

IONOSPHERIC DATA IN JAPAN

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«WDC for Ionosphere and Space Weather ... <https://wdc.nict.go.jp/IONO/wdc/index.html> »



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I) and solar radio emission (S) obtained at the following stations under the

National Institute of Information and Communications Technology, Japan.

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

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

IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

- A Impossible measurement because of the presence of a lower thin layer, for example **Es** (for $foF2$).
- C Impossible measurement because of any failure in observation.
- G Impossible automatic scaling because of very small ionization density of the layer (for fEs).
- N Impossible automatic scaling because of complex echoes.
- Blank No digital record because of problems occurring in the auto matic data processing system, but existence of film record.

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

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

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

of values.

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

fxl	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 replace 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 atmospheric.
- 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 associated 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

NOV. 2021

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	53	51	51	42	A	31	38	69	78	93	76	86	79	77	76	79	75	63	49	35	N 34	30	31	32	
2	33	33	33	33	31	32	43	65	79	81	80	81	87	93	78	85	67	51	40	37	32	34	34	37	
3	39	40	39	33	31	32	39	71	93	84	80	90	81	77	75	81	65	49	44	42	A	40	40	37	
4	34	35	39	41	41	41	36	61	81	101	125	112	75	79	93	106	94	55	41	39	40	33	37	37	
5	69	35	A	A	A	A	30	63	101	104	108	99	77	76	71	68	67	47	44	41	39	39	38	35	
6	33	34	34	33	35	33	37	58	76	66	89	99	80	81	83	64	63	41	34	34	A	A	A	36	
7	38	37	37	33	35	32	30	52	57	76	85	92	75	73	66	71	64	44	30	30	A	A	35	36	
8	38	37	A	34	35	35	29	50	66	77	76	77	78	78	69	61	65	A	A	A	33	31	32	32	
9	33	35	35	35	34	35	27	51	63	N 66	69	87	92	67	57	59	63	38	A	33	A	33	33	A	
10	A	38	37	37	35	40	32	55	70	73	77	77	76	74	75	81	61	43	35	A	33	33	35	34	
11	34	A	36	37	36	38	31	60	59	76	72	87	87	77	73	69	52	38	36	27	31	33	32	31	
12	33	34	33	A	A	33	30	55	65	75	68	72	79	65	57	64	59	37	24	25	A	29	31	33	
13	33	32	35	33	33	36	24	50	61	68	67	71	78	61	63	60	61	A	34	29	A	30	31	32	
14	32	33	33	32	33	33	26	51	61	70	76	65	67	63	61	54	47	34	A	28	30	29	32	31	
15	32	34	32	33	33	32	30	49	54	62	62	67	69	82	60	53	47	33	33	29	31	33	33	34	
16	34	33	34	33	33	33	26	47	66	74	C	C	C	C	C	C	C	C	37	41	49	49	52	57	
17	56	55	52	53	51	42	35	59	74	A	C	C	C	C	C	C	C	33	A	43	45	44	43	45	
18	49	50	51	50	50	57	41	63	66	71	C	C	C	C	C	81	57	36	33	39	40	37	40	42	
19	45	43	45	43	43	51	31	49	61	65	59	91	90	63	56	66	52	31	35	39	38	41	38	43	
20	41	44	45	41	42	46	32	51	62	64	63	76	69	66	52	57	61	33	29	32	34	37	33	35	
21	35	41	41	39	41	36	33	52	63	67	68	76	79	60	64	74	53	35	34	47	A	A	A	A	
22	41	41	37	36	35	34	54	72	63	66	71	82	65	65	65	60	A	A	A	A	A	A	A	A	
23	A	35	33	33	33	33	24	42	54	62	66	84	81	59	56	60	56	37	32	34	33	35	34	35	
24	35	38	37	38	36	36	31	44	67	63	69	100	78	63	56	54	48	39	33	29	31	30	29	31	
25	32	33	32	34	33	35	25	51	63	70	57	75	83	65	56	55	60	47	25	25	33	30	29	31	
26	32	33	36	34	33	31	25	50	60	56	73	74	75	65	64	60	43	31	30	32	34	33	34	36	
27	37	36	35	36	37	34	30	51	65	63	68	82	82	67	60	54	56	35	24	25	A	31	33	33	32
28	34	33	33	35	33	30	29	47	60	78	61	78	82	63	75	74	51	33	25	A	39	38	42	45	
29	45	46	41	43	49	46	40	50	65	79	81	84	77	70	67	64	57	N 34	28	32	39	40	41	41	
30	45	43	39	43	37	40	39	47	64	79	83	96	75	66	62	65	42	43	33	29	37	39	40	39	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	29	28	28	26	29	30	30	30	29	27	27	27	27	27	28	28	26	25	26	24	27	28	28	
MED	35	36	36	36	35	35	31	51	65	71	72	82	79	67	64	64	60	38	33	32	34	33	34	36	
U Q	43	42	40	41	41	40	36	59	72	78	80	91	82	77	75	74	63	44	36	39	39	39	39	39	
L Q	33	33	33	33	33	32	29	50	61	64	66	75	75	63	57	59	52	34	29	29	31	31	32	32	

HOURLY VALUES OF fEs AT Wakkanai

NOV. 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	G		29	30	G	G	G	28	33	40	47	54	49	57	59	39	39	35	32	26	G	G	G	G				
2	G	G	G	G	G	G	G	G		35	42	48	48	39	44	35	32	36	33	32	G	G	G	G				
3	G	G	G	G	G	G	G		32	37	38	41	40	38	36	35	G	34	39	28	36	39	33	G	G			
4	G	G	G	G		29	11	G	25	37	35	44	41	39	28	50	39	G	11	G		G	G	G	G			
5	60			32	33	30	33	G	30	32	38	38	38	75	34	41	46	G		32	37	33	33		G	G	G	
6	G	G	G	G	G	G	G		23	72	48	128	38	51	54	32	24	39	32	32	G		43	40	38	36		
7	28	33	33	24	G	G	G	G		35	40	44	34	35	41	36	G	33	11	G		28	38	56	28	31		
8	35	37	39		G	32	G		25	39		36	29	46	43	46	31	33	39	30	32			G	G	G	G	
9	36	37	35	155	G	G	G		48	48	38	33	40	30	48	48	25	40	40	39	28	33	26	26	39			
10	43	23		G	G	G	G	G		35	30	60	72	110		G	G		27	32	33	29	39	32	25	G	58	
11	34	46	28	33	127	33	28	54	28	36	34	30	36	28	48	37	G		11	27	G	G	G	G	G	G		
12	G	G		39	58	48	31	G	28	35	40	40	36	37	35	34	G	G	G		G	G	G	G	G	G		
13	G	G	G	G	G		104	G	37	32	38	38	37	37	35	33	31	30	40	32	27	31	24		G	G		
14	G	G	G	G	G	G	G		48	32	38	41	91	37	36	32	40	G	G		G	G	G	G	G	G		
15	G	G		G	G	G	G		34	48	90	36	36	36	35	G	G		G		G	G	G	G	G	G		
16	G	G	G	G	G	G	G		38	34	34		C	C	C	C	C	C	C					G	G	25		
17	G	G		G	G	G	G		48	40	64		C	C	C	C	C	C			32	60	35		G	G	25	28
18	G	30	31	32	34	36	11	G	27	106			C	C	C	C		59	35	32		G	G	G	G	G	G	
19	G	G	G	G	G		48	G	48		38	36	35	G		52	52	49	11		G	G	G		G	G	G	G
20	31	40	38	29	36	31	28	33	30	34	34	58	35	33	36	37	32	32		G	G	G	G	G	G	G	G	
21	G	G	G		G	G		G	48	52	40	79	38	38	35	33	50	11		G	G	30		G	G	G	G	
22		G	G		31		G	G		29	49	40	75	61	32	37	36	41	39	39	35	54	47	40	55	G	G	
23	43	30	29	24	26	22		G	34	47	48	92	30	28	28	25	G	G	G	G	G		32	32		G	G	
24	G	32	G	28	32	28	108	G		30	33	29	33	32	28	27	G	11	28	26		28		G	G	G	G	
25	G	G	G	G	G	G	G		90	48	35	38	40	34	28	37	31	32	34			27		G	G	G	G	
26	G	G	G	G	G	G	G		32	116	157	36	35	36	33	38	G	40	G	G	G	G	G	G	G	G	G	
27	G	G	G	G	G	G	G		48	49	34	36	40	35	33	35	28	23	11		G	G	G	G	G	G	G	
28	G	G	G		G	G	G	G		40	33	36	35	34	35	35	60	48	24	53	160	34		G	G	G	G	
29	G	G	G	G	G	G	G	G		G		40	39	36	69	38	34	31	11	27	27	26		G	G	G	G	
30	G		28	27	28		G	G		48	35	39	41	59	36	34	G	23	40	31	11			G	G	G	G	
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	30	29	30	29	29	30	29	30	30	29	27	27	27	27	27	28	28	29	28	27	30	30	30	30				
MED	G	G	G	G	G	G	G	32	35	38	39	38	37	35	35	31	32	31	28	26	G	G	G	G				
U Q	28	30	32	28	29	31	G	48	47	45	44	48	46	41	41	39	37	33	32	33	32	24	G	G				
L Q	G	G	G	G	G	G	G	G	32	35	36	35	35	32	32	12	11	6	G	G	G	G	G	G				

HOURLY VALUES OF fmin AT Wakkanai

NOV. 2021

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

$\begin{matrix} H \\ D \end{matrix}$	00	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	17	16	15	16	16	15	15	16	15	15	18	15	15	15	14	15	15	16	16	16	14	16	15	
2	15	17	15	17	15	15	15	15	15	15	15	15	17	15	15	16	15	16	16	16	15	15	15	14	
3	15	15	71	14	18	15	14	15	17	15	14	15	14	17	17	15	15	16	15	15	15	15	14	15	
4	15	15	15	14	16	16	16	16	15	17	15	15	15	17	13	13	16	14	16		15	15	14	15	
5	15	16	17	17	16	16	15	16	16	15	15	15	15	16	15	15	18	16	15	16	16	16	15	15	
6	14	14	14	15	18	17	184	15	15	15	14	15	16	14	16	16	15	16	16	16	15	16	16	15	
7	16	17	15	16	16	15	14	16	17	16	15	16	15	15	15	16	16	15	15	16	15	15	15	16	
8	15	15	17	15	14	16	14	17	21	16	17	17	20	16	16	17	15	15	16	16	16	16	16	17	
9	15	15	15	16	15	15	14	20	16	15	17	16	17	16	15	16	15	15	15	16	15	16	16	16	
10	17	16	15	16	15	16	16	15	17	17	20	17	17	16	15	16	16	15	16	15	16	16	16	16	
11	15	16	16	16	16	17	16	15	16	18	14	22	19	15	15	15	16	14	16	16	15	16	14	18	
12	15	20	17	16	16	16	16	15	15	15	14	17	15	15	15	15	15	16	15	20	14	15	17	15	
13	16	15	15	20	15	15	15	15	16	13	15	14	14	16	16	16	15	16	16	16	17	16	15	16	
14	15	15	15	15	15	14	15	14	15	14	15	15	14	14	16	15	17	15	16	15	15	15	15	15	
15	15	15	15	15	15	14	15	14	15	17	17	14	17	15	16	15	15	14	16	14	15	16	15	14	
16	15	15	14	16	17	14	15	14	17	17		C	C	C	C	C	C	C		16	15	16	17	16	16
17	15	14	15	16	15	15	14	15	15	18		C	C	C	C	C	C		17	17	15	16	15	16	16
18	16	16	16	16	16	17	15	18	16	18		C	C	C	C	C					9	14	15	22	14
19	14	15	15	15	14	15	16	14	15	15	15	15	17	16	16	16	17	15	14	16	15	16	16	15	
20	15	17	16	17	15	16	16	16	15	16	16	14	16	15	13	14	16	16	16	15	15	16	17	14	
21	14	14	16	15	15	15		16	15	15	16	14	13	15	14	15	17	16	15	16	16	14	15	14	
22	16	15	15	15		16	16	15	15	16	15	17	14	15	14	15	15	16	15	16	15	15	16	16	
23	16	16	15	15	16	17	15	15	15	15	15	15	16	15	15	15	15	14	14	15	16	16	16	14	
24	15	16	15	16	15	16	16	15	17	16	15	15	29	16	17	13	15	16	16	16	16	17	15	15	
25	16	14	15	14	15	14	14	16	15	17	14	14	14	13	13	14	15	15	15	14	15	15	14	14	
26	14	14	14	14	15	16	14	16	14	14	15	14	14	15	15	14	14	14	14	14	14	14	15	14	
27	14	15	15	14	14	14	14	17	16	17	15	13	16	12	15	14	16	16	15	14	15	14	15	15	
28	14	14	15	15	16	15	16	17	15	16	15	14	15	17	16	13	14	16	15	15	15	15	14	15	
29	14	17	16	15	15	15	15	16	16	15	15	14	16	15	15	16	14	15	15	16	15	16	14	14	
30	15	16	16	16	16	14	14	15	16	14	15	15	16	13	15	14	16	15	14	15	14	16	14	14	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	29	30	29	30	30	30	27	27	27	27	27	28	28	29	30	29	30	30	30	30	
MED	15	15	15	15	15	15	15	15	16	16	15	15	16	15	15	15	15	15	15	16	15	16	15	15	
U Q	16	16	16	16	16	16	16	16	16	17	15	16	17	16	16	16	16	16	16	16	16	16	16	16	
L Q	15	15	15	15	15	15	14	15	15	15	15	14	14	15	15	14	15	15	15	15	15	15	15	14	

HOURLY VALUES OF fof2 AT Kokubunji

NOV. 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	35	34	A	42	33	A	39	73	90	93	103	74	87	79	92	96	90	74	51	38	35	32	34	33
2	A	35	38	30	33	29	41	76	82	95	87	89	77	74	89	91	80	53	A	38	39	33	A	37
3	38	41	39	35	33	31	48	79	76	80	84	87	80	79	85	86	80	67	43	41	46	35	A	A
4	A	34	33	36	33	31	38	61	55	108	114	94	72	61	123	127	77	55	46	53	58	45	49	39
5	43	A	33	23	N 23	18	35	72	101	122	134	A	77	71	79	81	A	55	53	56	47	40	38	36
6	32	27	33	33	A	33	39	73	70	89	92	94	90	91	83	99	67	46	34	A	A	38	A	A
7	A	A	A	A	A	31	41	67	74	77	85	92	79	87	93	73	79	49	33	34	34	36	36	A
8	35	35	A	32	A	A	35	55	69	73	83	86	A	78	91	89	A	48	A	A	A	31	33	32
9	31	31	31	32	31	28	37	59	66	68	73	91	75	83	79	67	68	56	35	34	33	30	A	A
10	32	32	A	A	33	31	33	59	78	69	78	77	63	80	93	92	81	58	28	A	32	A	A	33
11	32	32	33	33	35	34	37	56	77	68	77	66	82	87	99	85	75	46	25	32	33	29	32	31
12	32	31	36	30	31	30	34	57	69	73	77	91	60	66	83	65	59	49	26	29	30	27	31	30
13	30	32	31	31	32	N 23	31	47	55	62	70	76	65	66	63	63	56	48	29	33	33	32	32	31
14	31	33	33	31	35	24	32	61	63	74	63	75	63	67	75	60	56	36	25	30	33	32	30	32
15	31	30	A	32	33	31	34	55	55	64	65	71	69	A	69	73	53	42	25	33	33	31	31	31
16	31	32	32	31	33	32	34	53	59	79	85	66	66	90	81	81	64	50	39	32	36	37	A	A
17	39	40	A	34	35	32	33	68	65	84	92	106	75	83	81	67	66	47	A	31	35	32	A	31
18	31	33	33	37	39	32	33	65	76	70	85	94	79	92	91	75	80	42	25	30	31	29	26	27
19	30	30	31	33	35	N 24	30	50	67	61	76	77	78	71	65	56	54	48	25	30	35	31	31	31
20	31	31	31	31	29	27	31	53	67	72	83	71	69	67	72	59	51	43	32	26	31	30	27	29
21	31	A	31	A	A	33	33	50	50	71	85	81	70	65	64	61	65	39	26	A	37	36	36	34
22	36	36	45	35	30	30	34	56	72	71	79	75	67	72	73	62	61	47	A	A	A	A	A	A
23	A	30	A	34	A	A	24	59	55	63	69	73	64	69	69	63	67	39	36	35	39	A	A	30
24	31	32	30	31	30	29	27	63	61	66	68	71	75	74	75	57	57	45	A	33	27	31	29	A
25	31	30	32	33	33	33	33	55	65	67	66	81	79	91	78	66	55	50	39	30	26	26	30	28
26	30	31	33	35	29	N 25	24	53	60	64	66	70	70	63	60	63	56	37	31	32	34	33	34	34
27	33	34	34	35	35	25	31	57	70	67	65	74	67	73	76	63	55	46	32	31	30	31	32	30
28	31	31	30	31	30	25	26	54	62	67	75	76	A	A	70	77	60	36	29	31	38	A	A	A
29	38	35	33	33	34	36	38	57	72	71	82	96	79	68	70	70	62	41	31	27	33	36	35	34
30	36	38	A	34	37	36	31	56	67	75	95	85	85	74	67	59	64	35	33	34	31	32	33	35
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	22	27	25	27	30	30	30	30	30	29	28	28	30	30	28	30	25	25	27	26	20	22
MED	32	32	33	33	33	31	34	57	67	71	80	77	75	74	78	68	64	47	32	32	33	32	32	32
U Q	35	35	33	35	35	32	37	65	74	79	85	91	79	83	89	85	76	50	37	34	37	36	34	34
L Q	31	31	31	31	30	25	31	55	61	67	70	73	67	67	70	63	56	42	26	30	31	31	30	30

HOURLY VALUES OF fEs AT Kokubunji

NOV. 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	36	G	57	33	58	27	23	28	35	43	44	51	71	45	37	39	40	33	G	24	G	G	G	26	
2	43	G	G	G	G	G	G	31	33	35	51	51	50	52	46	43	36	37	54	33	G	28	47	G	
3	G	G	24	G	23	G	23	24	41	34	44	35	57	56	116	55	31	26	G	G	G	26	69	61	
4	48	G	G	G	G	G	G	31	37	39	49	47	45	31	148	64	33	G	G	G	G	G	G	41	
5	24	28	23		G		G	G	37	43	41	95	45	40	53	45	71	79	G	G	G	G	G	56	
6	G	G	29	34	72	G	26	33	41	55	75	52	63	52	77	31	G	25	26	32	43	24	69	109	
7	84	90	103	81	67	24	31	37	48	110	55	53	43	45	55	38	G	41	30	26	G	G	47	47	
8	40	39	47	34	50	47	107	32	27	40	46	62	96	61	43	57	103	43	46	59	51	24	G	G	
9	G		G	G	G	G	32	34	28	39	47	101	45	39	60	57	87	11	53	34	25	33	50	34	
10	G	24	41	35	24	27	25	28	37	40	34	42	75	60	29	32	37	47		35	31	32	31	28	
11	24	G	G	G	G	G	G	29	28	40	31	55	39	40	G	31	29	27	G	110	G	G	31	39	
12	G	G	G	G	G	G	G	29	36	40	38	56	52	39	36	33	G	11	G	G	G	G	G	G	
13	G		G	G	G	11	G	49	34	40	41	41	36	37	38	32	43	G	G	G	G	G	G	G	
14	G	G	G	G	103		G	33	36	56	43	42	39	33	36	35		20	G	G	G	24	24	G	
15	G	24	27	26	G	G	G	27	32	31	36	52	53	108	40	37	29	11		G	25	G	G	G	
16	G	G	G	G	G	G	G	G	39	39	47	54	66	61	51	33	31	43	35	G	G	G	59	40	
17	33	37	37	36	36	G	G	33	39	52	66		126	112	60	51	51	37	40	27	G	31	32	27	
18	G	G	G	31	25	24	G	48	29	37	36	54	43	39	51	40	G	46	28	G	G	G	G	G	
19	G	G	G	G	G	G	G	G	33	43	35	34	55	37	39	146	G		G	G	92	G	G	G	
20	G	G	G	G	G	G	G	G	36	39	40	55	40	34	34	31	34	33	G	G	G	G	G	G	
21	24	27	G	40	33	29	32	31	31	33	40	37	37	35	38	32	25	41	G	36	G	31	28	30	
22	G	G	G	G	G	G	G	45	26	32	41	54	46	40	32	34	G	41	52	47	33	37	36	41	
23	35	G	34	28	36	31	G	29	47	34	54	G	38	39	47	29	G	33	11	34	25	55	27	G	
24	G	G	G	G	G	G	G	G	34	37	41	43	36	38	39	37	36	57	79	33	G	G	G	39	
25	G	G	G	G	G	G	11	47	32	52	34	37	36	33	33	G	G	G	G	G	G	G	G	G	
26	G	G	G	G	G	G	G	47	31	33	59	31	35	31	33	34	G	39	G	G	G	G	G	G	
27	G	G	G	G			G	47	54	33	34	36	33	36	35	33	26	47	G	G	G	G	G	G	
28	24	G	G	G	G		G	26	31	36	48	57	50	105	80	69	34	26	25	27	33	46	40	82	
29	29	G	29	G	G	G	G	28	140	47	41	60	40	57	36	25	35	33	G	G		G	G	34	
30	48	33	41	27	29	30	G	G	34	40	84	63	57	49	61	45	31	28	G	G	G	30	28	31	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	28	30	29	29	26	30	30	30	30	30	29	30	30	30	30	29	29	28	30	29	30	30	30	
MED	G	G	G	G	G	G	G	30	34	40	42	52	45	40	40	36	31	33	G	G	G	G	12	28	
U Q	33	24	29	32	34	24	23	34	39	43	49	55	57	56	55	45	36	42	32	33	25	30	36	40	
L Q	G	G	G	G	G	G	G	26	31	35	38	39	39	37	36	32	G	22	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Kokubunji

NOV. 2021

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

$\begin{matrix} H \\ D \end{matrix}$	00	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	15	16	16	15	16	15	15	14	13	23	15	17	14	14	14	16	16	16	13	15	14	15
2	16	15	16	13	13	13	13	15	17	17	15	14	23	16	15	14	14	17	16	15	15	15	15	13
3	16	15	16	15	16	14	15	17	15	14	14	17	16	14	16	15	15	15	13	13	15	17	15	17
4	17	14	15	13	13	13	13	15	16	15	16	15	15	15	13	16	15	16	16	18	13	16	29	15
5	16	15	16	15	14	15	16	21	15	15	13	14	17	14	14	15	17	15	14	16	14	16	13	15
6	14	15	16	16	14	16	16	16	14	15	12	15	14	14	14	16	15	15	16	16	15	16	15	17
7	16	15	20	17	16	16	16	17	15	15	14	15	15	15	15	15	15	16	16	15	15	16	15	15
8	16	17	15	15	15	16	14	17	16	15	15	16	16	17	16	14	8	15	16	15	15	16	15	13
9	15		13	14	15	15	16	15	15	16	15	13	18	15	15	15	15	16	16	15	14	16	15	16
10	15	16	15	15	16	16	16	15	15	15	15	14	15	16	16	15	15	15	15	15	16	16	16	16
11	16	15	15	14	15	13	13	15	16	17	16	17	16	15	14	14	16	16	15	15	16	15	17	15
12	15	15	15	16	14	13	14	15	15	15	15	16	24	14	16	16	15	13	13	13	15	13	15	14
13	14		15	14	13	13	17	15	17	15	14	15	14	14	14	16	20	16	15	13	13	14	14	14
14	13	13	13	13	13		15	15	17	14	15	14	14	15	15	15	15	15	15	16	15	16	15	15
15	16	16	16	16	13	15	15	15	15	15	14	13	14	7	15	17	16	13		13	15	15	13	14
16	14	13	13	15	14	14	13	20	15	15	15	14	15	14	14	15	16	15	16	15	15	14	15	15
17	15	15	15	15	15	14	13	15	15	15	17	11	10	17	15	15	16	15	15	16	17	16	16	16
18	13	16	15	16	15	16	15	14	16	15	15	16	16	17	15	15	15	16	16	13	15	14	13	14
19	14	14	15	16	15	16	15	15	16	16	16	17	15	15	15	17	16	16	16	13	63	14	13	13
20	13	15	15	16	15	13	13	17	14	15	15	15	13	14	15	15	16	15	16	16	14	14	13	15
21	15	15	15	15	16	16	16	15	15	15	15	14	14	16	13	16	16	13	16	16	16	15	16	15
22	15	13	16	15	14	16	16	18	15	16	15	15	15	15	16	16	16	17	16	15	16	15	15	15
23	15	15	15	16	16	16	15	15	15	17	16	15	13	14	15	14	20	16	15	15	16	16	16	14
24	17	15	15	15	14	15	15	15	15	15	13	15	15	14	14	15	15	16	17	17	15	18	15	15
25	15	14	14	13	15	15	13	13	15	15	15	16	15	14	16	15	15	13	14	13	14	14	14	13
26	13	15	13	13	15	17	15	13	17	15	14	15	15	14	14	13	17	16	14	14	14	14	16	15
27	17	15	16	15		15	13	22	16	17	15	14	16	15	15	15	16	16	15	18	17	13	14	16
28	16	13	13	15	14		14	15	16	14	15	15	14	12	11	13	14	15	17	16	15	16	15	15
29	17	15	15	15	15	15	13	15	15	14	14	14	14	14	16	15	15	16	15	15	16	15	15	16
30	15	16	15	16	15	16	16	15	16	15	15	14	15	14	15	15	16	16	15	13	13	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	30	30	29	28	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30
MED	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	15	16	16	15	15	15	15	15
U Q	16	15	16	16	15	16	16	17	16	15	15	16	16	15	15	16	16	16	16	16	16	16	16	16
L Q	14	14	15	14	14	14	13	15	15	15	14	14	14	14	14	15	15	15	15	13	14	14	14	14

HOURLY VALUES OF fof2 AT Yamagawa

NOV. 2021

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	39	42	42	44	39	N 31	29	55	75	87	100	74	79	A	99	107	99	84	75	54	52	50	A	46	
2	40	39	40	37	A	26	A	61	65	81	89	87	83	78	88	93	103	81	42	39	44	43	41	39	
3	41	44	36	33	A	33	37	58	61	77	87	78	83	86	90	93	92	76	69	49	50	45	32	A	
4	A	B 32	A	A	A	37	25	50	51	95	139	67	69	54	127	127	84	62	59	67	65	57	39	63	
5	41	35	43	39	39	52	46	67	115	112	117	83	78	74	80	89	82	70	54	49	51	50	44	41	
6	36	33	A	33	34	35	A	54	67	79	99	111	91	83	105	113	70	53	48	A	41	39	36	A	
7	36	36	A	35	44	25	N 27	54	65	69	89	86	77	95	112	91	70	66	52	33	39	34	A	31	
8	33	A	31	31	33	32	27	47	57	71	76	83	75	65	A	114	99	76	43	A	A	A	A	32	
9	34	32	31	31	31	32	32	51	68	61	74	49	67	77	99	96	87	88	53	31	34	30	29	31	
10	33	32	32	32	A	A	31	52	67	76	77	90	58	A	103	107	92	73	46	A	34	35	A	A	
11	A	32	35	33	35	33	31	47	59	79	80	73	79	80	95	94	94	66	36	34	43	37	33	31	
12	32	A	35	36	31	33	32	48	56	75	75	91	79	70	71	81	67	61	44	30	32	33	26	31	
13	31	31	A	32	32	33	30	45	59	61	74	81	71	58	67	67	59	59	42	33	36	33	33	33	
14	N 31	31	33	33	33	32	25	50	55	71	63	75	75	69	70	67	71	56	34	26	31	34	33	31	
15	31	31	31	A	31	38	31	46	61	58	68	81	73	71	79	93	74	55	A	A	A	35	A	A	
16	29	31	31	32	31	32	31	44	53	79	75	72	67	73	105	96	71	A	51	46	A	A	37	35	
17	34	37	A	39	A	A	A	53	66	75	92	95	97	67	89	98	79	65	46	25	A	A	A	31	
18	31	32	35	33	34	26	26	50	64	58	69	95	83	93	99	87	85	65	40	24	32	34	30	31	
19	31	31	31	33	34	31	N 25	44	50	67	71	76	71	71	81	69	57	57	N 38	N 24	31	32	31	N 25	
20	30	29	30	30	35	29	N 25	43	66	69	75	84	65	63	76	73	53	51	41	35	32	30	31	33	
21	31	33	32	36	34	38	26	44	60	69	66	75	68	70	75	69	A	61	37	A	A	34	A	31	
22	31	38	34	34	33	32	33	43	56	79	77	77	75	56	77	81	61	65	52	35	A	A	31	31	
23	31	A	A	A	36	A	26	46	52	63	67	73	67	78	79	74	66	58	43	34	39	37	A	35	
24	31	32	31	32	33	32	25	46	63	70	79	76	80	71	81	74	67	64	47	39	37	31	35	26	
25	A	A	32	34	36	32	31	41	54	81	68	84	75	87	91	76	61	65	51	39	31	31	30	31	
26	30	30	33	36	31	B 26	N 24	43	53	66	66	62	71	66	66	69	62	57	42	31	32	33	31	32	
27	29	31	34	36	33	26	27	46	63	59	74	69	79	79	83	73	65	58	40	38	33	A	A	33	
28	B 27	31	32	31	32	29	25	44	63	67	73	69	76	77	78	67	77	55	A	A	38	A	34	31	
29	31	34	35	39	33	35	33	47	77	78	75	77	87	79	78	77	75	68	36	33	34	33	35	31	
30	A	A	36	33	35	34	26	41	61	69	73	87	77	77	76	79	86	A	A	A	31	29	31	A	
31																									
CNT	26	25	24	27	25	27	27	30	30	30	30	30	30	28	29	30	29	28	27	23	24	24	21	25	
MED	31	32	33	33	33	32	27	47	61	71	75	78	76	74	81	84	74	64	44	34	35	34	33	31	
U Q	34	35	35	36	35	34	31	52	66	79	87	86	79	79	99	96	86	69	52	39	42	38	35	34	
L Q	31	31	31	32	32	29	25	44	56	67	71	73	71	68	76	73	65	57	40	31	32	32	31	31	

HOURLY VALUES OF fEs AT Yamagawa

NOV. 2021

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	41	G	29	G	24	24	G	40	33	43	50	55	69	110	87	112	50	48	34	48	38	29	59	30
2	37	G	G	26	40	115	38	26	33	41	50	49	45	42	38	45	36	24	32	G	G	G	G	G
3	G	31	G	33	33	28	G	53	37	42	37	45	44	45	52	45	39	G	11	23	28	24	G	71
4	45	B	58	41	53	33	G	28	50	43	46	48	48	50	47	45	32	G	G	G	G	G	G	G
5	G	G	24	29	32	31	23	29	34	41	37	38	44	45	41	39	40	39	40	37	32	36	30	G
6	25	59	44	29	G	27	30	30	41	45	61	51	83	33	32	38	34	29	23	40	G	G	G	44
7	33	36	25	27	24	G	G	30	40	47	71	47	56	56	74	127	79	40	39	32	G	G	32	G
8	G	30	25	G	40	49	G	23	43	41	40	43	54	74	165	126	62	34	41	56	81	59	39	28
9	G	G	G	G	111	G	G	26	32	34	60	67	62	114	50	35	27	30	G	G	G	G	G	G
10	G	G	G	35	40	37	34	172	54	39	46	54	74	92	89	85	50	30	33	43	29	28	32	35
11	32	27	G	G	G	G	G	27	35	42	46	40	56	32	38	39	34	G	36	G	G	G	G	G
12	G	44	26	24	G	G	G	32	33	36	38	40	46	47	31	35	31	48	11	G	G	24	G	G
13	G	G	26	G	G	G	G	29	34	42	42	45	41	35	37	36	34	26	24	G	34	25	22	G
14	G	G	54	G	G	G	G	24	34	40	45	51	47	48	46	55	58	40	31	33	26	G	G	G
15	G	G	26	28	26	G	G	31	36	42	48	59	84	52	71	78	76	58	73	70	24	30	32	28
16	G	G	G	G	G	G	G	26	38	39	54	58	77	81	95	71	73	105	59	38	40	37	24	G
17	38	48	83	35	127	50	36	31	39	92	59	78	88	110	82	92	45	39	33	29	43	39	33	26
18	G	G	G	G	G	G	G	G	50	41	55	39	40	42	42	38	36	50	32	G	G	G	G	G
19	G	G	G	G	G	11	G	37	48	32	43	44	32	38	37	40	43	26	40	G	G	G	G	G
20	G	G	G	G	G	26	26	33	33	40	45	43	42	41	43	38	29	43	41	25	G	G	G	G
21	G	G	G	26	28	34	G	33	174	33	42	43	58	40	48	55	82	50	58	42	40	G	34	30
22	29	32	27	G	G	G	G	47	31	39	39	58	49	53	48	47	60	48	35	35	28	33	G	G
23	31	29	48	59	38	36	72	26	35	42	45	49	41	40	37	35	36	32	G	29	35	32	41	31
24	27	G	G	G	G	G	72	G	31	35	36	44	45	41	38	39	31	33	35	40	31	G	26	24
25	38	30	G	G	G		31	G	32	40	43	40	49	39	40	33	42	25	43	G	G	G	G	G
26	G	G	G	G	G	B	G	35	52	35	41	44	44	40	52	33	40	31	28	G	G	G	G	G
27	G	G	G	G	G	G	G	G	30	55	36	40	46	40	59	35	33	25	25	G	G	31	28	G
28	B	G	G	G	G	G	G	26	32	56	44	56	46	42	40	40	44	48	61	47	36	45	G	G
29	G	43	28	28	G	G	G	G	29	36	130	53	43	54	48	52	49	56	32	25	30	G	28	G
30	58	40	36	G	G	G	G	G	54	40	40	61	50	52	57	49	43	94	71	46	26	G	G	47
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	30	28	29	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	G	G	12	G	G	G	G	28	35	41	45	47	48	45	48	45	41	36	34	29	26	G	G	G
U Q	32	31	28	28	33	32	28	33	43	42	50	54	58	54	71	55	50	48	41	40	34	31	32	28
L Q	G	G	G	G	G	G	G	24	33	39	40	43	44	40	38	38	34	26	28	G	G	G	G	G

