F-893

IONOSPHERIC DATA IN JAPAN

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≪WDC for Ionosphere and Space Weather ･･･ https://wdc.nict.go.jp/IONO/wdc/index.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

MAY 2023

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	63	59	54	58	59	69	79	90	89	84	83	87	91	91	89	88	87	87	82	84	86	87	82	71
2	68	70	66	58	51	45	42	54	59	61	60	66	71	68	70	72	76	72	78	79	73	67	59	59
3	59	59	61	60	59	73	89	91	98	91	90	90	92	93	95	91	92	87	81	95	93	87	71	69
4	69	67	67	64	67	72	87	90	84	87	87	89	93	93	91	85	85	79	90	101	93	N 32	72	67
5	69	70	66	67	64	68	78	84	89	75	81	84	85	86	88	92	89	89	89	94	92	85	81	76
6	71	70	69	67	68	73	86	93	86	79	81	85	91	85	93	93	100	101	96	81	77	74	73	73
7	71	68	65	64	65	59	65	67	65	A	64	66	69	69	70	75	76	74	N 85	93	93	N 74	68	70
8	67	67	65	57	57	61	62	64	65	67	68	61	70	74	75	73	70	68	69	81	82	78	70	63
9	63	58	57	58	59	69	82	87	80	64	55	68	64	64	64	67	69	66	69	79	89	85	77	69
10	66	69	71	63	63	72		78	66	58	61	55	A	75	71	75	77	72	71	75	76	71	A	67
11	69	70	66	65	63	64	75	70	77	78	A	A	82	80	79	83	83	78	77	85	91	81	84	77
12	75	72	71	69	71	69	87	94	93	85	82	92	83	85	93	95	97	89	79	82	83	75	76	79
13	77	74	75	72	69	68	67	68	78	74	71	A	A	72	79	72	74	72	76	79	79	A	84	76
14	79	74	71	69	71	74	78	75	93	87	76	85	76	79	83	85	84	83	80	83	A	88	A	72
15	71	70	69	63	C	C	C	C	C	C	C	C	C	C	C	C	C	71	67	73	78	73	C	C
16	C	C	C	C	C	C	C	C	74	65	69	A	75	78	80	C	A	73	A	82	91	78	67	65
17	65	64	61	62	67	78	96	C	97	92	86	A	A	87	81	84	77	79	83	88	92	87	84	70
18	73	69	68	66	67	73	85	93	C	85	86	83	80	80	77	83	89	86	82	90	83	A	85	81
19	76	74	69	70	70	C	81	83	77	80	72	71	71	79	78	79	70	76	80	92	94	82	78	73
20	67	65	63	60	61	75	C	70	77	75	77	82	91	56	87	89	71	69	66	73		75	69	61
21	53	55	56	45	58	69	59	53	A	A	A	50	A	58	51	64	66	62	63	67	70	A	72	68
22	64	61	61	61	59	61	62	64	59	61	62	A	59	69	66	A	73	67	65	68	77	74	75	69
23	71	67	64	56	57	63	66	59	63	A	63	A	63	65	68	75	73	73	68	72	79	87	63	74
24	70	64	65	63	66	73	71	65	65	63	A	N 63	54	69	A	59	71	75	69	69	77	77	70	69
25	69	71	70	63	62	65	64	73	A	77	A	56	70	68	74	77	77	75	69	65	N 37	83	84	79
26	84	73	75	63	66	61	70	83	83	87	75	A	74	83	84	86	A	73	75	A	A	87	75	77
27	77	72	71	71	69	74	73	83	89	79	79	82	A	82	81	74	76	75	74	83	C	93	87	83
28	81	78	70	68	68	67	74	76	82	C	83	69	65	70	71	75	78	75	67	77	A	N	N	
29	65	A	68	67	58	65	66	67	68	66	67	71	69	71	78	80	79	72	77	78	81	84	83	88
30	84	75	71	69	C	75	87	84	96	75	79	77	72	69	71	78	80	75	76	81	90	83	84	78
31	78	83	78	70	67	61	60	62	N 66	73	76	74	71	70	69	74	70	72	80	88	85	81	73	70
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	28	28	27	28	27	26	26	23	25	30	29	28	28	31	30	30	26	27	27	29
MED	70	70	68	64	64	69	74	76	78	76	76	74	72	74	78	78	77	75	76	81	83	81	75	71
U Q	76	72	71	68	67	73	85	85	89	85	82	85	84	83	85	85	84	79	81	88	91	87	84	77
L Q	66	64	64	60	59	63	65	66	66	66	67	66	69	69	70	74	72	72	69	75	77	74	70	68

HOURLY VALUES OF fEs AT Wakkanai

MAY 2023

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	40	29	G	G	G	25	49	46	54	54	48	49	50	47	36	38	33	43	34	33	G	30	G	G
2	G	G	G	G	G	24	32	44	47	48	41	39	132	38	38	34	36	38	32	G	27	G	G	G
3	G	G	G	G	G	32	39	46	48	106	38	38	39	36	37	N	46	48	39	25	G	G	G	G
4	G	G	G	G	G	149	33	40	45	41	40	54	46	54	145	36	33	31	39	30	32	25	25	G
5	G	32	G	G	G	32	40	45	49	64	46	53	37	33	38	36	35	36	46	29	28	G		G
6	G	G	G	G	G	G	34	69	49	62	46	47	40	38	36	62	55	47	40	38	34	34	24	G
7	G	G	G	11	34	32	46	148	71	74	84	86	102	54	N	34	59		71	67	43	54	29	60
8	29	G	G	G	G	30	42	48	57	43	43	43	39	92	38	35	32	43	40	32	34	G	G	G
9	G	G	G	30	G	50	40	58	53	38	43	38	G		73	57	49	64		50	24	G	G	G
10	31	G	G	G	G	36		70	58	92	42	56	136	55	64	62	72	45	49	46	72	34	60	52
11	31	G	G	G	G	32	34	45	77	78	134	111	69	52	38	37	32	35	62	49	59	G	G	G
12	27	G	G	G	G	31	33	56	34	38	42	56	72	58	53	40	31	43	26	G	29	38	30	32
13	47	34	26	26	28	44	50	55	60	62	60	127	98	50	46	35	54	61		41	33	150	56	34
14	53	43	41	38	G	28	32	48	55	50	53	51	114	42	46	51	54	54	34	35	60	69	84	32
15	39	32	32	G	C	C	C	C	C	C	C	C	C	C	C	C	C	49	38	63	57	53	C	C
16	C	C	C	C	C	C	C	C	59	56	111	80	84	52	62	C	90	54	84	40	G	G	60	27
17	G	G	G	G		33	158	C	76	82	55	107	151	62	38	60	62	71	77	48	G	29	G	G
18	G	G	G	G	G	36	47	62	C	49	50	50	56	60	37	51	59	81	34	58	30	31	26	G
19	G	G	25	G	26	C	35	53	57	117	54	38	48	52	G	35	48	48	43	40	26	26	G	G
20	G	G	G	G	G	135	C	56	57		39	46	51	75	58	33	32	49	56	54		30	29	G
21	24	32	33	G	40	38	49	47	54	158	53	46	38	40	35	108	49	48	45	60	39	88	60	29
22	32	31	G	G	G	40	43	51	52	51	54	77		50	44	82	50	55	40	42	50	38	54	29
23	26	24	G	G	28	50	42	54	60	89	128	67	64	45	37	40	113	57	56		G	25	G	G
24	G	G	28	G	G	32	44	60	56	63	64	90	50	62	116	58	38	40	39	36	40	25	33	29
25	30	27	G	G	G	35	44	46	116	50	97	43	53	36	36	41	45	56	28	G	32	33	28	40
26	G	G	G	G	G	31	37	52	63	64	65	85	61	60	63	127	130			84	90	45	G	G
27	G	G	27	G	G	29	48	60	54	63	64	65	101	53	54	55	60	65	42	44	C	33	53	G
28	G	40	30	G	26	40	42	56	58	C	54	56	51	48	105	36	37	36	39	38	36	G	G	
29	G	26	G	G	41	40	57	91	65	65	49	54	40	41	52	52	48	60	48	35	45	31	45	32
30	27	32	26	25	C	36	45	49	60	49	60	50	51	48	89	53	69	71	72		106	60	31	46
31	55	G	49	30	26	40	130	56	69	63	54	54	52	40	40	44	37	48	38	G	32	49	25	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	27	28	27	28	29	28	30	30	29	29	29	28	30	29	28	29	29	31	29	29
MED	G	G	G	G	G	34	42	54	57	62	54	54	52	50	44	42	48	48	40	40	33	31	26	G
U Q	31	31	26	G	26	40	48	59	61	76	64	77	91	56	62	57	59	58	52	49	47	45	49	32
L Q	G	G	G	G	G	31	35	46	52	49	43	46	43	40	37	36	36	43	38	31	26	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

MAY 2023

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	16	16	15	14	16	15	15	14	16	19	19	19	17	20	14	15	14	16	16	15	15	14	15
2	14	15	15	17	14	16	15	17	16	16	18	18	18	19	17	16	14	17	15	16	15	18	14	15
3	22	16	14	15	16	15	16	15	15	18	16	17	17	15	17	16	13	14	14	15	14	15	14	15
4	14	14	14	15	14	16	17	15	15	16	19	17	18	17	15	17	14	17	15	16	16	14	16	16
5	14	16	16	15	15	16	15	15	15	16	18	16	17	17	15	16	14	16	14	15	15	16	17	15
6	14	16	16	14	14	15	17	14	16	14	21	21	17	20	23	17	15	14	15	15	16	16	16	14
7	15	14	14	16	15	17	13	14	16	13	16	18	19	17	17	17	15	14	14	14	15	14	16	16
8	15	18	14	14	14	16	15	15	18	21	21	21	20	21	20	17	15	14	15	15	15	15	16	14
9	15	15	14	16	15	16	16	17	14	14	19	17	23		16	15	15	15	15	14	15	14	17	15
10	16	15	14	14	15	16		15	17	17	16	19	19	20	15	15	16	14	13	14	15	17	16	14
11	16	14	16	15	15	15	13	15	14	17	11	13	16	17	17	15	16	14	14	14	15	14	14	15
12	15	15	14	15	15	15	16	15	15	15	16	18	16	17	17	15	15	15	15	17	15	14	15	15
13	15	16	14	16	16	15	15	14	14	17	18	31	17	19	22	17	16	15	16	14	16	9	15	15
14	16	15	14	15	15	16	15	15	15	17	17	16	17	17	22	17	14	13	16	15	15	15	16	16
15	15	15	16	15	C	C	C	C	C	C	C	C	C	C	C	C	C	15	13	13	14	15	C	C
16	C	C	C	C	C	C	C	C	11	14	15	16	11	15	16	C	13	11	12	15	14	15	16	16
17	15	16	15	14		15	14	C	12	17	15	16	7	20	17	16	13	13	14	14	14	16	16	17
18	16	14	14	14	15	16	13	14	C	17	19	16	15	18	17	14	17	13	15	17	14	16	15	15
19	16	16	16	17	17	C		19	17	16	31	15	20	15	39	17	16	13	16	14	15	15	16	14
20	14	14	14	16	13	15	C	16	20	15	17	20	20	19	16	17	17	17	13	14		16	15	14
21	16	16	16	14	15	15	17	15	14	19	14	18	17	17	16	11	15	14	13	15	14	17	14	16
22	16	15	16	16	15	14	13	15	14	14	14	14	17	16	18	15	14	12	13	15	14	14	14	15
23	16	15	14	14	15	15	13	14	13	15	14	16	18	18	17	17	14	14	14	15	14	15	20	15
24	14	15	15	17	16	16	13	14	14	14	15	15	16	16	13	13	15	15	12	14	15	14	16	16
25	16	16	16	16	17	16	16	20	10	15	19	22	22	21	20	19	19	17	20	20	15	15	15	14
26	15	15	16	14	17	17	16	15	15	16	14	14	13	14	14	14	13	13	14	15	13	15	14	14
27	14	16	15	14	16	17	15	15	20	16	15	17	13	16	14	15	14	13	14	15	C	14	15	15
28	15	14	16	15	15	16	15	14	14	C	15	16	21	20	19	23	19	16	15	16	14	20	18	
29	22	16	16	14	15	15	14	13	13	15	17	17	16	16	17	15	15	14	14	14	14	17	15	16
30	15	15	14	15	C	16	14	14	13	14	14	19	17	20	14	14	14	13	14	13	12	15	15	14
31	14	15	15	15	14	15	103	13	15	15	19	19	20	19	19	15	15	14	13	15	15	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	27	28	27	28	29	29	30	30	30	29	30	29	30	31	31	31	29	31	30	29
MED	15	15	15	15	15	16	15	15	15	16	16	17	17	17	17	16	15	14	14	15	15	15	15	15
U Q	16	16	16	16	16	16	16	15	16	17	19	19	19	19	19	17	16	15	15	15	15	16	16	16
L Q	14	15	14	14	14	15	14	14	14	14	15	16	16	16	16	15	14	13	13	14	14	14	15	14

HOURLY VALUES OF foF2 AT Kokubunji

MAY 2023

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	66	64	58	59	59	65	85	85	87	88	102	111	114	113	114	112	108	100	98	95	94	91	A	83
2	82	78	72	65	61	58	60	67	70	73	83	87	97	101	95	86	91	102	111	94	59	65	64	59
3	60	59	59	59	56	65	80	91	95	97	97	103	109	112	110	109	102	102	102	109	94	75	73	72
4	73	73	71	69	71	80	90	95	91	93	101	111	113	111	105	100	97	102	A	115	94	76	76	72
5	81	81	76	75	71	83	105	107	93	93	89	95	105	109	109	106	105	105	111	109	A	A	91	A
6	87	90	86	87	84	87	105	109	90	83	A	A	107	53	N 100	110	120	123	111	95	80	A	80	81
7	84	81	77	72	71	85	93	81	91	95	103	109	100	107	92	87	88	97	114	117	94	A	A	72
8	73	A	72	59	A	68	80	81	76	75	A	83	A	87	95	89		113		89	A	A	73	72
9	73	72	61	69	64	72	97	99	A	89	93	95	91	90	83	75	78	80	86	89	A	75	A	A
10	135	80	73	73	73	73	96	88	87	86	85	89	97	97	90	91	93	91	A	110	A	80	83	78
11	73	80	74	73	72	73	92	88	81	87	95	88	91	96	97	97	93	89	92	95	93	A	A	A
12	A	83	79	80	74	87	90	102	102	A	A	99	97	104	109	114	114	114	109	102	87	86	89	85
13	88	83	85	88	68	72	81	86	84	85	86	A	95	96	94	96	94	88	83	85	83	A	A	82
14	83	82	81	73	72	76	84	91	103	112	100	86	89	96	101	108	108	97	91	96	A	91	A	78
15	78	76	76	64	69	71	77	65	A	61	67	75	77	81	86	88	89	87	73	88	85	81	79	72
16	69	65	65	69	63	71	93	103	94	92	91	97	97	94	99	100	93	A	105	109	91	77	79	77
17	72	72	67	60	66	80	95	106	105	92	96	106	214	111	110	109	104	104	96	95	94	91	85	77
18	73	72	68	64	65	77	88	89	91	89	90	92	90	94	101	105	108	103	106	96	85	83	83	85
19	84	80	72	72	78	84	99	102	95	95	85	87	93	94	102	100	97	98	A	109	91	A	85	84
20	82	78	73	65	64	73	99	99	97	87	91	N 97	109	108	112	117	91	85	92	96	93	73	81	72
21	67	55	68	69	70	79	64	A	109	58	90	A	65	73	83	86	83	82	80	73	72	72	68	67
22	73	73	73	76	78	70	70	86	82	A	A	71	80	82	91	89	88	81	82	87	92	78	79	77
23	77	73	72	72	65	69	80	76	A	A	A	86	A	91	95	99	100	89	85	83	A	89	A	78
24	73	72	69	68	64	72	81	91	91	80	81	93	93	92	101	104	98	96	92	89	84	77	81	80
25	77	83	90	72	62	71	78	88	83	80	80	84	85	88	90	95	95	91	86	90	80	81	80	79
26	80	87	77	72	71	72	93	109	95	92	94	93	100		111	105	106	92	112	146	84	A	93	A
27	87	87	81	88	76	77	95	96	83	81	92	96	101	101	N 95		83	83	A	87	87	91	93	108
28	92	82	72	68	61	69	89	86	93	89	85	83	84	83	85	89	97	101	97	95	91	92	A	94
29	A	91	88	72	73	76	95	105	143	102		95	93	A	101	101	98	90	76	A	89	A	A	A
30	A	94	90	83	79	81	87	97	101			N	201	100	92	92	94	95	99	104	96	106	103	83
31	A	A	93	73	85	73	A	94	81	89	93	108	93	90	97	97	98	92	90	101	A	84	83	77
	00	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	29	31	31	30	31	30	30	28	27	24	27	29	29	31	30	30	30	26	30	24	22	22	26
MED	77	80	73	72	70	73	90	91	91	89	91	93	97	96	97	100	97	96	94	95	90	81	81	78
U Q	84	83	81	73	73	80	95	102	96	93	95	99	106	105	105	106	104	102	106	109	93	91	85	83
L Q	73	72	69	65	64	71	80	86	83	81	85	86	90	89	92	89	91	89	86	89	84	76	79	72

HOURLY VALUES OF fEs AT Kokubunji

MAY 2023

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	29	45	51	80	55	58	53	63	50	32	56	117	80	59	32	152	77
2	27	G	G	G	G	G	37	44	59	54	53	51	56	50	G	37	32	33	37	36	G	39	G	G
3	G	G	G	G	G	G	34	55	50	83	57	39	G	83	G	G	36	48	67	53	27	G	G	G
4	G	G	G	G	G	G	34	47	49	48	53	47	G	39	38	63	65	51	120	87	59	71	39	32
5	G	G	25	G	G	G	42	52	51	65	81	58	G	71	38	61	52	65	79	77	175	185	115	93
6	71	39	59	54	32	32	45	64	63	90	89	117	55	55	G	G	G	42	42	49	110	93	69	90
7	72	32	29	G	39	G	48	78	39	39	49	47	58	54	G	51	53	70	53	32	59	92	90	72
8	51	89	34	78	84	43	53	60	70	65	120	98	79	102	76	86	109	122	147	122	131	149	110	G
9	G	G	G	G	G	G	44	76	145	82	91	75	49	G	62	115	50	44	48	96	126	93	150	92
10	G	G	G	G	G	G	G	53	99	108	55	45	91	G	78	51	57	123	178	94	105	83	71	83
11	59	50	58	71	58	49	42	73	61	63	53	53	58	G	67	35	46	76	70	48	111	135	132	126
12	116	G	G	G	G	G	48	79	70	158	106	45	70	57	68	50	61	26	G	G	38	68	77	60
13	35	32	38	G	G	32	70	59	54	52	56	175	G	G	G	G	39	43	51	42	149	116	149	45
14	70	59	47	48	29	G	29	53	55	88	80	69	63	118	47	35	33	53	57	39	111	49	91	77
15	83	38	47	46	41	39	40	68	83	55	53	43	64	65	65	62	63	83	114	107	57	59	69	59
16	59	27	28	G	35	G	39	64	71	70	80	75	53	63	140	100	116	127	83	69	31	52	40	33
17	31	29	28	G	G	G	43	57	107	75	61	G	82	53	G	55	91	75	70	131	90	101	46	33
18	27	G	G	28	G	35	43	47	48	51	68	70	81	G	37	41	G	54	56	102	43	54	G	G
19	37	49	47	37	37	35	45	56	65	83	G	54	65	G	172	45	60	89	197	70	58	132	41	29
20	25	G	G	G	G	23	42	60	59	49	59	G	78	80	53	G	75	50	52	37	128	35	37	39
21	G	47	39	33	G	49	56	94	116	62	70	65	60	59	42	53	57	98	57	113	58	29	48	59
22	71	G	59	50	38	36	64	62	70	75	65	G	G	39	40	38	G	40	44	32	33	49	59	92
23	G	56	59	38	G	31	49	76	99	107	101	73	107	69	G	36	31	45	59	46	155	53	169	41
24	42	32	35	G	29	32	46	60	69	83	58	54	54	G	G	44	32	49	23	G	32	108	57	71
25	52	39	39	33	G	30	39	71	69	39	54	G	G	G	57	82	97	57	43	31	G	25	G	25
26	G	29	31	G	33	30	33	56	63	56	62	91	48	153	70	96	121	74	140	115	131	116	70	170
27	88	107	93	68	35	41	60	77	93	59	83	61	54	105	92	106	75	60	109	52	37	79	71	155
28	90	32	37	37	31	32	43	55	71	62	53	51	59	62	65	93	64	75	71	89	35	175	111	59
29	179	83	59	43	51	47	81	80	109	248	209	173	108	200	100	63	55	103	81	155	116	183	126	116
30	135	111	116	58	59	75	70	71	159	218	124	238	176	203	111	59	77	105	115	39	88	71	73	86
31	108	116	49	56	57	31	74	92	72	78	85	116	G	40	38	55	47	41	83	76	92	59	57	51
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	42	32	35	28	29	31	43	60	69	65	65	55	58	55	53	51	55	57	70	69	59	71	70	59
U Q	72	50	49	48	38	36	53	76	93	83	85	75	78	80	70	63	75	83	114	96	116	116	111	90
L Q	G	G	G	G	G	G	39	55	55	54	54	45	48	G	G	37	33	45	51	39	37	49	41	33

HOURLY VALUES OF fmin AT Kokubunji

MAY 2023

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

HOURLY VALUES OF foF2 AT Yamagawa

MAY 2023

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	84	79	N 77	67	62	61	71	85	83	91	97	113	117	120	122	126	119	113	107	105	98	93	84	87
2	85	88	81	67	67	64	66	78	79	86	97	96	119	144	129	120	125	137	131	111	A	A	73	72
3	67	63	61	60	56	51	65	90	91	88	92	A	117	127	119	120	119	115	120	124	94	76	80	82
4	79	85	83	77	76	69	79	90	89	97	109	118	115	124	118	115	117	118	120	130	113	78	A	92
5	89	95	94	91	81	84	106	98	82	83	A	A	113	121	116	113	113	117	121	138	113	97	97	87
6	86	93	91	83	78	79	107	99	80	84	91	103	115	115	105	120	127	138	123	106	88	95	93	94
7	94	88	82	79	80	79	86	90	95	103	114	A	133	135	119	108	107	120	135	140	102	A	91	95
8	A	84	79	73	65	66	77	87	96	110	88	101	A	104	106	99	97	93	92	95	95	72	A	73
9	77	85	65	71	68	69	88	98	81	94	103	A	119	A	113	101	103	106	105	103	A	81	A	A
10	69	72	77	85	A	76	90	87	87	A	102	93	104	111	105	105	N 47	109	99	93	91	90	88	A
11	84	92	98	96	93	91	99	96	87	102	82	A	99	110	103	110	111	102	99	99	96	90	86	82
12	85	94	90	81	75	71	83	95	98	93	92	95	103	107	114	120	114	123	111	99	89	89	89	92
13	94	82	84	95	74	65	82	98	95	91	99	105	108	109	110	113	116	105	93	95	87	79	89	93
14	85	84	83	66	66	65	N 76	74	95	110	A	73	A	109	107	A	109	100	96	103	99	79	84	81
15	80	81	82	78	73	71	78	93	77	A	A	88	91	103	101	105	103	97	91	96	92	A	71	76
16	79	75	70	71	66	69	76	88	A	89	85	91	A	A	97	99	97	103	100	100	A	92	89	88
17	93	83	81	67	69	70	89	103	87	81	A	98	106	114	102	113	119	105	97	102	105	85	92	89
18	A	85	81	80	71	70	82	94	89	87	90	93	102	102	110	114	114	109	99	A	97	61	96	93
19	90	89	87	84	87	83	95	101	109	87	87	94	99	102	106	107	107	107	115	111	93	90	90	93
20	94	89	83	72	71	75	93	103	91	78	A	97	98	110	111	121	99	97	99	98	92	81	A	85
21	79	76	76	79	81	87	90	64	49	81	A	85	89	94	A	104	103	101	87	A	A	80	79	73
22	75	65	67	70	76	65	78	95	89	46	A	A	A	100	112	A	A	92	88	93	97	82	82	81
23	72	75	89	90	82	60	81	85	79	A	A	85	A	100	107	111	119	102	93	86	88	A	81	68
24	88	88	87	A	77	74	79	97	81	A	A	89	91	101	117	122	111	106	104	97	91	91	86	89
25	91	95	117	95	59	61	72	77	84	75	A	A	A	95	97	101	96	96	92	72	86	85	81	90
26	91	98	93	66	66	74	89	82	74	91	89	99	103	117	114	100	104	100	111	A	86	91	93	91
27	95	102	100	86	83	74	84	91	72	A	87	99	117	A	A	98	94	95	99	97	93	87	89	63
28	68	89	89	A	61	60	A	93	85	87	86	88	96	100	A	103	108	98	105	107	100	95	95	74
29	98	105	97	73	74	76	86	A	A	95	103	102	A	A	117	51	A	91	87	94	95	91	76	67
30	70	63	75	A	73	72	A	95	37	47	49	82	94	95	97	96	A	97	94	100	94	97	95	95
31	101	95	91	74	70	64	72	80	89	98	91	122	61	A	109	113	112	107	108	104	93	88	81	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	31	31	28	30	31	29	30	29	26	21	24	24	26	28	29	28	31	31	28	27	27	27	28
MED	85	85	83	78	73	70	82	92	87	88	91	96	104	109	110	110	110	105	99	100	94	88	88	87
U Q	92	93	91	84	78	76	89	97	91	95	100	101	116	117	116	117	116	113	111	106	98	91	92	92
L Q	78	79	77	70	66	65	76	85	79	83	87	88	97	101	105	101	103	97	93	95	91	80	81	75

HOURLY VALUES OF fEs AT Yamagawa

MAY 2023

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	25	G	29	40	G	G	22	46	58	55	55	48	48	58	65	49	42	46	55	42	49	88	59	26
2	G	26	72	38	30	G	53	44	48	50	54	45	57	37	35	38	37	42	49	59	87	60	36	27
3	G	G	G	G	G	G	40	51	48	55	84	109	83	46	51	37	60	61	60	48	47	26	G	G
4	G	G	G	G	G	24	31	40	46	52	74	87	50	67	46	46	61	55	53	56	54	116	165	60
5	28	27	24	34	29	26	G	39	65	64	94	108	92	60	36	41	51	62	38	30	28	G	31	33
6	27	34	42	28	G	G	36	59	67	52	97	93	34	48	40	72	62	50	58	65	50	49	69	32
7	39	29	35	112	47	39	41	43	59	75	105	149	75	46	56	60	69	74	88	114	91	79	90	84
8	96	40	60	56	42	G	43	54	77	102	185	106	106	184	54	42	34	51	60	59	37	109	92	70
9	31	34	33	25	G	G	39	53	60	75	78	116	80	127	51	72	54	38	44	79	79	112	89	133
10	57	G	G	26	88	60	36	55	78	89	91	78	75	65	50	64	120	72	79	50	69	78	71	110
11	47	G	G	28	31	32	25	56	71	66	49	116	60	54	93	56	34	38	27	36	60	44	36	45
12	57	34	34	26	23	G	24	39	48	38	39	49	59	64	44	45	35	36	25	G	G	39	40	47
13	41	28	74	59	41	34	53	79	54	60	70	73	62	48	38	44	39	45	60	33	35	29	91	46
14	60	72	52	27	26	G	32	45	60	70	92	53	92	58	68	110	92	66	70	46	59	31	56	46
15	46	44	32	26	G	G	32	49	81	96	81	80	93	81	52	59	56	42	67	82	83	72	25	84
16	G	28	29	24	40	32	58	60	130	80	64	72	124	100	78	84	88	87	85	89	107	70	32	55
17	33	28	G	G	G	G	84	42	57	66	85	108	95	147	92	98	78	58	62	81	82	72	71	84
18	116	32	G	G	G	G	34	44	49	60	64	86	88	91	54	55	70	76	79	104	84	69	115	49
19	39	39	28	35	27	G	52	61	63	76	66	70	68	67	G	46	50	35	40	40	50	90	34	72
20	46	32	28	34	25	G	40	49	78	72	96	63	52	48	66	40	63	92	83	85	44	49	85	39
21	29	43	33	40	53	G	41	50	86	61	135	65	61	83	134	66	47	42	47	84	88	70	57	50
22	25	30	G	G	G	G	40	52	78	116	108	113	127	112	170	172	135	59	56	60	57	40	60	39
23	30	49	58	40	30	G	34	70	95	166	98	104	176	41	59	54	53	31	49	85	60	59	40	69
24	55	124	93	90	40	26	110	46	73	107	90	71	61	54	78	64	49	42	41	33	39	26	28	44
25	83	34	G	25	30	G	41	42	41	65	103	164	101	78	60	53	41	42	42	82	74	46	32	25
26	26	27	G	G	G	G	36	44	55	65	83	39	88	72	70	57	44	38	34	116	92	59	59	41
27	58	43	28	38	35	31	39	48	40	155	74	88	91	108	150	116	74	43	32	60	31	55	58	70
28	42	31	61	92	56	28	74	48	64	78	76	67	97	90	148	60	64	92	69	39	53	48	41	35
29	60	48	57	55	54	34	60	124	150	169	113	167	121	138	106	132	116	72	50	71	71	56	59	50
30	72	53	72	92	59	40	124	150		159	102	48	116			128	121	73	168	88	109	58	59	44
31	53	59	150	38	35	28	32	76	86	92	108	113	132	164	86	74	72	52	60	146	163	91	87	48
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	30	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31
MED	41	32	32	34	30	G	40	49	64	72	85	86	88	67	60	59	60	51	56	60	60	59	59	47
U Q	57	43	58	40	41	31	53	59	78	96	102	109	101	100	86	74	74	72	69	85	84	78	85	70
L Q	27	27	G	25	G	G	32	44	54	60	70	65	61	54	50	46	44	42	42	42	47	44	36	39

HOURLY VALUES OF fmin AT Yamagawa

MAY 2023

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	17	16	15	16	15	15	16	19	21	22	23	22	17	21	17	16	14	15	15	14	15	15
2	16	16	15	15	15	15	14	15	17	18	20	21	21	19	16	20	16	15	15	15	15	15	15	16
3	15	14	15	17	15	15	15	15	16	18	19	19	20	22	23	17	19	16	16	15	15	16	15	15
4	15	14	14	14	18	16	17	17	17	19	17	23	23	22	22	19	18	16	15	14	15	14	15	14
5	15	15	15	15	16	16	15	15	18	16	20	18	18	22	21	27	19	18	16	15	15	15	16	16
6	15	16	16	15	16	14	16	14	17	15	19	23	19	42	20	21	17	15	14	14	14	15	16	16
7	15	16	15	5	15	15	15	15	15	19	21	20	20	16	22	20	20	14	13	5	15	15	16	16
8	15	15	15	14	14	15	15	13	19	19	24	19	24	17	20	19	22	15	14	15	15	15	14	14
9	15	15	17	16	16	15	16	16	15	17	21	20	24	46	28	18	19	18	14	15	14	14	14	9
10	16	16	14	16	14	14	17	14	17	15	19	19	22	23	19	17	23	17	15	14	15	15	15	11
11	15	14	15	15	16	16	15	15	18	18	21	21	21	18	21	22	18	17	15	14	15	15	15	16
12	15	15	16	15	16	14	15	15	15	17	16	20	23	22	19	19	17	17	15	17	15	15	14	15
13	15	15	16	15	15	15	17	15	17	21	18	21	17	26	21	23	18	18	16	15	16	16	14	15
14	15	15	14	15	15	15	15	16	15	19	18	22	19	20	24	18	19	17	16	14	16	16	14	15
15	16	15	15	15	15	15	16	15	16	19	19	19	21	23	24	20	18	15	16	13	15	15	16	16
16	15	15	15	16	15	16	15	14	17	16	19	19	17	23	20	17	17	13	13	14	13	15	15	15
17	16	15	16	16	15	15	16	15	19	17	20	20	20	15	21	19	18	17	14	13	17	16	16	10
18	9	17	15	15	15	15	16	14	14	18	19	19	21	20	21	23	13	15	15	17	13	15	14	15
19	15	15	16	15	16	16	16	15	18	17	24	20	19	19	56	22	21	17	15	15	15	16	16	15
20	16	16	16	16	15	15	15	15	18	18	22	19	21	21	21	19	17	23	16	14	14	14	15	15
21	16	16	16	15	15	14	14	16	16	19	21	21	21	22	22	21	18	17	14	15	13	16	15	15
22	16	15	16	15	14	15	15	15	17	14	18	22	22	21	12	13	16	17	16	15	14	15	15	15
23	16	15	15	15	16	15	16	13	14	19	18	21	23	19	18	19	20	17	15	15	15	15	15	16
24	16	16	11	11	15	15	16	15	14	19	20	19	20	25	21	24	17	17	15	16	15	16	15	16
25	15	16	15	15	15	17	15	15	16	17	15	10	21	21	21	21	16	16	15	14	15	15	16	16
26	15	14	16	16	15	15	16	16	15	19	18	17	20	20	17	19	19	15	15	14	5	14	15	15
27	15	15	17	15	16	16	15	14	22	5	18	20	23	21	113	17	17	15	16	17	15	15	15	14
28	15	15	16	14	15	15	16	14	16	17	17	19	19	15	6	17	17	14	15	15	15	15	16	15
29	16	15	15	15	16	16	14	10	125	18	18	19	5	86	20	19	18	17	15	15	15	15	15	15
30	16	15	16	14	15	15	15	7	14	11	20	23	18	17		18	19	18	16	15	8	16	16	14
31	15	16	5	13	16	15	15	15	17	14	19	20	18	67	21	20	19	17	14	12	15	16	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	31	31	30	31	31	31	31	31	31	31	31	31
MED	15	15	15	15	15	15	15	15	17	18	19	20	21	21	21	19	18	17	15	15	15	15	15	15
U Q	16	16	16	16	16	16	16	15	18	19	21	21	22	23	22	21	19	17	16	15	15	16	16	16
L Q	15	15	15	15	15	15	15	14	15	16	18	19	19	19	19	18	17	15	14	14	14	15	15	15

HOURLY VALUES OF foF2 AT Okinawa

MAY 2023

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	127	137	128	106	91	81	85	90	80	92	103	115	125	133	138	141	138	134	149	135	131	103	93	96
2	99	97	97	79	73	68	67	97	81	98	103	113	132	169	159	165	175	172	162	127	117	101	99	83
3	85	83	74	70	61	52	61	91	79	89	83	123	141	147	157	150	141	137	141	135	100	93	96	101
4	98	99	100	94	85	86	83	87	80	100	118	121	131	137	141	141	142	141	153	147	118	95	N 104	107
5	108	109	117	100	98	101	108	93	75	89	99	108	130	141	142	136	136	133	147	155	160	108	134	127
6	122	122	127	120	116	119	121	109	83	89	103	121	130	135	130	134	143	147	135	115	112	111	99	112
7	A	102	97	94	82	75	65	87	95	116	121	129	143	141	145	143	150	160	164	163	163	141	147	134
8	145	155	160	123	77	82	91	112	103	81	93	115	A	124	A	132	133	125	125	119	107	88	80	A
9	A	80	93	87	88	89	105	98	72	A	113	113	130	132	122	127	126	144	144	125	95	A	93	A
10	A	97	101	94	85	87	80	93	A	92	A	A	114	126	127	A	128	142	130	123	119	115	112	117
11	111	130	127	122	115	116	119	112	98	46		97	114	122	123	130	127	122	123	125	121	107	100	98
12	98	95	91	91	85	74	81	93	92	A	211	95	112	124	121	127	137	150	144	107	98	96	98	97
13	103	104	95	95	83	67	81	A	A	A	A	A	119	128	125	128	126	117	100	105	104	99	96	105
14	109	104	101	77	67	67	75	76	92	104	102	83	101	119	130	120	116	113	123	133	108	74	93	84
15	82	86	89	80	72	74	80	94	81	83	79	103	109	117	123	129	119	117	112	117	105	A	A	A
16	80	75	67	79	76	63	66	80	91	87	A	92	107	115	109	107	113	117	116	99	93	98	84	94
17	95	93	91	80	74	76	83	97	87	83	82	100	113	115	121	126	127	112	111	123	95	68	80	88
18	80	75	65	89	78	72	78	91	90	83	95	101	115	118	120	122	127	A	A	125	108	97	A	99
19	103	101	96	92	85	81	90	97	N 97	87	A	102	114	121	115	126	124	N 130	131	120	A	94	98	A
20	100	101	95	88	86	75	75	115	92	46	80	104	A	122	122	131	119	105	115	114	80	89	86	A
21	A	79	77	83	81	84	77	62	67	94	92	107	A	A	127	138	138	125	113	97	A	A	A	75
22	77	80	65	85	89	81	85	87	71	79	81	89	105	112	126	130	127	121	113	116	114	98	91	96
23	97	88	96	86	65	64	85	93	67	84	77	89	107	116	A	128	134	123	A	38	A	A	A	A
24	84	93	91	76	75	70	73	91	A	75	A	91	108	119	137	156	162	153	150	127	105	115	115	126
25	121	123	153	94	72	67	71	84	85	76	75	89	105	103	111	111	103	107	95	84	85	86	93	94
26	95	102	92	79	76	80	76	82	78	77	95	104	120	141	113	110	114	120	116	97	92	94	98	106
27	103	117	112	90	92	79	94	79	70	75	A	110	115	116	114	110	108	109	119	114	109	A	77	77
28	79	101	84	69	65	59	68	93	82	91	74	101	117	118	121	115	114	169	A	118	A	98	97	102
29	101	107	105	85	80	64	62	73	A	84	103	109	118	133	125	117	103	107	115	121	121	96	87	A
30	A	86	97	78	64	65	73	83	85	A	A	87	97	103	105	A	61	104	A	115	111	102	97	101
31	101	103	100	94	81	66	70	73	84	49	A	A	103	A	121	126	129	134	128	110	102	110	105	108
	00	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	31	31	31	31	31	31	30	27	27	22	28	28	29	29	29	31	30	27	31	27	26	27	24
MED	100	101	96	88	81	75	80	91	83	84	95	104	114	122	123	128	127	125	125	119	108	98	97	100
U Q	108	107	105	94	86	82	85	97	92	92	103	113	127	134	133	137	138	142	144	127	118	107	100	107
L Q	85	86	91	79	73	67	71	83	78	77	81	93	107	116	120	121	116	117	115	110	98	94	91	94

HOURLY VALUES OF fEs AT Okinawa

MAY 2023

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	60	40	25	41	G	G	G	37	46	72	54	60	57	55	55	54	46	59	49	71	29	36	48	72
2	40	27	G	40	36	29	33	59	55	52	50	45	45	43	44	48	36	48	54	61	28	G	G	40
3	43	31	G	G	G	G	27	46	89	50	58	69	55	57	52	51	53	75	109	66	133	60	59	59
4	34	G	G	G	G	G	G	34	46	47	47	52	85	54	46	55	49	50	42	37	39	59	49	60
5	78	65	32	29	G	G	G	34	58	64	93	54	56	56	59	60	97	49	53	111	60	54	31	G
6	G	G	G	G	G	G	G	45	54	50	76	47	56	50	54	64	61	66	46	52	40	46	44	G
7	136	56	47	54	37	35	44	59	55	61	116	56	48	52	58	64	56	76	94	74	73	54	90	54
8	60	93	61	34	27	53	22	52	56	68	92	94	150	144	172	50	50	60	57	65	41	54	58	152
9	116	90	94	56	51	27	29	44	58	94	99	58	68	G	45	44	54	37	42	43	54	168	135	116
10	92	33	39	34	G	G	115	50	106	91	101	110	102	72	60	132	74	56	46	39	50	28	88	72
11	71	37	78	61	35	29	41	61	84			74	93	79	97	56	36	32	28	43	24	G	60	39
12	28	45	57	49	34	48	40	46	71	152	162	84	68	79	66	59	76	47	31	28	23	30	G	29
13	46	58	34	G	29	46	47	90	115	147	161	122	96	67	64	74	50	38	69	72	35	27	33	46
14	91	92	127	59	58	64	34	45	61	52	55	60	60	66	68	71	88	71	93	76	69	58	47	55
15	33	36	27	G	G		30	43	48	72	106	76	71	107	75	57	68	77	59	101	127	135	93	109
16	60	66	90	40	35	30	29	43	52	164	161	76	70	59	60	57	179	94	55	67	60	60	72	70
17	38	32	56	30	34	G	33	47	65	179	56	52	145	54	49	59	110	61	56	79	57	40	49	59
18	53	56	115	90	32	36	32	47	56	56	88	93	51	149	55	73	67	153	151	62	49	111	92	87
19	39	33	47	28	39	42	38	57	156	96	137	86	83	48	G	47	64	157	70	100	144	G	G	91
20	45	115	33	G	G	G	44	46	48	113	106	52	116	66	48	47	36	47	44	55	130	35	44	81
21	93	59	59	58	34	56	42	52	69	74	150	97	124	149	101	46	52	72	74	32	94	116	107	92
22	38	24	G	G	G	G	29	42	46	42	50	54	72	60	64	68	50	56	57	36	40	61	81	60
23	39	32	33	34	24	G	29	41	43	39	51	53		97	172	60	68	69	130	128	126	110	92	110
24	83	90	43	28	30	35	38	66	144	73	108	76	95	61	61	54	50	36	36	39	27	24	G	G
25	G	56	59	66	35	26	31	41	49	55	64	47	45	53	89	56	40	40	40	37	108	72	53	44
26	35	G	G	G	G	G	32	40	58	46	76	75	54	51	62	67	70	66	60	78	33	28	46	33
27	G	G	G	G	27	G	27	39	91	57	115	125	132	117	88	43	40	37	54	32	29	103	43	36
28	60	81	104	46	49	47	33	72	168	105	77	56	127	116	110	52	73	137	134	108	126	60	50	31
29	28	G	23	G	G	G	36	55	81	70	66	54	46	73	102	128	54	38	76	62	53	92	48	140
30	92	G	G	36	39	46	72	51	47	128	128	77	58	69	85	116	121	83	110	116	59	51	43	32
31	33	26	32	35	G	G	G	40	66	133	142	154	96	136	84	92	75	48	65	53	37	66	36	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	31	30	31	31	31	30	30	31	30	31	31	31	31	31	31	31	31	31	31	31
MED	45	37	34	34	29	26	32	46	58	71	92	69	70	66	62	57	56	59	57	62	53	54	49	59
U Q	78	65	59	49	35	42	40	55	84	105	116	86	96	97	88	68	74	75	76	78	94	72	81	87
L Q	34	26	G	G	G	G	27	41	49	52	58	54	56	54	54	51	50	47	46	39	35	30	43	36

HOURLY VALUES OF fmin AT Okinawa

MAY 2023

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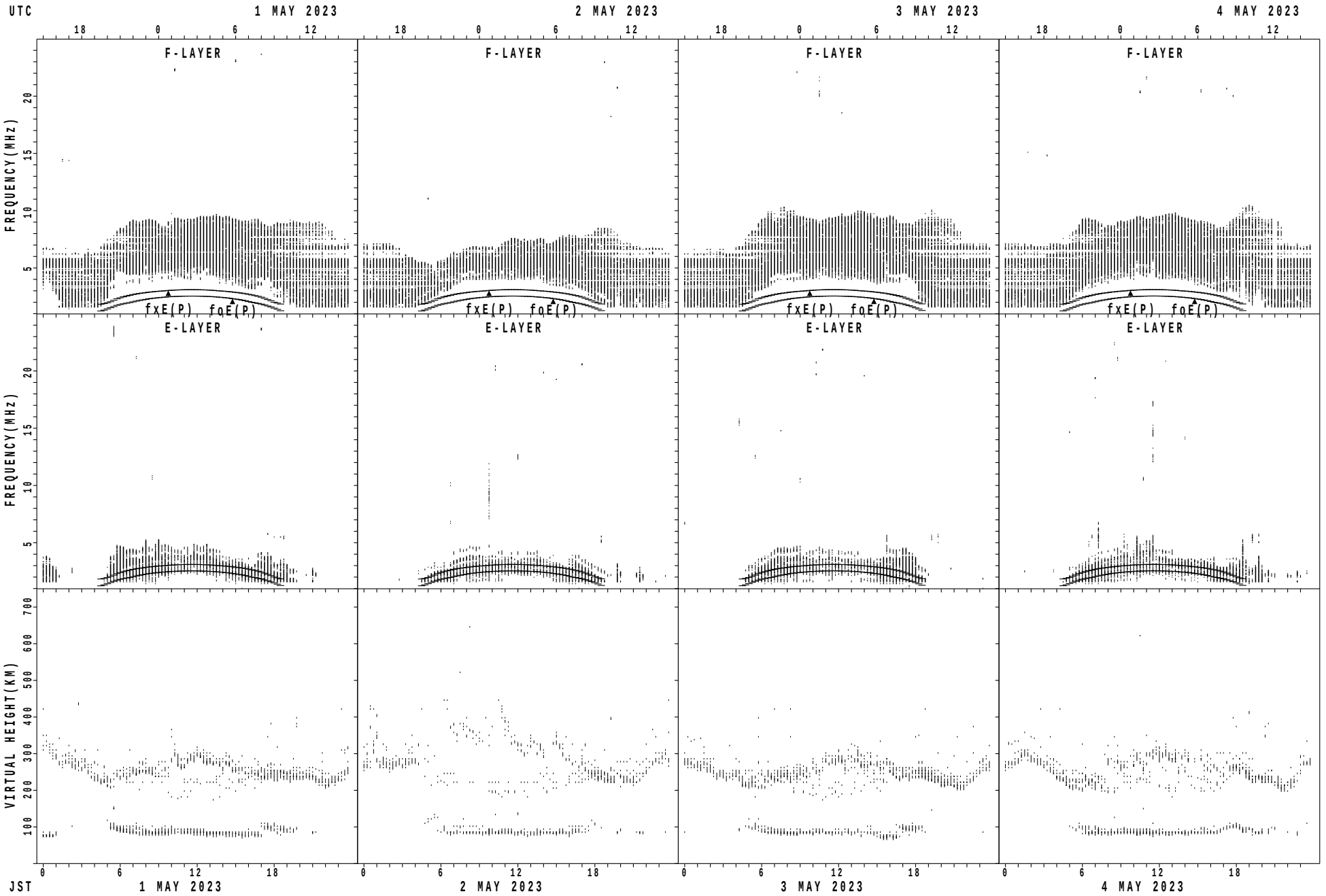
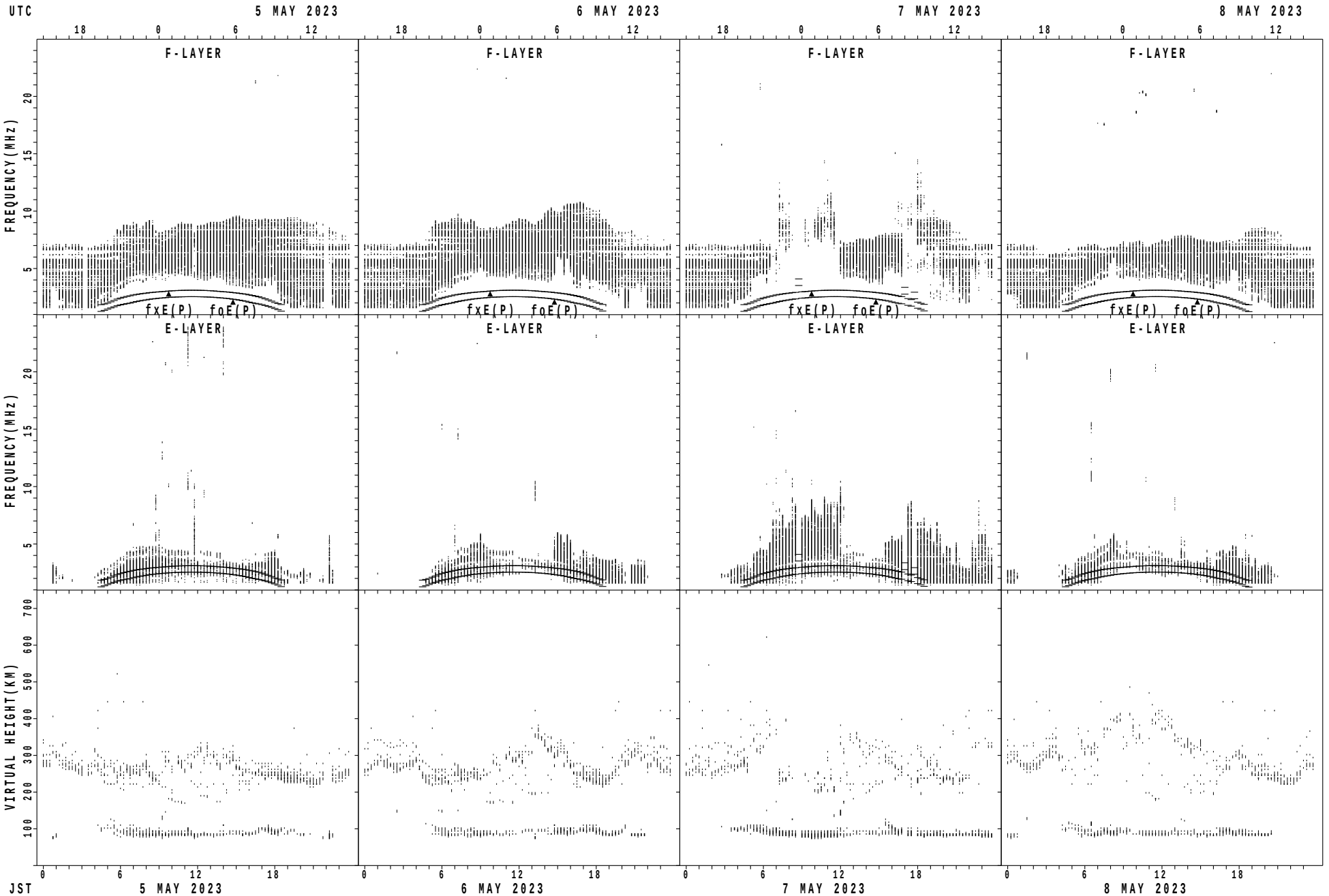
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	15	15	15	15	15	15	15	15	17	17	19	19	20	20	21	19	18	17	15	15	15	15	15	15
U Q	16	16	16	16	15	15	16	16	18	18	20	21	23	21	21	20	19	17	16	15	15	16	16	16
L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

SUMMARY PLOTS AT Wakkanai



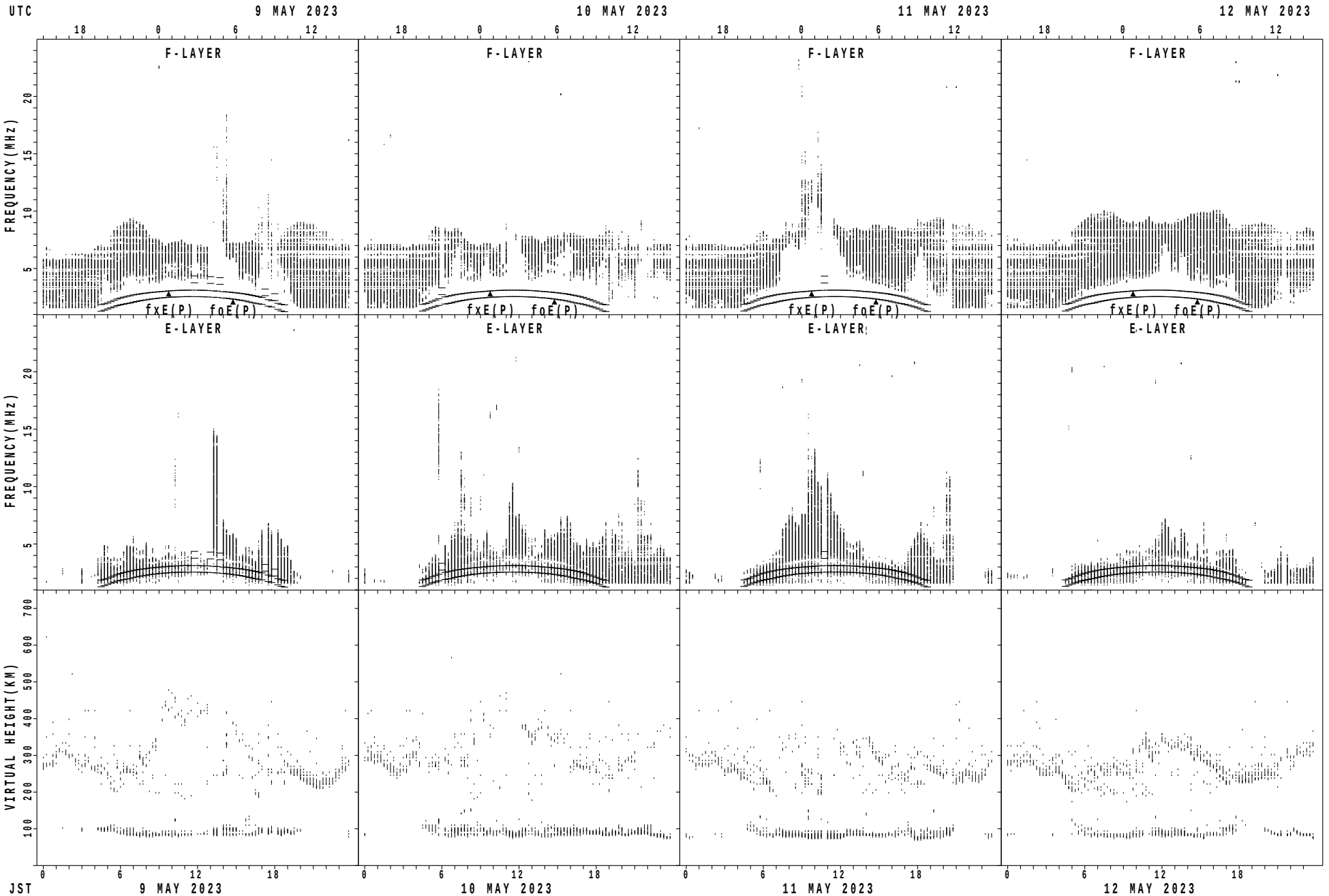
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



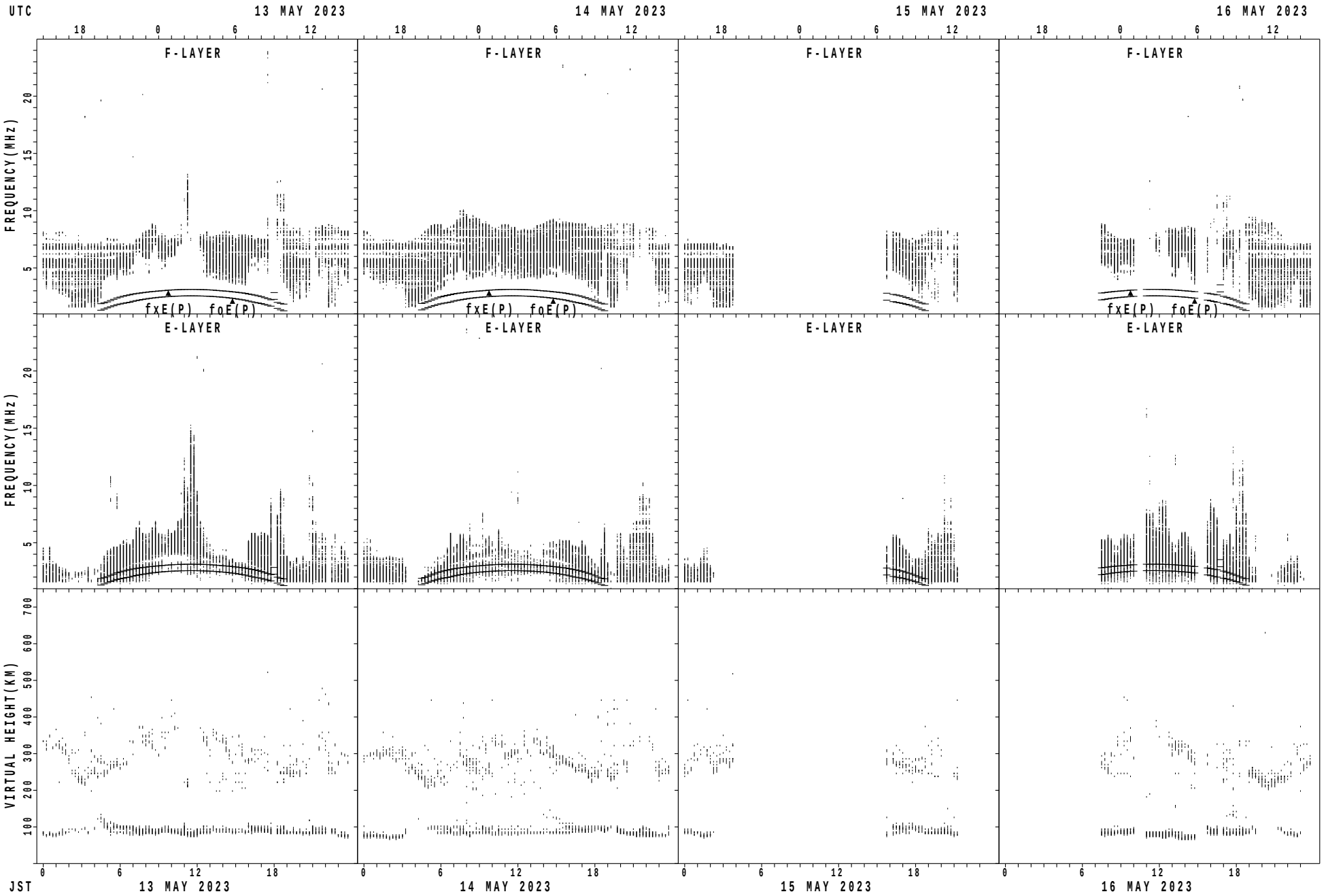
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



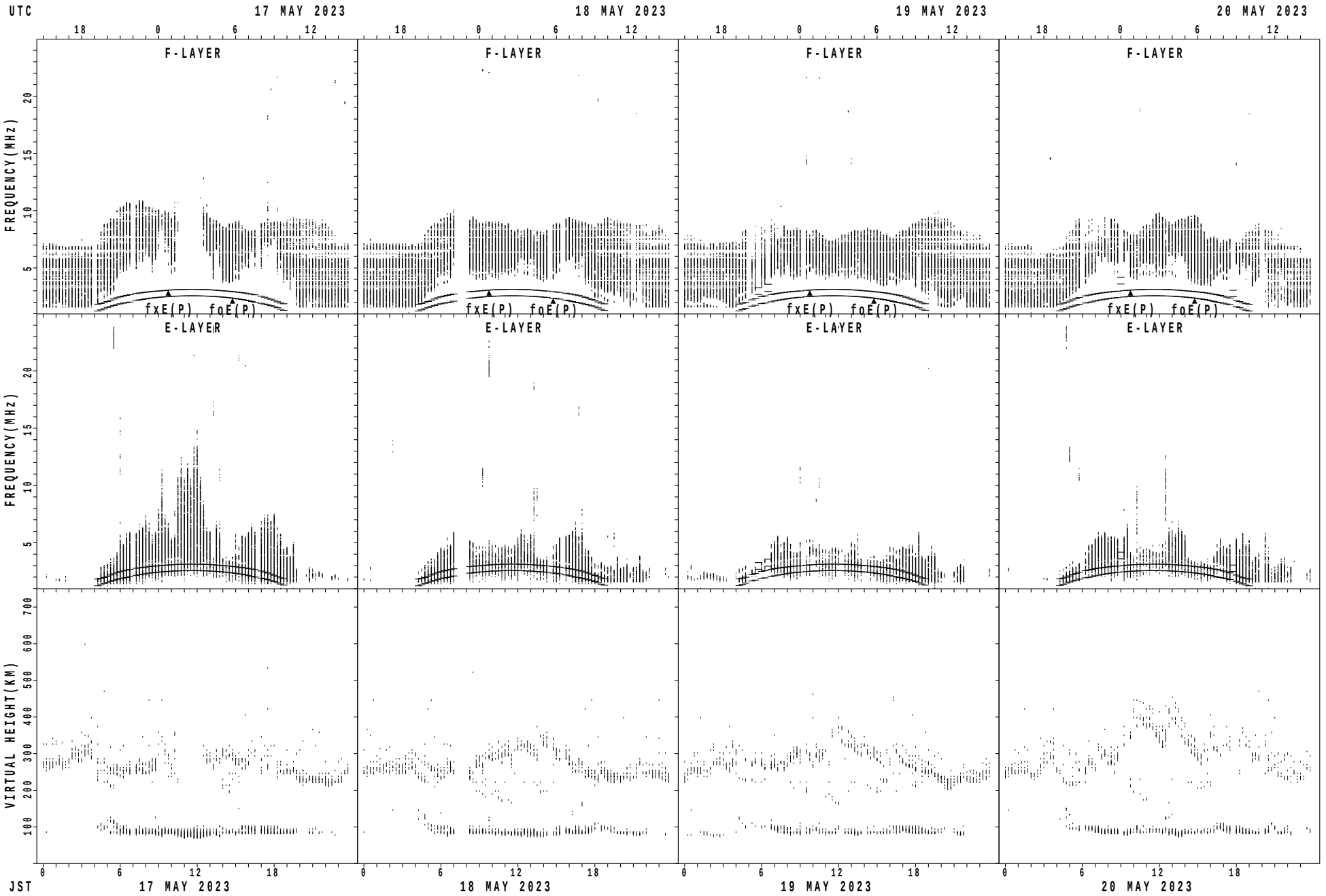
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



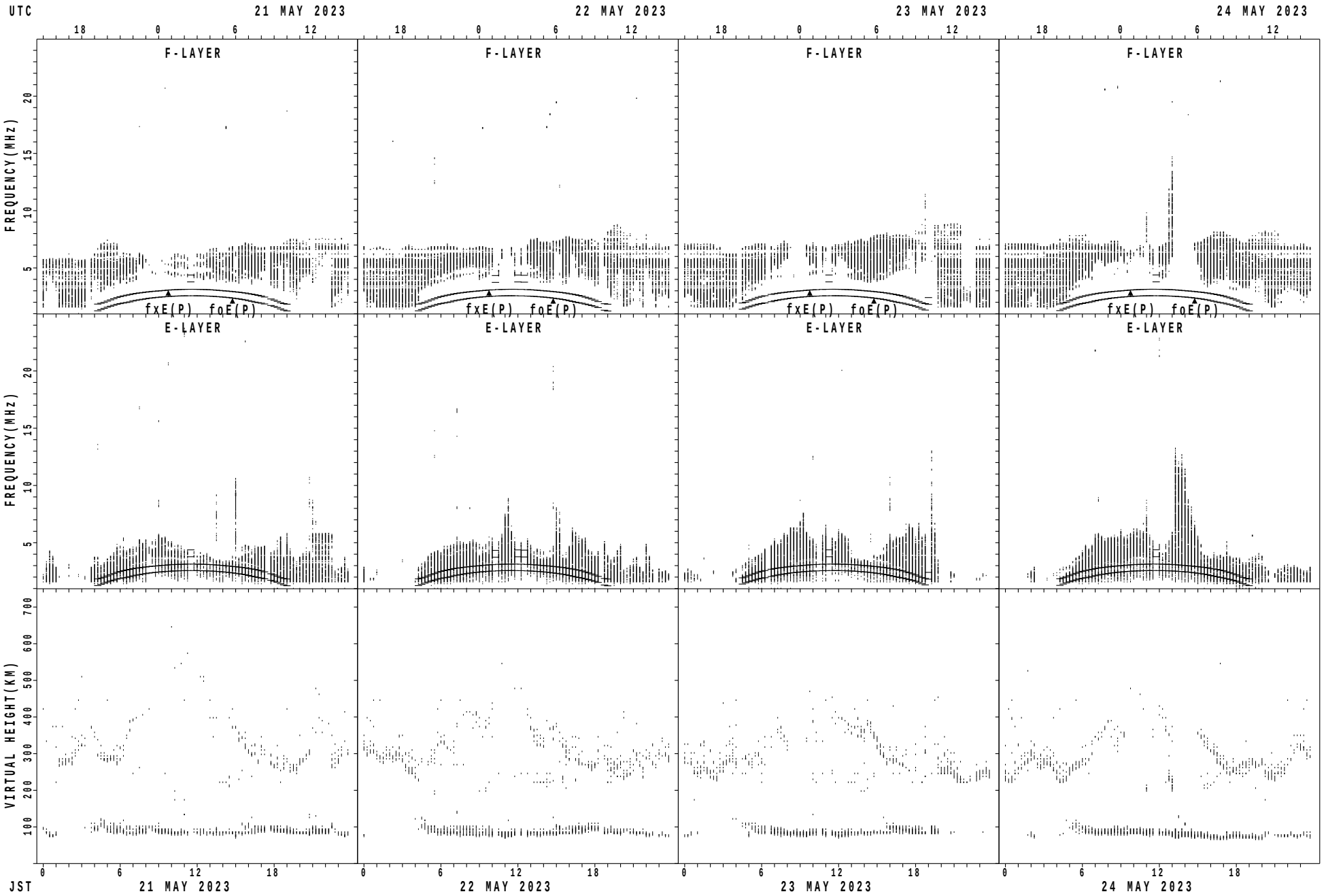
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



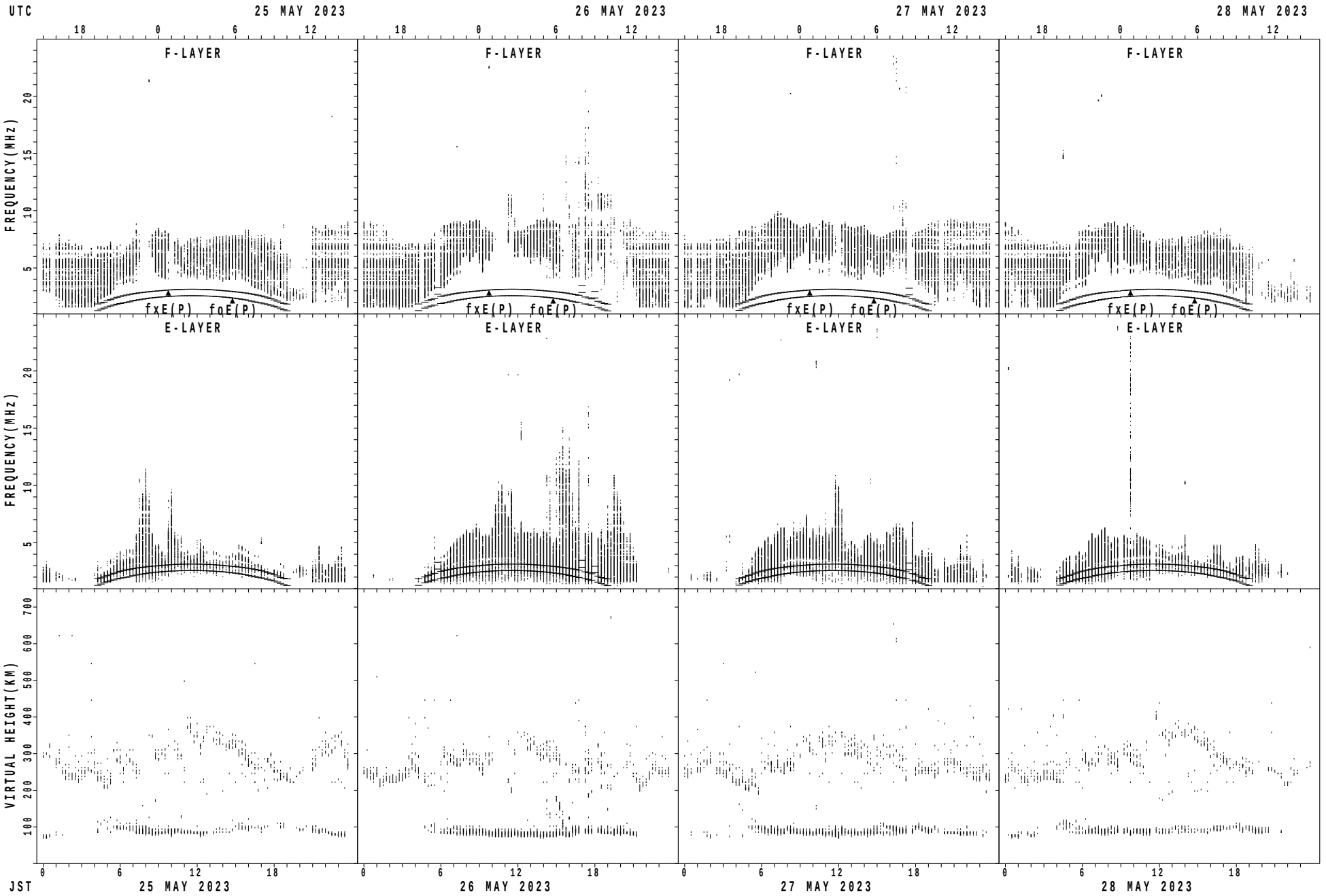
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



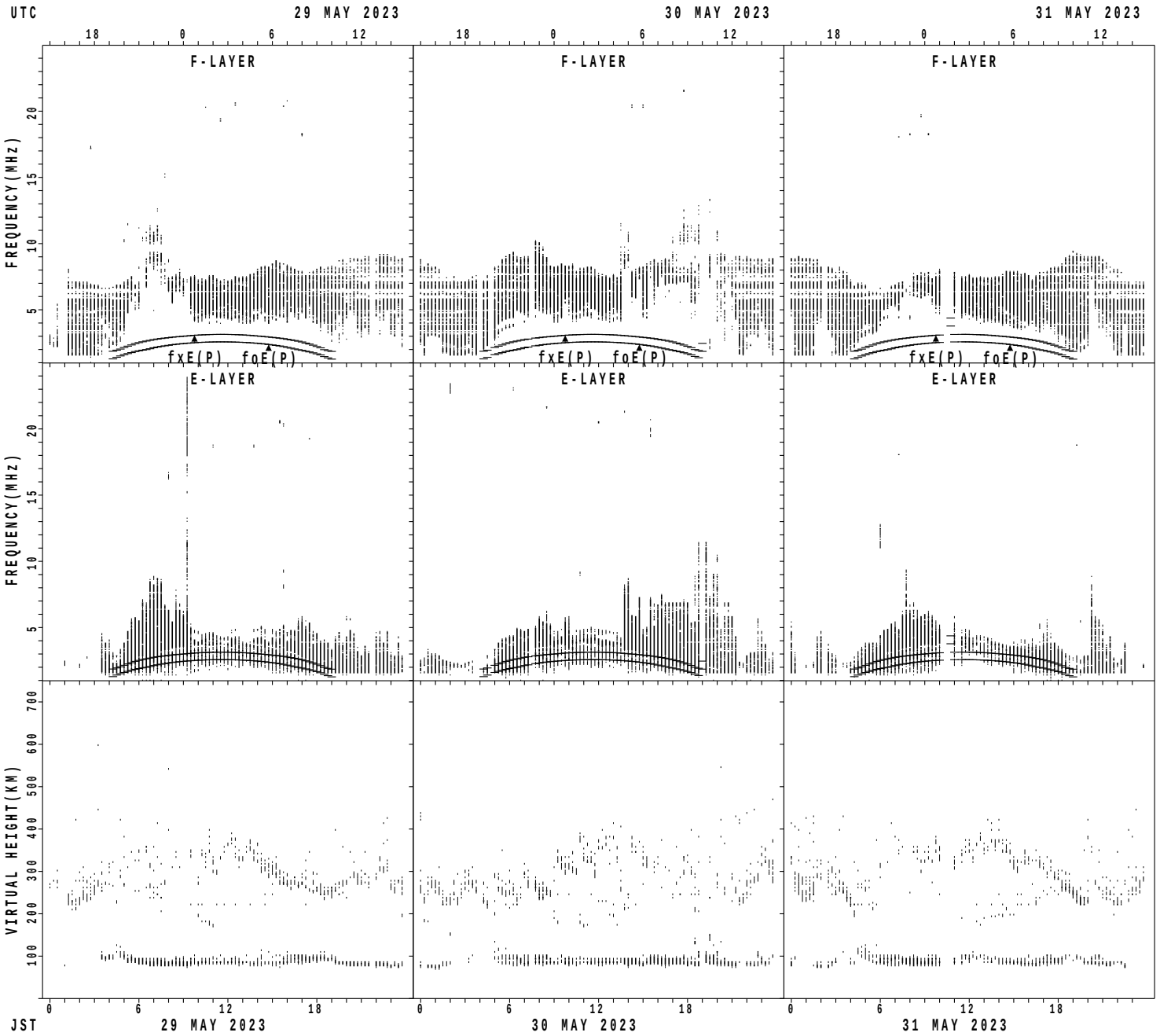
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



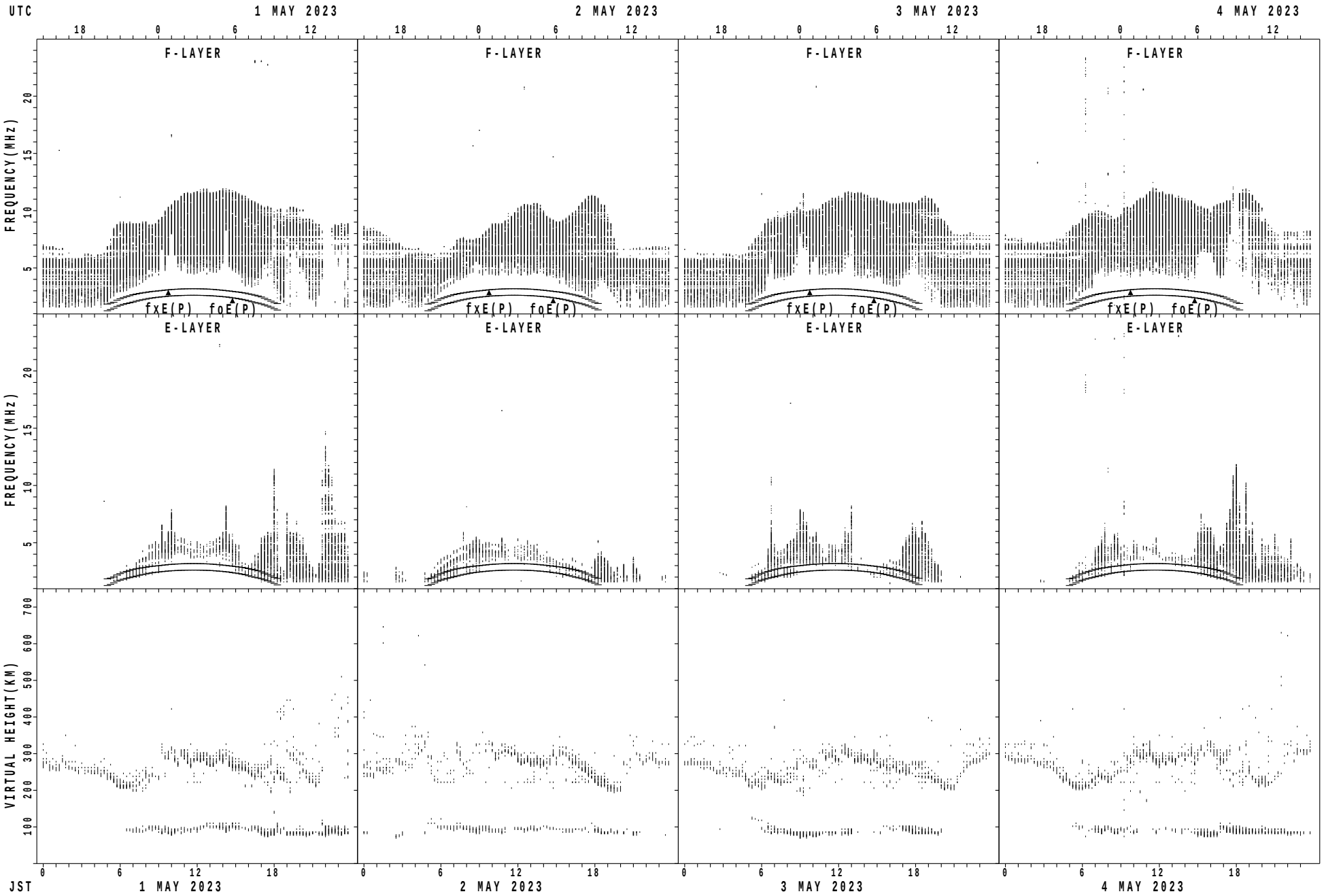
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



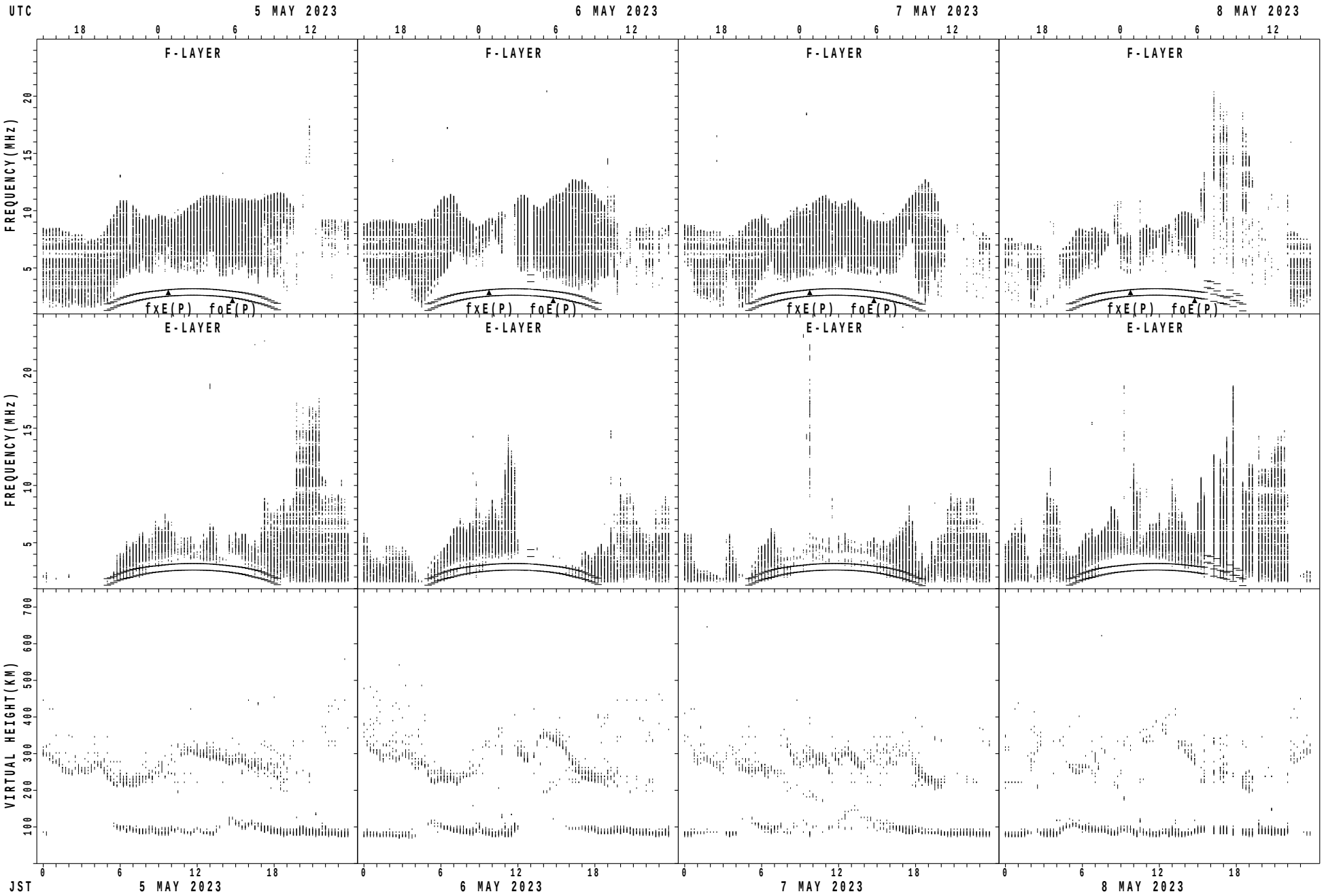
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



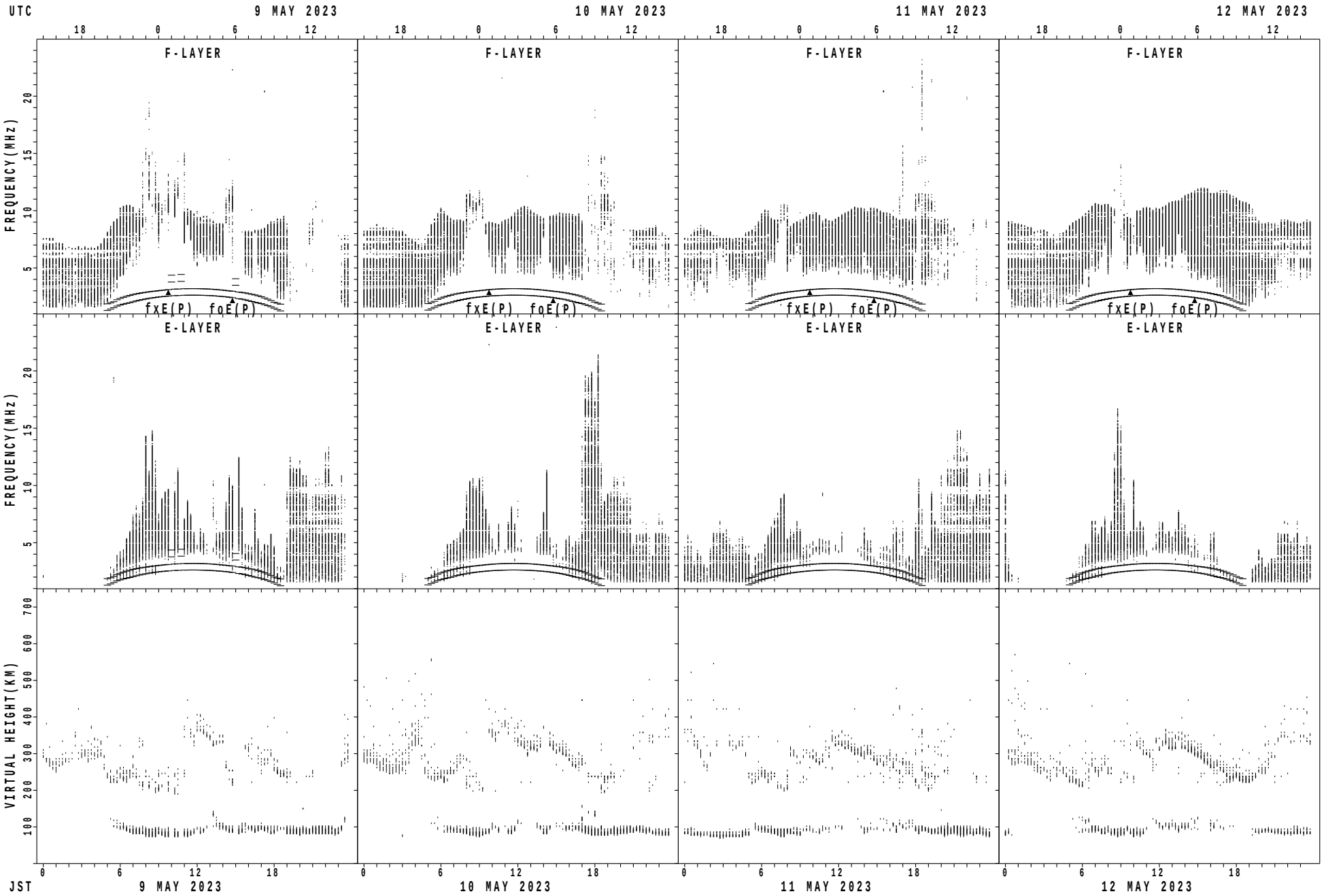
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



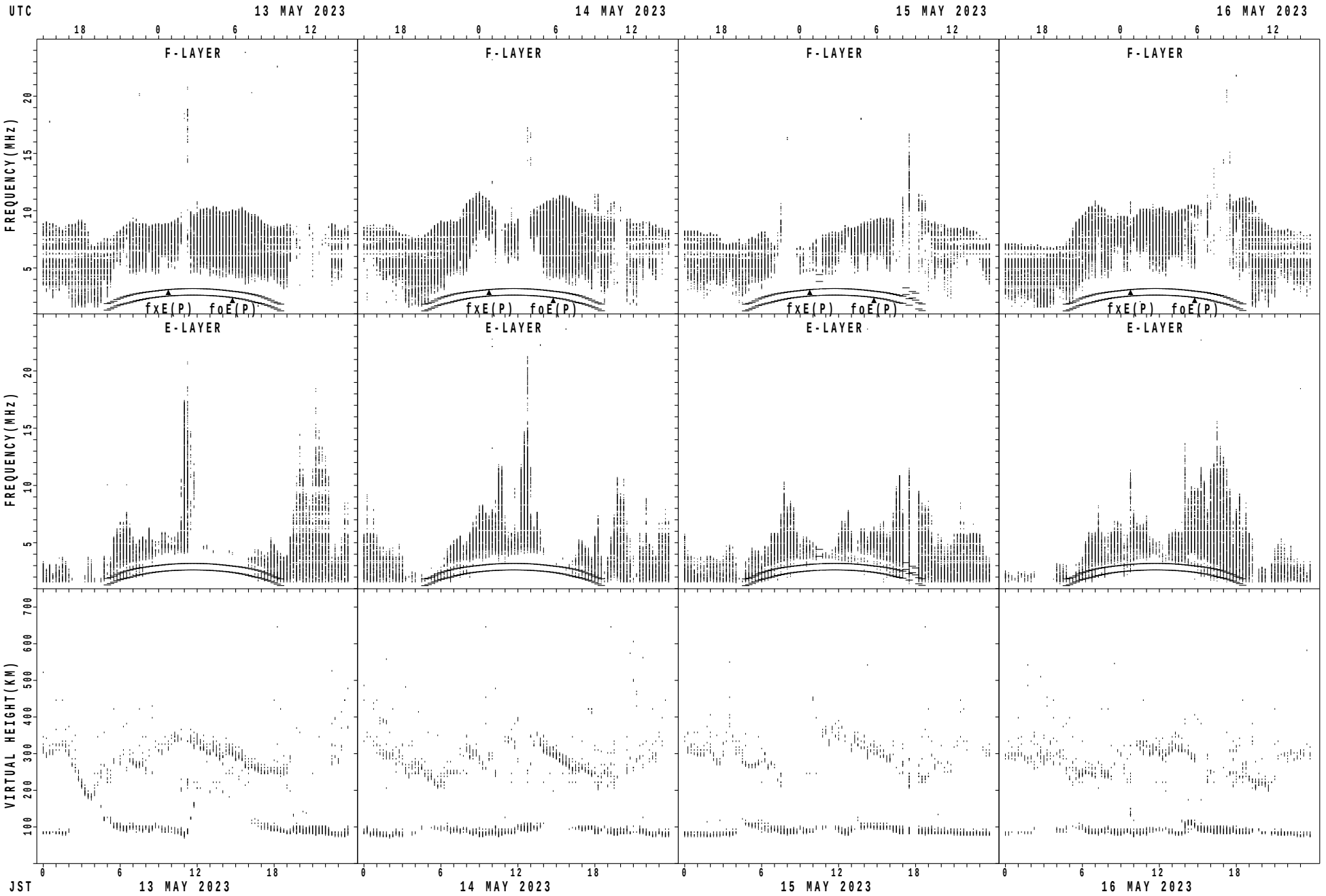
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



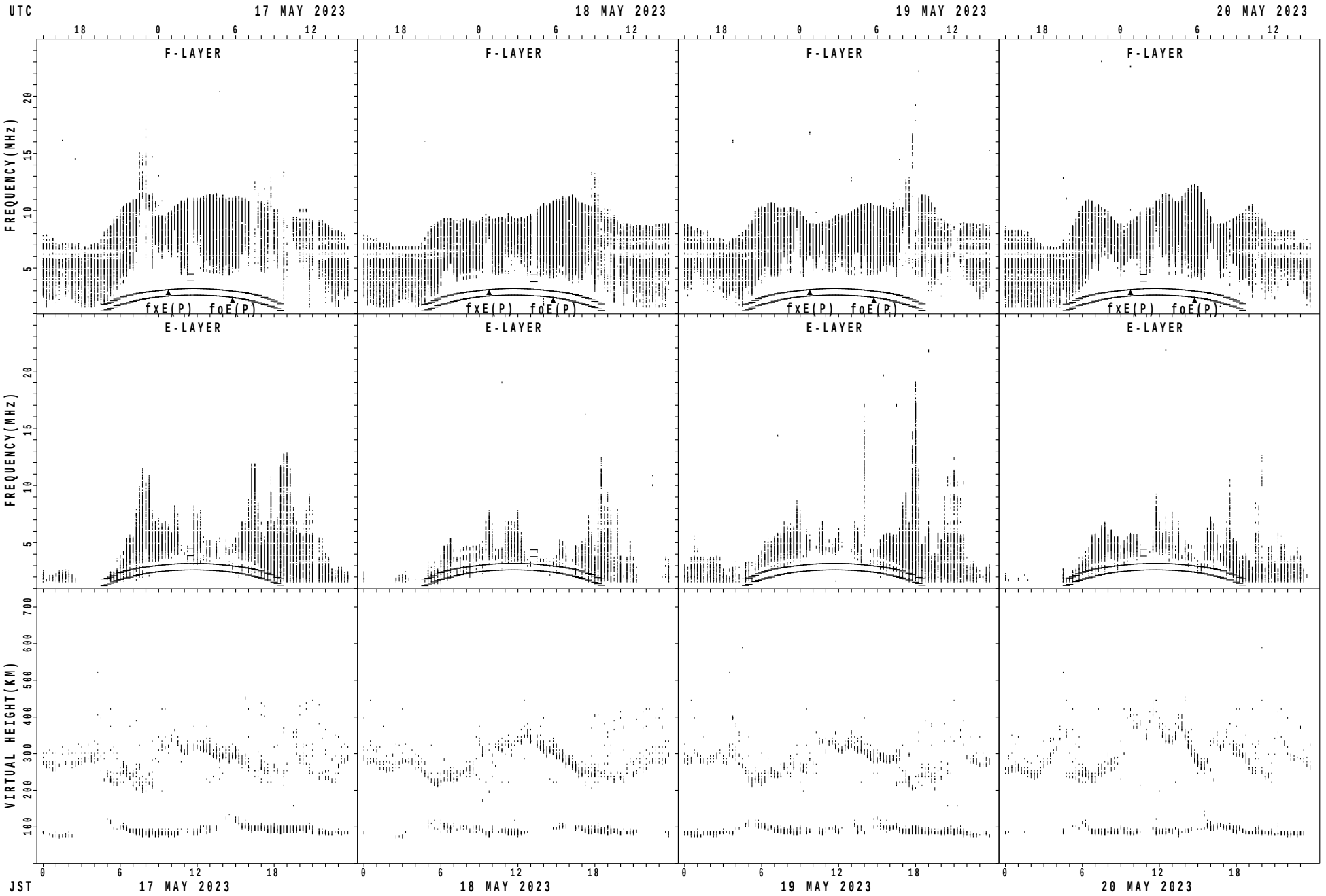
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



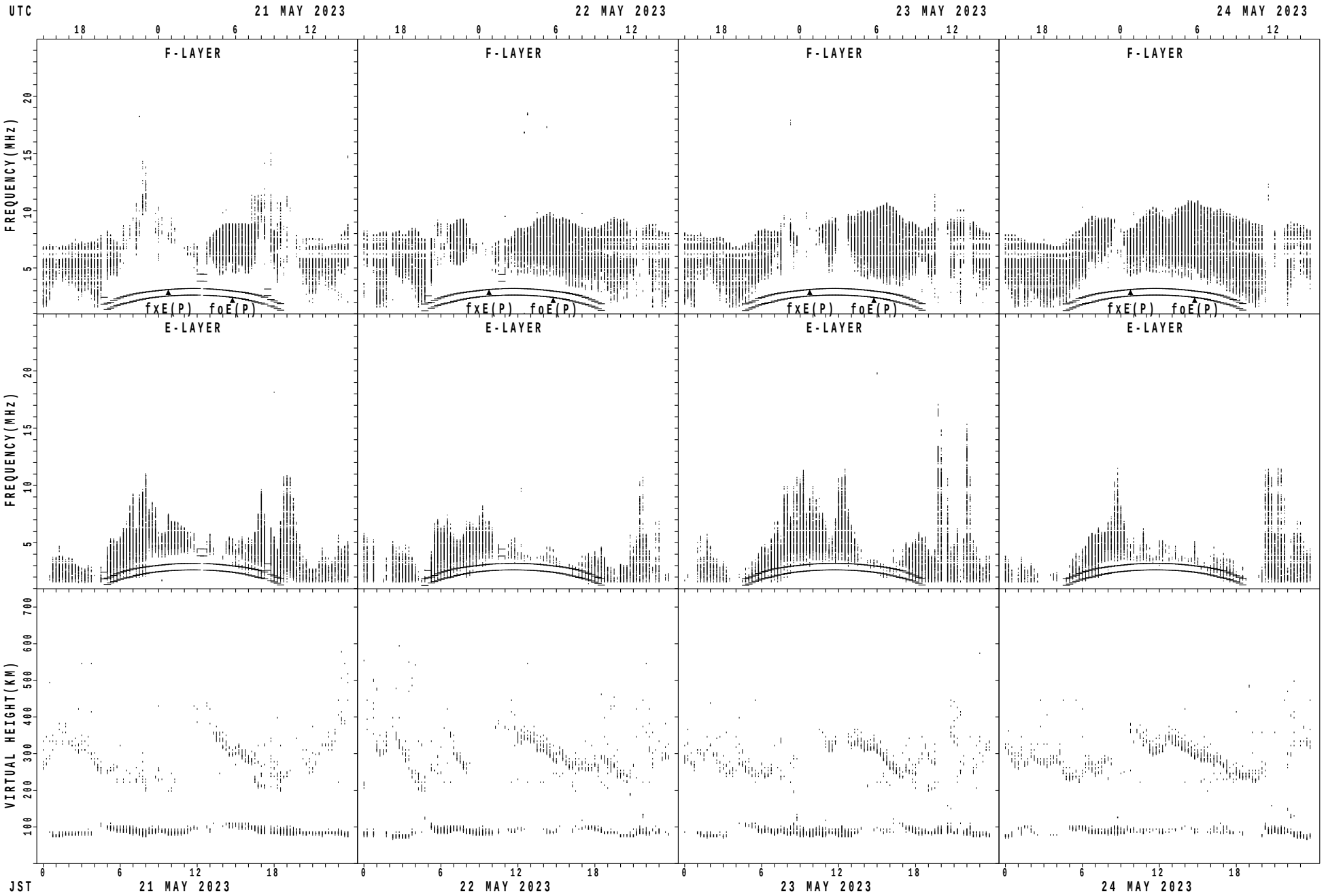
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



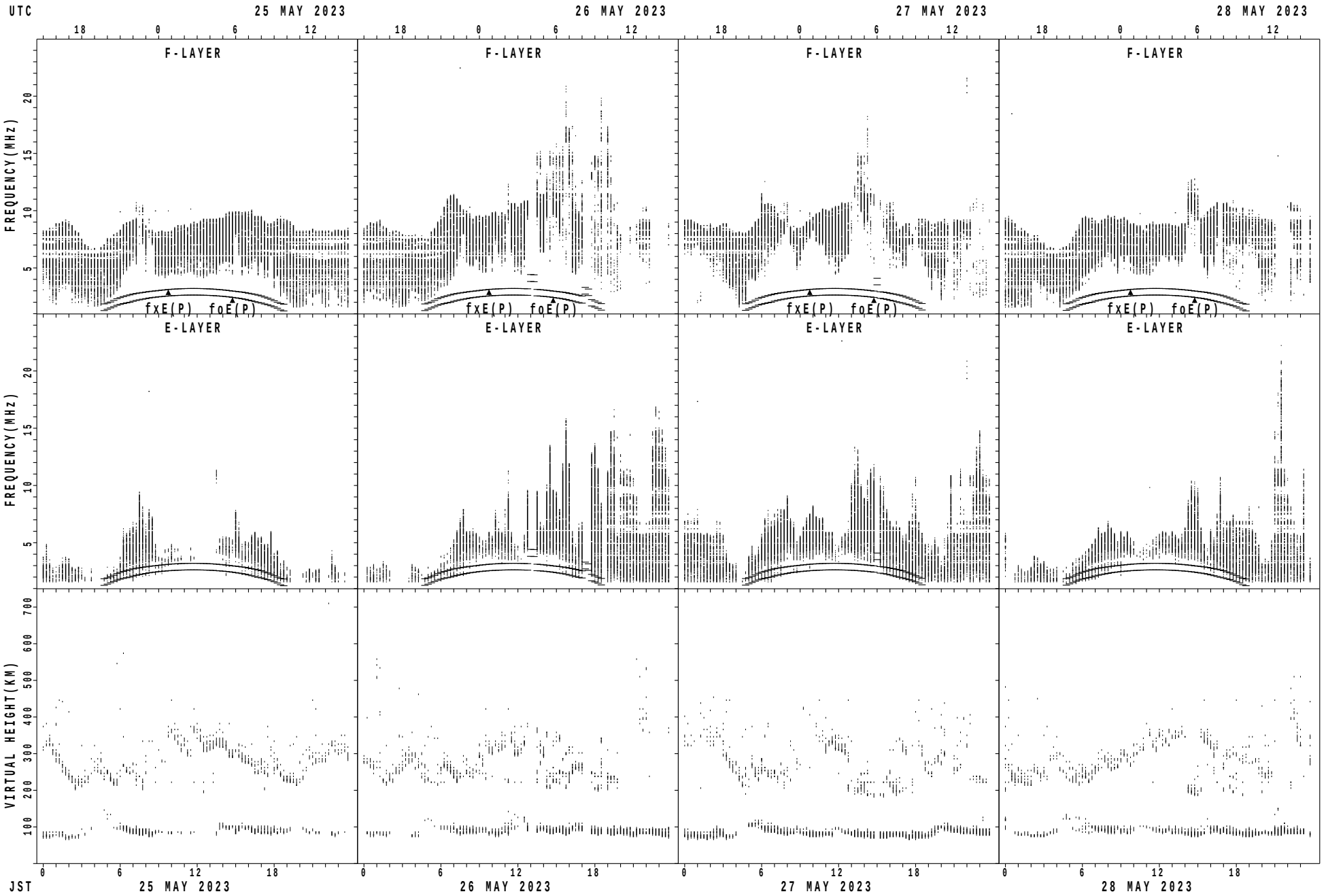
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



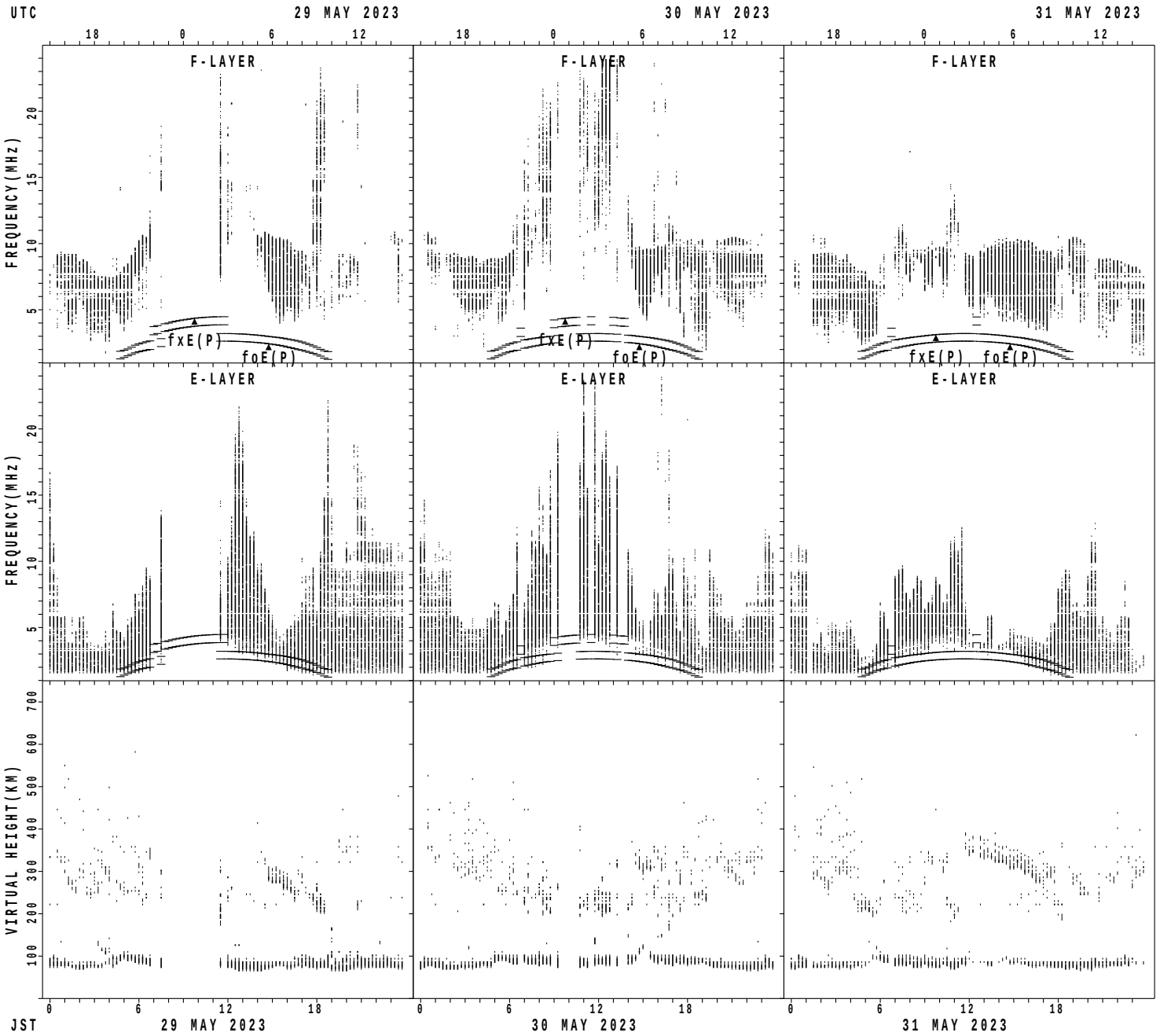
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



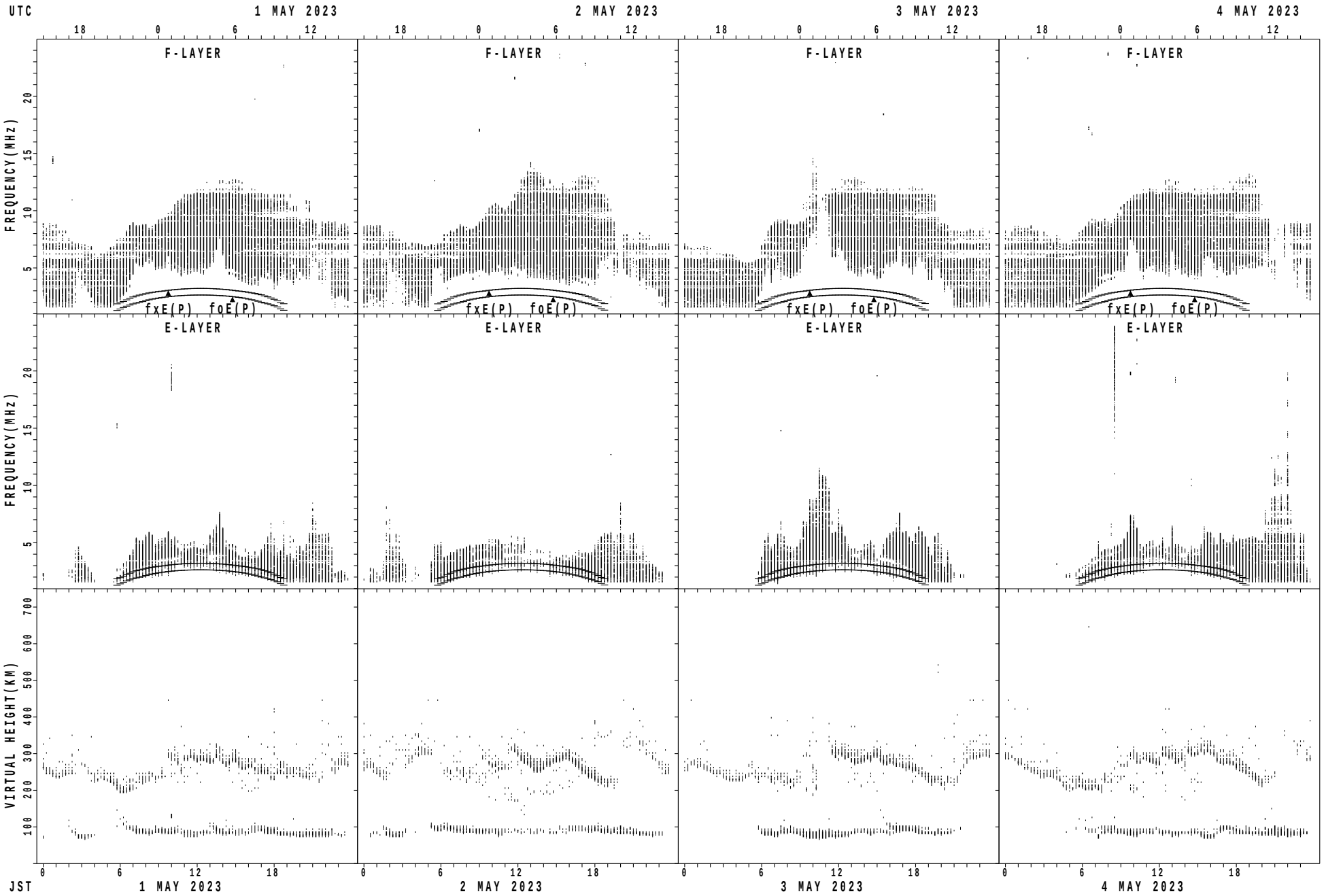
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



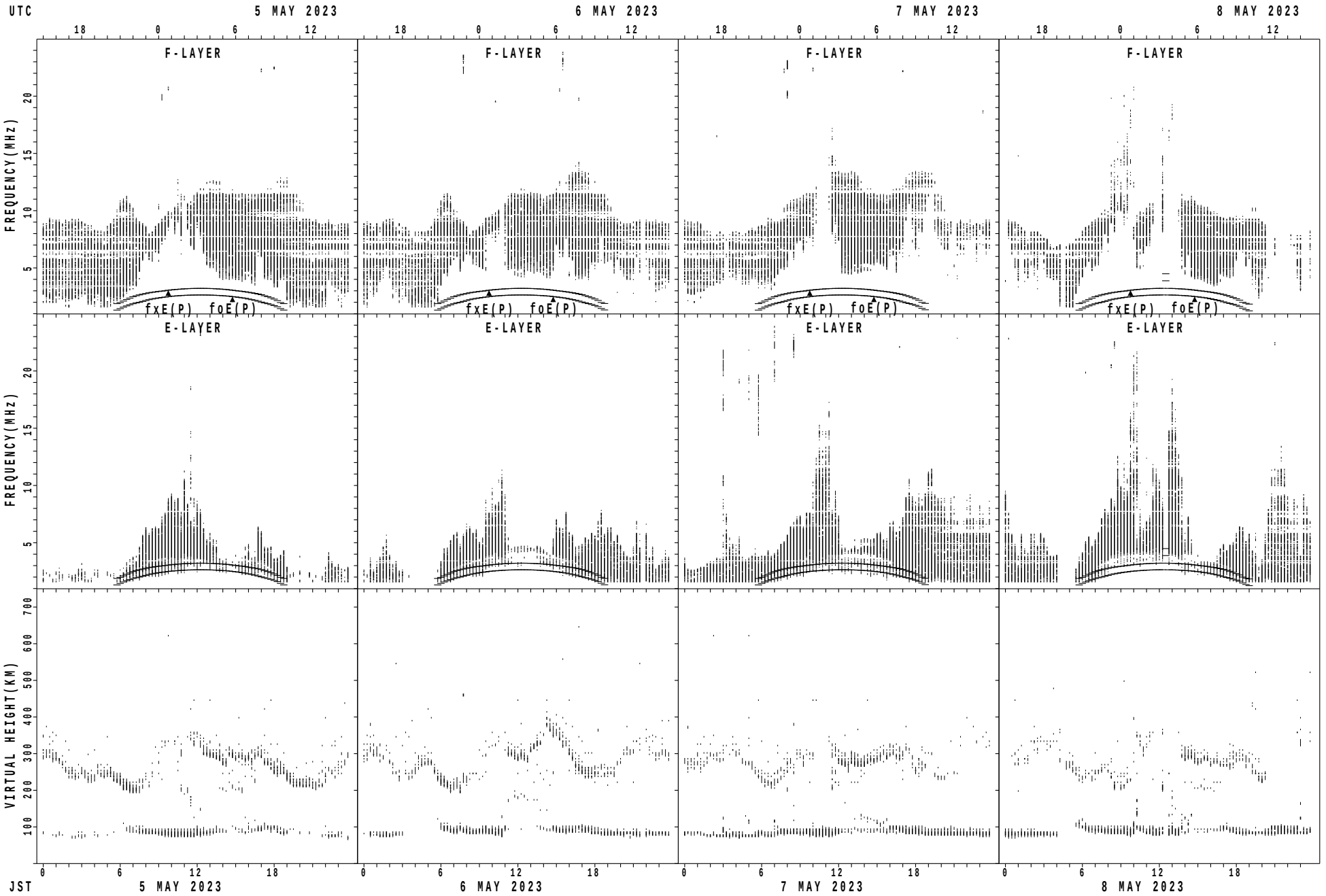
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



