F-871

IONOSPHERIC DATA IN JAPAN

FOR July 2021
VOL. 73 NO. 7

CONTENTS

≪Real Time Ionograms on the Web ・・・・・・・・・・・・http://wdc.nict.go.jp/index_eng.html≫

NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I) and solar radio emission (S) obtained at the following stations under the National Institute of Information and Communications Technology , Japan.

Stations	Geographic(WGS84)		Geomagnetic (IGRF-10(2005))		Technical Method
	Latitude	Longitude	Latitude	Longitude	
✳Wakkanai/Sarobetsu	45˚10'N	141˚45'E	36.4˚N	208.9˚	Vertical Sounding (I)
Kokubunji	35˚43'N	139˚29'E	26.8˚N	208.2˚	Vertical Sounding (I)
Yamagawa	31˚12'N	130˚37'E	21.7˚N	200.5˚	Vertical Sounding (I)
Okinawa	26˚41'N	128˚09'E	17.0˚N	198.6˚	Vertical Sounding (I)
Hiraiso	36˚22'N	140˚37'E	27.6˚N	209.1˚	Solar Radio Emission (S)

✳We moved the observation facilities at Wakkanai to Sarobetsu on February 2009. The new observatory is located at approximately 26km south from the old observatory. The observation at Sarobetsu commenced on March 6, 2009.

IONOSPHERE

Ionospheric observations are carried out at the above four stations in Japan by means of vertical sounding using ionosondes. The ionosonde produces ionograms, which are recorded digitally on a computer storage medium. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five characteristics of the ionospheric are listed below. The reliability of these factors has been ascertained by comparison of the automatically-scaled parameters with the manually-scaled values of large amounts of test ionograms.

The published data consist of tabulations of hourly values of three factors (*foF2, fEs*, *fmin*) and monthly medians of two factors (*h'Es* ,*h'F*), daily Summary Plots and monthly medians plot of *foF2*.

a. Characteristics of Ionosphere

foF2	Ordinary wave critical frequency for the ***F2*** layer
fEs	Highest frequency of the ***Es*** layer whether it may be ordinary or extraordinary
fmin	Lowest frequency which shows vertical iono-spheric reflections
h'Es ***h'F***	Minimum virtual height on the ordinary wave for the ***Es*** and ***F*** layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

A Impossible measurement because of the presence of a lower thin layer, for example *Es* (for *foF2*).

C Impossible measurement because of any failure in observation.

G Impossible automatic scaling because of very small ionization density of the layer (for *fEs*).

N Impossible automatic scaling because of complex echoes.

Blank No digital record because of problems occurring in the auto matic data processing system, but existence of film record.

c. Definitions of CNT, MED, UQ ,and LQ

Median count (**CNT**) is the number of numerical values from which the median has been computed. In addition to numerical values, the count may include a descriptive letter G.

Median (**MED**) is defined as the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (**UQ**) is the median value of the upper half of the values when they are ranked according to magnitude; the ***lower quartile*** (**LQ**) is the median value of the lower half.

If CNT is less than 10, there are blank spaces left.

d. Reliability of Automatic Scaling

The results of the comparison between automatically-scaled values and manually-scaled ones showed that hourly values of *foF2 , fEs* and *fmin* were scaled within a difference of 1 MHz from about 90, 90 and 99%, respectively of the test ionograms.

e. Summary Plot

Daily Summary Plots which are made from quarter-hourly digital ionograms are published to present general ionosphere conditions. The upper and middle parts of a Summary Plot show the diurnal variation of the frequency range of the echoes reflected from the *F* and *E* regions, respectively. The two solid arcing lines indicate the predicted values of *fxE* and *foE* calculated by the method described in the CCIR report 340. The lower part shows the diurnal variation of the virtual height where the echo traces become horizontal.

A2. Manual Scaling

The published data consist of tabulations of hourly values of the ionospheric characteristics and figures of daily *f*-plot.

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Hand-book of Ionogram Interpretation and Reduction (Second Edition) 1972 " and its revision of chapters I-4, published in July 1978.

a. Characteristics of Ionosphere

fxI	Top frequency of spread ***F*** trace
foF2 ***foF1*** ***foE*** ***foEs***	Ordinary wave critical frequency for the ***F2***, ***F1***, ***E,*** and ***Es*** (including particle type ***E)*** layers, respectively
fbEs	Blanketing frequency of the ***Es*** layer, e.g. the lowest ordinary wave frequency visible through ***Es***
fmin	Lowest frequency that shows vertical ionospheric reflections
M(3000)F2 ***M(3000)F1***	Maximum usable frequency factor for a path of 3000 km for transmission by the ***F2*** and ***F1*** layers, respectively
h'F2 ***h'F*** ***h'E*** ***h'Es***	Minimum virtual height on the ordinary wave for the ***F2,*** whole ***F, E*** and ***Es*** layers, respectively
Types of ***Es***	See below b. (iii)

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replaced a numerical value on the monthly tabulation sheets, if necessary.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.

B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced by, or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

K Presence of particle *E* layer.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

P Man-made perturbations of the observed parameter; or spur type spread *F* present.

Q Range spread present.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before a numerical value on the monthly tabulation sheets, if necessary.

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple trace is indicated after the type letter.

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km as-sociated with high absorption and large *fmin*.

n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.

k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

c. Definitions of the CNT, MED, UQ and LQ

Median count (**CND**) is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

Median (**MED**) is the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (**UQ**) is the median value of the upper half of the values when they are ranked according to magnitude; the ***lower quartile*** (**LQ**) is the median value of the lower half.

HOURLY VALUES OF foF2 AT Wakkanai

JUL.2021

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	48	45	43	43	38	51	49	89	47	A	A	A	A	A	A	49	A	55	55	61	66	65	64	61
2	47	52	52	47	51	61	62	66	60	A	A	A	54	A	A	51	51	A	53	65	75	67	58	A
3	58	49	45	A	46	47	59	47	40	A	51	51	A	A	A	A	A	43	A	A	58	56	A	51
4	A	A	39	38	A	44	51	57	62	A	52	49	A	59	50	A	A	52	57	59	69	63	A	A
5	A	A	A	A	A	38	44	A	88	49	A	52	53	54	A	A	59	49	123	49	A	A	65	55
6	A	55	51	51	37	40	46	80	47	55	49	49	A	A	A	49	A	A	56	61	74	71	A	A
7	41	41	45	43	43	51	56	59	51	A	A	A	A	A	A	53	53	53	57	A	A	65	A	A
8	A	A	44	37	37	A	A	A	47	45	A	A	52	C	54	A	48	45	46	N 46	A	A	A	A
9	37	38	A	A	A	A	48	A	50	A	A	A	A	A	A	A	53	A	51	A	A	61	56	49
10	39	A	33	33	31	A	A	51	56	49	A	A		A	A	A	A	A	53	49	A	A	A	52
11	A	A	A	A	A	A	A	46	A	A	71	A	A	N 47	A	121	A	A	98	A	A	A	58	53
12	49	A	A	40	37	A	A	A	84	47	61	51	50	48	A	A	A	42	69	59	A	A	A	50
13	A	A	37	A	41	43	49	53	49	47	A	A	A	A	60	A	A	44	43	A	A	A	57	A
14	A	A	A	41	51	47	54	51	82	A	A	A	A	A	52	49	48	A	A	46	48	50	A	46
15	43	38	35	36	35	A	A	43	A	N 49	A	A	A	A	50	A	A	A	A	53	63	61	A	58
16	54	A	A	49	43	41	47	84	74	78	47	70	49	73	47	50	47	37	A	A	55	59	52	50
17	47	47	45	39	40	50	43	54	82	A	54	A	A	54	A	A	47	A	A	A	A	A	A	A
18	A	A	A	34	33	39	47	A	98	49	101	79	51	A	75	51	A	49	87	A	63	62	62	49
19	55	51	42	46	41	A	A	A	122	79	A	A	A	A	A	49	52	A	A	52	A	A	A	A
20	A	A	A	A	34	42	52	49	69	69	45	53	49	A	N 55	51	47	A	56	A	69	69	65	A
21	44	39	A	A	39	51	60	64	77	56	A	A	A	50	A	A	A	53	54	A	63	64	59	57
22	51	48	47	43	41	46	A	A	54	A	A	A	A	47	A	47	44	45	50	61	64	70	82	54
23	42	37	A	35	A	61	49	A	50	57	A	54	A	A	A	A	55	53	N 59	A	67	62	59	53
24	45	40	41	40	39	50	61	A	55	A	A	A	A	A	A	A	A	A	A	63	65	A	A	55
25	A	A	A	A	37	A	A	A	51	49	49	51	55	A	A	A	A	46	49	53	61	63	53	41
26	38	37	34	35	35	36	50	A	A	A	A	A	A	A	52	51	46	50	A	49	63	61	57	A
27	A	42	37	A	A	42	A	53	A	60	57	51	51	A	49	49	51	51	49	57	65	60	62	52
28	51	43	42	45	40	38	50	A	A	A	A	A	A	54	52	50	57	55	54	55	63	59	59	58
29	55	A	33	30	30	41	58	A	39	A	A	A	A	A	A	A	A	A	48	51	59	55	53	51
30	56	54	54	A	55	41	41	A	54	A	47	N 47	A	A	A	A	A	A	54	56	61	61	60	41
31	41	53	53	53	48	51	49	47	57	44	53	56	A	A	A	A	A	A	53	58	63	A	57	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	20	18	20	21	25	23	22	17	26	16	13	13	9	9	11	14	15	17	23	20	21	21	19	20
MED	47	44	42	40	39	44	50	53	56	49	52	51	51	54	52	50	51	49	54	56	63	62	59	52
U Q	52	51	46	45	43	51	56	65	77	58	59	55	53	56	55	51	53	53	57	60	66	65	62	55
L Q	41	39	37	35	36	41	47	48	50	48	48	50	49	47	50	49	47	44	50	50	61	59	57	49

HOURLY VALUES OF fEs AT Wakkanai

JUL.2021

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	33	35	G	30	G	56	73			71	106	124	90	77	89	81	70	54	44	56	128		44	41
2	53	33	36	32	33	34	180	50	57	70	70	94	48	70	60	57	39	71	116	38	34	85	71	71
3	60	43	39	49	30	35	37		111	142	126		124	98	98	162	108	96	134	128	57	54	92	57
4	69	59	31	26	58	33	41	168	60	55	108	83	109	100		72	124		115	72	91	106	126	71
5	116	116	107	116	72	95		108		110	118	49	37	60	55	145		125			143	128	60	47
6	73	70	38	28	38	40		78	94	79	62		78	48	72	48	64	109	61	38	26	56	90	61
7	41	28	103	35	38	40	42	62	134	90	58	66	56	95	60	37	47	57	41	94	91	54	70	90
8	60	60	44	38	33	127	72	116			133	68	55	C	41	56	81		85	90	116	71	128	60
9	33	54	35	37	37	74	83	44	125	117	63	68	57	70	44	56	78	112	93	91	84	45	41	34
10	39	34	33	25	32	113	111	50	64	78	124	72		93	74	49	72	62	65	59	69	58	69	58
11	59	112	91	40	38	50	50	82	73	73		68	134	84	80	133	136	133		163	132	78	59	41
12	56	56	40	43	38	59	58	63		87	70	112	116	79	65	82	60	48	84	146	91	92	115	40
13	71	48	37	38	39	39	179	47	50	71	90	83	91	73	62	63	108	94	149	127	145	71	56	56
14	72	91	64	38	34	40	40	106	80	83	133	117	106	90	62	53	109	167	144	114	37	34	59	34
15	32	G	G	G	G	44	59	40	60	90	81	60	74	42	50	91	86	81	71	60	69	29	60	91
16	72	58	83	44	40	40	83	94	85				61	86	110			66	90	65	35	36	40	115
17	83	58	39	32	31	34	45		93	77		79	71	48	53	117		70	58	60	111	109	146	150
18	144	91	39	27	G	40	59	171	124	70		86	98	117	95	106	74	55	85	83	115	60	59	45
19	39	44	38	34	39	71	60	146			120	113	93	65	116		115	121	130		126	109	91	60
20	110	92	56	46	31	45	73	78	67	70	95	69	82	112	117	51	72	127	108	169	84	58	59	60
21	31	38	91	58	40	49	91	146	135		74	76	76	50	60	114	163	74	40	70	34	84	44	50
22	58	48	38	32	26	40	58	59	50	64	66	66	42	40	64	32	45	32	32	G	G	26	29	G
23	G	G	35	32	34	79	54	179	47	54	54	47	49	66	61	92	79		49	62	33	26	40	24
24	33	30	28	29	32	115	48	116	56	108	70	62	46	62	39	53	62	84	117	55	41	50	59	48
25	90	60	70	58	26	67	91	72		116	84		78	67	84	60	60	48	37	33	53	49	40	31
26	31	G	G	31	G	109	156	60	71	92	142	84	71	92	48	116	36	53	58	62	44	40	70	59
27	59	46	39	72	58	53	59	49	90	50	49	54	46	45	42	40	37	36	32	G	91	54	71	39
28	36	33	32	34	33	125	40	56	112	72	60	88	116	59	50	43	34	41	34	35	31	45	32	46
29	37	38	G	G	G	31	112	132	145	116	98	96	65	74	61	115	106	61	30	G	28	58	34	36
30	39	46	71	107	49	160	35	60	92	145		122	91	56	91	60	56	57	52	58	40	50	69	30
31	G	54	151	G	32	29	39	50	40	105		41	56	78	109	135	94	60	43	31	33	69	49	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	29	28	25	27	25	27	30	30	30	29	28	28	29	29	31	30	31	31
MED	56	48	39	34	33	49	59	75	80	79	84	76	75	72	62	63	73	68	65	62	69	57	59	50
U Q	72	60	70	44	39	79	87	116	111	108	119	94	93	90	89	114	107	102	111	92	111	78	71	60
L Q	33	34	33	29	30	40	43	53	58	70	64	66	56	59	53	52	58	54	42	38	34	45	44	39

HOURLY VALUES OF fmin AT Wakkanai

JUL.2021

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	16	15	15	16	15	14	13	9	13	16	18	15	15	19	21	15	16	14	14	14	15	15	15	15
2	16	15	15	16	16	16	14	15	13	16	14	18	19	18	18	17	15	15	14	15	15	16	15	15
3	15	15	15	15	15	15	14	13	9	61	11	17	12	14	19	23	15	11	11	15	15	16	15	16
4	15	15	16	16	16	15	14	13	19	15	19	18	17	16	19	16	17	13	13	14	17	14	16	16
5	10	5	14	17	14	14	13	100	6	15	38	17	20	19	16	82	13	12	15	15	15	16	15	15
6	15	15	15	15	16	15	14	13	15	15	15	16	15	15	21	20	14	18	14	15	16	15	15	15
7	15	15	14	15	15	14	14	15	7	17	15	19	15	13	16	15	14	13	15	15	15	15	16	15
8	15	15	16	15	16	13	15	13	5	8	9	13	15	C	15	14	15	13	13	15	10	16	19	17
9	16	15	16	16	15	16	16	15	15	14	16	17	15	19	16	15	16	15	17	14	12	15	15	15
10	15	15	15	16	17	14	13	14	15	13	17	18	16	20	15	16	15	16	14	15	15	15	16	16
11	17	16	15	17	15	15	13	15	16	15	14	15	15	21	18	13	127	84	49	29	5	15	15	16
12	17	16	16	15	15	15	15	14	14	15	17	16	16	18	18	16	15	15	15	19	15	14	15	15
13	15	16	15	15	15	15	14	14	14	16	17	16	18	15	16	17	13	17	14	5	15	15	15	16
14	16	15	16	14	16	15	14	14	15	15	17	10	15	16	16	15	16	7	13	14	15	16	15	16
15	16	15	14	14	18	15	13	15	14	15	16	15	15	15	17	16	15	16	14	15	14	16	16	16
16	16	16	15	17	15	14	16	14	14	12	17	16	19	15	15	18	15	15	15	14	16	16	15	15
17	15	17	15	16	15	16	15	15	15	15	15	15	19	17	15	11	16	16	15	15	13	14	15	16
18	20	17	15	16	14	14	13	13	7	14	15	15	18	17	14	13	14	14	14	16	15	16	17	15
19	17	16	16	16	14	15	14	5	5	14	16	20	19	17	15	14	11	5	12	20	10	16	17	16
20	15	15	13	17	15	14	14	14	14	14	16	15	17	9	13	16	15	9	15	5	16	16	16	17
21	16	15	17	17	15	15	15	15	15	16	16	15	16	15	15	13	12	13	14	14	14	15	15	15
22	16	16	15	16	16	15	13	15	15	15	15	15	17	15	17	17	15	16	15	15	15	16	16	16
23	15	14	15	17	16	15	15	16	14	15	14	17	19	17	15	15	14	18	14	15	16	16	15	16
24	16	16	16	17	16	14	14	9	15	15	18	20	17	19	19	17	15	15	10	15	16	15	16	15
25	15	15	17	17	16	14	15	14	19	13	16	9	17	17	18	16	16	15	14	16	14	16	15	16
26	16	16	16	15	15	8	15	14	14	15	16	17	16	19	17	16	15	15	15	14	14	16	17	17
27	15	15	16	16	17	15	15	14	13	14	15	14	17	19	16	17	15	15	16	15	7	15	16	15
28	15	16	16	16	17	15	15	14	16	15	16	17	15	19	19	16	15	14	15	15	16	16	16	16
29	15	15	16	14	15	15	15	13	5	53	48	15	17	17	15	14	16	14	15	15	15	17	16	15
30	15	15	17	9	14	15	16	14	16	14	5	17	17	18	15	16	14	13	14	15	16	15	17	15
31	14	16	16	16	16	15	14	14	16	15	19	17	18	17	16	19	14	15	15	15	15	15	16	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31
MED	15	15	15	16	15	15	14	14	14	15	16	16	17	17	16	16	15	15	14	15	15	16	16	16
U Q	16	16	16	17	16	15	15	15	15	15	17	17	18	19	18	17	16	16	15	15	16	16	16	16
L Q	15	15	15	15	15	14	14	13	13	14	15	15	15	15	15	15	14	13	14	14	14	15	15	15

HOURLY VALUES OF foF2 AT Kokubunji

JUL.2021

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	57	A	41	39	40	48	52	53	65	63	57	A	A	55	59	63	65	63	57	51	55	54	51	A
2	A	A	A	A	39	49	52	56	62	112	A	77	78	76	71	47	72	57	70	84	75	53	A	A
3	A	A	A	A	37	47	43	61	52	57	60	A	A	A	55	N71	53	51	55		67	60	49	45
4	50	44	42	39	37	36	56	63	62	56	A	49	51	A	A	A	70	65	59	65	61	A	A	A
5	A	43	41	38		39	51	59	54	51	A	A	61		63		49	49	55	65	70	51	47	A
6	43	A	36	35	35	A	47	62	91	A	A	81	A	54	59	63	64	63	65	79	80	68	34	A
7	33		33	36	37	38	46	61	55	A	A	A	A	A	63	61	65	53	A	65	67	59	54	51
8		53	54	43	32	36	49	50	50	73	51		53	72	73	59	A		52	56	A	A	55	
9	58	56	51	55	50	37	A	37	47	A	99	50		48	50	A	51	52	46	45	59	49	52	A
10	39	37	33	A		A	50	62	A	A	A	A	A	A	A	A	52	A	51	A	51	A	46	A
11	41	A	A	A	31	A	43	66	A	48	A	57	70	A	A	A	56	48	55	56	53	43	42	49
12	40	37	A	A	30	A	47	46	48	147	A	49	90		A	69	59	A	47		A		A	53
13	49	A	A	34	A		54	63	A	44	A	A	106	A	65		67	71	60	63	67	A	A	A
14	A	A	37	A	A	A	46	56	N46	A	54	A		A	A	49	A	N73	A	59	55	51	A	A
15	40	42	A	A	A	37	A	55	N55	A	A	A	56	53	A	A	A	53	55	64	A	A	A	A
16	A	A	37	37	36	48	A	65	47	47	76	A	48	A	47	A	A	53	A	A	56	53	A	A
17	A	41	40	A	37	A	45	N39	55	A	A	68	A	A	A		49	A	52	78	A	52	54	A
18	A	A	33	30	31	A	48	58	A		62		194		38	111	A	A	55	71	A	A	57	54
19	51	43	A	A	A	37	51	51	57	A	A	A	A	55	A	81	67	A	A	A	64	64	55	51
20	41	41	A	34	34	37	49	A	A	62	51	A	73	79	65	A	60	N37	38	A	80	A	64	63
21	61	59	54	A	A	A	A	82	A	A	A	A	62	A	55	56	55	56	64	70	69	59	57	55
22	51	49	48	49	47	43	A	A	63	A		57	A	61	A	A	57	58	53	A	A	80	61	A
23	A	A	A	A	35	A	A	47	48	81	A	101	A	A	63	A	77	79	A	83	83	67	59	48
24	44	A	40	36	37	40	55	A	71	N75	A	A	A	52	58	61	64	70	167	A	64	66	59	52
25	48	42	39	35	33	35	49	66	37	A	A	A	50		A	A	A	A	62	A	A	A	A	A
26	A	A	A	A	A	33	A	A	A	A	A	A	A	A	68	A	A	A	A	67	63	63	66	A
27	A	A	A	35	38	38	48	48	49	81	69	A		50	51	A	48	64	A	75	74	67	68	64
28	56	54	51	49	38	42	51	61	A	A	A	A	A	99	N68	71	A	A	60	A	A	68	64	N64
29	60	49	33	31	31	34	51	A	A	A	A	A	A	A	A	A	53	54	55	60	63	67	57	55
30	53	50	52	55	40	38	46	55	60	52	A	A	N	A	A	A	34	47	A	A	66	A	A	A
31	A	A	A	A	A	A		65	A	A	A	A	A		N65	A		66	80	85	65	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	19	16	19	18	22	20	23	26	21	15	9	9	13	12	19	13	22	22	23	20	23	20	21	13
MED	49	44	40	36	37	38	49	58	55	62	60	57	62	55	63	63	58	56	55	65	65	60	55	53
U Q	56	51	51	43	38	42	51	63	62	81	72	79	84	74	65	71	65	65	62	76	70	67	60	59
L Q	41	41	36	35	33	36	46	51	48	51	52	49	52	52	55	57	52	52	52	59	59	52	50	50

HOURLY VALUES OF fEs AT Kokubunji

JUL.2021

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	60	70	40	G	G	G	35	33	42	36	38	48	38	39	41	41	40	67	40	37	34	41	31	60
2	58	111	57	49	36	42	119		50	97	70	116	98	127	104	109	142	142	24	G	28	57	93	90
3	84	104	91	53	37	39	38	40	40	54	49	41	64	73	95	150	G	45	55		89	50	40	31
4	G	G	35	33	G	55	51	52	45	45	61		G	54	65	84	51	61	42	39	81	57	78	83
5	60	57	40	37		72	89	54	65		114	77	55		48		146	106	41	74	58	34	33	57
6	111	104	39	31	G	69		103		174	47	53	61	39	38	38	31	39	36	40	38	29	24	69
7	33		29	33	28	29	43	29		116	114	103	63	40	49	35	36	57	93	39	60	53	34	83
8		47	70	57	34		57	77	95	101	85		124		128	G	71		84	104	150	112	52	
9	36	33	36	37	40	30	55	54	85	84	97	94		84	91	56	46	32	40		50	26		55
10	35	27	69	48		36	70	41	60	129	60	60	48	34	33	39	50	55	52	80	69	60	46	48
11	40	41	40	42	36	54	44	60	73	70	60	109	124	138	117	166	156	134	61	40	57	55	40	32
12	32	33	37	31	G	33	62	71	106	139	104	136			122	81	33	54	40		150		116	91
13	50	115	83	40	46		42	51	69	61	97	128	82	69	148		107	37	34	30	33	92	72	61
14	55	56	33	41	40	34	51	67	76	75	84	104		126	81	82	59	94	131	55	G	37	83	71
15	37	27	47	47	47	31	55	54	80	172	59	70	47	54	57	62	70	37	52	37	125	127	84	94
16	107	72	39	29	32	35	52	45	70	75		167	146	180	140	110	106	53	58	65	47	27	80	92
17	90	82	55	59	38	50	79	70	55	174	112	149	104	69	84		130	148	92	57	130	104	70	59
18	39	39	32	31	G	113	39	52	78		80		158		111	109	73	60	76	56	92	135	60	36
19	35	112	55	79	103	60	148	166	111	166	175	89	84	56	90	161	142	148	167	60	50	54	57	38
20	39	40	43	25	G	31	47	60	85	69	143	75	128		128	78	97	140		137	136	82	51	52
21	40	34	57	49	57	73	65	52	94	142	124	40	83	61	98	52	50	93	29	29	34	46	37	36
22	34	34	38	34	28	150	60	84		161		48	64	36	46	65	83	40	83	132	112	108	53	91
23	60	71	94	59	25	55	104	155			71	97	59	53	50	63	73	58	97	G	60	60	69	40
24	32	43	G	G	38	38	43	60	57	40	97	57	45		G	45	56	51	114	150	60	29	33	54
25	48	38	34	G	G	33	43	83	135	70	58	61	83		122	77	96	86	31	56	56	107	58	60
26	84	60	55	41	71	32	57	137	152	90	55	51	74	61	130	148	126	76	90	84	78	50	83	73
27	106	67	60	38	32	29	48	95	106	86	96	86		40	47	64	72	61	135	83	48	29	33	25
28	G	G	22	G	G	G	42	53	92	61	136	100	118	115	96	70	78	60	50	60	84	25	40	25
29	29	39	27	G	26	G	38	65	62	74	135	40	43	38	41	65	40	52	39	27	33	26	48	37
30	32	40	G	24	G	G	33	33	37	40	41	64	93	172	126	88	85	39	106	83	115	82	91	72
31	92	70	84	95	82	154		91	165	143	150	81	69		117	119		104	62	28	73	136	113	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	30	30	31	31	29	29	29	30	27	28	29	28	27	23	31	28	30	30	30	28	31	30	30	30
MED	40	45	40	37	32	36	51	60	76	85	85	79	74	61	91	74	72	60	56	56	60	54	55	60
U Q	60	71	57	49	40	57	63	83	95	140	114	103	104	115	122	109	106	94	92	81	92	92	80	73
L Q	34	34	34	29	G	30	42	52	57	65	59	55	55	40	48	54	50	51	40	37	47	34	40	38

HOURLY VALUES OF fmin AT Kokubunji

JUL.2021

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	16	15	15	15	14	16	16	16	15	18	31	24	28	21	22	17	17	16	14	15	15	16	16	15
2	14	15	16	15	17	16	16	15	16	17	19	22	21	27	20	16	20	28	16	15	15	15	15	15
3	15	13	14	14	15	15	15	15	17	19	22	19	21	21	20	22	17	16	14		7	15	15	16
4	15	15	15	15	15	15	13	15	16	20	23		48	36	19	21	16	15	15	14	15	15	17	15
5	16	15	16	15		15	15	14	17	20	17	20	19		36		12	15	14	15	15	15	16	15
6	5	12	15	16	14	15	14	15	11	19	23	23	20	20	22	18	16	15	14	15	15	15	15	14
7	15		16	16	16	15	15	16	16	20	22	23	16	19	34	21	15	15	15	15	14	15	16	17
8		15	15	15	15	15	16	14	19	25	22	22	21	23	20	45	13		13	12	7	15	15	
9	15	14	16	15	15	15	15	14	17	17	21	21		20	15	17	17	17	14	14	16	15	16	15
10	15	15	14	14		14	15	15	16	13	17	21	23	16	15	19	18	15	13	16	16	15	15	15
11	15	15	15	15	15	14	15	13	18	18	18	22	17	21	19	21	19	15	16	14	15	15	15	16
12	16	16	15	16	13	16	16	14	15	9	21	19	20		19	17	16	18	15		8		13	17
13	16	9	11	15	15		17	14	16	15	17	23	34	29	25	19	17	17	15	15	16	8	15	15
14	15	15	15	15	15	15	15	16	14	16	18	17		21	25	20	15	14	16	15	16	15	17	15
15	15	16	16	15	15	16	15	16	15	35	17	19	17	16	16	16	14	14	14	14	13	11	15	14
16	9	16	15	16	16	15	15	16	18	15	15	45	23	11	90	17	15	14	15	15	17	15	15	16
17	15	17	15	15	15	16	16	15	19	19	26	25	21	15	17		11	5	15	15	14	17	16	15
18	15	15	17	16	15	18	15	15	15		23	21	32		17	18	14	16	16	14	15	11	16	16
19	15	11	15	14	11	14	11	10	19	8	25	20	22	25	15	14	16	5	5	15	15	15	15	15
20	15	15	15	15	15	15	15	14	17	17	18	20	30	25	23	17	16	10	5	49	5	17	15	15
21	16	15	16	15	14	14	15	15	17	9	15	19	17	17	22	19	13	17	16	16	15	15	15	15
22	16	16	15	15	15	90	13	16	15	25		23	20	21	19	20	17	15	16	5	13	16	15	14
23	15	15	12	16	16	14	14	5	17	46	19	26	19	20	47	20	15	14	15	13	15	15	15	16
24	17	16	13	14	14	15	15	15	17	22	21	19	23		47	17	20	14	12	16	16	15	16	15
25	16	15	15	16	15	16	17	15	12	18	22	18	23	21	18	20	15	13	15	16	15	15	15	15
26	14	16	15	15	15	16	15	12	27	21	20	25	23	23	21	9	11	14	13	15	15	16	13	15
27	9	15	15	15	16	16	16	14	17	14	22	23		23	22	21	13	16	17	14	15	16	17	16
28	15	15	15	16	16	18	15	13	14	17	21	17	24	20	21	20	17	16	14	15	14	15	16	15
29	15	15	15	16	15	15	17	16	15	18	22	20	26	20	33	16	20	15	15	15	16	16	15	15
30	15	15	15	16	15	17	16	16	17	16	33	23	11	7	8	15	13	14	14	14	15	15	15	17
31	15	16	15	14	15	15	10	15	13	86	17	17	21		14	13	15	12	14	16	15	5	11	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	31	31	29	30	31	31	31	30	30	30	28	26	31	29	31	30	31	29	31	30	31	30
MED	15	15	15	15	15	15	15	15	16	18	21	21	21	21	20	18	16	15	15	15	15	15	15	15
U Q	16	16	15	16	15	16	16	16	17	20	22	23	23	23	25	20	17	16	15	15	15	15	16	16
L Q	15	15	15	15	15	15	15	14	15	16	18	19	19	19	17	16	14	14	14	14	14	15	15	15

HOURLY VALUES OF foF2 AT Yamagawa

JUL.2021

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	51	47	48	52	41	42	51	58	69	67	A	A	A	54	67	84	81	77	63	50	56	50	50	47
2	A	A	51	A	A	40	48	50	A	A	59	A	48	A	A	A	64	63	74	79	57	62	59	59
3	56	53	A	A	A	39	A	A	58	68	A	A	A	57	49	52	53	A	A	A	A	60	53	A
4	50	55	53	40	47	40	45	55	59	A	52	55	55	47	51	67	66	61	61	58	59	55	54	51
5	49	50	45	40	37	A	50	49	46	50	A	65	52	A	63	A	78	58	64	A	73	55	57	56
6	56	55	49	43	43	37	45	49	58	55	A	N46	A	A	A	A	63	A	82	84	71	51	49	43
7	42	38	A	A	A	39	41	57	52	A	A	46	A	63	A	A	59	A	A	A	A	A	57	A
8	53	44	53	51	47	37	43	A	67	63	A	49	53	67	67	78	89	72	60	52	57	54	54	51
9	43	A	A	42	37	A	43	A	A	A	A	A	N37	45	48	36	60	37	A	A	55	A	34	36
10	35	35	A	36	A	34	A	50	46	65	54	A	A	A	51	49	47	58	64	59	57	53	A	A
11	A	A	32	A	A	A	50	48	52	N48	A	A	A	58	46	63	A	A	59	50	A	A	A	42
12	40	41	34	33	37	33	36	A	56	A	A	A	A	64	A	A	56	A	49	51	58	A	A	A
13	A	A	A	35	A	37	41	55	61	47	A	A	A	A	A	A	73	73	69	69	71	63	A	A
14	A	A	A	38	B	B34	42	49	A	A	A	A	A	A	A	A	37	A	A	48	50	A	40	38
15	A	A	A	A	B27	33	42	60	A	A	A	A	A	55	A	A	51	A	A	A	61	A	50	A
16	39	A	A	A	33	33	43	60	A	43	A	47	A	A	A	45	78	47	A	A	A	55	48	A
17	A	A	A	A	A	A	A	A	A	A	A	A	A	A	53	57	66	65	71	73	66	46	A	32
18	A	A	33	31	34	30	49	A	54	56	51	A	A	37	A	A	A	A	A	A	A	A	57	53
19	51	43	40	40	39	35	A	55	56	A	A	A	51	A	81	71	60	56	63	69	72	63	54	51
20	52	44	46	40	37	34	38	59	38	54	53	A	A	A	A	A	63	A	A	64	A	N61	51	A
21	51	47	42	A	39	A	49	56	54	48	A	A	66	55	A	A	A	A	76	72	69	A	51	A
22	49	43	41	39	34	34	43	A	A	A	68	67	A	69	A	63	A	59	A	A	A	A	A	48
23	48	47	47	49	A	A	37	58	A	61	A	A	71	A	69	78	88	A	85	81	92	A	58	A
24	47	55	A	A	A	36	A	57	77	62	A	A	A	55	58	70	66	66	63	64	74	59	47	A
25	47	50	51	42	37	36	45	69	59	A	A	A	A	56	A	66	63	73	A	77	A	A	A	A
26	A	A	A	40	39	37	43	61	69	A	A	A	A	67	77	75	77	75	72	63	65	58	A	47
27	A	53	A	49	43	38	40	52	A	61	47	36	A	A	A	A	66	44	A	A	71	71	63	61
28	60	56	55	53	37	34	48	59	60	53	52	49	A	A	A	A	61	70	68	76	81	87	68	60
29	56	55	49	A	38	33	53	67	51	A	A	A	A	A	53	49	50	51	53	55	61	60	58	53
30	50	43	42	41	A	37	47	55	55	A	A	52	A	49	58	A	52	53	A	A	59	54	43	39
31	37	A	39	35	A	37	42	A	A	A	A	53	A	58	64	A	A	69	89	88	70	61	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	20	19	21	19	25	26	23	21	16	8	11	8	17	16	16	26	20	19	21	23	20	22	18
MED	50	47	46	40	37	36	43	56	56	56	52	49	52	56	58	64	63	62	64	64	65	58	54	50
U Q	52	54	51	46	41	37	48	59	60	62	56	55	60	63	67	73	73	71	74	76	71	61	57	53
L Q	43	43	40	37	37	34	42	50	52	49	51	46	49	51	51	50	56	54	61	53	57	54	49	42

HOURLY VALUES OF fEs AT Yamagawa

JUL.2021

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

HD	00	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	40	50	28	59	33	33	43	52	126	64	58	71	50	69	58	53	71	48	36	34	G	43	33
2	72	92	54	73	60	44	40	50	70	72	57	75	87	106	110	106	40	38	33	36	35	G	G	40
3	34	54	71	57	50	43	73	71	48	50	88	56	71	40	48	53	58	129	73	71	60	48	46	54
4	43	38	G	37	34	40	30	40	105	50	47	43	41	36	49	53	55	58	49	35	32	33	23	G
5	G	G	40	28	30	57	43	43	46	54	57	47	52	155	49	62	108	44	36	61	23	G	31	28
6	G	30	G	G	39	G	32	37	38	56	61	74	63	56	78	66	49	85	50	48	46	G	G	G
7	40	41	60	49	56	34	40	56	46	91	145	111	116	55	92	69	49	91	112	126	85	55	36	70
8	38	33	G	G	G	24	35	57	55	62	69	45	83	38	42	40	43	39	G	34	27	G	22	23
9	G	56	44	71	72	72	49	115	122	92	104	63	84	92	126	134	71	88	116	89	41	41	G	G
10	G	34	84	83	59	28	48	47	49	85	46	60	52	51	41	46	44	42	45	34	33	56	71	46
11	65	54	31	53	38	38	G	40	48	49	132	86	60	58	41	50	113	153	56	50	54	41	58	39
12	35	35	33	G	G	28	36	84	56	91	91	90	84	56	71	84	52	74	35	34	52	84	114	83
13	60	72	74	28	58	41	31	52	56	113	130	148	124	71	60	61	46	48	50	45	41	33	31	48
14	60	55	56	35	B	B	40	48	61	112	110	76	70	49	100	99	83	111	67	85	33	69	40	45
15	59	38	39	37	B	G	44	56	79	91	90	95	84	49	60	73	44	72	74	81	28	60	72	106
16	23	87	53	56	34	G	G	40	78	114	90	95	70	163	152	128	124	128	132	115	81	53	35	88
17	60	46	43	80	72	59	58	61	95	115	167	112	104	102	45	42	53	45	40	48	50	40	41	G
18	43	56	G	G	G	G	31	66	49	45	50	52	67	136	156	149	139	151	90	109	59	56	43	58
19	32	35	38	G	G	G	60	44	80	76	68	56	54	128	43	56	50	52	50	35	G	32	46	37
20	G	G	33	34	31	29	G	54	154	89	48	70	75	76	146	113	75	92	112	52	67	46	48	59
21	48	41	40	67	G	52	69	70	49	63	87	84	58	60	63	92	152	66	59	106	69	57	35	58
22	34	43	35	G	G	G	39	60	90	110	93	66	96	79	74	60	84	112	127	145	91	83	58	41
23	34	23	40	41	88	47	58	56	89	54	60	56	96	70	68	61	58	91	52	106	111	92	43	91
24	36	44	58	94	70	G	108	38	57	53	56	57	49	44	44	44	38	61	41	40	G	G	G	48
25	46	41	G	G	G	30	40	48	77	116	135	115	70	54	66	48	54	55	116	92	92	60	70	84
26	58	56	46	44	41	G	41	40	45	60	70	89	83	51	62	67	59	64	56	44	39	69	60	G
27	69	50	58	G	G	G	G	50	85	58	96	110	163	149	115	115	92	144	145	113	84	33	G	G
28	G	G	G	G	G	G	G	40	49	50	54	112	61	108	112	93	60	60	48	41	41	G	28	G
29	G	46	41	40	G	28	32	43	57	95	63	62	48	50	52	46	38	44	42	34	31	33	23	39
30	39	37	54	35	70	G	G	38	50	55	58	56	42	N	48	68	43	44	91	107	49	46	34	40
31	27	58	32	45	104	G	58	91	113	150	142	91	56	46	56	92	79	51	67	70	54	43	71	67
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	29	30	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31
MED	38	41	40	37	38	28	40	50	57	76	70	74	70	57	63	66	55	66	56	52	46	43	40	41
U Q	58	55	54	56	59	41	49	60	85	110	104	95	84	102	100	93	83	92	91	106	67	57	58	59
L Q	23	35	32	G	G	G	31	40	49	54	57	56	56	50	48	53	46	48	45	36	33	32	23	23

HOURLY VALUES OF fmin AT Yamagawa

JUL.2021

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	15	16	15	15	15	15	16	19	16	21	22	23	23	21	23	17	16	13	14	15	16	15	17
2	16	14	15	14	15	15	15	16	15	21	21	20	19	24	21	22	19	15	15	14	15	16	16	19
3	15	15	16	15	15	15	16	15	20	22	21	22	20	21	23	19	20	11	14	14	16	15	15	15
4	15	15	16	14	16	15	15	15	16	21	21	23	21	23	21	21	16	17	13	15	16	16	15	15
5	15	17	15	15	15	14	15	15	14	19	19	21	21	15	24	19	19	17	16	15	16	26	16	16
6	15	15	15	17	15	15	16	14	15	17	21	21	20	21	19	21	16	15	13	13	15	15	16	15
7	15	15	15	15	14	15	14	15	15	19	17	21	22	35	17	17	17	11	12	5	15	15	15	15
8	16	15	15	16	15	15	15	15	15	21	21	23	21	23	20	21	17	17	15	15	16	17	16	16
9	16	15	15	16	15	15	14	13	5	18	21	23	19	20	10	16	15	20	5	14	16	15	15	15
10	16	15	17	13	18	17	18	14	16	19	19	23	23	22	22	20	19	16	12	14	15	15	15	15
11	15	16	16	14	15	16	14	14	16	19	15	20	20	22	21	22	22	5	14	15	15	15	16	15
12	15	16	15	16	14	16	15	11	15	23	22	21	22	23	18	19	19	19	15	16	15	15	12	16
13	15	16	15	16	15	15	15	14	15	21	14	19	14	15	23	21	15	14	13	15	15	16	16	16
14	17	16	15	15	B 17	B	15	16	18	19	21	19	22	19	18	22	18	11	16	14	15	16	15	16
15	16	15	15	17	B 15	15	13	14	15	15	21	22	22	23	19	17	18	14	11	15	16	15	17	17
16	16	15	16	15	15	15	14	15	13	15	16	21	22	10	15	20	20	13	8	13	13	16	16	16
17	15	15	15	16	16	15	15	14	15	12	13	21	20	16	19	15	21	17	14	14	15	15	15	15
18	20	15	16	18	15	14	15	17	14	16	17	21	21	18	5	21	12	15	13	13	14	15	15	15
19	17	15	15	15	14	15	17	14	19	18	21	23	22	19	22	19	21	18	15	13	16	15	15	15
20	16	15	16	16	15	16	26	15	14	20	20	22	22	21	16	16	17	15	10	15	14	15	16	15
21	15	16	15	16	16	15	15	13	15	18	17	23	23	23	21	18	19	18	13	8	12	16	15	16
22	16	15	16	16	16	15	16	15	16	17	17	21	22	22	23	23	19	16	15	9	12	16	15	16
23	15	15	15	17	8	15	14	14	19	20	19	23	21	23	20	21	18	12	15	16	15	7	15	13
24	15	16	15	8	16	15	16	15	18	20	22	23	23	22	21	22	21	17	12	14	15	16	16	15
25	16	15	16	16	14	15	15	16	15	18	17	20	22	22	22	20	16	14	12	13	14	17	17	15
26	16	15	15	16	15	15	16	18	17	21	23	23	22	23	23	21	21	16	13	13	15	17	15	15
27	14	14	16	22	14	15	15	14	15	19	17	21	71	17	21	20	20	5	5	9	16	15	16	16
28	16	16	16	15	16	16	15	15	15	19	18	21	21	21	21	20	17	16	14	15	15	17	15	15
29	16	15	15	15	15	16	17	14	15	19	22	21	21	24	23	20	16	18	12	16	15	16	16	15
30	15	15	15	15	15	15	21	15	16	18	21	21	23	22	22	18	18	17	15	14	14	15	15	15
31	16	17	15	16	19	15	15	15	15	7	25	22	21	23	19	21	16	14	13	15	15	15	16	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	15	15	16	15	15	15	15	15	19	21	21	22	22	21	20	18	16	13	14	15	15	15	15
U Q	16	16	16	16	16	15	16	15	16	20	21	23	22	23	22	21	20	17	15	15	16	16	16	16
L Q	15	15	15	15	15	15	15	14	15	17	17	21	21	19	19	19	16	14	12	13	15	15	15	15

HOURLY VALUES OF foF2 AT Okinawa

JUL.2021

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	49	53	53	47	52	34	44	54	75	A	A	A	A	66	82	89	97	83	80	75	64	58	54	41
2	55	A	A	A	35	37	43	51	A	A	A	A	A	A	A	70	74	71	75	65	59	59	61	61
3	55	56	53	47	A	44	A	A	A	67	60	61	62	55	57	A	A	A	48	A	76	57	57	52
4	51	53	53	44	44	37	40	61	57	51	55	57	A	A	53	68	67	70	62	54	61	56	50	46
5	49	50	42	37	34	A	41	A	50	54	A	A	A	50	63	75	45	65	63	82	74	69	62	61
6	55	53	51	42	39	37	48	47	67	54	58	59	A	A	55	A	71	89	91	86	65	54	51	50
7	A	40	A	36	41	33	42	54	A	A	A	A	63	A	75	A	A	A	57	A	69	70	62	62
8	57	55	43	46	41	33	38	53	A	A	A	A	57	67	77	93	96	91	66	52	54	57	56	47
9	41	43	43	39	A	A	A	A	51	A	A	A	A	A	63	A	65	A	A	A	78	51	A	A
10	27	31	33	A	A	25	A	A	52	68	A	A	A	A	59	52	49	65	67	69	59	50	A	A
11	A	A	A	A	B 25	A	42	45	51	A	50	A	56	57	A	A	A	61	55	53	61	50	41	36
12	38	36	35	35	33	32	41	A	A	A	A	A	A	A	67	74	A	A	67	71	67	62	A	A
13	A	A	33	A	N 24	26	34	58	54	57	A	57	A	A	49	68	73	79	83	75	87	76	33	A
14	A	A	A	A	A	N 24	A	A	A	A	A	53	A	A	A	A	A	A	A	74	57	A	41	A
15	A	A	A	A	A	A	44	53	A	A	A	57	A	A	A	A	50	53	68	74	63	58	55	A
16	A	42	A	A	A	25	40	51	65	A	A	A	67	71	62	37	65	73	79	83	74	48	37	35
17	36	A	36	38	A	A	A	48	A	A	A	A	49	A	65	66	80	83	86	89	83	A	34	31
18	32	33	B 34	30	30	B 25	35	51	60	61	50	48	67	61	51	A	72	73	85	A	72	59	57	49
19	38	37	34	34	35	35	44	48	A	A	51	A	63	77	86	84	77	75	83	90	A	77	47	50
20	43	43	A	41	37	A	A	46	53	A	68	A	A	A	A	73	73	81	62	A	77	66	A	A
21	49	43	41	39	A	37	43	A	59	53	53	A	70	72	A	52	65	A	83	78	67	A	A	A
22	50	44	41	A	A	32	34	A	A	A	A	A	A	90	87	89	84	66	A	A	83	A	49	46
23	45	42	44	50	35	29	39	63	A	A	59	56	63	78	82	91	96	105	106	103	104	78	A	A
24	51	A	A	A	A	A	35	75	73	A	A	53	A	63	76	81	82	79	83	91	91	50	38	38
25	38	37	34	33	33	31	48	65	56	53	A	49	A	129	38	A	91	97	99	89	65	56	A	45
26	41	A	37	37	37	34	35	57	58	52	A	65	79	105	115	117	111	103	100	106	108	66	50	A
27	50	55	51	40	40	37	39	57	69	56	A	A	56	66	A	48	83	91	101	95	A	71	60	61
28	58	54	54	54	45	34	45	57	A	55	64	50	A	A	68	A	A	86	85	89	89	95	63	56
29	56	53	49	42	38	37	42	73	58	50	A	A	A	48	50	53	51	56	57	59	59	59	58	55
30	51	44	47	34	A	35	39	59	56	53	A	60	52	50	59	64	69	71	91	65	63	39	A	A
31	42	37	37	37	A	33	A	51	63	A	A	A	A	58	68	69	76	91	99	95	79	64	A	62
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	23	23	22	19	24	24	23	19	14	10	13	13	18	24	21	25	25	28	25	29	27	22	20
MED	49	43	42	39	37	34	41	54	58	54	56	57	63	66	64	70	73	79	82	78	69	59	52	50
U Q	53	53	51	44	41	37	43	59	65	57	60	59	67	77	76	86	83	90	88	89	81	69	58	58
L Q	39	37	35	36	33	30	38	51	53	53	51	51	56	57	56	58	65	68	64	67	62	54	41	43

HOURLY VALUES OF fEs AT Okinawa

JUL.2021

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	26	28	G	28	31	50	58	58	96	75	57	42	35	48	78	73	41	60	46	G	G	36
2	33	91	61	40	G	80	28	40	79	78	90	126	116	114	69	55	67	38	39	29	25	G	G	G
3	32	56	39	59	57	48	39	56	91	60	48	55	46	50	63	62	69	68		78	44	26	40	27
4	34	25	G	G	G	27	37	45	51	50	46	46	54	45	51	47	48	45	34	44	35	28	26	26
5	G	G	G	25	34	40	33	54	45	51	88	96	92	49	52	72	100	41	36	29	35	35	G	24
6	G	G	G	G	G	G	32	36	41	38	48	36	76	81	50	73	56	43	44	57	33	32	34	27
7	36	34	38	G	G	G	33	33	79	125	166	60	58	94	76	107	71	70	70	88	92	38	44	40
8	34	33	32	G	G	G	G	53	89	102	146	111	50	60	52	46	42	47	G	G	24	G	41	G
9	49	66	33	54	91	106	128	122	128	69	164	146	151	73	60	162	67	77	163	127	59	48	25	30
10	G	G	128	38	65	G	67	50	71	63	104	47	59	51	48	45	43	46	38	30	28	36	54	48
11	36	46	60	36	B	36	28	36	44	160	53	78	50	58	153	146	116	57	36	35	49	58	33	G
12	G	G	G	31	G	G	32	70	127	125	98	111	70	65	146	108	97	108	49	39	38	31	30	93
13	103	41	G	36	G	G	30	43	47	67	85	67	52	50	38	62	48	42	52	43	41	60	31	48
14	57	58	48	54	34	38	77	50	93	105	92	91	126	70	153	133	102	122	110	93	91	70	57	48
15	49	31	58	65	36	28	31	50	92	74	116	124	69	174	115	63	49	40	41	38	G	G	G	94
16	60	109	60	43	59	132	32	43	49	147	156	152	128	74	85	138	73	52	44	91	92	44	24	28
17	G	94	33	G	70	108	57	51	69	70	65	91	46	91	46	56	43	44	32	34	29	40	G	G
18	G	G	B	G	G	B	26	33	44	45	46	98	77	90	85	145	48	50	106	145	58	45	39	46
19	G	23	G	G	G	40	G	32	58	69	52	88	58	55	49	47	38	54	55	52	91	60	G	39
20	36	38	73	36	32	29	35	43	43	92	48	55	70	77	108	56	45	50	93	148	60	60	93	40
21	32	43	29	G	62	35	53	71	39	64	102	52	51	53	96	52	52	155	94	72	45	78	57	41
22	33	25	G	69	73	59	55	78	67	128	133	116	116	56	50	50	67	54	146	149	92	60	58	44
23	32	29	34	G	G	G	28	45	91	72	78	49	50	52	50	57	57	67	34	56	33	56	45	117
24	46	135	91	116	123	60	28	93	90	65	112	78	61	53	48	52	48	41	67	52	40	28	29	G
25	33	G	G	G	26	27	G	36	66	47	78	135	152	146	150	127	61	57	41	43	30	40	82	31
26	33	47	115	G	G	30	93	152	88	49	62	60	52	65	58	59	51	45	46	27	36	32	33	60
27	56	G	G	G	G	G	28	38	47	40	62	54	54	147	89	135	60	74	164	143	128	60	36	34
28	26	33	33	G	G	G	G	41	58	48	47	49	69	151	112	150	107	57	59	54	48	29	G	G
29	G	G	G	26	30		132	38	55	55	69	51	60	51	51	44	45	51	46	41	56	39	45	33
30	40	G	36	56	59	130	26	44	48	81	70	48	46	49	48	51	51	46	36	40	28	35	53	91
31	32	26	G	40	163	G	36	58	55	55	64	176	179	51	57	48	51	56	48	41	32	31	90	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	30	31	30	29	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31
MED	33	31	33	28	28	29	32	45	58	67	78	78	60	60	58	59	56	52	46	52	41	38	34	36
U Q	40	47	58	43	59	53	53	56	89	92	104	111	92	90	96	127	71	68	70	88	59	58	53	48
L Q	G	G	G	G	G	G	28	38	47	51	53	52	52	51	50	50	48	45	38	38	32	29	24	26

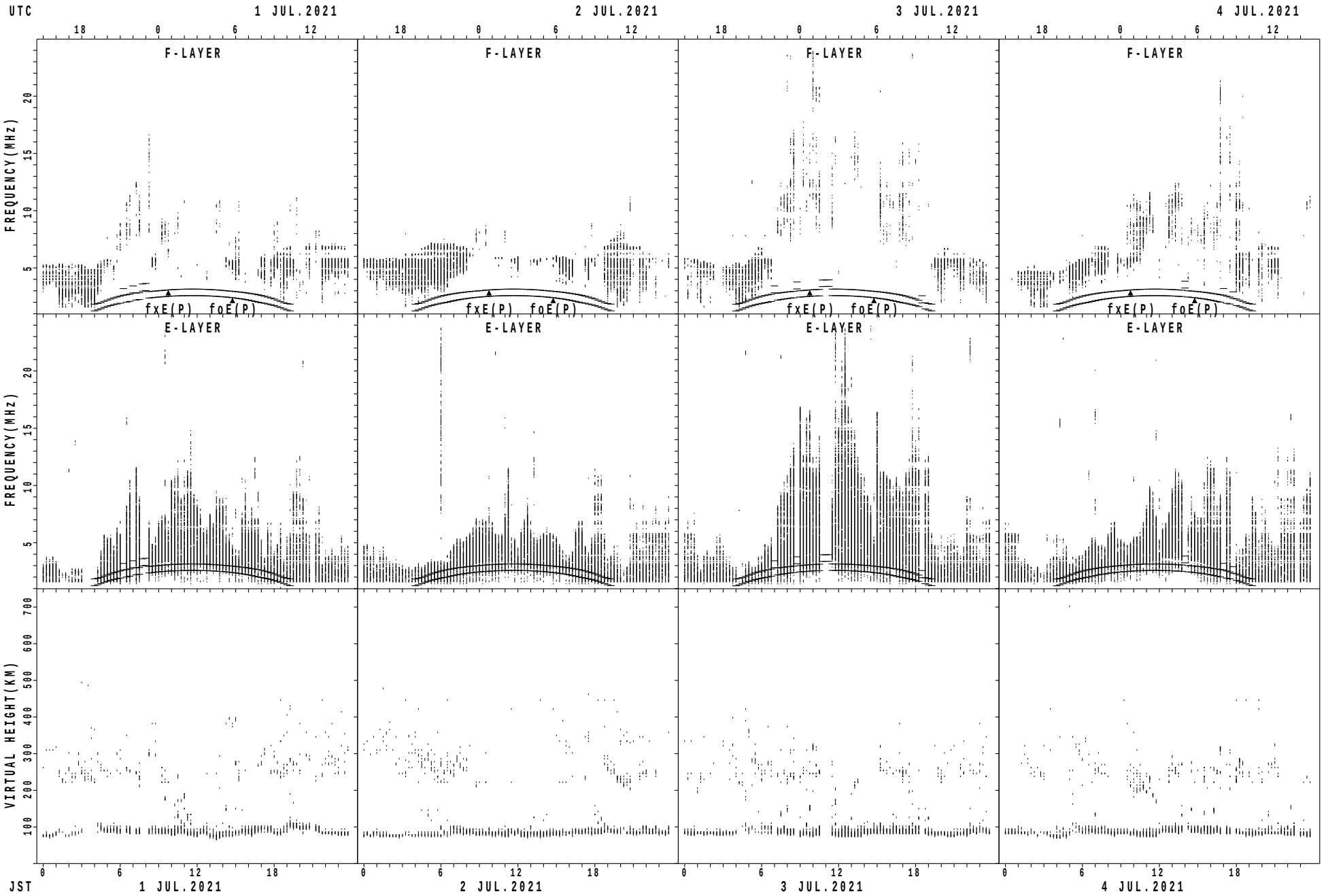
HOURLY VALUES OF fmin AT Okinawa

JUL.2021

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

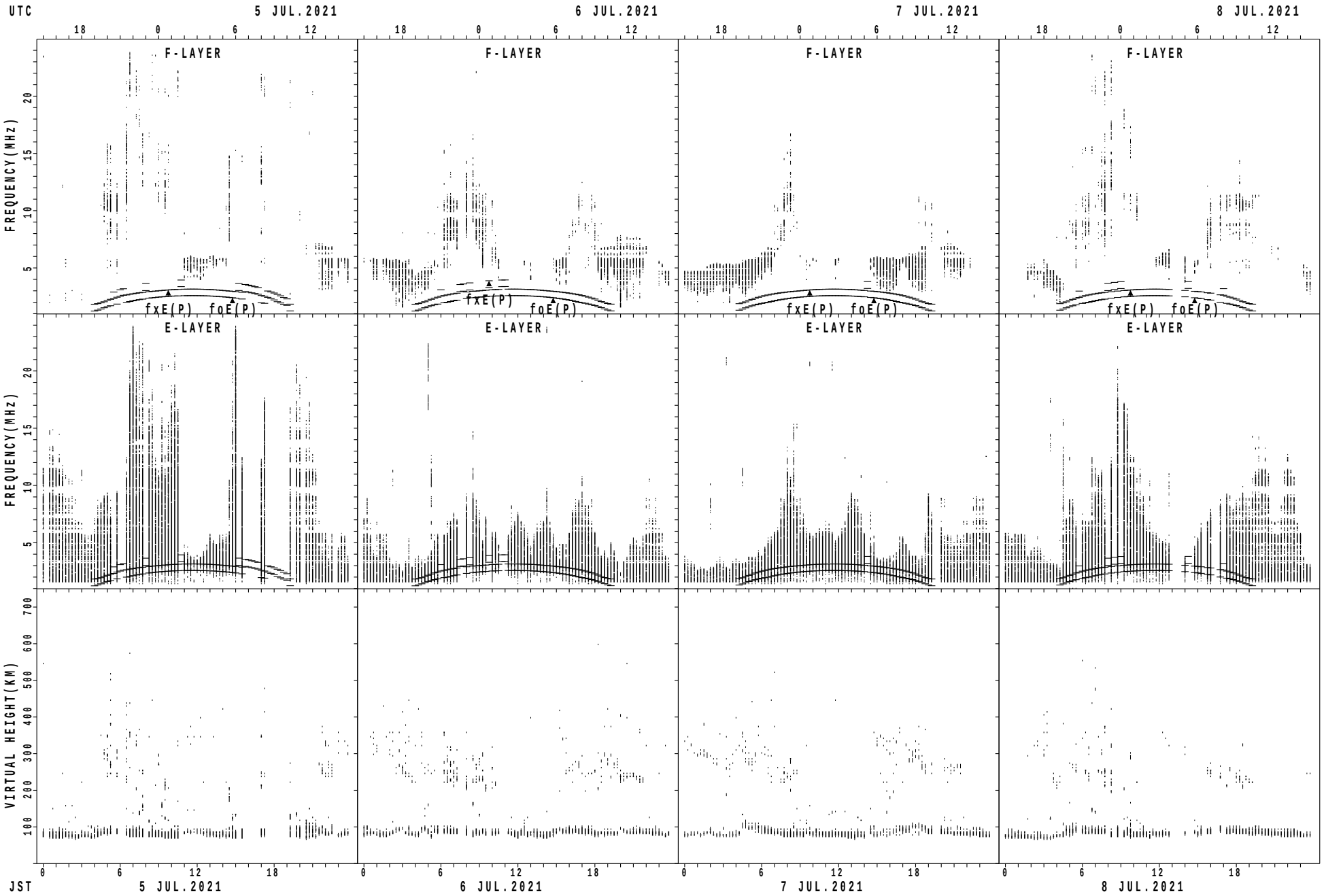
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	16	16	15	16	15	14	14	17	19	19	21	18	16	18	15	13	13	14	16	15	14	15
2	15	14	15	16	15	14	15	15	14	17	17	11	17	18	18	16	16	13	13	14	15	15	14	14
3	15	15	15	15	15	15	14	15	14	17	18	20	19	21	22	17	16	13	8	14	15	16	16	15
4	17	15	15	14	15	17	15	14	15	18	18	24	21	21	18	21	15	15	14	14	16	15	16	15
5	14	15	16	15	16	15	15	13	13	14	15	15	15	17	17	17	14	14	15	15	15	16	16	16
6	15	14	16	15	15	15	15	15	14	14	16	17	21	18	21	17	14	15	13	15	16	17	17	15
7	15	15	15	15	15	15	16	16	13	11	5	19	17	18	16	16	15	13	13	14	13	17	15	15
8	15	16	16	16	14	14	15	14	13	14	15	19	18	18	19	15	15	15	15	15	15	16	15	15
9	15	15	16	15	14	14	5	50	14	13	5	31	19	16	16	16	15	15	9	5	16	16	15	16
10	15	15	15	15	17	15	15	14	13	18	16	21	20	22	17	17	16	14	13	15	16	15	15	16
11	15	14	14	15	B	16	15	15	14	7	16	15	18	19	17	15	14	14	15	16	15	15	16	16
12	15	16	15	16	16	16	15	13	11	7	15	18	20	22	18	14	18	14	14	15	15	16	16	16
13	13	15	16	15	15	15	15	15	14	15	18	18	18	18	18	15	15	13	13	15	15	15	15	15
14	15	15	15	15	17	15	15	15	16	13	16	18	17	16	14	10	12	70	5	14	15	17	16	15
15	15	17	16	16	16	16	15	15	14	14	16	19	18	15	15	16	15	13	14	14	15	17	15	12
16	14	14	15	15	15	15	17	14	14	14	11	79	17	17	17	9	12	13	13	15	16	16	15	16
17	16	14	17	16	17	6	15	14	14	14	17	12	19	13	17	17	15	14	15	15	16	15	16	15
18	15	15	B 15	17	14	B 15	15	16	15	18	19	21	17	17	17	8	14	14	15	19	15	15	15	16
19	16	15	15	15	15	15	15	16	14	17	18	18	19	19	22	17	16	13	13	15	15	15	15	15
20	15	15	16	16	16	16	16	14	14	15	15	17	15	18	17	15	16	14	16	8	17	15	15	15
21	16	15	15	15	17	16	15	14	14	17	18	18	20	16	17	18	14	55	15	14	15	15	17	15
22	15	16	15	15	15	16	17	15	13	11	14	17	18	20	21	18	15	15	58	20	17	15	16	15
23	15	16	16	14	15	15	16	14	10	17	18	19	18	19	21	15	17	12	15	21	16	15	15	11
24	15	14	16	16	15	15	15	15	17	19	16	20	23	19	21	15	16	13	13	14	16	16	16	15
25	15	14	14	15	16	16	15	14	16	16	16	18	11	12	11	15	15	13	13	16	16	15	15	16
26	16	16	15	14	16	16	14	13	15	15	17	20	19	19	20	19	15	15	13	15	15	16	15	16
27	15	16	22	15	14	14	16	15	15	17	19	19	26	21	18	7	14	13	14	15	5	15	15	15
28	16	16	15	14	14	15	16	15	15	16	17	19	17	9	19	12	17	14	12	16	17	16	16	16
29	14	14	15	16	15		15	15	13	13	14	19	17	20	19	17	16	14	13	14	15	16	16	16
30	15	15	15	16	15	29	16	15	15	15	16	17	19	21	22	18	19	14	14	14	15	15	15	15
31	16	16	15	16	16	15	15	15	14	13	15	13	9	17	21	17	14	13	11	14	16	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	31	31	31	31	30	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	14	15	16	19	18	18	18	16	15	14	13	15	15	15	15	15
U Q	15	16	16	16	16	16	16	15	15	17	18	20	20	20	21	17	16	15	15	15	16	16	16	16
L Q	15	14	15	15	15	15	15	14	13	13	15	17	17	17	17	15	14	13	13	14	15	15	15	15

SUMMARY PLOTS AT Wakkanai



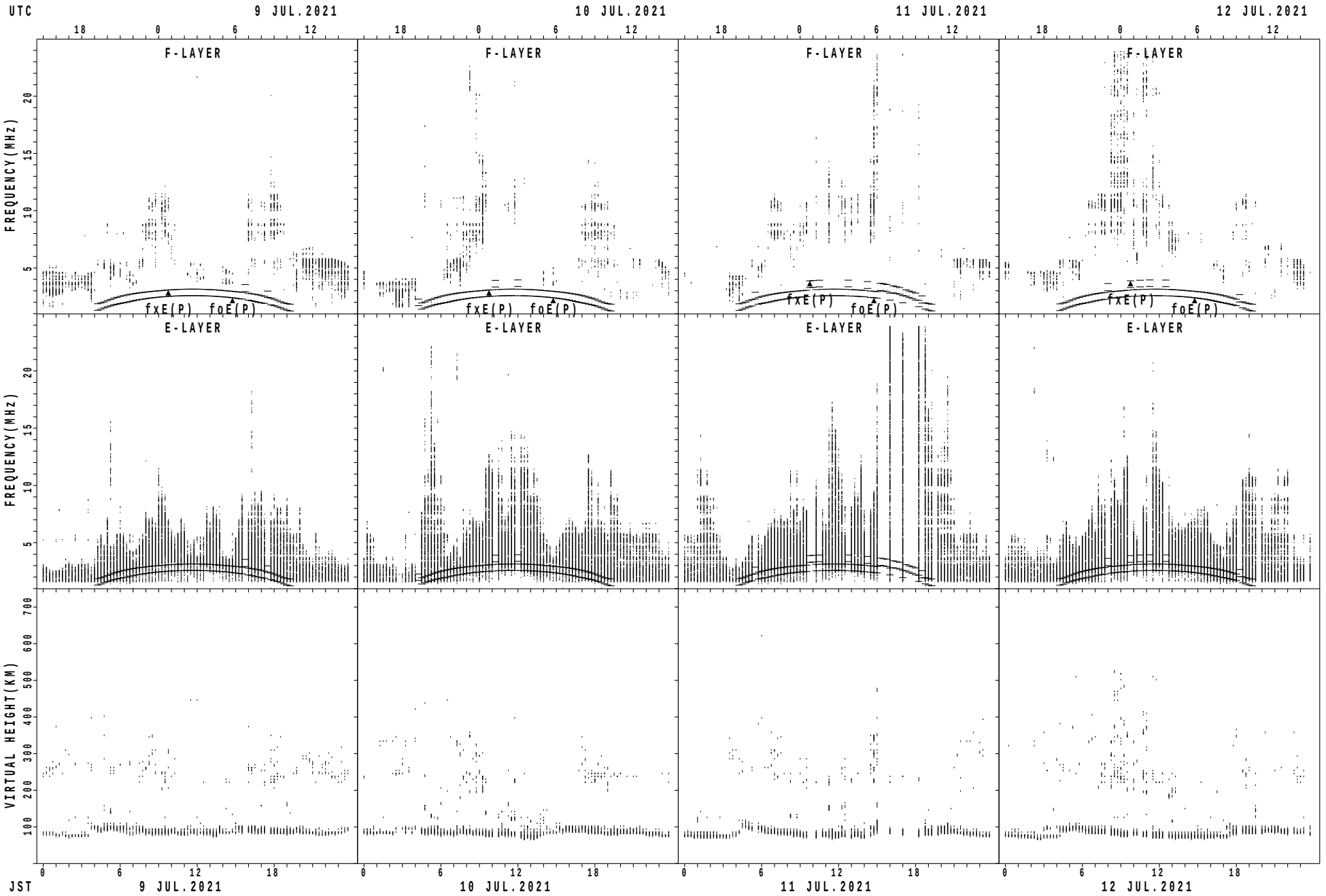
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



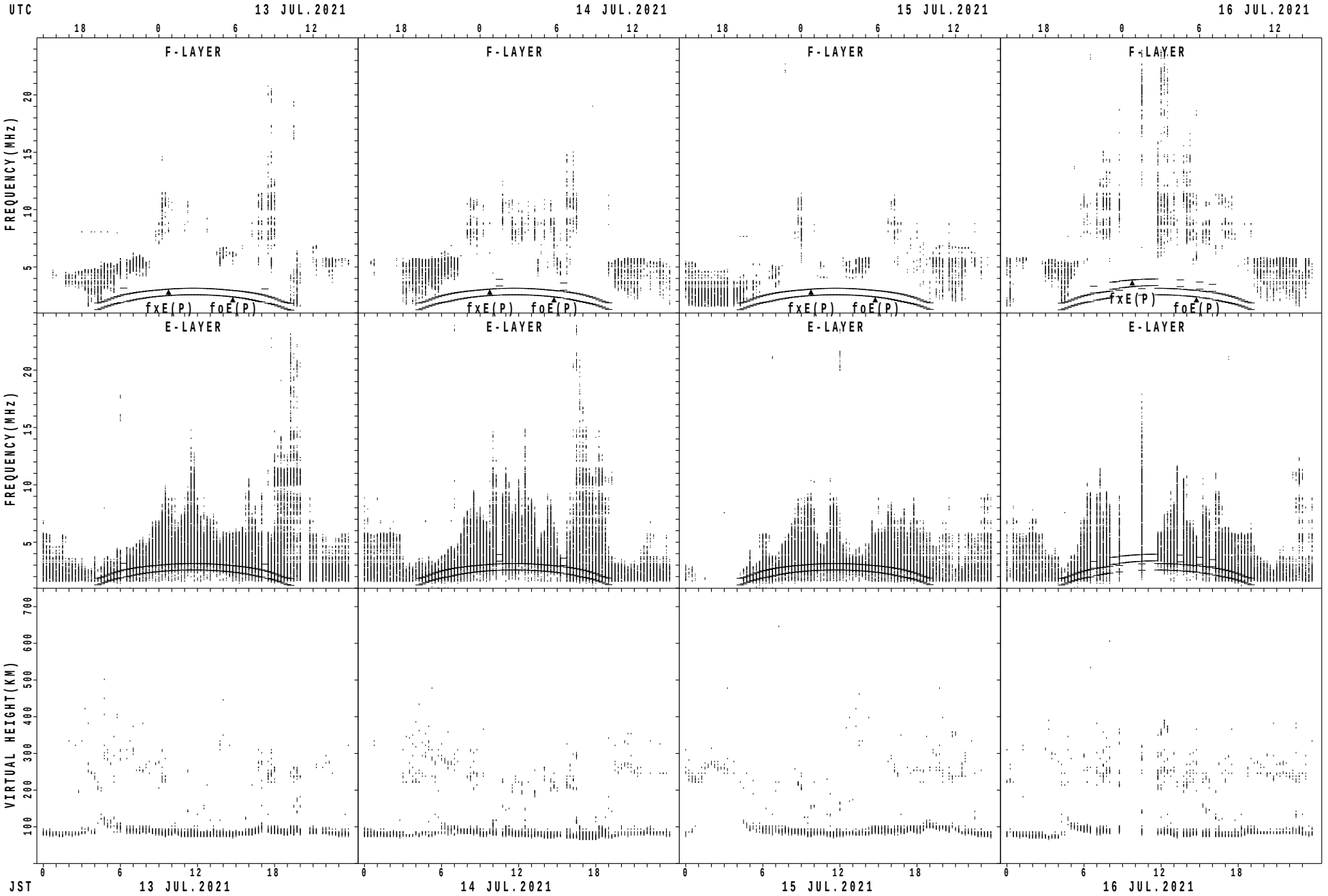
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



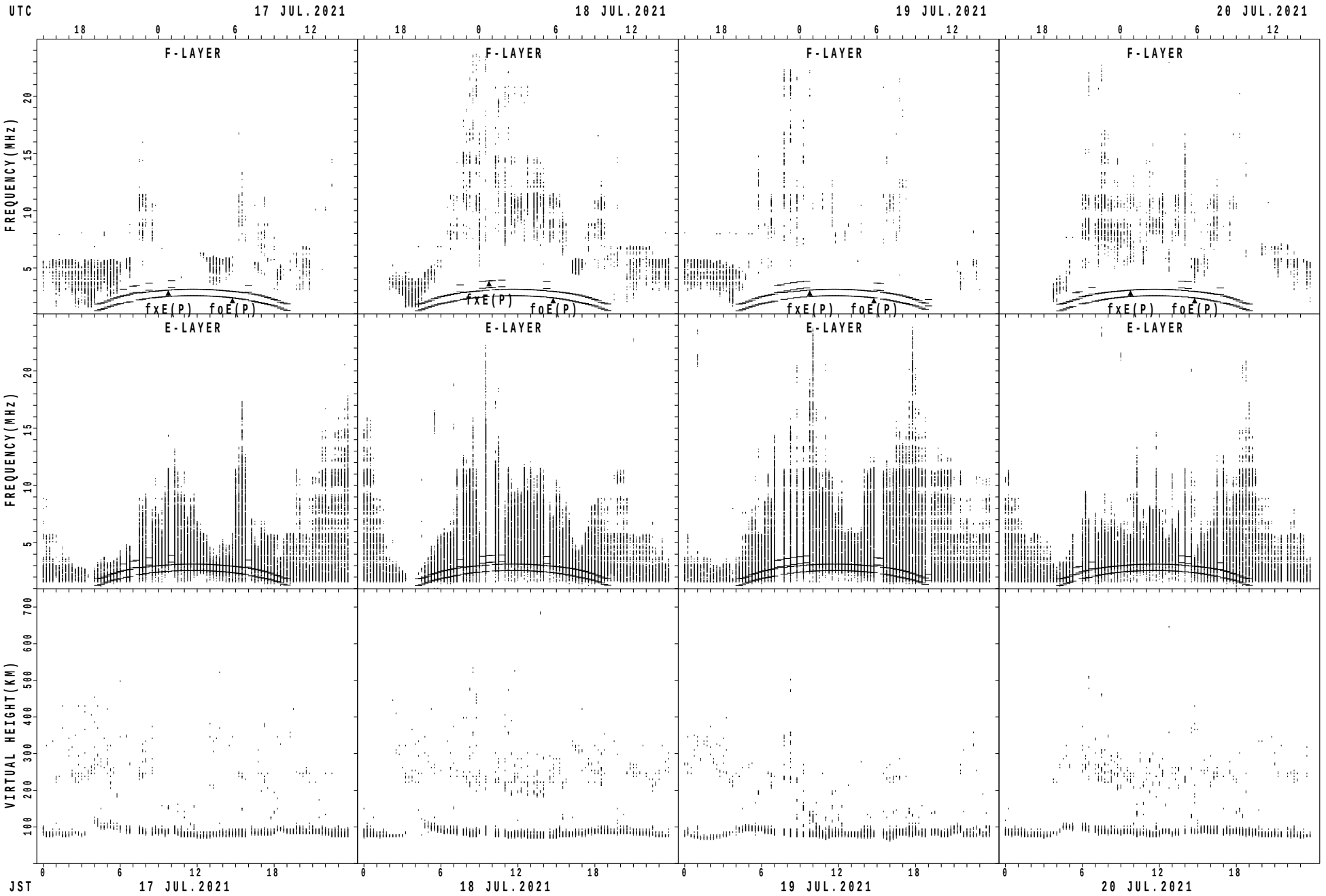
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



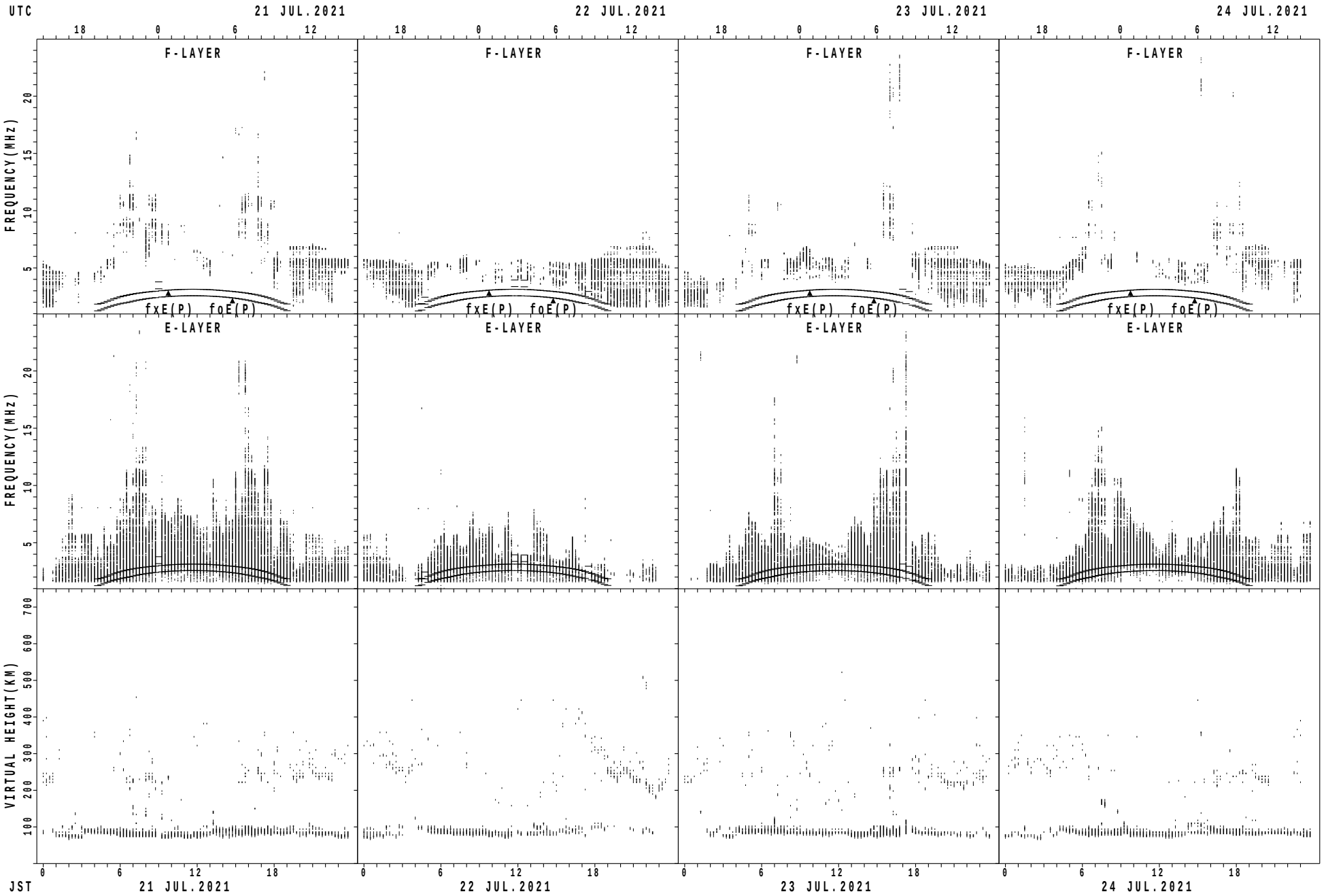
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



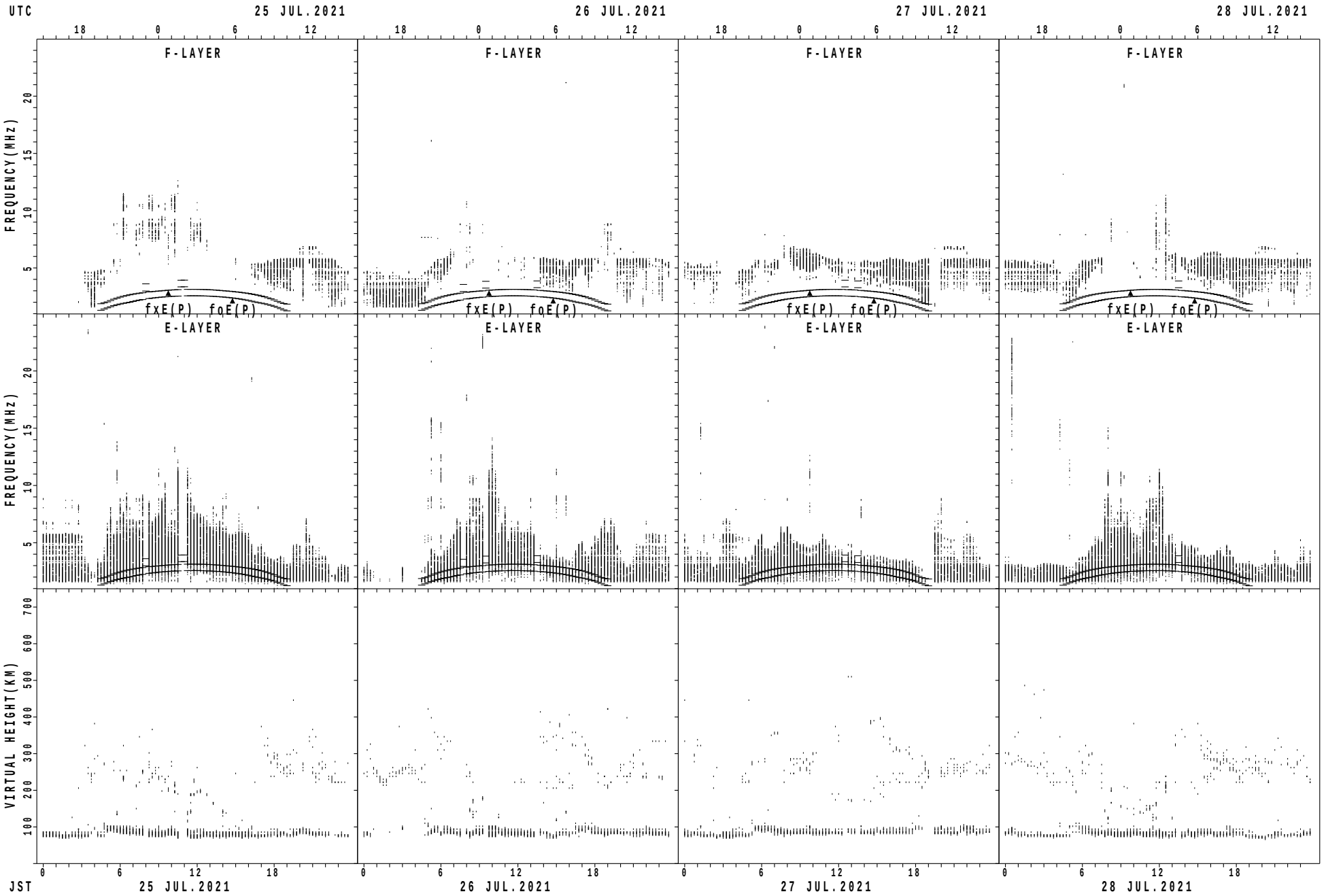
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



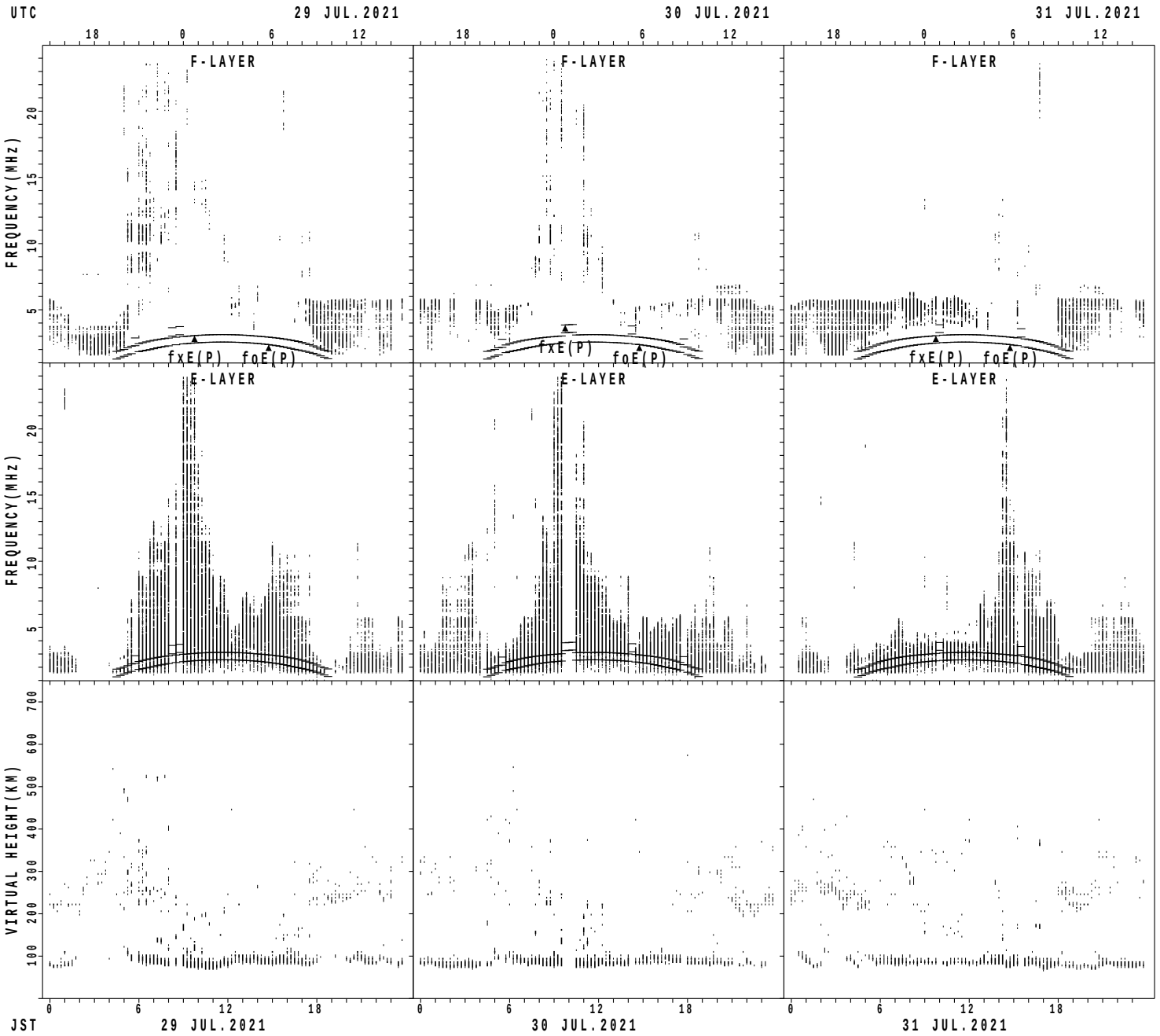
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



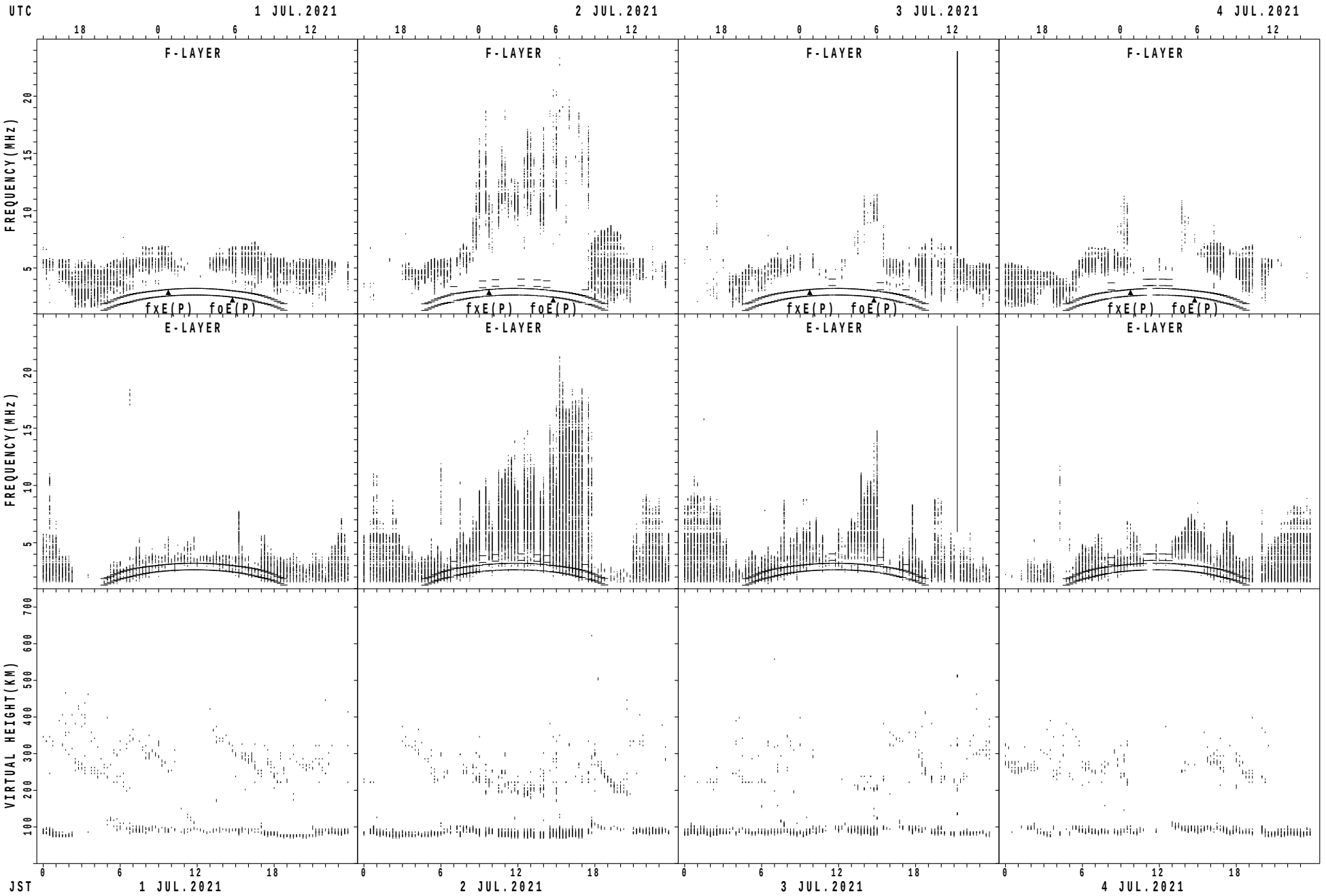
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



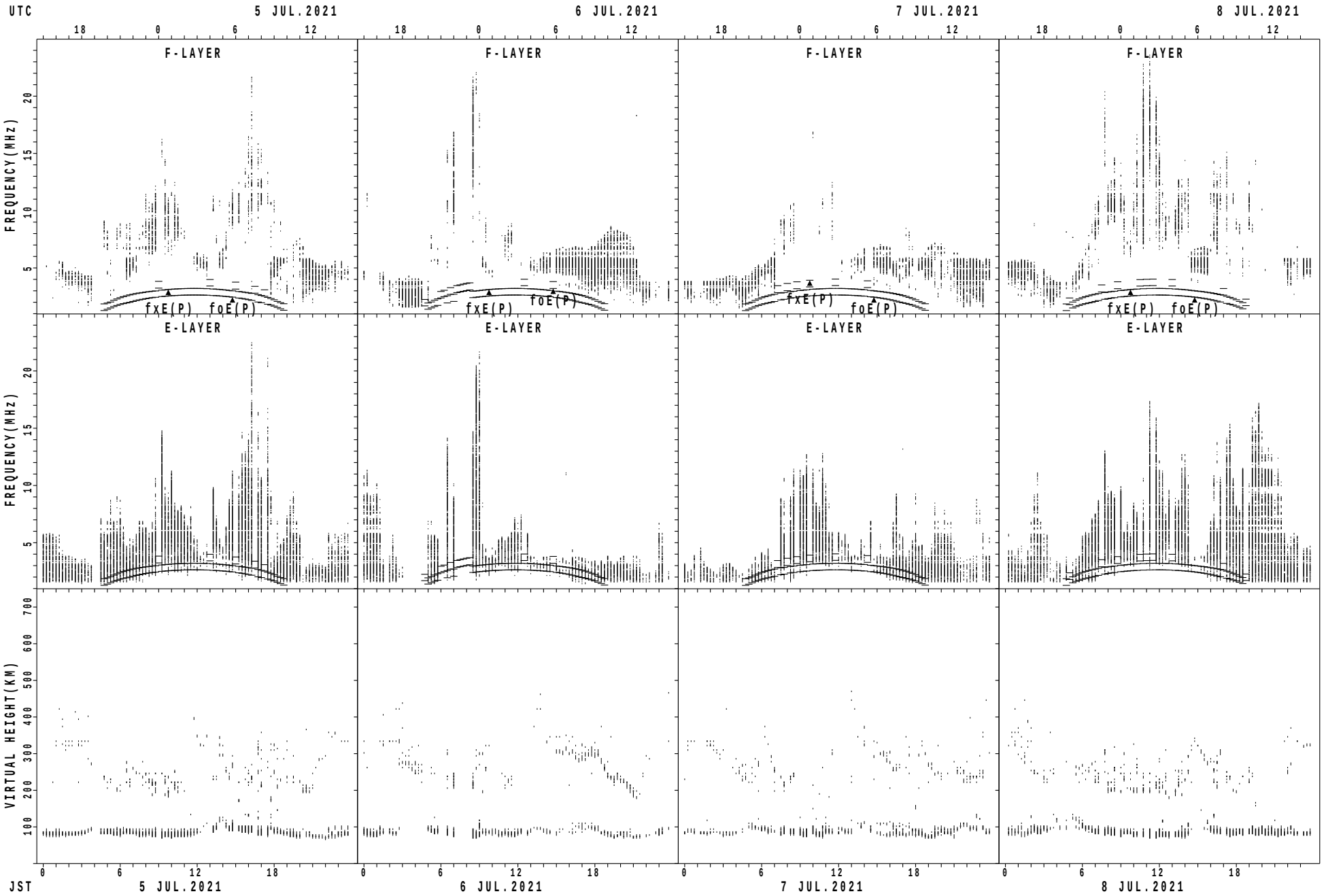
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



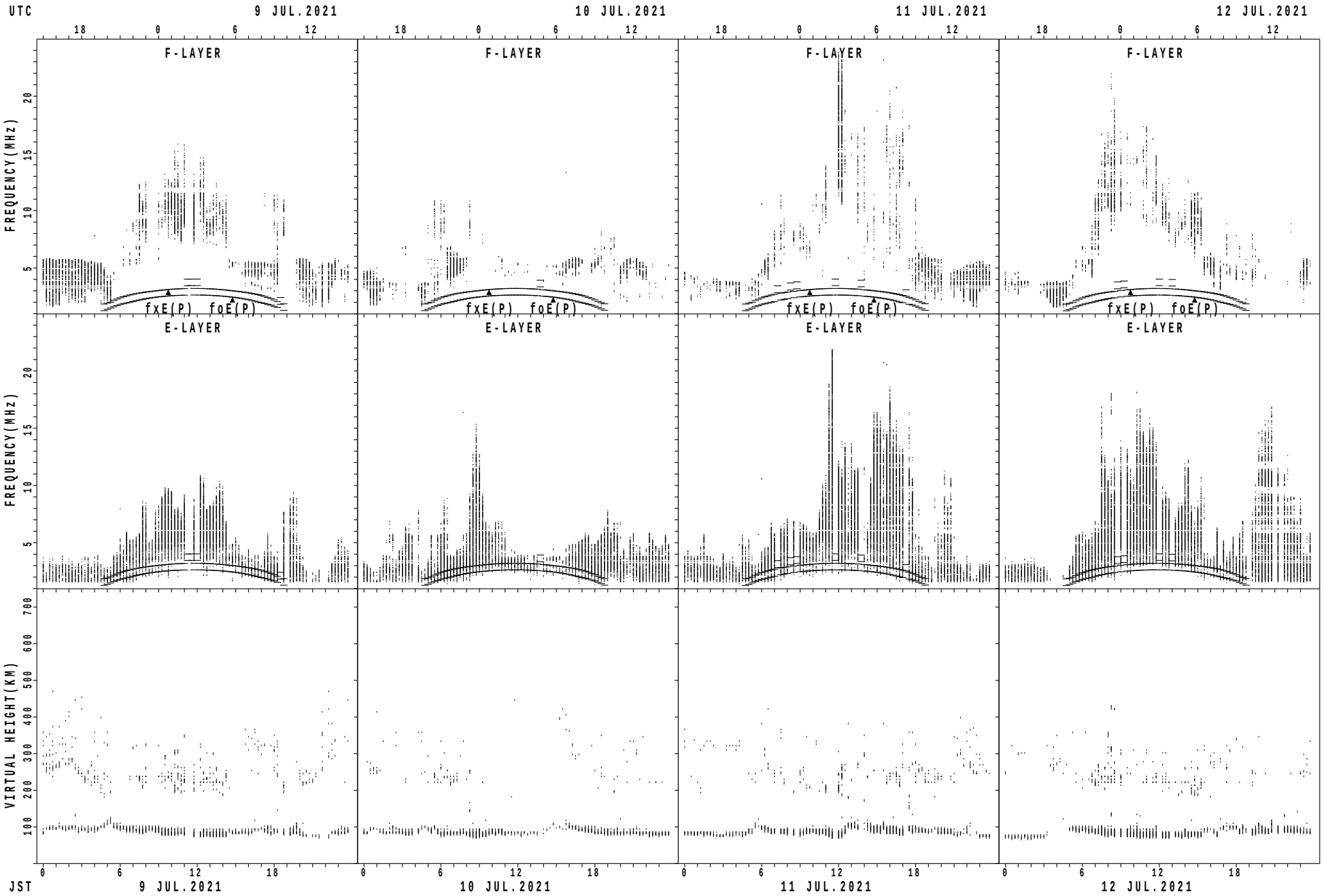
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



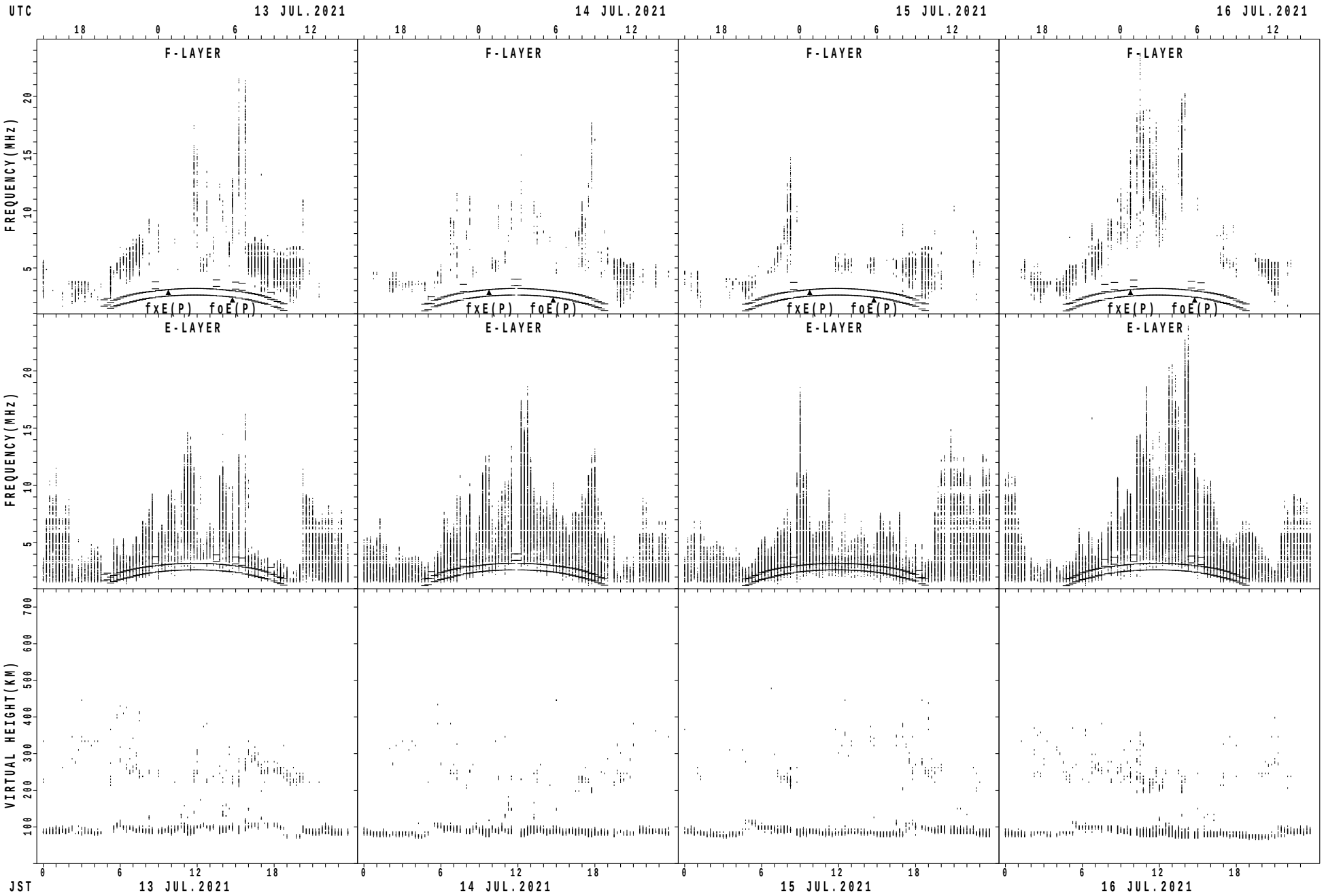
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



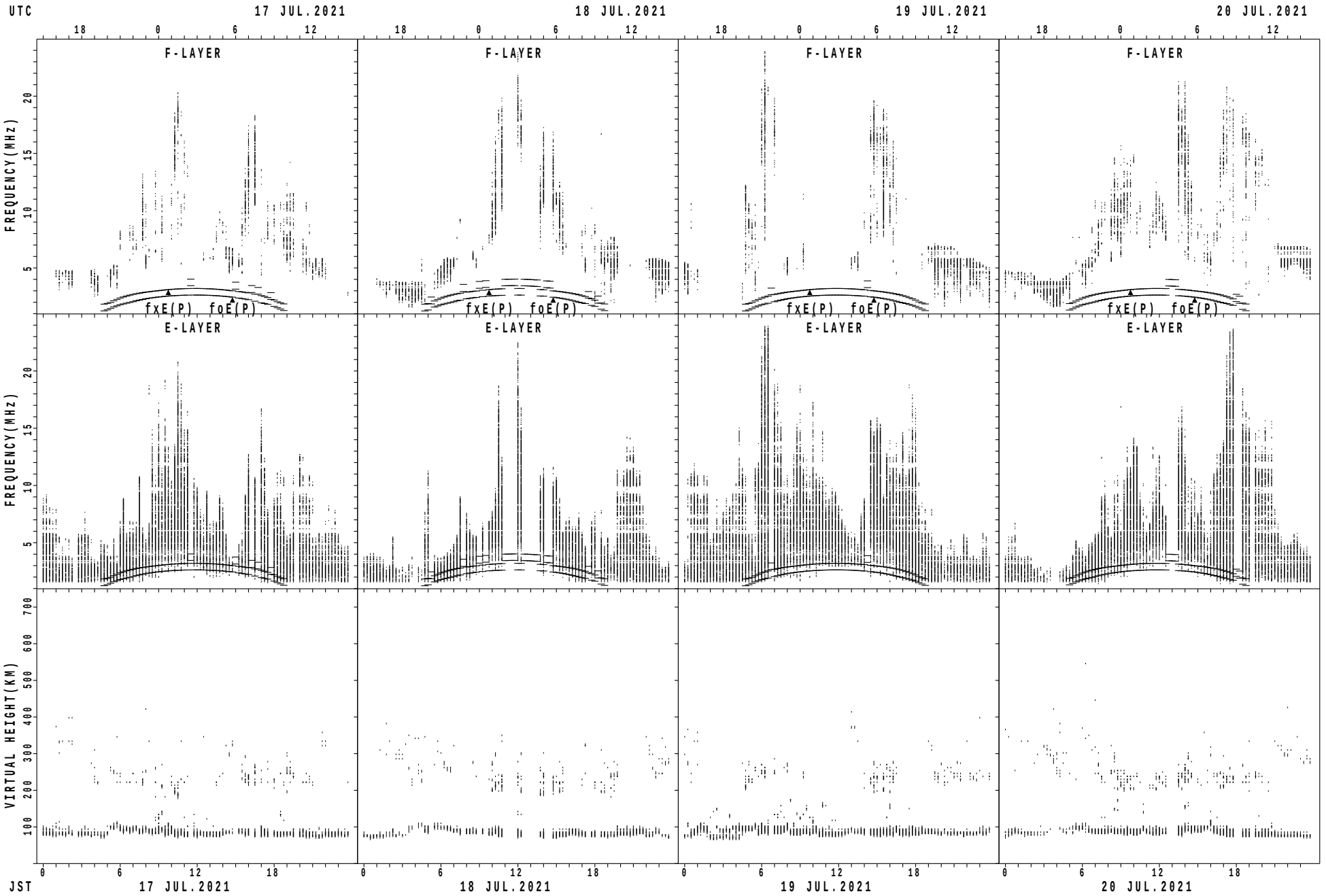
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



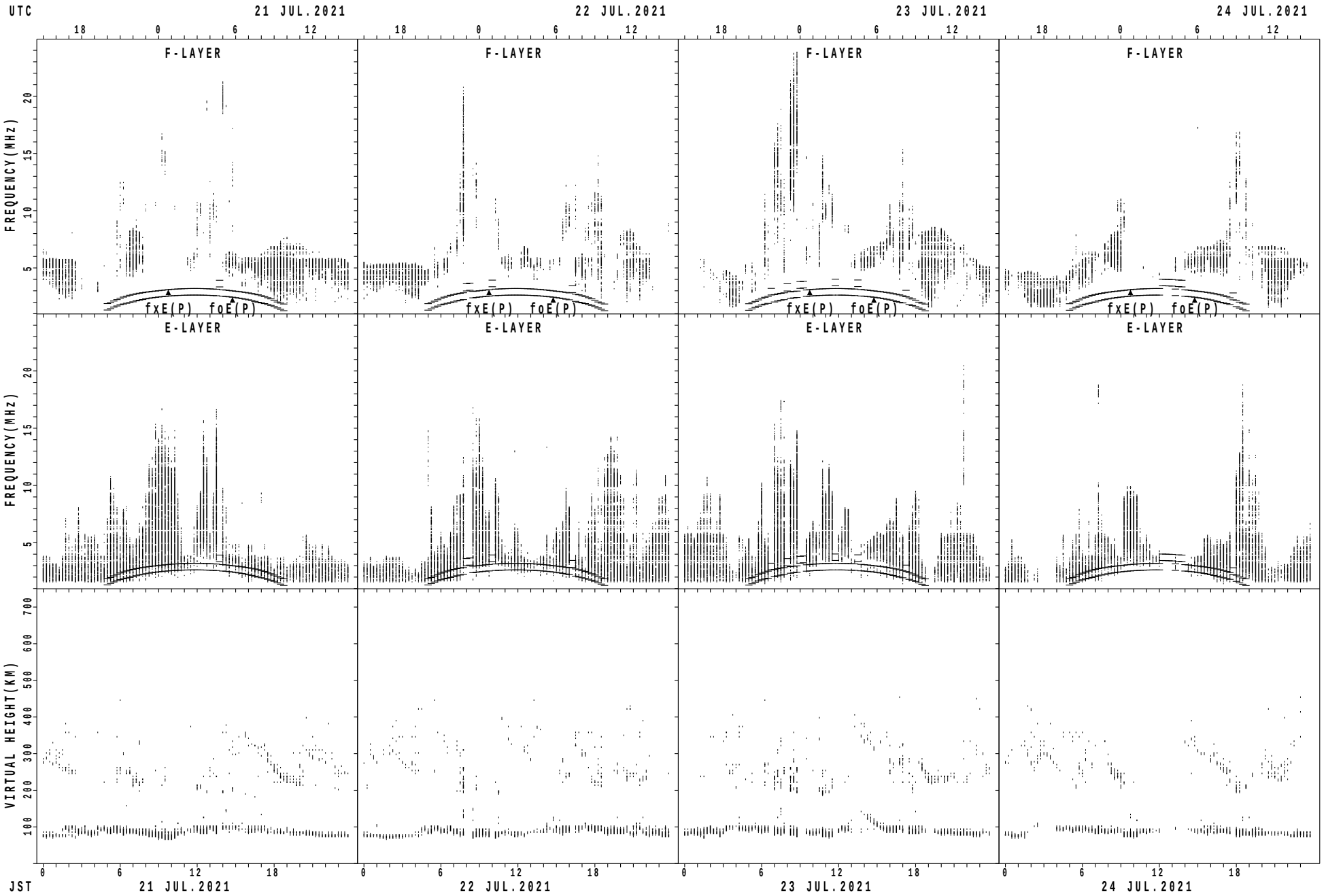
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



