F-850

IONOSPHERIC DATA IN JAPAN

FOR OCTOBER 2019

VOL. 71 NO. 10

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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

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	51	42	40	38	36	29	41	38	51	64	58	A	50	54	52	54	54	48	40	40	34	32	33	A
2	34	34	32	32	32	32	40	45	51	52	52	51	54	54	50	48	47	47	36	34	38	34	34	34
3	30	30	30	49	A	A	A	49	48	57	56	56	58	48	50	45	49	50	52	44	36	189	34	30
4	34	34		34	37	A	43	44	47	53	57	56	59	57	56	51	57	47	43	46	43	36	40	40
5	36	40	36	37	40	37	51	43	47	52	64	58	57	54	56	49	50	58	50	48	47	43	42	38
6	42	42	39	42	40	34	36	45	51	45	51	61	54	54	52	50	55	50	41	42	34	34	36	37
7	36	34	40	38	29	34	42	48	48	54	58	55	57	54		50	47	46	40	40	42	40	40	37
8	34	34	31	34	36	34	44	49	54	62	62	62	58	54	50	52	51	47	A	A	42	42	49	44
9	42	42	37	44	43	34	34	47	50	59	71	61	56	58	50	51	56	53	46	43	40	40	34	34
10	35	36	A	34	30	29	41	49	51	61	68	61		56	51	54	52	56	49	51	N	A	A	A
11	A	A	32	34	34	30	40	53	54	62	70	68	59	62	52	52	50	60	A	50	50	42	37	36
12	40	42	43	43	40	35	42	48	N	58	68	61		65	55	52	56	A	A	50		52	54	48
13	42	42	51	49	49	44	44	51	46	51	68	71	67	60	51	52	50	51	34	A	36	42	44	50
14	42	44	44	50	44	44	45	50	54	64	61	64	65	60	58	52	47	50	A	38	24	34	34	A
15	36	34	36	36	36	30	42	48	52	62	65	74	65	59	53	50	54	54	38	43	42	41	40	44
16	47	45	43	34	47	40	46	58	50		63	67	60	61	56	55	58	63	50	52	44	28	40	41
17	46	47	47	43		40	50	N	60	58	68	75	68	63	56		61	48	40	34	48	48	44	47
18	47	47	41	46	51	34	40	50	52	62	65	67	70	64	60	52	54	56	41	45	44	40	39	43
19	42	40	39	39	50	29	38	52	52	64	79	85	59	56	56	58	51	51	45	47	42	44	42	42
20	42	42	42	42	47	44	50	29	45	65	69	75	64	59	53	57	50	47	38	42	43	44	42	54
21	37	42	43	40	35	34	42	52	29	64	71	64	62	65	60	53	55	54	A	36	A	40	A	A
22	42	42	47	42	42	39	48	48	51	57	65	58	65	62	53	51	54	51	34	40	40	30	36	40
23	35	40	44	43	43	40	43	52	64	57	67	58	66	N	54	50	54	52	34	54	42	40	43	42
24	42	42	49	50	51	45	44	46	54	N	58	62	54	64	58	52	58		37	46	46	43	47	47
25	48	48	42	49	45	46	49	48	50	A	68	78	89	58	62	70	69	43	37	40	38	34	A	38
26	38	A	36	A	A	31	40	44	84	89	60	65	A	68	63	58	64	49	32	40	40	A	A	34
27	A	34	32	31	30	A	54	42	47	50	52	75	70	59	55	52	49	A	34	34	A	A	35	32
28	30	31	28	28	34	36	38	42		60	50	65	A	58	66	55	54	40	36	34	34	35	36	37
29	34	34	37	A	A	34	35	50	52	60						C	C	37	36	A	38	A	42	
30	44	48	46	44	42	32	32	46	46	60	62	65	C	C	C	C	C	C	C	29	32	34	34	34
31	34	36	36	34	34	34	39	54	58	C	C	70	64	64	C	C	C	C	C		44	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	29	29	29	29	27	28	30	30	29	27	29	29	25	28	27	27	28	26	24	27	27	26	26	25
MED	40	42	40	40	40	34	42	48	51	60	64	64	60	59	55	52	54	50	39	42	42	40	40	40
U Q	42	42	43	44	45	40	45	50	54	62	68	70	65	62	58	54	56	54	44	47	44	43	42	44
L Q	34	34	36	34	34	32	40	45	47	54	58	59	57	55	52	50	50	47	36	38	36	34	35	35

HOURLY VALUES OF fEs AT Wakkanai

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	28	G	G	G	34	G	52	55	45	G	G	33	33	32	G	G	G	G	G	39
2	24	26	24	G	29	28	G	30	34	G	69	52	38	40	39	41	29	G	39	29	34	26	176	29
3	G	G	28	30	37	41	43	33	35	36	G	G	40	113	35	G	125	29	35	35	26	180	26	59
4	G	G		G	94	41	32	59	115	60	G	G	G	G	84	39	31	G	G	G	24	G	G	G
5	G	G	G	G	G	G	48	93	37	G	42	G	G	36	40	38	34	36	27	G	G	G	G	G
6	G	G	G	33	G	G	34	32	40	41	90	42	37	G	40	38	34	G	G	G	G	G	25	G
7	G	G	G	G	35	G	26	38	36	56	42	43	G	37		39	126	33	28	26	G	G	G	23
8	G	G	G	G	G	G	28	34	36	43	43	37	45	52	G	32	33	35	129	28	G	27	29	46
9	32	G	G	27	G	G	G	30	36	43	40	55	42	G	36	35	37	39	158	24	G	G	G	G
10	26	32	39	28	G	26	121	31	38	90	40	G		G	G	G	G	30	34	27	48	54	43	40
11	39	53	35	27	25	G	G	31	35	38	39	82	44	49	G	G	29	41	53	39	32	33	G	G
12	27	29	G	93	G	G	G	33	151	40	66	48		G	42	36	36	63	82	28		G	39	38
13	27	G	G	G	34	34	157	36	54	36	55	G	69	53	38	34	40	28	33	46	33	36	24	34
14	29	30	23	G	G	G	28	32	38	36	G	G	44	G	G	36	32	34	70	36	32	G	28	43
15	29	25	24	28	26	G	40	50	34	39	47	108	38	36	G	G	G	20	G	G	G	G	G	38
16	57	36	32	24	G	35	G	G	124		40	40	39	48	36	56	G	20	50	G	32	40	G	G
17	G	24	G	G		25	G	29	33	52	53	39	41	49	49		28	44	G	33	G	25	G	G
18	G	G	G	G	20	36	127	38	34	34	45	41	G	45	G	36	G	28	G	G	G	G	G	28
19	G	G	G	G	G	25	30	37	34	49	42	46	38	48	34	34	28	11	G	G	G	G	34	36
20	50	35	26	G	30	27	24	156	52	46	39	38	G	35	40	34	34	34	34	G	G	G	38	34
21	31	128	32	30	G	G	34	30	39	41	41	41	43	91	35	G	31	36	38	49	157	53	92	58
22	44	31	25	28	30	26	21	29	34	43	46	46	84	50	G	G	32	23	G	G	G	G	G	G
23	G	G	G	G	32	G	40	39	38	54	40	45	42	38	54	35	33	27	35	60	58	38	G	G
24	G	24	G	G	G	G	126	46	108	39	41	50	61	36	33	37	37		124	58	25	26	32	38
25	53	30	39	G	G	G	33	38	44	60	42	46	38	G	36	G	29	33	G	26	27	G	57	36
26	39	40	38	41	39	29	G	36	56	40	84	38	86	105	46	39	G	34	33	35	32	43	56	24
27	59	35	24	G	26	40	53	32	43	70	G	41	36	46	G	31	40	48	G	25	34	28	G	27
28	G	G	G	G	G	G	56	59		53	52	101	90	56	G	G	28	23	G	G	30	G	G	G
29	26	27	33	27	38	32	25	28	33	41						C	C	11	25	41	59	34	35	
30	40	G	G	G	G	G	G	36	42	42	37	G	C	C	C	C	C	C	C	G	G	G	G	G
31	G	G	G	G	G	G	11	G	60	C	C	108	93	40	C	C	C	C	C		35	70	59	92
	00	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	30	31	30	31	31	31	30	29	29	30	27	29	27	27	28	28	29	30	30	31	31	30
MED	26	24	G	G	10	G	28	33	38	41	42	42	41	40	35	34	32	31	33	26	26	G	24	28
U Q	39	31	28	28	30	29	43	38	52	52	52	50	45	49	40	38	35	35	44	35	33	36	38	38
L Q	G	G	G	G	G	G	G	30	34	37	39	37	37	G	G	G	28	21	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

OCT.2019

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

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

HOURLY VALUES OF foF2 AT Kokubunji

OCT. 2019

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

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

HOURLY VALUES OF fEs AT Kokubunji

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	29	G	G	G	G	G	G	34	G	G	G	G	G	G	G	G	G	28	11	G	G	G	G	32
2	G	G	33	G	G		G	85	G	43	38	39	G	39	G	G	G	G	G	11	G	G	G	G
3	G	92	40	G	81	34	33	G	34	G	G	39	G	45	50	41	47	48	30	37	G	33	G	G
4	G	26	G	G	G		26	G	G	40	G	G	G	G	G	61		63	11	G	G	G	G	G
5	G	G	G	G	G	G	41	33		G	40	G	G	G	G	38	34	G	47	34	G	G	G	G
6	G	G	G	G	G	G	G	33	G	38	86	40	G	G	37	G	35	36	28	33	47	32	G	G
7	G	G	G	G	G	G	33	32	43	54	41	40	G	G	G	47	G	G	30	29	G	G	G	G
8	G	G	G	G	G	G	26	33	G	51	39	39	G	G	G	34	G	27	28	G	35	32	G	G
9	G	G	G	G	G	G	26	35	42	G	41	G	G	G	G	G	31	32	26	G	G	G	G	G
10	G	G	G		G	G	G	34	37	G	40	39	G	G	43	53	56	34	27	47	25	65	49	G
11	57	47	40	31	G	27	32	45	57	53	50	55	71	G	G	G	40	62	143	112	114	60	60	29
12	44	41	26	26	29	G	26	32	40	41	45	39	51	45	47	52	35	34	57	48	49	52	46	24
13	32	G	G	G	G	32	38	32	35	39	53	72	55	46	41	G	37	48	39	36	70	69	60	30
14	33	49	49	G	40	53	46	35	36	G	47	41	70	N	G	G	G	G	36	55	46	49	50	29
15	27	G	G	G	G	G	36	41	G	G	55	40	G	G	G	36	34	37	38	31	G		G	G
16	G	G	G	G	11	G	40	G	G	G	38	40	C	G	G	G	54	29	29	34	48	G	26	G
17	41	35	29		G	G	34	G	34	G	G	40	G	G	36	48	42	35	84	G	G	G	55	31
18	28	30	28	G	36		34	33	G	G	43	G	39	G	G	40	117	26	24	29	33	28	G	G
19	G	G	G	24	22	G	G	G	38	G	94	56	39	42	45	42	G	33	27		G	G	40	27
20	G	G	G	G	G	G	G	G	G	36	53	54	38	G	36	G	37	11	11	G	24	G	G	
21	G	G	G	29	G		G	36	33	43	127	51	45	43	50	78	37	45	54	54	49	45	55	45
22	49	40	G	G	24	G	37	29	35	G	38	G	38	39	G	33	63	57	74	69		50	45	28
23	29	28	G	31	25	G	32	47	49	40	39	G	G	G	52	52	60	78	59	39	G	53	40	34
24	37	32	36	29	41	43	28	37	46	42	50	54	51	41	41	57	39	31	26	29	37	50	79	55
25	53	35	32	G	G	G	23	39	43	38	40	G	47	G	40	37	35	47	37	32		29	53	34
26	G	G	G	G	29	G	G	G	33	67	G	93	55	G	G	G	94	144	130	49	33	29	49	36
27	G	G	G	G	G	G	G	34	G	G	42	G	38	G	G	47	G	G	G	32	71	50	31	26
28	G		G	G	G		G	44	G	G		G	G	45	G	33	29	46	G	G	G	G		G
29	G	G	26	27	28	24	27	G	G	40	49	51	41	43	42	43	40	40	46	50	48	54	32	G
30	27	G	G	G	G	G	G	31	43	52	40	60	57	71	53	40	41	27	24	25	41	G	28	G
31	G	G	G	G	G	G	11	43	41	G	41	101	41	113	51	G	41	57	35	30	31	40	33	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	29	31	26	31	31	30	31	30	31	30	30	31	31	30	31	31	30	29	30	30	30
MED	G	G	G	G	G	G	26	33	34	36	41	40	38	G	G	37	37	34	30	32	31	30	32	G
U Q	32	32	28	12	25	G	34	37	41	42	50	54	47	43	43	47	42	48	47	47	47	50	49	30
L Q	G	G	G	G	G	G	G	G	G	G	38	G	G	G	G	G	29	27	24	11	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	15	14	14	14	21	13	18	17	44	42	42	42	39	17	26	18	14	13	17	18	20	13
2	14	17	13	14	14		18	13	15	18	22	42	21	39	40	18	24	17	14	14	18	14	14	13
3	18	13	14	14	15	14	13	14	13	17	15	17	42	20	18	15	15	13	13	14	14	13	14	14
4	14	14	13	15	14		25	14	13	14	14	14	33	40	30	17		13	13	14	15	13	14	18
5	14	13	17	14	14	17	17	13		18	20	42	30	33	18	15	20	14	13	14	14	17	14	14
6	15	14	13	14	14	14	18	14	17	20	23	32	41	22	28	17	15	13	13	13	13	13	14	15
7	14	14	14	13	14	18	14	14	14	14	20	34	42	42	20	13	14	15	13	14	13	14	14	14
8	14	20	14	14	13	13	15	13	13	18	18	44	39	33	18	14	14	13	13	14	13	13	15	14
9	14	17	14	13	13	18	13	15	14	15	17	17	14	17	15	14	13	15	14	13	21	17	18	14
10	17	13	18		17	13	17	13	13	14	18	18	39	21	21	15	13	13	13	13	14	14	13	13
11	13	15	13	13	18	14	13	14	14	15	17	23	21	31	15	13	13	14	13	14	13	14	13	14
12	13	13	13	14	13	14	18	13	15	17	20	23	21	22	20	14	13	14	13	13	14	13	13	13
13	13	13	18	15	15	13	14	13	14	15	18	15	17	23	14	13	20	13	14	13	13	13	13	14
14	14	14	13	20	13	14	13	14	15	14	18	22	21	15	13	13	14	20	13	13	14	13	14	13
15	13	13	14	14	13	14	18	14	14	17	18	18	40	40	29	18	17	17	14	14	18		14	14
16	13	15	13	14	13	14	18	13	17	15	18	23	C	39	18	15	14	13	14	14	14	13	13	14
17	13	14	13		14	17	17	13	18	18	21	18	39	31	21	17	14	13	13	15	14	14	14	13
18	14	14	14	14	14		13	14	14	14	17	17	17	18	14	18	15	14	14	13	13	15	14	14
19	14	14	14	13	13	13	14	14	14	14	32	18	17	17	14	17	13	14	14		23	14	14	14
20	14	14	14	14	14	14	14	13	14	17	39	18	15	17	13	17	14	17	14	15	14	17	14	
21	14	14	14	13	18		17	14	13	17	18	18	15	15	17	14	13	14	14	14	14	13	13	13
22	14	14	15	14	14	15	15	14	14	14	17	17	20	20	15	15	17	13	14	14		14	14	15
23	15	13	14	14	15	14	14	24	17	17	17	34	33	31	29	18	14	18	15	14	15	13	15	13
24	14	14	13	13	14	15	14	13	14	15	18	20	22	23	14	14	13	13	14	14	13	14	14	13
25	14	14	13	14	17	14	14	14	14	13	14	18	20	20	15	17	14	14	14	13		13	14	15
26	17	18	14	13	13	14	14	13	14	17	17	17	22	21	28	30	14	14	14	13	13	14	14	13
27	15	14	13	13	15	14	14	15	14	18	15	39	31	31	20	15	23	14	14	14	14	14	14	14
28	14		14	14	13		14	13	14	20		15	22	14	14	14	13	14	15	17	14	14		17
29	14	14	14	14	13	14	13	23	14	17	13	18	20	17	14	17	17	14	14	13	18	13	14	14
30	14	13	14	14	13	14	14	13	14	17	18	15	14	14	14	23	17	15	14	14	14	14	14	14
31	14	18	13	13	14	14	13	14	14	20	18	20	22	20	20	14	14	15	13	13	13	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	30	31	29	31	26	31	31	30	31	30	31	30	31	31	31	30	31	31	30	29	30	30	30
MED	14	14	14	14	14	14	14	14	14	17	18	18	22	22	18	15	14	14	14	14	14	14	14	14
U Q	14	14	14	14	15	14	17	14	15	18	20	32	39	33	21	17	17	15	14	14	15	14	14	14
L Q	14	13	13	13	13	14	14	13	14	14	17	17	20	17	14	14	13	13	13	13	13	13	14	13

HOURLY VALUES OF foF2 AT Yamagawa

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42	42	42	40	38	34	32	54	54	72	72	73	84	72	59	61	74	77	65	36	34	32	A	32
2	31	32	49	31	28	N	34	49	52	58	58	70	72	72	60	55	58	55	67	48	N	28	29	30
3	30	29	30	26	B	B	A	25	43	51	64	56	60	49	54	52	48	58	47	43	N	26	N	N
4	26	26	N	26	26	B	29	45	53	55	47	54	57	A	73	70	63	189	50	44	49	49	32	32
5	34	34	49	30	31	26	30	51	52	57	57	56	69	82	78	67	65	55	52	41	28	30	32	30
6	32	32	30	34	A	N	31	46	54	51	61	62	85	78	54	62	66	68	64	38	A	A	32	A
7	A	32	31	32	28	N		50	50	54	55	57	74	76	58	56	53	58	64	41	26	30	179	32
8	32	31	32	30	34	34	32	48	52	62	64	61	64	72	67	52	51	54	54	54	38	30	34	35
9	37	38	35	31		N	29	54	60	72	66	69	80	67	62	60	63	67	169	42	38	28	36	34
10	39	37	28	28	26	29		48	53	56	68	57	64	61	60	67	A	49	72	N	28	N	N	29
11	31	31	30	30	25	49	30	54	69	54	A	89	A	139	63	76	71	67	54	22	A	A	A	A
12	A	29	29	30	30	A	26	54	54	67	70	68	87	82	60	65	60	54	65	A	A	A	A	A
13	32	30	31	31	28	28	31	45	65	74	64	51	70	74	58	57	60	54	57	A	30	A	A	A
14	A	A	A	A	32	30	32	52	67	62	62	59	77	61	64	80	64	54	45	32	29	30	30	30
15	34	31	A	29	29	A	A	44	54	72	65	74	71	67	62	63	74	54	A	40	A	30	30	26
16	32	32	31	29	31	30	27	48	54	53	58	60	68	71	70	66	65	67	59	A	A	A	A	34
17	A	35	37	37	34	B	26	46	64	77	71	61	68	72	65	69	70	51	A	A	28	30	34	34
18	34	A	37	49	A	A	N	42	39	55	75	62	70	79	74	75	71	54	50	32	N	30	A	30
19	30	30	28	32	37	A	N	47	55	54	54	65	62	69	56	63	72	70	52	36	28	29	32	32
20	32	34	34	32	37	N	A	48	59	70	71	63	64	64	64	65	51	54	47	34	34	34	30	30
21	N	30	31	30	34	29	34	45	54	53	56	78	67	A	81	77	66	46	A	A	A	A	A	A
22	A	A	A	A	34	N	N	51	54	60	61	70	72	68	66	68	57	51	38	A	A	A	30	31
23	31	31	A	30	34	N	N	40	48	51	56	62	56	61	65	77	72	51	31	N	A	A	A	30
24	31	34	31	28	A	A	A	40	39	50	51	60	51	68	84	79	64	46	B	34	31	A	A	30
25	A	32	31	A	28	26	N	53	71	71	60	B	82	101	97	87	67	N	29	A	23	40	A	37
26	40	A	36	36	34	34	31	54	54	78	89	91	74	70	69	78	74	66	54	36	40	A	A	37
27	36	36	35	32	30	30	31	52	78	82	83	86	84	81	76	71	60	50	47	A	36	32	A	A
28	A	34	A	28	30	B	N	51	54	N	62	71	N	70	66	60	63	55	47	A	A	32	32	31
29	32	A	31	32	35	B	N	51	65	66	60	74	78	66	72	74	62	51	39	A	A	A	A	31
30	A	A	31	28	28	25	N	48	54	51	61	81	82	80	89	82	58	50	44	25	29	A	A	A
31	32	32	32	34	34	N	28	50	51	45	77	71	71	71	87	72	67	63	54	23	38	32	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	22	25	25	28	26	13	17	31	31	30	30	30	29	29	31	31	30	30	27	19	18	18	14	22
MED	32	32	31	30	31	30	31	48	54	58	62	64	71	71	65	67	64	54	52	36	30	30	32	31
U Q	34	34	35	32	34	34	32	52	60	71	70	73	79	78	74	76	70	66	64	42	38	32	34	34
L Q	31	30	30	29	28	27	28	45	52	53	58	60	64	67	60	61	60	51	47	32	28	30	30	30

HOURLY VALUES OF fEs AT Yamagawa

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	32	36	43	53	47	G	50	46	43	G	31	28	35	G	G	25	G
2	G	G	G	G	G	G	G	29	44	39	41	40	44	46	38	37	36	G	G	48	G	G	G	G
3	G	G	G	G	B	B	93	31	48	40	48	G	47	47	G	51	59	113	57	32	28	G	G	G
4	30	G	G	G	G	B	G	29	34	41	40	41	44	87	44	46	49	44	48	38	25	G	G	G
5	G	G	G	G	G	G	G	31	39	42	38	48	54	45	43	G	34	33	23	41	G	G	G	G
6	G	G	G	G	26	G	G	28	34	108	44	47	46	G	40	G	34	34	33	33	26	32	86	46
7	43	24	27	G	11	G		33	40	39	56	45	45	61	G	40	34	29	29	23	G	G	G	26
8	G	G	G	G	G	G	28	29	32	G	G	48	45	40	41	G	36	31	23	20	22	G	35	G
9	G	G	11	G	G	G	G	32	44	38	40	41	46	44	G	40	34	29	29	24	G	G	G	G
10	G	G	G	G	G	G		32	35	44	40	41	110	43	39	56	92	57	51	41	28	G	G	G
11	40	G	G	26	G	G	G	39	58	79	107	108	91	76	52	50	40	29	25	40	35	46	58	58
12	40	G	G	G	11	26	G	32	38	42	41	42	G	G	42	43	40	38	50	47	39	41	55	28
13	25	29	G	G	G	G	G	27	50	48	38	49	41	44	38	43	60	37	34	115	54	58	58	72
14	47	49	56	35	32	G	32	28	36	38	G	46	61	42	43	39	34	30	11	G	G	G	G	G
15	G	27	41	G	32	72	79	38	40	50	60	74	52	48	50	45	38	44	52	45	25	G	G	G
16	G	G	G	G	G	G	G	48	53	G	46	48	45	48	49	65	47	34	34	49	59	60	43	29
17	40	27	G	G	35	B	G	28	38	42	41	40	G	42	50	55	52	33	79	33	G	G	G	26
18	G	58	G	G	40	25	23	40	45	39	44	42	44	G	57	41	38	28	25	29	39	33	35	27
19	G	G	G	G	40	34	G	137	33	70	38	169	45	46	42	46	38	31	31	31	G	G	26	G
20	28	G	G	29	23	28	27	38	34	41	G	G	46	46	G	36	42	43	24	G	26	32	G	G
21	G	G	G	G	G	34	26	48	55	40	G	61	46	64	46	46	38	48	50	59	32	73	111	79
22	43	58	56	44	G	G	G	29	G	39	54	57	G	46	50	40	37	28	36	54	60	58	G	G
23	G	G	40	24	11	32	G	42	46	39	43	38	47	G	42	52	37	36	36	20	35	28	34	34
24	28	25	40	23	39	36	33	40	42	57	41	46	48	46	41	60	60	44	B	34	24	26	34	27
25	29	29	28	31	G	G	G	28	38	35	G	B	45	G	46	G	33	38	35	38	32	29	53	35
26	38	39	37	G	G	G	G	G	36	36	49	44	39	41	41	42	34	39	31	27	35	44	49	28
27	30	31	28	G	G	G	G	27	33	36	42	43	46	43	44	41	34	G	30	41	39	G	41	45
28	38	35	34	G	26	B	G	32	G	44	46	44	38	38	G	G	52	28	29	32	25	28	26	G
29	G	58	24	G	37	B	G	34	33	70	48	56	53	43	44	41	36	26	44	58	50	40	58	39
30	40	40	G	24	G	30	G	40	48	38	42	48	50	49	57	39	40	29	32	46	G	90	45	45
31	G	25	25	31	24	24	G	30	44	52	41	43	47	50	48	40	35	G	37	32	G	G	71	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	31	31	31	31	30	26	29	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31
MED	G	G	G	G	G	G	G	32	38	41	41	46	46	45	43	41	38	33	32	35	26	26	34	26
U Q	38	31	28	24	26	28	24	39	45	48	48	48	48	48	48	46	47	39	44	46	35	41	53	39
L Q	G	G	G	G	G	G	G	29	34	38	38	41	44	41	39	39	34	29	28	29	G	G	G	G

HOURLY VALUES OF fmin AT Yamagawa

OCT.2019

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

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

HOURLY VALUES OF foF2 AT Okinawa

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	37	37	36	34	28	31	30	45	56	71	74	91	123	121	104	91	99	94	51	54	32	B	28	28
2	29	29	28	26	26	B	N	46	52	67	70	77	90	103	91	86	92	88	78	54	31	B	28	B
3	29	26	29	28	B	B	N	50	58	51	68	46	68	83	91	71	64	66	60	A	A	A	A	26
4	N	A	N	28	N	B	N	48	52	53	59	A	56	70	89	79	67	62	60	40	A	A	30	30
5	29	32	31	29	26	B	N	53	51	61	62	62	70	89	102	86	72	179	52	34	A	29	30	32
6	49	31	30	32	B		N	45	54	50	63	74	77	89	78	72	76	86	51	37	A	A	A	A
7	30	A	28	A	B	A	A	47	52	58	66	64	71	85	74	61	59	65	72	35	B	B	28	28
8	28	28	A	30	28	N	N	39	51	65	82	62	64	81	77	60	52	54	58	64	30	28	28	30
9	31	32	32	31	B	B	B	51	64	62	77	77	169	100	104	90	74	66	51	48	40	34	37	38
10	39	37	35	28	26	26	26	65	54	57	53	67	68	68	75	90	86	72	84	47	A	A	A	B
11	26	30	28	26	25	26	A	54	52	64	61	71	77	75	91	88	82	68	63	A	A	A	A	A
12	28	25	28	29	A	B	59	50	64	67	82	101	121	124	111	98	85	74	64	A	A	A	A	A
13	30	31	28	31	B	N	N	50	60	68	60	75	86	78	85	78	62	67	54	38	28	39	28	59
14	A	A	31	A	31	39	28	52	52	68	65	82	90	90	92	101	111	71	47	32	28	26	28	28
15	29	26	26	26	28	N	N	44	50	67	77	74	73	75	85	86	A	A	54	A	A	A	30	30
16	31	30	28	28	30	N	N	47	51	54	64	77	82	74	88	104	91	65	52	A	A	A	A	28
17	A	31	32	42	N	A	N	49	52	71	85	90	71	76	86	82	75	53	52	36	A	A	A	31
18	30	32	30	28	N	B	N	44	52	55	67	82	75	95	104	90	85	A	52	A	A	26	29	A
19	26	28	29	34	B	B	B	48	50	54	59	73	69	72	86	A	82	72	63	37	A		29	30
20	30	33	30	30	30	B	N	48	66	63	62	78	71	68	78	82	58	56	58	39	59	34	28	28
21	26	28	28	28	29	N		44	51	55	58	80	73	56	80	97	67	65	45	A	29	30	28	49
22	30	B	28	N	N	B	A	A	49	52	65	91	87	72	82	84	73	57	42	30	A	A	A	30
23	29	29	32	30	29	B	A	37	46	51	63	68	67	67	74	91	92	67	40	34	A	A	28	A
24	A	31	29	N	N	B	N	48	52	50	54	72	A	57	88	96	54	A	A	A	A	A	A	A
25	A	49	28	B	A	B	B	51	74	71	67	63	189	97	B	B	79	71	53	51	A	40		34
26	35	A	A	34	32	A		54	65	71	86	101	98	91	101	94	90	80	70	51	51	38	A	A
27	42	43	32	30		26	30	54	72	71	90	111	88	75	105	70	62	51	54	36	A	A	A	30
28	A	A	31	A	A	B	N	54	64	53	67	91	91	94	104	91	72	54	47	38	A	A	32	A
29	32	34	35	31	32	B	B	52	70	66	67	83	88	86	87	79	50	48	50	46	38	32	31	32
30	A	A	34	37	29	B	A	46	54	62	67	86	95	86	104	90	60	55	44	41	31	32	34	34
31	A	A	32	32	28	A	N	44	54	60	78	88	67	67	91	93	72	67	67	50	A	A	A	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	23	28	25	16	5	5	30	31	31	31	30	30	31	30	29	30	28	30	23	11	12	18	21
MED	30	31	30	30	28	26	30	48	52	62	67	77	77	81	88	88	74	66	54	39	31	32	28	30
U Q	32	33	32	32	30	35	44	52	64	67	77	88	90	91	102	92	85	72	63	50	40	36	30	33
L Q	29	28	28	28	27	26	27	45	51	54	62	71	70	72	82	79	62	56	51	36	29	28	28	28

HOURLY VALUES OF fEs AT Okinawa

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	60	30	130	G	G	46	45	40	G	44	58	32	34	31	30	B	G	G
2	G	G	G	G	G	B	G	28	34	44	71	G	G	46	46	40	37	G	G	48	G	B	G	B
3	G	G	G	G	B	B	G	27	38	G	G	40	48	49	49	46	46	42	40	43	54	40	25	G
4	G	28	G	G	G	B	G	28	39	41	42	87	50	54	43	47	64	48	44	36	148	44	G	G
5	G	G	G	G	G	B	G	32	36	46	45	50	51	49	46	G	38	32	29	29	60	31	G	G
6	G	24	G	11	B	G	G	29	33	39	40	42	43	44	41	40	37	34	54	24	32	60	43	35
7	29	57	23	40	B	26	28	108	39	36	45	45	47	G	G	G	38	G	G	35	B	B	G	G
8	G	G	32	G	26	11	G	31	38	36	91	167	48	44	44	43	48	60	24	31	G	G	G	G
9	G	G	G	35	B	B	B	29	44	47	41	40	49	47	41	41	39	34	34	35	28	G	G	29
10	27	G	G	G	G	G	G	40	36	42	44	46	48	48	G	44	53	48	49	44	47	32	40	B
11	G	G	G	G	G	G	26	40	58	78	89	92	65	60	57	57	38	N	41	41	38	71	50	43
12	28	28	G	28	150	B	G	29	38	48	54	57	47	G	45	44	44	43	45	146	73	46	51	32
13	G	25	G	26	B	G	24	130	33	38	45	150	44	43	47	46	41	33	23	44	G	41	G	28
14	33	32	G	39	28	G	G	36	38	40	46	47	46	46	G	41	56	92	48	G	G	G	G	G
15	G	G	G	G	G	G	147	87	70	50	64	96	90	89	84	58	108	92	55	47	57	37	G	G
16	G	G	G	G	G	G	G	G	48	47	45	45	48	48	52	50	38	40	45	38	33	33	47	G
17	32	34	G	35	28	100	G	28	41	43	53	44	45	50	70	59	47	41	31	24	57	78	41	29
18	26	G	G	G	G	B	G	31	45	40	46	41	48	47	47	56	110	144	111	53	40	29	29	43
19	25	G	G	G	B	B	B	45	34	40	G	41	48	48	64	169	78	46	35	29	28		29	26
20	29	G	G	G	G	B	G	116	36	52	50	44	44	43	43	40	34	G	27	29	36	27	G	G
21	G	G	G	G	G	11	G	47	48	45	47	45	62	52	59	42	46	35	40	92	G	G	G	G
22	28	B	G	26	35	B	113	47	55	48	G	49	75	55	46	50	45	G	40	25	58	55	91	106
23	G	27	35	39	60	B	34	34	36	45	50	47	G	G	45	47	48	38	32	19	58	49	24	34
24	30	27	24	G	G	B	G	48	32	45	47	57	108	57	48	66	61	86	78	79	57	32	33	30
25	27	32	26	B	27	B	B	161	33	41	48	60	G	40	B	B	48	40	112	30	43	34		G
26	34	45	56	33	31	26		46	G	38	43	44	G	G	44	56	57	48	43	27	24	32	57	39
27	45	32	G	26		G	G	26	36	40	47	50	50	57	50	59	41	34	26	29	58	34	34	28
28	40	40	30	40	33	B	G	48	32	G	G	G	G	41	G	37	38	30	11	23	30	34	G	48
29	25	34	25	28	28	B	B	28	36	38	45	44	45	43	47	46	59	54	60	43	28	G	G	34
30	38	43	28	G	G	B	24	27	31	36	93	G	45	47	45	41	G	48	11	G	26	G	G	26
31	57	56	30	30	25	27	G	28	35	56	51	46	42	44	49	40	40	28	25	28	38	33	35	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	30	24	15	26	31	31	31	31	31	31	31	30	30	31	30	31	31	30	27	30	29
MED	25	24	G	G	G	G	G	32	36	41	46	46	47	47	46	45	46	40	40	31	37	33	12	26
U Q	30	32	25	30	28	26	24	47	44	47	51	57	50	50	49	56	57	48	48	44	57	44	40	34
L Q	G	G	G	G	G	G	G	28	34	38	42	42	44	43	43	41	38	32	26	27	28	27	G	G

HOURLY VALUES OF fmin AT Okinawa

OCT.2019

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	20	14	14	15	14	17	15	14	14	15	15	16	15	14	14	14	14	14	14	14	B	14	15
2	14	15	14	15	15	B	14	14	14	17	14	18	18	17	18	15	14	14	15	14	15	B	14	B
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U Q	15	15	15	15	14	15	16	15	14	14	16	17	18	18	18	16	14	14	14	14	14	14	14	15
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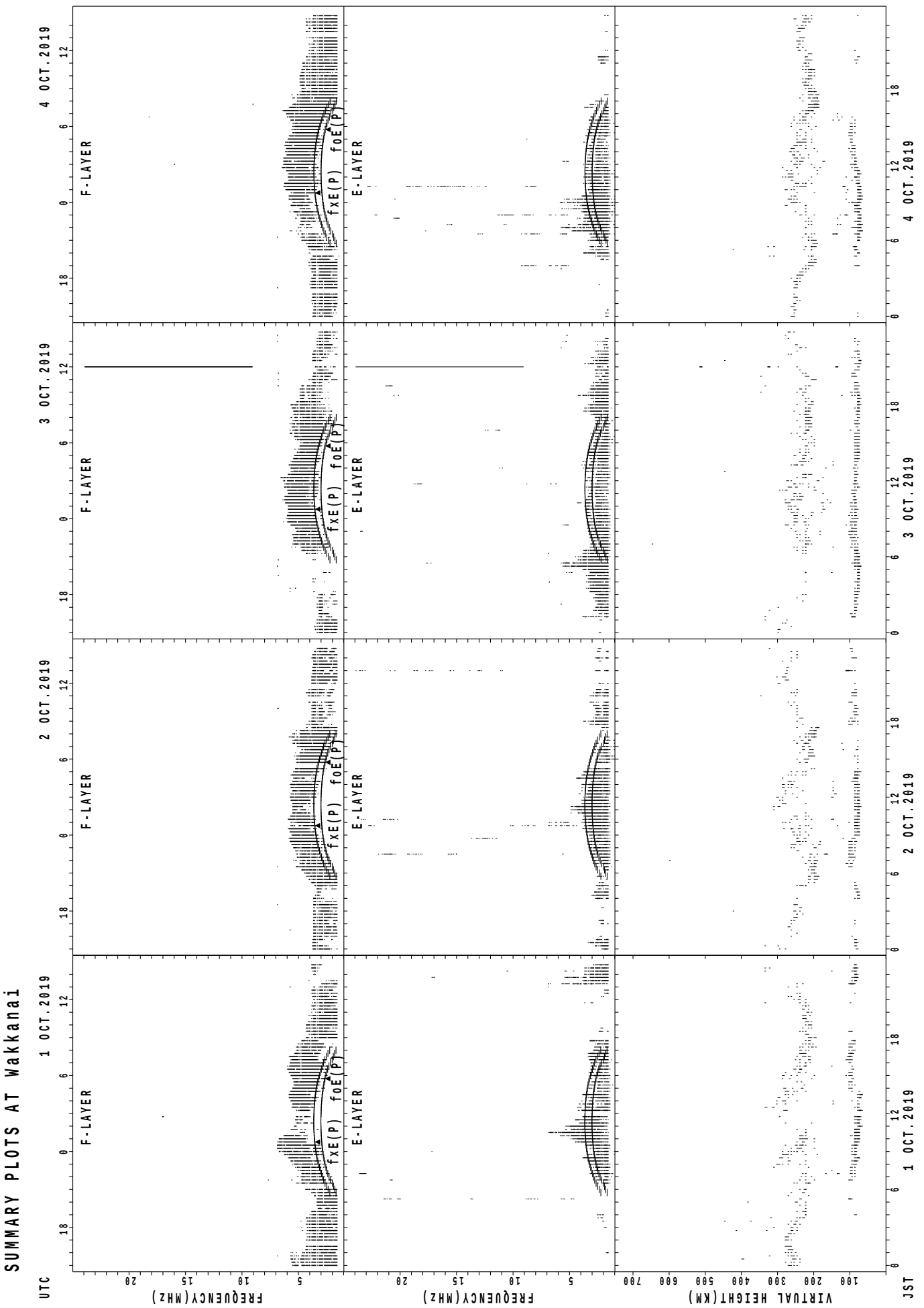
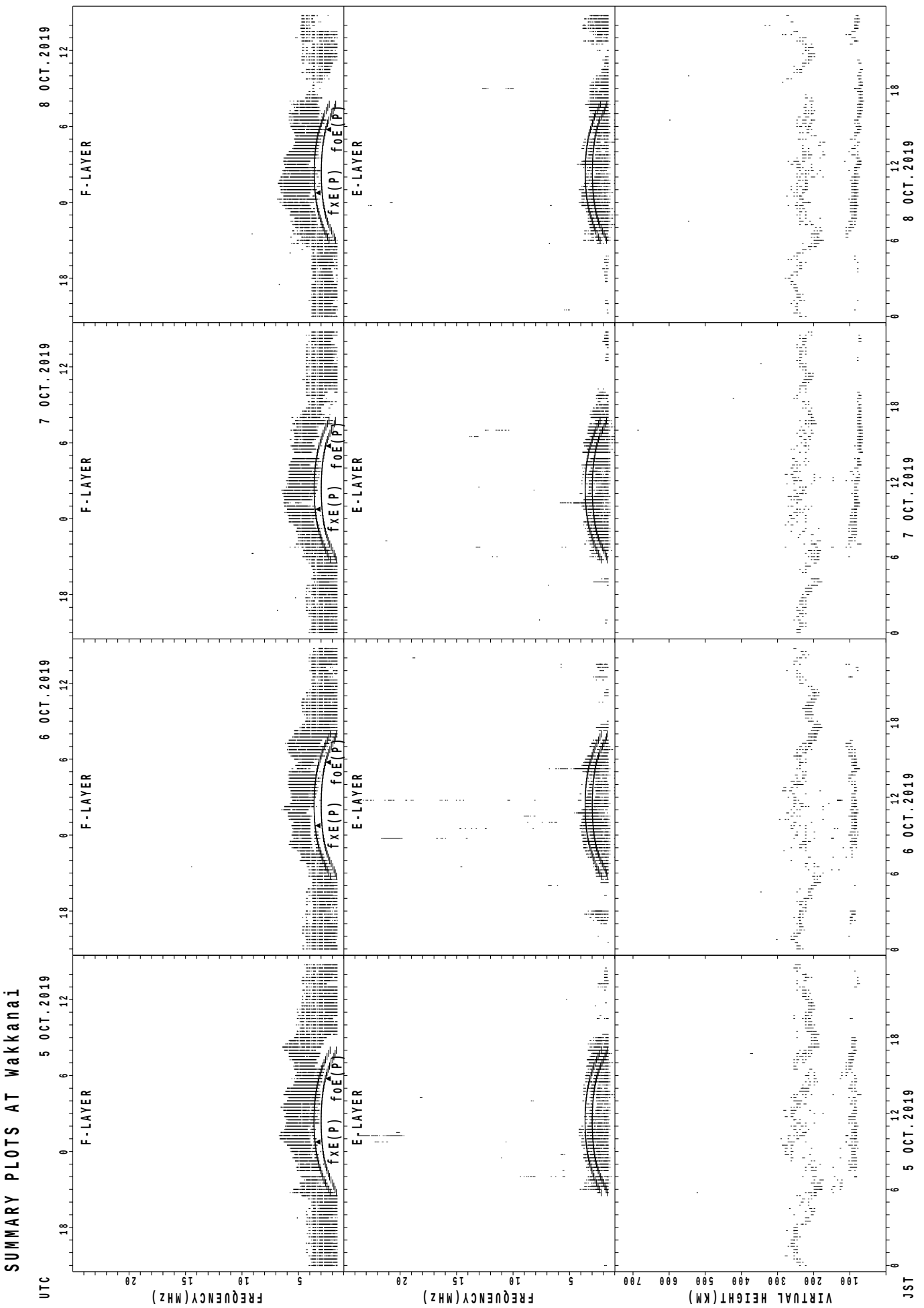

SUMMARY PLOTS AT Wakkanai
UTC
JST
1 OCT.2019
2 OCT.2019
3 OCT.2019
4 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
5 OCT.2019
6 OCT.2019
7 OCT.2019
8 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
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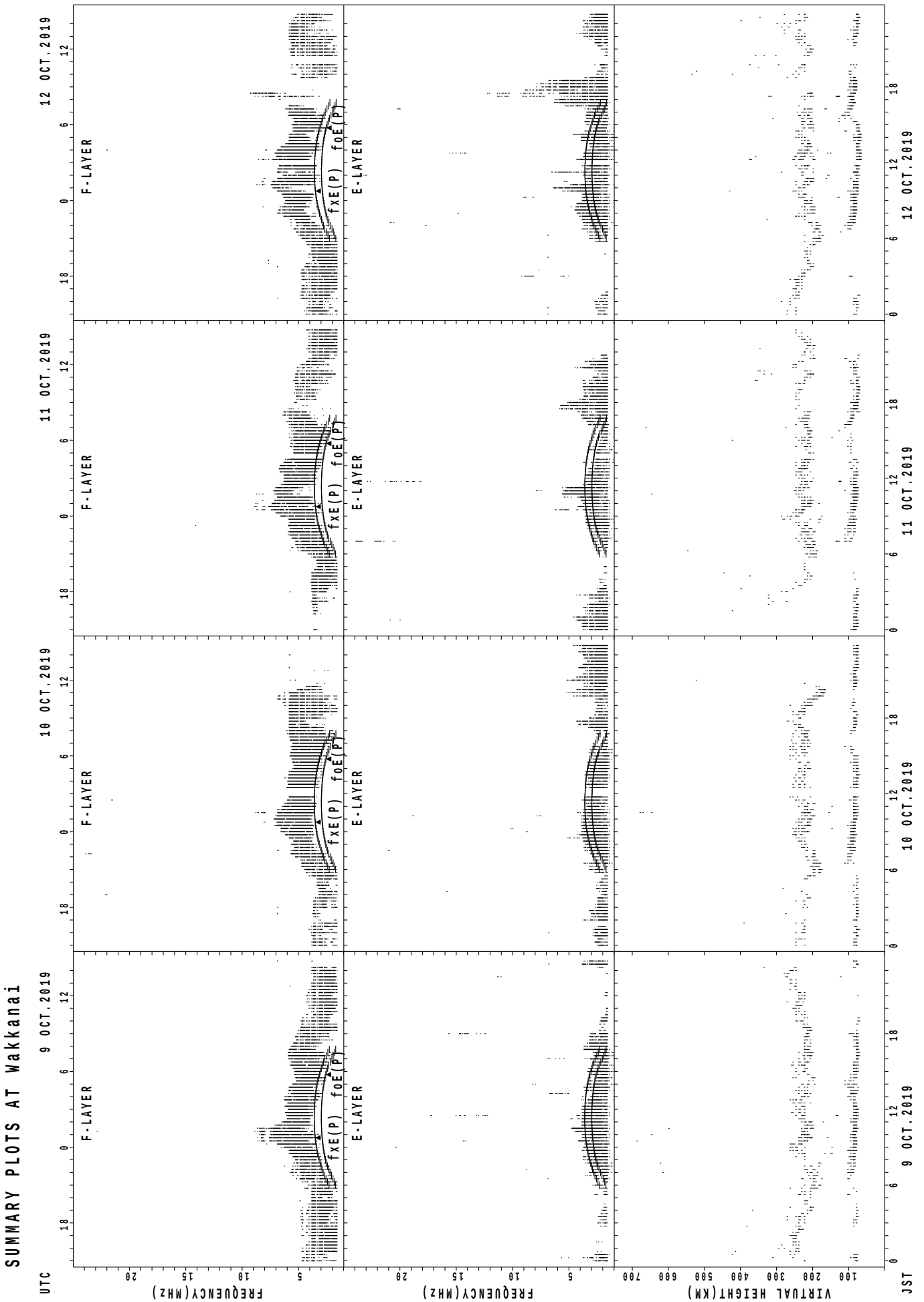
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
9 OCT.2019
10 OCT.2019
11 OCT.2019
12 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
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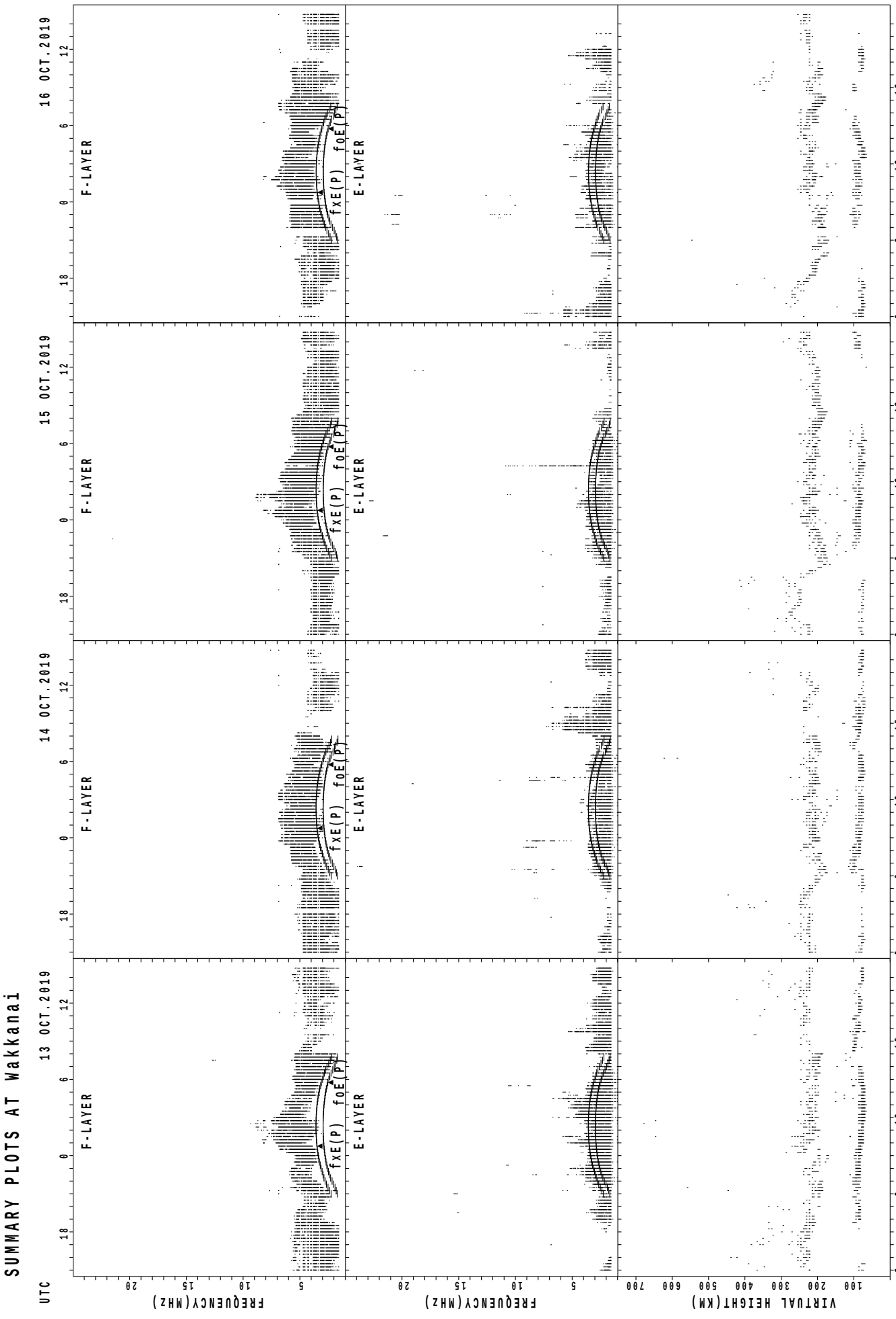
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
13 OCT.2019
14 OCT.2019
15 OCT.2019
16 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
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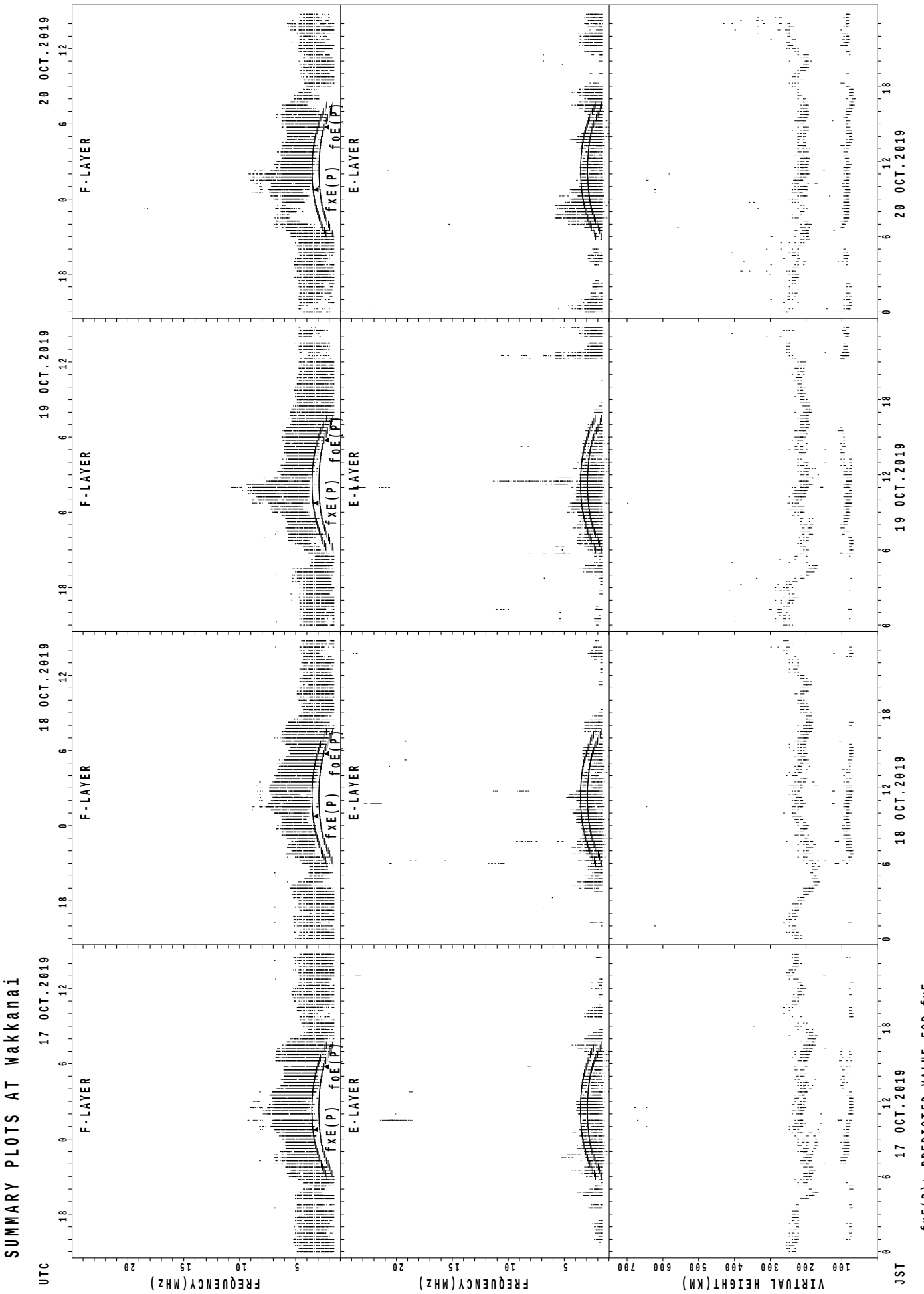
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
17 OCT.2019
18 OCT.2019
19 OCT.2019
20 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
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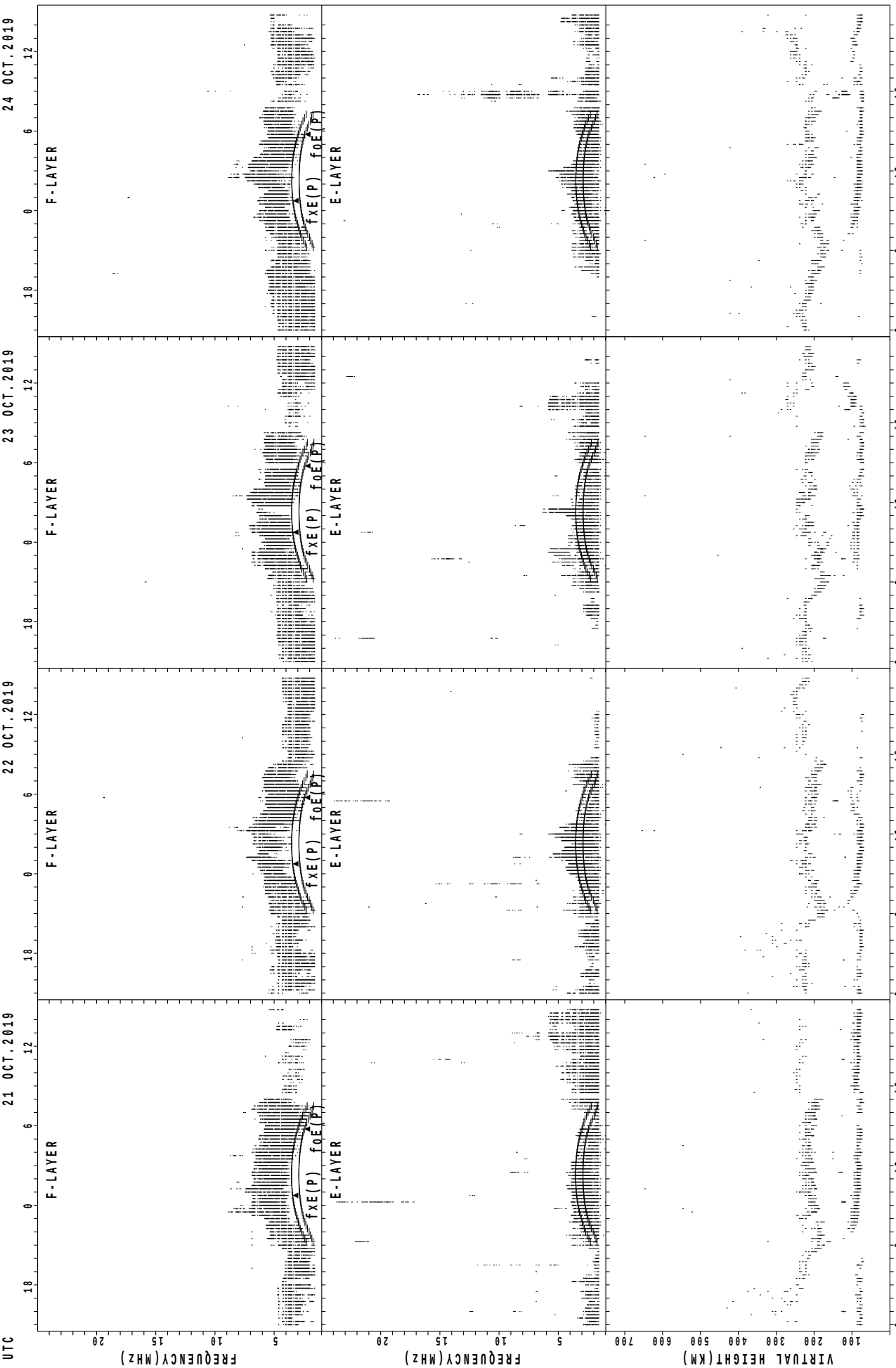
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
21 OCT.2019
22 OCT.2019
23 OCT.2019
24 OCT.2019
F-LAYER
E-LAYER
fxE(P)
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VIRTUAL HEIGHT(KM)
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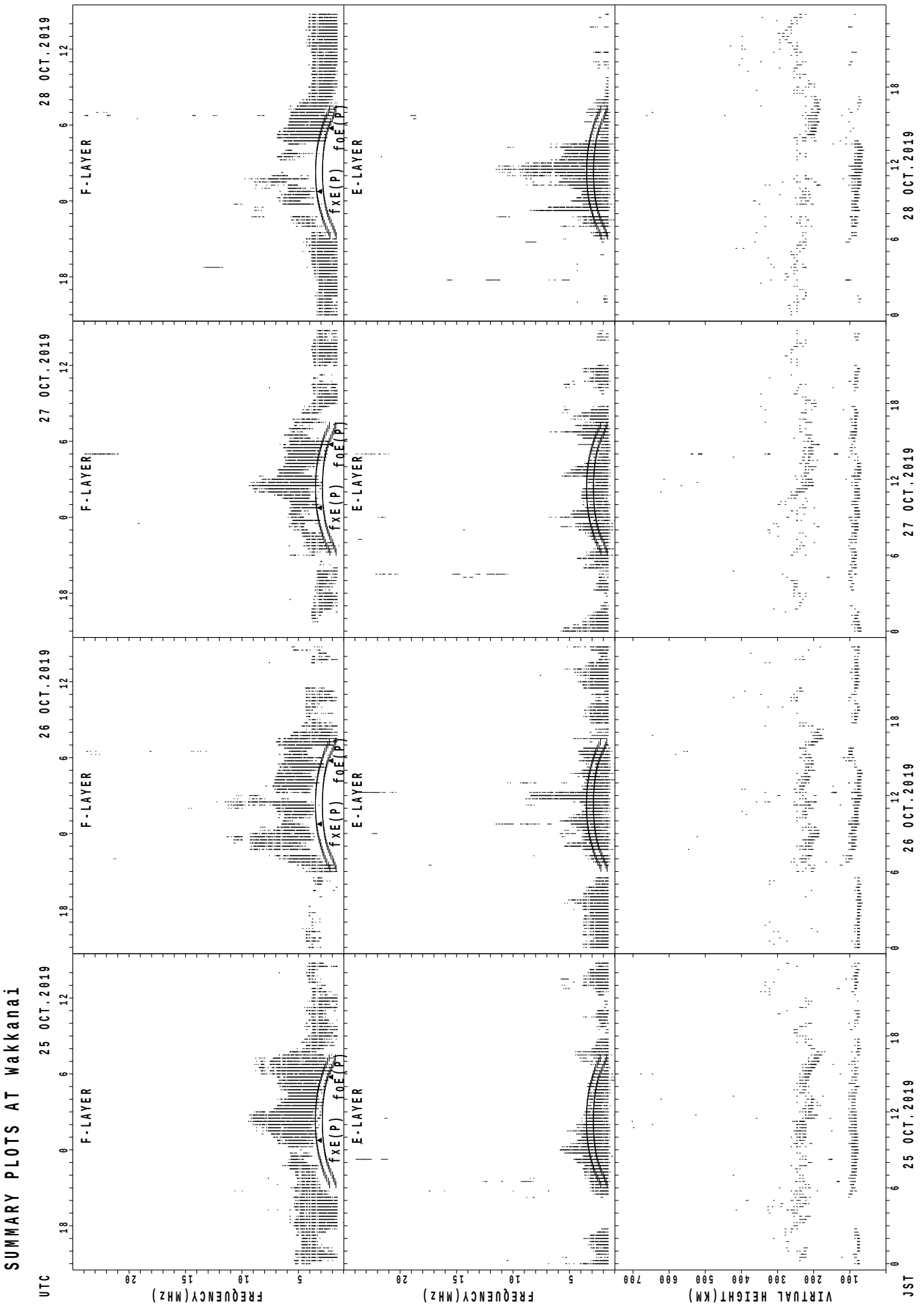
SUMMARY PLOTS AT Wakkanai
UTC
JST
25 OCT.2019
26 OCT.2019
27 OCT.2019
28 OCT.2019
F-LAYER
E-LAYER
fxE(P)
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VIRTUAL HEIGHT(KM)
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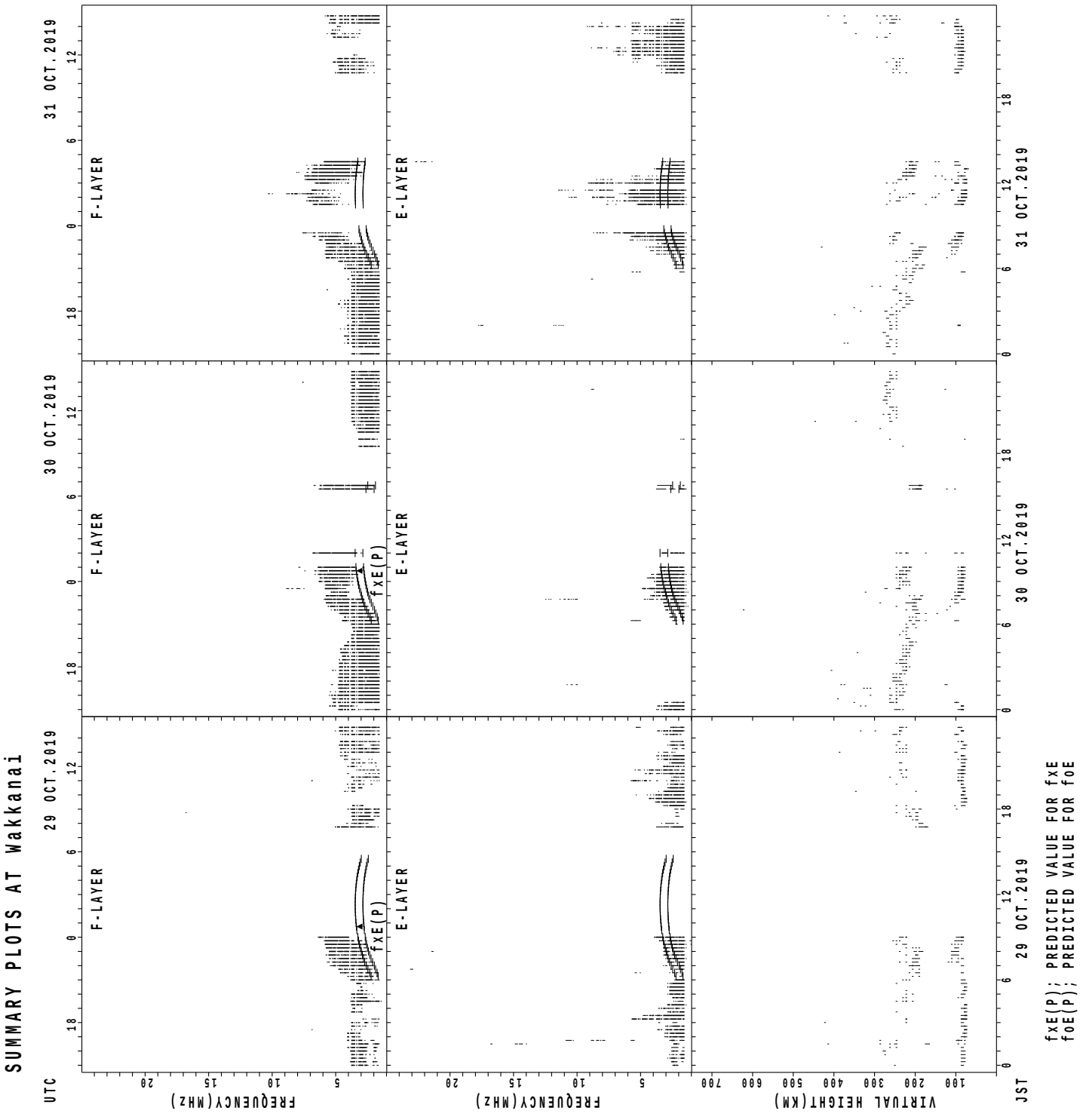
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
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JST
29 OCT.2019
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31 OCT.2019
F-LAYER
E-LAYER
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VIRTUAL HEIGHT(KM)
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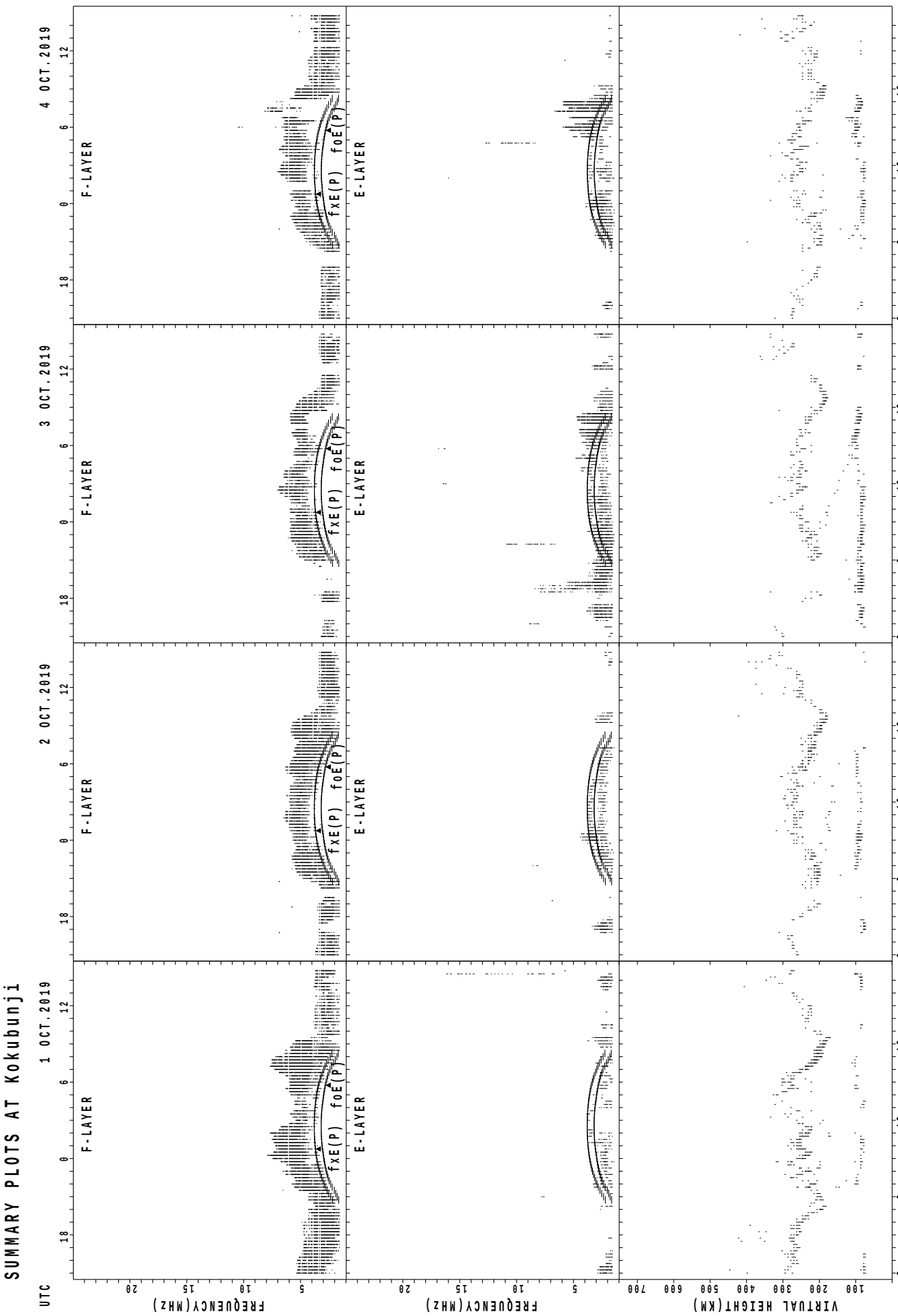
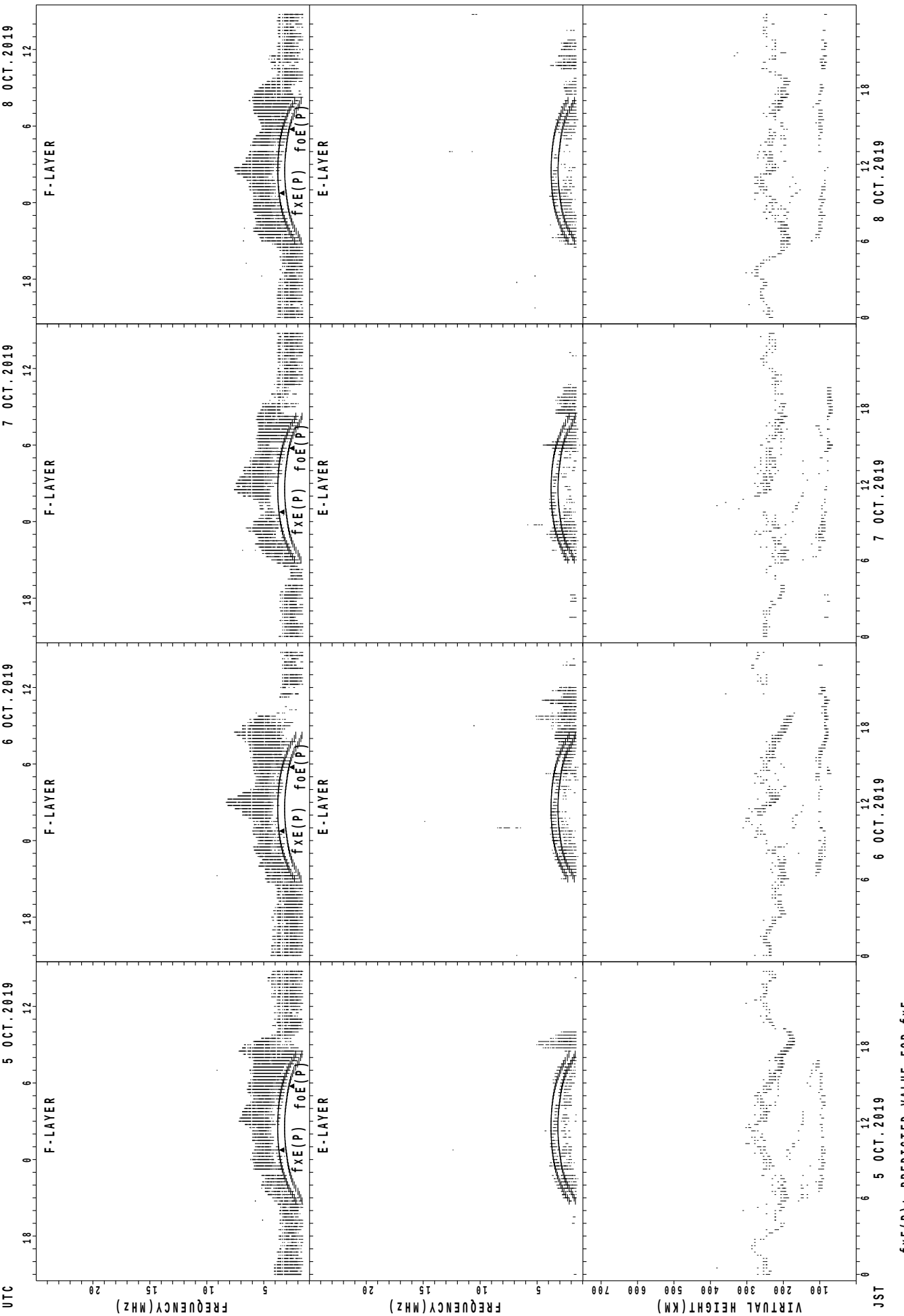
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
1 OCT.2019
2 OCT.2019
3 OCT.2019
4 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
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JST
5 OCT.2019
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7 OCT.2019
8 OCT.2019
F-LAYER
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fxE(P) foE(P)
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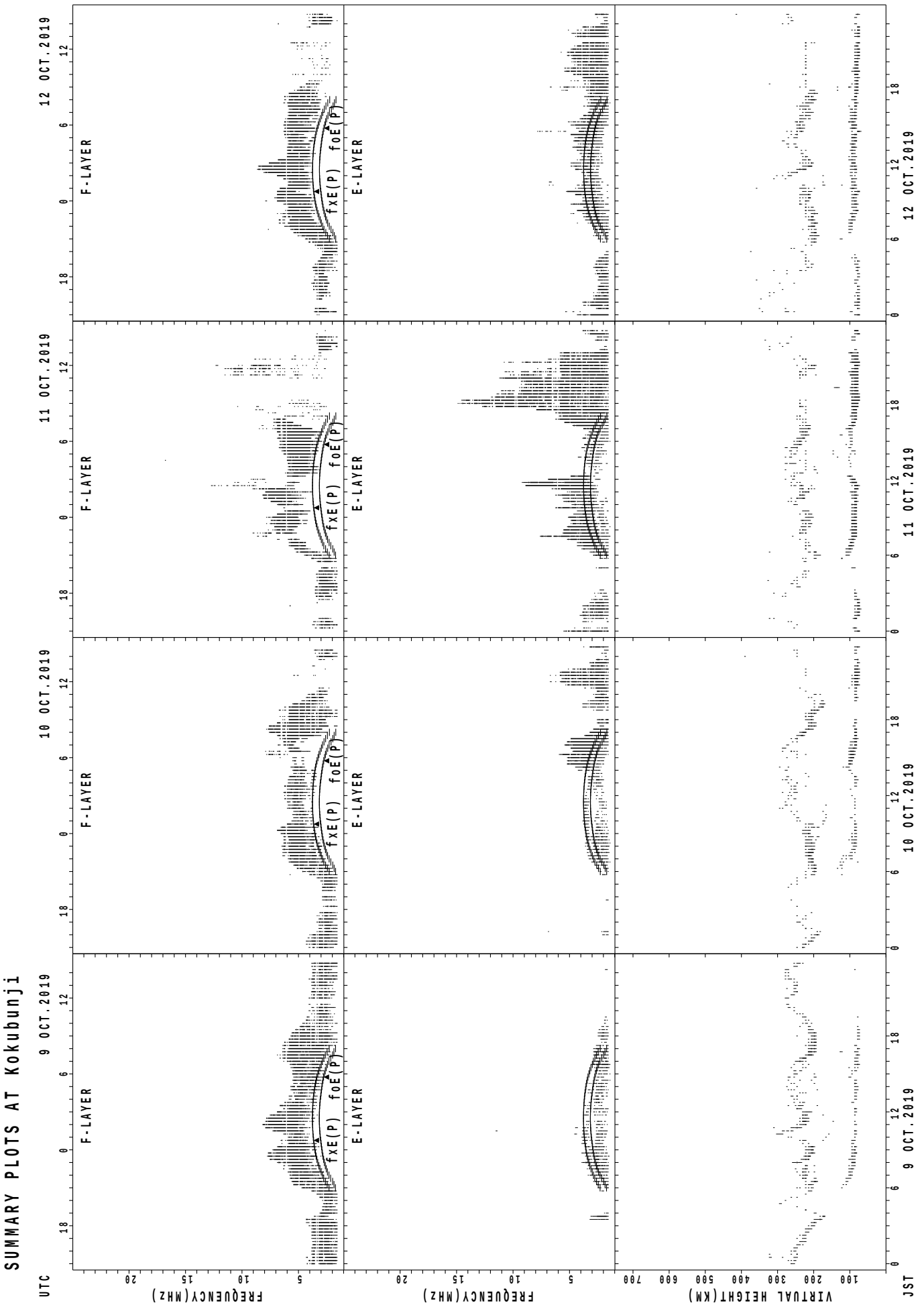
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
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JST
9 OCT.2019
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12 OCT.2019
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
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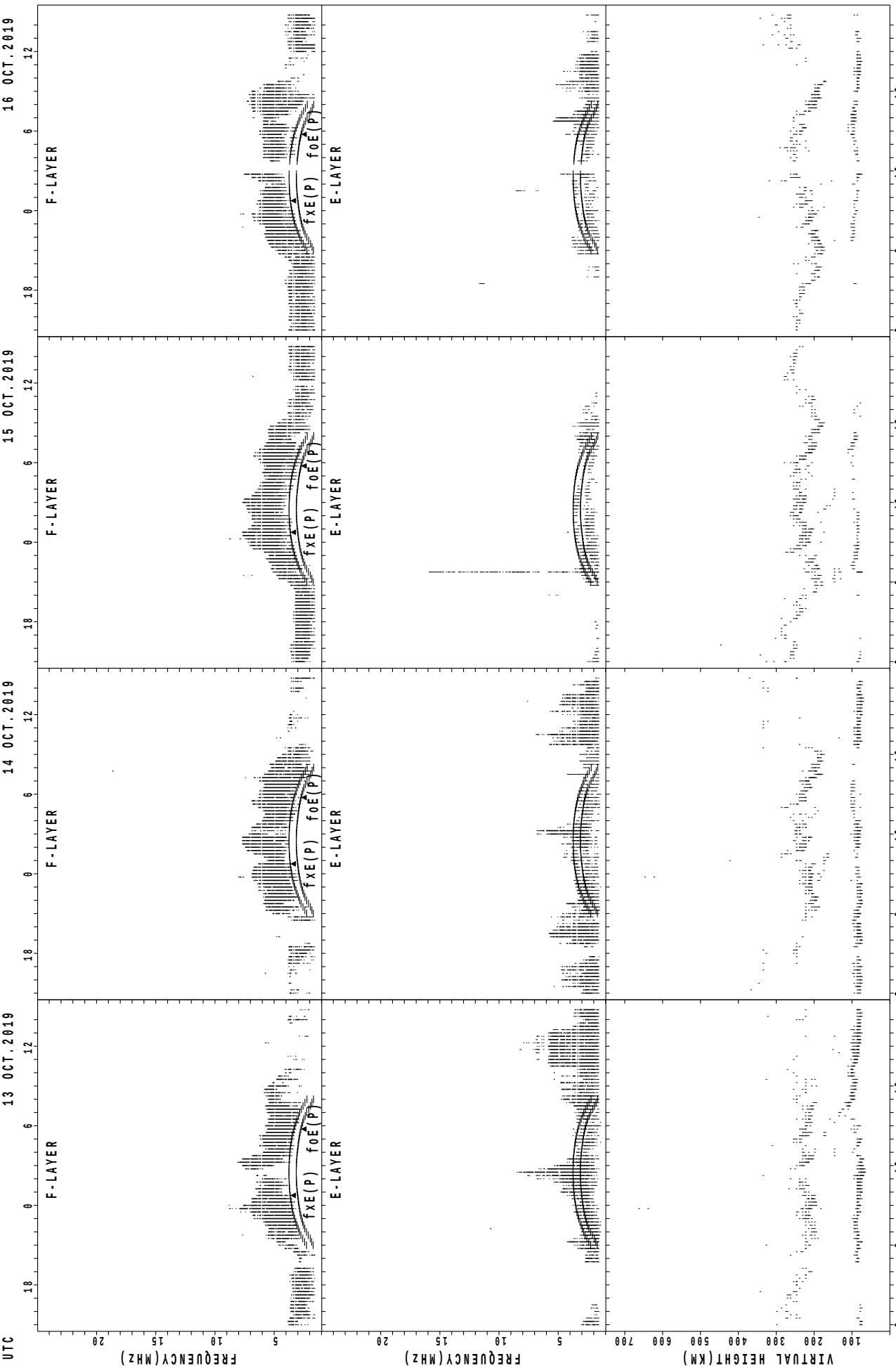
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
13 OCT.2019
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16 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
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VIRTUAL HEIGHT(KM)
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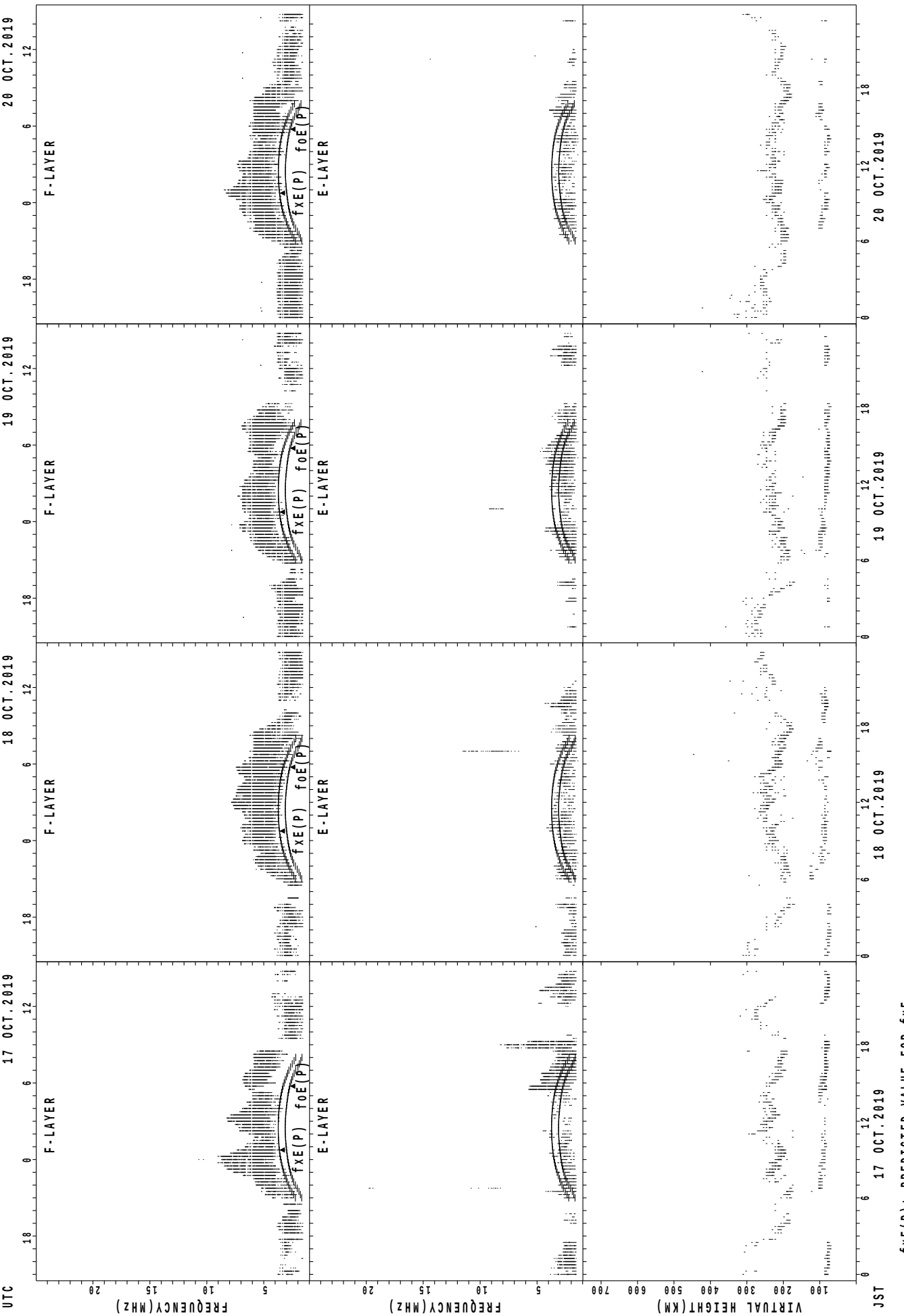
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
17 OCT.2019
18 OCT.2019
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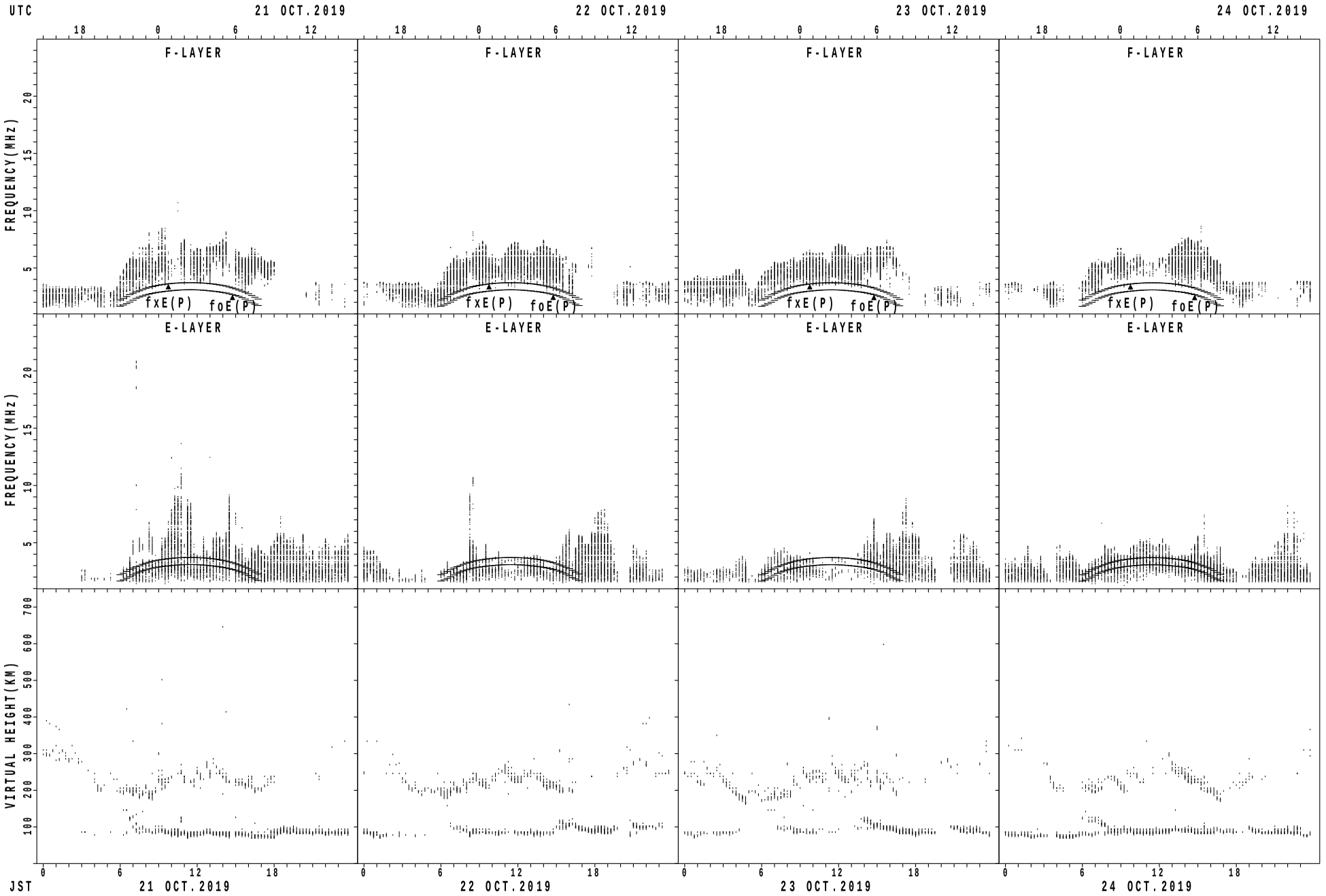
20 OCT.2019
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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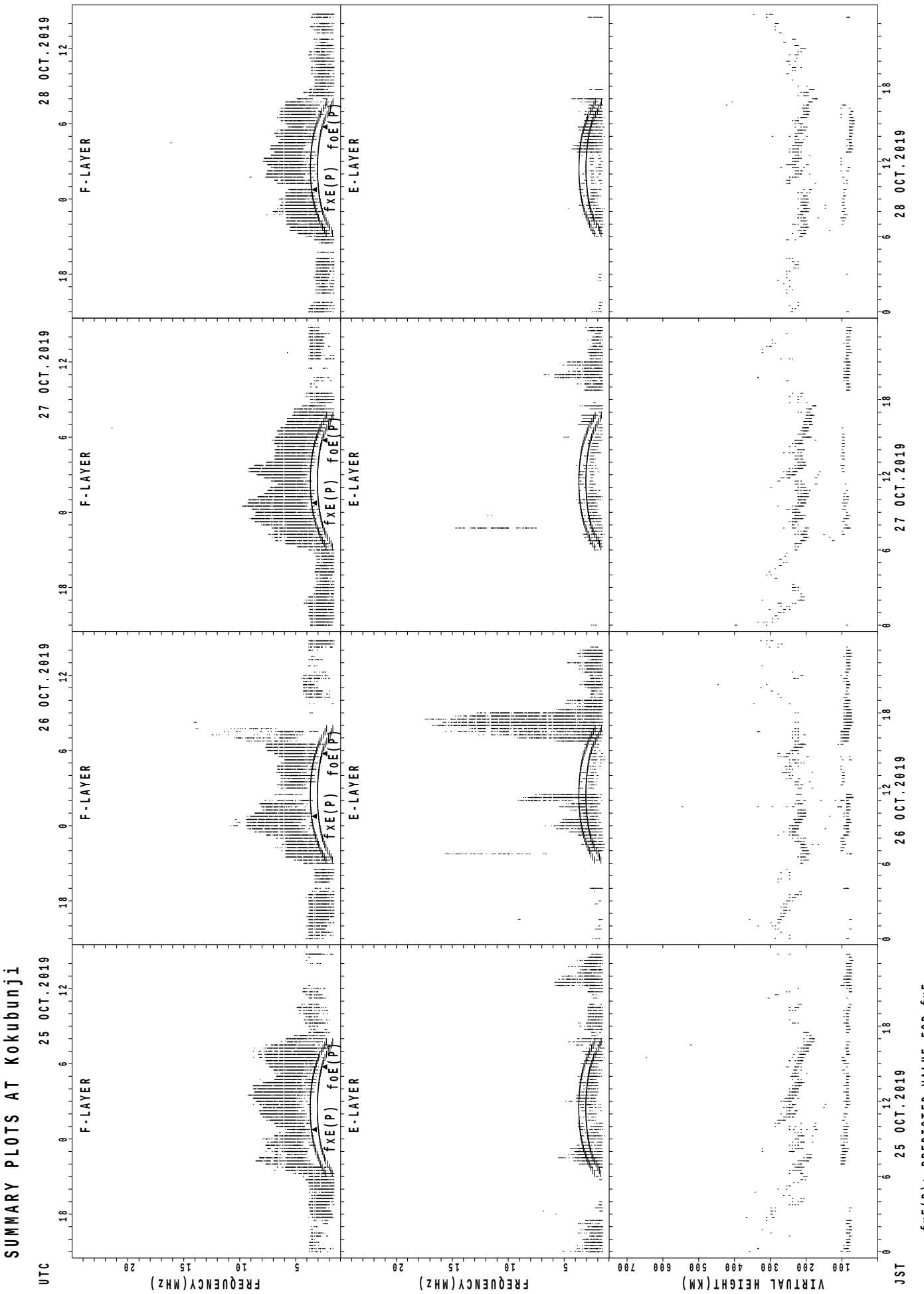
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
25 OCT.2019
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28 OCT.2019
F-LAYER
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fxE(P) foE(P)
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VIRTUAL HEIGHT(KM)
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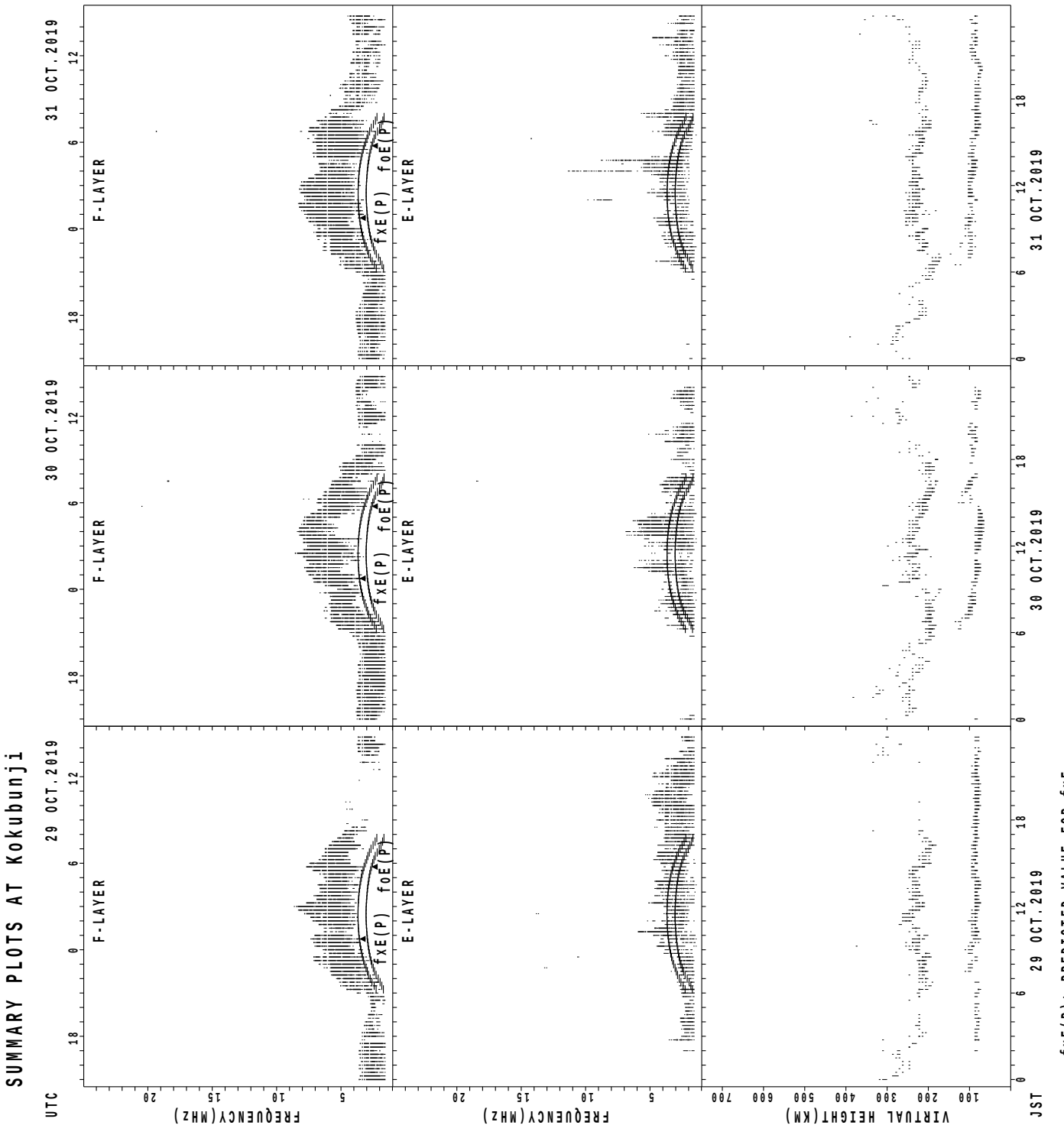
SUMMARY PLOTS AT Kokubunji
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fxE(P) foE(P)
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VIRTUAL HEIGHT(KM)
JST
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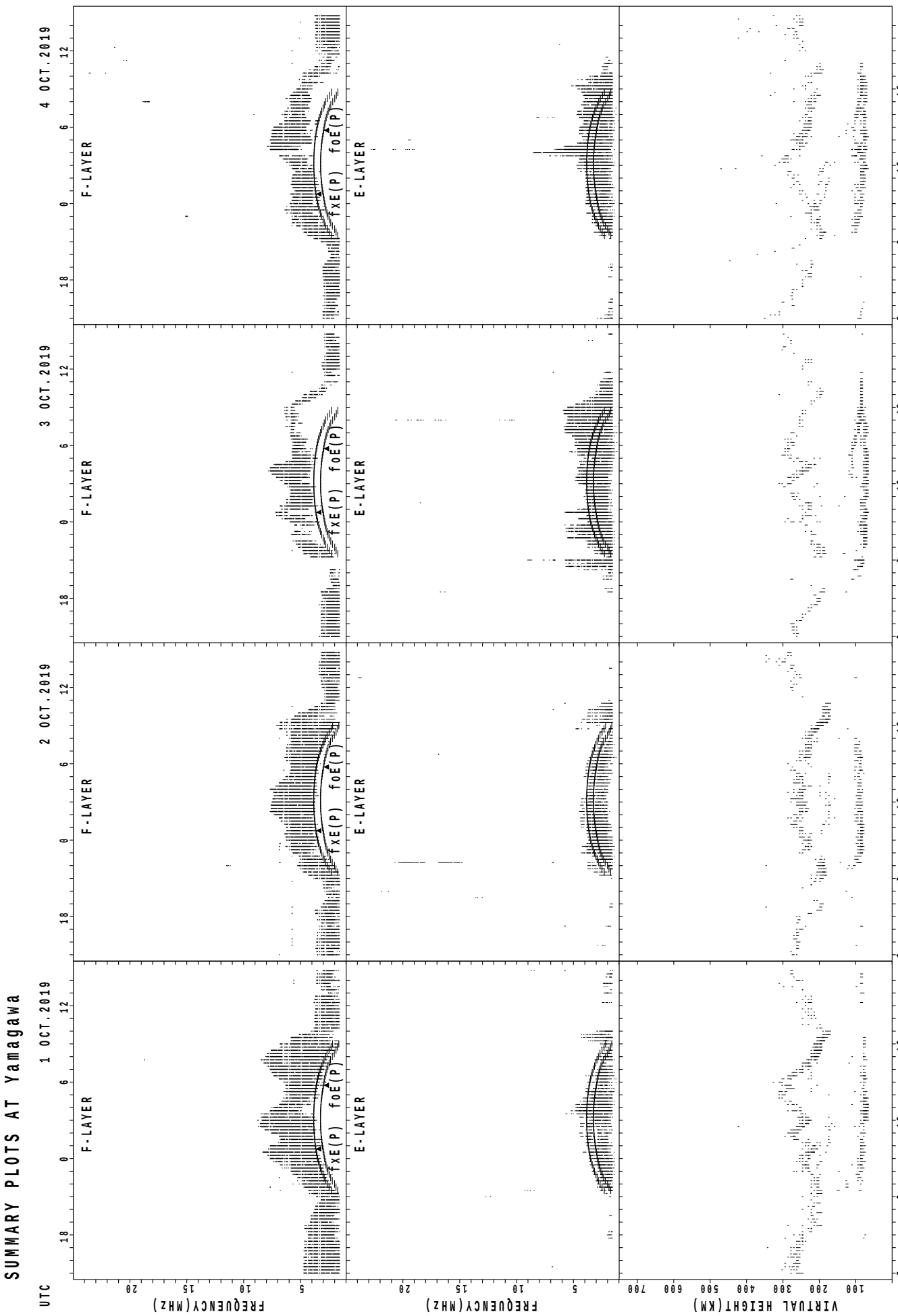
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
UTC
JST
1 OCT.2019
2 OCT.2019
3 OCT.2019
4 OCT.2019
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
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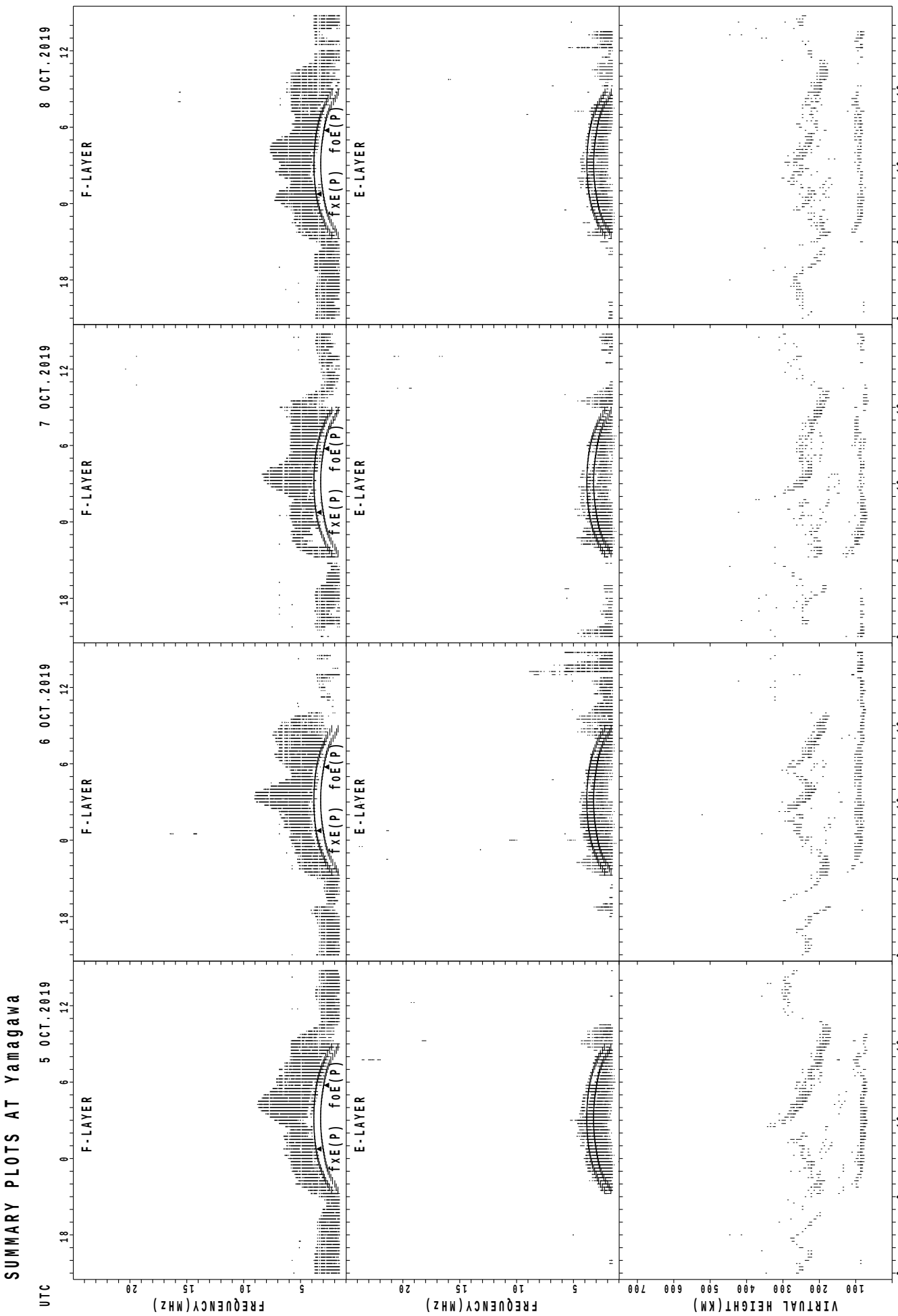
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
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JST
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8 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
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VIRTUAL HEIGHT(KM)
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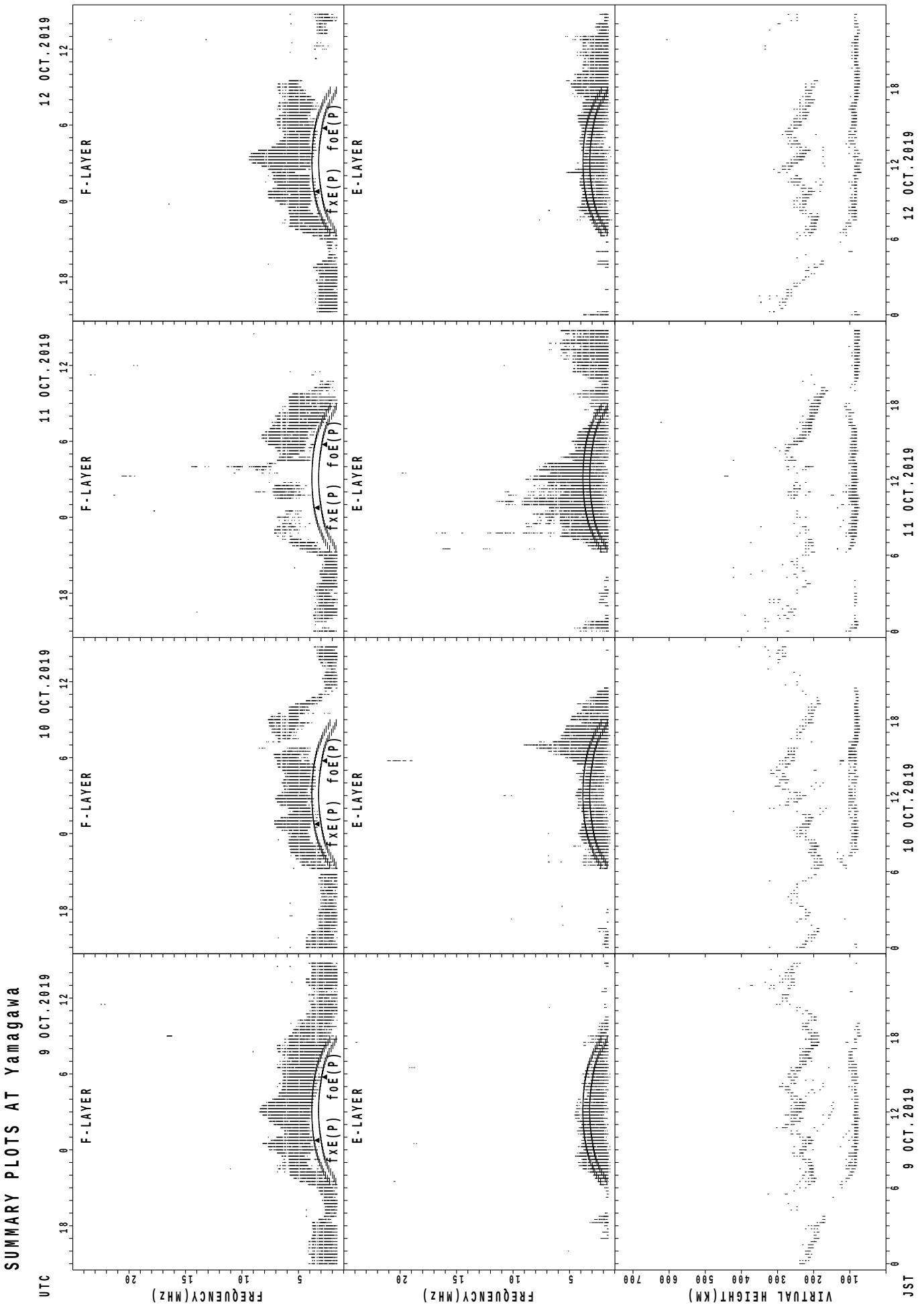
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
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11 OCT.2019
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F-LAYER
E-LAYER
fxE(P) foE(P)
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VIRTUAL HEIGHT(KM)
JST
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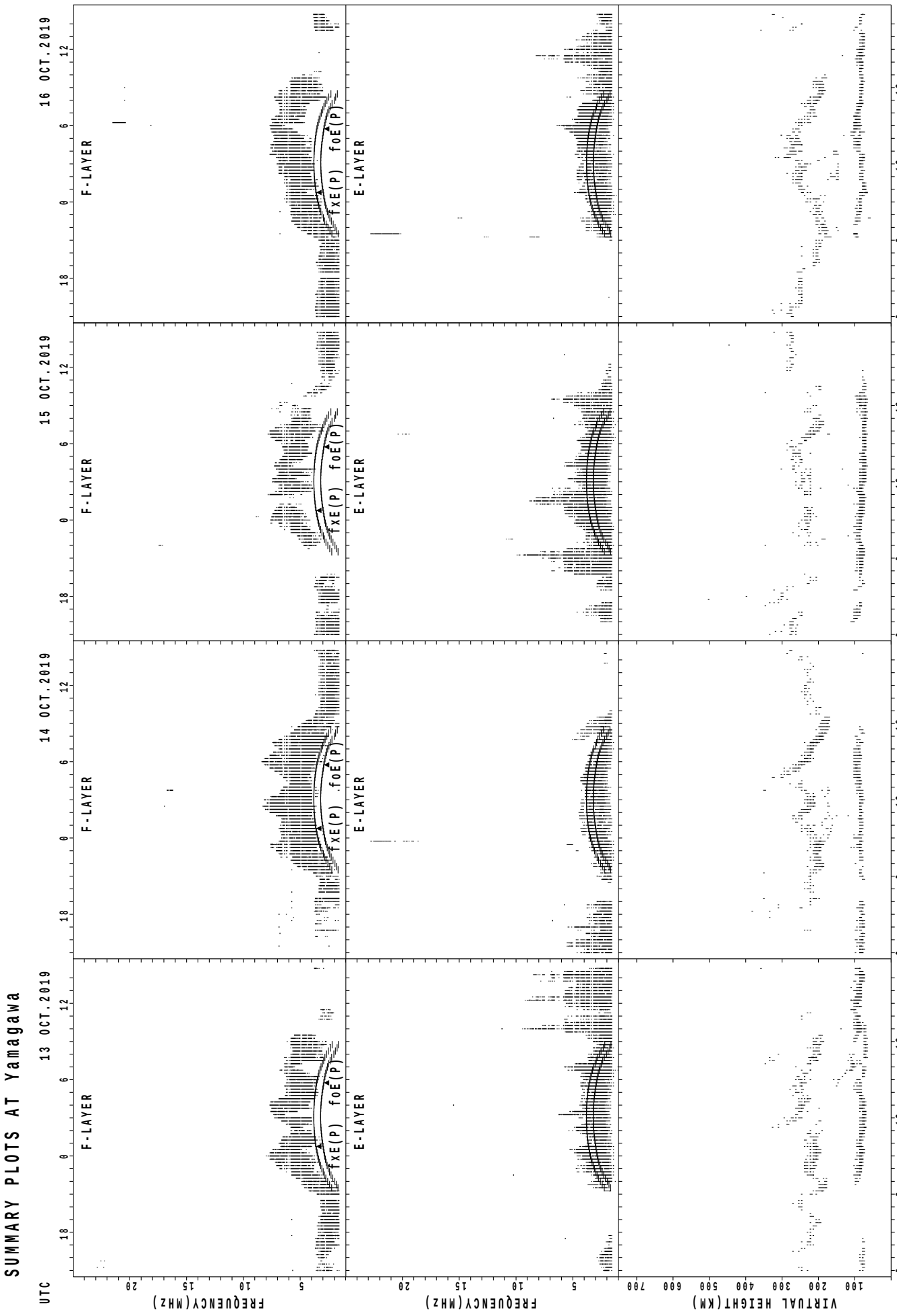
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
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JST
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F-LAYER
E-LAYER
FREQUENCY(MHz)
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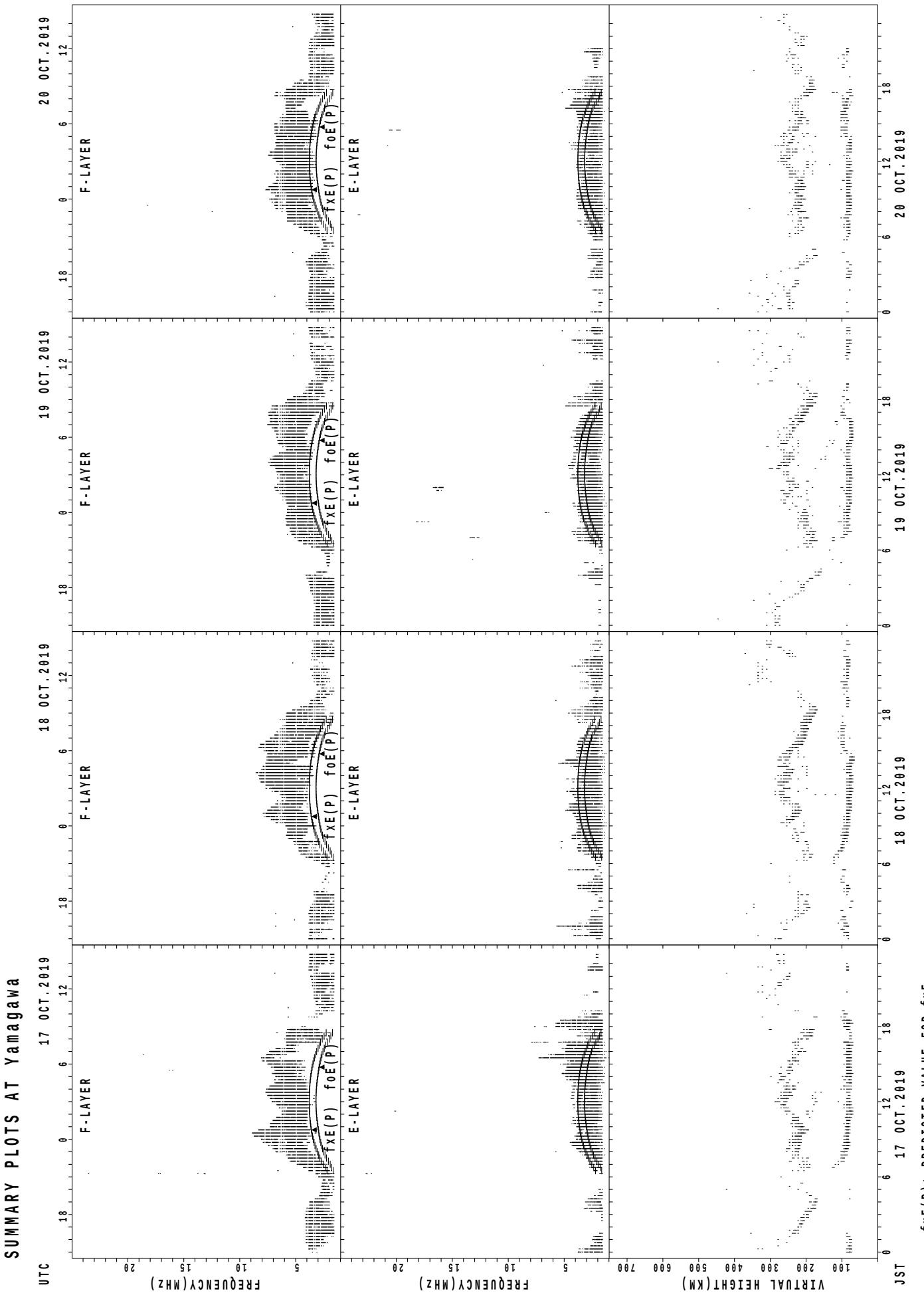
SUMMARY PLOTS AT Yamagawa
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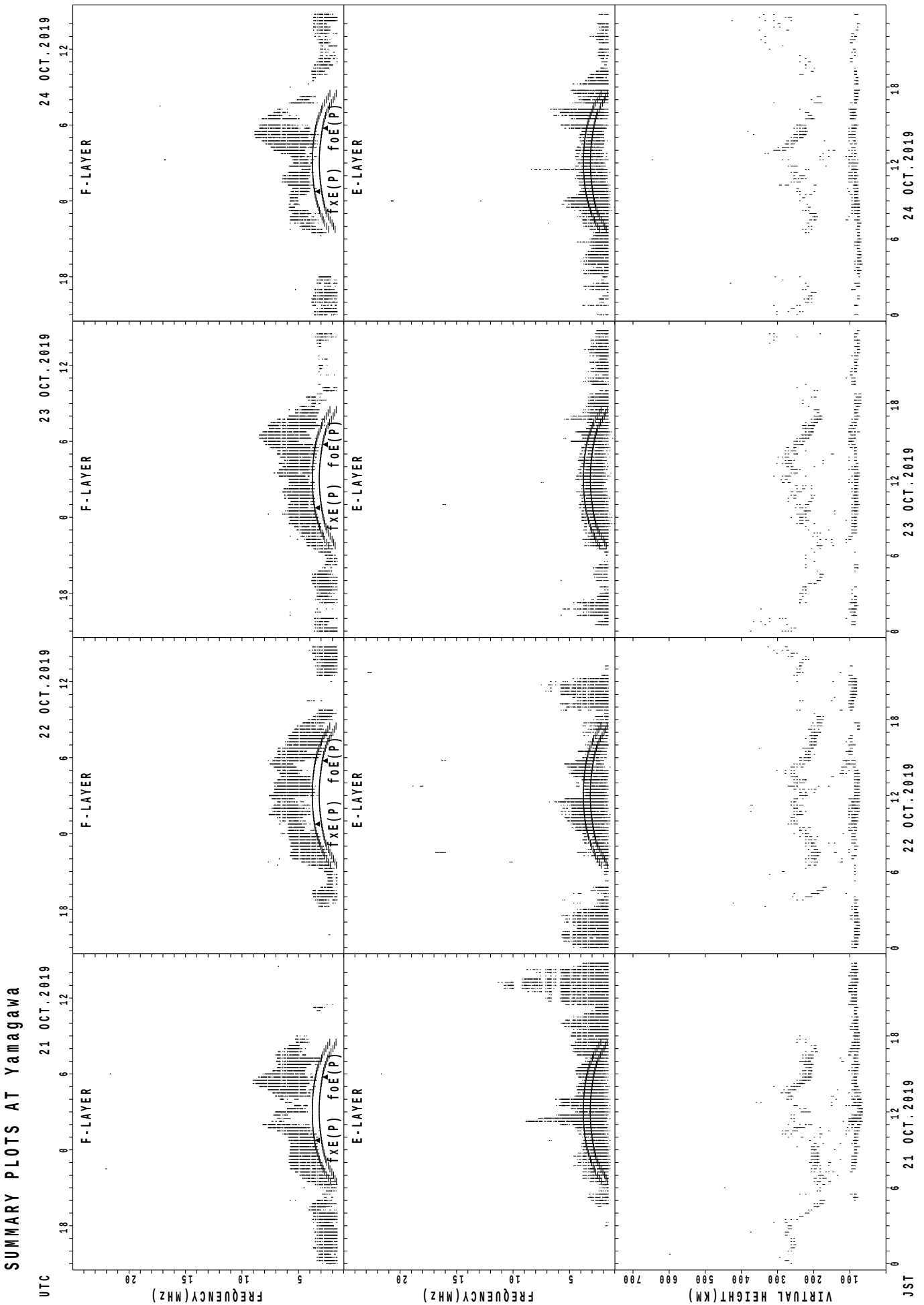
SUMMARY PLOTS AT Yamagawa
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E-LAYER
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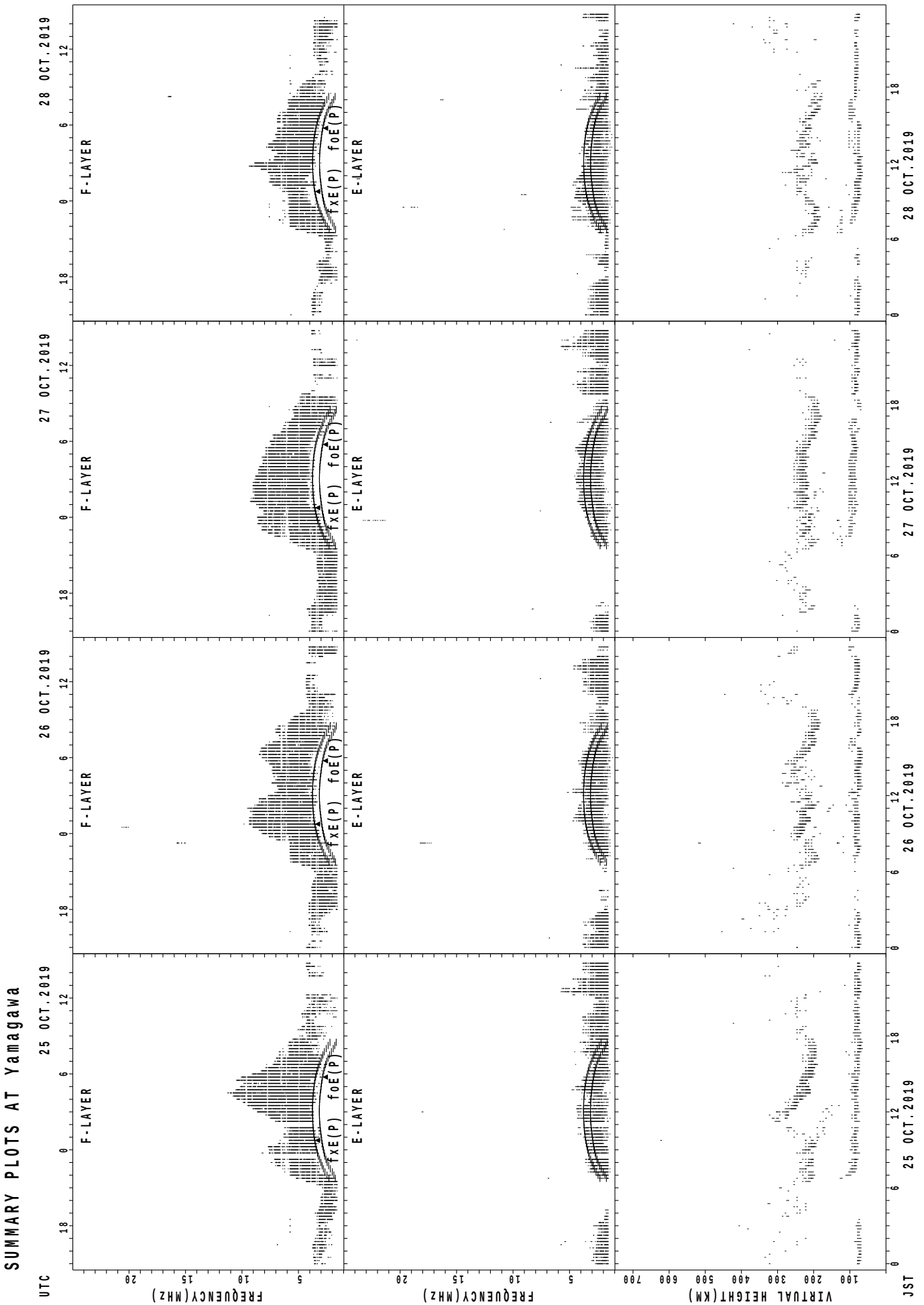
SUMMARY PLOTS AT Yamagawa
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25 OCT.2019
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E-LAYER
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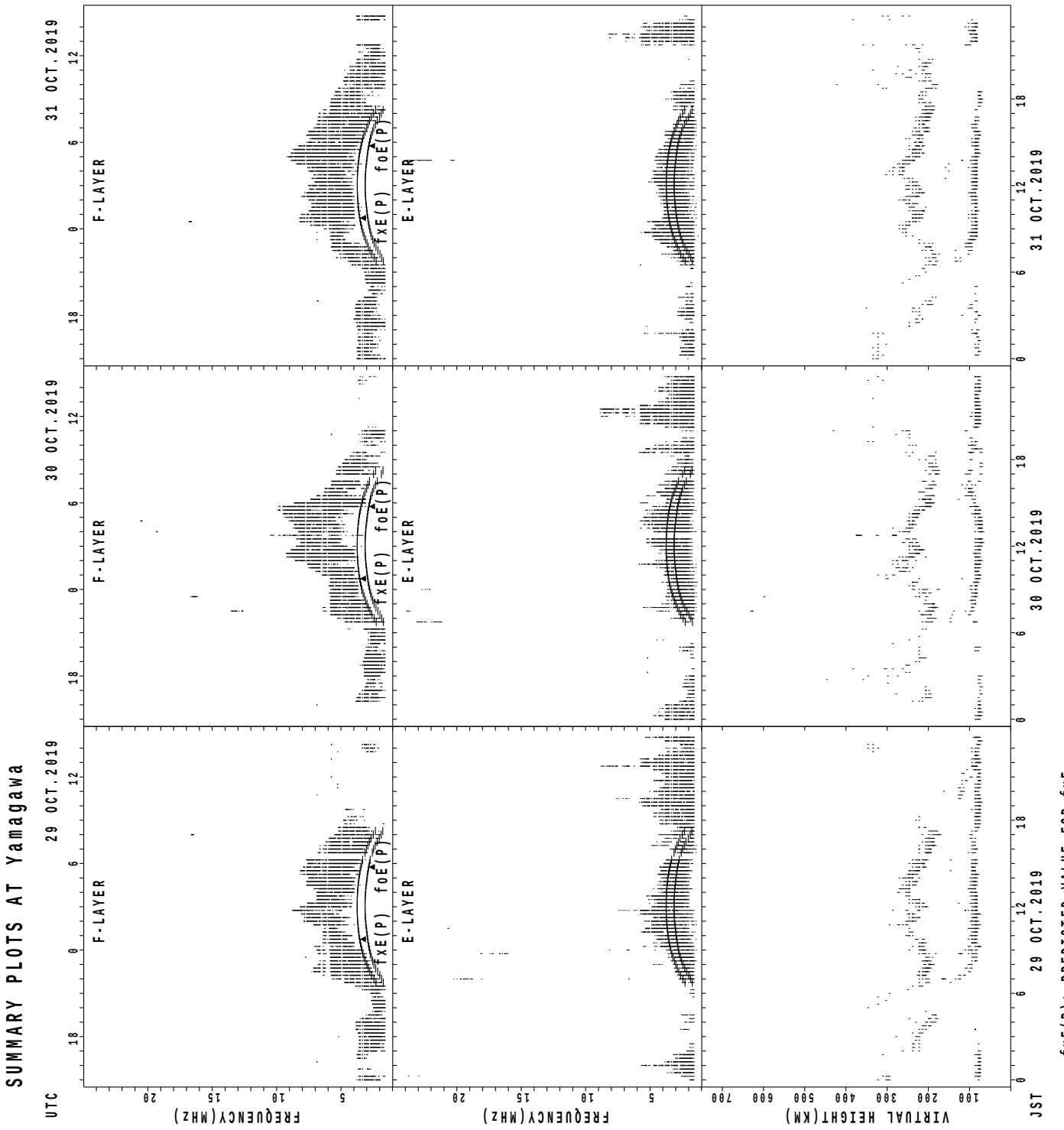
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
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F-LAYER
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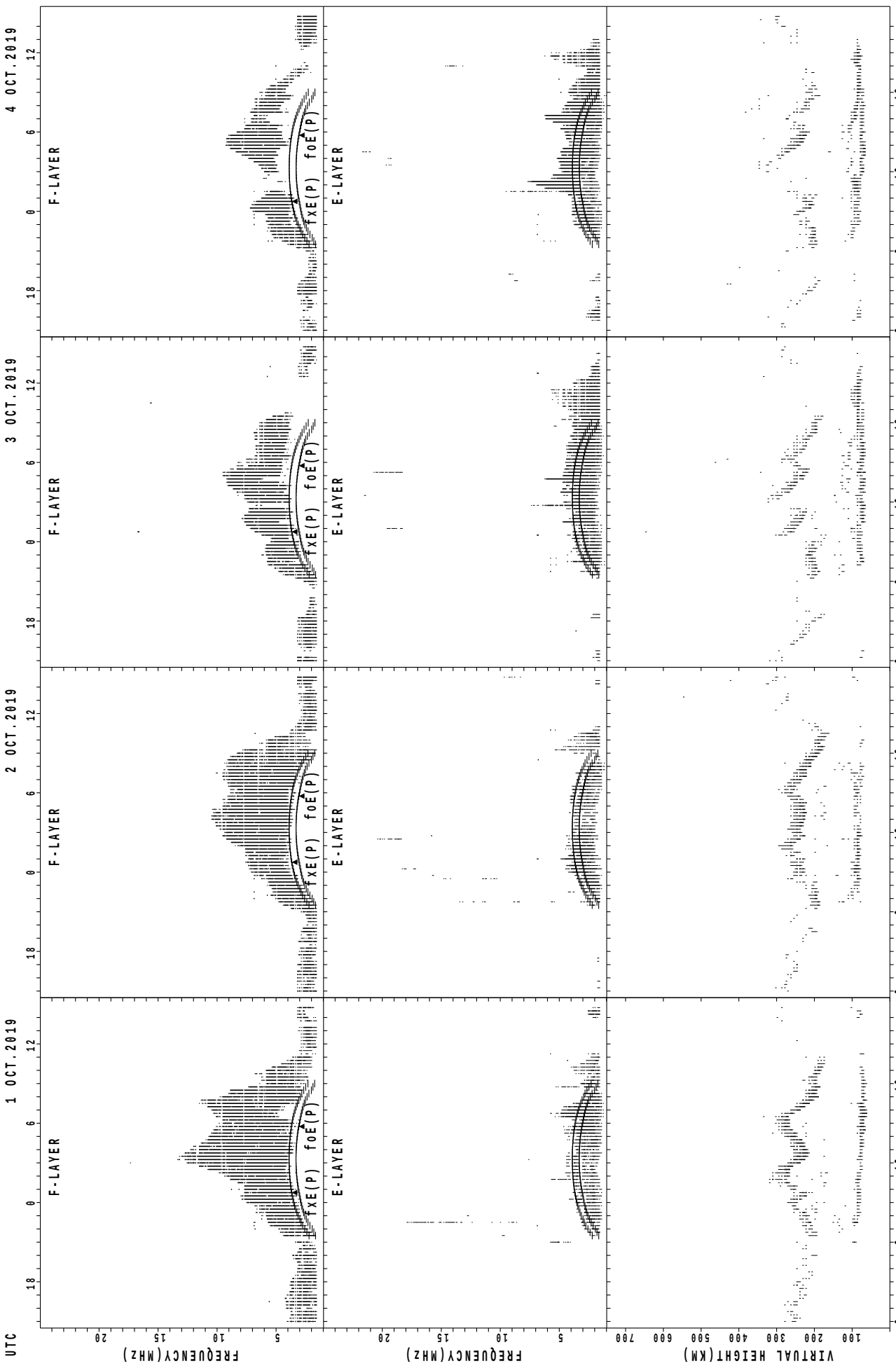
SUMMARY PLOTS AT Okinawa
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VIRTUAL HEIGHT(KM)
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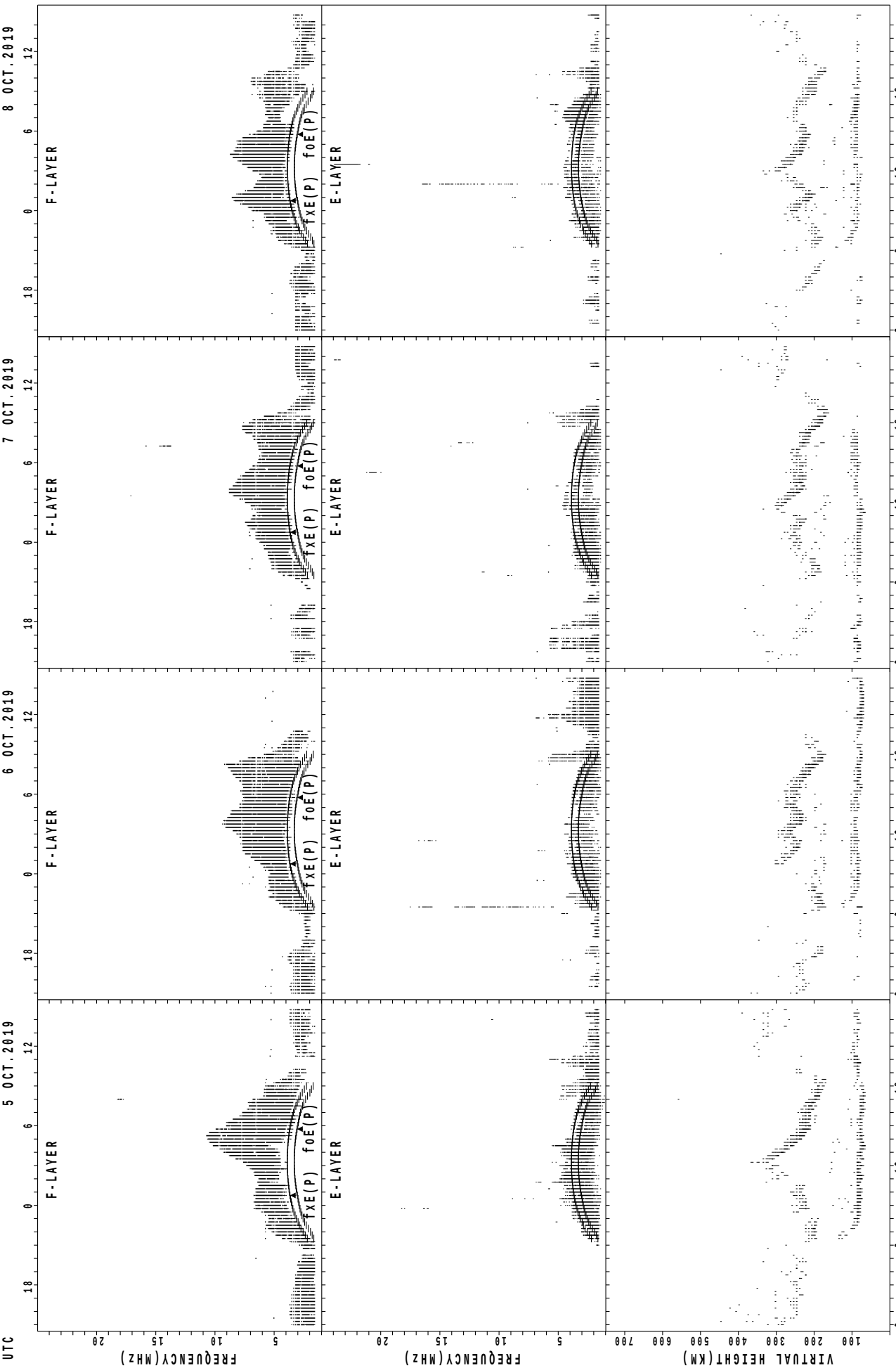
SUMMARY PLOTS AT Okinawa
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FREQUENCY(MHz)
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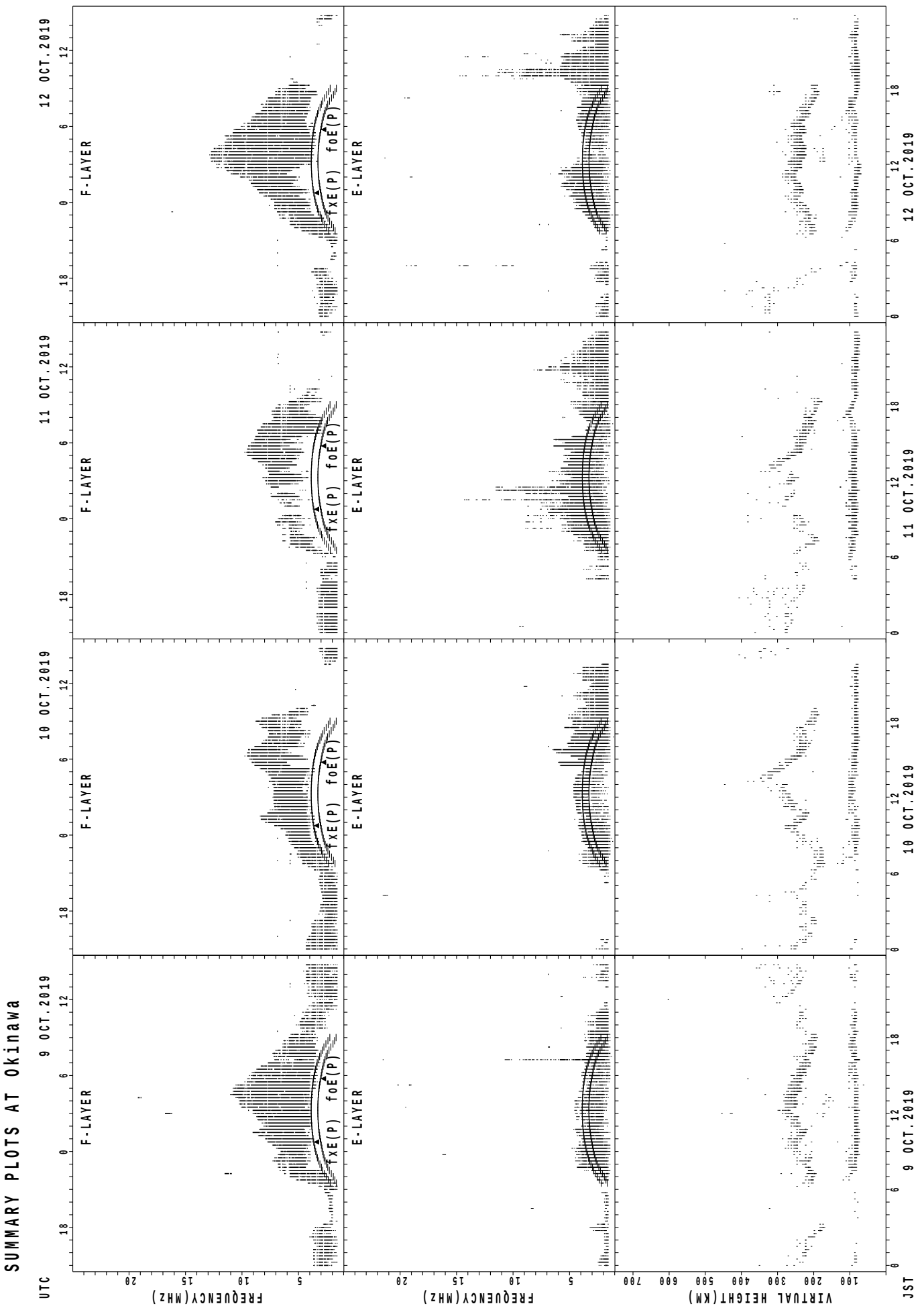
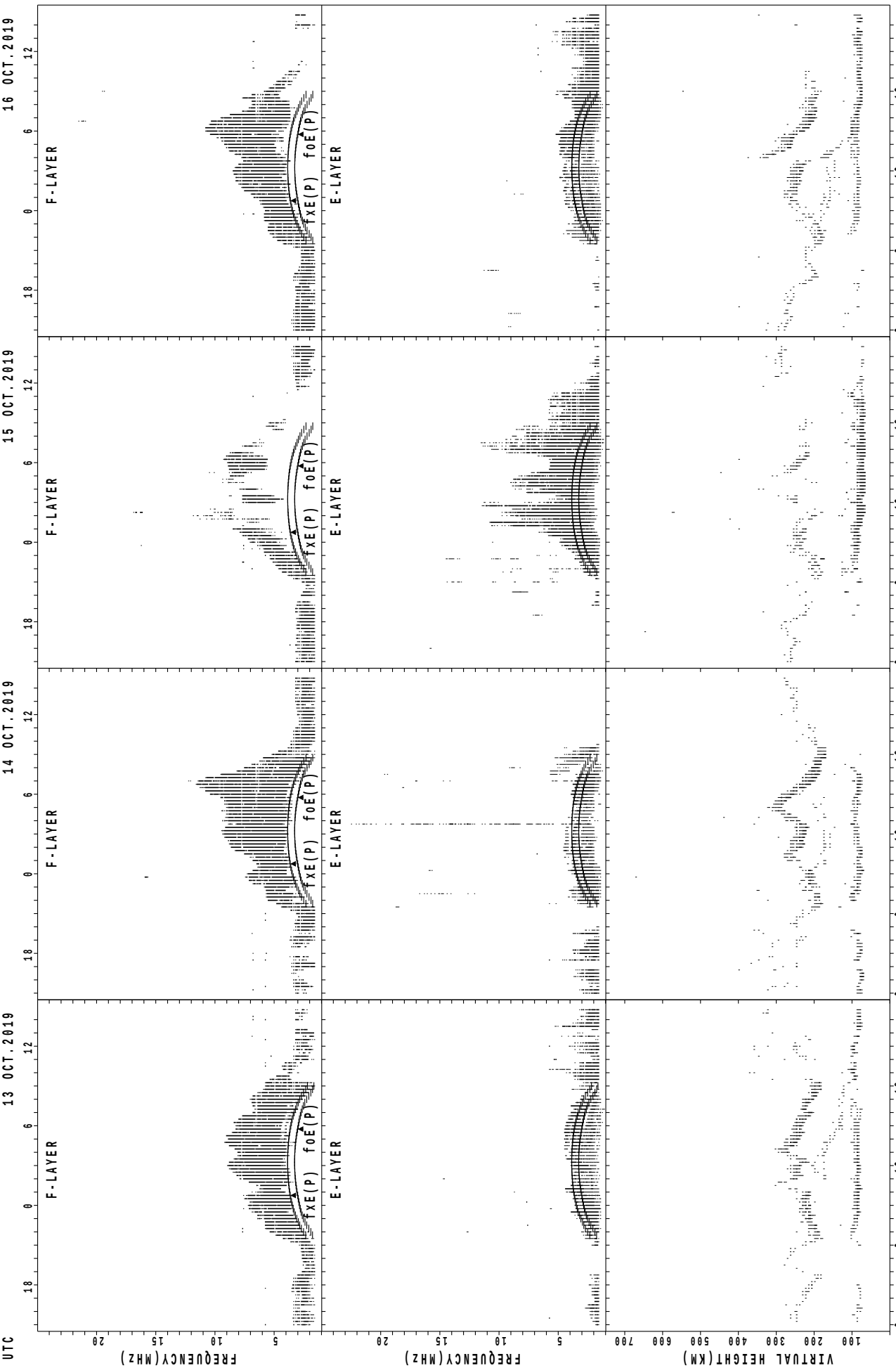
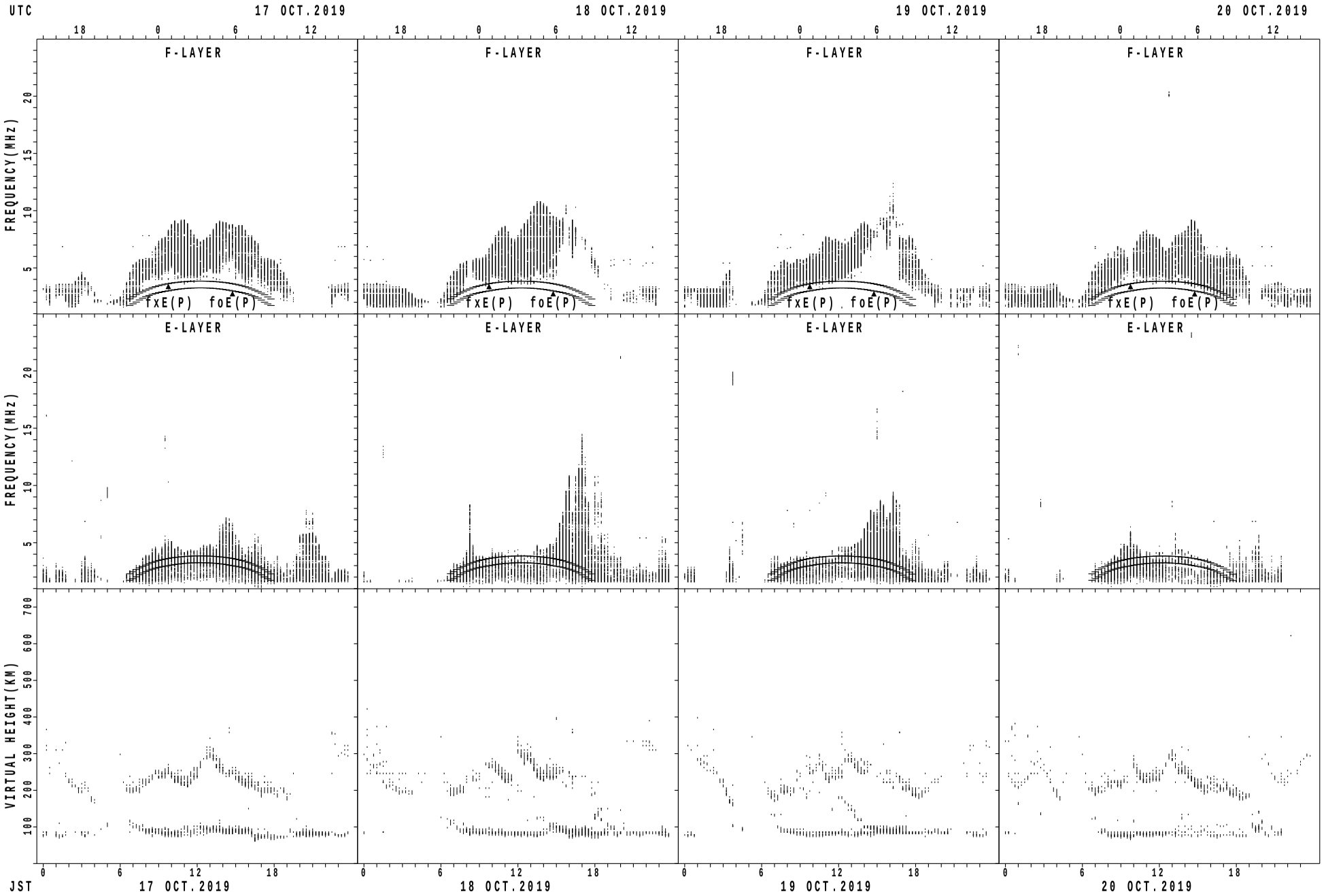
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Okinawa
UTC
JST
9 OCT.2019
10 OCT.2019
11 OCT.2019
12 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