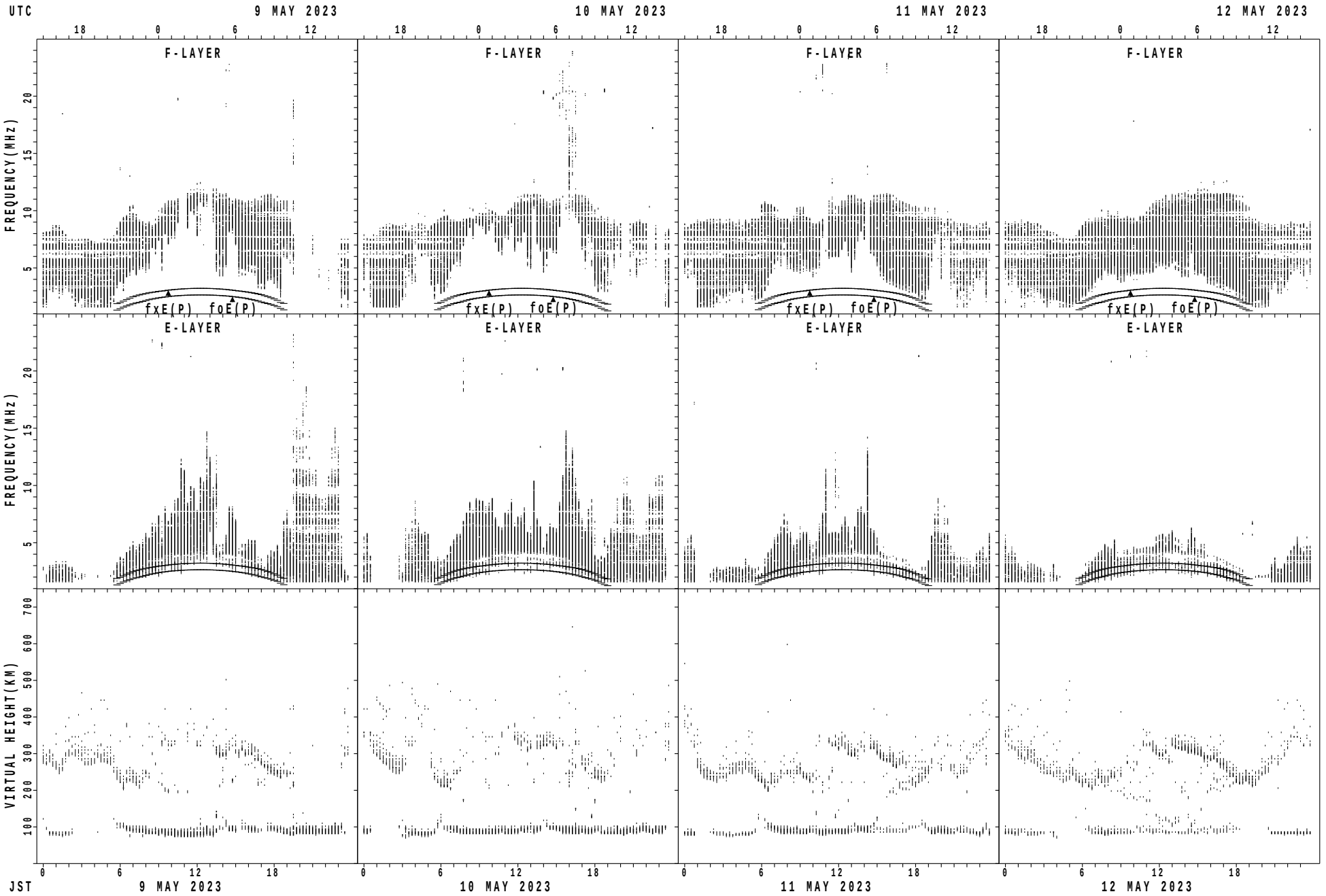
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



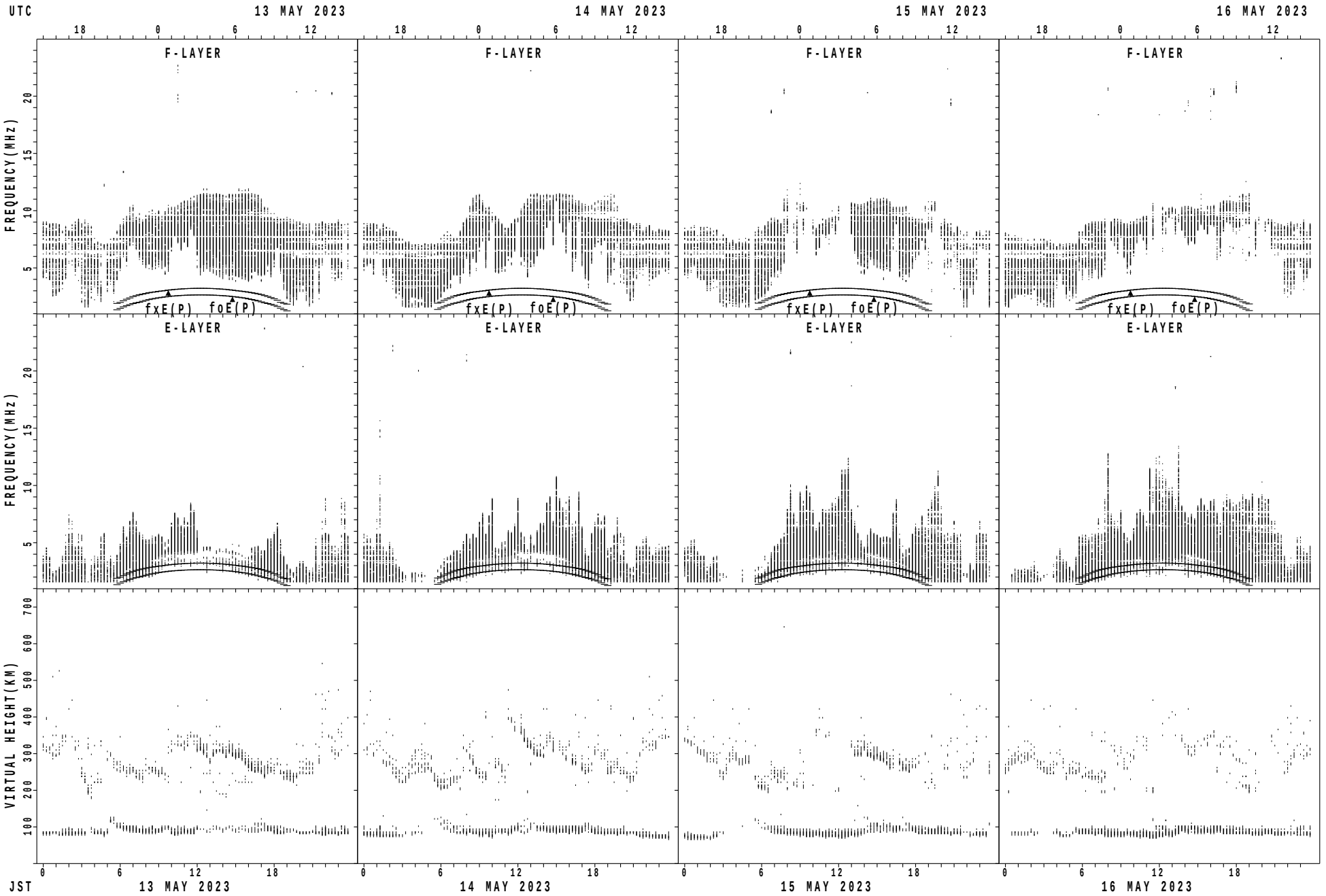
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



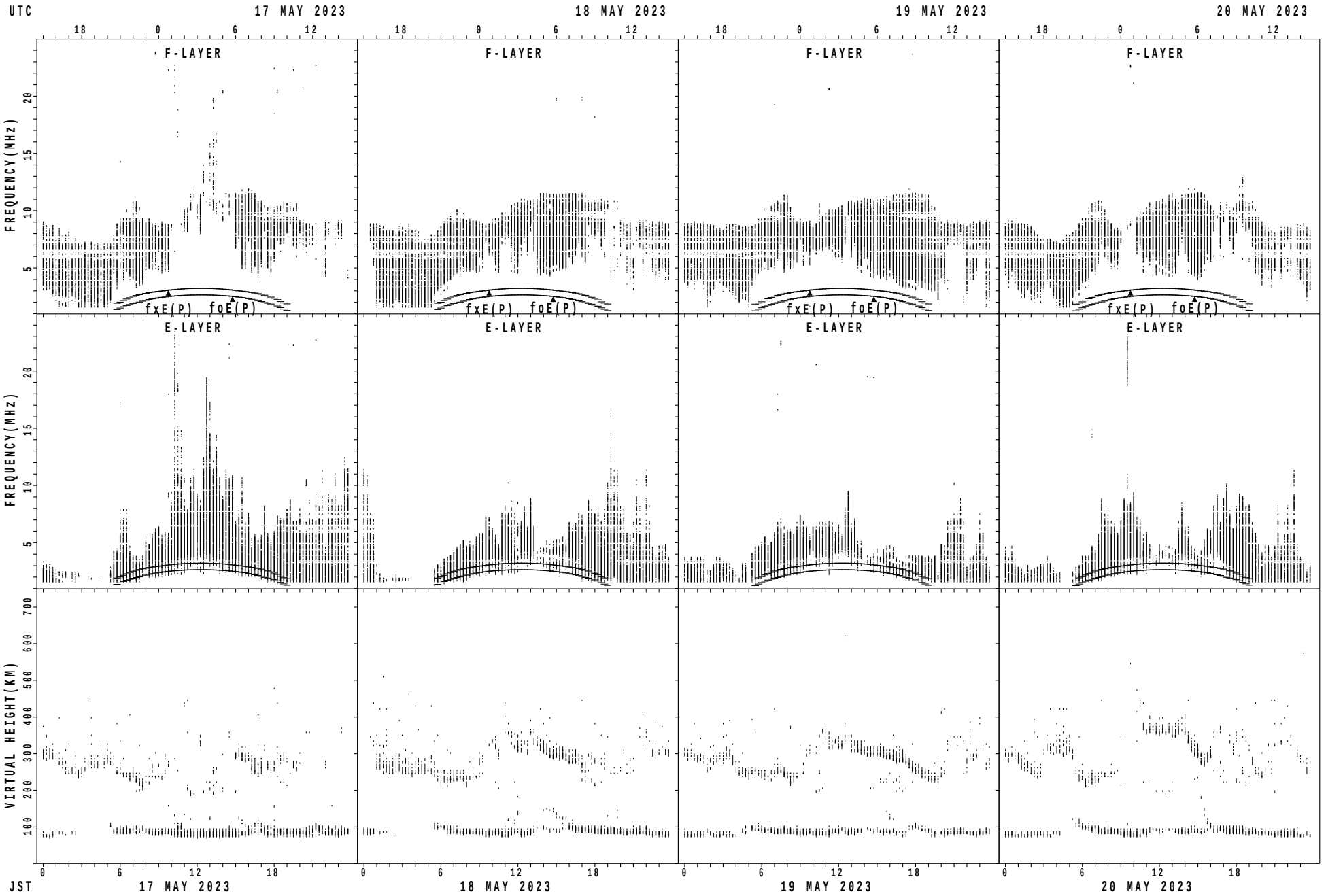
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



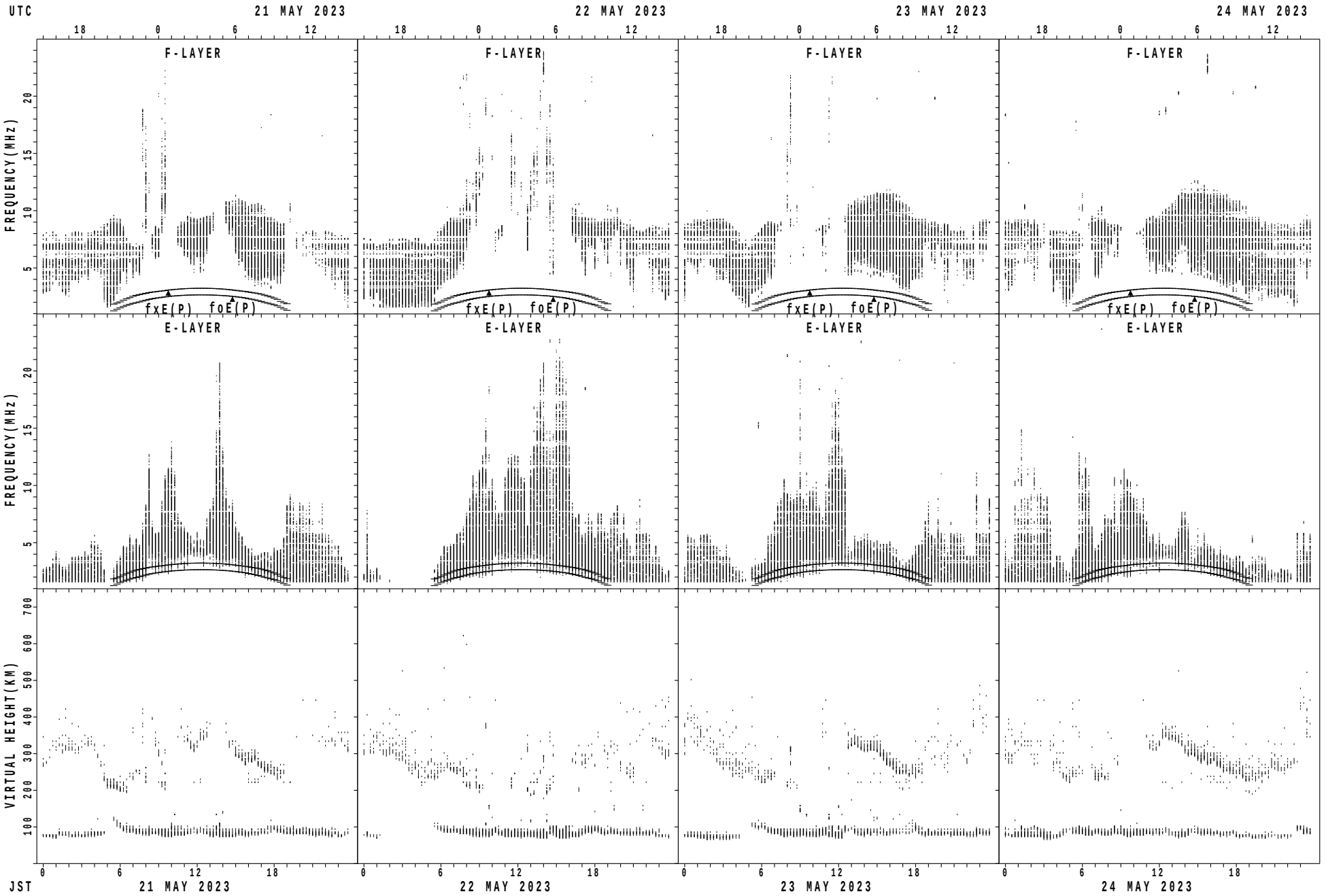
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



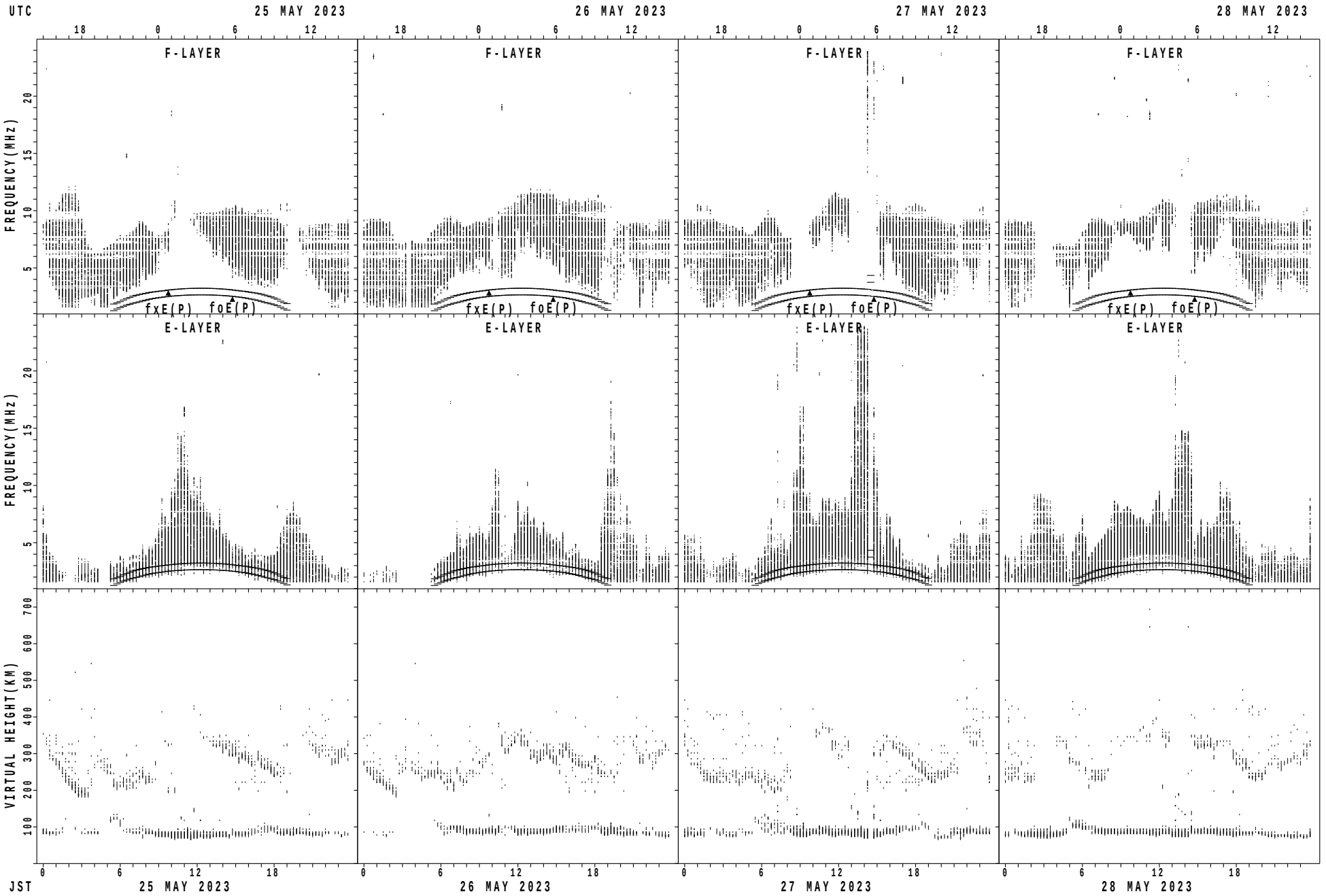
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



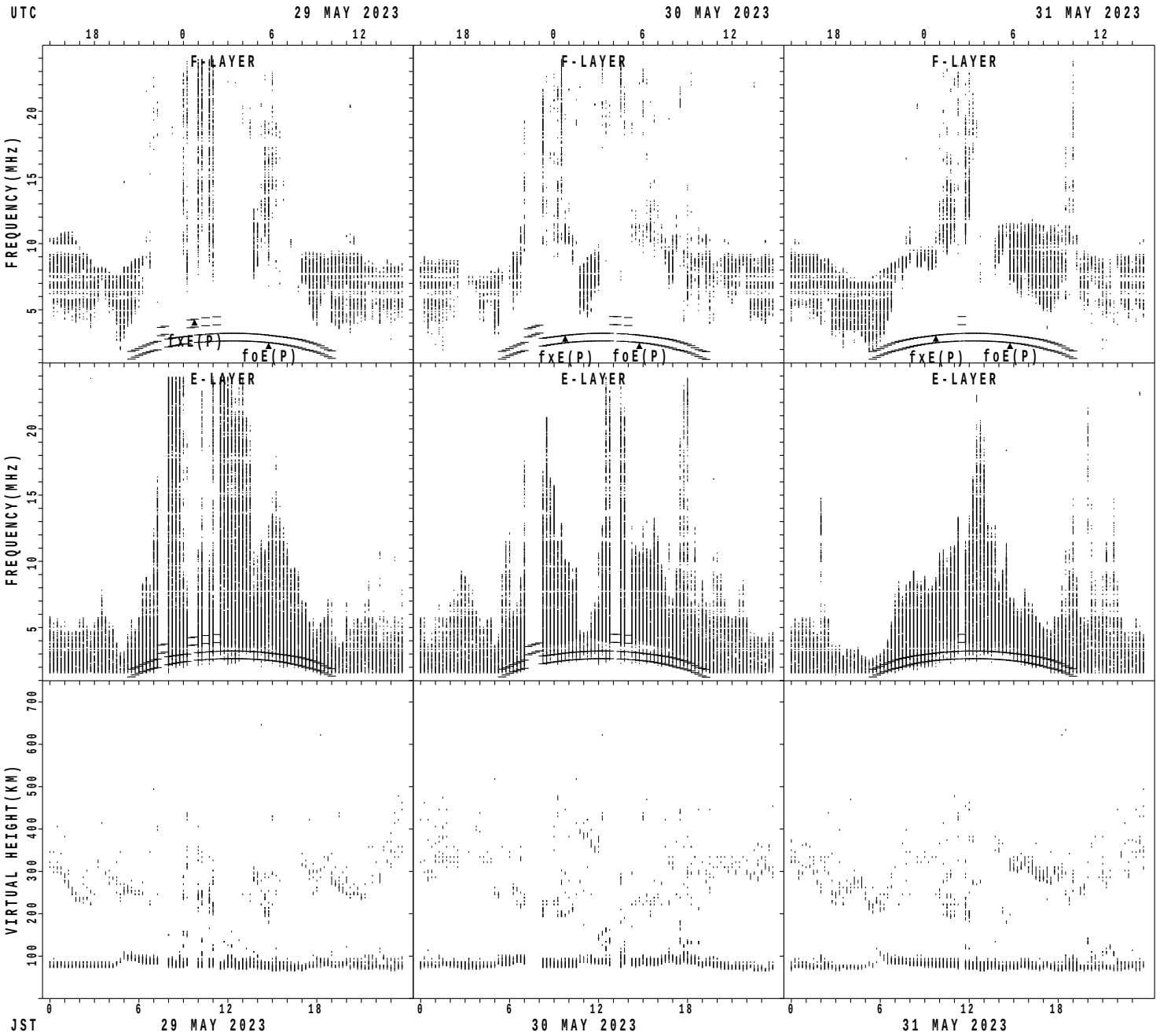
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



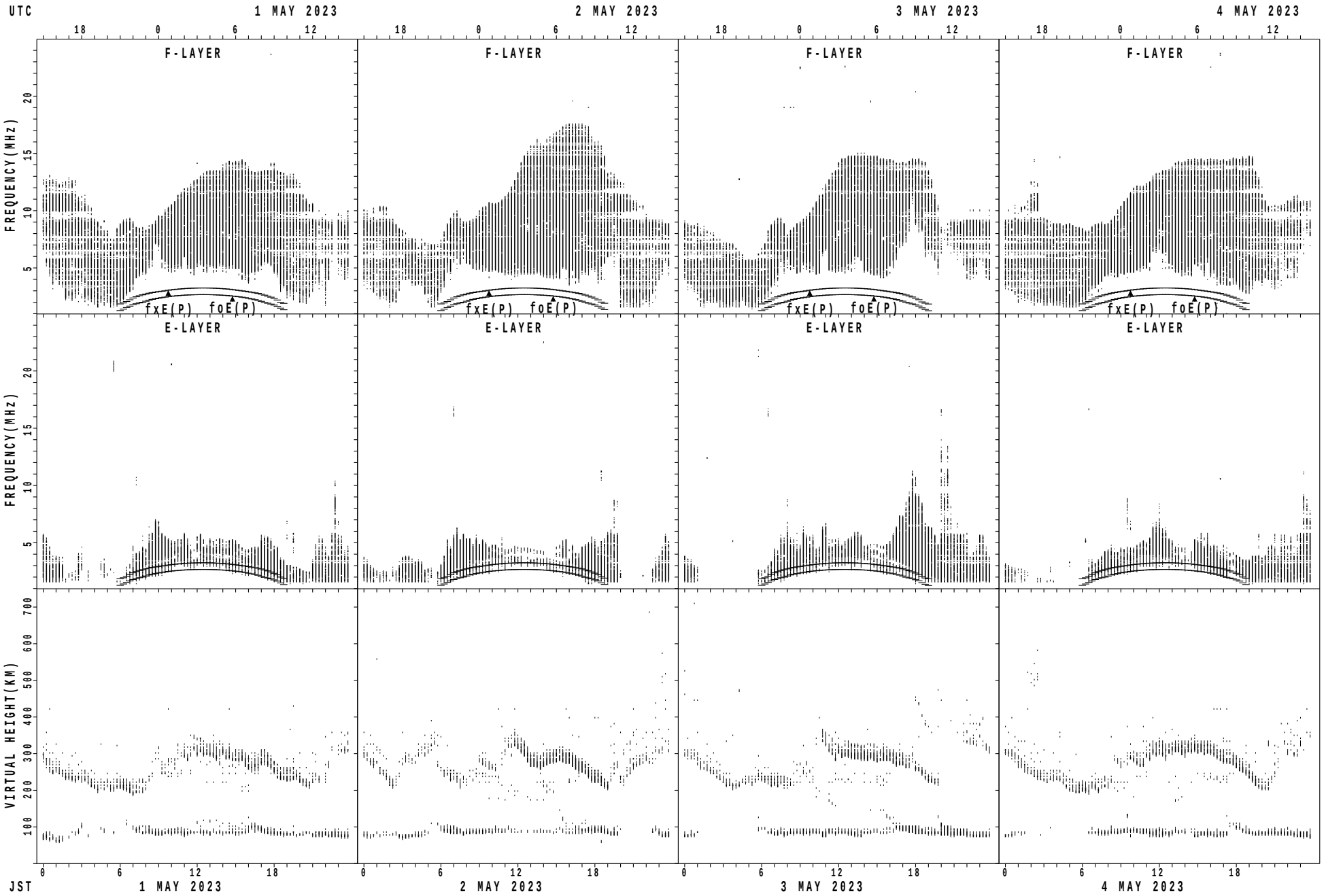
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



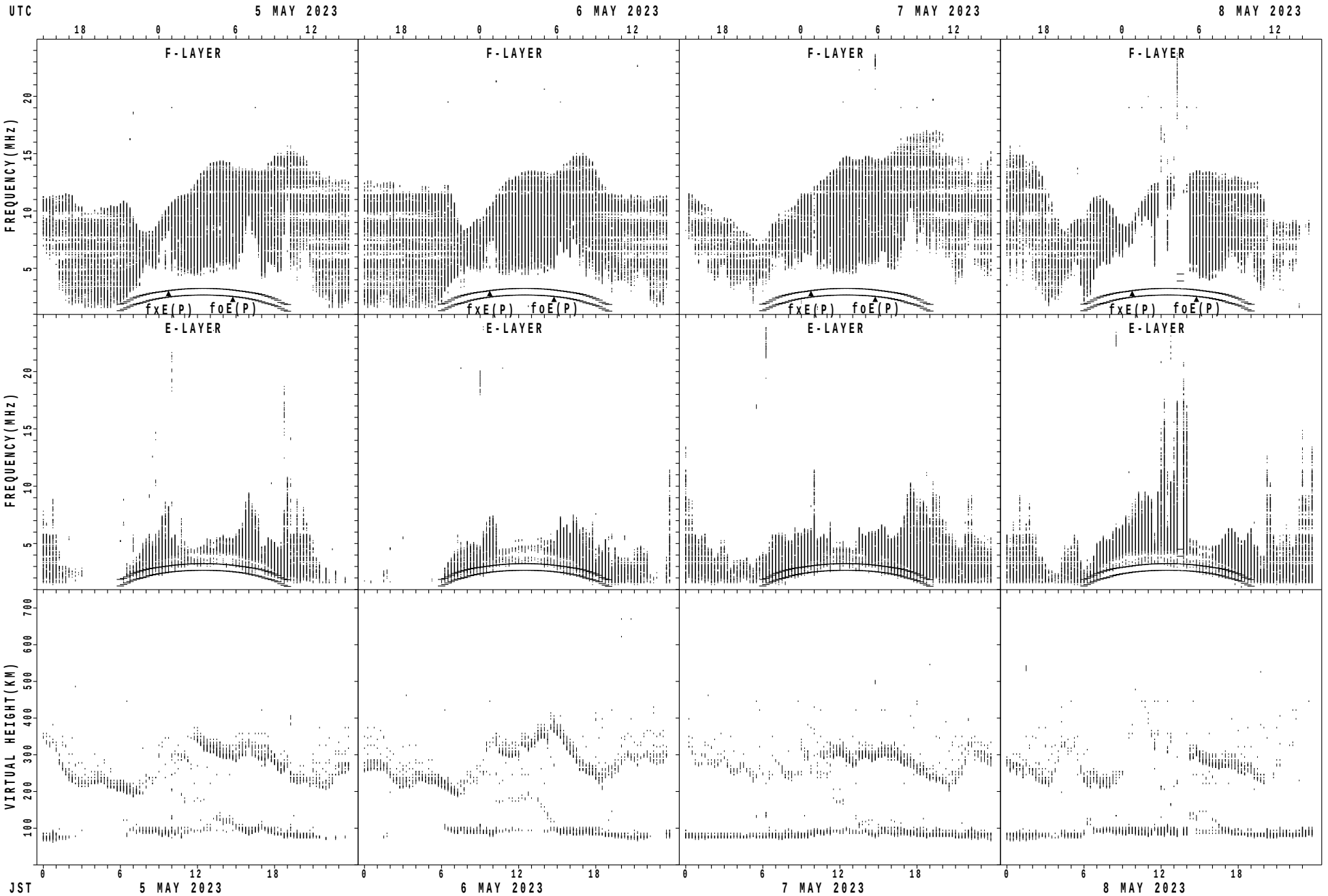
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



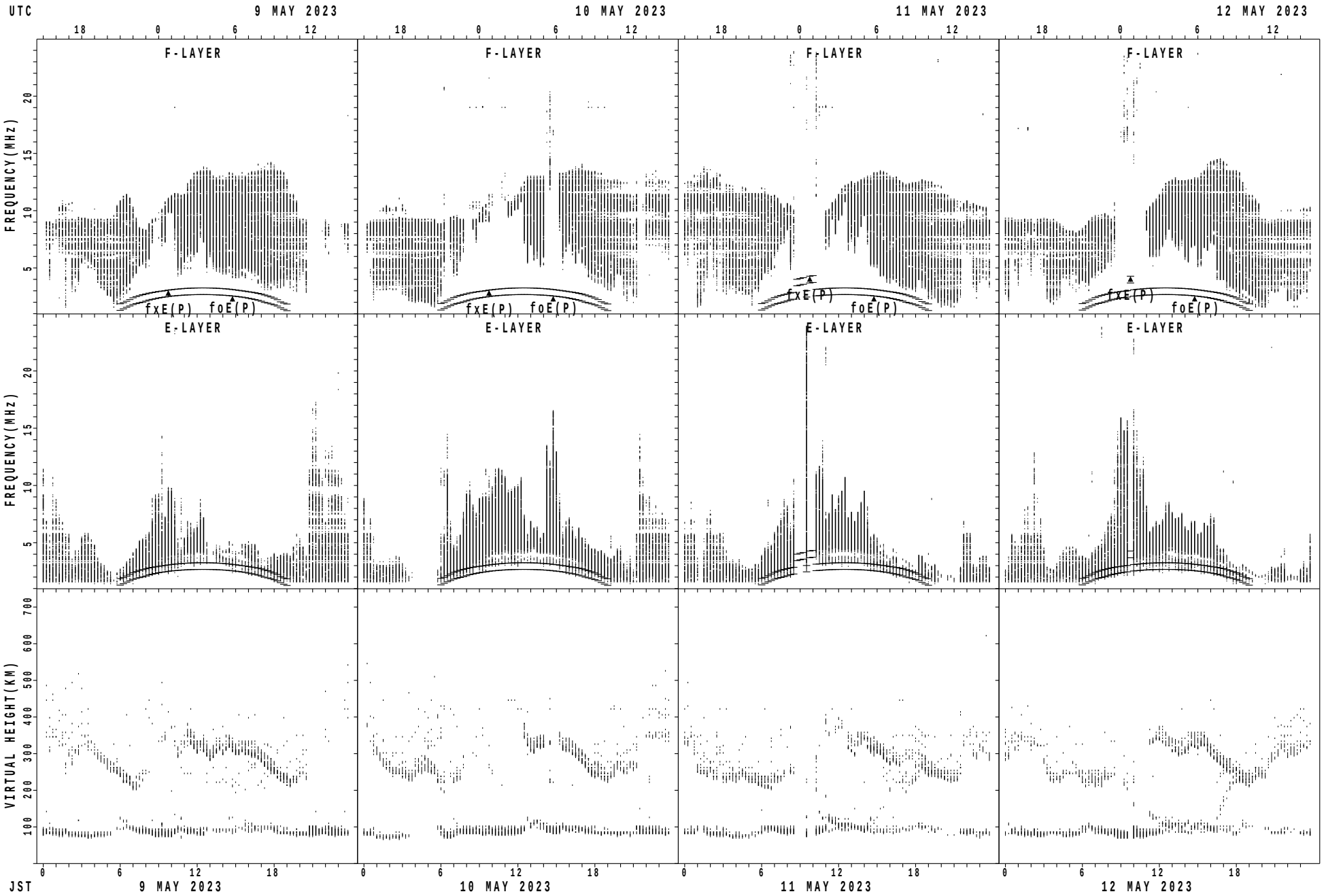
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



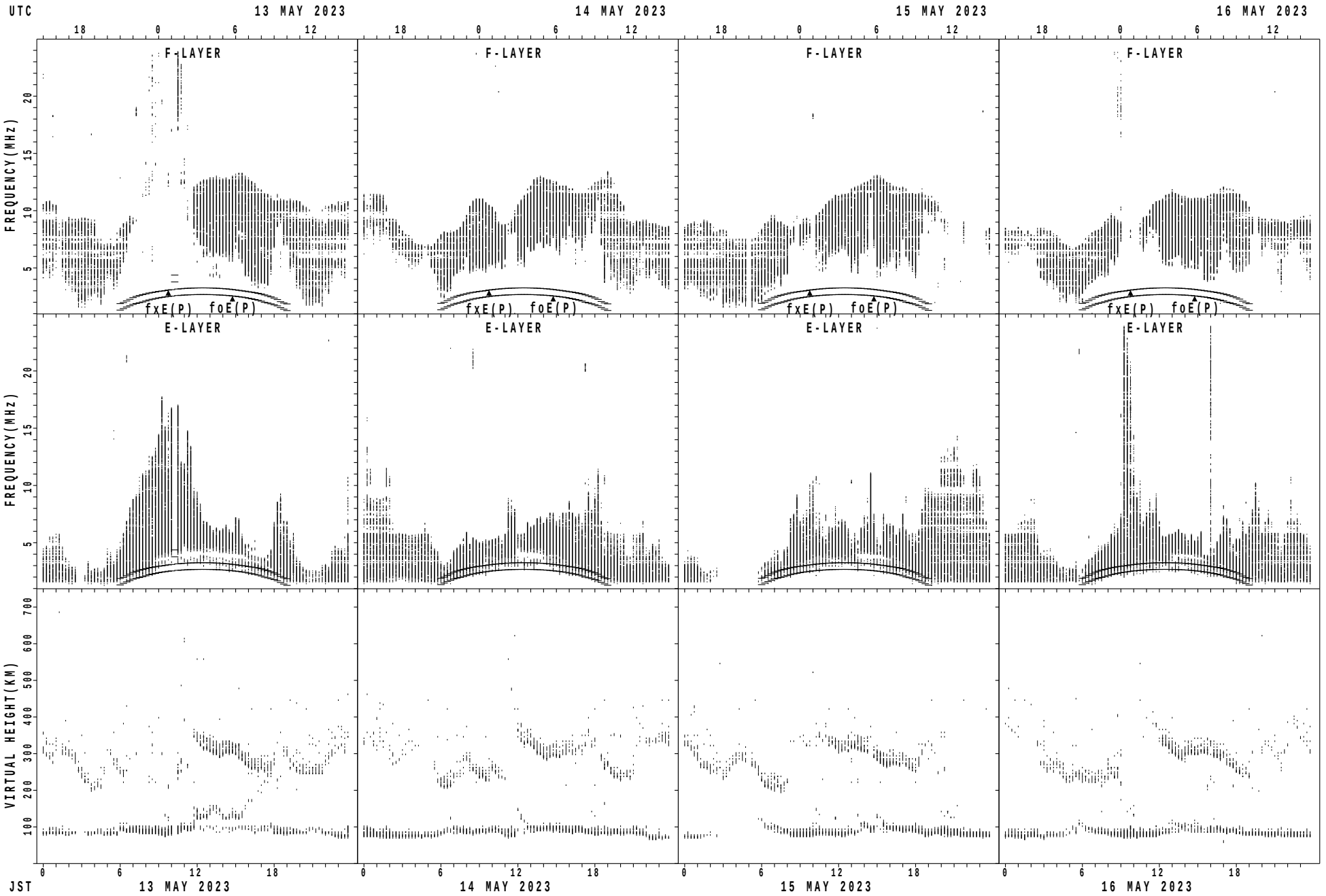
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



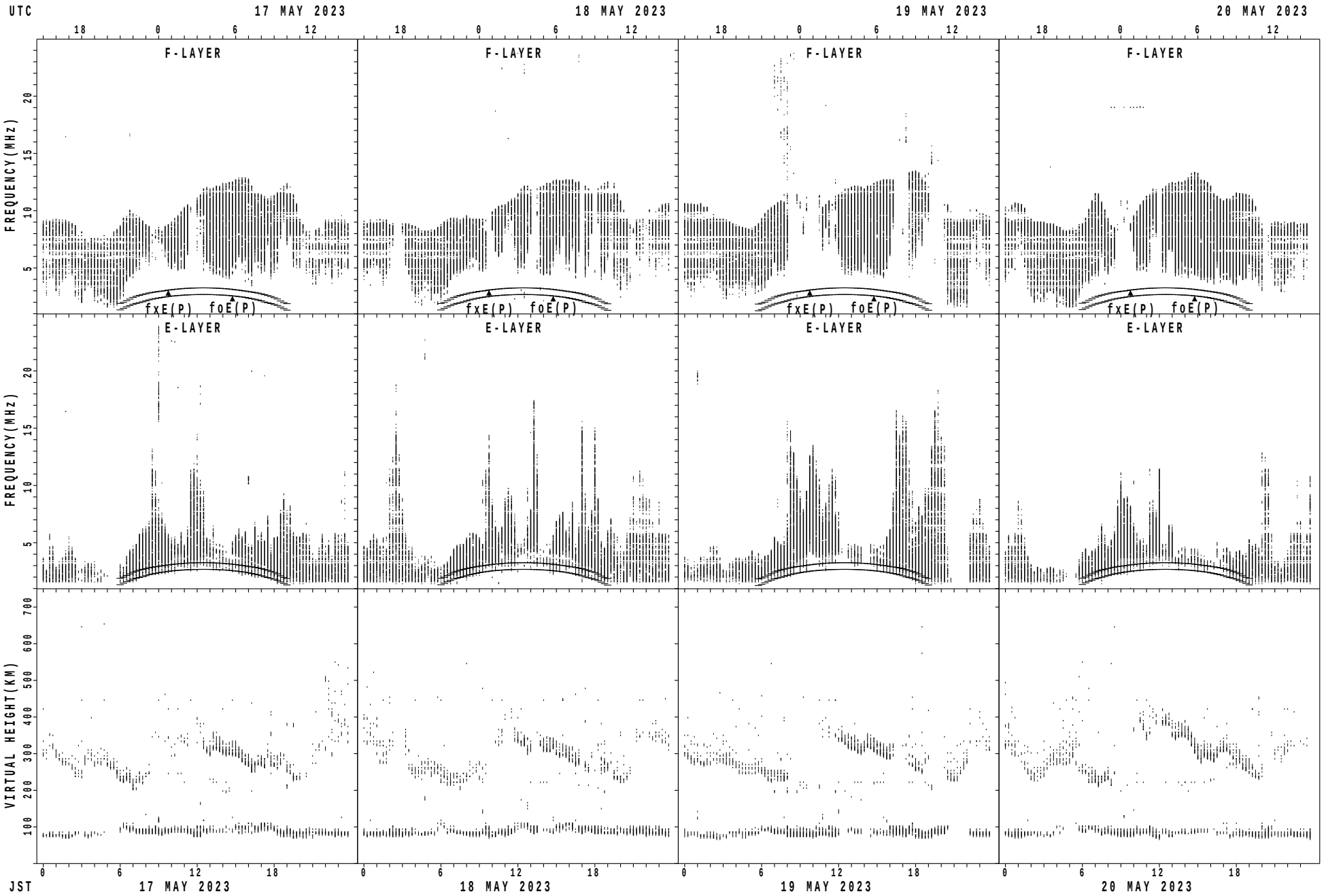
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



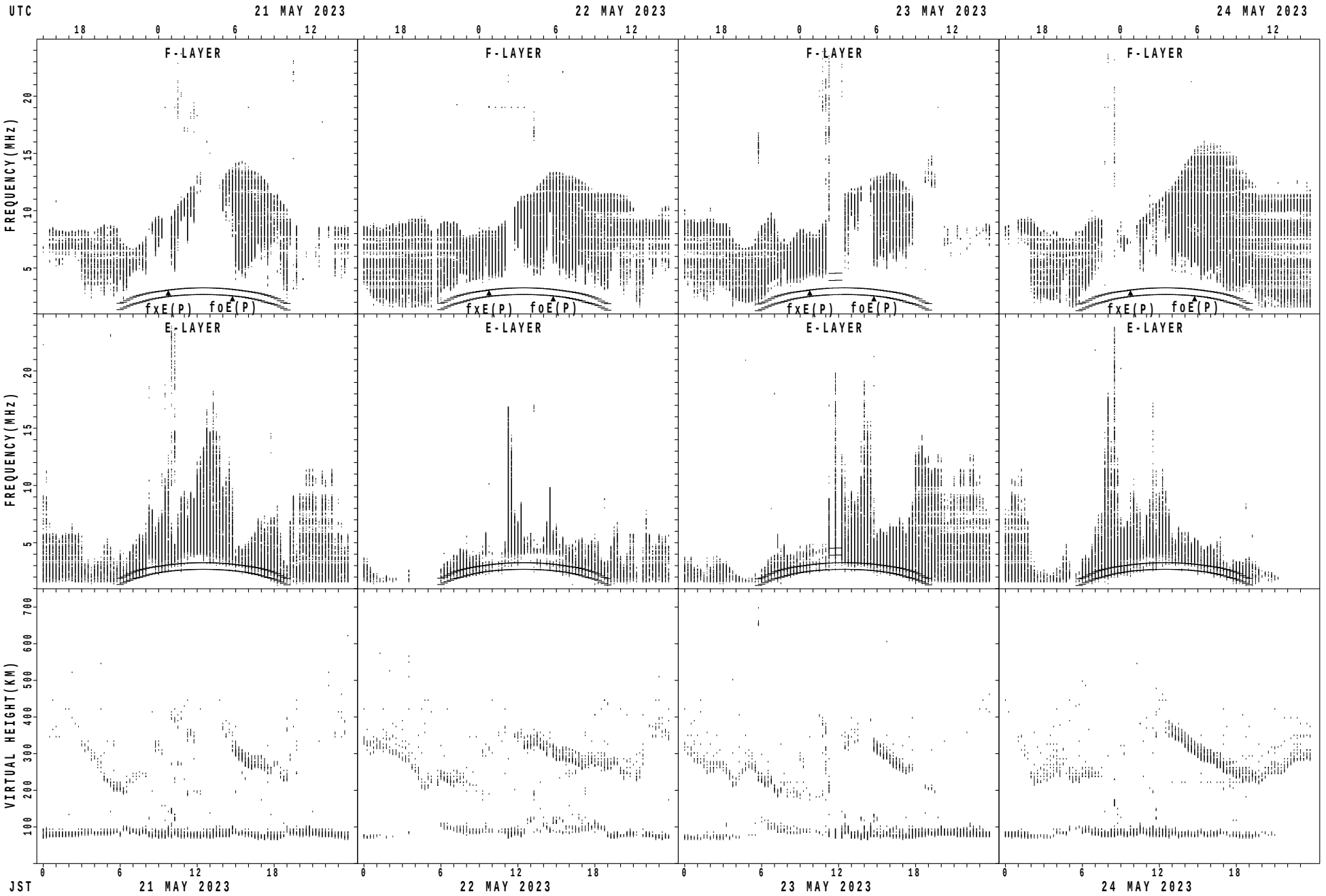
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



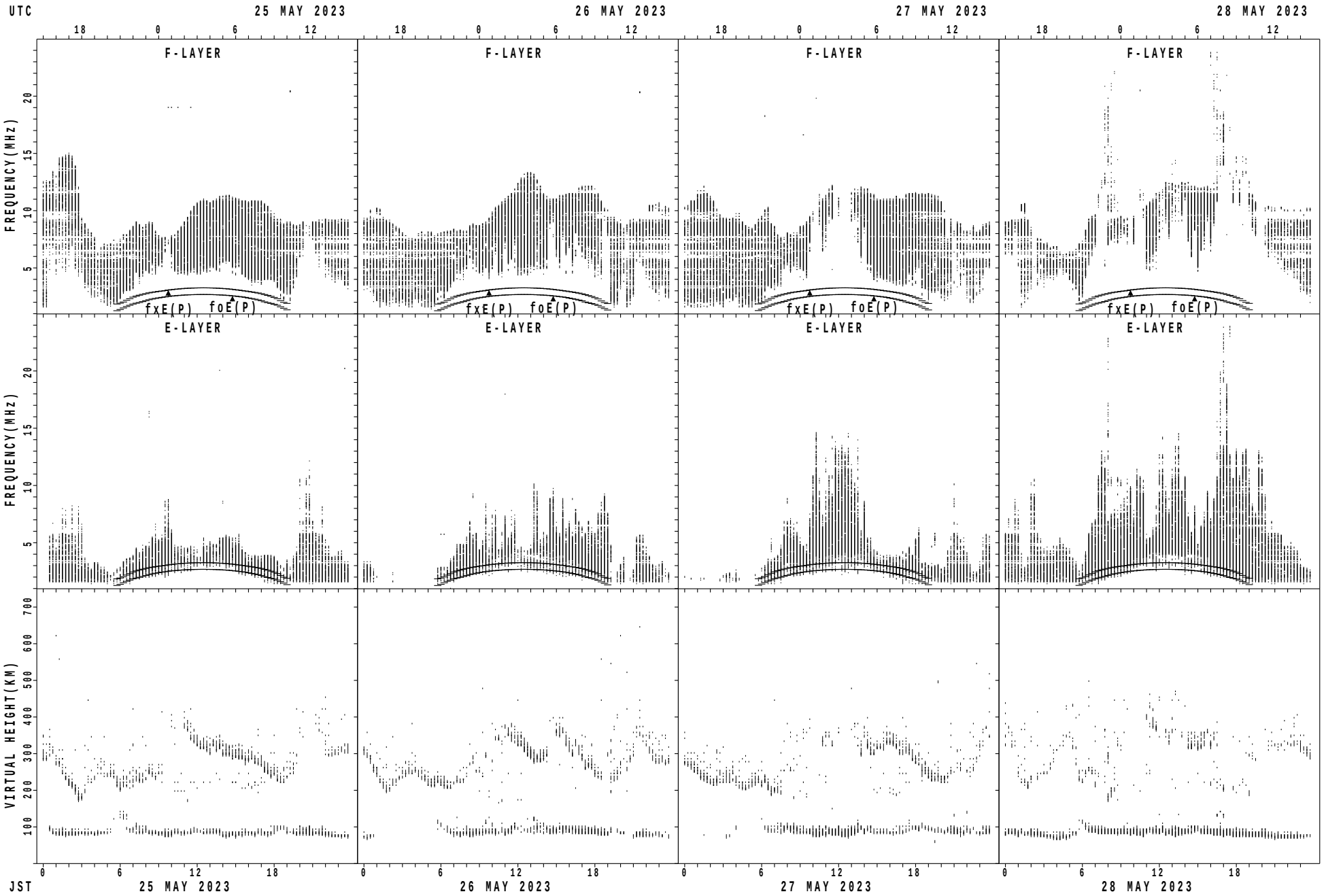
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



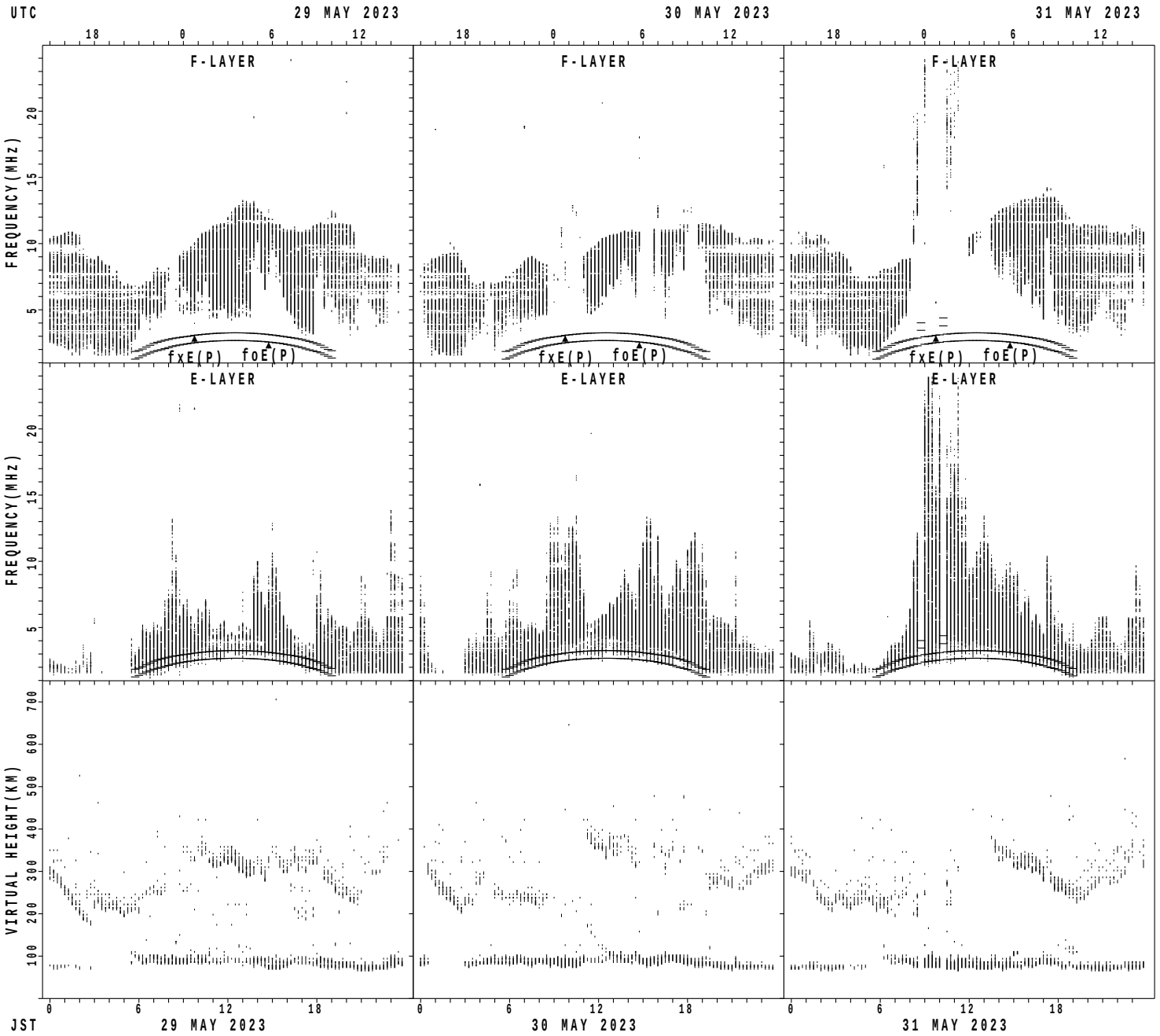
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

MAY 2023 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	4	5	2		6	17	8									5	24	16	21	14	16	7	6
MED	309	314	320	310		304	272	255									264	281	263	266	266	275	290	302
U Q	325	365	345	316		338	300	301									286	292	277	284	282	291	324	320
L Q	299	298	298	304		280	256	240									254	255	236	255	258	256	276	290

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	21	25	21	20	19	28	27	28	29	29	30	30	29	29	29	29	30	31	31	29	25	27	23	23
MED	98	96	96	98	98	98	98	96	96	96	96	96	96	96	98	98	98	96	98	98	98	98	98	98
U Q	98	98	98	98	98	100	100	98	98	98	98	98	98	98	98	98	98	98	100	98	100	100	98	98
L Q	95	95	96	95	96	98	98	95	96	94	94	94	94	92	94	94	96	96	94	94	96	94	94	96

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	27	29	31	31	30	31	30	30	27	27	23	26	28	29	31	30	31	30	26	30	24	22	22	26
MED	286	274	274	262	259	238	241	246	244	268	274	285	284	312	312	275	280	264	261	250	244	255	278	290
U Q	310	296	282	278	282	250	254	254	274	276	292	316	311	338	332	302	294	284	280	258	263	282	314	304
L Q	264	260	254	248	250	234	230	230	232	242	248	274	253	272	278	260	262	242	248	242	228	242	260	266

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	24	24	24	19	22	29	31	31	31	30	27	24	22	24	28	28	31	31	31	31	30	29	29
MED	96	94	95	96	96	98	98	96	96	96	94	96	96	96	96	98	96	96	96	94	96	96	96	94
U Q	98	98	96	96	98	100	100	98	98	98	96	98	98	99	98	100	98	100	98	98	98	98	98	97
L Q	92	92	91	92	92	98	98	96	96	94	93	92	95	94	94	95	94	96	94	92	94	92	94	92

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	13	21	18	14	9	9	20	27	28									31	31	28	21	13	11	17
MED	346	316	297	298	308	282	242	232	227									260	254	240	258	272	320	344
U Q	353	341	314	338	338	324	252	246	244									278	272	270	284	335	396	382
L Q	324	304	274	284	297	271	224	216	205									246	232	203	236	227	302	319

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	27	29	28	26	21	31	31	31	31	31	31	31	31	29	31	31	31	31	30	31	31	31	30
MED	94	94	96	96	95	96	98	98	96	96	96	96	96	96	96	96	96	98	96	94	94	94	94	94
U Q	96	96	98	97	96	98	98	98	98	98	98	96	98	98	97	98	98	100	98	96	96	96	96	96
L Q	92	92	94	92	92	96	96	96	94	94	94	94	94	96	94	94	96	96	94	92	92	92	92	92

MONTHLY MEDIANS OF h'F AND h'Es

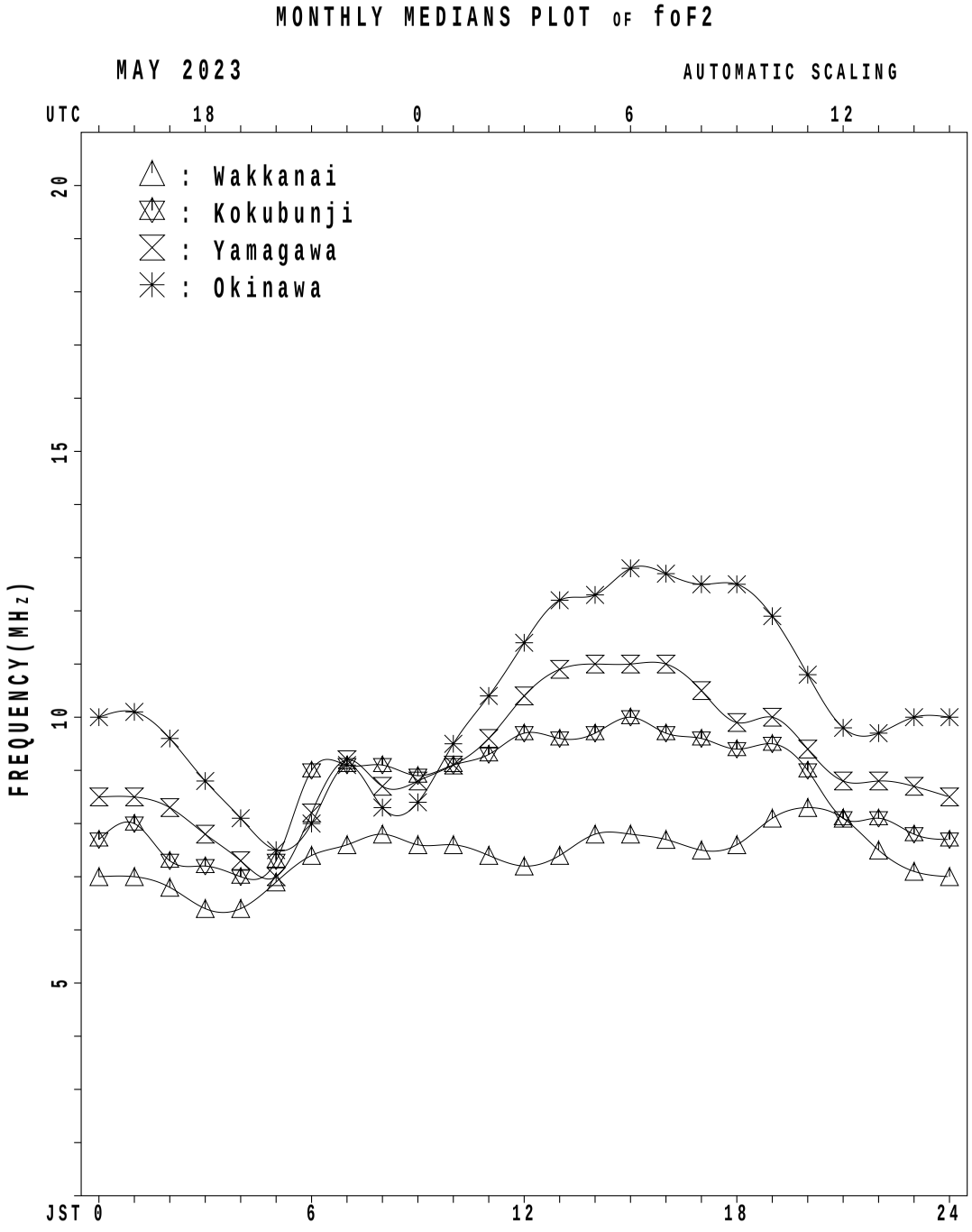
MAY 2023 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	25	27	27	24	18	10	22	27	22									30	27	30	25	22	23	18
MED	328	304	282	278	288	275	250	230	233									265	254	240	256	306	330	334
U Q	355	318	324	325	310	322	272	242	248									280	266	258	272	334	354	350
L Q	312	282	260	263	274	256	228	214	210									222	226	198	232	274	318	322

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	28	25	22	27	31	31	31	31	31	31	30	30	31	31	31	31	31	31	29	31	29
MED	93	94	94	94	96	96	98	96	96	96	96	96	96	96	96	96	98	98	96	94	94	96	94	92
U Q	94	96	96	96	98	98	98	98	98	98	98	98	98	98	96	98	98	98	98	98	98	98	96	96
L Q	92	92	92	92	94	94	96	94	94	94	96	94	94	96	94	94	94	96	94	92	92	92	92	90


MONTHLY MEDIANS PLOT OF foF2
MAY 2023
AUTOMATIC SCALING
UTC
18
0
6
12
: Wakkanai
: Kokubunji
: Yamagawa
: Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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 69	X 65	X 63	X 66	X 66																X 93	X 95	X 90	X 80
2	X 76	X 75	X 72	X 67																	X 82	X 76	X 67	X 68
3	X 66	X 66	X 67	X 67																	X 98	X 93	X 80	X 77
4	X 77	X 74	X 72	X 72																	X 99	C	X 83	X 76
5	X 77	X 76	X 75	X 74																	X 98	X 93	X 90	X 85
6	X 79	X 77	X 77	X 74																	X 85	X 85	X 82	X 82
7	X 79	X 77	X 75	X 72																	X 98	X 87	X 79	X 77
8	X 76	X 75	X 72	X 66																	X 88	X 85	X 79	X 72
9	X 73	X 66	X 64	X 65																	X 97	X 93	X 86	X 79
10	X 78	X 77	X 78	X 71			C														X 86	X 80	X 79	X 75
11	X 79	X 77	X 73	X 72																	X 97	X 91	X 91	X 86
12	X 81	X 79	X 78	X 77																	X 94	X 89	X 86	X 86
13	X 83	X 82	X 82	X 79																	X 88	X 86	X 89	X 87
14	X 86	X 80	X 77	X 75																	X 93	X 91	X 85	X 85
15	X 80	X 76	X 76	X 71	C	C	C	C	C	C	C	C	C	C	C	C	C				X 86	X 83	C	C
16	C	C	C	C	C	C	C	C								C					X 97	X 87	X 78	X 75
17	X 73	X 72	X 70	X 69				C													X 98	X 96	X 91	X 80
18	X 79	X 77	X 75	X 73					C												X 94	C	X 90	X 89
19	X 83	X 79	X 77	X 76		C															X 101	X 91	X 86	X 81
20	X 76	X 73	X 71	X 66			C														C	X 85	X 79	X 69
21	X 61	X 64	X 65	X 59																	X 79	X 79	X 79	X 78
22	X 73	X 71	X 68	X 70																	X 89	X 85	X 81	X 77
23	X 78	X 75	X 73	X 67																	X 90	X 93	C	X 81
24	X 79	X 76	X 72	X 71																	X 85	X 85	X 79	X 77
25	X 78	X 79	X 82	X 71																	X 86	X 88	X 89	X 88
26	X 93	X 92	X 82	X 75																	X 91	X 95	X 85	X 85
27	X 83	X 79	X 78	X 78																	C	X 99	X 95	X 93
28	X 90	X 86	X 79	X 75						C											O X 93	O X 66	O X 67	O X 62
29	O X 76	O X 39	X 79	X 74																	X 90	X 91	X 92	O X 100
30	X 90	X 84	X 78	X 76	C																X 98	X 95	X 93	X 90
31	93	92	90	84	76																X 93	X 91	X 83	X 78
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	2																29	29	29	30
MED	X 78	X 76	X 75	X 72	71																X 93	X 89	X 85	X 80
U Q	X 83	X 79	X 78	X 75																	X 98	X 93	X 90	X 86
L Q	X 76	X 73	X 72	X 67																	X 87	X 85	X 79	X 77

MAY 2023 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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	62	58	56	59	59	70	80	87	87	84	84	87	89	91	90	88	86	86	84	87	86	88	83	73
2	69	68	65	60	52	50	52	58	60	62	62	66	71	69	70	70	74	73	78	80	75	69	60	61
3	59	59	60	60	58	73	87	93	95	91	89	88	91	92	94	91	91	84	84	95	91	86	73	70
4	70	67	66	65	67	74	88	88	82	86	88	88	91	92	89	86	83	82	92	101	92	C	76	69
5	70	69	68	67	64	71	79	82	85	76	81	84	82	85	86	91	88	88	88	93	91	86	83	78
6	72	70	70	67	68	78	86	92	86	80	80	84	89	85	94	95	102	102	96	84	78	78	75	75
7	72	70	68	66	67	H 68	68	70	69	64	A	69	70	69	71	73	76	76	87	96	91	80	72	70
8	69	68	65	59	59	62	65	65	64	69	69	66	70	73	74	70	69	69	70	82	81	78	72	65
9	66	59	58	58	62	72	83	88	80	72	70	68	67	64	67	69	69	69	70	81	90	86	79	72
10	71	70	71	64	65	74	C	V 80	70	63	64	70	74	73	70	74	76	73	73	78	79	73	72	68
11	72	70	66	65	64	67	76	72	77	79	A	79	81	80	79	83	82	79	79	86	90	84	84	79
12	74	72	71	70	72	77	88	93	94	87	85	90	85	85	91	95	95	89	81	84	87	82	79	79
13	76	75	75	73	69	72	68	70	77	76	73	76	76	74	76	72	73	71	76	79	81	80	82	80
14	79	73	70	68	71	79	82	81	91	H 88	V 81	83	77	78	84	86	84	84	81	84	86	84	78	78
15	73	69	69	64	C	C	C	C	C	C	C	C	C	C	C	C	C	72	69	76	79	76	C	C
16	C	C	C	C	C	C	C	C	75	70	71	71	76	79	80	C	75	74	77	87	90	80	70	68
17	66	65	63	62	66	82	96	C	98	94	91	89	94	90	83	84	78	82	84	88	91	89	84	73
18	72	70	68	66	66	78	87	94	C	86	86	83	80	80	77	84	90	86	83	90	87	C	83	82
19	76	72	70	69	70	C	86	87	78	79	H 79	71	72	76	78	79	72	78	84	92	94	83	79	74
20	69	66	64	59	63	79	C	C	89	V 81	76	83	94	84	89	91	72	70	69	77	C	78	72	62
21	54	57	58	52	58	69	62	57	56	54	56	57	57	61	60	65	67	63	64	70	72	72	72	70
22	66	64	61	63	61	63	64	65	62	64	62	63	61	70	68	70	73	69	67	76	82	78	74	70
23	71	68	66	60	58	64	70	63	68	64	66	63	66	67	69	75	74	73	71	78	83	86	C	74
24	72	F 65	65	64	68	73	72	66	67	65	61	65	64	70	66	68	74	77	70	71	79	78	72	70
25	71	72	75	64	62	67	70	U R 79	65	78	74	67	72	71	74	78	81	76	C	C	79	82	82	81
26	86	J R 85	75	68	68	69	78	85	84	86	76	78	78	83	86	85	85	76	78	81	84	89	78	78
27	76	72	71	71	73	80	81	92	V 90	82	81	84	83	81	82	H 74	76	78	76	84	C	92	88	86
28	83	79	72	68	69	69	78	78	84	C	83	71	72	72	74	H 76	81	J R 80	U R 80	D C 74	D C 86	D C 59	D C 60	D C 55
29	D C 69	D C 32	72	67	60	67	71	A	V 70	71	69	72	68	70	76	80	79	74	77	79	83	84	85	93
30	83	77	71	69	C	79	87	84	95	77	80	77	73	71	73	78	81	80	80	87	91	88	86	83
31	F	F 84	F 78	F	F 68	63	60	65	70	73	76	74	72	71	71	75	71	74	80	90	86	84	76	71
	00	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	29	28	28	27	26	29	29	28	30	30	30	30	29	30	31	30	30	29	29	29	30
MED	72	70	68	65	66	72	78	80	78	77	76	75	75	75	76	78	77	76	78	84	86	82	78	74
U Q	75	72	71	68	68	78	86	88	88	85	82	84	83	84	86	86	84	82	84	88	90	86	83	79
L Q	69	65	65	60	60	67	68	66	68	67	69	68	70	70	71	72	73	73	71	78	80	78	72	70

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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 504	U L 508	536	L 536	L 584	528	U L 504	476	420	L						
2							408	444	480	504	U L 540	524	524	528	512	516	U L 480	L	L					
3							L	L	L 508	L 516	L 544	L 552	L 568	U L 540	L 548	524	L							
4								L	L 564	L 524	L 516	L 592	532	L 524	U L 540	U L 444	U L 456	L	L					
5							L	L	500	U L 504	U L 516	U L 484	L 632	U L 556	L 560	L 492	L	L						
6						L	L	L 476	492	A	L 560	L 556	L 572	L 560	536	A	L	L						
7							416	444	A	A	A	A	552	H 560	U L 488	U L 520	A	A						
8						L	436	456	U L 516	532	520	572	536	532	532	520	U L 448	L 420						
9							L	L	L 496	U L 556	528	548	520	540	A	U L 476	U L 484	A						
10					L	L	C	472	U L 524	H 556	540	516	A	536	A	500	L	L						
11									A	A	A	A	L 552	H 556	L 564	L 516	L	L						
12								L	L 520	L 516	484	532	548	U L 576	556	528	L 492							
13							A	U L 492	528	A	580	A	A	U L 524	556	U L 524	A	A						
14							L	U L 480	516	L 504	H 616	H 536	536	U L 520	L 508	L 512	U L 496	L	L					
15					C	C	C	C	C	C	C	C	C	C	C	C	C	U L 432						
16					C	C	C	C	488	512	L 504	U L 572	536	512	L 504	C	A	L						
17								C	A	508	516	548	A	532	532	476	A	A						
18						L	L	A	C	520	524	540	540	528	532	504	A	L	L					
19					L	C	436	472	500	512	U L 504	U L 540	548	536	564	476	U L 476	L 452	L					
20						U L 444	C	L	496	L 512	540	516	528	520	516	508	496	U L 468						
21						360	404	460	480	A	492	492	488	496	516	476	472	L 448						
22							L 444	464	480	496	516	A	520	516	500	504	L 476	A						
23						L	432	472	484	500	532	U L 568	528	524	H 508	512	L 488	A						
24						L	L	460	484	488	A	492	520	488	A	492	476	L 432	L					
25					L		440	L 476	U L 488	U L 516	516	556	536	536	528	512	468	L	L					
26							L	480	508	512	U L 504	560	U L 504	524	512	504	A	L						
27							484	A	L 504	A	512	532	A	528	L	504	A	A						
28						L	L 460	A	L 496	C	516	564	520	520	512	476	L 484	L 440	L					
29					L	U L 416	A	A	A	A	U L 516	516	L 552	544	524	512	L 464	A						
30					C	L	L	L 512	A	U L 524	548	532	L 592	536	A	512	A	A						
31							L 452	480	508	524	532	536	540	536	540	H 504	496	U L 460	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	11	16	24	22	27	26	26	30	25	28	17	8						
MED						U L 416	436	472	500	512	520	538	536	530	528	504	L 476	L 444						
U Q						U L 444	L 452	L 480	L 512	524	540	L 556	L 552	540	L 544	514	L 490	U L 456						
L Q						360	416	460	488	504	516	524	524	524	L 510	484	L 466	L 432						

MAY 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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						172	260	292	324	336	348	U A 360	A	A	360	A	312	268	184	A				
2					B	A 248	308	344	356	368	356	384	376	364	336	304	260	200	B					
3					B	200	260	308	336	344	376	G 404	376	372	364	340	312	260	200	B				
4					B	196	260	308	332	360	A	A	A	380	368	316	316	276	216	A				
5					B	188	264	312	336	A	A	A	380	G 380	368	344	316	288	204	A				
6					B	208	268	308	344	356	380	384	364	380	372	344	316	280	208	A				
7					A	200	260	304	332	348	352	356	A	360	364	352	324	268	A	A				
8					B	196	264	308	356	364	A	A	384	392	368	344	320	276	200	A				
9					B	204	268	316	328	368	368	380	384	B	372	348	316	280	200	A				
10					B	220	C 312	A 384	A	396	A	368	364	340	312	276	204	A						
11					B	224	280	316	332	360	A	372	A	360	372	356	316	272	A	A				
12					B	212	272	316	344	324	A	384	A	364	364	344	320	276	236	B				
13					B	204	268	312	340	368	380	A	A	A	A	312	316	280	200	A				
14					B	232	272	320	344	368	376	388	372	380	376	352	320	280	A	A				
15					C	C	C	C	C	C	C	C	C	C	C	C	C	268	200	A				
16					C	C	C	C	328	352	368	A	A	A	A	C	308	272	152	A				
17					B	220	276	C	340	348	360	A	A	A	368	344	312	272	196	A				
18					B	228	284	320	C	368	372	U A 376	A	A	368	344	316	260	204	A				
19					B	C 304	336	356	368	380	392	396	372	G 388	356	332	280	196	A					
20					B	248	C 336	356	360	388	376	372	A	A	344	328	288	228	A					
21					A	228	276	316	340	372	372	360	364	A	364	348	324	284	224	A				
22					B	232	268	316	340	340	356	A	A	A	A	A	332	288	224	A				
23					A	212	280	308	336	352	352	A	A	A	372	348	328	288	208	A				
24					B	236	280	308	332	352	372	372	A	A	A	A	316	A	224	A				
25					B	236	284	312	336	A	A	A	384	G 380	376	348	324	288	224	B				
26					A	220	284	320	340	360	368	368	A	A	A	A	A	280	224	A				
27					B	228	284	312	348	356	352	360	A	A	340	A	324	280	208	A				
28					A	220	276	320	340	C	372	380	380	A	U A 356	356	344	284	228	A				
29					A	216	280	308	332	356	368	368	372	368	376	352	324	288	232	A				
30					C	236	280	324	348	348	356	388	364	352	352	352	328	280	220	A				
31					A	232	284	328	356	360	376	A	A	396	384	360	332	A	236	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						27	27	28	28	27	23	20	14	16	24	24	29	29	28					
MED						220	276	312	340	356	368	376	378	374	368	346	320	280	208					
U Q						232	280	320	344	368	376	386	384	380	372	352	326	284	224					
L Q						204	264	308	332	348	356	364	372	366	364	344	316	272	200					

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	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 36	J A 21	E B 16	E B 16	E B 16	24	J A 43	38	J A 54	J A 47	40	41	42	40	G 35	38	G 27	36	26	J A 25	J A 18	J A 23	E B 16	E B 16
2	E B 16	E B 16	20	20	E B 16	23	28	36	40	40	40	40	G 35	G	G	G	33	31	24	J A 19	J A 20	J A 14	E B 16	18
3	J A 18	J A 30	E B 16	E B 16	E B 16	24	31	38	39	41	G	G	G	G	G	37	38	39	32	J A 18	E B 16	E B 16	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	23	29	34	38	41	42	J A 47	41	G	G	36	34	31	32	J A 26	J A 26	J A 17	J A 17	J A 16
5	E B 16	J A 25	J A 14	E B 16	J A 18	23	33	38	40	J A 64	39	41	41	G 33	40	37	35	36	J A 39	J A 21	J A 20	J A 19	J A 19	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16	G	30	37	42	J A 54	G	G	41	G	G	J A 55	J A 51	38	J A 35	J A 33	J A 31	J A 25	J A 17	E B 16
7	E B 16	E B 16	E B 16	J A 17	J A 27	24	38	J A 77	J A 65	J A 67	J A 78	J A 79	48	44	40	38	J A 52	J A 56	J A 63	J A 63	J A 37	J A 49	J A 23	J A 78
8	J A 21	20	E B 16	E B 16	E B 16	24	34	40	48	42	43	42	G	G	G	G	G	36	31	J A 25	J A 27	J A 17	E B 16	E B 16
9	20	18	E B 16	J A 24	J A 18	J A 44	34	41	J A 46	G	42	40	G	E B 49	J A 65	49	41	J A 57	J A 57	J A 44	J A 17	E B 16	E B 16	E B 16
10	J A 25	19	J A 13	E B 16	E B 16	29	C	J A 65	J A 48	G	J A 45	49	J A 71	J A 50	J A 57	J A 58	J A 67	37	J A 42	J A 45	J A 77	J A 30	J A 63	J A 47
11	J A 25	E B 16	J A 24	20	E B 16	G	G	36	J A 71	J A 72	J A 128	J A 107	J A 63	44	G	G	36	32	J A 52	J A 43	J A 31	E B 16	E B 16	E B 16
12	J A 21	J A 16	E B 16	E B 16	E B 16	24	32	35	G	38	42	42	J A 65	J A 51	46	39	G	35	G	E B 16	J A 22	J A 32	J A 23	J A 24
13	J A 41	J A 27	J A 19	J A 20	J A 25	36	42	J A 51	J A 53	J A 58	J A 53	J A 101	J A 95	J A 43	41	36	46	J A 55	J A 74	J A 34	J A 26	J A 128	J A 61	J A 31
14	J A 39	J A 40	J A 35	J A 31	E B 16	G	32	40	43	43	45	44	42	G	45	44	45	J A 47	J A 27	J A 31	J A 58	J A 62	J A 79	J A 25
15	J A 31	J A 30	J A 25	J A 20	C	C	C	C	C	C	C	C	C	C	C	C	C	J A 44	30	J A 59	J A 51	J A 45	C	C
16	C	C	C	C	C	C	C	C	J A 53	J A 49	J A 59	J A 73	J A 65	J A 52	J A 55	C	J A 83	J A 50	J A 77	J A 35	E B 16	J A 24	J A 31	J A 29
17	J A 15	19	E B 16	E B 16	J A 17	26	J A 45	C	J A 71	J A 82	J A 55	J A 103	J A 144	J A 55	G	42	J A 54	J A 67	J A 71	J A 41	J A 15	J A 24	J A 15	J A 17
18	J A 15	E B 16	E B 16	E B 16	E B 16	28	39	J A 54	C	43	43	J A 49	J A 53	J A 54	G 32	43	J A 53	J A 55	27	22	J A 23	D C 30	J A 19	J A 15
19	E B 16	J A 15	J A 19	J A 19	J A 18	C	34	45	49	45	48	G	44	45	G	G	40	40	J A 41	J A 33	J A 19	J A 19	J A 16	E B 16
20	E B 16	E B 16	E B 16	J A 23	E B 16	G	C	47	J A 50	48	G	42	42	J A 58	J A 51	G	36	40	J A 49	J A 47	C	J A 25	J A 31	E B 16
21	J A 21	J A 24	J A 16	E B 16	J A 32	33	40	40	47	J A 53	45	41	40	40	G	38	42	41	J A 39	J A 54	J A 33	J A 86	J A 64	J A 24
22	J A 24	E B 16	E B 16	J A 13	18	32	36	42	44	41	J A 49	J A 69	44	J A 42	38	J A 75	J A 45	J A 49	32	J A 35	J A 43	J A 32	J A 51	J A 23
23	J A 18	J A 17	E B 14	E B 14	20	28	36	44	J A 52	J A 65	J A 49	J A 62	J A 58	40	G	40	J A 51	J A 51	J A 52	J A 49	E B 16	J A 17	E B 16	J A 17
24	E B 16	J A 15	J A 23	J A 18	17	27	37	J A 52	48	J A 56	J A 57	J A 87	43	J A 55	J A 86	J A 52	J A 31	J A 35	31	J A 29	J A 35	J A 17	J A 28	J A 24
25	J A 24	J A 25	J A 20	J A 18	J A 18	27	36	40	J A 109	J A 50	J A 93	40	42	G	G	41	39	32	27	E B 21	J A 24	J A 28	J A 23	J A 34
26	E B 16	19	J A 20	E B 16	16	26	32	J A 45	J A 57	J A 59	J A 63	J A 79	J A 53	J A 53	J A 58	J A 51	J A 77	J A 120	J A 46	J A 80	J A 84	J A 49	E B 16	E B 16
27	E B 16	J A 15	J A 29	E B 16	17	28	40	J A 51	J A 46	J A 61	J A 57	J A 54	J A 95	J A 45	J A 50	J A 51	J A 52	J A 63	J A 34	J A 40	C	J A 26	J A 74	E B 16
28	20	J A 35	J A 24	E B 16	19	31	33	J A 49	J A 51	C	47	48	44	42	J A 52	G	38	35	31	J A 31	J A 31	J A 15	J A 19	E B 20
29	E B 22	J A 19	J A 18	E B 16	J A 48	32	J A 50	J A 83	J A 58	J A 61	41	42	41	40	44	44	41	J A 53	J A 41	J A 30	J A 37	J A 23	J A 38	J A 25
30	J A 20	J A 25	J A 27	J A 20	C	28	38	41	J A 53	42	J A 52	43	43	42	J A 83	J A 47	J A 62	J A 64	J A 65	J A 107	J A 104	J A 65	J A 23	42
31	J A 50	J A 15	J A 49	J A 23	J A 21	30	38	J A 49	J A 63	J A 55	J A 49	J A 49	J A 47	G	G	G	36	J A 44	J A 35	21	J A 25	J A 51	J A 19	J A 13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	28	28	27	28	29	29	30	30	30	30	30	29	30	31	31	31	29	31	30	30
MED	J A 20	J A 18	J A 16	E B 16	17	26	36	42	J A 49	J A 49	46	46	44	42	39	39	41	J A 41	J A 35	J A 33	J A 26	J A 25	J A 19	J A 16
U Q	J A 24	J A 25	J A 23	J A 20	J A 18	30	39	J A 50	J A 56	J A 60	J A 55	J A 69	J A 58	J A 50	J A 51	J A 48	J A 52	J A 55	J A 52	J A 45	J A 37	J A 45	J A 31	J A 25
L Q	E B 16	16	E B 16	E B 16	E B 16	24	32	38	44	42	42	41	41	G	G	G	36	36	31	25	J A 20	J A 17	E B 16	E B 16

MAY 2023 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Wakkanai

MAY 2023 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	E B 16	E B 16	E B 16	E B 16	23	39	38	44	44	40	41	40	39	G 32	35	G 24	32	25	22	E B 16	18	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	22	28	34	38	40	40	40	G 33	G	G	G	32	29	24	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	23	30	37	37	39	G	G	G	G	G	36	38	37	31	E B 16	E B 16	E B 16	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	22	28	34	38	40	40	44	41	G	G	35	34	29	28	18	21	E B 16	E B 16	E B 16
5	E B 16	19	E B 16	E B 16	E B 16	22	31	35	39	40	39	40	41	G 31	40	37	33	34	32	18	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	G	30	36	39	50	G	G	40	G	G	54	43	36	29	23	22	24	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	22	23	36	34	54	56	A A 78	66	42	43	39	38	51	42	58	56	25	43	20	40
8	E B 16	E B 16	E B 16	E B 16	E B 16	22	32	38	46	41	40	41	G	G	G	G	G	33	29	21	20	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	34	32	39	42	G	42	40	G	E B 49	52	42	40	42	44	22	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	26	C	37	39	G	42	44	54	40	56	40	37	34	34	22	23	21	20	36
11	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	35	60	68	A A 128	66	46	42	G	G	34	29	43	36	23	E B 16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	24	31	34	G	38	41	42	50	48	42	37	G	34	G	E B 16	18	21	19	20
13	18	20	E B 16	16	E B 16	32	40	44	46	52	52	61	56	40	41	36	44	48	51	22	E B 16	22	E B 16	24
14	E B 16	24	23	18	E B 16	G	31	40	39	41	43	42	41	G	44	42	43	35	24	16	45	33	21	E B 16
15	E B 16	E B 16	E B 16	E B 16	C	C	C	C	C	C	C	C	C	C	C	C	C	37	27	38	35	E B 16	C	C
16	C	C	C	C	C	C	C	C	44	44	40	46	40	40	44	C	51	32	30	19	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	25	40	C	54	40	42	50	60	48	G	40	48	45	64	28	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	27	35	52	C	40	41	40	42	41	G 28	41	48	32	24	20	19	20	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	C	34	43	47	41	45	G	44	42	G	G	40	38	28	23	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	G	C	46	46	46	G	40	41	39	44	G	34	40	44	44	C	E B 14	E B 16	E B 16
21	E B 16	24	E B 16	E B 16	22	27	35	36	45	50	42	40	40	40	G	38	38	39	31	44	E B 16	E B 16	42	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	28	33	39	40	38	40	53	40	40	38	38	40	45	28	21	40	E B 16	E B 16	E B 16
23	E B 16	E B 16	E B 14	E B 14	18	27	32	40	44	40	38	40	41	39	G	38	42	46	39	24	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	25	31	43	46	48	51	45	42	47	58	39	G 26	30	26	26	29	E B 16	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	26	35	35	38	37	42	39	41	G	G	40	37	30	26	E B 21	22	E B 15	E B 16	27
26	E B 16	E B 16	E B 16	E B 16	16	25	30	42	49	47	45	42	47	38	39	36	52	33	42	56	52	22	E B 16	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	25	38	44	45	49	47	43	73	42	41	45	50	45	32	22	C	20	E B 16	E B 16
28	E B 16	20	20	E B 16	18	31	32	45	47	C	43	44	41	40	39	G	36	34	30	28	25	E B 15	E B 16	E B 20
29	E B 22	E B 20	E B 16	E B 16	20	31	48	A A 83	56	53	40	40	40	40	42	42	40	44	34	25	25	E B 16	18	E B 16
30	E B 16	E B 16	E B 16	E B 16	C	26	36	40	49	40	42	42	43	42	60	40	56	54	49	63	E B 16	47	E B 16	18
31	E B 16	E B 16	22	E B 16	18	29	36	43	40	49	44	42	41	G	G	G	36	36	26	18	22	E B 16	E B 16	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	28	28	27	28	29	29	30	30	30	30	30	29	30	31	31	31	29	31	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	25	32	39	44	41	42	42	41	40	38	38	39	36	30	22	20	E B 16	E B 16	E B 16
U Q	E B 16	16	E B 16	E B 16	16	27	36	43	47	49	44	44	44	42	42	40	44	42	42	28	25	21	16	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	22	31	36	39	40	40	40	40	G	G	G	34	32	26	19	E B 16	E B 16	E B 16	E B 16

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	16	14	18	19	23	23	18	22	14	16	14	15	16	16	16	16	16
2	16	16	16	16	16	16	16	14	16	17	17	18	22	22	20	16	14	16	16	16	16	16	16	16
3	16	16	16	16	16	16	17	15	16	16	16	22	18	16	16	16	14	16	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	17	16	20	21	20	21	16	16	16	16	15	14	16	16	16	16
5	16	16	16	16	16	16	16	15	15	17	16	16	22	22	17	16	16	18	16	14	16	16	16	16
6	16	16	16	16	16	16	16	16	17	17	21	23	22	24	26	22	16	16	16	16	16	16	16	16
7	16	16	16	16	16	16	16	16	16	16	18	22	22	21	22	18	17	15	15	16	16	16	16	16
8	16	16	16	16	16	16	16	16	24	25	27	25	22	24	23	18	16	16	16	16	16	16	16	16
9	16	16	16	16	16	16	16	17	17	17	19	18	23	49	16	16	15	16	16	16	16	16	16	16
10	16	16	16	16	16	16	C	15	17	17	17	22	24	24	17	16	15	14	16	16	16	16	16	16
11	16	16	16	16	16	16	10	16	16	16	20	16	18	23	17	16	15	16	16	16	16	16	16	16
12	16	16	16	16	16	16	16	15	15	17	18	24	17	16	16	16	16	16	16	16	16	16	16	16
13	16	16	16	16	16	16	14	16	16	22	24	25	18	20	23	22	18	16	16	16	16	16	16	16
14	16	16	16	16	16	14	15	16	16	17	17	17	17	17	22	16	16	14	15	16	16	16	16	16
15	16	16	16	16	C	C	C	C	C	C	C	C	C	C	C	C	C	13	14	13	16	16	C	C
16	C	C	C	C	C	C	C	C	12	16	20	16	14	16	15	C	15	10	11	15	16	16	16	16
17	16	16	16	16	16	16	15	C	16	15	18	16	18	20	19	16	14	14	16	16	16	16	16	16
18	16	16	16	16	16	16	12	15	C	16	20	18	17	18	18	14	18	15	15	16	16	16	16	16
19	16	16	16	16	16	C	24	23	18	20	33	19	26	17	30	17	17	15	16	16	16	16	16	16
20	16	16	16	16	16	16	C	19	23	19	19	24	22	18	18	18	18	19	14	15	C	14	16	16
21	16	16	16	16	16	16	18	16	14	22	17	18	19	20	15	17	16	15	16	16	16	16	16	16
22	16	16	16	16	16	16	15	16	16	16	16	16	19	16	18	16	16	14	15	16	16	16	16	16
23	16	16	14	14	16	16	15	16	16	16	15	18	17	18	17	16	16	16	15	16	16	16	16	16
24	16	16	16	16	16	16	14	16	16	16	17	17	18	18	16	14	16	16	10	10	16	16	16	16
25	16	16	16	16	16	16	18	23	16	19	19	24	24	24	20	20	20	21	18	21	14	15	16	16
26	16	16	16	16	15	16	16	16	15	14	15	15	15	16	14	15	15	16	13	13	14	15	16	16
27	16	16	16	16	16	14	16	16	25	21	16	17	15	17	16	16	16	15	13	16	C	16	16	16
28	16	16	16	16	16	16	16	15	15	C	18	18	22	23	23	22	21	20	16	16	16	15	16	20
29	22	20	16	16	16	16	16	17	13	18	17	18	19	18	18	16	16	16	15	15	16	16	16	16
30	16	16	16	16	C	16	14	16	19	15	18	23	19	23	16	16	14	14	16	16	16	16	16	16
31	16	16	16	16	16	16	14	13	16	16	20	21	22	22	22	16	17	15	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	30	30	30	30	28	28	27	28	29	29	30	30	30	30	30	29	30	31	31	31	29	31	30	30
MED	16	16	16	16	16	16	16	16	16	17	18	18	19	20	18	16	16	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	17	18	20	23	22	23	22	18	17	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	15	15	15	16	17	17	18	17	16	16	15	14	15	15	16	16	16	16

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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	273	285	270	279	293	317	318	317	316	310	298	304	301	303	303	311	309	319	299	294	292	295	305	288
2	275	265	278	267	268	276	267	291	294	302	282	285	301	301	312	293	306	304	312	309	294	296	270	263
3	272	283	286	291	293	315	320	317	339	314	314	305	305	298	301	304	315	312	295	301	312	311	288	276
4	276	272	269	271	294	307	307	319	316	315	305	289	306	299	296	296	301	291	290	311	307	C	295	270
5	270	272	283	286	275	276	316	318	326	309	302	299	302	297	295	306	298	311	300	299	294	287	290	286
6	280	267	273	276	274	291	317	319	333	314	310	309	299	287	271	277	290	305	308	297	272	262	265	268
7	273	276	270	271	276	H 252	269	281	293	305	A	A	300	292	295	304	299	292	294	300	308	299	279	269
8	272	276	278	267	271	291	293	312	271	299	293	256	286	287	297	297	295	297	284	289	289	285	283	268
9	274	261	258	270	271	301	299	302	302	272	256	275	274	250	269	281	293	298	283	286	289	297	292	278
10	263	265	281	277	264	279	C	V 275	291	247	274	264	285	292	266	290	302	301	296	300	283	277	270	253
11	256	268	262	279	281	293	313	306	306	301	A	297	305	291	289	305	301	296	291	284	290	281	285	281
12	279	273	272	275	287	285	289	308	293	297	289	302	288	283	285	291	297	309	293	282	286	283	273	263
13	261	250	265	304	279	283	304	291	288	304	269	295	294	294	294	296	302	302	304	293	287	262	269	285
14	275	284	280	278	283	286	301	272	310	H 305	V 273	317	302	283	288	299	302	310	297	296	287	286	282	293
15	284	275	282	264	C	C	C	C	C	C	C	C	C	C	C	C	C	305	295	284	287	297	C	C
16	C	C	C	C	C	C	C	C	326	313	296	276	286	301	296	C	306	298	284	294	306	299	286	272
17	271	273	268	267	281	294	296	C	313	293	290	287	296	300	296	307	300	304	306	301	297	295	308	292
18	286	275	283	284	277	290	305	317	C	307	306	294	298	293	289	299	312	314	299	305	289	C	288	291
19	290	288	283	281	278	C	308	312	309	313	H 278	301	290	301	295	309	292	304	303	295	311	298	291	288
20	290	287	294	285	267	277	C	C	313	V 276	258	258	270	245	272	291	279	281	276	268	C	273	279	285
21	254	272	276	247	269	295	302	273	243	240	231	273	256	281	250	288	304	300	298	293	285	268	266	270
22	265	263	260	270	284	277	280	297	276	284	279	271	258	281	294	295	307	300	290	278	294	271	287	271
23	277	285	287	270	283	296	298	274	298	280	278	271	286	283	286	295	304	311	295	281	283	290	C	288
24	291	F 283	281	271	289	304	301	299	276	305	267	290	273	304	294	284	292	313	309	285	288	291	274	263
25	267	281	285	280	286	302	324	U R 303	293	302	295	263	298	282	289	299	306	306	C	C	G 293	277	263	261
26	286	J R 305	299	271	284	262	279	303	306	333	312	296	280	288	301	303	313	305	313	282	280	303	281	285
27	291	281	286	293	283	307	295	288	V 312	307	302	308	293	303	289	H 305	304	312	294	287	C	283	301	295
28	299	301	296	294	289	291	296	294	308	C	312	299	290	294	286	H 286	286	J R 303	U R 290	C	C	C	C	C
29	C	C	276	277	288	270	278	A	284	306	308	313	287	298	300	304	308	310	308	291	287	277	284	273
30	292	294	285	278	C	288	302	299	337	287	293	291	284	273	279	292	299	308	290	273	285	287	280	266
31	F	F 285	F 286	F	F 327	301	298	284	290	306	295	303	287	282	277	297	295	282	289	294	291	295	289	275
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	29	28	28	27	26	29	29	28	29	30	30	30	29	30	31	30	29	28	28	28	29
MED	275	276	280	277	282	291	301	300	306	305	293	294	290	292	292	297	302	304	295	293	289	287	284	275
U Q	286	285	285	282	288	301	308	312	314	310	304	302	300	299	296	304	306	310	303	300	294	296	290	287
L Q	270	270	270	270	274	278	293	288	290	290	276	274	285	283	285	291	295	298	290	284	286	277	274	268

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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 377	U L 389	381	L 361	L 352	371	U L 364	368	389	L						
2							350	360	363	358	U L 358	366	371	372	367	343	U L 347	L	L					
3							L	L	L 372	L 382	L 384	L 370	L 357	U L 363	L 357	362	L							
4								L	L 363	L 377	L 392	L 360	369	L 384	U L 365	U L 397	U L 375	L	L					
5							L	L	368	U L 395	U L 400	U L 433	L 337	U L 361	L 356	L 361	L	L						
6						L	L	L 379	380	A	367	L 361	L 351	L 350	356	A	L	L						
7							355	361	A	A	A	A	355	H 352	U L 395	U L 350	A	A						
8						L	345	371	A	368	381	357	369	351	355	351	U L 379	L 363						
9							L	L	L 366	U L 338	372	367	370	B	A	A	A	A						
10					L	L	C	365	U L 364	H 354	374	409	A	377	A	361	L	L						
11									A	A	A	A	L 345	H 358	L 347	L 353	L	L						
12								L	L 381	L 383	423	394	A	A	349	341	L 357							
13							A	A	A	A	A	A	A	U L 363	344	U L 360	A	A						
14							L	U L 360	361	L 399	H 359	H 395	378	U L 369	L 370	L 358	A	L	L					
15					C	C	C	C	C	C	C	C	C	C	C	C	C	A						
16					C	C	C	C	A	374	L 394	U L 347	368	381	L 389	C	A	L						
17								C	A	375	377	A	A	A	365	377	A	A						
18						L	L	A	C	380	396	381	380	378	362	354	A	L	L					
19					L	C	360	A	A	372	U L 412	U L 383	374	377	342	392	U L 369	L 358	L					
20						U L 342	C	L	A	A	373	402	344	371	A	339	344	A						
21						352	358	349	A	A	406	417	391	365	355	376	355	A						
22							L 339	359	381	381	385	A	372	359	356	354	L 359	A						
23						L	360	360	A	371	376	U L 357	369	361	H 366	345	A	A						
24						L	L	A	A	A	A	423	372	A	A	356	358	L 363	L					
25					L		354	L 366	U L 390	U L 379	392	355	363	360	354	352	352	L	L					
26							L	A	A	A	U L 386	366	A	374	357	357	A	L						
27							381	A	A	A	A	390	A	362	L	A	A	A						
28						L	L 365	A	A	C	384	366	411	376	366	387	L 350	L 350	L					
29					L	U L 353	A	A	A	A	U L 385	426	L 369	355	360	356	L 383	A						
30					C	L	L	L 363	A	U L 379	361	398	L 336	387	A	350	A	A						
31							L 351	A	354	A	400	386	369	368	354	H 363	353	U L 354	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	11	11	13	18	25	25	24	26	24	26	14	5						
MED						U L 352	355	361	L 368	378	384	381	369	366	357	356	L 358	L 358						
U Q						U L 353	360	L 366	380	L 382	395	400	372	376	L 366	363	L 375	L 363						
L Q						U L 342	350	360	363	371	374	L 361	L 354	360	354	351	352	L 352						

MAY 2023 M(3000)F1 (0.01)

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								262	264	262	294	274	310	284	266	268	250	244						
2							432	362	360	344	396	374	314	332	300	342	296	284	252					
3							250	240	242	256	276	294	296	286	272	282	258							
4								224	276	274	276	316	288	288	274	250	262	256	270					
5							256	262	274	250	278	262	318	300	304	276	260	256						
6						264	246	256	240	244	292	298	310	320	336	310	276	244						
7							330	348	328	E A 338	A	E A 372	340	348	284	300	282	276						
8						298	312	296	372	332	346	474	378	346	328	324	300	284						
9							254	262	288	364	436	388	410	506	410	338	310	296						
10					320	278	C	320	308	498	370	420	358	342	408	336	294	268						
11									318	E A 332	A	342	308	344	318	294	268	242						
12								248	266	266	268	302	322	324	330	300	278							
13							258	314	328	284	412	346	324	308	338	300	266	284						
14							262	304	278	260	348	294	290	306	306	278	274	262	258					
15					C	C	C	C	C	C	C	C	C	C	C	C	C	276						
16					C	C	C	C	258	286	302	362	336	306	314	C	294	270						
17								C	252	274	266	298	308	282	304	276	276	268						
18						276	244	250	C	278	290	310	318	308	332	296	278	262	248					
19					282	C	278	270	274	288	274	306	368	328	332	294	290	288	268					
20						304	C	270	276	294	414	380	340	402	338	292	356	324						
21						284	298	400	528	554	576	450	490	398	486	348	308	318						
22							348	316	386	382	404	422	460	372	330	332	292	282						
23						274	286	376	298	386	394	442	372	360	344	326	296	276						
24						262	286	314	372	324	430	364	412	334	366	362	316	274	256					
25					288		282	284	304	290	326	462	354	374	334	326	276	272	260					
26							268	280	292	266	272	328	292	324	296	296	282	260						
27							286	242	276	286	298	288	E A 360	304	324	302	304	274						
28						268	296	274	280	C	280	316	360	354	352	326	302	284	278					
29					320	314	E A 314	A	E A 364	276	286	310	372	338	330	304	276	276						
30					C	290	258	298	244	288	316	338	378	388	374	324	288	262						
31							324	362	354	310	338	318	350	352	380	316	324	318	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					4	11	22	26	29	29	28	30	30	30	30	29	30	29	9					
MED					304	278	282	282	284	287	309	328	339	333	330	302	285	274	260					
U Q					320	298	312	316	341	335	395	380	372	354	344	326	300	284	274					
L Q					285	268	258	262	270	270	279	302	310	306	304	293	276	262	254					

MAY 2023 h'F2 (KM)

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IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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	EA 284	270	278	258	236	220	230	220	240	216	190	196	194	186	174	206	208	228	242	236	242	236	216	240
2	260	278	260	260	286	238	222	220	214	208	198	192	190	192	208	212	224	230	234	230	236	220	248	278
3	272	262	258	242	248	220	216	216	212	190	188	184	190	194	212	208	234	238	240	236	220	220	222	252
4	258	278	284	264	242	220	206	212	194	190	190	194	190	184	196	184	200	224	258	240	226	220	210	256
5	278	284	264	254	278	226	218	210	200	198	184	174	202	182	226	214	214	236	248	236	238	220	236	242
6	252	276	264	266	290	230	222	214	212	A	178	180	214	202	208	A	EA 262	234	234	232	274	290	264	264
7	248	264	244	256	272	256	EA 244	208	A	A	A	A	224	208	202	212	A	A	EA 298	EA 268	230	EA 248	EA 244	EA 328
8	270	276	264	290	292	230	230	226	EA 284	200	188	198	186	214	204	208	204	238	266	254	248	238	228	256
9	262	288	288	264	274	238	222	222	EA 234	200	216	186	184	EB 280	A	EA 254	EA 254	A	EA 296	268	242	218	224	244
10	266	288	260	254	294	242	C	210	224	180	178	186	A	186	A	214	244	238	258	250	250	270	288	EA 356
11	300	276	282	250	262	220	224	198	A	A	A	A	252	216	210	206	212	204	EA 268	264	242	228	248	242
12	264	272	272	246	262	214	222	214	208	190	184	182	EA 270	EA 270	222	212	206	232	236	238	240	248	272	290
13	300	312	276	222	252	238	A	EA 282	EA 266	A	EA 320	A	A	214	220	208	A	A	EA 284	242	248	278	266	264
14	250	266	288	268	256	218	218	224	218	196	192	178	190	206	236	242	EA 254	252	218	248	EA 280	EA 266	264	234
15	236	262	256	272	C	C	C	C	C	C	C	C	C	C	C	C	C	EA 254	244	EA 266	EA 282	236	C	C
16	C	C	C	C	C	C	C	C	EA 238	222	196	214	190	178	218	C	A	238	258	252	224	218	222	260
17	262	262	268	288	258	224	240	C	A	198	216	A	A	EA 266	214	224	A	A	EA 292	250	230	222	222	220
18	250	262	252	250	254	230	224	A	C	200	192	176	186	182	200	236	A	232	220	238	226	240	248	242
19	230	248	254	266	254	C	226	EA 258	A	214	206	188	200	188	230	202	224	260	250	248	224	216	234	230
20	244	244	242	272	260	224	C	EA 254	A	EA 248	198	182	258	200	EA 258	210	222	EA 272	EA 306	EA 302	C	250	232	236
21	252	EA 312	282	324	318	258	256	222	EA 270	A	194	180	188	218	218	202	242	EA 282	EA 264	276	250	272	EA 314	266
22	294	292	288	280	246	234	240	248	210	200	188	A	202	218	214	208	234	A	258	258	264	260	248	278
23	272	244	240	256	270	234	222	234	EA 278	214	192	192	194	224	196	214	EA 256	A	EA 264	274	248	244	222	242
24	232	Q 254	Q 268	270	242	238	228	A	EA 344	A	A	200	200	EA 288	A	226	222	208	238	254	262	232	244	302
25	274	260	234	240	254	214	236	200	192	174	190	180	200	182	198	222	232	212	234	232	250	262	294	324
26	252	244	226	232	258	218	216	EA 256	A	A	218	194	EA 238	188	204	202	A	218	252	EA 294	EA 314	238	218	B 250
27	246	256	274	238	224	210	202	A	EA 250	A	EA 234	184	A	200	210	EA 264	A	A	242	242	C	256	244	232
28	228	240	234	234	234	232	214	A	A	C	202	196	184	192	196	204	210	234	236	258	260	248	216	242
29	266	248	218	250	276	248	A	A	A	A	196	182	182	192	226	240	226	A	264	248	262	260	264	250
30	248	246	230	266	C	208	218	210	A	194	190	176	210	196	A	226	A	A	EA 282	EA 338	236	EA 270	246	282
31	292	Q 246	258	256	228	218	228	EA 286	216	A	184	188	188	192	188	184	208	218	236	250	226	232	222	248
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	28	28	25	23	20	19	27	25	26	30	26	28	22	22	31	31	29	31	30	30
MED	260	262	262	257	258	228	222	216	U 209	199	191	186	192	195	210	210	218	232	244	246	241	238	242	250
U Q	272	278	276	268	275	238	230	EA 248	EA 258	214	202	194	210	216	220	225	EA 242	238	EA 266	EA 266	261	260	264	278
L Q	248	248	244	250	247	219	218	210	211	190	188	180	188	188	200	206	210	224	236	238	230	222	222	242

MAY 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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						110	104	102	102	102	102	98	A	A	102	A	106	106	102	A				
2					B	A 102	102	102	100	100	100	104	100	100	100	98	100	114	B					
3					B	114	104	102	100	100	100	100	100	100	100	98	94	98	108	B				
4					B	108	98	98	98	98	A	A	A	100	100	100	100	102	108	A				
5					B	108	104	100	100	A	A	A	96	100	100	100	100	106	106	A				
6					B	102	96	96	98	98	98	100	100	100	102	102	104	104	104	A				
7					A	110	102	102	100	100	98	98	A	98	98	98	100	100	A	A				
8					B	106	100	100	98	98	A	A	98	98	104	100	100	102	104	A				
9					B	104	104	100	100	98	98	98	98	B	98	100	100	102	108	A				
10					B	108	C	98	A	98	A	98	A	102	100	104	102	102	102	A				
11					B	104	100	100	100	98	A	98	A	98	98	98	98	100	A	A				
12					B	116	102	100	98	94	A	98	A	98	98	100	100	100	106	B				
13					B	106	104	100	100	96	96	A	A	A	A	96	100	104	106	A				
14					B	104	104	102	100	100	100	100	100	100	98	100	100	102	A	A				
15					C	C	C	C	C	C	C	C	C	C	C	C	C	98	106	A				
16					C	C	C	C	98	98	98	A	A	A	A	C	98	98	98	A				
17					B	104	102	C	98	98	98	A	A	A	102	102	102	98	106	A				
18					B	110	100	100	C	100	100	98	A	A	98	98	100	98	104	A				
19					B	C	104	102	98	98	98	98	98	98	98	98	100	100	106	A				
20					B	104	C	98	98	98	98	98	98	A	A	100	100	102	102	A				
21					A	102	102	98	98	98	96	96	96	A	96	96	98	98	104	A				
22					B	104	98	98	98	98	96	A	A	A	A	A	100	100	100	A				
23					A	106	100	100	96	96	96	A	A	A	96	102	102	102	100	A				
24					B	104	102	100	98	98	98	98	A	A	A	A	102	A	106	A				
25					B	104	100	100	98	A	A	A	98	98	98	98	102	102	108	B				
26					A	102	102	102	98	98	98	98	A	A	A	A	A	98	102	A				
27					B	102	102	100	100	98	96	96	A	A	96	A	98	100	100	A				
28					A	100	100	100	98	C	98	98	96	A	100	100	98	104	106	A				
29					A	104	96	96	96	96	96	96	96	96	96	98	98	100	102	A				
30					C	108	100	100	100	100	100	100	100	100	100	98	98	98	100	A				
31					A	100	100	98	98	96	96	A	A	98	100	100	98	A	100	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						27	27	28	28	27	23	20	14	16	24	24	29	29	28					
MED						104	102	100	98	98	98	98	98	99	99	100	100	100	104					
U Q						108	104	101	100	100	100	99	100	100	100	100	101	102	106					
L Q						104	100	98	98	98	96	98	96	98	98	98	98	98	102					