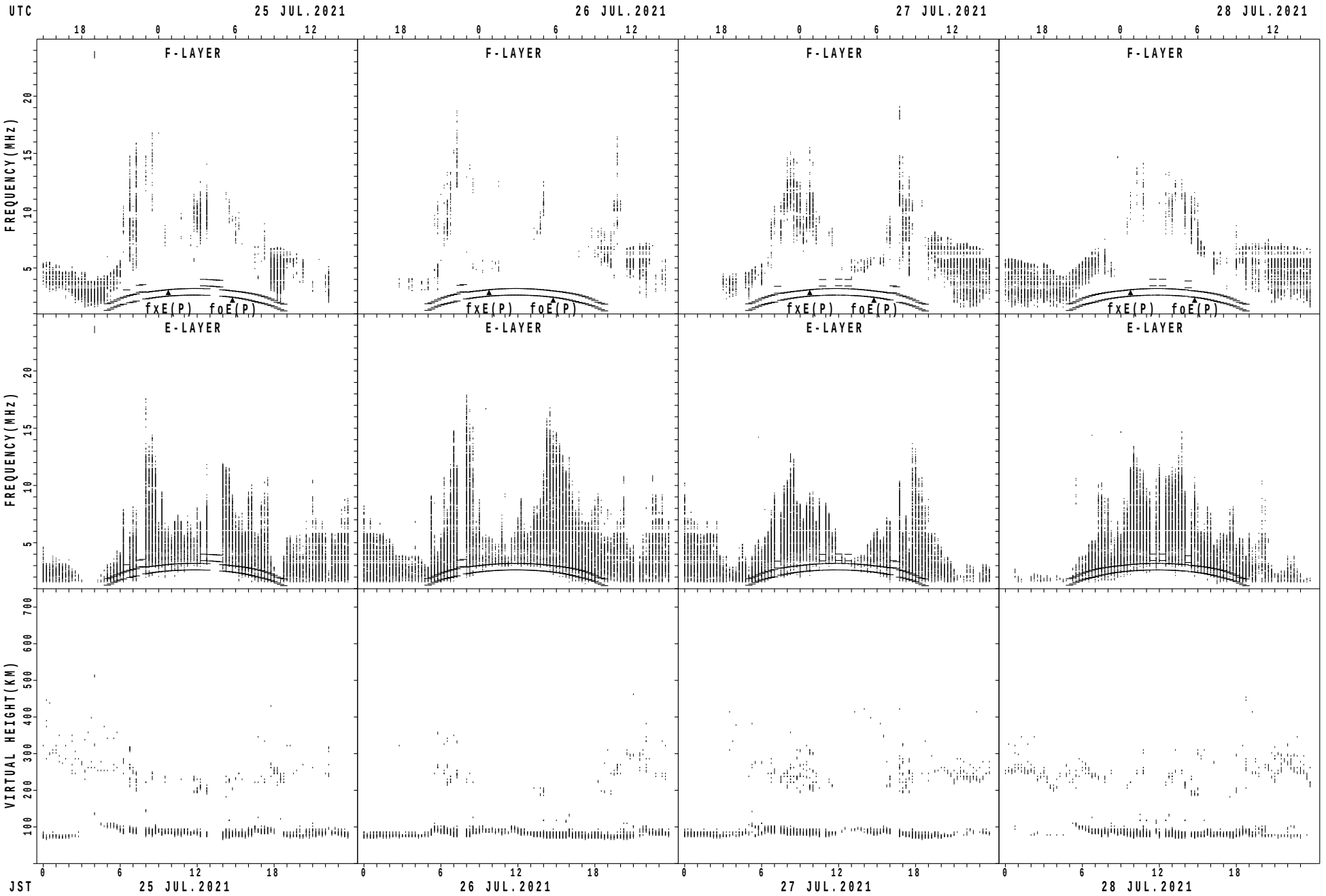
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



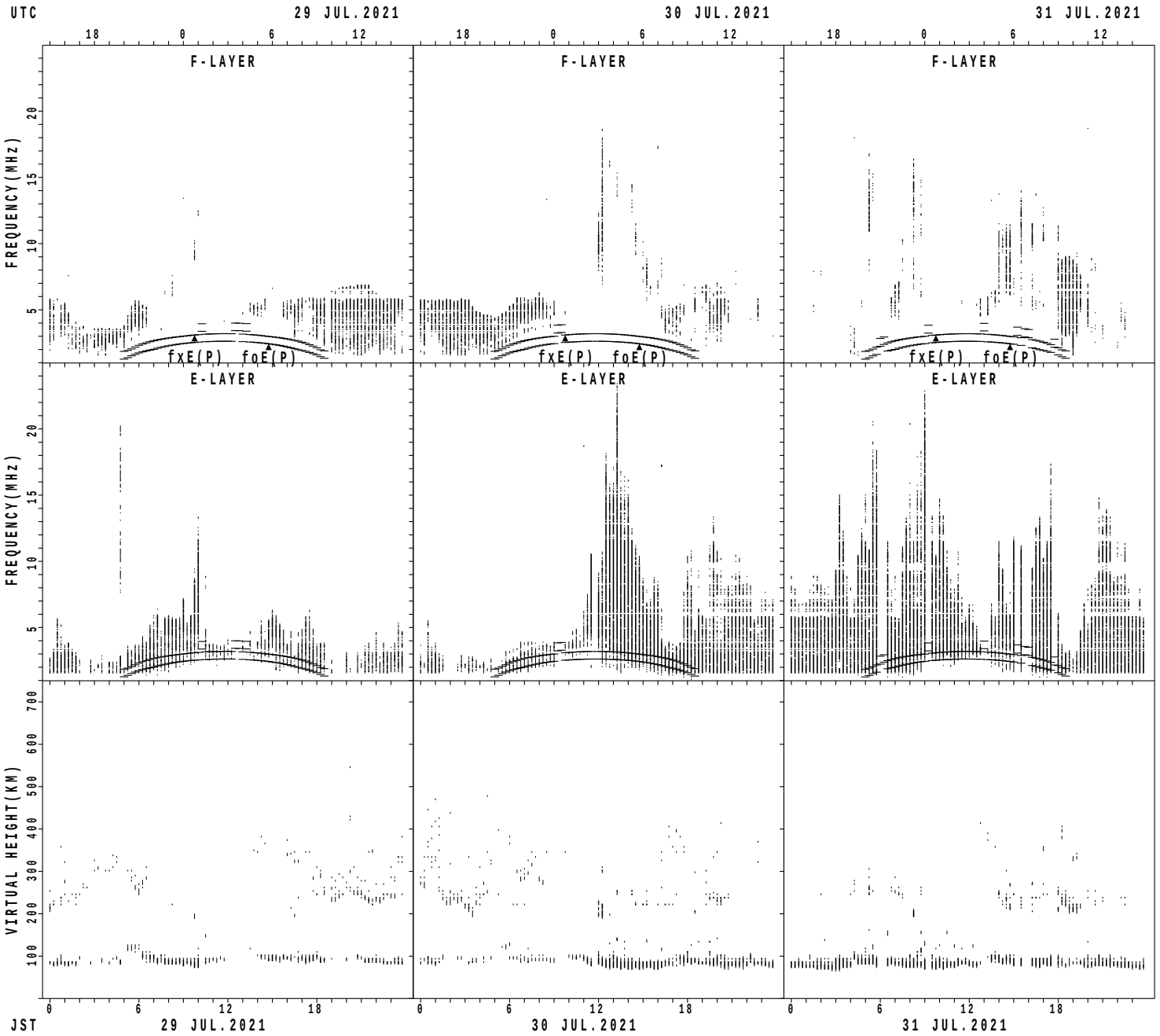
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



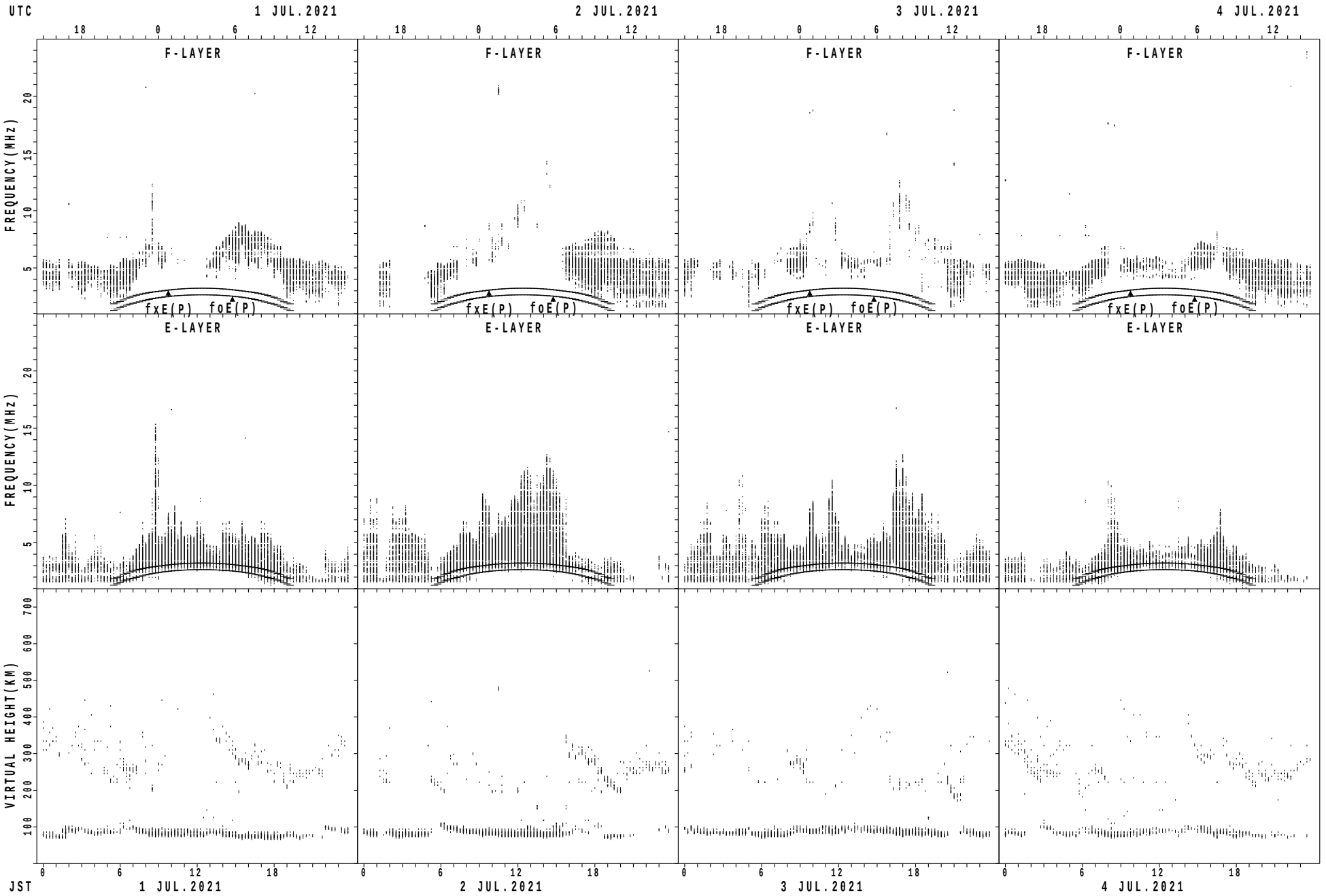
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



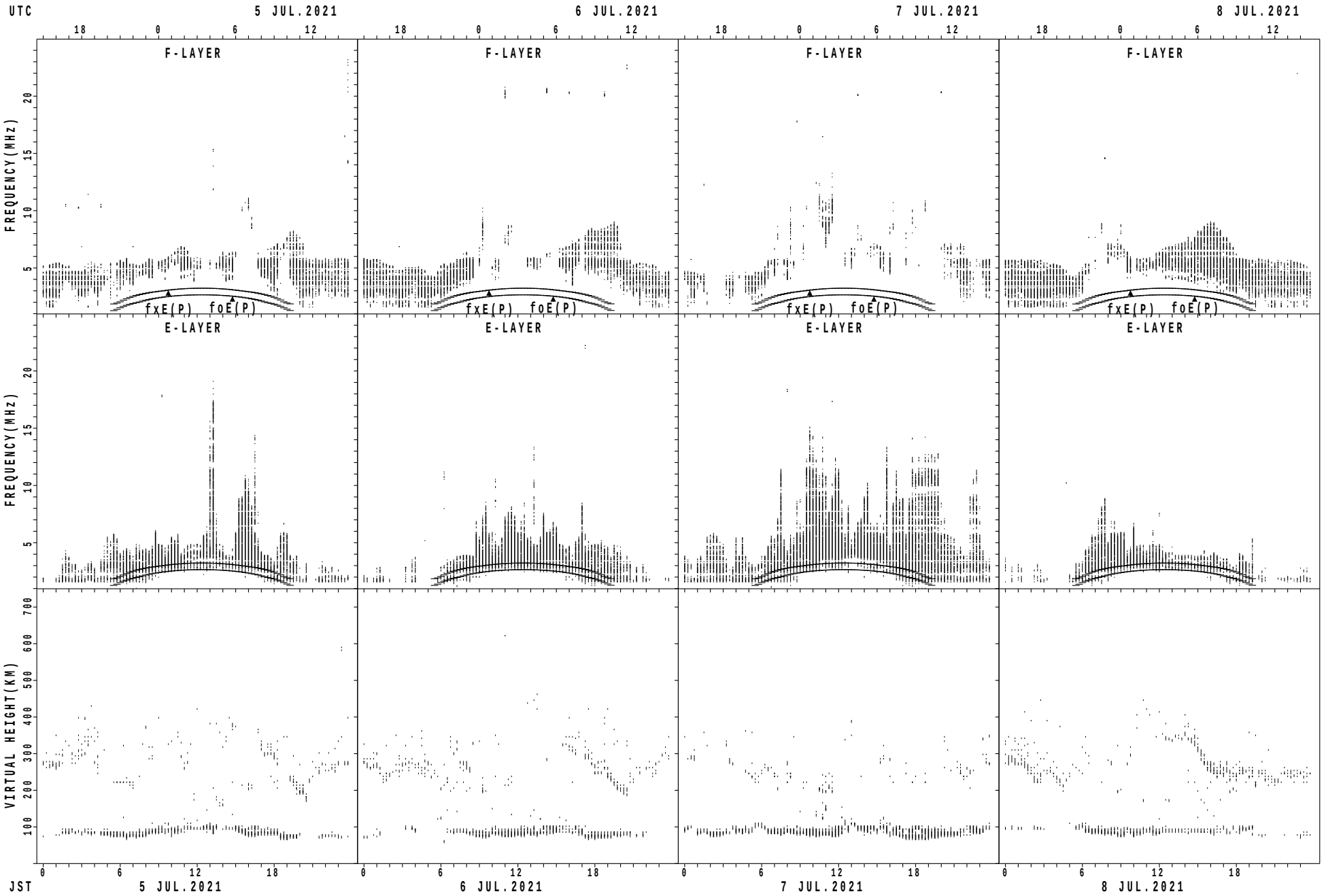
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



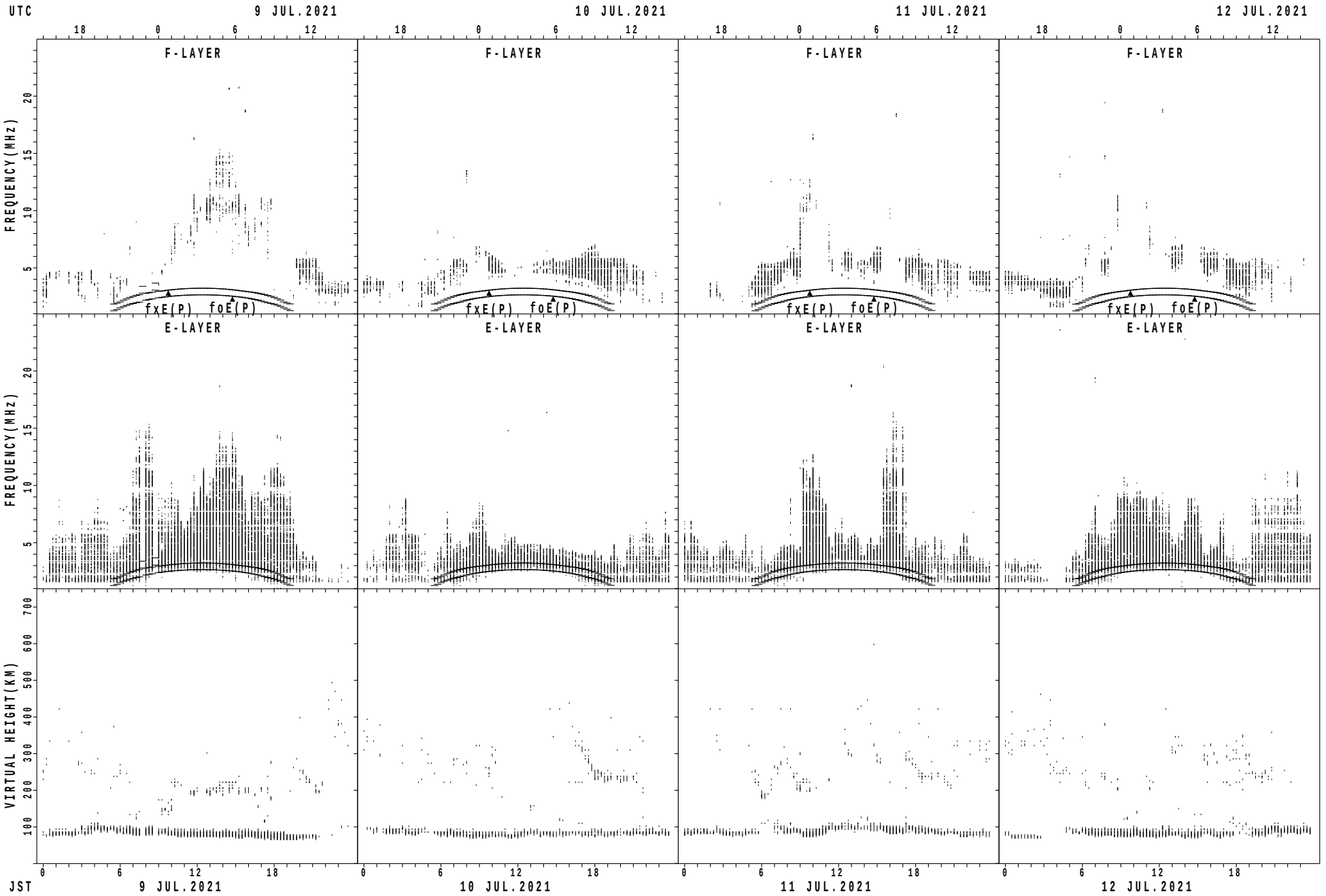
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



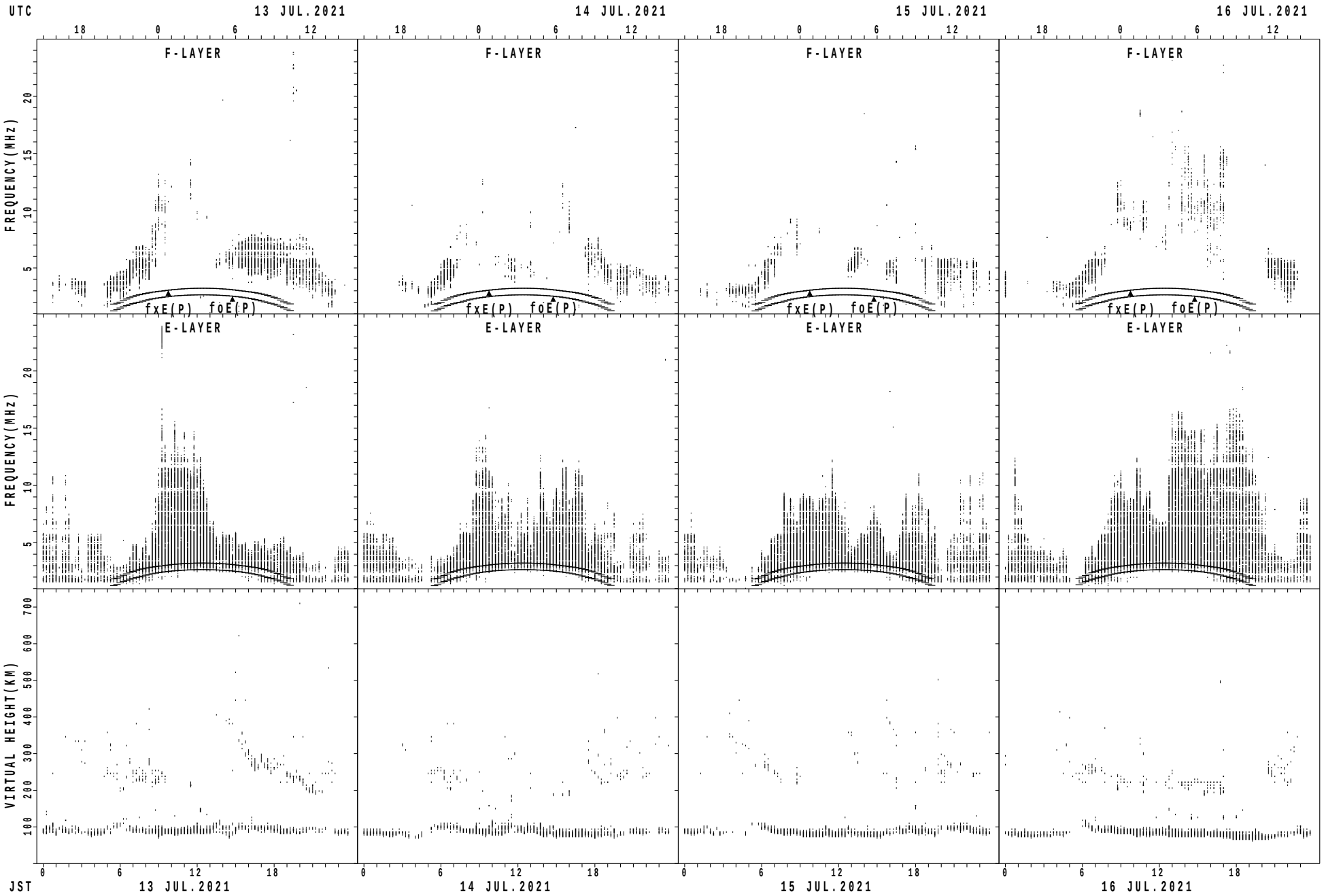
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



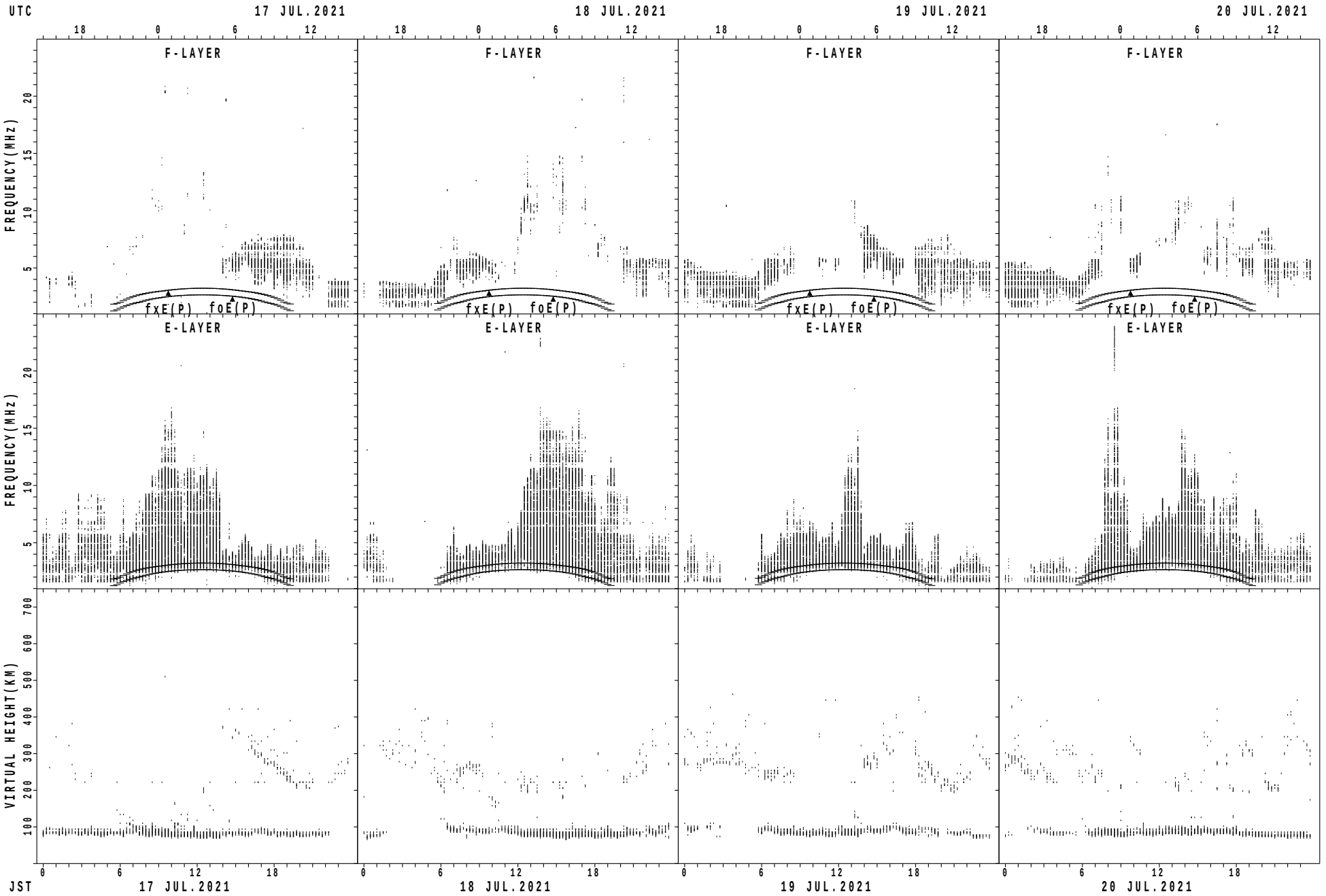
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



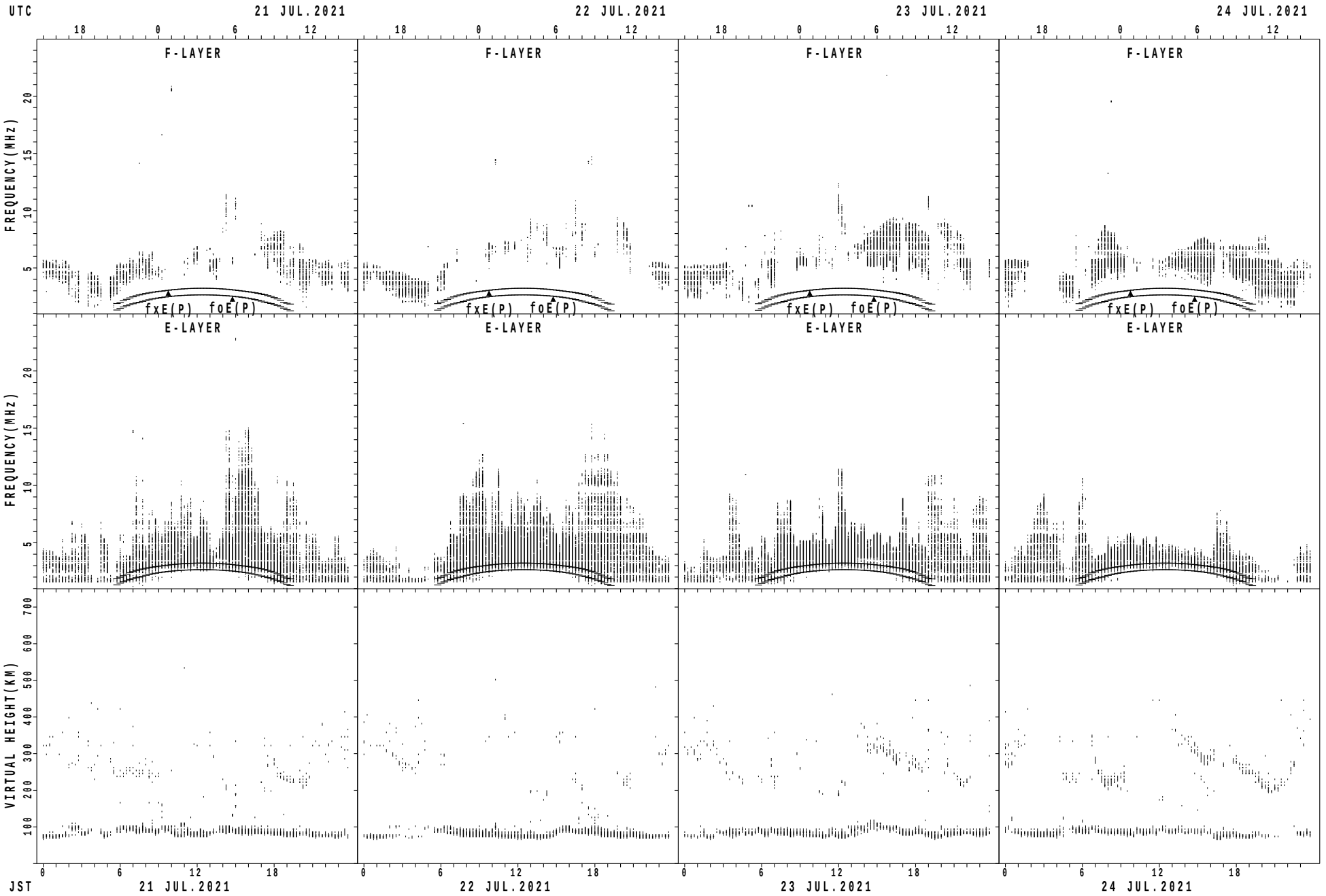
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



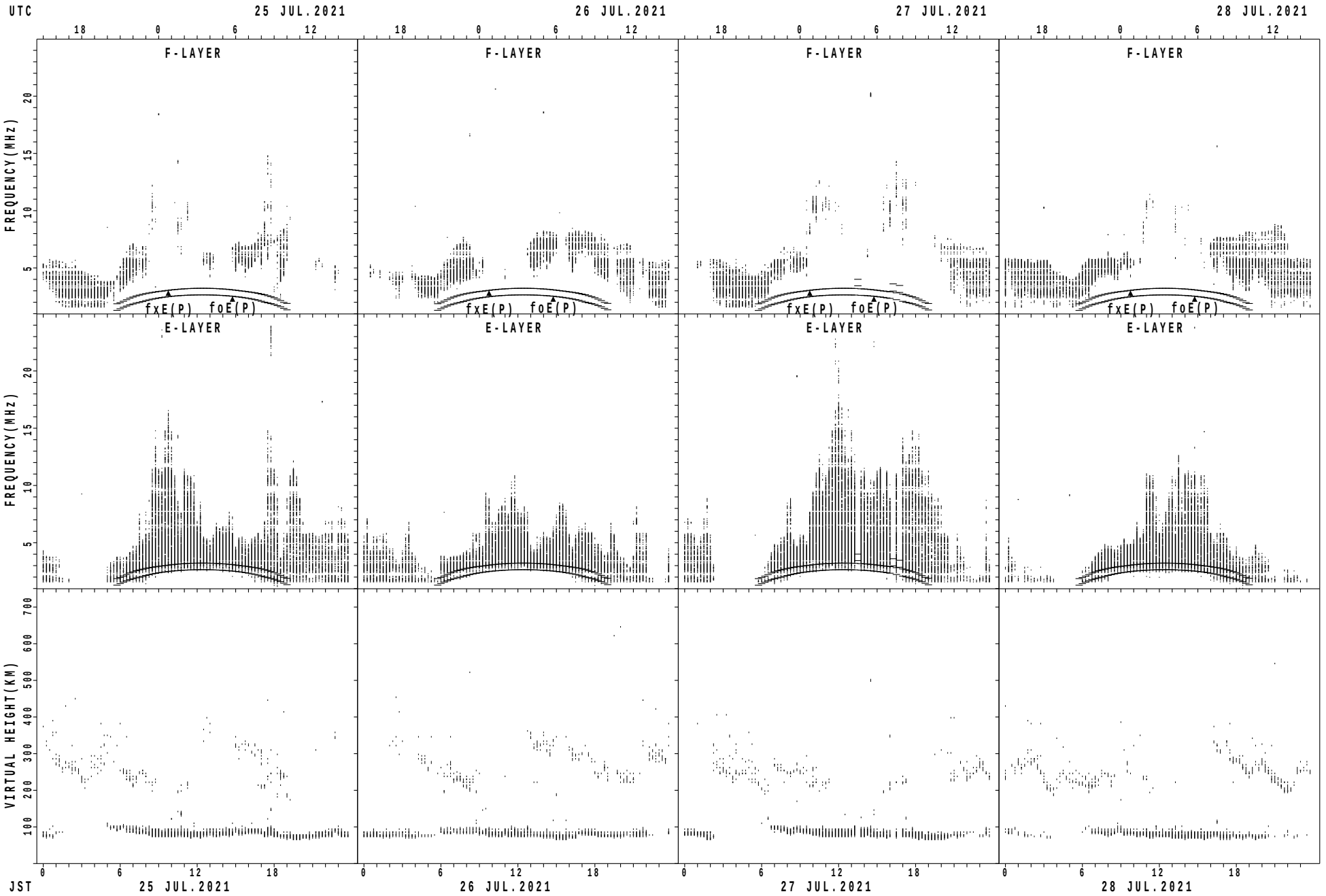
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



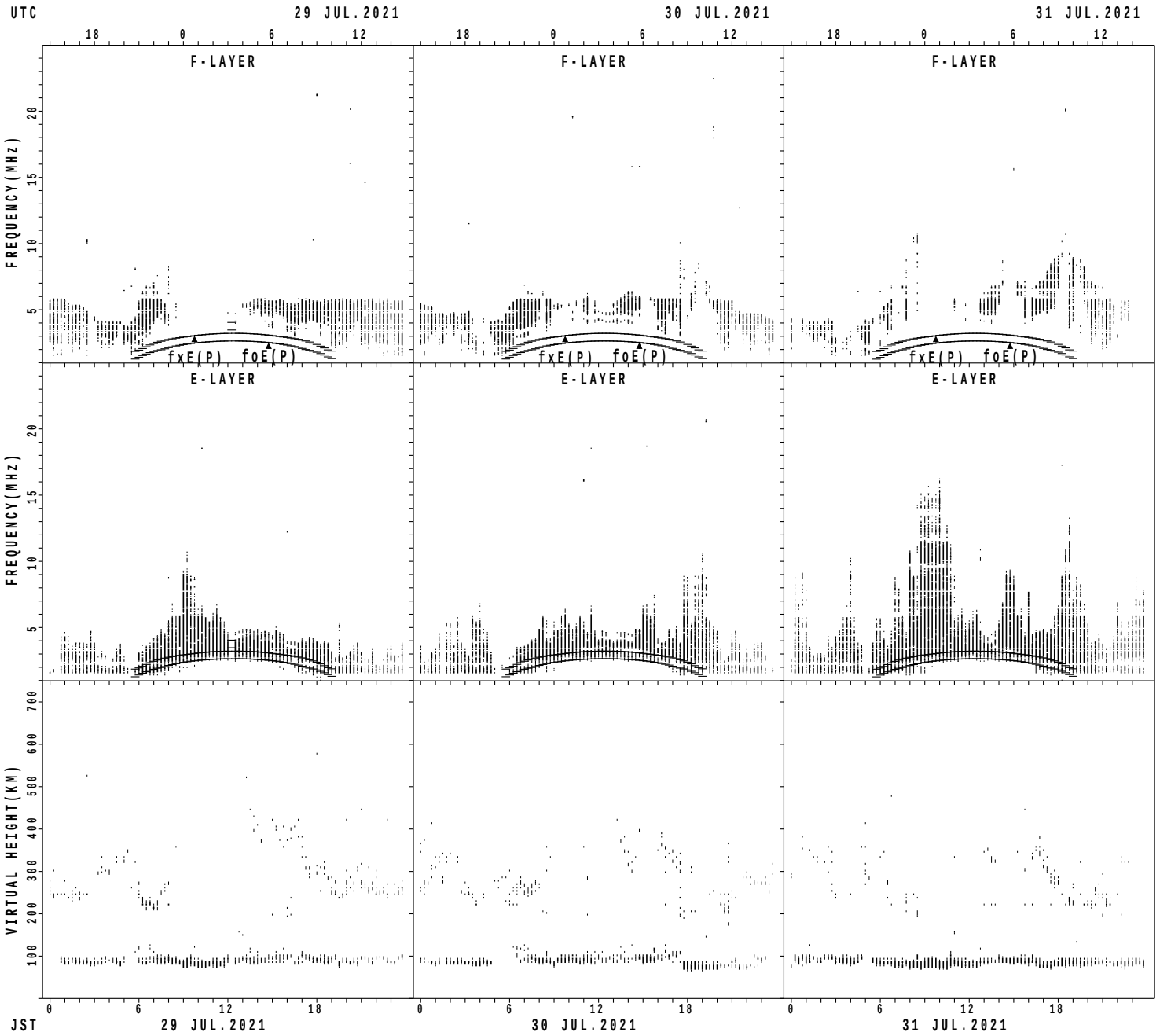
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



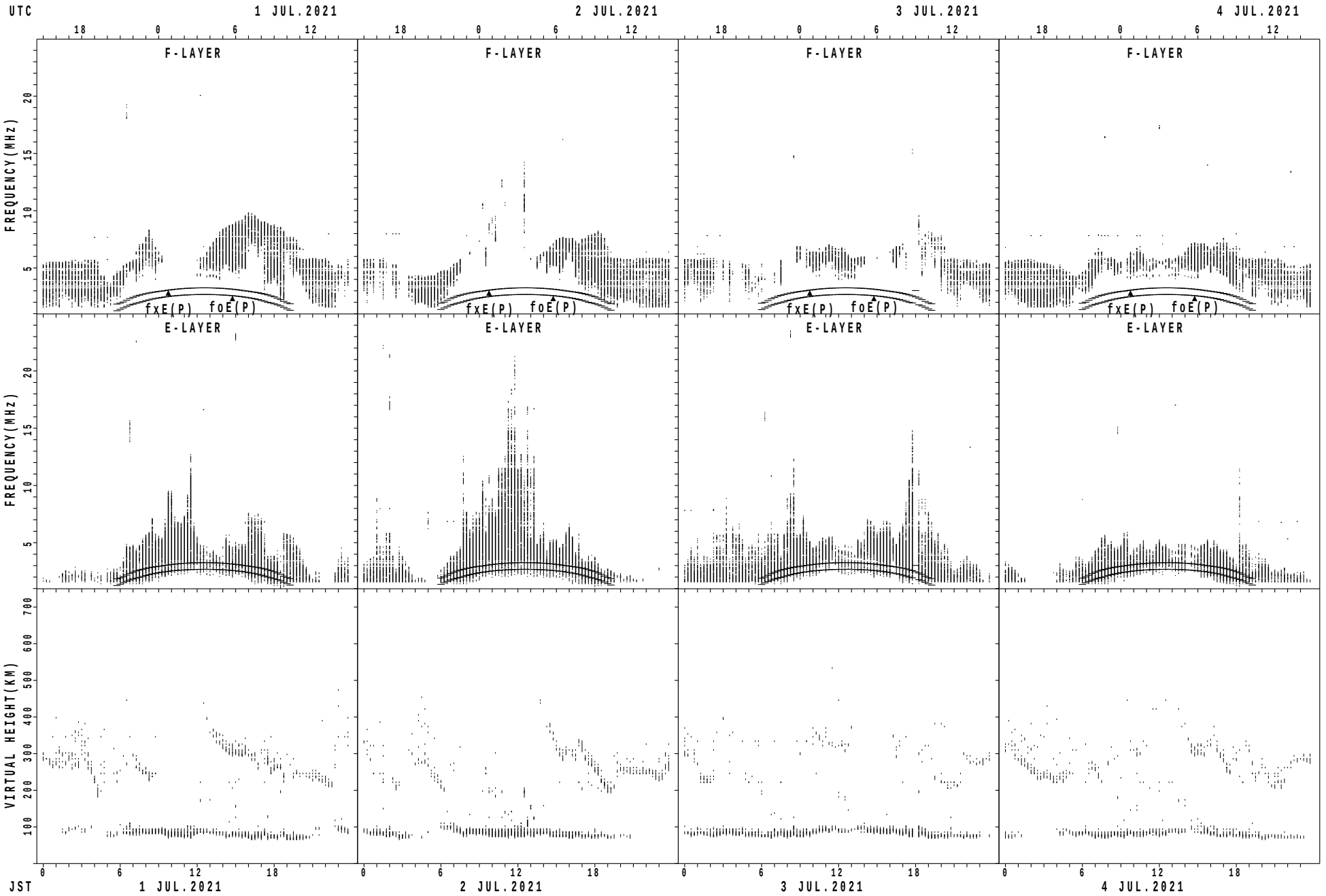
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



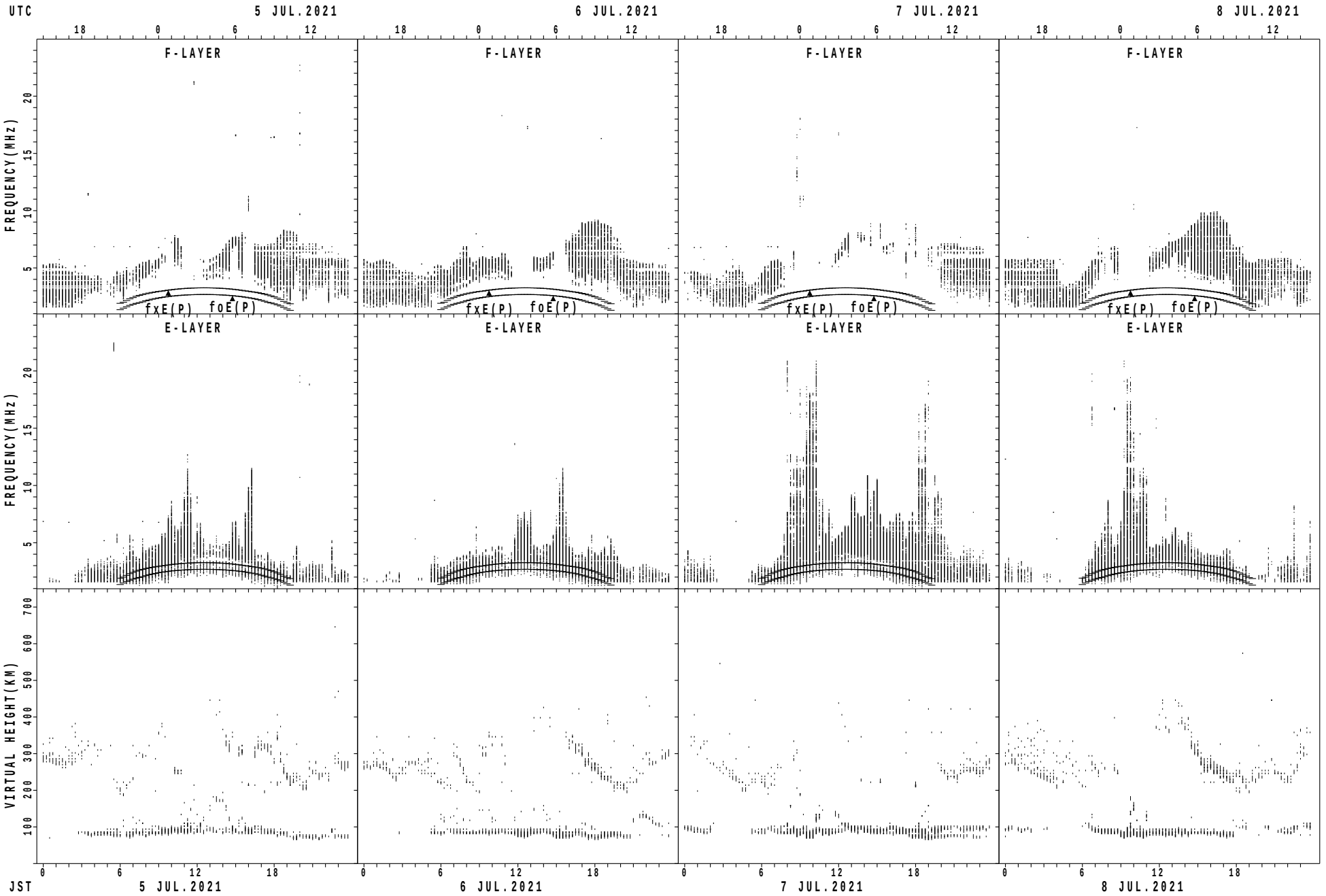
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



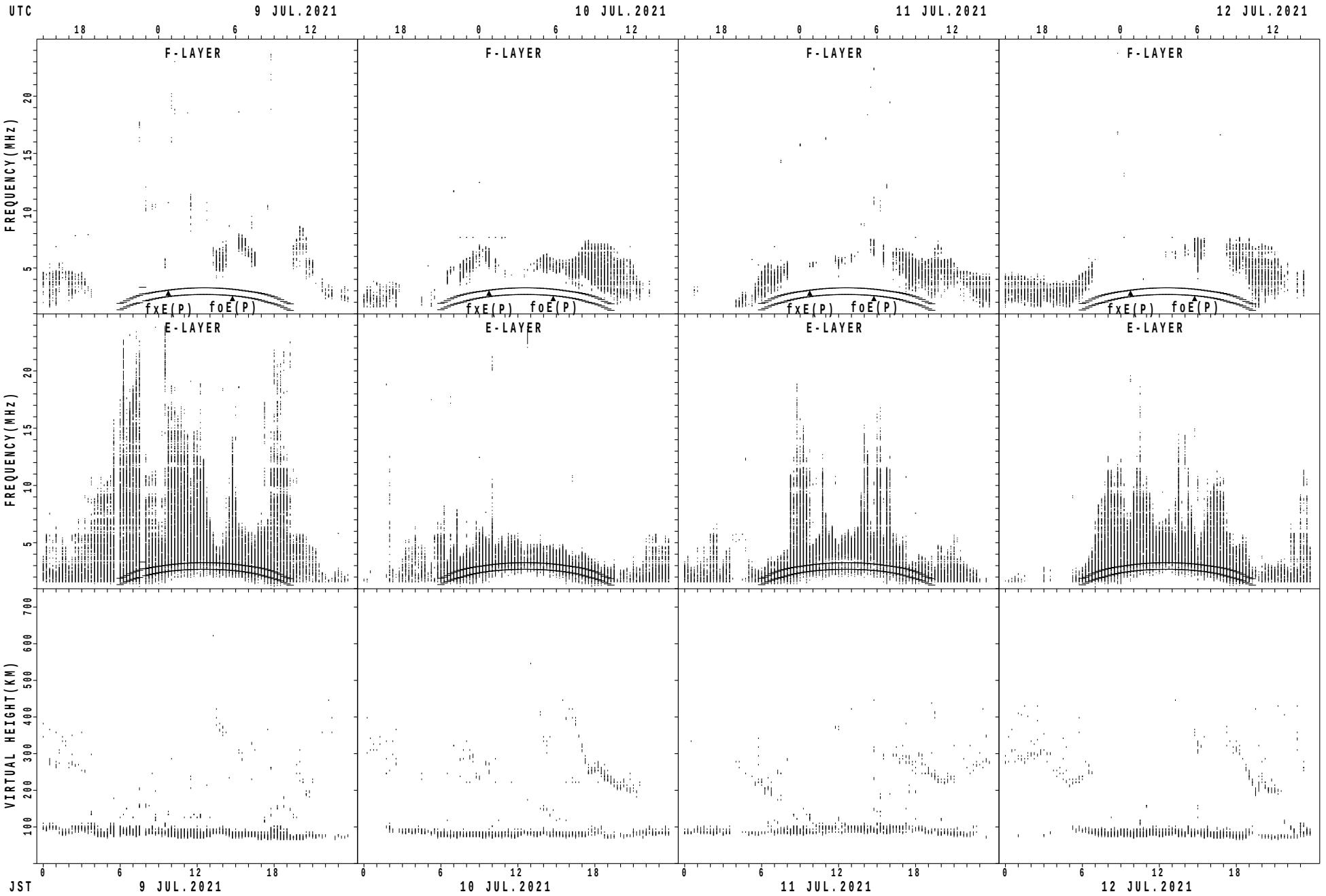
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



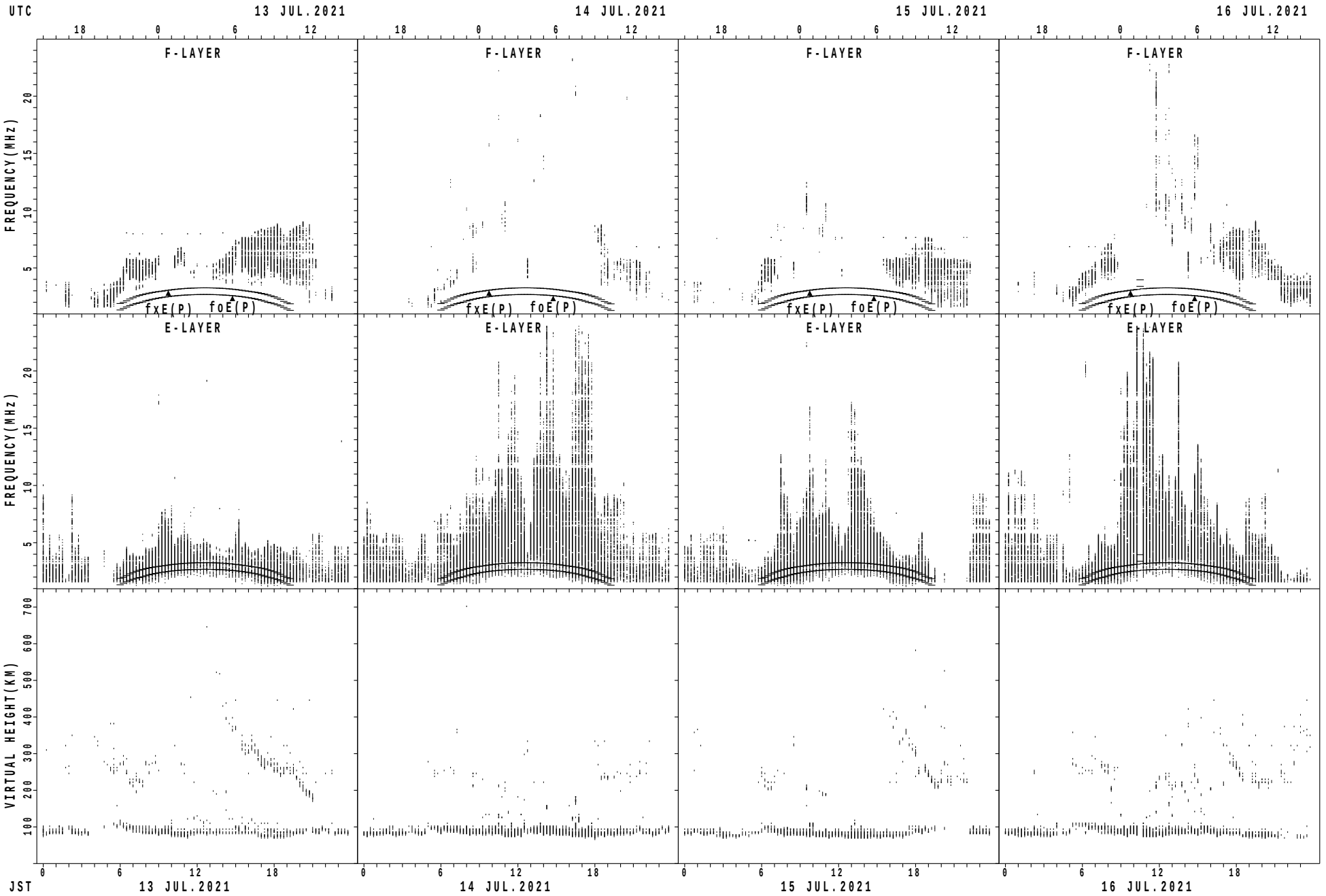
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



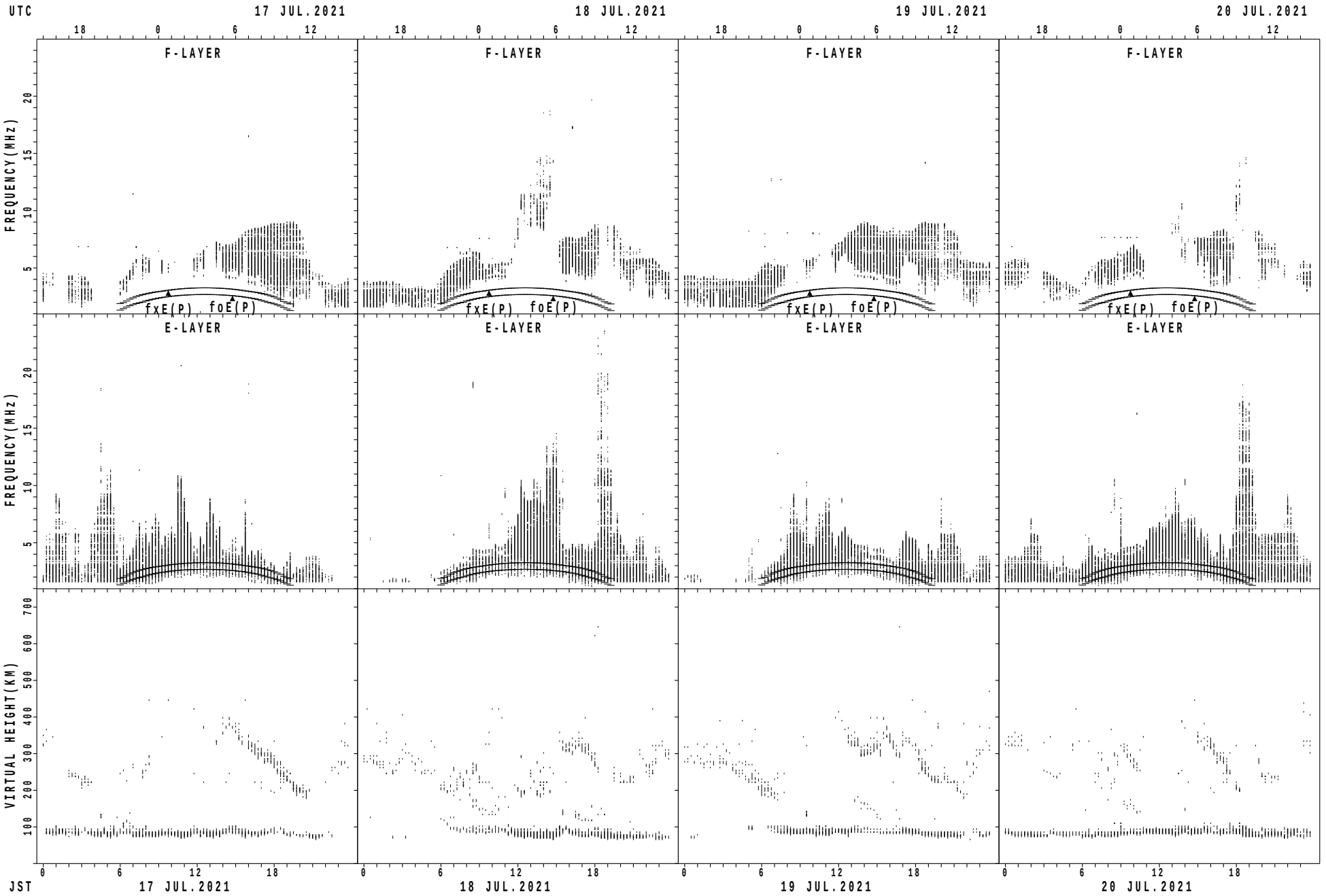
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



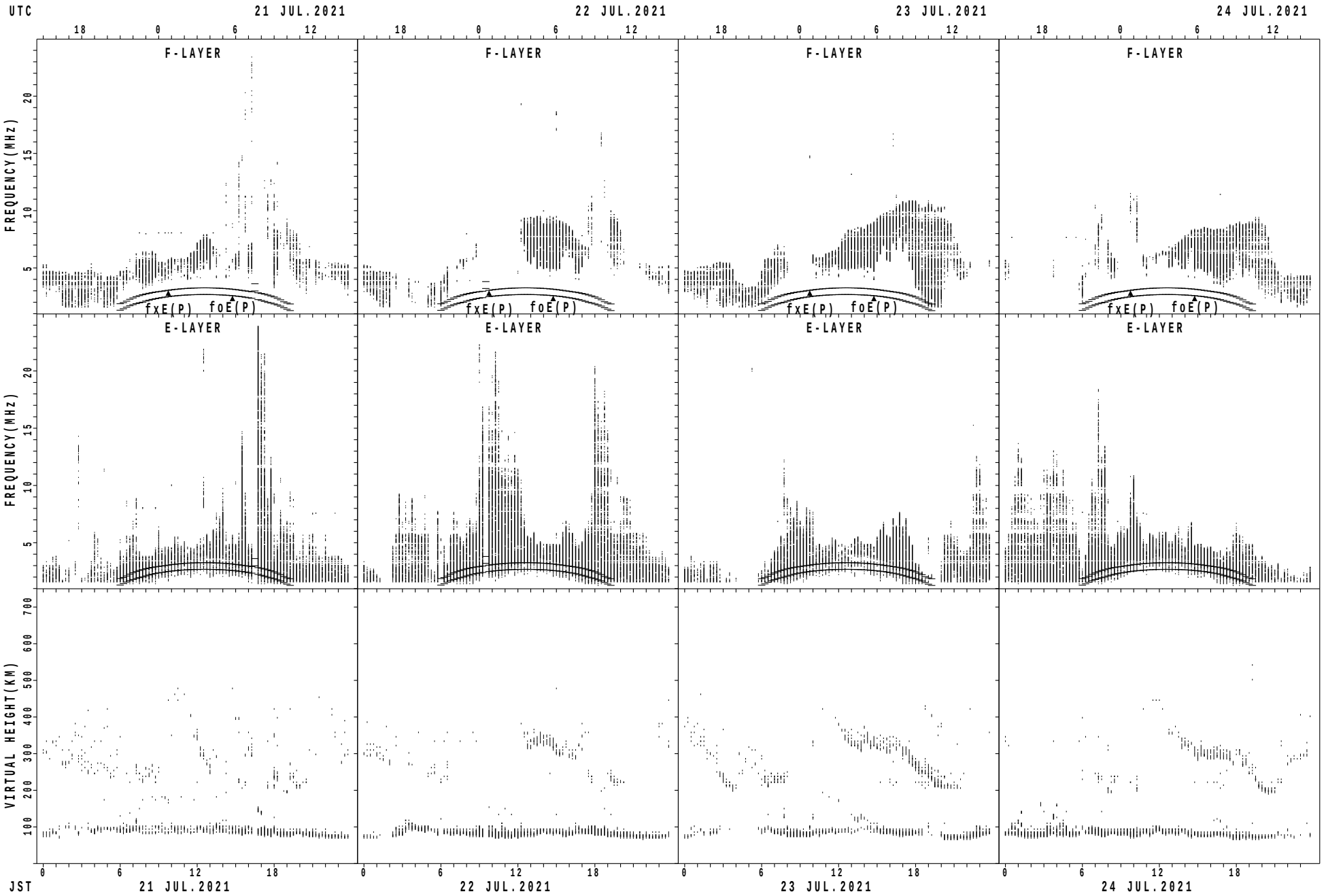
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



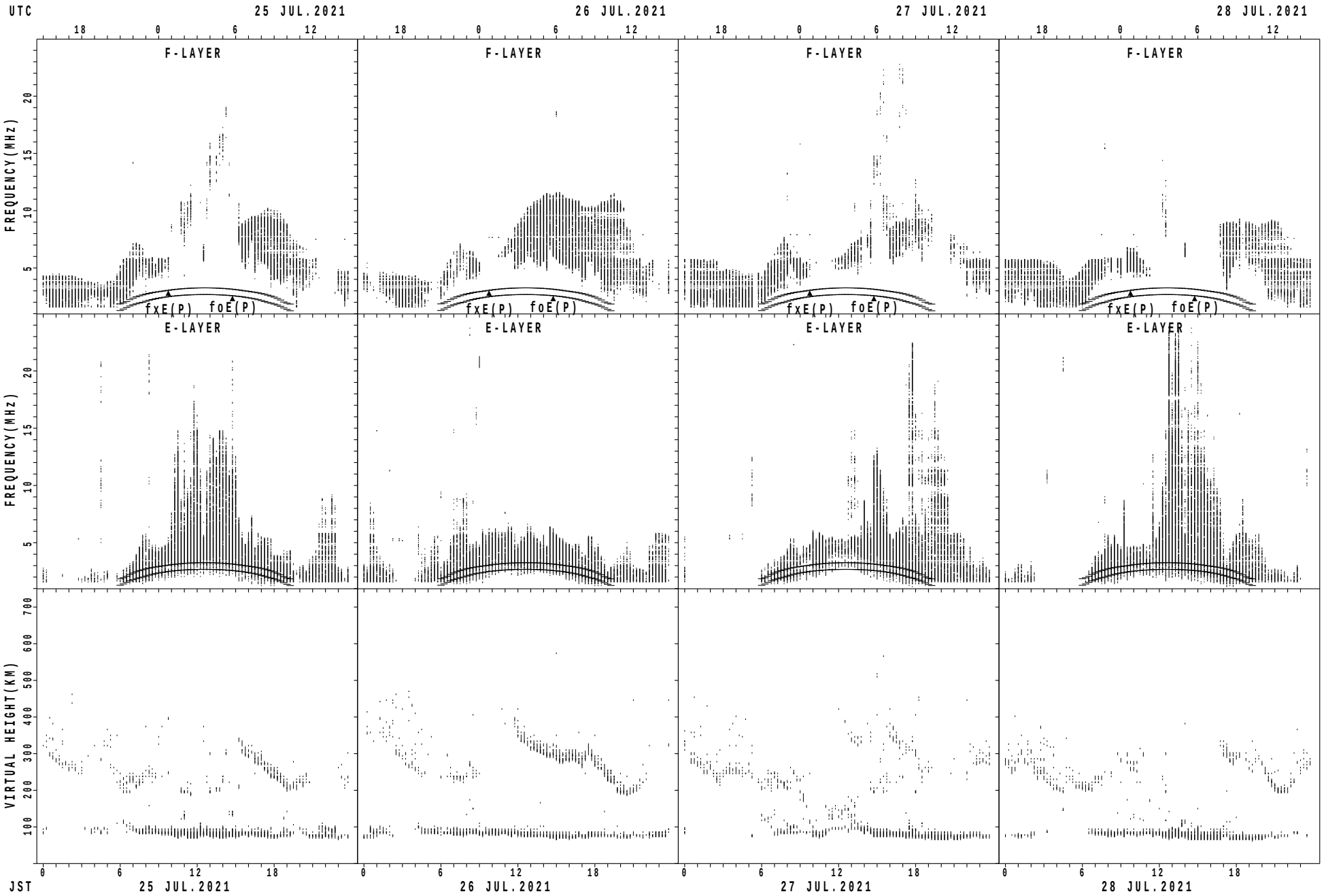
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



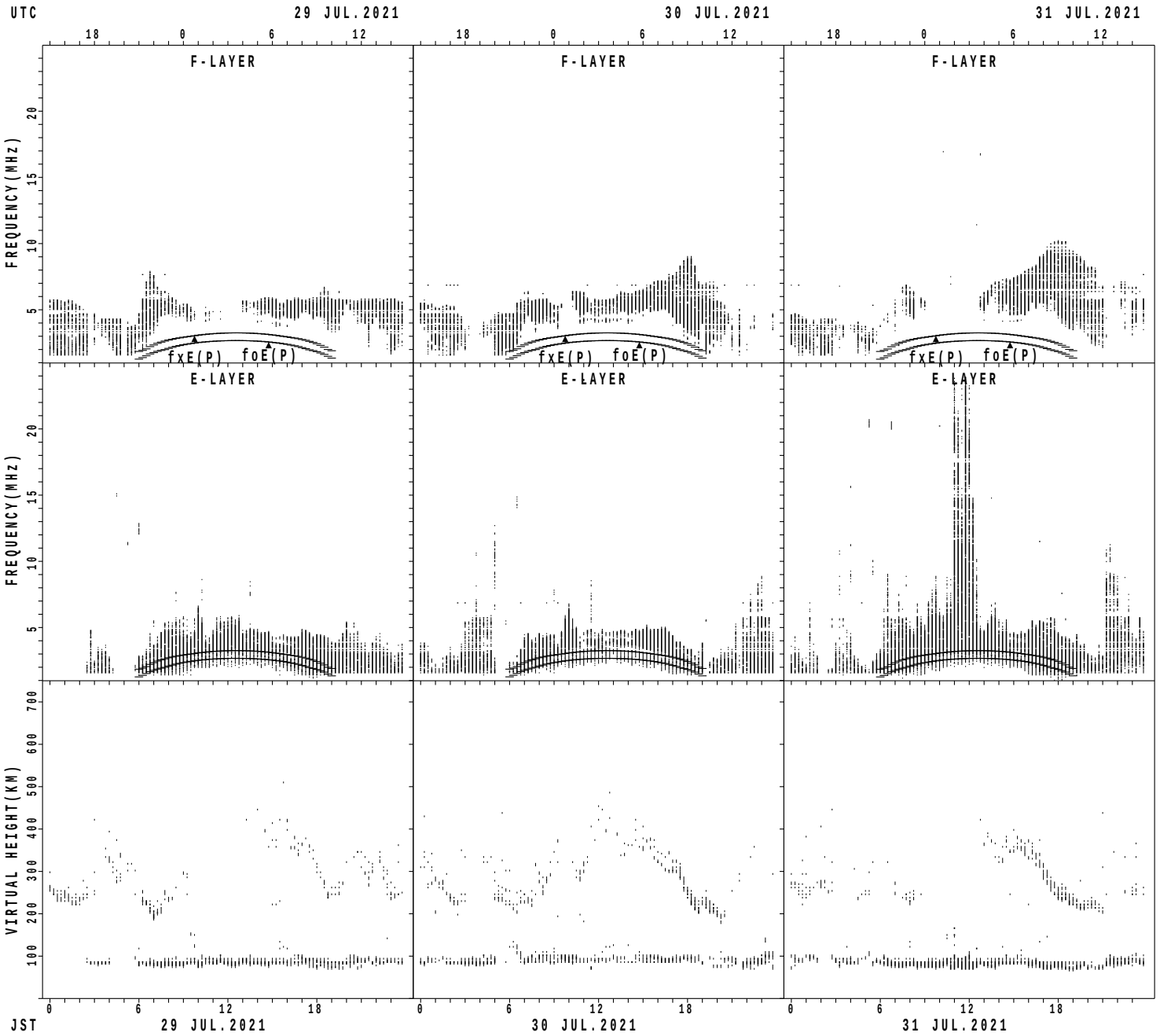
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

JUL.2021 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1					2	6											6	10	5	2	2	1	1
MED	348					197	237											217	209	206	272	260	238	288
U Q	174					198	288											264	224	218	290	272	119	144
L Q	174					196	216											200	202	198	254	248	119	144

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	31	30	29	28	31	31	31	31	31	31	31	31	30	31	31	31	31	31	30	30	31	31	31
MED	95	94	96	96	98	98	96	96	96	96	94	96	96	94	94	96	96	96	96	95	96	94	94	94
U Q	98	96	96	98	98	98	98	98	98	98	96	98	98	96	96	98	98	98	98	96	98	96	96	96
L Q	90	90	90	92	96	94	94	96	94	94	94	92	92	92	92	94	94	94	94	94	94	94	92	90

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	5	15										11	11	9	5	2		1
MED						219	214	220										200	212	250	262	230		378
U Q						228	253	274										252	258	268	299	248		189
L Q						210	197	204										192	198	233	218	212		189

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	30	30	26	28	31	31	31	30	30	30	26	26	30	28	31	30	31	28	31	30	31	30
MED	94	92	94	94	96	98	98	94	96	96	96	94	94	96	96	96	96	96	96	94	94	94	96	94
U Q	96	98	98	96	98	98	98	96	98	98	96	96	96	96	98	98	98	98	98	98	98	96	96	96
L Q	92	92	90	92	92	95	94	94	94	94	94	92	94	94	96	94	94	94	94	92	92	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								2	8									9	7	7		1		
MED								236	228									208	280	248		302		
U Q								240	263									281	290	288		151		
L Q								232	209									202	256	192		151		

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	29	25	26	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	30
MED	94	94	94	96	94	96	98	96	96	96	96	96	96	96	96	96	98	96	94	94	94	95	96	95
U Q	96	96	96	98	97	98	98	98	96	96	96	98	96	98	98	98	98	98	98	96	94	96	96	96
L Q	92	92	92	93	93	96	95	94	94	94	94	94	94	96	94	94	94	92	92	90	90	92	92	92

MONTHLY MEDIANS OF h'F AND h'Es

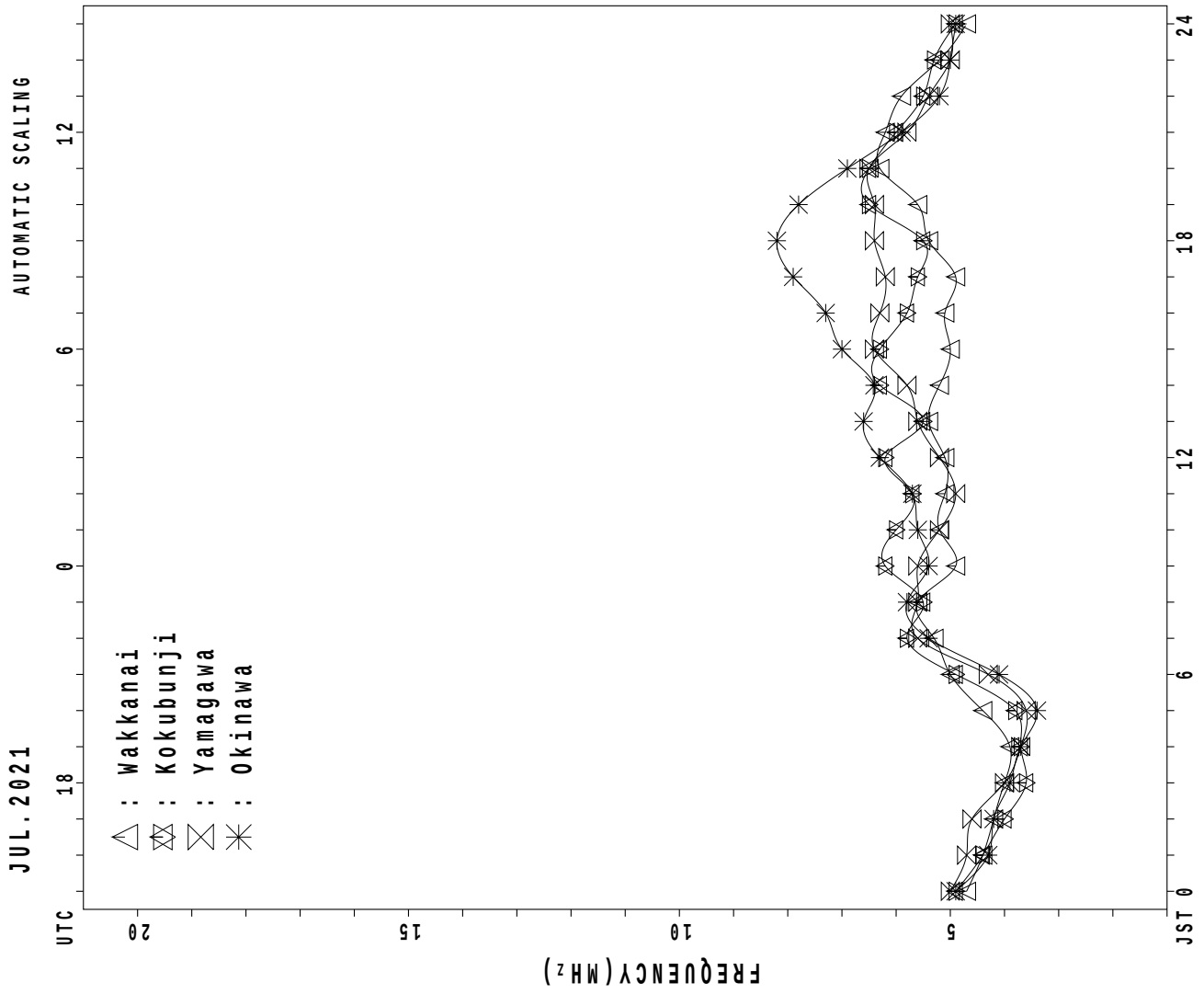
JUL.2021 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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								6	10									20	20	18	14	5		
MED								238	232									293	273	258	243	232		
U Q								258	258									327	284	262	250	249		
L Q								234	202									275	241	240	232	211		

h'Es

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


MONTHLY MEDIANS PLOT OF foF2
JUL.2021
AUTOMATIC SCALING
: Wakkanai
: Kokubunji
: Yamagawa
: Okinawa
UTC
0
6
12
18
JST 0
6
12
18
24
5
10
15
20
FREQUENCY(MHz)

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 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 55	X 54	53	56																	70	84	89	72
2	69	58	58	58	63																	X 72	X 67	X 59
3	X 61	X 56	56	54																		X 64	X 65	X 58
4	X 51	X 48	X 49																			X 69	A	A
5	A	A	A																			X 71	72	X 59
6	X 57	X 59	58																			X 79	X 68	X 57
7	X 49	X 51	X 53		54																	X 69	X 59	A
8	A	A	X 50	55																		O X 66	A	A
9	X 49	X 53	O X 45																			X 67	O X 65	X 58
10	X 45	X 38	X 41																			X 59	X 55	X 58
11	X 47	A	A																			X 59	X 58	X 58
12	X 54	53	X 46		48																	A	A	X 56
13	X 46	X 44	X 45																			X 67	X 64	X 57
14	X 59	X 55	X 59																			X 58	X 54	X 54
15	X 54	X 48	56	48																		X 71	X 66	X 65
16	X 61	X 59	A																			X 66	X 58	X 58
17	X 59	X 58	X 57																			A	A	A
18	A	A	X 44																			X 69	X 70	X 57
19	X 58	X 58	X 59																			X 57	X 57	X 57
20	A	A	A																			X 74	X 74	X 59
21	X 59	X 46	X 44																			X 72	X 66	X 59
22	X 59	X 55	X 55																			X 77	X 84	X 62
23	X 53	X 45	X 44																			X 75	X 65	X 59
24	X 55	X 58	X 51																			X 63	X 58	X 58
25	X 57	X 53	A																			70	X 62	X 53
26	X 48	X 48	X 44																			X 65	X 64	X 61
27	X 54	X 54	X 55																			X 68	X 69	X 60
28	X 56	X 55	X 55																			X 64	X 66	X 62
29	X 62	X 46	X 40																			X 62	X 60	X 59
30	X 59	X 61	X 61																			X 67	X 65	X 54
31	X 54	X 59	X 57																			X 64	X 57	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	27	26	26	5	3																1	29	27	27
MED	X 55	X 54	X 53	55	54																70	X 67	X 65	X 58
U Q	X 59	X 58	X 57	57	63																	X 72	X 68	X 59
L Q	X 51	X 48	X 45	51	48																	X 64	X 58	X 57

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 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	48	47	F 43	43	40	43	A	A	48	A	A	54	A	A	52	52	56	57	58	58	60	F 67	F 56	F
2	F	F 48	F 47	F 43	F 45	62	67	66	60	R 58	51	52	54	53	53	55	52	53	54	64	73	65	60	52
3	54	49	F 44	F 37	47	51	60	54	A	A	A	A	A	A	51	49	A	48	50	51	59	57	58	51
4	44	41	42	40	39	46	52	58	61	53	55	A	R 49	A	51	R 50	53	56	58	60	67	J R 62	A	A
5	A	A	A	49	40	A	A	A	A	A	A	52	52	55	52	A	A	A	A	56	58	64	F	52
6	50	52	F 46	49	36	41	48	58	A	58	56	52	J R 51	46	56	52	54	57	58	60	72	72	61	50
7	42	44	46	46	F 42	51	56	59	A	56	53	A	53	A	51	54	54	54	56	69	67	62	52	A
8	A	A	43	F	36	A	A	A	A	A	54	52	56	C	R 55	51	A	A	50	A	A	S 59	A	A
9	42	46	R 38	R 38	R 38	A	48	E G 40	A	A	A	A	R 47	E G 44	E G 43	R 39	A	A	48	46	59	60	R 58	51
10	R 38	R 31	34	R 35	32	34	47	50	59	45	A	A	C	A	R 43	41	50	46	47	48	51	52	48	51
11	41	A	A	30	36	37	46	A	54	52	A	50	A	A	51	A	A	A	A	A	61	52	51	51
12	47	F 39	39	40	F	46	47	A	A	A	62	53	A	A	U R 48	52	50	44	A	A	A	A	A	49
13	39	37	38	39	44	46	50	50	48	A	52	A	52	55	59	55	51	46	48	54	60	60	57	51
14	52	48	52	47	50	48	56	54	A	A	56	A	A	52	A	51	48	A	48	48	50	51	47	47
15	47	41	F 36	F 36	34	R 30	36	45	50	R 54	50	43	54	49	50	52	53	55	51	54	R 65	64	59	58
16	54	52	A	47	47	46	A	A	A	A	A	A	A	A	A	A	47	A	44	51	56	59	51	51
17	52	51	50	47	51	50	47	54	A	52	56	A	54	54	51	53	53	A	45	50	59	A	A	A
18	A	A	37	35	33	43	A	A	A	51	A	A	A	A	A	A	A	51	A	55	60	62	62	50
19	51	51	52	46	48	43	47	A	A	A	54	A	51	50	A	A	53	A	51	48	52	50	50	50
20	A	A	A	35	32	A	52	A	51	A	A	A	A	A	56	53	A	46	A	51	68	67	67	52
21	52	39	37	37	40	50	58	65	76	57	A	58	61	51	52	A	50	54	56	60	66	65	59	52
22	52	48	48	46	42	46	48	48	56	52	49	A	51	47	48	49	48	49	53	61	61	70	77	55
23	46	38	37	36	36	A	51	51	53	60	54	54	E G 46	54	53	56	55	55	59	63	68	68	58	52
24	48	51	44	41	41	50	59	A	55	E G 44	57	49	49	51	49	48	A	52	58	66	67	56	51	51
25	50	46	A	41	38	A	A	51	A	A	52	A	A	A	47	47	47	48	52	54	59	F	55	46
26	41	41	37	39	36	42	53	61	56	50	A	50	50	52	55	52	50	51	51	48	59	58	57	54
27	47	47	47	39	40	42	A	51	60	60	57	53	53	50	52	50	52	52	50	58	65	R 61	J R 62	53
28	49	48	48	48	40	43	50	52	52	52	51	52	53	57	53	55	59	55	55	55	R 63	57	59	55
29	55	39	33	Z 32	32	44	A	A	A	A	A	A	A	50	48	47	49	50	50	52	58	55	53	52
30	52	54	54	A	50	42	46	48	54	A	A	A	A	52	47	46	48	50	50	55	58	60	58	47
31	47	52	50	50	51	48	50	50	57	49	53	56	50	48	51	52	A	52	54	58	61	57	50	F 47
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	26	26	29	30	25	23	20	17	17	18	15	19	19	27	25	22	23	26	28	29	28	26	26
MED	48	47	44	40	40	46	50	52	55	52	54	52	52	51	51	52	52	52	51	55	60	60	58	51
U Q	52	51	48	46	45	49	56	58	60	58	56	54	54	54	53	53	53	55	56	60	66	64	59	52
L Q	44	41	37	36	36	42	47	50	52	50	52	50	50	49	48	48	49	48	50	51	58	57	51	50

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A	A	A	A	A	L	A	A	A	428	L	L	368					
2						344	L	L	A	A	A	A	456	L	L	432	408	A	L	L				
3					L	L	L	A	A	A	A	A	A	A	L	L	A	L	L	A				
4					A	L	L	L		L	E A 464	A	L	A	L	A	L	L	348					
5				A	A	A	A	A	A	A	A	L	L	L	L	A	A	A	A	A	A			
6						L	A	A	A	A	A	L	A	A	E A 436	L	L	L	L					
7						L	L	A	A	A	L	A	L	A	L	L	L	L	L					
8						A	A	A	A	A		E A 440	L	C	L	A	A	A	A	A	A			
9						A	L	400	A	A	A	A	L	L	428	R 384	A	A	A					
10						L	L	L	L	L	A	A	C	A	404	A	A 420	L	A	A	A			
11				A		A	A	A	A	A	A	E A 444	A	A	A	A	A	A	A	A				
12						A		A	A	A	A	L	A	A	L	L	L	L	A	A	A			
13						L	L	L	L	A	L	A	A	A	424	A	A	A	A					
14						L	L	L	A	A	A	A	A	A	A	L	L	A	L					
15						L	L	L	L	A	L	A	L	L	L	A	A	A	A	A				
16					A	A	A	A	A	A	A	A	A	A	A	A	A	A	L	A				
17					L	L	392	L	A	A	A	A	L	436	L	A	A	A	L					
18						L	A	A	A	A	A	A	A	A	A	A	A	L	A	L				
19						L	L	A	A	A	A	A	L	L	A	A	A	A	A	A	A			
20						A	L	A	A	A	A	A	A	A	A	L	A	A	A	A				
21					A	L	A	L	L	A	A	A	L	L	L	A	L	A	L	E				
22				L	L	L	L	A	L	L	L	A	L	L	452	L	L	L	L	L				
23						A	L	L	L	L	L	L	456	A 464	A	A	A	L		A				
24						L	L	A	A 436		L	A	L	L	L	L	A	A	A					
25				A		A	A	A	A	A	L	A	A	A	L	L	L	L	L					
26						L	L	A	A	L	A	A	L	L	L	432	424	A	A	A				
27							A	E A 428	L	L	L	452	L	444	444	L	432	L	352					
28						L	380	A	L	A	L	A	A	L	L	L	L	392	L					
29						L	A	A	A	A	A	A	A	A	A	A	L	L	L					
30				A			L	A	A	A	A	A	A	L	L	L	L	A	L					
31							L	L	L	L	L	L	L	A	L	L	A	A	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	2	2		1	1	3	2	3	6	4	4	1	3	1				
MED						344	386	414		436	E A 464	E A 444	456	444	429	430	422	392	352	E				
U Q												452		A 464	444	432	428		368					
L Q												E A 440		436	424	406	414		348					

JUL.2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				A	A	212	264	296	308	332	332	332	280	296	A	320	296	276	232	224	A			
2				A	A	244	268	296	308	328	332	332	344	292	264	308	308	252	212	280	8 204			
3				B	224	256	256	292	312	324	332	336	336	320	328	328	320	268	236	A	A			
4				B	252	196	280	280	308	320	336	336	356	356	344	332	296	272	216	A	A			
5				B	A	216	240	280	308	308	308	364	336	284	264	488	348	272	236	A	A			
6				224	B	228	264	292	308	324	324	332	332	300	A	300	300	276	216	A	B			
7				B	A	208	244	288	308	308	308	A	A	A	264	312	284	260	220	A	A			
8				B	A	208	248	296	296	312	336	A	A	C	324	304	288	268	204	A	A			
9				220	A	208	256	276	304	316	316	320	320	336	336	316	300	260	192	A	272			
10				B	A	312	224	256	316	332	332	304	D C 208	A	324	324	300	260	204	A	A			
11				A	A	204	256	280	304	304	316	316	308	280	A	348	292	252	208	A	304			
12				B	A	224	248	288	300	320	320	320	300	A	A	A	A	264	264	A	A			
13				B	A	228	248	284	316	328	328	328	304	292	A	A	A	276	208	A	A			
14				B	A	A 252	284	316	316	324	340	340	312	A	A	A	A	280	A	A				
15				B	B	236	252	280	320	320	320	320	A	344	328	328	288	260	220	4 192	A			
16				B	A	192	252	276	292	308	328	328	328	312	312	300	264	212	A	A	A			
17				B	A	200	252	288	316	328	344	332	364	340	300	356	296	236	184	A	A			
18				A	B	200	264	300	300	316	336	316	324	316	296	A	A	A	208	A	A			
19				A	188	A 276	292	308	308	312	A	348	A	A	316	292	244	A	A	A				
20				A	A	180	268	300	324	336	348	348	308	340	340	316	304	268	220	A	A			
21				A	A	188	244	280	292	A	A	A	A	340	340	328	312	272	204	A	188			
22				A	224	192	248	272	300	328	328	A	356	340	340	316	304	256	200	A	B			
23				A	A	200	256	288	332	320	320	316	356	304	A	272	300	260	208	A	A			
24				A	A	208	252	272	300	296	296	312	264	A	332	320	312	276	204	276	A			
25				A	A	172	252	288	308	312	324	324	308	308	A	A	A	A	224	A	A			
26				A	B	196	236	284	296	296	308	328	328	A	328	288	292	260	216	A	A			
27				A	A	A 260	284	304	316	340	340	340	340	340	352	324	292	264	224	A	A			
28				B	A	A 224	272	292	A	292	308	288	A	A	A	284	248	204	204	A				
29				B	A	196	232	272	296	296	288	288	288	360	344	312	288	244	188	B	B			
30				A	A	200	244	276	284	324	324	320	316	316	292	320	296	248	200	A	A			
31				A	A	200	220	252	312	320	320	320	332	332	316	284	284	244	212	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				2	4	27	31	31	31	29	30	26	27	23	21	25	26	28	29	5	4			
MED				222	224	204	252	284	308	320	324	326	328	316	328	316	296	260	212	224	238			
U Q					238	224	260	292	312	326	332	332	340	340	340	328	304	270	222	278	288			
L Q					206	196	244	276	300	308	316	316	304	300	298	306	288	250	204	198	196			

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	34	36	24	J A 26	J A 23	J A 51	J A 65	J A 95	J A 65	J A 65	J A 99	J A 79	J A 85	J A 69	J A 85	41	J A 62	49	J A 37	J A 57	J A 142	J A 106	J A 43	J A 33
2	J A 43	J A 32	J A 27	31	J A 31	J A 28	36	J A 45	J A 49	J A 84	J A 62	J A 153	J A 44	J A 69	J A 89	J A 49	40	71	J A 54	38	J A 32	J A 86	J A 70	J A 73
3	59	J A 48	J A 35	J A 50	J A 25	J A 29	J A 37	J A 69	J A 108	J A 165	J A 126	J A 89	J A 152	J A 143	97	J A 157	J A 101	J A 95	J A 143	J A 87	35	J A 81	J A 85	60
4	J A 73	J A 82	J A 27	27	J A 52	J A 31	J A 37	J A 51	J A 54	J A 47	J A 52	84	56	98	44	73	J A 117	J A 119	J A 49	J A 68	J A 67	J A 46	J A 128	J A 65
5	J A 120	J A 123	J A 85	J A 61	J A 64	J A 88	J A 103	J A 288	J A 153	106	J A 189	46	43	J A 54	56	J A 241	116	128	J A 181	J A 64	J A 184	J A 168	J A 63	J A 52
6	J A 64	J A 65	38	32	J A 34	J A 34	59	78	J A 88	73	J A 61	J A 44	75	43	J A 67	J A 39	J A 63	J A 105	J A 57	J A 33	J A 19	J A 50	J A 65	60
7	J A 39	J A 21	J A 104	J A 31	J A 31	J A 31	J A 35	J A 57	J A 127	61	J A 54	J A 63	57	J A 89	J A 53	39	36	J A 53	35	J A 89	J A 63	J A 51	J A 63	J A 83
8	60	59	J A 40	J A 33	J A 27	J A 82	73	J A 87	J A 133	J A 135	J A 143	J A 66	J A 52	C	39	J A 49	J A 73	J A 127	J A 77	J A 82	J A 116	J A 62	J A 152	59
9	J A 26	25	J A 26	33	J A 27	J A 63	J A 83	36	J A 71	J A 106	64	J A 60	40	J A 62	40	J A 45	J A 67	J A 88	J A 83	J A 83	J A 75	J A 31	J A 31	J A 23
10	J A 30	J A 25	32	24	J A 29	J A 112	J A 83	J A 41	60	J A 69	J A 108	J A 66	C J A 20	J A 83	41	44	J A 62	J A 53	J A 53	59	J A 61	J A 52	J A 63	J A 52
11	J A 51	J A 52	J A 66	34	J A 27	J A 43	41	J A 76	J A 65	J A 70	J A 142	J A 61	J A 128	J A 77	J A 75	J A 185	J A 290	J A 229	J A 222	J A 162	J A 128	J A 83	J A 52	J A 49
12	J A 35	J A 51	J A 40	J A 47	38	J A 52	59	60	J A 85	J A 85	J A 71	J A 75	J A 109	J A 57	J A 57	J A 63	J A 52	J A 40	J A 75	J A 108	J A 85	J A 97	J A 114	J A 51
13	J A 64	J A 50	J A 33	J A 35	39	J A 35	J A 41	J A 41	J A 44	73	J A 85	76	J A 84	J A 65	J A 55	J A 55	J A 101	J A 86	J A 140	J A 121	J A 126	J A 82	J A 52	J A 52
14	J A 83	J A 83	J A 57	J A 41	J A 30	J A 33	34	J A 40	79	J A 76	J A 141	J A 109	J A 99	J A 83	J A 55	58	J A 70	J A 160	103	48	J A 31	J A 28	J A 53	J A 32
15	J A 25	26	E B 16	E B 16	E B 16	J A 37	58	J A 33	J A 53	J A 109	J A 67	J A 51	J A 55	J A 45	46	J A 57	J A 79	J A 73	J A 64	J A 56	J A 62	J A 27	J A 52	J A 116
16	J A 65	J A 52	J A 83	J A 51	40	J A 33	J A 74	J A 93	J A 83	J A 109	J A 168	J A 142	60	J A 77	J A 64	J A 63	J A 63	J A 58	J A 51	J A 62	J A 27	J A 29	40	J A 107
17	J A 99	32	J A 32	J A 27	J A 26	J A 27	J A 39	J A 47	J A 86	J A 69	J A 107	J A 76	J A 66	J A 53	J A 56	J A 109	J A 86	71	J A 51	J A 51	J A 107	J A 109	J A 174	J A 173
18	J A 173	J A 85	J A 36	28	E B 16	J A 32	J A 52	J A 64	J A 125	J A 82	J A 137	J A 85	J A 94	J A 110	J A 97	J A 101	J A 74	J A 49	J A 77	J A 82	J A 107	J A 53	J A 53	J A 53
19	J A 53	49	J A 32	J A 29	J A 36	J A 65	J A 52	J A 137	J A 153	J A 115	J A 90	J A 105	J A 86	J A 62	J A 107	J A 99	J A 109	J A 136	J A 186	J A 141	J A 127	J A 51	J A 66	J A 66
20	J A 85	J A 65	J A 50	J A 45	30	J A 39	J A 65	J A 71	J A 63	70	J A 59	70	J A 76	J A 109	J A 109	J A 51	J A 66	J A 120	J A 102	J A 167	J A 83	J A 52	J A 52	59
21	J A 31	39	J A 65	J A 51	J A 41	J A 51	J A 65	J A 74	J A 64	75	J A 68	J A 70	J A 70	44	J A 52	J A 107	J A 166	J A 67	J A 50	J A 69	J A 32	J A 77	J A 38	J A 50
22	J A 52	J A 45	J A 34	J A 25	33	J A 32	J A 50	J A 50	J A 50	J A 57	J A 63	J A 60	41	40	J A 55	38	38	29	J A 25	J A 25	E B 16	27	J A 27	20
23	19	23	J A 32	J A 27	J A 27	J A 71	J A 53	J A 181	J A 48	J A 48	J A 48	J A 39	G	J A 60	J A 53	J A 98	J A 72	J A 121	48	59	32	29	J A 40	27
24	J A 28	J A 25	31	J A 25	J A 27	J A 33	J A 41	J A 115	J A 51	J A 100	J A 63	J A 55	J A 37	J A 55	38	J A 46	J A 53	J A 76	J A 109	J A 47	J A 52	49	J A 51	48
25	J A 83	59	J A 61	J A 51	27	J A 61	J A 85	J A 64	J A 83	J A 71	J A 77	J A 116	76	J A 59	J A 72	J A 53	J A 51	J A 47	30	J A 31	J A 47	J A 48	J A 37	31
26	J A 25	28	J A 25	29	E B 17	J A 104	J A 159	J A 52	J A 63	J A 83	J A 137	J A 83	J A 69	J A 83	39	J A 116	36	J A 46	J A 53	J A 62	J A 40	J A 38	J A 63	J A 52
27	J A 52	J A 39	J A 33	J A 76	J A 51	J A 30	J A 52	J A 42	J A 59	J A 42	J A 44	J A 51	J A 39	J A 38	J A 43	35	J A 31	J A 34	J A 27	26	90	J A 52	J A 84	J A 41
28	J A 47	32	J A 30	J A 27	J A 25	J A 133	J A 48	J A 53	J A 144	J A 73	J A 56	J A 64	J A 111	J A 49	J A 49	J A 35	33	37	J A 28	J A 30	32	J A 39	J A 25	J A 51
29	37	39	J A 101	E B 16	J A 21	23	J A 108	J A 127	J A 143	J A 251	J A 168	J A 93	J A 60	J A 67	J A 53	77	J A 63	J A 56	26	E B 17	J A 23	J A 51	J A 27	J A 31
30	J A 41	J A 46	J A 83	J A 101	48	J A 208	J A 31	J A 52	J A 87	J A 220	J A 169	J A 88	84	J A 51	J A 85	J A 53	56	J A 52	J A 52	J A 52	J A 50	J A 45	J A 63	30
31	E B 16	J A 63	J A 25	J A 25	J A 27	J A 21	J A 30	J A 47	J A 41	36	40	37	40	J A 75	J A 108	J A 129	93	J A 52	J A 37	J A 24	J A 28	J A 63	J A 51	J A 61
	00	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	30	31	31	31	31	31	31	31	31	31	31
MED	J A 51	J A 46	J A 34	J A 31	J A 29	J A 37	J A 52	J A 60	J A 71	J A 75	J A 77	J A 70	J A 66	J A 64	J A 55	J A 57	J A 66	J A 71	J A 53	J A 59	J A 61	J A 51	J A 53	J A 52
U Q	J A 65	J A 59	J A 61	J A 47	38	J A 65	J A 73	J A 87	J A 108	J A 106	J A 137	J A 88	J A 85	J A 83	J A 85	J A 101	J A 93	J A 119	J A 102	J A 83	J A 107	J A 81	J A 66	J A 61
L Q	J A 31	32	J A 30	27	J A 26	J A 31	J A 39	J A 47	J A 54	J A 69	J A 61	J A 60	43	J A 53	46	45	52	J A 49	J A 37	J A 38	J A 32	J A 39	J A 40	33

JUL.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 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	17	19	E B 16	E B 16	17	28	A A 65	A A 95	A	A A 65	A A 99	40	A A 85	A A 69	A	38	34	30	26	G 20	18	22	20	16
2	18	E B 16	E B 16	E B 16	19	G 24	G 27	36	46	50	A	39	37	36	33	32	32	30	26	G 16	G 18	16	16	20
3	19	19	17	17	G 17	G 24	32	E 46	A A 108	A A 165	A A 126	A A 89	A A 152	A A 143	35	A	A A 101	30	24	A	17	19	18	16
4	16	16	E B 16	E B 16	A	22	30	32	35	38	A	A A 84	38	A A 98	40	A	A 38	A	22	22	20	20	A A 128	A A 65
5	A A 120	A A 123	A A 85	E A 46	A	A A 88	A A 103	A A 288	A A 153	A A 106	A A 189	38	37	40	39	A A 241	A A 116	A A 128	A A 181	E A 46	E A 34	23	20	21
6	23	21	21	E B 16	18	G 21	30	A	A A 88	A	E A 46	39	E A 47	37	A	37	34	30	25	A	E B 16	20	22	22
7	18	E B 16	E B 16	18	20	28	32	A	A A 127	A 44	39	A A 63	39	A A 89	37	33	32	28	27	22	22	19	18	A A 83
8	A A 60	A A 59	18	18	18	A A 82	A A 73	A A 87	A A 133	A A 135	47	40	39	C	36	38	A A 73	A A 127	A	A A 82	A A 116	24	A A 152	A A 59
9	E B 16	E B 16	16	G 19	22	A A 63	27	34	A A 71	A A 106	A A 64	A A 60	36	G 33	36	G 31	A A 67	A A 88	A	22	G 26	18	20	E B 17
10	17	17	17	E B 17	17	G 20	26	28	A	A	A A 108	A A 66	C	A A 83	35	E A 37	A	33	A	24	A	28	29	22
11	22	A A 52	A A 66	24	22	A	E A 39	A A 76	E A 47	E A 48	A A 142	A A 35	A A 128	A A 77	A	A A 185	A A 290	A A 229	A A 222	A A 162	G 27	18	23	19
12	22	22	E A 22	19	21	E A 42	E A 42	A A 60	A A 85	A A 85	E A 50	A A	A A 109	A A 57	31	A	23	27	A A 75	A A 108	A A 85	A A 97	A A 114	17
13	18	20	16	16	23	24	27	33	39	A A 73	39	A A 76	A	A	29	E A 46	A	31	A	20	17	17	18	20
14	20	22	22	17	E B 17	24	29	33	A A 79	A A 76	A	A A 109	A A 99	A	A A 55	38	20	A A 160	A	22	17	19	19	16
15	E B 16	E B 16	E B 16	E B 16	E B 16	G 22	G 24	G 28	32	A	A	A	32	G 34	34	A	A	A	A	A	23	20	20	23
16	16	16	A A 83	22	22	E A 20	A A 74	A A 93	A A 83	A A 109	A A 168	A A 142	A A 60	A A 77	A A 64	A A 63	A	A A 58	22	18	18	18	18	18
17	17	19	18	18	E B 16	25	29	31	A A 86	A	43	A A 76	39	36	37	A	A	A A 71	26	25	21	A A 109	A A 174	A A 173
18	A A 173	A A 85	18	17	E B 16	25	A A 52	A A 64	A A 125	A	A A 137	A A 85	A A 94	A A 110	A A 97	A A 101	A A 74	27	A A 77	25	18	18	18	18
19	16	17	16	21	G 17	23	G 26	A A 137	A A 153	A A 115	A	A A 105	36	38	A A 107	A A 99	A	A A 136	A	A	23	A	20	18
20	A A 85	A A 65	A A 50	A E B 16	16	A A 39	G A 26	A A 71	A	A A 70	A A 59	A A 70	A A 76	A A 109	A	A	A A 66	A	A A 102	A	22	22	22	A
21	E B 17	E B 16	E B 16	19	21	20	A	31	A	33	A A 68	A	33	39	38	A A 107	G 29	A	27	19	G 18	20	16	24
22	18	19	16	16	E B 16	26	26	A	34	35	40	A A 60	37	38	36	G 32	35	27	24	18	E B 16	E B 16	E B 16	E B 16
23	E B 16	E B 16	16	16	20	A A 71	A	30	G 32	36	37	37	G	A	A	A	A	27	G 18	23	20	17	17	E B 17
24	17	E B 17	E B 17	E B 16	E B 16	24	G 21	A A 115	A	39	41	A	36	36	36	G 32	A A 53	A	A	G 20	17	20	18	18
25	A	A	A A 61	A	E B 16	A A 61	A A 85	A	A A 83	A 71	38	A A 116	A A 76	A A 59	34	29	29	23	G 20	20	25	22	20	E B 17
26	E B 17	E B 17	E B 17	E B 17	E B 17	G 18	27	A	A	35	A A 137	A	41	40	34	34	G 29	A	G 20	A	20	20	20	20
27	20	20	17	18	20	20	A A 52	E A 40	40	32	38	38	38	36	G 33	G 32	G 28	G 26	G 22	16	16	17	17	20
28	18	18	18	18	18	20	25	A	39	A	36	A	A	37	37	32	31	25	G 19	24	18	20	20	20
29	18	16	16	E B 16	E B 16	G 20	A A 108	A A 127	A A 143	A A 251	A A 168	A A 93	A A 60	A	A	E A 37	29	G 24	26	E B 17	E B 17	E B 17	18	18
30	19	21	23	A A 101	18	G 17	G 24	E A 45	A	A A 220	A A 169	A A 88	A A 84	37	33	38	32	A	20	23	19	19	E B 16	E B 16
31	E B 16	16	E B 17	E B 17	E B 17	G 19	28	33	G 30	G 30	36	34	39	36	A	33	A A 93	G 24	24	19	16	22	22	20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	30	29	30	29	25	24	25	26	25	28	26	24	24	24	24	23	25	30	30	31	30
MED	18	18	17	17	17	24	28	U 42	A A 81	A A 70	A A 54	A A 66	39	40	36	37	34	30	25	22	18	20	20	20
U Q	20	A A 21	A A 22	19	20	A A 28	A A 52	A A 90	A A 116	A A 108	A A 137	A A 88	A A 80	A A 77	A A 38	A A 54	A A 70	A A 80	A A 27	A 24	23	22	22	22
L Q	E B 17	E B 16	E B 16	E B 16	E B 16	G 20	G 26	32	39	37	39	39	37	36	34	G 32	29	27	G 22	19	17	18	18	E B 17

JUL.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 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	15	16	16	16	16	16	14	15	16	16	20	16	16	18	24	15	16	15	13	14	16	16	16	16
2	17	16	16	16	16	16	15	14	15	16	16	16	21	14	14	16	14	12	10	15	15	16	16	16
3	16	17	16	15	15	15	12	16	14	16	16	17	17	15	15	15	16	14	9	16	16	16	16	16
4	14	16	16	16	17	15	13	14	20	15	24	20	18	16	19	16	16	14	14	14	16	17	16	16
5	16	16	16	15	15	16	16	15	15	15	15	15	16	18	17	22	16	15	14	16	16	17	16	16
6	16	16	16	16	16	16	16	15	15	15	15	16	15	14	24	18	15	15	13	16	16	16	16	16
7	16	15	16	16	13	15	13	15	16	16	17	16	16	16	16	16	13	13	12	15	16	16	16	16
8	15	16	15	15	16	11	12	15	13	15	15	15	16	C	16	16	13	15	13	16	16	16	16	16
9	16	16	16	16	16	12	12	11	14	16	16	16	16	16	17	17	17	18	15	13	17	16	16	16
10	16	16	16	15	16	16	16	16	16	16	16	19	17	16	16	16	16	16	15	16	16	16	16	16
11	17	16	16	16	16	15	11	16	16	16	16	15	17	19	16	17	16	16	13	16	16	16	16	16
12	17	17	16	16	16	15	16	16	16	16	21	18	18	19	18	18	17	17	16	16	16	16	16	16
13	16	16	16	16	17	16	14	14	14	14	16	16	16	15	15	15	16	16	14	16	17	16	16	16
14	16	16	16	16	16	16	15	16	16	15	18	16	16	17	15	15	16	16	16	16	16	16	16	16
15	16	16	16	16	16	17	15	16	15	16	16	16	17	17	18	16	16	16	16	16	16	17	17	17
16	16	16	16	16	16	11	15	15	16	16	17	17	24	16	16	17	15	15	16	16	16	16	16	16
17	16	16	16	16	16	16	15	15	16	16	16	15	17	18	18	16	15	16	13	15	15	16	15	16
18	16	16	16	17	16	16	14	16	15	15	16	16	16	18	16	16	16	16	14	16	16	16	16	16
19	16	16	16	15	16	16	15	15	17	17	17	19	18	18	18	17	14	14	13	17	17	16	16	16
20	16	17	14	16	13	16	12	14	16	15	16	16	17	18	15	16	16	16	11	15	16	16	16	15
21	17	17	17	16	16	16	15	16	16	16	17	17	16	16	16	15	16	12	16	15	16	16	16	17
22	16	16	16	16	16	15	13	16	16	16	16	16	16	16	16	16	16	15	16	16	16	16	16	15
23	16	16	16	16	16	15	16	16	16	16	17	17	23	17	16	18	12	16	16	16	16	15	17	16
24	16	16	17	16	16	14	14	16	16	16	19	16	16	20	20	17	16	16	16	16	16	17	17	17
25	16	16	16	16	16	12	16	16	16	17	17	17	18	18	16	16	16	14	14	16	16	16	17	17
26	17	17	17	16	17	16	17	16	17	17	21	17	18	17	17	16	16	16	15	15	12	16	16	16
27	16	16	16	16	16	16	16	16	16	16	16	16	15	17	18	16	15	16	16	15	16	17	17	17
28	17	17	14	16	16	15	15	14	14	14	16	17	16	18	22	17	17	13	14	16	16	16	16	17
29	16	16	16	16	16	17	16	14	16	17	17	17	18	18	16	18	16	15	14	17	17	16	16	17
30	17	17	17	16	14	16	16	17	17	16	16	16	17	17	16	16	16	14	14	16	16	16	16	16
31	16	16	16	16	16	15	14	16	16	16	16	17	17	18	17	17	15	16	15	16	16	17	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	30	31	31	31	31	31	31	31	31	31	31
MED	16	16	16	16	16	16	15	16	16	16	16	16	17	17	16	16	16	15	14	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	16	17	17	18	18	18	17	16	16	16	16	16	16	16	16
L Q	16	16	16	16	16	15	13	15	15	15	16	16	16	16	16	16	15	14	13	15	16	16	16	16

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 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	300	297	F 304	290	306	305	A	A	251	A	A	316	A	A	309	280	311	295	303	320	290	F 265	F 288	F
2		F 271	F 279	F 325	F	285	306	342	341	R 342	290	305	291	306	306	311	311	311	309	308	314	304	303	300
3	311	309	F 305	F 305	319	269	354	192	A	A	A	A	A	A	288	218	A	216	313	310	323	295	318	315
4	312	311	288	287	293	324	297	316	350	308	315	A	R	A	292	R	289	306	318	318	306	R	A	A
5	A	A	A	317	316	A	A	A	A	A	A	287	305	309	293	A	A	A	A	194	239	305	F	315
6	302	273	F 301	279	335	324	320	229	A	214	229	272	R	362	318	287	293	310	300	300	316	318	318	336
7	295	288	288	310	F 293	321	303	303	A	303	308	A	282	A	310	309	313	293	301	315	311	316	320	A
8	A	A	320	F	365	A	A	A	A	A	319	307	299	C	R 324	313	A	A	310	A	A	S	A	A
9	296	286	R 313	R 313	R 339	A	381	G	A	A	A	A	R 272	G	G	R 321	A	A	318	302	310	303	R 303	324
10	R 359	R 299	297	R 297	297	297	298	295	346	343	A	A	C	A	R 350	368	325	297	253	310	A	307	304	318
11	301	A	A	275	315	269	287	A	343	308	A	286	A	A	292	A	A	A	A	A	337	309	322	306
12	297	F 312	296	295	F	344	349	A	A	A	351	340	A	A	U R 306	322	337	316	A	A	A	A	A	349
13	272	304	303	295	328	316	319	315	374	A	291	A	289	286	296	332	322	327	260	313	313	312	319	318
14	308	311	308	333	311	291	313	335	A	A	307	A	A	325	A	284	313	A	246	321	300	314	310	308
15	299	331	F 286	F 301	329	R 250	375	342	306	R	355	412	292	275	304	287	221	253	217	297	R 304	304	303	311
16	310	307	A	303	279	285	A	A	A	A	A	A	A	A	A	A	305	A	302	300	299	322	322	300
17	301	298	287	297	291	302	305	339	A	310	324	A	309	300	286	331	226	A	273	318	317	A	A	A
18	A	A	304	304	304	331	A	A	A	316	A	A	A	A	A	A	A	314	A	302	315	315	314	313
19	284	281	288	306	330	301	299	A	A	A	299	A	294	273	A	A	313	A	335	242	370	323	311	307
20	A	A	A	326	306	A	R	A	200	A	A	A	A	A	321	292	A	213	A	263	317	317	319	319
21	304	304	303	331	287	292	292	231	341	377	A	317	327	274	297	A	282	264	334	310	309	306	305	315
22	301	299	307	304	290	283	329	271	340	303	278	A	282	250	280	293	255	283	293	298	298	318	326	326
23	311	300	299	286	285	A	345	263	328	308	333	317	G	290	291	291	235	312	312	312	311	310	319	312
24	310	262	308	316	294	284	308	A	307	G	307	255	299	312	309	269	A	218	268	329	328	309	306	291
25	317	314	A	294	294	A	A	299	A	A	296	A	A	A	352	293	290	290	313	313	293	F	296	319
26	308	308	296	295	295	277	312	331	369	332	A	301	251	282	299	331	284	312	319	350	327	315	315	314
27	311	280	322	322	321	325	A	293	327	342	331	330	329	270	294	291	307	308	306	305	305	R 305	J R 304	319
28	304	292	289	286	357	334	351	333	332	298	287	292	288	297	301	293	326	329	318	311	R 318	318	295	302
29	333	338	359	Z 305	283	303	A	A	A	A	A	A	A	263	276	200	291	305	302	300	302	302	297	302
30	299	299	296	A	313	305	280	286	342	A	A	A	A	275	272	258	303	306	313	302	272	287	326	296
31	293	281	301	267	286	332	333	289	334	272	294	329	R	237	282	317	A	311	312	311	334	327	326	F 310
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	26	26	29	29	25	22	20	17	16	18	15	16	19	27	24	22	23	26	28	28	26	26	26
MED	303	299	301	303	306	302	312	297	340	308	307	307	292	282	297	293	304	306	308	310	311	310	312	314
U Q	311	309	307	314	324	324	345	332	344	337	324	329	302	306	309	319	313	312	313	314	318	317	319	319
L Q	299	286	289	292	292	284	299	267	317	300	291	287	282	270	288	286	284	283	293	300	301	304	303	306

