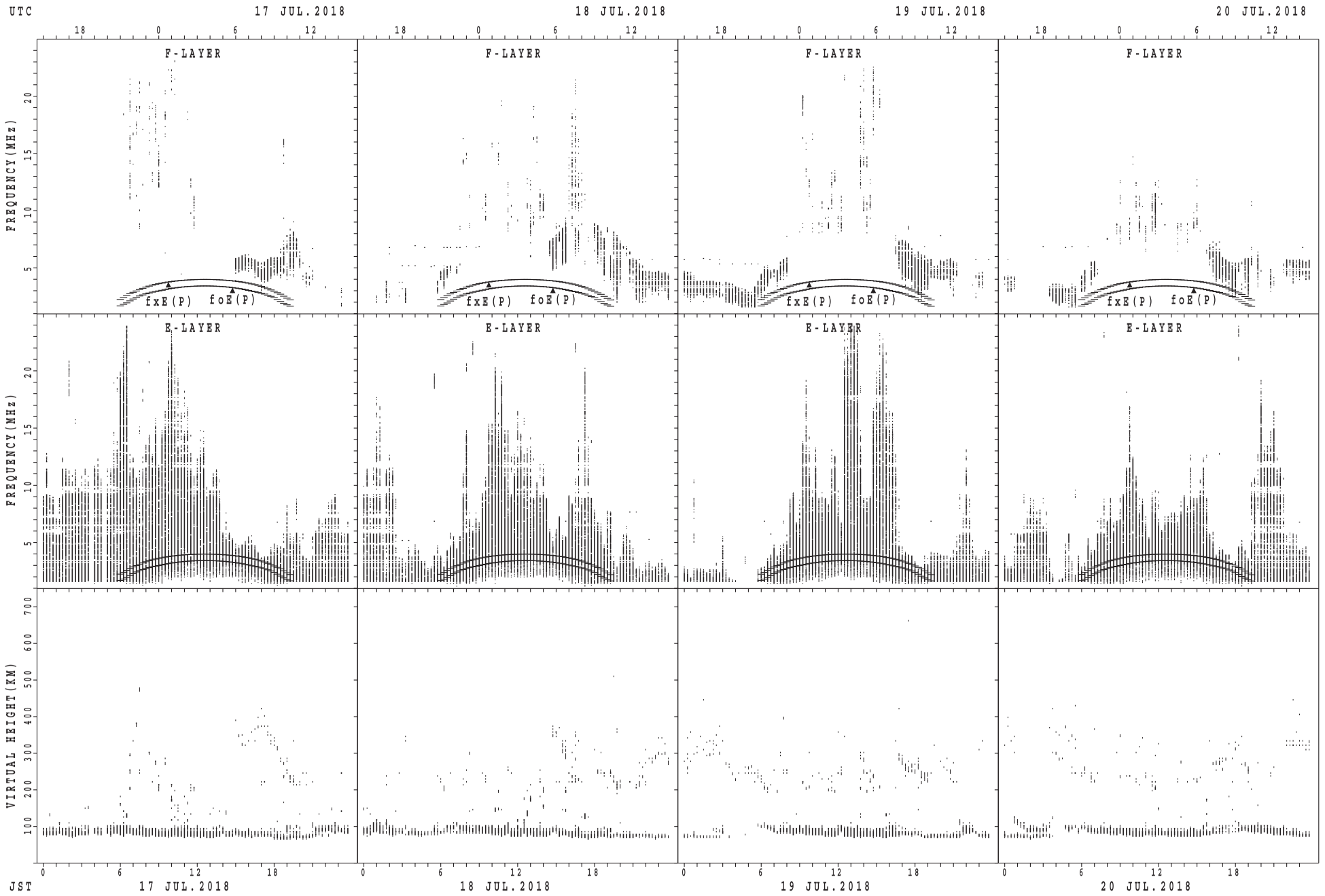
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



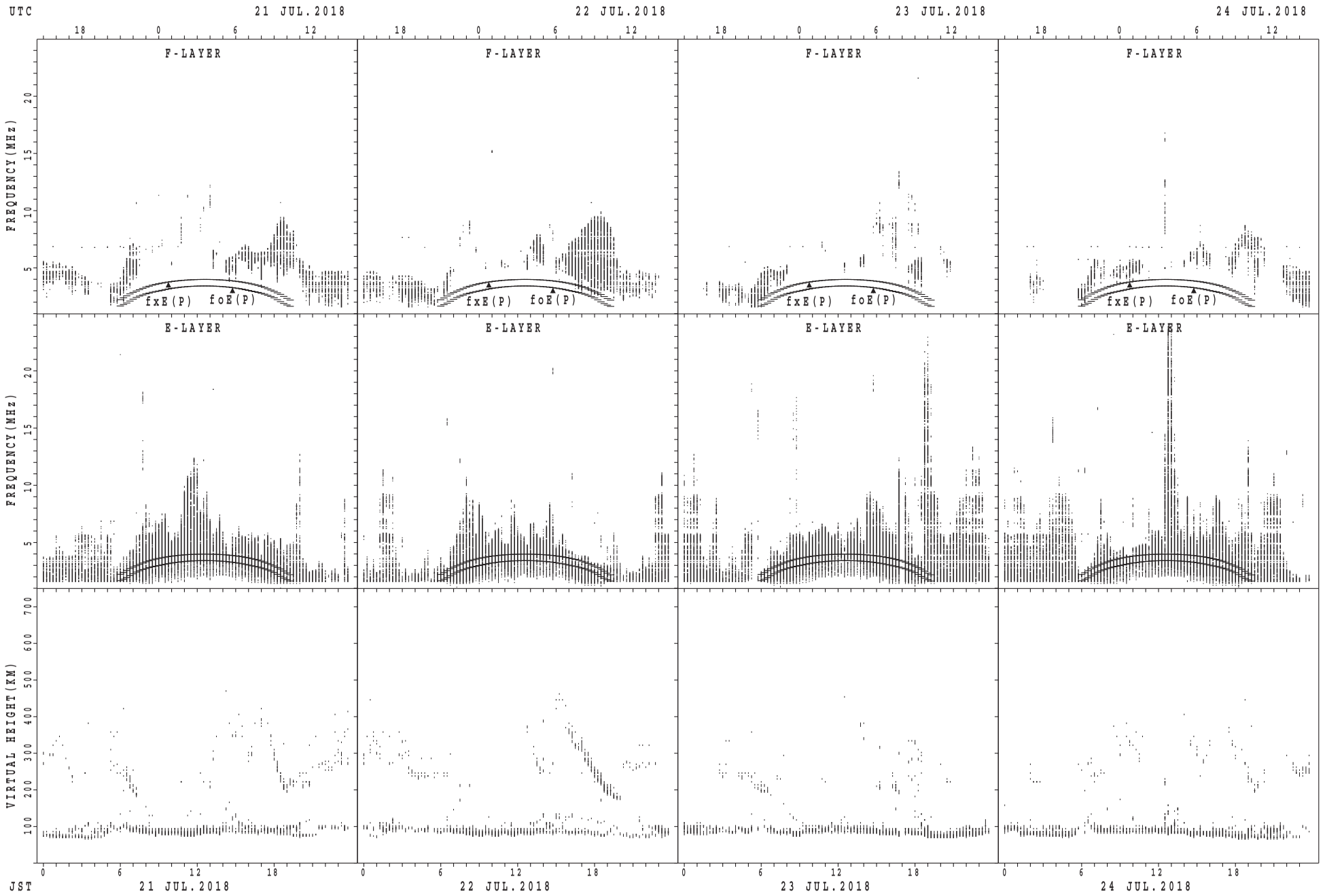
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



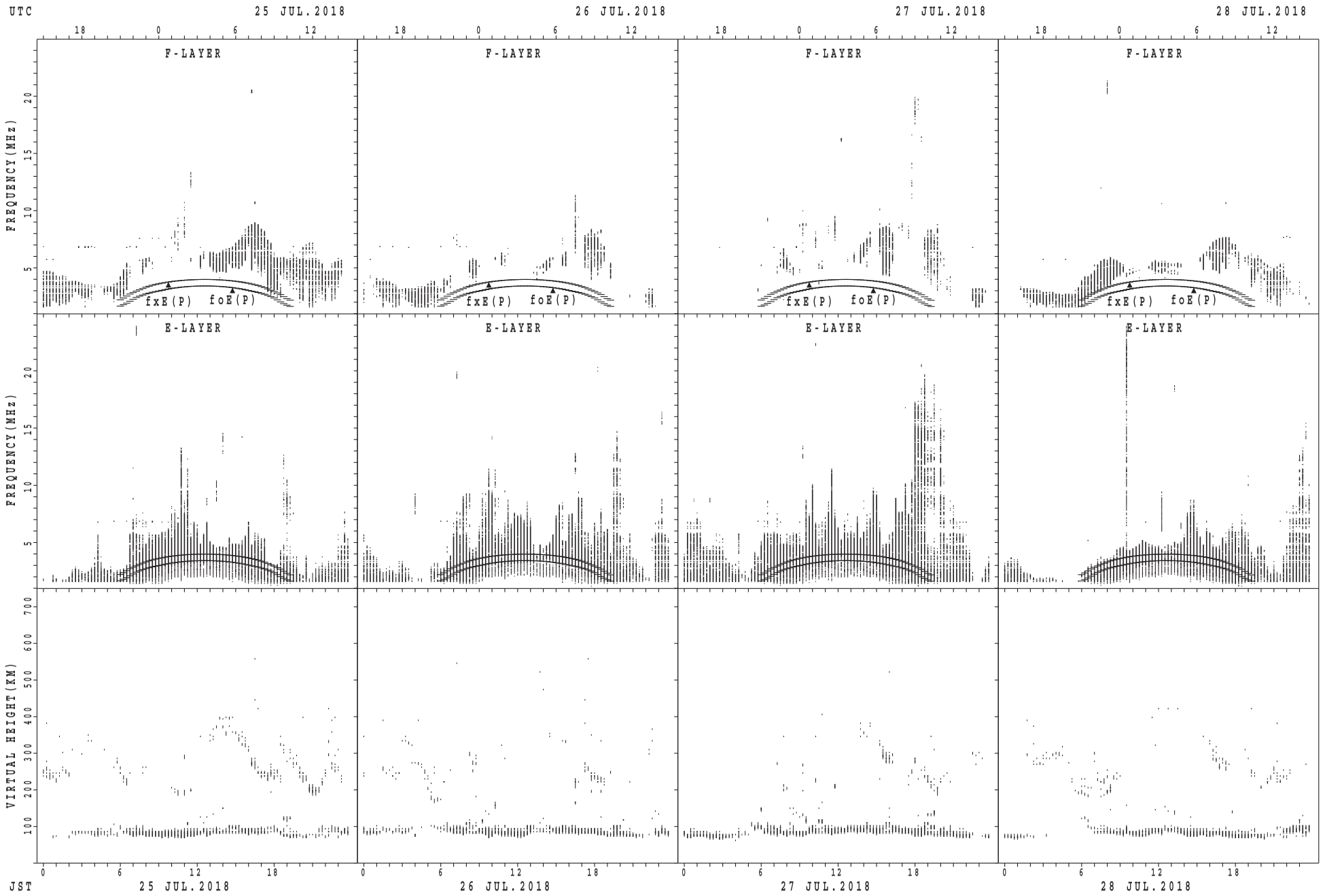
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



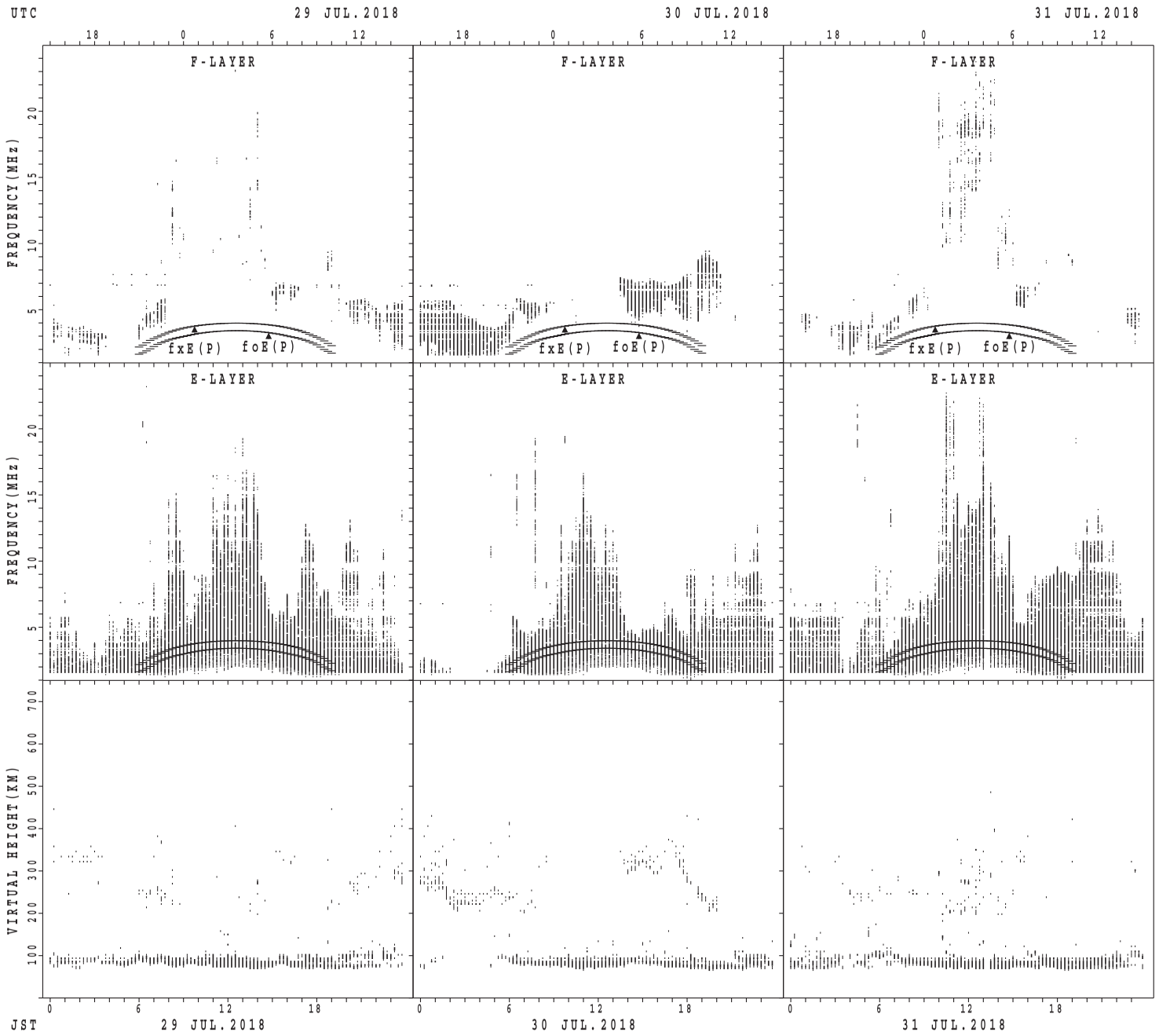
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

JUL.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		6	9	13	8	10	4	8	4	4	9	10	9	12	6	4	2	3	
MED					192		205	204	198	207	197	204	191	207	238	208	207	214	209	201	208	238	246	
U Q					96		220	229	211	266	206	211	219	215	245	218	216	240	269	206	215	270	278	
L Q					96		200	199	196	197	192	199	190	195	226	196	198	203	199	194	204	206	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	26	26	27	24	21	31	30	26	28	26	30	28	31	30	29	30	29	28	29	30	31	31	30	29
MED	88	83	81	81	85	101	94	90	90	89	88	90	95	90	95	96	89	95	95	89	97	91	91	89
U Q	91	89	87	86	92	119	103	95	95	95	95	104	121	99	119	113	103	107	107	97	107	97	97	99
L Q	81	81	79	79	82	95	89	89	87	83	81	82	81	83	84	83	87	89	88	87	89	89	89	82

h'F STATION Kokubunji LAT. 35°43.0'N LON. 139°29.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2		5	9	12	14	17	11	16	11	6	5	7	10	8	8	3	1	1	
MED					236		214	200	201	198	198	202	200	192	196	240	274	242	206	208	242	228	206	
U Q					256		265	244	231	218	206	230	209	216	202	301	296	272	221	239	252	114	103	
L Q					216		206	194	193	192	190	190	192	190	190	190	206	206	201	203	202	114	103	

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	31	30	30	29	26	29	30	28	26	22	27	26	29	29	27	28	29	25	30	30	29	31	30	29
MED	87	87	84	81	89	95	96	95	89	89	91	93	95	93	89	90	97	95	90	94	89	89	90	89
U Q	89	89	89	88	95	109	105	98	97	99	97	105	105	109	99	97	104	103	103	99	98	99	95	92
L Q	85	81	81	79	83	89	93	89	85	85	83	89	85	83	83	83	90	85	83	87	82	83	87	84

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		1						1	6	6	10	6	5	3	5	8	8	9	2	2	2			
MED		200						240	195	198	200	199	192	206	226	331	247	224	254	201	246			
U Q		100						120	202	240	208	202	241	222	285	339	322	281	290	208	258			
L Q		100						120	192	190	198	190	190	202	205	300	208	215	218	194	234			

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	29	26	27	26	20	22	31	31	31	31	31	31	31	31	31	31	31	31	31	28	31	29	30	28
MED	89	85	83	85	83	90	97	95	93	95	89	91	87	93	95	97	95	89	91	90	89	89	88	87
U Q	93	89	87	89	90	99	103	101	97	105	101	99	95	97	121	121	101	95	103	95	95	95	97	90
L Q	82	81	77	81	80	81	91	89	87	87	87	85	81	89	83	83	81	81	83	82	83	81	81	81

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

MONTHLY MEDIANS OF h'F AND h'Es

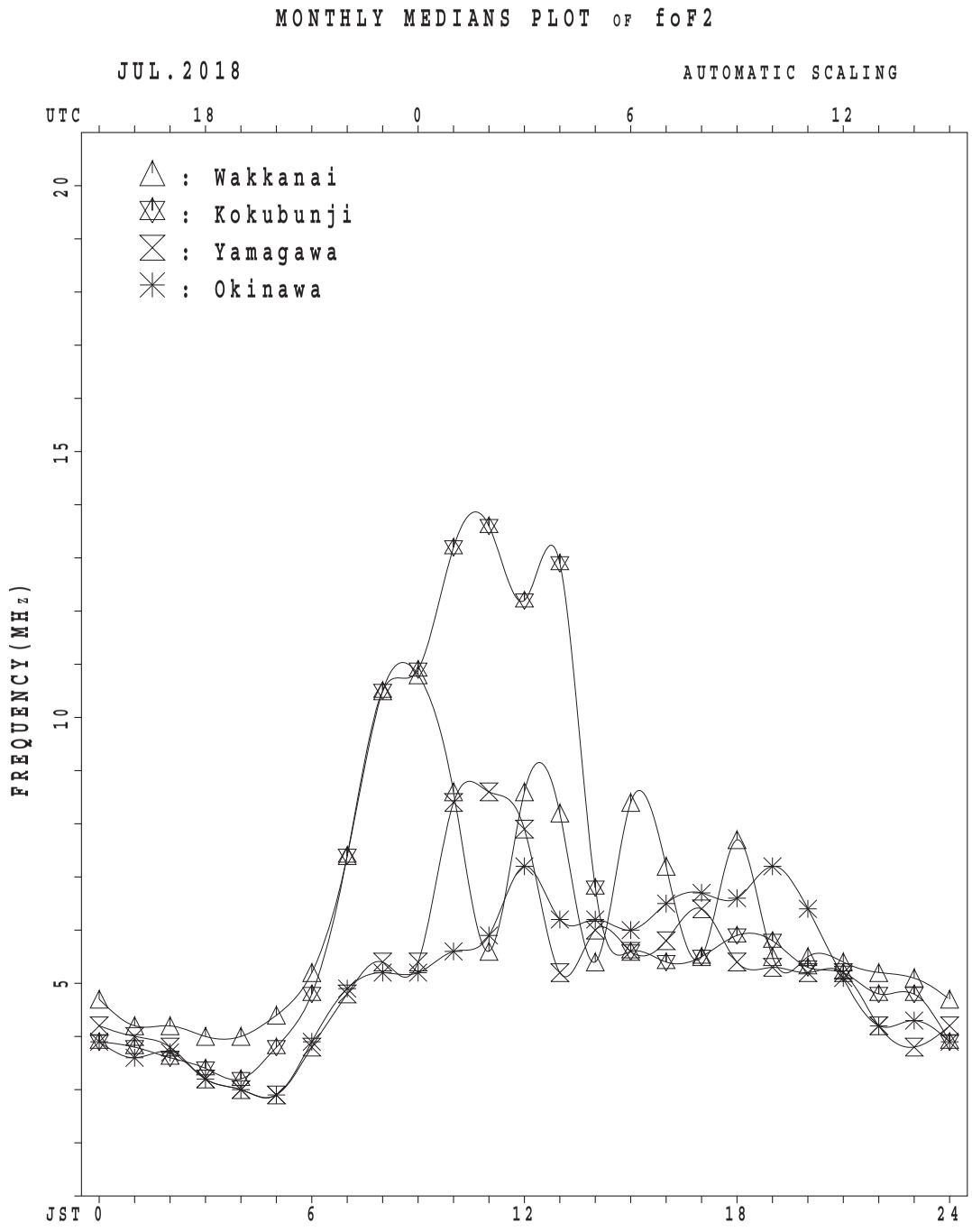
JUL.2018 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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								2	3	5	7	7	4	7	7	8	7	5	14	15	7	3	1	
MED								214	242	208	204	198	195	208	288	275	268	270	252	230	228	218	212	
U Q								224	278	214	288	206	202	296	344	344	298	306	300	248	240	218	106	
L Q								204	210	195	200	190	191	190	192	213	192	214	210	208	218	208	106	

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	26	26	26	22	22	29	31	31	31	31	31	31	30	30	30	31	30	31	30	29	30	29	29
MED	90	90	94	89	89	90	99	95	97	97	95	87	95	95	99	95	95	91	89	89	85	89	89	91
U Q	101	103	101	95	95	99	105	97	113	105	101	97	113	101	123	101	111	101	97	95	94	95	96	103
L Q	79	87	83	87	87	87	94	89	91	87	87	83	87	83	89	87	83	89	83	83	77	81	82	81


MONTHLY MEDIANS PLOT OF foF2
JUL.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

JUL. 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	A	X 45	47	50																		69	70	58
2	X 43	X 41	X 40																			X 57	X 56	58
3	47	X 45	X 41	45																		X 64	X 61	X 53
4	X 48	X 46	X 45																			X 55	X 53	X 50
5	X 56	X 54	X 48																			X 58	X 59	X 54
6	X 51	X 52	X 49																			X 62	X 60	58
7	X 57	X 52	X 55																			X 72	X 65	X 48
8	X 45	X 47	56	56	44																	X 64	X 58	A
9	A	A	X 47				53								63							X 62	A	X 55
10	X 57	56	56	60	52																	X 65	A	69
11	X 57	54	56	56	44																	X 61	A	68
12	X 59	X 50	X 43																			X 57	X 55	A
13	58	49	49	49																		X 61	X 61	X 60
14	X 58	A	A																			A	A	59
15	X 54	58	X 45		55																	A	A	A
16	54	57	58																			X 60	C	C
17	X 48	X 44	X 43																			X 54	X 52	X 51
18	48	53	52	49	48																	X 60	X 55	A
19	A	A	X 37	58																		A	A	X 59
20	X 46	A	X 43																			X 66	X 61	X 59
21	X 59	X 57	X 53		52																	X 60	X 61	X 55
22	X 53	A	X 59																			X 54	X 48	X 46
23	X 45	X 44	X 46	45	45																	X 56	X 51	X 43
24	X 40	X 40	X 41																			X 74	X 70	X 59
25	54	X 48	X 46																			X 62	A	A
26	A	A	A	53	47																	X 56	A	X 37
27	A	A	A	41																		X 57	46	A
28	X 44	X 46	47	47	51																	X 63	68	60
29	X 51	A	A	48	44																	X 67	66	X 58
30	X 59	X 59	X 57																			X 66	X 59	58
31	X 44	X 40	47	46	38																	A	X 60	X 58
	00	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	23	27	14	11		1								1							27	22	24
MED	X 52	X 49	X 47	49	47		53								63							X 61	X 60	X 58
U Q	X 57	54	55	56	52																	X 65	61	X 59
L Q	X 46	X 45	X 43	46	44																	X 57	X 55	X 52

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	A		F	F					A							R		A	A	A		F	F	F
		38	33	36	36	42	47	48		48	50	51	48	47	48	47	44				62	58	58	48
2			F	F			E G	E G	A	A							E G							F
	36	34	31	30	36	44	37	46			50	54	51	50	45	46	39	42	41	41	47	50	49	46
3	F			F			A	A	A	A						E G	E G							
	38	38	34	32	36	38					58	54	50	48	48	40	39	45	48	47	54	57	54	46
4													E G					A	J R					
	41	39	38	38	40	41	45	44	48	46	49	49	43	47	52	54	47		40	40	46	48	46	43
5								A	A			A	A	A										
	49	47	41	40	40	39	43			48	47				50	53	55	44	43	48	53	51	52	47
6								A	A	A	A	A	A	A	E G	A		A		A				F
	44	45	42	41	31	41	44								40		44		44		56	55	53	46
7				F					A	A	A	E G			A	A	A							
	50	45	48	48	48	48	54	58				45	48	42				46	50	59	59	65	58	41
8			F	F	F		A	A	A	A	A		A	A	A					A	A			A
	38	41	43	40	32	38						50				53	48	45	46			57	51	
9	A	A					F	A	A	A		E G			F	E G							A	
			40	38	38	38	103				52	44	45	43	49	48	46	43	48	52	55	56		48
10		F	F	F	F			A	A		A	A	A	A	A								A	F
	50	41	37	43	34	43	47			63						49	50	51	52	58	50	58		54
11		F	F	F	F		A	A	A	A	A	E G	E G					A	A	A			A	F
	50	30	38	38	33	37						43	43	46	49	45					53	54		57
12							A	A	A	A		E G		E G	A	A		A	A	A	A			A
	52	43	36	35	33	38					49	43	48	43			46					50	48	
13	F	F	F	F			A	A	A				A	A			A							
	35	36	38	32	35	39				49	51	47			47	50		42	44	46	54	54	54	53
14		A	A			A	A	A		A	A		A	A	A	A						A	A	F
	51			36	33				51			47					50	48	40	40	52			46
15		F			F		A	A	A	A		A	A	A	A		A	A	A		A	A	A	A
	47	46	38	32	36	38					48					46				47				
16	F	F	F						A		A	A		E G				A					C	C
	38	44	47	52	50	43	43	48		49			48	42	46	48	45		43	53	60	53		
17								A					A	A	A			A						
	41	37	36	32	32	35	39		45	47	49	50				41	44		50	52	48	47	46	44
18	F	F	F	F	F			E G	A	A								A	A					A
	37	37	36	34	34	46	43	41			54	50	47	51	46	50	48			48	55	53	48	
19	A	A		F			A	A	A		A						A					A	A	
			30	40	37	38				51		49	53	48	47	46		46	44	46	55			52
20		A						A	A	A	A	A	A											
	39		36	34	34	42	44							49	42	46	45	44	51	53	58	59	54	52
21					F		A	A	A	A			A				A							
	52	50	46	41	39	39					56	52		48	49	49		54	56	59	51	53	54	48
22	J R	A		A		A	A	A	A	A	A	A		A			44	47	47	42	48	47	41	39
	46		52		32								42		39	42								
23				F	F		A	A	A			A	A	A	A	A	A							
	38	36	39	31	32	39				48	42							44	51	52	60	49	44	36
24					V				A			E G	E G		A	A	A		A	A				
	33	33	34	32	36	44	44	44		44	47	42	42	48				50			64	67	63	52
25	F				A				A	A		A		A	C								A	A
	42	41	39	39		36	43	46			44		46			46	52	45	46	55	57	55		
26	A	A	A	F	F	A		A	R	A	A	A		A	A	A	A						A	
				37	32		48		55				48					44	42	47	54	49		30
27	A	A	A	F			A	A	A	A	A			A	A	A	A	A						A
				31	32	42						47	47					47	A	50	54	50	46	
28			F	F	F			A	A	A	A	A	A	A	A	A	A	A					F	F
	37	39	35	33	37	38	42											46	A	58	66	56	48	44
29		A	A	F	F	A	A	A		A	A												F	
	44			25	26				48			49	45	42	48	49	46	47	48	57	66	60	52	51
30												E G												F
	52	52	50	49	43	43	42	48	45	50	48	42	46	46	46	44	56	45	47	52	58	59	52	48
31			F	F	F		A	A			A					A				A		A		
	37	33	33	32	30	38			44	44		50	62	48	46		42	42	41		58		53	51
	00	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	23	27	30	30	27	17	9	7	12	16	20	19	17	18	21	20	22	23	24	28	27	22	24
MED	42	39	38	F 36	34	39	44	46	48	48	49	49	47	47	47	46	46	45	46	51	55	54	52	48
U Q	50	45	42	40	37	43	47	48	51	50	52	50	48	48	49	50	49	47	50	54	58	58	54	52
L Q	38	36	F 35	F 32	32	38	42	44	45	46	48	E G 44	E G 45	43	46	46	44	44	43	46	52	50	48	44

JUL. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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					L	L	L	L	A	A	L	A	L	L	L	L	372	A	A	A				
2						L	368	460	A	A	A	R 436	L	L	L	L	L	368	L	A				
3						L	A	A	A	A	L	L	L	428	L	L	L	L	A					
4					L	332	L	L	A	L	A	L	L	L	L	L	396	A	L					
5						L	A	A	A	L	A	A	A	A	L	L	L	372	L					
6					216	L	L	A	A	A	A	A	A	A	L	A	L	A	L	A				
7						324	364	L	A	A	A	L	L	436	A	A	A	L	L	L	L			
8					L	L	A	A	A	A	A	A	A	A	A	L	L	L	L	A	A			
9				372		L		A	A	A	A	L	L	L	A 608	476	L	L	332	L	L			
10						L	L	A	A	L	A	A	A	A	A	L	L	376	A	L				
11						A	A	A	A	A	A	L	L	L	L	L	A	A	A	A				
12						L	A	A	A	A	A	L	L	L	A	A	L	A	A	A	A			
13					A	332	A	A	A	L	A	A	A	A	L	L	A	A	L		A			
14						A	A	A	A	A	A	L	A	A	A	A	A	A						
15				324		300	A	A	A	A	A	A	A	A	A	A	A	A	A		A			
16						340	A	A	A	L	A	A	A	L	L	356	L	A	A					
17							L	A	404	L	A	L	A	A	A	408	A	A	A					
18							L	L	A	A	A	A	L	A	416	A	A	A	A	A				
19							A	A	A	A	A	L	L	L	420	L	A	A	A					
20					L	L	A	A	A	A	A	A	A	A	L	L	396	A	L					
21							A	A	A	A	L	A	A	A	L	L	A	A	L					
22				A		A	A	A	A	A	A	A		A	A	392	L	364	L	L				
23						L	A	A	A	L	A	A	A	A	A	A	A	A	L	A				
24						L	L	L	A	L	A	420	420	A	A	A	A	A	A	A				
25					A	L	A	A	A	A	A	A	A	A	C	L	L	L	344					
26						A	A	A	A	A	A	A	L	A	A	A	A	L						
27					L	L	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
28						292	L	A	A	A	A	A	A	A	A	A	A	L	A	L	L			
29						A	A	A	A	A	A	L	L	L	L	L	L	A	A					
30						296	L	L	A	L	420	416	416	L	L	L	L	364	L					
31							A	A	A	A	A	L	A	L	L	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				2	1	7	2	1	1		1	3	2	2	3	4	3	5	2					
MED				348	216	324	366	460	404		420	420	418	432	420	400	396	368	338					
U Q						332						R 436			A 608	442	396	374						
L Q						296						416			416	374	372	364						

JUL. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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				B	A	220	248	272	288	308	308	332	320	284	A	A	288	260	216	A	0 122			
2				B	A	184	252	280	280	312	316	320	A	A	300	284	A	A	A	A	A			
3				B	B	220	256	280	300	312	320	304	A	A	320	308	292	260	220	A	A			
4				B	B	212	260	284	304	308	324	324	304	324	316	A	A	A	A	A	B			
5				A	B	192	260	272	312	328	328	332	332	332	A	A	288	256	A	A	A			
6				B	B	216	252	284	296	316	316	316	316	300	284	A	A	A	260	A	B			
7				B	B	220	248	280	292	312	316	A 616	A	328	328	324	284	256	204	A	A			
8				B	B	200	260	280	304	316	316	328	328	304	264	240	A	A	A	A	A			
9				B	264	A	236	276	296	308	324	332	328	328	296	A	288	268	A	A	A			
10				B	B	188	244	280	296	308	320	320	332	320	288	256	288	260	220	220	B			
11				B	A	188	244	280	312	320	320	320	320	284	352	340	324	A	A	A	B			
12				B	A	204	248	264	296	296	304	304	256	320	320	276	300	252	208	A	B			
13				B	188	204	228	272	304	304	312	312	308	308	276	A	284	260	208	A	B			
14				B	A	208	240	268	284	316	A	A	A	A	A	A	292	260	212	A	A			
15				B	A	192	240	276	288	312	312	312	312	A	A	A	A	296	208	A	B			
16				B	A	184	244	276	288	288	304	300	268	336	320	308	280	244	192	A	B			
17				B	B	196	248	272	304	292	312	328	300	A	300	316	280	244	212	A	B			
18				B	A	204	232	280	300	320	320	316	316	284	308	A	280	A	196	A	B			
19				B	A	196	240	276	304	304	332	316	316	296	248	256	252	236	A	A	B			
20				B	A	216	244	272	296	312	324	300	A	280	A	296	308	260	212	A	A			
21				B	A	208	236	280	304	320	308	308	272	336	308	308	276	248	A	A	B			
22				B	A	188	236	272	288	300	316	316	316	320	276	A	A	A	A	A	A			
23				B	228	A	216	268	288	308	308	236	252	A	A	304	272	228	A	A	B			
24				B	A	A	224	240	268	268	268	268	268	340	320	300	284	248	A	A	A			
25				B	A	A	216	260	280	280	320	320	336	320	268	296	276	248	A	A	A			
26				B	A	A	224	256	280	300	300	300	A	A	A	A	A	248	204	A	A			
27				B	A	A	240	256	288	296	312	312	A	260	A	A	A	A	A	A 604	A			
28				B	A	A	252	292	292	308	320	312	308	276	A	A	A	252	200	A	256			
29				B	A	A	232	268	288	296	320	284	292	328	284	A	240	252	A	A	A			
30				B	B	172	232	260	284	304	A	268	320	320	348	A	308	240	196	A	A			
31				A	A	A	232	256	284	296	A	296	296	A	A	A	A	A	A	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	22	31	31	31	31	28	30	24	23	21	15	21	22	16	2	2			
MED					228	202	240	272	292	308	316	314	314	320	300	300	284	252	208	412	189			
U Q					264	212	248	280	304	312	320	320	320	328	320	308	292	260	214					
L Q					188	188	232	268	288	296	310	300	294	284	280	276	278	248	202					

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	59	J A 60	J A 25	29	J A 33	J A 38	J A 45	J A 47	J A 65	J A 60	J A 57	J A 58	J A 62	J A 48	J A 55	J A 42	J A 62	J A 58	J A 77	J A 88	J A 77	J A 23	25	24
2	E B 16	E B 16	26	J A 30	J A 25	26	32	J A 46	J A 100	J A 51	J A 47	J A 36	J A 41	J A 56	J A 39	34	J A 46	J A 49	J A 40	J A 42	J A 40	J A 29	J A 32	J A 51
3	20	J A 23	31	20	25	J A 30	J A 43	J A 58	J A 58	J A 61	J A 47	J A 50	J A 53	J A 53	35	J A 31	30	34	J A 35	J A 34	J A 26	36	J A 21	E B 16
4	27	25	20	21	E B 16	J A 55	34	J A 52	J A 49	J A 42	J A 43	J A 43	36	J A 42	J A 56	40	J A 35	J A 51	J A 41	J A 45	J A 33	28	J A 40	J A 37
5	26	26	25	22	25	J A 52	34	J A 60	J A 58	J A 43	J A 61	J A 63	J A 127	J A 58	40	J A 35	G	G	40	J A 33	J A 31	J A 27	J A 38	27
6	23	21	E B 16	E B 16	E B 16	26	30	J A 49	J A 63	J A 85	J A 78	J A 65	J A 97	J A 55	J A 61	J A 71	J A 155	88	32	J A 75	38	J A 65	J A 65	J A 96
7	J A 38	J A 38	28	J A 28	J A 27	28	J A 43	J A 40	J A 63	J A 64	J A 134	J A 89	J A 89	J A 48	106	J A 127	J A 262	J A 102	J A 80	J A 32	J A 87	J A 69	J A 83	36
8	J A 62	34	38	38	E B 16	J A 34	59	94	J A 85	J A 129	J A 126	J A 69	72	J A 77	J A 121	J A 104	J A 50	J A 46	J A 37	J A 79	J A 109	J A 86	J A 53	J A 101
9	J A 77	59	J A 51	J A 47	40	J A 37	J A 68	J A 86	J A 72	J A 87	J A 53	J A 79	J A 51	J A 61	J A 58	J A 85	J A 52	J A 37	J A 62	J A 53	J A 51	J A 64	68	J A 83
10	J A 82	J A 51	J A 31	J A 19	E B 16	J A 31	J A 43	J A 86	J A 105	J A 81	J A 164	J A 78	J A 155	J A 142	J A 76	33	34	30	J A 38	J A 50	60	J A 35	76	J A 38
11	J A 61	J A 65	J A 40	J A 49	J A 31	J A 31	J A 51	80	J A 99	J A 143	J A 102	J A 37	J A 37	J A 41	45	J A 50	J A 78	J A 176	J A 155	J A 144	J A 42	J A 52	J A 105	J A 62
12	J A 40	30	26	33	32	J A 31	J A 66	61	J A 80	J A 63	J A 82	J A 57	J A 39	J A 62	J A 78	J A 126	69	J A 109	J A 207	J A 254	71	76	85	J A 64
13	45	27	J A 25	28	28	J A 33	J A 95	J A 74	J A 85	J A 100	J A 92	J A 66	J A 72	J A 62	J A 52	102	J A 84	J A 101	J A 44	J A 42	J A 56	J A 34	36	J A 65
14	J A 52	J A 86	59	J A 47	J A 50	J A 59	J A 53	J A 103	J A 80	J A 146	J A 141	66	J A 103	J A 75	J A 80	J A 81	J A 83	J A 65	J A 71	J A 37	45	78	J A 65	J A 51
15	J A 62	J A 37	J A 45	J A 55	J A 50	J A 33	J A 48	J A 61	J A 77	J A 57	J A 61	J A 79	J A 61	J A 147	J A 102	64	J A 53	J A 61	J A 62	50	J A 87	J A 86	J A 85	J A 108
16	J A 51	58	39	J A 24	J A 22	27	J A 41	J A 51	J A 51	J A 60	J A 71	J A 84	J A 68	40	J A 57	38	J A 52	J A 50	J A 54	96	J A 63	J A 31	C	C
17	20	J A 26	30	E B 16	25	25	31	J A 46	J A 52	J A 53	J A 110	79	J A 127	J A 175	J A 97	39	40	J A 57	J A 80	J A 129	J A 51	78	J A 32	J A 119
18	59	J A 51	J A 31	26	J A 21	J A 22	J A 39	J A 51	J A 51	J A 63	J A 57	61	J A 49	J A 58	J A 54	J A 50	J A 83	J A 96	J A 96	J A 126	J A 110	J A 107	J A 80	J A 83
19	J A 84	J A 65	J A 52	J A 50	J A 75	J A 29	J A 53	J A 103	J A 126	J A 120	J A 73	72	39	J A 37	59	J A 73	88	J A 106	J A 54	J A 47	J A 31	J A 53	J A 87	J A 87
20	J A 109	71	J A 60	38	J A 31	J A 31	J A 51	J A 46	65	J A 51	J A 89	J A 99	J A 95	J A 94	J A 53	J A 43	J A 52	J A 68	J A 60	J A 45	J A 51	44	J A 66	J A 24
21	J A 24	J A 28	J A 32	J A 51	J A 33	J A 39	J A 50	72	94	J A 64	J A 52	J A 55	J A 63	J A 155	36	38	J A 93	83	J A 68	J A 161	J A 87	36	52	38
22	J A 85	J A 155	J A 51	J A 52	J A 51	J A 43	59	J A 104	J A 87	J A 65	77	J A 109	54	J A 69	J A 52	60	J A 53	J A 55	J A 45	J A 26	J A 30	J A 31	J A 25	J A 45
23	J A 52	40	J A 37	J A 62	32	J A 38	J A 47	J A 64	J A 83	J A 45	J A 54	J A 80	J A 86	J A 87	J A 108	J A 65	86	61	J A 81	J A 53	J A 40	28	J A 25	32
24	J A 34	J A 25	33	J A 26	J A 51	J A 51	J A 51	J A 70	J A 201	76	J A 73	J A 53	J A 37	56	J A 98	J A 113	102	J A 117	J A 127	J A 88	J A 69	J A 38	J A 48	J A 44
25	J A 51	J A 47	J A 27	J A 140	J A 87	J A 143	J A 67	57	J A 74	J A 74	38	J A 55	J A 59	J A 74	C	J A 69	J A 60	85	J A 77	J A 47	J A 87	J A 43	J A 85	J A 54
26	J A 59	J A 64	J A 59	J A 49	38	J A 77	J A 64	J A 161	J A 106	J A 163	J A 101	J A 108	J A 53	J A 119	J A 74	J A 65	J A 63	63	J A 51	J A 61	J A 23	J A 63	J A 85	J A 107
27	J A 65	J A 85	J A 52	J A 32	J A 51	J A 30	J A 80	J A 243	J A 135	J A 110	J A 99	J A 60	J A 51	J A 71	65	J A 63	J A 52	J A 62	J A 59	J A 53	J A 49	J A 87	J A 51	J A 51
28	J A 52	J A 45	J A 50	J A 27	32	J A 26	J A 37	J A 65	J A 65	J A 69	J A 69	J A 127	J A 110	J A 79	76	J A 79	J A 97	J A 102	76	J A 104	J A 84	J A 79	J A 61	J A 63
29	J A 52	J A 84	J A 84	J A 51	J A 51	J A 53	J A 48	J A 84	J A 63	J A 68	J A 78	J A 61	J A 40	J A 53	J A 41	J A 43	J A 74	J A 63	J A 89	46	J A 65	J A 37	J A 53	J A 63
30	J A 24	J A 21	J A 30	J A 25	E B 16	25	J A 51	J A 51	J A 63	J A 56	J A 86	J A 42	J A 38	J A 44	47	J A 77	J A 66	63	J A 31	34	J A 62	38	J A 47	J A 47
31	J A 62	J A 52	J A 32	J A 34	J A 51	J A 43	J A 65	61	J A 62	J A 107	J A 131	J A 55	74	J A 55	J A 55	J A 63	J A 43	J A 49	J A 52	J A 144	J A 70	71	J A 39	J A 62
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	30	30
MED	J A 52	J A 45	J A 32	J A 32	J A 32	J A 33	J A 50	J A 61	J A 74	J A 65	J A 77	J A 65	J A 61	J A 61	J A 58	J A 63	J A 62	J A 63	J A 60	J A 53	J A 56	J A 44	J A 53	J A 52
U Q	J A 62	J A 64	J A 51	J A 49	J A 50	J A 43	J A 59	J A 86	J A 94	J A 100	J A 101	J A 79	J A 89	J A 79	J A 78	J A 79	J A 84	J A 96	J A 80	J A 96	J A 77	J A 76	J A 80	J A 83
L Q	27	26	27	25	E B 25	28	41	J A 51	J A 63	J A 57	J A 57	J A 55	J A 41	J A 53	52	40	50	J A 50	J A 41	J A 42	J A 40	J A 34	J A 38	38

JUL. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	A A 59	17	16	E B 16	17	25	27	34	A A 65	A	36	A	38	37	34	34	31	A A 58	A A 77	A A 88	G 26	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	16	24	30	37	A A 100	A A 51	42	36	35	37	34	33	31	26	25	25	22	21	16	41
3	E B 16	16	16	E B 16	E B 16	23	A A 43	A A 58	A A 58	A A 61	38	37	37	35	34	G 30	30	27	25	25	19	19	16	E B 16
4	16	16	E B 16	E B 16	E B 16	22	32	32	A	37	A	39	33	G 32	35	33	31	A A 51	23	21	22	17	17	19
5	19	17	E B 16	E B 16	E B 16	24	A	A A 60	A A 58	36	A	A A 63	A A 127	A A 58	36	30	G	G	18	22	21	25	20	16
6	E B 16	E B 16	E B 16	E B 16	E B 16	G 22	26	A A 49	A A 63	A A 85	A A 78	A A 65	A A 97	A A 55	34	A A 71	34	A A 88	27	A A 75	25	24	20	24
7	E B 16	16	E B 16	E B 16	20	23	30	33	A A 63	A A 64	A A 134	G 36	36	35	A A 106	A A 127	A A 262	29	24	18	24	22	27	20
8	18	19	24	21	E B 16	23	A A 59	A A 94	A A 85	A A 129	A A 126	A	A A 72	A A 77	A A 121	34	28	25	25	A A 79	A A 109	25	25	A A 101
9	A A 77	A A 59	18	20	G 20	22	35	A A 86	A A 72	A A 87	A	39	39	36	40	40	34	30	25	25	23	24	A A 68	16
10	16	23	16	E B 16	E B 16	22	36	A A 86	A A 105	43	A A 164	A A 78	A A 155	A A 142	A A 76	31	30	26	35	G 22	20	21	A A 76	18
11	17	17	21	21	18	22	A A 51	A A 80	A A 99	A A 143	A A 102	36	36	36	36	36	A A 78	A A 176	A A 155	A A 144	22	22	A A 105	E B 16
12	21	E B 16	16	16	16	26	A A 66	A A 61	A A 80	A A 63	43	36	35	38	A A 78	A A 126	A	A A 109	A A 207	A A 254	A A 71	A	22	A A 64
13	E B 16	E B 16	E B 16	E B 16	20	22	A A 95	A A 74	A A 85	A	46	A	A A 72	A A 62	35	30	A A 84	A	26	24	21	18	18	21
14	21	A A 86	A A 59	19	22	A A 59	A A 53	A A 103	A	A A 146	A A 141	36	A A 103	A A 75	A A 80	A A 81	34	A	26	23	23	A A 78	A A 65	29
15	24	24	21	21	23	24	A A 48	A A 61	A A 77	A A 57	A	A A 79	A A 61	A A 147	A A 102	E A 43	A A 53	A A 61	A A 62	E A 42	A A 87	A A 86	A A 85	A A 108
16	18	17	17	16	E B 16	24	A	A	A A 51	37	A A 71	A A 84	A	38	36	34	30	A A 50	E A 40	26	22	E B 16	C	C
17	E B 16	E B 16	E B 16	E B 16	E B 16	25	28	A A 46	34	36	44	36	A A 127	A A 175	A A 97	32	29	A A 57	A	22	22	20	20	22
18	16	16	16	E B 16	16	G 20	36	31	A A 51	A A 63	46	E A 44	40	E A 44	35	40	E A 42	A A 96	A A 96	E A 42	21	21	21	A A 83
19	A A 84	A A 65	E A 25	21	22	26	A A 53	A A 103	A A 126	40	A A 73	E A 40	E A 37	35	36	40	A A 88	E A 36	24	23	E B 16	A A 53	A A 87	16
20	16	A A 71	18	E B 16	18	G 20	36	A A 46	A A 65	A A 51	A A 89	A A 99	A A 95	E A 42	32	31	31	40	24	21	25	21	17	17
21	E B 17	17	17	17	21	24	A A 50	A A 72	A A 94	A A 64	E A 39	E A 47	A A 63	A	34	34	A A 93	A	25	26	37	16	16	E B 16
22	16	A A 155	E A 24	A A 52	20	A A 43	A A 59	A A 104	A A 87	A A 65	A A 77	A A 109	38	A A 69	E A 35	35	E A 34	26	22	17	E B 17	17	19	17
23	22	19	22	E B 19	E B 17	20	A A 47	A A 64	A A 83	34	36	A A 80	A A 86	A A 87	A A 108	A A 65	A A 86	38	23	27	21	16	E B 16	16
24	E B 16	E B 16	E B 16	E B 16	24	21	25	30	A A 201	40	A	37	36	A	A A 98	A A 113	A A 102	A	A A 127	A A 88	21	21	21	22
25	23	20	E B 16	21	A A 87	20	A	A	A A 74	A A 74	A	A A 55	A	A A 74	C	33	30	28	24	24	17	20	A A 85	A A 54
26	A A 59	A A 64	A A 59	21	22	A A 77	26	A A 161	A	A A 163	A A 101	A A 108	A	A A 119	A A 74	A A 65	A A 63	30	25	26	17	23	A A 85	22
27	A A 65	A A 85	A A 52	17	19	24	A A 80	A A 243	A A 135	A A 110	A A 99	43	A	A A 71	A A 65	A A 63	A A 52	E A 40	A A 59	G 22	21	21	21	A A 51
28	20	16	16	17	17	22	29	A A 65	A A 65	A A 69	A A 69	A A 127	A A 110	A A 79	A A 76	A A 79	A A 97	29	A A 76	26	G 25	24	23	28
29	17	A A 84	A A 84	20	20	A A 53	A A 48	A A 84	43	A A 68	A A 78	36	36	36	36	30	33	A	26	19	17	18	22	18
30	E B 16	E B 16	E B 16	E B 16	E B 16	23	31	E B 39	40	42	36	34	38	38	36	35	40	43	24	19	21	21	16	20
31	22	20	E A 22	20	A 22	23	A A 65	A A 61	A	A	A A 131	U A	37	37	35	A A 63	A	A	A 34	A A 144	16	A A 71	20	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	28	29	27	28	25	27	27	29	30	31	29	25	30	31	31	30	30	30
MED	17	17	16	16	18	23	40	A A 61	A A 74	A A 63	A A 73	A 41	39	A 44	36	35	34	37	26	24	22	21	21	20
U Q	A A 22	A A 59	A 22	20	21	25	A A 53	A A 86	A A 94	A A 80	A A 102	A A 79	A A 95	A A 76	A A 78	A A 65	A A 81	A A 58	A A 59	A A 42	25	24	A A 65	A A 29
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	22	30	42	A A 58	41	42	36	36	36	35	33	30	28	24	22	20	18	17	16

JUL. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

IONOSPHERIC DATA STATION Wakkanai

JUL.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	A	302	283F	296F	319	289	322	359	A	300	300	319	303	293	318	265R	320	A	A	A	321	303F	330F	343F
2	306	327	305F	315F	325	355	G	G	A	A	328	315	333	334	302	310	G	289	329	345	302	308	302	327F
3	346F	326	322	313F	320	300	A	A	A	A	360	333	337	332	316	G	G	324	325	316	313	329	347	330
4	330	343	319	326	335	337	341	318	373	320	329	308	G	298	321	326	367	A	R	321	315	310	316	307
5	340	355	323	315	323	338	279	A	A	304	249	A	A	A	294	318	357	308	330	334	322	323	321	332
6	315	307	328	332	289	347	379	A	A	A	A	A	A	A	G	A	291	A	307	A	309	287	290	284F
7	336	331	291	299F	302	312	323	321	A	A	A	G	287	323	A	A	A	310	305	314	244	323	338	306
8	313	312	297F	315F	286F	311	A	A	A	A	A	337	A	A	A	318	307	321	310	A	A	343	316	A
9	A	A	319	312	321	360	291F	A	A	A	362	G	336	396	379F	G	281	291	307	323	350	294	A	319
10	316	297F	286F	265F	287F	302	281	A	A	248	A	A	A	A	A	307	307	326	325	233	306	291	A	313F
11	287	303F	313F	304F	294F	325	A	A	A	A	A	G	G	274	311	277	A	A	A	A	291	293	A	307F
12	334	332	307	302	305	334	A	A	A	A	312	G	314	G	A	A	307	A	A	A	A	210	275	A
13	350F	281F	359F	311F	335	316	A	A	A	307	322	274	A	A	284	319	A	203	324	317	267	309	309	311
14	324	A	A	306	336	A	A	A	357	A	A	384	A	A	A	A	314	351	346	290	314	A	A	288F
15	304	299F	281	299	359F	298	A	A	A	A	292	A	A	A	A	238	A	A	A	326	A	A	A	A
16	322F	315F	319F	315	328	291	314	343	A	340	A	A	306	G	261	302	299	A	231	302	338	310	C	C
17	329	317	328	279	298	327	268	A	285	289	302	342	A	A	A	337	272	A	206	346	328	319	307	338
18	279F	292F	315F	301F	302F	354	329	G	A	A	353	298	285	301	279	313	250	A	A	313	328	305	325	A
19	A	A	327	319F	300	363	A	A	A	364	A	269	313	271	284	209	A	328	328	324	309	A	A	303
20	332	A	301	313	313	328	365	A	A	A	A	A	A	300	340	320	320	234	338	302	313	330	320	328
21	329	312	331	313	310F	354	A	A	A	A	336	353	A	290	308	299	A	311	323	341	308	296	290	328
22	276JR	A	249	A	275	A	A	A	A	A	A	A	397	A	308	260	282	315	316	328	306	316	326	313
23	326	288	278	321F	313F	314	A	A	A	330	359	A	A	A	A	A	A	221	333	325	330	323	323	310
24	313	314	306	327	349V	375	318	332	A	384	310	G	G	309	A	A	A	313	A	A	301	316	329	293
25	328F	311	305	305	A	259	312	357	A	A	324	A	272	A	C	301	339	290	306	321	308	296	A	A
26	A	A	A	333F	338F	A	313	A	249R	A	A	A	304	A	A	A	A	332	338	330	328	311	A	352
27	A	A	A	290F	330	335	A	A	A	A	A	343	268	A	A	A	A	217	A	309	335	327	321	A
28	337	320	346F	321F	322F	327	326	A	A	A	A	A	A	A	A	A	A	345	A	322	324	303	362F	317F
29	318	A	A	287F	379F	A	A	A	318	A	A	346	315	423	301	328	306	336	312	310	314	325	295F	313
30	298	319	327	314	323	320	330	344	290	321	313	G	273	285	316	291	237	256	335	317	303	309	330	295F
31	305	335	309F	291F	273F	325	A	A	363	319	A	296	362	337	288	A	307	323	243	A	322	A	328	321
	00	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	23	27	30	30	27	17	9	7	12	16	20	19	17	18	21	20	22	22	24	28	27	22	24
MED	323	314	313	312F	320	327	318	332	318	320	323	303	304	300	305	302	306	312	324	321	314	310	321	313
U Q	332	327	327	315F	330	347	330	350	363	335	344	340	333	333	316	318	317	326	330	327	326	323	329	328
L Q	306	302F	297	299F	300	311	286	G	285	302	306	G	272G	280	284	262	276	289	307	312	306	296	307	306

JUL.2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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					L	L	L	L	A	A	L	A	L	L	L	L	403	A	A	A				
2						L	402	332	A	A	A	R 414	L	L	L	L	L	377	L	A				
3						L	A	A	A	A	L	L	L	416	L	L	L	L	A					
4					L	387	L	L	A	L	A	L	L	L	L	L	396	A	L					
5						L	A	A	A	L	A	A	A	A	L	L	L	389	L					
6					330	L	L	A	A	A	A	A	A	A	L	A	L	A	L	A				
7						354	A	L	A	A	A	L	L	395	A	A	A	L	L	L	L			
8					L	L	A	A	A	A	A	A	A	A	A	L	L	L	L	A	A			
9				312		L		A	A	A	A	L	L	L	A	319	L	L	365	L	L			
10						L	L	A	A	L	A	A	A	A	A	L	L	351	A	L				
11						A	A	A	A	A	A	L	L	L	L	L	A	A	A	A				
12						L	A	A	A	A	A	L	L	L	A	A	L	A	A	A	A			
13					A	355	A	A	A	L	A	A	A	A	L	L	A	A	L		A			
14						A	A	A	A	A	A	L	A	A	A	A	A	A						
15				A		340	A	A	A	A	A	A	A	A	A	A	A	A	A		A			
16						340	A	A	A	L	A	A	A	L	L	435	L	A	A					
17							L	A	396	L	A	L	A	A	A	386	A	A	A					
18							L	L	A	A	A	A	L	A	406	A	A	A	A	A				
19							A	A	A	A	A	L	L	L	407	L	A	A	A					
20					L	L	A	A	A	A	A	A	A	A	L	L	411	A	L					
21							A	A	A	A	L	A	A	A	L	L	A	A	L					
22				A		A	A	A	A	A	A	A		A	A	400	L	360	L	L				
23						L	A	A	A	L	A	A	A	A	A	A	A	A	L	A				
24						L	L	L	A	L	A	421	414	A	A	A	A	A	A	A				
25					A	L	A	A	A	A	A	A	A	A	C	L	L	L	330					
26						A	A	A	A	A	A	A	L	A	A	A	A	L						
27					L	L	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
28						372	L	A	A	A	A	A	A	A	A	A	A	L	A	L	L			
29						A	A	A	A	A	A	L	L	L	L	L	L	A	A					
30						394	L	L	A	L	415	419	416	L	L	L	L	291	L					
31							A	A	A	A	A	L	A	L	L	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				1	1	7	1	1	1		1	3	2	2	2	4	3	5	2					
MED				312	330	355	402	332	396		415	419	415	406	406	393	403	360	348					
U Q						387						421				418	411	383						
L Q						340						R 414				352	396	321						

JUL. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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					274	330	312	288	A	E A 372	372	338	372	372	332	398	320	A	A	A				
2						256	G	G	A	A	310	310	316	300	374	374	G	358	308	270				
3						344	A	A	A	A	262	304	312	340	344	G	G	320	272					
4					254	254	290	350	256	344	320	342	G	382	328	286	272	A	304					
5						290	A	A	A	380	A	A	A	A	372	320	264	346	300					
6					316	264	242	A	A	A	A	A	A	A	G	A	372	A	316	A				
7						310	300	310	A	A	A	G	388	G 304	A	A	A	340	316	272	310			
8					282	348	A	A	A	A	A	292	A	A	A	352	312	312	312	A	A			
9				284		232		A	A	A	276	G	294	252	198	G	366	398	326	294	282			
10						352	352	A	A	476	A	A	A	A	A	364	340	310	274	486				
11						238	A	A	A	A	A	G	G	442	360	414	A	A	A	A				
12						298	A	A	A	A	332	G	338	G	A	A	346	A	A	A	A			
13					238	330	A	A	A	330	304	450	A	A	418	322	A	E A 660	282		A			
14						A	A	A	258	A	A	258	A	A	A	A	A	A						
15				274		340	A	A	A	A	378	A	A	A	A	E A 348	A	A	A	E A 300	A			
16						368	344	276	A	300	A	A	346	G	344	336	372	A	E A 578					
17							472	A	392	392	358	300	A	A	A	312	426	A	494					
18							276	G	A	A	258	364	380	350	446	332	512	A	A	332				
19							A	A	A	286	A	414	334	334	408	426	A	282	278					
20					278	264	242	A	A	A	A	A	A	348	242	316	336	E A 546	270					
21							A	A	A	A	270	268	A	420	338	338	A	308	268					
22				A		A	A	A	A	A	A	A		A	E A 322		404	328	272	272				
23						284	A	A	A	290	276	A	A	A	A	A	A	A	276	238				
24						226	334	316	A	308	A	G	G	360	A	A	A	E A 328	A	A				
25					A	432	304	278	A	A	334	A	440	A	C	368	276	276	322					
26						A	A	A	A	A	A	A	362	A	A	A	A	314						
27					300	260	A	A	A	A	A	316	428	A	A	A	A	A	A	298				
28						300	300	A	A	A	A	A	A	A	A	A	A	288	A	326	276			
29						A	A	A	316	A	A	306	322	206	360	322	322	282	316					
30						266	268	272	382	338	340	G	432	390	330	388	562	464	278					
31							A	A	278	338	A	354	250	296	284	A	368	316	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				2	7	22	14	9	6	12	14	20	18	17	18	20	19	19	20	10	3			
MED				279	278	294	302	310	297	336	315	348	367	350	344	350	366	316	296	290	282			
U Q					300	340	344	G	382	376	340	G	G 432	405	374	393	426	358	316	326	310			
L Q					254	260	276	277	258	304	276	305	322	302	328	322	320	308	275	272	276			

JUL. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A 234	266	Q 250	220	236	222	212	A 200	194	194	194	198	A	A	A	234	228	210	200					
2	Q 202	262	262	252	232	196	198	A 226	A	A	A 182	190	208	182	196	196	202	202	A	250	264	252	252	
3	206	230	246	226	222	208	A	A	A	A 196	196	196	196	182	198	194	194	228	A	270	256	236	214	214
4	226	244	256	236	214	204	220	198	A	198	A 184	176	186	194	200	190	A	204	228	264	256	256	270	
5	208	208	214	234	232	218	A	A	A	196	A	A	A	A	222	200	194	194	178	230	246	264	238	238
6	238	254	232	252	E B 236	212	202	A	A	A	A	A	A	A	202	A	208	A	236	A	254	224	226	254
7	214	240	254	240	266	202	A	218	A	A	A	198	198	198	A	A	A	222	196	216	212	220	200	222
8	250	238	242	186	216	222	A	A	A	A	A	A	A	A	A	202	200	188	188	A	A	234	242	A
9	A	A	254	A	222	198	242	A	A	A	A	196	A	196	A	A	214	198	202	A	204	218	A	218
10	232	Q 248	Q 236	Q 238	Q 250	230	212	A	A	212	A	A	A	A	A	192	192	192	A	222	208	260	A	Q 238
11	272	218	222	254	254	A	A	A	A	A	A	192	180	196	206	232	A	A	A	A	246	278	A	248
12	Q 216	204	252	252	284	226	A	A	A	A	A	186	194	190	A	A	220	A	A	A	A	A	216	A
13	Q 192	266	222	248	A	228	A	A	A	A	A	A	A	A	202	218	A	A	218	254	A	264	264	244
14	244	A	A	272	240	A	A	A	A	A	A	164	A	A	A	A	A	A	218	218	270	A	A	Q 256
15	208	Q 256	272	A	228	218	A	A	A	A	A	A	A	A	A	A	A	A	A		A	A	A	A
16	236	Q 250	242	230	230	210	A	A	A	200	A	A	A	216	202	202	202	A	A	230	220	254	C	C
17	248	262	248	280	242	216	208	A	194	194	A	192	A	A	A	198	A	A	A	220	258	258	242	232
18	268	Q 252	Q 242	Q 246	242	232	224	194	A	A	A	A	204	A	198	A	A	A	A	A	250	252	254	A
19	A	A	A	Q 234	222	224	A	A	A	A	A	A	196	196	196	A	A	A	A	238	238	A	A	200
20	200	A	242	242	A	198	A	A	A	A	A	A	A	A	174	184	184	A	226	228	258	220	234	230
21	230	258	236	236	226	238	A	A	A	A	A	A	A	A	194	202	A	A	216	228	E A 324	236	248	224
22	290	A	A	A	270	A	A	A	A	A	A	A	A 220	A	A	198	198	192	192	206	258	258	242	252
23	208	294	250	218	236	236	A	A	A	190	A	A	A	A	A	A	A	A	188	A	204	214	214	234
24	272	254	258	238	228	202	200	192	A	204	A	190	200	A	A	A	A	A	A	A	228	248	222	230
25	254	254	254	232	A	218	A	A	A	A	A	A	A	A	C	198	198	202	216	250	236	244	A	A
26	A	A	A	228	254	A	A	A	A	A	A	A	A	A	A	A	A	226	226	A	224	224	A	208
27	A	A	A	210	186	198	A	A	A	A	A	A	A	A	A	A	A	A	A	A	198	202	214	A
28	214	214	230	226	234	234	234	A	A	A	A	A	A	A	A	A	A	212	A	212	230	232	232	260
29	220	A	A	194	196	A	A	A	A	A	A	188	200	190	204	200	A 226	A	A	238	238	226	232	232
30	244	220	226	Q 234	214	214	206	212	A	A 246	196	190	198	198	198	204	A	246	206	250	270	262	Q 210	206
31	198	220	258	Q 278	A	236	A	A	A	A	A	A	A	198	186	A	A	A	A	A	258	A	234	234
	00	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	23	25	28	27	26	11	7	1	8	3	12	13	13	16	17	15	12	16	17	27	26	22	24
MED	228	248	246	237	231	218	212	212	194	199	196	190	198	196	198	200	198	202	205	228	242	240	233	233
U Q	248	256	255	251	242	230	224	218		208	200	194	200	198	202	202	208	224	218	244	258	258	242	250
L Q	208	220	234	229	222	204	202	194		195	196	185	192	190	194	195	194	193	194	219	224	224	214	220

JUL. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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				B	A	96	96	96	96	100	100	100	100	94	A	A 94	108	108	108	A	B			
2				B	A	100	100	100	100	100	100	100	A	A	100	96	A	A	A	A	A			
3				B	B	96	96	96	100	96	96	96	96	A	96	96	96	96	96	A	A			
4				B	B	118	108	108	108	108	102	98	98	98	96	A 104	A	A	A	A	B			
5				A	B	114	114	106	106	94	94	104	104	104	A	A	96	96	A	A	A			
6				B	B	110	110	110	110	104	104	104	104	104	104	A	A	A	106	A	B			
7				B	B	94	104	104	104	92	98	A	A	98	104	104	104	104	98	A	A			
8				B	B	96	96	96	96	100	100	100	100	100	100	100	A	A	A	A	A			
9				B	102	A	102	102	102	102	102	98	98	98	98	A	100	100	A	A	A			
10				B	B	100	100	100	100	100	100	100	100	100	100	100	94	98	98	92	B			
11				B	A	100	92	102	102	102	102	102	92	92	94	98	98	A	A	A	B			
12				B	A	104	98	98	98	98	98	98	98	98	98	98	100	100	96	A	B			
13				B	128	110	102	102	102	102	102	102	96	96	96	A	100	100	100	A	B			
14				B	A	100	100	100	100	100	A	A	A	A	A	A	100	100	100	A	A			
15				B	A	110	104	104	98	98	98	98	98	A	A	A	A	104	106	A	B			
16				B	A	106	104	98	98	98	98	98	94	98	100	100	100	100	96	A	B			
17				B	B	100	100	100	102	102	94	100	100	A	100	106	106	106	106	A	B			
18				B	A	106	98	112	102	102	102	92	98	98	98	A	98	A	98	A	B			
19				B	A	98	98	98	100	100	100	100	100	100	100	100	100	100	A	A	B			
20				B	A	106	98	104	104	104	104	96	A	96	A	96	96	96	90	A	A			
21				B	A	116	96	106	106	106	98	98	98	100	100	104	104	104	A	A	B			
22				B	A	114	114	114	102	102	102	102	102	102	102	A	A	A	108	A	A			
23				B	128	A	102	102	102	102	90	90	90	A	A	98	98	98	A	A	B			
24				B	A	A	98	98	98	96	96	96	96	96	96	96	102	102	A	A	A			
25				B	A	A	102	102	102	102	102	102	102	102	102	104	104	104	A	A	A			
26				B	A	A	104	104	104	96	96	96	A	A	A	A	A	100	112	A	A			
27				B	A	A 112	96	96	104	104	104	104	A	104	A	A	A	A	A	A	A			
28				B	A	A	110	110	110	104	104	104	92	92	A	A	A	100	100	A	114			
29				B	A	A	104	104	104	98	98	98	98	98	98	A	98	102	A	A	A			
30				B	B	116	104	104	104	104	A	96	96	96	96	A	104	104	104	A	A			
31				A	A	A	104	104	104	104	A	104	104	A	A	A	A	A	A	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	23	31	31	31	31	28	29	25	23	21	17	21	22	17	1	1			
MED					128	106	102	102	102	102	100	100	98	98	100	100	100	100	100	92	114			
U Q					128	112	104	104	104	104	102	102	100	100	100	104	104	104	106					
L Q					102	100	98	98	100	98	98	97	96	96	96	96	98	100	97					

JUL. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	92	92	92	92	92	124	112	112	100	100	100	100	96	96	96	96	96	110	104	104	104	94	94	94
2	B	B	94	100	92	116	104	104	94	94	96	104	94	102	100	100	100	100	102	102	102	104	104	104
3	96	96	92	92	104	92	122	106	106	104	100	100	98	98	136	98	98	114	110	110	110	102	98	B
4	94	94	104	96	B	96	120	124	112	114	106	102	96	96	90	90	90	90	100	108	108	108	108	86
5	86	86	86	100	92	94	120	114	108	108	108	108	108	98	98	98	G	G	92	92	92	104	106	96
6	100	100	B	B	B	100	128	118	110	106	106	98	98	98	98	98	106	98	106	114	112	114	102	102
7	100	100	94	98	98	116	104	104	102	102	100	112	112	102	114	106	106	106	106	106	106	106	102	96
8	114	94	90	90	B	108	100	100	110	106	106	106	94	94	94	98	94	84	84	96	102	110	104	104
9	104	104	98	98	98	98	104	104	98	98	104	100	100	100	100	96	112	112	100	94	94	106	100	100
10	96	96	90	94	B	112	112	98	98	98	98	98	104	98	92	96	120	114	108	106	100	110	102	102
11	102	92	92	92	100	116	106	106	106	102	100	100	100	92	92	118	108	96	100	96	116	110	110	98
12	98	94	94	94	94	110	108	108	98	98	100	108	104	104	98	106	106	106	106	116	100	110	102	102
13	98	96	96	96	126	116	116	108	108	108	102	102	102	102	110	100	100	102	102	102	102	102	102	102
14	102	102	102	96	96	110	110	104	104	110	96	96	96	96	96	96	100	100	100	106	106	106	106	106
15	96	96	88	88	88	96	118	112	106	106	106	98	98	102	94	98	92	100	102	106	106	106	110	106
16	98	98	98	92	92	120	112	108	98	98	98	90	96	110	110	116	90	112	104	100	102	108	C	C
17	96	96	94	B	98	110	110	110	122	108	102	196	100	100	100	110	122	108	116	112	104	112	100	100
18	100	100	96	100	96	144	110	116	106	104	104	90	96	96	96	98	104	104	104	104	108	134	104	104
19	104	100	84	94	94	120	108	108	102	102	102	102	98	100	104	96	96	96	96	96	100	100	100	108
20	102	102	102	96	96	102	108	116	110	110	100	98	98	98	98	90	84	106	84	104	104	96	96	96
21	86	90	90	112	96	114	110	104	98	98	98	98	98	98	110	120	102	102	102	110	108	110	116	102
22	114	102	102	102	102	110	110	104	104	104	104	104	100	100	100	100	92	92	112	108	108	100	100	98
23	94	94	94	106	126	118	108	108	108	108	108	94	102	98	98	110	100	100	100	100	92	92	106	94
24	94	96	96	96	98	98	98	98	98	106	98	98	98	108	108	108	108	108	100	100	98	102	102	96
25	96	96	108	108	108	120	106	106	98	98	106	114	118	118	C	110	118	114	104	106	108	108	96	96
26	96	96	90	90	108	108	108	106	106	100	100	100	100	100	96	96	96	116	106	106	100	100	100	100
27	100	100	100	90	90	100	110	106	106	106	96	96	96	96	96	96	96	92	88	88	88	102	102	102
28	102	102	96	96	96	120	120	102	102	102	102	94	94	94	94	94	104	104	104	104	104	104	100	100
29	100	100	100	100	100	108	108	104	104	100	98	104	96	96	100	100	100	102	102	102	102	102	98	98
30	110	104	90	92	B	106	106	106	106	106	94	94	104	104	104	100	104	104	112	104	104	102	102	96
31	96	Q 90	90	98	92	94	102	102	102	116	98	98	98	98	98	98	92	92	108	108	108	100	98	98
	00	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	26	31	31	31	31	31	31	31	31	31	30	31	30	30	31	31	31	31	30	29
MED	98	96	94	96	96	110	110	106	104	104	100	100	98	98	98	98	100	103	102	104	104	104	102	100
U Q	102	100	98	100	100	116	112	110	108	108	104	104	102	102	104	106	106	108	106	108	108	110	104	102
L Q	96	94	90	92	92	100	106	104	98	100	98	98	96	96	96	96	96	98	100	100	100	102	100	96

JUL. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	F 8	F 6	F 5	L 3	L 3	C 6	C 4	C 3	C 3	C 3	C 2	C 2	C 3	C 2	L 2	L 2	CH 11	C 5	C 7	L 7	L 2	F 1	F 1	F 1
2			FF 31	L 2	L 2	C 2	C 3	C 4	C 7	C 3	C 2	C 1	L 2	L 2	C 2	C 2	L 2	L 3	L 4	L 3	L 4	F 4	F 2	F 5
3	F 1	F 3	F 2	L 2	L 1	LC 12	C 3	C 5	C 5	C 3	C 3	L 2	L 2	L 2	HL 11	LC 21	CL 22	CL 21	CL 72	LL 22	L 3	F 3	F 1	
4	F 2	F 1	F 1	L 1		LC 11	C 3	C 2	C 3	C 2	C 2	C 2	C 1	C 1	LC 21	L 2	C 2	L 4	L 4	L 7	L 7	FF 31	F 5	F 3
5	F 3	F 2	F 2	L 1	L 1	LC 12	C 3	C 5	C 3	C 2	C 2	C 2	C 3	C 3	L 1	L 1			L 2	L 3	L 2	F 5	F 3	F 3
6	F 1	F 1				LC 11	C 2	C 3	C 3	C 6	C 3	C 3	C 3	C 2	C 2	C 5	L 2	LQ 53	C 3	L 7	L 4	F 8	F 6	F 5
7	L 5	L 2	L 2	L 2	L 2	C 2	C 4	C 3	C 5	C 4	C 4	L 2	L 2	C 1	C 4	C 6	C 5	C 3	C 4	L 4	L 5	F 8	FQ 62	FQ 31
8	FFQ 22	F 3	F 3	L 3		C 3	C 5	C 4	C 5	C 6	C 5	C 2	C 4	C 5	C 6	C 4	C 3	C 2	CC 31	L 7	L 8	F 8	F 8	F 6
9	F 6	F 4	F 3	L 3	LQ 11	LQ 21	CQ 71	CQ 71	CQ 62	CQ 72	C 2	C 2	C 2	C 2	C 3	LQ 21	C 2	C 3	L 5	L 7	L 7	L 8	F 5	F 6
10	F 3	F 3	F 2	LQ 11		C 3	C 4	C 6	C 6	C 4	C 4	C 4	C 4	C 4	C 5	C 2	CL 21	C 2	C 6	C 6	L 6	F 3	F 9	F 5
11	F 4	F 9	F 4	L 3	LQ 21	C 3	C 4	C 6	C 7	C 5	C 4	C 1	C 1	C 2	C 1	C 2	C 4	LQ 63	LQ 63	LQ 53	LQ 31	FQ 31	FQ 81	F 2
12	F 4	F 3	F 3	L 3	L 2	C 3	C 6	C 4	C 6	C 4	C 3	C 1	C 1	C 2	C 4	C 3	C 4	C 8	C 7	C 8	L 5	F 6	F 6	F 8
13	F 1	F 2	F 2	L 1	C 1	C 3	C 5	C 7	C 5	C 2	C 3	C 2	C 3	C 3	C 2	L 4	C 4	C 4	C 4	L 5	L 7	F 5	F 3	F 4
14	F 4	F 5	F 3	L 3	L 2	C 4	C 8	C 4	C 5	C 5	L 5	L 2	L 3	L 2	L 3	LQ 41	CQ 41	CQ 31	CQ 41	CQ 31	CQ 41	F 7	F 8	F 3
15	F 5	F 6	F 6	L 4	L 2	LC 12	C 5	C 6	C 4	C 3	C 2	C 4	C 3	LQ 31	LQ 21	LQ 31	LQ 51	CQ 31	CQ 81	L 5	L 8	F 8	F 8	F 5
16	F 5	F 3	F 3	L 4	L 1	C 2	C 4	C 4	C 4	C 2	L 3	L 3	C 3	C 1	C 1	C 1	LC 11	C 7	C 5	L 6	L 3	F 2		
17	F 2	F 1	F 1		L 1	C 3	C 4	C 3	C 2	C 2	C 3	C 2	C 3	L 5	C 5	C 1	C 2	C 3	C 5	L 4	L 4	F 3	F 5	F 5
18	F 5	F 2	F 2	L 2	L 2	C 2	C 2	C 2	C 4	C 6	C 3	C 3	C 3	C 3	C 2	L 2	C 4	LQ 61	CQ 81	L 8	L 6	F 4	F 5	F 6
19	FQ 51	FQ 61	FQ 41	LQ 21	LQ 31	CQ 31	CQ 41	CQ 61	C 5	C 3	C 3	C 2	C 1	C 2	C 2	C 3	C 5	C 4	L 6	LL 21	L 2	F 5	F 6	F 8
20	F 3	F 6	F 4	L 3	L 3	LC 31	C 3	C 3	C 4	C 2	C 4	C 3	L 3	C 3	L 3	L 3	L 2	CL 42	C 1	L 4	L 6	F 4	F 2	F 2
21	F 2	F 3	F 3	LL 23	L 4	C 4	C 5	C 3	C 5	C 5	C 4	C 4	C 2	C 2	C 2	C 2	C 6	C 5	L 5	L 5	L 4	F 7	F 2	F 1
22	F 2	F 5	F 5	L 8	L 3	C 5	C 5	C 5	C 5	C 3	C 5	C 4	C 2	C 2	C 3	L 2	L 2	L 4	LL 21	L 2	L 2	F 3	F 4	F 8
23	F 7	F 7	F 5	LL 22	CC 21	C 3	C 3	C 5	C 4	C 2	C 2	C 4	C 3	C 5	L 3	C 4	C 4	C 5	L 3	L 3	L 3	F 2	F 2	F 2
24	F 1	F 2	F 3	L 2	L 4	L 3	C 2	C 2	C 4	C 2	C 3	C 2	C 2	C 2	C 4	C 5	C 4	C 7	L 6	L 9	L 5	F 5	F 3	F 3
25	F 4	F 3	F 2	L 4	L 8	LL 33	C 4	C 3	C 4	C 4	C 4	C 3	C 2	C 4	C	C 2	C 3	C 2	C 6	L 3	L 3	F 6	F 9	F 9
26	F 8	F 5	F 5	L 3	L 5	L 5	C 5	C 5	C 4	C 5	C 2	C 3	C 2	LQ 22	LQ 42	LQ 31	LQ 31	C 2	C 4	L 6	L 4	F 7	F 8	F 4
27	F 6	F 7	F 4	L 7	LQ 21	C 1	CQ 71	CQ 71	CQ 61	CQ 41	CQ 41	C 3	L 2	C 3	L 3	L 3	L 4	L 5	L 5	L 6	L 5	F 4	F 4	F 9
28	F 4	F 2	F 2	L 3	L 2	L 2	C 2	C 5	C 3	C 5	C 5	C 5	C 7	C 4	L 4	L 4	L 5	C 4	C 6	L 7	C 8	L 8	L 9	L 3
29	F 5	FQ 41	FQ 61	LQ 31	LQ 31	LQ 81	CQ 71	CQ 72	CQ 41	CQ 41	CQ 41	CQ 11	C 2	C 1	C 2	L 3	C 3	C 3	L 8	L 3	L 2	F 2	F 3	F 3
30	F 1	F 1	F 1	L 1		C 2	C 3	C 3	C 3	C 3	L 2	C 2	C 2	C 2	C 1	CL 22	CL 32	C 3	C 2	L 4	L 7	F 4	F 1	F 5
31	F 5	F 3	F 2	L 2	L 3	L 6	CQ 71	CQ 41	CQ 31	CQ 41	CQ 31	CQ 21	CQ 31	C 2	L 2	L 5	L 3	L 3	L 7	L 5	L 7	F 6	F 6	F 7
	00	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																								

JUL. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

JUL. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

IONOSPHERIC DATA STATION Kokubunji

JUL. 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						A	A	A	A	A	A	A	A	UL 436	420	408	392	A	336	A				
2							A	A	A	A	A	A	A	A	420	UL 412	UL 396	368	A					
3							360	UL 404	A	A	A	A	A	A	A	A	A	A	A	A				
4						A	A	A	A	A	A	A	A	A	A	A	A	A	UL 324	A				
5						UL 304	UL 360	A	A	A	A	A	A	A	A	UL 412	396	A	A	A				
6								A	A	A	A	A	A	A	UL 396	412	UL 384	A	L					
7								A	A	416	A	440	A	A	UL 420	A	A	UL 364	324	A				
8							360	L	UL 408	412	UL 516	A	A	UL 440	UL 432	424	A	384	A	A				
9						L	A	A	A	A	A	UL 424	A	A	A	A	A	A	A	A				
10							A	A	408	A	A	A	A	A	A	A	A	A	A					
11							A	A	A	A	A	A	A	A	A	A	A	UL 376		A				
12						UL 300	A	A	A	A	A	A	A	A	A	A	396	A	A	A				
13						A	A	A	A	A	A	A	UL 440	UL 428	A	A	392	380	L					
14						A	A	A	A	A	A	A	UL 504	440	UL 448	424	A	A	L					
15							A	UL 388	A	A	A	A	A	A	A	A	UL 376	UL 360	A	A				
16							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
17							A	A	A	A	A	A	UL 444	A	400	A	380	A	A					
18								UL 376	A	A	A	A	A	A	A	A	A	372	L					
19							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
20						A	352	A	A	A	A	A	A	A	A	A	A	A	A	A				
21							UL 352	A	A	A	A	A	444	A	A	412	A	UL 364						
22							A	A	A	A	A	A	A	A	A	404	A	A	A					
23						A	352	A	A	A	A	A	A	UL 424	A	A	A	A	A					
24							UL 408	A	A	A	A	A	A	A	UL 404	A	A	352	A					
25							A	A	A	A	432	UL 420	A	A	A	A	A	A	A	A				
26							A	A	UL 516	A	A	A	A	A	A	A	A	A	L					
27							A	A	A	A	A	A	A	A	A	A	UL 380	A	A	A				
28							UL 380	A	A	A	A	A	A	A	A	A	A	UL 372	A	A				
29							A	A	A	A	A	A	A	A	A	A	UL 400	A	A					
30								A	A	A	A	A	UL 428	A	A	A	A	UL 368	400	A				
31							A	A	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	8	3	3	2	2	3	5	5	8	8	10	11	4					
MED						UL 302	360	UL 388	UL 408	414	474	UL 424	UL 444	UL 436	UL 420	412	392	UL 368	330					
U Q							UL 370	UL 404	UL 516			440	UL 474	440	UL 426	418	UL 396	376	368					
L Q							352	UL 376	408			UL 420	UL 434	UL 426	UL 402	410	UL 380	UL 364	324					

JUL. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
2						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
3						A	A	A	A	A	A	A	A	A	A	A	A	A	B	B				
4						A	U A 248	A	A	A	A	A	A	A	A	A	A	A	A	B				
5						A	A	A	A	A	A	A	A	A	A	U R 308	A	A	A	B				
6						A	A	A	A	B	A	A	A	A	R	A	A	A	A	B				
7						A	A	A	A	A	A	A	A	A	U A 332	A	A	A	A	B				
8						R	A	R	A	U R 316	A	A	A	A	A	A	A	U R 268	U A 192	B				
9						B	A	A	A	A	A	A	A	A	A	A	A	A	A 192	B				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
11						B	A	A	A	A	A	A	A	A	A	A	A	U R 256	A	B				
12						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
13						B	A	A	A	A	A	A	A	A	A	A	A	A	B	B				
14						B	A	A	A	A	A	A	A	R	U R 320	A	A	A	A	B				
15						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
16							A	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	288	A	A					
18						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
19						B	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	A	A	B				
21						B	A	A	A	A	A	A	A	A	A	U A 316	A	U A 244	A					
22						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
23						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
24						B	A	A	A	A	A	A	A	A	R	A	A	A	B	B				
25							A	A	A	A	A	A	A	A	A	A	A	A	B	B				
26							A	A	A	A	A	A	A	A	A	A	A	A	B					
27						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
28							A	A	A	A	A	A	A	A	A	A	A	A	B	B				
29							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
30							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
31							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1			1					2	2	1	3	2					
MED							U A 248			U R 316					U 326	U 312	288	U R 256	A 192					
U Q																		U R 268						
L Q																		U A 244						