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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	86	92	B	B	B	120	102	102	98	98	100	98	92	92	88	102	88	108	106	102	106	94	B	B
2	B	B	92	88	B	122	136	106	108	102	102	104	92	G	G	G	152	122	116	116	100	100	B	90
3	94	90	B	B	B	108	116	102	98	98	G	G	G	G	G	150	112	104	100	102	B	B	B	B
4	B	B	B	B	B	138	126	112	106	102	100	98	98	G	G	112	142	150	110	102	98	98	94	94
5	B	90	94	B	116	110	104	114	104	100	98	100	160	88	174	196	144	114	100	98	96	92	82	B
6	B	B	B	B	B	G	132	112	104	96	G	G	102	G	G	102	106	106	102	98	98	96	100	B
7	B	B	B	110	108	120	104	102	102	96	92	92	106	180	170	152	110	100	92	94	94	94	96	90
8	90	90	B	B	B	122	106	102	98	100	100	98	G	G	G	G	G	104	98	96	96	100	B	B
9	86	86	B	104	112	106	106	100	100	G	102	112	G	B	108	106	122	104	104	102	102	B	B	B
10	92	90	98	B	B	104	C	106	102	G	102	102	104	106	102	102	104	104	100	100	100	102	102	94
11	90	B	90	92	B	G	G	110	96	96	96	92	90	98	G	G	120	132	86	104	100	B	B	B
12	92	88	B	B	B	126	120	132	G	114	104	104	100	100	104	110	G	112	G	B	100	96	96	96
13	94	90	96	94	100	106	106	100	100	98	98	94	94	98	100	98	108	104	102	102	98	98	100	88
14	86	86	82	86	B	G	116	108	106	106	102	104	106	G	140	124	106	104	102	102	96	94	92	88
15	94	96	88	98	C	C	C	C	C	C	C	C	C	C	C	C	C	108	104	98	98	94	C	C
16	C	C	C	C	C	C	C	C	100	98	98	90	90	100	82	C	100	102	92	98	B	122	92	92
17	92	84	B	B	132	124	106	C	96	94	96	88	90	92	G	118	108	102	96	98	112	98	100	92
18	88	B	B	B	B	116	104	102	C	102	100	98	100	92	88	106	100	98	102	102	92	92	92	92
19	B	90	88	88	124	C	110	104	98	98	98	G	172	98	G	G	110	102	98	96	96	96	94	B
20	B	B	B	90	B	G	C	100	100	98	G	96	98	100	96	G	150	106	98	98	C	102	98	B
21	100	94	112	B	108	110	106	106	102	98	98	104	98	104	G	130	110	102	100	100	98	96	98	90
22	88	B	B	120	124	106	100	104	102	102	96	90	94	92	92	106	114	102	102	100	94	96	90	88
23	88	88	B	B	112	110	108	98	96	92	92	90	88	90	G	120	110	102	100	96	B	96	B	90
24	B	86	86	90	118	120	104	98	96	100	98	96	96	88	90	88	82	84	110	108	80	92	88	90
25	86	86	86	86	84	120	104	104	100	98	98	100	150	G	G	112	108	110	120	B	98	98	100	90
26	B	90	100	B	140	122	120	104	96	98	96	94	92	92	88	100	90	104	100	100	100	92	B	B
27	B	88	84	B	130	128	102	102	108	98	92	94	88	90	100	102	108	102	104	100	C	96	106	B
28	94	86	86	B	132	106	108	102	100	C	98	98	100	104	100	G	112	108	108	104	98	98	98	B
29	B	86	92	B	106	106	98	96	96	96	100	104	108	112	114	106	106	102	102	100	94	92	92	90
30	90	86	94	96	C	124	106	104	102	106	98	100	96	96	96	110	104	98	92	98	112	92	92	94
31	92	90	88	98	100	112	112	106	100	100	100	98	104	G	G	G	122	104	100	102	94	94	98	98
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	22	17	14	16	24	26	28	28	27	27	27	27	21	18	22	28	31	30	29	26	28	22	18
MED	90	89	90	93	114	118	106	104	100	98	98	98	98	98	100	108	109	104	101	100	98	96	96	90
U Q	94	90	95	98	127	122	116	106	102	102	100	102	104	102	108	120	117	108	104	102	100	98	100	94
L Q	88	86	86	88	107	107	104	102	98	98	96	94	92	92	90	102	105	102	98	98	96	94	92	90

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAY 2023 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	F5	F4				C2	C3	C2	C3	C3	C1	C2	L2	L2	L2	C2	L2	CL22	C3	C3	F1	F4		
2			F1	F1		C1	H1	CL11	CL11	C2	C1	C1	L1				H1	C2	C2	C1	F2	F1		F1
3	F1	F1				C2	C2	C2	C1	C2						H1	C2	C3	C6	C1				
4						H2	C1	C2	C2	C2	C1	C2	C1			C1	H1	H1	C2	C3	F3	F1	F1	F1
5		F3	F1		C1	C1	C3	C1	C2	C1	C1	C1	H1	L1	H1	H1	H1	C2	C5	C3	F3	F1	F1	
6							H2	C1	C1	C3			C1			C2	C4	C2	C3	C3	F5	F3	F1	
7				F1	C6	C2	C4	C2	C4	C3	L5	L3	C1	HC11	H1	H1	C2	C4	L9	L8	F7	F9	F4	F6
8	F4	F1				C1	C3	C3	C1	C1	C1	C1						C3	C5	C4	F5	F2		
9	F1	F1		F2	C2	C3	C2	C2	C2		C1	C1			C3	C2	C2	C2	C5	C8	F1			
10	F3	F1	F1			C3		C2	C1		C2	C2	CL12	C1	C2	C2	C2	C2	C5	C7	F4	F7	F5	F8
11	F5		F1	F1				C1	C3	C4	C4	L4	L2	C2			C1	H1	L3	CL53	FF32			
12	F1	F1				C1	CL31	H1		C1	C1	C1	C2	C2	C1	C1		C3			F3	F4	F3	F3
13	F4	F5	F2	F3	C2	C3	C3	C3	C2	C2	C2	L3	LQ21	C1	C2	C1	C2	C3	C8	C4	F3	FQ41	FQ31	F6
14	FQ41	FQ41	F4	F3			C1	C1	C1	C1	C1	C1	C1		H1	C1	C2	C2	C2	C4	F5	F4	FQ61	F3
15	F2	F2	F2	F1														C3	C4	C7	F8	F4		
16									C3	C2	C2	L2	L3	C1	L3		C4	C4	L3	C3		F1	F5	F2
17	F1	F1			H1	C2	C3		C3	C2	C2	L3	L3	L2		C1	C3	C3	C4	C7	F1	F2	F1	F1
18	F1					C2	C3	C3		C2	C1	C1	C2	L2	L1	C2	C2	C2	C3	C3	F6	F3	F2	F1
19		F1	F2	F1	C1		C1	C3	C2	C1	C1		H1	C2			C2	C3	C3	C4	F2	F3	F1	
20				F1				C2	C2	C2		C1	C2	C1	C2		H1	C2	C3	C7		F2	F2	
21	F2	F6	C2		C4	C3	C3	C2	C2	C2	C2	C1	C1	C1		H1	C2	C3	C4	C5	F6	F3	F5	F3
22	F4			F1	C1	C5	C4	C2	C2	C1	C1	L3	L1	L2	L1	C2	C2	C4	C4	C5	F9	F3	F3	F5
23	F2	F1			C3	CL31	C3	C3	C2	L2	L1	L1	L2	L2		C1	C2	C3	C5	C5		F2		F1
24		F1	F2	F1	C1	C1	C2	C3	C3	C2	C3	C2	C2	L2	L3	L2	L2	L3	CL13	CL44	F8	F2	F3	F2
25	F2	F1	F1	F1	L1	C2	C2	C2	C2	CQ11	C2	C1	H1			C1	C2	C1	C2		F3	F3	F5	F7
26		F1	F1		H1	C1	C1	C3	C2	C3	C3	C3	L2	L2	L2	C2	L3	C2	C5	C8	F6	F5		
27		F1	F2		H1	C2	C5	C2	C2	C2	C2	L2	L3	L2	CL21	C2	C2	C3	C5	C3		F5	FF26	
28	F1	F3	F3		HC22	C4	C2	C2	C2		C1	C2	C2	C1			C1	C2	C4	C4	F6	F1	F1	
29		F2	F1		C3	C3	C3	C3	C3	C2	C1	C1	C1	C1	C1	C2	C3	C4	C4	C6	F9	F4	F3	F4
30	F2	F5	F2	F2		C2	C3	C3	C2	C1	C1	C1	C2	C1	C3	CL11	CL42	C4	L3	L5	FF34	F4	F4	F4
31	F4	F2	F4	F1	C1	C3	C3	C3	C2	C2	C2	C1	C1				C1	C2	C2	C3	F4	F4	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																								

MAY 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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 72	X 70	X 67	X 65	X 64															X 102	X 102	X 96	X 89	90
2	90	X 85	X 78	X 73	X 68															X 100	X 70	X 71	X 70	X 72
3	X 68	X 68	X 67	X 65	X 64															X 114	X 100	X 83	X 82	X 81
4	X 81	X 80	X 77	X 75	X 77															X 121	X 104	X 84	X 84	X 84
5	X 86	X 87	X 84	X 82	X 77															X 114	X 97	X 100	X 98	96
6	93	100	94	92	X 90	94														X 102	X 86	X 88	X 88	X 85
7	X 90	X 87	X 84	X 81	X 83															X 126	X 100	X 78	A	X 79
8	X 79	X 75	X 72	X 65	X 66															X 95	X 92	A	X 82	X 79
9	X 79	X 78	X 69	X 69	X 69															X 95	X 86	X 82	84	X 81
10	87	91	88	85	79	84														A	X 88	X 86	X 84	X 86
11	X 78	X 86	X 82	X 78	X 78															X 101	X 98	X 89	89	X 85
12	X 78	X 89	X 87	X 86	X 81															X 108	X 92	X 93	X 90	X 92
13	X 94	X 89	X 90	X 95	X 74															X 91	X 88	X 89	X 91	X 88
14	90	93	91	84	79															X 104	X 98	X 97	X 93	X 88
15	X 84	X 82	X 81	X 73	X 74															X 94	X 90	X 88	X 85	X 82
16	X 74	X 71	X 71	X 69	X 68															X 114	X 98	X 87	X 85	X 84
17	X 81	X 78	X 74	X 71	X 73															X 100	X 103	X 100	X 91	X 83
18	X 81	X 78	X 75	X 70	X 71																X 92	X 89	X 88	X 90
19	X 90	X 88	X 81	X 77	X 79																X 98	X 91	X 91	X 90
20	X 89	X 86	X 80	X 72	X 70																X 98	X 84	X 86	X 80
21	X 74	X 71	X 74	X 74	X 76																X 80	X 79	X 76	82
22	89	82	84	X 80	X 84																X 98	X 84	X 89	X 84
23	X 82	X 81	X 78	X 77	X 70																X 93	104	104	X 84
24	82	82	X 74	76	X 70																X 90	86	92	X 87
25	X 84	91	X 89	X 77	68																X 86	X 87	X 86	X 85
26	X 88	X 94	X 83	82	81																X 88	94	113	101
27	101	92	91	X 82	X 81																X 92	X 98	96	111
28	101	90	83	X 74	X 67																X 98	X 89	115	114
29	107	98	89	84	77	85															X 94	X 96	X 99	108
30	111	115	102	93	88																X 102	X 107	104	115
31	94	94	110	102	91																X 97	X 91	X 88	X 84
	00	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	3														16	31	30	30	31
MED	X 86	X 86	X 82	X 77	X 76	85														X 102	X 94	X 89	X 89	X 85
U Q	90	91	89	84	X 81	94														X 114	X 98	X 96	93	90
L Q	X 79	X 78	X 74	X 72	X 69	84														X 98	X 88	X 84	X 85	X 82

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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	66	64	61	59	58	66	84	85	87	88	102	112	114	113	114	113	107	101	99	96	96	90	83	F 82
2	F 81	79	72	67	62	58	62	67	71	73	84	90	98	101	96	87	91	103	109	94	64	65	64	66
3	62	62	61	59	58	64	79	92	95	97	98	104	108	111	110	108	102	103	103	108	94	77	76	75
4	75	74	71	69	71	80	90	95	H 92	94	102	111	112	111	106	100	98	103	A	115	98	78	78	78
5	80	81	78	76	71	84	104	101	93	93	90	96	105	109	108	106	105	106	112	108	91	94	92	F 86
6	F 82	F 86	F 85	F 82	84	F 86	105	108	90	82	90	98	107	C	101	110	121	123	110	96	80	82	82	79
7	84	81	78	75	77	85	93	82	92	98	104	110	101	107	92	87	88	98	114	120	94	72	A	73
8	73	69	66	59	60	68	79	81	76	H 76	76	86	81	87	95	89	A	A	A	89	86	A	76	73
9	73	72	63	63	63	76	96	98	90	89	96	96	92	92	86	78	79	81	88	89	80	76	F 77	75
10	F 76	F	F	F 72	F 69	F 70	96	88	87	86	86	89	97	97	90	93	93	91	86	A	82	80	78	80
11	72	80	76	72	72	76	92	88	80	88	95	89	90	98	97	97	93	89	91	95	92	83	74	79
12	72	83	81	80	75	81	F 88	101	101	93	93	99	98	104	109	114	114	114	108	102	86	87	84	86
13	88	83	84	89	68	73	80	87	84	85	87	A	95	98	95	96	94	88	82	85	82	83	85	82
14	F	F	F	F 73	F 71	76	84	85	102	113	100	86	89	96	102	108	107	98	93	98	92	91	87	82
15	78	76	75	67	68	70	76	65	61	64	67	76	77	82	86	89	89	87	A	88	84	81	79	76
16	68	65	65	63	62	71	93	98	94	92	91	97	98	94	99	100	94	93	105	108	92	81	79	78
17	75	72	68	65	67	81	96	106	104	91	96	106	107	110	110	108	104	103	97	94	97	94	85	77
18	75	72	69	64	65	78	88	89	90	88	90	92	90	94	102	106	109	102	102	96	86	83	82	84
19	84	82	75	71	73	84	99	102	96	95	85	88	93	95	103	100	98	98	106	108	92	85	85	84
20	83	79	74	66	64	76	100	101	97	87	90	98	109	108	112	118	92	85	92	100	92	78	80	74
21	68	65	68	68	70	78	64	A	A	61	A	65	67	73	84	87	85	83	80	A	74	73	70	F 66
22	F 71	F 72	F 72	74	78	64	69	85	86	69	67	71	81	84	91	90	88	82	82	88	92	78	83	78
23	76	75	72	71	64	69	79	77	A	74	76	86	88	91	96	99	100	90	84	82	87	F	F 89	78
24	F 72	72	68	F 66	64	72	81	91	90	83	83	95	94	92	104	105	98	96	92	88	84	F 76	F 82	81
25	78	F 83	83	71	F 60	72	77	88	83	80	80	84	86	91	90	95	96	92	86	90	80	81	80	79
26	82	88	78	F 73	F 71	73	93	109	96	92	94	94	100	A	110	105	A	92	A	A	82	F 82	F	F 87
27	F 87	F 83	F	76	75	76	94	98	84	82	92	95	100	100	96	92	82	83	86	88	86	92	F 85	F 104
28	F 85	F 78	F 74	68	61	69	89	87	92	89	85	83	85	84	86	89	98	103	97	98	92	83	F	F
29	F	F 83	F 80	F 72	F 68	F 76	96	108	94	102	A	99	95	A	102	103	98	91	77	85	88	90	93	F 94
30	F 88	F	F	F	F 76	76	86	97	94	A	A	A	A	96	92	92	94	95	98	97	96	101	F 94	F
31	F	F	F	F	F	69	65	A	82	90	93	A	88	92	98	98	99	93	91	100	91	85	82	78
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	26	29	30	31	31	29	29	30	28	28	30	28	31	31	29	30	27	28	31	29	28	29
MED	76	78	73	71	68	76	88	91	90	88	90	94	95	96	98	99	98	94	93	96	88	82	82	79
U Q	82	F 83	78	74	72	78	96	101	94	93	96	98	101	106	106	106	103	103	105	101	92	88	85	F 83
L Q	72	72	68	66	63	69	79	85	84	82	84	86	88	92	92	90	92	89	86	88	82	78	78	76

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	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 496	U L 492	A	L 572	L 584	L 528	552	L	L	A						
2						L		U L 508	L 488	U L 508	L 544	L 576	L 528	L 532	L 540	L 520	L 496	L						
3								L	L	A	L 552	L 564	L 556	L 560	L	L	L	L						
4									L	L 532	U L 596	U L 532	L 548	L 560	L 572	L 556	L 540	A	A					
5							L	L	U L 480	A	U L 584	L 580	572	A	L 556	L	L	A						
6							L	A	A	L 504	A	A	572	C	L 564	536	L	L						
7						L	A	L	L 556	U L 532	L 584	L 560	L	552	L 536	L 580	U L 484	L						
8								L	A	U L 524	556	572	L 560	548	544	A	A	A	A					
9										U L 672	A	A	572	B	A	A	L	L						
10							L	A	A	A	564	576	580	560	A	532	L	L						
11							L	A	L	L 520	L 564	U L 632	L 596	568	540	504	L	L						
12									L	L	A	L 588	564	572	552	L 544	L 488	L						
13								L 488	L	L 560	U L 604	A	592	572	544	516	L	L						
14									L 568	A	A	U L 616	652	A	544	536	L 480	A						
15							L	A	A	U L 548	540	544	544	544	A	A	L	A	A					
16							L	L	L 488	L 536	U L 596	544	548	L 556	L 540	A	A	A						
17							L	L	A	A	U L 616	540	508	544	L 532	540	A	A						
18							L	L	U L 496	L 596	540	544	U L 568	548	532	504	480	A	L					
19							L	L	L	L 528	L 544	U L 556	560	556	E B 588	520	A	A						
20							L	A	L	U L 600	540	552	544	536	540	508	A	L						
21							A	A	A	504	A	A	536	524	512	512	L 492	A		A				
22								476	A	U L 540	U L 572	548	532	548	544	496	L 480	U L 464	A					
23								L	A	U L 572	A	A	A	564	524	532	L 476	L						
24								A	A	516	U L 556	544	544	532	528	496	L 500	L	L					
25								A	L	L 572	L 592	540	560	540	536	496	L	A	L					
26							L	L	A	U L 568	552	U L 572	544	A	A	A	A	A	A	A				
27									A	484	A	548	548	A	A	704	A	L 516						
28							L	A	A	A	U L 552	U L 616	L 580	L 592	A	A	A	A						
29								A	A	A	A	A	A	A	A	508	L	L 492						
30								A	A	A	A	A	A	A	A	520	A	A						
31								A	A	A	A	A	552	544	532	532	H 500	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	7	21	20	23	27	23	22	22	11	3						
MED								L 488	L 496	L 532	L 560	560	560	548	540	520	L 488	L 492						
U Q								U L 508	L 556	U L 570	U L 588	L 576	572	560	552	536	L 500	L 516						
L Q								476	L 488	512	548	544	544	540	532	508	L 480	U L 464						

MAY 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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						188	236	304	328	352	360	368	A	A	A	364	336	A	A					
2						A	240	308	348	368	A	368	A	340	A	A	A	A	A					
3						A	248	292	A	A	A	384	A	A	388	356	332	276	A					
4						A	232	300	U A 332	348	A	A	A	A	A	A	A	280	A					
5						188	252	304	328	352	A	356	A	A	380	372	336	296	A					
6						A	252	300	340	A	A	A	A	B	A	A	320	284	188					
7						A	252	316	332	352	364	396	U G 404	404	396	352	332	272	A					
8						A	252	312	A	A	A	A	A	A	A	388	332	280	A					
9						A	260	312	344	364	A	A	A	B	A	360	328	280	A					
10						A	A	316	348	A	A	R 396	A	A	A	360	328	280	A					
11						A	260	312	332	352	A	A	A	A	A	372	324	284	212					
12						216	264	316	344	A	A	A	A	404	A	364	332	264	204					
13						A	256	312	348	A	A	A	B	396	384	A	332	280	204					
14						192	284	308	348	U A 352	A	A	396	A	A	360	332	284	A					
15						A	264	312	336	A	A	A	396	A	388	356	324	276	208					
16						188	280	312	A	344	A	A	A	A	A	348	320	268	A					
17						A	264	300	336	336	348	A	A	A	U G 396	A	320	272	200					
18						A	276	324	344	344	A	A	A	U R 392	U R 392	360	A	268	180	A				
19						A	A	320	348	356	B	A	A	B	B	372	332	284	A	A				
20						180	284	304	A	352	A	B	A	A	A	R 368	348	292	204	A				
21						196	260	308	332	A	A	A	A	A	380	364	340	284	A	A				
22						A	272	336	348	A	A	A	A	356	A	A	328	288	204	A				
23						A	244	276	328	A	A	A	A	A	R 400	356	332	292	A	A				
24						A	268	316	A	A	A	A	A	A	404	396	320	A	A	B				
25						A	272	312	332	A	A	380	A	396	380	360	300	280	A	A				
26						A	260	320	344	A	A	A	A	A	384	364	316	296	200	A				
27						188	264	312	A	356	A	A	A	A	A	A	A	A	A	A				
28						204	268	316	348	360	A	A	A	A	A	A	332	280	A	A				
29						A	280	312	332	A	A	A	A	A	A	A	A	A	A	A				
30						A	272	316	356	A	A	A	A	A	384	372	340	280	A	A				
31						A	280	328	360	372	A	A	A	A	400	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						9	29	31	25	16	3	7	3	7	14	21	25	25	10					
MED						188	264	312	344	352	360	380	396	396	388	364	332	280	204					
U Q						200	272	316	348	358	364	396	U G 404	404	396	372	332	284	204					
L Q						188	252	304	332	350	348	368	396	356	384	358	322	276	200					

MAY 2023 foE (0.01MHz)

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	29	G	39	44	J A 74	J A 49	J A 53	47	J A 57	44	G	J A 50	J A J A 120	J A 74	J A J A 54	J A 26	J A J A 145	J A 72
2	J A 20	E B 16	E B 16	J A 20	E B 16	20	30	38	42	47	46	44	J A 50	J A 45	43	40	32	33	J A J A 32	30	J A J A 18	J A 34	E B 16	E B 16
3	E B 16	E B 16	E B 16	J A 21	E B 16	19	28	J A J 48	A J 45	A J 78	A J 51	A G	46	J A 80	G	38	37	J A 42	J A J A 64	A J 46	A E 20	B E 16	B E 16	B E 16
4	E B 16	E B 16	E B 16	J A 16	E B 16	20	28	J A J 41	A J 47	A J 49	A J 48	A 42	47	44	44	J A 58	J A J 59	A J 46	J A J 115	A J 83	J A J 54	A J 65	A J 32	A J 26
5	J A 22	20	J A J 18	A J 18	E B 16	G	36	J A J 47	A J 46	A J 59	A J 77	A J 53	A 44	J A 64	G	J A 56	J A J 46	A J 59	J A J 73	A J 71	J A J 149	A J 178	A J 109	A J 96
6	J A 63	J A J 33	A J 52	A J 46	A J 24	24	37	J A J 58	A J 57	A J 85	A J 83	A J 110	A J 49	A E 46	B 48	40	G	36	J A J 38	A J 43	J A J 105	A J 80	A J 64	A J 51
7	J A 66	J A J 26	A J 22	A J 16	A J 31	20	J A 42	J A 76	38	40	49	46	52	47	45	44	45	J A 64	J A J 48	A J 26	J A J 53	A J 86	A J 84	A J 69
8	J A 44	J A J 58	A J 26	A J 72	A J 78	A J 36	A J 47	A J 54	A J 64	A J 63	A J 114	A J 54	A J 74	A J 103	A J 73	A J 81	A J 103	A J 115	A J 141	A J 116	A J 125	A J 140	A J 107	A J 18
9	J A 17	E B 16	E B 16	E B 16	E B 16	E B 16	20	38	J A J 70	A J 138	A J 80	A J 85	A J 69	48	E B 57	J A J 56	A J 110	43	38	J A J 48	A J 90	J A J 120	A J 88	A J 146	A J 85
10	E B 16	E B 16	20	J A 21	E B 16	20	33	J A J 48	A J 92	A J 102	A 49	45	J A 85	45	J A 72	46	J A J 51	A J 46	J A J 172	A J 88	J A J 88	A J 48	A J 65	A J 78
11	J A 53	J A J 45	A J 51	A J 62	A J 53	A J 45	A J 43	J A J 66	A J 61	A J 58	A 47	47	45	44	J A 62	39	40	J A 70	J A J 64	A J 43	J A J 106	A J 151	A J 130	A J 110
12	J A 121	A J 16	A E 16	B E 16	B E 16	B G	42	J A J 80	A J 64	A J 152	A J 100	A 44	J A 64	52	J A 62	44	J A 54	29	G	E B 16	J A J 32	A J 33	A J 71	A J 54
13	J A 29	J A J 26	A J 32	A E 16	B E 16	B 25	J A 65	J A J 54	A J 48	A 46	50	J A 170	E B 46	G	G	41	38	38	J A J 45	A 36	J A J 144	A J 121	A J 142	A J 38
14	J A 63	J A J 62	A J 42	A J 37	A J 22	G	G	J A J 47	A J 50	A J 82	A J 74	A J 63	A J 58	A J 113	A 46	G	36	J A 47	J A J 51	A J 33	J A J 105	A J 43	A J 87	A J 66
15	J A 84	J A J 32	A J 40	A J 40	A J 27	A J 33	33	J A J 62	A J 76	A J 49	A 48	J A 44	J A J 52	A J 56	A J 59	A J 56	J A J 56	A J 81	J A J 108	A J 102	J A J 50	A J 53	A J 64	A J 64
16	J A J 58	A J 21	A J 22	A E 16	B J 30	A G	34	J A J 61	A J 65	A J 65	A J 71	A J 71	A J 47	A J 57	A J 134	A J 94	J A J 110	A J 121	J A J 77	A J 66	J A J 25	A J 47	A J 32	A J 26
17	J A 25	J A J 20	A J 22	A J 15	A E 16	B 23	36	J A J 52	A J 106	A J 68	A 57	45	J A J 72	A 47	43	48	J A J 85	A J 69	J A J 64	A J 126	J A J 63	A J 103	A J 39	A J 32
18	J A 21	E B 16	E B 16	J A J 21	A J 18	A J 29	A 36	39	41	45	J A 62	J A 64	A 74	G	G	42	39	J A 48	J A J 50	A J 97	J A J 36	A J 47	A J 15	A J 17
19	J A 28	J A J 44	A J 42	A J 26	A J 29	A 29	J A 41	J A J 51	A J 60	A J 78	A E 44	B 49	J A 60	E B 42	E B 59	44	J A J 54	A J 84	J A J 192	A J 65	J A J 50	A J 127	A J 35	A J 22
20	J A 18	20	19	E B 16	E B 16	B 22	35	J A J 54	A J 53	A 44	J A 54	E B 44	J A J 70	A J 74	A J 48	G	J A J 69	A J 44	J A J 46	A J 32	J A J 138	A J 30	A J 32	A J 33
21	E B 16	J A J 34	A J 33	A J 26	A J 18	A J 43	A J 51	A J 89	A J 113	A J 50	A 64	59	46	53	44	45	J A J 51	A J 92	J A J 51	A J 108	J A J 51	A J 23	A J 33	A J 57
22	J A 65	J A J 32	A J 52	A J 46	A J 23	28	J A 58	J A J 58	A J 63	A J 70	A J 59	A 44	43	39	41	38	G	34	J A J 38	A J 26	J A J 27	A J 43	A J 54	A J 85
23	20	J A J 50	A J 47	A J 31	A E 16	B 24	J A 42	J A J 71	A J 94	A J 110	A J 95	A J 65	A J 102	A J 64	A	G	G	36	40	J A J 54	A J 40	J A J 124	A J 45	A J 184	A J 36
24	J A 36	J A J 24	A J 29	A J 17	A J 23	25	J A 40	J A J 55	A J 64	A J 77	A J 53	A J 48	A J 48	A 42		G	G	J A 38	39	E B 24	17	J A J 25	A J 105	A J 30	A J 71
25	J A J 41	A J 26	A J 31	A J 26	A J 22	A 24	36	J A J 64	A J 62	A 38	J A 48	G	37	G	J A J 51	A J 81	J A J 47	A J 53	J A J 36	A 24	E B J 16	A E 20	B J 16	A 19
26	J A 18	J A J 22	A J 25	A E 16	B J 27	A 24	33	44	J A 58	49	J A J 52	A 86	48	J A 148	J A J 64	A J 90	J A J 114	A J 69	J A J 134	A J 108	J A J 146	A J 88	A J 64	A J 163
27	J A J 67	A J 70	A J 50	A J 62	A J 28	A J 35	A J 54	A J 71	A J 88	A J 53	A 78	J A 56	J A J 48	A J 99	A J 86	A J 100	J A J 70	A J 55	J A J 85	A J 46	J A J 32	A J 64	A J 65	A J 148
28	J A J 84	A J 26	A J 25	A J 34	A J 25	A 24	36	J A J 49	A J 64	A J 56	A 46	45	J A J 53	A J 56	A J 59	A J 88	J A J 58	A J 69	J A J 68	A J 83	J A J 30	A J 131	A J 112	A J 52
29	J A J 178	A J 82	A J 54	A J 36	A J 41	A J 42	A J 76	A J 74	A J 105	A J 119	A J 212	A J 169	A J 103	A J 184	A J 98	A J 51	A J 49	A J 98	A J 75	A J 43	A J 110	A J 188	A J 120	A J 113
30	J A J 131	A J 104	A J 110	A J 53	A J 62	A J 70	A J 65	A J 65	A J 122	A J 212	A J 131	A J 233	A J 119	A J 114	A J 109	A J 52	A J 72	A J 102	A J 111	A J 62	A J 82	A J 64	A J 68	A J 74
31	J A J 78	A J 110	A J 43	A J 50	A J 51	A J 25	A J 68	A J 86	A J 66	A J 73	A J 78	A J 110	46	44	G J A 38	47	J A J 42	A 35	J A J 78	A J 70	A J 88	A J 54	A J 51	A J 46
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 36	J A J 26	A J 26	A J 21	A J 22	A 24	37	J A J 55	A J 63	A J 63	A J 59	A J 49	A J 50	U 50	48	45	J A J 47	A J 50	J A J 64	A J 62	J A J 54	A J 64	A J 64	A J 54
U Q	J A J 66	A J 45	A J 43	A J 40	A J 29	A J 29	A J 47	A J 70	A J 88	A J 80	A J 78	A J 69	A J 70	A J 74	A J 62	A J 58	J A J 59	A J 70	J A J 108	A J 88	J A J 110	A J 105	A J 109	A J 78
L Q	E B 18	E B 16	E B 18	E B 16	E B 16	B 20	33	48	48	49	49	44	46	44	G 41	40	38	38	J A J 46	A J 33	J A J 32	A J 43	A J 32	A J 26

MAY 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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 16	28	G	38	43	69	48	46	45	52	42	G	40	31	41	E B 16	18	25	22
2	E B 16	E B 16	E B 16	E B 16	E B 16	20	30	36	41	46	44	43	43	42	42	40	30	29	30	22	E B 16	24	E B 16	E B 16
3	E B 16	E B 16	E B 16	18	E B 16	18	27	36	42	66	48	G	42	43	G	38	36	40	44	26	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	19	28	37	41	43	42	41	44	43	42	43	46	44	A A 115	21	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	G	34	41	42	50	44	45	43	58	G	46	40	51	41	29	27	80	25	E B 16
6	40	E B 16	26	30	E B 16	24	34	48	53	40	65	72	45	E B 46	48	40	G	34	33	33	20	64	28	40
7	29	E B 16	E B 16	E B 16	E B 16	20	40	35	37	39	48	46	50	46	44	43	37	46	40	21	39	35	A A 84	28
8	40	49	E B 16	E B 16	E B 16	28	42	44	62	42	51	54	53	45	48	78	A A 103	A A 115	A A 141	77	54	A A 140	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	20	35	56	76	56	70	63	48	E B 57	53	67	42	34	37	33	53	64	62	35
10	E B 16	E B 16	E B 16	E B 16	E B 16	20	33	45	62	74	46	45	46	45	71	44	44	39	62	A A 88	48	29	39	36
11	E B 16	27	35	26	30	28	34	50	45	47	46	47	44	43	44	39	36	32	62	36	34	28	24	50
12	E B 16	E B 16	E B 16	E B 16	E B 16	G	36	44	44	48	63	44	52	50	46	40	36	29	G	E B 16	30	30	23	23
13	28	24	E B 16	E B 16	E B 16	25	50	43	46	45	49	A A 170	E B 46	G	G	41	37	36	40	33	E B 16	E B 16	43	28
14	33	20	19	E B 16	17	G	G	42	44	69	56	49	52	70	46	G	36	44	46	31	62	19	34	36
15	20	19	23	24	18	28	30	44	51	42	47	43	47	48	54	53	46	65	A A 108	62	33	20	27	32
16	E B 16	E B 16	E B 16	E B 16	E B 16	G	33	40	36	50	52	46	43	49	48	63	74	54	72	36	20	E B 16	E B 16	20
17	E B 16	E B 16	E B 16	E B 16	E B 16	20	34	42	67	56	52	44	45	46	43	46	51	45	36	E B 16	41	29	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	23	34	38	40	43	42	42	48	G	G	41	39	39	29	E B 16	21	20	E B 16	E B 16
19	E B 16	26	19	E B 16	E B 16	26	36	43	47	43	E B 44	49	53	E B 42	E B 59	44	51	54	88	45	42	34	21	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	22	33	48	50	42	50	E B 44	50	45	44	G	63	42	43	29	E B 16	E B 16	20	18
21	E B 16	E B 16	28	E B 16	E B 16	39	46	A A 89	A A 113	48	A A 64	57	45	50	44	45	45	77	48	A A 108	E B 16	19	24	32
22	41	E B 16	E B 16	24	E B 16	27	54	44	51	49	46	43	43	U Y 39	41	U Y 38	G	33	36	25	24	28	40	E B 16
23	E B 16	E B 16	25	E B 16	E B 16	22	39	42	A A 94	54	62	53	54	54	G	G	36	34	36	38	E B 16	44	42	E B 16
24	22	E B 16	E B 16	E B 16	E B 16	23	35	48	62	45	45	44	44	41	G	G	37	34	24	E B 17	24	18	E B 16	28
25	E B 16	E B 16	24	E B 16	E B 16	22	33	53	46	38	42	G	U Y 37	G	48	46	44	46	32	22	E B 16	E B 16	E B 16	E B 16
26	E B 16	E B 16	18	E B 16	22	20	32	42	53	48	44	51	47	A A 148	56	68	A A 114	46	A A 134	A A 108	E B 16	45	44	26
27	40	30	38	25	21	28	42	46	70	46	72	52	46	66	75	69	61	43	53	28	22	E B 16	49	66
28	E B 16	E B 16	E B 16	20	18	24	34	47	59	53	45	44	50	54	57	52	56	40	48	30	22	28	56	26
29	21	28	35	25	20	31	51	64	66	62	A A 212	90	61	A A 184	64	45	40	38	42	37	41	57	66	66
30	63	43	46	33	28	47	50	48	86	A A 212	A A 131	A A 233	A A 119	88	74	44	52	72	61	27	E B 16	38	29	47
31	47	39	26	24	28	23	47	A A 86	64	57	72	A A 110	44	43	G 37	41	36	34	72	35	41	31	28	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	22	34	44	51	48	49	46	46	46	45	43	40	40	43	31	22	28	25	23
U Q	29	24	25	24	18	27	42	48	64	56	64	54	50	54	54	46	51	46	62	38	41	38	42	35
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	20	33	41	42	43	45	44	44	43	G 41	40	36	34	36	22	E B 16	E B 18	E B 16	E B 16

MAY 2023 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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	16	18	18	20	22	23	29	38	34	34	22	20	15	18	16	16	16	16	16
2	16	16	16	16	16	16	16	19	21	24	34	29	29	26	24	20	20	16	15	16	16	16	16	16
3	16	16	16	16	16	16	17	18	20	21	30	31	36	23	26	26	18	18	17	16	16	16	16	16
4	16	16	16	16	16	16	16	22	25	22	34	33	35	34	26	28	20	16	16	16	16	16	16	16
5	16	16	16	16	16	16	18	18	21	27	30	30	32	34	31	29	24	20	16	18	16	16	16	16
6	16	16	15	16	16	16	17	20	22	24	30	36	40	46	42	36	20	16	14	16	16	18	16	16
7	16	16	16	16	16	16	17	16	21	25	29	31	32	29	30	25	19	16	16	16	18	16	16	16
8	16	16	16	16	16	16	16	19	35	40	38	38	36	34	27	22	22	17	16	18	16	16	16	16
9	16	16	16	16	16	16	16	18	22	21	29	40	42	57	28	24	18	18	16	16	16	16	16	16
10	16	16	16	16	16	16	28	20	24	36	41	29	43	42	38	28	23	17	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	18	22	39	40	40	41	35	27	19	17	17	16	16	16	16	16
12	16	16	16	16	16	16	16	18	22	28	24	38	41	33	40	24	18	15	16	16	16	16	16	16
13	16	16	16	16	16	16	16	18	24	38	40	36	46	32	31	38	21	17	17	16	16	16	16	16
14	16	16	16	16	16	16	15	19	21	22	36	30	32	40	39	28	20	18	16	16	16	16	16	16
15	16	16	16	16	16	16	16	18	20	34	35	35	33	31	23	20	18	17	14	16	16	16	16	16
16	16	16	16	16	16	16	17	17	30	27	29	27	37	33	30	25	16	17	16	16	16	16	16	16
17	16	16	16	16	16	16	17	19	18	21	31	38	30	33	26	36	24	19	16	16	16	16	16	16
18	16	16	16	16	16	16	14	22	23	29	36	34	34	30	33	25	36	16	15	16	16	16	16	16
19	16	16	16	16	16	17	30	25	28	31	44	39	42	42	59	30	26	18	16	16	16	16	16	16
20	16	16	16	16	16	16	19	18	35	31	35	44	31	34	33	25	25	24	16	16	16	16	16	16
21	16	16	16	16	16	16	16	20	20	36	36	40	42	40	36	26	22	18	17	16	16	16	16	16
22	16	16	16	16	16	16	16	21	18	35	31	36	29	27	29	29	21	17	16	16	15	16	16	16
23	16	16	16	16	16	14	15	16	18	31	32	35	35	29	27	30	24	18	17	16	16	16	16	16
24	16	16	16	16	16	16	16	18	22	27	30	34	30	31	29	29	21	16	16	17	16	16	16	16
25	16	16	16	16	16	16	15	17	20	25	32	29	33	32	28	24	18	18	17	16	16	16	16	16
26	16	16	16	16	16	16	18	20	21	39	36	35	34	36	24	25	20	18	15	16	16	16	16	16
27	16	16	16	16	16	16	17	19	34	24	35	34	31	35	34	20	21	16	14	16	16	16	16	16
28	16	16	16	16	16	16	16	17	25	21	30	31	27	32	34	34	22	16	17	16	16	16	16	16
29	16	16	16	16	16	16	16	22	29	23	33	27	33	26	26	24	17	16	15	16	16	16	16	16
30	16	16	16	16	16	18	18	18	22	27	29	42	40	34	28	26	20	20	17	14	16	16	16	16
31	16	16	16	16	16	16	16	17	25	32	38	30	35	33	33	30	20	16	16	16	16	16	16	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	16	16	16	16	16	16	18	22	27	33	34	35	33	30	26	20	17	16	16	16	16	16	16
U Q	16	16	16	16	16	16	17	20	25	32	36	38	40	36	34	29	22	18	17	16	16	16	16	16
L Q	16	16	16	16	16	16	16	18	20	22	30	30	32	31	27	24	19	16	16	16	16	16	16	16

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E 0SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	282	289	286	286	289	307	348	333	325	284	290	296	294	295	294	304	307	300	302	294	299	314	285	F 284
2	F 293	280	293	280	261	281	276	282	317	287	294	282	303	304	310	299	297	302	322	334	265	265	266	282
3	278	285	290	291	293	327	316	328	323	312	294	291	286	295	294	300	296	304	297	318	321	274	272	269
4	272	277	277	277	287	315	319	306	H 313	297	285	284	292	289	287	285	279	287	A	323	334	272	274	265
5	270	281	290	289	278	299	329	327	314	313	297	283	287	291	294	289	288	287	304	323	289	282	289	F 267
6	F 265	F 275	F 279	F 275	277	F 304	320	345	324	301	306	292	284	C	253	267	277	299	311	314	263	260	264	249
7	273	271	278	279	287	296	307	269	274	284	284	305	292	303	302	295	294	287	302	333	342	268	A	271
8	277	270	277	261	253	286	321	317	309	H 289	287	278	276	280	296	298	A	A	A	291	291	A	265	272
9	271	289	262	268	262	288	309	308	308	254	249	270	257	278	275	290	291	288	290	303	288	278	F 273	272
10	F 264	F	F	F 290	F 246	F 277	317	293	285	315	276	264	275	284	273	278	298	311	303	A	276	271	248	254
11	255	266	280	265	266	287	310	312	314	290	305	282	284	286	287	300	298	293	285	295	294	276	258	275
12	267	270	276	287	278	291	F 292	307	307	290	279	284	283	277	276	282	291	298	300	299	276	269	270	259
13	271	262	274	326	279	300	296	301	299	296	269	A	282	285	287	299	306	315	302	289	267	269	279	285
14	F	F	F	F 287	F 290	291	308	295	273	306	317	276	263	275	282	294	307	298	291	291	284	283	283	268
15	271	275	277	265	264	287	287	316	292	275	260	284	288	293	297	297	304	302	A	289	290	277	279	273
16	271	273	280	276	279	284	299	307	314	293	276	286	289	285	291	294	300	283	292	317	304	276	276	276
17	284	290	290	274	268	296	303	307	324	276	268	282	278	286	281	296	302	310	309	293	301	300	297	277
18	276	282	286	286	288	317	322	318	297	288	286	278	274	280	282	288	298	303	303	306	287	280	276	277
19	285	284	293	289	280	297	309	318	302	314	297	281	295	285	292	291	287	294	296	317	310	270	277	282
20	287	286	296	281	258	265	308	314	307	270	255	247	254	266	267	293	285	268	271	290	296	250	268	269
21	272	270	265	266	275	318	310	A	A	274	A	263	276	279	293	282	298	308	305	A	281	274	263	F 249
22	F 250	F 266	F 248	265	284	279	282	301	304	290	259	285	294	282	288	292	312	301	295	282	297	271	261	269
23	272	282	278	302	265	300	306	291	A	291	263	296	288	290	288	283	305	300	311	274	278	F	F 304	272
24	F 269	287	273	F 284	275	308	278	318	309	324	266	276	286	282	275	287	287	299	304	306	292	F 266	F 278	267
25	274	F 275	317	317	F 285	316	299	313	301	280	275	287	281	279	286	296	302	302	289	301	278	269	268	260
26	277	292	302	F 281	F 278	267	284	331	315	300	291	277	284	A	297	301	A	308	A	A	289	F 261	F	F 297
27	F 284	F 280	F	279	292	281	310	334	298	266	266	279	283	297	303	254	306	285	286	297	274	299	F 293	F 254
28	F 301	F 292	F 305	303	274	288	314	313	312	299	292	272	271	271	277	274	276	281	284	290	302	282	F	F
29	F	F 282	F	F 287	F 269	F 287	279	311	273	273	A	279	282	A	290	294	308	313	283	285	280	274	274	F 282
30	F 291	F	F	F	F 277	288	294	302	312	A	A	A	A	287	283	283	284	287	290	283	270	273	F 280	F
31	F	F	F	F	F	340	309	A	299	291	298	A	274	269	275	276	287	279	270	292	311	272	276	271
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	25	29	30	31	31	29	29	30	28	28	30	28	31	31	29	30	27	28	31	29	28	29
MED	272	280	280	281	278	291	308	312	308	290	284	282	284	285	287	292	298	299	297	296	289	273	275	271
U Q	283	286	292	289	285	307	316	318	314	300	294	286	288	290	294	297	304	303	304	316	301	279	280	277
L Q	270	271	276	274	266	286	294	302	298	280	267	276	276	279	277	283	287	287	289	290	278	269	267	266

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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 387	U L 405	A	L 356	L 352	L 379	A	L	L	A						
2						L		U L 334	L 371	U L 375	371	L 350	388	383	L 359	L 356	L 341	L						
3								L	L	A	L 383	374	L 373	371	L	L	L	L						
4									L	380	U L 356	U L 416	368	L 358	L 352	L 351	L 336	A	A					
5							L	L	A	A	U L 381	L 373	359	A	L 359	L	L	A						
6							L	A	A	L 404	A	A	359	C	L 324	359	L	L						
7						L	A	L	L 348	U L 373	L 352	L 355	L	373	L 368	L 338	U L 359	L						
8								L	A	U L 379	A	A	A	359	341	A	A	A	A					
9									U L 309	A	A	346	B	A	A	L	L							
10							L	A	A	A	380	361	361	357	A	345	L	L						
11							L	A	L	A	L 361	U L 343	L 348	355	360	365	L	L						
12									L	L	A	L 357	A	A	337	L 340	L 356	L						
13								A	L	L 352	U L 338	A	348	363	371	357	L	L						
14									L 352	A	A	U L 341	339	A	370	340	355	A						
15							L	A	A	U L 346	375	374	386	A	A	A	L	A	A					
16							L	L	L 388	A	U L 340	366	381	A	A	A	A	A						
17							L	L	A	A	U L 337	383	408	382	L 362	A	A	A						
18							L	L	U L 389	L 356	382	381	U L 363	374	379	370	356	A	L					
19							L	L	L	376	L 384	A	A	368	B	A	A	A						
20							L	A	L	U L 341	A	376	A	365	344	356	A	L						
21							A	A	A	A	A	A	367	A	378	369	L 366	A		A				
22								A	A	A	U L 355	377	366	368	353	372	L 363	U L 355	A					
23								L	A	A	A	A	A	A	364	349	L 374	L						
24								A	A	378	U L 348	395	378	377	358	370	L 353	L	L					
25								A	L	L 356	L 347	384	359	369	A	A	L	A	L					
26							L	L	A	U L 361	374	A	A	A	A	A	A	A	A	A				
27									A	A	A	A	358	A	A	A	A	L 339						
28							L	A	A	A	U L 356	U L 341	A	A	A	A	A	A						
29								A	A	A	A	A	A	A	A	364	L	L 353						
30								A	A	A	A	A	A	A	A	A	A	A						
31								A	A	A	A	A	390	374	369	338	H 354	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	6	15	18	19	21	17	18	17	11	3						
MED								U L 334	L 379	U L 373	L 358	373	363	369	360	356	L 356	L 353						
U Q									L 388	L 379	L 380	381	380	376	369	367	L 363	U L 355						
L Q									L U 352	L U 352	U L 348	U L 355	355	361	352	342	L 353	L 339						

MAY 2023 M(3000)F1 (0.01)

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								226	252	248	298	296	292	278	288	274	260	248						
2						312		354	270	310	320	314	290	276	280	282	294	266						
3								232	256	260	270	296	288	290	294	282	268	262						
4									232	268	300	288	272	286	296	292	302	286	A					
5							232	224	238	246	288	314	306	296	296	300	276	266						
6							240	232	242	240	286	308	306	C	358	336	296	244						
7						262	262	250	326	274	302	274	294	292	266	314	296	288						
8								292	294	282	338	340	360	362	304	EA 346	A	A	A					
9										408	EA 390	348	374	348	338	EA 358	320	288						
10							246	252	EA 310	EA 316	356	386	340	322	EA 360	314	292	272						
11							252	236	258	268	296	328	336	316	298	280	292	300						
12									254	258	340	304	320	322	324	300	272	258						
13								286	270	316	352	A	336	306	302	290	270	254						
14									322	276	268	330	394	340	312	296	270	270						
15							286	266	EA 346	392	448	362	344	316	322	308	286	EA 288	A					
16							250	246	246	292	340	298	306	318	316	294	312	302						
17							258	248	236	EA 256	346	310	286	308	296	298	268	270						
18							234	244	270	338	284	304	328	340	308	296	278	246	250					
19							226	248	254	264	276	308	318	328	308	286	286	282						
20							248	230	278	350	376	350	380	336	352	278	306	328						
21							EA 268	A	A	420	A	444	392	392	326	308	286	EA 366		A				
22								306	258	330	452	382	342	344	316	286	272	280	276					
23								246	A	338	EA 400	320	318	324	316	310	270	244						
24								252	280	250	344	336	312	336	318	300	286	274	252					
25								262	262	324	370	332	352	322	328	292	282	260	268					
26							268	244	260	302	312	332	304	A	304	280	A	260	A	A				
27									EA 324	268	EA 352	314	318	304	EA 304	452	284	322						
28							246	252	276	288	308	366	356	354	350	344	324	270						
29								262	354	308	A	EA 406	324	A	300	284	270	282						
30								252	EA 356	A	A	A	A	EA 394	EA 344	304	312	338						
31								A	EA 308	276	EA 302	A	346	340	328	316	308	288						
	00	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	14	24	28	30	28	28	30	28	31	31	29	30	4					
MED						287	248	249	264	282	U 317	320	322	322	310	297	286	272	260					
U Q							262	262	EA 309	324	354	349	346	340	328	314	299	288	272					
L Q							240	240	254	264	297	306	306	305	298	286	271	260	251					

MAY 2023 h'F2 (KM)

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	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	256	258	246	246	240	216	206	196	200	A	196	224	216	A	238	212	A	258	E A 266	226	226	E A 260	272
2	246	258	248	262	286	270	224	218	218	E A 242	208	202	196	192	200	210	204	234	230	204	202	E A 300	282	268
3	266	270	264	252	246	220	214	212	212	A	214	186	190	194	218	192	228	254	252	242	216	210	268	284
4	292	278	284	268	250	222	210	224	216	198	196	174	210	198	204	218	E A 266	A	A	242	218	208	264	292
5	296	276	250	256	264	238	222	216	E A 206	A	198	176	180	A	222	266	242	A	256	234	244	E A 348	248	254
6	E A 320	288	E A 270	E A 282	260	246	234	A	A	184	A	A	216	218	304	216	228	236	234	230	262	E A 384	E A 300	E A 334
7	294	268	272	250	260	252	A	202	202	198	260	230	272	212	240	234	222	E A 278	258	226	210	E A 272	A	E A 316
8	E A 310	E A 328	258	282	314	254	258	274	A	186	E A 280	A	A	222	E A 272	A	A	A	A	E A 354	E A 282	A	280	288
9	288	262	284	290	290	242	228	266	E A 300	E A 292	A	A	264	B	A	A	E A 262	246	262	E A 242	E A 292	E A 370	E A 384	E A 288
10	Q 278	Q 260	Q 250	Q 258	Q 324	244	234	A	A	A	202	202	196	216	A	E A 234	274	260	E A 288	A	E A 312	E A 282	E A 350	E A 318
11	322	E A 306	E A 270	294	E A 306	240	224	A	220	E A 246	206	228	198	206	230	214	222	220	E A 298	252	E A 262	E A 236	E A 312	E A 322
12	288	Q 274	274	250	236	232	218	254	240	236	A	188	E A 270	E A 264	256	226	224	220	246	230	E A 252	E A 284	290	E A 306
13	E A 304	E A 308	286	216	192	228	268	E A 254	E A 250	228	254	A	220	194	188	226	222	242	254	E A 250	250	270	E A 298	268
14	E A 292	274	276	246	252	234	218	232	240	A	A	228	266	A	214	198	218	A	E A 250	E A 248	E A 304	256	E A 268	E A 294
15	286	286	296	E A 282	290	260	224	A	A	214	232	196	202	E A 290	A	A	A	A	A	E A 304	E A 264	252	262	E A 282
16	270	282	272	276	278	234	222	230	198	E A 270	E A 278	E A 230	196	E A 290	E A 274	A	A	A	E A 296	228	216	216	254	274
17	264	252	260	270	276	246	226	230	A	A	E A 270	196	200	208	218	E A 264	A	A	258	234	E A 276	E A 242	226	248
18	274	270	258	264	268	238	218	210	202	192	178	166	228	192	202	214	230	A	240	230	226	244	266	272
19	272	272	254	266	282	234	218	240	250	208	188	E A 252	A	184	B	E A 252	A	A	E A 330	E A 242	E A 242	E A 268	256	264
20	256	254	238	260	310	240	226	A	A	196	E A 316	188	E A 314	232	250	226	A	282	300	266	244	208	278	234
21	262	290	E A 320	288	276	252	A	A	A	E A 372	A	A	220	A	222	E A 250	E A 266	A	260	A	248	252	E A 296	E A 352
22	E A 384	312	316	E A 272	216	242	E A 334	A	A	E A 286	212	184	206	208	212	242	216	214	A	268	240	E A 244	E A 322	286
23	276	262	E A 278	244	256	250	246	E A 238	A	E A 316	A	A	A	A	220	222	220	226	250	282	302	E A 324	E A 254	228
24	302	266	282	272	272	236	234	A	A	E A 236	E A 228	182	194	194	218	224	222	220	230	240	242	E A 232	258	E A 304
25	288	280	232	218	256	250	212	A	234	190	180	182	202	206	E A 284	E A 286	E A 272	A	252	234	222	276	282	292
26	274	246	224	260	E A 250	234	224	A	A	234	198	E A 292	E A 242	A	A	A	A	A	A	A	242	E A 336	E A 324	E A 276
27	E A 282	E A 290	E A 302	E A 274	246	218	246	242	A	E A 236	A	A	E A 240	A	A	E A 404	A	E A 280	E A 290	236	E A 278	244	E A 266	E A 342
28	206	230	224	236	274	232	228	A	A	A	220	184	E A 268	E A 328	A	A	A	A	272	250	246	E A 242	E A 326	E A 300
29	280	E A 262	E A 252	E A 236	E A 274	248	E A 284	A	A	A	A	A	A	A	A	266	252	240	E A 266	E A 276	E A 286	E A 326	E A 270	E A 304
30	E A 300	E A 294	E A 280	E A 270	E A 262	276	266	A	A	A	A	A	A	A	A	E A 240	A	A	E A 294	E A 242	274	E A 282	E A 270	E A 288
31	E A 324	E A 322	E A 272	E A 268	E A 258	222	278	A	A	A	A	A	190	192	206	218	206	234	E A 352	258	234	E A 248	278	266
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	29	17	15	22	20	21	26	22	21	25	21	16	26	28	31	30	30	31
MED	279	268	264	258	262	240	225	227	215	U 210	206	191	206	202	219	221	223	236	253	238	U 234	E A 254	266	U 276
U Q	E A 300	E A 290	282	274	282	250	246	248	240	E A 246	E A 257	228	E A 242	E A 222	253	E A 251	E A 257	257	E A 290	262	E A 276	E A 284	E A 298	E A 304
L Q	270	262	252	250	250	234	218	214	202	198	198	183	196	194	209	217	219	223	250	234	226	242	262	268

MAY 2023 h'F (KM)

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IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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						E B 154	100	100	100	98	98	98	A	A	A	98	102	A	A					
2						A 102	102	100	100		A 100		A	98	A	A	A	A	A					
3						A 102	100		A	A	A	98	A	A	100	100	100	102	A					
4						A 102	102	102	102		A	A	A	A	A	A	A	102	A					
5						E B 110	98	98	98	98	A	98	A	A	102	102	106	106	A					
6						A 106	102	98		A	A	A	A	B	A	A	102	102	106					
7						A 102	102	98	98	98	98	98	102	102	102	102	102	102	A					
8						A 100	100		A	A	A	A	A	A	A	98	96	100	A					
9						A 102	102	100	100		A	A	A	B	A	98	98	100	A					
10						A	A 100	100		A	A	106		A	A	104	102	102	A					
11						A 106	98	98	98		A	A	A	A	A	98	104	100	114					
12						134	96	98	98		A	A	A	108	A	102	102	100	108					
13						A 100	100	100		A	A	A	B	110	108	A	108	102	108					
14						100	100	100	100	96	A	A	96	A	A	104	100	100	A					
15						A 100	98	98		A	A	A	100	A	100	102	102	104	104					
16						104	104	98	A	98	A	A	A	A		100	100	100	A					
17						A 100	100	96	96	94		A	A	A	94	A	98	104	110					
18						A 100	100	100	100		A	A	A	98	100	102	A	102	104	A				
19						A	A 100	96	94		B	A	A	B	B	108	100	100	A	A				
20						112	108	98	A	98	A	B	A	A	A	98	98	102	104	A				
21						114	96	102	96	A	A	A	A	A	102	102	102	98	A	A				
22						A 102	102	96		A	A	A	A	96	A	A	102	102	102	A				
23						A 98	94	100		A	A	A	A	A	100	100	100	100	A	A				
24						A 102	96		A	A	A	A	A	A	96	96	102	A	A	B				
25						A 102	96	100		A	A	98	A	98	102	102	102	102	A	A				
26						A 102	102	102		A	A	A	A	A	104	100	98	104	104	A				
27						110	110	100	A	100	A	A	A	A	A	A	A	A	A	A				
28						122	100	98	98	98	A	A	A	A	A	A	100	102	A	A				
29						A 102	100	100		A	A	A	A	A	A	A	A	A	A	A				
30						A 102	100	98		A	A	A	A	A	102	100	102	102	A	A				
31						A 104	100	100	100		A	A	A	A	122	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						9	29	31	25	16	3	7	3	7	14	21	25	25	10					
MED						111	102	100	100	98	98	98	100	98	102	100	102	102	105					
U Q						128	102	102	100	100	98	100	102	108	102	102	102	102	108					
L Q						107	100	98	98	98	94	98	96	98	100	98	100	100	104					

MAY 2023 h'E (KM)

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IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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	B	B	B	B	B	B	140	G	104	100	94	96	96	104	106	108	G	A 96	94	92	94	92	102	104
2	92	B	B	86	B	114	112	104	100	96	98	96	100	102	102	164	94	94	100	96	96	92	B	B
3	B	B	B	94	B	132	122	100	94	88	86	G	98	92	G	154	132	106	94	94	94	B	B	B
4	B	B	B	80	B	148	108	102	102	98	92	102	98	174	98	90	88	108	96	94	94	94	90	90
5	94	90	90	94	B	G 100	100	98	94	102	96	98	92	G	118	114	104	98	94	94	94	96	90
6	90	86	90	88	108	118	108	102	98	108	90	108	106	B	196	118	G	104	100	96	96	92	94	90
7	90	90	94	92	92	118	106	104	102	102	176	168	110	146	128	118	108	100	94	96	92	92	92	90
8	90	88	94	90	90	110	106	102	96	102	96	92	92	92	90	106	100	98	98	92	94	96	100	94
9	92	B	B	B	B	144	106	100	92	94	94	92	100	B	114	102	106	106	100	96	96	96	96	94
10	B	B	94	82	B	124	116	98	94	90	104	108	120	146	96	110	106	102	94	92	96	100	98	92
11	92	92	86	84	88	92	106	98	98	92	96	102	106	154	98	136	114	106	104	98	98	98	98	98
12	92	84	B	B	B	G	124	102	102	96	90	140	112	110	108	128	112	150	G	B	98	96	92	96
13	92	90	92	B	B	128	110	110	104	104	100	88	B	G	G	168	122	110	102	96	100	100	100	86
14	96	90	82	86	92	G	G	100	100	90	98	94	116	110	110	G	142	102	98	96	96	98	94	94
15	90	88	88	92	96	110	120	102	96	102	186	106	100	102	108	110	110	98	100	98	94	94	92	90
16	92	90	90	B	98	G	106	98	100	94	88	94	98	94	112	106	102	98	98	96	94	92	90	88
17	94	86	86	88	B	120	108	98	92	92	90	94	92	96	144	124	104	106	102	104	104	98	92	94
18	94	B	B	82	86	110	114	108	104	98	98	98	92	G	G	116	112	102	100	104	94	94	94	94
19	86	88	88	92	98	108	108	100	98	96	B	96	92	B	B	126	104	100	98	94	94	94	92	88
20	88	88	88	B	B	136	116	96	96	98	92	B	96	94	96	G	106	108	98	96	92	90	88	88
21	B	88	88	92	96	108	102	96	96	100	90	96	100	100	122	114	110	98	98	94	94	92	92	92
22	88	112	86	84	92	108	98	104	98	94	94	100	100	100	100	96	G	110	100	94	88	88	96	96
23	92	90	86	80	B	112	98	92	96	90	94	94	92	92	G	G	138	108	98	94	98	96	94	88
24	86	96	102	84	84	104	102	98	94	94	98	102	94	100	G	G	110	100	110	B	86	102	92	84
25	86	82	82	88	100	120	110	98	96	96	92	G	94	G	108	100	104	98	100	98	B	94	B	92
26	94	90	92	B	84	124	108	102	98	96	98	116	130	104	104	100	100	104	98	96	96	88	96	94
27	88	84	86	96	86	114	108	102	96	94	90	92	102	90	88	86	88	88	86	86	108	100	96	96
28	102	88	86	88	94	122	112	106	100	96	100	102	100	96	96	90	98	98	94	94	94	94	96	96
29	90	90	82	88	112	112	102	98	92	92	92	90	90	86	86	88	88	102	98	82	98	96	96	92
30	86	88	102	84	92	104	102	102	98	96	96	92	96	96	100	124	100	96	92	92	90	84	84	82
31	86	92	88	88	86	88	106	96	96	96	90	88	92	92	96	94	90	118	86	90	90	90	92	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	26	24	24	24	19	26	30	30	31	31	30	28	30	25	24	27	28	31	30	29	30	30	28	29
MED	91	89	88	88	92	114	108	100	98	96	94	96	98	100	103	110	106	102	98	94	94	94	94	92
U Q	92	90	92	92	98	124	112	102	100	98	98	102	102	107	111	124	112	106	100	96	96	96	96	95
L Q	88	88	86	84	86	108	106	98	96	94	90	93	94	92	96	100	100	98	94	93	94	92	92	89

IONOSPHERIC DATA STATION Kokubunji

MAY 2023 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							H 1		C 1	C 1	C 2	C 1	C 1	C 1	C 2	C 1		C 3	L 3	F 4	F 4	F 3	FF 24	FF 25
2	F 2			F 2		C 2	C 2	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	HC 11	L 1	L 1	C 3	F 4	F 1	F 3		
3				F 1		H 1	C 1	C 1	L 2	L 3	L 2		C 1	L 1		H 1	H 1	C 2	L 4	F 4	F 2			
4				F 1		HC 11	C 1	C 2	C 1	C 1	L 1	C 1	C 1	HL 11	C 1	L 2	L 2	C 2	L 3	F 3	F 2	F 2	F 2	F 2
5	F 2	F 1	F 1	F 1			C 1	C 2	C 2	L 2	C 1	C 1	C 1	L 2		C 2	C 1	C 2	C 3	F 4	F 3	FQ 51	FQ 31	F 3
6	FQ 31	F 4	F 4	F 2	FF 12	C 2	C 3	C 4	C 2	C 1	L 2	CL 23	C 1		H 1	C 1		C 2	C 3	F 4	F 2	F 4	F 4	F 5
7	F 3	F 1	F 1	F 1	F 2	C 1	C 3	C 1	C 1	C 1	HC 11	H 1	C 1	H 1	C 1	C 1	C 1	C 3	L 2	F 3	F 5	F 3	F 5	F 5
8	F 6	F 5	F 2	F 5	F 3	C 2	C 2	C 2	C 2	C 1	L 2	L 1	L 2	L 2	L 1	C 3	C 4	C 6	C 5	F 5	FQ 51	FQ 61	FQ 21	F 1
9	F 1					HC 11	C 1	C 3	L 3	L 3	L 2	L 2	C 1		C 1	C 3	C 1	C 2	C 3	F 7	F 3	F 4	FQ 41	F 6
10			F 1	F 1		C 1	C 1	C 1	C 4	L 3	C 1	C 1	C 1	H 1	L 2	C 1	C 2	C 3	L 4	F 6	F 6	F 3	F 5	F 5
11	F 3	F 5	F 4	F 4	F 4	L 3	C 2	C 4	C 2	L 2	C 1	C 2	C 1	H 1	C 1	H 1	C 1	C 2	C 4	F 3	F 2	F 2	F 3	F 6
12	FQ 21	F 1					C 2	C 2	C 2	L 2	L 3	HC 11	C 2	C 1	C 2	C 1	C 1	H 1			F 4	F 5	F 3	F 3
13	F 5	F 3	F 3			C 2	C 3	C 2	C 2	C 1	C 1	L 3				H 1	C 1	C 2	C 3	F 3	F 3	F 2	F 3	F 3
14	F 3	F 4	F 3	F 2	F 2			C 1	C 2	L 3	CL 22	L 2	C 1	C 2	C 1		H 1	C 2	C 4	F 4	F 7	F 2	F 3	F 3
15	F 2	F 2	F 2	F 3	F 2	C 2	C 1	C 3	C 2	C 1	HL 11	C 1	C 1	C 1	C 2	C 2	C 2	C 3	C 7	F 4	F 3	F 3	F 3	F 4
16	F 2	F 2	F 4		F 5		C 1	C 2	C 1	C 2	L 2	L 2	C 1	L 1	CL 21	C 3	C 4	C 4	C 4	F 5	F 6	F 3	F 4	F 3
17	F 1	F 2	F 1	F 1		C 1	C 2	C 2	L 3	L 3	L 2	L 1	L 2	L 1	H 1	C 1	C 3	C 4	C 4	F 2	F 5	F 3	F 3	F 2
18	F 3			F 2	F 1	C 2	C 2	C 1	C 1	C 1	C 1	C 1	L 1			C 1	C 1	C 2	C 2	CL 23	F 3	F 3	F 1	F 1
19	F 3	F 3	F 3	F 3	F 2	C 2	C 1	C 2	C 2	C 2		C 1	L 1			C 1	C 2	C 4	C 5	L 4	F 5	F 3	F 3	F 2
20	F 2	F 1	F 1			H 1	C 1	C 3	C 2	C 1	L 2		L 2	L 2	L 1		C 3	C 1	C 2	L 3	F 3	F 5	F 4	F 3
21		F 4	F 3	F 1	F 1	C 3	C 3	C 4	C 4	C 1	L 2	C 2	C 1	C 1	C 1	C 1	C 2	C 4	C 3	L 6	F 5	F 3	F 4	F 3
22	F 3	FF 21	F 4	F 4	F 2	C 2	C 4	C 2	C 3	L 2	L 2	C 1	C 1	C 1	C 1	C 1		C 1	C 2	L 2	F 5	F 4	F 5	F 2
23	F 1	F 2	F 3	F 3		C 1	C 3	L 2	C 4	L 2	L 2	L 2	L 2	L 2			H 1	C 1	C 4	L 4	FQ 21	F 4	FQ 31	F 3
24	F 3	F 1	F 3	F 1	F 1	C 1	C 1	C 2	L 2	L 2	C 1	C 1	L 1	C 1			C 1	C 1	CL 11		F 2	F 4	F 2	F 4
25	F 3	F 2	F 3	Q 1	F 1	C 1	C 2	C 3	C 2	C 1	L 1		L 1		C 1	C 2	C 1	C 2	C 2	C 2		F 2		F 2
26	F 1	F 2	F 2		F 2	C 1	C 1	C 2	C 2	L 2	C 1	CL 21	HC 11	C 4	C 2	C 3	C 3	C 3	C 4	L 6	F 3	F 4	F 4	FQ 31
27	FQ 31	F 3	F 2	FF 22	F 3	C 3	CL 21	C 4	C 3	C 2	L 2	L 2	C 1	L 3	L 3	L 3	L 3	L 2	LQ 31	L 3	F 3	F 2	F 4	F 5
28	F 2	F 3	F 2	F 2	F 3	C 1	C 2	C 2	C 3	C 2	C 1	C 1	C 2	C 2	C 2	L 3	C 3	C 3	L 4	L 3	F 6	F 2	F 5	F 4
29	F 3	F 3	F 4	F 3	FF 32	CF 32	C 4	C 4	L 3	L 3	L 4	L 4	L 3	LQ 31	L 3	L 2	L 2	CL 21	CL 22	L 3	FF 22	FF 33	FF 32	F 3
30	FQ 31	F 4	FF 24	F 4	F 2	CL 32	C 4	C 2	C 4	L 4	L 2	L 4	L 4	L 4	L 3	C 1	C 2	C 3	L 3	L 3	F 2	F 4	F 5	F 4
31	F 4	F 4	F 3	FQ 31	FQ 21	L 2	C 3	C 4	C 3	C 3	C 2	L 3	L 1	L 1	L 1	L 1	L 1	CL 11	L 4	L 3	F 2	F 2	F 2	F 2
	00	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																								

MAY 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 89	X 89	X 81	X 72	X 69	X 69															X 114	X 102	X 94	X 92
2	X 91	X 89	X 83	X 75	X 74	X 70															X 80	X 82	X 82	X 78
3	X 73	X 70	X 69	X 65	X 63	X 57															X 103	X 88	X 86	X 88
4	X 86	X 90	X 89	X 84	X 81	X 75															X 118	X 91	X 92	X 98
5	X 94	X 99	X 99	X 94	X 86	X 90															X 120	X 104	X 102	X 94
6	X 93	X 96	X 95	X 89	X 83	X 84															X 97	X 102	X 98	X 98
7	X 97	X 93	X 85	X 84	X 82	X 85															X 116	X 94	X 96	X 98
8	X 102	X 91	X 81	X 78	X 71	X 72															X 99	X 80	X 78	87
9	X 82	X 89	84	X 76	X 75	80															X 90	X 87	83	X 79
10	88	92	90	90	106	90	96														X 96	X 96	X 94	X 92
11	X 88	X 96	X 104	X 101	X 97	X 97															X 103	X 99	X 92	X 92
12	94	X 96	X 92	X 88	X 81	X 77															X 95	X 94	X 94	X 96
13	X 96	X 91	X 90	X 100	X 80	X 73															X 96	X 92	X 93	X 93
14	X 94	X 89	88	X 76	X 73	X 73															X 112	X 98	X 90	X 87
15	X 88	X 88	X 86	X 82	X 78	X 78															X 97	X 90	X 82	X 78
16	X 82	X 80	X 77	X 77	X 73	X 74															X 96	X 98	X 95	X 96
17	X 93	X 88	X 84	X 76	X 74	X 74															X 104	X 88	X 93	100
18	X 93	X 90	X 85	X 82	X 77	X 75															X 108	O X 96	X 99	X 97
19	X 94	X 92	X 88	X 86	X 90	X 88															X 102	X 98	X 98	X 96
20	X 96	X 92	X 88	X 78	X 76	X 81															X 98	X 90	X 90	X 92
21	X 84	X 83	X 82	X 84	X 85																X 83	X 86	X 83	X 80
22	X 80	75	77	X 78	X 82																X 104	X 89	X 87	X 89
23	96	109	108	105	X 89																X 93	X 90	X 87	104
24	X 107	109	X 90	X 90	90	83															X 96	X 94	X 92	X 87
25	X 98	X 109	X 122	X 98	X 67																X 90	X 92	104	X 98
26	X 99	X 103	X 98	X 74	X 74																X 92	X 93	X 97	X 95
27	X 98	X 107	X 102	X 88	X 86																X 97	X 93	94	106
28	X 93	X 92	X 92	83	76	73															X 104	X 102	X 100	X 94
29	X 106	X 109	X 102	X 82	X 79	86															X 107	X 94	X 87	90
30	92	92	92	X 76	83	83															X 108	X 105	X 101	X 98
31	X 99	105	104	88	X 74																X 100	X 97	X 91	X 90
	00	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	24	1														31	31	31	31
MED	X 93	X 92	X 89	X 83	X 79	X 78	96														X 99	X 94	X 93	X 93
U Q	X 97	X 99	X 98	X 89	X 85	X 84															X 107	X 98	X 97	X 98
L Q	X 88	X 89	X 84	X 76	X 74	X 73															X 96	X 90	X 87	X 88

MAY 2023 fxI (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

MAY 2023 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	83	83	75	66	63	63	72	85	83	88	98	111	118	120	123	125	118	114	111	109	108	96	88	86
2	85	83	77	69	68	64	69	79	81	87	101	99	120	139	129	122	125	129	129	110	74	76	76	72
3	67	64	63	59	57	51	66	87	89	88	96	110	120	127	122	122	120	116	122	122	97	82	80	81
4	80	84	83	78	75	69	80	89	89	98	110	118	119	125	119	116	119	120	123	130	112	85	86	92
5	88	93	93	88	80	83	106	99	82	86	98	A	115	122	118	115	114	116	121	128	114	98	96	88
6	87	90	89	83	77	78	106	97	84	82	94	105	115	116	109	119	130	135	124	111	91	96	92	92
7	91	87	79	78	76	79	85	91	103	109	116	123	132	132	118	112	111	124	132	132	110	88	90	92
8	96	85	75	72	65	66	79	90	96	A	90	100	104	106	108	103	97	92	94	98	93	74	72	F 76
9	76	83	F 74	70	69	F 70	85	100	87	95	106	111	122	119	114	107	106	109	109	107	84	81	F 75	73
10	F 73	F	F 79	F 80	F 73	F 78	F 87	87	89	93	98	96	108	112	108	108	A	110	102	94	90	90	88	86
11	82	90	98	95	91	91	102	98	88	101	85	92	103	110	105	112	113	104	102	102	97	93	86	86
12	F 87	90	86	82	75	71	83	94	96	94	93	98	106	110	116	120	121	124	113	100	89	88	88	90
13	90	85	84	94	74	67	84	101	95	96	100	106	111	113	110	114	116	108	96	95	90	86	87	88
14	88	83	F 80	70	67	67	75	75	96	111	96	82	92	109	110	113	112	104	104	110	J R 106	91	84	81
15	82	82	80	76	72	72	82	91	79	A	A	88	R 98	103	104	108	104	100	92	92	91	84	76	72
16	76	74	71	71	67	68	80	89	A	89	89	94	98	99	101	98	101	105	109	104	90	92	89	90
17	87	82	78	70	68	68	90	106	91	84	87	98	109	A	110	114	119	106	100	104	98	82	87	F 89
18	87	84	79	76	71	69	83	93	90	87	89	94	106	106	113	115	113	114	108	110	102	U R 90	93	91
19	88	86	82	80	84	82	95	103	110	90	88	96	100	106	108	108	109	112	115	111	96	92	92	90
20	90	86	82	72	70	75	92	102	91	84	90	102	108	112	114	122	102	96	103	J R 107	92	84	84	86
21	78	77	76	78	79	86	88	66	A	84	79	90	93	94	102	108	104	J R 102	88	81	77	80	77	74
22	74	F 67	F 68	72	76	67	77	94	90	A	80	83	100	A	113	112	110	95	90	95	98	83	81	83
23	F	F	F 94	F 87	83	69	79	85	83	74	78	88	98	103	109	113	118	106	95	87	87	84	81	F 79
24	U R 101	F 98	84	84	F 74	72	81	94	86	82	76	90	94	102	118	123	114	111	106	97	90	88	86	U R 81
25	U R 92	J R 103	116	92	61	63	72	77	83	76	A	85	95	94	96	100	96	97	93	84	84	86	F 77	92
26	93	97	R 92	68	68	71	88	90	83	89	91	100	109	120	116	110	108	102	108	A	86	87	91	89
27	92	101	96	82	80	74	85	88	72	A	89	101	113	107	A	100	94	99	103	99	91	87	F 83	F 96
28	87	86	86	F 73	F 66	F	76	92	86	90	89	94	103	104	103	104	108	108	109	108	98	96	94	U R 88
29	100	103	96	77	73	F 76	88	84	86	98	104	106	113	119	119	A	102	94	92	96	101	88	81	F 81
30	F 83	F 80	F 78	70	F 71	F 72	82	A	A	A	A	82	95	98	98	99	A	104	102	108	102	99	95	92
31	93	F 91	F 87	F	68	68	74	81	90	94	94	A	A	105	110	113	114	110	111	107	94	91	85	84
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	31	30	31	30	31	30	28	26	28	29	30	29	30	30	29	31	31	30	31	31	31	31
MED	87	85	82	76	72	70	83	90	88	89	92	98	107	110	110	112	112	108	106	106	93	88	86	86
U Q	91	90	89	82	76	76	88	97	91	95	98	106	115	120	118	116	118	114	113	110	101	92	90	90
L Q	82	82	77	70	68	67	77	85	83	84	88	90	98	104	108	108	104	102	96	96	90	84	81	81

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E 0SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	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 560	U L 588	L 568	L 540	A	L 568	L 556	L						
2									L	L	L		L 600	564	L 580	L 552	L 536	L						
3									L	L	A	A	A	L 592	564	552	L	A						
4									L	L	A	584	L 568	L 596	L 528	L 580	L 544	L						
5											A	A	604	L 584	L 540	L 572	L 552	L	L					
6										U L 636	L	572	L 580	L 592	U L 648	L 556	L 536	L						
7										A	A	L 568	L 572	576	U L 584	L	A							
8									A	A	L	U L 632	A	L 576	560	L 532	L 520	L						
9										A	A	A	A	A	L 600	A	L 548	L						
10									A	A	A	A	A	L 608	564	A	A	A						
11										L 548	L	L 604	L 588	580	A	568	528	U L 512	L					
12								L	L	U L 540	U L 608	U L 576	L 576	L 620	L 544	L 552	L 540	U L 476	L					
13									L	A	L	L	576	L	L 588	524	540	L 432						
14									L	A	A	520	A	592	A	A	A	A						
15								L	A	A	A	A	A	A	564	548	504	L						
16									A	A	L 532	A	U L 540	A	A	A	A	A						
17								L	L	L	L	U L 708	A	A	A	A	L							
18								L	L	L	L 588	A	548	A	552	544	A	A						
19									A	A	A	A	572	A	548	552	536	L 480	L	A				
20								L	A	A	A	U L 588	544	576	544	536	A	A						
21									A	L 528	A	A	U L 568	A	A	520	528	L 460	L					
22							L	L	A	A	A	A	A	A	A	504	A	A						
23									A	A	U L 576	576	544	544	528	536	L 512	L	L					
24								L	A	L 520	U L 560	564	L 564	532	528	532	L 504	L 464	L					
25									L	U L 552	A	A	A	L 564	540	528	496	468	L					
26									L	L 552	U L 532	540	A	A	A	A	536	L 492	U L 468	A				
27								L	496	A	U L 616	A	A	A	A	L 580	A	L 508	L					
28								L		A	A	A	A	A	U L 828	508	L 532	L 488	L 440					
29									A	540	A	548	A	A	560	A	A	A	L					
30								A	A	A	A	572	A	A	560	A	A	A	A					
31									A	A	A	A	A	A	A	A	504	L 488	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	8	8	15	16	16	21	21	19	11	2					
MED									496	544	L U 568	576	L 570	L 578	L 560	548	L 536	L 480	L 454					
U Q										U L 552	U L 598	U L 588	L 578	L 592	L 582	L 562	L 540	L 492						
L Q										L 534	U L 546	564	556	564	542	530	512	L 464						

MAY 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A 204	260	304	340	356	A	A 384	A	396	368	352	312	U A 244	A				
2							A 220	272	320	352	364	A	A	368	372	376	340	300	224	A				
3							A 196	A 272	A 316	A 348	A	A	A 384	A	A	372	348	312	244	A				
4							204	272	324	352	372	A	A 384	A	392	316	A	308	264	A				
5							A 200	280	328	356	376	356	A	412	388	368	348	316	248	A				
6							A 204	268	328	348	380	412	G 412	G 416	404	376	340	304	236	A				
7							A 188	A 292	324	352	A	A	384	388	392	372	340	308	U A 248	A				
8							220	280	340	368	384	400	A	A	400	376	348	304	244	A				
9							204	280	328	352	384	388	A	A	404	376	352	316	248	A				
10							240	284	324	356	376	396	396	396	380	372	352	312	A	A				
11							188	292	332	348	372	380	388	384	392	372	344	308	264	A				
12							200	296	A	364	384	400	400	400	396	368	348	304	240	B				
13							216	284	332	360	388	388	400	420	396	380	352	316	248	A				
14							188	284	316	348	A	404	404	404	392	376	356	316	244	A				
15							200	280	320	348	356	356	A	A	A 376		344	308	244	A				
16							A 204	268	A	A	A	A	A	A	396	364	340	296	240	A				
17							A 200	A 280	308	A	A	A	A	A	A	A	A	304	A	A				
18							A 216	276	316	340	A	A	A	A	408	380	356	304	248	A				
19							216	288	336	360	360	A	392	U A 396	B	A	348	312	248	A				
20							220	288	332	344	360	A	A	A	A	A	372	316	256	A				
21						B	212	276	U A 332	U A 352	A	A	U A 380	U A 392	A	A	A	A	256	A				
22						B	224	292	324	352	360	372	A	A	A	A	A	A	256	A				
23						B	220	268	320	340	U A 340	A	A	400	A	A	352	304	264	A				
24						B	184	268	312	348	356	U A 356	A	A	A	A	A	A	A	A				
25						B	200	280	308	A	A	A	A	A	A	A	A	308	248	A				
26						B	216	280	316	344	356	400	A	A	A	368	348	296	280	A				
27						A	216	276	312	A	A	A	A	A	A	A	A 332	312	248	A				
28						B	224	276	328	348	372	388	380	380	A	372	344	296	A	A				
29						A	196	272	316	348	A	A	A	A	A	A	A	A	A	A				
30						A	A	U A 300	U A 336	U A 352	372	388	396	U A 372	372	364	344	328	268	A				
31						A	200	288	336	376	U A 392	U A 404	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							21	28	28	26	21	16	11	14	16	20	23	26	25					
MED							212	280	324	352	372	388	396	396	394	372	348	308	248					
U Q							220	286	332	356	382	400	400	404	398	376	352	312	256					
L Q							200	272	316	348	358	376	384	384	390	368	344	304	244					

MAY 2023 foE (0.01MHz)

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	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 18	E B 16	J A 38	J A 38	19	E B 16	23	38	J A 56	J A 49	48	43	47	52	J A 59	43	G	38	J A 53	J A 36	J A 44	J A 84	J A 64	J A 20
2	J A 16	J A 22	J A 78	J A 36	J A 28	E B 16	J A 48	35	41	43	47	50	50	G	G	G	G	38	J A 44	J A 54	J A 86	J A 65	J A 43	J A 21
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B J A 33	J A 44	J A 50	J A 49	J A 83	J A 104	J A 80	45	J A 47	42	J A 54	J A 54	J A 54	J A 42	J A 46	J A 20	20	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	J A 18	24	32	40	43	J A 71	44	45	J A 64	J A 36	J A 40	J A 59	J A 48	J A 47	J A 50	J A 48	110	209	J A 54
5	J A 24	J A 21	J A 19	J A 32	J A 28	J A 22	22	32	J A 59	59	J A 88	J A 105	J A 95	52	G	41	44	J A 56	32	J A 24	J A 22	19	26	29
6	J A 22	J A 31	J A 42	J A 22	J A 20	E B 16	30	J A 52	J A 64	46	J A 79	J A 88	48	47	44	J A 67	J A 59	J A 48	J A 52	J A 59	J A 44	49	65	J A 26
7	J A 35	J A 24	J A 40	J A 32	J A 48	J A 32	J A 35	35	J A 52	J A 72	J A 78	J A 150	J A 84	46	48	52	J A 64	J A 71	J A 82	J A 108	J A 85	64	J A 87	J A 84
8	J A 98	J A 42	J A 60	J A 50	J A 37	E B 16	J A 37	J A 48	J A 72	J A 101	J A 70	J A 65	J A 102	J A 198	J A 55	42	G	J A 44	J A 52	J A 53	J A 31	109	J A 86	J A 30
9	J A 29	J A 32	J A 28	J A 24	E B 16	E B 16	J A 34	J A 47	J A 54	J A 69	J A 74	J A 109	J A 75	J A 121	50	J A 66	47	G	J A 37	J A 74	J A 88	J A 121	J A 86	J A 148
10	J A 89	J A 19	E B 16	J A 19	J A 84	J A 59	31	J A 50	J A 73	J A 88	J A 88	J A 72	J A 68	J A 65	48	J A 58	J A 118	J A 69	J A 36	J A 44	J A 65	J A 66	J A 74	J A 108
11	J A 50	E B 16	J A 19	J A 23	J A 25	J A 26	24	J A 49	J A 70	J A 62	J A 43	J A 110	J A 54	J A 47	J A 90	49	G	G	G	J A 30	J A 74	J A 39	J A 33	J A 39
12	J A 54	J A 33	J A 32	J A 20	J A 16	E B 16	24	G	J A 44	G	G	G	52	J A 59	43	43	G	G	G	E B 16	J A 16	J A 33	J A 33	J A 42
13	J A 39	J A 22	J A 86	J A 66	J A 49	J A 42	J A 50	J A 72	J A 50	J A 53	J A 65	J A 68	J A 56	J A 47	G	43	38	38	J A 54	J A 26	J A 30	J A 24	J A 86	J A 46
14	J A 61	J A 84	J A 49	J A 25	J A 20	J A 18	25	38	J A 53	J A 64	J A 88	46	J A 85	51	J A 64	J A 103	J A 89	J A 60	J A 67	J A 45	J A 73	J A 24	J A 53	J A 45
15	J A 42	J A 42	J A 26	J A 22	E B 16	E B 16	25	J A 43	J A 82	J A 90	J A 80	J A 78	J A 88	J A 78	46	51	48	37	J A 62	J A 80	J A 81	J A 74	J A 18	J A 83
16	E B 16	J A 25	J A 24	J A 18	J A 42	J A 26	J A 54	J A 54	J A 124	J A 74	J A 64	J A 68	J A 84	J A 94	J A 73	J A 78	J A 83	J A 87	J A 80	J A 84	J A 103	J A 68	J A 32	J A 52
17	J A 29	J A 23	J A 19	J A 19	E B 16	E B 16	J A 77	J A 37	J A 52	J A 61	J A 80	J A 91	J A 88	J A 141	J A 86	J A 66	J A 72	J A 58	J A 57	J A 74	J A 77	J A 77	J A 35	J A 85
18	J A 110	J A 62	18	J A 15	E B 16	20	28	35	41	J A 54	J A 59	J A 88	46	J A 85	46	48	J A 64	J A 71	J A 76	J A 97	J A 104	J A 46	J A 113	J A 47
19	J A 33	J A 33	J A 21	J A 31	J A 28	J A 21	J A 45	J A 54	J A 63	J A 70	J A 59	J A 64	J A 62	J A 64	E B 52	J A 40	43	34	32	J A 34	J A 45	J A 98	J A 29	J A 85
20	J A 52	J A 26	J A 22	J A 29	J A 20	E B 16	32	J A 42	J A 76	J A 71	J A 90	J A 60	J A 47	42	J A 59	44	J A 59	J A 85	J A 78	J A 79	J A 39	J A 52	J A 83	J A 36
21	J A 23	J A 39	J A 32	J A 39	J A 52	E B 16	J A 39	J A 46	J A 82	J A 58	J A 77	J A 59	J A 55	J A 75	J A 115	J A 60	J A 42	36	J A 42	78	J A 84	J A 87	J A 53	J A 46
22	J A 21	J A 25	18	E B 16	E B 16	E B 16	J A 35	J A 47	J A 74	J A 117	J A 110	J A 106	J A 121	J A 106	J A 150	J A 183	J A 130	J A 53	J A 49	J A 54	J A 53	J A 36	J A 53	J A 41
23	J A 24	J A 50	J A 52	J A 39	J A 28	J A 21	27	J A 64	J A 88	J A 100	J A 94	J A 92	J A 110	44	J A 50	46	45	32	J A 49	J A 84	J A 108	J A 77	J A 48	J A 86
24	J A 64	J A 79	J A 104	J A 87	J A 37	J A 25	J A 86	J A 42	J A 70	J A 86	J A 86	J A 71	J A 58	J A 49	J A 80	J A 69	J A 43	J A 37	J A 37	J A 27	J A 35	J A 24	J A 26	J A 39
25	J A 78	J A 31	J A 18	J A 18	J A 25	J A 26	32	35	35	J A 63	J A 97	J A 122	J A 89	J A 76	J A 54	J A 48	36	36	33	J A 77	J A 75	J A 40	J A 25	J A 21
26	J A 23	J A 32	J A 23	J A 23	E B 16	E B 16	29	37	J A 50	J A 59	J A 83	43	J A 83	J A 66	J A 64	J A 56	39	32	G	J A 110	J A 110	J A 61	J A 53	J A 36
27	J A 53	J A 42	J A 30	J A 36	J A 45	J A 32	32	43	39	J A 158	J A 69	J A 85	J A 89	J A 99	J A 255	J A 109	J A 68	38	28	23	J A 25	J A 52	J A 53	J A 81
28	J A 40	J A 24	J A 84	J A 89	J A 52	J A 22	J A 71	J A 42	J A 58	J A 71	J A 70	J A 62	J A 91	J A 84	J A 150	52	J A 61	J A 89	J A 63	J A 54	J A 54	J A 42	J A 41	J A 31
29	J A 65	J A 51	J A 52	J A 51	J A 50	J A 29	J A 58	J A 120	J A 280	J A 101	J A 109	J A 96	J A 242	J A 234	J A 78	J A 131	J A 110	J A 66	J A 43	J A 70	J A 64	J A 68	J A 59	J A 48
30	J A 76	J A 50	J A 75	J A 111	J A 66	J A 36	J A 122	J A 174	J A 138	J A 152	J A 97	45	J A 65	J A 162	J A 74	J A 121	J A 116	J A 70	J A 122	J A 83	J A 107	J A 52	J A 63	J A 39
31	J A 46	J A 66	J A 146	J A 32	J A 30	J A 23	25	J A 72	J A 81	J A 90	J A 104	J A 110	J A 128	J A 189	J A 82	J A 68	J A 69	J A 47	J A 54	J A 109	J A 52	J A 86	J A 84	J A 44
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 39	J A 31	J A 30	J A 29	J A 28	J A 20	32	J A 43	J A 59	J A 69	J A 79	J A 72	J A 80	J A 65	J A 55	J A 52	J A 54	J A 47	J A 49	J A 54	J A 64	J A 61	J A 53	J A 44
U Q	J A 61	J A 42	J A 52	J A 39	J A 45	J A 26	J A 48	J A 52	J A 76	J A 90	J A 88	J A 104	J A 89	J A 99	J A 80	J A 68	J A 69	J A 66	J A 62	J A 80	J A 85	J A 77	J A 83	J A 81
L Q	J A 23	22	19	J A 19	E B 16	E B 16	25	37	50	54	65	59	54	47	46	43	G 39	36	36	J A 36	J A 44	J A 39	J A 33	J A 31

MAY 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	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	24	E B 16	E B 16	22	37	46	43	46	43	46	50	53	40	G	36	29	32	26	20	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	42	33	40	42	47	50	49	G	G	G	G	35	35	42	21	28	E B 16	18
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	28	42	35	43	60	56	56	42	42	40	50	50	51	28	23	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	24	31	38	42	59	43	43	45	G 33	39	45	46	44	36	40	20	24	30
5	E B 16	18	E B 16	21	E B 16	E B 16	21	31	53	55	64	A A 105	51	47	G	40	40	46	30	22	E B 16	E B 16	E B 16	19
6	E B 16	E B 16	29	20	E B 16	E B 16	28	51	52	44	54	46	47	46	44	42	40	36	47	44	40	35	28	22
7	22	19	26	27	23	22	25	35	50	64	61	50	52	44	48	50	58	60	50	104	63	22	40	44
8	E B 16	24	E B 16	28	22	E B 16	34	44	63	A A 101	59	50	64	45	44	G 28	G	42	49	52	22	E B 16	55	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	31	38	45	66	68	105	65	93	43	58	45	G 36	55	76	20	58	E B 16	
10	E B 16	E B 16	E B 16	E B 16	E B 16	22	26	42	67	80	70	68	68	50	46	54	A A 118	54	34	24	21	20	36	67
11	26	E B 16	E B 16	E B 16	21	22	24	42	43	42	42	57	52	45	70	46	G	G	G	24	E B 16	E B 16	E B 16	22
12	31	E B 16	E B 16	E B 16	E B 16	E B 16	23	G	37	G	G	G	51	53	43	42	G	G	G	E B 16	E B 16	28	22	35
13	21	E B 16	E B 16	E B 16	E B 16	E B 16	36	64	43	50	56	55	49	47	G	42	38	37	50	23	25	18	23	26
14	E B 16	21	E B 16	E B 16	E B 16	E B 16	25	35	51	52	80	45	78	46	58	97	52	45	58	35	24	E B 16	28	28
15	31	27	E B 16	E B 16	E B 16	E B 16	24	33	71	A A 90	A A 80	63	74	57	45	50	45	34	51	77	40	41	E B 16	22
16	E B 16	E B 16	E B 16	E B 16	19	E B 16	38	41	A A 124	56	45	53	46	61	64	74	80	64	77	78	66	62	21	22
17	21	E B 16	E B 16	E B 16	E B 16	E B 16	45	31	38	44	48	62	79	A A 141	75	61	45	43	56	62	57	44	20	49
18	28	E B 16	E B 16	E B 16	E B 16	E B 15	26	35	39	45	47	55	43	78	46	46	58	49	66	96	27	20	28	24
19	E B 16	20	E B 16	24	19	E B 16	37	49	50	57	58	58	54	57	E B 52	40	43	34	30	29	36	44	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	31	35	54	62	83	49	44	42	46	43	54	80	72	78	23	43	27	25
21	18	24	E B 16	30	24	E B 16	29	33	A A 82	50	62	55	53	70	63	50	39	33	32	74	58	28	28	22
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	29	40	63	A A 117	65	66	66	A A 106	91	41	63	48	42	47	46	E B 16	34	E B 16
23	21	24	27	29	E B 16	E B 16	26	40	76	52	46	44	52	43	43	45	41	31	32	53	40	E B 16	23	E B 16
24	21	25	19	42	25	E B 16	28	34	59	43	54	44	48	41	44	39	38	33	26	20	E B 16	E B 16	E B 16	E B 16
25	32	E B 16	E B 16	E B 16	E B 16	E B 16	29	34	34	42	A A 97	58	56	54	40	40	34	34	30	55	51	27	E B 16	E B 16
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	36	37	43	46	43	60	58	60	48	39	32	G	A A 110	E B 16	22	21	20
27	E B 16	22	E B 16	E B 17	22	20	29	32	38	A A 158	46	54	59	57	A A 255	42	61	35	27	21	19	E B 16	41	48
28	26	E B 16	22	41	32	E B 16	65	36	55	67	70	57	57	73	78	A A 50	51	43	35	26	20	23	21	17
29	40	23	21	22	24	19	32	75	67	46	60	50	71	77	52	A A 131	70	62	37	29	E B 16	21	26	24
30	20	E B 16	E B 16	42	30	20	43	A A 174	A A 138	A A 152	A A 97	43	60	68	51	53	A A 116	57	50	70	37	36	40	32
31	20	30	22	22	18	20	24	62	73	69	78	A A 110	A A 128	77	75	60	44	38	40	49	37	36	22	32
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	28	36	51	52	59	54	54	53	46	45	45	38	37	44	26	21	23	22
U Q	22	22	16	24	22	16	34	42	67	A A 67	70	58	65	70	63	53	58	49	50	70	40	35	28	30
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	33	39	43	47	45	49	45	43	40	G 38	34	30	26	E B 20	E B 16	E B 16	E B 16

MAY 2023 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

MAY 2023 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	16	20	20	25	25	27	24	25	22	20	20	16	16	16	16	16	16
2	16	16	16	16	16	16	16	16	18	21	23	26	24	25	25	22	19	19	16	16	16	16	16	16
3	16	16	16	16	16	16	16	15	17	21	23	21	24	24	29	22	21	19	17	16	16	16	16	16
4	16	16	16	16	16	16	16	16	20	22	22	26	26	27	26	22	22	20	21	16	16	16	16	16
5	16	16	16	16	16	16	16	16	20	20	24	24	24	26	24	28	23	23	17	16	16	16	16	16
6	16	16	16	16	16	16	16	16	19	21	26	27	28	35	26	28	20	20	16	16	16	16	16	16
7	16	16	16	16	16	16	16	16	18	20	24	24	24	22	27	21	23	18	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	24	27	29	31	31	33	22	20	21	19	16	16	16	16	16	16
9	16	16	16	16	16	16	16	16	18	20	26	29	34	50	27	24	22	22	14	15	16	16	16	16
10	16	16	16	16	16	16	16	16	18	20	26	31	29	24	25	24	22	20	16	16	16	16	16	16
11	16	16	16	16	16	16	16	18	18	22	24	25	28	23	26	22	21	19	19	15	16	16	16	16
12	16	16	16	16	16	16	16	16	18	20	20	26	28	28	22	22	22	18	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	19	24	28	29	29	24	24	23	20	21	17	16	16	16	16	16
14	16	16	16	16	16	16	16	17	19	23	22	24	32	26	31	27	22	19	17	16	16	16	16	16
15	16	16	16	16	16	16	16	18	21	21	21	22	25	33	29	28	21	22	18	16	16	16	16	16
16	16	16	16	16	16	16	16	16	20	20	22	23	22	29	23	23	21	16	16	16	16	16	16	16
17	16	16	16	16	16	16	16	16	19	21	23	24	23	28	25	22	19	17	16	16	16	16	16	16
18	16	16	16	16	16	15	16	16	17	20	24	27	23	26	30	27	28	18	16	16	16	16	16	16
19	16	16	16	16	16	16	17	19	23	21	31	26	35	28	52	27	23	22	21	16	16	16	16	16
20	16	16	16	16	16	16	16	17	21	21	27	22	28	27	28	23	25	28	16	14	14	16	16	16
21	16	16	16	16	16	16	16	19	20	22	21	24	31	30	29	27	19	21	16	16	16	16	16	16
22	16	16	16	16	16	16	16	16	17	20	21	23	29	27	24	20	22	20	19	16	16	16	16	16
23	16	16	16	16	16	16	16	15	17	20	22	24	30	27	25	25	21	21	16	15	16	16	16	16
24	16	16	16	16	16	16	16	16	16	21	23	22	22	36	23	26	20	22	16	16	16	16	16	16
25	16	16	16	16	16	16	16	16	18	20	21	22	26	22	25	24	19	19	16	16	16	16	16	16
26	16	16	16	16	16	16	16	19	16	22	22	25	28	23	19	22	20	20	16	15	16	16	16	16
27	16	16	16	17	16	16	16	15	23	20	21	24	26	24	23	22	21	17	17	16	16	16	16	16
28	16	16	16	16	16	16	16	16	17	18	23	22	26	25	23	22	20	18	17	14	16	16	16	16
29	16	16	16	16	16	16	16	16	16	20	22	22	22	29	23	22	20	18	16	16	16	16	16	16
30	16	16	16	16	16	16	16	16	18	20	24	26	22	22	22	24	22	20	16	16	16	16	16	16
31	16	16	16	16	16	16	16	16	19	20	22	25	24	26	31	24	22	22	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	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	16	16	16	16	16	16	16	18	20	23	24	26	26	25	23	21	20	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	20	21	25	26	29	29	28	26	22	21	17	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	17	20	22	23	24	24	23	22	20	18	16	16	16	16	16	16

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E 0SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	282	278	297	294	300	306	356	349	333	311	293	290	293	296	291	301	301	299	292	307	308	325	278	278
2	283	298	295	272	273	259	283	293	321	286	301	285	287	306	298	293	289	309	330	345	271	256	271	287
3	280	278	296	305	301	294	321	340	339	300	281	285	287	298	291	291	291	302	307	319	326	265	268	271
4	269	280	288	291	297	307	331	340	317	295	292	296	290	294	281	280	279	287	299	319	331	275	265	279
5	275	280	301	303	288	300	342	349	348	288	294	A	277	289	295	286	290	288	303	321	312	312	294	283
6	273	276	294	287	278	290	344	355	355	291	291	283	292	278	254	267	281	308	306	313	272	268	276	269
7	279	282	280	286	286	297	304	305	286	283	286	294	302	307	302	282	281	294	314	330	322	292	263	277
8	283	287	283	288	266	284	311	316	323	A	260	274	272	279	296	296	296	298	296	296	325	274	262	F 257
9	281	298	F 262	275	262	F 272	326	328	303	264	277	275	282	286	287	278	282	289	301	313	310	283	F 269	284
10	F 274	F	F 288	F 288	F 270	F 277	F 316	302	307	291	299	263	275	278	276	278	A	301	298	288	275	272	261	277
11	249	278	307	285	285	287	309	330	314	321	308	277	280	286	286	288	292	289	284	290	292	292	276	273
12	F 267	275	285	287	289	291	309	313	318	310	294	267	285	276	283	281	283	298	308	310	276	268	262	266
13	270	267	256	308	306	276	299	327	301	296	280	276	278	282	283	290	307	306	300	293	286	278	268	269
14	281	290	F 302	304	288	271	335	310	280	325	303	287	262	283	287	291	292	294	285	292	J R 310	281	273	265
15	265	279	282	298	272	268	303	333	290	A	A	289	R 264	286	282	286	311	301	304	291	301	295	270	259
16	287	276	276	293	283	303	314	319	A	313	291	274	273	284	295	288	287	293	301	321	266	295	275	268
17	279	283	294	282	280	281	308	325	325	301	273	260	279	A	282	292	304	302	304	309	307	282	289	F 269
18	281	286	285	290	296	285	304	319	307	308	279	270	284	273	288	294	298	307	303	306	297	U R 292	280	281
19	282	287	285	286	286	308	302	304	336	296	291	274	280	285	288	284	291	294	305	315	300	284	277	271
20	281	290	298	280	268	265	313	331	315	279	A	254	251	260	261	291	288	273	277	J R 295	292	257	266	286
21	279	268	264	273	279	318	353	327	A	299	278	270	266	271	275	283	294	J R 307	316	A	278	269	269	263
22	271	F 259	F 268	265	275	288	295	320	325	A	265	280	282	A	293	289	298	290	291	280	311	285	262	265
23	F	F	F 286	F 291	285	270	323	323	324	330	277	265	281	275	281	281	301	301	299	292	290	275	287	F 243
24	U R 275	F 290	294	280	F 301	302	289	321	317	322	275	275	271	270	284	295	291	297	296	306	299	280	279	U R 265
25	U R 295	J R 285	322	353	271	292	326	313	339	299	A	281	284	283	292	296	300	301	305	277	270	267	F 274	267
26	277	294	R 329	282	278	303	319	321	285	311	274	277	273	294	285	278	283	302	302	A	281	271	283	278
27	266	297	298	300	313	288	309	349	329	A	256	267	303	291	A	286	277	271	284	296	298	301	F 263	F 279
28	311	300	320	F 289	F 299	F	320	329	314	300	280	265	267	274	268	276	285	289	291	302	297	273	287	U R 296
29	267	298	318	289	304	F 313	311	336	268	273	276	287	282	286	306	A	299	284	277	288	297	326	286	F 273
30	F 282	F 290	F 272	286	F 269	F 286	306	A	A	A	A	256	271	287	276	276	A	285	289	281	284	280	289	272
31	267	F 288	F 298	F	282	288	314	307	286	302	277	A	A	265	277	284	286	284	291	304	292	287	268	282
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	31	30	31	30	31	30	28	26	27	29	30	29	30	30	29	31	31	29	31	31	31	31
MED	279	285	294	288	285	288	313	324	317	300	280	275	280	284	286	286	291	297	300	304	297	280	273	272
U Q	282	290	298	294	297	302	326	333	327	311	293	285	285	290	292	291	298	302	305	314	310	292	280	279
L Q	270	278	282	282	273	277	304	313	302	291	276	267	272	276	281	281	284	289	291	292	281	271	266	266

MAY 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 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 366	U L 357	L 358	U A 364	A	L 343	L 370	L						
2									L	L	L		L 336	366	L 365	L 353	L 350	L						
3									L	L	A	A	A	L 364	362	354	L	A						
4									L	L	A	363	L 364	L 352	L 394	L 343	L 339	L						
5											A	A	341	L 356	L 366	L 353	L 353	L	L					
6										U L 354	L	355	L 348	L 348	U L 325	L 342	L 334	L						
7										A	A	L 375	L 354	349	U L 362	L	A							
8									A	A	L	U L 344	A	L 341	348	L 362	L 366	L						
9										A	A	A	A	A	L 348	A	L 346	L						
10									A	A	A	A	A	L 331	351	A	A	A						
11										L 365	L	L 329	L 338	354	A	340	374	U L 377	L					
12								L	L	U L 382	U L 358	U L 386	L 343	L 351	L 380	L 343	L 356	U L 377	L					
13									L	A	L	L	363	L	L 357	370	365	L 383						
14									L	A	A	400	A	342	A	A	A	A						
15								L	A	A	A	A	A	A	341	352	A 372	L						
16									A	A	L 378	A	U L 373	A	A	A	A	A						
17								L	L	L	L	U L 323	A	A	A	A	L							
18								L	L	L	L 350	A	386	A	350	342	A	A						
19									A	A	A	A	A	A	A	346	344	L 359	L	A				
20								L	A	A	A	U L 332	375	350	349	355	A	A						
21									A	A	A	A	A	A	A	A	350	L 361	L					
22							L	L	A	A	A	A	A	A	A	379	A	A						
23									A	A	U L 347	347	A	377	382	357	L 354	L	L					
24								L	A	L 365	A	369	L 361	398	373	359	L 357	L 372	L					
25									L	U L 375	A	A	A	A	364	363	360	353	L					
26									L	L 358	U L 385	387	A	A	A	A	349	L 373	U L 354	A				
27								L	401	A	U L 329	A	A	A	A	L 339	A	L 342	L					
28								L		A	A	A	A	A	A	A	A	A	L 354					
29									A	376	A	366	A	A	A	A	A	A	L					
30								A	A	A	A	381	A	A	351	A	A	A	A					
31									A	A	A	A	A	A	A	A	360	L 348	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	7	7	15	13	15	18	19	18	10	2					
MED									401	L 365	U L 358	363	L 358	352	360	353	L 355	L 366	L 354					
U Q										376	L 378	381	368	364	L 366	359	365	U L 377						
L Q										L 358	U L 347	U L 344	L 342	L 348	349	L 343	L 349	L 353						

MAY 2023 M(3000)F1 (0.01)

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MAY 2023 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										268	298	294	286	280	284	292	274	262						
2									226	318	272		304	276	274	288	296	262						
3									234	244	E A 272	292	292	288	290	302	284	274						
4									228	266	292	292	278	300	280	310	310	290						
5											300	A	326	306	280	294	296	302	260					
6										326	308	314	290	316	358	360	308	250						
7										290	290	280	284	284	274	294	296							
8									254	A	368	318	330	326	292	282	280	278						
9										354	302	E A 448	324	324	306	310	312	286						
10									286	E A 354	304	362	334	322	332	320	A	278						
11										266	238	340	320	302	306	314	290	284	280					
12								230	246	252	290	324	304	328	320	310	292	278	236					
13									268	242	312	318	318	286	314	300	270	260						
14									312	250	E A 322	246	E A 406	324	300	E A 354	298	266						
15								248	E A 376	A	A	330	344	312	318	298	270	268						
16									A	282	296	300	300	332	304	E A 316	E A 336	300						
17								250	216	250	258	376	350	A	334	296	290							
18								238	224	280	342	334	318	E A 348	312	300	282	278						
19									244	264	288	346	324	316	310	304	292	288	256	240				
20								224	244	E A 316	E A 518	364	362	354	364	300	300	E A 378						
21									A	302	384	340	324	E A 354	342	300	290	268	254					
22							258	260	248	A	E A 372	354	348	A	334	298	278	268						
23									E A 320	246	354	360	328	328	318	318	276	260	246					
24								242	230	274	350	344	336	350	310	296	286	262	256					
25									232	300	A	334	322	330	314	306	284	278	248					
26									222	288	272	310	334	296	296	282	304	276	290	A				
27								234	266	A	348	312	288	298	A	318	322	306	270					
28								240		E A 298	E A 332	344	340	334	374	324	330	288	276					
29									E A 350	332	276	296	334	326	278	A	E A 292	E A 304	280					
30								A	A	A	A	388	350	332	332	334	A	304	288					
31									E A 336	E A 292	E A 356	A	A	358	340	314	306	290	288					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	9	21	25	28	28	30	29	30	30	29	29	14	1				
MED							258	240	239	274	297	330	324	320	311	302	292	278	265	240				
U Q								249	E A 299	309	349	350	336	332	332	316	305	290	280					
L Q								232	229	258	289	305	304	299	292	296	283	267	254					

MAY 2023 h'F2 (KM)