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A	A	A	A	A	L	A	A	A	371	L	L	339					
2						351	L	L	A	A	A	A	397	L	L	376	372	A	L	L				
3					L	L	L	A	A	A	A	A	A	A	L	L	A	L	L	A				
4					A	L	L	L		L	A	A	L	A	L	A	L	L	369					
5				A	A	A	A	A	A	A	A	L	L	L	L	A	A	A	A	A	A			
6						L	A	A	A	A	A	L	A	A	A	L	L	L	L					
7						L	L	A	A	A	L	A	L	A	L	L	L	L	L					
8						A	A	A	A	A		A	L	C	L	A	A	A	A	A	A			
9						A	L	396	A	A	A	A	L	L	385	R 340	A	A	A					
10						L	L	L	L	L	A	A	C	A	438	A	A	L	A	A	A			
11				A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
12						A		A	A	A	A	L	A	A	L	L	L	L	A	A	A			
13						L	L	L	L	A	L	A	A	A	382	A	A	A	A					
14						L	L	L	A	A	A	A	A	A	A	L	L	A	L					
15						L	L	L	L	A	L	A	L	L	L	A	A	A	A	A				
16					A	A	A	A	A	A	A	A	A	A	A	A	A	A	L	A				
17					L	L	377	L	A	A	A	A	L	397	L	A	A	A	L					
18						L	A	A	A	A	A	A	A	A	A	A	A	L	A	L				
19						L	L	A	A	A	A	A	L	L	A	A	A	A	A	A	A			
20						A	L	A	A	A	A	A	A	A	A	L	A	A	A	A				
21					A	L	A	L	L	A	A	A	L	L	L	A	L	A	L	E				
22				L	L	L	L	A	L	L	L	A	L	L	386	L	L	L	L	L				
23						A	L	L	L	L	L	L	421	A	A	A	A	L		A				
24						L	L	A	A	394	L	A	L	L	L	L	A	A	A					
25				A		A	A	A	A	A	L	A	A	A	A	L	L	L	L					
26						L	L	A	A	L	A	A	L	L	L	386	361	A	A	A				
27							A	E A 321	L	L	L	412	L	440	387	L	338	L	338					
28						L	360	A	L	A	L	A	A	L	L	L	L	357	L					
29						L	A	A	A	A	A	A	A	A	A	A	L	L	L					
30				A			L	A	A	A	A	A	A	L	L	L	L	A	L					
31							L	L	L	L	L	L	L	A	L	L	A	A	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	2	2		1		1	2	2	5	4	3	1	3					
MED						351	368	358		394		412	409	418	386	374	361	357	339					
U Q															412	381	372		369					
L Q															384	356	338		338					

JUL.2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A	A	E A 466	A	A	328	A	A	364	396	324	290	304					
2						310	292	266	266	286	406	392	378	378	378	338	338	324	310	286				
3					286	358	248	E A 646	A	A	A	A	A	A	386	416	A	416	312	320				
4					A 284	268	308	284		330	334	A	334	A	404	A	374	318	278					
5				A	304	A	A	A	A	A	A	422	366	364	392	A	A	A	A	A	A			
6						282	326	A	A	608	324	406	A	260	324	384	384	322	294					
7						288	324	324	A	308	360	A	434	A	364	344	324	356	310					
8						A	A	A	A	A		374	368	C	304	354	A	A	324	A	A			
9						A	240	G	A	A	A	A	416	G	G	362	A	A	A					
10						346	336	364	254	298	A	A	C	A	310	268	312	310	A		308			
11				A 292		A	340	A	286	E A 368	A	390	A	A	380	A	A	A	A	A				
12						294		A	A	A	290	330	A	A	A	334	310	304	A	A	A			
13						304	314	314	274	A	354	A	412	388	346	300	314	332	E A 444					
14						322	304	286	A	A	E A 322	A	A	E A 330	A	400	344	A	398					
15						332	222	288	350	340	286	206	368	462	362	392	A	426	A	270				
16					258	260	A	A	A	A	A	A	A	A	A	A	A	A	318	284				
17					282	288	304	266	A	E A 354	A	A	352	354	390	316	A	A	392					
18						300	A	A	A	346	A	A	A	A	A	A	A	296	A	316				
19						336	376	A	A	A	276	A	412	424	A	A	332	A	250	410	288			
20						A	242	A	A	A	A	A	A	A	340	362	A	A	A	268				
21					292	324	E A 336	A	256	292	A	A	312	422	380	A	392	420	262	284				
22				276	350	342	340	438	286	354	474	A	462	A	424	432	452	402	326	284				
23						A	272	320	298	344	304	380	G	392	378	374	528	322		318				
24						364	330	A	354	G	362	418	396	356	380	432	A	E A 480	298					
25				294		A	A	320	A	A	376	A	A	A	274	298	392	352	308					
26						410	306	288	252	316	A	A	506	426	346	328	392	320	290	300				
27							A	346	310	276	294	326	326	452	398	398	346	290	298					
28						262	276	290	290	328	366	410	408	374	374	376	300	300	286					
29						290	A	A	A	A	A	A	A	A	A	E A 378	384	328	302					
30				A			376	E A 420	292		A	A	A	414	406	482	370	E A 340	282					
31							282	358	288	394	364	316	368	A	406	318	A	324	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				3	7	20	22	18	15	17	16	13	18	16	25	24	19	22	22	11	2			
MED				292	286	307	306	311	287	334	344	380	387	390	378	365	346	323	302	286	298			
U Q				294	304	339	336	364	310	361	365	408	416	425	395	397	392	356	318	318				
L Q				276	282	288	276	288	266	303	299	327	366	360	346	331	324	310	286	284				

JUL.2021 h'F2 (KM)

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 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	252	252	274	254	260	A	A	A	A	A	A	188	A	A	A	234	220	220	210	264	292	250	294	268
2	278	Q 272	Q 262	256	240	232	220	222	A	A	A	A	194	202	194	212	200	A	202	212	240	218	252	272
3	272	232	262	262	232	202	212	A	A	A	A	A	A	A	212	A	A	A	206	A	244	244	244	244
4	244	264	264	264	A	198	218	214	214	204	A	A	184	A	232	A	A	A	202	240	246	246	A	A
5	A	A	A	A	A	A	A	A	A	A	A	188	186	198	206	A	A	A	A	A	A	A	240	236
6	264	284	276	Q 258	230	218	A	A	A	A	A	204	A	A	A	210	222	220	220	284	246	248	244	226
7	282	282	Q 282	Q 262	272	226	220	A	A	A	196	A	200	A	200	192	198	A	230	246	262	234	226	A
8	A	A	202	224	204	A	A	A	A	A	E 312	A	196	C	200	A	A	A	A	A	A	232	A	A
9	246	276	228	242	242	A	224	190	A	A	A	A	192	198	206	214	A	A	A	218	238	252	260	216
10	216	262	252	Q 230	278	206	200	200	A	200	A	A	C	A	198	A	A	228	A	240	A	A	220	250
11	236	A	A	A	248	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	256	270	262	260
12	262	198	A	256	238	A	292	A	A	A	A	A	A	A	200	A	202	196	A	A	A	A	A	220
13	220	270	270	256	248	244	228	222	206	A	218	A	A	A	200	A	A	A	A	254	238	262	262	272
14	242	248	226	254	236	224	220	228	A	A	A	A	A	A	A	228	194	A	210	238	240	Q 250	A	260
15	260	Q 236	276	274	250	218	192	200	212	A	A	A	200	192	204	A	A	A	A	A	268	238	252	226
16	244	266	A	264	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	264	260	240	248
17	252	Q 232	246	Q 248	236	216	212	212	A	A	A	A	194	202	242	A	A	A	220	296	264	A	A	A
18	A	A	272	250	250	236	A	A	A	A	A	A	A	A	A	A	A	218	A	218	270	238	238	230
19	272	Q 290	278	266	236	240	230	A	A	A	A	A	166	184	A	A	A	A	A	A	A	A	230	244
20	A	A	A	218	246	A	190	A	A	A	A	A	A	A	A	A	A	A	A	A	248	222	236	A
21	Q 252	268	260	232	A	220	A	206	194	A	A	A	194	200	236	A	236	A	220	A 232	256	256	264	274
22	274	286	270	224	262	254	226	A	202	A	202	A	192	200	200	216	210	218	228	234	270	250	230	224
23	260	300	236	332	296	A	212	214	206	190	204	186	186	380	A	A	A	218	284	A	244	222	242	254
24	254	Q 272	254	280	280	230	216	A	A	216	216	A	186	214	200	192	A	A	A	250	234	248	256	320
25	A	A	A	A	260	A	A	A	A	A	196	A	A	A	190	196	196	208	220	260	276	258	268	228
26	248	260	256	264	288	230	212	A	A	194	A	A	202	208	188	202	210	A	A	A	258	258	244	244
27	260	300	244	212	248	226	A	A	226	210	196	196	188	190	196	204	216	208	218	260	244	256	272	258
28	282	282	262	274	238	196	226	A	218	A	190	A	A	196	196	184	230	234	218	278	258	282	282	270
29	A	228	220	E B 276	282	220	A	A	A	A	A	A	A	A	A	A	192	202	212	256	258	254	282	268
30	268	268	268	A	266	256	200	A	A	A	A	A	A	216	210	244	A	A	216	254	288	256	214	270
31	242	270	250	Q 264	230	236	210	194	200	182	196	184	226	A	240	202	A	A	200	232	244	256	236	222
	00	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	25	25	27	27	21	20	11	9	7	10	6	16	14	21	14	13	11	17	20	26	26	26	26
MED	254	268	262	256	248	226	217	212	206	200	198	188	193	200	200	207	210	218	218	248	256	250	244	249
U Q	270	282	271	264	266	236	225	222	216	210	216	196	198	208	211	216	221	220	220	260	264	256	262	268
L Q	244	250	245	242	236	217	211	200	201	190	196	186	186	196	197	196	197	208	208	233	244	238	236	228

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				A	A	102	102	102	102	98	98	98	98	98	A	102	102	102	102	102	A			
2				A	A	102	102	102	98	98	98	98	98	98	98	96	96	100	100	108	A			
3				B	106	106	106	102	102	104	98	98	98	98	98	110	110	110	102	A	A			
4				B	92	92	100	100	100	100	100	100	100	100	100	100	100	100	100	A	A			
5				B	A	100	100	100	100	100	100	100	104	90	90	96	96	96	98	A	A			
6				108	B	108	100	100	100	100	100	100	100	88	A	98	98	98	98	A	B			
7				B	A	108	108	100	100	100	92	A	A	A	92	98	98	98	98	A	A			
8				B	A	90	98	98	98	98	98	A	A	C	98	96	100	100	100	A	A			
9				88	A	104	104	100	100	96	96	96	96	96	96	96	100	100	100	A	106			
10				B	A	106	100	96	96	96	96	96	92	A	96	96	102	102	102	A	A			
11				A	A	106	90	100	100	96	96	96	96	96	A	96	96	96	96	A	114			
12				B	A	114	104	94	94	94	94	96	100	A	A	A	A	92	102	A	A			
13				B	A	114	94	100	100	100	100	100	100	96	A	A	A	102	102	A	A			
14				B	A	A	96	102	102	102	102	94	94	94	A	A	A	A	94	A	A			
15				B	B	112	98	108	108	96	96	96	A	98	98	108	108	108	104	A	A			
16				B	A	106	106	94	94	94	94	94	94	94	94	94	94	94	A	A	A			
17				B	A	104	102	102	102	98	98	98	98	98	98	98	98	98	98	A	A			
18				A	B	98	100	100	100	100	98	98	98	98	100	A	A	A	100	A	A			
19				A	100	A	100	100	100	100	100	A	100	A	A	100	92	96	A	A	A			
20				A	A	110	98	98	98	90	90	90	104	102	102	102	102	102	102	A	A			
21				A	A	102	102	100	96	A	A	A	A	94	94	94	94	94	94	A	94			
22				A	124	96	100	102	102	92	92	A	102	102	102	102	96	106	106	A	B			
23				A	A	106	100	100	100	100	100	100	100	100	A	100	100	100	100	A	A			
24				A	A	108	104	104	94	94	94	94	94	A	94	94	100	100	100	100	A			
25				A	A	100	100	100	100	100	100	100	100	100	A	A	A	A	100	A	A			
26				A	B	100	100	100	100	100	100	100	100	A	100	90	96	96	96	A	A			
27				A	A	A	100	100	100	100	100	98	98	98	102	102	102	102	112	A	A			
28				B	A	A	96	96	96	A	96	96	96	A	A	A	102	102	102	88	A			
29				B	A	114	100	100	100	100	100	100	100	100	100	100	100	100	100	B	B			
30				A	A	108	108	98	98	98	98	96	96	96	96	104	104	100	100	A	A			
31				A	A	130	108	100	100	100	100	100	100	100	100	100	100	100	92	92	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT				2	4	27	31	31	31	29	30	26	27	23	21	25	26	28	29	4	3			
MED				98	103	106	100	100	100	100	98	98	98	98	98	98	100	100	100	101	106			
U Q					115	108	104	102	100	100	100	100	100	100	100	102	102	102	102	105	114			
L Q					96	100	100	100	98	96	96	96	96	96	95	96	96	96	98	94	94			

JUL.2021 h'E (KM)

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 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	96	96	88	108	112	112	112	112	112	112	108	112	108	90	102	108	108	114	104	122	120	120	106	96
2	96	98	92	98	98	98	94	120	108	102	102	102	102	102	102	102	102	104	104	114	102	104	106	106
3	106	98	108	100	100	102	124	114	110	102	102	102	102	102	102	106	106	106	116	108	100	100	100	114
4	106	106	106	96	96	96	104	104	104	104	98	98	116	110	118	112	112	112	104	104	102	102	102	102
5	100	100	94	96	96	104	104	104	102	102	102	106	106	98	98	98	98	104	102	102	108	132	98	94
6	104	112	104	112	98	112	110	110	104	104	104	104	96	136	98	102	118	108	108	102	102	102	102	110
7	96	96	98	98	98	112	120	106	102	102	102	102	102	98	90	120	136	110	118	110	110	102	102	102
8	94	94	94	94	94	110	110	110	98	98	98	94	96	C	138	92	108	108	108	102	102	104	104	104
9	104	92	92	98	114	114	114	116	108	108	108	100	100	102	102	122	114	106	106	106	106	106	100	100
10	102	102	102	102	106	106	106	100	108	102	102	102	C	94	122	122	108	120	104	102	104	104	102	102
11	102	94	94	94	94	118	116	106	106	100	100	100	100	98	98	116	106	106	100	100	106	106	106	104
12	104	100	94	100	98	112	112	112	104	104	100	100	94	98	94	94	94	92	114	114	114	106	106	106
13	106	106	96	102	102	122	114	114	114	102	106	100	112	96	96	96	96	118	110	106	106	110	110	104
14	100	100	100	100	100	94	118	112	112	104	116	110	98	98	98	98	98	98	98	98	106	106	106	104
15	98	106	B	B	B	110	106	122	108	108	102	96	96	102	104	112	112	106	108	120	114	106	106	96
16	96	96	96	96	96	122	108	108	108	108	118	112	108	98	98	98	98	98	98	104	104	104	104	104
17	110	98	100	100	128	118	112	112	104	104	104	104	98	94	96	96	100	100	100	108	108	104	104	104
18	104	104	94	94	B	120	116	106	104	104	104	104	100	96	96	104	104	104	110	110	118	102	102	102
19	106	98	86	100	108	112	112	104	104	104	100	100	124	100	102	106	106	98	102	102	102	116	110	110
20	110	100	100	88	100	108	120	112	108	100	104	104	106	96	104	130	110	106	106	106	100	100	100	94
21	102	102	92	100	104	104	104	104	102	96	96	96	96	108	112	112	106	106	106	106	106	106	96	96
22	96	102	112	114	102	110	110	98	104	104	100	92	188	122	122	126	116	116	116	116	B	106	106	92
23	92	132	100	100	100	106	112	110	110	104	100	100	G	98	98	98	106	106	106	106	100	100	90	104
24	88	96	96	98	98	106	106	100	104	104	104	100	102	90	122	122	112	112	108	100	100	100	100	100
25	100	100	94	94	110	112	112	104	104	104	104	104	98	98	98	98	98	98	104	96	104	106	100	92
26	92	100	88	108	B	94	94	108	104	104	104	104	100	100	100	118	118	108	108	100	100	100	102	102
27	102	102	92	100	100	100	108	118	110	108	108	108	108	108	98	174	122	122	116	106	106	106	106	106
28	106	102	90	90	100	100	100	108	114	108	108	98	98	98	98	98	136	118	94	102	88	104	96	102
29	94	102	92	B	100	120	110	110	108	110	108	104	104	108	112	104	110	110	100	B	106	114	100	106
30	106	100	100	100	102	124	124	112	106	106	106	106	106	102	108	114	114	114	110	108	104	100	100	100
31	B	106	92	92	108	134	100	102	110	110	148	102	158	108	108	108	108	102	102	94	94	102	94	96
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	30	29	28	31	31	31	31	31	31	31	29	30	31	31	31	31	31	30	30	31	31	31
MED	102	100	94	100	100	110	110	110	106	104	104	102	102	98	102	106	108	106	106	106	104	104	102	102
U Q	106	102	100	100	105	118	114	112	110	108	108	104	108	102	108	118	114	112	110	108	106	106	106	104
L Q	96	98	92	95	98	104	106	104	104	102	100	100	98	98	98	98	102	104	102	102	102	102	100	96

JUL.2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL.2021 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F3	F3	F1	LQ21	LQ11	CQ51	C6	C7	C3	C4	C4	C1	C2	C3	LQ21	C2	C2	C4	C6	C5	L3	F6	F5	F4
2	F3	F3	F2	LQ21	LQ31	LC21	LC21	C2	C3	C3	C3	C3	C2	C2	L2	C2	C3	C3	C3	C5	L3	F3	F3	F5
3	F7	F9	F5	L4	C2	C3	C2	C4	C4	C7	C4	C4	CQ42	CQ32	CQ21	CQ31	CQ41	CQ41	CQ41	LLQ42	LL31	FQ61	FQ31	FQ31
4	FQ31	FQ21	F2	L2	C3	CL32	CQ21	CQ41	C3	C2	C2	C4	C1	C3	C2	C2	C3	C4	C3	L4	L4	F6	F7	F9
5	F9	FQ61	FQ81	LQ51	LQ41	CQ61	CQ81	CQ43	CQ42	CQ42	CQ52	CQ11	C1	C2	C2	C3	C4	C9	C8	C6	CQ41	FF32	F6	F6
6	FQ42	FQ41	FQ21	C2	L3	C3	C3	C3	C6	C4	C3	C2	C4	HL11	LQ31	C3	C3	C4	C5	L6	L2	F8	F7	FQ31
7	FQ41	FQ21	F3	L4	LQ31	CQ41	CQ61	CQ61	CQ61	CQ31	CQ21	LQ21	LQ21	LQ31	LQ21	CL21	C3	C3	C5	L7	L7	FF31	FQ73	FQ53
8	F8	F4	F6	L3	LL11	C4	C5	C5	C6	C5	C3	L2	L2		H1	CL31	C5	C3	C5	L7	L9	F3	F4	F6
9	FQ21	F3	FQ31	LQ31	L5	CQ42	CQ31	CQ21	CQ31	CQ31	C3	C2	C2	C2	C2	C2	C4	C4	C7	L5	L8	F3	F6	F1
10	F3	F4	F6	LL11	L3	L3	C3	C4	C4	C5	C4	C2	C1	L3	C2	C2	C3	C4	C7	L4	L9	F4	F7	F7
11	F4	F6	F4	L3	L3	C5	C4	C4	C4	C4	C5	C2	C4	C3	L2	C8	C6	C8	C7	L6	L6	F6	F5	FQ61
12	FFQ31	FQ43	FQ51	LL22	LL22	CQ71	CQ61	CQ51	CQ51	CQ41	C3	C4	C6	L4	L4	L3	L3	LC21	CQ61	LQ51	LQ81	F7	FQ43	FQ11
13	FQ41	FQ41	F3	L5	L3	C3	C5	C3	C4	C5	C2	C3	C2	C3	L2	C3	L3	C5	C6	L3	L3	FQ41	FQ31	FQ31
14	FQ61	FQ51	F6	L3	L2	L3	C3	C4	C4	C4	C3	C3	C3	C5	L3	L3	L4	L5	L3	LQ31	LQ31	FQ21	F7	F3
15	F2	F1				C3	C3	C3	C3	C3	C3	C2	L2	C1	C2	C3	C3	C3	C4	C4	L5	F2	F7	F7
16	F3	F7	F6	L4	L4	C5	C3	C4	C5	C4	CQ41		C3	C4	C5	C3	C6	C7	L7	L6	L5	F5	F3	F3
17	F3	F3	F3	L3	C3	C3	C3	C4	C5	C3	C3	C2	C2	C2	C2	C4	C4	C4	C5	L4	L4	F7	F9	F8
18	F7	F8	F4	L3		C4	C6	C7	C6	C3	C4	C6	C4	C5	C5	L4	L4	L3	C8	L7	L6	F3	F8	F4
19	F3	FQ51	FQ41	L2	C2	L5	C4	C5	C7	C6	C3	LQ41	CQ11	LQ11	LQ31	C4	CQ41	C6	LQ41	LL52	L4	F5	F3	FQ42
20	FQ61	FF71	FQ91	LQ51	L4	C4	C6	C6	C3	C4	CC32	C4	C4	C3	C3	C2	C4	C4	C5	L8	L6	F6	F7	F7
21	F2	FF21	F3	LQ32	LQ61	CQ51	C3	C5	C4	L4	L3	L3	L2	CL11	C2	C3	C4	C5	C6	L7	C3	F4	F5	F5
22	F4	F4	FF21	LL21	LC11	C5	C5	C4	C2	C2	C2	L3	C1	C1	C1	C1	C2	C1	C2	L2		F2	F1	F1
23	F1	F1	F3	L3	LQ21	C6	C5	C2	C3	C2	C2	C2		C2	L4	CQ21	C4	C3	C6	L3	L3	F3	F4	FF11
24	F4	F2	FQ21	L2	L2	C5	C4	C5	C4	C2	C2	C2	C2	C2	C2	C1	C4	C4	C5	L5	LQ42	F7	F5	F7
25	F5	F6	F7	L4	L1	C5	C3	C3	C3	C3	C2	C5	C3	C3	C2	L3	L2	LQ31	CQ31	CQ31	L4	F7	F5	F3
26	F2	F1	F1	L1		LC22	LC13	C3	C3	C2	C3	C3	C2	C3	LC11	C2	CL22	C3	C3	L4	L4	F7	F6	F9
27	F7	F7	F6	L6	L3	L4	C3	C3	C3	C2	C2	C3	C2	C2	C2	H2	CL21	CL21	C2	L1	L4	FQ32	FQ32	FQ31
28	FQ31	FQ41	F2	L3	LQ21	LL11	LC12	C3	CQ31	LQ21	C2	C2	C2	L2	L2	L2	CL22	CL22	LC31	C3	L7	F4	F4	F5
29	F8	F6	F6		L2	C2	C7	C7	C8	CQ51	CQ31	C2	C2	C2	C2	C3	C2	C2	C2		L2	F2	F3	F3
30	FQ41	FQ51	FQ41	L5	L7	LQ21	C3	C3	C3	C5	CL33	C3	C2	C2	C2	C3	C3	C4	C3	L4	L8	F7	F3	F2
31		F3	FF11	L1	L1	C1	C3	C3	C1	C1	H1	C1	C1	C2	C2	C2	C4	C3	C4	L3	L2	F6	F6	F4
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUL.2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 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	70	59	59	59	56	56														X 60	X 60	X 59	X 58	X 56
2	60	60	60	58	55															X 85	X 79	X 55	60	60
3	63	A	A	51	48															C	X 74	X 70	57	X 52
4	X 53	X 52	54	X 46	X 44															X 72	X 66	X 60	59	63
5	57	58	58	48	C									C		C				X 72	X 75	X 58	X 53	59
6	X 51	62	50	47	42															X 83	X 84	X 73	X 41	X 38
7	43	C	X 41	45	X 44															X 70	X 73	X 65	60	58
8	C	58	59	54	41													C		X 60	X 70	68	60	C
9	61	61	61	60	59								C							A	X 64	X 54	67	58
10	56	53	43	A	C															A	X 58	X 59	X 52	52
11	52	X 45	X 42	42	39															X 63	X 60	X 50	58	58
12	56	48	X 38	40	X 37									C						C	X 64	C	58	62
13	58	X 43	X 42	X 39	42	C	61	71												X 68	X 70		55	A
14	49	56	50	46	40								C							X 67	X 60	57	X 54	59
15	59	55	X 39	X 44	46															X 69	X 67	X 67	63	A
16	A	57	49	49	46															X 58	X 63	59	A	A
17	56	54	51	53	50											C				X 80	X 82	X 58	59	61
18	46	51	43	X 37	X 37					C				C						X 75	X 78	A	66	60
19	60	56	X 48	X 45	X 45															X 68	X 72	X 68	X 62	X 58
20	52	X 48	52	44	40															A	X 86	80	72	72
21	68	64	61	50	46															X 76	74	70	66	X 60
22	58	58	X 54	X 54	57						C									A	90	X 83	X 65	X 58
23	X 52	A	54	54	48															X 87	X 87	X 75	X 68	X 53
24	X 52	X 45	48	48	48															X 73	X 70	X 70	67	60
25	57	54	54	50	46															X 66	X 64	62	X 59	51
26	A	X 44	A	46	46															X 72	74	76	74	71
27	X 53	57	A	48	48															X 80	X 78	X 74	X 73	X 67
28	X 61	X 60	X 55	X 53	X 44													X 66		X 74	X 76	X 73	74	X 68
29	X 67	X 54	X 42	X 38	X 38															X 66	X 68	X 70	X 64	X 61
30	X 59	60	X 58	61	50															X 67	X 71	A	61	61
31	61	62	58	58	49	110														X 89	X 72	X 59	61	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	28	28	28	30	29	2	1	1										1		25	31	27	30	26
MED	57	56	52	48	46	83	61	71										X 66		X 72	X 72	X 67	60	60
U Q	60	60	58	54	48															X 78	X 78	X 73	66	61
L Q	52	X 52	X 43	45	42															X 66	X 64	X 59	58	X 58

JUL.2021 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 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	F	F	F	F	F	F	56	54	66	65	61	54	R 60	56	60	65	66	64	57	54	54	55	52	50
2	F	F	F	F	F	48	53	58	62	A	58	A	A	A	A	A	A	60	69	79	73	49	F	F
3	F	A	A	F	F	46	45	56	53	57	60	51	A	A	A	A	54	54	57	C	68	64	F	46
4	47	46	F	40	38	38	57	62	62	56	51	52	54	54	A	60	70	67	62	66	60	54	F	F
5	F	F	F	F	C	39	51	58	56	A	A	A	59	C	62	C	A	A	56	66	69	52	47	F
6	45	F	F	F	F	35	A	60	A	A	49	A	56	56	58	62	63	63	66	77	78	67	35	32
7	F	C	35	F	38	40	48	60	57	A	56	A	A	55	63	63	64	54	57	64	67	59	F	F
8	C	F	F	F	F	38	50	A	A	A	A	A	A	A	A	60	64	C	57	54	64	F	F	C
9	F	F	F	F	F	41	A	A	A	A	A	A	C	A	A	48	52	51	35	A	58	48	F	F
10	F	F	F	A	C	32	49	62	56	A	53	52	50	47	54	54	54	54	52	A	52	53	46	F
11	F	39	36	F	F	34	45	64	A	A	A	59	A	A	A	52	54	A	57	57	54	44	F	F
12	F	F	32	F	31	37	47	A	A	A	56	A	A	C	A	A	59	49	49	C	58	C	F	F
13	F	37	36	33	F	C	F	F	58	A	A	A	A	60	67	A	67	70	60	62	64	A	F	A
14	F	F	F	F	F	36	47	A	A	A	56	60	C	A	52	50	54	A	61	61	54	F	48	F
15	F	F	33	38	F	38	A	56	54	A	A	A	57	56	52	56	56	54	56	63	61	61	F	A
16	A	F	F	F	F	46	47	63	A	A	A	A	A	A	A	A	52	53	46	52	57	F	A	A
17	F	F	F	F	F	38	A	A	56	69	55	A	60	60	64	C	A	A	63	74	76	52	F	F
18	F	F	F	31	31	34	47	55	55	C	A	A	A	C	A	A	A	54	59	69	72	A	F	F
19	F	F	42	39	39	39	51	A	60	70	A	A	A	57	A	A	A	A	55	62	66	62	56	52
20	F	42	F	F	F	40	48	60	59	62	A	A	A	A	68	58	60	A	A	A	80	F	F	F
21	F	F	F	F	F	A	53	77	64	A	A	52	65	58	57	58	57	58	65	70	F	F	F	54
22	F	F	48	48	F	44	54	68	A	A	C	59	58	61	52	A	56	59	A	A	F	77	59	52
23	46	A	F	F	F	A	A	A	A	A	60	A	55	58	63	67	76	78	75	81	81	69	62	46
24	46	39	F	F	F	40	58	60	71	71	A	54	55	52	59	64	64	69	A	67	64	64	F	F
25	F	F	F	F	F	38	50	64	A	53	53	54	54	A	A	53	55	59	63	59	58	F	53	F
26	A	38	A	F	F	36	52	72	A	53	53	56	54	57	A	A	65	64	64	66	F	F	F	F
27	47	F	A	F	F	40	48	A	A	A	A	A	A	52	52	58	A	61	A	74	72	68	67	61
28	55	53	49	47	38	42	52	62	57	53	A	A	A	A	68	72	63	60	60	68	70	67	F	62
29	61	48	36	32	32	36	52	42	A	A	A	A	R 64	51	55	A	53	56	56	60	62	64	58	55
30	53	F	52	F	F	39	48	56	58	52	60	A	A	A	A	A	A	48	52	59	65	A	F	F
31	F	F	F	F	F	F	51	63	A	A	A	53	A	56	61	A	A	65	81	83	66	53	F	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	8	8	10	8	7	26	25	22	17	11	14	12	14	17	18	17	23	24	27	25	28	20	11	10
MED	47	40	36	38	38	38	50	60	58	57	56	54	56	56	60	58	59	59	57	66	64	60	53	52
U Q	54	47	48	44	38	40	52	63	62	69	60	58	60	58	63	64	64	64	63	72	71	66	59	55
L Q	46	38	35	32	31	36	48	56	56	53	53	52	54	53	54	54	54	54	56	60	58	52	47	46

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							396	412	UL 456	448	468	464	UL 464	468	456	440	408	L	A					
2							408	A	A	A	A	A	A	A	A	A	A	A	376					
3							A	408	440	A	456	464	A	A	A	A	412	396	A					
4							A	408	A	452	468	460	464	A	A	A	A	A	A					
5						A	A	A	A	A	A	A	A	C	A	C	A	A	A					
6							A	A	A	A	464	A	A	UL 456	456	UL 440	420	392	344					
7							A	392	A	A	A	A	A	468	A	UL 456	UL 468	UL 388	A					
8							A	A	A	A	A	A	A	A	A	444	A	C	A					
9						UL 336	A	A	A	A	A	A	C	A	A	A	A	372	A					
10						A	A	L	424	A	444	UL 468	A	A	464	480	A	A	A					
11							A	A	A	A	A	A	A	A	A	A	A	A	344					
12						UL 320	A	A	A	A	A	A	A	C	A	A	UL 408	A	A					
13						C	A	A	A	A	A	A	A	A	A	A	A	A	L			A		
14							A	A	A	A	A	A	C	A	A	444	A	A	A					
15							A	A	A	A	A	A	448	452	UL 452	A	A	380	A					
16							A	396	A	A	A	A	A	A	A	A	A	A	A					
17							A	A	A	A	A	A	A	A	A	C	A	A	A					
18							368	A	A	C	A	A	A	C	A	A	A	A	A					
19						A	A	A	428	A	A	A	A	A	A	A	A	A	A					
20							A	A	A	A	A	A	A	A	A	A	A	A	A					
21						A	408	A	560	A	A	UL 452	A	A	A	444	A	UL 420	L					
22						A	A	A	A	A	C	472	480	448	UL 452	A	A	384	A					
23						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
24						308	L	480	A	452	A	A	472	UL 456	UL 436	A	A	A	A					
25							A	A	A	464	A	A	472	A	A	A	A	A	L					
26							A	A	A	A	472	UL 484	A	460	A	A	A	A	A					
27							A	A	A	A	A	A	A	460	452	A	A	A	A					
28							L	A	A	472	A	A	A	A	A	A	A		A					
29							L	A	A	A	A	A	UL 460	UL 436	432	A	UL 412	380	L					
30						UL 292	352	384	412	452	UL 476	A	A	A	A	A	A	384	A					
31							A	412	A	A	A	A	A	UL 448	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	5	8	6	6	7	7	7	10	8	7	6	9	3					
MED						UL 314	396	408	434	452	468	464	464	456	452	444	412	384	344					
U Q						UL 328	408	412	456	464	472	472	472	460	456	456	420	394	376					
L Q						300	360	394	424	452	456	460	460	UL 448	444	440	408	380	344					

JUL.2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	U A 240	A	A	R	U R 376	A	A	A	A	A	A	A	A					
2						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
3						B	A	A	A	A	A	U A 376	A	A	A	A	U R 316	A	A					
4						B	A	A	A	A	A	U R 404	R	A	A	A	A	A	A					
5						B	A	A	A	A	A	A	A	C	U A 356	C	A	A	A					
6						B	A	A	A	A	A	A	A	A	A	U A 320	U A 304	A	A					
7						B	A	A	A	A	A	A	A	U R 392	A	A	U A 300	A	A					
8						A	A	A	A	A	A	A	A	A	A	R	A	C	A					
9						A	A	A	A	A	A	A	C	A	A	A	A	A	B					
10						B	A	U R 320	A	A	A	A	A	A	A	A	A	A	A					
11						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
12						B	A	A	A	A	A	A	A	C	A	A	A	A	A					
13						C	A	A	A	A	A	A	A	A	A	A	A	A	A				A	
14						B	A	A	A	A	A	A	C	A	A	A	A	A	A					
15						B	A	A	A	A	A	A	A	A	A	A	A	U R 288	A					
16						B	A	U A 268	A	A	A	A	A	A	A	A	A	A	A					
17						B	A	A	A	A	A	A	A	A	A	C	A	A	A					
18						B	U A 268	A	A	C	A	A	A	C	A	A	A	A	A					
19						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
20						B	A	A	A	A	A	A	A	A	A	A	U A 296	A	A					
21						B	A	A	A	A	A	U R 400	A	A	A	A	A	A	B					
22						B	A	A	A	A	C	A	A	U R 388	A	A	A	A	A					
23						B	A	A	A	A	A	A	A	A	U A 360	A	A	A	B					
24						B	A	A	A	A	A	A	A	U A 364	R	A	A	A	A					
25						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
26						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
28						B	A	A	A	A	A	A	A	A	A	A	A		B					
29						B	U A 224	A	A	A	A	A	U R 364	U R 372	U A 340	A	A	A	B					
30						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
31						B	A	A	A	A	A	A	A	U R 360	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	2			1	3	1	5	3	1	4	1						
MED							U A 240	U 294			U R 376	U R 400	U R 364	U R 372	U A 356	U A 320	U A 302	U R 288						
U Q							U A 268					U R 404		U R 390	U A 360		U 310							
L Q							U A 224					U A 376		U 362	U A 340		U A 298							

JUL.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 53	J A 67	J A 34	J A 24	E B 15	22	29	32	J A 40	G	G	42	43	40	41	40	J A 36	J A 66	J A 36	J A 36	J A 33	J A 44	J A 29	J A 54
2	J A 55	J A 78	J A 54	J A 49	J A 43	J A 40	J A 48	J A 49	J A 46	J A 91	J A 67	J A 110	J A 92	J A 123	J A 101	J A 104	J A 162	J A 179	24	E B 16	J A 26	J A 52	J A 89	J A 89
3	J A 86	J A 106	J A 92	J A 50	J A 36	J A 35	J A 37	34	35	J A 50	J A 51	43	J A 64	J A 68	J A 92	J A 89	G	J A 41	J A 50	C	J A 86	J A 48	J A 42	J A 28
4	24	22	J A 32	J A 31	J A 27	J A 23	J A 46	J A 48	46	J A 44	J A 55	G	G	J A 52	J A 59	J A 58	J A 47	J A 64	J A 40	J A 34	J A 82	J A 55	J A 79	J A 78
5	J A 68	J A 54	J A 44	J A 34	C	J A 65	J A 84	J A 52	J A 60	J A 86	J A 108	J A 76	J A 50	C	51	C	J A 146	J A 101	J A 39	J A 71	J A 54	J A 34	J A 32	J A 54
6	J A 114	J A 98	J A 37	J A 33	E B 16	J A 63	J A 60	J A 101	J A 122	J A 216	40	J A 49	J A 54	40	44	36	34	33	J A 30	J A 36	J A 35	J A 29	J A 26	J A 65
7	J A 29	C	J A 27	J A 28	J A 25	23	J A 41	32	J A 57	J A 111	J A 109	J A 106	J A 70	G	J A 48	40	38	J A 58	J A 55	J A 40	J A 54	J A 51	J A 34	J A 82
8	C	J A 49	J A 52	J A 54	J A 32	21	J A 56	J A 71	J A 102	J A 100	J A 90	J A 234	J A 123	J A 84	J A 136	G	J A 66	C	J A 78	J A 82	J A 147	J A 112	J A 54	C
9	J A 36	J A 36	J A 35	J A 35	J A 42	J A 30	J A 51	J A 50	J A 81	J A 82	J A 90	J A 92	C	J A 90	J A 98	J A 52	J A 41	32	J A 34	J A 93	J A 56	J A 25	J A 30	J A 48
10	J A 34	J A 24	J A 87	J A 49	C	J A 33	J A 67	G	J A 56	J A 125	J A 59	J A 58	J A 55	J A 42	J A 40	J A 40	J A 46	J A 52	J A 47	J A 76	J A 52	J A 68	J A 44	J A 44
11	J A 36	J A 41	J A 43	J A 37	J A 34	J A 48	J A 40	J A 62	J A 67	J A 66	J A 57	J A 94	J A 121	J A 133	J A 67	J A 160	J A 182	J A 128	J A 65	J A 39	J A 86	J A 54	J A 34	J A 28
12	J A 33	J A 33	J A 34	J A 34	E B 15	J A 28	J A 58	J A 69	J A 100	J A 138	J A 104	J A 139	J A 106	C	J A 118	J A 76	33	J A 52	J A 37	C	J A 143	C	J A 107	J A 106
13	J A 51	J A 119	J A 89	J A 51	J A 51	C	J A 39	J A 48	J A 65	J A 56	J A 96	J A 125	J A 61	J A 63	J A 117	J A 136	42	35	27	27	J A 29	J A 88	J A 88	J A 66
14	J A 52	J A 53	J A 33	J A 42	J A 37	J A 29	J A 49	J A 63	J A 70	J A 74	J A 81	J A 63	C	J A 128	J A 78	J A 76	J A 54	J A 89	J A 128	J A 54	J A 24	J A 35	J A 82	J A 66
15	J A 37	J A 27	J A 48	J A 48	J A 42	J A 26	J A 50	J A 52	J A 89	J A 190	J A 66	J A 67	J A 62	J A 51	J A 54	J A 62	J A 65	G	J A 52	J A 34	J A 122	J A 123	J A 80	J A 89
16	J A 107	J A 74	J A 34	J A 34	J A 29	J A 36	J A 54	J A 54	J A 66	J A 72	J A 90	J A 186	J A 83	J A 206	J A 226	J A 118	J A 100	J A 48	J A 54	J A 61	J A 45	J A 22	J A 77	J A 85
17	J A 104	J A 87	J A 50	J A 64	J A 35	J A 44	J A 76	J A 65	J A 56	J A 89	J A 99	J A 106	J A 100	J A 68	J A 82	C	J A 126	J A 164	J A 91	J A 56	J A 126	J A 102	J A 89	J A 54
18	J A 43	J A 42	J A 35	J A 28	J A 26	J A 109	J A 31	J A 47	J A 71	C	J A 79	J A 147	J A 223	C	J A 112	J A 108	J A 68	J A 58	J A 73	J A 51	J A 90	J A 142	J A 76	J A 55
19	J A 35	J A 111	J A 53	J A 72	J A 117	J A 60	J A 218	J A 187	J A 111	J A 135	J A 176	J A 86	J A 86	J A 60	J A 86	J A 158	J A 94	J A 151	J A 175	J A 66	J A 44	J A 55	J A 57	J A 49
20	J A 43	J A 52	J A 43	24	23	25	J A 44	J A 62	J A 61	J A 72	J A 138	J A 58	J A 122	J A 105	J A 70	J A 78	J A 57	J A 136	J A 155	J A 175	J A 133	J A 78	J A 49	J A 50
21	J A 48	J A 35	J A 87	J A 50	J A 52	J A 68	J A 62	J A 52	J A 96	J A 139	J A 122	G	J A 87	J A 61	J A 85	J A 49	J A 46	J A 52	23	J A 37	J A 40	J A 48	J A 35	J A 38
22	J A 32	J A 32	J A 38	J A 38	J A 25	J A 34	J A 54	J A 78	J A 86	J A 162	C	J A 46	J A 62	G	40	J A 61	J A 77	35	J A 84	J A 130	J A 108	J A 125	J A 54	J A 100
23	J A 54	J A 68	J A 90	J A 60	J A 26	J A 54	J A 101	J A 151	J A 122	J A 170	J A 67	J A 95	J A 63	50	46	J A 60	J A 74	J A 64	J A 92	23	J A 55	J A 58	J A 54	J A 44
24	J A 31	J A 54	E B 15	26	J A 35	J A 34	J A 44	J A 55	J A 54	40	J A 100	J A 55	44	G	G	J A 46	J A 56	J A 46	J A 110	J A 80	J A 75	J A 31	J A 30	J A 50
25	J A 52	J A 34	J A 34	24	22	J A 30	J A 38	J A 77	J A 129	J A 66	J A 60	J A 58	J A 78	J A 96	J A 116	J A 72	J A 91	J A 92	J A 28	J A 56	J A 56	J A 103	J A 54	J A 66
26	J A 78	J A 61	J A 56	J A 36	J A 70	J A 26	J A 55	J A 143	J A 191	J A 87	J A 61	J A 52	J A 69	J A 66	J A 92	J A 145	J A 130	J A 83	J A 89	J A 87	J A 80	J A 44	J A 79	J A 79
27	J A 100	J A 65	J A 62	J A 35	J A 34	J A 30	J A 44	J A 90	J A 102	J A 81	J A 91	J A 82	J A 46	J A 37	J A 39	J A 58	J A 69	J A 58	J A 148	J A 89	J A 48	J A 29	J A 30	23
28	23	24	24	24	24	E B 17	J A 38	J A 52	J A 86	J A 58	J A 131	J A 106	J A 119	J A 115	J A 97	J A 69	J A 73	J A 57	J A 46	J A 56	J A 112	25	J A 35	25
29	J A 25	J A 37	23	J A 28	J A 23	21	30	J A 62	J A 62	J A 68	J A 143	39	G	G	44	J A 63	J A 37	J A 46	J A 32	J A 23	J A 28	J A 28	J A 46	J A 34
30	J A 39	J A 48	22	J A 28	23	E B 16	27	34	36	37	40	J A 58	J A 88	J A 177	J A 143	J A 89	J A 81	33	J A 110	J A 54	J A 103	J A 72	J A 72	J A 68
31	J A 86	J A 66	J A 86	J A 92	J A 54	J A 114	J A 119	J A 74	J A 158	J A 229	J A 146	J A 78	J A 70	G	J A 112	J A 114	J A 82	J A 100	J A 60	J A 26	J A 77	J A 130	J A 91	J A 68
	00	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	31	31	29	30	31	31	31	30	30	31	29	28	31	29	31	30	31	29	31	30	31	30
MED	J A 46	J A 52	J A 43	J A 35	J A 32	J A 32	J A 49	J A 55	J A 70	J A 84	J A 90	J A 76	J A 70	J A 62	J A 82	J A 69	J A 66	J A 58	J A 54	J A 54	J A 56	J A 53	J A 54	J A 54
U Q	J A 68	J A 68	J A 56	J A 50	J A 42	J A 48	J A 60	J A 74	J A 102	J A 135	J A 108	J A 106	J A 96	J A 100	J A 112	J A 106	J A 91	J A 92	J A 91	J A 78	J A 103	J A 88	J A 79	J A 78
L Q	J A 34	J A 35	34	28	24	25	39	48	J A 56	J A 66	J A 60	52	54	G 40	46	50	42	46	J A 36	J A 35	J A 44	J A 34	J A 34	J A 44

JUL.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 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	28	E B 16	E B 16	E B 16	E B 15	19	28	30	33	G	G	40	40	37	38	38	31	28	29	25	22	E B 16	E B 16	22
2	41	28	33	E B 16	E B 16	26	33	43	43	A A 91	47	A A 110	A A 92	A A 123	A A 101	A A 104	A A 162	48	23	E B 16	16	23	16	E B 16
3	43	A A 106	A A 92	32	20	29	28	32	34	44	42	41	A A 64	A A 68	A A 92	A A 89	G	30	29	C	21	21	20	E B 16
4	E B 16	E B 15	E B 15	22	E B 16	19	42	34	43	39	41	G	G	44	A A 59	52	44	44	33	27	24	34	24	39
5	26	27	24	23	C	33	46	42	48	A A 86	A A 108	A A 76	46	C	46	C	A A 146	A A 101	32	26	38	E B 15	19	21
6	E B 16	26	E B 16	E B 16	E B 16	19	A A 60	54	A A 122	A A 216	38	A A 49	46	37	40	35	34	31	24	23	24	16	E B 15	E B 15
7	18	C	E B 16	18	E B 16	22	28	29	41	A A 111	46	A A 106	A A 70	G	44	39	34	33	28	28	E B 16	E B 16	E B 16	E B 16
8	C	E B 16	20	E B 16	E B 16	21	39	A A 71	A A 102	A A 100	A A 90	A A 234	A A 123	A A 84	A A 136	G	54	C	44	49	43	43	19	C
9	20	E B 16	E B 16	E B 16	E B 15	19	A A 51	A A 50	A A 81	A A 82	A A 90	A A 92	C	A A 90	A A 98	41	37	31	25	A A 93	18	E B 16	E B 16	17
10	23	18	21	A A 49	C	23	36	G	35	A A 125	37	37	42	41	38	38	41	45	41	A A 76	23	33	33	33
11	28	20	20	20	E B 16	18	35	45	A A 67	A A 66	A A 57	48	A A 121	A A 133	A A 67	45	48	A A 128	24	23	E B 16	16	E B 16	20
12	20	20	23	20	E B 15	22	42	A A 69	A A 100	A A 138	47	A A 139	A A 106	C	A A 118	A A 76	31	38	31	C	28	C	E B 16	18
13	22	22	20	E B 16	E B 15	C	34	40	54	A A 56	A A 96	A A 125	A A 61	47	58	A A 136	39	34	27	20	18	A A 88	35	A A 66
14	22	22	21	23	19	20	36	A A 63	A A 70	A A 74	43	45	C	A A 128	46	37	50	A A 89	44	36	E B 16	21	23	23
15	24	17	23	25	E B 15	23	A A 50	44	44	A A 190	A A 66	A A 67	40	37	37	42	42	G	36	22	22	22	23	A A 89
16	A A 107	27	E B 16	E B 16	18	20	43	30	A A 66	A A 72	A A 90	A A 186	A A 83	A A 206	A A 226	A A 118	44	42	40	42	28	20	A A 77	A A 85
17	23	22	19	20	23	21	A A 76	A A 65	44	54	46	A A 106	48	47	56	C	A A 126	A A 164	54	37	43	33	20	24
18	24	19	19	E B 16	E B 15	22	28	36	45	C	A A 79	A A 147	A A 223	C	A A 112	A A 108	A A 68	49	49	44	60	A A 142	26	22
19	22	21	22	25	25	30	35	A A 187	35	44	A A 176	A A 86	A A 86	46	A A 86	A A 158	A A 94	A A 151	34	24	24	24	34	22
20	20	20	20	E B 16	E B 16	E B 16	34	41	50	50	A A 138	A A 58	A A 122	A A 105	55	50	40	A A 136	A A 155	A A 175	51	26	34	32
21	27	E B 16	18	19	18	A A 68	32	36	49	A A 139	A A 122	G	51	48	44	38	39	30	20	15	18	19	23	23
22	21	22	24	22	E B 16	24	44	44	A A 86	A A 162	C	41	41	G	40	A A 61	40	31	A A 84	A A 130	19	22	21	25
23	41	A A 68	24	E B 16	E B 16	A A 54	A A 101	A A 151	A A 122	A A 170	49	A A 95	50	47	44	52	62	54	36	16	47	37	25	20
24	20	20	E B 15	E B 16	E B 16	E B 16	29	39	44	40	A A 100	44	41	G	G	41	44	40	A A 110	49	21	E B 16	20	34
25	20	16	21	E B 16	E B 16	21	32	44	A A 129	38	48	47	42	A A 96	A A 116	47	47	43	22	25	24	23	20	26
26	A A 78	22	A A 56	26	26	21	34	45	A A 191	45	40	43	49	43	A A 92	A A 145	46	46	47	43	44	28	25	27
27	27	39	A A 62	19	E B 16	18	32	A A 90	A A 102	A A 81	A A 91	A A 82	A A 46	35	35	54	A A 69	41	A A 148	27	38	E B 15	20	16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	31	44	49	38	A A 131	A A 106	A A 119	A A 115	63	52	44	44	35	46	35	E B 17	19	E B 16
29	19	20	17	E B 16	E B 16	19	27	39	A A 62	A A 68	A A 143	A A 39	G	G	38	A A 63	34	30	22	E B 16	E B 16	E B 16	21	E B 16
30	E B 16	16	E B 16	E B 16	E B 16	E B 16	26	33	34	37	39	A A 58	A A 88	A A 177	A A 143	A A 89	A A 81	31	40	26	E B 16	A A 72	26	23
31	E B 16	16	E B 16	21	E B 16	24	39	31	A A 158	A A 229	A A 146	45	A A 70	G	49	A A 114	A A 82	49	34	E B 16	18	E B 16	E B 16	A A 68
	00	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	31	31	29	30	31	31	31	30	30	31	29	28	31	29	31	30	31	29	31	30	31	30
MED	22	20	20	18	E B 16	21	35	43	50	A A 73	A A 62	A A 58	A A 51	47	56	52	44	42	34	27	23	22	20	22
U Q	27	22	23	22	17	24	A A 43	A A 54	A A 100	A A 125	A A 100	A A 106	A A 90	A A 100	A A 98	A A 96	A A 68	A A 49	44	45	38	33	25	32
L Q	E B 20	E B 16	E B 16	E B 16	E B 16	19	31	34	43	44	43	43	42	G 37	40	40	39	31	27	22	E B 18	E B 16	E B 16	E B 17

JUL.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 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

HD	00	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	15	15	16	16	17	17	19	20	22	28	26	26	19	17	17	17	16	16	16	16	16
2	16	16	16	16	16	16	15	16	16	18	18	20	27	27	22	21	21	16	16	16	16	16	16	16
3	16	16	16	16	16	16	15	15	18	19	19	16	16	22	22	20	20	18	15	C	16	16	16	16
4	16	15	15	16	16	15	15	15	16	17	25	22	22	29	24	22	18	16	15	14	16	16	16	16
5	16	16	16	15	C	16	16	16	14	17	24	20	24	C	22	C	16	16	15	16	16	15	16	16
6	16	16	16	16	16	16	16	16	17	17	19	22	22	22	22	21	18	14	14	14	15	15	15	15
7	16	C	16	16	16	16	16	16	18	18	28	23	21	18	17	17	17	17	17	17	16	16	16	16
8	C	16	16	16	16	13	15	15	16	22	22	27	27	27	22	18	15	C	15	16	16	16	16	C
9	16	16	16	16	15	14	13	14	18	16	17	20	C	20	18	18	18	18	15	16	16	16	16	16
10	16	16	16	16	C	14	16	15	17	20	19	17	19	22	20	20	21	14	13	14	15	15	17	16
11	15	16	16	16	16	13	14	14	16	16	16	22	20	20	20	18	18	17	16	16	16	16	16	16
12	16	16	15	16	15	16	14	14	14	16	19	23	24	C	26	17	15	15	15	C	16	C	16	16
13	16	16	16	16	15	C	15	16	18	17	17	24	24	24	19	20	17	16	16	15	16	16	16	16
14	16	16	16	16	15	15	14	14	17	17	18	18	C	23	23	22	19	16	16	16	16	16	16	16
15	16	16	15	15	15	16	18	14	14	14	14	14	16	18	18	18	16	14	14	14	15	15	15	15
16	16	16	16	16	15	14	14	14	15	17	17	20	22	16	18	18	17	15	15	16	16	16	15	16
17	16	16	16	16	16	16	15	16	16	16	20	25	22	16	17	C	15	15	15	15	15	16	16	16
18	16	15	16	16	16	15	15	16	15	C	26	18	20	C	17	21	15	15	16	15	15	15	15	16
19	16	16	16	16	16	14	14	14	16	16	21	21	25	28	19	17	16	15	15	16	16	16	15	15
20	16	16	16	16	16	16	16	16	19	19	19	19	29	26	18	17	17	15	15	15	15	15	15	16
21	16	16	16	16	16	16	16	16	16	16	16	18	19	19	19	17	15	15	15	14	15	16	16	16
22	16	15	16	16	16	16	14	14	16	19	C	24	19	19	19	19	18	17	15	16	16	16	17	16
23	16	16	16	17	16	16	14	14	15	18	19	23	22	22	22	20	17	15	15	15	15	15	16	16
24	16	16	15	16	16	16	15	15	19	21	22	22	23	27	28	19	19	14	14	16	16	16	16	16
25	16	16	15	16	16	15	15	15	15	16	19	19	20	20	16	16	16	16	15	16	16	16	16	16
26	16	16	16	15	16	16	16	16	16	18	18	27	27	27	24	22	15	14	13	15	15	16	16	16
27	16	16	16	16	16	15	15	15	20	16	18	20	24	23	21	21	16	16	15	15	15	15	15	16
28	16	16	16	16	16	17	14	14	15	15	20	18	25	17	21	19	15	16	15	18	17	17	16	16
29	16	16	16	16	16	16	16	15	15	16	20	24	22	22	24	24	17	16	15	16	16	16	16	16
30	16	16	16	16	16	16	14	15	19	19	25	25	24	20	20	17	14	14	16	16	16	16	16	16
31	16	16	16	16	16	16	16	16	15	17	17	17	21	21	17	17	17	14	14	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	31	31	29	30	31	31	31	30	30	31	29	28	31	29	31	30	31	29	31	30	31	30
MED	16	16	16	16	16	16	15	15	16	17	19	21	22	22	20	19	17	16	15	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	18	19	21	23	24	26	22	21	18	16	16	16	16	16	16	16
L Q	16	16	16	16	16	15	14	14	15	16	18	18	20	20	18	17	15	15	15	15	15	15	16	16

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	F	F	F	313	301	313	328	354	325	R297	282	308	314	322	328	349	338	299	302	298	312
2	F	F	F	F	F	334	332	362	356	A	343	A	A	A	A	A	A	292	291	319	340	295	F	F
3	F	A	A	F	F	374	372	336	307	314	328	258	A	A	A	A	317	297	307	C	312	339	F	287
4	286	297	F	316	317	295	331	338	331	320	355	281	321	294	A	305	319	329	309	321	337	302	F	F
5	F	F	F	F	C	331	351	343	356	A	A	A	323	C	326	C	A	A	298	314	341	307	293	F
6	315	F	F	F	F	288	A	355	A	A	239	A	302	315	297	309	315	316	298	320	332	370	310	296
7	F	C	275	F	306	353	320	357	374	A	323	A	A	280	306	306	321	314	299	302	323	304	F	F
8	C	F	F	F	F	328	342	A	A	A	A	A	A	A	A	312	304	C	321	311	326	F	F	C
9	F	F	F	F	F	266	A	A	A	A	A	A	C	A	A	281	327	338	336	A	328	331	F	F
10	F	F	F	A	C	386	332	362	344	A	309	306	283	272	256	268	311	323	328	A	323	314	313	F
11	F	298	317	F	F	349	308	388	A	A	A	321	A	A	A	305	323	A	325	343	319	320	F	F
12	F	F	329	F	328	289	316	A	A	A	307	A	A	C	A	A	336	319	310	C	339	C	F	F
13	F	307	311	303	F	C	F	F	337	A	A	A	A	295	297	A	311	344	326	326	330	A	F	A
14	F	F	F	F	F	317	352	A	A	A	353	334	C	A	320	289	316	A	326	324	314	F	350	F
15	F	F	363	299	F	317	A	331	384	A	A	A	339	335	286	320	308	296	314	324	299	314	F	A
16	A	F	F	F	F	383	293	326	A	A	A	A	A	A	A	A	316	314	328	329	349	F	A	A
17	F	F	F	F	F	353	A	A	295	344	301	A	300	299	332	C	A	A	318	309	356	370	F	F
18	F	F	F	323	329	302	322	312	317	C	A	A	A	C	A	A	A	319	316	327	344	A	F	F
19	F	F	300	321	308	312	320	A	339	329	A	A	A	299	A	A	A	A	327	301	319	330	310	321
20	F	330	F	F	F	324	319	293	326	340	A	A	A	A	335	310	329	A	A	A	330	F	F	F
21	F	F	F	F	F	A	287	366	264	A	A	283	322	310	317	342	316	307	328	334	F	F	F	329
22	F	F	293	309	F	301	293	319	A	A	C	290	290	341	262	A	311	323	A	A	F	324	330	305
23	282	A	F	F	F	A	A	A	A	A	315	A	286	304	307	302	315	320	302	311	323	320	322	302
24	312	331	F	F	F	306	341	332	344	367	A	329	279	296	317	312	327	335	A	331	301	301	F	F
25	F	F	F	F	F	295	314	352	A	295	276	276	287	A	A	296	318	326	329	336	321	F	314	F
26	A	299	A	F	F	281	325	341	A	327	310	275	288	313	A	A	314	326	332	324	F	F	F	F
27	308	F	A	F	F	349	338	A	A	A	A	A	A	310	284	316	A	312	A	329	319	308	315	326
28	318	306	319	331	339	344	348	365	385	324	A	A	A	A	312	325	320	316	316	310	294	301	F	306
29	332	330	305	298	298	295	357	318	A	A	A	A	R320	268	309	A	307	305	303	316	294	308	311	313
30	297	F	304	F	F	290	297	328	343	319	273	A	A	A	A	A	A	305	310	330	333	A	F	F
31	F	F	F	F	F	F	325	344	A	A	A	339	A	278	312	A	A	292	332	339	314	292	F	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	8	8	10	8	7	26	25	22	17	11	14	12	14	17	18	17	23	24	27	25	28	20	11	10
MED	310	306	308	312	317	317	325	340	339	327	312	298	298	299	308	309	316	318	318	324	323	311	313	309
U Q	316	330	319	322	329	349	342	357	356	340	343	327	321	312	317	315	322	326	328	330	335	327	322	321
L Q	292	298	300	301	306	295	314	326	315	319	301	278	287	281	297	299	311	306	307	312	314	302	310	302

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 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							360	375	UL 391	411	423	427	UL 411	385	395	393	378	L	A					
2							384	A	A	A	A	A	A	A	A	A	A	A	349					
3							A	403	364	A	422	416	A	A	A	A	404	380	A					
4							A	432	A	431	415	421	418	A	A	A	A	A	A					
5						A	A	A	A	A	A	A	A	C	A	C	A	A	A					
6							A	A	A	A	418	A	A	UL 417	405	UL 365	382	356	360					
7							A	441	A	A	A	A	A	394	A	UL 383	UL 346	UL 398	A					
8							A	A	A	A	A	A	A	A	A	392	A	C	A					
9						UL 340	A	A	A	A	A	A	C	A	A	A	A	365	A					
10						A	A	L	405	A	426	UL 405	A	A	384	371	A	A	A					
11							A	A	A	A	A	A	A	A	A	A	A	A	358					
12						UL 357	A	A	A	A	A	A	A	C	A	A	UL 412	A	A					
13						C	A	A	A	A	A	A	A	A	A	A	A	A	L			A		
14							A	A	A	A	A	A	C	A	A	379	A	A	A					
15							A	A	A	A	A	A	401	404	UL 401	A	A	366	A					
16							A	381	A	A	A	A	A	A	A	A	A	A	A					
17							A	A	A	A	A	A	A	A	A	C	A	A	A					
18							375	A	A	C	A	A	A	C	A	A	A	A	A					
19						A	A	A	396	A	A	A	A	A	A	A	A	A	A					
20							A	A	A	A	A	A	A	A	A	A	A	A	A					
21						A	338	A	383	A	A	UL 461	A	A	A	387	A	UL 360	L					
22						A	A	A	A	A	C	418	392	420	UL 403	A	A	373	A					
23						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
24						338	L	388	A	391	A	A	407	UL 421	UL 379	A	A	A	A					
25							A	A	A	369	A	A	373	A	A	A	A	A	L					
26							A	A	A	A	420	UL 340	A	400	A	A	A	A	A					
27							A	A	A	A	A	A	A	400	410	A	A	A	A					
28							L	A	A	405	A	A	A	A	A	A	A		A					
29							L	A	A	A	A	A	UL 431	UL 424	358	A	UL 373	369	L					
30						UL 334	356	399	384	406	UL 395	A	A	A	A	A	A	384	A					
31							A	384	A	A	A	A	A	UL 410	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	5	8	6	6	7	7	7	10	8	7	6	9	3					
MED						UL 339	360	394	388	406	420	418	407	407	398	383	380	369	358					
U Q						UL 348	380	418	396	411	423	427	418	UL 420	404	392	404	382	360					
L Q						336	347	382	383	391	415	UL 405	392	400	382	371	UL 373	362	349					

JUL.2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							316	330	290	300	262	320	340	414	342	304	280	256	248					
2							292	248	248	A	E A 294	A	A	A	A	A	A	E A 316	304					
3							232	322	354	326	302	502	A	A	A	A	322	334	302					
4							260	254	268	312	322	428	354	388	A	E A 368	274	262	278					
5						E A 322	E A 282	E A 256	E A 262	A	A	A	314	C	290	C	A	A	308					
6							A	E A 284	A	A	R 418	A	358	334	358	314	300	296	296					
7							E A 276	260	222	A	E A 314	A	A	428	326	330	282	310	270					
8							E A 258	A	A	A	A	A	A	A	A	314	E A 328	C	E A 286					
9						330	A	A	A	A	A	A	C	A	A	392	316	302	230					
10						E A 238	302	242	282	A	332	350	418	E A 474	480	460	322	E A 298	E A 278					
11							338	236	A	A	A	318	A	A	A	352	E A 322	A	276					
12						380	E A 354	A	A	A	E A 354	A	A	C	A	A	286	E A 318	324					
13						C	284	262	E A 310	A	A	A	A	330	E A 350	A	298	258	262			A		
14							272	A	A	A	276	296	C	A	E A 330	404	E A 364	A	280					
15							A	E A 280	240	A	A	A	298	298	398	310	326	338	254					
16							E A 380	270	A	A	A	A	A	A	A	A	E A 330	E A 308	E A 300					
17							A	A	E A 356	270	356	A	E A 346	362	E A 310	C	A	A	E A 310					
18							310	E A 292	E A 292	C	A	A	A	C	A	A	A	E A 344	E A 318					
19						E A 318	284	A	262	262	A	A	A	372	A	A	A	A	274					
20							336	E A 322	E A 302	296	A	A	A	A	E A 286	E A 328	288	A	A					
21						A	378	218	486	A	A	406	308	324	324	296	308	312	258					
22						262	E A 350	272	A	A	C	360	380	280	444	A	334	300	A					
23						A	A	A	A	A	E A 324	A	E A 408	376	336	E A 312	E A 298	E A 268	268					
24						360	266	292	268	236	A	324	408	410	336	316	282	256	A					
25							316	252	A	E A 372	E A 444	E A 428	404	A	A	E A 388	E A 338	E A 288	258					
26							296	250	A	E A 320	368	428	E A 422	352	A	A	302	274	242					
27							276	A	A	A	A	A	A	394	394	E A 360	A	294	A					
28							282	248	E A 232	334	A	A	A	A	E A 344	276	284		284					
29							258	E A 356	A	A	A	A	338	352	334	A	342	314	308					
30						338	354	288	288	332	390	A	A	A	A	A	A	344	E A 344					
31							E A 308	258	A	A	A	298	A	394	322	A	A	E A 322	242					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						8	26	23	17	11	14	12	14	17	18	17	23	23	27					
MED						326	288	257	272	306	323	346	350	367	334	321	298	295	273					
U Q						349	336	292	E A 306	332	368	428	408	402	358	378	E A 328	318	304					
L Q						E A 290	276	250	255	270	302	319	338	332	324	311	286	274	258					

JUL.2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E A 278	E B 248	E B 262	E B 262	E B 238	E A 238	208	208	188	198	198	198	198	198	198	214	206	206	A	212	E A 244	E B 240	230	E A 230
2	E A 316	E A 254	E A 264	E B 282	E B 276	E A 252	208	A	A	A	A	A	A	A	A	A	A	A	198	212	196	E A 258	E B 258	E B 258
3	E A 320	A	A	E A 306	E A 236	218	A	190	234	A	208	208	A	A	A	A	192	208	A	C	214	212	212	E B 270
4	E B 260	E B 246	E B 258	E A 264	E B 232	208	A	190	A	190	194	194	194	A	A	A	A	A	A	E A 230	214	E A 274	E A 280	E A 302
5	E A 302	E A 290	E A 286	E A 290	C	A	A	A	A	A	A	A	A	C	A	C	A	A	A	222	222	200	E A 268	E A 280
6	E B 254	E A 324	E B 268	E B 262	E B 242	212	A	A	A	A	182	A	A	194	194	196	206	206	206	216	216	190	210	E B 298
7	E A 308	C	E B 300	E A 290	E B 238	222	A	200	A	A	A	A	A	202	A	202	202	198	A	E A 246	E B 218	E B 218	E B 218	E B 218
8	C	E B 270	E A 260	E B 216	E B 240	228	A	A	A	A	A	A	A	A	A	228	A	C	A	E A 320	E A 282	E A 258	228	C
9	E A 246	E B 248	E B 248	E B 240	206	206	A	A	A	A	A	A	C	A	A	A	A	206	A	A	220	E B 212	E B 254	216
10	E A 288	E A 242	E A 242	A	C	A	A	202	184	A	202	194	A	A	204	204	A	A	A	A	226	E A 248	E A 264	E A 296
11	E A 296	E B 236	E A 276	E A 254	E B 262	206	A	A	A	A	A	A	A	A	A	A	A	A	206	220	212	206	E B 262	E A 254
12	218	E A 268	E A 268	E A 288	E B 248	210	A	A	A	A	A	A	A	C	A	A	186	A	A	C	208	C	202	202
13	212	E A 262	E A 280	E B 280	E B 286	C	A	A	A	A	A	A	A	A	A	A	A	A	228	228	212	A	E A 270	A
14	E A 294	E A 290	E A 286	E A 272	E A 272	210	A	A	A	A	A	A	C	A	A	204	A	A	A	E A 234	E B 224	E A 278	E A 248	E A 302
15	E A 284	E A 234	210	E A 316	E B 236	228	A	A	A	A	A	A	204	204	204	A	A	204	A	E A 236	E A 236	E A 236	E A 236	A
16	A	E A 286	E B 218	E B 232	E A 270	212	A	212	A	A	A	A	A	A	A	A	A	A	A	E A 304	218	E A 252	A	A
17	E A 308	E A 288	E A 268	E A 266	212	204	A	A	A	A	A	A	A	A	A	C	A	A	A	E A 256	220	212	E A 244	E A 290
18	E A 330	E A 264	E A 254	E B 260	E B 208	222	214	A	A	C	A	A	A	C	A	A	A	A	A	E A 254	E A 254	A	E A 254	E A 236
19	E A 270	E A 256	E A 256	E A 272	E A 272	A	A	A	204	A	A	A	A	A	A	A	A	A	A	E A 232	E A 232	220	E A 258	E A 244
20	E A 244	E A 260	E A 270	E A 292	E B 250	206	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 234	E A 234	E A 282	E A 266
21	E A 266	E B 260	E A 240	E A 228	E A 280	A	E A 258	A	212	A	A	212	A	A	A	196	A	200	204	216	210	E A 244	E A 250	E A 236
22	E A 236	E A 270	E A 288	E A 252	E B 242	A	A	A	A	A	C	192	192	200	200	A	A	196	A	A	214	E A 226	212	212
23	E A 370	A	E A 296	E B 258	E B 250	A	A	A	A	A	A	A	A	A	A	A	A	A	A	230	E A 238	E A 226	220	E A 240
24	E A 246	E A 262	E B 262	E B 282	E B 250	224	208	208	A	208	A	A	208	208	208	A	A	A	A	E A 264	E A 232	E B 232	E A 232	E A 284
25	E A 274	E B 260	E A 260	E B 254	E B 254	E A 242	A	A	A	200	A	A	E A 254	A	A	A	A	A	212	212	214	E A 248	226	E A 234
26	A	E A 310	A	E A 282	E A 280	218	A	A	A	A	194	194	A	214	A	A	A	A	A	E A 252	E A 280	E A 280	E A 254	E A 244
27	E A 246	E A 314	A	E A 286	E B 264	224	A	A	A	A	A	A	A	188	198	A	A	A	A	214	E A 252	E B 218	E A 226	E A 226
28	E B 248	E B 248	E B 240	E B 240	212	212	212	A	A	196	A	A	A	A	A	A	A	E A 282	A	E A 270	E A 246	E B 216	E A 260	E B 240
29	E A 212	214	E A 218	E B 266	E B 276	E A 258	E A 238	A	A	A	A	A	190	190	216	A	216	210	214	E B 232	E B 254	E B 238	224	E B 230
30	E B 250	E B 276	226	E B 214	E B 216	242	226	216	216	198	198	A	A	A	A	A	A	202	A	236	E B 220	A	E A 302	216
31	216	216	212	212	216	216	A	210	A	A	A	A	A	210	A	A	A	A	A	E B 210	210	202	E B 220	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	28	28	28	30	29	24	8	9	6	6	7	7	7	10	8	7	6	11	7	25	31	27	30	26
MED	E A 268	E A 261	E A 261	E 265	E B 248	215	210	208	208	198	198	194	196	201	202	204	204	205	206	E 232	215	E 232	E A 246	E A 242
U Q	E A 299	E A 281	E A 273	E A 282	E A 271	E A 228	E A 232	211	216	200	202	208	208	208	206	214	206	208	214	E A 253	E A 238	E A 248	E A 260	E A 280
L Q	E A 246	E 248	E 241	E B 252	234	210	208	195	188	196	194	194	192	194	198	196	192	200	204	216	214	212	224	230

JUL.2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	110	110	A	110	110	A	110	A	110	A	A	A	A					
2						B	A	A	A	A	A	A	A	A	A	A	A	A	114					
3						B	A	A	A	A	A	110		A	A	A	A	110	110	A				
4						B	A	A	A	A	A	110	110		A	A	A	A	A	A					
5						B	A	A	A	A	A	A	A	C	110	C	A	A	A					
6						B	A	A	A	A	A	A	A	A	A	110	110	110	A					
7						B	A	110	A	A	A	A	A	114	108	108	108	A	A					
8						112	A	A	A	A	A	A	A	A	A	112	A	C	A					
9						112	A	A	A	A	A	A	C	A	A	A	A	112	B					
10						B	A	116	A	A	A	A	A	112	106	106	A	A	A					
11						B	A	A	A	A	A	A	A	110	110	A	A	A	A					
12						B	A	A	A	A	A	A	A	C	A	A	A	A	A					
13						C	110	A	A	A	A	A	A	A	A	A	A	110	112			A		
14						B	A	A	A	A	A	A	C	A	A	A	A	A	A					
15						B	A	A	A	A	A	A	A	A	A	A	A	108	A					
16						B	A	108	A	A	A	A	A	A	A	A	A	A	A					
17						B	A	A	A	A	A	A	A	A	A	C	A	A	A					
18						B	112	A	A	C	A	A	A	C	A	A	A	A	A					
19						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
20						B	A	A	A	A	A	A	A	A	A	A	112	A	A					
21						B	A	A	A	A	A	108	A	A	A	A	A	A	B					
22						B	A	A	A	A	C	A	A	108	A	A	A	108	A					
23						B	A	A	A	A	A	A	A	108	108	108	A	A	B					
24						B	A	A	A	A	A	A	A	108	108	A	A	A	A					
25						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
26						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						B	108	A	A	A	A	A	A	A	A	A	A	A	A					
28						B	A	A	A	A	A	A	A	A	A	A	A		B					
29						B	108	A	A	A	A	A	112	112	112	A	A	A	B					
30						B	112	112	112	112	108	A	A	A	A	A	A	A	A					
31						B	A	A	A	A	A	A	A	108	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	6	5	1	2	2	3	3	8	8	5	4	6	2					
MED						112	110	110	112	111	109	110	110	109	109	108	110	110	113					
U Q							112	114				110	112	112	110	111	111	110						
L Q							108	109				108	110	108	108	107	109	108						

JUL.2021 h'E (KM)

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 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	96	82	82	86	B	106	112	112	100	G	G	100	122	102	120	98	98	102	90	84	84	92	92	92
2	88	88	84	84	86	88	92	96	96	88	90	90	90	90	84	84	86	88	110	B	100	94	94	94
3	92	92	88	88	88	88	88	100	100	90	98	144	100	96	96	96	G	108	100	C	100	90	90	90
4	90	90	98	98	98	98	98	98	98	98	94	G	G	102	102	102	102	102	102	96	96	96	96	86
5	86	86	86	86	C	86	86	86	86	86	86	86	90	C	118	C	94	94	94	94	84	84	84	84
6	84	84	86	96	B	96	96	94	92	106	96	90	90	90	92	148	126	112	102	100	96	88	88	88
7	88	C	88	88	88	102	102	114	94	94	94	94	94	G	110	120	120	104	92	86	90	90	100	108
8	C	102	98	98	118	118	102	96	96	90	90	86	86	86	86	G	96	C	90	90	90	90	90	C
9	90	96	96	96	96	122	102	98	98	98	98	94	C	94	88	88	88	114	100	96	96	84	84	84
10	94	94	94	94	C	98	92	G	92	90	90	90	90	126	126	112	106	100	100	92	92	92	92	92
11	92	86	86	86	86	90	98	98	90	90	94	94	80	112	112	98	96	94	94	94	94	94	94	86
12	82	82	82	82	B	98	98	94	88	88	88	86	86	C	86	82	90	100	100	C	100	C	96	96
13	96	94	94	94	90	C	118	96	96	96	96	96	102	102	96	96	100	124	114	84	84	84	96	92
14	92	90	90	90	88	88	102	102	100	98	98	98	C	96	96	96	96	96	96	94	94	94	94	94
15	94	94	94	84	84	118	104	104	102	90	90	90	90	90	90	90	90	G	98	98	98	98	96	90
16	90	90	90	90	88	88	102	106	104	98	98	86	86	86	86	88	88	88	88	86	78	78	90	90
17	90	92	92	90	90	90	96	96	96	96	94	86	86	86	86	C	88	88	88	88	88	88	88	88
18	88	84	84	84	106	98	122	100	96	C	90	90	84	C	84	84	86	86	86	86	88	88	88	88
19	84	94	82	82	82	98	98	98	102	94	94	94	94	94	96	90	90	90	90	94	94	94	94	94
20	88	88	88	88	100	100	100	94	94	94	94	94	96	94	94	94	116	96	84	84	84	84	84	84
21	84	84	98	98	86	92	92	92	92	82	82	G	92	96	100	100	96	96	96	96	96	92	88	88
22	82	82	82	82	82	100	102	96	90	90	C	90	90	G	90	96	96	110	104	96	96	92	92	92
23	92	92	92	92	100	100	100	90	90	90	90	90	90	114	128	116	96	96	96	110	90	90	90	90
24	90	90	B	130	96	96	96	92	92	92	88	88	88	G	G	94	98	98	90	90	90	90	90	90
25	86	84	84	84	84	104	102	98	94	94	94	94	94	86	86	86	86	92	92	86	86	90	90	90
26	82	82	82	82	82	82	92	86	86	96	96	96	98	92	84	84	84	84	84	84	80	80	88	88
27	88	88	88	88	88	88	108	98	92	92	92	92	92	92	92	92	92	88	84	84	84	84	84	84
28	84	96	88	88	88	B	106	98	90	90	84	84	84	88	88	88	88	88	88	88	88	88	88	88
29	88	88	88	88	88	138	122	102	94	94	94	94	G	G	114	104	104	100	100	100	100	100	100	100
30	94	94	98	98	98	B	114	114	114	114	110	98	98	92	84	84	84	90	94	94	94	92	92	92
31	92	84	84	84	84	96	96	96	92	84	88	88	88	G	98	98	98	98	98	90	90	90	90	82
	00	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	31	26	28	31	30	31	29	29	29	27	23	30	28	30	29	31	28	31	30	31	30
MED	89	89	88	88	88	98	100	98	94	92	94	90	90	94	93	95	96	96	94	91	90	90	90	90
U Q	92	94	94	94	96	101	104	100	98	96	96	94	94	102	102	99	98	102	100	96	96	92	94	92
L Q	86	84	84	84	86	89	96	94	92	90	90	88	86	90	86	88	88	89	90	86	86	88	88	88

IONOSPHERIC DATA STATION Kokubunji

JUL.2021 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUL.2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 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	60	62	59	59	56															X 61	X 62	X 58	X 56	56
2	54	47	61	55	55	54														X 82	X 66	X 65	X 65	X 65
3	65	66	64	61	60	50														X 76	X 76	X 70	X 57	X 54
4	60	58	59	55	52	50														X 65	X 66	X 62	X 61	X 55
5	X 55	X 55	X 53	50	53	55														X 82	X 78	X 63	X 63	X 62
6	O X 62	X 59	X 55	54	52	50														X 89	X 78	X 58	X 55	X 51
7	X 50	47	49	50	48	X 44														X 61	X 68	X 69	X 65	61
8	64	71	67	59	59															X 59	X 64	X 62	X 60	X 58
9	X 50	51	51	49	44	37														A	X 65	X 66	X 47	41
10	46	42	A	44	A	40														X 65	X 65	X 57	X 48	50
11	X 43	A	42	A	40	40														X 56	X 61	X 56	X 53	53
12	52	51	47	43	46	42														X 60	X 64	60	46	A
13	A	50	50	42	42	40	52													X 77	X 78	X 69	X 45	47
14	A	X 38	A	45	X 35	42														X 55	X 55	X 54	X 48	49
15	X 38	47	44	44	40	40														X 66	X 67	X 64	59	58
16	53	48	47	44	44															A	A	X 61	60	54
17	X 42	47	47	45	42															X 79	X 74	X 55	X 44	X 39
18	43	43	44	43	42	38														X 82	X 77	X 63	X 62	67
19	64	60	57	57	44	50														X 77	X 80	X 73	X 62	X 58
20	X 58	59	59	49	46	41															X 84	X 71	60	60
21	X 57	60	57	55	46	43															X 77	61	61	61
22	58	56	X 49	X 46	42										A						A	X 66	X 54	X 54
23	X 52	X 53	56	X 54	61	44															A	93	71	A
24	71	71	62	57	48	50															X 78	X 67	X 53	59
25	56	58	60	57	47	42															A	X 63	60	57
26	X 53	X 53	52	49	49	46															X 74	X 65	62	62
27	60	60	59	63	56	53															X 78	X 77	X 71	X 67
28	X 65	X 60	60	64	49	47															X 85	X 91	X 75	X 66
29	X 63	X 61	X 54	X 46	X 44																X 66	X 66	X 65	X 63
30	X 56	54	55	55	X 46																X 67	X 62	X 50	X 47
31	48	45	45	42	41	50															X 78	X 68	X 55	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	29	30	29	30	30	24	1													17	27	31	31	29
MED	56	54	55	50	46	44	52													X 66	X 74	X 64	X 60	58
U Q	61	60	59	57	52	50														X 80	X 78	X 69	X 62	X 62
L Q	X 50	47	48	45	42	40														X 60	X 65	X 61	X 53	52

JUL.2021 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	L	A	A	A	A	A	464	464	448	A	A	A					
2								A	A	A	A	A	A	A	A	444	432	408	376					
3							A	A	A	A	A	472	A	476	480	456	A	A	A					
4								392	420	472	468	464	456	464	464	A	432	424	L					
5									444	452	A	468	464	464	A	A	A	392	380					
6							L	392	424	440	452	A	A	456	A	A	A	A	A					
7								A	U L 440	432	A	A	A	460	A	A	A	A	A					
8							L	392	A	A	A	456	452	U L 448	444	452	412	412	L					
9							L	A	A	A	A	A	A	A	A	A	A	A	A					
10						A	A	384		428	448	448	456	A	436	424	412	384	364					
11								A	412	U L 476	A	A	A	A	448	U L 432	A	U L 388	U L 356					
12								380	400	444	U L 436	A	468	460	A	A	404	392	348					
13								A	L	A	A	A	U L 456	A	A	A	416	A	A					
14							U L 352		A	A	U L 432	440	440	452	A	A	A	A	A					
15							A	A	A	A	A	452	452	428	444	A	412	A						
16							L	380	A	A	A	A	A	A	A	A	A	A	A					
17						A	A	A	A	A	A	A	A	A	444	444	A	U L 388	364					
18								A	A	436	444		A	A	A	A	A	A	A					
19								L	424		444	460	460	A	448	A	412	A	372					
20								L	A	444	440	A	A	A	A	U L 452	424	A	A	A				
21						A		L	L	L	448	456	A	460	A	A	432	A	A					
22								A	440	A	456	A	A	A		A	A	A	392	A				
23								380	A	A	A	A	A	A	A	A	A	A	A	A				
24								392	A	A	480	U L 480	468	464	468	444	444	424	384	A				
25							A	A	A	A	A	A	476	472	A	460	428	A	A					
26								380	420		476		A	476	472	A	A	A	A	A				
27								L	A	A	A	A	A	A	A	A	A	A	A	A				
28							L	L	424	440	464	A	468	A	A	A	432	408	L	A				
29							L	U L 352	A	A	U L 440	444	U L 448	460	440	436	412	384	U L 364	A				
30							L	L	A	428	440	452	460	452	444	A	424	396	A	A				
31								A	A	A	A	452	456	448	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	10	10	11	15	13	15	17	13	11	15	12	10					
MED							U L 352	382	424	440	448	456	456	460	448	444	424	394	368					
U Q								392	440	452	464	466	468	464	466	452	432	410	380					
L Q								380	420	432	440	450	452	452	444	436	412	388	364					

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	UR 228	A	A	A	A	A	A	UA 376	A	A	A	A	A					
2							UA 204	A	A	A	A	A	A	A	A	A	UR 324	UR 300	UR 256					
3						B	A	A	A	A	A	A	A	UR 388	A	A	A	A	A					
4						B	UR 216	R	A	A	A	UA 364	UA 384	A	356	344	A	A	A					
5						B	A	A	A	A	A	A	UA 364	A	UA 356	A	A	A	A					
6						B	UA 180	A	A	A	A	A	A	A	A	A	UA 316	A	A					
7							A	A	A	A	A	A	A	UA 368	A	A	UA 312	A	A					
8						B	A	A	A	A	A	A	A	UR 376	A	UA 340	A	U A 280	UR 248					
9						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
10						B	A	A	A	A	A	UA 336		A	UA 344	324	304	U A 284	A					
11							UR 208	UA 240	A	A	A	A	A	UA 364	UA 352	UA 336	A	A	A					
12						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
13						B	UR 240	A	A	A	A	A	A	A	UA 352	A	UA 304	A	A					
14						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
15							A	A	A	A	A	A	A	A	A	A	A	A	A					
16						B	UR 208	A	A	A	A	A	A	A	A	A	A	A	A					
17						B	A	UA 232	A	A	A	A	A	A	A	A	A	A	A					
18						B	UR 212	A	UA 280	A	A	A	A	A	A	A	A	A	A					
19						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
20							R	A	A	A	A	A	A	A	A	A	A	A	A	B				
21						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
22						B	A	A	A	A	A	A	A	A		A	A	A	A	B				
23						B	A	UR 280	A	A	A	A	A	A	A	A	A	A	A	B				
24							A	A	A	A	A	A	A	A	A	A 356	A	A	A	B				
25						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
26						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
27						B	UR 200	UA 244	A	A	A	A	A	A	A	A	A	A	A	B				
28							UR 224	A	A	A	A	A	A	A	A	A	A	A	A	B				
29						B	A	UA 244	A	A	A	A	A	UA 384	UA 344	328	UA 308	UA 280	A	B				
30						B	UA 180	UA 252	A	A	A	A	UA 356	A	UA 340	A	UA 308	A	A	B				
31						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							11	6	1			2	3	6	7	6	7	4	2					
MED							UR 208	UA 244	UA 280			UA 350	UA 364	UA 376	UA 352	338	UA 308	UA 282	UR 252					
U Q							UR 224	U 252					U A 384	U 384	356	344	U 316	U 292						
L Q							UA 200	UA 240					UA 356	UA 368	UA 344	328	304	U A 280						

JUL.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 35	J A 41	J A 50	25	J A 44	J A 30	G	34	J A 52	J A 66	J A 64	J A 56	J A 64	44	J A 70	J A 57	J A 56	J A 64	J A 48	J A 33	J A 32	24	J A 42	J A 31
2	J A 67	J A 87	J A 52	J A 65	J A 58	J A 42	J A 38	J A 44	J A 63	J A 66	J A 62	J A 68	J A 86	J A 91	J A 98	J A 106	G	G	G	J A 35	J A 33	23	21	J A 37
3	J A 35	J A 56	J A 74	J A 68	J A 49	J A 42	J A 66	J A 73	J A 42	J A 45	J A 83	J A 56	J A 66	G	43	J A 48	J A 56	J A 123	J A 69	J A 66	J A 66	E B 16	J A 46	J A 54
4	J A 41	J A 38	24	J A 38	J A 30	J A 36	G	G	J A 52	J A 44	J A 44	41	42	40	44	J A 49	J A 54	J A 55	J A 49	J A 36	J A 29	29	24	24
5	22	22	J A 36	J A 24	J A 26	J A 51	J A 40	J A 47	J A 42	J A 48	J A 52	42	44	J A 152	45	J A 59	J A 108	J A 39	J A 31	J A 64	J A 30	E B 16	J A 27	J A 27
6	22	J A 26	21	J A 31	J A 35	E B 16	24	32	33	J A 53	J A 57	J A 70	J A 60	J A 54	J A 72	J A 62	42	J A 82	J A 48	J A 44	J A 44	J A 30	J A 32	E B 16
7	J A 36	J A 42	J A 62	J A 48	J A 51	J A 32	J A 38	J A 54	J A 43	J A 66	J A 140	J A 76	J A 118	J A 55	J A 89	J A 64	J A 48	J A 85	J A 108	J A 124	J A 84	J A 54	J A 43	J A 84
8	J A 36	J A 30	22	25	E B 15	23	J A 34	J A 51	J A 53	J A 65	J A 64	J A 45	J A 50	G	38	38	J A 38	36	G	J A 32	26	E B 16	23	J A 28
9	J A 28	J A 53	J A 53	J A 76	J A 77	J A 52	J A 45	J A 109	J A 148	J A 60	J A 52	J A 60	J A 80	J A 87	J A 120	J A 130	J A 67	J A 82	J A 118	J A 88	J A 44	J A 38	20	J A 27
10	J A 28	J A 38	J A 77	J A 81	J A 63	J A 26	J A 46	J A 43	J A 44	J A 83	J A 41	40	J A 48	44	40	39	37	36	J A 41	J A 29	J A 35	J A 63	J A 72	J A 52
11	J A 67	J A 54	J A 31	J A 50	J A 36	J A 38	G	J A 38	J A 44	J A 50	J A 132	J A 82	J A 71	J A 52	41	43	J A 108	J A 148	J A 50	J A 50	J A 52	J A 42	J A 53	J A 32
12	J A 34	J A 35	J A 33	J A 41	E B 16	J A 34	J A 34	J A 78	J A 54	J A 84	J A 103	J A 85	J A 85	J A 46	J A 66	J A 80	J A 47	J A 80	J A 34	J A 44	J A 77	J A 86	J A 115	J A 100
13	J A 66	J A 66	J A 82	J A 27	J A 55	J A 52	G	J A 52	J A 54	J A 110	J A 127	J A 143	J A 120	J A 66	J A 55	J A 56	39	39	J A 47	J A 44	J A 38	J A 30	26	J A 44
14	J A 62	J A 52	J A 54	J A 36	J A 30	E B 16	J A 38	J A 43	J A 55	J A 87	J A 109	78	J A 68	J A 50	J A 100	J A 93	J A 91	J A 107	J A 63	J A 56	J A 43	J A 87	J A 52	J A 41
15	J A 54	J A 34	J A 40	J A 34	J A 26	22	J A 41	J A 54	J A 77	J A 85	J A 85	J A 98	J A 87	J A 51	J A 54	J A 77	J A 40	J A 78	J A 73	J A 76	J A 32	J A 88	J A 85	J A 106
16	J A 37	J A 88	J A 52	J A 53	J A 32	24	G	34	J A 72	J A 112	J A 83	J A 91	J A 67	J A 161	J A 147	J A 124	J A 120	J A 127	J A 164	J A 110	J A 83	J A 39	J A 32	J A 88
17	J A 68	J A 55	J A 53	J A 81	J A 66	J A 66	J A 44	J A 57	J A 88	J A 111	J A 170	J A 110	J A 101	J A 96	41	J A 42	J A 50	J A 42	J A 34	J A 53	J A 49	J A 46	J A 48	E B 16
18	J A 50	J A 63	J A 32	E B 15	E B 15	E B 15	G	J A 60	J A 44	J A 43	J A 38	J A 50	J A 62	J A 129	J A 157	J A 144	J A 135	J A 154	J A 90	J A 107	J A 53	J A 53	J A 50	J A 52
19	J A 49	J A 37	J A 41	23	E B 16	E B 16	J A 59	J A 45	J A 78	J A 78	J A 65	J A 55	J A 50	J A 134	40	J A 52	J A 49	J A 48	J A 51	J A 38	24	J A 28	J A 51	J A 40
20	J A 30	E B 16	24	J A 32	J A 32	J A 24	G	J A 54	J A 161	J A 86	J A 46	J A 68	J A 71	J A 74	J A 145	J A 111	J A 78	J A 85	J A 92	J A 55	J A 63	J A 40	J A 48	J A 53
21	J A 49	J A 40	J A 62	J A 64	22	J A 51	J A 43	J A 64	J A 45	J A 62	J A 84	J A 77	J A 57	J A 57	J A 60	J A 84	J A 161	J A 63	J A 56	J A 99	J A 80	J A 64	J A 37	J A 54
22	J A 30	J A 39	J A 33	22	22	J A 28	J A 36	J A 55	J A 82	J A 125	J A 92	J A 69	J A 91	J A 76	J A 71	J A 55	J A 80	J A 72	J A 81	J A 150	J A 88	J A 87	J A 63	J A 40
23	J A 36	27	J A 42	J A 41	J A 88	J A 44	J A 54	J A 51	J A 86	J A 50	J A 56	J A 53	J A 93	J A 64	J A 64	J A 56	J A 54	J A 85	J A 54	J A 110	J A 113	J A 98	J A 40	J A 104
24	J A 41	J A 41	J A 64	J A 88	J A 68	J A 29	J A 86	J A 36	J A 56	J A 52	J A 50	J A 53	42	J A 48	J A 42	40	37	J A 67	J A 38	J A 36	J A 29	24	J A 41	J A 52
25	J A 52	J A 35	J A 34	J A 32	E B 16	J A 25	J A 36	J A 49	J A 72	J A 110	J A 147	J A 112	J A 66	J A 50	J A 63	J A 44	J A 45	J A 51	J A 111	J A 55	J A 86	J A 64	J A 71	J A 83
26	J A 54	J A 54	J A 50	J A 47	J A 38	J A 24	J A 47	J A 36	J A 42	J A 64	J A 72	J A 86	J A 81	J A 49	J A 51	J A 65	J A 70	J A 67	J A 56	J A 44	J A 36	J A 67	J A 62	20
27	J A 67	J A 50	J A 64	E B 15	E B 16	E B 16	G	J A 52	J A 82	J A 53	J A 92	J A 104	J A 217	J A 147	J A 113	J A 109	J A 92	J A 138	J A 144	J A 108	J A 80	J A 33	J A 31	J A 26
28	J A 35	J A 25	J A 27	J A 30	J A 30	J A 28	G	J A 37	J A 47	J A 46	J A 49	J A 106	J A 68	J A 104	J A 106	J A 101	J A 60	J A 60	J A 44	J A 37	J A 40	J A 22	J A 23	20
29	J A 30	J A 50	J A 40	J A 40	22	J A 26	J A 29	J A 39	J A 58	J A 90	J A 61	J A 58	J A 47	44	44	41	36	37	J A 37	J A 30	J A 28	J A 30	J A 30	J A 36
30	J A 35	J A 33	J A 50	J A 30	J A 80	21	22	30	J A 48	J A 44	J A 48	J A 51	42	40	39	J A 64	37	37	J A 66	J A 106	J A 49	J A 44	J A 38	J A 38
31	J A 27	J A 86	J A 31	J A 39	J A 56	23	J A 53	J A 86	J A 106	J A 144	J A 164	56	J A 53	41	55	J A 84	J A 73	J A 51	J A 62	J A 87	J A 49	J A 44	J A 64	J A 66
	00	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 41	J A 42	J A 38	J A 32	J A 28	J A 36	J A 49	J A 54	J A 66	J A 65	J A 68	J A 67	J A 54	J A 60	J A 62	J A 54	J A 67	J A 54	J A 55	J A 44	J A 40	J A 42	J A 40
U Q	J A 54	J A 54	J A 54	J A 53	J A 56	J A 42	J A 45	J A 55	J A 78	J A 87	J A 103	J A 86	J A 86	J A 91	J A 98	J A 93	J A 80	J A 85	J A 81	J A 99	J A 77	J A 64	J A 53	J A 54
L Q	J A 30	J A 34	32	27	E B 22	E B 23	G	37	J A 44	J A 50	J A 52	J A 53	50	44	43	48	40	42	J A 41	J A 37	J A 32	28	30	27

JUL.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	24	25	27	E B 15	23	E B 15	G	28	42	42	44	48	A A 64	40	40	39	42	39	34	23	23	E B 16	26	E B 16
2	23	26	16	25	25	24	24	35	42	58	45	A A 68	A A 86	46	A A 98	35	G	G	G	24	20	E B 16	E B 15	E B 15
3	24	26	40	30	28	E B 16	40	39	39	40	A A 83	38	48	G	41	40	44	A A 123	A A 69	60	49	E B 16	28	23
4	24	26	E B 16	E B 16	E B 16	24	G	G	34	34	38	40	40	39	40	44	36	34	26	21	23	23	E B 16	E B 16
5	20	E B 16	23	E B 16	E B 16	28	24	24	33	42	46	39	41	42	43	51	A A 108	33	26	54	23	E B 16	19	20
6	E B 15	E B 15	E B 15	E B 16	E B 16	E B 16	23	28	33	40	40	A A 70	48	41	A A 72	51	40	A A 82	40	32	24	16	19	E B 16
7	E B 16	E B 16	26	E B 15	20	24	24	36	34	37	A A 140	A A 76	A A 118	43	A A 89	45	40	A A 85	34	34	28	28	E B 16	24
8	23	E B 16	E B 16	E B 16	E B 15	E B 15	24	34	47	54	A A 64	39	40	G	38	37	34	32	G	23	25	E B 16	E B 16	E B 16
9	E B 16	E B 16	24	23	E B 16	E B 16	24	A A 109	A A 148	A A 60	A A 52	A A 60	A A 80	A A 87	A A 120	A A 130	54	A A 82	A A 118	A A 88	27	30	E B 16	16
10	23	E A 17	A A 77	19	A A 63	23	28	28	28	37	37	38	38	43	38	37	36	34	27	22	19	25	35	27
11	26	A A 54	E B 16	A A 50	E B 16	E B 16	G	32	35	39	A A 132	A A 82	46	46	39	37	A A 108	31	32	28	42	26	28	25
12	25	27	26	24	E B 16	16	24	30	32	36	37	A A 85	39	40	51	51	32	29	25	24	E B 16	27	24	A A 100
13	A A 66	26	28	E B 16	E B 16	E B 16	G	39	30	A A 110	A A 127	46	40	47	55	53	36	38	36	35	31	22	24	28
14	A A 62	28	A A 54	E B 15	24	E B 16	27	30	A A 55	41	40	38	38	38	A A 100	A A 93	A A 91	40	37	32	17	23	24	24
15	24	24	24	26	E B 15	E B 16	34	41	A A 77	A A 85	49	40	37	36	40	39	32	38	36	27	16	24	27	27
16	E B 15	27	26	22	19	E B 16	G	28	A A 72	A A 112	A A 83	A A 91	52	52	A A 147	A A 124	A A 120	A A 127	A A 164	A A 110	A A 83	28	E B 15	28
17	24	24	E B 15	22	20	A A 66	24	A A 57	A A 88	A A 111	A A 170	A A 110	A A 101	46	36	36	41	33	25	24	36	24	24	E B 16
18	26	E B 16	E B 16	E B 15	E B 15	E B 15	G	46	40	36	36	40	A A 62	A A 129	A A 157	A A 144	A A 135	A A 154	A A 90	25	27	27	E B 15	25
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	31	32	34	38	38	38	40	A A 134	37	46	38	39	31	20	E B 16	E B 16	E B 16	22
20	E B 16	E B 16	E B 16	17	E B 16	E B 16	G	28	A A 161	39	36	45	A A 71	A A 74	A A 145	40	32	51	38	26	38	27	27	27
21	26	27	24	E B 16	E B 16	23	24	28	34	35	37	38	45	40	A A 60	A A 84	39	55	31	28	25	27	24	22
22	23	26	24	E B 16	E B 16	E B 16	29	42	35	60	38	48	51	51	A A 71	48	48	40	26	53	A A 88	39	29	25
23	25	23	24	24	35	21	24	G 24	A A 86	44	46	46	A A 93	56	56	52	49	77	44	37	A A 113	40	24	A A 104
24	E B 16	24	23	26	23	23	27	28	42	42	42	39	39	40	37	37	35	33	29	28	24	22	E B 16	E B 16
25	25	E B 16	E B 16	E B 16	E B 16	16	26	32	41	A A 110	A A 147	A A 112	41	41	A A 63	42	39	42	45	42	A A 86	44	21	27
26	29	26	25	25	25	E B 15	25	28	31	37	40	40	48	37	38	54	46	46	40	32	24	24	24	E B 16
27	28	25	24	E B 15	E B 16	E B 16	G	29	50	45	A A 92	A A 104	A A 217	46	52	48	A A 92	A A 138	A A 144	A A 108	46	24	17	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	34	36	41	A A 106	43	51	A A 106	56	37	34	28	23	23	E B 16	22	E B 15
29	E B 15	30	E B 16	24	E B 16	E B 16	23	28	36	42	38	38	38	40	40	38	35	32	30	23	21	20	E B 16	24
30	E B 16	24	E B 16	E B 16	23	E B 16	20	28	41	39	38	35	40	39	37	A A 64	34	34	A A 66	A A 106	28	36	23	23
31	20	20	22	E B 16	E B 16	E B 16	22	A A 86	A A 106	A A 144	A A 164	36	40	38	46	46	42	40	49	37	36	28	28	42
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	23	24	23	E B 16	E B 16	E B 16	24	30	40	42	44	45	45	42	51	46	40	39	34	28	25	24	23	23
U Q	25	26	26	24	23	23	26	39	A A 55	A A 60	A A 83	A A 76	A A 64	51	A A 89	A A 54	A A 49	A A 77	A A 45	42	38	28	26	27
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	34	37	38	38	40	39	39	39	35	33	27	24	23	E B 16	E B 16	E B 16

JUL.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 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	15	15	16	14	14	15	15	18	23	23	25	24	24	18	16	16	16	15	16	16	16
2	16	16	16	16	16	16	16	16	15	23	23	23	23	25	25	25	23	16	14	11	16	16	15	16
3	15	16	16	16	16	16	16	16	23	23	23	23	24	23	23	23	23	15	15	12	15	16	16	16
4	16	16	16	16	16	16	16	15	15	22	22	26	26	25	25	25	20	17	14	14	14	15	16	16
5	15	16	16	16	16	16	16	15	15	15	25	23	24	25	25	25	25	15	13	15	16	16	16	16
6	15	15	15	16	16	16	14	14	14	15	20	22	22	22	24	23	23	15	13	16	16	16	16	16
7	16	16	16	15	16	16	15	15	15	19	22	23	27	27	20	21	21	17	17	17	16	16	16	16
8	16	16	16	16	15	15	16	15	16	17	23	23	23	24	25	24	16	16	14	14	16	16	16	16
9	16	16	15	16	16	16	15	13	13	16	18	27	24	25	20	16	16	14	11	15	16	16	16	15
10	16	16	22	16	16	16	16	14	14	16	20	24	25	27	24	24	24	22	10	14	16	16	16	16
11	16	16	16	16	16	16	16	11	14	15	15	22	23	23	26	24	23	14	16	16	16	15	16	16
12	16	16	16	16	16	16	16	14	14	18	22	22	22	22	23	23	17	17	15	15	16	16	16	16
13	16	16	16	16	16	16	16	16	14	14	18	24	24	24	24	22	18	13	12	16	16	16	16	16
14	16	15	15	15	16	16	16	15	16	16	18	21	23	23	21	22	20	17	15	16	16	16	16	16
15	16	16	15	16	15	16	13	15	14	14	20	24	24	24	25	24	18	18	14	15	15	16	16	16
16	15	15	15	15	16	16	14	14	12	14	17	24	24	24	24	24	17	14	14	15	15	15	15	15
17	16	16	15	15	16	16	15	14	12	16	16	22	22	22	22	22	22	15	10	11	13	15	15	16
18	23	16	16	15	15	15	15	14	14	14	18	22	24	24	24	23	18	15	14	12	15	15	15	16
19	16	16	16	16	16	16	16	14	22	19	20	22	22	22	22	22	22	16	15	15	16	16	16	16
20	16	16	16	16	16	16	16	15	15	22	22	22	25	25	25	23	19	18	15	16	15	15	15	15
21	16	16	16	16	16	15	14	14	14	14	16	26	26	25	23	22	16	16	14	13	16	16	16	15
22	16	16	16	16	16	16	16	15	15	15	15	18	26	25	25	24	23	20	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	16	23	23	23	23	24	24	24	21	16	16	15	15	15	15	16
24	16	16	16	16	16	16	15	14	15	16	24	23	24	24	24	24	24	19	12	16	16	16	16	16
25	16	16	16	16	16	16	16	14	14	14	22	24	25	23	23	21	16	16	13	13	14	15	15	15
26	16	16	16	16	16	15	16	15	15	19	25	25	26	25	23	22	23	16	12	12	15	16	16	16
27	16	16	16	15	16	16	15	13	16	16	20	22	22	24	25	25	24	16	14	16	16	16	16	16
28	16	16	16	16	16	16	16	15	15	15	16	17	18	20	21	22	18	17	16	16	16	16	16	15
29	15	16	16	16	16	16	16	16	16	16	24	23	23	23	24	24	22	16	12	14	15	16	16	16
30	16	16	16	16	16	16	16	14	15	15	23	23	23	23	23	23	22	16	16	16	16	16	16	16
31	16	16	16	16	16	16	16	15	14	14	15	22	22	22	22	26	22	16	14	14	14	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	16	16	16	16	16	16	15	15	16	20	23	24	24	24	23	21	16	14	15	16	16	16	16
U Q	16	16	16	16	16	16	16	15	15	19	23	24	25	25	25	24	23	17	15	16	16	16	16	16
L Q	16	16	16	16	16	16	15	14	14	15	18	22	23	23	23	22	18	15	13	14	15	15	15	16

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	F	F	326	309	348	332	354	312	302	A	280	279	310	326	323	305	312	320	307	298	F
2	F	F	F	F	F	F	390	331	317	342	359	A	A	296	A	317	333	313	306	335	310	307	292	297
3	F	F	F	F	F	F	365	323	328	345	A	272	314	311	282	290	337	A	A	319	327	353	307	301
4	F	F	F	F	F	F	336	341	365	281	306	316	314	247	281	332	325	298	316	333	320	314	315	310
5	306	307	296	F	F	F	368	357	300	291	337	357	286	308	324	307	A	299	306	310	345	300	305	305
6	295	313	321	F	F	F	337	317	349	336	265	A	294	304	A	298	314	A	332	332	360	303	307	294
7	299	F	F	F	F	336	349	362	345	328	A	A	A	290	A	312	322	A	299	293	311	321	304	F
8	F	F	F	F	F	320	315	313	343	332	A	285	278	301	281	293	331	324	363	328	316	326	313	314
9	310	F	F	F	F	F	343	A	A	A	A	A	A	A	A	A	344	A	A	A	329	358	314	F
10	F	F	A	F	A	F	336	343	297	360	333	316	269	265	308	293	281	317	360	345	319	336	299	F
11	310	A	F	A	F	F	399	331	348	338	A	A	280	344	276	339	A	298	350	305	332	322	328	F
12	F	F	F	F	F	F	310	334	332	326	267	A	294	323	329	311	311	328	320	315	335	F	F	A
13	A	F 319	F	F	F	F	F	360	345	A	A	314	305	250	280	290	307	317	324	325	334	366	342	F
14	A	353	A	F	325	F	343	376	A	360	314	326	338	268	A	A	A	299	342	339	339	318	317	F
15	320	F	F	F	F	F	317	339	A	A	342	342	275	305	343	310	301	303	312	241	314	306	F	F
16	F	F	F	F	F	336	327	346	A	A	A	A	298	318	A	A	A	A	A	A	A	329	F	F
17	304	F	F	F	F	A	321	A	A	A	A	A	A	296	292	292	301	292	311	321	325	345	312	324
18	F	F	F	F	F	F	380	328	321	355	329	330	A	A	A	A	A	A	A	323	342	319	314	F
19	F	F	F	F	F	F	354	351	356	295	303	291	279	A	329	336	312	300	299	313	333	352	320	294
20	296	F	F	F	F	F	311	364	A	329	324	296	A	A	A	304	305	310	318	293	334	345	F	F
21	308	F	F	F	F	F	382	362	326	316	324	261	322	316	A	A	318	328	314	338	348	F	F	F
22	F	F	283	289	F	299	339	338	344	318	325	299	305	307	A	310	324	310	300	290	A	348	288	284
23	268	302	F	304	F	F	337	400	A	367	308	298	A	291	304	292	291	308	310	304	A	F	F	A
24	F	F	F	F	F	F	301	344	371	358	329	264	287	301	299	313	316	323	309	318	346	351	306	F
25	F	F	F	F	F	F	336	364	399	A	A	A	290	292	A	302	295	323	331	354	A	315	F	F
26	296	288	F	F	F	F	345	352	365	318	299	277	278	292	277	289	302	312	324	314	316	334	F	F
27	F	F	F	F	F	F	338	353	375	357	A	A	A	312	316	302	A	A	A	A	311	315	309	298
28	308	312	F	F	F	F	359	382	367	324	341	A	245	288	A	297	300	298	307	310	295	318	345	307
29	306	323	331	314	301	291	345	382	349	364	262	275	R 267	261	297	287	282	292	306	299	311	302	299	304
30	309	F	F	F	319	316	320	345	351	314	316	318	288	273	313	A	304	312	A	A	330	331	305	302
31	F	F	F	F	F	F	315	A	A	A	A	335	207	301	300	313	304	286	317	320	343	316	301	F
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	8	4	3	3	7	30	28	23	24	20	20	22	27	19	25	25	24	25	27	27	28	23	13
MED	306	312	308	304	319	320	338	347	345	334	320	300	288	296	299	304	311	310	314	318	329	322	307	302
U Q	309	321	326	314	325	336	354	362	365	356	331	322	305	308	316	312	324	320	328	332	339	345	315	308
L Q	296	304	290	289	301	299	320	336	328	318	304	281	278	280	281	292	301	298	306	305	316	314	301	296