JUL. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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	J A 87	J A 97	J A 108	J A 43	J A 50	J A 39	J A 50	J A 71	J A 56	J A 72	J A 130	J A 89	J A 82	J A 88	J A 40	J A 39	J A 38	J A 70	J A 30	J A 89	J A 168	J A 54	J A 42	J A 48
2	J A 53	J A 82	J A 55	J A 52	J A 25	23	J A 41	J A 57	J A 82	J A 86	J A 159	J A 75	J A 110	J A 67	J A 60	J A 47	J A 45	J A 45	J A 85	J A 59	J A 32	J A 30	J A 29	J A 47
3	J A 46	J A 52	J A 48	J A 26	J A 37	J A 35	31	J A 44	J A 133	J A 66	J A 114	J A 114	J A 90	J A 162	J A 92	79	J A 73	J A 65	J A 57	J A 78	J A 65	J A 65	J A 46	J A 66
4	J A 51	J A 23	J A 51	J A 32	J A 52	J A 41	35	J A 43	J A 64	J A 75	J A 104	J A 135	J A 154	J A 49	J A 56	J A 53	J A 64	J A 49	J A 38	J A 87	J A 41	J A 36	J A 55	J A 54
5	J A 52	J A 52	J A 50	E B 16	22	J A 31	J A 38	J A 55	J A 49	J A 66	J A 110	J A 58	J A 78	J A 98	J A 68	G	J A 40	J A 44	J A 49	J A 51	J A 32	J A 25	J A 24	J A 42
6	J A 49	J A 48	J A 52	J A 48	J A 40	J A 27	36	J A 57	J A 65	J A 84	J A 50	J A 48	J A 139	J A 43	G	J A 40	J A 45	J A 36	J A 32	J A 26	J A 123	J A 58	J A 53	J A 52
7	J A 67	J A 76	J A 54	J A 50	J A 42	J A 38	30	J A 86	J A 182	J A 64	J A 46	39	J A 84	J A 88	J A 54	J A 47	J A 76	J A 39	J A 33	J A 31	J A 52	J A 52	J A 66	J A 53
8	J A 31	J A 62	J A 38	J A 51	23	G	J A 34	G	37	38	J A 56	J A 69	J A 58	45	37	38	J A 44	29	J A 37	J A 51	J A 52	J A 50	88	124
9	J A 52	J A 52	65	J A 48	24	J A 27	J A 42	J A 49	J A 81	J A 148	J A 165	J A 92	J A 98	J A 121	J A 109	J A 98	J A 107	J A 112	J A 101	J A 146	J A 88	J A 50	J A 46	J A 44
10	J A 27	J A 22	22	J A 50	J A 42	J A 26	J A 42	J A 52	J A 43	J A 56	J A 78	J A 178	J A 75	J A 90	J A 84	J A 84	J A 86	J A 60	J A 60	J A 26	J A 24	J A 26	J A 142	J A 51
11	J A 51	J A 66	J A 54	J A 55	J A 30	J A 30	J A 54	J A 76	J A 130	J A 149	J A 165	J A 114	J A 127	J A 77	J A 87	J A 78	J A 113	G	J A 31	J A 35	J A 55	J A 28	J A 111	J A 53
12	J A 36	J A 29	J A 38	J A 54	J A 67	J A 49	J A 135	J A 102	J A 200	J A 109	J A 199	J A 143	J A 112	J A 84	J A 211	J A 150	J A 100	J A 135	J A 111	J A 72	J A 49	J A 54	J A 70	J A 55
13	J A 54	J A 52	J A 66	J A 54	J A 66	37	J A 74	J A 89	J A 99	J A 229	J A 112	J A 156	J A 48	J A 48	J A 104	J A 118	J A 52	J A 65	J A 75	J A 26	26	J A 53	J A 62	J A 53
14	J A 51	J A 54	J A 49	J A 29	J A 66	J A 56	J A 82	J A 150	J A 196	J A 192	J A 259	J A 167	J A 42	G	43	41	J A 46	J A 84	J A 65	J A 32	J A 29	J A 38	J A 53	J A 28
15	J A 45	J A 37	J A 52	J A 28	23	J A 29	J A 44	J A 41	J A 61	J A 148	J A 114	J A 152	J A 115	J A 74	J A 53	J A 64	J A 42	32	J A 61	J A 74	J A 72	J A 127	J A 64	J A 85
16	J A 46	J A 51	J A 53	J A 54	J A 55	J A 25	J A 45	J A 48	J A 108	J A 107	J A 80	J A 79	J A 127	J A 110	J A 73	J A 60	J A 108	J A 63	J A 72	J A 66	J A 54	J A 86	J A 48	J A 52
17	J A 31	J A 34	J A 30	J A 30	J A 40	J A 29	J A 38	J A 136	J A 107	J A 141	J A 54	J A 54	43	J A 77	38	44	34	J A 51	J A 89	J A 86	J A 106	J A 76	J A 52	J A 86
18	J A 158	J A 152	J A 31	J A 28	J A 23	J A 23	27	J A 46	J A 50	J A 72	J A 155	J A 162	J A 207	J A 171	J A 48	J A 74	J A 43	J A 48	J A 25	J A 24	J A 34	J A 48	J A 26	J A 36
19	J A 73	J A 109	J A 52	J A 79	J A 50	J A 31	J A 54	J A 72	J A 111	J A 210	J A 124	J A 171	J A 93	J A 130	J A 257	J A 206	J A 109	J A 132	J A 87	J A 112	J A 84	J A 54	J A 52	J A 69
20	J A 110	J A 66	J A 53	J A 38	J A 31	J A 44	J A 31	J A 50	J A 84	J A 113	J A 97	J A 242	J A 108	J A 134	J A 79	J A 74	J A 66	J A 78	J A 55	J A 56	J A 56	J A 54	J A 52	J A 107
21	J A 88	J A 85	J A 66	J A 53	J A 38	J A 32	J A 46	J A 55	J A 86	J A 230	J A 100	47	J A 52	J A 80	J A 122	36	J A 48	32	J A 45	J A 33	24	J A 64	J A 31	J A 28
22	J A 53	J A 82	J A 52	J A 37	J A 42	J A 26	J A 53	J A 67	J A 109	J A 163	J A 98	J A 135	J A 116	J A 138	J A 137	J A 44	J A 70	J A 70	J A 55	J A 77	J A 45	J A 37	J A 66	J A 87
23	J A 52	J A 54	J A 52	J A 112	J A 105	J A 64	J A 38	J A 53	J A 58	J A 94	J A 112	J A 54	J A 52	J A 42	J A 66	J A 63	J A 52	J A 63	J A 68	J A 111	J A 53	J A 36	J A 33	J A 31
24	J A 86	J A 116	J A 140	J A 88	J A 78	J A 35	J A 132	J A 201	J A 124	J A 149	J A 141	J A 157	J A 101	J A 55	G	J A 56	J A 133	J A 103	J A 82	J A 79	J A 88	J A 54	J A 46	J A 66
25	J A 75	J A 41	J A 54	J A 99	J A 74	J A 44	J A 90	J A 54	J A 48	J A 89	J A 50	J A 47	J A 55	J A 60	J A 53	J A 42	J A 48	J A 79	J A 110	J A 73	J A 53	J A 86	J A 63	J A 46
26	J A 53	J A 53	J A 44	J A 32	J A 36	J A 35	J A 54	J A 56	J A 54	J A 46	J A 101	J A 118	J A 120	J A 93	J A 141	J A 108	J A 64	J A 89	J A 234	J A 189	J A 154	J A 120	J A 170	J A 180
27	J A 172	J A 110	J A 88	J A 54	J A 49	J A 30	J A 77	J A 100	J A 150	J A 167	J A 253	J A 222	J A 123	J A 102	J A 99	J A 70	J A 54	J A 99	J A 78	J A 102	J A 85	J A 86	J A 77	J A 122
28	J A 80	J A 42	J A 54	J A 35	22	J A 24	J A 46	J A 83	J A 100	J A 156	J A 168	J A 110	J A 96	J A 108	J A 59	J A 54	J A 46	J A 40	J A 65	J A 109	J A 85	J A 54	J A 136	J A 42
29	J A 53	J A 64	J A 53	J A 73	J A 83	J A 34	J A 52	J A 87	J A 166	J A 90	J A 115	J A 108	J A 81	J A 48	J A 55	J A 72	J A 38	J A 60	J A 39	J A 80	J A 21	J A 30	J A 44	J A 77
30	J A 46	J A 30	J A 22	J A 25	J A 21	J A 40	J A 52	J A 50	J A 99	J A 109	J A 90	J A 80	J A 59	J A 75	J A 67	J A 82	J A 100	J A 54	J A 60	J A 109	J A 100	J A 56	J A 48	J A 63
31	J A 36	J A 34	J A 38	J A 66	J A 29	J A 29	J A 63	J A 54	J A 90	J A 191	J A 74	J A 59	J A 83	J A 79	J A 90	J A 51	J A 47	J A 57	J A 46	J A 66	J A 32	J A 29	J A 78	J A 55
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 52	J A 53	J A 52	J A 50	J A 40	J A 31	J A 46	J A 56	J A 90	J A 109	J A 112	J A 110	J A 93	J A 80	J A 67	J A 60	J A 52	J A 60	J A 60	J A 73	J A 53	J A 54	J A 53	J A 53
U Q	J A 75	J A 82	J A 54	J A 54	J A 55	J A 39	J A 54	J A 86	J A 124	J A 156	J A 155	J A 156	J A 116	J A 108	J A 99	J A 79	J A 86	J A 79	J A 82	J A 89	J A 85	J A 64	J A 70	J A 77
L Q	J A 46	J A 41	J A 44	J A 32	25	J A 27	38	J A 50	J A 58	J A 72	J A 80	J A 59	J A 59	J A 55	53	44	J A 45	44	J A 39	J A 35	J A 32	J A 36	J A 46	J A 46

JUL. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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 87	A A 97	A A 108	23	22	28	A A 50	A A 71	46	44	A A 130	A A 89	A A 82	38	34	32	32	A A 70	26	34	36	21	23	28
2	23	A A 82	A A 55	26	19	21	38	A A 57	A A 82	A A 86	51	A A 75	47	A A 67	39	38	34	32	A A 85	A A 59	22	22	21	E B 16
3	22	E B 16	20	18	18	21	28	36	A A 133	53	54	A A 114	A A 90	A A 162	A A 92	44	A A 73	A A 65	40	A A 78	30	30	30	22
4	22	E B 15	E B 16	22	22	30	A A 35	38	A A 64	A A 75	A A 104	A A 135	A A 154	39	44	41	44	A A 49	26	33	E B 16	20	26	A A 54
5	24	19	E B 15	E B 16	E B 16	21	30	44	42	44	A A 110	46	A A 78	A A 98	43	G	32	33	A A 49	33	24	19	E B 16	20
6	22	20	18	25	21	18	32	A A 57	A A 65	A A 84	42	A A 48	A A 139	A A 43	G	36	33	34	24	21	20	23	22	24
7	A A 67	E B 15	19	21	21	22	28	A A 86	44	37	A A 46	37	A A 84	A A 88	38	39	36	31	25	20	E B 15	18	21	E B 16
8	E B 16	E B 15	18	E B 16	E B 16	G	26	G	33	36	47	A A 69	A A 58	40	36	37	37	27	31	36	22	22	E B 16	18
9	22	25	20	16	E B 16	21	33	38	41	47	A A 165	40	A A 98	44	A A 109	A A 98	A A 107	A A 112	43	A A 146	A A 88	34	37	30
10	19	E B 16	E B 16	E B 16	E B 15	19	34	39	34	43	A A 78	A A 178	A A 75	A A 90	A A 84	49	A A 86	53	48	20	19	18	E B 16	33
11	19	21	E B 16	E B 16	18	24	A A 54	A A 76	A A 130	50	A A 165	A A 114	A A 127	A A 77	A A 87	46	A A 113	G	22	27	22	20	19	22
12	23	18	22	A A 54	23	24	A A 135	A A 102	A A 200	A A 109	A A 199	A A 143	50	A A 84	A A 211	A A 150	33	A A 135	A A 111	A A 72	19	36	23	A A 55
13	A A 54	A A 52	A A 66	A A 54	A A 66	33	A A 74	A A 89	A A 99	A A 229	52	A A 156	39	39	A A 104	42	33	28	23	17	E B 16	24	30	29
14	19	23	21	22	A A 66	32	41	A A 150	A A 196	A A 192	A A 259	A A 167	38	G	39	36	38	A A 84	23	26	19	21	19	20
15	23	27	24	19	16	24	A A 44	32	44	A A 148	A A 114	A A 152	A A 115	A A 74	40	45	32	29	30	A A 74	A A 72	E B 16	38	A A 85
16	26	21	A A 53	24	21	20	A A 45	39	A A 108	A A 107	80	A A 79	A A 127	A A 110	A A 73	A A 60	A A 108	A A 63	A A 72	48	20	44	24	22
17	21	20	22	24	E B 15	20	31	A A 136	A A 107	A A 141	A A 54	43	39	A A 77	36	A A 44	32	46	46	41	21	39	A A 52	A A 86
18	23	A A 152	E B 15	E B 16	E B 15	18	24	33	40	46	A A 155	A A 162	A A 207	A A 171	43	A A 74	38	30	22	19	21	25	22	23
19	31	A A 109	18	23	18	21	A A 54	A A 72	A A 111	A A 210	A A 124	A A 171	A A 93	A A 130	A A 257	A A 206	A A 109	A A 132	A A 87	A A 112	38	29	34	24
20	E B 15	21	A A 53	22	E B 15	25	28	38	A A 84	A A 113	A A 97	A A 242	A A 108	A A 134	A A 79	46	43	42	25	A A 56	44	36	23	A A 107
21	26	32	A A 66	A A 53	19	25	29	A A 55	44	A A 230	A A 100	43	39	A A 80	A A 122	34	39	29	38	22	21	20	22	20
22	24	22	22	24	19	19	A A 53	A A 67	A A 109	A A 163	A A 98	A A 135	A A 116	A A 138	A A 137	35	A A 70	40	42	22	24	30	20	A A 87
23	E B 16	20	22	20	21	A A 64	27	39	46	A A 94	A A 112	A A 54	A A 52	39	A A 66	A A 63	40	36	40	23	23	23	19	19
24	17	A A 116	A A 140	18	17	18	34	A A 201	A A 124	A A 149	A A 141	A A 157	A A 101	A A 55	G	46	44	31	37	25	37	40	37	A A 66
25	20	20	17	A A 99	21	22	38	50	41	A A 89	37	40	A A 55	A A 60	51	38	37	39	A A 110	38	23	40	34	33
26	29	27	23	18	E B 16	28	50	A A 56	44	A A 46	A A 101	A A 118	A A 120	A A 93	A A 141	A A 108	A A 64	39	23	38	A A 154	37	A A 170	A A 180
27	A A 172	A A 110	22	A A 54	20	20	A A 77	A A 100	A A 150	45	A A 253	A A 222	A A 123	A A 102	A A 99	A A 70	33	A A 99	A A 78	50	23	A A 86	A A 77	A A 122
28	A A 80	A A 42	A A 54	17	E B 16	E B 16	34	A A 83	A A 100	A A 156	A A 168	A A 110	A A 96	A A 108	A A 59	A A 54	44	31	A A 65	50	A A 85	25	22	23
29	23	E B 16	20	A A 73	E B 15	A A 34	A A 52	A A 87	A A 166	A A 90	A A 115	A A 108	A A 81	44	A A 55	46	31	39	34	26	E B 16	20	22	34
30	24	E B 16	E B 16	E B 16	E B 16	20	25	41	45	A A 109	A A 90	A A 80	41	A A 75	A A 67	42	A A 100	30	32	27	24	23	29	A A 63
31	22	20	22	19	E B 16	22	A A 63	40	A A 90	A A 191	A A 74	52	A A 83	A A 79	A A 90	44	42	A A 57	37	21	E B 16	23	19	20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	23	21	22	22	18	21	35	A A 56	A A 82	A A 90	A A 101	A A 110	A A 84	A A 77	A A 66	44	39	39	37	33	22	23	23	28
U Q	A A 26	A A 42	A A 53	A A 25	21	25	A A 52	A A 86	A A 111	A A 149	A A 141	A A 156	A A 116	A A 102	A A 99	A A 60	A A 70	A A 63	A A 49	A A 50	36	36	34	A A 63
L Q	20	E B 18	E B 18	E B 17	E B 16	20	29	39	44	46	54	52	52	44	39	38	33	31	25	22	E B 19	20	20	20

JUL. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

JUL. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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	A	312	331	317	A	A	345	345	A	A	A	307	288	304	299	A	313	327	F	F	F	F
2	F	A	A	327	336	380	322	A	A	A	350	A	364	A	295	324	303	318	A	A	314	326	F	F
3	F	F	F	F	F	331	316	304	A	349	351	A	A	A	A	299	A	A	336	A	334	F	F	317
4	337	329	F	F	341	377	A	376	A	A	A	A	A	323	310	302	325	A	340	325	315	308	F	A
5	F	F	330	F	F	306	328	351	359	358	A	334	A	A	310	336	326	350	A	324	325	353	308	316
6	312	290	318	320	304	364	364	A	A	A	384	A	A	A	295	294	304	336	360	356	318	298	F	F
7	A	F	F	319	F	339	343	A	350	391	A	R	A	A	302	317	279	320	300	312	363	364	292	F
8	306	299	296	F	306	346	339	373	333	346	294	A	A	282	325	319	325	313	329	310	321	317	F	F
9	F	302	300	342	F	369	350	353	302	333	A	281	A	319	A	A	A	A	322	A	A	358	326	337
10	332	329	321	298	325	333	315	290	366	376	A	A	A	A	A	309	A	339	332	318	330	354	338	368
11	338	F	F	F	F	322	A	A	A	349	A	A	A	A	A	311	A	329	300	301	307	311	F	F
12	F	F	310	A	315	327	A	A	A	A	A	A	336	A	A	A	293	A	A	A	328	356	F	A
13	A	A	A	A	A	334	A	A	A	A	342	A	B 283	281	A	306	339	329	326	344	313	299	F	333
14	313	291	290	301	A	302	317	A	A	A	A	A	288	280	296	319	347	A	344	352	299	300	F	F
15	F	315	323	315	322	356	A	308	298	A	A	A	A	A	295	306	310	345	334	A	A	329	F	A
16	F	333	A	310	338	354	A	338	A	A	A	A	A	A	A	A	A	A	A	323	326	339	F	F
17	321	327	325	322	366	336	380	A	A	A	A	325	302	A	285	A	254	305	305	330	341	328	A	A
18	F	A	315	342	F	381	367	332	353	356	A	A	A	A	315	A	326	328	328	329	341	303	F	319
19	297	A	F	335	299	360	A	A	A	A	A	A	A	A	A	A	A	A	A	A	322	333	351	315
20	334	307	A	281	F	332	341	365	A	A	A	A	A	A	A	327	331	314	245	A	345	310	320	A
21	335	316	A	A	F	342	266	A	357	A	A	346	320	A	A	316	297	339	330	309	352	F	309	287
22	306	304	F	F	316	352	A	A	A	A	A	A	A	A	A	317	A	309	326	332	331	323	316	A
23	311	287	322	339	313	A	343	337	355	A	A	A	A	306	A	A	335	347	311	339	F	369	313	302
24	F	A	A	F	329	371	318	A	A	A	A	A	A	A	284	328	368	314	328	331	F	F	F	A
25	277	F	F	A	F	269	320	355	367	A	310	233	A	A	322	328	334	312	A	325	315	F	F	F
26	318	301	295	314	314	324	349	A	260	A	A	A	A	A	A	A	A	292	284	328	A	350	A	A
27	A	A	F	A	368	383	A	A	A	350	A	A	A	A	A	A	308	A	A	325	366	A	A	A
28	A	A	A	299	331	F	351	A	A	A	A	A	A	A	A	A	310	314	A	338	A	298	300	300
29	F	312	F	A	308	A	A	A	A	A	A	A	A	310	A	305	310	330	321	309	333	358	F	F
30	F	F	F	317	343	346	342	340	353	A	A	A	292	A	A	356	A	345	312	311	337	F	F	A
31	F	F	F	315	F	379	A	393	A	A	A	358	A	A	A	312	328	A	325	323	331	347	374	285
	00	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	15	12	18	19	28	19	14	13	10	6	6	7	8	13	21	22	21	23	24	24	24	11	11
MED	316	307	316	316	325	344	341	346	353	350	346	330	302	306	296	316	318	328	326	325	329	328	316	316
U Q	334	327	322	327	338	366	350	365	358	358	351	346	336	314	312	326	331	339	332	332	339	354	338	333
L Q	306	299	298	310	313	329	318	332	318	346	310	281	288	282	292	306	303	314	311	315	316	309	308	300

JUL. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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						A	A	A	A	A	A	A	A	UL 450	422	378	384	A	365	A				
2							A	A	A	A	A	A	A	A	418	UL 392	UL 412	392	A					
3							406	UL 361	A	A	A	A	A	A	A	A	A	A	A	A				
4						A	A	A	A	A	A	A	A	A	A	A	A	A	UL 384	A				
5						UL 332	UL 400	A	A	A	A	A	A	A	A	UL 402	379	A	A	A				
6								A	A	A	A	A	A	A	UL 422	405	UL 400	A	L					
7								A	A	427	A	411	A	A	UL 438	A	A	UL 385	369	A				
8							379	L	UL 425	456	UL 362	A	A	UL 380	UL 413	404	A	365	A	A				
9						L	A	A	A	A	A	UL 437	A	A	A	A	A	A	A	A				
10							A	A	408	A	A	A	A	A	A	A	A	A	A					
11							A	A	A	A	A	A	A	A	A	A	A	UL 371		A				
12						UL 346	A	A	A	A	A	A	A	A	A	A	401	A	A	A				
13						A	A	A	A	A	A	A	UL 434	UL 446	A	A	386	389	L					
14						A	A	A	A	A	A	A	UL 393	450	UL 370	392	A	A	L					
15							A	UL 387	A	A	A	A	A	A	A	A	UL 403	UL 393	A	A				
16							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
17							A	A	A	A	A	A	UL 432	A	434	A	384	A	A					
18								UL 394	A	A	A	A	A	A	A	A	A	389	L					
19							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
20						A	379	A	A	A	A	A	A	A	A	A	A	A	A	A				
21							UL 305	A	A	A	A	A	402	A	A	417	A	UL 386						
22							A	A	A	A	A	A	A	A	A	384	A	A	A					
23						A	373	A	A	A	A	A	A	UL 418	A	A	A	A	A					
24							UL 342	A	A	A	A	A	A	A	UL 440	A	A	368	A					
25							A	A	A	A	422	UL 448	A	A	A	A	A	A	A	A				
26							A	A	UL 381	A	A	A	A	A	A	A	A	A	L					
27							A	A	A	A	A	A	A	A	A	A	UL 320	A	A	A				
28							UL 393	A	A	A	A	A	A	A	A	A	A	UL 384	A	A				
29							A	A	A	A	A	A	A	A	A	A	UL 378	A	A					
30								A	A	A	A	A	UL 409	A	A	A	A	UL 382	359	A				
31							A	A	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	8	3	3	2	2	3	5	5	8	8	10	11	4					
MED						UL 339	379	UL 387	UL 408	442	392	UL 437	UL 409	UL 446	UL 422	397	385	UL 385	367					
U Q							UL 396	UL 394	UL 425			UL 448	UL 433	450	UL 436	404	UL 401	389	376					
L Q							UL 358	UL 361	UL 381			411	398	UL 399	UL 416	388	UL 379	371	362					

JUL. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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						E A 302	A	A	E A 282	280	A	A	A	356	410	356	380	A	326	262				
2							E A 352	A	A	A	E A 294	A	E A 282	A	416	324	352	342	A					
3							334	366	A	E A 316	E A 298	A	A	A	A	E A 368	A	A	E A 304	A				
4						234	A	238	A	A	A	A	A	324	344	356	E A 326	A	296	E A 280				
5						320	298	E A 274	E A 274	282	A	E A 340	A	A	332	268	272	240	A	E A 276				
6								A	A	A	266	A	A	A	392	366	342	276	244					
7								A	E A 290	242	A	R 400	A	A	400	348	432	306	314	270				
8							282	258	402	300	360	A	A	436	342	316	320	316	266	294				
9						272	258	E A 310	350	E A 280	A	436	A	E A 350	A	A	A	A	E A 314	A				
10							334	376	250	224	A	A	A	A	A	E A 352	A	E A 284	E A 272					
11							A	A	A	E A 290	A	A	A	A	A	E A 374	A	298		E A 276				
12						324	A	A	A	A	A	A	E A 310	A	A	A	380	A	A	A				
13						E A 338	A	A	A	A	E A 310	A	428	E A 482	A	338	278	280	294					
14						E A 390	E A 364	A	A	A	A	A	384	434	376	312	250	A	260					
15							A	354	E A 352	A	A	A	A	A	376	E A 342	342	262	E A 272	A				
16							A	318	A	A	A	A	A	A	A	A	A	A	A	E A 302				
17							222	A	A	A	A	314	352	A	400	A	516	E A 368	E A 294					
18								294	280	248	A	A	A	A	302	A	304	302	278					
19							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
20						E A 284	290	240	A	A	A	A	A	A	A	E A 318	E A 330	E A 338	E A 332	A				
21							454	A	248	A	A	292	334	A	A	330	326	264						
22							A	A	A	A	A	A	A	A	A	316	A	312	E A 286					
23						A	282	E A 248	E A 262	A	A	A	A	412	A	A	288	272	E A 316					
24							350	A	A	A	A	A	A	A	400	E A 306	E A 274	332	E A 262					
25							E A 300	E A 252	232	A	378	488	A	A	E A 322	252	282	320	A	274				
26							234	A	472	A	A	A	A	A	A	A	A	E A 398	384					
27							A	A	A	274	A	A	A	A	A	A	326	A	A	E A 268				
28							326	A	A	A	A	A	A	A	A	A	E A 332	322	A	E A 282				
29							A	A	A	A	A	A	A	E A 352	A	392	304	E A 298	E A 272					
30								270	E A 262	A	A	A	398	A	A	272	A	284	322	E A 246				
31							A	242	A	A	A	E A 260	A	A	A	E A 368	326	A	E A 280					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						8	15	14	13	10	6	7	7	8	13	21	22	21	21	11				
MED						U 294	295	264	271	270	300	340	352	U 369	376	U 327	324	293	E A 294	E A 276				
U Q						E A 331	350	318	351	E A 290	360	436	398	435	400	361	342	327	315	E A 282				
L Q						278	282	248	256	248	294	292	E A 310	E A 351	337	314	288	278	272	E A 268				

JUL. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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	A	E A 284	E A 266	A	A	A	A	A	A	A	A	188	194	188	216	A	212	A	E A 270	220	E A 250	E A 282
2	E A 286	A	A	E A 242	204	204	A	A	A	A	A	A	A	A	190	210	202	204	A	A	230	E A 236	E A 262	228
3	E A 294	234	E A 324	E A 240	E A 260	212	200	E A 266	A	A	A	A	A	A	A	A	A	A	A	A	234	E A 264	E A 310	E A 238
4	262	230	E B 252	E A 278	234	A	A	A	A	A	A	A	A	A	A	A	A	A	212	A	234	E A 270	E A 258	A
5	E A 294	E A 238	218	210	214	E A 242	212	A	A	A	A	A	A	A	A	202	204	A	A	A	E A 236	206	E B 234	E A 248
6	E A 254	E A 296	E A 242	E A 278	E A 292	226	210	A	A	A	A	A	A	A	214	206	210	A	210	206	220	E A 242	E A 298	E A 310
7	A	E B 256	E A 282	E A 276	E A 276	222	216	A	A	202	A	186	A	A	200	A	A	212	212	A	200	192	E A 246	E B 258
8	E B 270	E B 264	E A 266	E B 262	E B 240	212	204	186	218	184	212	A	A	218	190	200	A	192	A	A	226	218	232	228
9	E A 232	E A 298	E A 276	224	E B 256	220	A	A	A	A	A	200	A	A	A	A	A	A	A	A	A	212	E A 276	E A 278
10	226	224	E B 236	E B 268	E B 240	220	A	A	192	A	A	A	A	A	A	A	A	A	A	236	218	208	192	E A 260
11	E A 238	E A 276	E B 256	E B 246	222	E A 242	A	A	A	A	A	A	A	A	A	A	A	202	204	A	E A 240	220	220	E A 296
12	E A 272	E A 244	E A 266	A	E A 284	230	A	A	A	A	A	A	A	A	A	A	202	A	A	A	222	198	E A 304	A
13	A	A	A	A	A	A	A	A	A	A	A	A	188	198	A	A	208	202	208	230	216	E A 260	E A 260	E A 252
14	E A 274	E A 292	E A 318	E A 284	A	A	A	A	A	A	A	A	180	176	234	216	A	A	204	228	E A 246	E A 288	E A 258	E A 280
15	E A 274	E A 284	E A 274	E A 252	E B 240	214	A	208	A	A	A	A	A	A	A	A	200	200	A	A	A	E B 258	E A 310	A
16	E A 290	E A 300	A	E A 282	E A 270	226	A	A	A	A	A	A	A	A	A	A	A	A	A	A	216	E A 268	222	212
17	E A 260	E A 258	E A 256	E A 250	218	E A 240	A	A	A	A	A	A	188	A	198	A	214	A	A	E A 262	224	E A 318	A	A
18	E A 270	A	E B 240	224	216	202	200	208	A	A	A	A	A	A	A	A	A	206	210	224	218	E A 252	E A 228	E B 292
19	E A 310	A	210	216	E A 286	232	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 286	228	E A 252	E A 288
20	E A 236	E A 294	A	E A 388	E B 258	A	212	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 274	E A 268	224	A
21	E A 282	E A 300	A	A	E A 284	226	E A 298	A	A	A	A	A	206	A	A	204	A	202	E A 246	242	212	E A 256	232	E A 256
22	E A 308	E A 284	E A 286	E A 240	224	232	A	A	A	A	A	A	A	A	A	204	A	A	A	202	216	E A 266	E A 240	A
23	E B 276	E A 292	E A 306	E A 288	E A 346	A	218	A	A	A	A	A	A	214	A	A	A	A	A	232	210	200	E A 280	E A 270
24	E A 288	A	A	E A 240	230	220	E A 270	A	A	A	A	A	A	A	186	A	A	E A 256	A	220	E A 294	E A 264	E A 250	A
25	E A 254	E A 282	E A 246	A	E A 310	E A 420	A	A	A	A	184	194	A	A	A	A	A	A	A	A	E A 248	E A 244	E A 266	E A 284
26	E A 274	E A 280	E A 296	E A 272	E B 252	E A 316	A	A	E A 238	A	A	A	A	A	A	A	A	A	E A 322	E A 246	A	E A 296	A	A
27	A	A	E A 286	A	232	188	A	A	A	A	A	A	A	A	A	A	E A 310	A	A	A	206	A	A	A
28	A	A	A	E A 314	E B 248	190	202	A	A	A	A	A	A	A	A	A	A	222	A	A	A	E A 290	E A 278	E A 292
29	E A 284	E B 248	E A 258	A	E B 274	A	A	A	A	A	A	A	A	A	A	A	206	A	A	E A 256	210	200	236	E A 292
30	E A 274	E B 246	230	E B 234	212	218	204	A	A	A	A	A	206	A	A	A	A	222	212	A	216	216	224	A
31	E A 246	E A 278	E A 280	E A 262	E B 270	220	A	A	A	A	A	A	A	A	A	A	A	A	A	232	216	214	196	E A 310
	00	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	23	23	25	29	24	12	4	3	2	2	3	5	5	8	8	10	11	11	13	27	30	28	21
MED	E A 274	E A 278	E A 266	E A 262	E 252	218	208	202	U 205	193	198	194	188	198	196	204	206	203	211	228	219	E A 243	E A 250	E A 278
U Q	E A 286	E A 292	E A 286	E A 280	E A 275	E A 232	217	237	E A 238			200	206	216	207	208	214	222	E A 212	E A 244	E A 240	E A 266	E A 271	E A 292
L Q	E A 254	246	242	240	227	213	203	197	192			186	184	182	190	201	202	202	208	222	216	214	230	250

JUL. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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						B	A	A	A	A	A	A	A	A	A	A	112	A	A	B				
2						B	110	A	A	A	A	A	A	A	A	A	A	A	A					
3						116	116	110	A	A	A	A	A	A	A	A	A	A	B	B				
4						A	114	116	110	A	A	A	A	A	A	A	A	A	A	B				
5						A	108	108	A	A	A	A	A	A	A	110	A	A	A	B				
6						A	108	A	A	A	A	A	A	A	110	A	A	A	A	B				
7						A	112	A	A	A	A	112	A	A	114	114	A	A	A	B				
8						118	A	118	114	110	A	A	A	A	112	A	A	112	114	B				
9						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
11						B	A	A	A	A	A	A	A	A	A	108	A	110	110	B				
12						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
13						B	A	A	A	A	A	A	A	106	A	A	A	A	B	B				
14						B	A	A	A	A	A	A	A	112	112	110	110	A	A	B				
15						B	116	116	A	A	A	A	A	A	A	A	A	108	A	B				
16							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
17						B	A	A	A	A	A	A	A	A	112	112	110	A	A					
18						B	114	A	A	A	A	A	A	A	A	A	A	A	A	B				
19						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
20						B	114	A	A	A	A	A	A	A	A	A	A	A	A	B				
21						B	A	A	A	A	A	A	A	A	A	112	A	112	A					
22						B	A	A	A	A	A	A	A	A	A	A	110	A	A					
23						B	A	A	A	A	A	A	A	112	112	A	A	A	A	B				
24						B	A	A	A	A	A	A	A	A	110	A	A	A	B	B				
25							A	A	A	A	A	A	A	106	A	106	108	A	B	B				
26							A	A	A	A	A	A	A	A	A	A	A	A	B					
27						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
28							A	A	A	A	A	A	A	A	A	A	A	A	B	B				
29							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
30							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
31							A	A	A	A	A	A	A	A	A	A	A	A	A	B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	9	5	2	1		1		4	7	7	5	4	2					
MED						117	114	116	112	110		112		109	112	110	110	111	112					
U Q							115	117						112	112	112	111	112						
L Q							109	109						106	110	108	109	109						

JUL. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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	88	88	88	88	88	88	98	98	98	92	92	90	88	92	90	90	112	90	92	90	96	96	92	90
2	92	92	86	86	86	118	110	96	98	96	90	94	96	96	90	98	106	104	90	90	90	88	96	98
3	90	92	84	90	82	112	120	116	92	92	90	90	90	90	90	90	90	88	88	96	108	106	106	96
4	96	96	96	92	92	92	128	118	114	92	92	86	86	94	92	88	88	104	106	98	104	104	104	96
5	90	90	88	B	118	118	116	110	102	102	100	100	98	92	94	G	90	90	84	84	84	82	94	94
6	94	94	90	90	90	98	122	102	102	102	102	104	98	100	G	100	108	98	102	108	96	96	100	96
7	92	92	90	90	84	86	116	96	94	102	102	108	94	102	116	112	104	104	104	94	100	100	92	92
8	94	88	100	100	92	G	102	G	112	120	102	102	108	108	106	96	96	118	108	98	94	94	94	92
9	92	92	92	92	92	94	106	100	100	96	100	102	102	98	96	98	92	92	92	84	86	86	86	86
10	86	86	86	94	108	104	102	98	98	98	96	92	92	92	88	88	88	88	86	100	84	86	100	100
11	92	92	92	94	94	122	106	100	96	96	90	94	94	94	108	106	96	G	114	88	88	88	92	92
12	86	86	84	84	84	104	100	96	94	92	92	94	96	96	82	88	104	96	96	96	96	96	96	96
13	96	88	88	88	84	84	102	98	92	90	90	90	96	116	96	96	100	100	100	100	98	88	90	86
14	84	84	84	84	92	98	98	90	86	88	86	88	98	G	116	120	116	94	100	96	96	96	94	92
15	92	92	88	84	82	106	120	114	102	88	92	92	88	94	98	92	92	110	106	96	98	98	98	96
16	94	94	94	90	90	100	104	102	90	90	90	90	90	86	86	96	96	96	94	94	94	94	94	94
17	94	84	82	82	104	116	106	104	98	96	102	104	98	94	114	126	148	106	98	98	102	98	98	98
18	88	92	92	92	88	88	112	100	100	100	100	90	86	92	100	98	98	98	94	92	92	86	92	84
19	94	94	94	94	94	114	112	102	100	96	96	94	98	96	90	92	86	88	86	84	90	90	90	90
20	96	96	96	86	90	102	122	104	98	96	96	94	94	94	92	92	102	98	96	96	96	96	96	92
21	92	88	88	88	88	108	102	100	100	86	88	96	102	100	94	126	102	114	104	104	96	94	98	98
22	90	90	90	90	90	104	102	102	100	90	94	92	88	92	88	88	114	84	84	96	88	88	90	94
23	94	92	92	86	92	92	104	104	96	88	88	96	104	114	114	100	98	92	90	90	86	86	86	86
24	104	102	94	94	94	96	88	88	92	86	88	86	86	96	G	104	92	98	98	88	88	88	88	88
25	88	88	106	102	100	98	98	98	96	96	96	96	104	118	102	120	112	102	98	98	96	100	96	92
26	92	90	86	86	90	92	98	98	98	96	96	86	86	86	86	86	98	98	98	94	96	94	94	92
27	86	86	88	86	86	84	98	92	94	92	88	88	88	88	88	94	102	92	92	92	100	92	98	92
28	88	88	88	82	82	92	102	94	94	90	90	90	90	90	98	106	102	102	98	88	86	86	86	98
29	94	86	86	86	88	108	106	96	94	94	94	92	92	98	96	94	90	90	90	90	90	90	90	90
30	82	88	88	86	92	92	96	96	96	96	96	90	90	90	86	88	88	94	94	88	88	88	88	86
31	92	82	82	86	96	104	104	98	98	92	98	90	90	90	86	88	88	88	88	86	86	86	86	86
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	30	31	30	31	30	31	31	31	31	31	30	29	30	31	30	31	31	31	31	31	31
MED	92	90	88	88	90	99	104	99	98	94	94	92	94	94	94	96	98	97	96	94	94	92	94	92
U Q	94	92	92	92	94	108	112	102	100	96	98	96	98	98	101	104	104	102	100	98	96	96	98	96
L Q	88	88	86	86	86	92	100	96	94	90	90	90	88	92	88	90	90	90	90	88	88	88	90	90

JUL. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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	F9	F6	F4	F4	F4	L5	L4	L6	L3	L3	L4	L4	L4	L2	L2	L2	C2	L4	L3	L5	F5	F5	F5	F7
2	F5	F6	F7	F6	F4	C2	C5	L4	L5	L6	L3	L3	L2	L3	L2	L2	L1	L2	L6	F5	F5	F4	F4	F4
3	F5	F4	F6	F4	F3	CL22	C2	C3	L4	L4	L4	L4	L3	L3	L4	L2	L3	L3	L3	LL34	FF23	F5	F6	F7
4	F5	F3	F4	F5	F5	L4	CL32	CL22	C4	L4	L4	L4	L4	L2	L2	L2	L3	L3	L6	L4	F2	F6	F7	F8
5	F5	F5	F2		F2	L5	C2	C3	L2	L2	L4	L2	L4	L4	L2		L2	L3	L5	L6	F6	F3	F2	F5
6	F6	F5	F3	F5	F4	L3	C3	L4	L3	L3	L2	L2	L4	L2		L1	L2	L3	L3	L3	F3	F5	F7	F6
7	F8	F3	F6	F4	F5	L3	C2	L6	L3	L2	L2	L1	L4	L4	C2	C2	L2	L3	L3	L3	F3	F3	F5	F2
8	F2	F2	F3	FF22	F2		L2		C1	C1	L2	L3	L2	L2	C1	L2	L3	C2	C4	L5	F5	F4	F3	F3
9	F5	F6	F5	F5	F2	L5	L5	L3	F4	L3	L3	L2	L3	L3	L4	L4	L3	L3	L5	L5	F5	F5	F6	F7
10	F3	F3	F2	F2	F2	L3	L4	L3	L2	L3	L4	L5	L4	L4	L4	L4	L6	L5	L4	L2	F4	F3	F3	F5
11	F5	F4	F2	F3	F3	C3	L4	L4	L5	L4	L4	L3	L4	L2	L3	C2	L3		C2	L3	F3	F3	F4	F5
12	F5	F3	F4	F3	F2	L4	L6	L4	L4	L4	L4	L5	L4	L3	L5	L5	L3	L5	L5	L6	F3	F4	F3	F7
13	F6	F5	F5	F5	F5	L3	L6	L6	L5	L5	L4	L4	L3	C1	L3	L2	L2	L2	L3	L3	F1	F4	F6	F5
14	F5	F5	F4	F2	F4	L7	L6	L5	L5	L5	L4	L4	L1		C1	C1	C2	L4	L3	L4	F5	F5	F5	F5
15	F4	F7	F3	F2	F2	L3	C3	C2	L2	L4	L4	L4	L4	L3	L2	L3	L2	C3	L5	L6	F7	F5	F7	F5
16	F4	F5	F5	F4	F3	L2	L3	L3	L4	L4	L4	L3	L3	L4	L3	L3	L4	L4	L6	L6	F4	F5	F7	F5
17	F2	F2	F4	F4	F2	C3	L3	L4	L4	L3	L3	L2	L1	L3	C1	C2	H1	L4	L5	F4	F4	F6	F7	F7
18	F6	F5	F2	F4	F4	L2	C2	L2	L2	L2	L4	L5	L4	L4	L2	L3	L2	L2	L3	L2	F3	F3	F4	F6
19	F8	F5	F5	F4	F5	L2	L5	L4	L5	L5	L4	L5	L4	L5	L4	L6	L5	L5	L5	L5	F6	F5	F7	F5
20	F5	F6	F5	F7	F2	L4	C2	L3	L3	L3	L3	L3	L4	L5	L4	L3	L3	L3	L3	L4	F5	F7	F5	F6
21	F6	F5	F5	F5	F5	L4	L3	L4	L3	L5	L5	L2	L2	L3	L3	C1	L2	C1	L6	L4	F3	F5	F4	F6
22	F5	F4	F3	F8	F8	L3	L4	L3	L4	L5	L3	L3	L4	L3	L3	L2	CL22	L2	L4	L4	F6	F5	F4	F5
23	F2	F2	F3	F4	F5	F3	L4	L4	L2	L4	L4	L3	L2	C1	C3	L3	L3	L4	L4	L4	F5	F7	F2	F2
24	F4	F5	F6	F4	F3	L4	L3	L4	L3	L3	L3	L4	L3	L2		L2	L4	L4	L5	L5	F5	F7	F6	F5
25	F4	F5	F4	F5	F6	L5	L5	L3	L2	L2	L2	L1	L3	C3	L3	C2	C2	L3	L5	L4	F5	F7	F6	F6
26	F5	F6	F7	F4	F2	L5	L5	L3	L3	L3	L2	L4	L4	L4	L4	L5	L3	L4	L4	L4	F7	F6	F7	F5
27	F5	F5	F5	F5	F5	L3	L5	L4	L4	L4	L4	L4	L4	L4	L3	L3	L2	L3	L4	L5	F3	F5	F7	F5
28	F4	F4	F4	F3	F2	L1	L2	L4	L5	L6	L6	L3	L3	L4	L3	L2	L2	L3	L3	L4	F4	F5	F6	F4
29	F6	F4	F2	FF43	F4	L4	L5	L5	L5	L4	L4	L4	L3	L2	L2	L2	L2	L4	L3	L4	F7	F4	F4	F6
30	F6	F2	F2	F2	F1	L3	L3	L3	L3	L4	L2	L3	L2	L3	L4	L3	L5	L3	L5	L8	F4	F6	F6	F5
31	F3	F5	F3	F2	F2	CL32	L4	L4	L3	L4	L3	L3	L3	L3	L4	L3	L3	L4	L5	L4	F4	F4	F2	F4
	00	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																								

JUL. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	42	X 37	X 32	X 32	X 29		X 44														X 66	A	A	48
2	54	52	52	X 42	A																X 65	X 60	X 50	X 41
3	42	40	38	X 32	X 32																X 71	X 48	X 43	X 43
4	41	A	A	38	40																X 69	X 70	58	51
5	48	A	44	39	X 30													X 64			X 67	X 52	X 46	45
6	45	40	40	39	39	35															A	A	X 48	X 48
7	X 44	X 41	X 39	40	40																X 76	X 59	X 44	X 44
8	48	X 44	X 44	X 42	X 36	37															X 58	X 54	X 47	A
9	47	43	43	38	38																X 82	X 79	X 66	56
10	48	X 44	46	46	40																X 74	X 68	X 59	X 47
11	X 42	43	40	40	36	32															X 72	X 83	X 44	46
12	47	47	46	46	43	40															X 82	X 66	X 51	X 44
13	48	48	45	42	41	40															X 66	X 68	X 58	A
14	40	X 37	40	40	39	39															O X 41	X 45	X 45	X 54
15	X 40	43	X 39	39	39																X 53	X 43	X 43	A
16	A	A	A	A	A																A	A	A	42
17	A	52	46	46	X 37	36															X 73	X 54	A	A
18	A	A	A	A	36																X 69	X 63	X 51	X 48
19	X 48	48	41	40	42	38															X 55	X 59	X 52	X 44
20	46	A	A	A	39																A	A	A	A
21	A	56	51	43	39	36															X 73	X 58	X 53	X 50
22	44	X 45	48	X 43	X 42	35														X 85	X 60	A	47	X 45
23	39	A	46	38	37	37														X 70	X 64	53	X 38	42
24	40	40	X 36	A	A	A															X 70	X 66	X 54	X 52
25	X 50	X 43	42	40	X 39	41															A	X 65	X 64	X 58
26	58	A	44	X 38	X 36	X 36	X 54	X 54													X 50	A	A	A
27	X 39	A	A	A	38	A															X 72	X 41	A	X 36
28	X 35	38	X 33	34	34	X 28															A	X 54	47	44
29	43	41	A	A	X 31	A														A	X 64	X 64	X 52	X 51
30	X 50	X 48	49	X 45	X 35	X 33														X 70	X 79	X 59	X 50	49
31	X 44	41	X 38	X 38	X 37	41														X 68	A	X 60	X 48	X 46
	00	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	23	25	25	28	16	2	1										1		4	25	25	25	25
MED	44	43	43	40	38	36	X 49	X 54										X 64		X 70	X 69	X 59	X 50	X 46
U Q	48	48	46	42	40	40														X 78	X 73	X 66	X 54	X 50
L Q	41	40	X 39	38	X 36	35														X 69	X 62	X 54	X 46	X 44

JUL. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

JUL. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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								A	A	A	A	A	A	UL 432	432	412	400	392	348	L				
2							A	A A	A	A	A	A	A	436	A	A	A	A	UL 356	A				
3								UL 372	A	A	A	A	A	A	A	416	396	364	340	A				
4								A A	A	UL 408	UL 432	UL 432	A	A	432	428	400	384	352	A				
5									A	A	A	A	436	428	424	A	A		A	A				
6								A	A	A	A	A	A	A	A	400	388	A	A	A				
7								A	A		A	428	444	436	UL 436	420	UL 416	A	408	A				
8									UL 408	A	UL 432	UL 432	UL 432	440	UL 440	424	408	388	UL 364	L				
9								A	A	A	A	A	A	A	A	A	412	A	A	A				
10							UL 328	372	A	A	A	436	A	A	A	A	A	A	A	A				
11								A	400	A	A	A	A	A	A	A	400	A	A	L				
12								A	UL 408	432	444	UL 444	UL 444	A	A	420	A	A	A	L				
13								A	A	A	432	444	444	UL 444	UL 444	A	408	A	A					
14								UL 400	A	A	UL 428	444	UL 452	UL 444	UL 432	424	400	396	UL 324					
15							A	A	A	A	A	A	A	UL 420	A	A	A	A	A					
16								A A	A	A	A	A	A	A	A	A	A	A	A	A				
17								A A	A	416	A	A	A	A	A	424	UL 380	A	A	A				
18							A	A	A	A	UL 416	440	A	A	A	A	A	380	356	L				
19								A	A	A	A	A	A	A	A	A	A	A	A	A				
20								A	A	A	A	A	A	A	A	A	A	A	A					
21								A UL 372	A	A	A	A	A	448	436	416	A	A	A					
22								UL 364	UL 396	UL 420	UL 420	UL 428	428	428	424	A	A	A	A					
23								L	L	UL 412	A	432	A	A	428	A	A	380	328					
24								L UL 352	A	A	A		A	A	432	A	A	368	UL 340					
25								A A	UL 424	A	UL 440	UL 436	424	428	A	A	UL 408	A	A					
26									A	A	A	A	A	A	A	A	A	A	A	A				
27								UL 356	A	A	A	A	A	A	A	A	A	360	A					
28								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					
30								L		A	416	A	UL 444	A	A	A	A	A	A					
31									A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	7	5	5	9	11	9	11	11	10	12	9	10					
MED							UL 328	UL 372	UL 408	UL 416	UL 432	436	444	436	432	420	400	380	350					
U Q								UL 372	UL 416	426	UL 436	444	UL 444	UL 444	UL 436	424	408	390	UL 356					
L Q								UL 356	398	UL 410	UL 418	432	430	428	428	416	398	366	340					

JUL. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	R	U R 304	A	U A 228	B				
2						B	B	A	A	A	A	A	A	A	A	A	A	A	U A 240	B				
3						B	U A 204	A	A	A	A	A	A	A	A	A	U A 304	U A 280	A	B				
4						B	B	A	A	A	A	A	A	A	A	344	300	U A 260	A	B				
5						B	U R 224	A	A	A	A	A	A	A	A	A	A		A	A				
6						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
7						B	B	A	A	A	A	A	A	A	A	U A 324	A	A	B	B				
8						B	B	U A 236	A	A	A	A	A	A	U R 356	U A 328	U R 304	U R 292	U R 224	B				
9						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
11						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
12						B	B	A	A	A	A	A	A	A	A	U A 324	A	A	A	B				
13						B	B	A	A	A	A	A	A	A	A	A	A	A	A	B				
14						B	A	A	A	A	R	A	A	A	A	A	U A 304	A	U R 240	B				
15						R	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
16						B	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	U R 316	A	A	B				
18						B	B	A	A	A	A	U A 444	A	A	A	A	A	A	A	B				
19						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B 444				
20						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
21							B	A	A	A	A	A	A	A	U A 348	A	A	A	B	B				
22							B	A	A	A	A	A	A	A	U A 332	A	A	A	A					
23							B	A	A	A	A	A	A	A	A	A	A	A	A					
24							B	U A 248	A	A	A	A	A	A	A	A	A	A	B	248				
25							B	A	A	A	A	A	A	U A 348	A	A	A	A	A	B				
26									A	A	A	A	A	A	A	A	A	A	A	B				
27							B	A	A	A	A	A	A	A	A	A	A	A	A	B				
28							B	A	A	A	A	A	A	A	A	A	A	A	A	B				
29							B	A	A	A	A	A	A	A	A	A	A	A	A					
30							U R 196	A	A	A	A	A	A	A	A	A	A	A	A					
31							B	A	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	2				1		1	3	4	6	3	4	2				
MED							U R 204	U A 242				U A 444		U A 348	U A 348	U A 326	U 304	U A 280	U 234	346				
U Q							U R 224								U R 356	336	U R 304	U R 292	U 240					
L Q							U R 196								U A 332	U A 324	304	U A 260	U 226					

JUL. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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 34	J A 78	J A 40	J A 38	J A 50	J A 71	J A 34	J A 54	J A 112	J A 93	J A 84	J A 58	J A 68	J A 40	42	G	G	J A 35	31	22	J A 25	J A 77	J A 80	J A 32
2	J A 35	J A 33	J A 33	J A 31	J A 55	J A 51	J A 50	J A 43	J A 55	J A 67	J A 86	J A 112	J A 89	J A 106	J A 81	J A 57	J A 58	J A 69	30	J A 58	J A 39	J A 35	J A 26	J A 36
3	J A 27	J A 42	J A 41	J A 53	J A 22	J A 27	26	34	J A 52	J A 83	J A 89	J A 83	J A 59	J A 156	J A 53	J A 50	35	32	J A 36	J A 49	J A 41	J A 54	J A 54	J A 48
4	J A 50	J A 42	J A 52	J A 28	J A 33	J A 34	J A 51	J A 54	J A 54	J A 48	J A 49	J A 54	J A 85	J A 72	39	40	36	34	J A 45	J A 54	J A 40	J A 51	J A 51	J A 51
5	J A 34	J A 61	J A 51	J A 28	J A 28	J A 32	G	J A 38	J A 54	J A 74	J A 107	J A 74	J A 53	J A 42	J A 43	J A 98	J A 90	J A 112	J A 89	J A 47	J A 26	J A 27	J A 27	J A 38
6	J A 24	J A 41	J A 53	J A 46	J A 33	J A 33	28	J A 40	J A 50	J A 53	J A 124	J A 54	J A 52	J A 90	J A 108	J A 47	34	J A 52	J A 58	J A 34	J A 78	J A 106	J A 86	J A 28
7	J A 51	J A 75	J A 51	J A 36	J A 36	23	J A 35	J A 65	J A 99	J A 66	J A 105	J A 64	44	41	44	40	34	J A 44	J A 44	J A 46	30	23	J A 24	21
8	J A 26	E B 16	J A 24	22	J A 22	22	J A 29	30	J A 52	J A 51	J A 50	J A 61	J A 55	J A 44	G	38	G	G	G	21	J A 29	J A 39	J A 43	J A 52
9	J A 46	J A 51	J A 40	J A 26	J A 36	21	J A 28	J A 50	J A 52	J A 53	J A 79	J A 76	J A 88	J A 145	J A 69	J A 70	J A 69	J A 55	J A 89	J A 104	J A 87	J A 53	J A 51	J A 34
10	J A 35	J A 35	J A 34	J A 34	J A 33	J A 30	J A 27	J A 36	J A 50	J A 53	J A 48	J A 44	J A 50	J A 86	J A 63	J A 83	J A 112	J A 55	J A 126	J A 65	J A 54	J A 46	J A 29	J A 27
11	J A 54	J A 86	J A 53	J A 35	J A 29	J A 26	J A 32	J A 49	J A 153	J A 123	J A 84	J A 67	J A 58	J A 101	J A 60	J A 60	J A 63	J A 93	J A 151	J A 26	J A 38	J A 48	J A 51	J A 48
12	J A 42	J A 32	J A 52	J A 27	J A 25	J A 27	J A 32	J A 73	J A 44	36	J A 45	J A 42	J A 52	J A 58	J A 54	J A 37	J A 58	J A 73	J A 68	J A 27	J A 52	J A 52	J A 34	J A 30
13	23	E B 16	E B 15	E B 16	J A 30	J A 39	J A 34	J A 81	J A 138	J A 146	J A 58	J A 51	J A 49	38	40	J A 50	39	J A 68	J A 64	J A 100	J A 24	J A 24	J A 32	J A 54
14	J A 52	J A 28	21	22	J A 26	J A 24	J A 30	J A 38	J A 66	J A 106	G	J A 44	J A 43	38	38	38	35	J A 40	G	J A 32	J A 87	J A 101	J A 44	J A 52
15	J A 66	J A 38	J A 53	J A 24	J A 28	J A 21	J A 37	J A 49	J A 61	J A 65	J A 55	J A 60	J A 78	J A 90	J A 110	J A 65	J A 71	J A 58	J A 48	J A 24	J A 33	J A 52	J A 46	J A 105
16	J A 111	J A 143	J A 67	J A 52	J A 67	J A 33	J A 43	J A 38	J A 64	J A 56	J A 101	J A 106	J A 110	J A 139	J A 73	J A 77	J A 98	J A 92	J A 85	J A 102	J A 147	J A 109	J A 89	J A 54
17	J A 62	J A 120	J A 52	J A 52	J A 84	J A 55	J A 47	J A 56	J A 110	J A 51	J A 70	J A 71	J A 94	J A 127	J A 52	J A 42	G	J A 42	J A 44	J A 63	J A 54	J A 53	J A 76	J A 63
18	J A 103	J A 72	J A 53	J A 45	J A 31	J A 66	J A 33	J A 54	J A 88	J A 120	J A 65	J A 119	J A 91	J A 155	J A 121	J A 78	J A 73	J A 38	J A 26	E B 18	25	J A 26	J A 26	J A 35
19	J A 35	J A 35	J A 34	J A 50	21	J A 31	J A 29	J A 41	J A 111	J A 109	J A 82	J A 138	J A 68	J A 126	J A 75	J A 144	J A 78	J A 154	J A 109	J A 154	J A 51	J A 44	J A 38	J A 51
20	J A 47	J A 66	J A 53	J A 44	J A 55	J A 78	J A 29	J A 53	J A 102	J A 50	J A 60	J A 56	J A 67	J A 99	J A 85	J A 86	J A 82	J A 85	J A 126	J A 53	J A 110	J A 88	J A 107	J A 70
21	J A 66	J A 54	J A 38	J A 38	24	20	J A 44	J A 49	J A 51	J A 104	J A 83	J A 85	J A 68	J A 62	41	41	J A 92	J A 50	J A 49	J A 44	J A 44	J A 30	J A 29	J A 31
22	J A 81	J A 101	J A 38	J A 53	J A 65	J A 38	J A 29	34	J A 48	J A 42	J A 51	J A 54	J A 58	J A 48	42	J A 60	J A 109	J A 63	58	J A 79	J A 54	J A 51	J A 30	J A 46
23	J A 52	J A 64	J A 27	J A 41	J A 33	J A 38	J A 35	J A 36	J A 40	36	J A 53	J A 46	J A 82	J A 51	J A 46	J A 49	J A 59	J A 37	J A 48	J A 48	J A 51	J A 53	J A 38	J A 42
24	J A 54	J A 39	J A 41	J A 65	J A 56	J A 42	J A 32	J A 34	J A 50	J A 147	J A 54	40	J A 80	J A 108	J A 62	J A 57	J A 55	J A 38	J A 42	J A 34	J A 41	J A 32	J A 23	J A 23
25	J A 23	21	J A 32	J A 29	24	23	J A 42	J A 88	J A 79	J A 92	J A 56	J A 51	J A 46	40	J A 51	J A 54	J A 46	J A 44	J A 42	J A 29	J A 45	J A 85	J A 39	J A 52
26	J A 34	J A 52	J A 51	J A 42	J A 32	J A 34	J A 38	J A 73	J A 64	J A 64	J A 53	J A 121	J A 110	J A 122	J A 58	J A 54	J A 105	J A 116	J A 71	J A 80	J A 39	J A 54	J A 108	J A 65
27	J A 53	J A 54	J A 65	J A 70	J A 36	J A 33	J A 34	J A 41	J A 68	J A 86	J A 82	J A 129	J A 147	J A 150	J A 65	J A 49	J A 54	J A 40	J A 66	J A 128	J A 53	E B 15	J A 52	J A 34
28	J A 34	J A 34	J A 31	J A 31	J A 26	21	J A 25	J A 37	J A 81	J A 84	J A 76	J A 77	J A 175	J A 108	J A 155	J A 110	J A 71	J A 57	J A 64	J A 60	J A 85	J A 86	J A 146	J A 42
29	J A 85	J A 146	J A 87	J A 86	E B 16	J A 38	J A 36	J A 60	J A 109	J A 157	J A 82	J A 110	J A 92	J A 144	J A 77	J A 53	J A 121	J A 65	J A 47	J A 73	J A 53	J A 46	J A 50	21
30	E B 16	21	J A 24	22	22	E B 16	G	J A 31	J A 43	J A 106	J A 66	J A 52	J A 63	J A 63	J A 73	J A 75	J A 66	J A 84	J A 91	J A 55	J A 51	21	J A 38	J A 37
31	J A 42	J A 50	J A 33	J A 36	J A 45	J A 49	J A 32	J A 40	J A 64	J A 135	J A 74	J A 149	J A 145	J A 119	J A 75	J A 61	J A 55	J A 58	J A 54	J A 54	J A 66	J A 52	J A 33	24
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 46	J A 50	J A 41	J A 36	J A 32	J A 33	J A 32	J A 43	J A 64	J A 74	J A 70	J A 64	J A 68	J A 90	J A 60	J A 54	J A 59	J A 55	J A 54	J A 53	J A 51	J A 51	J A 43	J A 42
U Q	J A 54	J A 72	J A 53	J A 50	J A 45	J A 39	J A 37	J A 54	J A 99	J A 106	J A 84	J A 106	J A 91	J A 126	J A 75	J A 75	J A 82	J A 73	J A 85	J A 73	J A 54	J A 54	J A 54	J A 52
L Q	J A 34	34	J A 33	28	25	23	29	J A 37	J A 51	J A 53	J A 53	J A 52	J A 53	48	43	42	36	J A 40	42	J A 32	J A 38	J A 32	J A 30	J A 31

JUL. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	E B 16	17	18	E B 16	20	23	26	42	A A 112	A A 93	A A 84	42	44	37	37	G	G	31	28	20	18	A A 77	A A 80	E B 16
2	16	22	20	20	A A 55	22	A A 50	36	A A 55	A A 67	A A 86	A A 112	A A 89	39	A A 81	45	A A 58	A A 69	26	A A 58	34	E B 15	21	21
3	E B 16	20	E B 16	20	E B 15	E B 16	24	31	40	A A 83	47	A A 83	A A 59	A A 156	43	35	34	30	28	38	33	36	28	24
4	24	A A 42	A A 52	E B 16	21	18	33	A A 54	A A 54	35	37	40	A A 85	A A 72	35	38	34	30	28	24	24	18	21	21
5	E B 16	A A 61	23	E B 16	19	18	G	33	44	A A 74	45	A A 74	39	36	36	A A 98	A A 90	46	A A 89	37	19	19	E B 16	20
6	E B 16	19	21	E B 16	E B 16	E B 16	26	31	38	44	A A 124	A A 54	A A 52	A A 90	A A 108	38	32	36	30	22	A A 78	A A 106	22	E B 16
7	27	28	29	20	20	16	29	35	A A 99	35	A A 105	40	38	39	40	38	32	38	34	40	29	E B 16	E B 16	E B 16
8	16	E B 16	E B 16	E B 16	19	E B 16	24	26	34	39	38	38	38	38	G 36		G	G	G	18	22	25	E B 16	A A 52
9	20	20	20	E B 16	E B 16	E B 15	23	40	40	41	A A 79	A A 76	A A 88	A A 145	A A 69	43	34	40	42	35	35	40	24	24
10	26	23	23	22	20	20	21	30	44	43	41	38	44	A A 86	A A 63	A A 83	A A 112	48	36	50	28	23	18	E B 16
11	20	E B 16	18	E B 16	E B 16	E B 16	26	35	32	A A 123	A A 84	A A 67	42	A A 101	A A 60	42	37	A A 93	A A 151	19	27	24	21	E B 16
12	E B 16	20	21	E B 16	E B 16	E B 16	21	31	32	34	38	37	40	A A 58	A A 54	36	41	41	55	20	21	24	24	E B 16
13	E B 16	E B 16	E B 15	E B 16	E B 16	20	24	A A 81	A A 138	A A 146	38	40	40	36	36	41	34	40	34	24	E B 16	17	17	A A 54
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	A A 66	A A 106	G	34	35	36	38	36	33	30	G	25	23	22	32	E B 16
15	20	18	18	16	E B 16	18	28	A A 49	A A 61	44	A A 55	A A 60	A A 78	39	A A 110	A A 65	A A 71	40	36	19	22	22	29	A A 105
16	A A 111	A A 143	A A 67	A A 52	A A 67	18	A A 43	27	A A 64	40	A A 101	A A 106	A A 110	A A 139	A A 73	A A 77	A A 98	A A 92	A A 85	A A 102	A A 147	A A 109	A A 89	23
17	A A 62	21	24	26	22	E B 16	A A 47	A A 56	36	32	A A 70	44	A A 94	A A 127	44	35	G	37	39	A A 63	38	38	A A 76	A A 63
18	A A 103	A A 72	A A 53	A A 45	18	A A 66	27	49	A A 88	A A 120	38	G 38	A A 91	A A 155	A A 121	47	41	34	25	E B 18	E B 17	18	18	24
19	22	18	24	E B 16	E B 16	E B 16	19	31	A A 111	A A 109	A A 82	A A 138	A A 68	A A 126	A A 75	A A 144	40	45	A A 109	A A 154	25	25	29	22
20	21	A A 66	A A 53	A A 44	19	E B 16	20	A A 53	A A 102	A A 50	A A 60	A A 56	A A 67	44	A A 85	A A 86	A A 82	A A 85	A A 126	27	A A 110	A A 88	A A 107	A A 70
21	A A 66	35	25	E B 16	E B 16	E B 16	A A 44	28	40	A A 104	40	A A 85	43	40	38	40	A A 92	40	38	35	31	25	E B 16	24
22	24	20	19	21	E B 16	17	22	26	30	36	37	36	37	37	39	53	A A 109	44	42	68	39	A A 51	22	20
23	20	A A 64	E B 16	E B 16	E B 16	17	18	27	32	34	A A 53	36	44	42	40	42	45	29	24	37	34	35	26	23
24	21	21	18	A A 65	A A 56	A A 42	20	28	41	A A 147	43	37	A A 80	A A 108	39	44	40	28	30	G 21	30	23	E B 16	17
25	E B 16	E B 16	18	19	E B 15	E B 15	27	A A 88	35	A A 92	36	40	38	38	45	47	35	38	37	24	A A 45	E B 16	23	22
26	22	A A 52	22	21	21	22	33	33	A A 64	A A 64	A A 53	A A 121	A A 110	A A 122	A A 58	A A 54	A A 105	A A 116	51	55	35	A A 54	A A 108	A A 65
27	22	A A 54	A A 65	A A 70	22	A A 33	22	31	A A 68	A A 86	A A 82	A A 129	A A 147	A A 150	45	44	46	31	31	28	24	E B 15	A A 52	21
28	20	18	17	E B 15	E B 15	E B 16	20	32	A A 81	A A 84	A A 76	A A 77	A A 175	A A 108	A A 155	A A 110	52	44	A A 64	A A 60	A A 85	40	20	21
29	E B 16	22	A A 87	A A 86	E B 16	B A 38	24	A A 60	A A 109	A A 157	A A 82	A A 110	A A 92	A A 144	A A 77	A A 53	A A 121	44	42	A A 73	23	23	34	E B 16
30	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	G	25	28	A A 106	35	A A 52	38	43	43	A A 75	A A 66	A A 84	34	32	35	16	18	E B 16
31	28	17	23	22	22	E B 16	28	33	A A 64	A A 135	50	A A 149	A A 145	A A 119	A A 75	A A 61	48	A A 58	42	32	A A 66	44	E B 16	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	20	20	21	16	E B 16	16	24	33	A A 54	A A 74	A A 53	A A 54	A A 59	A A 72	45	44	41	40	36	32	30	24	22	21
U Q	24	A A 42	A A 25	A A 22	21	20	28	A A 49	A A 81	A A 106	A A 82	A A 85	A A 91	A A 126	A A 75	A A 65	A A 82	A A 48	A A 51	A A 55	A A 38	A A 40	A A 32	A A 24
L Q	E B 16	E B 17	E B 18	E B 16	E B 16	E B 16	21	30	36	40	38	38	40	39	39	38	34	31	28	22	23	18	E B 18	E B 16

JUL. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

JUL. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	F	284	300	306	367	320	329	363	A	A	A	322	283	269	301	333	323	307	309	313	353	A	A	F
2	F	F	F	330	A	349	A	318	A	A	A	A	A	290	A	297	A	A	324	A	341	348	360	313
3	F	F	F	308	366	367	367	296	316	A	338	A	A	A	317	319	310	325	329	323	361	359	307	325
4	F	A	A	F	F	336	359	A	A	304	341	314	A	A	287	278	267	291	315	285	327	323	F	F
5	F	A	F	F	335	350	379	359	309	A	324	A	324	324	314	A	A	325	A	326	370	336	306	F
6	F	F	F	F	F	F	376	298	341	391	A	A	A	A	A	327	344	338	320	344	A	A	307	311
7	303	331	326	F	F	323	336	341	A	379	A	325	346	332	260	266	281	312	312	317	368	349	313	304
8	F	296	314	325	350	F	397	386	279	306	321	276	281	325	301	307	290	307	318	323	328	344	309	A
9	F	F	F	F	F	349	376	331	339	318	A	A	A	A	A	282	305	316	316	310	326	338	350	F
10	F	295	F	F	F	323	310	359	386	356	281	299	305	A	A	A	A	312	305	314	317	339	357	315
11	326	F	F	F	F	F	321	368	345	A	A	A	314	A	A	302	326	A	A	296	309	399	285	F
12	F	F	F	F	F	F	366	356	361	299	320	357	300	A	A	277	303	306	304	313	369	335	351	297
13	F	F	F	F	F	F	338	A	A	A	309	274	283	R 301	307	310	316	332	316	315	329	339	366	A
14	F	341	F	F	F	F	333	336	A	A	294	324	281	R	283	312	325	331	375	358	306	318	313	333
15	381	F	324	F	F	338	358	A	A	351	A	A	A	265	A	A	A	329	345	330	338	309	297	A
16	A	A	A	A	A	353	A	377	A	357	A	A	A	A	A	A	A	A	A	A	A	A	A	F
17	A	F	F	F	301	F	A	A	341	329	A	338	A	A	275	299	284	301	288	A	351	355	A	A
18	A	A	A	A	F	A	340	382	A	A	281	311	A	A	A	314	312	324	325	335	344	337	345	303
19	303	F	F	F	F	F	347	359	A	A	A	A	A	A	A	A	342	325	A	A	311	335	323	319
20	F	A	A	A	F	310	378	A	A	A	A	A	A	311	A	A	A	A	A	308	A	A	A	A
21	A	F	F	F	F	F	A	361	371	A	318	A	328	312	310	304	A	306	306	317	349	319	319	291
22	F	310	F	314	310	F	318	333	341	288	330	292	256	284	325	309	A	311	322	365	353	A	F	289
23	F	A	F	F	F	F	378	357	398	348	A	327	294	287	301	326	349	303	305	318	330	F	292	F
24	F	F	365	A	A	A	355	357	353	A	322	336	A	A	316	332	332	294	327	325	351	343	316	307
25	318	333	F	F	296	F	344	A	370	A	275	R 313	301	321	312	304	304	338	323	319	A	R 317	334	302
26	F	A	F	304	342	358	424	393	A	A	A	A	A	A	A	A	A	A	353	380	384	A	A	A
27	310	A	A	A	F	A	370	272	A	A	A	A	A	A	320	324	303	329	333	338	372	323	A	301
28	342	F	319	F	F	325	364	382	A	A	A	A	A	A	A	A	310	321	A	A	A	372	F	F
29	F	F	A	A	325	A	324	A	A	A	A	A	A	A	A	A	A	345	317	A	317	329	299	305
30	308	314	F	340	313	337	338	396	366	A	349	A	320	307	316	A	A	A	313	322	357	375	291	F
31	334	F	303	291	307	F	417	402	A	A	369	A	A	A	A	A	334	A	323	334	A	357	320	309
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	8	7	8	11	14	27	24	15	12	15	14	14	13	16	20	20	24	25	25	25	24	22	16
MED	318	312	319	311	325	338	358	359	345	338	321	318	300	307	308	308	311	318	318	322	344	338	314	306
U Q	338	332	326	328	350	350	376	380	370	356	338	327	320	322	316	322	329	329	326	334	359	352	345	314
L Q	306	296	303	305	307	323	336	334	339	305	294	299	283	286	294	298	303	306	310	314	326	326	306	302

IONOSPHERIC DATA STATION Yamagawa

JUL. 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								A	A	A	A	A	A	UL 434	435	395	407	393	362	L				
2						A	A	A	A	A	A	A	A	449	A	A	A	A	UL 365	A				
3								UL 391	A	A	A	A	A	A	A	408	430	419	399	A				
4							A	A	A	UL 411	UL 450	UL 432	A	A	449	432	407	406	365	A				
5									A	A	A	A	407	447	440	A	A		A	A				
6								A	A	A	A	A	A	A	A	411	419	A	A	A				
7								A	A		A	436	424	452	UL 385	402	UL 390	A	379	A				
8									UL 331	A	UL 425	UL 431	UL 459	399	UL 423	417	413	396	UL 358	L				
9								A	A	A	A	A	A	A	A	A	386	A	A	A				
10							UL 365	388	A	A	A	378	A	A	A	A	A	A	A	A				
11								A	388	A	A	A	A	A	A	A	375	A	A	L				
12								A	UL 386	389	383	UL 404	UL 437	A	A	284	A	A	A	L				
13								A	A	A	436	425	416	UL 416	UL 416	A	383	A	A					
14								UL 355	A	A	UL 423	415	UL 427	UL 435	UL 448	385	407	375	UL 433					
15							A	A	A	A	A	A	A	UL 457	A	A	A	A	A					
16							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
17							A	A	A	381	A	A	A	A	A	392	UL 406	A	A	A				
18						A	A	A	A	A	UL 496	435	A	A	A	A	A	392	364	L				
19								A	A	A	A	A	A	A	A	A	A	A	A	A				
20								A	A	A	A	A	A	A	A	A	A	A	A					
21							A	UL 399	A	A	A	A	A	416	391	381	A	A	A					
22								UL 370	UL 405	UL 421	UL 434	UL 414	411	412	418	A	A	A	A					
23								L	L	UL 440	A	424	A	A	410	A	A	399	409					
24							L	UL 421	A	A	A		A	A	361	A	A	393	UL 384					
25							A	A	UL 395	A	UL 399	UL 420	434	429	A	A	UL 354	A	A					
26									A	A	A	A	A	A	A	A	A	A	A	A				
27								UL 410	A	A	A	A	A	A	A	A	A	387	A					
28								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					
30								L		A	432	A	UL 429	A	A	A	A	A	A					
31									A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	7	5	5	9	11	9	11	11	10	12	9	10					
MED							UL 365	UL 391	UL 388	UL 411	UL 432	424	427	434	418	398	406	393	372					
U Q								UL 410	UL 400	UL 430	UL 443	432	UL 436	449	440	411	410	402	399					
L Q								UL 370	UL 358	385	UL 411	UL 414	414	416	391	385	384	390	364					

JUL. 2018 M(3000)F1 (0.01)

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JUL. 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								E A 252	A	A	A	322	E A 374	476	406	308	306	322	300	272				
2						E A 264	A	E A 306	A	A	A	A	A	378	A	E A 378	A	A	304	A				
3								398	E A 346	A	E A 322	A	A	A	338	296	326	300	294	E A 264				
4							E A 258	A	A	388	326	342	A	A	388	426	442	376	296	E A 360				
5									364	A	324	A	350	350	350	A	A		A	E A 278				
6								E A 338	272	240	A	A	A	A	A	302	278	272	274	244				
7								E A 278	A		A	326	296	328	528	468	424	332	332	E A 280				
8									E A 434	E A 376	366	434	426	316	366	332	356	356	302	256				
9								E A 320	254	306	A	A	A	A	A	406	346	284	290	264				
10							358	268	226	298	416	398	366	A	A	A	A	E A 294	316	E A 304				
11								238	272	A	A	A	330	A	A	366	312	A	A	294				
12								248	276	346	322	262	406	A	A	402	352	302	E A 310	282				
13								A	A	A	356	460	400	374	356	318	324	266	266					
14								296	A	A	380	358	432	R	432	324	284	304	256					
15							E A 246	A	A	E A 282	A	A	A	454	A	A	A	282	236					
16							A	236	A	266	A	A	A	A	A	A	A	A	A	A				
17							A	A	266	336	A	E A 308	A	A	E A 416	390	400	336	E A 362	A				
18						A	E A 268	E A 254	A	A	432	368	A	A	A	314	314	278	266	258				
19								254	A	A	A	A	A	A	A	A	264	298	A	A					
20								A	A	A	A	A	A	330	A	A	A	A	A					
21							A	242	236	A	302	A	312	358	334	354	A	312	E A 308					
22								312	302	420	352	402	502	438	300	E A 368	A	350	268					
23								268	248	298	A	326	E A 406	420	394	312	E A 286	352	338					
24							256	276	E A 310	A	E A 344		A	A	318	302	268	364	290					
25							254	A	246	A	442	R 400	390	328	322	302	320	256	256					
26									A	A	A	A	A	A	A	A	A	A	244	242				
27								428	A	A	A	A	A	A	312	312	E A 334	296	272					
28								250	A	A	A	A	A	A	A	A	E A 380		A	A				
29								A	A	A	A	A	A	A	A	A	A	256	E A 290					
30								226		A	300	A	320	338	E A 318	A	A	A	316					
31									A	A	266	A	A	A	A	A	E A 318	A	290					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	6	20	14	11	15	13	14	13	16	20	20	22	25	13				
MED						E A 264	254	260	U 262	302	344	358	376	358	348	322	319	301	290	264				
U Q							268	309	E A 310	376	380	401	406	429	400	384	354	336	309	288				
L Q							254	249	248	282	322	324	330	329	320	310	296	282	267	257				

JUL. 2018 h'F2 (KM)

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IONOSPHERIC DATA STATION Yamagawa

JUL. 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	E B 258	E A 250	E A 300	E B 270	E A 274	E A 300	E A 244	A	A	A	A	A	A	198	188	188	186	188	218	218	208	A	A	E B 286
2	232	232	232	204	A	A	A	A	A	A	A	A	A	180	A	A	A	A	216	A	226	206	206	E A 246
3	232	E A 302	E B 270	E A 270	208	208	202	216	A	A	A	A	A	A	A	182	188	186	196	A	202	E A 258	E A 306	E A 254
4	E A 276	A	A	E B 262	E A 274	234	A	A	A	206	190	190	A	A	190	184	184	190	194	A	222	212	212	E A 314
5	E B 240	A	E A 238	E B 242	E A 260	220	194	200	A	A	A	A	200	188	186	A	A	E A 286	A	A	198	198	232	E A 308
6	E B 252	E A 316	E A 308	216	224	E B 248	202	A	A	A	A	A	A	A	A	224	198	A	A	A	A	A	E A 258	230
7	E A 256	E A 284	E A 292	E A 292	228	218	E A 242	A	A	196	A	196	182	182	E A 258	212	198	A	226	A	208	192	E B 246	E B 264
8	E B 264	E B 260	228	218	218	228	196	196	E A 284	A	208	200	188	206	180	186	186	182	186	202	202	216	234	A
9	226	E A 280	E A 304	E B 238	212	210	208	A	A	A	A	A	A	A	A	A	222	A	A	A	E A 240	E A 234	200	E A 238
10	E A 276	E A 286	E A 284	E A 272	E A 260	E A 266	232	198	A	A	A	196	A	A	A	A	A	A	A	A	220	216	202	202
11	E A 248	E B 248	E A 316	E B 248	228	E B 278	236	A	200	A	A	A	A	A	A	A	E A 258	A	A	238	236	202	E A 288	E B 278
12	E B 266	E A 264	E A 292	E B 250	E B 260	226	194	A	214	206	210	204	204	A	A	A	A	A	A	214	202	214	212	E B 278
13	E B 290	228	E B 240	E B 254	E B 268	E A 236	228	A	A	A	182	182	190	188	188	A	196	A	A	218	218	212	200	A
14	E B 288	234	E B 260	E B 282	E B 260	218	218	194	A	A	194	188	188	202	194	194	192	202	200	230	E A 282	E A 290	E A 328	210
15	206	E A 280	E A 274	E B 270	E B 262	E A 250	A	A	A	A	A	A	A	192	A	A	A	A	A	200	204	E A 260	E A 326	A
16	A	A	A	A	A	230	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 270
17	A	E A 308	E A 308	E A 256	E A 342	E B 264	A	A	A	216	A	A	A	A	A	206	206	A	A	A	214	210	A	A
18	A	A	A	A	E A 276	A	A	A	A	A	180	176	A	A	A	A	A	E A 238	E A 236	206	206	206	206	E A 284
19	E A 284	234	E A 260	E B 266	E B 258	210	210	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 250	E A 236	230	E A 272
20	E A 304	A	A	A	E A 304	E B 284	202	A	A	A	A	A	A	A	A	A	A	A	A	E A 268	A	A	A	A
21	A	E A 244	210	E B 210	E B 252	E B 260	A	192	A	A	A	A	A	198	216	E A 238	A	A	A	E A 252	210	222	222	E A 278
22	E A 324	E A 286	E B 266	E A 256	E B 244	E A 250	238	206	202	202	202	202	202	202	202	A	A	A	A	E A 250	E A 238	A	E A 282	E A 304
23	E A 316	A	E B 238	E B 258	E B 258	220	210	202	194	200	A	190	A	A	208	A	A	208	208	E A 244	196	E A 236	E A 316	E A 306
24	E A 292	E A 292	218	A	A	A	218	210	A	A	A	202	A	A	E A 252	A	A	210	E A 240	230	212	212	E B 236	E A 236
25	E B 236	226	E A 262	E A 294	E B 274	E B 264	A	A	210	A	192	204	204	190	A	A	E A 276	A	A	E A 246	A	240	232	E A 244
26	200	A	E A 296	E A 292	E A 260	E A 234	202	202	A	A	A	A	A	A	A	A	A	A	A	A	212	A	A	A
27	E A 294	A	A	A	200	A	210	210	A	A	A	A	A	A	A	A	A	212	A	220	204	186	A	E A 284
28	E A 256	E A 266	E A 268	E B 268	E B 238	E B 238	202	A	A	A	A	A	A	A	A	A	A	E A 274	A	A	A	E A 256	216	E A 270
29	E B 238	E A 254	A	A	E B 260	A	224	A	A	A	A	A	A	A	A	A	A	A	A	A	224	216	E A 292	E B 262
30	E B 260	E B 246	240	200	218	236	216	192	216	A	194	A	186	A	A	A	A	A	A	E A 252	218	180	218	E B 248
31	E A 264	E A 264	E A 274	E A 274	E A 290	204	194	204	A	A	A	A	A	A	A	A	A	A	A	E A 244	A	E A 248	E A 226	E B 254
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	23	25	25	28	26	23	13	7	6	9	12	9	11	11	9	12	11	10	17	25	25	25	25
MED	E 260	E A 264	E A 268	E B 258	E 260	U 220	209	202	206	204	194	196	190	192	191	191	194	198	205	U 216	210	209	U 217	E A 270
U Q	E A 288	E A 286	E A 294	E A 271	E A 271	E B 260	228	208	216	206	205	202	203	202	E A 216	218	214	E A 238	E A 226	E A 248	E A 225	E A 238	E A 285	E A 284
L Q	238	244	239	240	228	220	202	195	200	200	186	189	187	188	188	185	187	188	196	216	204	206	212	E A 245

JUL. 2018 h'F (KM)

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JUL. 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		A	A	A	A	A	A	A	A	114	108	A	108	B				
2						B	B	110	110	A	A	A	A	A	A	A	A	A	110	B				
3						B	122	120	A	A	A	A	A	A	A	A	118	112	112	B				
4						B	B	A	A	A	A	A	A	A	112	112	108	108	A	B				
5						B	112	112	A	A	A	A	A	A	A	A	A		A	A				
6						B	112	A	A	A	A	A	A	A	A	A	112	A	A	B				
7						B	B	A	A	A	A	A	A	A	112	112	112	A	B	B				
8						B	B	110	A	A	A	A	A	A	110	110	110	108	108	B				
9						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
11						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
12						B	B	A	A	108	A	A	A	108	110	112	A	A	A	B				
13						B	B	A	A	A	A	A	A	A	112	A	A	A	A	B				
14						B	A	A	A	A	112	A	A	A	A	112	112	A	114	B				
15						B	116	A	A	A	A	A	A	A	A	A	A	A	A	B				
16						B	B	116	A	A	A	A	A	A	A	A	A	A	A	B				
17						B	A	A	A	A	A	A	A	A	A	A	116	A	A	B				
18						B	B	A	A	A	A	178	A	A	A	A	A	A	114	B				
19						B	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	A	A	B				
21							B	A	A	A	A	A	A	A	108	108	A	A	B	B				
22							B	116	A	A	A	A	A	A	116	A	A	112	A					
23							B	A	A	112	A	A	A	112	110	A	A	A	A					
24							B	116	A	A	A	108	A	A	A	A	A	A	B	104				
25							B	A	A	A	A	A	A	104	104	108	108	108	A	B				
26									A	A	A	A	A	A	A	A	A	A	A	B				
27							B	108	A	A	A	A	A	A	A	A	A	A	A	B				
28							B	A	A	A	A	A	A	A	A	A	A	A	A	B				
29							B	A	A	A	A	A	A	A	A	A	A	A	A					
30							116	A	A	A	A	A	A	A	A	A	A	A	A					
31							B	A	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	8	1	2	1	2		3	9	8	9	5	6	1				
MED							116	114	110	110	112	143		108	110	112	112	108	111	104				
U Q							119	116						112	112	112	114	112	114					
L Q							112	110						104	109	109	108	108	108					

JUL. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	92	92	88	88	88	88	100	96	96	96	92	92	90	90	90	G	G	90	108	86	86	86	94	94
2	92	88	88	88	88	84	100	114	110	98	98	96	96	104	100	100	100	98	124	106	102	102	94	94
3	94	94	94	94	90	100	122	122	106	102	98	94	96	96	104	100	146	134	120	102	96	96	96	96
4	96	96	96	96	96	90	90	88	94	98	98	98	98	92	114	136	128	126	106	100	100	100	96	96
5	106	84	84	84	84	84	G	108	104	104	100	96	96	96	96	92	88	88	88	88	88	88	88	88
6	88	94	94	94	104	104	124	104	104	104	100	100	100	98	94	98	112	104	100	100	100	100	98	98
7	98	98	98	94	94	94	100	100	100	100	96	102	102	102	120	120	120	102	102	98	98	98	92	92
8	92	B	92	92	92	92	126	126	104	104	104	104	104	104	G	138	G	G	G	112	104	104	100	100
9	92	92	92	92	92	92	112	104	104	102	102	98	92	92	96	96	96	96	94	92	88	88	82	88
10	88	88	80	80	80	80	96	96	96	96	96	96	94	90	90	88	86	86	86	86	84	84	84	84
11	84	84	86	92	92	92	100	100	100	96	96	96	96	96	96	96	98	98	98	98	94	94	94	94
12	86	86	86	86	86	102	102	102	102	114	100	100	100	108	116	148	104	104	100	100	96	96	96	94
13	86	B	B	B	108	108	108	102	96	96	96	96	96	96	108	102	102	102	102	96	96	96	96	96
14	86	88	88	88	94	106	106	100	98	98	G	98	98	98	98	110	118	104	G	112	102	98	98	98
15	92	92	92	92	92	106	120	102	102	100	100	100	96	96	94	94	94	94	94	94	94	94	94	94
16	100	92	92	92	92	100	88	114	104	98	94	94	94	94	94	88	88	88	88	88	88	94	94	94
17	94	94	94	90	90	102	106	100	100	100	92	92	92	92	92	92	G	94	94	94	94	94	94	94
18	94	94	94	94	94	94	102	102	102	100	100	102	94	94	94	94	94	94	108	B	92	92	86	86
19	86	86	80	90	90	96	96	100	100	100	100	100	100	96	96	96	96	96	86	86	86	86	86	88
20	88	88	88	88	88	100	92	96	96	96	96	96	96	96	98	98	98	98	100	100	100	100	100	100
21	90	86	86	86	86	86	100	100	100	98	98	98	98	98	140	116	106	94	92	92	92	92	92	92
22	98	98	98	98	98	98	106	106	100	100	96	96	96	96	124	120	98	98	86	86	84	84	86	98
23	98	98	102	92	92	92	100	98	98	98	98	98	98	112	112	106	100	98	96	88	86	84	84	84
24	84	84	84	88	88	88	96	124	102	102	102	110	88	92	92	92	92	92	92	90	82	82	82	82
25	82	102	94	94	94	94	94	94	94	94	94	94	94	116	114	114	114	114	98	98	98	94	94	96
26	94	90	90	90	88	88	88	90	90	94	98	94	88	88	88	102	102	100	98	98	98	98	96	96
27	92	94	86	88	88	86	112	110	102	94	94	94	98	98	100	98	104	102	96	94	94	B	86	86
28	84	82	82	82	82	82	94	94	94	94	94	94	92	92	92	92	92	92	92	90	90	90	90	90
29	90	94	94	94	B	96	96	96	96	94	94	90	90	90	90	90	90	90	88	88	88	88	88	82
30	B	84	82	82	82	B	G	104	102	98	98	96	96	94	88	88	88	88	88	88	86	86	110	98
31	92	92	84	82	82	82	102	102	100	98	98	86	86	86	86	86	86	86	86	86	86	86	86	86
	00	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	30	30	30	29	31	31	31	30	31	31	31	30	30	28	30	29	30	31	30	31	31
MED	92	92	89	90	90	93	100	102	100	98	98	96	96	96	96	98	98	97	96	94	94	94	94	94
U Q	94	94	94	94	94	100	107	106	102	100	100	100	98	98	108	110	105	102	101	100	98	98	96	96
L Q	86	86	86	88	88	88	96	96	96	96	96	94	92	92	92	92	92	92	88	88	86	86	86	88