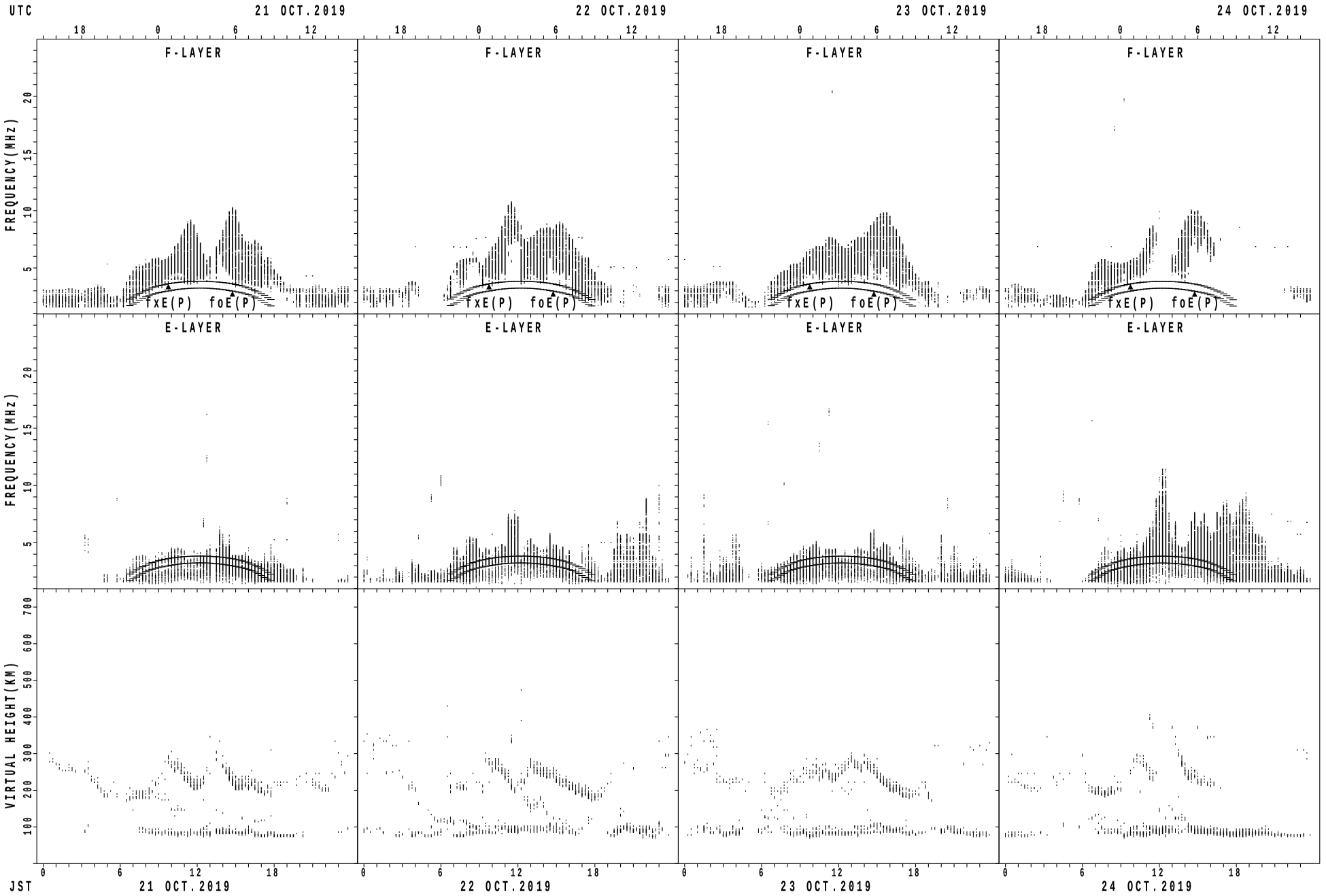

SUMMARY PLOTS AT Okinawa
UTC
JST
13 OCT.2019
14 OCT.2019
15 OCT.2019
16 OCT.2019
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



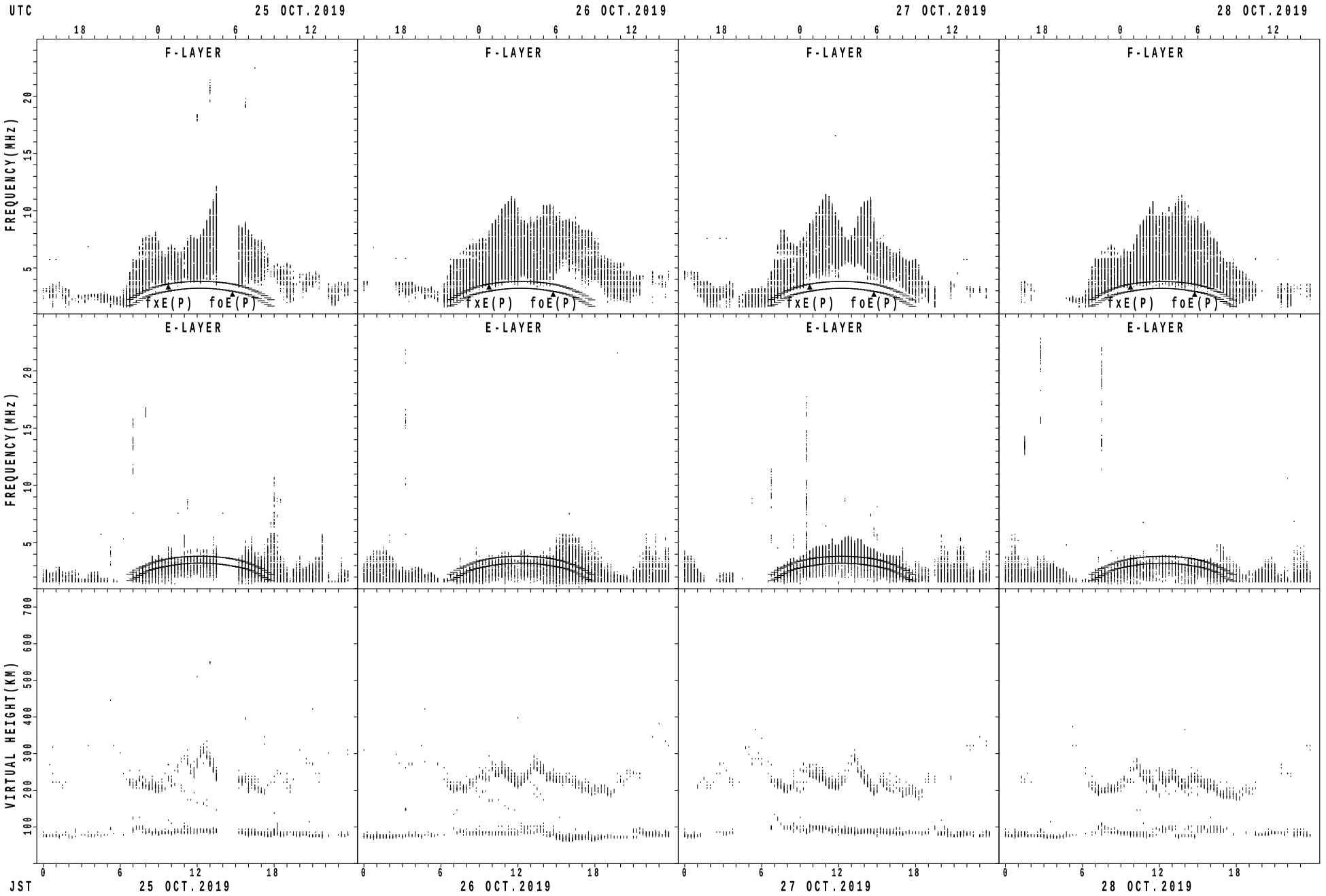
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



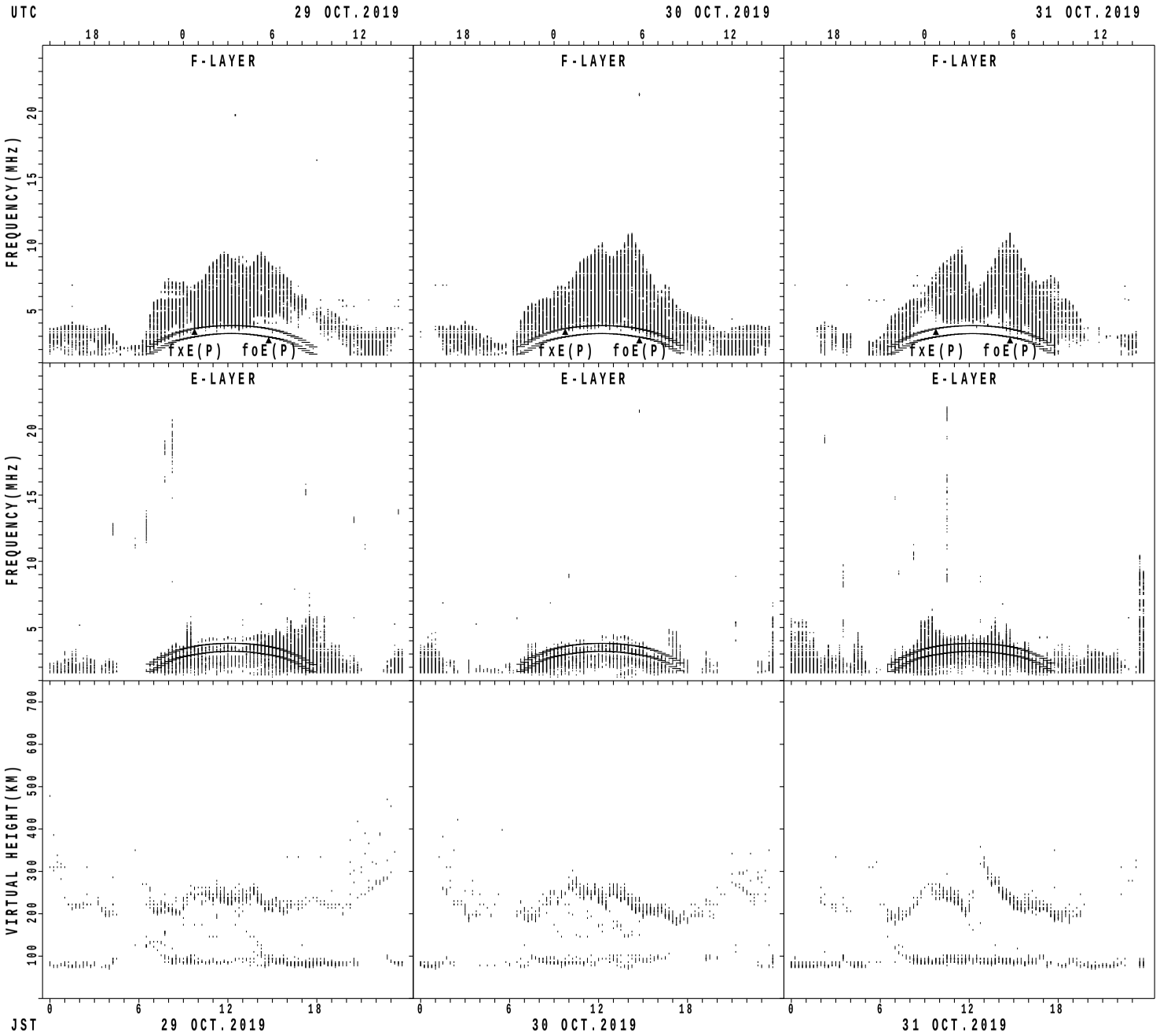
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	5	8				2	5	1	3					1		
MED								204	216	216				220	244	232	220					326		
U Q								220	222	221				222	254	116	234					163		
L Q								202	209	208				218	220	116	210					163		

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	17	16	14	12	14	14	20	28	30	24	25	23	22	21	17	19	23	22	18	18	17	15	16	19
MED	83	82	81	83	81	84	115	99	95	89	87	87	87	105	87	99	101	82	89	83	89	85	89	83
U Q	87	86	87	89	87	89	139	116	107	99	98	157	163	176	100	135	113	89	95	89	96	95	99	89
L Q	81	79	81	81	79	79	86	89	89	87	83	81	79	80	80	81	81	77	85	79	83	83	84	81

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	11	6					7	17	8	3	4			1		
MED								218	232	223					240	236	227	226	206			200		
U Q								234	246	242					250	250	237	242	210			100		
L Q								205	224	218					220	224	208	210	197			100		

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	13	11	10	7	10	6	19	23	18	16	25	21	16	12	15	19	23	25	25	22	17	18	18	14
MED	83	81	81	87	83	88	131	113	91	91	127	153	90	88	97	95	89	89	89	89	87	88	87	87
U Q	88	87	81	87	89	89	167	139	95	103	176	177	159	109	113	107	101	98	98	99	89	91	89	91
L Q	81	81	75	79	79	85	91	97	89	88	87	89	85	83	85	87	87	87	85	85	83	83	83	83

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									4	11						16	16	6	5	1				
MED									224	226						236	226	222	216	220				
U Q									228	238						245	238	230	225	110				
L Q									212	216						216	218	216	211	110				

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	15	15	12	9	11	10	8	30	29	29	26	28	27	26	26	26	30	28	28	29	21	16	19	17
MED	85	81	85	81	87	93	89	119	95	95	91	93	89	95	95	98	95	90	85	87	89	88	85	89
U Q	87	85	90	88	175	113	111	137	122	114	101	116	155	149	119	113	101	100	89	103	92	94	89	92
L Q	81	79	81	77	81	83	85	101	94	89	83	88	79	89	87	87	89	85	80	83	83	83	83	82

MONTHLY MEDIANS OF h'F AND h'Es

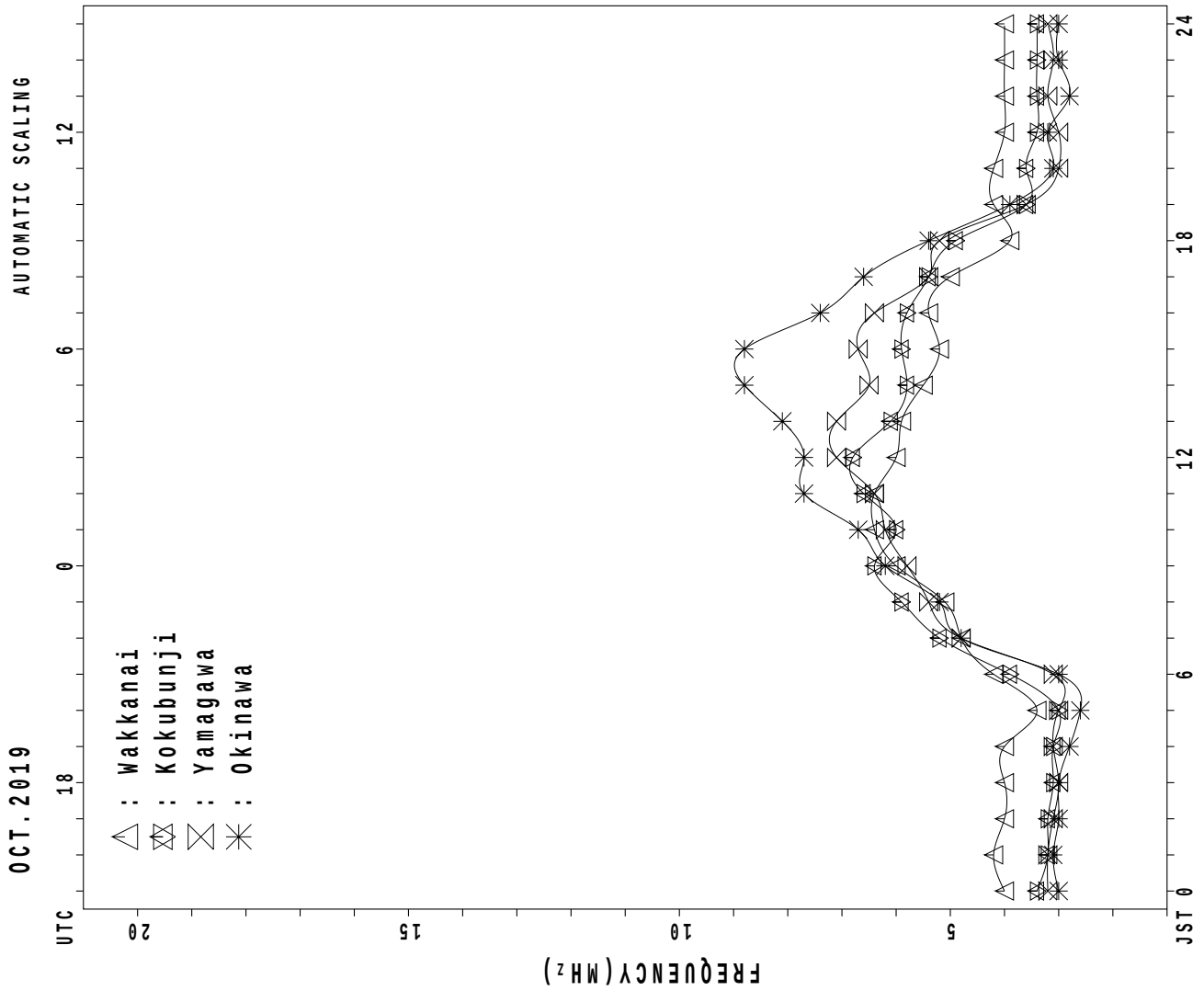
OCT.2019 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									9	14						8	26	16	6	1				
MED									224	242						216	218	213	208	220				
U Q									230	254						225	226	225	214	110				
L Q									216	220						207	208	207	204	110				

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	17	16	10	13	11	4	8	30	30	28	25	28	26	27	25	27	30	26	27	28	25	21	15	16
MED	83	83	82	83	81	84	85	119	104	95	101	100	102	149	119	95	92	89	85	88	89	85	83	82
U Q	88	89	87	86	87	97	94	131	113	106	136	141	167	169	149	113	101	101	95	95	96	89	87	89
L Q	81	80	81	81	81	81	84	103	95	89	95	91	93	95	95	89	89	83	81	85	83	81	81	81


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

IONOSPHERIC DATA STATION Wakkanai

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

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

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

OCT.2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

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

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L		L	L	L	L	A	L	L	L	L	L							
2						B		L	L	392	L	L	L	L	L	L	L							
3						A	344	L	L	L	400	L	L	L	L	L	L							
4								L	L	L	L	428	C	416	380	L	312	L						
5						L		L		L	408	L	L	L	388	L	L							
6								L	372	396	L	396	L	368	L	380	L							
7								L	L	L	L	L	416	L	L									
8								L	L	L	L	L	L	396	L	L								
9								L	L	L	L	L	L	L	L	L	L							
10								L	L	L	L	L	L	L	L	L	L							
11						C	C	C	L	400	412	L	L	L	L	L								
12								L		L	L	L	L	L										
13						L			L	L	L	L	L	L	L									
14								L	L	L	L	392	L	L	L	276								
15									L	L	L	L	412	L	L									
16									L	C	388	L	388	392	348	L	L							
17								L	L	376	L	L	L	404	L	L								
18								L	L	L	408	408	408	384	L									
19										388	388	L	L		L									
20										L	396	L	L	L	L									
21									L	376	380	L	396	L	L									
22									L	L	L	L	L	L	L									
23								256	L	380	L	L	L	380	L	L	224							
24								L	L	372	408	408	L	384	384	332								
25								L	L	A	L	L	L	L	L	L								
26							L		A	L	L	L	A	L	L									
27							L	L	L	L	L	L	L		L	L								
28									L		L	L	A		L	L								
29							L	L		L	C	C	C	C	C	C	C							
30										L	L	L	C	C	C	C	C	C						
31										C	C	L	400	380	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	1	8	9	5	6	9	4	3	2							
MED							344	256	372	384	400	408	404	384	382	332	268							
U Q										394	408	418	412	400	386	380								
L Q										376	388	394	396	380	364	276								

OCT.2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	B	244	216	276	A	A	272	292	264	248	216	A	B					
2						B	B	224	256	284	300	A	312	264	224	252	212	B	A					
3						A	A	220	252	244	288	288	288	276	276	244	200	A	A					
4						A	200	A	256	288	280	272	C	280	272	232	228	B	B					
5						256	236	208	248	272	292	296	272	292	272	236	196	A	A					
6						B	192	200	244	280	A	268	292	292	248	232	196	B	B					
7						B	184	208	268	280	280	280	292	288	A	A	A	A	200					
8						204	176	204	240	264	264	244	A	268	268	240	220	A	A					
9						B	B	224	252	264	312	244	292	276	276	A	212	A	A					
10						B	236	224	248	252	288	300	300	288	284	236	196	204	A					
11						C	C	C	240	252	240	316	300	284	272	240	192	A						
12						B	B	212	232	232	A	296	296	280	A	244	200	A						
13						200	180	192	264	256	236	300	A	A	A	232	172	208						
14						A	A	216	248	252	292	264	296	276	260	264	200	A						
15						B	172	196	236	268	A	296	288	276	252	228	200	B						
16						B	A	196	256	C	276	256	296	284	268 UA	236	192	A						
17						B	B	208	248	280	284	A	A	276	264	244	176	B						
18						B	B	208 UR	256	256	260	A	284	268	268	A	184	B						
19						B	B	208	248	284	264	A	192	284	260	220	184	B						
20						B	228	204	248	252	256	296	296	276	A	236	216	A						
21						B	180	224	240	260	272	248	260	220	A	232	180	B						
22						B	B	208	244	260	260	A	A	280	260	220	A	B						
23						B	A	188	252	276	292	276	288	272	256	A	284	A						
24						B	192	208	240	260	260	296	A	280	240	A	A	A						
25						B	A	B	204	244	244	A	276	276	248	228	192	B						
26						B	B	196	232	248	A	288	A	260	260	232	204	B						
27						B	A	200	196	200	268	A	272		256	208	A	A						
28						B	B	A	208	232	208	A	A	A	256	212	A	A						
29							B	196	244	244	C	C	C	C	C	C	C	B						
30							B	180	224	224	A	280	C	C	C	C	C	C						
31								216	232	C	C	A	A	A	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	11	27	31	29	23	20	20	25	23	23	23	2	1					
MED						204	192	208	244	260	272	284	290	276	260	236	200	206	200					
U Q						256	228	216	252	276	288	296	296	284	272	244	212							
L Q						200	180	196	232	246	260	266	274	274	256	228	192							

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 19	E B 17	E B 17	E B 16	24	E B 18	37	28	26	34	53	52	36	34	G	32	26	J A 23	E B 18	E B 19	E B 22	E B 21	B	38
2	E B 19	E B 26	24	E B 19	28	28	E B 18	23	G	29	J A 62	J A 49	J A 31	33	30	G	G 22	E B 16	35	29	35	E B 19	E B 22	E B 20
3	E B 19	E B 16	27	27	35	41	J A 35	25	29	29	G 28	36	32	32	30	28	24	J A 23	34	J A 29	25	27	J A 32	J A 51
4	J A 27	J A 27	E B 15	E B 16	J A 96	40	32	J A 51	J A 108	J A 60	31	J A 42	C	42	G	27	24	E B 16	E B 15	26	25	J A 19	19	19
5	21	32	22	26	E B 15	34	29	J A 110	29	31	J A 51	35	29	32	32	30	26	34	J A 21	21	E B 16	32	29	21
6	20	J A 30	25	J A 31	22	J A 63	28	24	32	33	J A 37	35	J A 29	33	J A 33	30	25	E B 16	E B 16	E B 16	E B 16	22	25	27
7	24	19	E B 16	E B 16	E B 16	26	J A 25	J A 62	30	J A 51	J A 38	34	34	32	37	40	34	34	J A 23	26	E B 16	20	20	22
8	20	20	19	21	J A 24	G	20	29	30	35	36	31	J A 41	G	33	J A 35	J A 29	34	J A 27	J A 31	J A 23	28	J A 30	J A 41
9	J A 33	32	25	29	29	E B 20	26	J A 25	35	32	41	J A 34	J A 38	33	37	40	J A 73	J A 35	J A 28	23	23	23	23	23
10	J A 19	33	39	27	24	30	G	J A 26	J A 31	J A 41	J A 41	37	36	32	29	27	23	J A 22	34	C	23	50	42	C
11	J A 49	C	C	27	C	C	C	C	J A 28	J A 31	J A 32	J A 77	37	32	G	J A 56	27	39	52	38	J A 31	J A 42	20	28
12	33	32	28	J A 87	29	25	E B 16	25	J A 38	J A 32	J A 63	32	94	31	J A 35	28	J A 30	63	J A 77	30	34	26	45	38
13	32	28	E B 16	30	J A 34	J A 31	28	J A 30	J A 47	37	J A 49	41	J A 62	J A 55	36	34	J A 47	28	J A 26	44	33	38	26	32
14	J A 25	29	23	20	J A 19	27	27	24	30	30	34	34	36	31	32	30	25	34	J A 61	J A 38	33	21	27	J A 38
15	28	26	J A 29	31	28	E B 16	25	25	28	32	46	34	33	32	30	26	26	J A 38	23	24	26	26	26	J A 36
16	J A 51	J A 34	J A 27	27	20	E B 16	23	24	28	C	32	J A 33	J A 33	J A 50	J A 32	J A 49	22	J A 26	J A 51	J A 49	J A 32	J A 39	33	E B 16
17	E B 16	24	32	26	26	25	E B 16	25	27	G 28	34	38	42	31	G	G	21	E B 16	32	34	20	33	28	E B 16
18	30	25	E B 16	E B 16	21	22	34	J A 32	34	J A 50	J A 38	J A 33	32	J A 49	G 26	J A 29	J A 33	J A 27	21	32	20	J A 19	30	29
19	22	26	E B 16	20	J A 25	26	J A 25	J A 31	J A 27	J A 48	J A 37	J A 41	J A 33	32	30	26	20	E B 16	E B 16	E B 16	E B 16	E B 16	34	38
20	J A 52	J A 30	25	E B 16	J A 26	J A 21	G	J A 34	J A 45	J A 38	J A 31	J A 31	33	G	J A 35	J A 27	J A 31	31	J A 41	J A 21	24	J A 24	J A 34	33
21	J A 26	J A 149	J A 30	31	J A 22	28	22	J A 25	J A 45	33	34	J A 34	J A 51	28	J A 28	24	J A 30	J A 31	J A 32	J A 42	J A 43	J A 48	J A 84	J A 53
22	44	34	25	J A 43	32	29	24	J A 21	26	J A 35	J A 38	45	J A 54	31	G	24	J A 49	29	23	23	22	J A 26	E B 15	28
23	24	26	28	J A 23	J A 31	27	20	J A 41	30	35	35	J A 40	30	30	J A 52	J A 32	33	30	J A 35	J A 52	58	J A 42	E B 16	26
24	E B 16	J A 23	26	E B 16	20	J A 21	28	22	J A 109	34	40	J A 49	J A 56	J A 31	34	36	36	34	32	J A 27	30	26	J A 31	J A 38
25	J A 47	28	36	20	20	26	33	37	44	59	J A 37	J A 40	32	J A 31	J A 31	33	28	J A 26	27	27	27	22	40	40
26	J A 33	40	J A 33	J A 42	40	27	E B 16	J A 32	J A 49	J A 36	J A 57	36	86	J A 100	J A 45	32	28	E B 16	J A 33	35	34	45	J A 51	26
27	J A 52	34	24	23	28	38	40	J A 31	43	J A 63	32	40	J A 30	47	32	25	39	J A 49	28	J A 27	J A 31	J A 31	26	J A 31
28	22	26	E B 16	J A 42	E B 16	J A 25	28	J A 51	J A 30	J A 47	46	J A 97	J A 88	56	J A 31	23	J A 35	J A 26	19	19	J A 33	24	E B 16	E B 16
29	27	29	33	26	38	35	25	29	J A 26	J A 32	C	C	C	C	C	C	C	E B 18	25	J A 48	J A 51	35	J A 30	J A 25
30	J A 33	25	E B 16	E B 16	E B 16	E B 16	E B 16	25	J A 37	J A 37	J A 28	29	C	C	C	C	C	C	C	22	E B 16	E B 16	E B 16	20
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	J A 19	J A 53	C	C	J A 63	J A 87	40	C	C	C	C	C	C	J A 32	J A 63	59	J A 85
	00	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	31	30	30	30	30	31	29	29	30	28	29	28	28	28	29	29	29	31	31	30	30
MED	26	28	25	26	24	26	25	J A 27	30	35	J A 37	36	36	32	32	30	28	28	28	27	26	26	28	28
U Q	J A 33	32	28	J A 30	29	30	28	J A 32	J A 44	J A 44	J A 46	J A 42	J A 52	41	34	34	J A 34	34	J A 34	J A 36	33	J A 38	34	J A 38
L Q	E B 20	25	E B 16	E B 16	E B 20	E B 21	E B 20	25	28	32	33	34	32	31	G 28	26	24	E B 20	22	22	E B 22	21	E B 22	22

OCT. 2019 foEs (0.1MHz)

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 19	E B 17	E B 17	E B 16	E B 20	E B 18	20	E B 25	26	G 28	A	A	31	33	G	30	23	20	E B 18	E B 19	E B 22	E B 21	B	20
2	E B 19	E B 26	E B 19	E B 19	26	E B 18	E B 18	23	G	G 28	30	32	G 30	32	28	G	G 21	E B 16	19	A	E A 24	E B 19	E B 22	E B 20
3	E B 19	E B 16	18	E B 20	20	A A 41	24	24	26	27	G 27	30	30	30	28	25	22	16	20	18	E B 16	18	E B 16	E B 17
4	E B 16	E B 16	E B 15	E B 16	E B 16	17	22	21	26	G 28	28	32	C	30	G	26	G 21	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G 20	25	28	30	32	32	29	30	30	27	20	24	17	E B 16	E B 16	E B 16	E B 16	E B 16
6	16	E B 16	E B 16	16	16	16	G 18	24	29	30	32	32	G 28	31	30	G 22	24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 16	23	28	G 28	30	31	32	30	23	30	24	20	G 19	16	E B 16	E B 16	E B 16	16
8	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 17	25	27	31	32	28	29	G	G 26	G 24	G 21	23	17	17	16	16	16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 20	16	G 22	26	30	32	32	30	30	G 27	23	22	22	22	16	E B 16	E B 16	E B 16	E B 16
10	16	E B 16	15	16	16	E B 16	G	G 18	26	29	G 28	32	G 29	31	G 27	26	20	G 20	24	C	16	A A 50	A	C
11	16	C	C	E B 16	C	C	C	C	26	28	26	G 30	G 29	G 28	G	25	23	18	23	21	18	18	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	34	30	27	30	G 30	29	21	26	27	22	22	E B 16	E B 16	E B 16	E B 16	22
13	E B 16	E B 16	E B 16	E B 16	E B 16	G 18	G 16	26	G 26	28	30	G 30	31	31	28	24	20	G 18	23	24	17	17	E B 17	22
14	E B 16	16	E B 16	E B 16	E B 16	E B 16	16	G 22	28	28	G 29	30	35	29	28	G 22	22	24	A A 61	20	17	E B 17	E B 17	17
15	17	E B 17	E B 17	E B 17	E B 17	E B 16	G 17	23	26	G 26	28	32	30	29	26	23	G 18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
16	19	19	E B 16	16	E B 16	E B 16	E B 16	22	G 26	C	30	32	G 29	G 28	28	25	20	E B 16	E B 16	E B 16	18	17	16	E B 16
17	E B 16	E B 16	16	E B 16	E B 16	E B 17	E B 16	23	26	G 28	30	31	27	29	G	G	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	23	26	28	30	30	30	29	G 24	26	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	23	26	G 23	28	29	29	30	28	25	19	E B 16	E B 16	E B 16	E B 16	E B 16	17	18
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	21	G 24	26	29	G 29	G 29	G	27	G 24	G 20	23	E B 16	20	E B 16	E B 15	19	E B 16
21	E B 16	E B 16	E B 16	E B 16	E B 16	16	E B 16	G 22	28	31	30	30	29	27	26	G 22	18	25	21	18	18	18	18	18
22	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 19	G 22	30	32	25	30	29	G	22	20	E B 16	E B 16	18	E B 15	E B 16	E B 15	E B 16
23	E B 16	E B 16	E B 16	E B 16	16	E B 16	16	21	28	G 27	33	29	G 28	28	26	24	G 18	17	18	E B 17	E B 16	E B 15	E B 16	E B 15
24	E B 16	E B 17	E B 17	E B 16	E B 17	E B 17	E B 15	G 19	26	29	30	30	33	29	28	26	22	22	20	E B 17	16	E B 16	E B 16	22
25	21	16	E B 17	E B 16	E B 16	E B 16	20	22	26	30	28	28	29	G 28	G 24	23	G 18	16	E B 16	E B 16	E B 16	E B 16	18	18
26	18	18	E A 22	E B 18	18	E B 17	E B 16	22	25	28	30	30	A A 86	27	27	28	G 18	E B 16	18	22	20	E A 21	18	16
27	16	E B 16	E B 16	E B 16	16	17	16	G 18	21	27	28	29	29	24	G 24	23	24	21	E B 15	E B 14	16	E B 16	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	14	E B 17	21	23	40	32	31	24	28	26	23	18	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
29	E B 16	E B 16	16	E B 16	E B 16	E B 16	E B 16	G 16	G 24	29	C	C	C	C	C	C	C	E B 18	E B 16	20	E B 16	E B 16	E B 16	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	G 18	G 22	22	G 28	C	C	C	C	C	C	C	E B 16	E B 16	E B 16	E B 16	E B 16
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 19	G 23	C	C	32	26	26	C	C	C	C	C	C	E B 16	E B 16	A	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	30	30	31	30	30	30	30	31	29	28	29	28	29	28	28	28	29	29	28	31	31	28	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	16	22	26	28	30	30	29	29	G	24	20	18	17	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	17	16	E B 16	E B 16	16	17	19	23	27	30	31	32	30	30	28	26	22	22	20	18	17	17	17	18
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 21	G 25	G 28	28	29	G 29	G	26	23	G 20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

OCT.2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

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

OCT.2019 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	303	303	293	293	364	349	366	353	344	353	366	366	323	335	351	336	353	360	341	352	338	R 320	B	314
2	318	327	337	336	336	352	373	393	365	355	336	334	346	343	357	370	347	351	352	322	311	301	319	315
3	313	323	318	351	353	A	G	382	363	355	348	348	338	352	365	346	367	364	358	349	359	338	311	328
4	309	310	322	322	344	322	384	396	340	369	350	349	C	358	377	339	357	344	328	340	326	317	314	326
5	318	316	317	307	341	335	397	365	343	338	349	363	345	355	371	362	352	360	366	343	346	326	311	333
6	323	312	312	330	330	344	369	358	369	379	365	348	358	367	367	325	358	360	334	339	352	309	310	317
7	327	319	325	347	342	313	399	372	367	353	337	357	356	353	362	368	356	363	327	318	347	318	321	328
8	326	308	327	315	328	342	408	367	369	363	353	357	336	390	363	366	366	370	331	332	347	341	322	296
9	308	F 308	F 295	F 296	F 342	305	375	364	348	349	364	369	352	367	371	358	354	371	347	337	315	331	321	322
10	322	338	339	333	345	345	392	376	366	368	366	361	342	357	359	338	336	342	326	C	394	A	225	C
11	295	C	C	295	C	C	C	C	384	350	365	360	361	360	360	349	356	371	351	347	348	F 330	318	336
12	323	318	313	327	321	334	369	385	395	372	368	331	353	376	365	376	362	364	282	319	324	327	324	F 312
13	F 325	F 294	F 327	F 285	348	335	377	382	405	317	367	380	384	367	362	354	336	370	347	351	335	290	F 311	F 370
14	F 331	F 303	F 327	324	F 297	336	380	362	358	379	370	385	365	352	372	360	373	358	A	331	334	349	326	308
15	328	303	306	F 306	F 305	314	395	394	369	337	358	381	337	373	368	374	350	362	351	348	359	339	329	319
16	347	318	271	326	354	372	373	401	398	C	359	374	356	366	342	348	347	375	348	356	375	331	329	324
17	320	330	330	336	331	356	392	376	376	363	364	369	369	380	363	355	386	371	333	325	324	336	324	330
18	317	326	324	331	390	389	388	372	338	381	344	353	355	361	355	363	375	367	342	338	358	326	327	316
19	F 317	F 284	F 301	F 300	F 348	F 318	380	393	384	368	368	373	364	371	357	370	356	357	352	343	332	348	F 327	295
20	F 317	299	301	318	346	F 324	369	395	386	363	377	373	381	371	370	343	360	367	337	345	358	F 299	F 328	F 274
21	288	F 296	F 311	F 320	F 329	337	401	372	355	400	364	358	359	342	367	350	360	384	373	339	364	329	F 291	339
22	F 320	F 321	F 325	F 288	F 318	F 314	390	381	376	362	351	338	366	367	362	371	362	374	321	318	324	321	325	310
23	315	300	341	332	336	329	366	366	391	379	366	348	340	394	362	351	367	385	360	312	335	329	337	334
24	345	314	320	320	335	317	405	372	368	398	377	341	380	378	353	344	369	377	321	346	335	310	301	F 273
25	F 328	320	285	310	F 279	F 285	F 348	366	380	317	347	352	377	377	347	356	366	351	311	332	308	299	285	300
26	300	300	311	328	336	308	366	R	372	389	374	337	A	346	372	367	357	371	311	328	328	316	286	307
27	203	315	343	336	299	320	287	338	337	354	342	357	374	389	370	381	355	363	356	316	316	312	312	319
28	331	313	306	281	F 296	F 329	F 356	376	378	379	386	376	344	351	364	374	382	375	326	318	314	314	F 272	319
29	331	310	348	330	343	343	345	374	354	357	C	C	C	C	C	C	C	382	364	329	317	302	340	F 312
30	F 318	F 287	F 309	335	335	337	317	369	383	361	367	359	C	C	C	C	C	C	C	308	317	326	315	315
31	326	F 307	311	288	304	304	338	388	366	C	C	363	324	377	C	C	C	C	C	C	342	339	314	F 292
	00	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	31	30	29	30	29	31	29	29	30	27	29	28	28	28	29	28	29	31	30	30	30
MED	320	311	318	322	336	334	374	374	369	363	364	358	356	367	363	357	358	367	342	337	335	326	318	316
U Q	327	319	327	332	345	344	392	386	383	379	368	369	366	376	369	369	366	372	352	346	352	331	326	328
L Q	313	303	306	300	F 321	316	366	366	355	353	350	348	342	352	358	347	354	360	326	320	324	312	311	308

OCT.2019 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L		L	L	L	L	A	L	L	L	L	L							
2						B		L	L	387	L	L	L	L	L	L	L							
3						A	362	L	L	L	399	L	L	L	L	L	L							
4								L	L	L	L	388	C	368	368	L	380	L						
5						L		L		L	379	L	L	L	374	L	L							
6								L	375	379	L	411	L	420	L	365	L							
7								L	L	L	L	L	384	L	L									
8								L	L	L	L	L	L	401	L	L								
9								L	L	L	L	L	L	L	L	L	L							
10								L	L	L	L	L	L	L	L	L	L							
11						C	C	C	L	368	399	L	L	L	L	L								
12								L		L	L	L	L	L										
13						L			L	L	L	L	L	L	L									
14								L	L	L	L	412	L	L	L	412								
15									L	L	L	L	388	L	L									
16									L	C	419	L	408	389	425	L	L							
17								L	L	408	L	L	L	397	L	L								
18								L	L	L	389	387	385	406	L									
19										399	397	L	L		L									
20										L	414	L	L	L	L									
21									L	390	392	L	415	L	L									
22									L	L	L	L	L	L	L									
23								412	L	427	L	L	L	395	L	L	421							
24								L	L	405	406	391	L	392	360	414								
25								L	L	A	L	L	L	L	L	L								
26							L		A	L	L	L	A	L	L									
27							L	L	L	L	L	L	L		L	L								
28									L		L	L	A		L	L								
29							L	L		L	C	C	C	C	C	C	C							
30										L	L	L	C	C	C	C	C	C						
31										C	C	L	375	391	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	1	8	9	5	6	9	4	3	2							
MED							362	412	375	394	399	391	386	395	371	412	400							
U Q										406	410	412	408	404	400	414								
L Q										383	390	388	384	390	364	365								

OCT.2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 2019 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						268		244	294	260	242	250	314	304	278	280	246							
2						230		216	254	260	284	312	296	280	256	248	256							
3						A	G	246	254	254	268	256	272	282	252	244	248							
4								216	244	256	278	276	C	266	242	260	246	222						
5						254		228		286	268	254	264	254	240	240	260							
6								238	248	248	264	262	276	258	252	286	242							
7								228	254	264	278	246	254	268	242									
8								246	246	226	238	238	254	228	240	240								
9								228	230	262	234	226	250	250	230	250	250							
10								230	230	232	228	234	262	248	242	256	240							
11						C	C	C	232	262	238	238	238	242	230	246								
12								214		226	238	238	254	236										
13						230			212	252	238	224	224	238	232									
14								222	242	224	238	224	252	242	222	222								
15									230	242	222	228	262	232	232									
16									204	C	248	216	238	238	270	256	242							
17								214	216	230	230	234	224	224	244	244								
18								206	222	222	254	238	238	246	238									
19										228	238	228	216		250									
20										252	216	214	214	226	230									
21									246	210	234	234	244	244	244									
22									224	238	242	272	234	234	230									
23								220	204	224	242	252	252	218	230	270	216							
24								198	242	220	220	252	232	226	244	244								
25								244	222	276	250	250	234	224	250	244								
26						312	240		228	210	224	230	A	254	226									
27							348	258	322	270	296	246	222		222	226								
28									234		228	224	256		236	230								
29							230	210		234	C	C	C	C	C	C	C							
30										234	234	244	C	C	C	C	C	C						
31										C	C	244	258	224	C	C	C	C						
	00	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	4	19	24	28	29	30	27	26	27	18	10	1						
MED						254	294	228	233	240	238	238	252	242	240	245	246	222						
U Q						290	G	244	247	260	259	252	262	254	250	256	250							
L Q						230	235	214	223	226	232	228	234	228	230	240	242							

OCT. 2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	268	260	272	268	230	216	242	200	EA 232	206	A	A	174	198	212	224	208	232	216	226	226	246	B	284
2	EB 254	260	258	248	242	B	214	188	190	196	186	200	188	194	194	194	204	214	220	A	EB 266	EB 278	EB 286	266
3	EB 290	290	272	230	EB 246	A	198	198	198	192	192	200	196	192	210	196	212	220	220	220	212	238	252	262
4	256	256	256	248	218	208	202	192	170	190	194	198	C	194	194	200	200	198	220	220	Q 220	236	244	236
5	248	248	256	254	212	218	196	196	212	194	194	214	196	210	210	194	220	224	210	210	216	216	242	236
6	254	254	240	240	232	210	196	202	210	200	196	194	188	188	194	206	222	218	214	228	210	226	268	238
7	252	244	232	226	194	240	210	194	206	206	198	178	188	206	186	230	226	208	226	246	222	238	242	226
8	238	256	250	274	240	228	186	186	196	208	196	196	192	184	176	188	220	220	222	248	226	226	226	250
9	Q 222	250	Q 250	250	Q 206	Q 214	198	198	184	202	202	190	178	212	200	200	200	208	212	232	252	226	260	260
10	242	236	234	226	218	250	200	218	188	192	188	188	180	226	216	218	224	228	246	C	192	A	A	C
11	B	C	C	Q 258	C	C	C	C	204	196	196	190	190	210	210	216	234	218	224	224	222	244	222	230
12	248	258	252	248	218	234	200	192	214	186	194	182	182	182	212	232	234	218	A	250	230	218	242	Q 242
13	Q 204	Q 226	Q 242	Q 226	216	202	210	210	190	190	204	198	194	204	182	228	218	212	230	240	240	240	240	240
14	Q 212	Q 244	238	230	Q 244	234	206	172	192	208	186	186	208	194	212	190	226	222	A	238	214	214	252	244
15	244	252	266	Q 258	Q 258	Q 216	198	198	198	198	186	206	192	194	202	224	224	204	220	212	212	212	224	244
16	224	258	250	236	212	188	200	200	196	C	186	186	186	202	188	210	210	210	218	210	202	216	242	248
17	248	236	236	236	230	190	208	204	202	188	182	186	186	196	196	196	218	202	226	244	236	218	248	232
18	232	242	250	230	202	190	202	186	188	194	198	194	190	190	198	226	226	218	210	224	220	226	236	256
19	Q 252	Q 268	Q 244	Q 252	Q 200	194	206	198	204	198	196	184	184	218	200	234	214	214	230	230	242	226	Q 256	Q 264
20	Q 238	250	264	Q 230	204	228	210	214	224	208	188	198	176	192	206	216	206	210	236	238	210	Q 240	258	Q 258
21	252	Q 280	Q 262	Q 250	236	214	196	212	192	192	192	192	192	198	208	222	222	194	218	224	210	248	240	240
22	224	Q 238	Q 230	Q 238	238	220	204	204	186	210	210	192	198	198	200	220	218	202	244	252	226	236	256	246
23	222	232	234	230	230	216	196	182	198	180	208	192	192	192	188	204	188	198	220	244	230	230	238	226
24	236	EB 236	238	214	214	212	184	182	194	196	190	184	200	200	200	200	214	202	196	206	222	262	Q 236	258
25	258	232	258	268	Q 258	Q 250	226	212	212	A	204	200	190	190	200	210	210	196	234	216	266	242	302	258
26	288	268	280	244	204		198	240	A	192	186	200	A	200	214	230	230	216	216	266	250	A 250	A	228
27	A	264	242	258	238	268	234	206	206	206	176	190	186	186	192	188	216	216	216	240	262	262	262	230
28	266	246	224	266	250	246	218	204	192	220	192	202	A	228	198	208	208	202	226	244	234	246	Q 284	Q 254
29	254	278	238	238	228	204	200	206	218	200	C	C	C	C	C	C	C	200	208	280	252	230	236	Q 246
30	Q 246	Q 244	Q 256	240	218	218	236	214	208	208	192	192	C	C	C	C	C	C	C	258	256	256	272	272
31	256	266	250	Q 250	238	218	212	202	248	C	C	200	196	204	C	C	C	C	C	C	222	206	298	276
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	31	30	27	30	30	30	28	28	29	26	29	28	28	28	29	27	28	31	30	28	30
MED	247	251	250	244	226	216	202	200	198	197	193	192	190	198	200	210	218	212	220	235	224	234	244	246
U Q	255	260	258	254	238	234	210	206	210	206	197	200	194	205	210	224	224	218	226	245	242	246	261	258
L Q	234	242	238	230	212	208	198	192	192	192	187	187	186	192	194	198	209	202	216	222	214	226	239	236

OCT.2019 h'F (KM)

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	B	112	100	104	A	A	104	104	104	106	106	A	B					
2						B	B	108	108	100	100	A	104	96	96	98	98	B	A					
3						A	A	106	106	96	104	104	104	104	106	102	106	A	A					
4						A	B	A	102	102	102	102	C	108	112	112	122	B	B					
5						106	146	118	112	112	112	112	112	112	106	106	106	A	A					
6						B	132	110	110	110	A	100	98	98	98	100	100	B	B					
7						B	126	108	98	106	106	106	106	106	A	A	A	A	A					
8						90	122	110	110	110	102	102	A	96	108	102	102	A	A					
9						B	B	112	112	112	112	102	102	102	102	A	102	A	A					
10						B	124	100	114	114	114	108	108	108	108	104	92	100	A					
11						C	C	C	100	100	100	104	110	102	102	102	102	A						
12						B	B	108	102	102	A	102	102	102	A	92	B	A						
13						106	98	110	110	110	104	104	A	A	A	104	104	120						
14						A	A	106	106	96	108	100	100	100	100	100	114	A						
15						B	138	100	112	112	A	112	112	112	112	112	106	B						
16						B	A	106	112	C	106	106	106	106	106	106	106	A						
17						B	B	106	106	106	106	A	A	104	98	94	94	B						
18						B	B	102	102	102	102	A	102	102	102	A	102	B						
19						B	B	102	106	106	94	A	100	100	100	100	108	B						
20						B	120	120	118	94	96	108	108	108	A	108	102	A						
21						B	110	120	106	118	100	100	110	108	A	104	104	B						
22						B	B	114	114	102	96	A	A	96	106	116	A	B						
23						B	A	114	104	114	114	108	108	108	102	A	102	A						
24						B	102	104	104	104	104	112	A	112	100	A	A	A						
25						B	A	B	100	100	100	A	116	116	116	110	90	B						
26						B	B	120	120	110	A	98	A	98	98	108	122	B						
27						B	A	122	116	104	102	A	102		102	102	A	A						
28						B	B	A	102	102	102	A	A	A	102	104	A	A						
29							B	104	118	118	C	C	C	C	C	C	C	B						
30							B	108	108	108	A	108	C	C	C	C	C	C						
31								108	108	C	C	A	A	A	C	C	C	C						
	00	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	10	27	31	29	23	20	20	25	23	23	22	2						
MED						106	123	108	108	106	102	104	105	104	102	104	103	110						
U Q						106	132	114	112	111	106	108	109	108	106	108	106							
L Q						90	110	106	102	102	100	102	102	100	100	100	102							

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	94	B	98	104	100	100	92	92	92	140	G	106	122	102	B	B	B	B	B	94
2	B	B	94	B	94	94	B	110	G	114	98	94	94	98	98	G	118	B	100	100	100	B	B	B
3	B	B	100	100	94	94	94	140	108	108	100	104	148	142	158	130	140	92	92	94	96	86	90	90
4	92	84	B	B	86	96	92	92	112	104	102	90	C	104	G	152	130	B	B	94	94	94	92	92
5	86	92	92	90	B	92	146	94	138	114	104	116	102	144	134	118	110	104	104	104	B	100	86	94
6	102	102	102	102	116	96	154	138	122	108	106	104	100	166	106	106	124	B	B	B	B	96	90	106
7	92	92	B	B	B	88	94	82	154	104	96	110	144	134	88	88	88	88	88	88	B	88	88	88
8	88	88	88	88	88	G	130	112	104	104	104	102	94	G	104	84	84	84	84	84	84	98	98	98
9	98	112	102	94	90	B	90	102	102	148	102	102	94	156	116	86	86	98	90	90	90	90	90	90
10	90	90	98	86	98	92	G	100	104	106	102	96	96	148	158	148	120	104	98	C	98	98	98	C
11	98	C	C	88	C	C	C	C	116	104	100	114	102	166	G	110	116	104	92	94	94	106	90	90
12	90	90	90	96	96	96	B	108	100	100	100	86	104	156	90	134	120	102	102	102	90	98	98	94
13	94	94	B	106	106	100	100	106	106	106	94	94	94	94	90	112	112	124	112	104	104	104	98	98
14	98	90	90	90	90	90	90	112	104	104	98	92	164	152	114	126	118	108	104	104	90	84	98	98
15	96	96	88	88	88	B	142	142	146	102	102	158	148	148	146	128	84	84	84	84	94	84	84	98
16	102	L 92	92	94	94	B	100	144	124	C	102	102	102	94	98	100	122	92	106	114	94	94	94	B
17	B	94	94	94	94	88	B	136	138	110	96	92	92	146	G	G	136	B	104	94	94	94	94	B
18	96	92	B	B	98	98	90	92	94	86	98	98	92	100	110	90	92	92	92	92	92	102	102	94
19	94	98	B	90	90	94	94	94	108	98	108	102	100	148	132	130	130	B	B	B	B	B	112	104
20	106	92	92	B	118	104	G	112	106	102	98	98	98	G	94	94	94	86	98	98	98	122	102	98
21	98	126	92	94	94	92	98	132	108	110	100	100	100	100	94	148	96	90	108	102	104	104	104	98
22	98	98	98	98	94	94	96	114	124	102	98	90	98	140	G	146	104	102	104	88	88	88	B	96
23	96	96	96	96	94	94	94	94	118	124	172	96	130	110	96	96	90	90	90	112	112	128	B	90
24	B	94	94	B	94	94	94	118	104	104	100	100	98	98	90	90	90	94	90	92	92	92	106	96
25	96	96	94	94	110	120	104	104	104	104	104	104	152	100	92	90	90	90	98	98	96	96	96	G 96
26	96	96	96	98	98	90	B	114	108	108	108	94	94	100	84	116	134	B	102	102	102	102	102	92
27	92	92	106	88	104	98	102	102	102	102	178	94	86	94	98	116	102	102	102	102	102	102	94	94
28	94	84	B	114	B	114	114	98	98	98	94	100	100	90	90	132	88	88	88	84	108	108	B	B
29	94	94	94	94	94	94	94	94	116	100	C	C	C	C	C	C	C	B	102	102	102	102	108	112
30	104	96	B	B	B	B	B	142	112	100	100	118	C	C	C	C	C	C	C	82	B	B	B	82
31	B	B	B	B	B	B	90	116	116	C	C	98	104	96	C	C	C	C	C	C	104	104	104	112
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	21	22	25	23	23	30	30	29	29	30	28	27	23	26	28	22	25	26	25	27	25	26
MED	96	94	94	94	94	94	96	109	108	104	100	99	100	134	98	114	111	93	98	96	96	98	98	95
U Q	98	96	98	98	98	98	104	118	118	108	104	104	104	148	116	130	122	102	104	102	102	104	102	98
L Q	92	92	92	90	92	92	94	98	104	101	98	94	94	98	90	94	90	90	90	90	92	92	90	92