HOURLY VALUES OF fmin AT Yamagawa

NOV. 2021

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

$\begin{matrix} H \\ D \end{matrix}$	00	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	15	16	15	16	16	15	14	15	15	20	19	16	17	15	16	15	15	15	15	15	15	15	16
2	15	14	14	15	15	15	15	16	14	15	15	17	21	19	16	15	14	15	16	16	16	15	14	16	
3	14	16	15	16	16	16	16	15	17	14	15	15	15	15	14	15	14	18	14	15	15	16	16	17	
4	15	^B 15	16	15	15	16	15	15	16	14	14	15	16	14	14	15	15	15	15	15	15	15	16	15	
5	15	15	15	15	15	16	15	16	16	14	15	17	15	18	16	14	15	15	15	15	16	15	15	15	
6	15	17	15	16	16	16	15	16	15	14	15	15	15	15	15	15	15	15	16	15	15	16	16	15	
7	16	15	16	16	16	15	15	16	15	15	16	16	15	15	16	13	15	15	16	16	14	15	16	14	
8	15	16	16	15	16	16	16	15	15	14	14	17	18	17	12	15	16	16	16	16	15	16	15	16	
9	15	15	14	15	15	15	15	15	16	15	15	16	15	17	12	14	14	14	16	16	16	14	14	14	
10	14	14	15	15	15	15	15	15	14	14	14	14	17	16	14	18	15	16	16	15	16	16	16	15	
11	16	15	14	14	16	15	15	15	16	15	14	15	15	15	17	14	16	15	15	14	16	16	15	16	
12	15	15	16	15	15	15	16	14	16	13	14	15	15	16	17	16	15	15	17	16	16	16	15	16	
13	14	16	15	15	15	15	14	17	16	14	14	14	15	16	17	14	16	16	15	15	15	16	16	15	
14	16	14	9	14	15	15	14	15	15	15	15	14	15	15	15	15	15	15	16	16	16	16	14	16	
15	16	16	15	15	15	16	15	15	15	13	14	15	14	16	15	15	16	15	16	14	16	16	16	16	
16	15	15	15	14	15	16	16	15	16	13	14	13	15	14	17	17	15	12	16	14	15	15	16	15	
17	15	15	16	14	15	16	16	16	14	12	13	14	16	15	17	16	15	15	16	16	15	15	15	16	
18	15	14	15	14	14	16	14	15	16	15	15	16	18	17	15	15	15	15	15	17	15	14	15	15	
19	14	15	14	14	14	14	15	16	15	17	14	17	16	17	14	14	16	16	15	66	15	14	15	17	
20	15	15	15	15	15	16	15	15	16	15	15	16	16	15	15	15	16	15	16	15	14	15	14	14	
21	15	16	15	16	15	16	15	16	15	13	14	15	16	14	14	15	17	15	15	15	15	16	16	15	
22	16	16	16	16	14	15	14	15	16	15	14	16	15	15	14	15	14	13	14	15	16	16	16	15	
23	16	16	15	15	15	14	16	15	15	13	14	13	17	15	15	15	14	16	16	16	15	16	15	16	
24	15	16	15	16	15	16	42	17	16	16	15	15	15	16	16	15	15	15	16	15	16	15	15	15	
25	15	15	15	15	14		14	15	14	14	14	15	17	15	14	15	15	15	16	15	14	15	14	14	
26	15	14	14	14	14	^B	15	15	15	14	14	15	14	14	14	14	15	15	16	16	15	17	14	14	
27	16	14	15	14	14	15		16	15	14	13	14	14	15	15	13	15	16	16	14	15	15	15	16	
28	^B	16	16	15	16	15	15	16	15	14	15	16	15	15	15	16	15	15	15	15	15	16	16	14	
29	14	16	15	16	18	14	15	15	16	14	14	15	14	15	15	15	16	14	15	16	16	16	16	16	
30	16	16	15	16	14	14	15	16	16	14	14	13	16	15	17	16	14	13	15	16	16	15	15	15	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	30	30	30	28	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	15	15	15	15	15	15	15	15	15	14	14	15	15	15	15	15	15	15	16	15	15	16	15	15	
U Q	16	16	15	16	15	16	16	16	16	15	15	16	16	16	16	15	16	15	16	16	16	16	16	16	
L Q	15	15	15	14	15	15	15	15	15	14	14	14	15	15	14	14	15	15	15	15	15	15	15	15	

HOURLY VALUES OF fof2 AT Okinawa

NOV. 2021

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

$\begin{matrix} H \\ D \end{matrix}$	00	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	63	73	63	53	A	A		51	77	89	99	89	73	93	113	122	113	114	103	125	57	137	88	94		
2	64	55	61	48	48	A	N	24	57	69	84	90	107	93	87	97	100	106	76	57	42	55	54	48	43		
3	48	52	35	A	34	35	33	56	64	73	89	91	77	92	100	102	101	93	83	77	64	47	39	34			
4	34	35	35	35	A	A	A	46	59	82	169	74	56	101	170	156	121	105	101	115	98	85	55	77			
5	56	55	52	64	65	A		72	95	116	112	97	99	76	87	94	A		A	A		57	55	35	A		
6	39	30	31	32	37	32	22	53	81	91	104	121	119	121	144	153	109	72	63	55	43	61	40	35			
7	B	33	35	34	37	54	N	23	53	65	70	85	99	91	111	137	151	120	94	75	62	61	52	B	37	37	
8	33	31	31	32	36	33	A	54	64	69	80	95	79	76	101	124	137	116	63	43	B	33	35	A	A		
9	A	A	A	A	35	33	30	53	66	73	73	79	73	81	113	136	132	121	98	59	54	46	38	35			
10	35	36	36	38	40	41	31	45	67	86	77	76	69	79	107	123	123	111	80	54	47	44	38	37			
11	35	35	36	37	41	40	29	46	65	78	78	87	90	94	109	125	153	109	86	78	78	72	57	50			
12	42	42	43	49	45	39	30	56	65	60	77	91	82	90	102	82	83	77	56	39	36	42	34	31			
13	31	31	33	33	35	32	26	45	60	61	71	69	87	71	67	73	77	64	53	43	41	44	36	35			
14	33	32	34	33	34	26	N	24	44	61	64	71	71	78	79	77	83	76	71	57	41	40	45	41	33		
15	31	31	32	31	35	35	26	49	61	65	72	75	82	77	95	112	107	95	70	50	44	51	34	N	31		
16	30	29	N	31	32	40	N	23	39	59	78	79	68	74	97	102	A	A	A	A	A	A	A	A	36		
17	A	33	36	A	A	A	A	49	67	74	97	103	111	102	110	146	151	113	90	54	41	43	41	A			
18	B	36	31	35	33	33	N	25	B	23	47	67	60	69	83	109	109	120	121	96	94	68	57	55	53	50	43
19	50	50	55	53	48	44	N	24	47	55	56	72	89	74	79	84	85	68	58	47	40	31	35	33	25		
20	A	N	29	29	30	33	N	25	23	43	70	65	85	91	93	103	112	119	116	99	90	54	59	45	42	45	
21	43	43	39	37	49	43	A	45	60	73	67	79	74	80	101	75	65	61	50	40	43	37	37	31			
22	A	35	32	A	30	29	32	44	60	74	93	88	85	82	72	91	81	73	68	43	A	A	39	37			
23	A	A	33	32	31	26	A	44	58	67	70	73	80	81	98	88	81	79	62	42	58	49	45	46			
24	37	32	32	30	34	24		41	64	81	82	84	90	105	114	146	152	111	80	68	66	45	40	39			
25	B	33	32	33	35	44	N	25	N	23	43	57	76	73	82	71	78	120	124	112	108	100	59	51	45	33	30
26	29	B	31	31	36	30	B	23	N	23	40	54	65	69	76	68	77	75	63	70	64	51	36	36	33	32	27
27	27	31	31	31	34	25	N	23	43	65	75	89	87	86	97	115	106	80	65	54	45	51	32	N	23	27	
28	A	29	31	31	33	31	25	44	64	73	72	71	71	92	92	85	80	74	A	A		47	39	38	30		
29	29	30	A	35	34	36	29	46	64	82	76	79	78	89	92	85	90	86	56	A	A	A	36	38			
30	34	25	A	A	32	33	B	22	42	61	74	76	76	89	80	94	104	89	81	58	52	50	31	32	33		
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	24	28	27	25	28	25	23	30	30	30	30	30	30	30	30	28	29	29	27	26	27	27	28	27			
MED	34	32	34	35	35	32	25	46	64	74	78	84	80	88	102	109	101	86	68	53	51	45	38	35			
U Q	41	39	36	37	44	35	30	53	67	81	89	91	90	97	113	124	120	108	86	59	58	53	41	43			
L Q	32	31	31	32	33	25	23	44	60	65	72	76	74	79	94	85	80	72	56	42	41	39	34	31			

HOURLY VALUES OF fEs AT Okinawa

NOV. 2021

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	32	G	48	26	38	34	32	27	58	44	48	56	58	70	58	36	45	30	G	11	11	11	11	G	
2	G	G	G	G	39	115	G	30	44	35	50	47	51	39	49	40	81	28	23	G	G	G	G	G	
3	G	G	G	28	G	29	G	33	32	40	59	48	52	45	36	40	39	34	G	G	11	11	G	G	
4	G	G	30	G	40	50	61	30	36	42	42	40	51	45	39	36	31	G	G	G	G	41	30	42	
5	40	38	36	45	56	73	32	40	44	45	42	45	57	36	56	95	91	65	66	107	59	26	86	34	
6	29	26	G	G	G	24	G	28	113	45	45	67	55	45	60	41	36	28	26	33	37	G	G	G	
7	B	G	G	24	G	G	G	29	37	44	62	59	78	57	115	76	64	93	46	33	38	29	B	G	
8	G	G	G	G	G	G	G	33	24	71	34	45	37	69	46	59	62	60	41	38	40	B	24	57	60
9	45	54	56	34	26	G	G	20	35	36	46	66	48	58	60	64	69	56	51	37	33	131	G	26	
10	G	24	G	G	G	11	G	27	36	48	50	53	62	50	89	66	37	50	52	48	34	28	G	G	
11	27	G	G	G	G	G	G	27	34	44	52	54	50	55	56	40	38	28	48	20	25	23	24	G	
12	G	G	G	G	G	11	G	G	30	38	37	44	52	55	38	36	35	37	48	22	G	29	G	G	
13	G	G	G	G	G	G	G	139	53	50	50	59	50	54	64	48	49	33	26	G	G	G	G	24	
14	26	24	G	G	G	G	G	24	32	46	48	63	65	93	51	55	52	40	29	21	G	G	G	G	
15	G	G	25	G	G	26	G	27	87	67	63	83	73	112	62	67	93	108	28	56	35	45	32	24	
16	G	G	G	G	G	G	G	G	43	45	43	50	56	78	93	115	74	92	94	67	70	60	112	32	
17	32	26	46	59	62	26	164	26	53	71	75	93	58	59	62	60	49	33	40	55	35	25	40	30	
18	B	G	G	G	11	G	B	26	52	34	38	33	45	39	40	47	47	56	60	44	33	28	28	27	
19	G	G	G	G	11	46	G	26	52	34	36	43	56	55	39	48	50	36	31	20	G	G	G	G	
20	49	G	G	27	24	G	G	111	31	41	51	35	56	49	40	36	32	52	31	28	33	41	31	G	
21	G	G	23	G	G	24	28	G	50	41	46	50	49	53	70	44	40	30	23	30	32	25	G	G	
22	31	G	G	38	32	27	G	G	32	36	37	46	44	45	66	88	59	34	35	34	46	44	32	G	
23	26	29	29	28	37	G	27	148	53	39	46	45	47	47	46	41	38	43	34	28	24	24	27	G	
24	G	G	G	G	G	11	G	26	33	40	58	74	62	81	50	50	38	34	53	48	G	11	25	G	
25	B	G	24	G	G	G	90	93	46	39	38	62	49	46	44	39	32	32	48	40	11	G	G	G	
26	G	B	G	G	G	B	G	G	145	49	43	46	45	46	46	40	34	26	11	G	25	G	G	G	
27	G	G	G	G	G	G	G	G	29	35	37	36	59	46	45	36	35	31	32	11	24	G	G	G	
28	32	G	G	27	32	25	G	27	32	35	37	55	76	54	42	38	40	46	77	71	31	26	G	G	
29	G	G	94	G	G	27	G	20	54	35	41	42	46	60	54	46	56	39	41	41	53	39	26	G	
30	G	G	46	46	G	34	B	40	30	35	47	44	78	56	110	130	69	30	58	32	29	G	G	G	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	27	29	30	30	30	29	28	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	29	30	
MED	G	G	G	G	G	11	G	27	44	40	46	49	56	54	55	46	46	35	36	32	29	24	G	G	
U Q	31	12	29	27	32	28	27	30	53	45	50	59	62	58	62	64	60	50	51	44	35	29	30	24	
L Q	G	G	G	G	G	G	G	20	32	35	41	44	49	46	44	40	37	30	26	20	G	G	G	G	

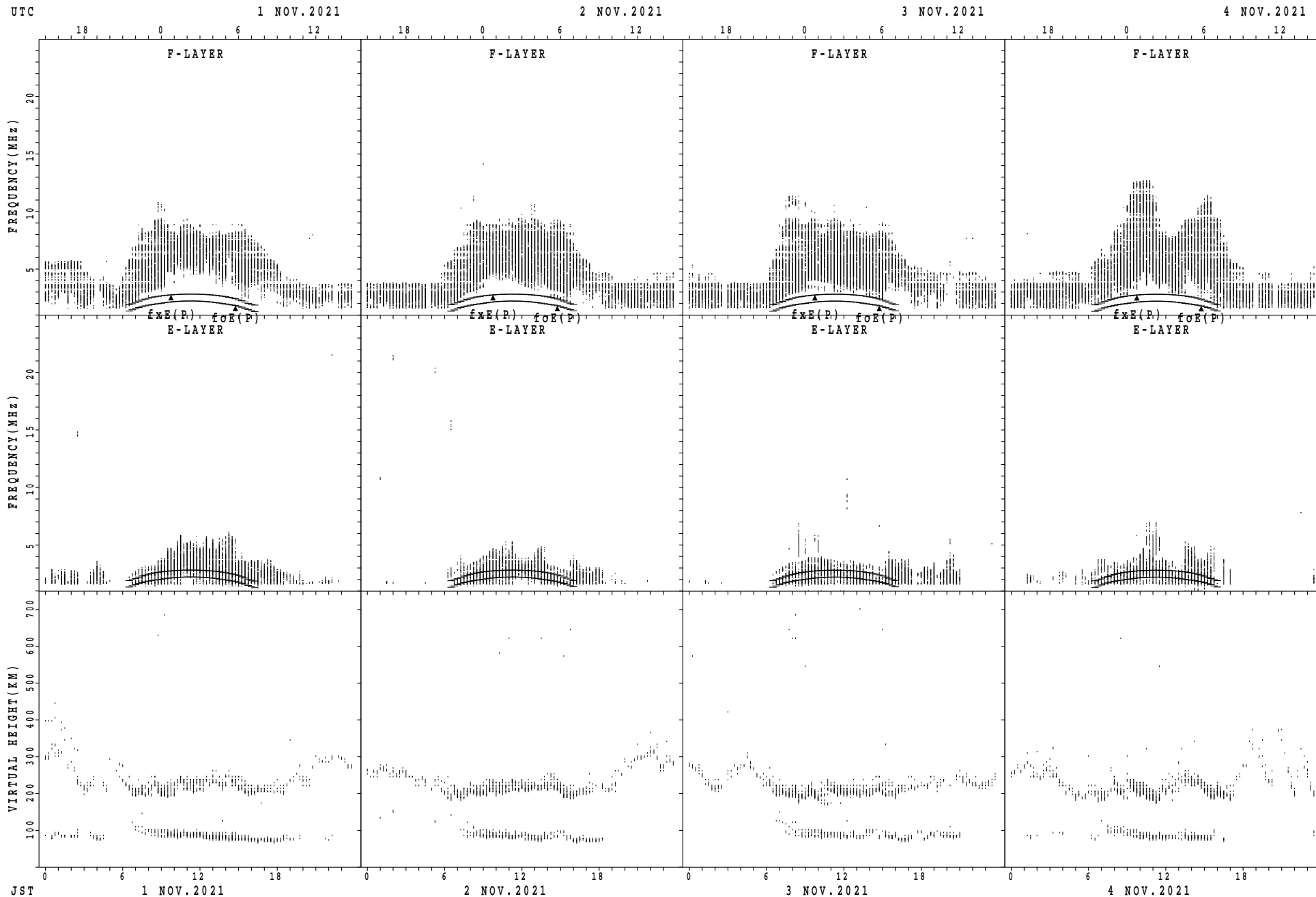
HOURLY VALUES OF fmin AT Okinawa

NOV. 2021

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

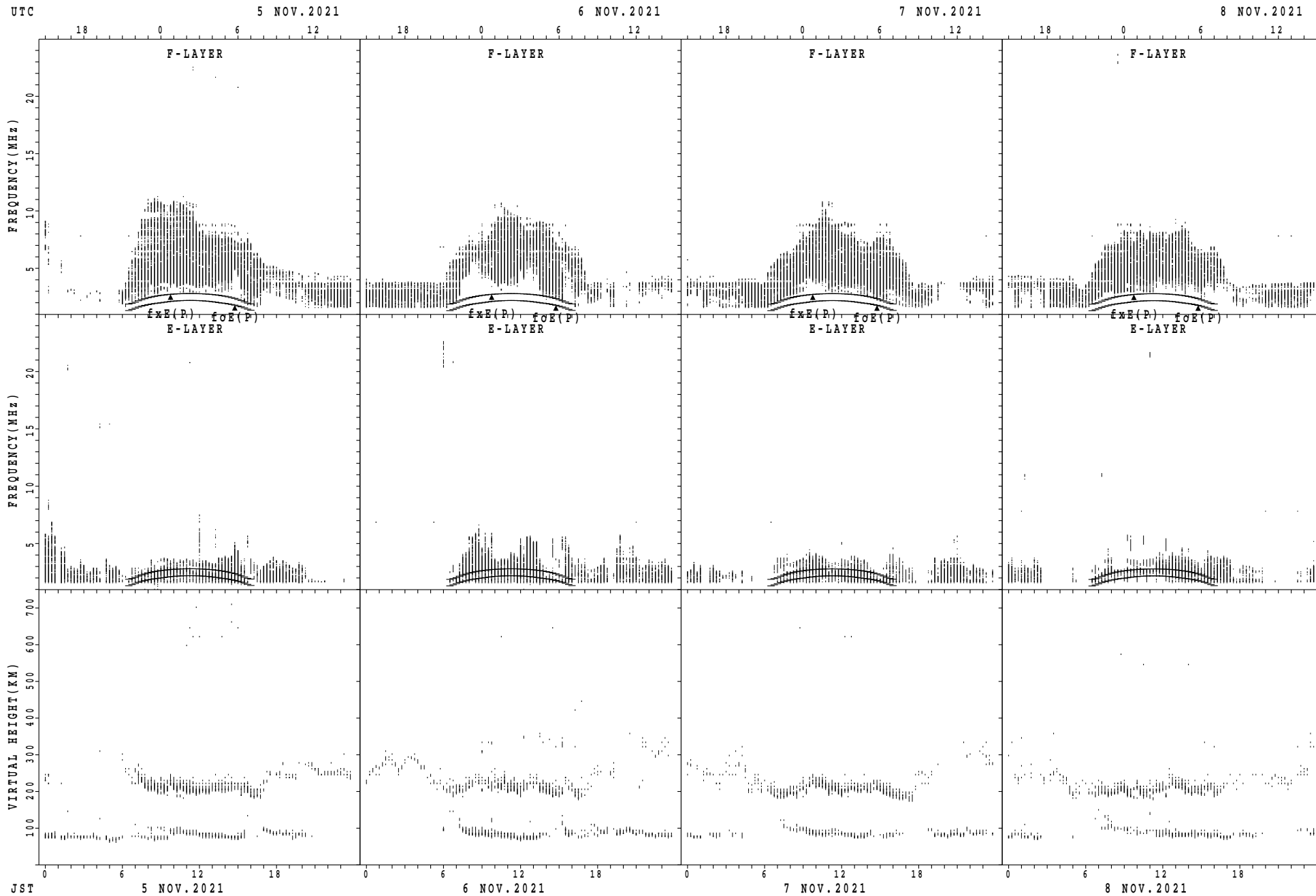
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	17	15	15	16	16	16	15	15	14	15	23	18	19	17	17	14	15	14	14	14	14	15	15
2	15	16	15	15	15	15	15	16	14	14	15	18	23	19	17	15	14	14	16	14	15	15	14	14
3	14	14	12	15	16	15	16	16	15	15	13	17	19	15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

SUMMARY PLOTS AT Wakkanai



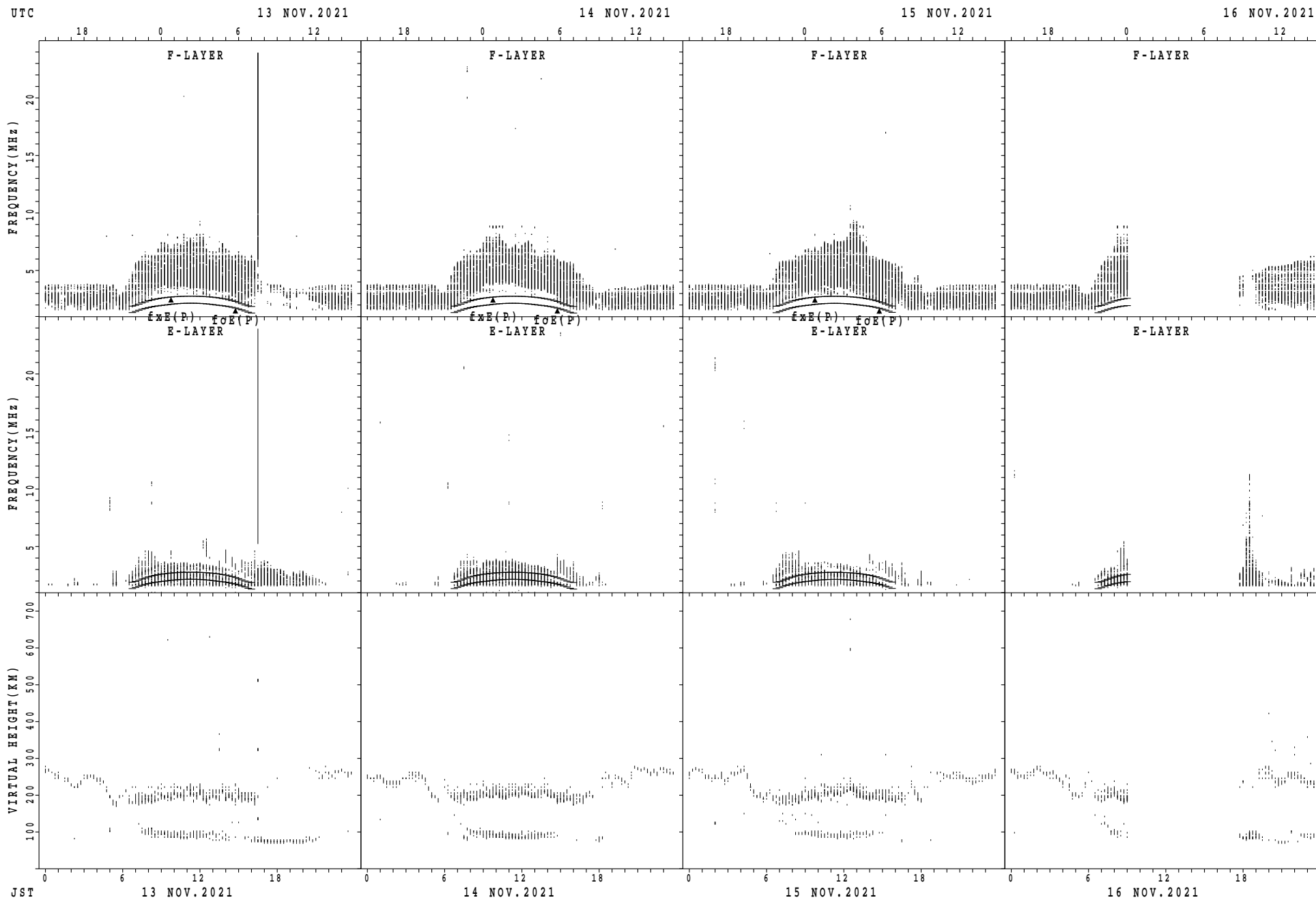
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



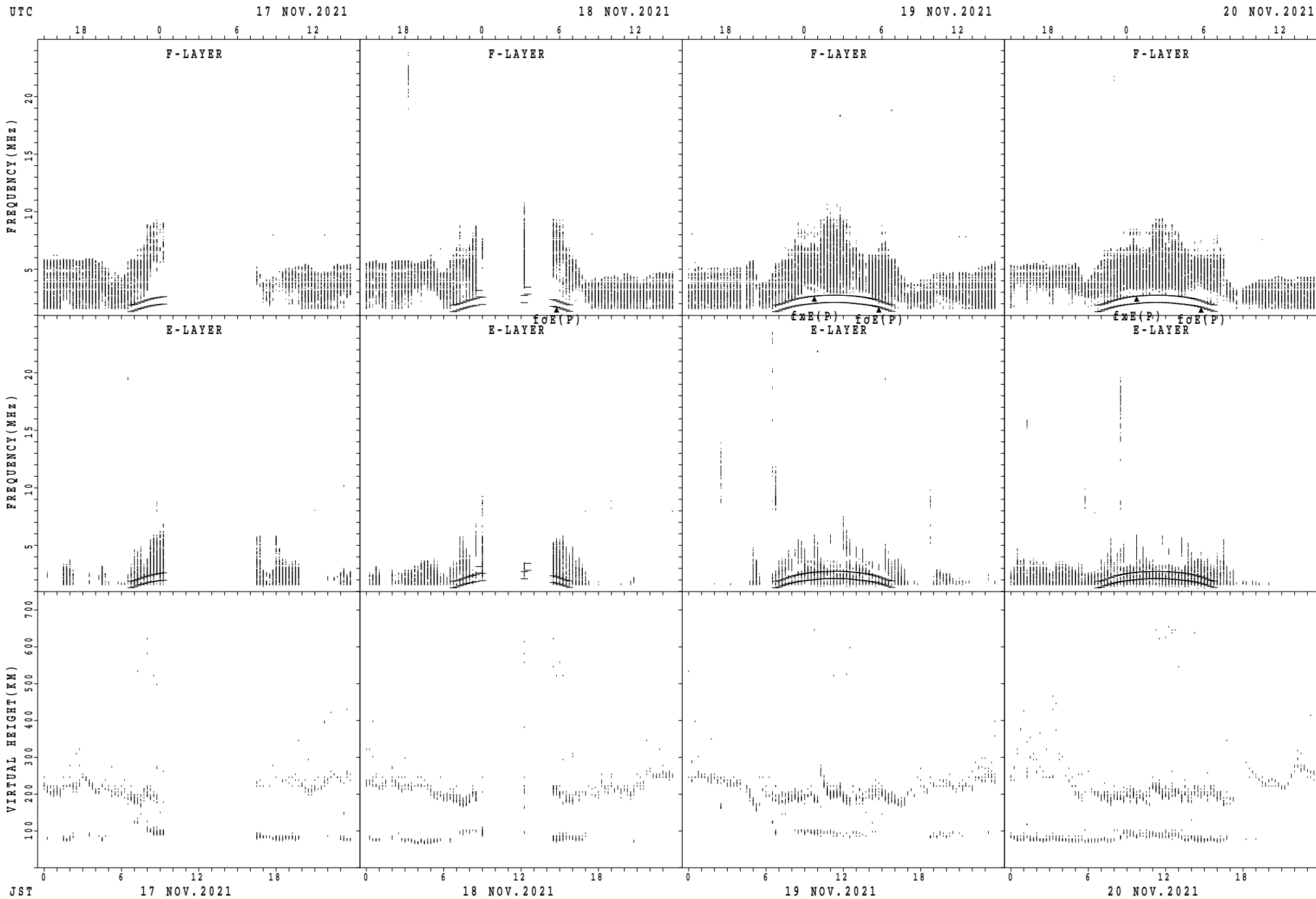
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



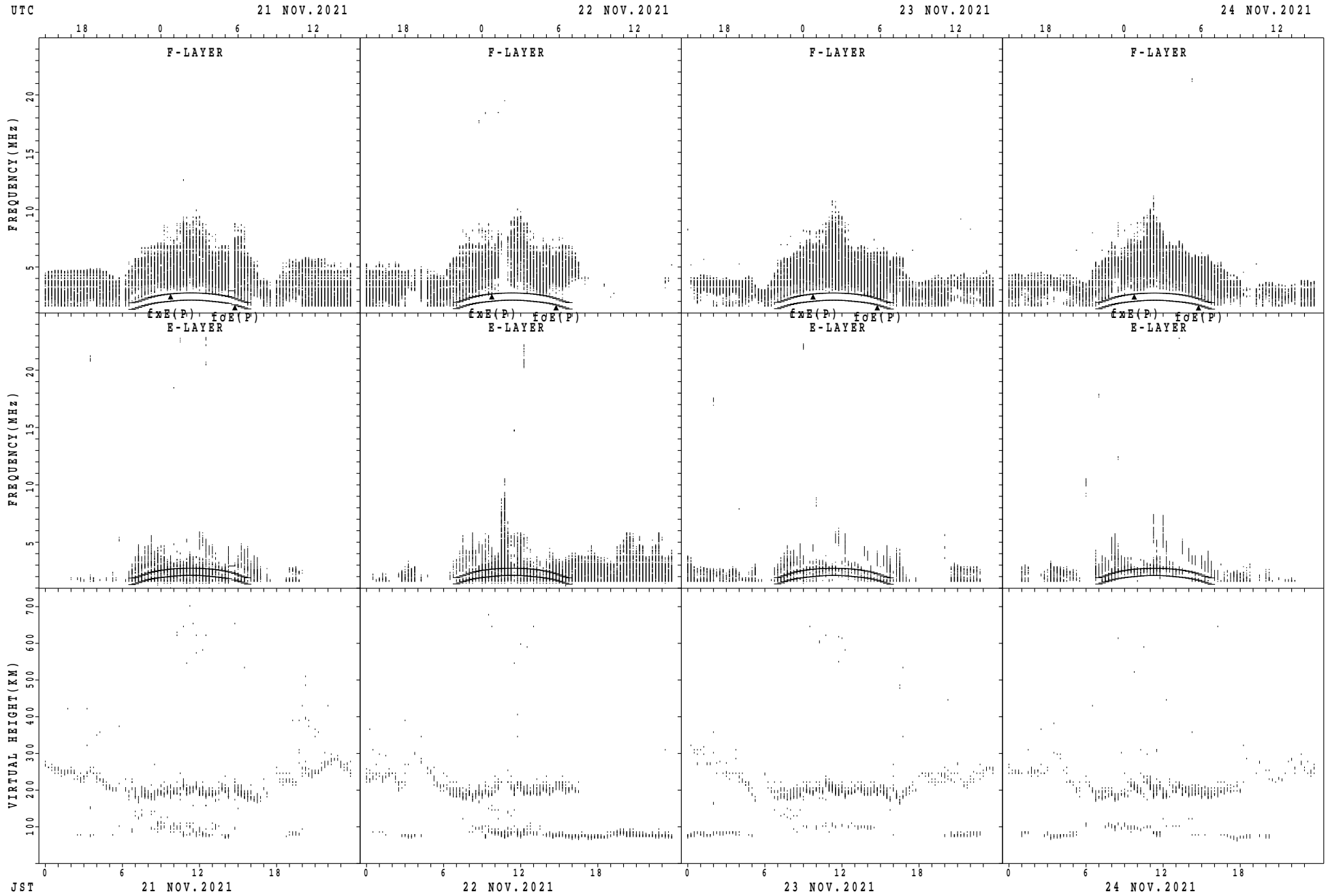
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



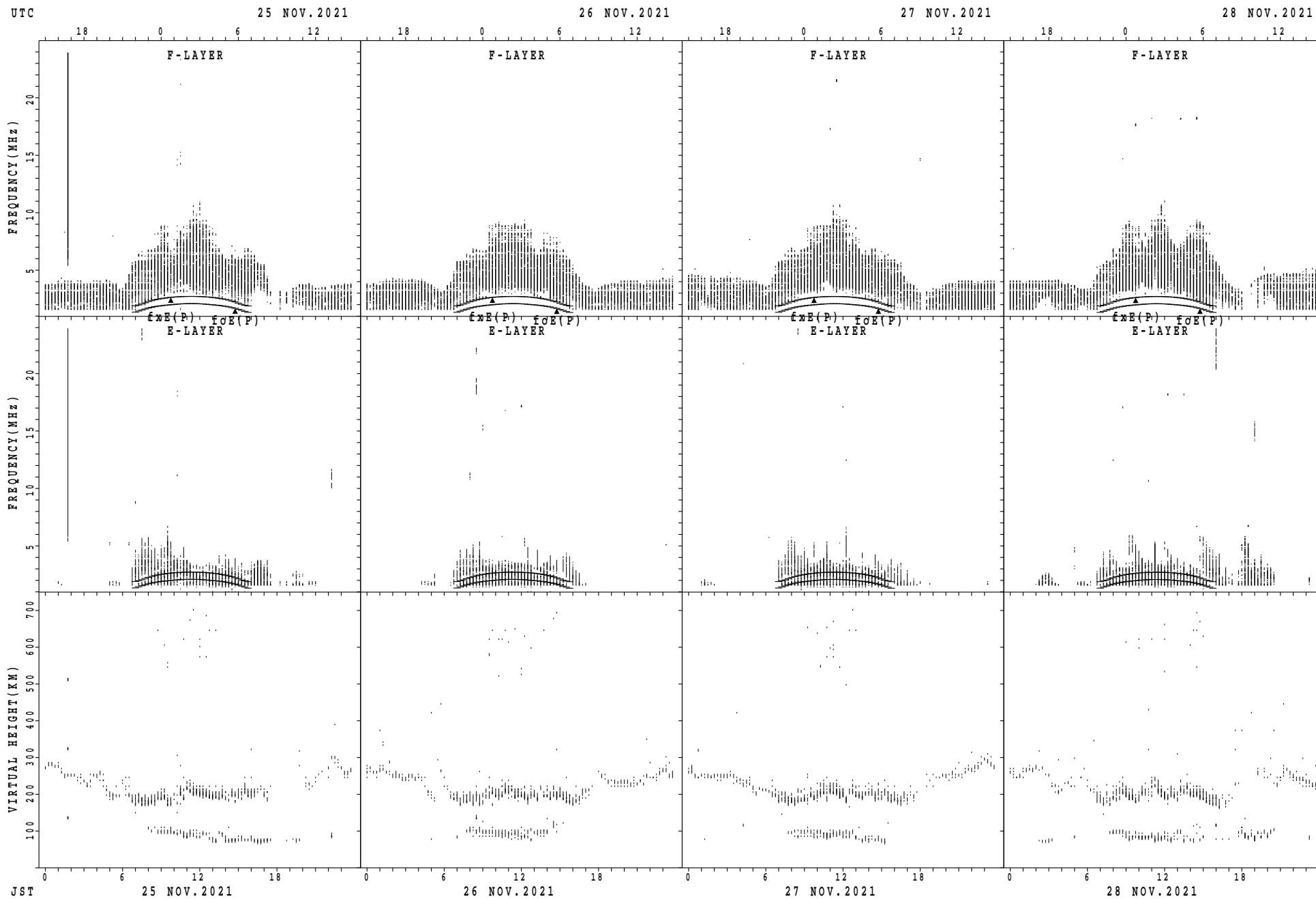
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