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	F2	F6	F6	F2	F4	F4	L5	L4	L9	L6	L3	L3	L3	L1	L1			L2	C2	L3	F4	F5	F7	F2
2	F6	F6	F6	F7	F8	L4	L6	CL43	C5	L5	L6	L4	L3	L1	L3	L3	L4	L5	C3	L8	F6	F3	F5	F5
3	F5	F5	F2	F7	F5	L2	C4	C2	L2	L5	L4	L3	L3	L5	L5	L2	H1	H1	C2	L4	F6	F6	F5	F5
4	F3	F3	F5	F5	F4	L4	L4	L7	L3	LC21	L3	L2	L2	L3	C1	H1	C1	C2	L2	L4	L5	F2	F4	F7
5	F4	F6	F6	F2	F5	L2		C3	L3	L5	L2	L4	L2	L2	L2	L5	L4	L6	L6	L5	L4	L4	L4	L4
6	F2	F3	F6	F6	F2	L2	CL32	L3	L3	L3	L4	L3	L3	L3	L5	L2	C1	L3	L4	L4	F6	F5	F5	F3
7	F9	F7	F6	F6	F5	L2	L4	L4	L5	L3	L3	L2	L2	L2	C2	C2	C1	L3	L3	L5	F5	F1	F3	F2
8	F2		F2	F1	F3	L1	C3	C2	L3	L2	L2	L2	L2	L2		H1				C2	F5	F2	F3	F9
9	F4	F5	F5	F5	F3	L3	C4	L4	L4	L4	L4	L3	L4	L3	L3	L3	L2	L3	L4	L6	F8	F7	F7	F4
10	F4	F2	F3	F3	F3	L3	L2	L4	L5	L2	L3	L2	L3	L5	L4	L5	L6	L8	L5	L8	F7	F3	F1	F2
11	F2	F4	F3	F3	F3	L3	L7	L4	L2	L3	L4	L3	L2	L4	L4	L5	L3	L5	L4	L3	F4	F3	F4	F3
12	F2	F2	F4	F2	F1	L2	L3	L4	L2	C2	L3	L1	L2	C2	C2	H2	L3	L4	L4	L3	F6	F7	F5	F2
13	F2				F1	L6	L6	L6	L8	L6	L3	L3	L2	L2	C1	L3	L2	L5	L5	L4	F3	F3	F2	F5
14	F3	F2	F1	F2	F2	L1	L6	L6	L6	L4		L2	L2	L2	L2	C1	C1	L2		L2	F5	F4	F8	F3
15	F6	F6	F2	F2	F2	F3	C7	L4	L6	L6	L4	L4	L4	L2	L5	L4	L5	L5	L4	L2	F5	F5	F8	F8
16	F5	F6	F6	F8	F8	L7	L7	C3	L4	L3	L5	L3	L4	L4	L4	L6	L7	L6	L6	L7	F8	F5	F5	F6
17	F6	F6	F5	F5	F5	L3	L8	L5	L3	L2	L3	L3	L4	L3	L3	L2		L3	L4	L8	F8	F6	F8	F7
18	F5	F5	F5	F4	F3	L5	L5	L5	F7	L5	L2	L3	L5	L5	L5	L5	L2	L2	C2		F2	F4	F4	F5
19	F5	F2	F3	F2	F2	L2	L4	L5	L6	L5	L5	L5	L4	L5	L4	L5	L5	L5	L6	L6	F4	F3	F6	F6
20	F6	F8	F7	F9	F5	F2	L4	L7	L7	L6	L4	L4	L3	L3	L4	L4	L5	L6	L5	L3	F4	F6	F6	F6
21	F6	F6	F9	F4	F2	F1	L6	L4	L4	L5	L4	L3	L3	L2	H1	C1	L5	L4	L7	L7	F8	F8	F2	F5
22	FF38	F3	F4	F3	F4	F4	L3	C3	L3	L2	L2	L1	L2	L2	CL22	CL22	L4	C4	L6	F5	F7	F7	F6	F4
23	F6	F9	F1	F2	F2	F5	L3	L3	L2	C3	L5	L2	L2	L2	C2	L3	L4	L3	L6	F7	F9	F7	F6	F4
24	F4	F3	F4	F5	F5	F5	L4	C3	L3	L4	L3	C1	L5	L3	L3	L3	L3	L3	L4	F4	F6	F6	F6	F5
25	F2	F1	F4	F2	F2	F1	L6	L7	L5	L6	L3	L2	L3	C2	C3	C2	C2	C3	L3	L7	F6	F4	F5	F7
26	F7	F6	F6	F4	F3	F3	F5	F5	L6	L5	L5	L6	L7	L5	L3	L3	L5	L4	L8	L6	F6	F9	F5	F4
27	F6	F6	F6	F6	F2	F5	CL22	C5	L5	L5	L5	L3	L3	L5	L3	L2	L4	L3	L5	L5	F4		F7	F7
28	F3	F5	F2	F2	F1	F2	L2	L6	L4	L7	L5	L5	L9	L7	L5	L7	L7	L4	L6	L7	F8	F5	F5	F5
29	F3	F5	F6	F7		F8	L5	L7	L5	L5	L5	L4	L5	L5	L4	L3	L7	L6	L9	F7	F5	F5	F5	F2
30		F1	F2	F2	F2			L2	L4	L4	L2	L3	L3	L2	L4	L5	L5	L5	L3	L6	F8	F1	F2	F2
31	F4	F2	F7	F3	F4	F4	L4	L4	L6	L7	L4	L5	L6	L4	L3	L4	L4	L6	L7	F5	F7	F7	F3	F2
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUL. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	41	44	47	37	A																X 72	X 57	X 38	38
2	47	48	50	X 36	32																X 69	X 61	A	A
3	X 34	42	X 32	X 33	A																X 68	X 43	A	42
4	46	42	X 38	A	36	34															X 72	X 76	X 41	43
5	A	36	X 32	O X 30	X 23		A														X 62	X 44	X 40	X 40
6	42	39	38	39	30	31															X 54	X 52	X 49	49
7	48	47	44	45	37	X 28															X 76	X 51	X 52	X 52
8	58	58	48	52	X 33	X 34															X 60	X 55	X 44	X 38
9	A	A	38	39	A	A															X 82	X 86	X 78	X 50
10	57	57	50	54	51	47															X 84	X 77	X 50	X 43
11	X 44	X 35	X 34	X 34	X 32	X 31															X 90	X 65	X 40	X 39
12	48	48	48	39	X 36	34															X 90	X 64	X 45	X 38
13	X 38	X 36	X 32	33	34	X 29															X 74	X 77	A	X 37
14	X 35	X 35	X 32	33	36	X 29															X 42	X 45	48	58
15	44	39	X 32	34	38	34															X 54	X 45	X 44	A
16	A	A	A	A	X 30	A															X 84	X 60	X 44	A
17	A	A	A	A	A	A															X 68	X 40	A	A
18	A	45	38	45	A	34															X 76	X 62	X 51	X 48
19	X 46	X 39	44	40	X 35	X 31															X 58	X 57	A	X 44
20	47	47	A	43	39	38															X 68	X 60	X 58	66
21	59	57	X 50	X 44	44	42															X 64	X 54	X 49	48
22	53	52	X 44	49	X 38	X 34															X 54	X 52	X 48	57
23	X 45	A	44	43	39	X 32															X 71	X 50	X 36	A
24	44	47	49	X 44	A	A															X 82	X 54	X 53	X 53
25	X 50	X 45	X 43	X 38	X 35	X 36															X 68	X 74	X 50	60
26	X 38	42	X 38	X 32	38	38															A	X 38	X 29	X 26
27	A	A	A	A	A	26															X 70	A	A	X 34
28	X 33	38	X 32	33	30	33															X 60	X 52	X 50	X 45
29	51	X 39	X 36	X 33	X 31	X 29															X 66	X 58	X 53	58
30	58	57	59	X 45	X 39	X 36															X 87	X 59	A	X 44
31	X 45	48	X 45	47	44	X 41															A	A	X 52	X 52
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	27	27	24	23															29	29	24	26
MED	46	44	X 43	39	36	X 34															X 69	X 57	X 48	X 44
U Q	50	48	48	45	38	36															X 79	X 63	X 52	52
L Q	X 42	39	X 34	X 33	X 32	X 31															X 61	X 50	X 42	X 39

JUL. 2018 fxI (0.1MHz)

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IONOSPHERIC DATA STATION Okinawa

JUL. 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 32	F	F	F 26	A	A	38	46	45	50	A	52	A	A	51	59	61	54	56	62	66	51	32	F 26
2	F 34	F	F	30	F 24	23	A	A	A	A	76	A	A	A	A	A	A	A	50	A	63	55	A	A
3	28	F 32	26	27	A	22	34	40	47	57	A	51	A	A	58	73	85	87	J R 76	71	61	36	A	F 30
4	F 33	F 33	32	A	F 23	F	39	A	A	A	57	A	A	A	A	46	A	53	62	65	66	70	35	F
5	A	F 26	26	24	18	18	A	38	46	A	54	A	54	A	54	63	71	74	77	75	56	38	34	34
6	F 32	F 30	F 28	F 30	F 21	20	39	42	48	50	A	A	A	48	51	62	65	52	54	A	48	46	43	F
7	F 38	F 38	F 36	F 35	F 25	22	33	48	45	E G 42	48	56	53	48	44	A	52	48	54	67	70	45	46	46
8	F	F 38	38	F 42	27	28	37	43	40	46	52	52	57	53	51	51	51	53	56	65	54	49	38	32
9	A	A	F 25	F 27	A	A	36	48	53	48	A	A	A	A	A	54	67	70	71	77	76	80	72	44
10	F 45	F	F	F	F	F	41	51	44	47	49	56	53	A	A	A	A	66	74	83	78	71	44	37
11	38	J R 29	28	28	27	25	34	48	52	53	52	A	55	52	51	58	56	57	59	66	84	59	34	33
12	F 38	F 39	F 38	F 30	30	F 26	35	43	47	51	63	56	46	E G 44	A	57	69	76	79	87	84	58	39	32
13	32	30	26	F 26	F 25	23	35	46	63	55	49	54	52	60	50	50	61	71	75	65	68	71	A	31
14	29	29	26	F 24	F 24	23	39	50	51	49	56	53	49	46	55	61	62	68	60	38	36	39	F 41	F
15	F 33	F 24	26	F 25	F 25	F 24	32	50	62	47	51	A	46	E G 43	48	A	A	66	60	52	48	39	38	A
16	A	A	A	A	24	A	44	A	49	52	A	A	55	63	62	58	61	A	A	59	78	54	38	A
17	A	A	A	A	A	A	36	A	A	A	A	A	A	A	48	54	55	50	56	73	62	34	A	A
18	A	F 33	F 30	F 32	A	F 20	42	A	A	A	A	A	A	60	A	75	A	80	83	A	70	56	45	42
19	40	33	F 34	F 30	29	25	39	44	54	44	55	53	53	A	64	A	72	70	60	53	52	51	A	38
20	F 34	F 34	A	F 29	F 30	F 27	39	50	A	A	A	A	56	A	A	56	64	56	50	55	62	54	52	F 54
21	F 49	F 47	44	38	F 32	F 32	36	66	48	48	50	A	53	61	53	58	65	60	75	83	58	48	43	F 39
22	F 38	F 37	38	F 35	32	28	32	46	47	A	48	48	46	62	66	53	65	80	91	85	48	46	42	F 39
23	39	A	F 32	F 33	F 30	26	40	43	47	45	A	A	A	A	58	59	52	49	53	A	65	44	30	A
24	F 34	F 32	F 38	38	A	A	30	52	46	49	51	A	A	46	53	64	58	54	67	82	76	48	47	47
25	44	39	37	32	29	30	38	A	56	A	52	A	58	60	61	68	81	80	61	57	62	68	44	F 52
26	32	F 33	32	26	F 23	F 28	28	A	A	48	50	57	A	A	48	A	59	72	76	A	A	32	23	20
27	A	A	A	A	A	F	A	A	58	A	A	53	A	56	68	A	82	A	A	80	64	A	A	28
28	27	F 28	26	F 24	F 22	F 20	34	43	53	50	46	47	50	49	48	52	65	72	65	57	54	46	44	39
29	F 38	33	30	27	25	23	34	44	A	A	A	A	59	A	A	60	A	A	66	A	60	52	47	F 47
30	F 48	F 46	F 48	39	33	30	40	52	47	50	51	A	58	69	69	65	66	65	73	87	81	53	A	38
31	39	F 41	39	F 36	F 33	35	29	40	56	54	A	A	A	A	A	62	63	A	A	A	A	A	46	46
	00	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	23	24	26	23	23	28	23	24	21	19	13	18	17	22	24	25	26	28	24	29	29	24	23
MED	F 36	F 33	32	F 30	F 25	25	36	46	48	49	51	53	53	53	53	58	64	66	64	66	63	51	42	38
U Q	39	F 38	38	F 35	F 30	28	39	50	54	52	55	56	56	60	61	62	68	72	75	81	73	57	46	46
L Q	32	30	26	F 26	F 24	22	34	43	46	47	49	52	50	47	50	54	58	54	56	58	55	44	36	32

JUL. 2018 foF2 (0.1MHz)

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JUL. 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	A	404	A	A	A	A	420	408	400	372	344	L				
2							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
3									A	A	A	A	A	A	A	412	400	368	344	A				
4							L	A	A	A	A	A	A	A	A	A	A	368	A	A				
5									UL 392	A	420	A	436	A	A	420	A	A	A					
6									UL 384	408	A	A	A	432	424	A	392	388	A	A				
7								L	A	416	416	432	432	440	428	A	396	388	A	A				
8									A	A	420	436	436	436	440	412	400	388	UL 360	L				
9								A	A	L 436	A	A	A	A	A	A	404	376	360	L				
10								UL 364	UL 396	416	428	432	A	A	A	A	A	A	A					
11									L 424	420	420	A	444	436	A	A	404	A	A					
12									392	420	428	444	444	444	A	424	408	A	A	L				
13								A	L 408	UL 416	L 428	432	436	436	UL 460	420	404	392	A	L				
14								L	UL 408	408	428	440	436	440	A	A	412	384	L					
15								360	400	L 424	428	A	444	432	A	A	A	A	352					
16								A	L 404	A	A	A	448	460	452	440	UA 408	A	A	A				
17								A	A	A	A	A	A	A	420	412	400	384	344					
18								A	A	A	A	A	A	A	A	428	A	A		A				
19									392		A	A	A	A	A	A	A	388	L 360					
20									A	A	A	A	A	A	A	A	412	392	364					
21									A	A	A	A	432	A	L 448	420	A	392						
22									A	A	A	A	436	A	432	412	396	380	352					
23								L	L 392	UL 416	A	A	A	A	UA 420	A	A	372	L 352	A				
24								L 344	A	392	416	A	A	424	416	A	404	UA 380	348					
25							L	A	A	A	A	A	UA 436	A	424		A	380	L 336					
26							A	A	A	396	A	424	A	A	424	A	A	A	A	A				
27							A	A	UL 388	A	A	A	A	A	A	A	A	A	A					
28								UL 348	384	412	428	UA 440	436	A	A	A	A	A	A					
29									A	A	A	A	A	A	A	A	A	A	A	A				
30								A	A	400	428	A	A	A	424	420	408	A	340					
31								A	A	A	A	A	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	13	15	12	8	13	10	14	12	16	17	13					
MED								L 354	L 392	416	428	434	436	436	424	420	404	384	352					
U Q								362	L 406	420	428	440	444	440	440	422	408	388	360					
L Q								L 346	390	404	420	432	436	432	420	412	400	374	344					

JUL. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
2						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
3						B	A	240	264	296	A	344	336	A	328	324	304	272	224	A				
4						B	A	A	A	A	A	A	A	340	336	320	A	A	248	A				
5						B		A	A	A	A	340	A	A	A	A	A	A	A	A				
6							A	A	A	A	A	A	A	A	336	320	300	272	220	A				
7							A	A	A	A	A	336	A	A	A	332	308	284	A	A				
8							A	A	276	312	332	A	A	A	A	A	304	A	A	A				
9							A	224	A	A	A	344	A	A	A	A	A	A	A	A				
10							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
11							A	A	U A 292	340	328	336	A	A	336	324	300	276	U A 232	A				
12							A	A	A	A	A	A	356	352	336	328	308	292	A	A				
13							A	228	A	A	A	A	A	A	A	A	A	A	A	A				
14							A	A	A	A	A	A	A	A	348	A	A	A	A	A				
15							A	A	U A 296	A	A	A	A	A	A	A	A	A	A	A				
16							A	A	A	A	A	A	336	344	A	332	316	280	216	A				
17							A	A	A	A	A	A	A	A	A	A	A	268	A	A				
18							A	252	A	A	A	A	A	A	A	A	A	A	A	A				
19							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
20							A	236	A	A	A	A	348	U A 344	A	A	A	A	216	A				
21							A	224	A	A	A	A	A	360	A	A	A	292	A	A				
22							A	A	A	A	A	A	A	A	A	A	296	276	220	A				
23							B	A	A	A	324	348	344	352	340	A	296	A	A	A				
24							A	A	268	304	324	336	344	A	A	A	A	A	A	A				
25							B	A	A	A	A	A	A	A	A	324	296	264	216	A				
26							A	A	A	A	A	A	A	A	340	324	304	268	A	A				
27							A	A	A	308	332	336	336	A	336	328	312	276	A	A				
28							B	A	272	A	A	A	A	348	A	A	A	A	A	A				
29							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
30							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
31							A	A	272	A	A	A	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	7	5	5	8	7	7	9	10	12	12	8					
MED								232	272	308	328	338	344	348	336	324	304	276	220					
U Q								240	U A 292	326	332	344	348	352	340	328	308	282	228					
L Q								224	268	300	324	336	336	344	336	324	298	270	216					

JUL. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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 86	J A 50	J A 66	J A 38	J A 39	J A 52	J A 50	J A 52	J A 65	J A 47	J A 130	J A 162	J A 104	J A 70	J A 62	J A 50	J A 50	J A 38	J A 41	J A 30	J A 27	J A 22	J A 31	J A 31
2	J A 35	J A 26	J A 53	J A 46	J A 24	J A 26	J A 72	J A 52	J A 50	J A 80	J A 68	J A 84	J A 79	J A 84	J A 89	J A 126	J A 156	J A 97	J A 54	J A 126	J A 83	J A 32	J A 50	J A 66
3	J A 52	J A 26	J A 52	J A 33	J A 42	J A 29	J A 29		J A 40	J A 84	J A 122	J A 90	J A 120	J A 109	J A 63			G		J A 46	J A 46	J A 41	J A 65	J A 54
4	J A 52	J A 52	J A 46	J A 38	J A 19	E B 16		J A 90	J A 83	J A 103	J A 73	J A 85	J A 56	J A 76	J A 53		J A 116	J A 110	J A 61	J A 86	J A 51	J A 38	J A 38	J A 50
5	J A 86	J A 108	J A 109	J A 70	J A 31	J A 33	J A 41	J A 37	J A 42	J A 88	J A 96	J A 70	J A 53	J A 76	J A 66	J A 66	J A 62	J A 84	J A 84	J A 55	J A 84	J A 24	J A 30	J A 29
6	J A 52	J A 87	J A 32	J A 87	J A 52	J A 50	J A 30	J A 38	J A 36	J A 43	J A 64	J A 99	J A 90	J A 177	J A 49	J A 76	J A 56	J A 46	J A 66	J A 72	E B 30	J A 42	J A 52	J A 108
7	J A 52	J A 52	J A 108	J A 19	J A 20	J A 32	J A 32	J A 37	J A 99	J A 139	J A 54	J A 70	J A 100	J A 40	J A 40	J A 53	J A 63	J A 43	J A 36	J A 30	J A 38	J A 34	J A 41	J A 20
8	J A 24	J A 33	J A 28	J A 18	J A 19	J A 20	J A 25	J A 42	J A 51	J A 48	J A 42	J A 41	J A 44	J A 38	J A 45	J A 41	G 24	 29	 24	J A 22	 20	 18	J A 18	J A 31
9	J A 52	J A 51	J A 48	J A 38	J A 104	J A 77	J A 53	J A 54	J A 85	J A 200	J A 103	J A 158	J A 274	J A 268	D D 300	J A 60	J A 45	 35	J A 29	J A 27	J A 257	J A 84	J A 50	J A 32
10	J A 33	J A 32	J A 26	J A 24	J A 20	J A 16	J A 20	J A 28	J A 39	J A 96	J A 40	 40	J A 55	J A 62	J A 166	J A 82	J A 91	J A 58	J A 88	J A 89	J A 52	J A 35	J A 27	J A 49
11	J A 16	E B 16	J A 61	J A 24	J A 33	J A 88	J A 38	J A 38	J A 40	 	G J A 44	J A 134	J A 95	J A 42	J A 50	J A 45	 37	J A 49	J A 65	J A 46	J A 83	J A 63	J A 18	 20
12	 21	 18	E B 16	J A 22	E B 16	 18	 21	J A 87	J A 100	J A 40	 40	 38	 44	J A 50	J A 54	J A 71	J A 46	J A 62	J A 48	J A 31	J A 51	J A 27	J A 49	J A 33
13	J A 22	J A 19	J A 17	E B 16	J A 17	J A 22	J A 19	J A 46	J A 39	J A 56	J A 42	J A 54	J A 80	J A 54	J A 40	J A 43	J A 37	 31	J A 75	J A 103	J A 52	J A 52	J A 33	J A 53
14	J A 41	E B 16	 17	J A 22	E B 16	J A 26	J A 20	 	G J A 35	J A 37	J A 56	J A 49	J A 44	J A 41	J A 45	J A 50	 36	J A 39	J A 42	J A 31	J A 26	J A 109	J A 42	J A 63
15	J A 52	J A 20	J A 26	J A 26	J A 26	J A 48	J A 26	J A 37	J A 51	J A 48	J A 50	J A 65	J A 53	J A 64	J A 61	J A 176	J A 163	J A 89	J A 37	J A 62	J A 18	J A 54	J A 64	J A 62
16	J A 118	J A 82	J A 52	J A 64	J A 90	J A 59	J A 88	J A 59	J A 40	J A 63	J A 85	J A 83	 46	 37	J A 40	 36	 41	J A 71	J A 71	J A 62	J A 157	J A 110	J A 86	J A 86
17	J A 98	J A 85	J A 118	J A 108	J A 144	J A 115	J A 193	J A 119	J A 136	J A 118	J A 218	J A 159	J A 119	J A 94	J A 54	J A 46	J A 51	J A 32	J A 46	J A 77	J A 53	J A 50	J A 66	J A 79
18	J A 98	J A 186	J A 126	J A 32	J A 60	J A 24	J A 33	J A 50	J A 144	J A 62	J A 153	J A 147	J A 163	J A 84	J A 90	J A 61	J A 86	J A 80	J A 84	J A 78	J A 34	J A 42	J A 32	J A 30
19	J A 24	J A 27	J A 24	J A 50	 17	E B 16	J A 24	J A 43	J A 47	J A 83	J A 90	J A 84	J A 90	J A 292	J A 76	J A 194	J A 162	J A 44	J A 30	J A 26	J A 39	J A 39	J A 140	J A 33
20	J A 38	J A 52	J A 87	J A 59	J A 42	J A 53	J A 26	J A 39	J A 65	J A 85	J A 119	J A 68	J A 66	J A 71	J A 86	J A 86	J A 53	J A 39	 28	J A 32	J A 197	J A 160	J A 52	J A 41
21	J A 40	J A 52	J A 33	J A 59	J A 48	J A 53	J A 27	J A 39	J A 80	J A 62	J A 47	J A 94	J A 125	J A 66	J A 56	J A 55	J A 52	J A 38	J A 49	J A 44	J A 125	J A 21	J A 24	J A 24
22	J A 52	J A 22	J A 96	J A 21	J A 22	J A 41	J A 32	J A 42	J A 103	J A 79	J A 49	 45	J A 59	J A 62	J A 60	J A 45	 38	 35	 28	J A 27	J A 19	J A 21	J A 24	J A 88
23	J A 123	J A 100	J A 50	J A 32	J A 53	J A 58	J A 21	J A 38	J A 50	J A 61	J A 52	J A 59	J A 63	J A 56	J A 48	J A 81	J A 58	J A 110	J A 32	J A 269	J A 82	J A 62	J A 140	J A 148
24	J A 63	J A 142	J A 51	J A 53	J A 87	J A 86	J A 19	J A 44	J A 48	 36	 40	J A 44	J A 55	J A 274	J A 59	J A 50	J A 52	J A 64	J A 56	J A 135	J A 58	J A 110	J A 35	J A 16
25	 20	 19	J A 16	J A 22	J A 45	J A 22	J A 27	J A 65	J A 51	J A 52	J A 70	J A 82	J A 61	J A 47	 41	 45	J A 66	J A 52	 25	J A 42	J A 22	 21	J A 28	J A 51
26	J A 52	J A 37	J A 30	J A 33	 18	J A 16	J A 27	J A 64	J A 96	J A 59	J A 90	J A 63	J A 68	J A 67	 41	J A 69	J A 70	J A 85	J A 63	J A 57	J A 136	J A 36	J A 22	J A 64
27	J A 52	J A 82	J A 88	J A 53	J A 31	J A 22	J A 48	J A 59	J A 50	J A 50	J A 96	J A 67	J A 58	J A 59	J A 54	J A 90	J A 60	J A 72	J A 168	J A 146	J A 177	J A 78	J A 52	E B 16
28	J A 32	J A 33	J A 20	 19	J A 17	J A 24	J A 19	 25	 31	J A 41	J A 41	J A 46	J A 41	 44	J A 53	J A 63	J A 57	J A 50	J A 56	J A 64	J A 46	J A 31	J A 42	J A 124
29	J A 52	J A 84	J A 36	J A 36	J A 49	J A 52	J A 53	J A 78	J A 157	J A 88	J A 83	J A 159	J A 139	J A 146	J A 150	J A 57	J A 70	J A 98	J A 80	J A 61	J A 108	J A 52	J A 46	J A 82
30	J A 22	J A 21	J A 16	 19	E B 16	J A 17	J A 28	J A 44	J A 40	J A 51	J A 108	J A 161	J A 77	J A 118	J A 45	J A 45	J A 54	J A 60	J A 42	J A 64	J A 71	J A 64	J A 100	J A 80
31	J A 79	J A 50	J A 65	J A 70	J A 23	J A 53	J A 89	J A 37	J A 67	J A 63	J A 118	J A 131	J A 139	J A 184	J A 100	J A 85	J A 76	J A 82	J A 91	J A 84	J A 128	J A 128	J A 98	J A 48
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 52	J A 50	J A 48	J A 33	J A 31	J A 32	J A 28	J A 43	J A 51	J A 62	J A 70	J A 82	J A 68	J A 67	J A 54	J A 57	J A 56	J A 52	J A 49	J A 61	J A 52	J A 42	J A 42	J A 50
U Q	J A 63	J A 82	J A 66	J A 53	J A 49	J A 53	J A 48	J A 59	J A 85	J A 85	J A 103	J A 131	J A 104	J A 109	J A 76	J A 81	J A 70	J A 82	J A 71	J A 84	J A 108	J A 64	J A 64	J A 79
L Q	J A 32	 22	J A 26	J A 22	 19	J A 22	J A 22	J A 37	J A 40	J A 48	J A 47	J A 54	J A 55	J A 50	J A 45	 45	 45	 38	 34	J A 31	J A 30	J A 31	J A 30	J A 31

JUL. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	E B 16	E B 16	E B 16	E B 16	A A 39	A A 52	33	31	43	36	A A 130	47	A A 104	A A 70	37	34	32	27	29	22	20	19	E B 16	E B 16
2	E B 16	18	E B 16	19	E B 16	E B 16	A A 72	A A 52	A A 50	A A 80	58	A A 84	A A 79	A A 84	A A 89	A A 126	A A 156	A A 97	38	A A 126	28	26	A A 50	A A 66
3	E B 16	20	E B 16	E B 16	A A 42	E B 16	24	33	39	51	A A 122	46	A A 120	A A 109	46	36	34	G	32	44	27	21	A A 65	E B 16
4	20	21	24	A A 38	E B 16	E B 16	18	A A 90	A A 83	A A 103	50	A A 85	A A 56	A A 76	A A 53	42	A A 116	31	48	42	42	E B 16	E B 16	20
5	A A 86	E B 16	E B 16	19	E B 16	E B 16	A A 41	33	35	A A 88	38	A A 70	39	A A 76	51	37	61	37	39	40	43	20	21	22
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	32	34	36	A A 64	A A 99	A A 90	40	39	46	35	33	43	A A 72	E B 30	E B 16	E B 16	20
7	24	28	E B 16	E B 16	E B 16	E B 16	21	29	42	35	36	41	38	35	35	A A 53	38	32	36	29	30	20	33	E B 16
8	18	17	E B 16	E B 16	E B 16	E B 16	20	27	37	43	38	36	38	35	37	34	G 22	29	24	16	E B 16	E B 16	E B 16	E B 16
9	A A 52	A A 51	E B 16	E B 16	A A 104	A A 77	21	42	43	37	A A 103	A A 158	A A 274	A A 268	A A 300	45	31	32	25	16	20	50	30	18
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	27	33	35	37	37	48	A A 62	A A 166	A A 82	A A 91	50	54	32	37	E B 16	E B 16	E B 16
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	31	29	34	G	36	A A 134	40	40	48	44	34	48	47	42	E B 16	E B 16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	27	33	34	37	38	42	42	A A 54	38	35	52	36	18	31	E B 16	E B 16	E B 16
13	20	E B 16	E B 16	E B 16	E B 16	E B 16	18	39	33	36	34	39	38	39	38	36	35	31	54	21	24	28	A A 33	18
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	G	32	33	35	36	40	39	44	44	35	34	27	28	17	25	19	E B 16
15	E B 16	E B 16	21	E B 16	E B 16	E B 16	24	31	38	37	38	A A 65	38	39	44	A A 176	A A 163	52	25	36	E B 16	21	22	A A 62
16	A A 118	A A 82	A A 52	A A 64	E B 16	A A 59	22	A A 59	33	50	A A 85	A A 83	41	36	36	36	41	A A 71	A A 71	53	41	30	28	A A 86
17	A A 98	A A 85	A A 118	A A 108	A A 144	A A 115	23	A A 119	A A 136	A A 118	A A 218	A A 159	A A 119	A A 94	35	34	36	29	31	64	28	30	A A 66	A A 79
18	A A 98	E B 16	E B 16	E B 16	A A 60	E B 16	30	A A 50	A A 144	A A 62	A A 153	A A 147	A A 163	44	A A 90	39	A A 86	70	42	A A 78	19	27	E B 16	20
19	18	E B 16	E B 16	20	E B 16	E B 16	23	32	36	38	51	46	50	A A 292	58	A A 194	51	31	27	24	29	19	A A 140	23
20	21	24	A A 87	18	E B 16	E B 16	20	31	A A 65	A A 85	A A 119	A A 68	51	A A 71	A A 86	51	36	35	26	26	18	E B 16	24	20
21	20	28	25	22	E B 16	E B 16	19	29	41	44	43	A A 94	38	52	40	40	41	32	43	31	28	20	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	38	40	A A 79	43	43	40	56	41	40	36	31	25	24	E B 16	E B 16	21	E B 16
23	30	A A 100	E B 16	E B 16	E B 16	E B 16	E B 16	26	35	37	A A 52	A A 59	A A 63	A A 56	42	50	49	33	30	A A 269	46	36	24	A A 148
24	18	E B 16	E B 16	21	A A 87	A A 86	18	29	39	34	37	A A 44	A A 55	38	37	42	38	38	28	31	22	26	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	A A 65	42	A A 52	45	A A 82	44	44	40	43	60	35	24	35	E B 16	E B 16	E B 16	27
26	19	20	E B 16	E B 16	E B 16	E B 16	21	A A 64	A A 96	32	47	35	A A 68	A A 67	39	A A 69	52	57	47	A A 57	A A 136	22	E B 16	E B 16
27	A A 52	A A 82	A A 88	A A 53	A A 31	E B 16	A A 48	A A 59	34	A A 50	A A 96	48	A A 58	45	50	A A 90	42	A A 72	A A 168	23	E B 16	A A 78	A A 52	E B 16
28	18	22	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	36	39	44	40	43	46	46	45	45	47	44	37	18	21	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	28	A A 157	A A 88	A A 83	A A 159	56	A A 146	A A 150	46	A A 70	A A 98	58	A A 61	29	24	20	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	36	39	37	42	A A 161	49	44	40	36	35	44	29	48	39	36	A A 100	21
31	28	20	20	20	E B 16	22	21	35	45	48	A A 118	A A 131	A A 139	A A 184	A A 100	46	49	A A 82	A A 91	A A 84	A A 128	A A 128	22	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	18	E B 16	E B 16	E B 16	E B 16	E B 16	21	32	39	38	47	A A 65	50	52	44	44	41	35	36	36	28	21	21	18
U Q	A A 28	A A 24	20	20	A A 16	A A 16	24	A A 50	A A 45	A A 62	A A 96	A A 99	A A 79	A A 76	A A 58	A A 51	A A 60	A A 52	47	A A 57	37	28	A A 33	A A 22
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	29	34	36	38	43	40	40	39	37	35	31	27	24	E B 18	E B 16	E B 16	E B 16

JUL. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

JUL. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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 320	F	F	F 327	A	A	352	366	327	329	A	314	A	A	287	307	318	305	313	321	351	373	329	F 303
2	F 326	F	F	348	F 370	343	A	A	A	A	373	A	A	A	A	A	A	A	309	A	358	396	A	A
3	334	F 309	311	330	A	326	395	342	320	356	A	313	A	A	296	271	309	293	J R 290	342	364	358	A	F 277
4	F 329	F 346	324	A	F 304	F	392	A	A	A	361	A	A	A	A	249	A	285	303	314	339	385	415	F
5	A	F 334	342	325	332	306	A	352	333	A	347	A	325	A	288	286	301	307	313	338	394	322	300	302
6	F 305	F 328	F 303	F 362	F 356	310	397	337	338	383	A	A	A	266	280	326	345	336	333	A	319	311	331	F
7	F 314	F 339	F 337	F 319	F 353	335	353	353	313	G	281	327	330	243	228	A	309	282	305	341	367	316	305	303
8	F	F 315	308	F 353	352	365	367	392	327	307	317	318	317	309	268	300	283	298	320	335	324	325	365	315
9	A	A	F 298	F 351	A	A	359	362	376	301	A	A	A	A	A	285	304	312	304	323	326	351	378	321
10	F 314	F	F	F	F	F	352	360	318	374	274	339	313	A	A	A	A	286	302	339	353	382	323	302
11	323	J R 362	313	315	304	338	350	341	342	323	307	A	322	293	273	312	292	278	305	306	354	395	284	290
12	F 307	F 313	F 320	F 319	337	F 326	360	342	303	325	345	344	290	G	A	278	283	296	300	327	368	360	346	303
13	306	332	319	F 328	F 330	352	333	319	353	323	305	318	297	345	259	259	292	301	328	311	336	389	A	313
14	309	303	300	F 299	F 319	355	368	357	334	311	352	345	319	227	300	299	289	332	360	365	301	333	F 318	F
15	F 310	F 310	290	F 300	F 277	F 314	339	349	383	375	354	A	280	G	258	A	A	302	310	338	353	299	332	A
16	A	A	A	A	301	A	414	A	363	284	A	A	300	284	297	295	283	A	A	291	359	366	288	A
17	A	A	A	A	A	A	350	A	A	A	A	A	A	A	262	299	309	286	304	346	376	357	A	A
18	A	F 323	F 407	F 308	A	F 311	383	A	A	A	A	A	A	308	A	287	A	307	321	A	349	327	330	298
19	323	296	F 295	F 303	325	324	374	344	372	382	329	332	282	A	284	A	315	323	318	341	312	345	A	311
20	F 302	F 321	A	F 299	F 302	F 309	345	385	A	A	A	A	326	A	A	296	322	339	309	329	333	317	304	F 281
21	F 304	F 317	339	339	F 299	F 316	331	403	347	319	315	A	327	335	279	291	325	281	306	354	346	296	310	F 302
22	F 320	F 310	309	F 294	335	347	328	352	316	A	278	280	237	302	351	273	272	290	338	376	288	303	320	F 296
23	323	A	F 307	F 320	F 304	338	386	395	352	312	A	A	A	A	320	339	315	299	302	A	372	386	310	A
24	F 311	F 311	F 337	383	A	A	347	384	351	342	320	A	A	244	297	324	315	290	313	353	371	306	303	320
25	312	334	327	311	307	308	359	A	349	A	335	A	308	305	280	281	314	345	331	301	318	378	326	F 335
26	345	F 300	325	329	F 315	F 351	418	A	A	337	339	346	A	A	270	A	333	334	363	A	A	331	334	277
27	A	A	A	A	A	F	A	A	400	A	A	321	A	291	289	A	292	A	A	341	387	A	A	310
28	302	F 316	309	F 329	F 326	F 336	391	342	366	383	274	269	278	292	A 257	294	312	321	331	331	332	320	359	345
29	F 301	323	315	314	321	330	356	346	A	A	A	A	325	A	A	284	A	A	326	A	323	330	319	F 288
30	F 305	F 295	F 336	331	342	322	367	394	369	343	319	A	293	304	310	300	301	284	305	342	375	326	A	284
31	319	F 310	316	F 307	F 330	422	361	346	376	367	A	A	A	A	A	298	305	A	A	A	A	A	312	279
	00	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	23	24	26	23	23	28	23	24	21	19	13	18	17	22	24	25	26	28	24	29	29	24	23
MED	F 313	F 316	316	F 322	F 325	330	360	352	348	329	320	321	310	292	282	294	309	300	312	338	351	333	322	302
U Q	323	332	F 332	331	337	347	384	384	368	370	347	342	325	306	297	300	315	321	327	342	368	376	333	313
L Q	F 306	F 310	F 308	F 308	F 304	314	350	342	327	312	305	314	290	244	268	282	292	286	304	322	325	318	308	288

JUL. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	A	441	A	A	A	A	415	417	404	409	385	L				
2							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
3									A	A	A	A	A	A	A	438	401	414	A	A				
4							L	A	A	A	A	A	A	A	A	A	A	372	A	A				
5									U L 386	A	422	A	429	A	A	414	A	A	A					
6									U L 394	412	A	A	A	403	420	A	409	390	A	A				
7								L	A	405	415	411	436	434	487	A	A 393	379	A	A				
8									A	A	448	445	449	449	428	439	417	392	U L 377	L				
9								A	A	L 409	A	A	A	A	A	A	396	420	374	L				
10								U L 398	U L 420	440	448	453	A	A	A	A	A	A	A					
11									L 376	410	445	A	411	431	A	A	418	A	A					
12									399	396	415	432	421	437	A	A 387	431	A	A	L				
13								A	L 393	U L 433	L 436	431	444	418	U L 390	428	403	377	A	L				
14								L	U L 410	429	434	429	438	442	A	A	380	390	L					
15								386	A	L 420	426	A	449	476	A	A	A	A	389					
16								A	L 386	A	A	A	416	412	396	413	A	A	A	A				
17								A	A	A	A	A	A	A	442	406	414	398	A 362					
18								A	A	A	A	A	A	A	A	389	A	A		A				
19									393		A	A	A	A	A	A	A	391	L 380					
20									A	A	A	A	A	A	A	A	373	393	367					
21									A	A	A	A	448	A	A 338	A	A	376						
22									A	A	A	A	424	A	A	388	399	382	361					
23								L	L 398	U L 392	A	A	A	A	A	A	A	399	L 386	A				
24								L 388	A	442	430	A	A	442	440	A	A	A	374					
25							L	A	A	A	A	A	A	A	422		A	A 375	L 388					
26							A	A	A	414	A	438	A	A	402	A	A	A	A	A				
27							A	A	U L 412	A	A	A	A	A	A	A	A	A	A					
28								U L 384	416	441	435	A	442	A	A	A	A	A	A					
29									A	A	A	A	A	A	A	A	A	A	A	A				
30								A	A	383	A	A	A	A	A 390	398	363	A	374					
31								A	A	A	A	A	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	12	15	11	7	12	10	12	11	14	16	12					
MED								L 387	L 396	414	434	432	437	436	418	413	402	390	376					
U Q								L 393	U L 411	440	445	445	446	442	434	428	414	398	386					
L Q								385	L 390	405	422	429	422	418	393	389	393	378	370					

JUL. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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						A		240	E A 360	318	A	358	A	A	398	338	302	334	314	260				
2							A	A	A	A	238	A	A	A	A	A	A	A	314	A				
3									334	272	A	360	A	A	368	340	280	276	278	242				
4							214	A	A	A	268	A	A	A	A	534	A	372	314	268				
5									316	A	282	A	324	A	E A 410	378	A 342	294	256					
6									280	246	A	A	A	488	422	298	270	280	284	A				
7								260	E A 360	G	430	316	318	570	658	A	354	408	338	230				
8									E A 338	E A 386	344	350	332	356	474	376	402	360	296	244				
9								246	244	394	A	A	A	A	A	398	318	288	286	258				
10								234	330	260	452	306	358	A	A	A	A	362	304					
11									286	318	358	A	324	400	A 452	332	362	372	328					
12									378	332	284	284	428	G	A	408	348	322	296	258				
13								310	262	294	372	340	390	290	500	480	358	310	272	272				
14								252	298	338	280	302	360	654	374	348	356	274	238					
15								280	220	258	290	A	454	G	504	A	A	A 322	300					
16								A	260	E A 438	A	A	366	356	328	354	350	A	A	A 370				
17								A	A	A	A	A	A	A	488	374	328	386	314					
18								A	A	A	A	A	A	330	A	348	A	E A 338		A				
19									256		322	318	A 428	A	A 400	A	316	278	262					
20									A	A	A	A	A 334	A	A	384	298	270	324					
21									268	E A 336	316	A	324	306	426	362	290	384						
22									A 332	A	438	440	596	A 358	262	426	372	324	250					
23								218	278	L 366	A	A	A	A	324	302	A 350	362	338	A				
24								238	286	300	334	A	A	560	380	306	320	374	292					
25							264	A	256	A	318	A	334	334	382		300	250	242					
26							186	A	A	304	312	288	A	A	466	A	320	282	232	A				
27							A	A	208	A	A	E A 340	A	390	342	A	286	A	A					
28								292	250	246	464	482	432	410	E A 520	386	316	282	260					
29									A	A	A	A	A 346	A	A	356	A	A	A 304	A				
30								212	A 244	290	342	A	374	318	312	330	306	354	292					
31								A 280	252	258	A	A	A	A	A	332	330	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	12	24	20	19	13	18	17	22	23	25	26	26	9				
MED							214	249	270	302	322	340	359	390	398	356	320	322	294	258				
U Q							264	280	A 331	352	372	359	428	565	474	386	352	362	314	270				
L Q							186	236	254	266	284	304	332	332	368	332	301	282	262	243				

JUL. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	304	Q 292	Q 274	256	A	A	E A 266	200	A	188	A	A	A	A	204	196	190	214	222	232	216	174	230	320
2	238	284	202	238	222	246	A	A	A	A	A	A	A	A	A	A	A	A	A	A	214	184	A	A
3	238	272	280	276	A	262	204	E A 248	A	A	A	A	A	A	A	188	212	176	A	A	192	200	A	330
4	Q 282	Q 230	A 270	A	Q 296	Q 262	196	A	A	A	A	A	A	A	A	A	A	228	A	A	240	202	168	Q 288
5	A	260	Q 234	A 290	226	362	A	E A 262	A 226	A	202	A	190	A	A	204	A	A	A	228	206	A 210	280	302
6	278	260	Q 314	216	Q 236	304	200	E A 248	214	204	A	A	A	224	206	A	212	214	A	A	236	242	246	Q 288
7	316	262	Q 230	Q 242	Q 222	266	226	238	A	194	198	A 222	184	184	156	A	A 244	226	A	A	196	232	E A 300	Q 270
8	262	274	262	210	190	208	210	218	A	A	178	166	170	166	186	170	188	208	200	206	204	226	200	250
9	A	A	310	242	A	A	228	A	A	190	A	A	A	A	A	A	204	194	194	204	210	232	204	198
10	252	Q 280	Q 276	Q 258	Q 246	Q 236	204	190	176	182	168	172	A	A	A	A	A	A	A	234	220	196	194	278
11	246	242	286	276	260	260	A 276	192	216	184	174	A	216	204	A	A	190	A	A	284	224	168	280	280
12	284	270	244	274	236	222	200	196	208	204	202	180	210	204	A	A 240	192	A	A	228	212	172	188	272
13	284	246	258	274	Q 254	240	212	A	198	172	160	198	178	206	208	186	200	220	A	230	218	190	A	268
14	276	272	286	300	Q 268	222	208	186	180	174	164	204	198	192	A	A	236	A 230	214	212	266	260	266	260
15	240	280	330	Q 282	Q 312	Q 278	236	A 232	A	198	190	A	166	160	A	A	A	A	200	260	198	226	238	A
16	A	A	A	A	292	A	206	A	198	A	A	A	202	H 182	186	H 200	A	A	A	A	218	214	E A 306	A
17	A	A	A	A	A	A	226	A	A	A	A	A	A	A	174	198	220	204	E A 264	A 274	192	E A 270	A	A
18	A	258	Q 184	Q 228	A	310	216	A	A	A	A	A	A	A	A	242	A	A	262	A	200	218	204	288
19	246	286	266	286	220	242	224	210	E A 234	206	A	A	A	A	A	A	A	202	200	234	264	216	A	282
20	Q 300	300	A	Q 292	Q 270	Q 268	212	222	A	A	A	A	A	A	A	A	236	230	194	252	232	216	274	272
21	262	278	248	240	300	264	218	206	A	A	A	A	170	A	E A 302	E A 280	A	234	294	202	220	228	250	280
22	270	Q 288	260	Q 284	210	226	236	A 264	A	A	A	A	206	A	A	E A 272	A 220	226	212	208	174	246	244	Q 252
23	E A 280	A	288	218	250	232	208	192	222	228	A	A	A	A	A	A	A	218	224	A	226	202	A 292	A
24	262	Q 258	228	194	A	A	236	216	A	184	192	A	A	182	192	A	A	A	236	222	212	258	268	240
25	246	220	236	274	310	274	212	A	A	A	A	A	A	A	212	364	A	A	208	A 276	234	200	234	250
26	228	298	238	246	276	218	A	A	A	190	A	176	A	A	220	A	A	A	A	A	A	240	262	408
27	A	A	A	A	A	Q 298	A	A	A 192	A	A	A	A	A	A	A	A	A	A	228	192	A	A	264
28	296	332	260	Q 268	Q 268	Q 260	202	198	192	176	192	A	186	A	A	A	A	A	A	268	250	234	220	226
29	274	250	274	278	288	278	200	186	A	A	A	A	A	A	A	A	A	A	A	A	246	210	234	294
30	Q 258	Q 258	Q 222	Q 230	214	248	236	A	A	E A 242	A	A	A	A	A 244	224	252	A	238	234	204	A 246	A	326
31	A 290	262	278	254	242	190	238	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	256	266
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	27	27	24	26	27	19	12	16	11	7	12	10	12	13	14	15	15	20	29	29	24	26
MED	266	271	262	258	252	260	212	204	200	190	190	180	188	188	202	201	212	218	213	231	216	216	240	275
U Q	284	284	280	278	282	274	236	E A 238	219	204	198	204	204	204	216	257	236	228	238	256	233	237	271	288
L Q	246	258	Q 236	238	224	232	204	192	192	183	168	172	174	182	186	192	192	204	200	217	202	200	212	260

JUL. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
2						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
3						B	A	108	104	104	A	102	102	A	104	104	104	104	104	A				
4						B	A	A	A	A	A	A	A	102	102	104	A	A	104	A				
5						B		A	A	A	A	102	A	A	A	A	A	A	A	A				
6							A	A	A	A	A	A	A	A	102	102	102	102	102	A				
7							A	A	A	A	A	102	A	A	A	104	102	102	A	A				
8							A	A	112	104	102	A	A	A	A	A	100	A	A	A				
9							A	100	A	A	A	100	A	A	A	A	A	A	A	A				
10							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
11							A	A	102	102	102	100	A	A	100	100	100	100	100	A				
12							A	A	A	A	A	A	100	102	102	102	102	104	A	A				
13							A	104	A	A	A	A	A	A	A	A	A	A	A	A				
14							A	A	A	A	A	A	A	A	104	A	A	A	A	A				
15							A	A	100	A	A	A	A	A	A	A	A	A	A	A				
16							A	A	A	A	A	A	104	104	A	104	102	102	102	A				
17							A	A	A	A	A	A	A	A	A	A	A	106	A	A				
18							A	106	A	A	A	A	A	A	A	A	A	A	A	A				
19							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
20							A	104	A	A	A	A	100	100	A	A	A	A	102	A				
21							A	102	A	A	A	A	A	102	A	A	A	102	A	A				
22							A	A	A	A	A	A	A	A	A	A	102	102	102	A				
23							B	A	A	A	102	104	104	104	104	A	104	A	A	A				
24							A	A	104	104	104	102	102	A	A	A	A	A	A	A				
25							B	A	A	A	A	A	A	A	A	102	102	102	102	A				
26							A	A	A	A	A	A	A	A	102	100	106	106	A	A				
27							A	A	A	106	106	106	104	A	104	104	104	104	A	A				
28							B	A	104	A	A	A	A	104	A	A	A	A	A	A				
29							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
30							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
31							A	A	102	A	A	A	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	7	5	5	8	7	7	9	10	12	12	8					
MED								104	104	104	102	102	102	102	102	103	102	102	102					
U Q								106	104	105	105	103	104	104	104	104	104	104	103					
L Q								102	102	103	102	101	100	102	102	102	102	102	102					

JUL. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	104	104	102	94	94	92	92	92	98	96	90	86	94	92	92	90	92	88	88	88	84	82	108	100
2	96	96	104	96	94	122	90	86	110	106	102	100	108	110	106	102	96	96	112	104	102	92	88	94
3	94	92	98	96	88	90	120	118	114	104	100	104	98	104	108	114	146	G	112	102	100	100	100	100
4	104	98	94	98	98	B	124	106	106	106	106	100	102	102	108	154	104	104	104	98	98	98	96	106
5	96	128	90	96	94	94	116	110	110	102	100	100	98	94	96	98	90	90	106	88	88	84	84	82
6	110	100	100	102	96	94	116	118	118	116	106	100	96	114	124	106	108	108	102	96	B	100	102	100
7	96	102	102	92	92	92	178	116	102	158	106	102	106	106	102	118	106	106	102	94	86	86	92	92
8	88	88	102	100	100	98	102	94	112	106	112	100	98	98	94	94	88	114	112	90	82	82	94	94
9	94	96	102	100	100	100	98	106	106	110	100	100	118	96	96	100	94	104	98	90	96	90	86	86
10	84	86	86	86	86	84	102	92	106	102	102	100	94	94	94	88	90	88	86	88	88	88	88	98
11	84	B	98	98	96	96	110	110	108	G	108	102	98	106	108	108	128	108	100	96	96	96	88	86
12	82	82	B	86	B	108	112	134	96	128	94	138	118	116	112	108	118	102	104	98	92	88	92	86
13	86	86	82	B	106	104	104	102	102	98	100	100	98	98	98	98	98	102	98	94	94	90	84	86
14	86	B	108	88	B	96	120	G	96	104	104	98	98	136	114	112	158	92	88	104	86	98	92	102
15	100	82	82	102	102	96	114	114	110	104	104	100	106	100	98	92	92	90	92	88	86	96	118	100
16	100	100	100	98	96	92	92	94	112	108	104	112	126	152	104	102	132	106	108	100	136	102	104	110
17	98	98	98	98	100	102	104	100	96	94	124	98	94	92	98	92	94	116	92	106	90	112	106	106
18	100	112	102	100	96	94	118	114	108	112	106	98	124	98	98	104	94	90	92	104	90	88	88	84
19	80	82	98	98	80	B	108	108	108	106	102	98	96	96	96	94	94	98	94	88	90	86	102	90
20	88	118	104	108	128	102	110	102	100	100	94	100	100	98	96	96	96	112	124	106	104	98	98	94
21	114	86	86	98	96	96	104	104	100	100	100	94	102	102	106	138	116	122	104	108	112	92	108	104
22	106	84	102	102	100	100	100	102	100	98	96	112	100	124	136	130	130	130	116	106	88	86	86	104
23	104	104	104	98	98	98	118	104	124	94	110	106	110	106	110	102	100	96	98	96	90	92	96	96
24	106	106	96	92	94	90	120	114	104	118	118	110	102	106	120	96	92	102	98	92	102	102	106	82
25	96	82	82	94	94	94	106	94	96	92	92	92	94	94	124	112	104	100	112	92	88	84	106	96
26	96	96	100	96	98	102	102	102	108	100	94	104	94	110	118	104	104	100	98	96	110	86	88	92
27	98	96	86	86	86	86	112	108	92	128	108	108	104	112	106	102	122	104	100	116	92	92	92	B
28	88	86	86	82	84	84	112	126	160	92	94	94	102	160	100	98	94	94	92	90	84	106	98	108
29	98	98	98	98	98	94	106	102	100	98	100	100	96	94	94	122	110	110	106	102	106	112	112	108
30	86	98	84	100	B	150	102	98	100	98	108	94	96	98	98	130	110	100	94	102	88	112	108	94
31	132	118	108	106	106	96	110	112	102	100	96	92	92	94	94	94	116	108	102	102	98	98	104	118
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	29	30	30	28	29	31	30	31	30	31	31	31	31	31	31	31	30	31	31	30	31	31	30
MED	96	96	98	98	96	96	110	105	106	103	102	100	98	102	102	102	104	102	100	96	91	92	96	96
U Q	104	103	102	100	100	101	116	114	110	108	106	104	106	110	110	112	116	108	106	104	100	100	106	104
L Q	88	86	86	94	94	92	102	100	100	98	96	98	96	96	96	96	94	96	94	90	88	86	88	90

IONOSPHERIC DATA STATION Okinawa

JUL. 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 2	F 2	FQ 21	FQ 21	FQ 31	LQ 41	L 6	LQ 31	LQ 51	LQ 21	LQ 71	LQ 41	LQ 41	LQ 31	LQ 21	LQ 21	LQ 21	LQ 11	LQ 31	LQ 31	FQ 61	F 4	FF 11	F 2
2	FQ 21	FQ 31	FQ 21	FQ 21	FQ 21	CL 12	LQ 61	LCQ 33	CLQ 52	CQ 51	C 4	C 5	CL 51	LLQ 51	CQ 31	CQ 71	LQ 91	LQ 81	CLQ 45	CQ 81	FQ 71	FQ 31	FQ 31	FQ 31
3	FQ 31	FQ 21	FQ 21	FQ 31	FQ 31	LQ 21	C 5	C 2	C 4	C 5	CQ 71	CQ 31	LQ 61	CQ 31	C 2	CH 11	H 1		C 3	C 4	F 9	F 8	F 7	FQ 41
4	FQ 21	FQ 41	FQ 21	FQ 21	F 2		C 1	C 5	C 5	C 6	CQ 41	CQ 51	CQ 41	C 4	C 4	HC 11	CQ 51	CQ 41	C 3	LQ 51	FQ 71	F 4	FQ 31	FQ 31
5	FQ 31	FFQ 23	FQ 31	FQ 41	F 1	LQ 21	C 8	CQ 41	CQ 31	CQ 31	CQ 31	C 3	L 3	L 6	L 4	L 4	L 3	LQ 51	CL 16	LQ 51	FQ 61	F 4	F 3	F 7
6	FF 12	FQ 21	FQ 21	FQ 21	FQ 21	FQ 21	C 4	CL 52	C 2	CLQ 21	CQ 21	CQ 51	LQ 31	CLQ 13	C 2	C 5	C 3	C 3	C 6	LC 72		FF 22	FQ 41	FQ 31
7	FQ 31	FQ 41	FQ 21	FQ 21	F 3	F 4	HC 13	CQ 31	CQ 41	HLQ 11	CQ 11	CQ 21	CQ 21	C 1	CQ 11	CQ 31	CQ 31	C 3	C 3	L 8	FF 33	FF 34	FQ 61	FQ 31
8	FQ 61	FQ 21	FF 22	F 1	F 1	F 1	C 1	LHQ 21	CQ 41	CQ 21	CQ 21	CQ 11	LQ 11	LQ 11	LH 11	LQ 11	L 1	CL 11	CL 11	L 1	F 1	F 1	F 1	FQ 21
9	FQ 81	FQ 41	FQ 31	F 3	FQ 41	FQ 81	LQ 31	C 6	C 5	CQ 31	CQ 41	C 4	CLQ 15	LQ 51	LQ 51	CQ 41	L 1	C 2	L 3	L 2	FQ 31	FQ 41	FQ 41	FQ 41
10	FQ 21	FQ 31	FQ 21	FQ 11	FQ 11	F 2	CL 11	L 2	C 2	C 2	C 1	C 1	L 3	L 5	LQ 31	LQ 61	LQ 61	LQ 81	LQ 91	LQ 41	FQ 31	FQ 31	FQ 31	FQ 21
11	F 2		FQ 31	FQ 31	F 5	FQ 91	C 5	C 5	C 2		C 2	C 6	L 3	CH 11	C 2	C 1	C 1	C 6	C 6	L 9	F 4	F 5	F 1	F 1
12	F 1	F 1		F 1		FF 11	C 2	HL 12	LQ 21	CL 11	L 2	HL 11	C 1	C 1	C 2	C 2	C 1	C 4	C 4	L 3	F 3	F 3	FQ 21	F 4
13	F 3	F 1	F 1		F 1	F 1	C 1	C 8	C 2	LQ 31	C 2	CH 11	LQ 21	L 2	L 1	L 1	L 1	C 1	LQ 51	L 4	F 4	F 5	F 5	FQ 31
14	FQ 21		F 1	F 1		F 1	C 3		LQ 11	C 1	C 1	L 1	LH 11	HL 11	C 2	CQ 21	HL 11	L 2	L 4	CL 32	F 4	FF 33	FQ 31	F 7
15	F 3	F 2	F 4	F 1	FF 11	FQ 31	CQ 31	CQ 31	CQ 41	CQ 21	CQ 21	CQ 31	C 1	C 3	LQ 31	LQ 81	LQ 71	LQ 51	L 3	L 6	F 1	F 4	FFQ 34	FQ 91
16	FQ 81	FQ 41	FQ 51	FQ 61	FQ 61	FQ 61	L 6	LQ 61	CQ 11	CQ 41	CQ 51	CQ 21	C 1	HC 11	L 1	CH 11	HL 11	C 4	CL 82	CL 94	FFQ 55	FQ 51	FFQ 33	FFQ 14
17	F 6	FQ 71	FQ 51	FQ 71	FQ 61	FQ 61	CQ 41	CQ 81	LQ 81	LQ 91	CLQ 25	LQ 51	LQ 61	LQ 31	LQ 11	L 1	L 3	CL 12	LC 33	CL 36	F 9	FFQ 35	FF 81	F 8
18	FQ 51	FQ 21	FQ 21	FQ 31	FQ 31	FQ 41	CL 32	C 5	CQ 61	CQ 51	CQ 51	LQ 71	CLQ 14	L 3	L 5	CH 31	LQ 41	LQ 51	LQ 31	CLQ 74	FQ 31	F 4	F 3	F 5
19	F 3	F 7	FF 23	FF 22	F 1		C 4	C 3	C 3	CQ 31	CQ 51	L 5	L 4	LQ 61	LQ 41	LQ 91	LQ 61	LQ 31	L 3	L 5	F 5	FQ 31	FQ 31	FQ 61
20	F 7	FFQ 14	FFQ 37	FFQ 27	FFQ 11	F 1	C 4	C 3	CQ 71	CQ 61	LQ 81	CQ 31	C 3	L 4	L 4	LQ 31	LQ 31	CQ 31	C 2	C 6	FQ 41	FQ 31	FQ 51	F 6
21	FF 14	FQ 61	FF 25	FF 16	FF 23	F 2	C 3	C 3	C 3	C 5	C 2	L 5	C 3	C 3	C 2	H 2	CQ 21	C 1	C 4	CL 81	FF 16	FQ 21	FQ 21	FQ 11
22	FQ 21	FQ 31	FQ 31	FQ 21	F 2	F 5	L 3	CQ 41	CQ 71	L 4	L 2	C 2	CH 11	CL 42	HL 21	HL 21	H 1	HL 22	CL 22	CQ 31	F 2	F 3	F 4	FQ 31
23	FQ 51	FQ 51	FQ 31	FQ 21	FQ 41	F 3	C 1	C 2	CL 13	LQ 21	C 3	C 3	C 3	C 2	C 2	C 5	C 4	L 7	L 3	LQ 71	FQ 51	FQ 31	FQ 31	FQ 41
24	FQ 21	FQ 31	FQ 41	FQ 61	FQ 61	FQ 51	C 1	CL 32	C 3	C 2	C 1	C 2	C 2	CQ 21	CL 11	LHQ 11	LC 32	CL 32	L 3	LQ 71	FF 46	FFQ 27	FFQ 12	F 3
25	F 1	F 1	F 3	F 2	FQ 31	FQ 21	C 1	L 6	L 3	L 4	L 2	L 6	L 2	L 2	CL 11	C 2	C 4	C 3	C 1	L 7	F 1	F 1	FF 21	FF 62
26	F 3	F 5	F 2	F 2	F 1	F 1	C 2	C 7	C 5	C 2	LQ 41	CL 21	L 3	CL 31	C 1	C 2	C 3	C 6	L 8	L 8	FF 14	F 3	F 2	FQ 51
27	FQ 31	FQ 81	FQ 61	FQ 31	FQ 21	F 1	CH 61	CHQ 61	LQ 41	CHL 32	C 3	C 4	C 3	C 2	C 3	C 5	C 2	C 8	C 9	CLQ 13	F 3	F 6	F 5	
28	F 9	F 5	F 2	F 1	F 2	F 1	C 1	C 1	H 1	LH 31	LH 21	L 2	C 1	HC 11	C 3	L 3	L 3	L 3	L 8	L 8	F 6	FF 23	FF 41	FQ 31
29	FQ 31	F 2	FF 22	F 2	F 3	F 3	C 3	C 3	C 5	L 5	CQ 31	CQ 51	LQ 51	LQ 81	L 7	CL 23	CL 43	CL 54	CL 66	CL 88	FF 26	FF 14	FFQ 16	FF 22
30	F 1	F 3	F 2	F 1		FF 11	CH 41	LQ 41	CQ 41	LQ 31	CL 13	LQ 51	LQ 41	LQ 21	L 2	HC 11	CLH 12	CLQ 14	LC 62	CHL 21	F 5	FF 25	FF 56	F 7
31	FFQ 23	FFQ 15	FFQ 23	FFQ 13	F 3	FF 12	CH 21	C 3	C 4	C 6	L 5	LQ 91	L 9	L 9	L 6	LQ 41	CL 26	CL 82	CL 88	CL 89	FF 98	FFQ 66	FFQ 33	FQ 21
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUL. 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

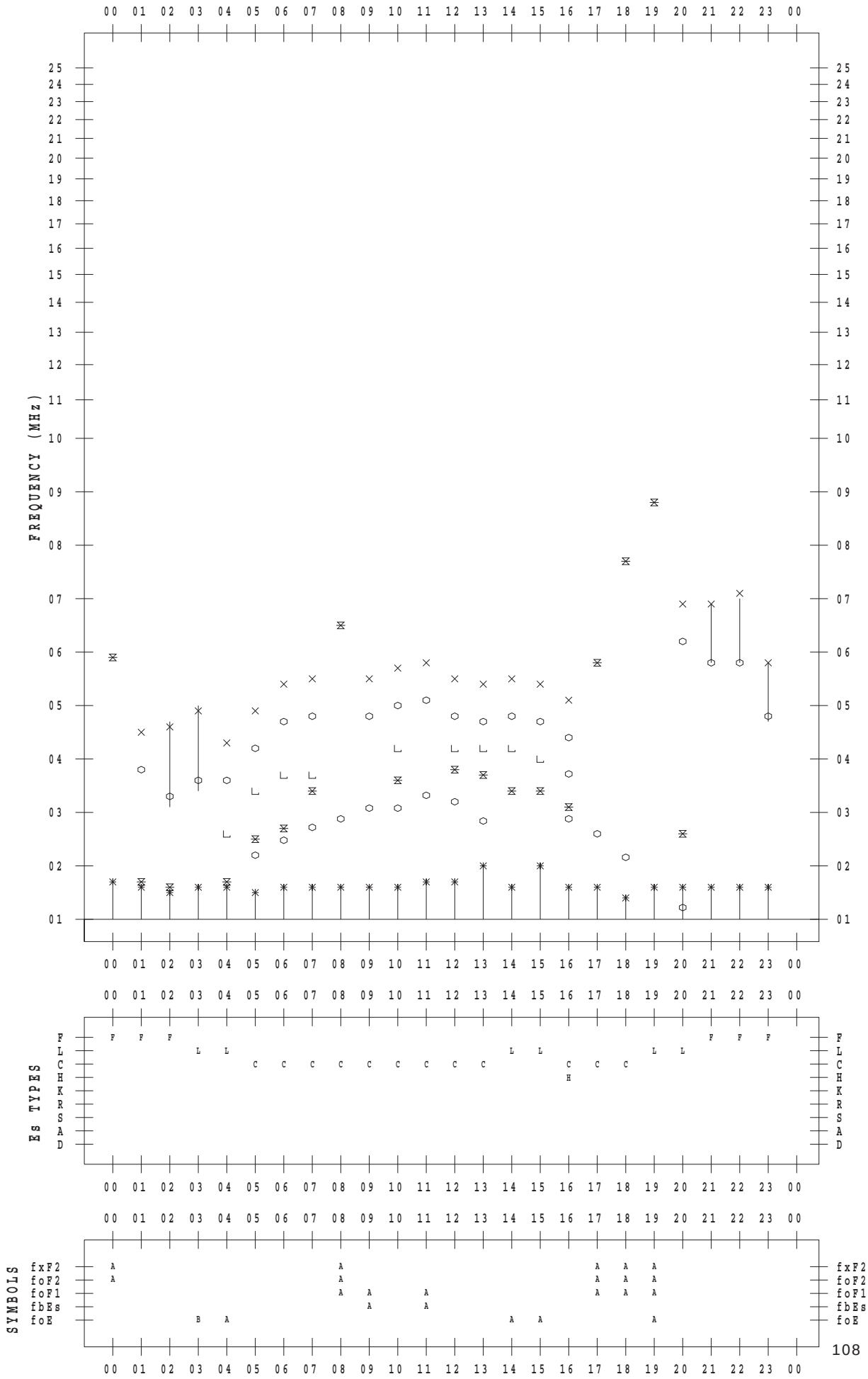
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 1

135 °E MEAN TIME



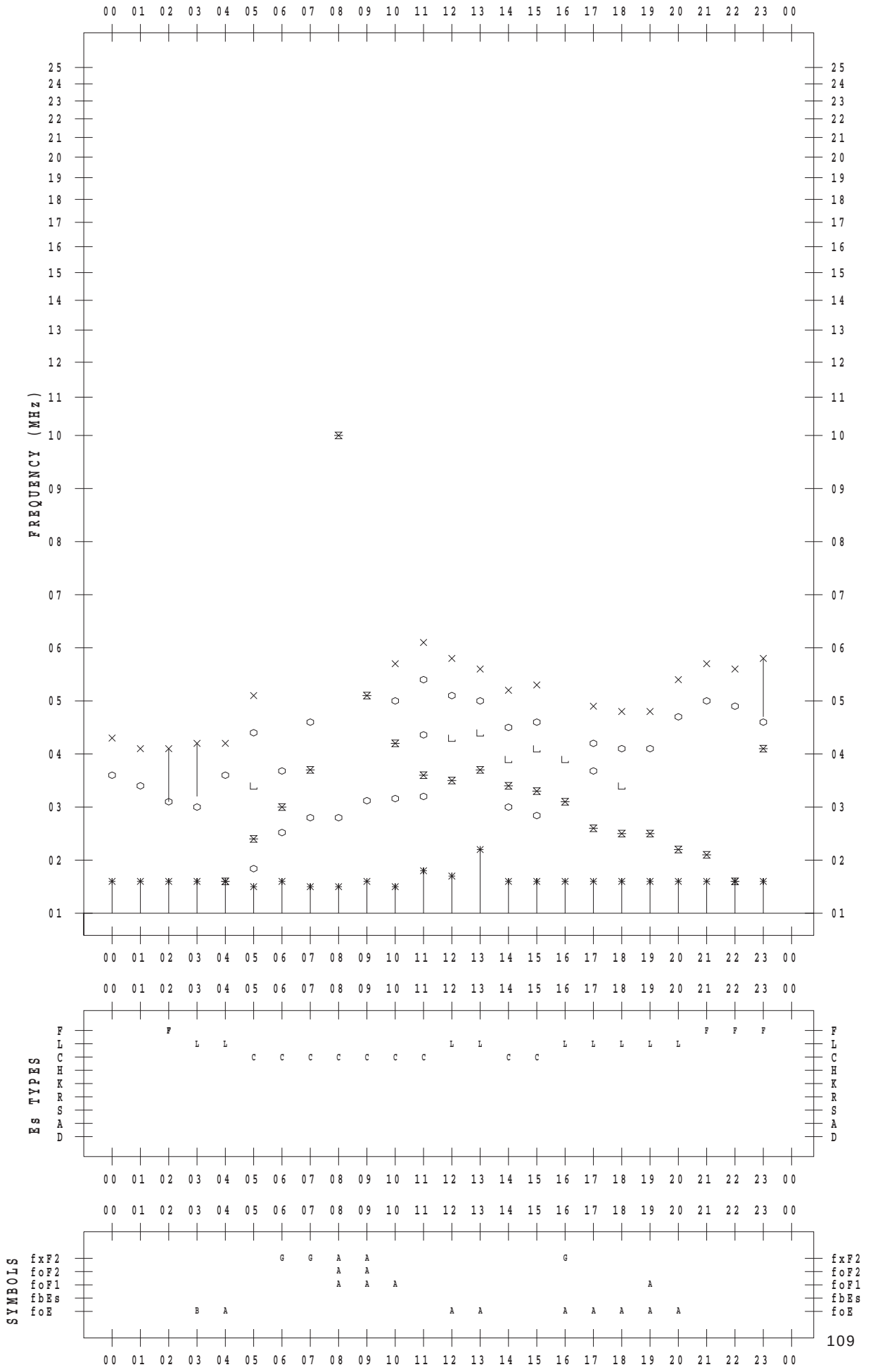
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 2

135 °E MEAN TIME



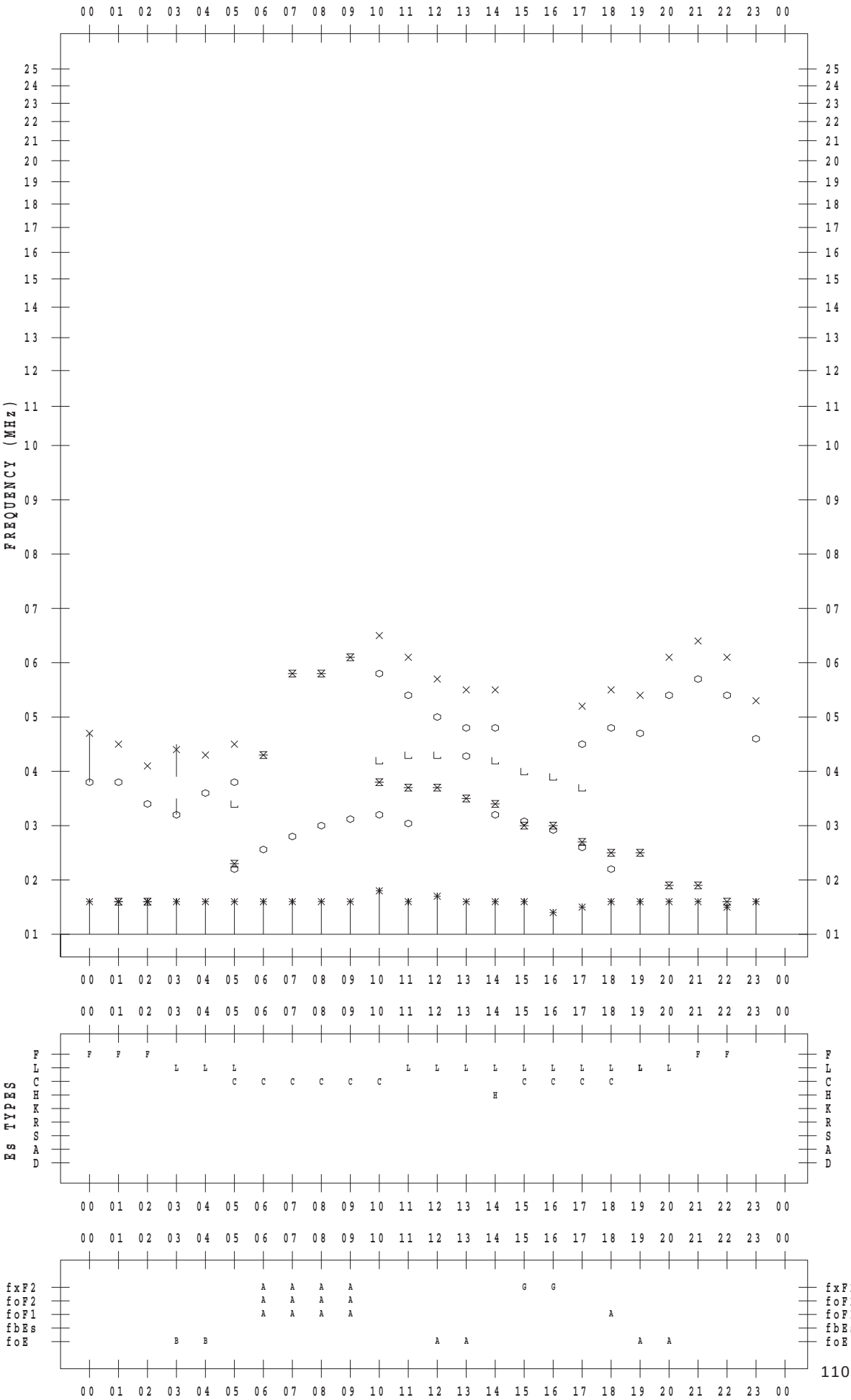
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 3

135 °E MEAN TIME



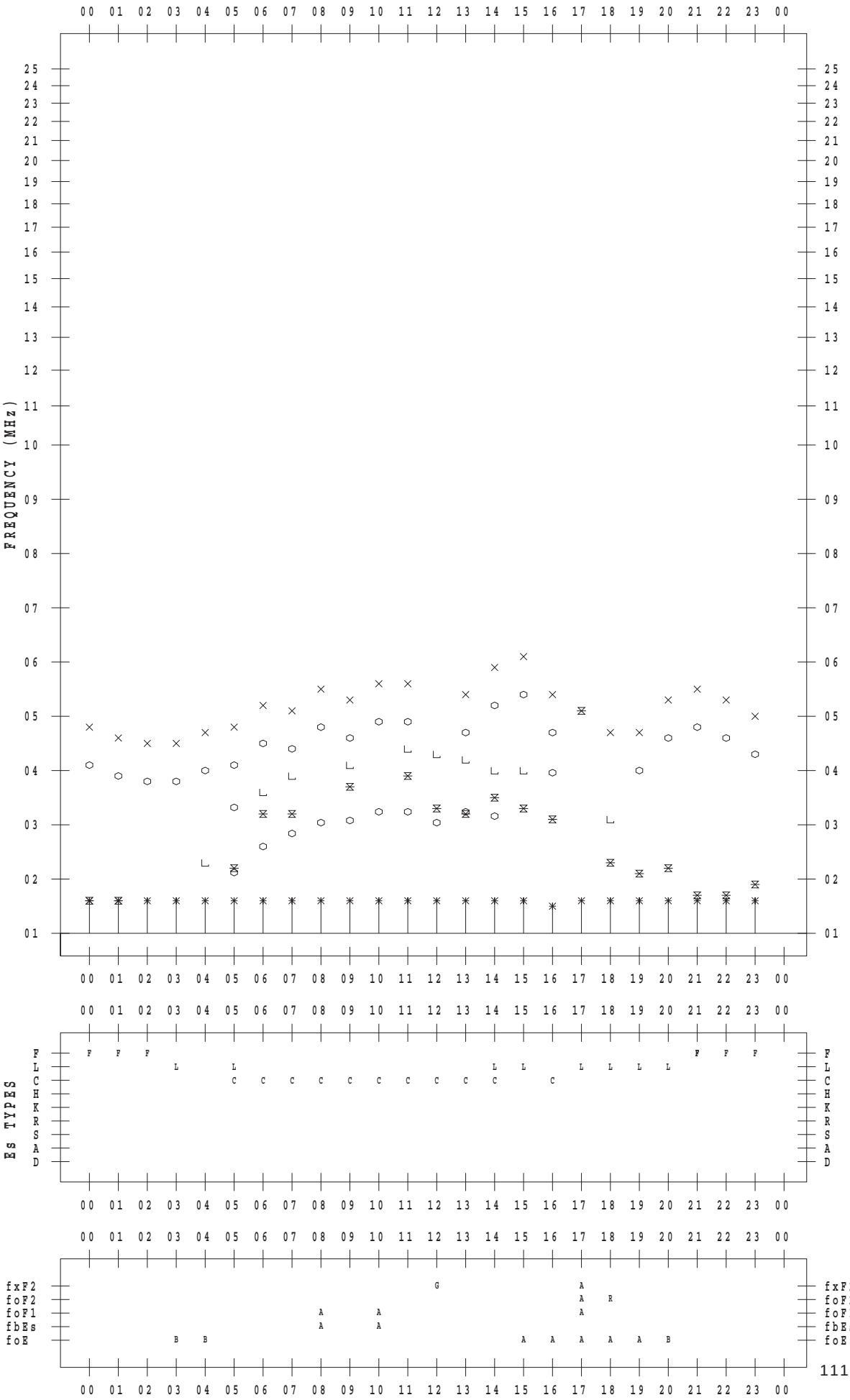
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 4

135 °E MEAN TIME



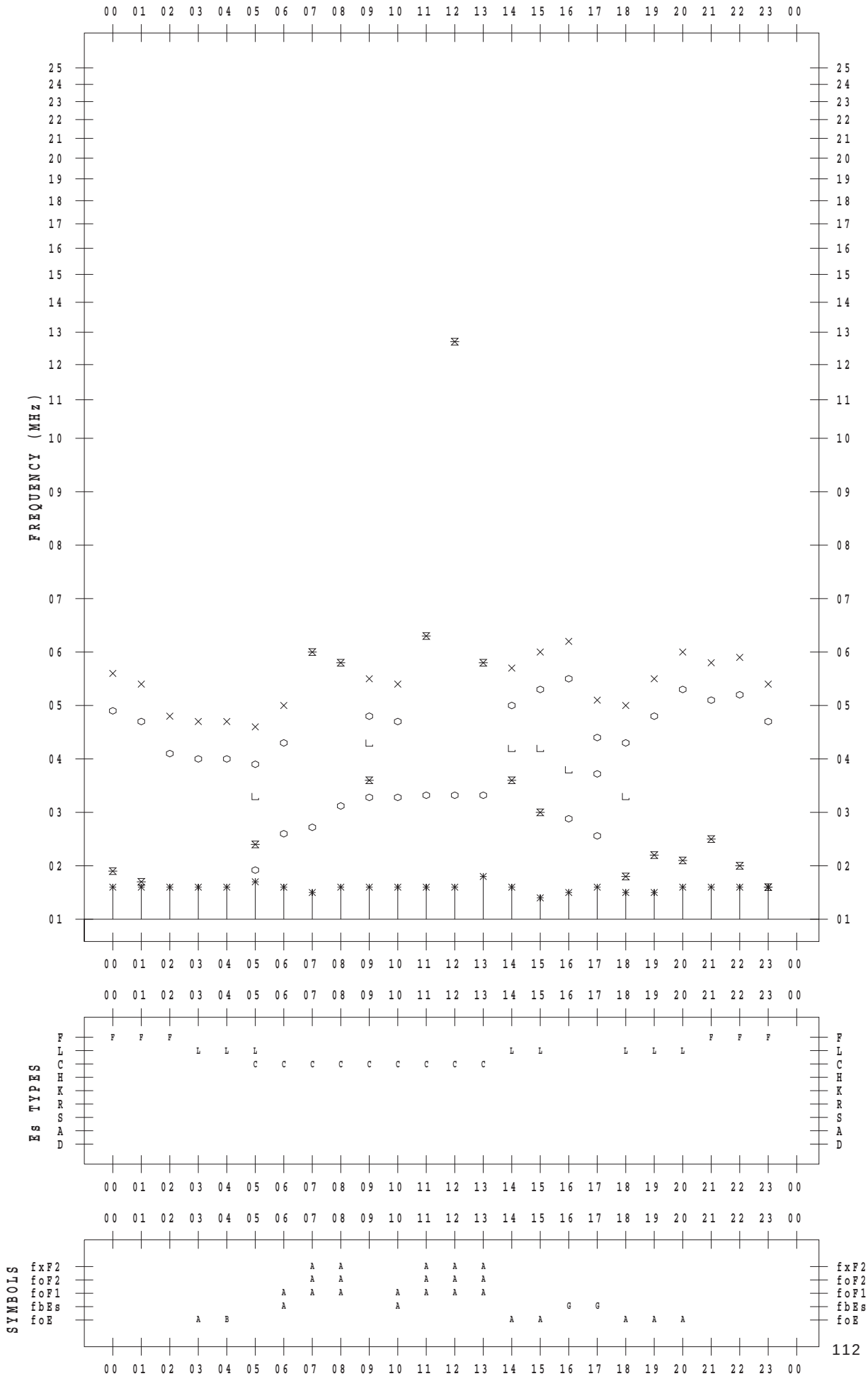
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 5

135 °E MEAN TIME



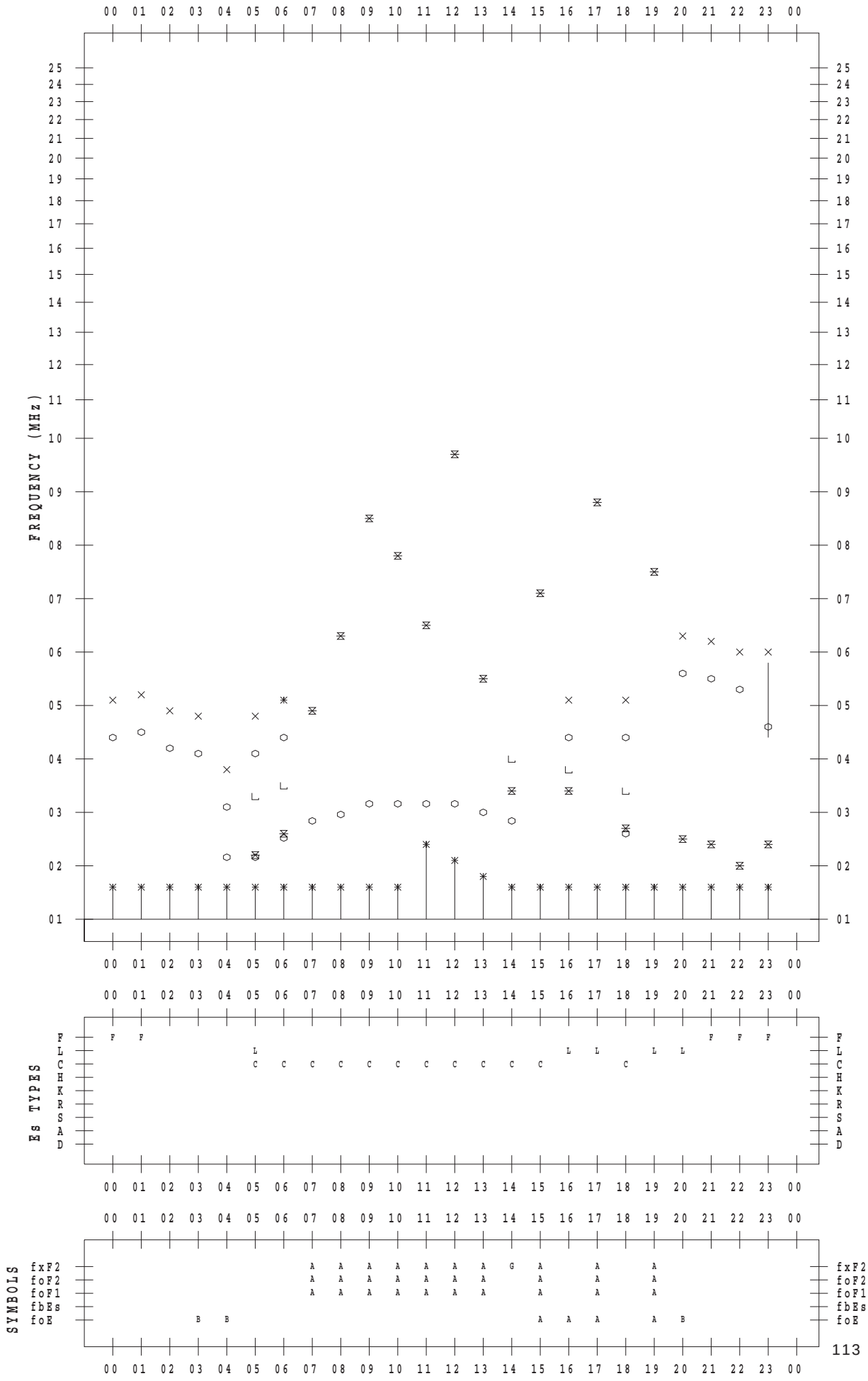
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 6

135 °E MEAN TIME



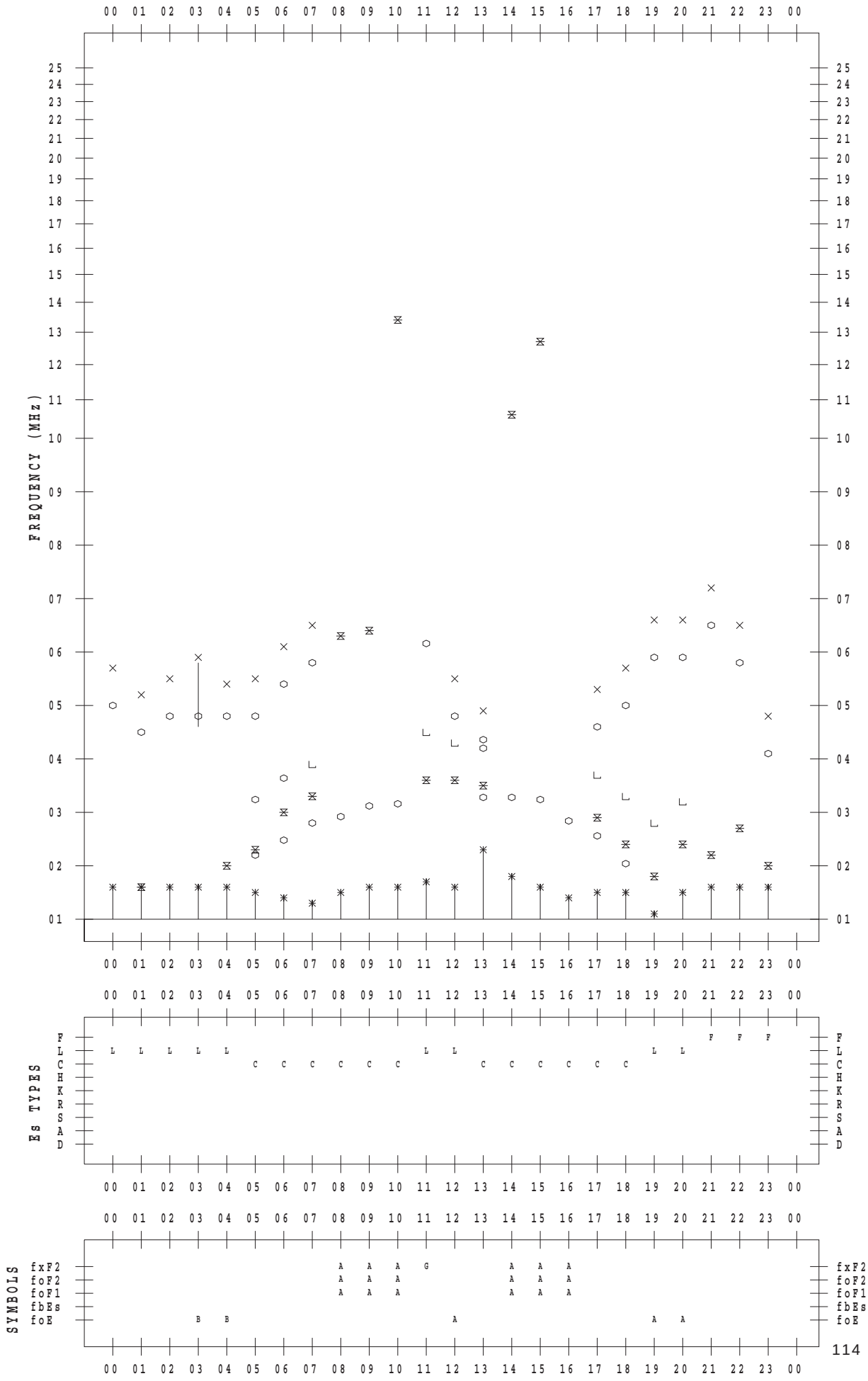
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 7

135 °E MEAN TIME



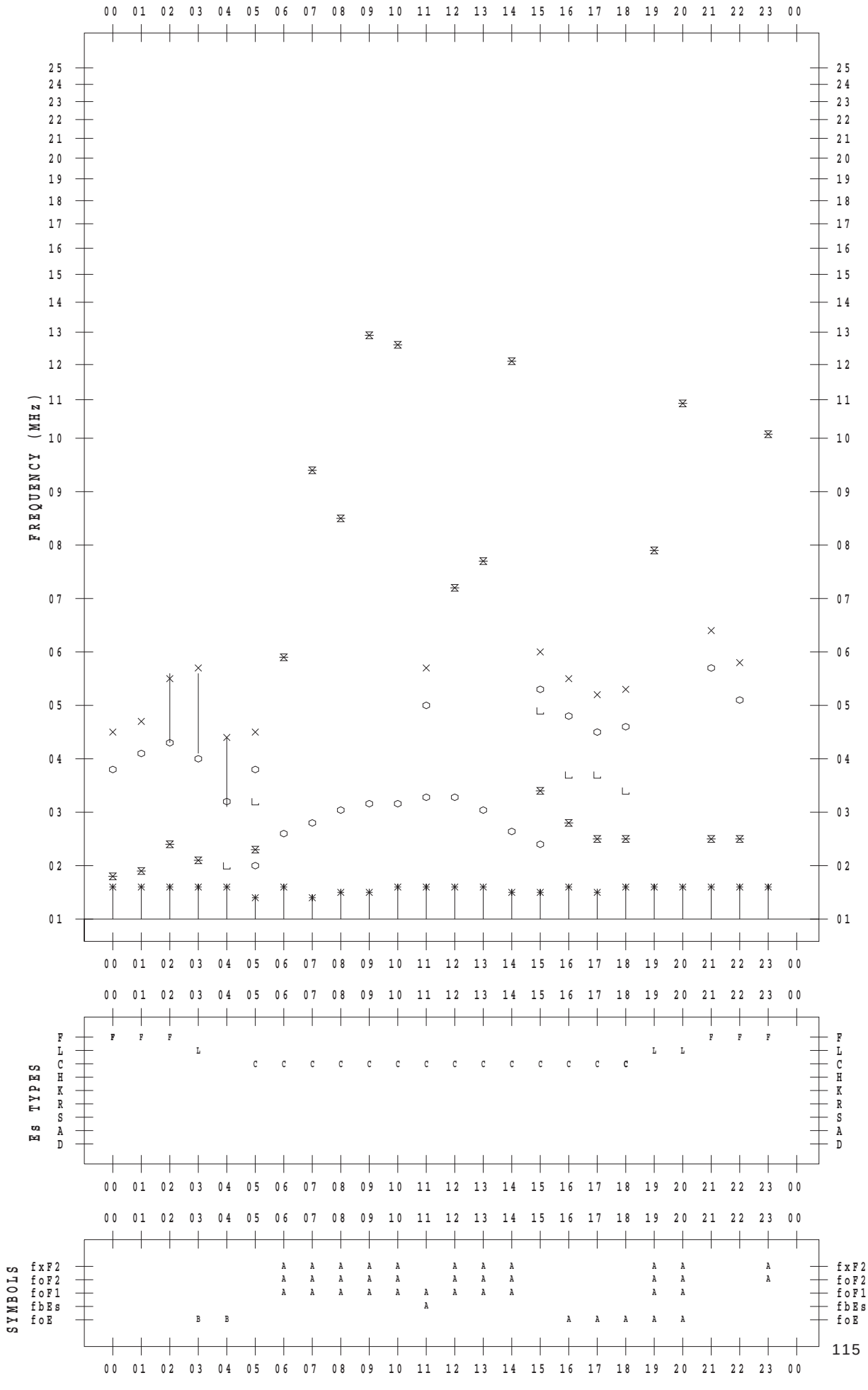
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 8