OCT.2019 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					F1		L1	L1	C2	LC11	L3	L2	L2	H1		C2	C2	L2						F2
2			F1		F2	L1		C2		CL11	L1	L2	L1	C1	C2		C1		L1	F1	F1			
3			F1	F1	F3	L3	L2	C1	C2	C2	C1	C1	C1	CL11	HL21	CL31	L2	L2	L4	F4	F1	F2	F1	F1
4	F1	F1			F1	L6	LC31	L4	CL13	CL12	CL21	LC11		LC11		HL11	C1			F1	F2	F1	F1	F1
5	F1	F1	F1	F1		C1	H1	LC12	CL11	CL21	C2	C1	C1	H1	C2	C2	C2	L4	L2	F1		F1	F2	F1
6	F1	F1	F2	F2	F1	L1	H1	H2	C2	C2	L2	C3	C2	H1	C3	C3	C2					F1	F2	F1
7	F1	F1				L1	LC11	LC12	H2	C2	LC21	C1	HL12	C2	L3	L4	L4	L3	L4	F2		F1	F1	F3
8	F1	F2	F1	F1	F1		C1	C2	C3	C4	C3	L2	L3		C2	LC21	LC31	L3	L3	F1	F2	F2	F2	F4
9	F3	F1	F1	F1	F1		L1	C2	C2	HL21	LL21	L2	L2	H1	L2	L2	LC21	L3	L2	F2	F1	F1	F1	F1
10	F3	F3	F4	F3	F2	LQ21		LC11	C2	C2	L2	L2	L2	HL12	HL13	CL13	C2	L3	L6		F1	F5	F8	
11	F3			F2					C2	C2	C2	C2	C2	H1		C2	C2	L3	F5	F4	F4	F6	F1	F1
12	F1	F5	F1	F1	F1	L1		C2	C3	C2	L3	L2	CL22	HL12	L3	HL11	C3	L4	F6	F2	F5	F1	F4	F2
13	F1	F1		F1	F2	L4	C1	C3	C2	C2	C2	C2	L2	L3	L2	C2	CL11	CL21	F4	F4	F2	F3	FF11	F4
14	F1	F3	F2	F2	F1	L2	LQ11	C2	C2	C2	LC11	C2	CL11	HL11	CL21	CL12	C2	L3	LL52	L3	F3	F2	F2	F5
15	F2	F2	F2	F2	F2		C1	HL22	HL12	C2	L2	CL12	H1	H1	H1	C1	LC11	L1	F1	F1	F1	F2	F1	F2
16	F3	F4	F3	F3	F1		L1	H2	C2		C2	C2	LC11	LC11	LC21	LC12	CL21	L1	F1	F1	F3	F4	F1	
17		F2	F2	F1	F1	L2		C1	C3	C1	LC11	L2	L3	H1			H2		F1	FQ21	F1	F1	F1	
18	F1	F1			F1	L1	L1	LH21	LC21	LC12	C3	L2	C2	LC11	CL21	L3	L1	L1	F1	F1	F1	F1	F1	F2
19	F1	F1		F1	F1	L1	L2	L4	C2	C2	C3	L2	C1	HL11	CL21	C2	C1						F3	F4
20	FQ31	F2	F2		F1	L1		C1	C2	F4	C2	C2	LC21		L3	LC12	LC21	L4	F2	F2	F1	F1	F3	F2
21	F4	LL12	F3	F2	F2	LQ21	CL11	C2	CL42	CL31	C3	C2	C3	C2	L2	HL21	LC11	L3	F3	F6	F3	F3	F3	F7
22	F3	F2	F1	F2	F3	LQ31	L2	CL21	CL21	C3	C3	L3	L3	HL11		HL11	LL21	LQ11	F1	F1	F1	F1		F1
23	F1	F1	F1	F1	F3	L1	L1	LC11	CL22	CL21	HL11	L3	HL12	C2	LC21	L3	L3	LQ11	L3	FF22	FQ41	F1		F1
24		F1	F1		F1	L1	L1	CL21	C2	C2	C3	C3	C3	C1	LC21	L3	L3	L5	F4	FF21	FQ11	F2	F2	F4
25	F5	F3	F5	F1	F1	L1	L3	L3	C3	C4	CL22	L2	H1	LC11	LC21	LC21	C2	L4	F1	FQ11	FQ11	F1	F3	FQ31
26	F5	F4	F4	F6	F5	L3		LC22	C3	C3	C2	C2	L5	CL21	L2	C4	C1		F5	FQ31	F3	F5	F7	F3
27	F5	F3	F2	FF11	F3	L3	L6	L4	C4	C4	HL12	L3	L2	L3	C2	C2	L3	L4	F2	F1	F3	F3	F1	F1
28	F1	F1		F1		L1	L1	L4	C4	C4	C2	L4	L3	L4	LC11	C2	LC11	L1	F1	F1	F2	F2		
29	F2	F2	F3	F2	F4	F1	L2	LC11	C2	C4									F1	F6	F3	F4	F2	F2
30	F3	F1						C2	C4	C4	L2	C1								F1				F1
31							L1	LC11	C3			L3	L3	L2							F1	F3	F4	F3
	00	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																								

OCT. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

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

OCT.2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

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

IONOSPHERIC DATA STATION Kokubunji

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

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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	U L 388	L	U L 408	L	U L 400	U L 424	L								
2									L	U L 400	428	420	U L 416	408	L	L								
3								L	L	L	U L 416	U L 420	424	A	A	A	A							
4								L		U L 400	408	432	U L 424	420	U L 396	A	A	A						
5									L	U L 404	U L 440	U L 428	420	L	L	L	L							
6								L		404	U L 428	420		L	L	L	L							
7								L	L	U L 408	U L 432	A	A	U L 420	L		L							
8								L		L	A	U L 440	U L 432	L	L									
9								L	L	L	U L 436	A	U L 416	L	L	L	L							
10									L	L	L	U L 436	U L 420	A	A	A	A							
11									A		A	A	A		U L 404	L		A						
12										U L 408	U L 428	432	A	L	L	A	A							
13									L	L	U L 420	U L 428	U L 420	U L 436	U L 400	A		A						
14									L	L	L	U L 424	L	U L 420	U L 416	L								
15									L	368		L	416	L	L	L								
16									L	L	A		C	L	L	A	A							
17									L	L	L	436	U L 432	408	L	A			A					
18										L	U L 428	L	408	U L 404	L									
19									L	L	U L 416	424				A								
20									L	L	U L 432	L	U L 400	L	A	L								
21									L	L	A	L	U L 460	A	A	A								
22									L	L	U L 444	L	U L 416	400		L		A						
23										L	L	L	404	U L 396	L	A								
24						A			A	A	A	A	A	408	384	A								
25									L	L	L	U L 408	L		L	L								
26										L		L	L	L	L	L	A	A						
27									L	L		L	404	U L 400	L									
28										L	U L 432	U L 400	U L 400	L	L	L								
29										L	A	U L 440		L	A					A	A			
30										L	L	L		A										
31											L	U L 424	L		L									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										8	14	17	17	12	6									
MED										U L 402	U L 428	U L 424	U L 416	U L 408	U L 402									
U Q										U L 406	U L 432	U L 434	U L 424	U L 420	U L 416									
L Q										U L 394	U L 420	U L 420	406	U L 400	396									

OCT.2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	U A 212	A	U R 312	A	R	B	R	A	R	A	B						
2							B	A	A	A	U R 316	U R 312	U R 324	R	U R 304	268	228	B						
3							B	U R 240	A	R	U R 304	A	R	A	A	U A 272	A	B						
4							B	U A 240	U R 300	A	U R 328	R	R	A	U R 304	A	A	B						
5							B	U A 228	A	A	R	R	U R 328	A	A	A	A	B						
6						B	B	A	U A 272	A	A	A	U A 376	A	A	U R 288	A	B						
7							B	U R 256	A	A	U R 328	R	U A 320	U A 300	U R 288	A	A	B						
8							B	A	A	R	U A 320	R	U R 336	U A 296	U R 292	U R 264	224	B						
9							B	A	A	R	R 328		R	R	U R 288	U R 264	U R 236	B						
10						B	U R 172	A	A	R	U R 328	R	U R 304	U R 320	A	A	A	B	B					
11						B	B	A	A	A	A	A	A	R	U A 296	A	A	B	B					
12						B	B	A	A	A	A	A	A	A	A	A	A	B						
13								U R 252	U R 284	U R 304	A	A	A	R	U R 276	U R 256	U R 196	B	B					
14							B	A	A	U R 304	A	A	A	R	R	A	U A 208	R	B					
15							B	U A 212	U R 272	R	U R 324	R	R	U A 292	R	A	A	B						
16							B	U R 228	A	R	U R 328	R	C	A	A	A	A	B		A				
17							B	U R 260	R	A	A	U R 316	U R 340	R	A	A	A	A	B					
18						B	A	U A 216	A	A	A	A	U A 320	304	A	U A 252	A							
19						B	B	U A 224	A	U R 308	R	R	U A 336	A	A	A	A	A	B					
20						B	B	A	A	A	R	R	A	U R 324	A	U R 256	A							
21						B	B	U R 212	U A 272	A	A	A	A	A	A	A	A	A						
22						B	B	U R 240	A	R 312	R	U A 320	A	A	A	A	A	B						
23						B	B	U A 208	A	A	A	R	R	R	U A 280	A	A	B						
24						B	B	U A 212	A	A	A	A	A	A	A	A	A	A						
25						B	B	A	A	A	R	R	R	A	R	A	A	B						
26						B	B	U R 228	U A 284	A	A	A	U R 308	U R 296	U R 280	R	A	B						
27							B	A	R	R	U R 336	A	A	U R 300	R	U A 240	U R 196	B						
28						B	B 192		248	U R 284	R	R	U R 324	A	U R 276	A	A	B						
29							B	U R 212	U R 276	A	A	A	A	A	A	A	A	A	A	A	A			
30						B	B	U R 236	A	U R 296	A	A	A	A	A	A	A	B						
31						B	B 204		U A 260	A	A	A	R	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	20	9	7	9	4	11	8	10	9	6							
MED							U R 172	U 226	U 272	U R 304	U R 328	U 318	U R 324	U 300	U R 288	U R 264	U 216							
U Q								U R 240	U R 284	R 312	U R 328	324	U R 336	U R 312	U R 296	U 270	228							
L Q								U A 212	U A 266	U R 296	U R 318	U R 314	U R 320	U A 296	U R 280	U A 254	U R 196							

OCT. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 27	23	19	22	19	E B 14	E B 15	28	31	G	33	G	E B 34	G	33	G	29	21	E B 15	E B 16	J A 23	21	E B 14	J A 29
2	22	E B 16	J A 29	22	E B 15	20	19	25	31	J A 41	G	G	G	G	G	31	26	E B 14	20	E B 15	E B 15	E B 16	E B 16	21
3	23	J A 22	J A 40	J A 33	J A 91	J A 34	22	G	J A 31	G	G	J A 40	G	40	J A 44	36	J A 42	J A 44	J A 26	E B 15	E B 16	B J A 31	22	E B 16
4	J A 27	25	E B 16	20	20	20	21	28	G	36	G	G	G	34	G	J A 57	J A 70	J A 62	22	E B 16	E B 15	25	20	21
5	20	E B 15	E B 16	E B 15	20	E B 16	20	28	33	34	G	G	G	35	35	32	28	J A 25	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16
6	E B 16	E B 16	E B 15	E B 16	E B 15	E B 16	E B 16	27	33	38	34	34	G	36	38	G	J A 32	27	28	J A 30	J A 44	J A 27	E B 15	23
7	E B 16	E B 16	E B 16	22	E B 16	E B 15	21	G	J A 38	J A 34	G	41	38	35	G	J A 41	25	22	J A 28	J A 28	22	19	21	E B 15
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	31	G	39	G	G	34	G	G	26	21	J A 21	E B 16	J A 33	J A 28	J A 22	E B 16
9	19	E B 16	E B 16	E B 16	E B 15	E B 16	22	J A 33	J A 42	G	G	38	G	G	G	G	J A 33	23	J A 22	23	E B 16	21	E B 14	E B 16
10	19	E B 14	E B 17	20	E B 17	E B 15	G	28	J A 33	G	G	G	G	36	37	J A 50	J A 50	J A 29	J A 24	22	J A 27	J A 78	J A 50	20
11	J A 52	J A 44	J A 36	J A 25	E B 15	J A 24	J A 30	J A 42	J A 53	J A 49	J A 48	J A 51	J A 65	G	36	31	J A 35	J A 62	J A 147	J A 111	J A 108	J A 66	J A 56	J A 25
12	J A 39	J A 40	J A 26	24	J A 26	20	20	J A 31	J A 37	J A 37	J A 47	J A 38	J A 48	J A 42	J A 42	J A 58	J A 32	J A 31	J A 33	J A 46	J A 48	J A 48	J A 43	J A 30
13	J A 30	23	J A 28	E B 15	E B 16	J A 30	J A 34	J A 29	G	J A 39	J A 51	J A 68	J A 52	G	G	32	32	J A 45	J A 34	J A 41	J A 66	J A 66	J A 54	J A 29
14	J A 34	J A 44	J A 45	J A 28	J A 43	J A 48	J A 44	J A 32	J A 34	G	36	J A 39	J A 65	G	G	31	24	G	E B 15	J A 51	J A 44	J A 47	J A 48	J A 29
15	J A 26	21	E B 15	22	E B 16	21	19	28	G	G	39	G	G	37	G	31	28	J A 36	22	J A 30	22	E B 16	E B 15	E B 15
16	E B 15	E B 16	E B 16	E B 15	21	E B 16	E B 16	G	29	G	40	G	C	31	34	33	J A 48	J A 26	J A 26	J A 40	J A 50	J A 22	J A 24	23
17	J A 42	J A 38	J A 29	23	E B 15	E B 14	E B 15	G	G	38	37	G	G	G	J A 40	J A 47	42	J A 32	J A 82	E B 16	E B 15	B J A 42	J A 51	J A 29
18	J A 25	J A 24	J A 25	22	J A 26	E B 16	J A 31	28	33	34	J A 42	J A 35	37	36	32	32	27	J A 21	J A 22	J A 28	J A 32	J A 26	E B 16	E B 16
19	23	24	E B 15	24	22	21	24	26	J A 38	G	G	G	39	J A 41	J A 45	J A 41	25	J A 32	J A 29	E B 15	E B 16	E B 15	B J A 35	J A 28
20	J A 26	E B 16	E B 15	E B 16	E B 17	E B 15	E B 16	25	J A 35	J A 36	G	G	J A 40	J A 34	38	G	J A 33	23	E B 16	20	24	20	E B 16	22
21	22	J A 21	E B 15	J A 29	22	21	23	32	32	J A 42	J A 76	J A 48	J A 47	J A 42	J A 49	J A 48	J A 32	J A 43	J A 49	J A 48	J A 50	J A 44	J A 50	J A 44
22	J A 57	J A 38	24	23	24	E B 15	E B 16	G	J A 32	G	G	37	J A 34	J A 36	J A 37	32	J A 58	J A 54	J A 57	J A 73	24	J A 47	J A 40	J A 25
23	J A 26	J A 24	24	J A 29	J A 26	E B 14	E B 15	26	31	J A 40	J A 42	G	G	G	J A 48	J A 52	J A 59	J A 80	J A 58	J A 47	22	J A 54	J A 51	J A 34
24	J A 34	J A 28	J A 32	J A 39	J A 45	J A 47	22	32	J A 42	J A 40	J A 46	J A 49	J A 50	J A 40	J A 35	J A 54	J A 35	J A 27	J A 23	J A 32	J A 32	J A 48	J A 89	J A 54
25	30	J A 30	J A 30	20	23	E B 16	E B 16	J A 34	J A 40	32	G	G	J A 49	35	G	J A 35	J A 29	J A 27	J A 34	J A 28	J A 26	J A 28	J A 50	J A 34
26	J A 25	23	21	24	J A 23	E B 15	E B 15	G	31	J A 72	J A 42	J A 88	G	G	G	G	J A 92	J A 168	J A 131	J A 50	J A 28	J A 28	J A 48	J A 34
27	J A 24	20	E B 16	E B 15	E B 15	E B 16	E B 17	28	G	G	J A 44	36	34	G	G	28	G	E B 16	E B 16	B J A 28	J A 68	J A 49	J A 28	J A 22
28	J A 27	21	21	23	E B 15	E B 14	E B 16	23	28	G	G	G	G	J A 45	G	J A 28	J A 31	21	E B 15	E B 16	E B 16	21	E B 16	21
29	J A 26	E B 16	J A 25	J A 23	J A 23	J A 20	A 26	G	G	34	J A 44	J A 71	J A 40	J A 39	J A 42	J A 41	J A 38	J A 37	J A 40	J A 44	J A 47	J A 52	J A 42	23
30	J A 22	E B 16	E B 16	E B 16	E B 15	20	E B 16	G	J A 39	G	J A 37	J A 56	J A 64	J A 68	J A 49	34	J A 37	J A 24	J A 20	J A 31	J A 44	E B 16	J A 25	J A 24
31	24	24	23	E B 16	E B 15	E B 15	E B 16	25	33	34	34	J A 41	G	J A 119	J A 50	J A 27	J A 45	J A 55	J A 32	J A 27	J A 26	J A 50	J A 28	J A 23
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31
MED	J A 25	22	21	22	19	E B 16	19	27	32	34	36	35	G	35	35	32	J A 32	J A 27	J A 26	J A 28	J A 26	J A 28	J A 28	J A 23
U Q	J A 30	J A 25	J A 28	J A 24	J A 23	J A 21	J A 22	J A 29	J A 37	J A 38	J A 42	J A 41	J A 47	J A 40	J A 42	J A 41	J A 42	J A 44	J A 34	J A 44	J A 44	J A 48	J A 50	J A 29
L Q	22	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	G	G 29	G	G	G	G	G	G	G 28	28	22	E B 20	E B 16	E B 16	E B 21	E B 16	E B 20

OCT. 2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 14	E B 15	26	30	G	32	G	E B 34	G	31	G	25	19	E B 15	E B 16	E B 16	E B 15	E B 14	E B 15
2	E B 16	E B 16	18	E B 16	E B 15	E B 16	17	24	30	35	G	G	G	G	G	29	26	E B 14	E B 16	E B 15	E B 15	E B 16	E B 16	E B 16
3	E B 17	E B 16	E B 16	E B 16	16	E B 16	21	G	27	G	G	35	G	36	39	32	36	35	20	E B 15	E B 16	19	E B 15	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	18	24	G	34	G	G	G	33	G	51	A A 70	A A 62	E B 16	E B 16	E B 15	E B 16	E B 16	16
5	E B 16	E B 15	E B 16	E B 15	E B 16	E B 16	19	26	29	32	G	G	G	34	33	29	26	17	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16
6	E B 16	E B 16	E B 15	E B 16	E B 15	E B 16	E B 16	26	30	36	32	32	G	34	36	G	25	27	22	18	A A 44	19	E B 15	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	19	G	31	31	G	39	36	34	G	38	24	19	20	20	E B 16	E B 15	E B 16	E B 15
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	24	28	G	37	G	G	32	G	G	25	19	18	E B 16	18	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	18	24	31	G	G	36	G	G	G	G	G 19	19	E B 15	E B 16	E B 16	E B 15	E B 14	E B 16
10	E B 15	E B 14	E B 17	E B 16	E B 17	E B 15	G	24	28	G	G	G	G	35	36	43	46	23	18	E B 16	E B 17	20	A A 50	E B 16
11	E B 16	E B 16	19	E B 16	E B 15	E B 15	21	32	46	43	42	38	A A 65	G	34	30	26	50	28	A A 111	A A 108	A A 66	19	E B 16
12	17	20	E B 16	E B 16	E B 16	E B 16	18	23	28	30	33	32	36	33	32	35	26	21	22	A A 46	A A 48	A A 48	A A 43	E B 16
13	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	22	G 18	G	G 24	33	33	36	G	G	28	29	34	28	28	A A 66	22	A A 54	18
14	19	22	19	E B 16	20	20	25	23	28	G	32	32	32	G	G	28	24	G	E B 15	24	22	19	24	E B 16
15	E B 16	E B 16	E B 15	E B 16	E B 16	E B 15	19	25	G	G	37	G	G	34	G	29	25	23	E B 16	E B 15	E B 16	E B 16	E B 15	E B 15
16	E B 15	E B 16	E B 16	E B 15	E B 15	E B 16	E B 16	G	27	G	38	G	C	28	32	31	42	18	22	24	19	E B 15	E B 15	E B 15
17	15	19	20	E B 15	E B 15	E B 14	E B 15	G	G	31	32	G	G	G	33	39	35	25	A A 82	E B 16	E B 15	E B 16	17	21
18	E B 16	E B 16	18	E B 16	E B 16	E B 16	20	25	30	31	32	30	34	34	30	31	24	E B 15	E B 16	E B 16	19	E B 15	E B 16	E B 16
19	E B 16	E B 15	E B 15	E B 15	15	E B 16	E B 16	G 22	28	G	G	G	38	33	29	33	22	23	21	E B 15	E B 16	E B 15	18	E B 16
20	18	E B 16	E B 15	E B 16	E B 17	E B 15	E B 16	24	28	29	G	G	32	G 24	33	G	28	19	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16
21	E B 16	E B 15	E B 15	E B 16	E B 16	E B 16	E B 16	24	30	33	42	32	33	35	39	33	22	34	22	19	18	22	20	20
22	E B 16	21	E B 16	E B 16	E B 15	E B 15	E B 16	G	28	G	G	36	31	30	29	27	31	A A 54	A A 57	A A 73	22	19	19	E B 16
23	E B 15	E B 15	15	E B 15	E B 16	E B 14	E B 15	24	28	29	32	G	G	G	33	35	30	32	A A 58	17	E B 16	E B 15	18	E B 16
24	18	E B 16	20	17	E B 16	A A 47	19	27	38	34	41	41	37	34	32	44	27	18	E B 16	E B 16	21	A A 48	22	E B 16
25	E B 16	19	18	E B 16	E B 16	E B 16	E B 16	30	32	28	G	G	34	34	G	26	23	E B 16	20	E B 16	19	20	27	21
26	E B 16	E B 16	E B 16	E B 16	18	E B 15	E B 15	G	30	31	31	34	G	G	G	G	40	A A 168	23	A A 50	20	E B 16	24	18
27	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	E B 17	26	G	G	G 26	34	33	G	G	27	G	E B 16	E B 16	22	E B 16	18	20	E B 16
28	E B 15	E B 15	E B 15	E B 16	E B 15	E B 14	E B 16	21	27	G	G	G	G	31	G	22	24	16	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16
29	E B 16	E B 16	E B 16	E B 15	18	E B 16	20	G	G	32	38	34	34	34	35	34	30	30	27	A A 44	A A 47	18	19	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	G	31	G	33	32	37	42	44	31	29	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
31	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	23	29	32	33	33	G	34	31	23	24	23	20	18	21	18	E B 15	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	30	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	24	28	29	32	32	E G 32	33	31	29	26	21	20	E B 16	E B 17	E B 16	E B 16	E B 16
U Q	16	16	17	E B 16	16	E B 16	19	25	30	32	33	34	34	34	33	34	30	32	22	A A 24	A A 21	19	20	16
L Q	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15	E B 16	G	G 27	G	G	G	G	G	G	G 23	24	18	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16

OCT. 2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

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

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	295	293	296	F	F	368	395	382	384	347	342	371	356	347	313	332	354	384	356	341	326	335	324	280
2	315	313	311	F	363	329	380	389	385	344	356	357	353	354	318	370	362	358	374	375	334	289	317	296
3	302	317	343	361	312	347	375	392	371	362	373	342	351	365	318	364	375	361	364	357	351	320	294	295
4	309	319	324	366	367	329	400	375	403	357	367	339	346	345	328	360	A	A	392	322	324	327	287	335
5	308	344	302	340	359	352	391	385	350	369	365	358	358	356	346	359	387	362	380	364	324	322	324	325
6	311		335	348	349	321	384	400	393	359	361	347	359	374	351	354	365	359	389	395	A	328	321	329
7	326	334	339	346	377	339	369	377	342	396	319	351	353	360	368	362	391	374	354	368	337	320	334	329
8	329	326	320	313	305	352	404	370	377	376	350	343	363	371	380	373	362	366	368	337	322	337	317	328
9	311	321	330	352	336	331	366	364	353	391	338	366	389	348	355	353	351	375	354	331	316	314	325	312
10	341	380	350	341	330	331	382	396	397	387	378	353	331	357	351	363	335	353	347	368	395	343	A	326
11	357	303	318	320	335	362	364	395	385	388	352	372	A	327	356	356	374	378	342	A	A	A	312	322
12	327	311	324	330	F	345	372	394	394	369	364	329	385	339	355	388	374	375	378	A	A	A	A	300
13	315	318	334	346	366	352	388	393	388	394	379	346	358	359	371	375	358	373	381	356	A	345	A	352
14	352	330	330	335	F	F	393	391	375	385	372	377	355	347	339	367	368	369	381	354	334	347	323	F
15	282	333	318	311	333	374	373	401	381	388	388	348	335	356	338	367	383	382	375	347	338	326	327	326
16	340	330	339	347	357	330	406	388	380	387	374	304	C	342	359	369	366	367	389	440	341	323	321	311
17	F	F	303	336	384	364	397	352	378	386	390	329	360	356	356	358	397	384	A	315	311	307	329	318
18	313	305	334	346	425	378	385	393	358	385	359	335	342	359	348	397	385	364	380	356	332	312	F	307
19	F	F	F	F	F	395	413	379	372	390	367	354	361	342	326	359	355	377	381	333	327	318	354	350
20	F	F	332	314	F	382	380	374	368	353	375	350	373	380	343	362	367	387	366	326	348	366	349	321
21	291	308	314	328	366	375	372	411	389	358	371	369	364	357	359	375	358	380	386	343	340	309	335	314
22	309	346	322	327	368	353	378	375	381	379	349	360	371	354	385	389	384	A	A	A	311	327	298	F
23	310	353	326	F	394	369	381	413	396	340	373	357	359	351	350	380	390	371	A	315	306	307	294	F
24	326	321	332	345	394	A	366	394	383	382	364	365	325	348	370	364	380	368	346	350	365	A	321	F
25	F	309	333	F	328	F	338	372	354	366	325	350	337	366	361	370	380	387	316	314	296	356	316	317
26	337	300	315	325	320	339	351	384	329	364	382	373	370	342	368	366	354	A	367	A	305	357	316	304
27	282	331	371	339	306	316	345	370	338	363	354	V 346	336	368	376	403	388	354	327	350	288	339	300	321
28	329	332	331	320	341	306	355	371	402	396	365	377	366	387	346	370	382	404	344	321	325	348	314	308
29	320	325	299	341	354	344	358	374	374	362	377	361	382	365	350	363	383	383	397	A	A	297	291	F
30	F	328	333	F	355	339	380	394	389	385	353	350	324	359	379	388	391	351	394	326	321	312	319	312
31	315	298	290	365	333	341	394	V 339	385	373	363	352	345	359	361	373	395	358	345	359	338	320	355	306
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	30	25	26	28	31	31	31	31	31	31	29	31	31	31	30	28	28	26	26	28	27	26
MED	315	321	328	340	354	346	380	385	381	376	365	352	358	356	355	367	374	372	371	348	326	324	321	318
U Q	329	332	334	346	367	366	393	394	389	387	374	365	365	365	368	375	385	381	381	359	338	341	327	326
L Q	309	309	315	326	333	331	366	374	368	362	353	346	344	347	343	360	362	362	350	326	316	313	312	307

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	U L 427	L	U L 440	L	U L 413	U L 369	L								
2									L	U L 434	403	427	U L 430	418	L	L								
3								L	L	L	U L 431	U L 443	396	A	A	A	A							
4								L		U L 413	425	396	U L 419	410	U L 409	A	A	A						
5									L	U L 419	U L 406	U L 413	418	L	L	L	L							
6								L		426	U L 423	444		L	L	L	L							
7								L	L	U L 415	U L 429	A	A	U L 385	L		L							
8								L		L	A	U L 413	U L 386	L	L									
9								L	L	L	U L 431	A	U L 418	L	L	L	L							
10									L	L	L	U L 404	U L 411	A	A	A	A							
11									A		A	A	A		U L 381	L		A						
12										U L 405	U L 409	400	A	L	L	A	A							
13									L	L	U L 431	U L 438	U L 447	U L 397	U L 407	A		A						
14									L	L	L	U L 433	L	U L 396	U L 383	L								
15									L	449		L	427	L	L	L								
16									L	L	A		C	L	L	A	A							
17									L	L	L	429	U L 398	406	L	A			A					
18										L	U L 408	L	416	U L 421	L									
19									L	L	U L 420	433				A								
20									L	L	U L 382	L	U L 434	L	A	L								
21									L	L	A	L	U L 381	A	A	A								
22									L	L	U L 398	L	U L 418	413		L		A						
23										L	L	L	437	U L 416	L	A								
24						A			A	A	A	A	A	425	390	A								
25									L	L	L	U L 432	L		L	L								
26										L		L	L	L	L	L	A	A						
27									L	L		L	447	U L 374	L									
28										L	U L 405	U L 417	U L 398	L	L	L								
29										L	A	U L 396		L	A					A	A			
30										L	L	L		A										
31											L	U L 406	L		L									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										8	14	17	17	12	6									
MED										U L 422	U L 414	U L 427	U L 418	U L 412	U L 386									
U Q										U L 430	U L 429	U L 436	U L 432	417	U L 407									
L Q										U L 414	U L 405	U L 405	U L 398	U L 396	U L 381									

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OCT. 2019 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									250	250	254	240	256	276	312	286								
2									236	260	262	252	270	270	302	244								
3								226	238	242	256	288	256	242	E A 268	252	236							
4								236		260	244	280	262	280	276	252	A	A						
5									266	244	256	258	256	252	262	250	228							
6								228		248	268	272		230	266	270	248							
7								260	272	230	314	272	240	244	238		234							
8								214		228	248	262	230	238	234									
9								244	260	226	270	230	222	260	250	272	262							
10									222	228	238	280	272	252	254	E A 262	258							
11									218		252	222	A		264	248		216						
12										234	230	270	216	272	256	242	224							
13									226	214	228	254	240	232	244	240		218						
14									226	228	252	240	230	250	278	248								
15									240	230		254	228	256	264	248								
16									228	220	228		C	258	258	246	E A 242							
17									232	218	210	290	236	234	254	234			A					
18										230	244	252	244	244	258									
19									242	220	232	230				240								
20									238	228	224	228	228	236	230	238								
21									228	242	234	232	246	242	242	218								
22									230	226	260	258	232	250		230		A						
23										268	236	244	242	256	264	232								
24						A			232	212	248	228	294	262	242	222								
25									262	242	286	242	254		256	240								
26										240		228	228	258	238	242	224	A						
27									264	226		230	250	228	236									
28										218	256	226	226	242	236	230								
29										238	220	254		242	236					A	A			
30										224	264	254		240										
31											242	230	236		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								6	20	29	28	30	25	27	28	24	9	2						
MED								232	237	230	248	252	240	250	254	242	235	217						
U Q								244	255	242	258	262	256	258	264	251	253							
L Q								226	228	225	233	230	229	240	240	236	226							

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 266	E B 258	E B 256	E B 256	E B 244	194	196	218	224	194	196	182	184	184	192	216	232	206	198	192	216	212	E B 256	E B 298
2	E B 252	E B 260	E A 290	E B 240	200	E B 238	204	204	196	188	188	186	176	176	182	206	216	214	198	190	204	E B 238	E B 236	E B 296
3	E B 274	E B 270	E B 264	226	E A 326	E B 270	214	200	200	188	188	188	184	A	A	A	A	216	192	184	202	E A 270	E B 288	E B 264
4	E B 268	E B 244	E B 248	212	202	E B 236	200	198	202	192	190	190	186	186	190	A	A	A	190	208	E B 214	212	E B 266	220
5	224	E B 232	E B 258	E B 232	204	208	196	212	192	186	180	180	172	222	212	212	200	212	182	182	226	228	E B 240	E B 232
6	226	230	244	E B 216	204	216	198	196	208	182	178	178	226	200	200	192	208	212	200	182	A	E A 256	E B 242	E B 266
7	E B 252	E B 240	E B 234	216	202	218	194	200	206	178	180	A	A	204	206	E A 238	194	214	202	208	212	212	E B 248	E B 222
8	224	228	E B 252	E B 246	E B 254	212	192	188	200	184	A	184	196	200	192	202	214	214	198	196	E A 250	200	222	232
9	E B 252	E B 248	222	210	186	E B 246	210	196	198	190	176	A	180	192	194	200	214	204	192	206	E B 232	E B 264	E B 242	E B 256
10	222	192	226	204	E B 244	E B 234	198	210	196	184	172	184	176	A	A	A	A	228	206	180	186	E A 242	A	E B 236
11	224	E B 260	E A 286	E B 254	E B 242	224	192	210	A	212	A	A	A	198	208	216	220	A	212	A	A	A	E A 278	E B 260
12	E A 238	E A 290	E B 262	E B 244	192	214	202	204	200	184	184	182	A	192	198	A	A	202	198	A	A	A	A	E B 250
13	E B 266	E B 250	E B 250	E B 232	210	E B 254	204	200	190	192	182	178	172	170	182	A	212	A	202	206	A	226	A	222
14	220	E A 270	E A 238	236	E A 262	E A 266	210	196	184	182	182	182	182	176	180	202	216	196	190	E A 232	E A 272	224	E A 278	E B 282
15	E B 250	E B 240	260	E B 254	218	218	182	192	196	182	210	190	174	208	206	202	202	202	184	198	198	E B 230	E B 248	E B 248
16	224	E B 232	E B 242	226	202	192	182	192	190	186	A	180	C	176	202	A	A	206	190	190	214	E B 230	E B 242	E B 250
17	E B 260	E A 258	E A 270	220	190	206	188	194	190	194	186	176	182	192	194	A	200	204	A	206	E B 262	E B 246	226	E A 284
18	E B 268	E B 266	E A 236	212	188	218	200	188	196	192	190	176	178	184	204	208	210	202	186	194	E A 242	E B 240	222	E B 248
19	E B 246	E B 254	E B 252	E B 238	192	204	200	194	190	186	190	176	224	210	200	A	220	202	194	202	E B 240	E B 240	E A 246	212
20	E A 240	E B 232	E B 238	E B 244	210	200	198	192	206	198	186	184	194	194	A	208	204	198	190	222	202	E B 198	E B 212	E B 236
21	E B 288	E B 276	E B 280	E B 258	218	204	202	200	202	196	A	192	172	A	A	A	208	198	198	E A 240	E A 250	E A 284	226	E A 286
22	E B 238	E A 262	E B 234	222	196	196	190	192	202	188	180	208	184	186	214	196	200	A	A	A	E A 260	E A 250	E A 264	E B 206
23	230	218	228	218	198	188	186	188	190	172	194	192	192	190	216	A	196	194	A	E A 322	E B 248	E B 250	E A 264	E B 258
24	E A 232	E B 262	E A 264	E A 250	196	A	206	196	A	A	A	A	A	186	202	A	190	186	E B 198	212	226	A	E A 292	E B 278
25	E B 278	E A 234	E A 244	E B 272	206	E B 242	206	220	208	198	188	190	214	226	212	196	196	188	E A 232	E B 238	204	224	E A 318	E A 272
26	228	E B 258	E B 248	E B 236	218	222	214	198	202	212	208	198	184	200	206	206	A	A	206	A	E A 294	210	E A 270	E A 294
27	E B 280	E B 260	222	214	E B 266	E B 252	222	210	200	198	212	194	190	196	196	194	196	196	214	E A 238	E B 266	E A 244	E A 298	E B 250
28	E B 232	210	E B 234	E B 240	214	E B 252	210	206	204	188	188	192	198	204	202	194	200	182	200	226	216	210	226	E B 272
29	E B 288	E B 244	E B 254	212	216	E B 256	212	210	210	196	A	184	218	198	A	198	200	200	218	A	A	E A 300	E A 298	E B 270
30	E B 246	E B 238	E B 236	226	200	230	204	202	198	180	204	186	200	A	224	208	196	190	190	214	E B 258	E B 256	E B 262	222
31	228	E B 254	E B 252	208	208	224	192	180	208	212	196	192	188	226	198	216	204	210	210	204	204	224	210	E B 230
	00	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	29	30	25	27	26	27	26	20	25	26	28	26	26	28	28	31
MED	E B 246	E B 250	E B 248	E 232	203	U 209	200	198	200	188	188	184	184	194	201	203	204	202	198	200	U 209	E 234	E 248	E B 250
U Q	E B 266	E B 260	E 260	E B 244	E B 218	E B 242	206	206	205	196	195	192	196	204	206	210	214	212	204	E A 222	E A 250	E A 250	E A 274	E B 272
L Q	228	232	236	216	198	206	192	192	194	184	181	180	178	186	194	197	198	196	190	192	204	218	231	232

OCT.2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B 120	108	110	A 112		B 112		A 112	112		B							
2							B 110	110	A 110	110	110	110	110	110	110	110	B							
3							B 110	A 110	110	A 110	110	108	108	108	A	B								
4							B 114	112	108	108	106	110	110	110	A	A	B							
5							B 114	126	110	110	110	112	112	108	112	112	B							
6						B	B 110	112	110	110	116	116	118	114	112	A	B							
7							B 116	A	A 110	110	116	118	110	A	116	B								
8							B	A 110	A 110	110	116	116	112	112	112	B								
9							B	A 108	A 108	112	110	110	108	108	120	B								
10						B 118	124	A 112	108	108	110	110	116	A	A	B	B							
11						B	B	A	A	A	A	A	A 120	114	114	114	B	B						
12						B	B	A	A	A	A	A	A	A	A	A	A	B						
13							118	116	110	A	A	A 110	114	110	110	B	B							
14							B	A	A 112	108	A	A 110	108	114	114	120	B							
15							B 112	118	118	112	114	114	112	120	120	116	B							
16							B 116	112	112	112	118	C	A 110	110	A	B		A						
17							B 116	122	A	A 108	110	116	A	A	A	A	B							
18						B 120	118	114	112	A	A 108	106	108	112	112									
19						B	B 114	A 114	110	110	108	A	A	A 106	A	B								
20						B	B 116	A	A 112	110	A	A 110	A 114	A										
21						B	B 126	124	A	A	A	A	A	A	A	A	A	A						
22						B	B 118	A 110	110	108	A	A	A	A	108	108	B							
23						B	B 114	114	A	A 112	110	112	116	112	A	B								
24						B	B 118	A	A	A	A	A	A	A	A	A	A							
25						B	B	A	A	A 108	108	112	110	110	A	B								
26						B	B 114	120	A	A	A	114	112	116	114	A	B							
27							B 120	120	114	114	114	114	114	114	110	112	B							
28						B	B 112	110	110	110	110	108	A 108	A	A	B								
29							B 126	126	A	A	A	A	A	A	A	A	A	A	A	A	A			
30						B	B 116	A 114	A	A	A	A	A	A	118	114	B							
31						B	B 114	120	110	110	A	110	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	25	17	19	19	19	19	21	20	19	15	1						
MED							119	116	116	110	110	110	110	112	110	112	112	120						
U Q								118	121	112	110	112	114	115	114	114	114							
L Q								114	112	110	108	108	110	110	108	110	110							

OCT. 2019 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	92	84	82	80	80	B	B	144	126	G	102	G	B	G	98	G	128	112	B	B	100	94	B	90
2	90	B	86	86	B	94	138	122	126	98	G	G	G	G	G	134	154	B	86	B	B	B	B	86
3	86	86	90	98	94	94	118	G	98	G	G	92	G	124	112	114	106	102	98	B	B	90	82	B
4	94	88	B	88	88	88	126	132	G	112	G	G	G	108	G	102	104	96	96	B	B	96	96	96
5	86	B	B	B	90	B	136	138	126	116	G	G	G	134	132	120	118	104	B	B	B	B	B	B
6	B	B	B	B	B	B	B	126	138	116	110	110	G	124	108	G	102	204	88	88	92	92	B	98
7	B	B	B	86	B	B	134	G	104	98	G	148	156	142	G	82	114	90	84	82	82	86	88	B
8	B	B	B	B	B	B	118	102	102	G	148	G	G	146	G	G	142	114	98	B	96	96	94	B
9	84	B	B	B	B	B	122	102	100	G	G	146	G	G	G	G	90	118	82	88	B	86	B	B
10	90	B	B	90	B	B	G	120	96	G	G	G	G	148	122	102	94	96	92	90	90	88	86	88
11	86	90	88	88	B	90	118	98	92	92	92	92	96	G	138	128	116	92	92	92	88	86	94	96
12	84	92	84	90	98	90	118	106	102	96	96	104	102	100	102	98	102	92	96	92	92	90	86	84
13	86	86	86	B	B	94	94	98	G	92	90	88	76	G	G	148	132	106	106	100	100	94	90	92
14	92	88	86	88	94	90	86	84	92	G	114	98	92	G	G	112	142	G	B	90	94	92	88	90
15	90	88	B	90	B	88	138	140	G	G	164	G	G	140	G	124	112	104	86	90	88	B	B	B
16	B	B	B	B	88	B	B	G	126	G	156	G	C	88	128	108	96	96	96	94	90	86	86	86
17	86	86	78	96	B	B	B	G	G	98	96	G	G	G	102	90	88	86	86	B	B	92	90	84
18	82	90	86	86	84	B	122	116	116	114	102	98	142	134	118	122	116	100	98	96	94	92	B	B
19	92	92	B	92	92	94	94	136	108	G	G	G	152	88	86	84	102	88	86	B	B	B	84	98
20	94	B	B	B	B	B	B	136	104	90	G	G	92	88	80	G	104	82	B	76	92	100	B	100
21	96	96	B	94	92	92	94	130	132	98	94	96	94	92	92	86	86	84	84	94	96	92	86	94
22	92	88	86	86	86	B	B	G	92	G	G	140	94	90	90	114	112	108	100	94	100	98	98	106
23	82	86	86	86	86	B	B	136	112	96	96	G	G	G	122	112	106	94	94	94	98	104	94	96
24	92	84	82	80	80	80	132	120	100	90	92	92	90	96	102	92	92	98	94	100	96	90	90	90
25	94	92	90	86	82	B	B	98	98	98	G	G	98	124	G	94	94	94	92	92	88	86	84	88
26	90	90	84	98	100	B	B	G	152	92	100	100	G	G	G	G	96	88	90	90	94	98	90	90
27	98	98	B	B	B	B	B	114	G	G	98	126	118	G	G	148	G	B	B	92	92	92	92	92
28	86	82	92	88	B	B	B	152	150	G	G	G	G	82	G	80	112	88	B	B	B	88	B	86
29	92	B	94	94	94	92	92	G	G	100	94	94	92	92	92	94	94	94	90	90	90	90	90	88
30	88	B	B	B	B	90	B	G	96	G	96	90	90	86	80	122	114	96	96	98	98	B	94	90
31	90	92	94	B	B	B	B	150	126	112	108	102	G	100	94	98	96	88	88	86	80	94	94	96
	00	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	20	17	21	16	13	17	23	25	18	19	17	15	21	19	25	30	28	25	22	23	26	22	24
MED	90	88	86	88	89	90	118	122	104	98	98	98	94	100	102	108	105	96	92	92	92	92	90	90
U Q	92	92	90	93	94	94	133	136	126	112	110	118	118	134	122	122	116	104	96	94	96	94	94	96
L Q	86	86	84	86	85	89	94	102	98	92	94	92	92	89	92	93	96	89	86	90	90	88	86	88

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2	F2	F2	F1	F1			H2	C1		L1				L1		C1	C1			F1	F1		F2
2	F1		F3	F2		F1	H1	C2	C2	L2						H1	H1		F1					F2
3	F1	F2	F4	F2	F4	F3	C22	L		L2			L2		C1	C2	L4	L4	F3			F5	F2	
4	F2	F3		F1	F1	F2	C21	L	H2		C22	L		C1		L3	L4	L5	F1			F1	F1	F1
5	F1				F1		H2	H2	C2	C1				C1	C1	C1	C1	L1						
6								C2	H1	C1	C1	C1		C1	C1		L2	L3	F3	F3	F5	F3		F2
7				F2			C2		L2	L1		H1	H1	H1		L3	C2	L1	F3	F3	F1	F1	F1	
8							C2	L2	L2		H1			H1			H1	C3	F3		F3	F2	F1	
9	F1						C2	L1	L2			H1					L1	C22	F3	F1		F2		
10	F1			F3				C2	L1					H1	C2	L3	L5	L4	L3	F1	F3	F4	F6	F2
11	F3	F3	F6	F2		L2	C4	L5	L3	L3	L2	L2	L3		H2	C1	C3	L5	L5	F6	F8	F7	F4	F2
12	F4	F4	F3	F2	F3	F3	H2	L3	L4	L3	L2	L2	L2	L3	L3	L3	L3	L4	F3	F7	F8	F8	F9	F3
13	F2	F2	F2			F6	L3	L2		L2	L3	L2	L3			H1	H2	L6	L6	F6	F8	F4	F6	F4
14	F4	F5	F7	F2	F6	F3	L3	L3	L2		C1	L1	L3			C1	H1			F4	F4	F4	F6	F4
15	F2	F2		F1		F1	H1	H2			H1			H1		C1	C2	L4	F1	F2	F2			
16					F1				C2		H1			L1	C1	C1	L4	L4	F4	F4	F5	F2	F2	F2
17	F2	F2	F5	F2						L1	L1				L1	L2	L4	L4	L6			F2	F4	F4
18	F2	F4	F2	F2	F3		C2	C2	C2	C2	L1	L2	H1	H1	C1	C1	C2	F1	F1	F3	F3	F2		
19	F2	F1		F2	F1	L1	L1	H1	L2				H1	L3	L2	L4	C23	L2	L3				F3	F2
20	F2							C1	L3	L3			L2	L2	L3		L3	L1		F1	F1	F1		F1
21	F1	F1		F2	F1	L1	L1	H2	C2	L2	L2	L2	L2	L3	L4	L2	L2	L3	F5	F3	F5	F5	F3	F4
22	F3	F3	F3	F2	F2				L3			H1	L3	L3	L2	C1	C5	L5	F7	F5	F2	F3	F4	F2
23	F3	F3	F2	F3	F2			H2	C1	L2	L2				C2	L2	L3	L4	F5	F4	F1	F2	F4	F2
24	F5	F2	F6	F2	F2	F5	C22	C32	L2	L2	L3	L3	L3	L1	L2	L3	L2	L2	F2	F2	F6	F8	F5	F3
25	F4	F3	F3	F1	F2			L3	L3	L2			L2	C1		L4	L3	L2	F2	F2	F3	F3	F6	F3
26	F2	F2	F1	F1	F3				H1	L2	L1	L2					L3	L3	F4	F3	F4	F1	F5	F2
27	F1	F1						C2			L2	C1	C1			H2				F3	F3	F3	F3	F2
28	F2	F1	F1	F2				H2	H2					L3		L4	C22	L2				F1		F1
29	F2		F2	F2	F6	F2	L4			L1	L3	L1	L2	L2	L2	L3	L2	L3	L3	F9	F6	F4	F5	F2
30	F2					L1			L3		L2	L1	L2	L2	L3	C2	C3	L3	F2	F3	F3		F2	F2
31	F2	F2	F2					HC12	C2	C1	C1	L2		L2	L2	L2	L2	L2	F3	F3	F5	F2	F3	F1
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

OCT. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	56	X 48	X 48	X 48	X 44															X 42	X 40	X 39	X 37	X 38
2	X 38	X 38	X 37	X 37	X 33															X 54	X 32	X 33	X 34	X 34
3	X 34	X 34	X 35	X 33	X 26															X 50	X 30	X 33	X 32	X 32
4	X 32	X 32	X 30	X 30	X 30															X 50	X 36	X 39	X 39	37
5	X 38	X 38	X 36	X 34	X 36															X 48	X 34	X 38	X 38	X 37
6	X 37	X 37	X 36	X 38	X 30															X 46	X 33	X 35	X 37	39
7	38	X 36	X 37	X 36	X 32															X 46	X 33	X 35	X 37	X 37
8	X 37	X 36	X 36	40	42		X 36													X 61	X 46	X 41	X 40	X 39
9	X 42	X 44	X 41	X 38	X 28															X 55	X 44	X 44	X 45	X 41
10	X 44	X 43	X 34	X 32	X 32															X 65	X 36	X 30	X 32	X 34
11	X 35	39	39	X 34	X 31														X 62	X 44	A	A	X 33	X 33
12	35	38	X 33	X 34	X 35														X 70	A	X 35	X 37	X 36	X 35
13	X 37	X 37	X 37	X 36	X 35		X 36													A	X 36	A	46	39
14	X 37	X 36	X 36	X 34	X 36															X 38	X 35	X 37	X 37	X 37
15	X 37	X 37	39	39	41															X 46	X 32	X 36	X 37	X 37
16	X 36	X 37	X 37	X 34	X 36	X 34														X 52	A	A	37	X 38
17	X 38	X 39	X 40	X 42	X 37		X 30													X 36	X 34	X 37	X 38	X 36
18	X 38	X 38	X 40	X 40	X 34															X 39	X 33	X 34	39	38
19	38	X 34	38	X 36	43															X 45	X 34	X 36	X 38	X 39
20	41	42	40	39	X 41															X 40	X 40	X 41	X 36	X 34
21	X 36	X 36	X 36	X 35	X 37															A	X 36	X 38	44	A
22	44	X 35	A	X 34	40															X 34	A	X 34	X 36	X 36
23	X 36	40	X 36	X 35	X 39															X 30	X 31	X 34	X 36	X 34
24	X 35	X 38	X 36	36	A														C	X 42	X 37	X 33	40	42
25	X 36	X 36	X 36	X 33	X 33	X 31						C							X 52	X 45	X 46	X 45	X 41	X 42
26	X 44	X 38	X 41	42	40	40	X 36													X 42	X 44	X 44	X 43	X 41
27	X 41	X 41	X 40	X 36	X 35															X 43	X 41	X 40	X 37	A
28	X 40	X 39	X 36	X 32	X 34		X 29													X 37	X 34	X 37	X 37	X 37
29	X 37	X 38	X 38	X 38	X 40	29	X 29													X 45	A	A	A	X 36
30	37	X 38	X 36	X 31	X 32	X 30	X 29													X 35	X 36	A	X 38	43
31	X 38	X 38	X 38	X 39	X 37															X 51	X 50	X 37	X 34	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	31	31	30	31	30	5	7												3	28	27	26	30	28
MED	X 37	X 38	X 37	X 36	X 36	X 31	X 30												X 62	X 45	X 36	X 37	X 37	X 37
U Q	X 40	X 39	X 39	39	40	37	X 36												X 70	X 50	X 40	X 39	X 39	X 39
L Q	X 36	X 36	X 36	X 34	X 32	30	X 29												X 52	X 40	X 33	X 34	X 36	X 36

OCT. 2019 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	42	42	42	38	32	30	45	58	72	70	72	83	69	59	61	73	76	64	36	34	33	31	32
2	32	32	31	31	26	24	32	48	52	59	58	70	71	71	58	56	60	56	68	48	26	27	28	28
3	30	28	29	27	20	20	29	48	53	56	62	56	62	73	53	52	56	59	61	44	24	27	26	26
4	26	26	24	24	24	19	27	44	47	55	52	52	58	A	73	69	62	56	50	44	30	33	33	F
5	32	32	30	28	30	25	29	48	48	56	58	56	68	83	78	66	66	56	58	42	28	32	32	31
6	31	31	30	32	24	24	31	46	52	56	61	61	85	78	53	63	66	68	63	40	27	29	31	F
7	F	30	31	30	26	20	26	48	56	53	56	56	76	76	58	55	55	58	62	40	27	29	31	30
8	30	30	30	F	F	30	30	48	52	63	64	60	64	72	66	52	52	54	61	55	40	35	34	33
9	36	38	35	32	22	22	31	54	61	72	65	68	80	68	62	61	62	66	56	49	38	38	39	35
10	38	37	28	26	26	26	30	47	58	58	67	59	64	61	61	67	64	70	73	59	30	24	26	27
11	29	F	F	28	25	24	30	57	66	64	60	69	60	68	61	75	70	66	56	38	A	A	27	27
12	F	F	27	28	29	18	26	56	55	66	69	69	86	82	59	64	61	61	64	A	29	31	30	29
13	31	31	31	30	29	26	30	46	64	74	65	50	70	74	58	57	61	57	58	A	30	A	F	F
14	31	30	30	28	30	27	31	52	65	61	61	73	75	61	63	80	66	60	45	32	29	31	31	31
15	31	31	F	F	F	A	A	44	54	71	67	73	71	67	61	62	72	59	A	40	26	31	31	31
16	30	31	31	28	30	28	29	48	53	59	57	61	68	72	68	72	64	68	59	45	A	A	F	32
17	33	33	34	36	31	21	24	45	62	77	70	58	67	72	63	70	69	58	46	30	28	30	32	32
18	32	32	34	34	28	18	22	42	52	56	75	61	69	79	72	74	70	59	55	33	27	28	F	F
19	F	28	F	30	F	19	23	47	55	54	59	64	62	68	55	62	70	70	53	39	28	30	32	33
20	F	F	F	F	35	24	24	49	58	70	70	62	64	64	63	64	56	60	49	34	34	35	30	28
21	30	30	30	29	31	30	22	45	55	53	56	77	64	62	80	80	66	61	49	A	30	32	F	A
22	F	29	A	28	F	19	21	50	52	60	61	69	71	68	65	67	58	51	37	28	A	28	30	30
23	30	F	30	29	33	24	21	40	47	54	55	62	57	60	65	77	71	56	37	24	25	28	30	28
24	29	32	30	F	A	A	27	44	51	54	51	59	50	69	83	78	68	47	C	36	31	27	F	F
25	30	30	30	27	27	25	25	55	67	71	61	C	83	101	97	87	67	61	46	39	40	39	35	36
26	38	32	35	F	F	F	30	53	55	79	93	93	74	70	69	79	74	67	54	36	38	38	37	35
27	35	35	34	30	29	29	30	52	78	82	83	86	84	81	76	72	61	49	46	37	35	34	31	A
28	34	33	30	26	28	22	23	58	59	60	61	66	86	70	66	60	62	54	46	31	28	31	31	31
29	31	32	32	32	34	F	23	50	64	66	60	75	76	65	70	71	62	51	46	39	A	A	A	30
30	F	32	30	25	26	24	23	49	54	56	61	81	81	80	90	83	58	49	43	29	30	A	32	F
31	32	32	32	33	31	24	26	46	53	60	77	70	70	71	88	71	68	64	54	45	44	31	28	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	24	27	26	26	25	27	30	31	31	31	31	30	31	30	31	31	31	31	29	28	27	26	25	22
MED	31	32	30	29	29	24	27	48	55	60	61	65	70	70	65	67	64	59	54	39	30	31	31	31
U Q	32	32	32	32	31	26	30	52	61	71	69	72	80	76	73	75	69	66	61	44	34	33	32	32
L Q	30	30	30	28	26	20	23	45	52	56	58	59	64	68	59	61	61	56	46	34	27	28	30	28

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	U L 412	L	U L 448	U L 448	U L 448	432	U L 432	L	L						
2									L	L	U L 444	440	432	444	L	L	L	L						
3										U L 408	L	U L 436	436	U L 424	L	A	A							
4										L	432	432	U L 432	A	U L 432	A	A							
5									L	L	420	424	428	U L 392	A	412	L							
6									L	L	U L 420	A	U L 416	A	L	404	L							
7										L	428	428	408	A	L	L	L	L						
8										L	L	A	428	U L 440	L	L	L							
9									L	L	L	408	444	A	428	L	L							
10										L	416	440	L	U L 436	424	A	A							
11										L	L	L	A	A	A	A	L							
12									L	L	L	L	444	U L 436	L	L	L							
13									L	L	U L 412	L	U L 436	436	U L 436	L	A							
14										L	L	416	A	L	420	L	L							
15						A	A		L	L	A	A	432	L	L	L			A					
16									L	L	U L 416	A	U L 452	A	A	A								
17									L	L	L	L	448	U L 416	A	A								
18										L	L	U L 436	U L 436	L	U L 424	L	L							
19											U L 424	432	U L 432		L	A								
20									L	L		L	U L 428	U L 420	L	L								
21											L	U L 424		A	U L 420									
22										L	A	424	420		A	A								
23									L		L	412	U L 440	U L 440	416	A								
24						A					L	424	U L 440	408	A	A			C					
25									L	L	L	C	U L 408	L			L							
26										U L 408	L		U L 428	424	L	U L 404								
27											L	U L 428	400	U L 408	L									
28										L	L	L	L	L	L	L								
29										L	L	A	U L 432	U L 432	L	L								
30										L	444	432	L	424	U L 412									
31										A	L	U L 436	U L 436	U L 436		L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										3	10	18	25	17	10	4								
MED										U L 408	422	430	U L 432	U L 432	424	408								
U Q										U L 412	432	U L 436	U L 440	U L 438	U L 432	422								
L Q										U L 408	U L 416	424	428	U L 418	420	404								

OCT. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	B	A	244	U A 304	U A 312	U R 328	A	A	U R 316	280	A	A	B					
2						B	B	U R 212	A	U R 296	A	U R 328	U R 340	U R 328	U R 308	U R 296	U A 252	U A 196	B					
3						B	B	A	A	U A 284	A	U A 324	A	A	A	U A 296	A	A	B					
4						B	B	U R 208	A	A	A	A	A	A	U A 308	U A 284	A	A	B					
5						B	B	U A 192	U A 256	A	U R 316	A	A	U R 312	304	U A 288	A	A	B					
6						B	B	U R 212	A	A	A	A	A	A	A	U R 296	A	A	B					
7						B	B	A	A	A	U R 316	A	320	U A 316	U R 308	A	U R 264	U R 200	B					
8						B	U R 212	U R 256	A	U A 304	332		A	A	U A 304	284	256	A	B					
9						B	B	U A 200	A	A	A	A	R 336	U R 324	U R 312	A	U R 264	U R 224	B					
10						B	B	A	U A 276	A	A	A	A	A	A	A	A	B	B					
11						B	B	A	A	A	A	A	A	A	A	A	A	A						
12						B	B	A	A	A	A	A	U R 328	A	A	A	A	A						
13						B		A	A	A	A	A	A	A	U R 328	U A 288	A	A	B					
14						B	B	B	A	A	U R 308	U R 320	328	A	A	A	U R 256	U A 188	B					
15						B	B	A	A	A	A	A	A	U A 316	A	A	A	A	B					
16							B	U A 164	U A 244	U A 288	312	U A 336	A	U A 364	A	A	A	B	B					
17						B		U A 196	A	A	A	A	U R 332	A	A	A	A	A	B					
18						B	B	A	A	A	A	A	A	U R 332	A	A	A	B	B					
19						B	B	A	A	A	U R 308	A	324	332	312	A	A	A	B					
20						B	B	A	U R 268	A	300	312	U R 320	U R 308	U A 300	A	A	B	B					
21						B	B	U R 208	U A 240	A	A	A	A	U A 352	A	A	A	A	A					
22						B	B	U R 208	244	U A 284	A	A	U A 320	344	308	U A 284	U A 248	B	B					
23						B	B	A	A	A	A	A	A	A	U A 296	A	A	B	B					
24						B	B	A	A	A	A	A	A	320	A	A	A	B	C					
25							B	A	A	U R 280	U R 308	C	U R 320	312	A	U A 272	U R 236	A						
26						B		U R 212	A	U R 276	A	U A 312	U A 320	U R 328	A	A	A	A	B					
27						B	B	U R 200	U R 248	A	A	A	A	A	A	A	A	B	B					
28						B		B	U A 228	A	A	A	U R 320	U R 308	U R 300	A	U R 256	B	B					
29						B		U A 184	U R 260	A	A	A	A	A	A	U A 280	U R 264	B	B					
30								U A 180	U R 248	A	A	U A 308	A	A	A	U A 276	A	A	B					
31						B	B	B	A	A	A	A	A	A	A	A	U R 240	U R 184	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								14	12	7	9	9	12	15	13	12	10	5						
MED								U R 204	U 248	U A 284	U R 308	U 324	U R 322	U 324	U 308	U A 284	U R 256	U R 196						
U Q								U R 212	U R 258	U 296	U R 314	U 330	U R 330	U 332	U R 312	U 292	U R 264	U R 212						
L Q								U A 192	244	U R 280	U 306	U A 312	U 320	U R 312	U 302	U A 280	U R 248	U 186						

OCT. 2019 foE (0.01MHz)

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 15	E B 15	22	E B 15	E B 16	E B 16	25	30	G	G	G	J A 41	J A 48	G	34	31	26	J A 34	22	J A 46	24	24	23
2	E B 16	E B 16	23	E B 16	E B 16	E B 15	J A 22	G	J A 41	G	J A 44	G	G	G	G	G	30	24	E B 15	E B 15	E B 14	E B 17	E B 16	E B 16
3	23	E B 15	E B 16	E B 16	E B 14	23	J A 88	J A 32	J A 54	34	J A 44	36	J A 43	40	38	J A 49	J A 56	J A 54	J A 54	J A 32	J A 24	23	E B 16	E B 15
4	J A 28	J A 28	E B 15	E B 16	22	J A 25	E B 15	G	J A 34	35	34	36	J A 48	J A 82	37	J A 43	J A 45	J A 43	J A 46	J A 36	25	25	E B 16	E B 16
5	E B 16	21	E B 16	E B 16	E B 16	E B 16	E B 16	26	33	35	G	J A 45	J A 53	G	36	33	29	J A 30	J A 25	23	23	E B 16	E B 16	E B 16
6	20	E B 16	E B 16	21	22	20	E B 16	G	30	34	37	J A 44	J A 39	37	J A 39	G	J A 29	J A 36	J A 30	J A 30	J A 24	J A 30	27	J A 54
7	J A 42	J A 23	J A 24	J A 24	E B 16	E B 15	E B 15	J A 32	J A 38	33	G	36	40	37	G	34	G	G	J A 29	25	20	20	E B 16	J A 26
8	22	22	E B 16	E B 16	E B 16	E B 16	J A 26	G	G	32	34	41	36	36	35	33	30	J A 28	24	21	23	J A 30	J A 37	E B 16
9	21	E B 16	E B 16	E B 16	E B 15	E B 16	20	28	J A 42	34	J A 39	J A 42	G	38	G	J A 37	G	G	J A 29	J A 29	20	E B 16	E B 16	E B 16
10	21	21	21	19	19	E B 16	E B 16	24	30	J A 39	35	36	38	36	34	J A 53	J A 88	J A 53	J A 48	J A 44	J A 25	E B 15	E B 15	E B 15
11	52	J A 27	22	23	23	E B 16	E B 16	J A 38	J A 56	J A 79	J A 100	J A 83	J A 88	J A 74	J A 50	J A 45	J A 38	31	J A 22	J A 24	J A 34	J A 46	J A 54	J A 58
12	J A 44	E B 16	21	E B 16	20	E B 15	21	25	30	J A 40	J A 38	J A 40	G	36	35	J A 38	J A 38	J A 39	J A 51	J A 44	J A 50	J A 42	J A 53	J A 33
13	J A 23	J A 30	20	20	E B 16	E B 16	E B 16	J A 25	J A 49	J A 44	J A 38	J A 53	J A 49	J A 43	G	36	J A 55	J A 34	J A 32	J A 120	J A 51	J A 52	J A 55	J A 74
14	J A 49	J A 54	J A 54	J A 34	J A 31	J A 22	J A 31	24	31	J A 35	G	G	38	35	J A 40	38	G	24	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
15	E B 16	J A 34	J A 37	E B 16	J A 32	J A 73	J A 80	J A 34	J A 36	J A 44	J A 56	J A 78	J A 50	J A 37	J A 41	J A 40	J A 35	J A 40	J A 56	J A 49	24	24	22	E B 14
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	22	30	33	36	42	40	41	44	J A 64	J A 44	J A 32	J A 31	J A 29	J A 54	J A 56	J A 46	J A 34
17	J A 39	J A 25	20	20	20	23	22	26	J A 33	J A 42	J A 41	J A 38	G	J A 38	J A 46	J A 51	J A 49	J A 38	J A 86	J A 29	E B 16	24	E B 15	J A 24
18	24	J A 66	J A 38	21	J A 38	23	22	J A 35	J A 41	33	J A 39	J A 41	J A 44	G 28	J A 53	36	31	22	J A 22	J A 24	J A 40	J A 33	J A 39	J A 29
19	23	23	23	E B 16	E B 16	J A 31	20	24	29	32	G	J A 37	38	40	36	J A 39	30	29	J A 26	J A 29	E B 15	E B 15	J A 27	J A 24
20	J A 24	21	22	J A 26	22	22	J A 30	J A 34	G	J A 39	34	34	G	J A 42	33	32	J A 37	J A 37	J A 30	21	21	J A 30	E B 16	E B 16
21	E B 15	E B 15	E B 15	20	19	23	E B 16	G	32	32	35	J A 59	J A 45	42	J A 43	39	32	J A 46	J A 46	J A 56	J A 31	J A 78	J A 109	J A 80
22	J A 48	J A 52	J A 54	J A 43	23	21	20	J A 43	28	36	J A 52	J A 58	38	39	43	34	32	22	E B 16	J A 51	J A 54	J A 64	22	E B 16
23	20	22	J A 37	22	E B 16	J A 27	20	24	28	32	36	36	40	37	35	J A 46	J A 32	J A 30	J A 31	J A 26	J A 34	J A 31	J A 31	J A 31
24	J A 28	J A 24	J A 40	24	J A 35	J A 31	J A 29	J A 38	J A 37	J A 54	J A 40	J A 41	J A 40	G	35	J A 60	J A 58	J A 39	C	J A 30	23	21	J A 30	J A 28
25	J A 31	J A 24	J A 27	J A 24	23	E B 15	22	J A 23	J A 33	G	G	C	G	35	J A 44	32	G	J A 43	J A 32	J A 38	J A 28	28	J A 54	J A 36
26	J A 34	J A 38	J A 34	23	22	E B 16	22	G	J A 34	30	J A 46	38	37	G	36	J A 43	J A 35	J A 40	J A 32	J A 32	J A 34	J A 42	J A 50	J A 24
27	J A 37	J A 33	J A 36	20	E B 16	E B 20	E B 16	G	G	32	36	36	J A 42	J A 39	J A 43	J A 39	J A 34	24	J A 30	J A 40	J A 35	J A 25	J A 39	J A 44
28	J A 32	J A 32	J A 33	24	J A 25	J A 27	21	25	30	J A 40	J A 44	J A 40	G	G	G	34	G	22	J A 26	J A 27	24	J A 24	24	23
29	J A 28	J A 54	23	E B 16	E B 16	E B 15	23	23	G	32	J A 44	J A 52	J A 47	J A 40	J A 40	36	J A 33	21	J A 42	J A 54	J A 48	J A 40	J A 60	J A 36
30	J A 37	J A 34	J A 24	J A 38	22	J A 28	J A 23	24	G	J A 36	J A 51	35	J A 49	J A 47	J A 52	34	J A 38	28	J A 30	J A 53	J A 39	J A 85	J A 41	J A 40
31	J A 32	J A 28	J A 26	J A 28	23	24	E B 16	22	J A 38	J A 51	J A 39	J A 40	J A 43	J A 50	J A 44	J A 38	G	G	J A 34	J A 28	J A 20	22	J A 83	J A 67
	00	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	30	31	31	31	31	31	31	30	31	31	31	31	31
MED	J A 24	J A 24	23	20	20	20	20	24	32	34	J A 38	40	40	38	37	38	J A 32	30	J A 30	J A 29	J A 25	J A 25	J A 27	J A 24
U Q	J A 37	J A 33	J A 34	J A 24	J A 23	J A 24	J A 23	32	J A 38	40	J A 44	44	J A 45	J A 42	J A 43	J A 43	J A 38	39	J A 42	44	J A 39	J A 42	J A 50	J A 36
L Q	E B 20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 22	G 29	32	G 34	36	G 36	G 35	G 34	34	G 29	24	26	24	21	E B 21	E B 16	E B 16

OCT.2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	24	28	G	G	G	31	32	G	31	28	24	E B 16	E B 15	E B 15	E B 15	E B 16	E B 16
2	E B 16	E B 16	E B 15	E B 16	E B 16	E B 15	E B 16	G	26	G	31	G	G	G	G	G	29	22	E B 15	E B 15	E B 14	E B 17	E B 16	E B 16
3	E B 16	E B 15	E B 16	E B 16	E B 14	E B 15	20	19	31	31	33	34	34	37	34	40	47	45	48	24	17	17	E B 16	E B 15
4	E B 15	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15	G	27	31	32	32	32	A A 82	34	34	34	31	36	26	21	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	29	33	G	33	37	G	35	32	27	23	17	E B 16	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 17	16	E B 16	G	28	30	34	36	34	34	34	G	25	22	21	21	E B 16	E B 16	E B 16	18
7	E B 15	E B 16	17	E B 16	E B 16	E B 15	E B 15	22	31	30	G	33	38	36	G	32	G	G	16	E B 15	16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	30	32	41	35	35	34	31	27	22	16	E B 16	E B 16	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	24	28	31	32	32	G	36	G	30	G	G	23	16	16	E B 16	E B 16	E B 16
10	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	28	28	32	33	36	35	34	40	48	47	41	37	18	E B 15	E B 15	E B 15
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	42	28	32	33	49	51	40	39	28	22	E B 16	E B 16	A A 34	A A 46	22	18
12	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	22	29	31	32	33	G	33	33	31	27	26	36	A A 44	19	E B 16	E B 16	E B 16
13	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	19	26	29	30	33	33	34	G	34	31	24	21	A A 120	E B 16	A A 52	18	24
14	22	18	E B 16	20	E B 16	E B 16	E B 16	20	27	28	G	G	35	33	33	29	G	21	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
15	E B 16	E B 16	E B 16	E B 16	E B 15	A A 73	A A 80	25	28	30	39	38	34	36	32	34	24	23	A A 56	18	E B 16	E B 16	E B 16	E B 14
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	30	35	38	37	39	41	52	36	25	22	24	A A 54	A A 56	E B 16	E B 16
17	18	E B 16	E B 16	19	E B 16	E B 16	E B 16	22	28	28	30	33	G	33	38	40	40	19	19	E B 16	E B 16	E B 16	E B 15	16
18	E B 16	E B 16	E B 16	E B 16	20	E B 16	E B 16	28	32	31	34	34	34	G 25	30	33	28	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 15	E B 16	E B 16	E B 16	E B 18	E B 16	20	27	29	G	30	G 28	38	34	34	28	24	20	20	E B 15	E B 15	E B 15	E B 15
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	16	E B 16	G	30	32	33	G	G 24	32	30	24	24	E B 16	E B 16	E B 16	18	E B 16	E B 16
21	E B 15	E B 15	E B 15	E B 16	E B 16	E B 16	E B 16	G	29	31	34	33	35	40	32	35	29	39	40	A A 56	19	20	19	A A 80
22	22	20	A A 54	18	E B 16	E B 16	E B 16	G 18	26	32	41	33	36	38	38	32	27	19	E B 16	19	A A 54	19	E B 16	E B 16
23	E B 16	E B 16	18	E B 16	E B 16	19	E B 16	21	26	30	33	33	37	34	34	37	30	25	25	17	18	E B 16	19	18
24	E B 16	E B 16	E B 16	E B 16	A A 35	A A 31	18	23	23	45	32	37	35	G	34	34	46	29	C	22	E B 16	17	18	E B 16
25	E B 17	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	18	22	G	G	C	G	34	28	30	G	20	18	19	E B 16	E B 16	20	18
26	20	20	20	E B 16	E B 16	E B 16	E B 16	G	26	G 28	32	35	34	G	33	28	25	19	19	18	E B 16	22	22	E B 16
27	E B 16	E B 16	16	E B 16	E B 16	E B 16	E B 16	G	G	30	33	34	35	34	34	32	25	20	E B 16	28	E B 16	E B 16	19	A A 44
28	18	20	19	E B 15	17	17	E B 16	22	27	27	31	31	G	G	G	31	G	19	17	19	E B 15	18	E B 15	E B 15
29	E B 16	19	E B 16	E B 16	E B 16	E B 15	E B 16	20	G	30	34	41	33	33	33	30	G 19	19	24	31	A A 48	A A 40	A A 60	18
30	18	21	E B 16	E B 16	E B 16	E B 16	E B 16	20	G	26	34	34	32	36	35	30	30	19	21	E B 16	E B 16	A A 85	19	19
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	33	34	32	33	34	33	33	26	G	G	23	E B 16	E B 16	E B 16	17	A A 67
	00	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	30	31	31	31	31	31	31	30	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	30	32	33	34	34	33	32	27	22	20	18	E B 16	E B 16	E B 16	E B 16
U Q	16	16	16	E B 16	E B 16	16	16	22	29	31	34	34	35	36	34	34	30	25	24	24	18	A A 19	19	18
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G	G 26	28	G 30	33	G	G 32	G 30	30	G 24	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

OCT. 2019 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

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

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

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

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	304	304	301	312	349	363	378	353	358	358	322	340	337	328	317	336	363	375	386	346	326	314	320
2	325	325	317	328	377	357	371	412	358	376	344	349	344	358	348	321	349	369	374	387	333	314	311	283
3	321	321	332	357	359	345	356	390	386	350	379	354	327	361	336	350	356	373	397	378	367	318	319	319
4	286	326	306	347	354	338	346	370	374	361	361	376	318	A	353	377	353	383	364	357	354	323	315	F
5	303	343	321	324	315	343	364	381	356	363	349	368	337	336	357	353	357	377	379	379	313	303	303	294
6	333	336	336	338	376	349	367	401	375	370	354	316	352	376	368	336	366	374	374	399	300	306	327	F
7	F	332	328	332	382	351	332	396	364	355	336	336	340	369	356	364	377	372	380	397	344	326	321	330
8	330	332	332	F	F	399	358	385	362	361	359	331	341	351	381	369	368	376	359	373	369	343	306	322
9	336	361	365	362	326	307	360	378	371	359	390	342	353	348	340	349	366	369	375	339	330	301	291	296
10	337	379	341	343	343	348	348	393	389	351	390	317	365	350	326	332	351	366	371	388	360	330	304	325
11	295	F	F	304	324	314	355	375	394	391	351	356	349	346	336	362	387	383	389	427	A	A	360	303
12	F	F	306	348	414	329	325	385	382	376	371	338	343	360	332	372	361	378	381	A	333	316	309	318
13	348	328	338	342	352	333	366	379	391	380	383	375	342	348	364	351	359	384	381	A	359	A	F	F
14	299	296	298	319	369	322	341	380	390	373	374	377	367	352	327	350	352	387	393	359	340	329	333	333
15	316	312	F	F	F	A	A	384	357	381	383	380	350	333	358	357	396	361	A	384	332	312	323	319
16	316	309	310	332	373	377	367	408	398	367	366	350	350	332	329	365	377	380	384	409	A	A	F	322
17	304	321	358	371	413	335	346	366	371	360	363	341	345	346	343	351	378	380	370	384	289	311	310	316
18	312	329	359	324	377	389	331	397	383	339	369	340	335	333	337	355	376	368	397	372	308	299	F	F
19	F	296	F	347	F	280	377	394	389	380	349	371	336	353	339	347	374	377	384	353	299	318	314	346
20	F	F	F	F	383	399	354	376	378	390	391	357	340	369	353	378	366	363	375	321	321	332	341	321
21	317	318	317	296	362	399	400	394	393	391	349	387	390	343	358	341	372	395	375	A	315	317	F	A
22	F	331	A	327	F	330	322	380	393	383	365	354	365	361	345	373	373	397	387	322	A	330	328	328
23	321	F	321	334	395	402	371	405	377	346	379	367	321	329	350	352	380	409	372	377	319	310	321	345
24	322	338	362	F	A	A	382	390	398	390	342	359	321	326	362	367	383	384	C	358	355	307	F	F
25	304	305	347	283	317	311	321	375	376	379	345	C	315	353	367	382	363	390	343	313	342	347	289	302
26	356	328	314	F	F	F	316	372	357	353	361	375	368	345	349	352	379	364	374	298	309	335	306	314
27	326	323	366	352	281	298	325	353	369	372	369	356	358	366	350	370	380	386	362	353	347	331	278	A
28	314	322	352	360	379	297	326	376	388	386	376	352	396	356	353	341	389	379	379	338	310	301	301	301
29	277	335	308	331	387	F	318	349	392	379	347	364	381	350	347	361	382	391	369	388	A	A	A	308
30	F	321	377	323	350	374	331	380	395	364	334	344	345	346	360	394	402	398	365	348	308	A	314	F
31	299	292	294	351	381	306	333	398	375	336	362	350	355	340	359	360	379	369	344	369	333	341	322	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	24	27	26	26	25	27	30	31	31	31	31	30	31	30	31	31	31	31	29	28	27	26	25	22
MED	316	325	330	333	369	343	351	381	378	370	362	354	345	349	350	355	373	378	375	372	333	318	314	319
U Q	328	332	352	348	382	374	366	394	391	380	376	368	358	358	358	369	380	386	382	386	347	330	322	325
L Q	304	312	310	324	334	314	331	376	369	358	349	341	337	340	337	349	359	369	370	350	310	310	305	303

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	U L 386	L	U L 395	U L 395	U L 380	421	U L 365	L	L						
2									L	L	U L 411	408	416	405	L	L	L	L						
3										U L 408	L	U L 404	385	U L 381	L	A	A							
4										L	411	422	U L 441	A	U L 403	A	A							
5									L	L	441	428	438	U L 480	A	388	L							
6									L	L	U L 420	A	U L 446	A	L	408	L							
7										L	424	444	450	A	L	L	L	L						
8										L	L	A	429	U L 387	L	L	L							
9									L	L	L	439	423	A	386	L	L							
10										L	396	419	L	U L 415	394	A	A							
11										L	L	L	A	A	A	A	L							
12									L	L	L	L	413	U L 384	L	L	L							
13									L	L	U L 414	L	U L 429	429	U L 390	L	A							
14										L	L	429	A	L	397	L	L							
15						A	A		L	L	A	A	403	L	L	L			A					
16									L	L	U L 429	A	U L 395	A	A	A								
17									L	L	L	L	421	U L 425	A	A								
18										L	L	U L 418	U L 418	L	U L 403	L	L							
19											U L 407	402	U L 426		L	A								
20									L	L		L	U L 422	U L 404	L	L								
21											L	U L 413		A	U L 367									
22										L	A	400	405		A	A								
23									L		L	412	U L 404	U L 395	370	A								
24						A					L	414	U L 423	457	A	A			C					
25									L	L	L	C	U L 442	L			L							
26										U L 373	L		U L 412	417	L	U L 382								
27											L	U L 427	457	U L 434	L									
28										L	L	L	L	L	L	L								
29										L	L	A	U L 383	U L 398	L	L								
30										L	388	399	L	402	U L 390									
31										A	L	U L 411	U L 410	U L 384		L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										3	10	18	25	17	10	4								
MED										U L 386	412	414	U L 421	U L 404	392	385								
U Q										U L 408	424	427	U L 434	U L 427	U L 403	398								
L Q										U L 373	407	404	U L 404	U L 386	386	U L 374								

OCT.2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT.2019 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									254	246	246	270	238	262	296	306	270	242						
2									256	246	266	266	248	248	252	268	260	260						
3										260	240	264	280	236	278	270	E A 266							
4										262	262	262	314	A	270	234	238							
5									272	252	254	250	282	254	238	242	240							
6									254	242	254	260	250	238	254	260	248							
7										264	280	310	260	234	262	250	240	232						
8										238	238	288	262	250	228	256	256							
9									228	230	230	266	252	252	276	268	244							
10										244	222	318	244	280	298	264	248							
11										238	254	254	E A 262	274	280	246	232							
12									232	238	238	268	258	232	264	254	244							
13									236	224	224	258	258	258	258	262	236							
14										236	236	236	234	258	280	254	246							
15						A	A		268	238	230	226	238	280	268	268			A					
16									220	240	254	254	254	254	262	E A 248								
17									248	248	234	244	260	248	264	254								
18										260	236	252	252	258	250	250	230							
19											268	230	264		264	248								
20									228	228		242	262	244	254	242								
21											264	234		274	252									
22										242	242	242	230		260	226								
23									232		248	248	286	284	254	238								
24						A					274	244	300	296	242	236			C					
25									214	224	266	C	282	240			228							
26										244	228		228	254	254	244								
27											232	232	232	238	244									
28										238	248	248	212	250	250	248								
29										240	256	246	226	250	248	238								
30										238	282	264	246	246	238									
31										256	226	248	248	270		238	224							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									13	26	30	29	30	28	29	27	17	3						
MED									236	241	247	252	252	253	258	250	242	242						
U Q									255	248	262	265	262	266	269	262	252	260						
L Q									228	238	234	243	238	245	250	242	234	232						

OCT.2019 h'F2 (KM)

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IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 246	E B 248	E B 248	E B 234	206	206	206	206	206	198	188	182	182	182	182	190	226	202	202	186	212	218	218	E B 238
2	E B 250	E B 250	E B 250	E B 244	194	216	202	200	192	192	186	180	172	172	172	170	202	202	202	188	190	E B 254	E B 254	E B 270
3	E B 262	E B 262	228	210	210	E B 236	220	196	202	192	190	190	190	222	196	A	A	228	216	202	202	222	E B 242	E B 260
4	E B 284	E B 268	E B 268	218	218	E B 260	210	204	204	204	196	188	188	A	190	A	A	208	216	216	210	226	E B 238	E B 238
5	E B 250	234	E B 238	E B 248	226	222	220	208	204	198	188	186	182	174	A	192	196	206	194	182	220	E B 264	E B 274	E B 276
6	E B 240	E B 234	E B 238	218	180	220	200	198	196	190	188	A	176	A	190	190	192	210	198	198	E B 244	E B 272	E B 256	E A 272
7	E B 278	E B 232	E A 242	224	194	E B 248	222	204	216	196	188	178	202	A	202	200	196	196	196	188	204	E B 246	E B 246	E B 254
8	E B 248	E B 236	E B 236	E B 250	226	196	196	196	196	190	190	A	182	182	196	200	200	206	206	192	192	210	E B 304	E B 238
9	230	216	202	200	E B 252	E B 246	214	214	202	202	200	196	174	A	174	188	200	212	208	208	208	E B 270	E B 256	E B 256
10	230	202	218	212	234	226	190	190	200	200	192	184	206	190	196	A	A	230	210	208	198	E B 232	E B 266	E B 266
11	E B 266	E B 258	E B 258	E B 242	198	220	218	210	216	202	194	194	A	A	A	A	194	206	198	184	A	A	E A 294	E A 296
12	E B 274	E B 274	E B 266	216	184	E B 276	216	208	196	188	190	190	184	184	186	198	198	204	204	A	222	E B 250	E B 240	E B 240
13	232	E B 240	222	222	204	234	212	198	198	190	190	188	188	178	178	206	A	204	198	A	198	A	E A 312	E A 312
14	E A 300	E A 300	E B 288	E A 256	218	218	214	202	200	190	184	172	A	182	182	204	204	204	188	186	210	218	208	226
15	E B 252	E B 252	E B 258	E B 268	226	A	A	194	206	206	A	A	180	196	196	212	210	210	A	196	E B 224	E B 250	E B 250	E B 260
16	E B 266	E B 248	E B 248	E B 248	216	214	202	194	186	186	186	A	196	A	A	A	216	212	196	186	A	A	E B 230	E B 230
17	E A 276	E B 250	222	208	190	208	E B 230	204	204	204	202	186	186	182	A	A	202	202	196	188	E B 274	E B 272	E B 246	E A 252
18	E B 252	E B 250	220	206	206	204	E B 242	204	212	198	198	186	182	200	200	210	196	202	192	192	210	E B 274	E B 248	E B 248
19	E B 260	E B 264	E B 244	204	178	E B 328	218	196	196	196	192	192	194	256	210	A	222	212	194	194	E B 244	E B 244	E B 238	206
20	E B 262	E B 242	E B 230	E B 244	202	190	228	212	190	192	208	194	188	188	210	202	210	210	194	200	228	228	206	E B 236
21	E B 252	E B 250	E B 250	E B 250	214	186	186	186	198	198	190	188	210	A	220	220	220	196	204	A	E A 270	E A 264	E A 264	A
22	E A 330	232	A	E A 236	204	216	E B 250	208	208	202	A	200	200	238	A	A	206	192	190	E A 258	A	E A 244	E B 230	E B 220
23	E B 258	E B 268	E A 242	216	200	200	200	182	178	216	204	190	190	190	212	A	212	192	192	192	E A 276	E B 276	E A 274	E A 266
24	E B 246	216	212	212	A	A	210	200	200	214	196	196	196	182	A	A	204	204	C	216	208	E A 272	E A 272	E B 262
25	E B 272	E B 246	210	E B 300	228	E B 242	E B 246	204	192	186	186	C	172	214	218	204	192	200	200	212	218	218	E A 292	E A 264
26	224	E A 244	E A 260	E B 260	218	212	E B 234	206	204	182	192	208	186	186	186	186	210	210	198	210	E B 232	E B 246	E A 278	E B 250
27	E B 238	E B 252	190	208	E B 228	E B 274	E B 256	204	218	208	192	186	186	178	196	212	208	196	196	202	212	222	E A 290	A
28	228	E A 260	224	216	212	E A 292	E B 266	204	204	198	198	198	198	176	190	190	198	184	184	208	E B 246	E B 246	E B 266	E B 266
29	E B 276	E B 240	224	224	192	E B 244	E B 266	210	202	202	200	A	198	190	190	192	198	190	202	202	A	A	A	E A 288
30	E A 288	E A 256	206	E B 242	228	204	E B 204	198	198	192	192	200	198	198	198	198	196	190	190	196	E B 226	A	E A 260	E A 260
31	E B 266	E B 268	E B 258	196	196	E B 254	200	196	196	A	194	186	180	180	222	192	192	200	206	192	208	202	E A 240	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	31	31	30	31	30	29	30	31	31	30	29	25	29	24	25	21	27	31	29	28	27	26	30	28
MED	E B 258	E B 250	E U 238	212	206	210	208	204	200	198	192	188	188	185	196	198	202	204	198	196	207	E 246	E B 255	E B 258
U Q	E 274	E B 260	E B 250	E B 248	226	E B 247	E B 230	206	204	202	197	195	197	197	206	205	210	210	204	208	E B 232	E B 264	E A 274	E 266
L Q	246	236	222	212	196	207	202	196	196	190	188	186	182	181	186	190	196	196	194	188	208	222	E 240	E B 238

OCT.2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

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

OCT. 2019 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	84	B	B	B	124	124	G	G	G	90	90	G	160	108	108	90	90	82	82	82	88
2	B	B	88	B	B	B	88	G	88	G	88	G	G	G	G	G	150	138	B	B	B	B	B	B
3	88	B	B	B	B	94	94	92	92	114	90	126	86	116	116	116	112	98	96	96	94	94	B	B
4	94	102	B	B	100	100	B	G	96	96	98	98	98	98	110	116	116	102	100	96	94	94	B	B
5	B	94	B	B	B	B	B	114	130	122	G	94	92	G	142	130	118	104	92	94	94	B	B	B
6	102	B	B	96	96	102	B	G	122	118	114	98	98	98	98	G	96	96	96	96	96	94	100	98
7	94	94	94	94	B	B	B	102	102	120	G	120	148	148	G	118	G	G	106	96	88	88	B	88
8	88	88	B	B	B	B	88	G	G	126	130	148	122	122	146	154	142	106	106	100	100	106	104	B
9	96	B	B	B	B	B	116	116	116	116	96	96	G	144	G	104	G	G	84	84	98	B	B	B
10	98	96	96	96	96	B	B	124	124	102	102	102	108	110	118	108	92	92	92	92	92	B	B	B
11	108	100	94	94	94	B	B	94	94	98	98	98	98	98	98	98	98	98	98	98	98	88	86	86
12	86	B	96	B	96	B	110	116	116	100	100	100	G	100	110	102	102	100	96	96	96	96	96	96
13	96	96	96	94	B	B	B	94	94	94	94	94	94	94	G	134	122	122	112	104	102	102	102	92
14	90	90	90	90	90	96	96	96	108	102	G	G	150	98	100	100	G	124	B	B	B	B	B	B
15	B	118	100	B	92	92	92	92	98	96	96	96	94	136	90	90	88	88	86	86	86	84	84	B
16	B	B	B	B	B	B	84	138	138	138	152	152	128	146	124	102	L 102	102	96	94	94	94	86	90
17	90	90	90	82	82	84	84	126	110	104	100	96	G	96	96	96	96	94	92	92	B	92	B	92
18	92	92	92	88	86	100	114	122	104	110	102	98	96	92	90	110	110	108	104	96	96	94	94	94
19	94	94	94	B	B	102	120	120	120	112	G	94	158	148	148	84	112	102	102	96	B	B	96	96
20	96	96	96	92	92	92	92	92	G	92	142	132	G	92	154	122	102	102	88	86	94	94	B	B
21	B	B	B	94	94	94	B	G	140	118	118	118	84	138	92	110	124	100	94	94	94	94	94	94
22	94	90	90	90	90	92	92	92	164	130	96	94	116	156	126	126	122	122	B	110	104	100	100	B
23	100	100	100	100	B	94	92	112	110	118	118	114	112	112	148	106	106	96	94	94	102	102	100	94
24	94	92	92	92	92	90	88	88	90	90	90	90	104	G	110	98	98	98	C	98	98	98	98	90
25	84	84	84	84	84	B	134	108	98	G	G	C	G	140	100	128	G	84	82	82	88	86	86	86
26	86	86	86	86	86	B	86	G	86	114	96	148	140	G	100	94	94	92	90	90	90	88	90	90
27	90	90	90	90	B	90	B	G	G	108	110	112	102	100	100	100	98	92	86	86	86	86	84	84
28	84	84	84	84	84	84	84	118	118	96	88	88	G	G	G	116	G	108	104	96	96	96	94	94
29	94	88	88	B	B	B	88	140	G	116	106	100	100	100	98	128	102	110	94	90	116	116	94	94
30	94	86	86	84	90	90	90	124	G	104	98	134	94	90	90	116	112	112	102	102	102	94	94	90
31	96	96	96	96	96	96	B	116	116	98	98	98	98	96	96	92	G	G	92	92	92	92	92	92
	00	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	23	22	20	18	17	20	24	26	28	25	27	24	26	25	29	25	28	27	29	27	25	21	20
MED	94	92	92	91	92	94	92	115	110	109	98	98	99	100	100	110	106	102	94	94	94	94	94	92
U Q	96	96	96	94	96	98	103	123	122	118	112	120	119	138	125	124	117	108	102	96	98	97	99	94
L Q	89	88	88	85	86	90	88	94	96	98	96	96	94	96	97	99	98	96	90	90	92	88	86	89

IONOSPHERIC DATA STATION Yamagawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				F4				C3	C3				L2	L2		H2	C2	C2	L1	F1	F1	F1	F3	F3
2			F2				L1		L2		L2						H2	H2						
3	F1					L2	L4	L4	L6	CL23	L5	CL33	L3	CL23	CL23	C3	CL72	L6	L6	F8	F4	F1		
4	F2	F2			F4	F1			L2	L2	L2	L2	L2	L3	CL12	C2	C5	L8	L9	F7	F5	F1		
5		F1						C2	C3	C3		L3	L3		H2	H1	C1	L3	L1	F1	F1			
6	F1			F3	F1	L2			C2	C2	C2	L3	L2	L2	L1		L1	L3	L5	F5	F3	F3	F2	F5
7	F5	F5	F2	F2				L4	L3	C2		C1	H1	H1		C1			L3	F1	F1	F1		F2
8	F2	F2					F2			C1	C1	H2	C1	C1	H1	H1	H2	L3	L2	F1	F1	F2	F3	
9	F1						C1	C2	C3	C2	L2	L2		H1		L2			L3	F3	F1			
10	F2	F1	F2	F1	F1			C2	C3	L3	L2	L2	C1	C1	C1	L3	L5	L9	L9	F9	F9			
11	F3	F2	F2	F2	F2			L5	L3	L4	L3	L2	L3	L3	L3	L5	L3	L2	L2	F4	F9	F9	F8	F8
12	F5		F4		F1		C1	C3	C3	L2	L2	L2		L1	L2	L2	L2	L8	F9	F9	F6	F6	F6	F2
13	F2	F2	F4	F1				L2	L3	L2	L2	L3	L2	L2		H2	C2	C3	C2	F5	F2	F6	F6	F7
14	F6	F7	F5	F7	F3	L3	L3	L3	C2	L2			H1	L2	L2	L2		C2						
15		F2	F2		F2	L5	L6	L6	L4	L3	L3	L3	L3	HL13	L3	L4	L4	L6	L6	F3	F2	F2	F2	
16							L2	H3	H3	H2	H2	H2	C2	H3	C2	L5	L3	L8	L9	F8	F9	F8	F3	F2
17	F4	F2	F1	F2	F1	L2	L1	C2	C3	L3	L2	L3		L2	L3	L4	L5	L3	L3	F2		F2		F5
18	F2	F4	F3	F3	F3	L2	C1	C7	L5	C2	L3	L2	L2	L2	L2	C3	C2	L3	L3	F3	F2	F2	F7	F2
19	F2	F1	F1			L2	C1	C2	C2	C2		L2	HL12	H2	HC22	L4	CL23	L3	L6	F6			F6	F2
20	F2	F1	F2	F2	F3	L1	L5	L4		L3	H2	HL12		L2	H1	C1	L3	L4	L2	F1	F3	F5		
21				F1	F1	L3			H3	C2	C1	CL23	L4	HL23	LC32	CL22	CL22	L7	L6	F6	F7	F7	F6	F7
22	F8	F8	F6	F8	F3	L2	L2	L1	HL12	C3	L3	L3	C2	H2	C2	C2	C4	C2		F5	F7	F4	F2	
23	F2	F2	F6	F2		L5	L2	C2	C2	C2	C2	C2	C2	C2	H2	L2	L3	L7	L9	F2	F4	F6	F9	F3
24	F2	F2	F2	F2	F7	L7	L7	L6	L3	L5	L2	L3	L2		C2	L3	L6	L6		F9	F1	F3	F7	F2
25	F2	F4	F3	F2	F2		C1	L3	L3					H1	LH21	C2		L2	F2	F3	F2	F3	F4	F3
26	F4	F3	F2	F1	F1		L1		L3	C1	L3	H1	H3		L2	L2	L2	L2	L2	F2	F2	F4	F3	F2
27	F2	F2	F2	F2		L1				C2	C2	C2	L2	L2	L3	L3	L2	L2	L2	L6	L3	F2	F4	F6
28	F6	F4	F5	F2	F2	L2	L2	C4	C3	L3	L3	L3				C1		C3	L1	F4	F2	F3	F2	F1
29	F2	F7	F5				F2	H2		C2	L4	L3	L2	L2	L3	CL32	L3	C2	L4	F6	FF45	FF45	F7	F3
30	F6	F6	F6	F2	F1	F1	F2	C2		L3	L3	HL12	L3	L3	L4	C3	L3	L2	L3	F2	F1	F4	F5	F6
31	F2	F2	F2	F2	F1	L2		C3	C4	L4	L3	L2	L2	L3	L2	L2			L6	F2	F1	F1	F6	F9
	00	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																								

OCT.2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

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

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	38	35	32	28	30	28	45	59	70	72	90	123	119	103	96	99	93	57	55	32	26	28	28
2	29	29	27	27	25	20	26	45	52	66	68	76	89	102	95	86	89	86	79	54	29	24	27	27
3	27	27	28	28	18	17	23	46	57	49	68	73	H 68	82	90	H 68	63	63	59	A	27	25	26	26
4	25	25	24	27	20	17	21	47	51	65	58	A	56	69	88	78	66	63	60	40	28	26	28	28
5	28	F 31	31	28	26	24	24	47	48	60	61	60	70	88	101	86	72	63	52	33	28	28	F 28	31
6	F 30	30	28	34	21	20	24	45	48	48	62	73	76	88	77	72	76	85	57	37	27	A	27	29
7	30	F 30	30	29	24	A	23	46	51	57	65	62	70	84	74	60	58	63	68	34	25	24	27	27
8	28	28	27	29	30	23	24	45	50	64	80	61	64	80	76	60	51	53	59	63	31	28	30	29
9	32	33	32	30	18	18	23	54	64	61	76	76	85	97	105	90	72	65	57	46	41	J R 37	38	39
10	F 38	36	35	26	24	25	24	42	49	57	75	66	68	68	76	90	85	72	82	48	A	A	25	25
11	27	28	F 27	F 28	F 24	24	24	56	56	63	59	70	75	75	92	87	81	67	63	39	27	A	A	A
12	26	25	27	29	22	J B 14	20	49	62	66	82	J R 99	J R 119	123	110	96	84	74	63	A	A	A	31	28
13	30	31	30	30	22	21	25	48	59	67	60	74	85	77	84	78	63	66	56	R 26	29	28	22	24
14	26	F 29	F 28	26	F 27	F 25	F 25	50	58	68	63	82	89	J R 93	J R 93	J R 100	109	70	47	31	28	27	28	28
15	29	28	27	26	28	23	22	42	49	66	78	A	72	74	82	86	74	A	50	33	A	27	F 30	F 27
16	30	30	28	26	29	23	22	46	50	53	62	76	81	73	88	103	90	64	58	40	26	25	26	27
17	27	F 30	31	39	23	17	20	48	57	70	84	88	71	75	84	82	75	58	52	36	26	A	28	F 28
18	F 29	F 30	F 30	26	19	J B 16	18	42	52	54	67	82	74	94	102	90	86	75	54	31	22	26	F 27	F 27
19	27	27	28	32	R 22	J B 15	19	42	50	53	59	72	68	72	85	77	79	71	66	36	29	27	28	30
20	F 27	31	30	28	29	17	20	48	59	62	62	78	71	69	78	81	58	57	58	34	28	32	28	27
21	27	27	27	27	28	24	18	44	50	54	59	79	74	56	79	95	67	64	45	31	29	31	28	28
22	26	26	27	26	31	A	A	45	54	50	64	92	84	72	84	83	75	56	42	32	28	32	27	28
23	27	F 28	F 30	34	F 26	18	18	36	45	50	61	67	66	65	74	90	92	67	40	34	20	24	26	27
24	28	30	28	20	22	20	20	47	51	49	54	71	66	58	88	95	73	A	A	A	A	29	27	27
25	28	31	26	22	24	22	21	51	73	70	66	64	72	97	C	C	79	70	52	50	42	40	32	34
26	34	33	34	32	31	30	29	53	60	70	85	101	95	84	99	92	88	80	70	57	51	40	41	38
27	F 42	40	32	29	27	26	29	53	72	70	87	110	88	74	103	71	62	56	53	37	33	31	30	29
28	32	32	30	A	A	19	20	54	63	58	66	91	91	95	J R 110	94	73	54	47	38	26	29	32	31
29	30	33	32	31	31	17	19	52	70	67	66	81	88	84	87	78	70	56	50	45	32	F 30	F 29	F 30
30	F 30	32	32	36	26	21	19	45	54	61	66	85	95	86	103	89	60	54	44	40	30	31	34	33
31	32	31	34	31	27	21	25	43	53	59	78	88	69	67	92	94	72	67	68	48	34	28	27	27
	00	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	30	29	30	31	31	31	31	29	31	31	30	30	31	29	30	28	27	26	30	30
MED	29	30	30	28	26	21	22	46	54	61	66	76	74	80	88	86	74	65	57	38	28	28	28	28
U Q	30	32	32	31	28	24	24	50	59	67	76	88	88	93	101	94	85	72	63	47	32	31	30	30
L Q	27	28	27	26	22	17	20	45	50	54	61	70	69	72	82	78	66	58	50	34	27	26	27	27

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L 388	U L 456	452	444	440	436	L 412	L 388							
2									L	L 408	L 436	436	440	448	420	424	L	L						
3									L	L	L 432	436	U L 488	428	428	416	388	A						
4									L	396	432	A	436	A	412	416	A	A						
5										L 404	424	436	428	436	432	420	L 392							
6									L		416	436	452	436	444	420	396							
7										L 408	416	440	L 436	436	436	412	L 396	L						
8										L 420	432	432	432	444	432	L	A							
9									L	L	L 428	432	460	L 456	424	L 416	376							
10										U L 396	424	440	444	L 440	416	412	A							
11										L 408	U L 444	A	440	A	A	A	384							
12									L	L 420	424	440	444	444	432	408								
13									L	L	L 432	432	432	L 440	424	416	L							
14										L	432	416	432	440	448	424								
15										A	428	A	U L 440	U L 488	A	A	A	A						
16										U L 400	L 428	432	436	464	A	A	L	A						
17									L	L	A	444	436	L 448	L 416	408	L	A						
18										L	L 420	436	448	440	432	A	A							
19										L	428	L 428	L 420	L 452	A	A	A							
20									L	L	436	436	424	L 444	L 420	412	L	L						
21								212			L	L 432	L 432	444	L 428	L 404	L							
22							A				A 412	420		A	420	L 404	A							
23											L 424	424	424	436	412	L 404	L							
24											L 416	A	A	448	L 404	A	A	A	A					
25									L	L 392	L	U L 444	440	404	C	C								
26										L	L	436	L 440	L 448	L 416	L 416		A						
27										L	L	424	424	L	A	L 392								
28										L	U L 428	436	440	L 440	424	L 416	L							
29									L	L 400	U L 420	L 452	L 444	L 432	L 436		L							
30										U L 424	L 420	428	424	432	L 432		L							
31										L	L 436	L 432	432	444	428	L 416	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1		13	26	27	29	27	25	21	7							
MED								212		L 404	L 428	436	436	440	428	416	388							
U Q										L 414	L 432	440	444	L 448	432	416	396							
L Q										L 396	L 420	432	432	436	418	L 408	384							

OCT. 2019 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B 172	236	280	304	324	316	328	328	300	A	A	A					
2								B 192	248	A	A	324	312	316	312	284	A	A	A					
3								B 224	A	256	312	324	A	328	320	300	A	224	A					
4								B 212	256	288	308	320	332	328	A	300	268	212	A					
5								B 172	256	A	A	A	A	A	A	296	264	A	A					
6								B A	252	280	304	312	320	320	304	284	A	A	A					
7								B A	248	A	308	320	332	332	316	296	256	A	B					
8								B A	244	284	312	316	324	316	316	292	260	208	B					
9								B A	240	A	A	A	328	328	312	292	260	A	A					
10								B 192	252	280	308	324	324	328	312	296	264	A	A					
11								B U A 180	228	276	296	320	328	320	312	292	260	204	A					
12								B 204	248	264	U A 288	A	A	328	316	292	272	220	A					
13								B 184	248	A	A	316	A	316	308	288	260	216	B					
14								B A	240	276	312	A	316	324	300	A	A	208	B					
15								B A	240	A	A	A	A	A	A	A	A	A	A					
16								B 172	244	284	308	324	332	328	316	292	276	A	A					
17								B 184	U A 244	U A 284	A	U A 312	A	A	A	A	A	A	A					
18								B A	252	268	A	A	328	324	308	288	260	A	A					
19								B A	244	280	296	A	A	328	A	284	260	A	A					
20								B A	A	A	A	A	316	316	312	312	264	208	B					
21								B 172	232	272	296	292	328	A	A	288	252	A	A					
22								A A	252	284	304	320	324	328	312	296	260	196	B					
23								B 188	212	276	304	316	324	316	308	292	U A 272	A	A					
24								B 180	244	284	A	328	308	304	308	288	260	A	A					
25								B A	252	A	304	320	320	320	C	C	A	A	A					
26								B A	220	260	292	308	328	316	304	A	A	A	A					
27								B A	232	272	304	316	320	312	296	280	A	A	A					
28								B A	224	A	308	316	A	U A 324	312	288	264	A	B					
29								B A	U A 244	272	304	320	320	320	312	U A 280	A	A	A					
30								B A	A	A	A	312	316	312	304	284	240	188	B					
31								B A	232	U A 280	A	308	A	A	A	A	A	196	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								14	28	21	20	23	22	26	23	25	19	11						
MED								184	244	280	304	320	324	322	312	292	260	208						
U Q								192	250	284	308	324	328	328	316	296	264	216						
L Q								172	234	272	300	312	316	316	308	286	260	196						