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 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	258	242	248	260	232	234	202	200	220	206	228	188	234	E A 264	A	206	202	228	226	244	242	220	224	258
2	258	250	224	246	290	304	E A 272	210	216	200	250	B 260	262	198	196	200	212	242	240	208	E A 202	E A 302	284	268
3	254	266	250	236	228	238	232	228	196	214	A	A	A	188	204	204	E A 270	A	260	230	214	220	282	296
4	290	274	258	242	238	202	216	220	206	206	A	182	190	196	180	216	250	E A 264	272	244	220	206	E A 292	296
5	286	286	244	244	234	248	226	204	220	E A 240	A	A	E A 254	228	208	208	214	290	238	238	216	220	232	244
6	284	288	266	238	250	280	226	214	218	194	E A 270	224	246	238	228	208	240	238	244	248	264	E A 292	300	284
7	266	260	278	280	278	262	222	212	E A 244	A	A	E A 228	E A 268	204	242	258	A	288	256	E A 274	226	228	E A 314	E A 312
8	270	264	270	270	302	268	222	230	A	A	A	264	A	212	226	208	210	E A 254	274	E A 272	224	202	E A 396	312
9	278	250	278	282	272	280	230	234	236	A	A	A	A	A	232	A	246	222	250	250	E A 352	242	E A 370	258
10	304	296	Q 262	258	308	286	222	222	A	A	A	A	A	E A 268	236	A	A	A	242	242	254	274	E A 312	E A 366
11	E A 352	274	238	240	248	248	230	226	238	208	194	E A 324	E A 282	206	A	E A 262	200	208	220	254	248	242	252	298
12	E A 308	276	270	254	242	240	224	206	198	202	186	176	E A 280	E A 264	202	234	204	218	228	228	248	274	298	326
13	300	284	306	242	202	268	238	246	214	A	E A 290	E A 292	E A 230	254	196	214	206	224	258	238	250	256	310	276
14	280	258	250	220	Q 258	262	214	220	E A 290	A	A	210	A	238	A	A	A	A	E A 288	256	244	230	276	E A 306
15	E A 322	298	276	240	288	284	214	224	A	A	A	A	A	A	232	E A 278	E A 252	218	268	E A 346	E A 266	E A 266	234	E A 332
16	254	278	268	256	262	242	240	230	A	A	214	A	230	A	A	A	A	A	E A 282	268	E A 342	E A 308	E A 252	280
17	280	280	246	246	264	282	252	208	210	224	232	E A 302	A	A	A	A	A	256	266	274	E A 264	E A 294	234	E A 332
18	E A 296	262	250	Q 254	Q 248	260	218	218	198	232	224	A	188	A	224	264	A	A	272	E A 338	E A 224	E A 244	E A 274	282
19	280	268	260	274	256	242	236	244	A	A	A	A	A	A	A	206	246	202	220	A	242	E A 276	250	304
20	274	266	250	256	306	300	238	214	A	A	A	E A 266	194	200	E A 246	240	A	A	E A 330	E A 308	234	E A 310	E A 308	268
21	264	E A 296	300	E A 300	278	218	206	216	A	A	A	A	E A 292	A	A	A	218	214	216	E A 360	E A 348	E A 290	E A 294	E A 308
22	292	320	298	284	264	240	238	A	A	A	A	A	A	A	A	200	A	A	276	286	254	226	320	296
23	E A 298	E A 298	286	E A 256	242	260	230	238	A	A	228	208	A	222	200	234	230	212	238	E A 278	270	252	E A 254	E A 360
24	E A 274	E A 262	230	E A 280	E A 260	222	256	222	A	222	E A 340	198	E A 238	186	214	188	210	212	228	238	232	260	250	288
25	E A 310	268	226	188	E A 232	254	220	214	204	206	A	A	A	A	190	200	200	200	240	E A 274	E A 344	E A 296	284	278
26	270	228	208	254	244	246	240	210	194	210	204	210	A	A	A	A	202	204	204	A	250	284	274	286
27	290	262	232	228	234	244	214	204	184	A	226	A	A	A	A	210	A	210	226	240	228	246	E A 338	E A 288
28	E A 222	240	228	E A 304	E A 278	274	E A 306	224	252	A	A	A	A	A	E A 342	A	A	E A 282	250	244	234	252	260	258
29	E A 292	270	218	E A 216	250	248	236	E A 290	A	224	A	E A 264	A	A	A	A	A	A	248	270	234	232	262	E A 268
30	264	258	276	E A 292	E A 298	248	E A 244	A	A	A	A	176	A	A	E A 276	A	A	A	A	E A 298	272	E A 274	E A 270	E A 280
31	E A 292	E A 270	244	Q 224	236	244	216	288	A	A	A	A	A	A	A	A	E A 242	232	A	252	E A 242	E A 256	E A 282	E A 278
	00	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	29	18	14	13	17	14	16	19	20	19	22	29	29	31	31	31	31
MED	273	267	250	248	252	248	227	220	212	208	221	U 203	U 217	210	214	208	212	220	244	246	239	U 241	U 267	283
U Q	E A 296	284	276	274	278	274	238	230	236	224	E A 260	E A 265	E A 268	E A 246	E A 236	237	246	254	270	E A 276	E A 264	E A 284	E A 308	E A 308
L Q	266	260	238	240	238	242	218	211	198	206	209	193	230	199	200	205	204	212	228	241	228	230	252	276

MAY 2023 h'F (KM)

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A 100		96	98	98	A	A	A	A	A	102	102	102	A				
2							A 100		98	98	98	A	A	98	98	98	100	100	104	A				
3							A	A	A	A	A	A	A	A	A	98	98	102	104	A				
4							124	102	100	100	100	A	A	A	100	96	A	104	104	A				
5							A 100		98	98	98	96	A	A	98	100	100	100	104	A				
6							A 100		100	100	100	100	102	104	102	100	100	100	100	A				
7							A	A	A	98	A	A	98	98	100	102	102	102	102	A				
8							122	A 118	100	100	100	100	A	A	98	102	102	102	102	A				
9							110	100	100	100	100	100	A	A	100	98	100	100	104	A				
10							114	102	100	98	98	98	98	98	98	100	100	100	A	A				
11							106	98	98	98	98	98	98	98	98	100	98	98	108	A				
12							104	96	A	96	102	100	100	100	98	98	100	100	100	B				
13							112	98	98	96	96	96	94	94	98	98	98	98	102	A				
14							102	100	98	94	A	94	104	104	104	104	100	100	100	A				
15							104	100	96	96	96	94	A	A	A	98	98	98	102	A				
16							A	92	A	A	A	A	A	A	96	100	98	98	102	A				
17							A	A	102	A	A	A	A	A	A	A	A	104	A	A				
18							A	96	96	96	A	A	A	A	100	100	100	98	102	A				
19							104	100	100	96	96	A	104	100	B	A	100	102	104	A				
20							104	100	100	96	96	A	A	A	A	A	102	102	102	A				
21						B	102	100	96	98	A	A	98	98	A	A	A	A	100	A				
22						B	104	102	96	96	96	96	A	A	A	A	A	A	96	A				
23						B	104	98	96	96	94	A	A	104	A	A	A	100	100	A				
24						B	104	100	96	96	96	96	A	A	A	A	A	A	A	A				
25						B	98	100	96	A	A	A	A	A	A	A	A	100	102	A				
26						B	104	104	96	96	98	98	A	A	A	100	102	100	104	A				
27						A	104	98	98	A	A	A	A	A	A	A	98	102	104	A				
28						B	104	98	98	98	96	96	102	100	A	100	100	100	A	A				
29						A	100	96	92	96	A	A	A	A	A	A	A	A	A	A				
30						A	A	102	102	98	98	98	98	98	102	102	100	100	100	A				
31						A	100	100	100	98	98	96	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							21	28	27	26	21	16	11	13	15	19	22	26	25					
MED							104	100	98	98	98	97	98	98	98	100	100	100	102					
U Q							108	100	100	98	99	99	102	102	100	100	100	102	104					
L Q							103	98	96	96	96	96	98	98	98	98	98	100	100					

MAY 2023 h'E (KM)

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 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	84	B	120	84	82	B	146	100	96	102	96	106	108	108	104	108	G	102	98	90	90	92	92	88
2	90	90	92	90	90	B	102	102	100	98	160	192	156	G	G	G	G	110	102	100	100	92	90	88
3	B	B	B	B	B	B	94	90	96	92	86	86	86	92	98	146	112	104	100	98	92	100	98	B
4	B	B	B	B	B	96	132	126	102	96	92	92	92	88	90	94	84	106	100	92	92	96	92	88
5	90	88	84	84	84	84	122	110	94	94	90	90	106	106	G	124	110	102	106	96	94	94	102	84
6	84	88	88	88	98	B	106	98	98	98	98	108	182	164	140	100	102	102	96	92	92	92	92	88
7	90	92	90	88	86	84	90	112	100	92	92	92	96	136	118	114	108	100	96	92	90	90	92	92
8	92	90	90	92	90	B	108	100	98	98	98	98	94	96	124	140	G	104	98	92	92	96	96	96
9	124	90	90	90	B	B	104	102	98	96	90	90	90	90	126	102	104	G	102	94	98	98	96	100
10	100	90	B	82	94	90	128	100	98	96	96	96	100	110	124	106	98	98	100	96	96	96	102	98
11	92	B	92	92	90	90	136	108	100	100	100	96	96	102	104	126	G	G	G	102	98	94	94	94
12	94	96	92	90	82	B	134	G	98	G	G	G	118	112	140	140	G	G	G	B	104	92	94	94
13	92	92	92	94	94	94	110	102	102	100	96	96	102	154	G	174	148	108	98	98	96	94	94	90
14	92	92	86	88	92	104	116	104	96	92	88	106	106	108	108	98	98	100	100	96	96	92	86	86
15	82	86	82	86	B	B	120	104	96	94	94	88	88	90	130	112	110	138	102	98	100	96	92	92
16	B	90	94	90	90	84	98	92	90	90	90	90	90	90	104	102	102	98	96	94	94	90	94	104
17	88	88	88	92	B	B	98	102	100	90	90	90	88	88	88	88	106	116	104	96	96	100	90	94
18	92	114	90	90	B	108	104	104	98	96	92	88	100	96	150	134	108	104	100	94	96	96	94	90
19	90	90	90	90	84	88	100	98	98	94	94	90	96	96	B	92	120	126	106	98	94	94	94	94
20	90	86	86	88	92	B	106	108	98	94	90	90	96	96	94	196	114	102	98	94	92	90	90	88
21	88	84	86	90	92	B	110	102	96	96	92	92	94	94	90	90	90	92	104	94	96	90	90	88
22	90	84	86	B	B	B	106	102	94	90	92	92	88	88	86	90	90	94	104	94	92	92	92	92
23	82	84	82	82	82	92	108	96	92	92	88	94	88	170	88	122	114	148	102	92	92	92	88	98
24	90	88	88	84	84	104	94	100	96	96	96	96	90	88	88	96	94	90	88	86	86	86	84	102
25	92	92	106	92	94	92	114	112	102	90	88	88	84	86	88	90	94	108	98	92	94	92	94	90
26	86	82	88	90	B	B	118	104	96	96	100	184	92	94	92	100	112	122	G	94	94	90	92	90
27	98	88	98	96	90	94	116	114	106	88	94	108	96	90	88	92	96	108	126	106	80	96	96	98
28	90	90	94	88	90	126	106	104	96	96	96	96	96	B 96	90	98	98	96	92	92	92	84	84	86
29	88	90	90	88	88	110	98	98	96	90	90	94	92	88	88	84	86	86	108	112	92	96	96	96
30	92	90	90	84	86	90	94	96	94	92	90	104	96	94	98	94	96	104	112	90	90	84	86	82
31	82	84	100	82	82	86	118	100	96	96	90	88	88	84	86	86	100	84	84	96	84	116	100	88
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	28	28	23	18	31	30	31	30	30	30	31	30	27	30	26	28	28	30	31	31	31	30
MED	90	90	90	89	90	92	108	102	98	95	92	93	96	95	98	101	102	103	100	94	94	92	92	91
U Q	92	90	92	90	92	104	118	104	100	96	96	98	100	108	124	124	110	108	104	98	96	96	96	96
L Q	88	86	87	85	84	88	100	100	96	92	90	90	90	90	88	92	96	98	98	92	92	90	90	88

IONOSPHERIC DATA STATION Yamagawa

MAY 2023 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2		F1	F3	F1		H1	C3	C3	C2	C2	CL11	CL11	CL21	CL21	CL11		C1	C3	L6	F9	F6	F4	F2
2	F1	F2	F3	F2	F1		C7	C3	C2	C1	HC11	HL11	HL11					C1	C5	C7	F5	F5	F3	F2
3							L3	L4	L1	L2	L4	L3	L2	L1	C1	H1	C3	C2	C7	C7	F4	F2	F1	
4						F1	H2	C1	C2	C2	L2	L1	L1	L1	L1	L1	L3	C4	C3	L6	F9	F3	F4	F2
5	F1	F2	F1	F2	F1	F1	C1	C2	C5	C3	L2	L3	LL21	CL11		C1	C1	C2	C2	L1	F2	F2	FF22	F2
6	F1	F2	F7	F3	F1		C3	C4	C4	C2	C2	C1	H1	H1	H1	C2	C2	C2	L6	L9	F9	F5	F5	F3
7	F4	F2	F6	F9	FQ31	FQ41	LQ21	CL23	CL33	L3	L3	L2	C2	H1	C2	C2	C3	C3	L9	L9	F9	F5	FQ51	F6
8	F4	F7	F4	F4	F6		C6	CL61	C3	C3	C2	C1	L2	L2	C1	HL11		C3	C8	L9	F6	F3	F9	F4
9	F1	F2	F2	F1			C4	C4	C4	C3	L3	L5	L2	L2	C1	C2	C2		C4	L8	F7	FQ31	F7	F3
10	F3	F1		F2	F3	F8	C1	C5	C5	C4	C4	C3	C2	C1	C1	C2	C8	C6	C3	L5	FQ31	FQ71	F8	F7
11	F4		F1	F4	F6	F6	H1	C4	C3	C2	C1	C3	C1	C1	C4	C1				C5	FQ31	F3	F5	F8
12	F6	F4	F2	F1	F2		H1		C2				C1	C2	H1	H1					F1	F5	F5	F8
13	F4	F3	F3	F3	F3	F2	C4	C4	C3	C2	C2	C2	C1	H1		H1	H1	C1	C5	L2	F9	F4	F3	F6
14	F4	F3	F3	F3	F2	F1	C2	C2	C3	L2	L3	C1	C3	C1	C2	C3	C2	C3	C4	L7	F7	F4	FQ41	FQ31
15	F3	F4	F4	F1			C2	C2	C3	C5	C3	L3	L4	L2	HL11	C2	C3	H1	C7	C9	F5	F6	F3	F4
16		F3	F1	F1	F3	F2	C6	L4	L4	L4	L2	L3	L2	L3	C2	C5	C5	C6	C8	L9	F9	F8	F4	FF23
17	F3	F1	F1	F1			C4	C2	C2	L3	L3	L4	L3	L5	L5	L4	CL22	C4	CL52	C7	FF92	FF63	F4	F6
18	F6	FF12	F1	F1		F1	C3	C2	C2	C2	L3	L3	C1	L3	H1	H1	C2	C4	C4	L6	FQ31	FQ31	F3	F5
19	F5	F3	F2	F3	F1	F1	C4	C4	C4	C2	C2	L2	C2	C2		L1	C1	CL11	C3	C5	F9	F7	F3	F3
20	F3	F4	F3	F2	F1		C3	C2	C5	C3	L3	L2	L2	L1	L1	HC11	C2	C2	C8	L9	F9	F8	F4	F6
21	F4	F4	F2	F6	F5		C4	C1	C5	C3	C3	C2	L1	L4	L4	L2	L2	L2	C3	L9	F9	F4	F6	F4
22	F2	F2	F1				C4	C3	C4	L5	L4	L3	L3	L4	L4	L2	L4	L4	CH31	L8	F9	F8	F8	F4
23	F3	F6	F4	F3	F2	L1	C3	C4	C5	C3	L2	L1	LQ21	H1	L2	CL11	CL12	H1	C3	L7	F8	F4	F3	F4
24	F5	F5	F5	F3	F5	C1	L5	C3	C4	C3	C4	C2	L2	L1	L2	L2	L2	L2	L2	L2	F4	F2	F2	F2
25	F6	FQ21	F1	F2	F4	L1	C3	C2	C1	L2	L5	L4	L3	L2	L1	L1	L1	C2	C3	L9	F9	F7	F2	F1
26	F1	F1	F1	F1			C2	C3	C3	C2	C2	H1	L3	L2	L2	C2	C2	C1		L5	F4	F3	F3	F2
27	FF22	F3	F1	F2	F2	L2	C3	C2	C1	LQ51	L2	CL32	L2	L2	L4	L2	L3	C1	C1	C2	F4	F3	F9	F9
28	F4	F3	FF25	FQ71	FQ51	C1	C8	C3	C3	C5	C4	C3	C3	C3	L4	C3	C5	C4	L4	L3	F3	F8	F4	F3
29	FQ61	FQ51	FQ51	FQ61	F7	C3	C5	C5	CQ41	L5	L5	L3	LQ41	LQ61	L3	L7	L5	L6	CL43	CL43	F3	FF33	FF33	FF24
30	F3	F4	F3	F6	F5	L4	L5	C5	C7	L8	L4	C1	C3	L4	C2	C4	C7	C5	CL25	L6	F6	F6	F6	F5
31	F8	FQ51	FF13	F5	F5	L3	C1	C6	C5	C3	L5	L5	L5	L3	L3	L3	CL13	L3	L5	CL35	F5	FF39	FF28	F8
	00	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																								

MAY 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAY 2023 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 134	X 133	X 132	X 118	X 101	X 86															X 126	X 108	X 101	X 100
2	X 101	X 106	X 100	X 84	X 78	X 74															X 131	X 120	X 101	X 91
3	94	X 90	X 83	X 76	X 68	X 58															X 104	X 97	X 100	X 102
4	X 102	X 104	X 105	X 98	X 91	X 92															X 124	X 107	X 112	X 114
5	X 114	X 118	X 120	X 106	X 103	X 105															X 162	X 150	X 140	X 137
6	X 132	X 131	X 131	X 123	X 120	X 122															X 116	X 117	X 113	X 116
7	X 118	X 112	X 104	X 100	X 88	X 81															X 170	X 155	X 155	X 150
8	X 158	X 161	X 149	X 128	X 95	90															X 114	X 99	X 96	X 91
9	X 94	106	109	101	X 94	X 94	110														X 104	X 94	X 97	96
10	95	107	108	110	103	96	92														X 134	X 136	X 135	135
11	X 114	X 138	X 139	X 126	X 121	X 120															X 125	X 114	X 110	X 106
12	X 100	X 96	X 94	X 95	X 90	X 82															X 104	X 100	X 104	X 104
13	X 109	X 108	X 100	X 99	X 92	X 75															X 110	X 101	X 108	X 111
14	116	116	108	86	74	X 71															X 112	X 94	X 96	90
15	X 88	X 96	X 92	X 87	X 78	X 78															X 106	A	X 92	X 86
16	89	89	89	89	X 79	X 70															X 101	X 100	X 96	X 98
17	X 97	X 96	X 94	X 84	X 79	X 79															X 101	X 85	X 87	93
18	X 86	106	100	103	90	85	89														X 113	X 98	X 100	X 102
19	X 106	X 106	X 100	X 94	X 88	X 85															X 110	X 100	X 102	X 101
20	105	X 107	96	X 92	89	86	90														X 95	X 95	X 92	X 92
21	X 88	X 86	X 83	X 85	X 85	X 90															X 87	A	X 88	X 87
22	X 88	91	92	X 91	X 95	90															X 119	X 107	X 97	X 101
23	X 102	X 92	102	92	X 74	X 70															X 93	X 89	X 89	X 90
24	X 88	X 96	X 95	X 86	86	X 76	86														X 128	X 126	X 137	X 132
25	X 132	X 145	X 155	X 101	X 79	X 73															X 92	X 92	X 97	X 98
26	X 99	X 103	X 94	X 83	X 80	X 82															X 96	X 97	X 104	X 109
27	X 106	X 121	X 114	X 96	X 92	X 86															X 110	X 93	X 88	X 86
28	104	105	89	80	X 69	67															X 107	X 105	X 103	X 103
29	X 105	X 110	X 107	X 89	X 85	X 69															X 120	X 101	X 92	X 88
30	88	92	103	84	X 71	X 71															X 116	X 110	X 106	X 105
31	X 104	X 106	X 106	X 97	93	77															X 117	X 119	X 112	X 115
	00	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	5														31	29	31	31
MED	X 102	X 106	X 102	X 94	X 88	X 82	90														X 112	X 101	X 101	X 101
U Q	X 114	X 116	X 109	X 101	X 94	X 90	101														X 124	X 116	X 110	X 111
L Q	X 94	X 96	X 94	X 86	X 79	X 73	88														X 104	X 96	X 96	X 91

MAY 2023 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAY 2023 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	128	127	126	112	95	80	84	87	80	92	102	115	124	131	136	140	134	131	137	127	120	102	95	94
2	95	100	94	78	72	68	71	94	87	96	103	109	130	152	159	168	175	174	164	130	125	114	95	85
3	F 84	84	77	70	62	52	63	87	79	87	100	120	139	146	147	144	141	138	142	133	97	91	94	96
4	96	98	99	92	85	86	82	84	85	100	116	120	129	136	140	142	142	142	142	143	118	101	106	108
5	108	112	114	100	97	99	102	92	77	89	104	111	125	137	141	136	134	132	145	156	156	144	134	131
6	127	125	125	117	114	116	113	103	81	89	105	122	127	133	130	131	140	146	134	115	110	111	107	110
7	112	106	98	94	82	75	74	91	98	112	118	127	139	141	144	142	148	162	164	165	164	149	149	144
8	152	155	143	V 122	V 89	81	94	109	102	86	95	114	122	127	130	133	131	131	128	125	108	93	90	85
9	88	F 88	F	F 87	88	88	F 102	97	78	95	111	114	131	132	128	128	129	138	141	127	98	88	91	F
10	F	F	94	F 89	F 88	F 83	F 82	91	87	94	98	101	113	128	128	127	131	138	131	125	128	130	129	F 115
11	108	132	133	120	115	114	116	110	102	A	A	98	112	122	125	130	128	122	122	123	119	108	104	100
12	94	90	88	89	84	76	80	92	92	A	A	97	111	124	123	126	140	140	133	111	98	94	98	98
13	103	101	93	93	86	69	82	91	A	A	A	112	120	125	125	128	125	114	106	108	104	95	102	105
14	F 107	F	F 98	F 77	64	65	74	76	91	105	99	85	102	119	126	121	116	112	122	132	106	88	90	F 82
15	82	90	86	81	72	72	81	94	81	86	89	102	109	115	120	127	121	116	113	112	100	A	86	80
16	F 80	F 80	F	F	73	64	67	78	90	86	85	93	106	115	108	107	111	117	114	100	95	94	H 90	92
17	91	90	88	78	73	74	84	97	84	82	88	100	111	116	120	123	124	110	110	120	95	79	81	F
18	80	F	F	F	F	F	F 80	91	91	89	95	101	112	117	119	123	124	A	115	122	107	92	94	96
19	100	100	94	88	82	79	89	100	96	88	A	102	110	118	116	121	124	126	132	117	104	94	96	95
20	F 94	101	F 87	86	F 82	F 77	F 82	110	90	A	93	109	116	121	123	128	119	106	113	111	90	89	86	86
21	82	80	77	79	79	84	77	64	75	92	92	109	120	A	125	138	136	127	112	99	81	A	82	81
22	82	F	F 82	85	89	F 82	83	85	76	80	80	88	104	111	125	129	128	122	114	115	113	101	91	95
23	96	86	F 87	F 82	68	64	83	89	68	80	77	90	109	115	120	126	130	122	A	A	87	83	83	84
24	82	90	89	80	F 78	70	F 75	91	85	76	78	94	106	119	137	153	157	156	144	133	122	120	131	126
25	126	139	149	95	73	67	72	82	84	76	75	87	103	104	109	108	104	104	95	89	86	86	91	92
26	93	97	88	77	74	76	77	80	80	84	96	106	120	131	115	108	114	120	116	98	90	91	98	103
27	100	115	108	90	86	80	90	82	76	81	96	111	114	114	115	109	108	108	114	112	104	87	82	80
28	F 88	F 93	F 80	F 69	63	F 58	F 70	91	83	91	92	101	115	120	120	117	116	A	116	113	101	99	97	97
29	99	104	101	83	79	63	66	75	80	91	101	109	116	128	122	115	108	106	112	121	114	95	86	82
30	F 78	F 82	F 94	F 76	64	65	72	83	82	77	81	88	98	103	105	105	A	106	110	114	110	104	100	99
31	98	100	100	91	F 76	F 65	73	77	86	A	93	A	101	110	120	128	129	134	128	113	111	113	106	109
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	27	28	29	30	30	31	31	30	26	27	30	31	30	31	31	30	29	30	30	31	29	31	29
MED	96	100	94	87	80	76	81	91	84	88	95	104	114	122	125	128	128	126	122	118	106	95	95	96
U Q	107	112	104	94	88	82	84	94	90	92	102	112	124	131	130	136	136	138	137	127	118	110	104	106
L Q	84	90	88	78	73	65	73	82	80	82	88	97	109	115	120	121	119	113	113	112	97	90	90	85

IONOSPHERIC DATA STATION Okinawa

MAY 2023 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	A	L	L 568	L 560	L 592	644	L 564	504	L						
2										U L 592	U L 580	U L 600	L 588	L 552	L 584	568	L 576	L						
3								L	L	U L 548		U L 592	U L 640	576	L 564	L 580	L 568							
4										U L 556	L 580	U L 640	U L 612	U L 624	U L 552	L 576	L 584	L	L					
5										U L 580	U L 584	U L 608	L 628	L 600	L	L	A	L						
6										U L 588	U L 568	U L 564	U L 552	L 604	576	A		L						
7								L	L	U L 640	A	L	608	L 536	572	A	U L 588	A						
8									A	A	A	A	A	A	A	L 556	L 564	A						
9										A	A	U L 576	A	B	L 592	L 564	L 560	L 520	L					
10									A	A	A	A	A	A	584	A	A							
11										A	A	A	A	A	A	568	L	L	L					
12									L	A	A	A	A	A	A	U L 568	A	L	L					
13									A	A	A	A	A	A	L	A	L	L						
14									A	U L 508	U L 576	U L 656	L 616	A	A	A	A							
15									L	A	U L 532	596	L 584	588	A	536	A	A						
16								L	L	A	A	U L 604	U L 560	560	L 560	L 544	L 536	A						
17									L	U L 496	U L 532	U L 592	568	552	552	L 560	L 508	L 496						
18										L	U L 588	A	L 592	A	544	A	524	A						
19									A	A	A	L	L	572	596	548	A	A						
20								L	L	A	U L 560	L 564	A	A	548	536	540	468	L					
21										A	U L 628	A	A	A	604	508	L	A						
22								L	L	U L 588	U L 564	U L 608	A	556	528	A	L	A	L					
23										U L 536	U L 508	568	A	576	572	536	A	A	A	A				
24								L			U L 568	U L 576	A	L 564	552	544	508	L 480	U L 356					
25								L	L	L	588	568	532	548	532	L 536	544	L 492	L					
26									L	U L 496	U L 608	L 552	552	532	532	628	L 516	492						
27									L 444	U L 532	A	L	L	A	A	L 552	L 544	L						
28									A	U L 528	L 580	604	560	A	A	556	A	A						
29									L	U L 560	U L 572	540	560	532	A	A	L 592	L						
30									L	L	L 604	U L 640	560			A	A							
31									A	A	A	A	584	A	576	544	A	L 480	U L 428					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	14	18	20	18	17	20	21	16	7	2					
MED									L 444	U L 552	U L 578	U L 592	L 576	564	568	556	L 544	L 492	U L 392					
U Q										U L 588	U L 588	U L 606	L 608	L 590	584	568	L 572	L 496						
L Q										U L 528	U L 564	568	560	550	550	540	520	480						

MAY 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAY 2023 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							188	U A 256	308	324	368	A	A	A	A	372	U A 352	332	A	A				
2							A	260	296	348	360	A	A	A	388	380	348	320	240	A				
3							A	A	A	A	A	A	A	A	A	384	352	316	248	A				
4							A	A	A	A	396	A	A	A	400	A	A	312	272	A				
5							B	248	320	352	372	A	416	400	400	380	348	324	260	A				
6							192	252	308	344	U A 364	400	400	392	404	380	348	304	A	A				
7							A	A	A	A	A	A	A	408	408	380	348	304	240	A				
8							A	268	332	368	392	404	404	396	392	376	352	312	244	A				
9							224	272	332	U A 360	U A 384	U A 396	U A 412	B	396	396	360	316	256	A				
10							A	A	328	376	384	408	408	416	400	372	360	312	U A 248	A				
11							A	284	336	360	U A 380	400	408	408	392	380	348	312	272	A				
12							A	A	A	A	A	A	A	420	392	376	352	316	252	A				
13							A	268	320	364	376	G 440	U G 436	436	400	396	352	312	252	A				
14							A	272	316	U A 360	376	A	444	412	404	376	352	312	204	A				
15							A	264	308	A	A	A	A	A	400	388	352	312	244	A				
16							A	244	304	U A 340	A	A	A	400	396	372	348	308	244	A				
17							A	256	304	A	A	A	A	A	A	376	348	308	244	A				
18							A	264	A	A	A	A	420	408	400	380	364	300	232	A				
19							A	276	A	A	A	376	A	A	B	A	356	316	A	A				
20							A	284	308	352	356	A	A	A	A	A	356	324	264	A				
21							A	264	332	A	A	A	A	A	A	A	A	A	A	A				
22							220	280	A	368	376	376	U A 384	404	388	380	360	316	248	A				
23							204	264	304	348	372	A	A	A	A	A	A	A	A	A				
24							A	280	U A 304	A	A	360	A	A	A	A	A	312	A	A				
25							A	260	324	A	A	A	A	A	A	A	348	308	252	A				
26							A	A	A	A	A	A	A	396	356	372	348	312	248	A				
27							A	268	324	A	A	U A 368	A	A	392	368	348	312	260	A				
28							A	268	320	348	A	A	380	A	404	384	348	308	A	A				
29							228	264	320	352	380	404	424	392	392	A	A	312	256	A				
30							A	A	U A 328	A	A	A	424	412	396	364	344	324	264	A				
31							176	264	312	A	A	A	A	A	A	A	U A 372	316	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	24	23	16	15	11	13	15	21	22	26	29	23					
MED							204	264	320	352	376	400	412	408	396	380	352	312	248					
U Q							224	272	328	362	384	404	424	412	400	380	356	316	260					
L Q							188	260	308	348	368	376	402	396	392	372	348	310	244					

MAY 2023 foE (0.01MHz)

IONOSPHERIC DATA STATION Okinawa

MAY 2023 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 62	J A 36	J A 20	J A 48	E B 16	J A 22	G	30	39	J A 68	J A 51	J A 54	J A 52	48	48	46	42	J A 48	J A 44	J A 26	J A 23	J A 30	J A 41	J A 84
2	J A 42	J A 21	J A 21	J A 35	J A 36	J A 22	26	J A 54	J A 50	J A 46	J A 44	40	45	42	43	42	37	41	J A 49	J A 58	J A 32	E B 16	J A 19	J A 35
3	J A 41	J A 29	J A 25	E B 16	E B 16	E B 16	20	J A 40	J A 83	J A 46	J A 54	J A 64	J A 49	J A 50	J A 46	45	46	J A 68	J A 104	J A 61	J A 176	J A 64	J A 53	J A 54
4	J A 32	J A 30	J A 21	J A 29	E B 17	E B 16	18	28	J A 39	J A 43	G	45	J A 85	J A 48	G	J A 61	J A 48	J A 51	35	J A 30	J A 33	J A 53	J A 53	J A 66
5	J A 85	J A 87	J A 33	J A 38	E B 16	E B 16	E B 20	31	J A 48	J A 59	J A 50	J A 44	44	48	51	51	J A 90	43	J A 46	J A 109	J A 58	J A 52	J A 29	E B 16
6	J A 16	E B 16	J A 21	E B 16	E B 16	E B 16	G	34	J A 49	42	J A 74	G	49	50	48	J A 60	J A 60	J A 62	J A 52	J A 46	J A 37	J A 48	J A 38	J A 16
7	J A 148	J A 51	J A 42	J A 48	J A 32	J A 32	J A 39	J A 61	J A 48	J A 56	J A 110	J A 50	46	45	52	56	50	J A 71	J A 90	J A 70	J A 75	J A 52	J A 87	J A 53
8	J A 59	J A 87	J A 58	J A 28	J A 24	J A 50	22	J A 46	J A 51	J A 69	J A 88	J A 87	J A 156	J A 163	J A 168	44	43	J A 55	J A 51	J A 59	J A 34	J A 50	J A 52	J A 150
9	J A 124	J A 87	J A 106	J A 52	J A 52	J A 22	G 19	36	J A 49	J A 91	J A 92	J A 58	J A 68	E B 55	44	G	J A 49	G	J A 36	J A 37	J A 50	J A 181	J A 140	J A 110
10	J A 86	J A 29	J A 42	J A 29	J A 23	E B 16	J A 110	J A 48	J A 91	J A 85	J A 96	J A 107	J A 97	J A 70	53	J A 125	J A 68	J A 50	J A 40	J A 34	J A 47	J A 29	J A 69	J A 78
11	J A 86	J A 35	J A 83	J A 61	J A 33	J A 22	J A 36	J A 54	J A 84	J A 194	J A 124	J A 67	J A 88	J A 72	J A 91	49	37	G	30	J A 26	J A 18	J A 16	J A 63	J A 43
12	J A 24	J A 40	J A 52	J A 53	J A 32	J A 48	J A 34	J A 48	J A 67	J A 158	J A 170	J A 78	J A 61	J A 74	J A 62	J A 54	J A 74	40	J A 26	20	J A 18	J A 24	J A 19	J A 23
13	J A 53	J A 62	J A 31	J A 18	J A 22	J A 43	J A 46	J A 84	J A 108	J A 140	J A 164	J A 117	J A 90	J A 62	J A 59	J A 67	J A 43	G	J A 64	J A 70	J A 31	J A 22	J A 29	J A 46
14	J A 87	J A 87	J A 130	J A 54	J A 53	J A 64	J A 30	J A 37	J A 55	J A 46	J A 48	J A 53	J A 54	J A 63	J A 63	J A 70	J A 83	J A 70	J A 98	J A 78	J A 68	J A 62	J A 52	J A 53
15	J A 33	J A 42	J A 31	E B 16	E B 16	E B 15	23	J A 42	J A 53	J A 65	J A 92	J A 53	J A 65	46	J A 73	J A 52	J A 70	J A 73	J A 53	J A 96	J A 123	J A 143	J A 106	J A 110
16	J A 66	J A 66	J A 73	J A 37	J A 29	J A 22	22	J A 37	J A 52	J A 70	J A 103	J A 71	J A 65	J A 54	J A 54	J A 50	41	J A 69	J A 48	J A 61	J A 54	J A 65	J A 80	J A 86
17	J A 33	J A 28	J A 53	J A 34	J A 29	J A 17	J A 26	J A 47	J A 59	J A 89	J A 50	J A 49	J A 80	48	43	52	J A 55	J A 60	J A 51	J A 82	J A 52	J A 42	J A 52	J A 60
18	J A 48	J A 52	J A 135	J A 76	J A 48	J A 38	J A 34	J A 42	J A 50	J A 51	J A 78	J A 76	46	J A 82	G	J A 67	J A 67	J A 152	J A 148	J A 56	J A 48	J A 126	J A 119	J A 103
19	J A 44	J A 29	J A 47	J A 31	J A 33	J A 39	J A 31	J A 50	J A 158	J A 90	J A 131	J A 80	J A 64	44	E B 49	42	J A 57	J A 157	J A 65	J A 96	J A 139	E B 16	E B 16	J A 87
20	J A 52	J A 110	J A 30	J A 21	E B 20	E B 16	J A 39	36	J A 42	J A 106	J A 69	J A 46	J A 110	J A 67	J A 42	J A 46	G	40	37	J A 49	J A 129	J A 33	J A 48	J A 87
21	J A 110	J A 53	J A 60	J A 52	J A 28	J A 49	J A 36	J A 46	J A 66	J A 68	J A 43	J A 93	J A 120	J A 142	J A 96	40	J A 48	J A 74	J A 68	J A 26	J A 99	J A 108	J A 104	J A 86
22	J A 33	J A 19	J A 14	E B 16	E B 16	E B 16	G	34	38	G	G	46	J A 68	54	J A 58	J A 63	43	J A 50	J A 55	J A 30	J A 34	J A 62	J A 88	J A 54
23	J A 46	J A 28	J A 28	J A 31	J A 18	J A 15	G	35	36	38	40	42	J A 176	J A 104	J A 185	J A 54	J A 64	J A 60	J A 125	J A 122	J A 157	J A 119	J A 104	J A 108
24	J A 82	J A 87	J A 34	J A 30	J A 25	J A 28	J A 31	J A 60	J A 177	J A 78	J A 102	J A 70	J A 102	J A 59	J A 54	J A 48	J A 44	34	28	J A 33	J A 25	J A 18	J A 15	E B 16
25	E B 16	J A 52	J A 66	J A 38	J A 29	J A 20	24	35	41	J A 48	J A 59	42	40	J A 47	J A 50	J A 54	G	37	31	J A 30	J A 110	J A 74	J A 50	J A 44
26	J A 31	J A 26	19	E B 17	E B 16	E B 16	25	32	J A 56	40	J A 71	J A 69	42	46	J A 65	J A 70	J A 64	J A 61	J A 62	J A 75	J A 28	J A 21	J A 44	J A 34
27	J A 20	J A 20	E B 16	J A 20	J A 23	E B 16	26	J A 32	J A 84	J A 50	J A 110	J A 62	J A 128	J A 114	J A 82	G	40	37	J A 54	J A 29	J A 22	J A 99	J A 42	J A 33
28	J A 62	J A 105	J A 109	J A 46	J A 42	J A 37	26	J A 78	J A 65	J A 79	J A 82	J A 47	J A 72	J A 125	J A 104	46	J A 78	J A 134	J A 128	J A 102	J A 128	J A 53	J A 48	J A 28
29	J A 21	J A 18	J A 17	J A 22	19	E B 16	J A 32	J A 50	J A 74	J A 66	J A 63	J A 45	45	48	J A 99	J A 111	J A 44	J A 34	J A 71	J A 56	J A 48	J A 67	J A 43	J A 136
30	J A 101	J A 16	E B 16	J A 38	J A 37	J A 46	J A 75	J A 44	40	J A 132	J A 124	J A 69	52	J A 64	J A 78	J A 106	J A 114	J A 77	J A 104	J A 110	J A 71	J A 49	J A 39	J A 27
31	J A 26	J A 21	J A 26	J A 34	J A 16	J A 21	23	32	J A 62	J A 225	J A 221	J A 168	J A 86	J A 130	J A 82	J A 88	J A 78	40	J A 65	J A 25	J A 32	J A 64	J A 33	J A 60
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 48	J A 36	J A 33	J A 34	J A 24	J A 22	26	J A 42	J A 53	J A 68	J A 78	J A 58	J A 65	J A 55	J A 54	J A 52	J A 49	J A 51	J A 53	J A 56	J A 48	J A 52	J A 50	J A 54
U Q	J A 85	J A 66	J A 60	J A 48	J A 33	J A 38	J A 34	J A 50	J A 74	J A 90	J A 110	J A 76	J A 90	J A 74	J A 82	J A 67	J A 68	J A 70	J A 71	J A 78	J A 99	J A 67	J A 80	J A 87
L Q	J A 32	J A 26	J A 21	E B 21	E B 16	E B 16	G 20	34	48	46	50	46	49	48	48	46	43	40	40	J A 30	J A 32	J A 29	J A 38	J A 34

MAY 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAY 2023 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	25	30	20	E B 16	E B 16	18	G	29	37	56	45	50	49	45	46	44	37	38	40	22	20	22	E B 16	33
2	22	E B 16	E B 16	28	E B 16	E B 16	24	45	43	42	42	40	42	40	43	42	36	39	36	32	E B 16	E B 16	E B 16	E B 16
3	22	E B 16	E B 16	E B 16	E B 16	E B 16	18	32	34	37	40	46	46	46	44	44	45	66	78	43	44	26	20	34
4	25	E B 17	E B 16	E B 16	E B 17	E B 16	18	27	31	38	G	44	47	42	G	42	37	34	34	26	28	21	21	31
5	46	22	E B 16	E B 16	E B 16	E B 16	E B 20	30	44	47	46	41	42	47	48	49	84	41	44	80	46	23	22	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	33	38	40	49	G	48	49	47	56	52	46	35	40	28	22	26	E B 18
7	52	42	28	34	29	23	26	29	39	48	62	47	46	45	50	55	48	66	63	64	22	21	39	28
8	28	29	30	20	E B 16	21	21	42	47	58	65	84	75	88	91	41	41	49	48	56	33	23	29	50
9	29	62	20	27	31	E B 16	G 16	34	43	63	75	43	56	E B 55	44	G	40	G	34	33	31	52	E B 16	24
10	63	22	22	22	E B 16	E B 16	22	32	81	79	88	91	87	63	52	122	63	49	37	30	37	18	50	43
11	33	E B 16	20	24	24	20	24	49	51	A A 194	A A 124	60	74	69	88	46	37	G	29	22	E B 16	E B 16	22	20
12	E B 16	18	34	25	E B 16	24	27	30	35	A A 158	A A 170	57	60	69	56	51	65	40	G 17	19	E B 16	19	E B 16	E B 16
13	20	23	20	E B 16	E B 16	18	37	78	A A 108	A A 140	A A 164	99	76	56	54	66	43	G	60	38	22	E B 16	20	22
14	40	31	43	33	36	40	24	34	50	42	46	50	51	58	59	56	64	53	72	30	23	E B 16	20	26
15	21	21	E B 16	E B 16	E B 16	E B 15	21	28	37	56	46	45	49	45	56	45	52	64	41	67	44	A A 143	50	63
16	20	22	48	29	23	20	20	32	39	56	48	49	46	51	45	45	39	66	46	52	53	38	20	42
17	28	21	34	E B 16	18	E B 16	22	30	40	42	40	41	49	47	42	48	40	38	44	66	49	19	22	E B 16
18	22	43	24	34	E B 16	22	20	37	41	42	46	64	46	71	G	58	48	A A 152	45	54	23	46	44	29
19	E B 16	25	33	21	26	32	29	46	49	77	A A 131	58	54	42	E B 49	41	52	G 28	55	76	22	E B 16	E B 16	25
20	19	42	21	E B 16	E B 16	E B 16	30	34	36	A A 106	51	43	104	57	42	39	G	40	35	39	25	25	24	25
21	25	26	42	E B 16	21	22	32	33	40	59	39	65	100	A A 142	57	38	39	54	40	22	60	A A 108	E B 16	29
22	24	E B 16	E B 16	E B 16	E B 16	E B 16	G	32	35	G	G	46	58	53	45	53	41	44	28	24	26	28	44	41
23	24	E B 16	19	21	E B 16	E B 16	G	32	34	37	40	42	68	48	50	50	56	53	A A 125	A A 122	52	44	44	E B 16
24	22	49	E B 16	E B 15	E B 16	E B 16	28	37	52	46	46	43	56	42	41	45	40	33	26	24	E B 16	E B 16	E B 16	E B 16
25	E B 16	E B 16	22	E B 16	23	E B 14	23	31	36	40	42	41	40	42	45	40	G	34	28	24	32	47	22	22
26	20	E B 16	E B 16	E B 17	E B 16	E B 16	22	29	36	38	40	47	41	43	42	50	43	42	37	58	22	E B 14	21	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	30	38	39	58	55	50	62	61	G	38	36	46	22	19	20	E B 16	20
28	28	34	E B 16	22	30	23	23	43	55	45	47	45	43	56	69	44	57	A A 134	98	99	52	34	23	23
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	50	40	42	45	45	47	70	62	42	33	57	39	45	30	32	28
30	41	E B 16	E B 16	21	21	E B 16	28	33	38	40	42	46	50	57	59	77	A A 114	48	87	88	33	33	31	21
31	22	20	23	24	E B 16	E B 16	22	30	53	A A 225	78	A A 168	56	54	52	51	52	38	28	20	20	E B 16	24	38
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	22	21	20	E B 17	E B 16	E B 16	22	32	40	46	46	46	50	50	49	46	43	41	41	39	28	22	22	25
U Q	28	30	28	24	23	21	26	37	50	A A 63	65	58	60	58	57	55	52	53	57	64	44	34	31	33
L Q	E B 20	E B 16	E B 16	E B 16	E B 16	E B 16	G 20	30	36	40	42	43	46	45	44	42	39	34	34	24	22	E B 16	E B 16	E B 18

IONOSPHERIC DATA STATION Okinawa

MAY 2023 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E 0SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	16	17	21	24	26	30	25	28	22	21	19	15	14	16	16	16	16
2	16	16	16	16	16	16	16	20	20	23	22	26	30	30	28	24	22	18	14	14	16	16	16	16
3	16	16	16	16	16	16	16	16	16	23	25	29	28	26	31	24	21	20	13	14	14	16	16	16
4	16	17	16	16	17	16	16	18	22	23	25	28	28	28	25	25	22	19	22	14	16	16	16	16
5	16	16	16	16	16	16	20	20	22	22	26	25	27	27	29	29	22	24	20	16	14	16	16	16
6	16	16	16	16	16	16	16	16	21	22	25	29	33	30	28	22	22	19	18	14	14	14	16	18
7	16	16	16	16	16	16	15	15	19	22	22	28	26	27	28	26	21	20	15	17	16	16	16	16
8	16	16	16	16	16	16	16	18	23	28	32	32	37	29	26	24	20	20	18	16	16	16	16	16
9	16	16	16	16	16	16	16	14	20	21	24	28	31	55	24	24	22	20	16	16	16	16	16	16
10	16	16	16	16	16	16	16	17	20	23	27	28	28	30	25	31	22	21	20	16	16	16	16	16
11	16	16	16	16	16	16	16	18	20	24	27	26	32	30	27	26	23	22	20	14	16	16	16	16
12	16	16	16	16	16	16	16	17	18	21	21	25	23	28	25	21	23	21	14	17	16	16	16	16
13	16	16	16	16	16	16	16	20	20	25	31	31	33	27	26	28	22	18	18	16	16	16	16	16
14	16	16	16	17	16	16	16	16	20	22	26	25	29	27	34	24	21	20	16	15	16	16	16	16
15	16	16	16	16	16	15	16	17	20	23	24	28	29	30	27	27	22	22	19	15	16	16	16	16
16	16	16	16	16	14	16	16	14	20	21	21	22	26	26	25	22	20	21	14	14	16	16	16	16
17	16	16	16	16	16	16	16	16	21	22	25	26	25	28	26	26	21	21	19	15	14	16	16	16
18	16	16	16	16	16	18	16	16	14	22	26	30	24	28	28	26	27	21	18	15	16	16	16	16
19	16	16	16	16	16	16	17	19	20	24	38	24	35	32	49	26	22	20	16	16	14	16	16	16
20	16	16	16	16	16	16	16	18	20	20	24	28	32	33	27	25	26	25	16	14	15	16	16	16
21	16	16	16	16	16	16	14	18	22	22	23	28	38	29	31	25	23	20	15	16	15	16	16	16
22	16	16	16	16	16	16	16	20	20	22	24	27	29	32	28	24	22	21	14	13	15	16	16	16
23	16	16	16	16	16	16	16	18	20	23	22	24	27	25	26	24	21	19	14	14	16	16	16	16
24	16	16	16	15	16	16	16	14	15	19	24	24	31	28	26	22	21	22	14	15	16	16	16	16
25	16	16	16	16	16	14	16	15	21	20	24	26	26	28	26	25	22	19	14	16	16	16	16	16
26	16	16	16	17	16	16	16	16	20	23	22	28	26	27	24	22	21	15	17	16	14	14	16	16
27	16	16	16	16	16	16	16	14	24	21	22	23	24	25	28	24	19	14	15	15	16	16	16	16
28	16	16	16	16	14	16	16	16	17	21	25	29	31	28	22	26	20	20	14	14	16	16	16	16
29	16	16	16	16	16	16	16	14	18	18	22	26	29	24	26	24	22	20	16	17	16	16	16	16
30	16	16	16	16	16	16	16	16	22	25	26	30	24	27	25	24	21	22	18	15	16	16	16	16
31	16	15	16	16	16	16	16	16	20	21	23	24	28	28	31	27	24	21	16	14	16	16	16	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	16	16	16	16	16	16	16	20	22	24	27	29	28	27	24	22	20	16	15	16	16	16	16
U Q	16	16	16	16	16	16	16	18	21	23	26	28	31	30	28	26	22	21	18	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	19	21	22	25	26	27	25	24	21	19	14	14	15	16	16	16

IONOSPHERIC DATA STATION Okinawa

MAY 2023 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	292	289	303	279	298	311	341	360	337	308	282	287	286	290	293	292	302	295	314	308	321	293	274	276
2	288	291	321	284	283	264	280	331	299	291	296	276	284	306	297	288	291	304	315	320	265	249	270	272
3	F 271	275	297	313	314	314	320	346	356	302	256	276	286	296	292	291	293	303	317	339	288	264	263	269
4	270	280	297	300	288	310	347	347	304	288	296	289	291	282	281	279	279	285	301	316	320	257	260	273
5	271	280	310	302	303	322	345	361	330	290	276	274	274	286	284	279	283	283	296	317	306	277	270	271
6	270	268	289	310	291	313	338	372	313	294	270	283	279	277	263	267	283	305	315	291	271	274	265	269
7	280	293	280	284	299	300	273	284	290	273	277	287	292	294	291	285	284	297	311	314	314	266	261	267
8	284	298	302	V 301	V 234	273	293	335	331	300	244	263	278	279	292	292	292	280	291	294	309	265	255	264
9	268	F 301	F	F 275	279	276	F 309	353	301	281	279	266	283	290	270	280	278	287	298	306	292	258	264	F
10	F	F	307	F 295	F 280	F 283	F 308	316	298	279	282	258	263	280	276	U A 261	281	289	287	276	267	251	241	F 260
11	270	274	299	304	286	308	332	319	298	A	A	261	270	283	278	286	287	271	275	287	292	281	261	267
12	277	267	266	288	299	297	320	326	335	A	A	264	268	282	276	275	285	300	304	293	284	264	264	266
13	276	279	274	286	294	278	303	323	A	A	A	269	275	286	283	293	298	295	285	281	287	285	258	260
14	F 287	F	F 304	F 298	283	292	325	308	295	307	307	259	255	278	297	289	287	276	283	304	309	255	263	F 265
15	261	265	289	293	271	275	306	331	310	297	268	270	280	280	289	302	290	293	290	301	302	A	277	273
16	F 264	F 284	F	F	297	316	322	323	315	319	285	260	266	282	287	284	288	296	305	301	283	291	H 268	270
17	276	273	297	288	284	289	307	344	321	312	258	259	275	276	287	292	309	300	299	317	322	270	274	F
18	250	F	F	F	F	F	F 298	315	303	284	267	261	274	284	283	292	297	A	298	305	327	269	264	265
19	281	287	295	276	286	297	301	314	336	287	A	262	267	285	283	290	293	297	312	311	289	284	268	276
20	F 270	305	F 310	288	F 278	F 275	F 284	343	342	A	236	256	255	264	265	290	288	277	280	298	261	262	265	278
21	271	269	259	275	283	327	362	331	272	302	248	262	279	A	269	288	302	301	303	300	280	A	254	259
22	264	F	F 260	257	278	F 292	323	335	297	280	286	264	274	276	280	291	291	290	286	293	294	295	263	255
23	264	283	F 300	F 294	285	277	337	381	325	311	289	258	277	283	277	289	306	301	A	A	289	266	266	271
24	264	292	318	297	F 286	297	F 302	322	326	305	250	256	262	269	281	291	288	284	284	279	252	264	242	258
25	251	294	345	337	279	289	328	325	317	322	271	259	278	279	293	296	291	304	290	265	265	258	280	272
26	274	305	298	293	291	318	336	319	305	281	261	266	274	298	283	265	280	294	317	299	281	265	271	285
27	280	297	318	301	304	302	317	324	284	261	261	281	296	274	276	275	271	277	296	310	309	289	276	262
28	F 280	F 328	F 319	F 311	298	F 283	F 314	342	323	306	249	247	271	276	281	274	282	A	302	299	263	267	266	267
29	278	295	347	302	325	329	316	298	282	259	258	276	278	295	300	287	268	266	280	299	319	308	280	264
30	F 279	F 289	F 317	F 315	284	301	343	323	327	313	277	244	262	269	275	271	A	264	277	291	299	280	278	272
31	281	278	311	307	F 307	F 304	311	298	305	A	269	A	260	268	280	284	283	292	299	297	276	274	266	261
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	27	28	29	30	30	31	31	30	26	27	30	31	30	31	31	30	29	30	30	31	29	31	29
MED	272	287	301	295	286	297	317	326	312	296	270	264	275	282	283	288	288	293	298	300	289	267	265	267
U Q	280	295	314	303	298	311	336	344	327	307	282	276	280	286	291	291	293	300	305	310	309	282	271	272
L Q	268	275	292	285	283	283	303	319	298	281	258	259	267	276	276	279	283	282	286	293	276	263	261	263

MAY 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAY 2023 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	A	L	L 363	L 373	L 347	335	L 355	365	L						
2										U L 357	U L 350	U L 347	L 366	L 379	L 353	348	L 355	L						
3								L	L	U L 373		U L 355	U L 339	366	L 361	L 343	L 352							
4										U L 362	L 348	U L 347	U L 345	U L 347	U L 379	L 339	L 341	L	L					
5										U L 353	U L 360	U L 358	L 338	L 344	L	L	A	L						
6										U L 378	U L 363	U L 367	U L 368	L 336	356	A		L						
7								L	L	U L 344	A	L	357	L 398	362	A	U L 344	A						
8									A	A	A	A	A	A	A	L 345	L 357	A						
9										A	A	U L 361	A	B	L 346	L 351	L 339	L 352	L					
10									A	A	A	A	A	A	343	A	A							
11										A	A	A	A	A	A	341	L	L	L					
12									L	A	A	A	A	A	A	U L 342	A	L	L					
13									A	A	A	A	A	A	L	A	L	L						
14									A	U L 399	U L 371	U L 349	L 321	A	A	A	A							
15									L	A	U L 390	362	L 340	349	A	367	A	A						
16								L	L	A	A	U L 338	U L 371	U A 342	L 351	L 354	L 343	A						
17									L	U L 401	U L 386	U L 355	357	375	379	L 335	L 361	L 366						
18										L	U L 352	A	L 364	A	375	A	A	A						
19									A	A	A	L	L	375	324	356	A	A						
20								L	L	A	U L 345	L 376	A	A	368	348	340	350	L					
21										A	U L 334	A	A	A	A	333	412	L	A					
22								L	L	U L 351	U L 349	U L 333	A	A	382	A	L	A	L					
23										U L 373	U L 409	377	A	337	320	A	A	A	A	A				
24								L			U L 348	U L 355	A	L 372	375	350	368	L 359	U L 383					
25								L	L	L	354	364	391	375	379	L 363	351	L 362	L					
26									L	U L 400	U L 339	L 368	374	371	371	324	L 340	348						
27									L 415	U L 364	A	L	L	A	A	L 360	L 348	L						
28									A	U L 370	L 348	350	375	A	A	347	A	A						
29									L	U L 349	U L 360	381	368	383	A	A	L 331	L						
30									L	L	L 347	U L 321	346			A	A							
31									A	A	A	A	A	A	320	A	A	L 360	U L 368					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	14	18	20	17	16	20	19	15	7	2					
MED									L 415	U L 367	U L 351	U L 356	L 364	368	358	L 348	L 348	L 359	U L 376					
U Q										U L 378	U L 363	366	372	375	375	356	357	L 362						
L Q										U L 353	U L 348	U L 348	L 342	L 346	339	L 342	L 340	350						

MAY 2023 M(3000)F1 (0.01)

IONOSPHERIC DATA STATION Okinawa

MAY 2023 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									214	266	286	302	310	304	310	292	266	288						
2										296	270	298	328	278	276	288	286	260						
3								226	212	270		338	314	298	296	290	294							
4										276	292	304	308	316	308	314	312	286	274					
5										300	292	302	346	316	304	296	318	296						
6										256	288	310	298	334	354	364		270						
7								288	244	326	284	306	310	280	304	306	304	282						
8									224	242	398	E A 378	346	E A 332	E A 314	292	280	276						
9										306	340	320	312	294	306	308	308	290	258					
10									E A 388	E A 380	E A 402	E A 454	398	318	328	E A 502	318							
11										A	A	368	348	316	338	312	282	248	280					
12									242	A	A	320	348	314	314	328	306	272	252					
13									A	A	A	E A 428	338	316	304	308	278	276						
14									278	250	272	380	372	330	298	302	296							
15									224	254	252	356	310	326	314	292	276	282						
16								236	268	278	268	348	318	314	306	308	308	294						
17									224	256	300	348	338	306	312	306	272	278						
18										284	328	348	344	312	318	310	292	A						
19									236	E A 370	A	352	350	322	318	312	296	348						
20								230	242	A	348	350	E A 460	360	354	298	296	316	294					
21										306	394	346	E A 362	A	344	304	272	264						
22								232	228	328	306	368	340	328	320	294	290	266	282					
23										294	264	366	340	324	330	308	284	256	A	A				
24								248			394	350	362	360	328	300	288	262	244					
25								250	242	256	392	382	330	310	306	300	290	280	254					
26									270	262	356	334	332	298	296	364	316	292						
27									228	304	346	322	296	340	310	324	336	312						
28									278	288	308	408	350	332	324	320	326	A						
29									348	314	326	322	330	308	296	310	306	318						
30									256	274	378	406	362			E A 344	A							
31									270	A	E A 388	A	378	364	330	322	316	290	264					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								7	20	25	26	30	31	29	30	31	29	25	9					
MED								236	242	280	310	345	339	316	312	307	296	282	264					
U Q								250	270	306	378	368	350	331	328	320	310	293	281					
L Q								230	226	259	286	320	314	307	304	298	283	268	253					

MAY 2023 h'F2 (KM)

IONOSPHERIC DATA STATION Okinawa

MAY 2023 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	268	252	238	224	216	216	218	200	194	A	234	E A 254	E A 230	206	220	210	196	244	256	236	234	218	218	282
2	288	264	222	248	254	294	244	234	214	210	198	180	186	178	214	206	226	248	236	204	216	266	282	274
3	282	274	256	226	214	224	240	214	200	182	180	200	222	204	206	224	248	278	260	232	E A 230	296	310	324
4	300	270	250	236	238	210	210	212	196	190	186	200	228	182	184	216	218	224	248	242	210	E A 222	280	284
5	E A 326	288	240	220	228	224	214	198	200	226	240	174	180	220	272	268	A	246	282	260	230	214	210	246
6	262	264	246	218	232	232	222	202	214	190	E A 242	178	244	250	224	A	312	262	244	246	270	272	284	282
7	E A 306	260	264	272	250	238	232	214	220	224	A	204	196	184	E A 256	A	272	A	258	236	224	218	E A 272	282
8	266	256	244	226	278	268	232	236	A	A	A	A	A	A	A	208	228	A	262	256	228	E A 230	E A 298	E A 348
9	E A 284	E A 310	258	E A 282	288	256	250	214	218	A	A	194	A	B	224	202	204	222	242	226	242	E A 322	276	E A 328
10	E A 388	E A 298	250	242	242	256	208	216	A	A	A	A	A	A	E A 290	A	A	284	240	230	256	264	E A 314	E A 308
11	E A 306	256	238	228	234	230	220	230	E A 228	A	A	A	A	A	A	E A 244	196	214	236	248	244	232	262	294
12	276	294	E A 296	262	224	236	228	220	218	A	A	A	A	A	A	E A 278	A	252	232	220	244	276	290	306
13	296	278	286	244	198	246	242	E A 296	A	A	A	A	A	A	E A 292	A	250	198	E A 264	254	252	252	262	300
14	290	292	256	258	E A 278	E A 304	218	216	A	208	208	228	E A 288	A	A	A	A	290	308	264	230	230	312	E A 328
15	320	284	252	238	278	282	236	208	204	A	210	198	E A 248	214	A	242	A	A	252	E A 274	264	A	E A 346	E A 364
16	E A 310	276	E A 332	E A 264	262	222	232	220	210	A	A	262	208	E A 296	226	E A 236	216	A	260	238	E A 292	270	250	E A 326
17	294	292	262	240	272	276	230	214	216	206	182	182	254	218	192	278	222	242	276	E A 254	232	E A 250	278	300
18	E A 298	E A 290	264	E A 290	234	252	226	220	226	216	220	A	200	A	196	A	A	A	E A 264	260	222	E A 286	E A 332	E A 300
19	288	272	E A 270	278	262	252	246	242	A	A	A	E A 328	302	184	E B 276	204	A	A	264	264	230	228	276	298
20	306	276	234	248	274	276	252	218	210	A	E A 278	184	A	A	200	198	228	252	258	258	234	280	294	276
21	292	316	E A 358	300	268	224	214	214	214	A	214	A	A	A	E A 326	194	202	A	252	240	E A 326	A	320	E A 328
22	316	314	304	288	254	212	238	216	200	194	182	220	A	A	216	A	242	A	234	266	246	240	E A 320	E A 336
23	300	266	246	248	216	264	230	206	192	186	176	178	A	E A 248	E A 292	A	A	A	A	A	E A 278	E A 324	E A 324	302
24	322	E A 286	230	236	256	232	228	236	230	E A 232	E A 224	202	A	194	192	E A 240	220	212	214	234	234	256	268	288
25	286	260	214	178	E A 228	244	208	216	194	214	200	186	192	208	E A 212	200	198	204	210	232	E A 292	E A 366	E A 276	296
26	298	246	202	242	248	220	226	208	190	178	178	238	176	204	210	274	E A 256	E A 274	250	E A 260	252	302	304	270
27	272	250	224	224	216	216	218	208	194	210	A	A	A	A	A	186	202	236	282	246	230	242	236	258
28	E A 290	236	208	230	E A 272	E A 304	230	236	A	E A 238	E A 226	190	198	A	A	222	A	A	E A 330	E A 340	E A 268	E A 292	296	312
29	284	252	210	222	222	200	210	224	246	182	184	202	218	230	A	A	216	198	308	270	246	224	E A 270	E A 294
30	E A 326	Q 270	240	222	E A 256	240	218	218	202	182	184	244	E A 266	354	338	A	A	302	E A 366	E A 324	E A 256	256	E A 264	298
31	298	282	230	226	216	236	224	200	A	A	A	A	A	A	E A 326	A	A	206	228	246	240	270	272	E A 330
	00	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	24	18	20	22	18	17	23	20	20	21	30	30	31	29	31	31
MED	291	270	243	238	241	237	228	216	208	200	194	198	U 208	206	U 212	212	220	243	253	243	236	248	276	291
U Q	306	290	264	262	268	264	236	224	218	216	E A 225	228	E A 248	239	E A 290	243	245	268	264	260	E A 256	E A 283	E A 310	E A 326
L Q	284	260	230	226	224	224	218	208	198	186	183	184	196	189	206	203	203	213	240	236	230	230	268	282

MAY 2023 h'F (KM)

IONOSPHERIC DATA STATION Okinawa

MAY 2023 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							112	100	98	98	98	A	A	A	A	98	100	104	A	A				
2							A	104	98	96	96	A	A	A	100	98	98	100	102	A				
3							A	A	A	A	A	A	A	A	A	98	100	100	104	A				
4							A	A	A	A	100	A	A	A	100	A	A	102	102	A				
5							B	102	100	100	100	A	98	98	98	98	98	98	102	A				
6							108	100	98	98	96	100	100	100	100	100	100	100	A	A				
7							A	A	A	A	A	A	A	98	98	A	A	98	98	A				
8							A	98	96	96	96	100	104	100	100	100	100	100	104	A				
9							120	102	100	100	98	98	98	B	98	98	100	100	100	A				
10							A	A	100	100	100	100	100	100	100	100	100	100	102	A				
11							A	100	100	96	98	98	100	100	100	100	100	102	104	A				
12							A	A	A	A	A	A	A	102	102	102	100	106	104	A				
13							A	102	100	100	100	100	100	100	100	100	102	102	102	A				
14							A	96	96	96	98	A	98	98	100	100	100	100	100	A				
15							A	98	98	A	A	A	A	A	100	102	102	102	102	A				
16							A	100	96	96	A	A	A	100	100	100	100	100	100	A				
17							A	100	96	A	A	A	A	A	A	98	98	98	102	A				
18							A	98	A	A	A	A	94	102	102	102	102	100	100	A				
19							A	100	A	A	A	96	A	A	B	A	A	104	A	A				
20							A	100	98	96	96	A	A	A	A	A	100	100	98	A				
21							A	98	98	A	A	A	A	A	A	A	A	A	A	A				
22							110	102	A	98	98	98	98	98	98	98	98	100	98	A				
23							110	102	98	98	98	A	A	A	A	A	A	A	A	A				
24							A	98	94	A	A	94	A	A	A	A	A	106	A	A				
25							A	100	100	A	A	A	A	A	A	A	96	96	94	A				
26							A	A	A	A	A	A	A	96	96	94	98	98	98	A				
27							A	98	98	A	A	94	A	A	94	98	100	100	104	A				
28							A	104	96	96	A	A	96	A	96	98	98	98	A	A				
29							106	100	96	96	96	96	96	96	96	A	A	96	106	A				
30							A	A	100	A	A	A	100	100	100	100	100	100	100	A				
31							110	98	96	A	A	A	A	A	A	A	100	100	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							7	24	23	16	15	11	13	15	21	21	24	29	23					
MED							110	100	98	97	98	98	98	100	100	100	100	100	102					
U Q							112	102	100	99	100	100	100	100	100	100	100	102	104					
L Q							108	98	96	96	96	96	97	98	98	98	98	99	100					

IONOSPHERIC DATA STATION Okinawa

MAY 2023 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	80	74	76	110	B	96	G	104	100	92	98	104	110	114	108	104	124	104	96	94	92	88	90	90
2	86	88	84	80	90	90	102	100	96	96	96	100	96	92	168	150	154	114	100	92	98	B	92	90
3	88	92	92	B	B	B	102	92	92	92	96	90	96	92	94	132	124	104	100	94	112	92	90	88
4	86	90	86	88	B	B	122	92	90	96	G	94	90	92	G	88	90	90	104	96	90	92	92	88
5	80	92	86	86	B	B	B	116	98	96	100	98	124	142	122	112	98	108	96	90	88	86	82	B
6	82	B	86	B	B	B	G	98	100	102	94	G	166	180	146	102	102	98	98	88	84	98	86	82
7	88	88	88	86	86	86	88	90	104	102	96	96	172	136	116	114	110	100	98	92	90	90	92	92
8	92	92	88	88	82	88	132	102	100	96	98	96	100	100	100	140	124	102	96	92	90	90	90	92
9	92	92	100	86	90	90	94	102	98	94	90	98	98	B	148	G	110	G	100	92	92	92	94	94
10	92	82	82	84	86	B	106	88	98	96	96	96	98	114	114	98	104	104	98	94	94	90	96	96
11	96	104	92	92	84	86	112	102	98	90	90	114	114	114	102	124	144	G	150	108	102	86	94	94
12	90	90	90	90	90	90	110	108	92	86	90	90	122	114	116	116	106	168	92	108	96	96	96	92
13	92	92	92	94	94	90	106	100	98	96	104	108	136	144	134	134	170	G	98	94	96	96	90	84
14	90	88	90	90	86	86	94	104	96	98	98	90	150	108	104	106	100	100	94	96	92	96	92	90
15	84	82	84	B	B	B	116	108	100	90	94	96	94	140	112	124	106	100	98	92	94	94	90	90
16	88	88	90	82	92	92	108	100	94	88	88	88	94	118	112	112	124	100	98	92	92	90	90	88
17	88	86	84	96	106	94	98	102	96	94	98	102	88	100	140	112	118	112	104	98	92	94	94	94
18	94	88	96	90	92	90	120	100	92	92	88	90	164	106	G	112	114	98	100	96	98	94	94	98
19	96	90	86	84	88	94	102	96	94	92	90	94	94	98	B	150	112	98	102	96	96	B	B	92
20	92	88	90	88	100	B	100	100	100	88	90	98	84	88	92	94	G	106	104	92	96	90	90	90
21	98	90	90	92	92	94	90	102	100	86	98	88	88	88	88	90	88	84	84	100	90	92	90	94
22	84	80	80	B	B	B	G	118	112	G	G	98	98	118	106	122	138	120	112	104	88	92	88	80
23	80	80	80	80	82	82	G	106	108	144	132	136	104	86	86	122	108	106	94	92	94	90	90	88
24	86	84	84	80	94	100	98	98	90	94	92	96	90	92	92	88	88	110	110	86	86	88	84	B
25	B	90	92	94	92	94	130	118	106	92	90	122	94	92	86	84	G	108	104	96	108	92	92	84
26	82	82	88	B	B	B	110	122	106	90	110	94	106	106	114	102	98	98	98	90	90	84	88	88
27	84	86	B	84	98	B	126	112	110	104	92	88	94	92	94	G	112	178	110	102	98	100	102	92
28	90	90	92	86	80	84	120	102	96	96	100	96	94	94	96	104	96	90	90	90	90	84	82	84
29	86	84	82	82	82	B	96	106	96	98	108	168	180	114	100	86	88	128	100	98	94	82	82	98
30	92	86	B	92	92	96	96	96	98	92	92	98	132	110	102	96	96	102	98	92	90	82	84	84
31	82	82	80	80	82	86	136	112	94	88	90	86	90	88	88	120	100	102	128	86	84	82	82	88
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	26	23	20	26	31	31	30	29	30	31	30	28	29	29	28	31	31	31	29	30	29
MED	88	88	88	87	90	90	106	102	98	94	96	96	98	106	105	112	108	103	98	94	92	90	90	90
U Q	92	90	91	92	92	94	120	108	100	96	98	100	124	114	116	123	124	109	104	96	96	94	92	93
L Q	84	84	84	84	84	86	98	98	94	90	90	90	94	92	94	97	98	99	96	92	90	87	88	88

MAY 2023 h'Es (KM)

IONOSPHERIC DATA STATION Okinawa

MAY 2023 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F3	F4	F1	F1		F1		C1	C2	L3	C1	CL21	CL11	CL11	CL11	C1	C1	C3	C4	L3	F2	F9	F3	F6
2	F2	F1	F1	F3	F3	F2	C3	C7	C4	C2	C1	C1	L1	L1	H1	H1	H1	C1	C4	L8	F1		F1	F2
3	F2	F1	F1				C1	L2	L2	L1	L1	L2	LH11	L1	L1	H1	C1	C6	C8	L4	FF24	F5	F3	F4
4	F2	F1	F1	F1			C1	L1	L1	L1		L1	L2	L1		L2	LH11	LH11	C1	L3	F5	F3	F4	F7
5	F3	FF22	F1	F1				C1	C3	C2	C1	C1	C1	HC11	C1	C1	C5	C1	C3	L9	F9	F6	F2	
6	F1		F1					C2	C1	C1	L2		H1	H1	H1	C2	C4	C3	C5	L6	F4	FF23	F5	F1
7	F5	FF62	F5	F7	F6	F3	L6	LQ21	CL32	CL32	L2	L1	HL11	H1	C1	CL21	CL31	C6	C4	L9	F6	F6	F3	F3
8	FF23	FF32	FF31	F3	F1	F5	HL11	C2	C2	C2	C3	C3	C4	C4	C4	H1	C1	C3	C4	L9	F7	F5	F5	F7
9	FQ41	F8	FF13	F7	FQ41	F2	L1	C3	C3	C3	L3	C1	C2		H1		C2		C4	L7	F5	FQ41	F3	FQ51
10	F7	F3	F2	F1	F1		CL11	L4	C4	C5	C4	C4	C4	C2	C1	C4	C3	C3	C3	L5	F7	F4	F7	F5
11	F5	F2	F4	F3	F1	F2	CL21	C8	C5	L7	L4	CL21	C2	C2	C4	C1	H1		H1	CL21	F1	F1	F3	F2
12	F1	F2	F5	F5	F2	F2	C2	C1	L4	L6	L8	L3	CL21	C3	C2	C2	C4	H1	L1	C1	F1	F4	F1	F2
13	F5	F3	F3	F2	F3	F4	C5	C7	C8	C6	C4	C6	H3	H1	H2	H2	H1		C4	L8	F4	F2	F5	F4
14	FF32	F5	F3	FQ31	FQ51	FQ61	L4	C3	C3	C2	C1	L2	H1	C1	C3	C3	C4	C4	L9	L4	L5	F3	F3	FF16
15	F3	F1	F1				C2	C1	C2	L4	L2	L2	L2	HL11	C2	C1	C4	C4	C4	L8	F5	F7	F7	FQ41
16	FQ41	FQ31	FQ51	F2	F2	F1	C1	C3	C3	L4	L3	L2	LH21	C1	C1	C1	C1	C3	C6	L9	F9	F4	F4	F8
17	F5	F2	F2	R1	FF12	F1	L1	C4	C3	LQ21	C1	C1	L3	C2	HL11	C3	C1	C2	C7	L9	FF92	FF32	F3	F3
18	F5	F9	F4	FQ51	F3	F5	C1	C1	L3	L3	L2	L3	H1	C4		C3	C2	C3	C2	L6	F3	F3	F4	F2
19	F2	F1	F1	F1	F3	F4	C3	C5	L5	L4	L4	L3	L1	L1		HL11	CL21	CL61	CL82	CL94	F6			F4
20	F2	F3	F3	F1	F1		C5	C2	C2	L6	L2	C1	L4	L1	L1	L1		C1	CL31	L9	FF34	F4	F4	F4
21	FF23	FQ31	F7	F4	F3	F4	L5	C3	C3	L3	C1	L4	L4	L7	L3	L1	L2	L5	L6	C3	F5	F8	F3	FF24
22	F6	F2	F1					C1	C1			C1	C2	C1	CH11	C2	HC11	C2	C2	CL22	F7	F3	F6	F8
23	F5	F2	F3	F3	F3	F1		C1	C1	H1	H1	HC11	CL14	L2	L3	C2	CL31	CL34	LL94	L9	F9	F5	F5	F6
24	F6	F5	FQ21	F2	F2	F2	L2	C6	L6	C3	L3	C2	L3	L1	L1	L2	L3	CL11	CL23	L2	F1	F1	F1	
25		F4	F4	F4	F3	F1	H1	C1	C2	L2	L2	CL11	L1	L1	L2	L2		C1	C1	L2	FF13	F7	FQ41	F5
26	F3	F1	F1				C1	CL22	CL12	L2	C1	L2	C1	C1	C1	C2	C3	C3	C4	L4	F3	F3	F4	F2
27	F1	F1		F1	F1		C1	C1	C1	CQ11	L4	L2	L2	L3	L3		C1	H1	C5	C3	F2	F4	F2	F4
28	F4	F4	F3	F4	F6	F3	C1	C8	C5	C3	C2	C1	C2	C3	C3	C1	C5	L8	L8	L9	F4	F7	F6	F6
29	F2	F2	F2	F1	F1		L1	C1	C3	C2	C1	HC11	H1	H1	C4	L4	L2	C1	C5	CL72	FF67	F5	F6	FF13
30	F5	F1		F4	F4	F3	F3	C3	C1	L3	L2	L1	H1	C2	C2	C4	C5	C4	C7	L7	F6	F4	F6	F4
31	F4	F2	F5	F5	F2	F1	H1	C1	C6	L8	LQ51	L7	L2	L3	L2	CL32	C2	C2	HL12	LL22	F3	F3	F3	FF54
	00	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																								

MAY 2023 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

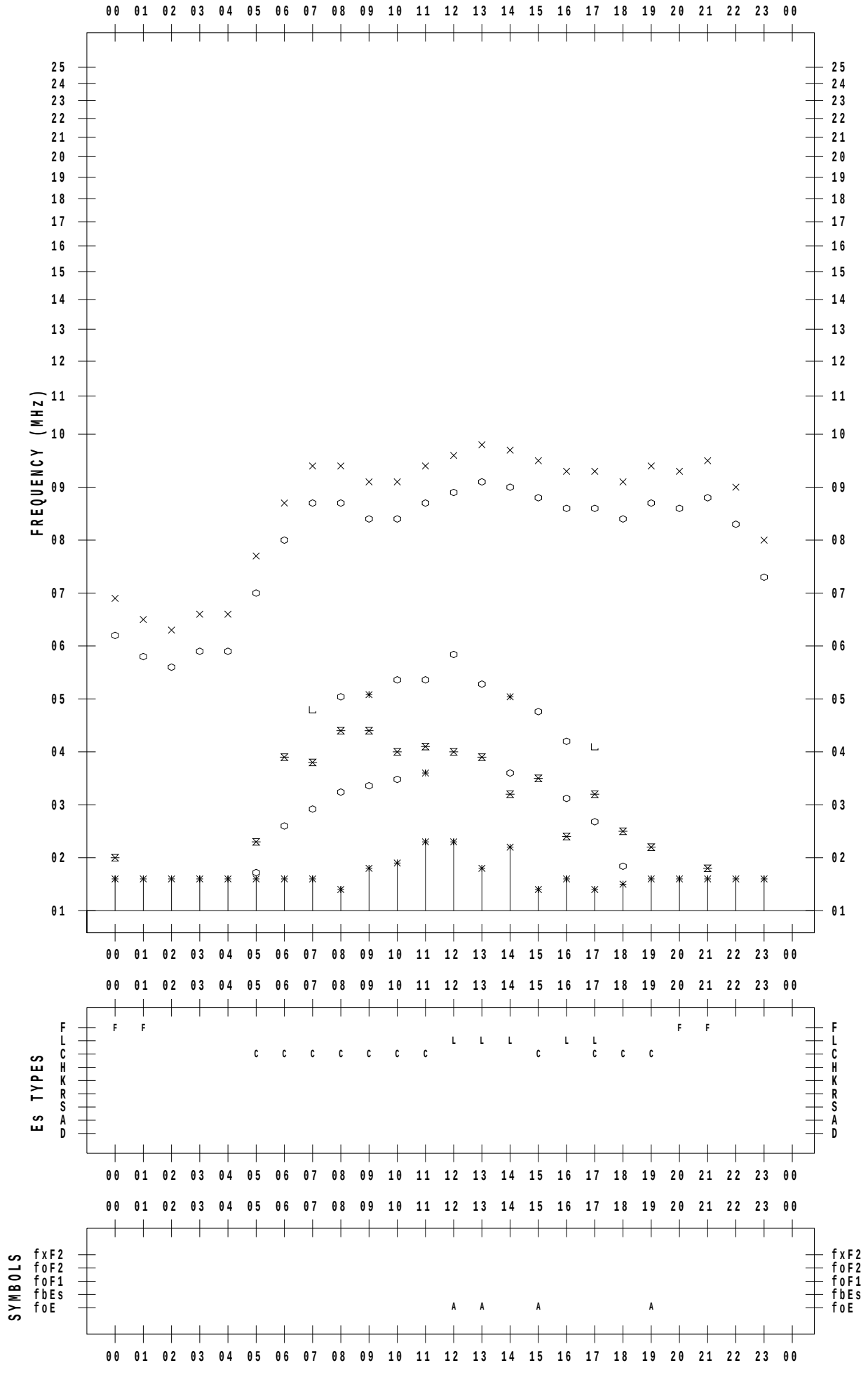
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 1

135 °E MEAN TIME



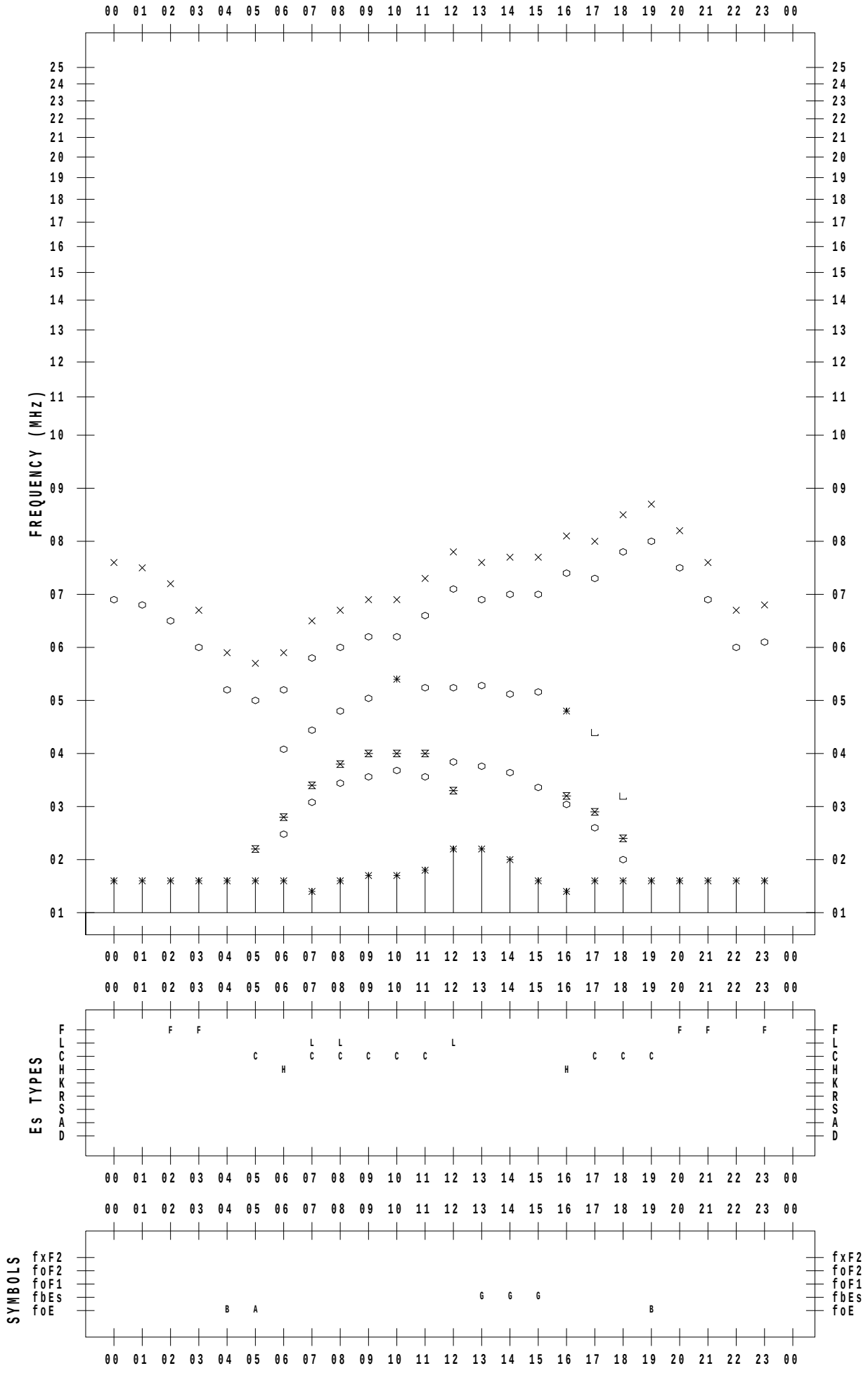
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 2

135 °E MEAN TIME



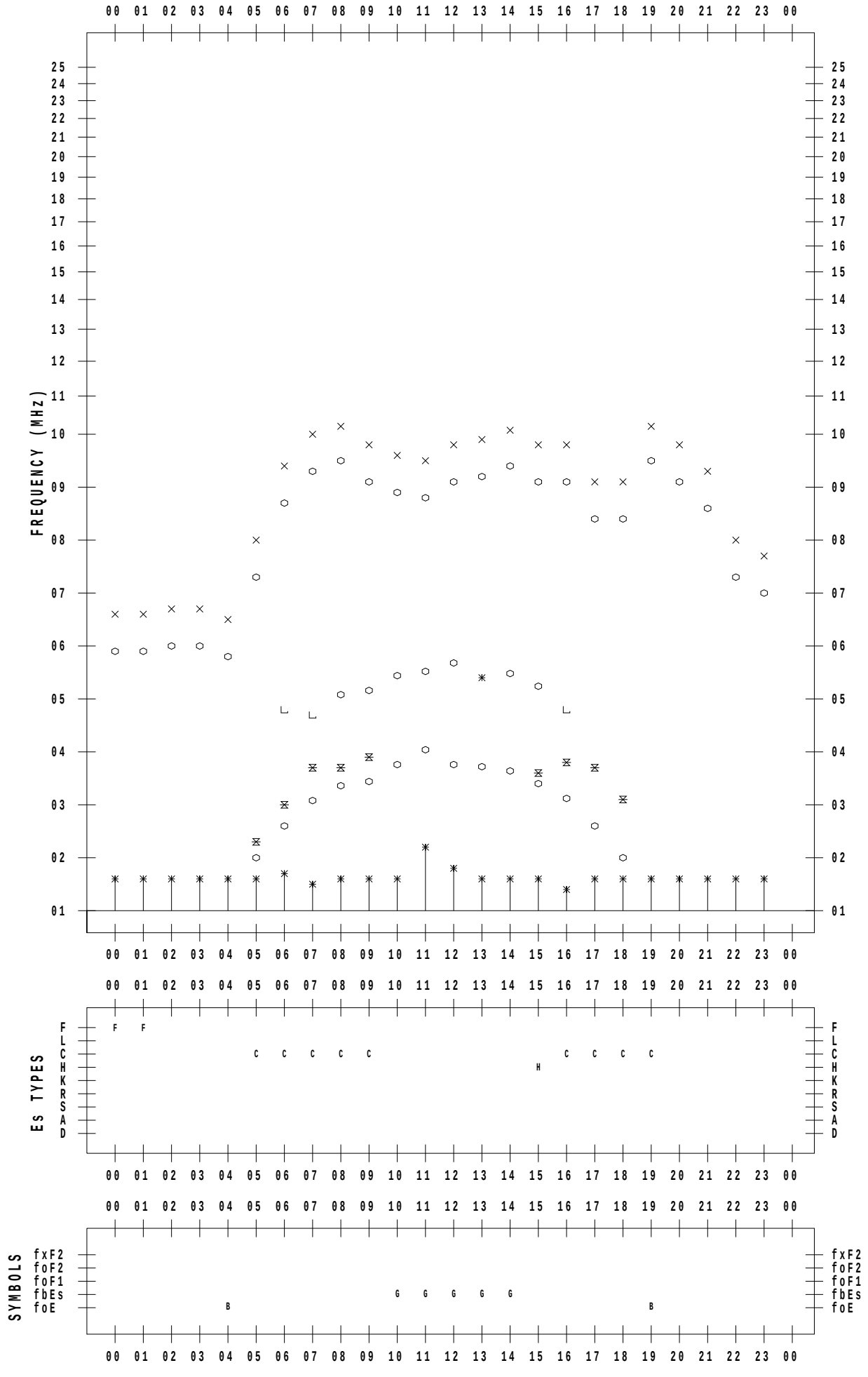
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 3

135 °E MEAN TIME



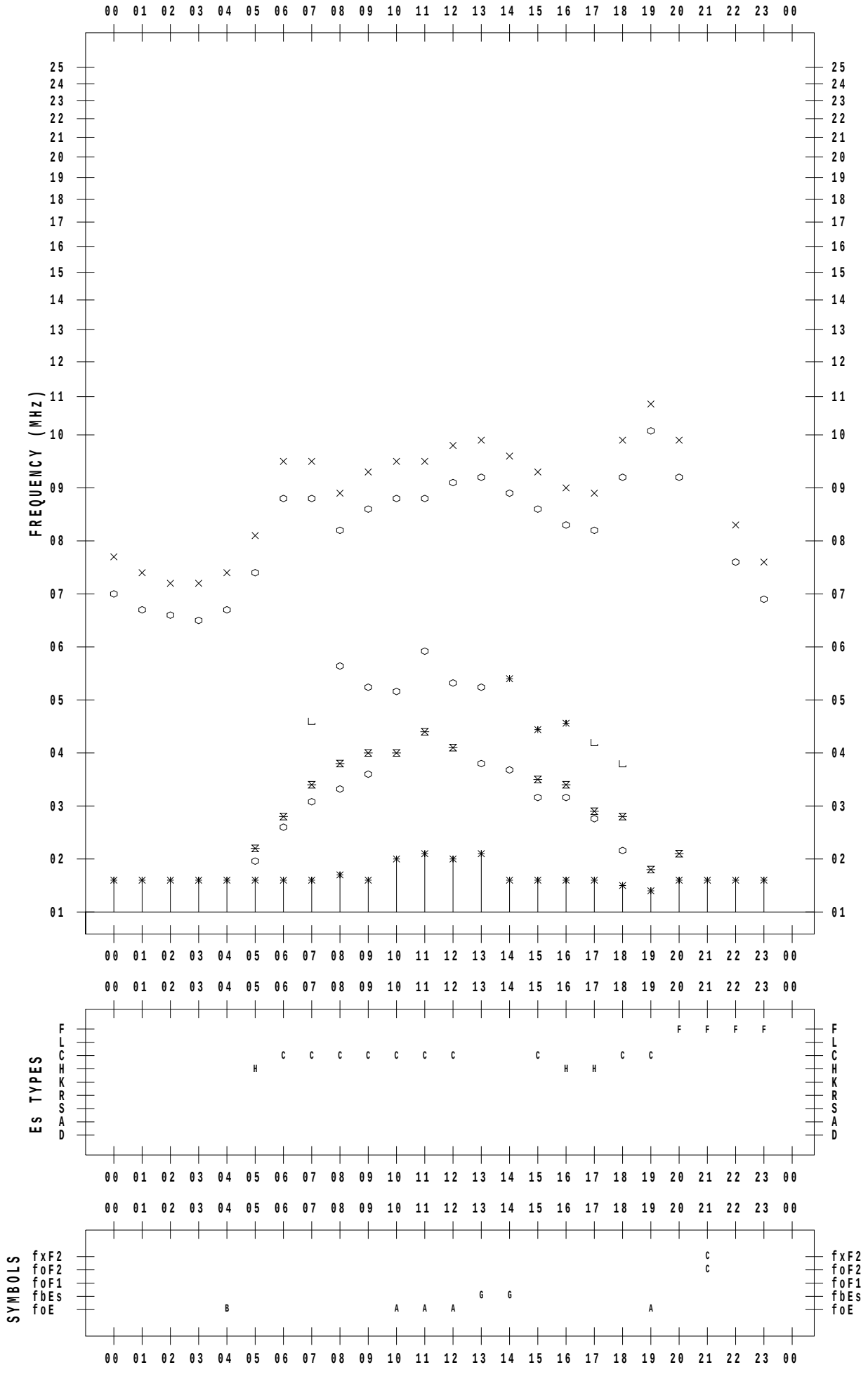
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 4

135 °E MEAN TIME



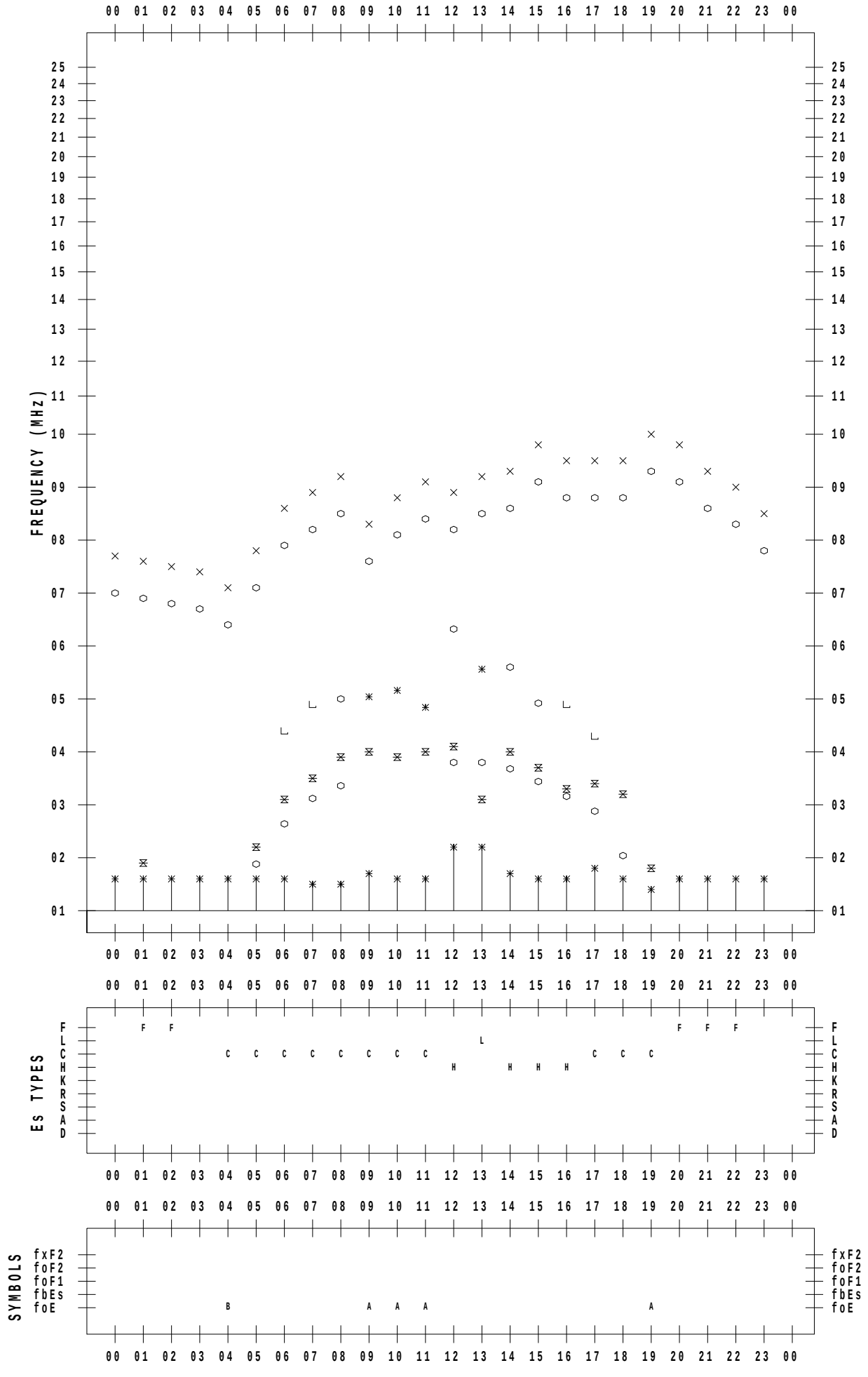
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 5

135 °E MEAN TIME



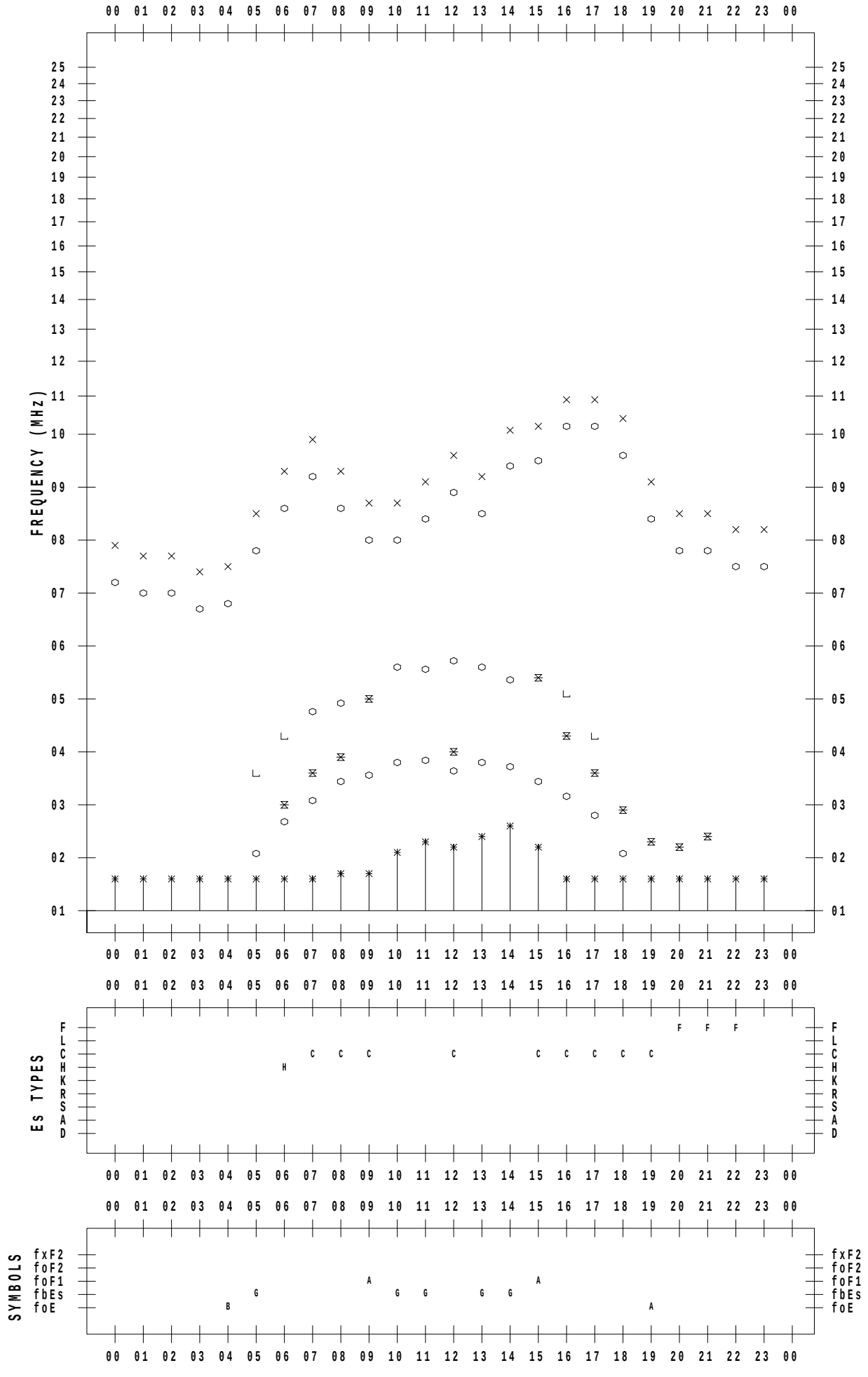
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 6

135 °E MEAN TIME



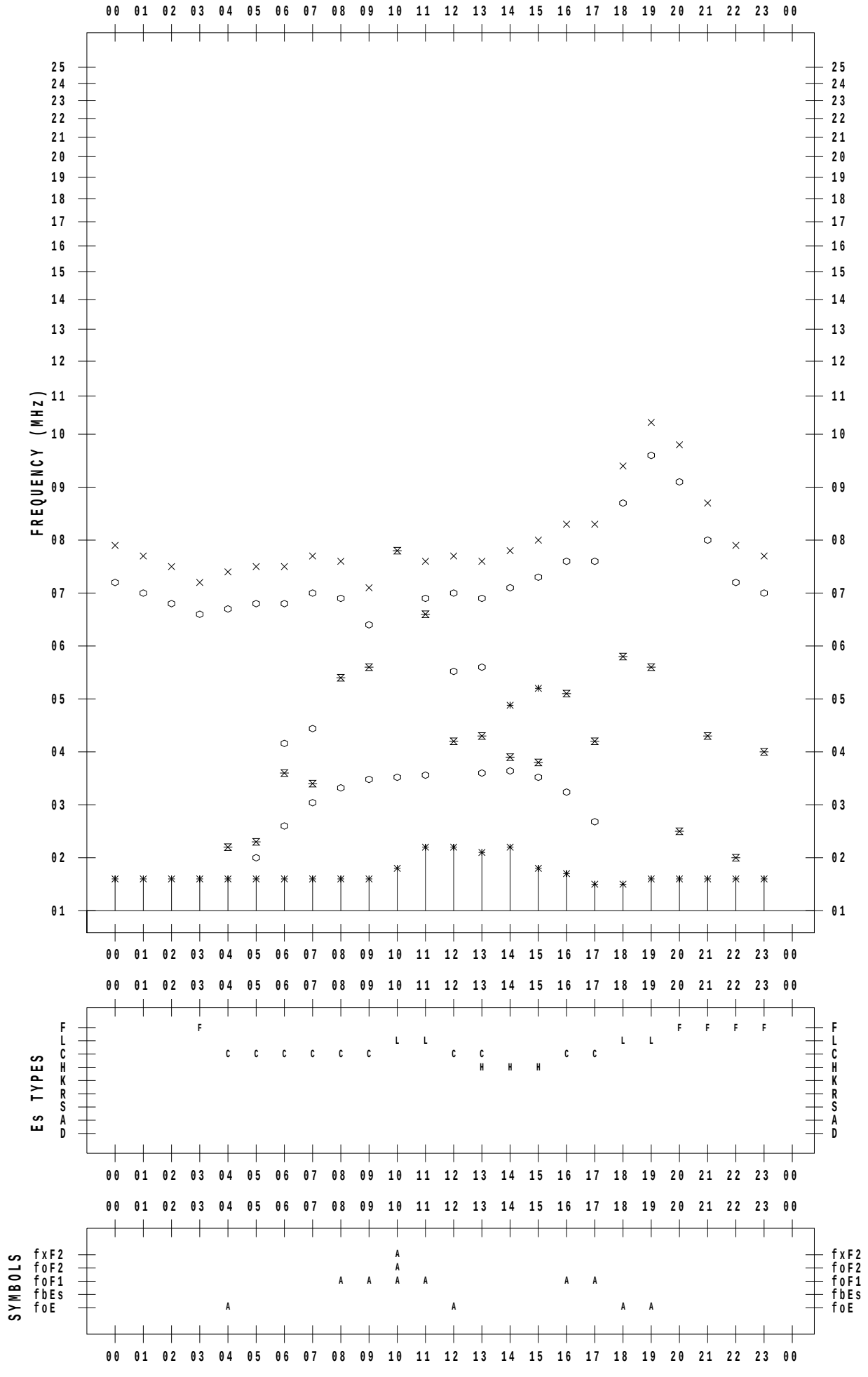
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 7

135 °E MEAN TIME



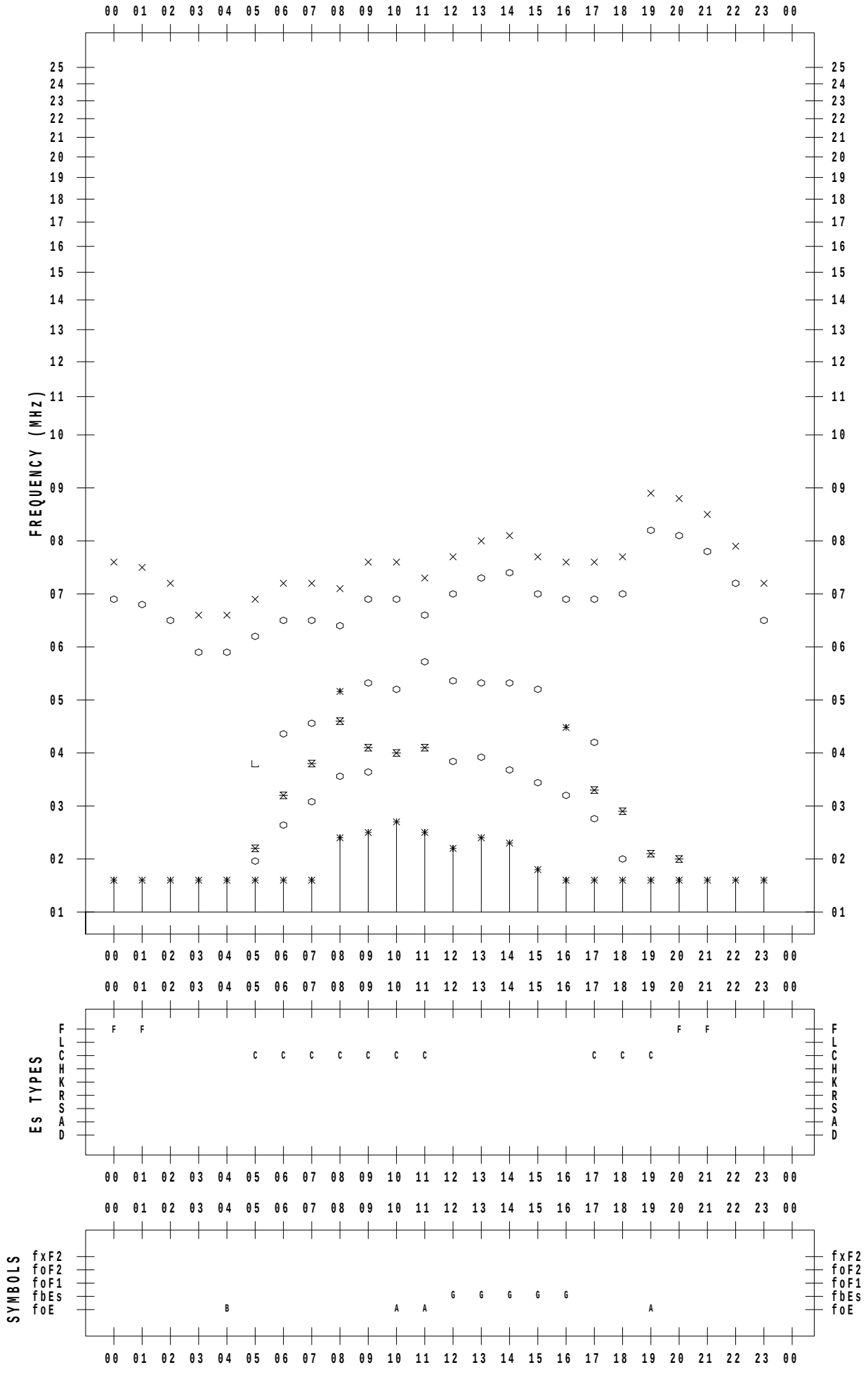
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 8

135 °E MEAN TIME



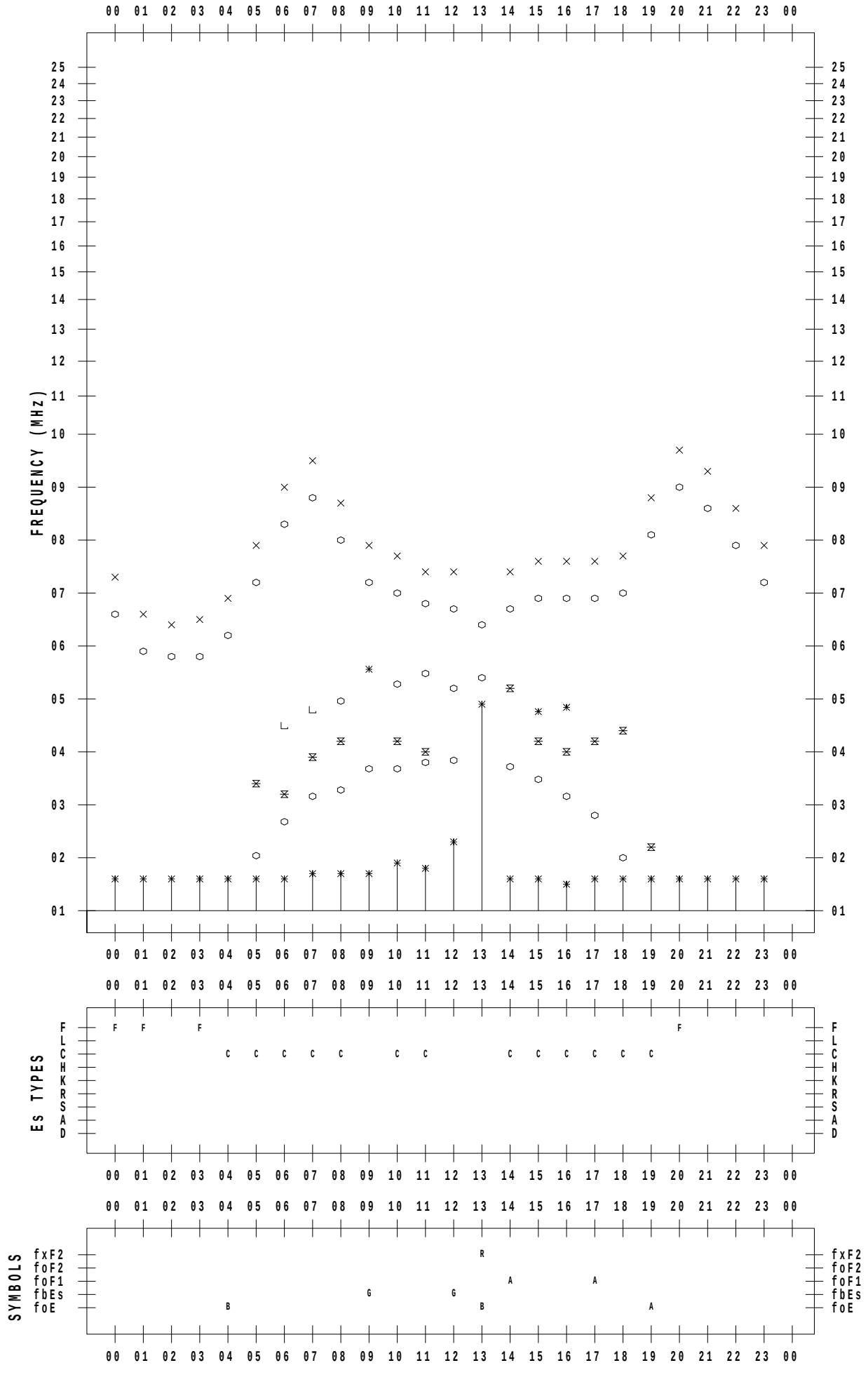
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/ 9