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 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	L	A	A	A	A	A	397	397	411	A	A	A					
2								A	A	A	A	A	A	A	A	381	392	380	363					
3							A	A	A	A	A	443	A	396	392	412	A	A	A					
4								377	390	360	381	416	456	427	428	A	385	363	L					
5									379	350	A	428	443	426	A	A	A	424	352					
6							L	380	391	401	416	A	A	424	A	A	A	A	A					
7								A	U L 360	428	A	A	A	395	A	A	A	A	A					
8							L	422	A	A	A	411	449	U L 436	423	416	395	377	L					
9							L	A	A	A	A	A	A	A	A	A	A	A	A					
10						A	A	382		432	427	440	438	A	419	407	418	398	363					
11								A	404	U L 396	A	A	A	A	401	U L 416	A	U L 368	U L 377					
12								382	368	416	U L 425	A	400	456	A	A	412	391	386					
13								A	L	A	A	A	U L 424	A	A	A	366	A	A					
14							U L 362		A	A	U L 378	428	433	432	A	A	A	A	A					
15							A	A	A	A	A	384	419	457	424	A	418	A						
16							L	374	A	A	A	A	A	A	A	A	A	A	A					
17						A	A	A	A	A	A	A	A	A	410	410	A	U L 405	362					
18								A	A	429	434		A	A	A	A	A	A	A					
19								L	383		435	420	420	A	432	A	400	A	369					
20								L	A	392	437	A	A	A	A	U L 382	399	A	A	A				
21						A		L	L	L	403	443	A	429	A	A	352	A	A					
22								A	380	A	406	A	A	A		A	A	A	341	A				
23								383	A	A	A	A	A	A	A	A	A	A	A	A				
24								369	A	A	397	U L 412	424	444	411	411	411	402	357	A				
25							A	A	A	A	A	A	393	397	A	387	416	A	A					
26								396	429		384		A	396	369	A	A	A	A	A				
27								L	A	A	A	A	A	A	A	A	A	A	A	A				
28							L	L	404	432	409	A	394	A	A	A	402	392	L	A				
29							L	U L 404	A	A	U L 409	406	U L 411	381	399	403	407	384	U L 380	A				
30							L	L	A	404	372	410	406	415	422	A	378	379	A	A				
31								A	A	A	A	429	408	438	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	10	10	11	15	13	15	17	13	11	15	12	10					
MED							U L 362	382	386	404	409	420	420	426	411	410	400	388	363					
U Q								396	404	429	427	434	438	437	424	412	412	400	U L 377					
L Q								377	379	392	384	410	406	396	398	387	385	378	357					

JUL.2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 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							326	272	286	260	328	E A 402	A	402	356	300	268	268	234					
2								250	E A 316	E A 304	256	A	A	408	A	314	294	300	280					
3							244	E A 332	312	264	A	450	E A 330	346	404	380	296	A	A					
4								264	246	430	366	350	346	524	408	290	290	320	278					
5									372	406	296	270	406	356	322	E A 336	A	318	294					
6							272	304	266	306	460	A	E A 392	374	A	E A 362	318	A	258					
7								240	268	290	A	A	A	356	A	308	286	A	276					
8							296	316	254	E A 268	A	420	382	340	356	316	258	250	240					
9							272	A	A	A	A	A	A	A	A	A	E A 284	A	A					
10						E A 258	238	276		266	290	348	442	E A 320	360	370	402	316	238					
11								254	280	306	A	A	400	290	422	284	A	348	266					
12								294	268	294	468	A	360	304	E A 304	E A 334	304	286	286					
13								248	238	A	A	342	372	E A 520	E A 436	E A 348	292	284	264					
14							304		A	256	332	298	298	418	A	A	A	306	240					
15							E A 304	254	A	A	E A 308	308	454	358	296	E A 322	346	336						
16							280	272	A	A	A	A	E A 396	E A 308	A	A	A	A	A					
17						A	E A 250	A	A	A	A	A	A	374	374	360	314	306	280					
18								E A 362	E A 252	258	304		A	A	A	A	A	A	A					
19								252	252		378	386	402	A	272	268	308	326	290					
20								240	A	300	320	E A 382	A	A	A	334	304	322	270	288				
21						E A 294		264	290	306	334	480	310	310	A	A	308	E A 308	264					
22								E A 270	292	E A 346	314	352	316	324		324	304	314	314	E A 314				
23								240	A	260	348	E A 376	A	E A 380	E A 330	310	302	E A 324	280	264				
24								272	226	250	322	466	406	378	356	302	296	278	278	E A 240				
25							254	214	214	A	A	A	356	356	A	320	320	276	E A 262					
26								236	226		332		380	352	338	E A 308	300	272	256	E A 234				
27								270	242	246	A	A	A	340	E A 332	312	A	A	A	A				
28							252	236	246	330	316	A	532	E A 396	A	E A 318	328	288	288	244				
29							268	232	266	288	486	432	406	484	364	408	384	336	312	262				
30							282	256	266	332	342	344	430	460	320	A	348	326	A	A				
31								A	A	A	A	322	710	358	336	324	324	316	262					
	00	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	26	22	22	20	18	22	27	19	25	25	24	24	7				
MED						E A 276	271	256	263	285	330	355	390	357	347	315	304	309	273	253				
U Q							296	272	286	306	357	420	406	402	374	342	322	323	283	288				
L Q							252	240	246	260	311	342	356	340	322	308	293	285	260	E A 240				

JUL.2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E A 276	E A 306	E A 262	E B 270	E A 256	218	224	212	A	A	A	A	A	200	200	200	A	A	A	200	218	E B 228	E A 266	E B 286
2	E A 294	E A 252	216	E A 230	E A 256	E A 256	206	A	A	A	A	A	A	A	A	206	190	190	198	212	194	E B 224	E B 238	E B 246
3	E A 242	E A 264	E A 278	E A 274	E A 288	E B 244	A	A	A	A	A	188	A	200	196	196	A	A	A	E A 318	E A 248	190	E A 240	E A 290
4	E A 298	E A 276	E B 250	210	E B 234	E A 240	198	198	198	198	198	196	182	182	182	A	194	214	202	220	E A 232	E A 232	E B 228	E B 248
5	E A 260	E B 254	E A 274	E B 274	E B 256	E A 236	210	198	198	222	A	190	186	192	A	A	A	192	196	E A 282	198	210	E A 248	E A 256
6	E B 260	E B 260	E B 226	E B 248	E B 262	E B 248	200	200	190	204	196	A	A	196	A	A	A	A	A	E A 238	196	204	E A 254	E B 254
7	E B 284	E B 298	E A 338	E B 276	E A 252	228	212	A	196	192	A	A	A	208	A	A	A	A	A	E A 306	E A 252	E A 232	212	E A 244
8	E A 266	E B 266	E B 234	E B 234	E B 222	222	214	212	A	A	A	190	186	182	182	196	196	210	202	226	E A 232	E B 220	E B 230	E B 230
9	E B 230	E B 252	E A 280	E A 280	194	E B 260	212	A	A	A	A	A	A	A	A	A	A	A	A	A	216	210	E B 194	E A 344
10	E A 286	E A 266	A	E A 256	A	A	A	194	194	194	192	182	182	A	192	216	204	204	204	E A 230	E A 224	E A 222	E A 310	E A 328
11	E A 320	A	E B 276	A	E B 276	E B 262	188	A	196	196	A	A	A	A	196	196	A	216	208	224	E A 248	E A 228	E A 284	E A 278
12	E A 278	E A 316	E A 298	E A 316	E B 224	218	208	208	208	198	198	A	194	194	A	A	194	192	198	E A 234	188	E A 240	E A 304	A
13	A	E A 290	E A 298	E B 246	E B 282	214	202	A	204	A	A	A	200	A	A	A	224	A	A	E A 234	224	198	212	E A 300
14	A	E A 296	A	E B 272	E A 352	E B 232	202	202	A	A	E A 264	186	186	186	A	A	A	A	A	202	226	E A 250	218	E A 320
15	E A 308	E A 264	E A 292	E A 324	E B 262	E B 254	A	A	A	A	A	210	186	178	186	A	186	A	E A 264	E A 368	E A 230	E A 254	E A 264	E A 234
16	E B 242	E A 242	224	E A 266	E A 258	E B 230	208	208	A	A	A	A	A	A	A	A	A	A	A	A	A	208	208	E A 264
17	E A 322	E A 310	E B 258	E A 258	216	A	A	A	A	A	A	A	A	A	216	210	A	210	210	228	212	198	E A 254	E B 226
18	E A 280	E B 280	E B 260	E B 260	E B 260	E B 274	210	A	A	200	198	E A 268	A	A	A	A	A	A	A	E A 234	220	220	E B 226	E A 276
19	E B 260	E B 260	E B 260	E B 250	E B 252	E B 234	E A 240	212	206	198	190	186	186	A	186	A	186	A	204	204	E B 204	194	E B 212	E A 264
20	E B 244	E B 260	E B 230	E A 230	206	E B 262	206	204	A	208	186	A	A	A	A	200	188	A	A	A	E A 246	196	E A 292	E A 292
21	E A 268	E A 284	E A 250	E B 276	228	A	206	198	196	180	180	180	A	192	A	A	E A 264	A	A	222	E A 222	E A 248	E A 268	E A 270
22	E A 264	E A 288	E A 288	E B 240	E B 240	E B 270	E A 254	A	196	A	186	A	A	A	A	A	A	A	190	A	A	196	E A 266	E A 266
23	E A 282	E A 282	E A 278	E A 256	220	220	214	200	A	A	A	A	A	A	A	A	A	A	A	A	A	212	212	A
24	E B 250	E A 256	E A 256	E A 308	E A 292	216	226	204	A	A	208	198	198	190	190	190	194	194	194	A	210	210	E B 230	E B 278
25	E A 292	E B 256	E B 256	E B 228	E B 238	E B 270	A	A	A	A	A	A	216	216	A	216	208	A	A	208	A	E A 294	E A 246	E A 296
26	E A 296	E A 290	E A 278	E A 286	E A 244	E B 238	E A 236	190	186	178	206	206	A	192	204	A	A	A	A	A	226	210	E A 278	E B 278
27	E A 330	E A 296	E A 258	E B 250	E B 230	E B 224	212	210	A	A	A	A	A	A	A	A	A	A	A	A	E A 256	E A 232	E A 232	E B 258
28	222	E B 258	E B 266	218	210	E B 210	204	200	196	190	190	A	220	A	A	A	198	200	216	A	E A 244	E B 216	204	E B 234
29	E B 234	E A 232	E A 232	E A 248	E B 264	E B 284	228	214	A	A	212	212	198	200	E A 222	194	194	202	204	A	E A 246	E A 262	E B 242	E A 242
30	E B 242	E A 278	E B 248	E B 248	E B 248	E B 248	220	208	A	208	E A 230	188	190	190	190	A	190	212	A	A	212	E A 232	E A 268	E A 268
31	E A 268	E A 312	E A 292	E B 226	E B 236	E B 244	214	A	A	A	A	194	194	184	A	A	A	A	A	218	218	E A 230	E A 230	E A 312
	00	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	29	30	30	28	26	19	13	14	15	15	15	17	13	11	15	12	14	20	27	31	31	29
MED	E A 268	E A 271	E A 260	E 256	E 250	E B 239	210	204	196	198	195	190	190	192	191	200	194	203	202	U 214	U 211	E 220	E A 240	E A 268
U Q	E A 293	E A 290	E A 279	E A 274	E B 262	E B 258	220	210	201	204	208	206	198	200	202	210	204	211	208	E A 236	E A 244	E A 232	E A 266	E A 291
L Q	E B 247	E 258	E B 249	E 240	228	223	206	198	195	192	190	186	186	185	186	196	190	193	198	215	212	208	218	E B 247

JUL.2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	108	108	A	A	A	A	A	108	A	A	A	A	A					
2							110	A	A	A	A	A	A	A	A	A	110	110	110					
3						B	A	A	A	A	A	A	A	108	108	A	A	A	A					
4						B	122	122	A	A	A	112	112	112	112	108	A	A	A					
5						B	A	A	A	108	A	100	110	A	110	A	A	A	A					
6						B	110	110	110	A	A	A	A	A	A	A	110	A	A					
7							A	A	110	A	A	A	A	110	A	108	112	A	A					
8						B	A	A	A	A	A	A	A	108	108	108	A	108	108					
9						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
10						B	A	A	A	A	108	108	A	108	108	112	112	112	A					
11							112	108	A	A	A	A	108	108	108	108	A	A	A					
12						B	A	A	A	A	A	A	A	A	A	A	A	A	B					
13						B	118	A	A	A	A	A	A	116	114	A	110	A	A					
14						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
15							A	A	A	A	A	A	A	A	A	A	A	A	A					
16						B	108	108	A	A	A	A	A	A	A	A	A	A	A					
17						B	A	108	A	A	A	A	A	A	A	A	A	A	A					
18						B	118	A	110	A	A	A	A	A	A	A	A	A	A					
19						B		A	A	A	A	A	A	A	110	A	A	A	A					
20							110	A	A	A	A	A	A	A	A	A	A	A	A	B				
21						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
22						B	A	A	A	A	A	A	A	A		A	A	A	A	B				
23						B	A	114	A	A	A	A	A	A	A	112	A	A	A	B				
24							A	A	A	A	A	A	112	A	A	112	114	A	A	B				
25						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
26						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
27						B	114	108	A	A	A	A	A	A	A	A	A	A	A	B				
28							108	A	A	A	A	A	A	A	A	A	A	A	A	B				
29						B	112	112	A	A	A	A	A	112	112	112	112	110	A	B				
30						B	110	110	A	A	A	A	112	112	110	A	110	110	A	B				
31						B	A	A	A	A	A	A	A	A	110	A	A	A	A	B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							13	10	3	1	1	3	5	10	11	8	8	5	2					
MED							110	109	110	108	108	108	112	109	110	110	111	110	109					
U Q							116	112	110			112	112	112	112	112	112	111						
L Q							109	108	110			100	109	108	108	108	110	109						

JUL.2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	94	80	96	96	96	96	G	108	98	98	96	88	88	128	90	90	90	90	82	82	82	82	98	98
2	90	90	90	90	88	88	110	104	102	96	96	90	88	88	88	88	G	G	G	88	74	74	80	92
3	98	98	88	88	88	92	84	96	92	100	96	96	96	G	116	98	98	88	88	88	88	B	88	88
4	88	88	94	102	94	90	G	G	90	90	90	138	136	128	120	120	100	94	94	94	88	88	82	82
5	82	82	90	90	90	90	90	90	90	110	100	108	120	102	158	98	94	94	96	78	78	B	78	78
6	78	88	80	100	96	B	124	124	116	92	92	86	86	90	100	100	108	94	94	90	90	90	90	B
7	98	98	86	86	94	96	104	96	108	94	94	94	92	118	104	108	112	94	88	88	88	88	88	96
8	100	100	100	100	B	108	108	96	92	84	84	94	94	G	120	128	96	110	G	106	82	B	82	82
9	82	88	88	98	98	98	98	98	92	92	92	92	92	86	86	86	86	86	84	76	76	76	76	92
10	96	96	96	100	94	94	92	90	90	90	114	130	88	136	130	126	122	114	98	96	96	96	94	94
11	86	96	92	92	92	92	G	110	96	96	88	94	108	116	126	124	94	94	94	94	94	94	92	92
12	92	82	82	82	B	102	102	90	90	90	90	90	90	90	90	90	90	90	104	104	96	96	96	96
13	96	90	90	90	90	96	G	96	96	92	92	96	96	110	110	96	114	104	98	98	98	98	96	88
14	92	92	90	90	86	B	100	104	100	94	94	94	98	98	98	84	84	84	84	88	88	88	88	90
15	104	96	96	96	92	110	110	102	96	96	96	92	92	92	92	92	92	92	92	92	92	104	104	92
16	92	86	86	86	86	86	G	126	102	98	94	94	94	94	86	86	86	86	78	78	78	78	78	96
17	88	88	88	88	88	88	88	110	94	94	86	86	86	86	86	86	86	92	92	92	92	92	92	B
18	92	88	88	B	B	B	G	94	110	100	100	98	90	90	90	86	86	86	86	92	86	90	90	102
19	102	102	102	86	B	B	92	92	92	92	92	92	92	92	110	94	94	94	94	94	94	94	94	86
20	86	B	86	86	86	86	G	86	88	88	88	88	88	88	88	92	92	92	92	92	90	88	88	88
21	82	82	82	82	94	86	92	98	98	98	98	98	94	94	94	94	94	94	94	94	94	88	88	86
22	86	86	86	86	86	98	98	96	94	90	90	90	90	86	86	92	98	98	98	90	88	88	88	88
23	88	88	88	88	88	90	90	94	94	94	88	88	88	96	96	114	100	92	92	88	88	88	88	88
24	88	88	88	88	88	88	92	92	92	92	92	92	108	96	96	128	128	96	90	90	90	90	90	90
25	86	86	92	82	B	106	106	100	100	90	88	88	88	88	88	98	100	100	92	82	82	82	82	88
26	88	88	88	88	80	80	94	94	94	94	96	96	92	92	86	82	84	92	92	92	88	88	88	88
27	88	88	80	B	B	B	G	112	90	96	92	92	88	88	88	84	84	84	84	82	82	82	82	82
28	92	90	90	90	90	90	G	98	98	98	94	90	90	88	82	82	80	80	80	84	84	84	84	84
29	84	92	92	92	92	92	124	124	96	88	88	88	92	128	122	116	116	110	94	94	94	94	96	96
30	96	96	96	92	92	92	134	120	96	96	96	96	116	116	116	94	112	112	80	80	80	88	86	92
31	82	96	96	96	96	118	90	90	88	88	88	88	88	88	108	94	94	88	88	88	88	88	88	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	31	30	31	29	25	26	22	30	31	31	31	31	31	29	31	31	30	30	29	31	31	28	31	29
MED	88	88	90	90	90	92	98	97	94	94	92	92	92	92	96	94	94	93	92	90	88	88	88	88
U Q	96	96	94	96	94	98	108	108	98	96	96	96	96	113	116	108	100	96	94	94	92	93	92	93
L Q	86	88	86	86	88	88	92	94	92	90	88	88	88	88	88	86	86	88	85	84	82	86	82	87

IONOSPHERIC DATA STATION Yamagawa

JUL.2021 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	F3	F2	F5	F2	L2		C1	L5	L4	L3	L3	L2	C1	L2	L3	L4	L4	L3	F2	F3	F1	F3	F2
2	F3	F4	F2	F5	F4	F3	C2	L4	L4	L5	L3	L3	L5	L3	L4	L3				F4	F4	F1	F1	F2
3	F2	F8	F9	F7	F4	L5	L4	L6	L3	L2	L4	L2	L4		L2	L2	L5	L5	L7	F9	F6		F4	F3
4	F2	F5	F2	F2	F5	L9			L4	L3	L2	H1	H1	C1	C2	C2	L3	L5	L4	F2	F4	F8	F2	F1
5	F2	F2	F9	F2	F2	F3	L3	L3	L5	C4	L3	C2	C2	L3	H1	L3	L6	L4	L3	F8	F7		F5	F5
6	F2	F3	F2	F1	F3		C2	C2	C2	L3	L2	L3	L3	L2	L3	L3	C3	L5	L7	F4	F3	F2	F2	
7	F3	F3	F3	F3	F4	L5	L2	L5	C3	L3	L6	L3	L3	C2	L4	C2	C2	L4	L3	F5	F5	F2	F2	F2
8	F2	F2	F2	F2		L1	L2	L8	L3	L4	L3	L1	L2		C1	C1	L2	C2		F3	F3		F2	F2
9	F2	F2	F3	F4	F4	F3	L4	L5	L5	L4	L4	L4	L3	L5	L6	L7	L7	L5	L7	F8	F4	F4	F1	F2
10	F2	F3	F5	F2	F9	L3	L5	L3	L3	L3	C2	CL12	L3	H2	CL12	CL22	C2	C2	L2	F2	F2	F4	F9	F9
11	F8	F9	F5	F9	F2	F2		C2	L4	L4	L7	L4	C3	C2	C1	C2	L4	L4	L4	F3	F5	F3	F4	F3
12	F2	F4	F3	F1		L3	L3	L4	L4	L2	L3	L3	L3	L2	L4	L4	L2	L3	L1	F2	F3	F6	F6	F9
13	F9	F4	F3	F2	F3	L2		L4	L3	L5	L8	L2	L2	C3	C2	L3	C2	L4	L8	F6	F9	F4	F2	F8
14	F6	F4	F5	F2	F2		L3	L3	L5	L3	L3	L2	L2	L1	L3	L3	F5	L3	L4	F2	F3	F3	F3	F3
15	F4	F3	F3	F3	F2	F1	L4	L8	L6	L5	L4	L3	L2	L2	L3	L3	L3	L4	L8	F8	F3	F4	F3	F7
16	F2	F7	F5	F5	F5	L1		C2	L6	L7	L7	L4	L4	L4	L7	L7	L7	L8	L6	F5	F9	F2	F2	F3
17	F5	F3	F3	F6	F3	L5	L4	C6	L8	L4	L3	L3	L4	L3	L2	L2	L4	L3	L3	F3	F6	F2	F2	
18	F3	F4	F2					L7	C3	L2	L2	L2	L4	L7	L5	L7	L7	L8	L7	F9	F9	F4	F2	F3
19	F3	F3	F2	F2			L4	L4	L4	L4	L3	L3	L2	L5	C1	L4	L2	L5	L8	F3	F3	F1	F2	F2
20	F2		F3	F4	F3	F2		L3	L6	L5	L2	L3	L4	L3	L3	L2	L2	L4	L5	L5	F8	F5	F3	F8
21	F5	F4	F3	F7	F2	L3	L2	L2	L3	L4	L3	L2	L4	L2	L3	L3	L3	L4	L5	L5	F3	F3	F3	F4
22	F4	F5	F4	F2	F2	F2	L3	L6	L3	L3	L3	L4	L4	L3	L5	L4	L4	L5	L3	L6	F6	F5	F7	F7
23	F3	F3	F2	F3	F4	L3	L8	L2	L5	L3	L3	L3	L6	L3	L2	C3	L2	L3	L8	L4	F9	F7	F7	F7
24	F5	F4	F3	F9	F5	F5	L6	L3	L4	L4	L2	L2	C1	L2	L2	C1	C2	L3	L4	L3	F3	F1	F2	F2
25	F3	F2	F2	F2		L3	L3	L3	L5	L5	L5	L5	L3	L2	L4	L2	L3	L5	L5	L6	F9	F4	F5	F7
26	F6	F2	F3	F2	F3	L2	L2	L1	L3	L3	L3	L2	L2	L2	L4	L4	L5	L6	L8	L4	F3	F3	F3	F1
27	F8	F7	F4					C3	L6	L3	L5	L8	L5	L4	L3	L5	L6	L9	L8	L9	F8	F3	F2	F2
28	F3	F2	F2	F3	F2	F2		F3	F4	L3	L4	L3	L3	L3	L6	L3	L2	L4	L2	L2	F3	F4	F5	F2
29	F2	F2	F4	F4	F2	L2	C2	C3	L3	L3	L3	L2	L3	C1	C1	C1	C1	C2	L5	L5	F7	F2	F3	F4
30	F4	F5	F4	F3	F4	L2	C2	C3	L4	L2	L2	L2	C1	C1	C1	L3	C2	C2	L6	L9	F8	F4	F4	F2
31	F2	F6	F4	F3	F3	L1	L4	L8	L5	L3	L5	L3	L3	L2	C2	L3	L3	L4	L8	L8	F4	F9	F5	F6
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUL.2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.2021 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 54	X 57	X 56	58	60	42															X 70	X 64	X 60	X 53
2	63	63	67	O X 34	X 41	46															X 64	X 66	X 66	X 66
3	66	69	63	58	59																X 82	X 64	X 60	X 58
4	X 55	X 56	59	57	54																X 66	X 63	X 54	X 54
5	X 54	57	55	48	45																X 78	X 75	X 68	X 68
6	X 60	X 58	X 56	X 48	X 46																X 73	X 61	X 57	X 54
7	X 51	X 47	X 42	X 40	X 48															X 70	X 75	X 75	X 69	X 69
8	66	69	64	60	56	45															X 60	X 63	X 62	X 53
9	X 48	57	54	X 46	X 39	A															X 88	X 58	X 37	X 34
10	X 35	X 32	44	X 37	A	X 30															X 65	X 54	X 40	X 38
11	X 31	X 37	X 32	A	X 27	37															X 68	X 56	X 48	X 44
12	X 44	53	46	44	X 38	X 38															X 74	X 67	X 40	58
13	48	44	47	41	41	X 32															X 89	X 81	X 38	A
14	A	A	X 33	X 27	X 27	X 28															X 64	X 59	X 50	X 41
15	49	X 38	48	A	X 34	X 30															X 70	X 62	X 58	A
16	A	X 51	X 50	X 39	X 34	X 32															X 78	X 54	X 44	X 42
17	50	X 45	X 43	X 43	X 31	A															X 86	X 53	X 40	X 38
18	X 37	41	X 39	X 34	X 33	X 31															X 78	X 68	X 63	58
19	X 45	X 43	X 41	X 40	X 41	X 42	53														X 88	X 79	X 57	X 54
20	58	66	58	X 44	X 41	X 35															X 83	X 75	X 55	X 54
21	X 55	X 48	X 46	X 46	X 48	48															X 74	X 60	56	57
22	X 54	X 51	X 47	X 48	X 43	X 37															X 88	X 55	X 54	X 54
23	X 52	X 50	X 50	X 55	X 43	X 35															X 108	X 85	X 53	53
24	59	A	59	57	49	X 38															X 91	X 57	X 45	X 45
25	X 45	47	X 42	X 41	X 38	X 38															X 74	X 62	X 53	X 51
26	X 48	X 39	X 38	46	48	X 39															X 115	X 73	X 56	X 56
27	59	59	X 54	51	X 45	X 42															X 88	X 78	X 68	X 66
28	X 62	X 57	62	62	X 46	X 39															X 92	X 97	X 72	X 62
29	X 62	X 58	X 54	X 50	X 44	X 44															X 65	X 63	X 63	X 62
30	58	X 52	X 53	X 36	X 41	X 41															X 70	X 50	X 50	X 47
31	X 48	X 43	X 44	X 44	X 40	X 38															X 85	X 75	X 75	X 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	29	29	31	29	30	24	1													1	31	31	31	29
MED	X 54	X 51	X 50	X 46	X 42	X 38	53													X 70	X 78	X 63	X 56	X 54
U Q	59	58	56	53	48	42															X 88	X 75	X 63	X 60
L Q	X 48	X 44	X 43	X 40	X 38	X 34															X 70	X 58	X 48	X 46

IONOSPHERIC DATA STATION Okinawa

JUL.2021 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	48	51	50	F 46	F 46	F 32	43	54	74	59	A	A	52	64	80	86	94	87	84	74	64	58	54	47
2	F 45	F 48	F 47	28	35	F 36	42	48	A	67	A	A	A	54	60	70	71	71	76	62	58	60	60	60
3	F 55	F 54	F 54	F 47	F 42	F 44	38	44	54	66	59	61	60	56	57	54	60	65	A	78	76	58	54	52
4	49	50	48	46	F 42	38	41	58	57	50	58	57	52	52	60	66	63	70	64	55	60	57	48	48
5	48	F 47	F 43	F 32	F 35	28	41	45	50	54	68	58	52	53	62	74	A	65	69	81	72	69	62	62
6	54	52	50	42	40	38	47	51	65	55	56	58	52	54	56	62	70	85	88	83	67	55	51	48
7	45	41	36	34	42	29	42	52	A	A	A	52	62	80	75	A	67	62	57	64	69	69	63	63
8	F 57	F 52	F 53	F 52	F 44	F 31	37	55	60	55	59	54	61	68	75	90	95	88	66	51	54	57	56	47
9	42	F 44	F 42	40	33	A	38	A	57	50	56	A	A	A	69	73	64	54	58	62	82	52	31	28
10	29	26	F 28	31	A	24	37	48	53	66	61	48	E G 45	49	57	52	53	64	67	68	59	48	34	32
11	25	31	26	A	21	F 24	42	46	50	53	49	51	56	58	67	68	A	62	54	54	62	50	42	38
12	38	F 35	30	F 30	32	32	40	52	A	47	53	52	59	60	66	73	75	74	69	72	68	61	34	F 37
13	F 31	F 26	F 29	F 23	F 24	26	36	57	52	56	50	60	50	48	56	68	72	80	81	75	83	75	32	A
14	A	A	27	21	21	20	R 32	44	58	54	54	A	52	A	A	52	63	82	85	73	58	53	44	35
15	F 38	32	F 34	A	R 28	24	43	51	A	A	58	60	49	57	64	52	54	56	67	73	64	56	52	A
16	A	45	44	33	28	26	40	49	67	A	52	A	67	71	62	A	65	72	80	80	72	48	38	36
17	F 35	39	37	37	25	A	33	49	57	49	50	A	56	65	66	69	79	82	85	86	80	47	34	32
18	31	F 32	33	28	27	25	37	50	60	58	48	50	A	A	A	70	73	73	84	84	72	62	57	F 49
19	39	37	35	34	35	36	F 44	47	49	53	53	62	66	78	84	82	78	76	81	86	82	73	51	48
20	F 45	F 48	F 44	38	35	29	34	48	51	56	65	49	52	64	66	72	73	80	A	A	77	69	49	48
21	49	41	40	40	42	F 34	41	53	58	50	54	54	67	70	A	58	66	73	84	77	68	54	F 48	F 48
22	48	45	41	42	37	31	36	53	57	A	72	74	82	90	96	95	82	67	A	96	82	49	48	48
23	46	44	44	49	37	29	38	61	53	A	58	58	65	81	81	90	94	104	104	102	102	79	47	F 42
24	F 50	A	F 48	F 39	F 34	32	37	72	70	A	A	56	58	64	75	80	80	80	84	87	85	51	39	39
25	39	F 37	36	35	32	32	46	67	54	54	54	56	61	A	A	A	90	95	96	84	68	56	47	45
26	42	33	32	F 35	F 28	33	37	58	60	51	52	64	84	99	109	112	107	100	100	106	109	67	50	50
27	F 46	F 50	48	40	39	36	39	58	67	55	48	50	54	66	A	A	81	89	96	95	82	72	62	60
28	56	51	F 53	F 48	F 45	33	45	53	58	53	62	E G 48	53	A	70	78	79	85	86	86	86	91	66	56
29	56	52	48	44	38	38	43	72	58	50	47	E G 44	48	52	53	55	54	54	58	59	59	57	57	56
30	48	46	47	30	35	35	40	58	54	50	56	58	52	54	59	62	68	72	87	66	64	44	44	41
31	42	37	38	38	34	32	33	54	62	51	E G 50	A	A	60	68	70	75	89	98	94	79	69	69	64
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	31	29	30	29	31	30	27	25	27	24	27	26	26	27	29	31	28	30	31	31	31	29
MED	45	44	42	38	35	32	40	52	57	54	54	56	56	62	66	70	73	74	82	78	72	57	49	48
U Q	49	50	48	43	F 40	36	42	58	60	56	59	59	62	70	75	80	80	85	86	86	82	69	57	54
L Q	38	36	34	32	28	27	37	48	53	50	50	50	52	54	60	62	64	65	67	66	64	52	42	38

IONOSPHERIC DATA STATION Okinawa

JUL.2021 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	U L 428	A	A	468	456	456	440	U A 436	396	L 396					
2								U L 380	A	A	A	A	A	A	436	440	A	400	372	L				
3									A	A	452	464	456	472	456	A	U A 444	A	A					
4								U L 392	U L 440	U L 476	452	460	460	468	444	448	428	420	U L 396	L				
5									U L 384	444	A	A	A	448	452	A	A	404	U L 372	L				
6								400	408	424	448	452	A	456	448	A	424	396	L 376					
7								L	A	A	A	444	A	A	A	A	A	A	A					
8								U L 384	L 428	L 480	432	456	452	A	444	432	432	400	368					
9								A	A	428	A	A	A	A	456	A	A	A	A					
10								U L 372	U L 416	424	436	448	452	448	436	424	420	396	368	L				
11								L	392	412	440	440	448	A	448	428	A	396	U L 364	L				
12								L 380	A	432	432	A	A	U A 452	436	424	A	388	368	L				
13								L	420	A	432	432	444	436	424	424	416	396	A					
14								U L 308	A	A	A	A	452	A	A	436	A	A	A					
15								A	A	A	A	A	456	A	A	A	416	408	376					
16								U L 380	392	A	A	A	A	A	444	A	A	U A 404	372					
17								332	A	A	440	A	444	A	444	428	412	388	368					
18								388	U L 444	412	448	448	A	A	A	A	424	A	A					
19								L	U L 432	444	440	A	A	U A 460	440	436	424	A	A					
20									L 428	432	416	456	A	A	U A 472	A	424	408	A	A				
21							L	U L 396	U L 412	U L 424	448	460	460	464	A	440	428	400	L 380					
22								L	L 452	A	A	A	A	468	456	444	U A 432	A	A					
23								L	L 400	A	448	456	476	460	472	A	A	A	388	L				
24								L 384	A	A	A	468	472	464	452	448	440	420	L 392					
25								L	U L 396	448	460	484	456	A	A	A	444	A	L 380	A				
26								A	396		U L 476	456	468	460	452	456	428	404	372					
27								L	412	444	456	A	A	A	A	A	A	A	A					
28								L	A	U L 444	460	476	A	A	A	A	A	400	A					
29									400	440	U L 436	444	444	440	436	424	404	U A 396	A					
30								L	L 428	U L 436	A	444	452	448	444	440	U A 420	408	364					
31								L 368	408	U L 432	496	A	A	452	440	440	U A 428	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								13	20	19	20	18	17	17	23	18	20	20	18					
MED								U L 380	L 412	432	448	456	456	456	444	438	426	400	372					
U Q								390	L 428	L 444	454	460	464	464	456	440	432	406	L 380					
L Q								L 370	398	424	436	444	450	448	440	428	420	396	368					

JUL.2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.2021 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	A	A	284	A	A	A	A	A	352	A	A	A	A	A				
2						B	A	248	276	316	336	348	A	328	A	A	A	A	A	A				
3						A	A	A	A	A	A	A	380	360	352	340	312	280	A	A				
4						B	A	A	A	A	A	A	A	A	364	340	308	A	A	A				
5						A	A	A	280	320	340	344	356	368	352	340	320	284	A	A				
6						B	A	212	A	A	A	368	A	A	A	A	A	284	A	A				
7						B	A	232	276	A	A	340	A	364	356	328	312	284	A					
8						B	A	216	272	A	A	A	A	A	A	A	A	A	192	A				
9							A	216	276	A	A	A	A	A	A	A	A	A	A	A				
10							A	A	A	A	A	A	A	A	A	A	A	272	204	A				
11							A	224	264	296	332	344	344	344	344	328	312	288	236	A				
12							A	A	256	276	A	A	A	A	A	A	A	A	A	A				
13							A	220	256	300	A	A	A	340	A	324	300	272	A	A				
14							A	200	264	292	312	328	A	344	332	A	A	A	A	A				
15							A	204	264	292	312	A	A	A	A	A	A	236	196	A				
16							A	192	272	304	328	336	336	344	340	328	312	260	A	A				
17							A	A	A	A	A	A	A	A	A	A	A	A	216	A				
18							A	A	280	304	320	336	344	328	300	A	A	A	A	A				
19							B	A	268	U A 308	A	A	360	348	348	340	320	276	228	A				
20							A	A	A	A	A	344	364	360	348	336	320	280	228	A				
21							A	A	A	A	336	A	356	360	360	340	312	276	216	A				
22							B	A	268	U A 304	A	A	A	A	A	332	A	280	224	A				
23							A	A	A	A	A	A	372	A	360	348	320	256	A	A				
24							A	U A 200	A	300	336	A	A	356	A	A	A	A	A	A				
25							A	220	A	A	A	A	A	A	A	A	A	A	A	A				
26							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
27							A	212	272	296	A	A	372	356	340	328	U A 300	A	A	A				
28							B	192	U A 252	276	A	A	A	A	A	A	A	A	A	A				
29							A	A	A	A	A	A	A	A	A	A	300	276	224	A				
30							A	212	272	300	328	340	360	348	340	332	300	272	224	A				
31							A	A	A	A	A	A	A	A	A	332	308	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								15	18	15	10	10	11	15	15	15	15	16	11					
MED								212	272	300	330	342	360	348	348	332	312	276	224					
U Q								220	276	304	336	344	372	360	356	340	320	282	228					
L Q								200	264	292	320	336	344	344	340	328	300	272	204					

JUL.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.2021 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 20	20	J A 22	J A 22	J A 22	J A 24	24	J A 43	J A 52	J A 52	J A 93	J A 69	J A 53	38	G	J A 49	J A 72	J A 67	J A 38	J A 53	J A 39	20	E B 16	J A 33
2	J A 32	J A 86	J A 58	J A 48	J A 21	J A 74	23	J A 35	J A 72	J A 73	J A 84	J A 107	J A 111	J A 54	J A 62	J A 48	J A 62	J A 31	J A 33	J A 23	J A 18	19	E B 16	E B 16
3	J A 33	J A 52	J A 35	J A 39	J A 54	J A 42	J A 43	J A 48	J A 64	J A 54	J A 41	J A 49	G	40	J A 58	J A 58	J A 63	J A 62	J A 87	J A 74	J A 53	J A 20	J A 41	J A 26
4	J A 30	J A 24	J A 16	19	J A 22	J A 28	J A 30	J A 39	J A 46	J A 43	J A 47	J A 42	J A 50	40	40	42	J A 45	J A 39	J A 30	J A 40	J A 31	J A 22	J A 19	J A 22
5	18	J A 17	E B 16	J A 26	J A 29	J A 43	J A 26	J A 48	J A 39	J A 43	J A 82	J A 72	J A 59	42	G	J A 67	J A 94	34	J A 32	J A 28	J A 30	J A 28	J A 23	J A 23
6	20	18	J A 21	19	J A 18	E B 16	J A 27	31	35	35	40	39	J A 76	J A 77	43	J A 66	J A 52	37	J A 44	J A 39	J A 27	J A 42	J A 29	J A 23
7	J A 31	J A 41	J A 49	20	E B 16	19	J A 29	27	J A 73	J A 118	J A 181	J A 54	50	J A 86	J A 70	J A 100	J A 64	J A 64	J A 73	J A 62	J A 85	J A 33	J A 40	J A 33
8	J A 32	J A 27	J A 28	J A 23	E B 16	E B 16	21	J A 47	J A 83	J A 70	J A 87	J A 64	J A 43	J A 54	J A 46	J A 40	35	J A 43	27	19	J A 18	J A 32	J A 37	20
9	J A 50	J A 64	J A 42	J A 52	J A 85	J A 110	J A 163	J A 187	J A 82	J A 64	J A 154	J A 146	J A 132	J A 68	J A 60	J A 96	J A 62	J A 62	J A 142	J A 110	J A 81	J A 43	J A 22	J A 52
10	J A 17	J A 16	J A 132	J A 32	J A 61	J A 19	J A 60	J A 44	J A 41	J A 61	J A 70	J A 42	J A 53	J A 40	42	39	36	J A 42	J A 38	J A 26	J A 24	J A 37	J A 51	J A 49
11	J A 33	J A 42	J A 36	J A 36	E B 16	J A 28	J A 24	29	J A 42	J A 168	45	J A 71	J A 47	J A 52	J A 148	J A 106	J A 110	J A 59	J A 36	J A 30	J A 43	J A 53	J A 32	J A 22
12	J A 18	J A 25	20	J A 25	E B 16	J A 17	J A 27	J A 64	J A 109	J A 119	J A 94	J A 90	J A 61	J A 59	J A 60	J A 54	J A 92	J A 102	J A 47	J A 34	J A 34	J A 26	J A 26	J A 89
13	J A 108	J A 42	J A 22	J A 32	E B 16	E B 16	J A 25	J A 36	38	J A 52	J A 73	J A 62	J A 46	44	37	J A 62	40	36	J A 46	J A 38	J A 36	J A 29	J A 29	J A 47
14	J A 53	J A 52	J A 50	J A 52	J A 32	J A 42	J A 70	J A 44	J A 88	J A 72	J A 87	J A 84	J A 124	J A 64	J A 167	J A 127	J A 96	J A 239	J A 107	J A 100	J A 87	J A 73	J A 60	J A 44
15	J A 50	J A 32	J A 53	J A 61	J A 35	J A 31	J A 25	J A 52	J A 86	J A 66	J A 63	J A 118	J A 62	J A 110	J A 105	J A 60	J A 46	36	J A 35	J A 32	J A 21	E B 16	J A 18	J A 102
16	J A 74	J A 86	J A 53	J A 53	J A 24	J A 20	26	36	J A 42	J A 88	J A 157	J A 186	J A 108	J A 69	J A 86	J A 132	J A 66	J A 45	J A 40	J A 84	J A 106	J A 40	J A 23	J A 26
17	J A 26	J A 65	J A 31	J A 29	J A 86	J A 113	J A 24	J A 38	J A 61	J A 63	J A 59	J A 84	40	J A 84	J A 41	J A 54	J A 39	J A 40	25	J A 30	J A 24	J A 40	J A 23	20
18	J A 22	J A 18	20	20	E B 16	20	18	26	32	34	39	40	J A 71	J A 83	J A 80	J A 125	J A 40	J A 45	J A 47	J A 110	J A 52	J A 50	J A 32	J A 50
19	J A 18	J A 19	20	20	20	J A 38	E B 16	27	J A 52	J A 70	J A 47	J A 82	J A 51	J A 54	G	40	36	J A 48	J A 48	J A 46	J A 85	J A 61	J A 23	J A 41
20	J A 52	J A 32	J A 68	J A 36	J A 25	J A 24	J A 29	J A 38	37	J A 85	38	J A 48	J A 63	J A 70	J A 66	J A 50	J A 44	J A 46	J A 86	J A 172	J A 63	J A 66	J A 87	J A 32
21	J A 30	J A 42	J A 25	J A 16	J A 58	J A 29	J A 38	J A 66	J A 32	J A 62	J A 42	J A 48	J A 46	J A 48	J A 78	J A 50	J A 50	J A 208	J A 96	J A 66	J A 44	J A 64	J A 52	J A 45
22	J A 50	J A 26	J A 24	J A 65	J A 74	J A 52	22	J A 72	J A 53	J A 140	J A 146	J A 109	J A 110	J A 50	J A 44	J A 44	J A 62	J A 48	J A 203	J A 146	J A 108	J A 52	J A 62	J A 52
23	J A 38	J A 29	J A 30	E B 16	J A 22	E B 16	J A 22	J A 38	J A 85	J A 68	J A 52	J A 47	G	34	45	43	J A 51	J A 52	J A 62	J A 28	J A 17	J A 31	J A 52	J A 40	J A 119
24	J A 48	J A 137	J A 87	J A 77	J A 60	J A 53	J A 22	J A 89	J A 55	J A 61	J A 104	J A 45	J A 56	J A 48	J A 43	J A 46	J A 42	J A 39	J A 62	J A 46	J A 39	J A 22	J A 26	J A 22
25	J A 36	J A 18	E B 16	20	J A 25	J A 22	19	29	J A 53	J A 42	J A 62	J A 83	J A 159	J A 142	J A 156	J A 104	J A 58	J A 55	J A 36	J A 41	J A 31	J A 36	J A 85	J A 25
26	J A 26	J A 50	J A 35	J A 18	J A 17	J A 26	26	J A 83	J A 82	J A 46	J A 54	J A 56	J A 51	J A 62	J A 51	J A 54	J A 48	J A 41	J A 41	J A 20	J A 28	J A 26	J A 53	J A 60
27	J A 50	E B 16	E B 16	E B 16	E B 16	E B 16	22	29	J A 41	39	J A 56	48	47	J A 52	J A 82	J A 129	J A 55	J A 70	J A 163	J A 71	J A 120	J A 64	J A 30	J A 30
28	J A 20	J A 29	J A 33	E B 16	E B 16	E B 16	E B 16	36	J A 51	J A 42	40	40	J A 62	J A 188	J A 84	J A 222	J A 108	J A 30	J A 58	J A 52	J A 46	J A 26	J A 24	J A 18
29	E B 16	E B 16	18	J A 21	J A 24	E B 16	J A 24	J A 36	J A 52	J A 43	J A 63	J A 45	J A 50	J A 47	J A 45	38	38	J A 45	J A 43	J A 37	J A 50	J A 39	J A 43	J A 29
30	J A 42	J A 33	J A 35	J A 50	J A 54	J A 34	19	J A 37	J A 42	J A 43	J A 64	38	42	43	40	44	44	39	28	J A 34	J A 22	J A 36	J A 51	J A 85
31	J A 35	J A 25	J A 19	J A 36	J A 42	J A 17	J A 32	J A 52	J A 51	J A 50	J A 63	J A 155	J A 130	J A 45	J A 56	41	J A 44	J A 51	J A 42	J A 36	J A 28	J A 25	J A 85	J A 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 32	J A 29	J A 30	J A 26	J A 24	J A 24	J A 25	J A 38	J A 52	J A 61	J A 63	J A 62	J A 53	J A 54	J A 56	J A 54	J A 52	J A 45	J A 43	J A 40	J A 39	J A 36	J A 32	J A 33
U Q	J A 50	J A 50	J A 49	J A 48	J A 54	J A 42	J A 29	J A 52	J A 73	J A 72	J A 87	J A 84	J A 76	J A 70	J A 80	J A 100	J A 64	J A 62	J A 73	J A 71	J A 63	J A 52	J A 51	J A 50
L Q	J A 20	J A 19	20	20	E B 16	E B 17	22	35	41	J A 43	47	45	47	45	42	44	42	39	J A 35	J A 30	J A 28	J A 26	J A 23	J A 23

JUL.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.2021 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	39	49	36	A A 93	A A 69	41	38	G	37	44	31	33	51	35	E B 16	E B 16	22
2	E B 16	19	24	21	E B 16	E B 16	21	29	A A 72	51	A A 84	A A 107	A A 111	49	40	40	59	30	30	19	E B 16	E B 16	E B 16	E B 16
3	E B 16	20	23	32	E B 16	25	22	30	51	49	39	40	G	38	42	46	44	50	A A 87	47	22	17	20	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	29	32	36	36	38	40	40	40	39	37	32	29	20	26	18	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	18	19	20	28	34	39	50	49	48	40	G	57	A A 94	32	26	22	20	23	21	18
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	32	35	39	38	48	42	41	48	35	33	34	27	E B 16	E B 16	E B 16	E B 16
7	25	18	E B 16	E B 16	E B 16	E B 16	21	26	A A 73	A A 118	A A 181	40	47	72	66	A A 100	51	52	50	28	E B 16	E B 16	26	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	32	40	37	38	40	41	47	38	34	34	32	26	18	E B 16	20	19	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	A A 110	23	A A 187	40	36	50	A A 146	A A 132	A A 68	39	56	46	50	46	45	42	31	19	E B 16
10	E B 16	E B 16	E B 16	23	A A 61	E B 16	22	31	33	35	38	38	39	39	41	38	34	32	27	20	E B 16	28	29	23
11	18	E B 16	18	A A 36	E B 16	E B 16	19	27	36	35	43	41	42	46	40	39	A A 110	33	25	22	E B 16	20	20	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	34	A A 109	36	41	46	45	45	40	36	54	32	27	18	18	18	20	E B 16
13	18	E B 16	E B 16	E B 16	E B 16	E B 16	22	32	34	42	40	40	42	41	37	40	35	35	40	35	28	26	E B 16	A A 47
14	A A 53	A A 52	18	E B 16	E B 16	E B 16	20	29	53	45	44	A A 84	41	A A 64	A A 167	37	47	67	66	34	26	36	23	20
15	18	E B 16	22	A A 61	E B 16	E B 16	21	34	A A 86	A A 66	48	52	39	50	49	45	33	30	29	26	E B 16	E B 16	E B 16	A A 102
16	A A 74	E B 16	23	E B 16	E B 16	E B 16	22	32	34	A A 88	43	A A 186	49	57	39	A A 132	52	40	31	35	27	28	E B 16	E B 16
17	E B 16	29	E B 16	E B 16	E B 16	A A 113	19	25	41	42	40	A A 84	40	50	39	36	35	29	24	25	19	26	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	25	31	33	39	39	A A 71	A A 83	A A 80	46	36	42	39	53	21	18	22	24
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	33	37	38	51	50	46	G	38	36	46	40	40	23	18	23	26
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	22	24	35	33	36	42	49	54	47	46	34	30	A A 86	A A 172	22	25	27	21
21	E B 16	E B 16	E B 16	E B 17	E B 16	E B 16	21	26	31	36	37	38	39	40	A A 78	39	38	33	28	58	E B 16	19	20	25
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	30	41	A A 140	48	49	54	44	39	41	43	42	A A 203	29	40	32	32	24
23	22	E B 16	E B 16	E B 16	E B 16	E B 16	20	29	32	A A 68	38	38	G 32	43	42	48	50	46	26	17	E B 16	30	23	22
24	35	A A 137	18	24	E B 16	20	20	30	41	A A 61	A A 104	41	40	42	40	41	37	33	27	28	21	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	E B 16	18	25	31	36	40	42	41	A A 142	A A 156	A A 104	42	44	30	20	19	21	35	19
26	22	E B 16	E B 16	E B 16	E B 16	E B 16	19	33	33	36	41	38	38	41	41	40	36	31	29	18	17	21	18	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	28	33	36	44	47	47	49	A A 82	A A 129	52	57	49	45	73	36	24	20
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	28	42	35	39	39	47	A A 188	50	53	50	29	40	34	32	E B 16	E B 16	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	26	32	35	35	38	38	41	39	37	37	40	38	32	41	22	29	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	30	37	37	50	38	39	40	40	42	42	36	27	32	20	E B 16	18	34
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	28	29	37	39	A A 155	A A 130	40	40	39	43	43	38	34	24	20	38	27
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	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	20	29	35	37	40	41	42	45	40	41	42	33	31	29	21	20	20	18
U Q	18	16	16	16	E B 16	16	21	32	42	A A 49	48	A A 52	49	A A 54	A A 49	48	50	44	40	40	27	26	24	24
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	26	32	36	38	38	39	40	39	38	36	32	27	20	E B 16	E B 16	E B 16	E B 16

JUL.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.2021 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

IONOSPHERIC DATA STATION Okinawa

JUL.2021 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	283	294	295	F 309	F 334	F 331	324	341	352	324	A	A	245	288	290	296	308	295	294	321	330	310	324	267
2	F 294	F 325	F 339	348	303	F 305	371	342	A	344	A	A	A	255	282	306	317	299	318	351	301	303	299	311
3	F 300	F 320	F 345	F 319	F 344	F 375	366	331	314	331	309	296	312	293	307	279	281	292	A	320	343	319	298	300
4	294	298	315	317	F 336	318	322	346	345	292	329	328	273	272	285	316	300	317	298	306	307	316	305	295
5	298	F 310	F 303	F 317	F 314	326	391	344	331	314	328	336	266	269	289	312	A	290	275	315	340	316	313	306
6	301	301	320	311	285	321	356	325	378	324	319	348	282	285	282	293	295	302	314	326	334	304	290	293
7	290	295	300	316	339	374	356	361	A	A	A	256	267	310	300	A	304	305	300	286	308	321	301	313
8	F 300	F 316	F 330	F 330	F 337	F 310	333	351	344	306	330	261	288	270	273	300	323	350	335	318	301	315	353	287
9	294	F 309	F 311	342	323	A	338	A	361	276	312	A	A	A	258	299	322	290	316	298	327	371	288	276
10	304	305	F 328	309	A	363	341	335	302	371	375	277	G	255	312	288	269	307	336	349	343	371	313	309
11	305	321	303	A	304	F 365	364	369	334	320	294	273	296	287	303	320	A	315	327	330	336	352	322	298
12	301	F 305	314	F 304	340	340	365	352	A	260	313	306	311	279	279	297	305	314	290	318	312	374	328	F 351
13	F 324	F 335	F 328	F 312	F 285	334	313	384	348	368	323	358	265	210	267	286	302	311	321	310	335	389	334	A
14	A	A	355	339	327	349	R 366	340	348	329	305	A	319	A	A	264	281	307	331	347	325	324	327	291
15	F 315	314	F 308	A	R 306	312	350	373	A	A	306	334	271	288	339	245	291	297	312	329	323	311	327	A
16	A	321	346	311	337	322	346	316	352	A	311	A	310	325	282	A	278	290	310	317	354	312	325	264
17	F 290	315	316	348	335	A	335	362	376	295	295	A	273	305	272	277	284	297	313	324	355	344	327	312
18	304	F 307	338	304	322	331	345	357	349	384	288	276	A	A	A	303	295	289	316	329	348	328	310	F 283
19	314	304	312	312	315	358	F 383	371	317	307	290	325	264	281	296	284	280	283	283	322	328	351	299	304
20	F 315	F 298	F 348	343	337	306	329	317	331	330	347	300	242	294	282	290	293	315	A	A	328	360	276	296
21	303	309	295	305	321	F 326	318	333	346	363	309	273	301	350	A	284	311	314	339	324	355	324	F 287	F 304
22	296	287	304	321	297	316	314	336	305	A	301	278	261	285	248	266	311	293	A	326	361	284	287	277
23	269	289	296	331	352	302	334	368	379	A	326	290	277	271	276	285	289	301	314	302	320	330	284	F 277
24	F 301	A	F 316	F 315	F 348	297	300	359	404	A	A	271	281	290	291	308	304	294	281	318	357	354	299	283
25	285	F 295	293	294	306	294	354	361	390	314	292	257	279	A	A	A	295	309	330	355	334	327	285	322
26	322	298	290	F 293	F 314	321	312	355	344	352	255	292	265	289	304	306	306	305	305	314	329	359	297	283
27	F 300	F 302	313	305	319	318	361	357	385	379	208	261	284	295	A	A	276	291	310	323	330	320	328	294
28	311	304	F 301	F 306	F 351	337	370	368	354	341	355	G	272	A	275	288	278	292	299	301	300	343	313	293
29	303	313	315	322	287	285	334	405	372	349	262	G	205	277	273	287	280	295	312	312	305	288	292	295
30	311	291	327	350	298	326	322	362	336	307	316	326	279	272	291	286	297	291	331	313	371	305	301	297
31	331	343	321	309	323	338	338	353	367	359	G	A	A	292	302	277	280	299	328	333	329	313	314	311
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	31	29	30	29	31	30	27	25	27	24	27	26	26	27	29	31	28	30	31	31	31	29
MED	301	305	315	315	322	326	341	354	348	329	309	284	273	286	284	288	295	299	314	320	330	324	305	295
U Q	311	316	F 328	330	337	339	364	362	372	356	326	326	288	293	300	303	306	309	328	329	343	352	325	308
L Q	294	298	303	308	306	311	324	340	334	307	292	266	265	272	275	284	280	292	300	313	320	312	292	283

IONOSPHERIC DATA STATION Okinawa

JUL.2021 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	U L 415	A	A	418	430	421	409	A	393	L 359					
2								U L 367	A	A	A	A	A	A	443	382	A	397	371	L				
3									A	A	387	404	433	419	416	A	A	A	A					
4								U L 382	U L 389	U L 388	437	418	420	410	461	A	402	369	U L 368	L				
5									U L 423	392	A	A	A	436	457	A	A	399	U L 362	L				
6								349	389	428	416	421	A	410	377	A	384	387	L 378					
7								L	A	A	A	455	A	A	A	A	A	A	A					
8								U L 374	A	L 361	438	426	447	A	405	406	397	395	376					
9								A	A	411	A	A	A	A	399	A	A	A	A					
10								U L 380	U L 374	397	435	429	447	444	443	386	386	389	369	L				
11								L	450	444	A	A	444	A	420	423	A	396	U L 386	L				
12								L 380	A	412	A	A	A	A	430	442	A	390	376	L				
13								L	374	A	A	454	425	422	422	A	385	360	A					
14								U L 438	A	A	A	A	415	A	A	422	A	A	A					
15								A	A	A	A	A	417	A	A	A	413	358	372					
16								U L 374	385	A	A	A	A	A	415	A	A	A	358					
17								400	A	A	400	A	423	A	396	419	383	402	380					
18								377	U L 384	452	424	435	A	A	A	A	372	A	A					
19								L	U L 394	399	426	A	A	A	453	426	379	A	A					
20									L 371	421	491	409	A	A	A	A	394	370	A	A				
21							L	U L 373	U L 389	U L 414	411	415	427	402	A	448	407	387	L 373					
22								L	A	A	A	A	A	403	415	403	A	A	A					
23								L	L 416	A	432	436	416	382	387	A	A	A	362	L				
24								L 378	A	A	A	411	416	431	430	U A 404	387	389	L 368					
25								L	U L 412	416	420	378	413	A	A	A	A	A	L 375	A				
26								A	429		U L 422	429	425	423	423	386	404	380	366					
27								L	401	413	424	A	A	A	A	A	A	A	A					
28								L	A	U L 401	432	409	A	A	A	A	A	393	A					
29									397	387	U L 418	427	415	416	412	405	402	A	A					
30								L	L 370	U L 393	A	429	431	420	413	A	A	U A 365	367					
31								L 389	384	U L 400	389	A	A	395	390	401	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								13	18	19	17	17	17	15	22	15	14	18	18					
MED								U L 378	L 389	411	424	426	423	419	418	406	390	389	370					
U Q								L 386	L 412	416	434	432	432	430	430	423	402	395	376					
L Q								U L 374	L 384	L 393	414	410	416	403	405	401	384	370	366					

JUL.2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.2021 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								294	256	282	A	A	564	376	330	312	300	282	274					
2								280	A	276	A	A	A	498	402	328	318	326	270	216				
3									E A 360	296	344	358	338	380	364	428	390	328	A					
4								272	282	U L 406	320	330	468	464	396	318	340	300	296	L 302				
5									242	354	300	292	484	466	382	314	A	328	292	248				
6								310	238	332	338	288	436	416	420	350	332	314	272					
7								248	A	A	A	500	420	E A 344	E A 344	A	322	E A 318	E A 352					
8								276	278	360	312	474	382	376	382	312	276	252	256					
9								A	266	434	E A 346	A	A	A	370	312	288	E A 394	302					
10								294	332	244	252	440	G	524	346	416	440	324	264	240				
11								236	302	336	414	454	374	386	338	300	A	304	268	264				
12								272	A	510	354	376	348	376	376	322	318	292	324	246				
13								226	282	256	344	264	482	726	440	352	318	284	270					
14								230	294	270	352	A	332	A	A	462	376	334	270					
15								222	A	A	348	294	474	394	288	516	382	350	310					
16								316	262	A	360	A	326	302	382	A	382	336	274					
17								256	244	390	400	A	422	346	366	378	330	312	282					
18								278	266	240	432	466	A	A	A	316	324	324	282					
19								226	336	364	398	314	392	338	310	332	346	340	318					
20									292	310	282	406	552	366	376	350	334	292	A	A				
21							310	288	252	260	368	456	354	264	A	410	328	300	250					
22								262	336	A	298	340	388	334	342	318	298	330	A					
23								238	230	A	316	390	394	338	346	332	322	296	272	256				
24								256	206	A	A	422	412	372	338	304	302	306	280					
25								244	228	344	392	494	422	A	A	A	304	288	252	216				
26								240	240		U L 478	370	366	330	316	306	296	280	286					
27								252	220	234	780	510	432	350	A	A	356	320	294					
28								230	260	298	276	G	464	A	374	330	350	312	278					
29									240	284	480	G	742	444	440	394	416	354	312					
30								246	294	336	346	314	424	452	378	372	340	318	254					
31								266	238	272	G	A	A	382	330	368	348	304	252					
	00	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	26	27	24	27	24	27	26	26	27	29	31	28	8				
MED							310	256	261	304	348	398	422	376	368	332	330	313	275	247				
U Q								278	294	357	400	470	474	444	382	378	353	328	295	260				
L Q								238	240	271	316	322	374	344	338	314	311	296	269	228				

JUL.2021 h'F2 (KM)

IONOSPHERIC DATA STATION Okinawa

JUL.2021 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	292	268	280	284	Q 228	234	230	A	A	204	A	A	188	178	172	198	A	204	234	E A 256	234	236	228	312
2	302	280	242	232	268	264	224	220	A	A	A	A	A	A	192	236	A	200	216	206	250	244	248	238
3	278	250	222	E A 290	238	206	212	236	A	A	212	214	194	180	214	A	A	A	A	262	222	200	258	258
4	292	286	252	244	218	244	204	214	178	172	164	176	194	194	174	E A 216	212	220	232	218	E A 244	220	228	270
5	284	276	278	280	256	E A 272	198	186	198	E A 226	A	A	A	184	190	A	A	200	184	240	218	244	232	260
6	266	268	246	248	268	236	216	210	184	190	198	196	A	220	254	A	210	212	E A 252	244	190	232	268	274
7	308	274	268	250	234	202	216	200	A	A	A	170	A	A	A	A	A	A	A	302	240	230	258	232
8	268	268	256	236	212	252	220	250	A	222	186	188	186	A	200	182	218	208	208	202	234	242	212	278
9	294	264	258	226	232	A	238	A	A	198	A	A	A	A	200	A	A	A	A	E A 304	232	200	E A 322	320
10	282	302	252	E A 324	A	214	E A 222	E A 246	216	202	182	190	174	174	196	224	212	212	206	230	214	204	E A 316	E A 330
11	E A 306	290	320	A	276	222	212	196	196	188	A	E A 278	194	A	204	192	A	202	206	228	224	204	238	262
12	276	266	292	286	238	216	214	E A 226	A	188	E A 276	A	A	A	194	166	A	220	218	218	216	200	E A 232	266
13	252	268	252	328	336	256	248	A	220	A	E A 230	178	206	216	184	E A 246	208	254	A	272	218	186	226	A
14	A	A	282	248	292	280	190	198	A	A	A	A	212	A	A	186	A	A	A	242	240	E A 248	E A 236	300
15	312	262	E A 270	A	310	300	240	A	A	A	A	A	202	A	A	A	192	198	218	252	228	214	218	A
16	A	212	E A 230	296	258	246	232	244	230	A	A	A	A	A	188	A	A	A	E A 242	250	206	E A 236	216	322
17	312	E A 312	236	216	222	A	228	220	A	A	220	A	200	A	214	198	234	208	188	242	200	206	222	250
18	286	278	234	270	260	246	214	198	H 192	162	202	180	A	A	A	A	248	A	A	254	204	210	248	298
19	270	264	266	274	250	220	204	196	190	196	184	A	A	A	166	190	212	A	A	248	222	204	194	270
20	276	270	222	226	228	E A 268	218	214	254	168	154	224	A	A	A	A	192	202	A	A	214	202	E A 292	286
21	274	282	278	254	240	260	236	200	182	178	178	178	172	214	A	184	222	206	210	E A 270	202	216	284	256
22	270	290	276	254	274	240	230	216	E A 258	A	A	A	A	224	190	226	A	A	A	254	212	E A 324	E A 328	E A 318
23	E A 324	300	280	236	204	264	222	210	204	A	180	176	172	250	228	A	A	A	212	218	220	196	E A 248	E A 322
24	E A 306	A	284	E A 272	232	E A 290	230	224	A	A	A	208	180	192	192	E A 222	220	204	216	256	210	188	262	278
25	312	286	266	252	268	282	218	208	184	174	194	218	206	A	A	A	A	A	A 220	A	218	226	E A 318	238
26	238	312	310	288	Q 268	258	206	A	176	172	178	178	174	206	202	224	214	200	238	240	200	200	222	278
27	Q 286	268	254	244	256	250	218	210	208	192	216	A	A	A	A	A	A	A	A	234	E A 302	248	236	268
28	270	262	256	248	208	228	220	192	A	204	176	180	A	A	A	A	A	198	A	258	266	208	204	256
29	260	238	232	240	312	300	236	206	200	184	168	192	202	222	206	208	216	A	A	252	E A 284	276	E A 284	244
30	260	270	240	230	286	240	228	232	232	196	A	184	174	200	204	A	A	E A 260	212	222	198	250	E A 290	E A 338
31	260	228	264	288	248	232	E A 262	206	190	202	188	A	A	210	244	210	A	A	A	236	212	210	E A 278	E A 234
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	31	29	30	29	31	26	19	20	19	18	17	15	22	17	14	18	18	29	31	31	31	29
MED	279	269	257	250	253	243	219	210	197	190	184	184	194	206	198	200	213	204	214	242	217	211	U 237	266
U Q	304	286	278	285	268	266	230	224	220	202	212	208	202	220	206	224	220	212	232	256	234	242	E A 284	306
L Q	269	264	242	238	232	230	214	200	184	176	178	178	174	184	190	188	210	200	208	229	210	202	226	256

JUL.2021 h'F (KM)

IONOSPHERIC DATA STATION Okinawa

JUL.2021 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	A	A 104		A	A	A	A	A	102	A	A	A	A	A				
2						B	A 102	102	102	102	102		A 100		A	A	A	A	A	A				
3						A	A	A	A	A	A	A	104	104	104	104	102	102	A	A				
4						B	A	A	A	A	A	A	A	A	102	102	102	A	A	A				
5						A	A	A	A 106	102	102	102	102	102	102	102	102	106	A	A				
6						B	A 104		A	A	A 102		A	A	A	A	A	108	A	A				
7						B	A 106	104		A	A 102		A	102	100	100	102	104	A					
8						B	A 104	102		A	A	A	A	A	A	A	A	A	102	A				
9							A 102	102		A	A	A	A	A	A	A	A	A	A	A				
10							A	A	A	A	A	A	A	A	A	A	A	104	106	A				
11							A	118	102	102	106	106	106	104	102	102	102	106	106	A				
12							A	A 104	104		A	A	A	A	A	A	A	A	A	A				
13							A	106	104	102		A	A	102		A	102	102	104	A				
14							A	104	104	102	102	102		A 102	102		A	A	A	A				
15							A	104	102	102	102		A	A	A	A	A		102	100				
16							A	104	104	104	104	104	104	102	102	102	102	102	102	A				
17							A	A	A	A	A	A	A	A	A	A	A	A	102	A				
18							A	A 106	104	102	102	102	102	102	102		A	A	A	A				
19							B	A 102	102		A	A	102	102	102	102	104	104	104	A				
20							A	A	A	A	A	104	102	102	102	102	102	100	102	A				
21							A	A	A	A	102	A	102	102	102	102	102	102	102	A				
22							B	A 100	102		A	A	A	A	A	100	A	102	100	A				
23							A	A	A	A	A	A 108		A	104	102	102	100	A	A				
24							A 100		A	102	102	A	A	102	A	A	A	A	A	A				
25							A 102		A	A	A	A	A	A	A	A	A	A	A	A				
26							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
27							A 102	102	102		A	A	102	102	104	104	102	A	A	A				
28							B 100	102	100		A	A	A	A	A	A	A	A	A	A				
29							A	A	A	A	A	A	A	A	A	A	102	108	104	A				
30							A 106	104	102	102	102		102	102	102	102	100	102	102	A				
31							A	A	A	A	A	A	A	A	A	104	104	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								15	17	15	10	10	11	15	15	15	15	16	11					
MED								104	102	102	102	102	102	102	102	102	102	103	102					
U Q								106	104	104	102	104	104	102	102	102	102	105	104					
L Q								102	102	102	102	102	102	102	102	102	102	102	102					

JUL.2021 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

JUL.2021 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	84	104	98	104	104	90	112	110	108	104	98	98	102	100	G	94	92	90	90	88	86	86	B	106
2	100	96	96	86	92	92	116	116	106	102	100	98	98	100	100	96	94	92	108	88	86	84	B	B
3	96	96	94	98	98	96	94	94	94	96	120	110	G	138	112	110	104	100	98	94	92	90	90	90
4	86	90	96	136	98	96	96	92	94	94	92	96	98	102	152	122	116	106	104	92	88	88	94	82
5	84	84	B	94	94	94	92	96	128	112	108	108	110	154	G	112	106	110	102	92	84	84	84	104
6	86	86	102	82	98	B	96	126	122	140	132	156	100	100	146	94	92	112	112	96	94	126	140	114
7	106	104	100	98	B	104	100	170	104	100	94	100	140	114	114	108	114	112	108	96	104	104	108	106
8	104	108	100	100	B	B	116	106	104	98	98	94	98	98	100	100	148	92	126	116	110	98	100	84
9	108	110	100	104	104	96	102	102	100	104	100	94	94	98	106	94	96	92	90	90	86	90	86	84
10	82	118	106	98	98	98	94	94	94	94	92	94	96	96	148	136	126	94	106	88	90	100	98	100
11	96	100	98	96	B	94	94	120	106	100	120	112	122	114	110	104	108	114	130	104	96	96	94	98
12	86	84	84	88	B	106	104	100	98	98	96	98	98	100	100	98	96	94	94	96	86	84	86	120
13	100	100	102	92	B	B	126	112	106	110	112	98	128	124	154	114	122	120	106	102	100	100	104	96
14	96	96	98	98	100	114	106	106	106	102	106	100	104	110	104	104	100	98	94	98	98	98	96	96
15	92	108	98	96	92	96	118	108	100	104	100	96	94	94	96	94	96	120	104	106	106	B	106	100
16	98	98	98	98	96	96	116	116	118	102	106	98	98	104	102	102	106	102	98	92	92	92	84	82
17	100	98	98	96	94	92	102	114	114	96	100	94	104	94	98	108	100	96	112	98	92	88	94	88
18	108	114	82	80	B	102	122	136	136	108	140	146	100	94	94	96	106	134	112	90	88	90	88	86
19	84	84	108	112	110	106	B	124	106	100	102	108	104	108	G	134	160	110	104	96	92	94	94	94
20	96	92	90	90	96	92	92	92	170	114	112	106	104	104	104	104	114	104	102	96	102	100	100	90
21	88	94	110	106	98	104	104	106	120	110	112	108	108	114	110	110	110	100	102	96	96	92	88	90
22	88	84	104	98	108	106	108	102	102	100	96	98	96	96	102	102	100	112	102	94	92	92	88	90
23	88	106	96	B	100	B	98	102	104	98	96	98	98	140	132	110	106	98	100	94	86	86	86	106
24	94	124	110	92	106	96	106	102	98	102	96	100	108	102	98	94	92	116	88	88	88	88	98	88
25	96	136	B	100	96	100	116	112	106	102	98	96	96	96	94	94	108	108	90	106	100	90	100	86
26	86	100	108	128	98	96	98	98	98	98	100	96	98	96	112	92	90	112	98	90	88	88	96	94
27	94	B	B	B	B	B	134	146	120	118	120	166	146	130	116	96	98	96	92	88	88	86	86	90
28	86	86	88	B	B	B	B	98	96	98	130	140	100	94	120	92	88	90	88	86	84	82	84	114
29	B	B	100	96	94	B	96	98	98	98	96	102	100	104	102	138	124	112	108	104	98	104	106	100
30	100	98	98	98	98	98	134	112	116	116	110	146	126	118	126	114	112	108	110	102	108	104	94	106
31	110	102	106	102	98	104	102	98	98	96	96	94	92	98	98	116	112	104	102	96	86	88	96	100
	00	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	28	28	23	24	29	31	31	31	31	31	30	31	28	31	31	31	31	31	31	30	29	30
MED	95	98	98	98	98	96	104	106	106	102	100	98	100	102	105	104	106	104	102	96	92	90	94	95
U Q	100	107	103	101	100	104	116	116	116	108	112	108	108	114	118	112	114	112	108	98	98	98	100	104
L Q	86	91	96	93	96	95	96	98	98	98	96	96	98	96	100	94	96	96	94	90	86	88	87	88

IONOSPHERIC DATA STATION Okinawa

JUL. 2021 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	F1	F1	F4	F2	F1	L3	C1	CL43	C2	C1	L4	L4	C1	L1		L2	L4	L2	L3	L4	F3	F1		F6
2	F4	F4	F3	F3	F2	L1	C1	C2	C6	C4	C5	L6	LQ31	L2	CH11	L2	L4	L2	CL31	L2	F1	F1		
3	F2	F3	F4	F5	F5	L5	L3	LH31	L5	L3	CL11	C1		H1	C1	C2	C3	C5	L6	L4	F4	F2	F3	F2
4	F3	F1	F1	F1	F1	L2	L2	L3	L3	L3	L2	L1	L2	C1	H1	C1	CL21	CL12	CL21	L3	F6	F4	F2	F2
5	F1	F1		F1	F3	L3	L3	LH21	CL11	C2	C3	C2	C2	H1		C4	C2	C1	C2	L1	F2	F3	F1	FF21
6	F1	F1	FF11	F1	F1		LH21	C3	C2	HL11	HL11	H1	C2	LH11	HC11	L5	LC21	C2	CL44	C7	F2	FF11	F2	F2
7	F3	F4	F2	F1		C1	L3	H1	C4	C4	L3	C2	HC21	C2	C3	C4	C2	C6	CL62	LQ31	FF24	FF12	FF22	FF12
8	F2	F4	F2	F1			C1	C4	C5	L4	L2	L2	L1	L2	C1	C1	HL11	L2	C1	C2	F1	F2	F5	F1
9	F3	F2	F3	F2	FQ21	FQ41	C7	C5	C3	C2	L3	L5	L5	L3	C1	L7	L4	L4	L7	LQ61	F4	F3	F1	F1
10	F1	F1	F1	F5	F3	F1	L4	L4	L2	L3	L3	LC21	L2	L2	HL11	HL11	CL12	LC21	C3	L3	F2	F3	F7	F9
11	F3	F8	F5	F5		F3	LC11	CL22	C2	C3	C1	C2	C1	C2	C2	C2	C3	C2	H2	C2	F3	F3	F3	F1
12	F1	F1	F1	F1		F1	C2	C5	L7	L3	L4	L3	L2	L2	L2	L2	L7	L3	LQ31	LQ11	F3	F3	F2	FF13
13	F2	F4	F2	FQ21			C3	C3	C2	C3	CL21	LC11	CL11	C1	H1	C2	C2	C1	CL42	CL52	F5	F2	F3	F4
14	F6	F4	F3	F3	FQ21	F1	C2	C2	C6	C4	C3	C5	C2	C3	C3	C2	LQ31	L5	L4	L3	F6	F3	F2	F2
15	F2	F1	F2	FF24	F2	F2	C2	C4	C5	C5	C5	L4	L2	L3	L3	L3	LH21	C1	C2	C4	F1		F1	F6
16	FQ41	F3	F3	F2	F4	F2	C4	C2	C2	C4	C3	L6	L2	C3	C3	C6	C4	C4	L3	L3	F3	F3	F1	F3
17	F1	F5	F2	F1	F3	F2	CH21	CL21	C2	L3	LH31	L4	C1	L3	L1	C1	H1	L2	C1	L5	F3	F3	F1	F1
18	F1	F1	F1	F1		F1	C1	H1	H1	C1	HC11	HC11	C2	L4	L6	L3	CH21	HL23	CL43	L8	F6	F4	F4	F5
19	F1	F1	F1	F1	F1	F1		C1	C3	C2	C2	CL22	C2	C2		H1	H1	C4	C3	L6	F3	F3	F2	F3
20	F2	F2	F3	F4	F2	F5	L5	L4	HL12	C1	C1	C2	C2	C3	C3	C3	C1	C2	C6	C7	FF34	FF23	FF33	F3
21	F2	F3	F2	F2	F2	F2	C2	C2	C1	C1	C1	C1	C1	C1	C2	C1	C2	C3	C2	L7	F2	F4	F4	FQ31
22	FQ21	F2	F1	F4	F3	F1	C1	C4	C4	C5	L4	L3	L3	L2	C1	C1	L3	C3	C5	L4	F4	F5	F3	F2
23	F2	FF11	F2		F1		L1	C3	C3	L3	L1	L1	L1	H1	H1	C2	C3	L2	L1	LC11	F2	F5	F5	FF44
24	F8	FF13	FF23	F3	FQ21	F4	C3	C5	L4	C5	L6	C1	C1	C1	L1	L2	L2	CL11	L4	L6	F6	F3	F3	F1
25	F1	F1		F1	F2	F2	C1	C1	C2	C2	L2	L2	L4	L8	L5	L5	CL32	CL43	L5	CL12	F2	F6	FF25	F5
26	F7	F2	FF12	F1	F1	F3	L4	L3	L3	L2	C2	L1	L1	L1	CL12	L3	L4	CL23	L3	L3	F4	F3	F2	F3
27	F2						H3	H1	C2	C1	CL22	HL22	HC11	HC21	CL22	L8	L2	L6	L6	L9	F6	F5	F6	F4
28	F1	F2	F2					LC21	L4	L1	HL11	HL11	CH31	L6	CL22	LQ41	LQ51	L1	L7	L6	F5	F3	F1	F1
29			F1	F2	F3		L3	L3	L3	L2	L3	C1	C1	CH11	CH11	HL11	C1	C2	CL41	CL83	F8	F4	F5	F2
30	F2	F2	F2	F3	F3	F3	H1	C4	C2	C2	C2	H1	C1	C1	C1	C1	C2	C2	C2	C2	FF22	FF21	F5	F5
31	FF32	F2	F1	F3	F5	F1	C3	L3	L2	L2	L2	L6	L7	L1	LC11	C1	C2	CL23	CL62	CL24	F2	F3	F3	F3
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUL. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

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

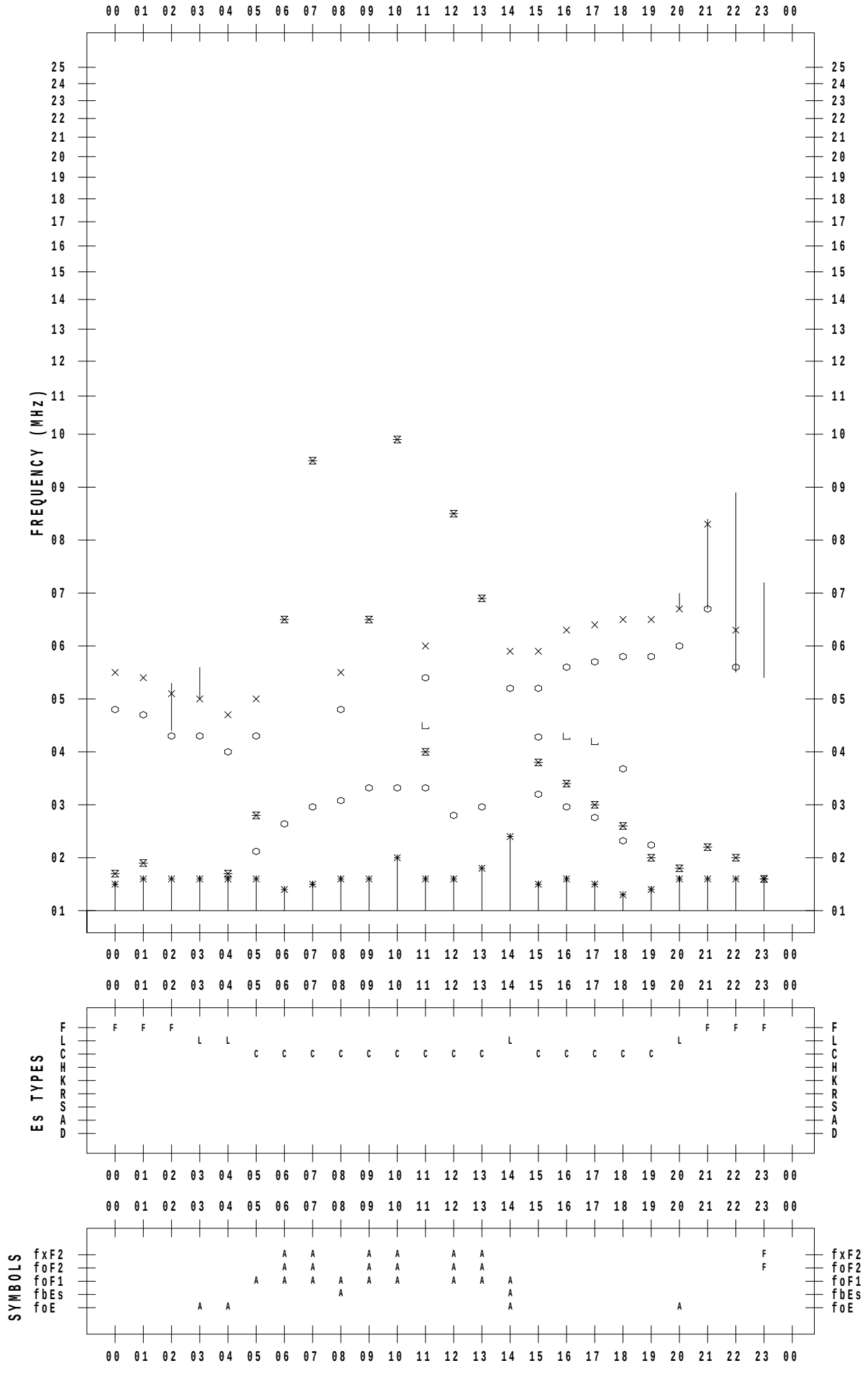
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 1

135 °E MEAN TIME



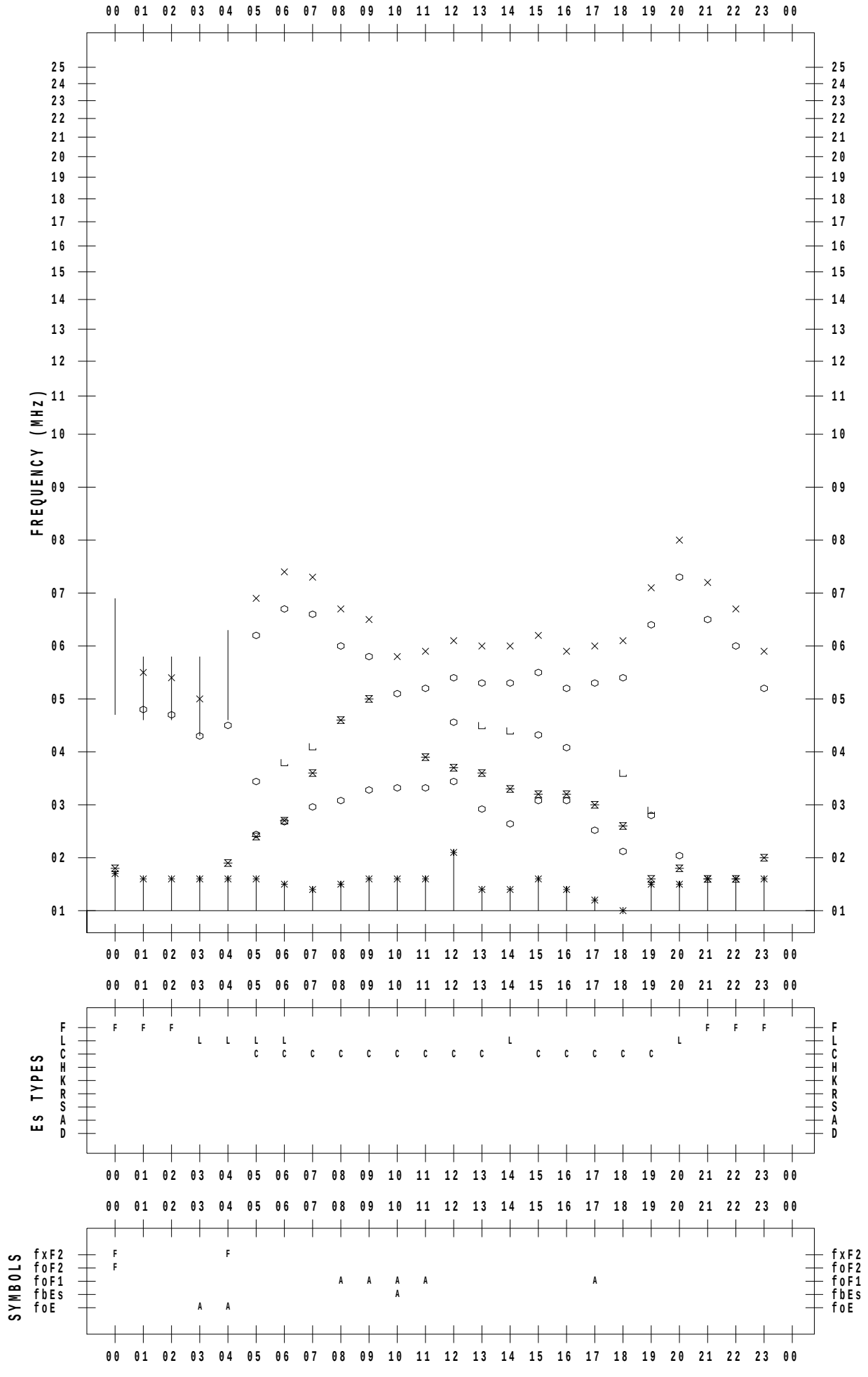
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 2

135 °E MEAN TIME



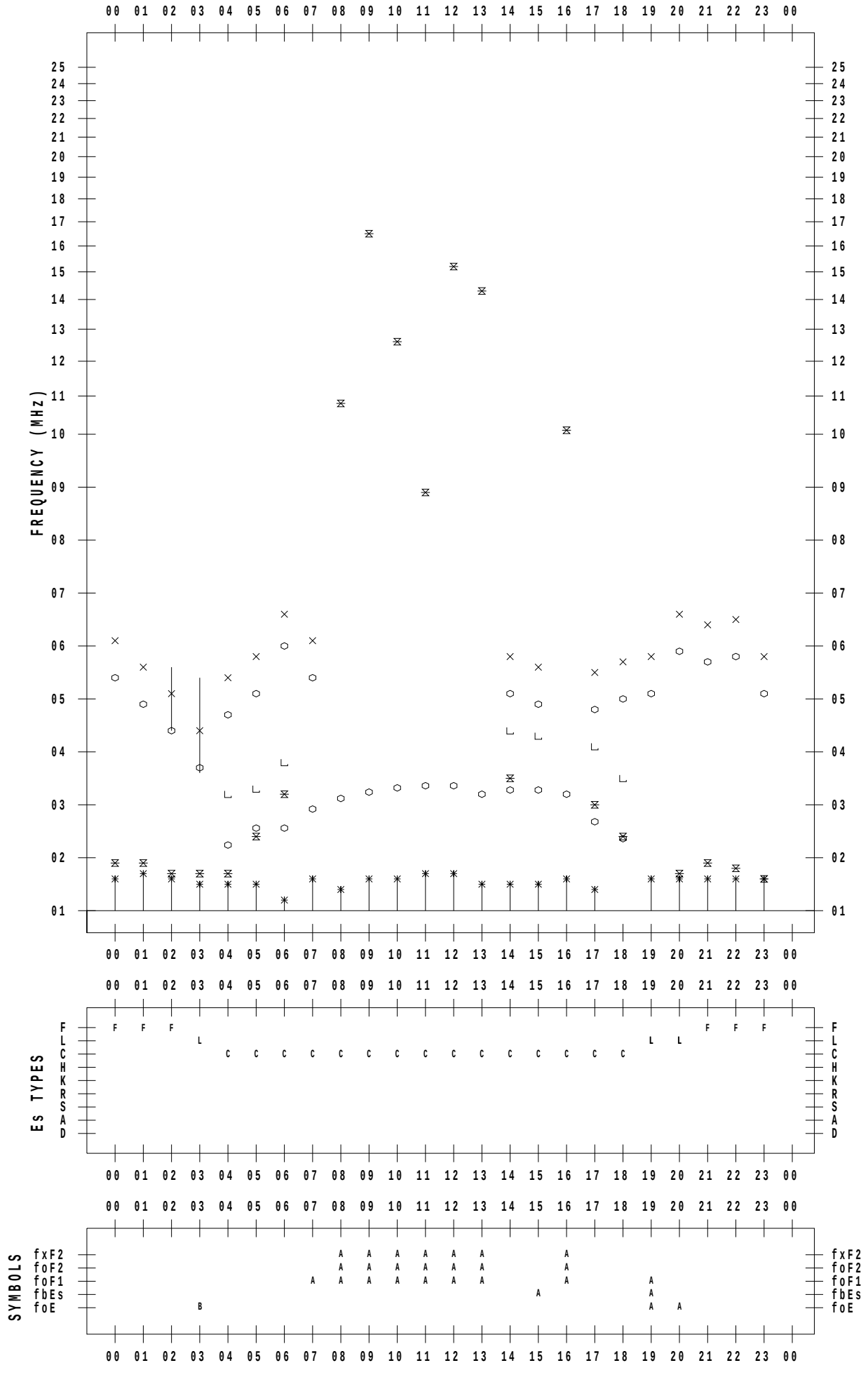
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 3

135 °E MEAN TIME



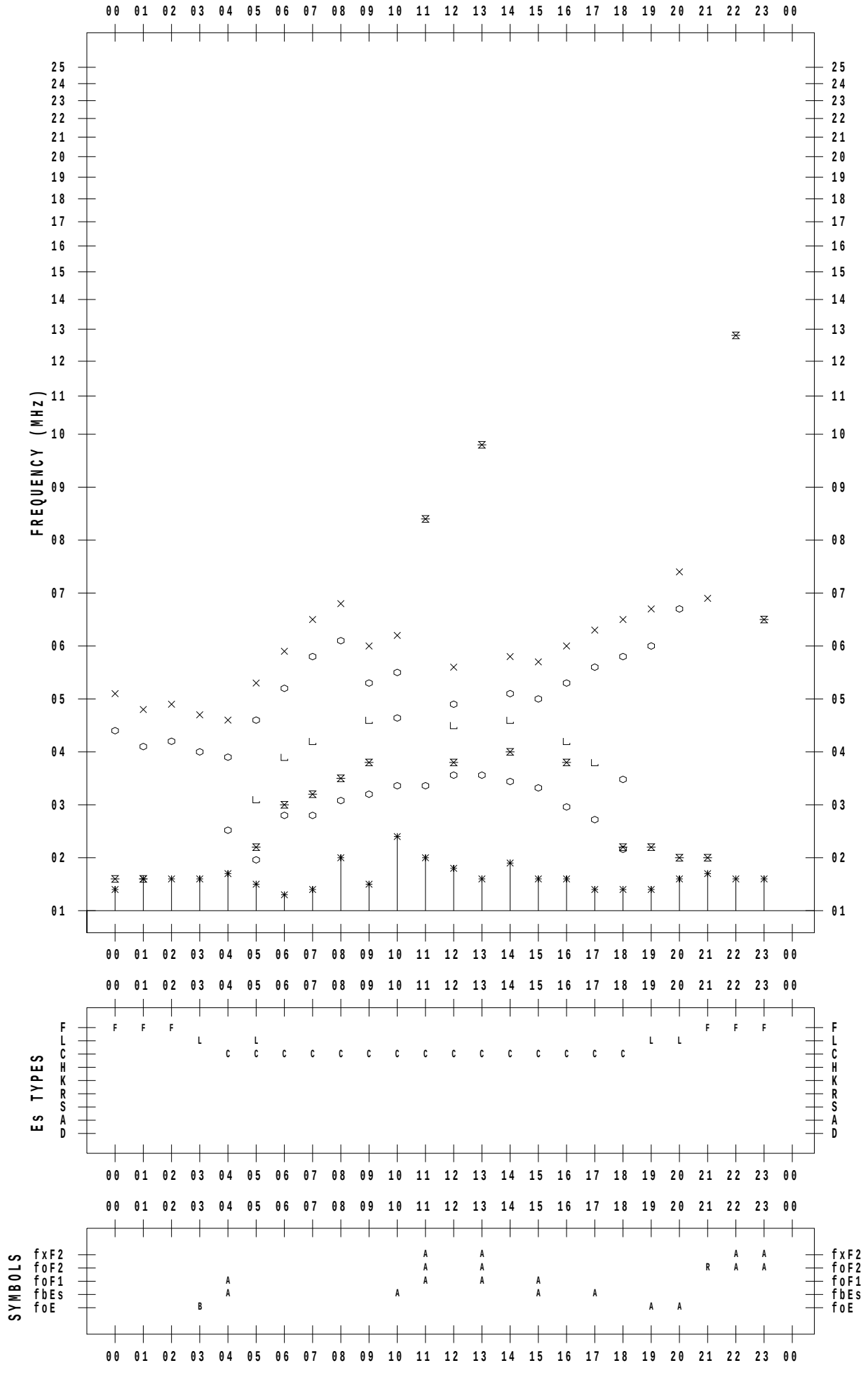
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 4

135 °E MEAN TIME



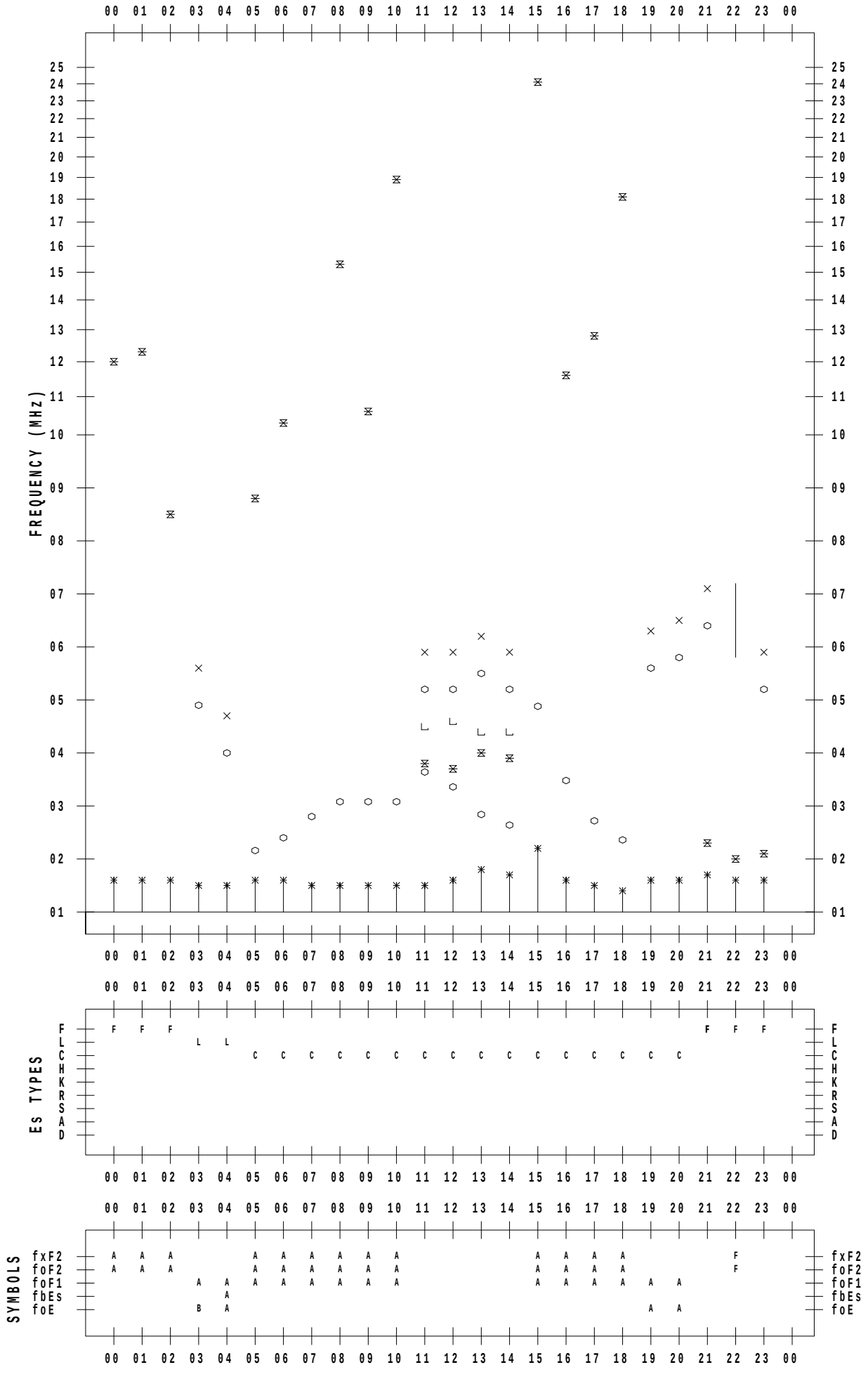
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 5

135 °E MEAN TIME



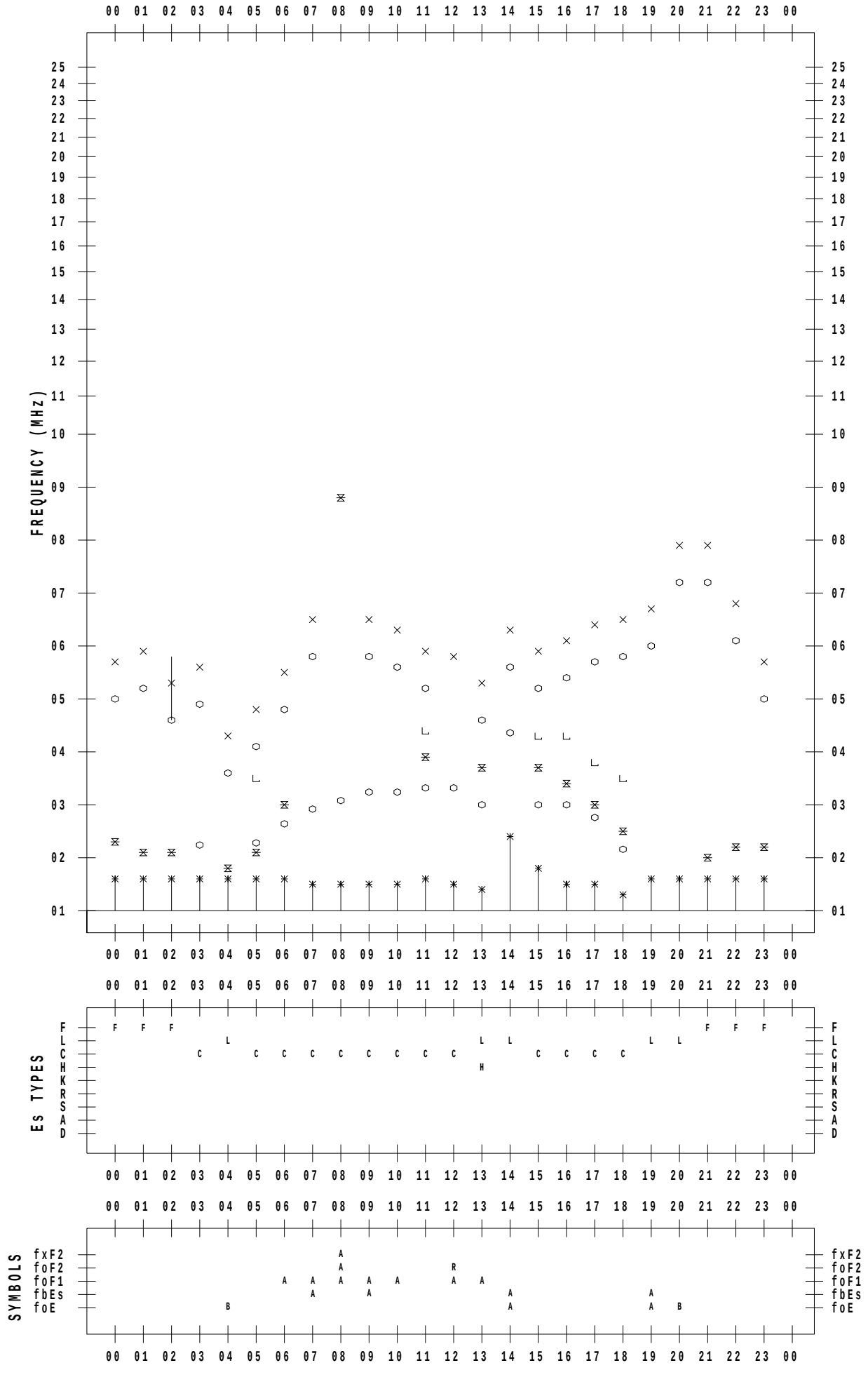
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 6

135 °E MEAN TIME



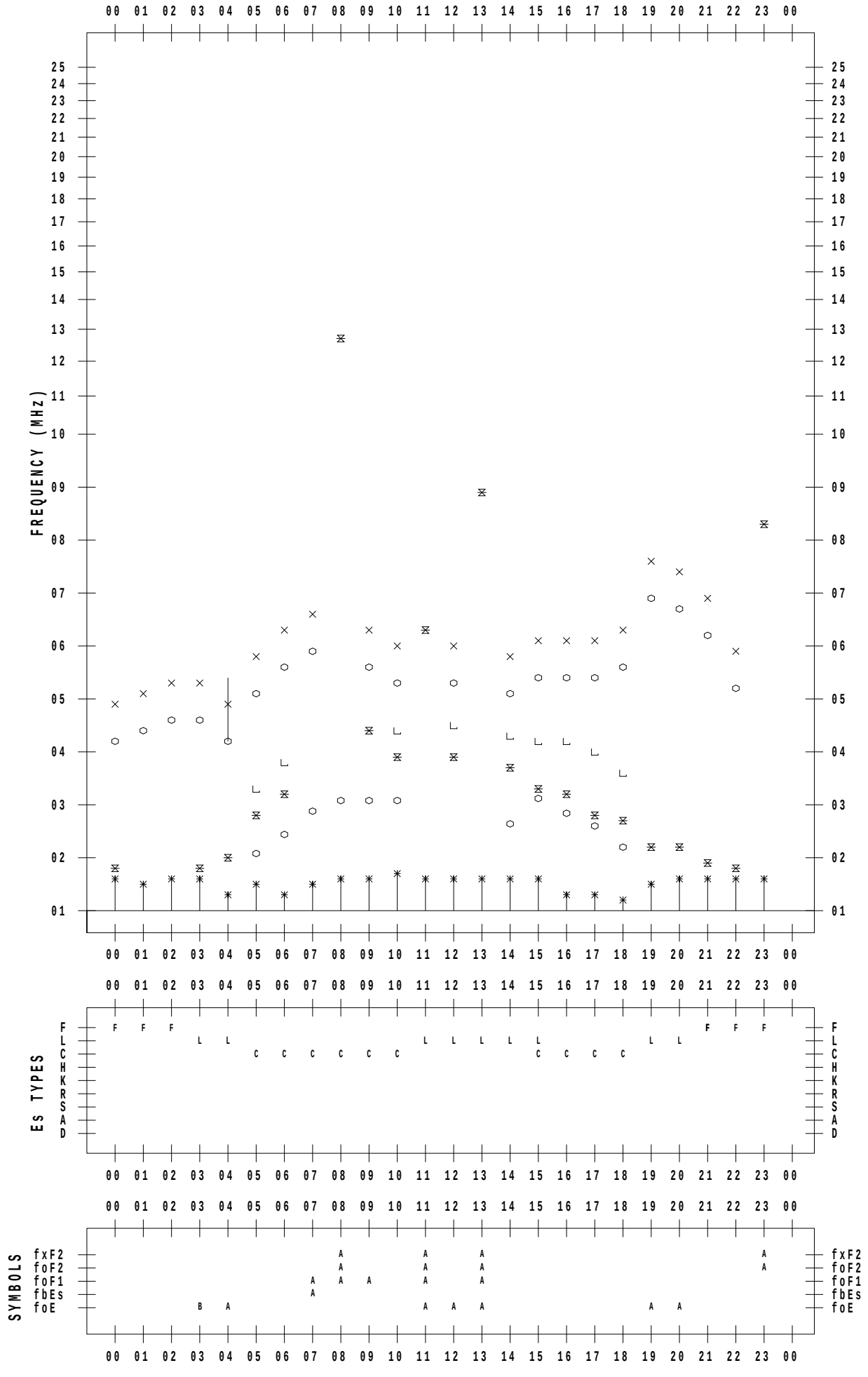
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 7

135 °E MEAN TIME



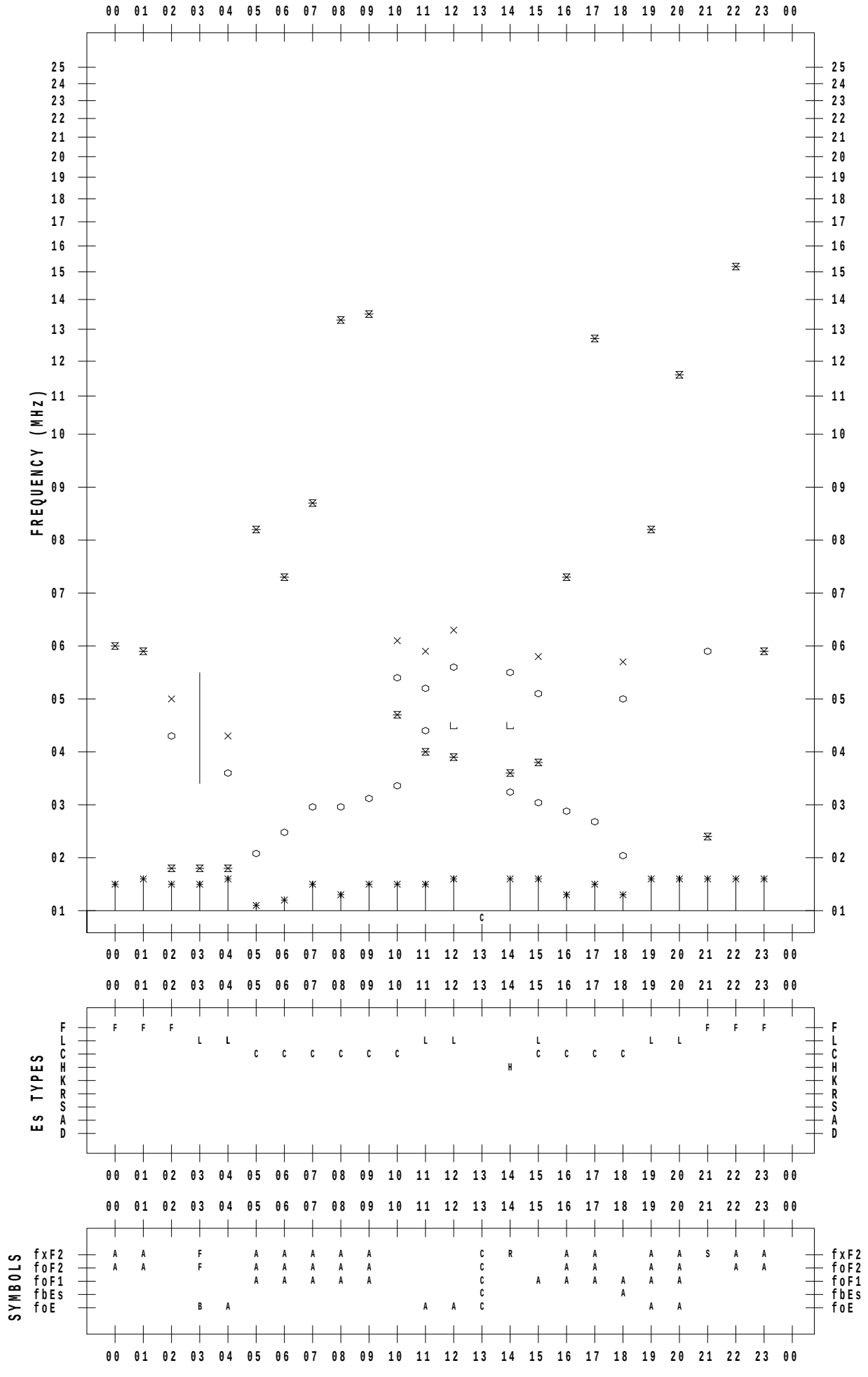
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 8

135 °E MEAN TIME



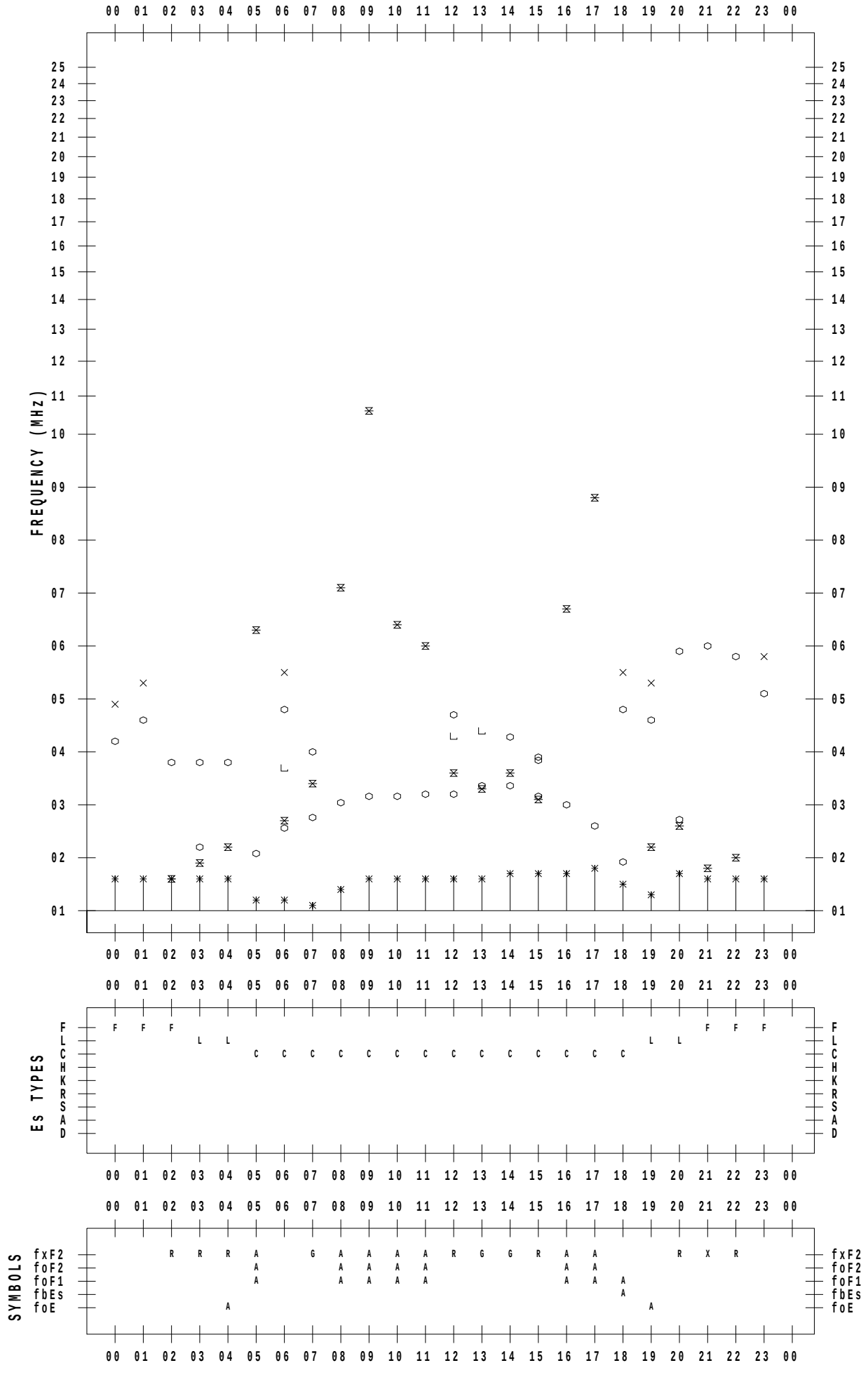
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/ 9