OCT. 2019 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 17	E B 16	20	E B 16	E B 16	E B 16	24	28	G	G	G	G	37	G 27	J A 40	J A 52	26	J A 27	J A 26	18	E B 16	E B 16	J A 22
2	E B 16	J A 16	J A 21	E B 16	19	E B 16	E B 16	22	28	J A 38	J A 47	J A 35	J A 32	G	G	34	32	J A 26	22	J A 16	18	E B 16	E B 16	17
3	19	19	E B 16	E B 16	E B 16	E B 16	E B 16	G	J A 30	32	35	37	42	42	42	J A 40	J A 39	J A 36	J A 34	J A 39	J A 42	J A 36	J A 20	20
4	E B 16	J A 30	19	E B 16	E B 16	E B 16	E B 16	G	32	34	35	J A 65	J A 44	J A 48	J A 35	40	J A 57	J A 43	J A 38	J A 30	J A 30	J A 38	J A 19	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	25	J A 29	J A 35	J A 40	J A 48	J A 44	J A 48	J A 45	35	32	27	J A 23	J A 23	J A 53	J A 29	J A 20	J A 18
6	E B 16	J A 19	19	19	19	J A 16	18	22	27	33	33	37	36	38	35	34	J A 32	J A 27	J A 27	J A 19	J A 26	J A 53	J A 41	J A 31
7	J A 28	J A 61	J A 26	J A 37	E B 16	J A 19	J A 22	22	32	J A 33	J A 28	35	36	35	36	33	30	24	20	E B 16	E B 16	E B 16	J A 18	18
8	19	J A 20	J A 29	19	J A 21	18	E B 16	24	30	32	39	37	38	36	38	35	J A 42	J A 33	23	J A 28	J A 17	J A 18	20	18
9	J A 21	J A 20	20	19	19	21	18	24	J A 36	J A 43	J A 37	J A 38	J A 28	G	34	34	32	28	J A 27	J A 29	J A 20	E B 16	20	J A 28
10	J A 28	18	18	E B 16	E B 16	18	J A 16	25	29	36	37	39	41	41	34	38	J A 47	J A 41	J A 42	J A 38	J A 39	J A 27	J A 36	E B 16
11	E B 16	E B 16	E B 16	E B 16	18	J A 32	J A 21	J A 32	J A 52	J A 71	J A 83	J A 85	J A 62	J A 54	J A 50	J A 52	32	32	J A 36	J A 39	J A 46	J A 66	J A 53	J A 38
12	J A 22	J A 22	20	J A 25	J A 28	19	18	23	32	J A 42	J A 48	J A 52	J A 50	G	34	38	J A 38	J A 37	J A 38	J A 110	J A 67	J A 41	J A 49	J A 26
13	19	J A 18	J A 17	J A 21	E B 16	18	J A 17	20	28	J A 32	J A 39	G	J A 37	G	40	40	35	26	J A 16	J A 42	J A 19	J A 40	J A 42	J A 28
14	J A 30	J A 27	J A 15	J A 36	J A 22	J A 20	E B 16	J A 30	31	J A 33	J A 40	33	34	35	34	34	31	G	J A 19	18	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	20	19	18	24	30	J A 44	J A 62	J A 84	J A 74	J A 60	J A 79	J A 52	J A 108	J A 71	J A 53	J A 37	J A 50	J A 31	20	20
16	20	E B 16	E B 16	19	18	E B 16	E B 16	G	30	G	39	38	41	G	45	43	30	J A 33	J A 39	J A 36	J A 28	J A 28	J A 51	J A 16
17	J A 29	J A 30	18	J A 36	19	18	18	21	J A 36	J A 35	J A 47	37	J A 39	J A 44	J A 64	J A 54	J A 43	J A 36	J A 27	J A 20	J A 51	J A 75	J A 37	J A 22
18	J A 22	18	E B 16	E B 16	E B 16	E B 16	19	22	J A 42	J A 34	J A 40	36	J A 45	G	40	J A 52	J A 104	J A 141	J A 50	J A 32	J A 41	J A 26	J A 24	J A 33
19	J A 19	E B 16	E B 16	E B 16	E B 16	18	19	21	30	34	36	38	41	42	J A 58	J A 74	J A 72	J A 52	J A 29	J A 24	J A 22	J A 22	J A 22	J A 21
20	J A 25	E B 16	E B 16	J A 19	E B 16	E B 16	E B 16	20	J A 30	J A 52	J A 36	J A 40	J A 48	G	37	G	G	G	J A 22	20	J A 32	J A 22	18	E B 16
21	E B 16	E B 16	E B 16	E B 18	E B 16	E B 16	18	G	28	31	40	38	37	J A 46	J A 52	J A 38	J A 40	J A 28	J A 35	J A 22	J A 20	19	E B 16	19
22	J A 24	J A 17	20	J A 21	J A J A 31	J A 18	J A 22	J A 42	J A 48	J A 42	36	42	J A 68	49	39	43	38	G	E B 15	J A 19	J A 52	J A 50	J A 85	J A 104
23	J A 18	J A 26	J A 32	J A 42	J A 52	J A 20	J A 27	23	30	34	J A 46	40	35	G	38	41	J A 50	J A 26	J A 25	J A 20	J A 66	J A 49	J A 20	J A 30
24	J A 27	J A 22	J A 19	20	E B 16	E B 16	18	22	28	39	J A 40	J A 50	J A 103	51	42	J A 62	J A 56	J A 82	J A 73	J A 88	J A 52	J A 28	J A 29	J A 26
25	J A 22	J A 26	J A 20	J A 15	J A 20	20	18	23	G	J A 35	J A 46	J A 54	G	37	C	C	J A 43	J A 38	J A 108	J A 25	J A 38	J A 32	J A 29	J A 22
26	J A 30	J A 39	J A 52	J A 26	J A 25	J A 20	J A 16	19	25	31	31	37	36	J A 37	38	J A 49	J A 53	J A 48	J A 43	J A 23	J A 25	J A 25	J A 53	J A 32
27	J A 40	J A 29	J A 19	J A 21	J A 18	E B 16	E B 16	20	30	34	40	43	43	J A 53	J A 44	J A 37	J A 35	J A 28	J A 21	J A 22	J A 39	J A 29	J A 28	J A 22
28	J A 33	J A 37	J A 26	J A 33	J A 27	J A 17	19	21	25	28	34	34	33	36	G	G	G	24	E B 16	J A 16	J A 24	J A 27	J A 24	J A 43
29	J A 20	J A 29	J A 22	J A 23	J A 26	E B 16	E B 16	21	28	32	G	38	38	36	40	J A 38	J A 52	J A 48	J A 62	J A 38	J A 39	J A 17	E B 16	J A 32
30	J A 34	J A 38	J A 22	J A 17	J A 17	J A 14	J A 18	J A 20	J A 26	J A 30	33	36	G	34	38	35	G	21	E B 16	19	J A 20	E B 16	E B 16	J A 21
31	J A 53	J A 52	J A 30	J A 28	J A 18	J A 21	J A 17	22	28	J A 50	J A 44	38	36	J A 39	J A 43	J A 34	J A 35	G	J A 22	J A 28	J A 32	J A 28	J A 28	22
	00	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	30	31	31	31	31	31	31	31	31
MED	J A 21	J A 20	19	19	18	18	18	22	30	J A 34	J A 39	38	38	37	38	38	J A 38	28	J A 27	J A 25	J A 32	28	J A 22	J A 22
U Q	J A 28	J A 29	J A 22	J A 25	J A 21	J A 19	J A 18	24	J A 32	J A 39	J A 44	J A 43	J A 44	J A 46	J A 44	J A 43	J A 52	41	J A 39	J A 37	J A 46	38	J A 37	J A 30
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	32	35	36	35	G	35	34	32	26	22	20	20	E B 18	E B 18	18

OCT.2019 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	23	28	G	G	G	G	36	G 22	G 24	31	25	24	20	E B 16	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	32	34	G 25	G 25	G	G	32	31	24	17	E B 16	E B 16	E B 16	E B 16	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	31	34	36	39	40	39	37	33	32	32	A A 39	18	E B 16	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	32	34	A A 65	40	44	34	39	52	38	32	28	20	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	28	32	33	36	34	35	36	34	30	26	20	20	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	27	31	32	36	35	38	35	32	29	24	24	E B 16	17	A A 53	E B 16	18
7	E B 16	E B 16	E B 16	E B 16	E B 16	A A 19	E B 16	22	29	30	G 24	34	35	34	35	32	29	23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	17	E B 16	E B 16	23	29	31	37	36	36	36	36	34	37	30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	32	32	34	34	G 24	G	34	33	30	27	26	21	E B 16	E B 16	E B 16	E B 16
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	28	33	35	38	40	40	33	35	45	39	40	36	A A 39	A A 27	21	E B 16
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	29	33	38	36	48	40	46	46	43	30	30	35	31	18	A A 66	A A 53	A A 38
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	29	32	35	36	36	G	33	36	34	28	29	A A 110	A A 67	A A 41	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	30	33	G	34	G	39	37	32	26	E B 16	18	18	E B 16	E B 16	E B 16
14	19	18	E B 16	E B 16	E B 16	E B 16	E B 16	28	26	G 25	G 26	33	33	34	33	32	29	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	28	40	35	A A 84	36	45	61	50	61	A A 71	27	29	A A 50	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	29	G	38	37	40	G	44	42	29	31	34	22	E B 16	E B 16	23	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	32	32	43	36	36	37	38	34	31	24	19	E B 16	E B 16	E B A 75	23	20
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	33	31	33	34	G 23	G	38	43	66	64	32	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	31	36	38	40	40	52	67	69	33	26	20	E B 16	E B 16	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	32	32	36	35	G	36	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 18	E B 16	E B 16	E B 16	G	28	31	39	37	37	39	38	G 21	29	27	28	20	E B 16	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	19	A A 18	A A 22	37	35	36	34	40	62	45	38	38	36	G	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16
23	E B 16	E B 16	E B 16	18	E B 16	E B 16	E B 16	23	29	32	40	37	34	G	37	39	32	23	23	E B 16	E B 16	E B 16	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	37	34	44	62	41	37	54	42	A A 82	A A 73	A A 88	A A 52	26	22	E B 16
25	E B 16	20	E B 16	E B 16	E B 16	E B 16	E B 16	20	G 32	34	34	G 37	C	C	29	22	18	E B 16	20	24	E B 16	E B 16		
26	20	21	28	E B 16	17	E B 16	E B 16	19	24	29	31	37	35	33	33	32	35	25	20	E B 16	E B 16	E B 16	21	20
27	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	28	32	39	40	41	44	42	34	32	25	18	19	21	25	18	E B 16
28	21	24	18	A A 33	A A 27	E B 16	E B 16	20	24	28	34	G 25	32	35	G	G	G	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	31	G	37	37	36	38	33	28	34	26	E B 16	E B 16	E B 16	E B 16	E B 16
30	18	24	E B 16	E B 16	E B 16	E B 16	E B 16	20	25	28	33	35	G	33	37	33	G	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	35	35	36	35	34	32	33	25	G	E B 16	E B 16	20	23	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	30	30	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	32	34	36	35	36	36	34	31	26	23	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	16	16	E B 16	E B 16	16	E B 16	E B 16	23	29	32	36	38	40	40	38	39	36	32	29	22	20	A A 24	16	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	30	33	34	G 33	G	33	32	29	23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

OCT.2019 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

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

OCT.2019 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	327	306	340	336	336	373	344	361	366	348	338	302	323	336	318	299	334	388	355	392	350	320	302	324
2	315	317	327	339	375	406	353	386	370	368	358	331	335	323	328	288	313	331	377	394	356	309	315	316
3	302	320	354	372	350	328	344	388	384	391	353	368	H 280	323	349	H 317	367	378	397	A	327	322	327	324
4	318	317	342	371	405	343	346	394	383	382	383	A	317	317	346	366	345	364	383	386	362	305	330	310
5	308	F 323	317	328	322	330	343	383	379	377	362	323	290	323	357	367	374	407	401	355	325	298	F 316	317
6	F 338	332	334	388	353	317	354	386	398	372	338	346	326	351	330	346	352	382	406	373	338	A	322	316
7	315	F 316	367	346	368	A	347	394	373	366	361	349	322	356	350	362	356	361	390	386	346	309	300	333
8	323	320	325	343	382	400	327	395	352	360	392	370	323	338	355	373	347	358	360	379	367	312	333	306
9	334	345	361	418	327	337	329	384	375	352	351	344	308	327	301	332	373	385	390	330	338	J R 304	310	325
10	F 310	352	359	347	339	356	385	408	371	365	363	348	332	281	306	331	366	353	377	404	A	A	323	277
11	320	332	F 318	F 353	F 318	368	329	388	381	386	336	345	338	300	333	356	376	382	399	362	315	A	A	A
12	320	335	315	353	423	B	343	376	378	358	346	J R 314	J R 326	342	330	326	343	382	389	A	A	A	310	324
13	328	340	351	366	370	342	360	379	388	386	379	346	341	309	344	345	375	387	372	R 396	391	358	333	330
14	335	F 341	F 333	307	F 334	F 339	F 341	396	375	393	367	354	358	J R 279	J R 261	J R 316	379	395	403	348	364	320	332	328
15	324	321	319	324	362	345	348	391	365	365	376	A	345	298	329	345	387	A	394	373	A	300	F 312	F 312
16	311	318	321	331	385	374	359	405	400	362	349	349	343	294	323	358	391	379	401	369	315	305	341	340
17	333	F 306	354	405	424	299	333	389	370	359	355	363	342	310	342	352	374	399	371	389	302	A	320	F 336
18	F 311	F 335	F 339	374	391	B	324	398	376	364	336	362	299	322	336	345	366	393	408	388	370	296	F 310	F 350
19	320	321	330	362	R 423	B	330	408	399	365	349	363	345	317	339	322	365	375	390	380	345	326	336	343
20	F 329	361	330	318	384	327	327	384	374	379	344	350	361	323	350	373	373	361	382	324	339	338	332	313
21	314	324	325	334	353	404	425	397	380	378	345	359	382	304	336	384	365	386	373	329	341	364	370	328
22	363	316	321	361	424	A	A	385	388	393	356	358	378	332	324	359	388	393	393	343	320	319	331	304
23	318	F 339	F 322	376	F 384	409	320	407	362	339	363	349	349	326	309	356	386	402	381	403	318	321	330	355
24	347	363	390	319	357	334	338	398	405	398	351	347	392	281	350	372	392	A	A	A	A	324	320	325
25	331	373	367	316	319	346	307	371	382	390	383	312	305	330	C	C	384	366	370	336	327	334	341	319
26	325	314	314	321	344	328	337	379	359	347	334	354	366	300	328	350	359	358	377	371	295	331	291	305
27	F 342	378	359	327	370	303	302	350	374	328	343	370	364	315	367	373	382	394	385	338	301	364	316	310
28	312	321	383	A	A	327	313	388	388	364	342	356	355	336	J R 310	315	361	396	378	379	305	313	337	309
29	297	339	364	331	384	314	311	368	380	375	352	345	366	325	357	357	386	384	370	369	347	F 300	F 306	F 298
30	F 299	355	318	374	405	363	354	384	373	355	328	335	355	336	352	388	378	398	352	368	315	298	307	319
31	303	310	328	372	387	314	342	398	373	348	351	356	349	311	339	373	366	367	379	346	334	359	308	314
	00	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	30	26	30	31	31	31	31	29	31	31	30	30	31	29	30	28	27	26	30	30
MED	320	324	333	346	370	340	342	388	376	365	351	349	342	323	336	354	373	382	382	372	338	320	321	319
U Q	331	341	359	372	387	368	348	397	384	382	363	358	358	332	350	367	382	394	394	387	350	331	332	328
L Q	311	317	321	328	344	327	327	383	371	358	343	344	323	304	324	331	359	365	373	347	315	305	310	310

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L 426	U L 383	398	410	383	402	L 382	L 356							
2										L 388	L 386	412	415	384	410	391	L	L						
3										L	L 375	394	U L 370	A	A	A 383	379	A						
4										L 394	390	A	425	A	425	A	A	A						
5										L 395	402	424	445	444	350	384	L 384							
6										L	414	394	401	383	385	384	377							
7										L 398	410	402	L 426	410	373	380	L 377	L						
8										L 374	386	413	418	406	380	L	A							
9										L	L 397	406	408	L 411	410	L 367	397							
10										U L 406	386	398	A 394	A 381	411	372	A							
11										A 406	U L 387	A	400	A	A	A	380							
12										L 391	405	412	397	403	389	376								
13										L	L	L 403	408	421	L 424	A 370	A 371	L						
14											L 416	452	425	407	382	354								
15										A	392	A	U L 422	A 368	A	A	A	A	A					
16										U L 410	L 391	401	A	417	A	A	L	A						
17										L	L	A	396	414	L 402	A 394	393	L	A					
18											L 408	L 412	393	398	369	A	A							
19											L 388	A	A	A 353	A	A	A							
20										L	L	394	376	422	L 390	L 381	388	L	L					
21								446			L	L	384	L 397	388	L 364	L 372	L						
22							A				A	A 413	403		A	372	A	A						
23												A 413	404	396	416	A	L							
24											L 406	A	A	A	A	A	A	A	A					
25										L	L 409	L	U L 400	416	412	C	C							
26											L	L	373	L 381	L 385	403	L 381		A					
27											L	L	A	A	L	A	L 412							
28											L	U L 377	383	401	L 378	395	L 394	L						
29										L	L 411	U L 408	L 377	L 386	L 393	L 366		L						
30										U L 376	L 390	390	414	423	367	L		L						
31											L	L 385	L 383	414	398	378	L 376	L	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1		13	25	25	26	25	23	18	7							
MED								446		L 398	L 392	400	412	398	382	382	379							
U Q										L 410	407	412	421	410	403	388	384							
L Q										L 390	L 386	387	L 397	384	370	372	377							

OCT.2019 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT.2019 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									232	260	264	284	252	236	264	282	254							
2									232	242	242	276	252	242	242	272	252	226						
3									222	218	268	240	336	272	240	258	242	220						
4									232	240	234	A	334	304	256	230	258	224						
5										232	248	306	306	296	250	226	226							
6									208		290	256	274	246	258	254	242							
7										248	252	252	286	246	242	244	256	232						
8										258	224	244	304	264	244	234	236							
9									232	248	248	252	272	264	254	246	224							
10										242	248	248	280	294	310	262	232							
11										224	276	262	262	306	264	242	230							
12									222	246	244	268	252	240	248	244								
13									224	222	226	256	252	284	254	248	220							
14										218	256	248	236	254	302	266								
15										246	230	A	260	312	272	248	228	A						
16										242	272	254	246	340	274	240	216	216						
17									230	244	248	228	252	306	254	242	224	198						
18										240	278	236	318	290	242	250	240							
19										248	258	244	250	292	256	E 302	A 252							
20									236	222	276	236	242	296	256	222	230	228						
21								192		232	278	242	222	352	278	218	218							
22							A			218	266	248		278	258	238	216							
23											246	264	256	290	286	246	214							
24											276	268	A 248	384	258	234	220	A	A					
25									224	208	226	300	280	282	C	C								
26										252	272	254	224	260	258	234		210						
27										270	248	232	222	288	236	212								
28										222	272	238	244	244	220	236	220							
29									224	224	258	242	236	248	244		216							
30										262	274	250	242	260	236		220							
31										250	252	240	222	324	264	228	224	224						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	12	28	31	29	30	31	30	28	26	9						
MED								192	227	242	256	250	252	284	256	242	227	224						
U Q									232	248	272	263	280	304	264	252	242	227						
L Q									223	223	246	241	242	254	244	234	220	213						

OCT.2019 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	252	264	226	234	226	202	216	220	208	188	188	178	172	214	164	218	A 230	206	200	194	178	246	272	270
2	262	262	244	238	206	200	214	206	196	200	204	176	176	170	180	198	210	220	200	184	186	260	268	284
3	288	262	224	200	E B 266	E B 366	236	206	206	194	194	198	212	E A 230	A	E A 234	E A 226	A	200	A	238	270	250	264
4	278	284	246	212	190	E B 294	250	214	208	202	214	A	198	A	178	A	A	A	206	206	E A 220	270	254	282
5	Q 282	242	252	240	232	218	246	206	204	204	190	180	166	156	248	218	206	202	186	204	258	296	Q 294	Q 258
6	240	220	238	186	212	294	218	194	186	192	180	206	174	230	202	206	200	214	184	188	228	A	290	268
7	280	264	220	244	192	A	238	198	204	182	172	182	168	168	232	210	202	206	192	174	208	278	282	272
8	258	254	258	234	206	190	246	194	192	208	216	180	172	166	226	216	A	218	206	194	194	258	238	274
9	244	226	218	178	E B 336	298	244	212	212	194	194	190	178	H 158	H 164	222	202	214	200	236	210	280	248	250
10	256	212	200	220	230	224	190	190	186	188	212	208	E A 226	E A 238	192	236	A	234	204	196	A	A	E A 294	336
11	276	256	Q 250	234	Q 250	218	250	212	208	A	202	A	E A 220	A	A	A	210	220	196	228	E A 244	A	A	A
12	290	252	280	208	174	B	E B 266	212	202	206	188	188	180	182	182	A 236	228	210	200	A	A	A	266	232
13	248	242	210	196	196	246	220	202	206	192	204	182	190	182	A	A	216	216	198	186	190	224	242	248
14	276	238	234	288	218	248	216	200	202	202	178	168	H 164	196	200	220	214	200	184	192	204	256	246	246
15	262	260	262	264	220	226	222	200	204	A	192	A	166	E A 270	A	A	A	A	E A 198	250	A	298	256	286
16	280	256	264	254	200	214	208	190	204	178	224	202	A	176	A	A	210	A	188	190	210	296	E A 306	244
17	264	252	218	186	166	410	274	212	212	204	A	194	186	190	E A 232	202	214	A	196	182	260	A	A 322	A 262
18	272	A 250	214	196	196	B	E B 310	198	216	194	180	172	206	168	240	A	A	218	188	178	220	290	274	244
19	274	270	254	214	182	B	E B 264	186	198	192	218	A	A	E A 268	A	A	A	216	194	190	214	270	242	238
20	Q 256	210	232	258	192	E B 350	E B 270	202	202	202	184	204	178	170	228	210	198	196	198	176	260	232	228	256
21	280	266	256	254	222	182	188	180	194	188	A	220	216	216	258	212	204	208	192	E A 210	218	214	202	240
22	218	274	228	228	186	A	A	E A 220	214	A	192	E A 228	208	A	248	A	A	196	188	208	264	262	230	258
23	284	258	Q 266	208	204	214	E B 346	194	208	222	A	198	186	186	200	A	A	198	190	188	294	298	258	242
24	236	220	198	286	220	266	268	200	202	214	190	A	A	E A 334	E A 236	A	A	A	A	A	A	E A 328	E A 310	258
25	264	218	218	296	266	236	284	220	206	194	222	190	174	214	C	C	210	206	202	200	238	E A 242	208	248
26	264	250	E A 304	250	234	246	238	208	208	194	H 178	238	222	212	190	208	228	A	190	192	224	232	268	282
27	240	206	210	244	204	278	272	224	210	208	228	A	A	E A 266	A	208	214	198	194	226	E A 298	E A 234	260	294
28	282	E A 268	204	A	A	288	288	206	208	184	212	206	200	204	204	198	198	194	188	186	290	282	234	274
29	294	230	216	230	194	E B 342	292	218	204	188	200	224	224	216	238	220	206	214	216	198	196	Q 250	Q 268	Q 268
30	290	E A 260	256	212	190	218	E B 272	198	202	176	208	202	182	182	230	206	202	192	188	200	220	262	248	236
31	284	282	230	192	192	308	214	188	212	230	210	200	186	174	174	220	202	194	196	184	218	E A 242	252	250
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	30	30	26	30	31	31	28	28	25	27	28	23	20	22	24	30	28	27	26	30	30
MED	272	253	231	232	204	U 234	U 234	202	204	194	197	196	183	184	202	212	209	207	196	192	219	262	254	258
U Q	282	264	256	250	226	294	272	212	208	204	212	206	208	E A 223	236	220	214	216	200	205	258	282	274	274
L Q	256	230	218	208	192	218	218	194	202	188	188	181	174	172	182	207	202	198	188	186	208	242	242	246

OCT.2019 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	114	98	102	104	100	100	98	104	104	A	A	A					
2							B	110	108	A	A	108	104	104	100	100	A	A	A					
3							B	114	A	104	104	104	A	104	104	104	A	104	A					
4							B	104	104	104	104	104	104	104	A	104	104	106	A					
5							B	116	106	A	A	A	A	A	A	102	104	A	A					
6							B	A	104	104	104	104	104	104	104	106	A	A	A					
7							B	A	110	A	108	106	106	110	106	106	102	A	B					
8							B	A	102	102	102	106	106	106	102	102	102	100	B					
9							B	A	104	A	A	A	104	104	104	104	104	A	A					
10							B	116	112	112	110	110	108	108	104	104	104	A	A					
11							B	114	104	104	104	104	104	104	102	100	100	104	A					
12							B	110	104	104	100	A	A	100	100	106	106	112	A					
13							B	104	104	A	A	102	A	102	102	102	102	110	B					
14							B	A	102	102	106	A	102	102	102	A	A	102	B					
15							B	A	102	A	A	A	A	A	A	A	A	A	A					
16							B	122	106	104	104	102	102	102	102	102	102	A	A					
17							B	110	106	106	A	104	A	A	A	A	A	A	A					
18							B	A	108	104	A	A	108	106	110	106	108	A	A					
19							B	A	108	104	104	A	A	108	A	108	108	A	A					
20							B	A	A	A	A	A	108	106	108	100	100	108	B					
21							B	E 140	B 102	102	100	100	114	A	A	110	110	A	A					
22							A	A	106	106	104	104	104	108	108	108	114	102	B					
23							B	126	104	104	104	106	106	104	104	106	106	A	A					
24							B	122	110	102	A	104	102	104	110	106	102	A	A					
25							B	A	102	A	102	104	102	102	C	C	A	A	A					
26							B	A	104	104	104	104	102	102	102	A	A	A	A					
27							B	A	102	104	104	104	104	104	104	102	A	A	A					
28							B	A	110	A	108	108	A	108	100	102	104	A	B					
29							B	A	104	104	104	104	102	102	102	102	A	A	A					
30							B	A	A	A	A	102	102	102	102	102	106	106	B					
31							B	A	102	102	A	102	A	A	A	A	A	104	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								14	28	21	20	23	22	26	23	25	19	11						
MED								114	104	104	104	104	104	104	104	104	104	104						
U Q								122	107	104	104	106	106	106	104	106	106	108						
L Q								110	102	102	104	102	102	102	102	102	102	102						

OCT. 2019 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	86	B	B	B	142	146	G	G	G	G	170	86	84	84	122	78	78	78	B	B	92
2	B	98	102	B	90	B	B	124	114	106	98	98	96	G	G	100	102	102	86	82	82	B	B	88
3	82	82	B	B	B	B	B	G	142	128	128	134	146	122	130	122	114	104	98	96	96	94	94	94
4	B	92	92	B	B	B	B	G	114	112	134	104	116	108	84	124	112	102	98	94	94	94	94	B
5	B	B	B	B	B	B	144	128	102	98	94	92	86	90	90	126	118	108	100	98	110	100	96	92
6	B	96	96	92	92	92	92	118	124	108	108	168	108	162	106	104	102	96	92	94	88	88	84	90
7	94	94	96	88	B	92	94	150	112	112	92	122	122	136	152	106	102	124	98	B	B	B	108	98
8	94	94	94	94	88	94	B	108	116	142	120	122	116	120	142	132	112	100	104	96	96	94	100	100
9	96	96	94	94	94	94	98	116	106	114	122	94	90	G	116	142	104	122	102	102	98	B	96	96
10	96	96	90	B	B	90	92	122	116	108	112	110	110	106	118	104	100	94	94	94	94	92	94	B
11	B	B	B	B	100	96	106	102	102	102	106	104	108	104	104	100	116	124	106	96	96	96	96	90
12	92	92	92	100	100	132	114	112	108	102	102	94	90	G	118	142	120	112	92	96	96	96	100	92
13	90	92	90	90	B	90	90	154	168	98	98	G	94	G	146	136	128	128	122	104	98	102	104	96
14	90	84	86	92	94	98	B	108	104	92	92	90	122	112	104	98	96	G	90	86	B	B	B	B
15	B	B	B	B	94	92	92	124	126	108	102	90	102	90	88	112	86	86	88	98	114	88	84	84
16	80	B	B	90	90	B	B	G	142	G	162	160	152	G	128	112	120	94	92	92	92	92	92	92
17	92	90	94	92	86	88	88	122	106	106	98	104	108	100	106	106	100	100	82	82	92	92	92	90
18	94	84	B	B	B	B	128	114	104	98	98	106	88	G	122	112	102	98	98	94	94	92	92	92
19	92	B	B	B	B	86	94	136	118	110	168	166	176	148	116	108	102	102	98	98	96	100	94	90
20	94	B	B	94	B	B	B	166	94	90	90	90	90	G	134	G	G	G	96	84	124	92	82	B
21	B	B	B	B	B	B	92	G	178	168	144	138	168	114	98	94	100	90	90	90	94	90	B	92
22	96	98	94	94	92	92	126	122	122	118	118	110	104	154	166	118	114	G	B	108	100	100	102	116
23	86	104	96	92	92	100	92	170	136	128	112	106	124	G	146	114	106	100	94	102	100	100	92	90
24	90	88	88	88	B	B	140	136	148	116	112	110	100	146	128	104	100	96	96	96	96	92	92	90
25	90	88	86	86	88	88	94	128	G	94	112	108	G	162	C	C	96	96	96	92	92	90	88	92
26	86	86	86	86	90	90	90	142	142	142	132	164	156	112	110	92	86	84	84	84	82	98	92	92
27	90	90	90	90	90	B	B	124	126	122	112	108	104	100	102	100	98	96	96	94	94	90	90	88
28	90	90	90	88	86	90	92	144	118	132	154	156	102	162	G	G	G	100	B	98	94	92	96	90
29	90	90	88	88	84	B	B	130	114	110	G	148	146	164	128	106	98	96	94	94	94	94	B	98
30	94	94	94	94	96	90	90	148	104	104	152	130	G	162	144	132	G	152	B	100	100	B	B	86
31	92	92	88	88	88	88	96	130	120	102	102	102	104	102	106	96	98	G	94	102	88	90	92	92
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	23	21	21	19	19	21	27	30	29	29	29	28	23	28	28	28	27	28	30	29	25	25	27
MED	92	92	92	90	90	92	94	128	117	108	112	108	108	120	117	107	102	100	95	95	94	92	94	92
U Q	94	96	94	94	94	94	110	142	136	120	130	136	123	162	132	123	113	112	98	98	98	97	96	94
L Q	90	88	88	88	88	90	92	118	106	102	98	100	98	104	104	100	98	96	91	92	92	91	92	90

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				F 1				H 2	H 1					H 1	L 1	LH 21	L 3	CL 12	L 2	F 1	F 1			F 1
2		F 1	F 1		F 1			C 1	C 1	C 1	L 2	L 1	L 1			C 1	C 1	CH 11	L 1	F 1	F 1			F 1
3	F 1	F 1							HL 24	HL 11	C 1	HL 13	HCL 11	CL 11	HL 11	CL 11	CL 12	CL 41	L 4	F 8	F 3	F 4	F 4	F 1
4		F 2	F 1						C 3	C 1	H 1	C 5	CL 21	CL 21	L 2	CL 22	CL 71	CL 52	L 3	F 4	F 4	F 3	F 2	
5							H 1	C 3	CQ 11	LQ 21	LQ 21	L 2	L 2	L 1	LH 11	C 1	C 1	CL 13	CL 11	F 4	FF 12	F 2	F 2	F 2
6		F 1	F 1	F 1	F 1	F 2	L 3	C 1	C 1	C 1	C 1	HC 11	C 1	HC 11	C 1	C 1	C 1	L 2	L 3	F 3	F 5	F 4	F 4	FQ 41
7	F 2	F 2	F 1	F 1		F 1	L 3	HL 11	CL 11	C 1	L 1	C 1	C 1	H 1	HC 11	C 1	C 1	CL 11	L 1				F 1	F 1
8	F 1	F 2	F 2	F 1	F 2	F 1		C 2	C 2	HC 11	C 1	C 1	C 1	C 1	H 1	H 1	C 2	C 2	C 1	F 3	F 1	F 1	F 1	F 1
9	F 2	F 1	F 2	F 1	F 2	F 2	L 1	C 1	C 2	C 1	CL 11	L 1	L 1		C 1	HC 11	C 2	CL 11	C 3	F 4	F 3		F 1	F 2
10	F 2	F 1	F 1			F 1	L 1	C 3	C 1	C 2	C 2	C 1	C 1	C 2	C 1	C 3	C 4	L 5	L 9	F 7	F 9	F 9	F 8	
11					F 2	F 1	C 2	C 3	C 3	C 2	C 2	C 3	C 2	C 2	C 3	C 4	C 1	C 4	C 8	F 6	F 4	F 5	F 5	F 5
12	F 5	F 2	F 1	F 2	F 3	F 1	C 1	C 2	C 2	C 1	C 2	L 1	L 1		C 1	HC 11	C 2	C 2	L 6	F 9	F 6	FQ 41	F 2	F 2
13	F 1	F 2	F 2	F 1		F 1	L 1	H 1	H 1	L 1	L 2		L 1		H 1	H 1	C 2	C 1	CL 11	FF 33	FF 21	F 2	F 1	F 3
14	F 2	F 2	F 1	F 2	F 3	F 1		C 2	C 1	L 2	L 1	L 1	C 1	C 1	C 1	L 1	L 1		L 1	F 1				
15					F 1	F 2	LC 21	C 2	C 1	CL 32	C 2	L 3	CL 12	L 3	L 5	CL 23	L 5	L 9	LQ 41	FF 15	FF 34	F 3	F 1	F 1
16	F 2			F 1	F 1				H 1		H 1	H 1	H 1		C 2	C 3	C 1	L 5	L 8	FF 72	F 4	F 3	F 6	F 1
17	F 3	F 2	F 1	F 3	F 1	F 1	L 1	C 1	C 3	C 1	L 2	C 1	C 1	C 1	CQ 21	C 2	C 2	CL 12	L 2	FF 12	F 3	F 6	F 6	F 2
18	F 1	F 1					C 1	C 2	C 2	C 1	C 1	CL 11	LH 11		C 1	C 3	C 3	C 6	L 9	FQ 21	FQ 21	F 2	F 2	F 2
19	F 1					F 1	L 1	H 1	CL 11	C 1	HC 11	HL 11	HL 11	H 1	C 3	C 7	C 7	C 3	L 6	F 2	F 2	F 1	F 2	F 2
20	F 2			F 1				HC 11	LH 31	LC 21	L 2	LH 21	LC 11		H 1				L 1	F 1	FF 11	F 2	F 1	
21							L 1		H 1	H 1	H 1	H 1	H 1	CH 11	LH 11	LC 11	LC 11	LC 31	L 6	F 2	F 1	F 1		F 1
22	F 3	F 1	F 1	F 3	F 4	F 2	CL 72	CL 52	CL 52	C 3	C 1	C 1	C 3	H 2	H 1	C 2	C 2			FF 21	F 2	F 2	FF 53	FF 11
23	F 1	F 1	F 2	F 4	F 3	F 1	LH 32	H 1	H 1	C 1	CL 22	C 1	C 1		HC 11	C 3	C 3	C 2	L 2	F 2	F 2	F 3	F 2	F 3
24	F 2	F 2	F 2	F 1			H 1	H 2	HL 11	C 2	CQ 11	C 2	C 5	HC 21	C 1	C 5	C 3	L 9	L 9	F 9	F 8	F 5	F 4	F 8
25	F 3	F 3	F 2	F 1	F 2	F 2	L 1	CL 11		L 2	CH 11	CL 11		HC 11			L 4	L 2	L 3	F 3	F 4	F 5	F 3	F 1
26	F 5	F 4	F 4	F 3	F 3	F 2	L 2	HC 11	HL 11	HL 11	H 1	HC 11	H 1	C 1	C 1	L 2	L 3	L 3	L 5	F 2	F 2	FF 21	F 2	FQ 21
27	FQ 21	FQ 11	F 1	F 1	F 1			C 2	C 1	C 1	C 2	C 1	C 2	C 3	C 2	C 1	L 2	L 2	L 3	F 2	F 4	F 6	F 3	F 4
28	F 2	F 5	F 4	F 5	F 6	F 1	L 1	H 1	C 1	HL 11	HL 11	HL 11	C 1	HC 11				C 1		F 1	F 2	F 3	F 1	F 3
29	F 2	F 3	F 2	F 2	F 3			H 1	C 1	C 1		H 1	H 1	H 1	C 1	C 2	L 2	L 4	LQ 31	FQ 31	F 2	F 1		FQ 11
30	FQ 21	FQ 31	F 1	F 1	FF 11	F 1	L 2	HL 11	C 1	C 1	HL 11	H 1		H 1	H 1	H 1		H 1		F 1	F 2			F 3
31	F 2	F 3	F 1	F 1	F 1	F 4	L 1	H 2	C 1	C 1	CQ 11	C 1	C 1	C 1	C 1	L 1	L 1		L 3	F 2	F 3	F 6	F 2	F 1
	00	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																								

OCT. 2019 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

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

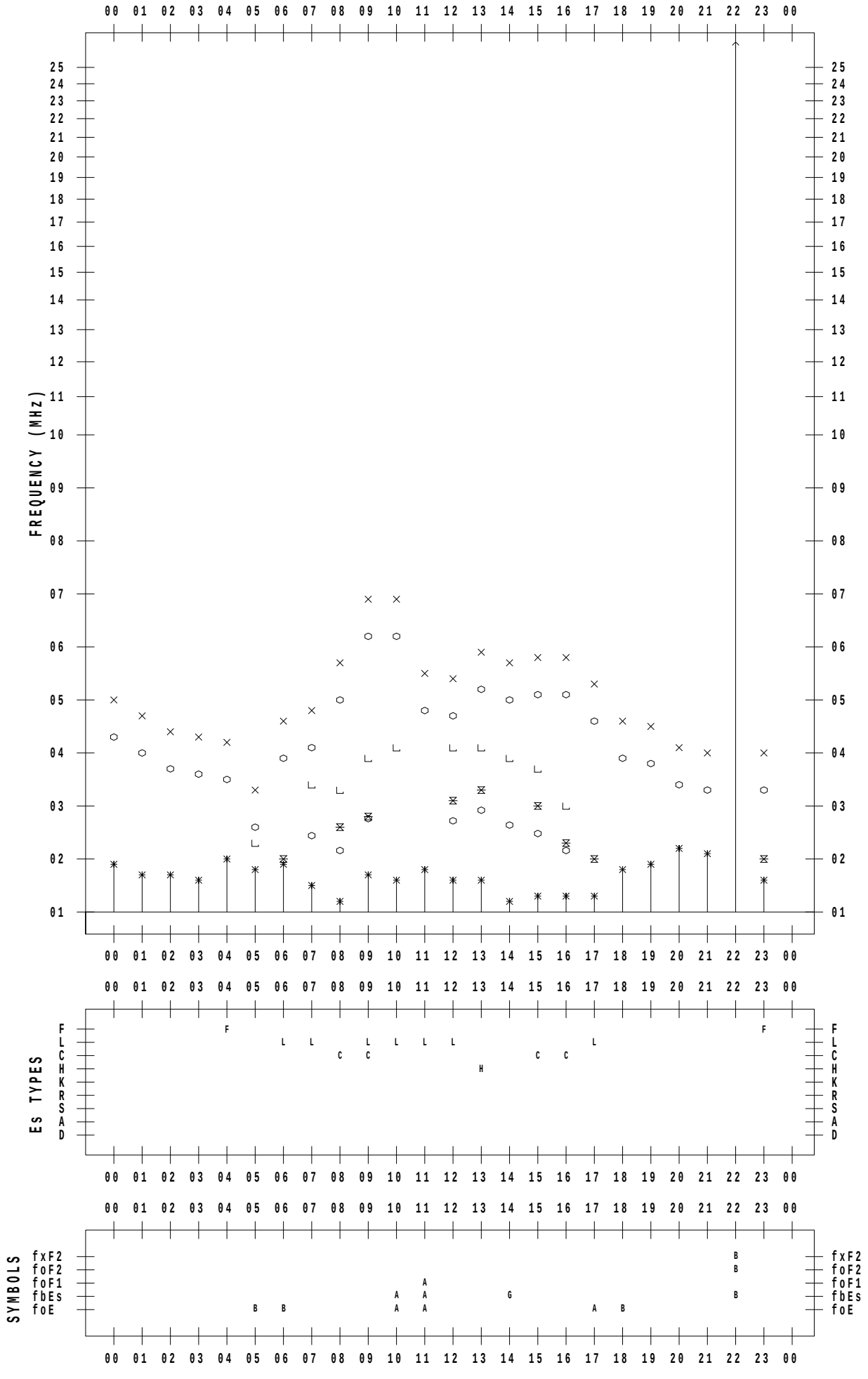
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 1

135 °E MEAN TIME



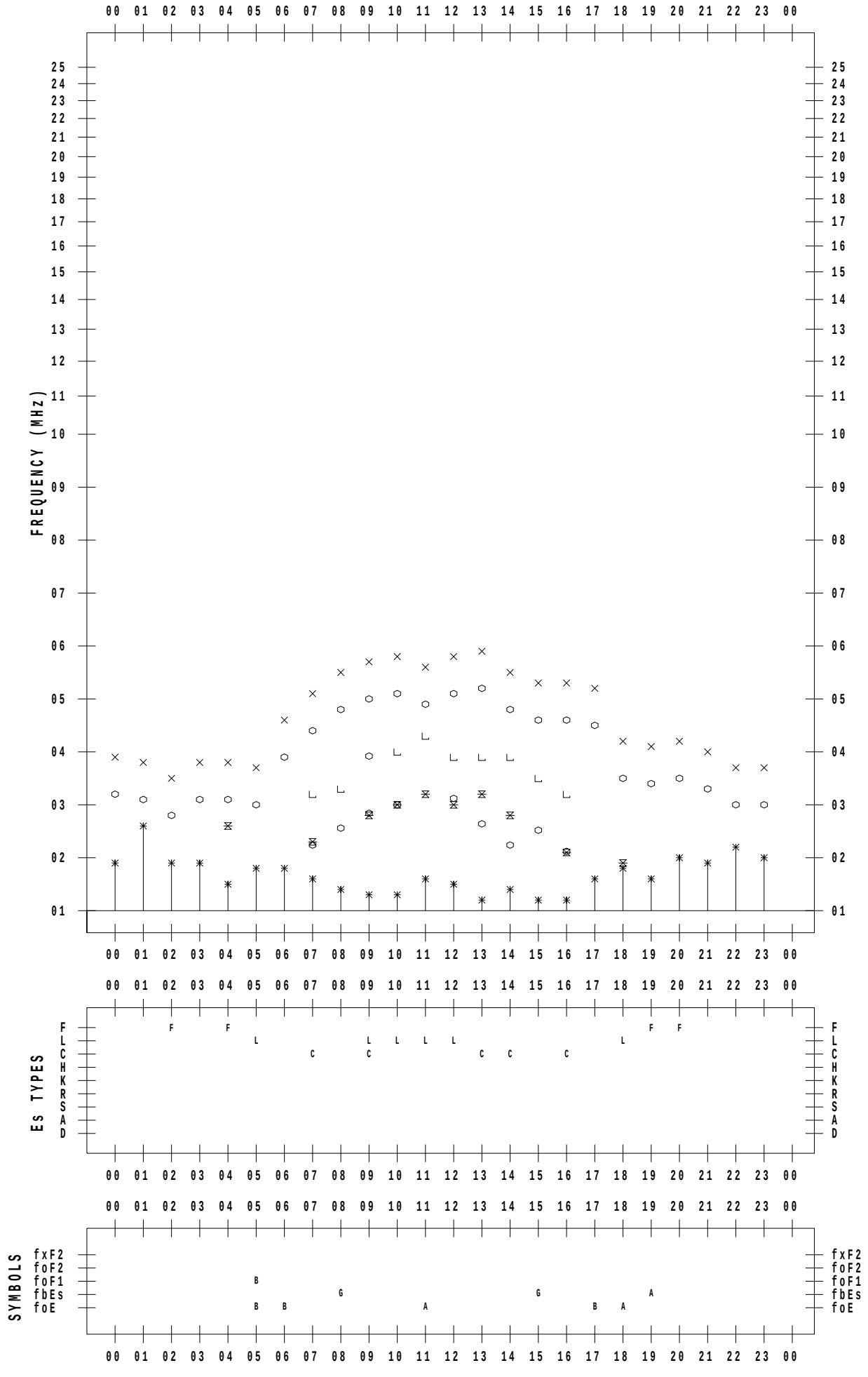
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 2

135 °E MEAN TIME



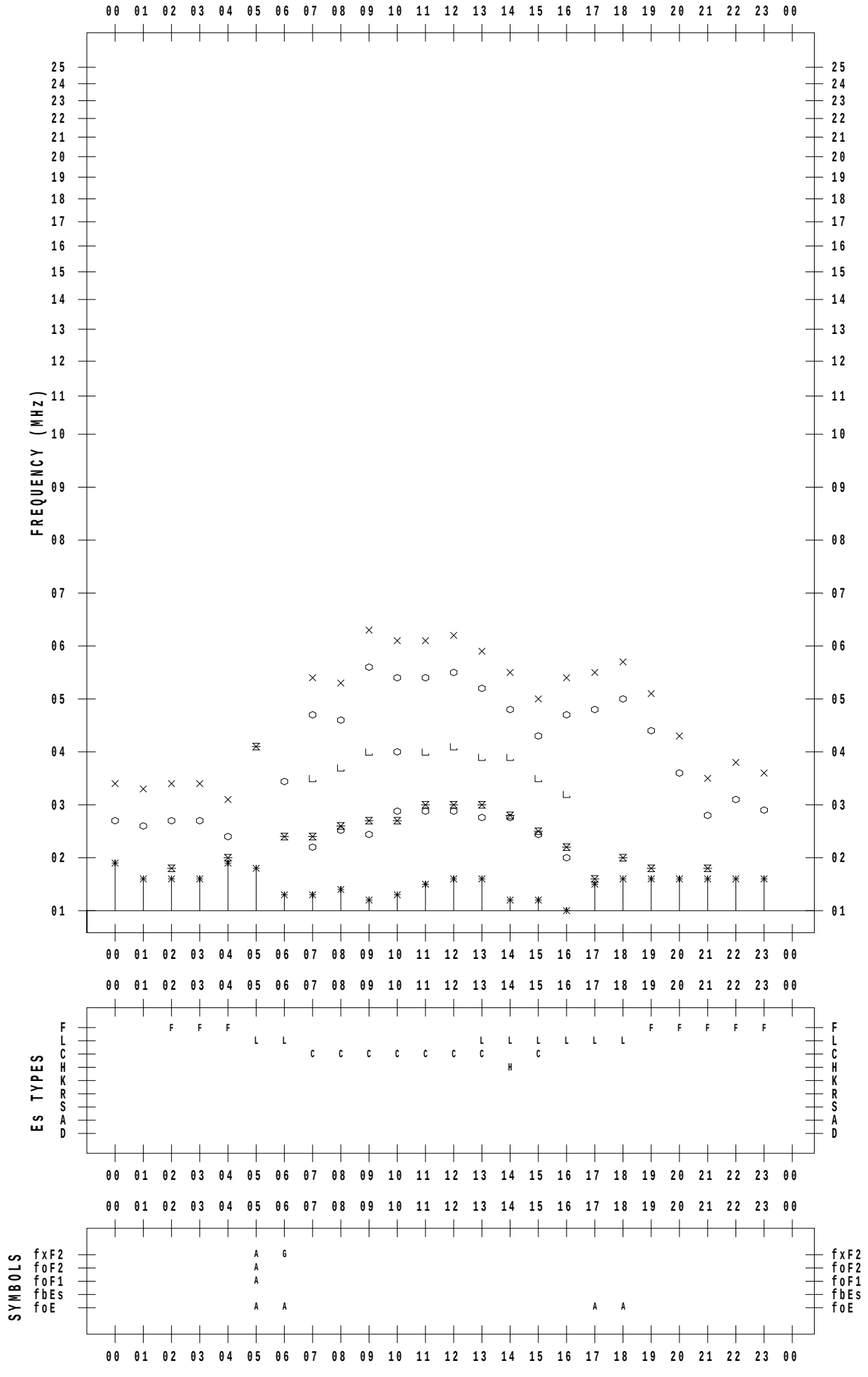
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 3

135 °E MEAN TIME



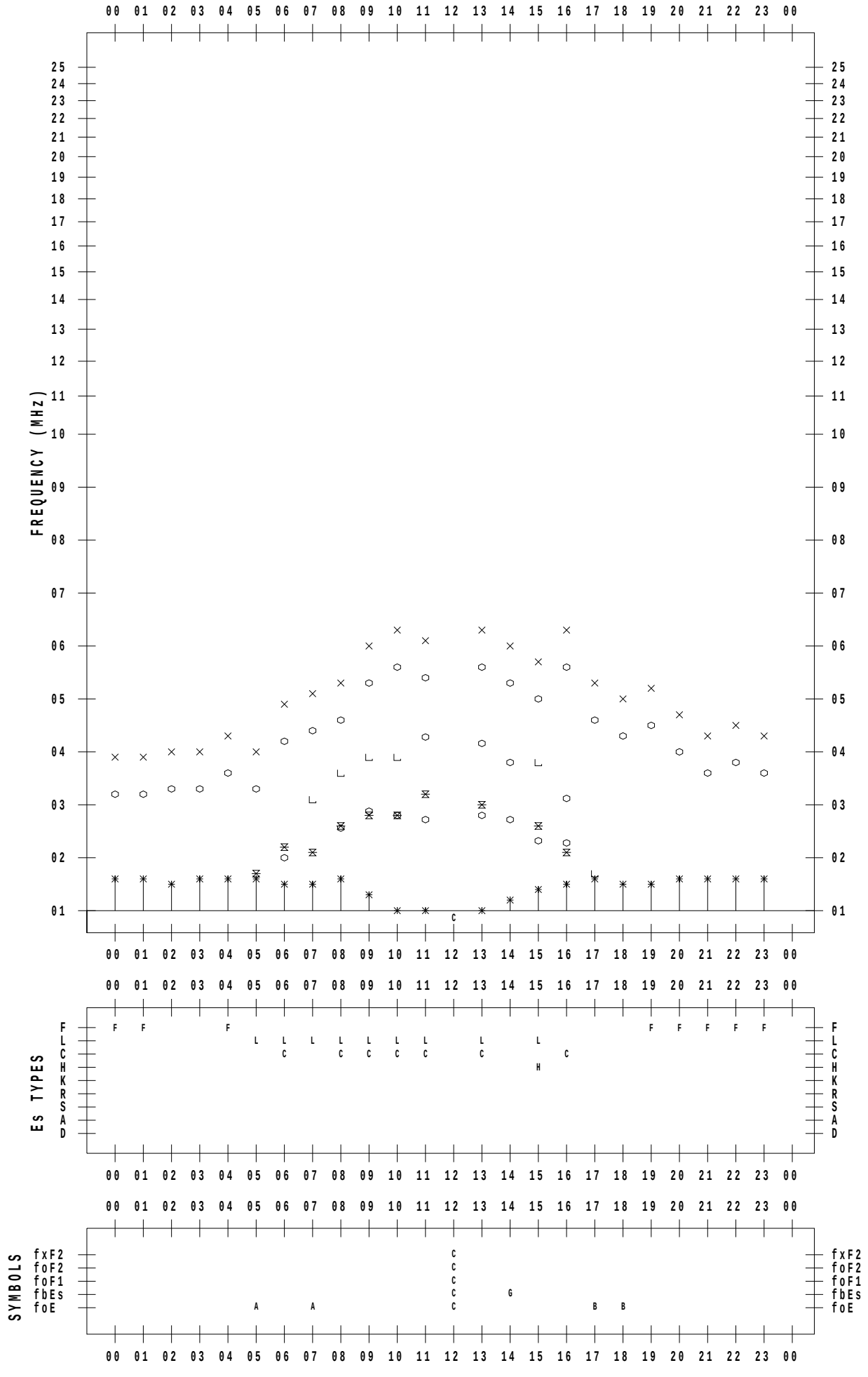
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 4

135 °E MEAN TIME



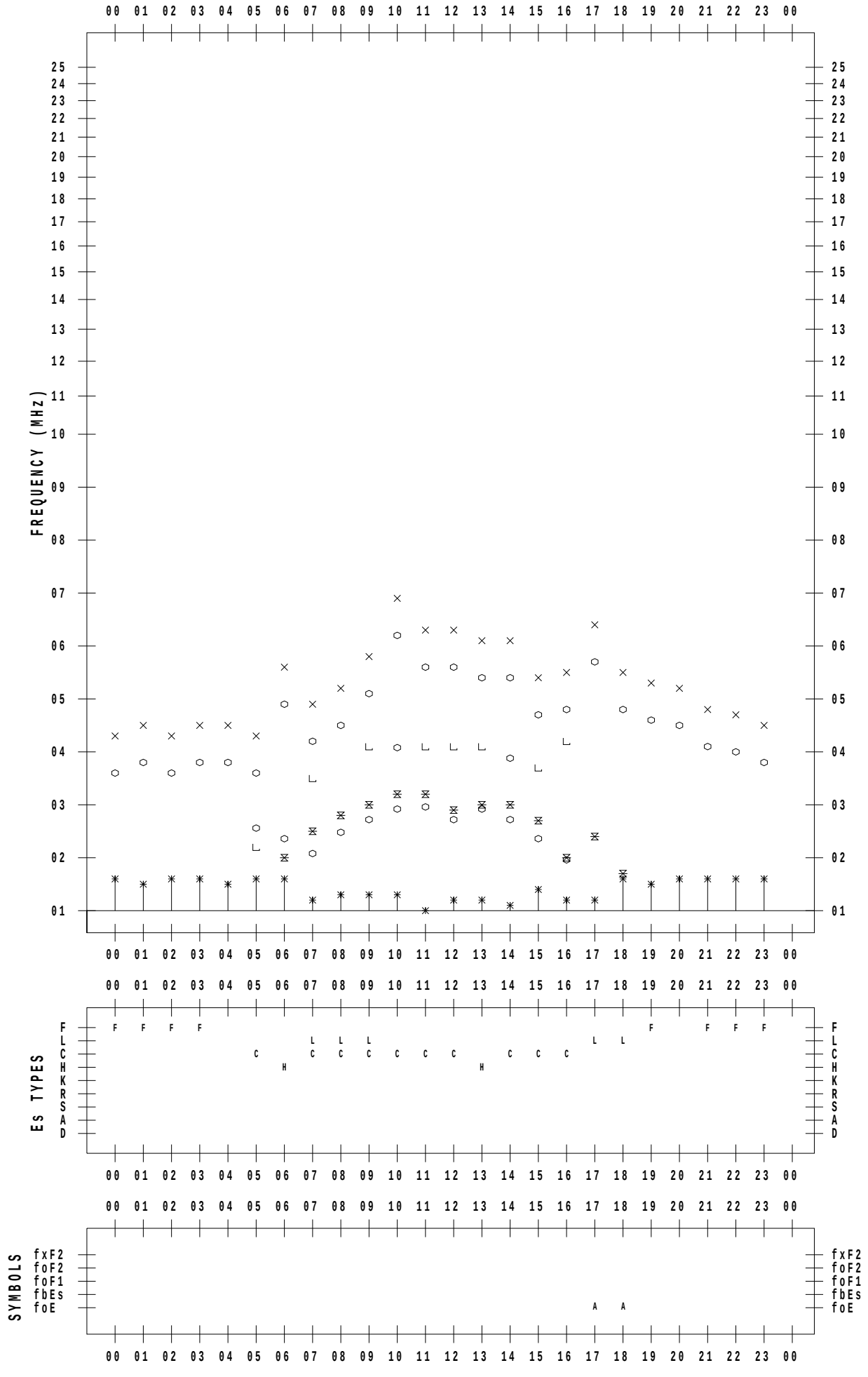
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 5

135 °E MEAN TIME



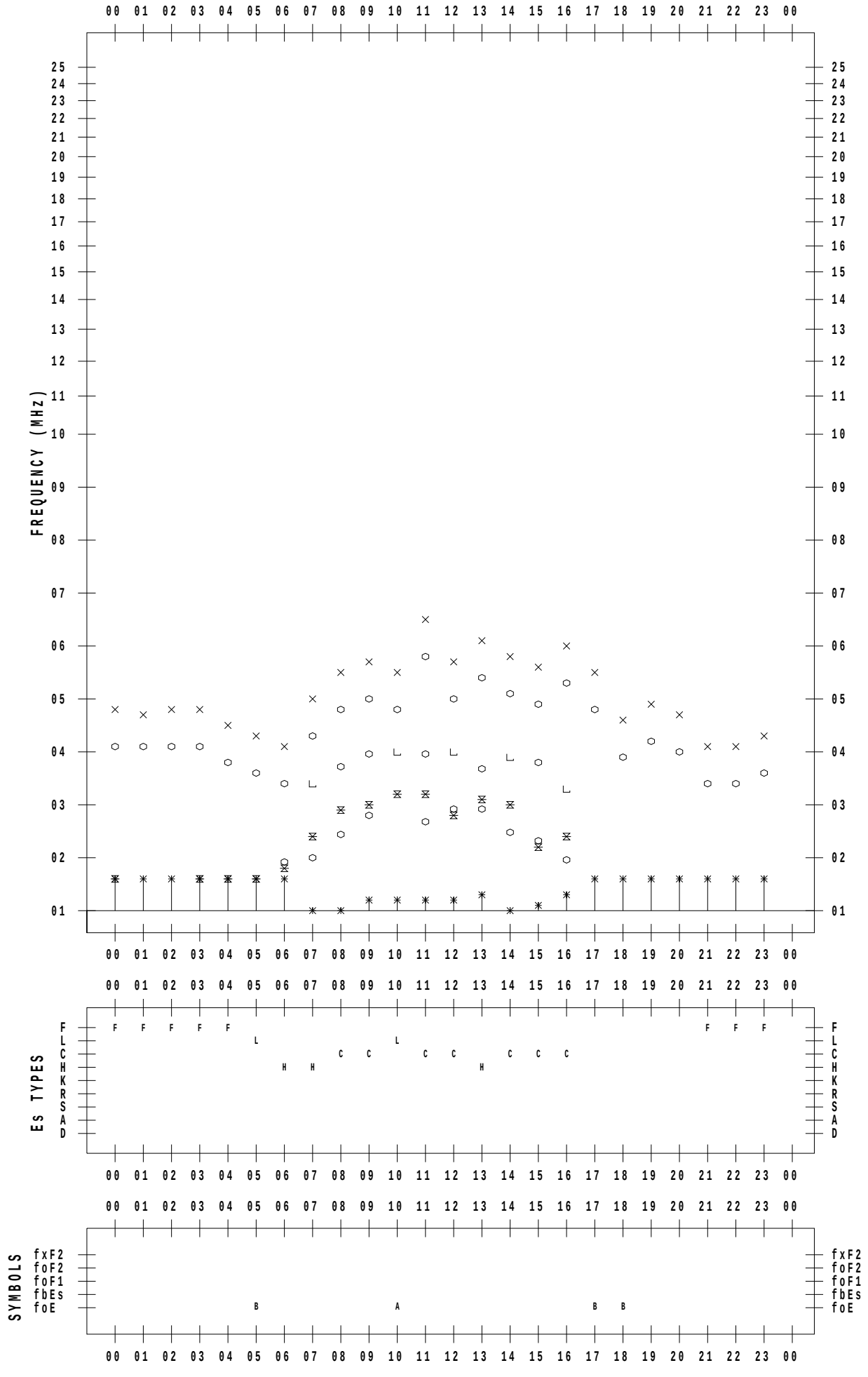
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 6

135 °E MEAN TIME



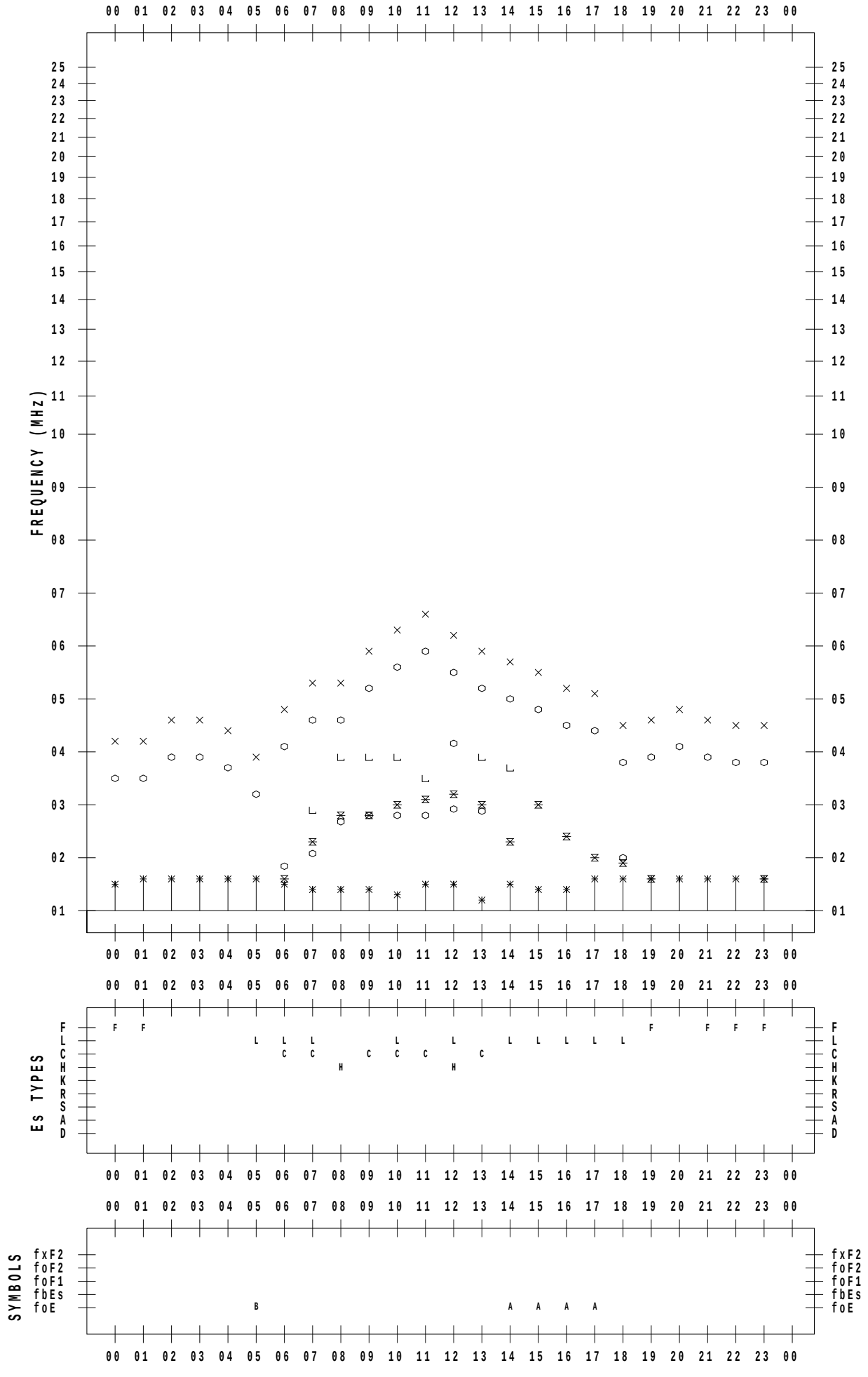
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 7

135 °E MEAN TIME



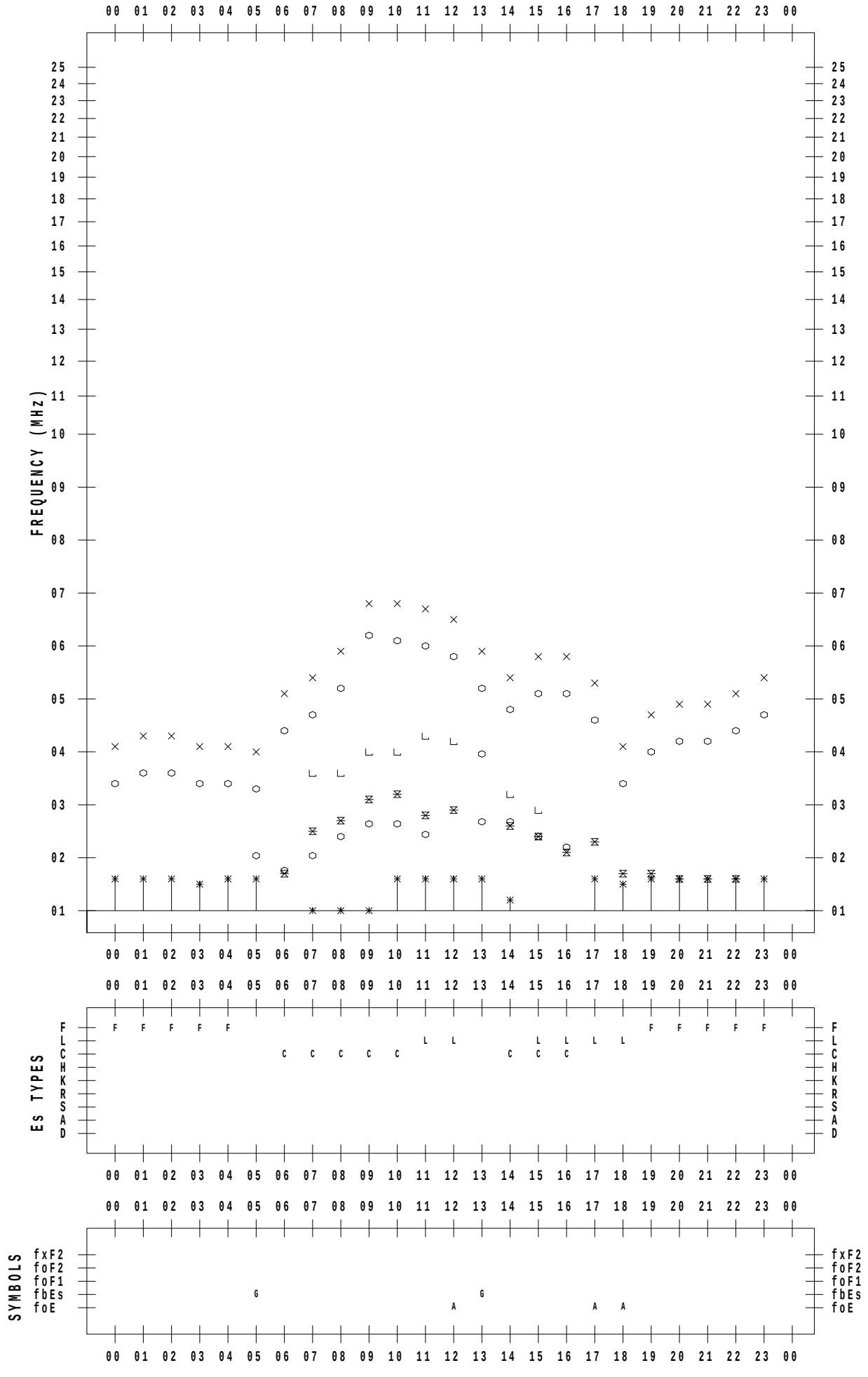
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 8

135 °E MEAN TIME



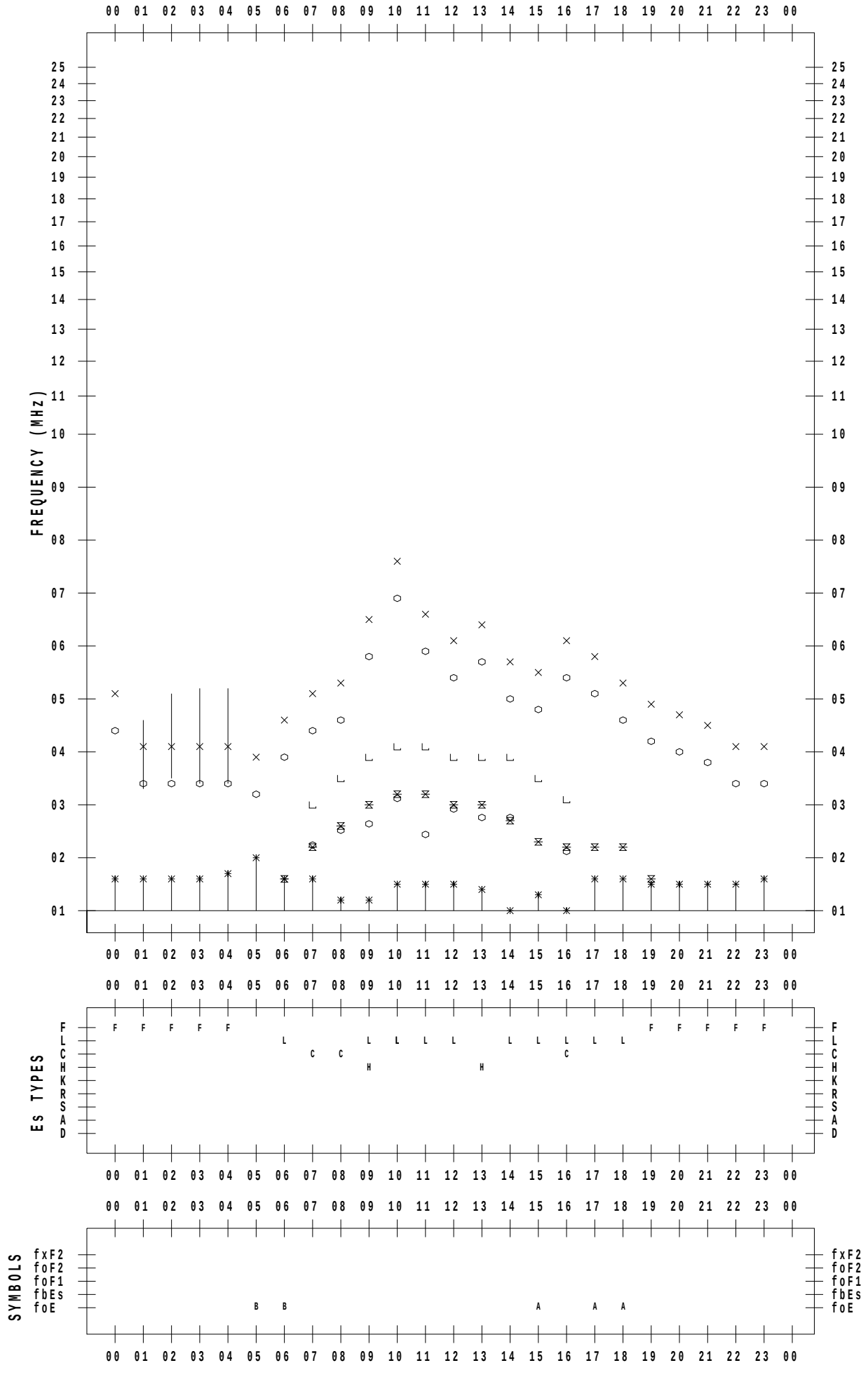
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/ 9

135 °E MEAN TIME



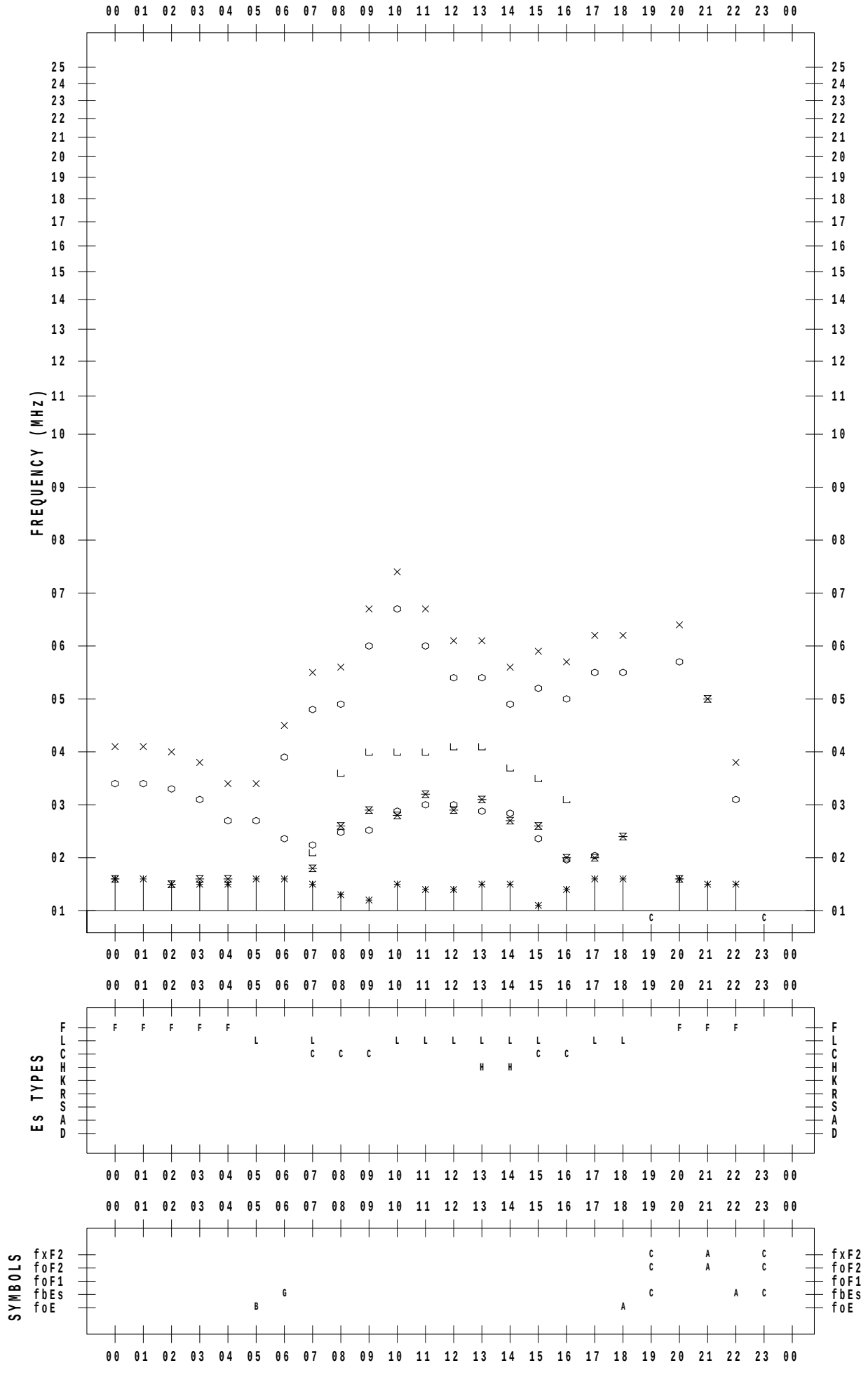
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/10

135 °E MEAN TIME



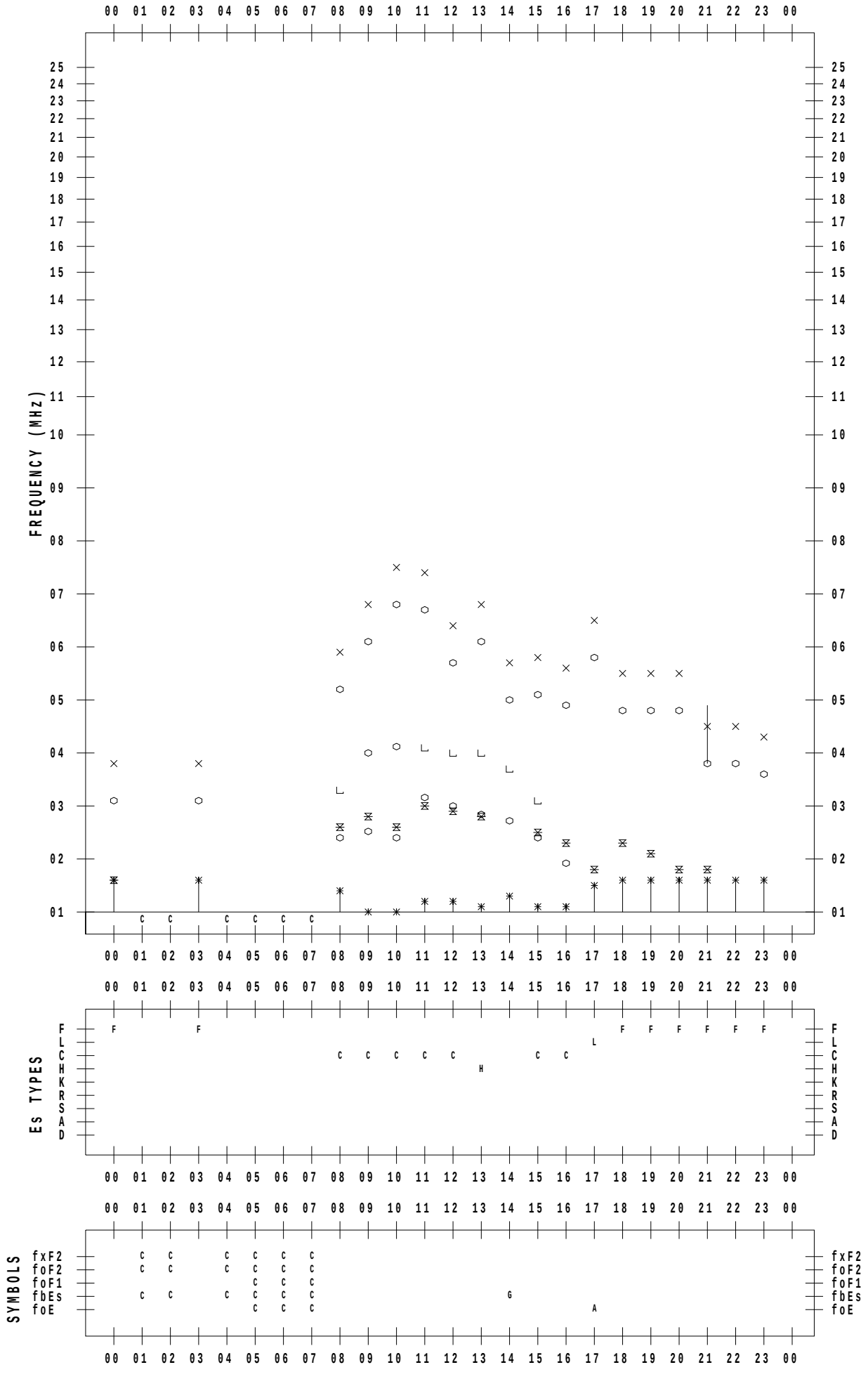
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/11

135 °E MEAN TIME



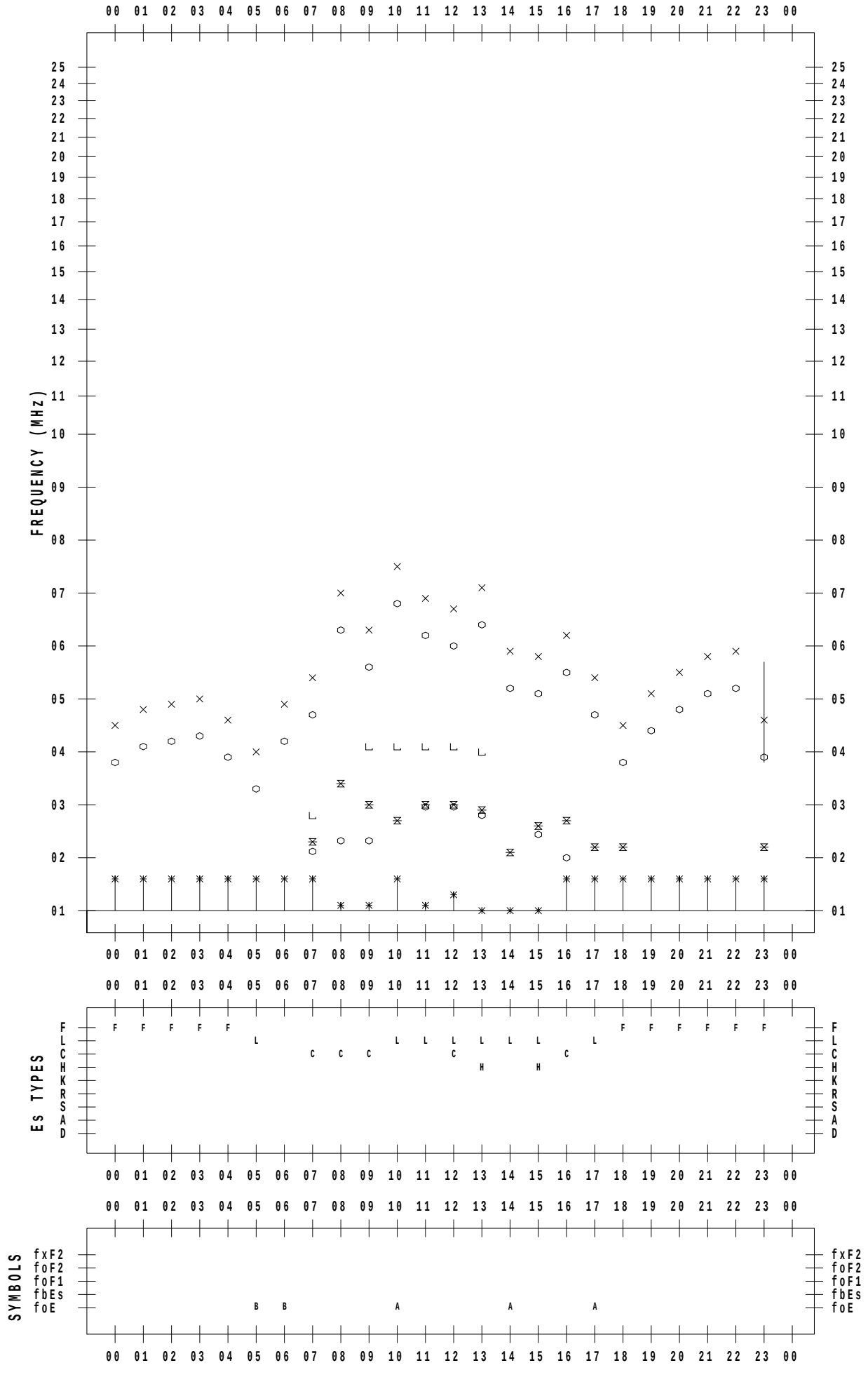
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/12

135 °E MEAN TIME



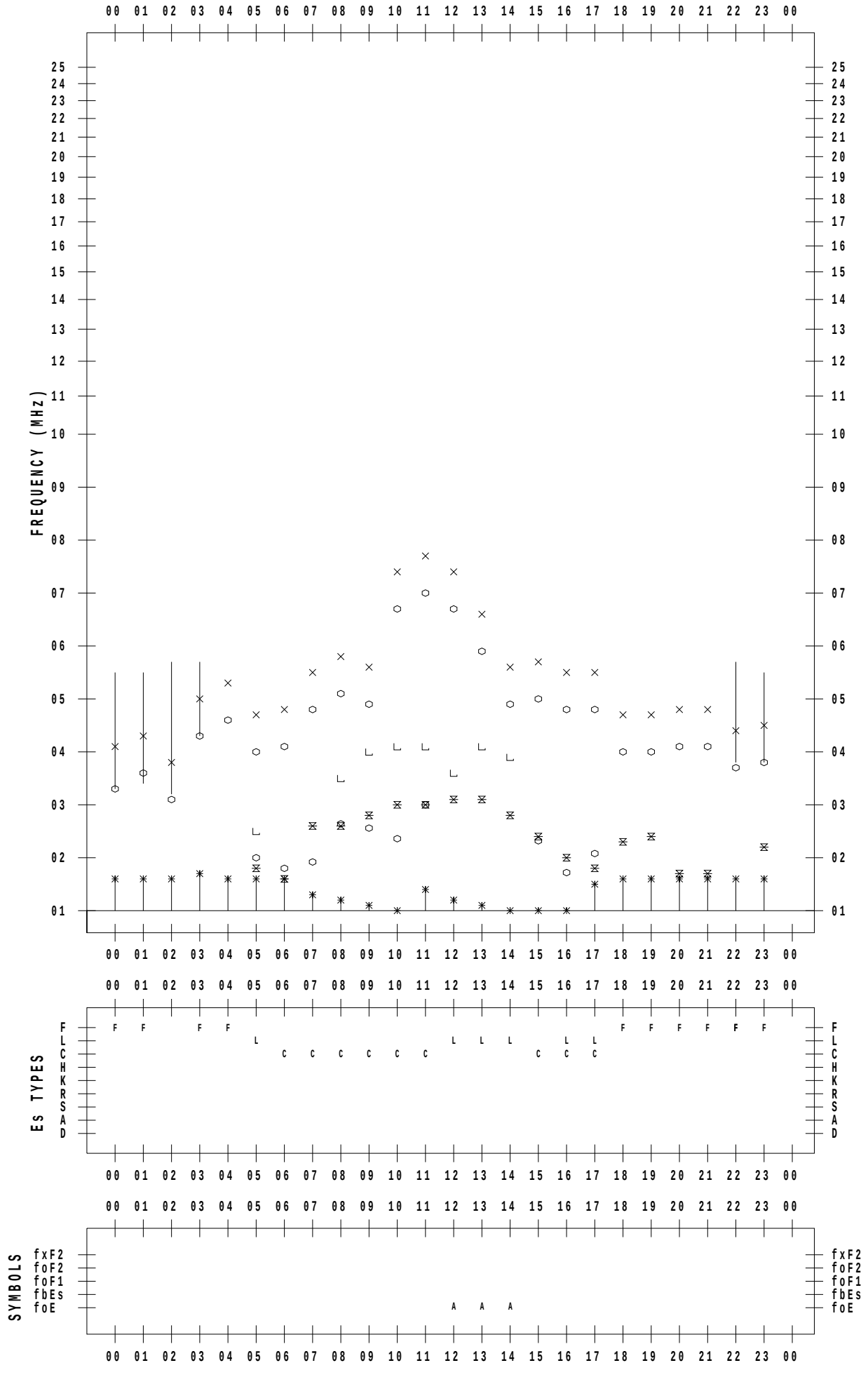
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/13

135 °E MEAN TIME



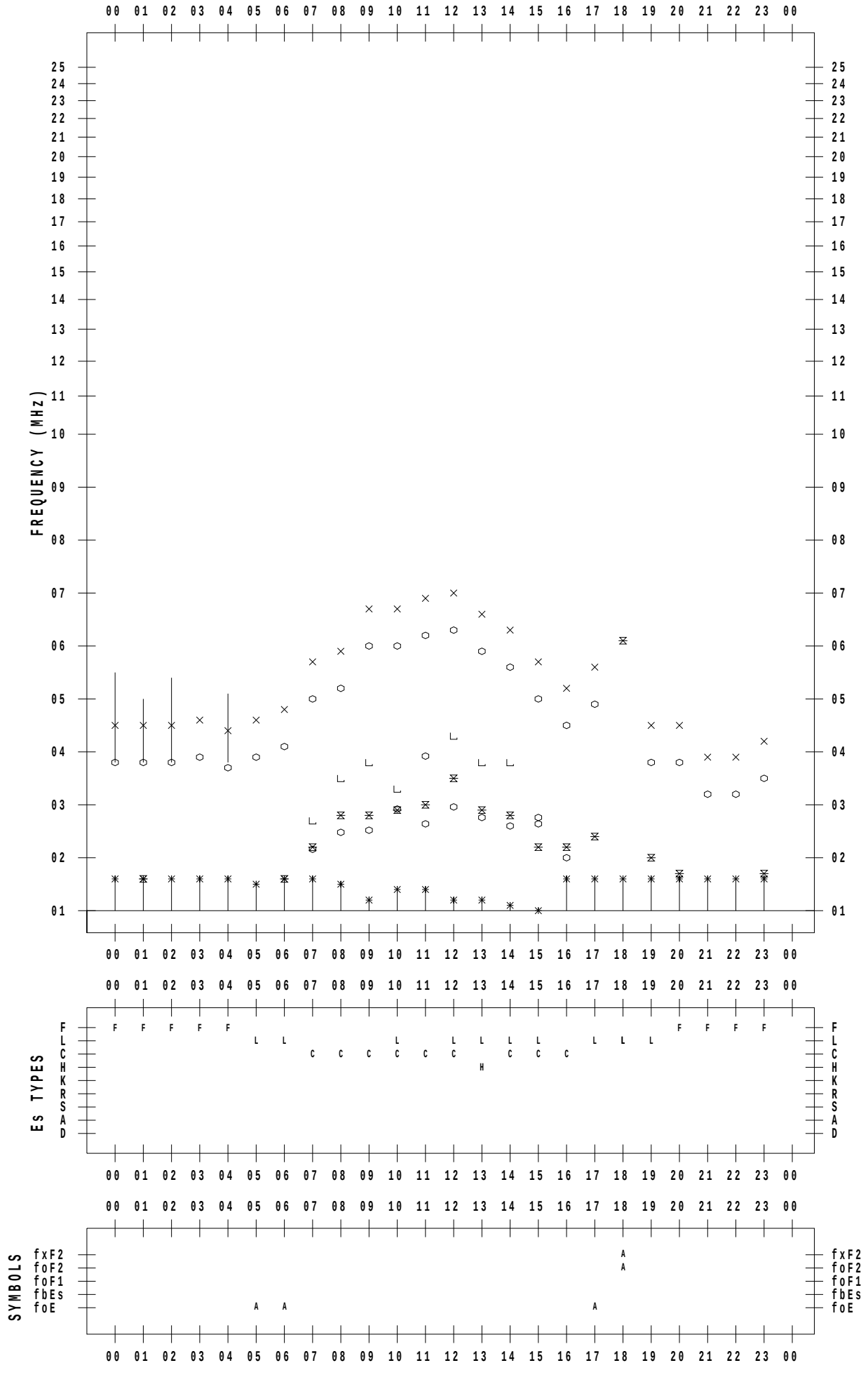
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/14

135 °E MEAN TIME



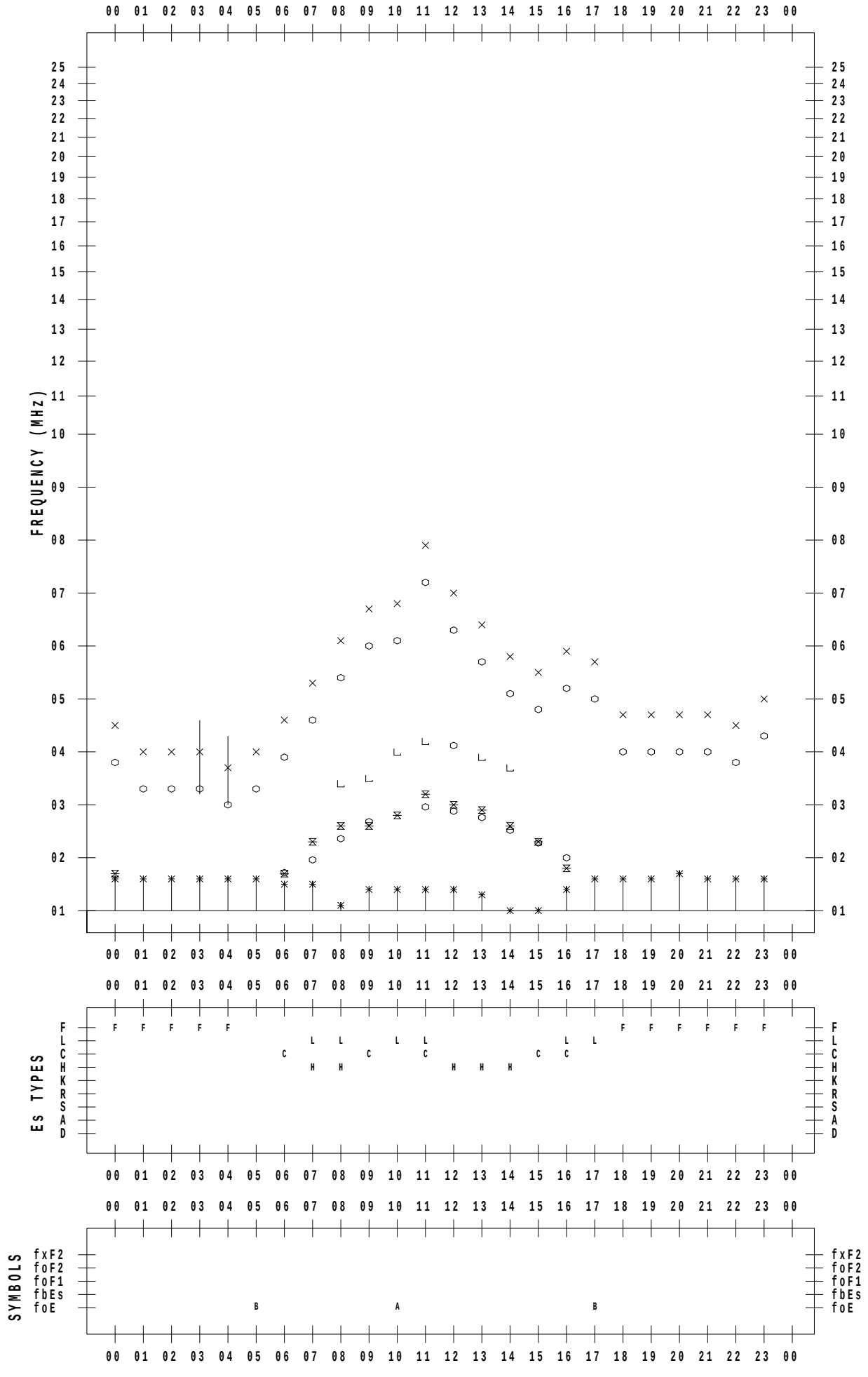
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/15

135 °E MEAN TIME



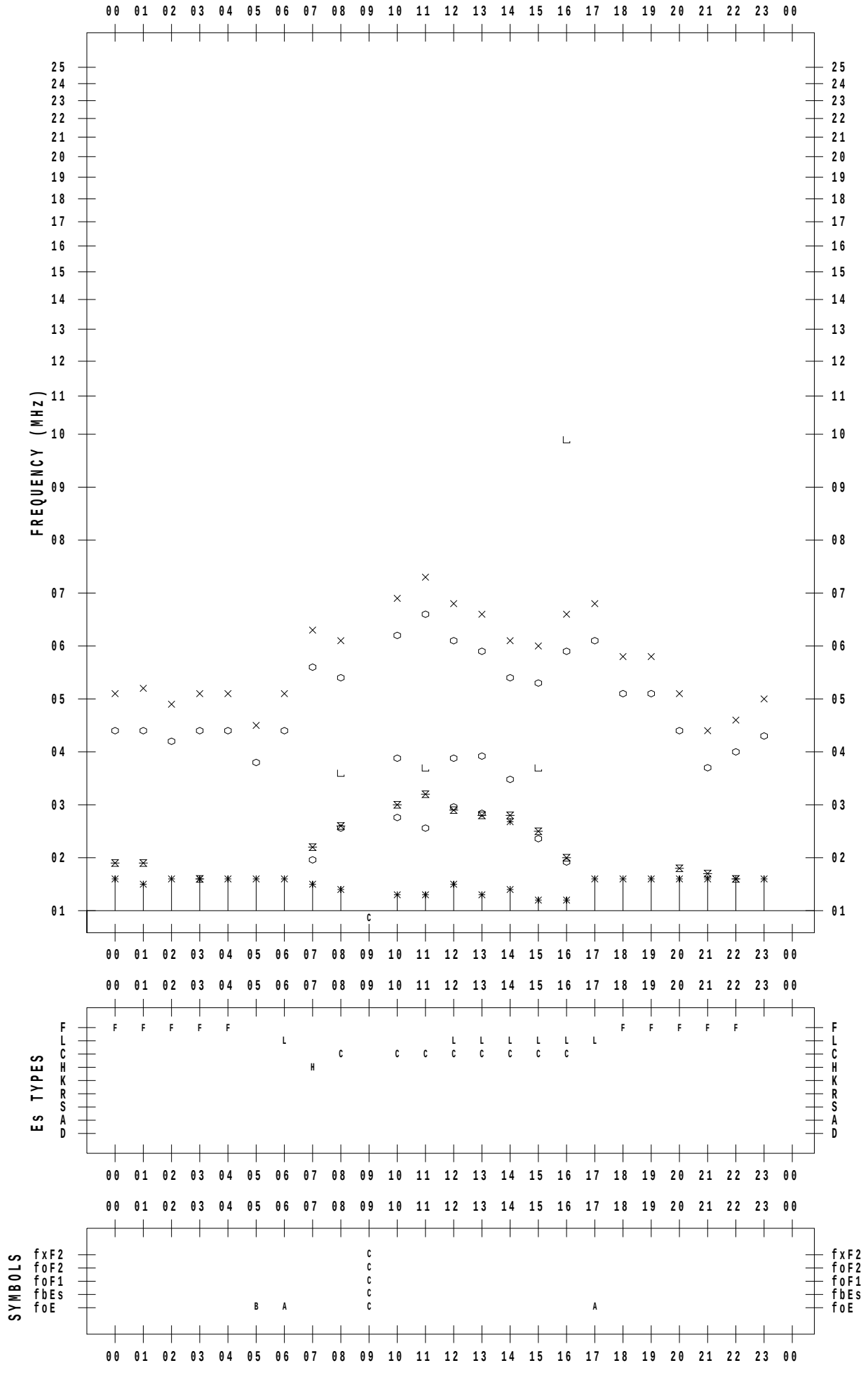
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/16

135 °E MEAN TIME



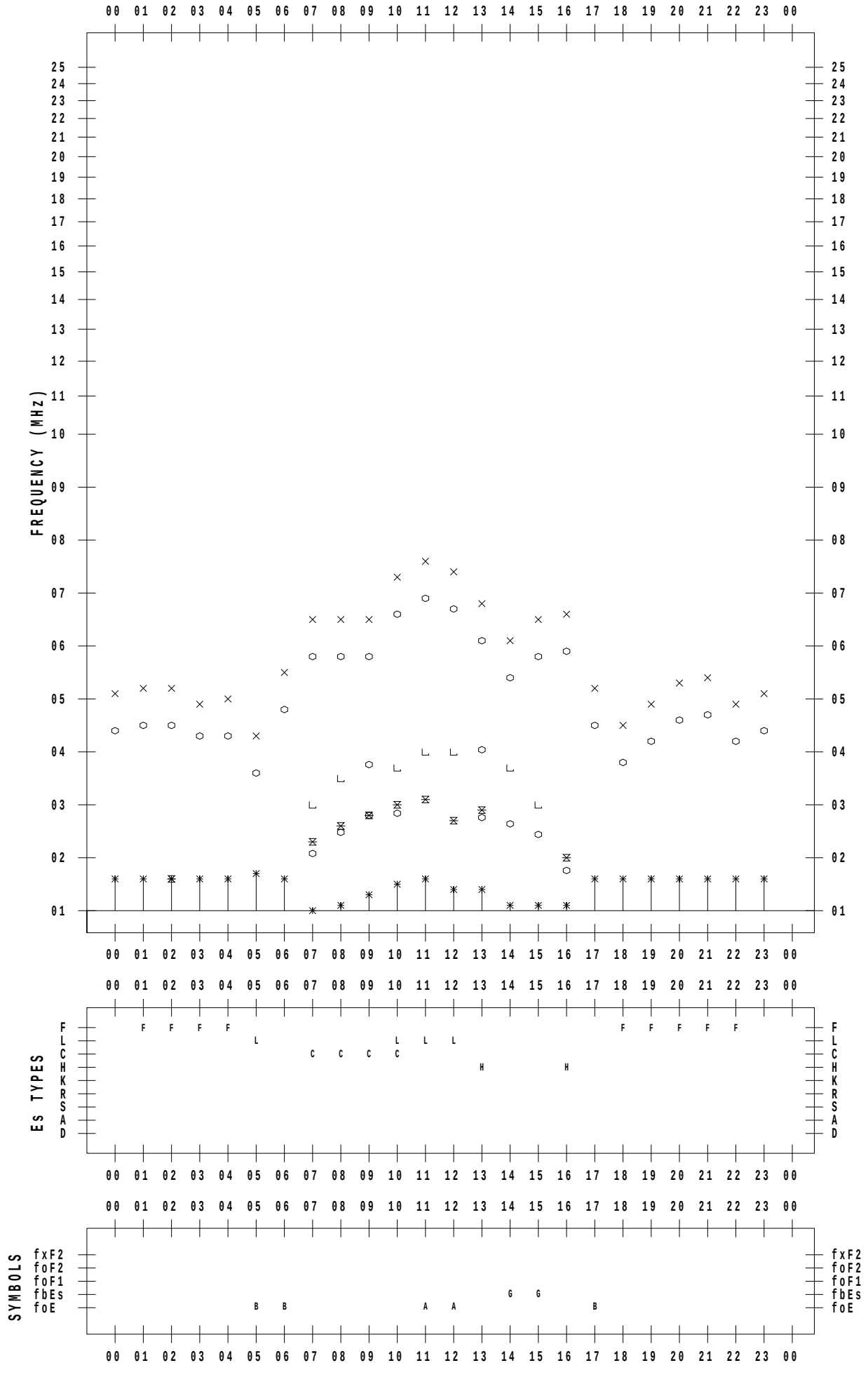
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/17