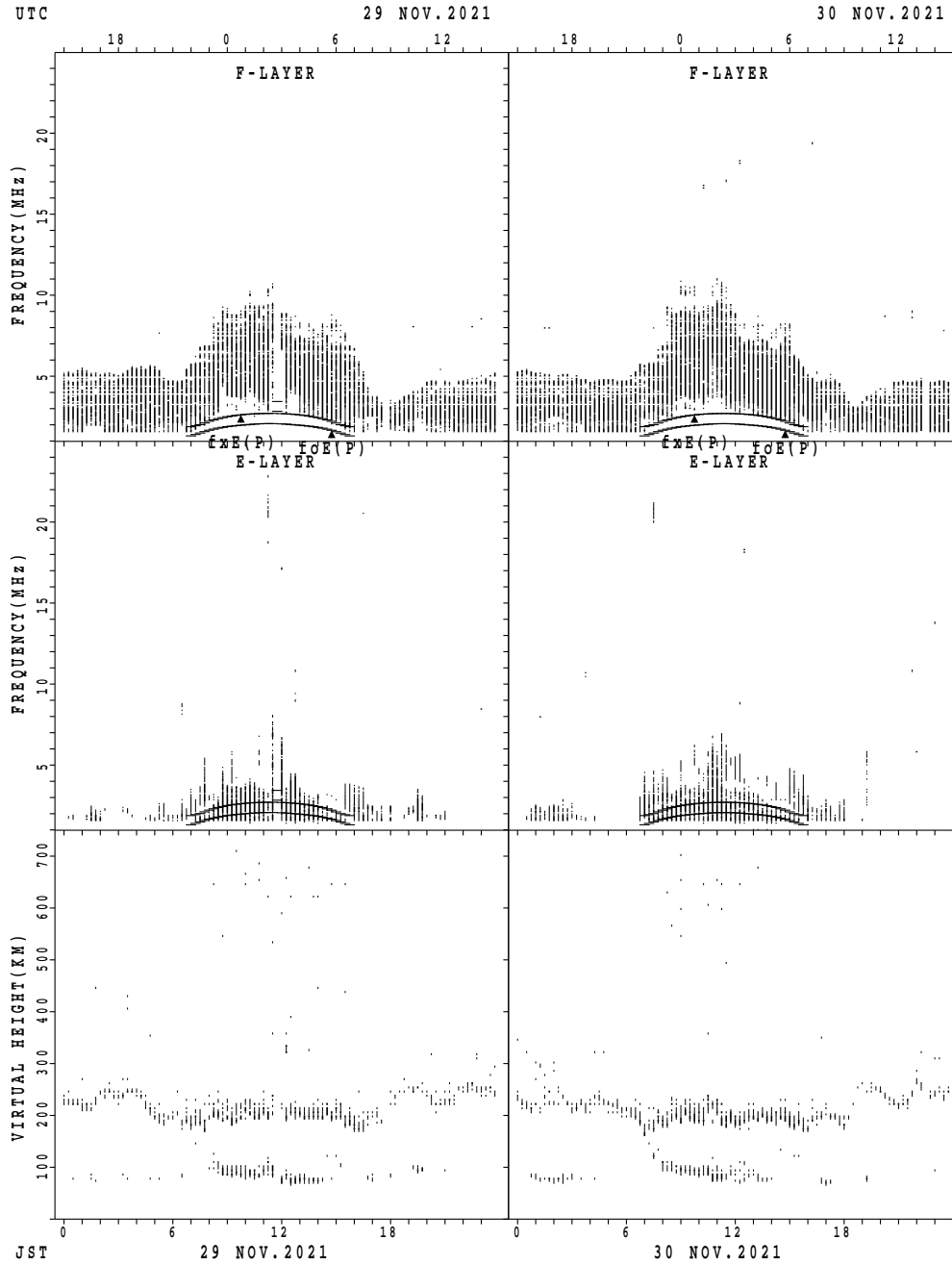
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



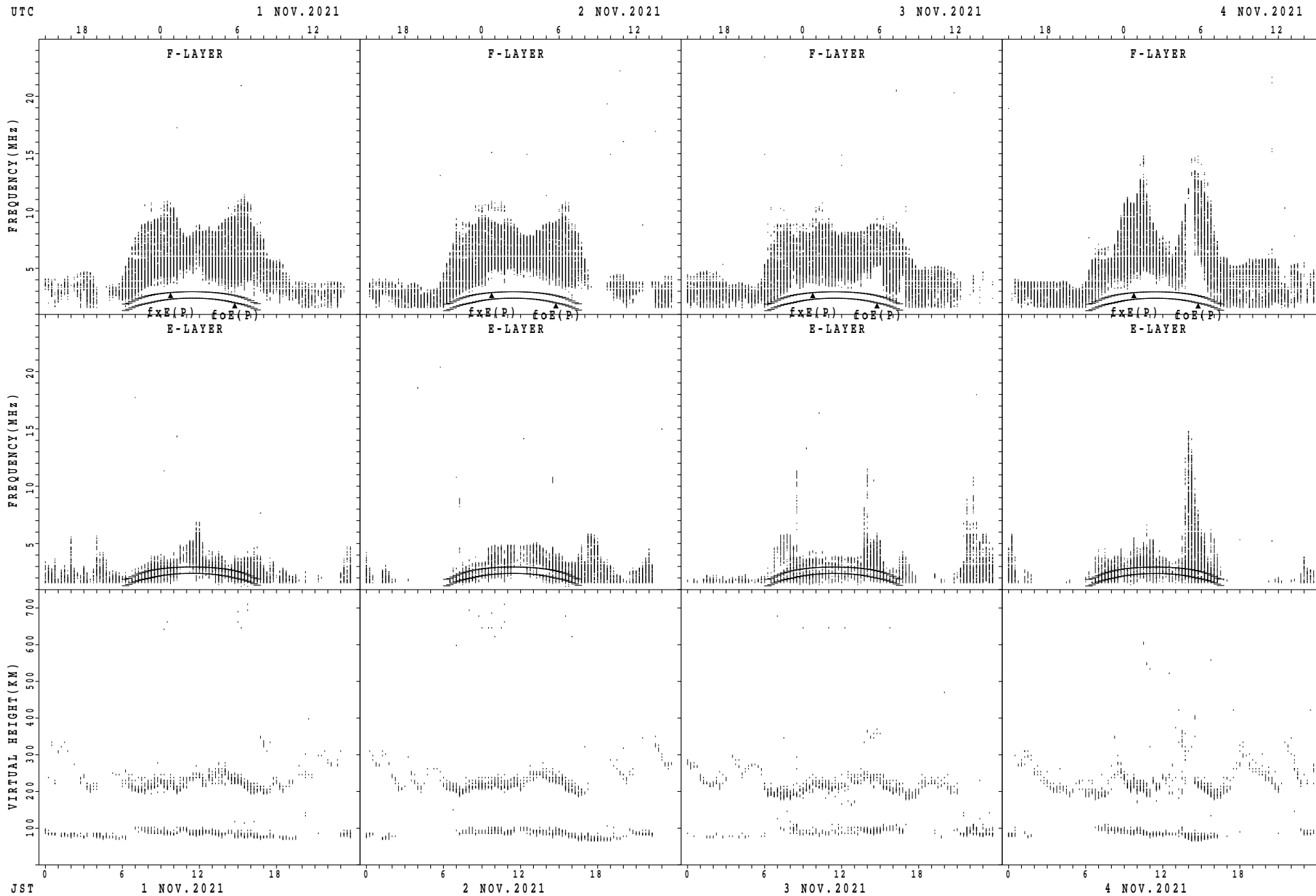
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



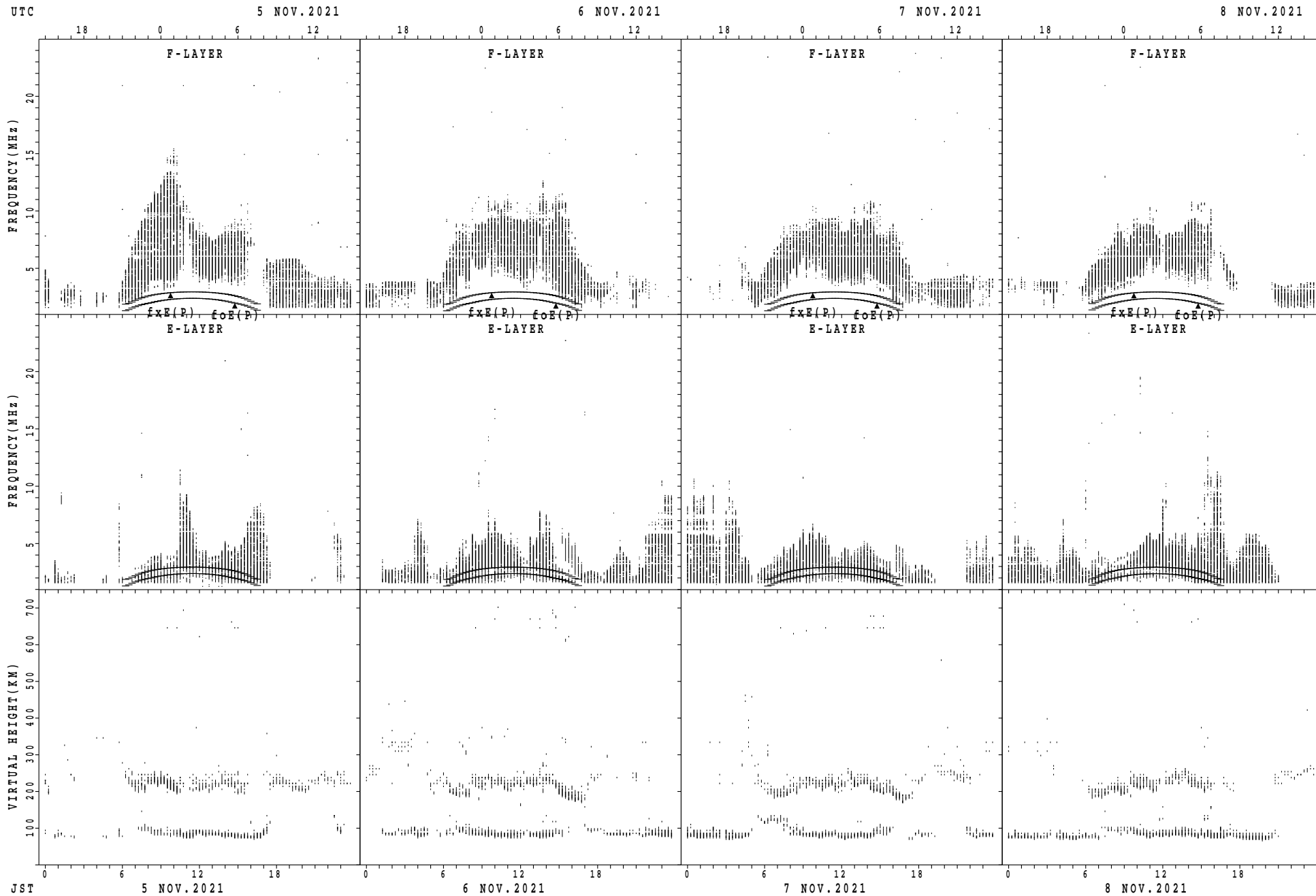
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



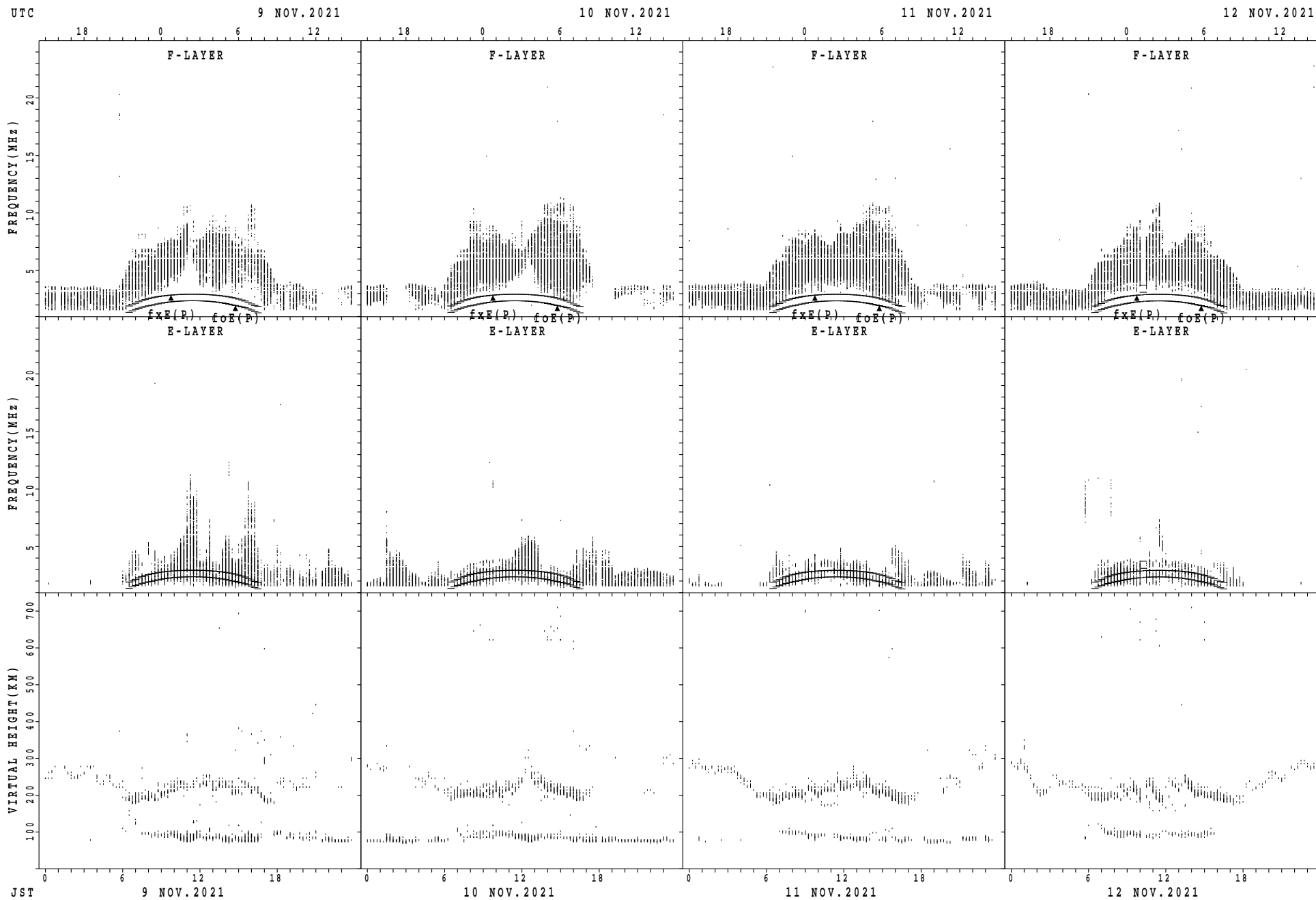
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



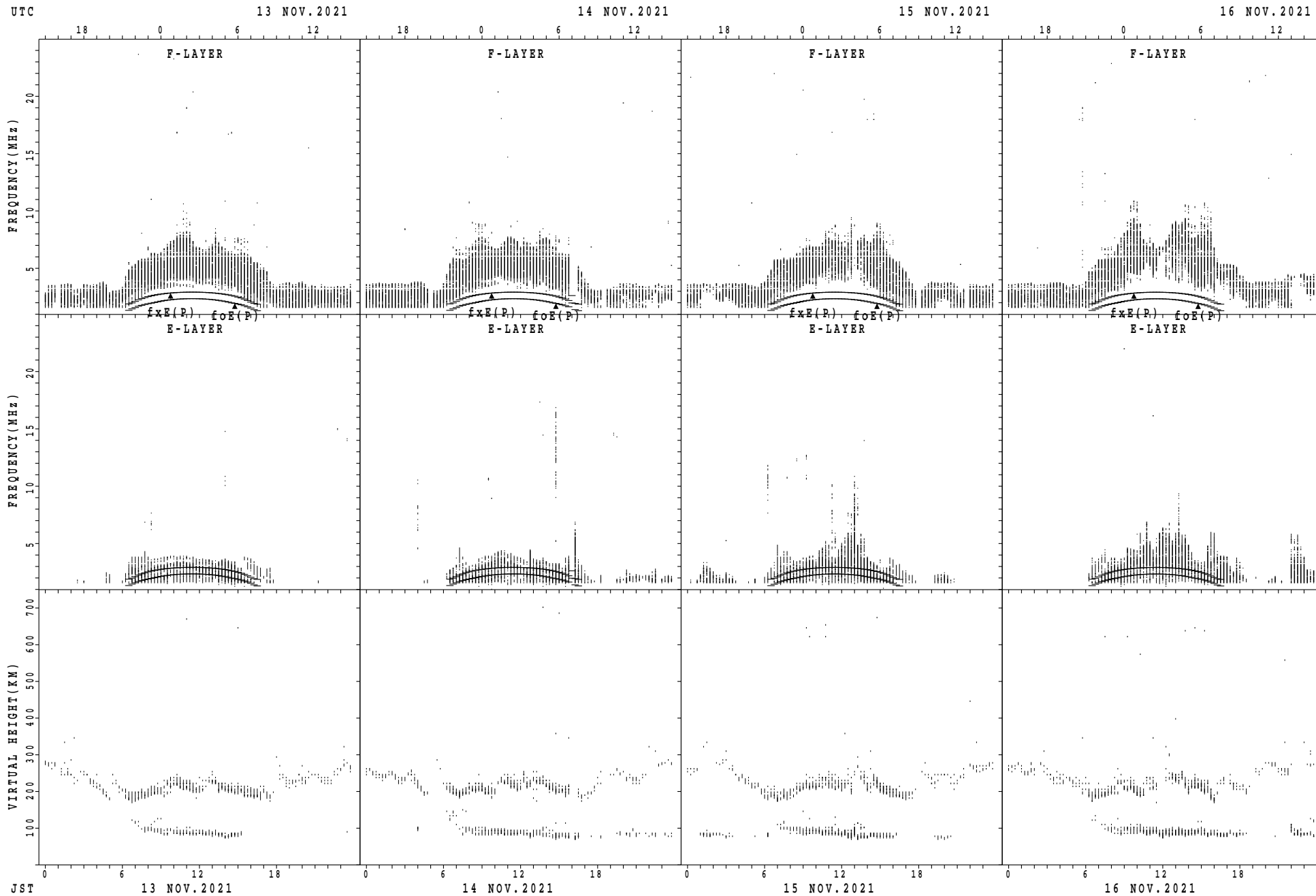
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



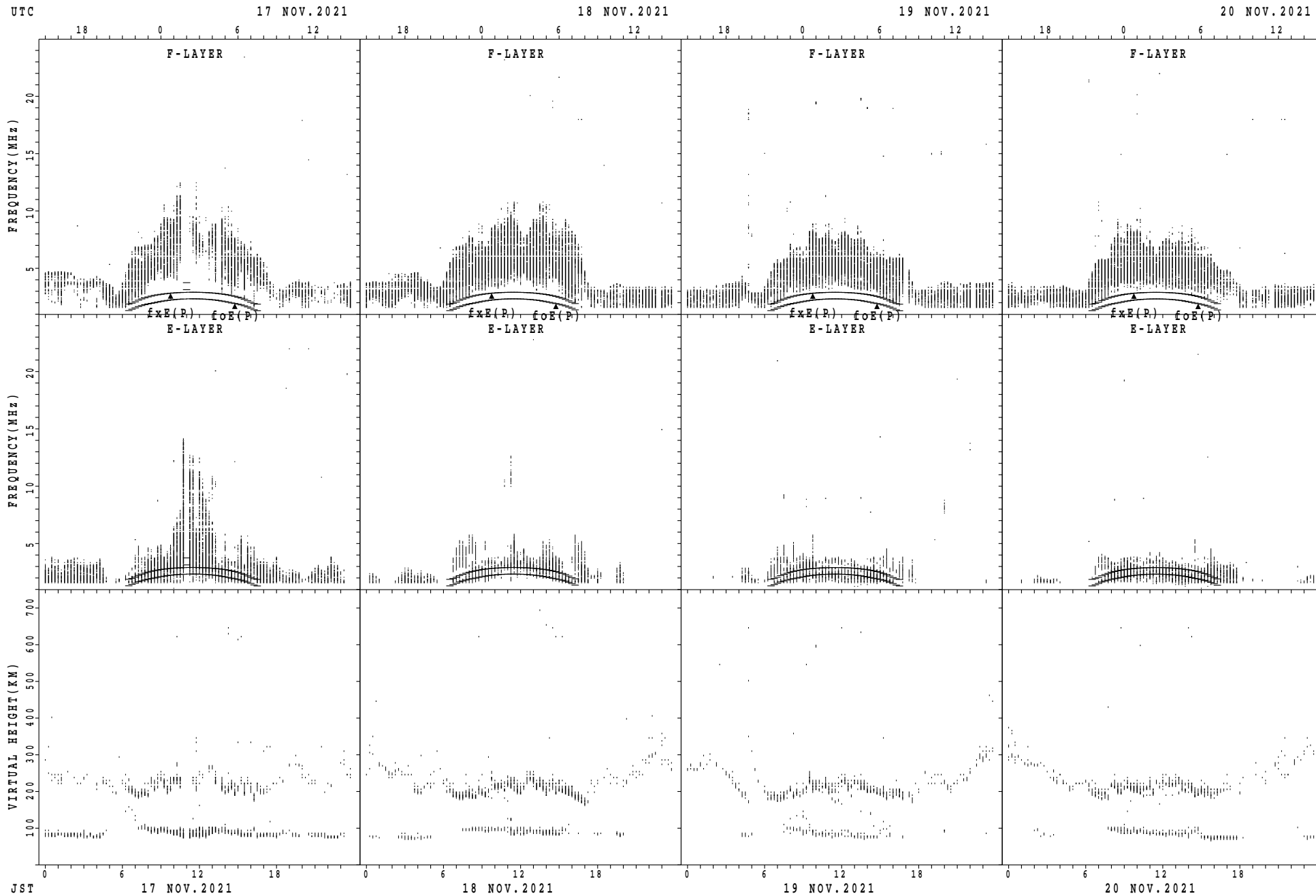
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



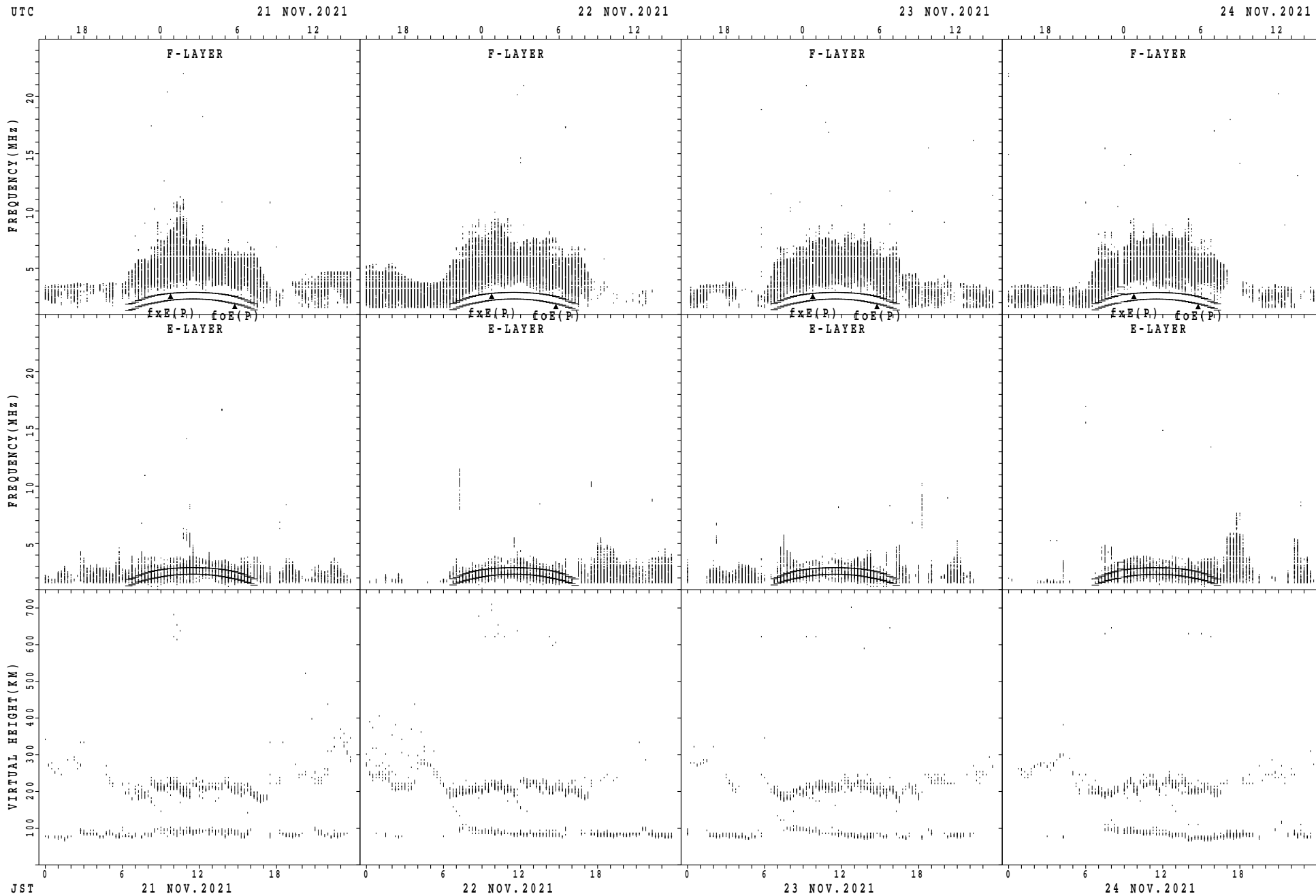
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



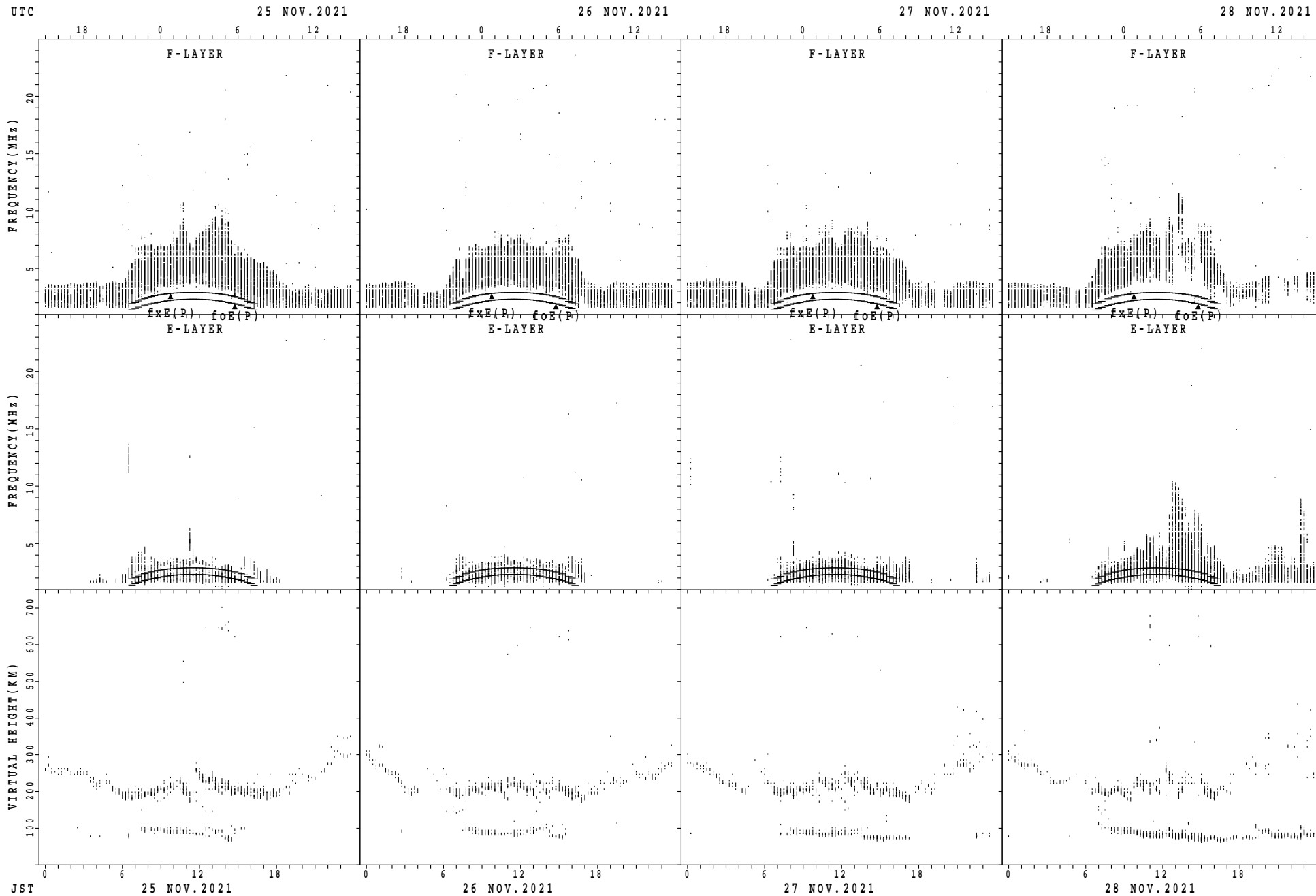
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



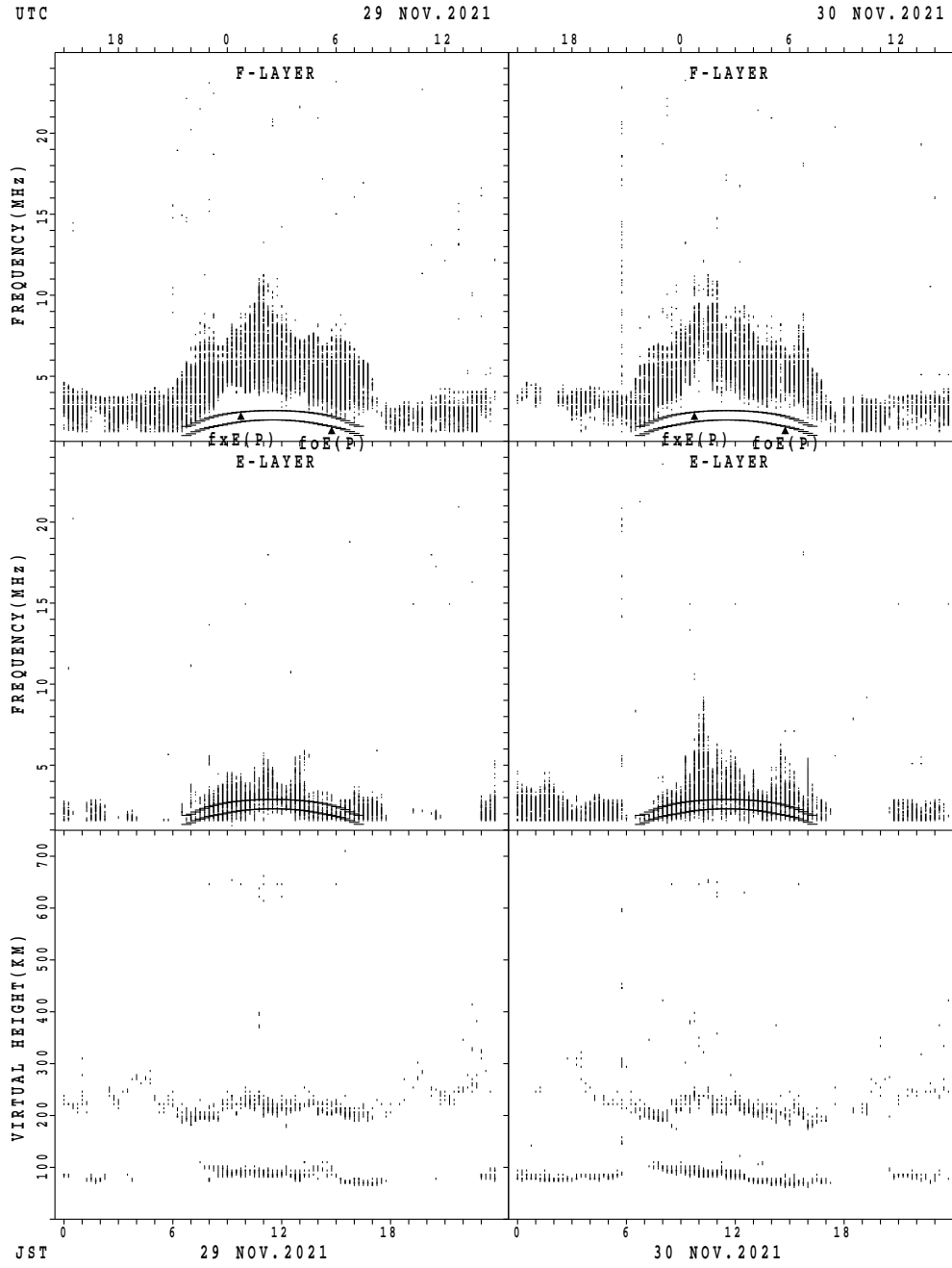
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



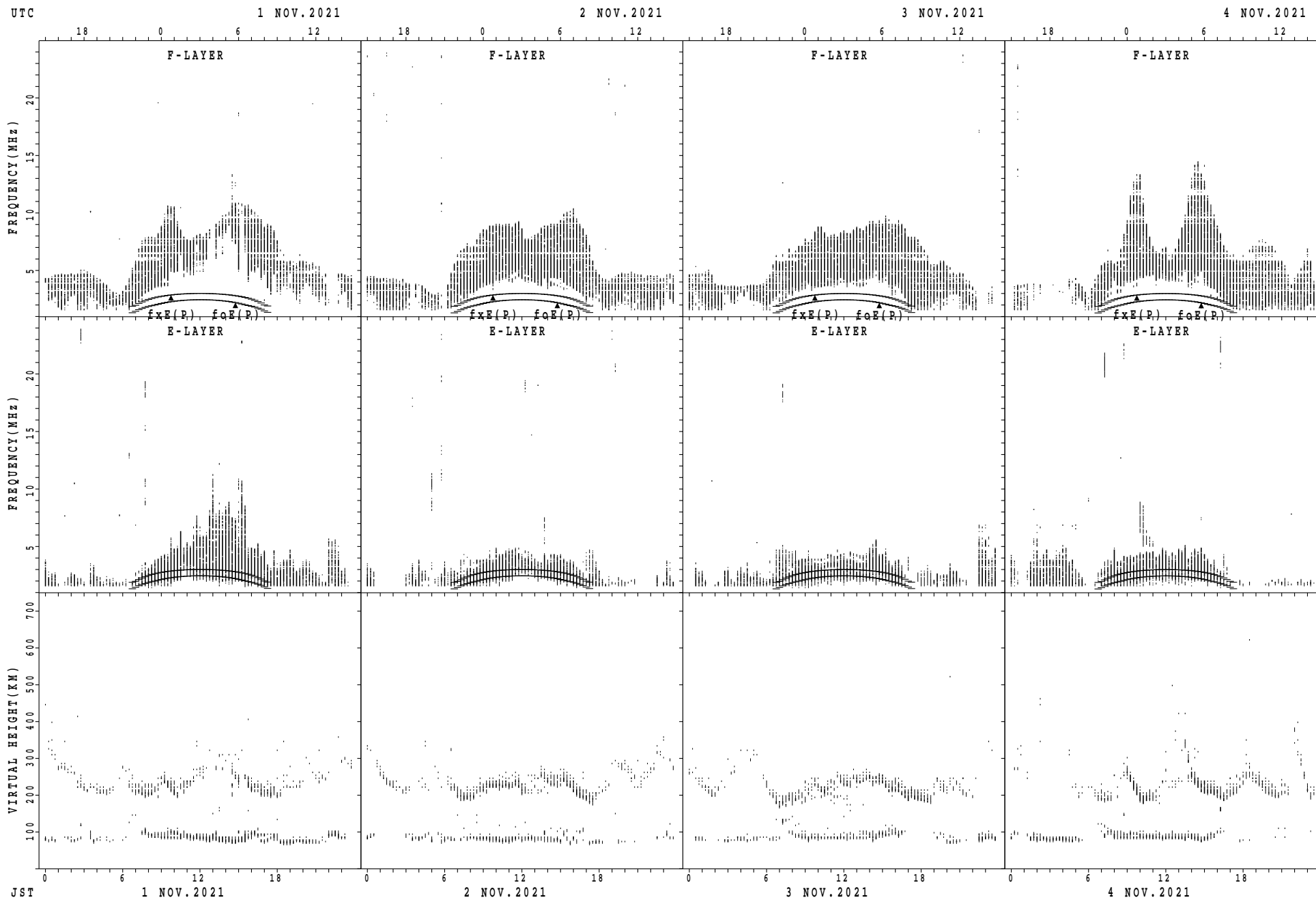
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