135 °E MEAN TIME



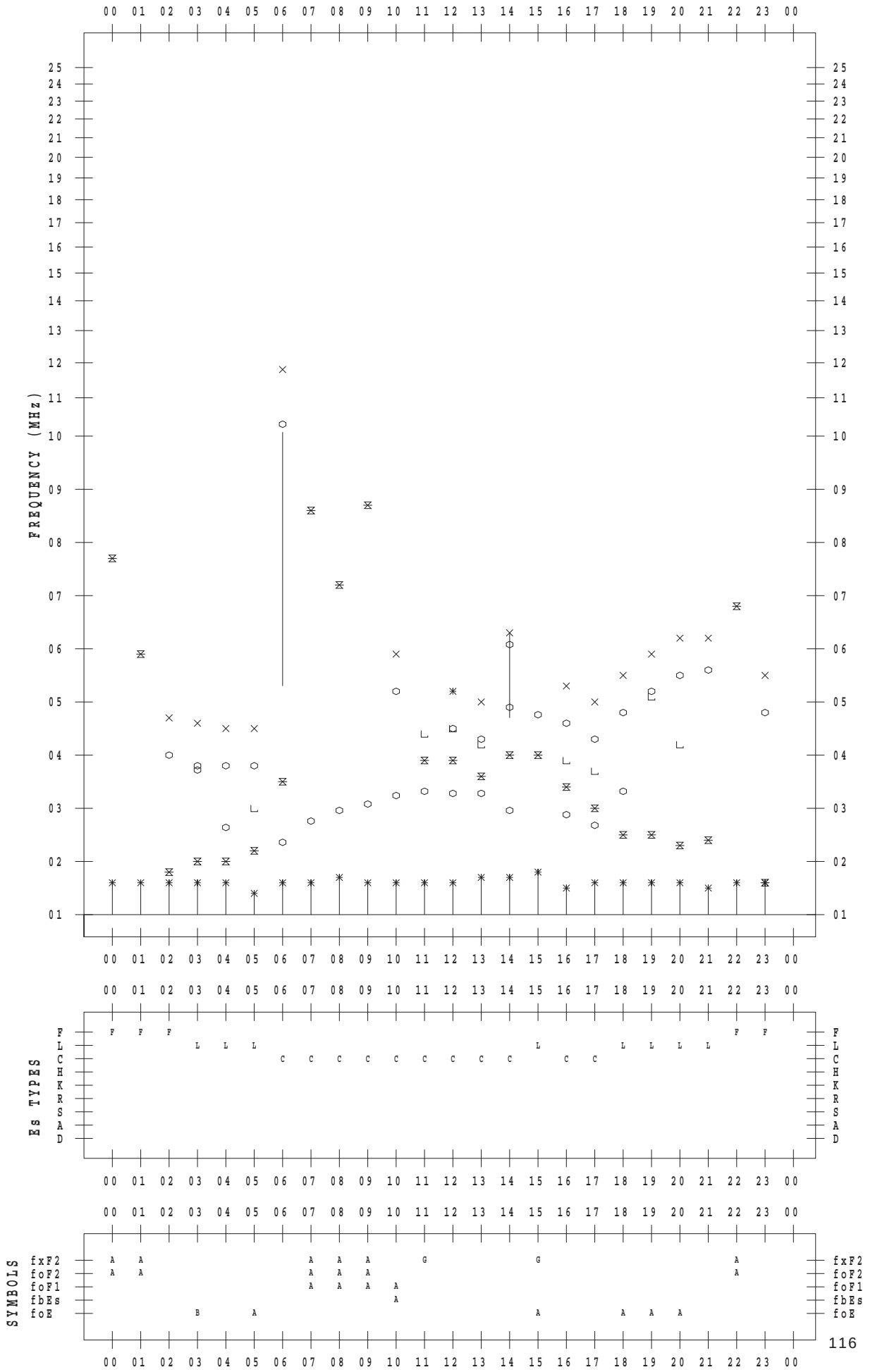
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/ 9

135 °E MEAN TIME



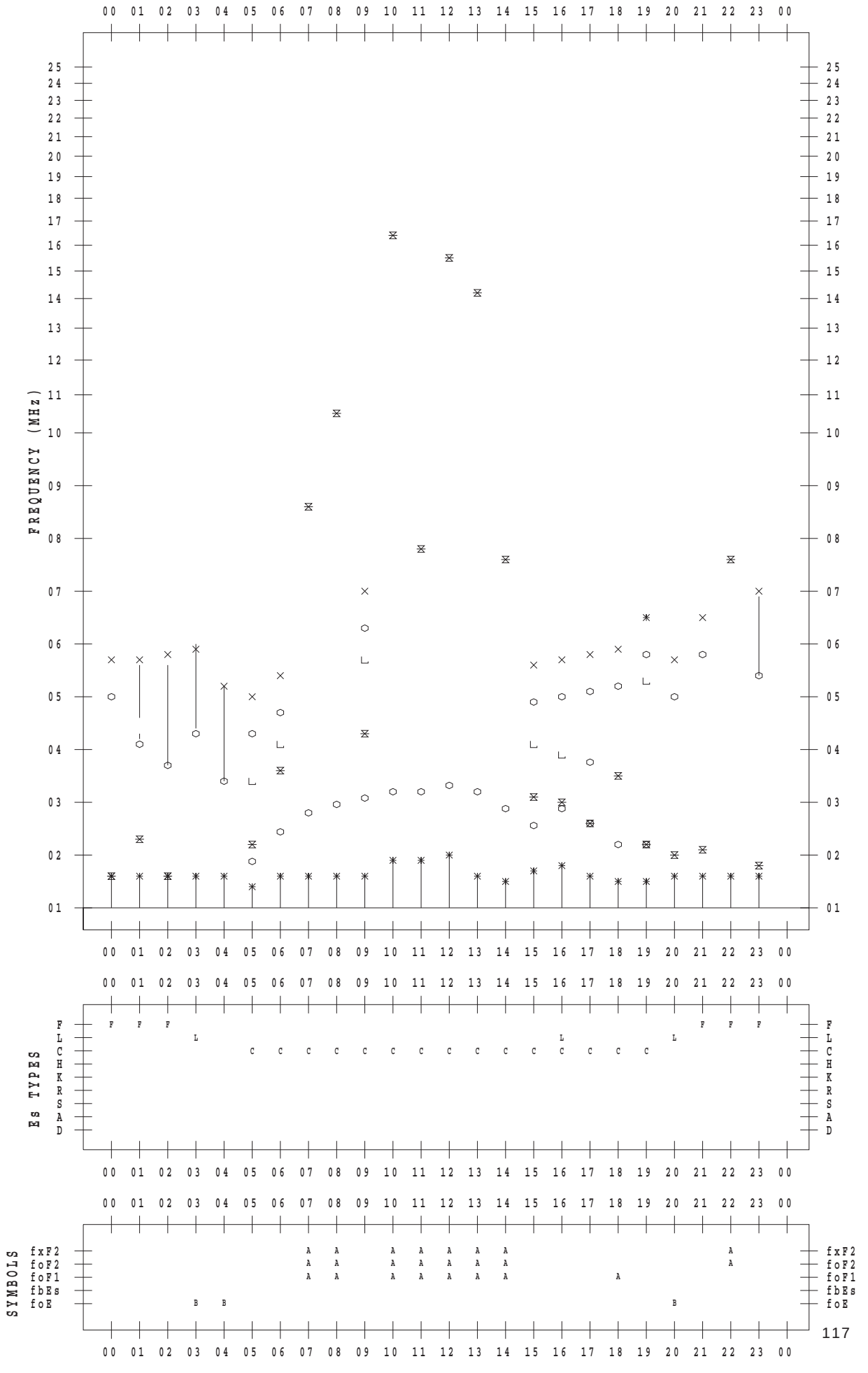
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/10

135 °E MEAN TIME



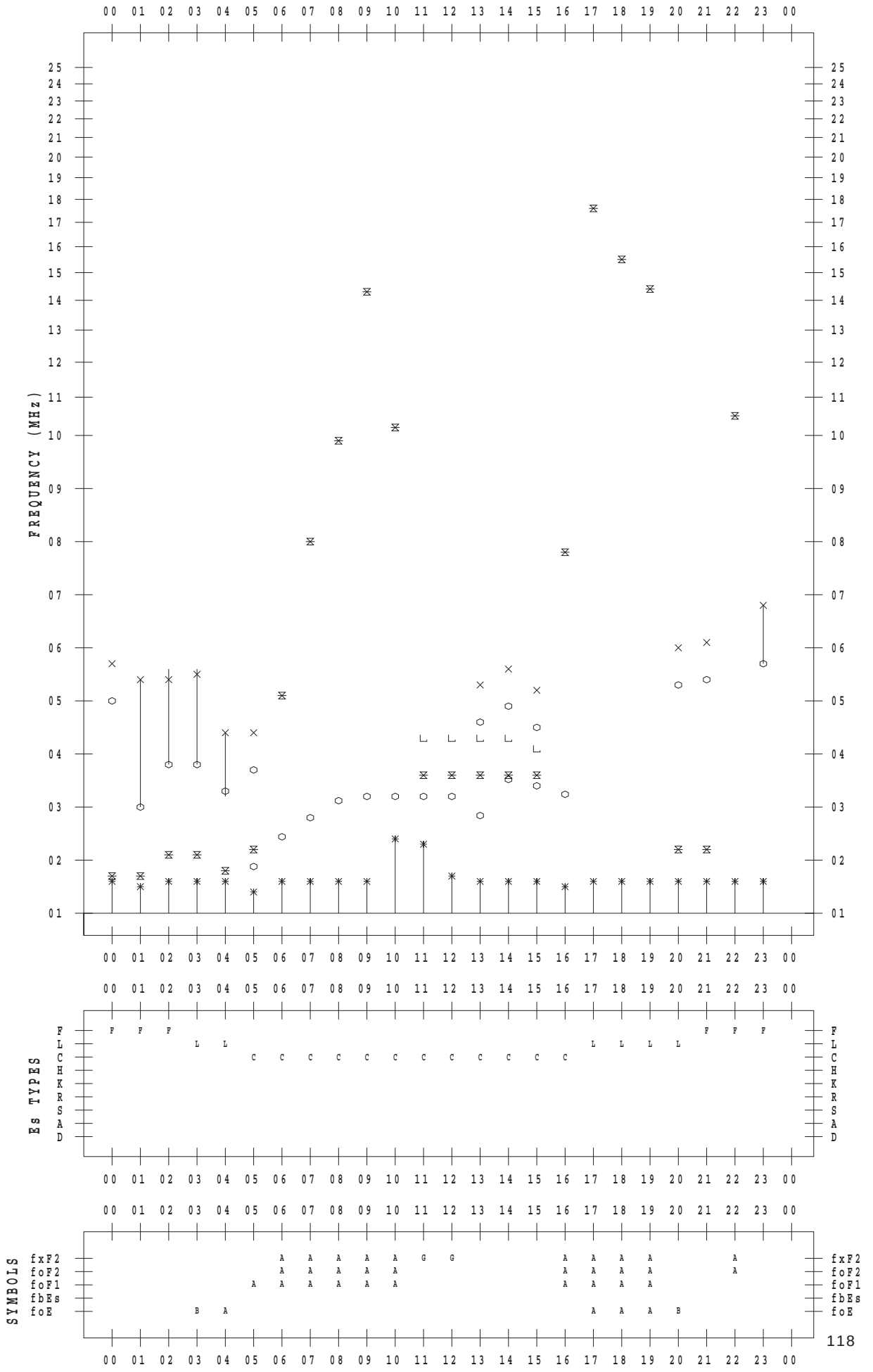
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/11

135 °E MEAN TIME



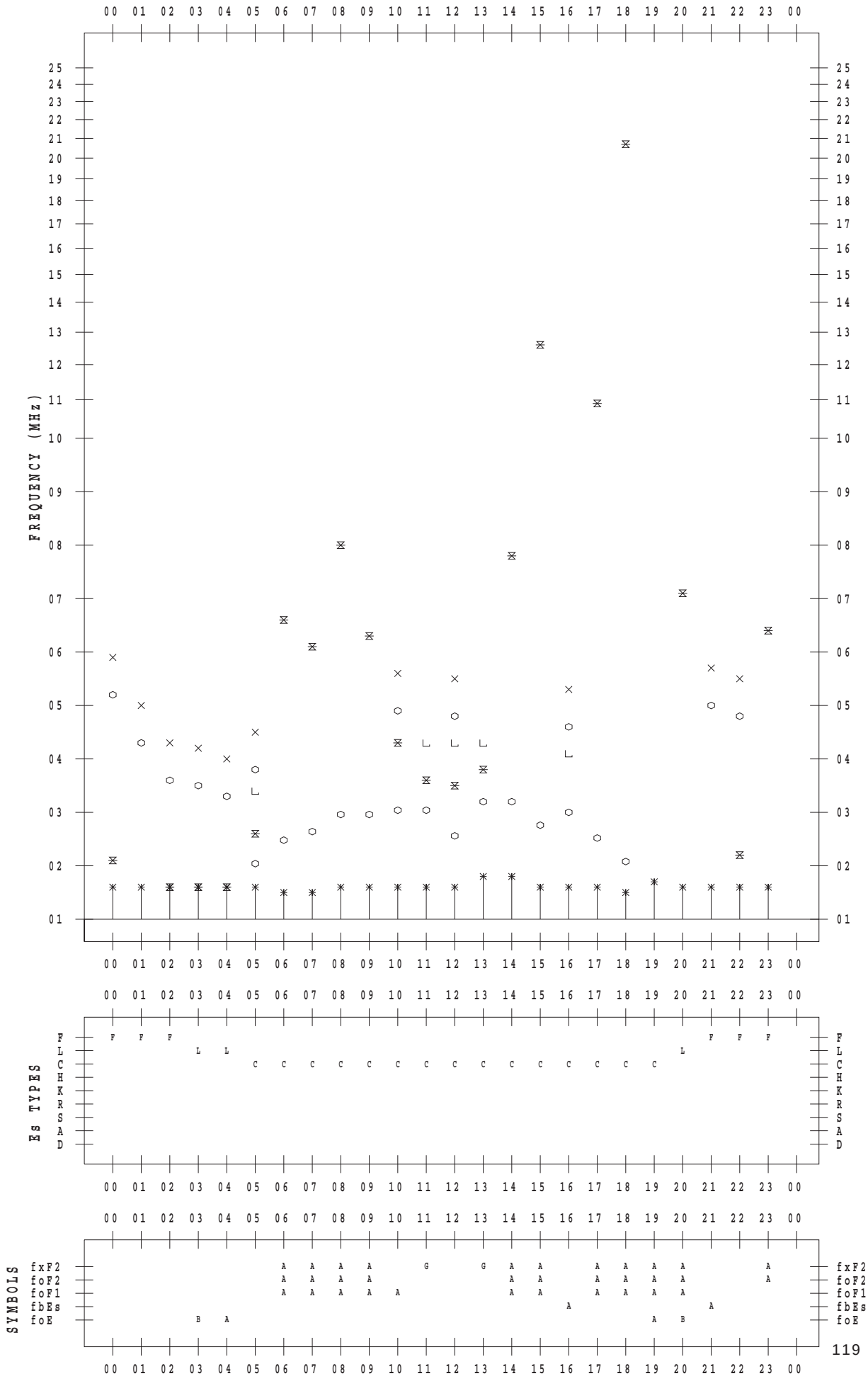
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/12

135 °E MEAN TIME



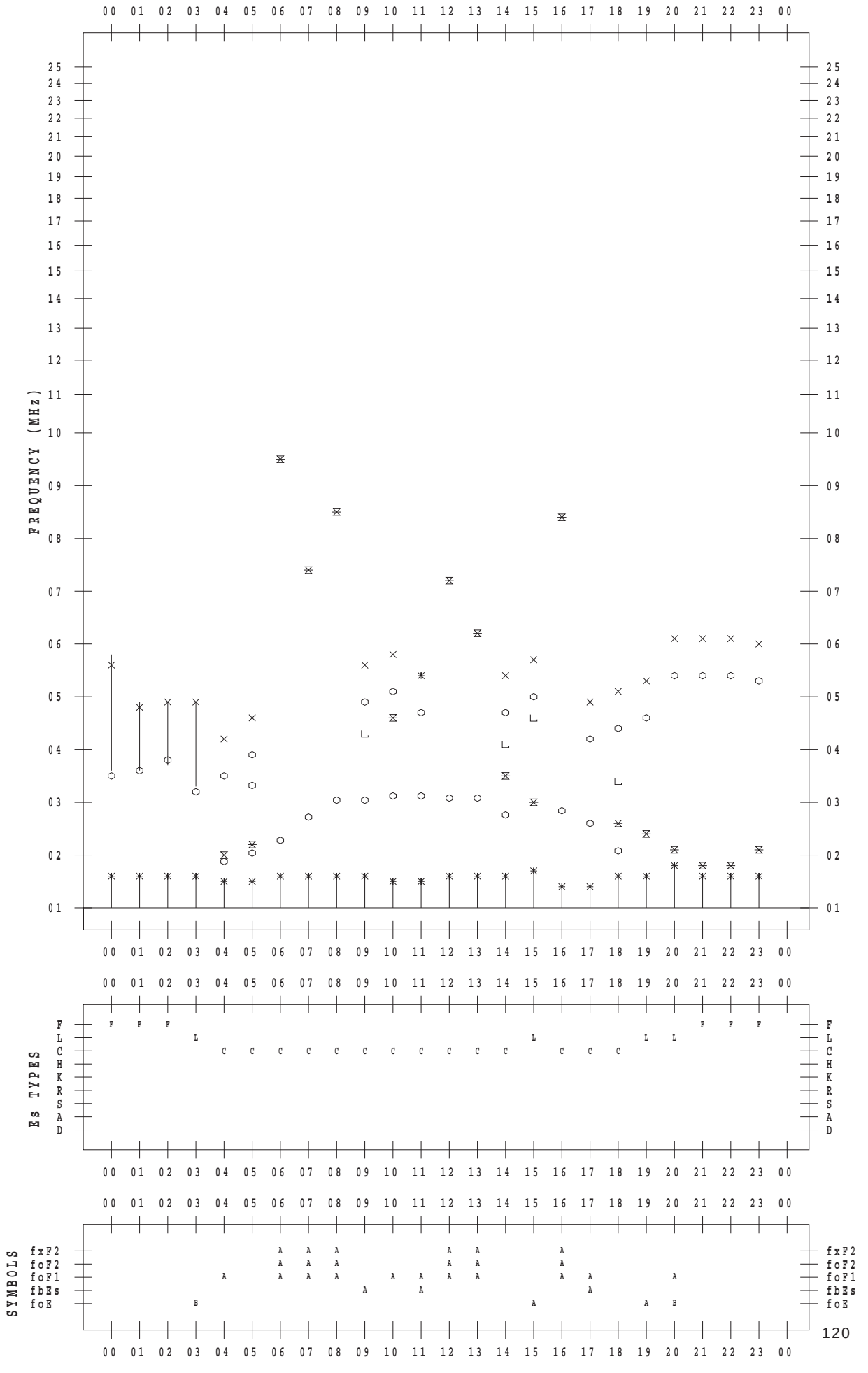
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/13

135 °E MEAN TIME



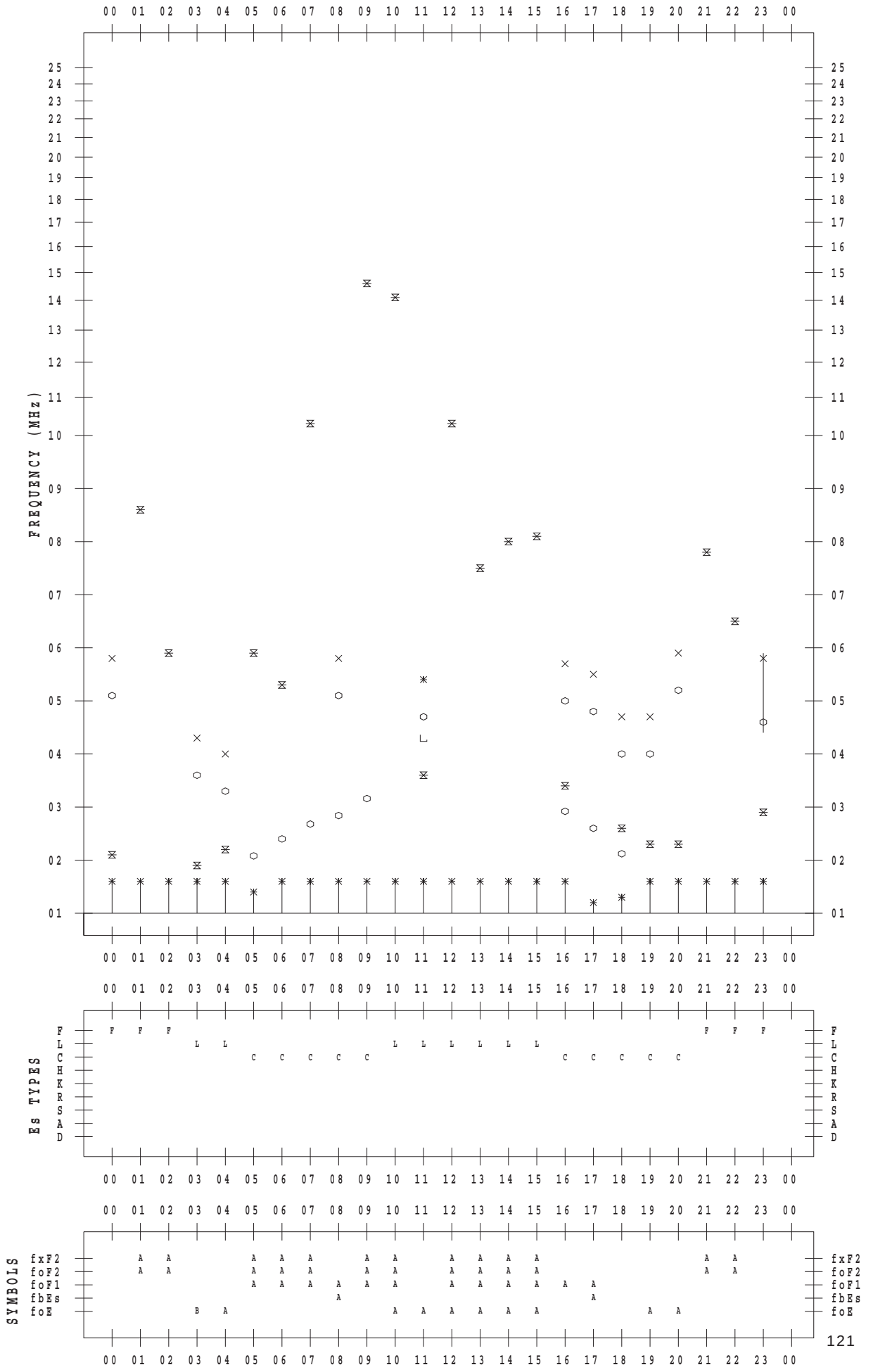
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/14

135 °E MEAN TIME



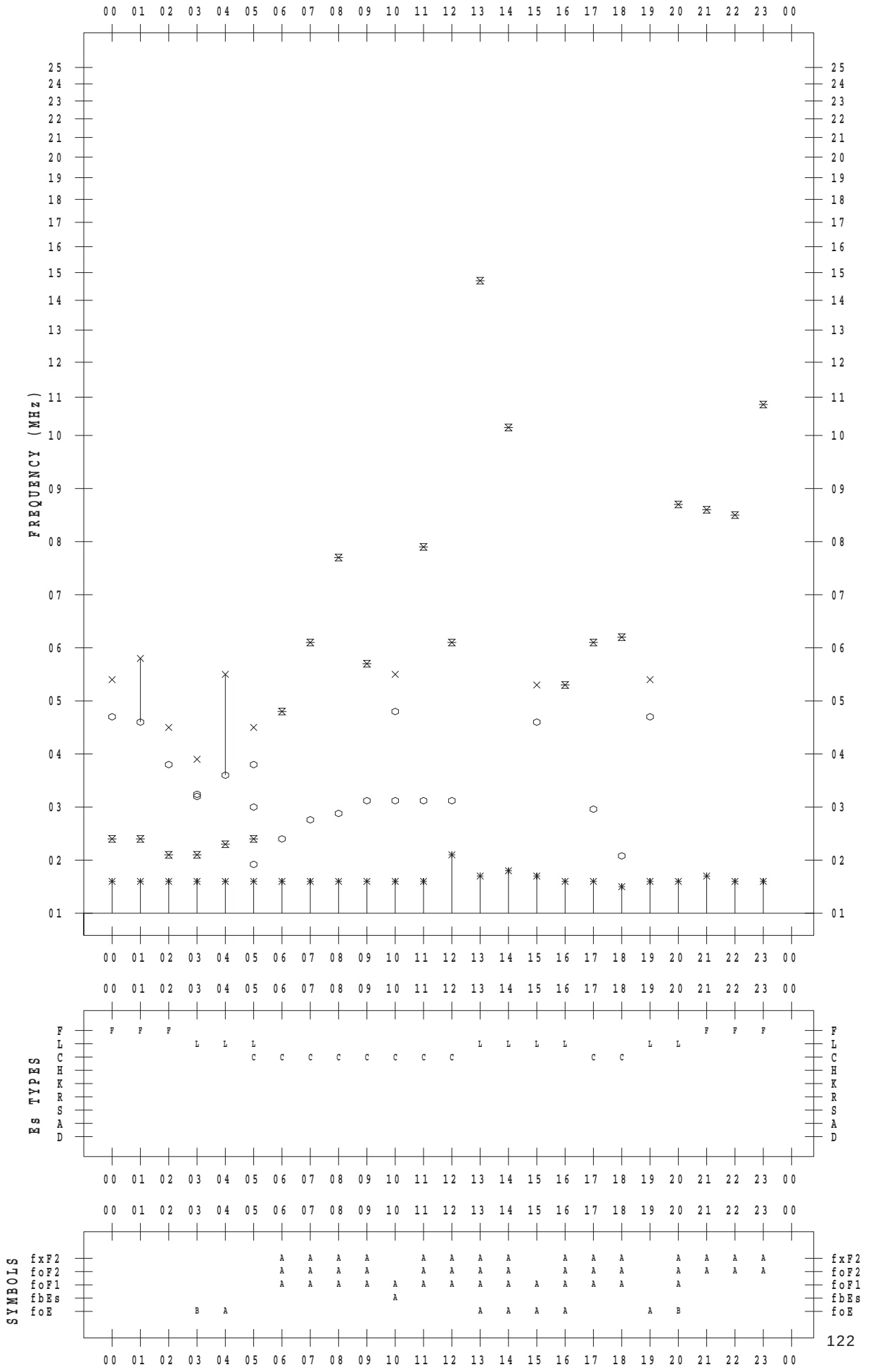
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/15

135 °E MEAN TIME



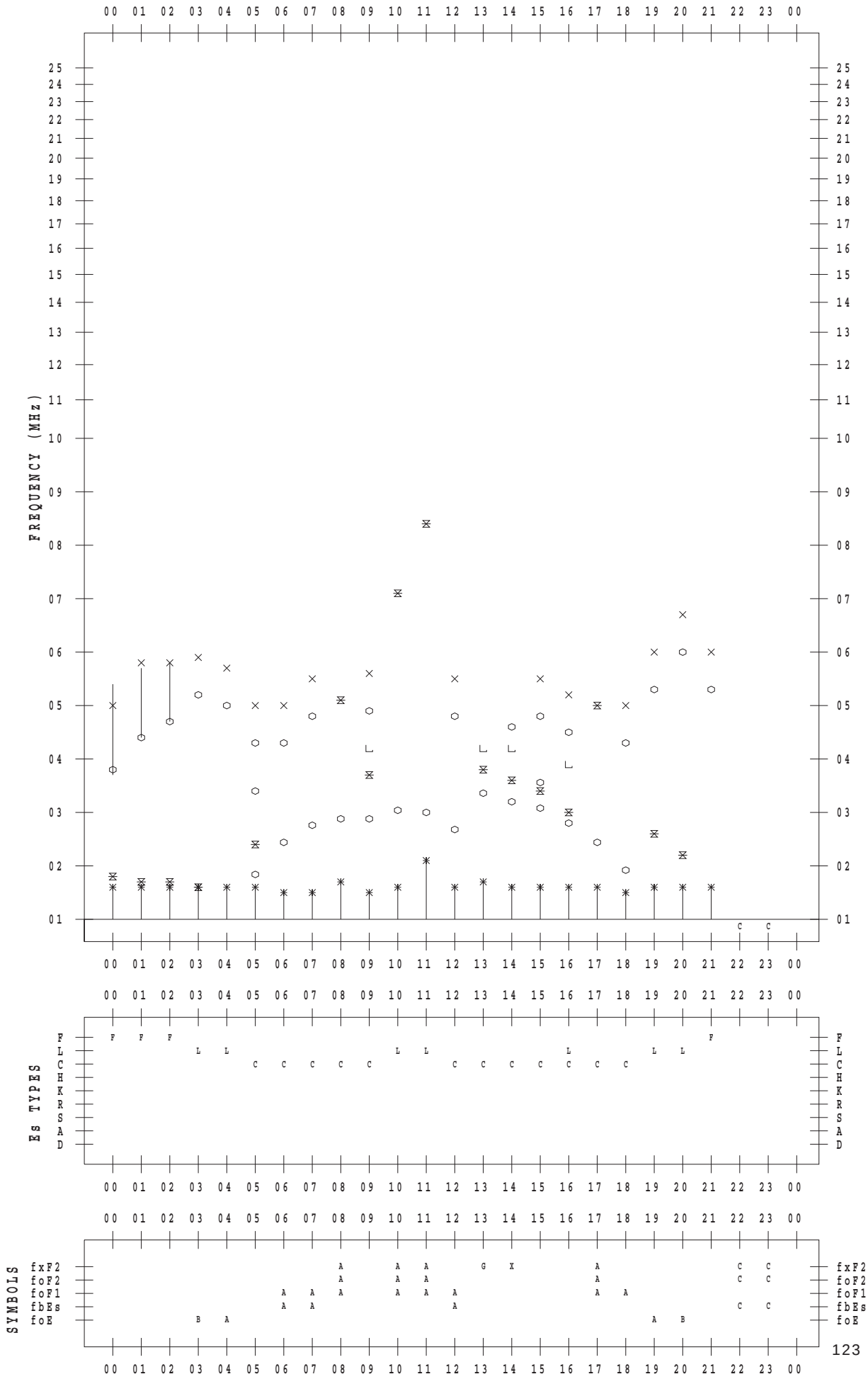
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/16

135 °E MEAN TIME



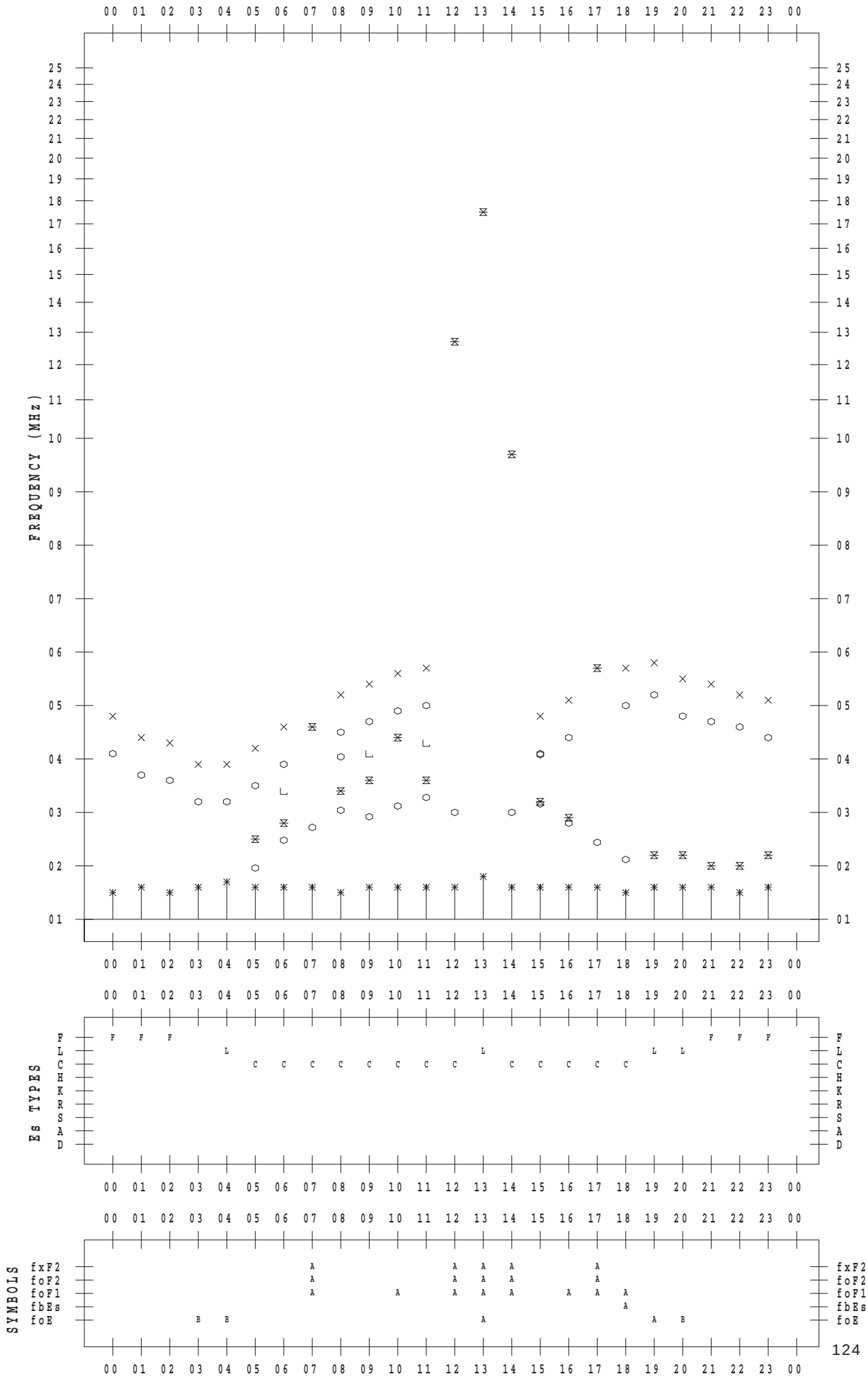
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/17

135 °E MEAN TIME



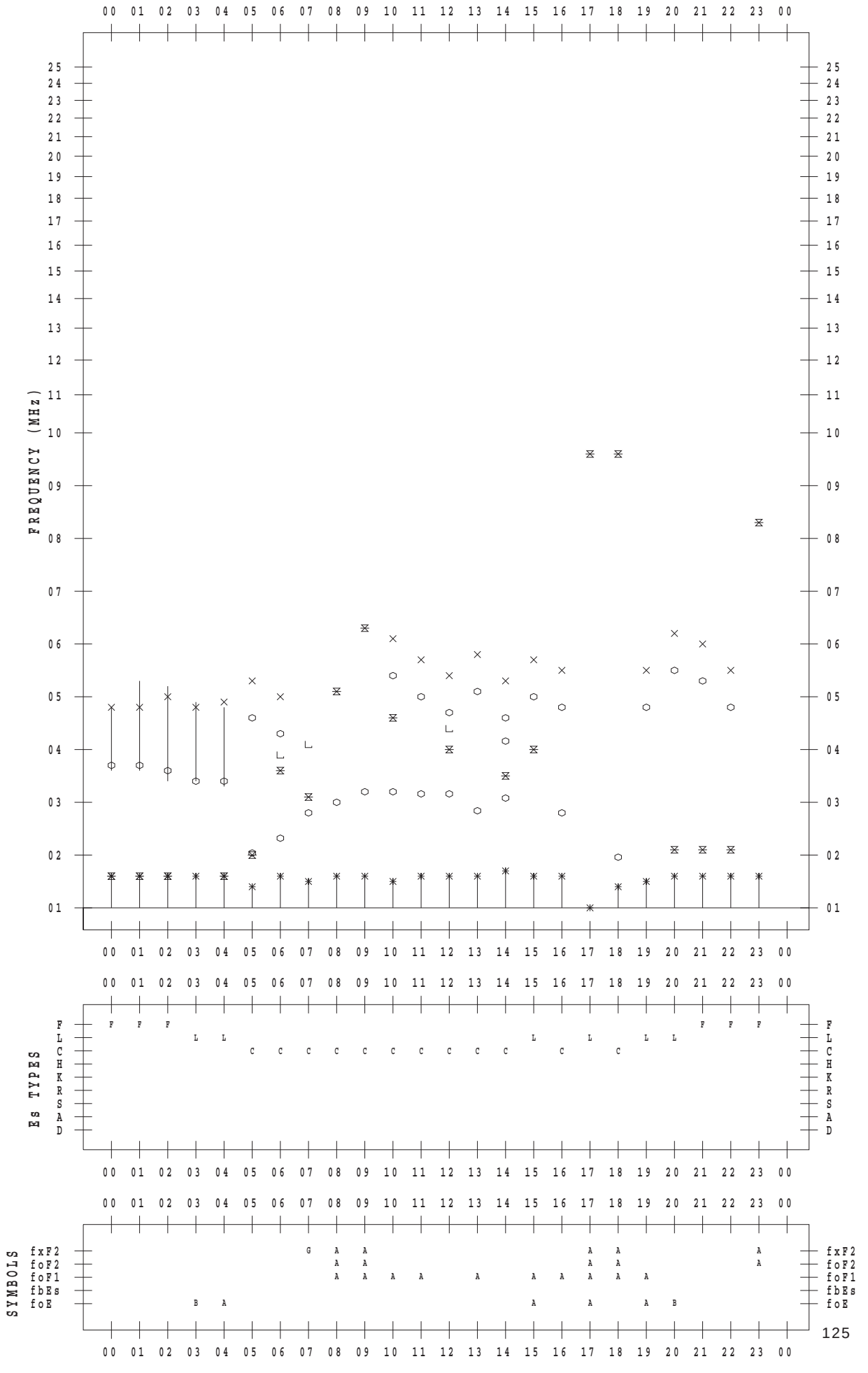
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/18

135 °E MEAN TIME



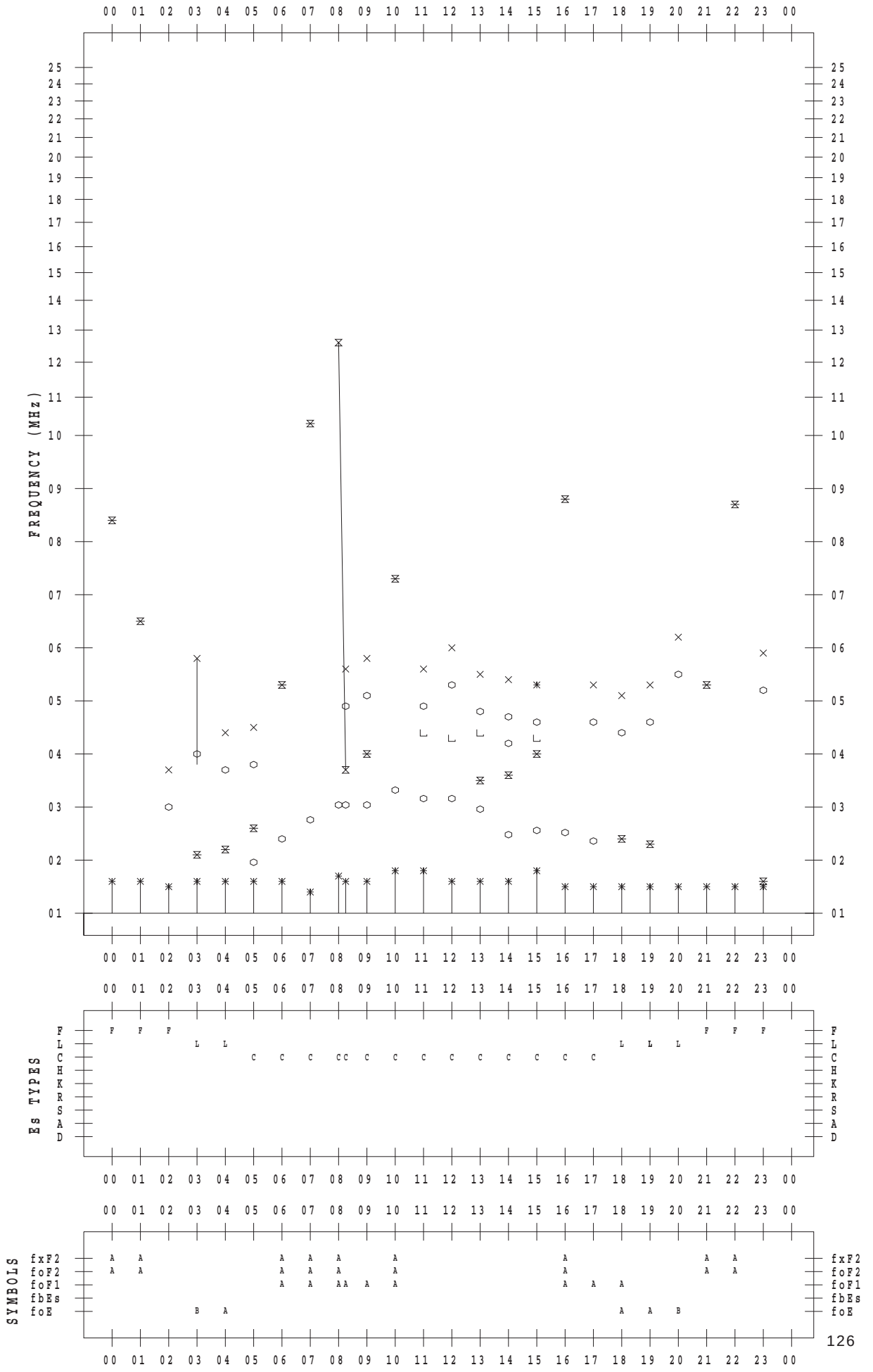
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/19

135 °E MEAN TIME



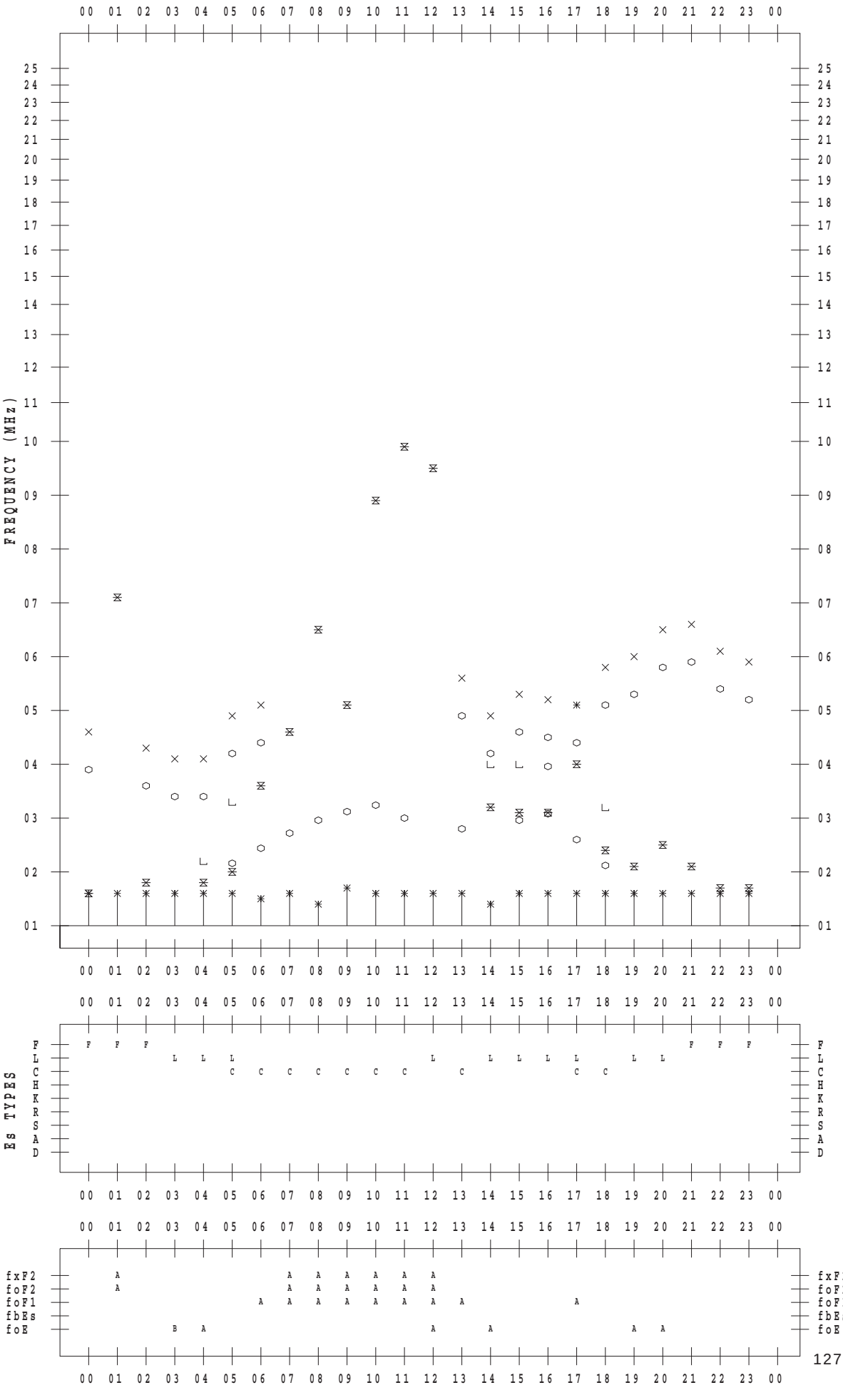
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/20

135 °E MEAN TIME



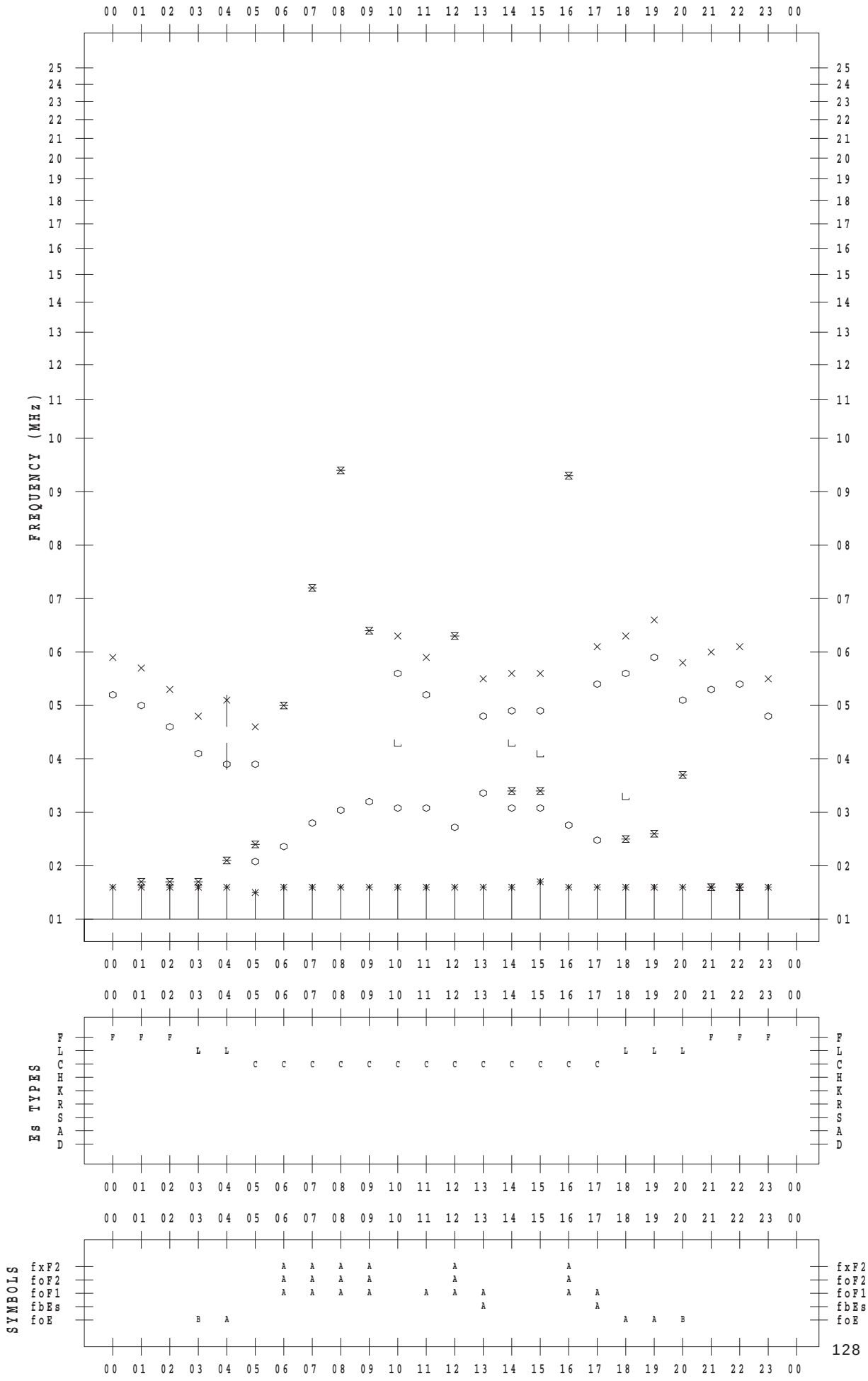
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/21

135 °E MEAN TIME



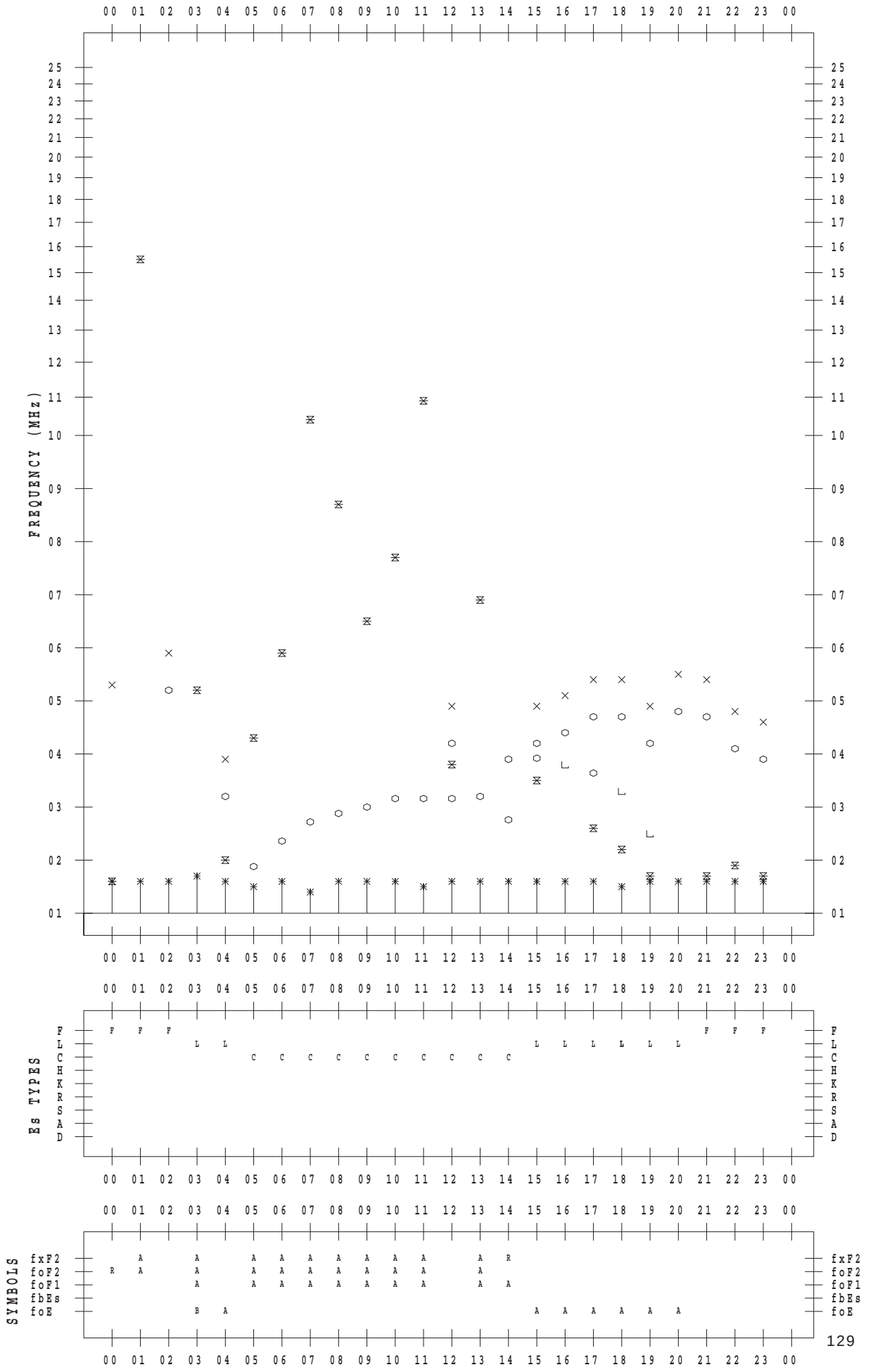
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/22

135 °E MEAN TIME



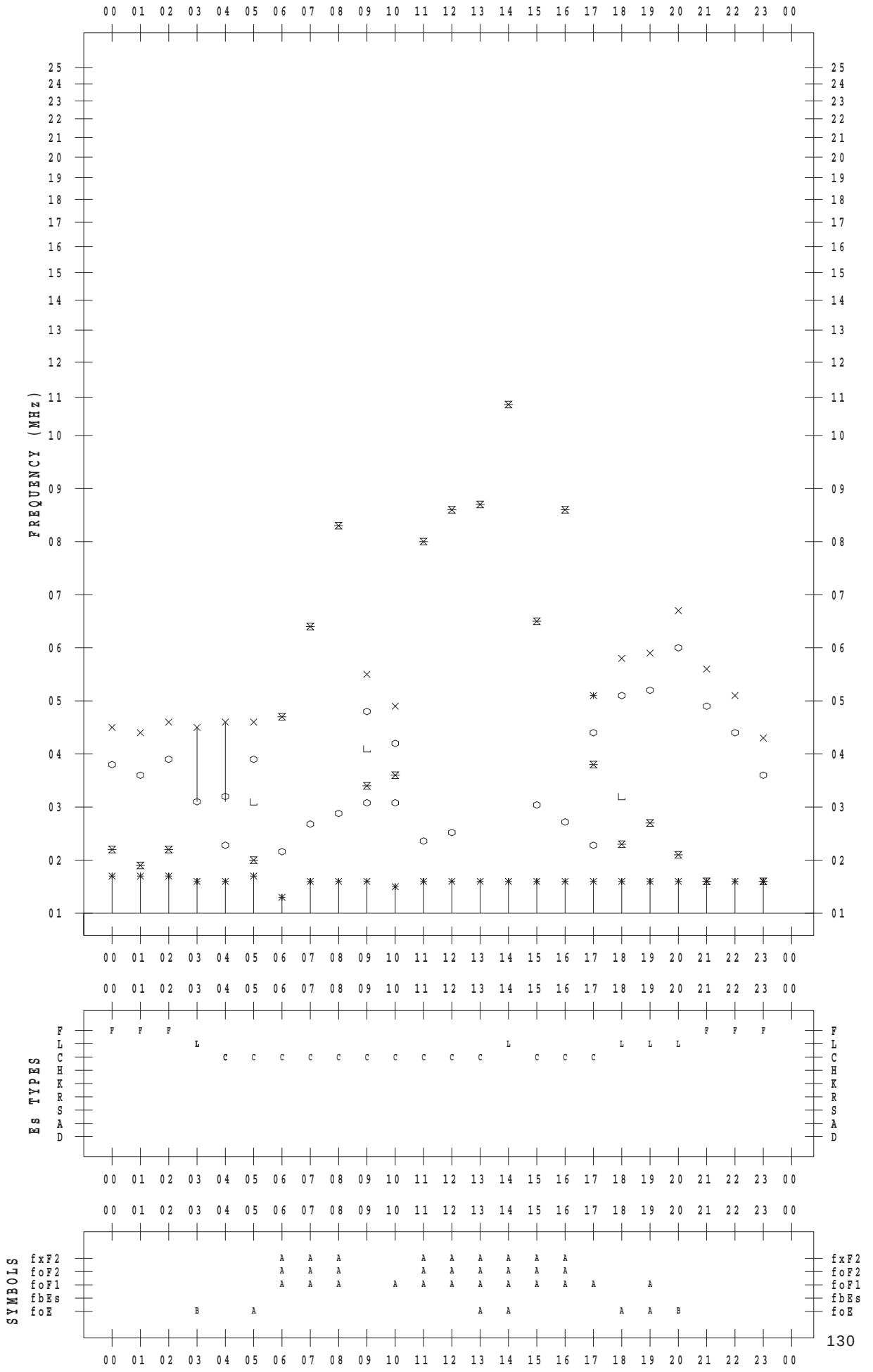
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/23

135 °E MEAN TIME



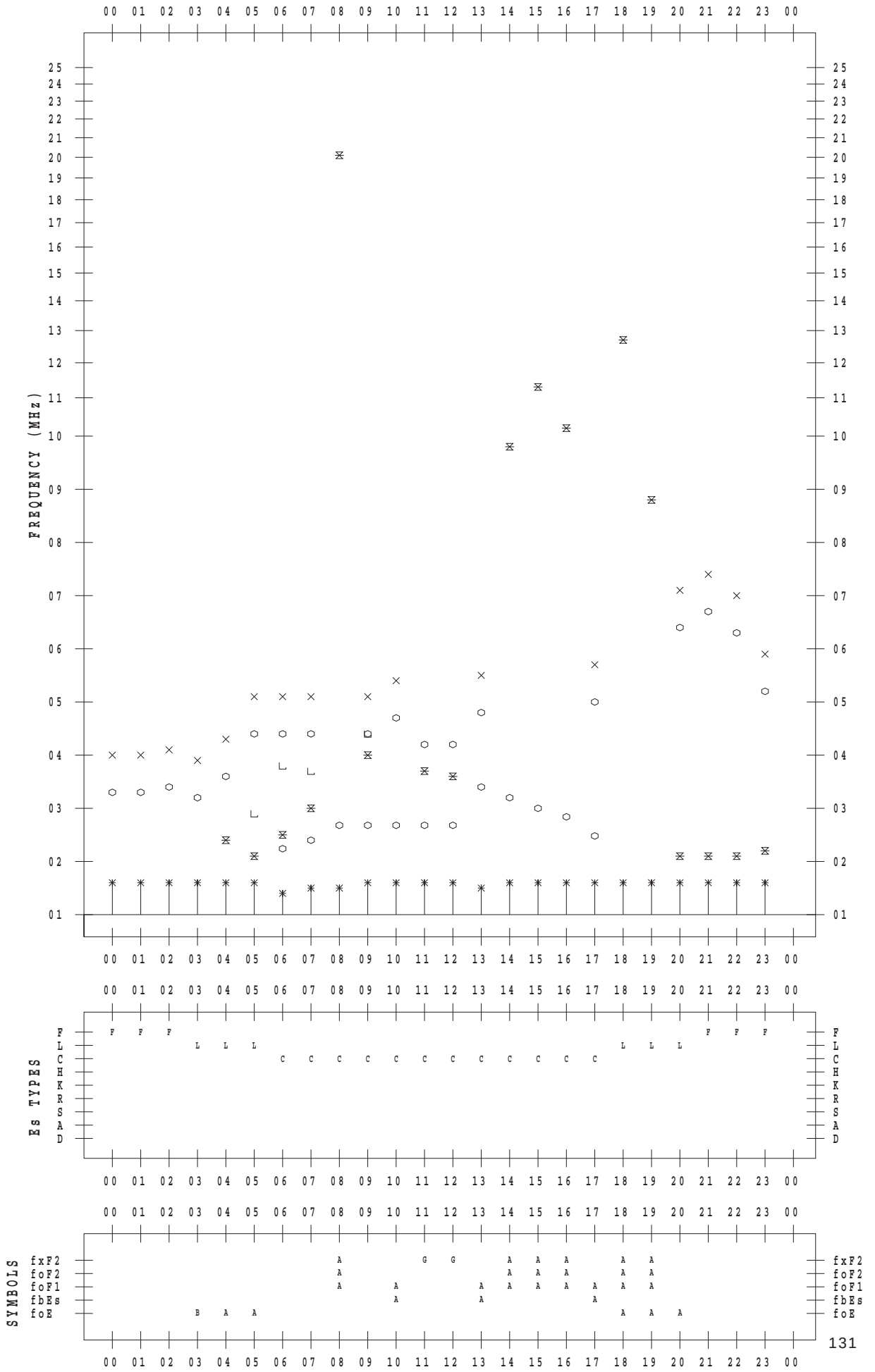
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/24

135 °E MEAN TIME



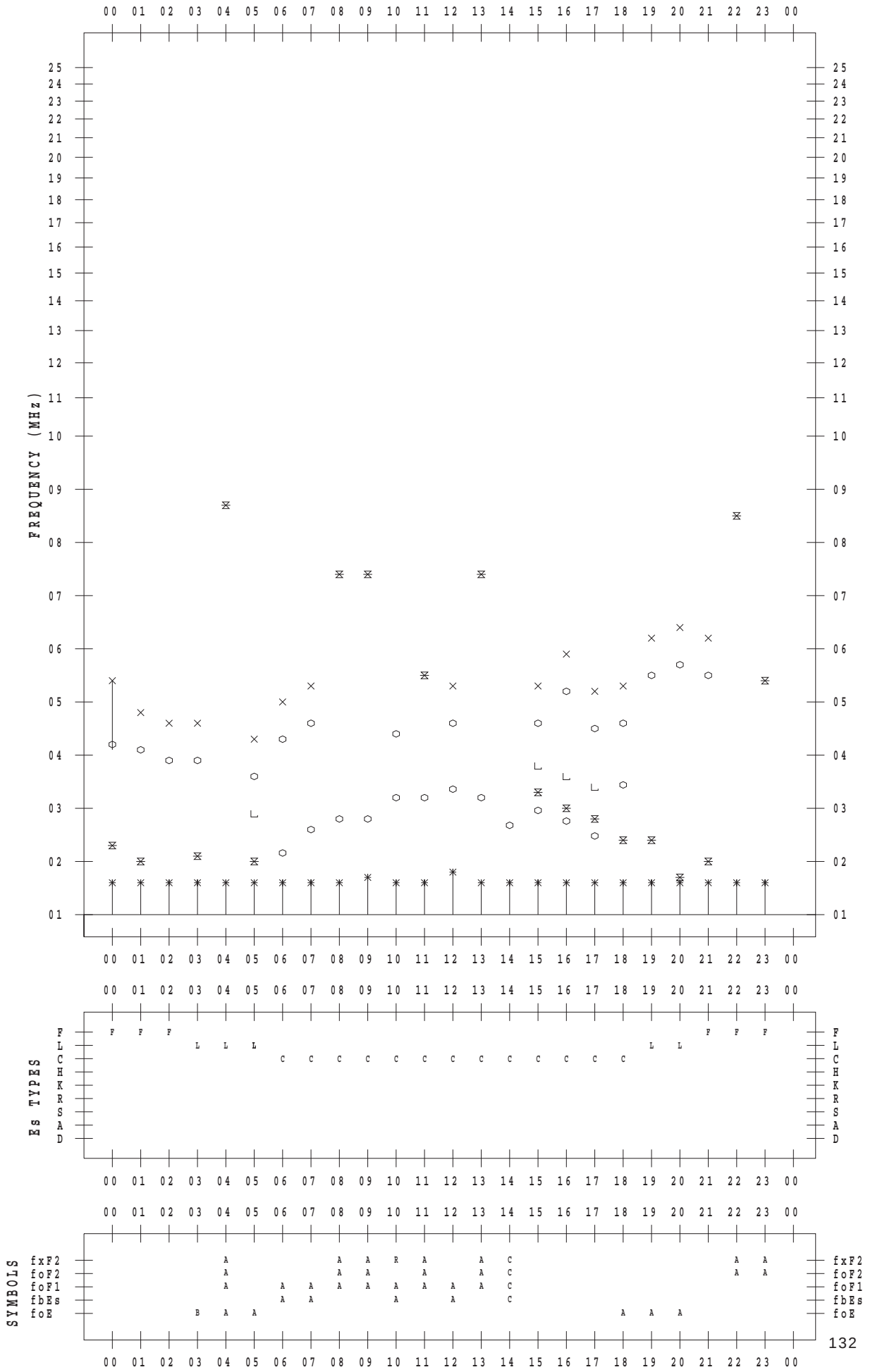
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/25

135 °E MEAN TIME



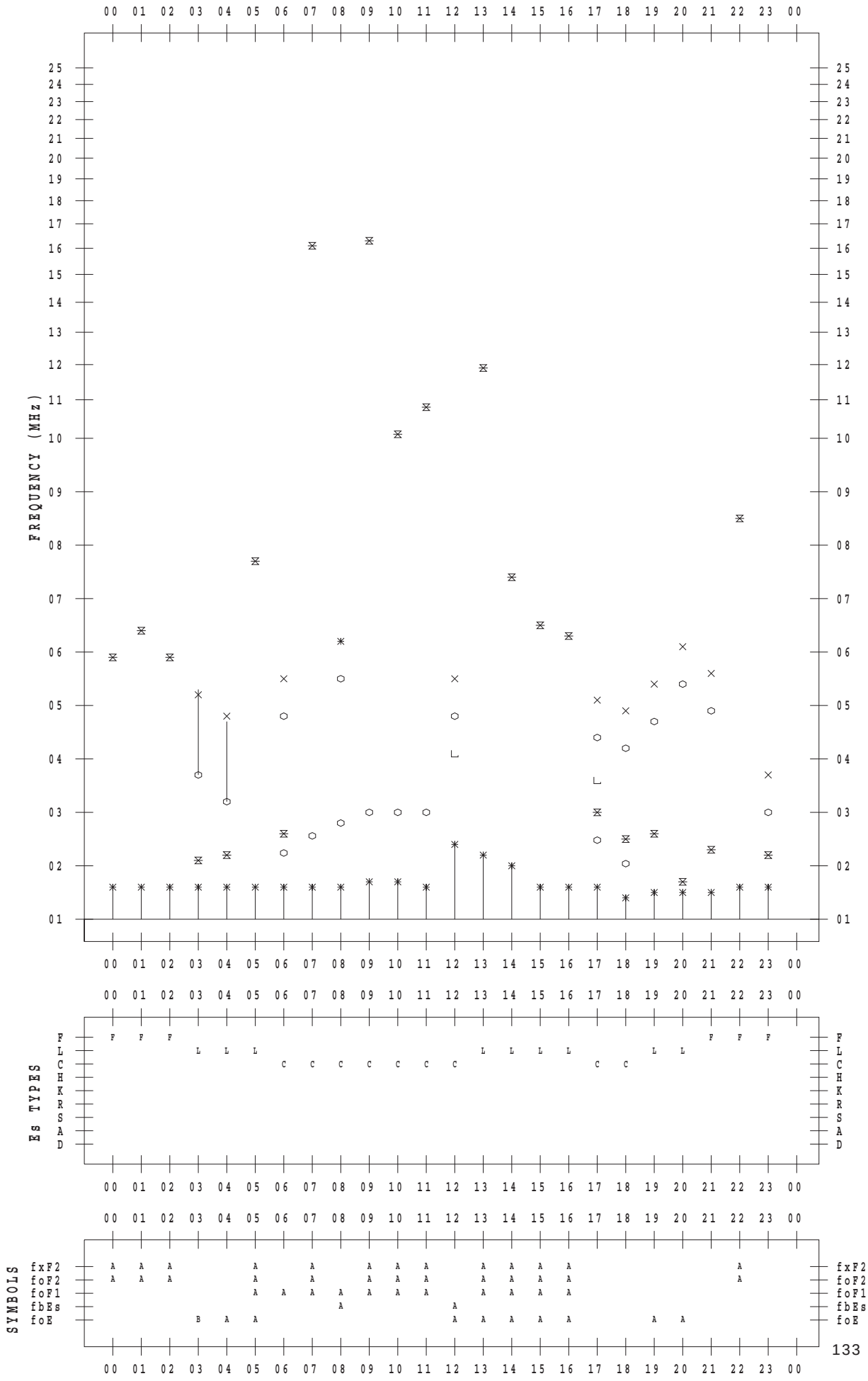
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/26

135 °E MEAN TIME



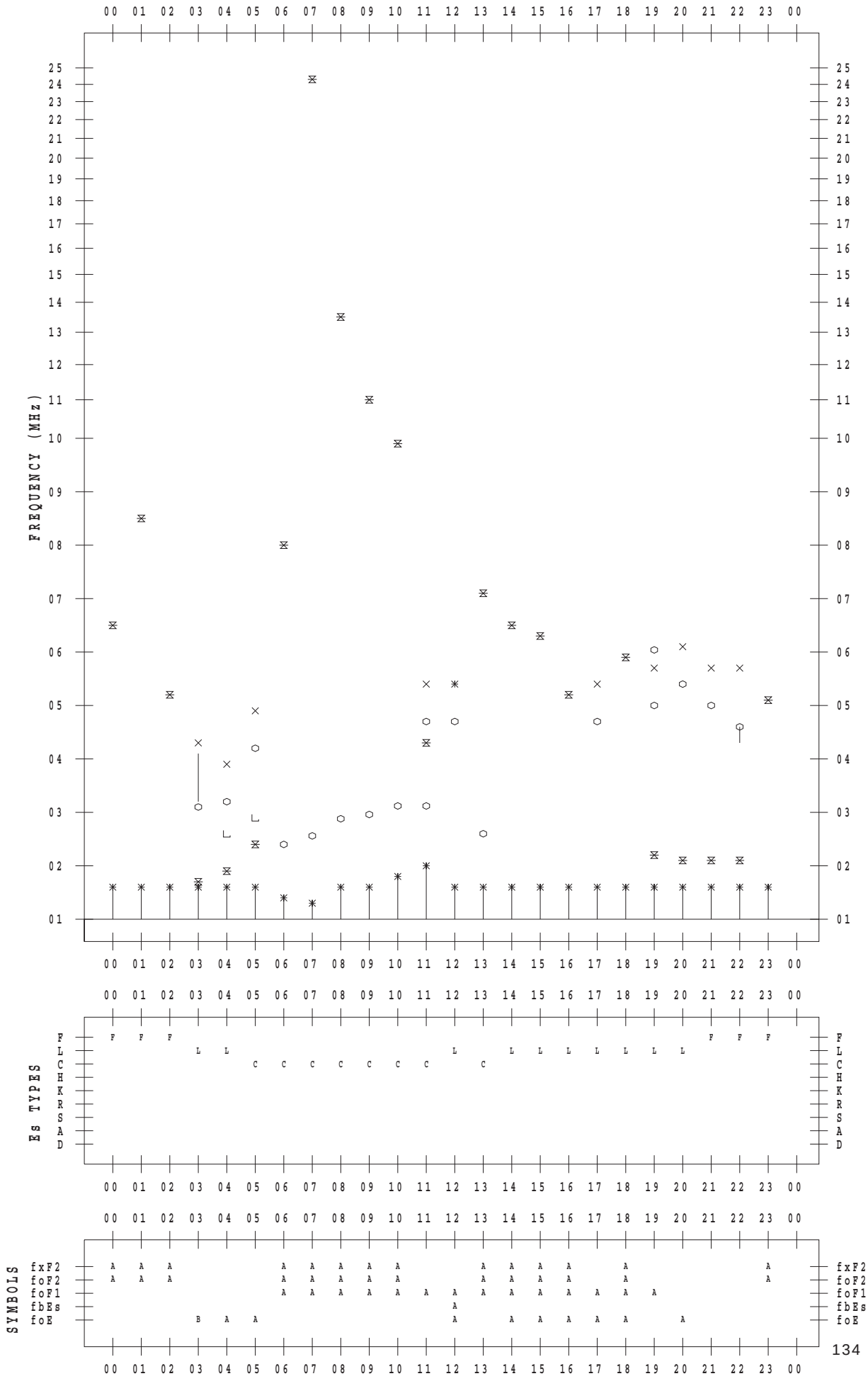
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/27

135 °E MEAN TIME



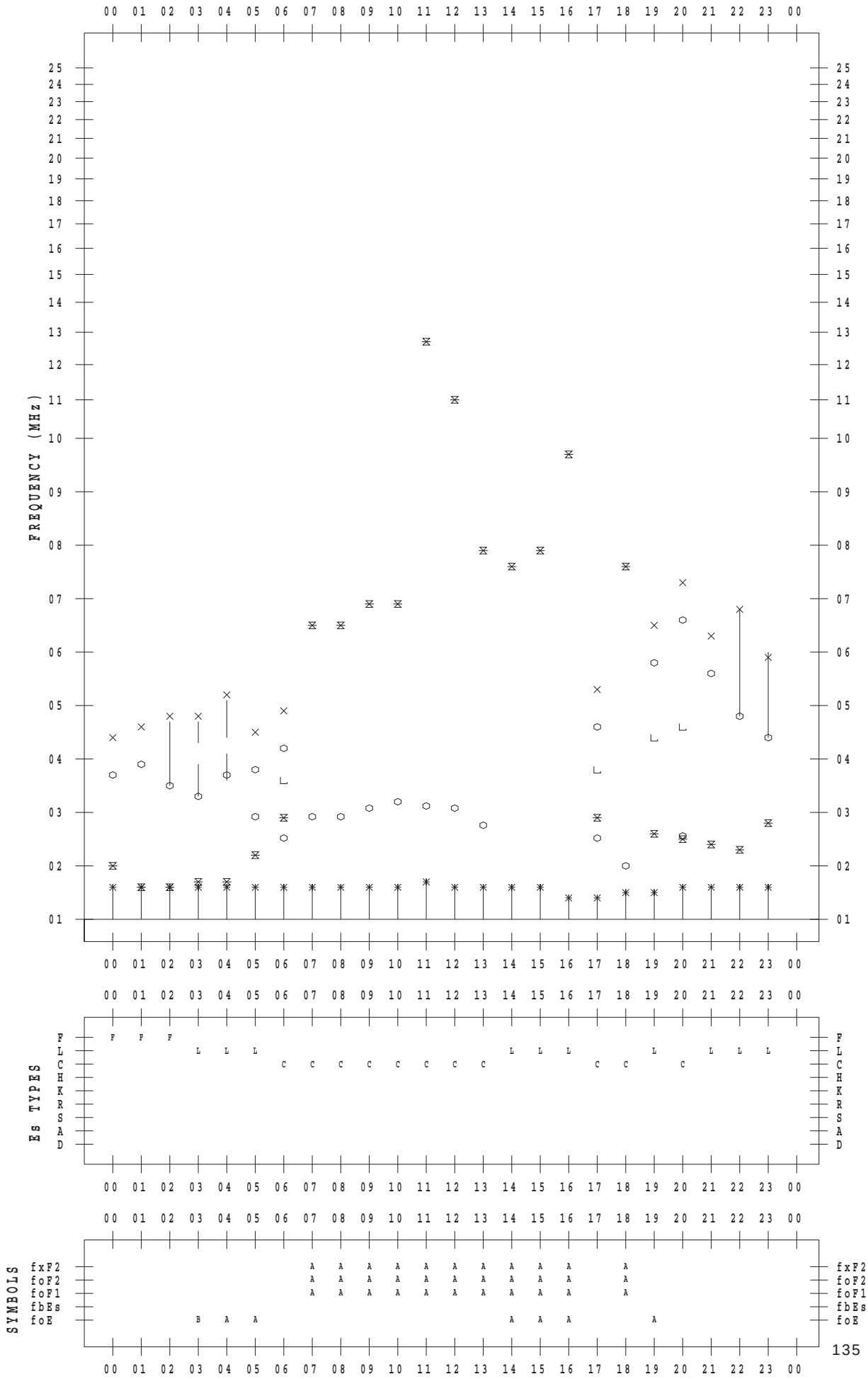
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/28

135 °E MEAN TIME



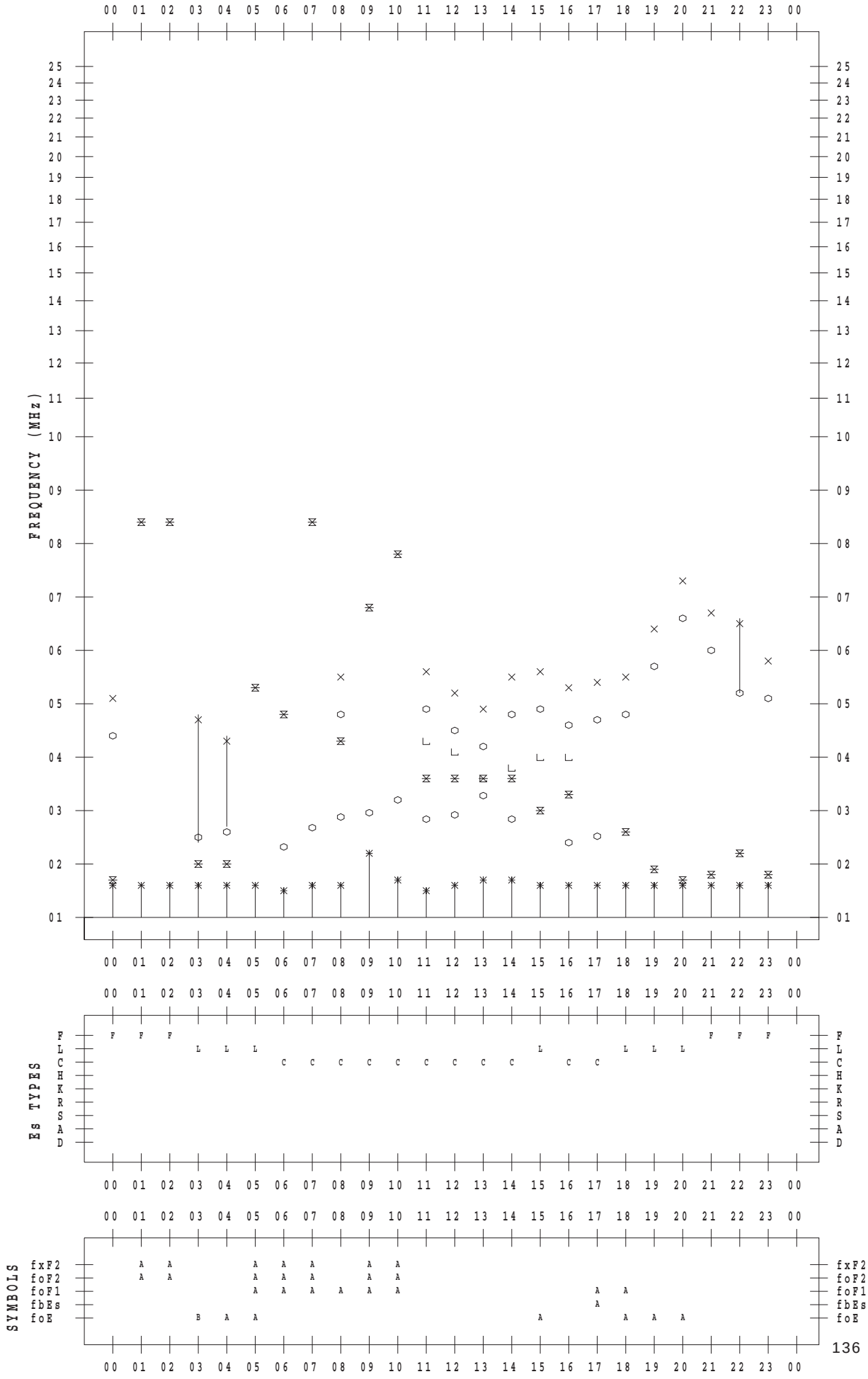
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/29

135 °E MEAN TIME



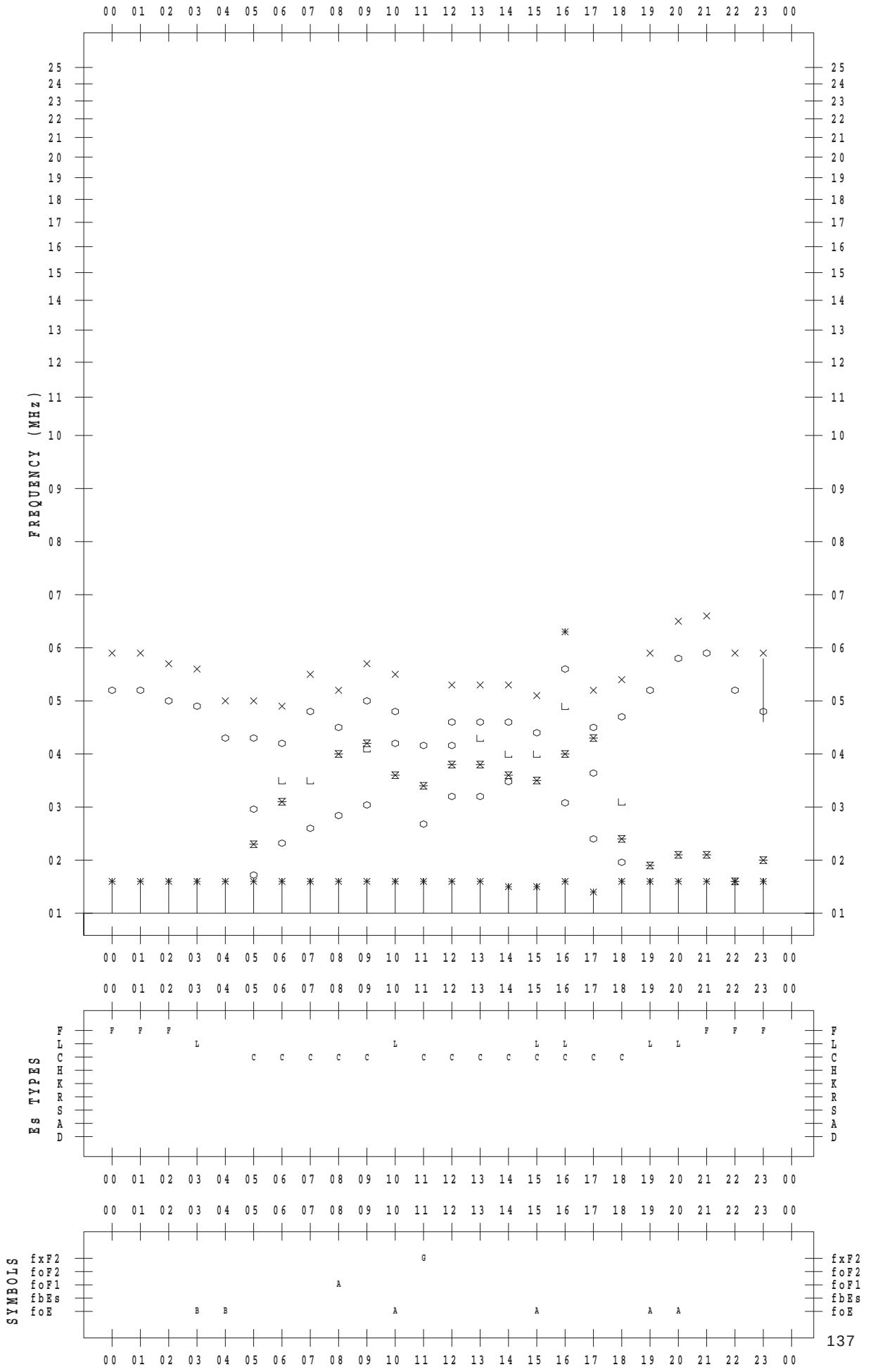
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/30

135 °E MEAN TIME



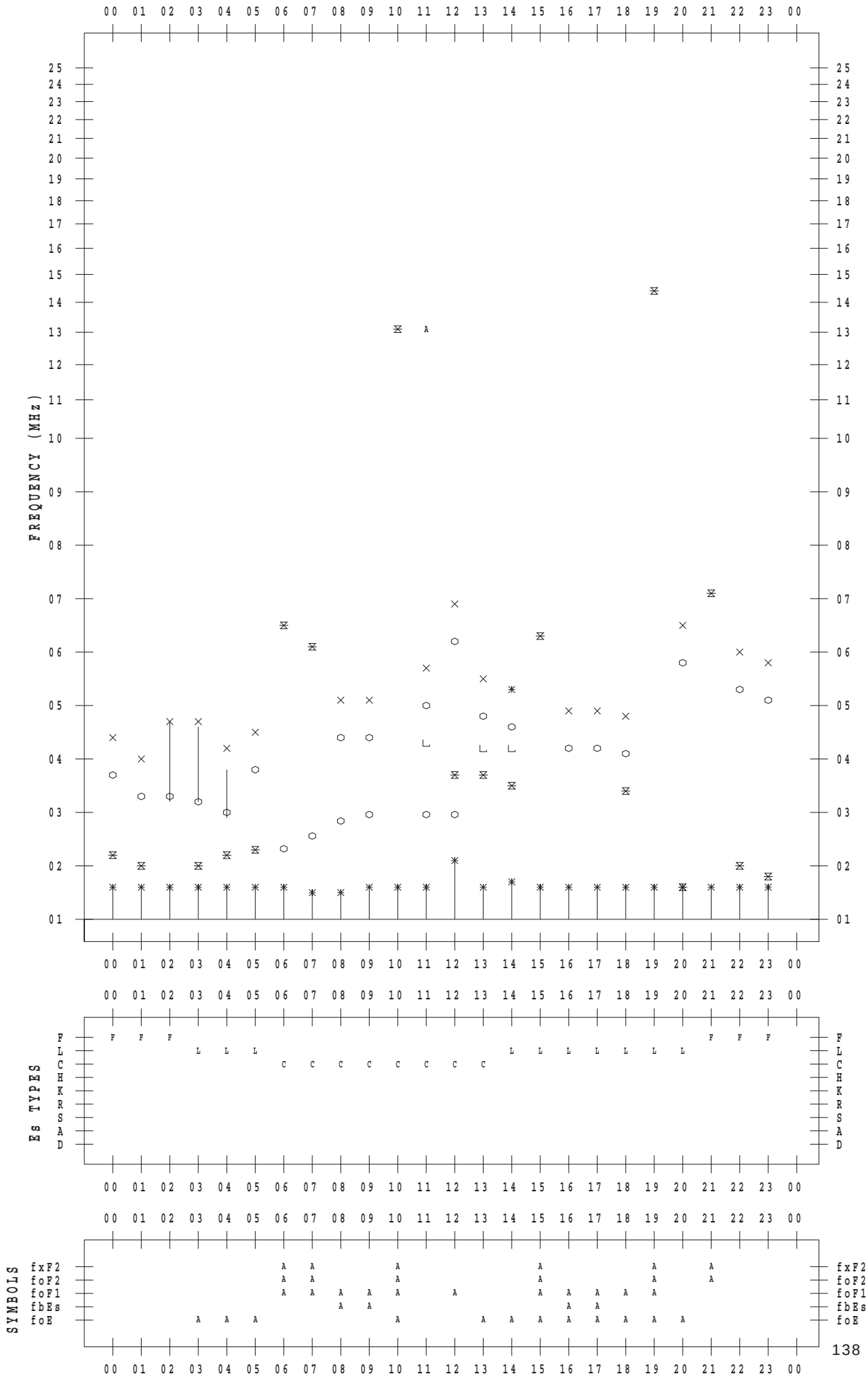
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/ 7/31