135 °E MEAN TIME



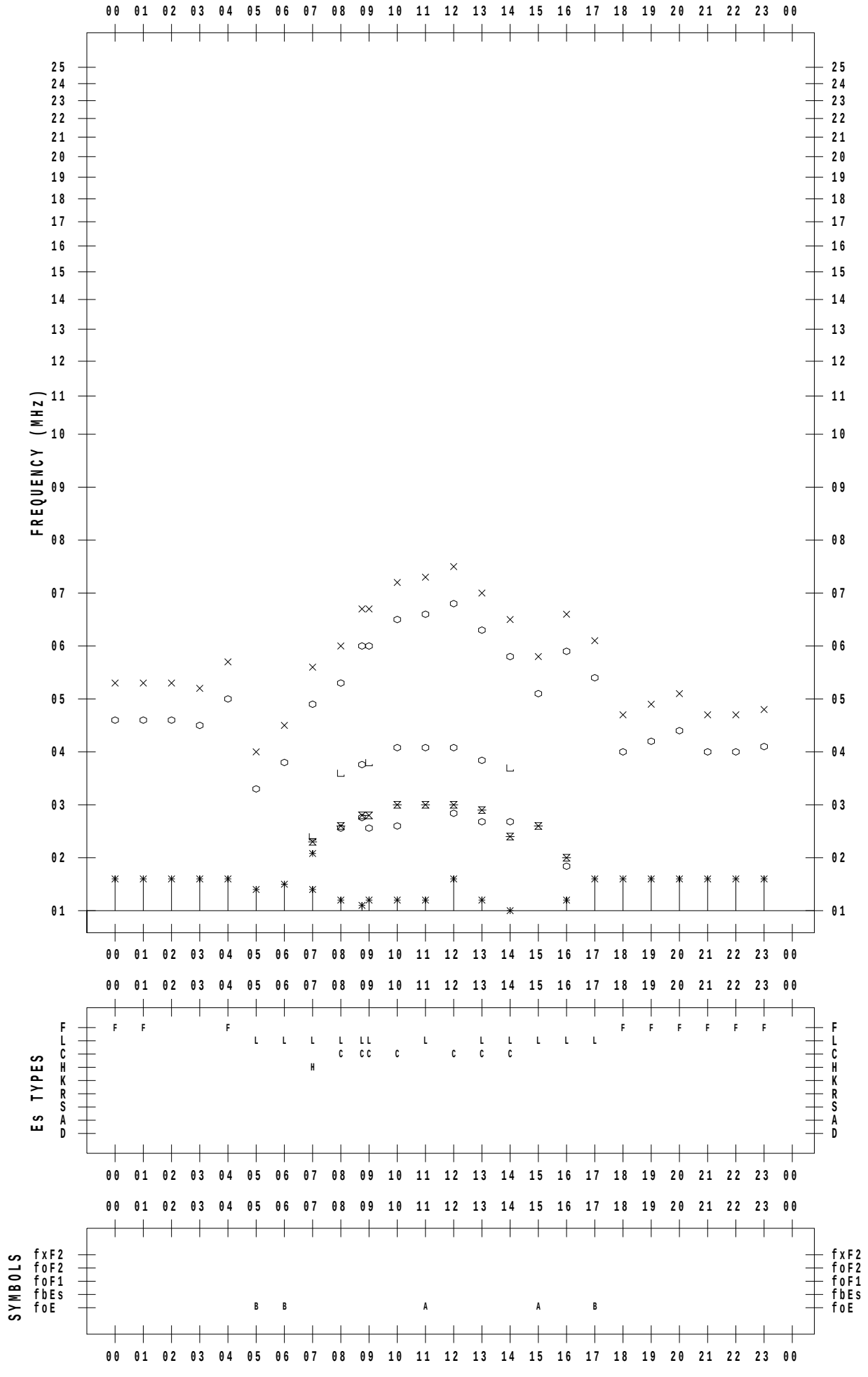
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/18

135 °E MEAN TIME



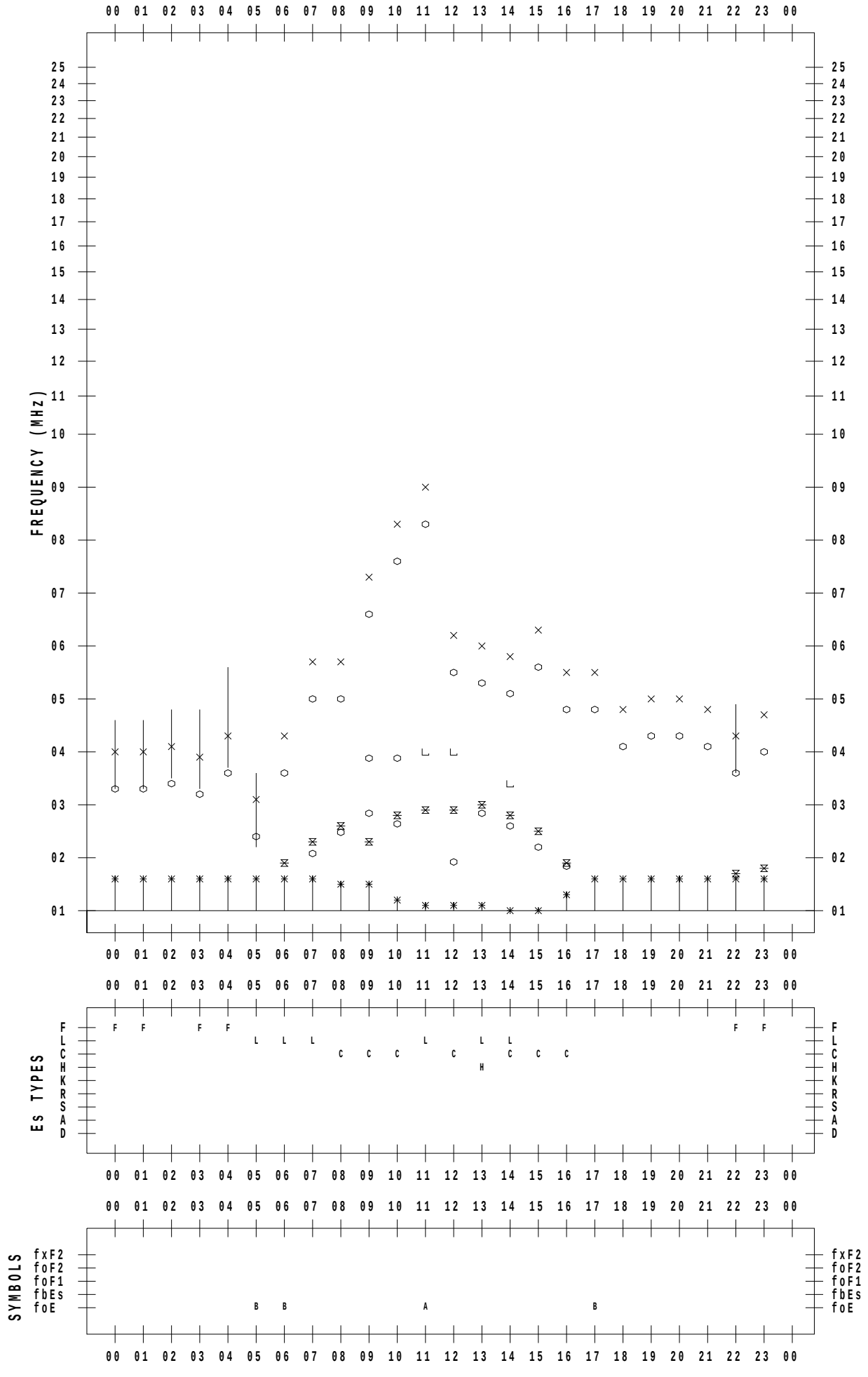
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/19

135 °E MEAN TIME



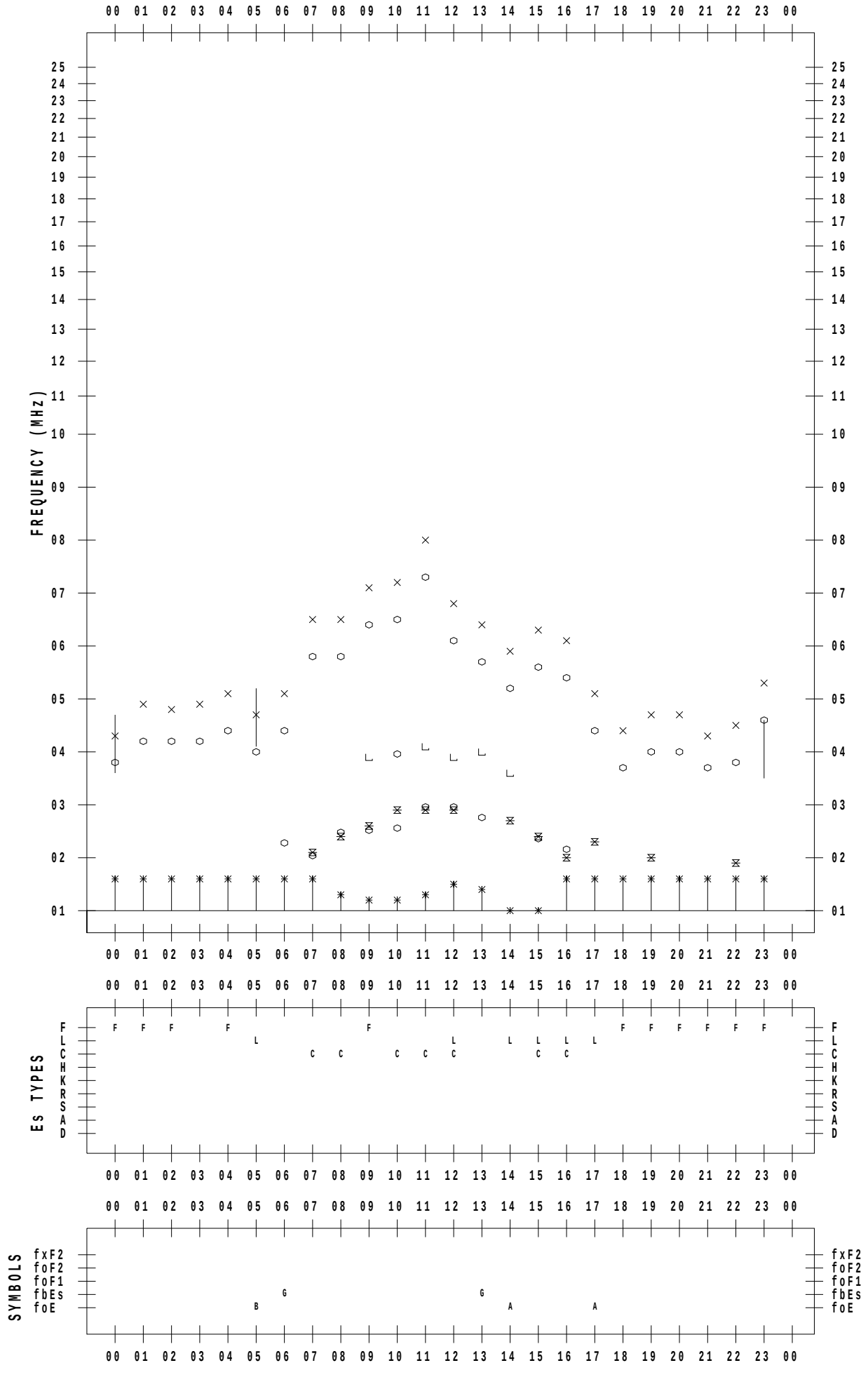
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/20

135 °E MEAN TIME



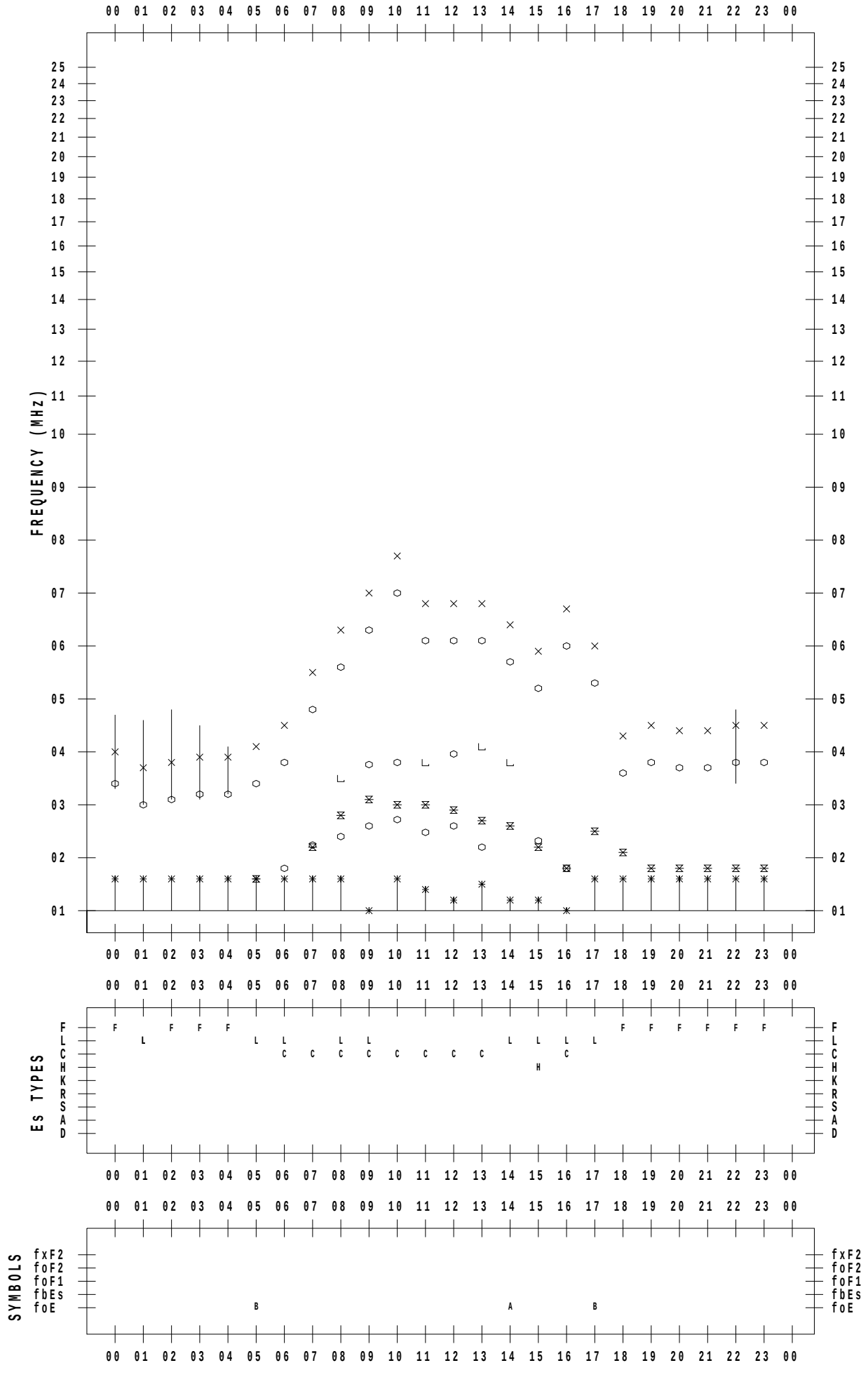
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/21

135 °E MEAN TIME



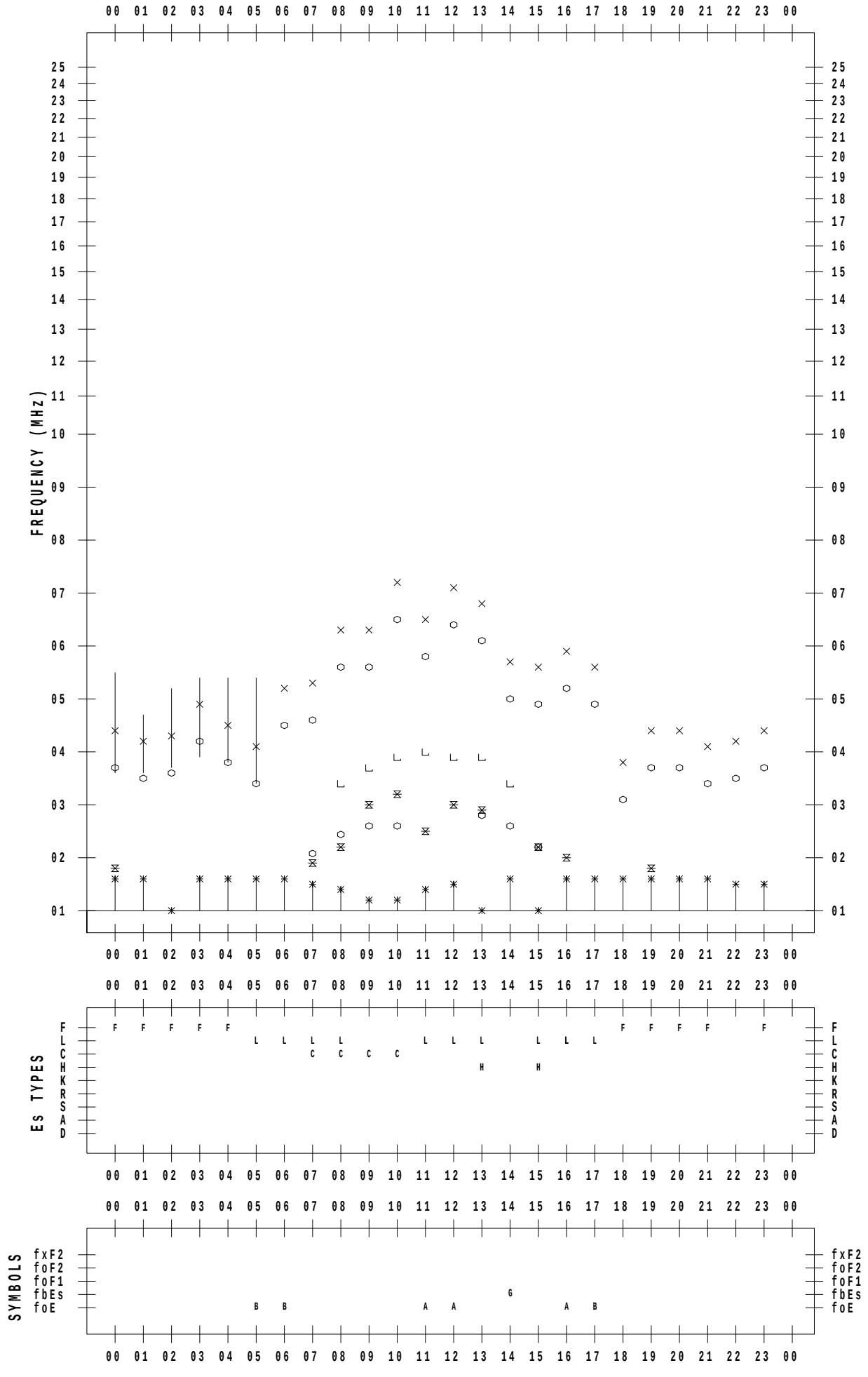
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/22

135 °E MEAN TIME



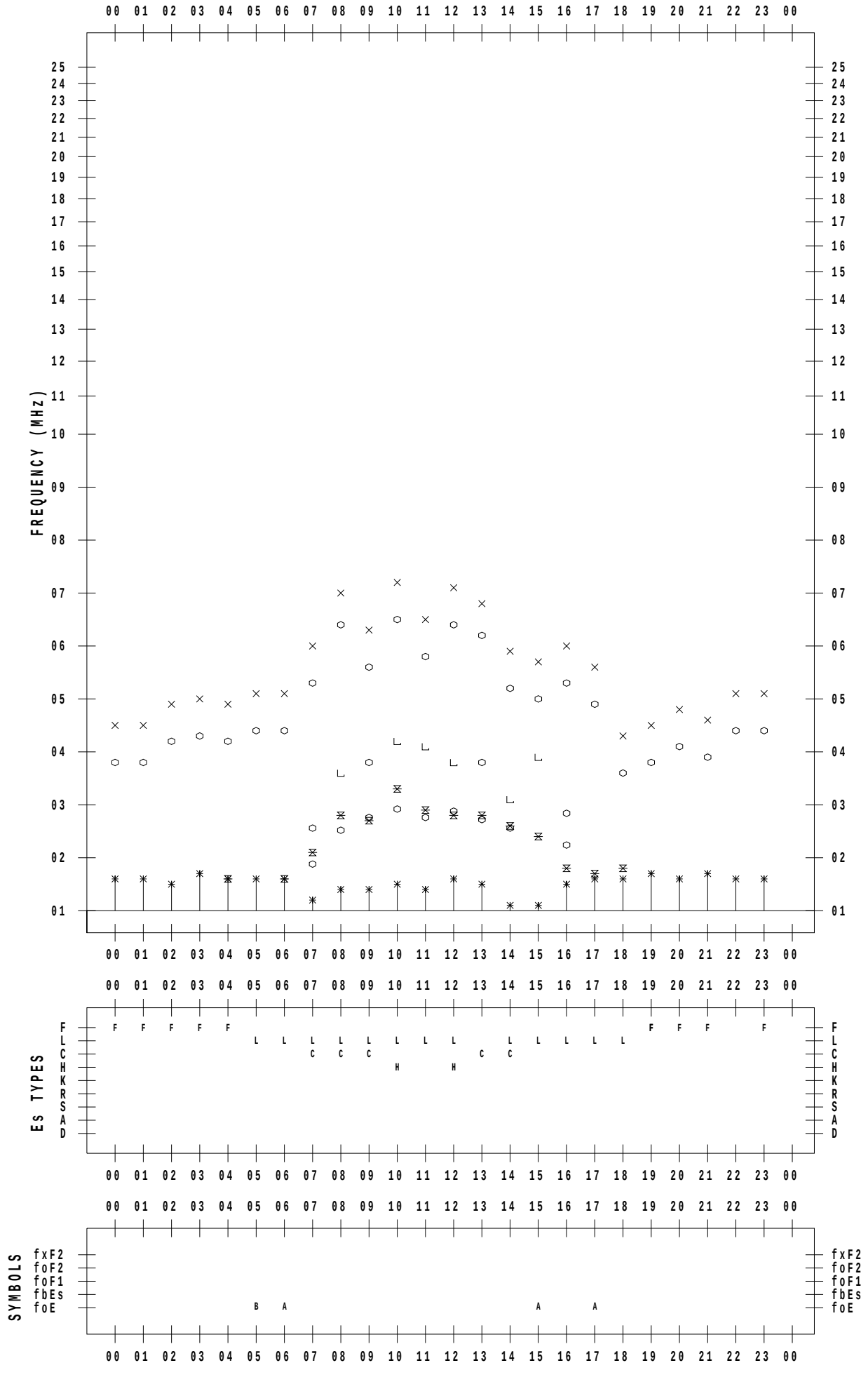
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/23

135 °E MEAN TIME



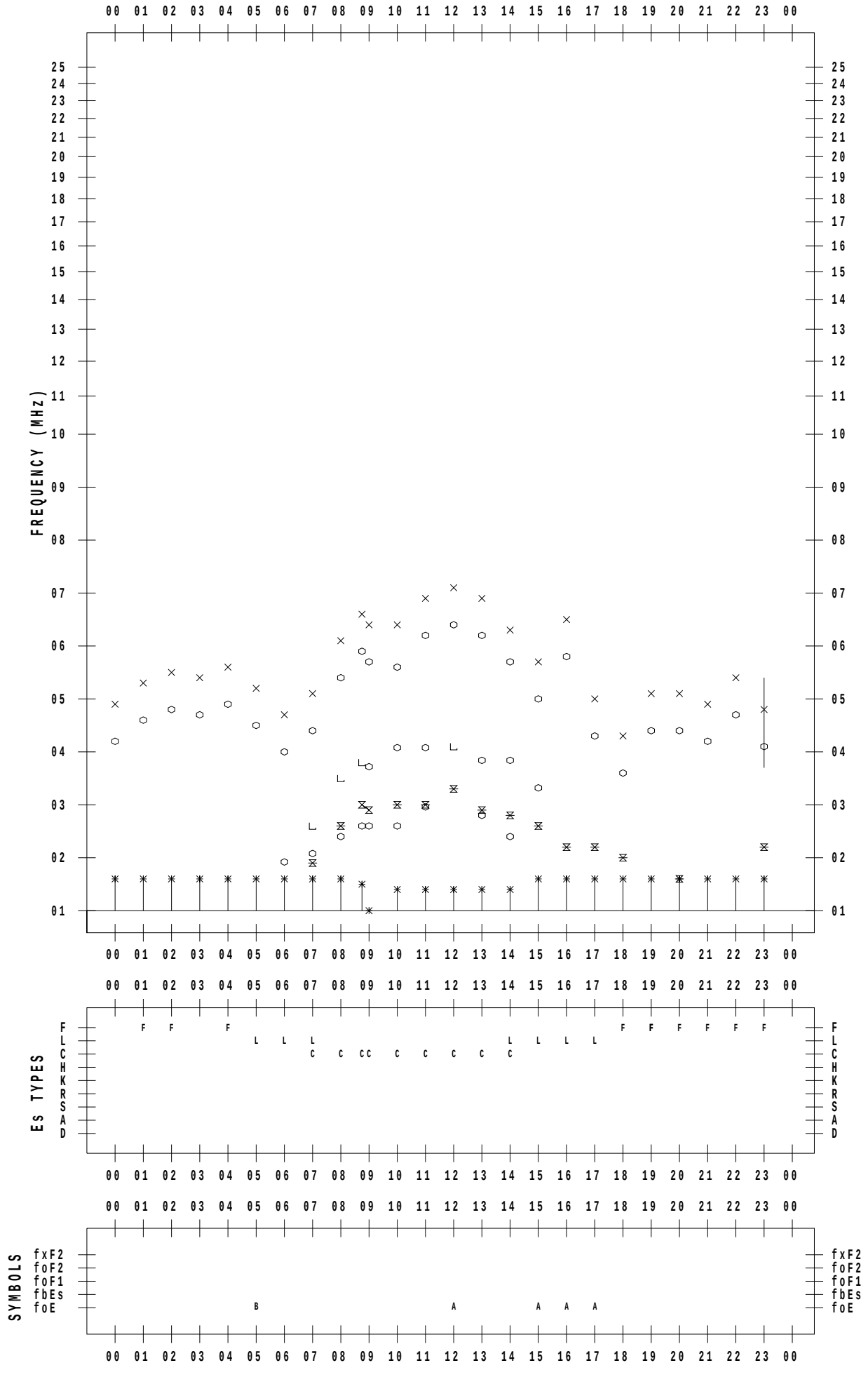
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/24

135 °E MEAN TIME



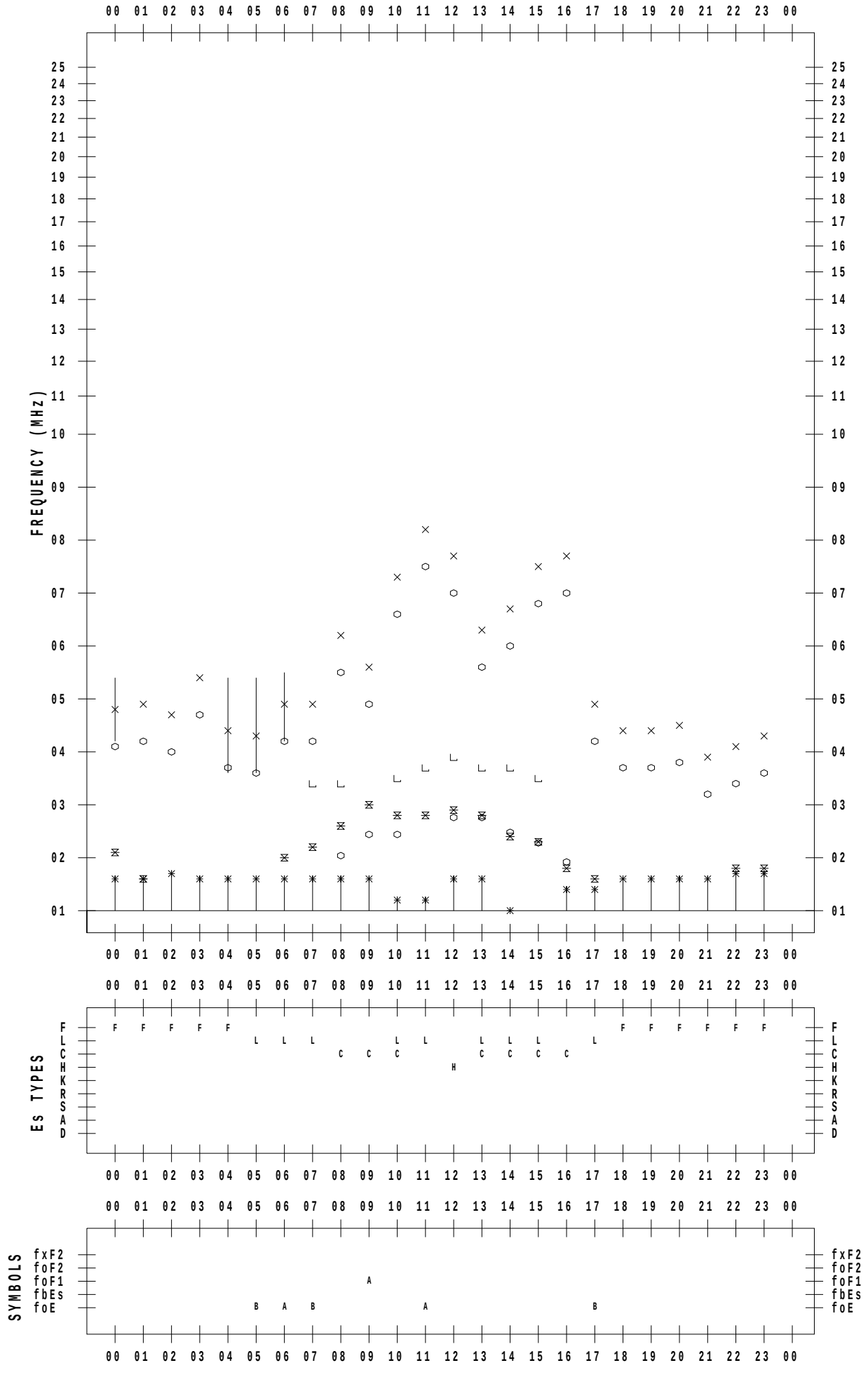
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/25

135 °E MEAN TIME



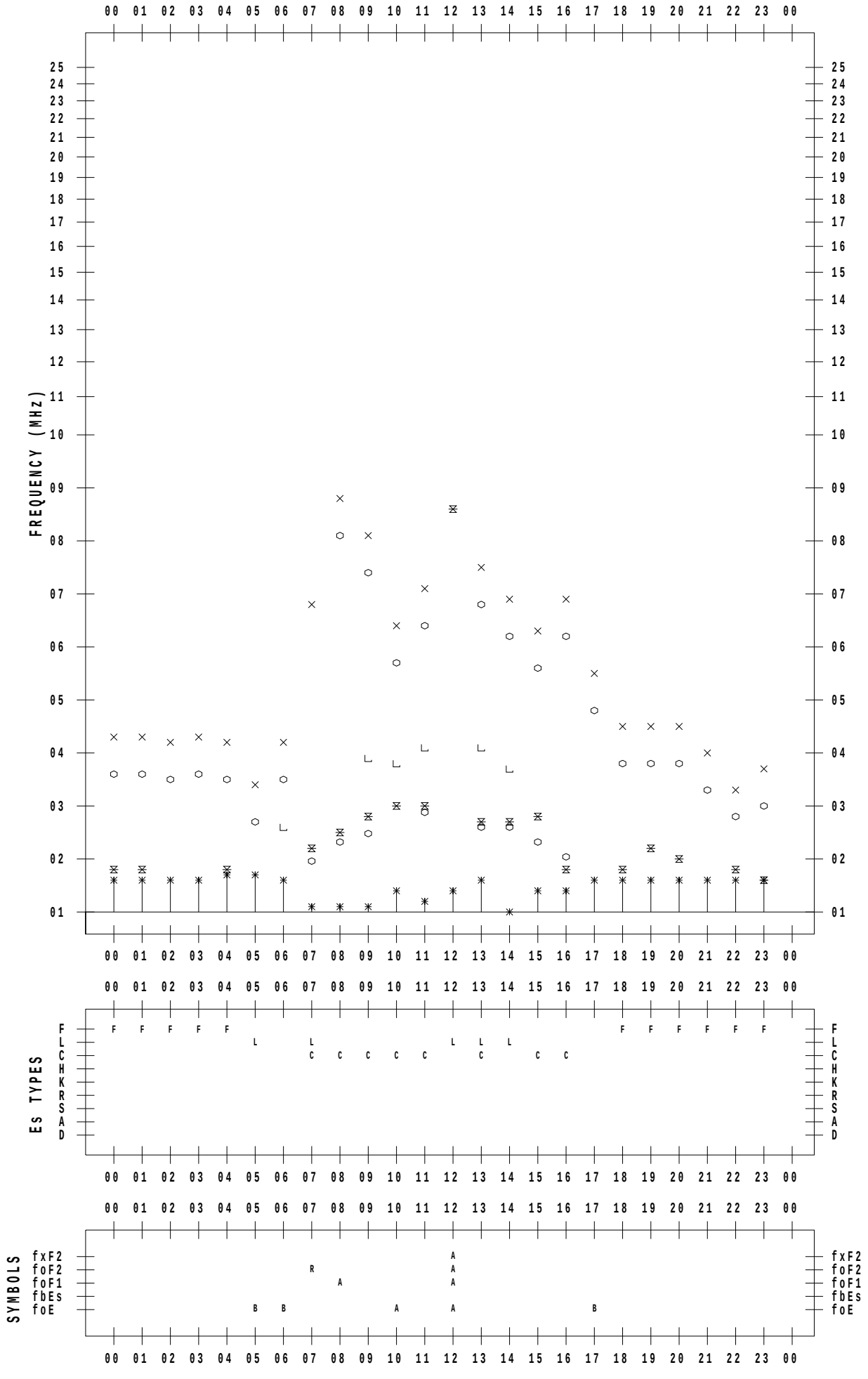
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/26

135 °E MEAN TIME



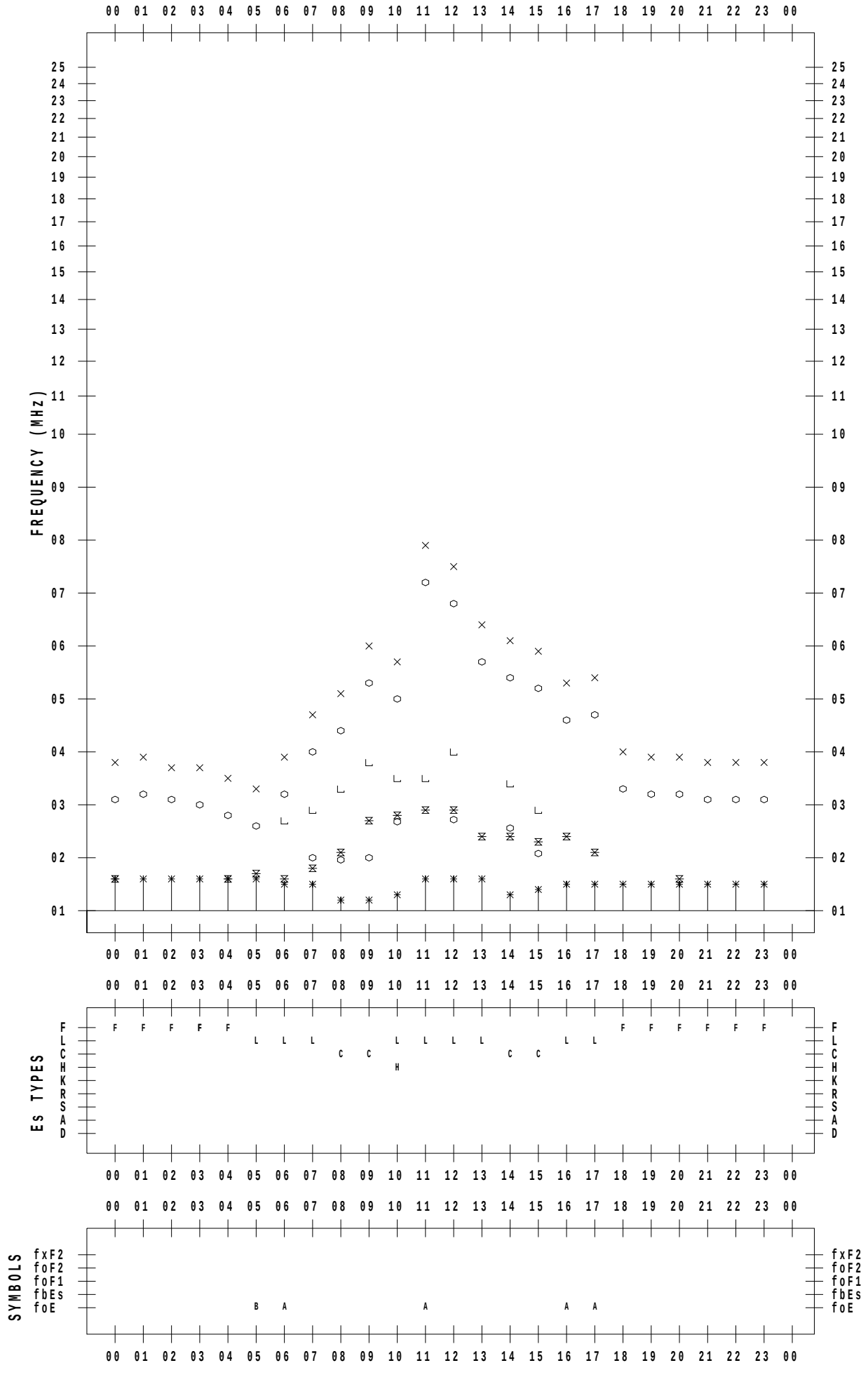
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/27

135 °E MEAN TIME



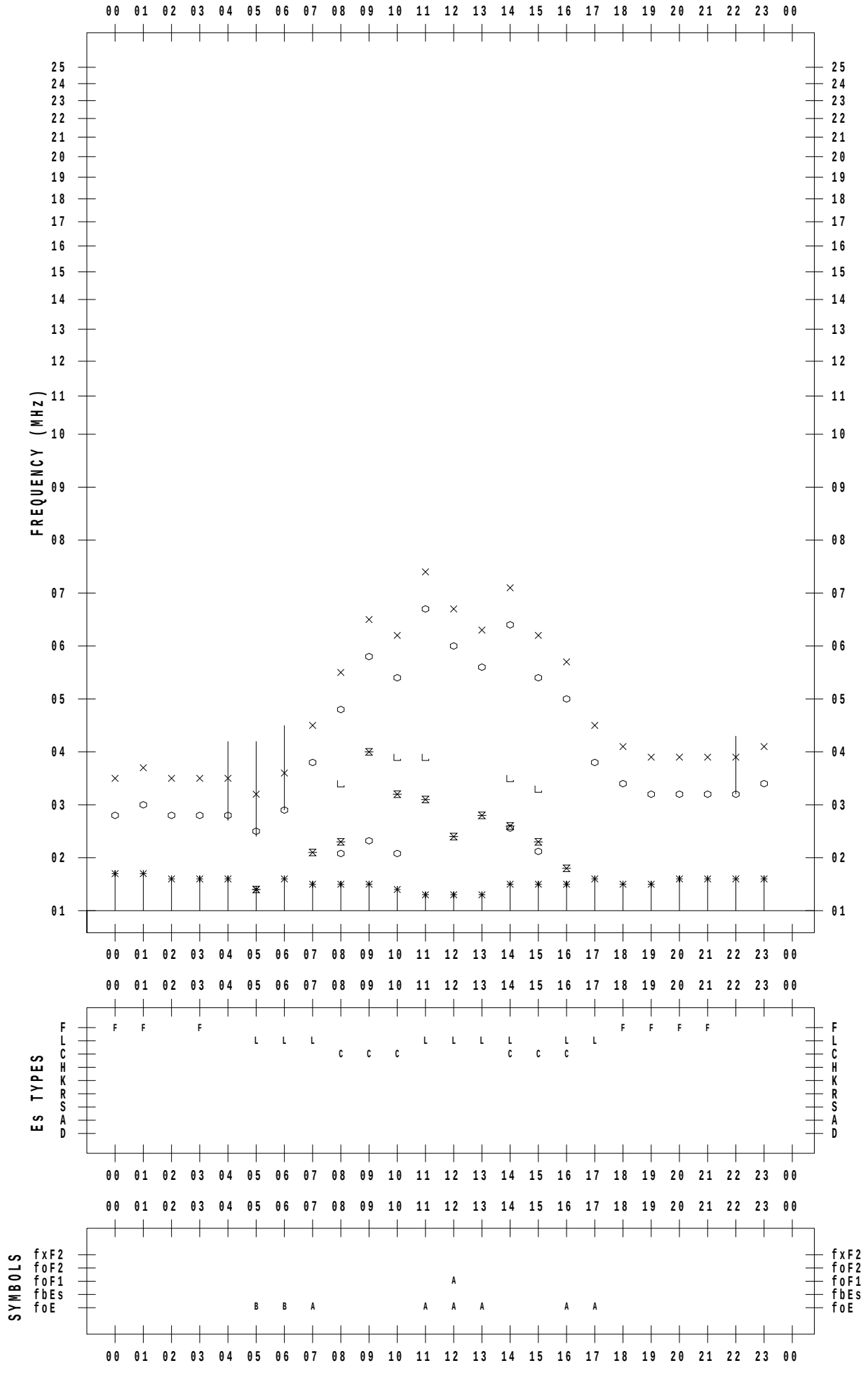
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/28

135 °E MEAN TIME



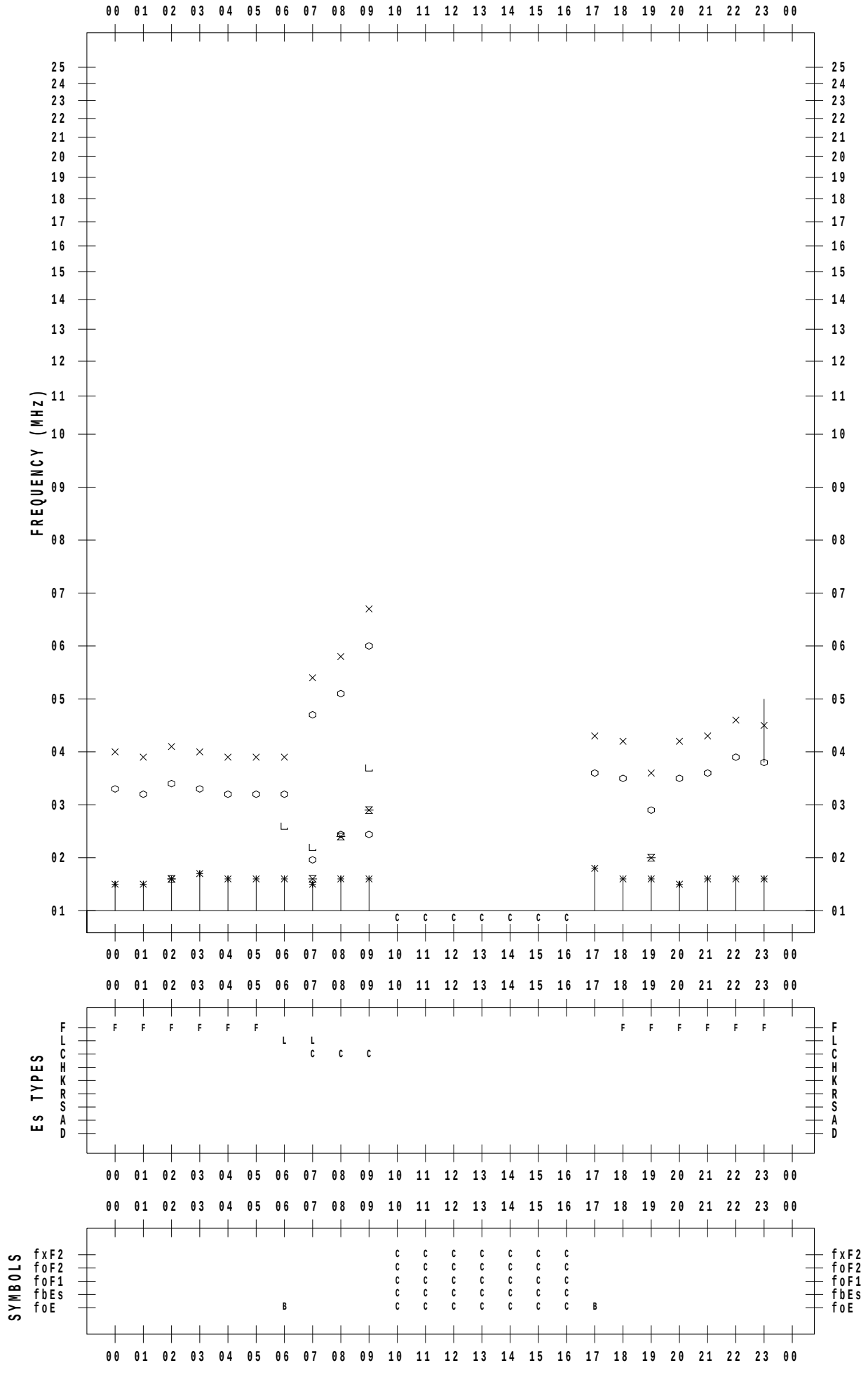
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/29

135 °E MEAN TIME



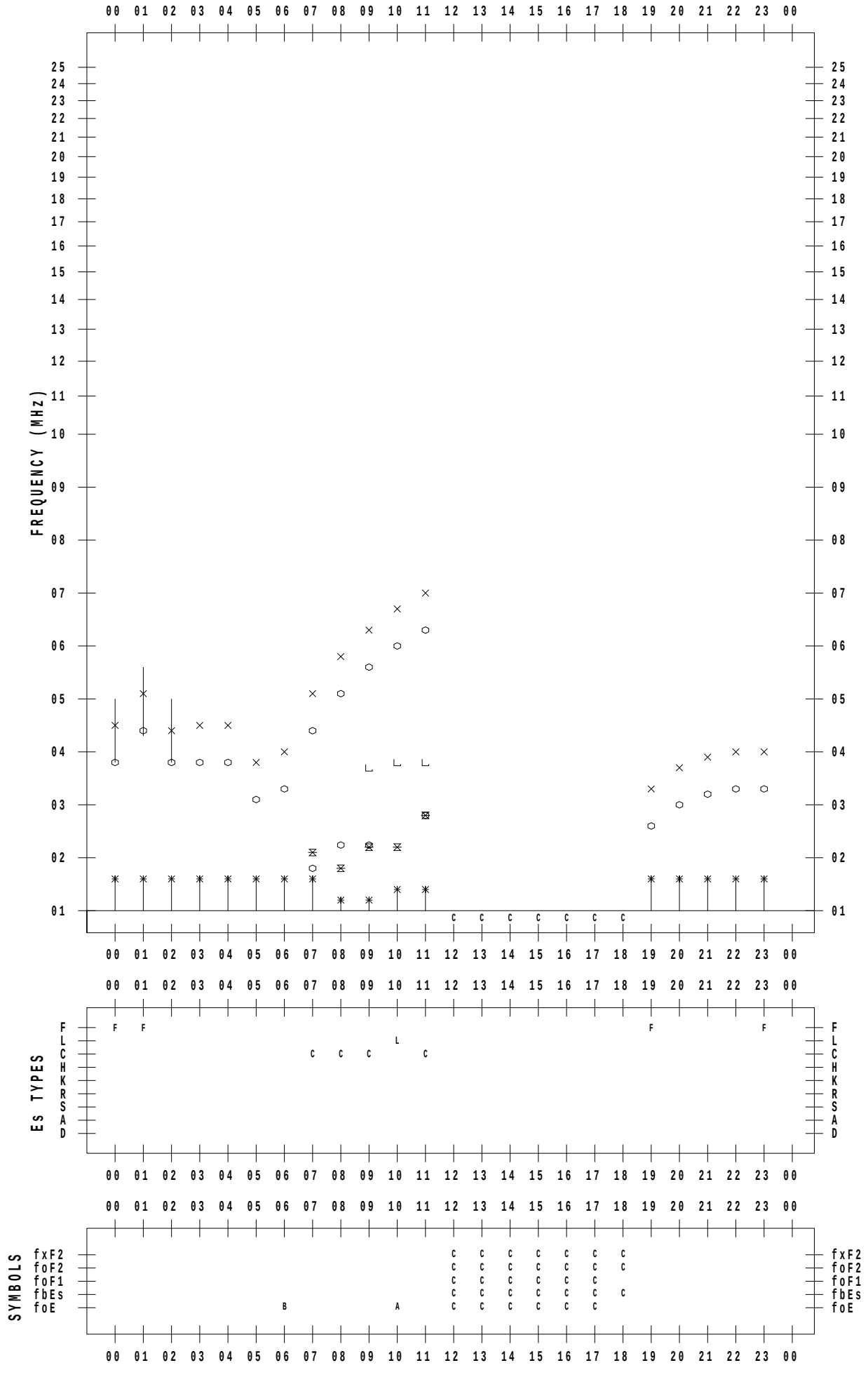
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/30

135 °E MEAN TIME



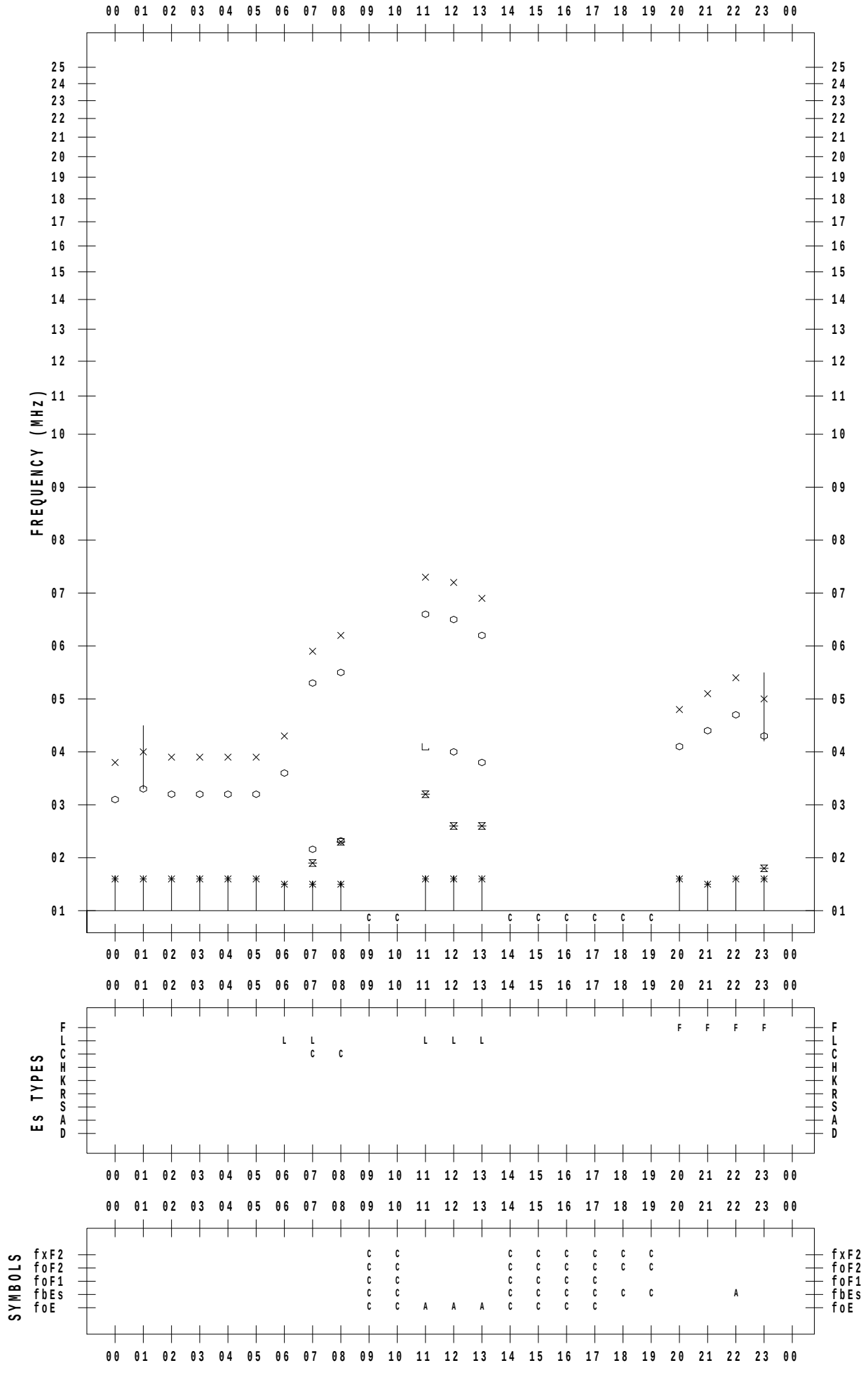
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2019/10/31

135 °E MEAN TIME



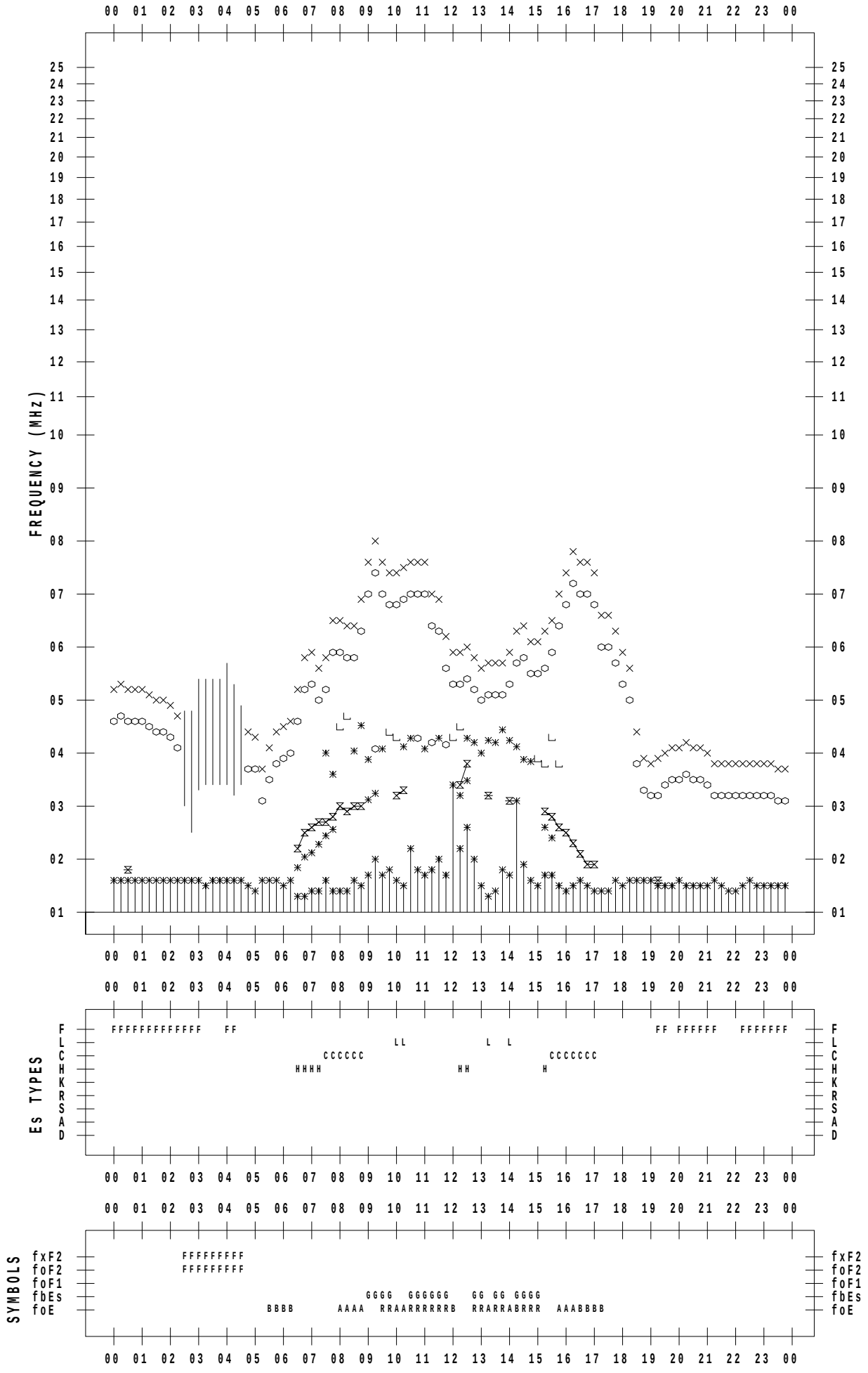
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 1

135 °E MEAN TIME



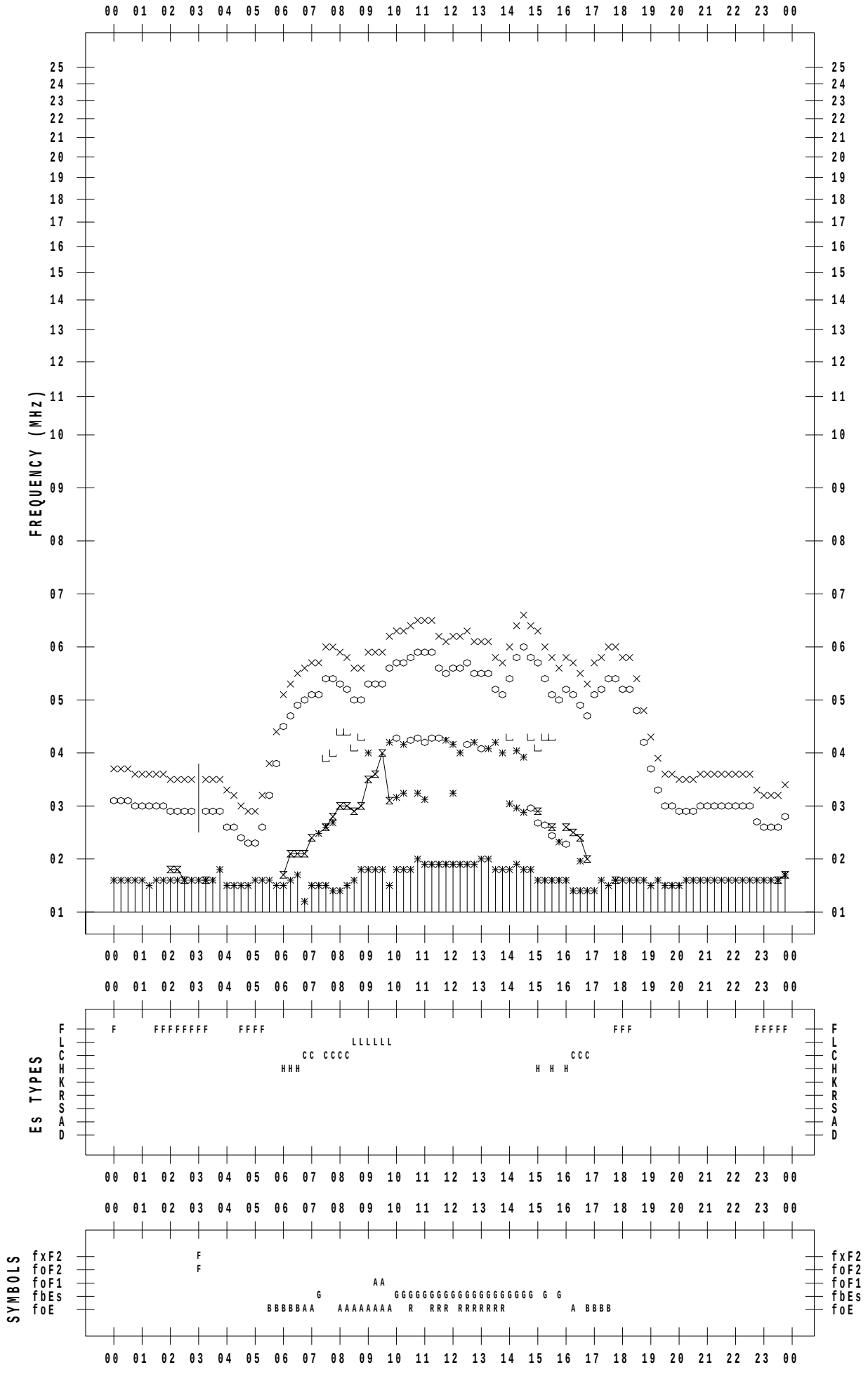
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 2

135 °E MEAN TIME



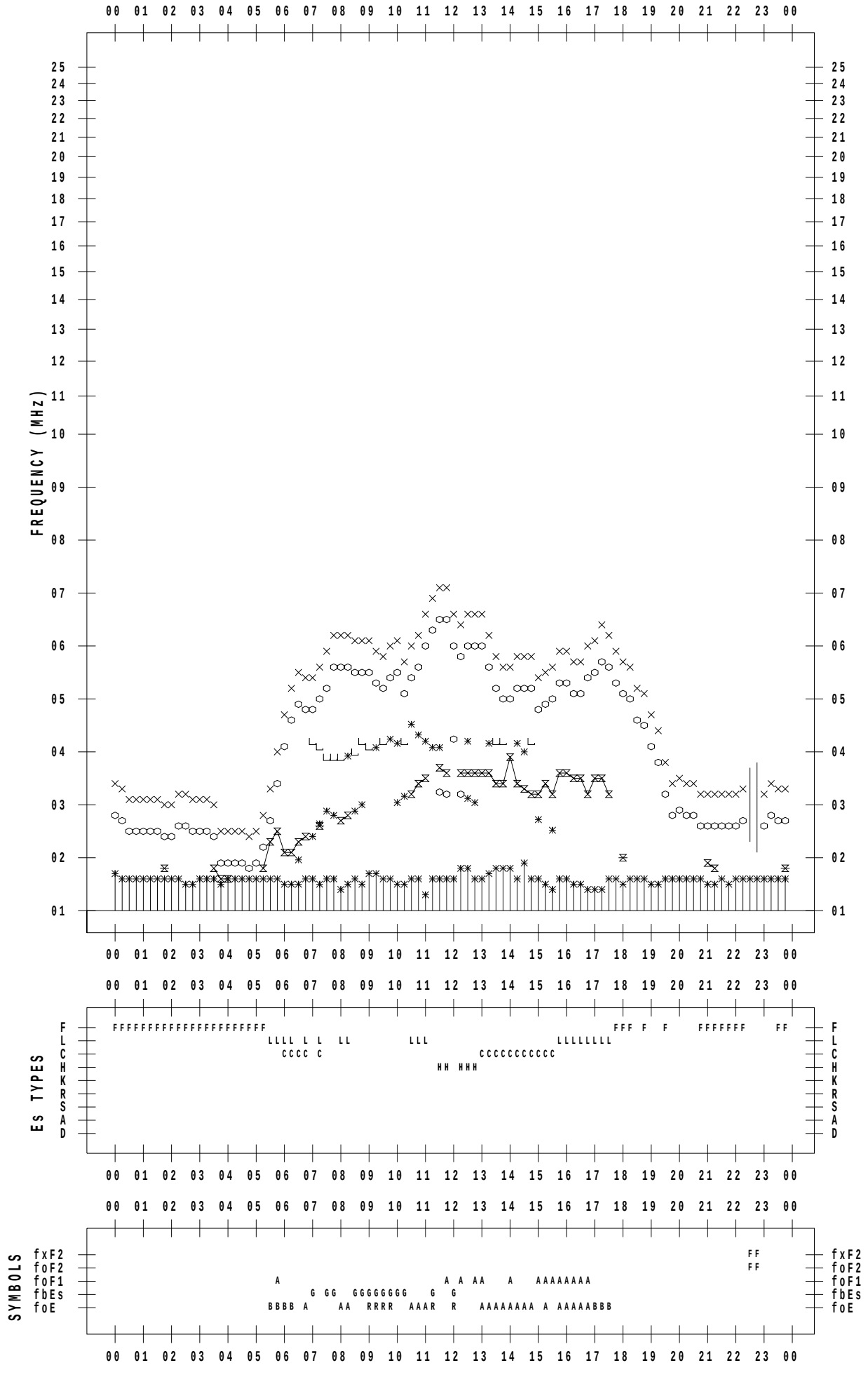
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 3

135 °E MEAN TIME



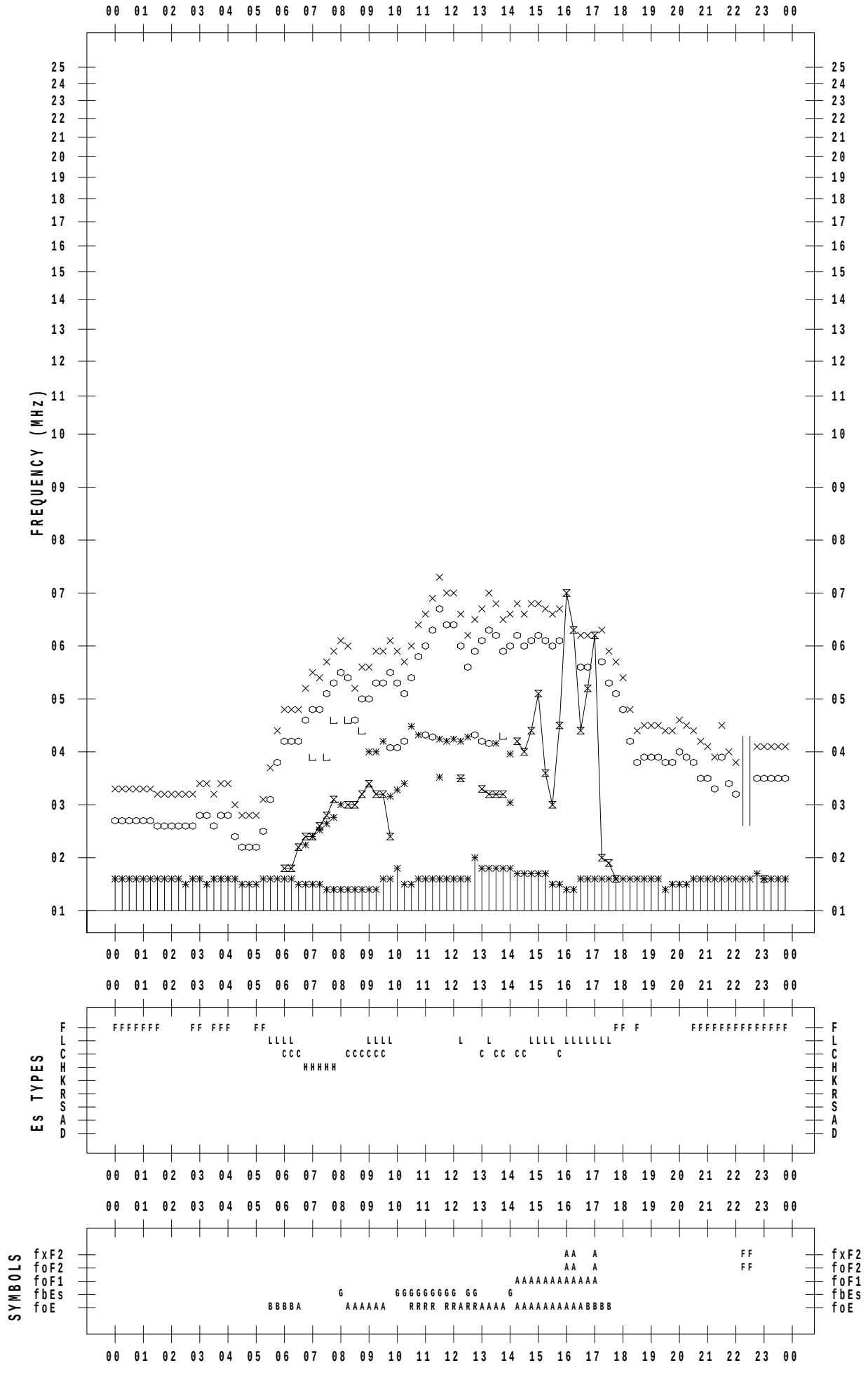
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 4

135 °E MEAN TIME



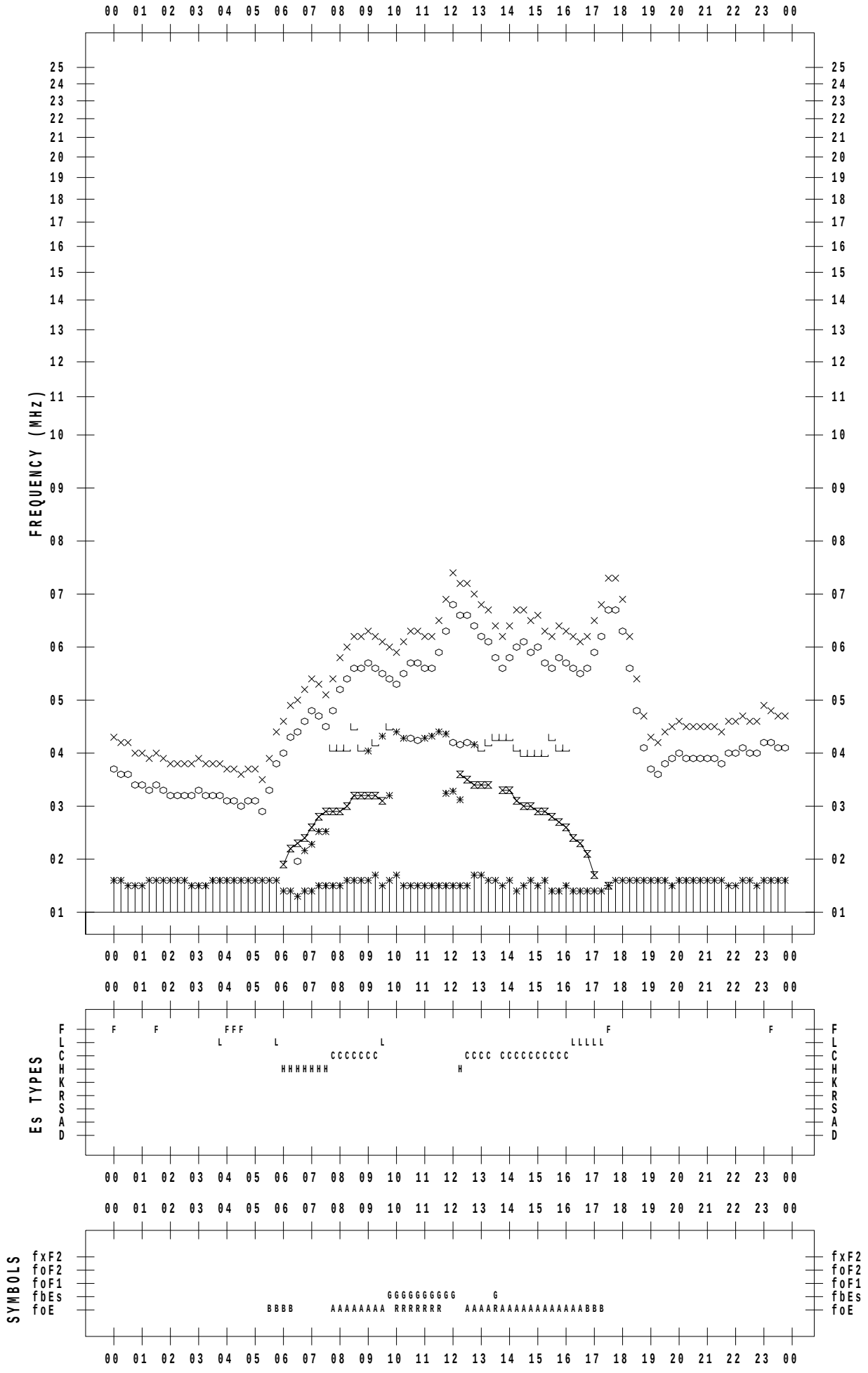
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 5

135 °E MEAN TIME



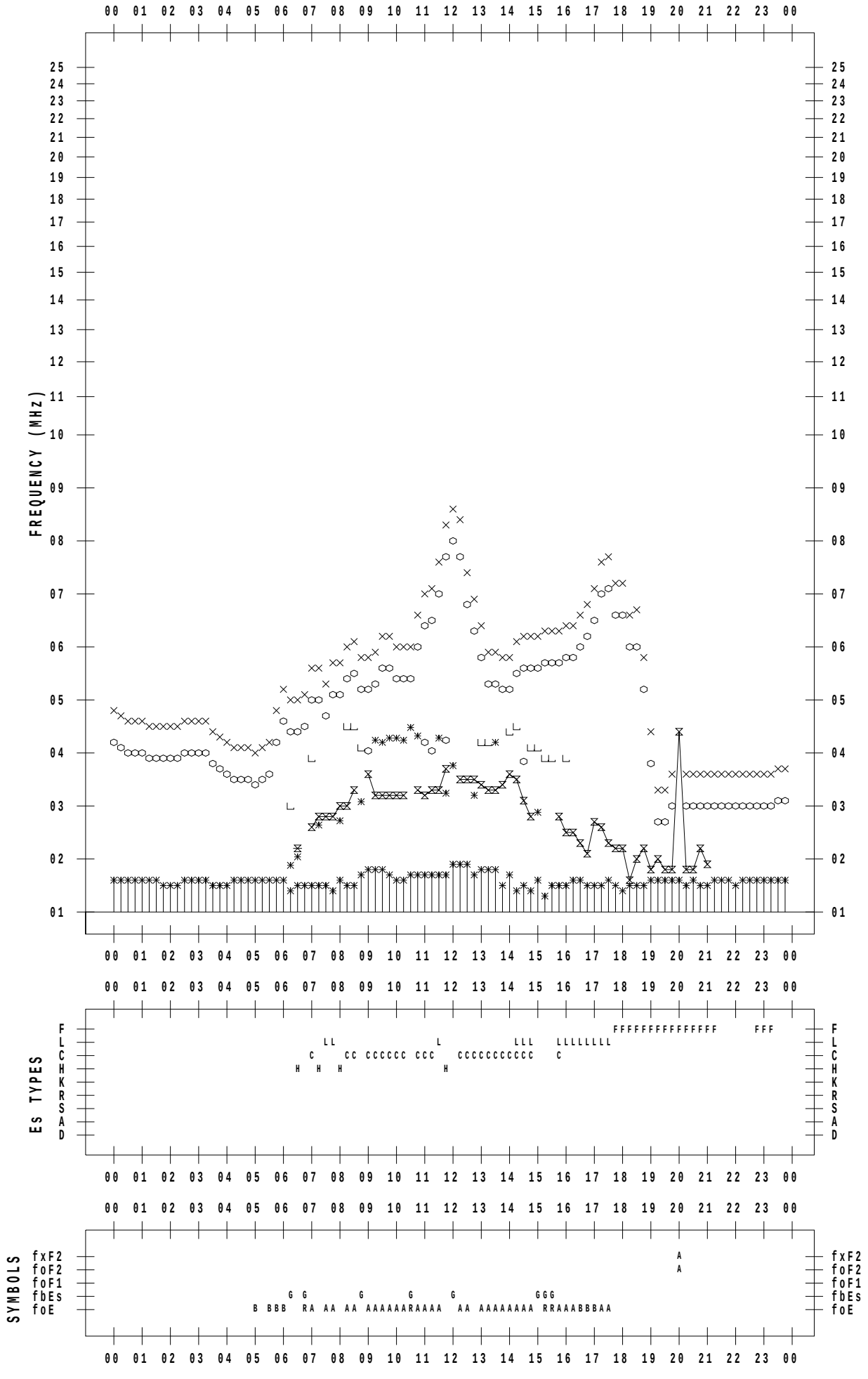
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 6

135 °E MEAN TIME



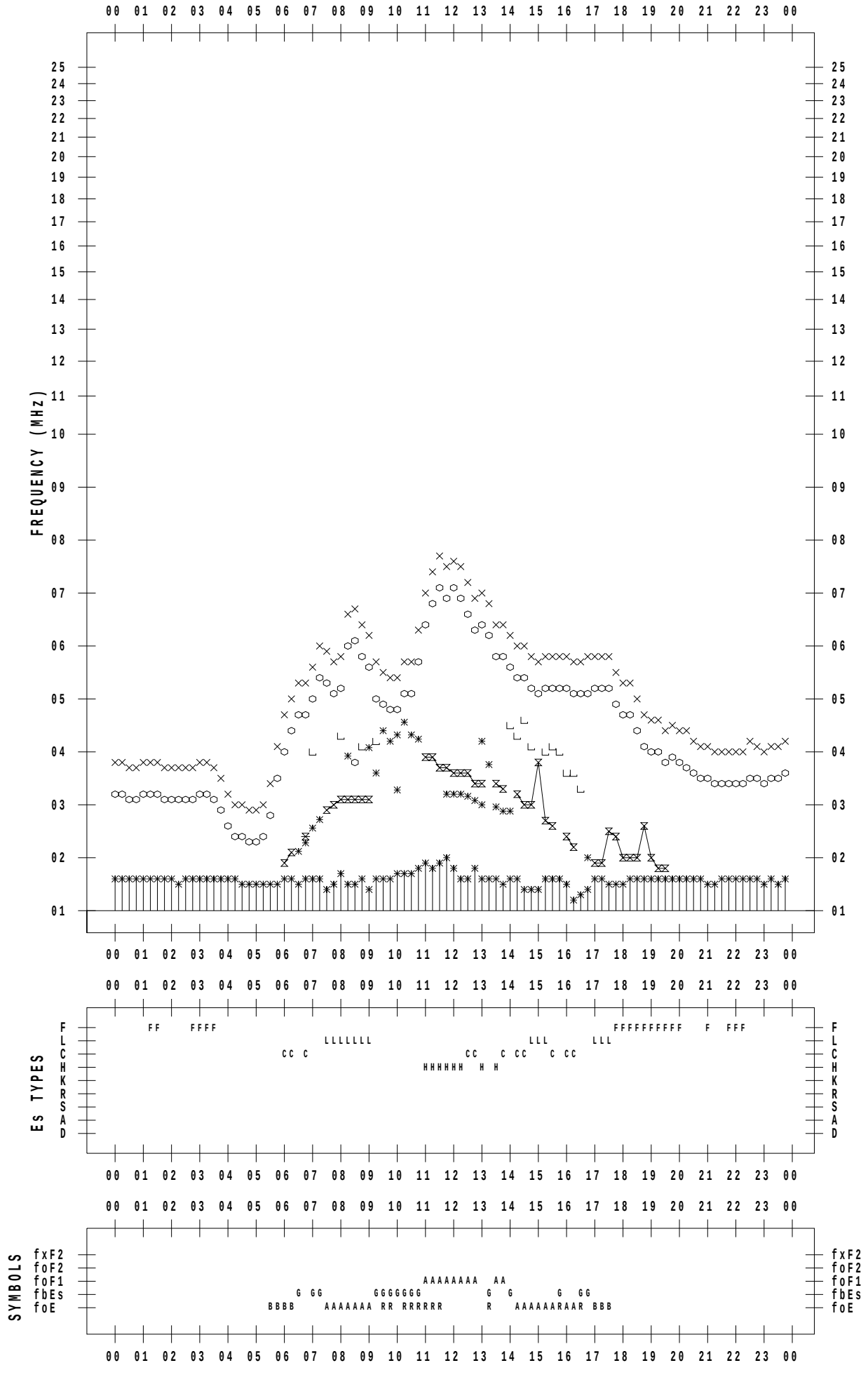
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 7

135 °E MEAN TIME



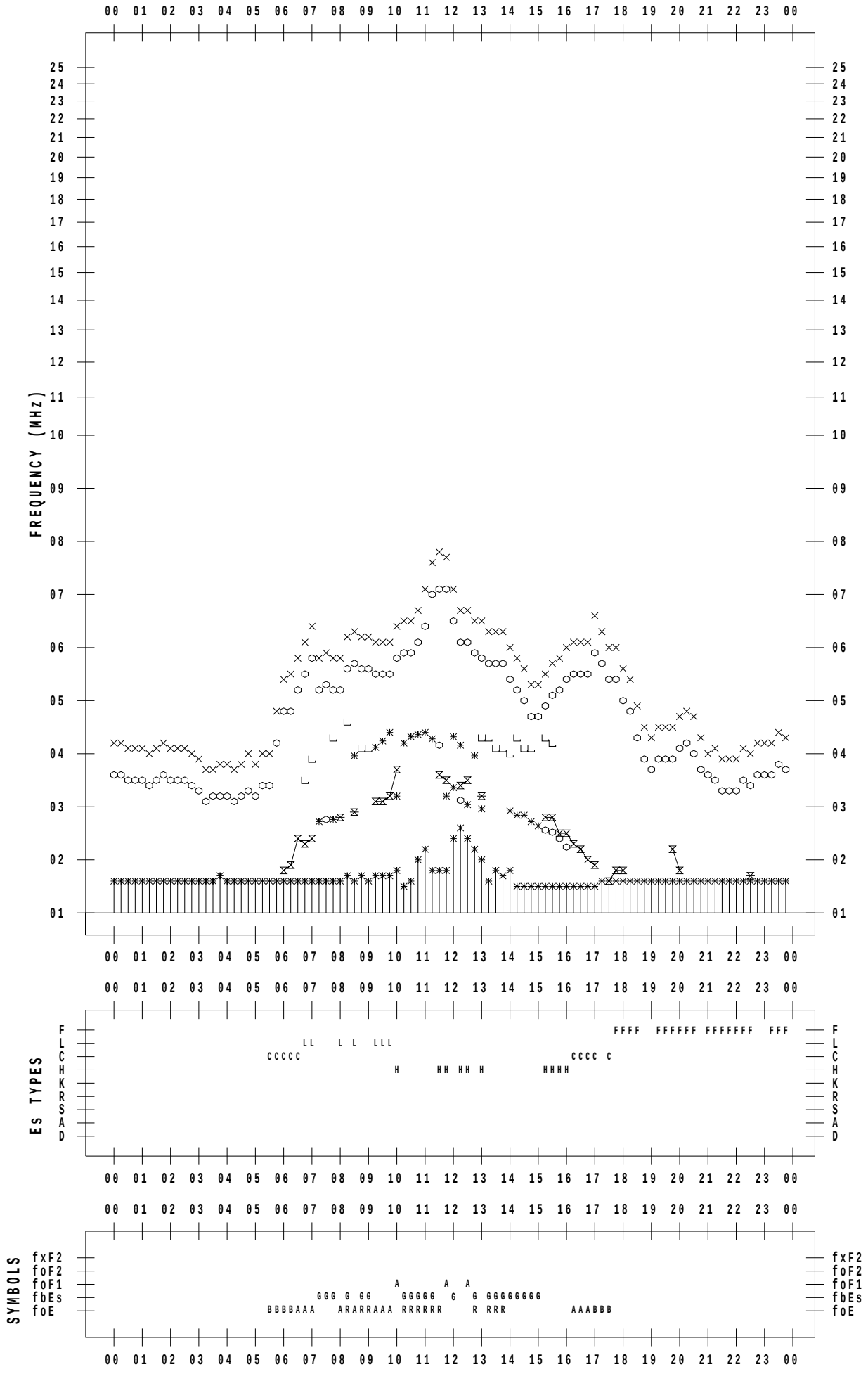
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 8

135 °E MEAN TIME



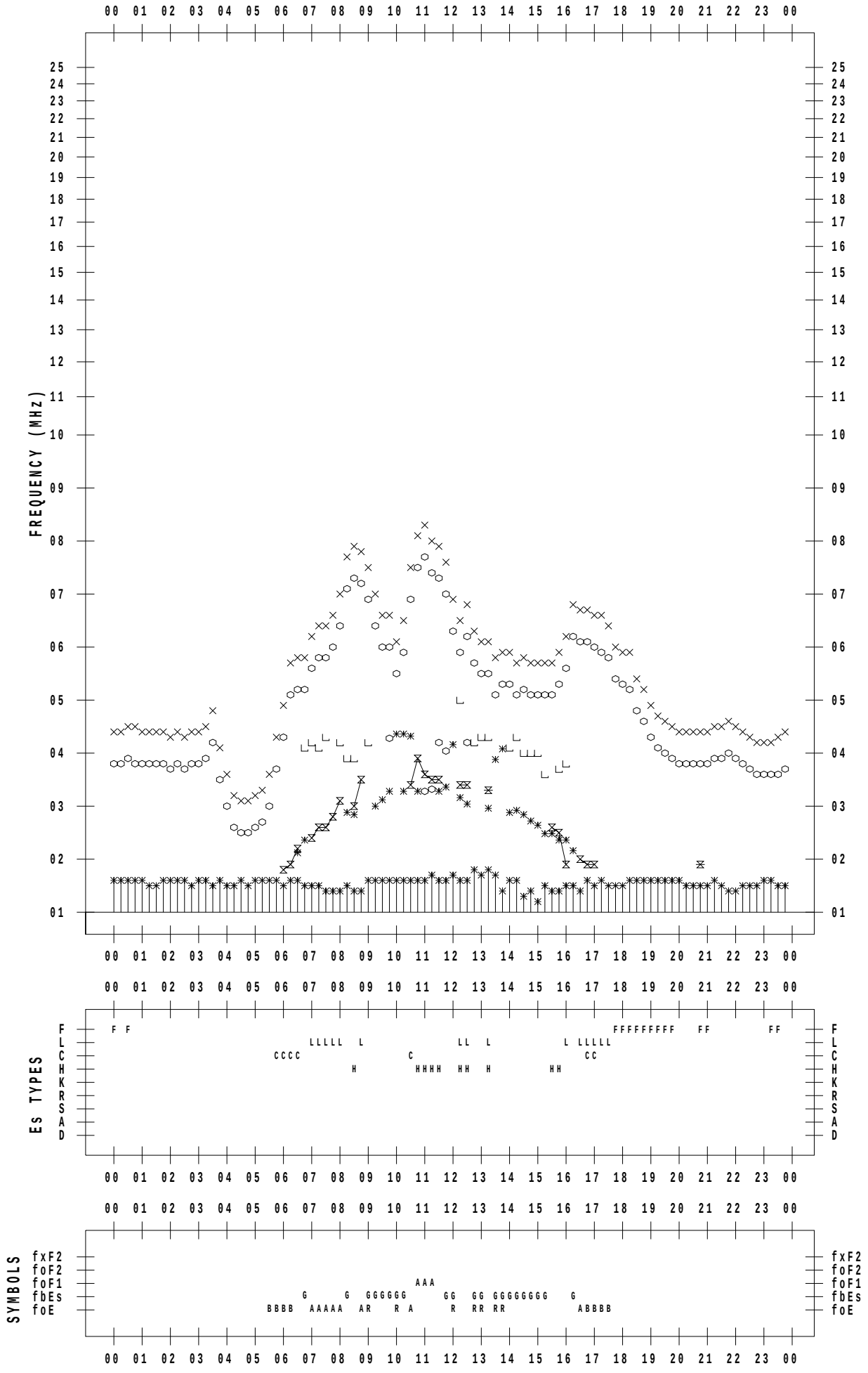
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/ 9

135 °E MEAN TIME



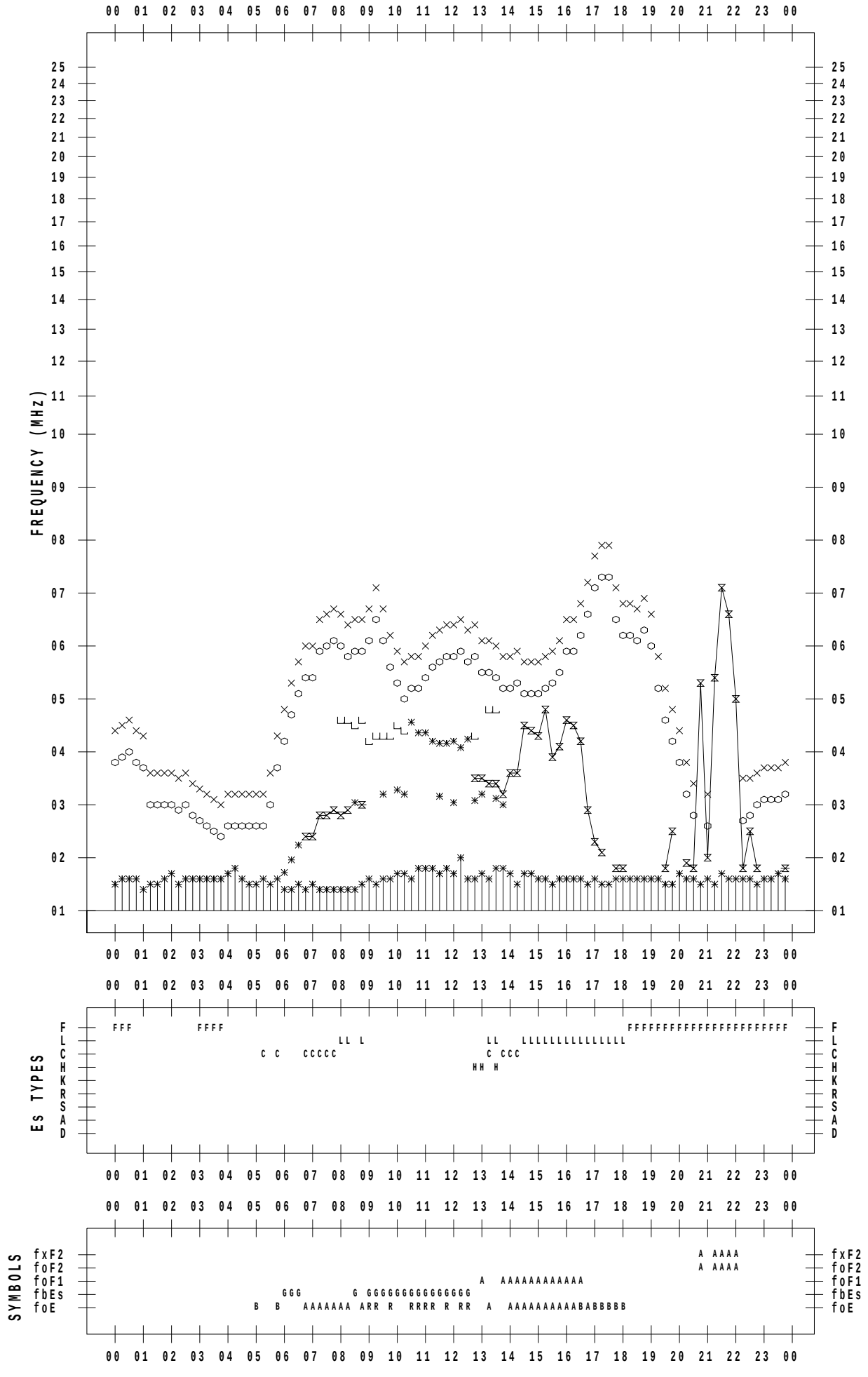
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/10

135 °E MEAN TIME



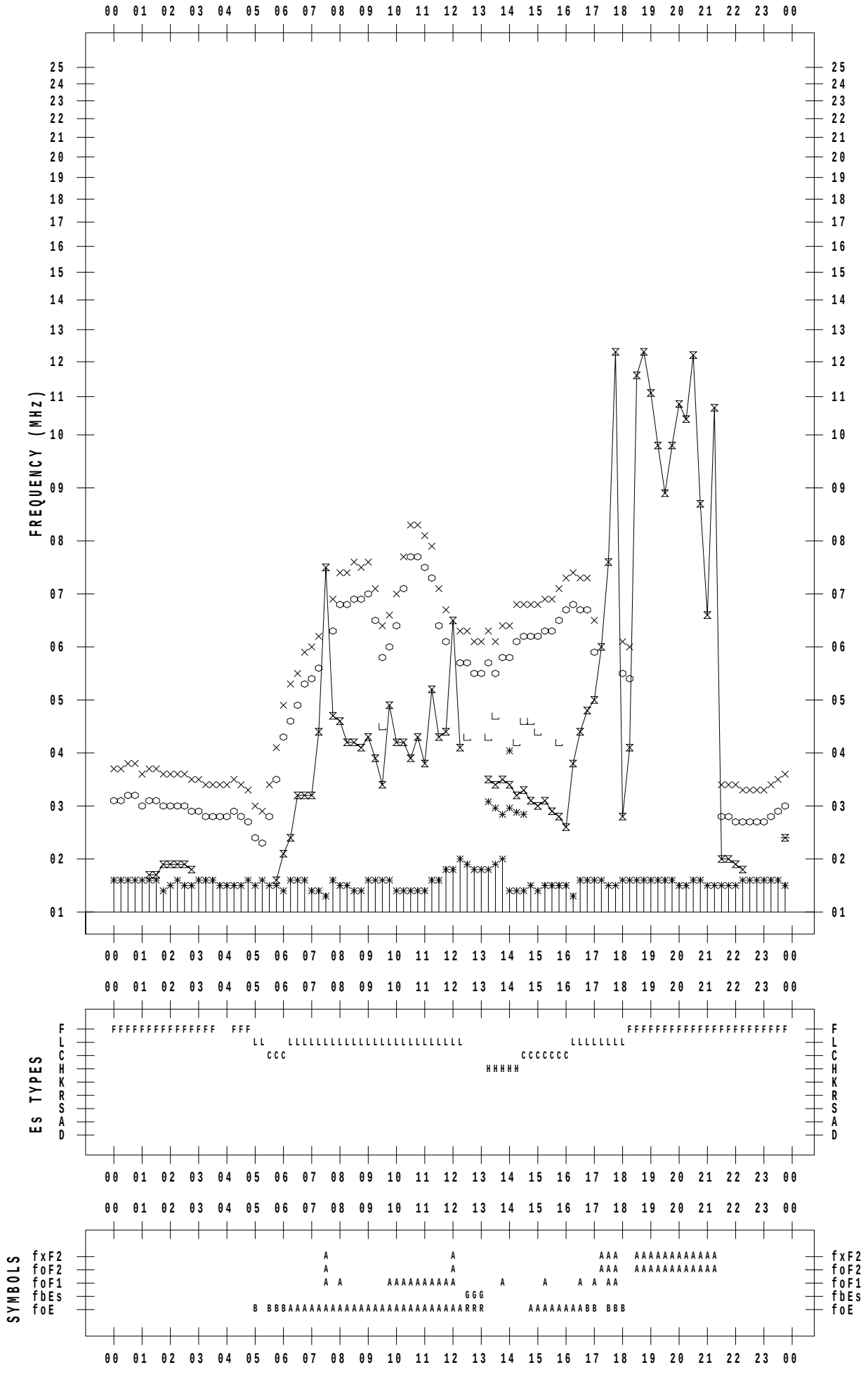
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/11

135 °E MEAN TIME



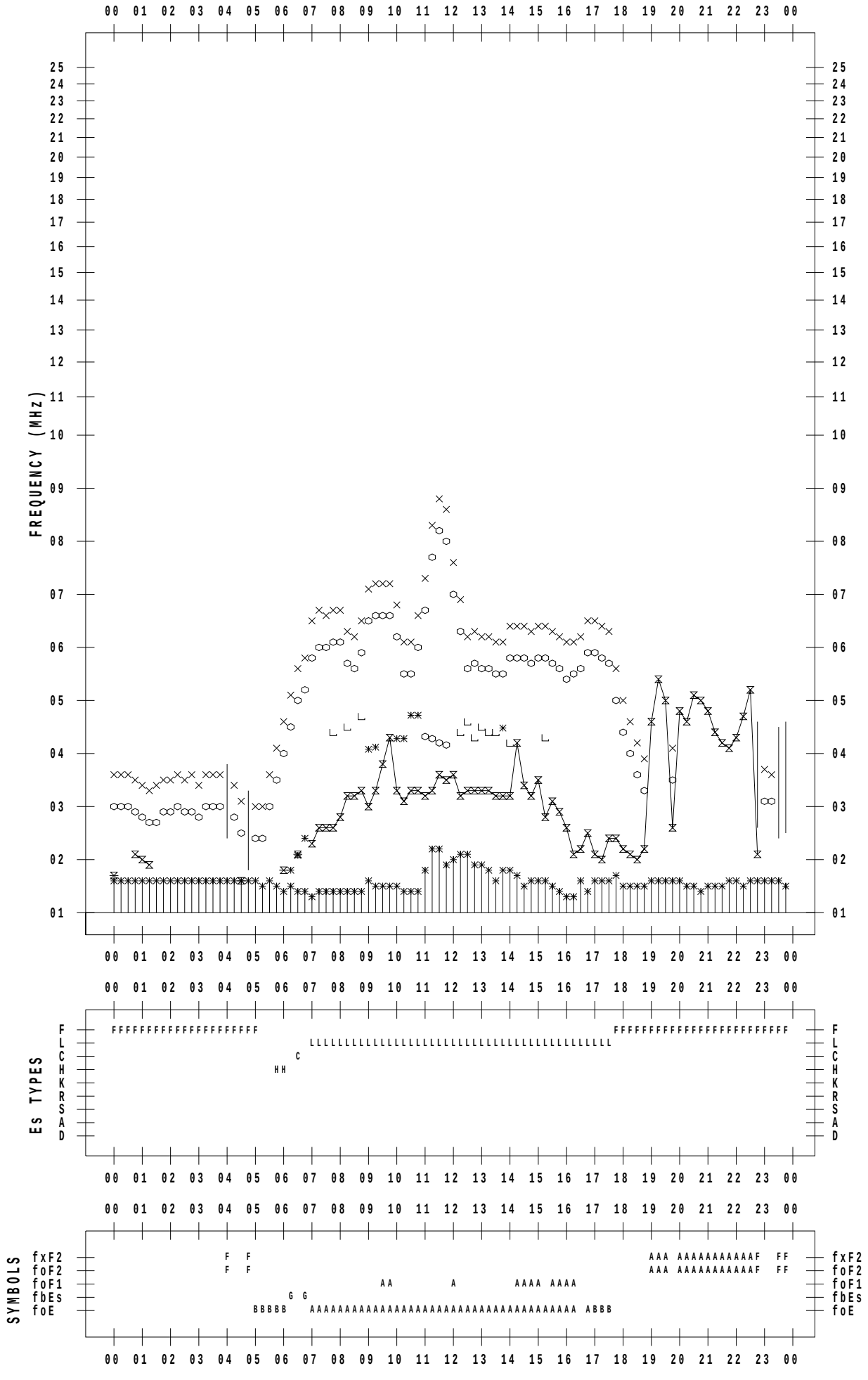
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/12