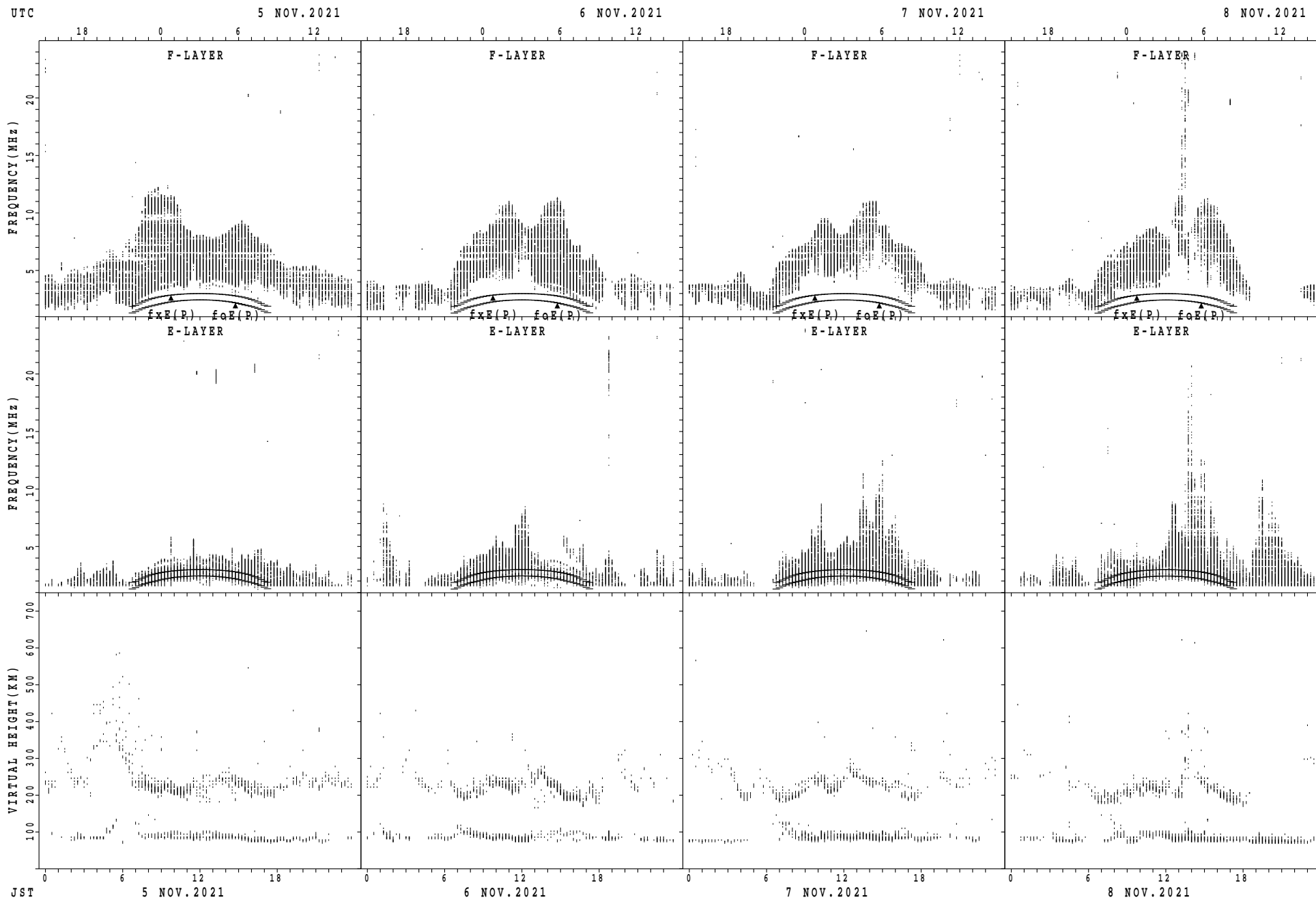
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



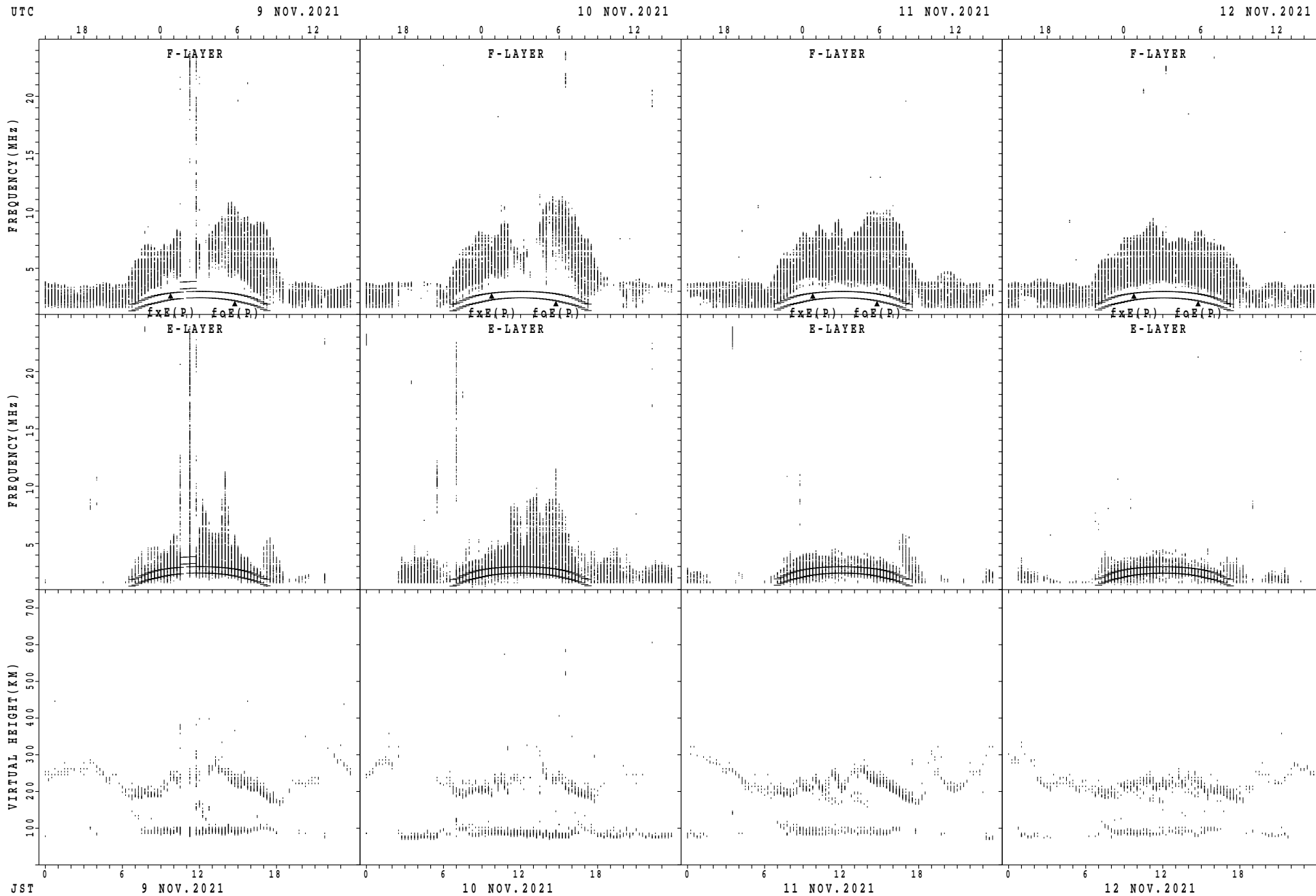
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



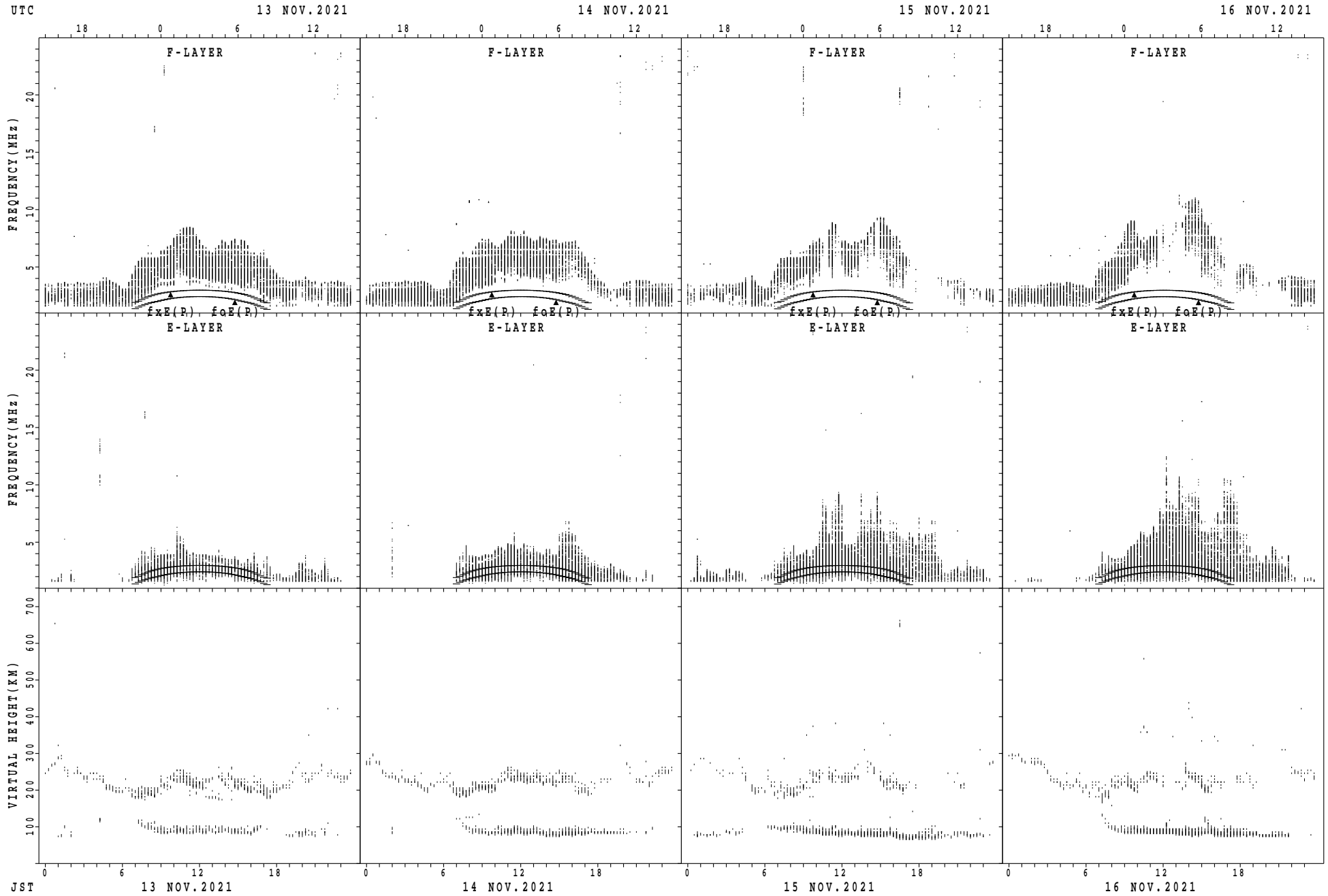
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



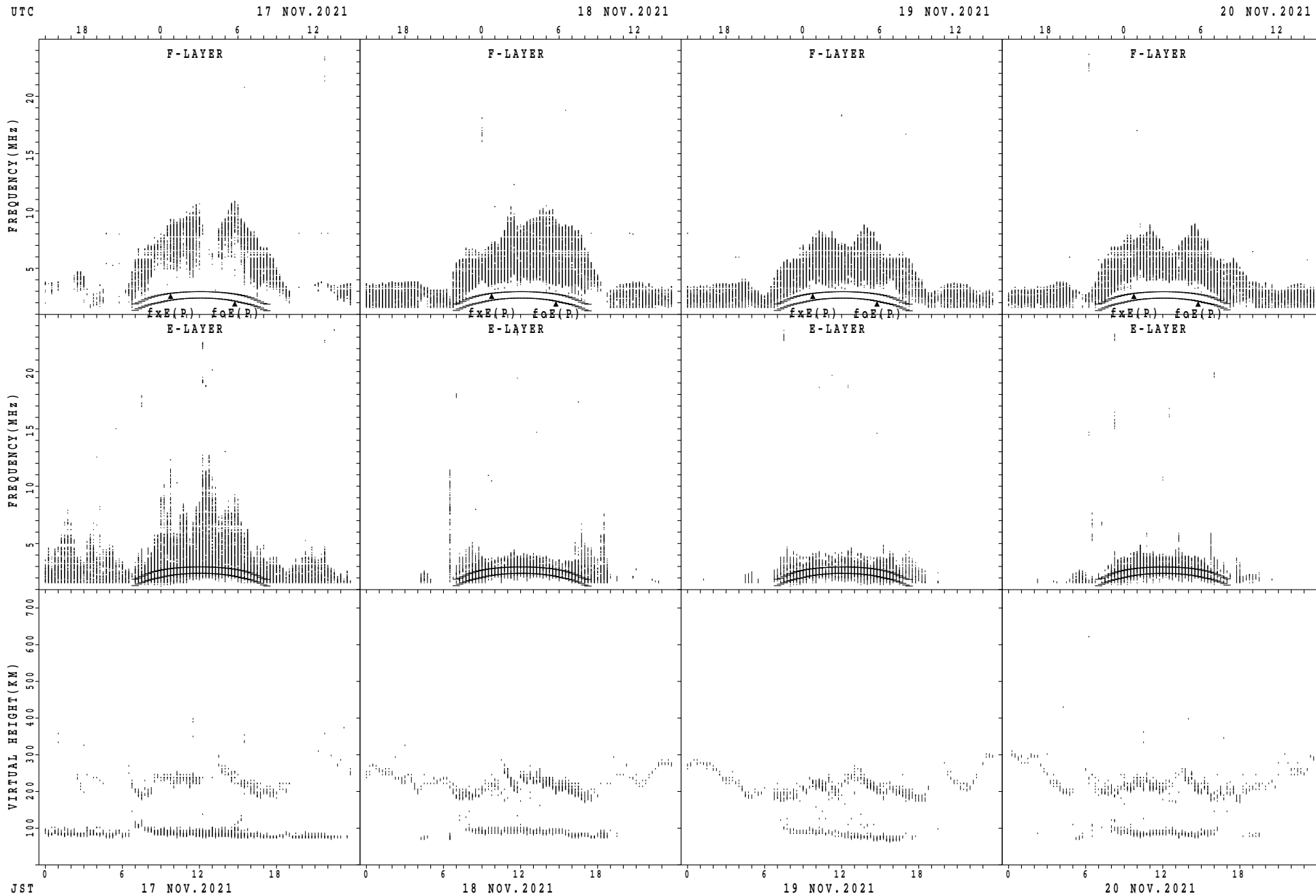
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



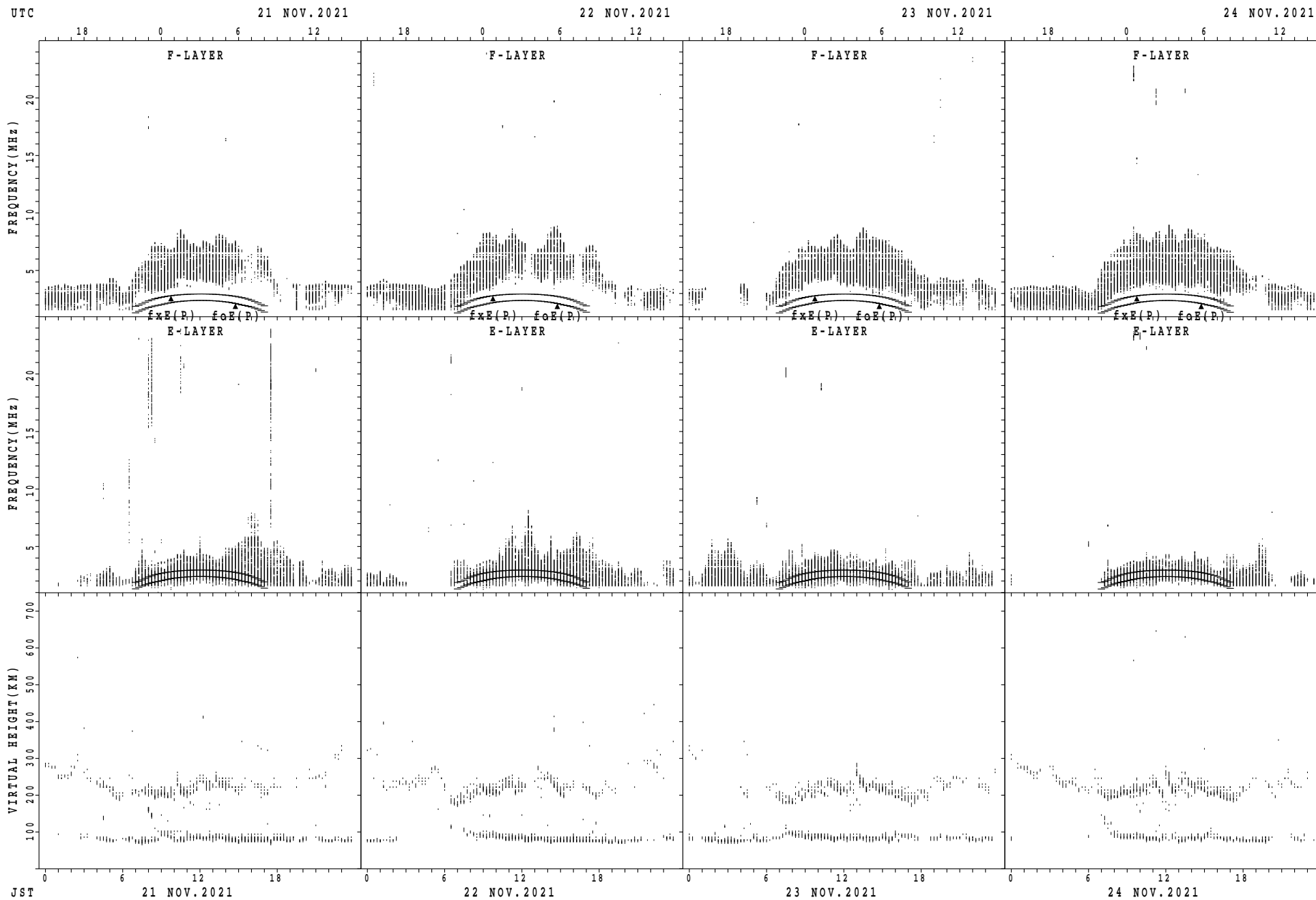
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



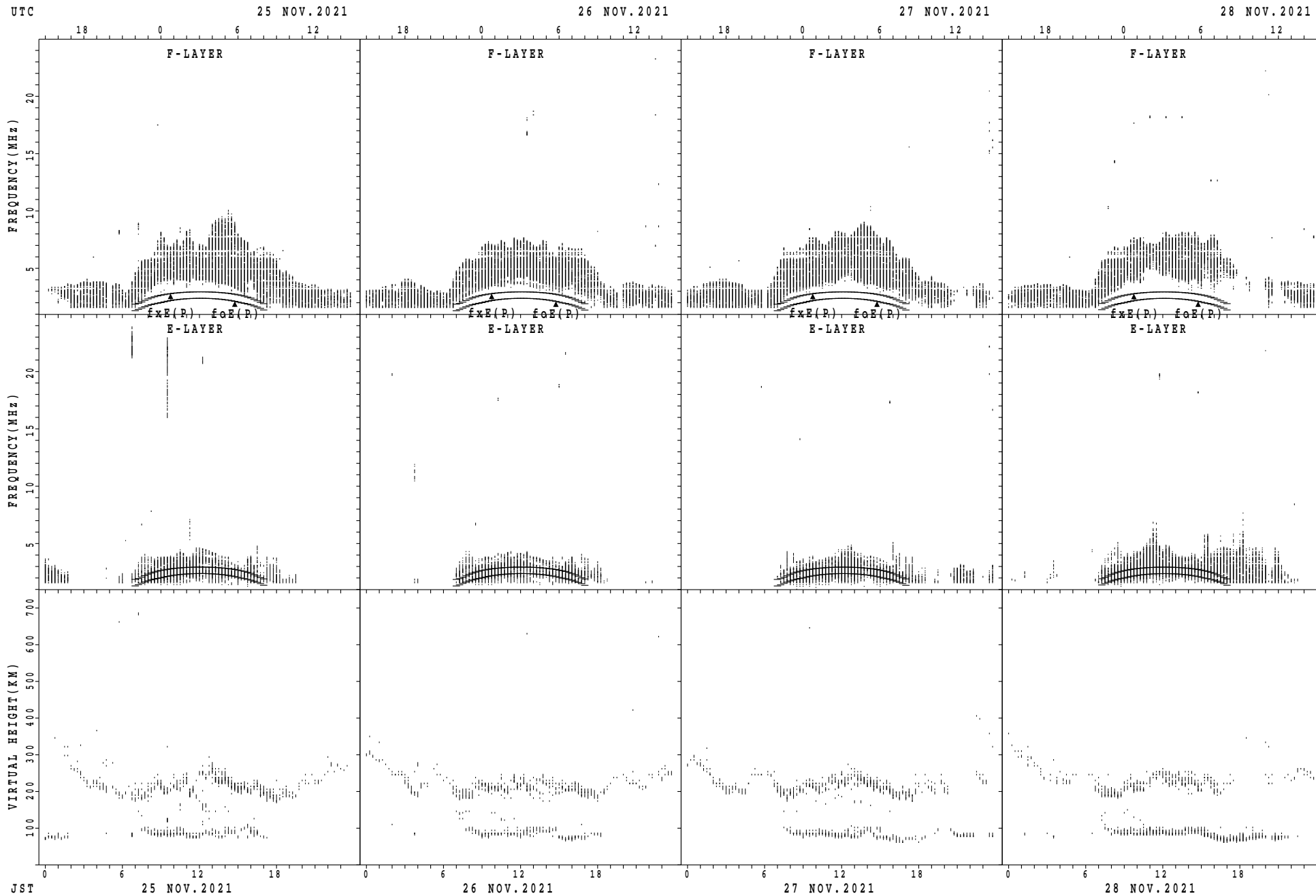
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



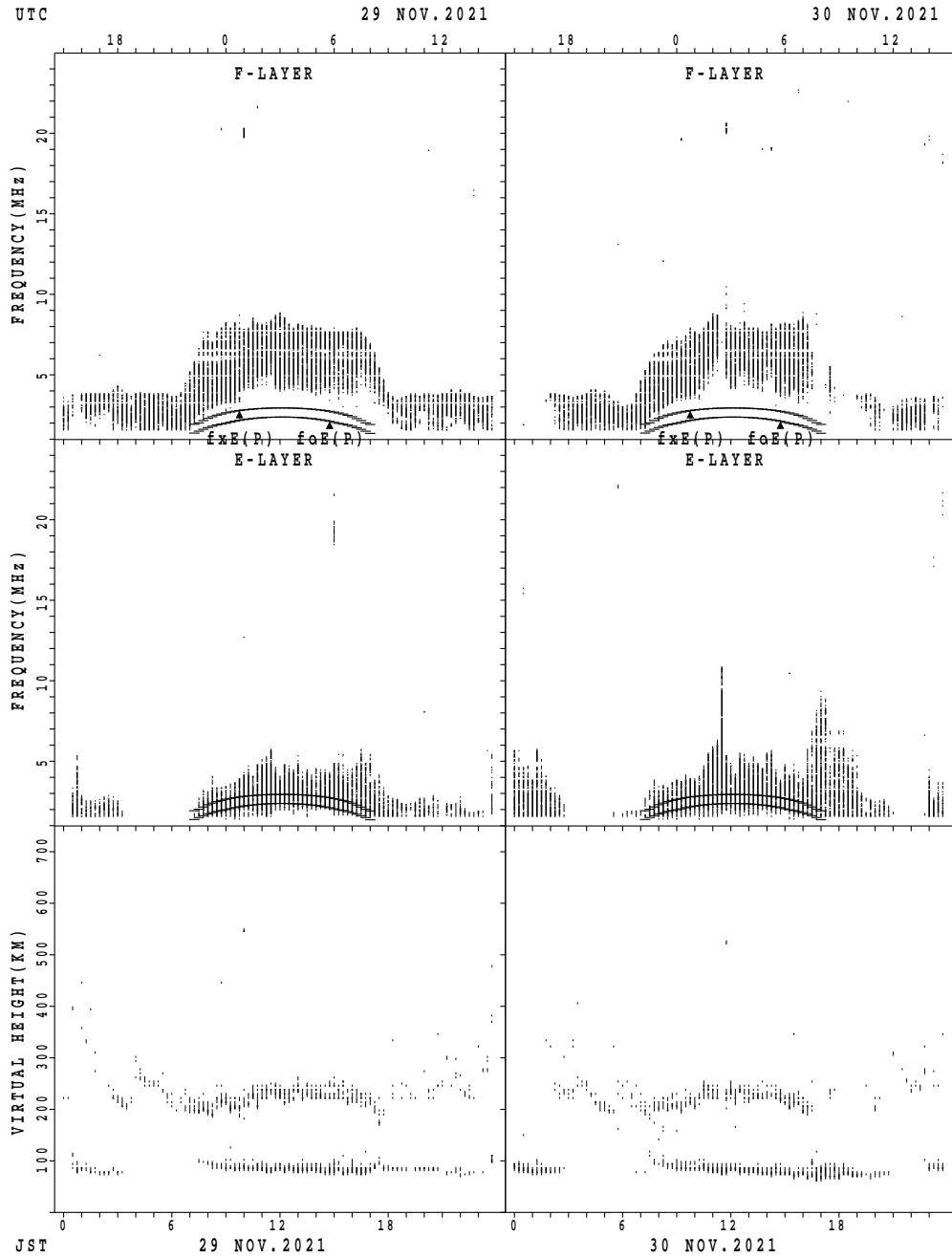
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



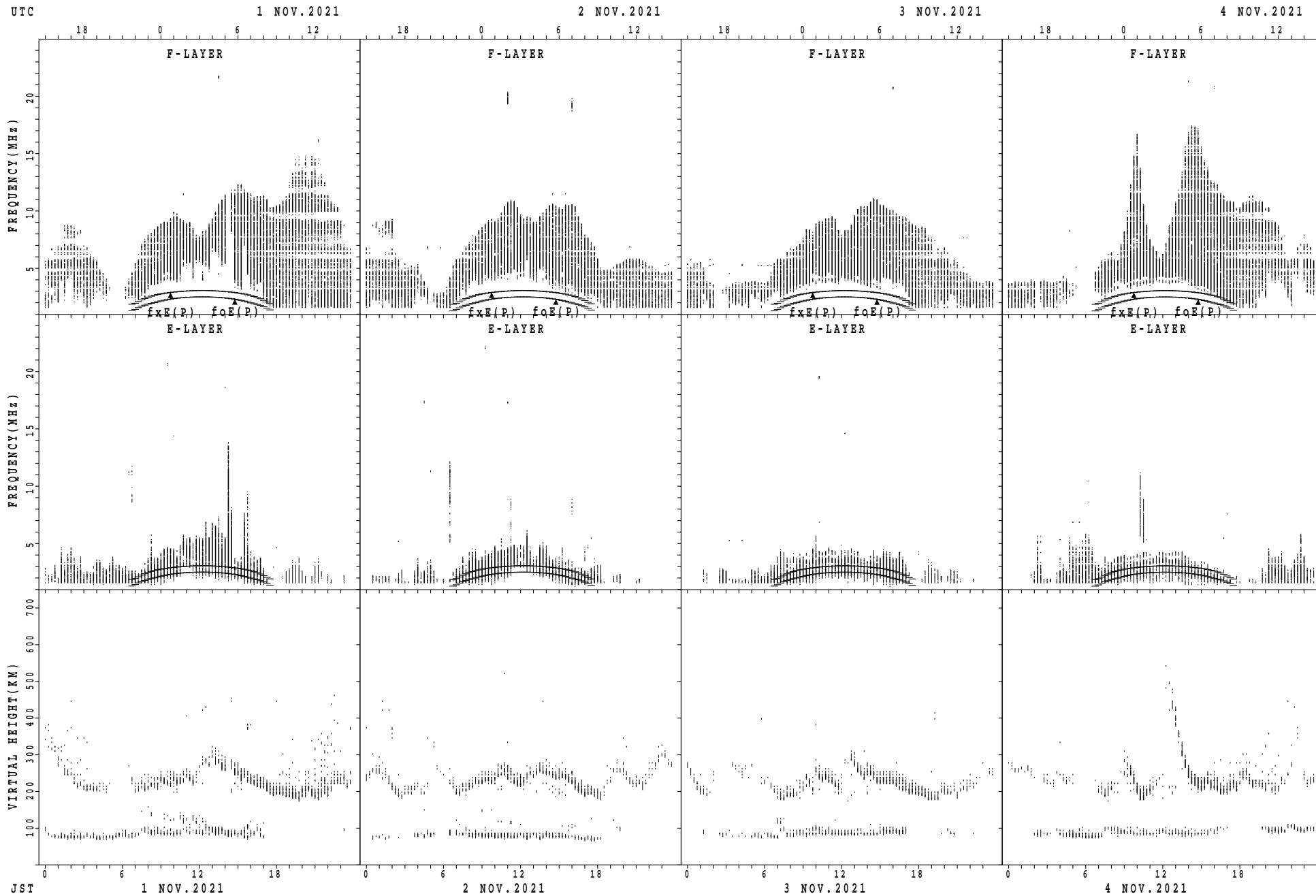
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



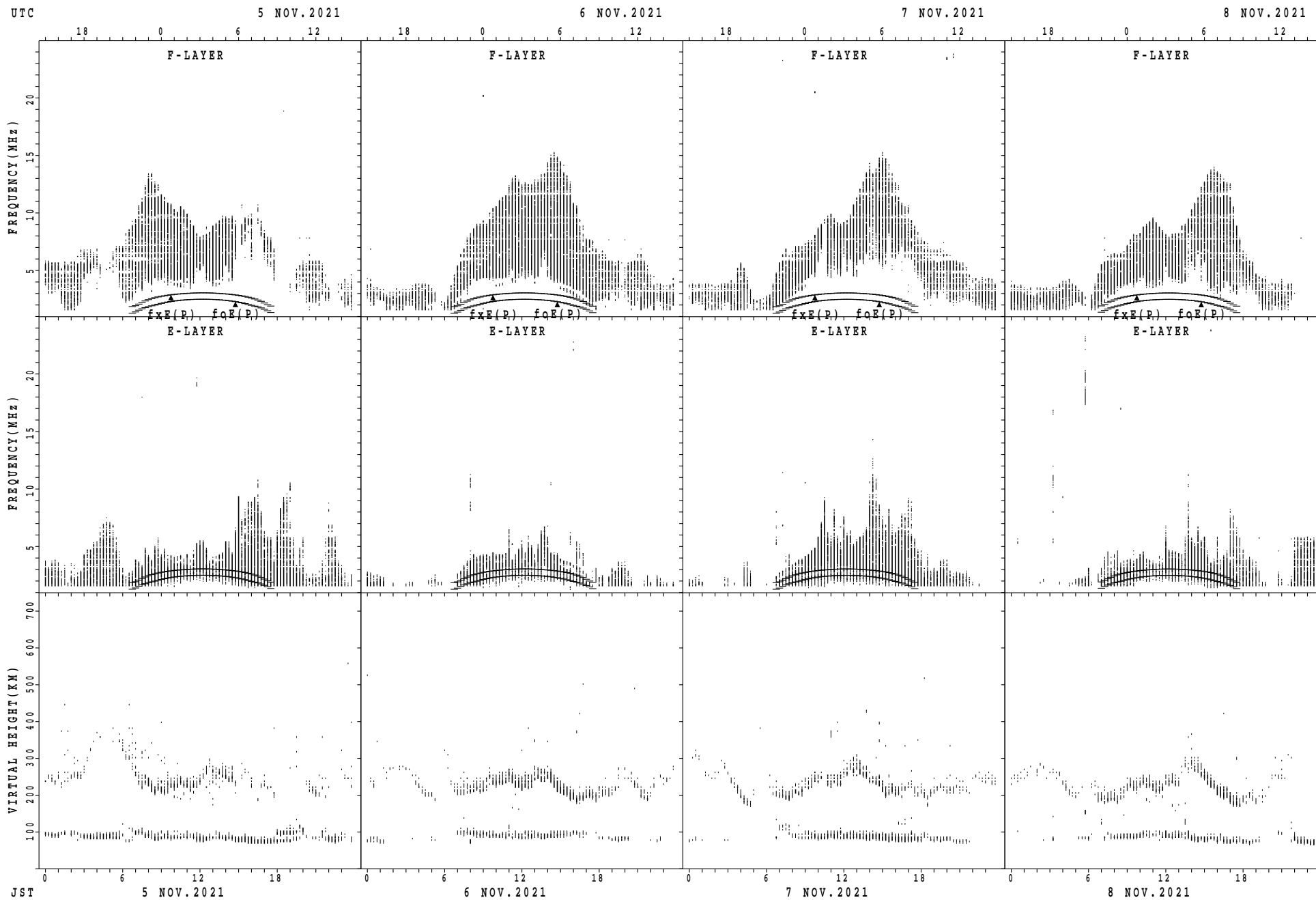
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