135 °E MEAN TIME



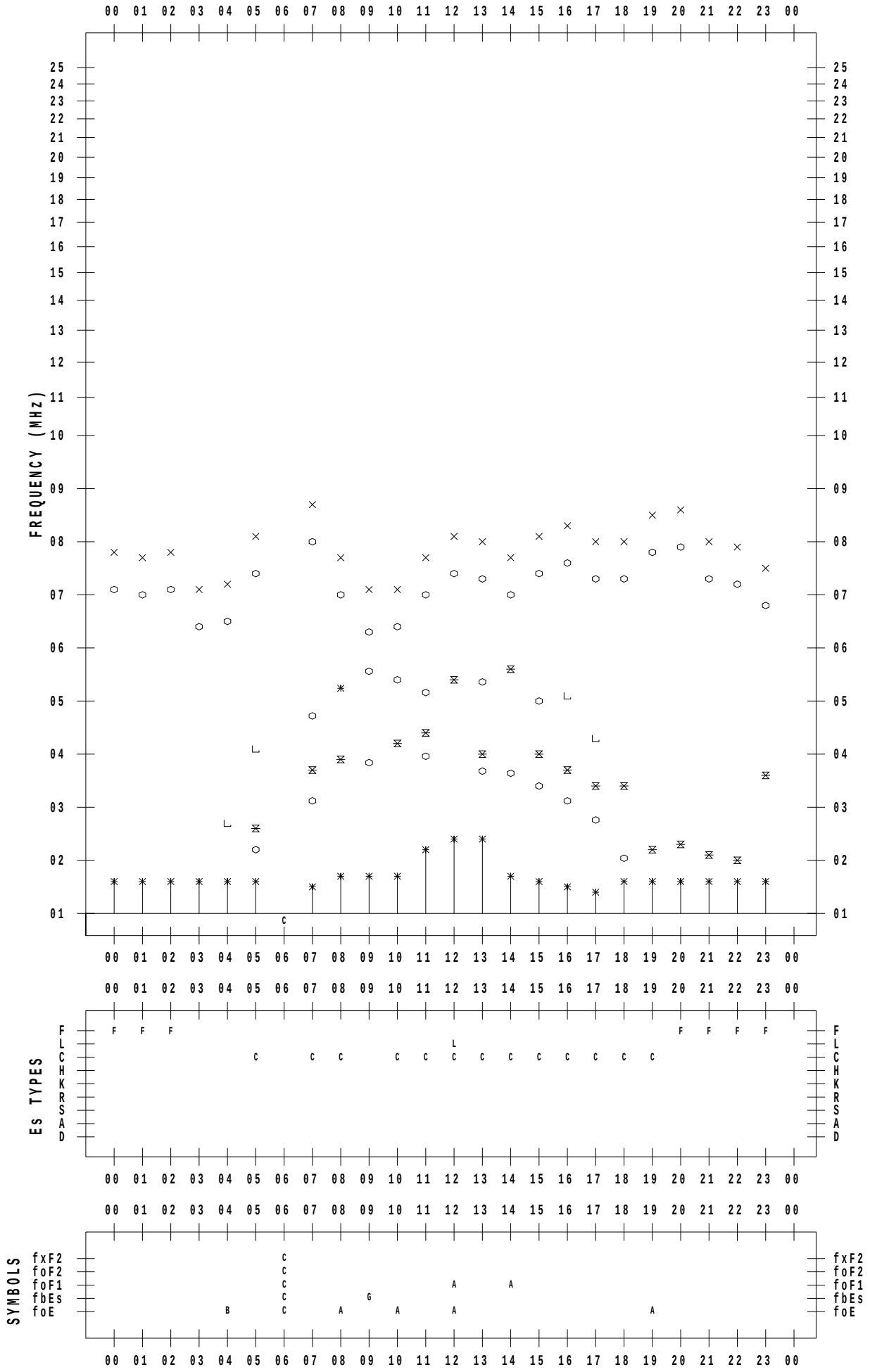
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/10

135 °E MEAN TIME



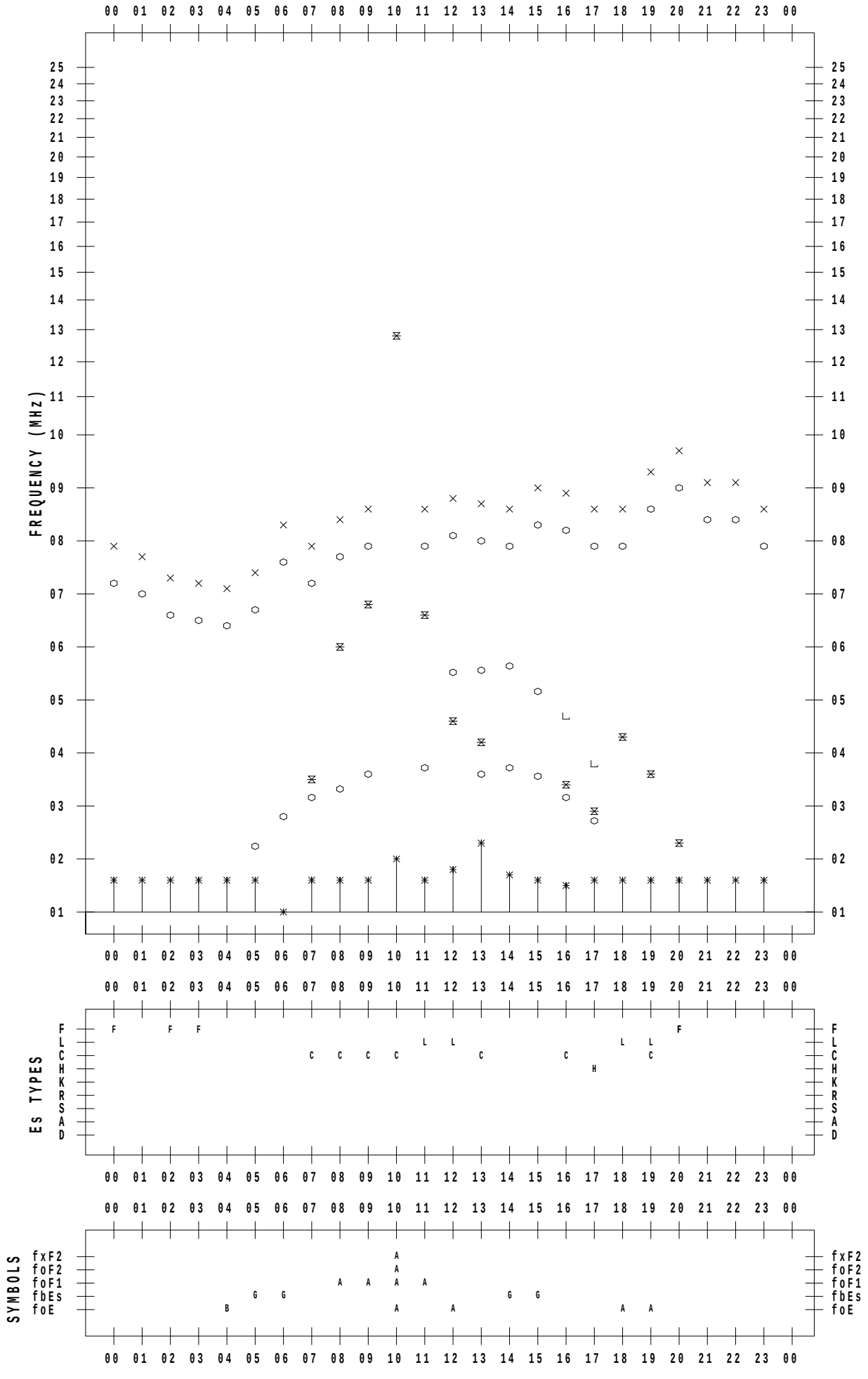
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/11

135 °E MEAN TIME



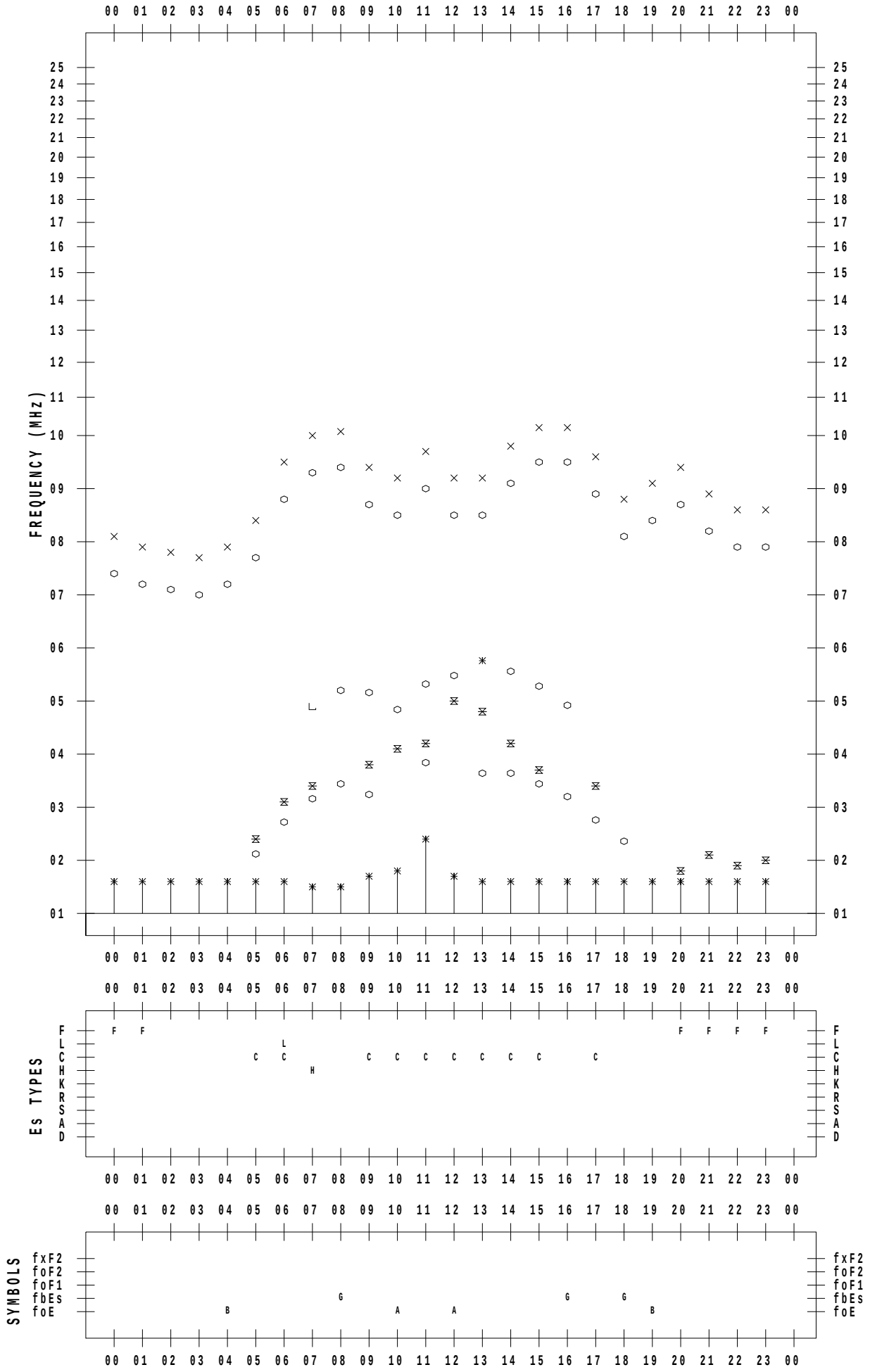
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/12

135 °E MEAN TIME



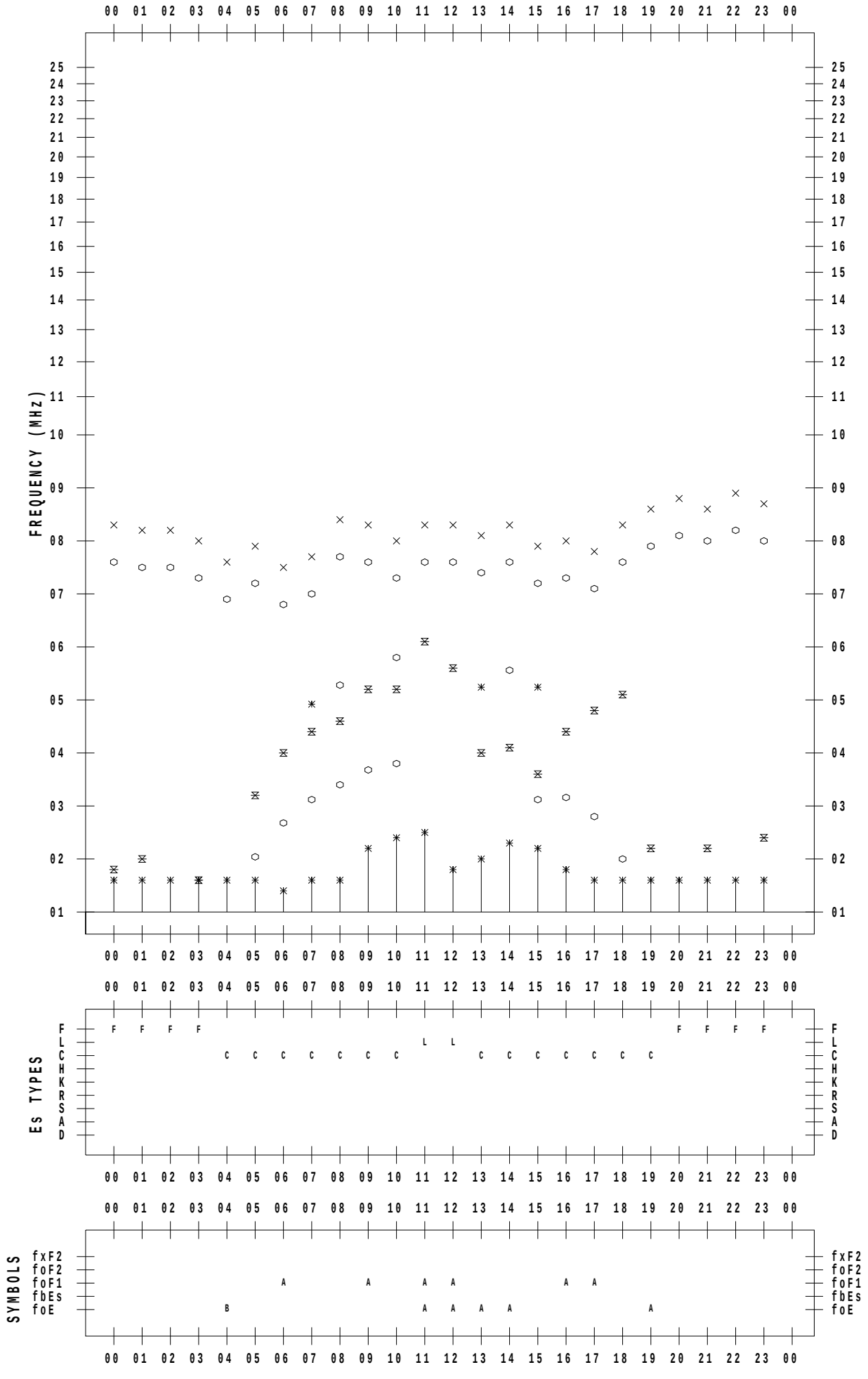
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/13

135 °E MEAN TIME



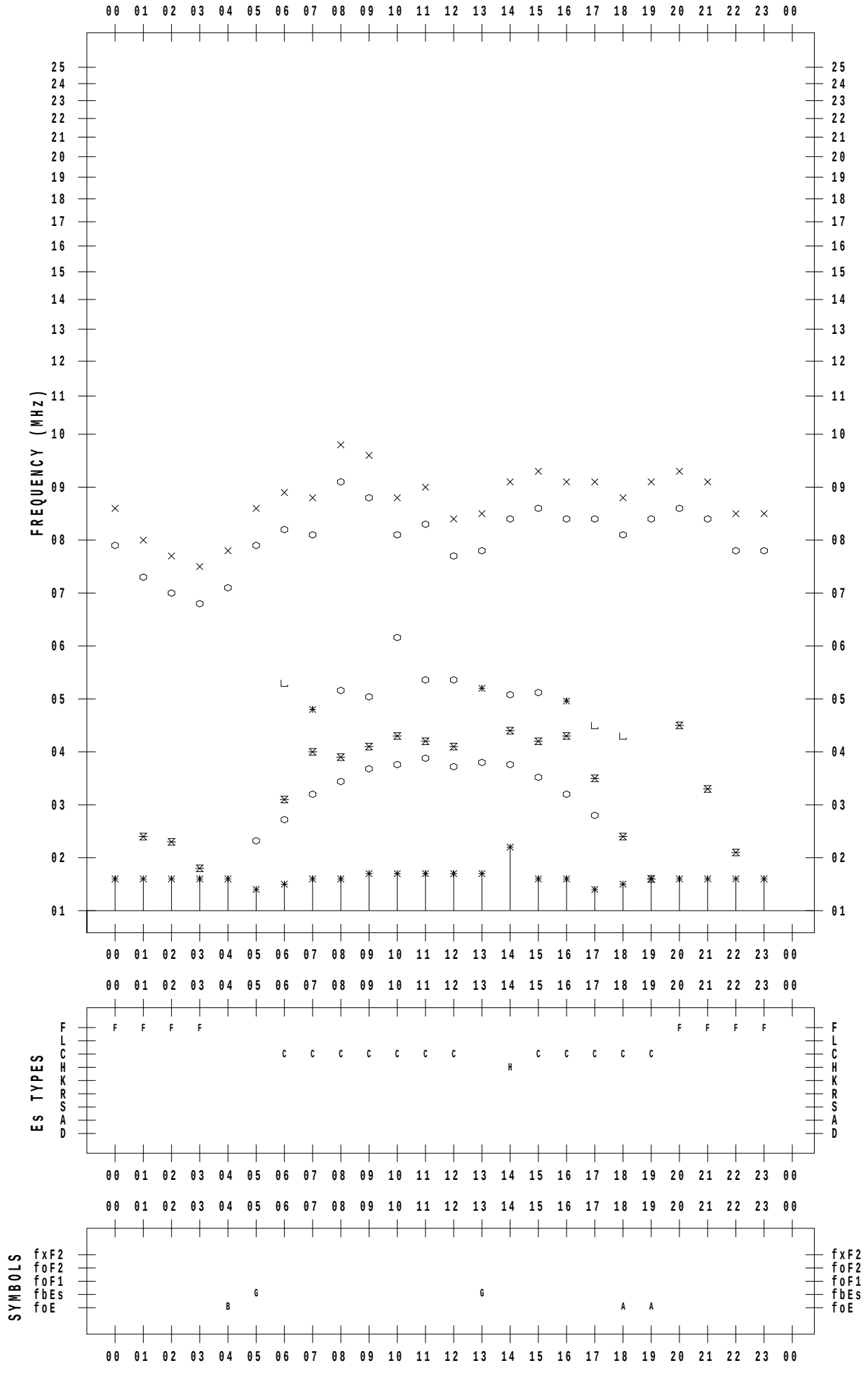
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/14

135 °E MEAN TIME



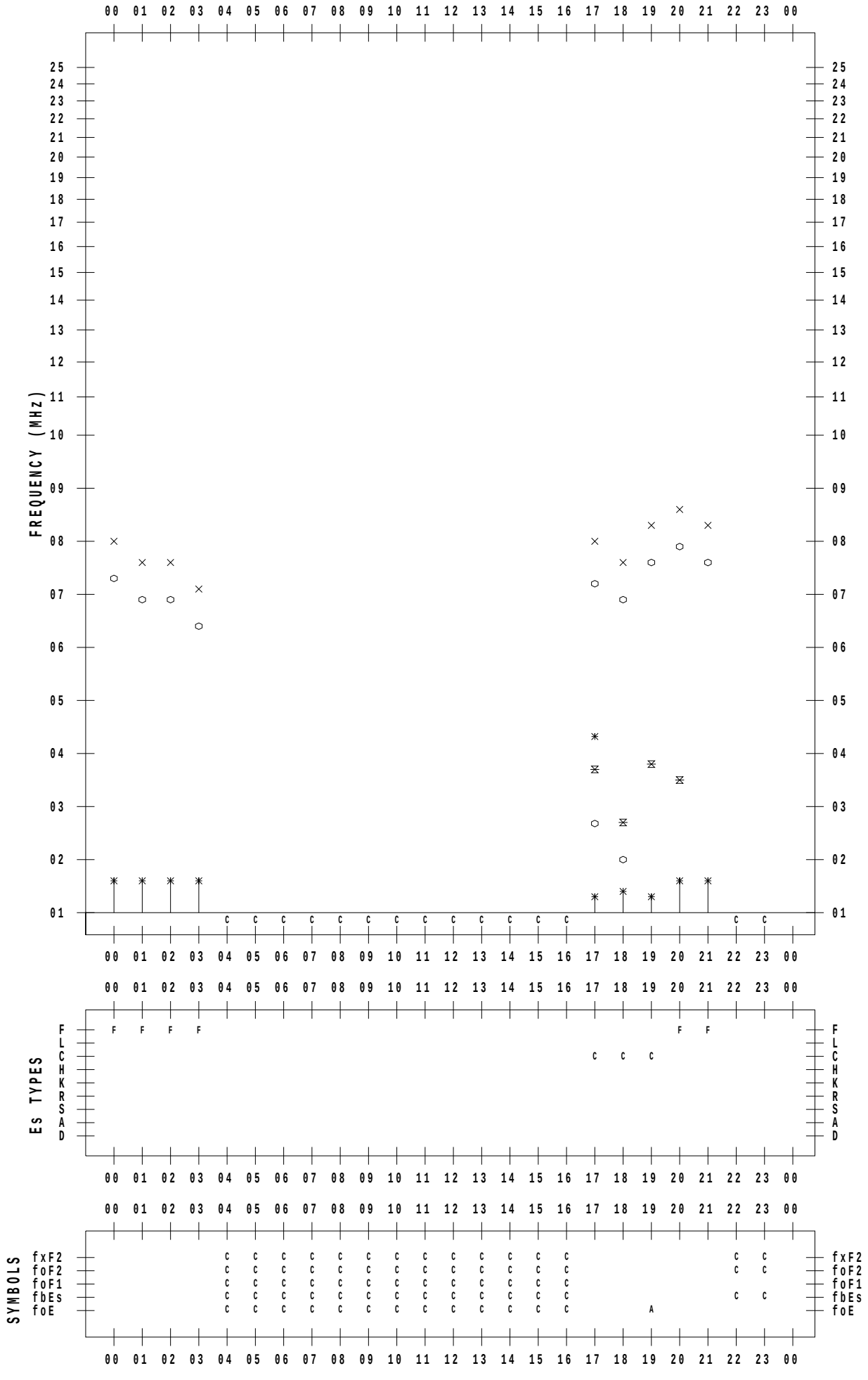
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/15

135 °E MEAN TIME



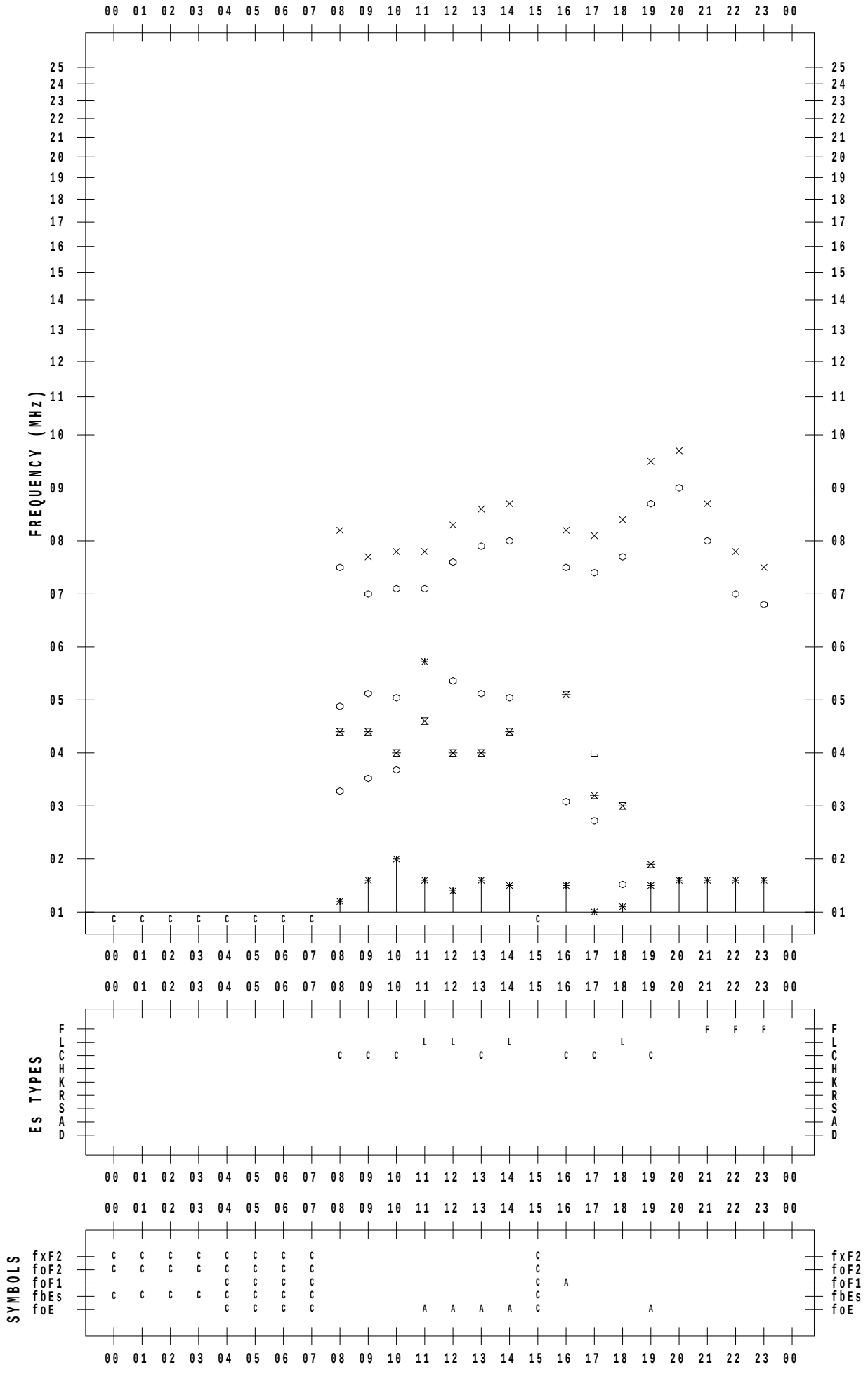
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/16

135 °E MEAN TIME



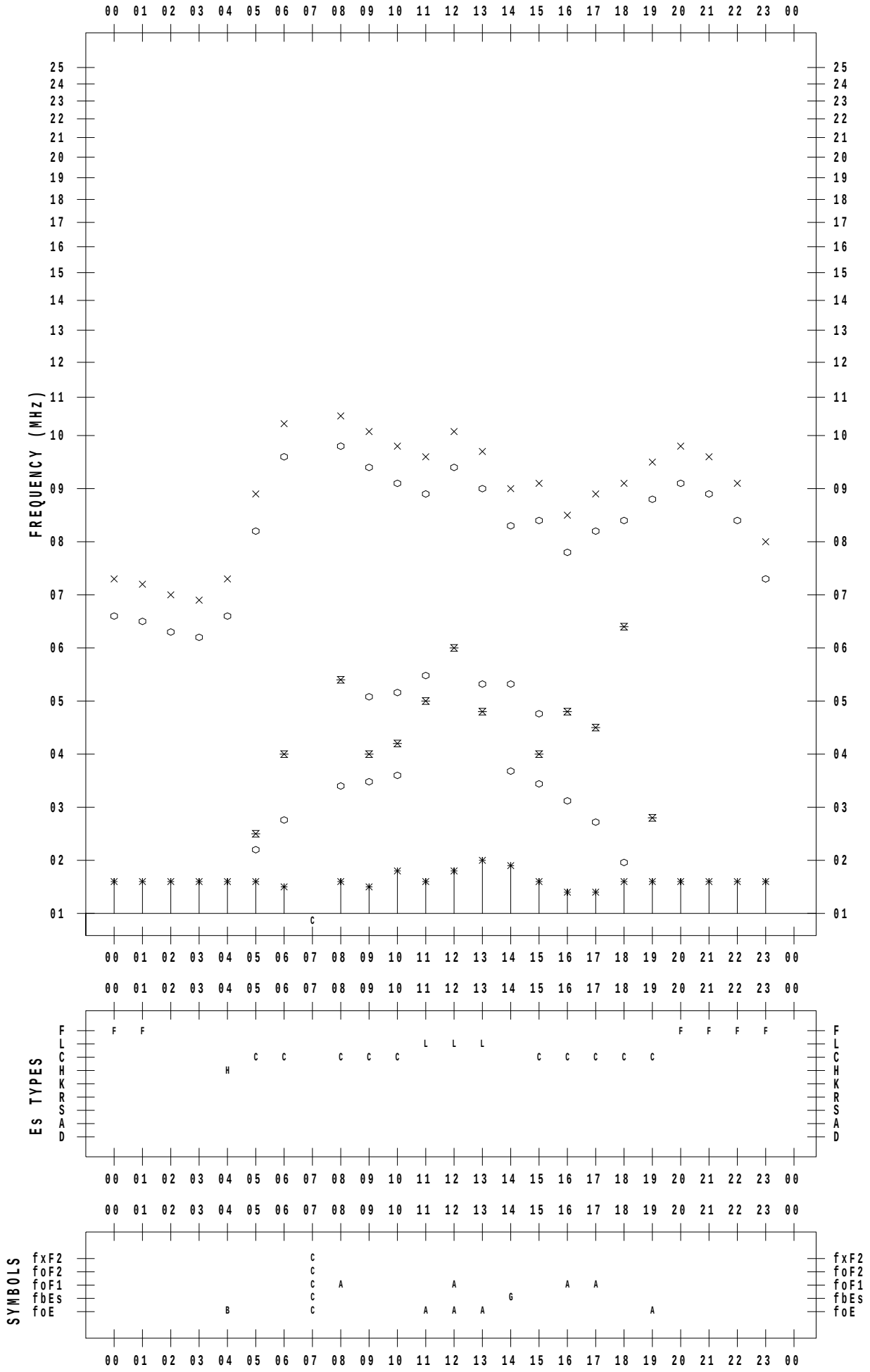
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/17

135 °E MEAN TIME



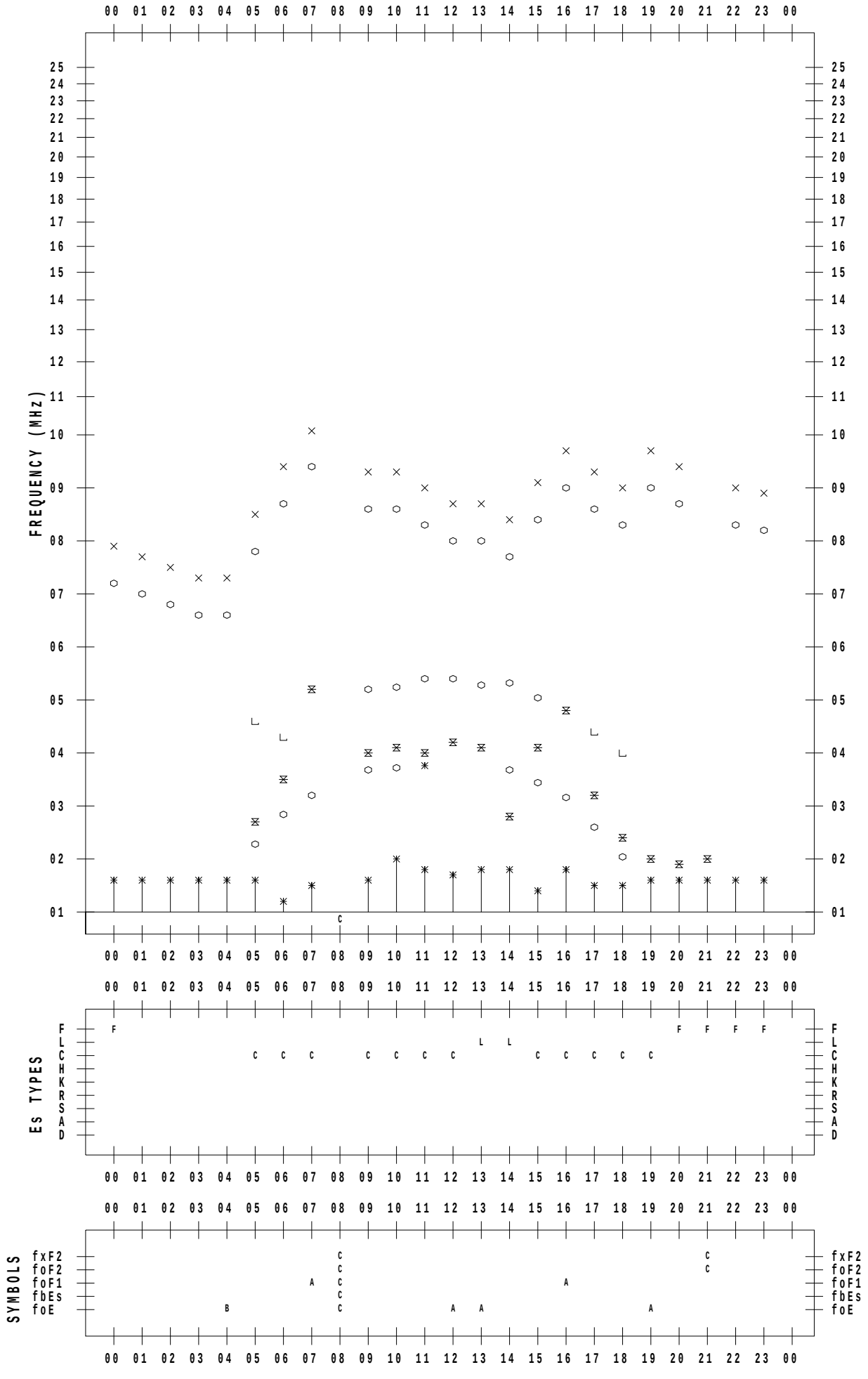
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/18

135 °E MEAN TIME



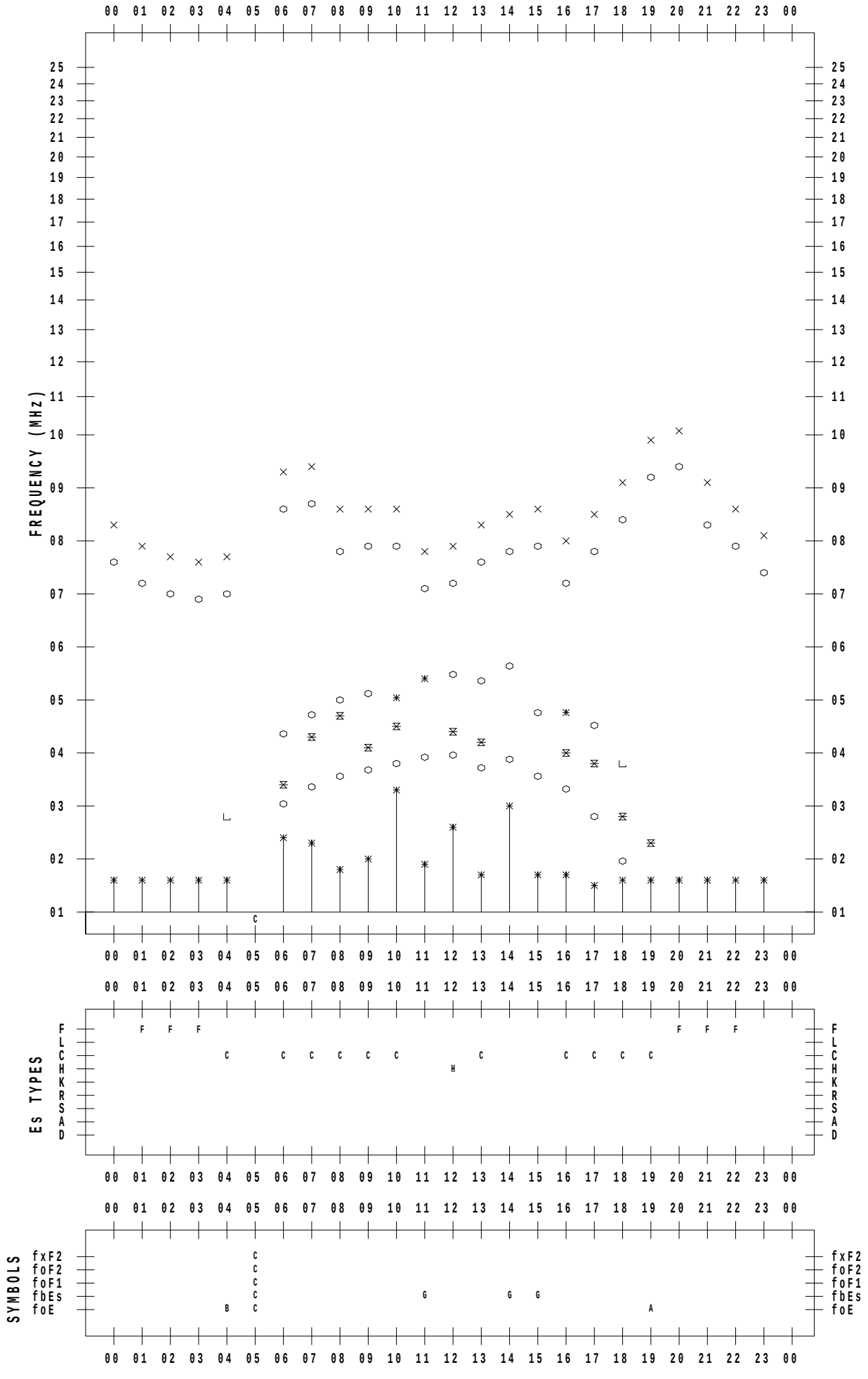
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/19

135 °E MEAN TIME



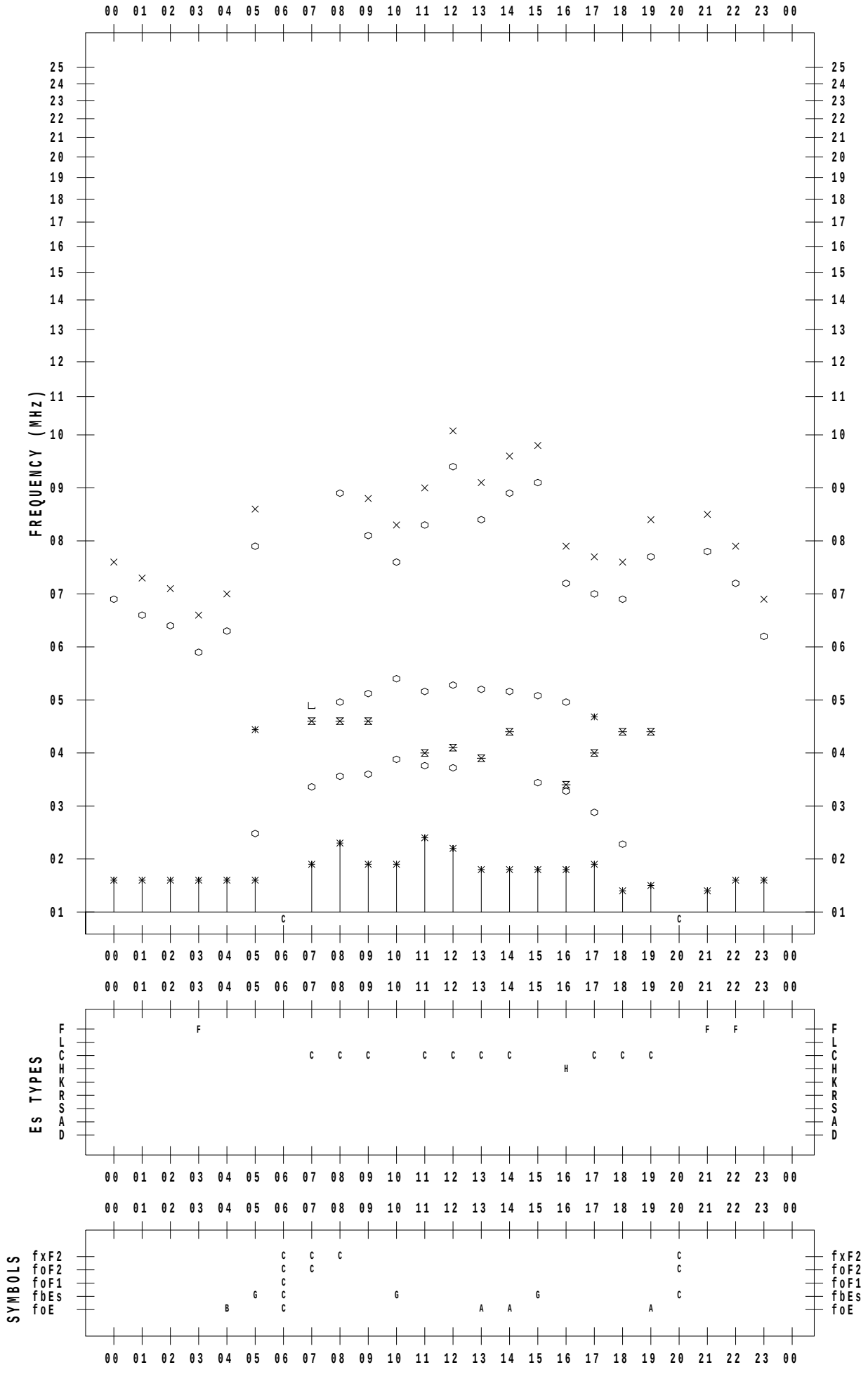
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/20

135 °E MEAN TIME



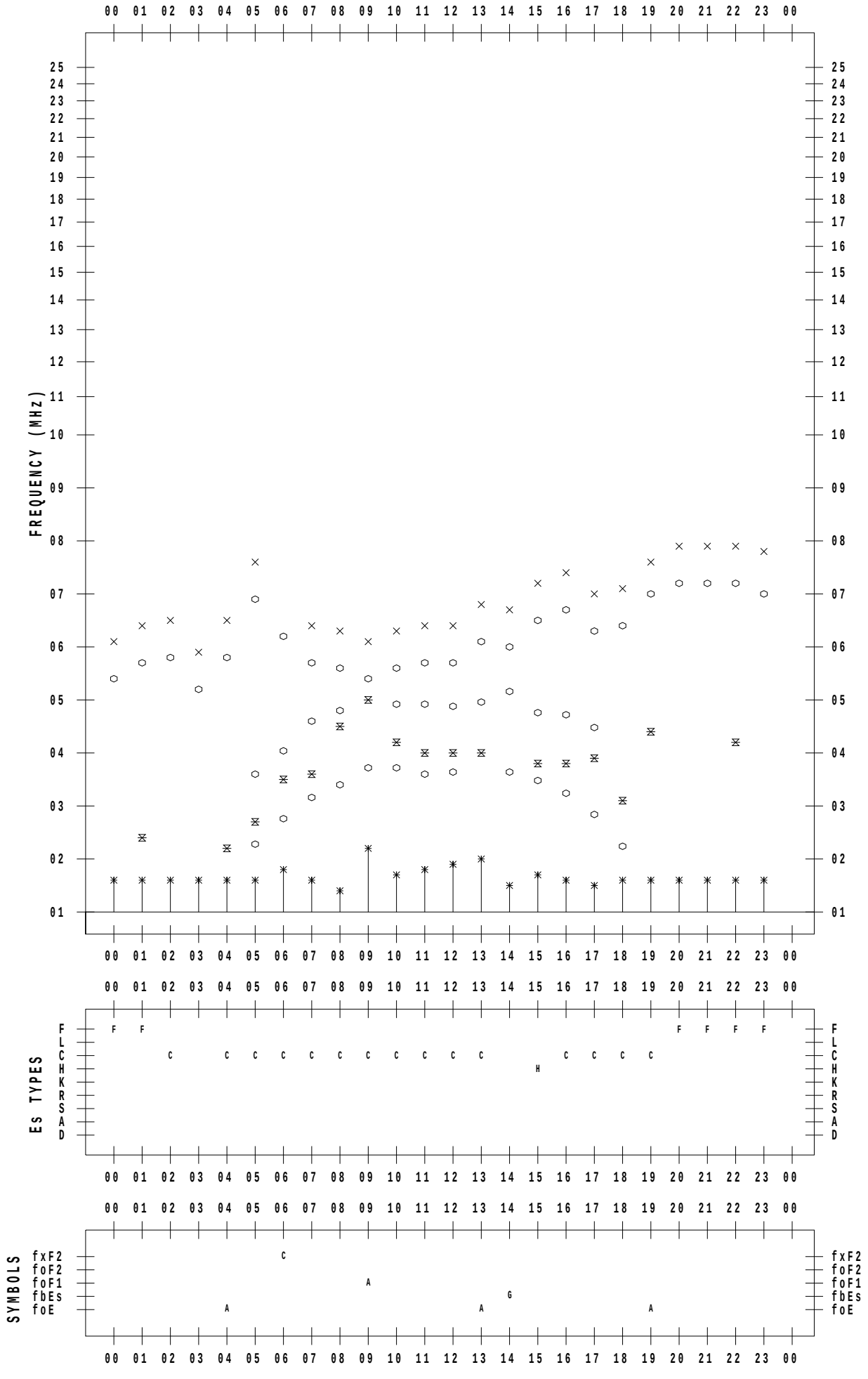
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/21

135 °E MEAN TIME



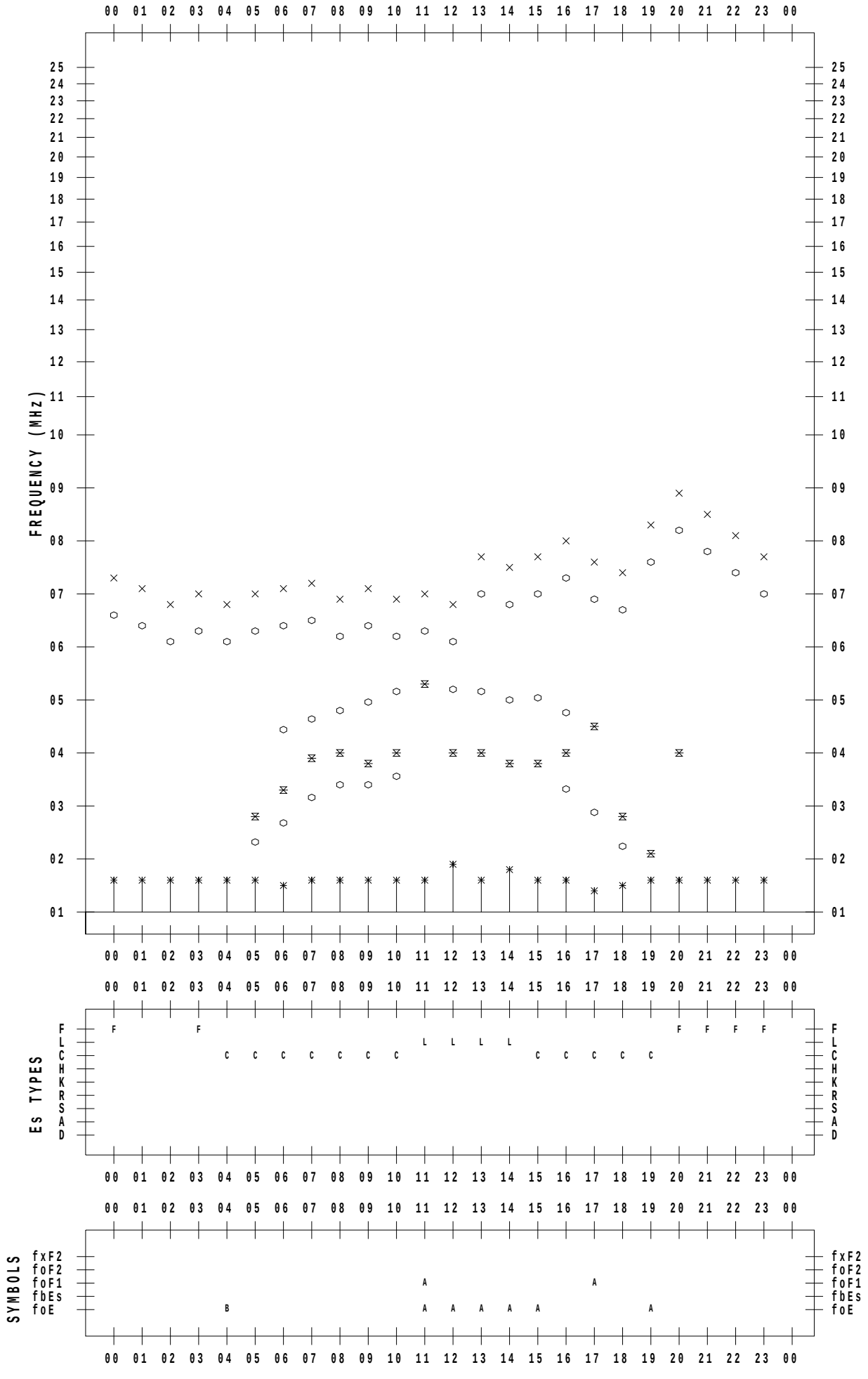
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/22

135 °E MEAN TIME



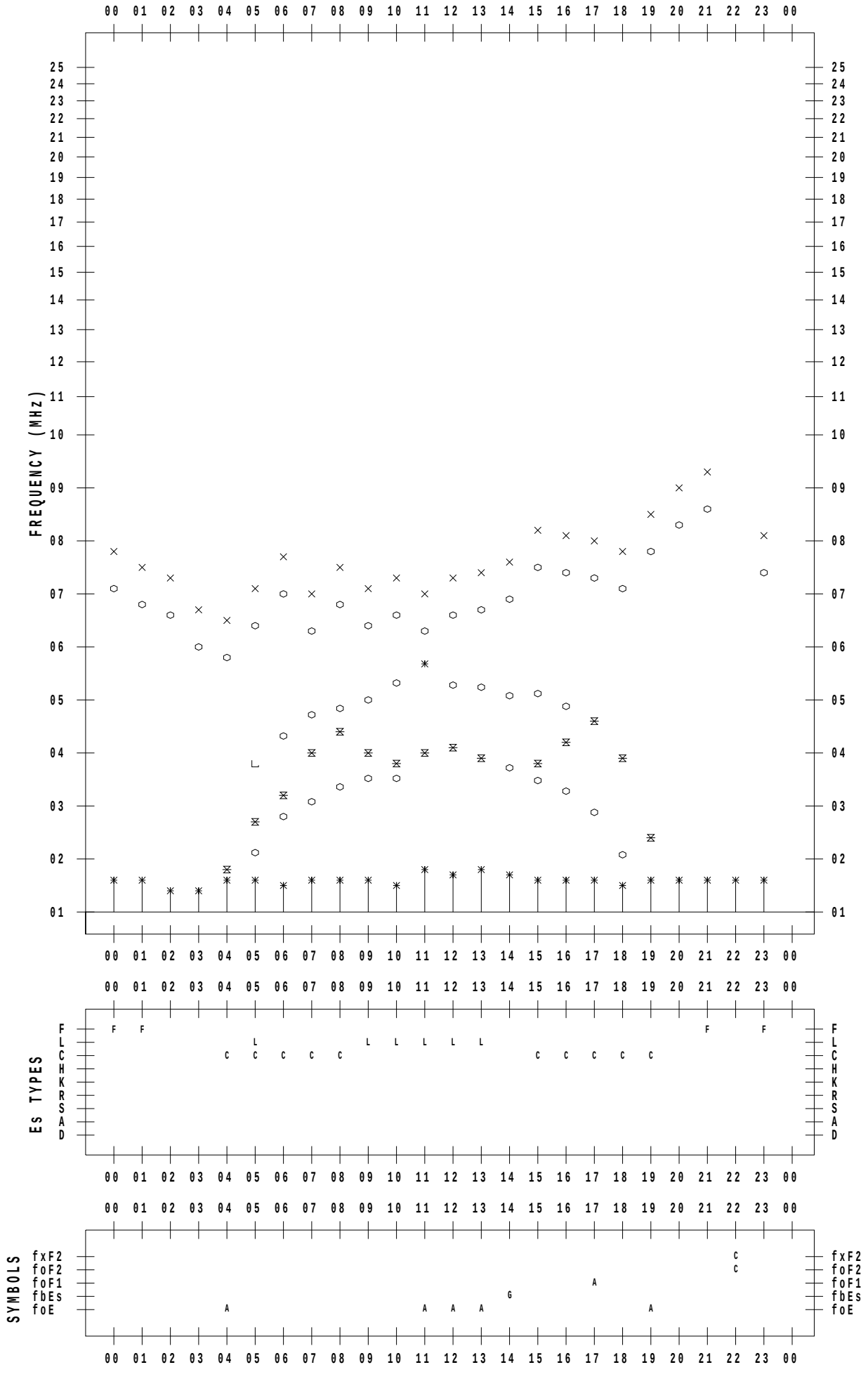
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/23

135 °E MEAN TIME



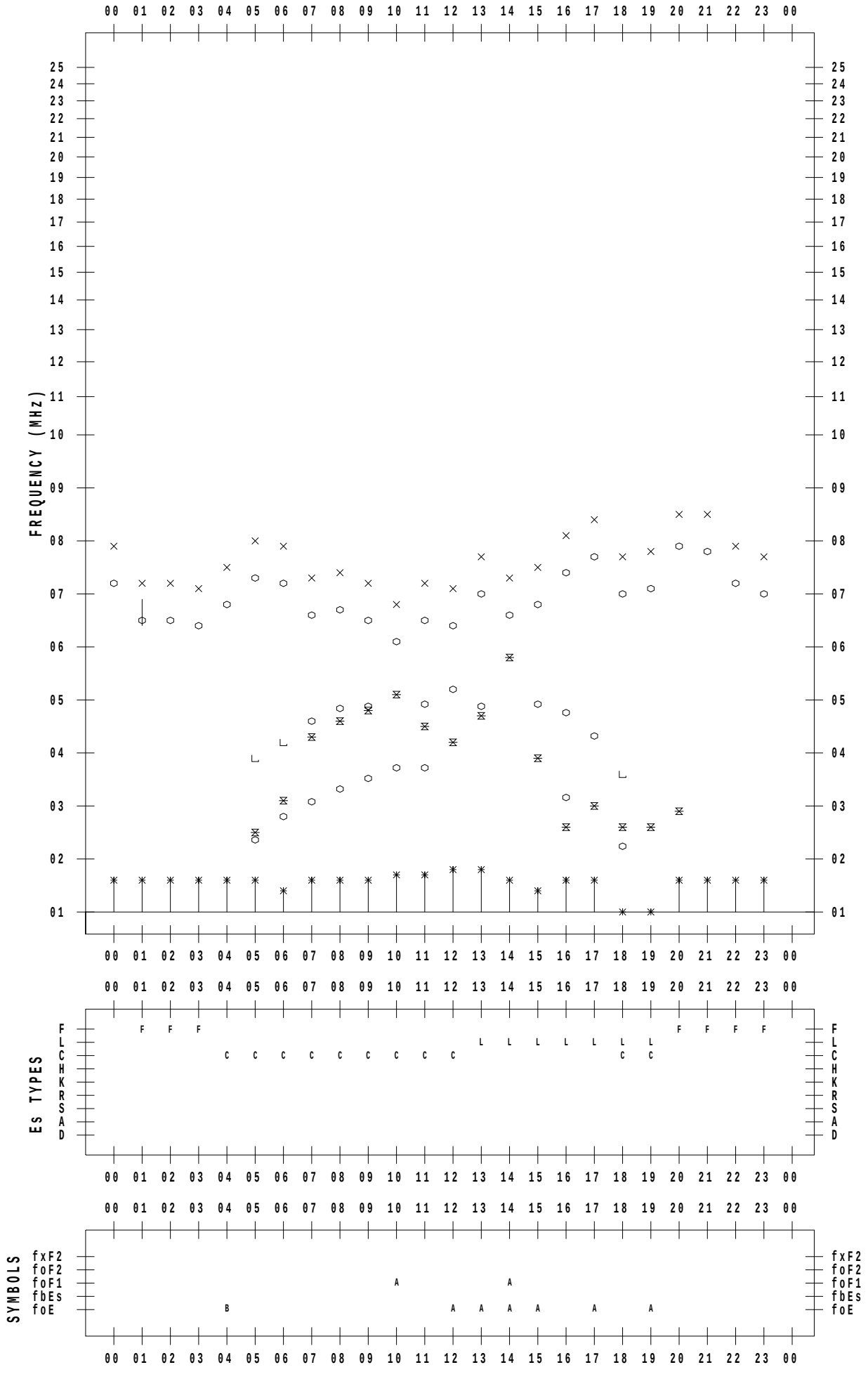
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/24

135 °E MEAN TIME



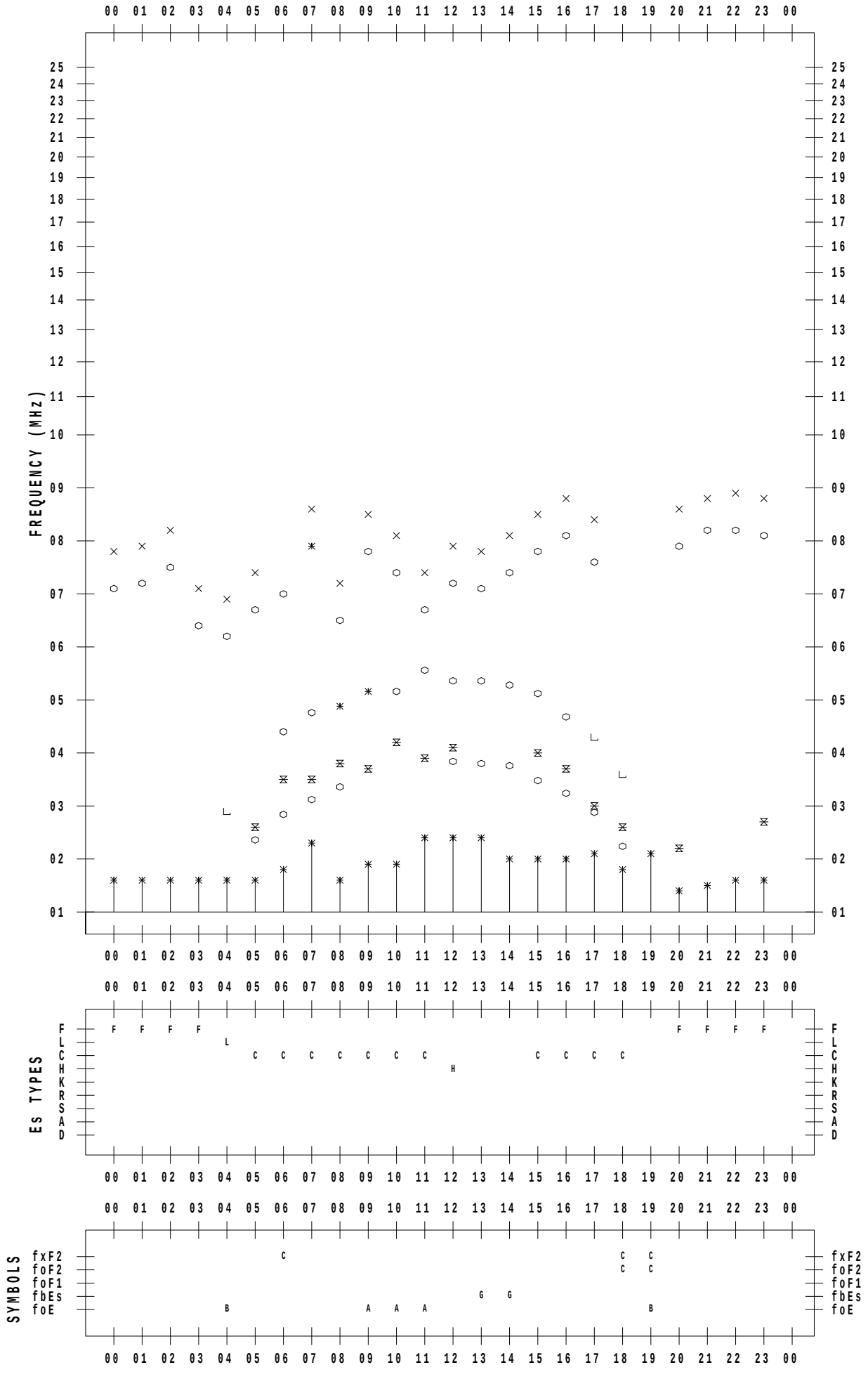
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/25

135 °E MEAN TIME



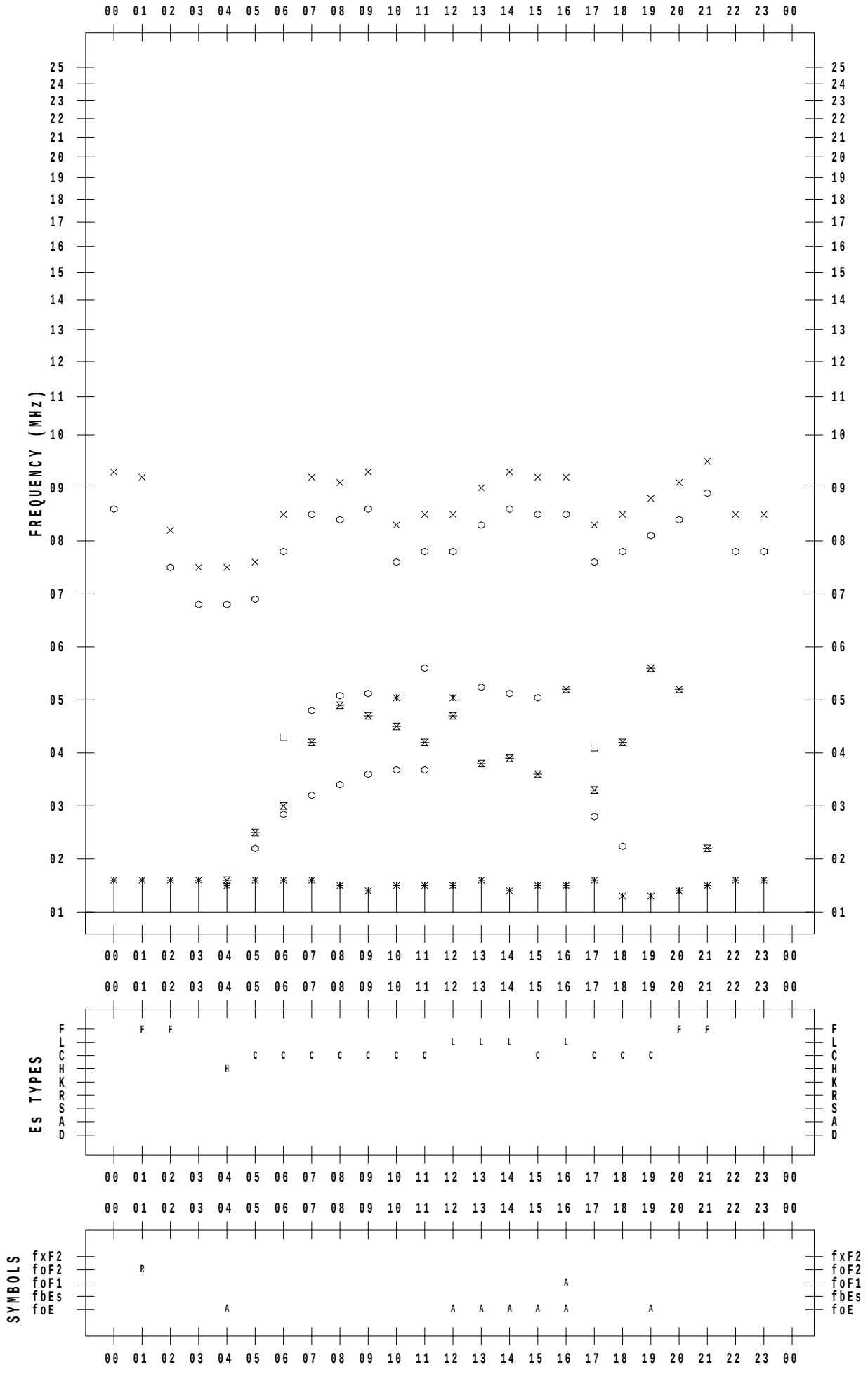
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/26

135 °E MEAN TIME



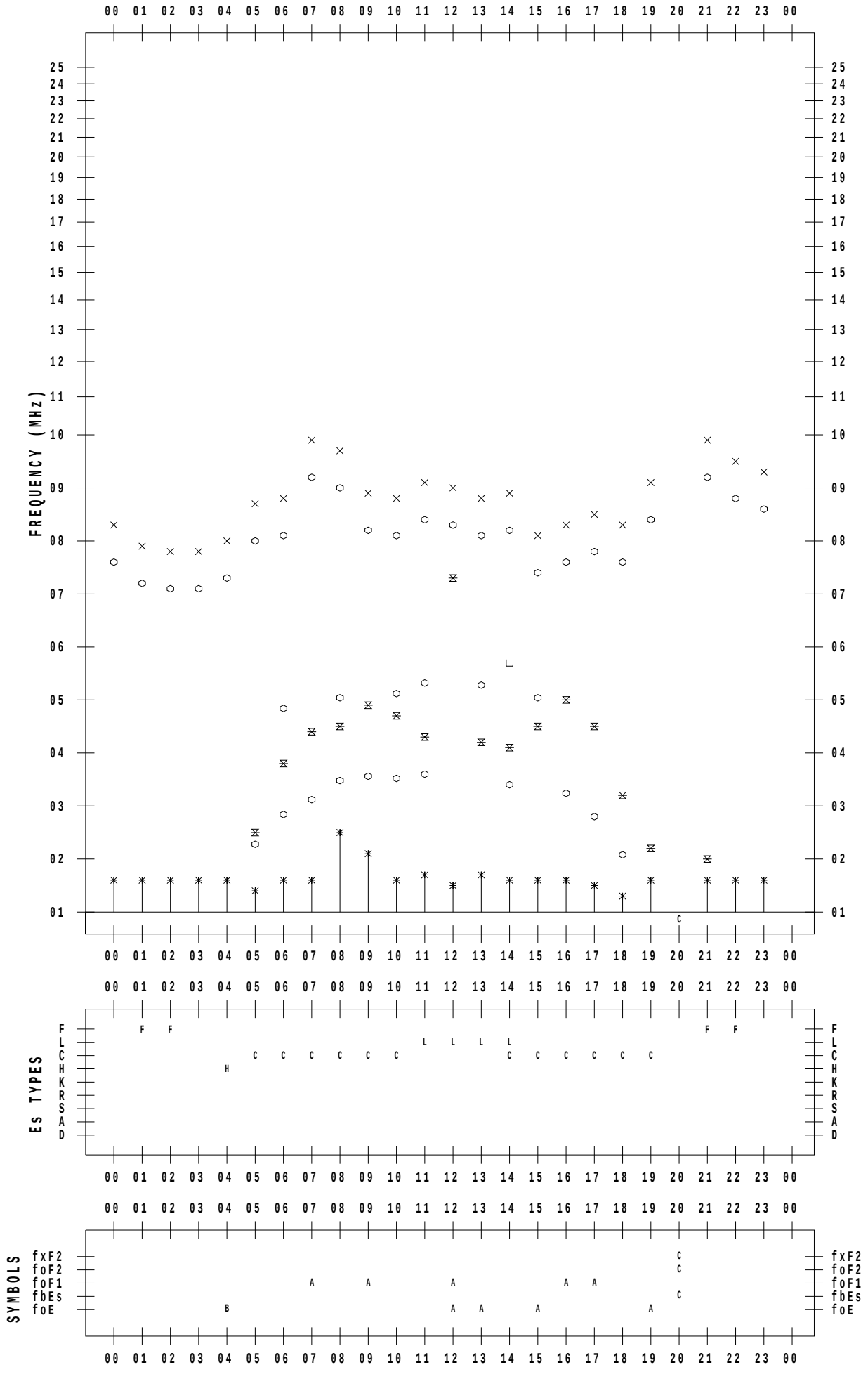
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/27

135 °E MEAN TIME



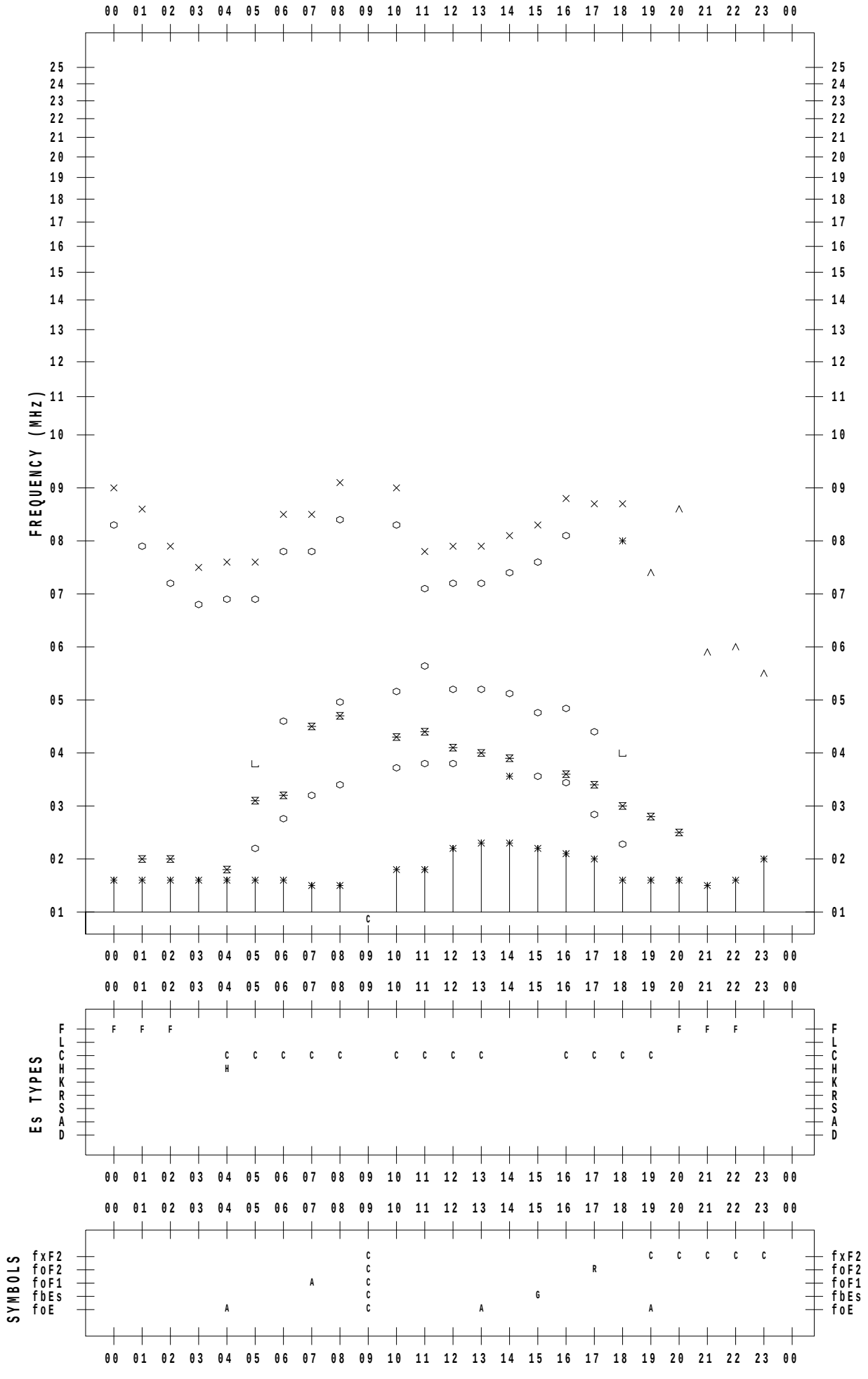
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/28

135 °E MEAN TIME



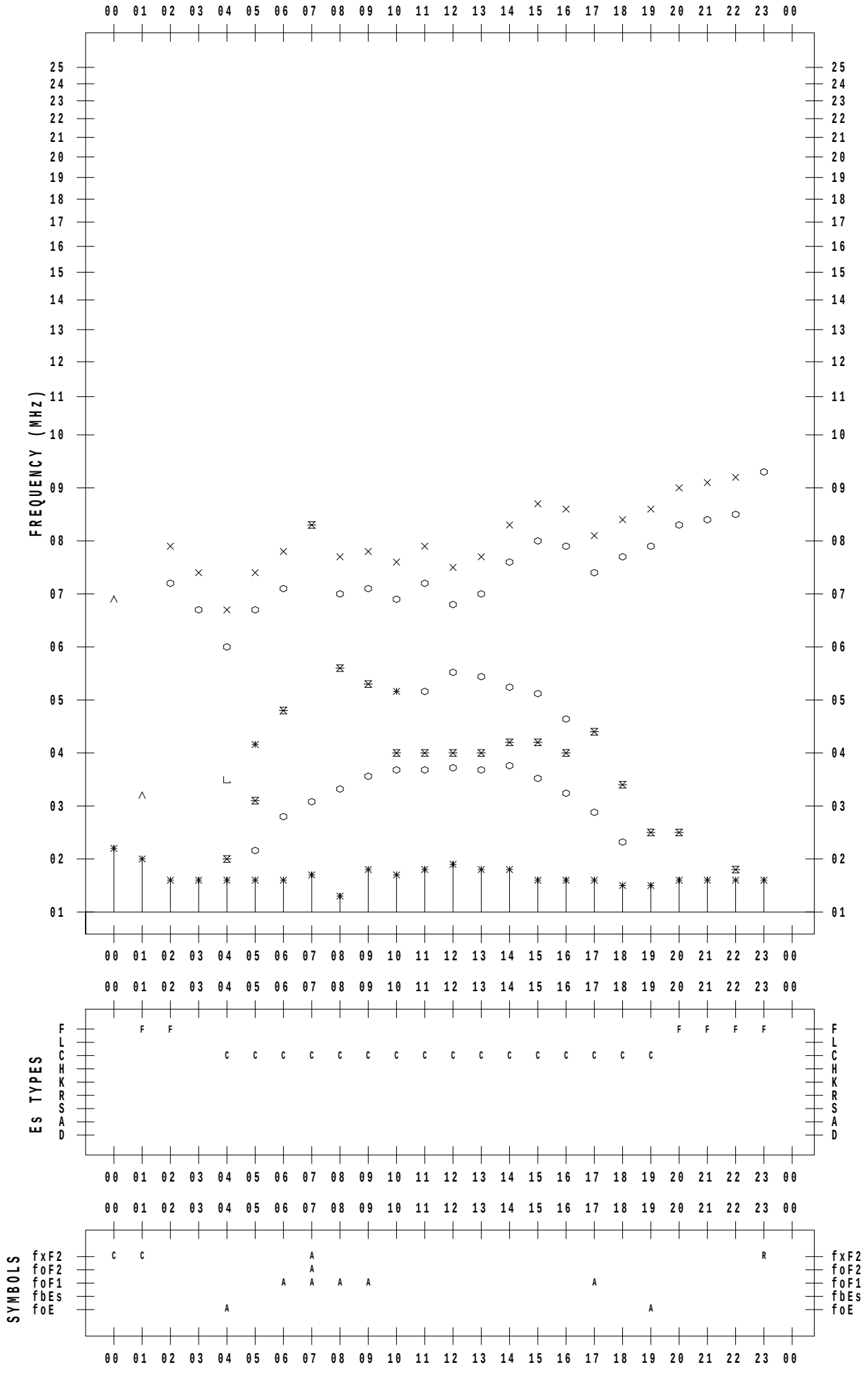
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/29

135 °E MEAN TIME



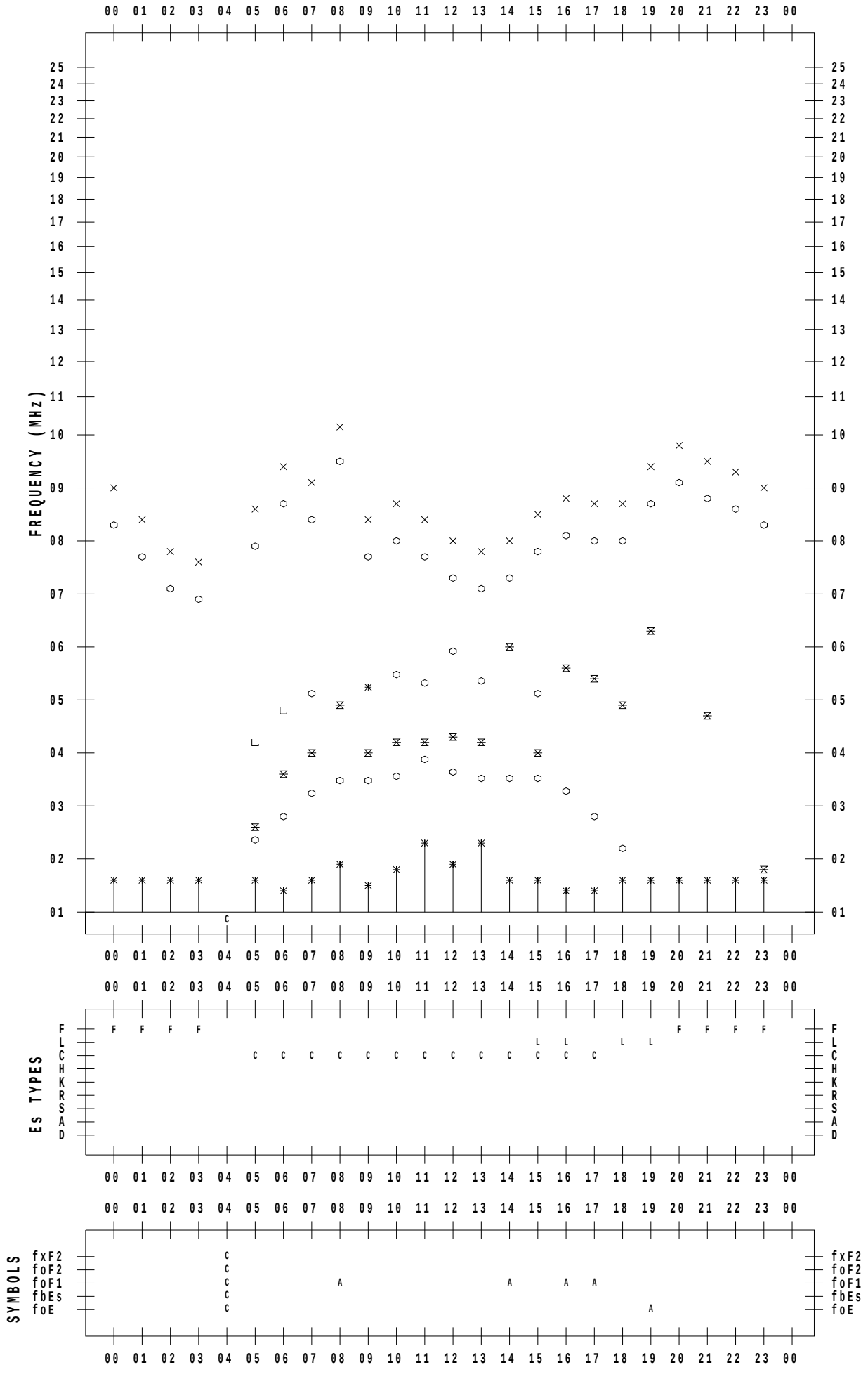
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/30

135 °E MEAN TIME



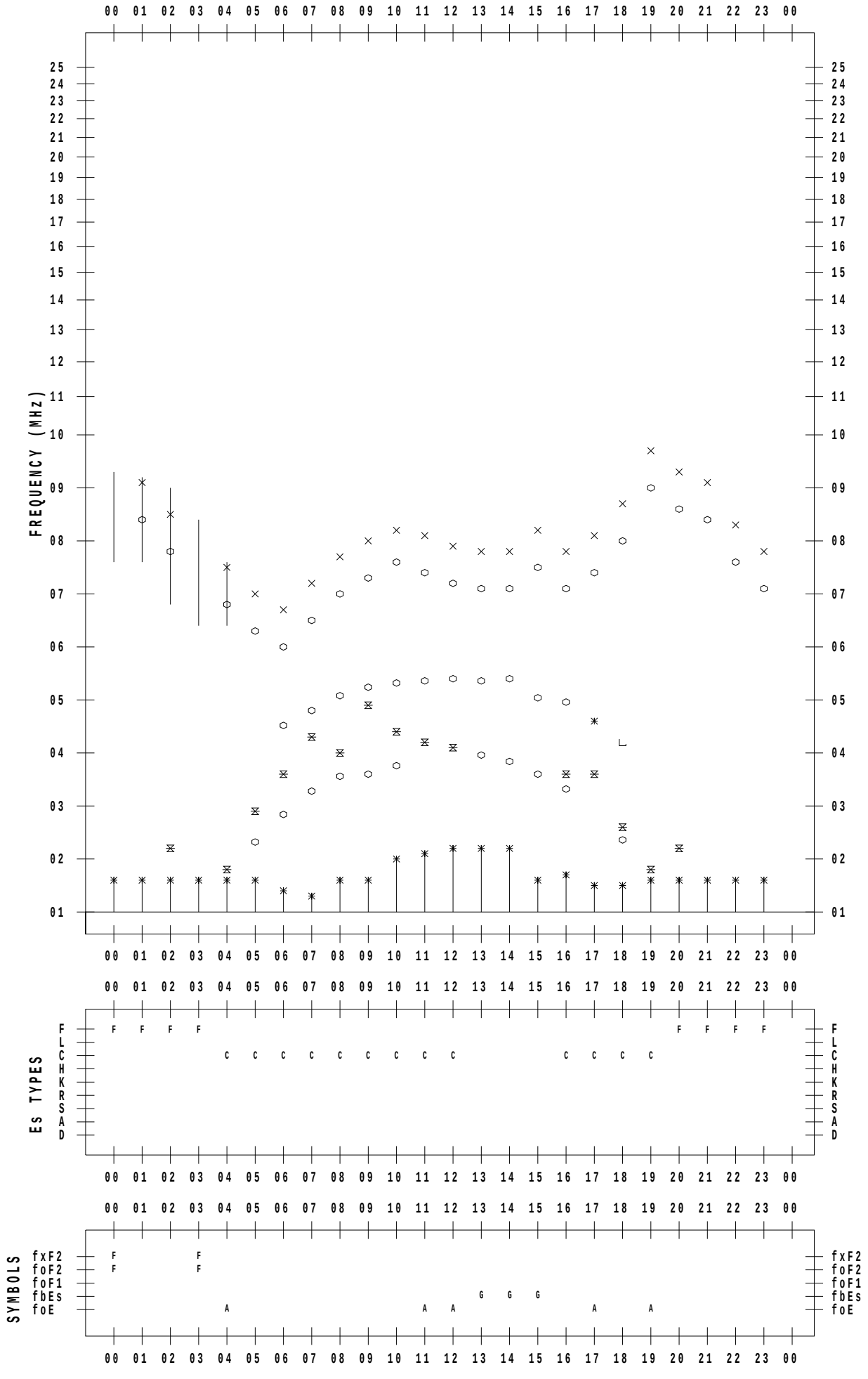
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 5/31

135 °E MEAN TIME



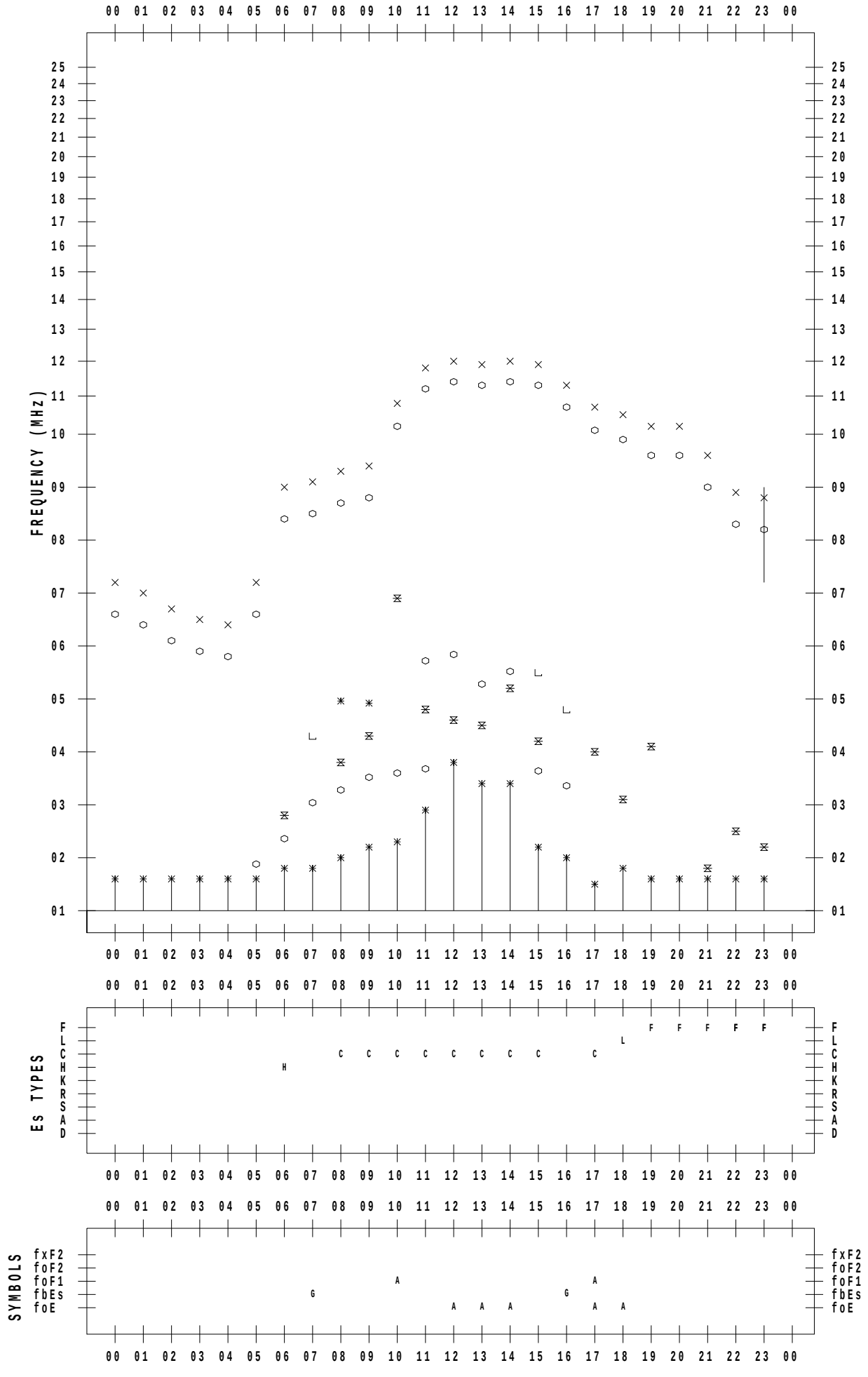
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 1

135 °E MEAN TIME



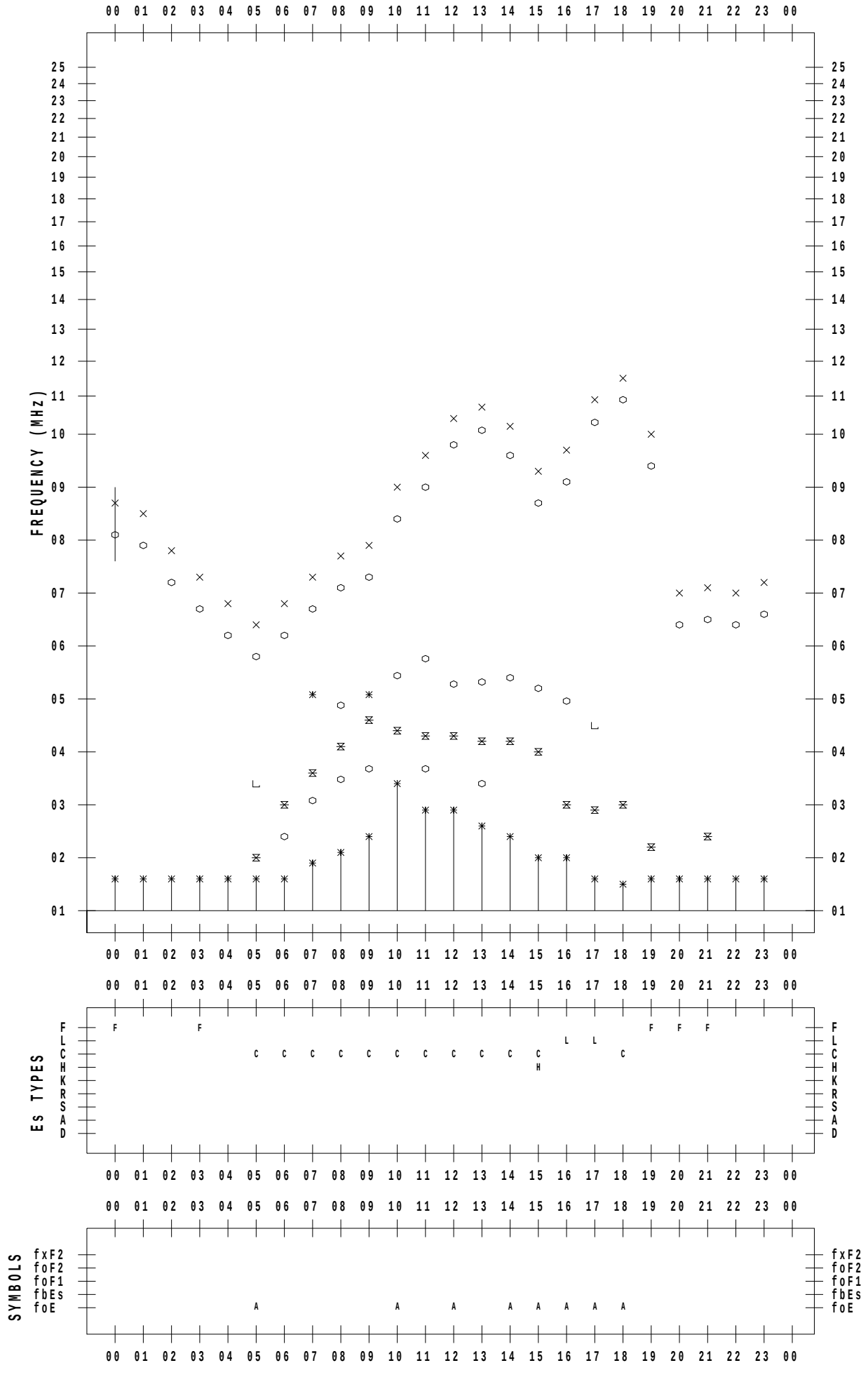
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 2

135 °E MEAN TIME



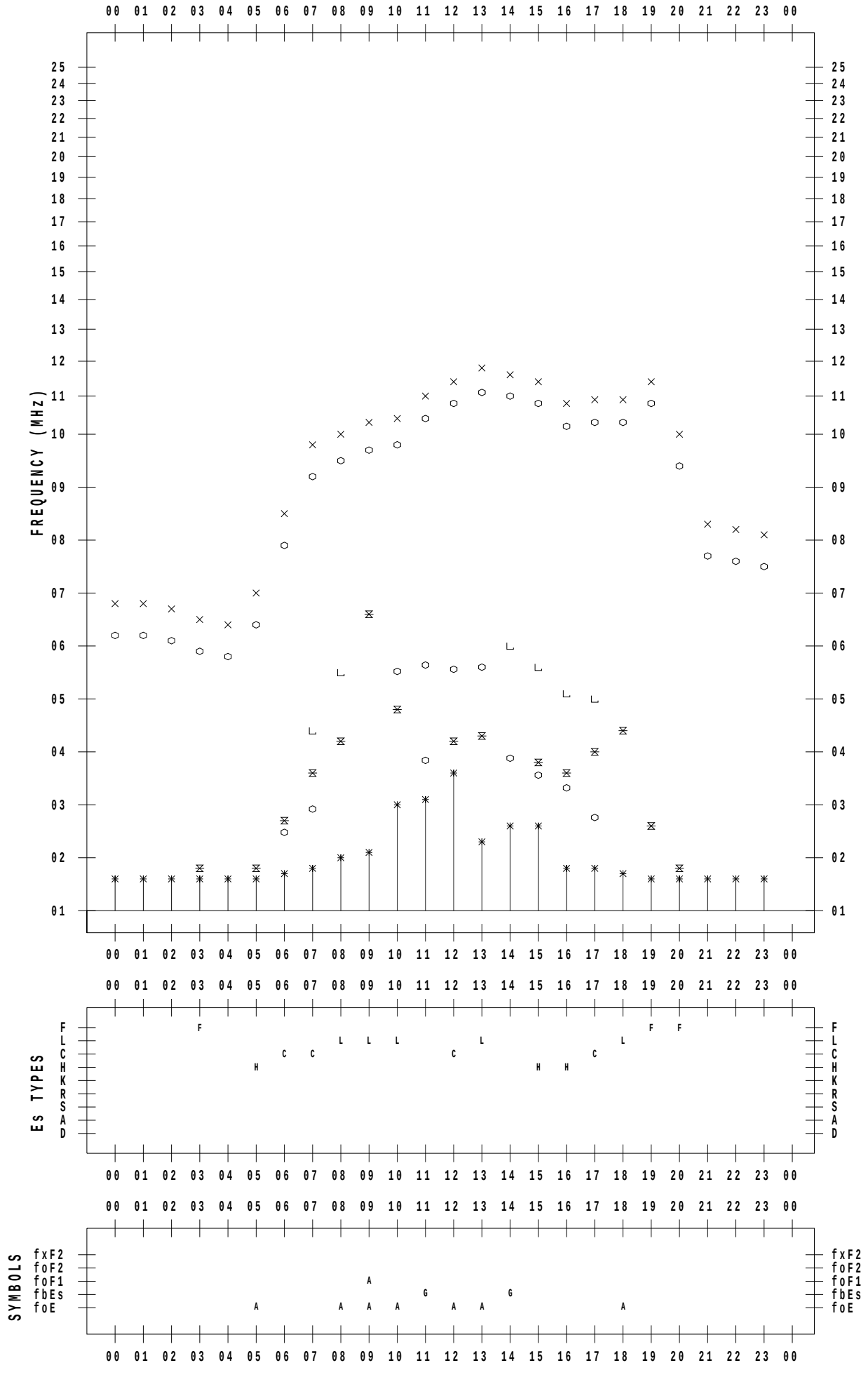
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 3

135 °E MEAN TIME



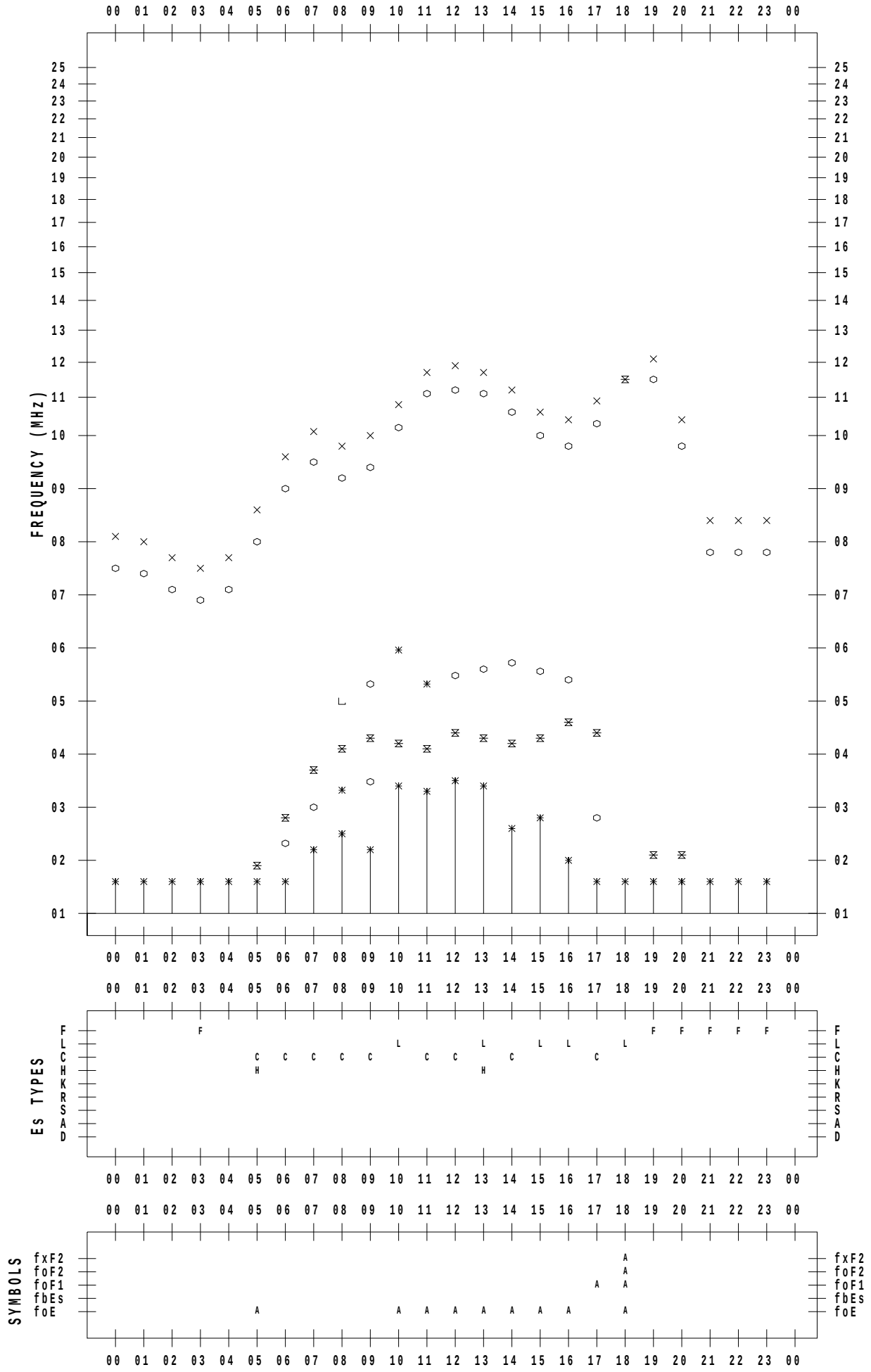
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 4

135 °E MEAN TIME



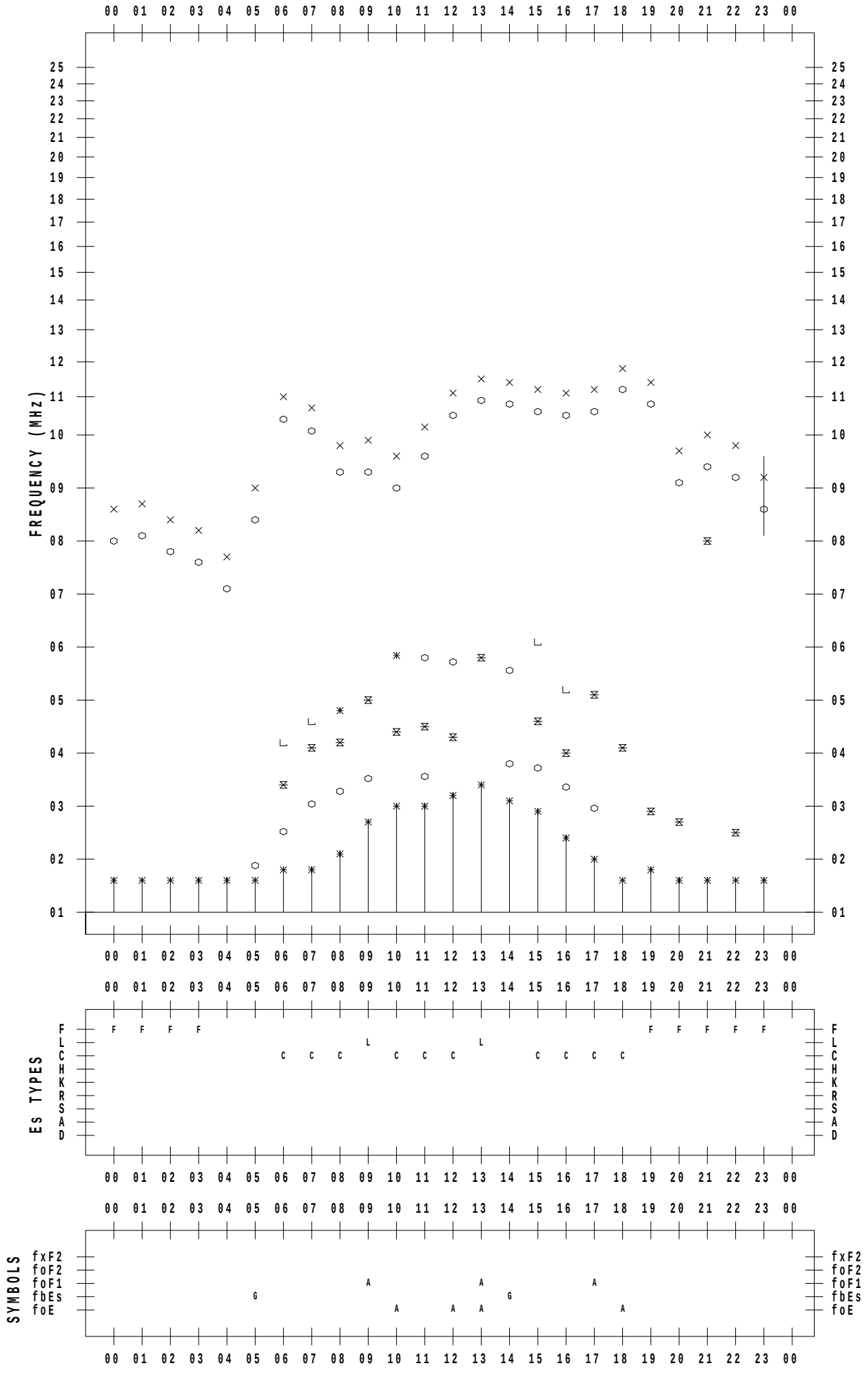
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 5

135 °E MEAN TIME



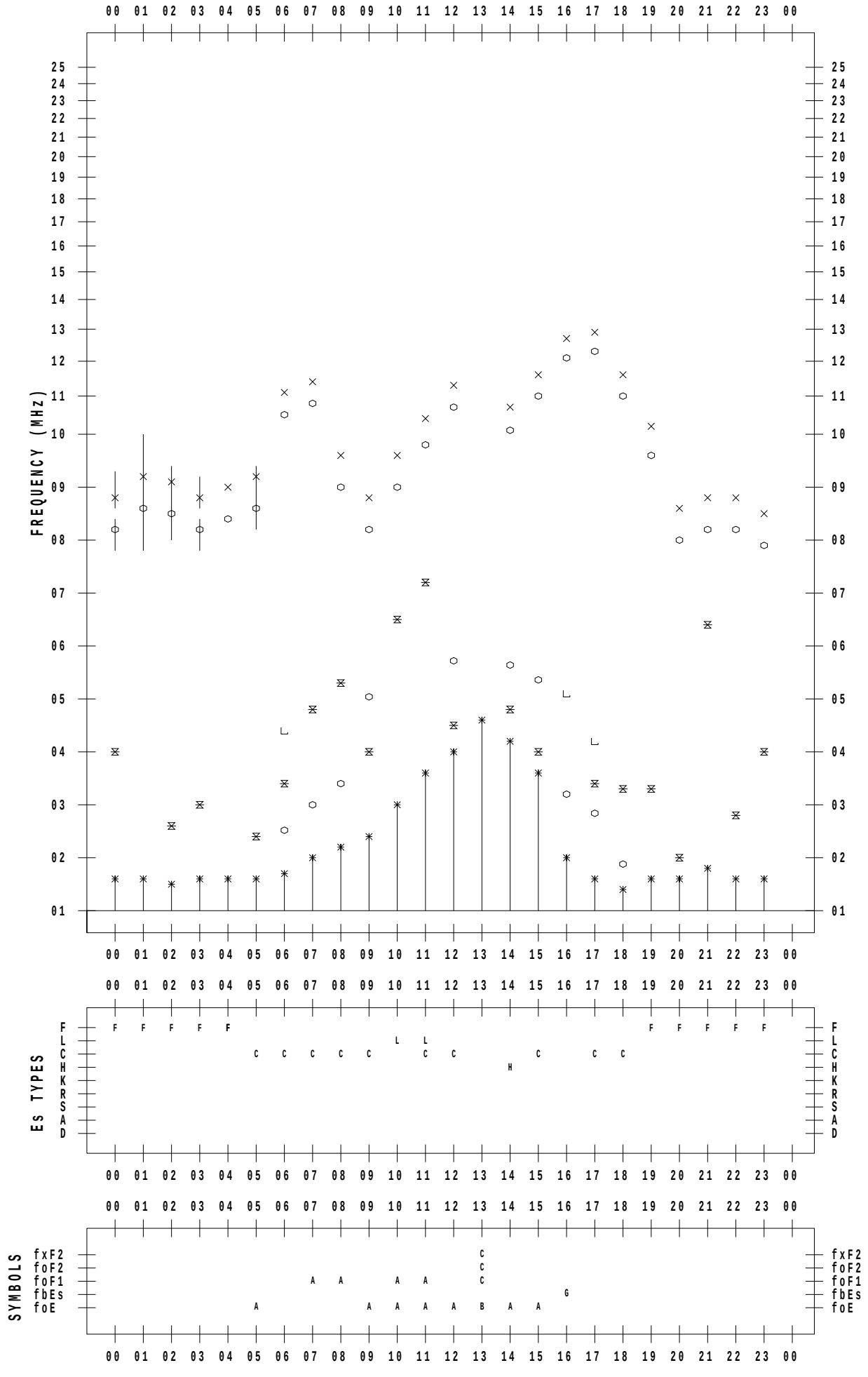
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 6