135 °E MEAN TIME



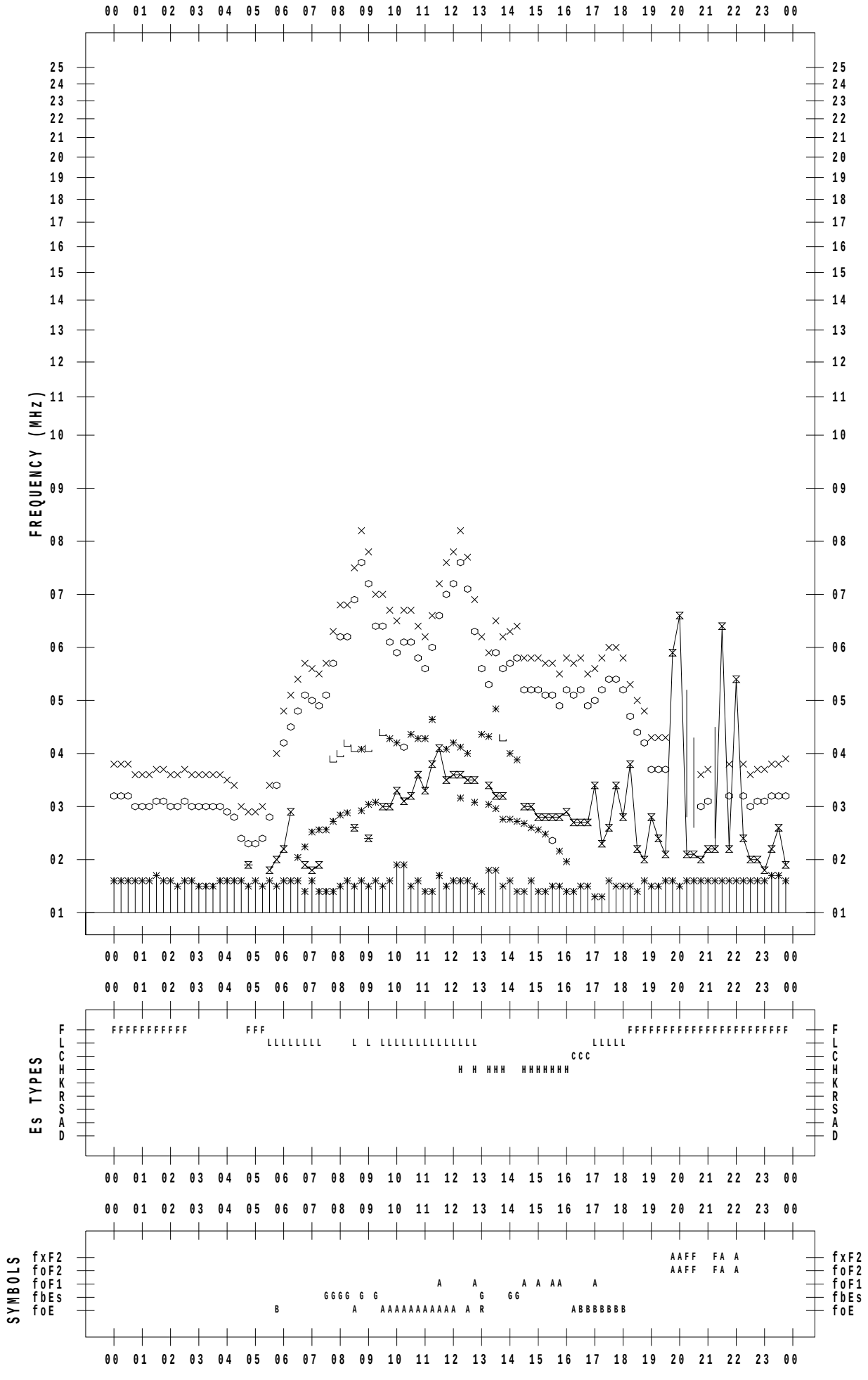
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/13

135 °E MEAN TIME



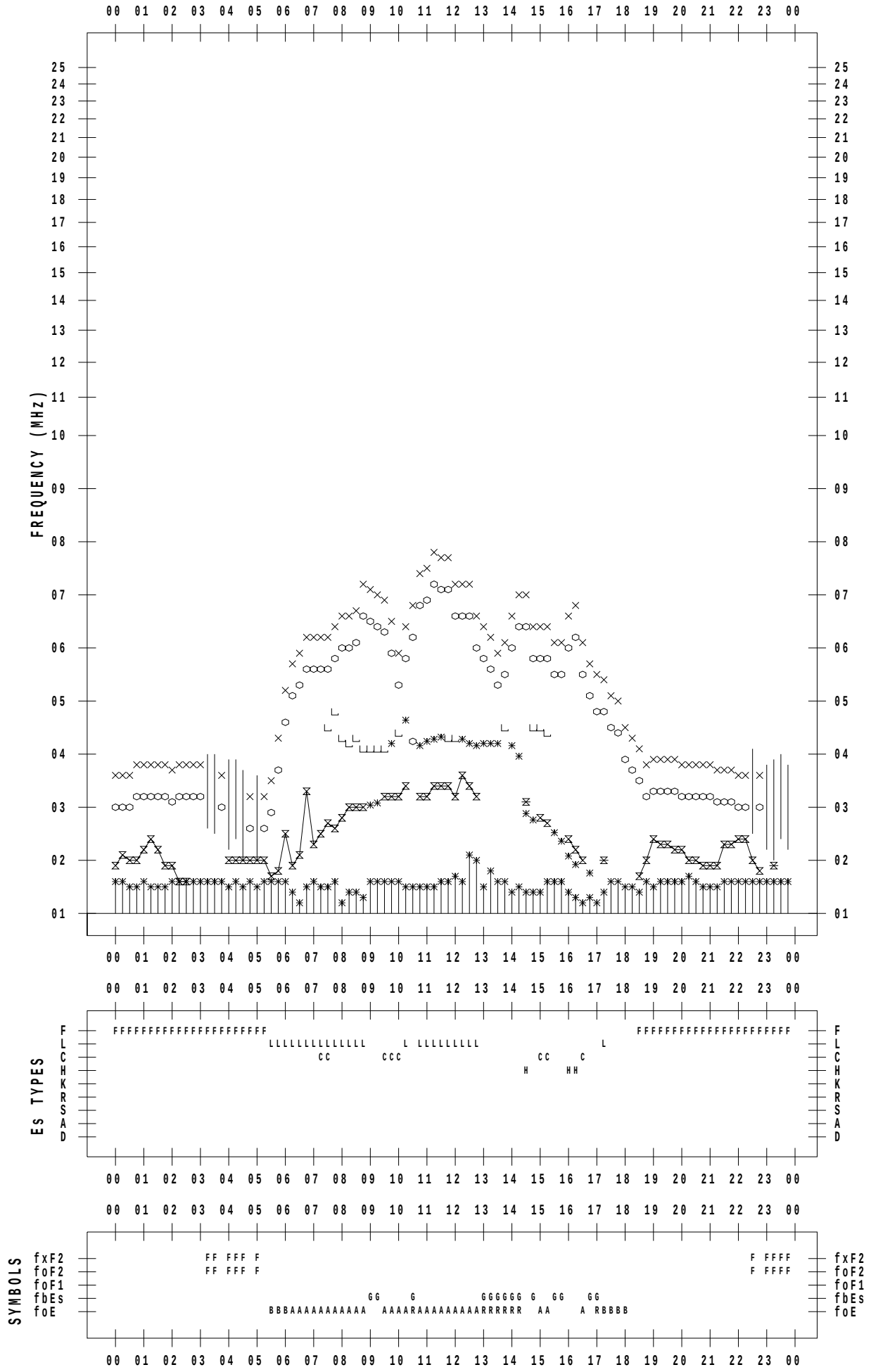
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/14

135 °E MEAN TIME



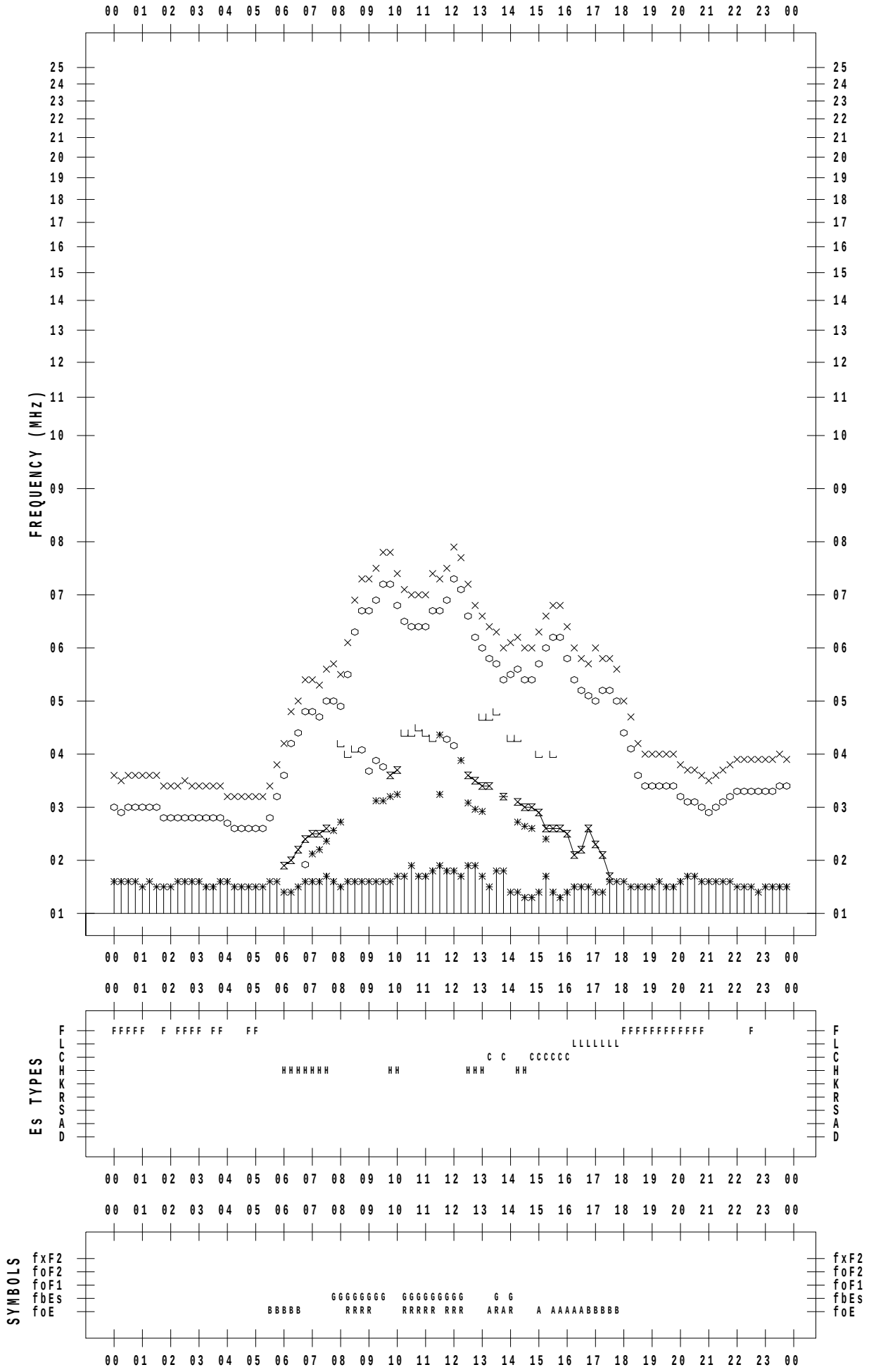
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/15

135 °E MEAN TIME



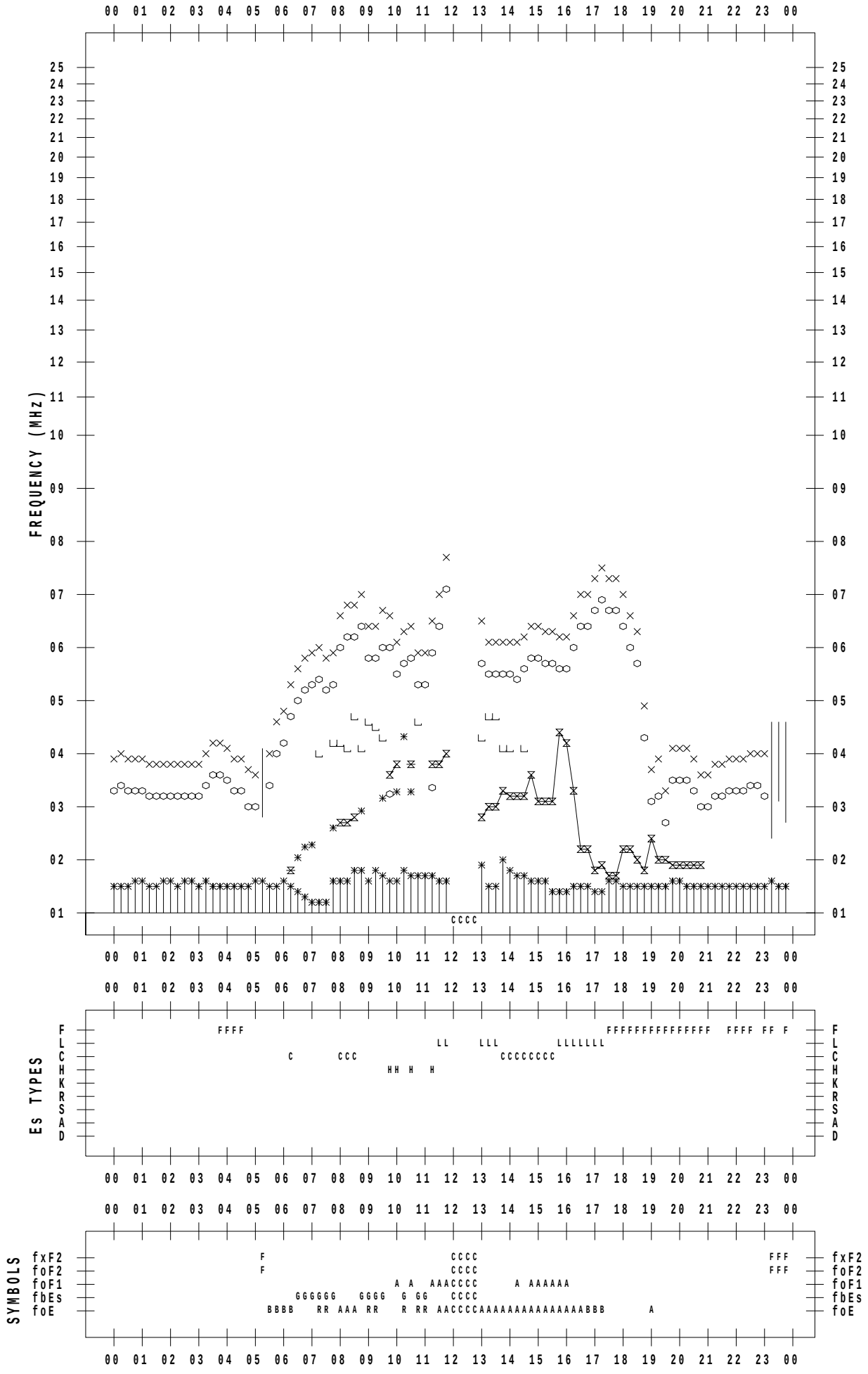
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/16

135 °E MEAN TIME



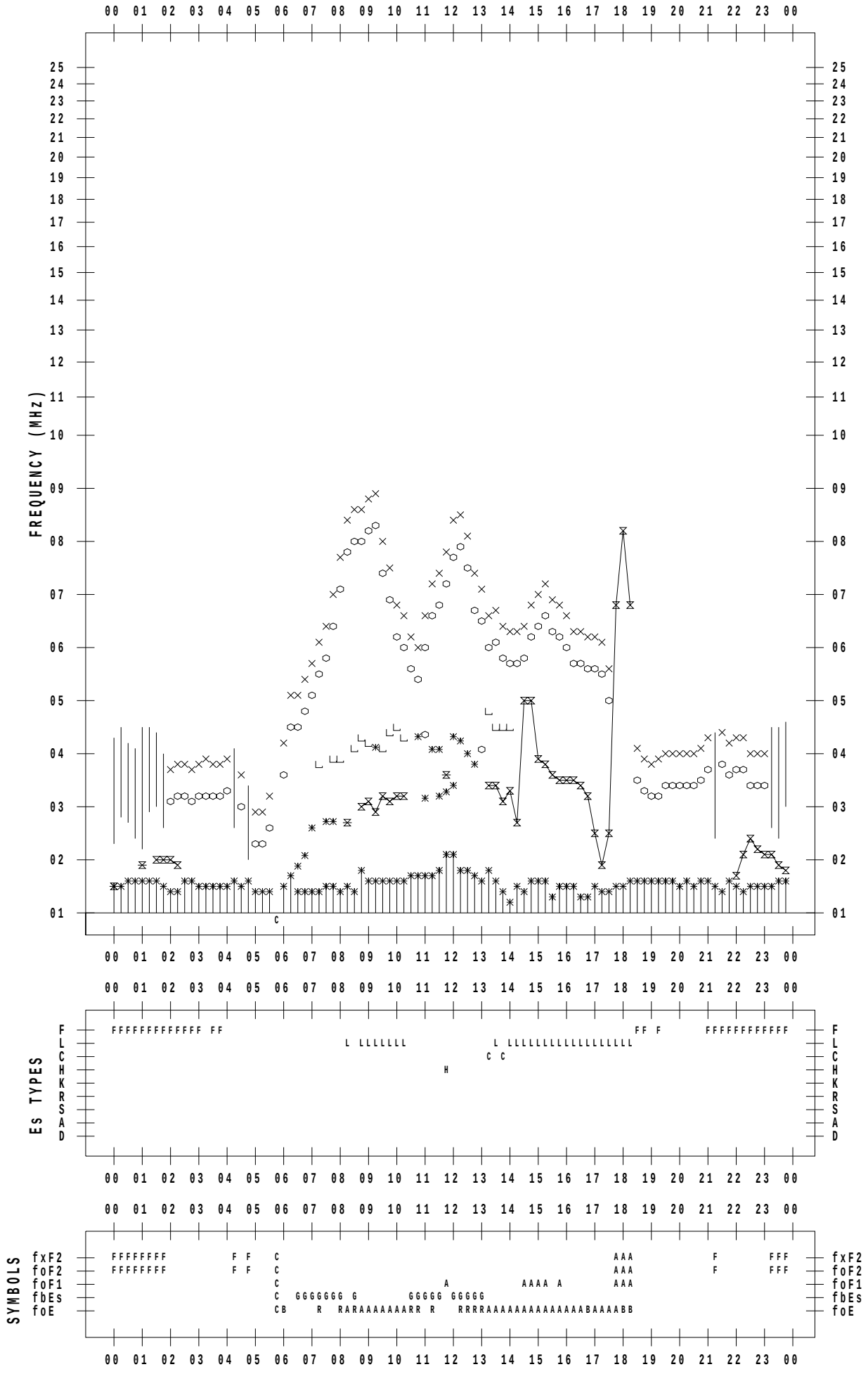
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/17

135 °E MEAN TIME



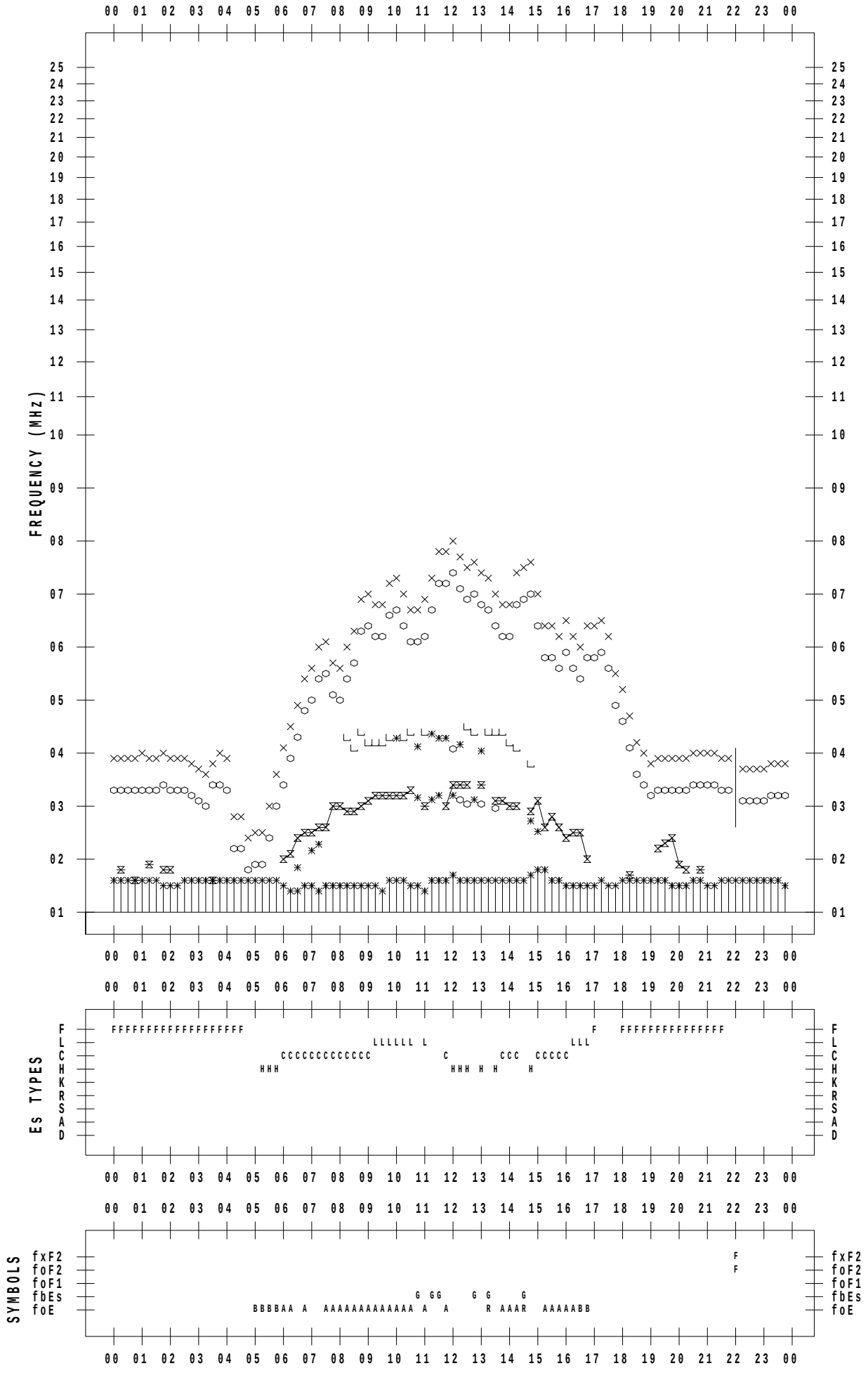
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/18

135 °E MEAN TIME



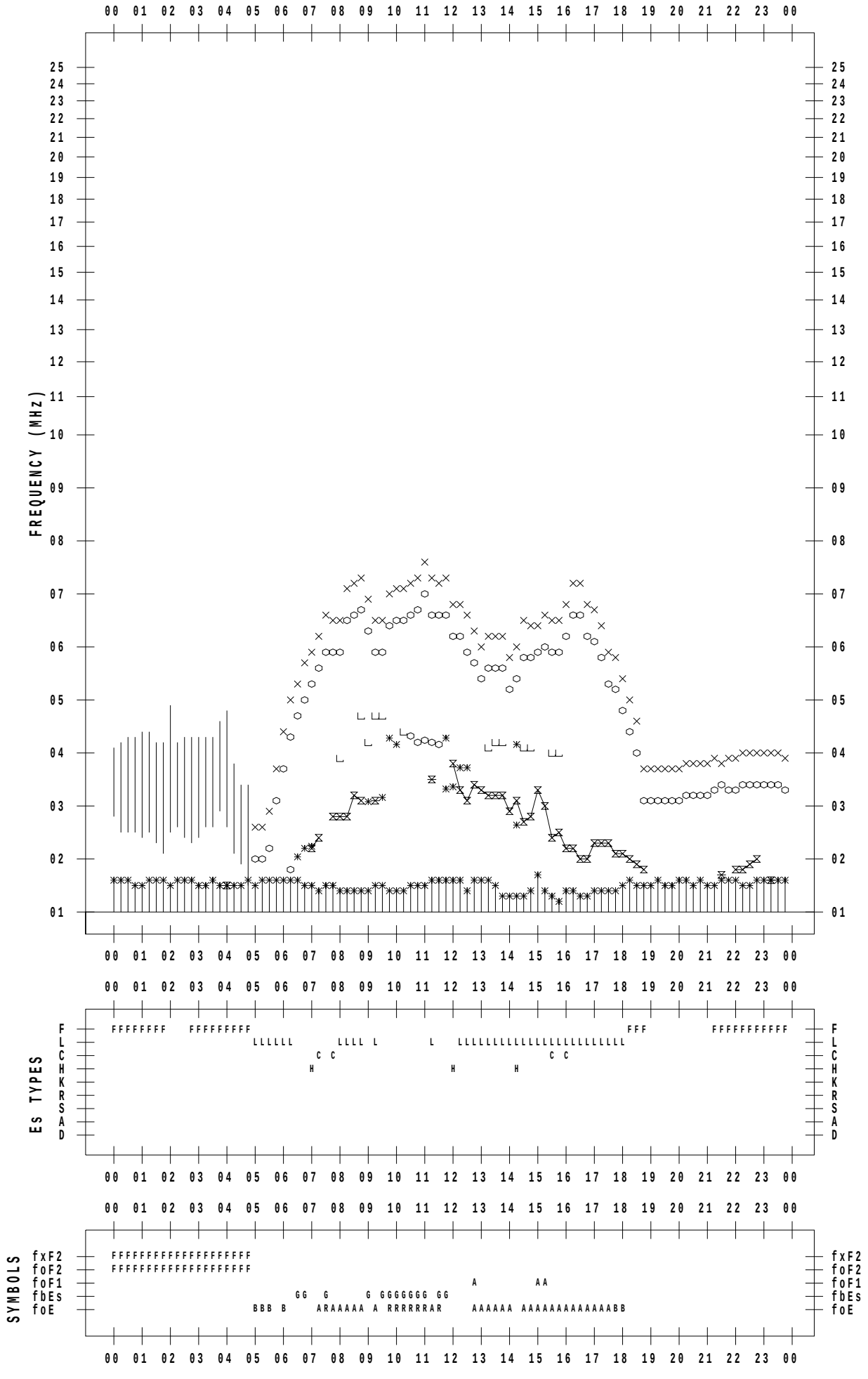
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/19

135 °E MEAN TIME



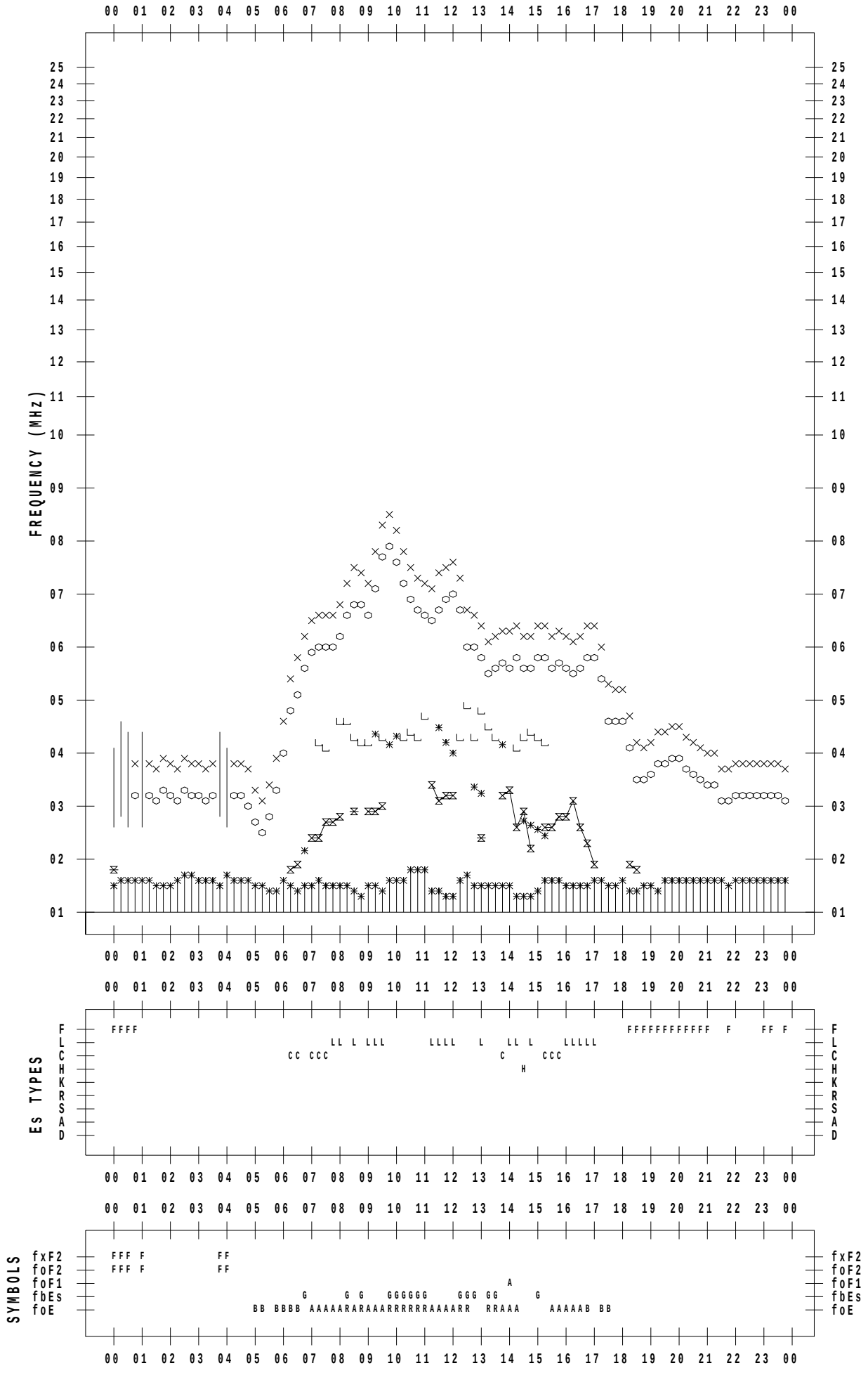
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/20

135 °E MEAN TIME



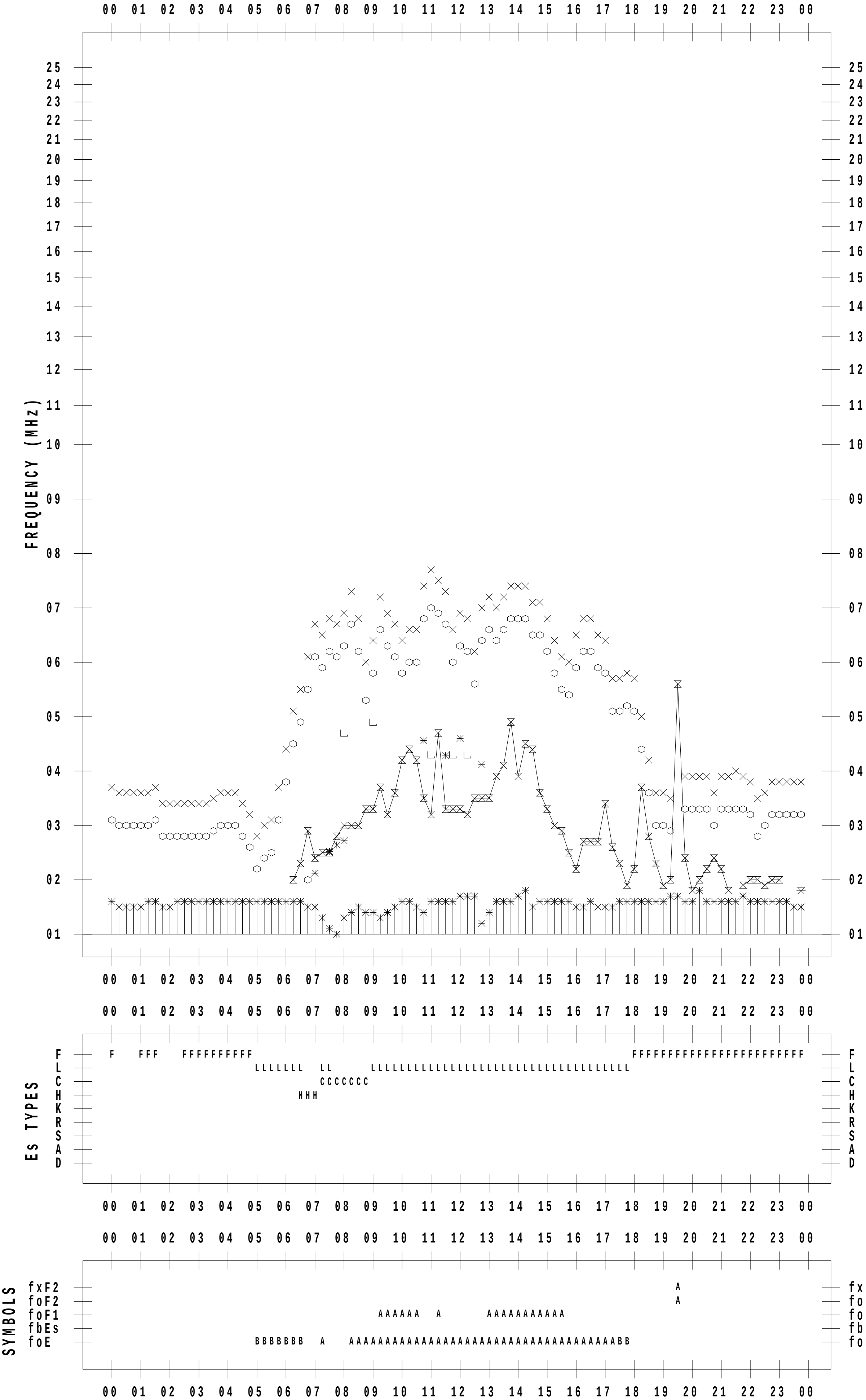
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/21

135 °E MEAN TIME



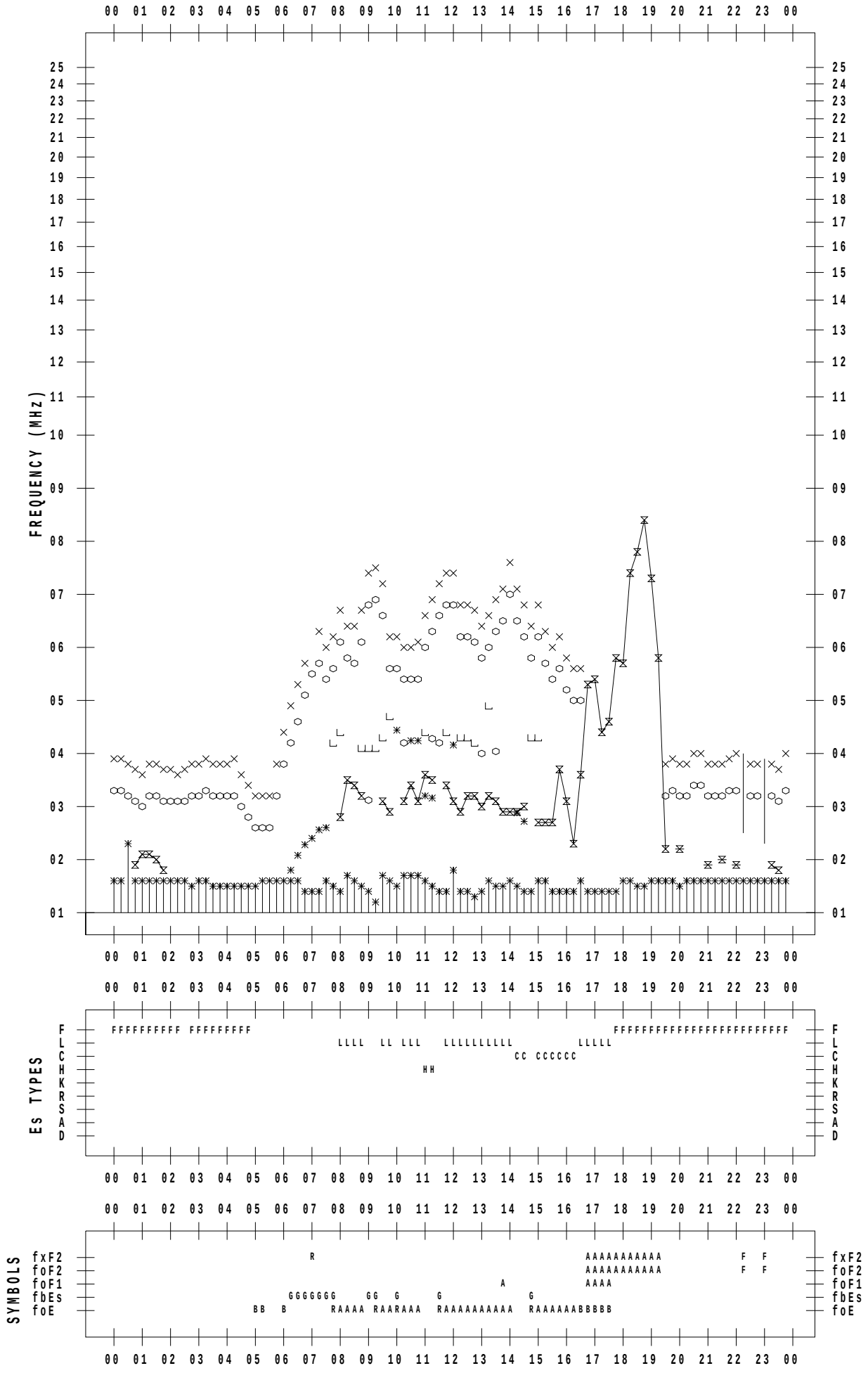
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/22

135 °E MEAN TIME



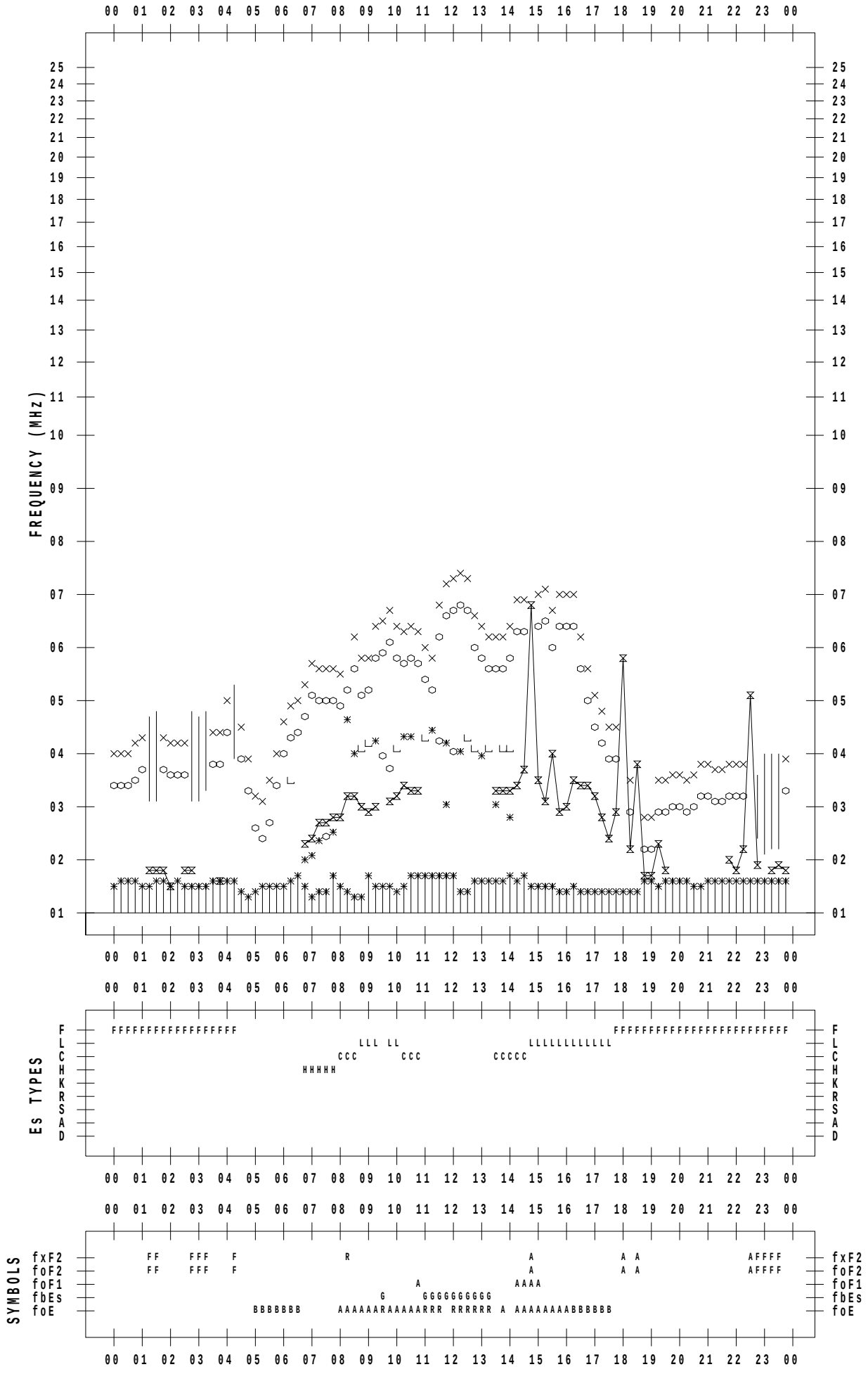
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/23

135 °E MEAN TIME



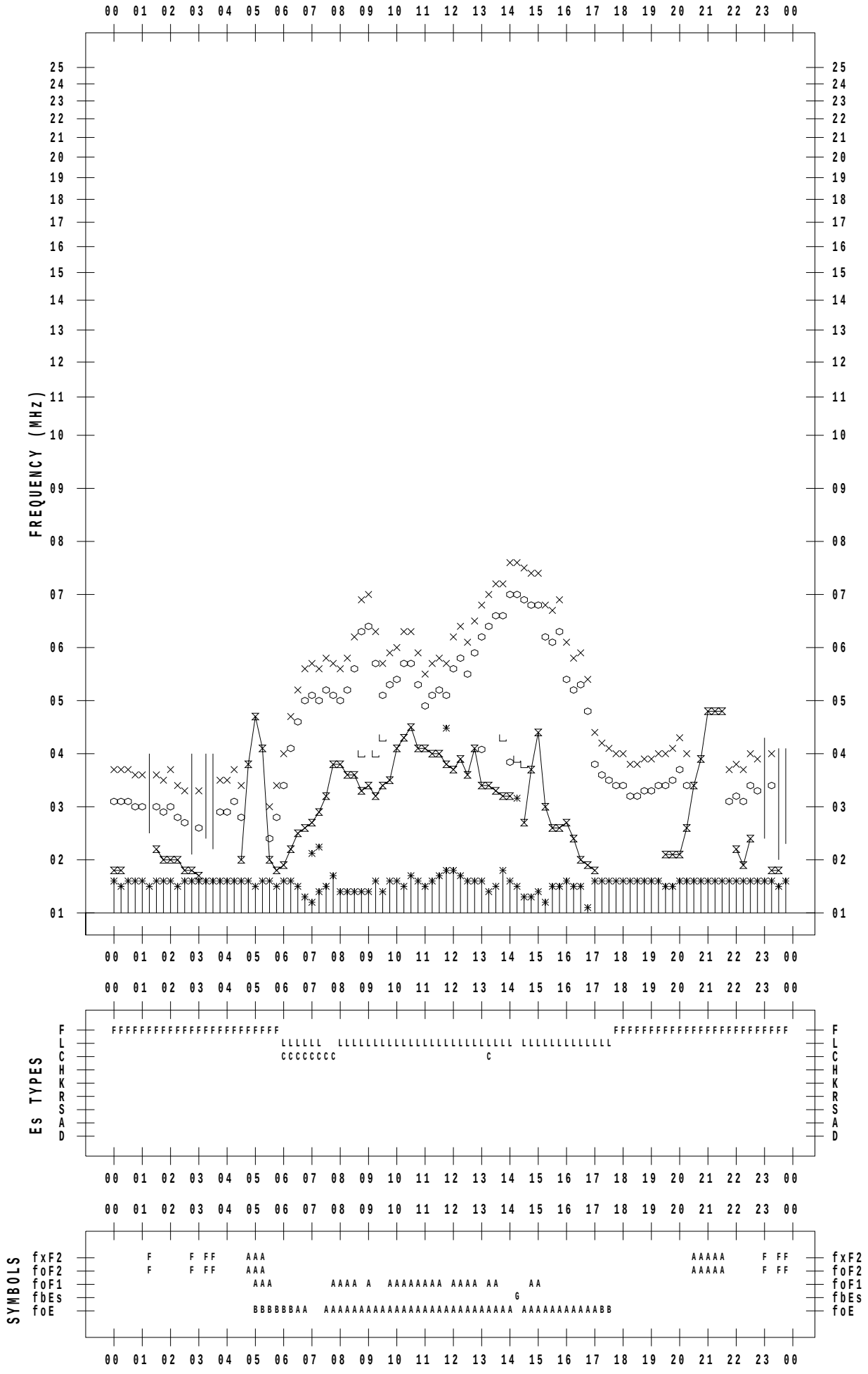
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/24

135 °E MEAN TIME



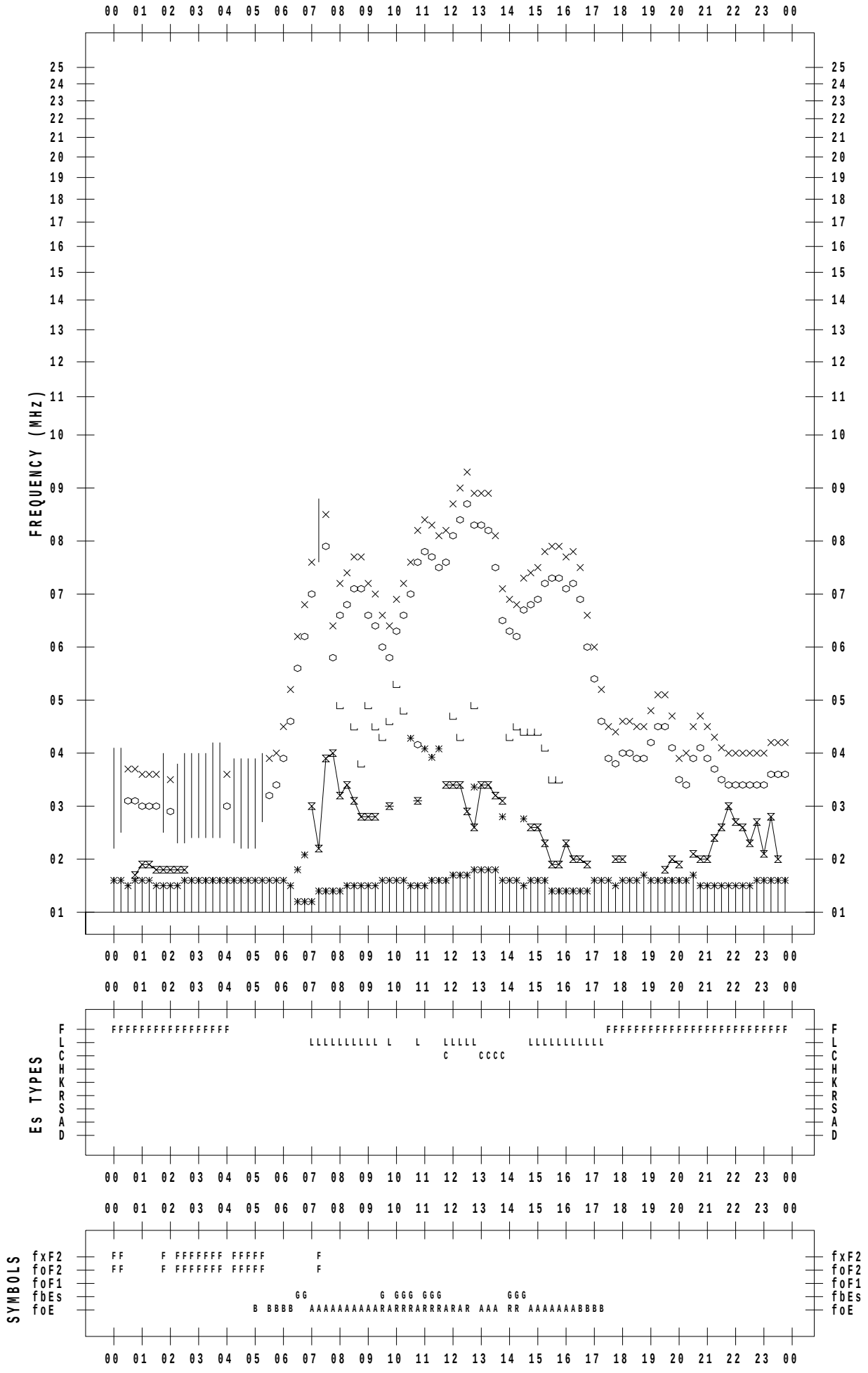
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/25

135 °E MEAN TIME



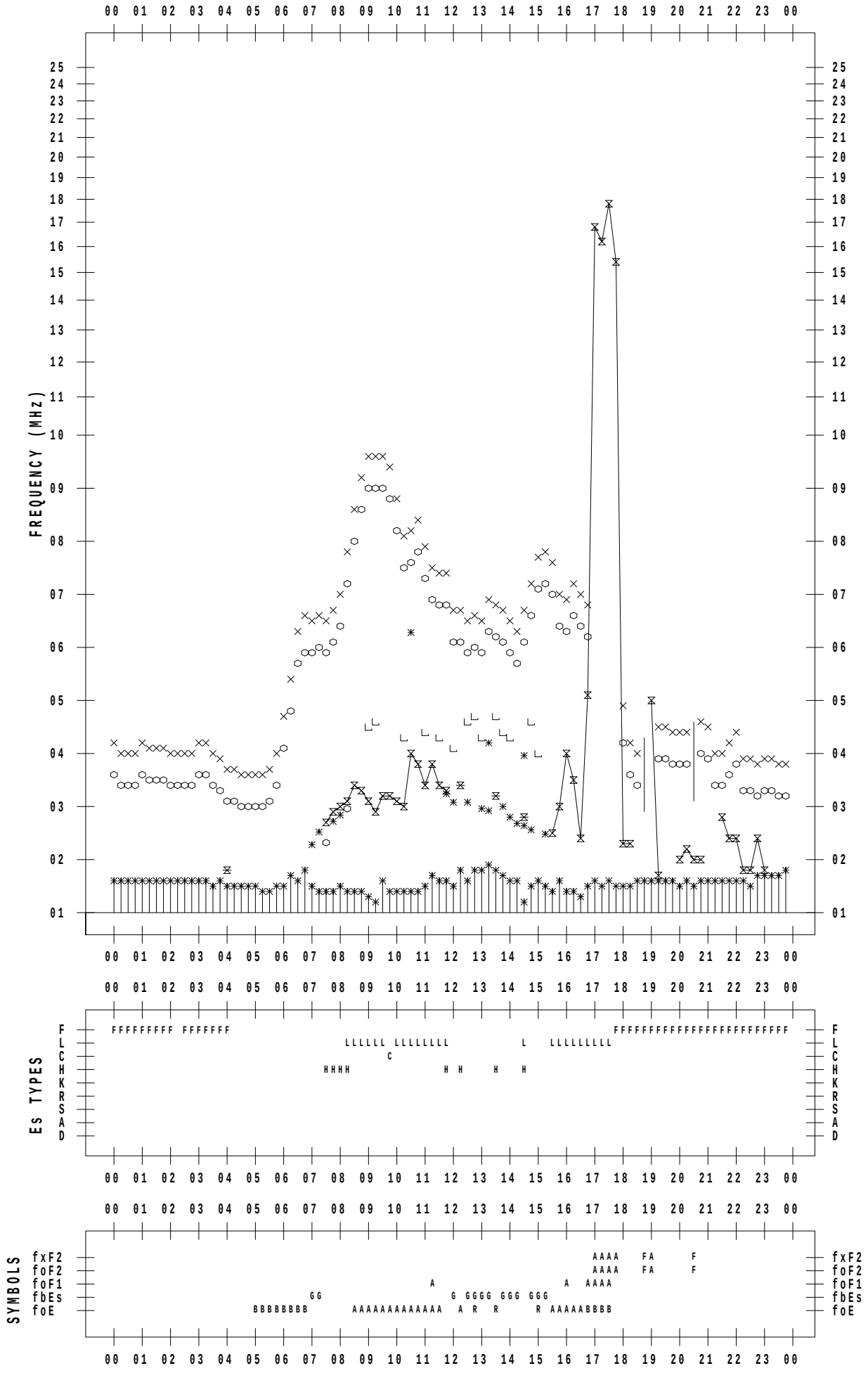
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/26

135 °E MEAN TIME



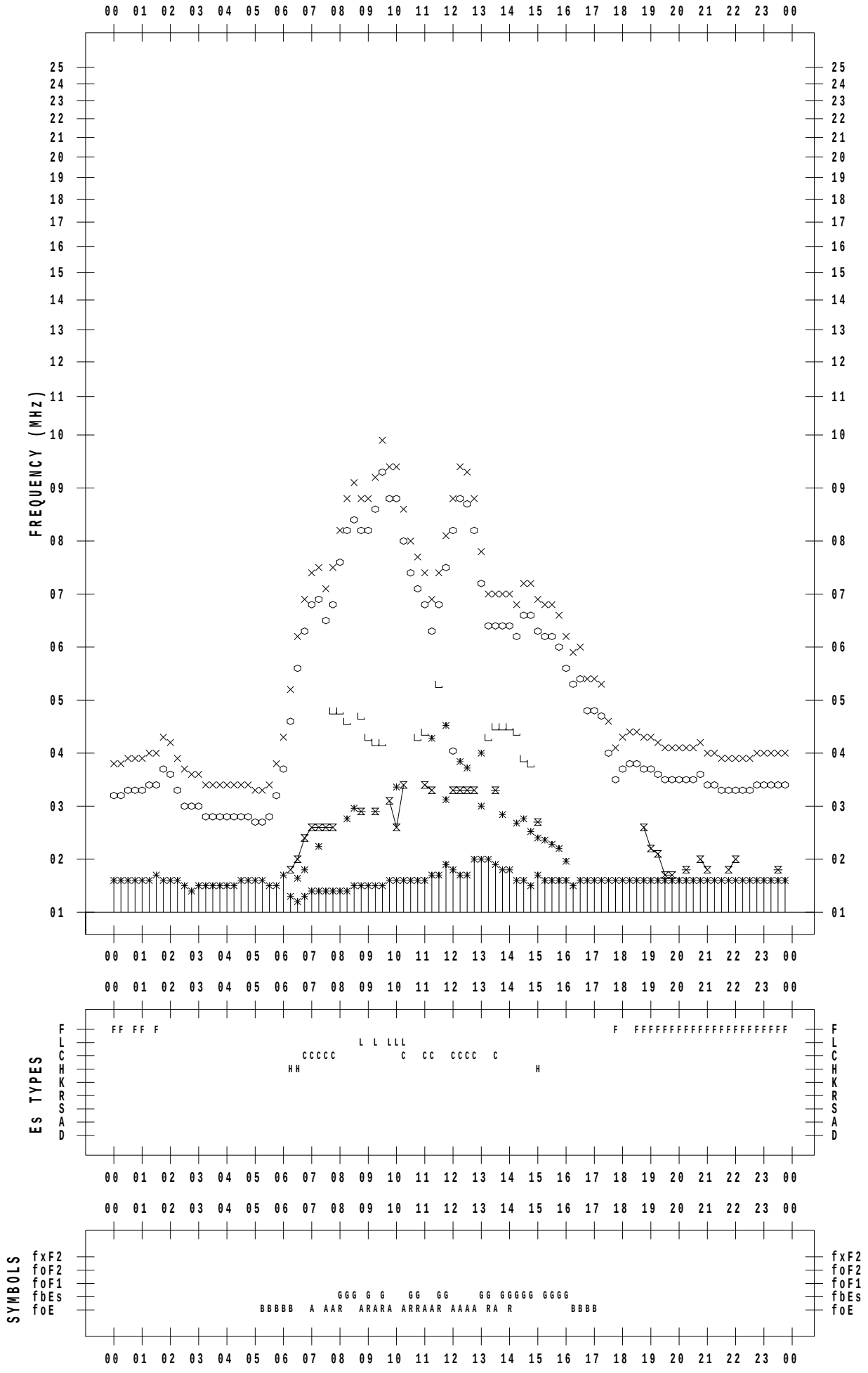
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/27

135 °E MEAN TIME



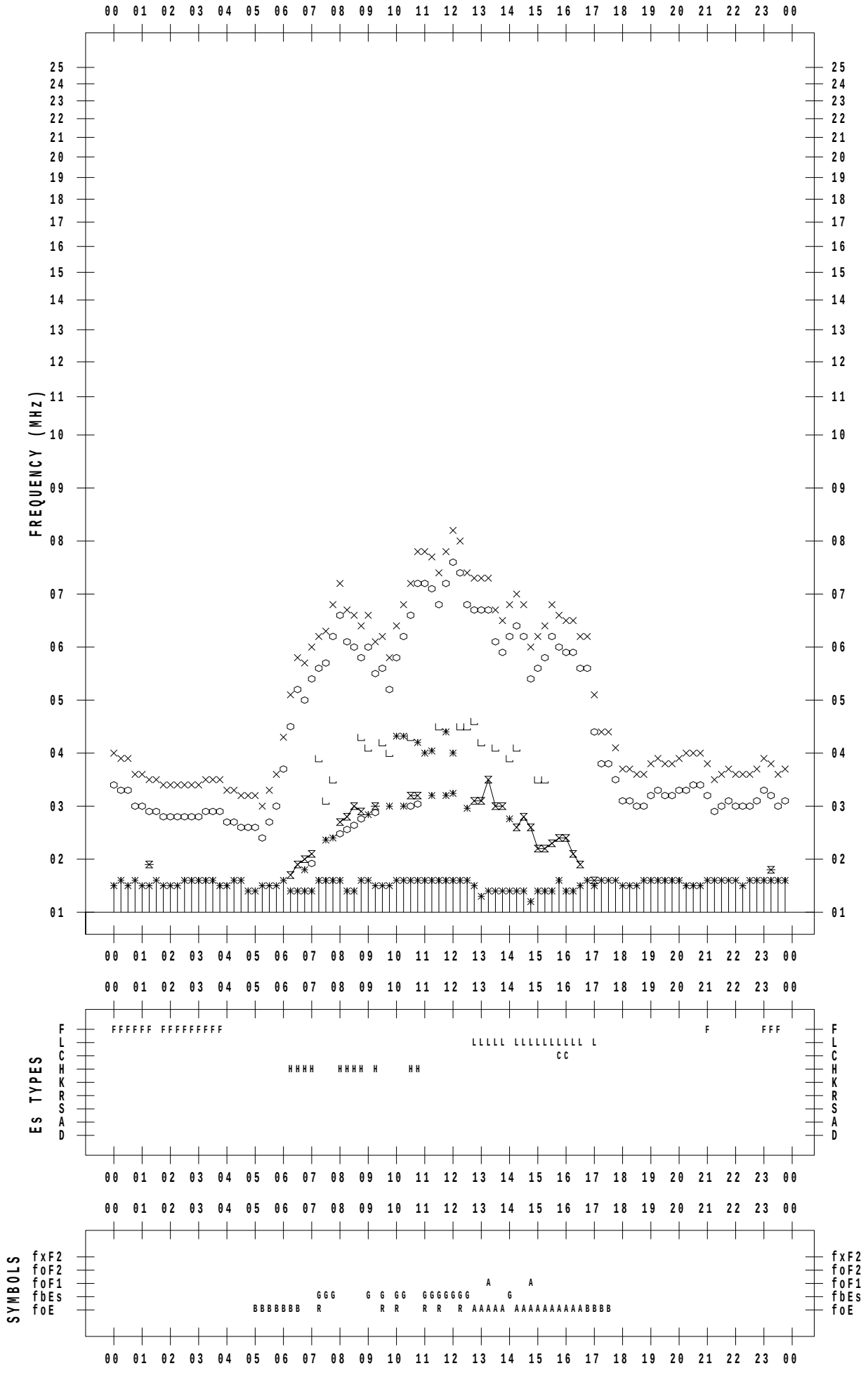
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/28

135 °E MEAN TIME



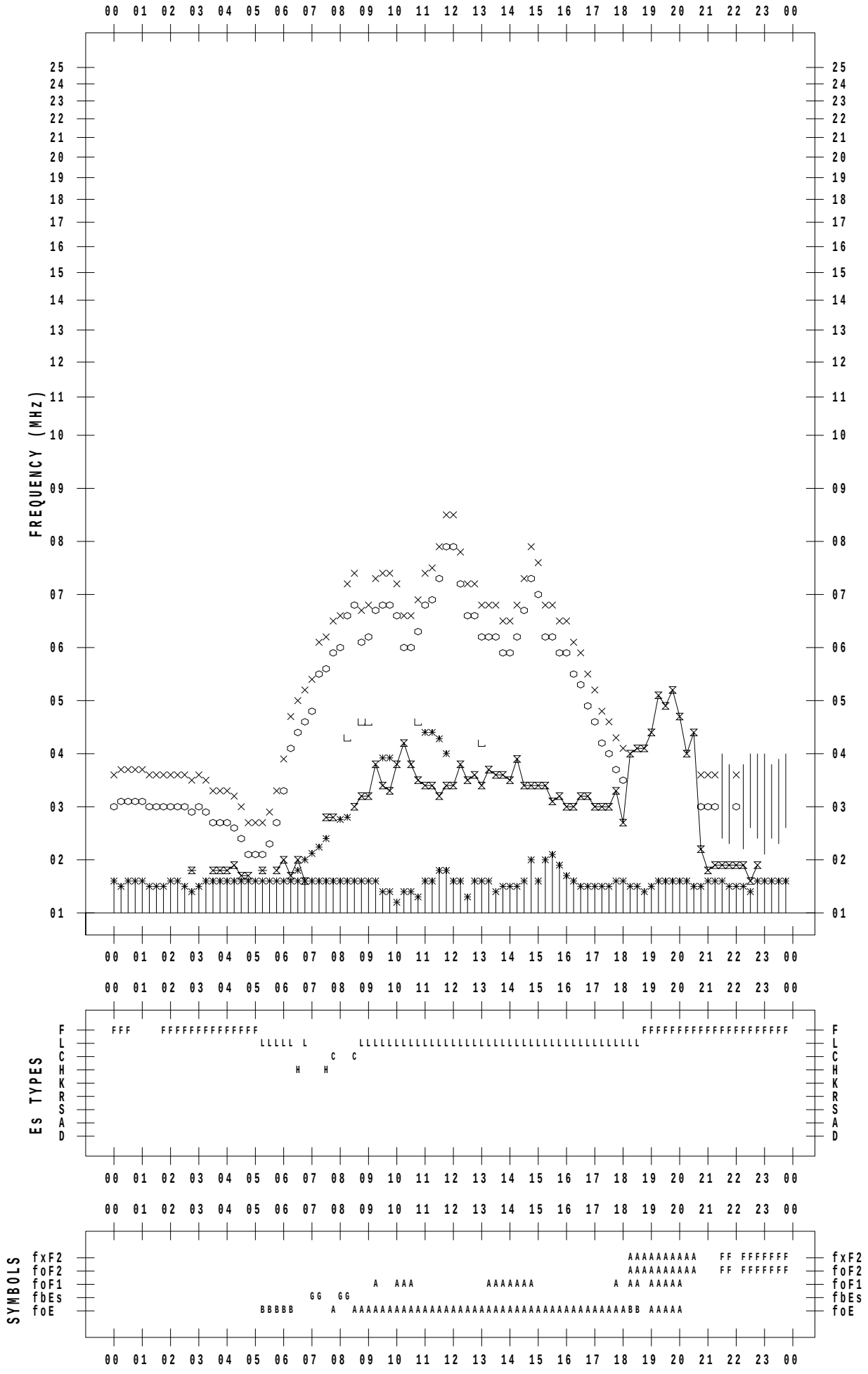
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/29

135 °E MEAN TIME



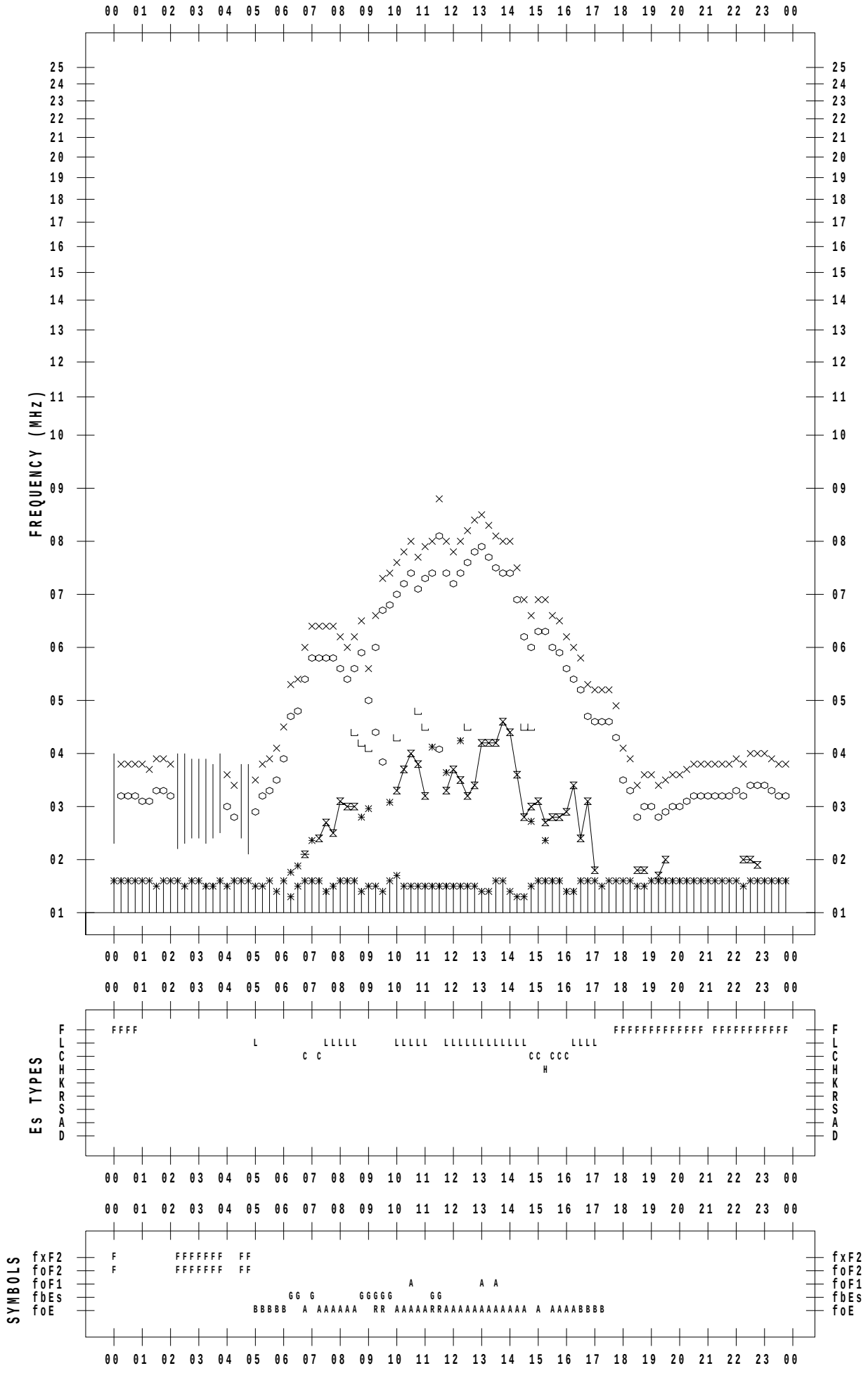
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/30

135 °E MEAN TIME



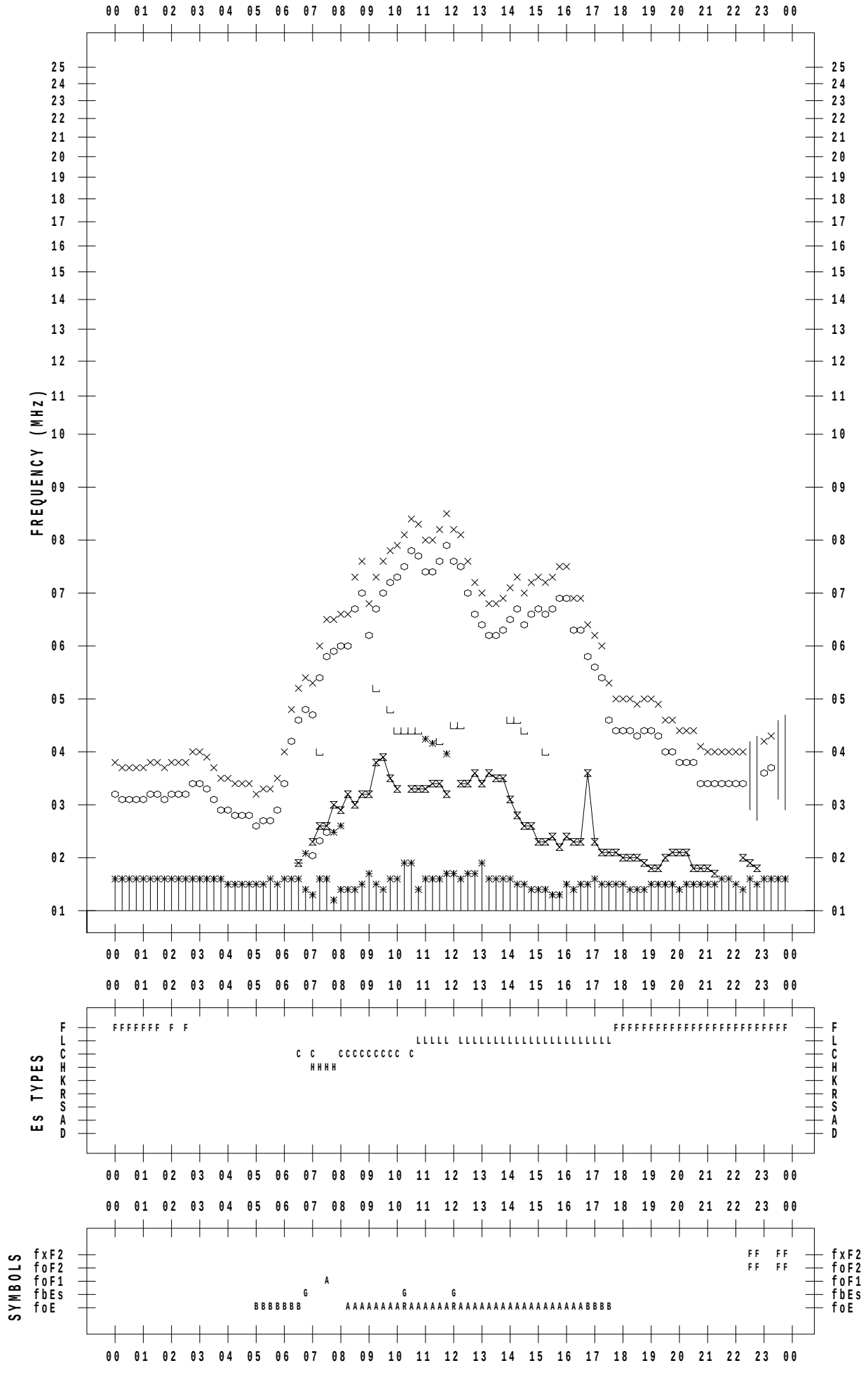
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2019/10/31

135 °E MEAN TIME



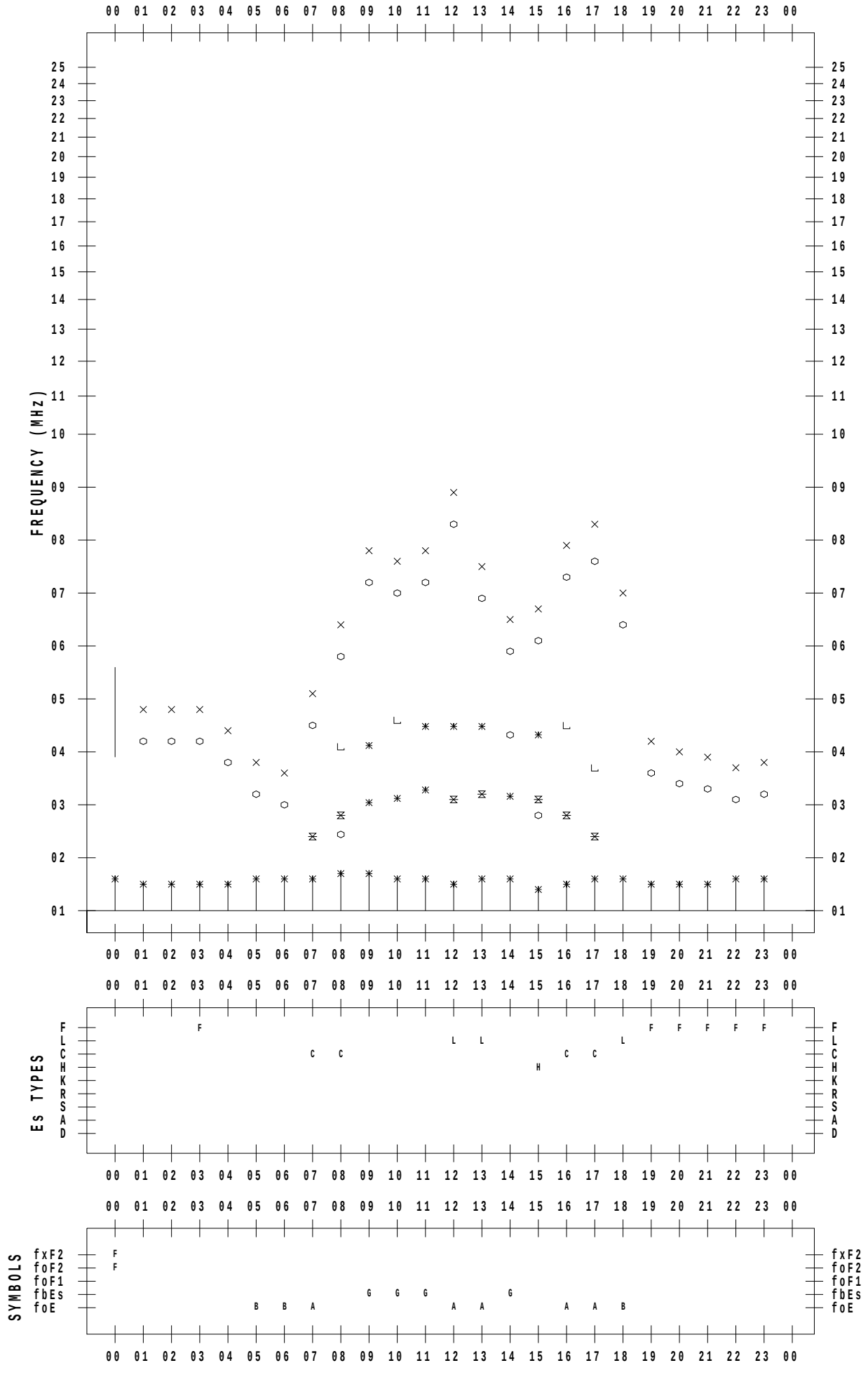
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 1

135 °E MEAN TIME



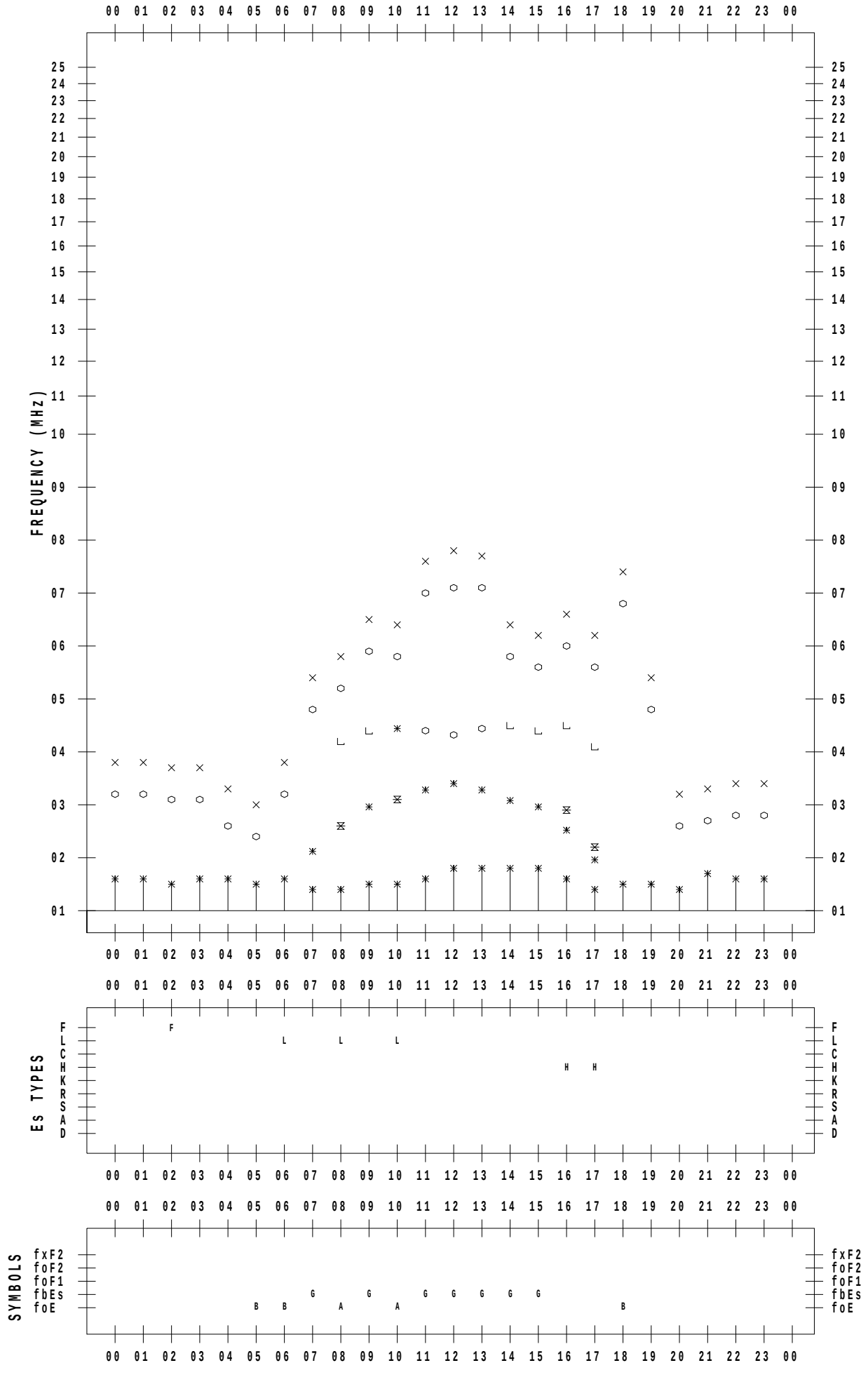
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 2

135 °E MEAN TIME



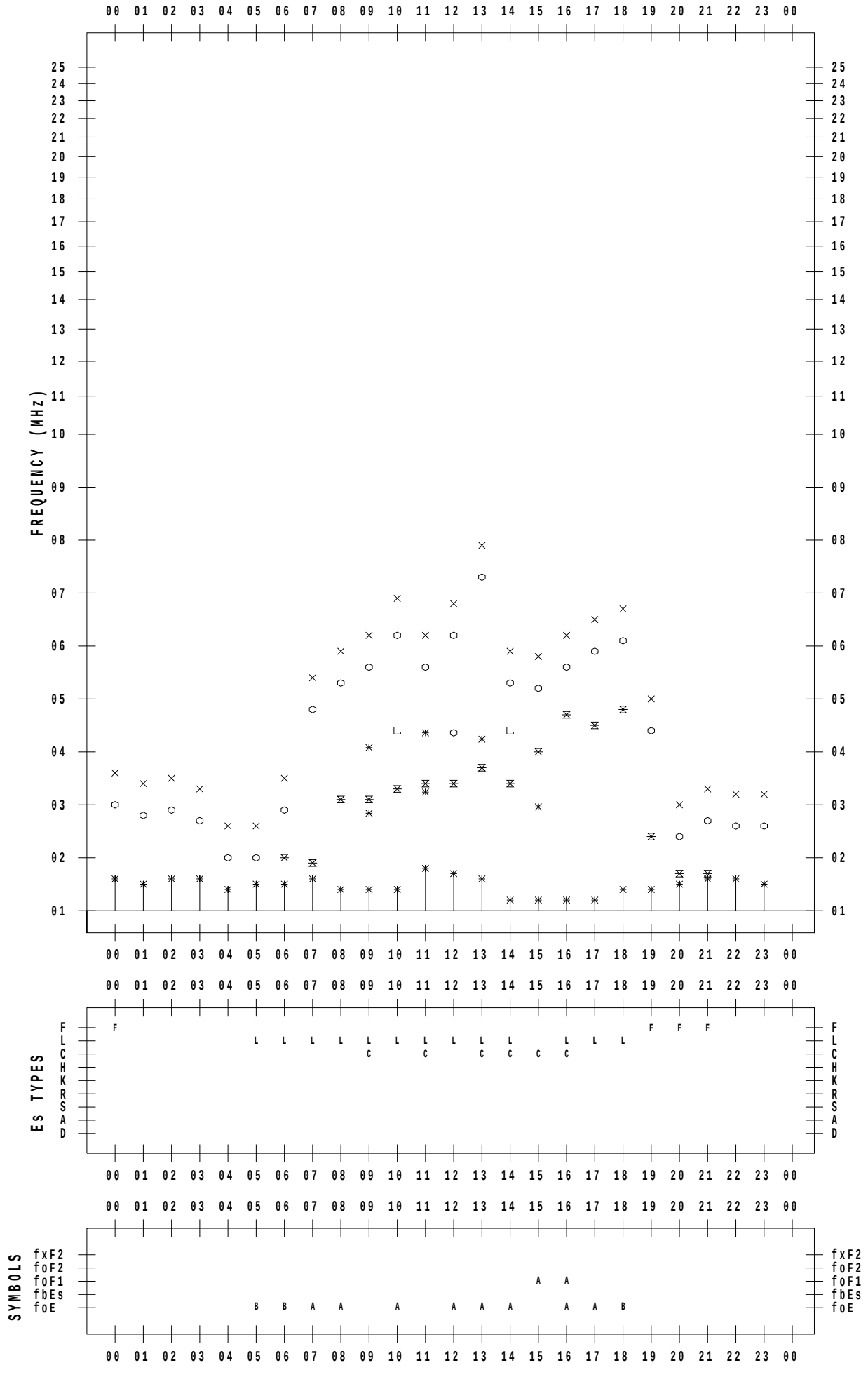
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 3

135 °E MEAN TIME



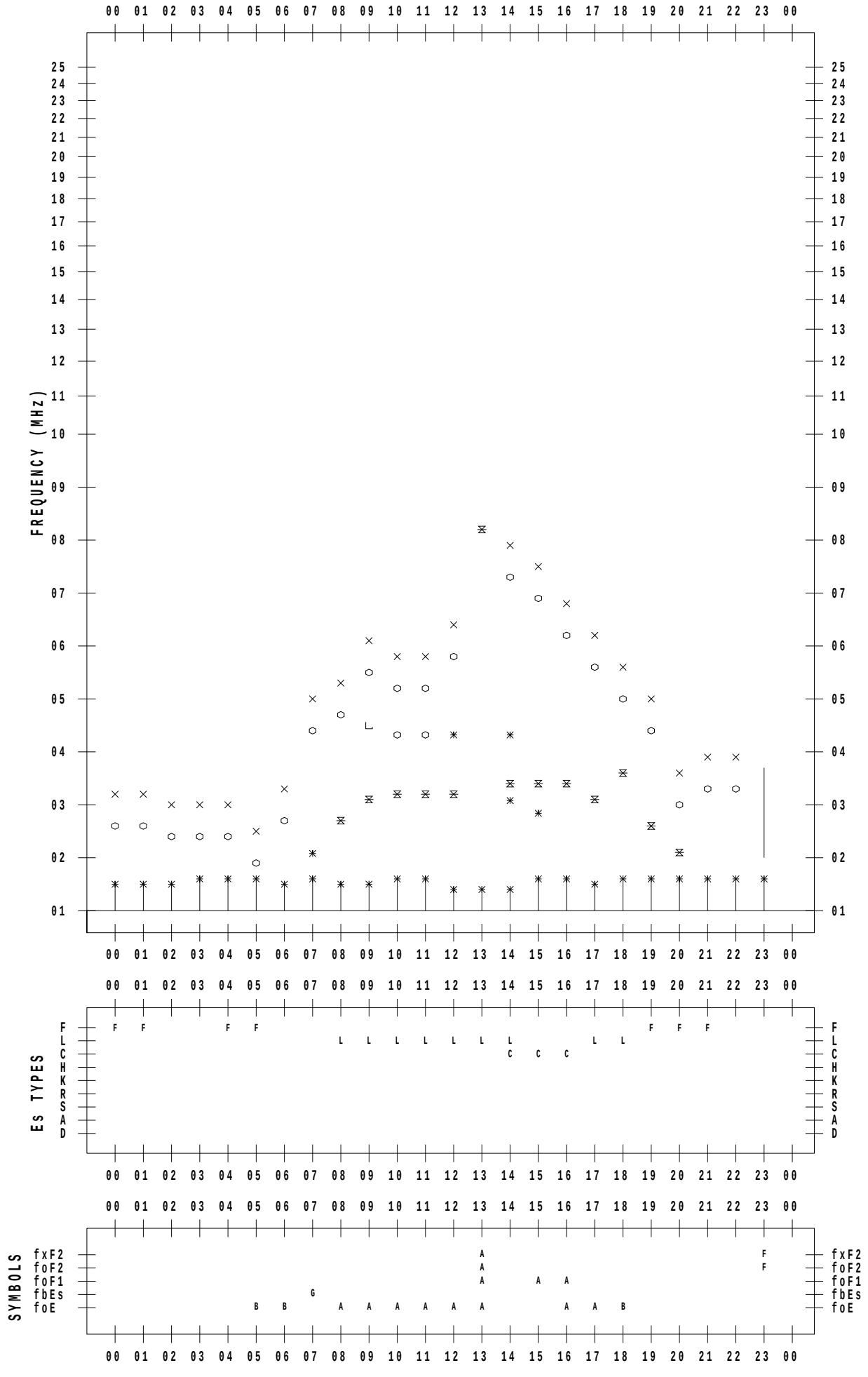
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 4

135 °E MEAN TIME



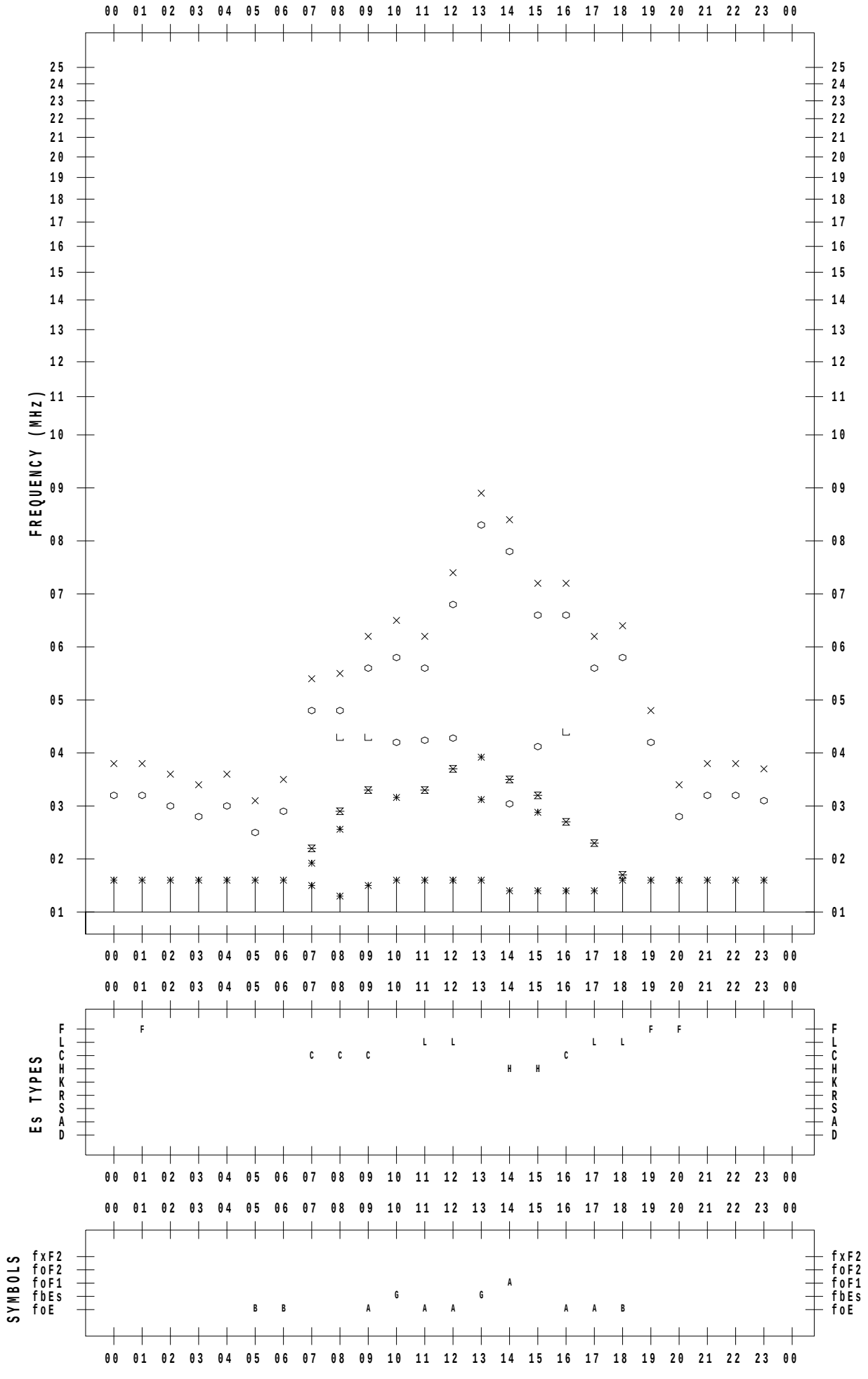
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 5

135 °E MEAN TIME



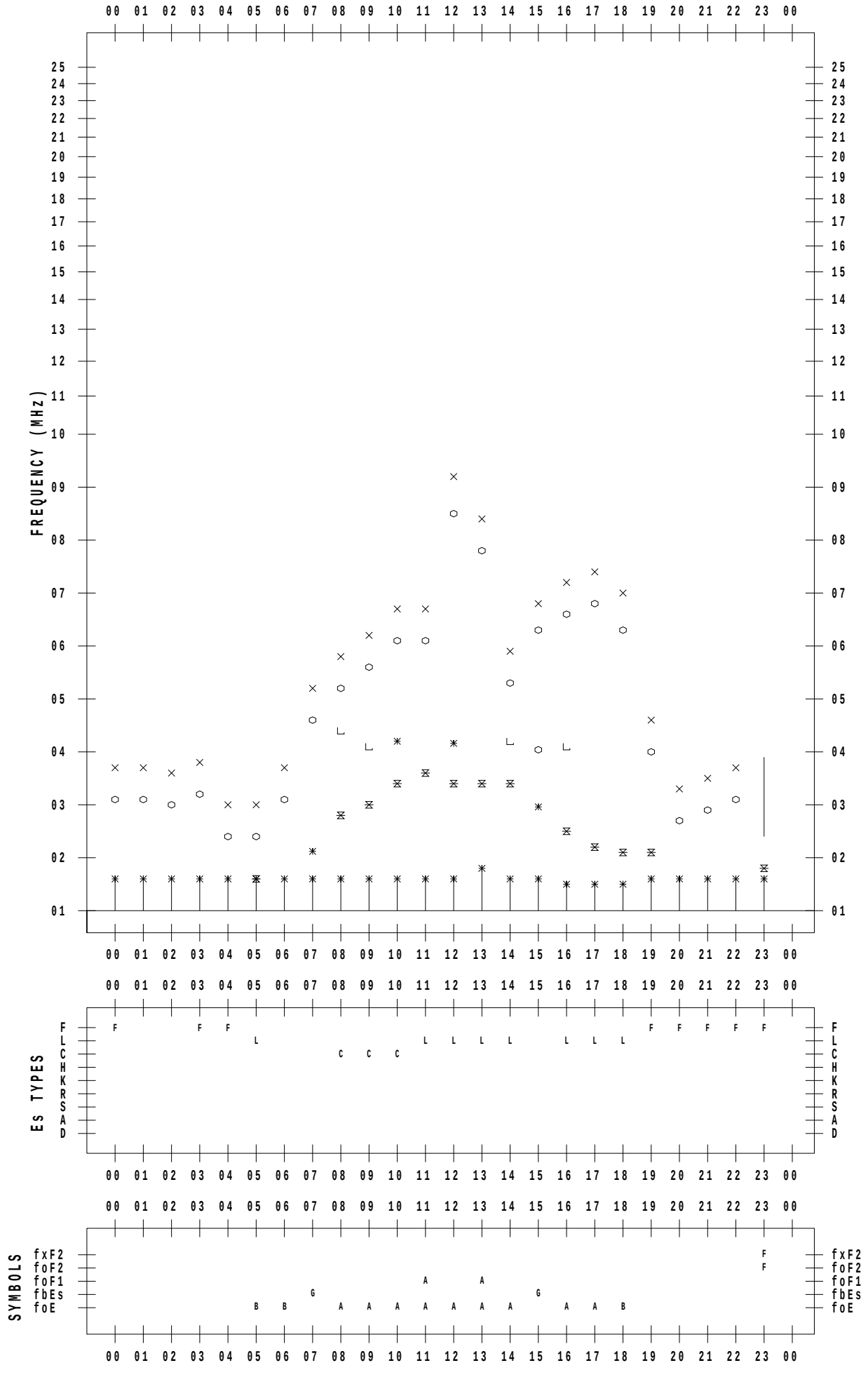
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 6

135 °E MEAN TIME



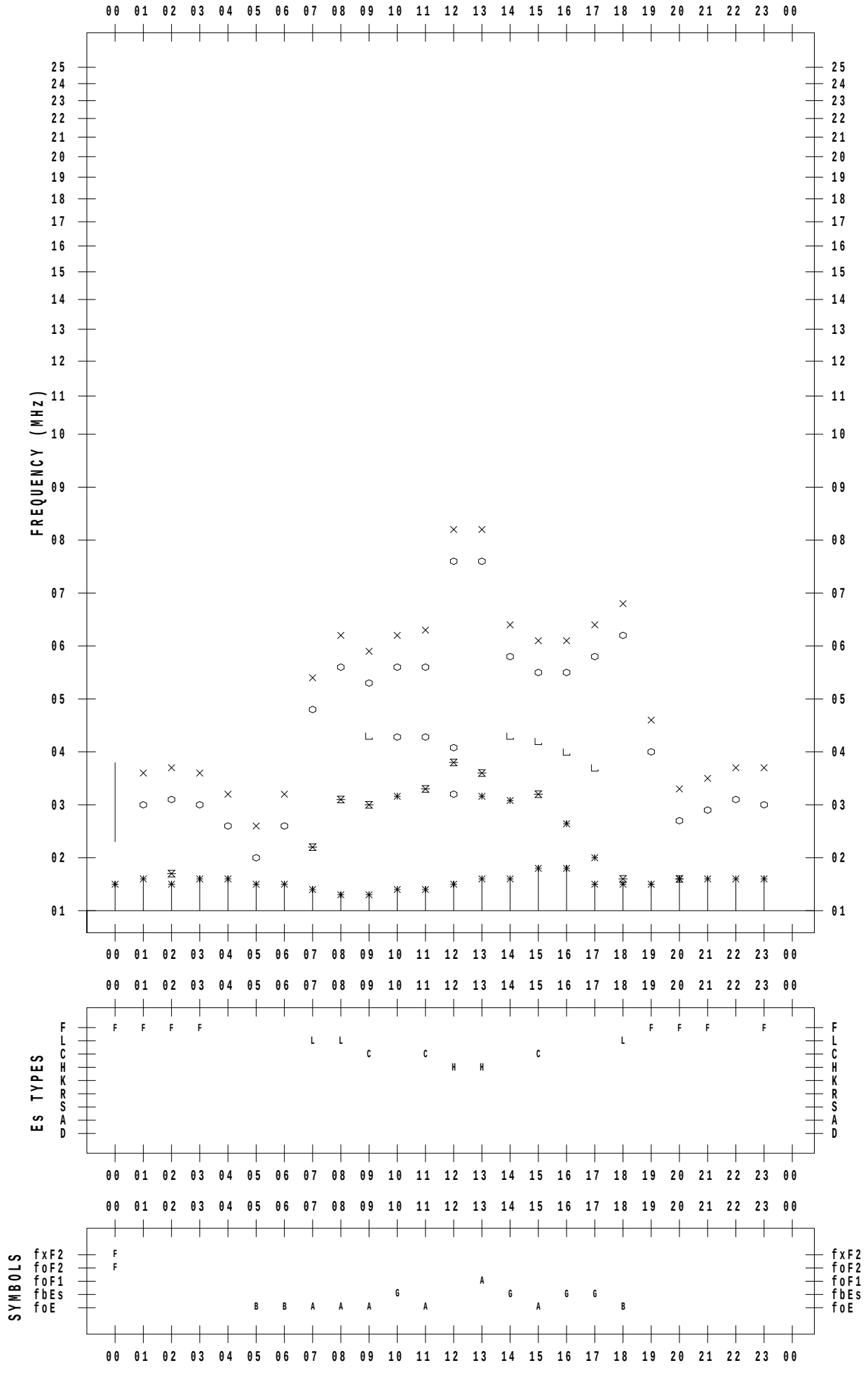
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 7

135 °E MEAN TIME



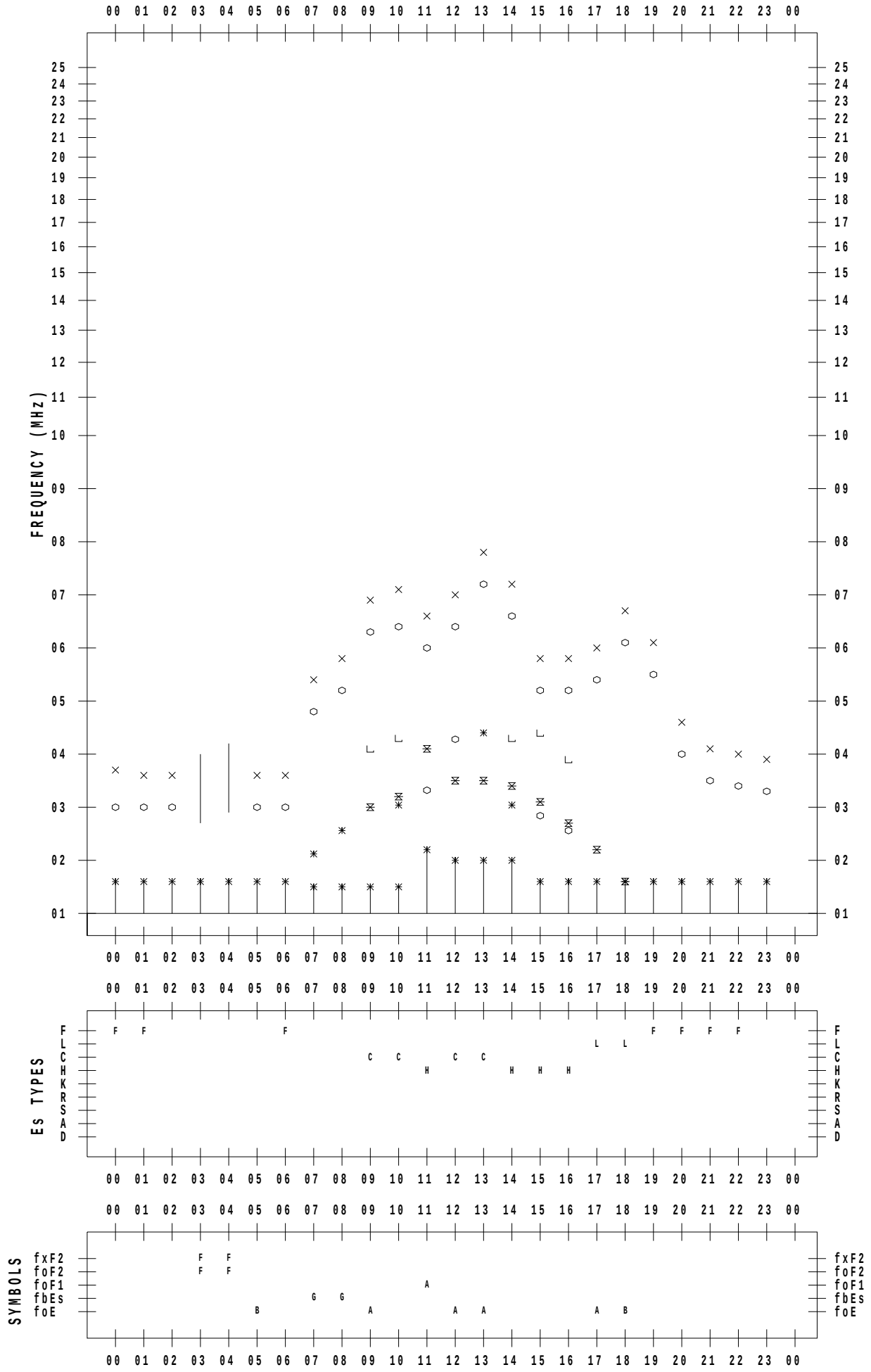
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 8