135 °E MEAN TIME



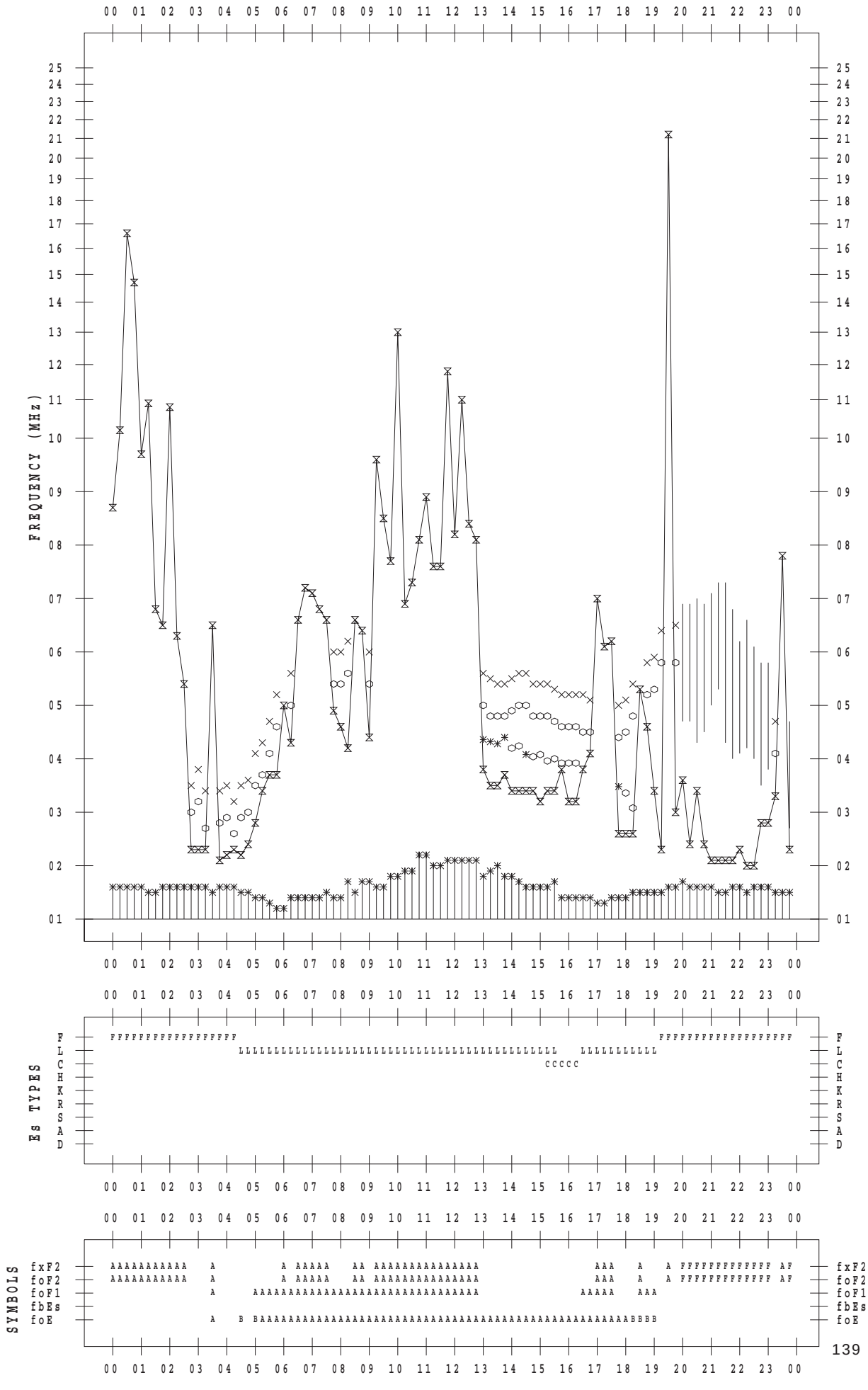
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 1

135 °E MEAN TIME



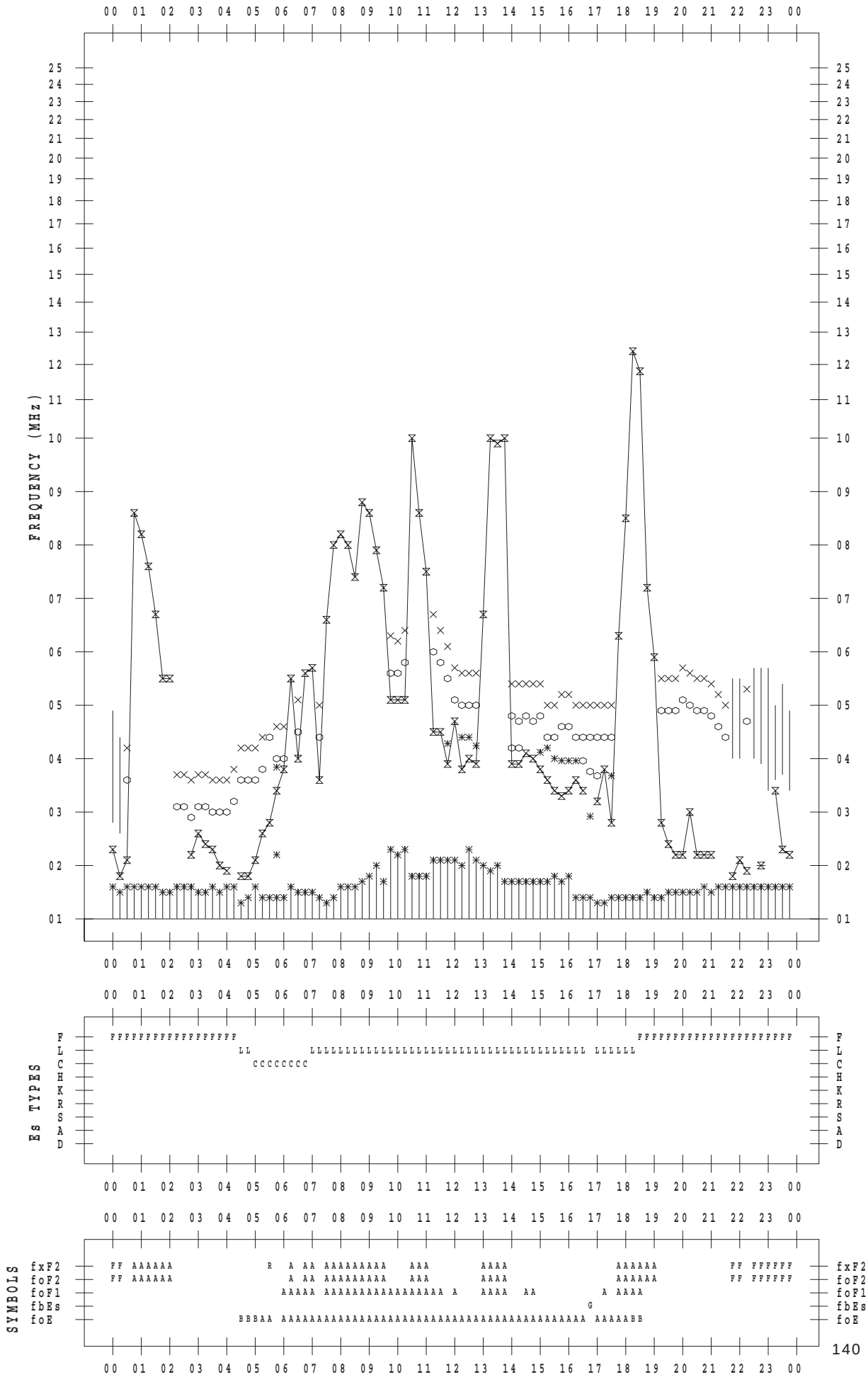
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 2

135 °E MEAN TIME



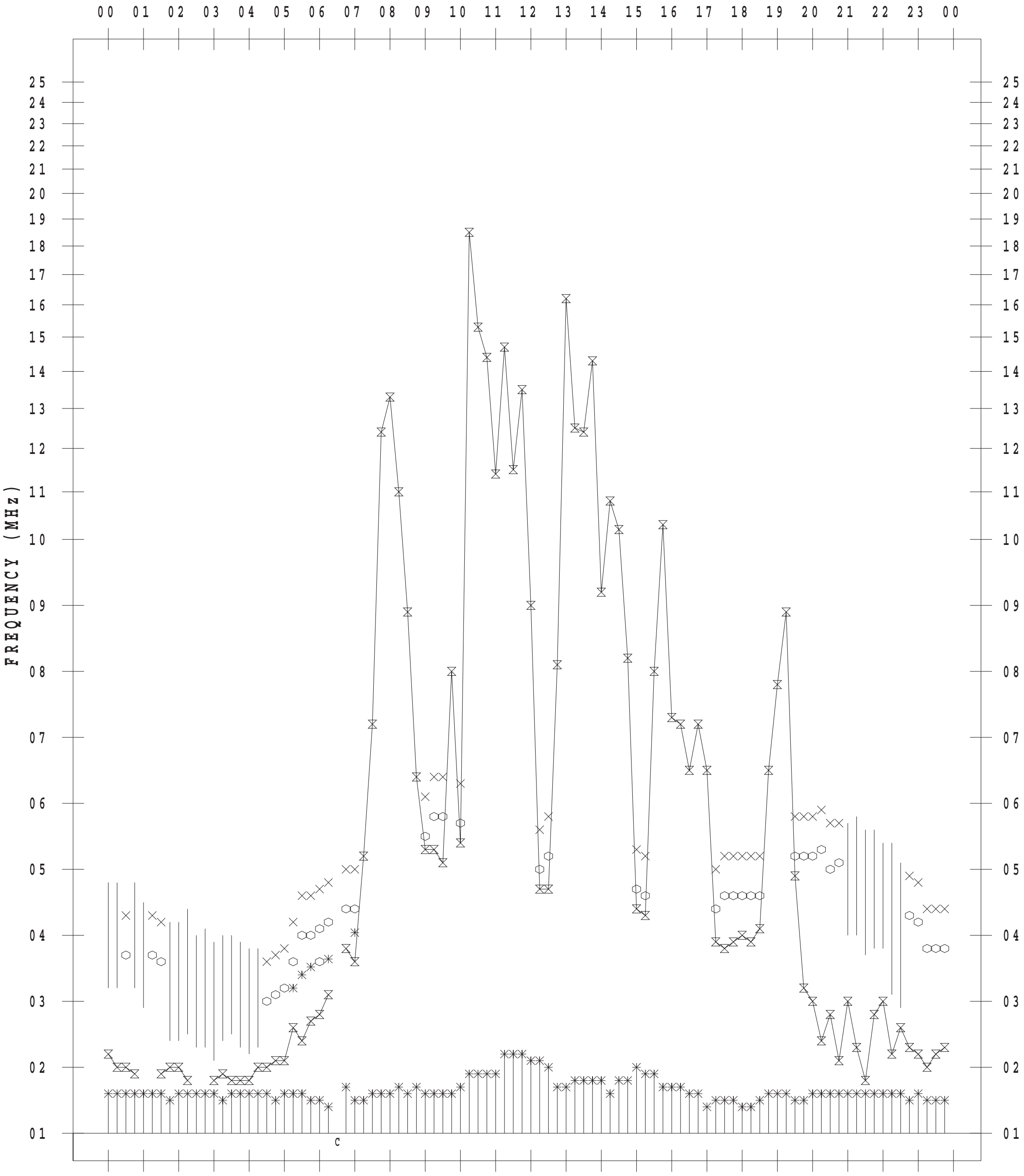
f-PLOT DATA

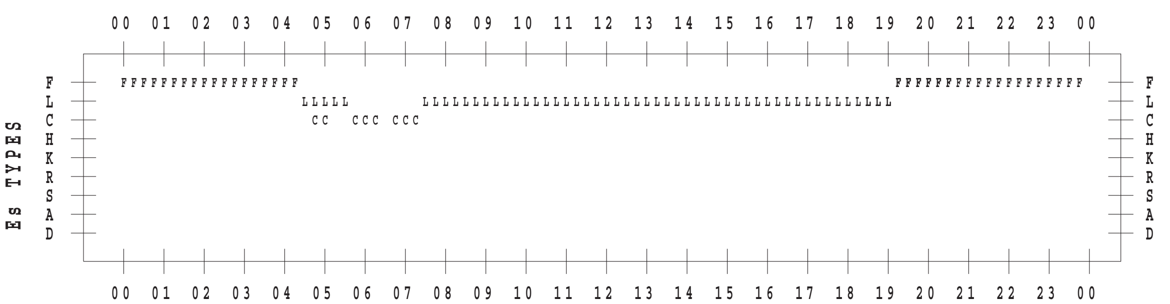
SCALER : I.NISHIMUTA

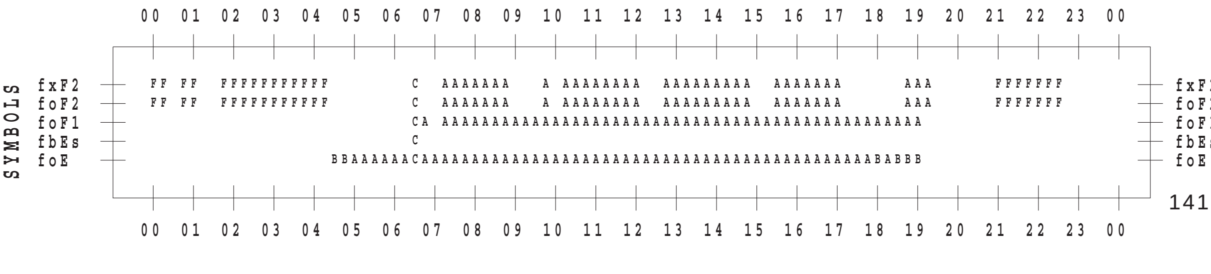
STATION : Kokubunji

DATE : 2018/ 7/ 3

135 °E MEAN TIME







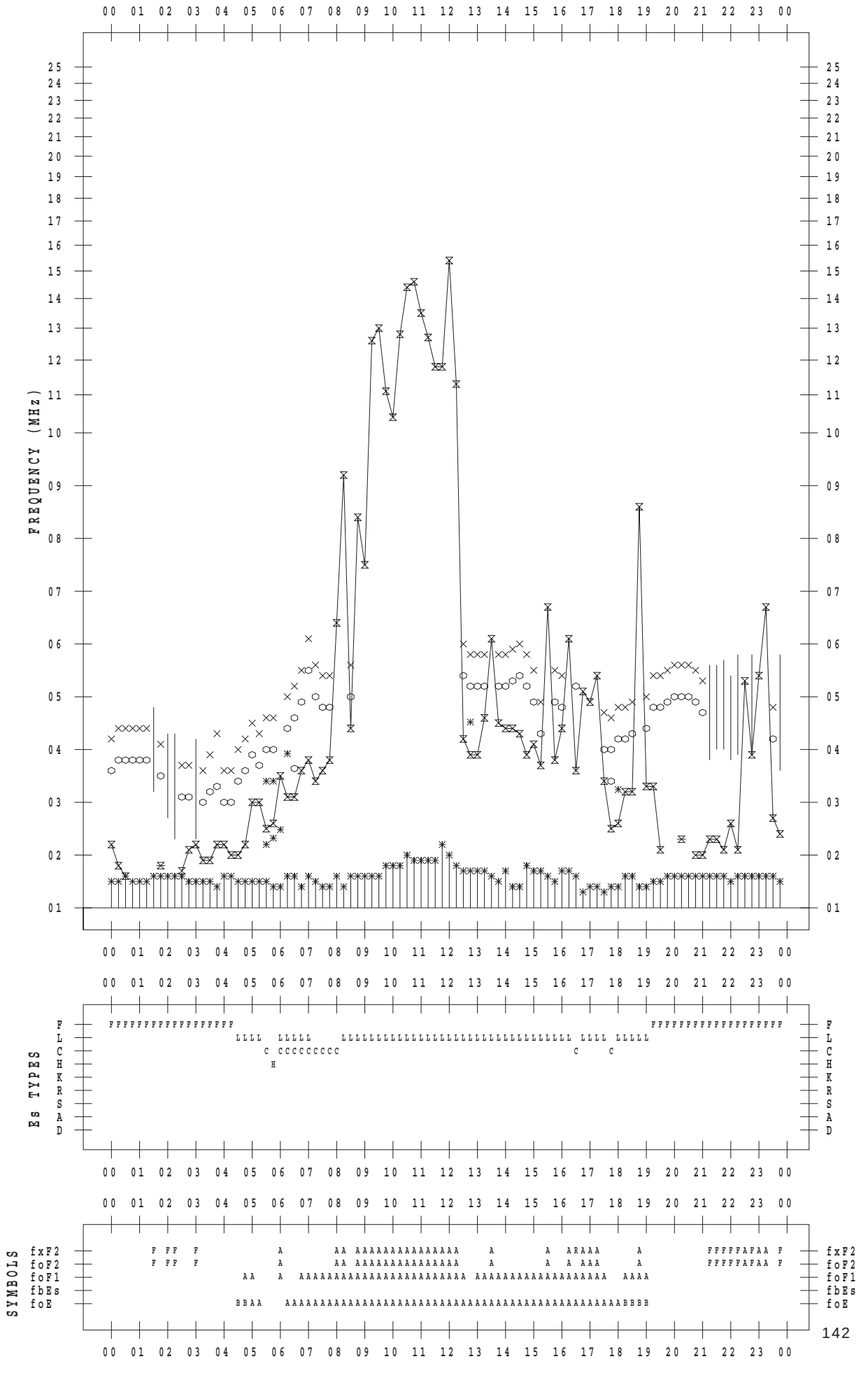
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 4

135 °E MEAN TIME



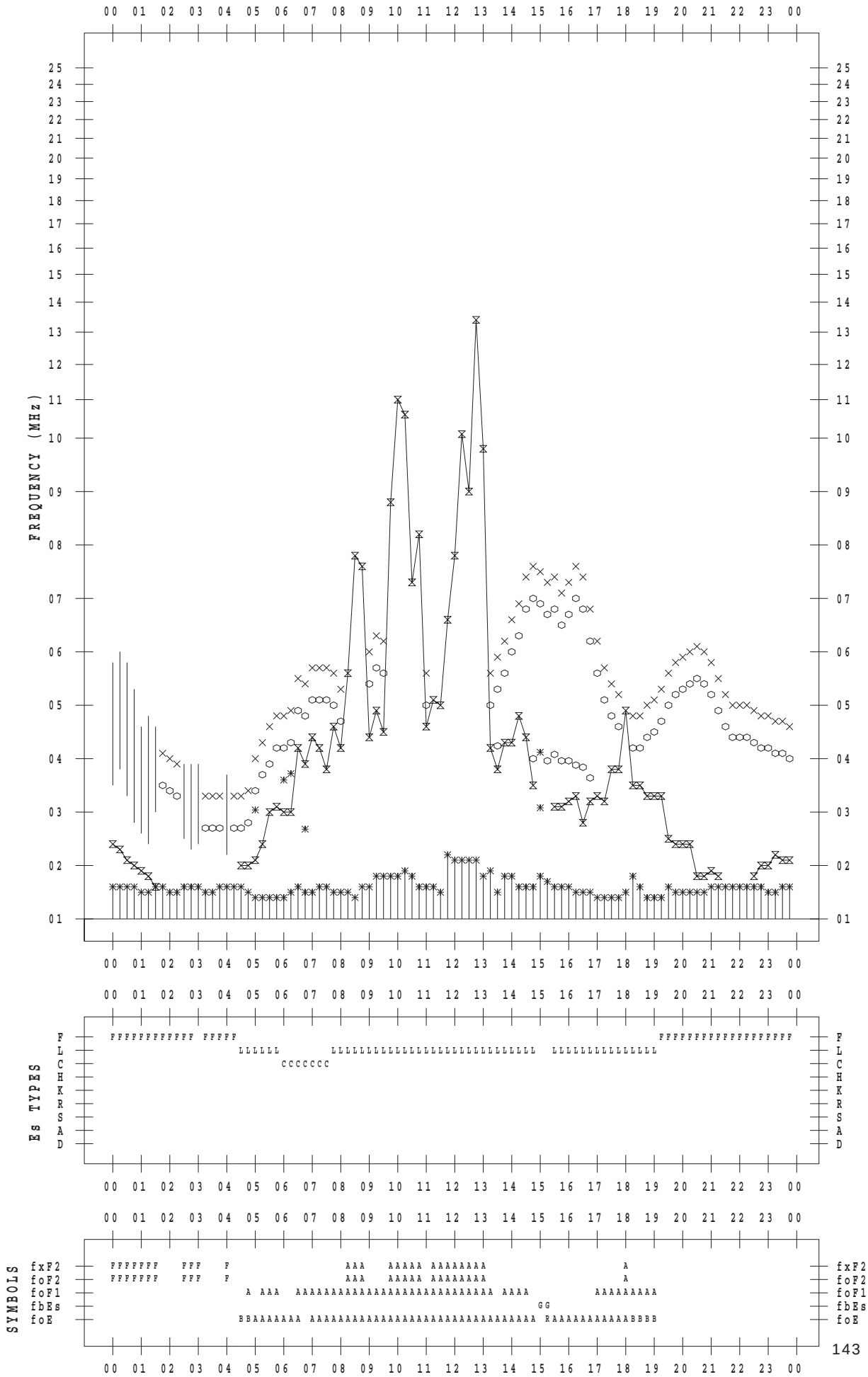
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 5

135 °E MEAN TIME



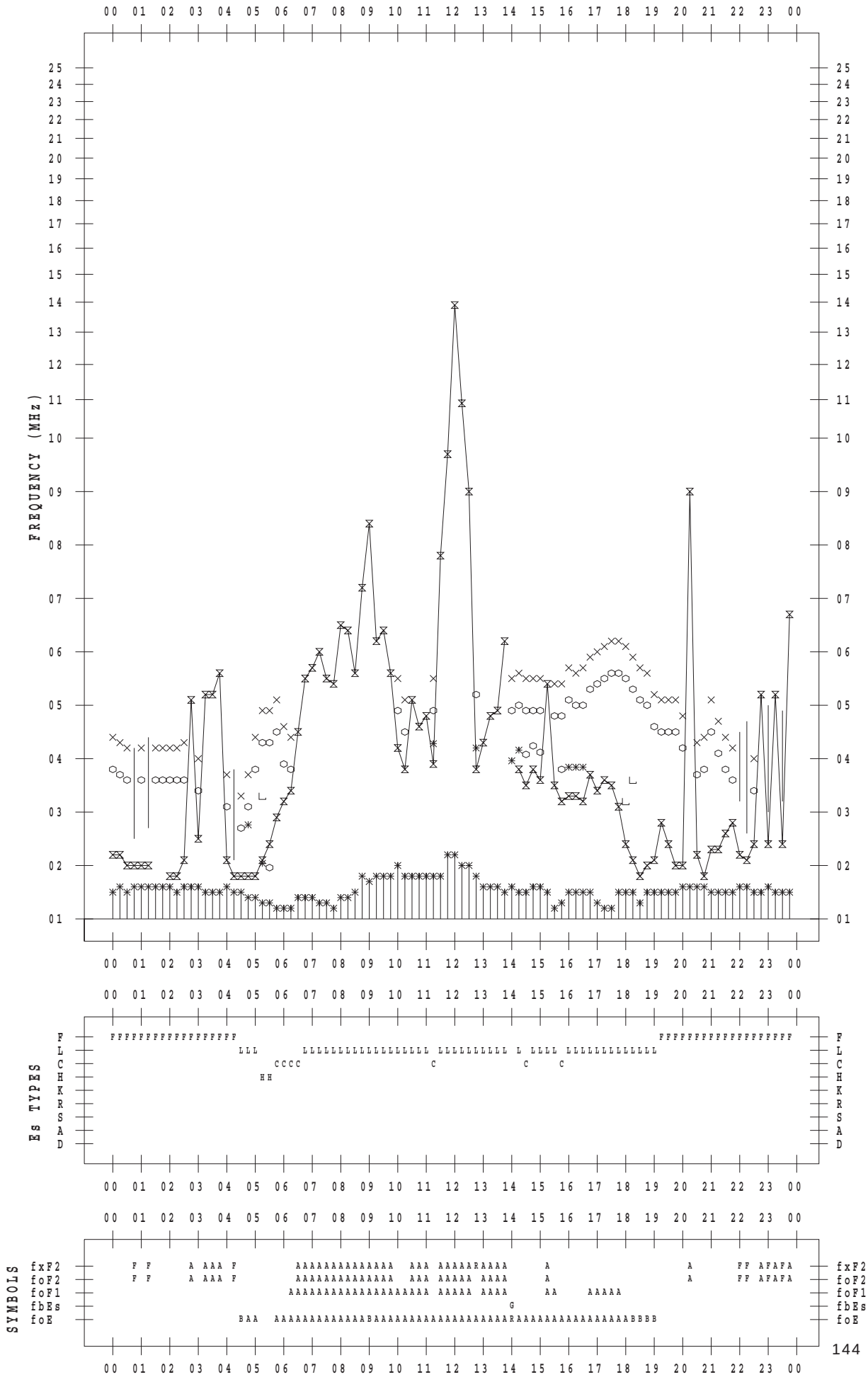
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 6

135 °E MEAN TIME



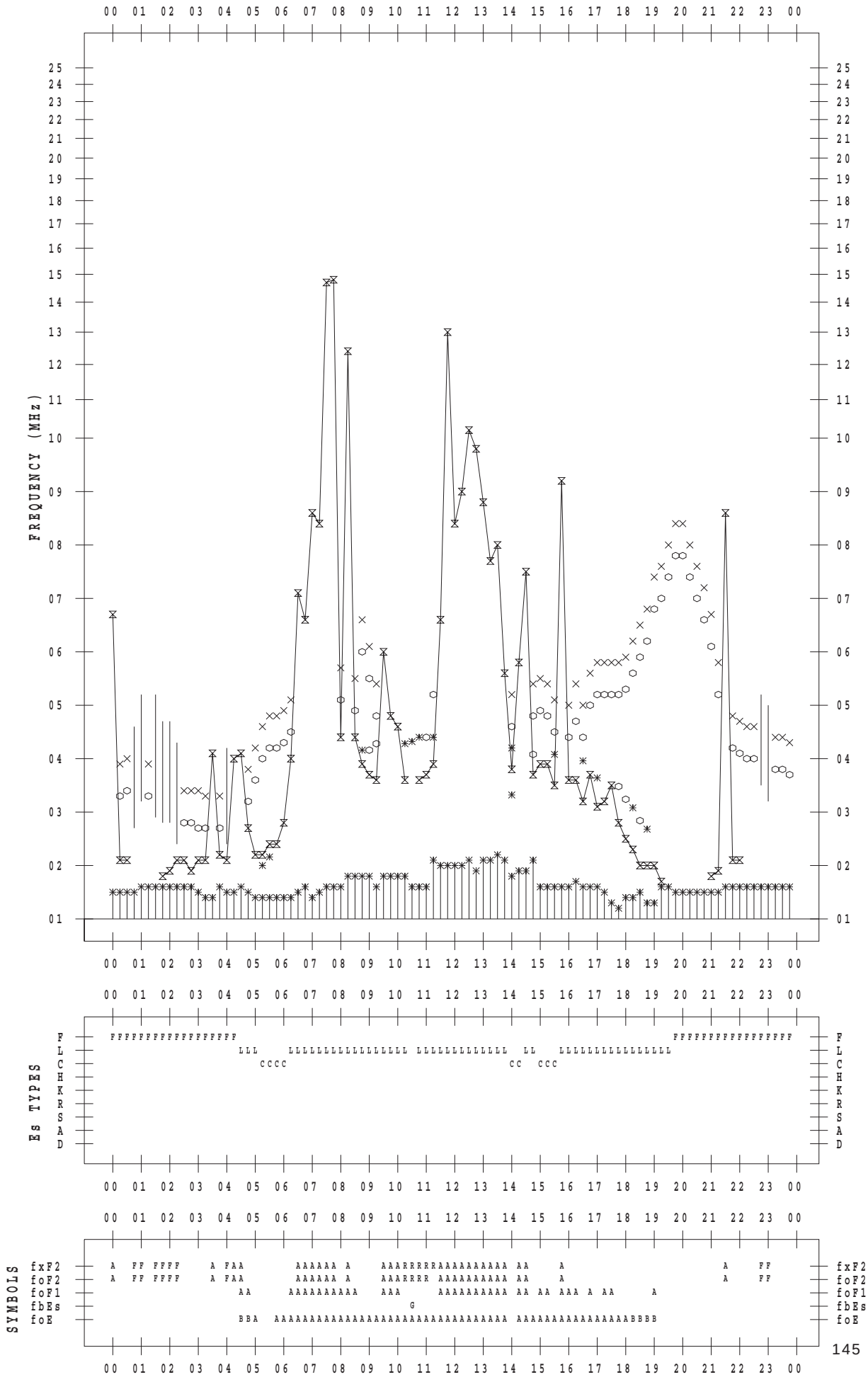
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 7

135 °E MEAN TIME



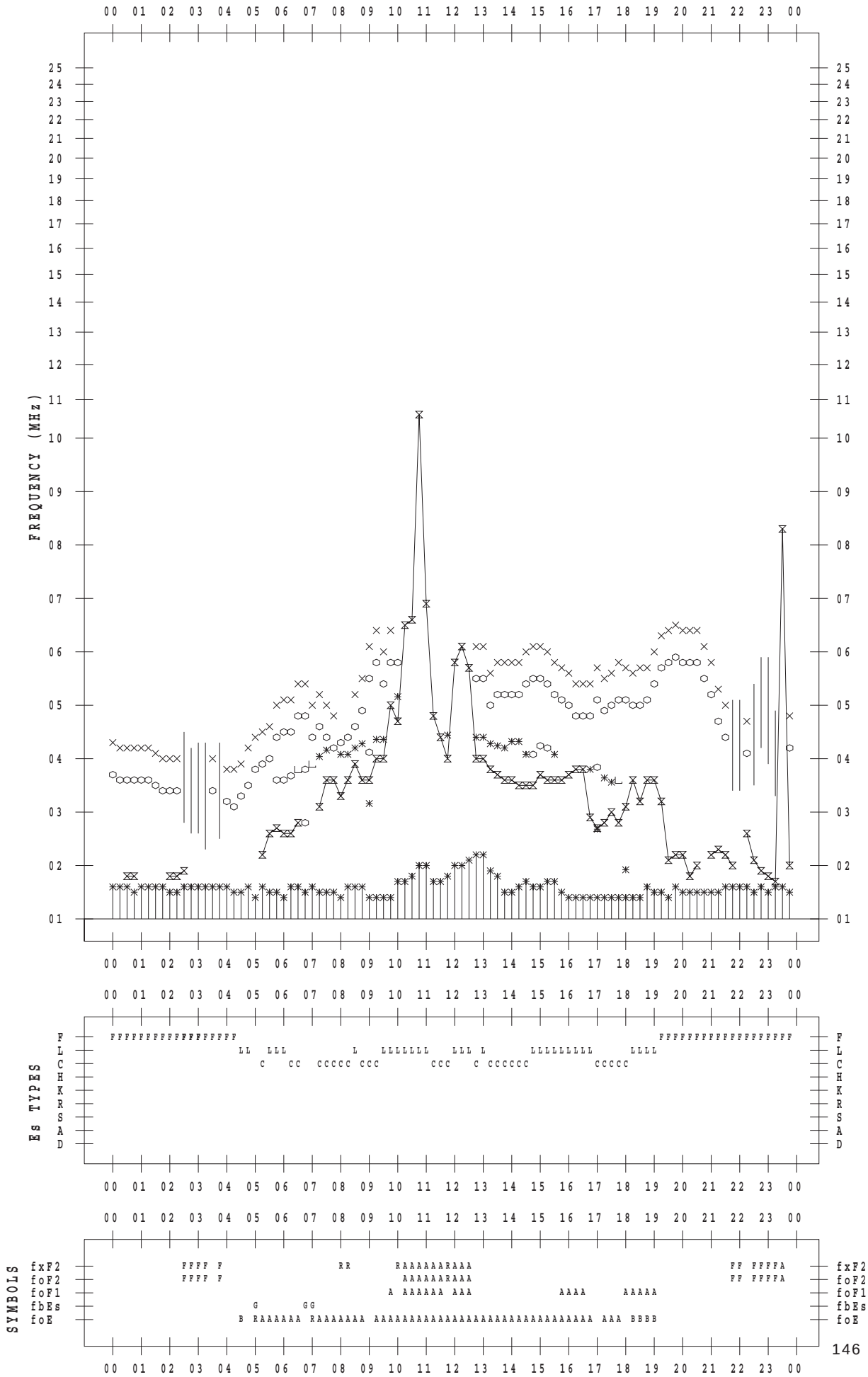
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 8

135 °E MEAN TIME



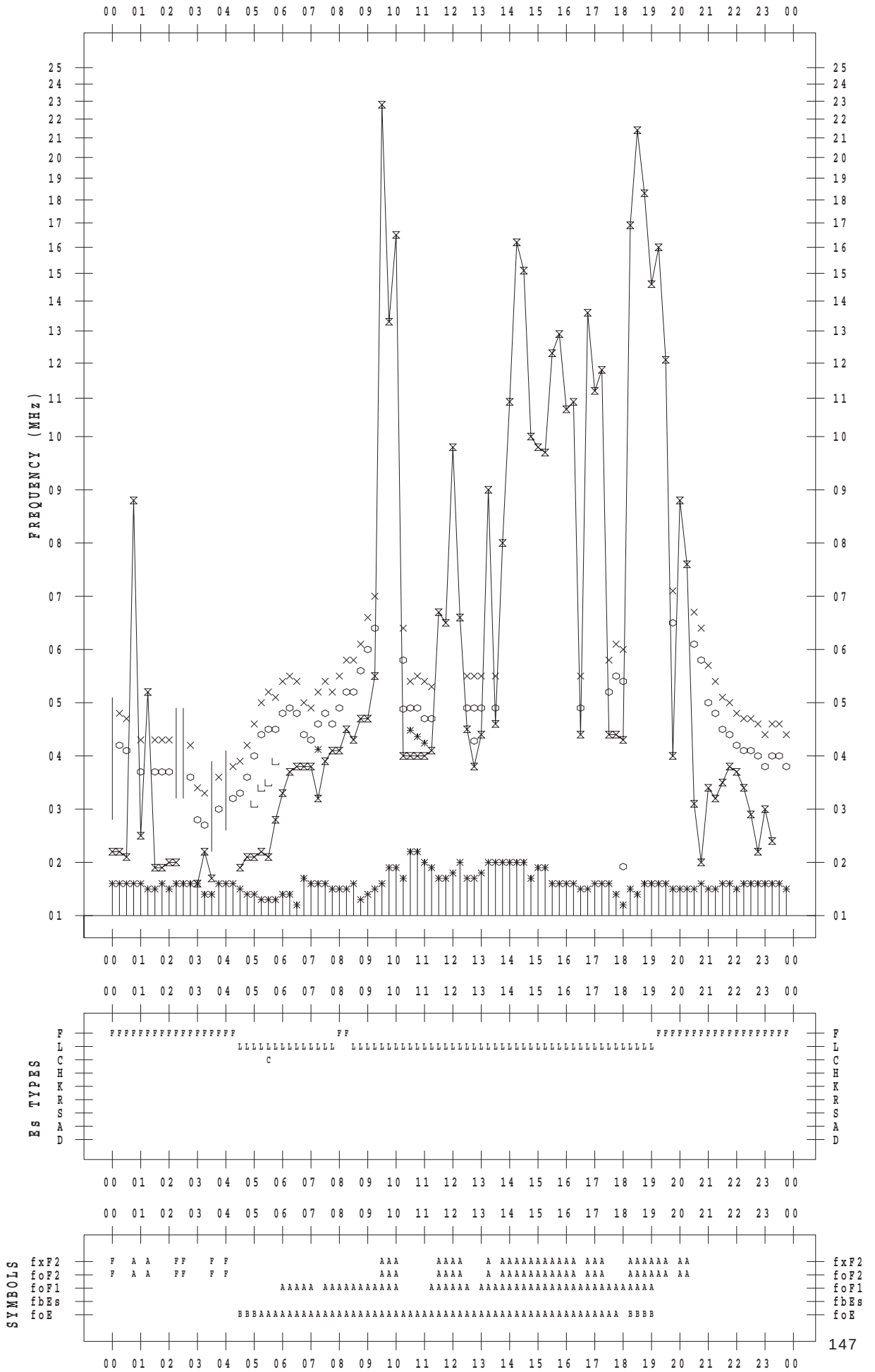
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/ 9

135 °E MEAN TIME



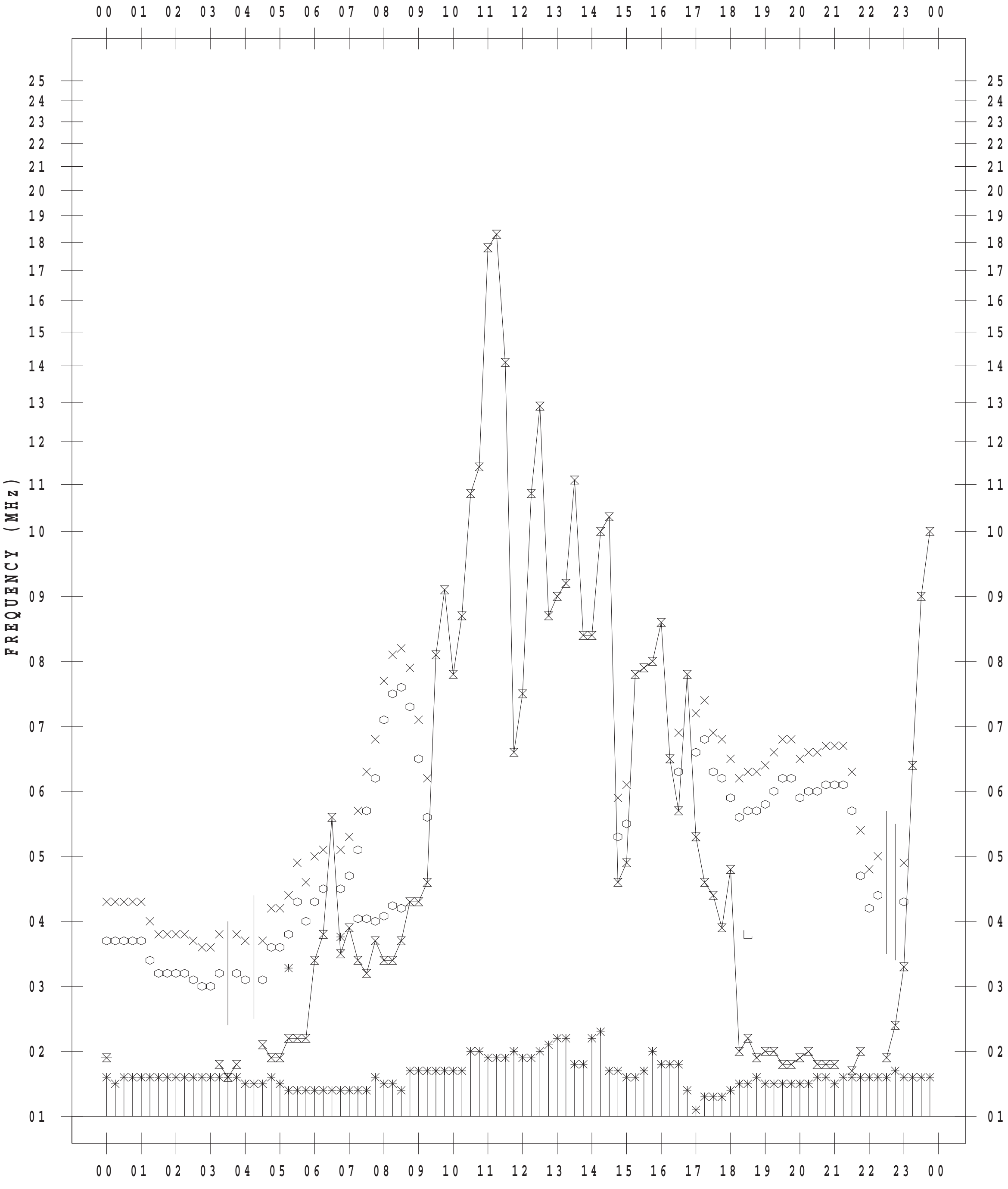
f-PLOT DATA

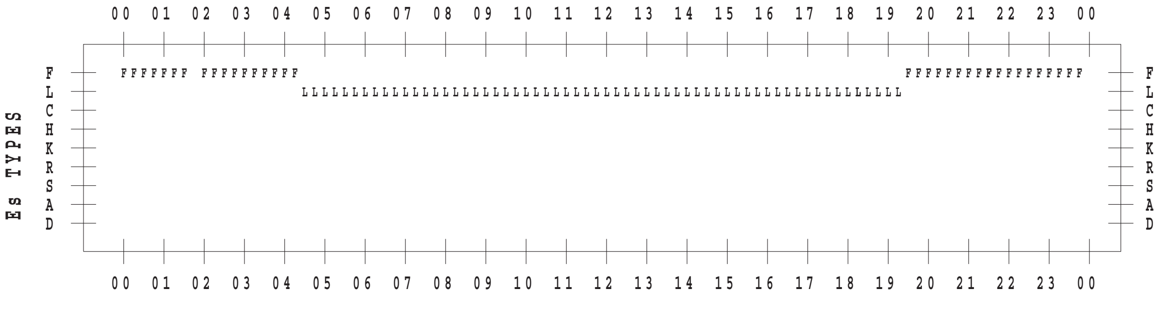
SCALER : I.NISHIMUTA

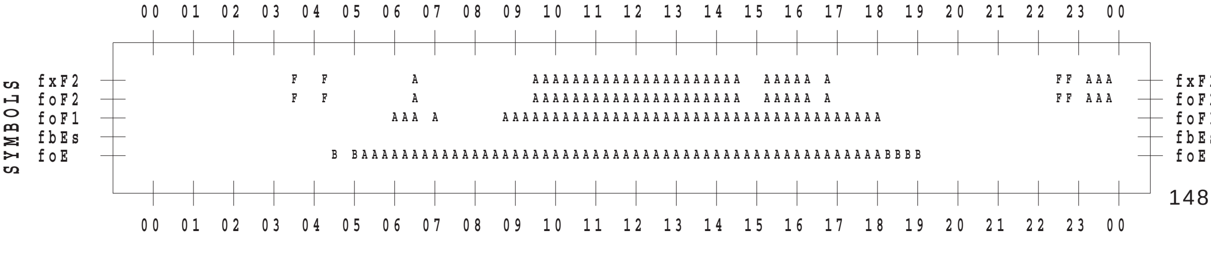
STATION : Kokubunji

DATE : 2018/ 7/10

135 °E MEAN TIME







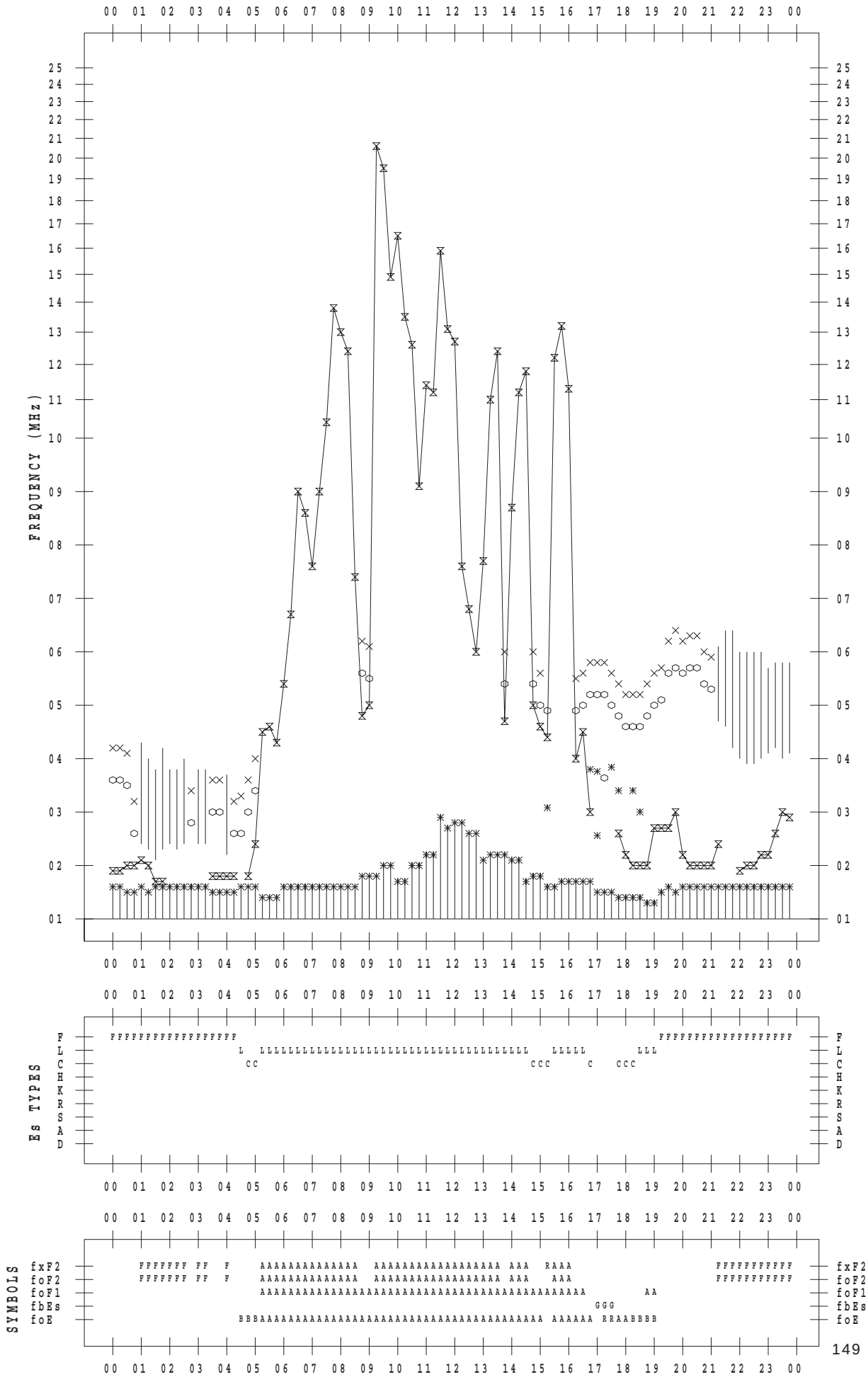
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/11

135 °E MEAN TIME



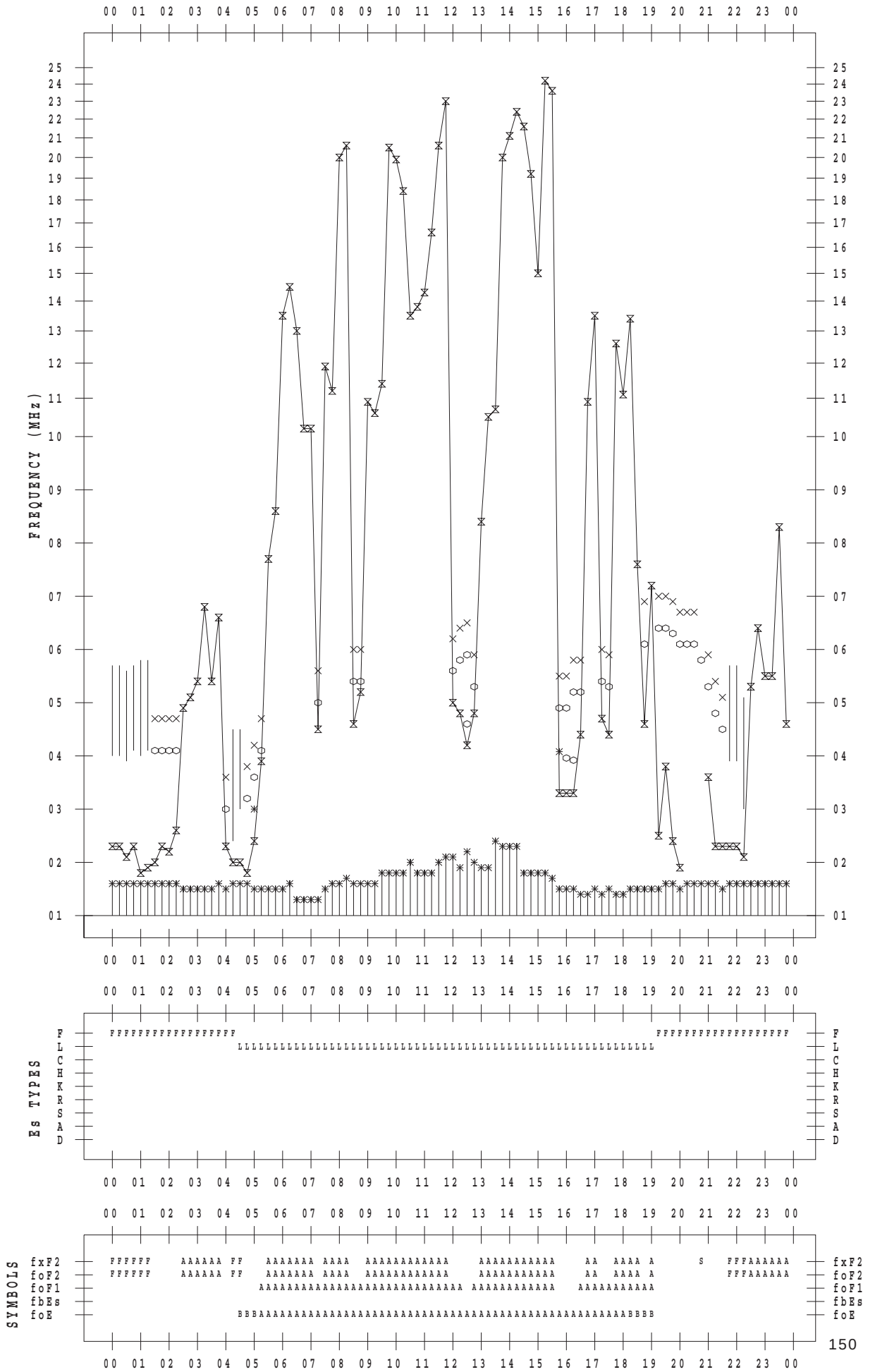
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/12

135 °E MEAN TIME



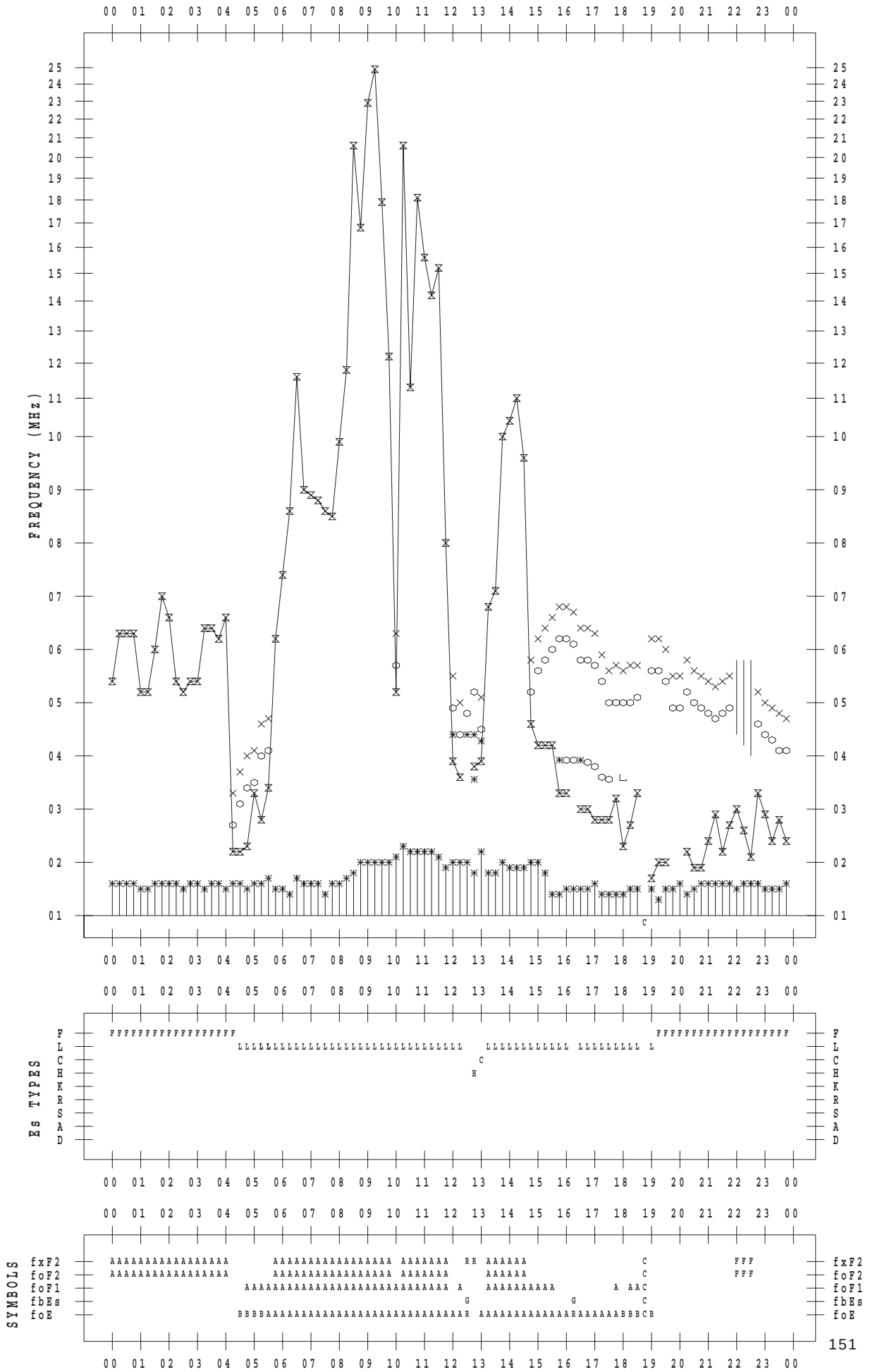
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/13

135 °E MEAN TIME



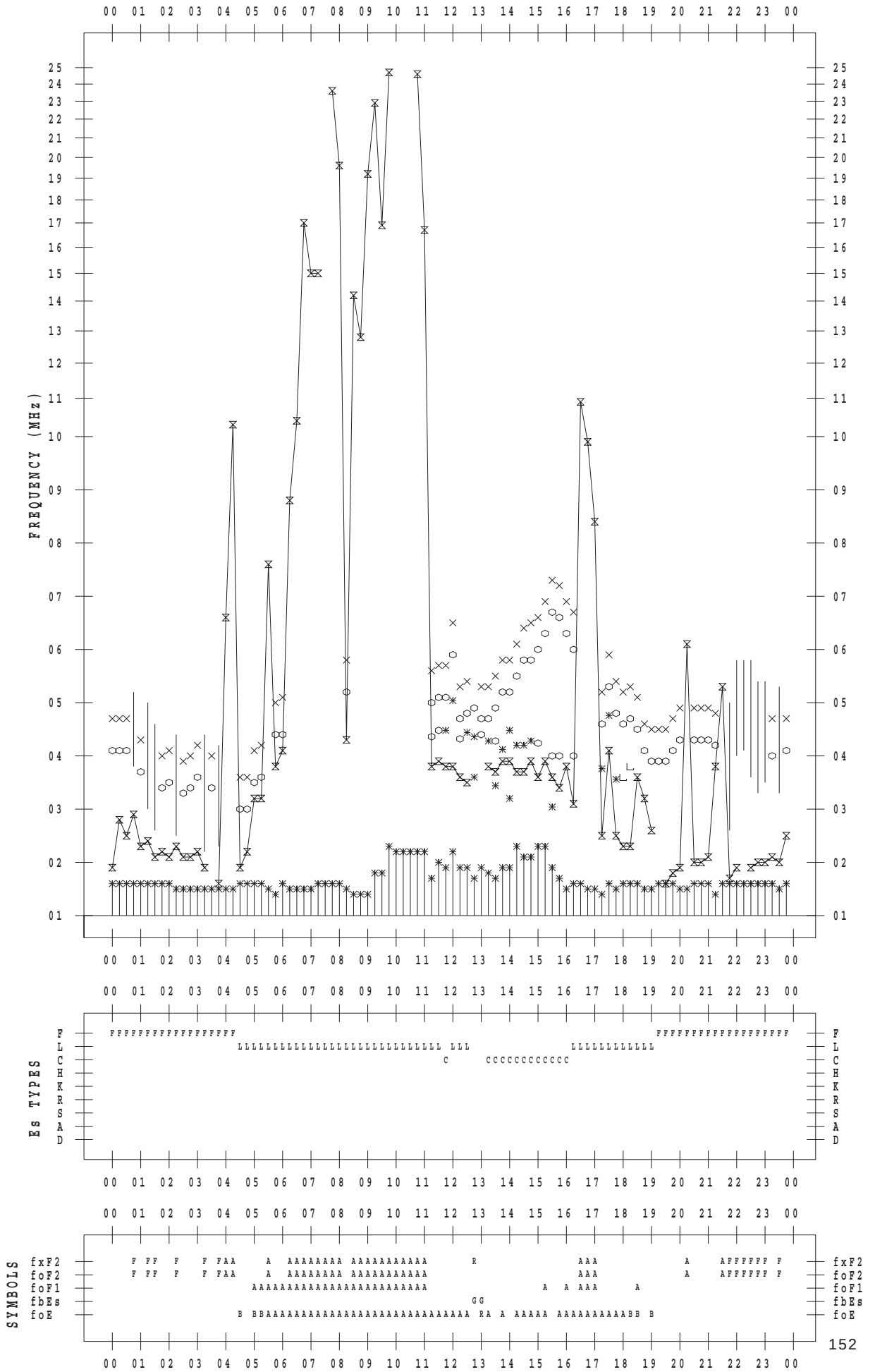
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/14

135 °E MEAN TIME



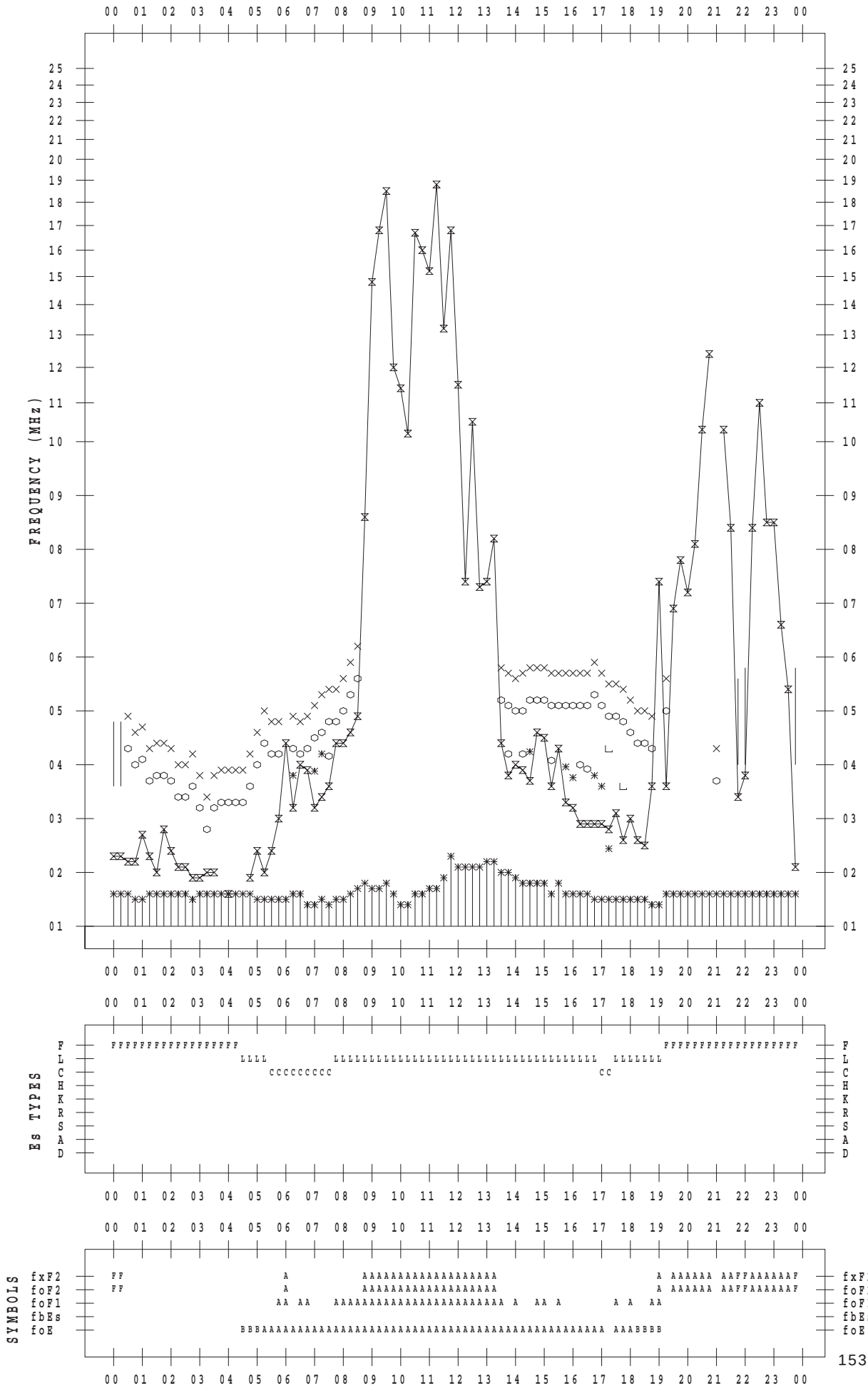
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/15

135 °E MEAN TIME



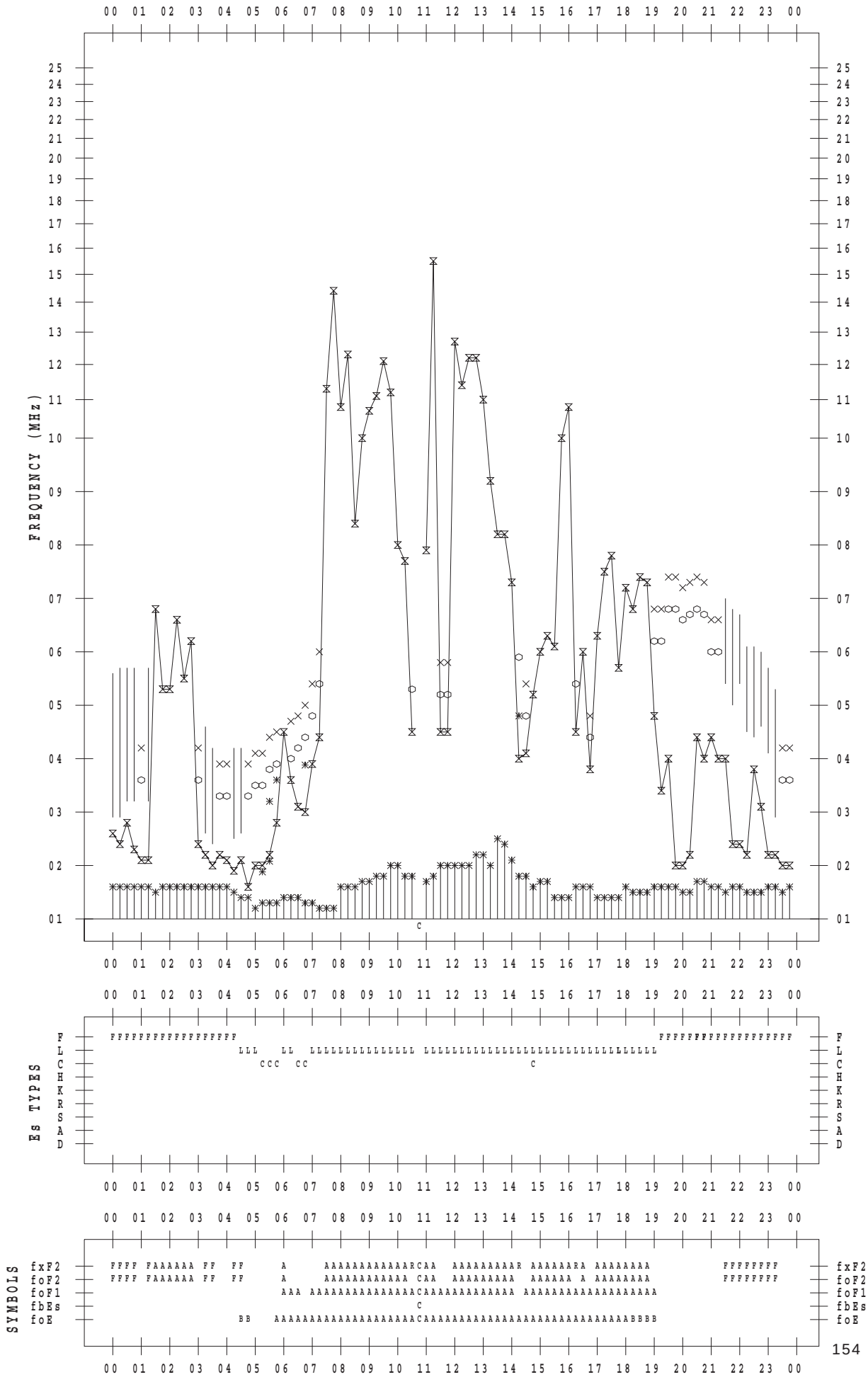
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/16

135 °E MEAN TIME



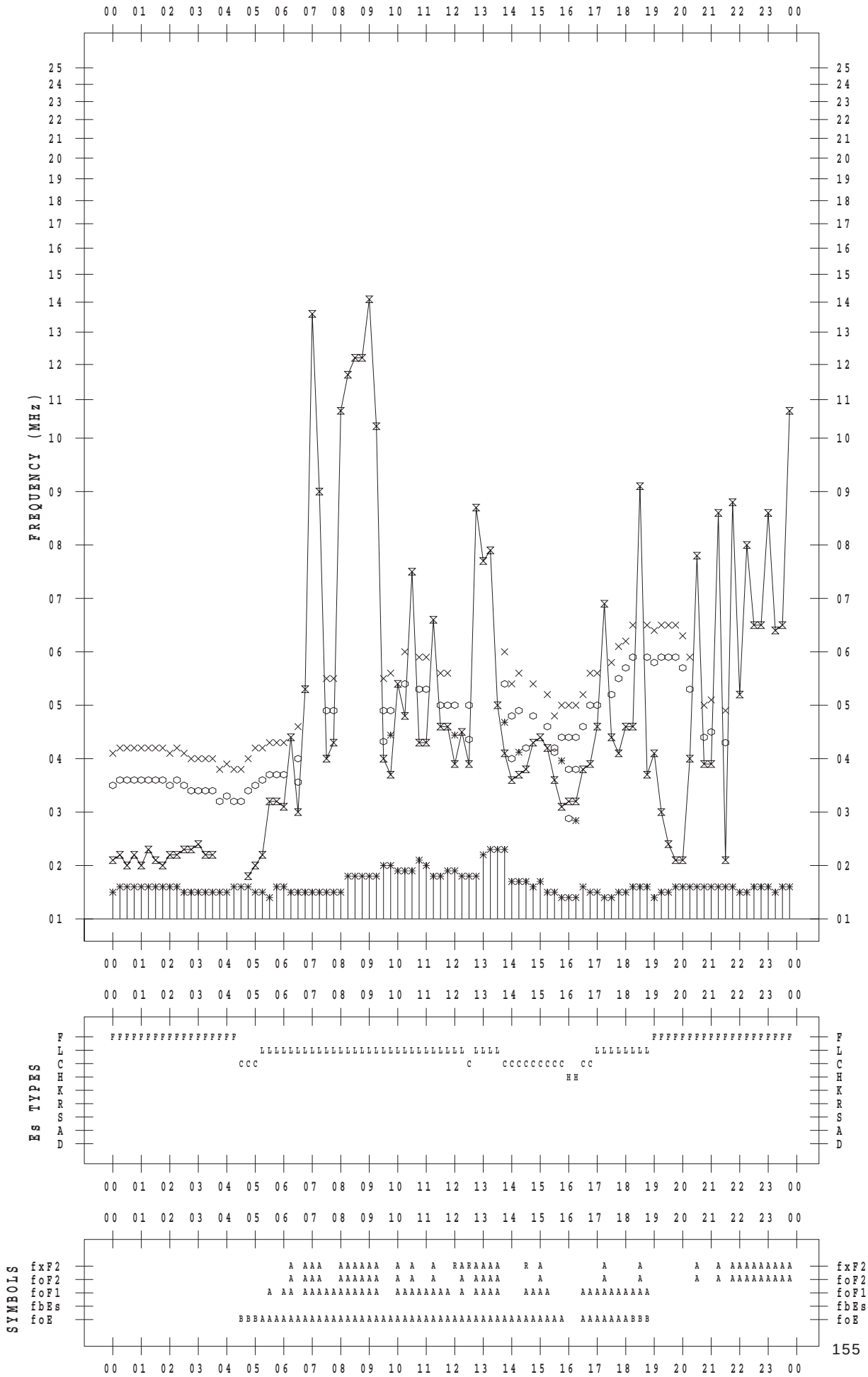
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/17

135 °E MEAN TIME



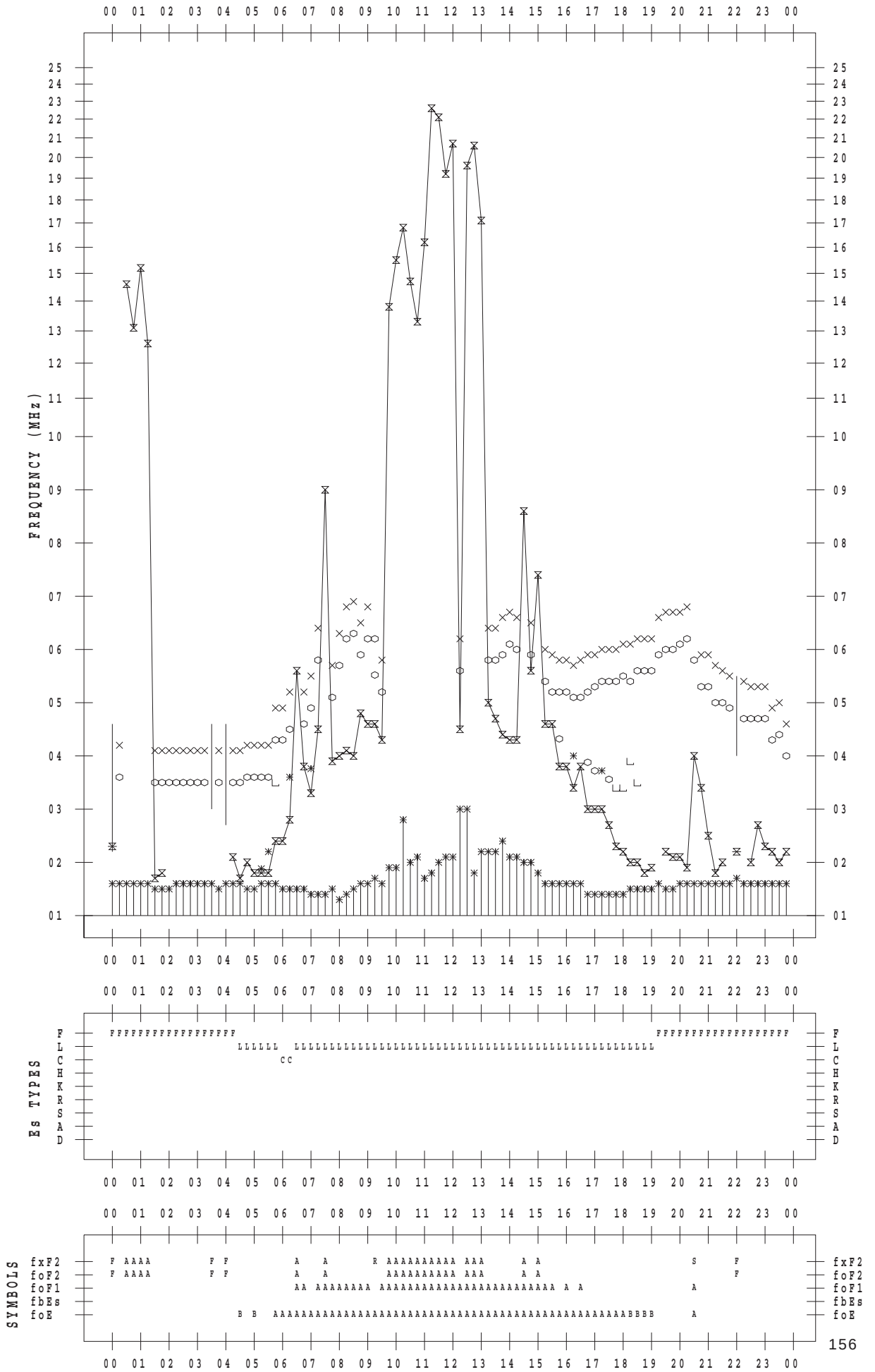
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/18

135 °E MEAN TIME



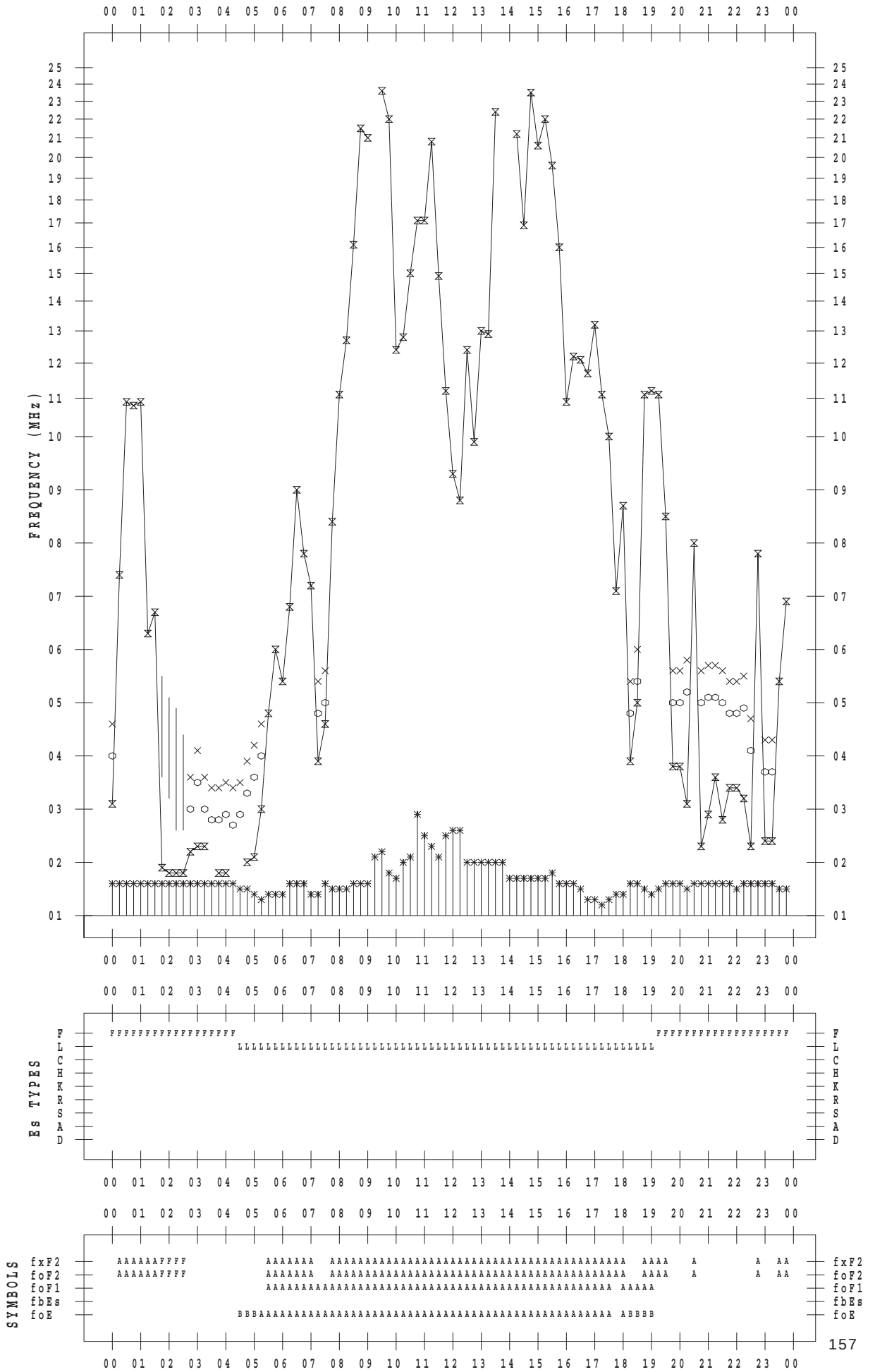
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/19

135 °E MEAN TIME

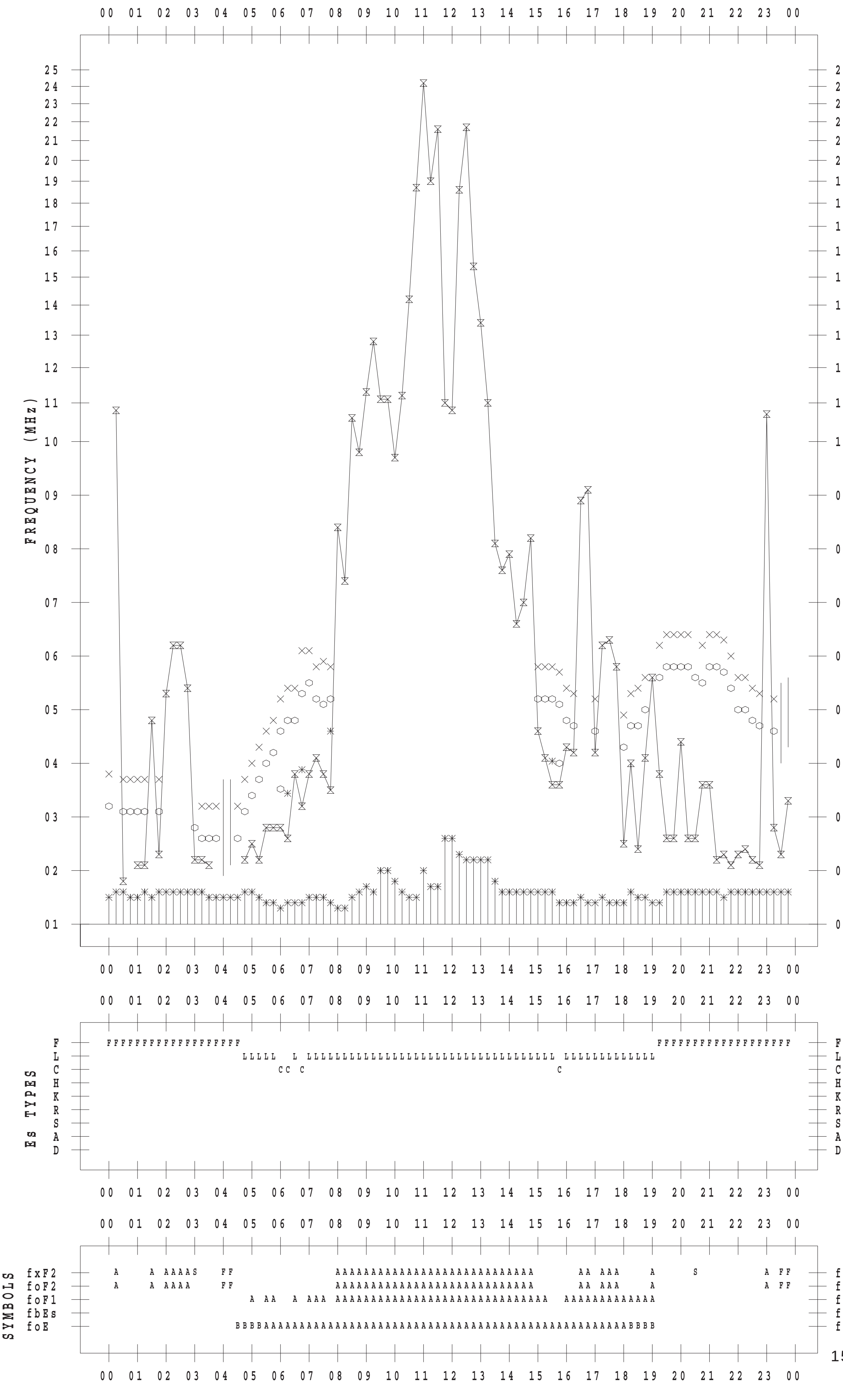


f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/20



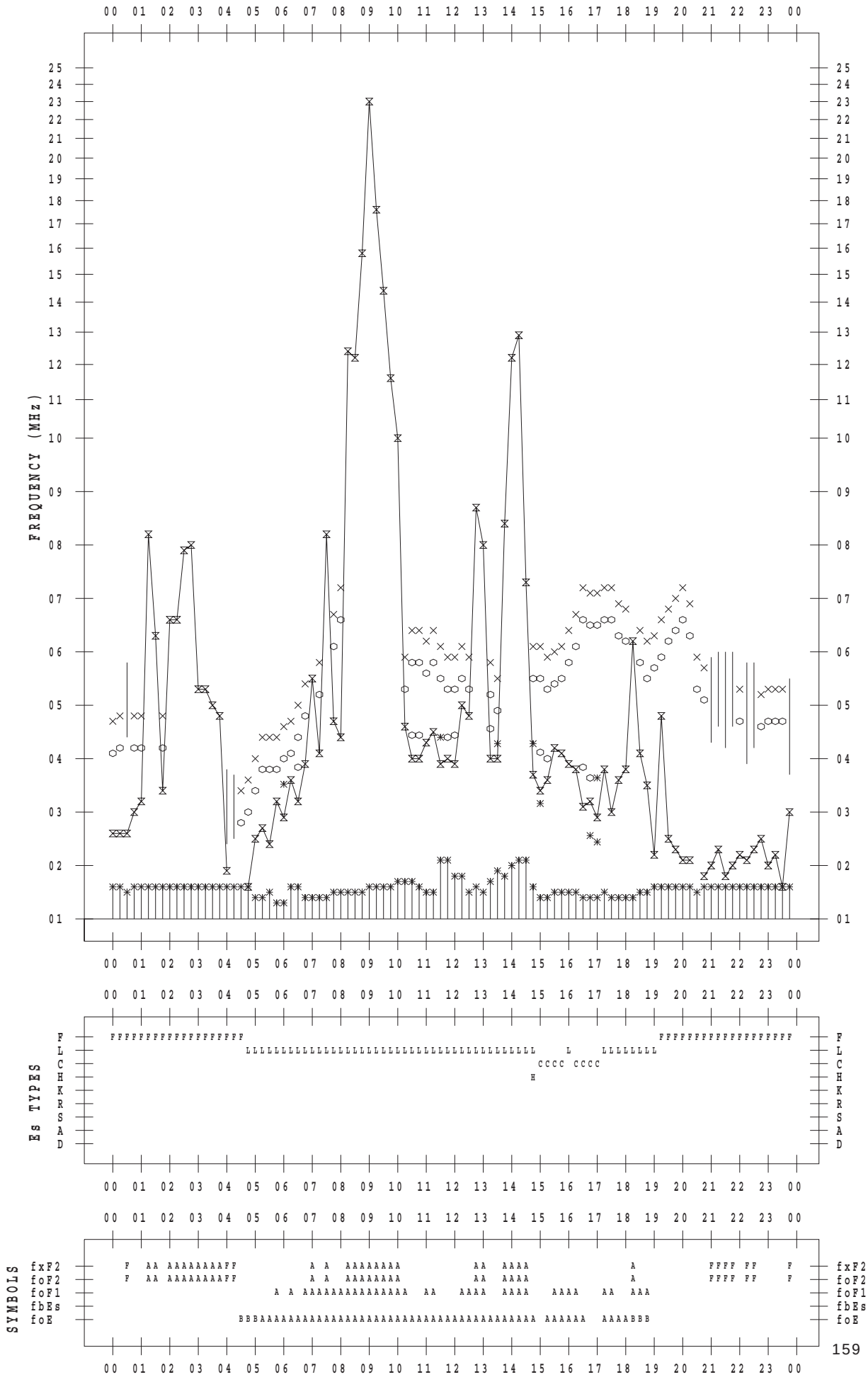
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/21

135 °E MEAN TIME



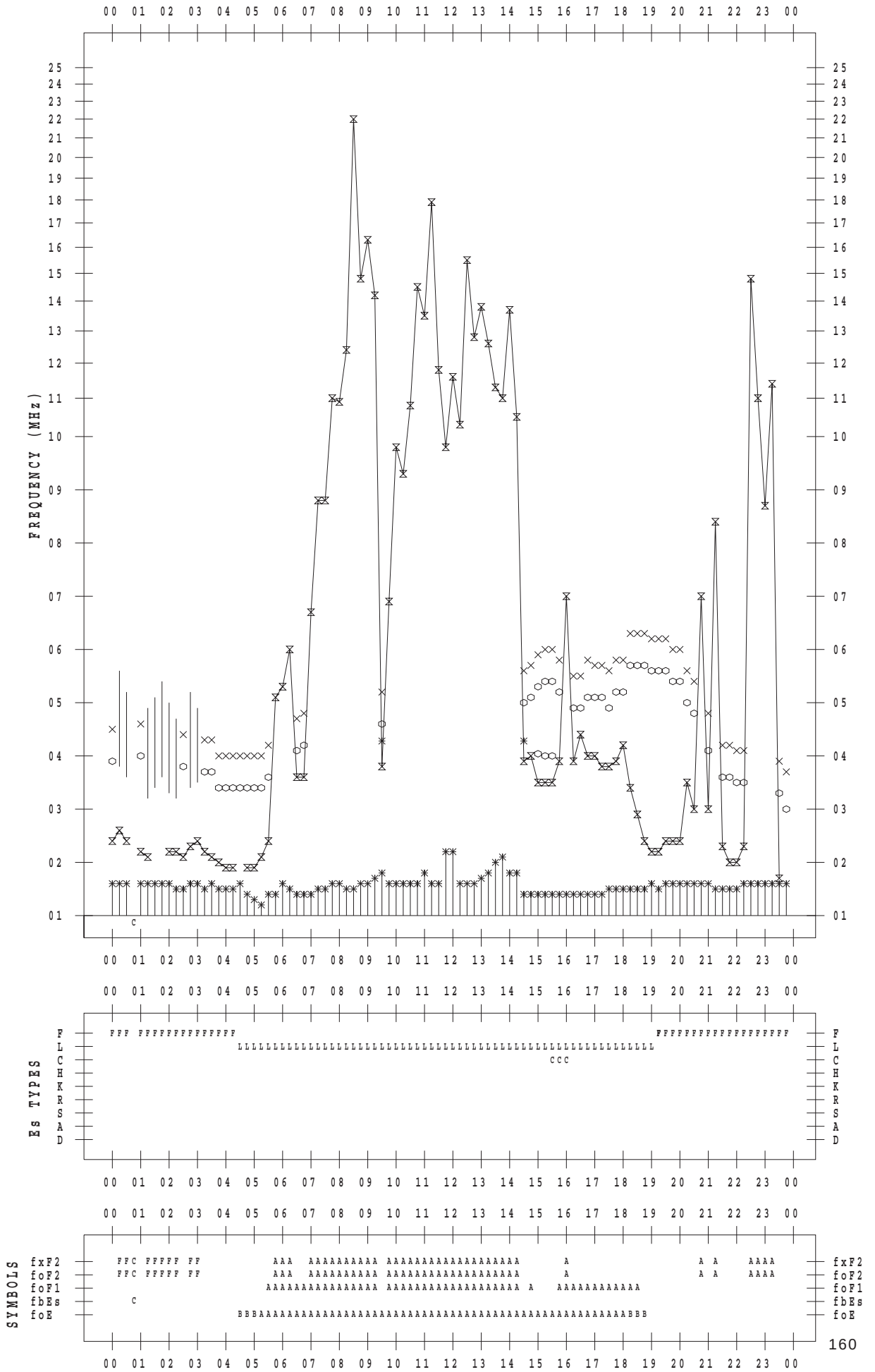
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/22