135 °E MEAN TIME



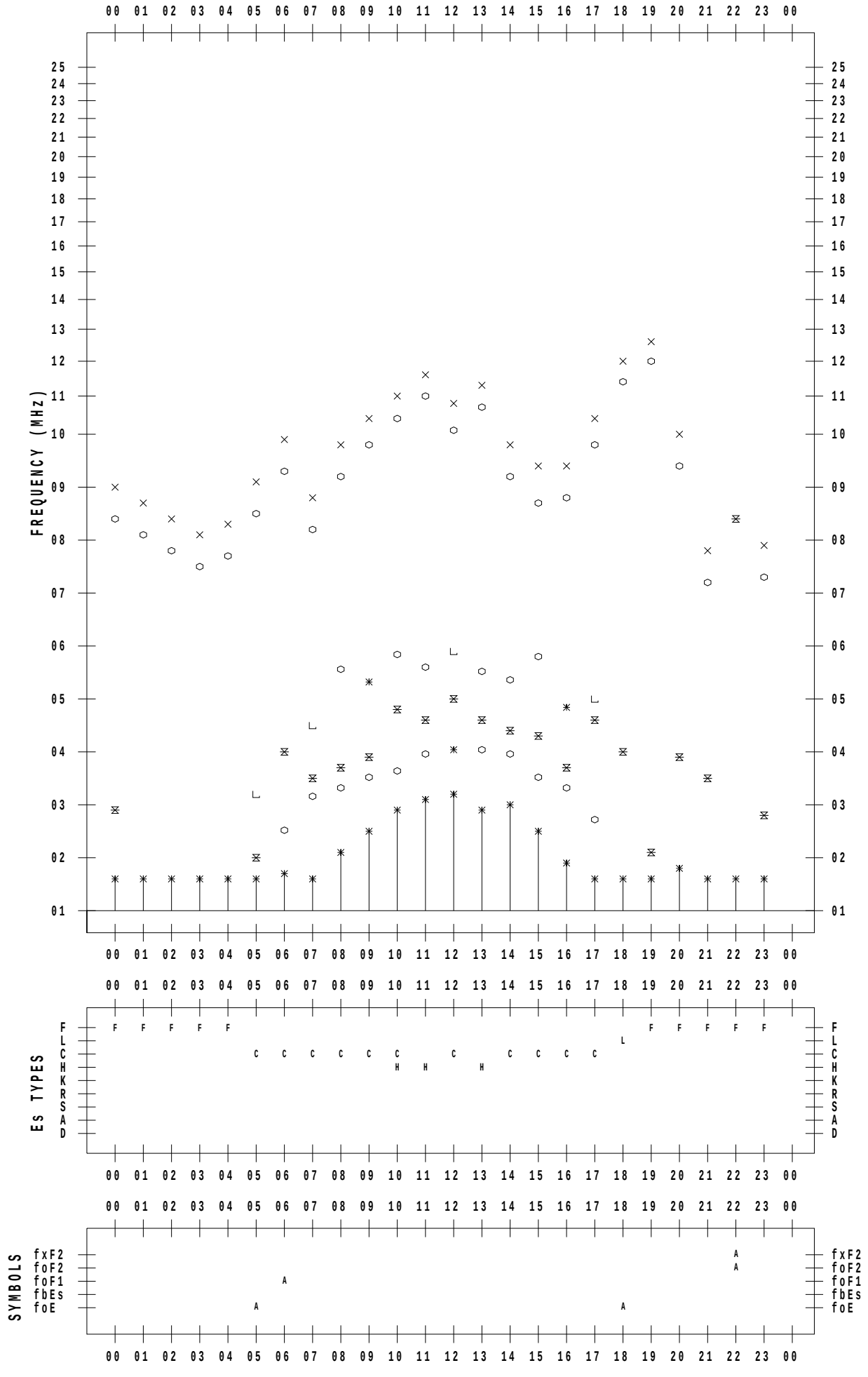
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 7

135 °E MEAN TIME



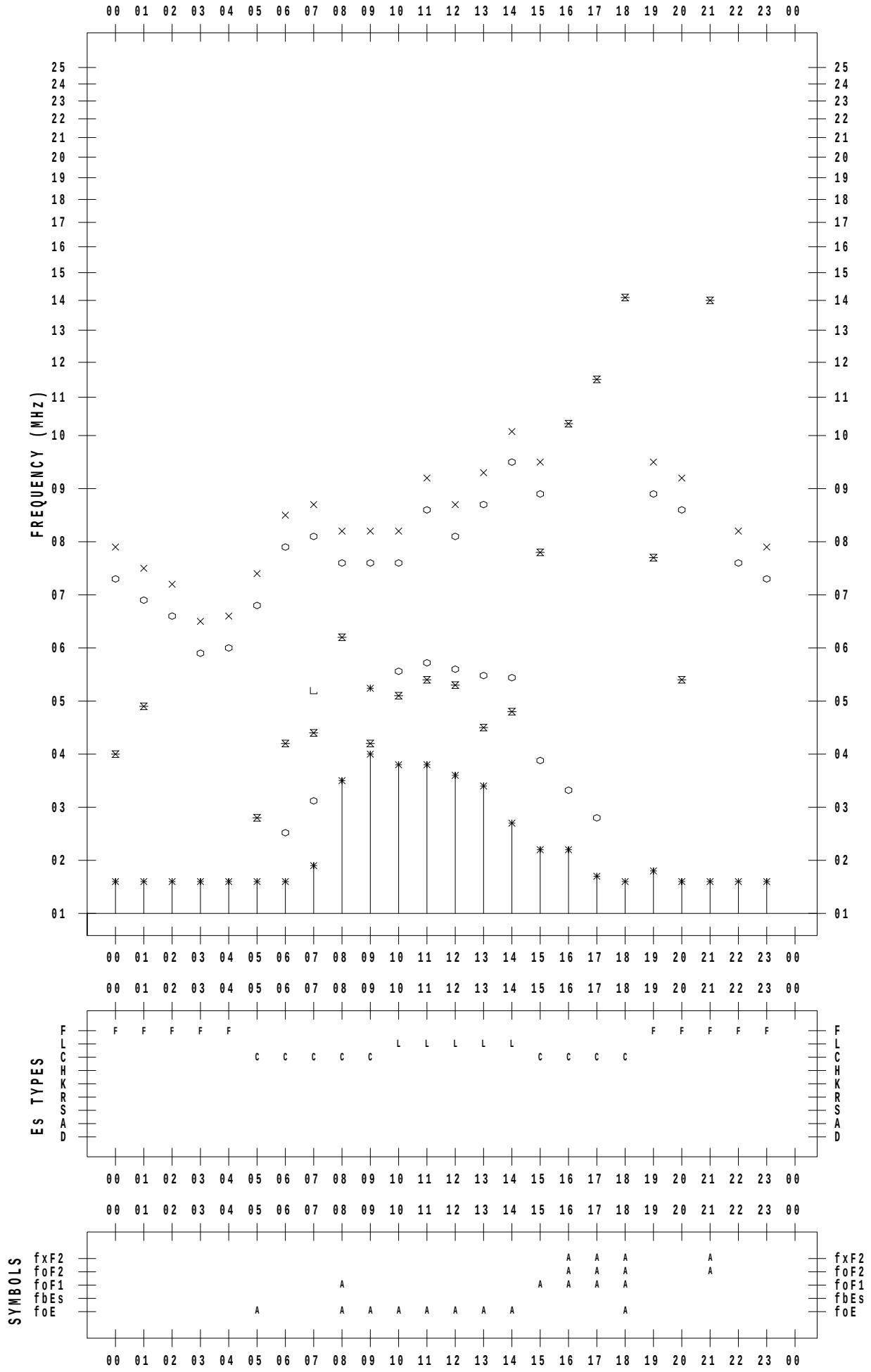
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 8

135 °E MEAN TIME



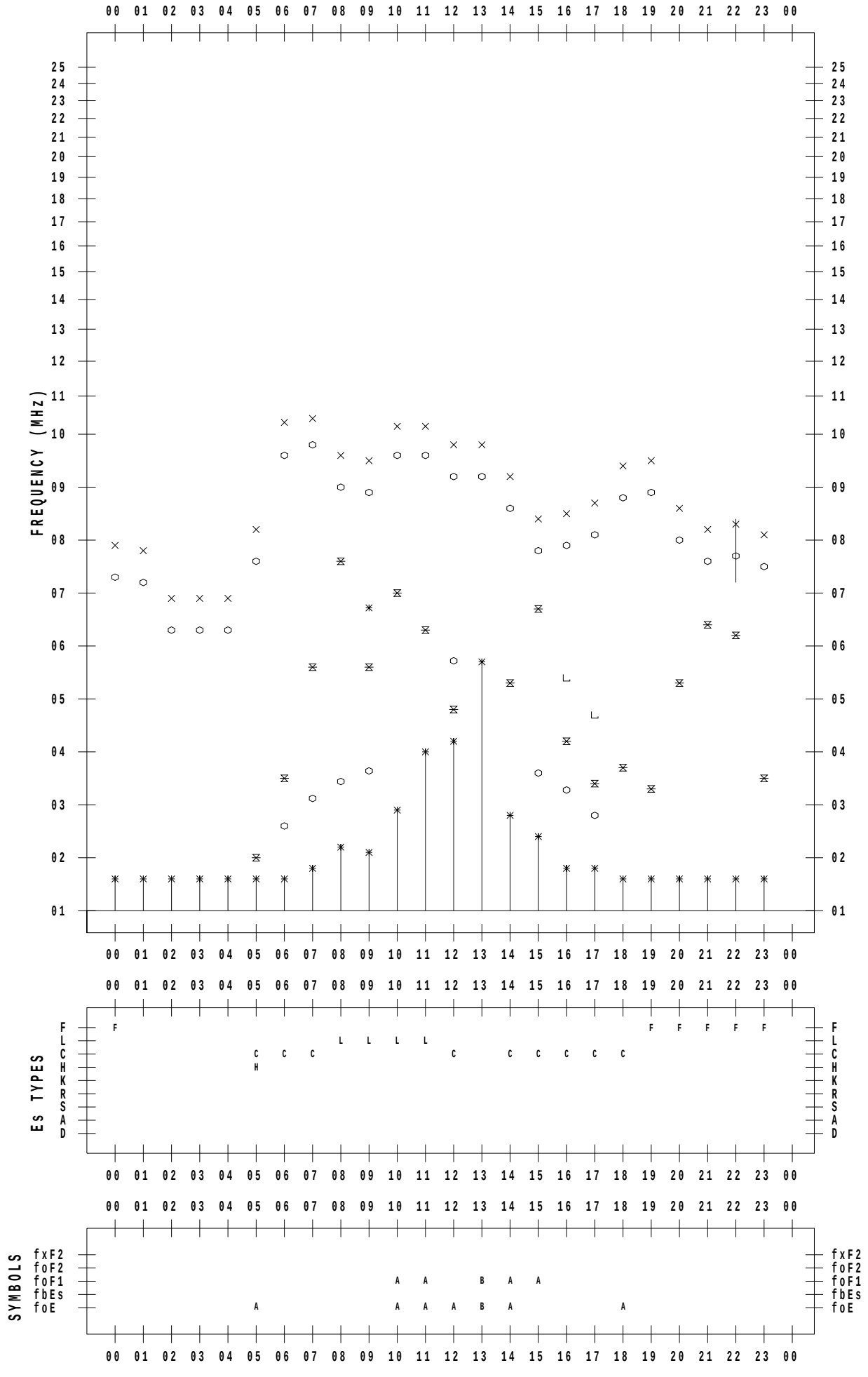
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/ 9

135 °E MEAN TIME



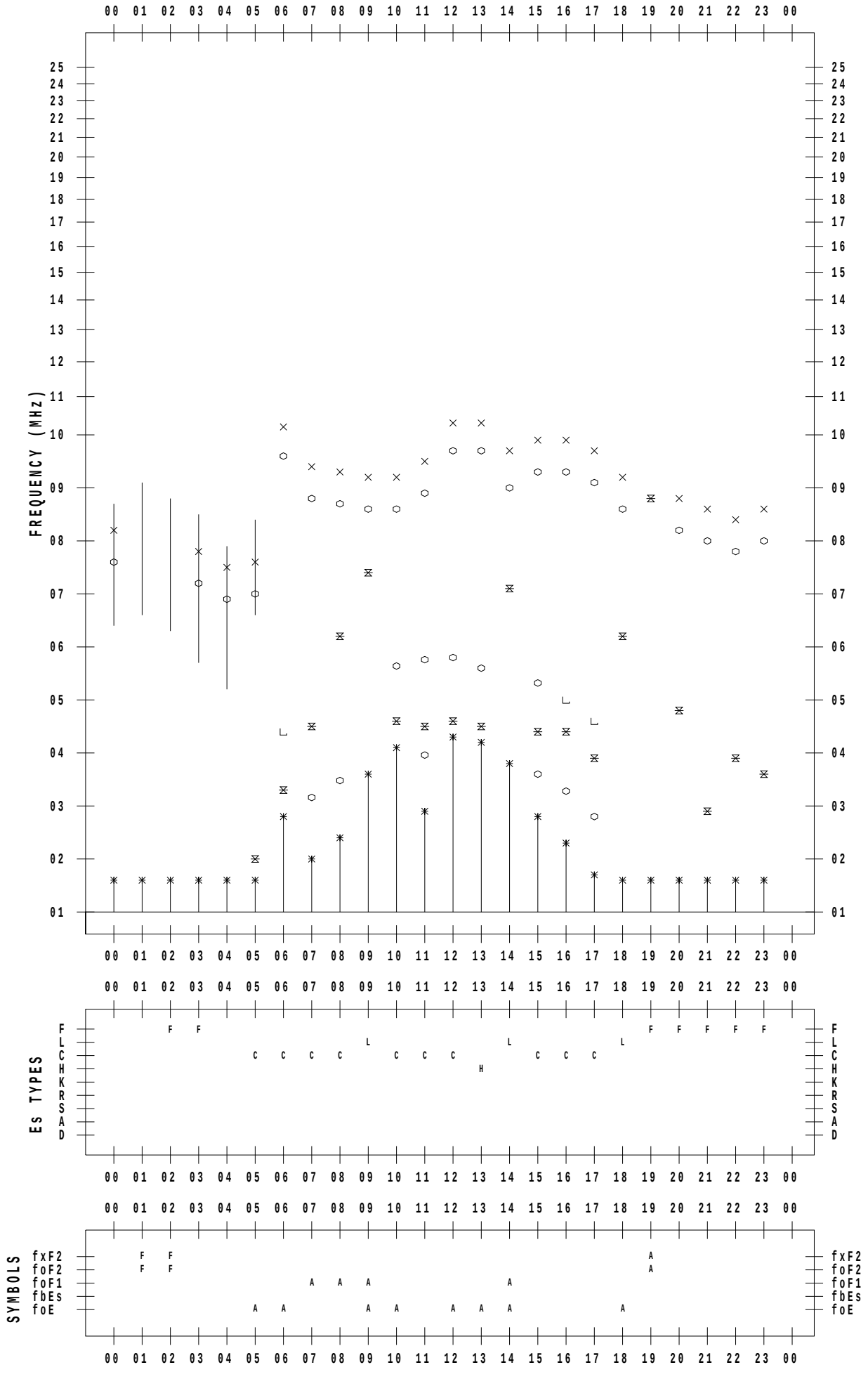
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/10

135 °E MEAN TIME



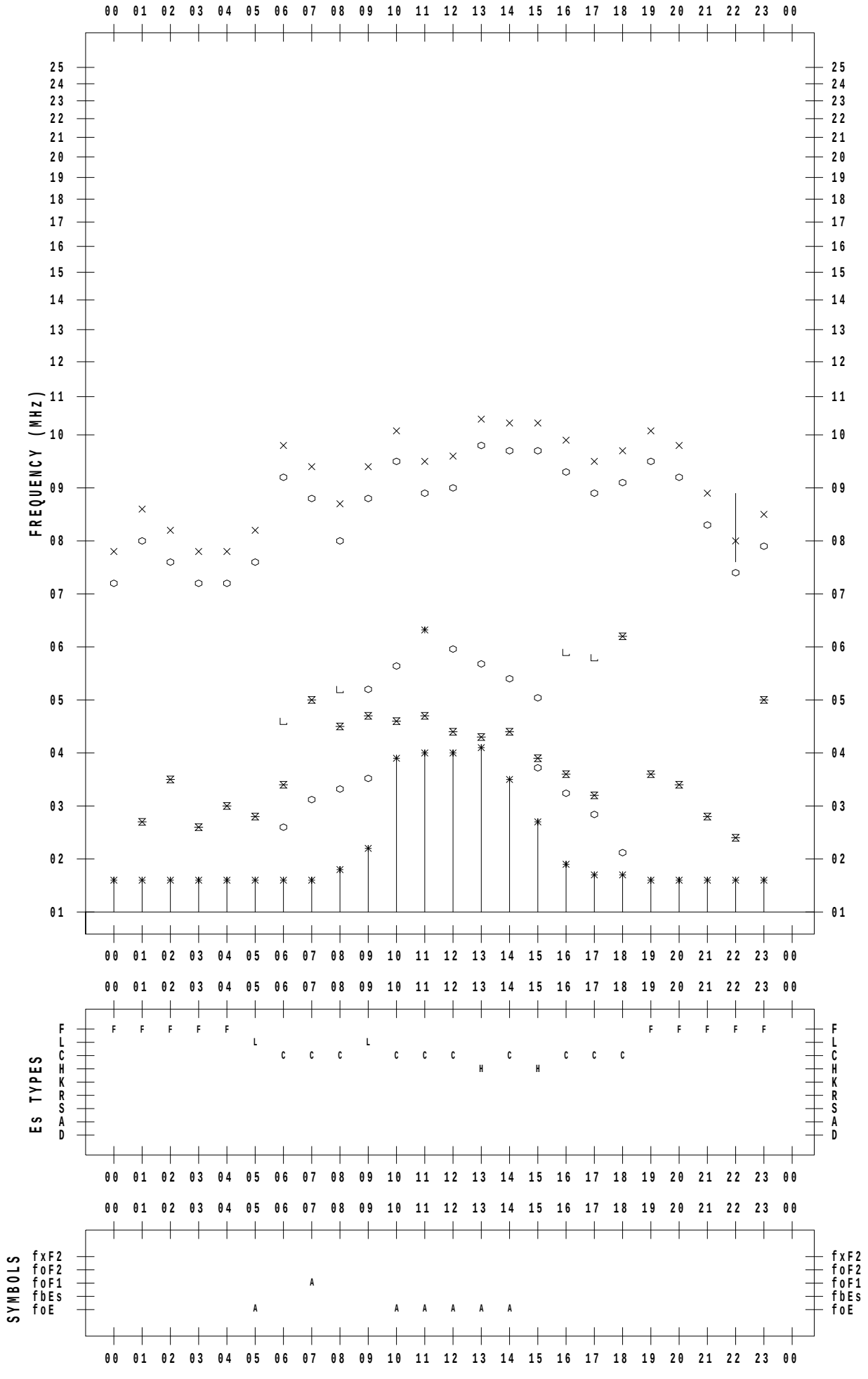
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/11

135 °E MEAN TIME



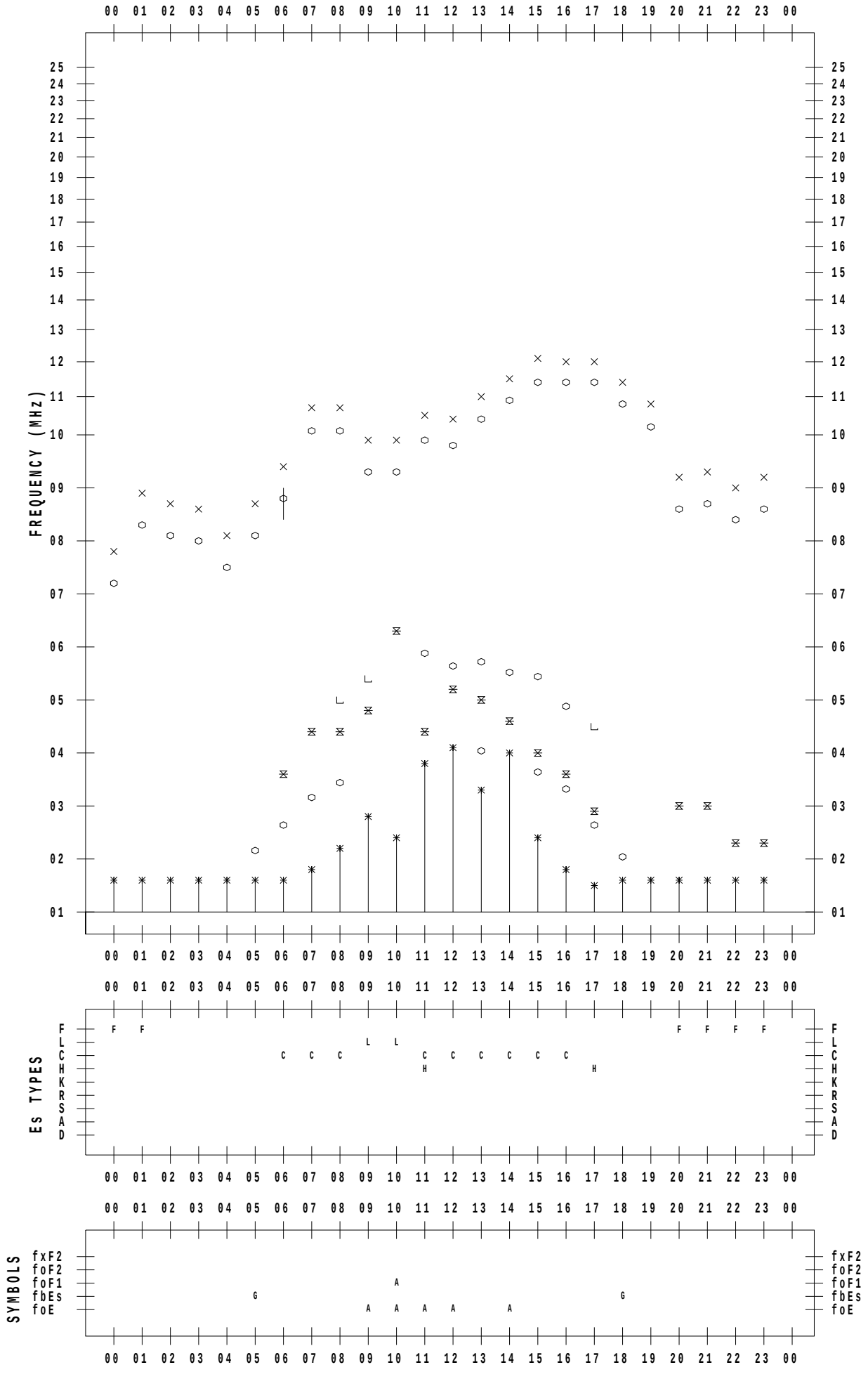
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/12

135 °E MEAN TIME



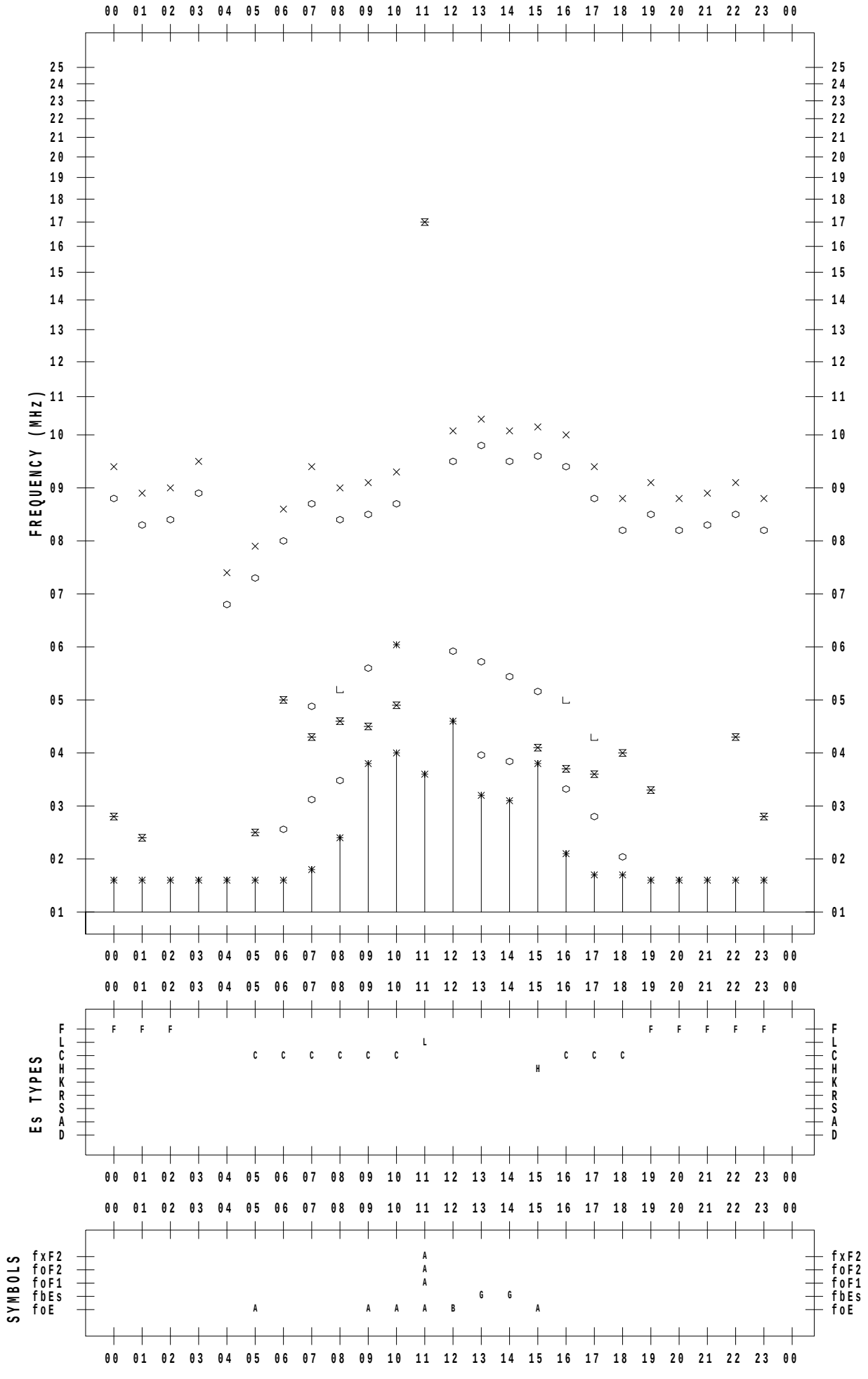
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/13

135 °E MEAN TIME



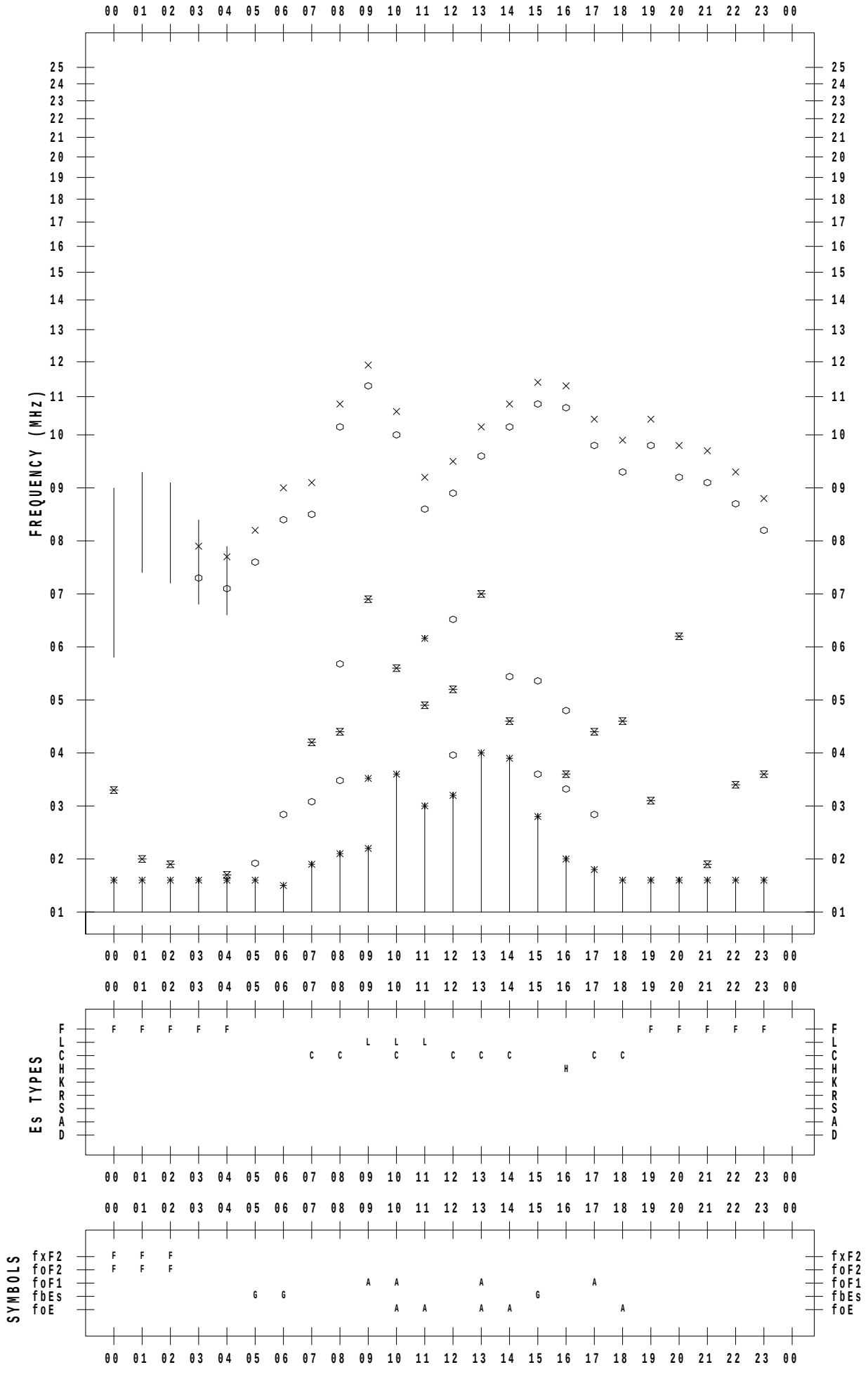
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/14

135 °E MEAN TIME



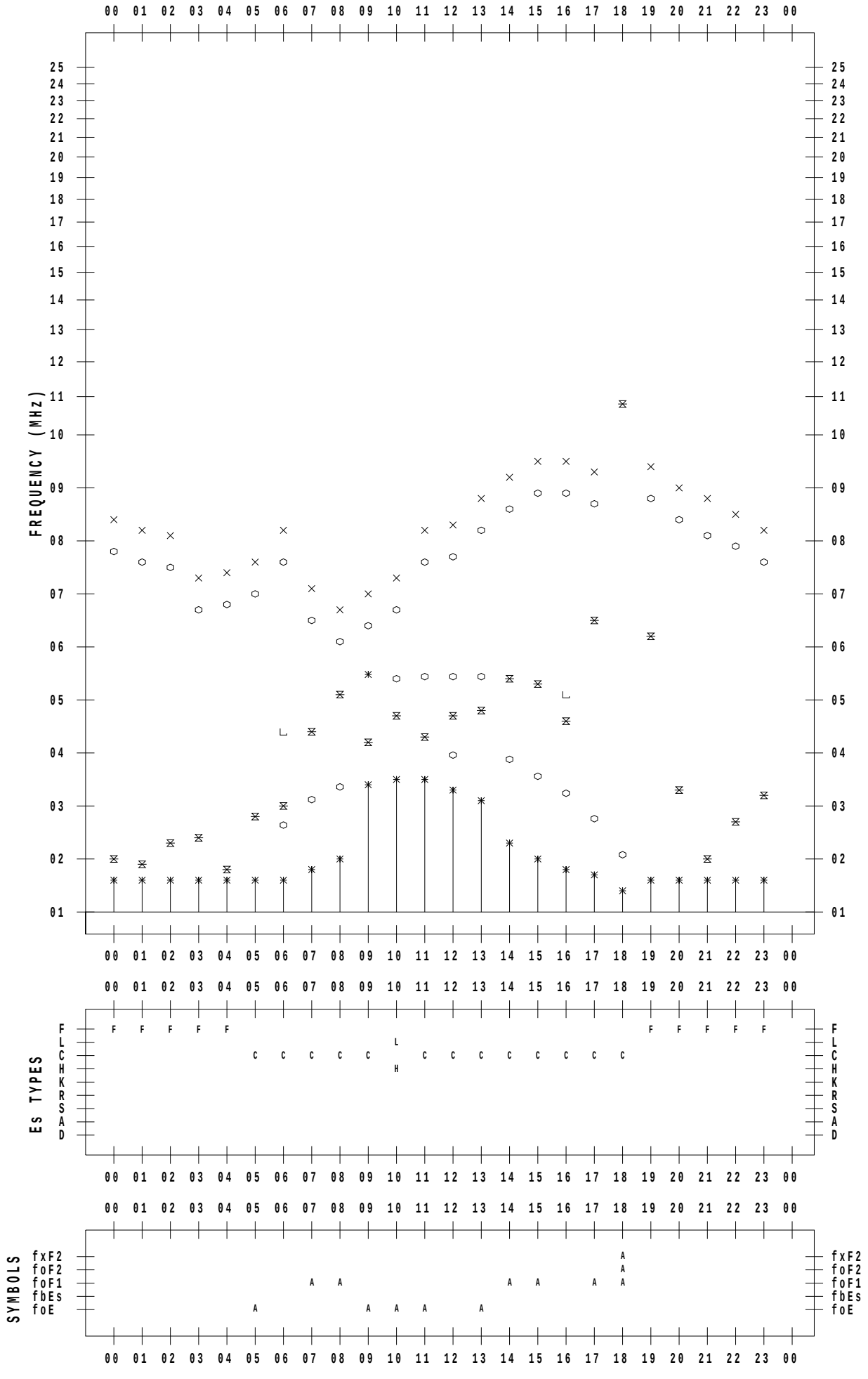
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/15

135 °E MEAN TIME



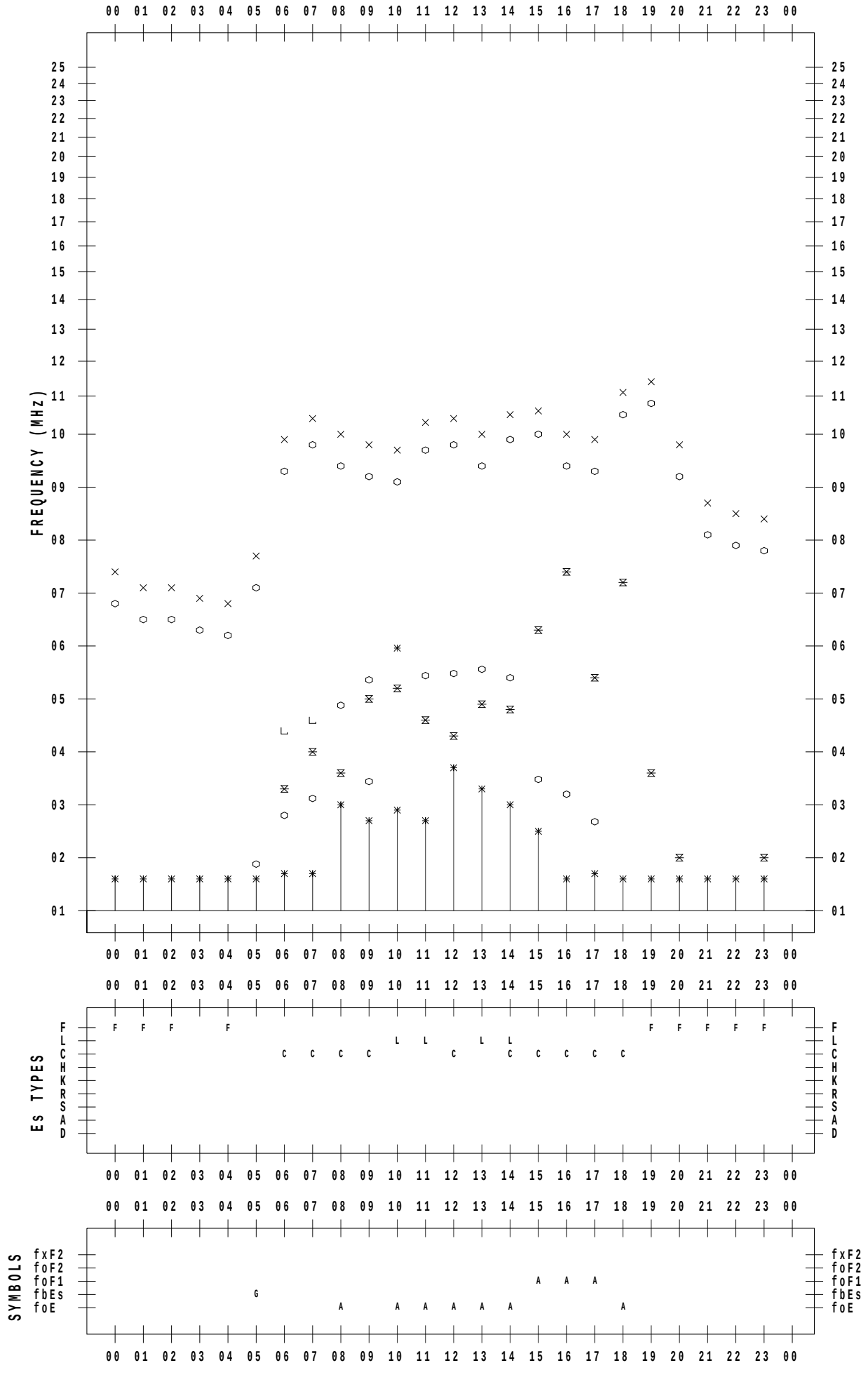
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/16

135 °E MEAN TIME



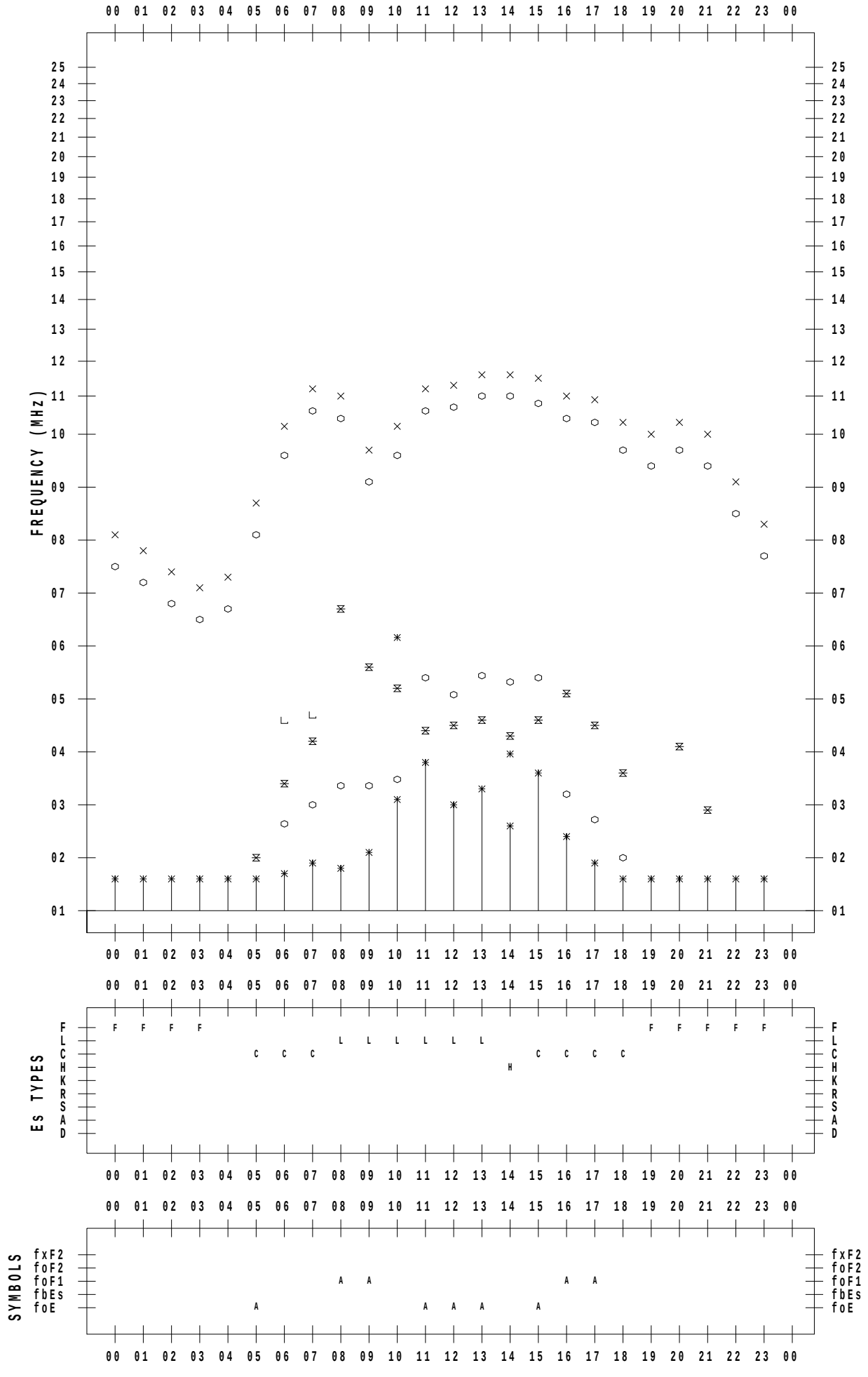
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/17

135 °E MEAN TIME



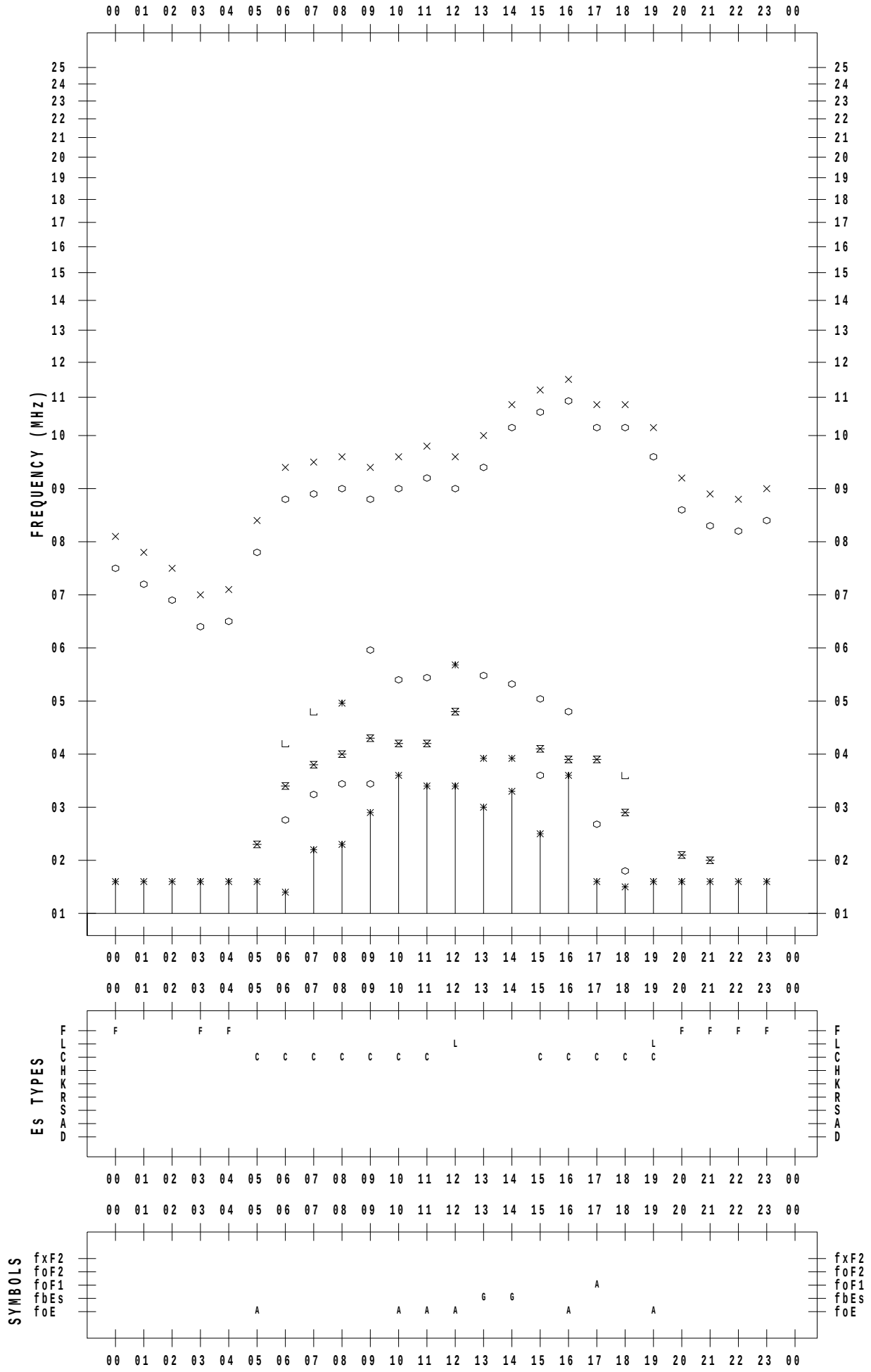
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/18

135 °E MEAN TIME



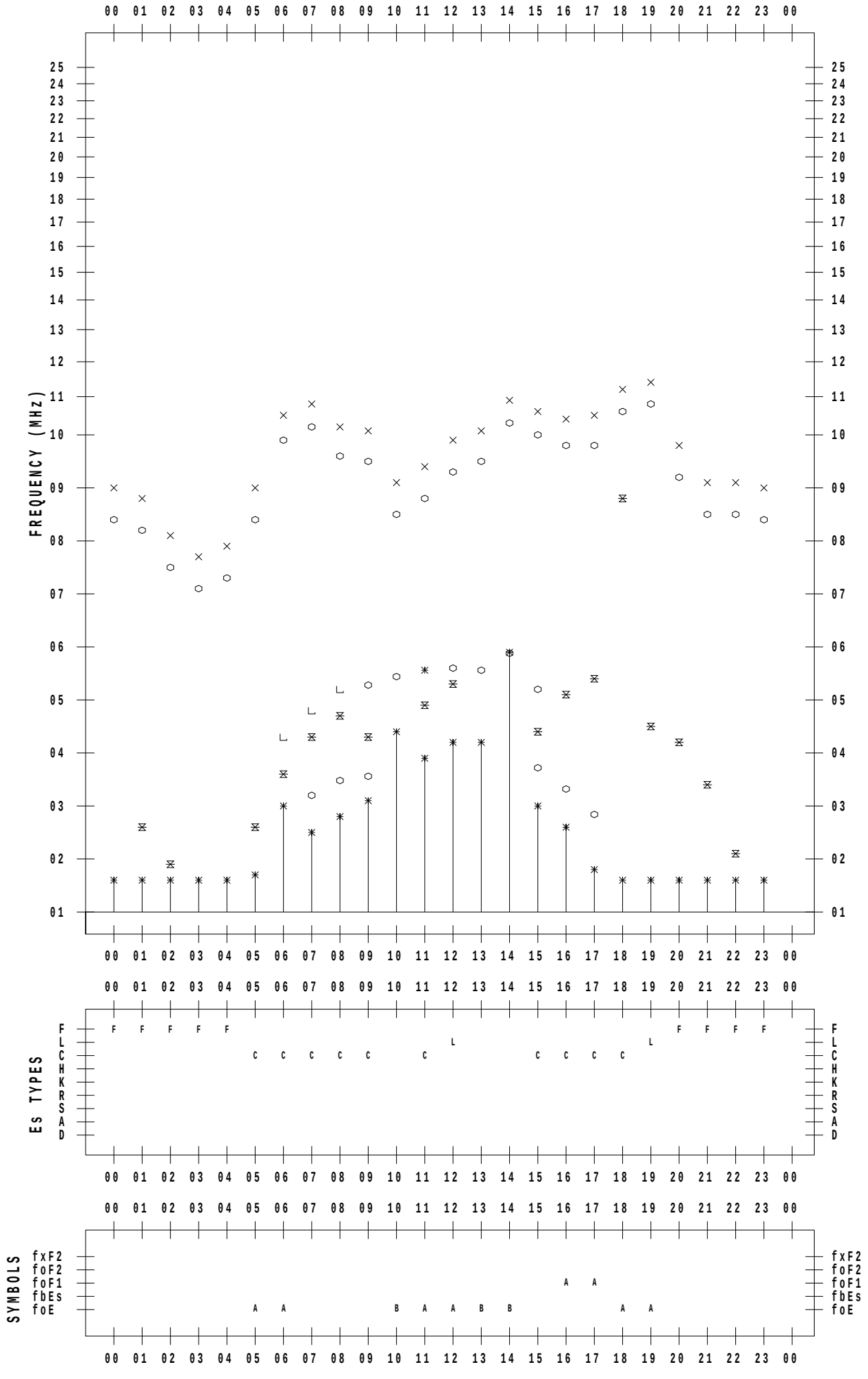
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/19

135 °E MEAN TIME



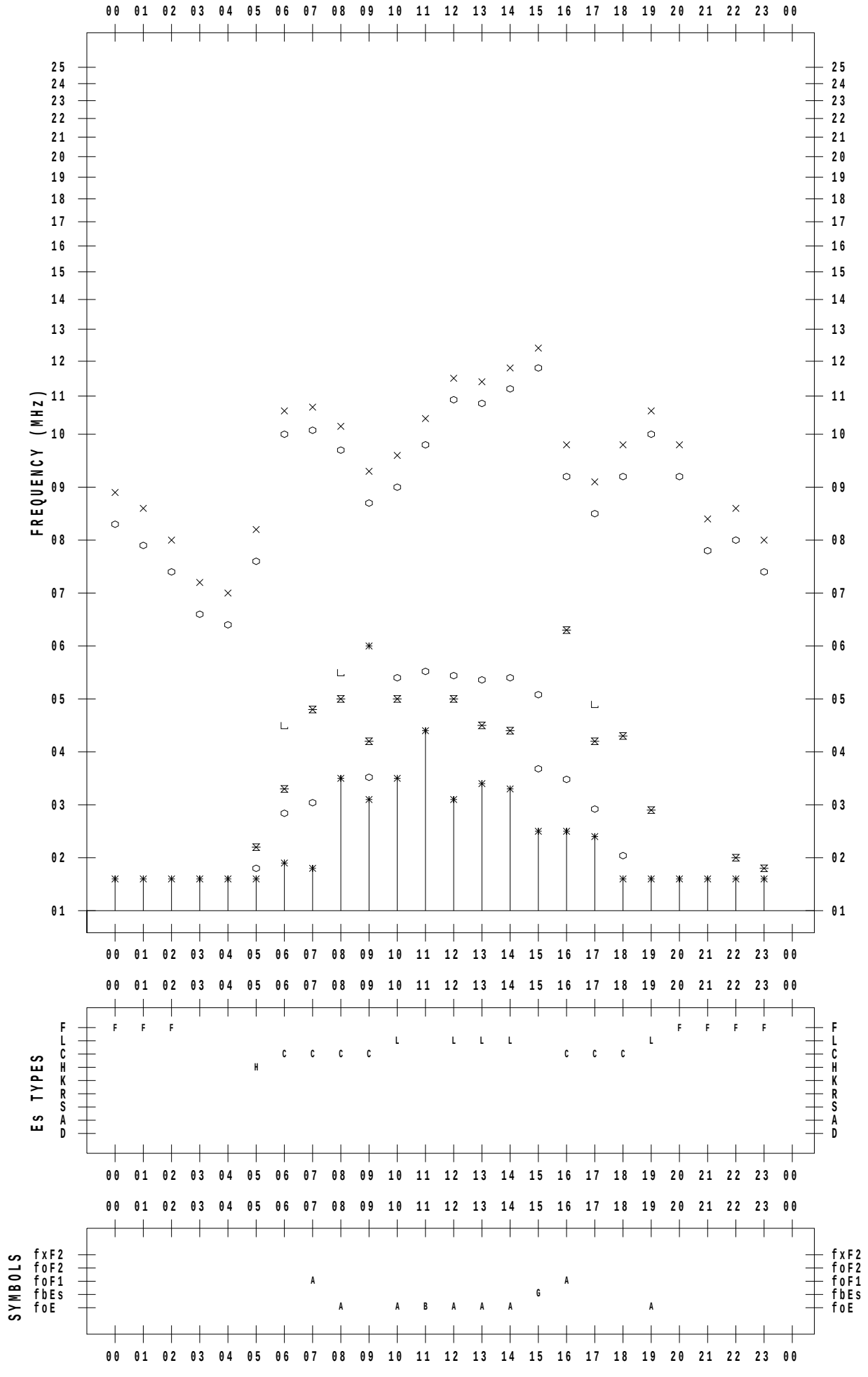
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/20

135 °E MEAN TIME



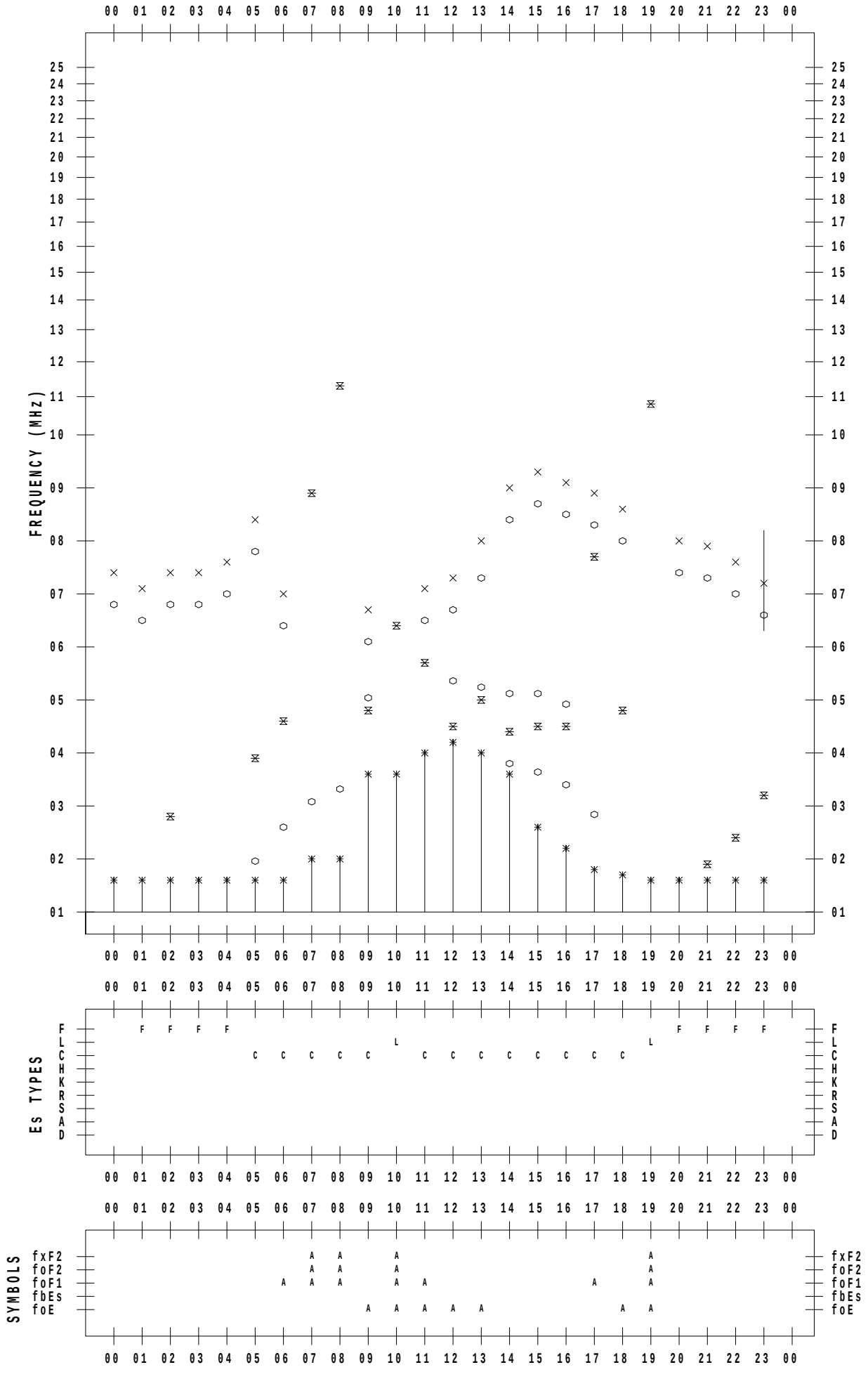
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/21

135 °E MEAN TIME



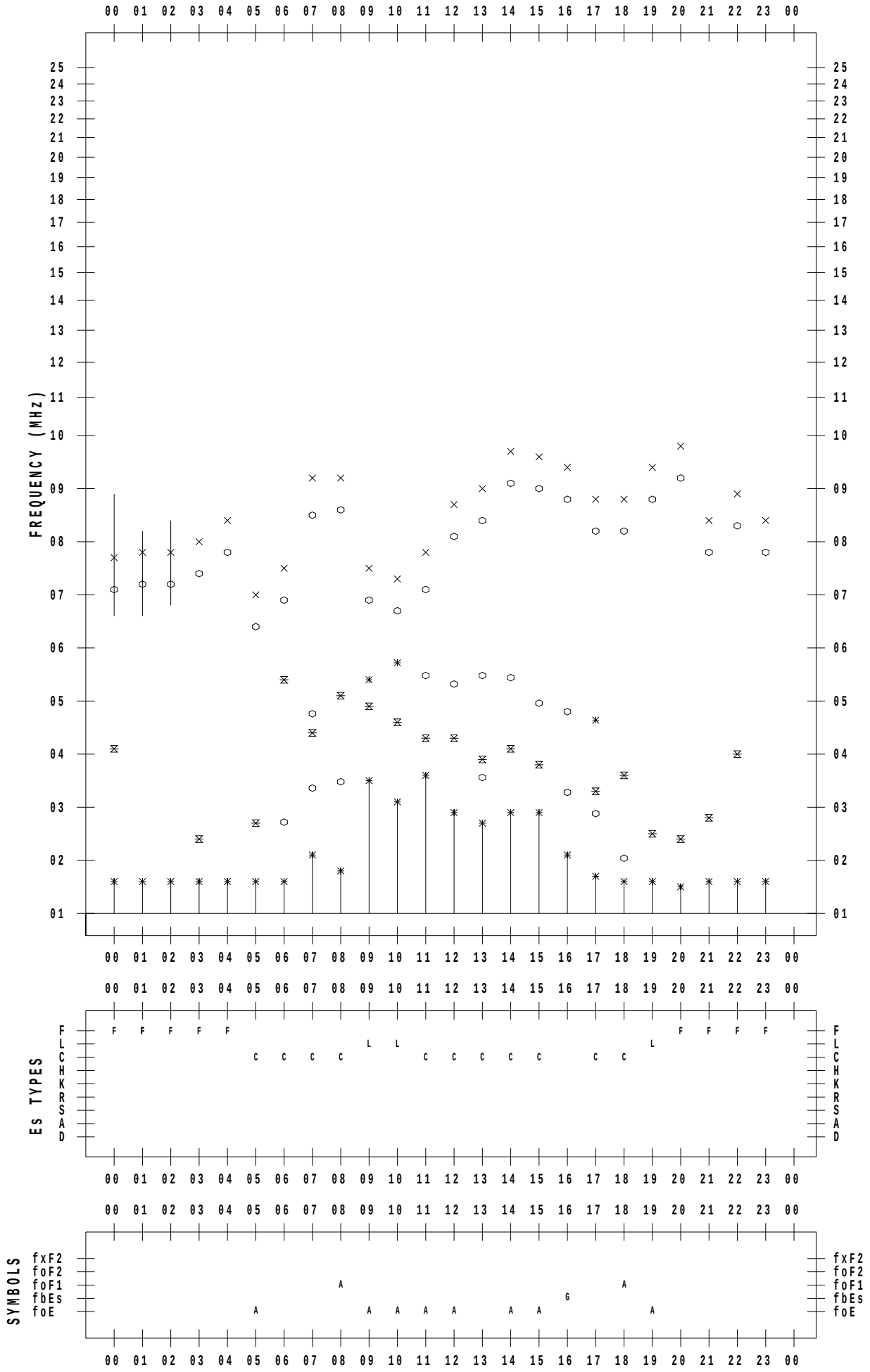
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/22

135 °E MEAN TIME



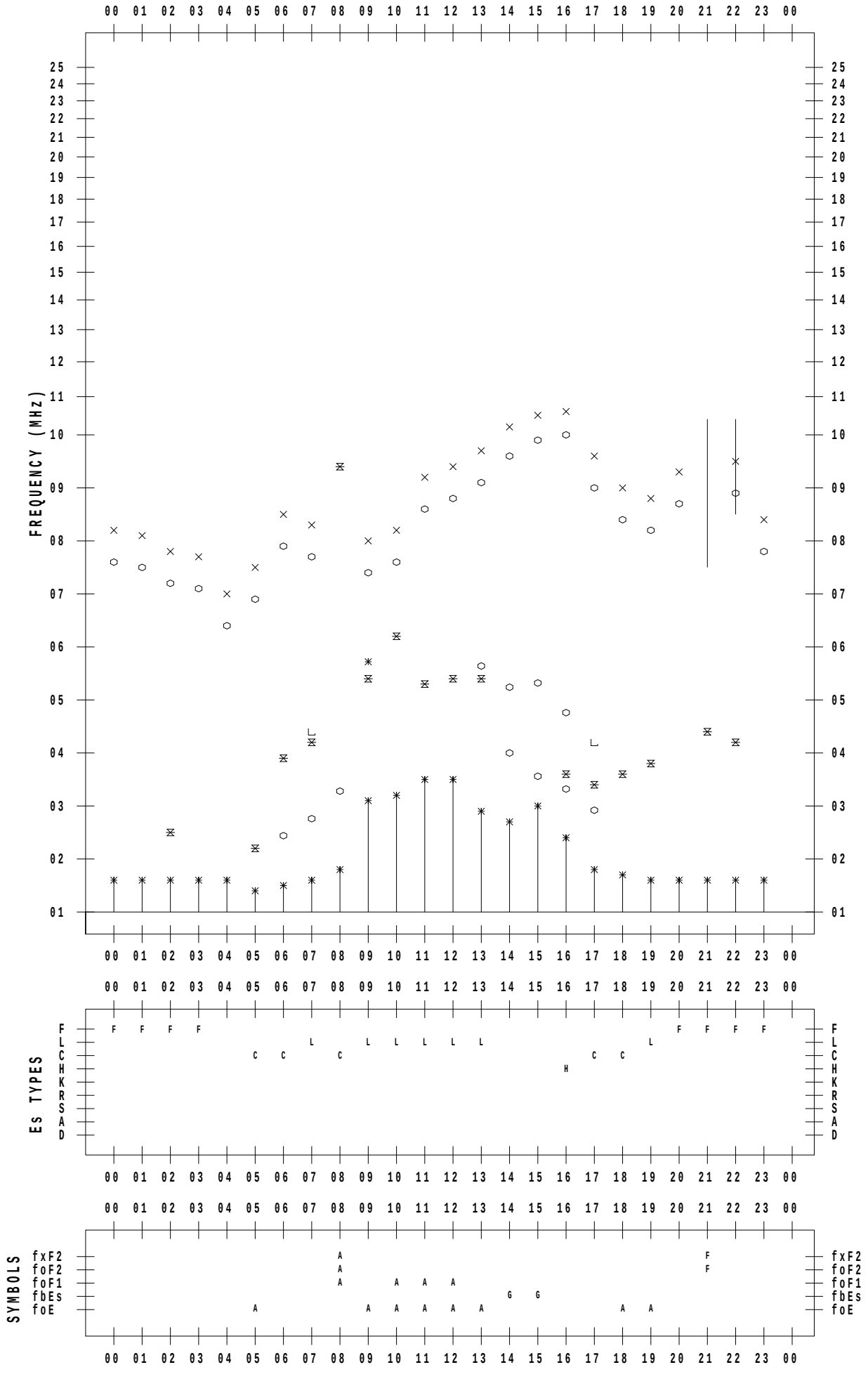
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/23

135 °E MEAN TIME



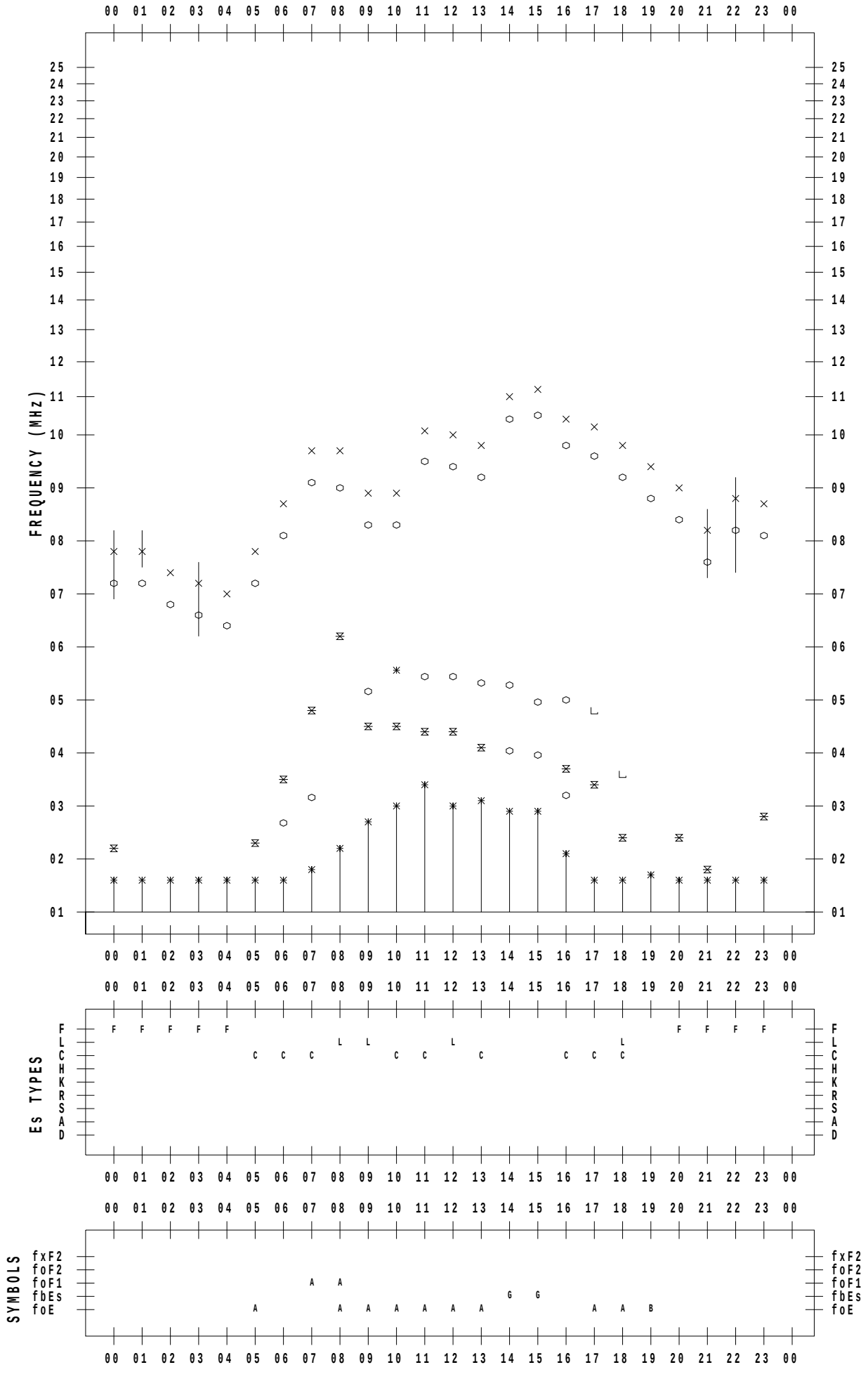
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/24

135 °E MEAN TIME



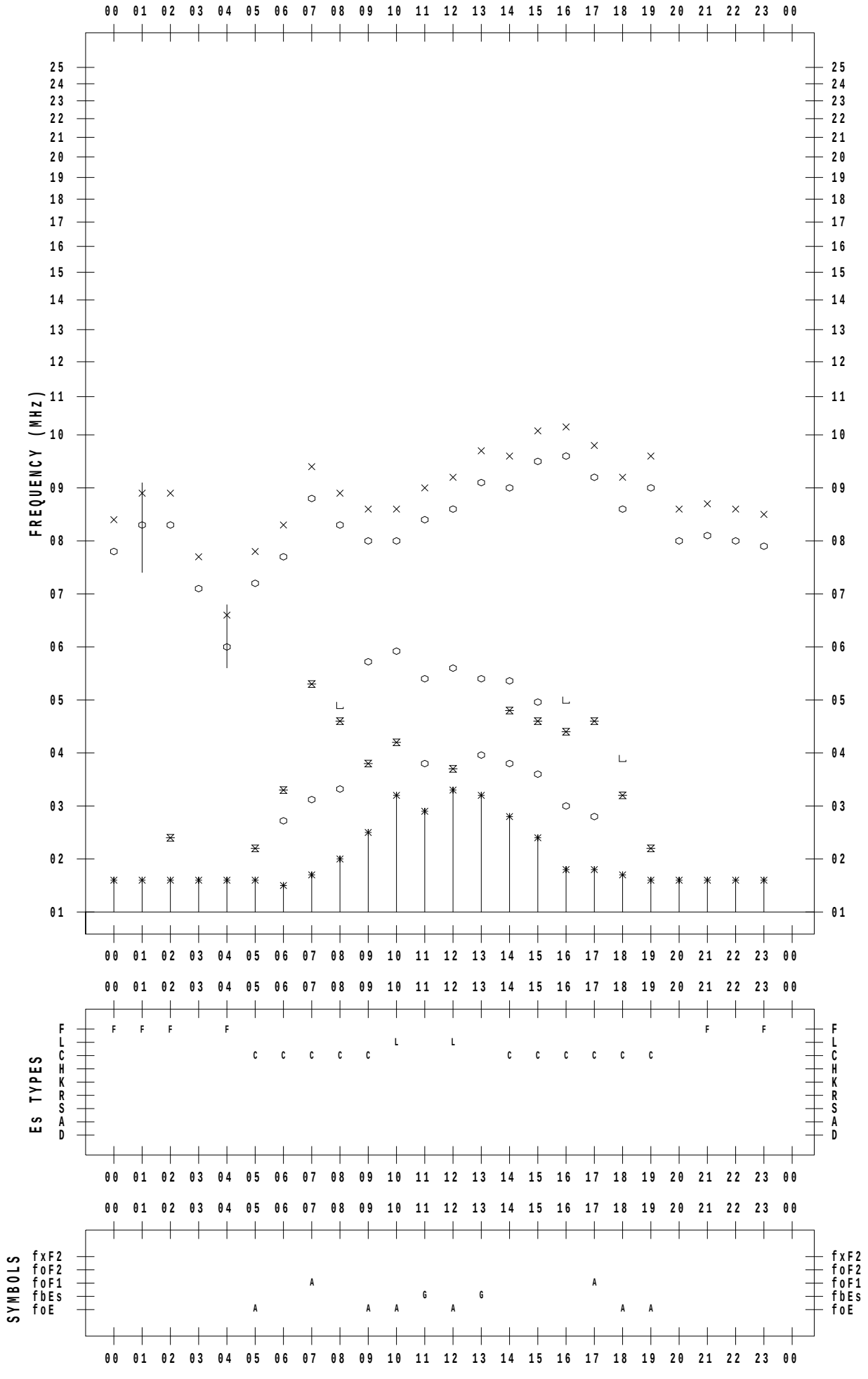
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/25

135 °E MEAN TIME



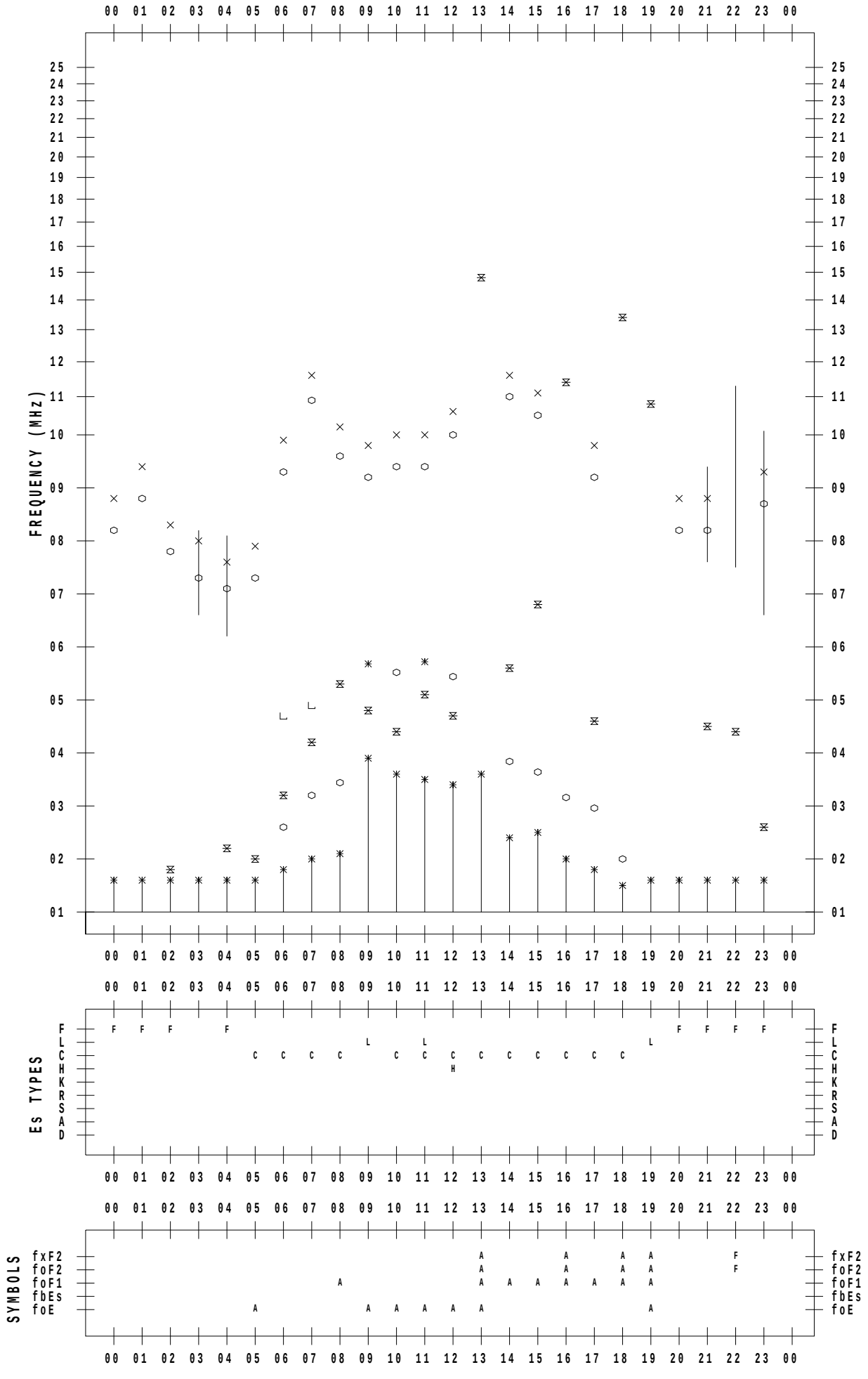
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/26

135 °E MEAN TIME



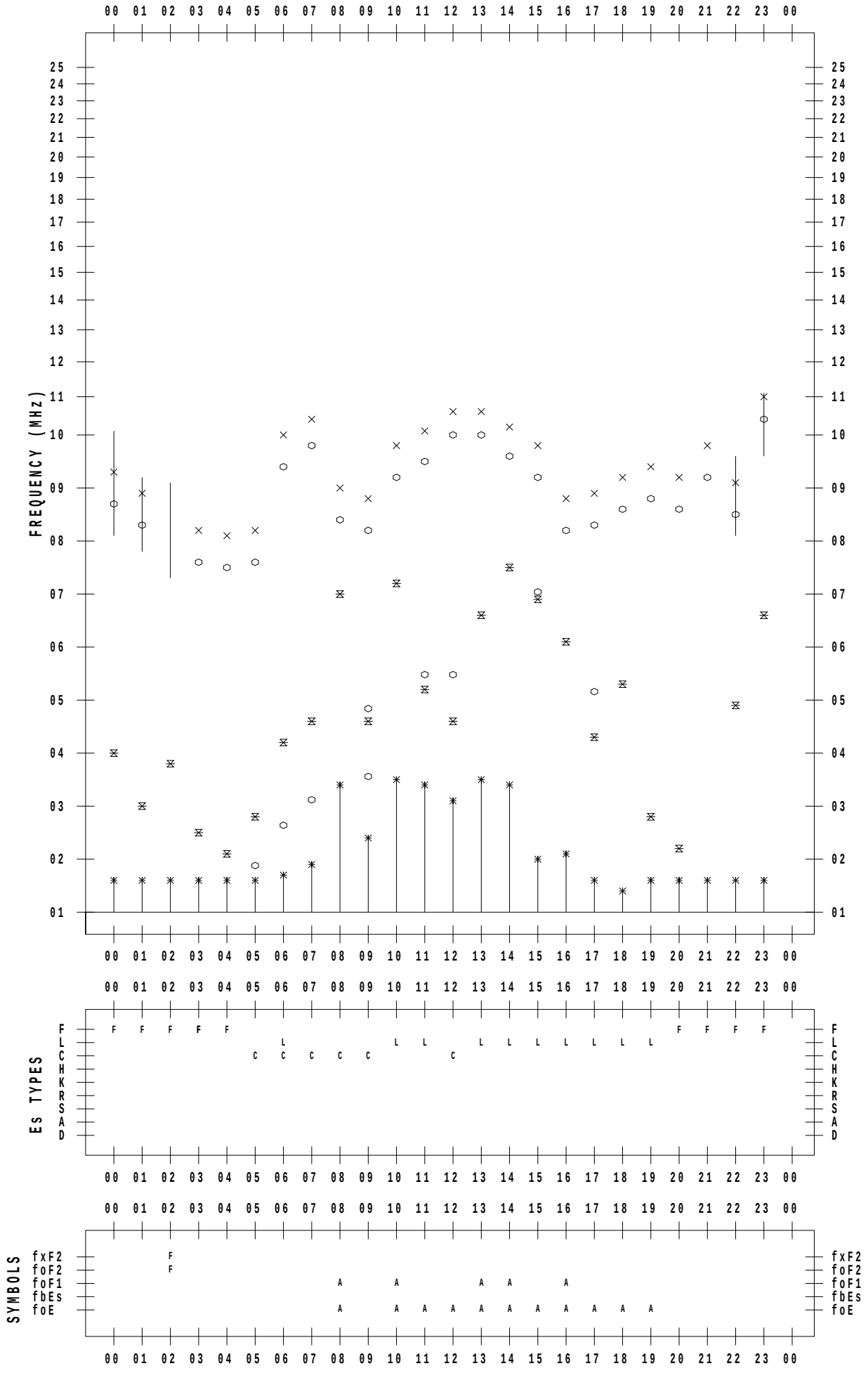
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/27

135 °E MEAN TIME



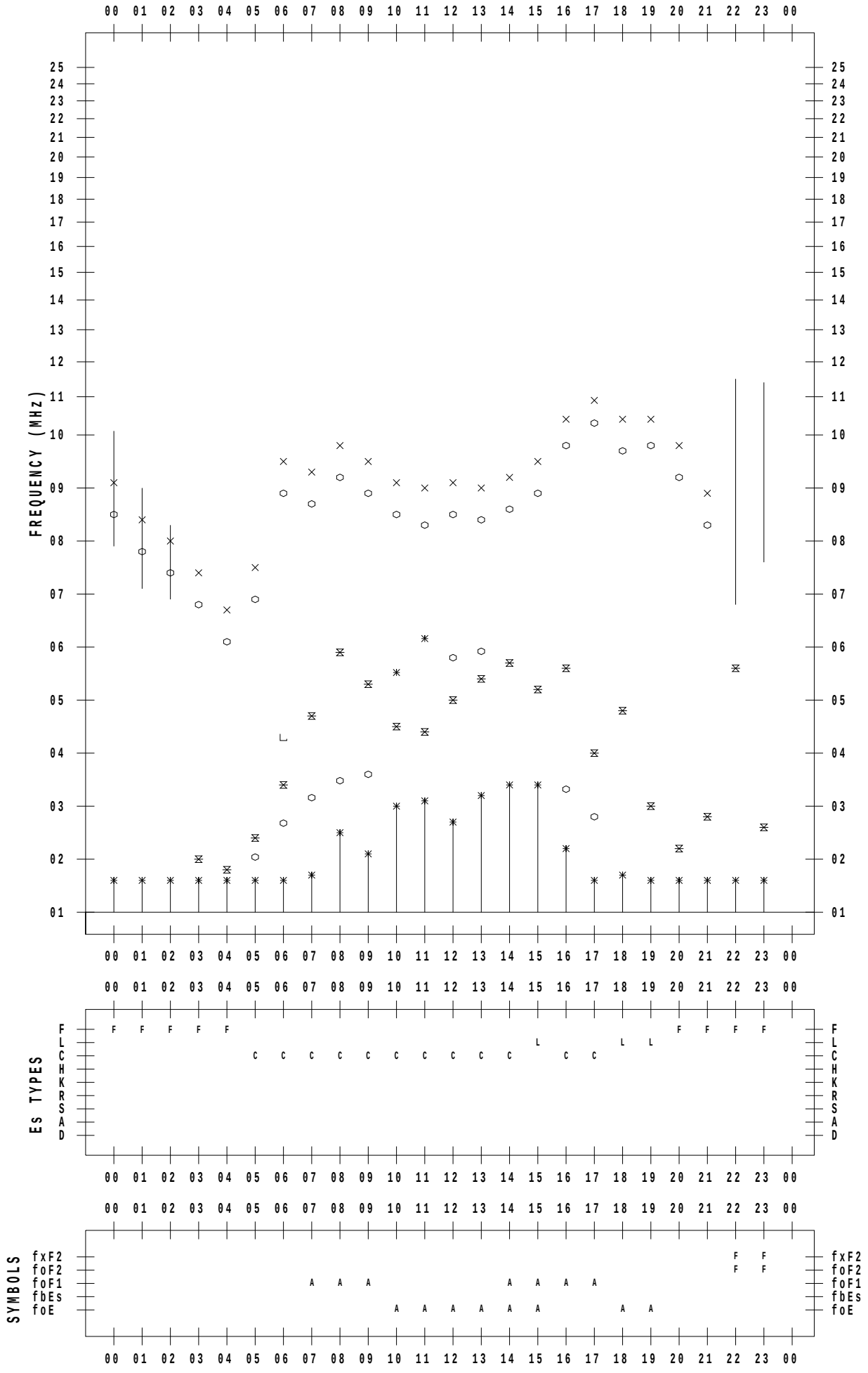
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/28

135 °E MEAN TIME



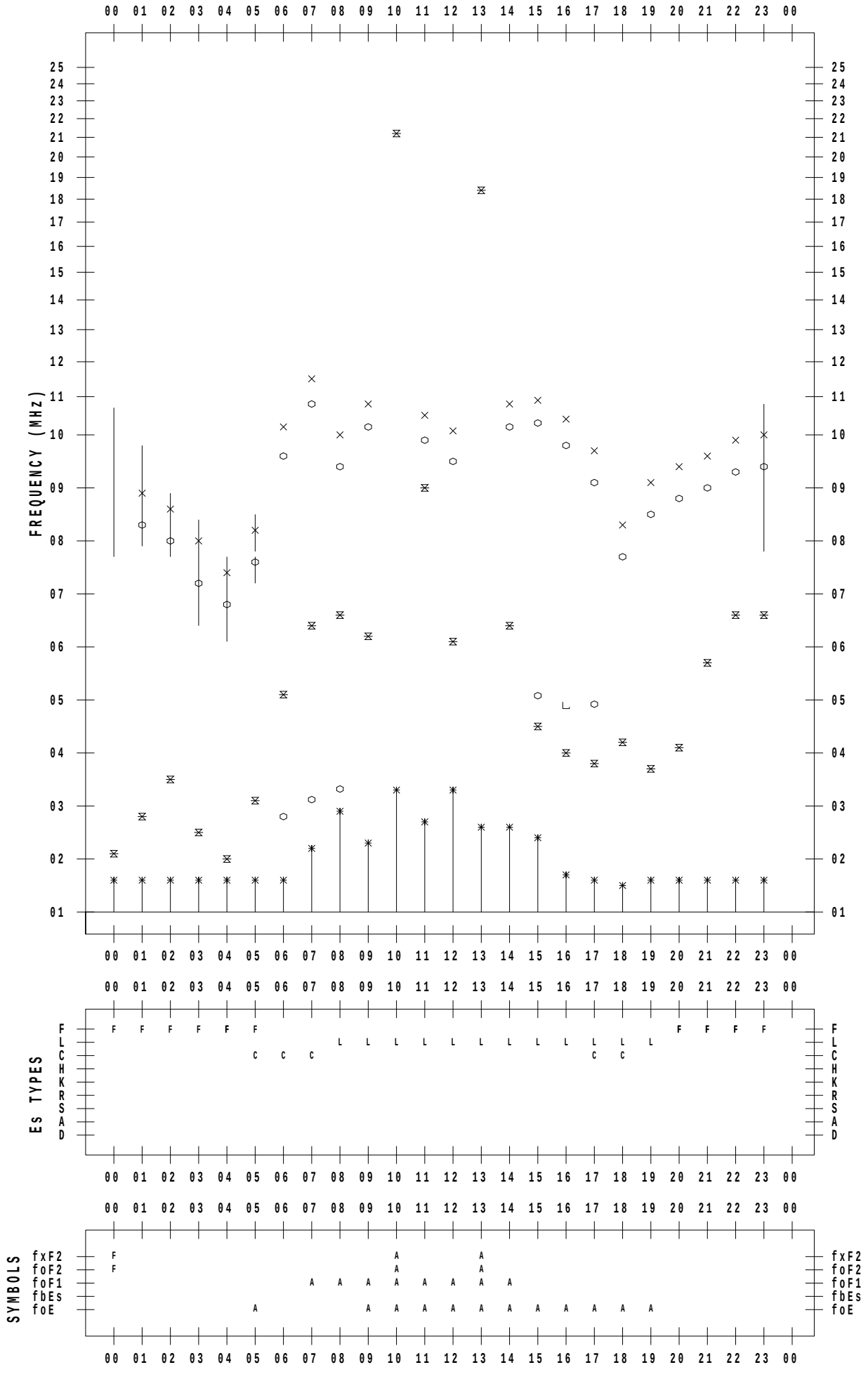
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/29

135 °E MEAN TIME



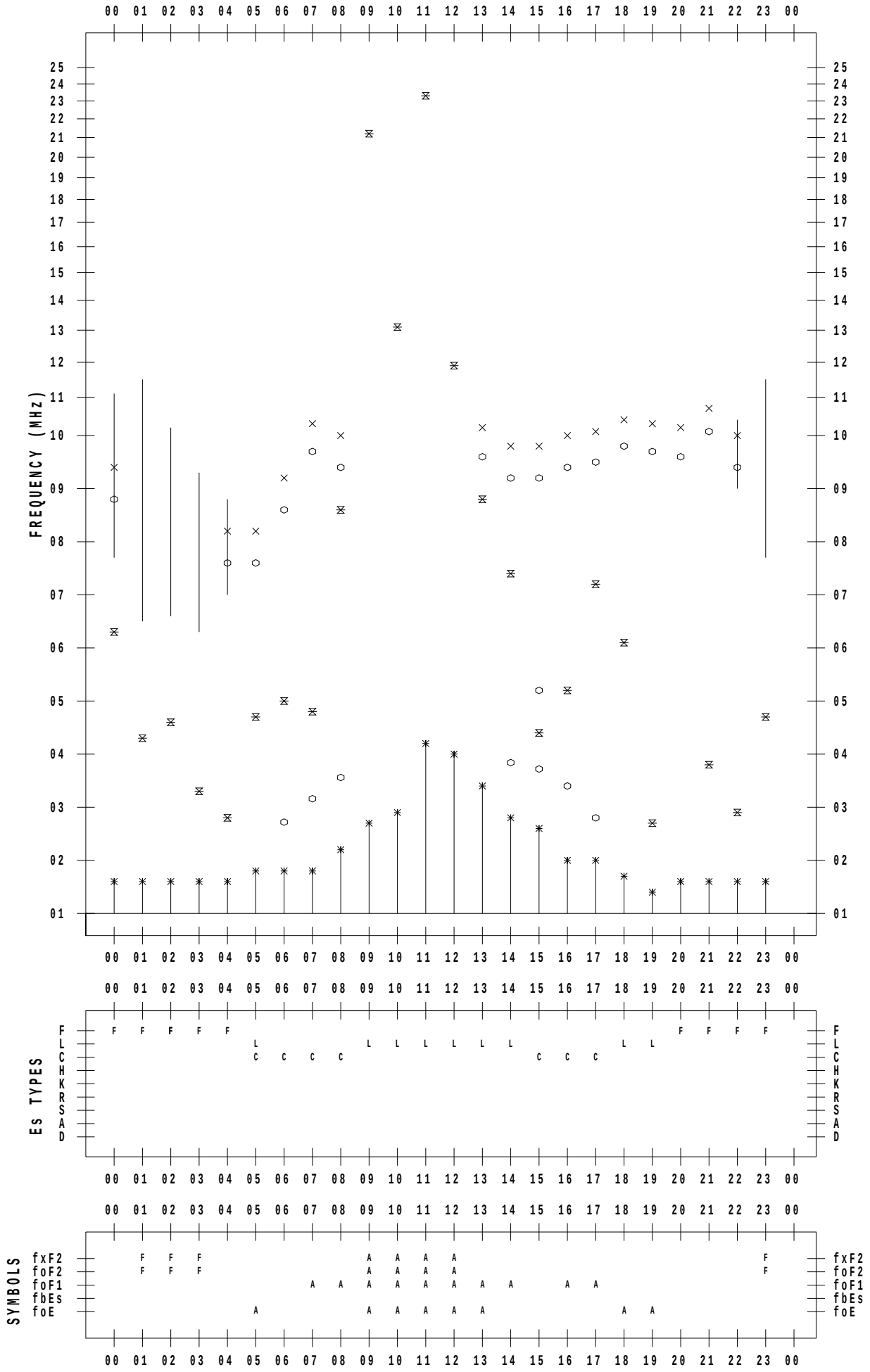
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/30

135 °E MEAN TIME



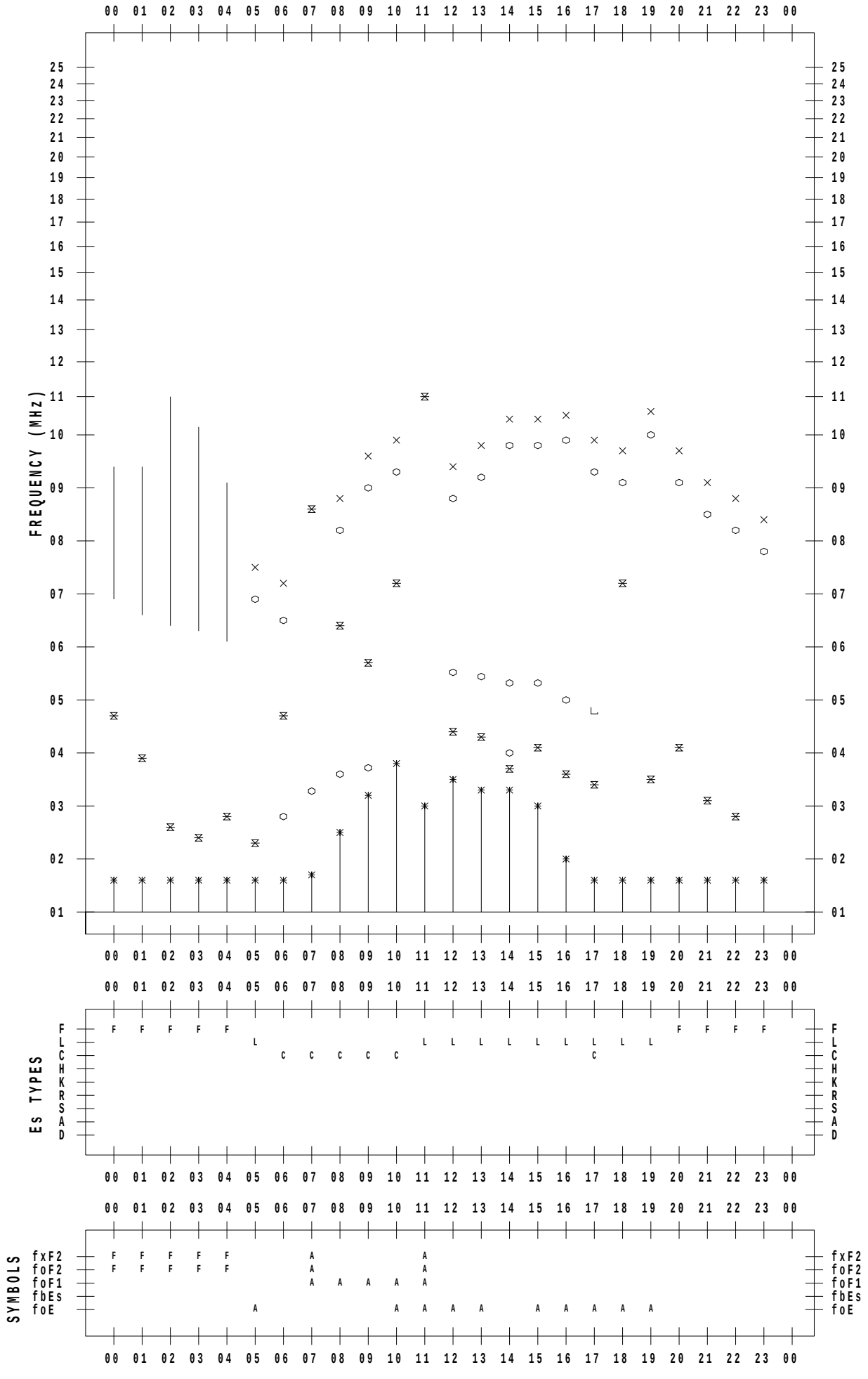
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 5/31

135 °E MEAN TIME



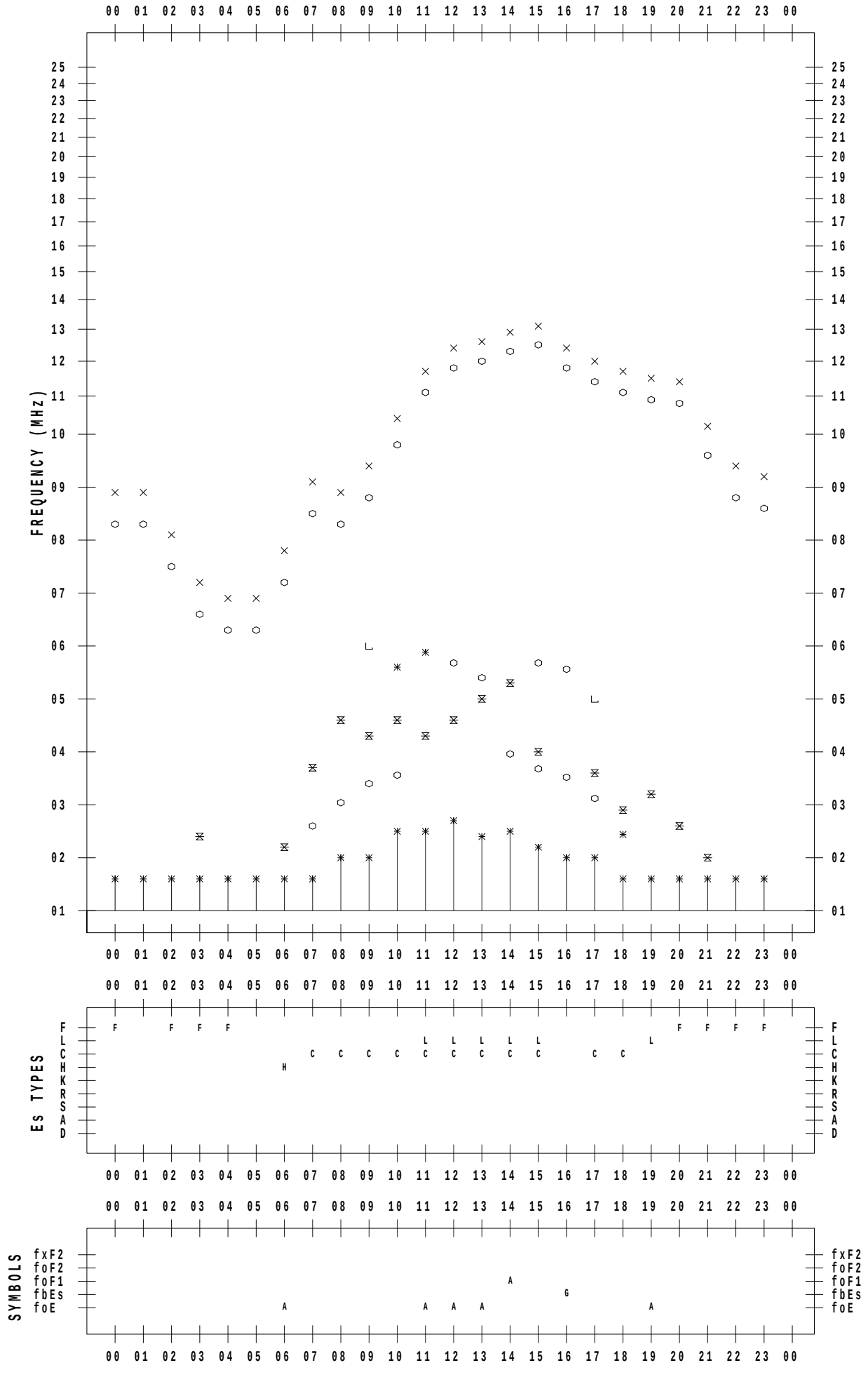
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 1

135 °E MEAN TIME



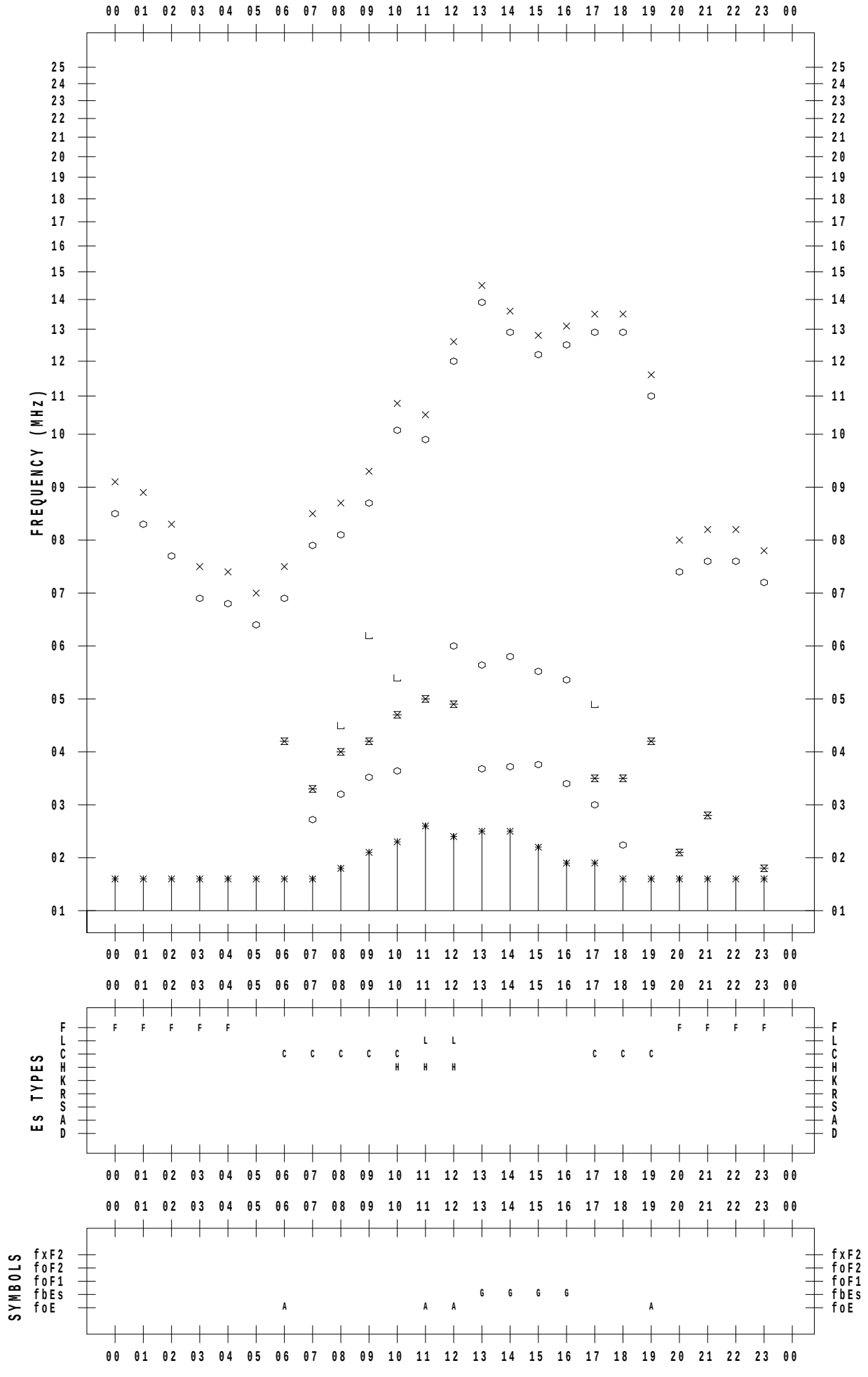
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 2

135 °E MEAN TIME



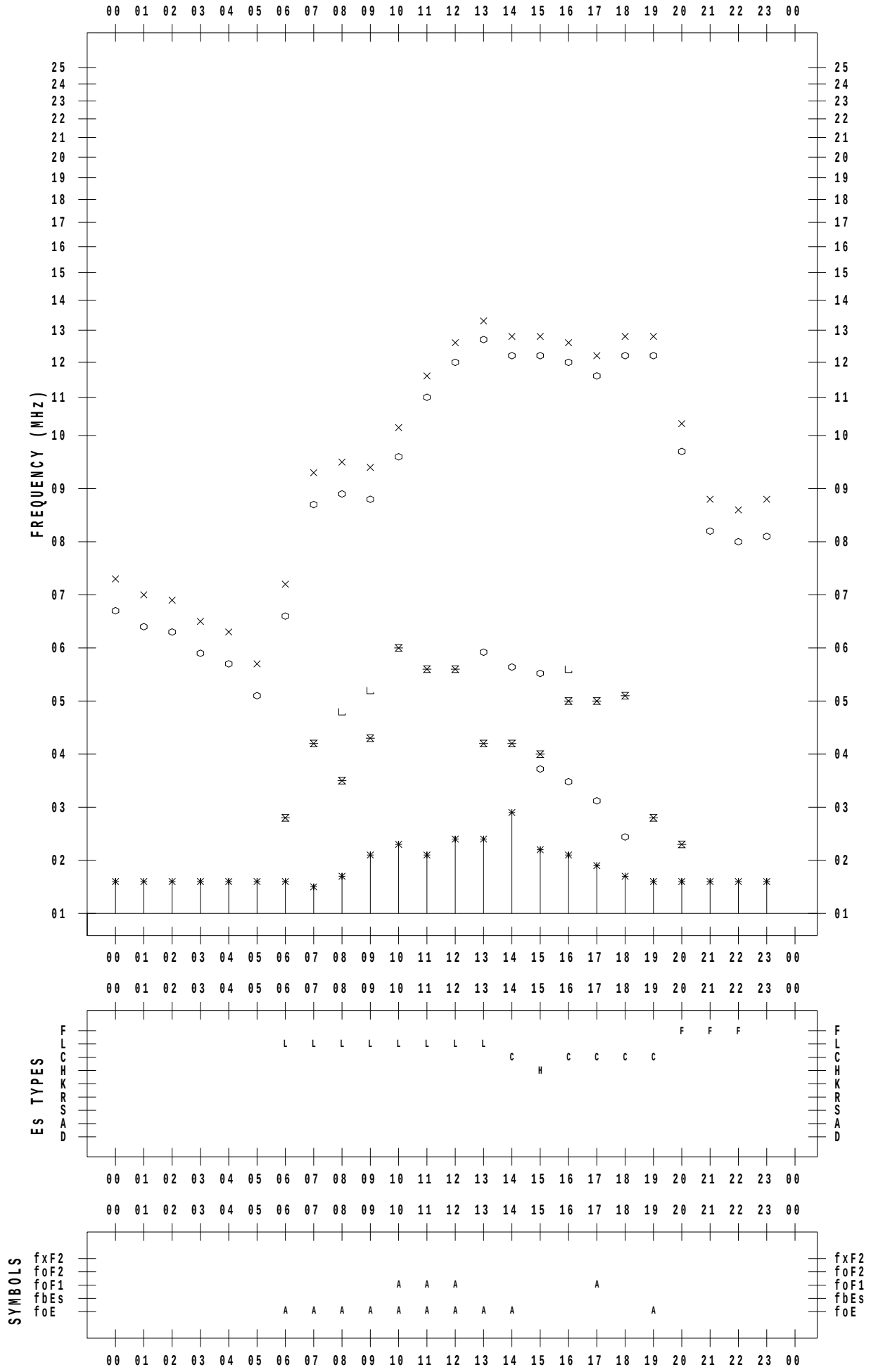
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 3

135 °E MEAN TIME



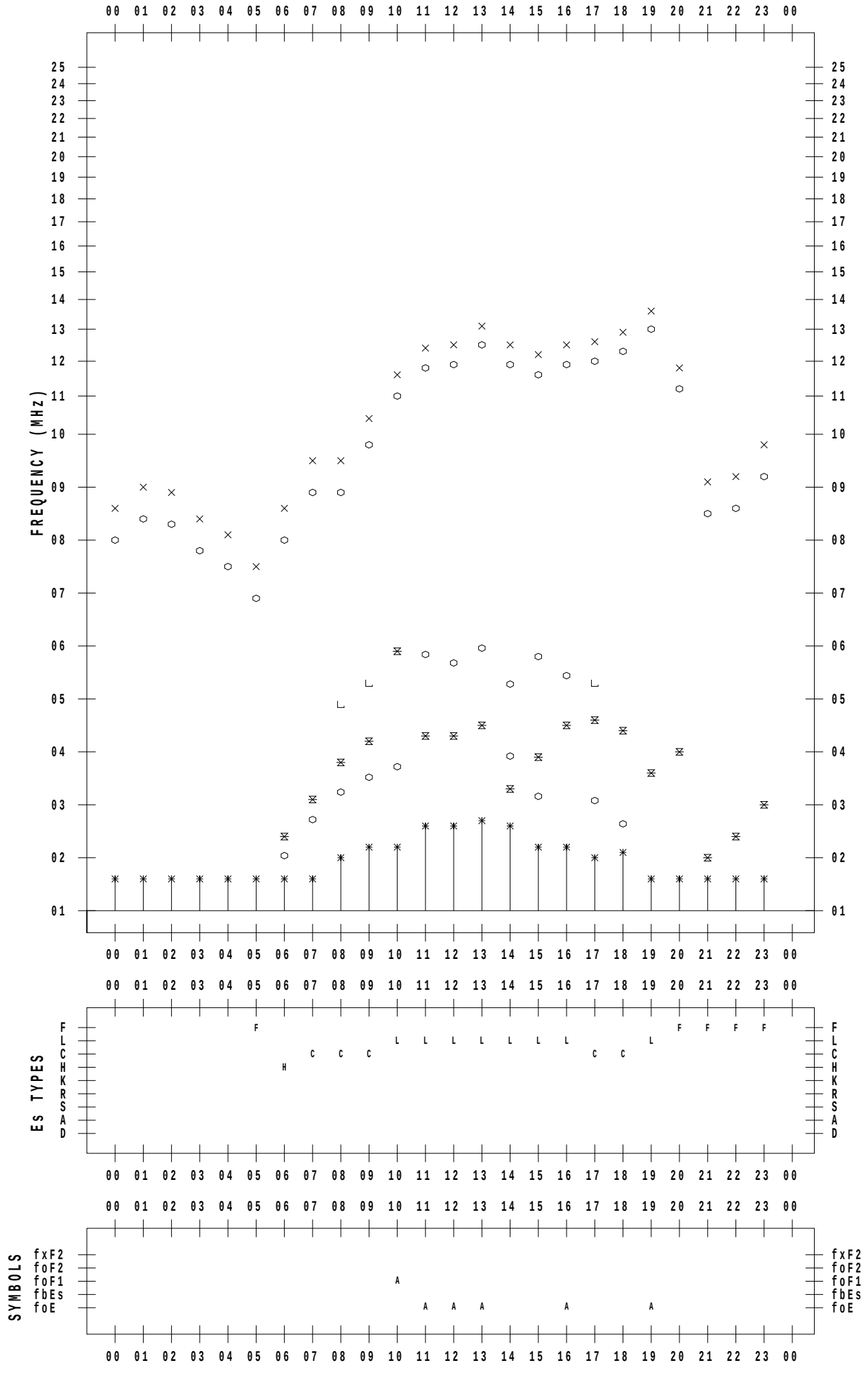
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 4