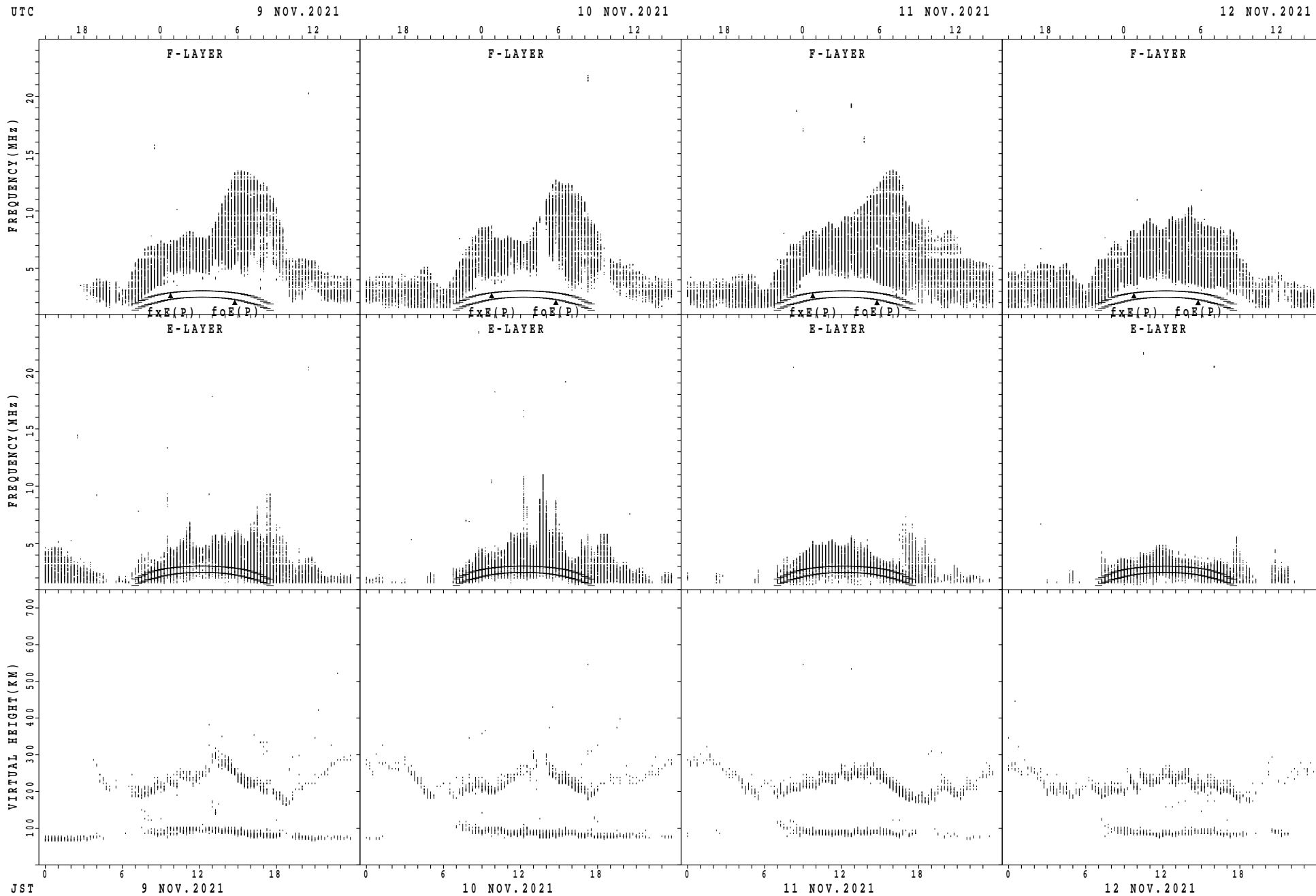
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



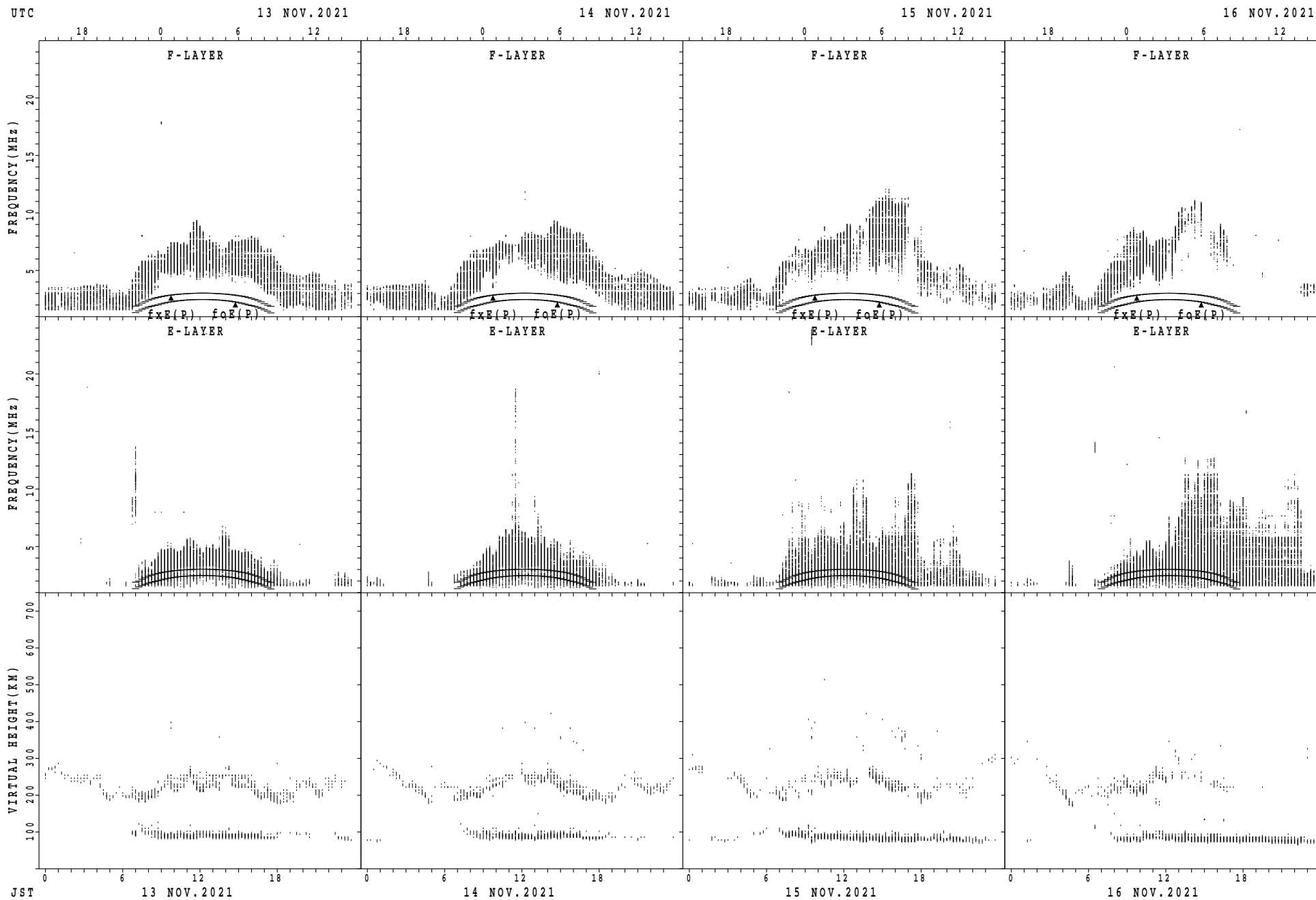
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



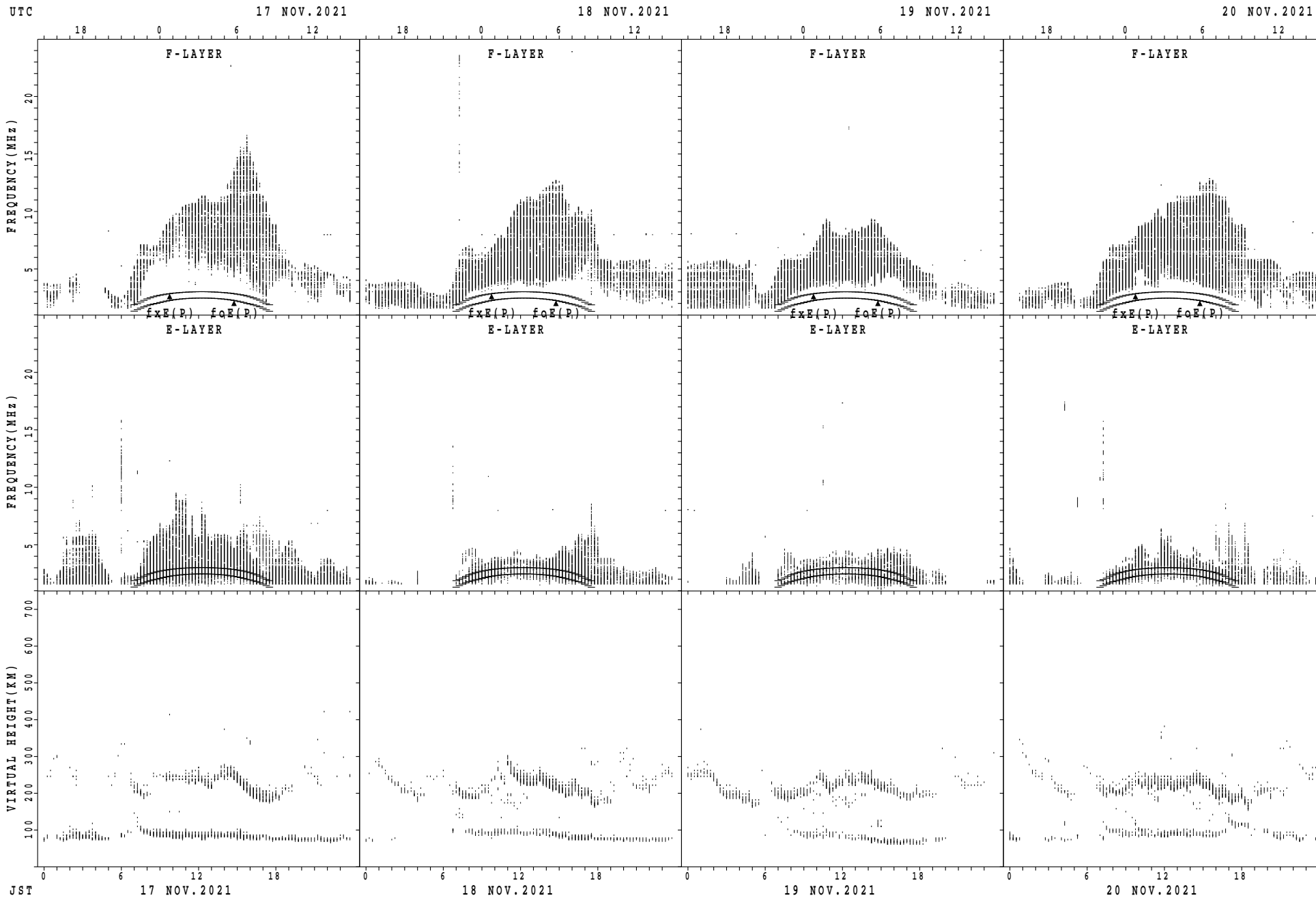
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



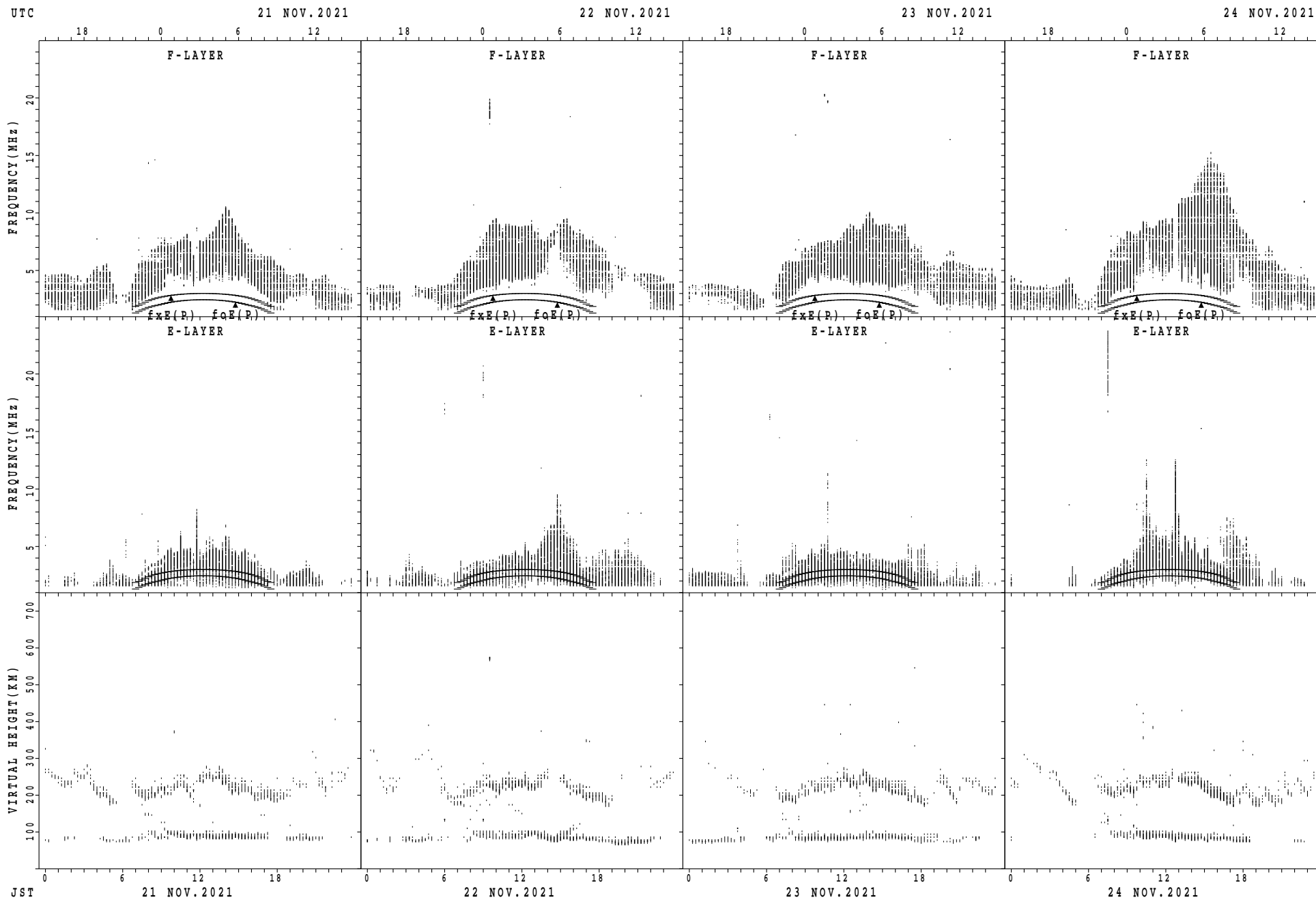
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



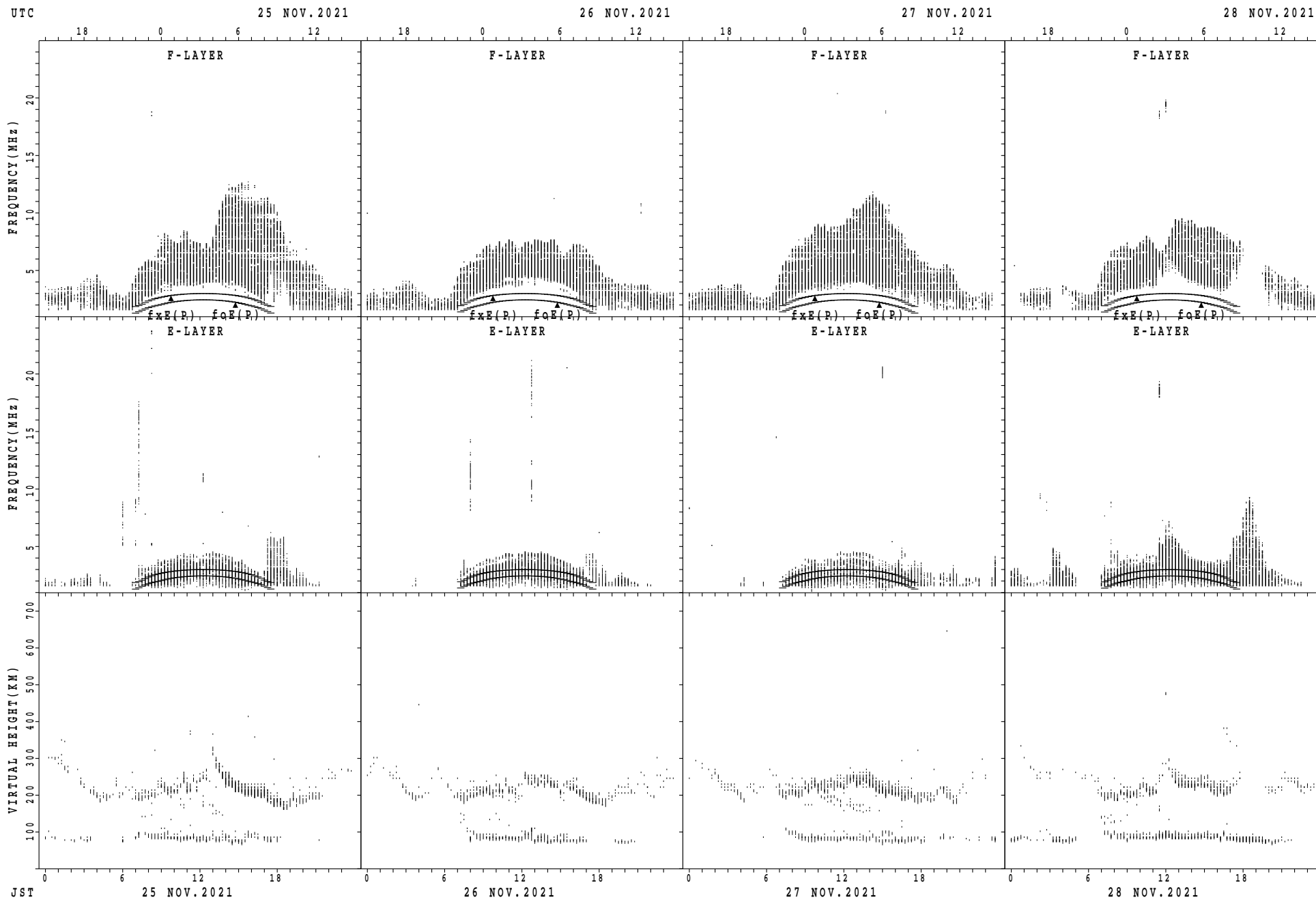
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



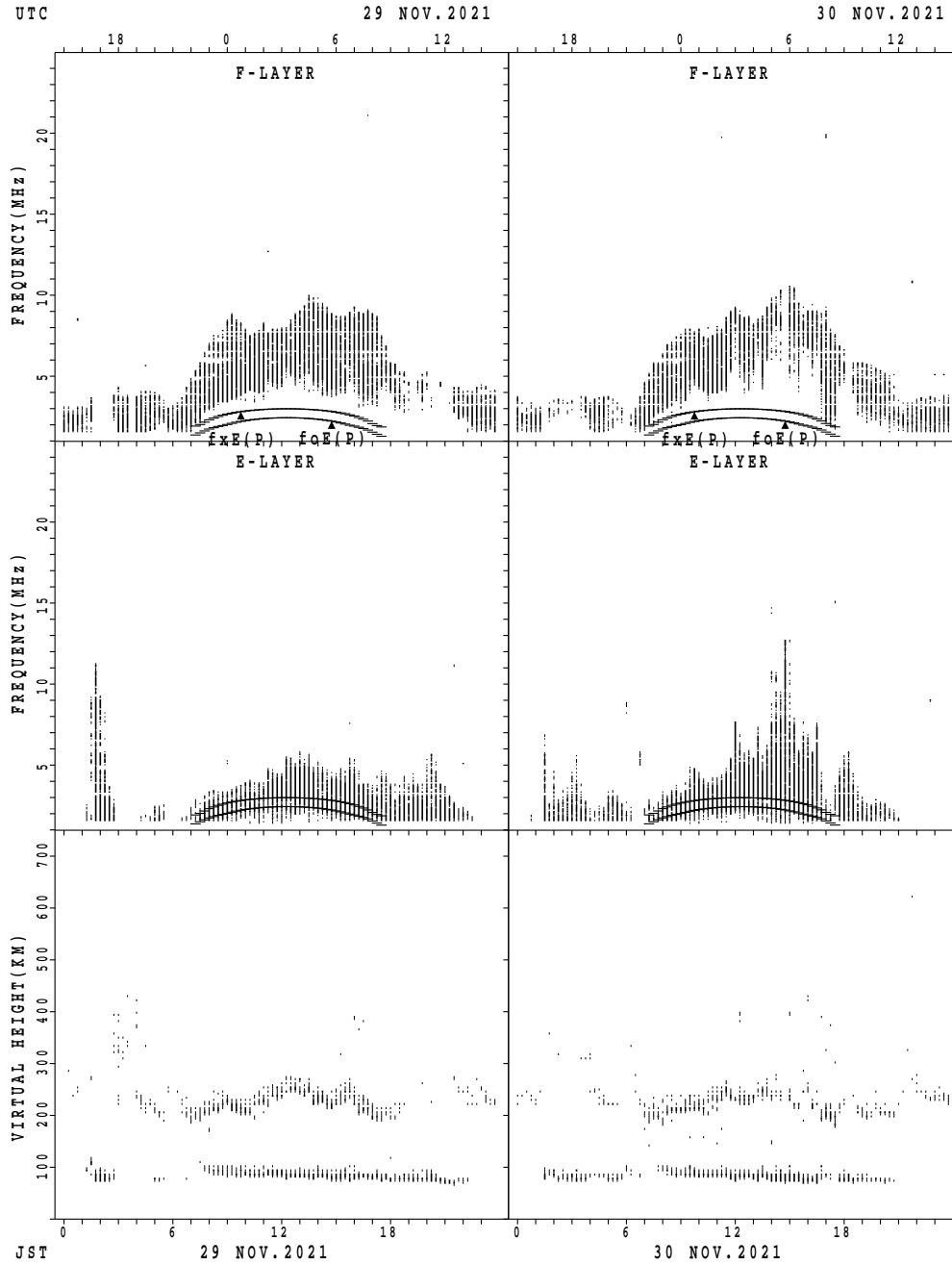
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

MONTHLY MEDIANS OF h'F AND h'Es
 NOV. 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	17	26	22	17	20	20	14	15	9							
MED	232							221	214	210	211	212	203	216	224	216	214							
U Q	116							226	224	224	216	223	215	231	240	224	218							
L Q	116							216	201	202	200	204	196	208	216	200	210							

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	20	27	24	23	22	15	27	30	30	27	27	27	27	27	28	22	23	27	24	22	20	19	16
MED	96	96	96	98	98	98	98	98	99	100	98	98	98	98	98	97	96	96	98	98	96	96	96	98
U Q	98	98	98	98	98	98	98	137	100	100	100	98	98	98	100	98	98	98	98	98	98	98	98	98
L Q	96	96	96	96	96	94	96	98	98	98	98	94	96	96	96	94	96	94	96	96	96	93	96	96

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	18	27	10			10	27	20	14	1						
MED								210	211	224	215			231	222	217	209	218						
U Q								234	228	234	224			236	232	228	214	109						
L Q								208	208	210	208			228	216	208	200	109						

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	20	20	24	22	21	19	17	28	30	30	30	30	30	30	30	30	29	27	24	19	20	21	20	21
MED	96	98	97	96	96	98	98	98	100	98	98	96	96	96	94	96	96	96	96	96	97	96	96	96
U Q	98	98	98	98	98	98	98	100	100	100	100	98	98	98	98	98	98	98	97	98	98	98	98	98
L Q	96	97	96	96	93	96	96	97	98	96	98	94	94	94	92	94	94	94	94	96	96	96	94	94

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									10	22	15				15	27	21	9	1					
MED									219	221	224				224	220	214	212	232					
U Q									226	232	242				234	232	222	217	116					
L Q									212	218	214				220	208	206	204	116					

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	18	26	22	21	19	22	21	27	30	30	30	30	30	30	30	30	30	29	29	26	25	23	21	22
MED	96	96	96	98	96	96	96	98	98	98	98	98	96	98	97	98	96	98	96	96	96	98	96	96
U Q	98	96	98	98	98	98	98	100	102	100	98	98	98	98	98	98	98	98	98	98	98	98	97	96
L Q	96	96	94	96	94	96	95	98	98	98	96	94	94	96	94	94	92	94	94	94	94	94	96	94

MONTHLY MEDIANS OF h'F AND h'Es
 NOV. 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			2					1	10	23	15					26	29	25	10	4	4	2	1	
MED			319					282	228	232	216					223	214	208	214	233	234	213	258	
U Q			382					141	234	234	240					232	226	225	230	256	246	218	129	
L Q			256					141	216	216	214					210	205	193	208	214	217	208	129	

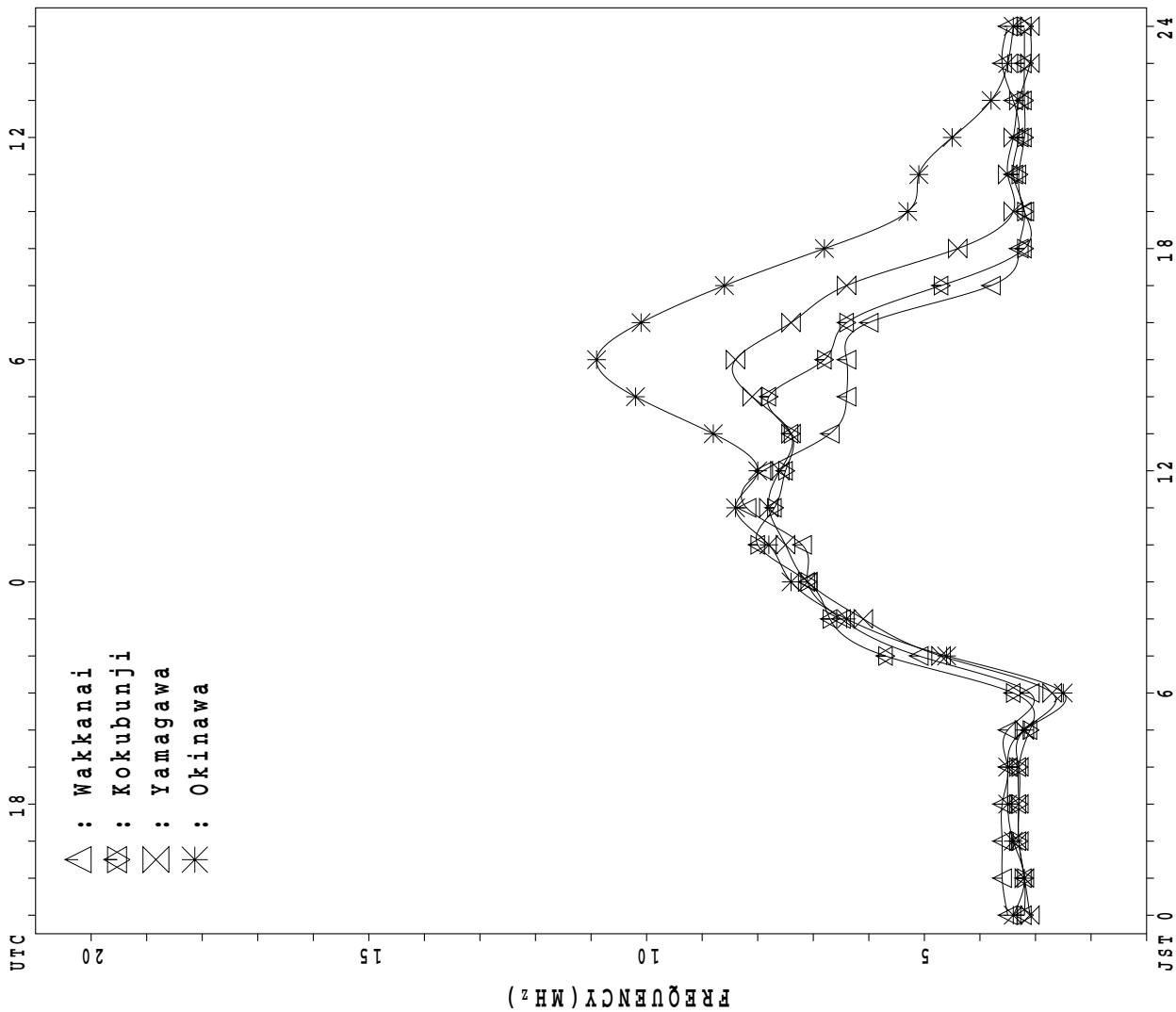
h'Es

	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	20	21	22	20	19	20	20	27	30	30	30	30	30	30	30	30	30	30	27	27	25	23	22	21
MED	96	96	96	96	96	96	96	98	98	98	98	96	96	96	95	96	96	96	96	98	96	96	96	96
U Q	98	98	98	98	98	98	98	100	100	100	98	98	98	98	98	98	98	98	98	98	98	98	98	98
L Q	94	96	94	93	94	96	93	98	96	98	96	96	94	94	92	94	92	92	92	92	94	94	94	96

MONTHLY MEDIANS PLOT OF fOF2

NOV. 2021

AUTOMATIC SCALING



UTC

20

15

10

5

JST 0

FREQUENCY (MHz)

18

0

6

12

24

18

12

6

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 59	X 58	X 58	X 51	X 43	X 37													X 55	X 43	X 41	X 37	X 39	X 40	
2	X 40	X 41	X 41	X 41	X 39	X 39													X 49	X 43	X 39	X 45	X 44	X 44	
3	X 46	X 47	X 46	X 40	X 41	X 39													X 52	X 51	X 48	X 49	X 49	X 45	
4	X 42	X 43	X 47	X 47	X 49	X 48													X 50	X 47	X 48	X 42	X 43	X 45	
5	A 29	X 35	X 33	X 32	X 32	A													X 53	X 51	X 46	X 46	X 46	X 45	
6	X 42	X 42	X 41	X 40	X 42	X 40													X 42	X 42	X 42	X 43	X 45	X 45	
7	X 45	X 45	X 45	X 41	X 43	X 38													X 38	X 38	X 40	X 42	X 43	X 45	
8	X 45	X 46	X 45	X 43	X 43	X 42													X 36	X 38	X 39	X 39	X 38	X 38	
9	X 39	X 43	X 43	X 43	X 43	X 41													X 44	X 40	X 34	X 41	X 41	X 41	
10	X 45	X 45	X 45	X 45	X 43	X 46													X 42	X 37	X 41	X 40	X 43	X 43	
11	X 44	X 45	X 44	X 45	X 45	X 45													X 43	X 37	X 37	X 39	X 39	X 39	
12	X 40	X 42	X 39	X 39	X 39	X 41													X 34	X 34	X 37	X 38	X 38	X 41	
13	X 39	X 42	X 42	X 39	X 41	X 43													X 43	X 37	X 36	X 38	X 39	X 39	
14	X 40	X 41	X 40	X 40	X 40	X 41													X 35	X 35	X 37	X 37	X 40	X 38	
15	X 38	X 41	X 40	X 40	X 40	X 40													X 39	X 35	X 39	X 40	X 41	X 41	
16	X 42	X 41	X 41	X 40	X 40	X 41													X 46	X 48	X 54	X 55	X 58	X 62	
17	X 63	X 63	X 60	X 59	X 59	X 51													X 47	X 51	X 52	X 51	X 51	X 54	
18	X 56	X 56	X 57	X 58	X 56	X 63													X 42	X 46	X 47	X 44	X 46	X 52	
19	X 53	X 53	X 52	X 51	X 53	X 59													X 43	X 46	X 46	X 49	X 47	X 56	
20	X 58	X 54	X 58	X 54	X 57	X 57	44												X 35	X 41	X 43	X 44	X 42	X 46	
21	X 45	X 48	X 48	X 46	X 49	X 43													X 49	X 59	X 58	X 58	X 58	X 57	
22	X 58	X 58	X 56	X 48	X 44	X 44													X 38	X 33	X 35	X 39	X 38	X 41	
23	X 43	X 43	X 42	X 42	X 41	X 42													X 38	X 42	X 42	X 43	X 41	X 49	
24	X 43	X 45	X 45	X 44	X 44	X 43													X 41	X 33	X 38	X 37	X 36	X 39	
25	X 40	X 43	X 41	X 44	X 42	X 42													X 34	X 35	X 40	X 37	X 37	X 39	
26	X 41	X 41	X 44	X 42	X 41	X 38													X 36	X 40	X 42	X 42	X 40	X 44	
27	X 46	X 44	X 43	X 43	X 44	X 41													X 32	X 33	X 38	X 41	X 41	X 41	
28	X 43	X 41	X 41	X 43	X 39	X 37													X 33	X 39	X 46	X 46	X 49	X 52	
29	X 53	X 54	X 53	X 51	X 58	X 54													X 37	X 40	X 46	X 48	X 48	X 49	
30	X 54	X 53	X 50	X 50	X 48	X 48													X 41	X 36	X 45	X 47	X 49	X 47	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	30	30	29	29	1												30	30	30	30	30	30	
MED	X 44	X 44	X 44	X 43	X 43	X 42	44												X 42	X 40	X 42	X 42	X 42	X 44	
U Q	X 53	X 53	X 50	X 48	X 48	X 47													X 46	X 46	X 46	X 46	X 47	X 49	
L Q	X 40	X 42	X 41	X 40	X 40	X 40													X 36	X 36	X 38	X 39	X 39	X 41	

NOV.2021 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	52	51	51	44	36	30	37	68	77	91	78	84	77	75	75	78	75	64	48	36	34	30	32	33	
2	33	34	34	34	32	32	42	65	80	81	81	80	87	91	78	87	68	52	42	36	32	38	37	38	
3	39	40	39	33	34	32	38	71	90	82	81	89	79	77	75	80	66	48	45	44	41	42	42	38	
4	35	36	40	40	42	41	38	J R 61	80	101	123	108	74	78	90	107	92	55	44	40	41	35	36	38	
5	A	22	28	26	25	A	31	63	102	102	104	98	78	74	73	67	67	50	46	44	R 39	R 39	R 39	R 38	
6	36	36	35	34	36	34	36	58	74	70	87	95	82	81	82	65	64	42	35	R 35	R 35	R 36	R 38	R 38	
7	38	38	38	34	36	F	32	54	57	76	84	90	76	72	67	74	63	46	R 31	31	33	35	R 36	38	
8	R 38	39	38	36	36	35	30	51	64	78	76	76	76	77	72	61	65	38	29	31	32	32	31	31	
9	32	36	36	36	36	34	30	52	63	66	70	88	92	68	59	60	63	39	37	33	27	34	34	34	
10	38	38	38	38	36	39	31	56	71	72	75	77	77	75	74	81	61	45	35	30	34	33	36	36	
11	37	38	37	38	38	38	32	59	59	75	70	84	87	79	74	70	54	38	36	30	30	32	32	32	
12	33	35	32	32	32	34	30	56	64	75	68	72	81	65	58	64	58	38	27	27	30	31	31	34	
13	32	35	35	32	34	36	26	51	60	69	67	70	76	61	64	61	60	36	36	30	29	31	32	32	
14	33	34	33	33	33	34	29	52	61	70	75	66	68	62	61	55	48	35	28	28	30	30	33	31	
15	31	34	33	33	33	33	29	49	55	63	62	68	71	82	60	55	48	34	32	28	32	33	34	34	
16	35	34	34	33	33	34	26	48	67	73	C	C	C	C	C	C	C	C	C	39	41	47	48	R 55	
17	56	56	53	52	52	44	37	58	74	62	C	C	C	C	C	C	C	C	33	40	44	45	44	47	
18	49	49	50	51	49	56	41	Z 64	63	71	C	C	C	C	C	C	R 76	R 58	R 37	R 35	R 39	40	37	39	F 45
19	46	46	45	44	46	52	32	50	R 62	63	60	89	86	63	57	67	53	31	36	39	39	42	40	F	
20	F 47	47	45	F 41	F 42	F 44	F 30	F 52	60	64	62	75	68	66	52	57	60	34	28	34	36	37	35	F 35	
21	38	41	41	39	42	36	34	52	62	69	69	75	77	60	65	74	53	Z 36	Z 42	Z 46	F 46	F 45	F 38	F 38	
22	F 44	F 44	F 34	F 34	C	37	37	53	70	63	65	71	82	63	64	62	59	36	31	26	28	32	31	Z 34	
23	36	36	35	35	34	35	26	42	55	62	66	82	81	60	56	60	56	38	31	35	35	36	34	Z 42	
24	36	38	38	37	37	36	30	46	66	61	70	95	76	62	56	55	48	39	34	26	31	30	29	32	
25	33	36	V 34	37	35	35	28	53	61	70	58	73	82	65	55	56	61	47	27	28	33	30	30	32	
26	34	34	37	35	34	31	28	51	60	58	73	73	H 77	63	63	61	44	31	29	33	35	35	33	37	
27	39	37	36	36	37	34	30	51	65	63	68	79	82	68	59	54	56	37	25	26	31	34	34	34	
28	36	34	34	36	32	30	28	47	60	78	H 64	76	80	H 66	76	73	52	34	26	32	39	39	42	45	
29	46	47	F 41	44	46	47	38	52	64	79	79	83	76	69	67	63	58	35	30	33	39	41	41	42	
30	47	46	43	43	41	41	41	51	63	79	81	92	76	66	61	66	43	44	34	29	38	40	42	40	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	27	30	29	30	29	28	30	30	30	30	27	27	27	27	27	28	28	29	30	30	30	30	29	29	
MED	36	38	37	36	36	35	31	52	64	70	70	80	77	68	64	64	58	38	34	33	34	35	35	37	
U Q	39	44	41	40	42	40	37	58	71	78	81	89	82	77	74	74	64	46	39	39	39	39	40	39	
L Q	33	35	34	34	34	34	29	51	60	63	66	73	76	63	59	60	53	35	29	29	31	32	32	34	