135 °E MEAN TIME



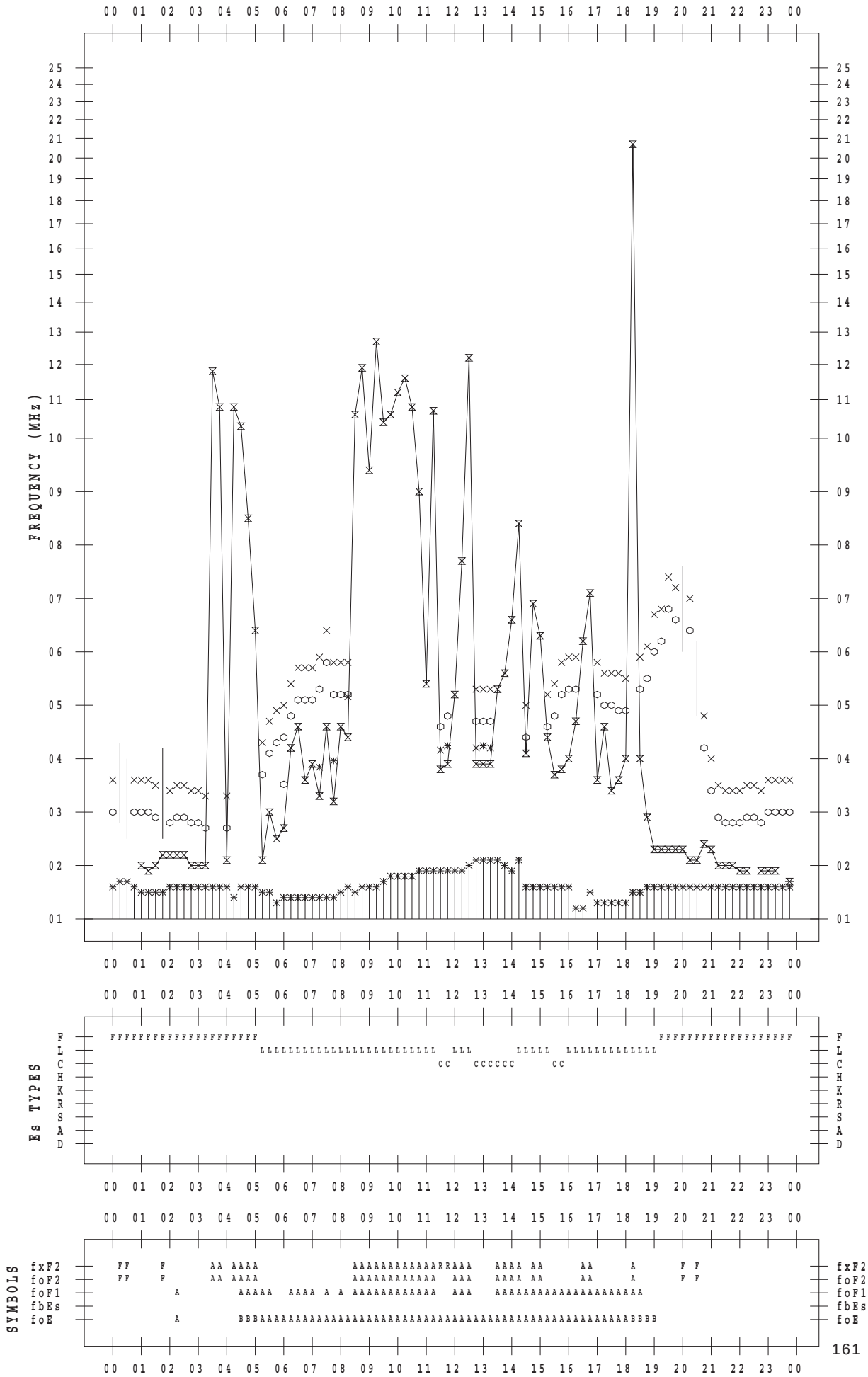
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/23

135 °E MEAN TIME



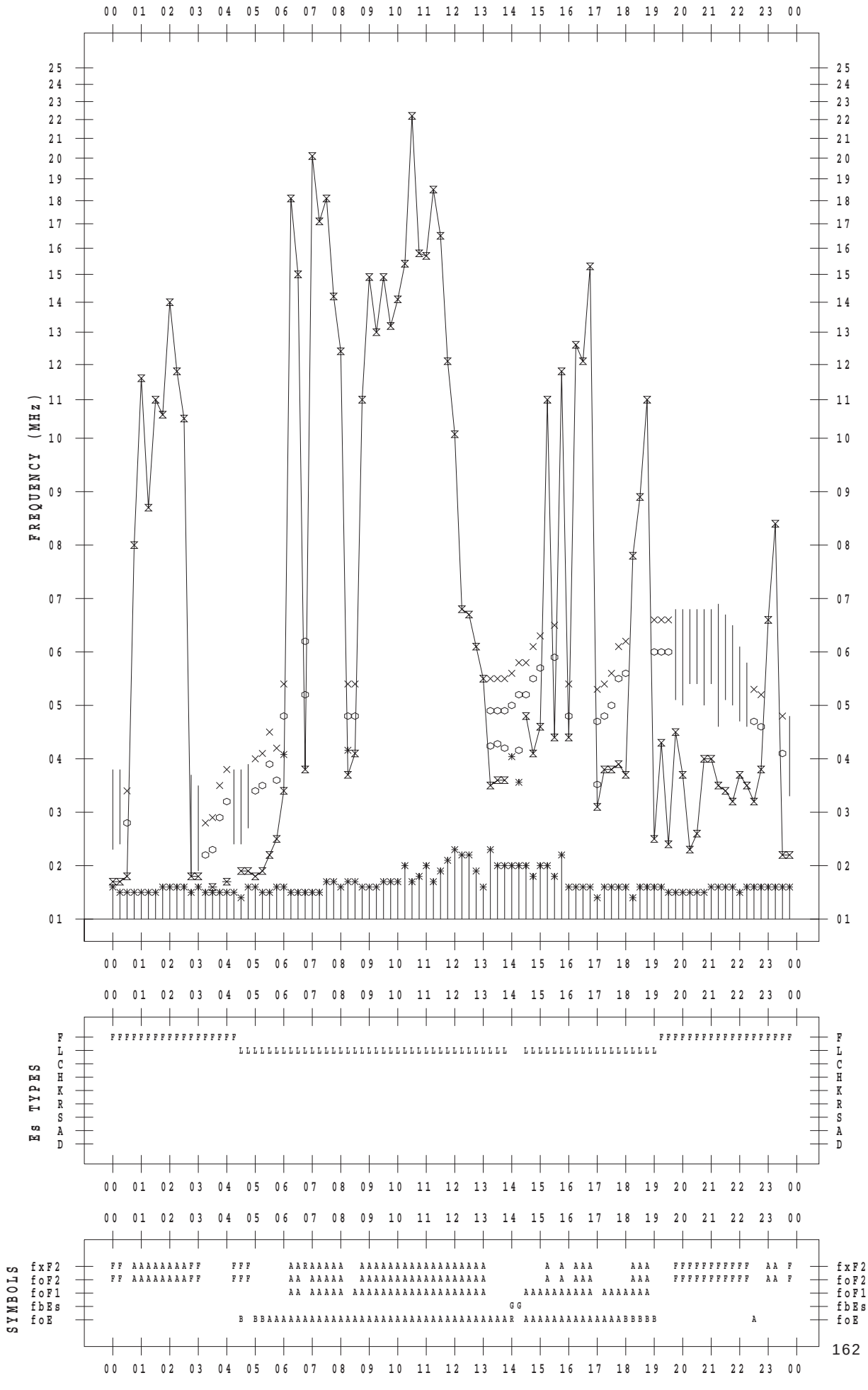
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/24

135 °E MEAN TIME



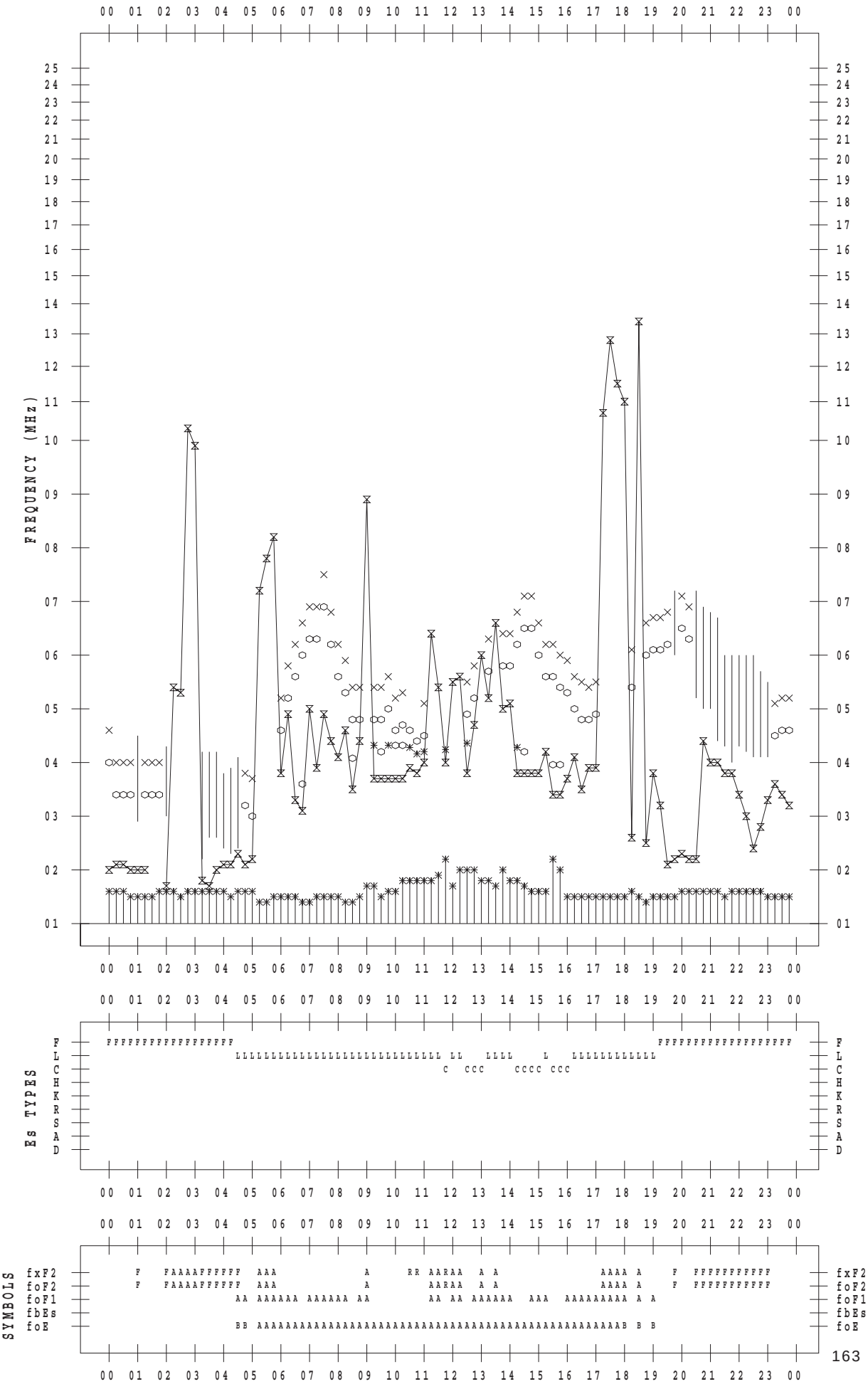
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/25

135 °E MEAN TIME



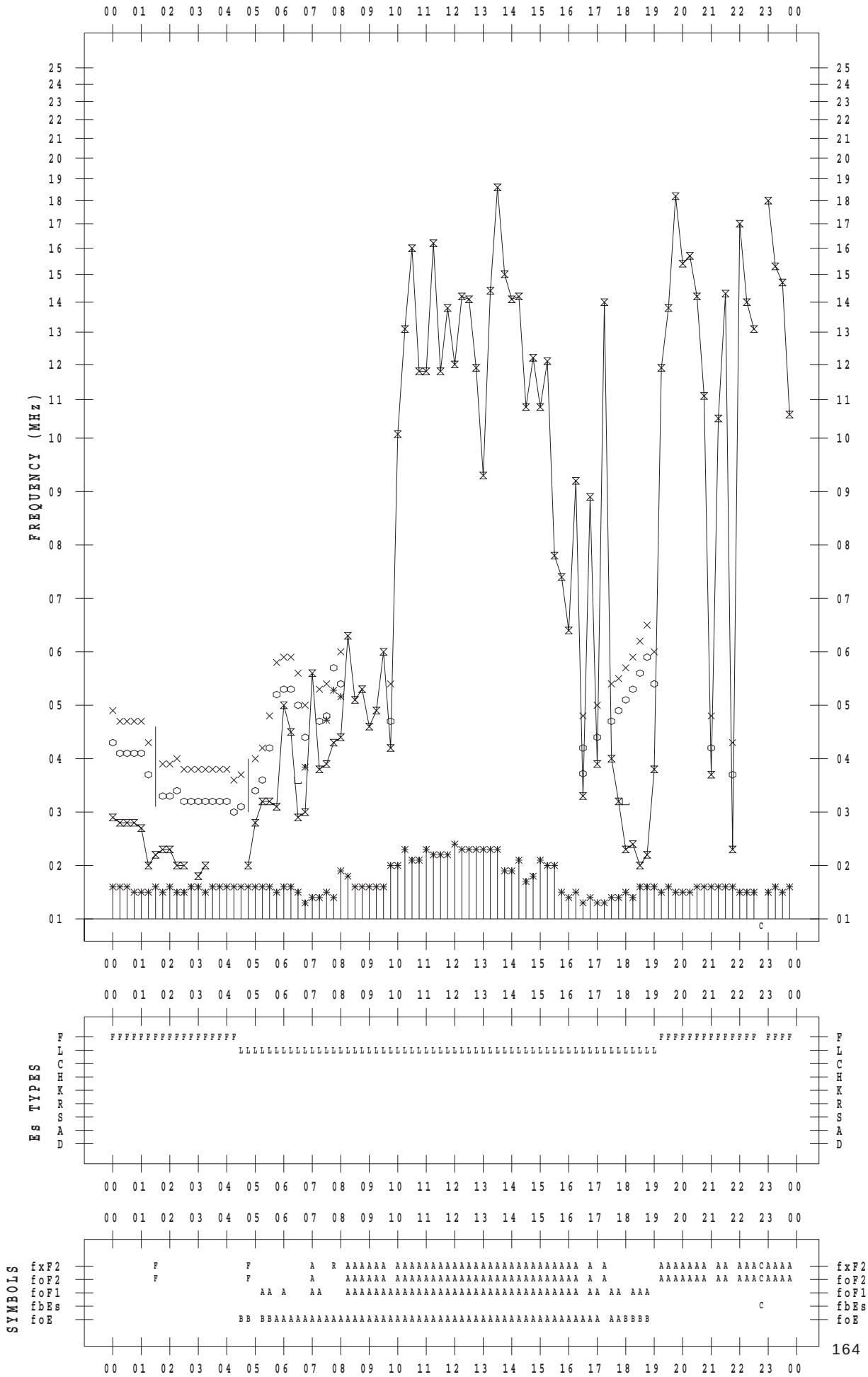
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/26

135 °E MEAN TIME



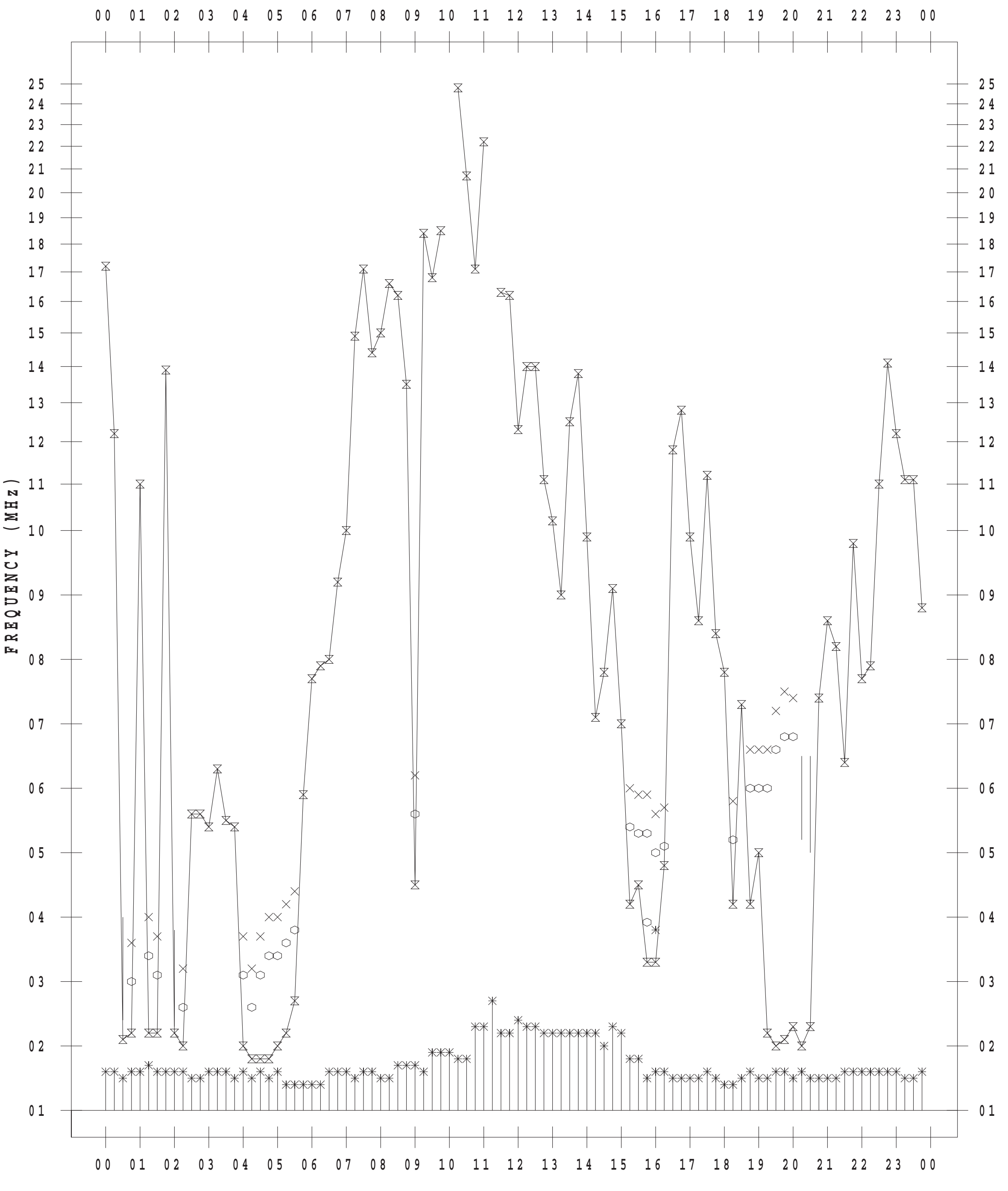
f-PLOT DATA

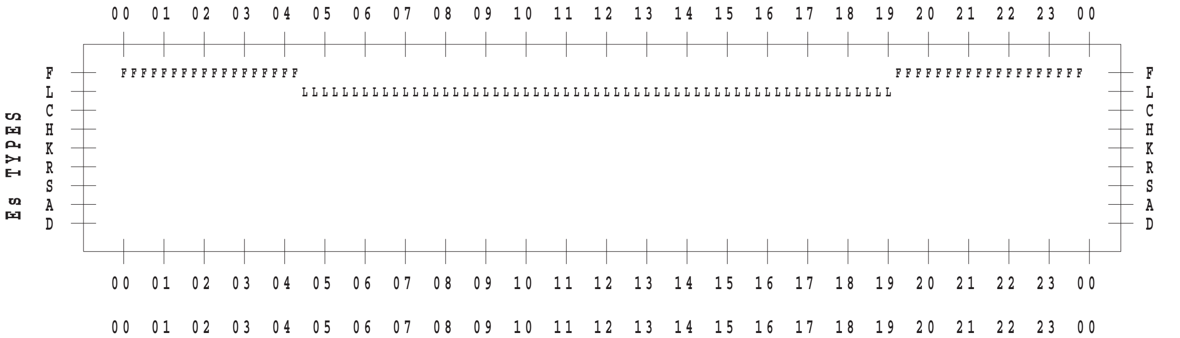
SCALER : I.NISHIMUTA

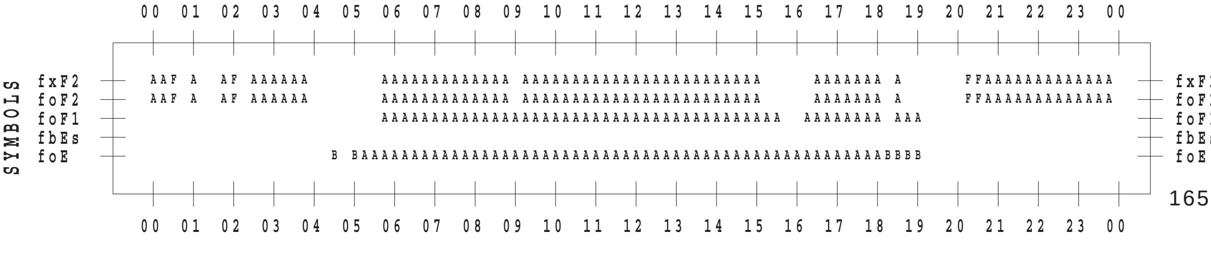
STATION : Kokubunji

DATE : 2018/ 7/27

135 °E MEAN TIME







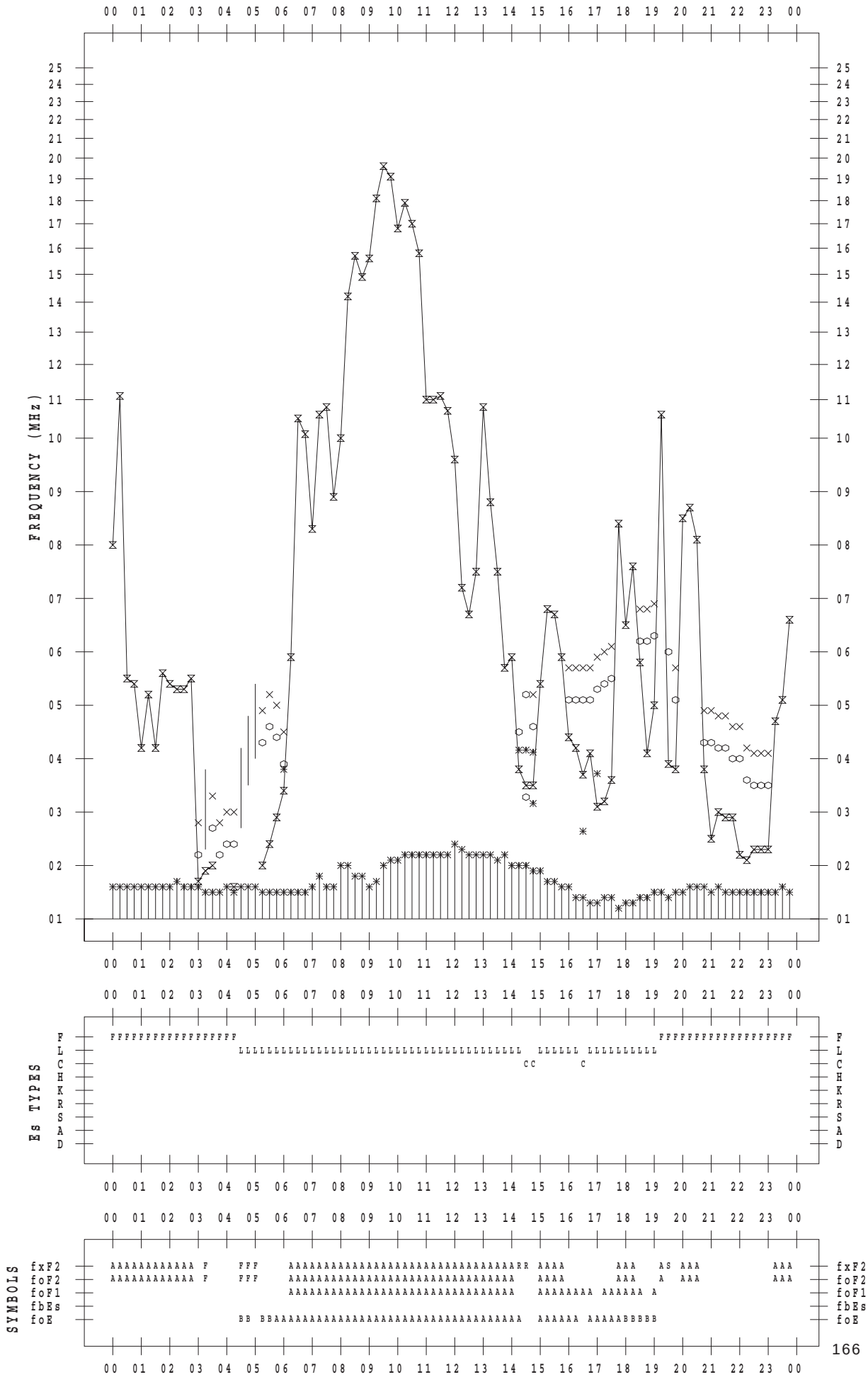
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/28

135 °E MEAN TIME



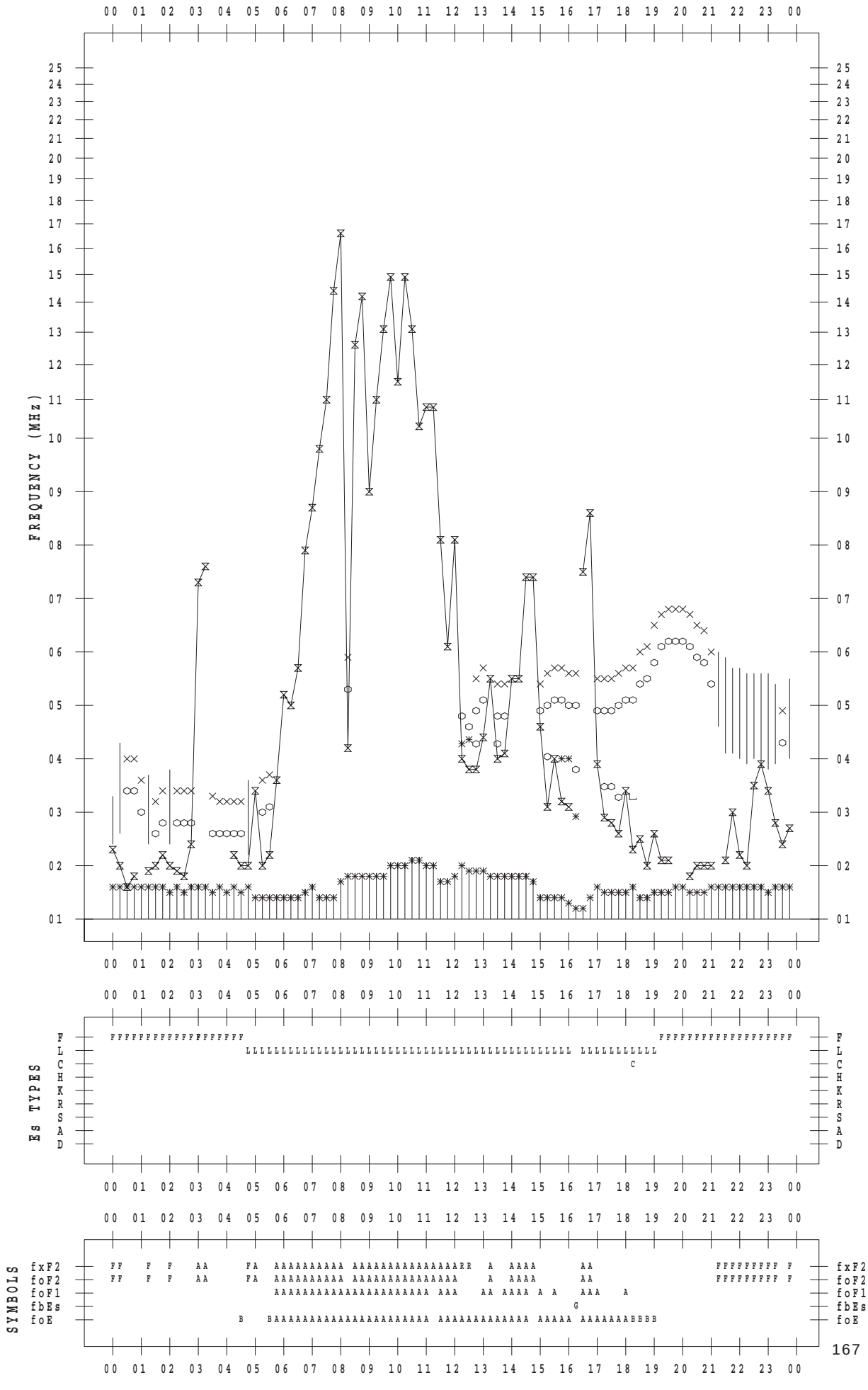
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/29

135 °E MEAN TIME



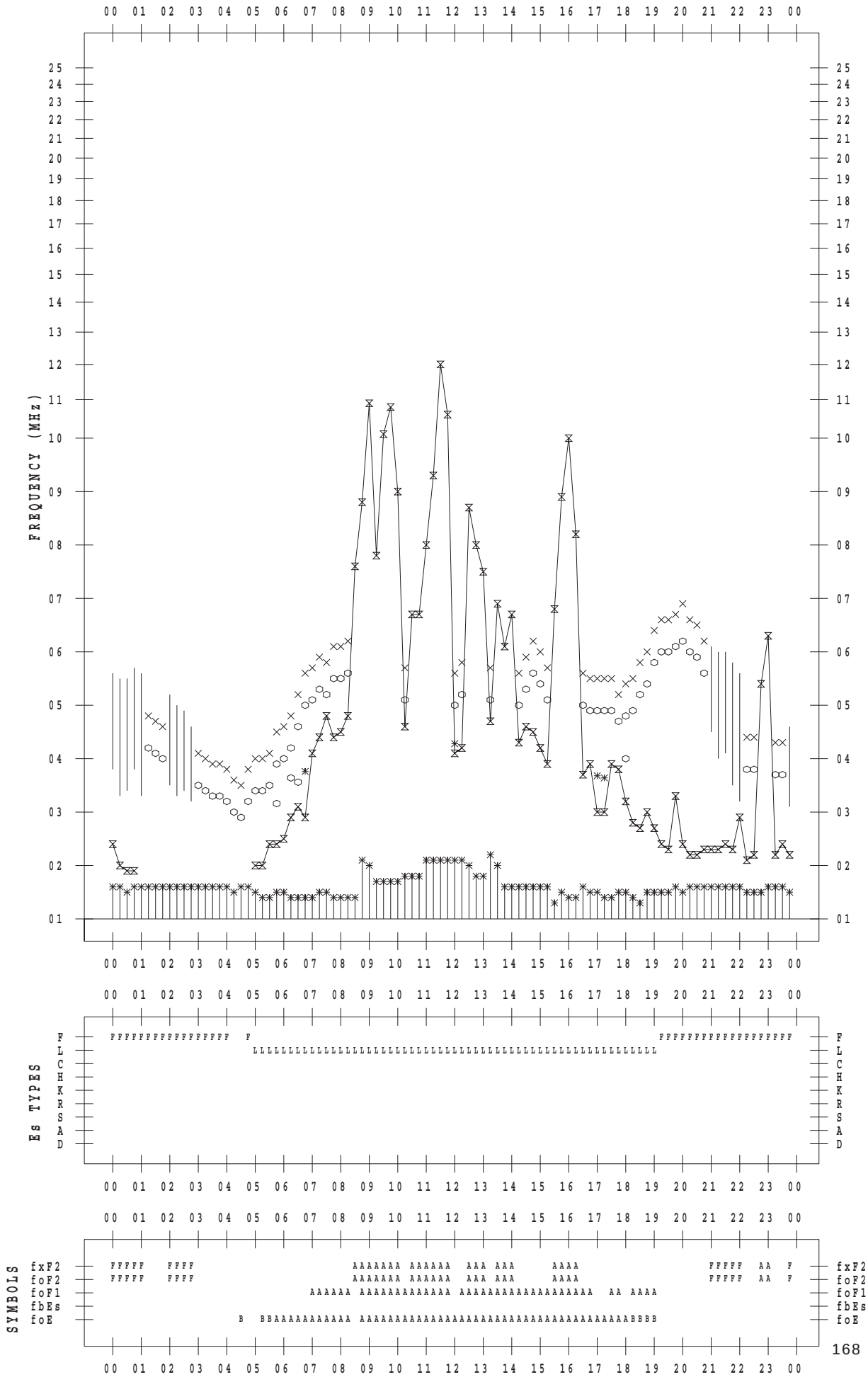
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/30

135 °E MEAN TIME



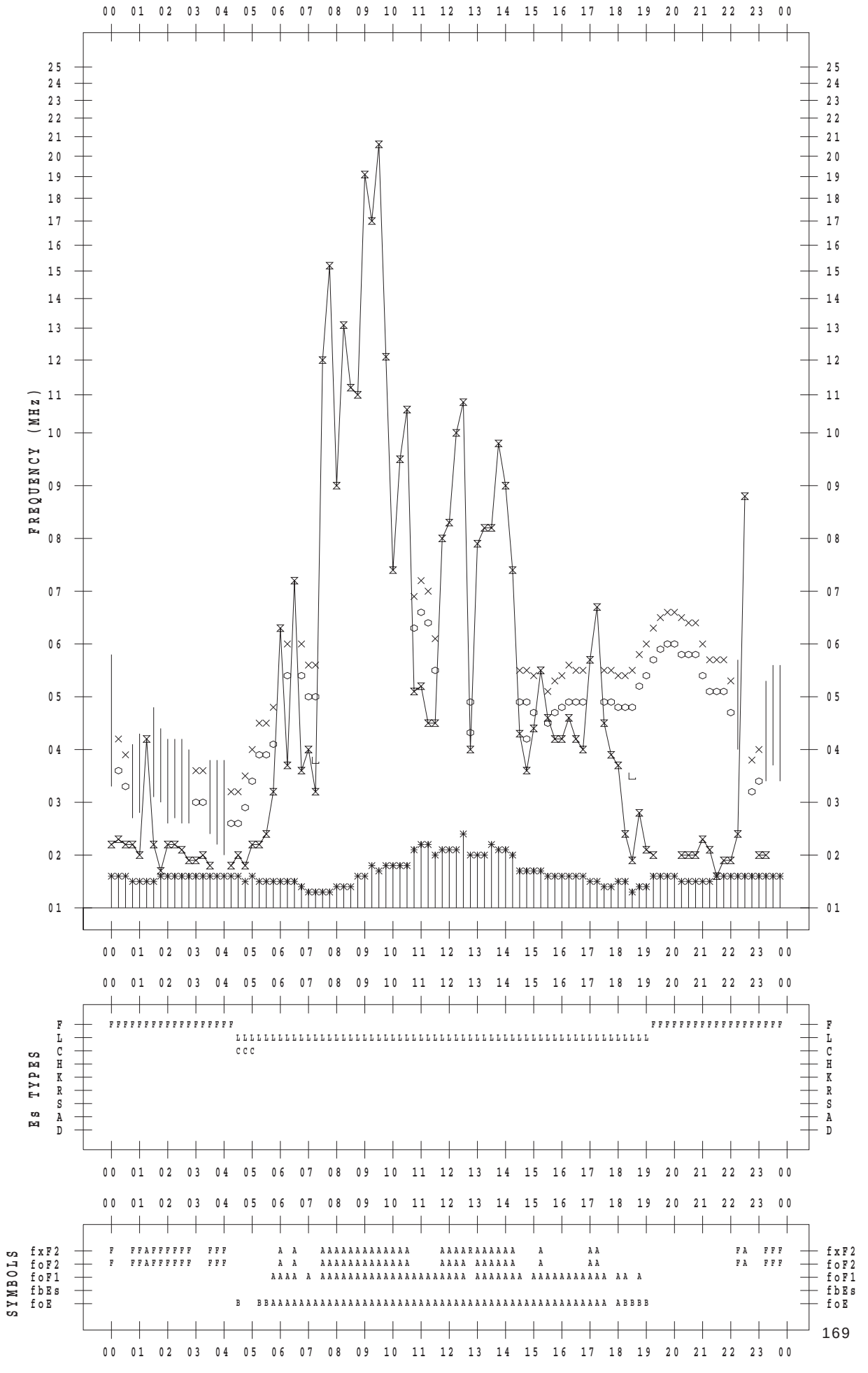
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/ 7/31

135 °E MEAN TIME



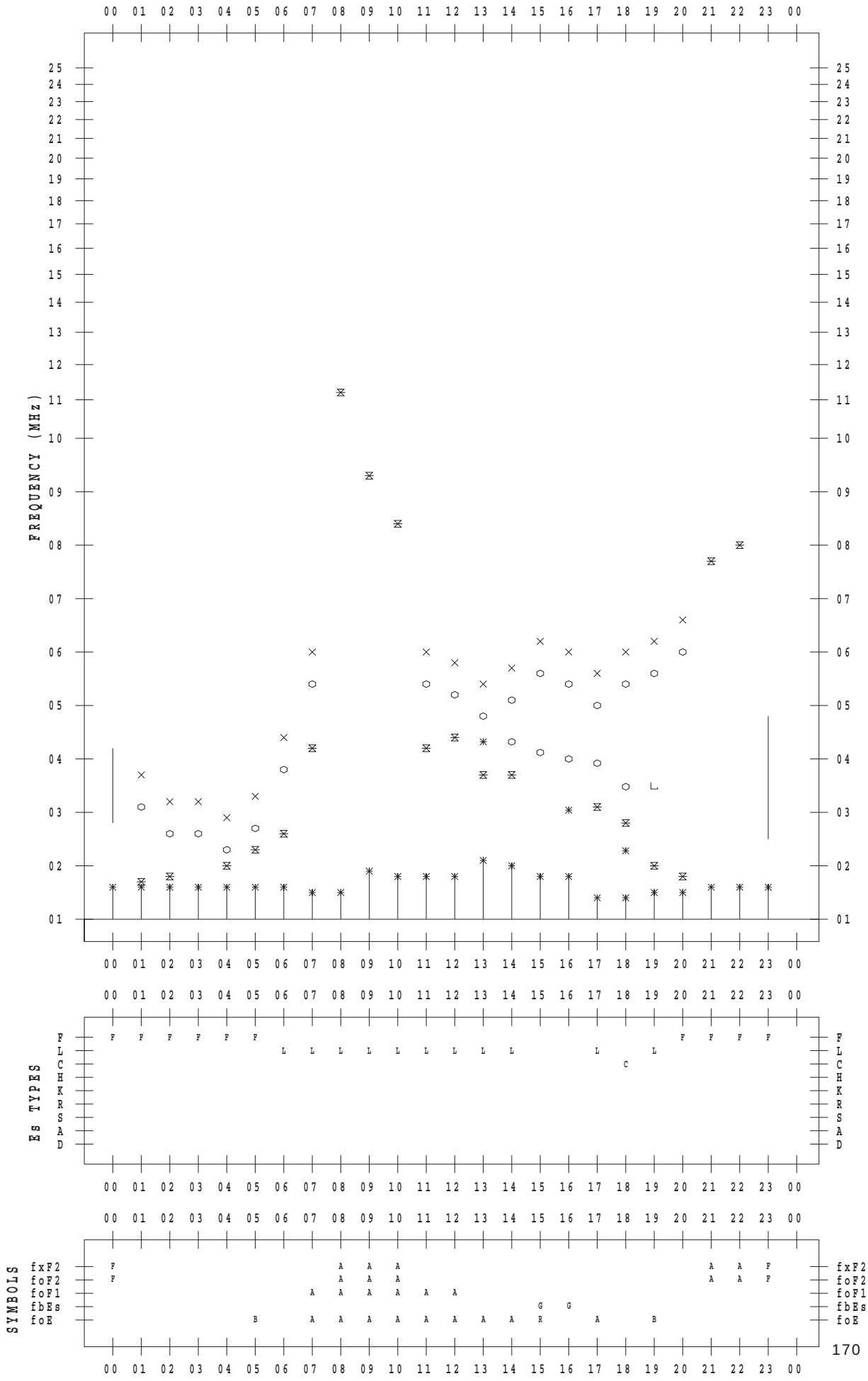
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 1

135 °E MEAN TIME



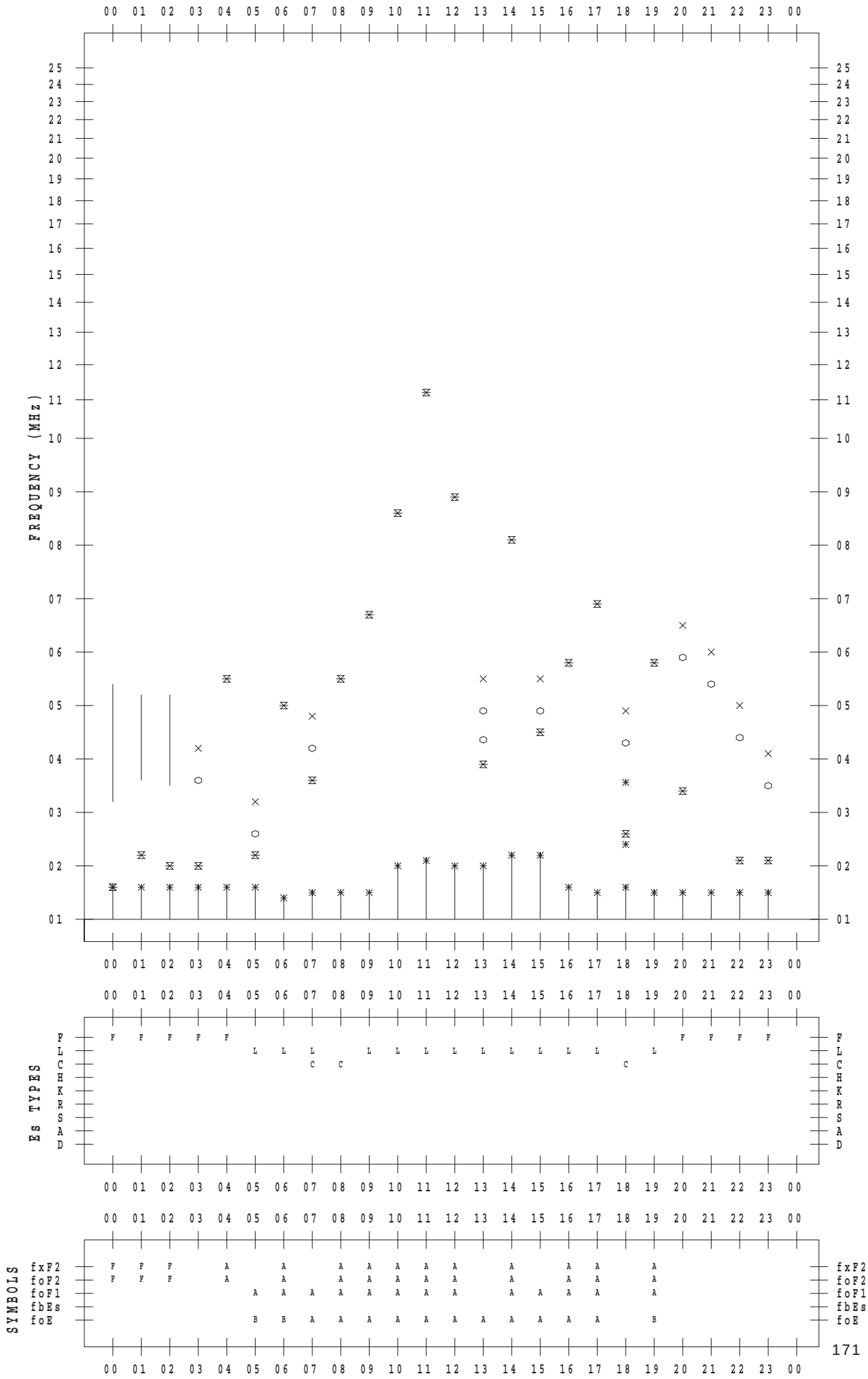
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 2

135 °E MEAN TIME



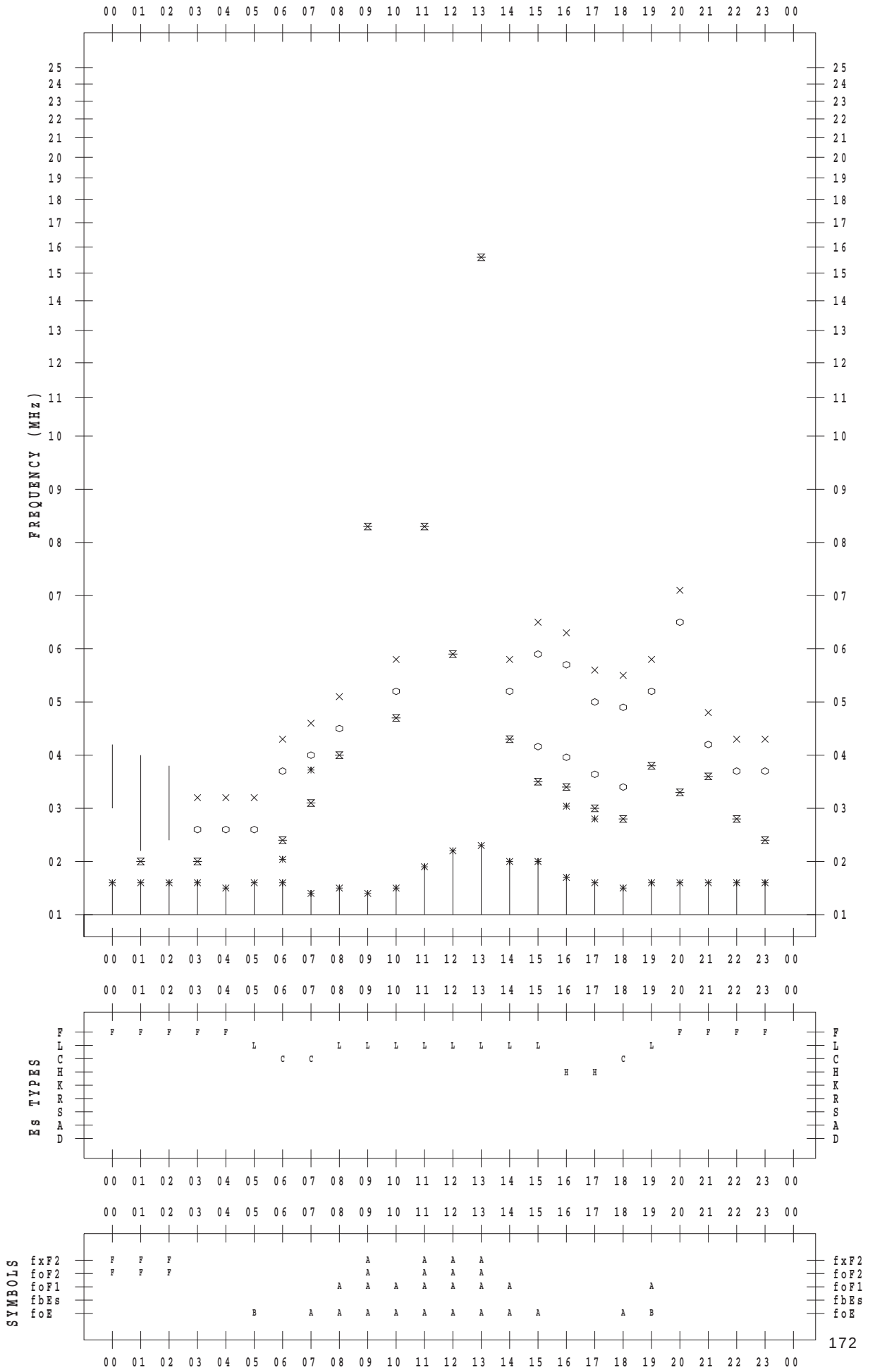
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 3

135 °E MEAN TIME



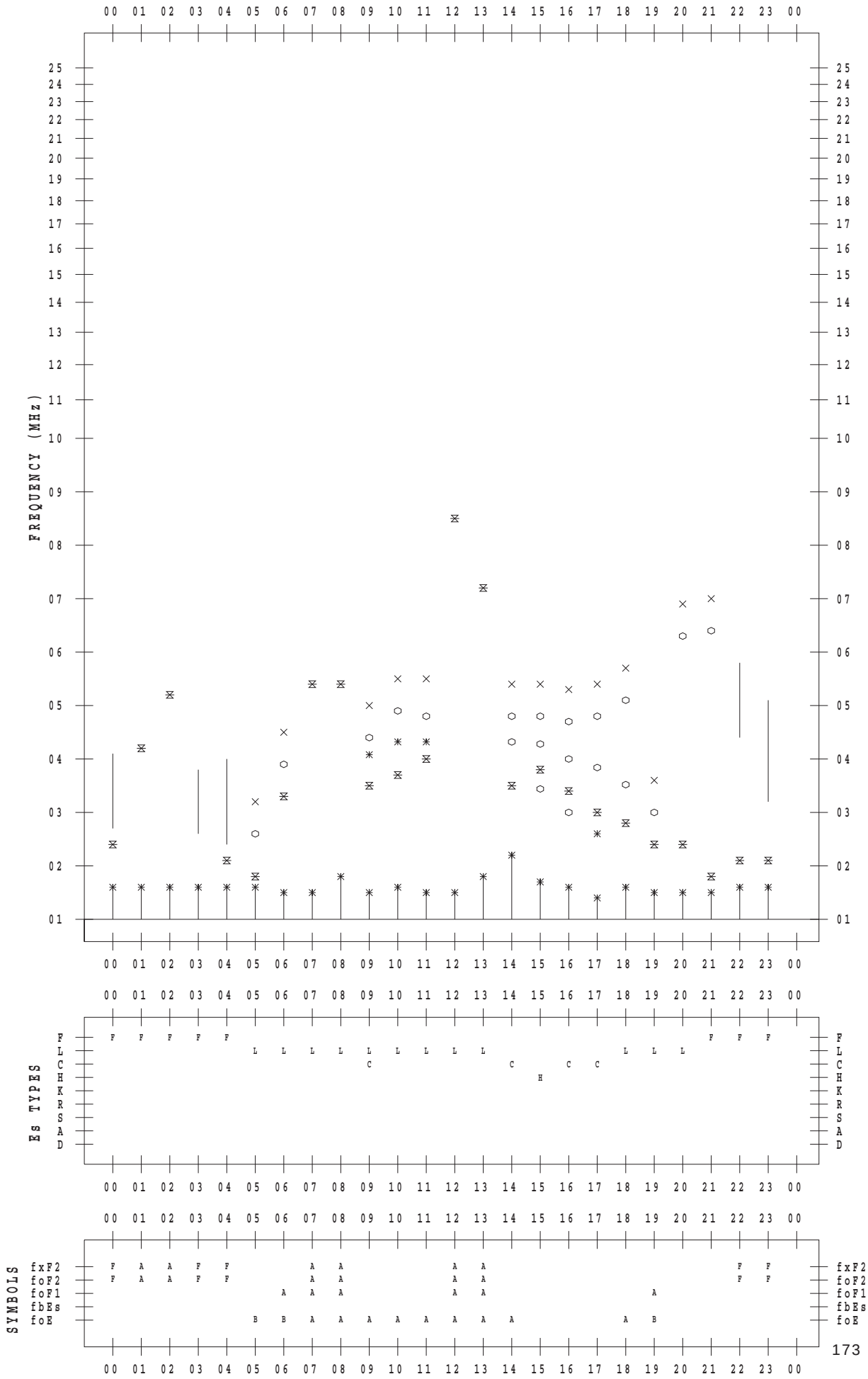
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 4

135 °E MEAN TIME



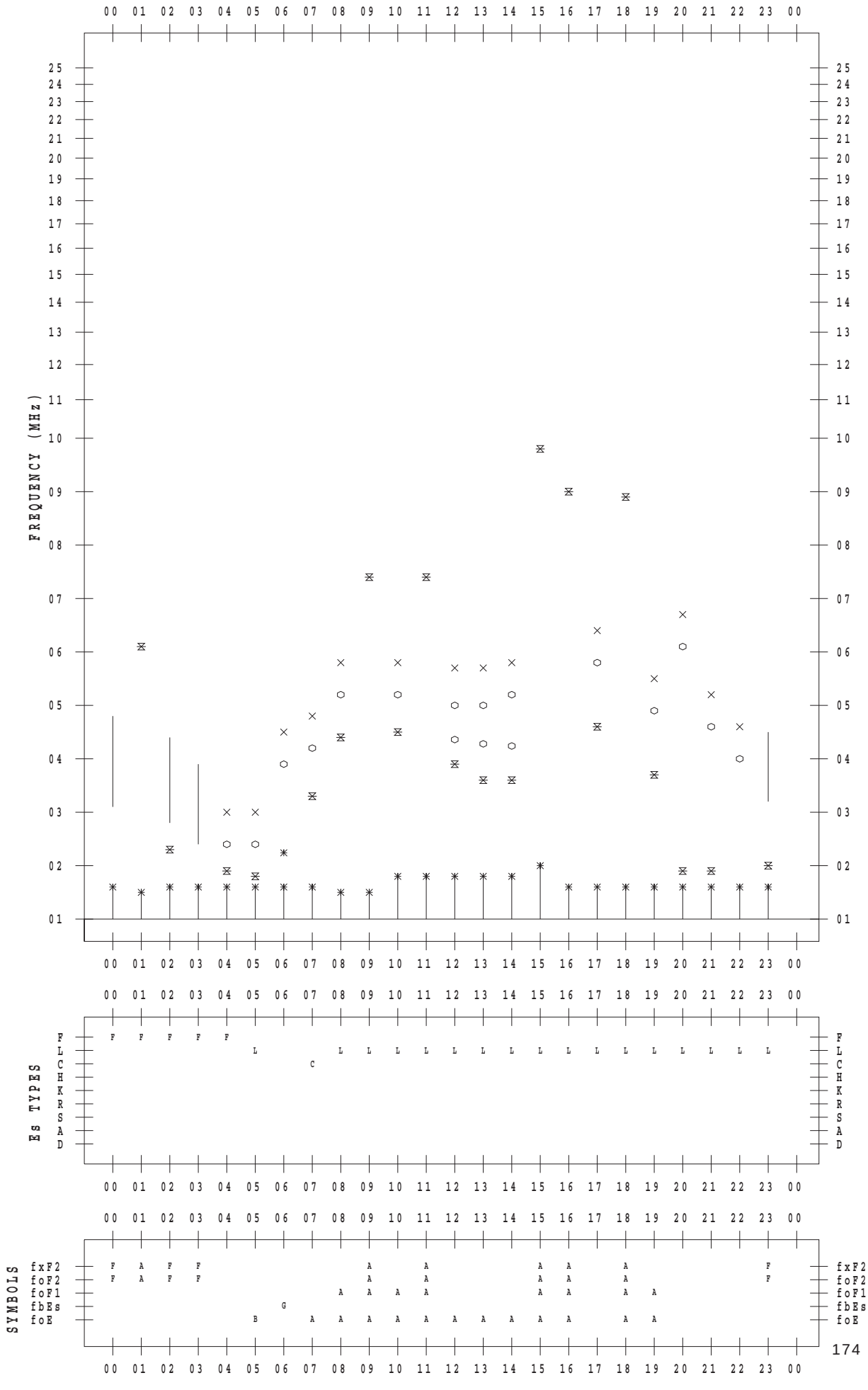
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 5

135 °E MEAN TIME



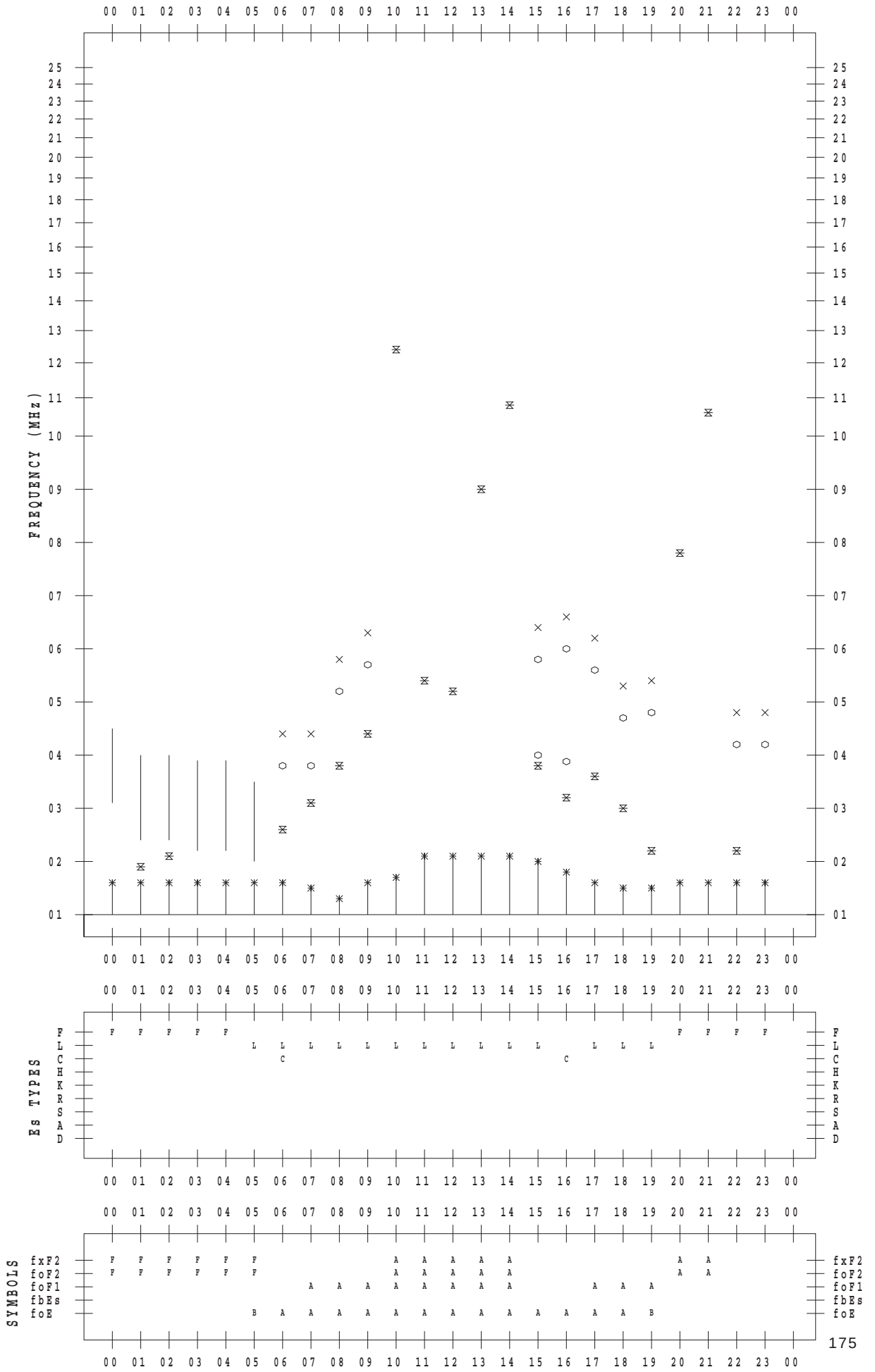
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 6

135 °E MEAN TIME



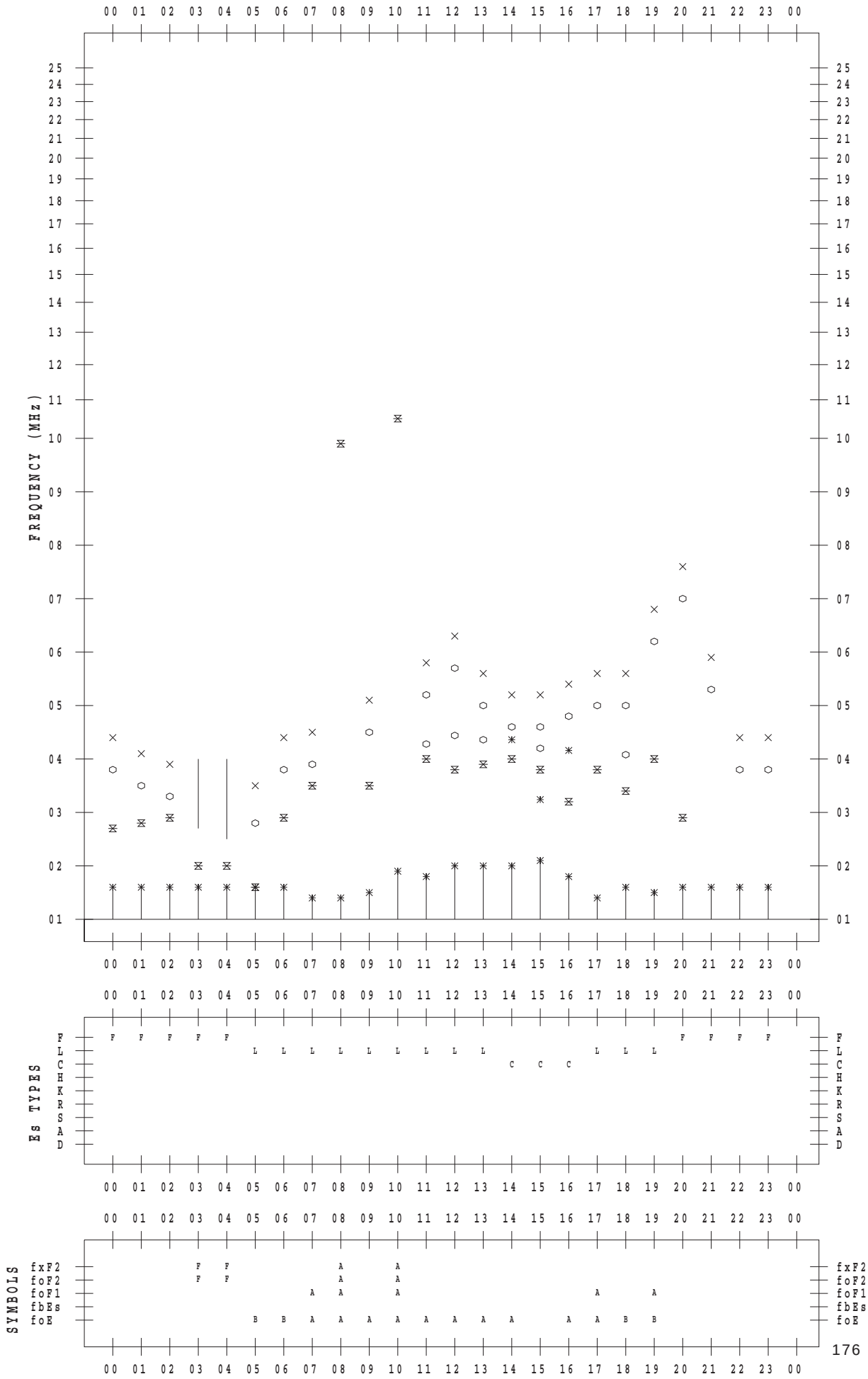
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 7

135 °E MEAN TIME



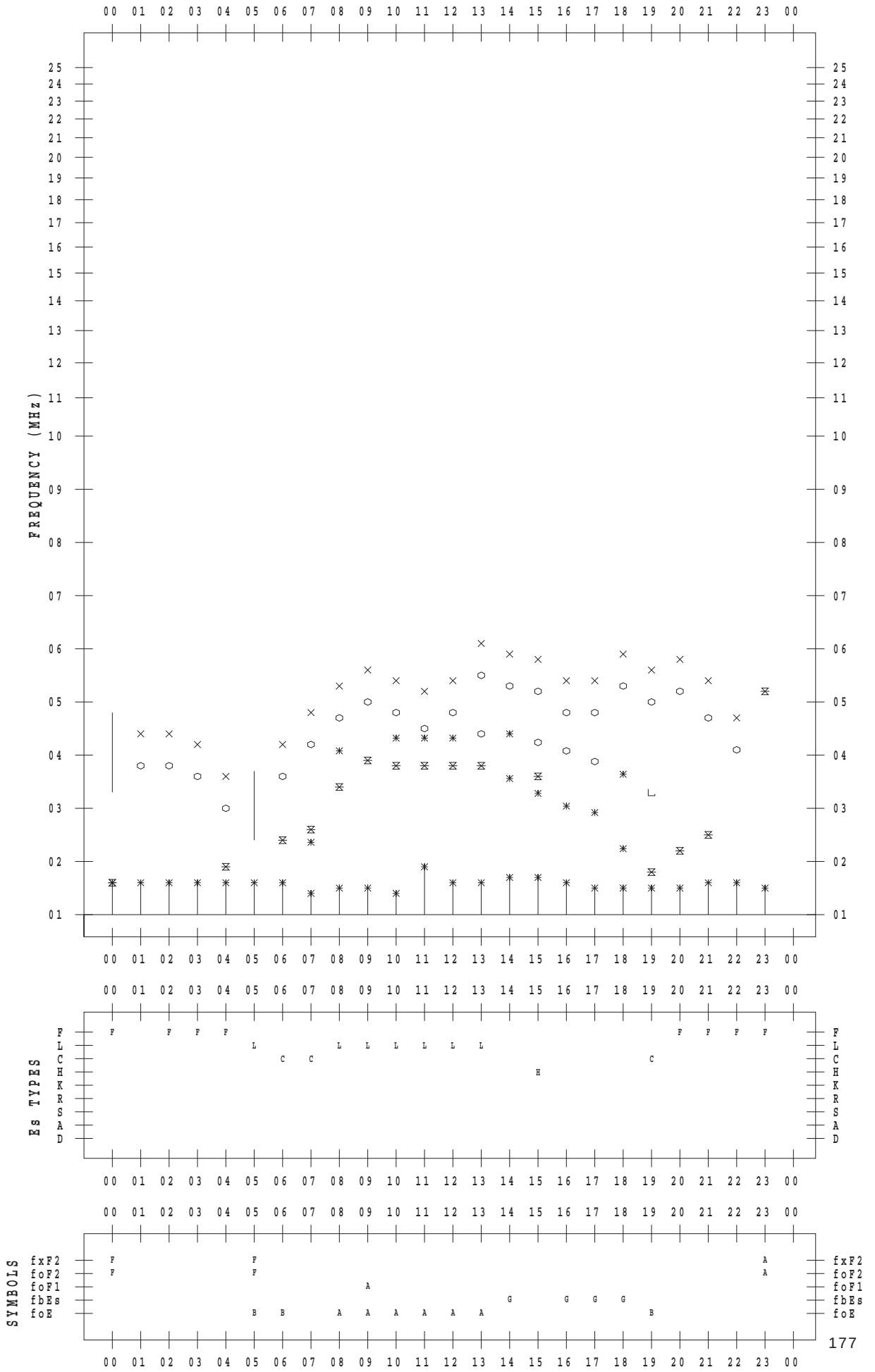
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 8

135 °E MEAN TIME



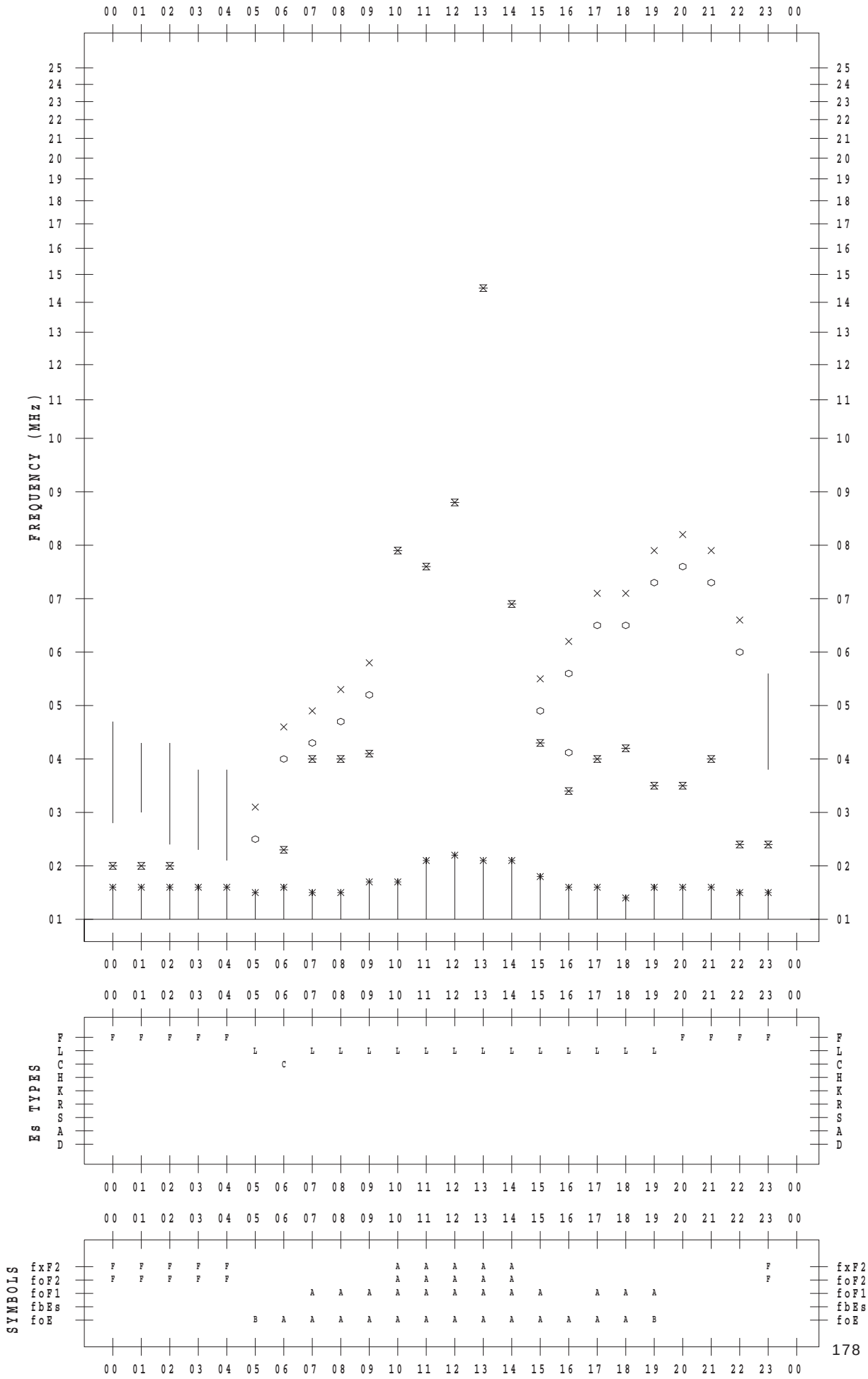
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/ 9

135 °E MEAN TIME



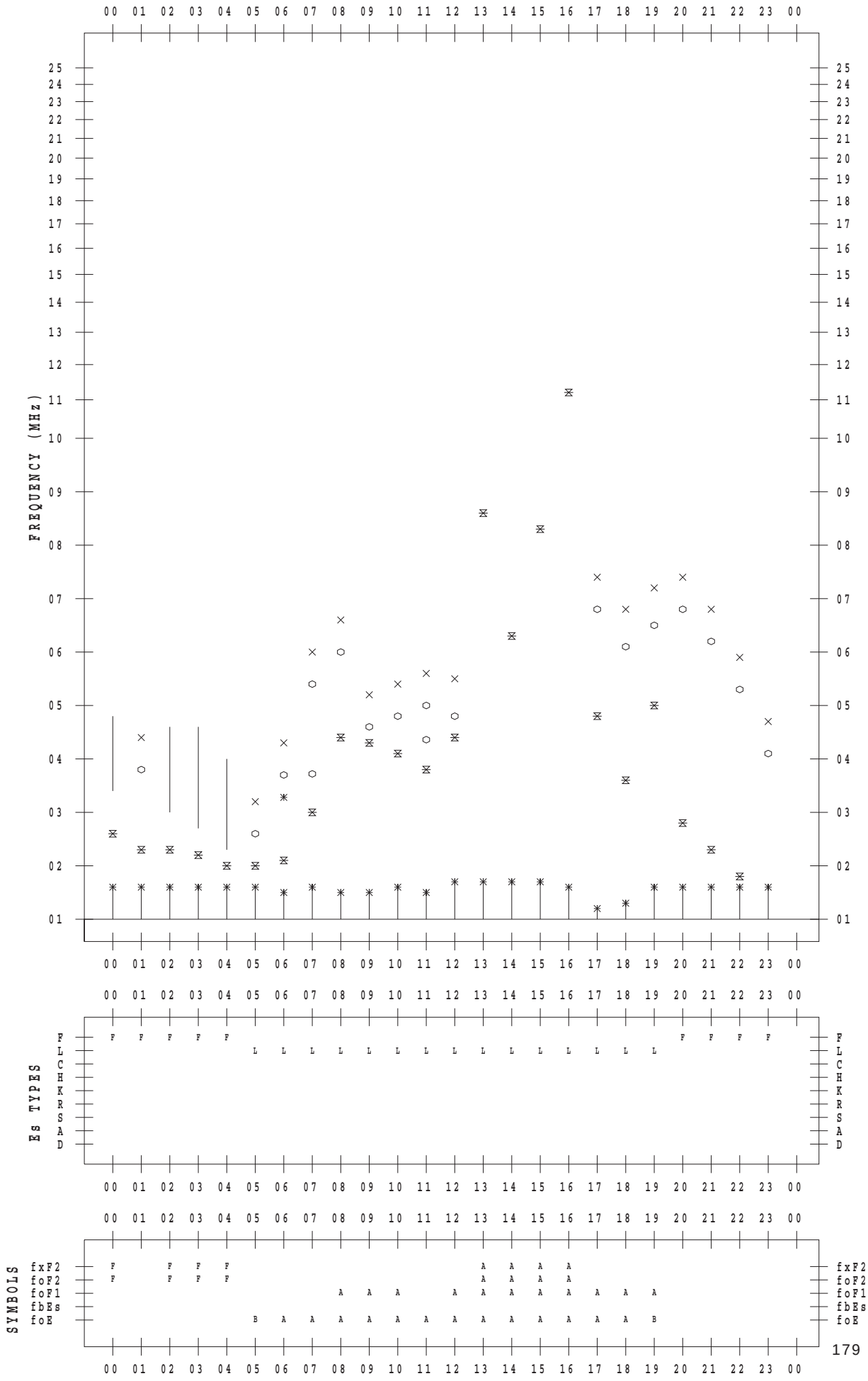
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/10

135 °E MEAN TIME



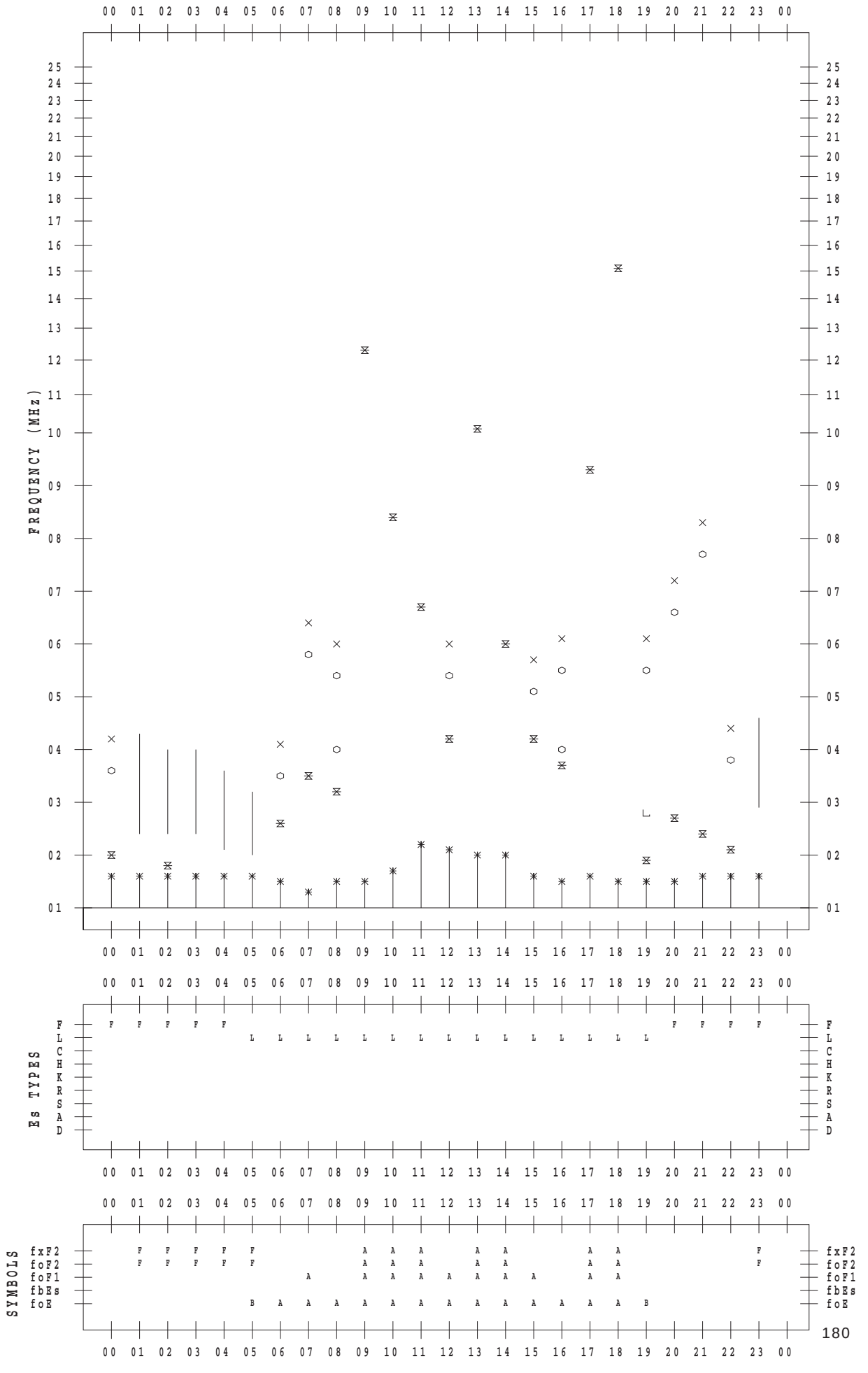
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/11

135 °E MEAN TIME



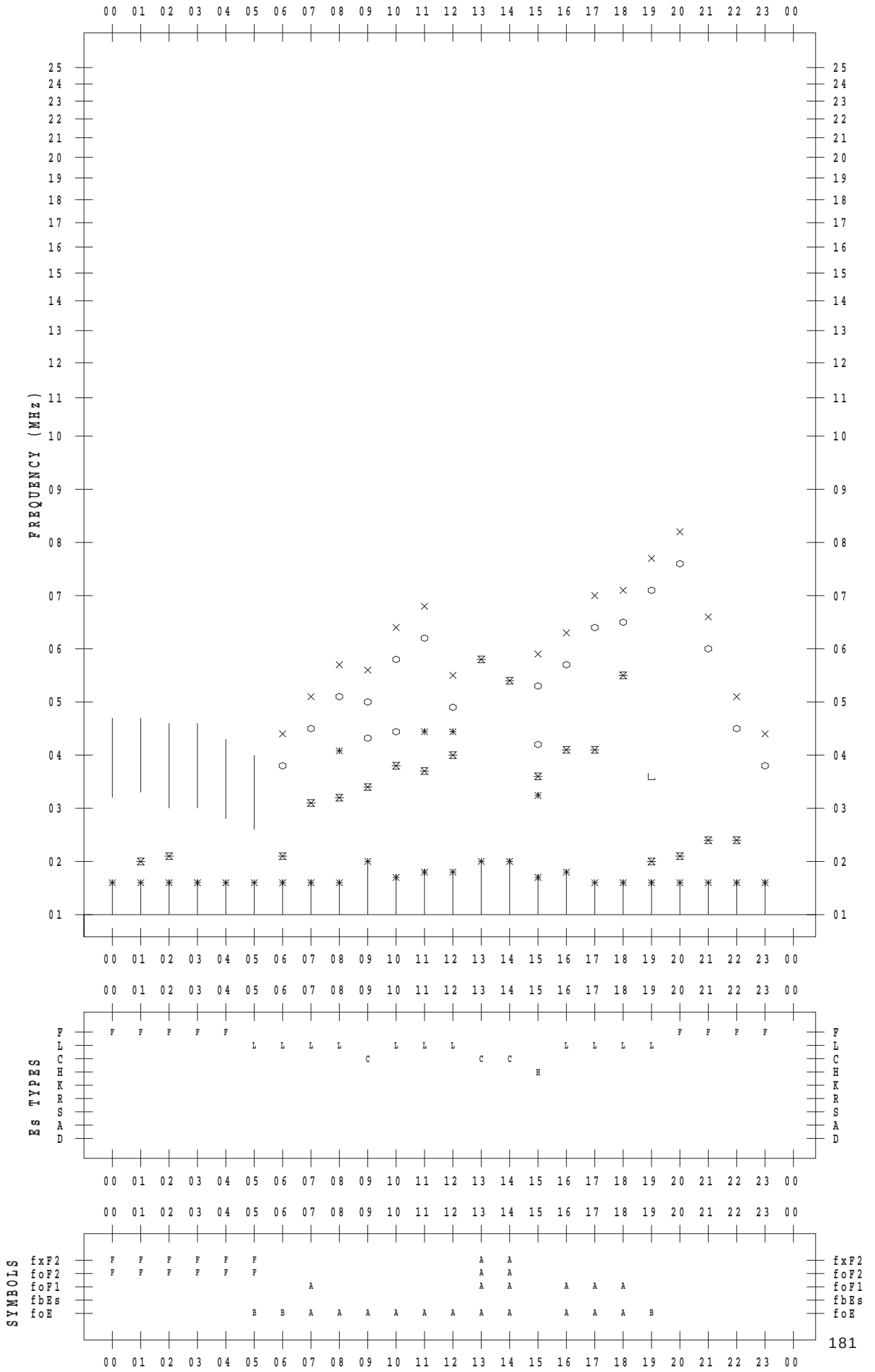
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/12

135 °E MEAN TIME



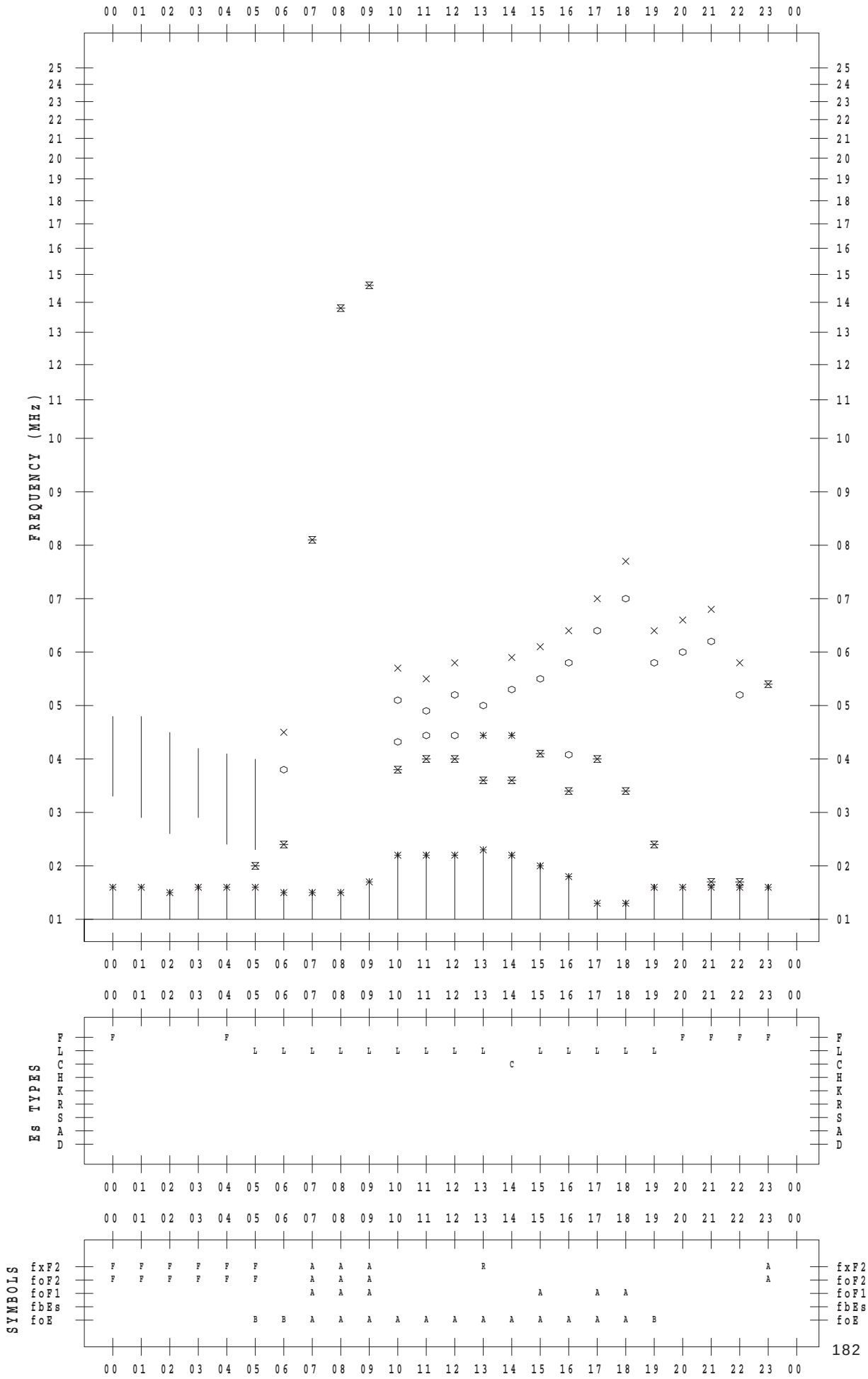
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/13

135 °E MEAN TIME



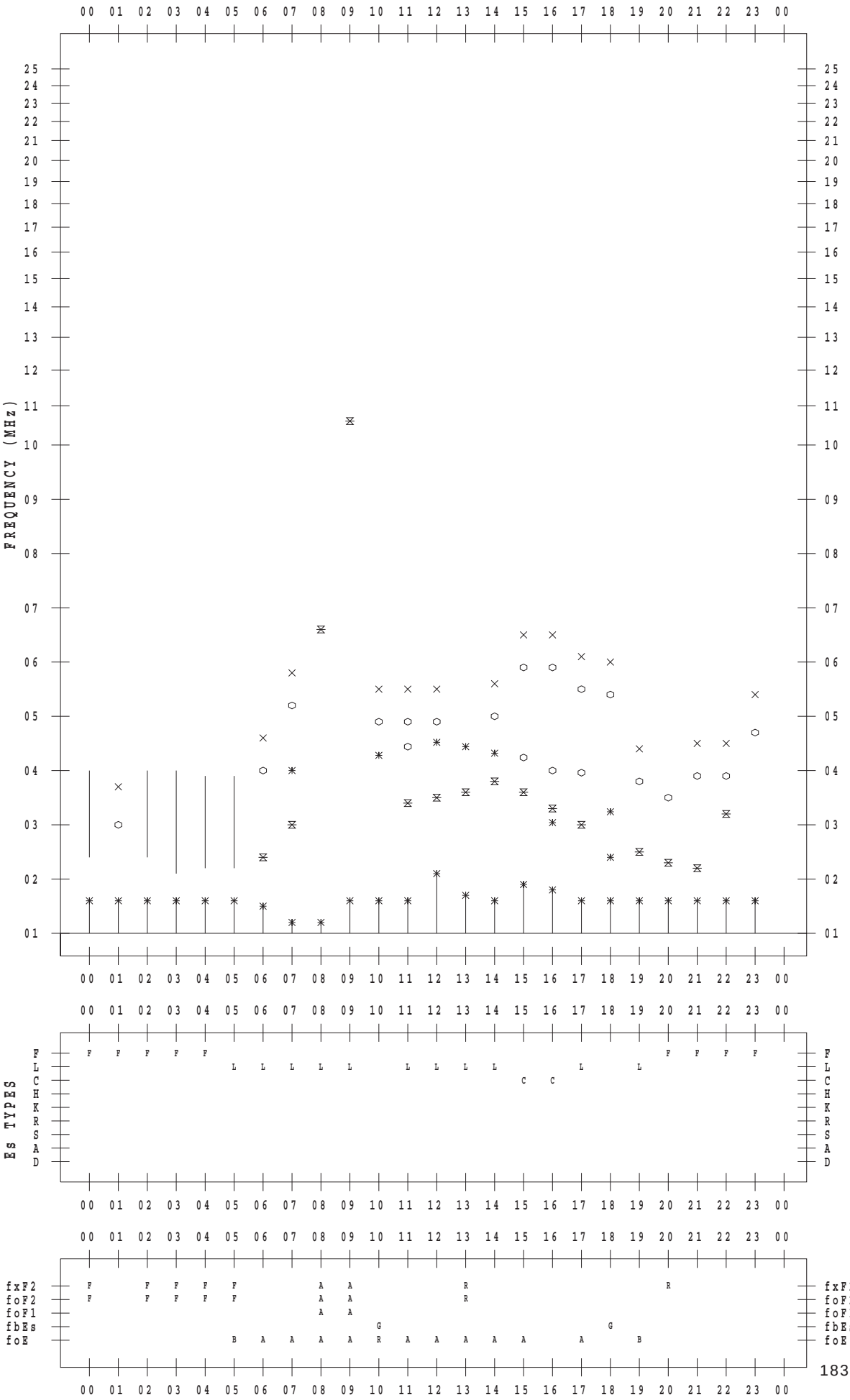
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/14