135 °E MEAN TIME



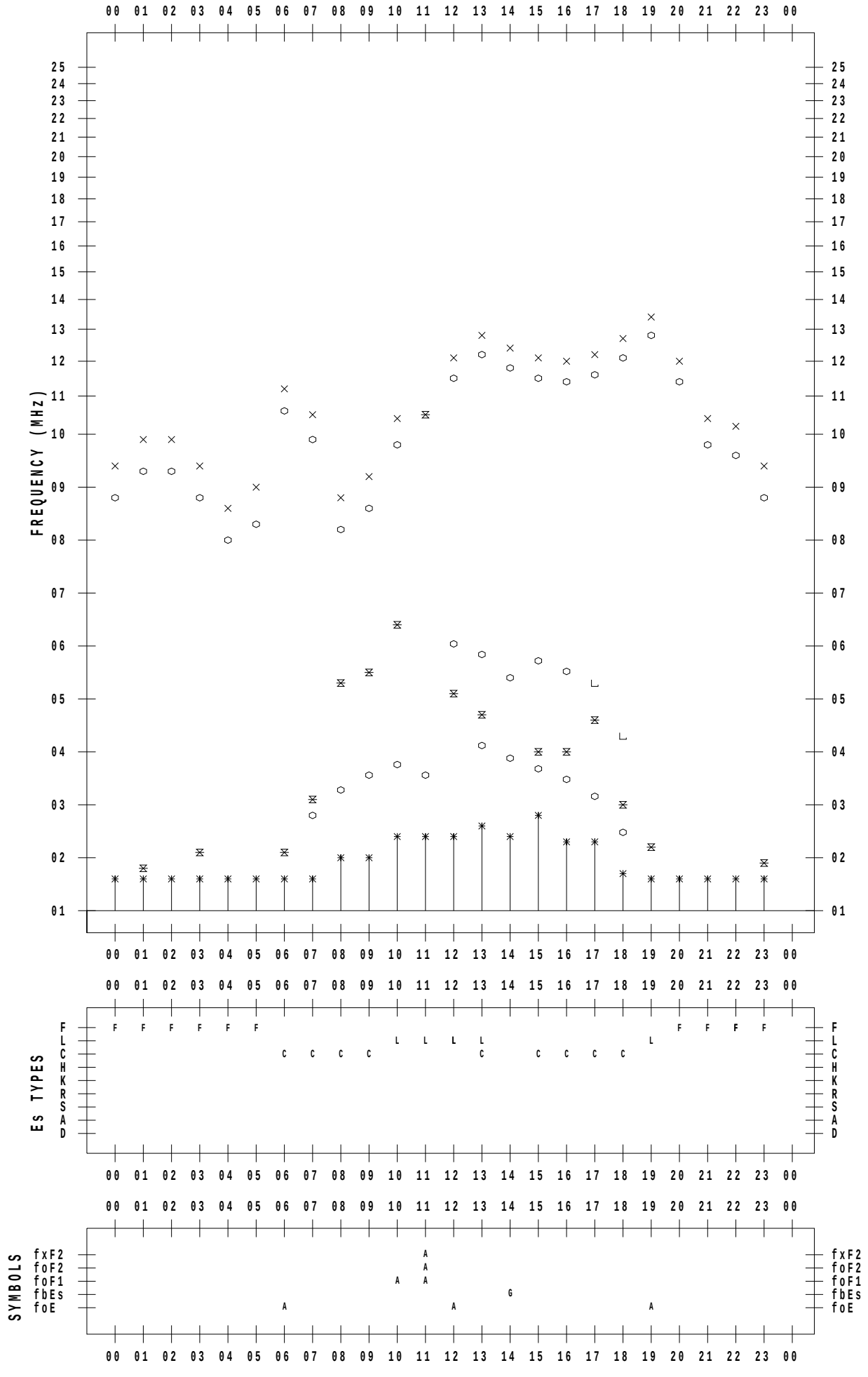
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 5

135 °E MEAN TIME



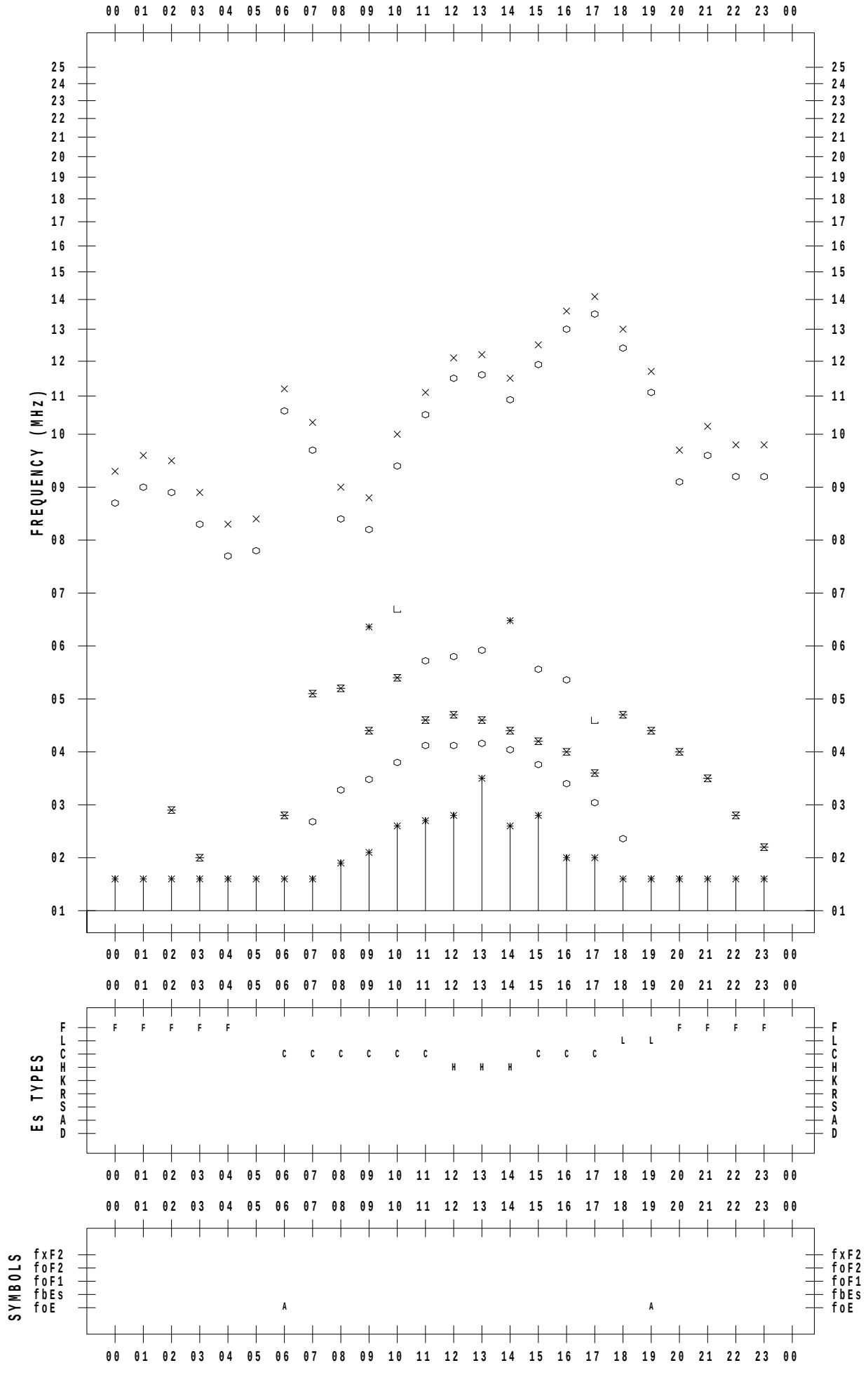
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 6

135 °E MEAN TIME



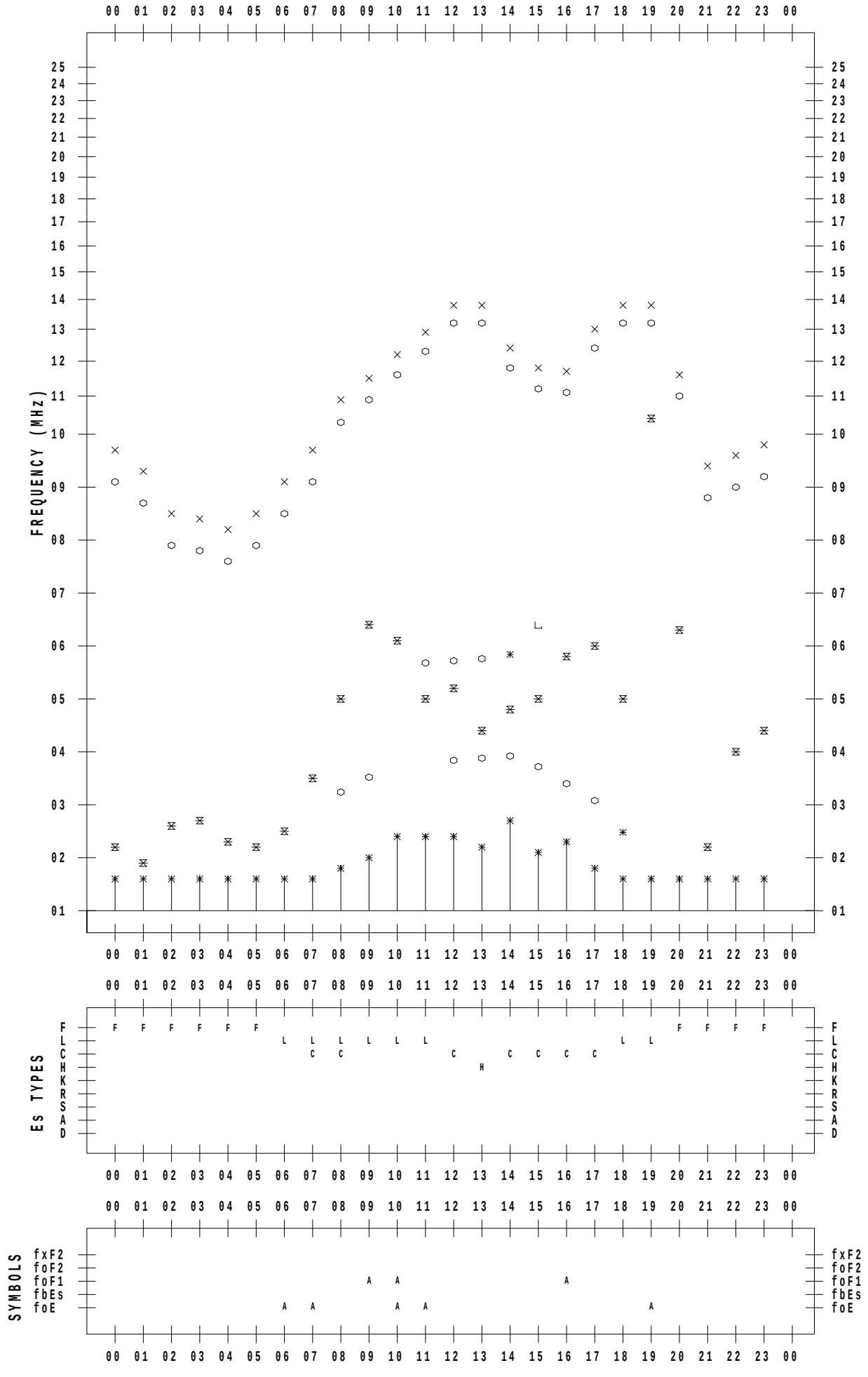
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 7

135 °E MEAN TIME



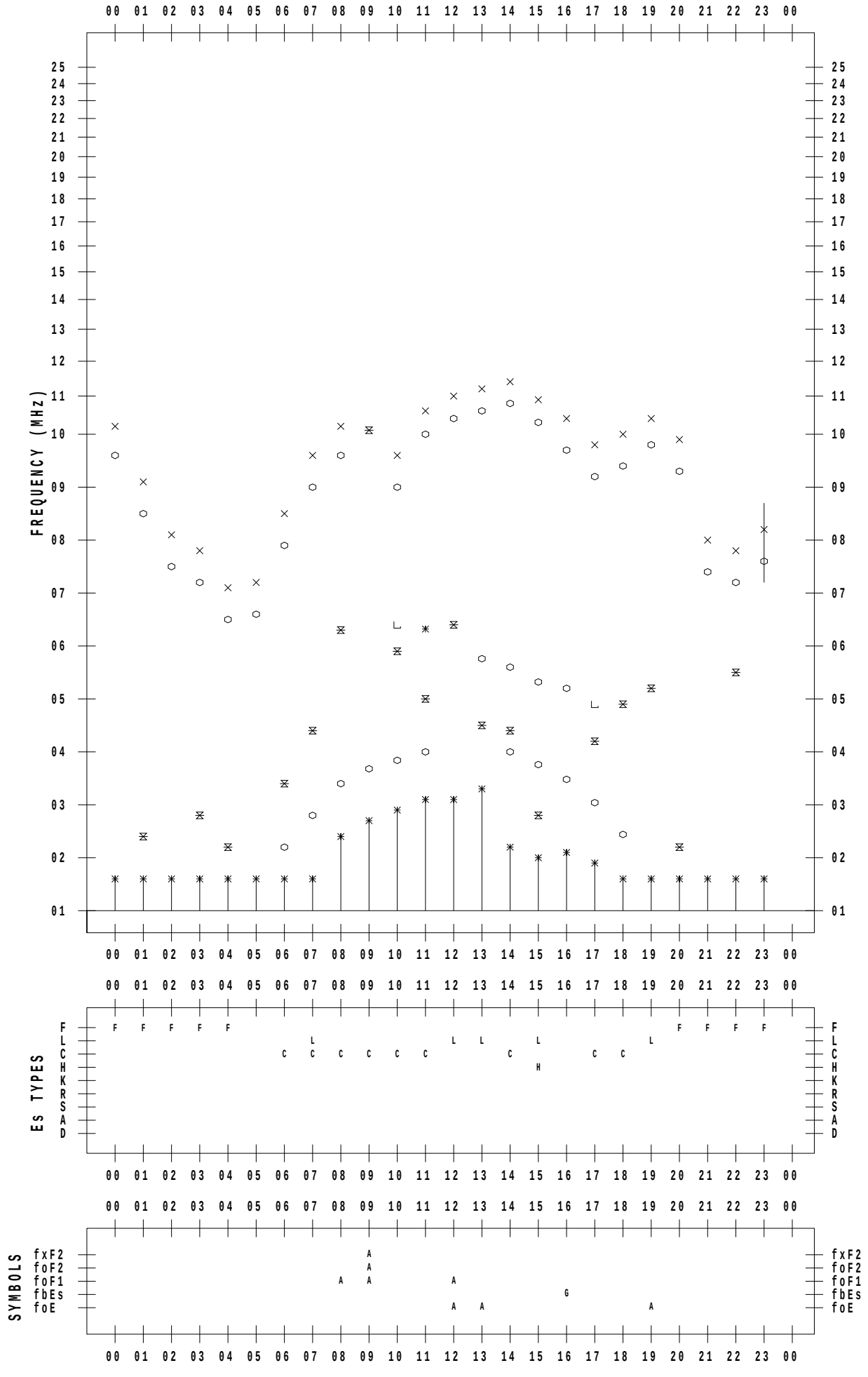
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 8

135 °E MEAN TIME



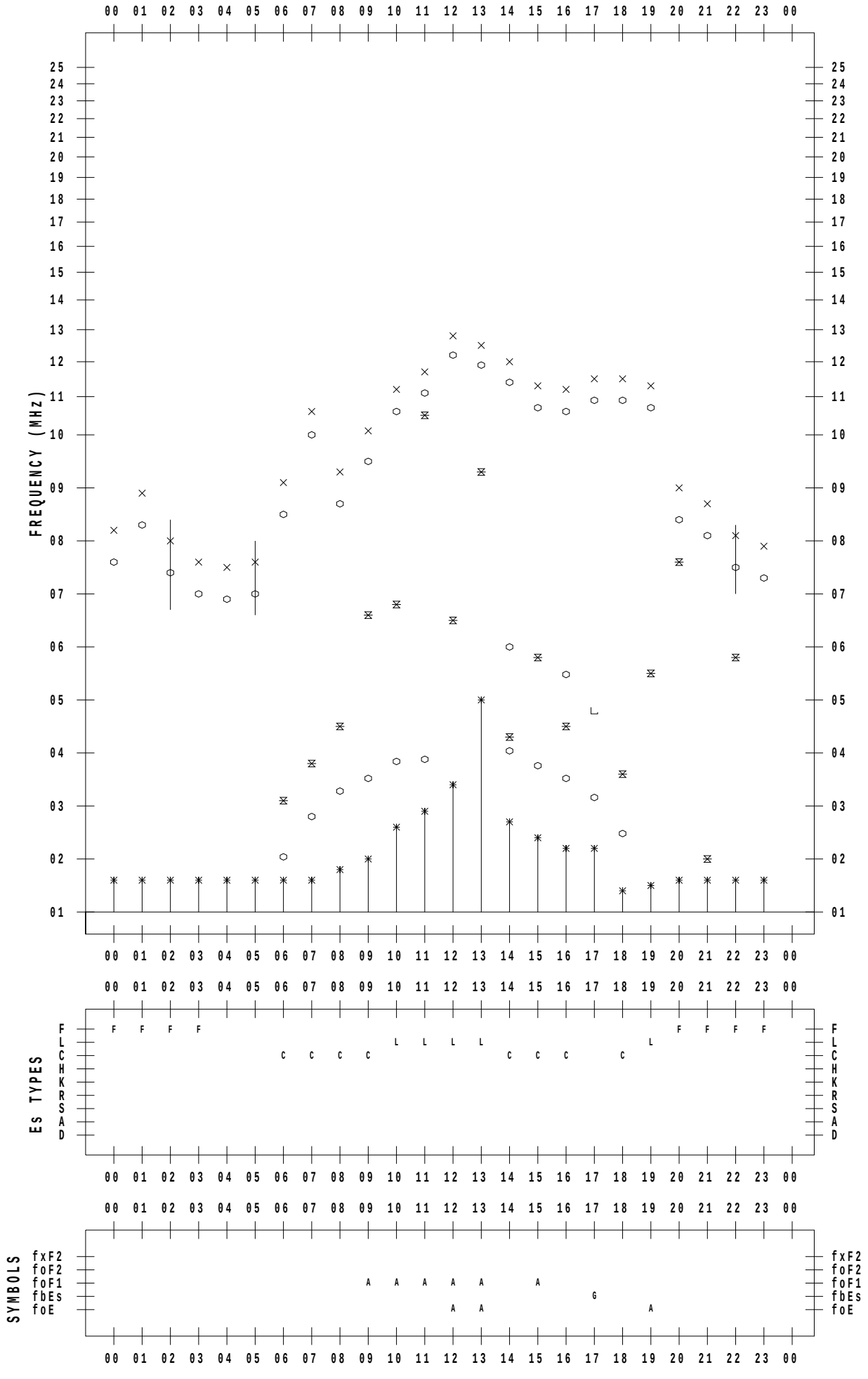
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/ 9

135 °E MEAN TIME



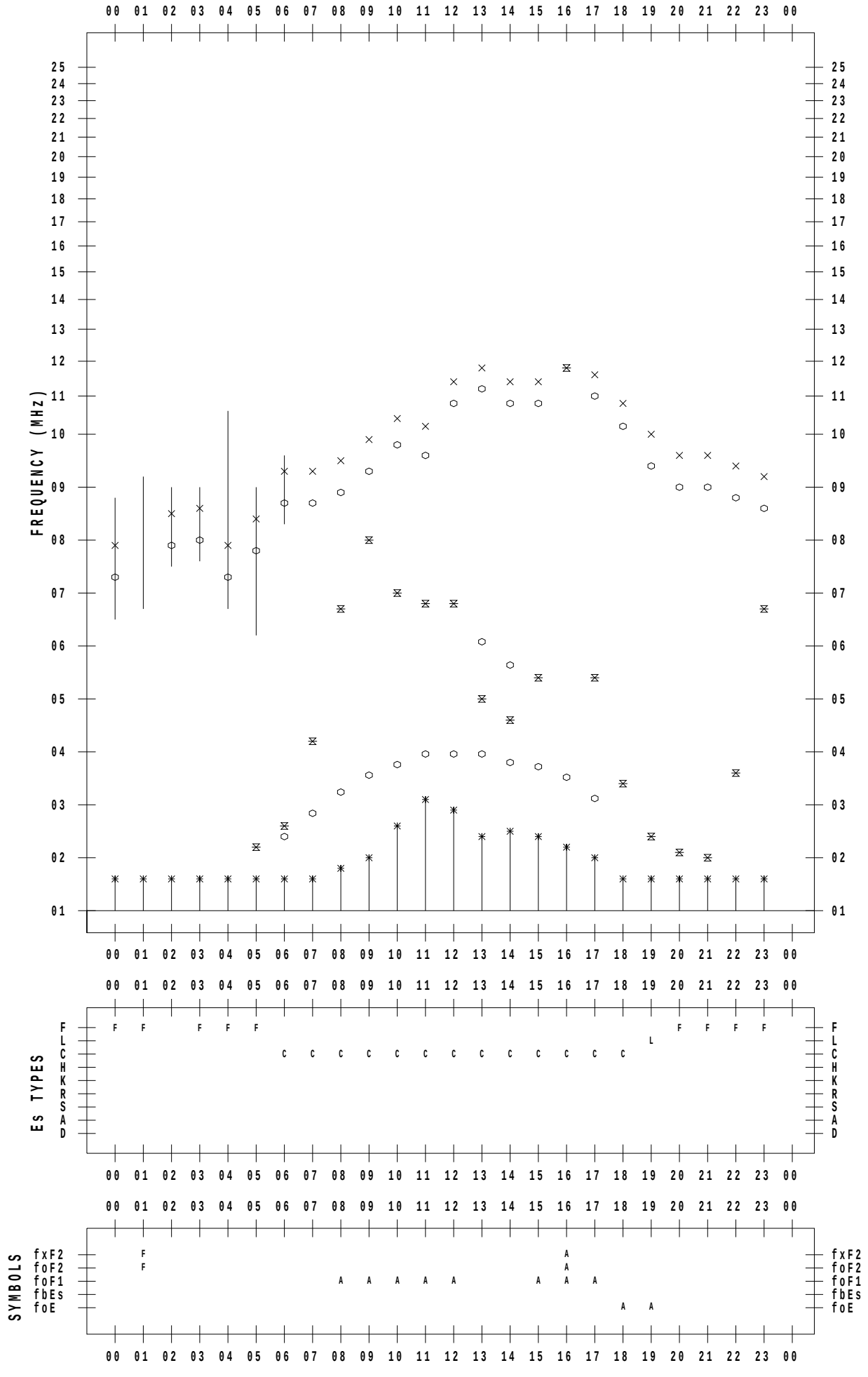
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/10

135 °E MEAN TIME



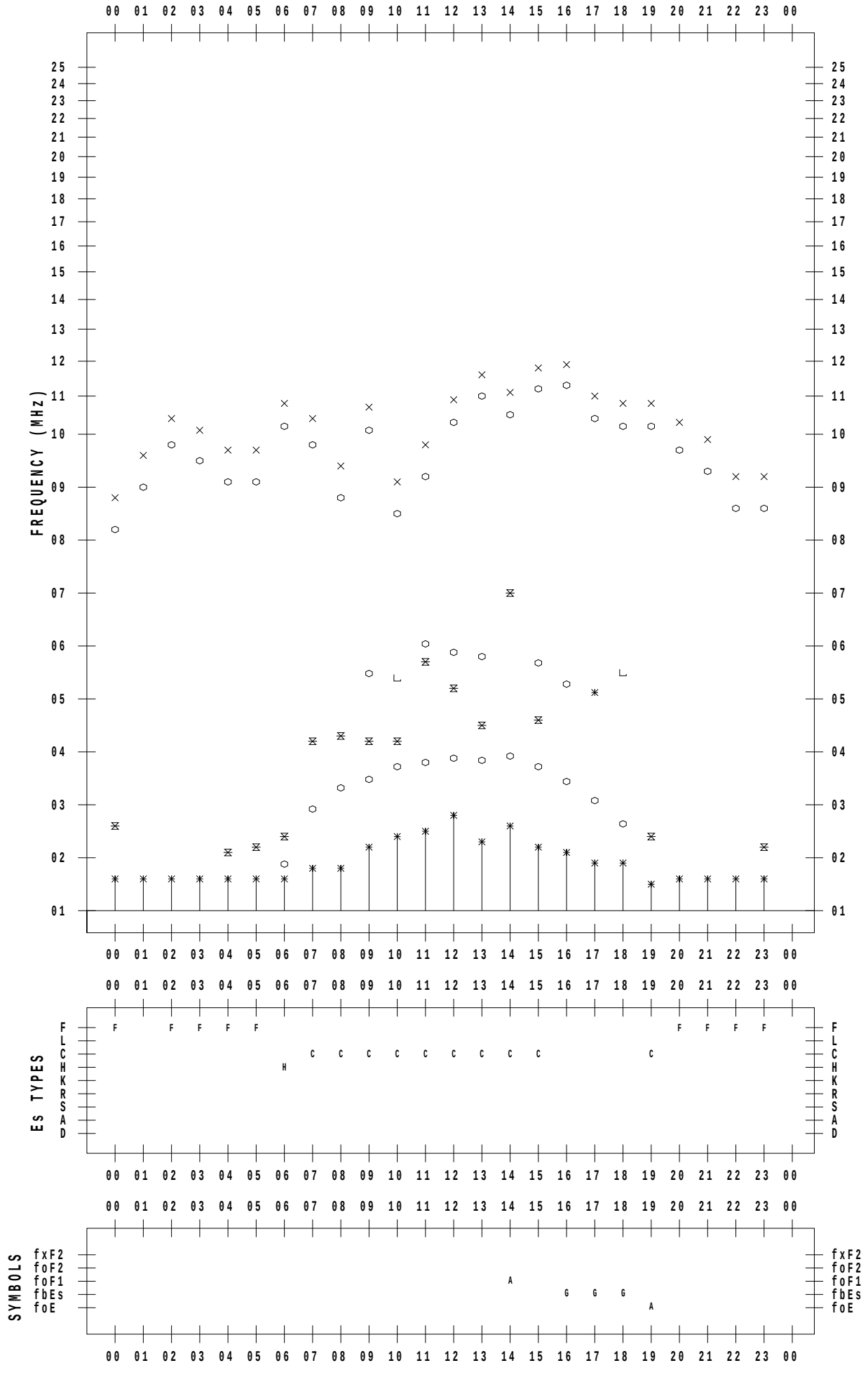
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/11

135 °E MEAN TIME



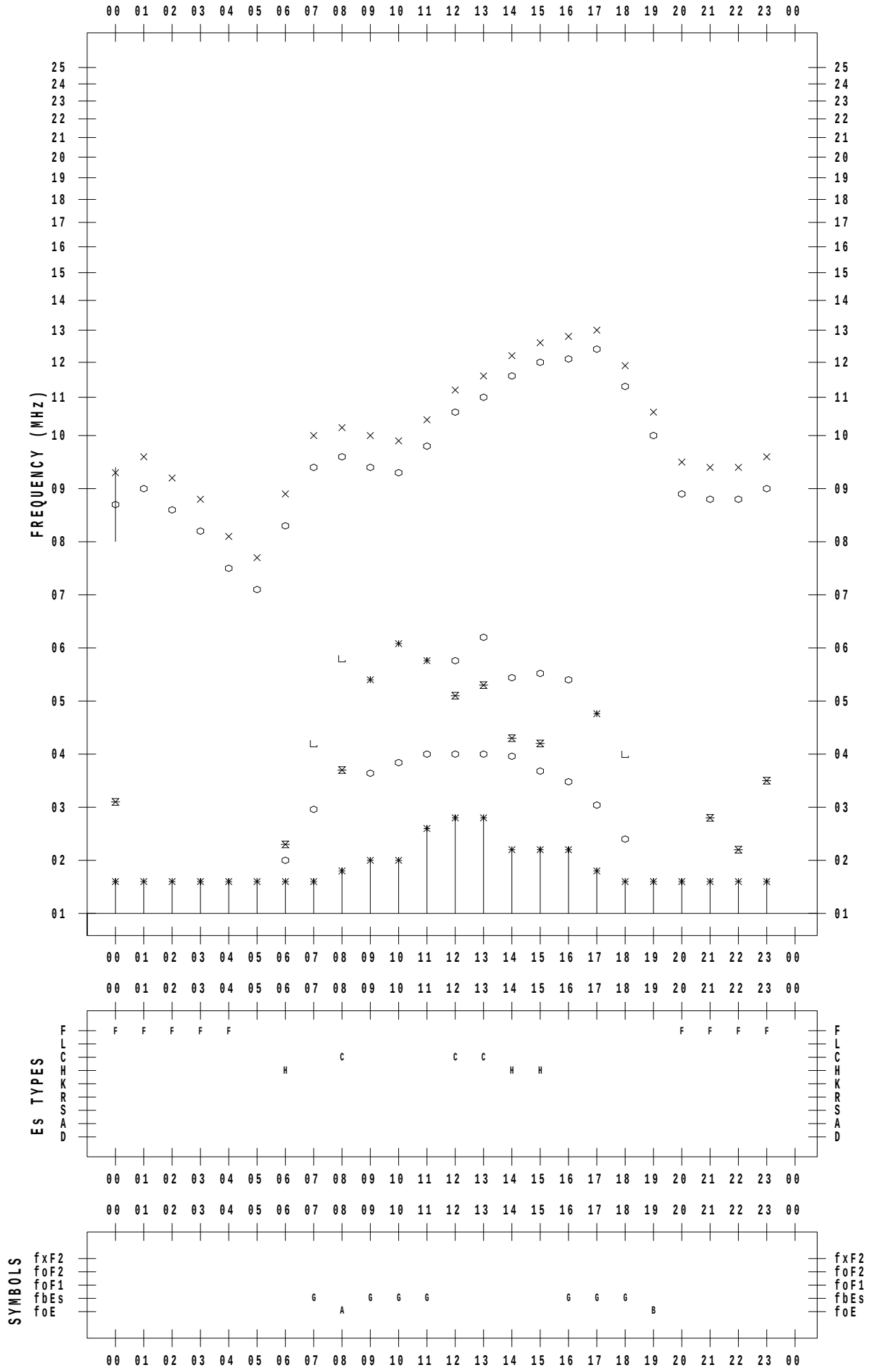
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/12

135 °E MEAN TIME



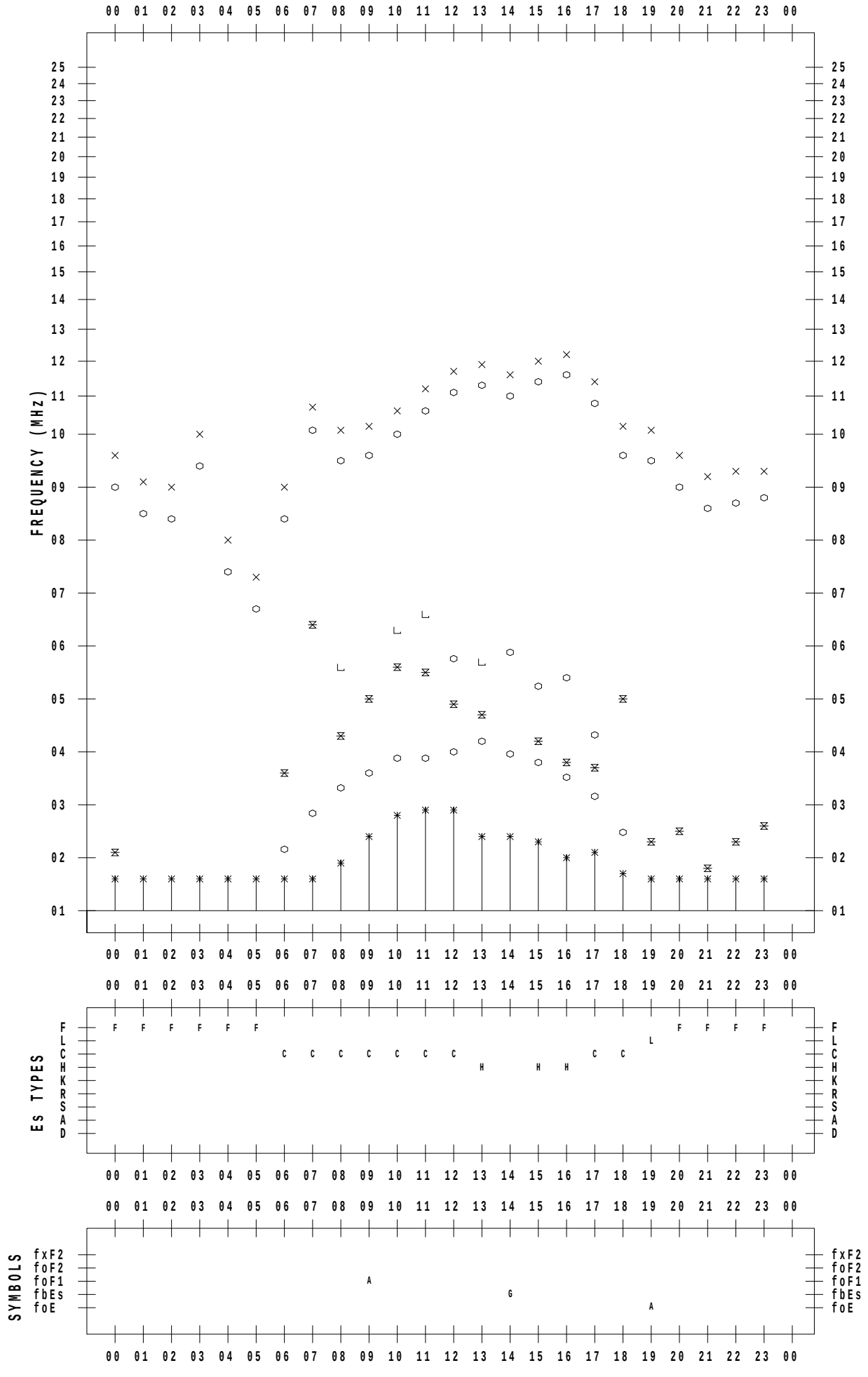
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/13

135 °E MEAN TIME



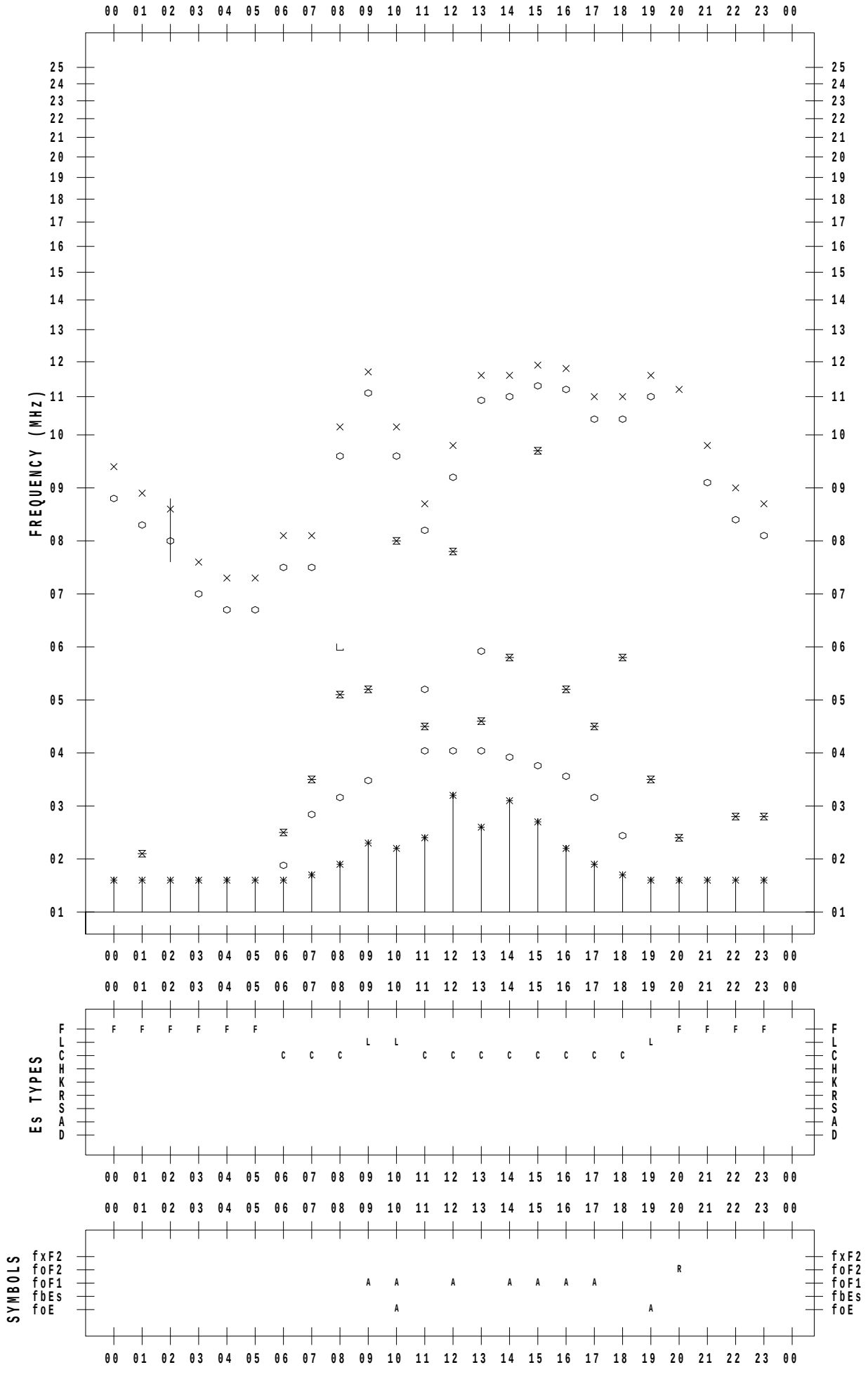
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/14

135 °E MEAN TIME



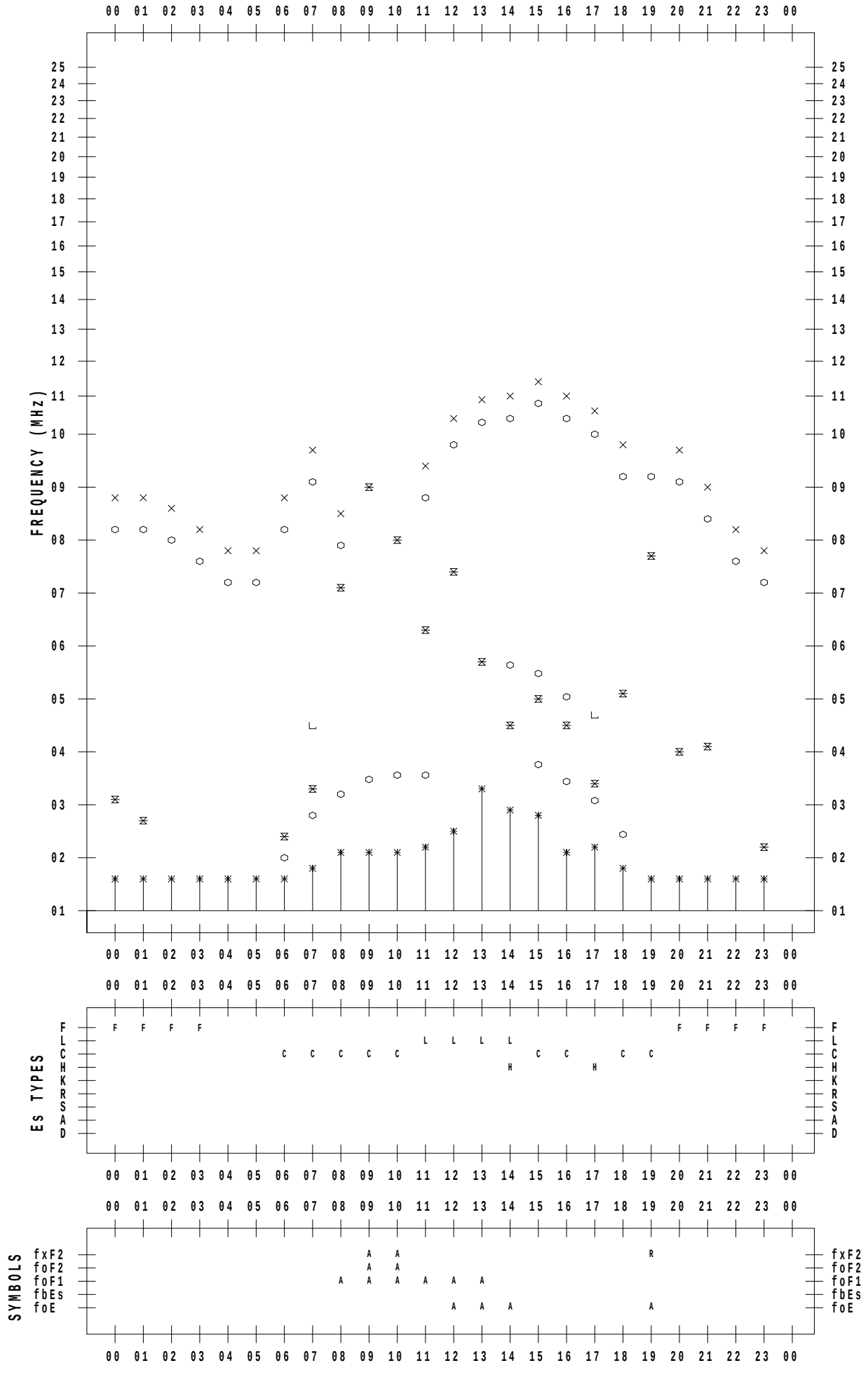
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/15

135 °E MEAN TIME



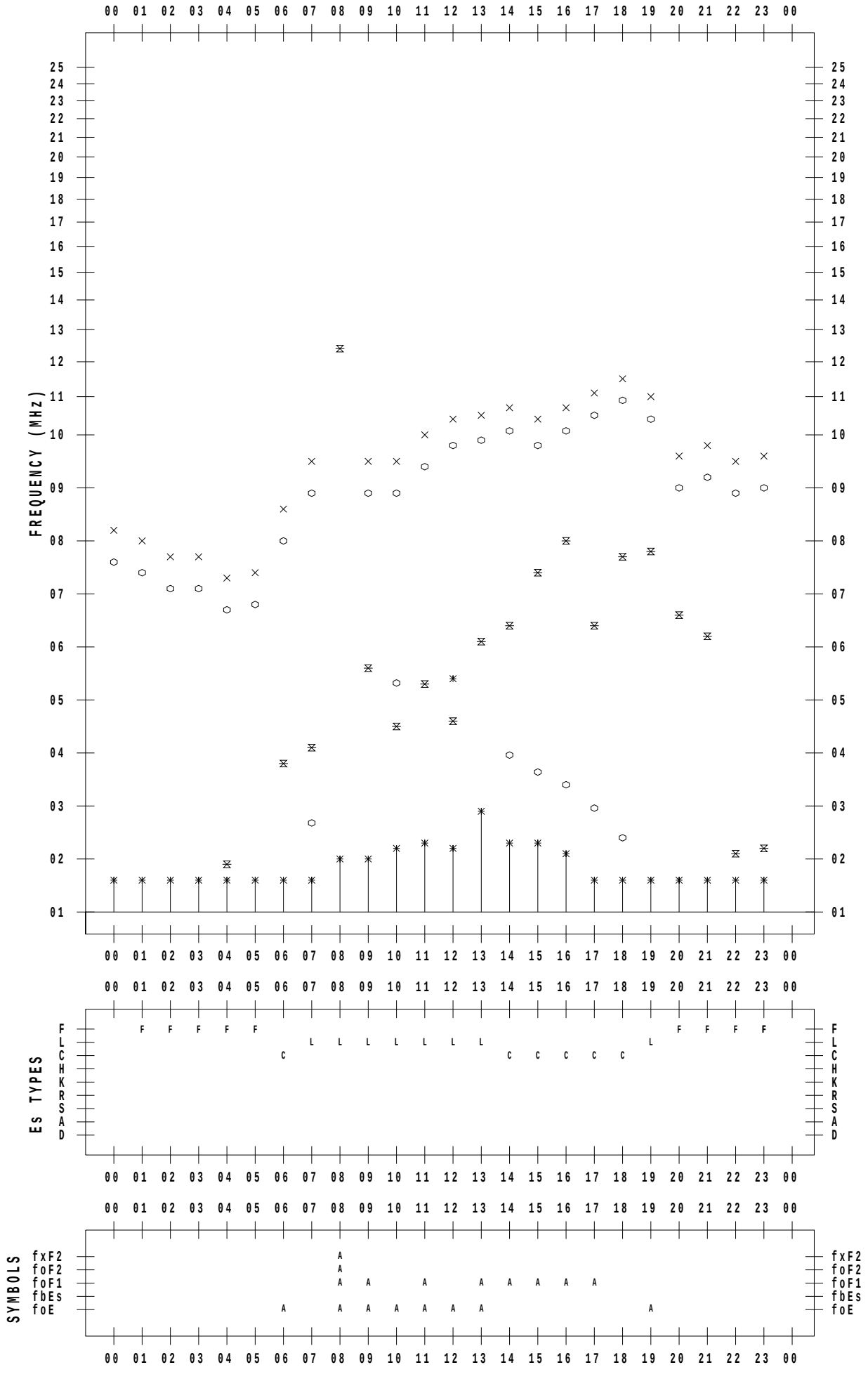
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/16

135 °E MEAN TIME



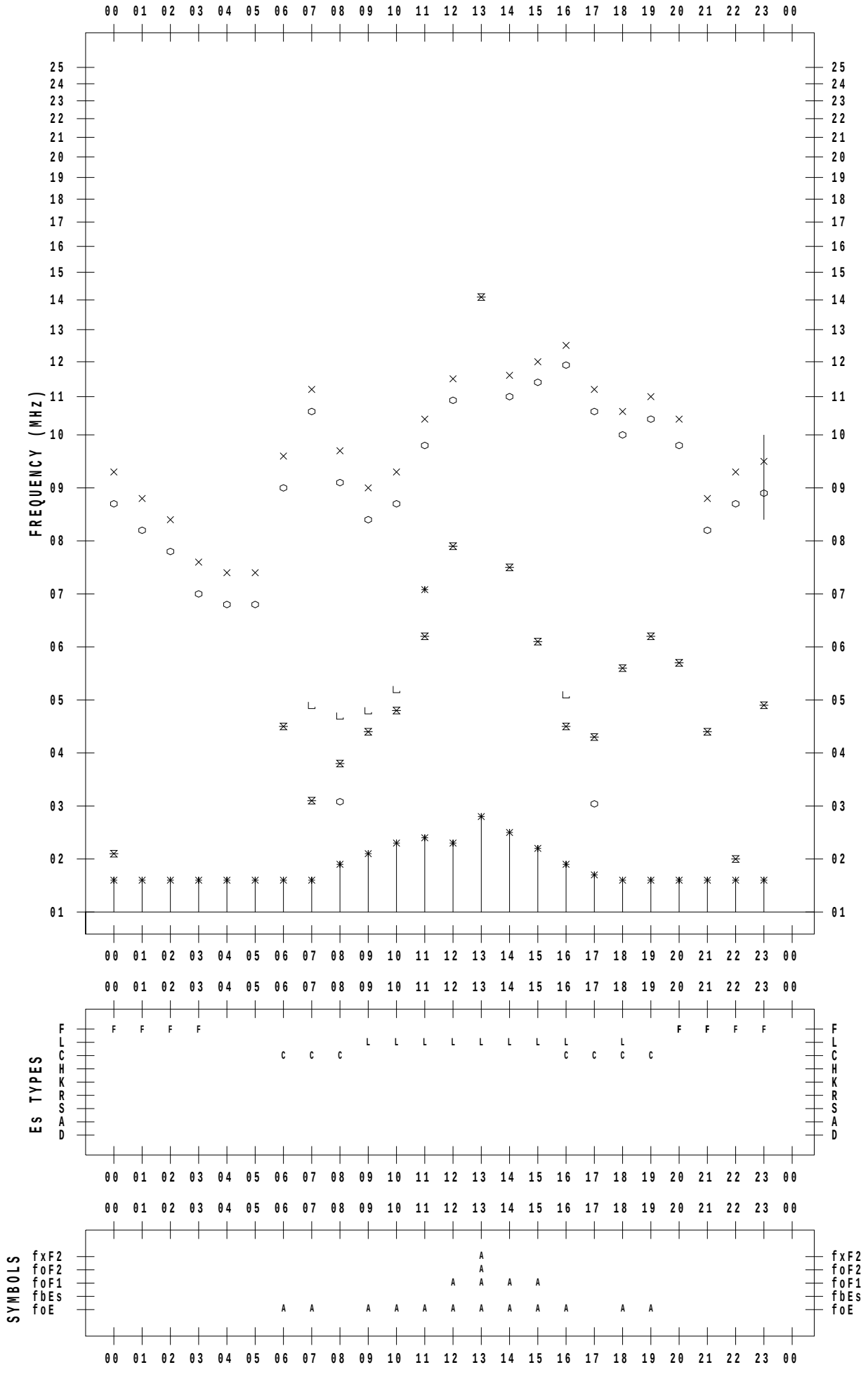
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/17

135 °E MEAN TIME



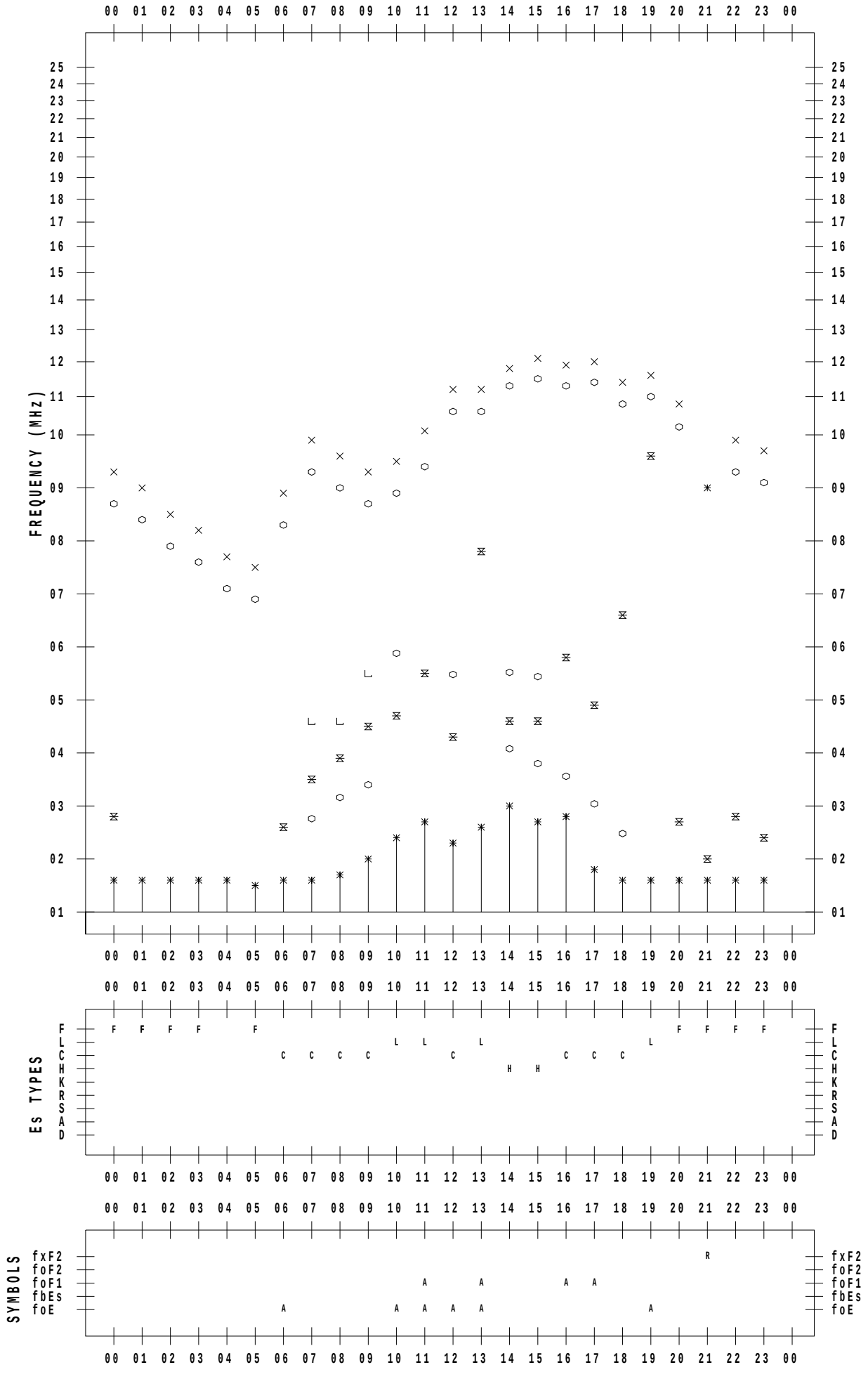
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/18

135 °E MEAN TIME



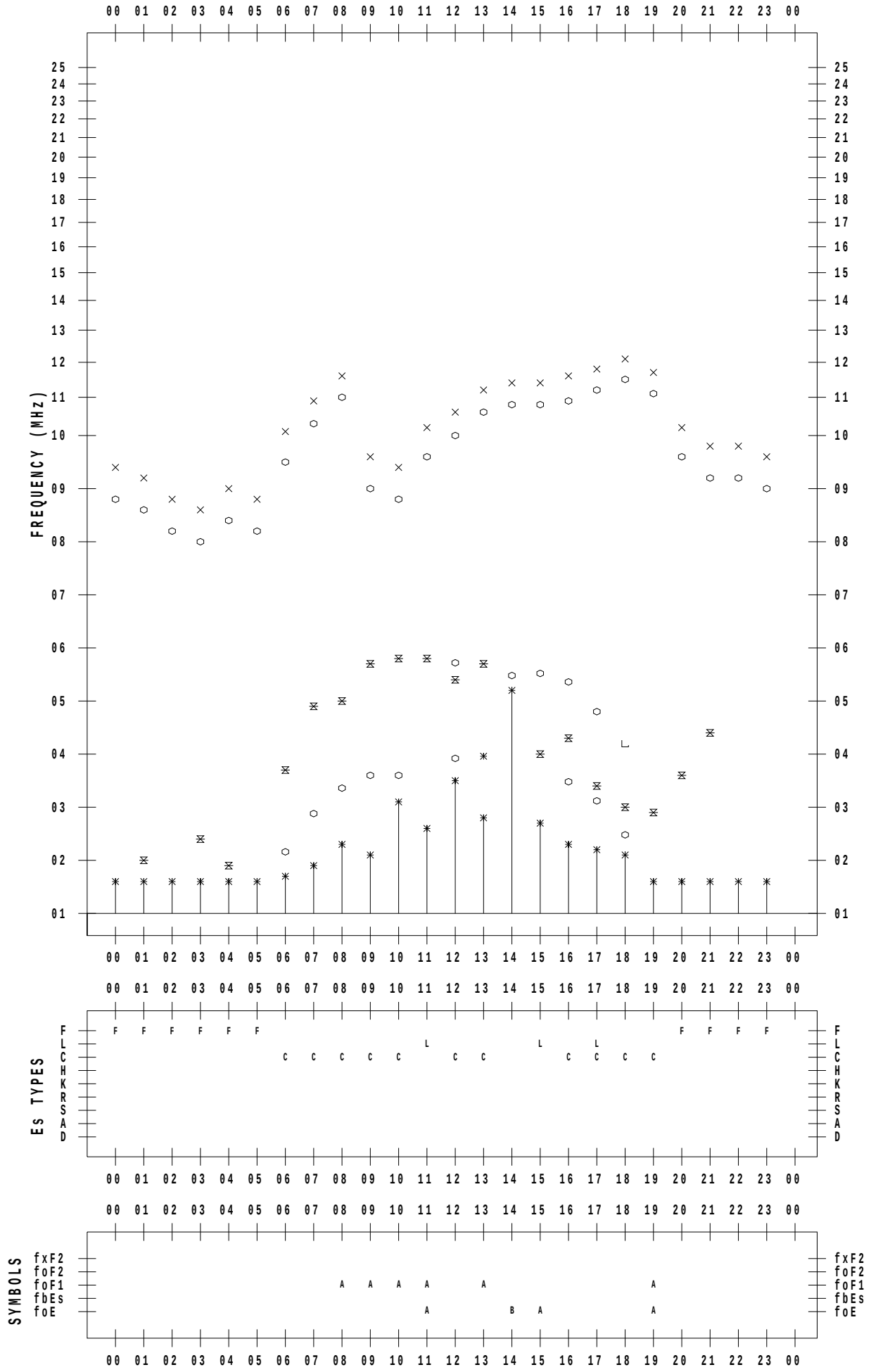
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/19

135 °E MEAN TIME



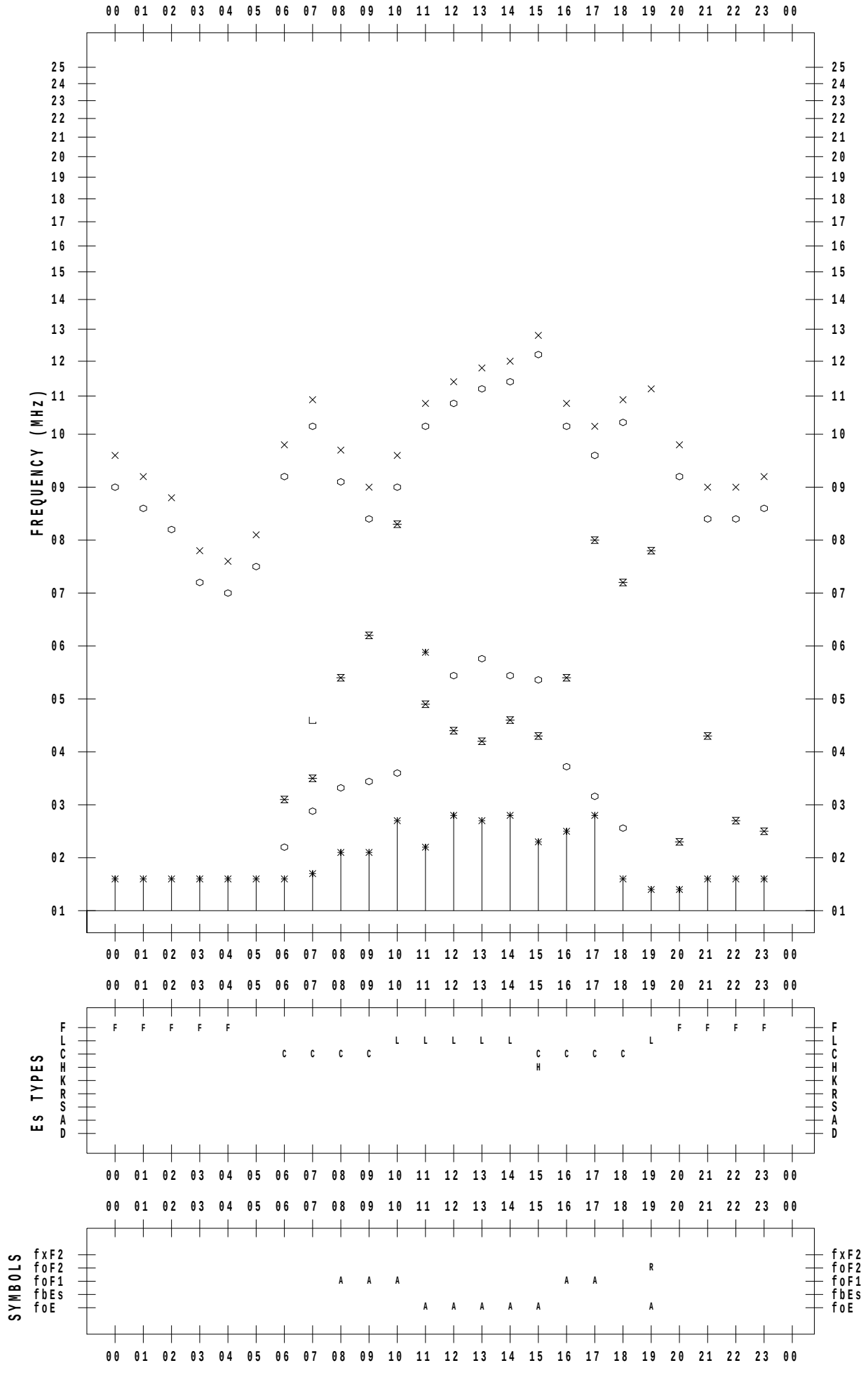
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/20

135 °E MEAN TIME



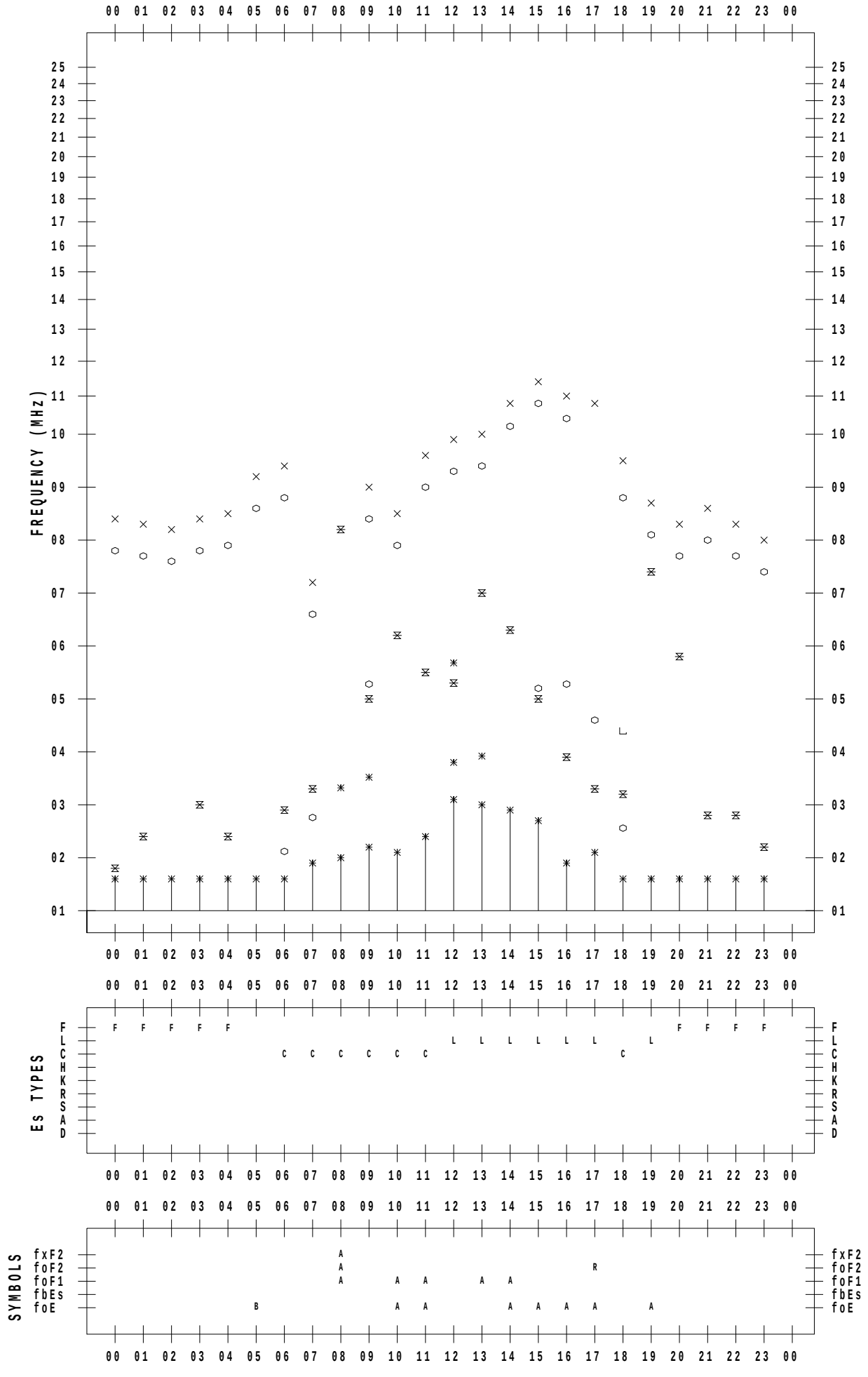
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/21

135 °E MEAN TIME



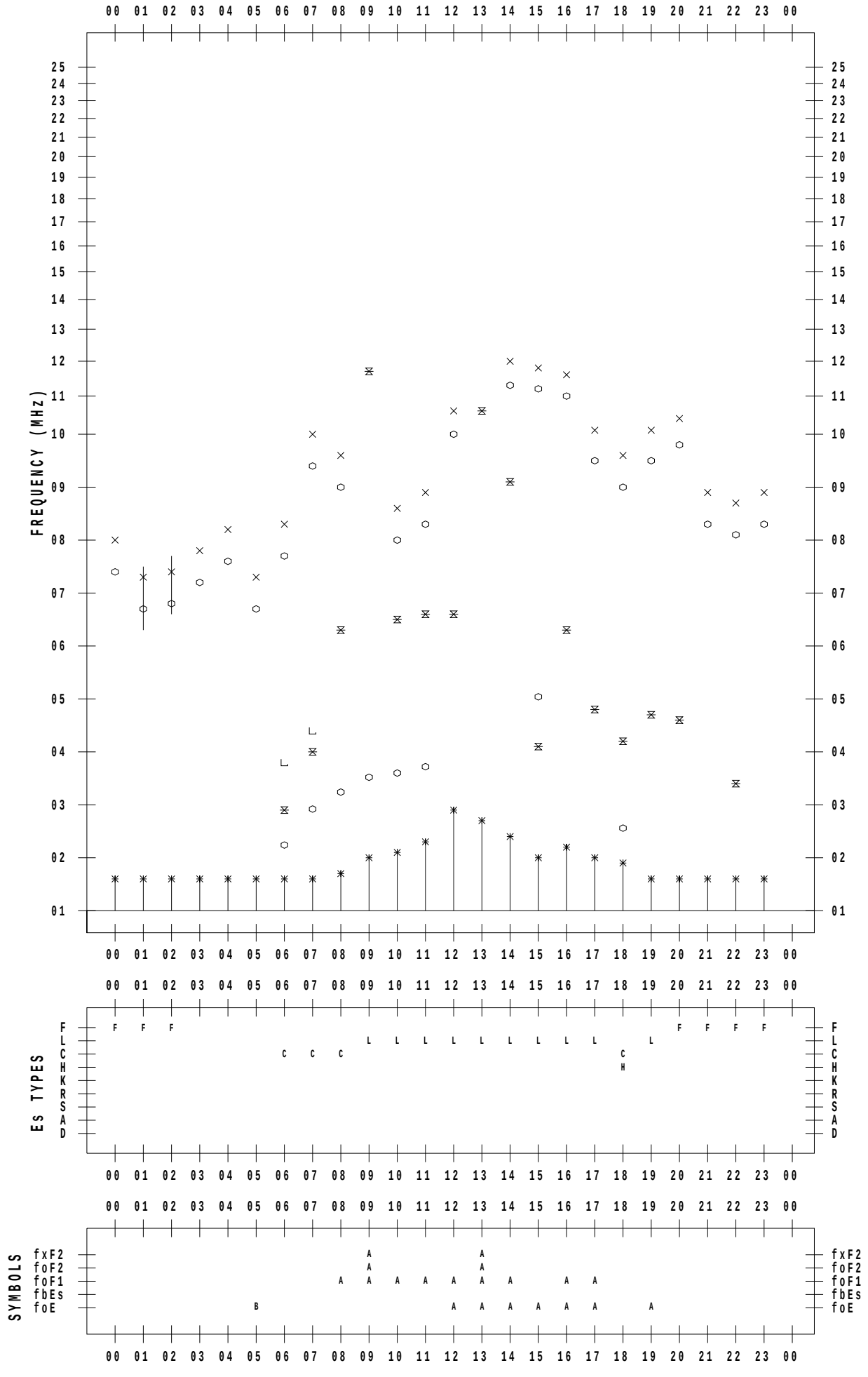
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/22

135 °E MEAN TIME



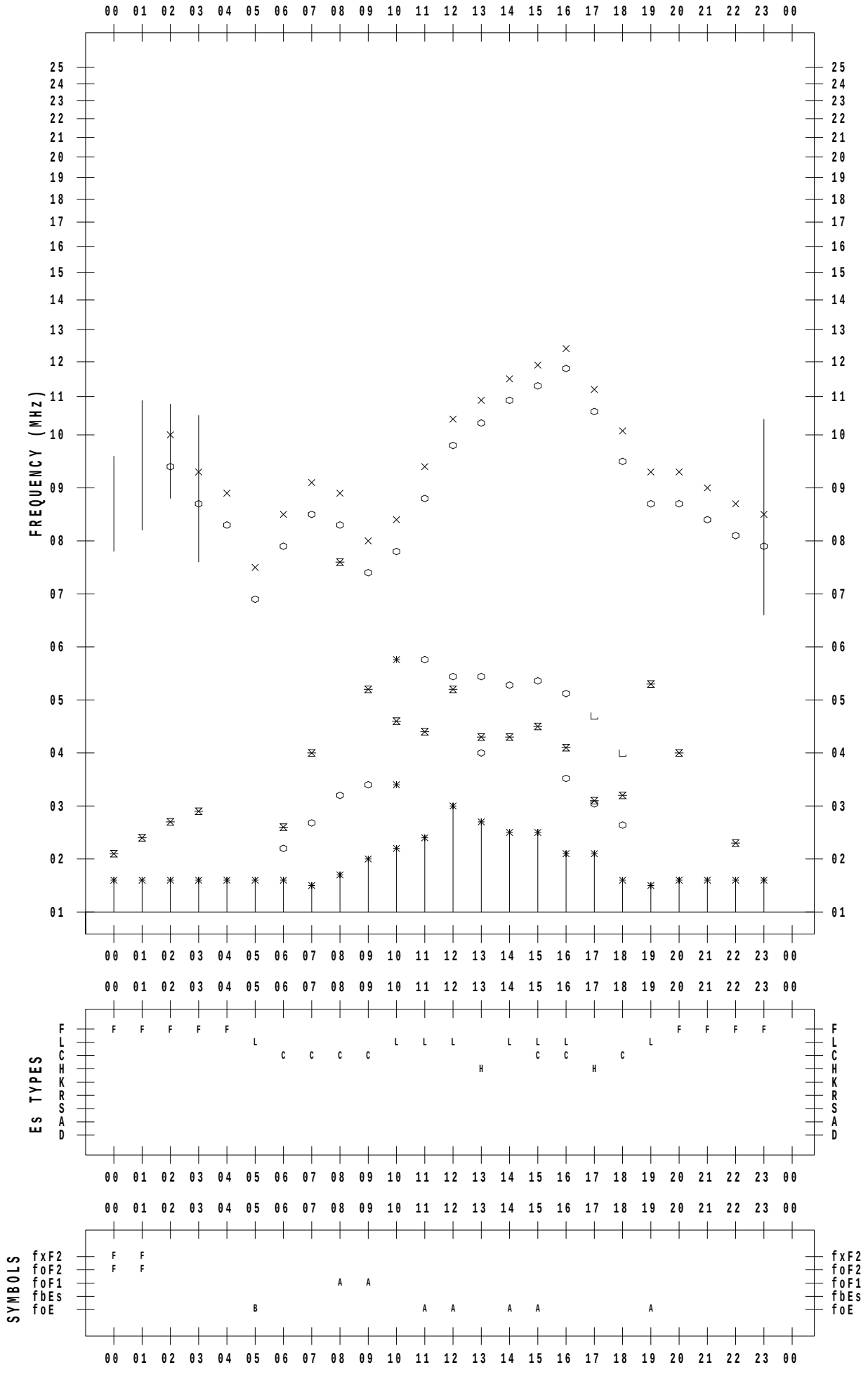
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/23

135 °E MEAN TIME



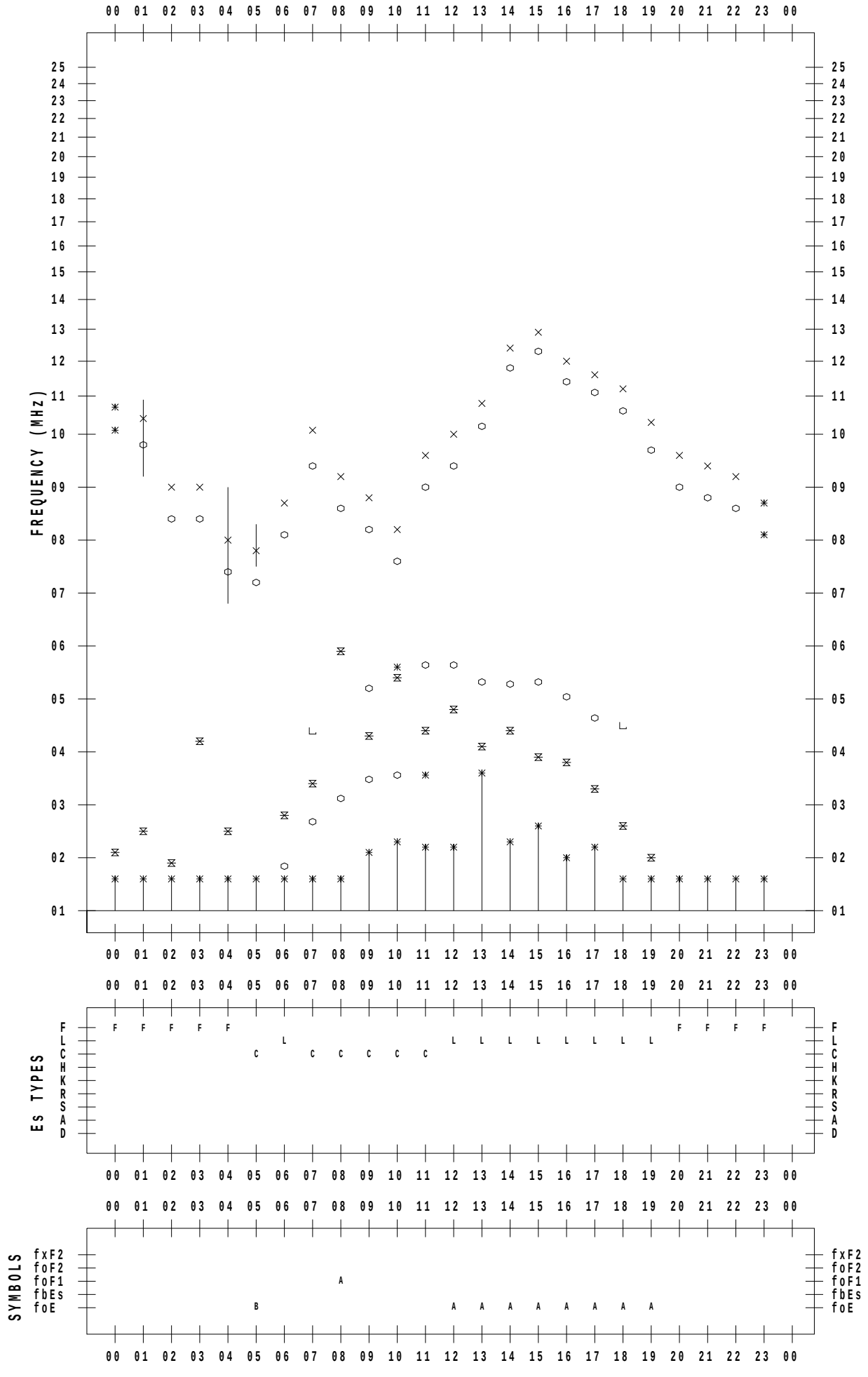
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/24

135 °E MEAN TIME



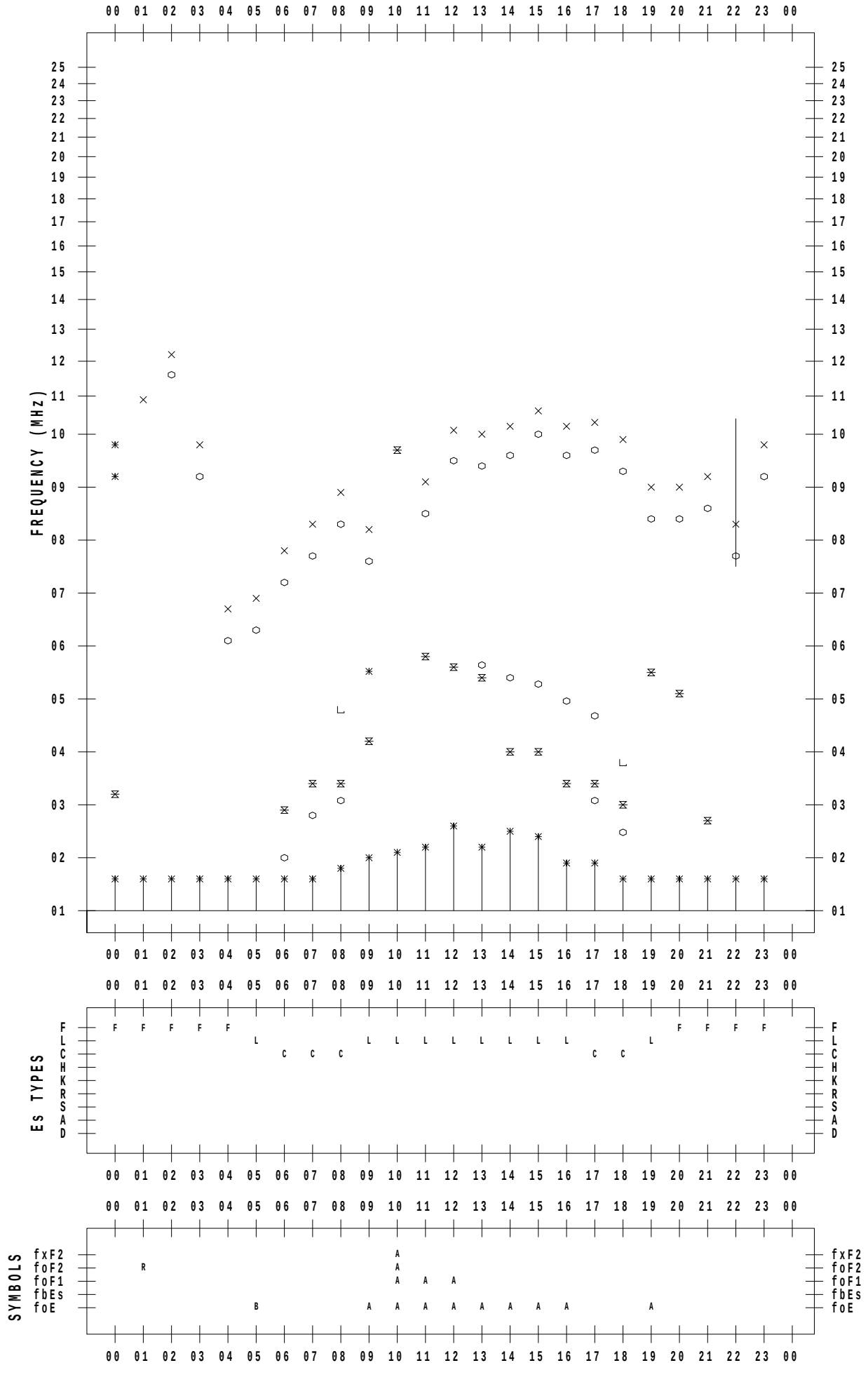
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/25

135 °E MEAN TIME



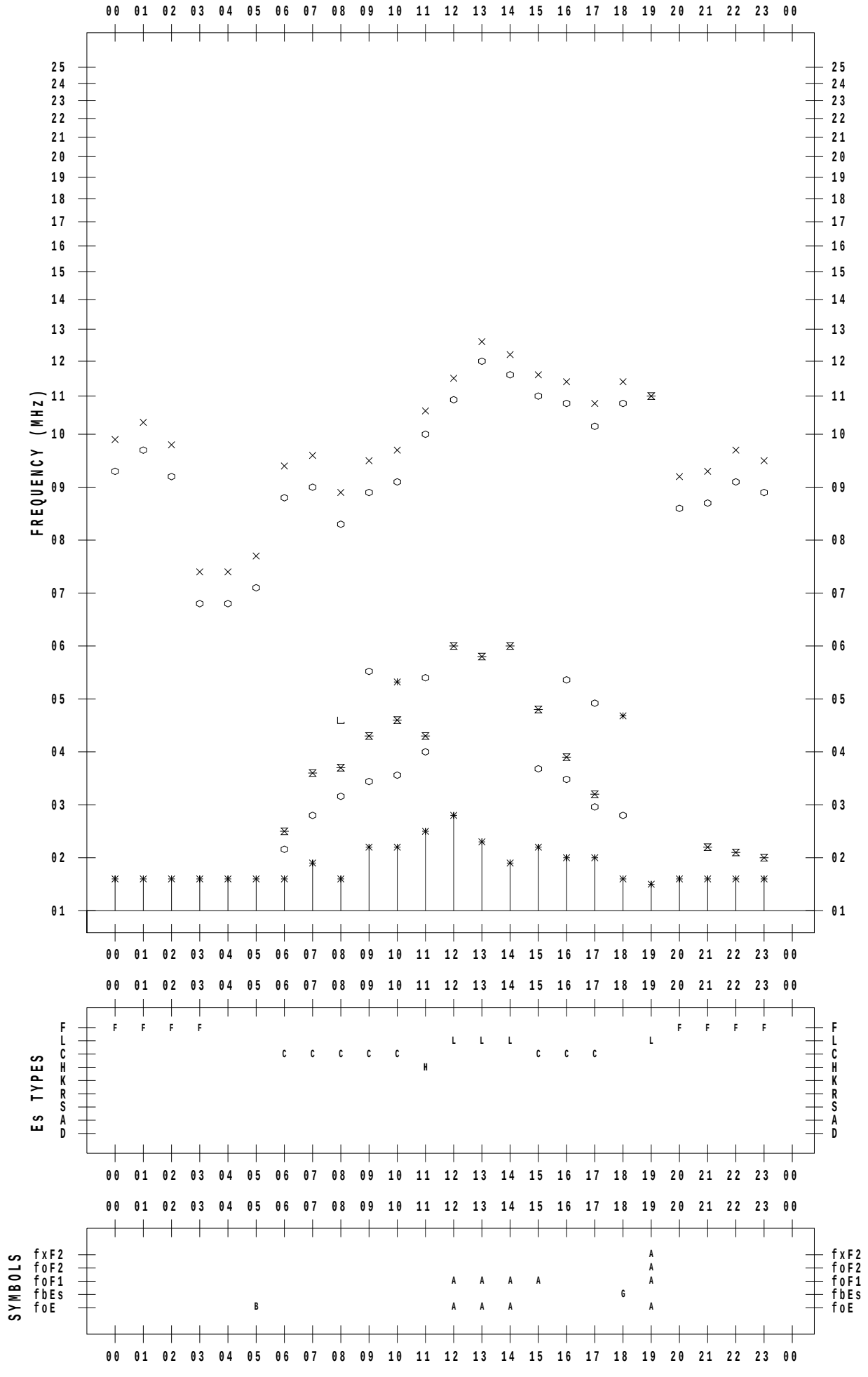
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/26

135 °E MEAN TIME



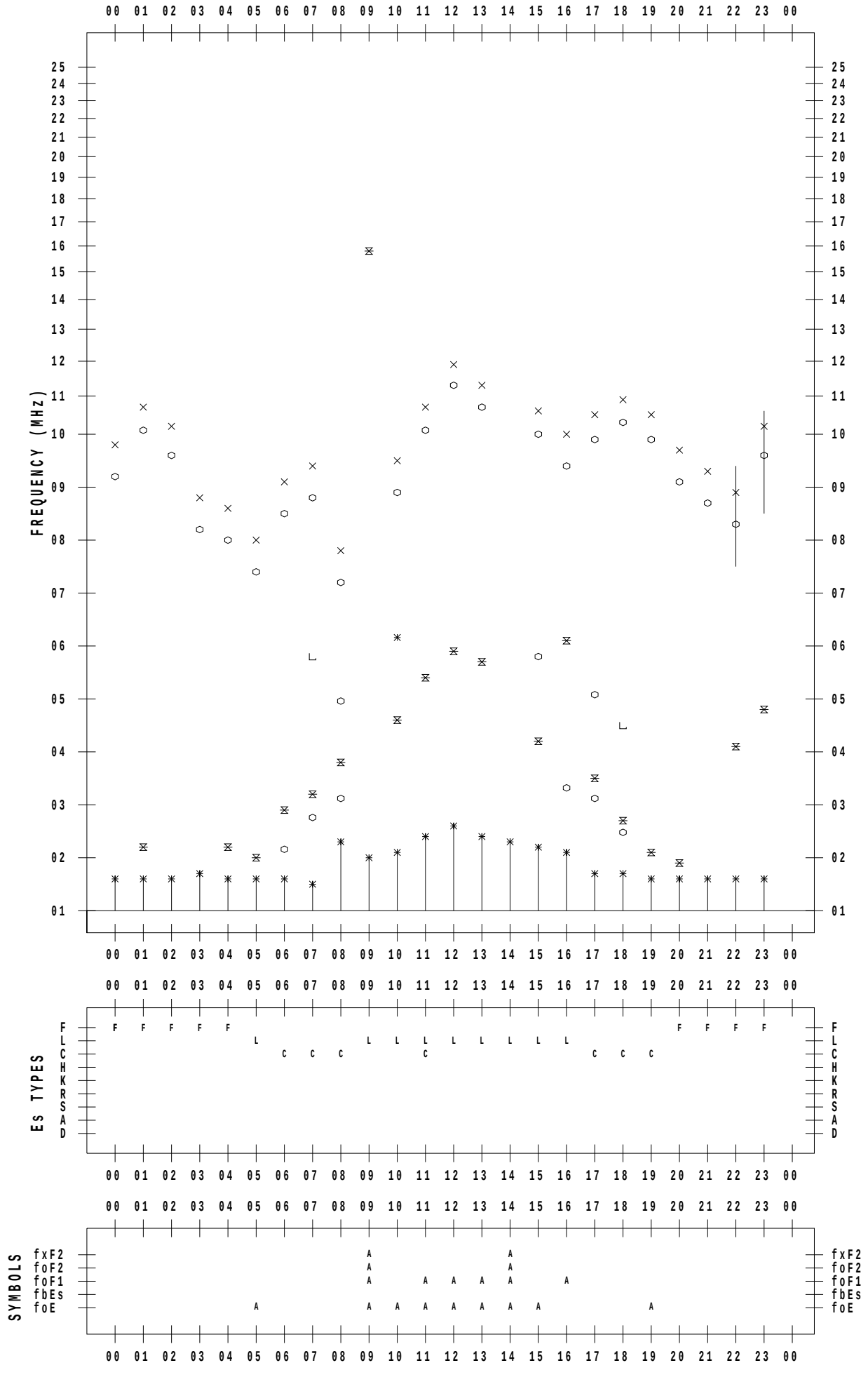
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/27

135 °E MEAN TIME



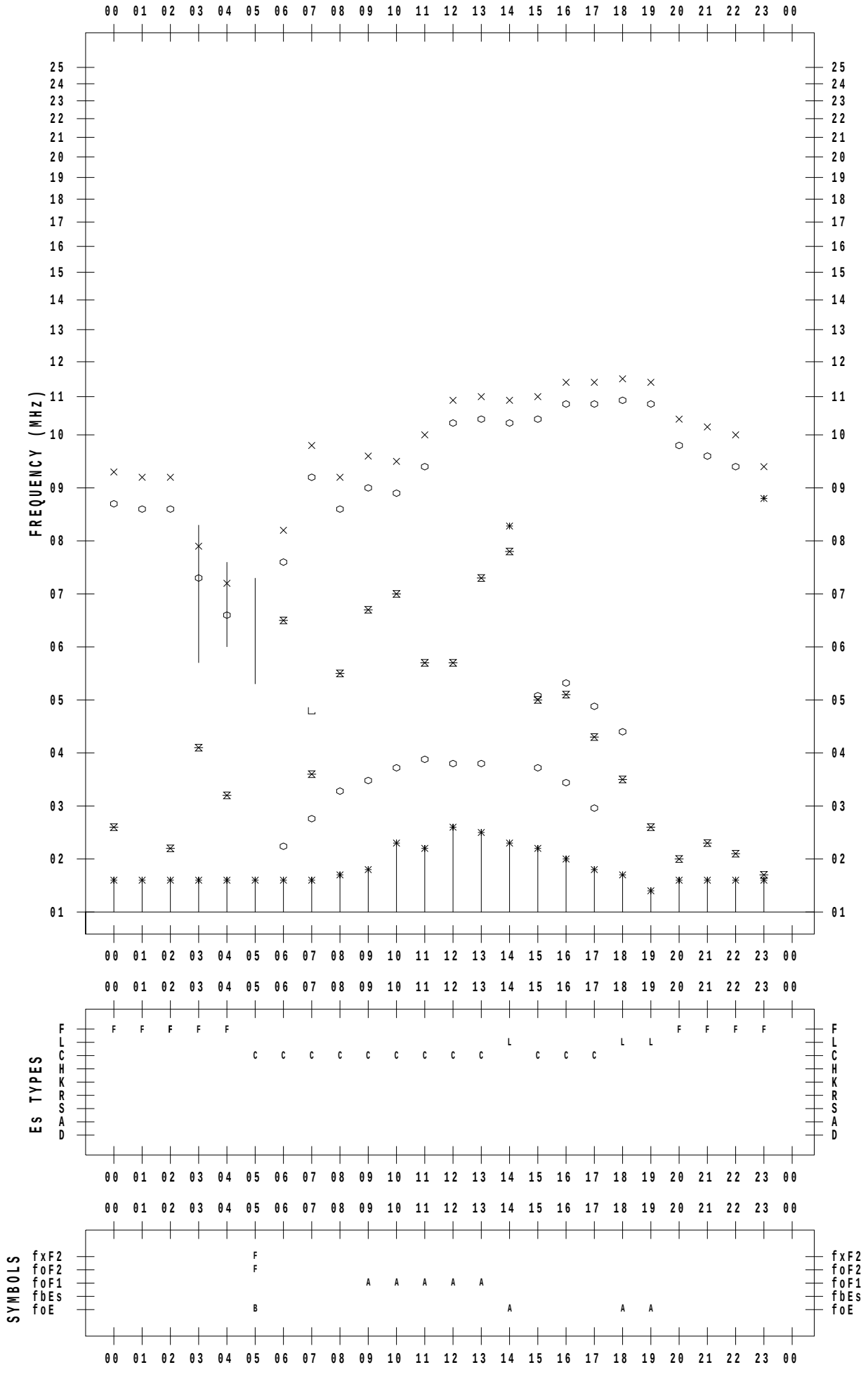
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/28

135 °E MEAN TIME



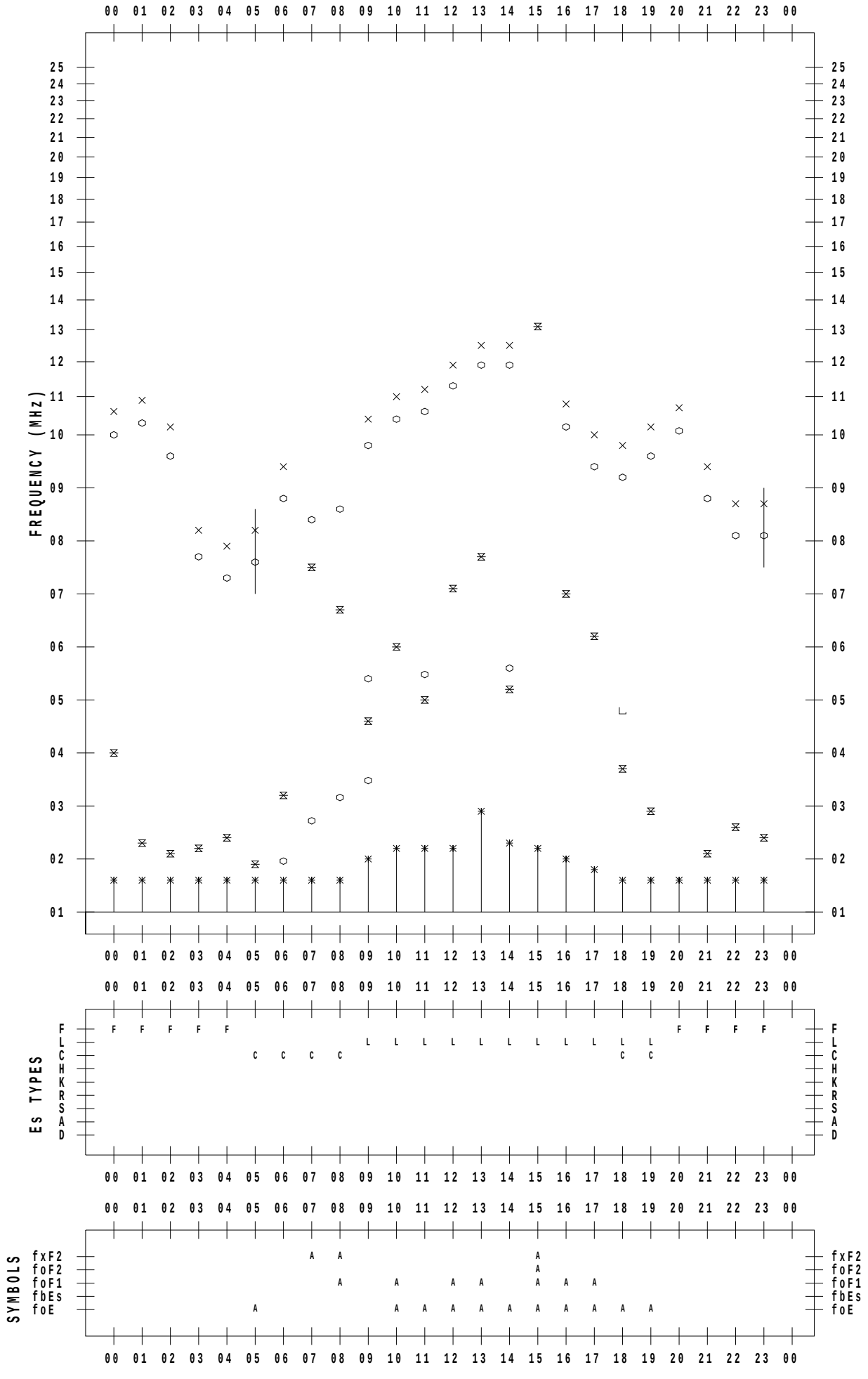
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/29

135 °E MEAN TIME



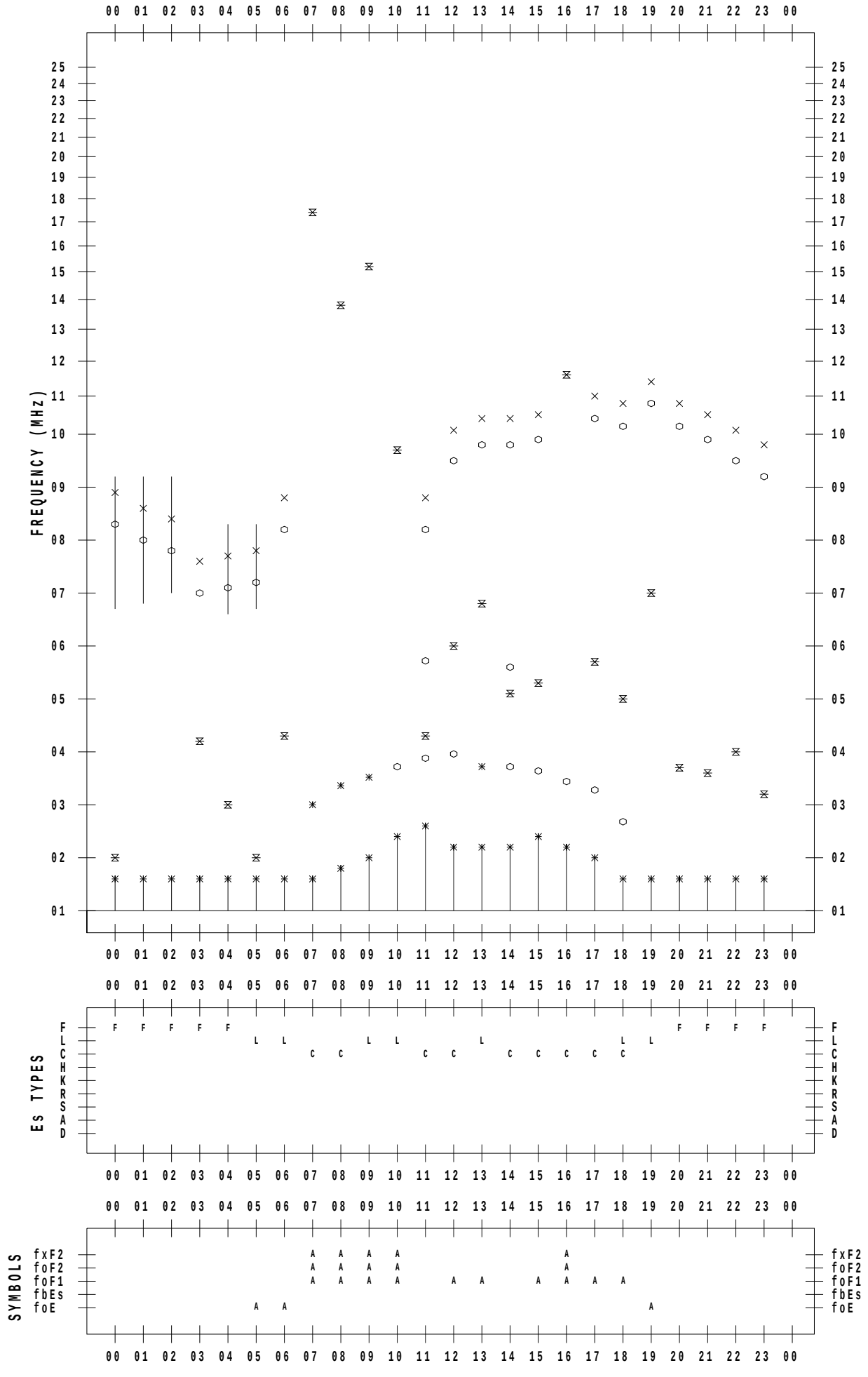
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/30

135 °E MEAN TIME



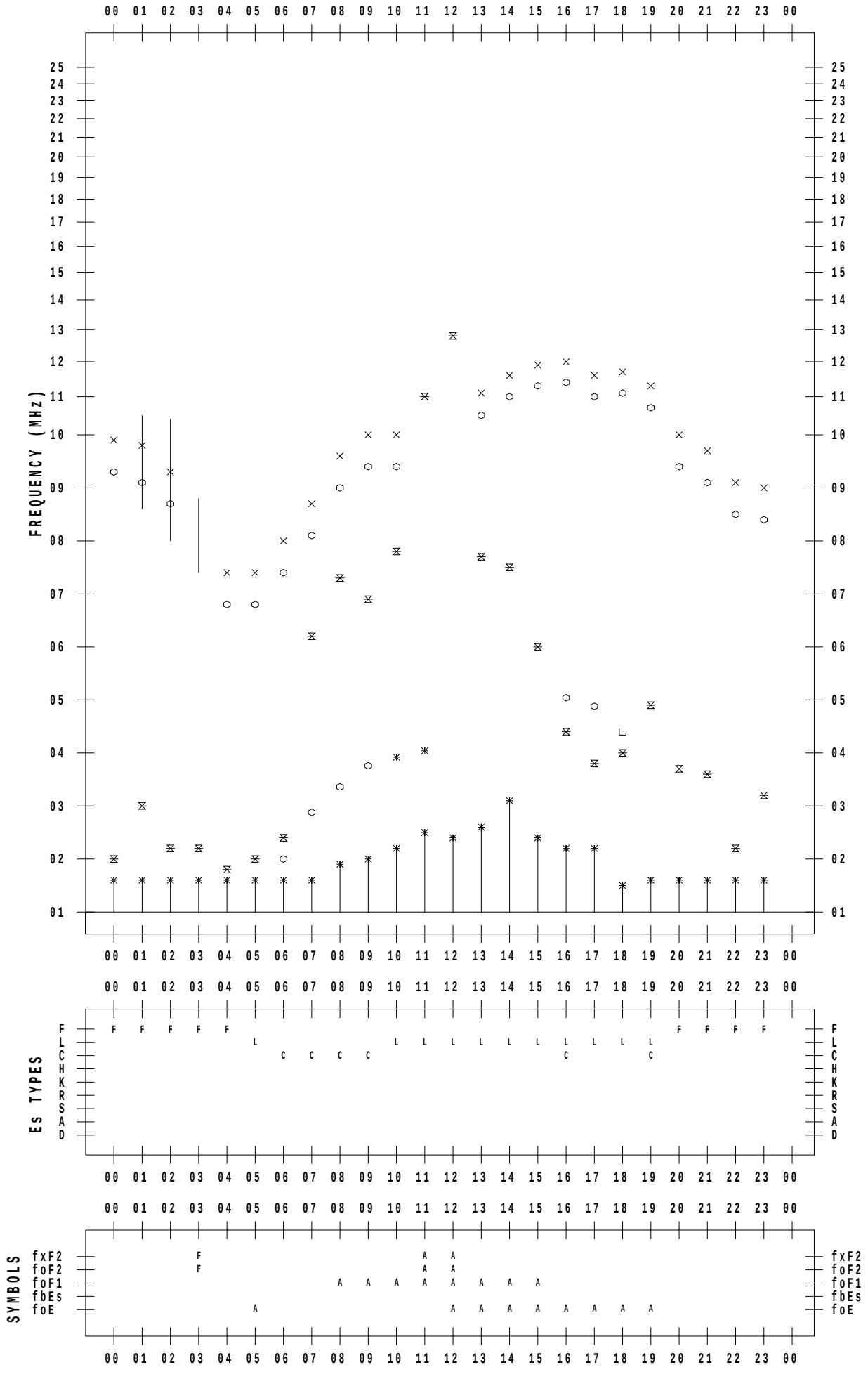
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 5/31

135 °E MEAN TIME



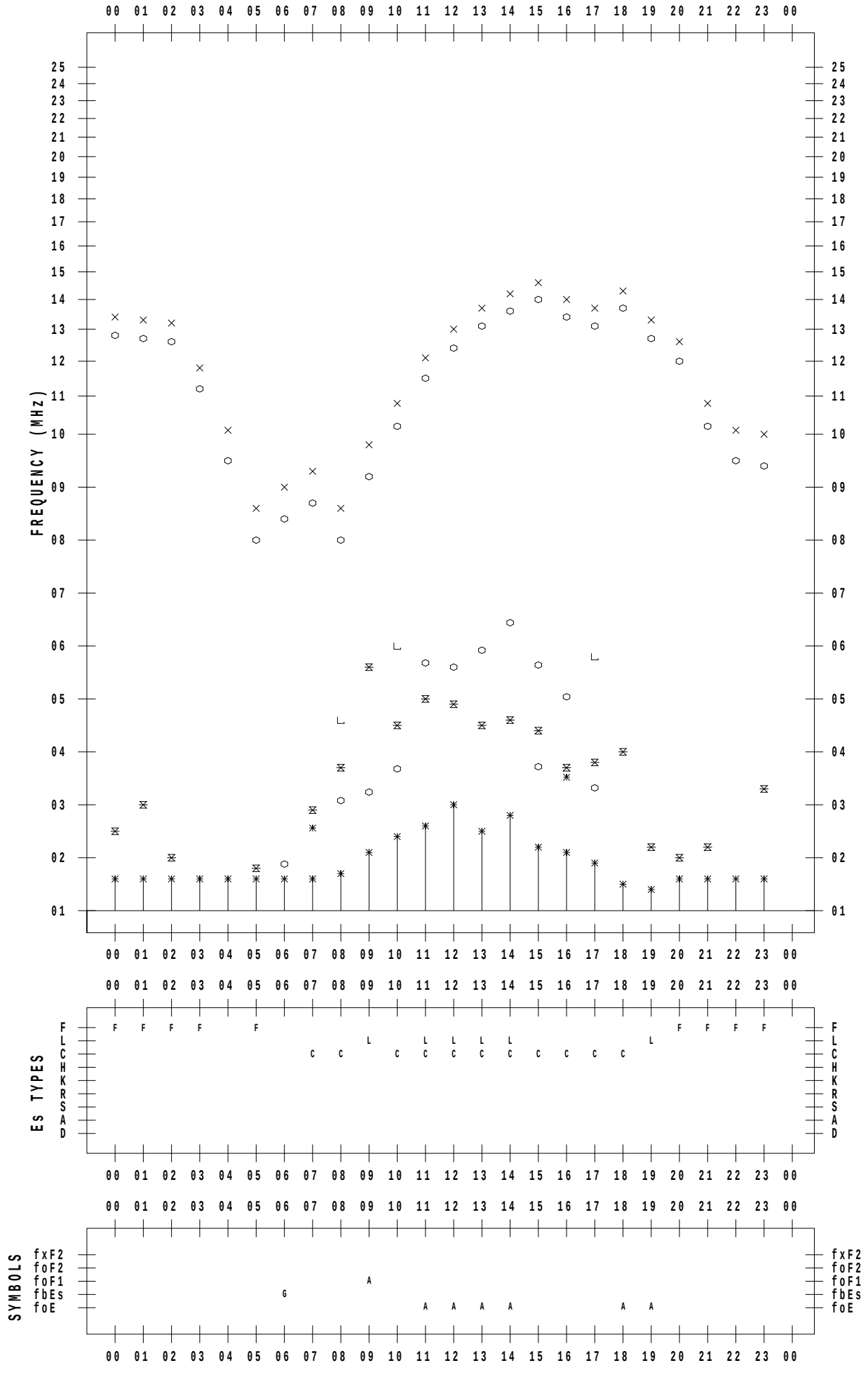
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 1