NOV.2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L		L		L	L								
2									L	L	L	424	380		L	L		344						
3										L	L	388	392		L	324								
4						380			L	L	L	L	L	L	L	L								
5								L	L	L	L	420	424	424		L	L							
6											340		428			L	268							
7										376	376	424	424		L	L	248							
8									L	408	424	408			L									
9						248					364		360		L	328			L					
10										L	L		L	L	L	L								
11											L	420	364	364			L							
12										L	L	404	404											
13								L		L	404		L	L	L									
14										L	400	400	380											
15										484		L	L			L								
16											C	C	C	C	C	C	C	C	C					
17											C	C	C	C	C	C	C							
18											C	C	C	C	C									
19										360	L	L	L		364									
20											336	392		L	L	L	264							
21										U L	368	344	396		L	L								
22										L		L												
23								292			L	L		396										
24											L		376		L	L								
25											L	356		L	L	L								
26										364		L	368	372		L								
27										L		L	408		L	L								
28										324	L	384		U L	356									
29										L	L	L	L		L									
30											L	L	U L	A U L	392		L							
31											L	U L	416	384	316									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2		1	7	11	14	17	8	2	3	1							
MED						314		292	368	376	402	392	364	326	264	344								
U Q										420	408	424	410	372		268								
L Q										336	344	392	374	360		248								

NOV.2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							B									A	A	A							
								212	252	284	304	328	312	276	276										
2							B											A							
								216	256	260	296	268	324	324	272	232	260								
3							B											A							
								212	248	272	288	280	224	288	268	216	220								
4								216	232	244	280	280	280	300	288	264	A	B	B						
							A								A	A	B	A							
5								224	224	236	280	268	300	272											
							B					A	A	A				A							
6								192	228	264	236					252	228		260						
							B											A	B						
7								212	240	252	252	284	272	264	264	216									
							B											A	A						
8								180	228	244	276	244	296	264	256	220									
							B											A	A						
9								172	212	260	292	292	284	272	256	208									
							B					A						A	A						
10								196	244	296	288		292	292	264	228									
							A											B	B						
11								188	240	292	292	292	292	292	240	240									
							B											B							
12								196	232	252	288	288	288	288	268	216			288						
							B											A	A						
13								192	256	256	292	292	292	272	252	228									
							B											A	A						
14								200	232	256	292	296	300	268	244	192									
							A					A						B	B						
15								248	228	260	272		288	288	256	192									
							B				C	C	C	C	C	C		C	C						
16								192	248	248															
							B				C	C	C	C	C	C		C							
17								204	232	280										220					
							A				C	C	C	C	C	A									
18								180	180		292							256	192						
							B											B	B						
19								208	244	244	284	284	264	272	244	208									
							A									A			A						
20								180		256	268	272	272	260	248		200								
							B										A								
21								224	236	248	276	292	292	268	216	220			164						
							A									A		A	A						
22								188	212	236	280	284	284	264	232										
							A											A	B						
23								200	200	252	272	272	288	288	252	208									
							B											A	A						
24								176	240	256	292	284	284	268	232	204									
							B		A									A	A						
25									228	256	280	240	284	268	244	204									
							B		A									B	B						
26								220	264	280	284	276	264	252	208										
							B		B									A	B						
27								208	240	284	300	280	264	232	192										
							A											A	A						
28								176		252	264	268	280	264	252	216									
							A		B				A					B	A						
29								220	252	292	292		264		216										
							B		B									B	A						
30								228	272	272	272	272	276	256	228	192									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							2	25	27	30	27	24	25	26	25	22	4	5							
MED							198	196	232	256	280	284	288	270	252	216	238	220							
U Q								212	244	272	292	292	294	288	264	220	258	274							
L Q								184	224	252	272	272	278	264	242	204	210	178							

NOV.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

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

NOV.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E 16	E 16	B 18	E 16	B 16	E 16	B 16	B 20	G 26				G 29	G 26	G 24	G 24				E 16	B 16	B 16	B 16	B 16
2	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 22	G 26	G 32	G 37	G 32	G 32	G 27	G 23	G 25	G 21	G 18	E 16	B 16	B 16	B 16	B 16	B 16
3	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 22	G 27	G 27	G 32	G 30	G 30	G 28	G 25	G 22	G 20	E 16	B 16	B 19	B 19	B 17	B 16	B 16
4	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 23	G 26	G 28	G 33	G 31	G 33	G 28	G 27	G 25	E 17	B 16	B 17	B 16	B 16	B 16	B 16	B 16
5	A 63	A 17	A 16	E 16	B 16	B 31	A 16	B 23	G 20	G 23	G 28	G 26	G 28	G 29	G 28	G 34	E 17	B 23	B 22	B 22	B 17	B 17	B 17	B 17
6	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 20	G 35	G 35	G 29	G 29	G 29	G 38	G 26	G 22	G 22	G 17	G 20	E 17	B 17	B 19	B 21	B 19
7	E 17	B 17	B 17	E 16	B 16	B 16	B 16	B 20	G 26	G 30	G 28	G 31	G 29	G 27	G 26	G 19	E 16	B 16	B 16	B 17	B 17	B 17	B 16	B 16
8	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 23	G 30	G 28	G 28	G 28	G 28	G 28	G 26	G 23	G 18	G 24	G 17	G 20	E 16	B 16	B 16	B 16
9	E 17	B 17	B 19	E 16	B 16	B 17	B 16	B 19	G 25	G 26	G 29	G 30	G 31	G 29	G 25	G 22	G 24	G 25	G 21	G 18	B 16	B 16	B 16	B 16
10	E 19	B 16	B 16	E 16	B 16	B 16	B 16	B 19	G 25	G 28	G 32	G 38	G 26	G 26	G 24	G 20	G 20	G 20	E 16	B 16	B 16	B 16	B 16	B 16
11	E 17	B 17	B 16	E 16	B 16	B 16	B 16	B 18	G 25	G 27	G 31	G 29	G 29	G 26	G 26	G 29	E 16	B 16	B 17	B 16	B 16	B 16	B 16	B 16
12	E 16	B 16	B 16	E 19	B 20	B 16	B 16	B 19	G 24	G 27	G 26	G 28	G 28	G 28	G 25	G 20	G 16	G 17	G 16	B 16	B 16	B 16	B 16	B 16
13	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 18	G 22	G 26	G 29	G 29	G 28	G 27	G 25	G 22	G 18	G 17	G 17	G 17	B 17	B 17	B 16	B 17
14	E 17	B 16	B 17	E 17	B 17	B 16	B 16	B 19	G 23	G 26	G 27	G 30	G 29	G 27	G 26	G 20	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16
15	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 21	G 24	G 28	G 28	G 28	G 28	G 28	G 26	G 21	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16
16	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 19	G 25	G 27	C	C	C	C	C	C	C	C	C	G 21	G 17	B 16	B 16	B 16
17	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 21	G 30	G 34	C	C	C	C	C	C	C	C	G 16	G 20	G 16	B 16	B 16	B 17
18	E 16	B 16	B 16	E 16	B 16	B 19	B 19	B 18	G 25	G 32	C	C	C	C	C	C	G 25	G 21	G 16	G 16	B 16	B 16	B 16	B 16
19	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 16	G 24	G 28	G 28	G 30	G 30	G 28	G 28	G 21	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16
20	E 16	B 16	B 20	E 16	B 17	B 16	B 16	B 16	G 22	G 28	G 30	G 29	G 27	G 26	G 24	G 19	E 18	B 16	B 16	B 16	B 16	B 16	B 16	B 16
21	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 20	G 26	G 30	G 28	G 28	G 28	G 26	G 24	G 24	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16
22	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 20	G 22	G 24	G 30	G 30	G 30	G 26	G 23	G 23	G 23	G 18	G 17	G 17	G 20	G 19	B 16	B 16
23	E 19	B 16	B 16	E 16	B 16	B 16	B 16	B 18	G 25	G 27	G 30	G 30	G 30	G 26	G 23	G 20	E 16	B 16	B 15	B 16	B 16	B 19	B 16	B 16
24	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 16	G 26	G 26	G 28	G 31	G 30	G 27	G 26	G 22	E 16	B 17	B 16	B 16	B 16	B 16	B 16	B 16
25	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 16	G 22	G 28	G 30	G 30	G 28	G 25	G 25	G 22	E 18	B 22	B 16	B 16	B 16	B 16	B 16	B 16
26	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 18	G 22	G 27	G 30	G 30	G 29	G 26	G 26	G 22	E 15	B 16	B 16	B 16	B 16	B 16	B 16	B 16
27	E 16	B 16	B 16	E 15	B 16	B 16	B 16	B 16	G 22	G 26	G 28	G 28	G 31	G 27	G 25	G 20	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16
28	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 16	G 22	G 26	G 28	G 27	G 28	G 28	G 26	G 22	G 15	B 16	B 17	B 17	B 17	B 16	B 16	B 16
29	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 16	G 22	G 28	G 30	G 29	G 32	G 28	G 25	G 22	E 16	B 17	B 17	B 16	B 16	B 16	B 16	B 16
30	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 16	G 22	G 26	G 26	G 27	G 27	G 25	G 25	G 21	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	27	27	27	27	27	28	28	29	30	30	30	30	30	30
MED	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 19	G 25	G 28	G 29	G 30	G 29	G 28	G 26	G 22	E 17	B 16	B 16	B 16	B 16	B 16	B 16	B 16
U Q	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 21	G 26	G 28	G 30	G 30	G 31	G 29	G 26	G 24	E 20	B 19	B 17	B 17	B 17	B 16	B 16	B 16
L Q	E 16	B 16	B 16	E 16	B 16	B 16	B 16	B 18	G 22	G 26	G 28	G 28	G 28	G 26	G 25	G 21	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16

NOV.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

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

NOV.2021 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	260	259	287	316	316	316	326	356	357	357	358	355	346	335	335	346	346	346	355	320	319	285	284	284		
2	322	296	314	313	318	338	340	379	355	373	365	336	345	325	324	359	360	345	335	334	304	285	265	302		
3	289	313	340	300	299	313	326	349	367	368	358	338	367	366	343	347	355	336	333	330	309	308	319	319		
4	301	286	306	292	336	369	325		R	336	304	350	365	334	303	331	336	347	367	274	274	318	265	366	302	
5	A	190	314	405	298		A	285	323	347	347	365	361	352	351	350	350	362	344	319	316	315	314	314	297	
6	307	305	295	295	294	329	354	341	378	359	323	372	338	337	355	350	349	392	322	322	R	R	R	R	294	
7	307	308	327	310	296	310	314	361	362	362	354	365	366	366	356	344	376	367	321	310	R	309	308	298	298	
8	R	297	304	295	312	312	364	327	355	369	377	371	370	362	354	367	368	368	378	319	318	352	332	332	298	
9	299	299	299	322	291	347	334	376	369	385	367	344	377	376	327	344	369	365	320	374	324	324	321	293		
10	277	323	302	314	304	373	328	362	361	377	395	370	341	361	339	359	359	367	339	316	315	315	314	300		
11	273	298	298	298	298	353	338	395	364	386	347	383	347	368	323	358	382	363	349	331	304	303	303	303		
12	321	310	310	309	314	374	325	354	395	378	355	333	332	365	364	364	363	341	317	317	317	306	318	314		
13	313	313	335	334	326	369	321	374	381	380	374	358	368	370	369	369	379	312	358	337	322	310	309	309		
14	314	313	331	324	323	367	311	370	381	350	368	366	358	374	364	353	380	358	301	322	321	312	311	311		
15	311	308	308	307	306	347	353	372	387	366	373	341	349	372	386	370	353	323	375	313	312	312	311	310		
16	294	315	298	313	313	344	311	375	352	365		C	C	C	C	C	C	C		334	315	303	308	305	317	
17	326	338	321	302	320	331	331	388	364	347		C	C	C	C	C	C			334	340	330	326	323	312	309
18	305	325	313	310	337	363	359	365	Z	344	363		C	C	C	C		R		R	R	328	327	318	287	
19	300	297	320	316	313	375	356	376	R	354	384	360	368	404	376	349	364	364	340	314	342	326	323	323	291	
20	F	287	299	295	F	F	F	F		376	375	383	360	378	356	382	364	375	361	295	294	312	335	291	288	
21	288	309	304	335	317	361	342	396	372	372	363	385	382	381	364	343	365	327	Z	314	327	F	F	F	F	
22	F	305	F	F	C	297	317	362	384	369	363	362	375	358	376	349	359	352	321	320	346	288	297	297	280	
23	295	288	283	282	323	357	351	369	374	342	371	362	362	361	368	353	334	350	338	338	301	321	321	293		
24	299	316	307	318	309	346	345	360	397	370	368	376	403	365	377	367	344	364	364	336	327	347	304	303		
25	299	299	314	313	313	361	313	383	401	365	346	346	355	H	375	379	354	354	380	302	321	336	322	298	309	
26	296	296	295	310	305	338	315	384	361	366	366	360	319	H	365	351	364	367	354	322	323	323	323	323	304	
27	291	312	313	292	304	343	342	372	405	372	364	372	371	362	362	346	368	365	344	321	320	309	297	268		
28	291	294	307	321	355	321	360	365	372	381	316	H	358	369	H	370	370	379	364	290	290	324	304	303	316	
29	305	331	F	296	286	333	346	363	329	363	351	356	370	327	355	354	354	341	340	304	330	315	295	310		
30	307	311	310	341	308	322	335	347	363	368	368	367	349	363	368	368	352	337	389	299	313	322	278	308		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	27	30	29	30	29	29	30	29	30	30	27	27	27	27	27	28	28	29	30	30	30	30	29	30		
MED	299	306	307	311	313	347	330	369	368	368	364	362	362	363	362	356	362	354	328	321	318	312	309	302		
U Q	307	313	314	318	322	364	345	378	381	377	368	370	371	370	369	366	370	366	340	331	326	323	318	309		
L Q	291	296	298	298	302	330	317	358	357	362	354	355	346	351	343	348	354	340	317	315	309	304	297	293		

NOV. 2021 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L		L		L	L								
2									L	L	L	400	410	L	L		413							
3										L	L	408	404	L	403									
4						314		L	L	L	L	L	L	L	L									
5							L	L	L	L	L	393	383	384		L								
6										415		414			L	403								
7									412	407	387	383		L	L	405								
8									L	404	403	403		L										
9						367				395		L	400	L	434			L						
10									L	L	L	388	391	L	L									
11											L	391	430	402		L								
12										L	L	401	397	L										
13							L		L	L	387		L	L										
14									L	381	400	397		L										
15									390	L	L	403	390		L									
16										C	C	C	C	C	C	C	C	C						
17										C	C	C	C	C	C	C								
18										C	C	C	C	C										
19									385	L	L	L	425											
20										421	398	L	L	L	399									
21									U L	420	417	377	L	L										
22								391	L	L	L	387												
23										L	L	398	L	L										
24										L	413	L	L											
25									438	L	388	401	L	L										
26									L		L	392	L	L										
27								431	L	L	411	L	L	L	L									
28									L	L	392	L	L	L										
29									L	L	L	A U	L	L	L									
30									L	U	L	358	400	399										
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2		1	7	11	14	17	8	2	3	1							
MED						340		391	412	404	399	398	402	418	403	413								
U Q									420	417	403	404	411		405									
L Q									390	387	387	392	399		399									

NOV.2021 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									248	230	236		250		268	258									
2									236	236	236	232	250	242	250		218								
3										226	218	246	220	232	242										
4							210		266	256	236	222	238	284	258										
5								300	238	254	244	236	230	252	246										
6											230	230	222		236	228									
7										240	240	224	224	236	236	238									
8										230	232	234	234	234											
9							258				236	248	234	222	222			258							
10											232	214		252	244	254									
11											254	232	246	232		226									
12											226	236	254	244	234										
13								220		234	234	252	240	224											
14										246	240	236	246	236											
15											252	222	252	248	234	224									
16											C	C	C	C	C	C	C	C							
17											C	C	C	C	C	C	C								
18											C	C	C	C	C										
19											206	206	220	212	224										
20												224	254	230	246	220	232								
21											230	230	228	220	220										
22											228	218	236	240	234										
23												238	238	238	230	230									
24												234	236	206	228										
25												210	250	232	226										
26												224		240	236	236									
27												222	234	240	230	236									
28												232	214	242	220		240								
29													250	250	216	236		250							
30													232	236	230	234									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							2	2	5	18	26	25	27	23	13	6	1	1							
MED							234	260	238	231	234	238	234	234	240	235	218	258							
U Q									257	240	236	249	244	236	252	250									
L Q									232	226	224	232	222	228	227	228									

NOV.2021 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	318 ^Q	312	308	232	254	224	276	226	216	214	202	244	206	250	234	232	230	226	224	254	242	314	282	304
2	270	280	272	286	240	226	230	216	200	214	204	230	198	200	224	236	184	236	236	250	300	316	322	288
3	294	266	232	266	278	276	248	236	228	200	200	178	192	192	184	236	218	214	244	256	248	262	244	240
4	270	294	258	280	242	218	202	218	218	174	204	184	204	200	196	246	238	220	316	338	250	340	224	286
5	A	A	278	A ^E B ^B	290	A	304	222	A	202	188	188	196	196	210	246	224	248	272	262	278	278	262	272 ^Q
6	234	274	304	282	288	258	228	238	232	224	188	172	184	240	220	196	220	210	268	240	246	326	282	282
7	270	256	246	260	260	210 ^Q	198	210	220	192	178	194	194	188	202	194	210	218	222	228	242	256	284	288
8	268	262	270 ^Q	228	248	202	234	212	218	208	188	188	188	212	234	234	222	196	252	252	242	248	232	268
9	286	264	274	254	270	222	212	214	220	226	180	200	200	210	184	230	222	190	244	218	250	266	274	286
10	A	270	256	244	290	214	246	222	216	200	200	244	196	206	212	228	214	214	232	240	260	272	272	296
11	266	240	264	274	246	230	214	202	208	208	194	194	180	190	226	196	204	216	238	252	264	276	272	288
12	258	258	242	210	A	204	244	222	218	208	182	182	182	182	216	216	216	200	248	264	264	272	262	274
13	274	260	242	252	252	212	198	194	214	192	192	192	196	192	224	234	220	232	204	230	260	276	264	278
14	262	262	240	252	260	220	240	222	226	206	206	196	186	204	224	216	210	224	204	248	248	278	262	274
15	272	284	254	254	284	220	222	226	210	202	190	200	180	204	198	224	224	210	200	232	252	268	250	254
16	270	258	280	270	240	206	254	222	230	230	C	C	C	C	C	C	C	C	210	236	278	244	264	244
17	230	230	230	254	234	222	210	206	228	210	C	C	C	C	C	C	C	208	244	230	252	240	242	252
18	260	230	242	240	240	216	206	226	200	214	C	C	C	C	C	214	198	216	212	230	218	236	258	248
19	226	268	252	246	238	194	220	222	208	180	190	204	210	170	212	232	204	206	244	236	236	234	232	248 ^Q
20	258 ^Q	268	268	256	260	206	228	210	224	224	188	196	196	184	184	184	212	204	282	260	246	232	280	272
21	286 ^Q	272	264	246	242	218	222	210	218	192	176	176	202	180	236	230	214	232	264	238	280 ^Q	252 ^Q	300 ^Q	270 ^Q
22	240 ^Q	258 ^Q	260 ^Q	240 ^Q	262	262	244	216	176	176	202	202	198	218	234	234	222	222	246	246	234	216	236	280
23	266	292 ^Q	252	266 ^Q	242	206	240	206	206	220	188	216	188	188	200	224	224	210	242	238	246	274	240	264
24	266	260	260	260	270	226	240	210	220	242	202	190	202	202	210	216	224	212	206	220	258	234	282	254
25	288	278	258	238	256	210	240	190	202	214	174	198	192	184	216	222	222	218	260	236	256	232	272	272
26	268	266	264	250	250	216	250	216	208	188	226	190	180	194	232	226	208	220	262	248	250	240	262	274
27	268	264	268	254	246	218	216	210	206	184	186	186	212	192	222	208	218	200	232	248	258	264	282 ^Q	306
28	268	266	272	254	222	222	240	216	216	212	196	196	192	216	208	214	210	210	284	316 ^A	246	246	252	246
29	244	232	258	252	258 ^Q	216	216	220	236	226	204	202	A	196	222	200	216	210	246	262	262	246	264	264
30	252	234	234	234	234	234	232	194	216	216	200	206	176	184	238	214	204	240	204	254	274	244	288 ^Q	248
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	29	29	29	30	30	29	30	27	27	26	27	27	28	28	29	30	30	30	30	30	30
MED	268	264	259	254	251	218	231	216	216	208	192	196	195	196	216	224	217	214	244	247	251	259	264	272
U Q	271	273	270	263	266	225	244	222	222	216	202	202	200	206	226	233	222	223	260	254	262	276	282	286
L Q	258	258	246	242	241	210	216	210	208	192	188	188	186	188	202	214	210	209	222	236	246	240	250	254

NOV. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							B									A	A	A							
								108	110	110	110	108	108	104	98										
2							B											A							
								116	116	104	104	96	104	104	104	100	100								
3							B											A							
								90	104	102	102	102	102	108	108	112	90								
4								96	90	102	102	102	102	102	106	102		B	B						
							A								A	A	B	A							
5								96	94	96	102	102	102	102											
							B					A	A	A			A								
6								102	102	102	102				106	118		A	98						
							B										A	B							
7								116	104	100	94	100	100	100	100	100		A	B						
							B										A	A							
8								102	102	102	102	102	102	102	102	102									
							B										A	A							
9								120	100	102	102	102	102	102	102	102									
							B					A					A	A							
10								110	110	110	110		112	106	94	94									
							A										B	B							
11								106	108	108	108	108	108	108	110	96									
							B										B								
12								110	110	110	98	98	98	98	106	100		100							
							B										A	A							
13								116	106	106	106	106	100	108	96	108									
							B										A	A							
14								154	104	104	104	104	110	110	108	108									
							A	B				A					B	B							
15									114	116	104		104	104	104	104									
							B				C	C	C	C	C	C	C	C							
16								126	110	102															
							B				C	C	C	C	C	C	C	C							
17								122	114	114									106						
									A		C	C	C	C	C	A									
18								98	110		110						96	96							
							B										B	B							
19								134	122	104	110	110	108	108	108	108									
							A		A							A									
20								96		100	106	114	102	98	106		102								
							B										A								
21								108	104	106	106	96	104	90	90	92		80							
							A									A	A	A							
22								108	108	98	98	98	98	98	98										
							A										A	B							
23								118	98	98	98	98	112	112	112	128									
							B										A	A							
24								112	112	112	112	110	108	108	104	104									
							B	A									A	A							
25								108	120	118	100	106	106	92	92										
							B	A									B	B							
26								112	106	106	108	102	104	114	104										
							B	B									A	B							
27								102	104	104	104	104	102	102	102										
							A	B	A								A	A							
28									104	102	102	102	102	102	102										
							A	B				A			A		B	A							
29								122	110	110	110		100		126										
							B	B								B	A								
30								114	112	112	112	110	100	100	106										
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							2	23	27	30	27	24	25	26	25	22	4	5							
MED							97	110	108	104	104	102	104	104	102	103	98	98							
U Q							118	112	110	110	108	108	108	107	108	101	103								
L Q							102	102	102	102	100	102	100	99	100	93	88								

NOV.2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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		104	98	98	98	98	98	98	134	146	120	100	104	104	100	100	94	90	90	92	92	92	92	92	92
2		B	B	92	92	92	92	B	152	120	106	106	102	102	96	112	100	90	90	90	90	88	B	B	B
3		100	100	B	B	B	B	B	138	122	116	98	98	98	114	118	124	104	94	104	104	100	100	B	B
4		100	100	100	100	100	100	94	132	114	140	102	100	160	118	102	94	B	B	B	B	B	B	B	B
5		94	94	90	94	92	86	86	88	86	100	100	100	100	94	94	94	B	112	102	102	102	88	88	100
6		B	B	B	B	B	104	B	134	110	102	96	96	88	92	96	132	100	104	108	B	108	104	98	98
7		92	96	106	106	B	100	B	148	108	104	98	158	98	92	94	G	94	B	B	100	100	100	100	100
8		98	98	92	B	B	88	B	98	118	118	102	102	100	100	100	100	100	90	92	92	96	104	B	106
9		106	96	96	96	98	B	B	172	146	108	108	102	102	166	128	98	98	98	98	86	92	104	104	104
10		104	94	94	94	94	94	94	110	110	110	110	96	G	G	114	94	94	94	94	94	100	100	90	98
11		100	98	104	96	96	96	96	96	100	100	104	102	102	92	152	98	B	B	92	92	B	82	B	B
12		B	B	104	98	92	92	B	112	112	104	104	106	116	88	116	112	B	88	88	B	B	96	B	B
13		96	90	90	B	90	108	B	154	120	106	106	100	126	120	104	158	96	96	96	96	88	90	B	96
14		102	B	98	98	98	B	B	160	114	108	108	104	104	110	178	142	94	96	96	96	B	96	B	B
15		B	100	96	102	94	B	B	90	154	154	142	118	106	106	168	134	138	B	B	88	B	98	98	B
16		B	B	B	114	96	B	B	144	144	124	C	C	C	C	C	C	C	C	98	108	108	96	110	104
17		B	B	94	B	B	106	B	134	124	108	C	C	C	C	C	C	C	120	104	104	108	B	B	90
18		94	94	94	94	88	94	B	98	108	116	C	C	C	C	C	96	106	100	100	100	B	114	B	B
19		B	B	B	B	B	B	B	G	140	102	102	152	94	G	158	144	B	B	B	118	102	106	B	112
20		96	96	96	96	96	96	86	92	92	168	156	160	172	100	100	100	90	96	88	88	92	B	92	94
21		94	B	94	94	96	96	B	104	138	122	144	134	116	92	92	148	92	92	94	94	98	114	B	B
22		114	98	94	94	98	96	96	104	124	110	102	102	94	110	90	90	90	102	94	94	98	98	98	98
23		92	92	92	92	92	92	90	98	132	136	108	108	G	G	G	170	94	B	B	B	88	94	94	B
24		96	96	96	96	94	94	100	G	110	112	110	162	140	142	126	92	90	88	86	86	86	86	86	86
25		96	88	88	B	B	B	B	90	94	152	140	102	96	114	102	86	94	94	86	86	86	86	100	B
26		B	B	88	B	88	88	B	92	166	110	156	140	146	146	126	160	B	B	B	B	B	B	B	B
27		B	86	94	B	B	B	B	B	158	138	134	98	164	92	134	134	90	B	90	82	110	B	88	96
28		B	B	96	94	94	94	94	144	108	152	90	102	102	124	138	98	86	92	116	102	104	90	B	92
29		B	94	94	94	94	94	92	B	130	110	102	170	96	96	90	128	B	94	98	98	122	98	B	98
30		B	96	90	90	90	B	B	90	118	112	104	104	130	128	146	146	92	88	88	88	B	102	B	B
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		18	20	26	21	22	21	13	25	30	30	27	27	25	24	26	27	20	21	25	24	22	22	16	16
MED		97	96	94	96	94	94	94	132	119	111	104	102	102	105	113	100	94	94	94	94	99	98	97	98
U Q		102	98	96	98	96	99	96	146	138	124	110	134	128	122	134	142	97	99	99	101	104	102	100	102
L Q		94	94	92	94	92	92	90	98	110	106	102	100	98	93	100	94	90	90	89	89	92	90	91	95

NOV.2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV.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	F	F	F	F	FQ	F	L	H	H	C	C	C	C	C	C	L	L	L	F	F	F	F	F	F	F	
2	F	F	F	F	F	F		H	H	C	C	C	C	C	C	CL	L	L	FQ	F	F					
3	F	F						H	C	C	C	C	C	C	C	C	C	L	F	F	F	F	F			
4	F	F	F	F	F	F	C	H	C	H	C	C	C	CL	C	L										
5	F	F	F	F	F	F	C	LC	LC	CL	CL	LC	LC	LC	L	L		L	F	F	F	F	F	F	F	
6						F		C	C	C	C	C	C	L	L	C	L	C	F	F	F	F	F	F	F	
7	F	F	F	F		F		H	C	C	C	H	LC	L	LC		LQ		F	F	F	F	F	F	F	
8	F	F	F			F		LC	C	C	C	C	C	C	LC	L	L	L	F	F	F	F	F	F	F	
9	FQ	FQ	F	F	F			H	H	C	C	C	C	H	C	LC	L	L	F	F	F	F	F	F	FQ	
10	F	F	F	F	F	F	L	C	C	C	C	L			C	C	L	L	F	F	FQ	F	F	F	F	
11	FQ	FQ	F	F	F	F	L	C	C	C	C	LC	C	LC	H	LC			F	F						
12			F	F	F	F		C	C	C	C	CL	CL	LC	C	C		C	F				F			
13	F	F	F		F	F		H	C	C	C	LC	C	C	C	HL	L	L	FQ	F	F	F	F		F	
14	F		F	F	F			H	C	C	C	C	C	C	HL	H	L	L	F	F			F			
15		F	F	F	F		L	H	H	H	C	L	L	H	H	H			F				F	F		
16			F	F				H	H	C									F	FQ	F	F	F	F	F	
17			F			F		H	C	C								CL	F	FQ	F				F	
18	F	F	F	F	F	F		L	L	L						L	CL	C	F	F		F				
19								HL	C	C						H	HL			F	FQ	F		F	F	
20	F	F	F	FQ	F	F	L	LC	LL	HC	HC	HL	HL	LC	LC	L	LC	L	F	F	F	F	F	F	F	
21	F		F	F	F	F		LC	HL	C	HL	HL	HL	LC	LC	HL	L	C	F	F	F	F	F	F	F	
22	F	FQ	F	F	F	F	L	CL	CL	C	LC	LC	LC	CL	CL	L	L	F	F	F	F	F	F	F	FQ	
23	FQ	F	F	F	F	F	L	LC	C	H	C	C				HL	L					F	F	F	F	
24	F	F	F	F	FQ	F	L		C	C	LC	H	H	H	CL	LC	L	L	F	F	F	F	F	F	F	
25	F	F	F				L	LC	HL	CL	C	C	CL	CL	CL	C	L	L	F	F	F	F	F	F	F	
26			F	F	F			L	H	L	CL	HL	HL	H	CL	H										
27		F	F					HL	HL	HL	LC	HL	LC	HL	LC	HL	L		F	F	F	F	F	F	F	
28			F	F	F	F	L	H	L	H	LC	LC	LC	C	HL	LC	L	L	FQ	F	FQ	FF		F	F	
29		F	F	F	F	F	L		C	C	LC	HL	L	L	C		L	L	F	F	F	F	F	F	F	
30		F	F	F	F		L	C	C	C	LC	CL	CL	CL	HL	HL	L	L	F	F	F	F	F	F	F	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT																										
MED																										
U Q																										
L Q																										

NOV.2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 42	X 44	X 45	X 48	X 41	X 38												X 78	X 58	X 46	X 42	X 40	X 40	X 40	
2	X 42	X 42	X 44	X 36	X 38	X 34												X 60	X 41	X 46	X 46	X 42	X A	X A	X 46
3	X 46	X 49	X 48	X 41	X 40	X 38												X 73	X 50	X 53	X 52	X 43	X 38	X 44	
4	X 46	X 41	X 39	X 43	X 41	X 36												X 62	X 55	X 60	X 65	X 54	X 55	X 47	
5	X 51	X 32	X 40	X 30	X 30	X 28													X 59	X 62	X 55	X 46	X 46	X 42	
6	X 39	X 39	X 39	X 40	X 38	X 40													X 41	X 42	X 46	X 45	X 42	X 45	
7	X 45	X 42	X 41	X 42	X 44	X 37													X 40	X 40	X 42	X 43	X 44	X 44	
8	X 42	X 42	X 43	X 39	X 39	X 41												X 54	X 34	X A	X A	X 36	X 38	X 38	
9	X 38	X 37	X 37	X 37	X 38	X 35												X 64	X 41	X 41	X 38	X 34	X 36	X 38	
10	X 38	X 38	X 38	X 40	X 39	X 37													X A	X 35	X 38	X 38	X 38	X 39	
11	X 39	X 40	X 40	X 40	X 41	X 42													X 35	X 39	X 39	X 38	X 38	X 38	
12	X 38	X 38	X 42	X 35	X 35	X 36													X 36	X 36	X 36	X 36	X 36	X 38	
13	X 36	X 36	X 37	X 37	X 38	X 32	X 37												X 38	X 39	X 39	X 38	X 37	X 36	
14	X 38	X 38	X 38	X 38	X 41	X 33												X 43	X 34	X 36	X 38	X 39	X 36	X 37	
15	X 37	X 38	X 38	X 39	X 38	X 38													X 34	X 41	X 40	X 37	X 37	X 37	
16	X 38	X 38	X 39	X 39	X 39	X 38													X 46	X 40	X 42	X 45	X 45	X 46	
17	X 47	X 48	X 48	X 42	X 42	X 40	X 40				X 108								X 34	X 37	X 41	X 38	X 38	X 38	
18	X 39	X 40	X 43	X 44	X 46	X 37	X 38											X 49	X 33	X 37	X 36	X 36	X 34	X 34	
19	X 35	X 35	X 36	X 38	X 43	X 31													X 33	X 35	X 41	X 37	X 37	X 37	
20	X 37	X 37	X 36	X 36	X 36	X 34													X 37	X 33	X 36	X 34	X 34	X 34	
21	X 37	X 37	X 37	X 39	X 38	X 39		X 57											X 34	X 40	X 45	X 45	X 51	X 51	
22	X 56	X 56	X 58	X 48	X 42	X 37													X 40	X 0	X 30	X 32	X 32	X 35	
23	X 36	X 36	X 38	X 39	X 36	X 32													X 44	X 42	X 45	X 38	X 38	X 36	
24	X 36	X 37	X 36	X 37	X 36	X 36													X 43	X 38	X 35	X 37	X 35	X 35	
25	X 37	X 37	X 37	X 38	X 40	X 39	X 39												X 46	X 35	X 35	X 36	X 36	X 35	
26	X 36	X 36	X 38	X 41	X 34	X 30													X 36	X 39	X 39	X 39	X 40	X 39	
27	X 39	X 40	X 41	X 42	X 40	X 34	X 36												X 40	X 39	X 35	X 38	X 42	X 38	
28	X 38	X 38	X 37	X 37	X 35	X 33							X C						X 36	X 40	X 44	X 44	X 39	X 50	
29	X 48	X 42	X 39	X 40	X 40	X 44													X 34	X 35	X 41	X 44	X 44	X 44	
30	X 44	X 47	X 43	X 46	X 44	X 44										X 65			X 40	X 40	X 38	X 38	X 38	X 45	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	5	1				1				1		8	29	28	29	30	29	30	
MED	X 38	X 38	X 39	X 39	X 37	X 38	X 57				108					65		X 61	X 40	X 40	X 40	X 38	X 38	X 38	
U Q	X 44	X 42	X 43	X 42	X 41	X 39	X 40											X 68	X 44	X 42	X 44	X 43	X 42	X 44	
L Q	X 37	X 37	X 37	X 37	X 38	X 34	X 36											X 52	X 34	X 36	X 37	X 37	X 36	X 37	