135 °E MEAN TIME



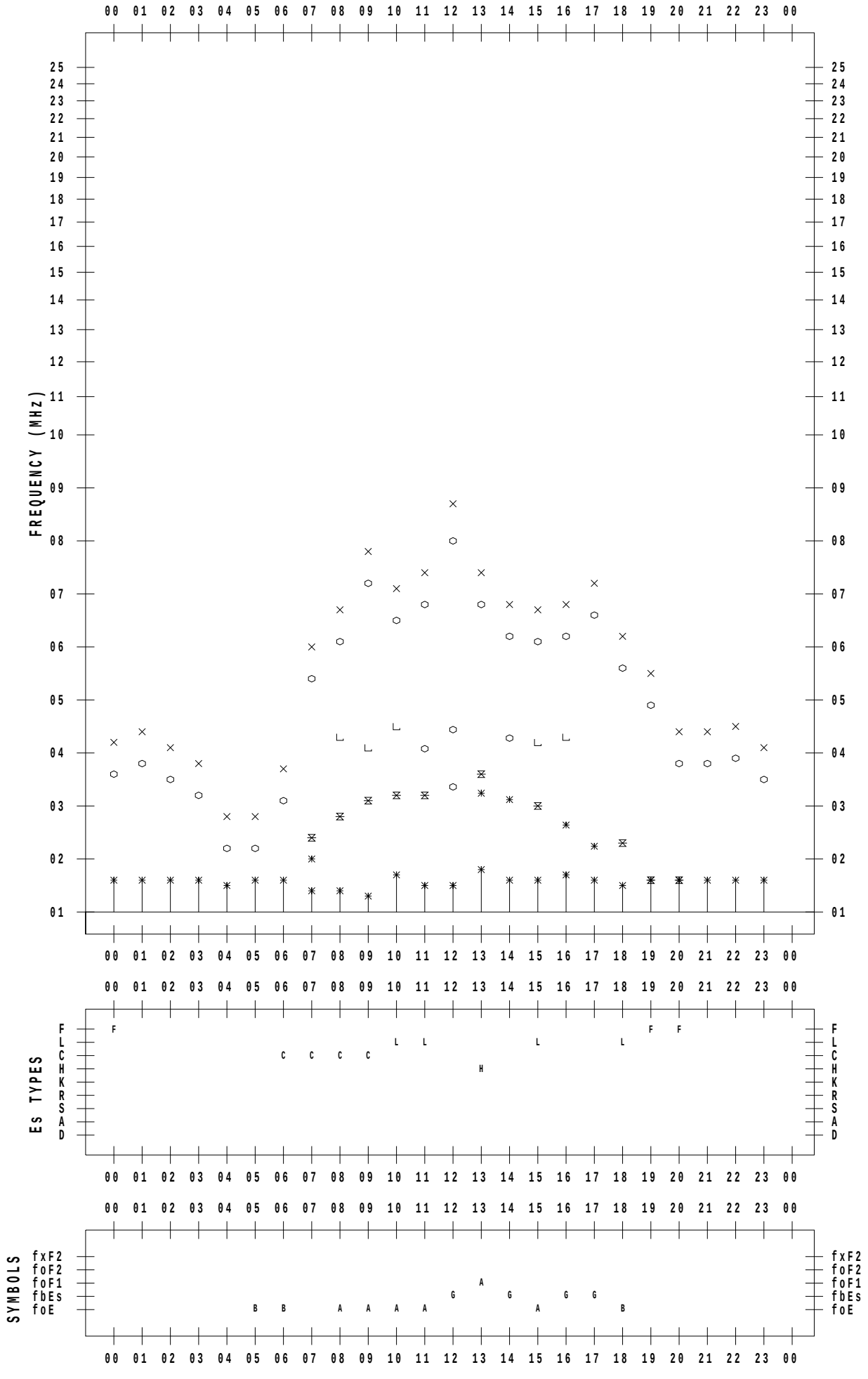
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/ 9

135 °E MEAN TIME



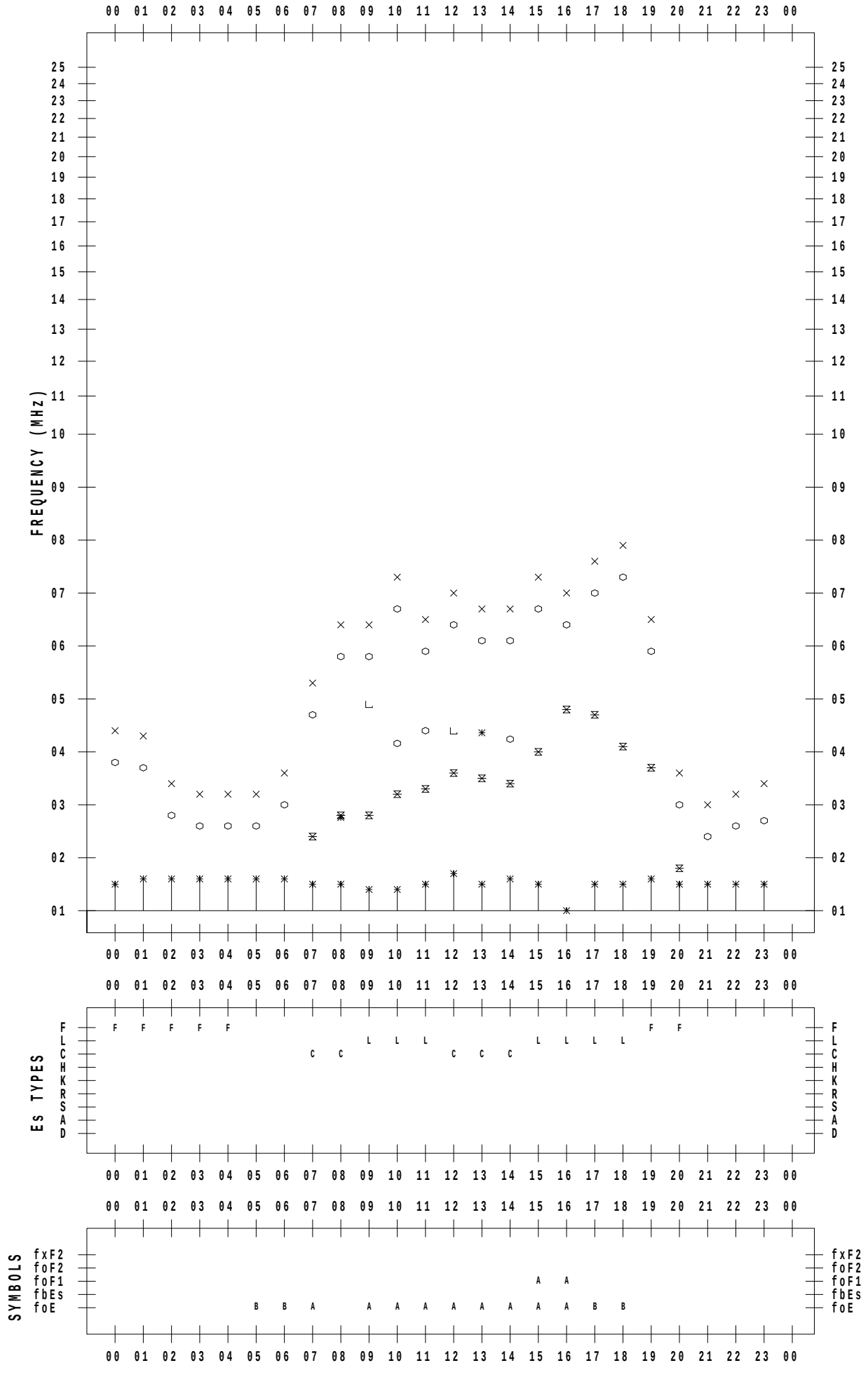
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/10

135 °E MEAN TIME



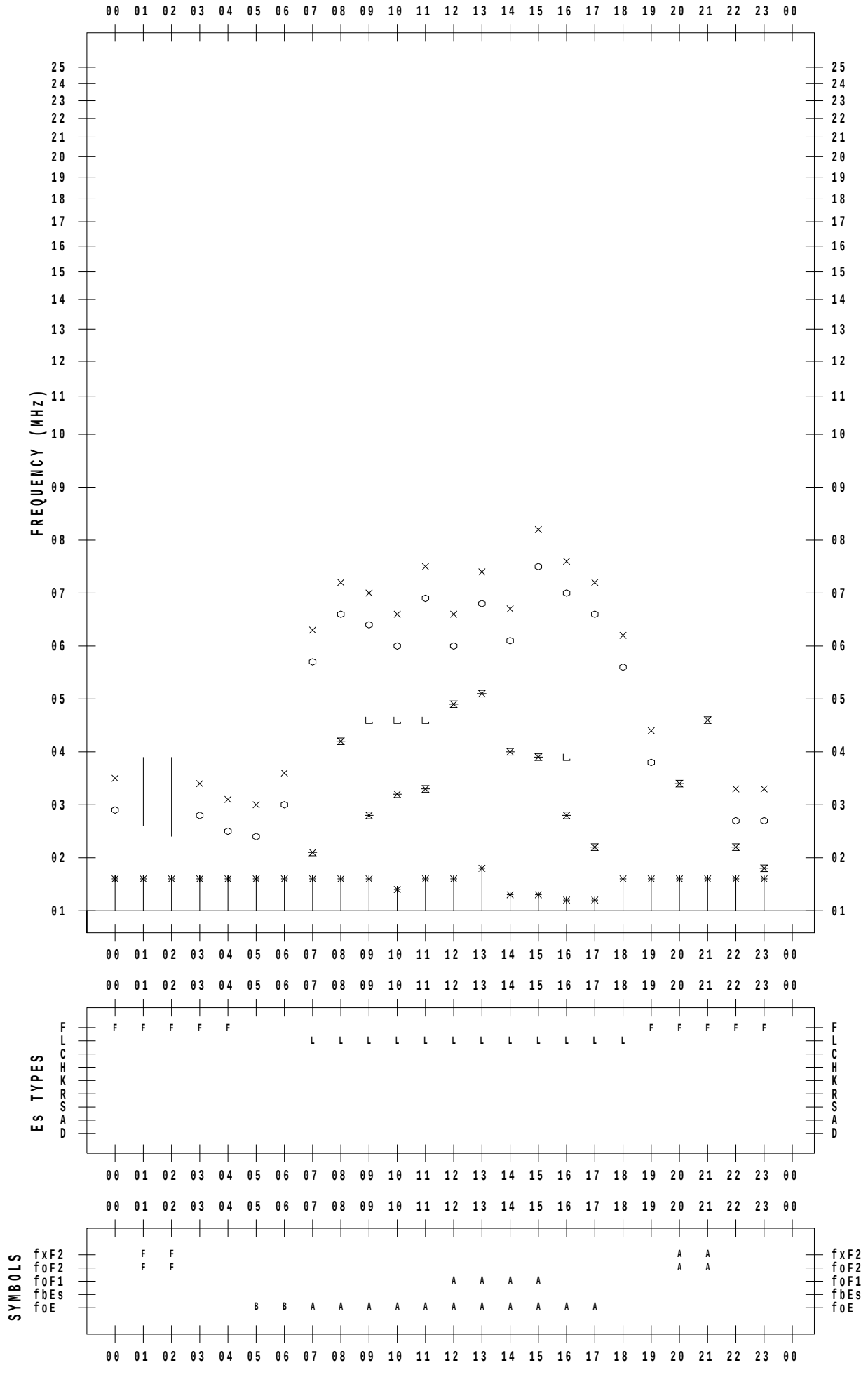
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/11

135 °E MEAN TIME



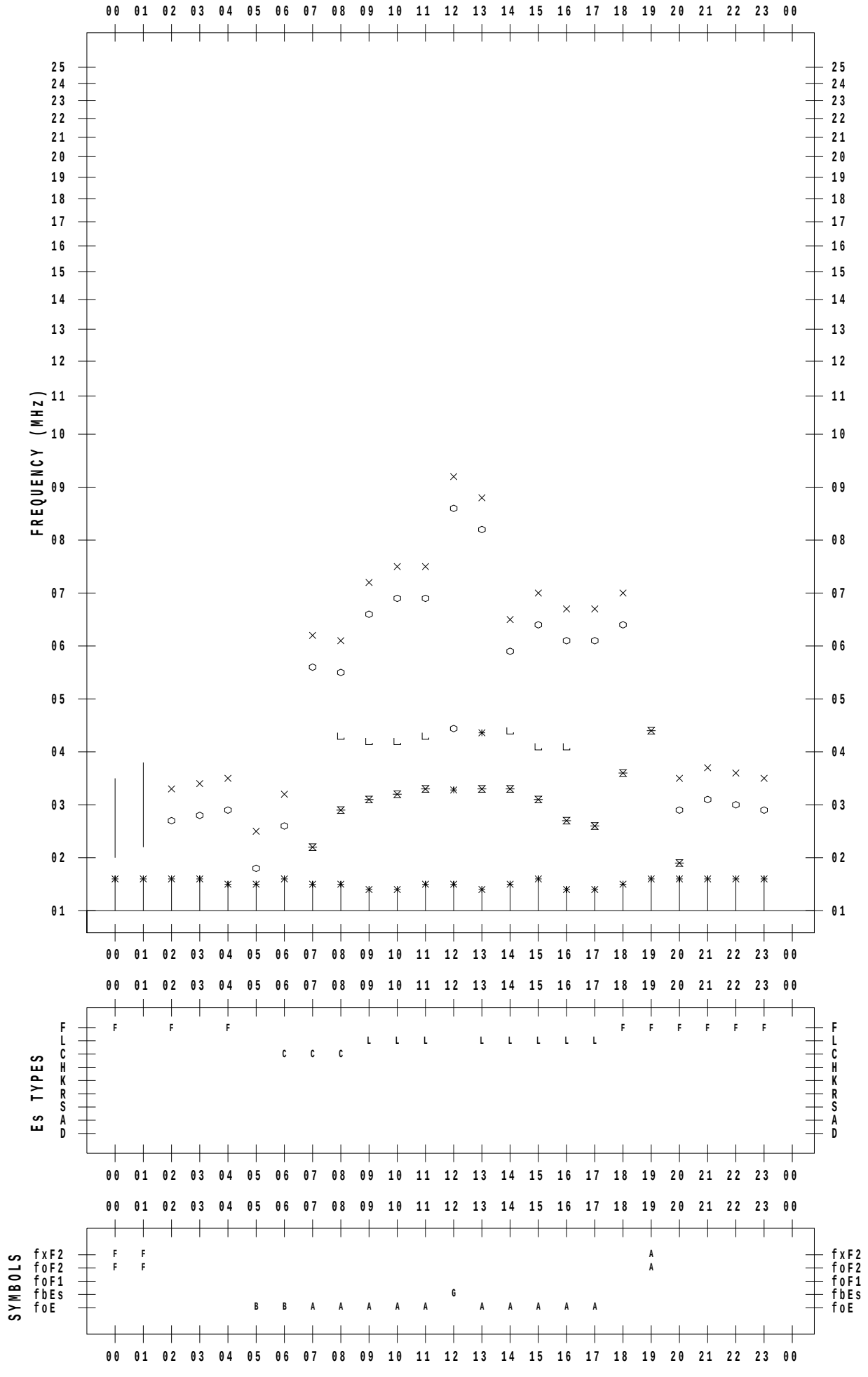
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/12

135 °E MEAN TIME



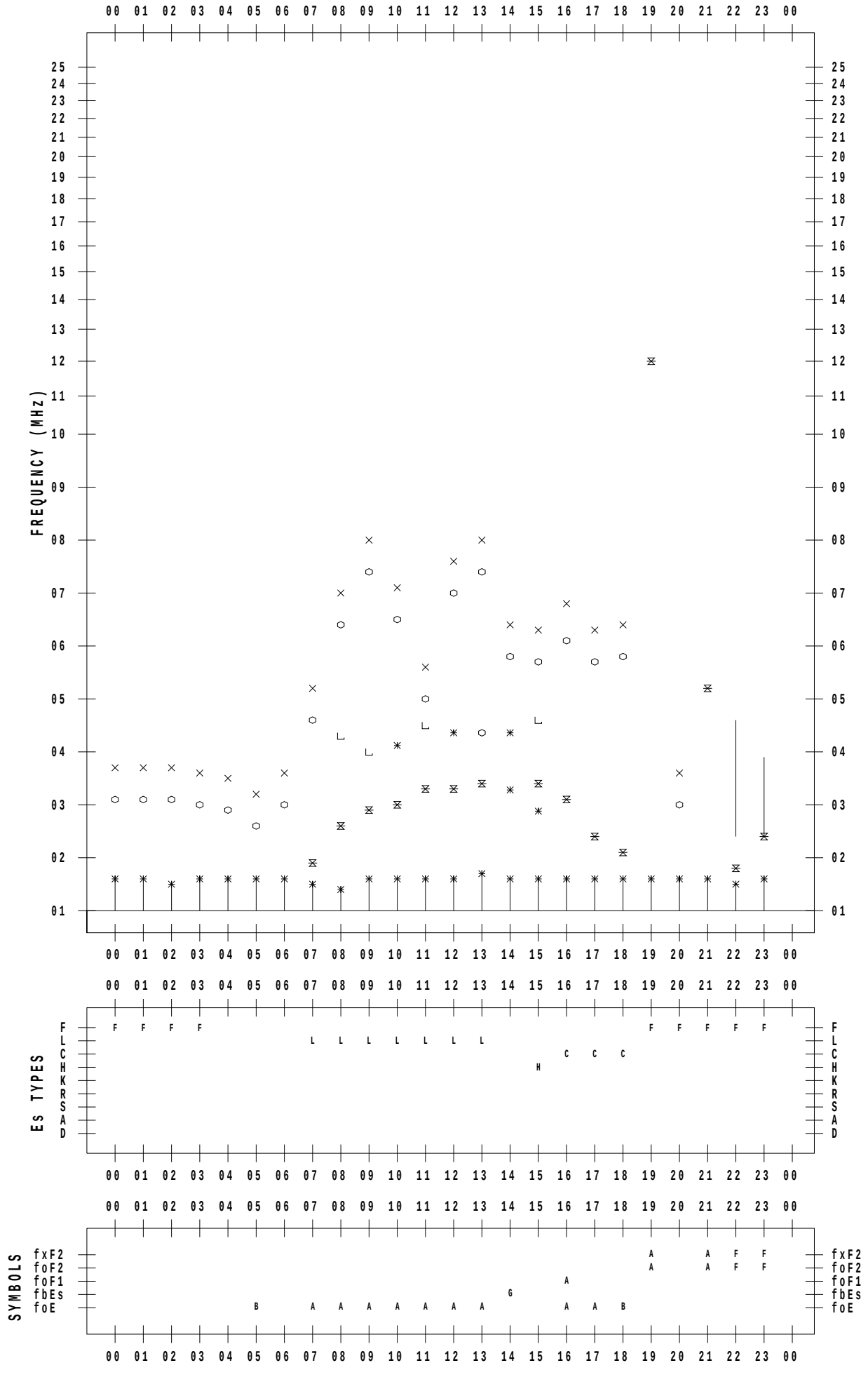
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/13

135 °E MEAN TIME



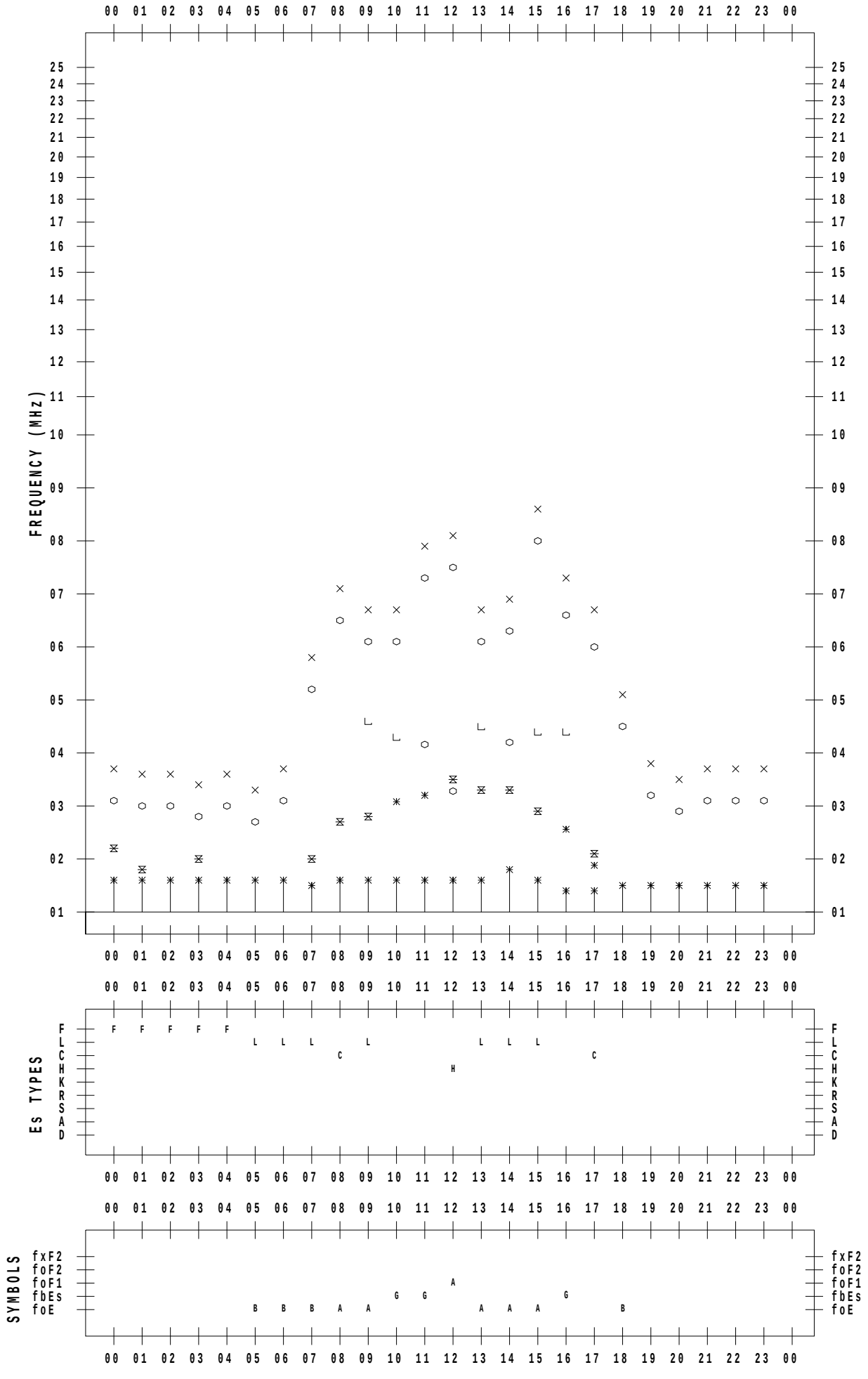
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/14

135 °E MEAN TIME



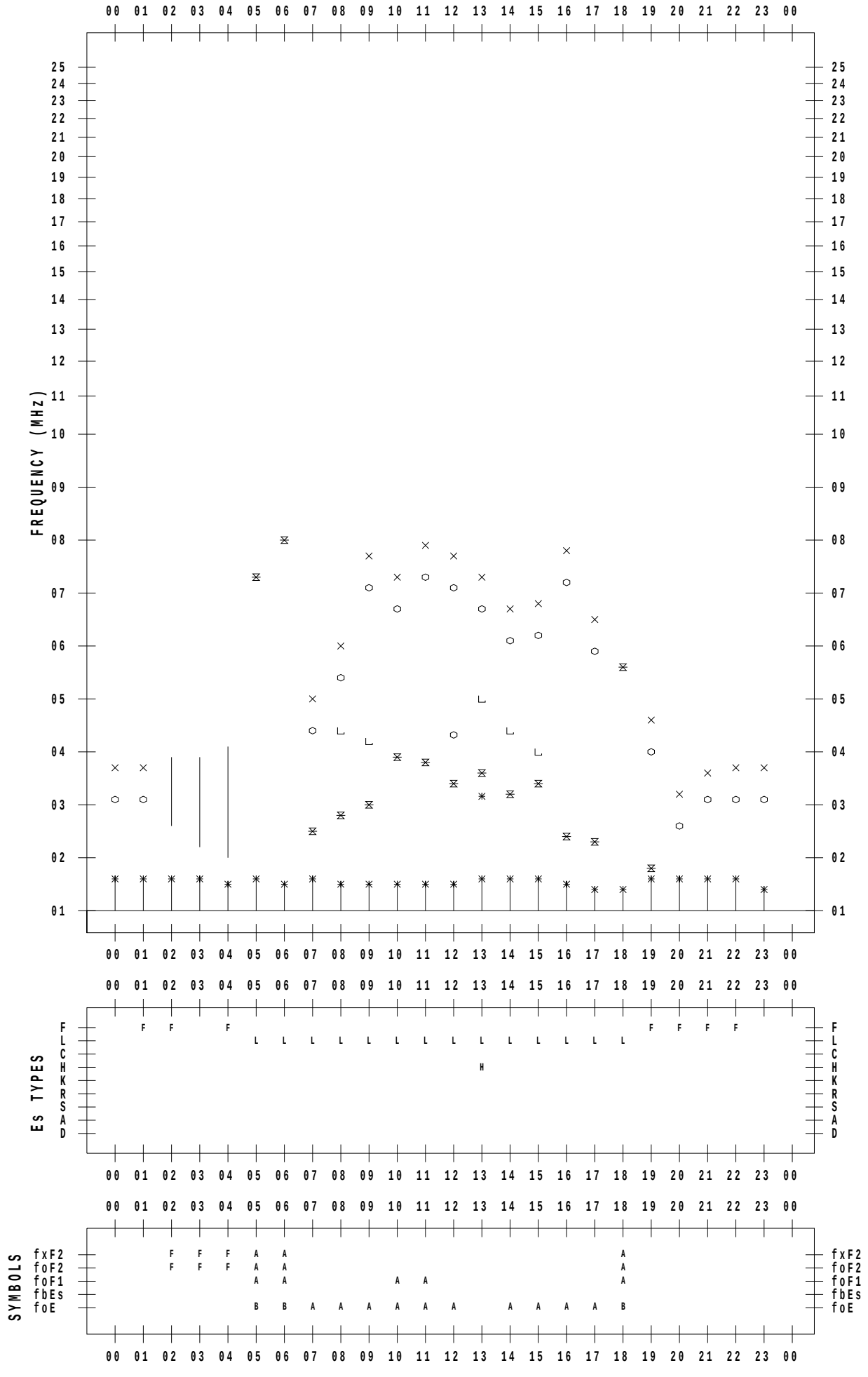
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/15

135 °E MEAN TIME



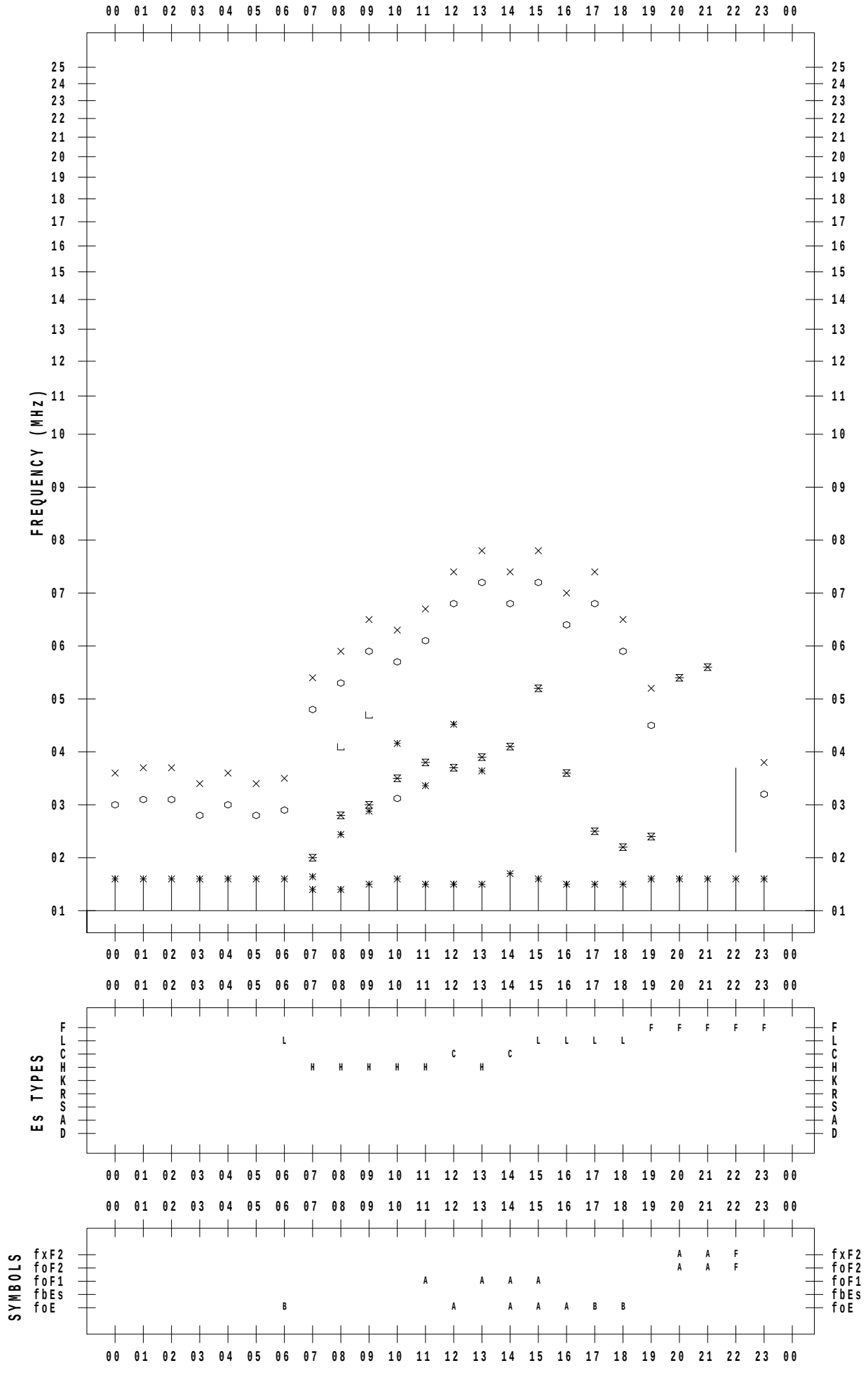
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/16

135 °E MEAN TIME



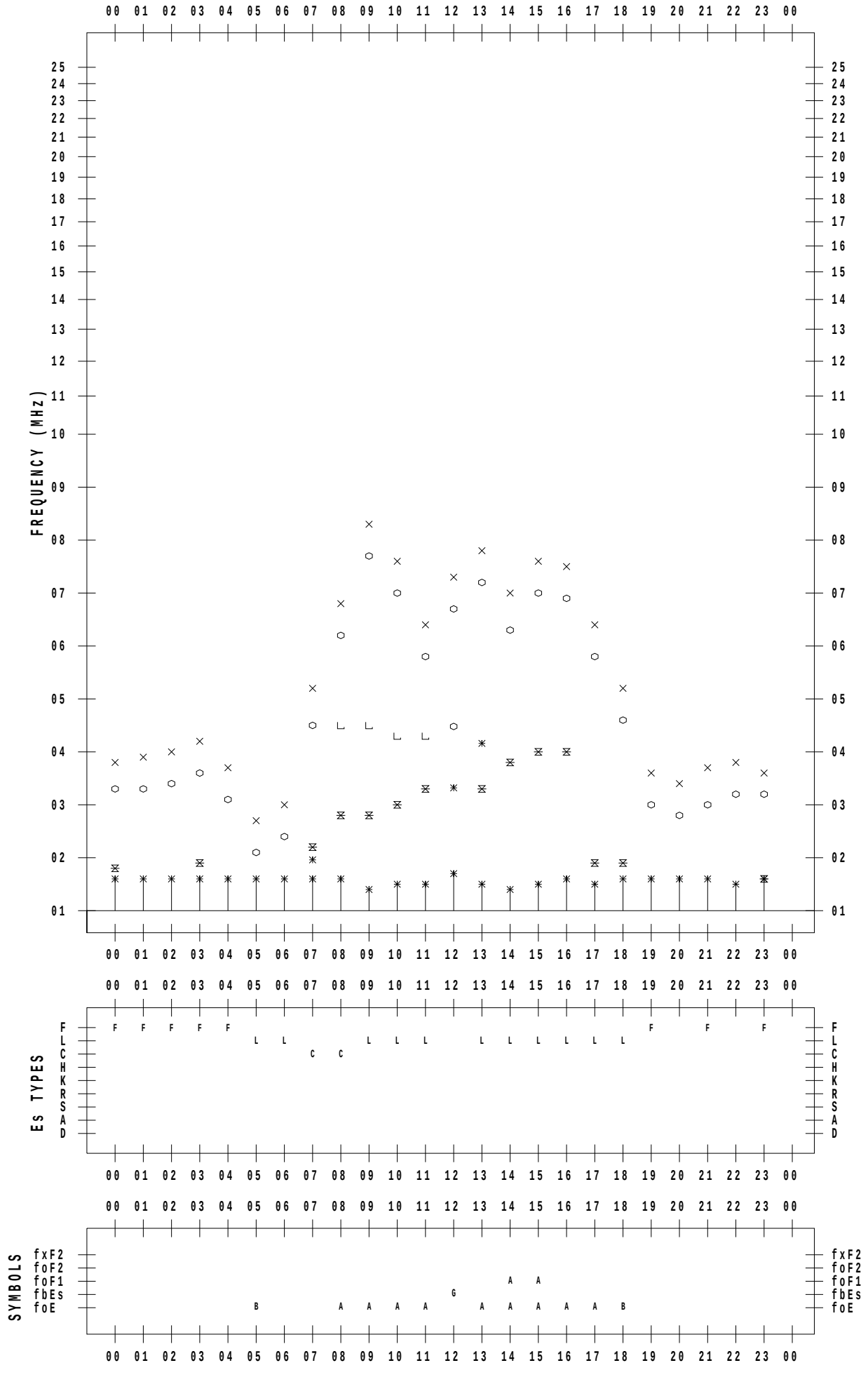
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/17

135 °E MEAN TIME



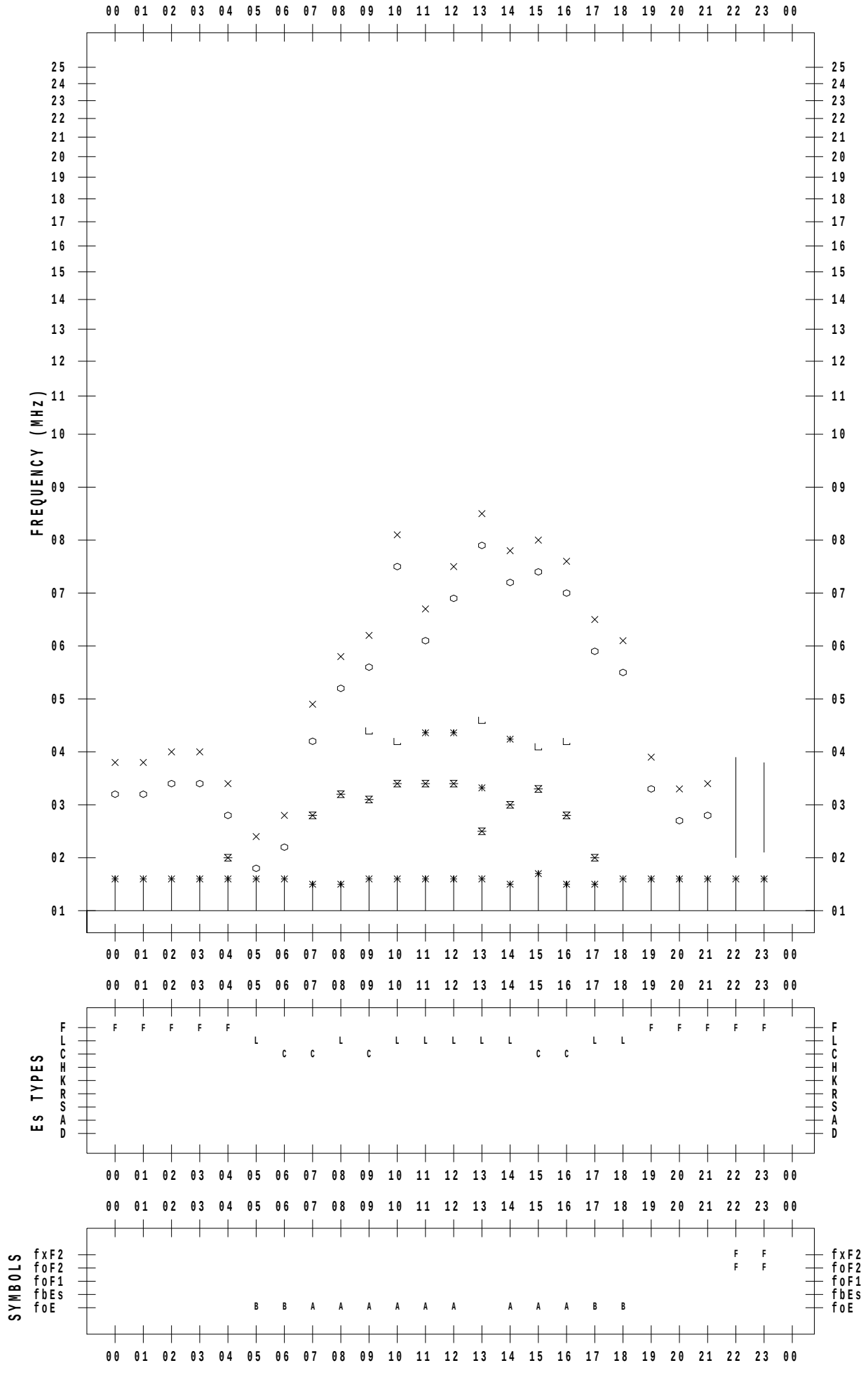
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/18

135 °E MEAN TIME



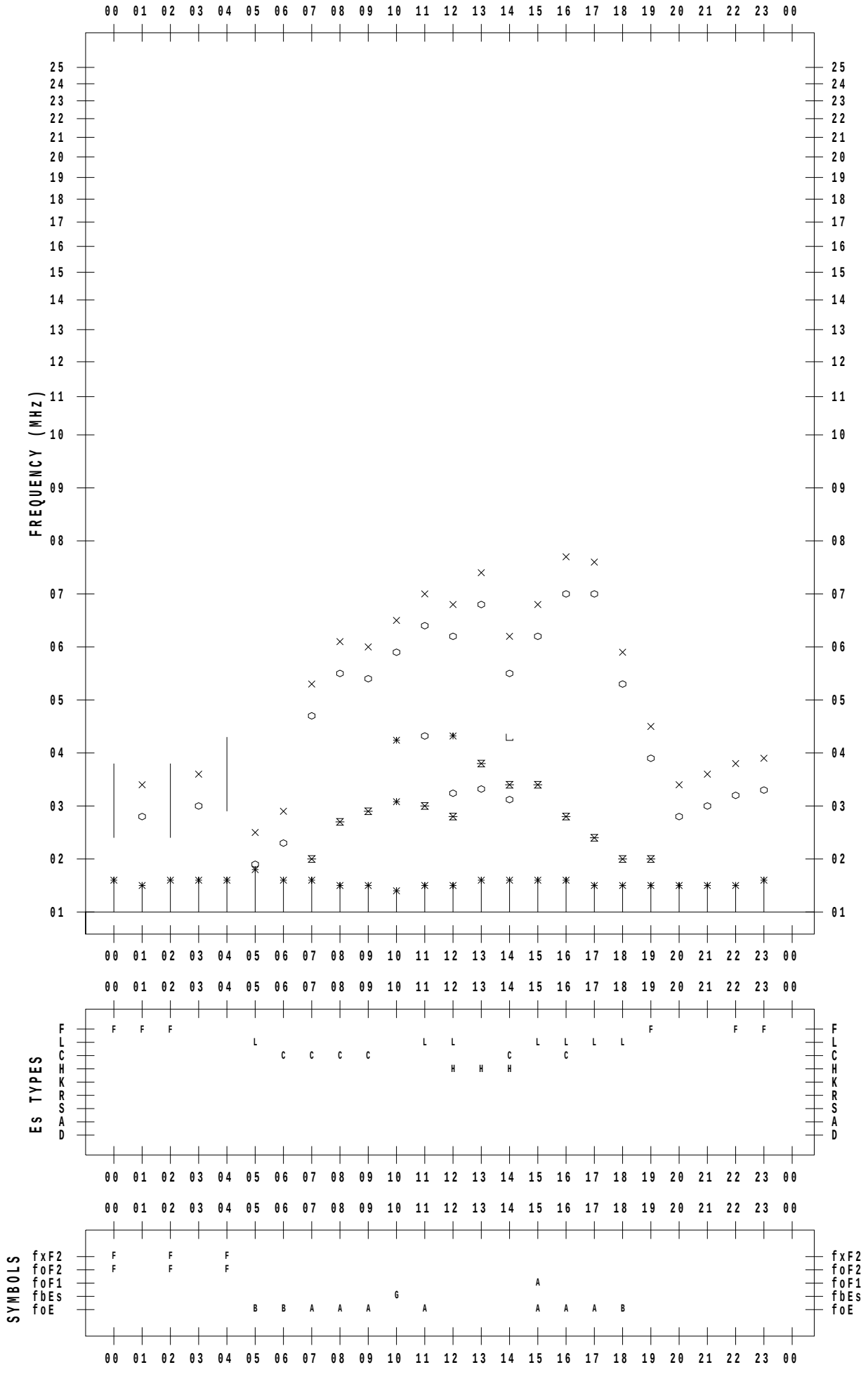
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/19

135 °E MEAN TIME



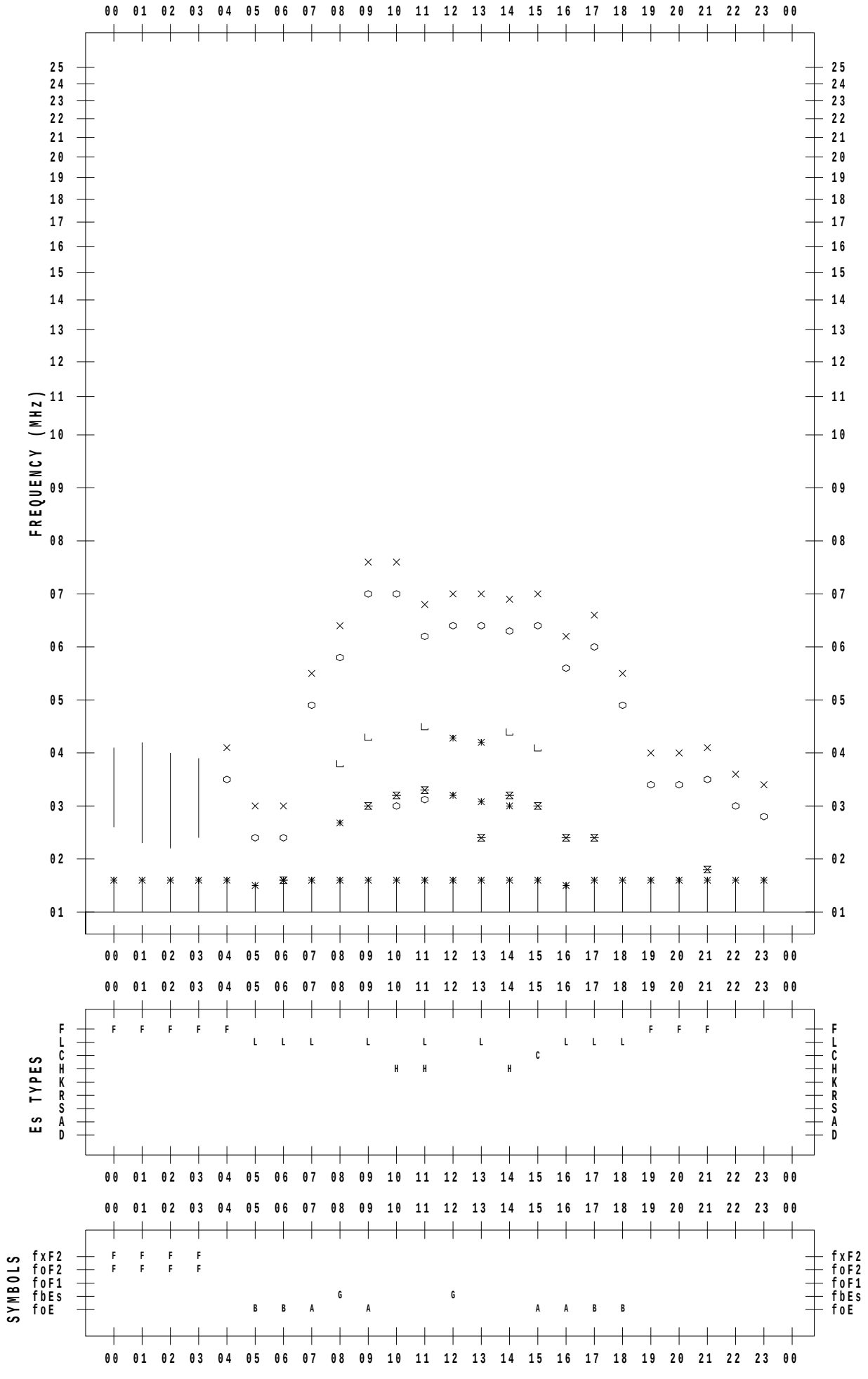
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/20

135 °E MEAN TIME



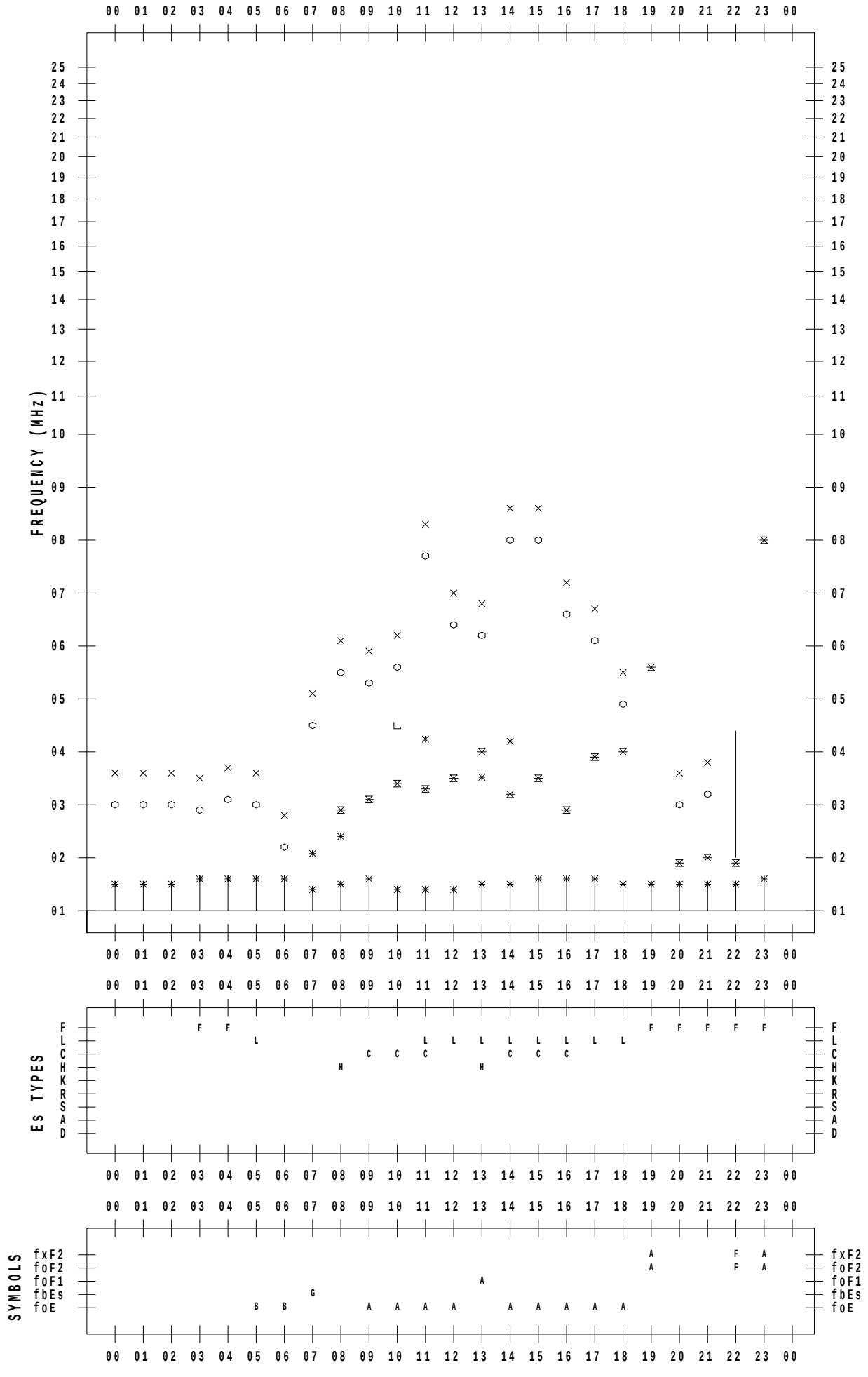
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/21

135 °E MEAN TIME



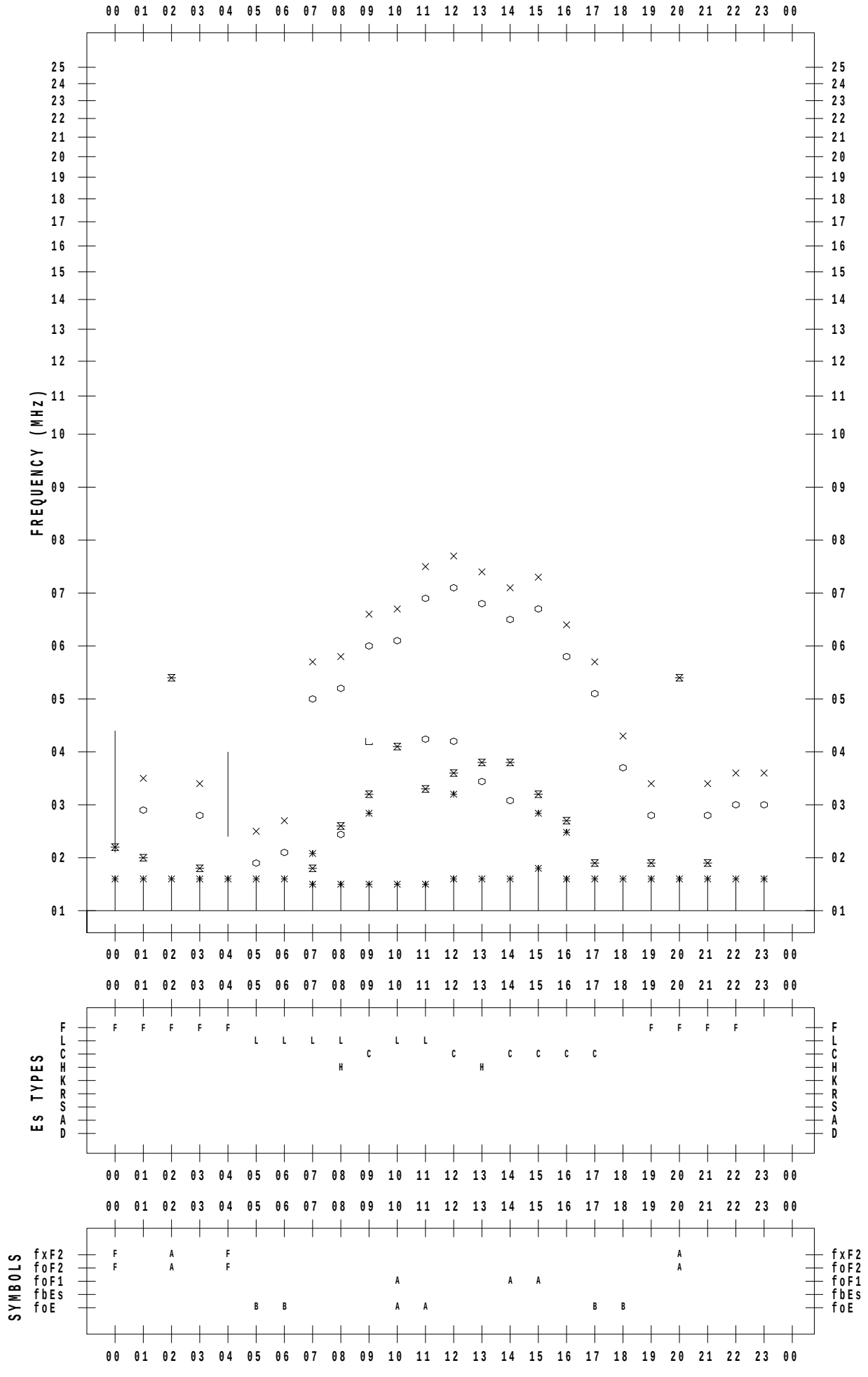
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/22

135 °E MEAN TIME



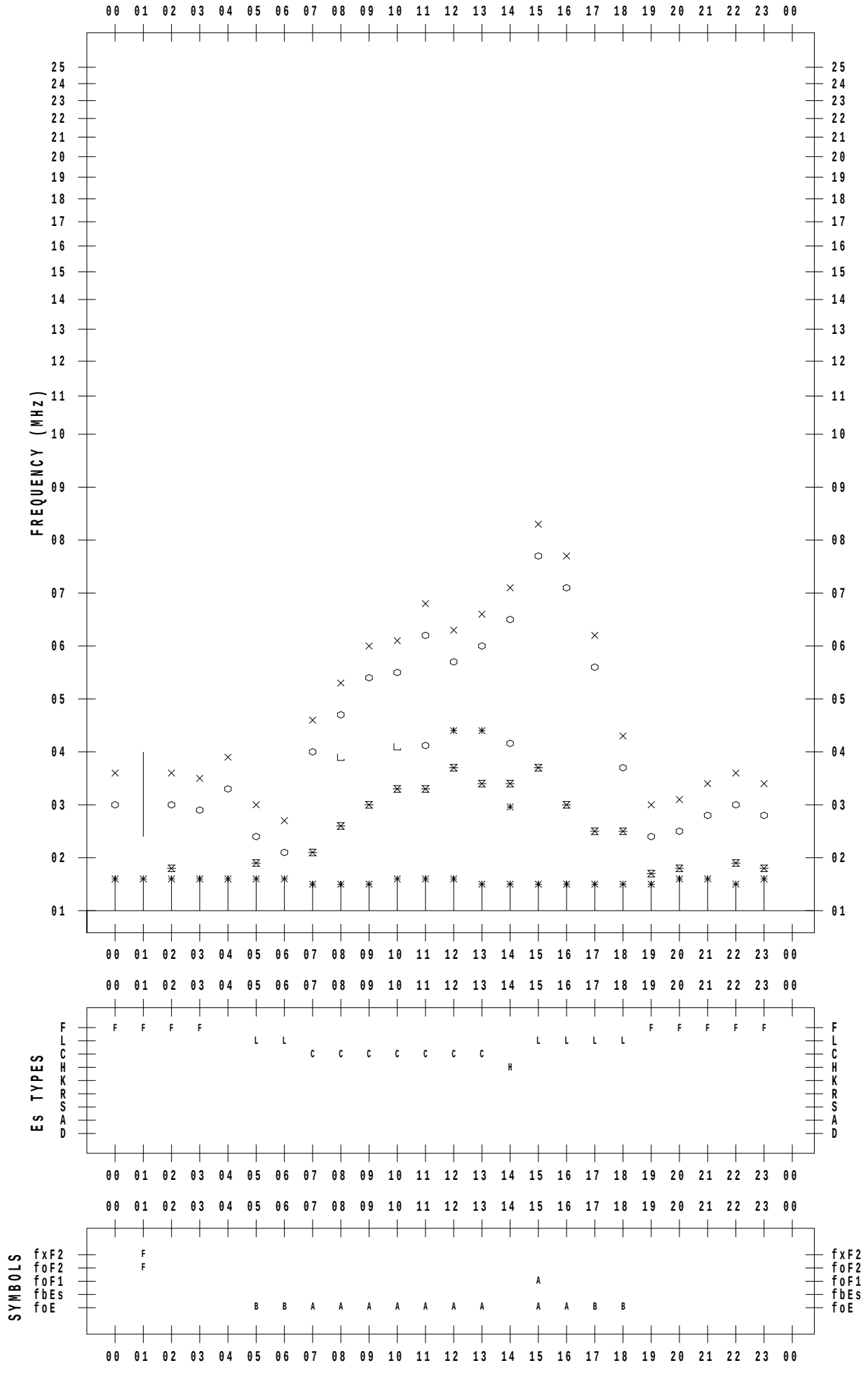
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/23

135 °E MEAN TIME



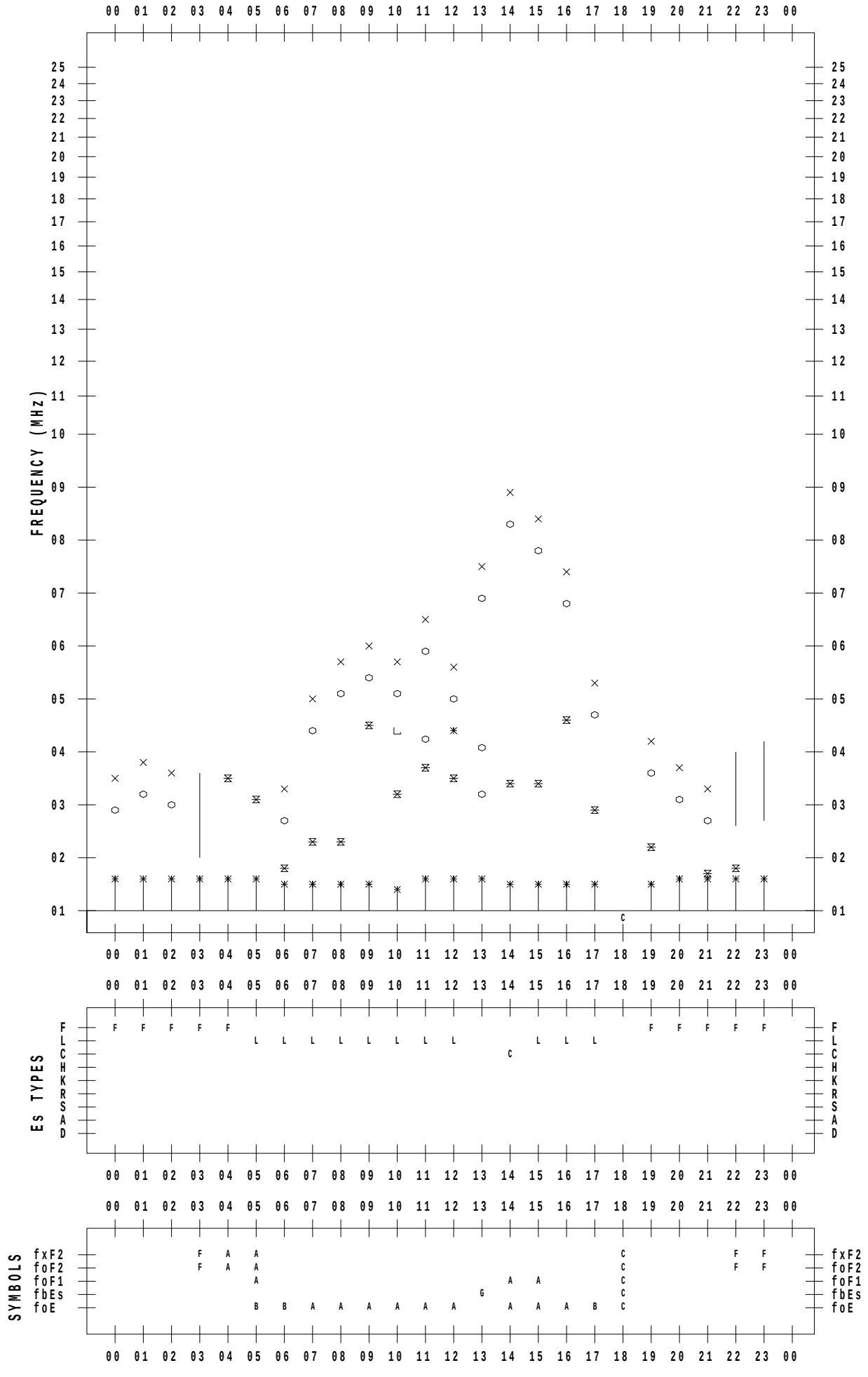
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/24

135 °E MEAN TIME



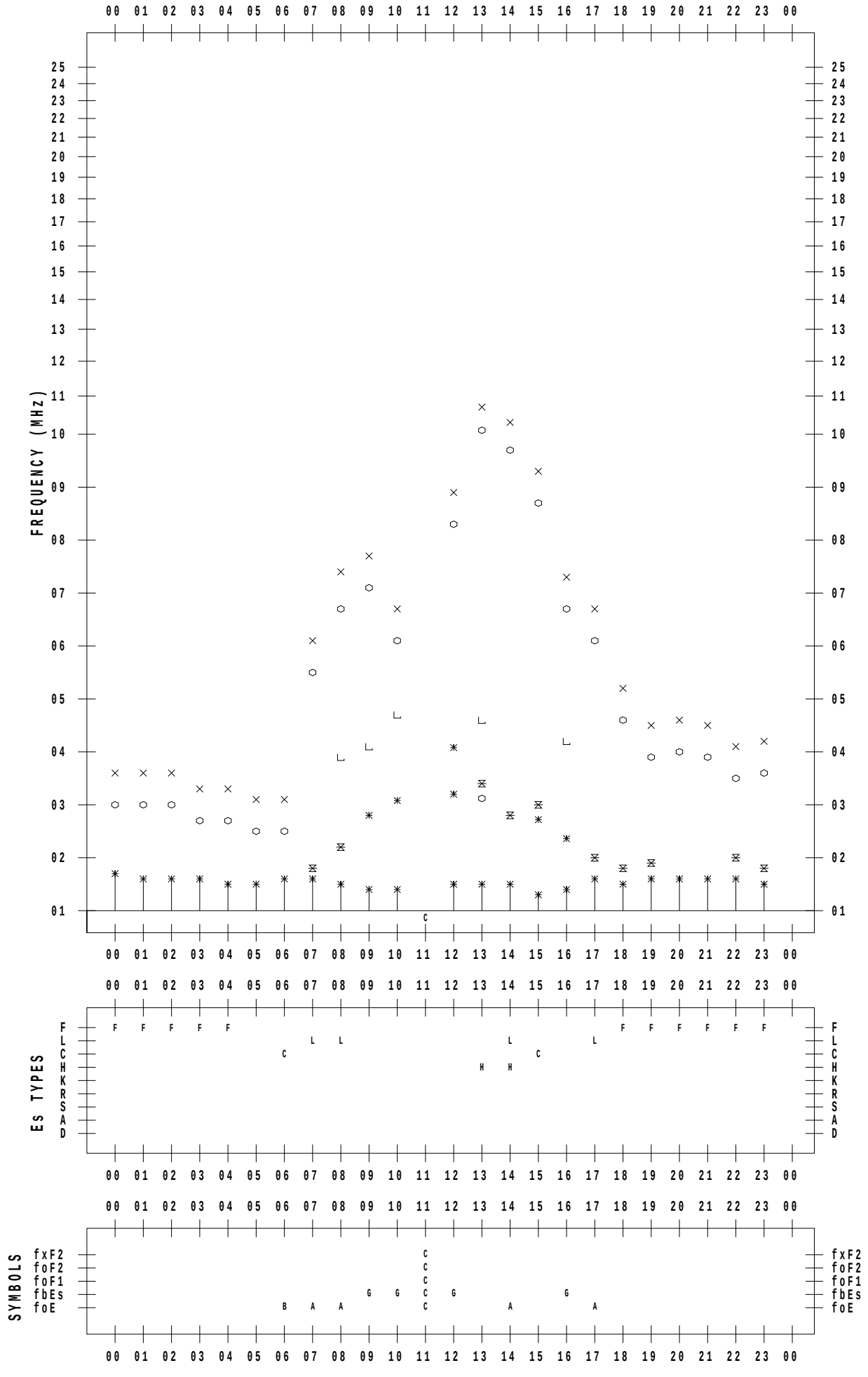
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/25

135 °E MEAN TIME



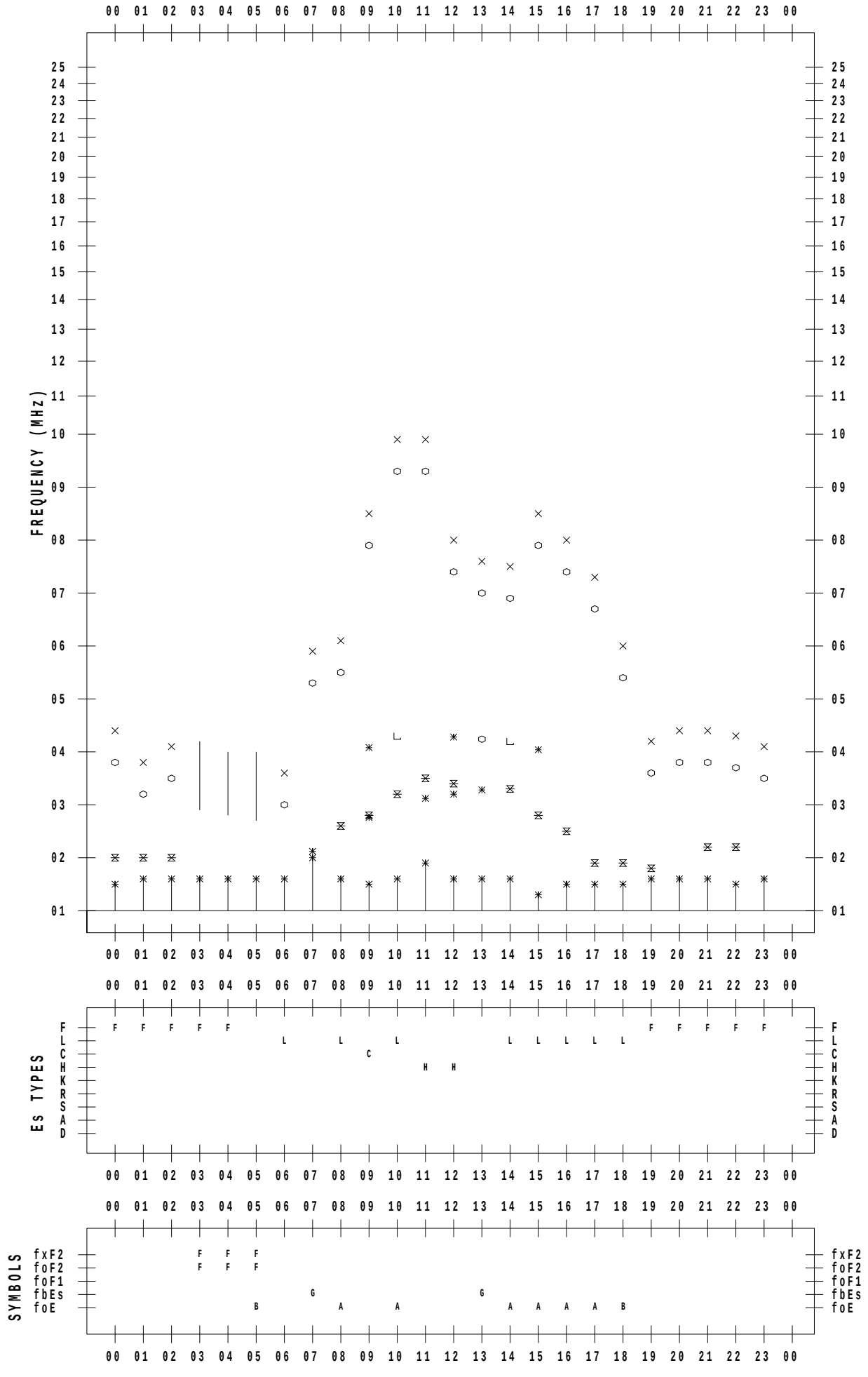
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/26

135 °E MEAN TIME



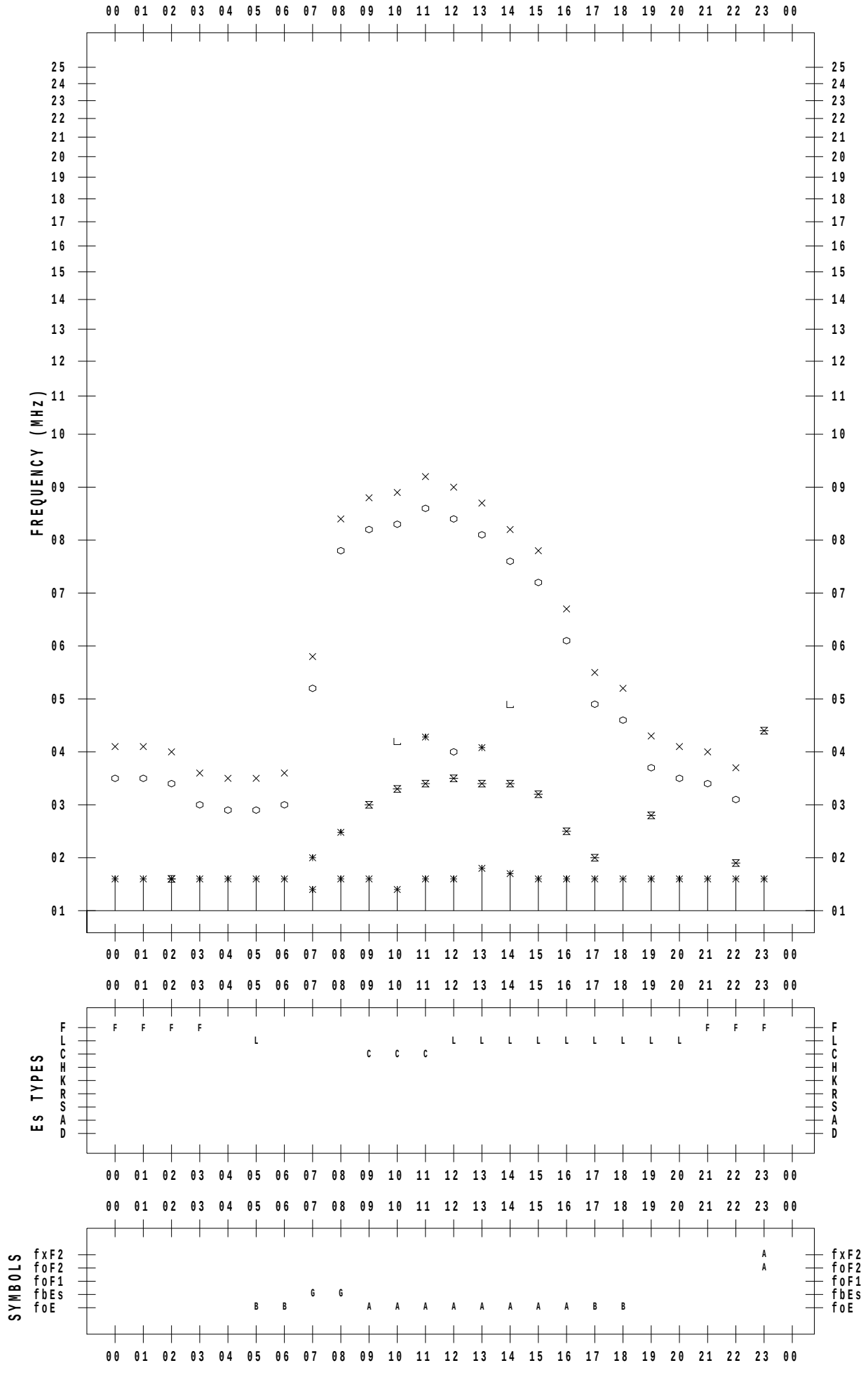
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/27

135 °E MEAN TIME



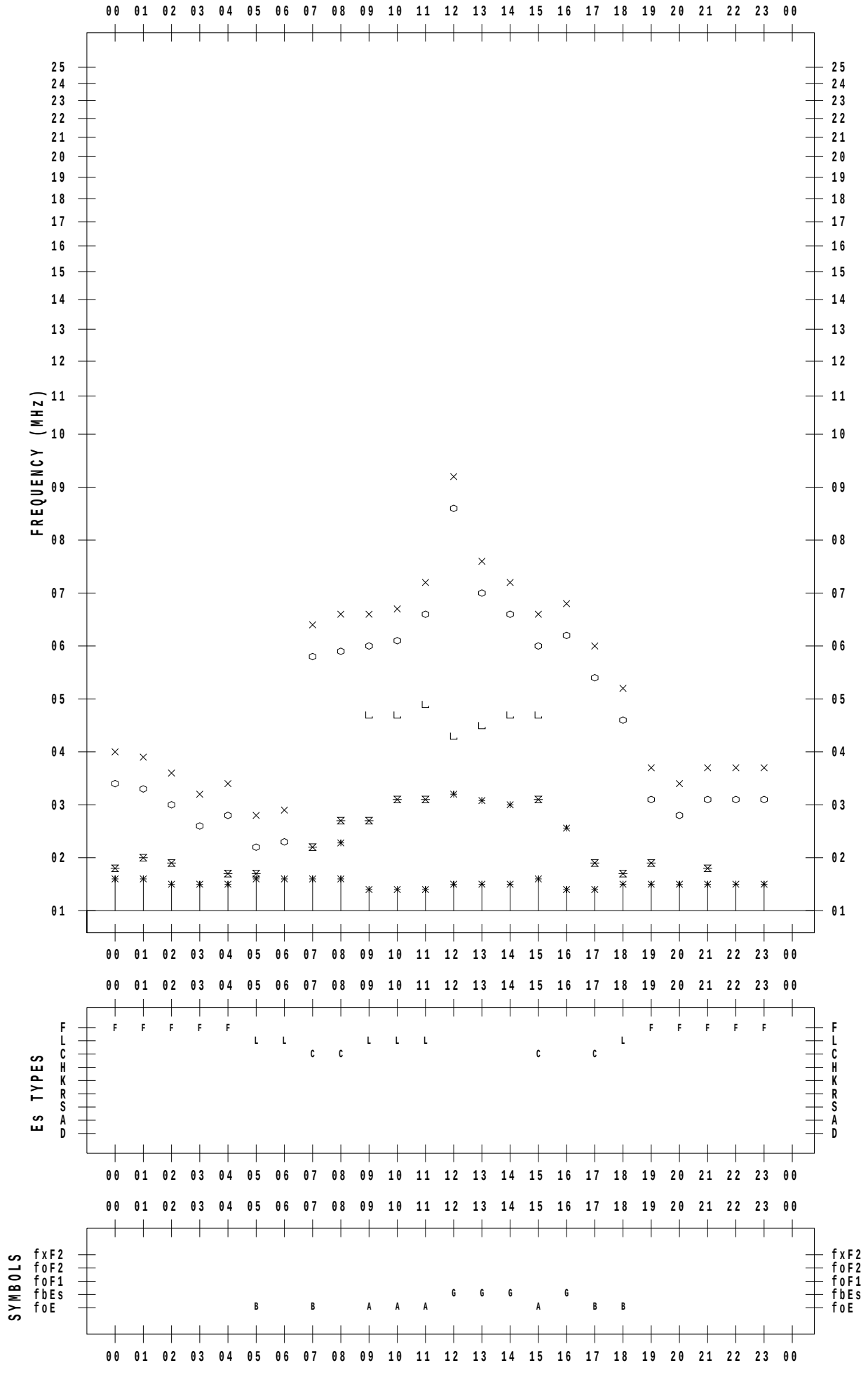
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/28

135 °E MEAN TIME



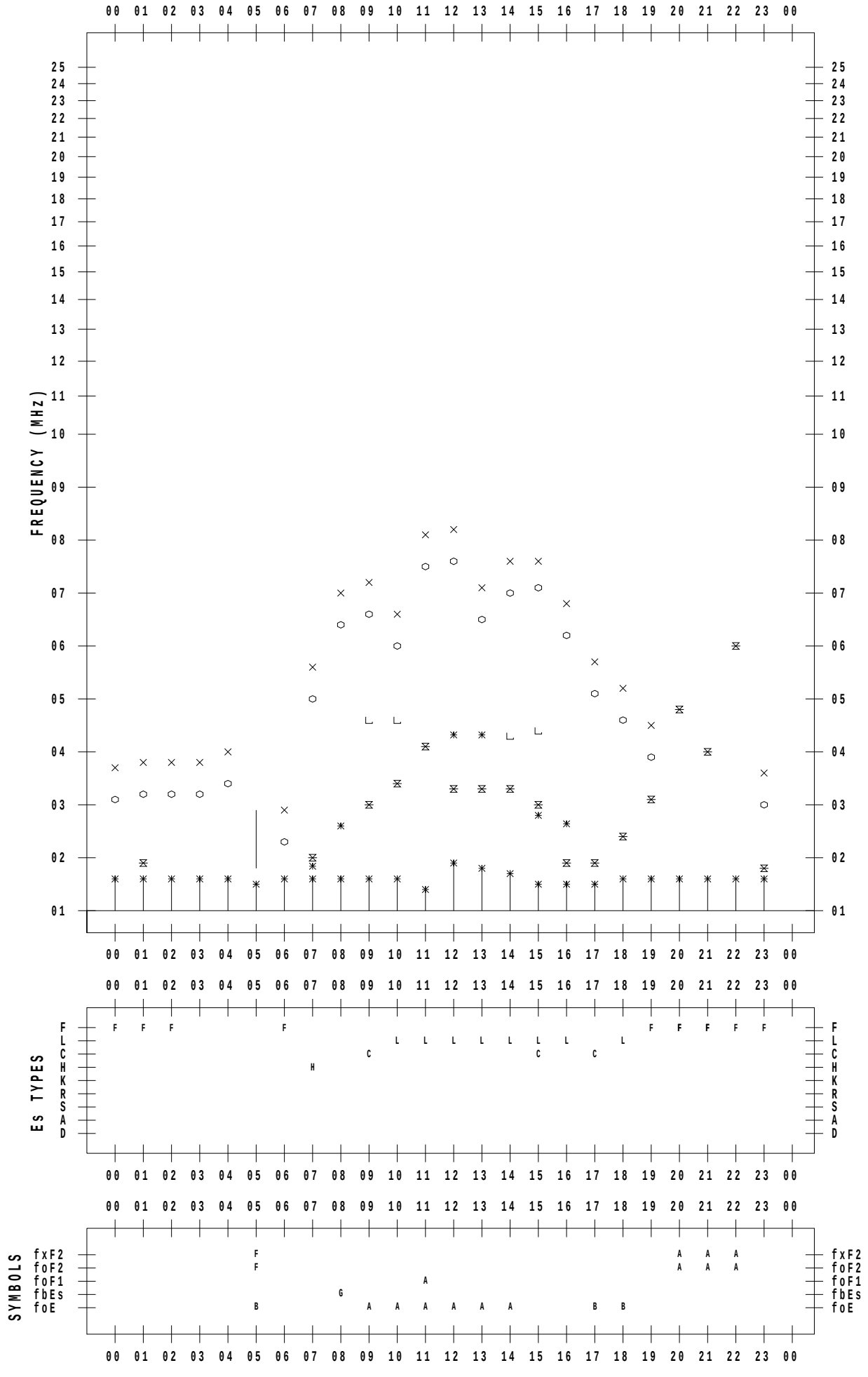
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/29

135 °E MEAN TIME



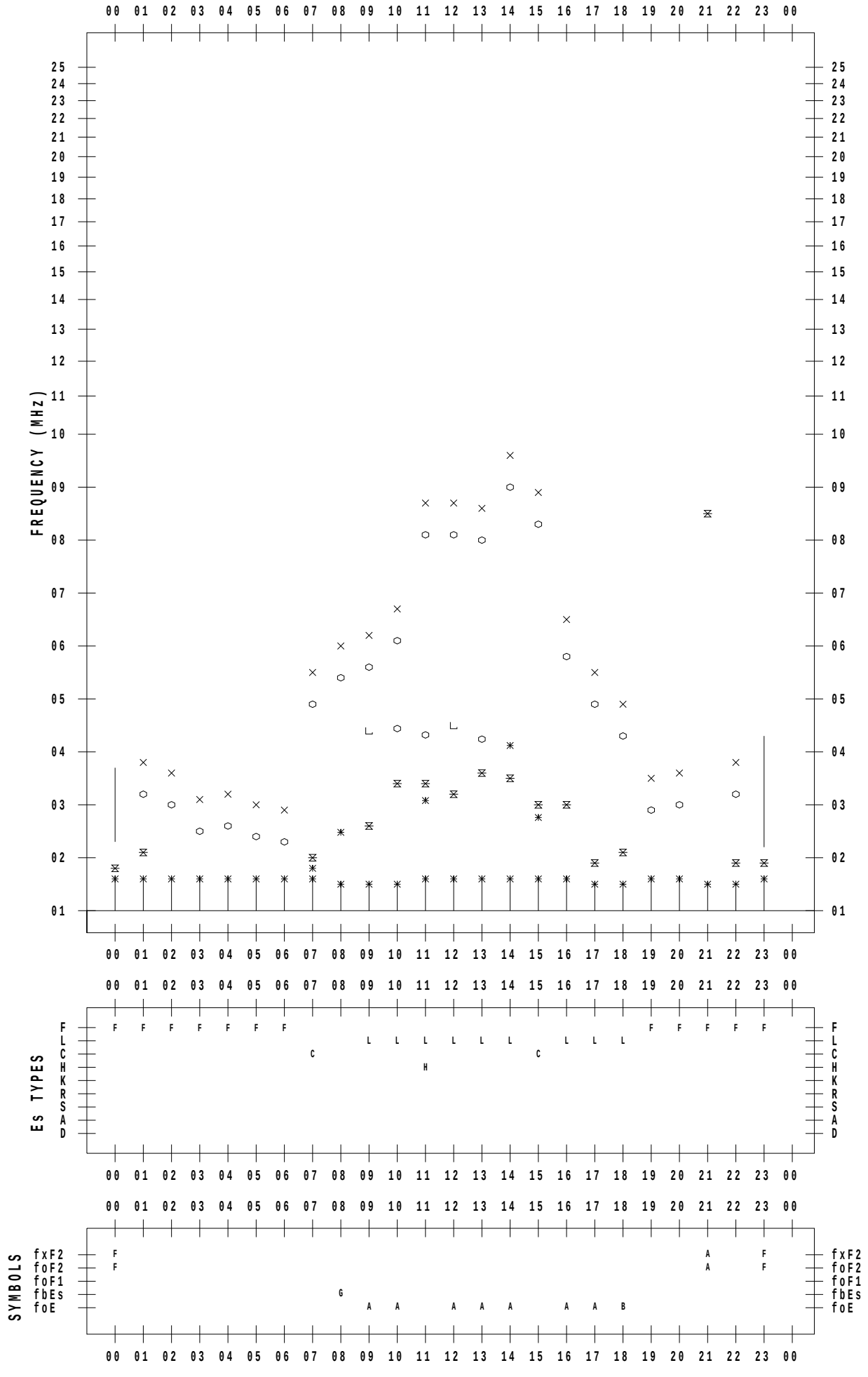
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/30

135 °E MEAN TIME



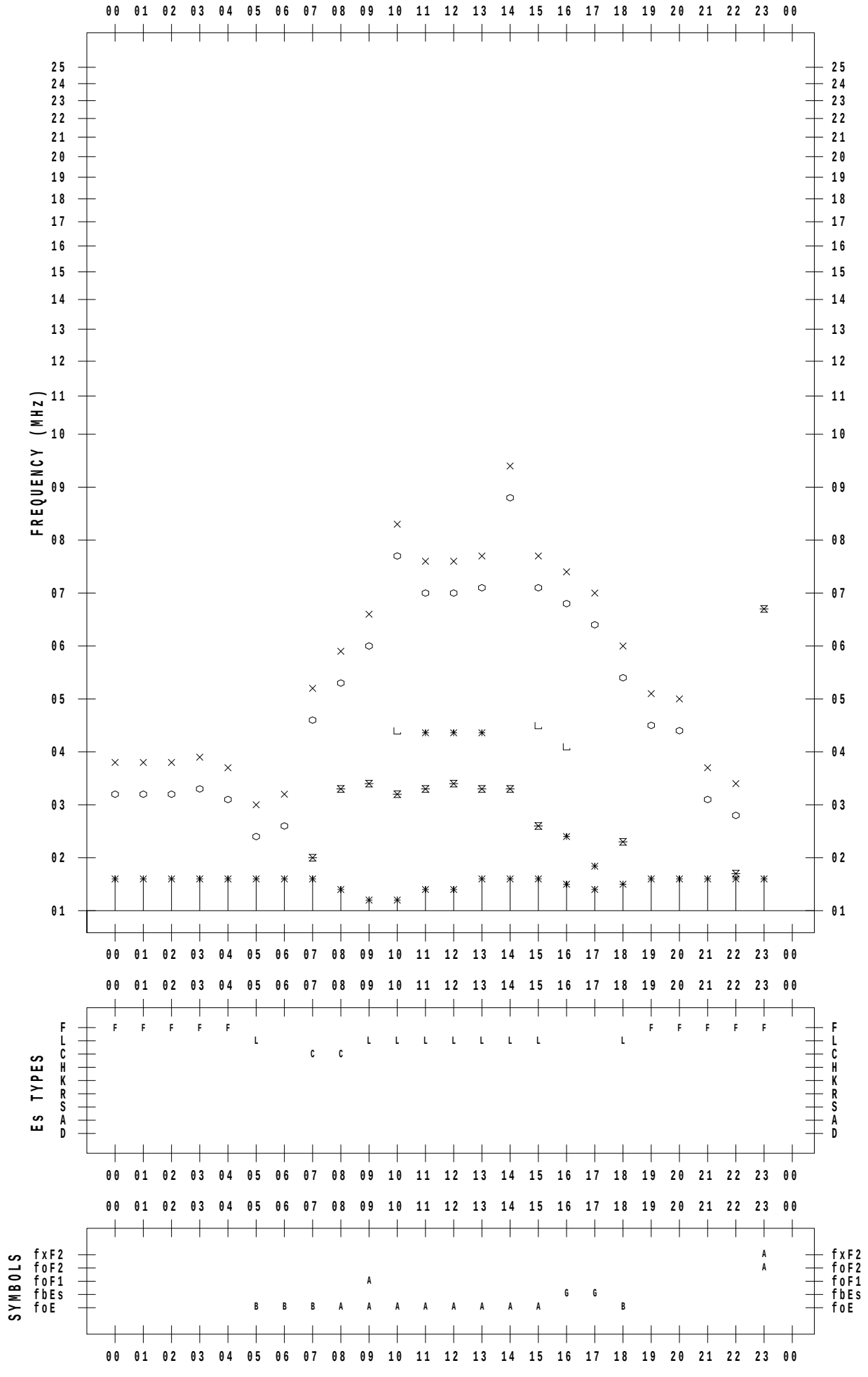
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2019/10/31

135 °E MEAN TIME



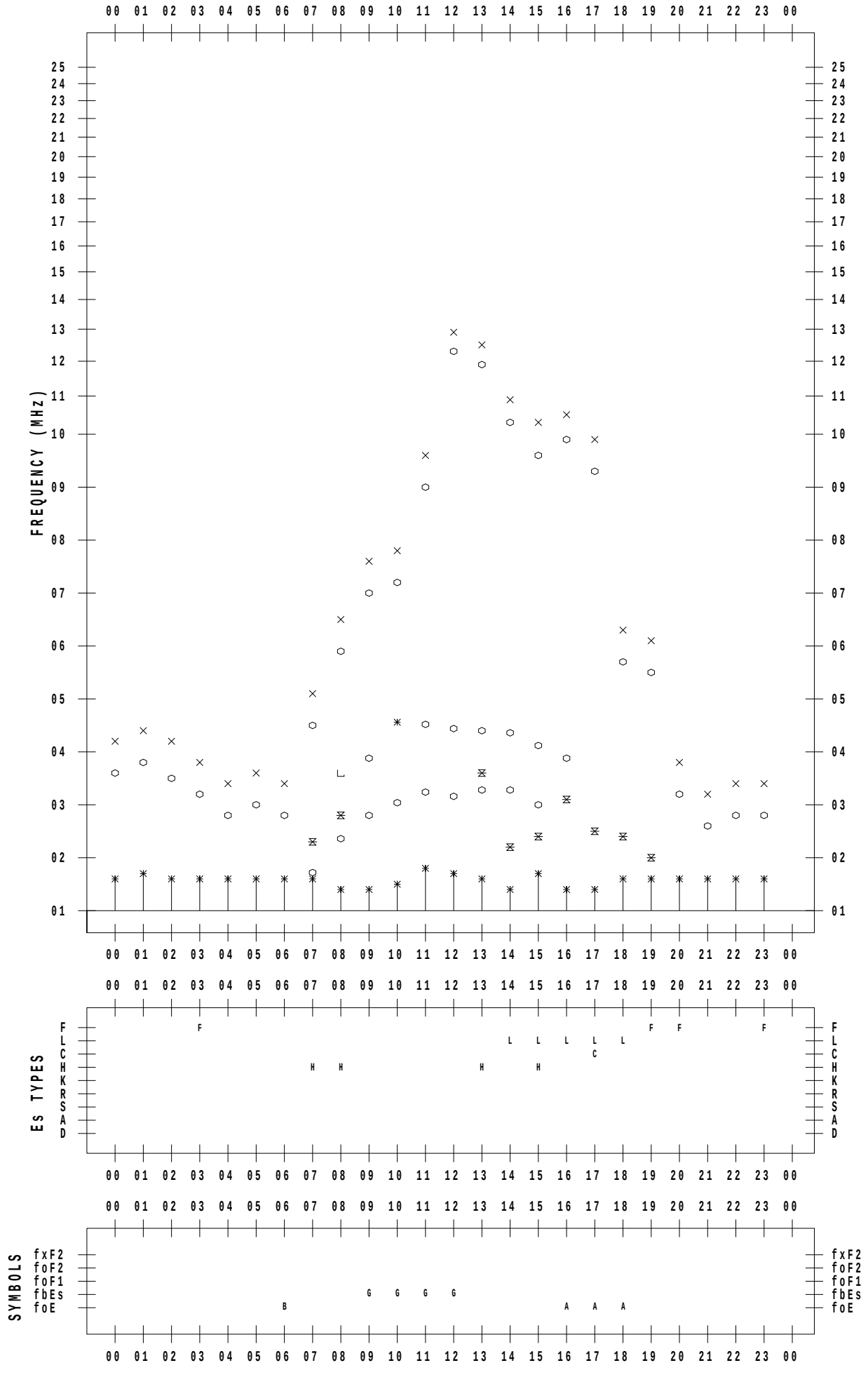
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 1

135 °E MEAN TIME



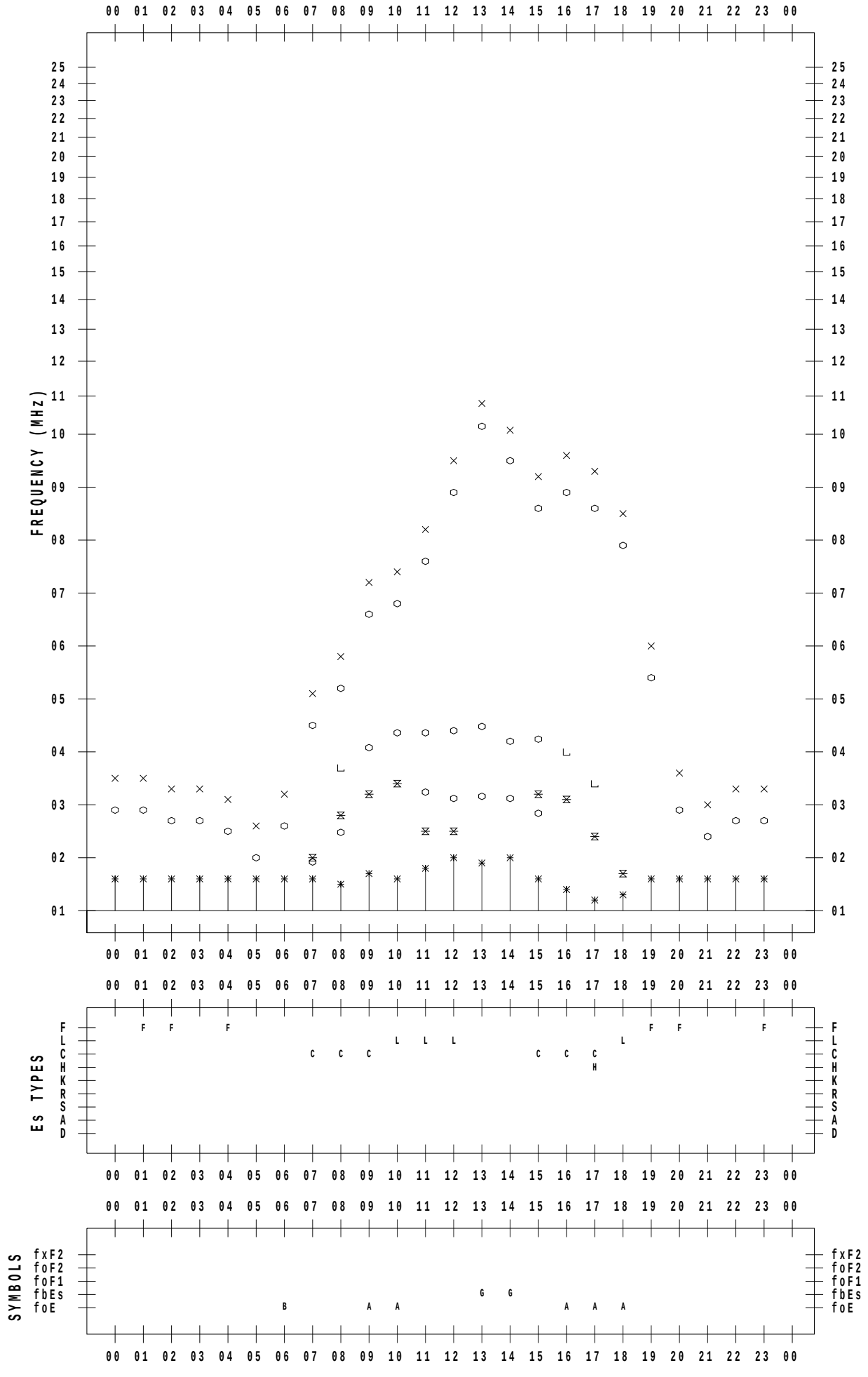
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 2

135 °E MEAN TIME



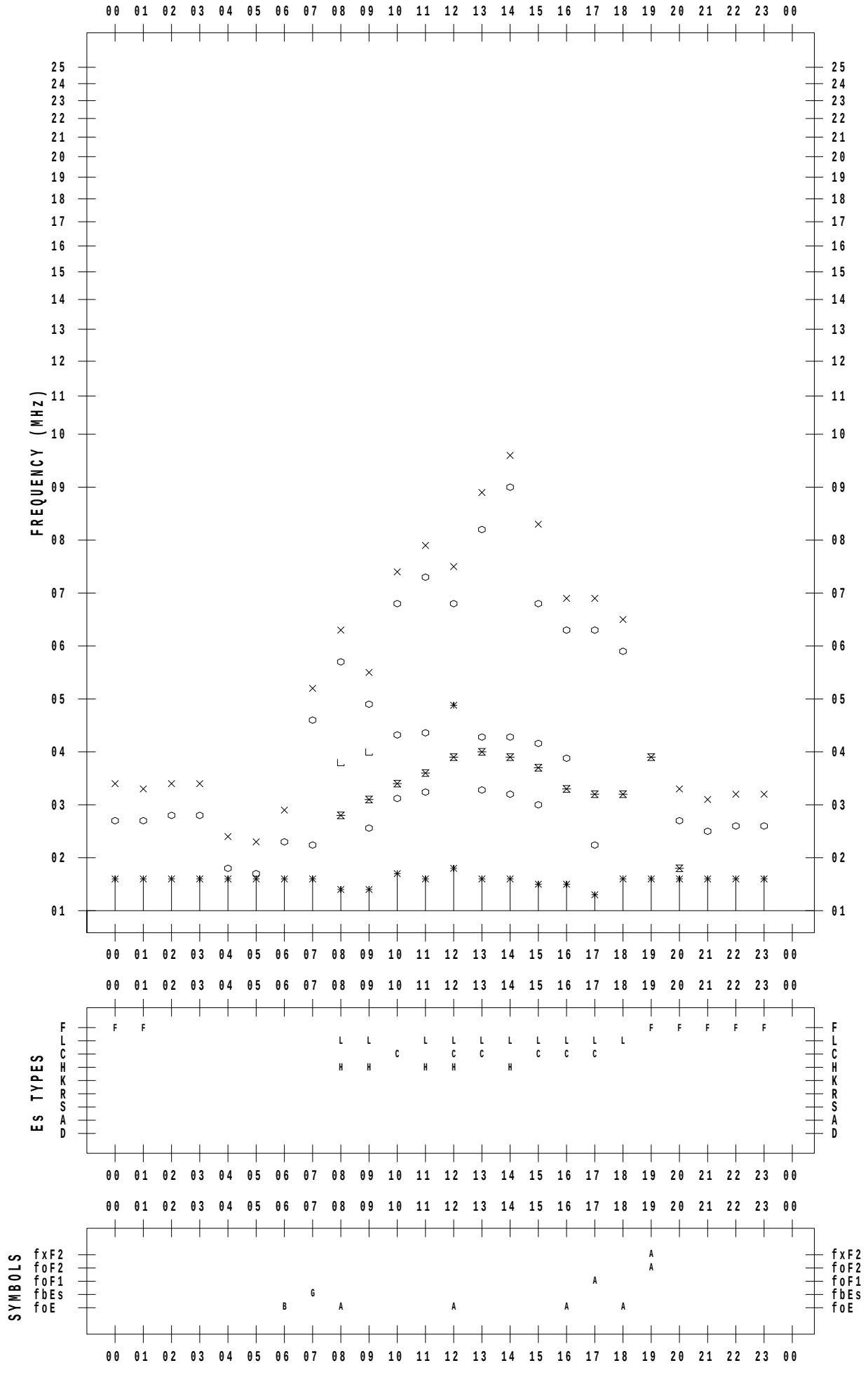
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 3