135 °E MEAN TIME



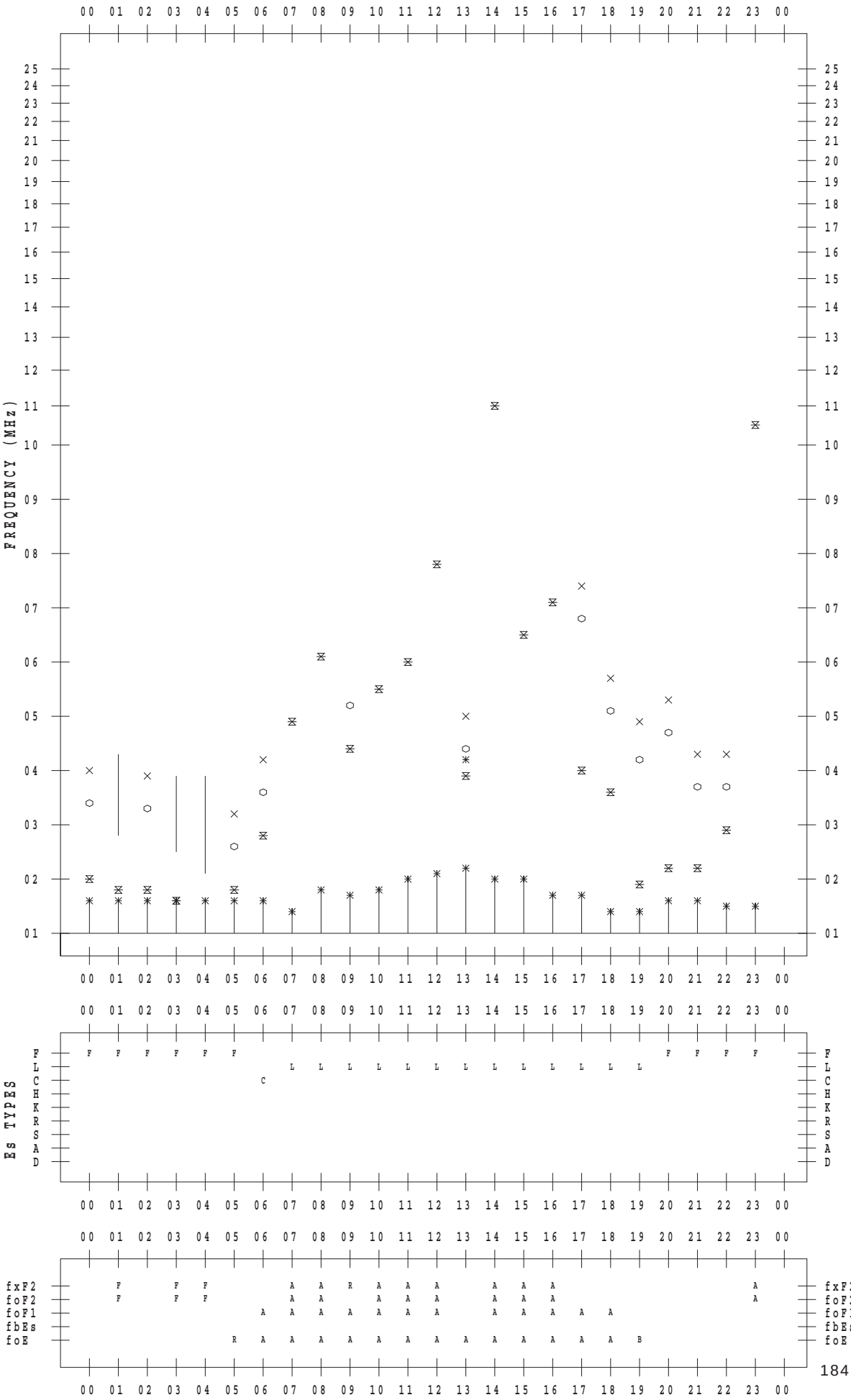
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/15

135 °E MEAN TIME



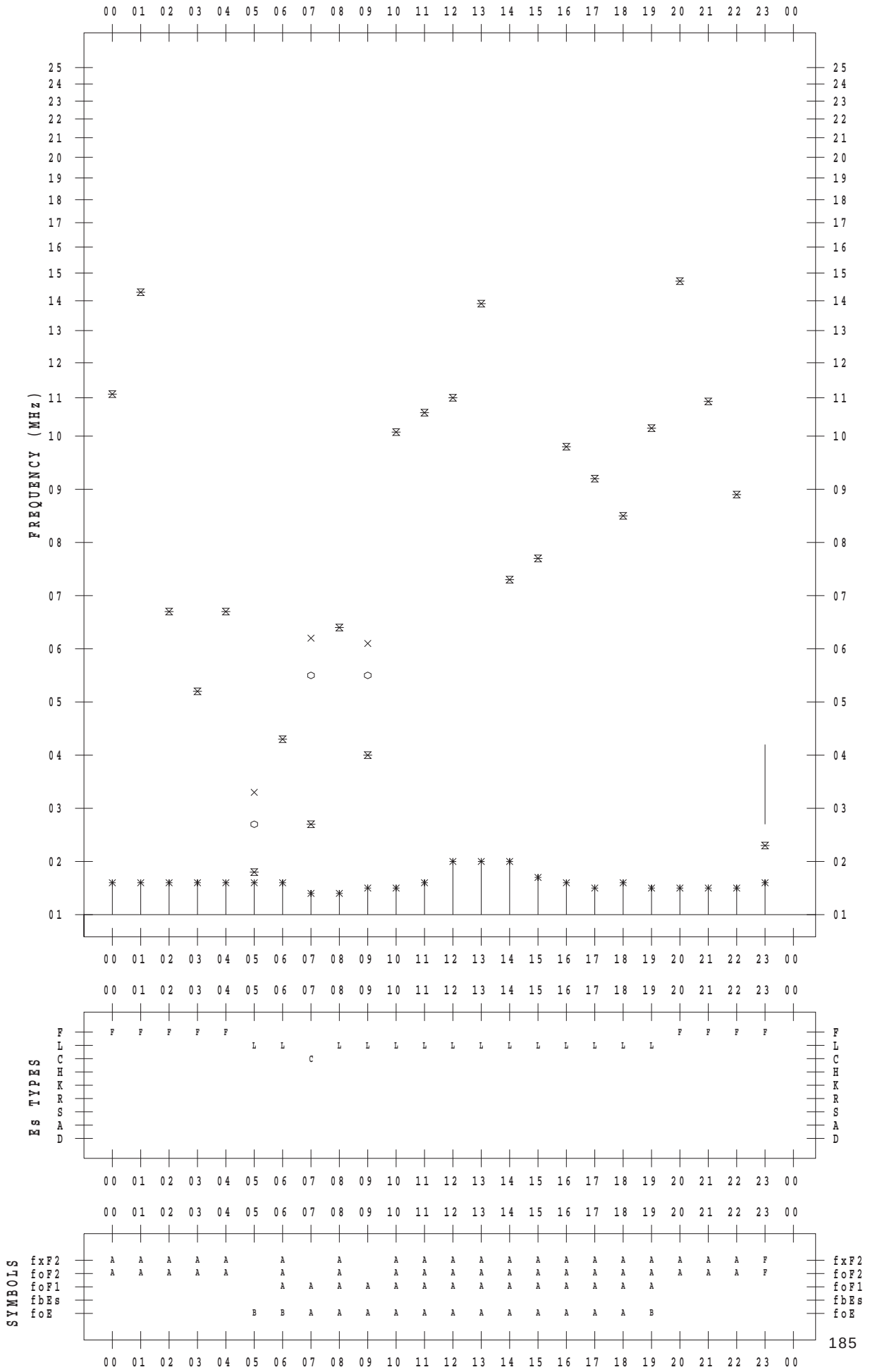
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/16

135 °E MEAN TIME



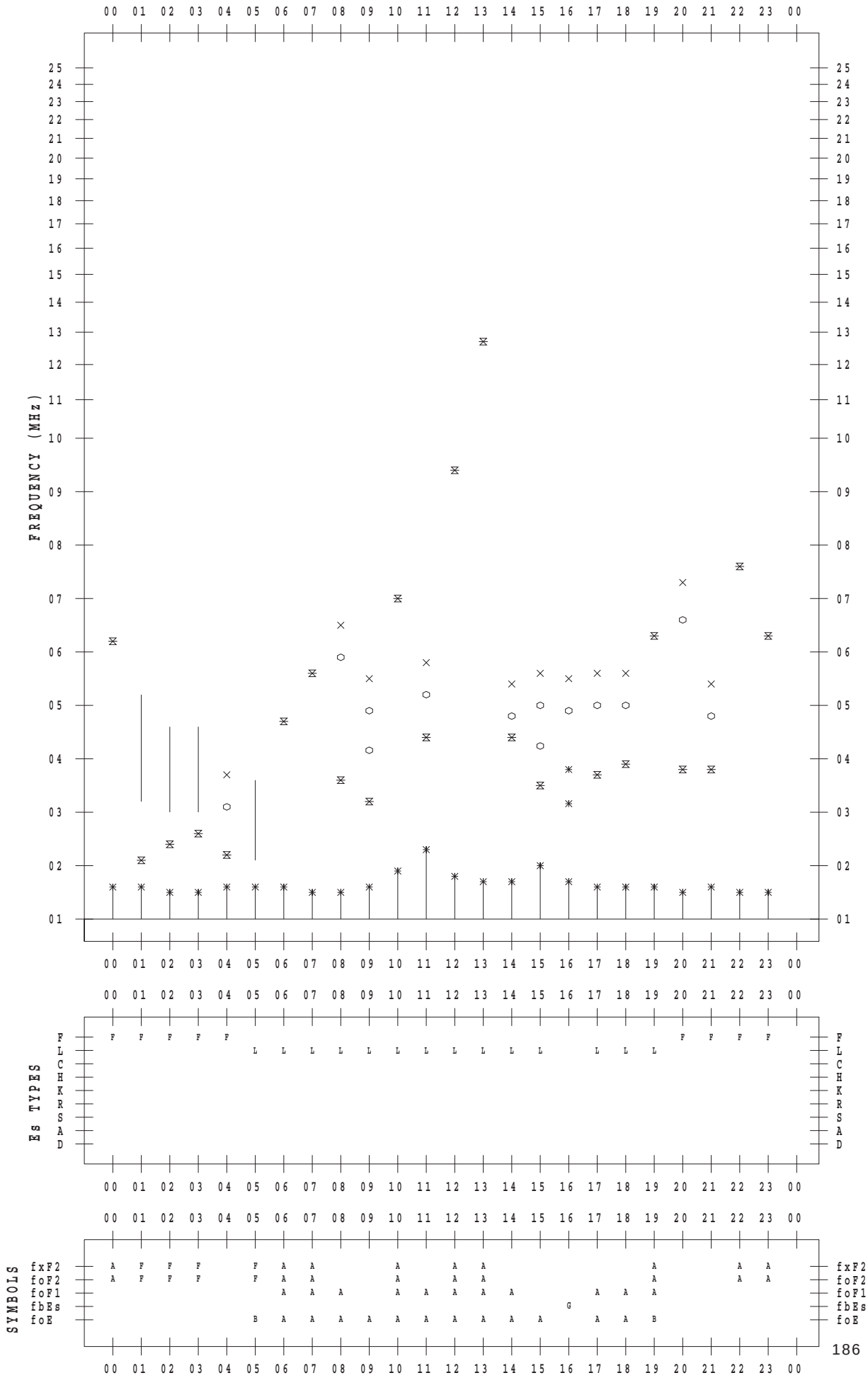
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/17

135 °E MEAN TIME



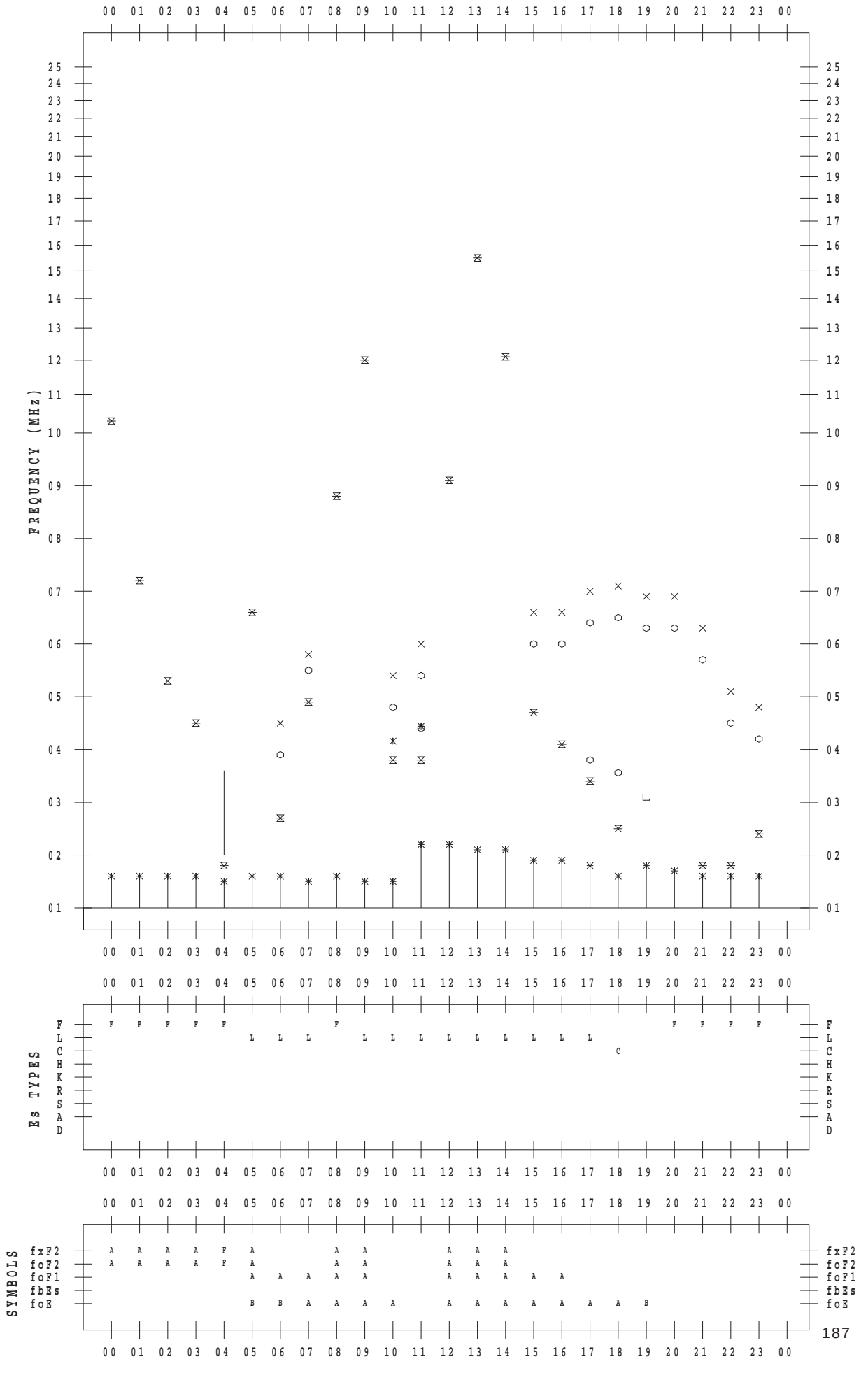
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/18

135 °E MEAN TIME



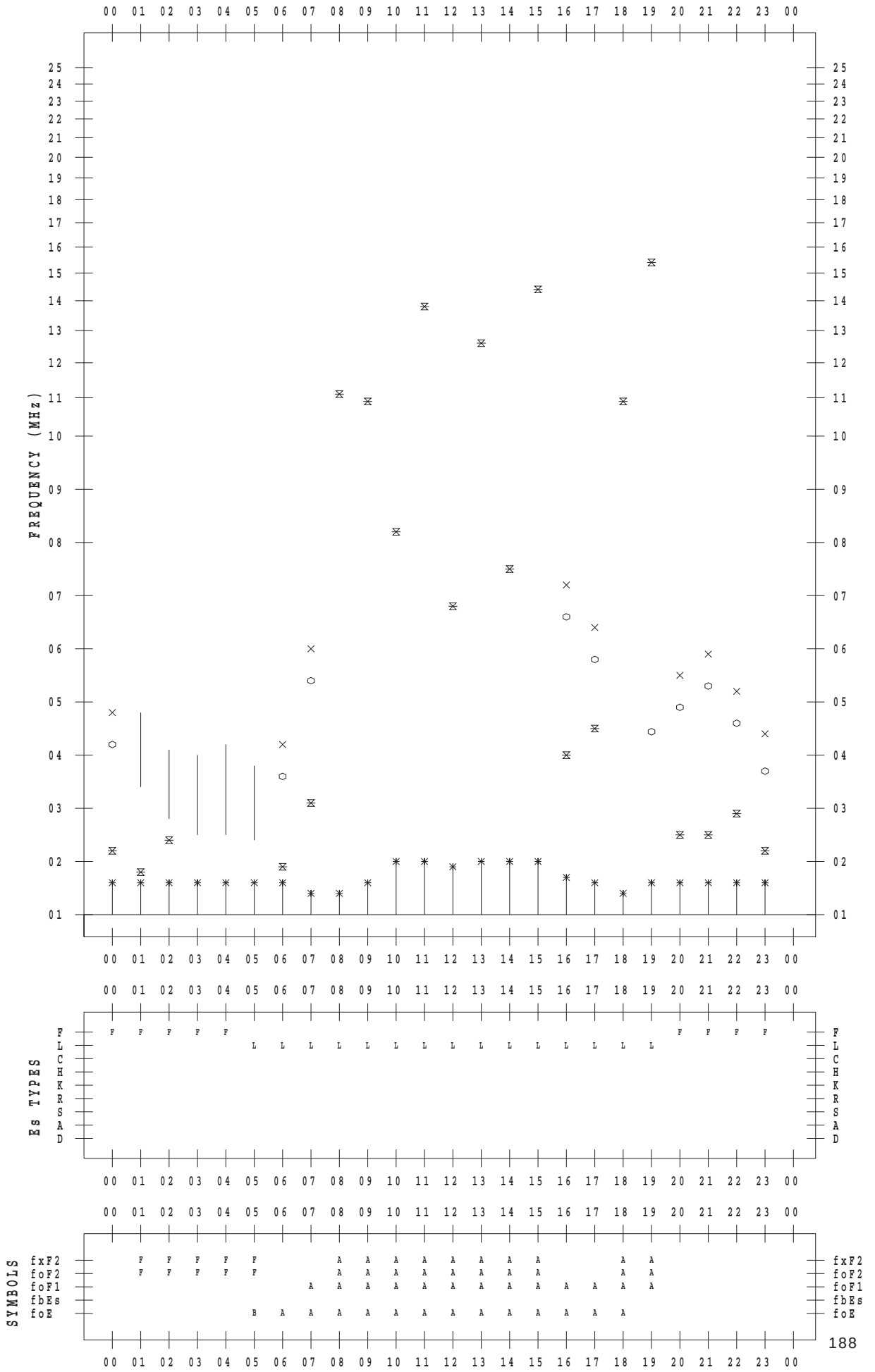
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/19

135 °E MEAN TIME



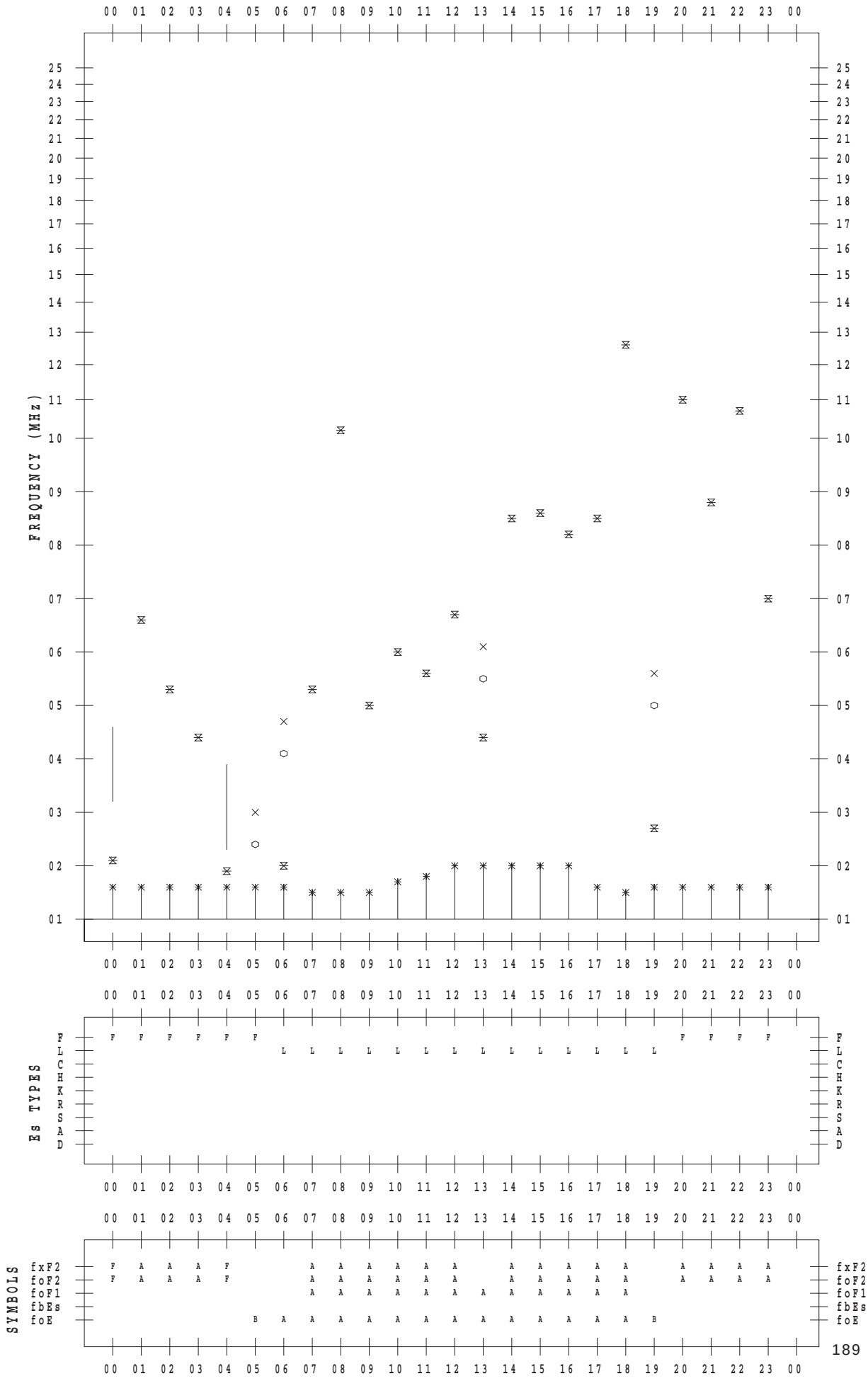
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/20

135 °E MEAN TIME



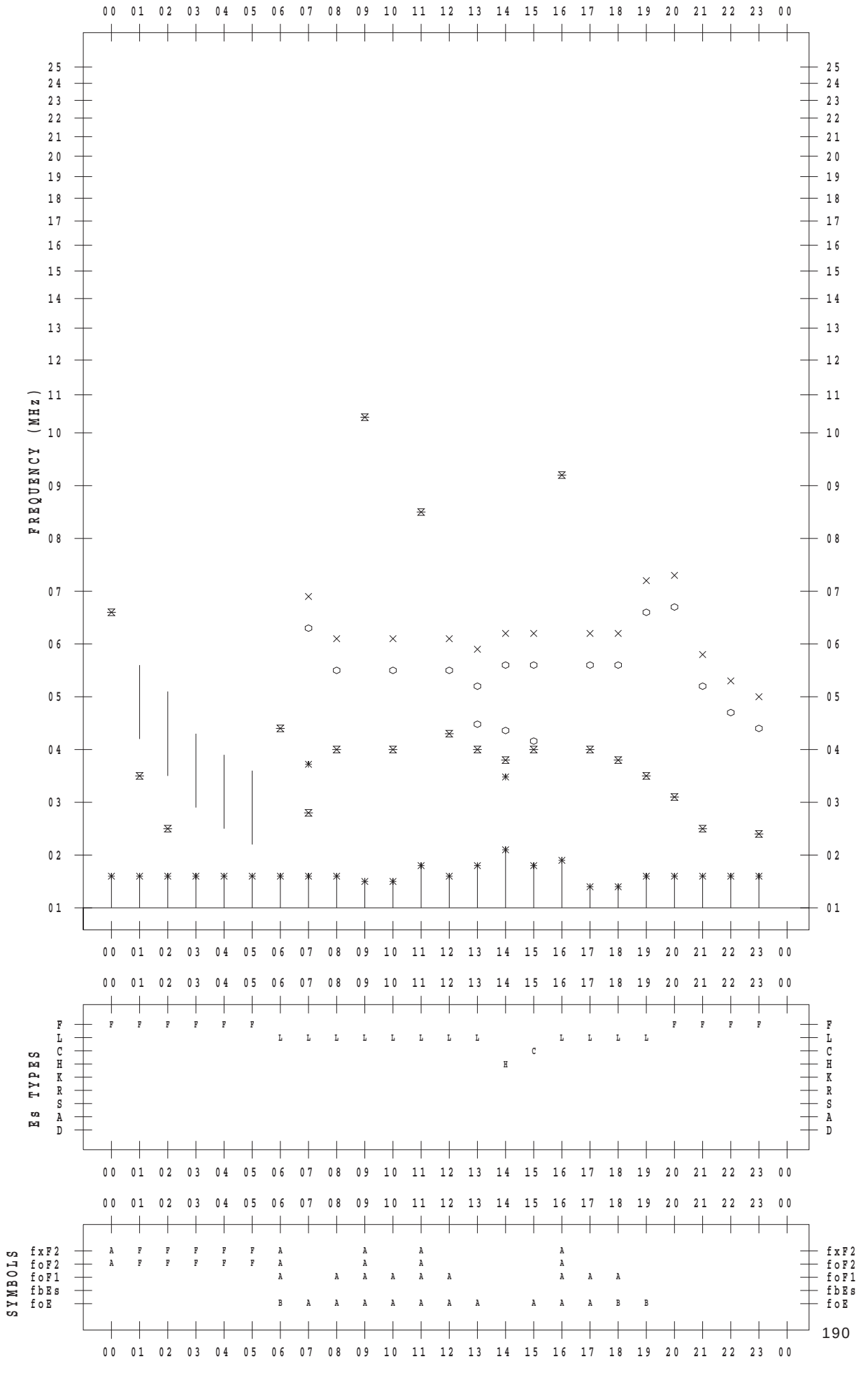
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/21

135 °E MEAN TIME



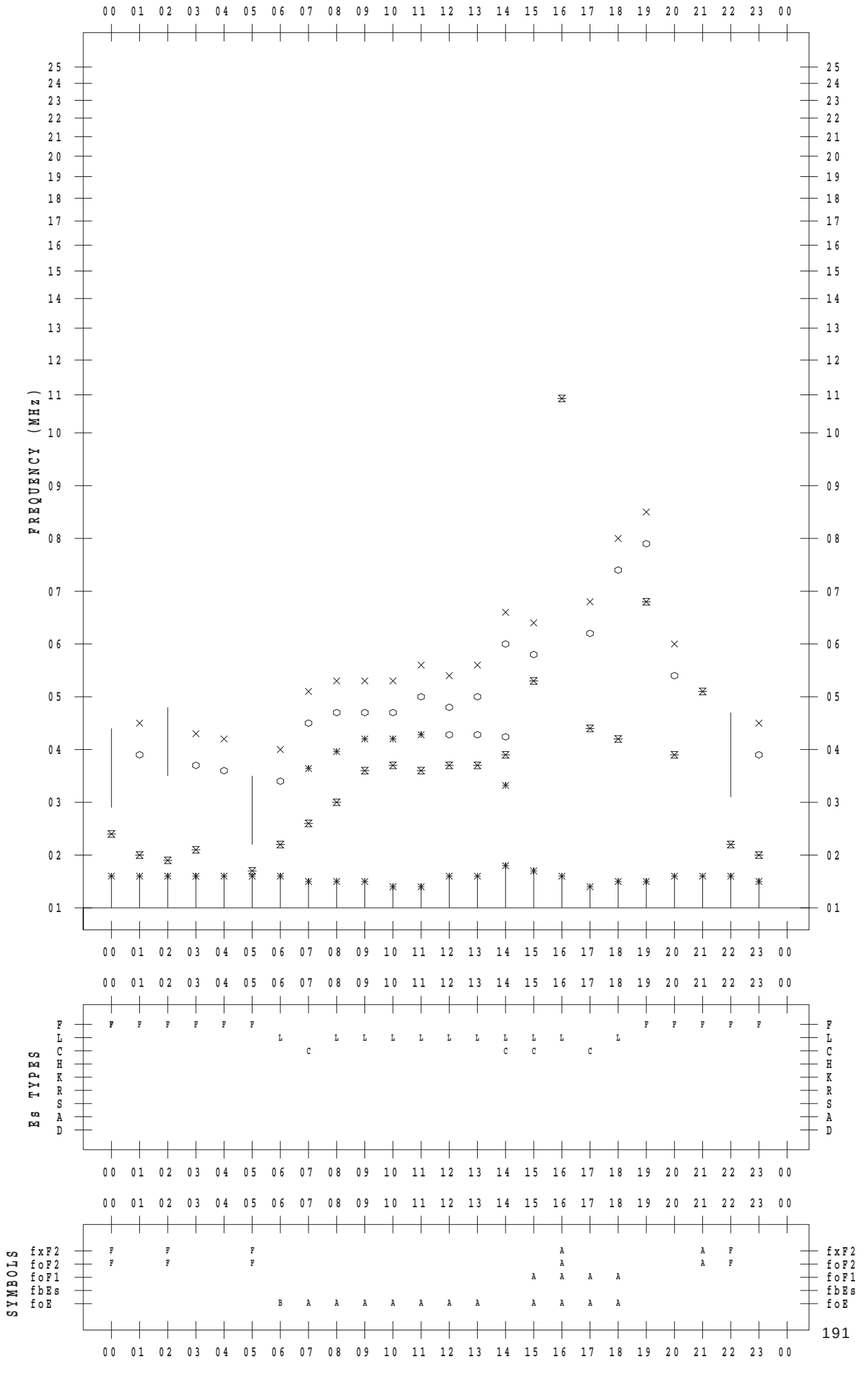
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/22

135 °E MEAN TIME



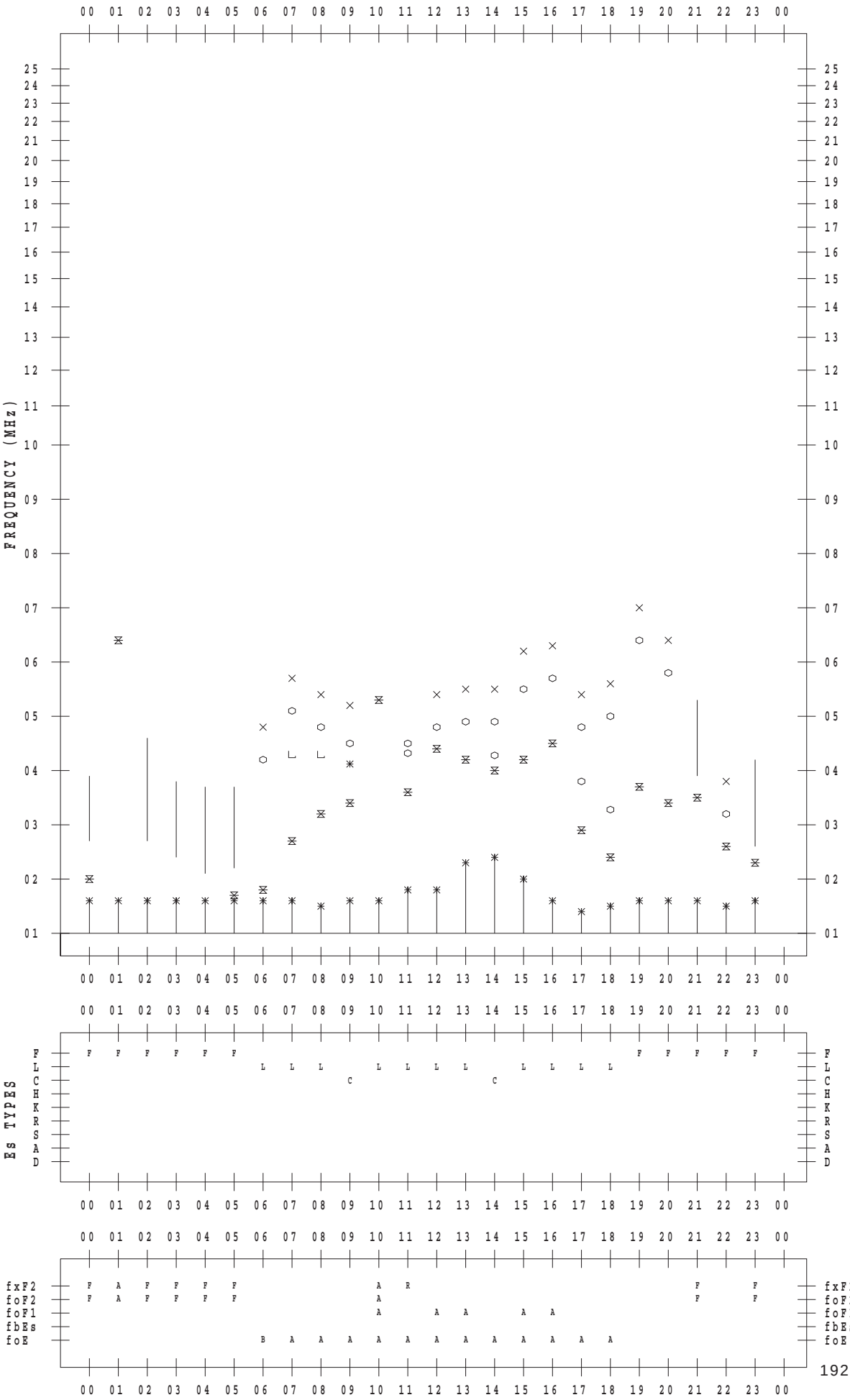
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/23

135 °E MEAN TIME



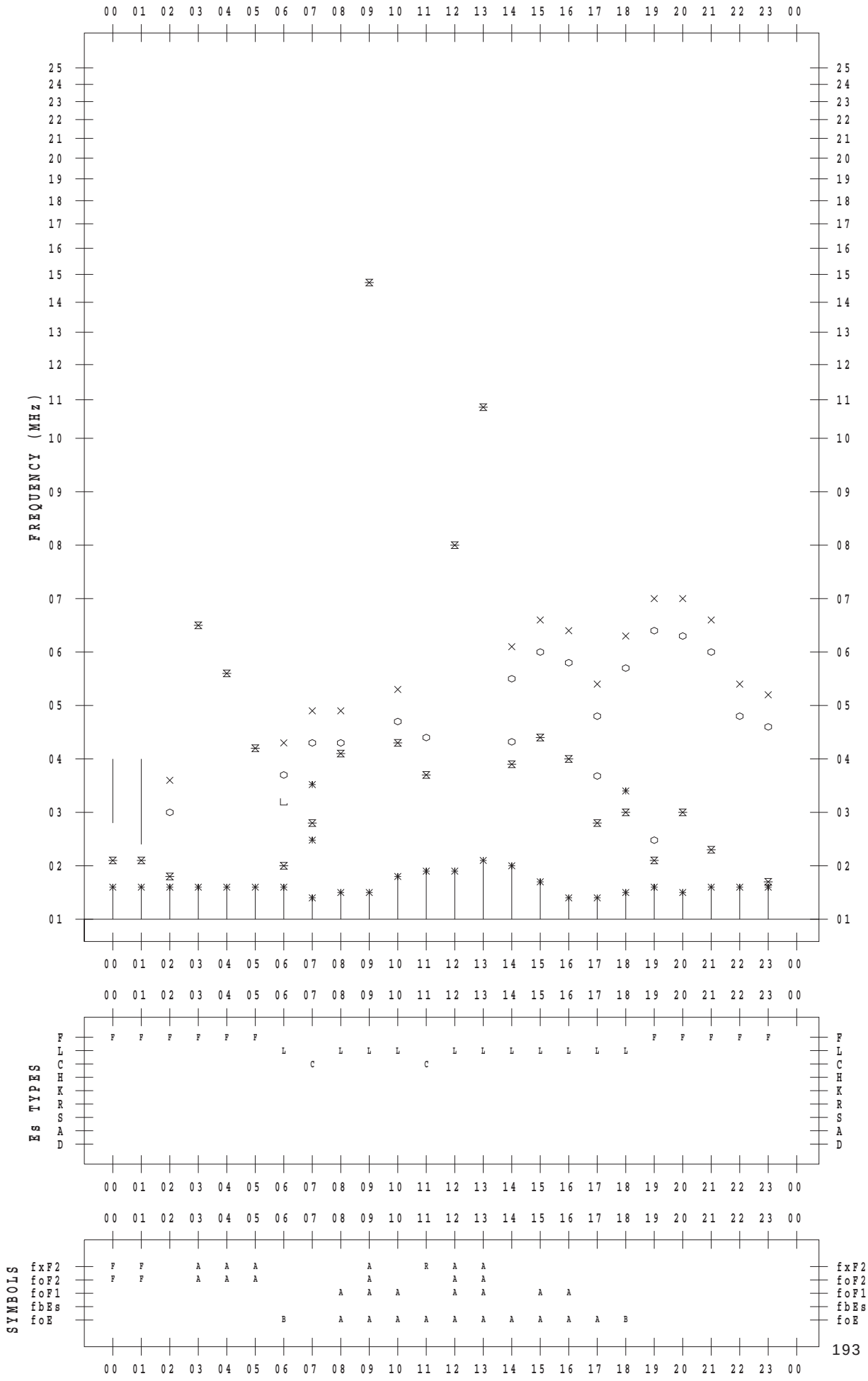
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/24

135 °E MEAN TIME



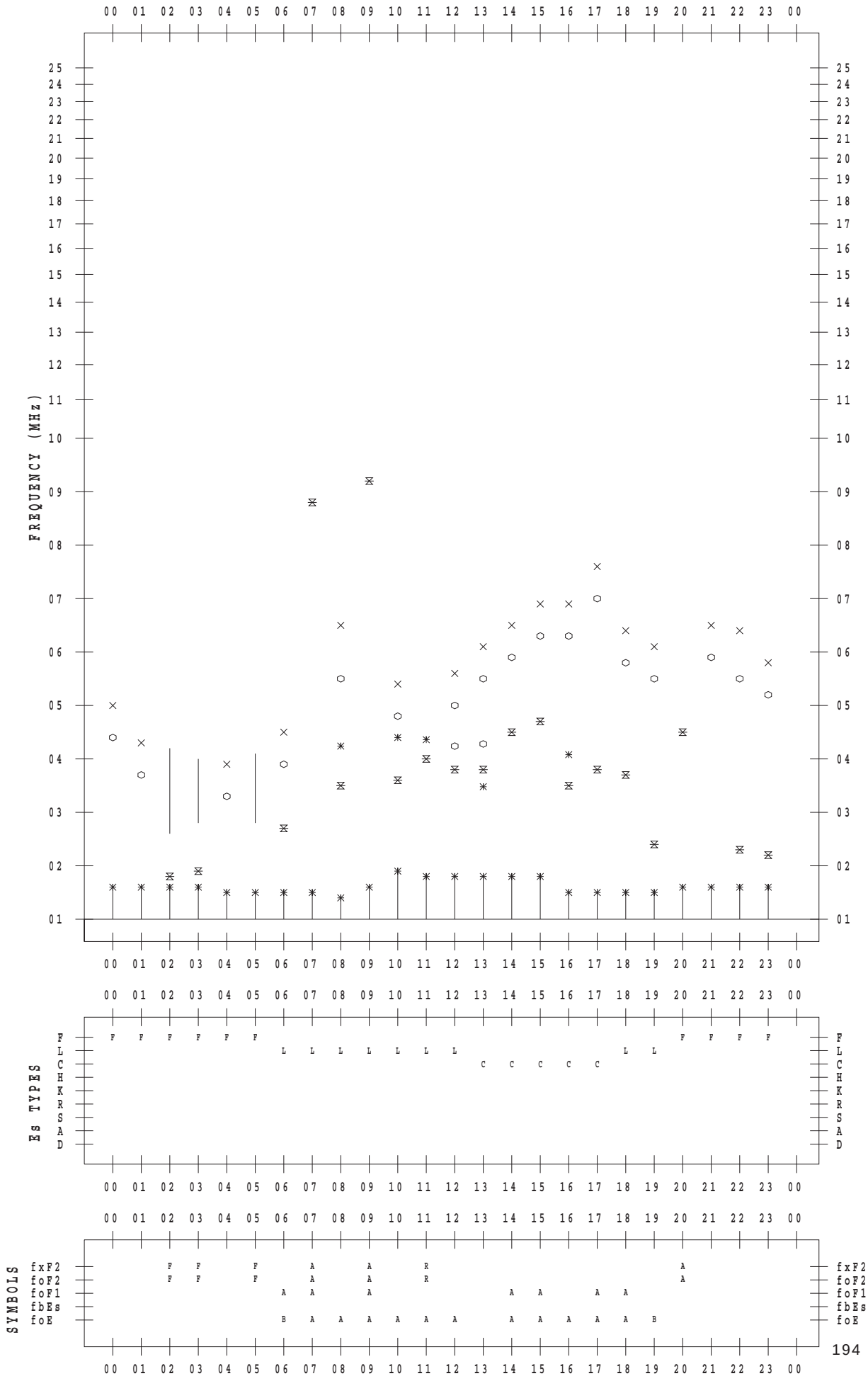
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/25

135 °E MEAN TIME



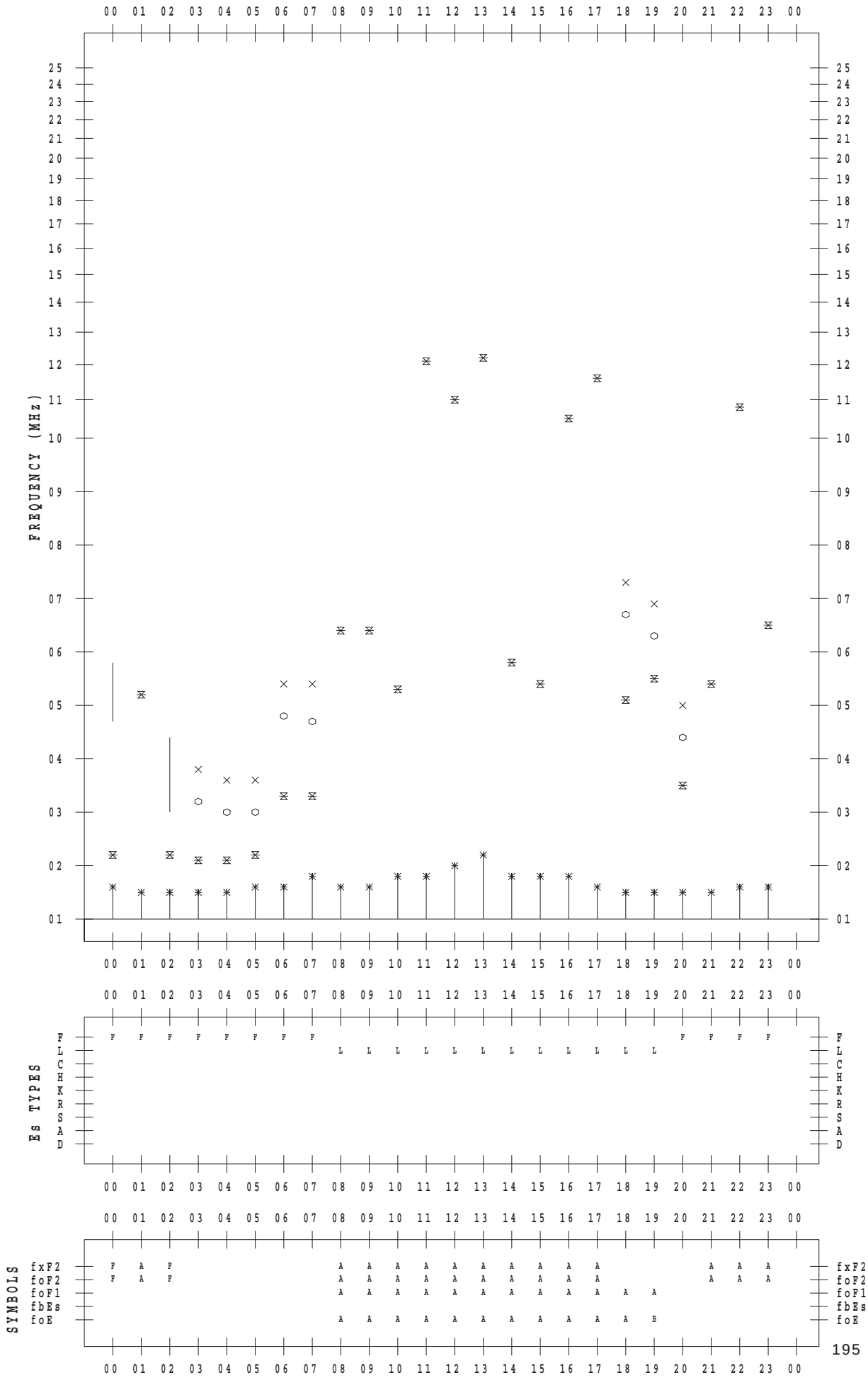
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/26

135 °E MEAN TIME



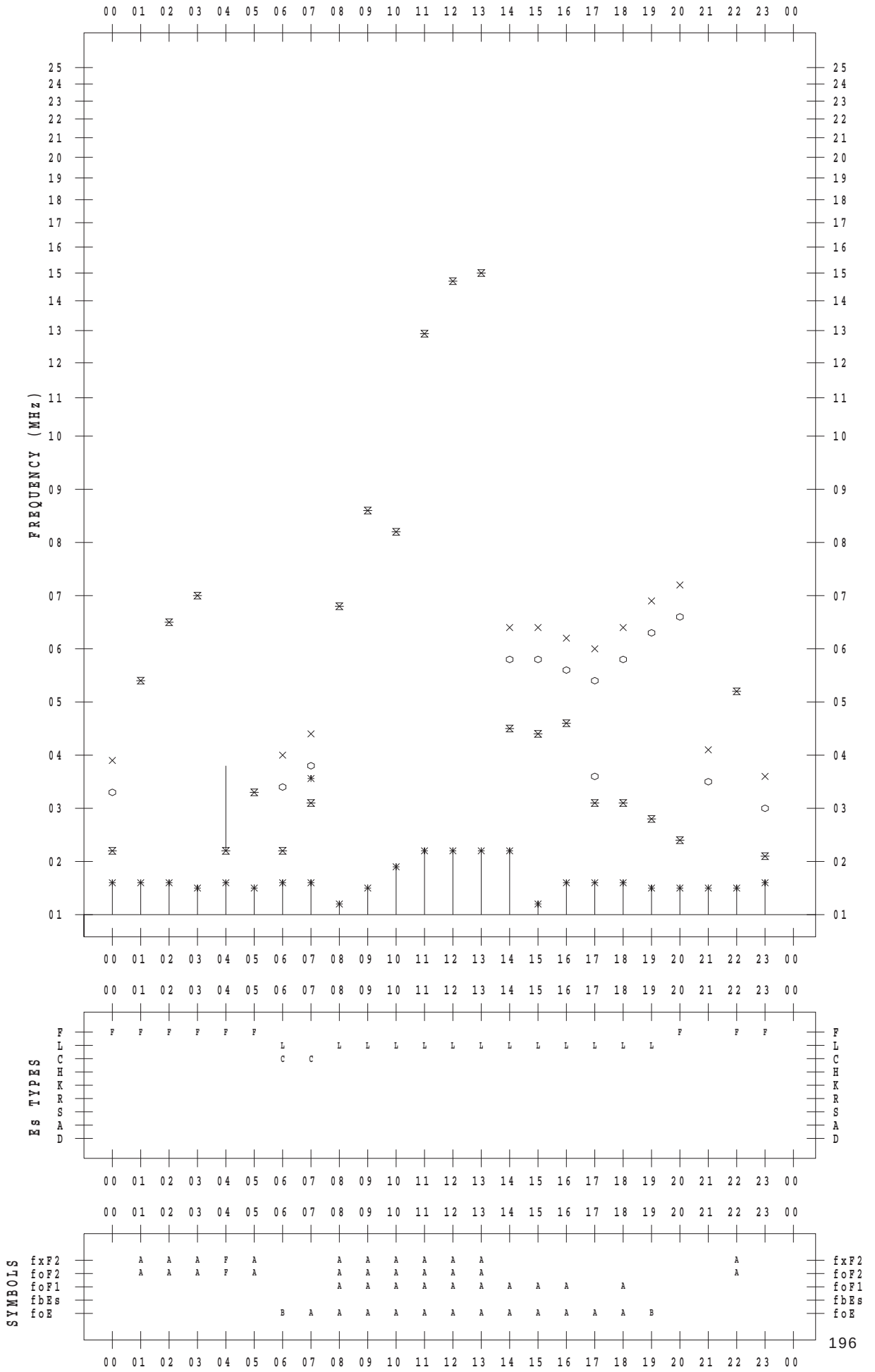
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/27

135 °E MEAN TIME



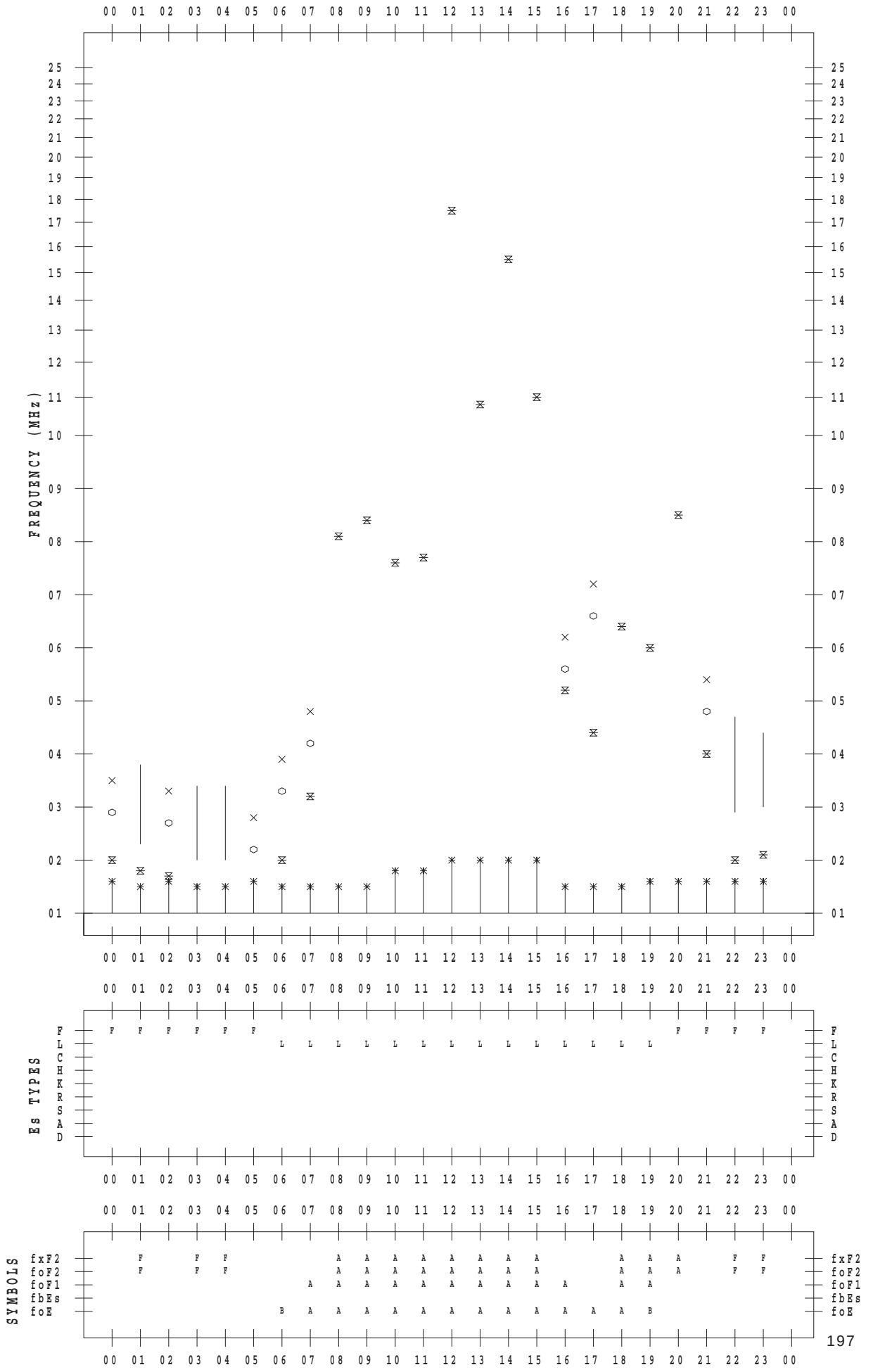
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/28

135 °E MEAN TIME



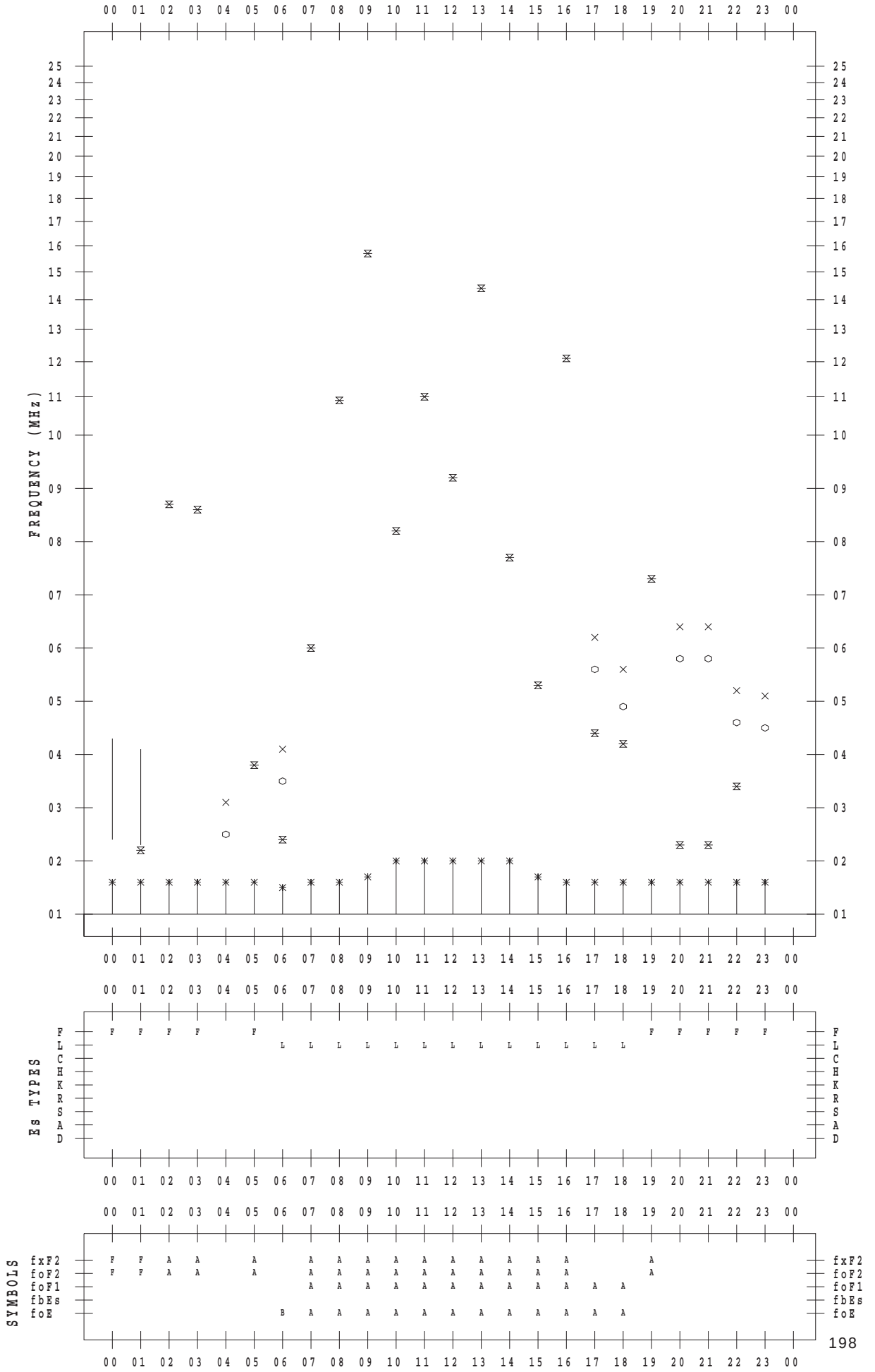
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/29

135 °E MEAN TIME



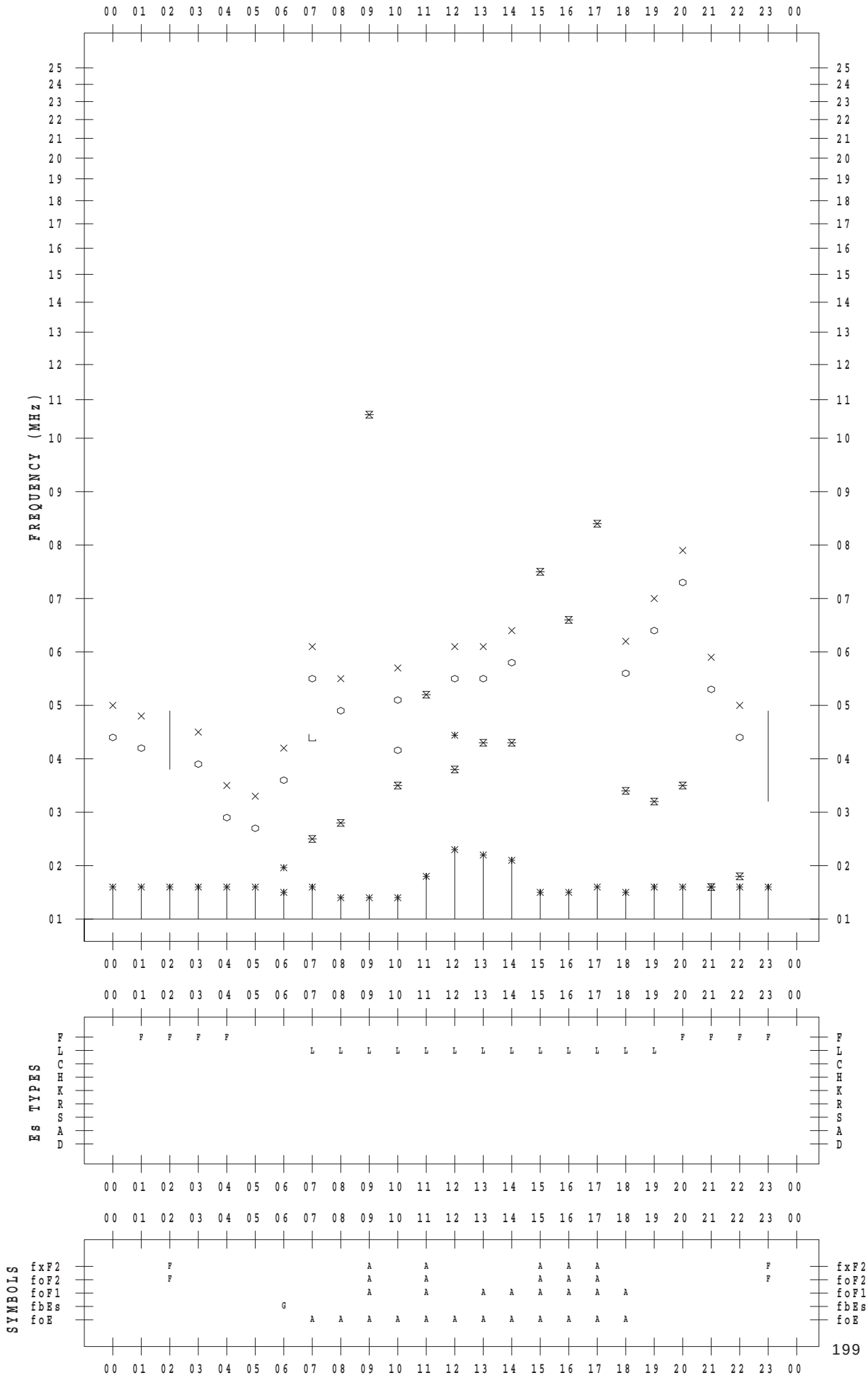
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/30

135 °E MEAN TIME



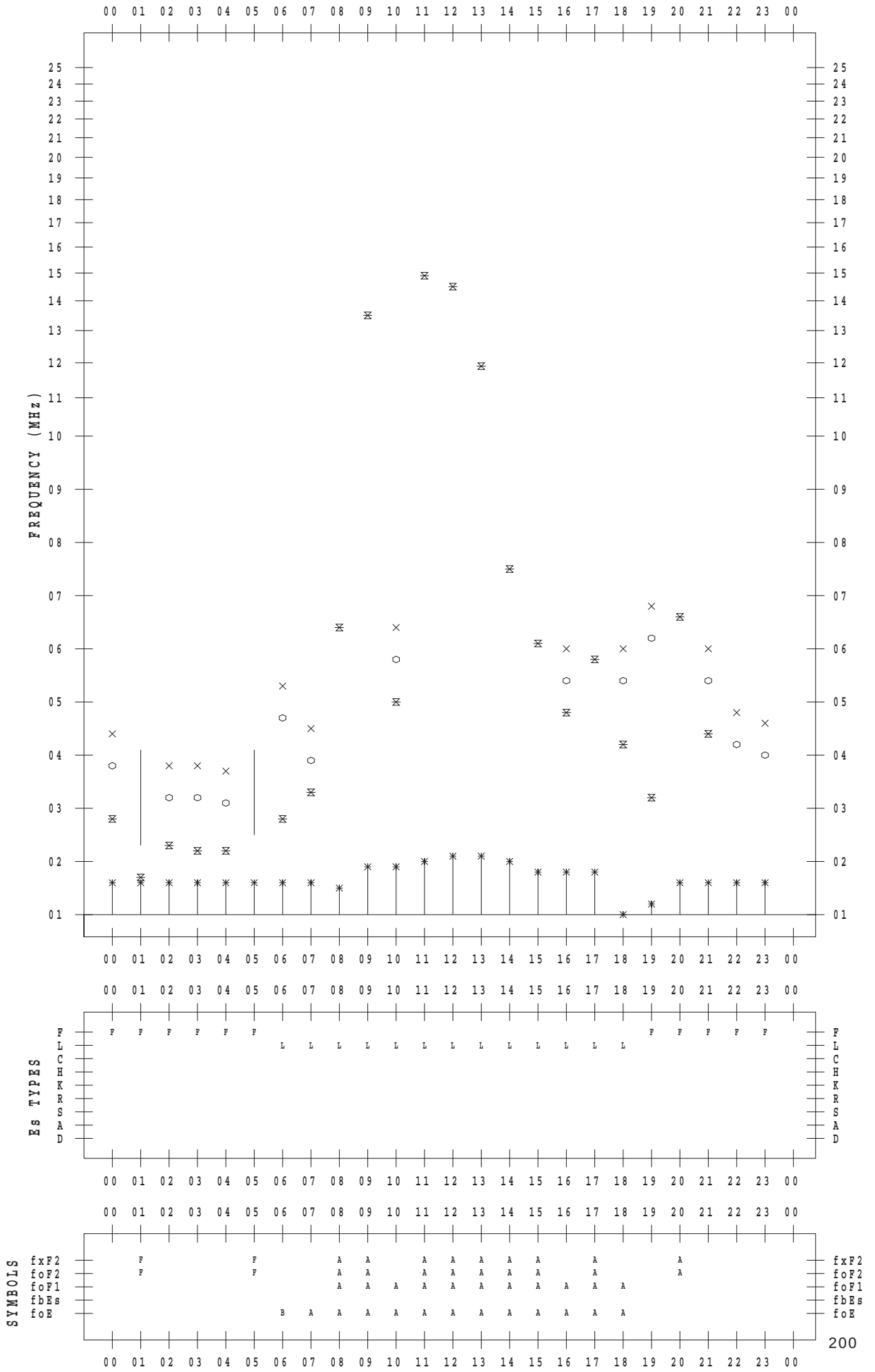
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/ 7/31

135 °E MEAN TIME



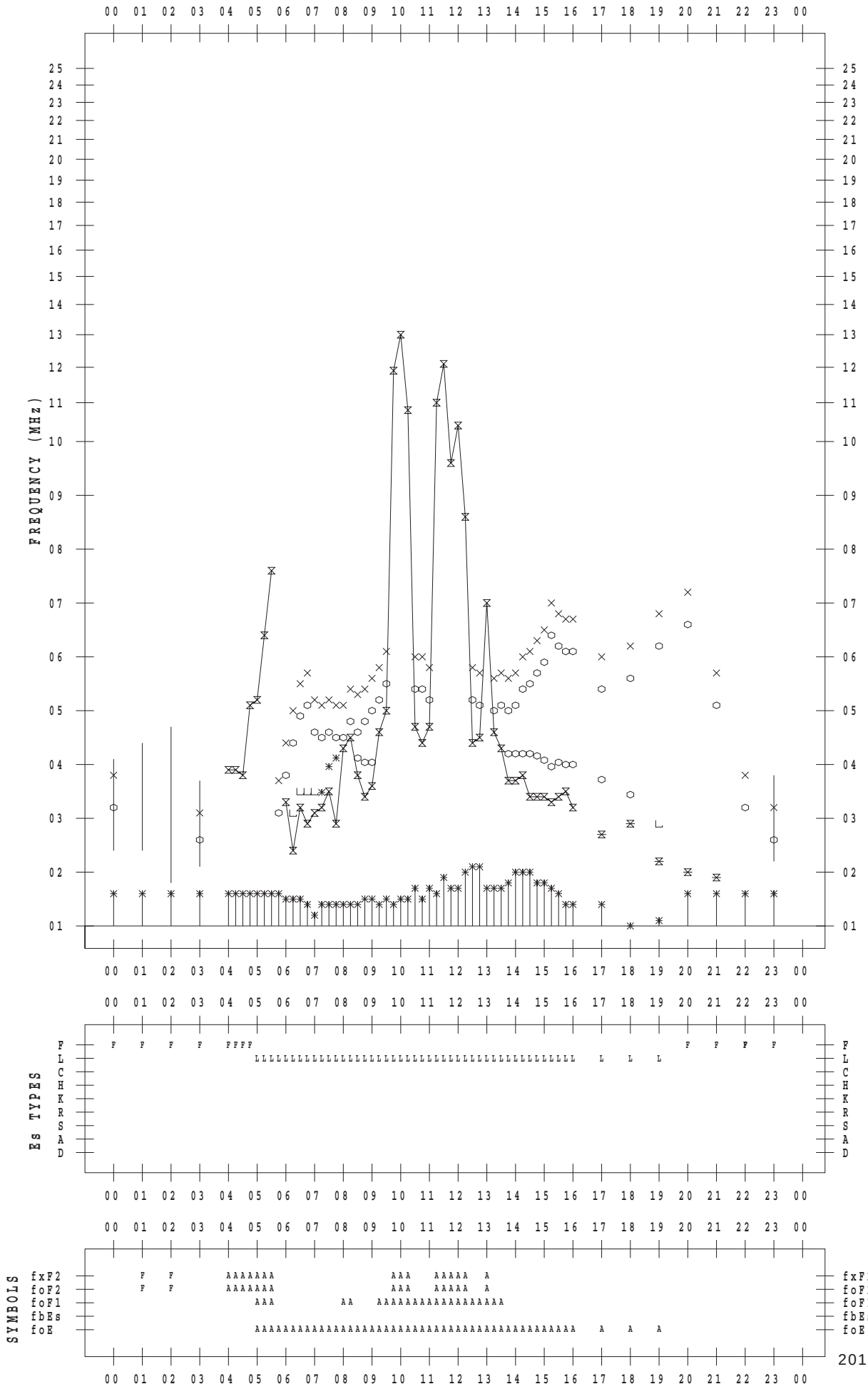
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 1

135 °E MEAN TIME



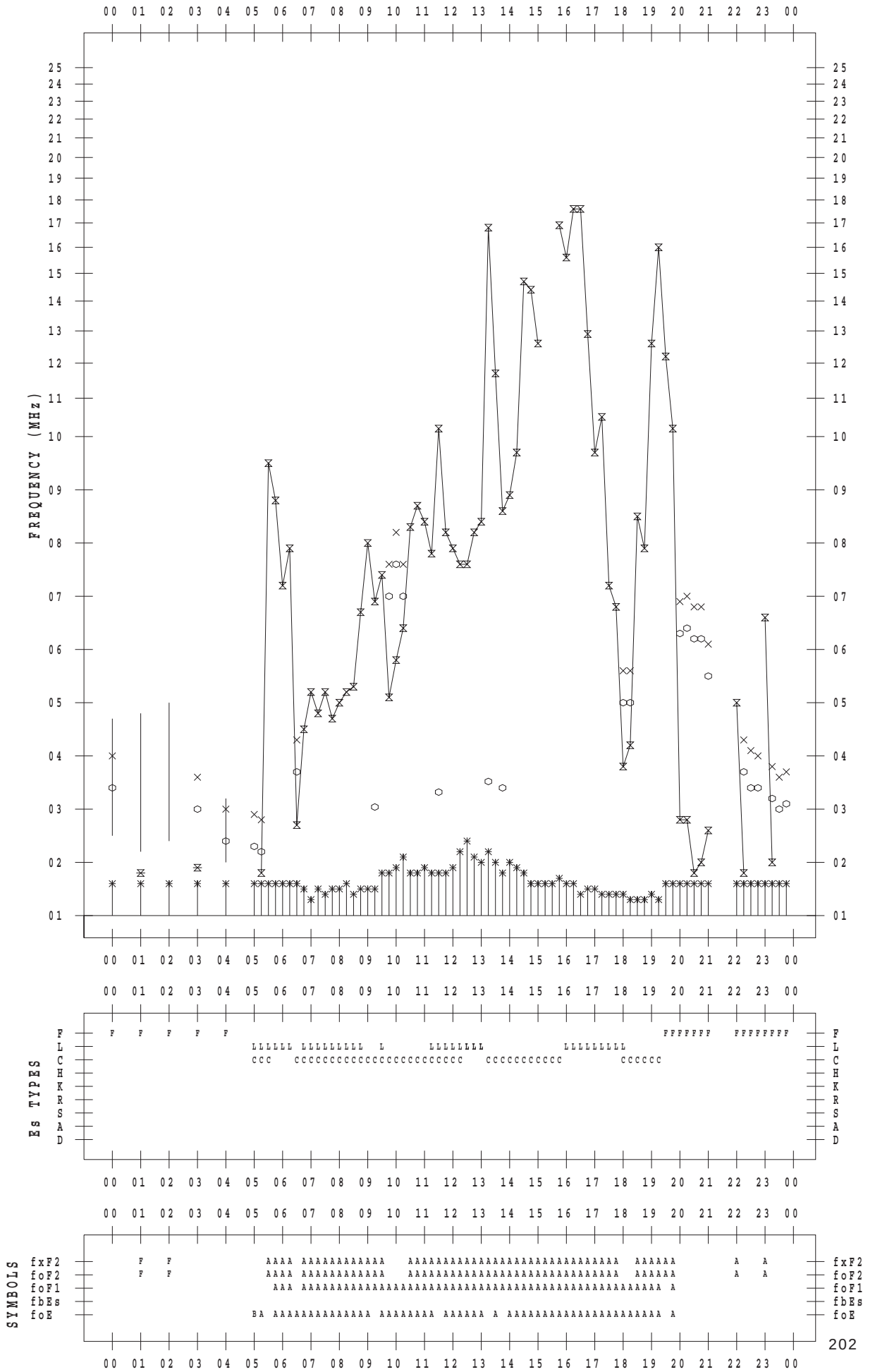
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 2

135 °E MEAN TIME



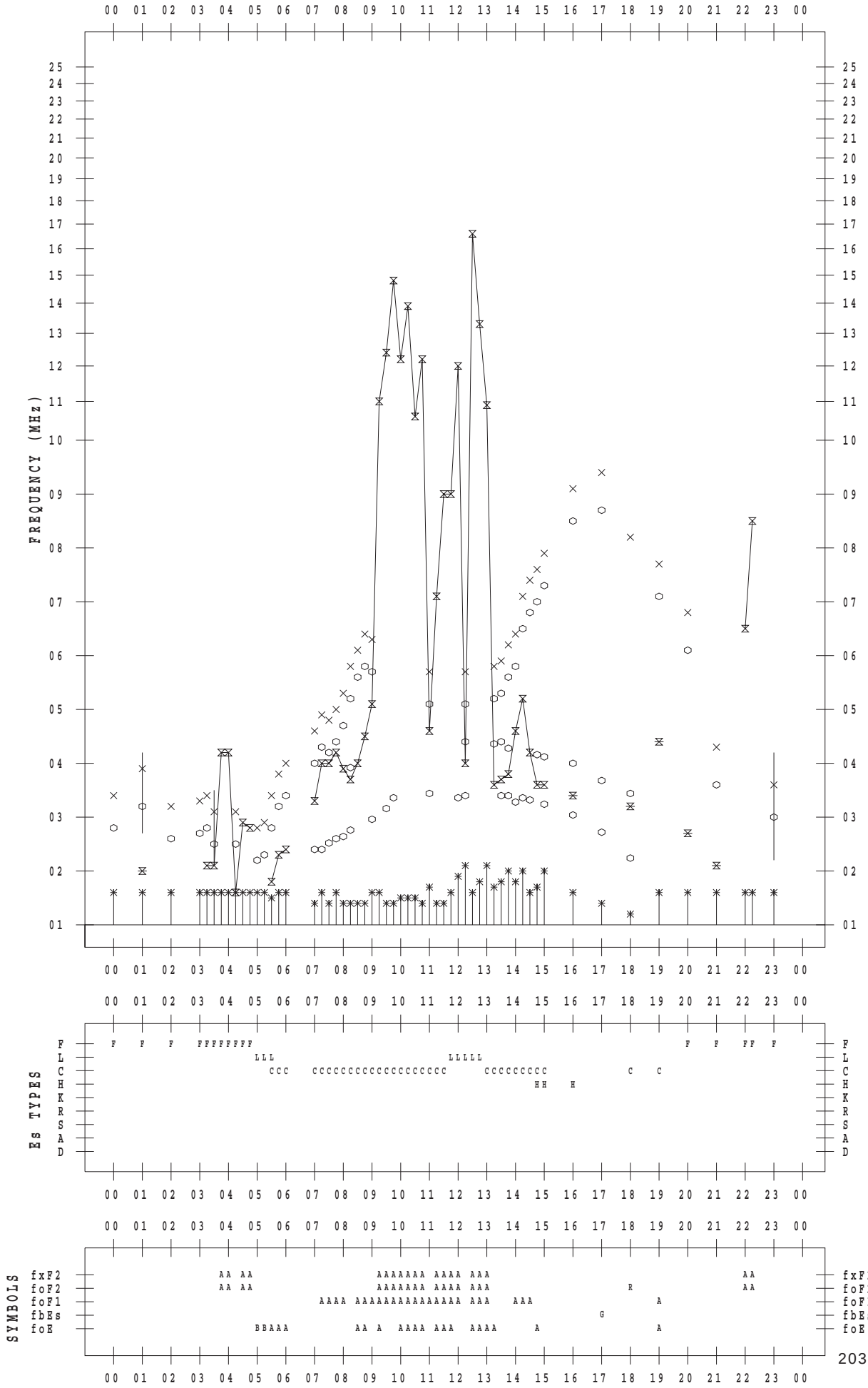
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 3

135 °E MEAN TIME



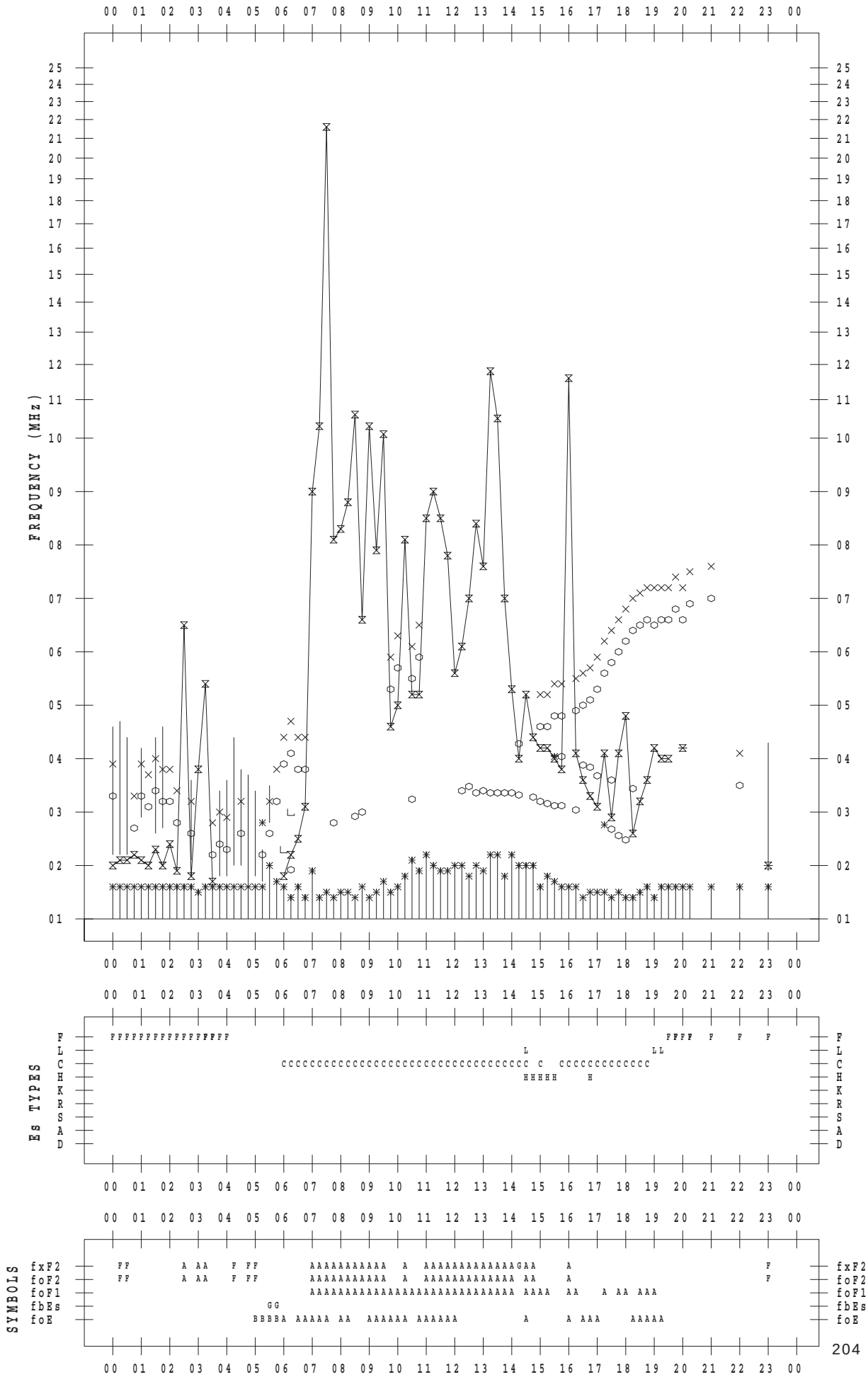
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 4

135 °E MEAN TIME



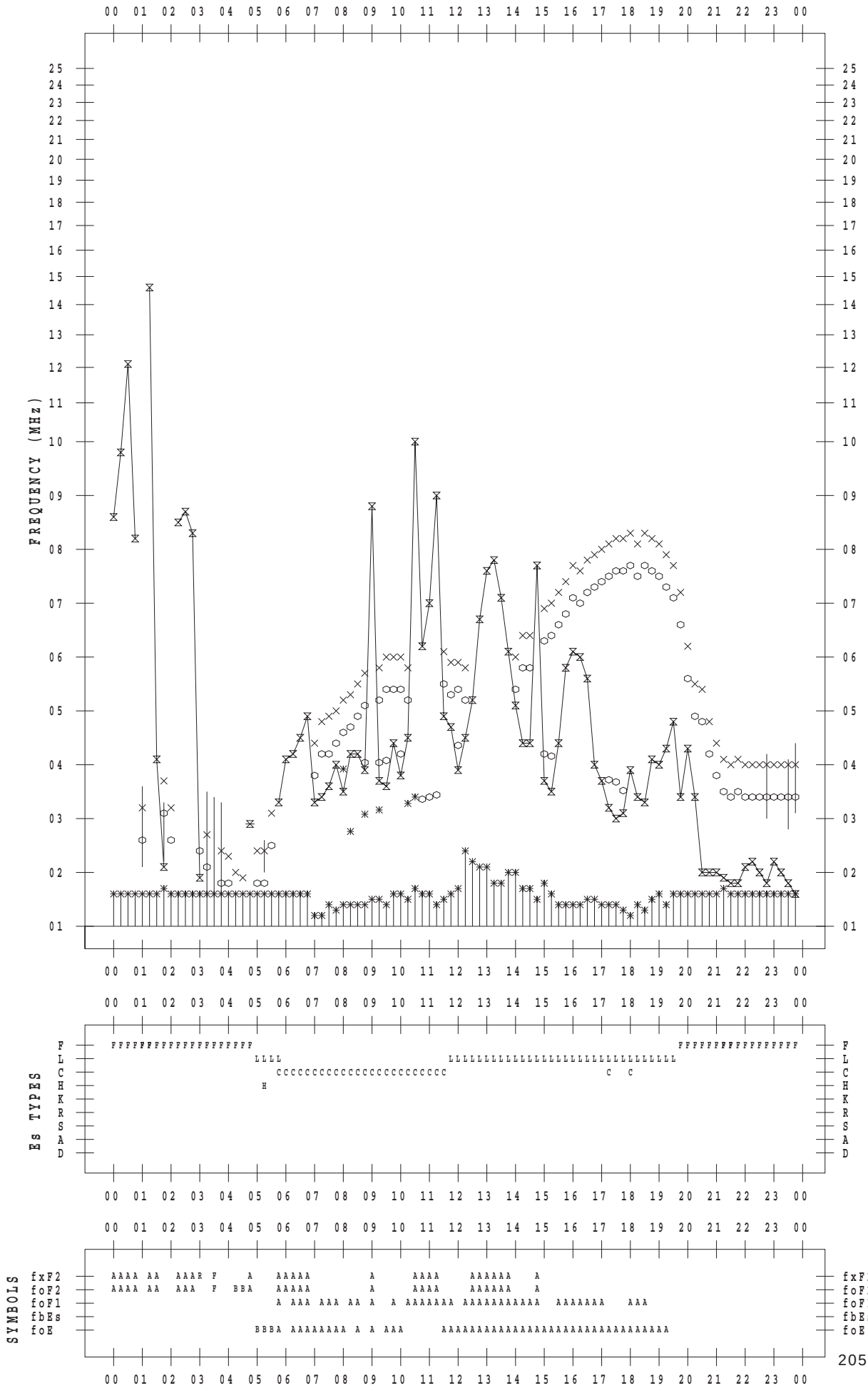
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 5

135 °E MEAN TIME



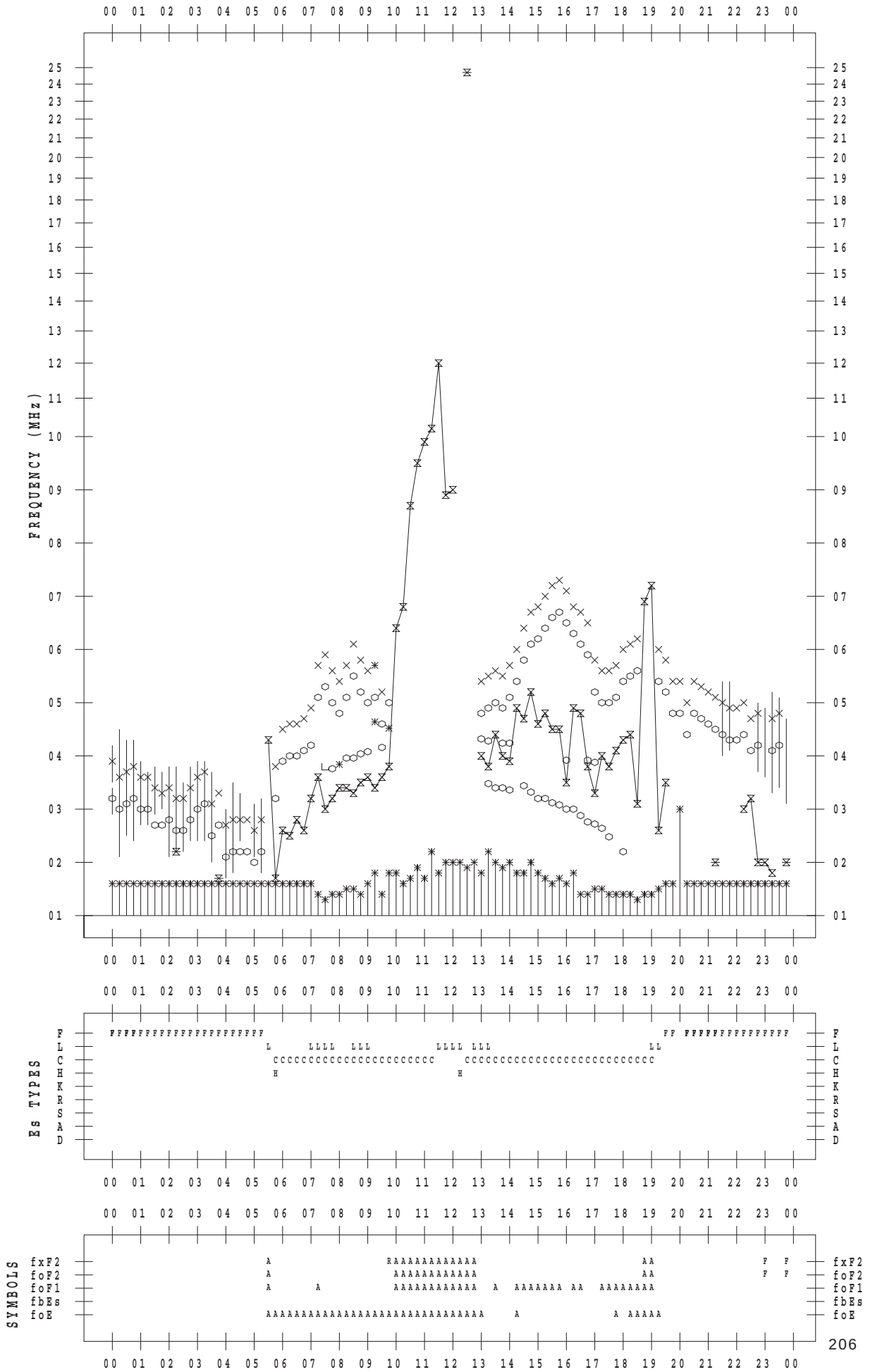
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 6

135 °E MEAN TIME



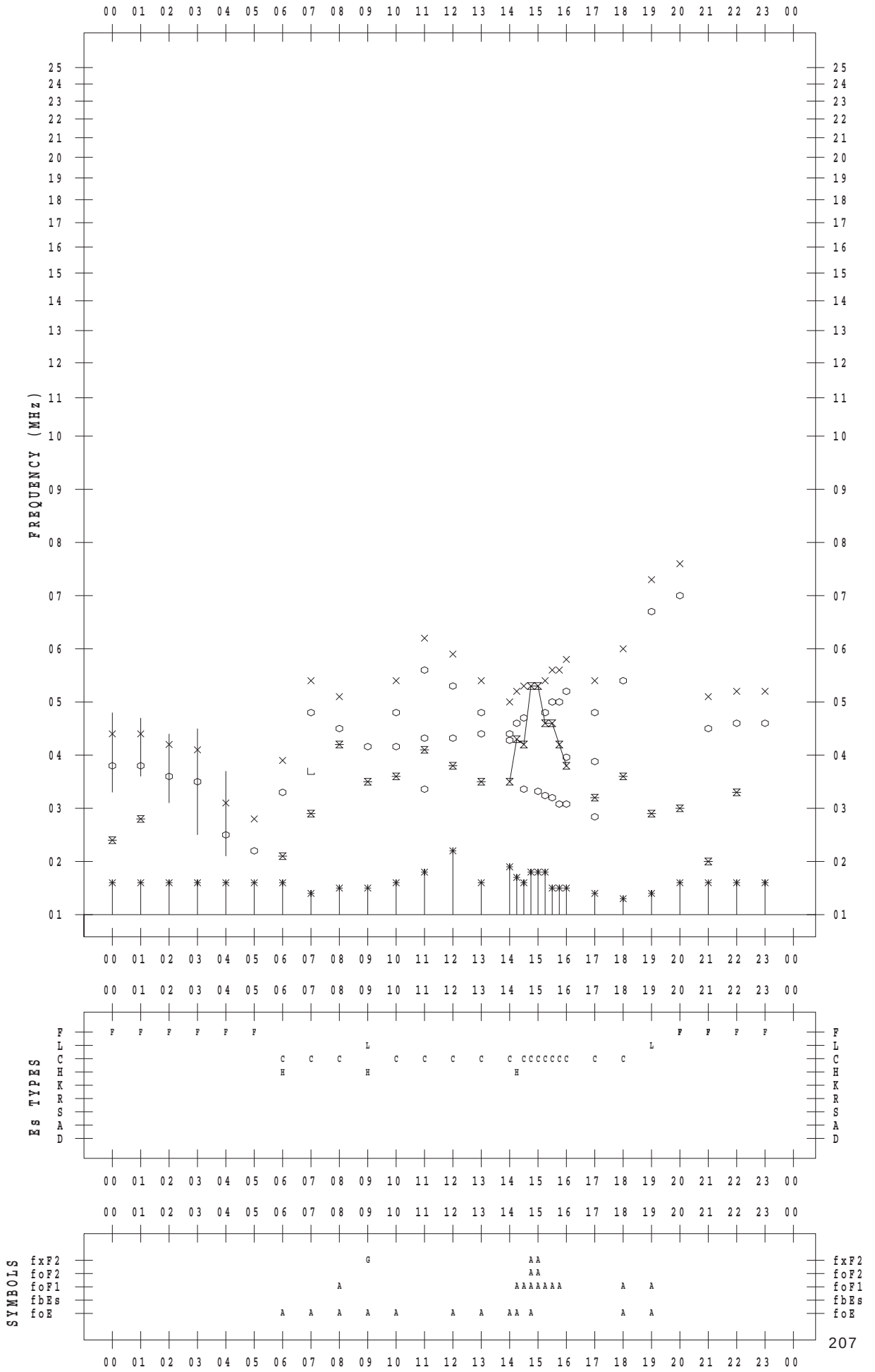
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 7