NOV.2021 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	38	39	42	35	32	41	72	88	92	98	74	83	78	88	94	86	72	52	40	36	34	34	34
2	36	36	38	30	32	28	43	75	79	92	86	86	76	75	84	89	79	54	35	40	40	36	A	40
3	40	43	42	35	34	32	48	76	74	78	82	84	79	78	82	83	78	67	44	47	46	37	32	F
4	F	35	33	37	35	30	39	62	57	103	112	93	69	66	119	121	76	56	49	54	59	48	49	41
5	45	26	34	24	24	22	35	71	98	119	126	84	76	70	78	79	70	54	53	56	49	40	40	36
6	33	33	33	34	32	34	41	71	71	84	91	92	88	88	82	96	67	48	35	36	40	39	36	39
7	39	36	35	36	38	31	41	66	71	76	82	88	78	88	88	71	75	51	34	34	36	37	38	38
8	36	36	F	33	33	35	35	57	67	72	81	83	71	77	88	85	69	48	28	A	A	30	32	32
9	32	31	31	31	32	29	39	60	65	68	72	87	73	81	77	66	66	58	35	35	32	28	30	32
10	32	32	32	34	33	31	34	58	75	69	77	73	63	80	92	91	80	58	A	29	32	32	32	33
11	33	34	34	34	35	36	39	55	74	68	78	67	79	84	93	82	74	49	29	33	33	32	32	32
12	32	32	36	29	29	30	35	58	67	72	74	87	59	68	80	64	59	48	30	30	30	30	30	32
13	30	30	31	31	32	26	31	48	54	61	70	74	64	66	62	62	56	46	32	33	33	32	30	30
14	32	32	32	32	35	27	32	61	63	74	62	74	63	66	72	60	57	37	28	30	32	33	30	31
15	31	32	32	33	32	32	35	55	55	62	64	71	68	V	70	72	53	42	28	35	34	31	31	31
16	32	32	33	33	33	32	35	53	59	76	84	66	66	87	81	78	63	50	40	34	36	39	39	40
17	41	42	42	36	36	34	34	64	64	83	88	102	76	81	81	67	66	49	28	31	35	32	32	32
18	33	34	37	38	40	31	32	64	73	71	83	91	79	88	88	74	78	43	27	31	30	30	28	28
19	29	29	30	32	37	25	30	51	66	60	74	76	76	71	66	55	55	50	27	29	35	31	31	31
20	31	31	30	30	30	28	29	54	68	72	80	71	69	68	68	59	50	44	31	27	30	28	28	28
21	31	31	31	33	32	33	33	51	52	71	82	78	70	62	64	60	63	41	28	34	39	39	F	F
22	F	F	F	F	F	31	35	57	71	71	80	74	66	71	70	61	61	52	34	A	24	26	26	29
23	30	30	32	33	30	26	26	58	56	63	70	72	65	68	68	60	65	41	38	36	39	32	32	30
24	30	31	30	31	30	30	29	61	61	65	70	71	73	72	74	58	58	45	37	32	29	31	29	29
25	31	31	31	32	34	33	33	56	65	66	66	78	77	85	76	64	57	51	40	29	29	30	30	29
26	30	30	32	35	28	24	26	54	59	62	66	70	71	64	59	62	57	38	30	33	33	33	34	33
27	33	34	35	36	34	28	30	58	69	66	64	73	66	73	73	64	54	47	34	33	29	32	F	32
28	32	32	31	31	29	27	27	54	62	65	74	75	C	88	70	76	60	37	30	34	38	38	33	F
29	F	36	33	34	34	38	39	58	71	69	80	93	79	68	70	70	63	44	28	29	35	38	38	38
30	38	41	37	F	38	38	33	55	66	73	90	84	81	74	67	59	62	35	34	34	32	34	34	39
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	28	28	29	30	30	30	30	30	30	30	29	30	30	30	30	30	29	28	29	30	27	27
MED	32	32	33	33	33	31	34	58	66	71	80	77	73	74	76	68	63	48	34	34	34	32	32	32
U Q	36	36	36	35	35	33	39	64	71	76	84	87	78	81	84	82	74	52	38	36	38	37	34	38
L Q	31	31	31	31	31	28	31	55	61	66	70	73	66	68	70	61	57	43	28	30	31	31	30	30

NOV.2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	A	L	L	L	L	L							
2										L	A	A	A	A	L									
3										L	L	L	L	L		A								
4										L	L			U L 512	A									
5									L	L	L		L	L	A	A	A							
6										A	A	L		L	L									
7										A	A	L	L	L	L									
8									L		L	A	L	L	L									
9										L	L		L	L	L									
10										L	L	L		L	L									
11										L		L	L	L	L	L								
12										L	L			L	L									
13											L	L	L	L										
14										L	L	L	L	L	L	A								
15											L	L	L	L		A								
16													A	A		L								
17											L			L										
18										L	L	L	L	L										
19											L	L	L	L										
20									L	L			L	L	L									
21									L	A	L		L	L	L									
22										L	L	L		L	L						A			
23										L	L	L			L									
24												L	L							A				
25										L			U L 392460	L	L									
26										L		L	L											
27										L	L	L	L	L	L									
28									L	L	L	L	C	A	L									
29											L	A	L	A	L									
30											L		L	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT												3	2	1										
MED												392	452	512										
U Q												428												
L Q												392												

NOV.2021 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							B	U	R	U	R	A	A	A	A	A	A								
2							B	U	R	U	R	A	A	A	A	A	A								
3							B	U	R	U	R	A	A	A	A	A	A								
4							B	U	R	A	A	A	A	A	A	A	A								
5							B	U	R	A	A	A	A	A	A	A	A	A							
6							B	A	A	A	A	A	U	A	A	A	U	R	R	B					
7							B	U	A	U	A	A	A	A	A	A	A	U	R	B					
8							B	A	A	A	A	A	A	A	A	A	A								
9							B	U	A	U	R	A	A	A	A	A	A								
10							B	U	R	A	A	A	A	A	U	R	U	R	A	A					
11							B	U	R	A	A	U	R	U	R	U	R	U	R	A	B				
12							B	U	R	A	A	U	R	U	R	U	R	U	R	B					
13							U	R	A	A	A	A	U	R	U	R	A	U	R	B					
14							B	U	A	A	A	A	A	A	A	A	A								
15							B	U	R	U	A	U	R	A	A	U	R	A	A	B					
16							B	U	R	U	A	A	A	A	A	A	A	A	B						
17							U	A	U	R	A	A	A	A	A	A	A	A	B						
18							U	A	U	R	U	R	A	A	A	A	A	A							
19							B	U	R	U	A	U	R	R	A	U	A	U	R	U	R	B			
20							B	U	R	A	U	A	U	R	U	R	U	R	A	B					
21							B	U	R	U	A	U	R	U	R	A	A	U	R	B					
22							B	U	R	U	A	U	R	U	R	A	U	R	A	B		A			
23							B	U	A	U	R	U	R	U	R	A	A	U	R	U	R	B			
24							B	U	R	A	U	R	A	U	R	U	A	A	A	A					
25							B	U	R	U	R	U	R	U	R	U	A	U	R	U	R	B			
26							B	U	R	U	A	U	R	U	R	U	R	A	U	R	B				
27							B	U	R	U	A	U	R	U	R	U	R	A	U	R	B				
28							B	U	R	U	A	U	R	U	R	A	A	A	A	B					
29							B	U	A	U	R	A	A	U	R	A	U	R	U	R	A	B			
30							B	U	A	U	R	A	A	A	A	A		A	B						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								25	19	13	10	10	14	9	11	12	9								
MED								U	R	U	U	U	R	U	R	U	R	U	R	U	R	U	R	U	R
U Q								208	256	288	310	314	320	300	284	254	204								
L Q								U	A	U	U	A	U	R	U	U	U	U	U	U	U	U	U	U	U
								200	244	284	300	308	312	294	280	242	186								

NOV.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	J A		J A	J A	J A	J A		G		J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	J A	J A				
2	J A	J A		E B	E B	E B	E B		G	32	35	J A	J A	J A	J A	J A	J A	J A	J A	J A		23	J A	J A	E B			
3		22	19	23	20	21	21	23		G	34	34	38	36		33	109	50	30	23	15	15	24	25	66	54		
4	J A		21	22	E B	E B	E B	E B		G	31	33	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	J A			
5		J A			E B					G	J A		J A	J A	J A	J A	J A	J A	J A	E B		E B			J A			
6	E B		J A	J A	J A	J A	J A		J A	J A	J A	J A	J A	J A	J A		G	G		J A	J A	J A	J A	J A	J A	J A		
7	J A	J A	J A	J A	J A	J A	J A		J A	J A	J A	J A	J A	J A	J A	J A		G		J A	J A	E B		J A	J A	J A		
8	J A	J A	J A	J A	J A	J A	J A	J A		29	32	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B		
9		E B	E B	E B			J A			G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A		27	24	43	33			
10		22	23	J A	J A		J A			G			J A	J A	J A		G	J A	J A	J A	J A	J A	J A	J A	J A	J A		
11		23	21	21	E B	E B	E B	E B		G	28	32		G	J A	J A		G	J A	J A	J A		J A	J A	J A	J A		
12		23	22	21	22	E B	E B	E B	E B		G		G	G	G	G	G	G	E B	E B	E B	E B	E B	E B	E B	E B		
13	E B	E B	E B		E B	E B	E B			G				G	J A		G				E B	E B	E B	E B	E B	E B		
14	E B	E B	E B	E B	E B	E B	E B		23	25	30	33	36	36	33	34	32	J A	J A	J A		21	22	22	22	24	23	23
15		22	24	J A	J A		20	20	23		G		33		J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
16	E B	E B	E B	E B		E B	E B	E B		G			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
17	J A	J A	J A	J A	J A	E B	E B	E B		G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
18		18	21	21	J A		E B			G			35	35	37	34	J A	J A		E B	J A	E B	J A	E B	E B	E B	E B	
19	E B	E B	E B		E B	J A				G							G	J A	E B	E B	E B	E B	E B	E B	E B	E B	E B	
20	E B		20	20	20	20	E B	E B		G	29	32	38					G	J A	J A	J A		E B	E B	E B	E B	E B	
21	J A		J A	J A	J A	J A	J A	J A		G							J A		E B	J A	J A	J A	J A	J A	J A	J A	J A	
22		E B			E B	J A				G		J A			G	J A		G		J A	J A	J A	J A	J A	J A	J A	J A	
23	J A		J A	J A	J A	J A				G					G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
24		27	19	22	22	22	22	E B		G	J A		J A		G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
25	E B	E B	E B	E B		E B	E B	E B		G								G	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B
26	E B	E B	E B	E B	E B	E B	E B	E B		G								G	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B
27	E B	E B	J A	J A	E B		E B	E B	E B		G						G	J A		22	20	22	16	16	16	16	16	22
28		E B			E B	E B	E B	E B		G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
29	J A		J A		E B	E B				G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
30	J A	J A	J A	J A	J A	J A			J A		G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	22	21	24	22	20	20	18			29	33	36	39	35	36	34	32	30	22	25	23	22	22	22	24	26		
U Q	J A	J A	J A	J A	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
L Q	E B	E B	E B	E B	E B	E B	E B			G	G	G	G	G	G	G	G	G	E B	E B	E B	E B	E B	E B	E B	E B	E B	

NOV.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV.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

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

NOV.2021 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

NOV.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

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

NOV.2021 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

NOV. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	273	283	316	349	362	331	327	363	361	348	382	354	345	338	337	340	372	380	339	345	312	310	310	289
2	294	311	330	327	352	309	338	371	372	368	356	358	353	318	333	328	370	351	305	312	322	294	A	293
3	296	314	318	325	331	307	357	386	395	383	362	377	319	334	334	350	362	356	323	346	349	366	320	F
4	F	296	311	342	361	364	354	374	319	334	333	309	350	280	327	351	355	324	283	291	299	306	291	307
5	361	267	345	294	283	263	309	349	342	350	369	360	368	356	344	355	377	343	322	340	363	323	330	359
6	311	311	292	293	307	323	338	373	361	359	353	364	365	362	345	363	383	351	312	312	342	320	284	323
7	321	328	304	349	328	322	345	368	379	366	366	348	355	347	356	379	374	361	330	315	A	A	A	325
8	306	294	F	314	314	340	343	387	368	375	363	376	332	355	342	360	397	380	371			342	335	327
9	328	316	316	304	332	329	348	384	409	383	373	385	335	341	354	352	374	365	383	322	346	342	303	317
10	307	321	302	316	331	345	336	371	374	376	373	356	340	334	336	347	380	369	A	323	320	335	316	315
11	306	302	305	305	325	330	351	378	380	368	365	360	346	339	364	360	388	382	336	309	316	329	329	320
12	303	310	358	312	350	346	352	362	355	379	395	369	349	363	374	386	369	363	354	355	326	329	324	309
13	314	317	317	322	330	358	328	392	384	354	368	370	357	356	372	373	385	365	297	337	337	330	329	310
14	318	330	332	329	348	316	346	393	375	370	385	368	341	352	367	363	385	368	332	322	338	339	311	310
15	321	324	324	312	334	342	365	401	383	372	375	369	388	304	355	381	391	377	323	340	331	339	305	309
16	312	318	317	317	335	343	356	381	369	367	377	366	352	355	371	378	397	354	361	316	308	313	295	290
17	298	348	322	350	334	345	337	394	384	331	345	384	348	340	374	355	370	386	391	324	313	344	308	303
18	317	306	311	335	364	359	354	405	387	380	376	352	349	367	369	368	383	403	371	325	326	327	272	274
19	328	329	309	328	366	318	372	396	378	361	383	372	354	370	377	384	385	351	362	330	330	313	311	274
20	276	280	309	330	334	356	346	385	364	364	380	384	371	363	363	392	381	369	388	305	346	311	319	312
21	295	339	340	325	310	353	374	363	367	384	373	399	368	365	368	391	371	380	345	310	329	326	F	F
22	F	F	F	F	F	302	357	382	376	381	364	371	331	353	368	354	342	347	364	A	291	305	315	298
23	314	316	323	347	323	368	320	380	380	384	347	369	353	338	384	357	379	319	366	355	356	328	313	326
24	320	334	325	319	301	330	323	381	391	380	389	367	351	370	373	370	382	374	340	353	318	333	316	313
25	322	324	331	328	350	344	381	382	388	381	363	396	346	354	373	382	366	352	355	356	330	329	299	289
26	285	289	328	366	362	322	324	377	375	377	381	371	380	358	367	359	380	371	350	320	333	325	318	322
27	302	305	325	336	347	295	333	377	389	381	368	372	326	365	373	333	367	387	343	353	318	294	F	272
28	280	299	310	323	341	335	335	370	385	393	358	390	C	382	356	357	392	348	315	302	315	323	283	F
29	F	301	317	318	319	311	345	380	377	353	353	374	358	366	373	355	359	373	363	327	311	330	314	302
30	295	337	328	F	325	363	336	365	381	365	389	380	363	382	363	382	385	373	329	340	326	324	324	291
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	28	28	29	30	30	30	30	30	30	30	29	30	30	30	30	30	29	28	29	30	27	27
MED	307	314	318	325	334	333	345	380	378	371	368	370	351	355	366	360	380	366	343	324	326	328	314	309
U Q	320	326	328	336	350	346	354	386	384	381	380	377	360	365	373	379	385	377	364	342	338	333	324	320
L Q	295	300	310	315	324	318	335	371	368	361	362	360	343	339	345	354	370	351	323	314	316	313	303	291

NOV. 2021 M(3000)F2 (0.01)

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	A	L	L	L	L	L							
2										L	A	A	A	A	L									
3										L	L	L	L	L		A								
4										L	L			U L 3 6 8	A									
5									L	L	L		L	L	A	A	A							
6										A	A	L		L	L									
7										A	A	L	L	L	L									
8									L		L	A	L	L	L									
9										L	L		L	L	L									
10										L	L	L		L	L									
11										L		L	L	L	L	L								
12										L	L			L	L									
13											L	L	L	L										
14										L	L	L	L	L	L	A								
15											L	L	L	L		A								
16													A	A		L								
17											L			L										
18										L	L	L	L	L										
19											L	L	L	L										
20									L	L			L	L	L									
21									L	A	L		L	L	L									
22										L	L	L		L	L						A			
23										L	L	L			L									
24												L	L							A				
25										L		U L 4 3 0	U L 3 8 0	L	L									
26										L		L	L											
27										L	L	L	L	L	L									
28									L	L	L	L	C	A	L									
29											L	A	L	A	L									
30											L		L	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT												3	2	1										
MED												430	404	U L 3 6 8										
U Q												458												
L Q												410												

NOV.2021 M(3000)F1 (0.01)

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IONOSPHERIC DATA STATION Kokubunji

NOV. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									230	230	216	222	244	260	260	240	230								
2										230	230	224	216	238	252										
3										216	226	220	226	226		226									
4										240	228			382	264										
5									240	240	222		222	232	232	232	E A 242								
6										224	212	212		224	240										
7										220	222	234	234	234	234										
8									234		234	226	240	240	240										
9										220	228		238	238	238										
10										232	226	236		248	240										
11										224		230	230	236	236	226									
12										226	212	212		230	230										
13											230	230	230	230											
14										224	224	224	238	242	234	214									
15											230	230	224	224		214									
16													226	238		232									
17											232			256											
18										226	226	232	218	232											
19											226	218	242	242											
20									242	236		228	228	228	228										
21									228	222	222		222	232	238										
22										224	224	218	250	250	230							A			
23										216	238	228			228										
24												242	242					E A 228							
25									228		206	248	248	230											
26										230		230	230												
27										220	220	220	256	226	226										
28									226	216	238	216	C E A 238	238	238										
29											238	212	232	226	226										
30											226		228	224	224										
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									6	21	24	23	23	27	21	7	2	1							
MED									232	224	226	224	230	235	234	226	236	E A 228							
U Q									240	230	230	230	242	242	240	232									
L Q									228	220	222	218	226	228	229	214									

NOV. 2021 h'F2 (KM)

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IONOSPHERIC DATA STATION Kokubunji

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	112	112		A	A	A	A	A	A	A							
2							B	112	112	108		A	A	A	A	A	A							
3							B	108	108	102		A	A		A	A	A							
4							B	110	110		A	A	A		A	A	A							
5							B	110	114		A	A	A		A	A	A	A						
6							B	114		A	A	A		A	A		112	112						
7							B	122	112		A	A	A		A	A	A							
8							B	A		112	112		A	A	A	A	A							
9							B	112	112		A	A	A		A	A	A							
10							B	110	110		A	A	A		A		A	A						
11							B	112	112		A	112	112	112		A	110	110						
12							B	110	110		A	110	110	110	110	110	110							
13								110	110	110			110	110		A	110	110						
14							B	112	112	112						112								
15							B	112	108	108	108		A	A	A		A	A	B					
16							B	114	114	116	116													
17								116	116		A	A	A	A	A	A	A							
18								116	116	116		A	A	A	A	A	A							
19							B	116	116	116	116	112	110		A	110	110	110						
20							B	110		110		A	110	110	110	110								
21							B		110	110		A	110	110	110		A	A						
22							B	120	114	114	114	114	112		A	112	112	112						
23							B	118	118	118	118	108	108		A		108	116						
24							B	116	116		116		116	114		A	A	A						
25								B	114	114	114	114	114	112	102	110	110							
26							B	130	118	112	110	108	108	108	108	108	108							
27								B	108	108	108	108	108	108	108	108								
28							B	126	116	114		A	A	C	A	A	A							
29							B	114	110		A	A	A		A		110	110						
30							B	110		110		A	A	A		A								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								26	27	18	11	10	15	10	12	13	10							
MED								112	112	112	114	110	110	110	110	110	111							
U Q								116	116	114	116	112	112	110	110	110	112							
L Q								110	110	110	110	108	110	110	108	109	110							

NOV.2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	100	94	94	92	90	90	90	G	G	96	96	96	96	96	96	92	92	86	86	86	B	B	98	98	
2	98	98	80	B	B	B	B	G	132	112	102	100	100	100	98	98	96	94	86	86	86	86	86	86	
3	86	86	86	86	86	92	92	G	114	114	98	96	G	96	96	96	102	104	B	B	104	102	102	100	
4	94	94	94	B	B	B	B	G	114	98	98	94	94	108	84	84	84	84	B	B	B	94	146	90	
5	90	90	90	90	B	90	90	G	110	102	98	88	92	92	92	92	86	98	B	98	B	98	98	98	
6	B	90	90	90	90	90	118	118	100	96	90	90	154	90	90	G	G	100	100	92	92	92	92	92	
7	84	84	84	84	84	88	118	132	116	90	90	90	88	88	88	100	G	82	86	86	B	86	88	88	
8	88	88	88	86	86	86	86	86	110	110	96	90	90	90	90	90	90	90	90	90	90	90	90	B	B
9	90	B	B	B	90	90	106	126	G	104	104	90	98	112	88	88	88	B	96	96	96	96	90	90	
10	90	90	90	86	86	86	86	G	114	104	102	102	94	90	G	G	90	90	90	90	90	90	90	90	
11	88	88	88	B	B	B	B	G	112	94	G	G	94	94	G	G	94	92	92	90	88	88	88	88	
12	88	88	88	100	B	B	B	G	118	102	G	G	G	G	G	G	G	B	B	B	B	B	B	B	
13	B	B	98	92	B	B	B	G	122	118	108	100	G	G	90	G	148	90	90	B	B	B	B	B	
14	B	B	B	B	B	B	98	132	136	116	104	94	94	94	114	88	88	88	86	86	86	86	86	86	
15	86	86	86	84	84	92	92	G	G	132	G	106	94	94	G	90	88	B	B	B	88	B	B	B	
16	B	B	B	88	88	B	B	G	112	112	112	102	94	94	94	94	94	92	92	92	92	92	98	98	
17	98	88	88	88	88	B	B	116	G	110	98	98	94	94	100	98	98	98	92	92	92	92	88	88	
18	132	84	84	84	84	84	122	G	G	104	98	98	98	98	98	94	92	B	92	B	92	B	B	B	
19	B	B	92	B	92	92	92	G	120	130	130	G	G	G	92	122	G	G	94	B	B	B	B	B	
20	B	94	94	94	94	B	B	G	94	146	98	G	G	G	G	G	82	82	82	82	B	B	B	82	
21	82	82	82	86	86	86	92	92	G	126	102	G	G	G	96	96	G	B	110	88	88	96	96	96	
22	96	B	92	92	92	86	86	G	154	120	92	G	G	92	116	G	G	102	94	94	94	92	92	92	
23	96	96	96	94	90	90	90	140	G	G	G	G	G	90	88	G	G	B	88	88	88	88	88	B	
24	86	86	86	86	86	86	B	B	120	94	G	94	G	142	76	76	76	82	82	82	82	82	96	90	
25	B	B	B	B	88	88	B	B	G	G	G	G	G	140	132	G	G	B	B	B	B	B	B	B	
26	B	B	B	B	B	B	B	G	138	G	138	128	G	G	G	112	G	B	B	B	B	B	96	94	
27	B	B	94	94	B	B	B	B	160	160	G	G	136	124	G	80	114	80	80	B	B	B	B	90	
28	90	B	90	84	B	B	B	156	150	G	96	92	C	86	80	76	76	76	80	80	92	92	86	88	
29	88	88	86	86	86	B	B	118	G	92	92	92	G	92	G	G	84	82	84	92	92	B	B	92	
30	90	90	86	86	86	86	92	152	104	G	100	98	96	80	80	80	80	80	80	B	B	84	84	84	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	21	20	25	22	19	18	15	12	21	24	23	21	17	25	21	20	21	23	21	19	18	19	20	21	
MED	90	88	88	87	86	90	92	124	116	110	98	96	94	94	92	92	90	90	90	90	91	92	91	90	
U Q	96	92	93	92	90	92	98	136	134	119	104	100	98	99	98	97	95	94	92	92	92	94	97	95	
L Q	87	86	86	86	86	86	90	117	111	97	96	91	94	90	88	86	84	82	83	86	88	86	88	88	

NOV.2021 h'Es (KM)

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F5	F4	F4	F4	F5	F2	L2			L1	L1	L1	L2	L1	L2	L2	L2	L3	F2	F2			F2	F2
2	F2	F2	F2						C2	C1	L2	L2	L1	L2	L2	L3	L3	L3	F5	F4	F2	F5	F7	
3	F1	F1	F4	F4	F3	F1	L2		C3	C2	L1	L2		L1	L2	L4	L2	L1			L2	F1	F3	F4
4	F7	F1	F1						C2	L1	L1	L3	L2	C1	L4	L2	L2	L1				F1	F1	F4
5	F2	F3	F2	F3		F2	L2		C2	L2	L1	L3	L2	L2	L3	L5	L5	L2		F1		F1	F1	F3
6		F1	F3	F2	F6	F1	C1	C3	L2	L3	L3	L3	L1	L2	L3		L1	F2	F4	F6	F6	F3	F7	F5
7	F6	F6	F6	F6	F7	F3	C4	C2	C4	L3	L3	L2	L2	L2	L2	L2	L2	L2	F2	F2		F1	F4	F3
8	F2	F5	F5	F2	F2	F4	L2	L2	C1	C1	L1	L2	L4	L2	L1	L2	L4	L3	F3	F3	F3	F2		
9	F1				F1	F1	L1	C2		L1	L1	L3	L1	L2	L2	L2	L4		F2	F3	F4	F2	F4	F5
10	F3	F2	F4	F5	F2	F2	L2		C1	L2	L1	L1	L3	L2			L2	L3	F6	F5	F6	F5	F6	F6
11	F3	F2	F2						C1	L2			L1	L1			L2	L2	F2	F2	F2	F2	F2	F2
12	F2	F1	F1	F2					C2	L2														
13			F1	F2					C1	C1	L2	L2			L3		H2	L1	F1					
14						L2	C3	C2	C1	C1	L2	L3	L2	L2	C1	L3	L5	L2	F2	F1	F1	F2	F2	F2
15	F2	F2	F3	F2	F2	F1	L1			C1		L2	L2	L2	L2	L3	L2				F3			
16				F1	F1				L4	L2	L3	L2	L3	L3	L2	L2	L2	L3	F3	F1	F2	F1	F3	F4
17	F3	F4	F6	F8	F6			C2		L2	L3	L3	L3	L2	L2	L3	L3	F3	F2	F2	F2	F3	F8	F7
18	F1	F2	F2	F4	F5	F2		C2			L1	L1	L2	L2	L2	L2	L1		F1		F2			
19			F1		F1	F1	L2		C2	C2	C1			L1	C1			L2						
20		F2	F2	F2	F2				L2	H1	L2						L3	L3	F2	F1				F2
21	F2	F4	F2	F2	F4	F3	L3	L3		C1	L2			L2	L2			F2	F4	F4	F2	F2	F2	F2
22	F1		F2	F1		F1	L2		H2	C1	L1			L2		C2		L1	F4	F5	F4	F3	F3	F4
23	F2	F1	F5	F2	F4	F4	L2	H2						L2	L3			L4		L2	F2	F4	F2	
24	F1	F1	F1	F2	F2	F1			C1	L1		L1		H1	L3	L2	L3	L3	F2	F2	F1	F2	F2	F2
25				F2	F1									H1	HL12									
26									H1		H1	H1				C2							F1	F2
27			F2	F1		F1			H2	H1			H1	C1		L2	L2	L2	F2					F2
28	F2		F1	F1			H2	H2			L3	L3		L5	L3	L3	L2	L4	F2	F2	F2	F3	F2	F3
29	F2	F1	F2	F1	F1			C2		L2	L2	L2		L3		L2	L2	L2	F1	F2	F2			F2
30	F2	F3	F4	F2	F3	F7	L1	H2	L2		L2	L3	L2	L3	L3	L2	L2	L2	F2			F3	F2	F2
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

NOV.2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.2021 f_{XI} (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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 45	X 46	X 48	X 51	X 46	X 36													X 78	X 63	X 60	X 58	X 48	X 49	
2	X 46	X 46	X 46	X 42	X 38	X 32													X 48	X 46	X 50	X 50	X 49	X 48	
3	X 48	X 50	X 43	X 38	X 38	X 38													X 76	X 56	X 56	X 51	X 36	X 36	
4	X 39	X 40	X 36	X 40	X 40	X 44	X 32												X 66	X 76	X 75	X 64	X 47	X 70	
5	X 47	X 52	X 52	X 47	X 45	X 70		8	4	1	2	3								X 56	X 56	X 55	X 51	X 48	
6	X 44	X 38	X 38	X 39	X 41	X 41													X 55	X 43	X 47	X 47	X 43	X 42	
7	X 40	X 40	X 40	X 42	X 51	X 31													X 56	X 40	X 44	X 43	X 38	X 37	
8	X 39	X 36	X 37	X 37	X 39	X 37													X 49	A	X 34		X 36	X 37	
9	X 38	X 38	X 36	X 36	X 38	X 38													X 60	X 38	X 40	X 38	X 33	X 36	
10	X 39	X 38	X 38	X 38	X 38	X 38													X 54	X 40	X 41	X 41	X 38	X 39	
11	X 39	X 40	X 40	X 40	X 41	X 40	X 36												X 44	X 41	X 50	X 44	X 38	X 38	
12	X 38	X 39	X 42	X 44	X 37	X 39													X 51	X 35	X 38	X 40	X 36	X 36	
13	X 37	X 37	X 37	X 37	X 38	X 41													X 47	X 40	X 43	X 38	X 38	X 39	
14	X 36	X 38	X 38	X 40	X 39	X 36													X 42	X 33	X 37	X 41	X 41	X 37	
15	X 38	X 36	X 36	X 36	X 38	X 43													A	X 39	X 44	X 44	X 33	X 34	
16	X 34	X 36	X 36	X 37	X 37	X 37													X 58	X 52	A	X 42	X 44	X 43	
17	X 40	X 43	X 48	X 44	X 37	X A	X 30												X 52	X 34	X 36	X 38	X 38	X 38	
18	X 37	X 38	X 39	X 39	X 40	X 34													X 45	X 34	X 38	X 39	X 36	X 36	
19	X 37	X 37	X 37	X 39	X 40	X 37													X 44	X 32	X 37	X 39	X 35	X 33	
20	X 34	X 35	X 35	X 37	X 40	X 35													X 50	X 43	X 38	X 34	X 37	X 38	
21	X 38	X 39	X 38	X 40	X 40	X 44													X 42	A	X 39	X 40	X 40	X 39	
22	X 38	X 42	X 40	X 40	X 39	X 36													X 59	X 42	X 34	X 34	X 35	X 36	
23	X 35	X 35	X 36	A	X 39	X 28													X 48	X 40	X 46	X 43	X 42	X 40	
24	X 36	X 36	X 38	X 37	X 38	X 38													X 53	X 48	X 44	X 38	X 40	X 35	
25	A	X 35	X 38	X 39	X 41	X 36													X 60	X 46	X 39	X 37	X 34	X 35	
26	X 34	X 34	X 38	X 41	X 36	X 32													X 49	X 36	X 38	X 38	X 35	X 35	
27	X 35	X 37	X 41	X 43	X 39	X 32	X 34												X 45	X 44	X 39	X 32	X 34	X 39	
28	X 34	X 37	X 37	X 37	X 37	X 33													X 47	X 41	X 44		X 40	X 38	
29	X 38	X 40	X 42	X 45	X 40	X 40												X 70	X 42	X 39	X 40	X 40	X 43	X 37	
30	X 38	X 39	X 39	X 39	X 39	X 40	X 34	X 49											X 53	X 40	X 38	X 34	X 37	X 37	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	30	29	30	29	5	2	1									1	28	28	29	28	30	30	
MED	X 38	X 38	X 38	X 39	X 39	X 37	X 34	6	6	1	2	3						7	0	5	0	4	0	3	8
U Q	X 40	X 40	X 41	X 42	X 40	X 40	X 35												5	7	4	6	4	2	3
L Q	X 36	X 36	X 37	X 37	X 38	X 34	X 31												X 46	X 38	X 38	X 38	X 36	X 36	