135 °E MEAN TIME



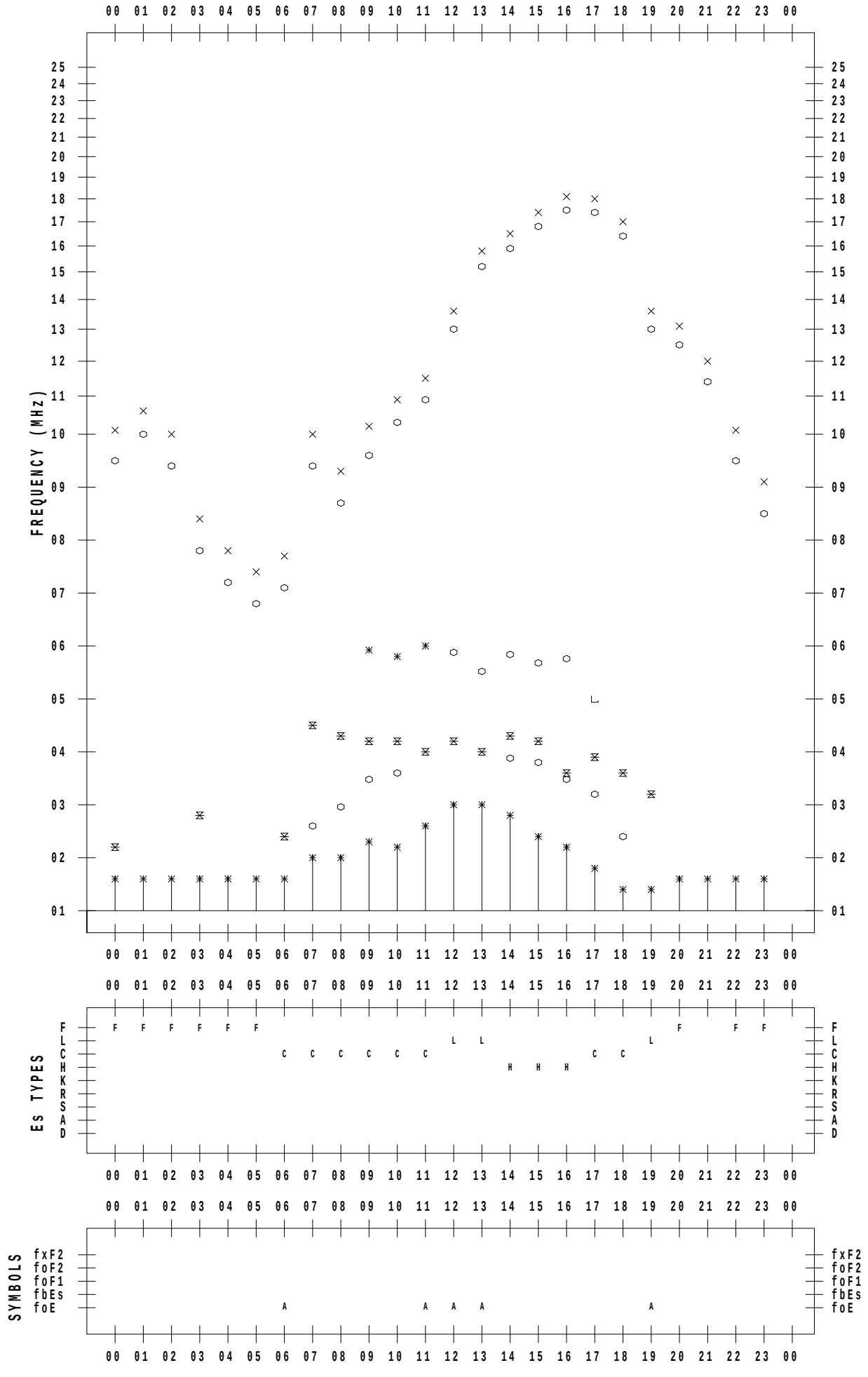
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 2

135 °E MEAN TIME



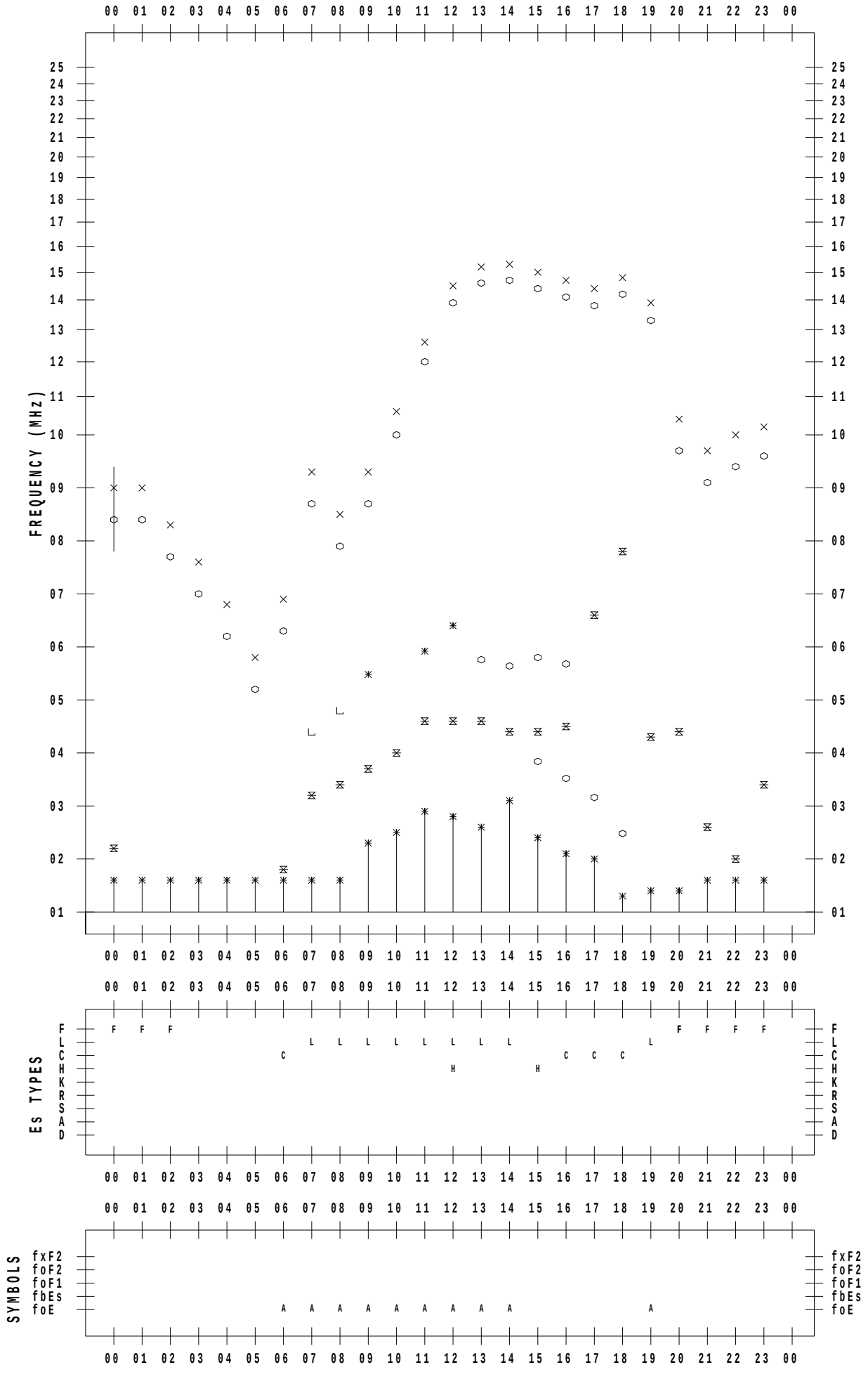
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 3

135 °E MEAN TIME



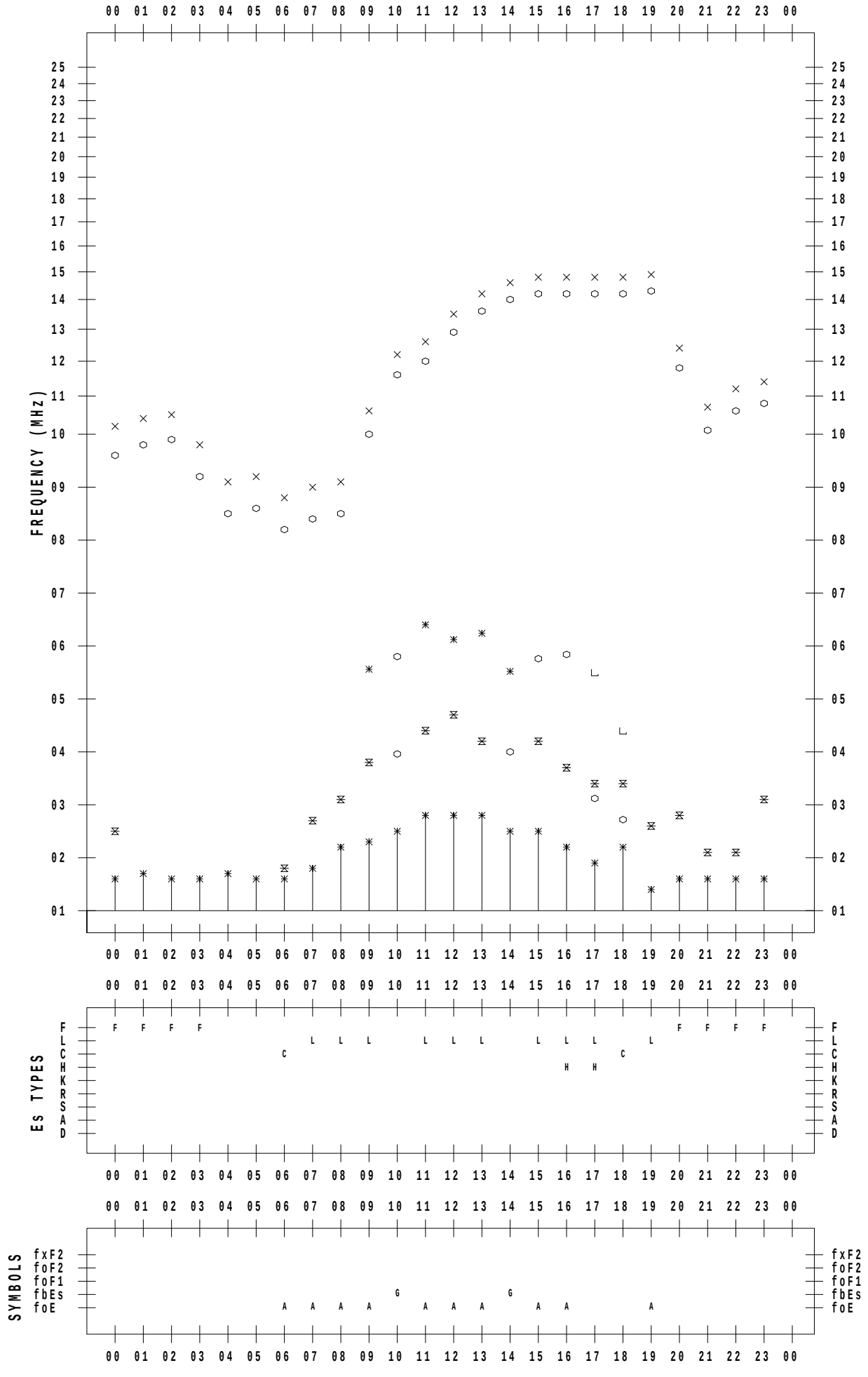
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 4

135 °E MEAN TIME



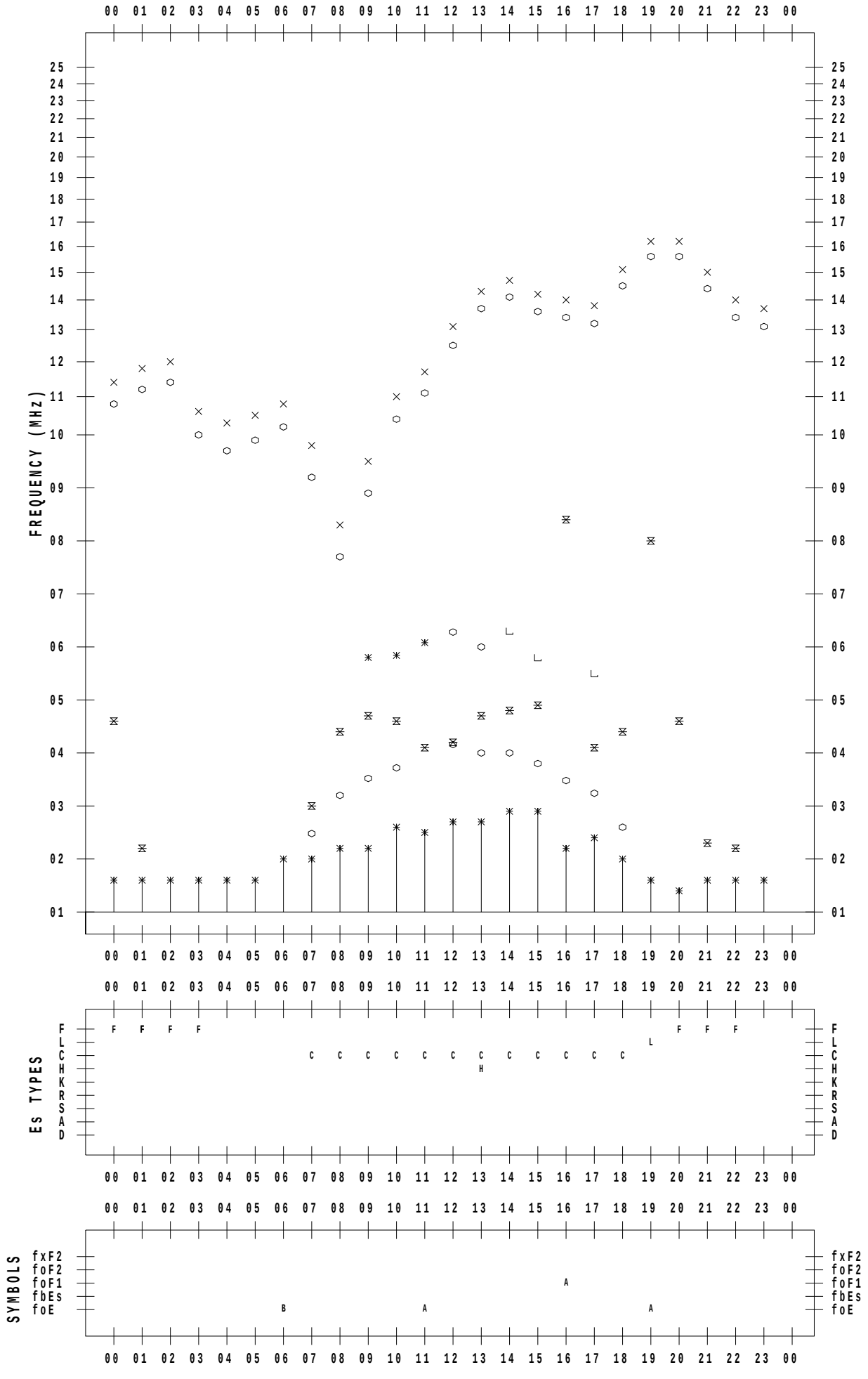
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 5

135 °E MEAN TIME



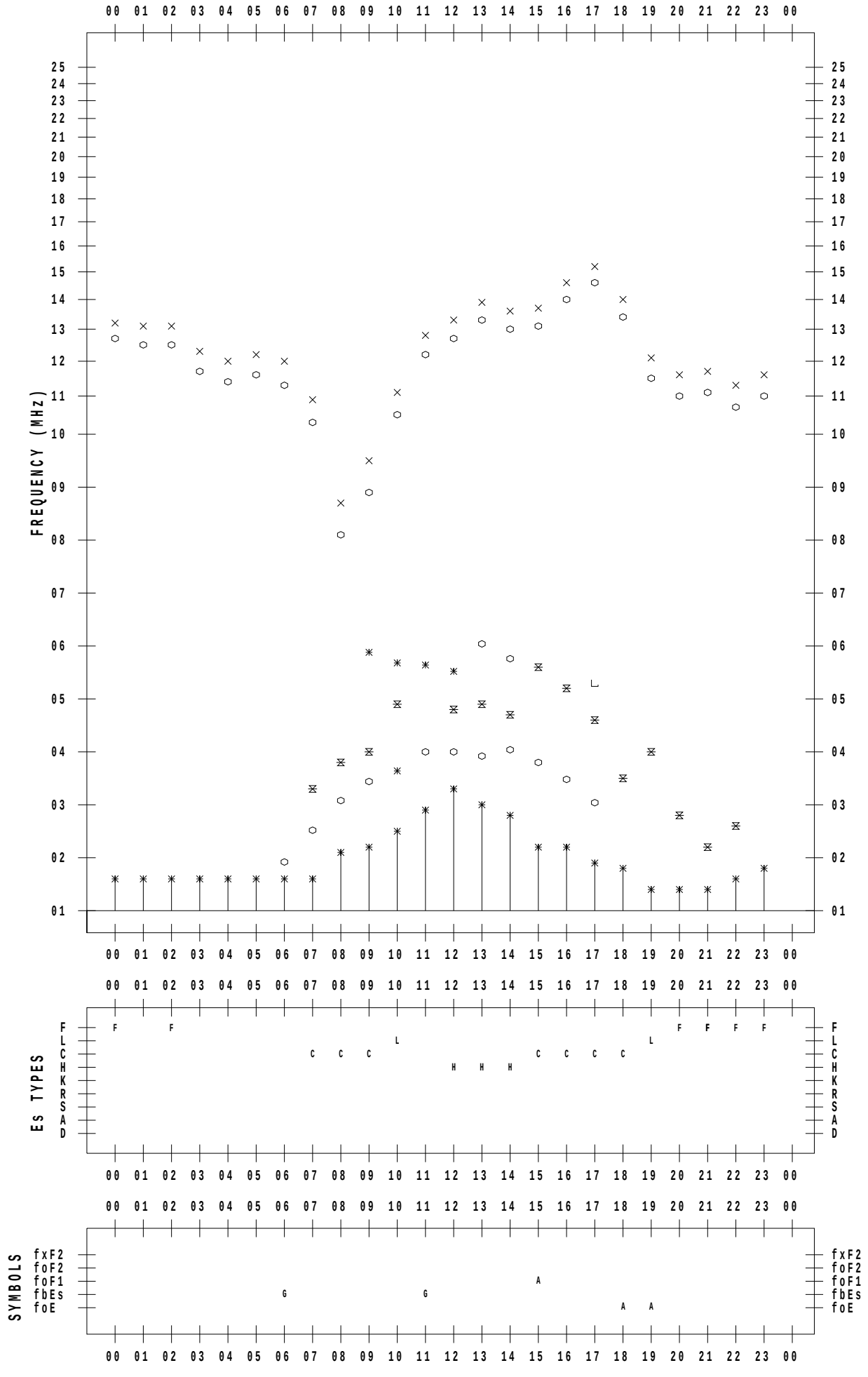
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 6

135 °E MEAN TIME



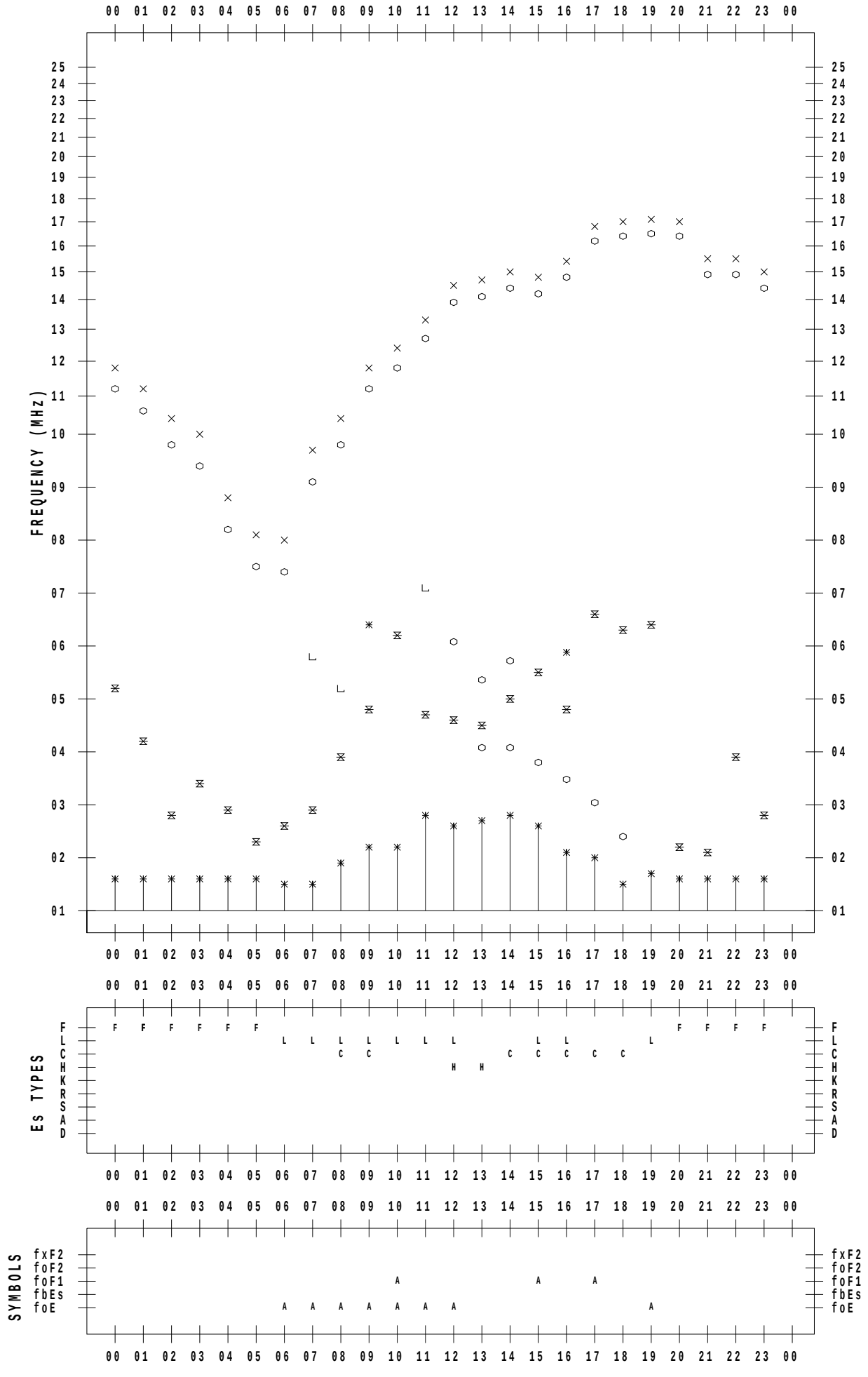
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 7

135 °E MEAN TIME



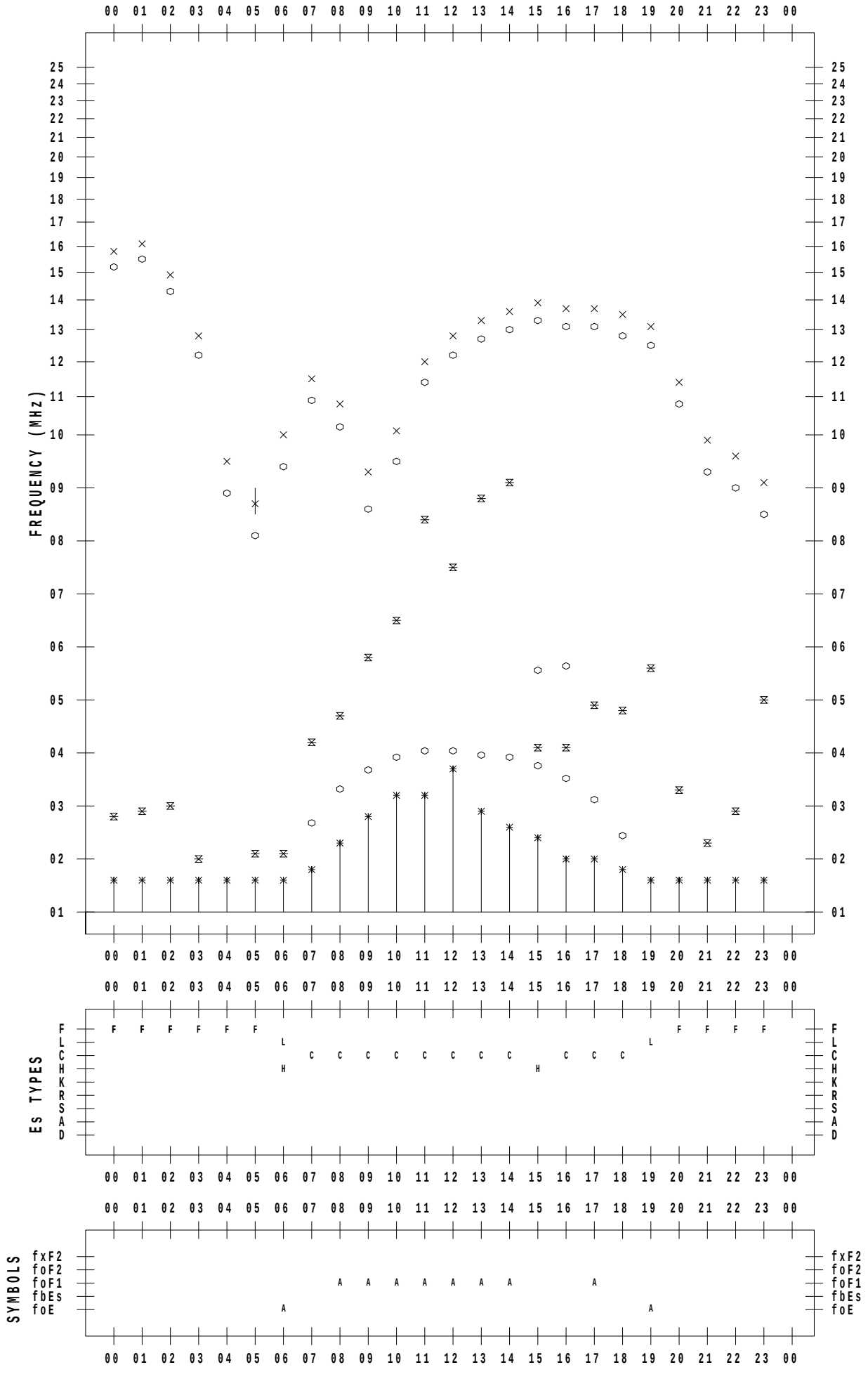
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 8

135 °E MEAN TIME



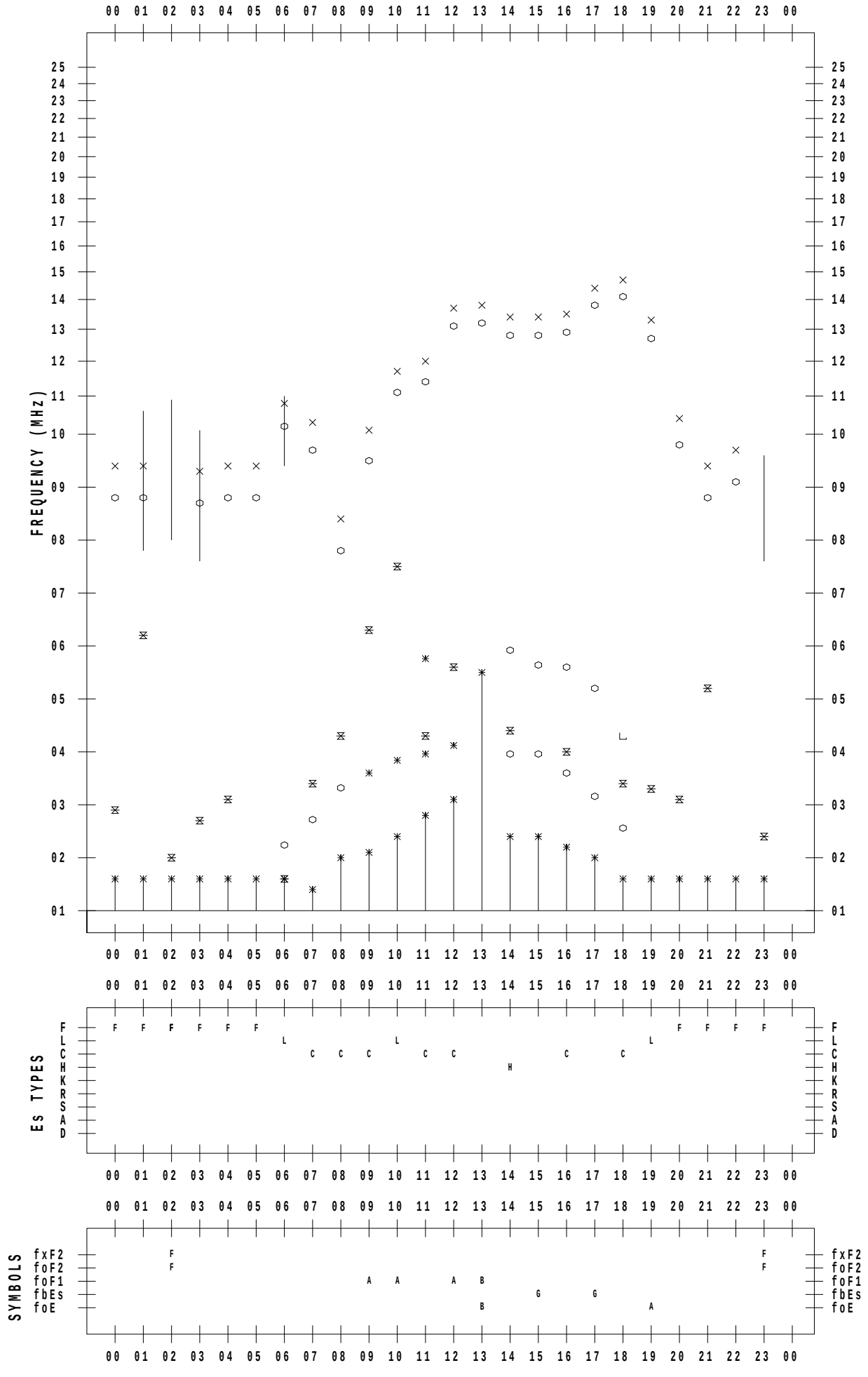
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/ 9

135 °E MEAN TIME



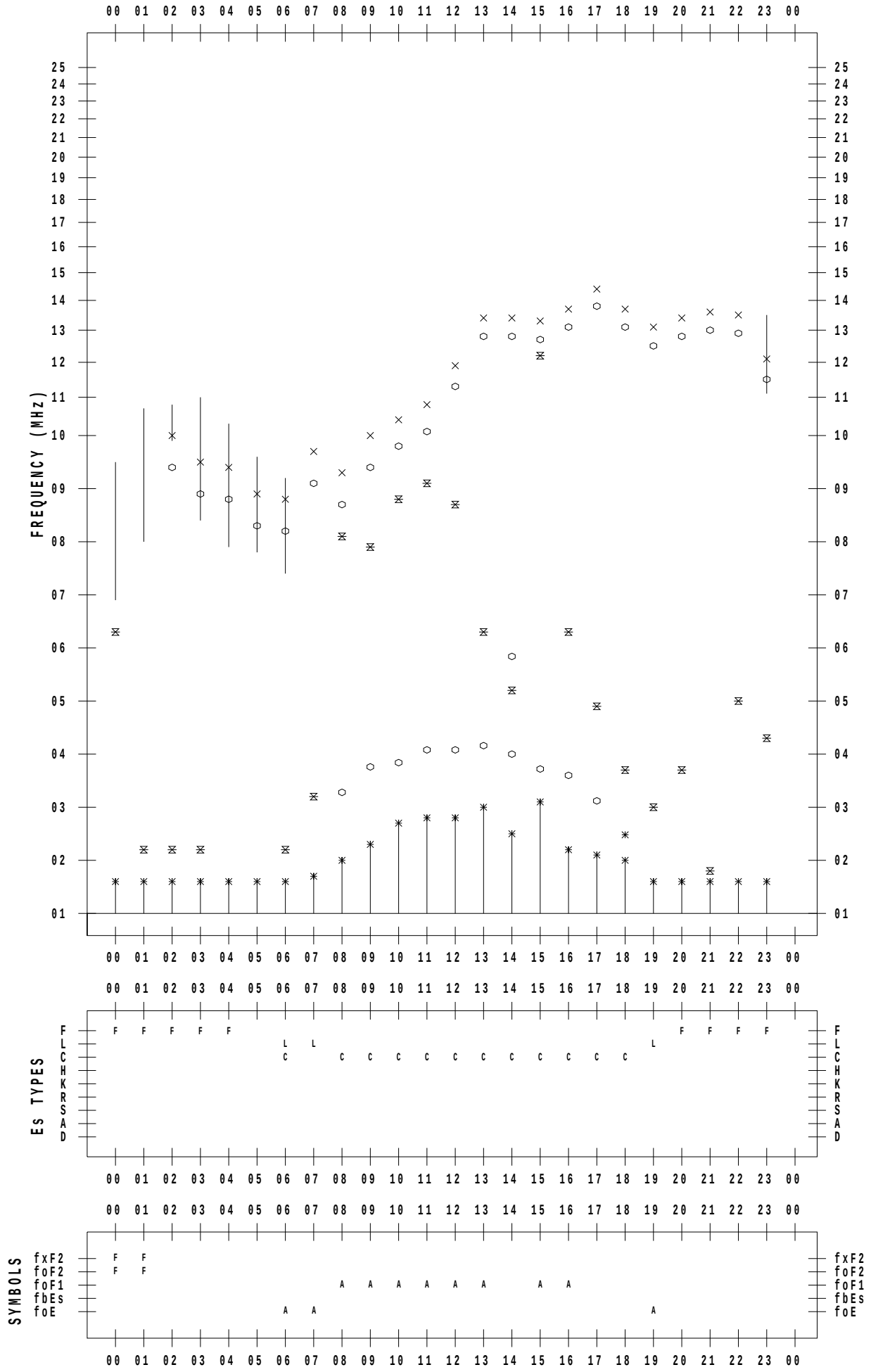
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/10

135 °E MEAN TIME



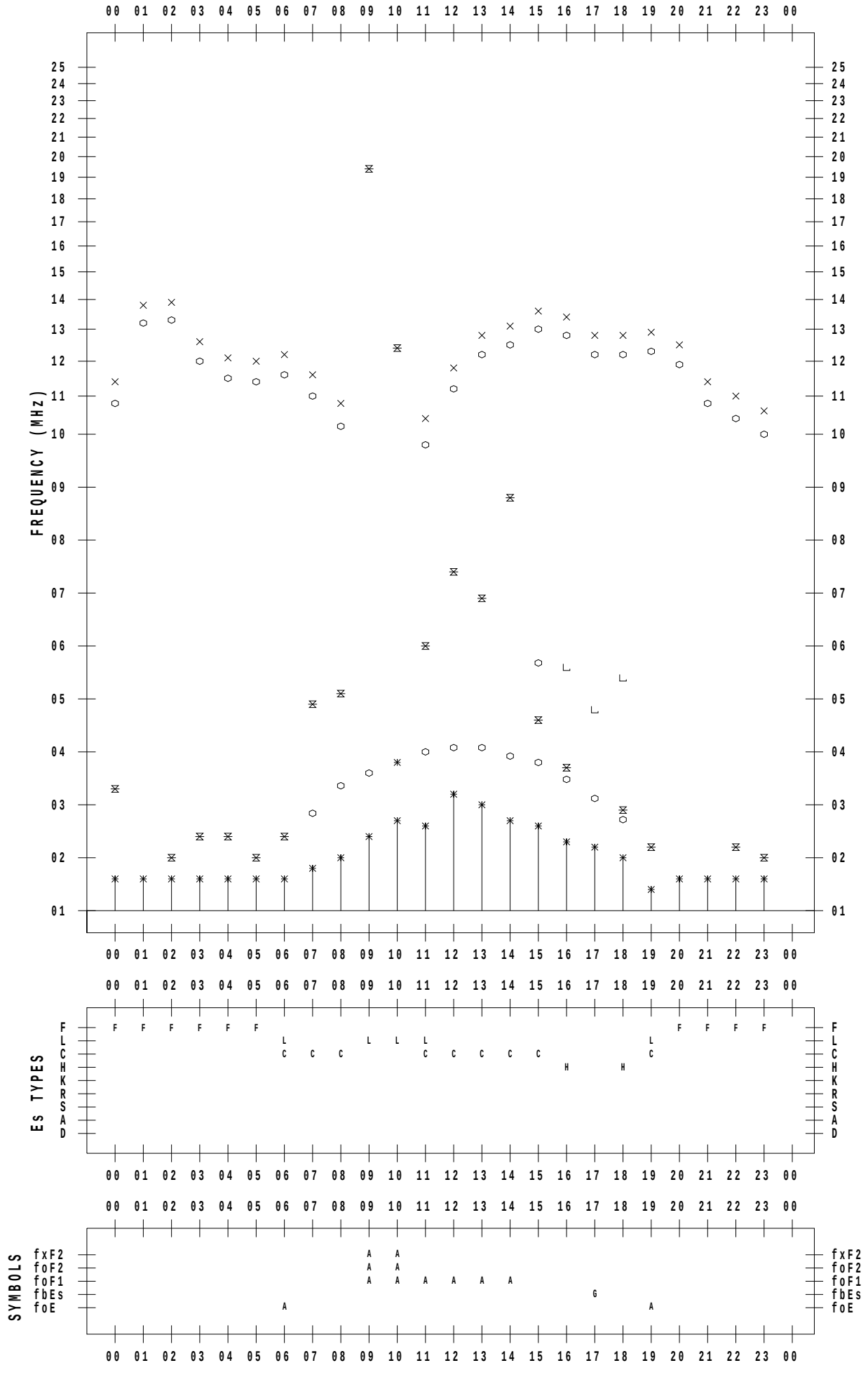
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/11

135 °E MEAN TIME



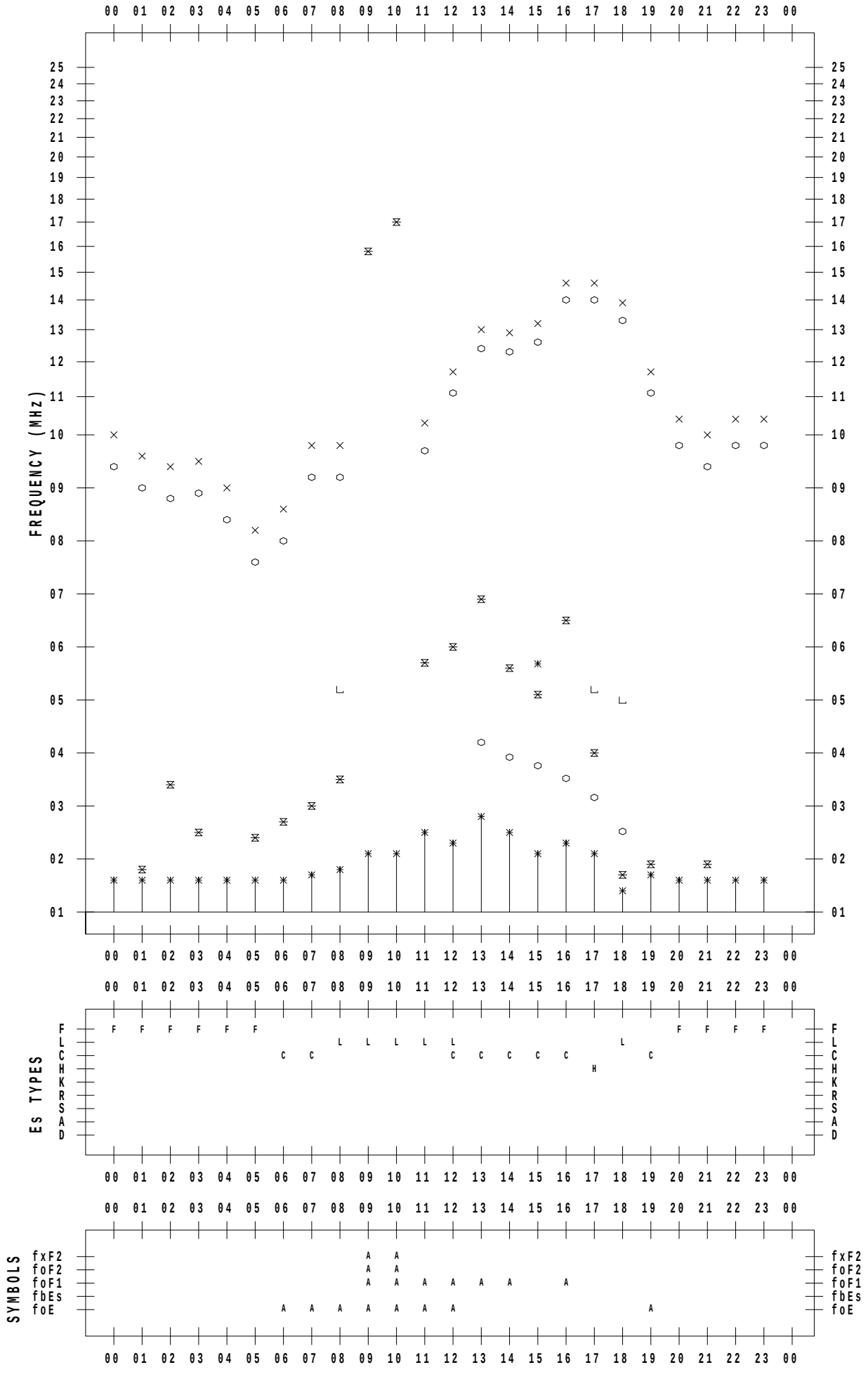
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/12

135 °E MEAN TIME



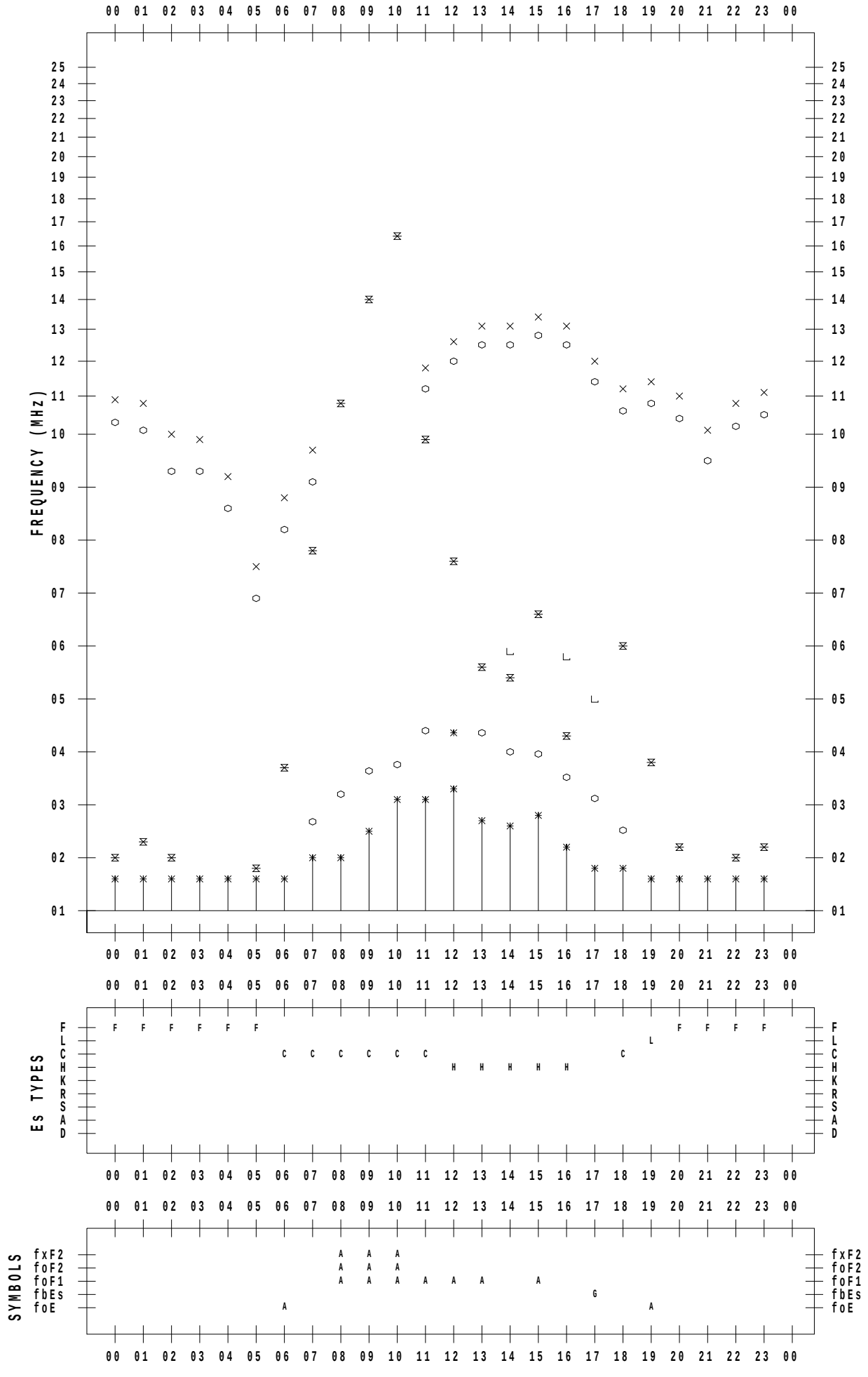
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/13

135 °E MEAN TIME



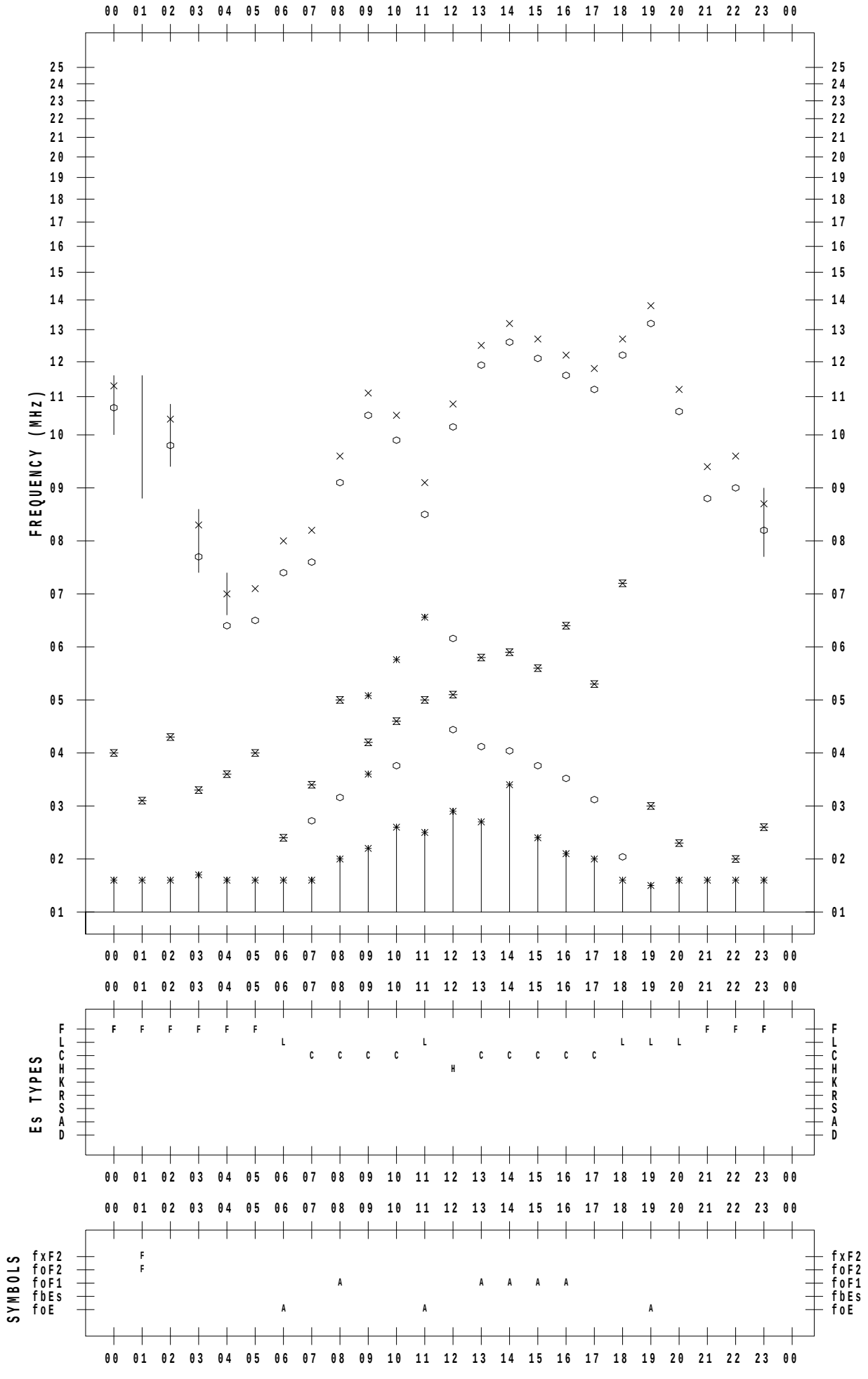
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/14

135 °E MEAN TIME



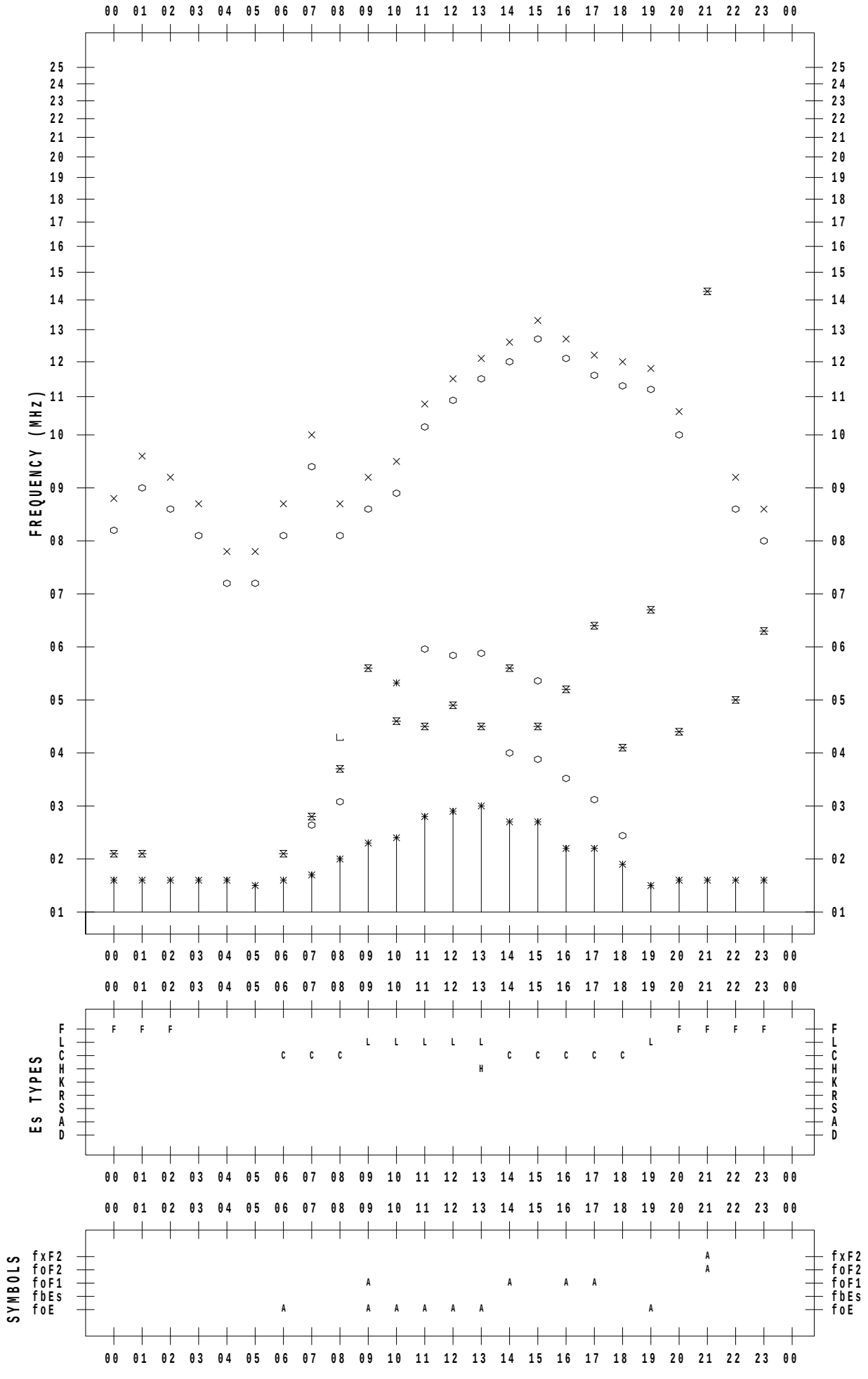
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/15

135 °E MEAN TIME



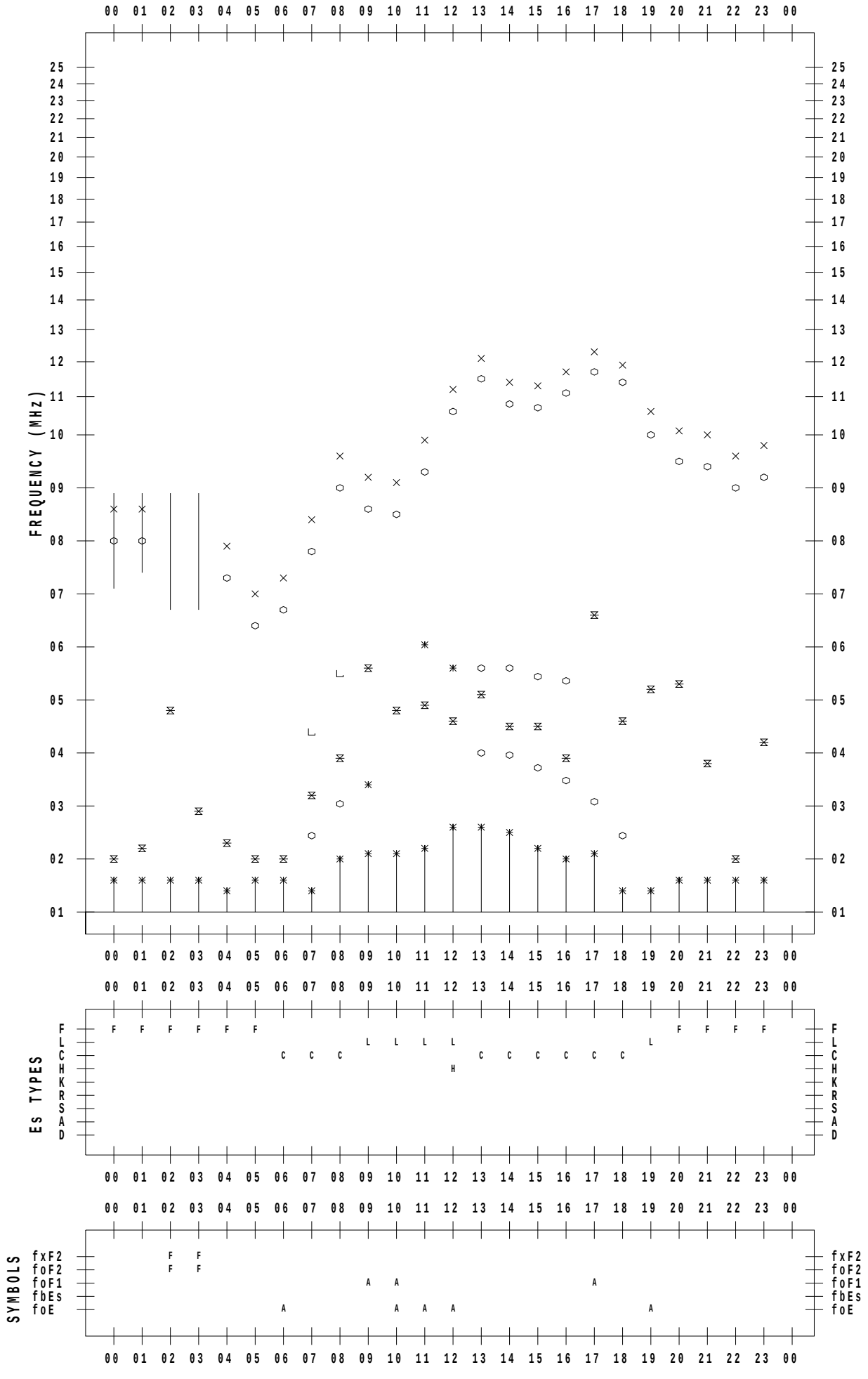
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/16

135 °E MEAN TIME



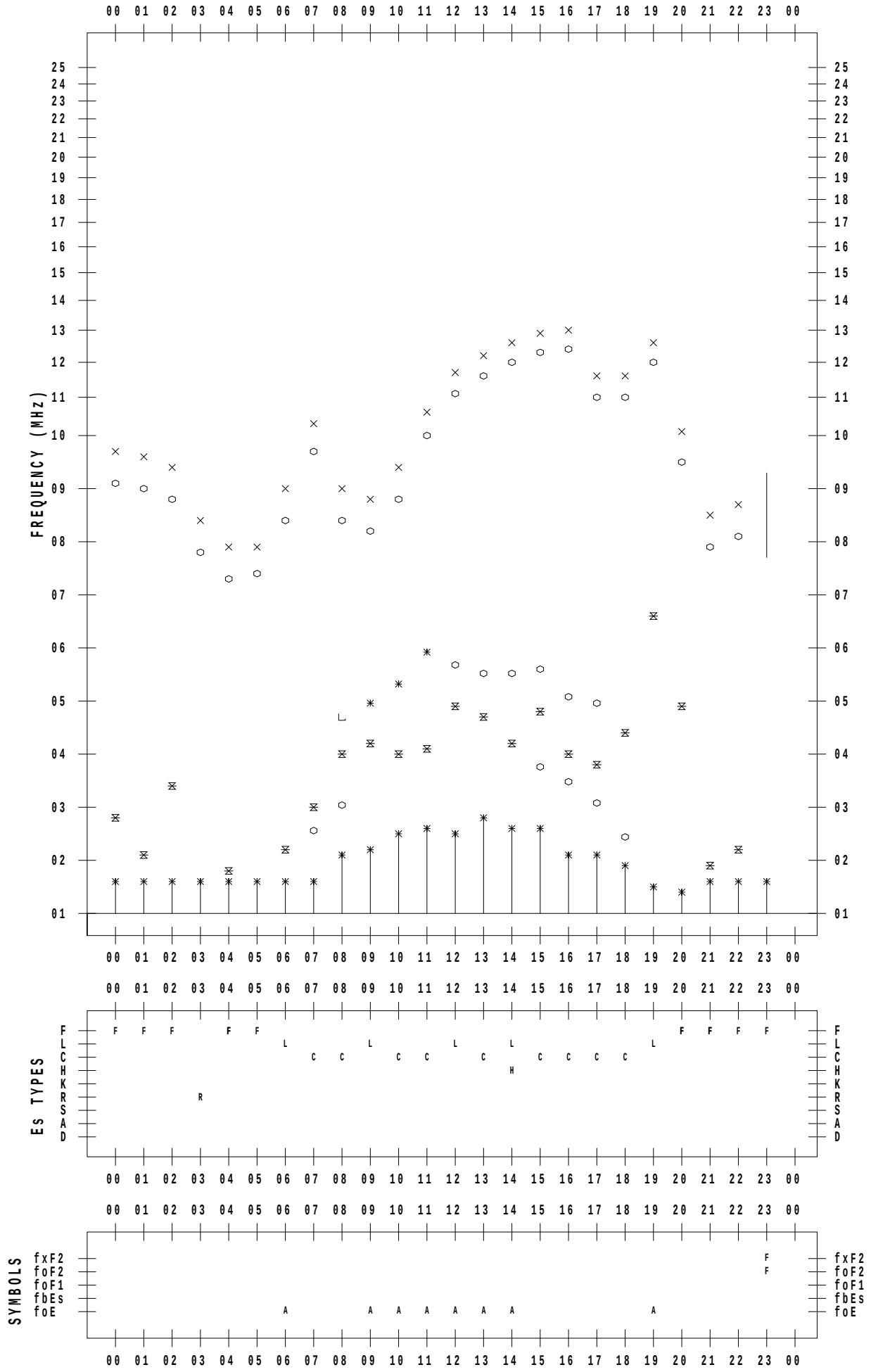
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/17

135 °E MEAN TIME



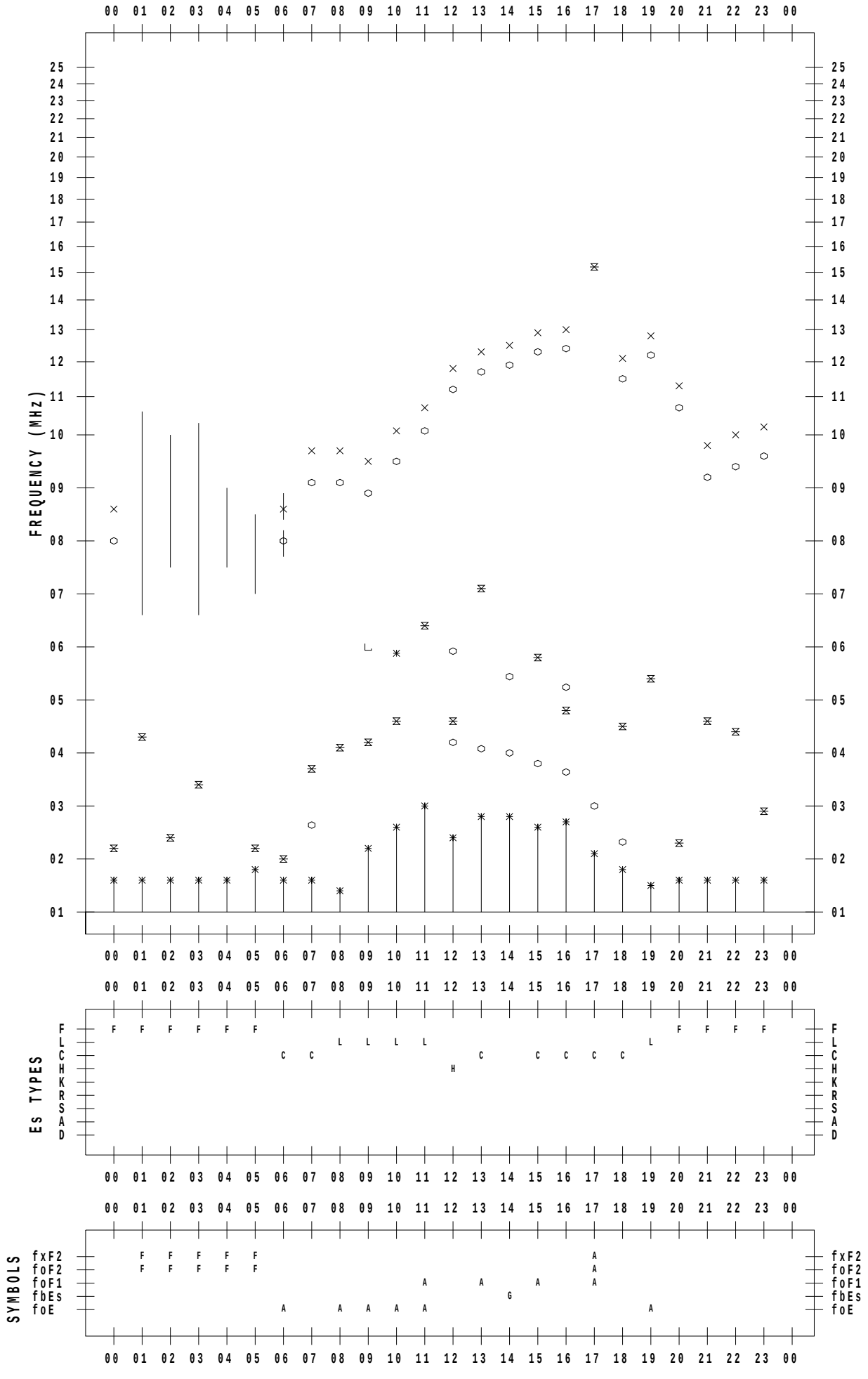
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/18

135 °E MEAN TIME



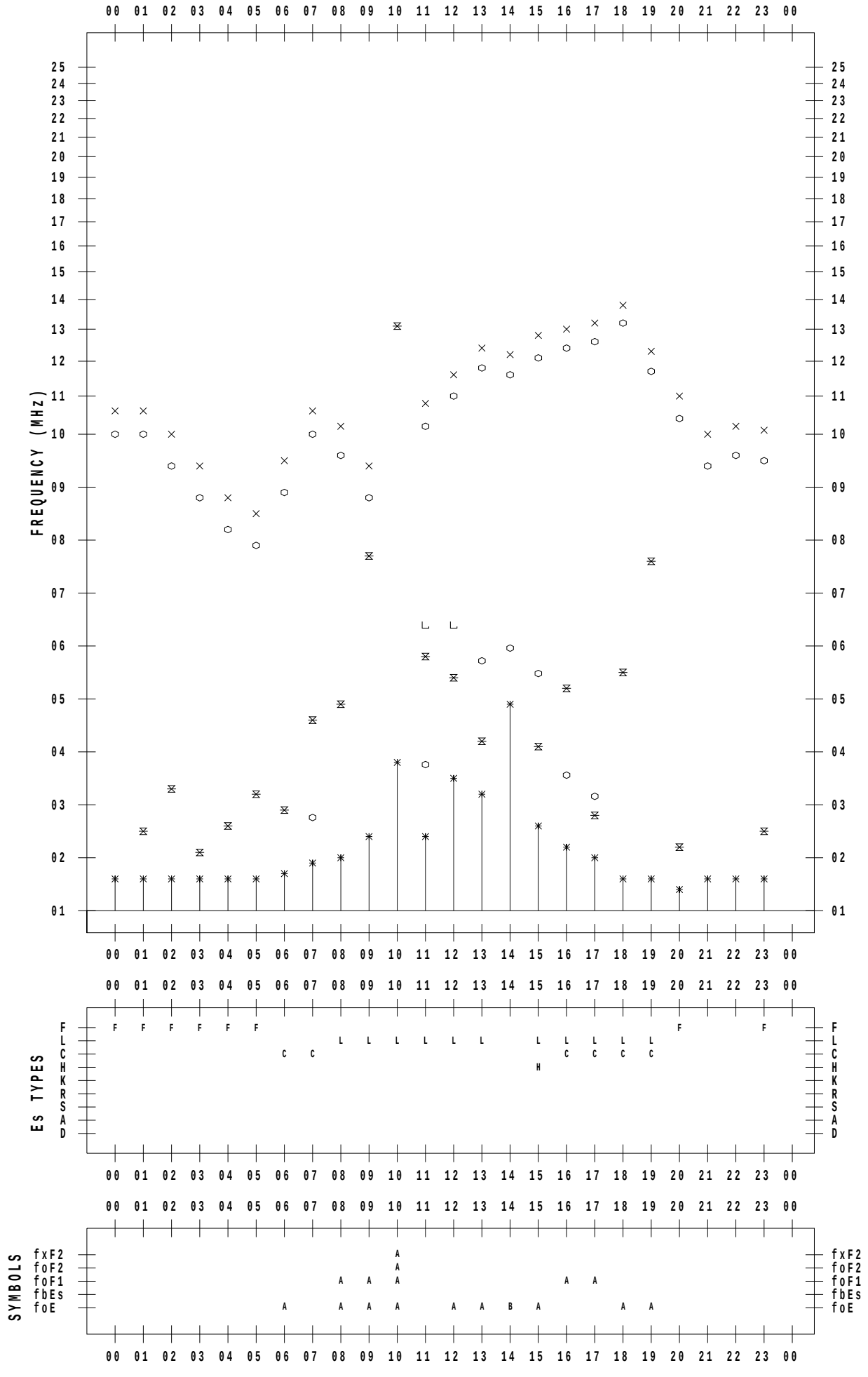
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/19

135 °E MEAN TIME



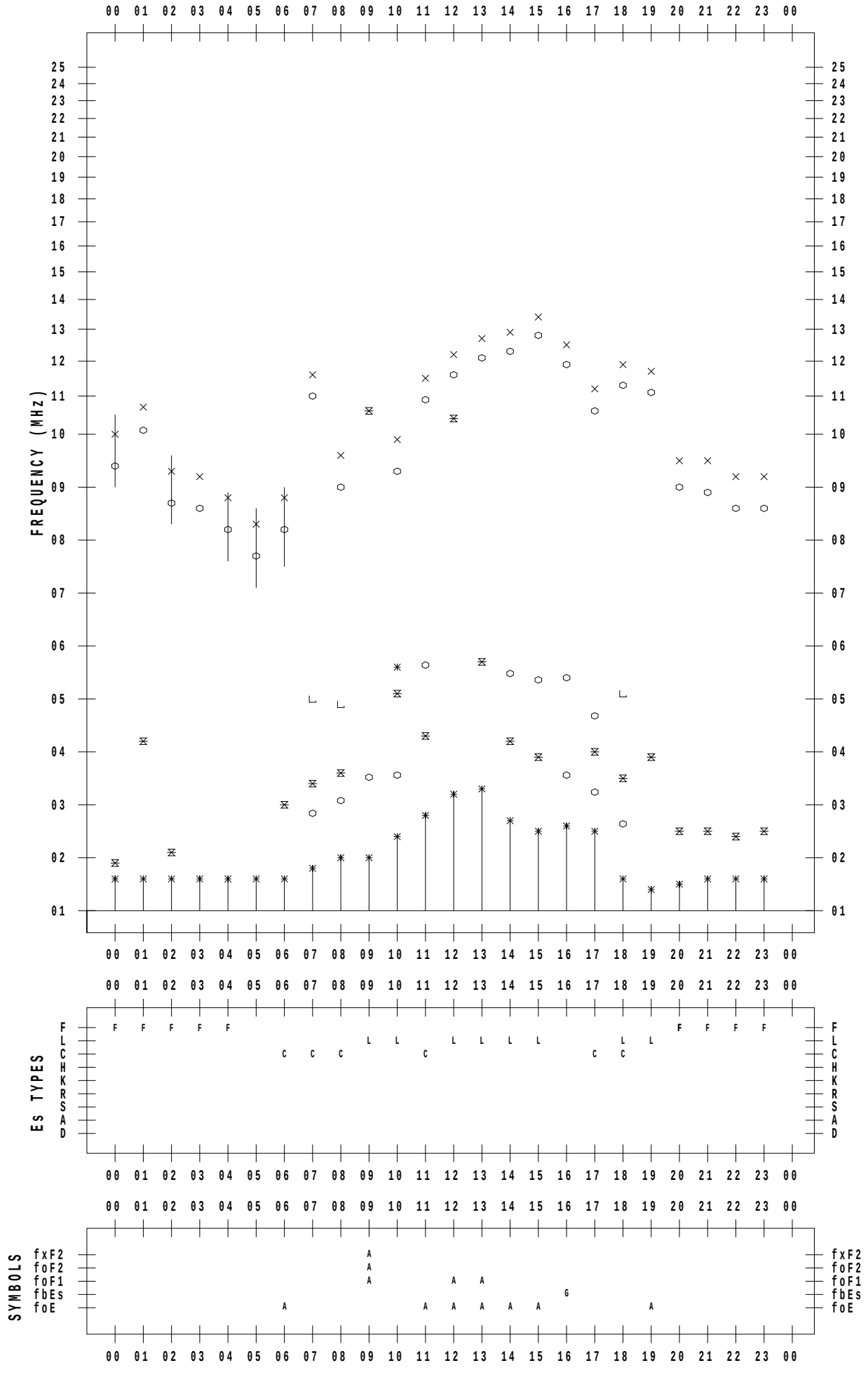
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/20

135 °E MEAN TIME



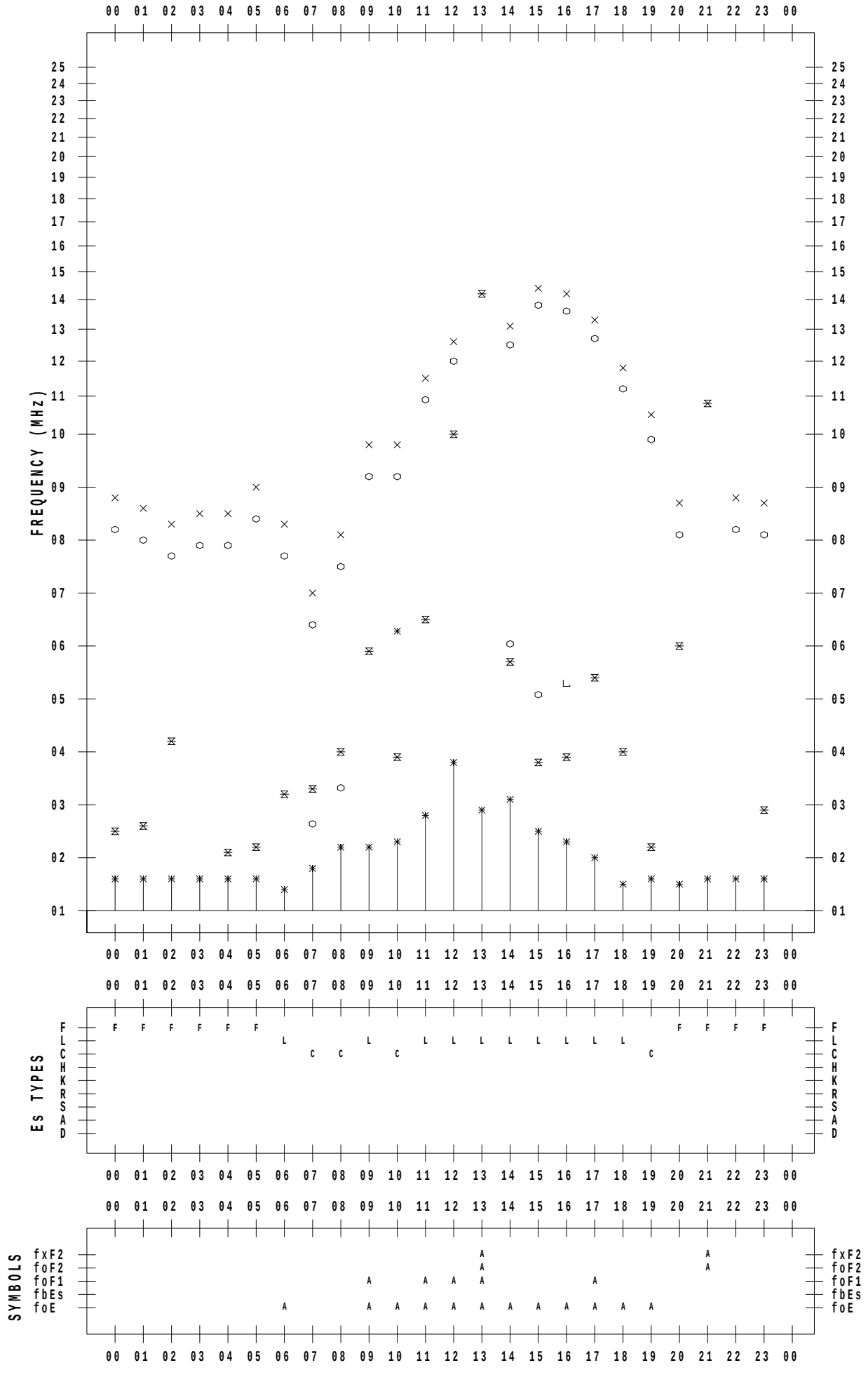
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/21

135 °E MEAN TIME



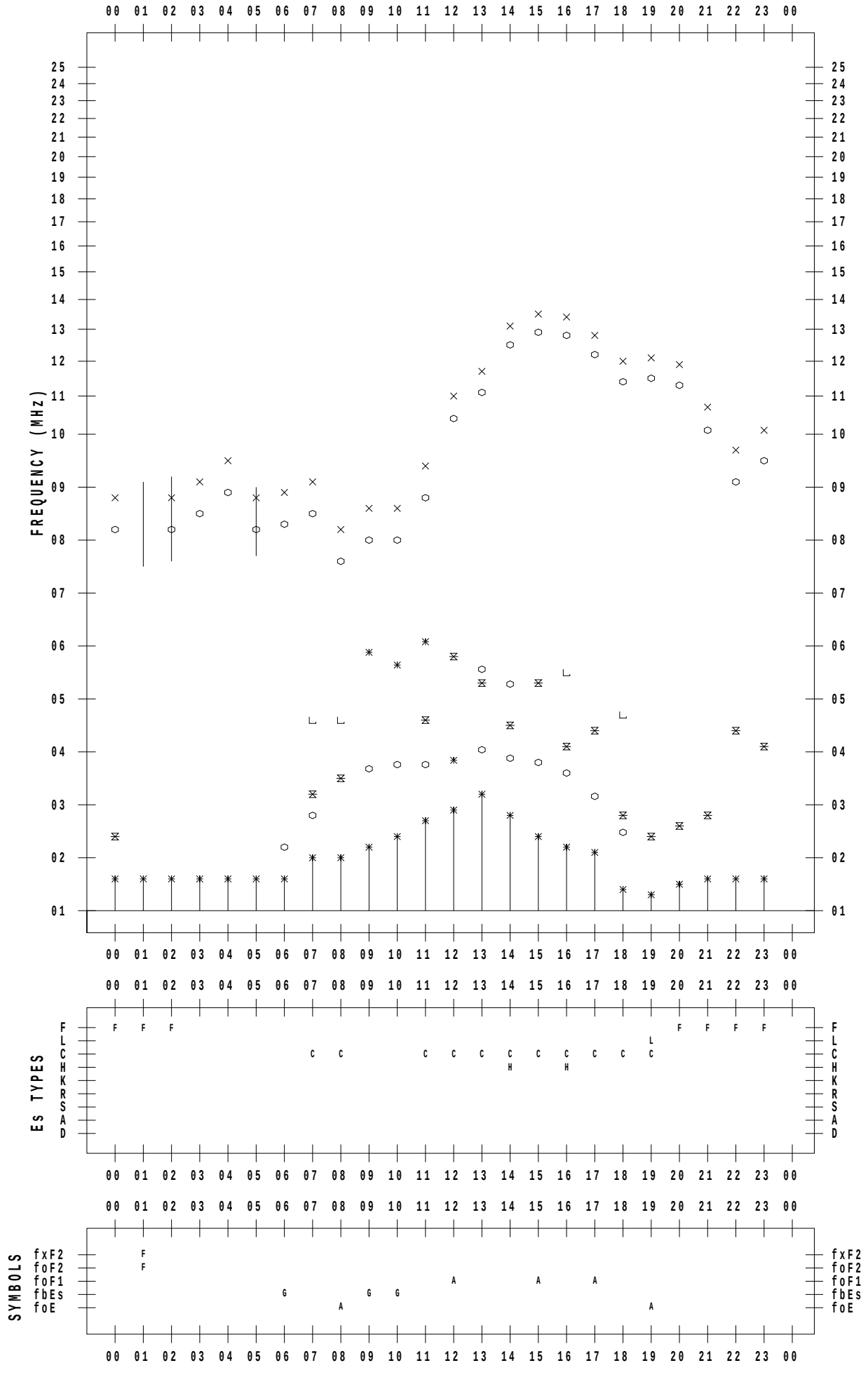
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/22

135 °E MEAN TIME



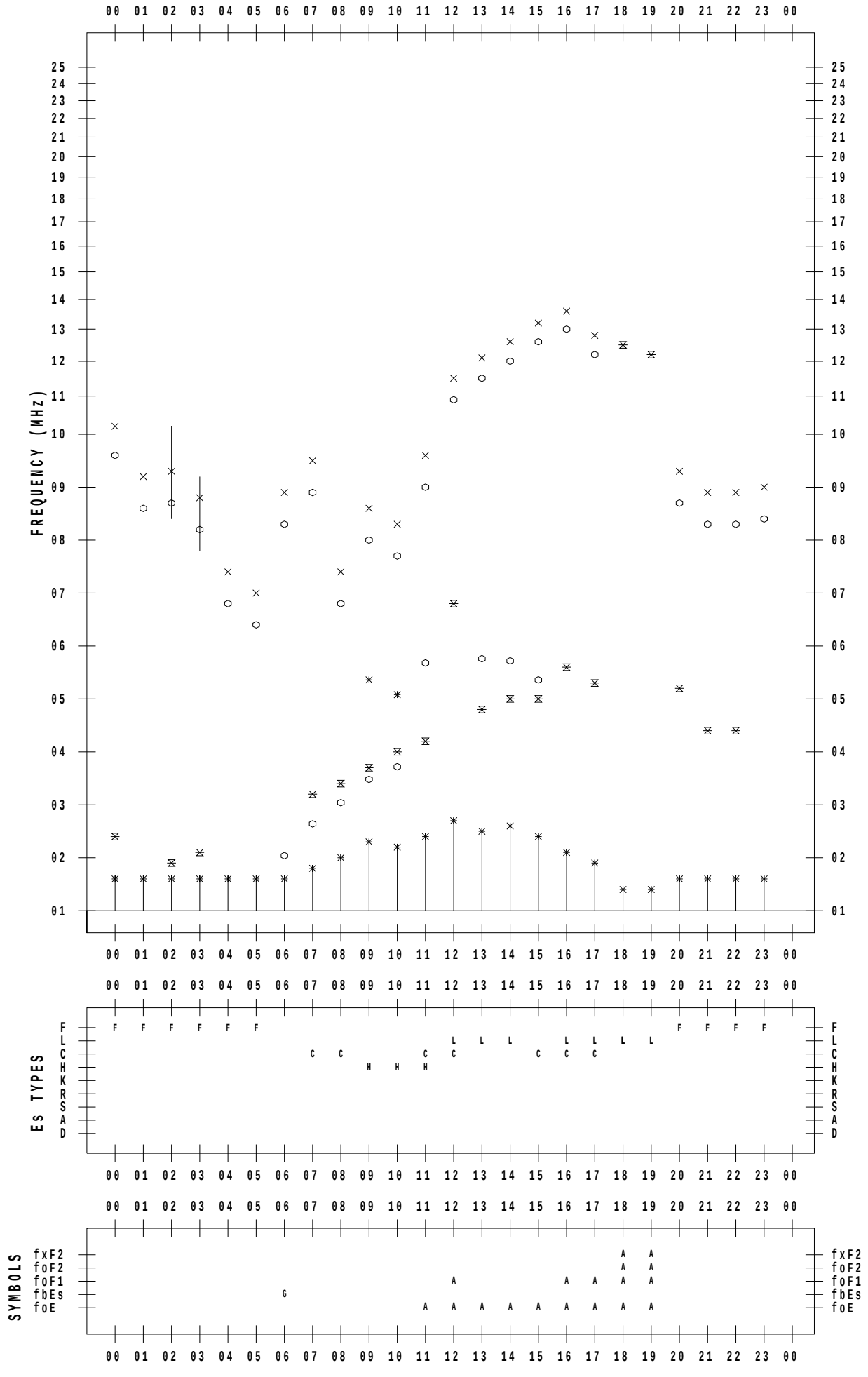
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/23

135 °E MEAN TIME



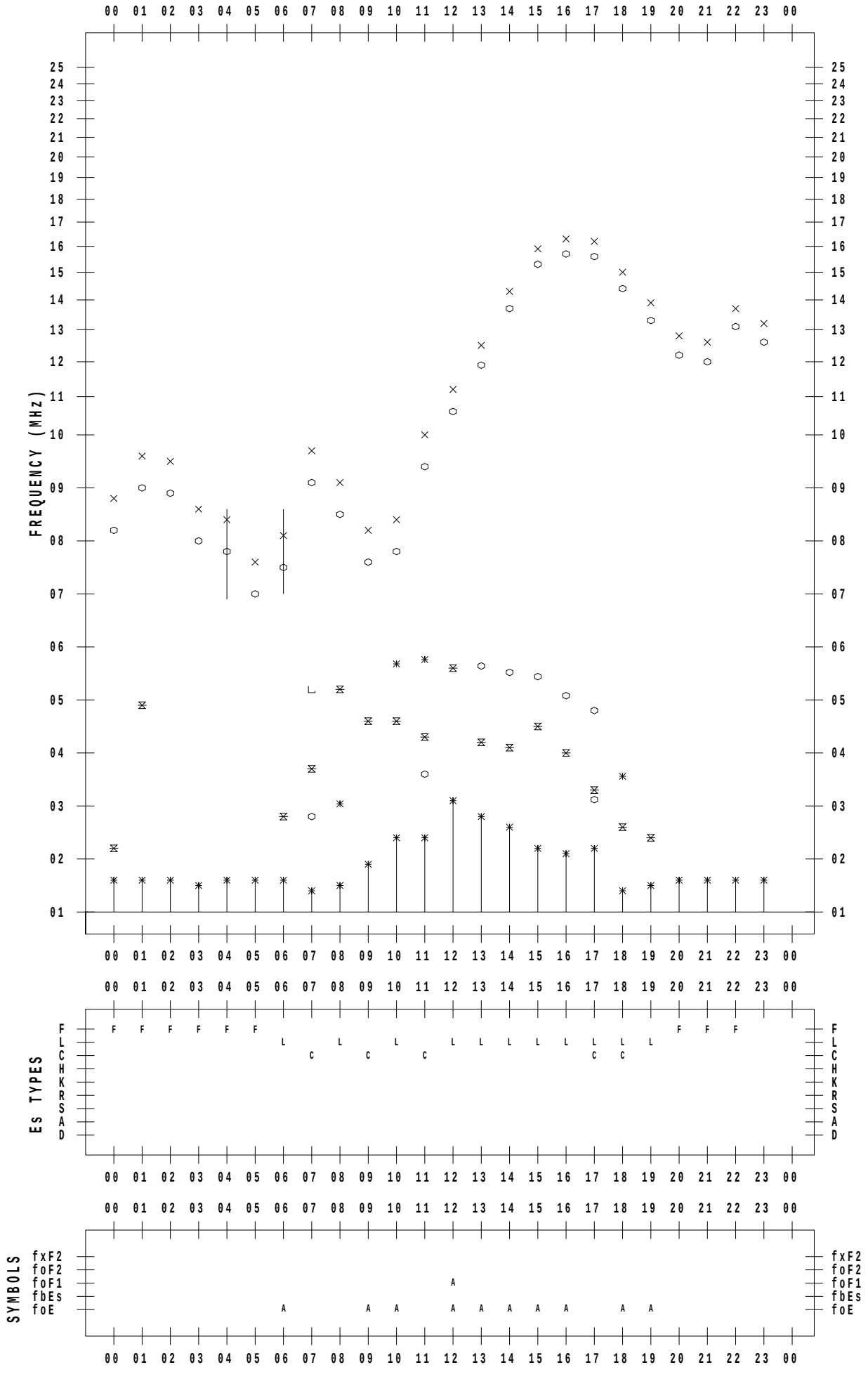
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/24

135 °E MEAN TIME



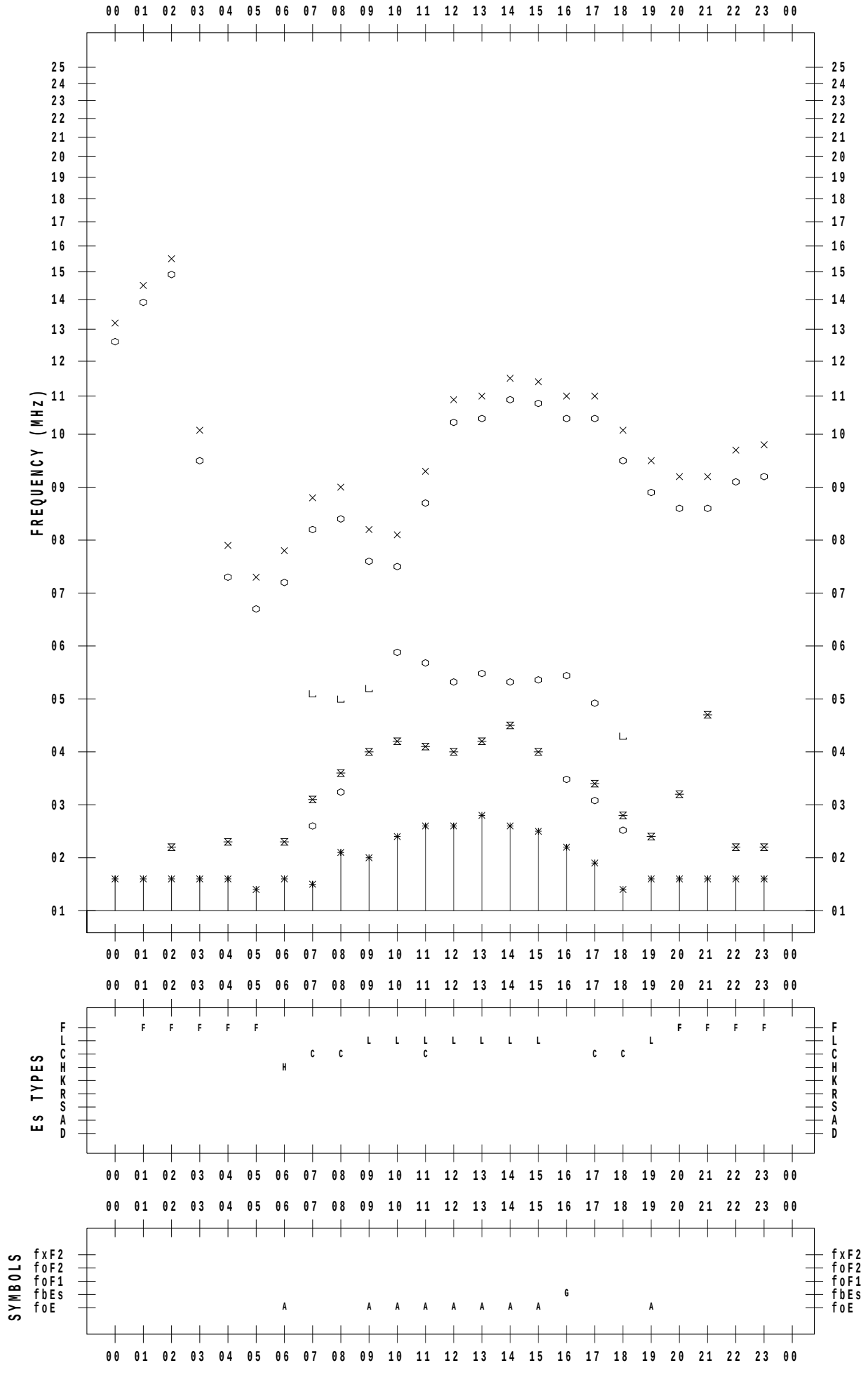
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/25

135 °E MEAN TIME



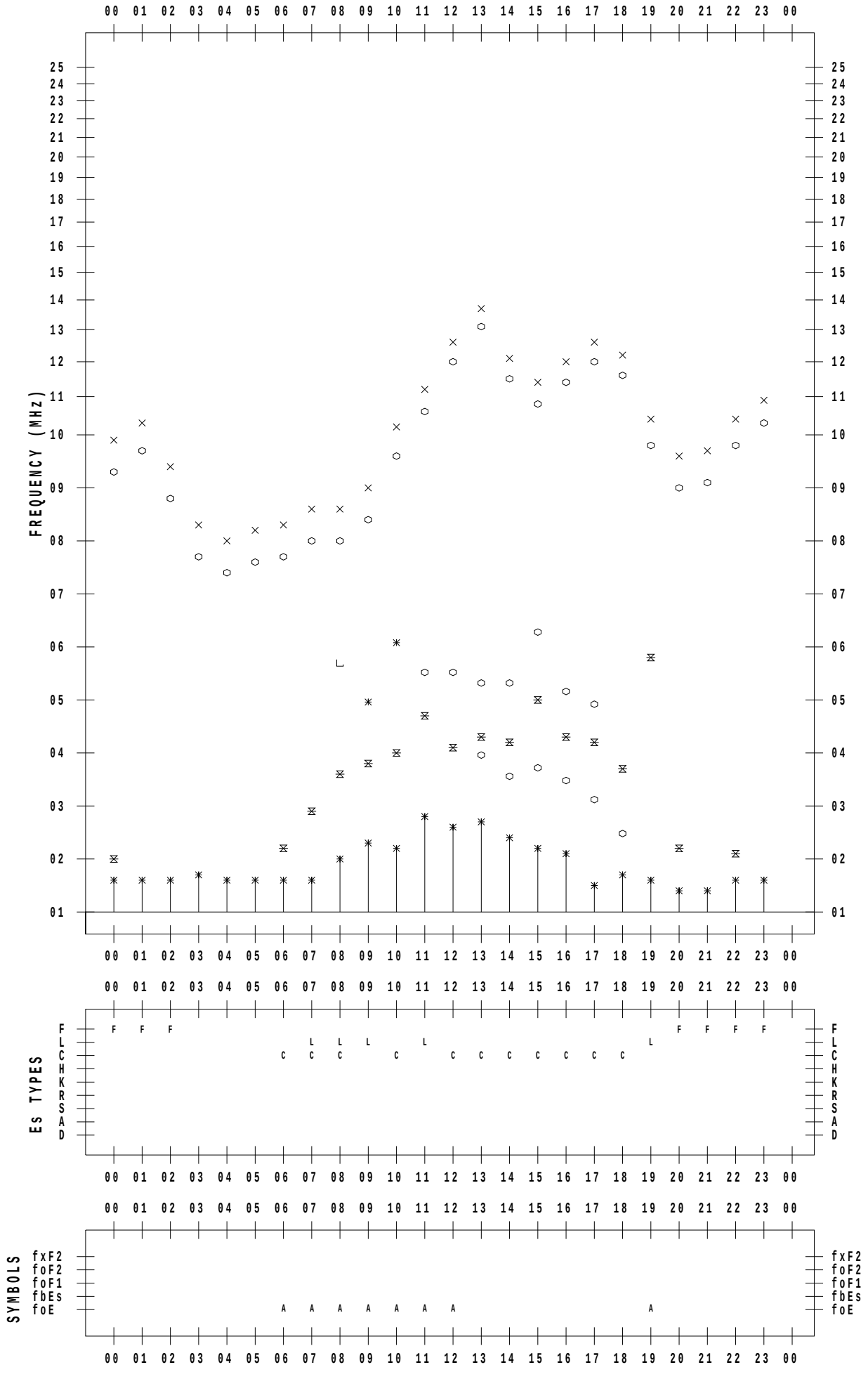
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/26

135 °E MEAN TIME



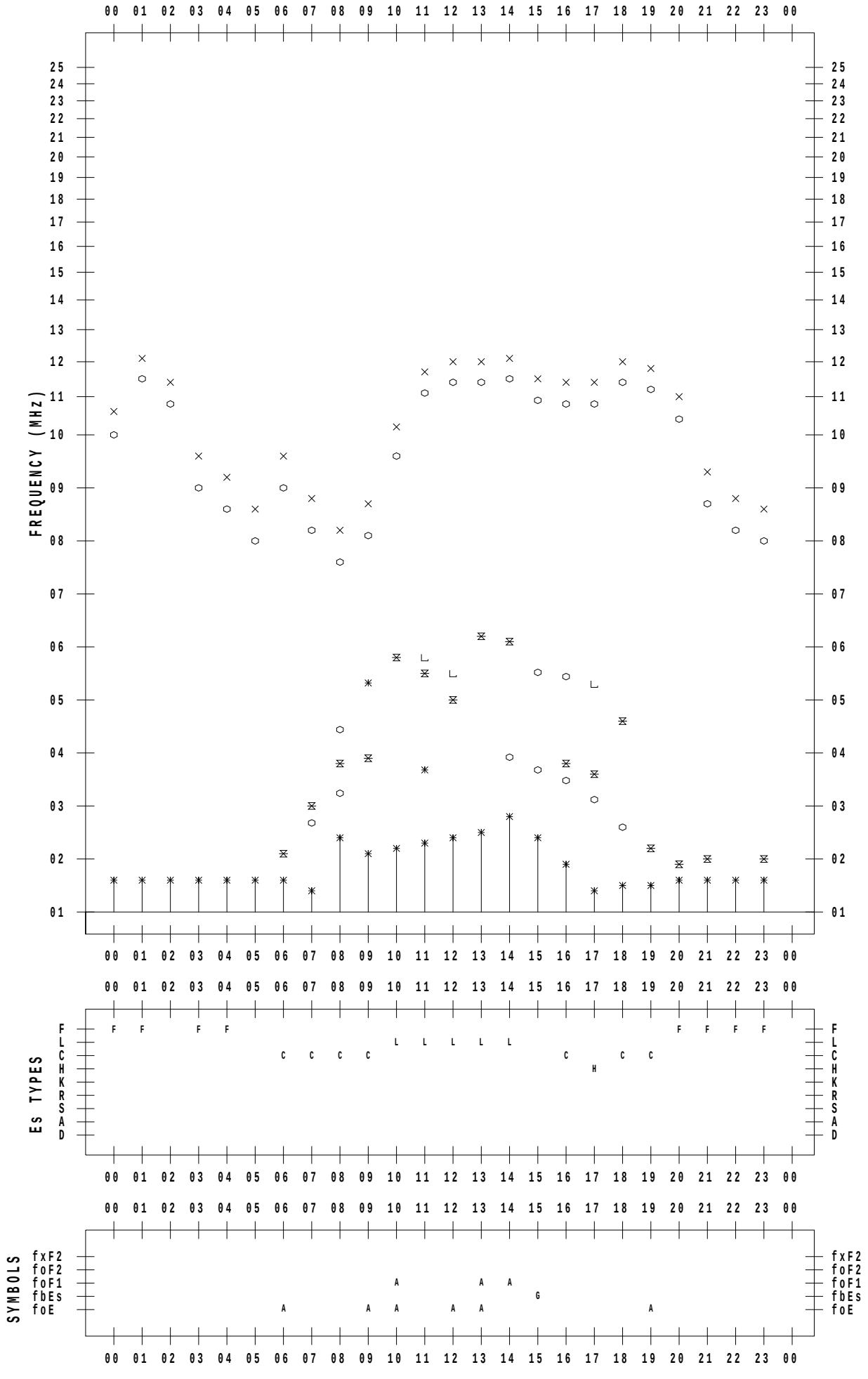
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/27

135 °E MEAN TIME



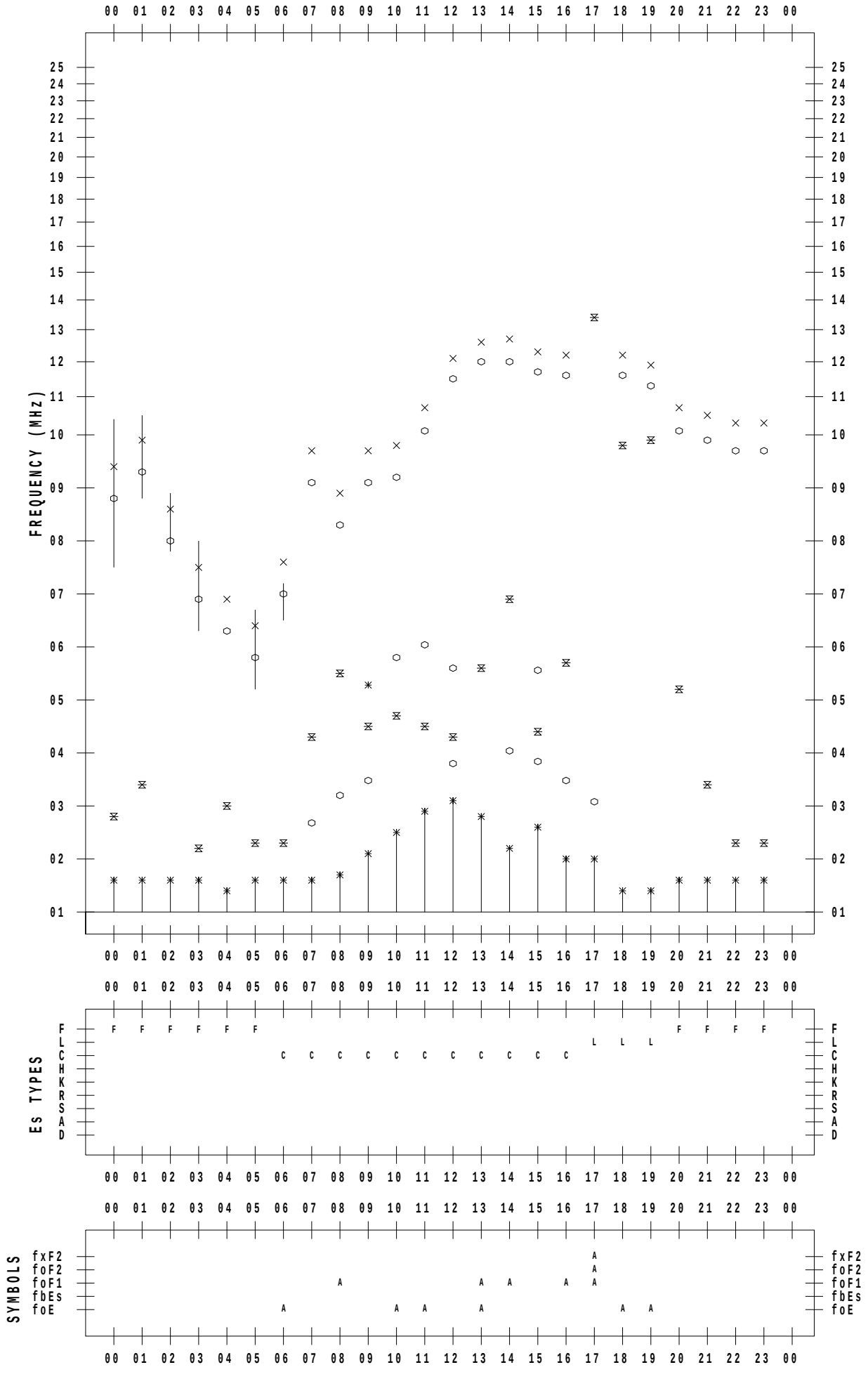
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/28

135 °E MEAN TIME



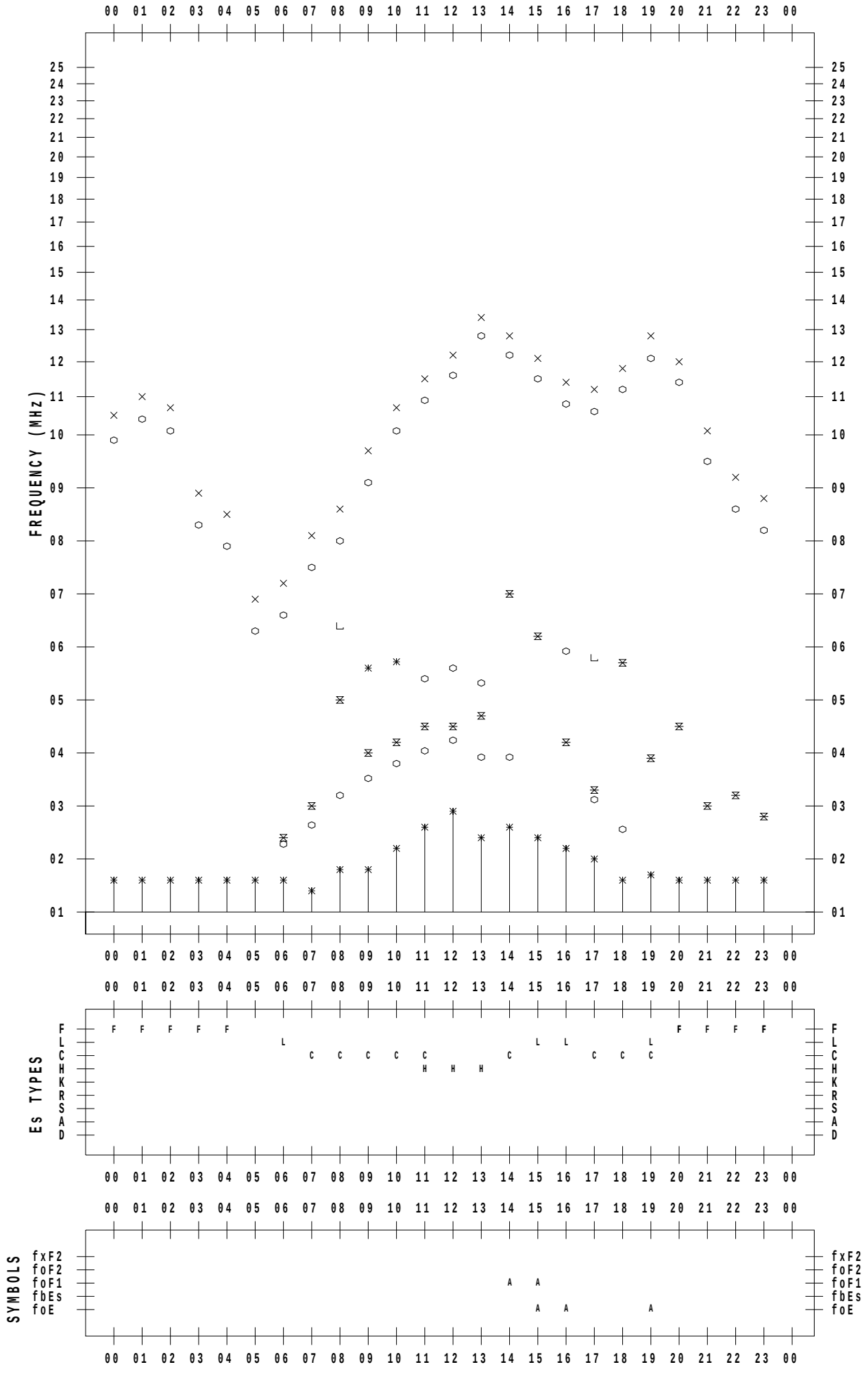
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/29

135 °E MEAN TIME



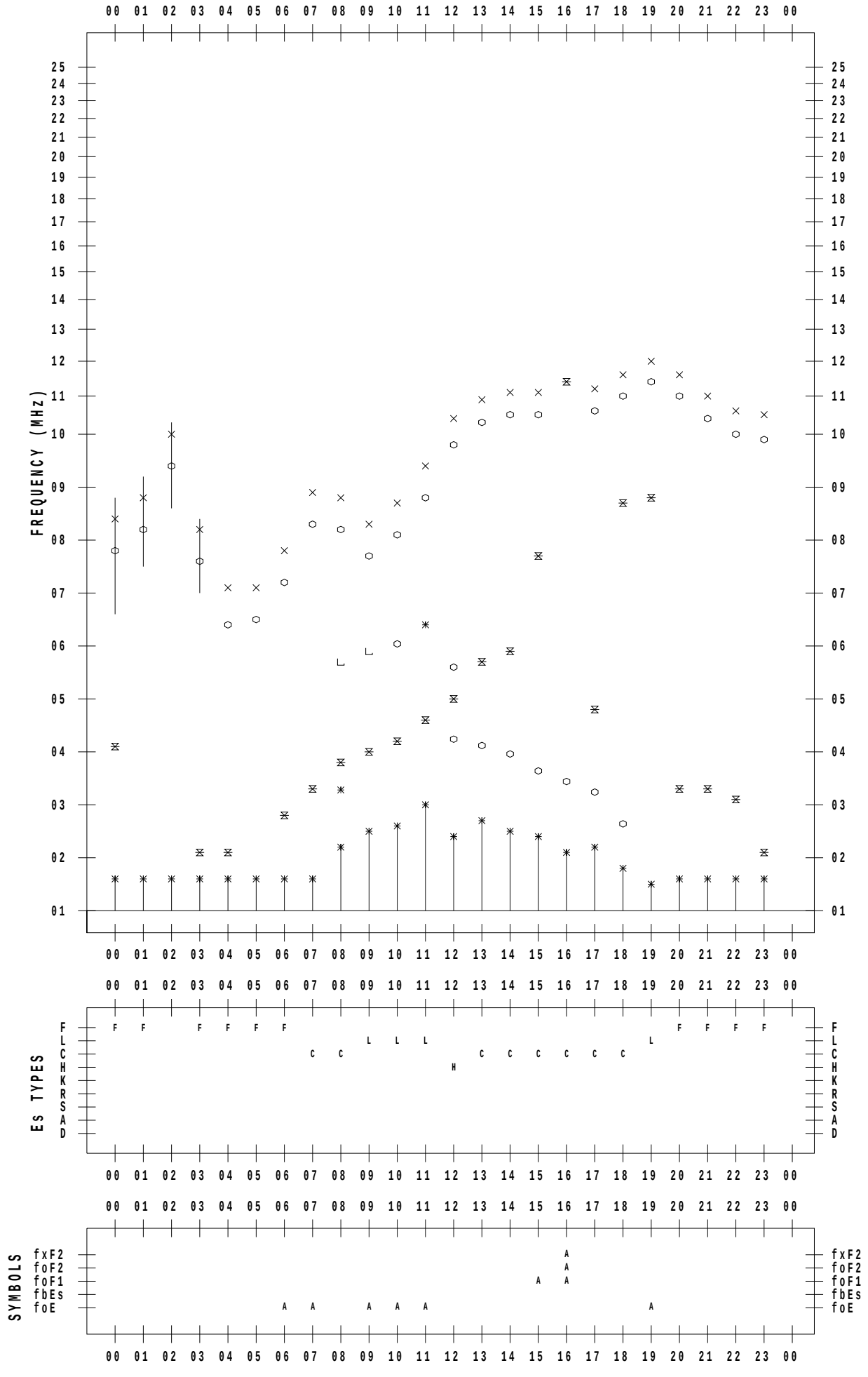
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 5/31

135 °E MEAN TIME