135 °E MEAN TIME



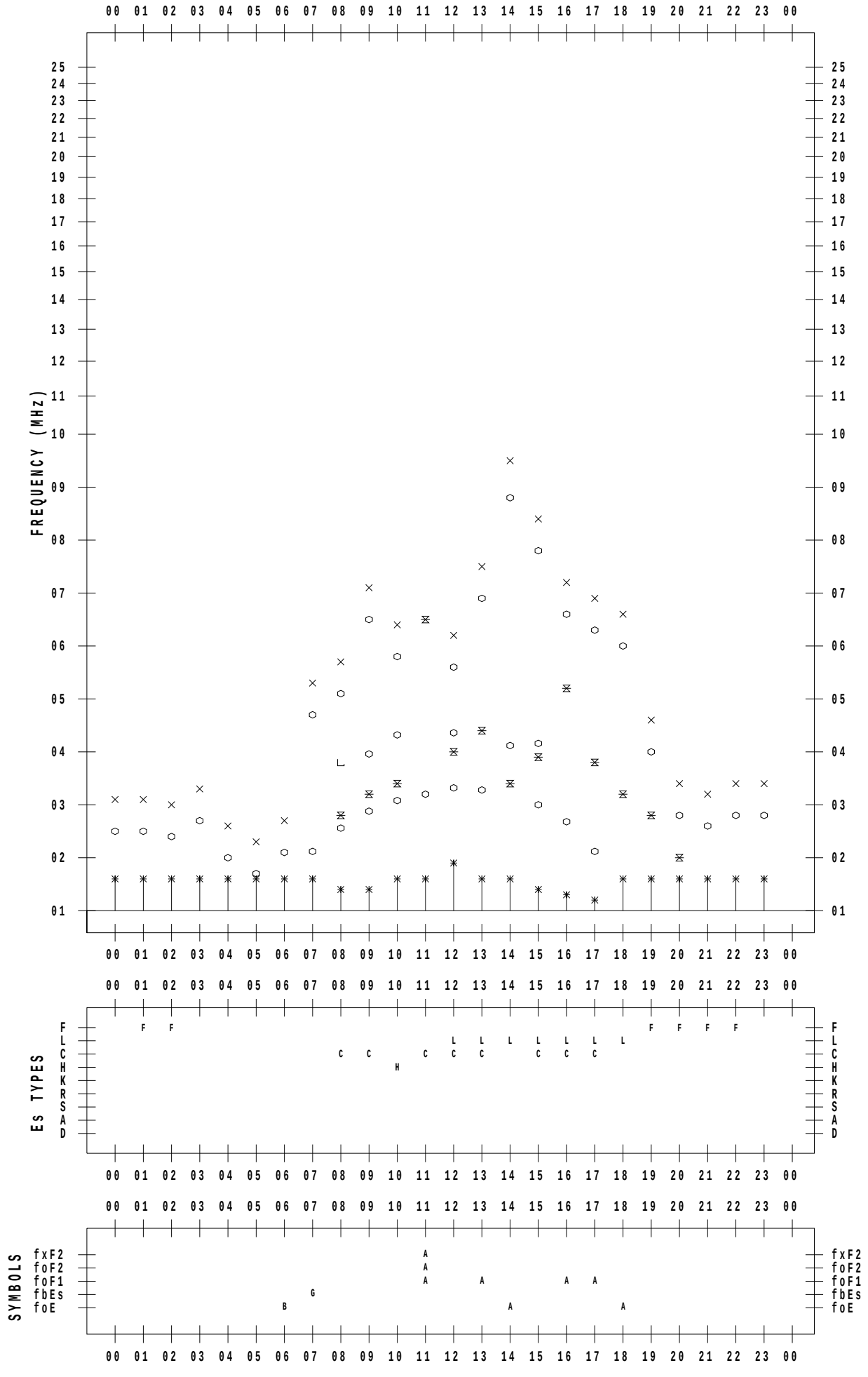
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 4

135 °E MEAN TIME



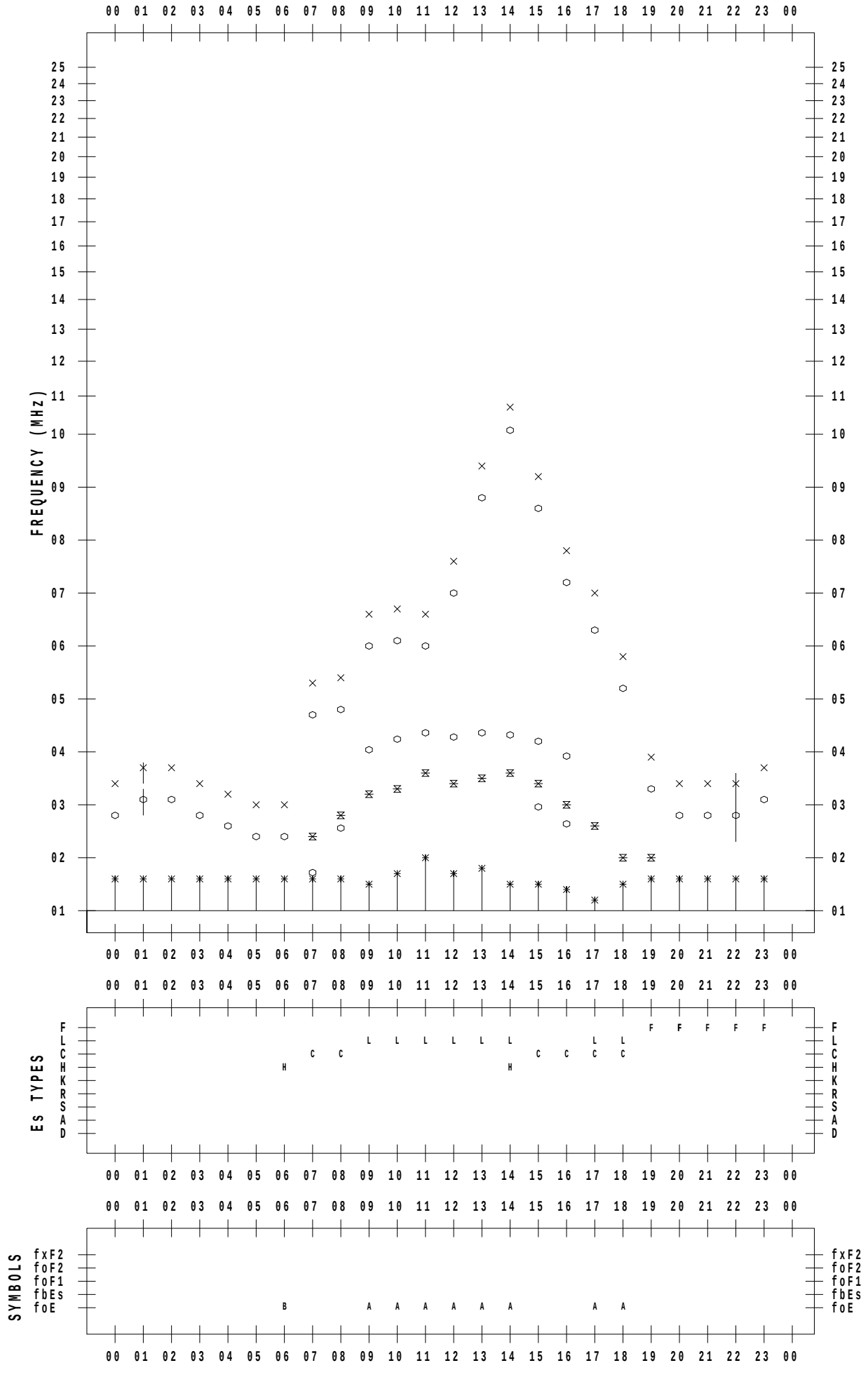
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 5

135 °E MEAN TIME



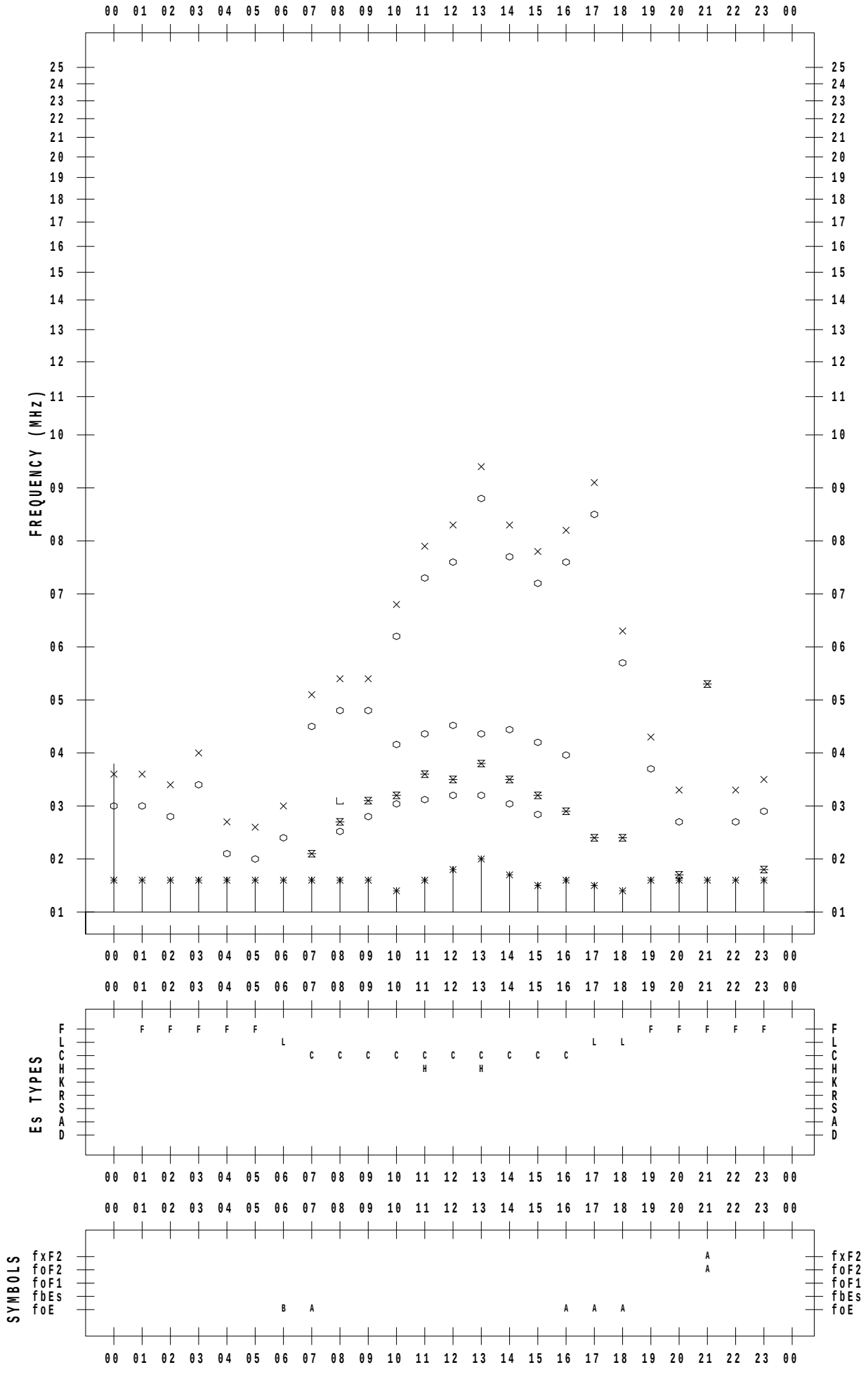
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 6

135 °E MEAN TIME



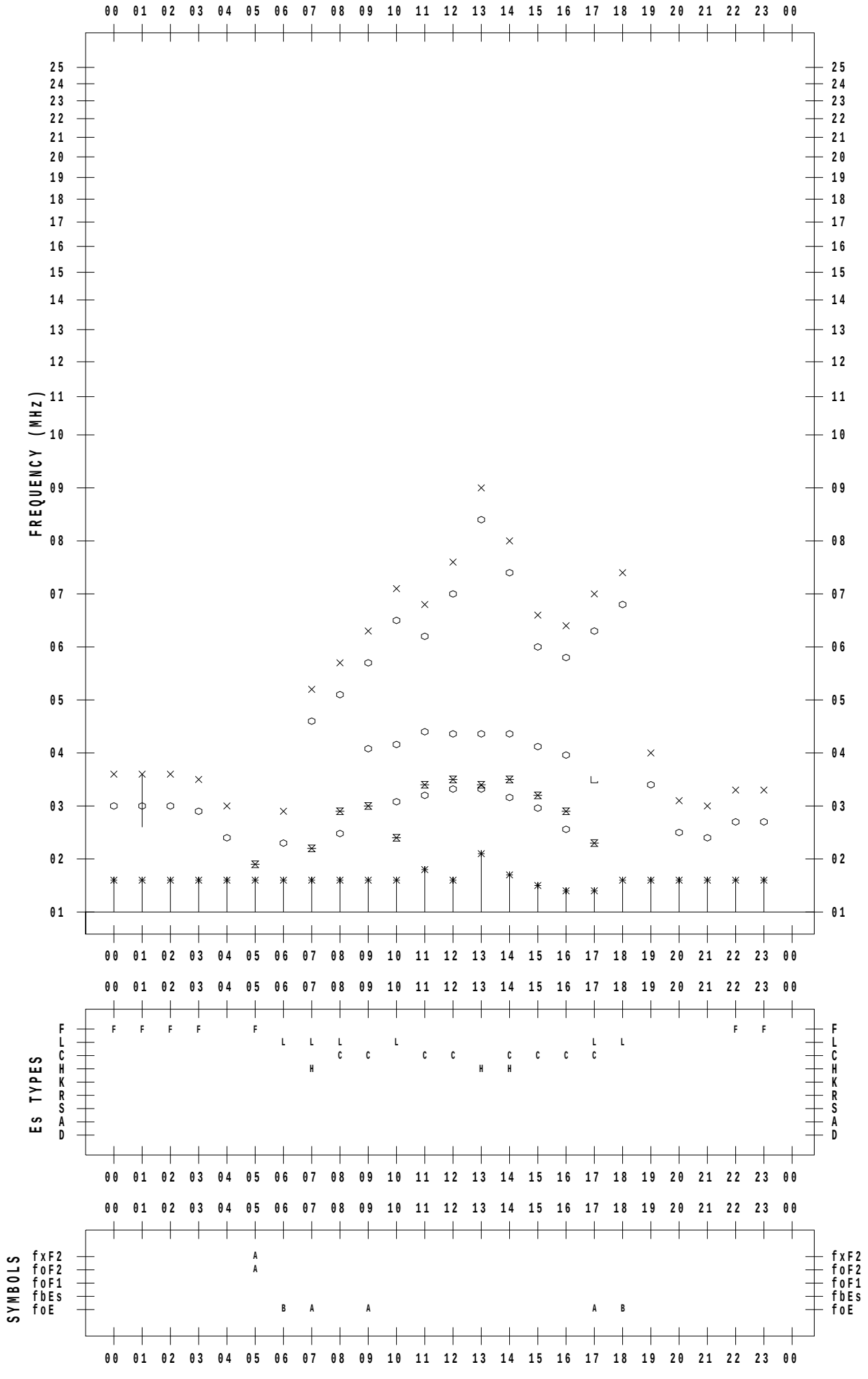
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 7

135 °E MEAN TIME



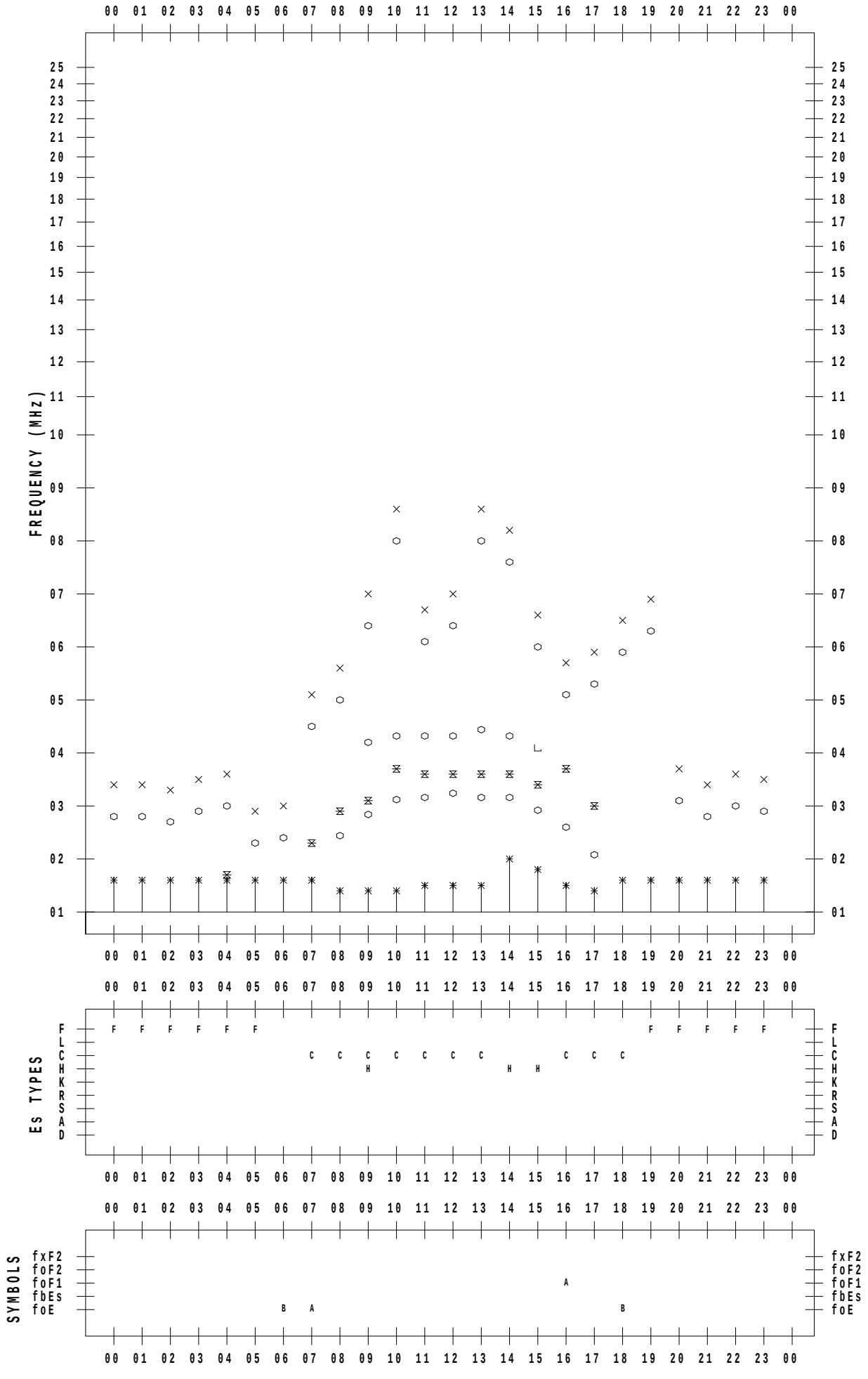
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 8

135 °E MEAN TIME



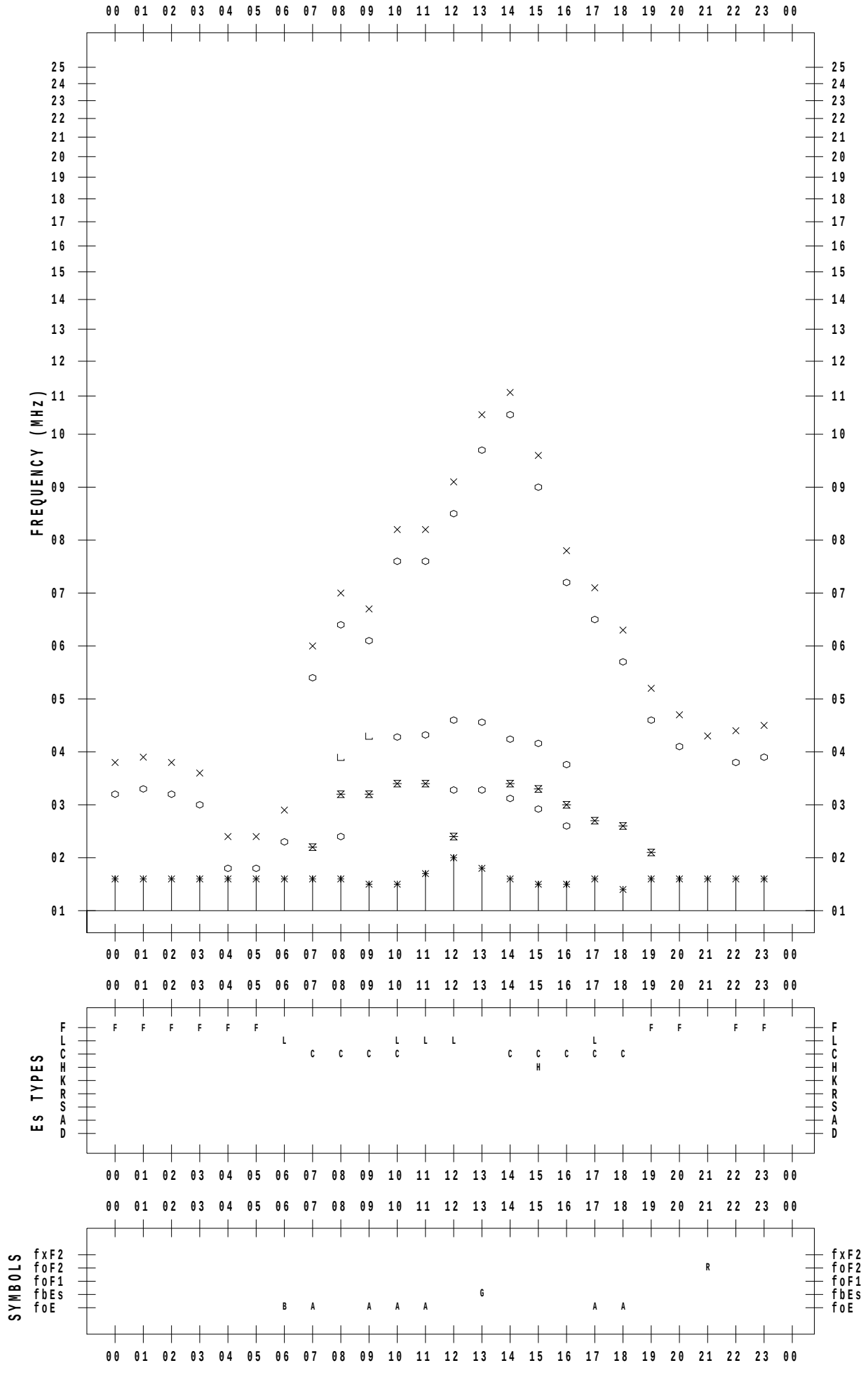
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/ 9

135 °E MEAN TIME



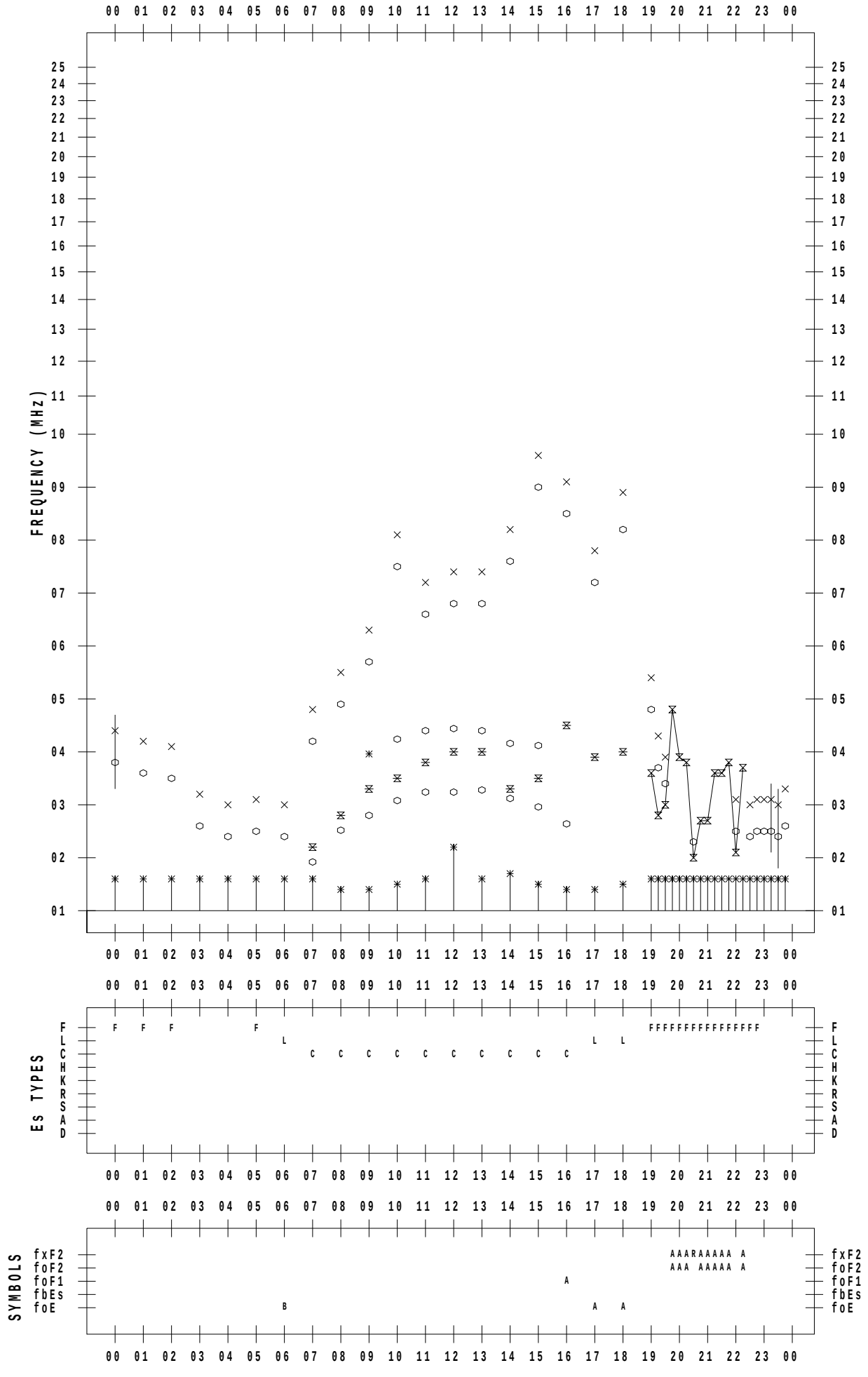
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/10

135 °E MEAN TIME



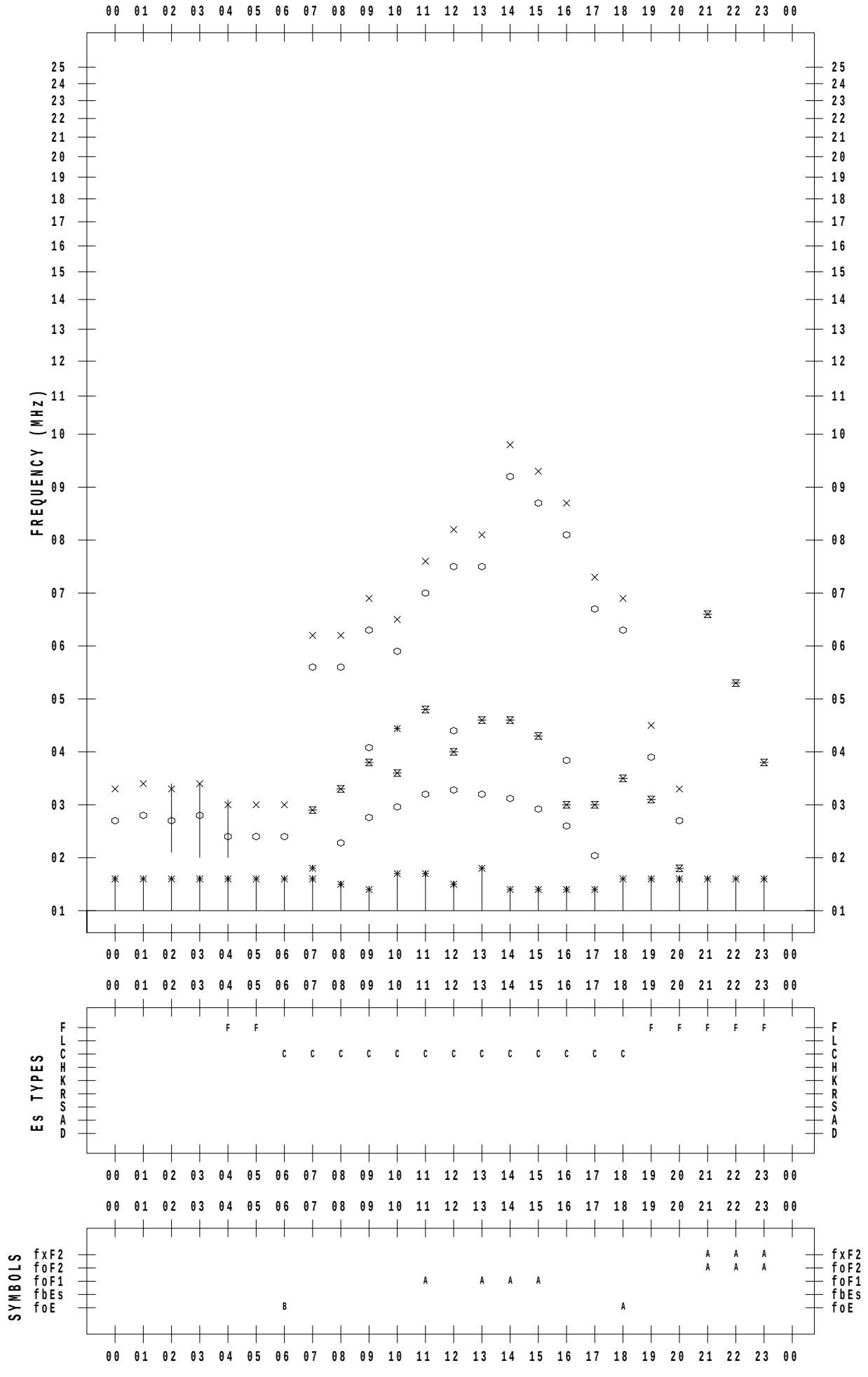
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/11

135 °E MEAN TIME



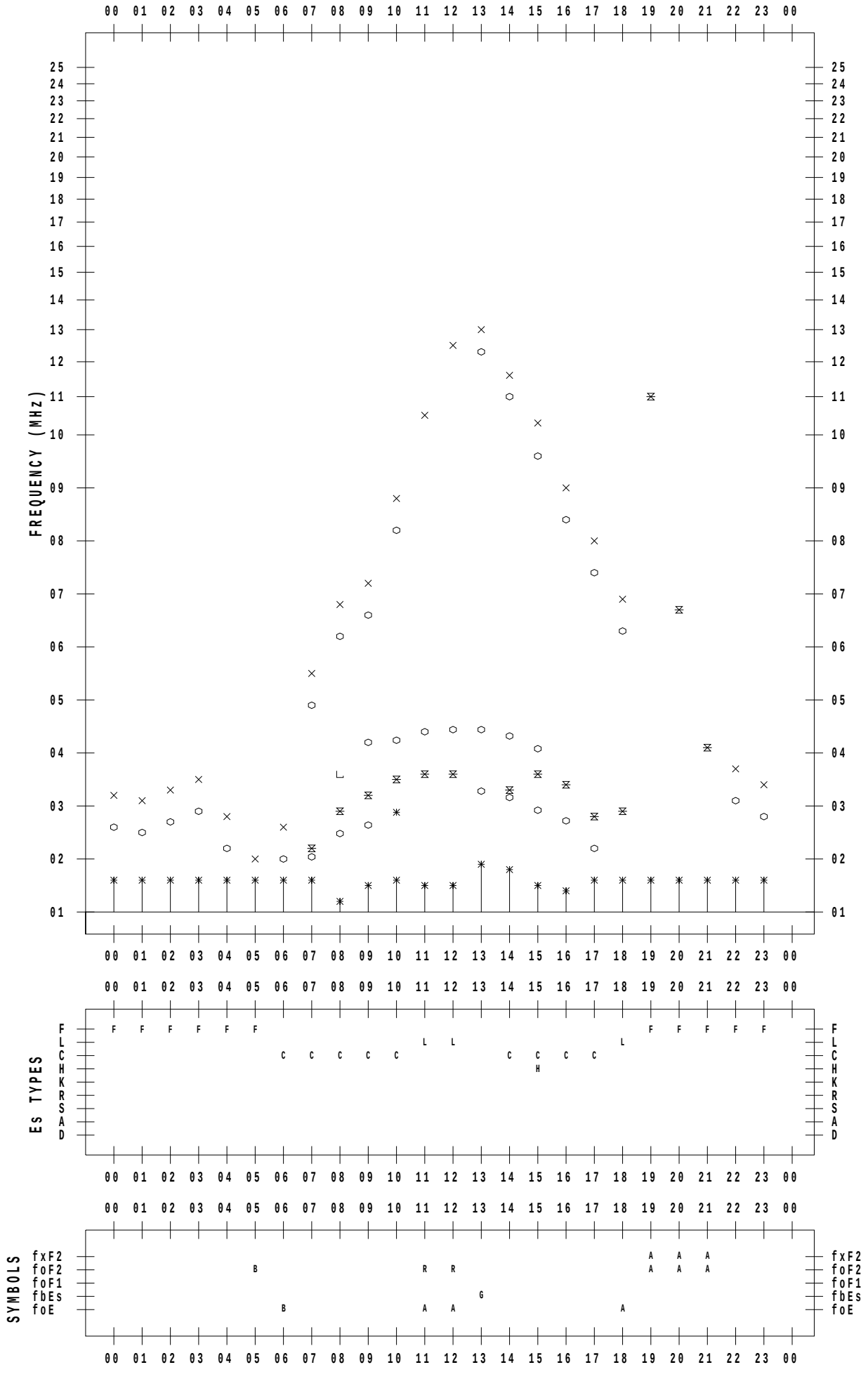
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/12

135 °E MEAN TIME



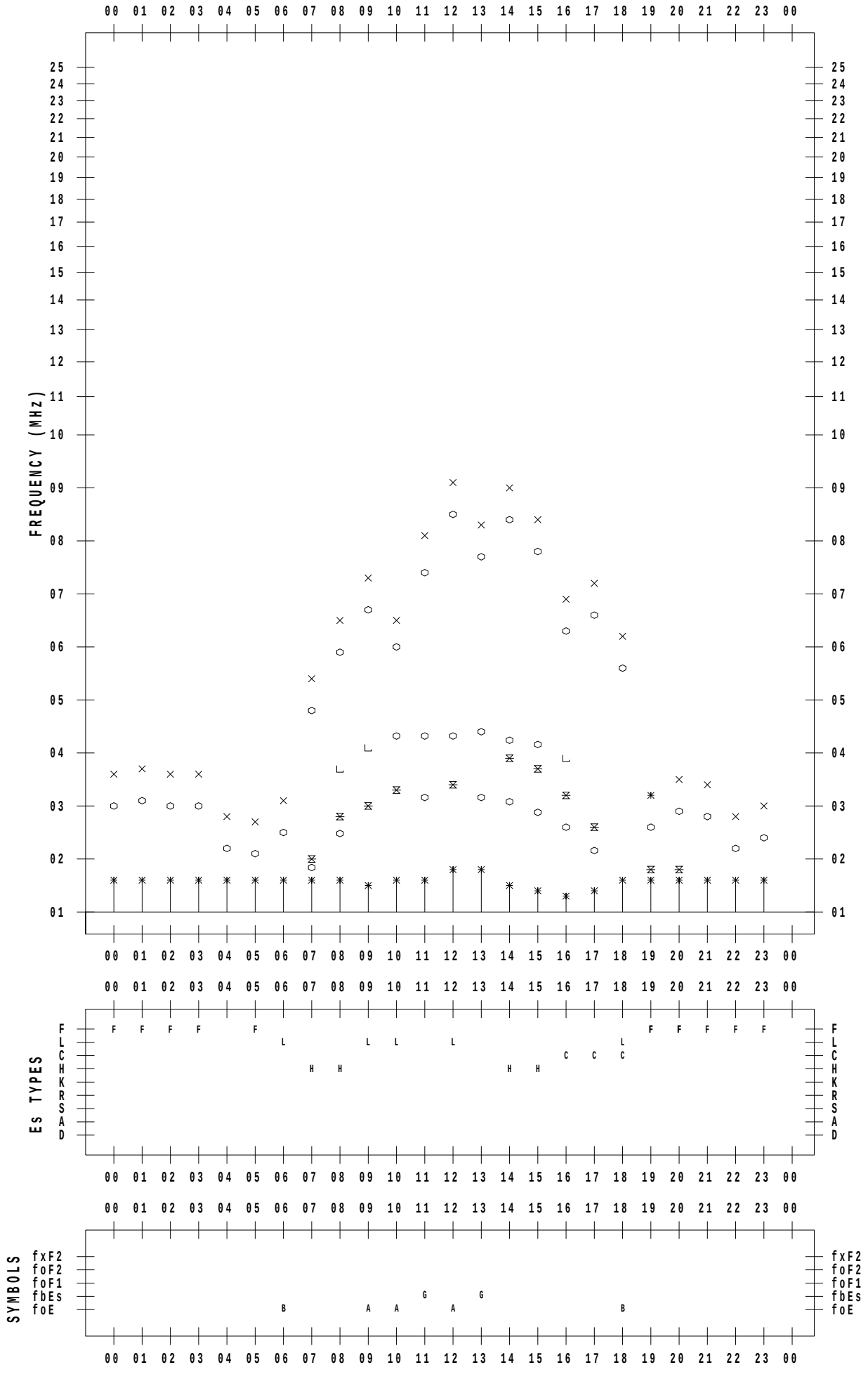
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/13

135 °E MEAN TIME



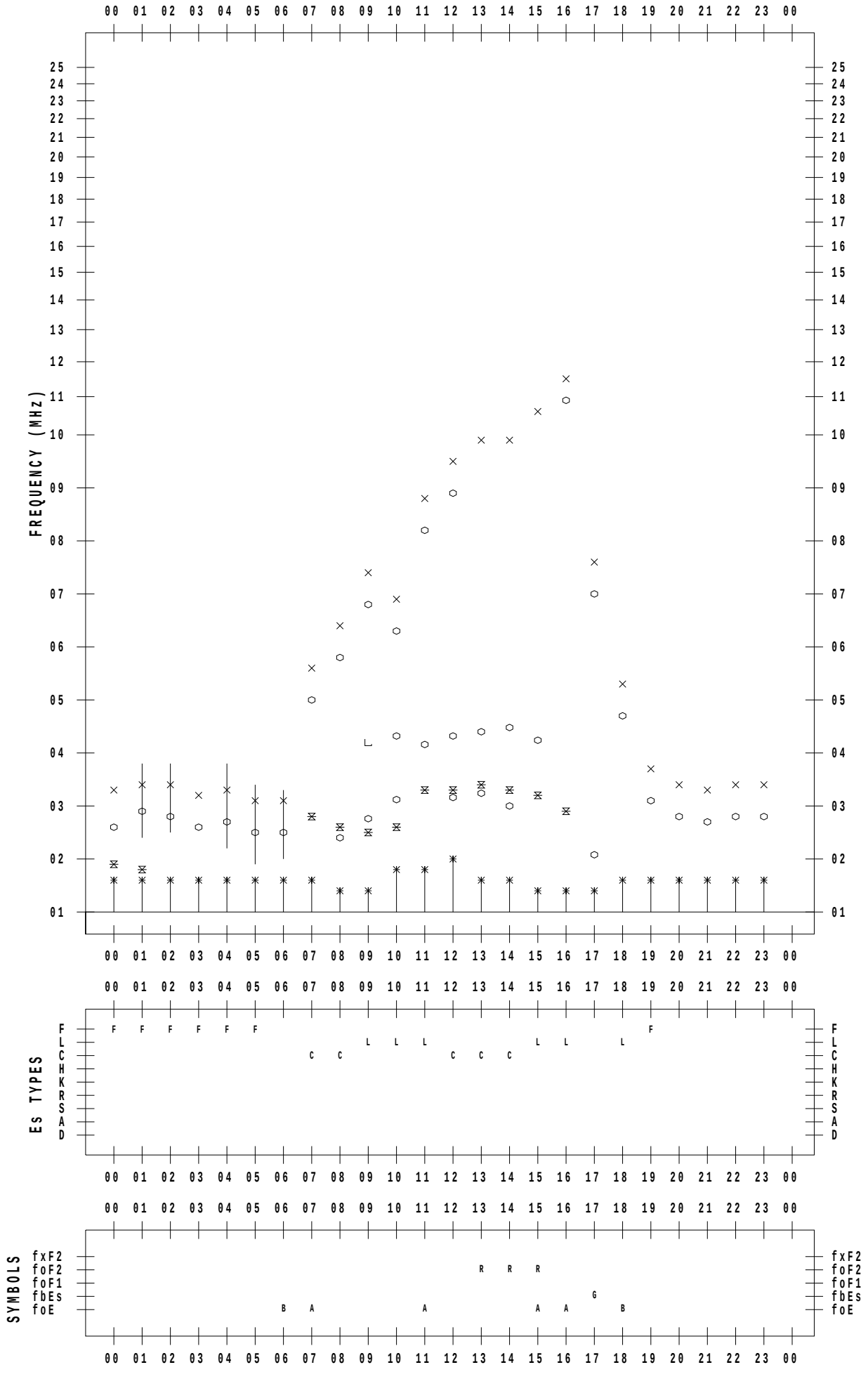
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/14

135 °E MEAN TIME



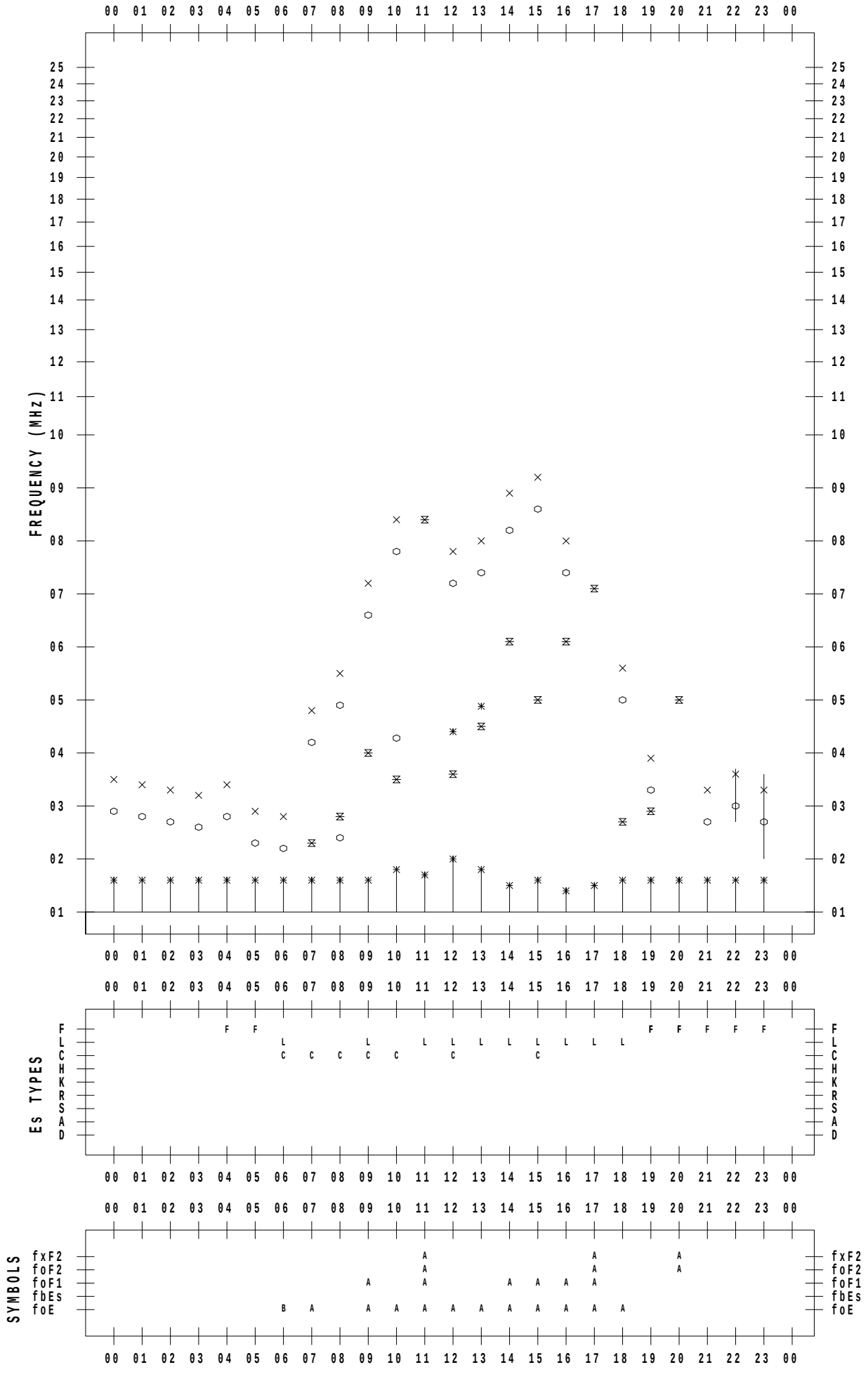
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/15

135 °E MEAN TIME



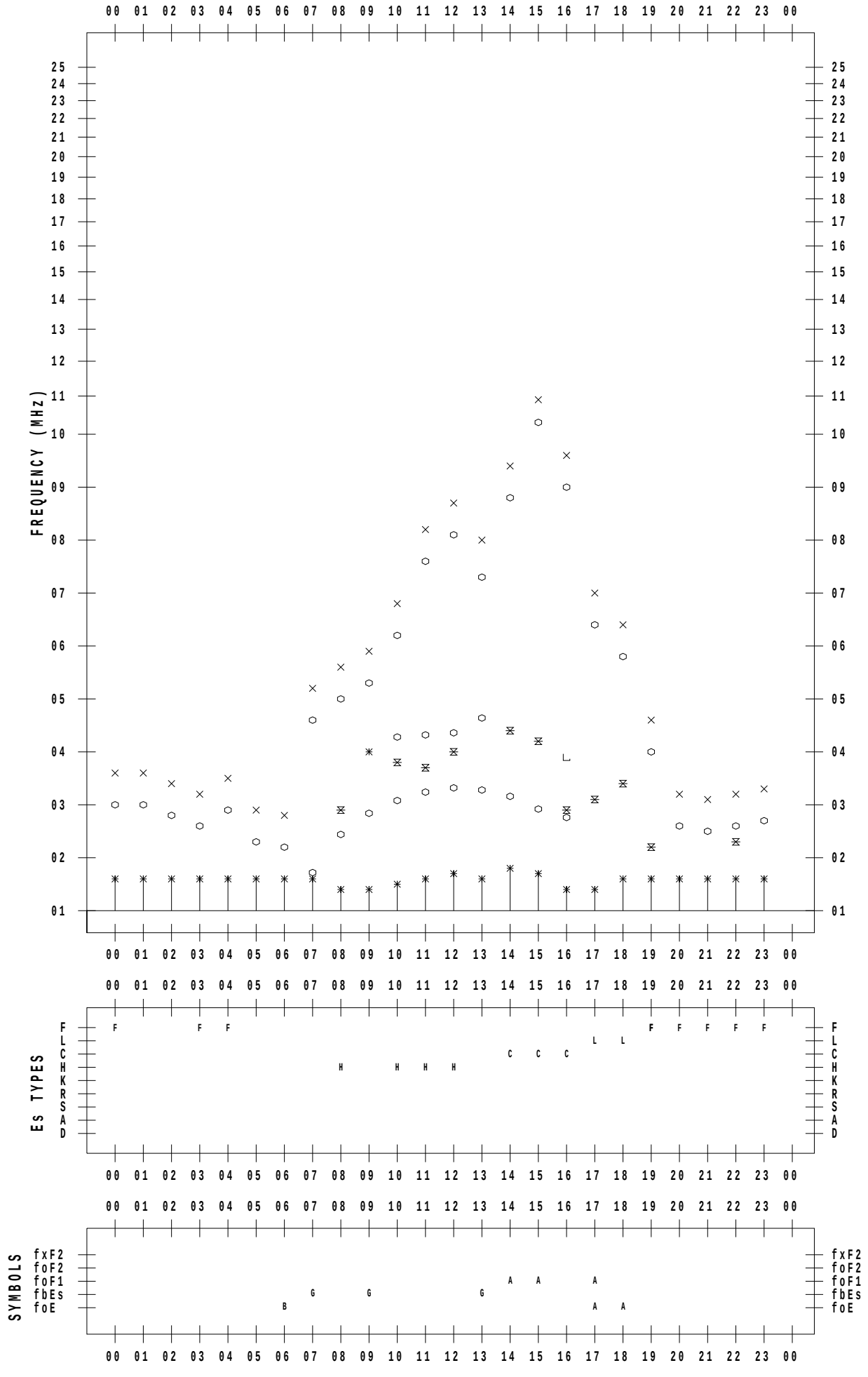
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/16

135 °E MEAN TIME



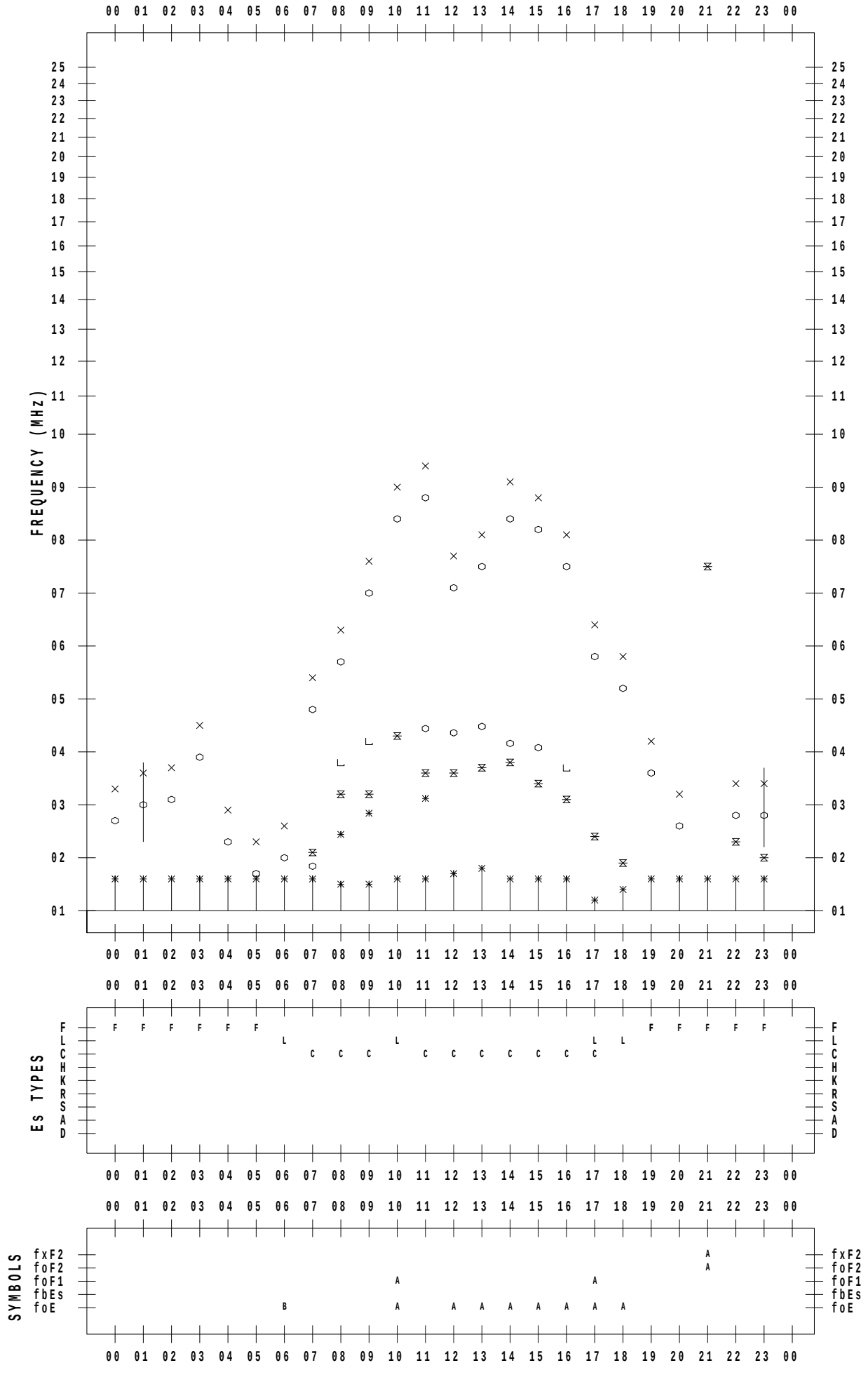
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/17

135 °E MEAN TIME



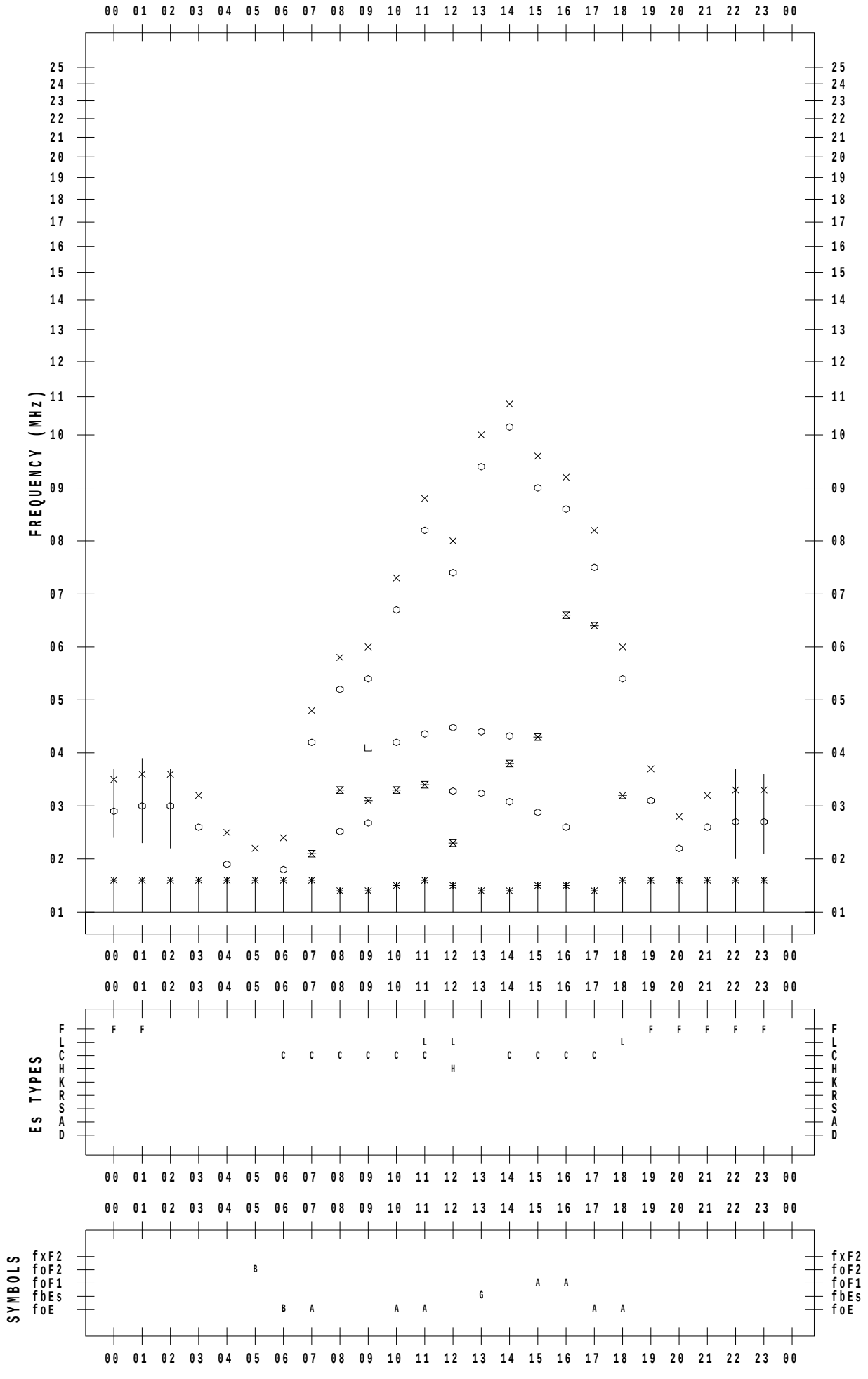
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/18

135 °E MEAN TIME



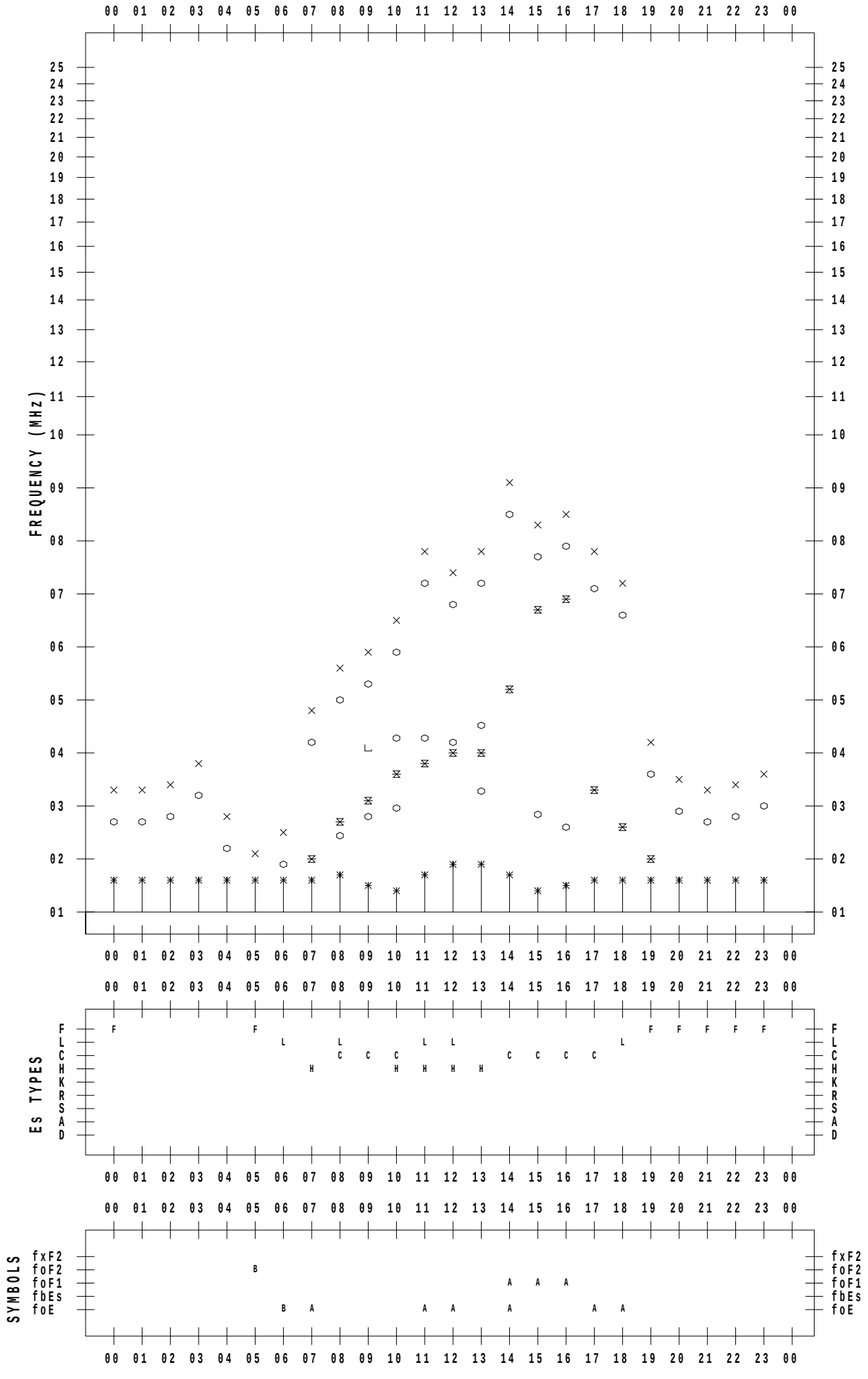
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/19

135 °E MEAN TIME



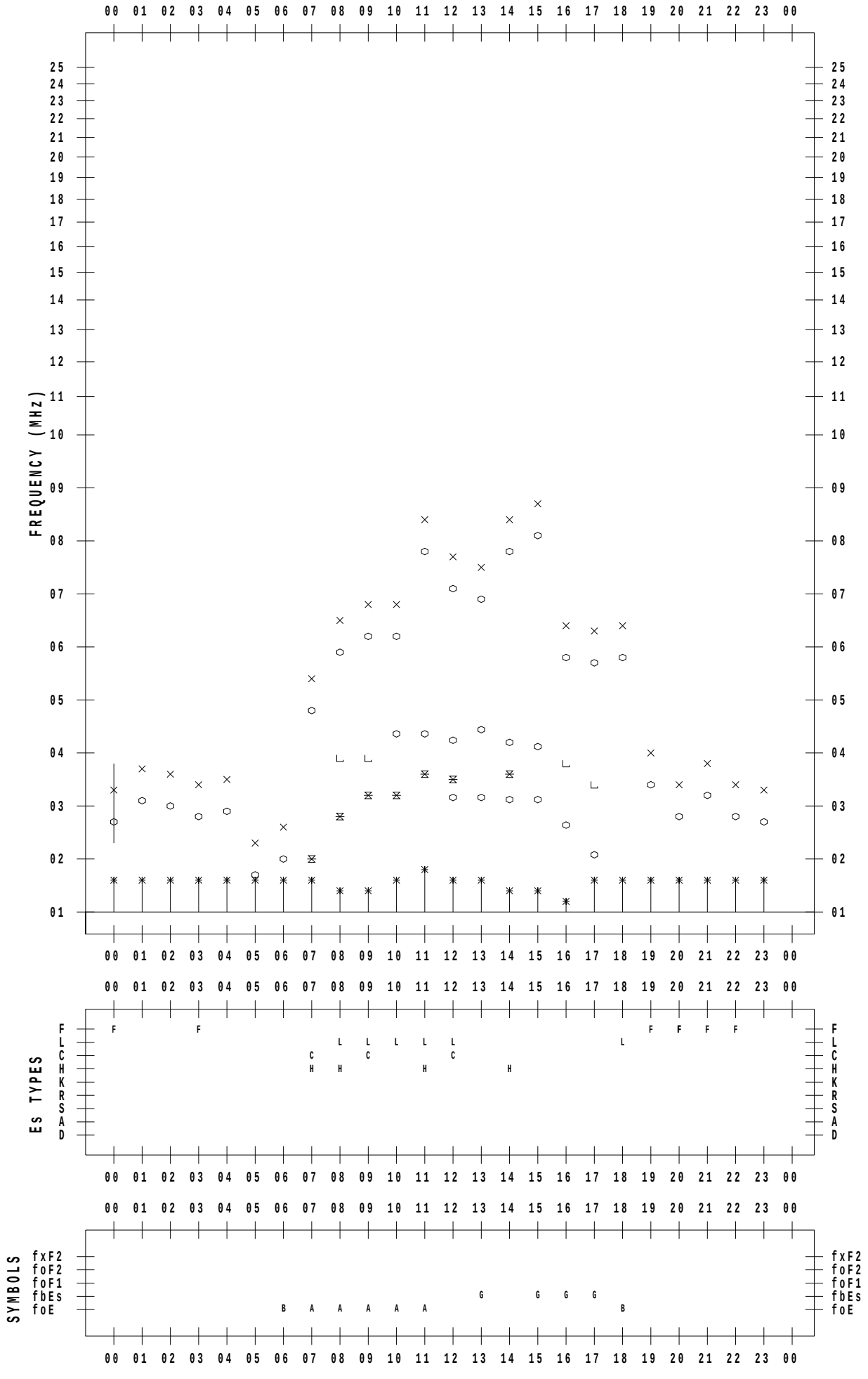
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/20

135 °E MEAN TIME



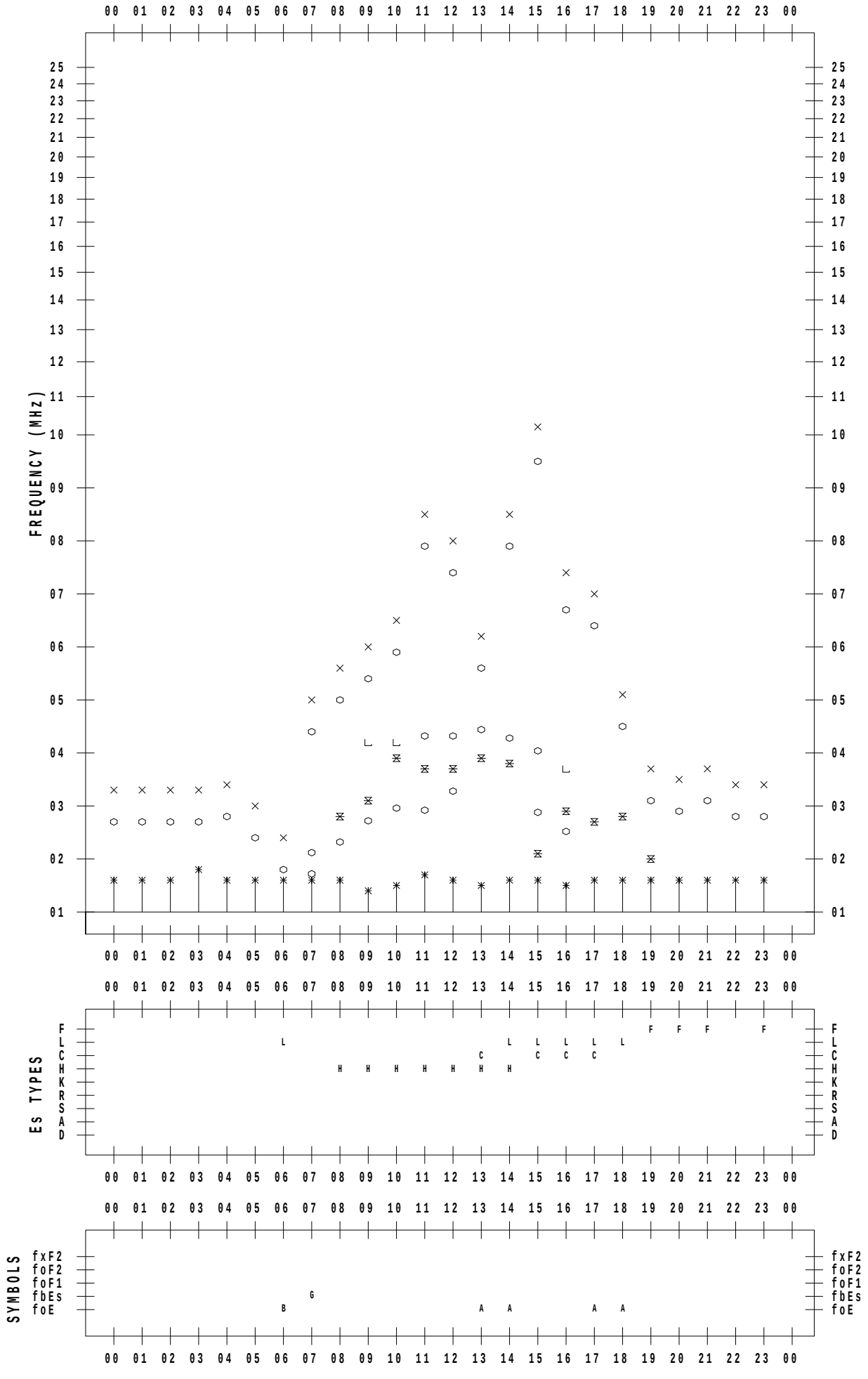
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/21

135 °E MEAN TIME



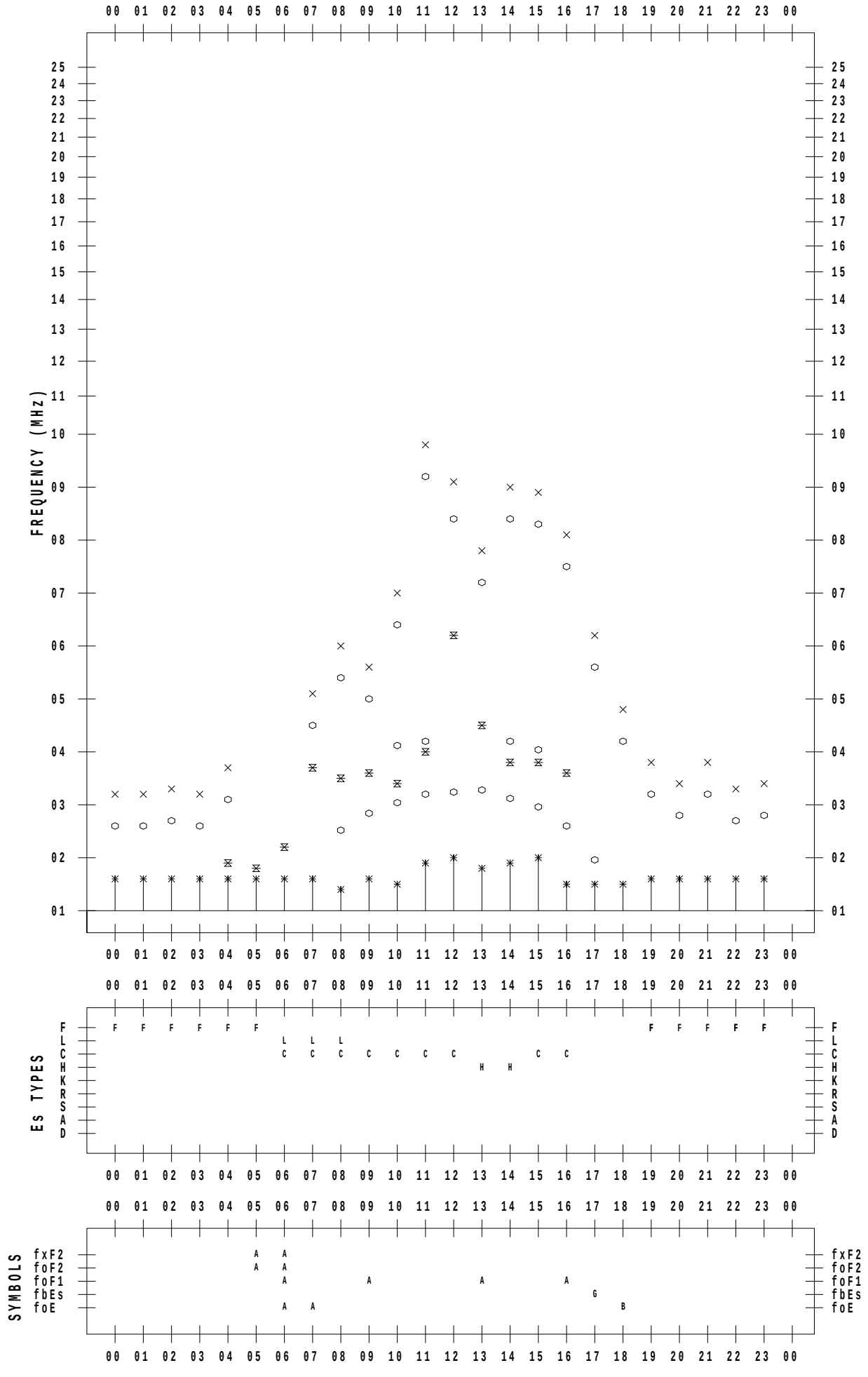
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/22

135 °E MEAN TIME



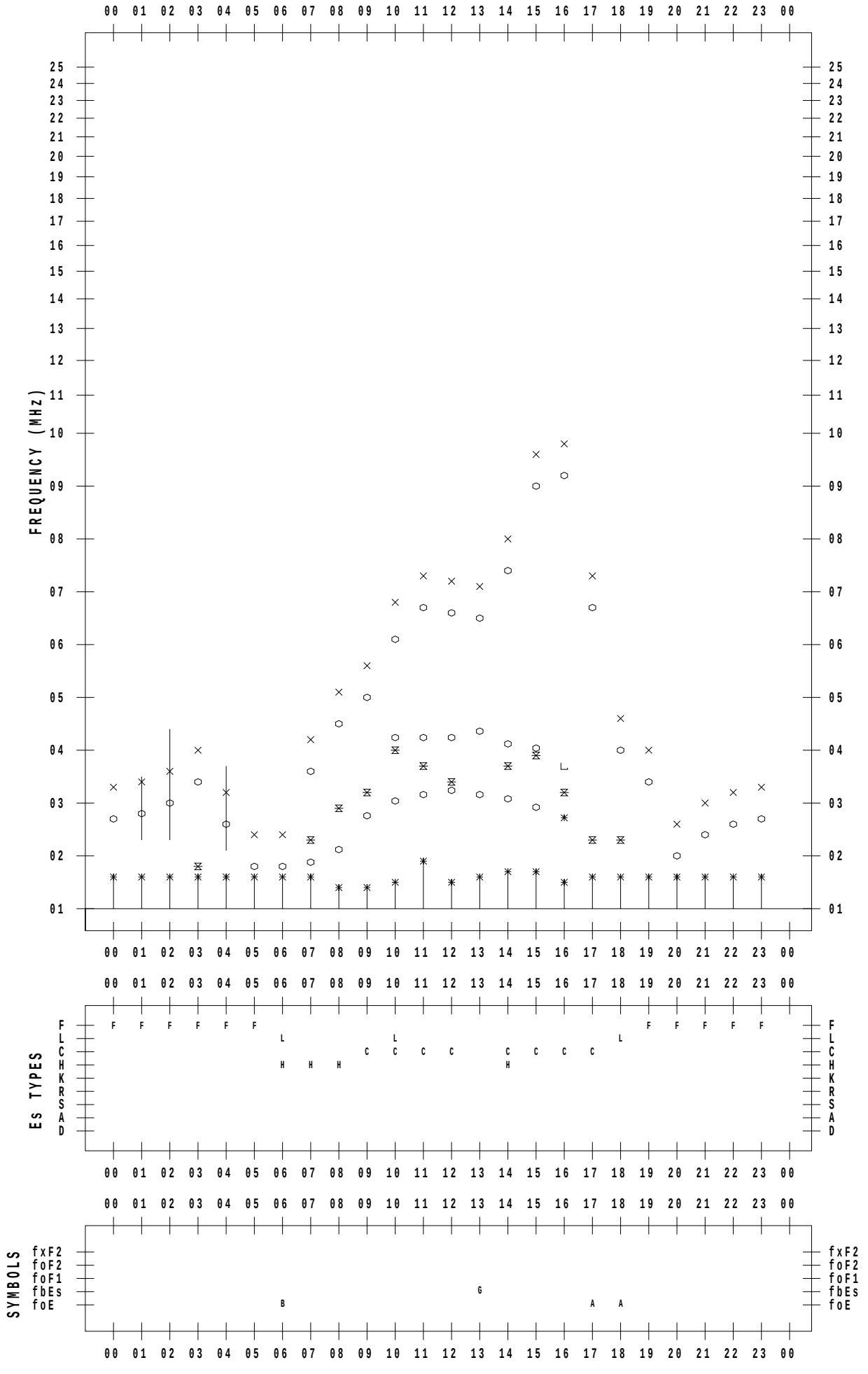
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/23

135 °E MEAN TIME



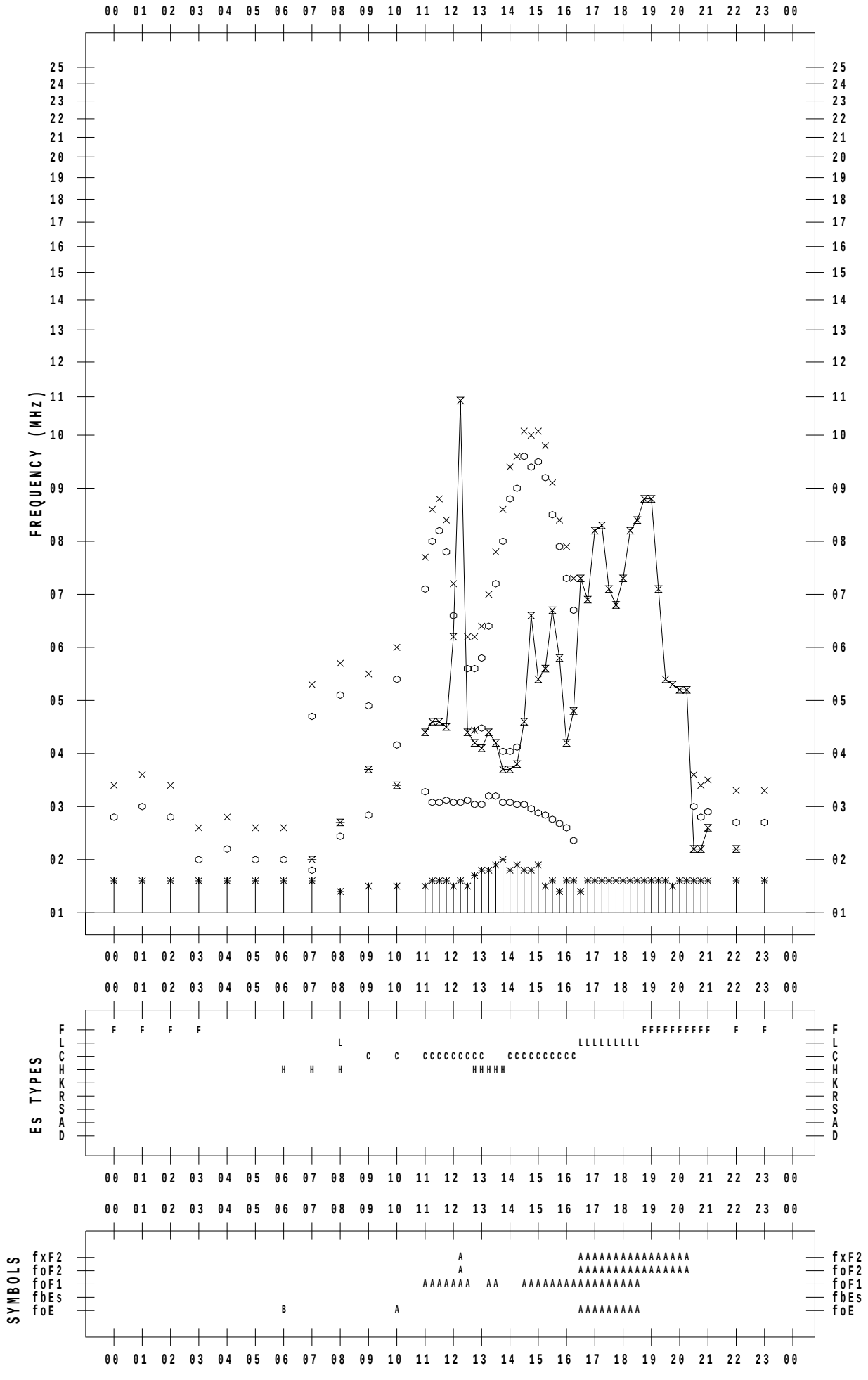
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/24

135 °E MEAN TIME



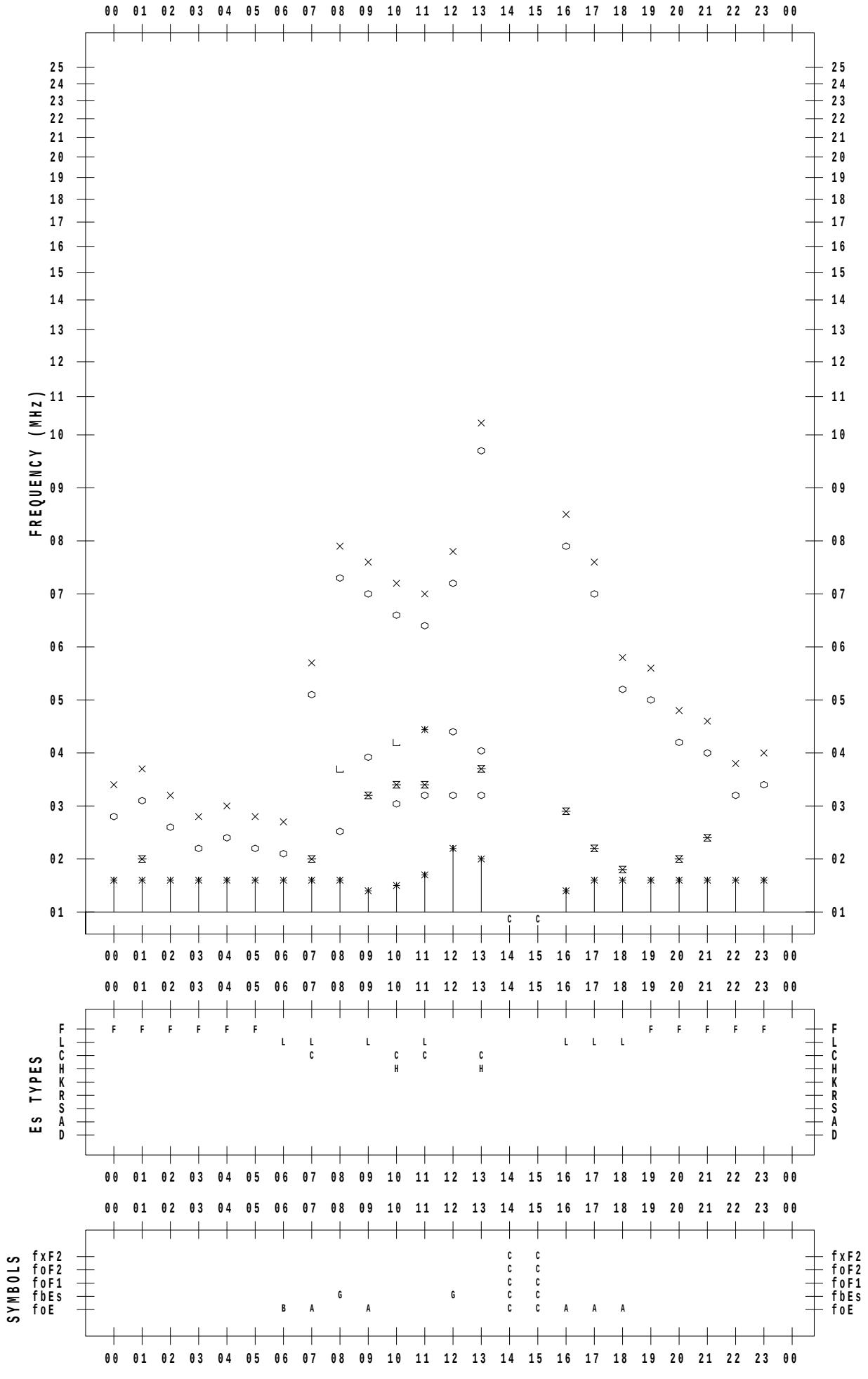
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/25

135 °E MEAN TIME



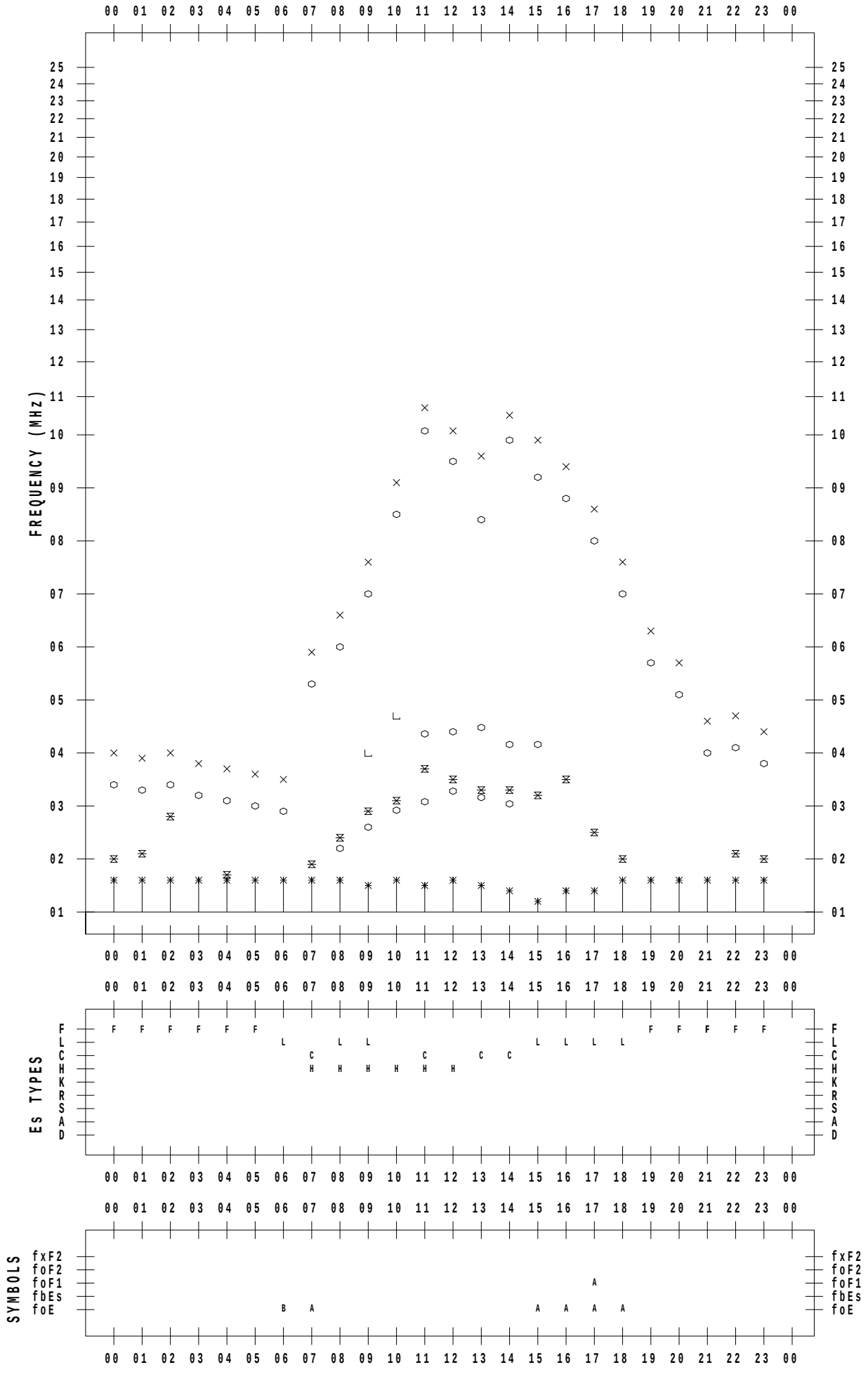
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/26

135 °E MEAN TIME



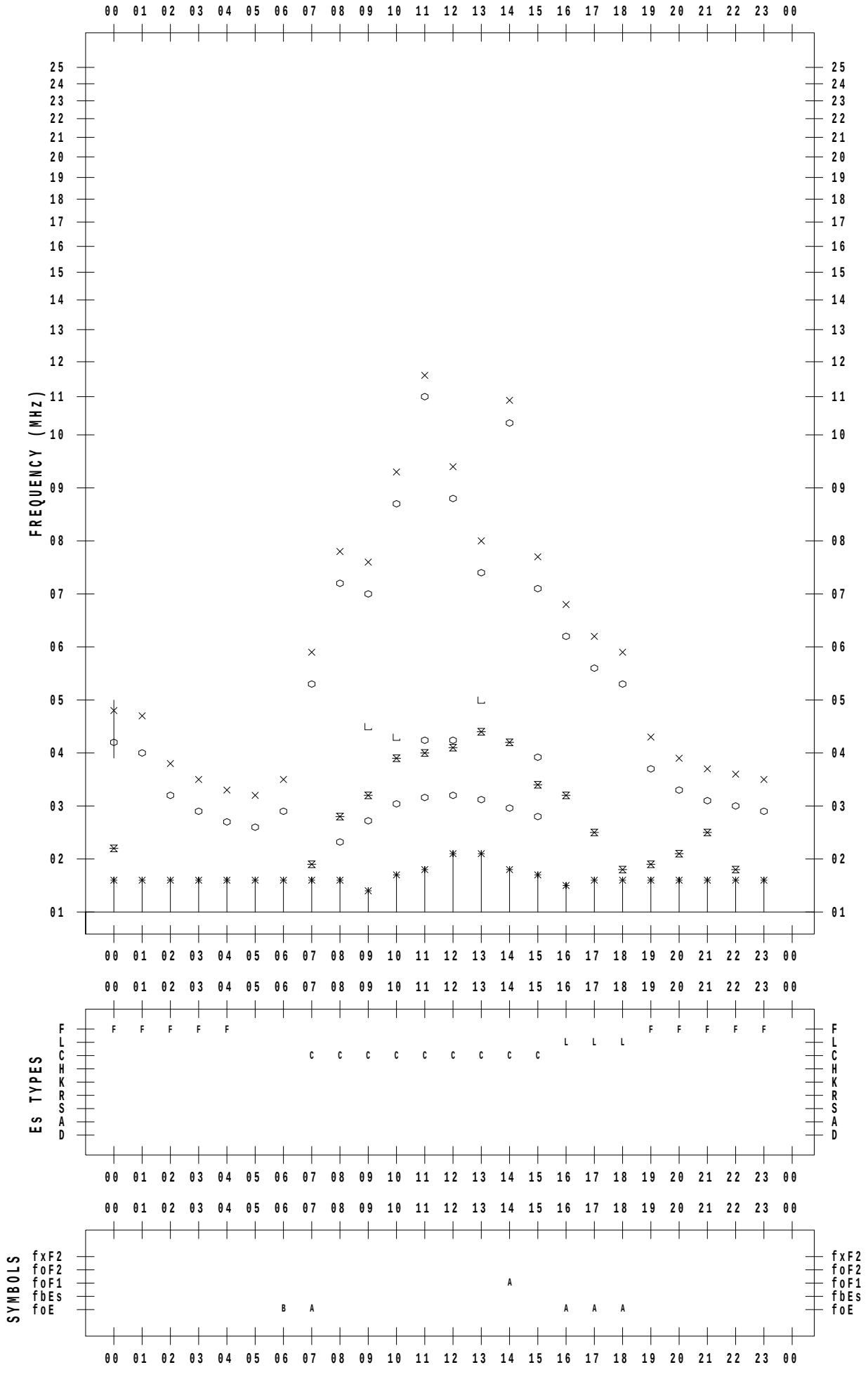
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/27

135 °E MEAN TIME



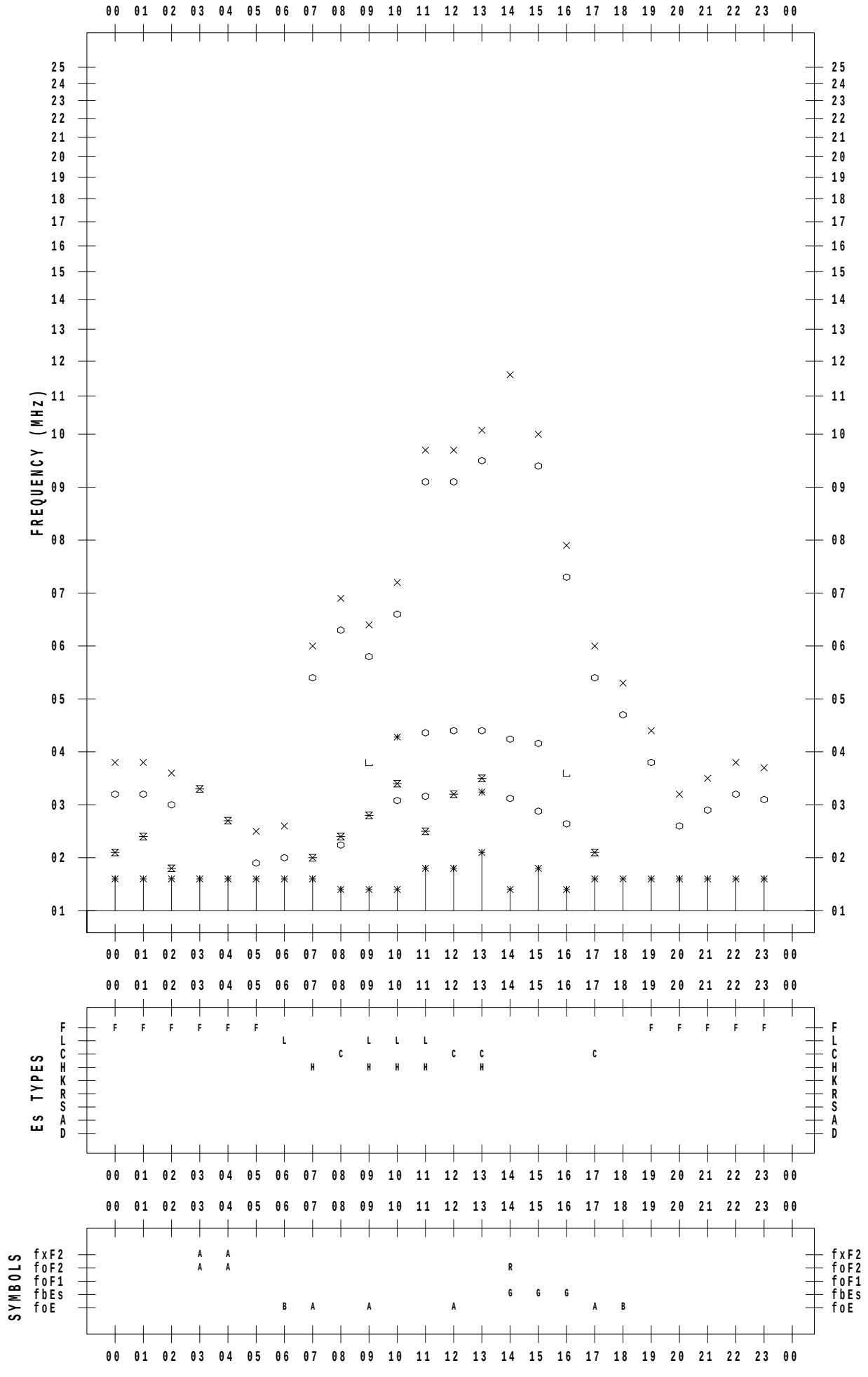
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/28

135 °E MEAN TIME



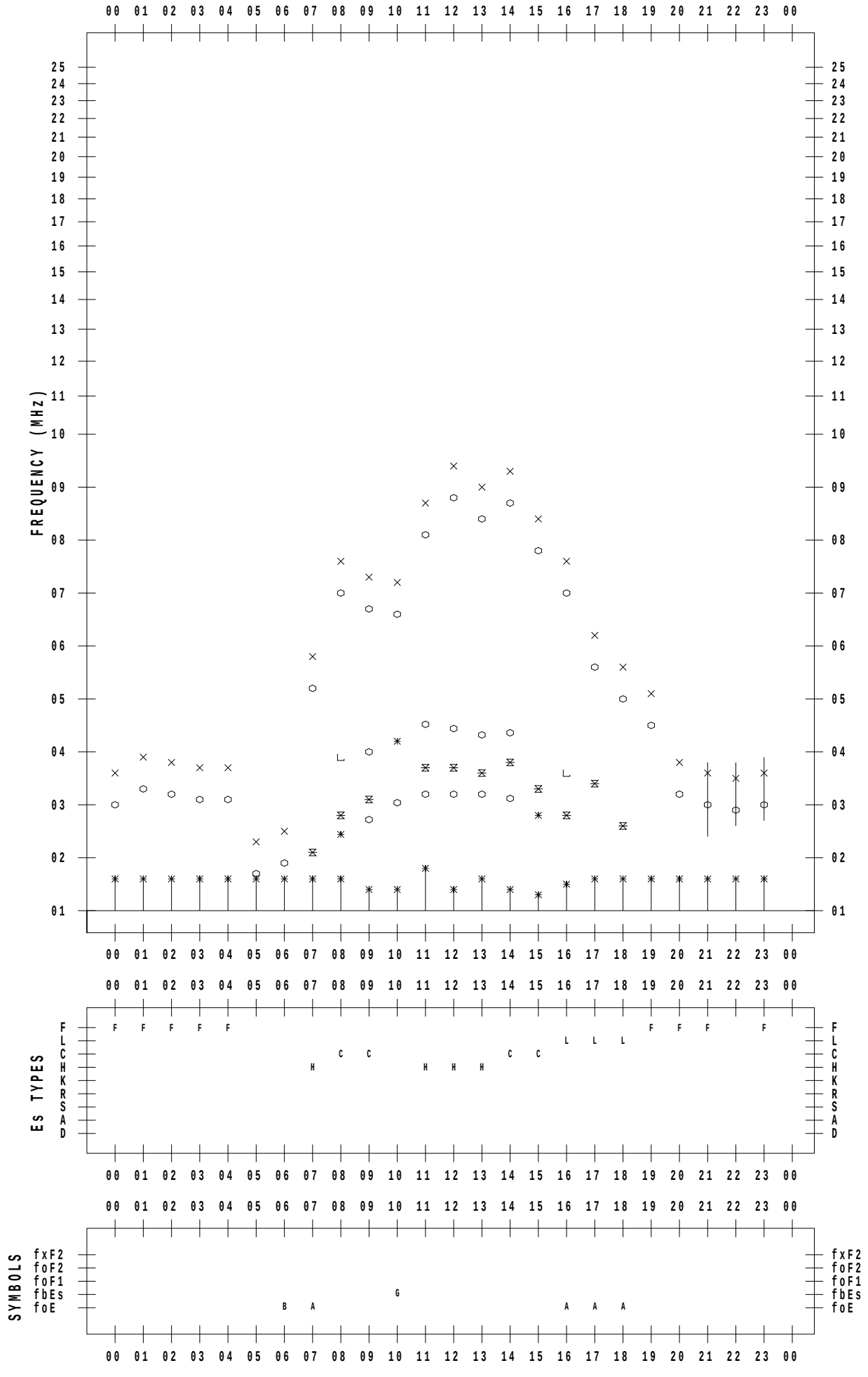
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/29

135 °E MEAN TIME



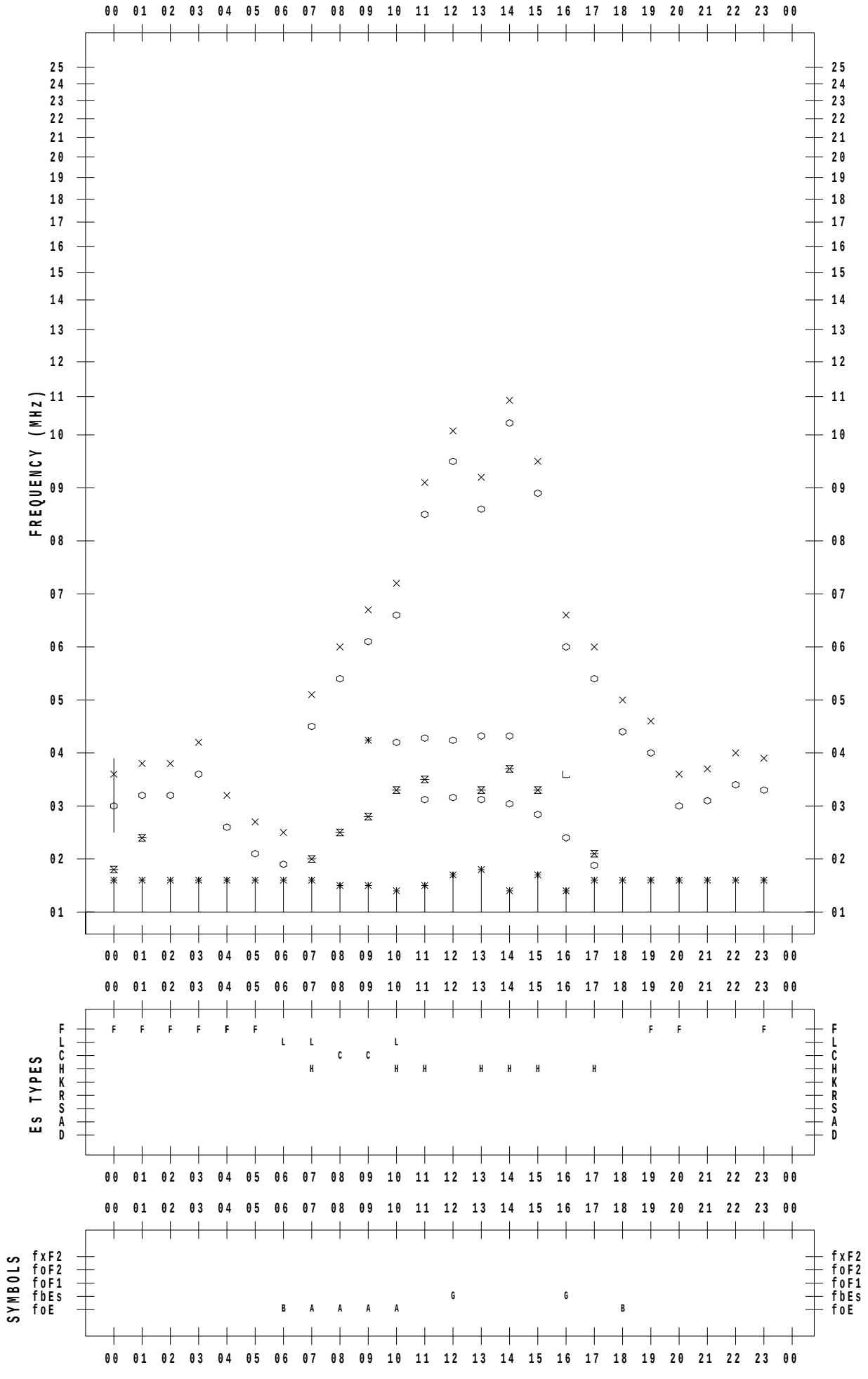
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2019/10/31

135 °E MEAN TIME