135 °E MEAN TIME



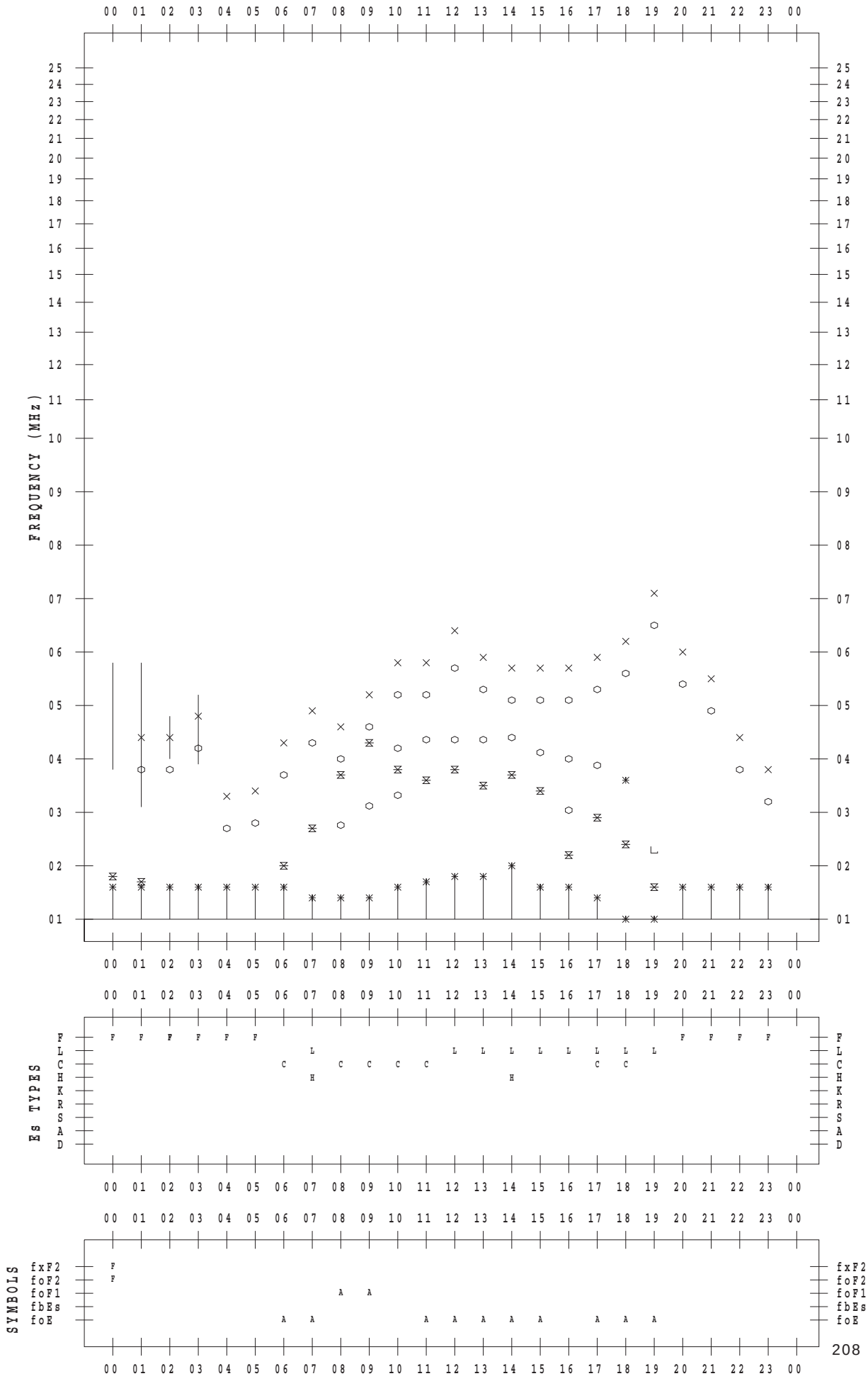
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 8

135 °E MEAN TIME



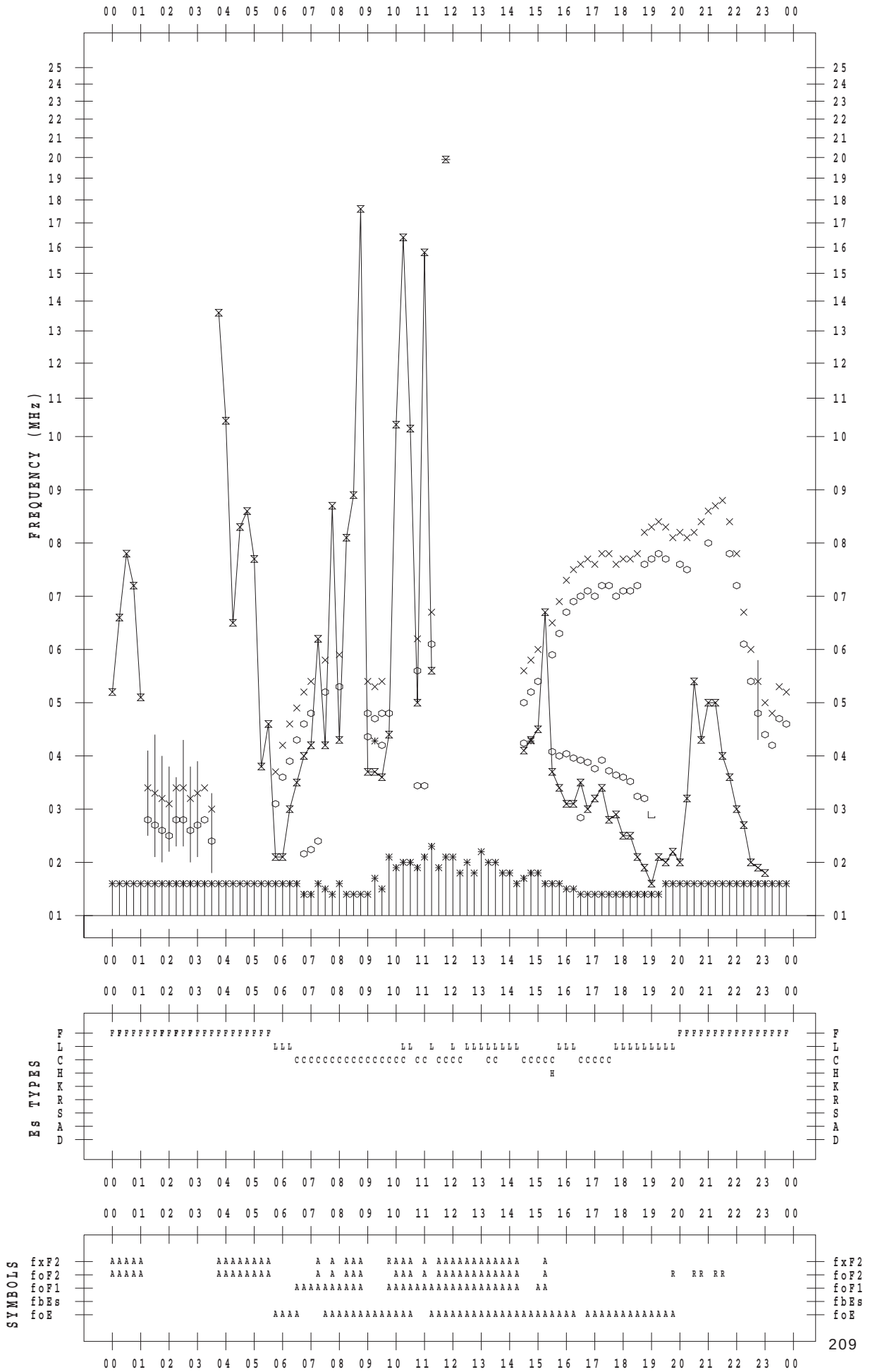
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/ 9

135 °E MEAN TIME



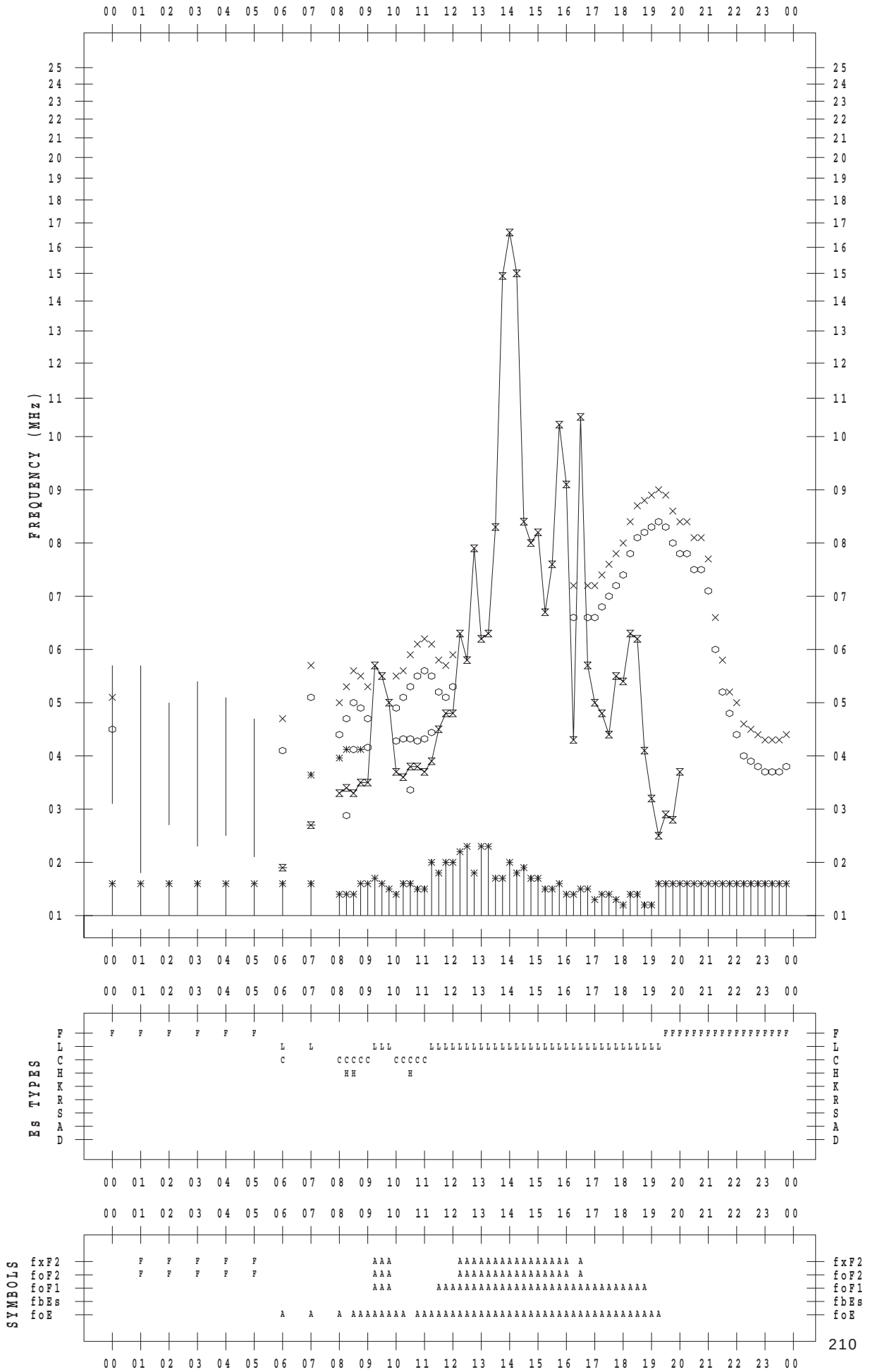
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/10

135 °E MEAN TIME



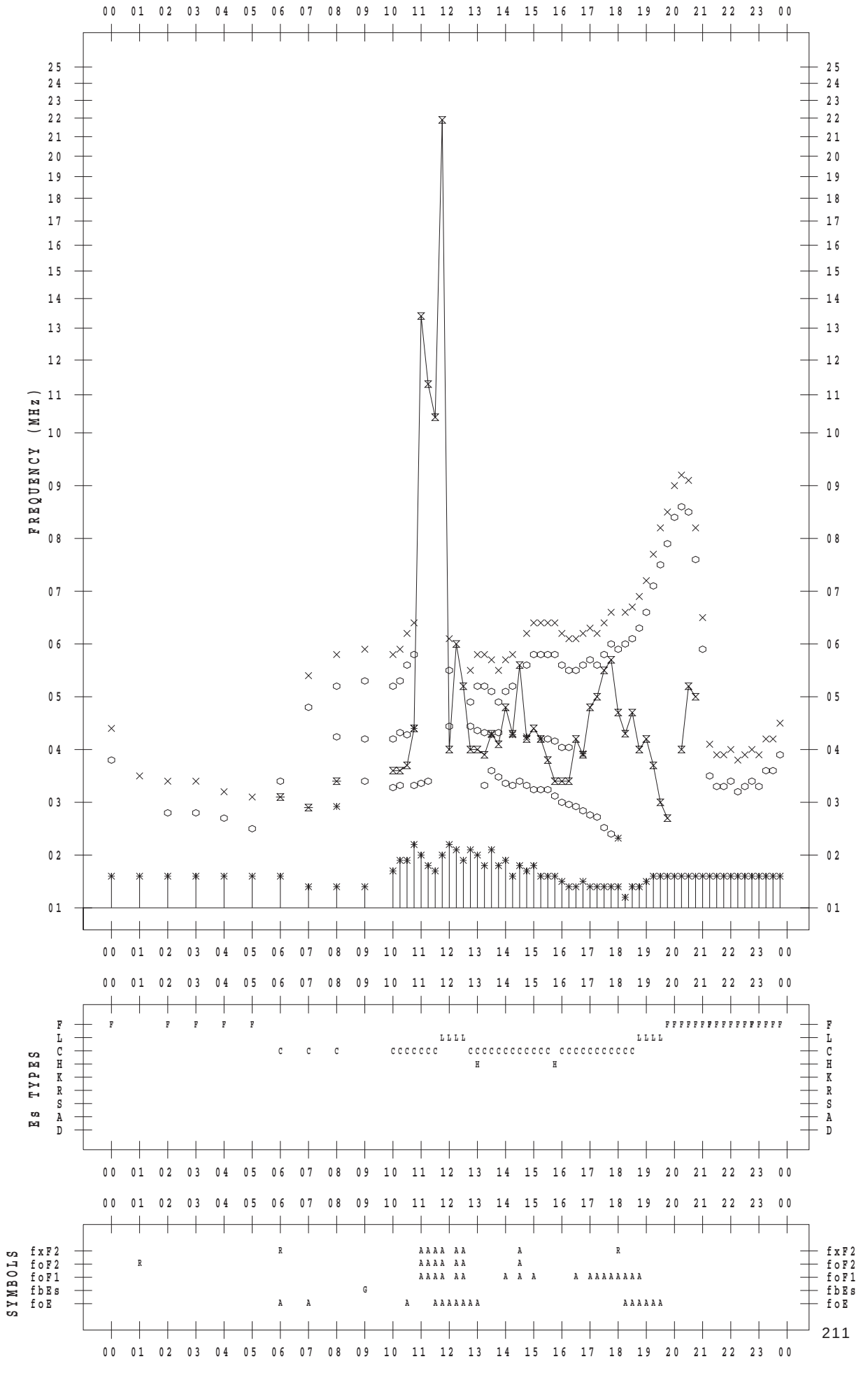
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/11

135 °E MEAN TIME



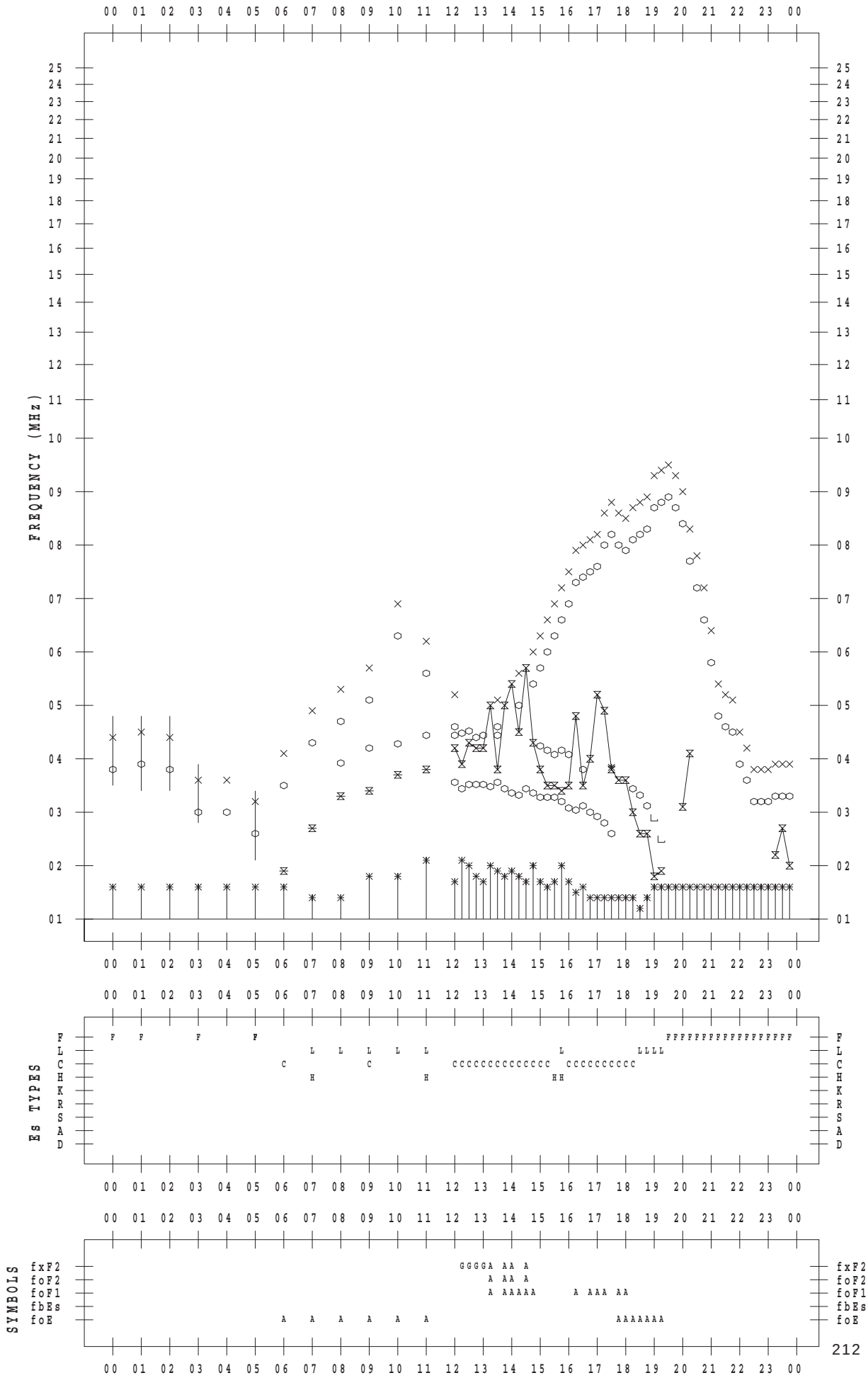
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/12

135 °E MEAN TIME



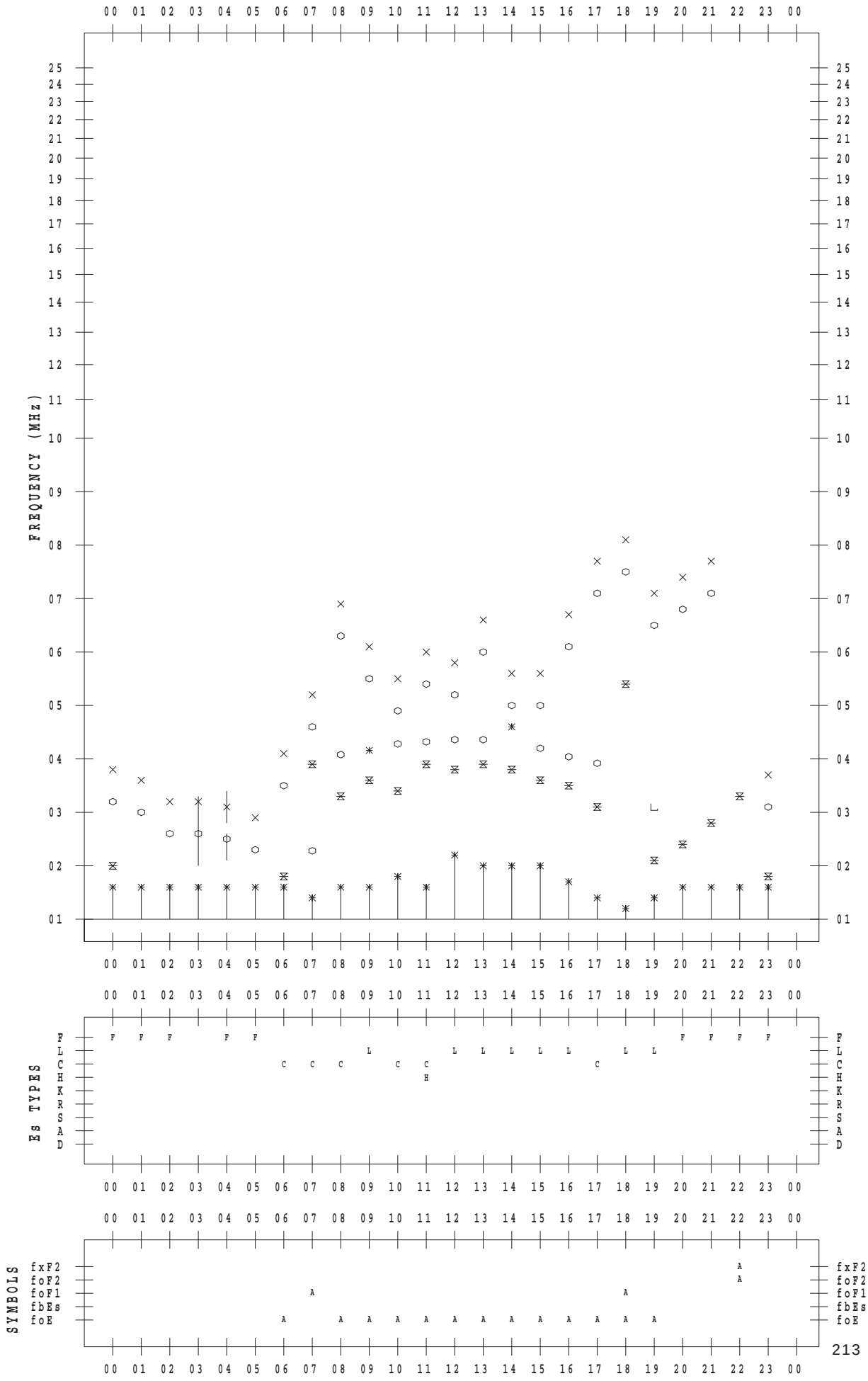
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/13

135 °E MEAN TIME



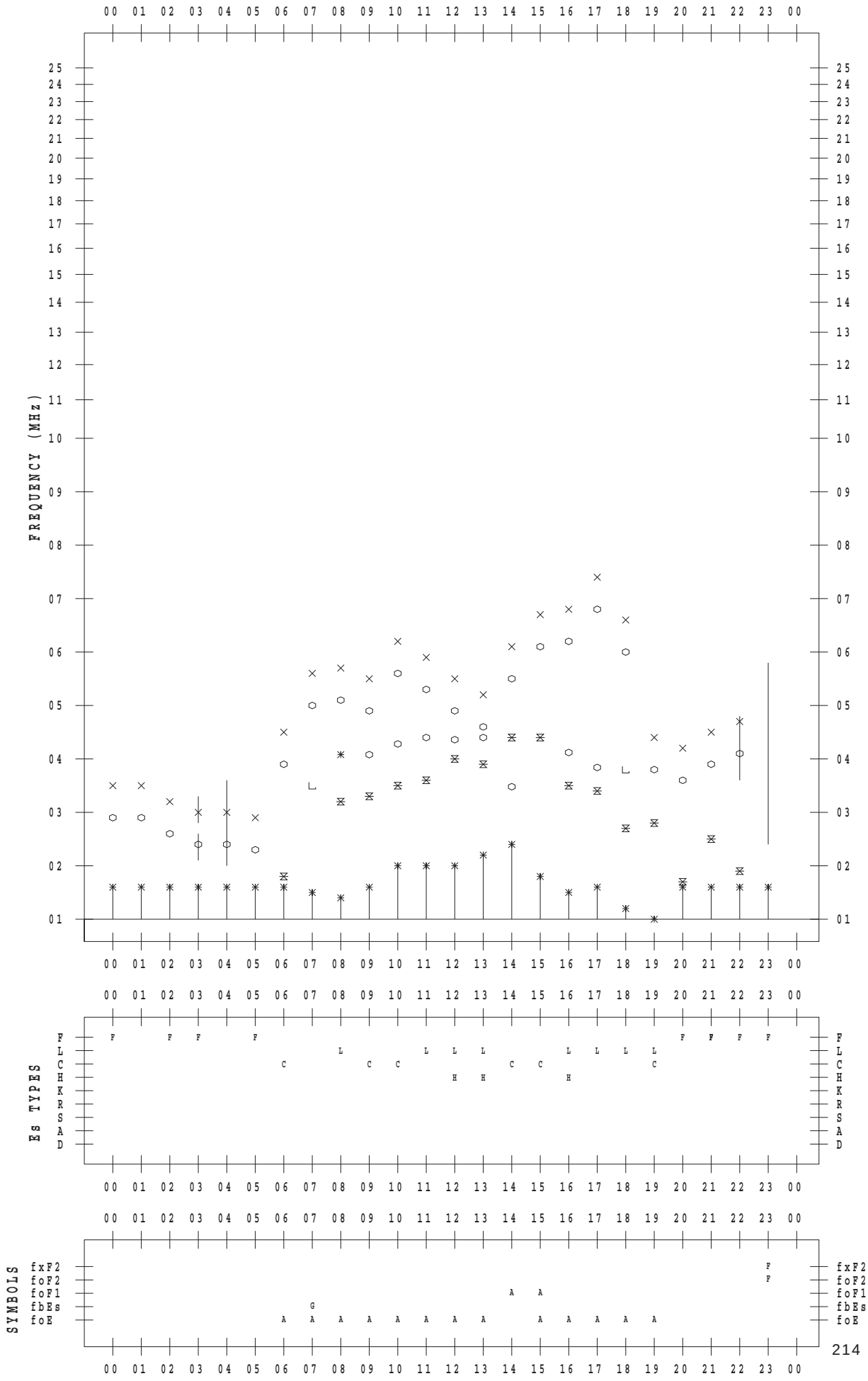
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/14

135 °E MEAN TIME



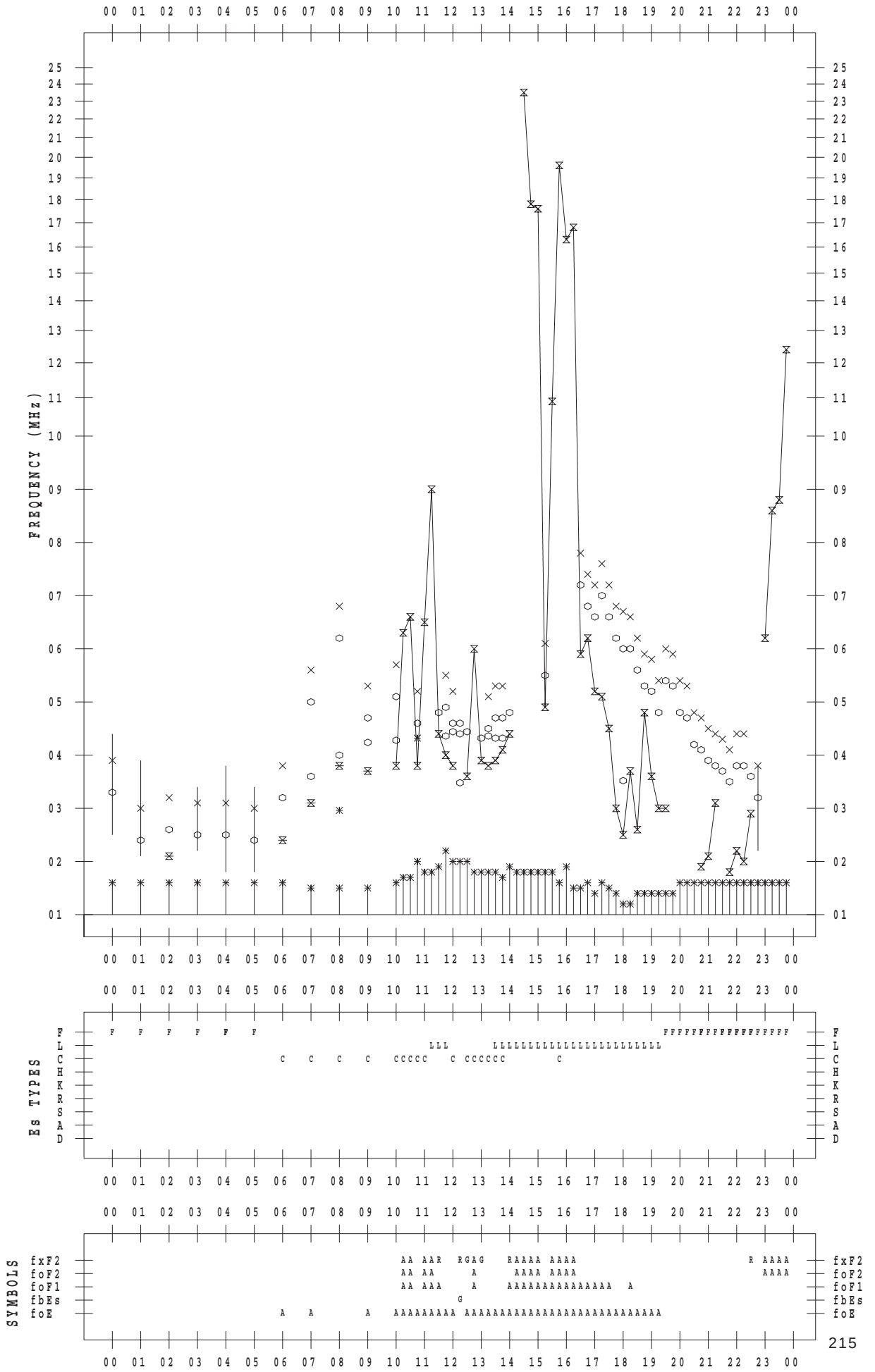
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/15

135 °E MEAN TIME



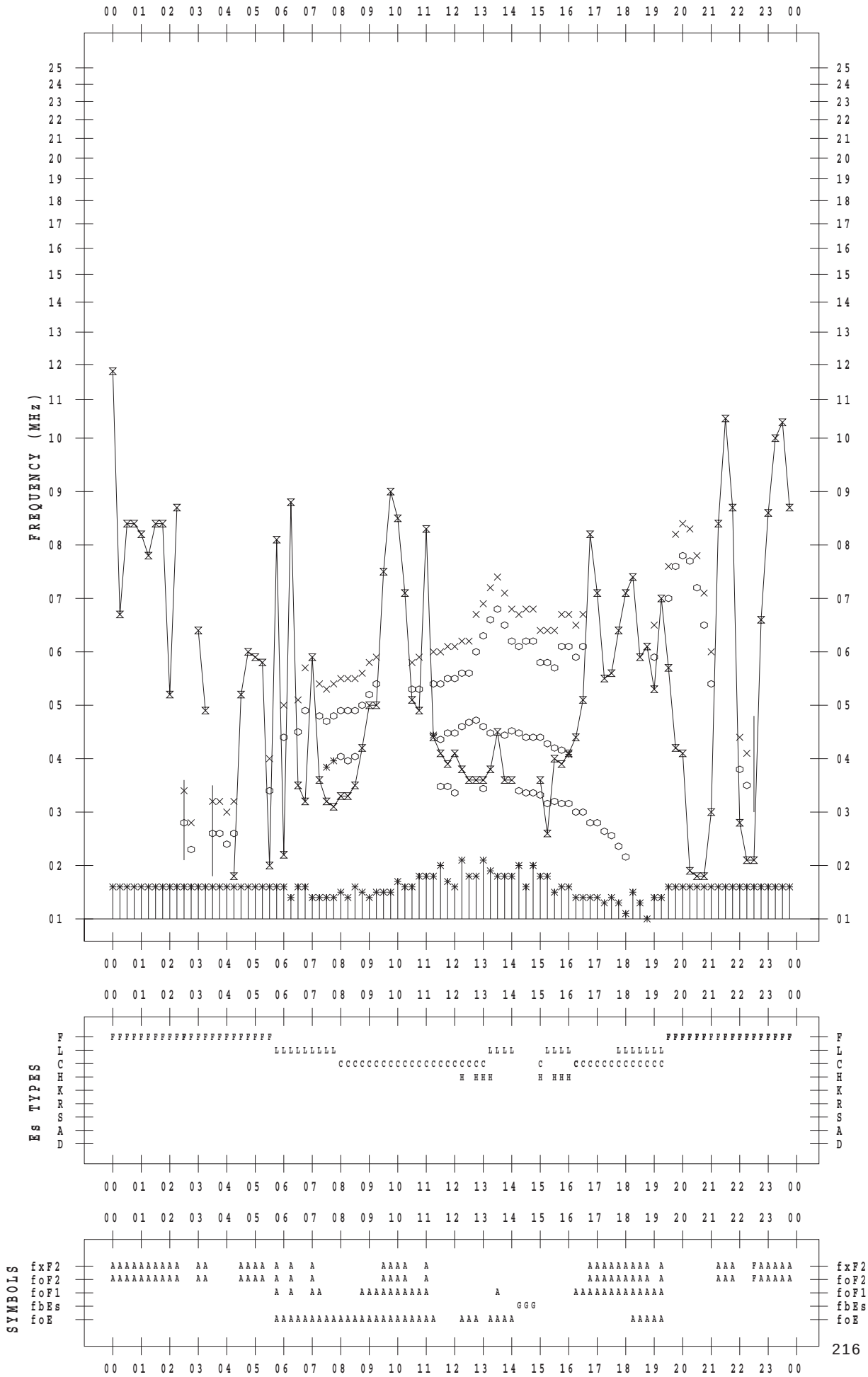
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/16

135 °E MEAN TIME



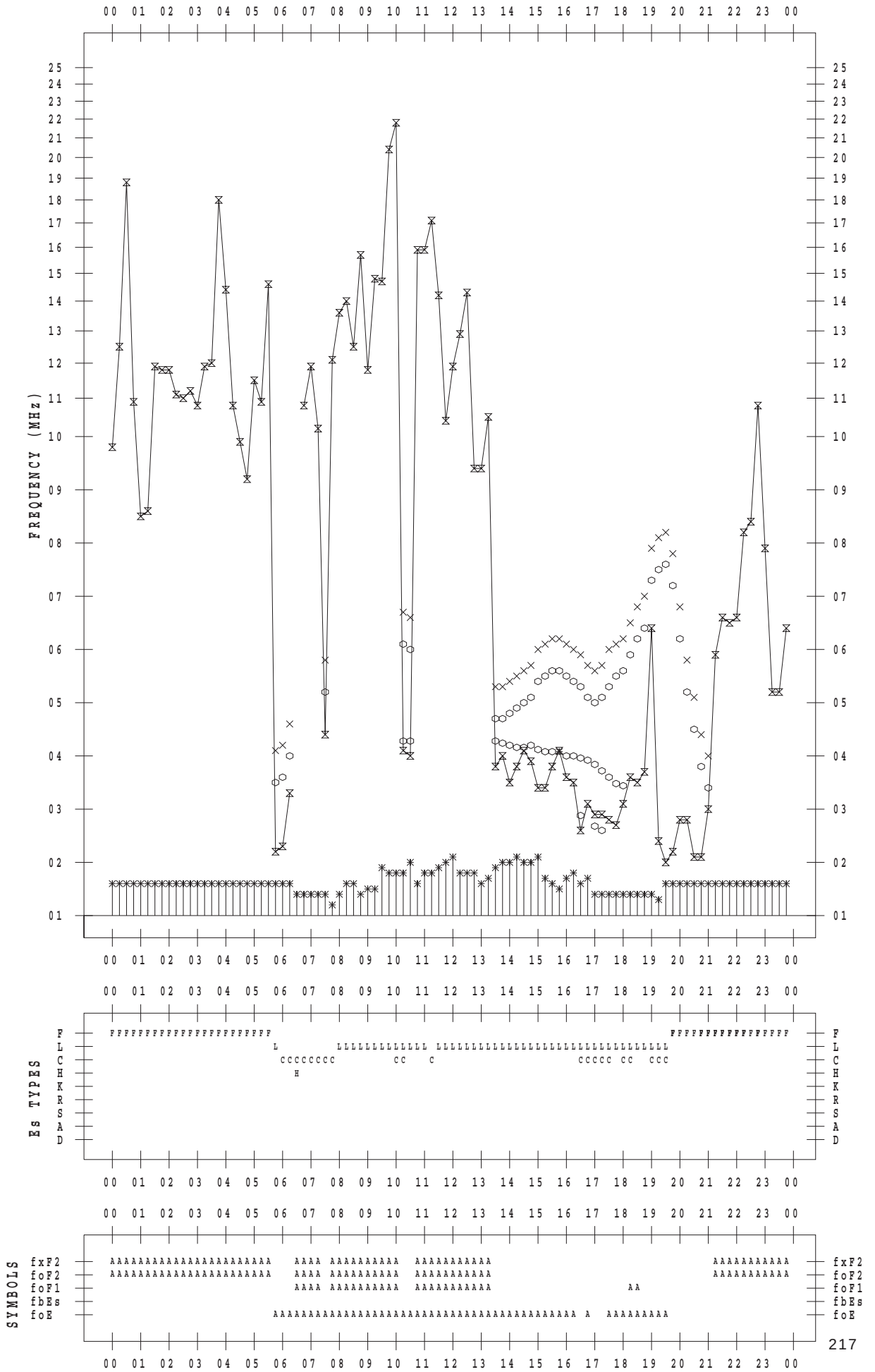
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/17

135 °E MEAN TIME



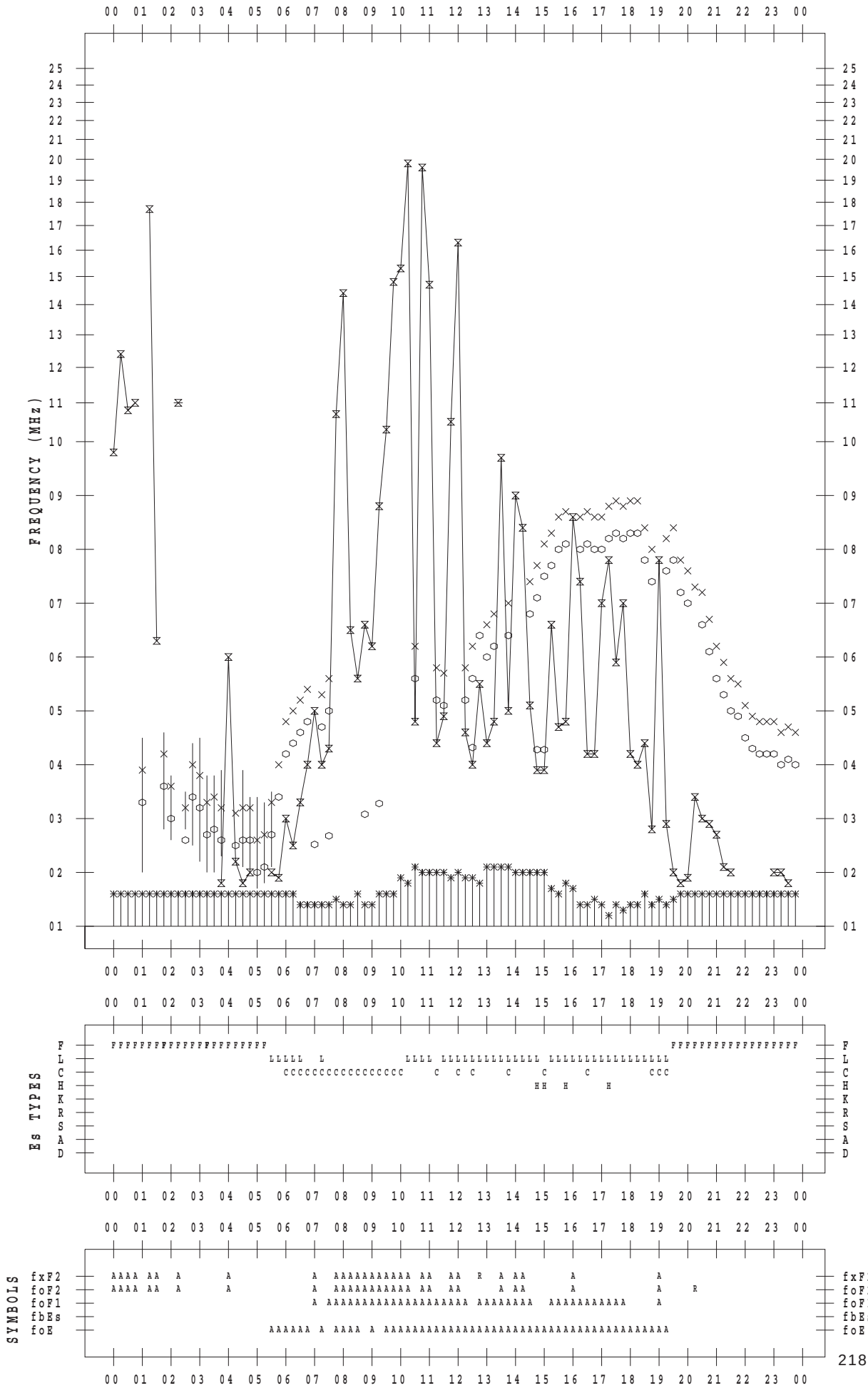
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/18

135 °E MEAN TIME



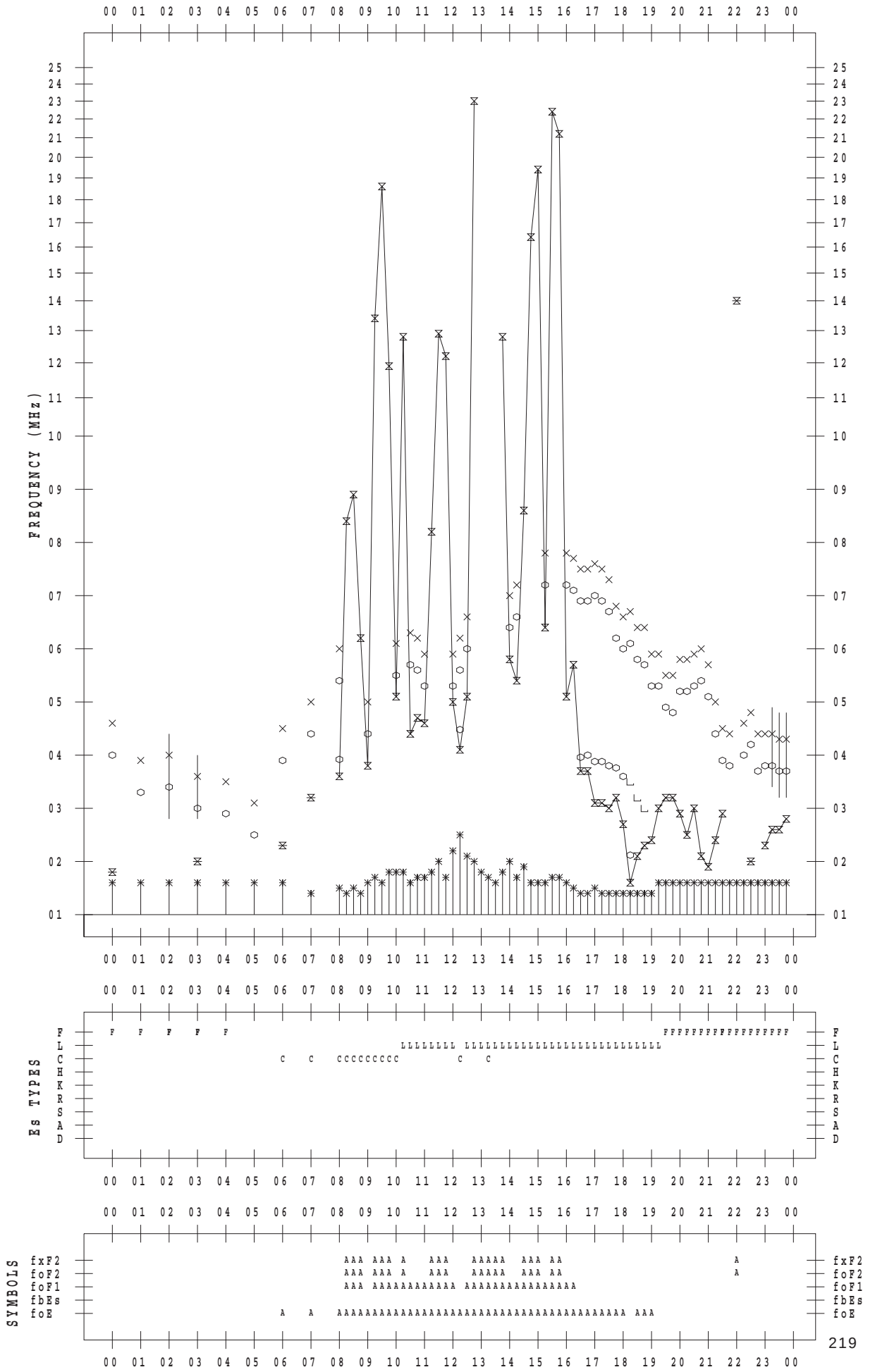
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/19

135 °E MEAN TIME



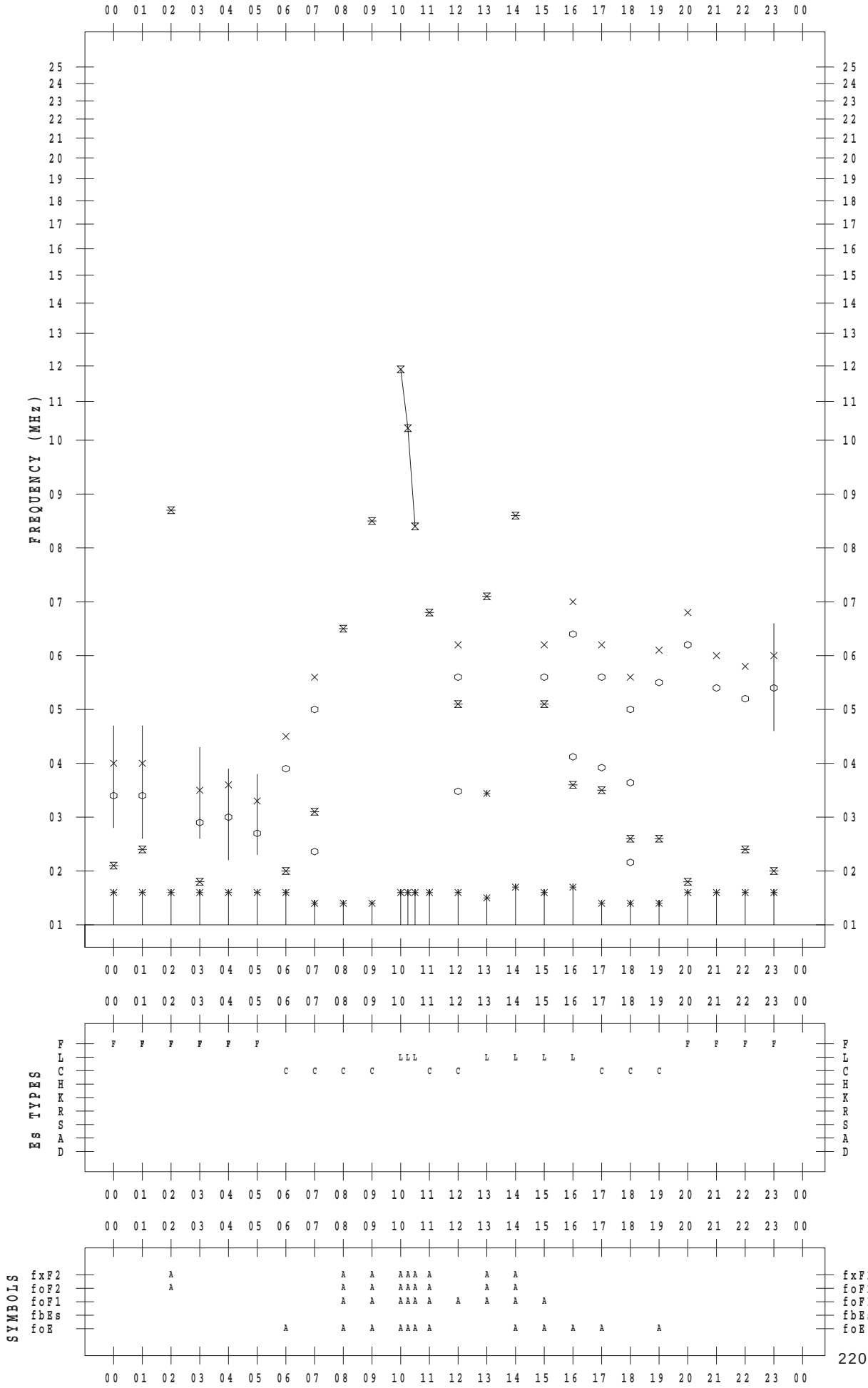
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/20

135 °E MEAN TIME



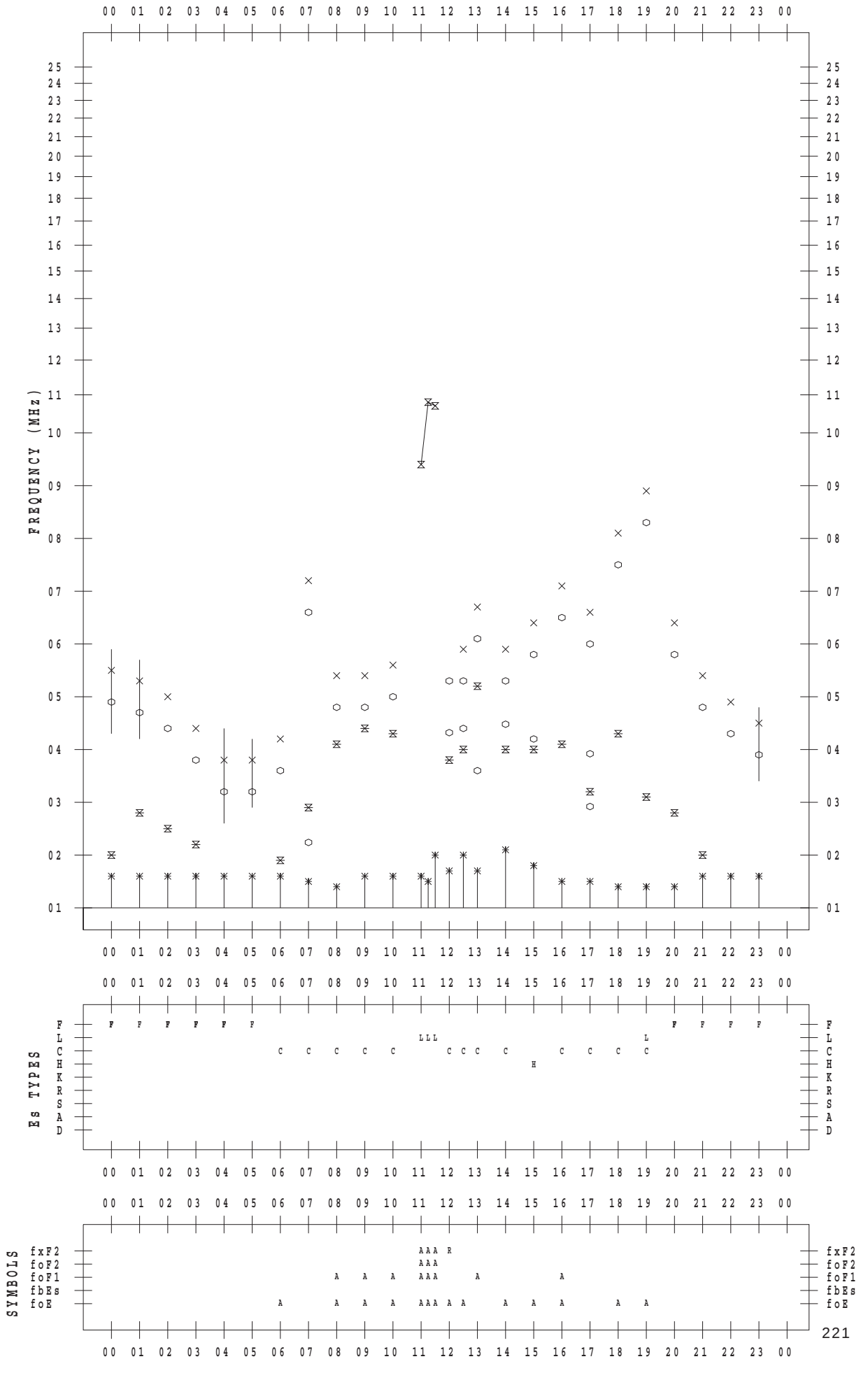
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/21

135 °E MEAN TIME



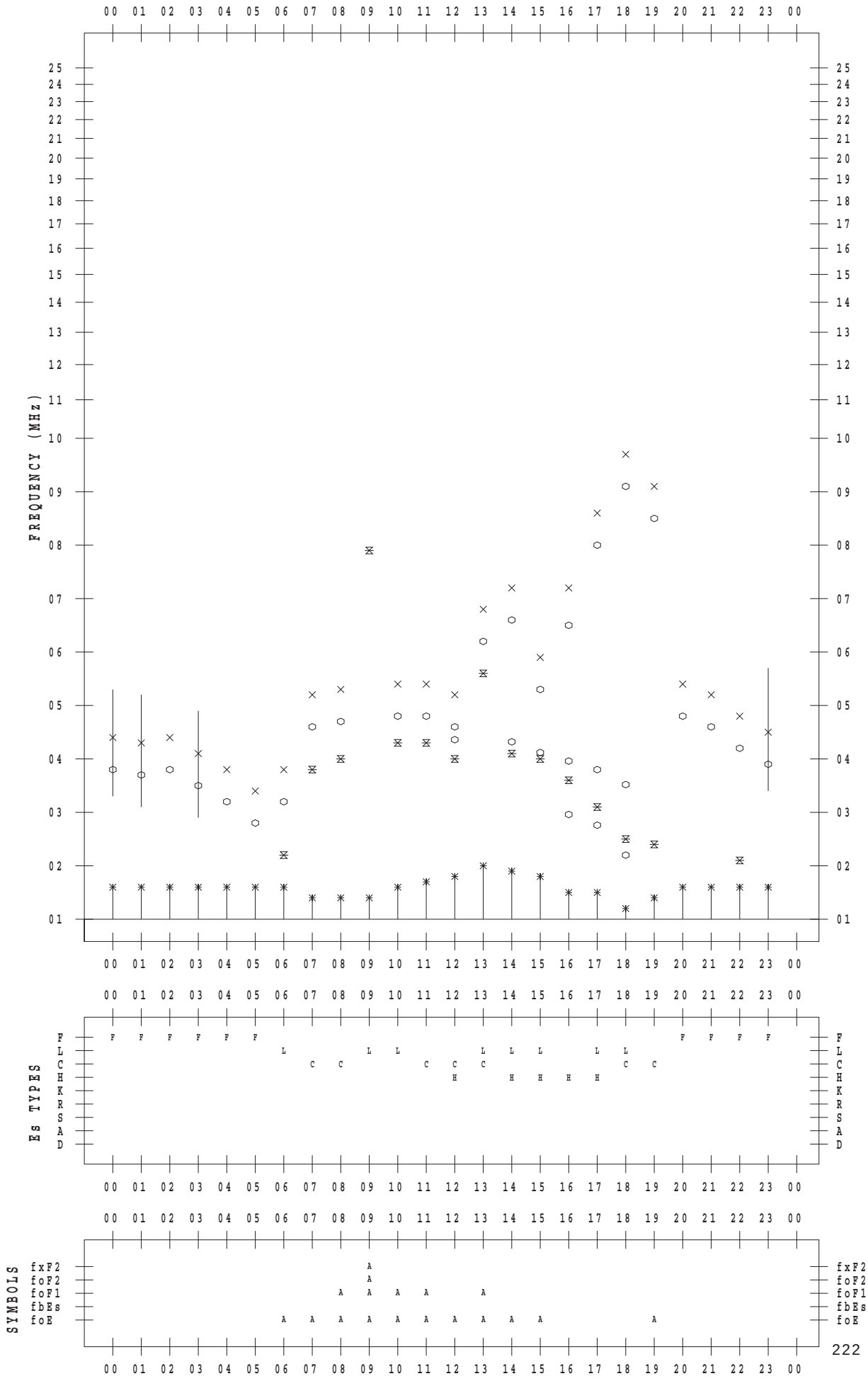
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/22

135 °E MEAN TIME



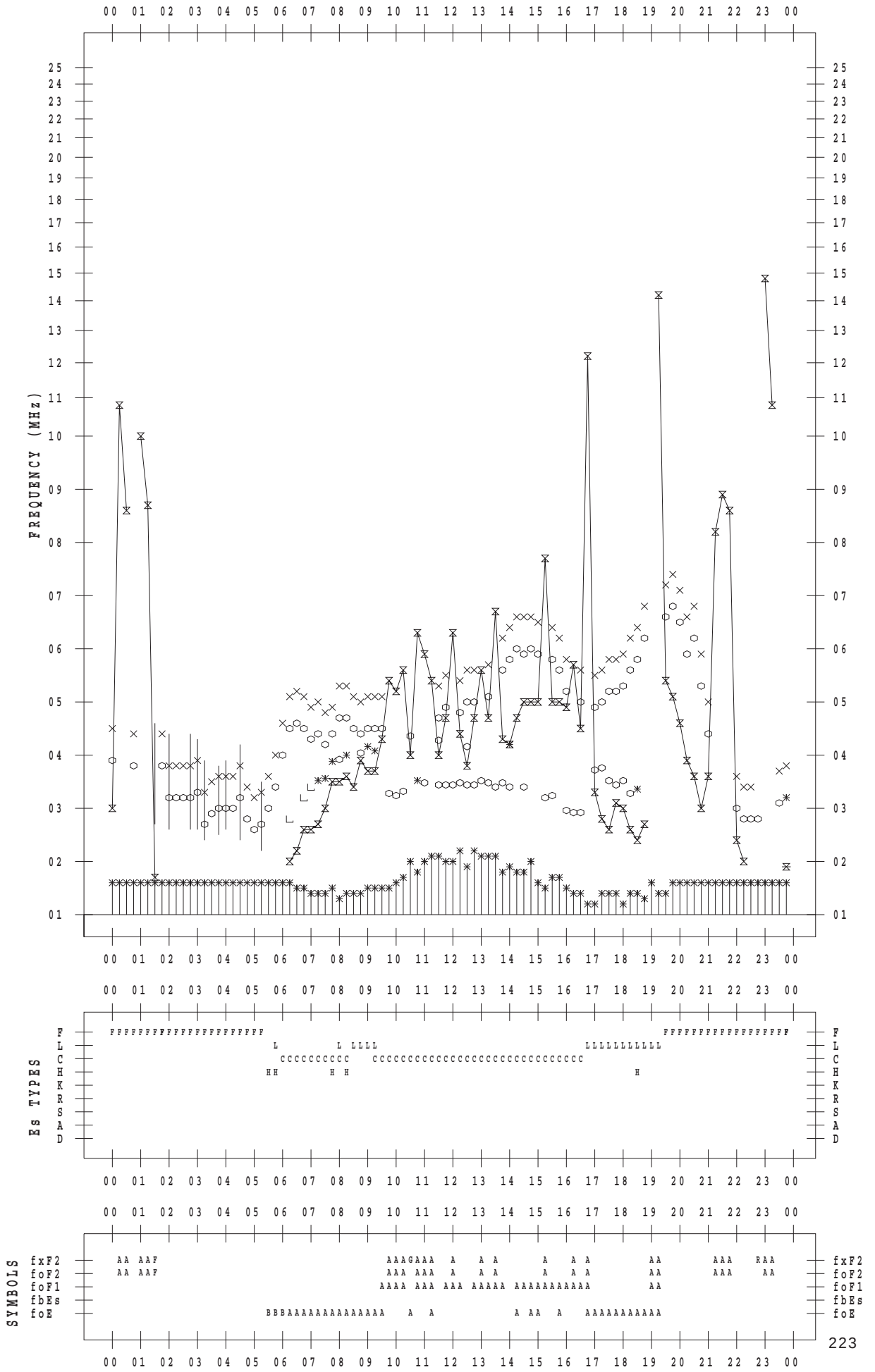
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/23

135 °E MEAN TIME



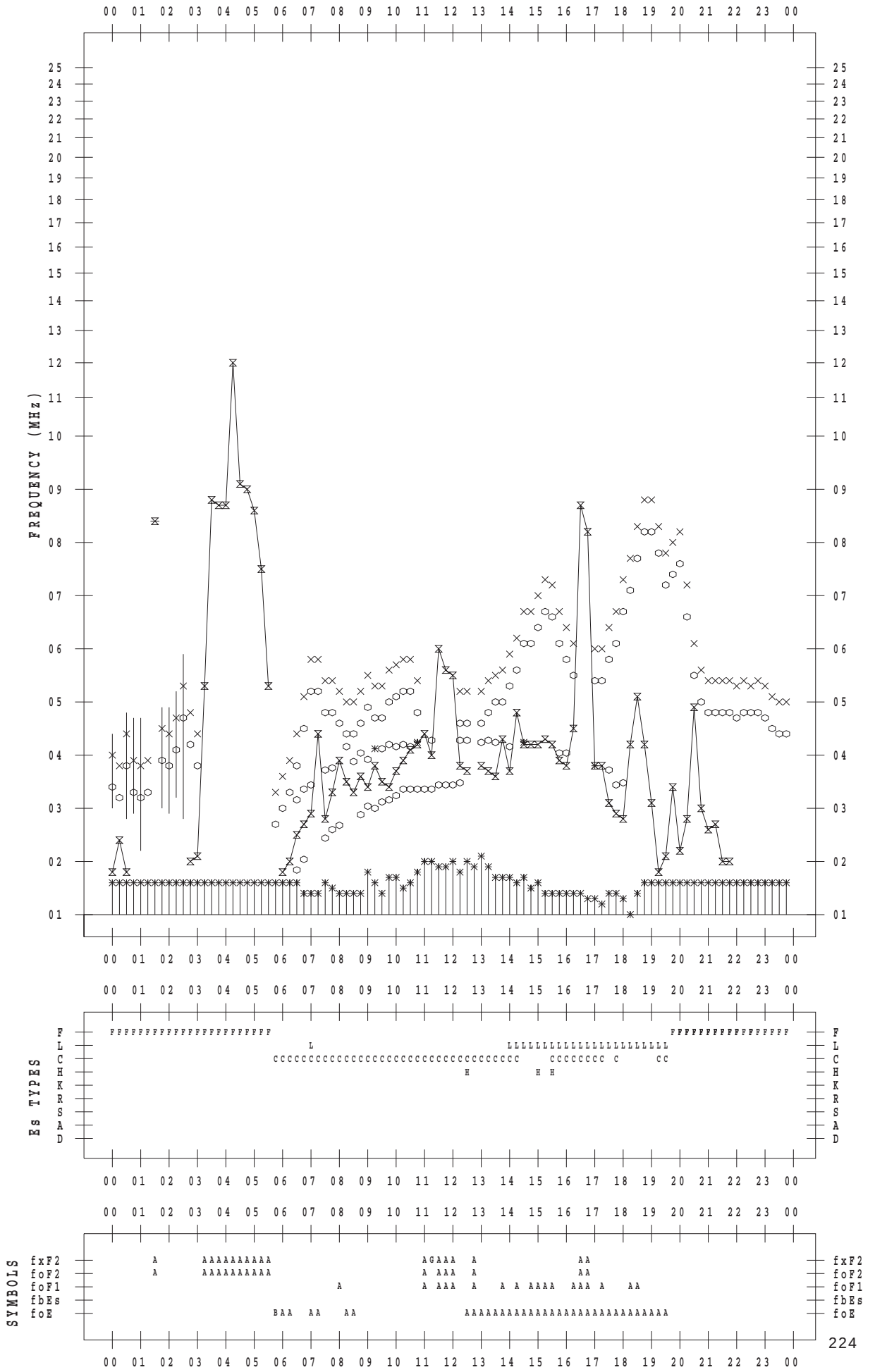
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/24

135 °E MEAN TIME



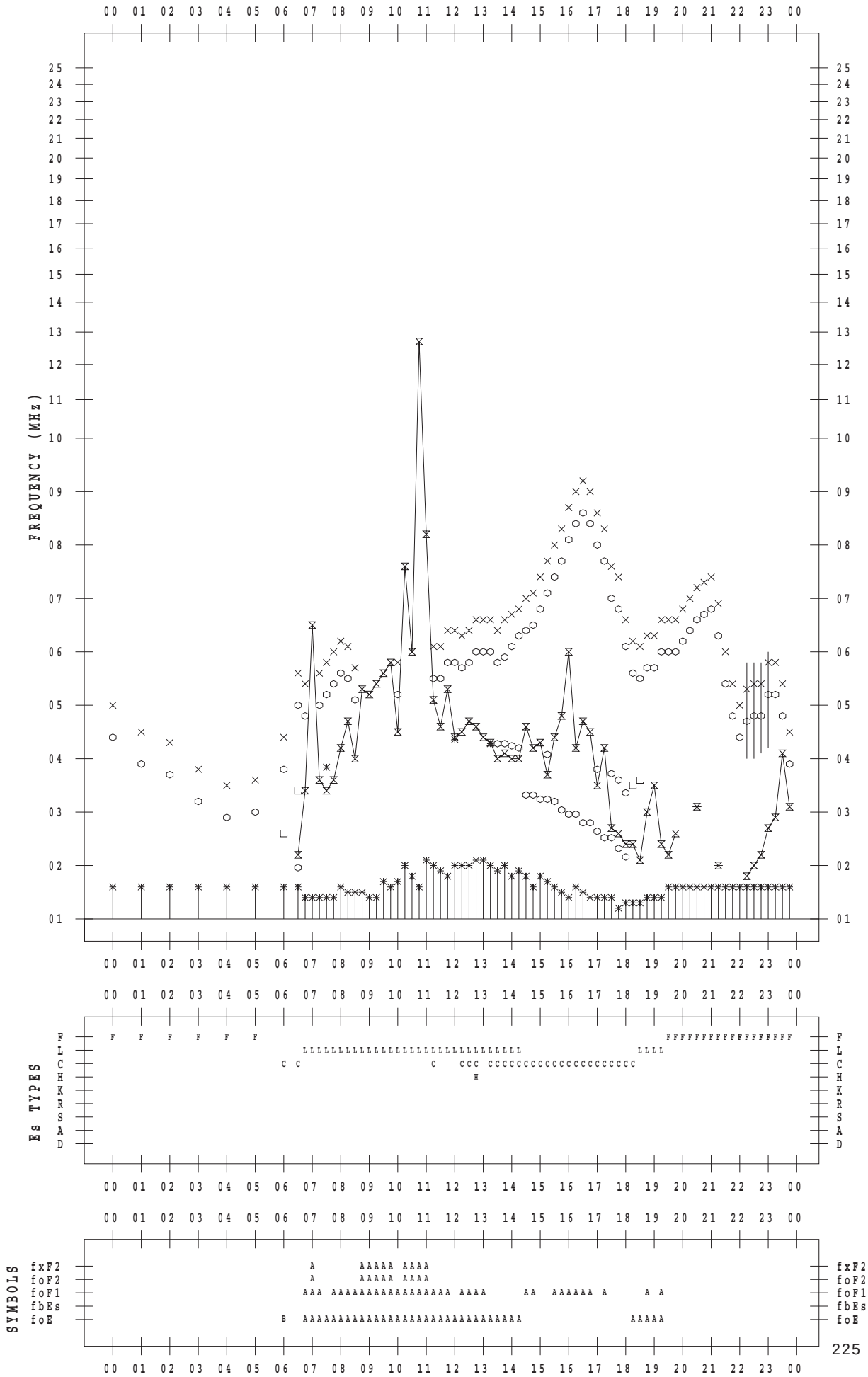
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/25

135 °E MEAN TIME



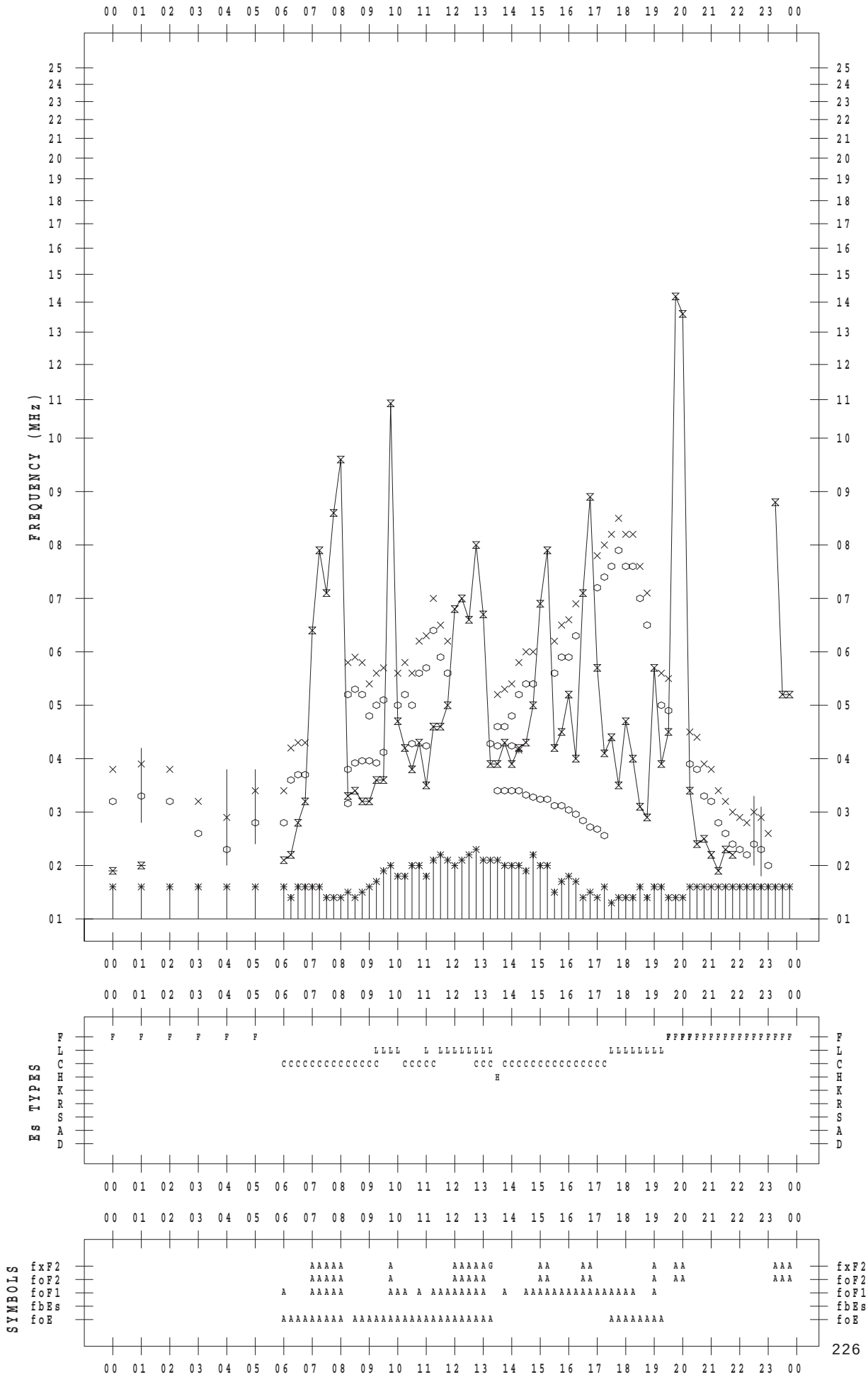
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/26

135 °E MEAN TIME



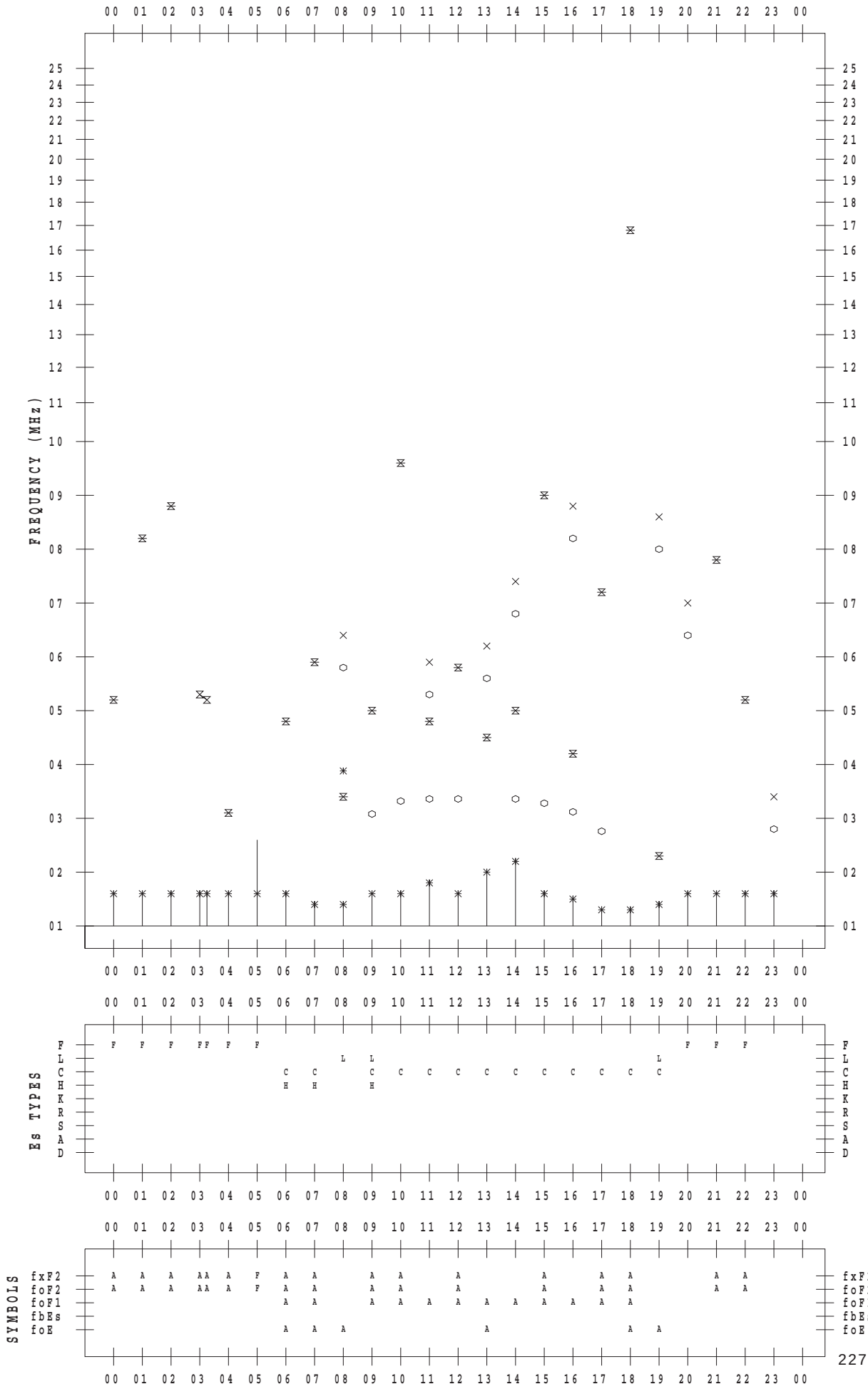
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/27

135 °E MEAN TIME



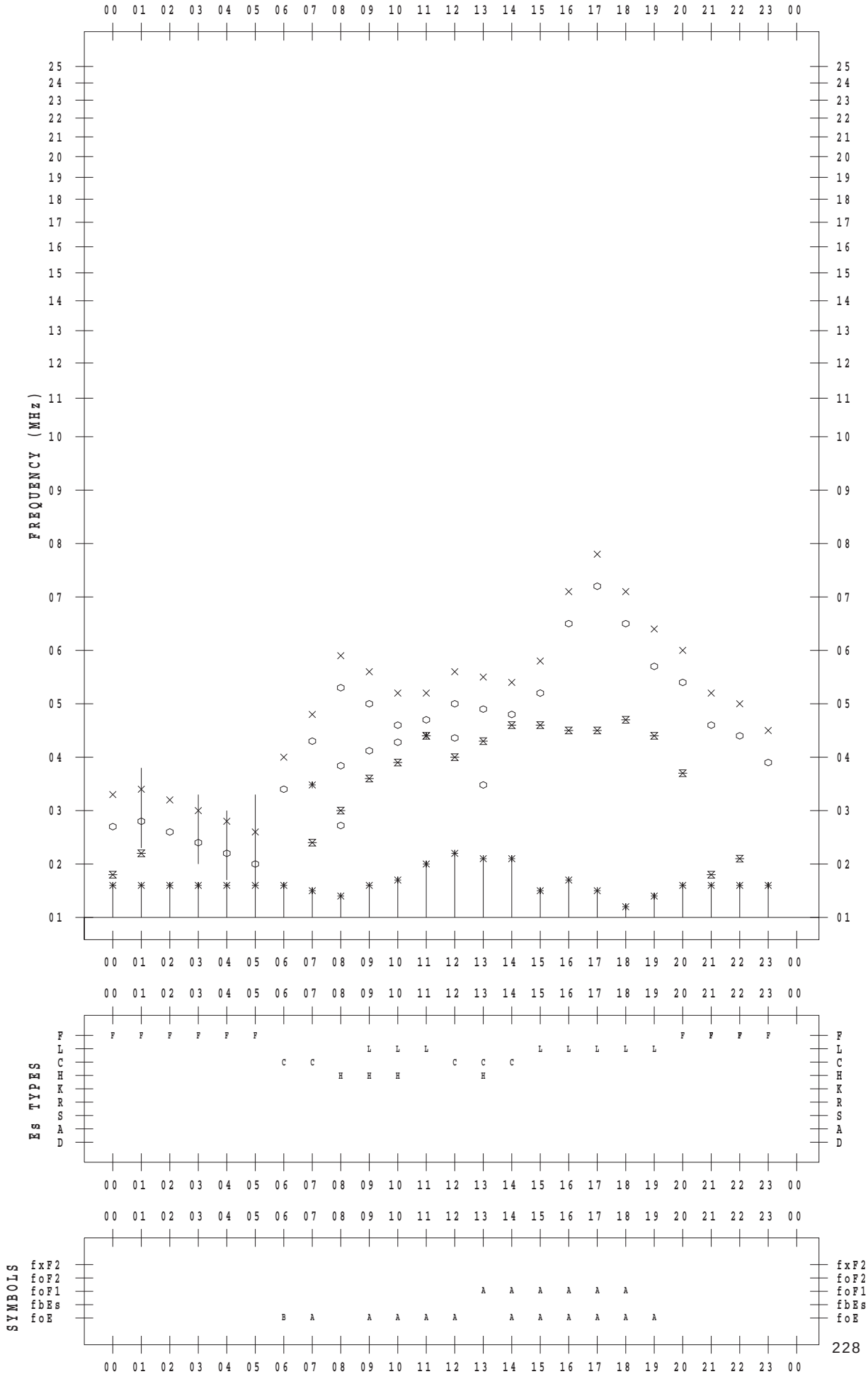
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/28

135 °E MEAN TIME



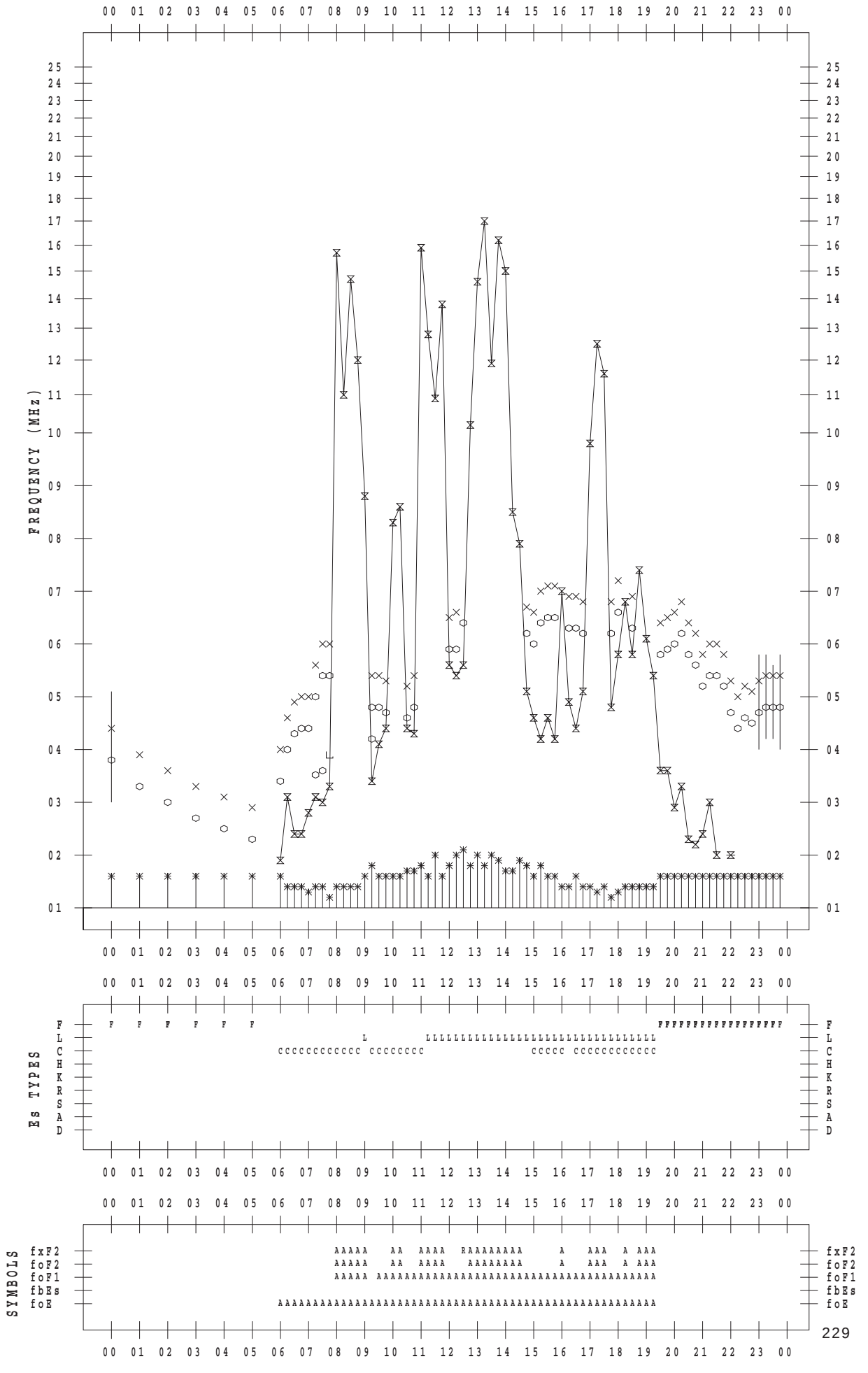
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/29

135 °E MEAN TIME



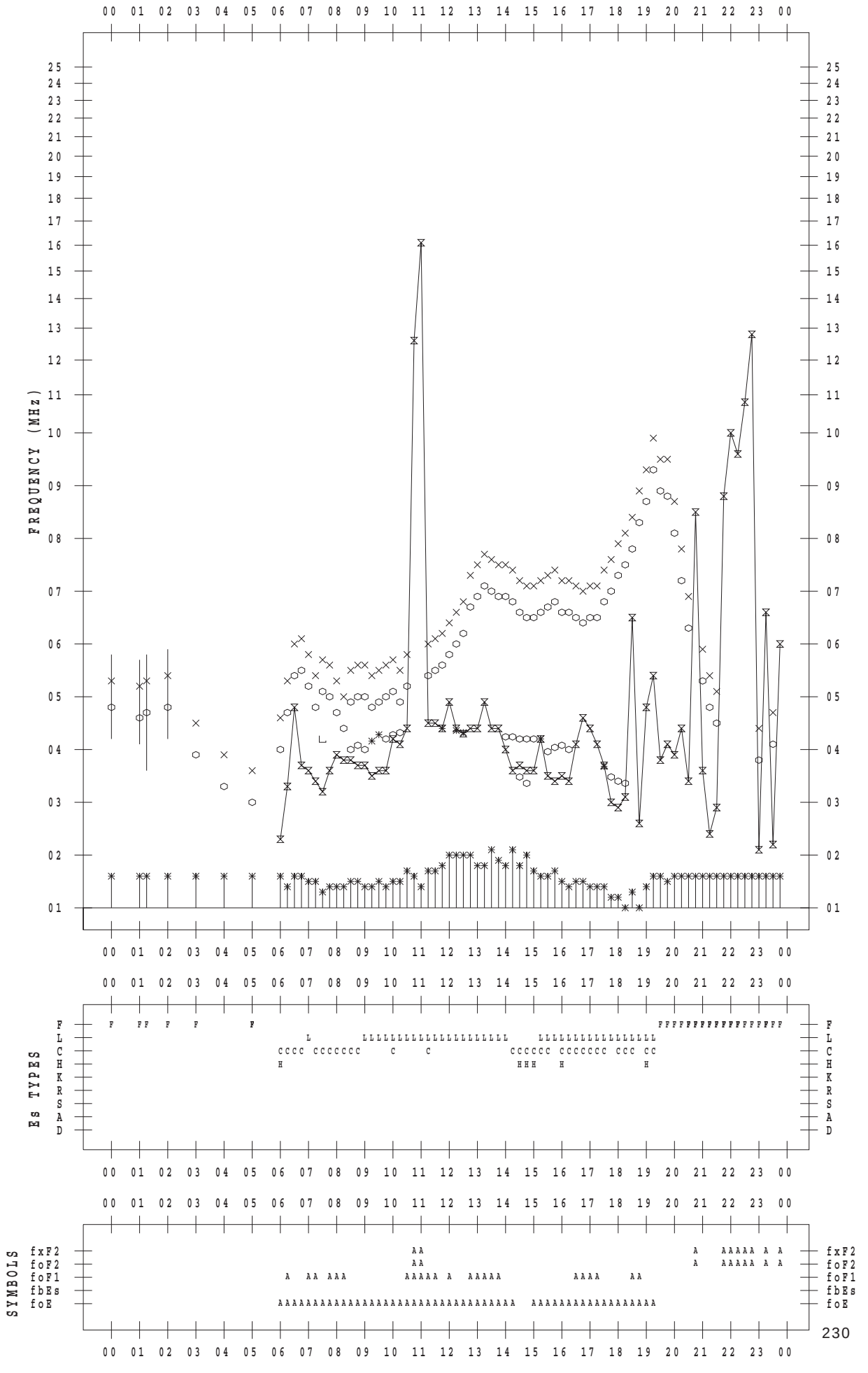
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/ 7/31

135 °E MEAN TIME