135 °E MEAN TIME



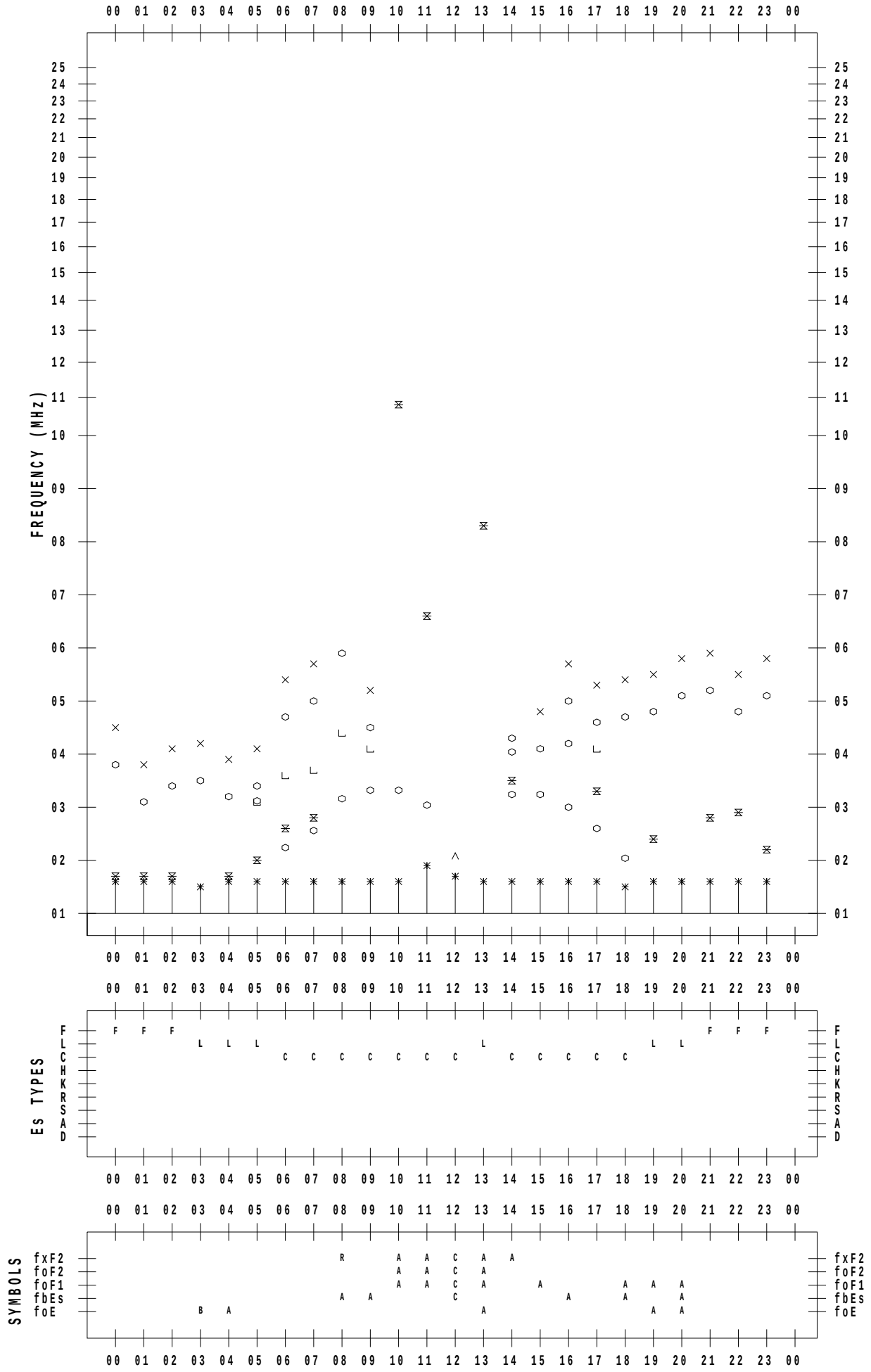
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/10

135 °E MEAN TIME



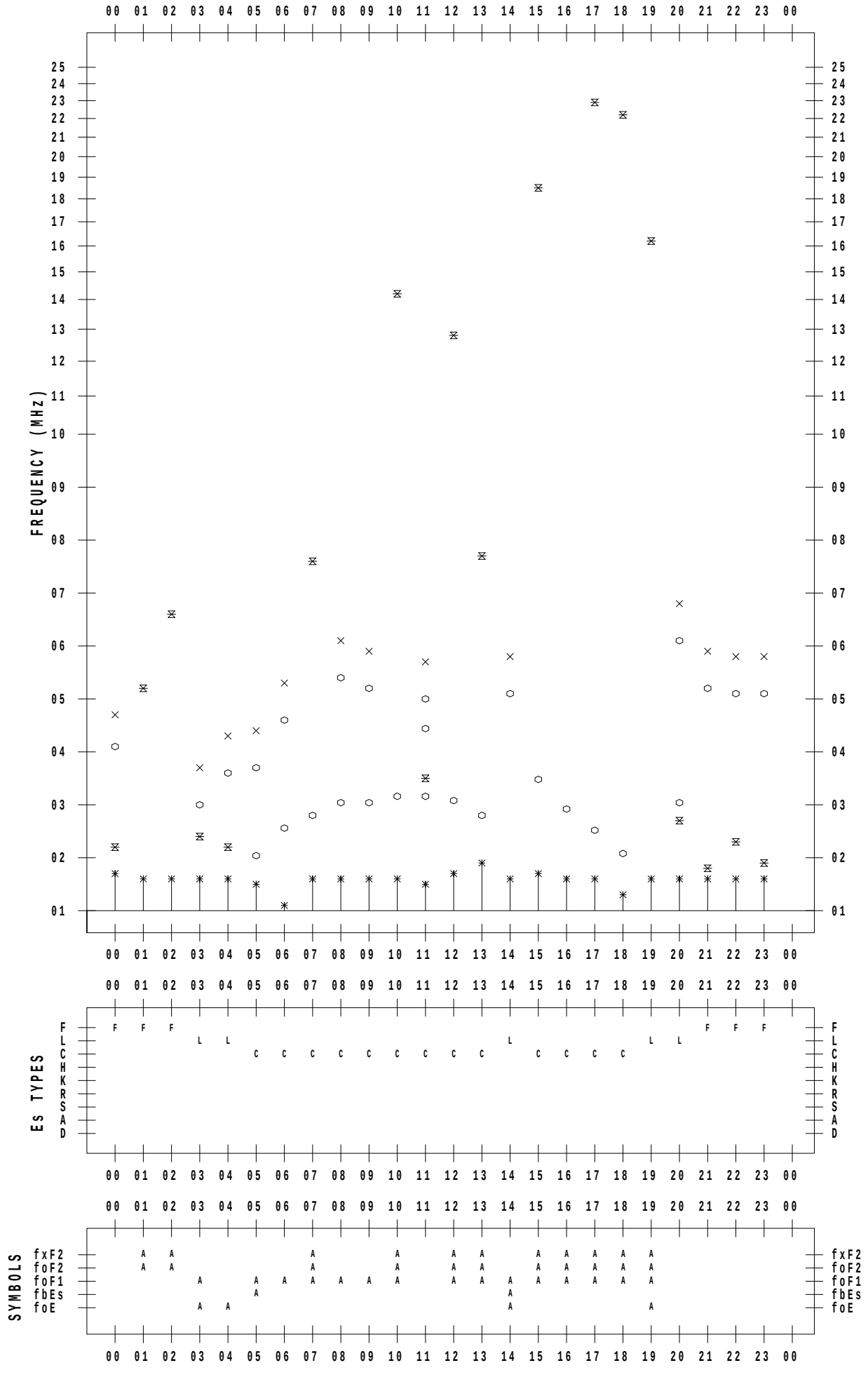
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/11

135 °E MEAN TIME



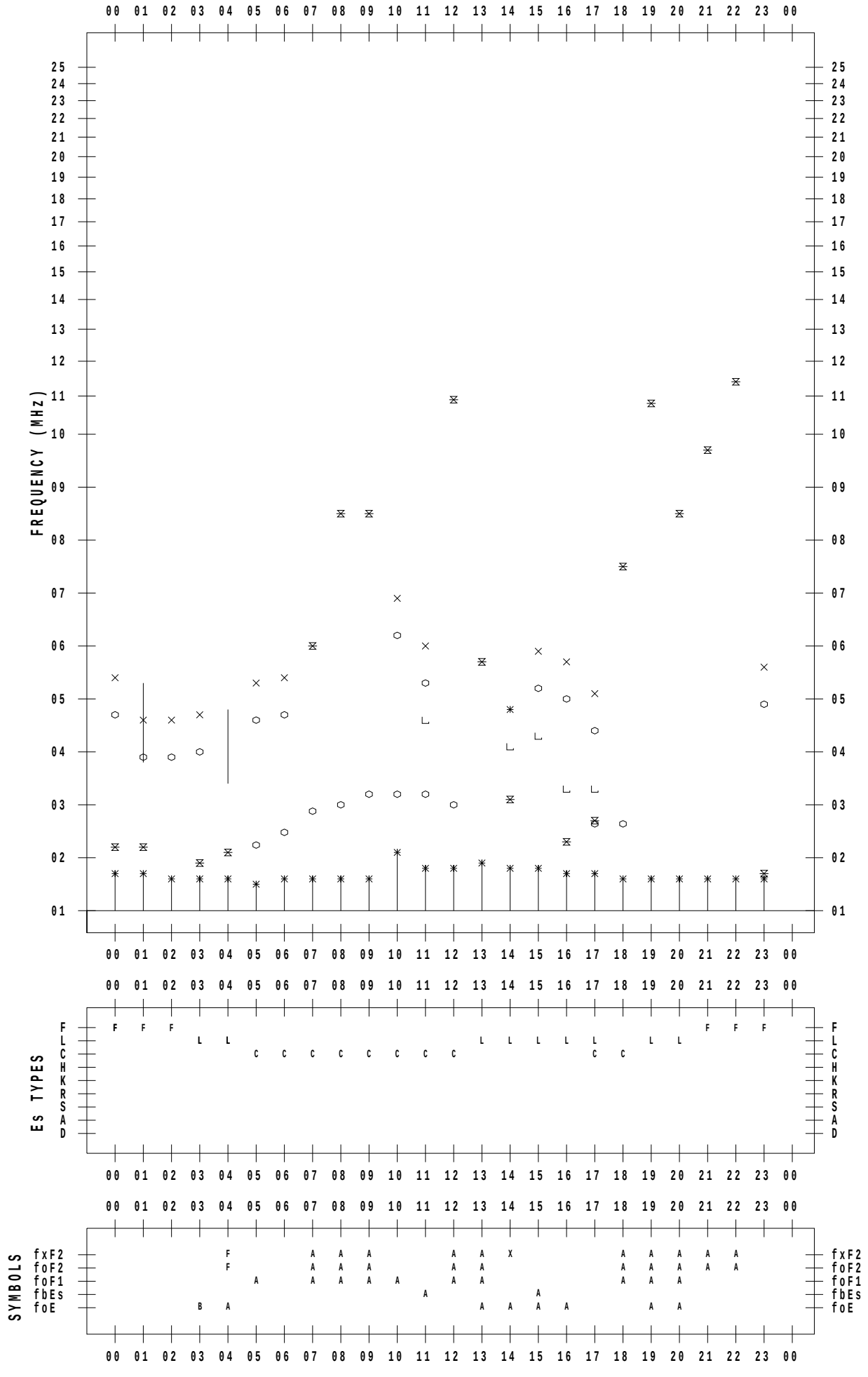
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/12

135 °E MEAN TIME



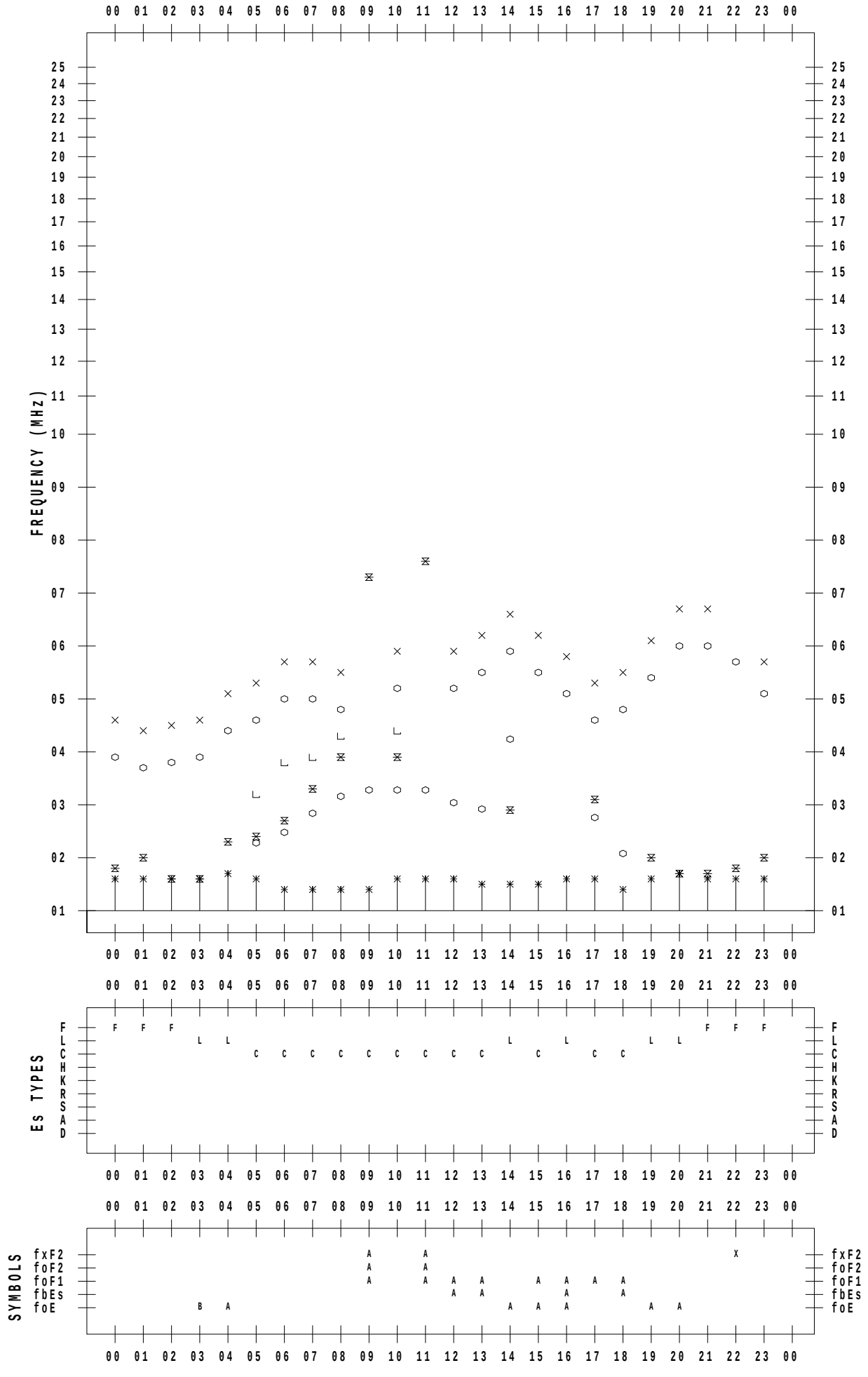
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/13

135 °E MEAN TIME



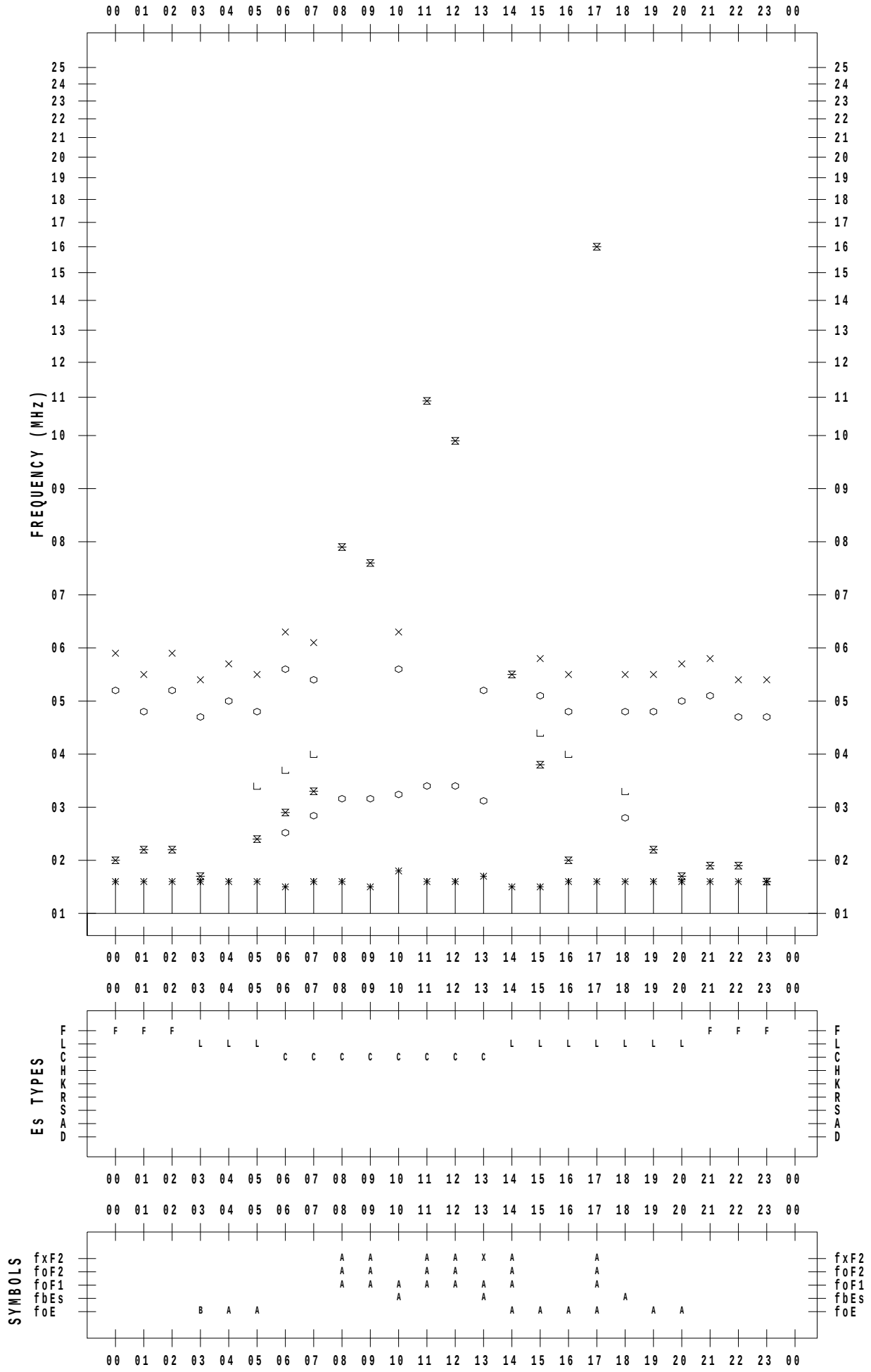
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/14

135 °E MEAN TIME



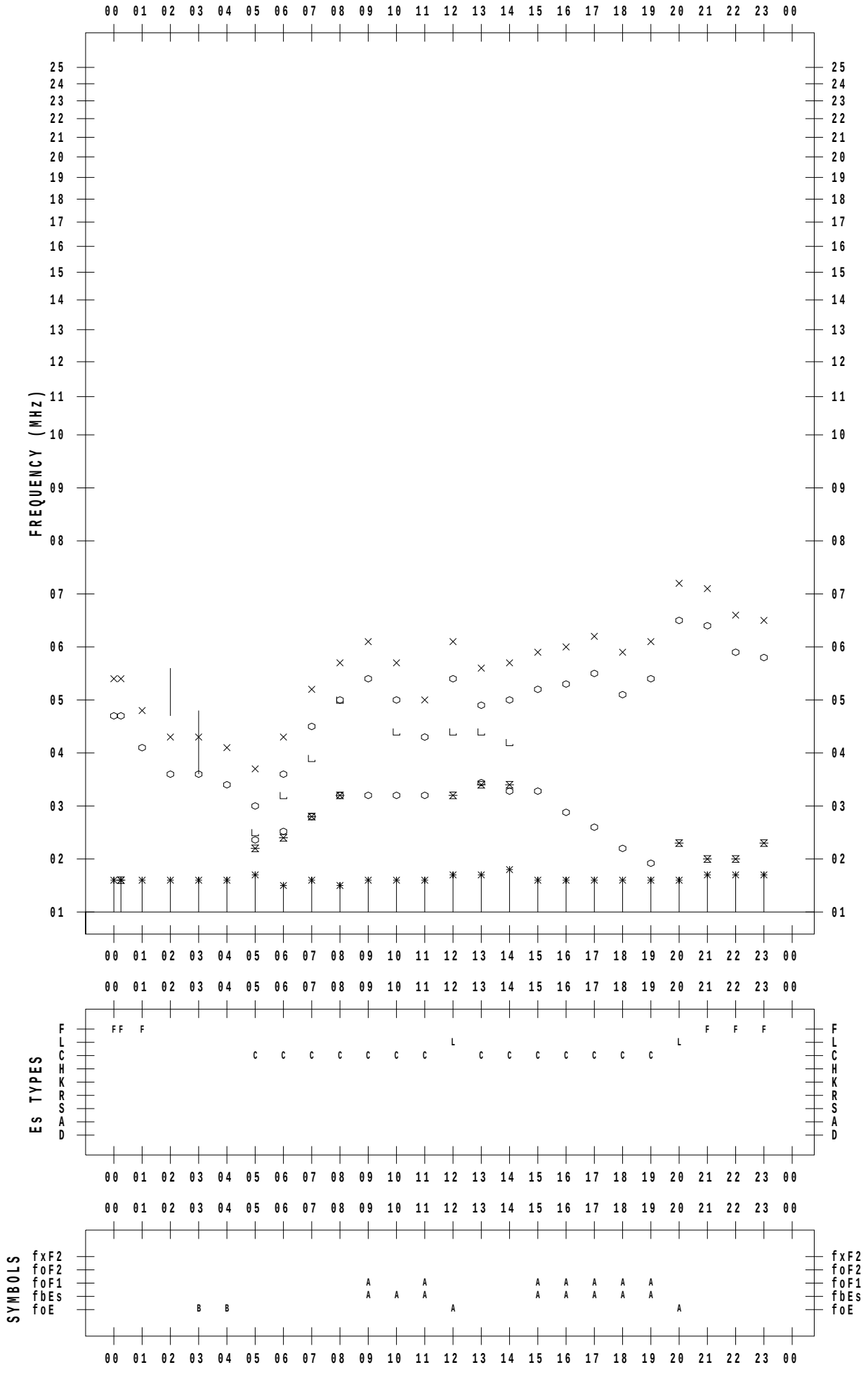
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/15

135 °E MEAN TIME



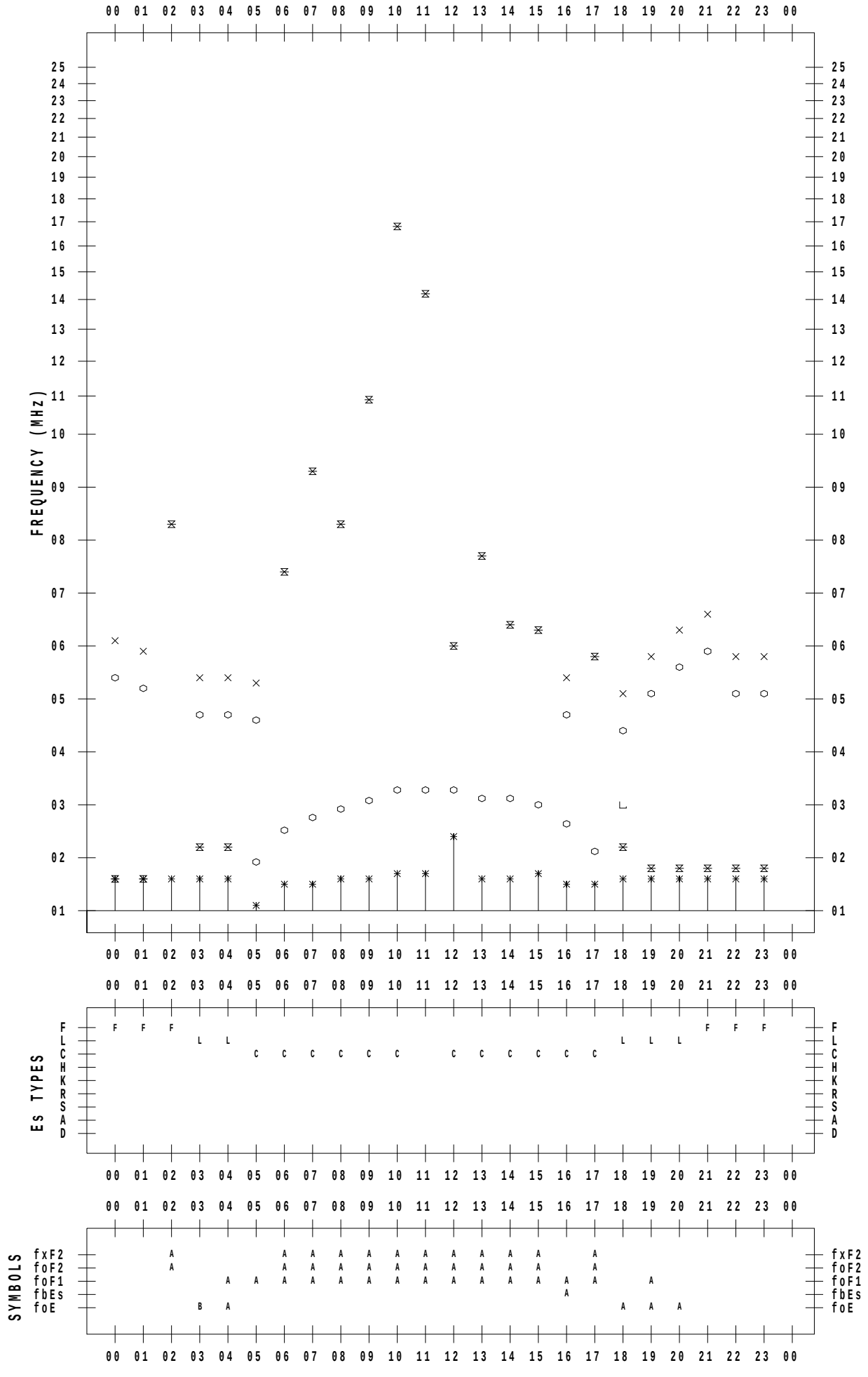
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/16

135 °E MEAN TIME



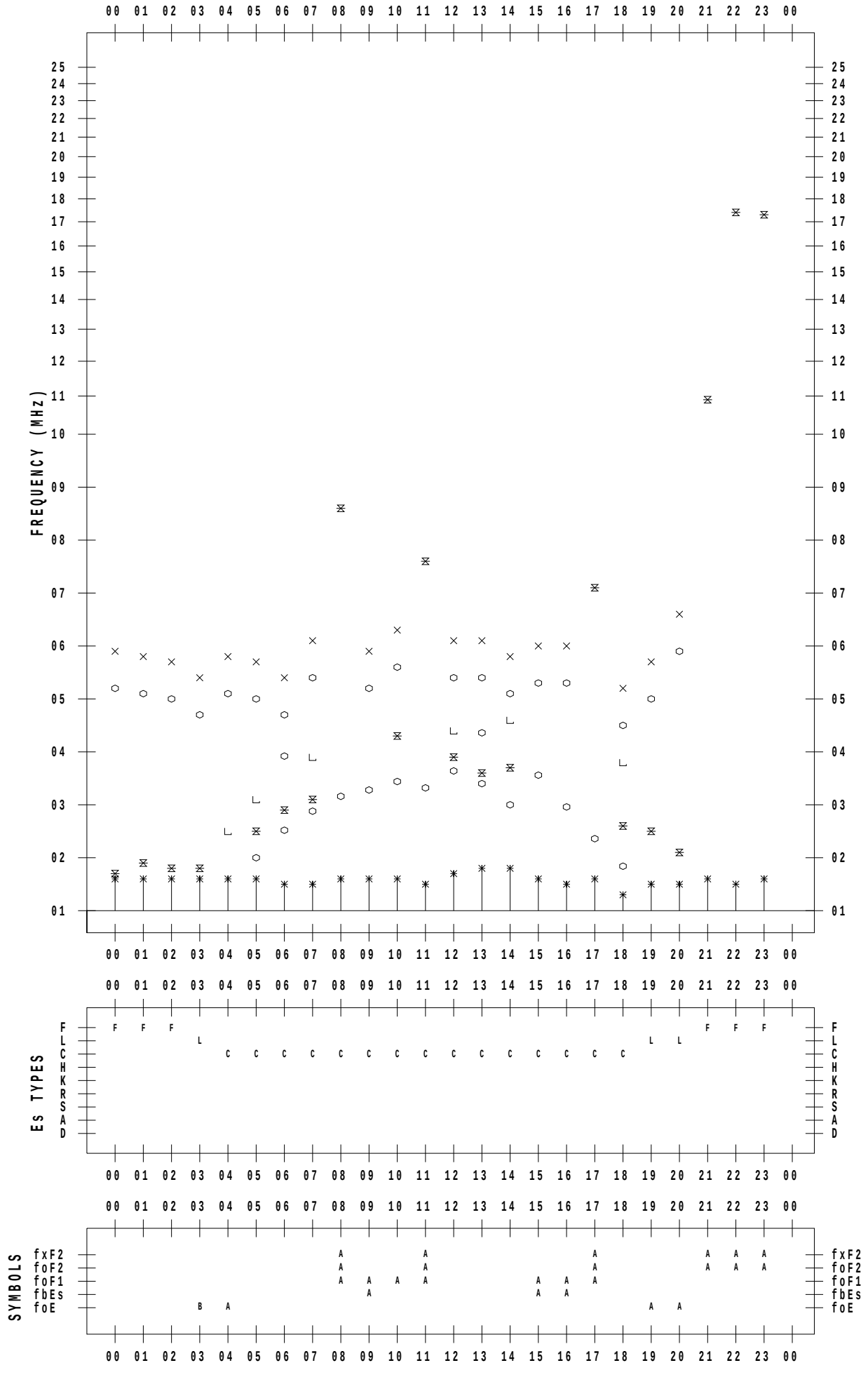
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/17

135 °E MEAN TIME



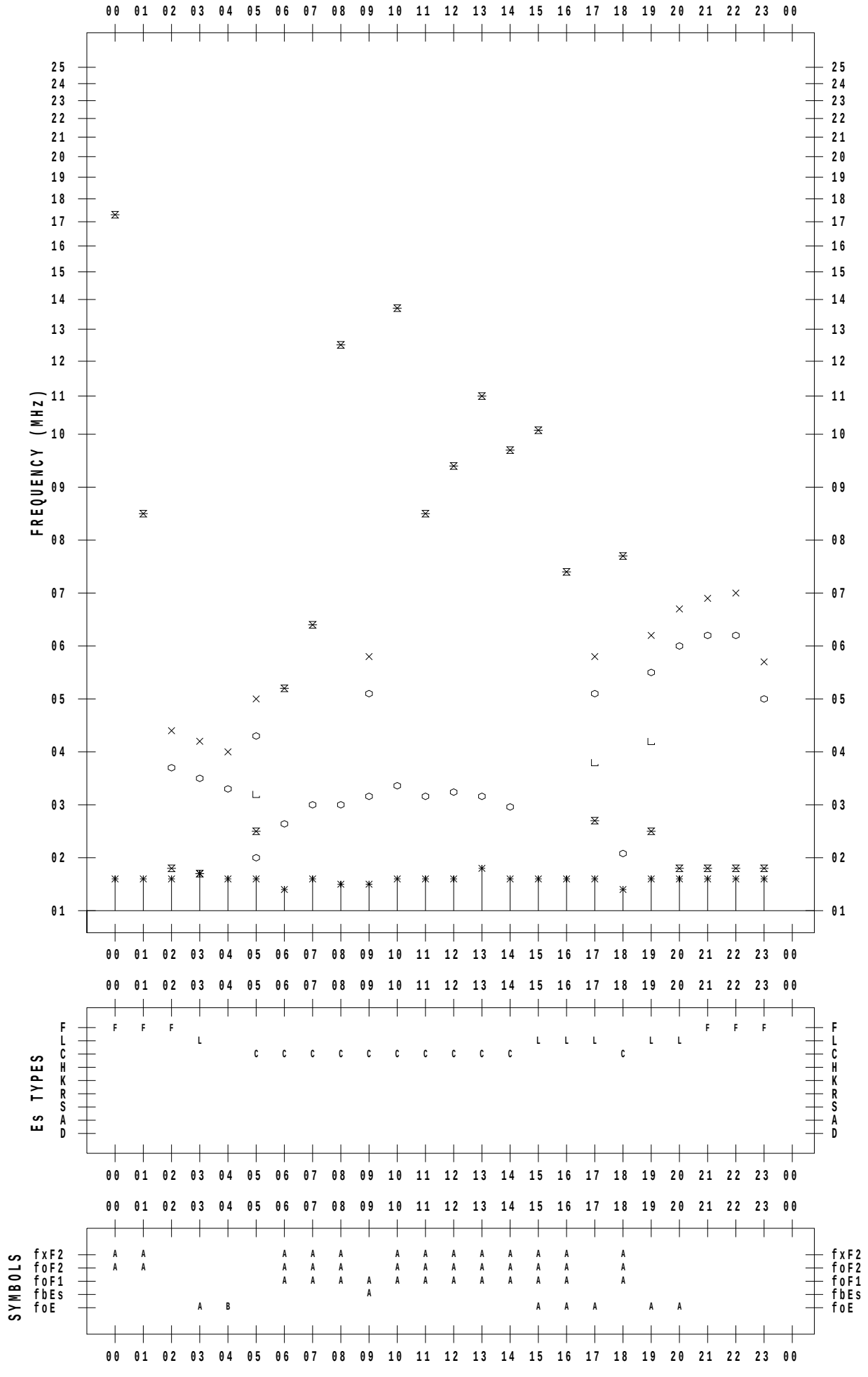
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/18

135 °E MEAN TIME



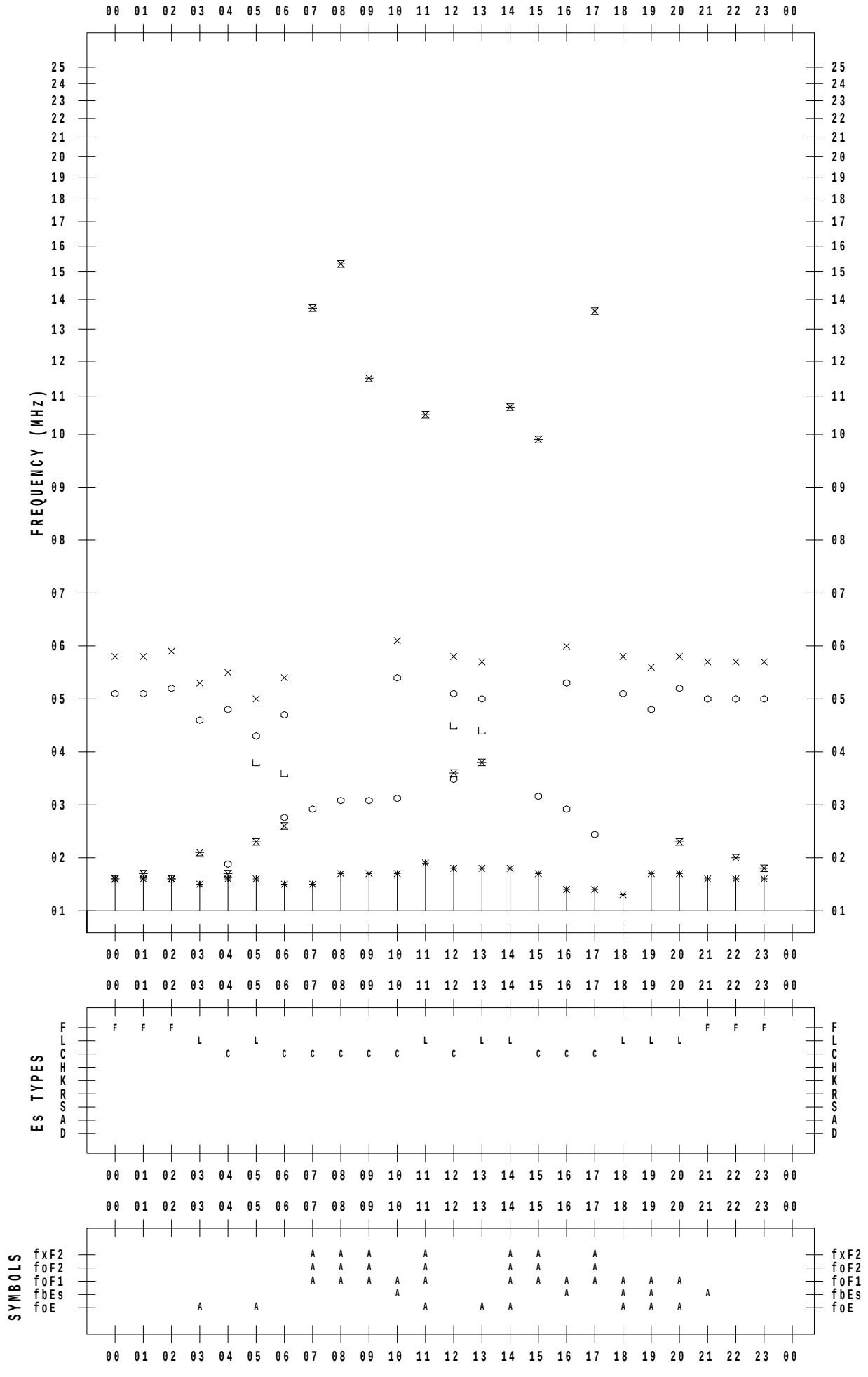
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/19

135 °E MEAN TIME



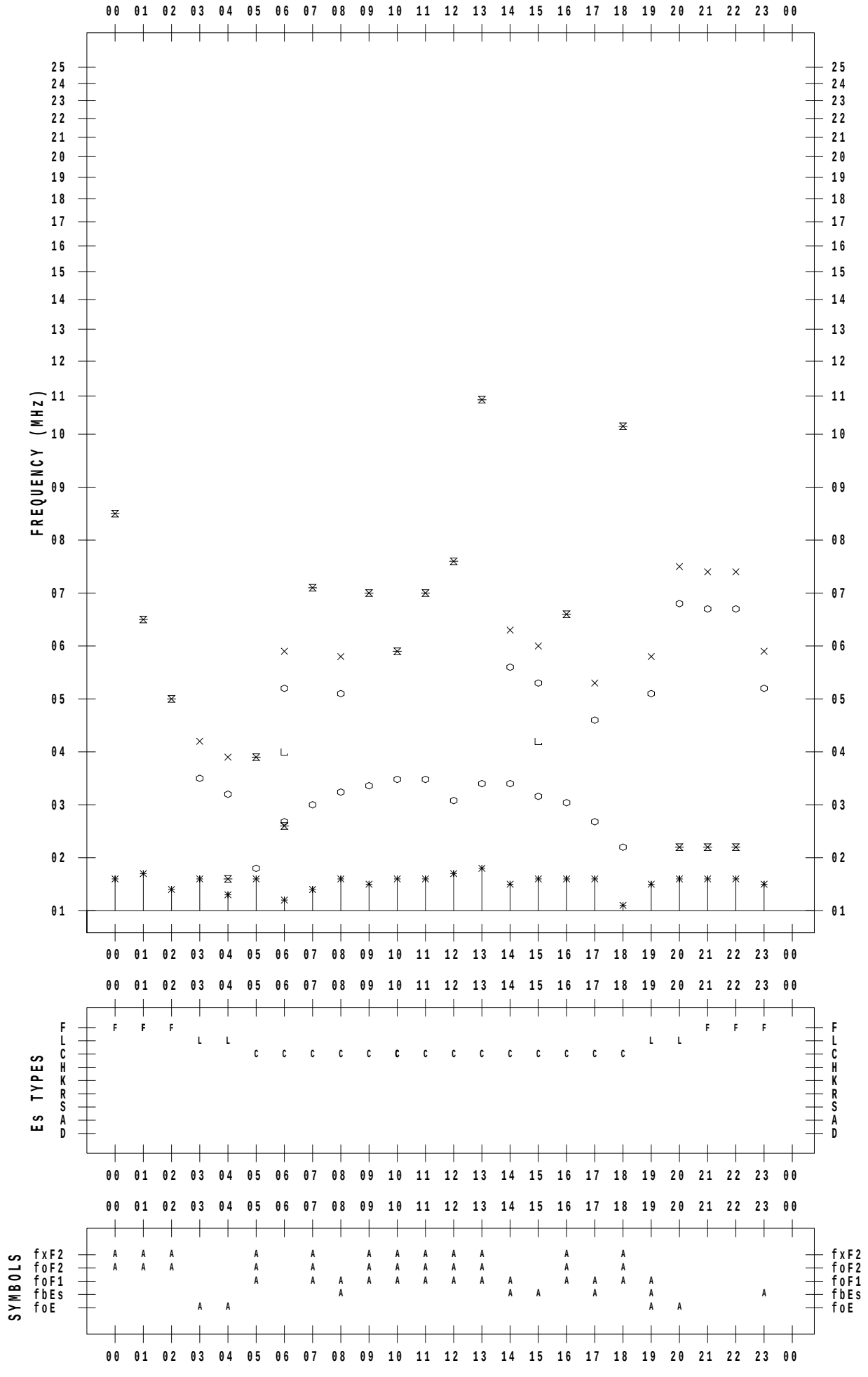
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/20

135 °E MEAN TIME



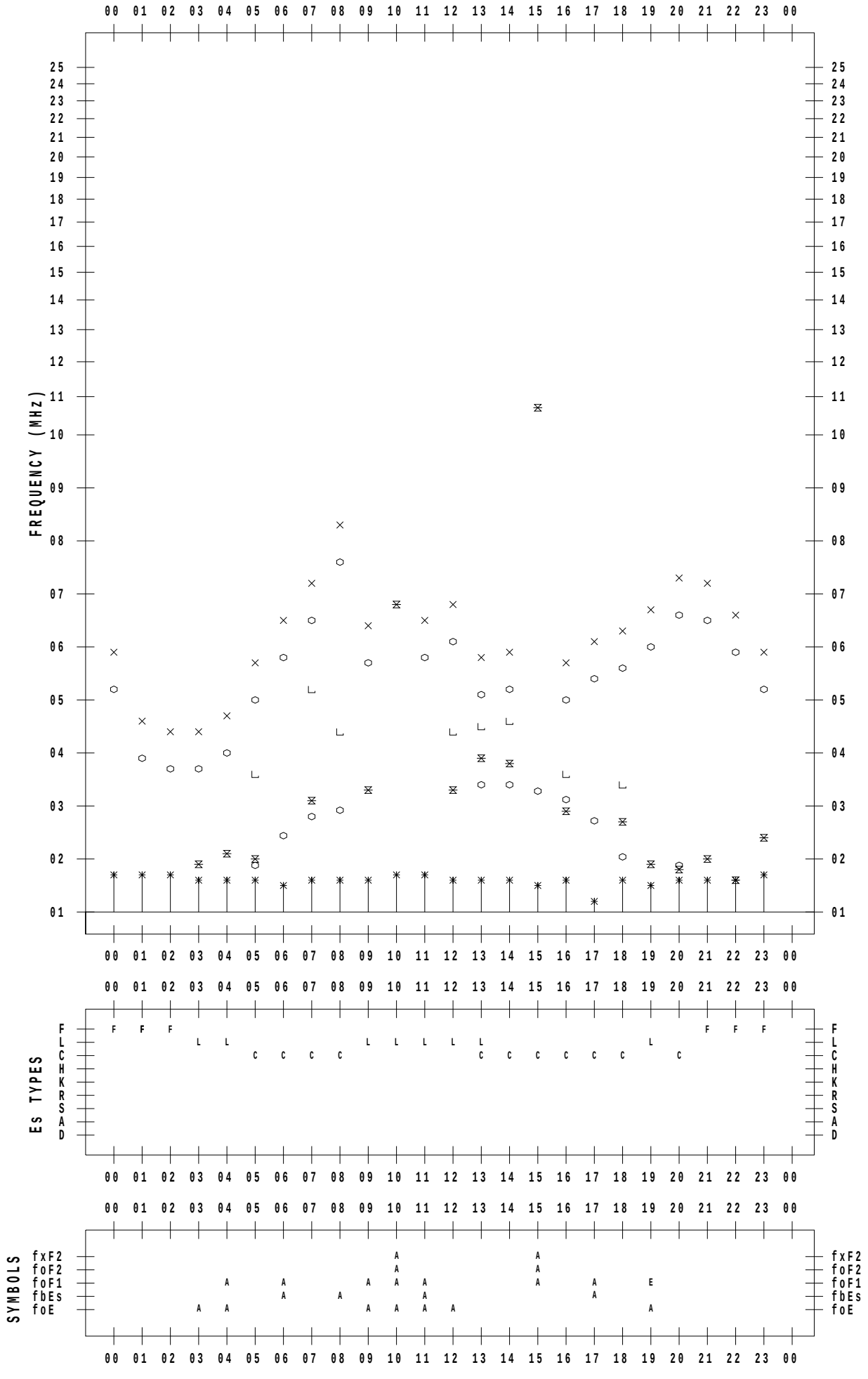
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/21

135 °E MEAN TIME



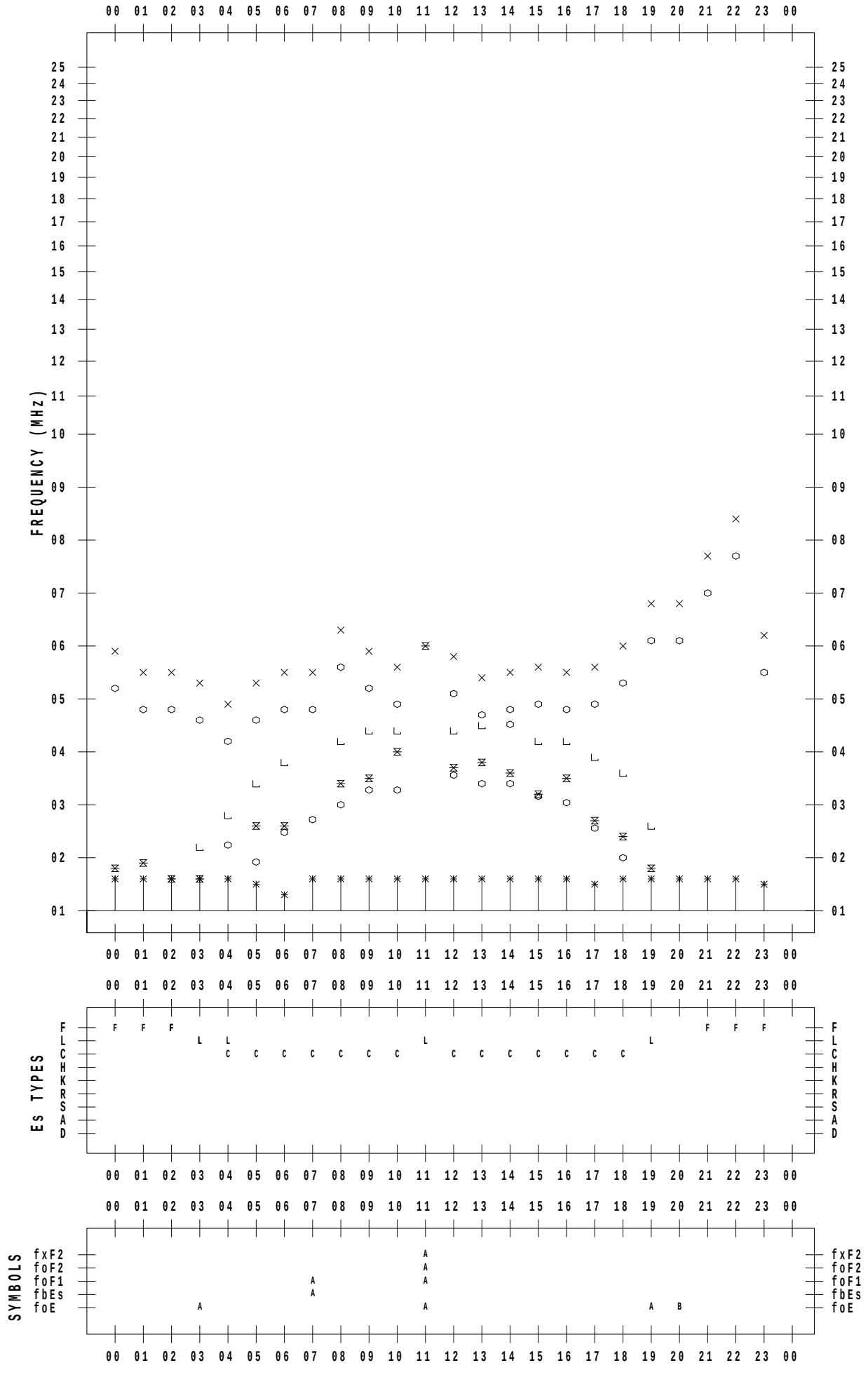
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/22

135 °E MEAN TIME



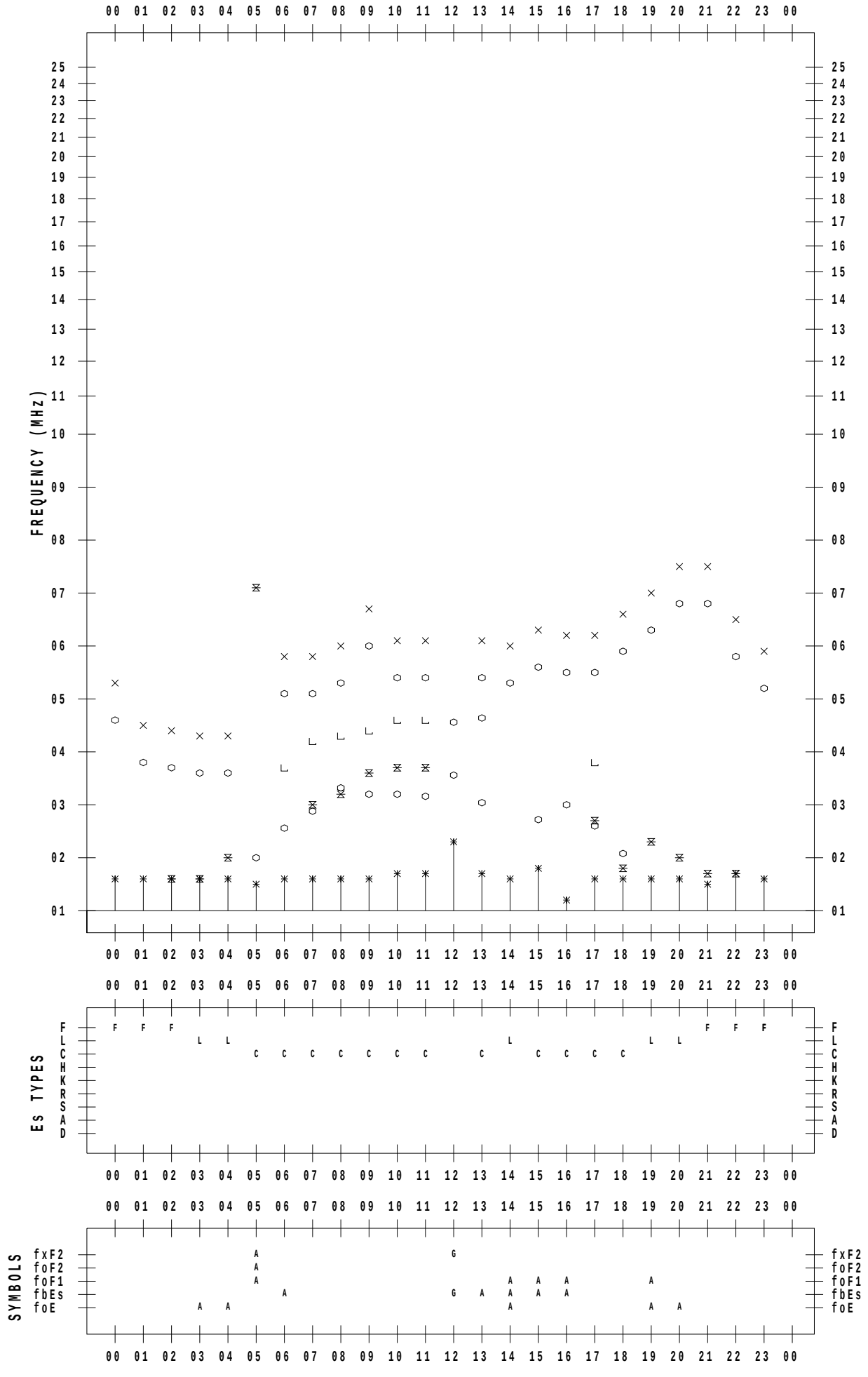
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/23

135 °E MEAN TIME



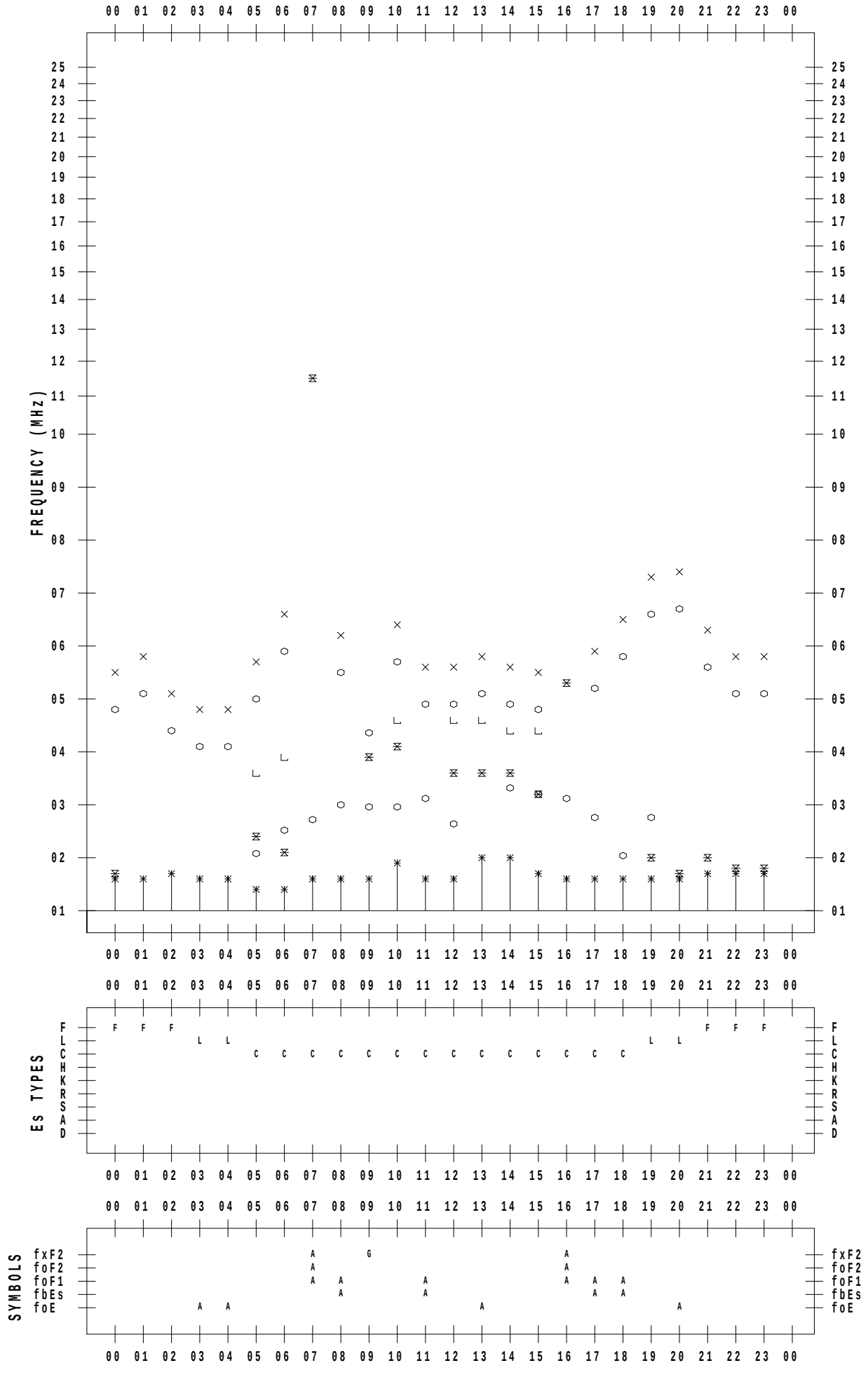
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/24

135 °E MEAN TIME



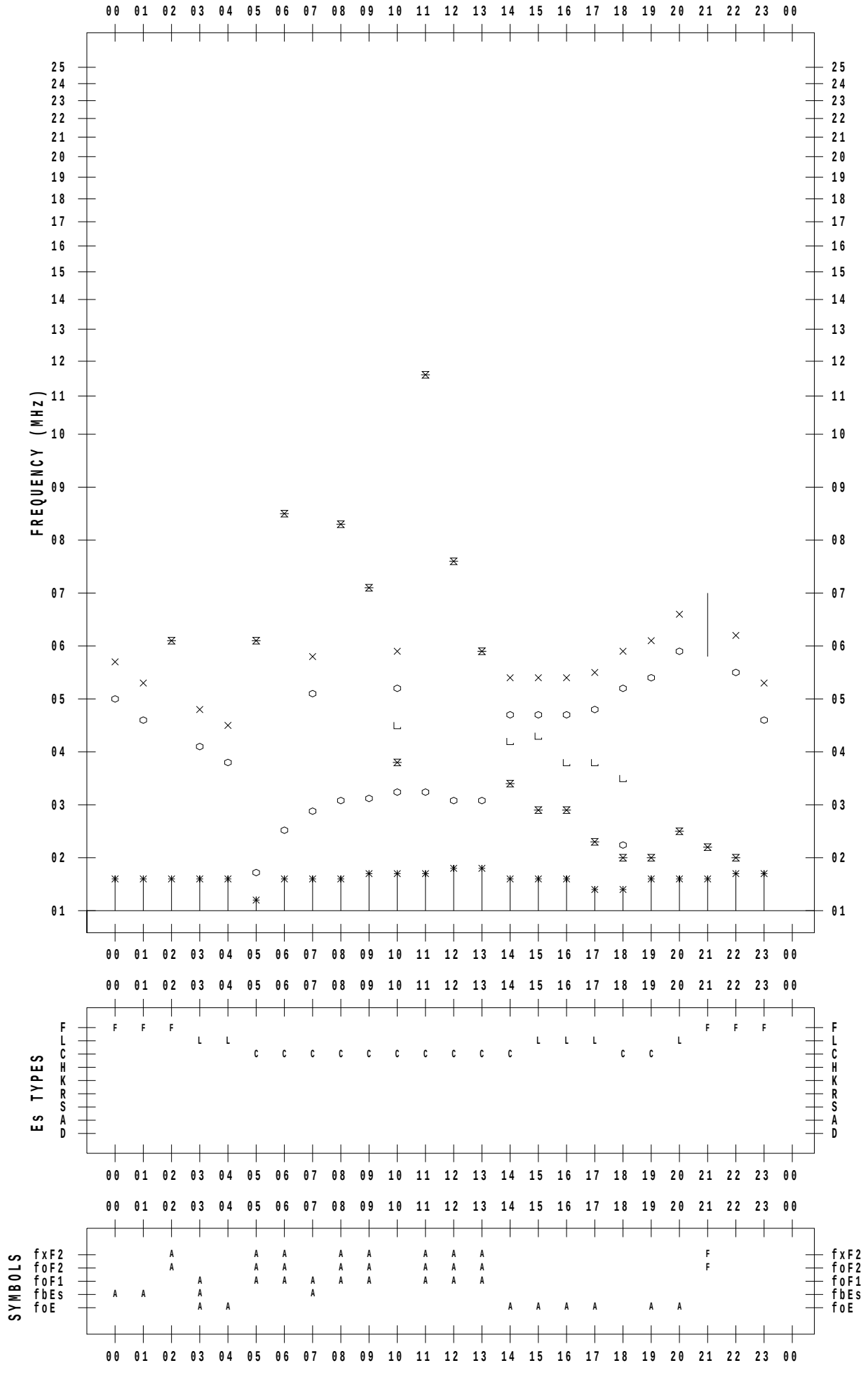
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/25

135 °E MEAN TIME



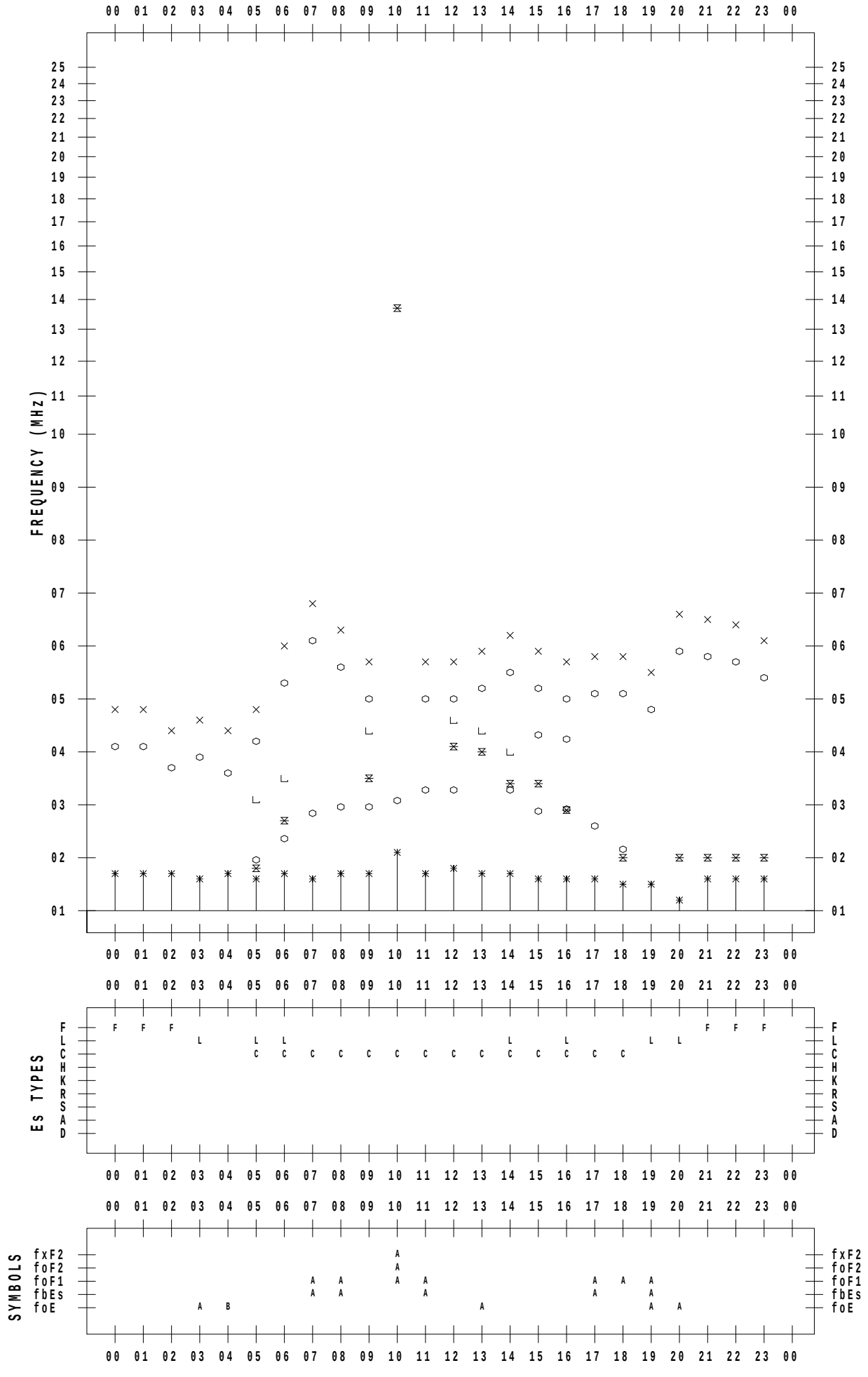
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/26

135 °E MEAN TIME



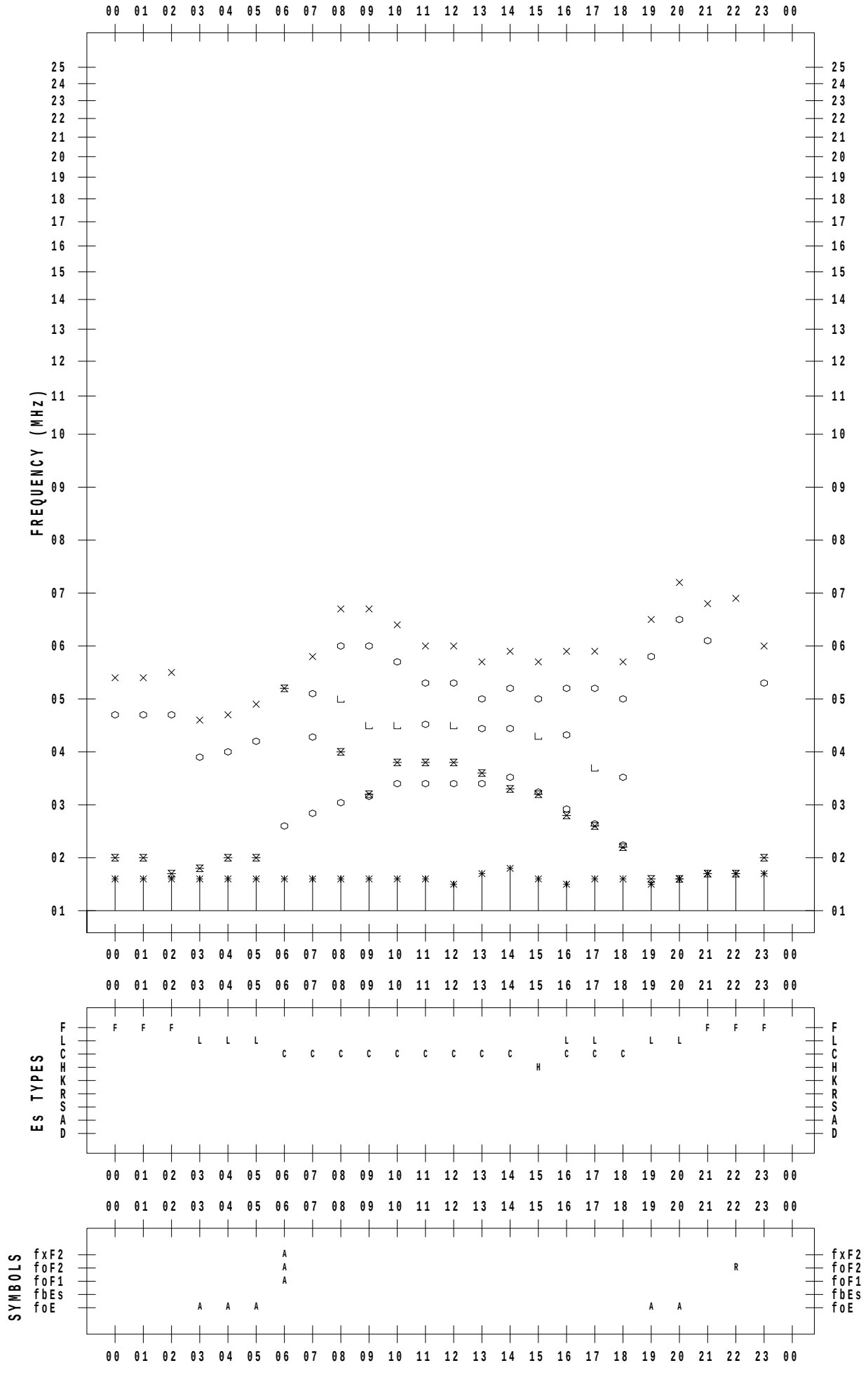
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/27

135 °E MEAN TIME



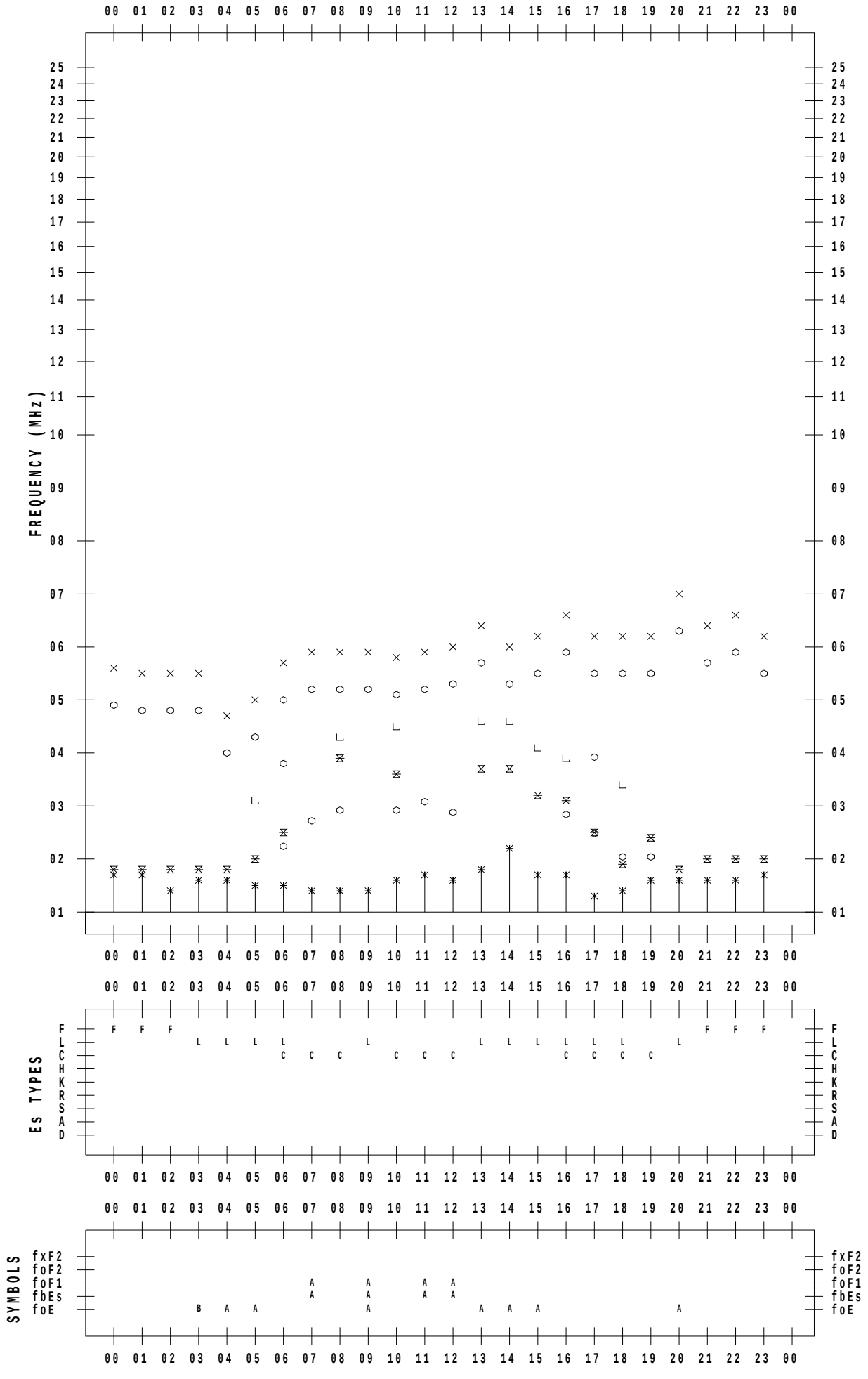
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/28

135 °E MEAN TIME



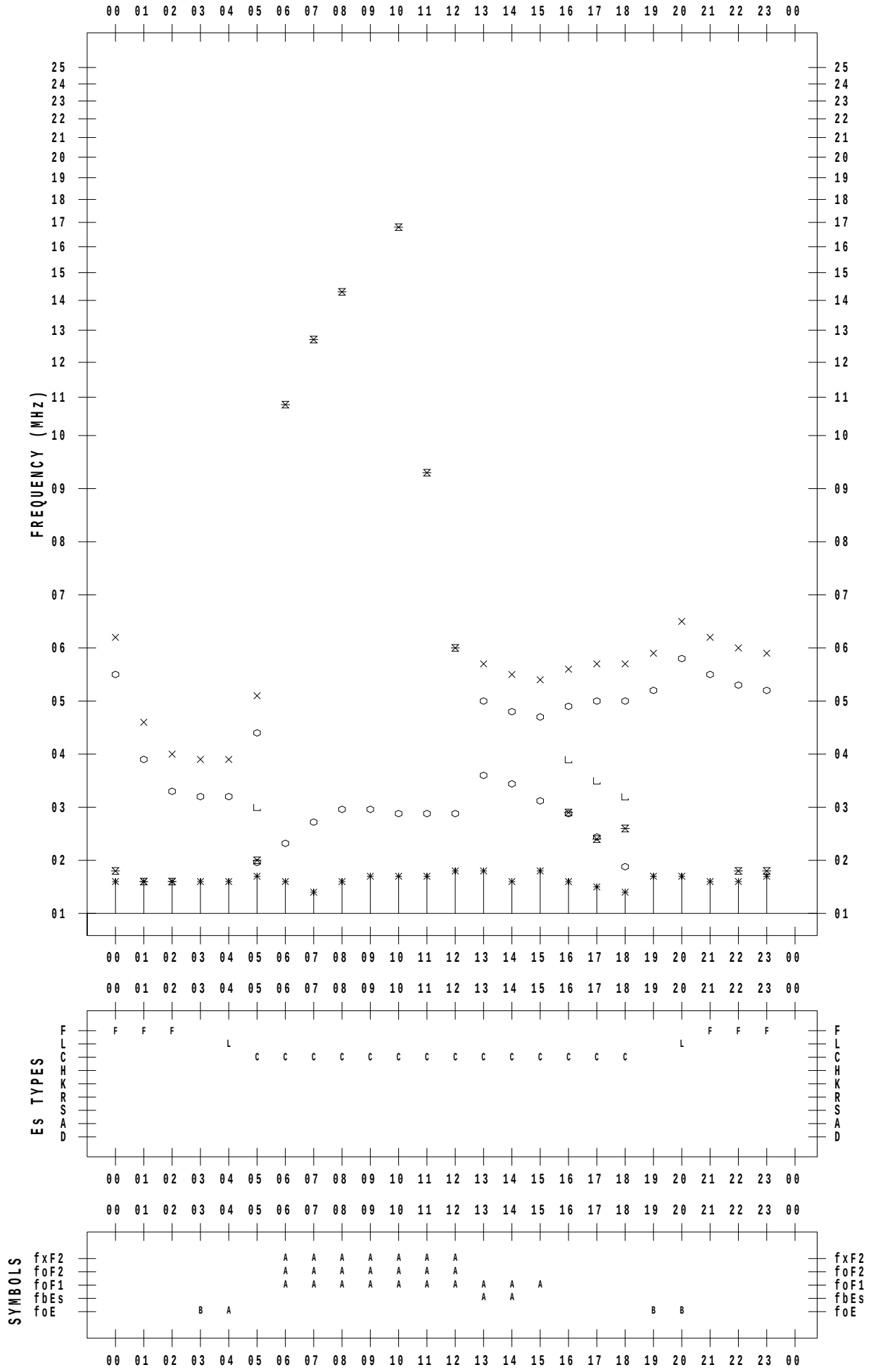
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/29

135 °E MEAN TIME



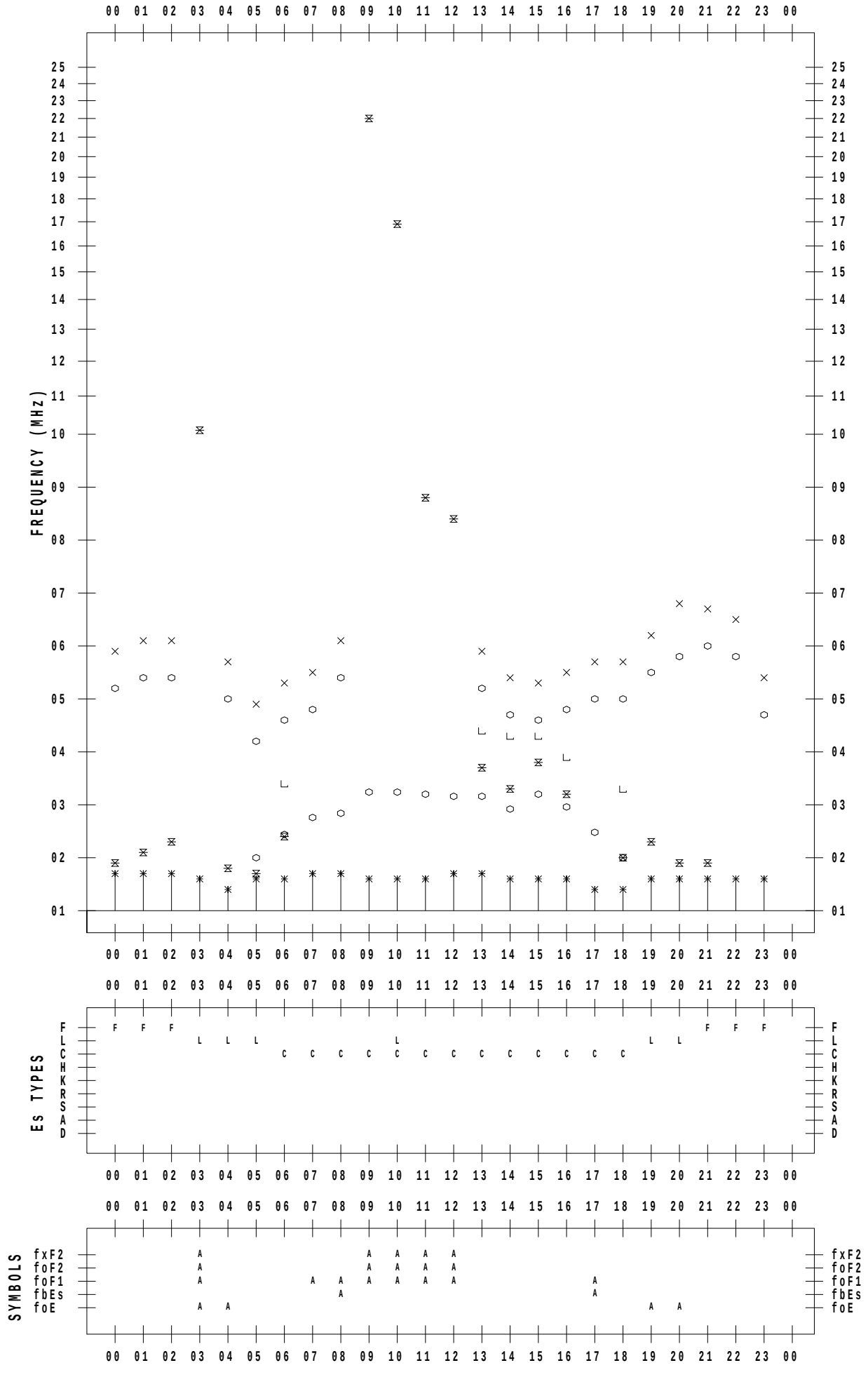
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/30

135 °E MEAN TIME



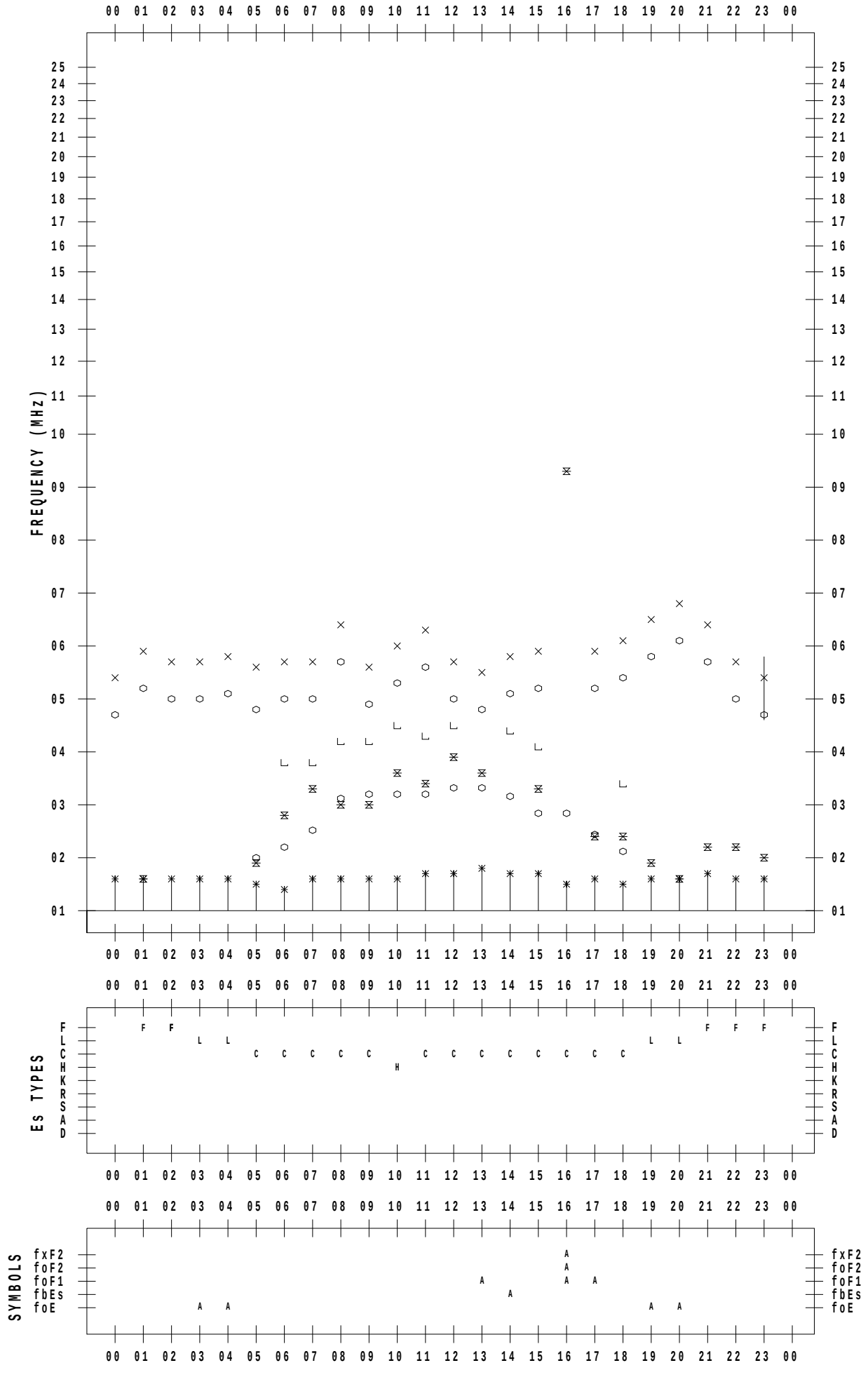
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/ 7/31

135 °E MEAN TIME



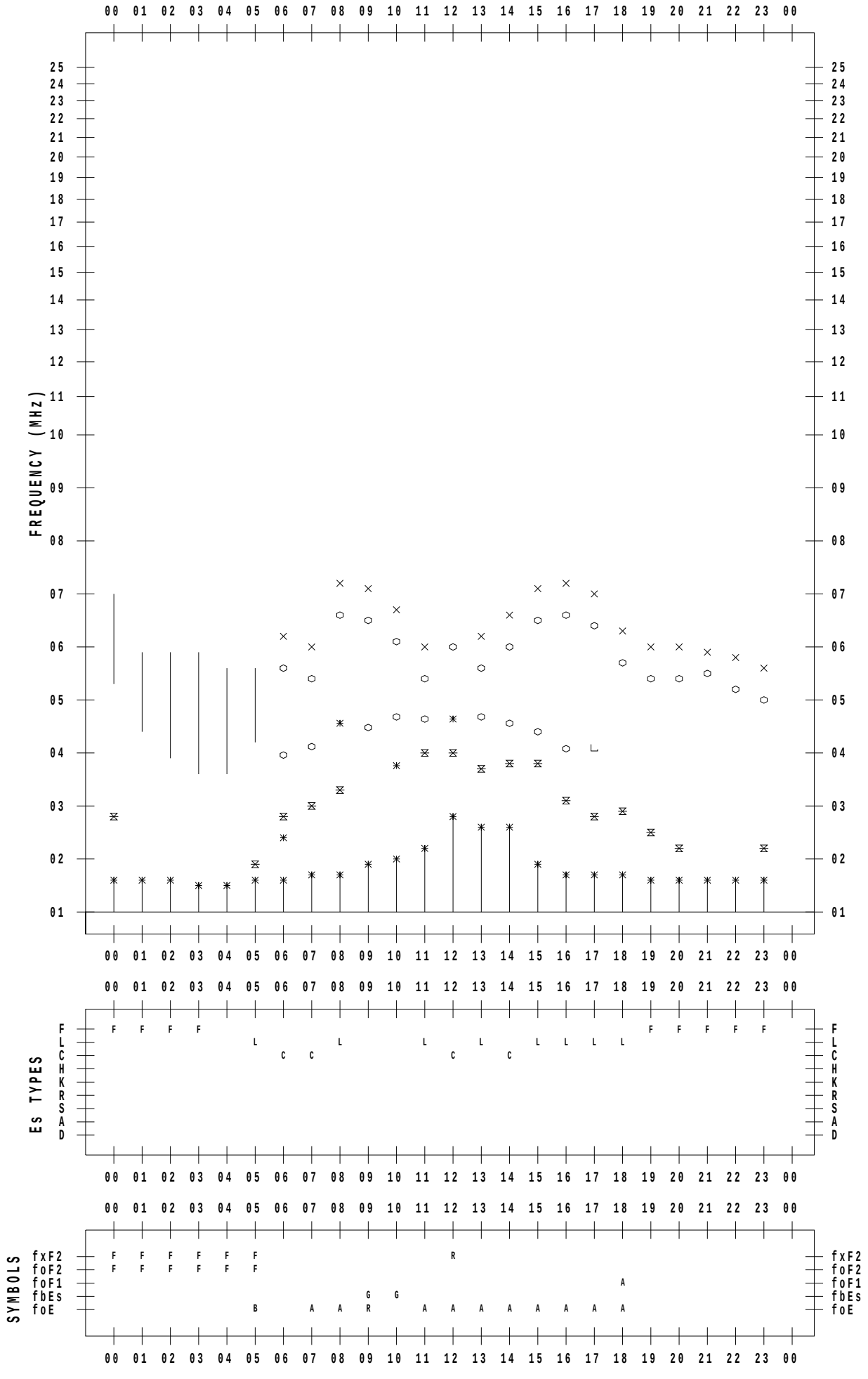
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 1

135 °E MEAN TIME



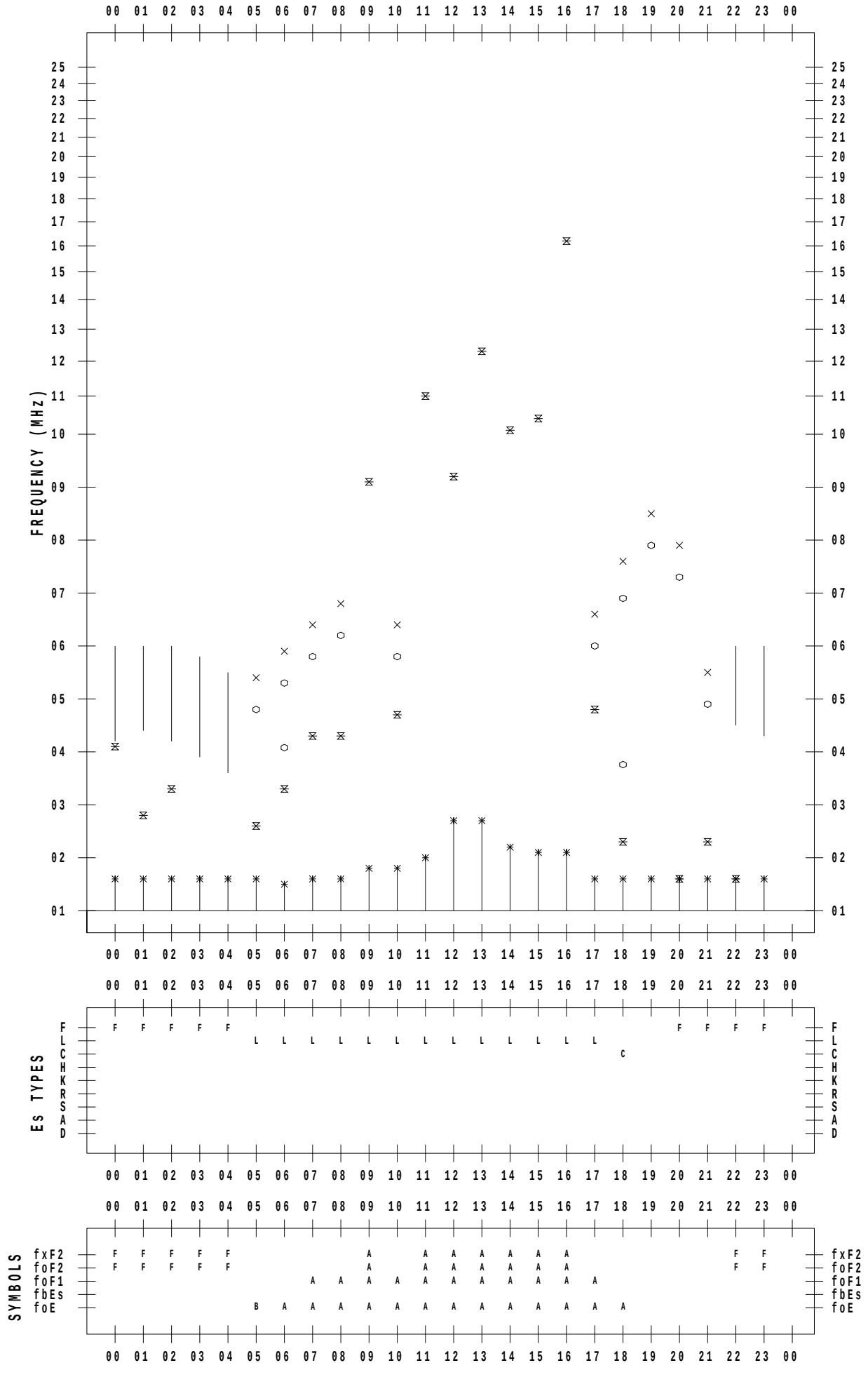
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 2

135 °E MEAN TIME



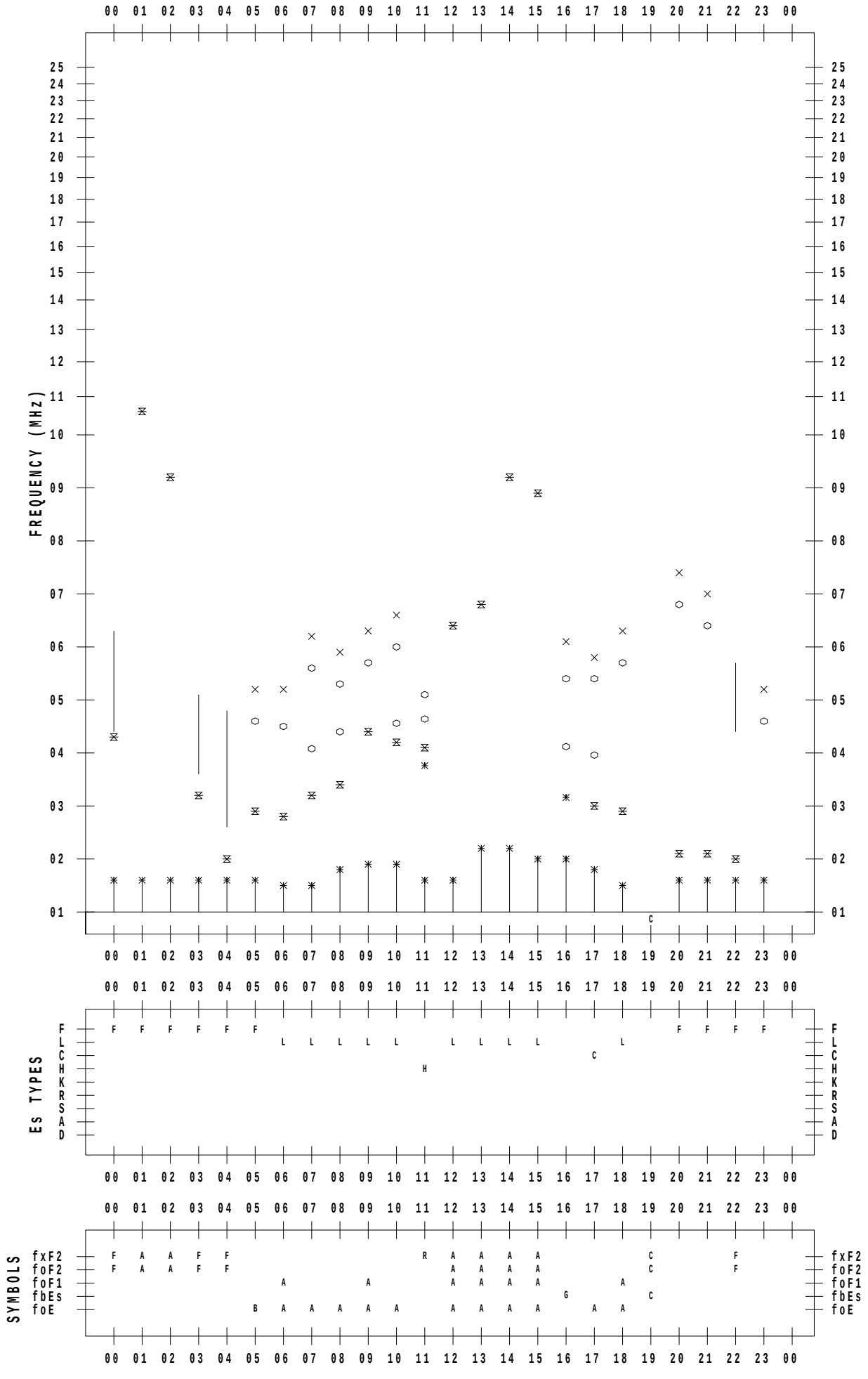
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 3

135 °E MEAN TIME



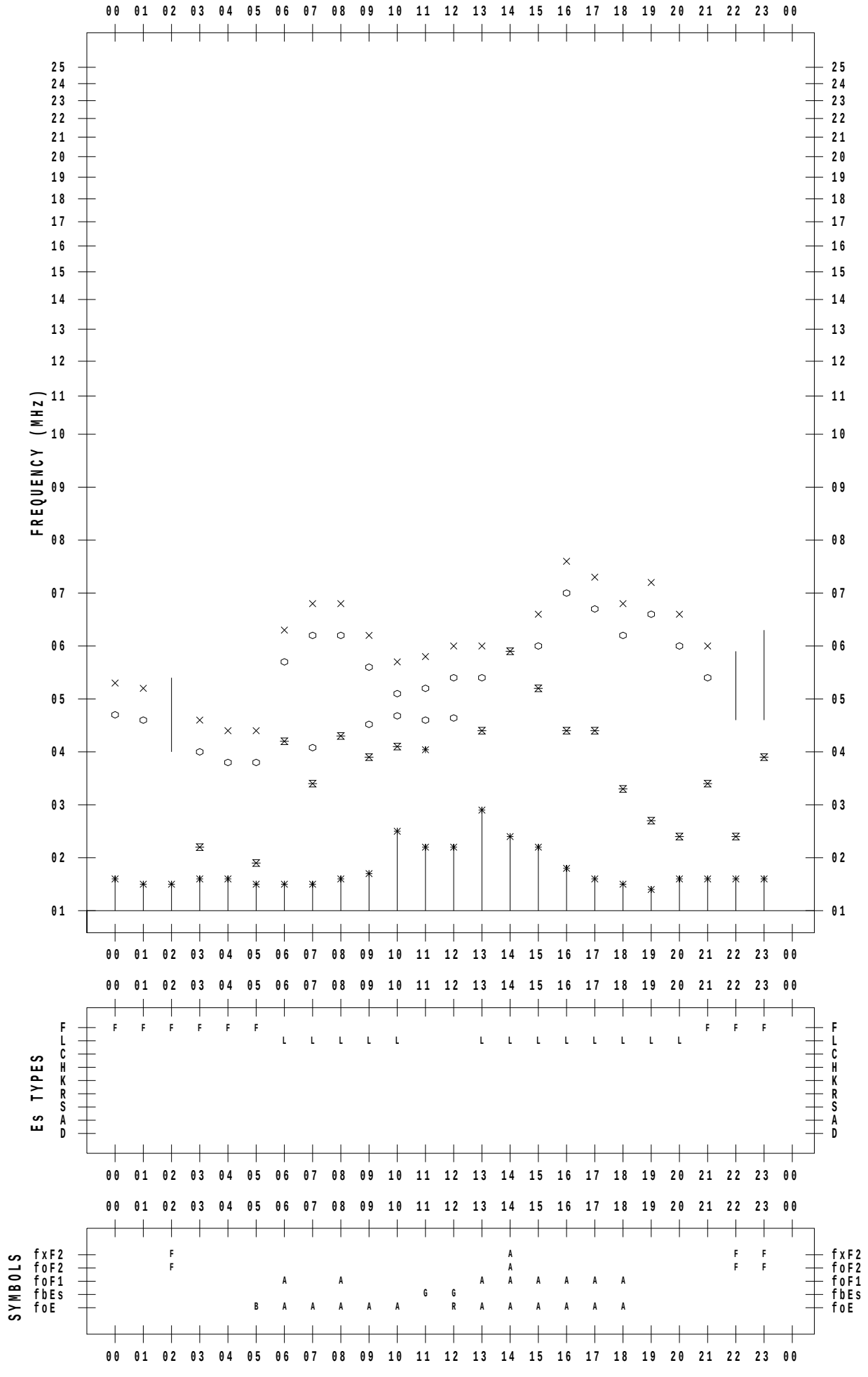
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 4

135 °E MEAN TIME



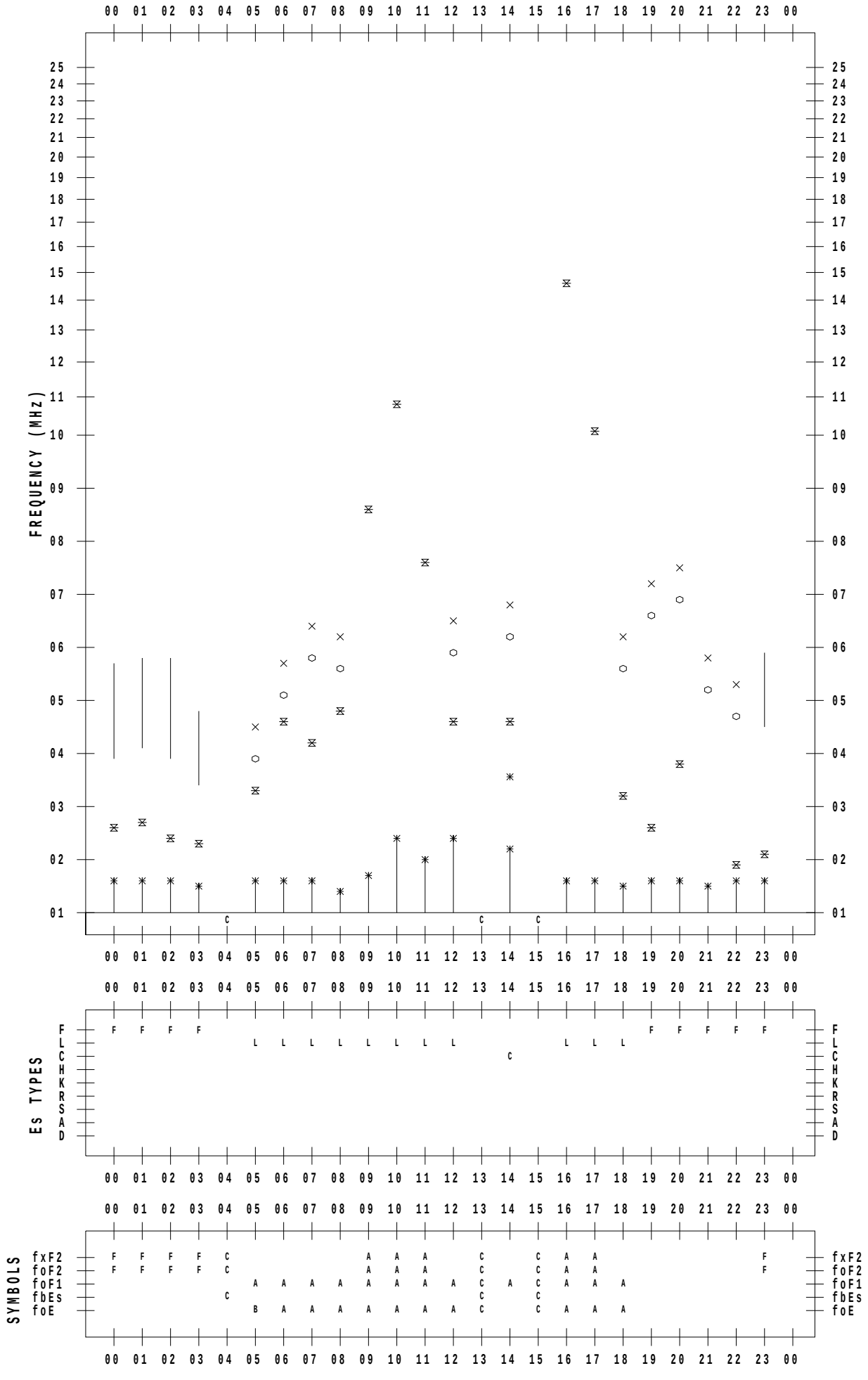
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 5

135 °E MEAN TIME



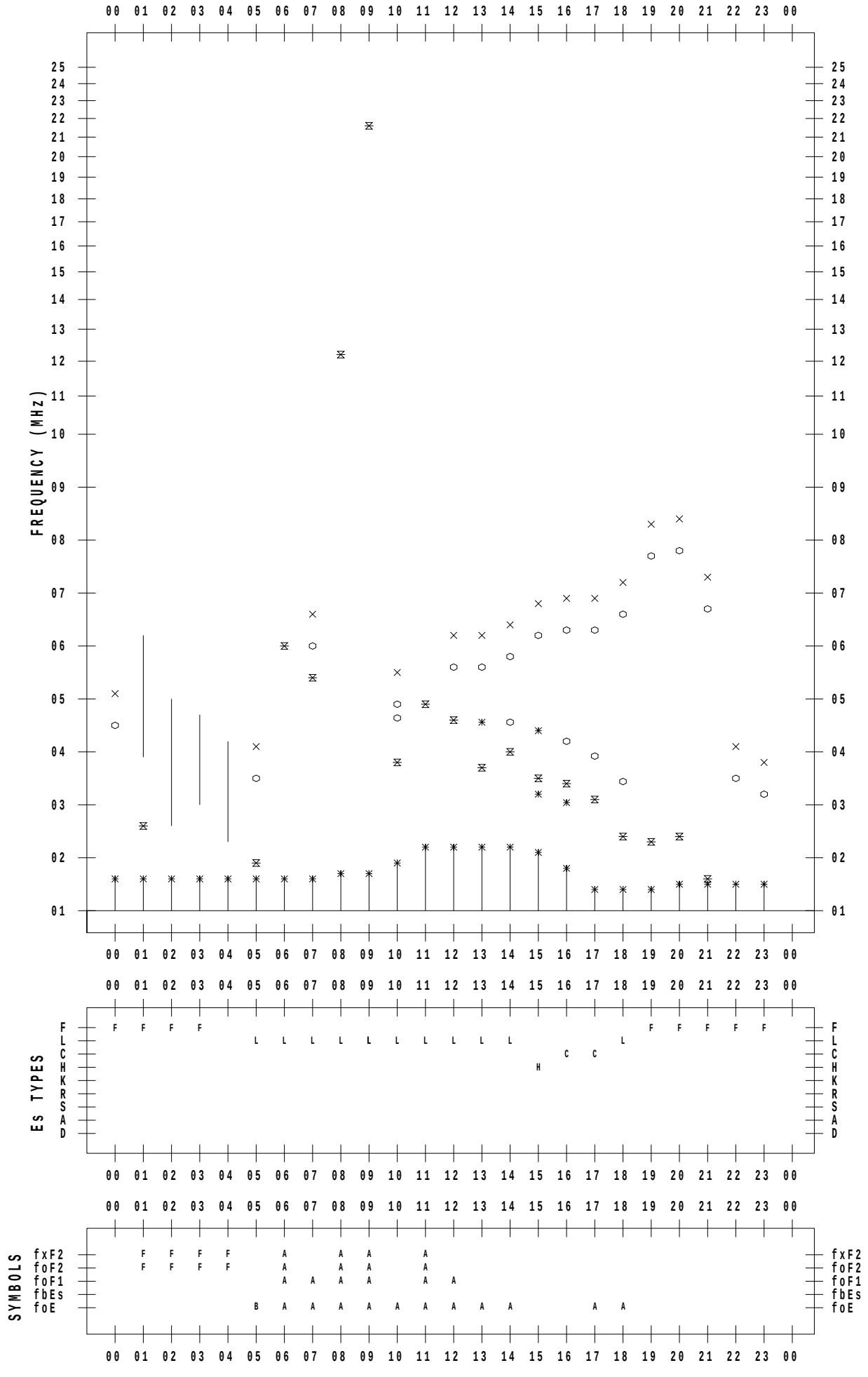
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 6

135 °E MEAN TIME



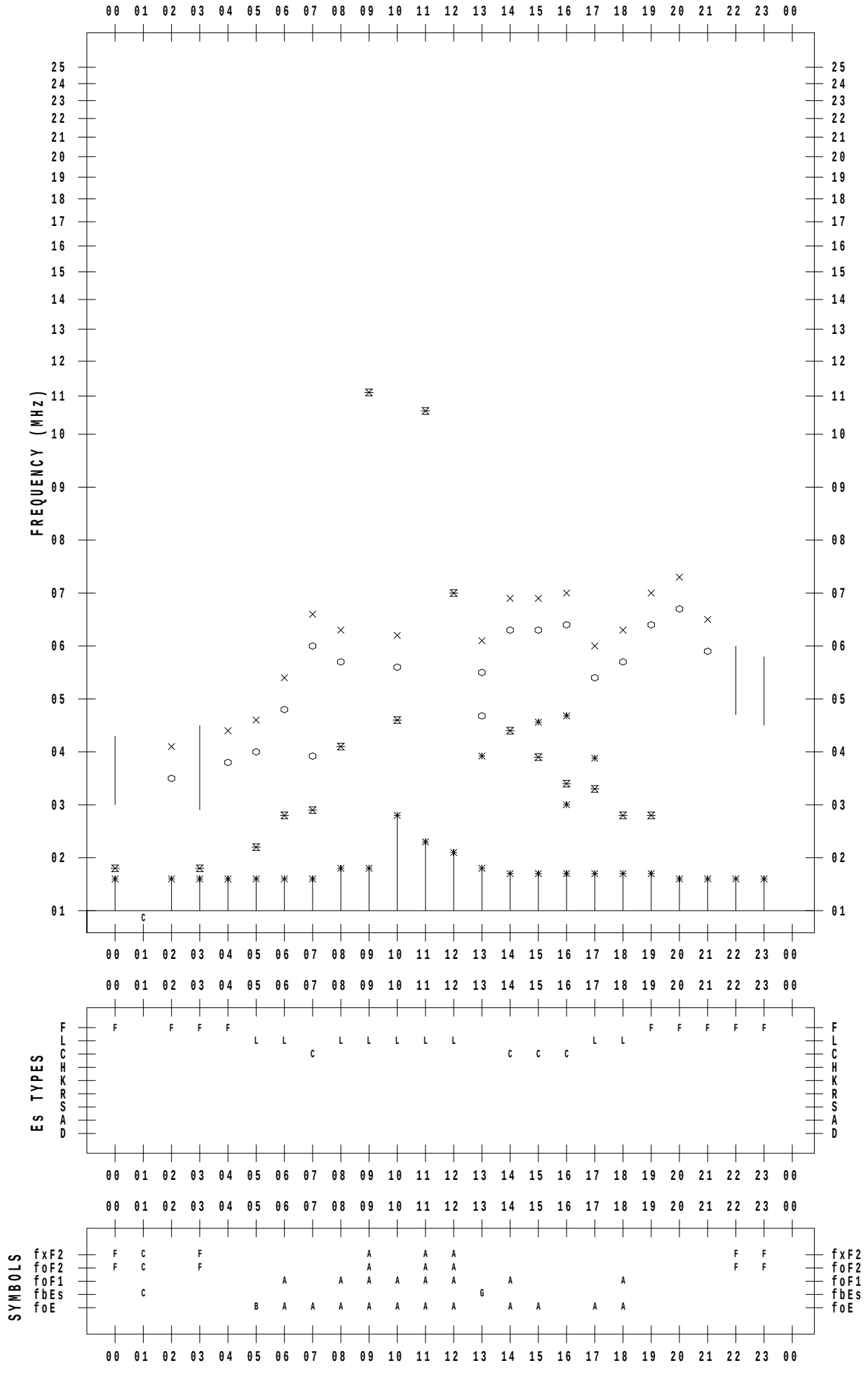
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 7

135 °E MEAN TIME



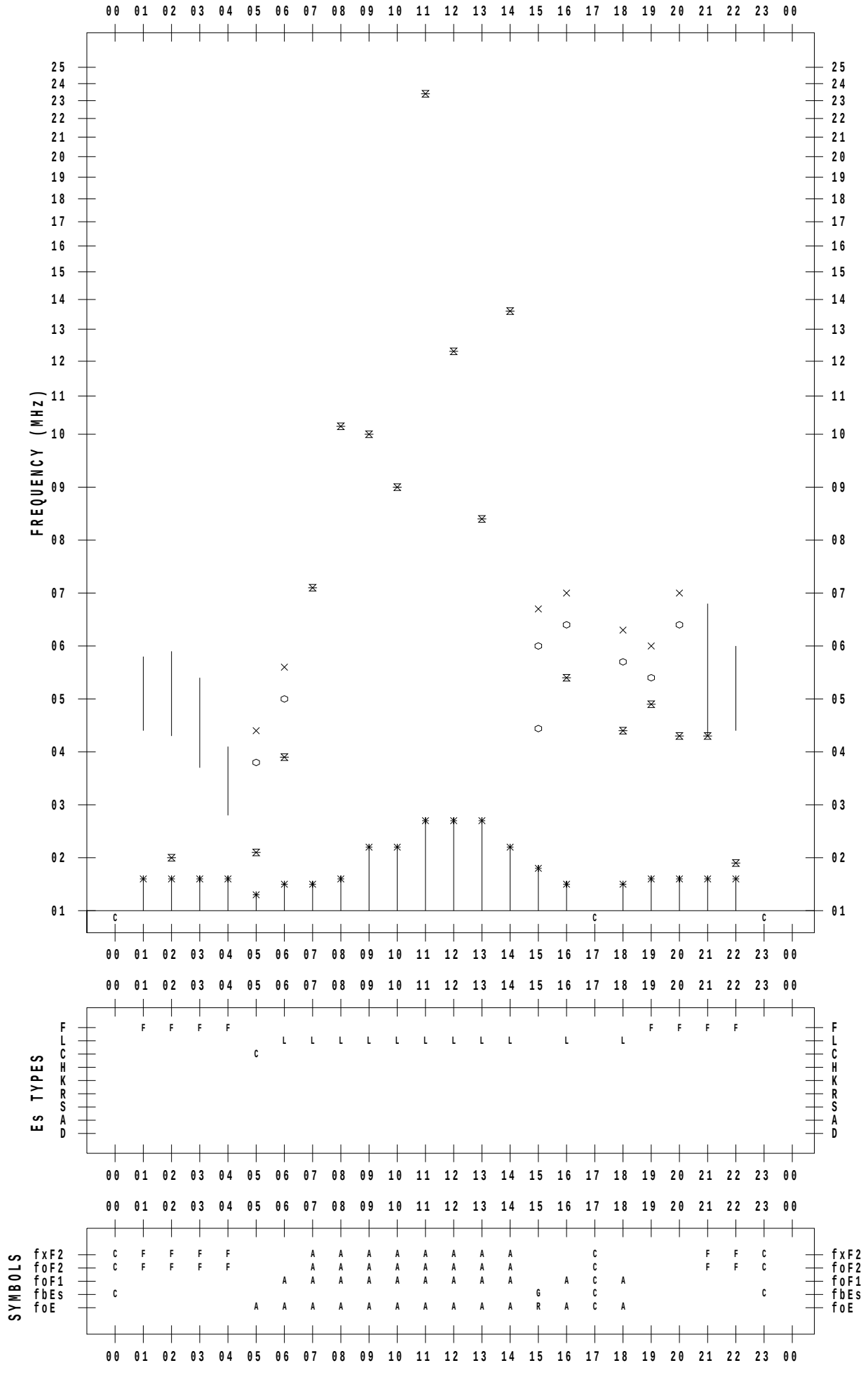
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 8

135 °E MEAN TIME



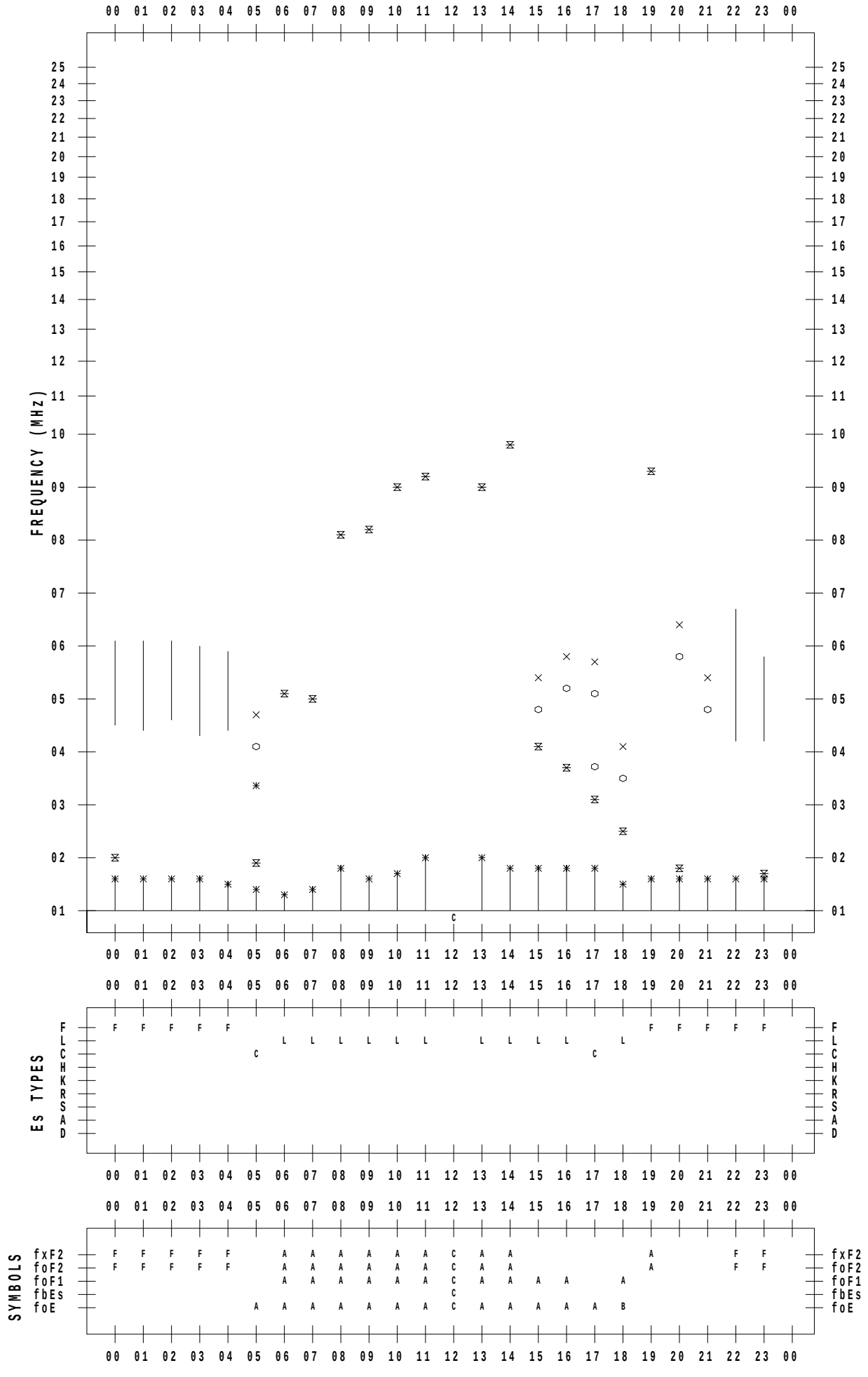
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/ 9

135 °E MEAN TIME



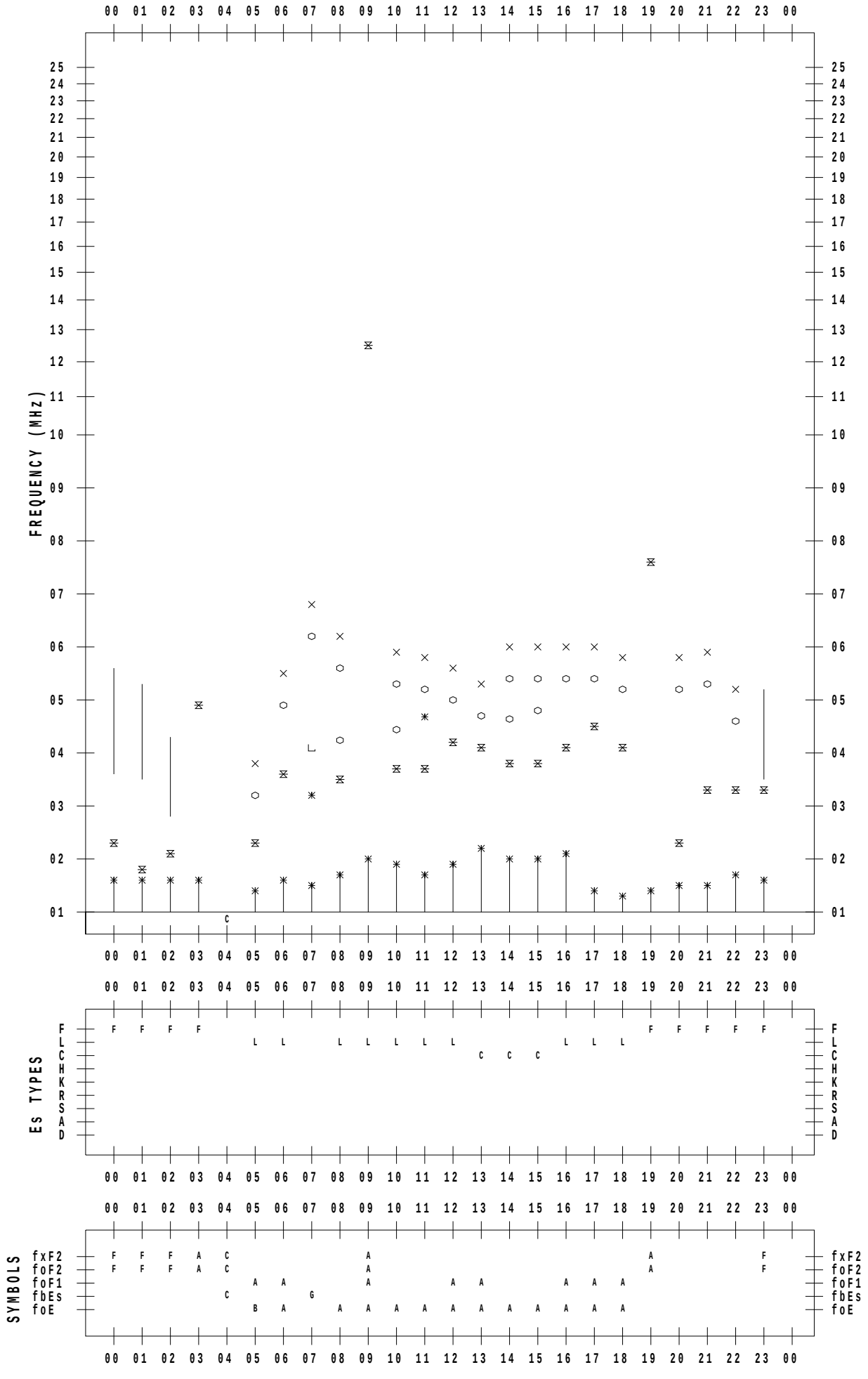
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/10

135 °E MEAN TIME



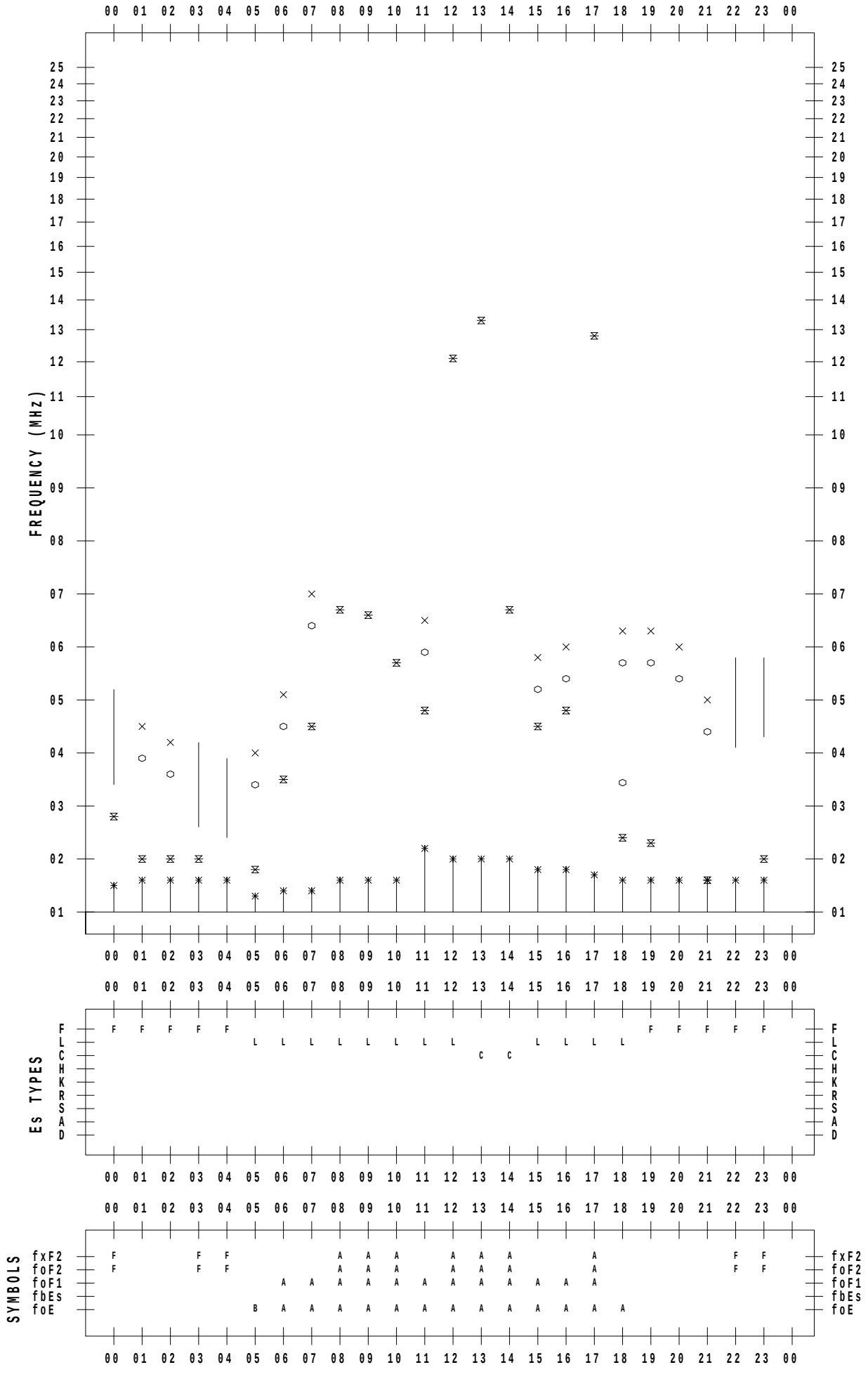
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/11

135 °E MEAN TIME



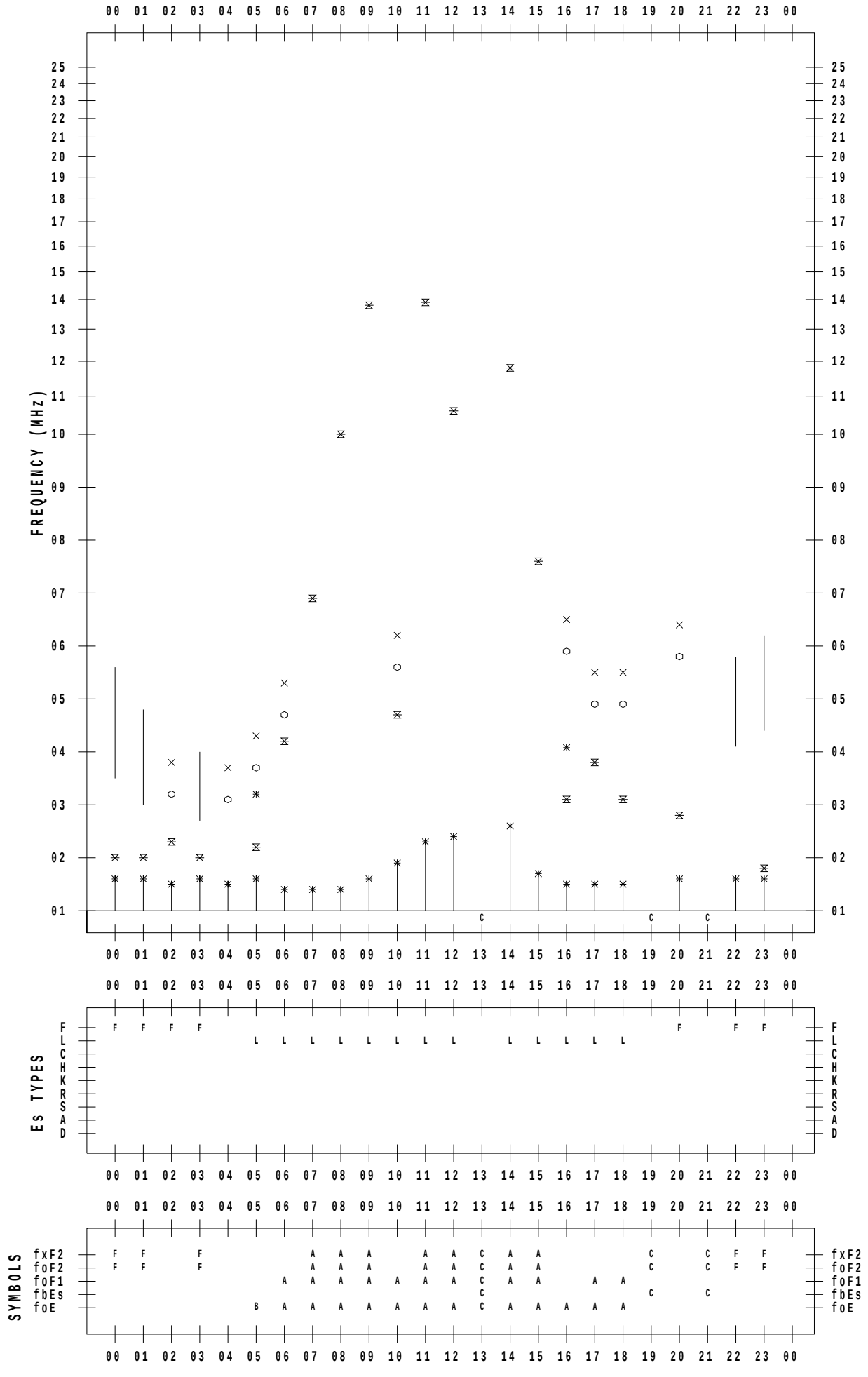
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/12

135 °E MEAN TIME



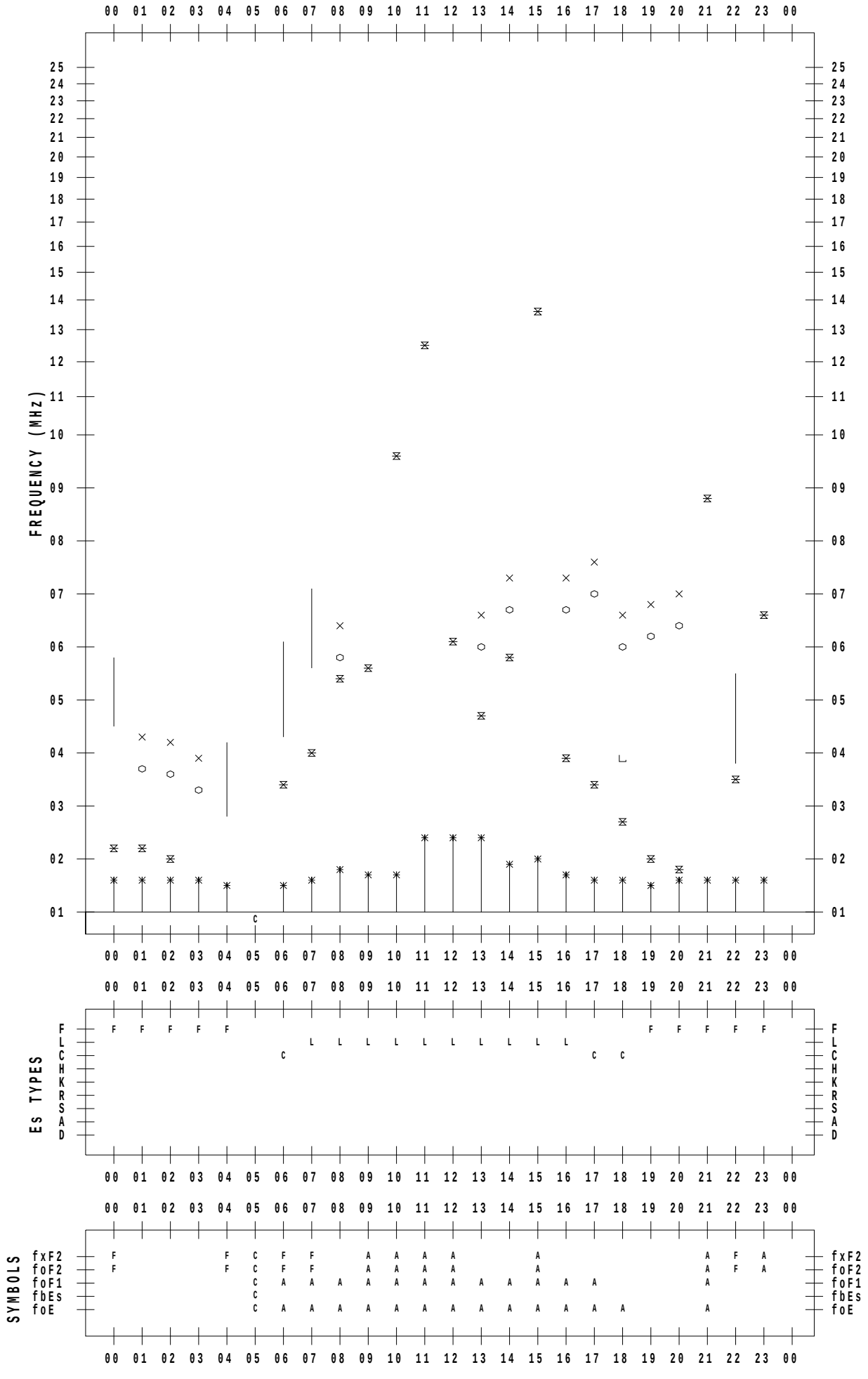
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/13

135 °E MEAN TIME



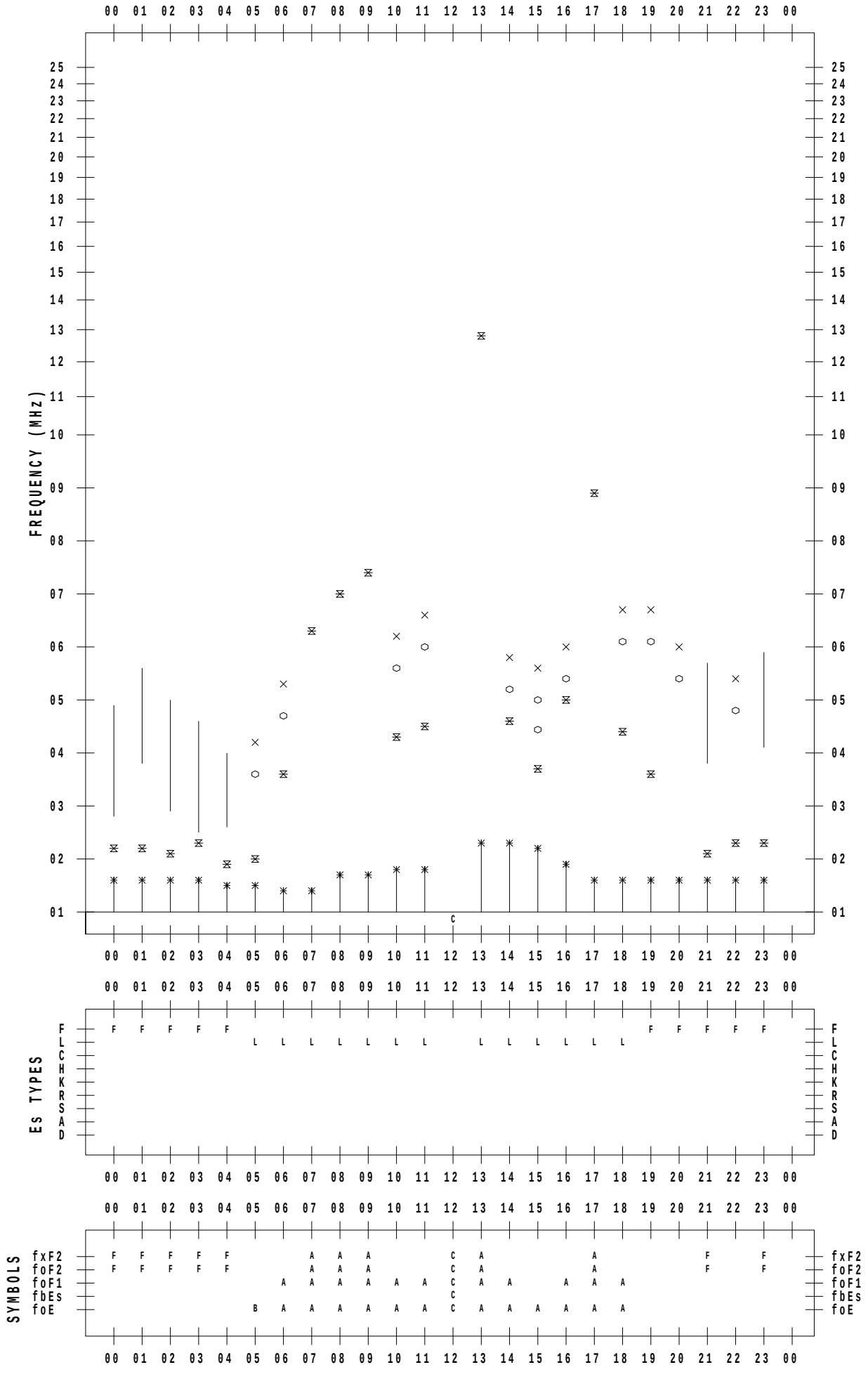
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/14

135 °E MEAN TIME



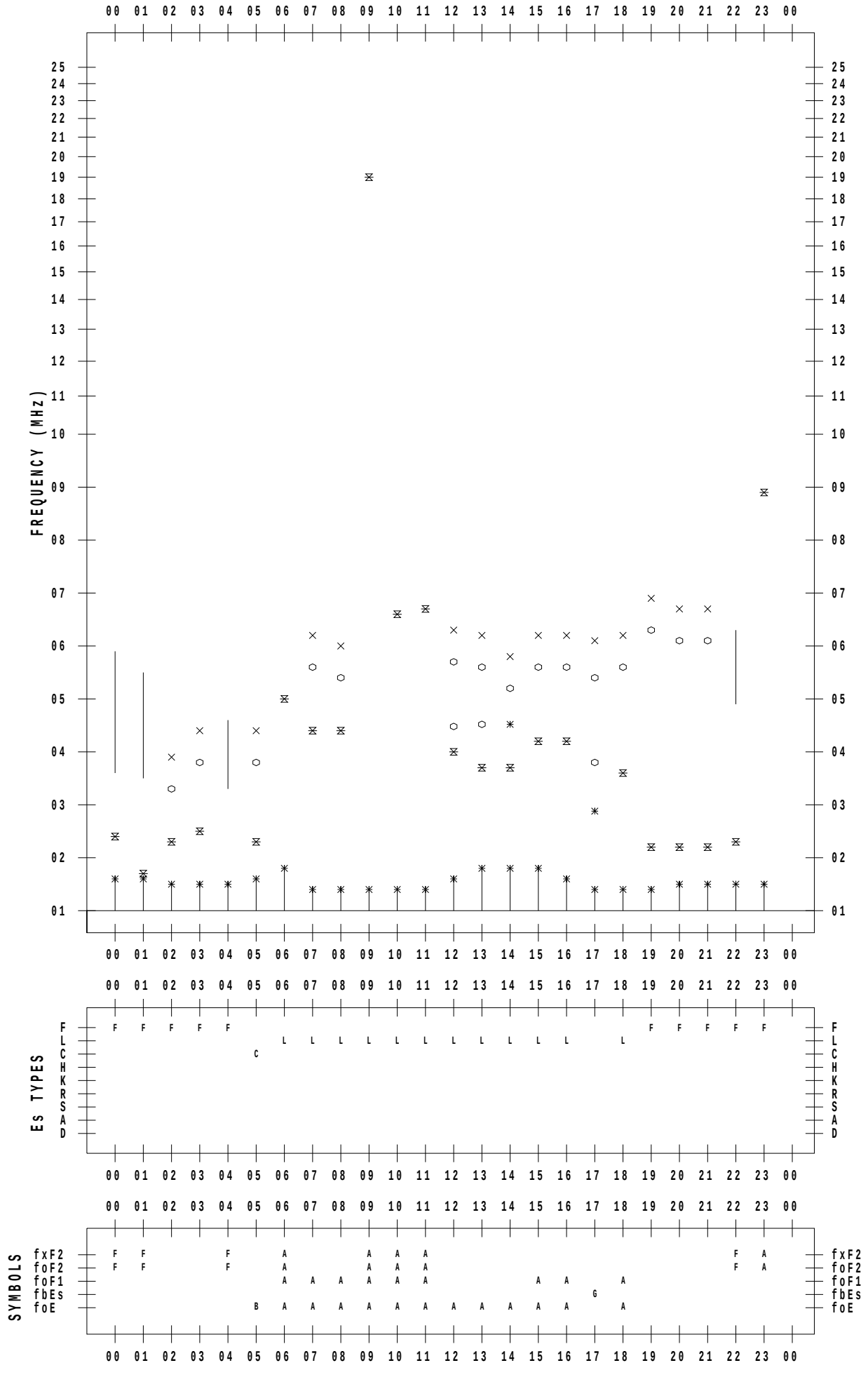
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/15

135 °E MEAN TIME



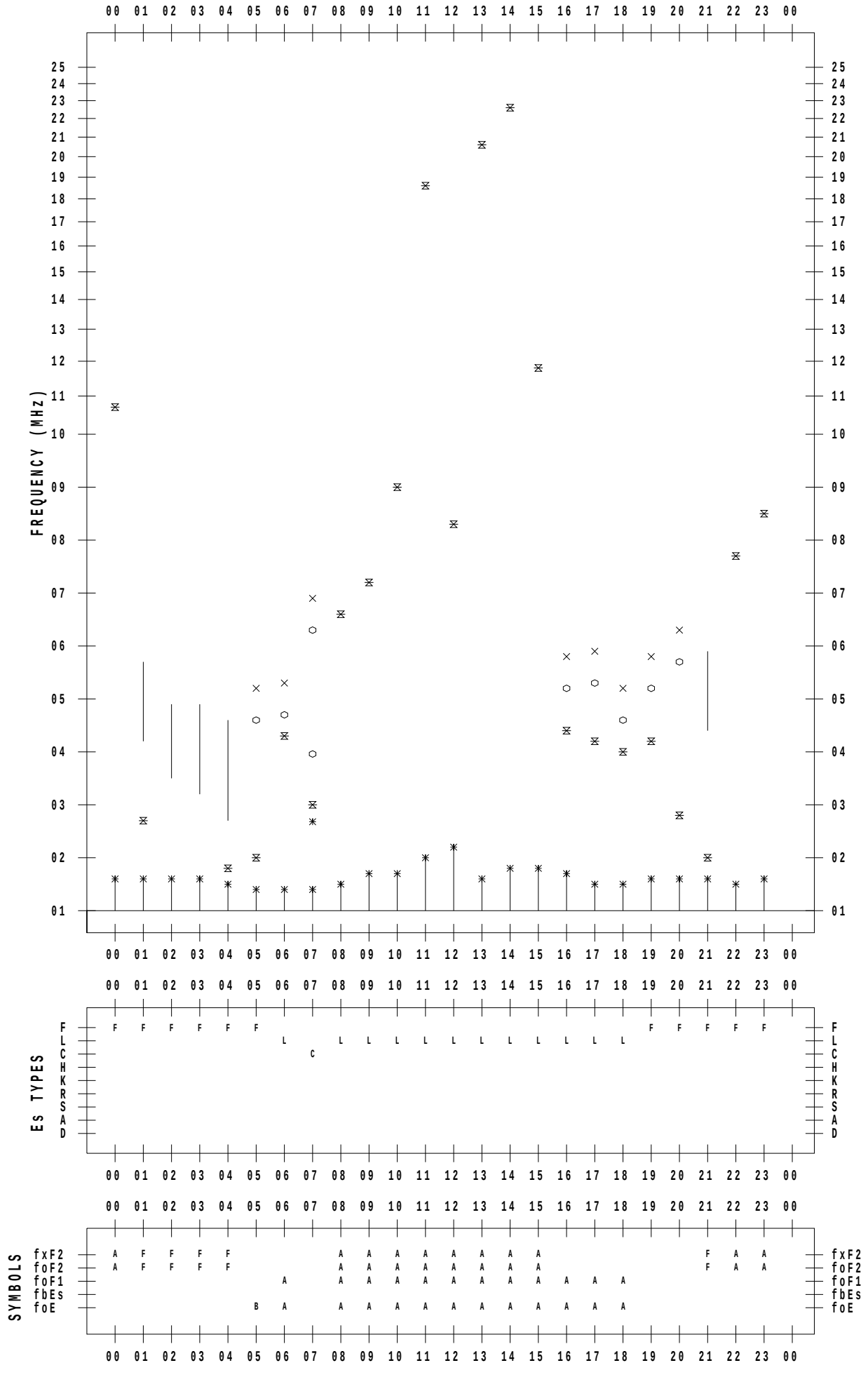
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/16

135 °E MEAN TIME



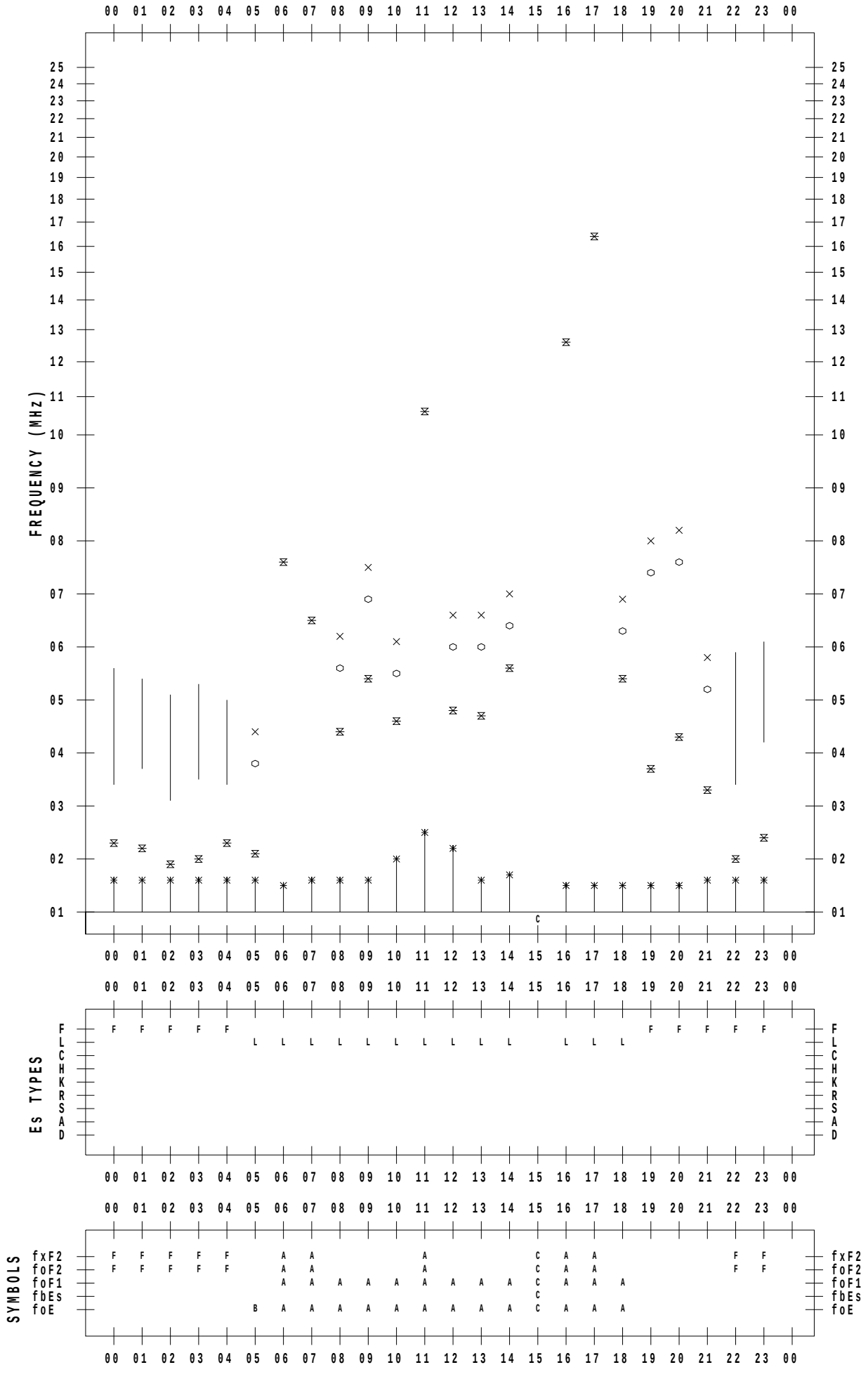
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/17

135 °E MEAN TIME



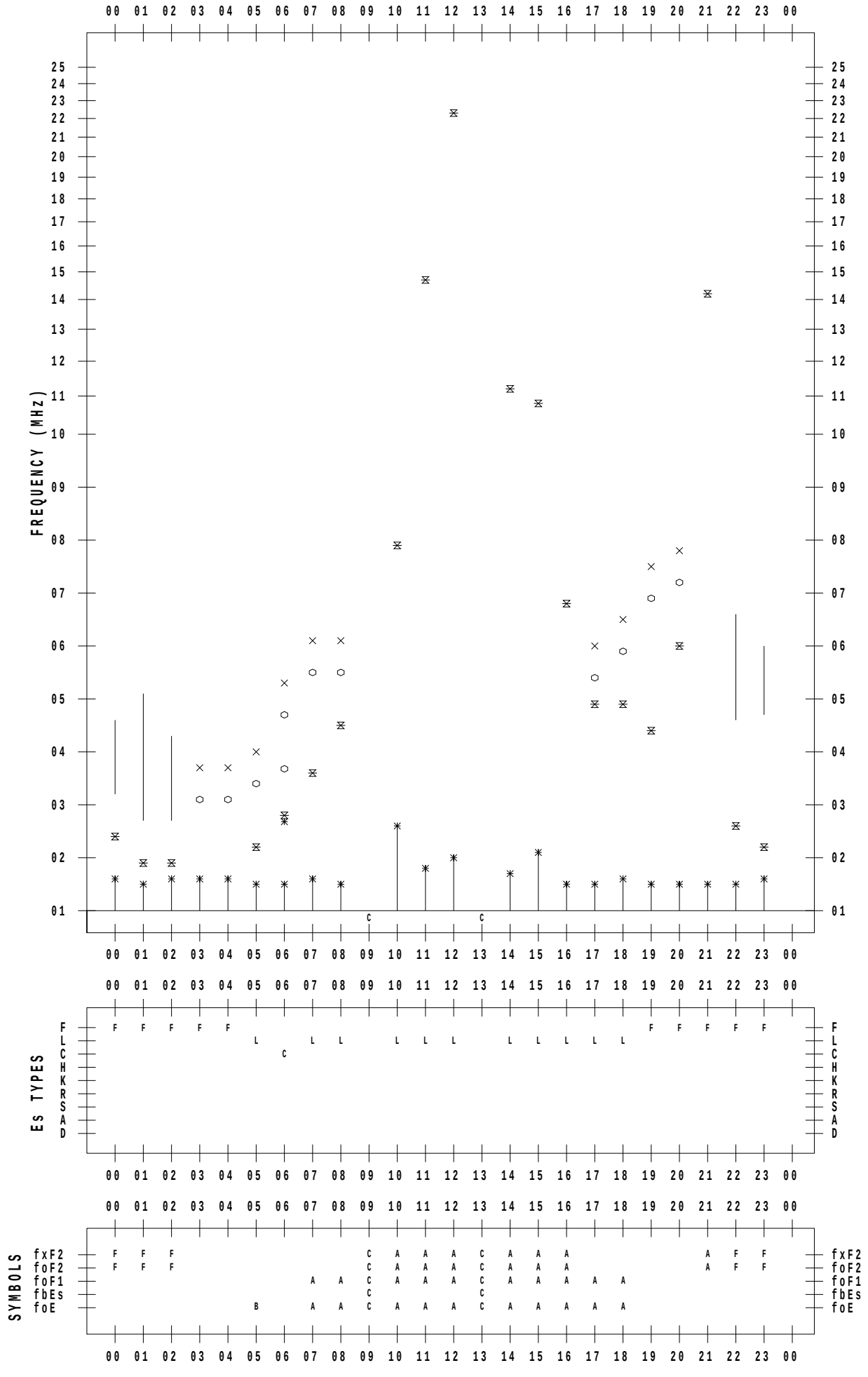
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/18

135 °E MEAN TIME



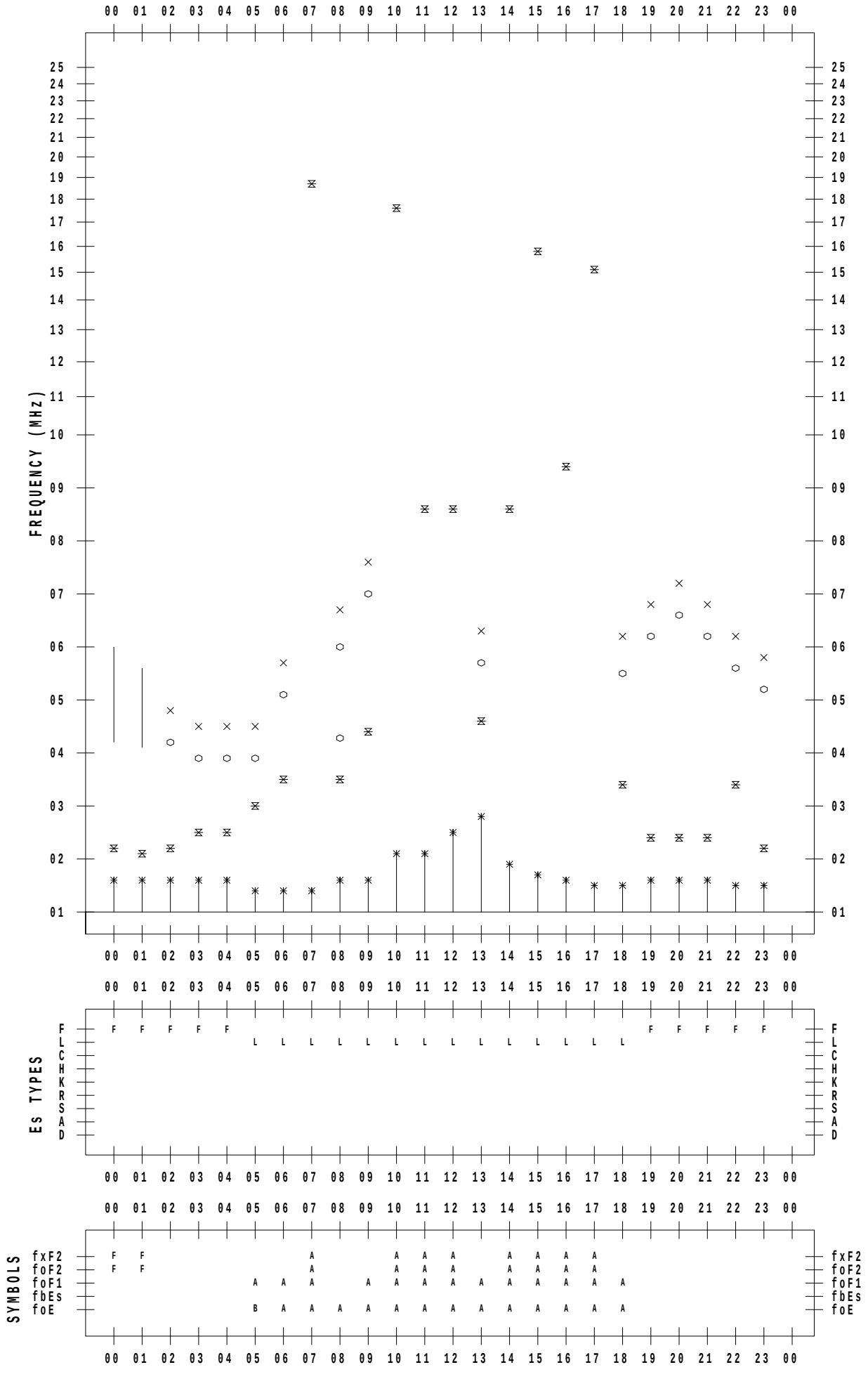
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/19

135 °E MEAN TIME



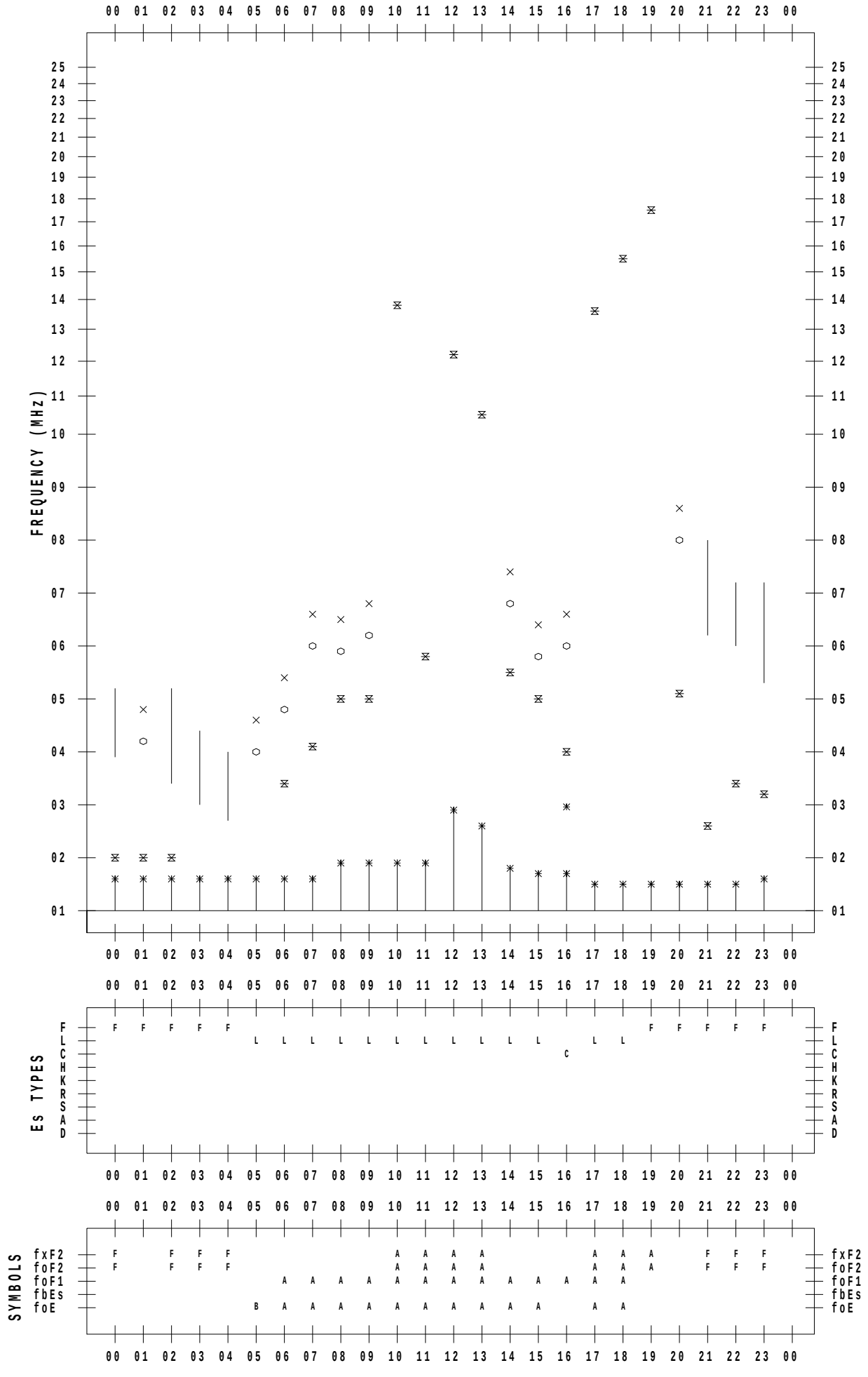
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/20

135 °E MEAN TIME



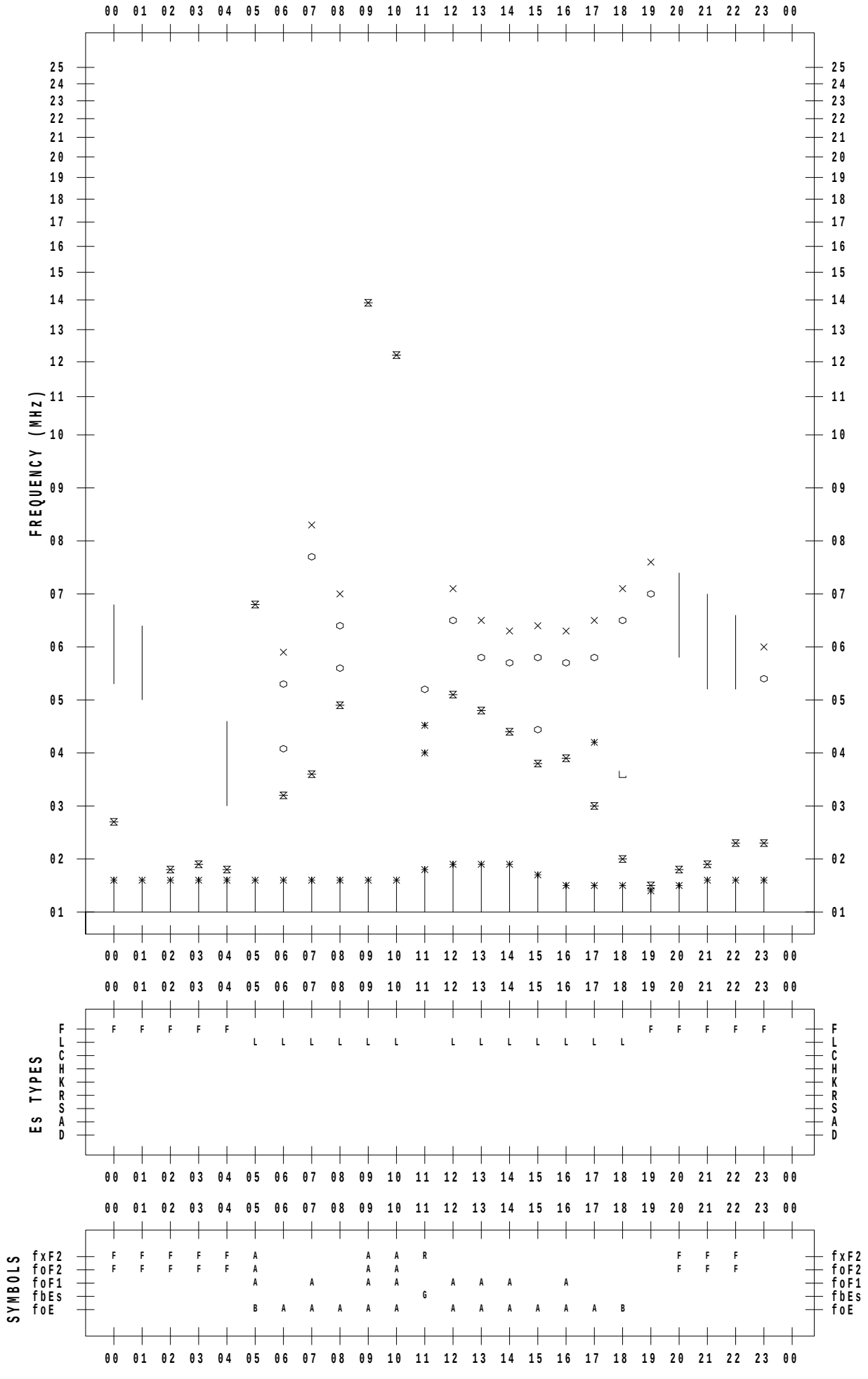
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/21

135 °E MEAN TIME



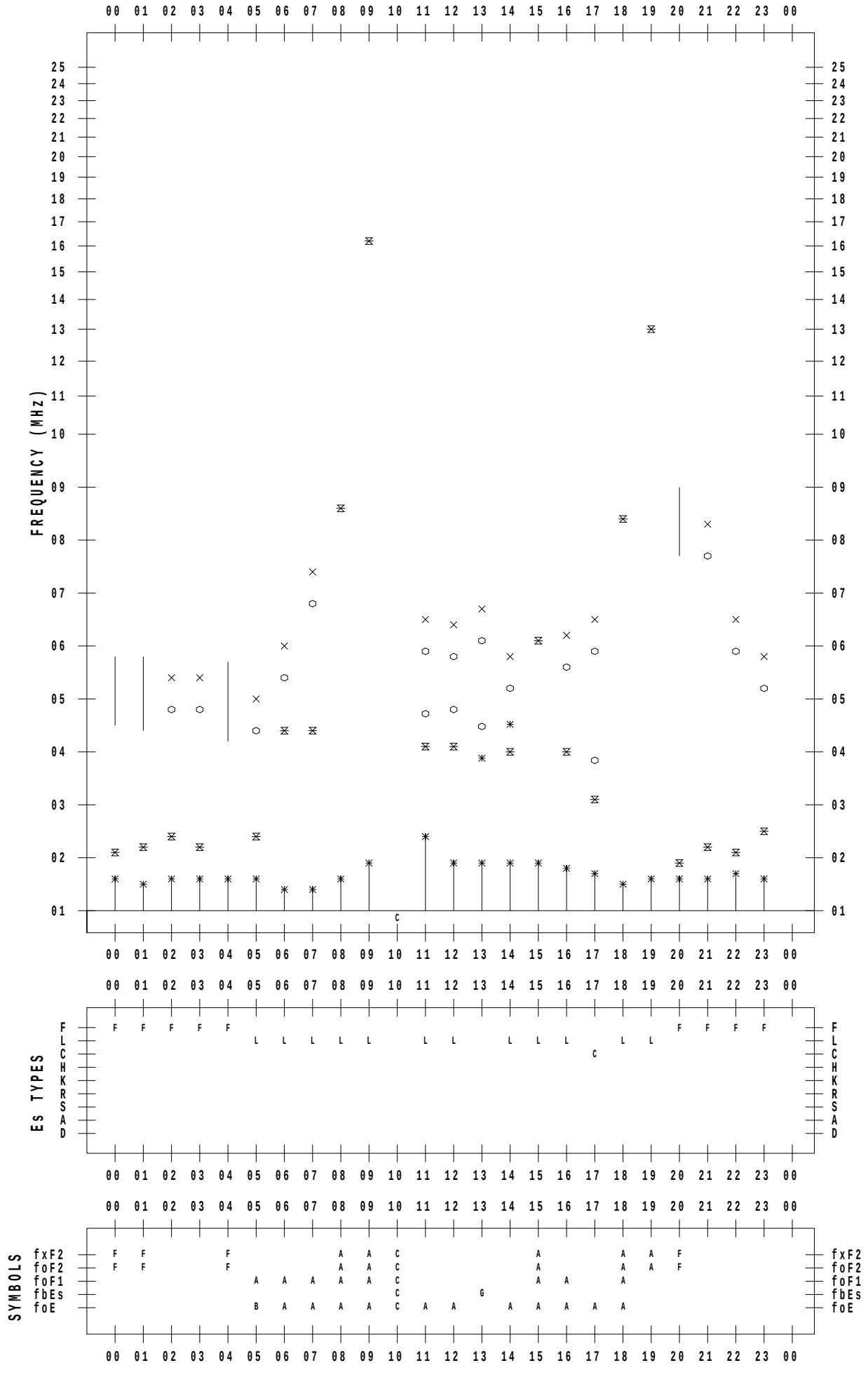
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/22

135 °E MEAN TIME



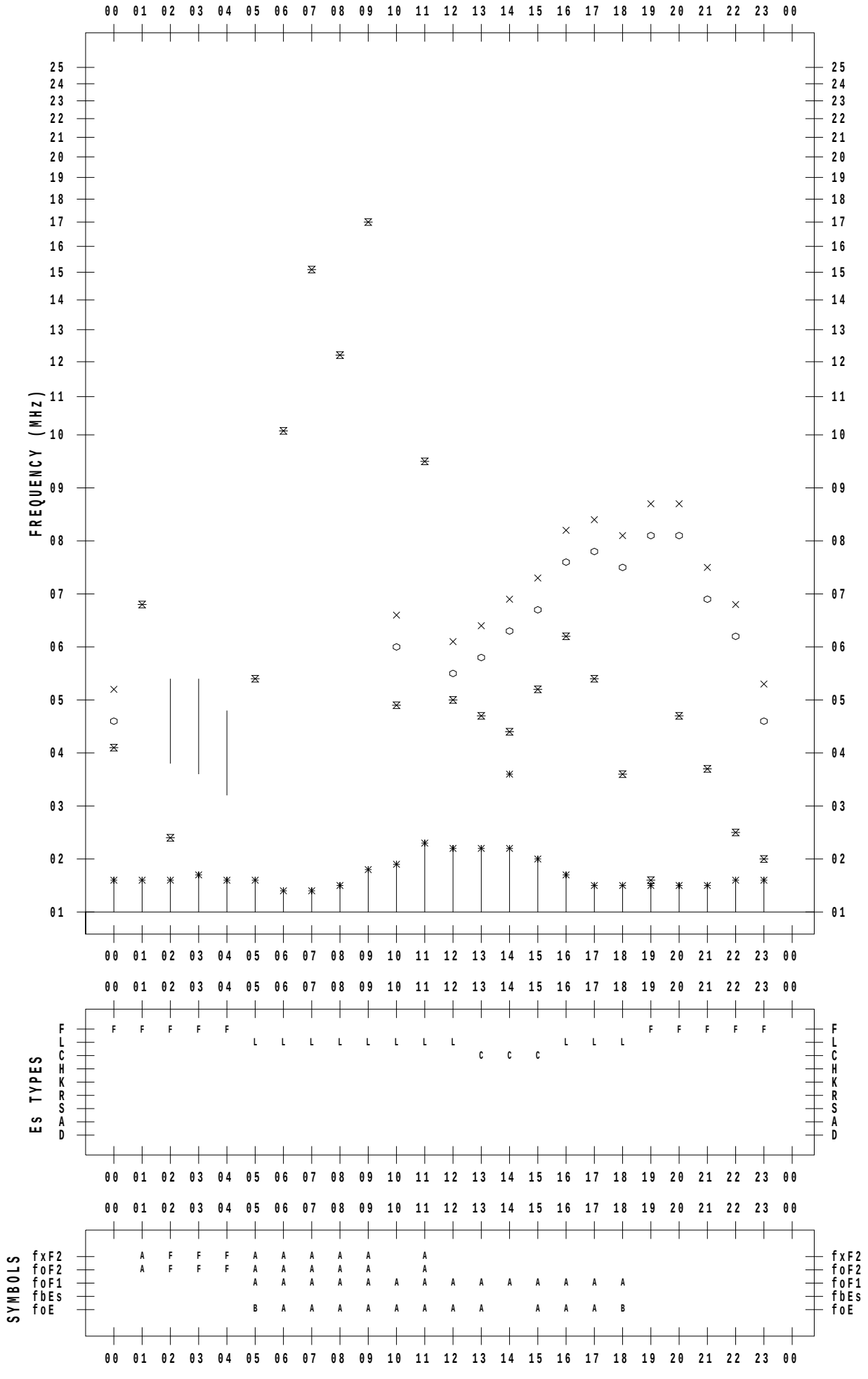
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/23

135 °E MEAN TIME



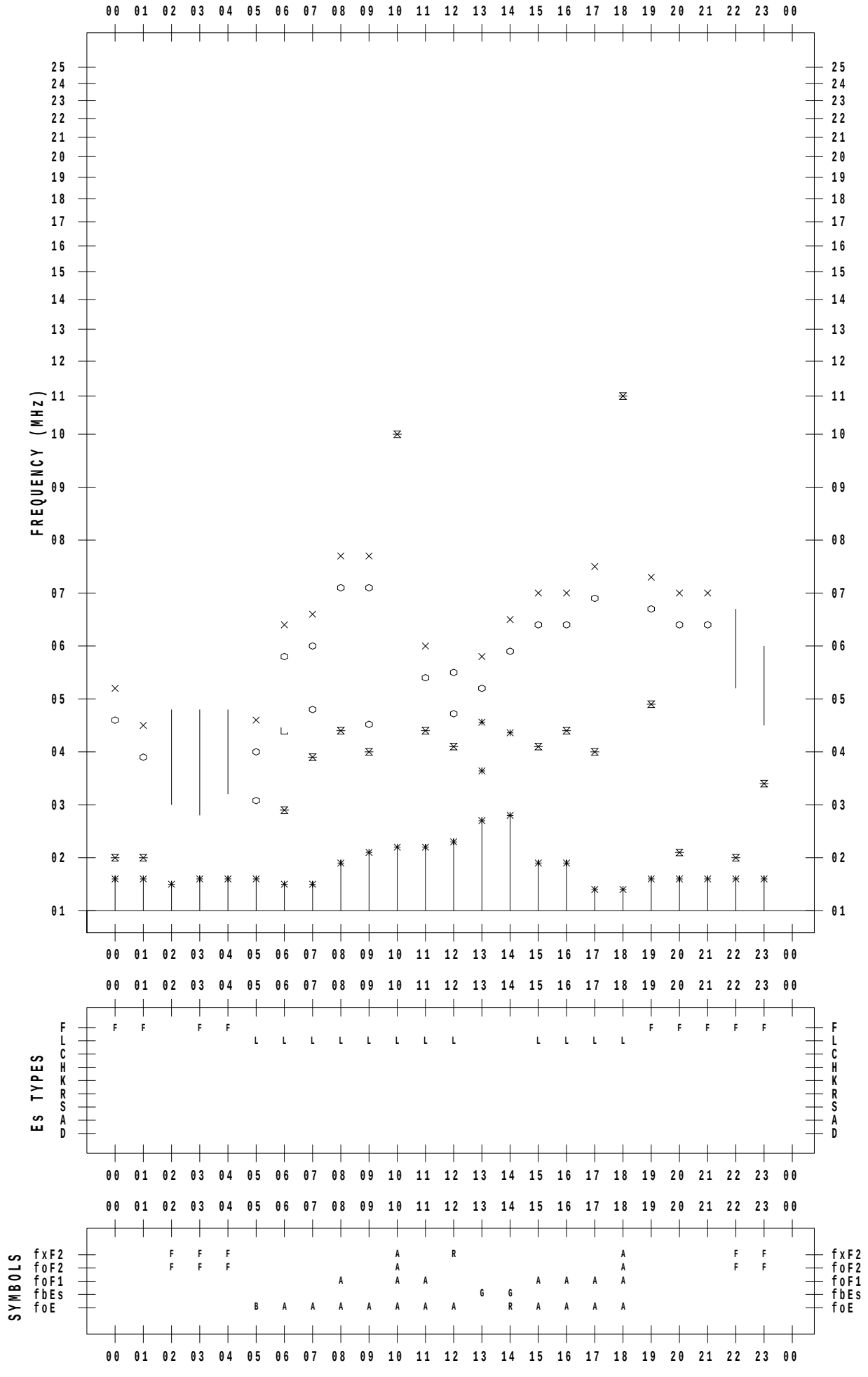
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/24

135 °E MEAN TIME



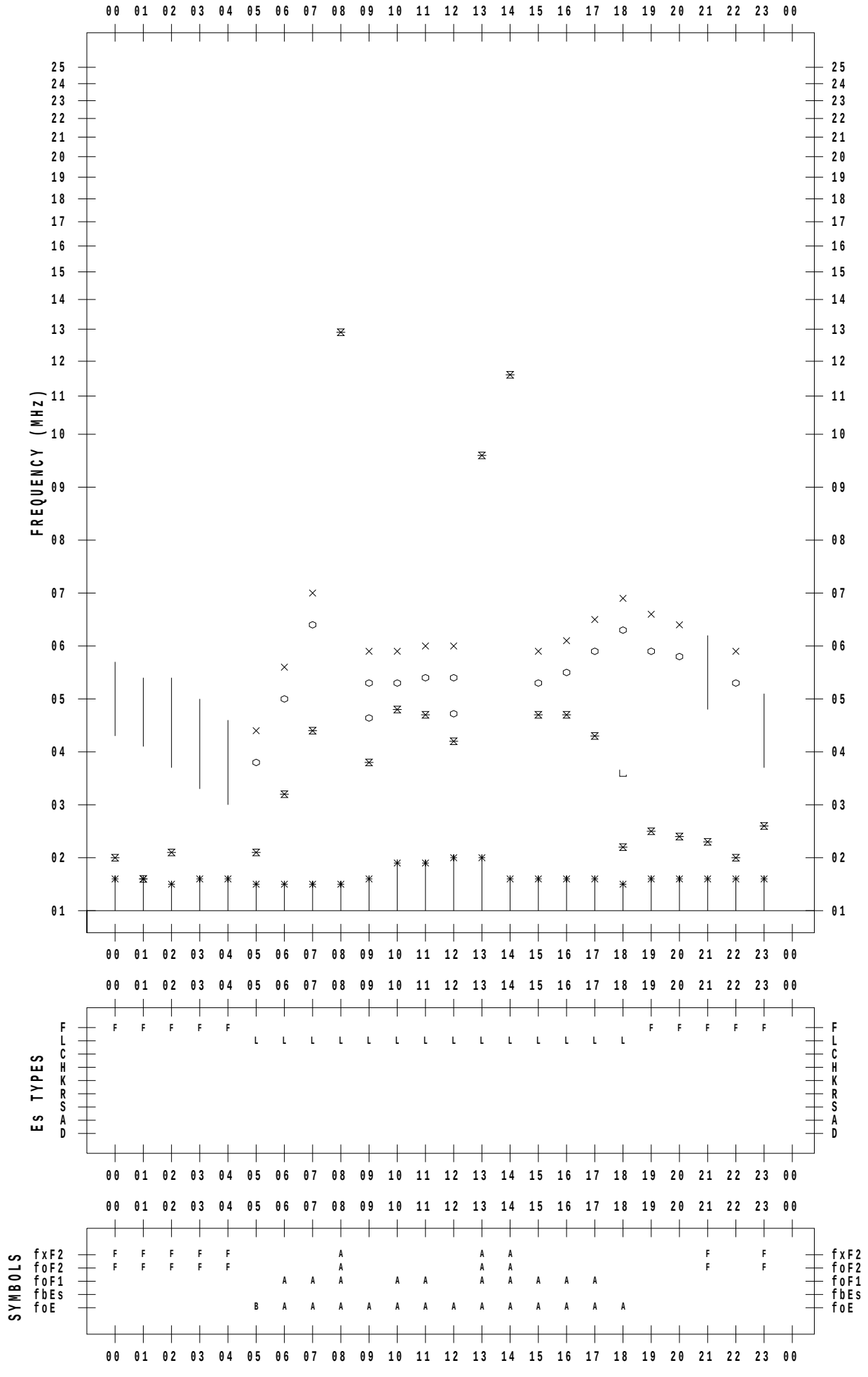
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/25

135 °E MEAN TIME



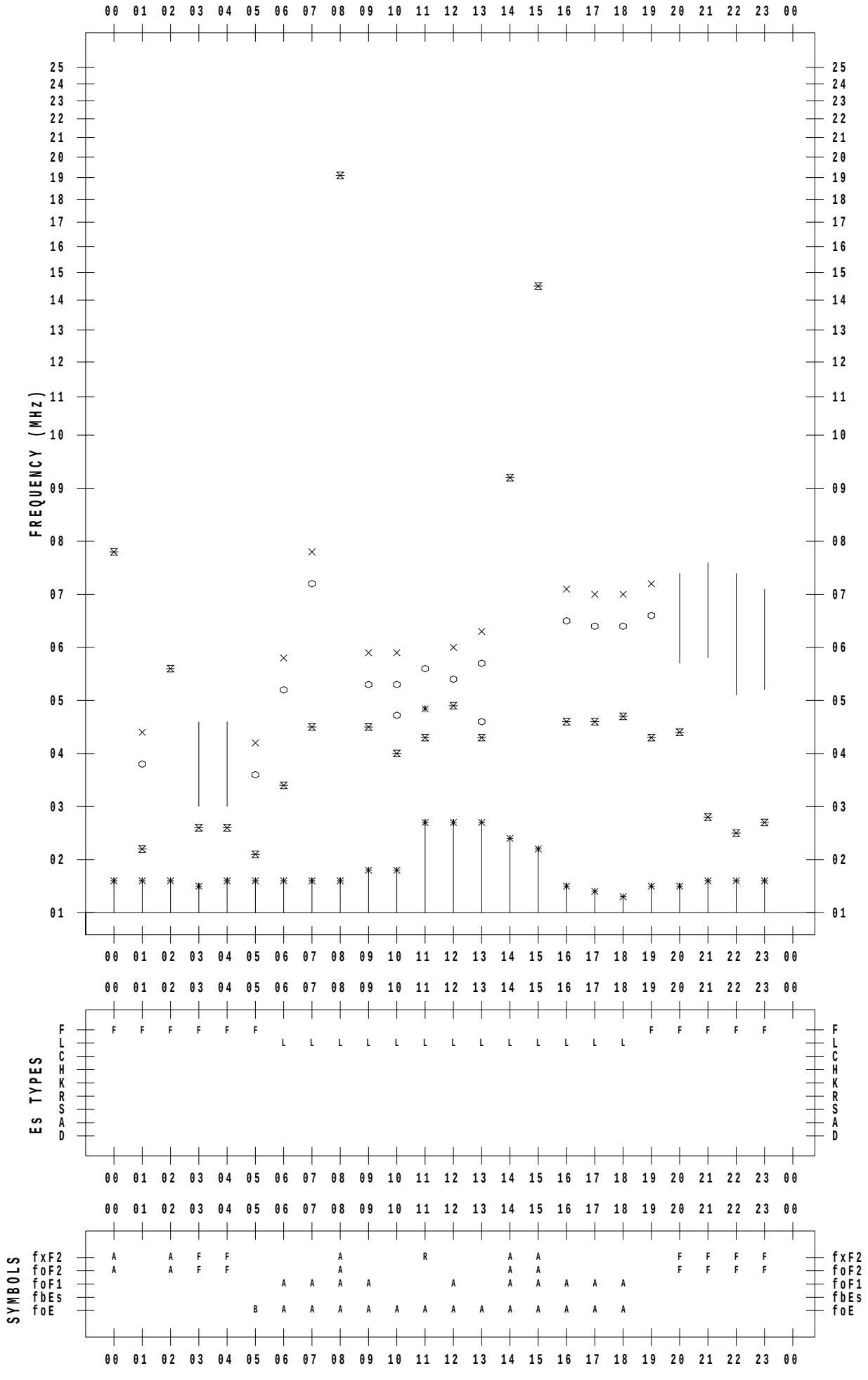
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/26

135 °E MEAN TIME



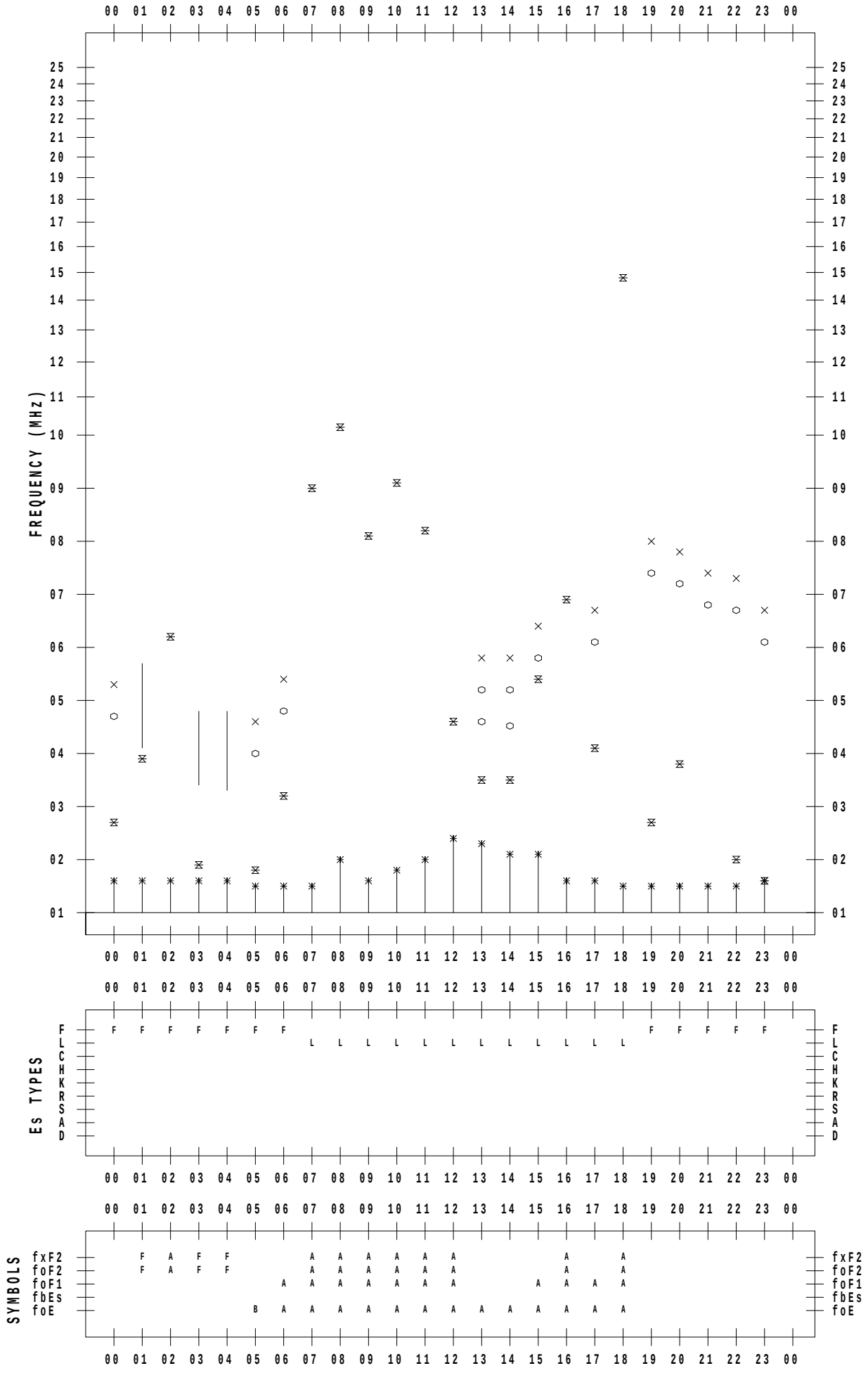
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/27

135 °E MEAN TIME



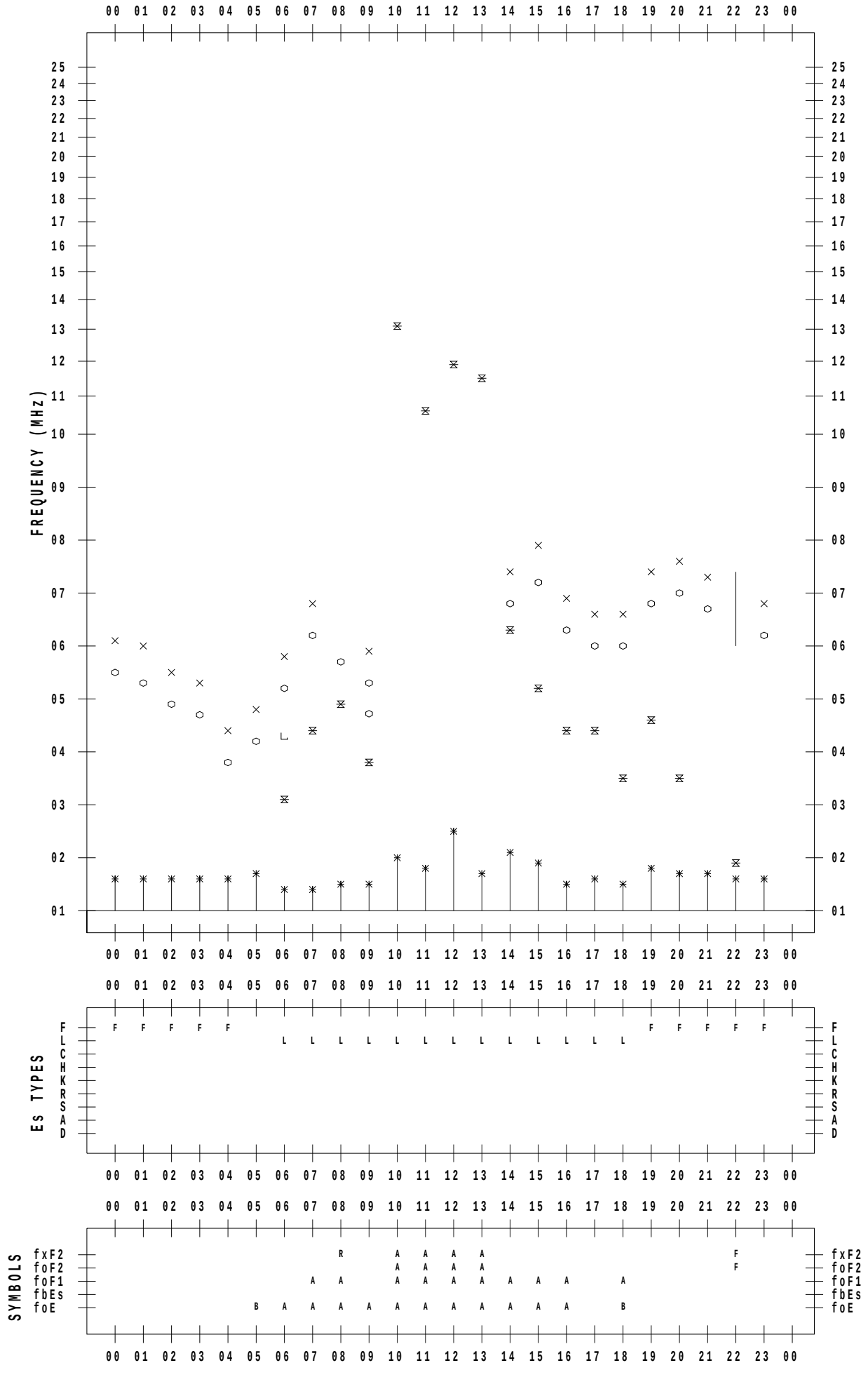
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/28

135 °E MEAN TIME



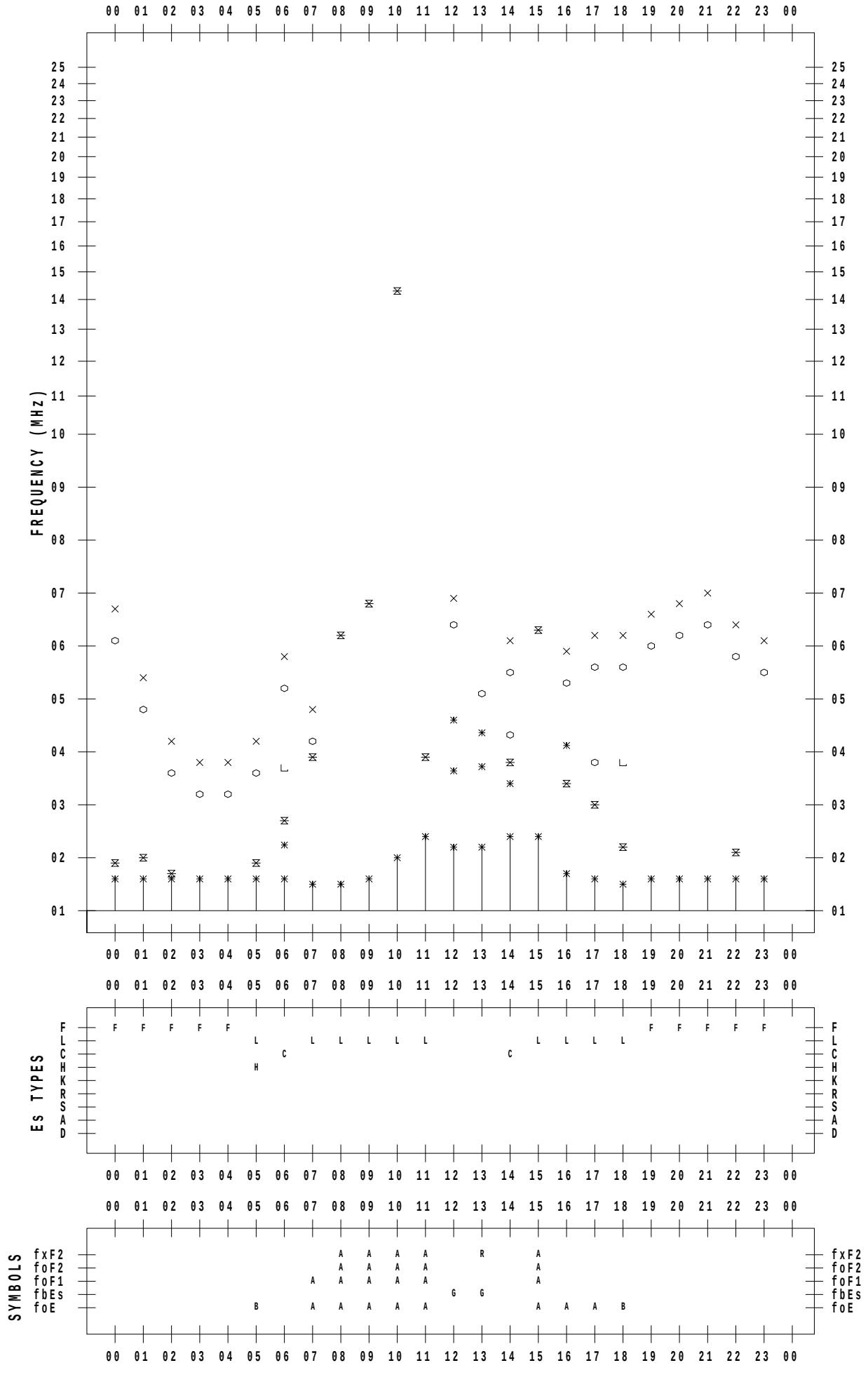
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/29

135 °E MEAN TIME



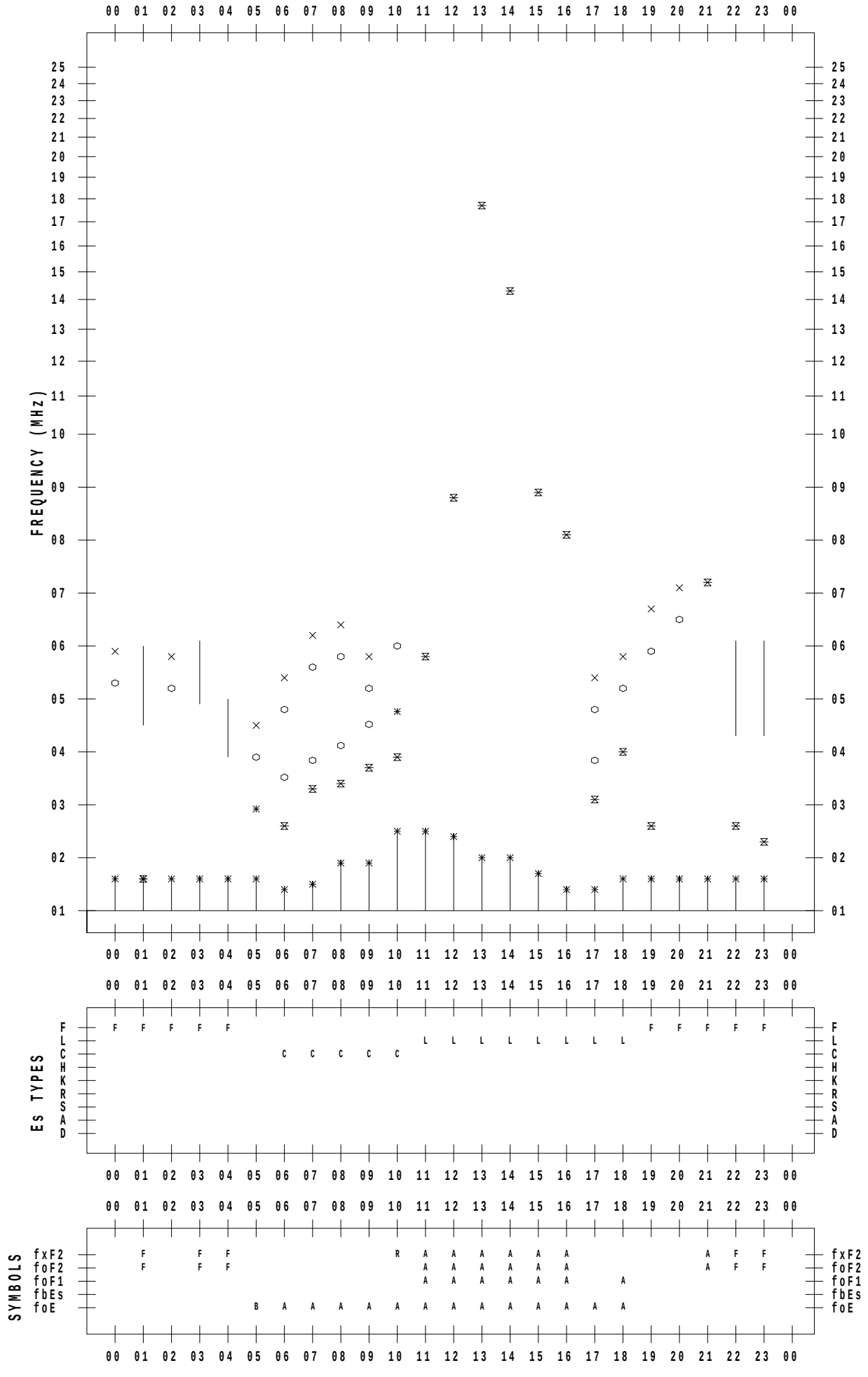
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/30

135 °E MEAN TIME



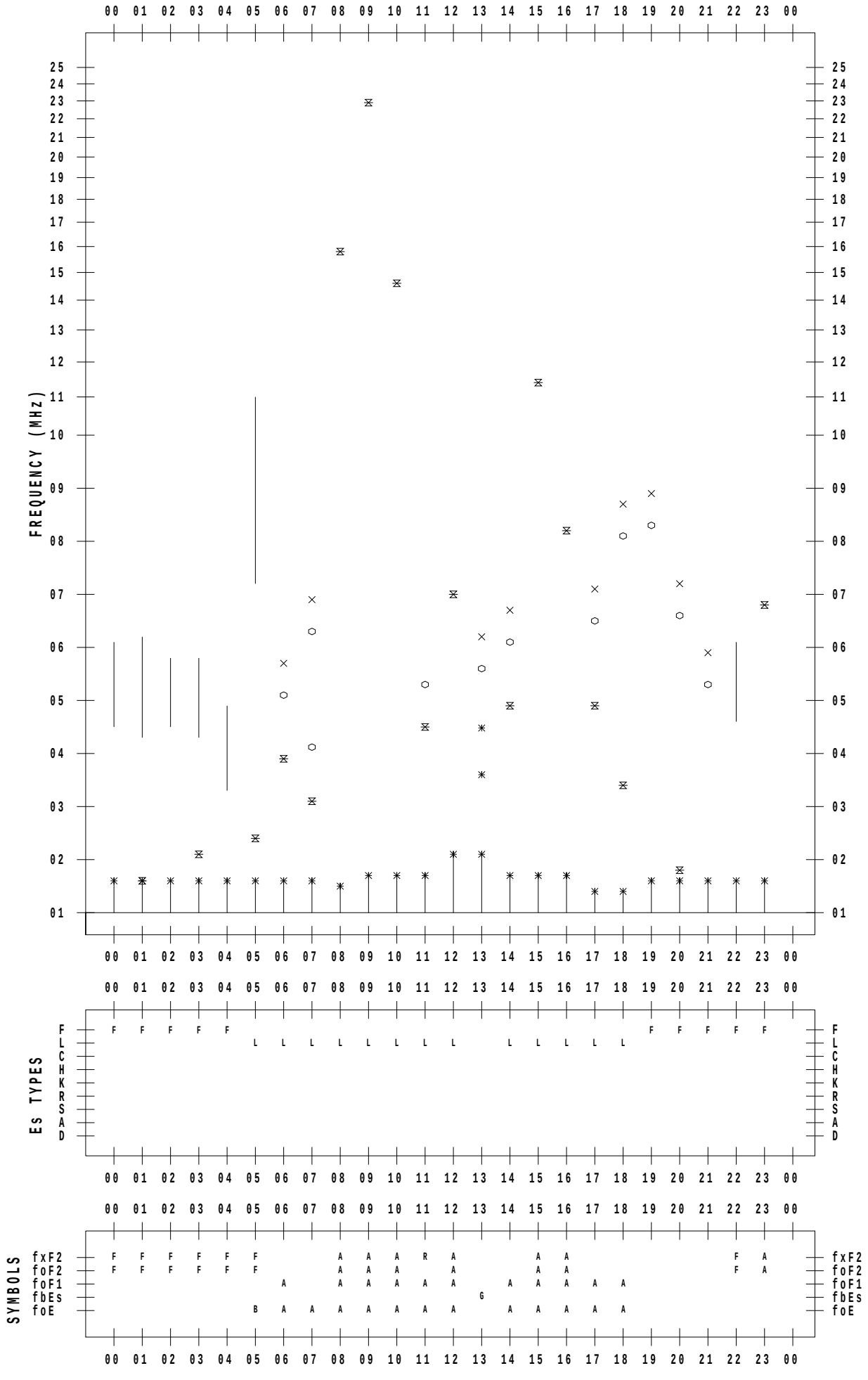
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/ 7/31

135 °E MEAN TIME



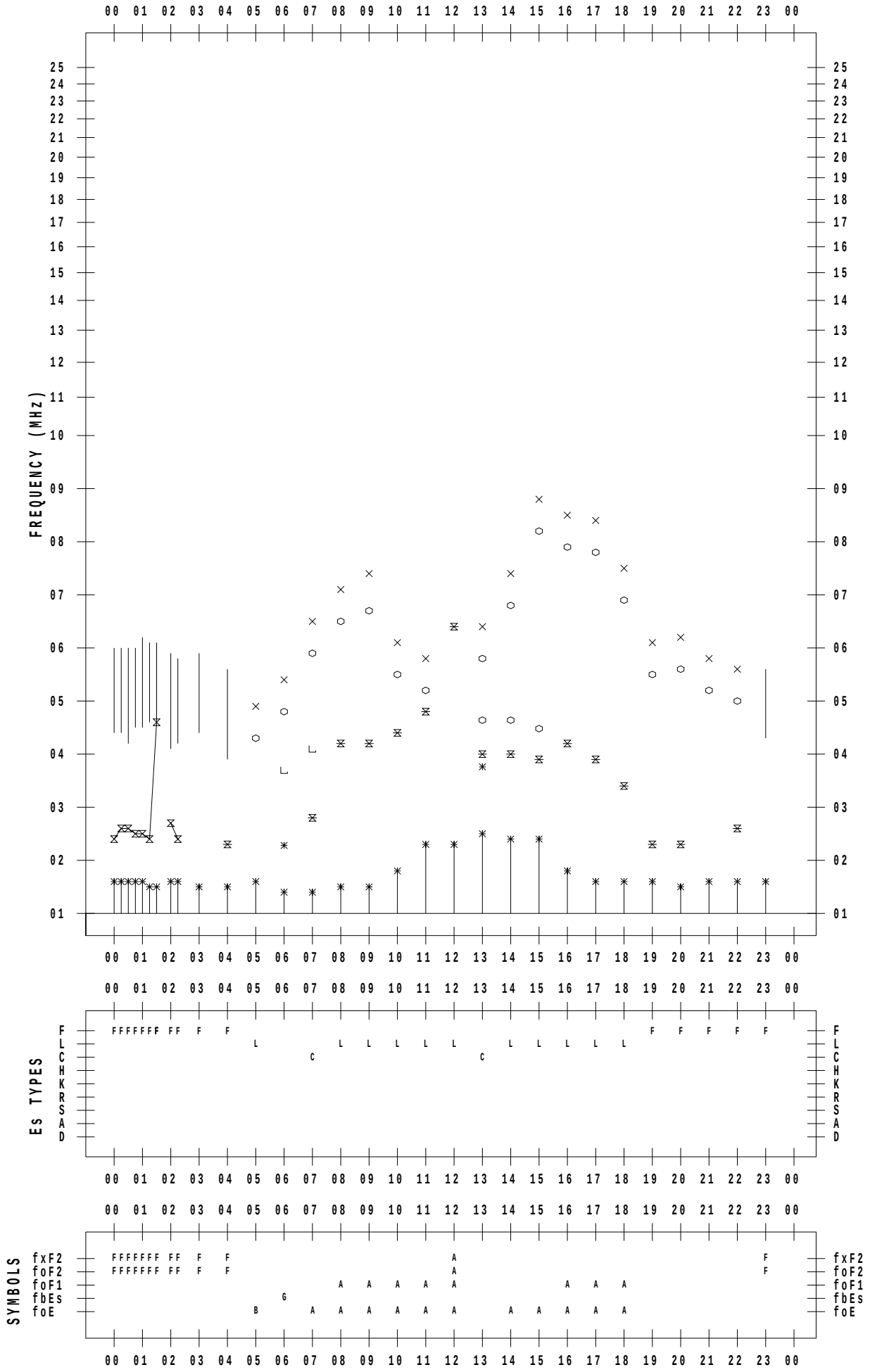
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 1

135 °E MEAN TIME



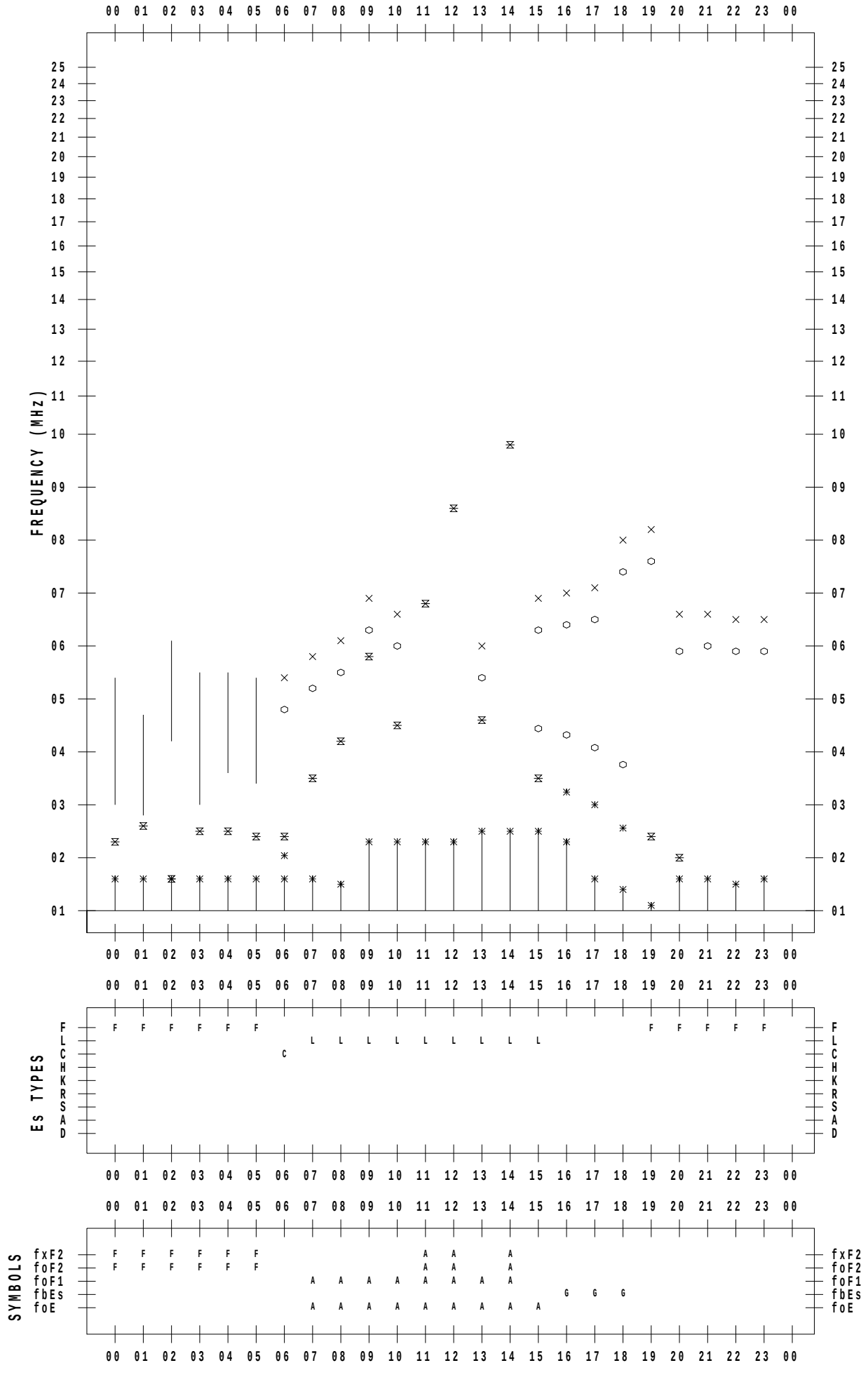
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 2

135 °E MEAN TIME



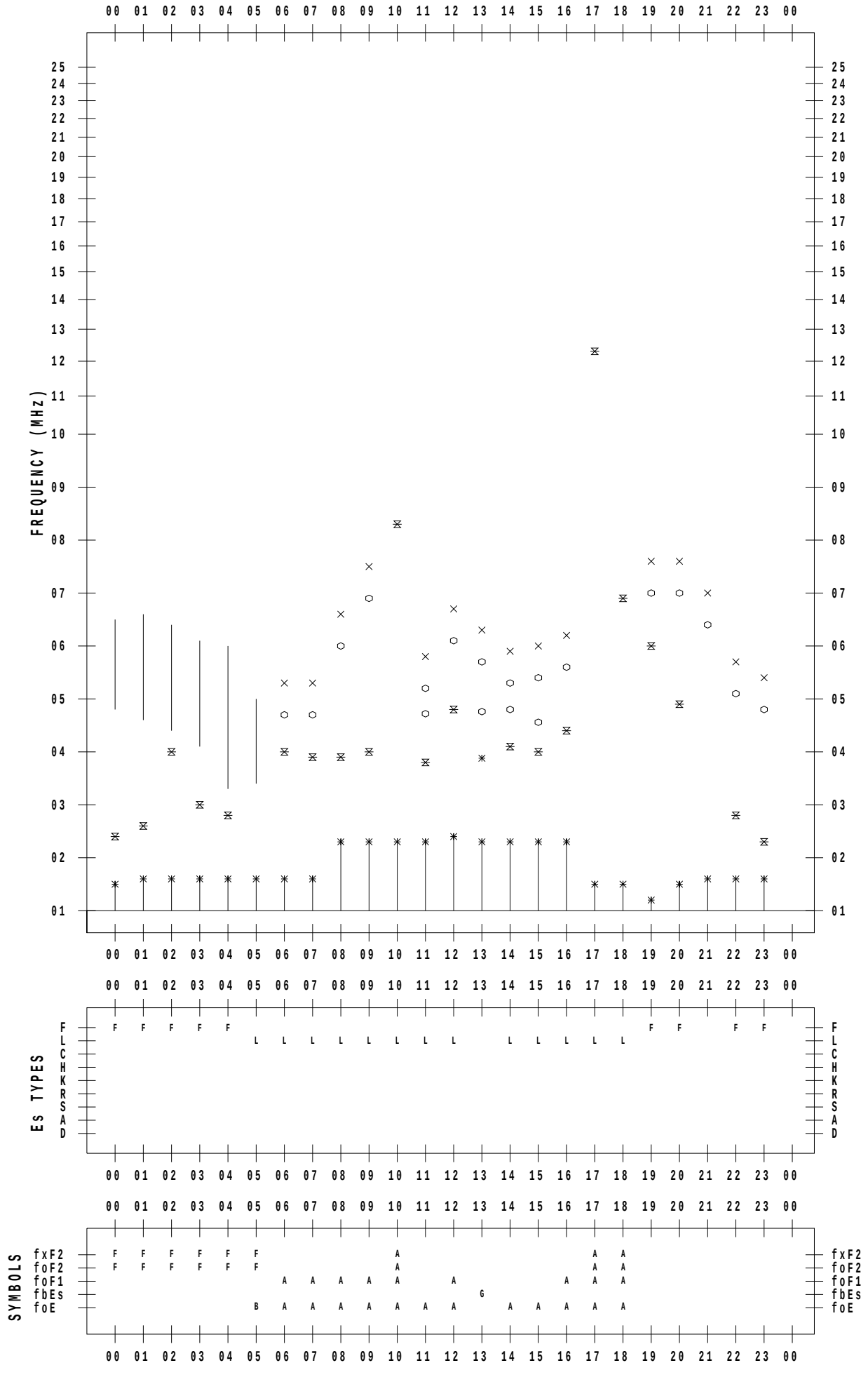
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 3

135 °E MEAN TIME



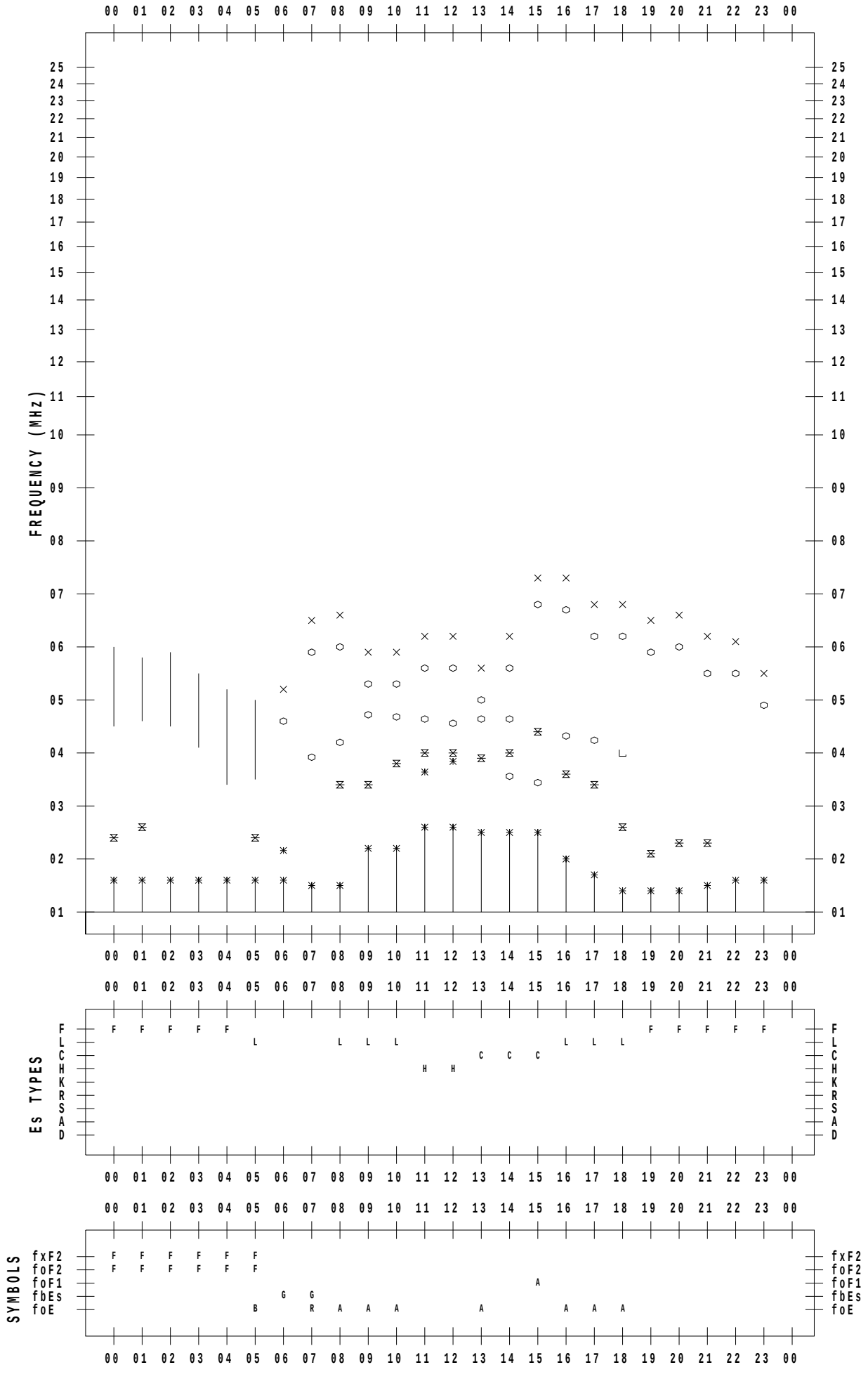
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 4

135 °E MEAN TIME



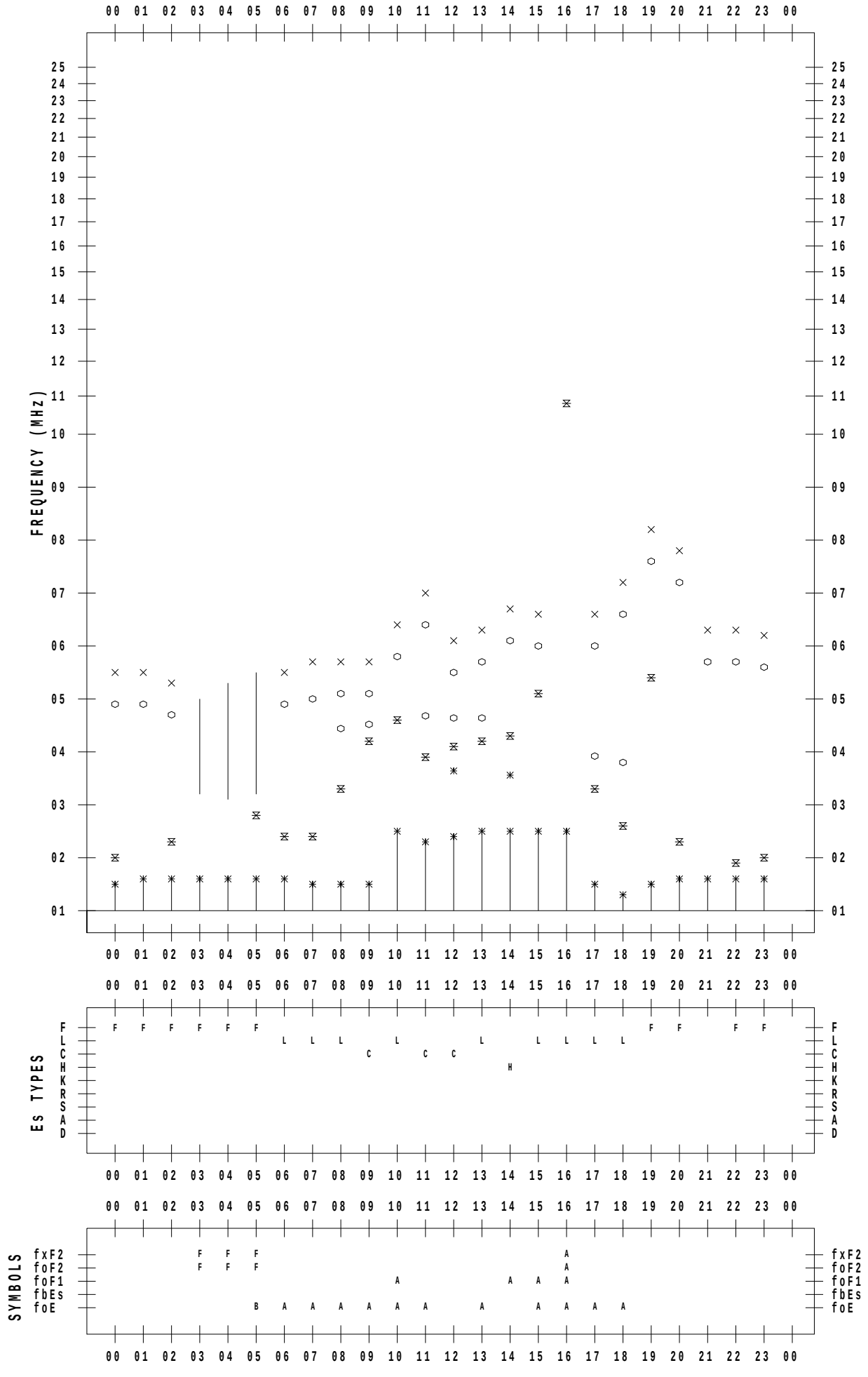
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 5

135 °E MEAN TIME



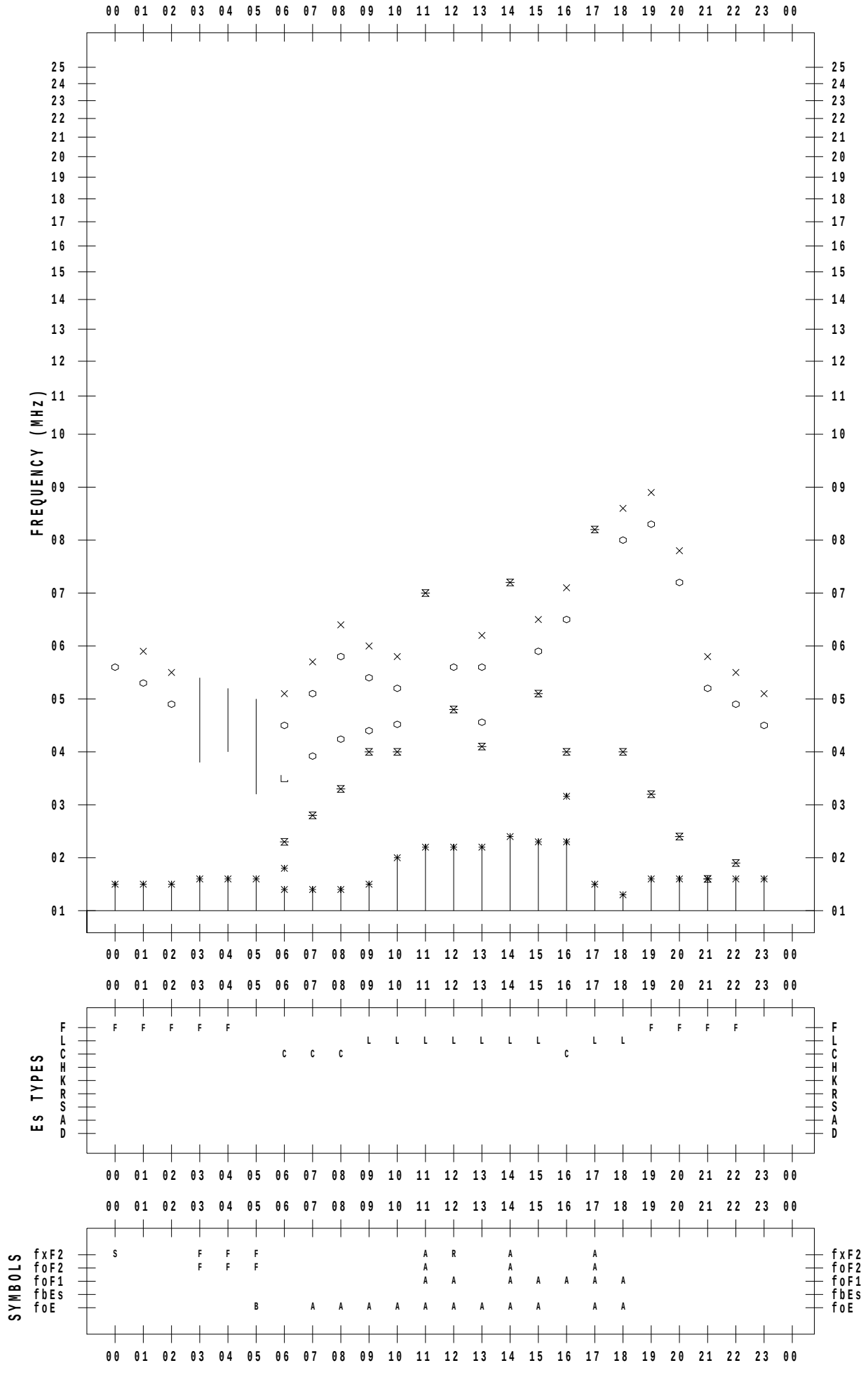
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 6

135 °E MEAN TIME



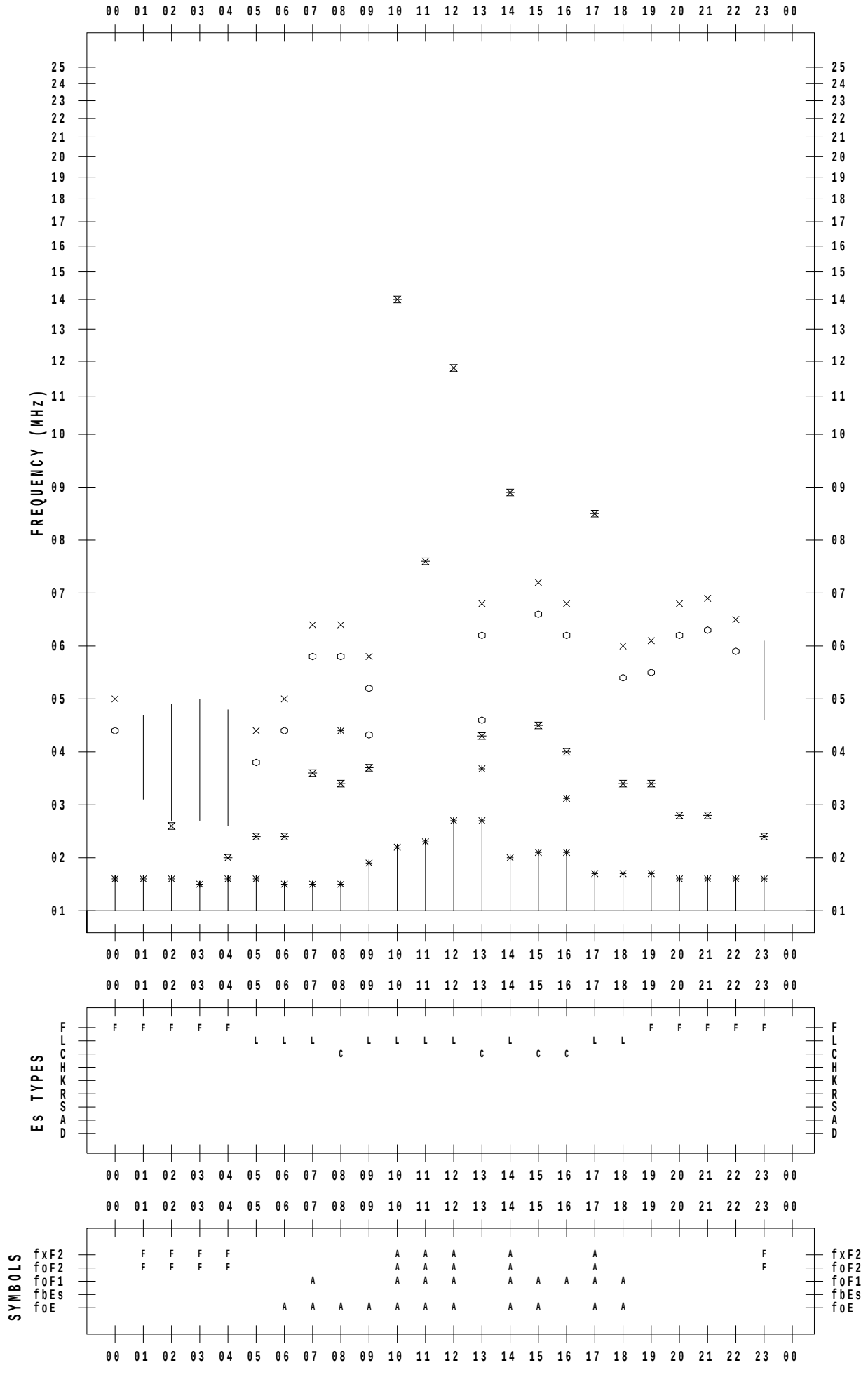
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 7

135 °E MEAN TIME



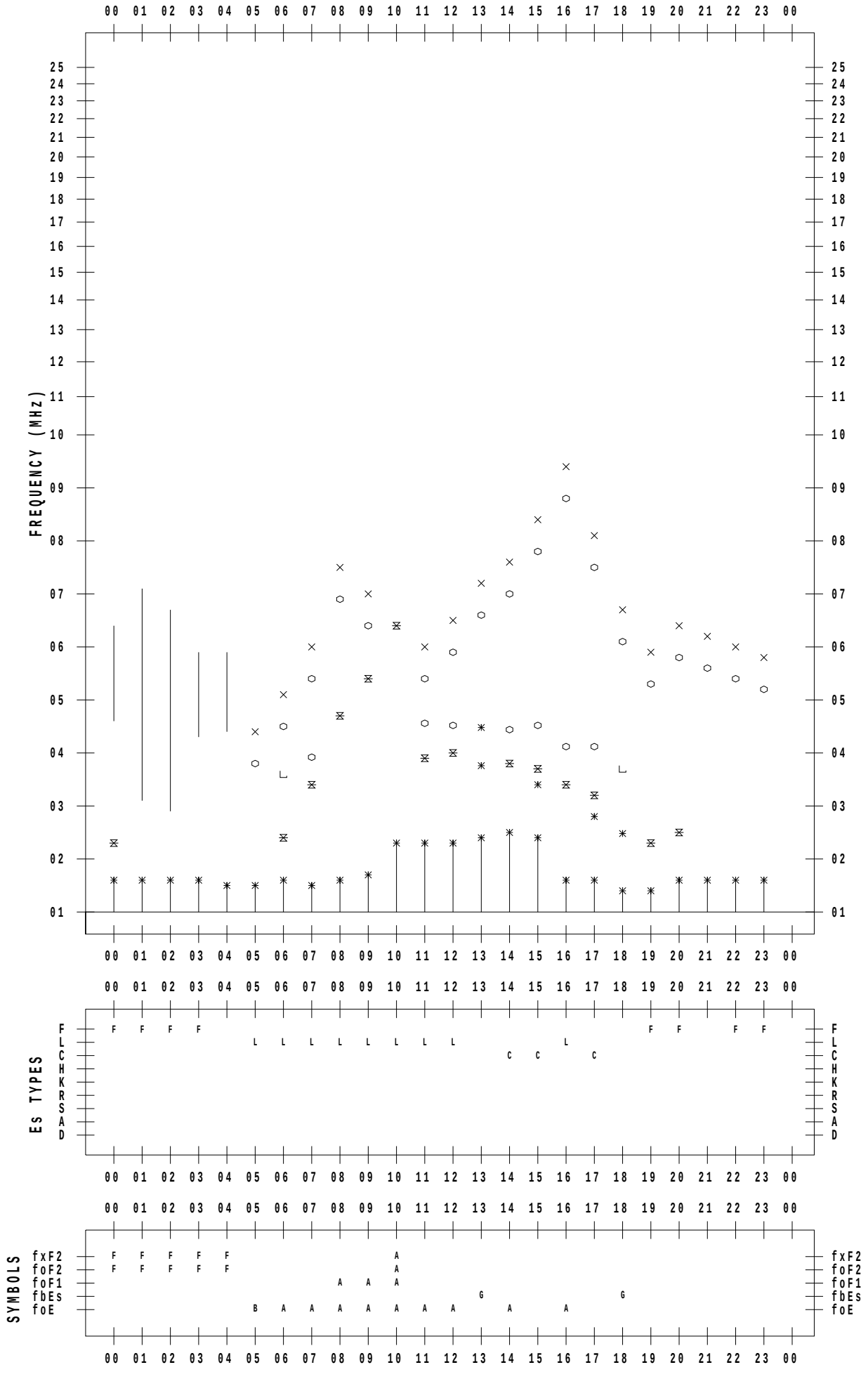
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 8

135 °E MEAN TIME



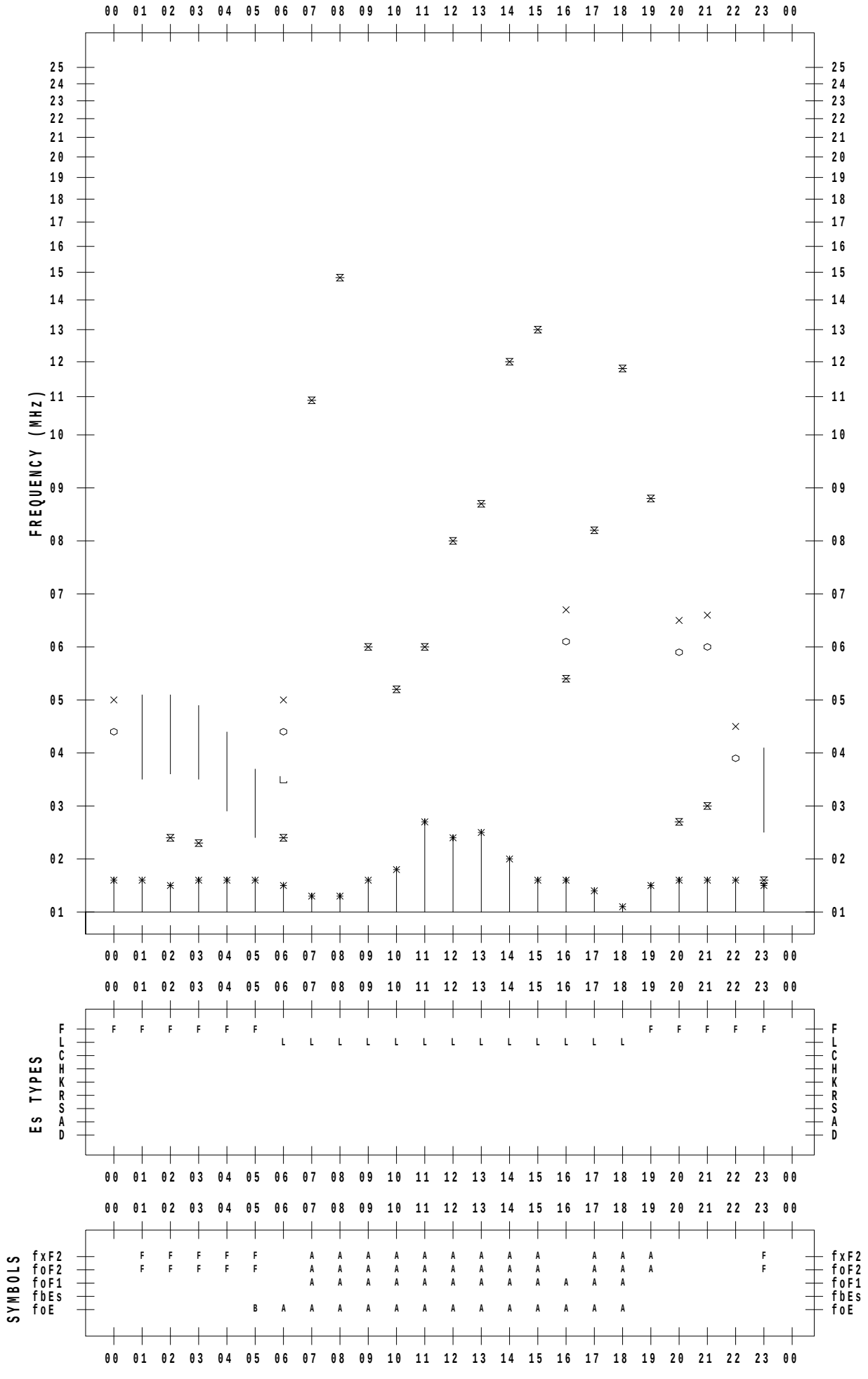
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/ 9

135 °E MEAN TIME



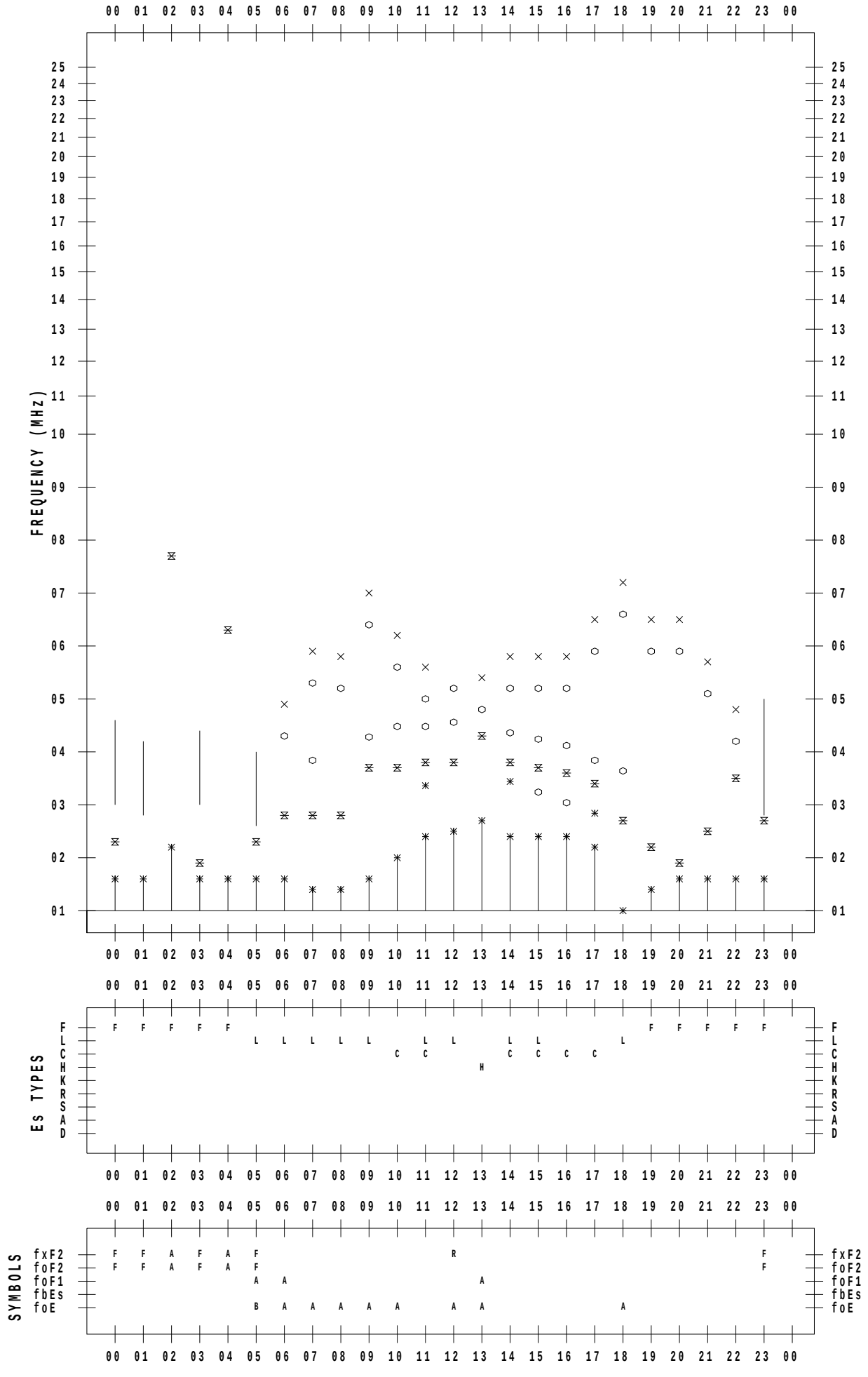
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/10

135 °E MEAN TIME



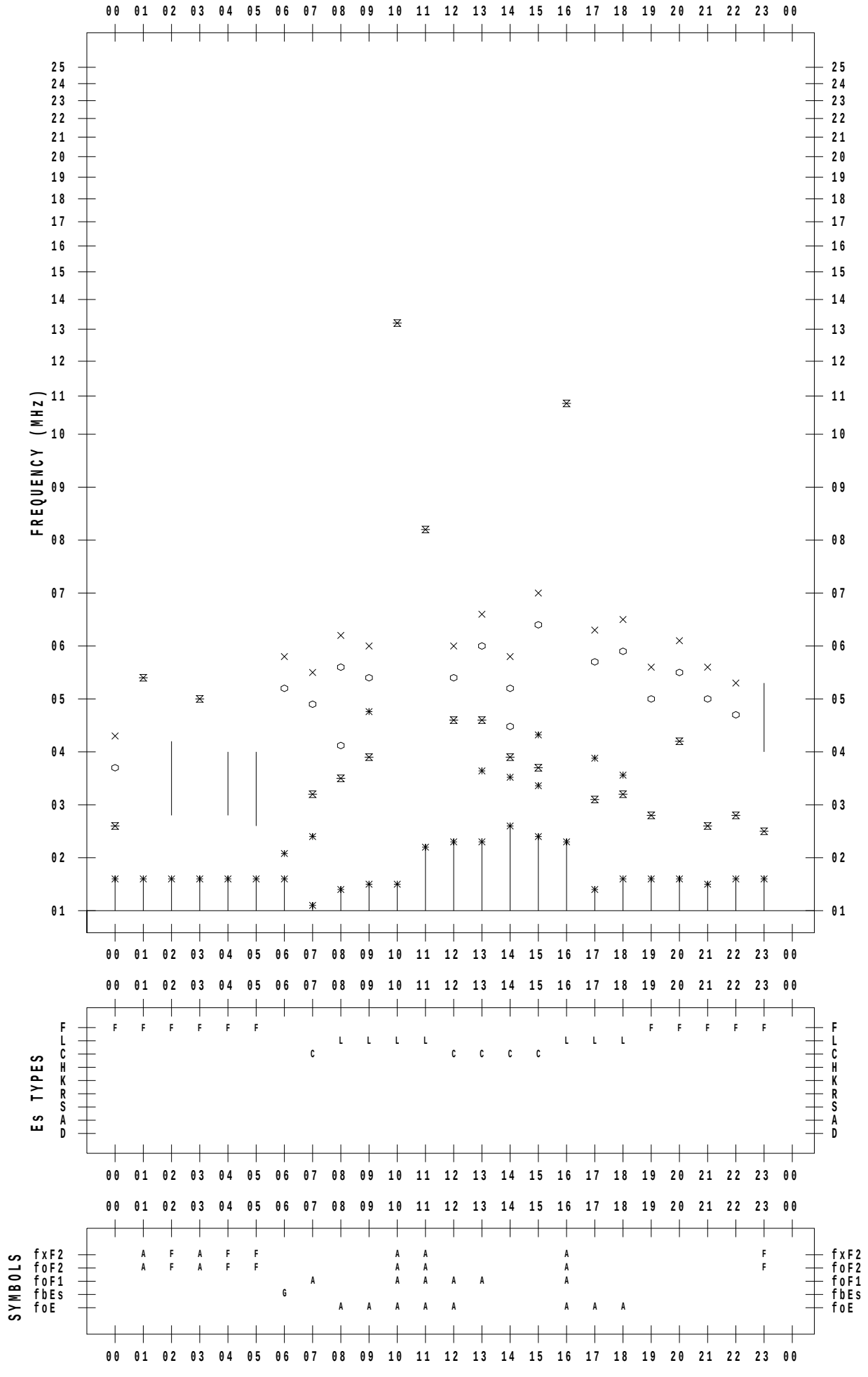
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/11

135 °E MEAN TIME



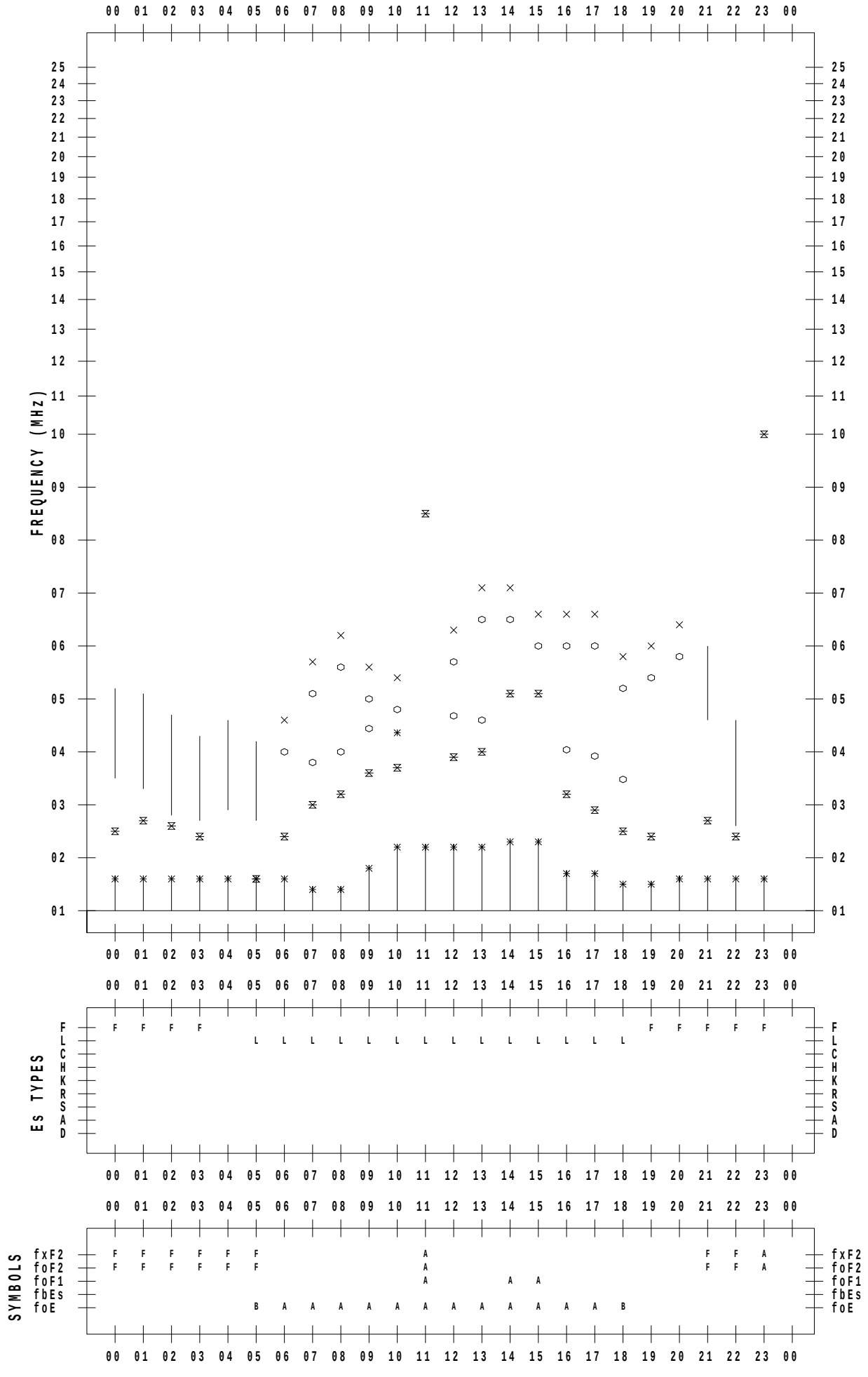
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/12

135 °E MEAN TIME



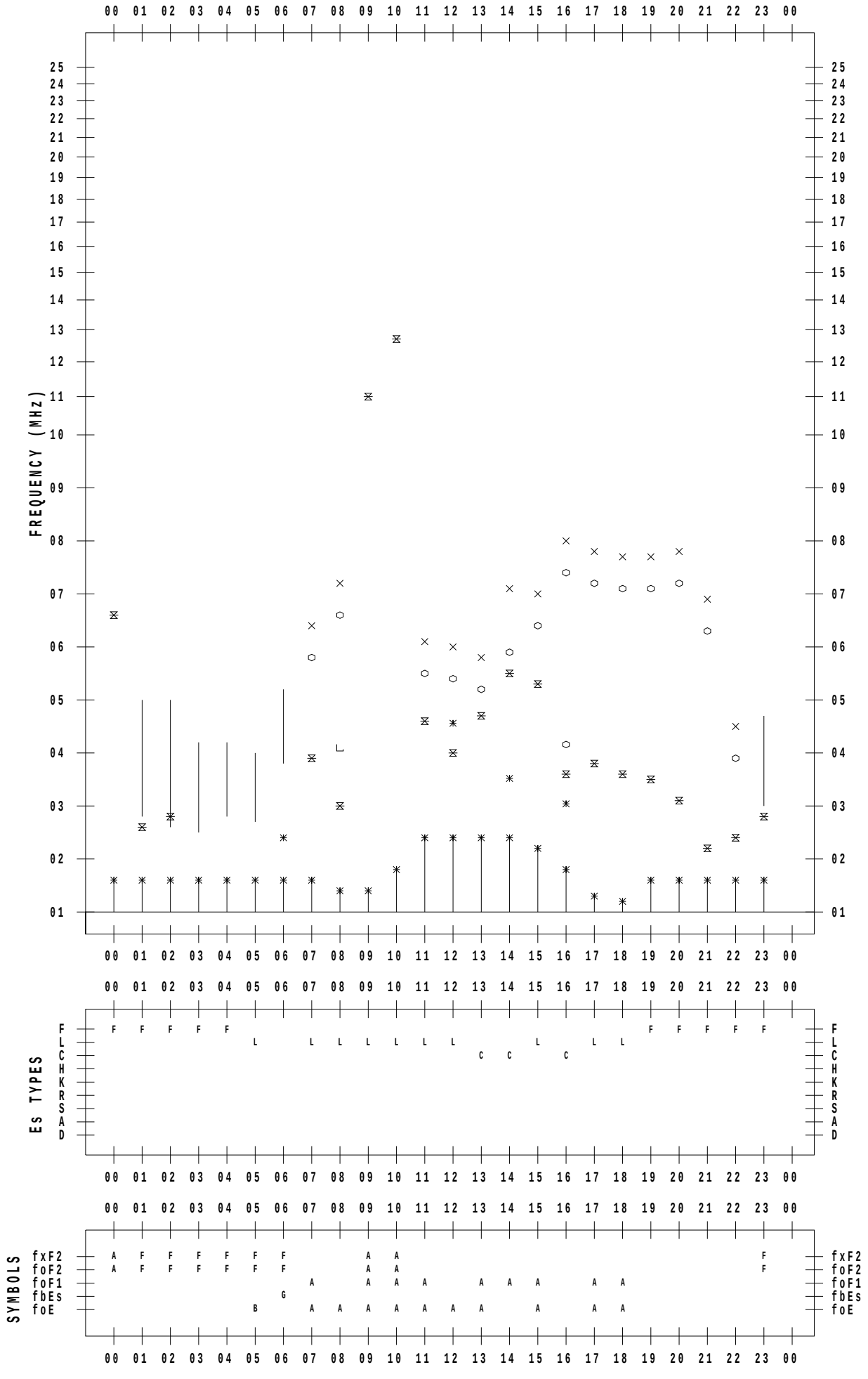
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/13

135 °E MEAN TIME



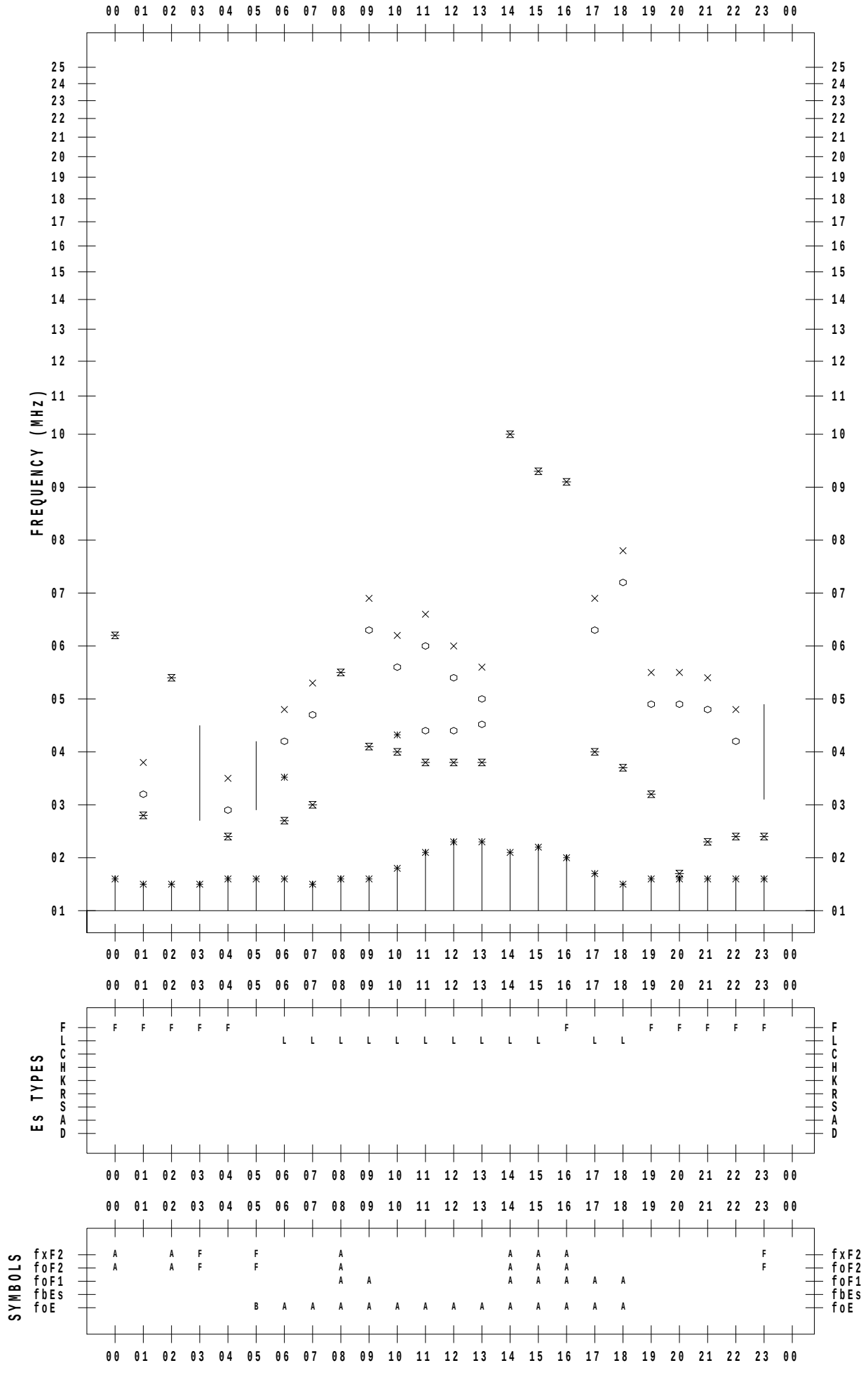
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/14

135 °E MEAN TIME



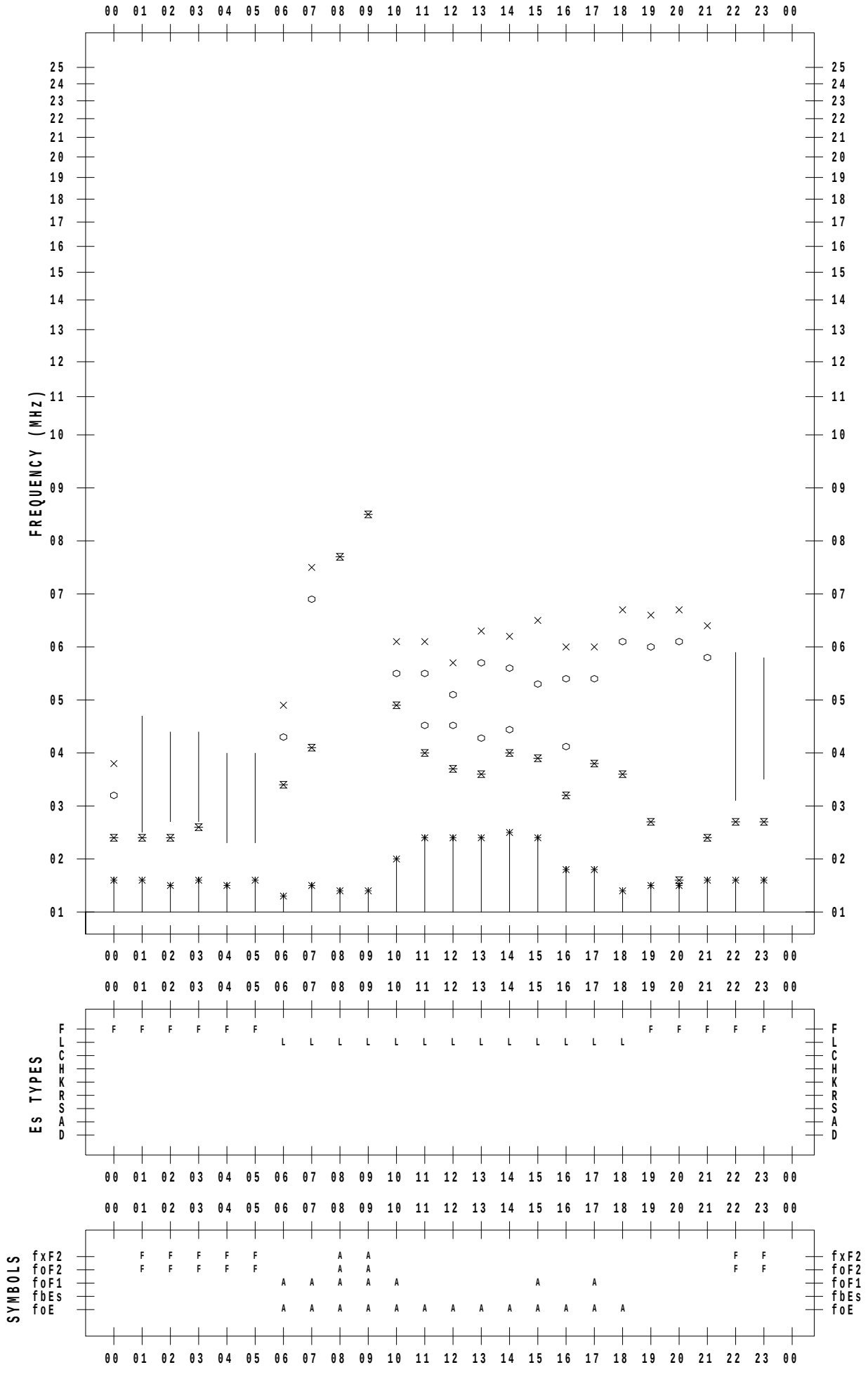
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/15

135 °E MEAN TIME



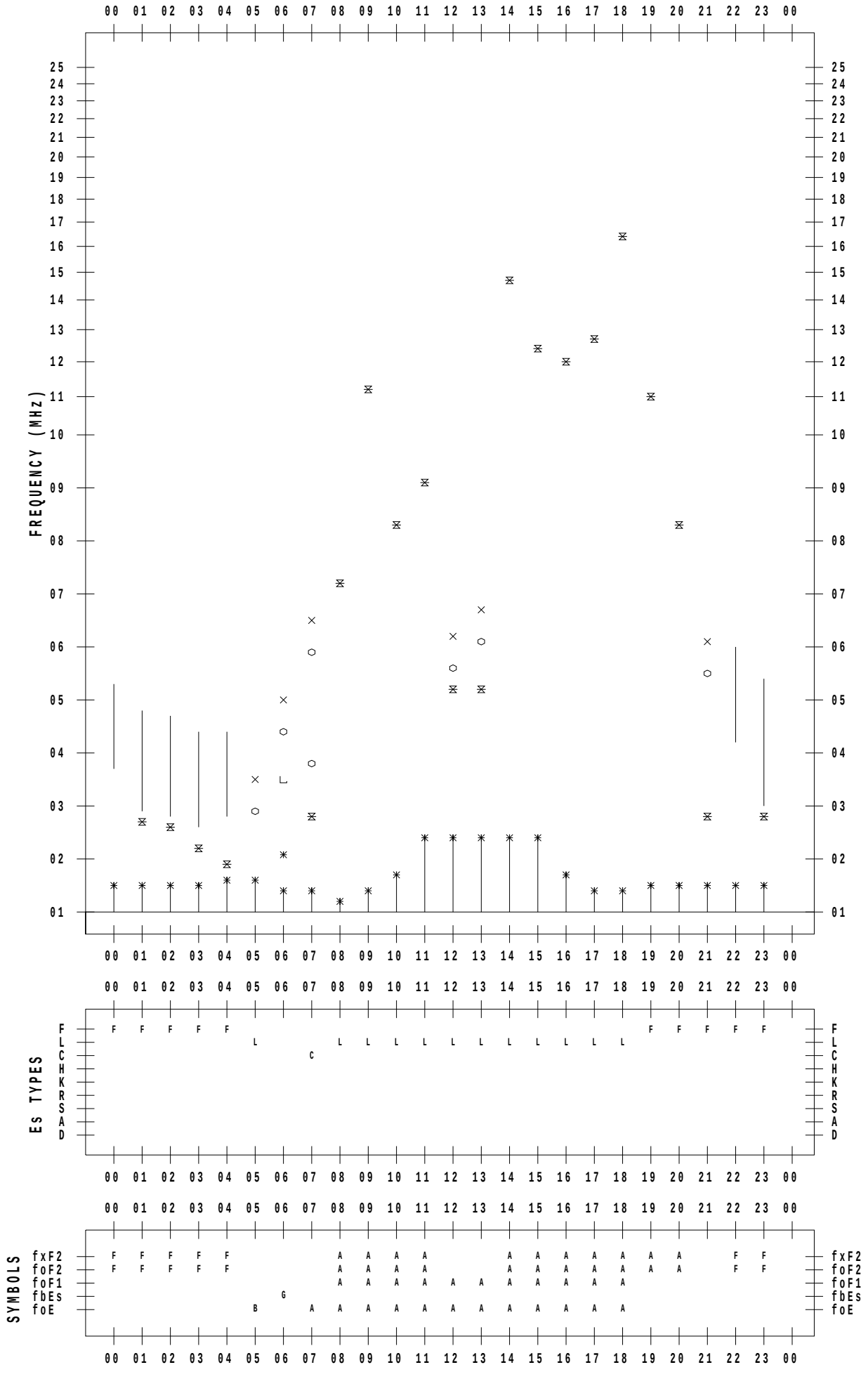
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/16

135 °E MEAN TIME



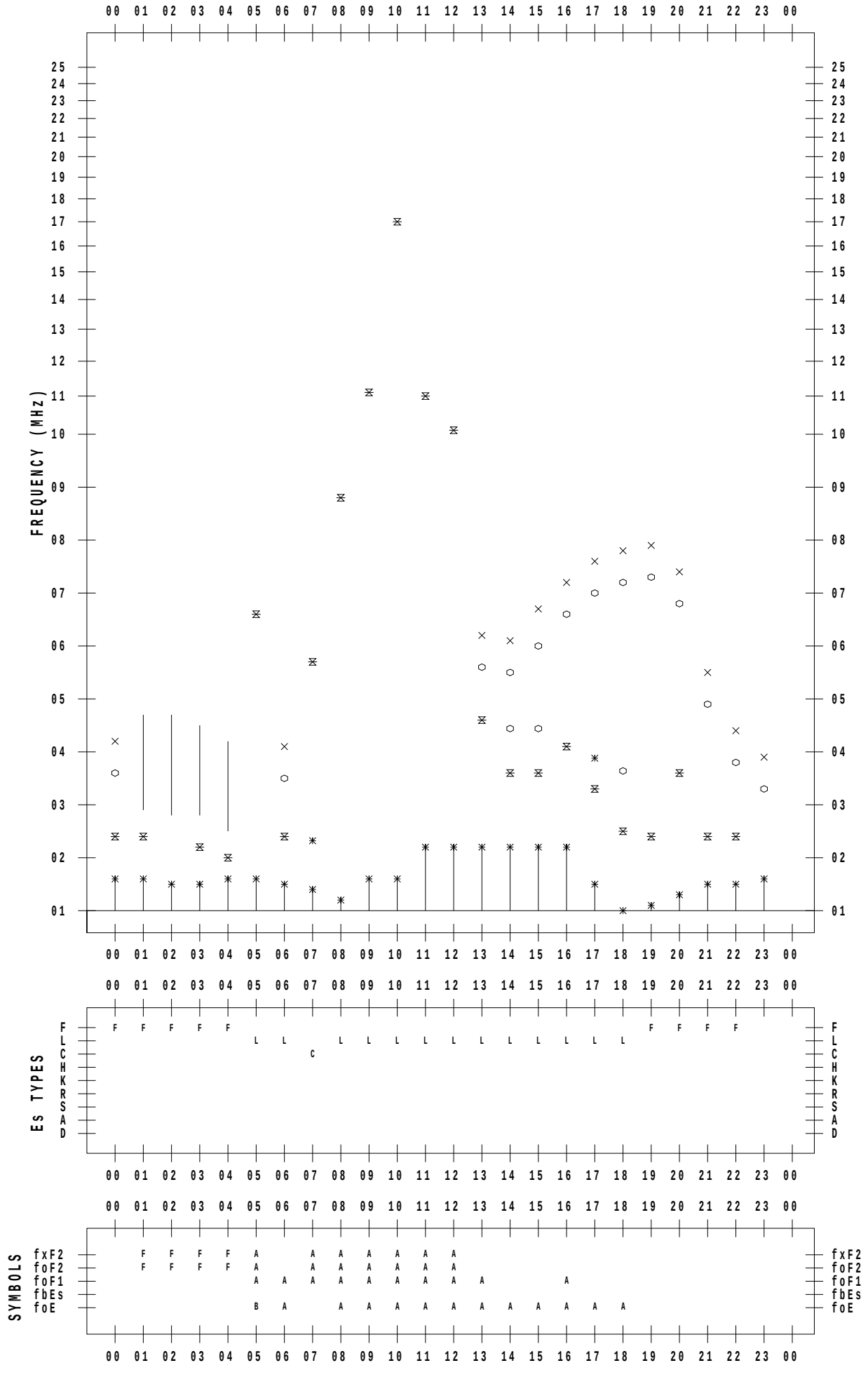
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/17

135 °E MEAN TIME



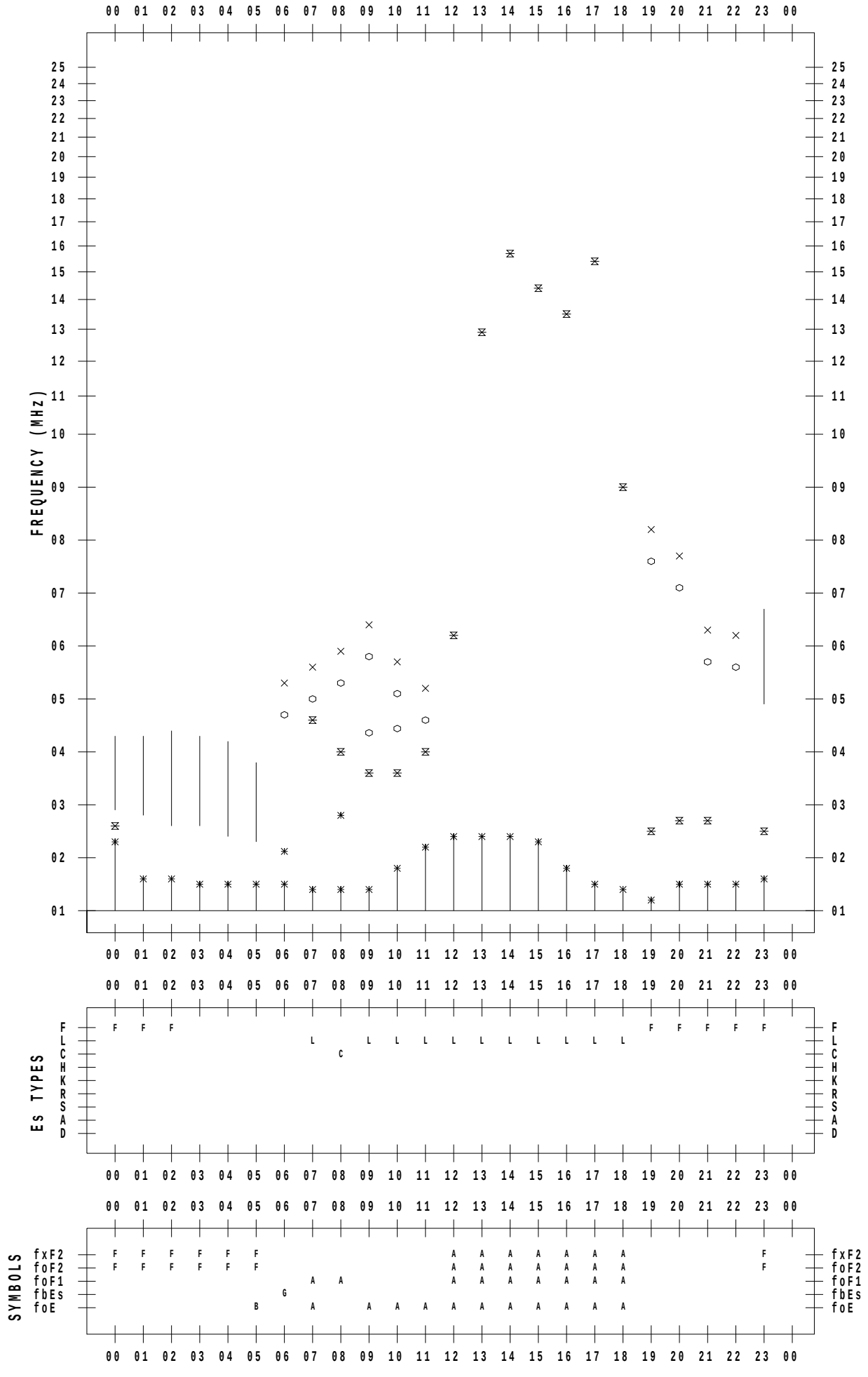
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/18

135 °E MEAN TIME



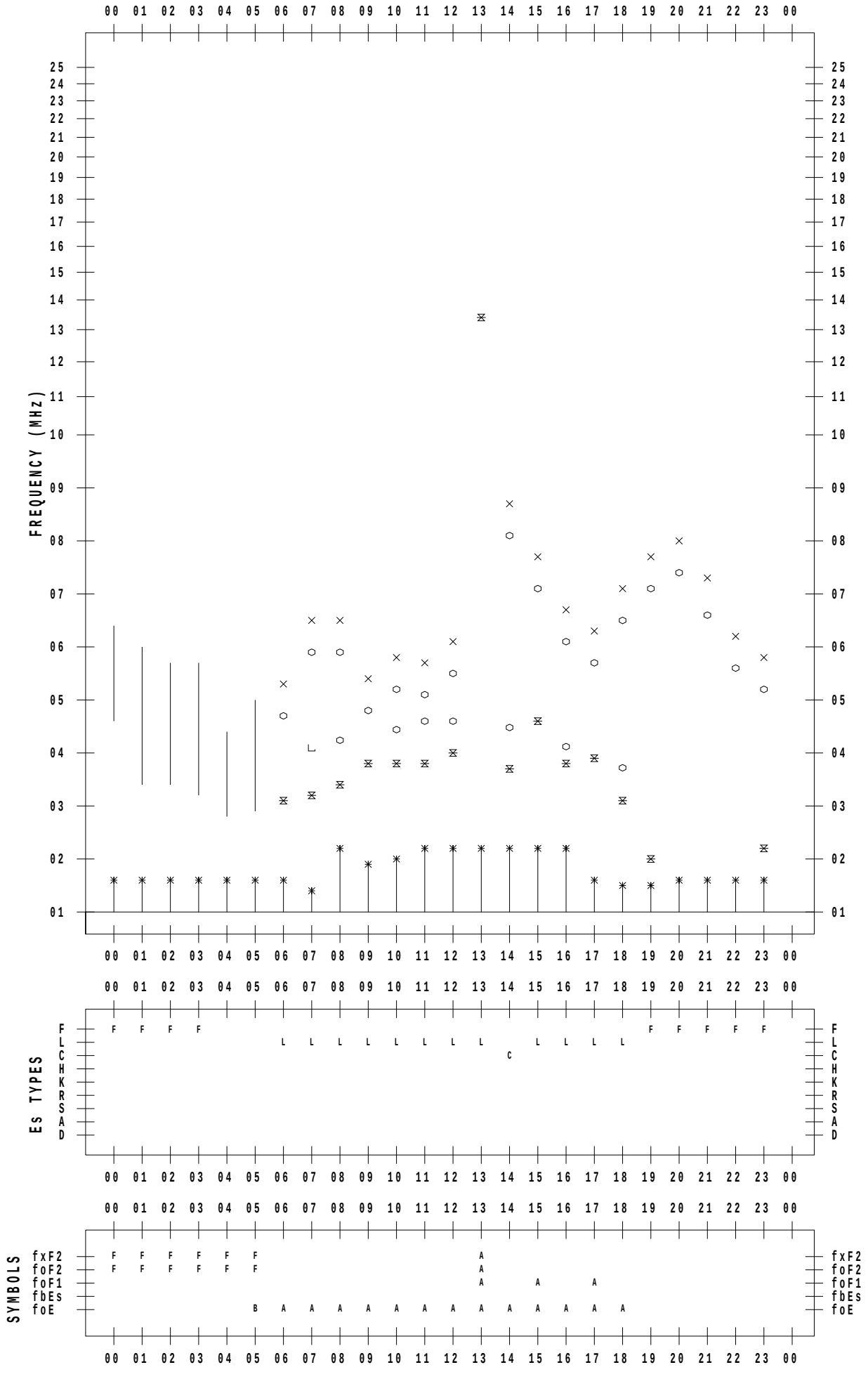
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/19

135 °E MEAN TIME



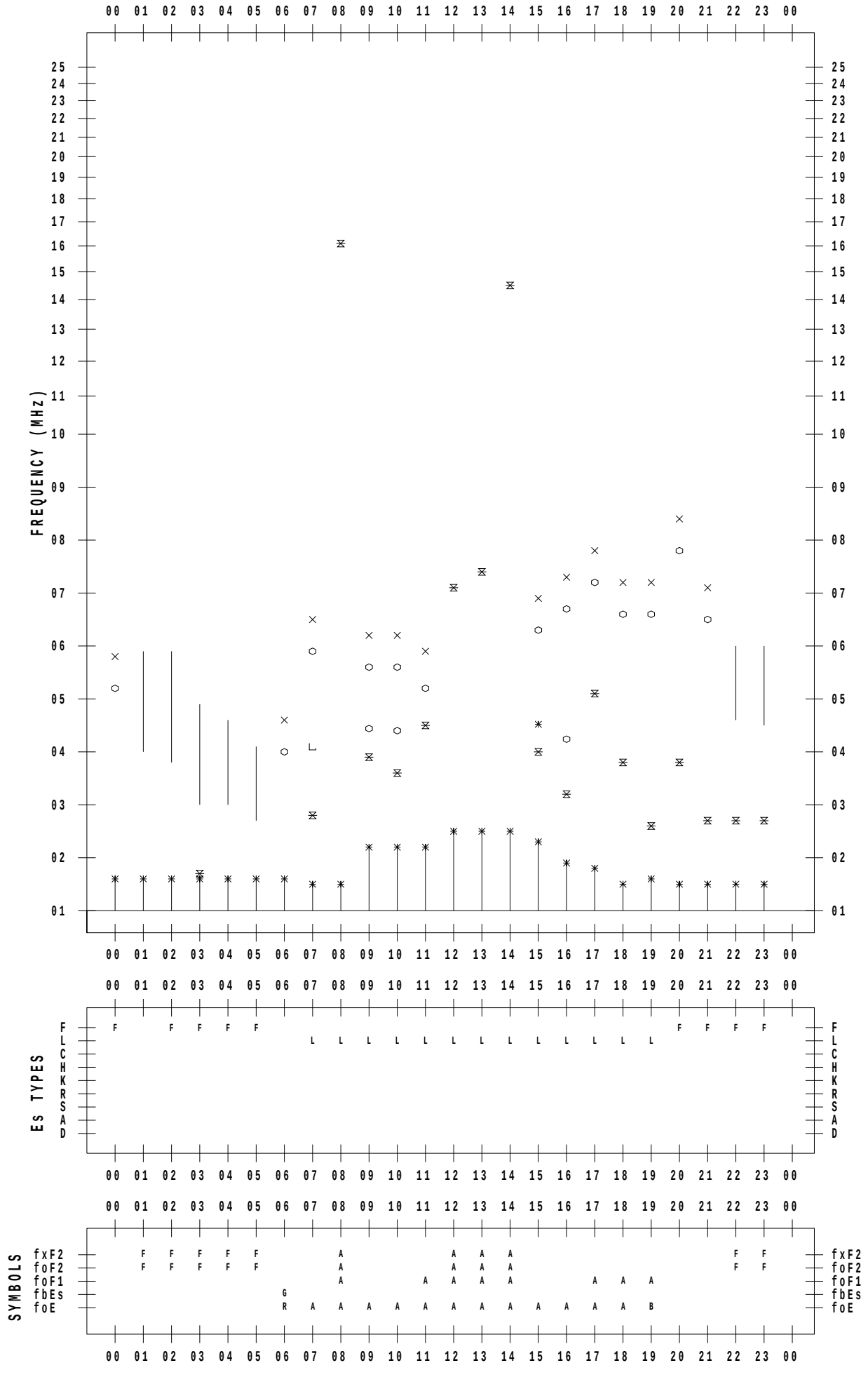
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/20

135 °E MEAN TIME



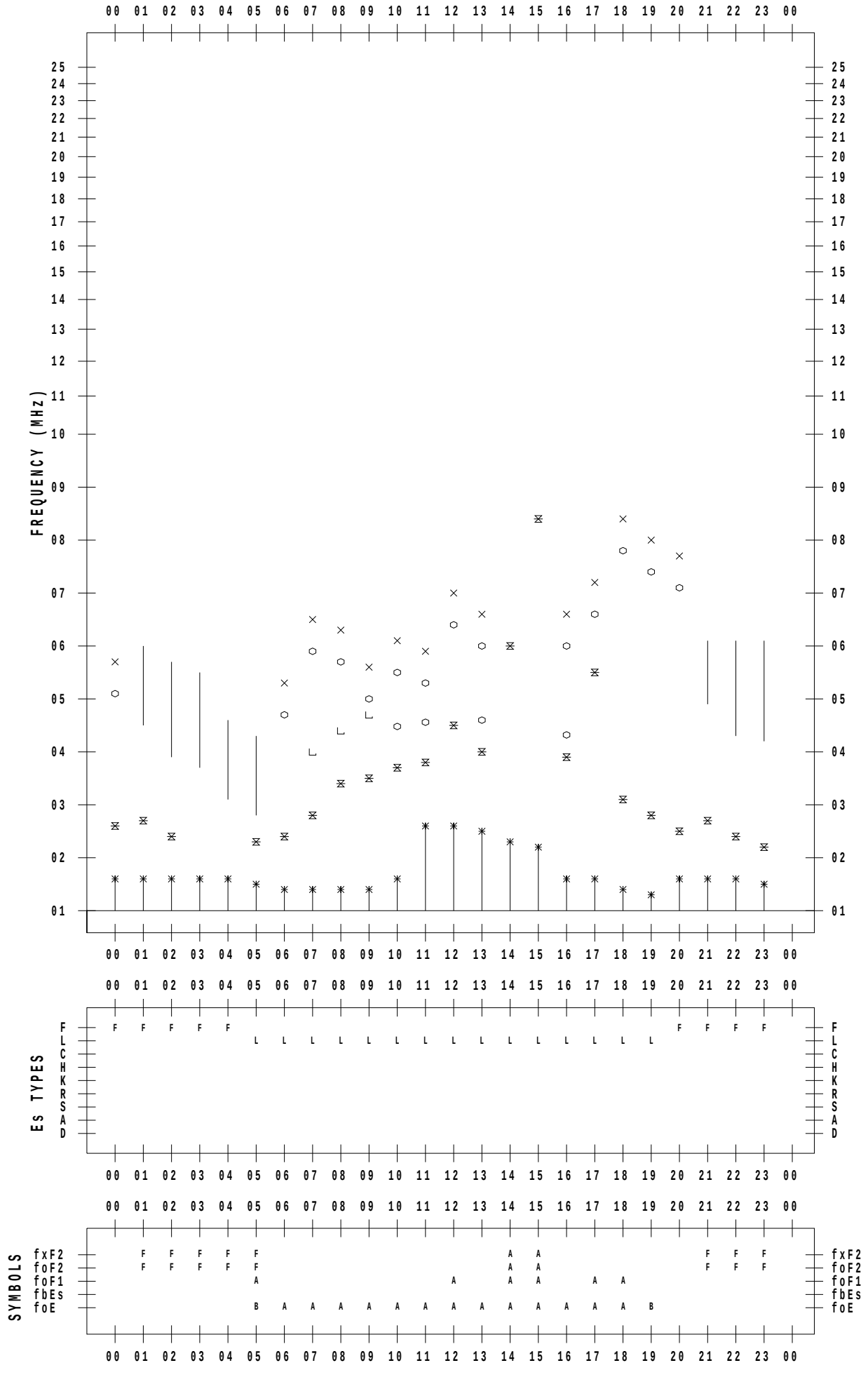
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/21

135 °E MEAN TIME



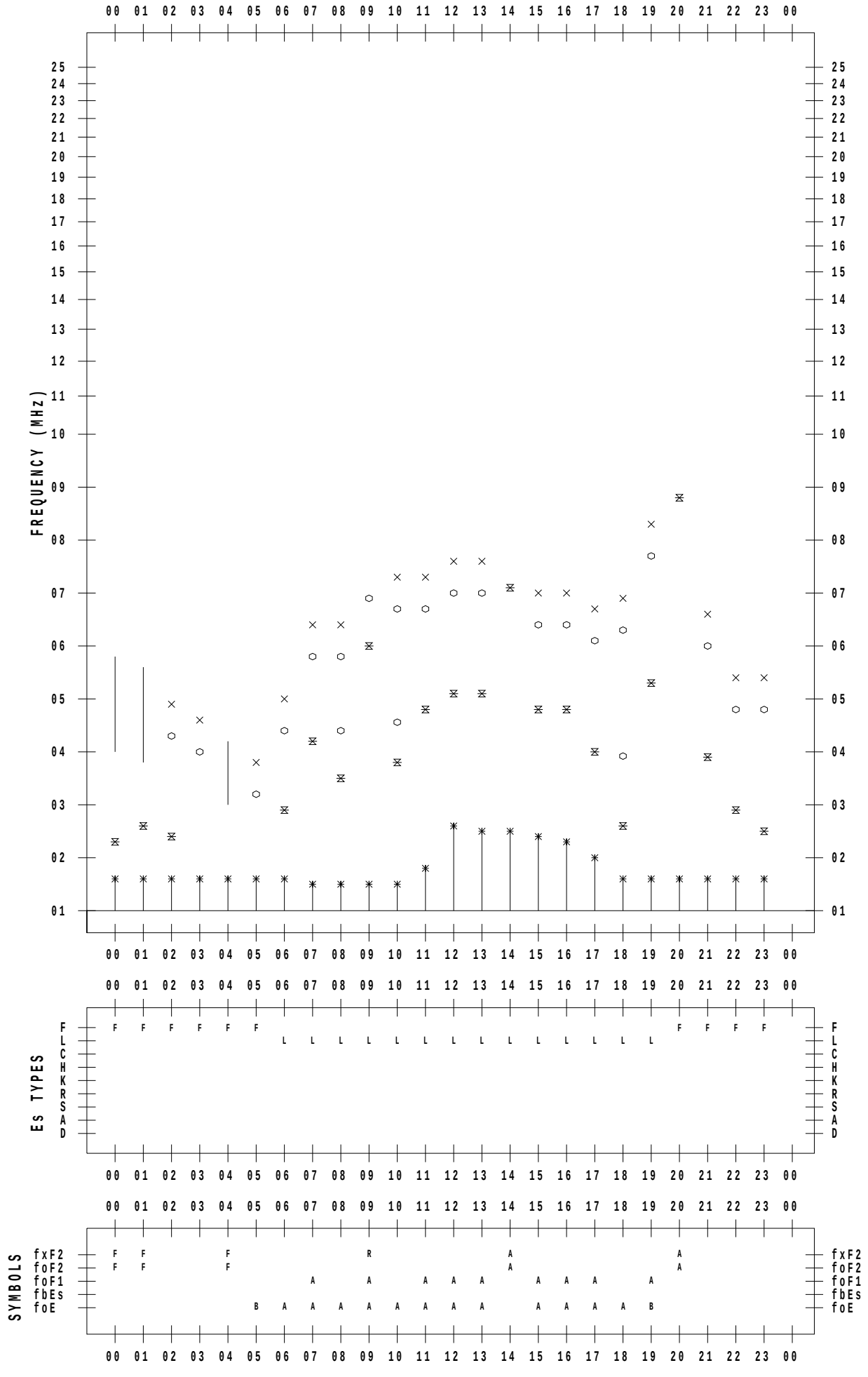
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/22

135 °E MEAN TIME



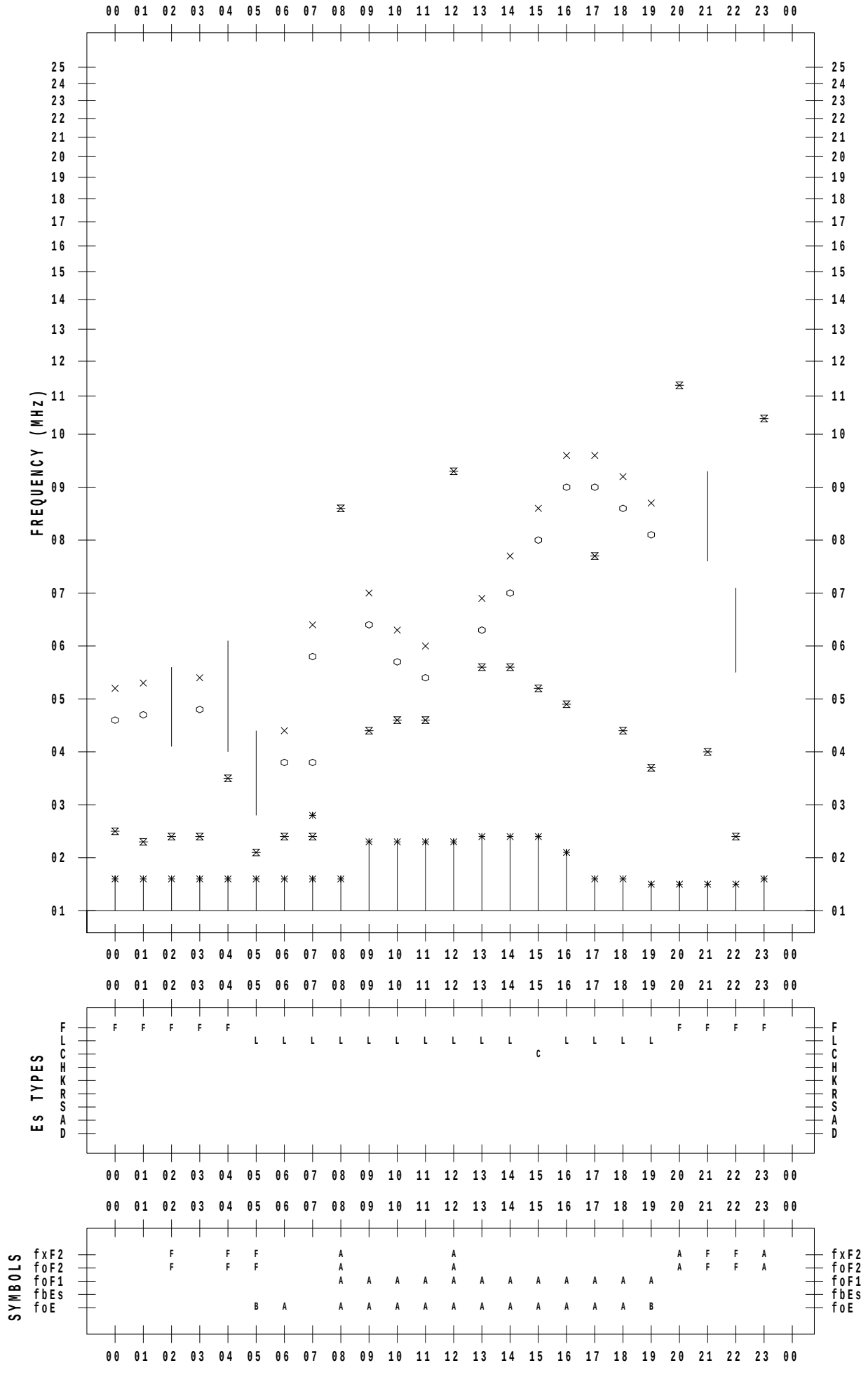
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/23

135 °E MEAN TIME



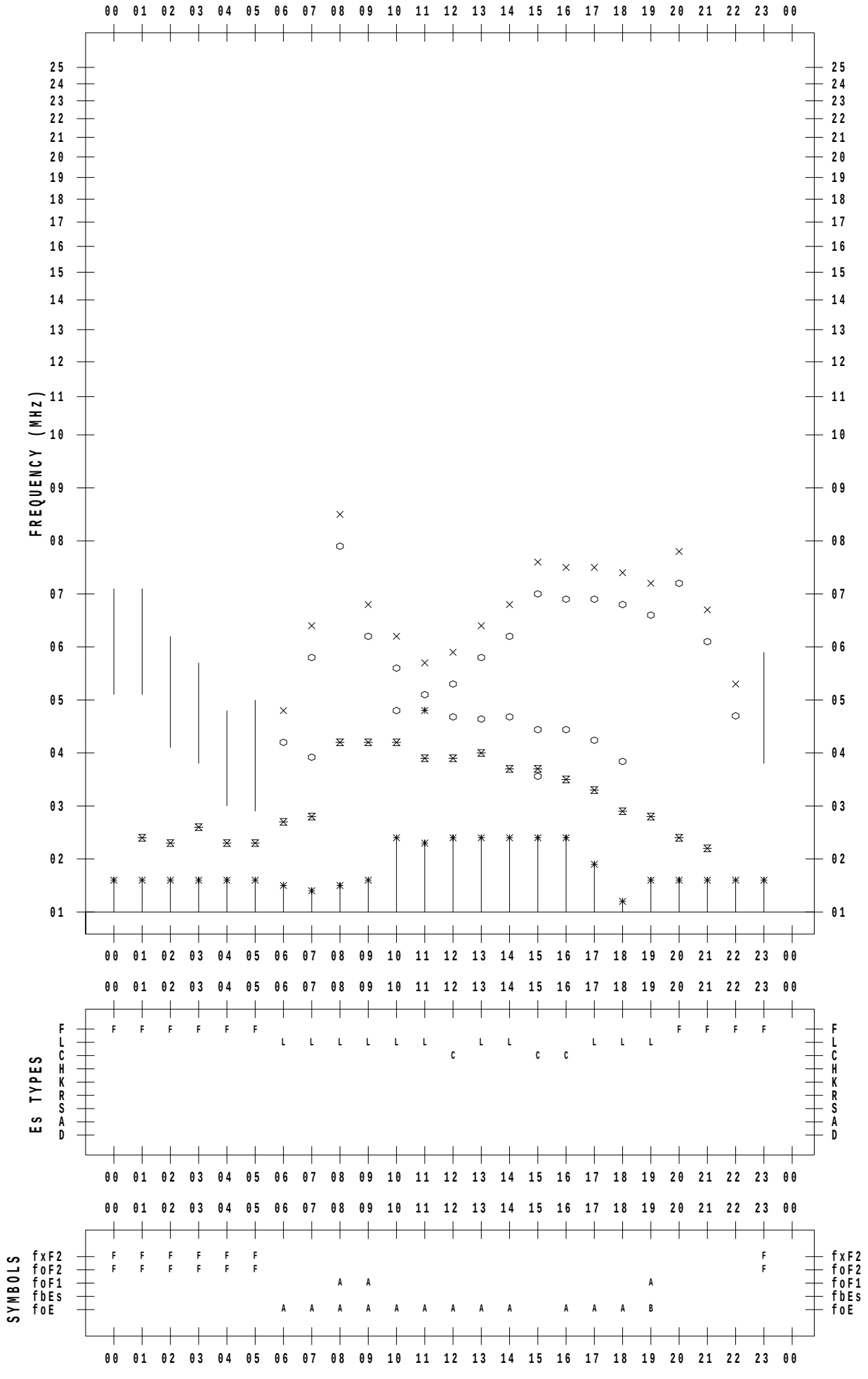
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/24

135 °E MEAN TIME



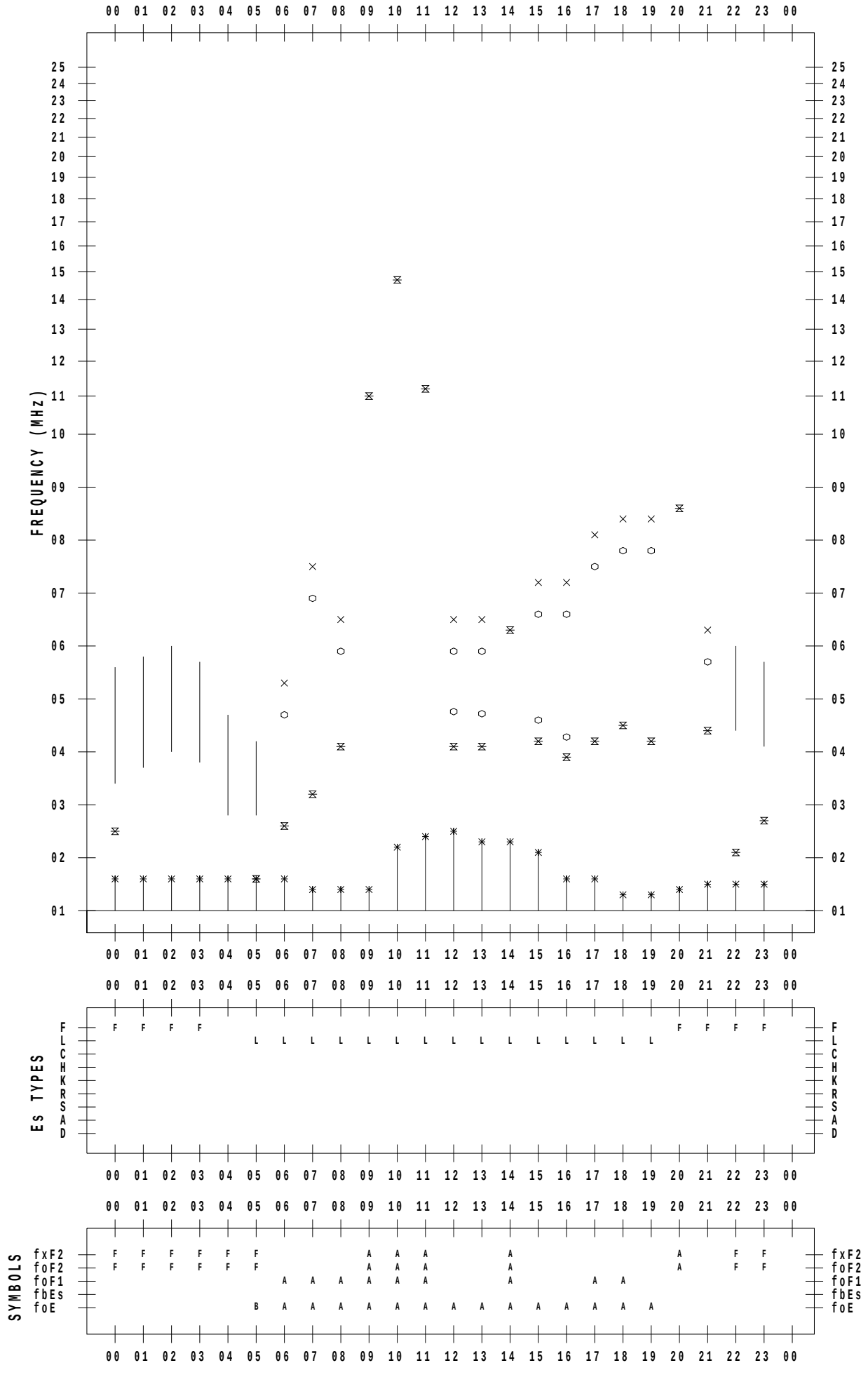
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/25

135 °E MEAN TIME



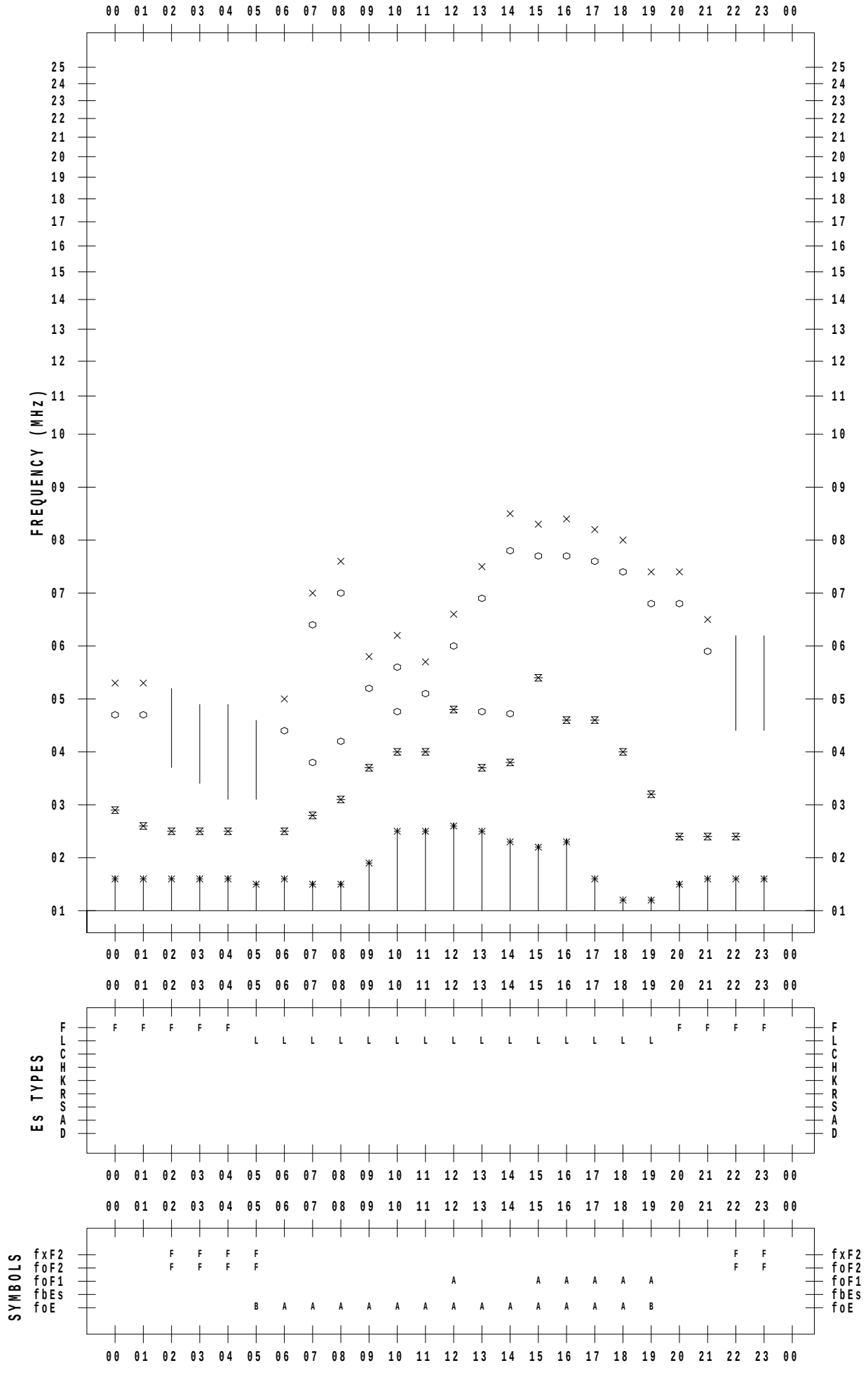
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/26

135 °E MEAN TIME



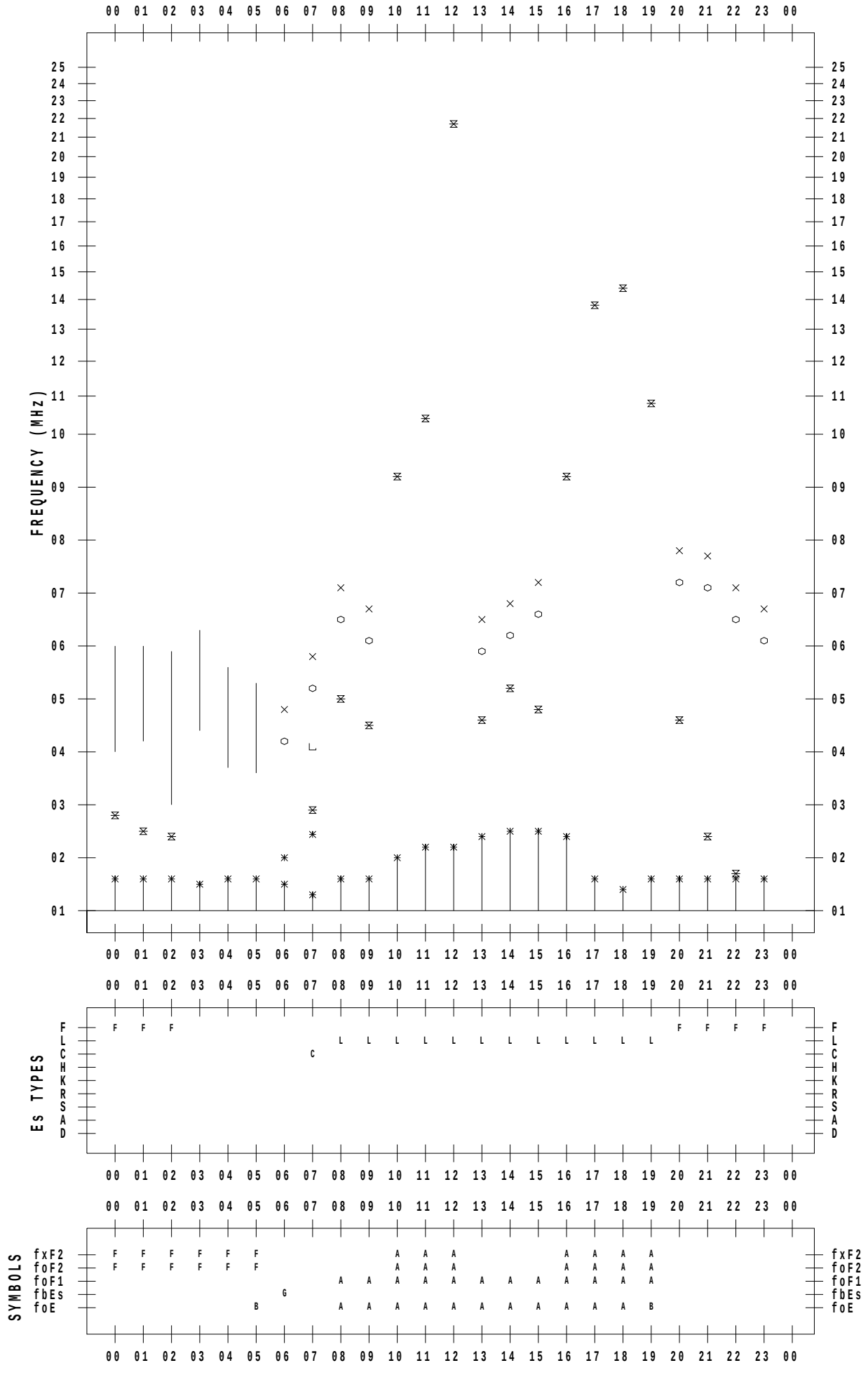
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/27

135 °E MEAN TIME



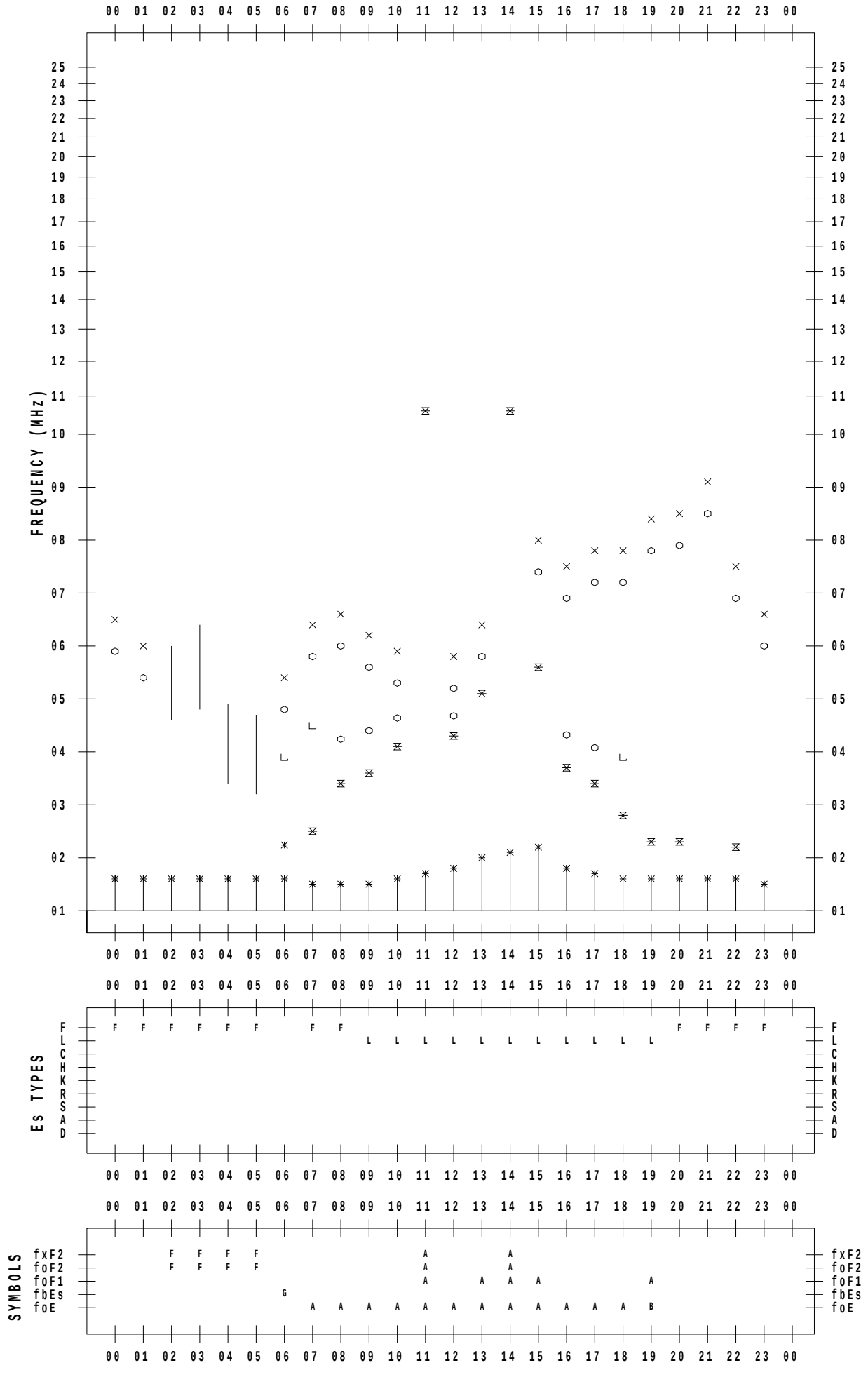
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/28

135 °E MEAN TIME



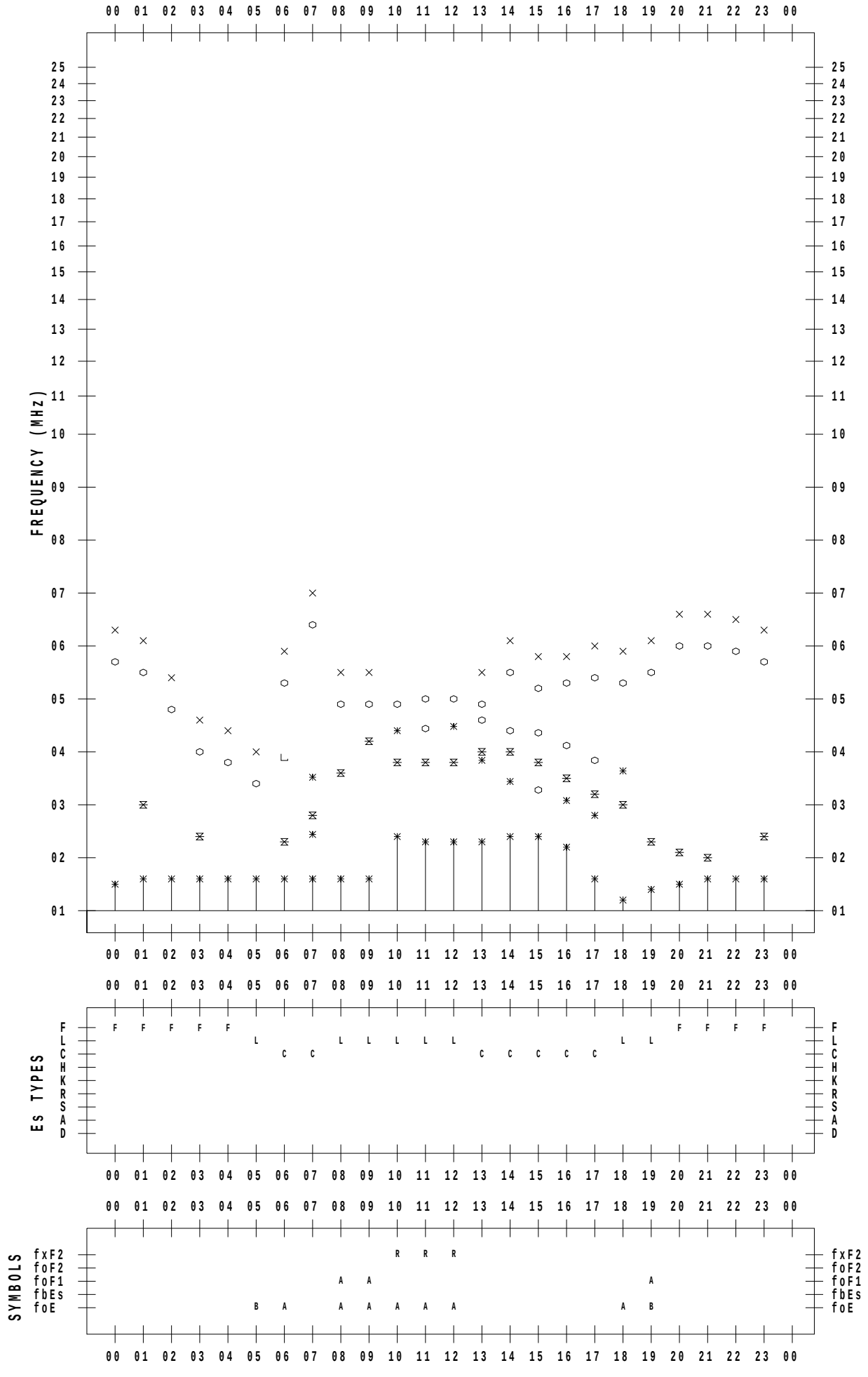
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/29

135 °E MEAN TIME



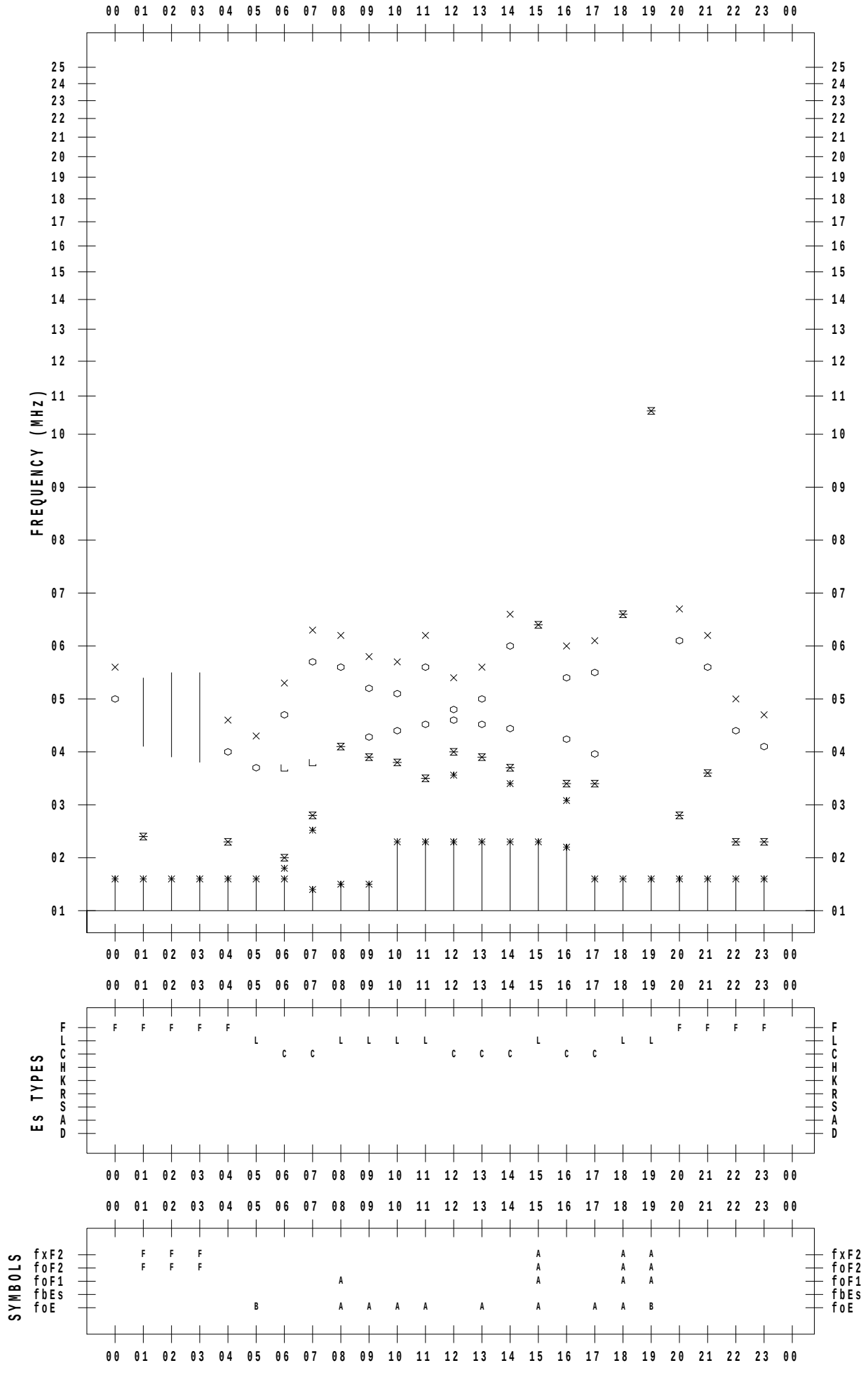
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/30

135 °E MEAN TIME



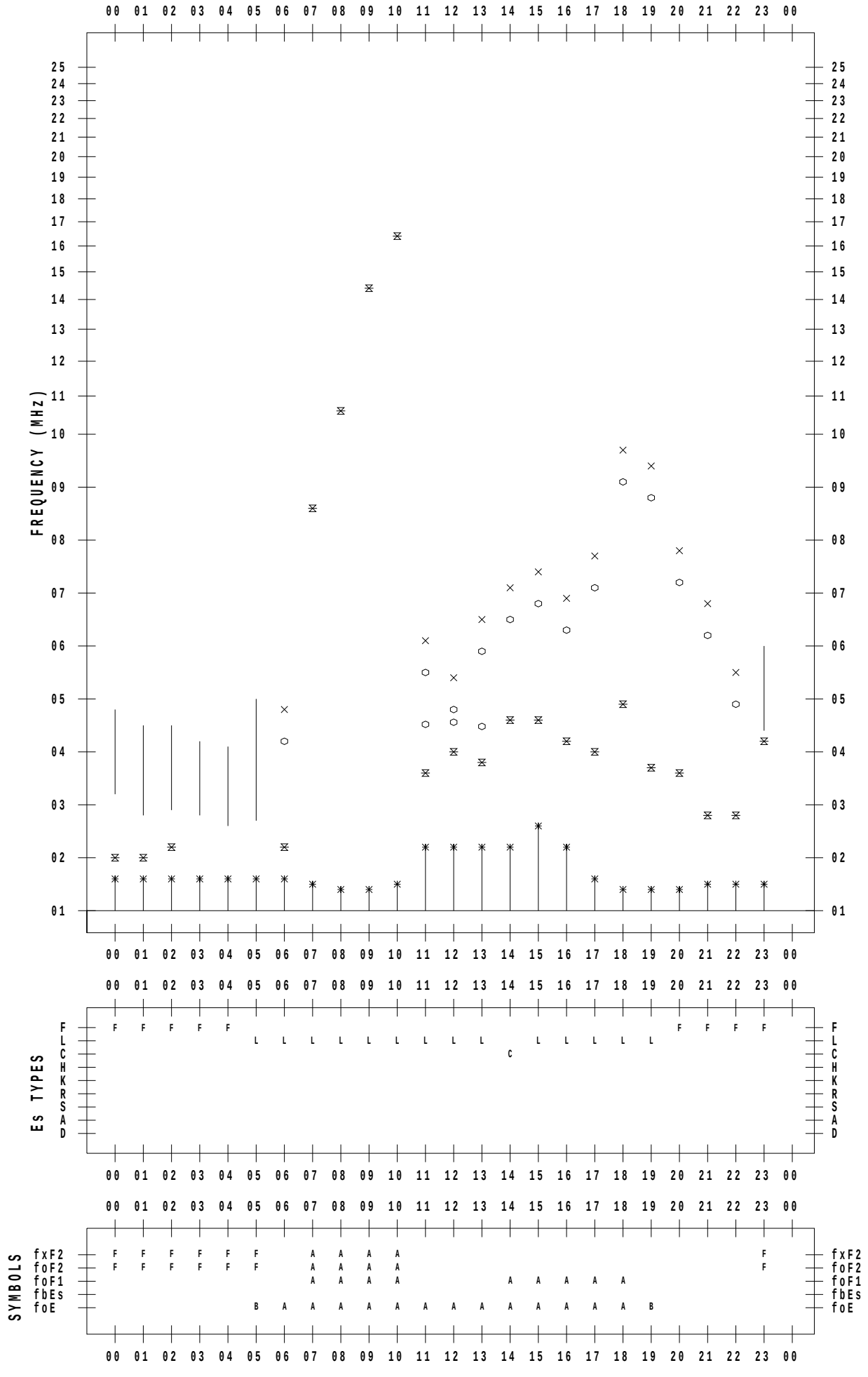
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/ 7/31

135 °E MEAN TIME



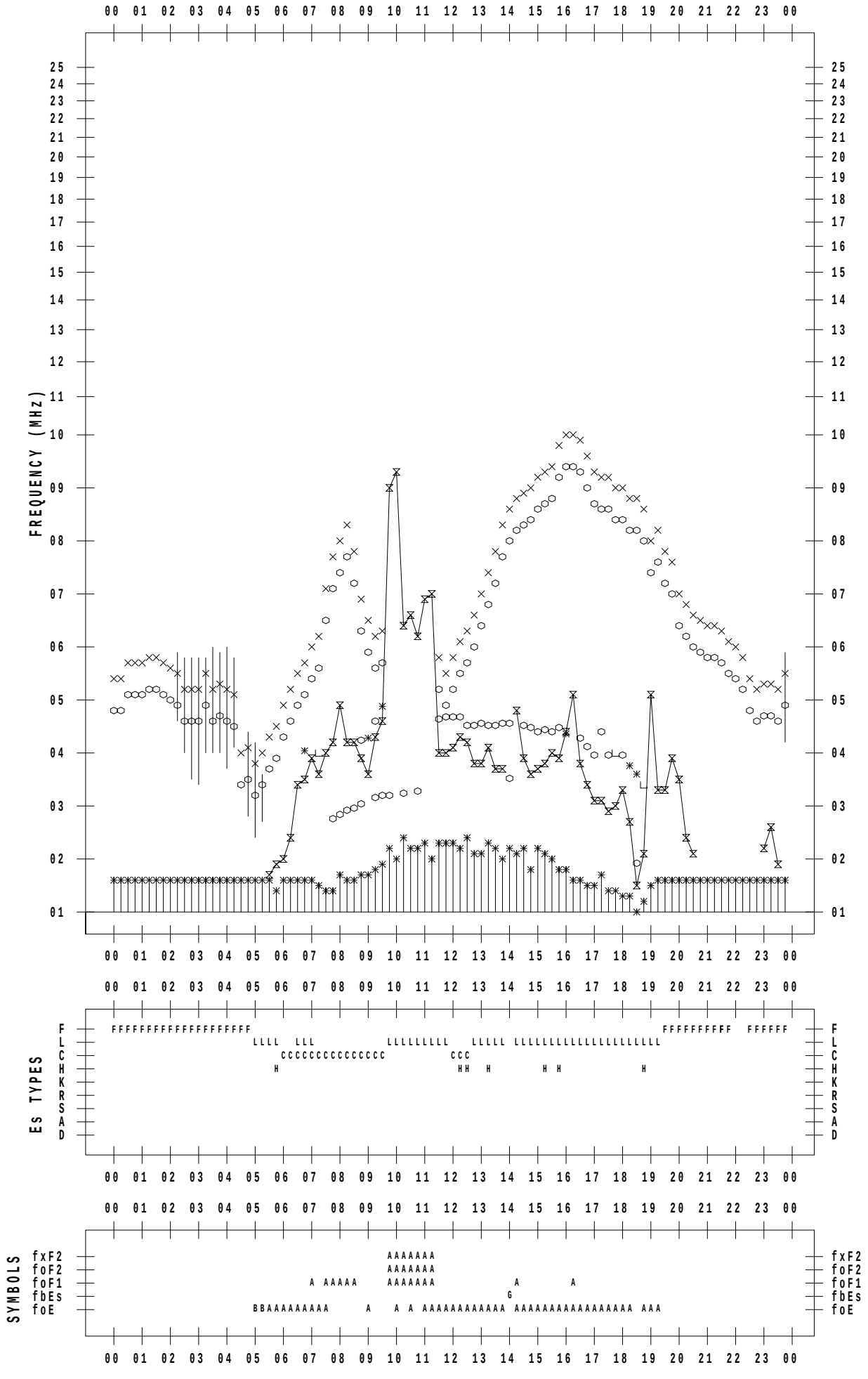
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 1

135 °E MEAN TIME



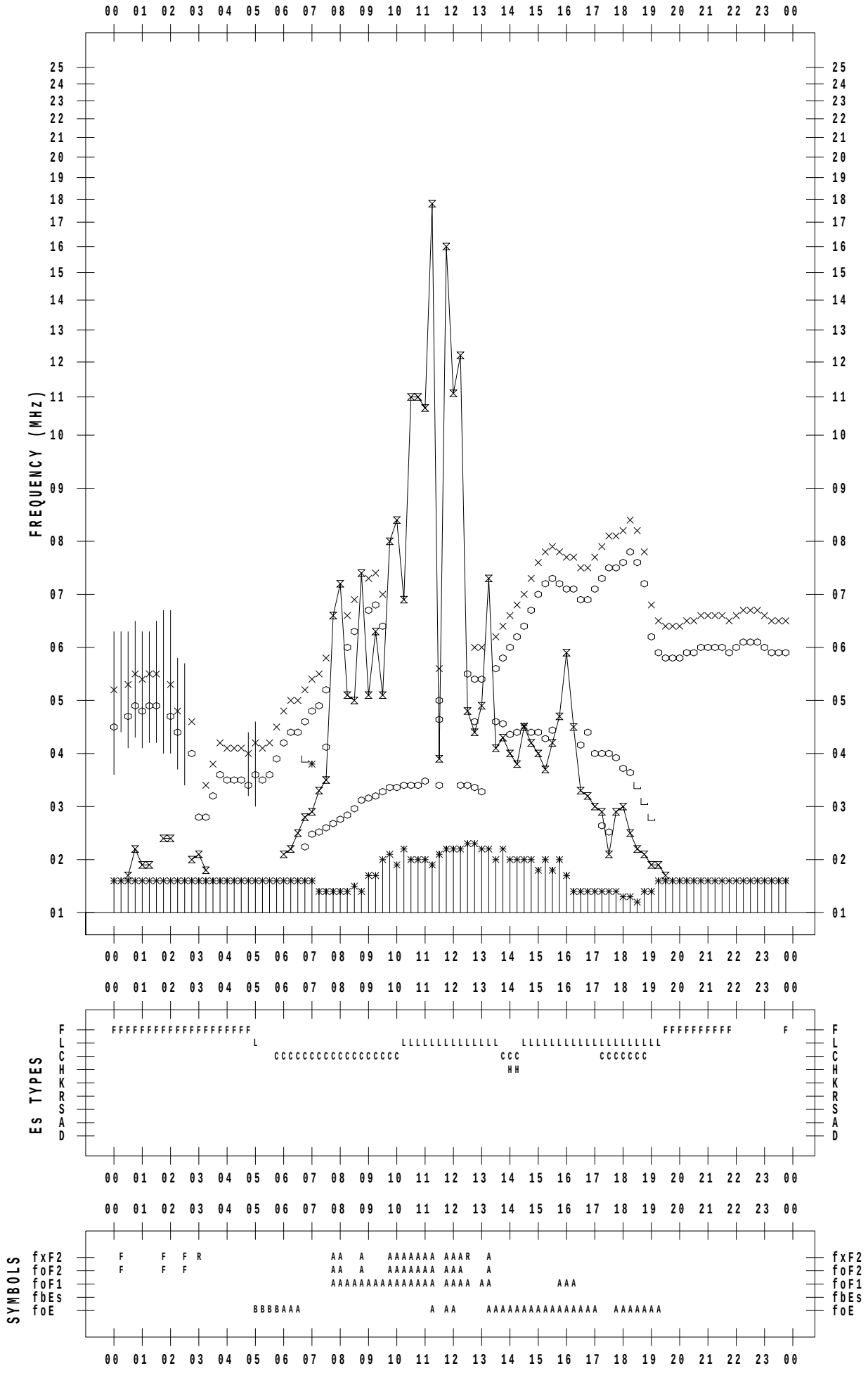
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 2

135 °E MEAN TIME



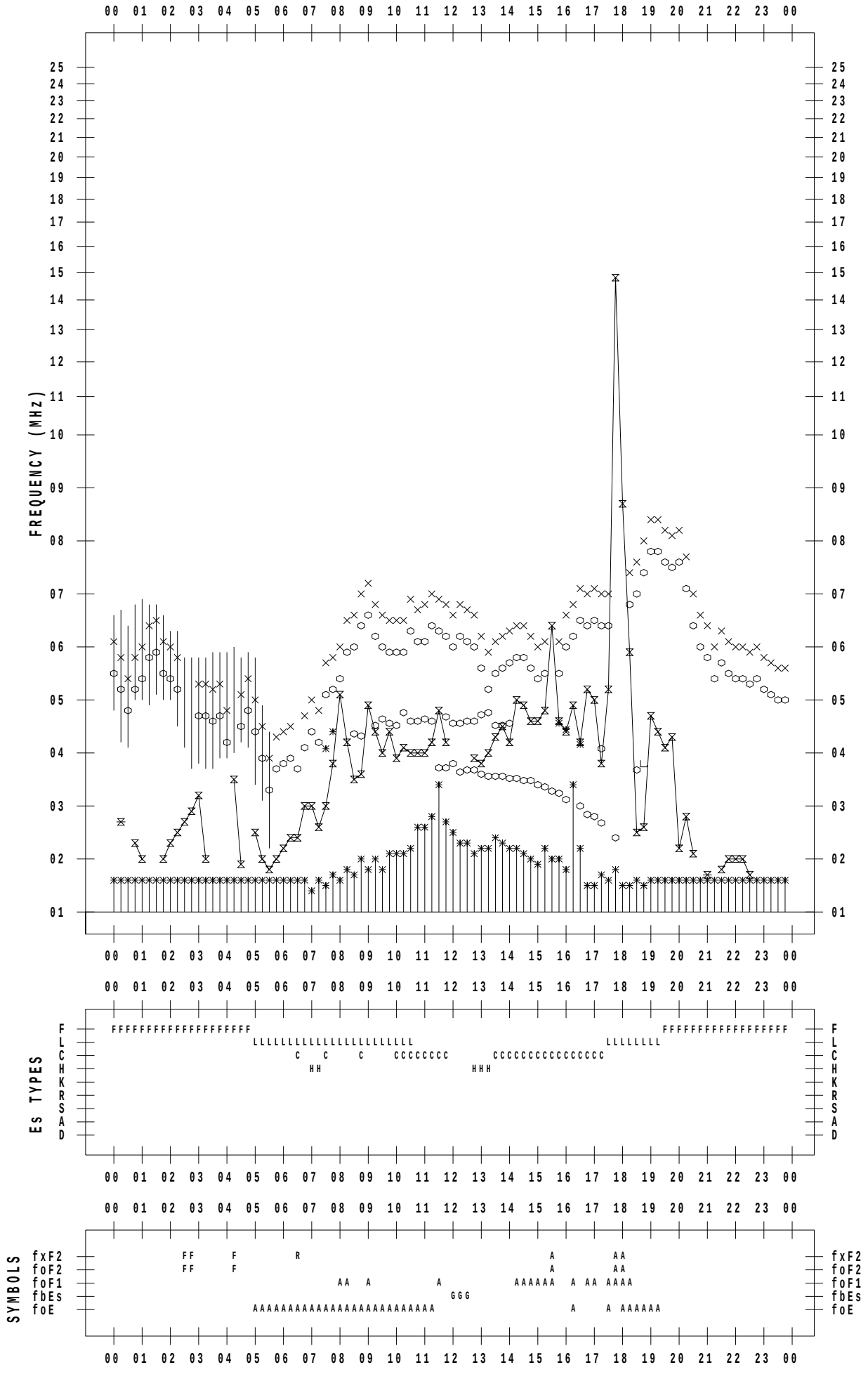
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 3

135 °E MEAN TIME



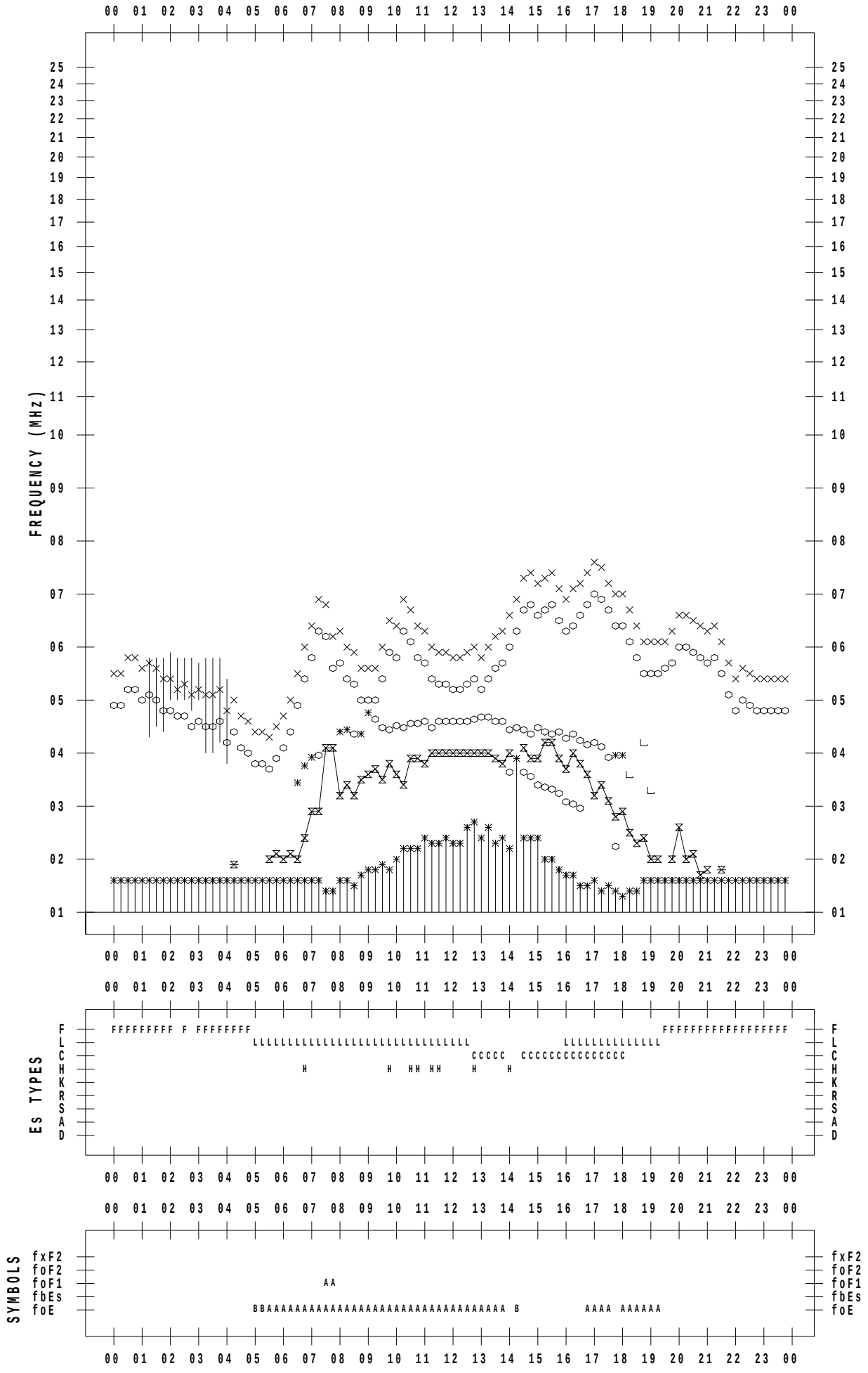
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 4

135 °E MEAN TIME



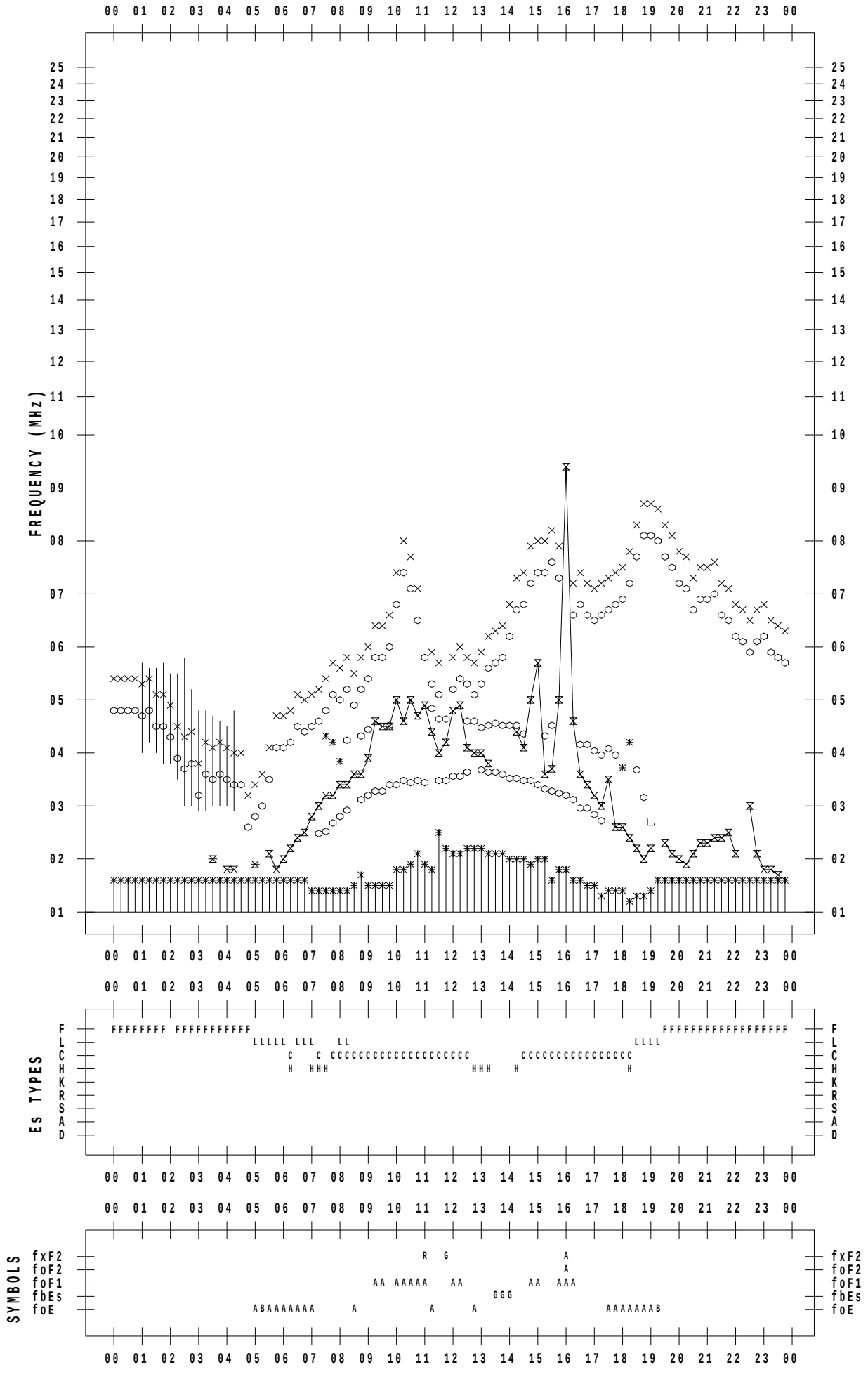
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 5

135 °E MEAN TIME



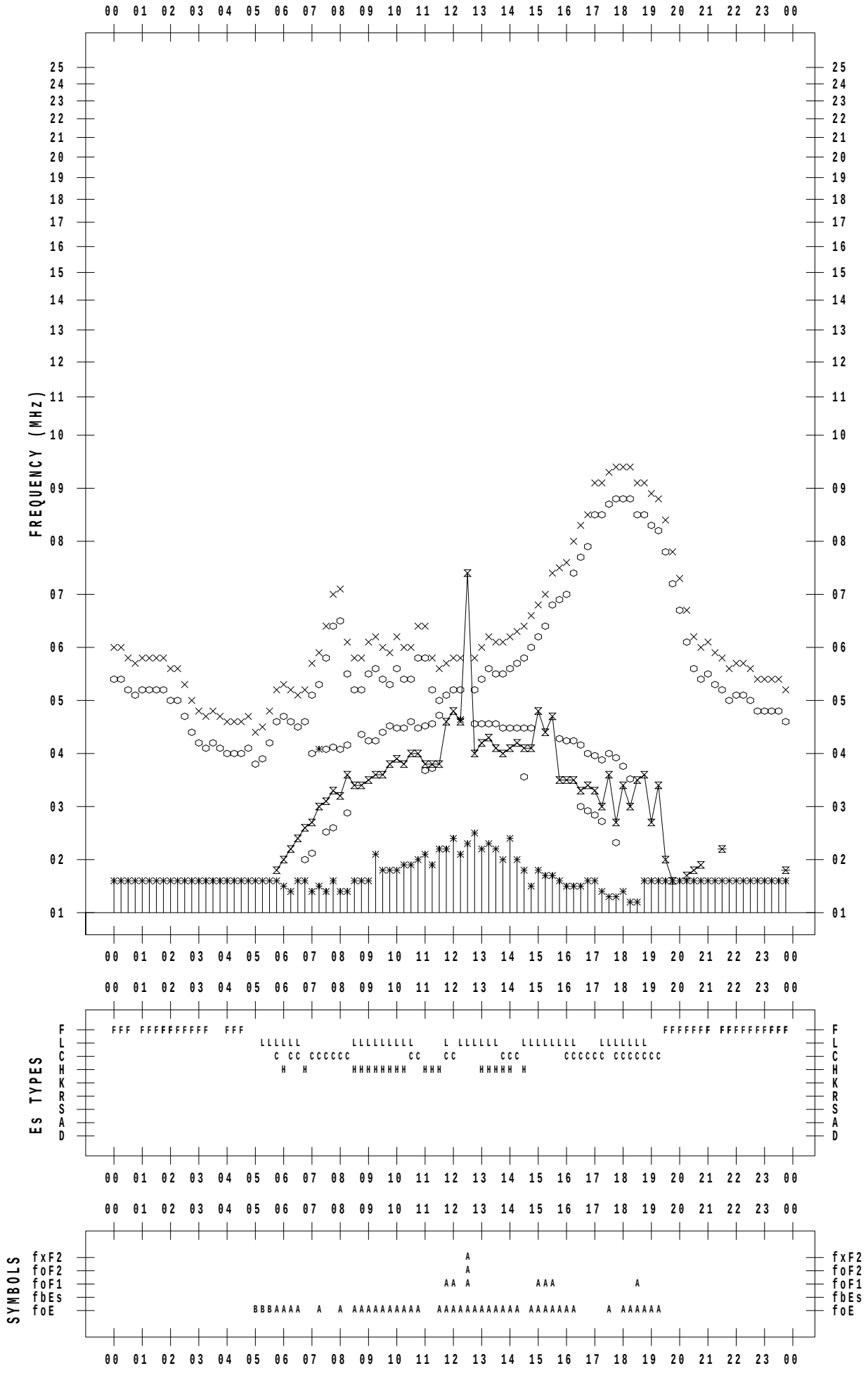
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 6

135 °E MEAN TIME



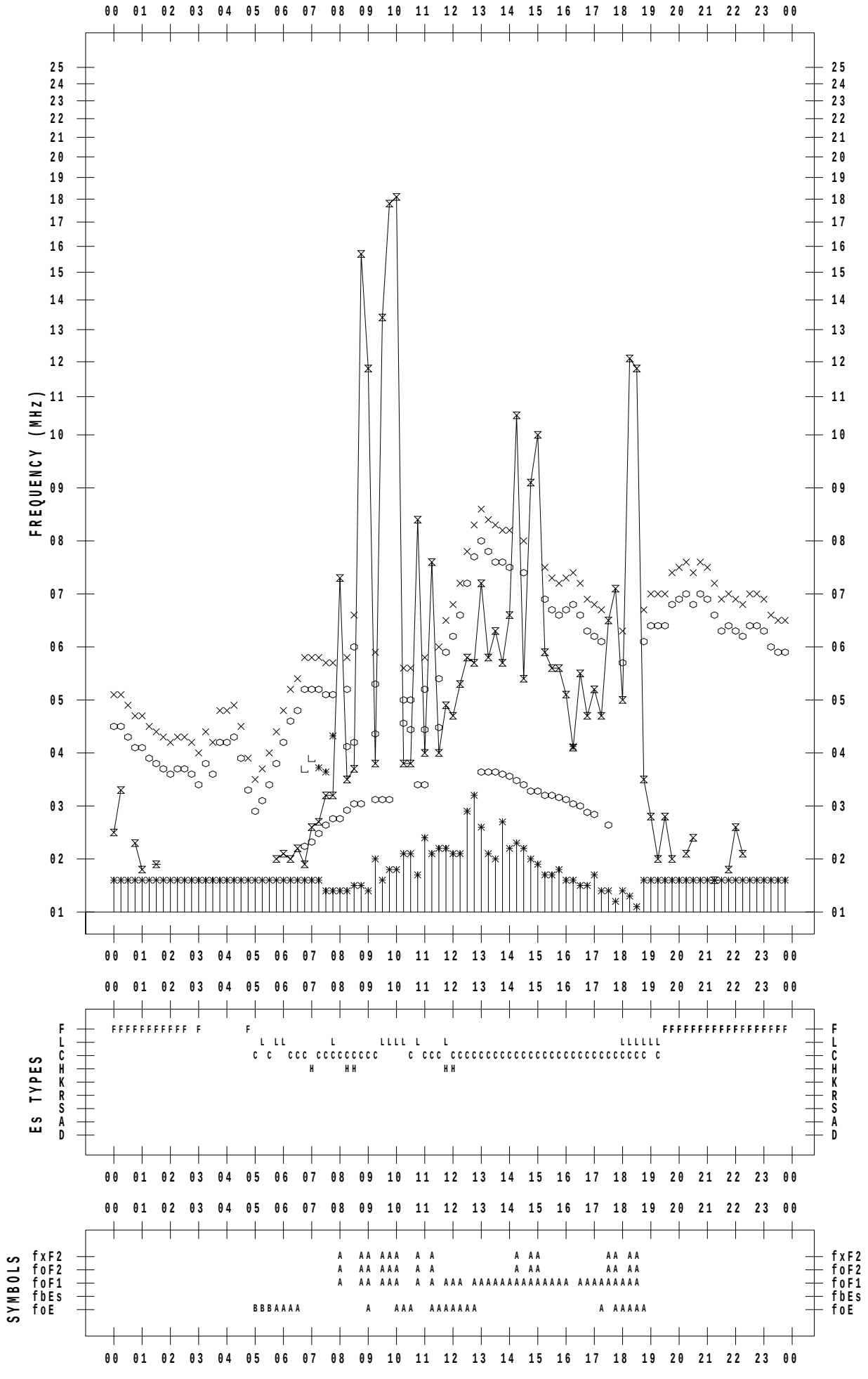
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 7

135 °E MEAN TIME



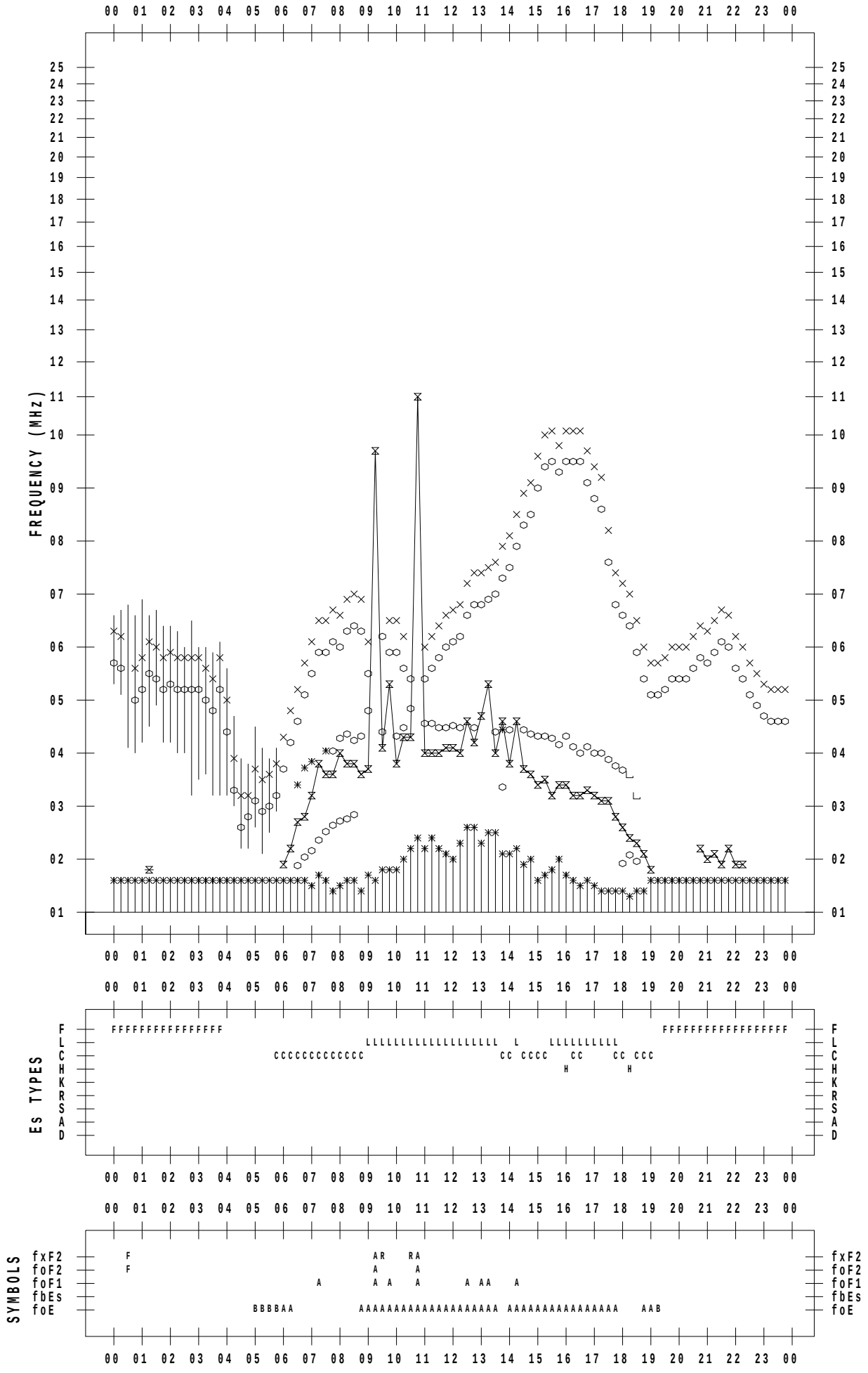
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 8

135 °E MEAN TIME



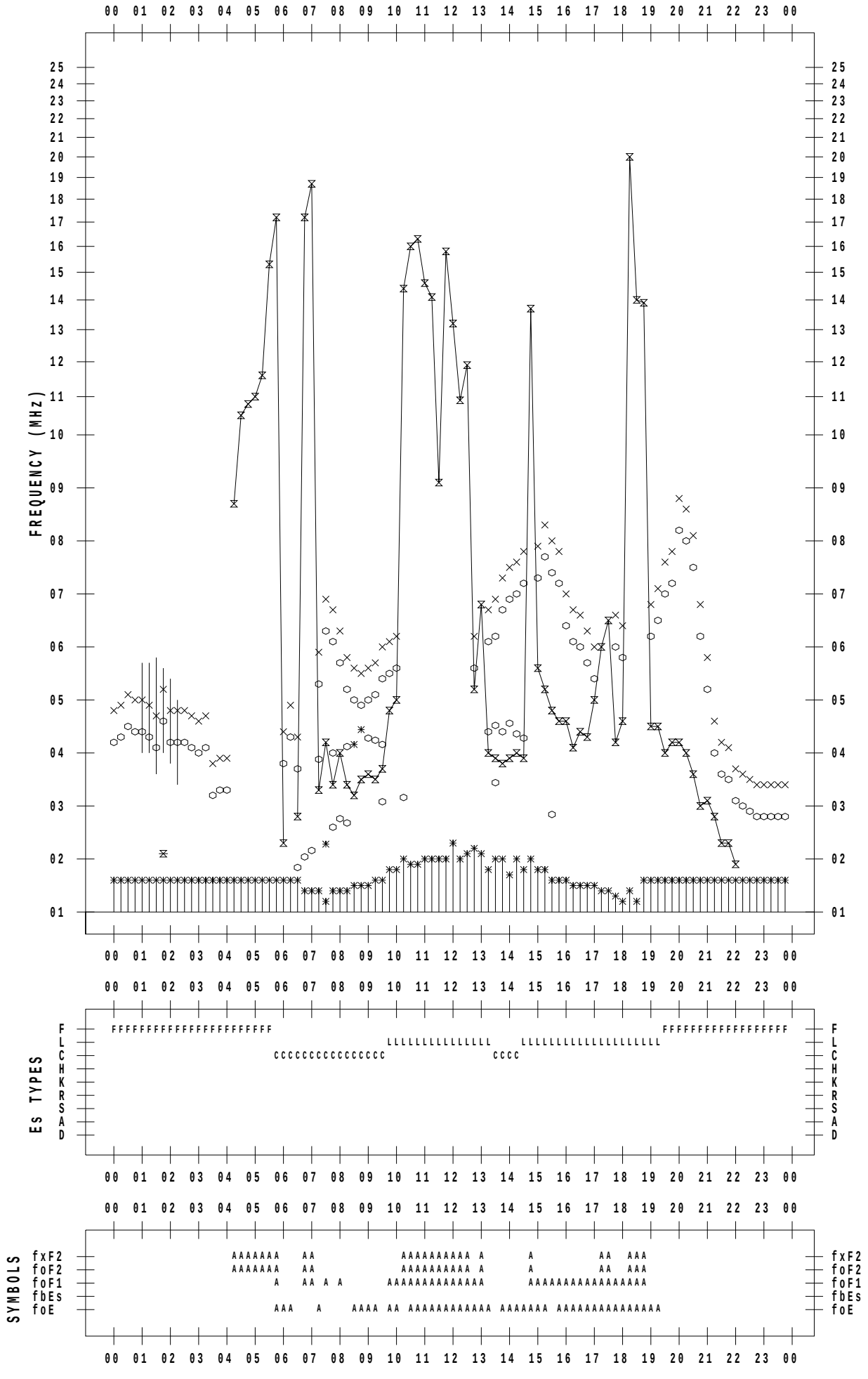
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/ 9

135 °E MEAN TIME



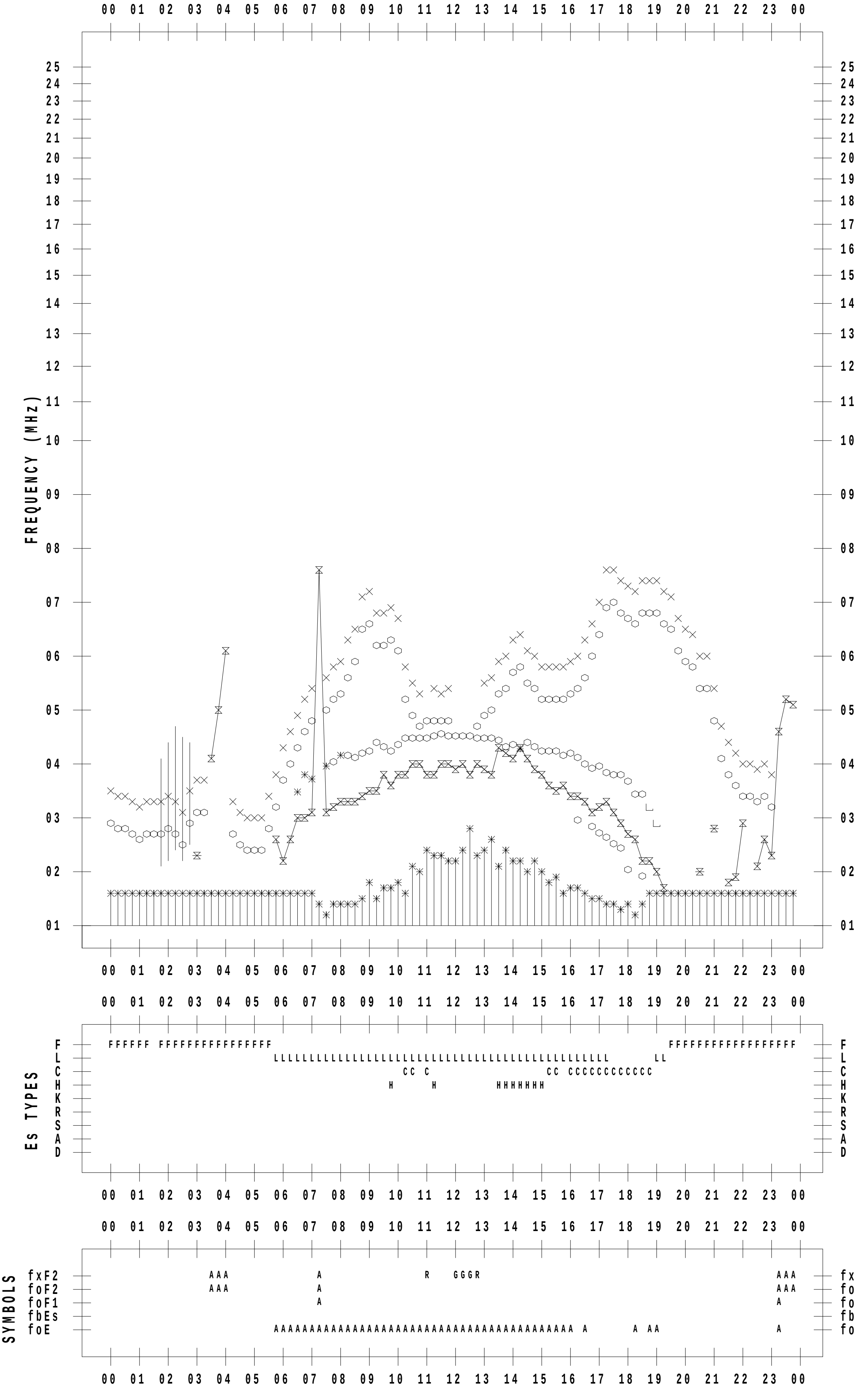
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/10

135 °E MEAN TIME



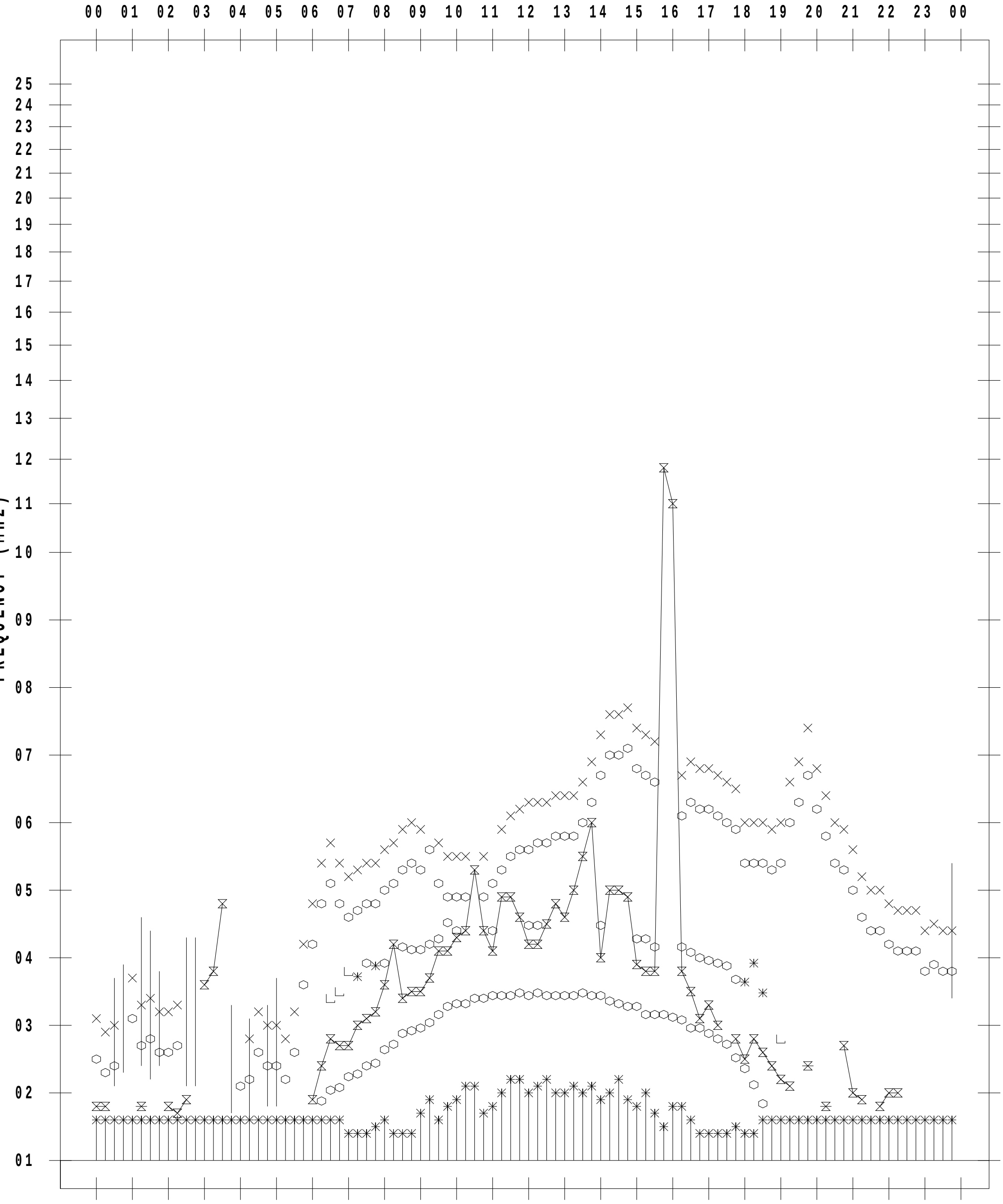
f-PLOT DATA

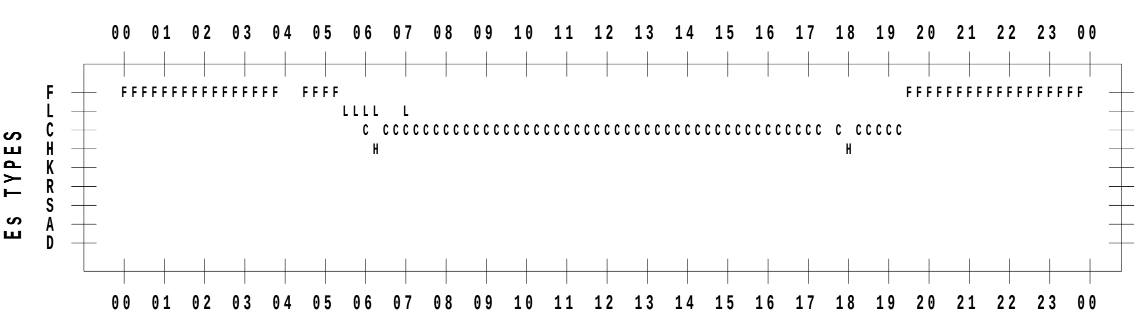
SCALER : I.YAMAZAKI

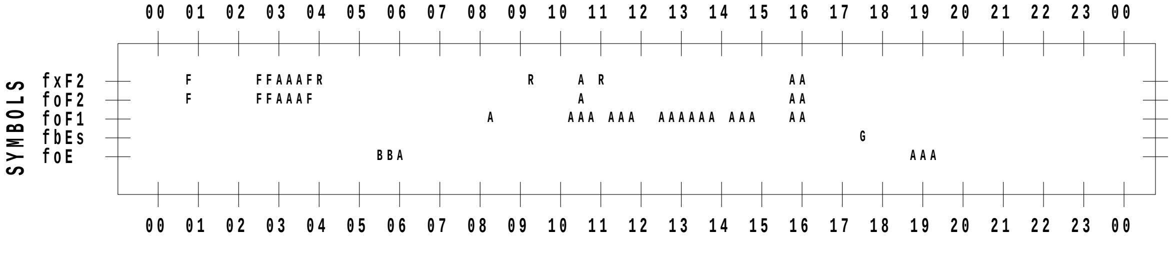
STATION : Okinawa

DATE : 2021/ 7/11

135 °E MEAN TIME







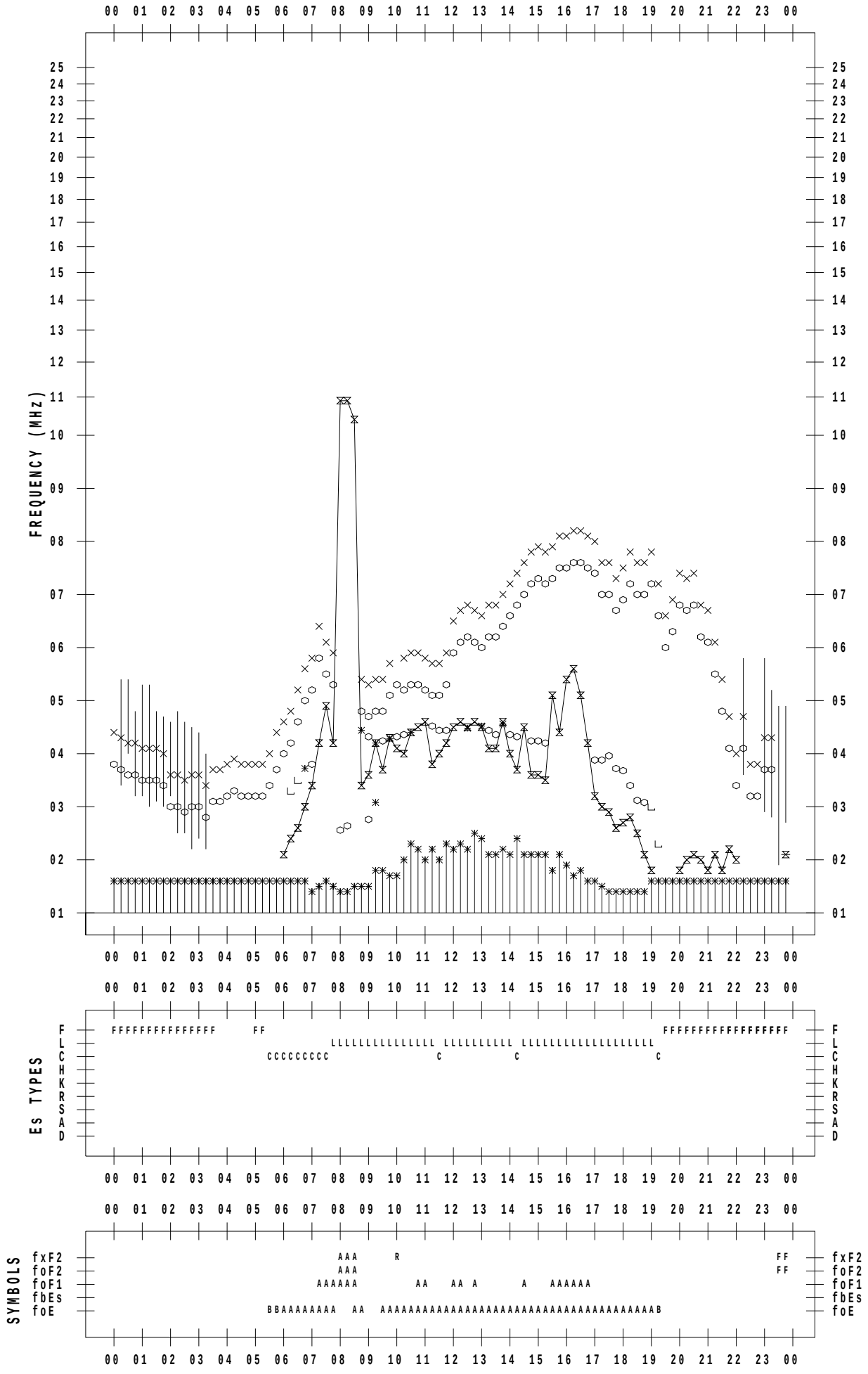
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/12

135 °E MEAN TIME



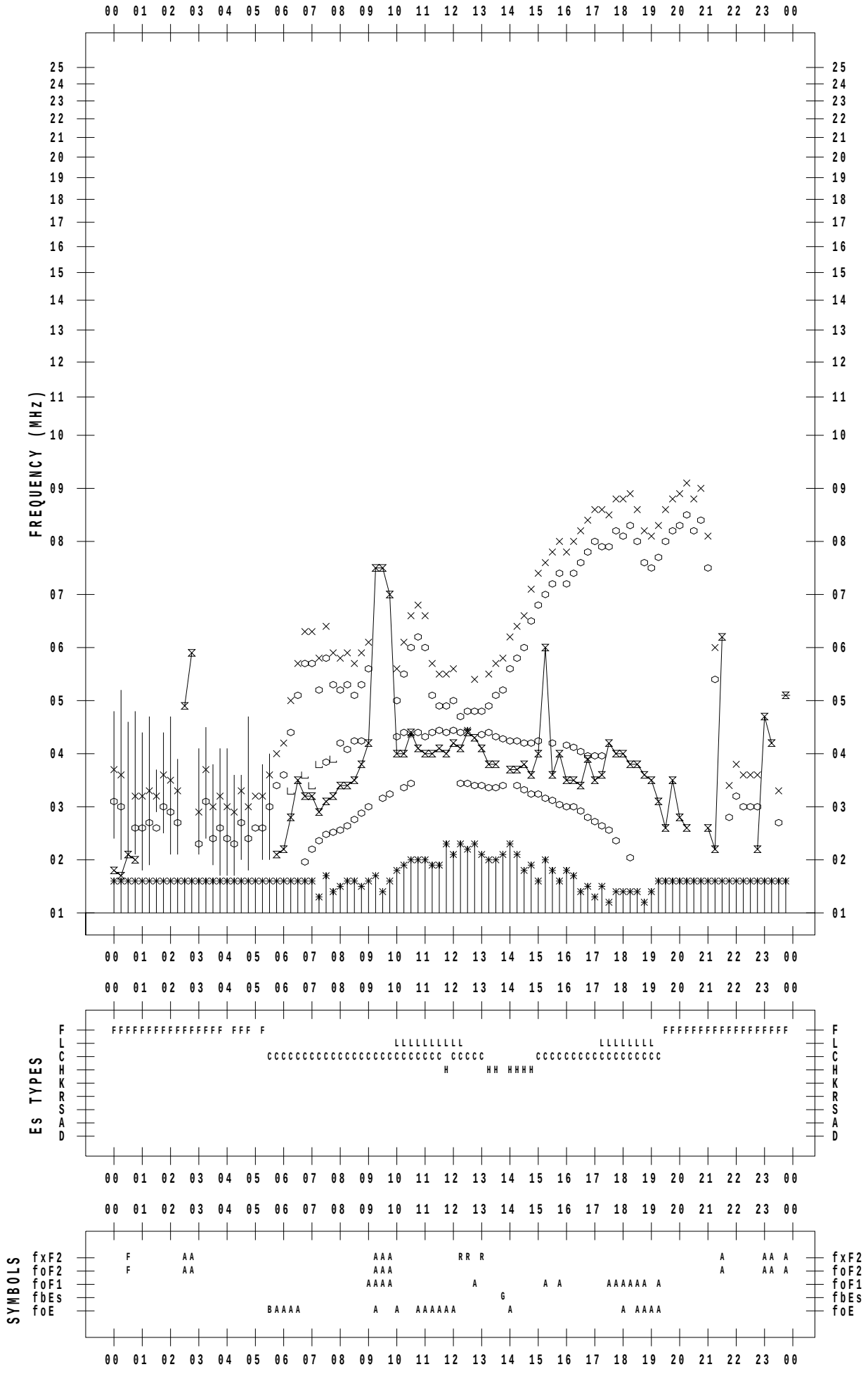
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/13

135 °E MEAN TIME



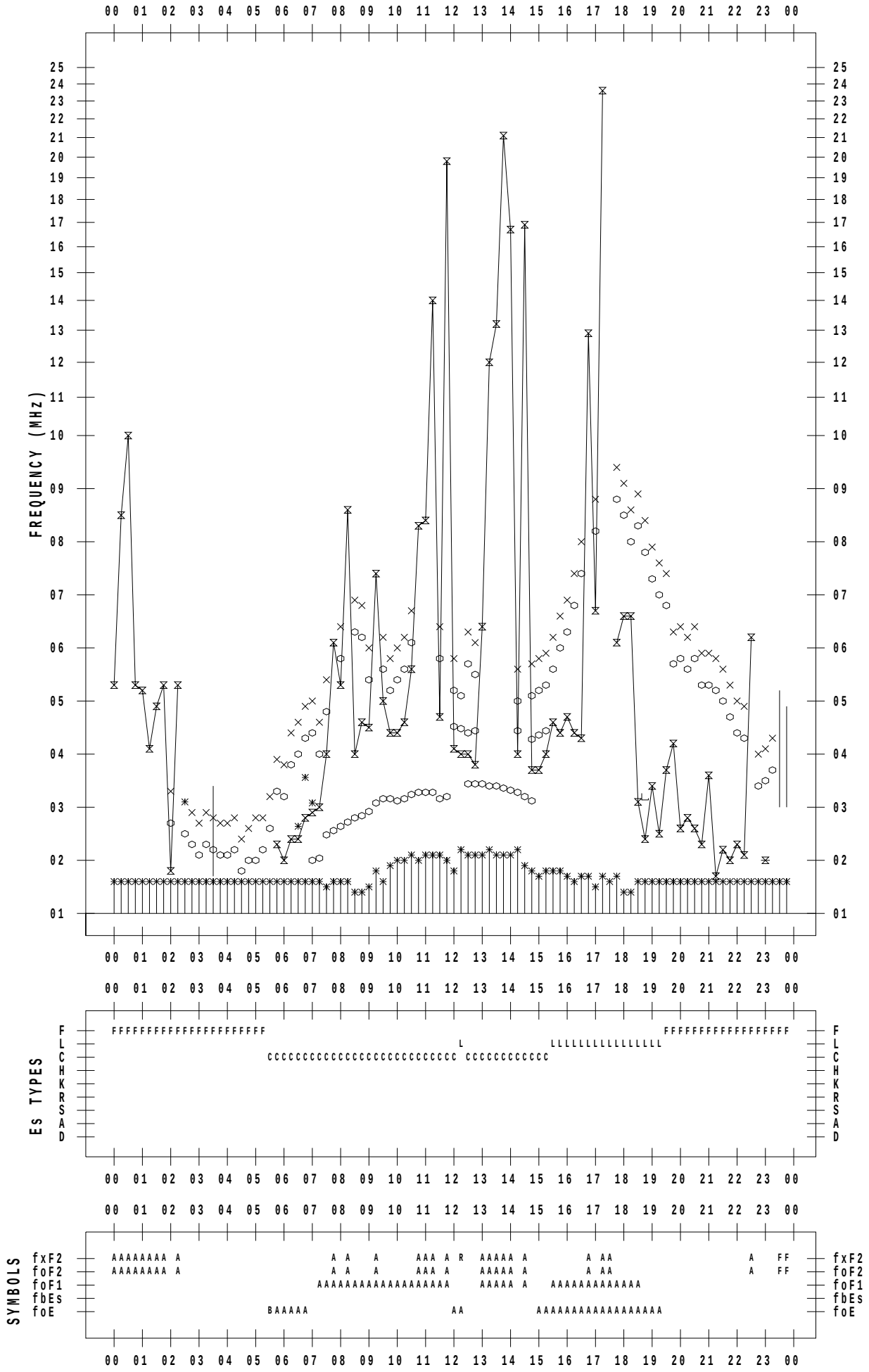
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/14

135 °E MEAN TIME



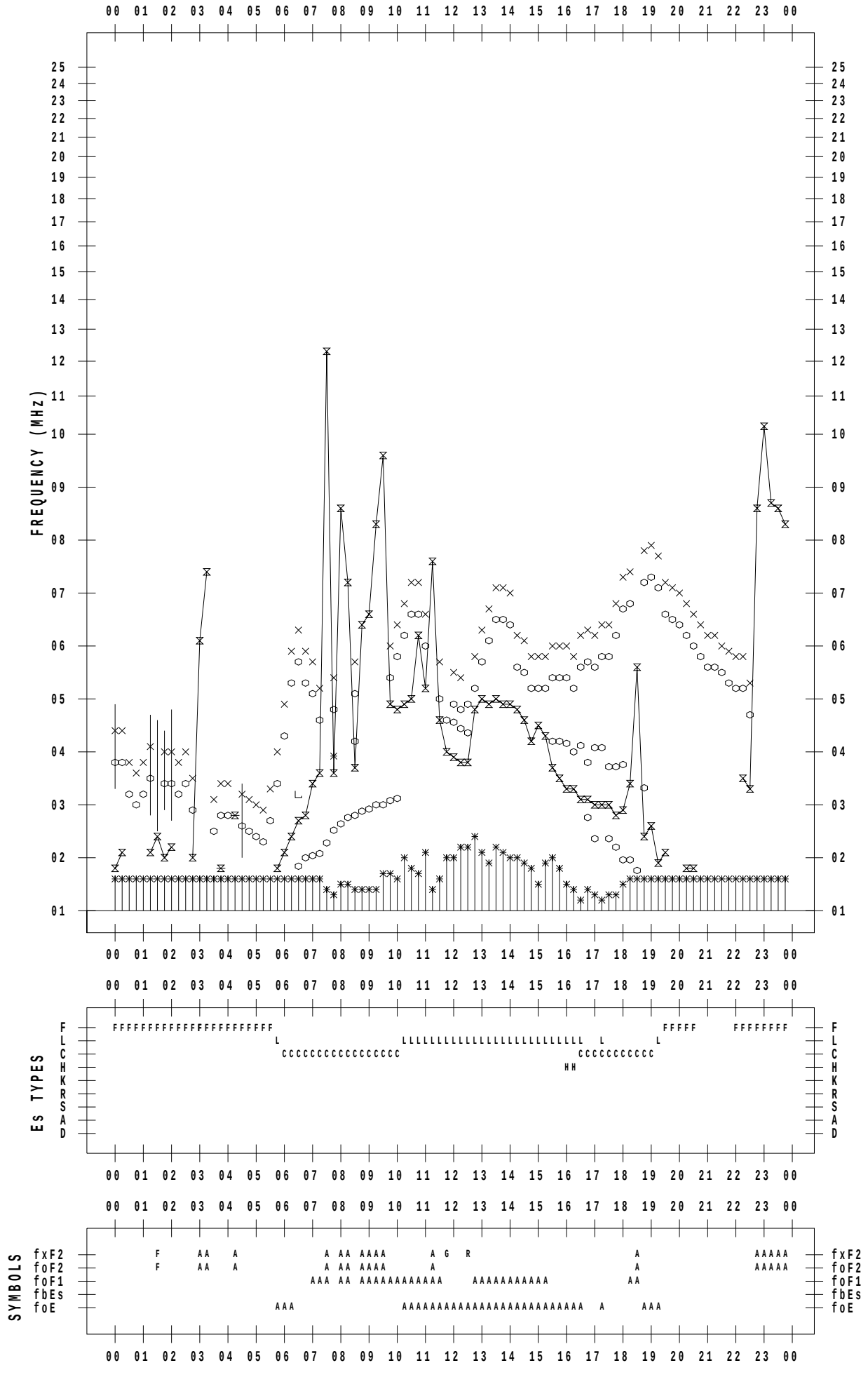
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/15

135 °E MEAN TIME



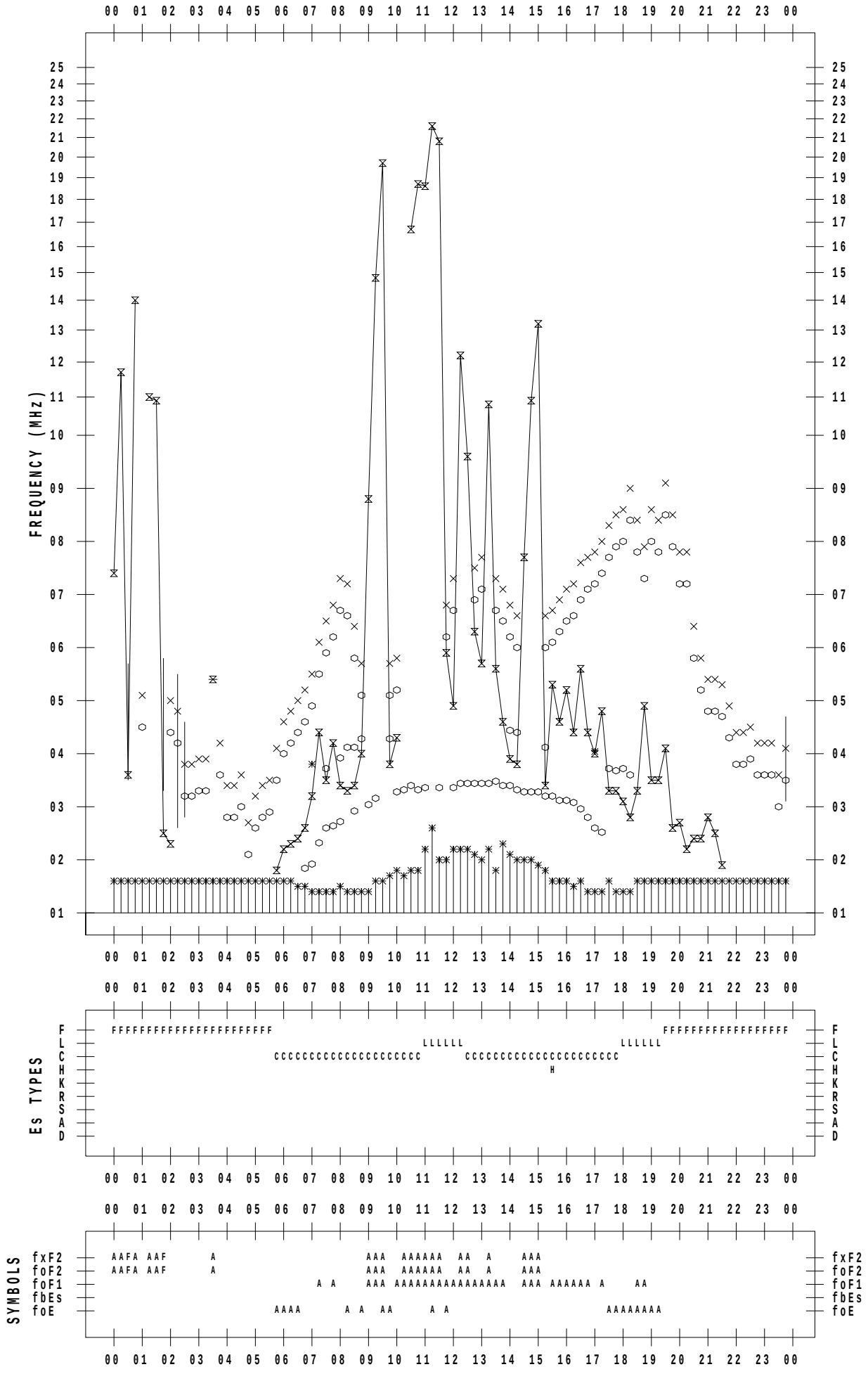
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/16

135 °E MEAN TIME



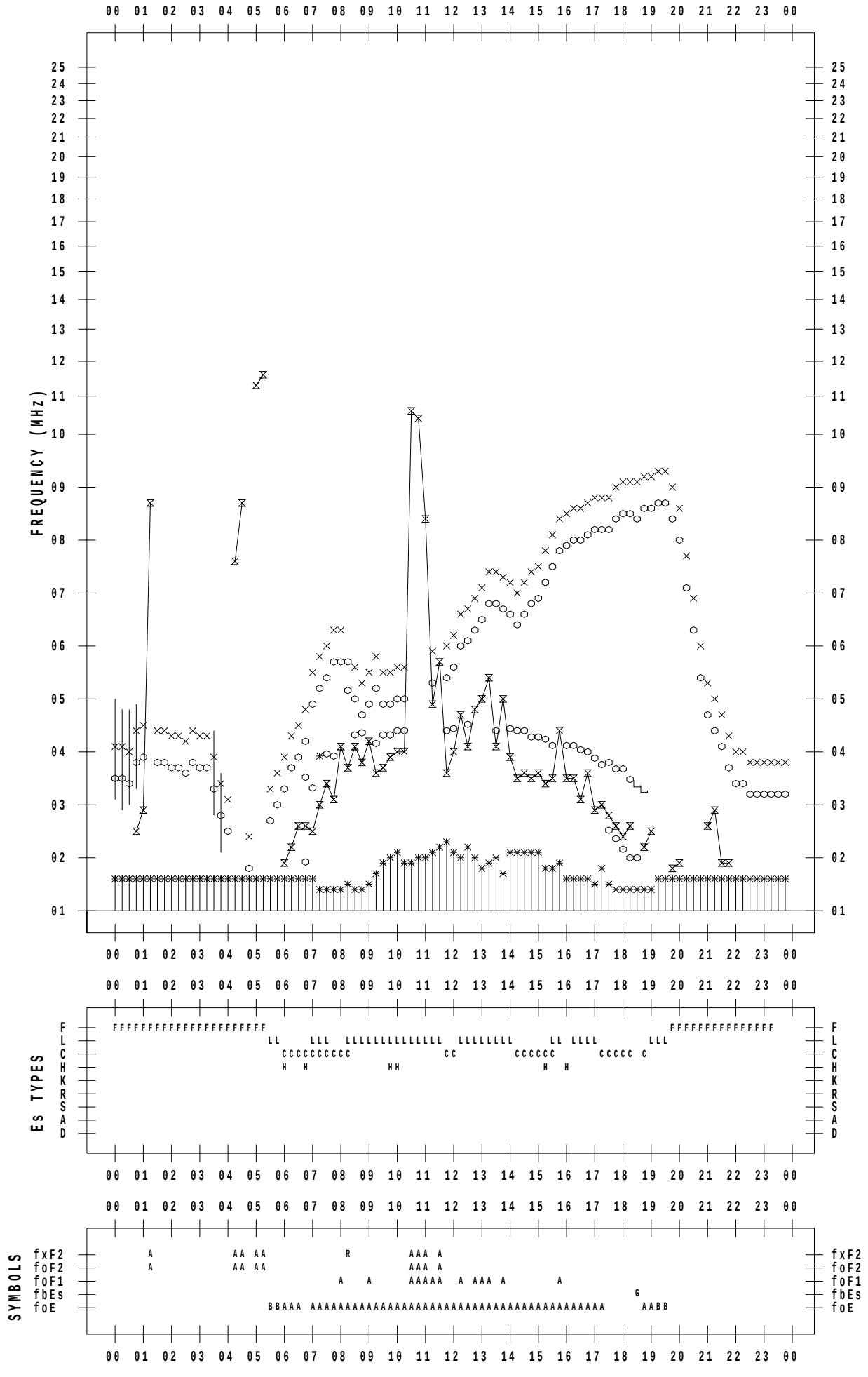
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/17

135 °E MEAN TIME



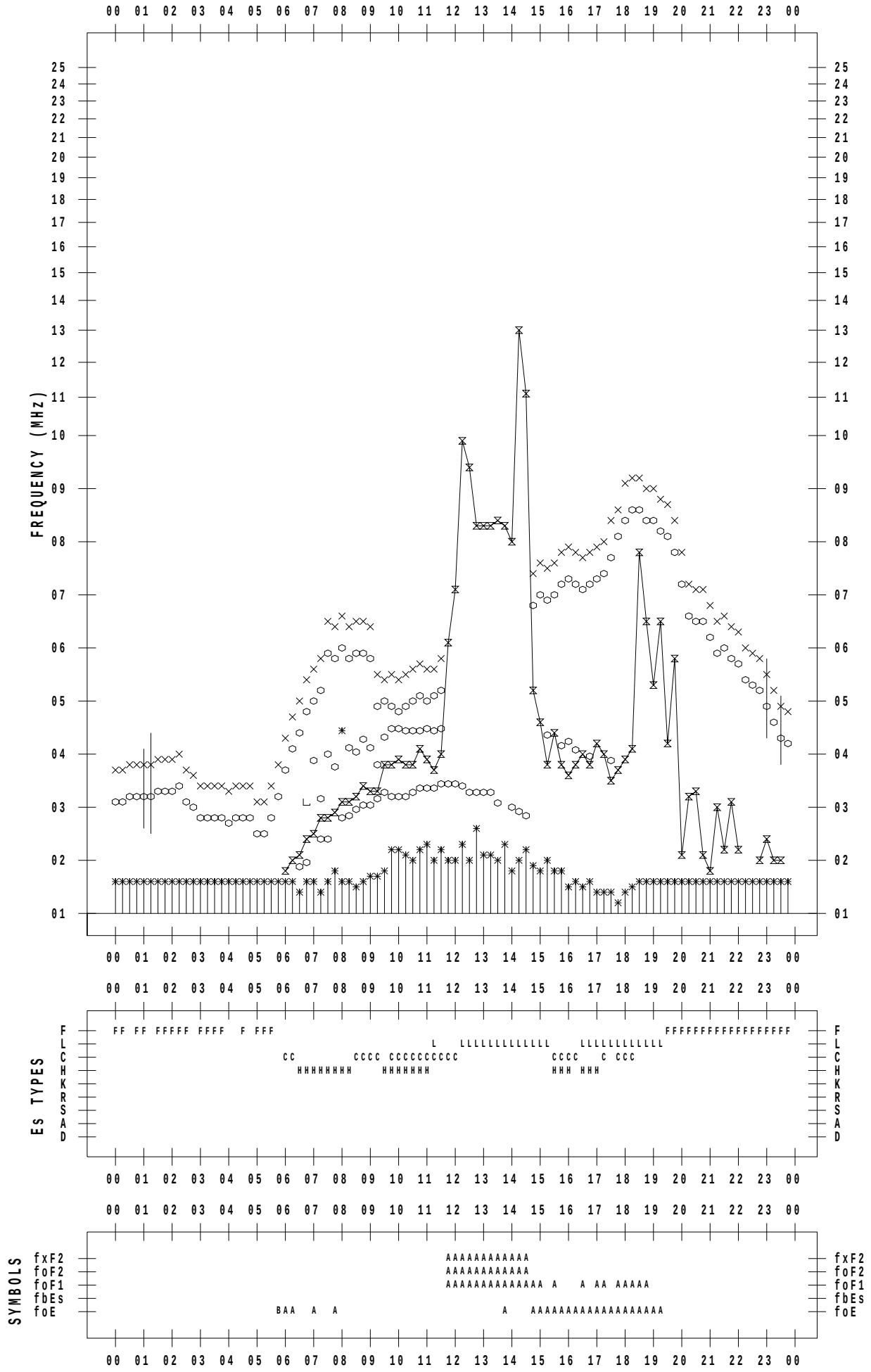
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/18

135 °E MEAN TIME



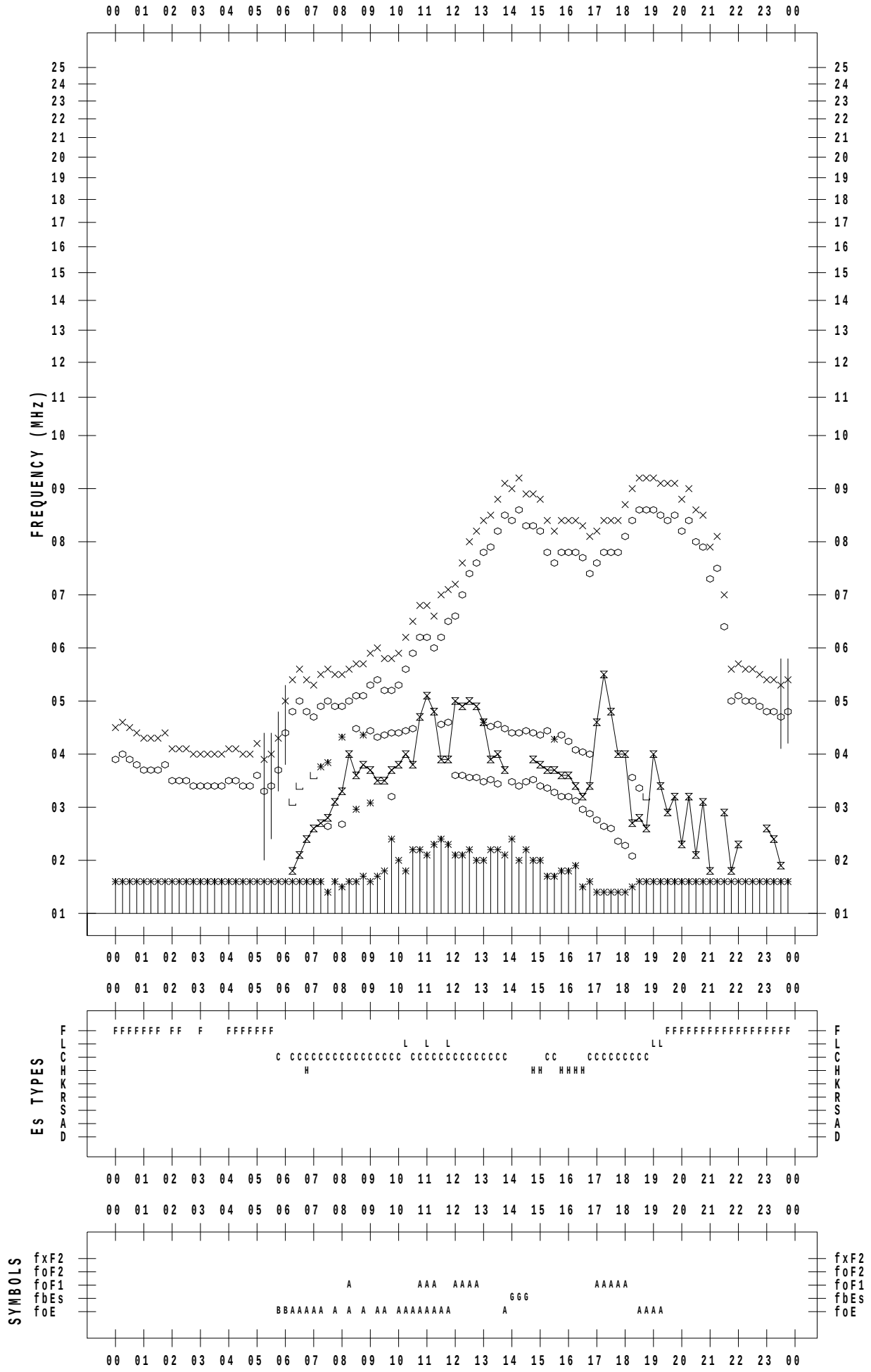
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/19

135 °E MEAN TIME



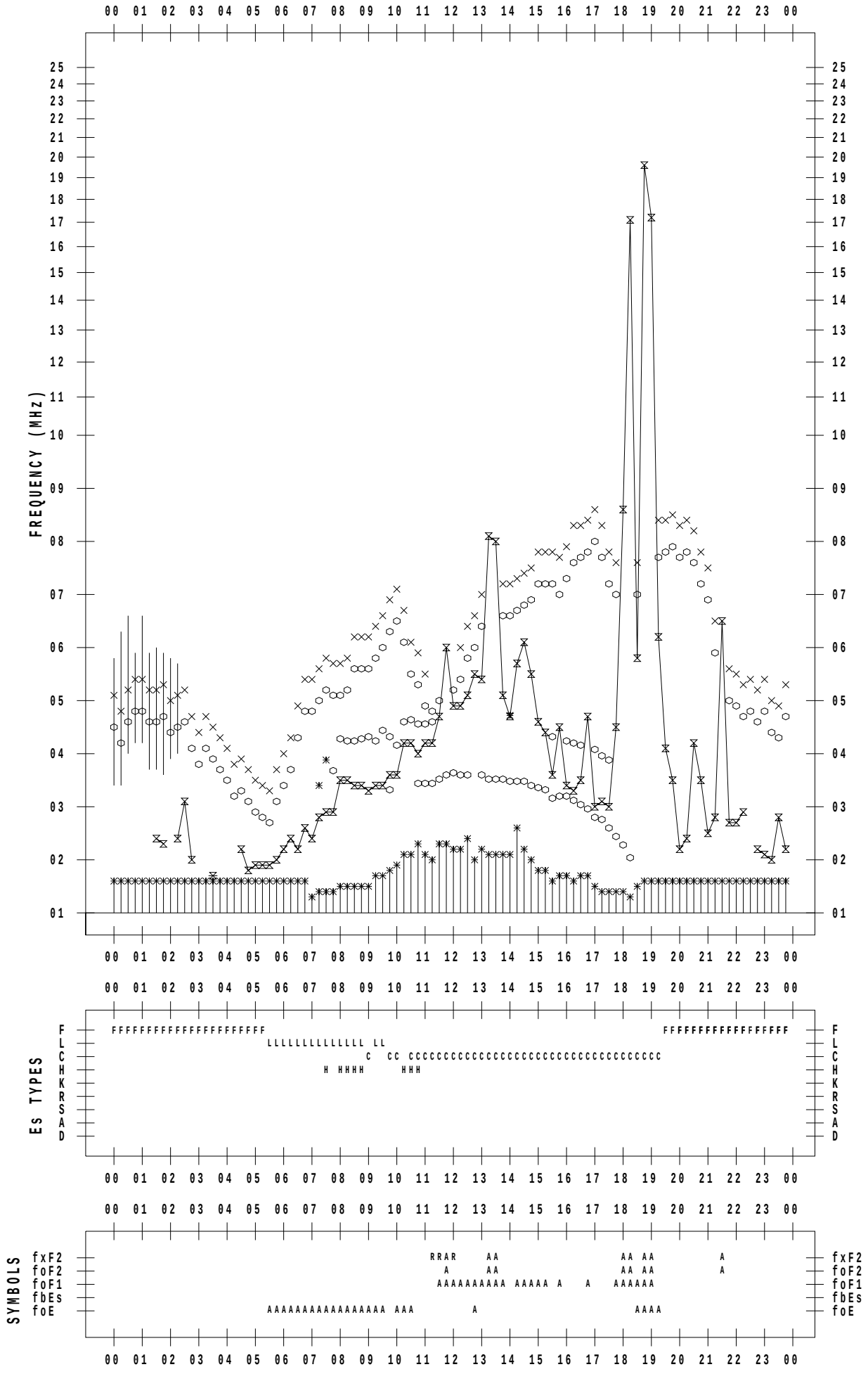
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/20

135 °E MEAN TIME



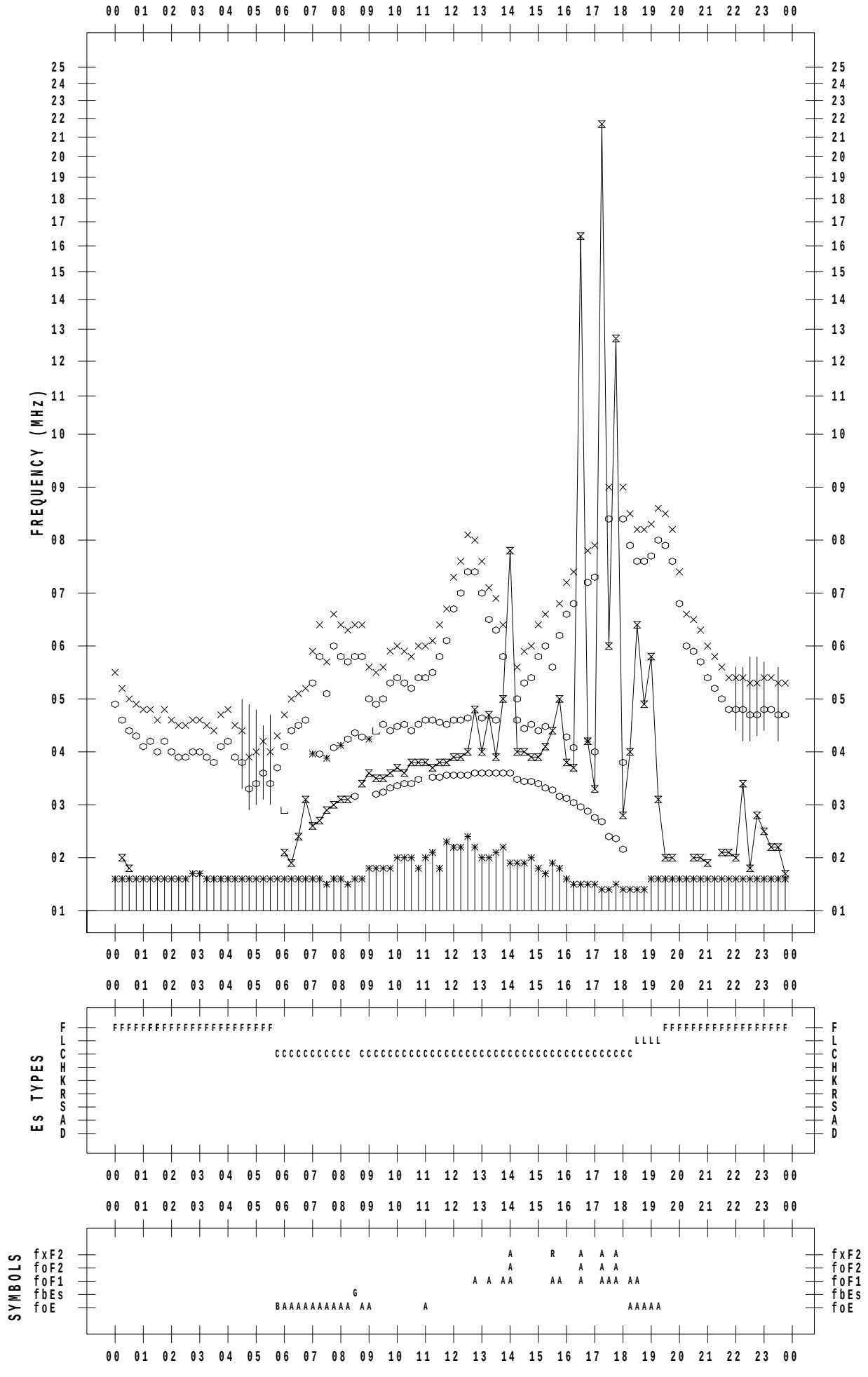
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/21

135 °E MEAN TIME



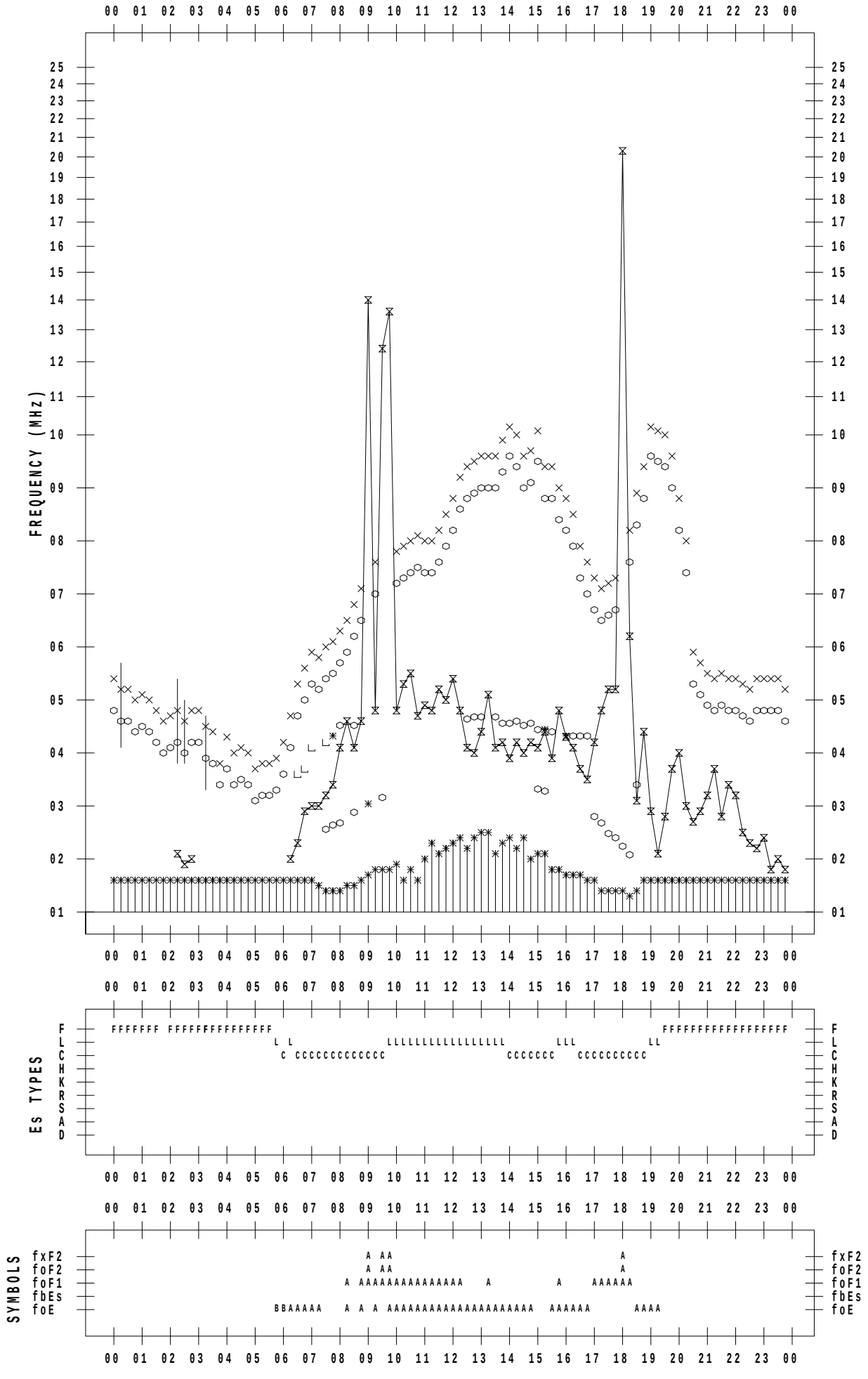
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/22

135 °E MEAN TIME



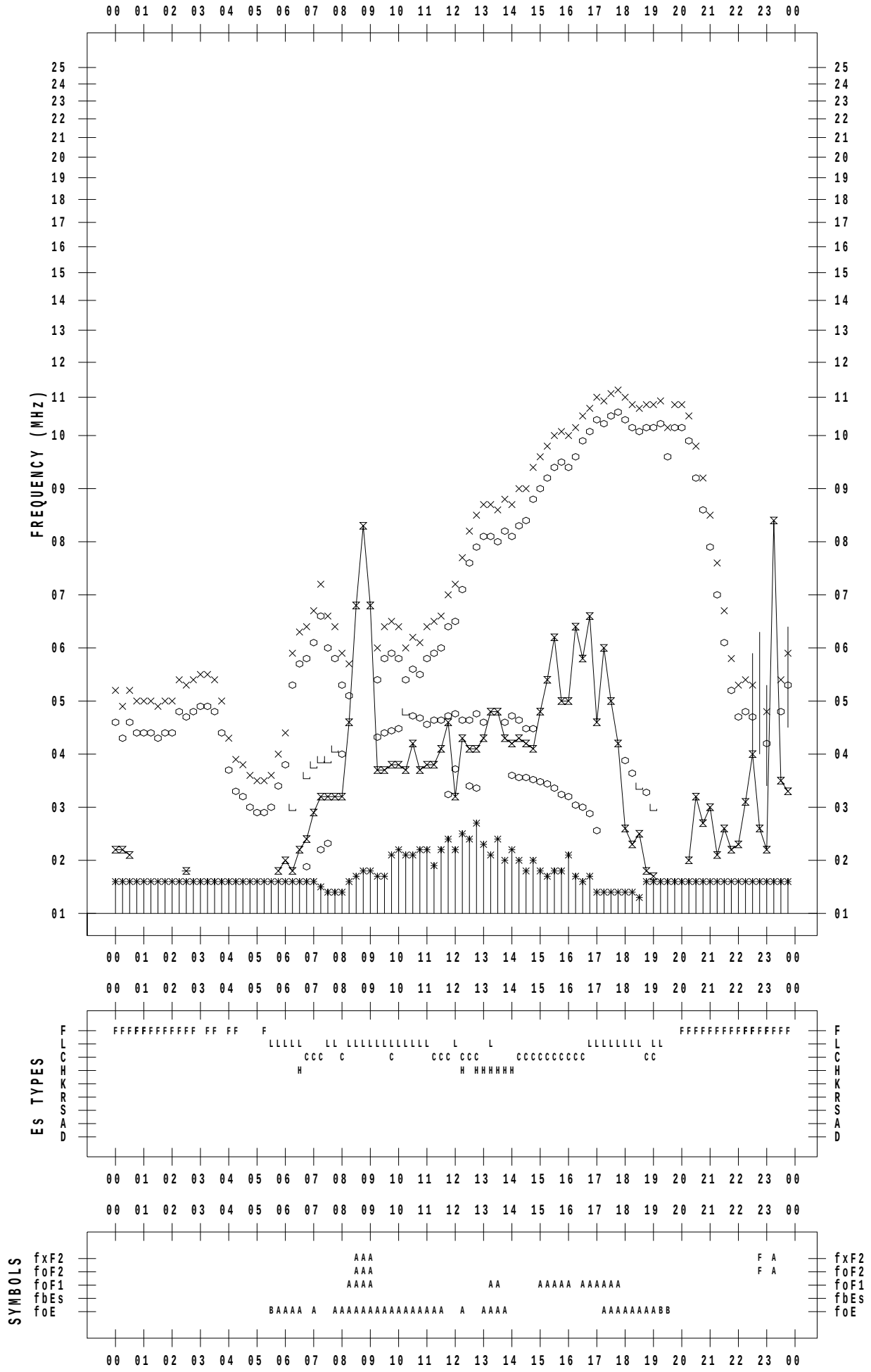
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/23

135 °E MEAN TIME



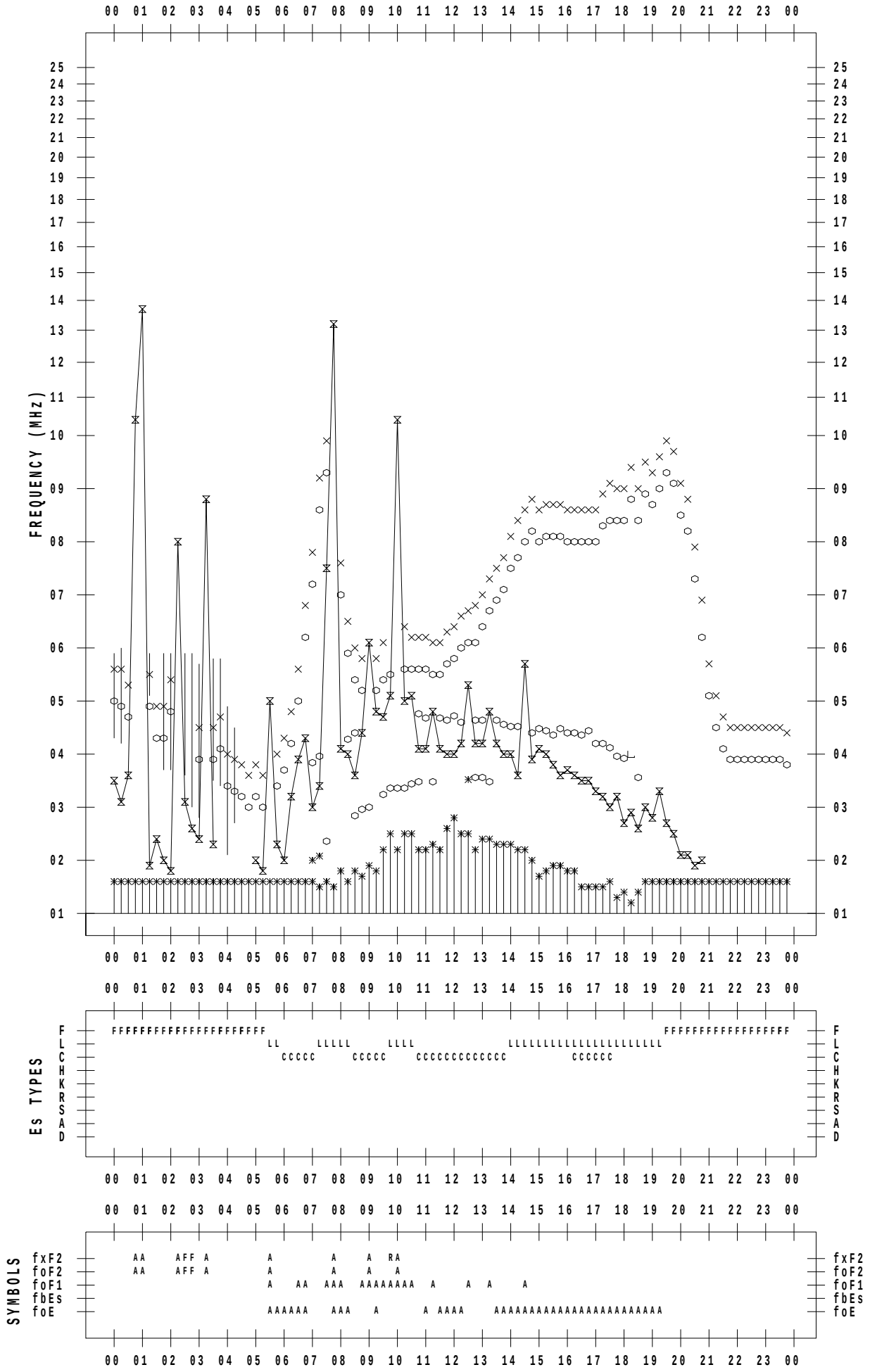
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/24

135 °E MEAN TIME



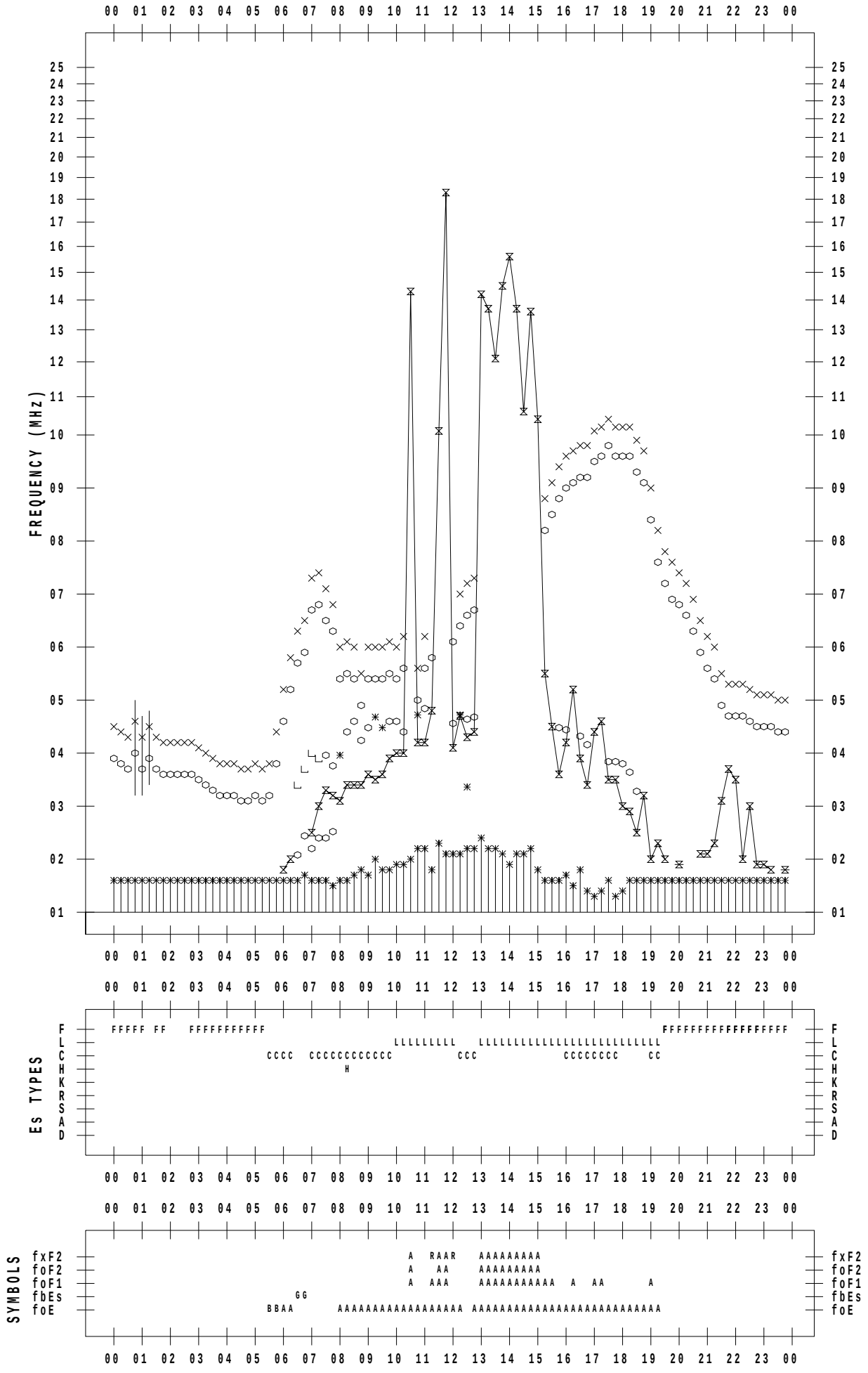
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/25

135 °E MEAN TIME



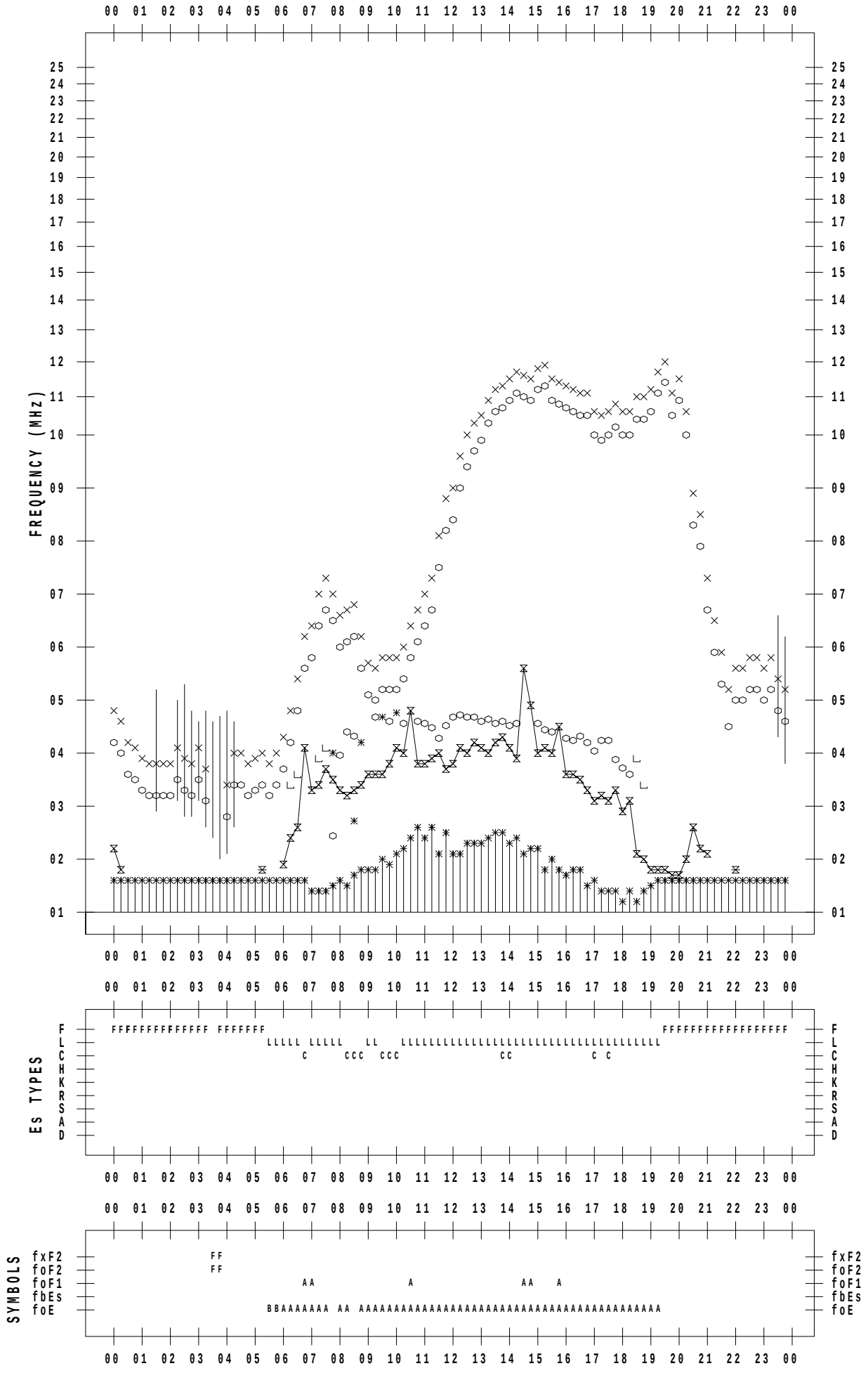
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/26

135 °E MEAN TIME



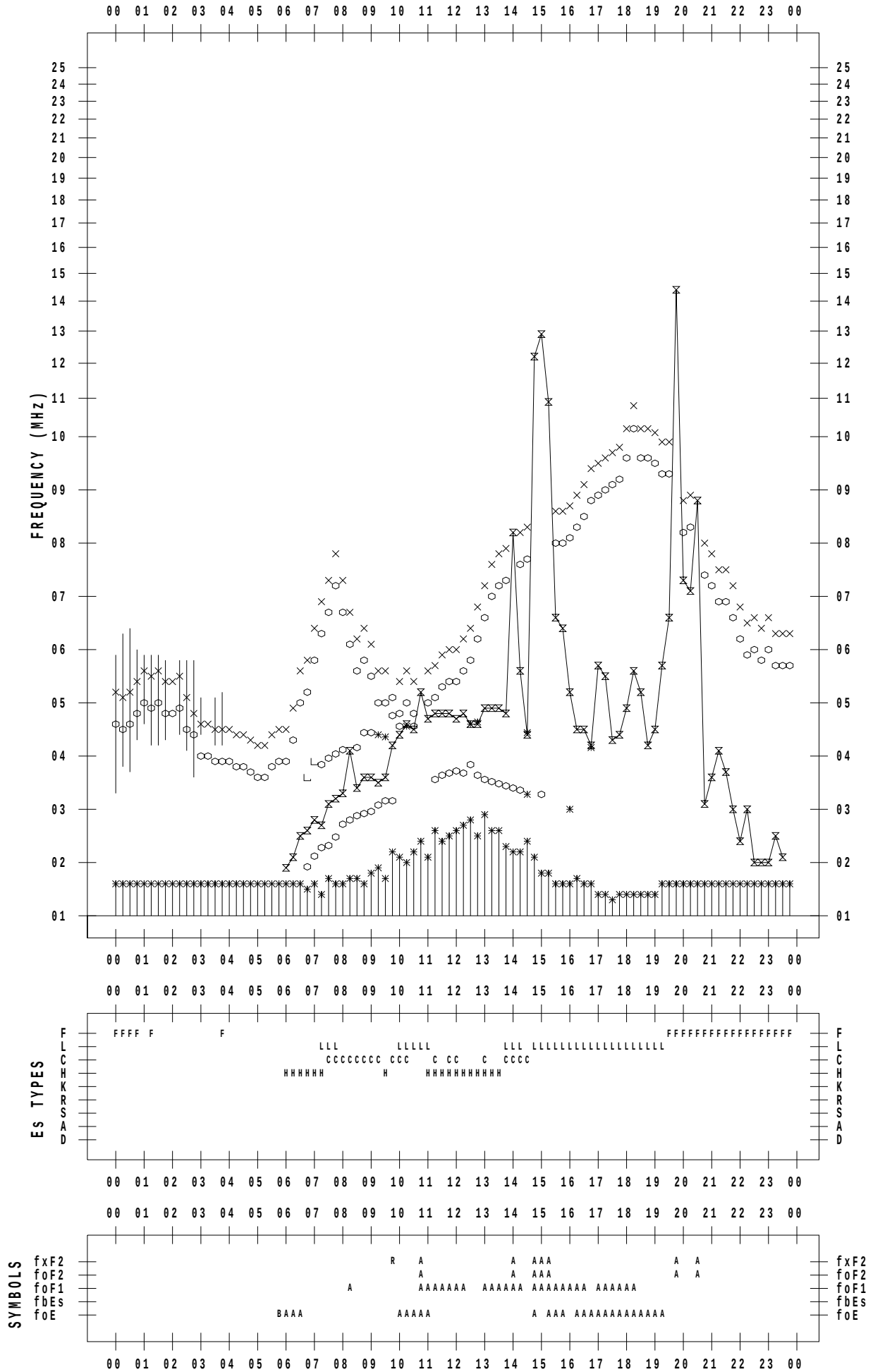
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/27

135 °E MEAN TIME



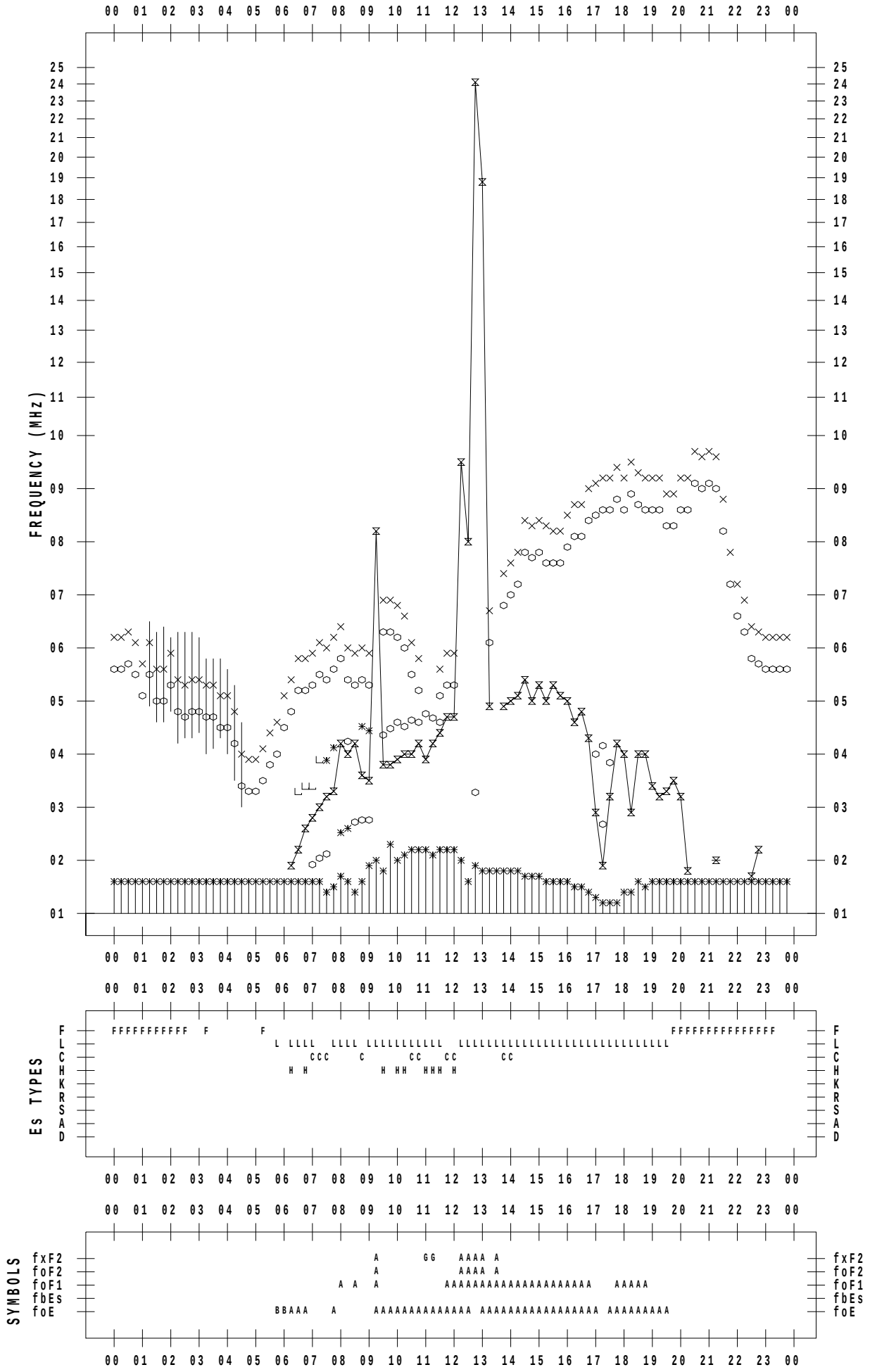
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/28

135 °E MEAN TIME



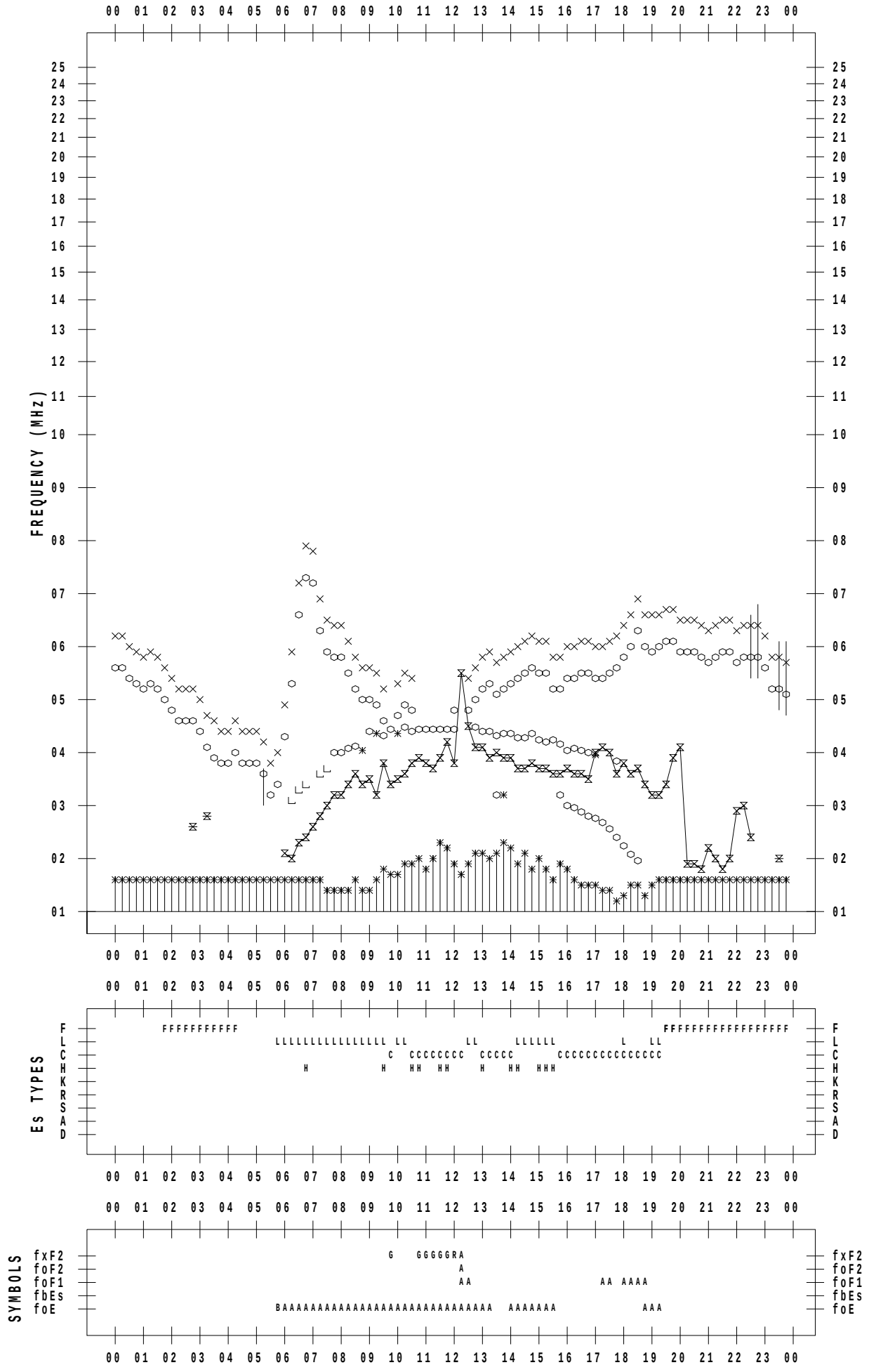
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/29

135 °E MEAN TIME



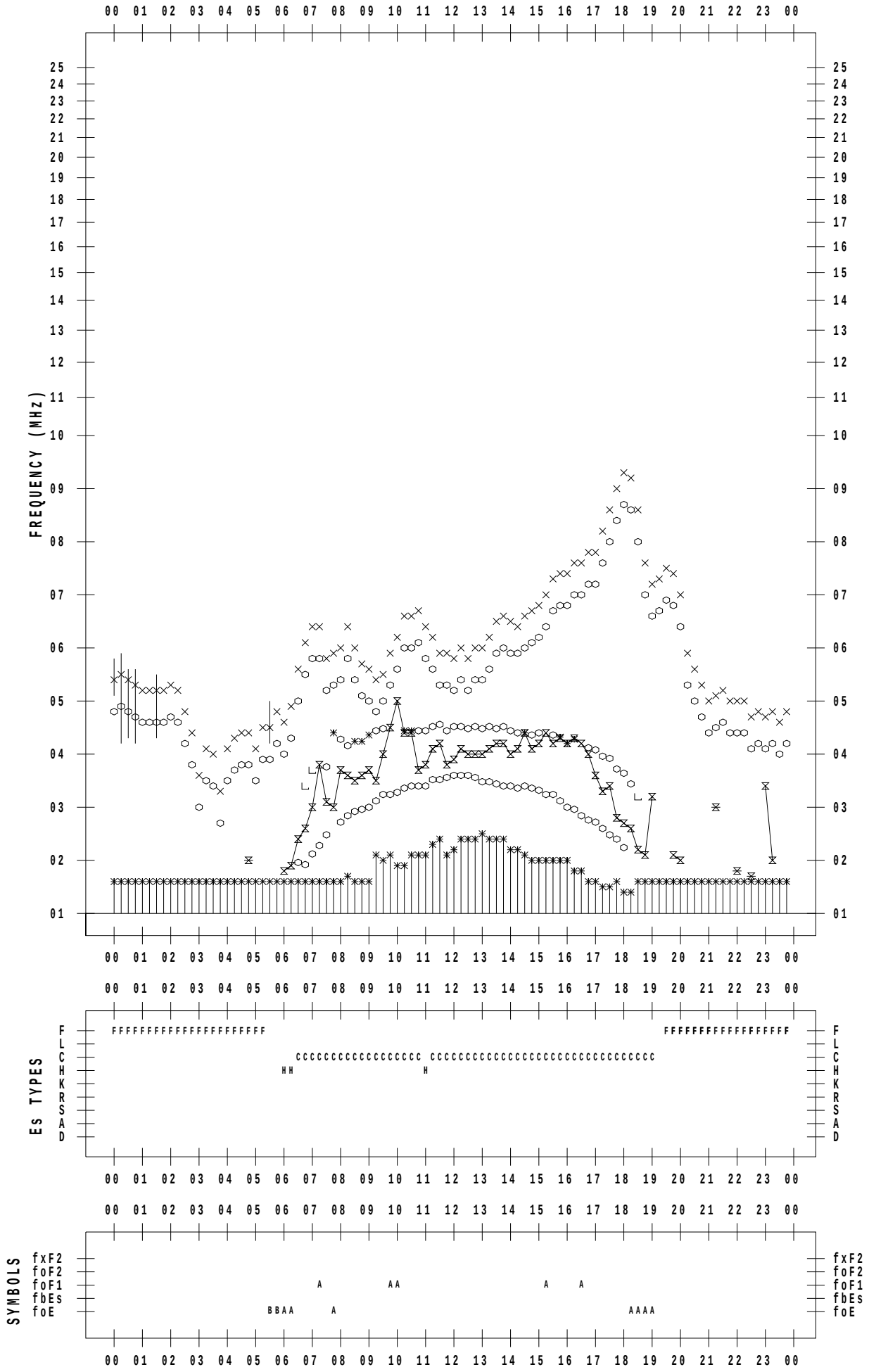
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/ 7/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa DATE : 2021/ 7/31