NOV.2021 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	39	40	42	45	40	30	28	58	75	84	102	73	76	84	94	104	99	83	72	57	54	52	42	43	
2	40	40	40	36	32	26	26	59	64	82	86	86	82	77	86	91	99	78	42	40	44	44	43	42	
3	42	44	37	32	32	32	38	57	60	73	84	76	81	83	88	91	89	76	70	50	50	45	30	30	
4	33	34	30	34	34	38	26	50	52	95	134	66	66	74	126	126	85	62	60	70	69	58	41	64	
5	41	46	46	41	39	F	F	F	F	107	109	80	77	74	78	87	80	70	55	50	50	49	45	42	
6	38	32	32	33	35	35	27	56	69	78	96	108	87	84	106	108	70	56	49	37	41	41	37	36	
7	34	34	34	36	45	25	26	55	64	69	87	87	77	94	108	88	68	66	50	34	38	37	32	31	
8	33	30	31	31	33	31	28	49	58	71	75	81	74	67	87	111	95	72	43	A	28	A	30	31	
9	32	32	30	30	32	32	32	54	68	58	72	A	67	77	100	95	86	86	54	32	34	32	27	30	
10	33	32	32	32	32	32	29	53	68	75	74	86	58	76	103	105	91	71	48	34	35	35	32	33	
11	33	34	34	34	35	34	30	48	59	77	80	73	80	78	94	94	93	68	38	35	44	38	32	32	
12	32	33	36	37	31	33	30	49	57	72	74	89	78	70	70	79	68	61	45	29	32	34	30	30	
13	31	31	31	31	32	35	27	46	58	60	71	80	69	60	67	67	60	58	41	34	37	32	32	33	
14	30	32	32	34	33	30	26	50	56	70	63	74	74	68	70	66	68	55	36	27	31	35	35	31	
15	32	30	30	30	32	37	27	47	60	58	68	80	70	68	75	90	72	54	A	33	38	38	27	28	
16	28	30	30	31	31	31	28	44	54	77	74	71	62	73	104	97	70	51	52	46	A	36	38	37	
17	34	37	F	38	31	A	24	55	67	73	88	96	96	70	89	98	78	63	46	28	30	32	32	32	
18	31	32	33	33	34	28	28	50	62	59	69	92	80	92	94	83	84	63	39	28	32	33	30	30	
19	31	31	31	33	34	31	22	44	52	66	70	73	69	69	81	66	56	59	38	26	31	33	29	27	
20	28	29	29	31	34	29	24	43	64	70	73	83	64	64	74	72	51	51	44	37	A	32	28	31	32
21	32	33	32	34	34	38	28	45	60	70	66	72	68	68	73	66	60	59	36	33	34	34	34	33	
22	32	36	34	34	33	30	34	44	58	78	77	76	70	60	75	77	59	66	53	36	28	28	29	29	
23	29	29	30	A	33	22	26	44	52	61	63	72	69	75	74	70	64	58	42	34	40	37	36	34	
24	30	30	32	31	32	32	26	46	62	68	76	74	79	70	80	72	66	63	47	42	38	32	34	29	
25	A	29	32	33	35	30	27	42	55	77	67	80	69	84	90	76	62	64	54	40	33	31	28	29	
26	28	28	32	35	30	26	26	44	54	64	66	63	71	66	66	68	61	57	43	30	32	32	29	29	
27	29	31	35	37	33	28	28	46	59	60	74	69	77	77	83	71	64	58	39	38	33	26	28	33	
28	28	31	31	31	31	27	24	44	61	64	70	68	75	75	76	67	75	54	41	35	38	35	34	32	
29	32	F	36	39	34	34	34	48	71	78	74	75	85	77	75	74	73	64	36	33	34	34	F	31	
30	32	33	33	33	33	34	28	43	60	69	73	84	76	76	71	78	81	53	47	34	32	28	31	31	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	30	28	29	29	29	30	30	29	30	30	30	30	30	30	29	28	29	29	29	30	
MED	32	32	32	33	33	31	27	48	60	70	74	76	74	74	82	81	71	62	45	34	34	34	32	32	
U Q	34	34	34	36	34	34	28	54	64	77	84	85	79	77	94	95	85	68	52	40	40	38	36	33	
L Q	30	30	31	31	32	28	26	44	56	64	70	72	69	68	74	71	64	57	40	32	32	32	30	30	

NOV.2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	A	L	L	A	A								
2										L	L	L	A	L	L									
3										L	L	L	L	L	L	A	L							
4									A	L			U L 500	U L 520	U L 424									
5									L	L	L	L	L	L	L	L	L							
6											L	L	L	U L 436	L	L								
7											A	L	A	L	A	A								
8								L		L	L	L	A	L	L	L	L						A	
9										L	A	A	L	L	A									
10										L	L	A		U L 472	U L 468	L	L							
11										L	L	L	L	L	U L 456	L	L							
12										L	L	L	A	L	L	L	L							
13										L	L	L	L	L	L									
14										L		A	L	L	L	L								
15											L	A	A	A	L	A	L							
16								A	L			A	A	A	A	A	L	A						
17									A	L	A	A	A	A	A	A								
18										L	L	L	L	L	L	L	L							
19										L	L	L	L	L										
20										L	L	L	L	L	L	L								
21											L	L	L	L										
22										L	L	L	L		A	A								
23											L	U L 460	L	U L 468	L	L								
24											L	L	L	L	L	L	L							
25											L	U L 448	U L 464	U L 448	L	L								
26										L	L	L	L	L	L									
27										L	L	L	L	L	L									
28											L	L	L	L	L	L		A					A	
29										L	L	L	L	L	L	A	L							
30											L	A	L	L	L	A		A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT												4	2	6	3									
MED												458	482	464	456									
U Q												460		472	468									
L Q												452		448	424									

NOV.2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1							B	B	U	R	U	A	A	A	A	A	A	A								
2							B	U	A	U	A	U	A	A	A	U	R	A	U	R	B					
3							B	U	A	U	A	A	A	A	A	A	A	A	A	B						
4							U	R	A	A	A	A	A	A	A	A	A	U	R	U	R					
5							B	U	R	U	A	A	A	A	A	A	A	A	A	B	A					
6							B	B	A	A	A	A	A	U	R	U	R	A	A	B						
7							B	U	R	A	A	A	A	A	A	A	A	A	B							
8							B	U	A	U	A	A	A	A	A	A	A	A	B					A		
9							B	U	R	U	A	A	A	A	A	A	A	A	B							
10							B	B	A	A	A	A	A	A	A	A	A	U	A	U	R					
11							U	R	U	R	A	A	A	U	R	U	R	U	R	A	U	R	U	R		
12							B	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R			
13							B	U	R	A	A	A	A	U	R	U	R	U	R	A	B					
14							B	U	A	U	A	A	A	A	A	A	A	A	A							
15							B	B	A	A	A	A	A	A	A	A	A	A	A							
16							B	B	U	A	A	A	A	A	A	A	A	A	A							
17							B	A	A	A	A	A	A	A	A	A	A	A	B							
18							B	U	R	A	U	R	U	A	U	R	A	U	R	A	B					
19							B	U	A	U	A	U	A	U	A	U	R	U	A	A	B					
20							B	U	R	U	A	A	A	A	U	R	A	A	U	A	B					
21							B	B	A	U	A	A	A	A	U	R	A	A	A	A						
22							B	B	U	A	A	A	A	A	A	A	A	A	A							
23							B	U	R	A	A	A	U	R	A	U	R	A	U	R	B					
24							B	U	R	U	A	U	R	U	R	U	R	U	R	U	R	B				
25							B	U	R	U	A	U	R	U	R	U	A	U	R	A	B					
26							B	B	U	R	U	A	A	A	U	R	U	R	A	B						
27							B	U	R	U	R	U	R	U	R	A	A	U	A	U	R	B				
28							B	U	A	U	A	A	A	A	U	R	U	R	A	B				A		
29							B	B	U	A	A	A	A	A	U	R	A	A								
30							U	A	U	A	U	A	A	A	A	A	A	A	A	B						
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT								11	24	16	11	8	7	10	13	9	9	4								
MED								U	R	U	A	U	U	R	U	R	U	R	U	R	U	R	U	R	U	R
U Q								184	236	284	304	318	324	324	312	280	236	180								
L Q								U	U	U	A	U	A	U	R	U	U	A	U	R	U	A	U	R	U	R
								176	230	270	300	310	316	320	304	272	228	174								

NOV.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	J A 38	20	J A 27	24	24	24	J A 29	23	30	36	48	51	62	106	86	110	51	42	35	46	34	30	52	29	
2	J A E B 33 16	16	J A 25	J A 33	J A 50	J A 35	J A 22	22	30	33	36	38	41	36	G J A 42	G	20	J A 30	21	22	20	E B 16	21		
3	E B J A 16 28	18	J A 30	J A 31	J A 29	J A 22	23	31	34	35	38	38	38	J A 49	J A 42	J A 35	A E 15	B E 16	B	J A 24	32	24	20	J A 74	
4	J A 50	22	J A 65	J A 39	J A 49	J A 31	E B 16	G	J A 48	J A 40	J A 42	J A 44	J A 47	J A 45	J A 42	J A 43	G	G	21	21	21	21	21	21	
5	19	19	20	J A 26	J A 26	J A 26	23	G	27	34	36	36	42	42	36	37	37	36	37	35	30	32	26	24	
6	J A 23	23	J A 39	J A 31	J A 23	J A 28	J A 28	23	34	44	64	48	78	G	G	32	29	22	23	J A 35	20	20	24	J A 40	
7	J A 29	J A 32	26	26	24	20	E B 16	23	33	42	86	41	50	46	72	120	76	40	42	32	16	23	27	E B 15	
8	E B J A 16 28	23	J A 25	J A 39	J A 49	J A 28	J A 23	36	35	36	37	52	71	109	74	64	29	30	62	78	66	40	27		
9	22	20	E B 16	22	22	22	E B 16	G	26	34	56	291	53	74	108	45	36	32	27	22	22	16	16	E B 16	
10	E B E B 16 16	E B 16	J A 34	J A 44	J A 40	J A 36	J A 21	28	33	44	50	54	89	86	81	45	G	J A 30	45	25	25	27	J A 29		
11	J A 29	J A 25	E B 15	E B 15	E B 28	E B 15	E B 15	G	G	J A 35	44	36	G	G	G J A 40	G	G	G	E B 22	16	24	23	E B 16	J A 25	
12	E B J A 16 42	25	24	20	20	22	G	G	33	G	40	G	G	G	G	G	E B 14	23	23	23	23	22	J A 16	E B 25	
13	E B 16	21	23	22	E B 16	E B 16	E B 16	16	34	35	41	41	41	G	G	G	29	16	23	23	J A 32	23	J A 25	E B 19	
14	E B 16	19	J A 91	E B 16	E B 16	E B 16	E B 16	19	27	32	36	46	43	45	41	47	57	40	33	29	24	22	E B 16	E B 16	
15	E B J A 16 32	24	J A 25	J A 25	J A 23	J A 23	J A 28	J A 33	J A 42	J A 43	J A 53	J A 82	J A 52	J A 70	J A 77	J A 72	J A 54	J A 57	J A 65	J A 30	J A 28	J A 28	J A 28	J A 25	
16	E B 15	20	20	E B 15	20	23	21	22	30	31	52	54	72	76	90	79	74	90	56	33	35	35	25	20	
17	J A 33	J A 52	J A 81	J A 33	J A 35	J A 48	J A 33	J A 25	J A 32	J A 97	J A 63	J A 72	J A 90	J A 103	J A 84	J A 77	J A 45	J A 34	J A 30	J A 28	J A 42	J A 41	J A 28	J A 25	
18	20	19	21	E B 16	E B 16	J A 33	E B 16	G	J A 39	G	36	G	G	J A 39	J A 40	G	J A 36	J A 27	J A 32	J A 28	16	16	16	20	
19	E B E B 16 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	27	G	35	35	34	G J A 36	J A 32	J A 44	J A 25	J A 26	J A 16	E B 16	E B 16	E B 16	E B 16	E B 16	
20	20	E B 16	20	E B 16	20	23	22	16	G	J A 32	J A 42	J A 38	J A 44	G J A 42	J A 36	J A 27	J A 22	E B 15	25	16	16	16	16	16	
21	E B 16	20	E B 15	J A 24	J A 26	J A 30	J A 24	J A 26	40	32	36	J A 38	J A 55	G J A 52	J A 50	J A 77	J A 46	J A 54	J A 38	J A 34	J A 26	J A 32	J A 32	J A 32	
22	J A 25	J A 27	J A 24	J A 24	E B 16	E B 16	E B 16	E B 16	26	31	33	J A 55	J A 48	J A 50	J A 44	J A 48	J A 56	J A 47	J A 38	J A 32	J A 27	J A 30	J A 16	J A 38	
23	J A 27	J A 28	J A 42	J A 55	J A 34	J A 34	J A 26	J A 26	G J A 38	J A 41	J A 43	G J A 36	G J A 31	G J A 31	G J A 31	G J A 28	J A 28	J A 26	J A 34	J A 30	J A 30	J A 38	J A 30	J A 30	
24	J A E B 24 16	22	E B 16	E B 16	E B 16	E B 16	E B 16	14	28	33	G	36	G	G	G	G	J A 28	J A 30	J A 43	J A 30	J A 30	E B 16	J A 23	J A 25	
25	J A 34	J A 32	J A 25	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	G	G	G	37	34	32	J A 39	E B 24	E B 16	E B 16	E B 16	E B 16	E B 16	
26	E B E B 16 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	26	31	32	36	37	34	G	G J A 41	J A 32	J A 32	J A 31	20	E B 16	20	E B 20	E B 16	
27	E B E B 16 16	E B 16	E B 16	E B 16	E B 16	J A 24	E B 16	21	G	G	G	G J A 44	J A 39	J A 33	31	G	24	24	16	16	25	25	22	22	
28	E B 16	25	21	J A 24	E B 16	E B 16	E B 16	22	28	34	39	J A 51	J A 42	J A 42	G	G J A 43	J A 44	J A 61	J A 51	J A 36	J A 40	J A 21	J A 15	E B 15	
29	E B J A 16 39	J A 25	J A 25	J A 16	E B 16	E B 16	E B 16	E B 16	28	30	46	J A 50	J A 41	J A 51	G J A 55	J A 53	J A 55	J A 31	J A 24	J A 26	J A 32	J A 25	J A 23	J A 23	
30	J A 53	J A 39	J A 41	J A 23	E B 16	E B 16	E B 20	20	31	34	35	J A 59	J A 46	J A 51	J A 53	J A 44	J A 42	J A 88	J A 53	J A 29	J A 26	J A 21	E B 16	J A 49	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	20	22	22	24	21	23	18	20	28	34	36	J A 41	J A 44	J A 40	J A 42	J A 40	J A 28	J A 30	J A 28	26	23	22	22	22	
U Q	J A 29	J A 28	J A 26	J A 26	J A 28	J A 30	J A 24	J A 23	J A 31	J A 36	J A 44	J A 51	J A 53	J A 51	J A 70	J A 55	J A 53	J A 42	J A 37	J A 35	J A 32	J A 30	J A 27	J A 29	
L Q	E B 16	E B 19	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	32	35	36	38	G	G	G	G	G	G	E B 20	E B 20	E B 16	E B 16	E B 16	

NOV.2021 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E 16	E 16	E 16	E 15	E 16	E 16	E 16		21	28	34	35	40	39	35	63	42	42	39	E 17	22	22	18	E 16	20	
2	E 17	E 16	E 16	E 16	E 17	E 16	E 17		21	28	32	35	37	39	35	G	34	G	19	19	E 16	E 16	E 16	E 16	16	
3	E 16	E 17	E 16	E 20	E 16	E 16	E 16		23	30	33	33	36	36	36	35	27	E 15	E 16	E 16	19	E 16	E 16	17		
4	E 16	E 16	E 16	E 16	E 24	E 20	E 16	G		33	32	32	36	36	37	32	35	G	G	E 16	E 16	E 16	E 16	E 16		
5	E 16	E 15	E 15	E 20	E 16	E 17	E 16	G		25	32	34	34	34	35	35	29	24	18	23	25	19	21	E 20	E 16	
6	E 16	E 16	E 16	E 16	E 16	E 16	E 16		21	30	34	34	36	36	G	G		30	25	20	E 15	20	E 15	E 15	18	
7	E 16	E 20	E 20	E 18	E 16	E 16	E 16		21	28	28	41	37	46	38	43	42	24	19	32	E 16	E 16	E 16	E 21	E 15	
8	E 16	E 15	E 16	E 16	E 16	E 16	E 16		19	29	33	34	34	40	54	35	29	27	18	E 16	A 62	A 18	A 66	E 20	E 16	
9	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G		26	31	34	29	46	35	34	34	24	18	E 16	E 16	E 16	E 16	E 16	16	
10	E 16	E 16	E 16	E 19	E 19	E 18	E 16		20	26	30	34	38	36	34	32	30	27	G	E 15	20	E 16	E 16	E 20	23	
11	E 20	E 17	E 15	E 15	E 15	E 15	E 15	G		31	33	32	G	G	G		29	G	G	E 16	E 16	E 16	E 16	E 16		
12	E 16	E 16	E 16	E 16	E 15	E 15	E 15	G		32	G	G		38	G	33	G	G	G	E 14	E 16	E 16	E 16	E 16		
13	E 16	E 16	E 16	E 16	E 16	E 16	E 16		G	32	34	36	35	G	G		G	E 26	E 16	E 17	E 17	22	17	E 16	16	
14	E 16	E 16	E 16	E 16	E 16	E 16	E 16		18	25	30	36	41	35	34	34	28	23	19	E 16	18	E 16	E 16	E 16	16	
15	E 16	E 16	E 16	E 16	E 16	E 16	E 16		17	21	27	30	37	41	40	33	35	22	41	A 57	A 27	22	18	18	18	
16	E 15	E 15	E 15	E 15	E 16	E 15	E 16		16	29	29	39	47	54	50	50	31	24	37	23	26	A 35	A 26	E 16	E 16	
17	E 16	E 16	E 16	E 16	E 18	A 48	E 19		20	22	58	28	43	41	41	42	37	35	27	23	E 16	E 16	18	18	18	16
18	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G		G	26	G	33	G	33	30	G	26	19	20	E 16	E 16	E 16	E 16	15	
19	E 16	E 16	E 16	E 16	E 16	E 16	E 16		G	24	G	34	34	33	G	G	24	29	28	19	E 15	E 16	E 16	E 16	16	
20	E 16	E 16	E 16	E 16	E 16	E 16	E 16		G	31	33	28	32	G	G	34	28	24	19	E 15	E 16	E 16	E 16	E 16	16	
21	E 16	E 16	E 15	E 15	E 15	E 15	E 15		18	26	30	34	34	34	G	31	40	24	36	27	A 38	E 27	E 16	E 21	E 16	
22	E 16	E 19	E 16	E 16	E 16	E 16	E 16		16	25	30	30	32	33	33	39	30	23	23	32	18	E 15	E 19	E 16	16	
23	E 16	E 16	E 18	A 55	E 20	E 16	E 16		G	22	30	33	G	32	G	28	G	G	E 18	E 16	20	E 20	E 16	E 16	16	
24	E 16	E 16	E 16	E 16	E 16	E 16	E 16		14	24	28	G	36	G	G	G	G	G	19	19	19	E 15	E 16	E 16	16	
25	A 34	E 16	E 16	E 16	E 16	E 16	E 16		G	G	G	G	G	G	35	33	30	22	E 16	E 16	E 16	E 16	E 16	E 16	16	
26	E 16	E 16	E 16	E 16	E 16	E 16	E 16		17	25	30	32	35	35	33	G	G	26	19	E 16	E 16	E 16	E 16	E 16	16	
27	E 16	E 16	E 16	E 16	E 16	E 16	E 16		G	G	G	G	G	31	34	32	30	G	18	E 16	E 16	E 16	18	20	E 16	
28	E 16	E 16	E 16	E 16	E 16	E 16	E 16		18	25	32	34	34	35	34	G	G	24	32	30	22	20	20	E 16	15	
29	E 16	E 16	E 16	E 16	E 16	E 16	E 16		16	26	28	28	31	32	34	G	32	25	18	18	E 16	E 18	E 16	E 19	E 16	
30	E 16	E 18	E 20	E 16	E 16	E 16	E 16		16	26	31	32	44	36	33	33	31	31	39	34	20	E 16	E 16	E 16	16	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G		25	30	33	36	35	34	32	30	24	19	16	E 16	E 16	E 16	E 16	E 16	
U Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16		19	28	32	34	37	39	35	35	34	26	23	23	20	19	18	18	16	
L Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16		G	28	G	30	33	G	G	G	G	G	G	E 18	E 16	E 16	E 16	E 16	16	

NOV.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

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

NOV.2021 fmin (0.1MHz)

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NOV.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	277	303	312	335	360	365	306	350	361	341	379	357	341	332	325	339	351	357	365	318	292	302	318	297	
2	289	324	334	376	344	311	314	394	373	363	358	367	376	320	333	320	354	371	340	297	307	317	293	291	
3	309	339	357	325	305	302	349	401	394	363	364	341	351	344	342	354	336	343	367	313	342	344	332	307	
4	308	313	329	322	312	369	350	383	356	309	373	386	331	244	324	350	359	334	295	310	322	334	263	330	
5	336	224	306	313	276	F	F	F	F	334	379	357	338	321	329	338	362	366	342	319	316	334	338	326	
6	319	313	287	311	346	367	316	358	364	337	355	357	345	314	339	382	371	337	358	313	320	346	331	324	
7	308	291	305	301	373	316	337	386	377	371	357	358	328	326	349	355	358	373	369	316	A	A	308	296	
8	315	295	329	309	321	350	350	379	395	375	366	376	A	366	319	340	346	361	386	371	330	345	316	294	292
9	323	325	310	319	325	330	346	370	379	364	356	371	332	341	348	362	367	352	332	321	321	336	320		
10	344	295	311	311	340	334	360	365	379	385	374	395	371	332	341	348	362	367	352	332	321	321	336	320	
11	302	303	311	320	330	348	363	366	383	376	364	341	368	332	342	343	365	387	378	299	334	341	320	308	
12	301	304	320	349	330	355	377	379	388	389	378	359	369	324	349	361	363	379	391	342	326	340	305	326	
13	326	302	326	348	339	341	386	377	392	376	359	365	383	347	353	346	378	386	372	337	347	342	331	340	
14	307	321	326	331	343	359	330	373	373	370	382	344	354	359	363	363	364	391	365	347	330	332	333	317	
15	318	303	322	322	322	382	367	361	400	384	358	353	374	344	334	360	362	377	A	338	A	340	323	330	317
16	317	304	304	340	352	357	370	378	356	355	375	364	371	334	341	372	366	380	353	382	A	290	311	319	
17	304	291	F	405	318	A	310	369	369	366	365	350	370	342	340	362	368	369	391	335	319	335	334	291	
18	299	300	304	334	374	347	335	374	382	365	365	350	343	351	351	369	378	384	409	306	310	345	319	307	
19	302	308	308	339	337	367	380	389	379	384	359	357	349	349	376	406	385	366	384	300	324	354	333	304	
20	292	300	300	311	354	371	336	357	359	371	366	384	388	323	349	325	376	351	366	318	A	316	316	328	326
21	301	317	318	333	325	360	361	369	358	380	351	385	329	329	360	378	351	378	383	A	344	311	319	285	
22	296	323	347	339	337	309	351	393	371	367	379	376	380	321	337	382	361	370	360	357	305	279	293	302	
23	302	310	307	A	366	327	356	393	387	363	380	370	355	338	355	373	381	384	331	327	338	333	311	346	
24	302	312	309	308	334	343	352	364	383	372	375	350	327	344	362	369	371	378	347	321	333	324	361	320	
25	A	312	299	339	338	348	390	361	373	386	364	367	315	347	352	379	364	373	361	351	327	331	314	317	
26	295	309	324	346	352	322	341	381	391	368	370	378	353	370	373	311	362	387	397	329	327	334	325	331	
27	306	299	342	373	348	312	319	364	398	355	361	342	334	335	344	360	401	360	360	365	362	323	311	333	
28	297	294	302	319	336	314	350	365	376	370	376	371	338	354	362	360	368	371	339	324	343	340	332	302	
29	326	F	320	353	297	298	325	348	393	370	346	353	361	353	345	349	364	373	359	314	328	295	F	302	
30	290	342	326	326	326	377	331	347	377	362	366	363	358	359	355	366	390	352	349	333	352	296	339	311	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	30	28	29	29	29	30	30	29	30	30	30	30	30	30	29	28	29	29	29	30	
MED	304	304	312	331	337	348	350	370	379	369	366	359	354	334	344	360	364	373	365	326	327	332	325	314	
U Q	318	315	326	343	348	362	362	382	390	376	375	374	371	347	355	369	371	384	380	338	341	340	332	326	
L Q	298	300	306	316	325	319	330	362	370	363	359	352	338	324	339	346	361	366	350	314	318	316	311	302	

NOV.2021 M(3000)F2 (0.01)

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										L	L	A	L	L	A	A									
2										L	L	L	A	L	L										
3										L	L	L	L	L	L	A	L								
4									A	L			U	U	U	U									
5									L	L	L	L	L	L	L	L	L								
6											L	L	L	U	L	L									
7											A	L	A	L	A	A									
8									L		L	L	L	A	L	L	L						A		
9											L	A	A	L	L	A									
10										L	L	A			U	L	L	L							
11										L	L	L	L	L	U	L	L								
12										L	L		A	L	L	L	L								
13										L	L	L	L	L	L										
14										L		A	L	L	L	L									
15											L	A	A	A	L	A	L								
16									A	L		A	A	A	A	A	L	A							
17										A	L	A	A	A	A	A									
18										L	L	L	L	L	L	L	L								
19										L	L	L	L	L											
20										L	L	L	L	L	L	L									
21											L	L	L	L											
22										L	L	L	L		A	A									
23											U	L	U	L	L	L									
24										L	L	L	L	L	L	L	L								
25											U	L	U	L	L	L									
26										L	L	L	L	L	L										
27										L	L	L	L	L	L										
28										L	L	L	L	L	L	L		A					A		
29										L	L	L	L	L	L	A	L								
30										L	A	L	L	L	L	A		A							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT												4	2	6	3										
MED												390	384	380	374										
U Q												403	410	381											
L Q												382	360	373											

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NOV. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										250	236	230	270	270	256	244									
2										244	238	236	216	260	252										
3										246	236	236	248	260	260	250	250								
4									E A 240	276			280	380	260										
5									232	232	232	232	232	248	262	252	234								
6											234	258	264	238											
7										238	238	236	260	236	226										
8									208	228	236	222	E A 258	276	234	224							A		
9										238	A E A 238	266	252	220											
10									220	236	204		282	252	244	226									
11									226	242	242	208	258	248	240										
12									224	224	232	226	234	254	232	222									
13									236	246	234	222	240	228											
14									228	244	244	244	242	242											
15									242	242	204	240	254	240	240										
16									224	244	244	E A 244	258	240	218	228	228								
17									232	232	230	224	224	244	228										
18									240	240	246	234	234	224	218										
19									218	238	238	238	258												
20									244	244	224	222	264	238	224										
21									224	256	244	232													
22									232	216	230	220	248	216											
23									240	240	240	272	244	226											
24									224	244	266	250	230	230	230										
25									246	232	270	258	246	228											
26									240	228	228	234	234	234											
27									234	234	242	242	252	232											
28									232	232	260	250	244	232	216							E A 266			
29									236	244	244	234	254	248	240	240									
30									214	230	240	240	246	224			E A 236								
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									4	18	25	28	29	29	29	22	10	3					1		
MED									222	235	236	235	238	258	246	231	229	222				E A 266			
U Q									236	244	241	241	252	262	253	240	240	E A 236							
L Q									216	228	230	230	223	242	237	224	224	216							

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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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	E B E B E B	218	208	208	236	204	204	200	200		A	200	200		A	A	216	210	202	202	214	E B E B E B	E B E B E B	A					
2	E A E B E B	290	254	228	210	210	E B E A	254	260	204	204	204	194	A	194	194	206	212	194	206	E B E B	242	248	220	E B E B E B	250	280		
3	E B	256	214	206	E A E B E B	246	268	274	220	194	182	188	180	186	184	210	210		206	198	E B	194	194	206	206	200	E A	274	
4	E B E B E B	262	262	288	306	E A	276	208	200	200		A	220	196	196	190	210	202	212	212	202	E B E B	232	232	210	208	E B	320	212
5	E B E B E B	222	304	244	226	E B E A E B	294	304	294	214	198	198	196	192	188	188	188	204	196	196	202	E A E A	E A E A	E A E A	E A E A	E B	226	226	
6	E B E B E B	226	226	264	250	E B E B	232	194	194	200	200	200	200	198	206	190	190	208	194	194	E B E A E B	234	242	212	220	E B E A	252	252	
7	E B E A E A	252	298	264	274	194	210	210	192	196	210		A	196		206			200	192	192	218	232	214	E B E B E B	E A E B	242	242	
8	E B E B E B	242	274	244	256	246	200	206	182	182	204	198	198	198		A	206	206	202	192	176		E A E A	E A E A	E A E A	E B	262	262	
9	E B E B E B	240	240	248	248	248	222	202	190	196	196	196		A	A			A				E B E B	E B E B	E B E B	E B E B	E B	276	276	
10	E B E B E B	240	254	260	294	278	236	196	196	196	196	188		A	204	182	182	212	190	190	190	204	220	220	E B E B E B	E A E A	276	276	
11	E A E A E B	284	272	268	252	236	200	198	198	198	198	190	178	170	180	180	200	200	200	190	180	250	216	210	E B E B E B	E B E B	242	242	
12	E B E B E B	284	276	246	214	214	206	206	196	196	196	196	196		A	192	196	186	186	186	186	E B E B	230	220	E B E B	E B E B	248	248	
13	E B E B E B	242	268	242	224	228	208	192	192	192	192	192	192	192	186	186	196	196	194	194	206	228	228	234	E B E B	E B E B	222	222	
14	E B E B E B	264	264	236	226	214	204	210	196	196	196	198		A	202	198	198	188	196	190	190	E B	190	190	E B E B E B	E B E B	238	238	
15	E B E B E B	254	254	240	240	250	206	198	190	190	208	208		A	A	A	A	A			A	278	224	218	E A E A	E A E A	276	276	
16	E B E B E B	276	276	268	244	212	212	200	200		A	200	204		A	A	A	A	A			188		210	210	E A E B E B	E B E B	218	218
17	E B E B E B	240	288	260	194	228		E A	304	206	206		A	206		A	A	A	A			202	202	190	E B E A E A	E A E A	256	256	
18	E B E B E B	238	244	244	218	202	202	214	190	190	200	190	188	188	188	194	194	194	186	186	196	230	222	222	E B E B E B	E B E B	260	260	
19	E B E B E B	260	264	264	228	218	182	194	194	194	178	210	184	180	180	212	200	198	188	E B E B	E B E B	238	210	210	E B E B	E B E B	250	250	
20	E B E B E B	280	280	280	232	214	198	230	200	200	200	200	188	186	186	186	186	186	202	178	192	200	234	238	E B E B E B	E B E B	246	246	
21	E B E B E B	268	252	252	252	232	216	198	198	198	198	198	182	182	190	206	206	200	200		A	E A E B E B	E A E B E B	E A E B E B	E A E B E B	E B	276	276	
22	E B E A E B	276	254	222	222	234	244	210	180	196	196	186	186	186	192		A	A			192	208	198	198	248	E B E B E B	E B E B	250	250
23	E B E B E A	276	276	276		A	E B	200	254	210	196	188	198	188	188	176	184	176	198	198	194	194	236	222	E B E B	E B E B	210	210	
24	E B E B E B	254	264	248	266	222	222	200	200	200	202	188	188	178	190	190	192	196	196	196	212	212	212	212	E B E B E B	E B E B	234	234	
25	E B E B E B	276	256	226	220	196	186	186	186	214	206	190	184	184	198	198	198	198	188	188		202	216	252	E B E B E B	E B E B	250	250	
26	E B E B E B	276	276	240	226	196	214	210	200	188	206	198	192	192	190	190	200	206	190	184	210	218	218	218	E B E B E B	E B E B	232	232	
27	E B E B E B	258	258	228	206	206	228	228	208	198	178	184	186	186	176	184	208	200	200	E B E B	E B E B	200	200	200	270	E A E A E B	E A E A	220	220
28	E B E B E B	270	284	266	234	234	234	228	210	200	200	200	200	200	200	198	192	198		A	E A	226		E B E B	E B E B	E B E B	234	234	
29	E B E B E B	210	264	234	212	250	250	206	206	200	196	194	194	194	194	194		A			204	196	190	222	E A E B E B	E A E B E B	226	226	
30	E B E A E A	290	262	252	220	232	214	214	204	204	204	180		A	190	192	198				198		E A E A E A	208	E B E B E B	E B E B	290	290	
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	29	30	30	29	30	29	30	30	28	29	29	22	23	26	25	20	30	27	29	28	29	28	30	30					
MED	E B E B E B	260	264	248	228	228	212	203	198	196	200	196	192	188	190	194	200	198	196	189	210	E B E B	226	221	E B E B E B	E B E B	249	249	
U Q	E B E B E B	276	276	264	251	246	235	220	204	200	204	200	196	198	196	200	206	204	200	201	235	245	243	250	E A E B	E A E B	262	262	
L Q	E B E B E B	241	254	240	219	212	203	198	192	191	196	189	188	184	184	187	193	194	190	186	195	E B	211	213	E B E B E B	E B E B	232	232	

NOV. 2021 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							B	B				A	A	A	A	A	A								
2							B		110	110	110		A	A				B							
3							B		98	114	110	110	110	110		A	A								
4								110		A	A	A	A	A	A	A		110	110						
5							B		120	110	110	110	110		A	A	A	A	B	A					
6							B	B		A	A	A	A		108	108	108		A	B					
7							B		108	108	108		A	A	A	A	A	A	B						
8							B		124	122	110	110		A	A	A	A	A	B				A		
9							B		118	108	108		A	A	A	A	A	A	B						
10							B	B		A		A	A	A	A	A		108	108						
11								112	112		A	A	A				A								
12							B		122	122	114	114	114	114	110	110	110	110	114						
13							B	B		114		114		A	A	112	112	112	112						
14							B	B		112	108	106		A	A	A	A	A	A						
15							B	B		A	A	A	A	A	A	A	A	A	A						
16							B	B			A	A	A	A	A	A	A	A	A						
17								B		114	112		A	A	A	A	A	A	B						
18							B		112	112		A				A		A	B						
19							B	B		114	114	114	114	110	108	108	108		A	B					
20							B	B		108	108		A	A		A	A		B						
21							B	B		A		A		A	A	A	A	A							
22							B	B		108	108		A	A	A	A	A	A	A						
23							B	B		108		A	A		A		A		B						
24							B		108	108	108	108	108	108	108	108	108	108		B					
25							B	B		108	108	108	108	108	108	108		A	B						
26							B	B		108	108	108	108	108	108	108		A	B						
27								B		108	108	108	108		A	108	108	110	108						
28							B	B		108	112	112		A	A		112	112					A		
29							B	B		112	110		A	A	A		110		A						
30									116	116	110		A	A	A	A	A	A	B						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								11	25	22	17	11	9	13	13	11	11	4							
MED								112	110	109	110	110	110	108	108	110	110	112							
U Q								120	114	110	112	114	113	111	111	112	110	118							
L Q								108	108	108	108	108	108	108	108	108	108	109							

NOV.2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	84	88	88	88	88	88	88	140	146	132	120	94	94	94	94	88	100	100	98	88	88	88	92	92
2	92	B	B	92	92	86	86	136	150	144	138	118	96	96	G	98	G	124	78	78	78	78	B	88
3	B	88	88	88	88	88	92	122	122	116	116	116	114	150	100	98	114	B	B	102	92	92	92	92
4	92	92	92	92	92	92	B	G	92	96	96	96	96	96	96	94	G	G	94	94	94	108	128	114
5	100	100	82	88	88	104	82	G	126	116	116	112	94	94	94	94	90	90	88	86	86	90	90	90
6	90	90	90	90	90	90	116	B	98	98	98	98	90	G	G	116	98	92	92	92	B	92	92	88
7	84	84	84	84	84	84	136	114	108	94	96	94	94	94	94	94	92	92	92	92	92	92	92	B
8	B	84	84	108	84	82	86	134	124	124	114	96	96	92	90	90	86	86	86	86	82	82	82	82
9	82	82	B	82	82	82	B	G	124	124	90	90	92	92	92	92	92	100	94	94	94	B	B	B
10	B	B	B	86	86	86	94	100	100	114	100	98	98	98	98	94	110	G	90	90	90	90	90	90
11	90	90	B	90	B	B	B	G	G	94	94	96	G	G	G	96	G	G	96	B	96	92	B	92
12	B	86	86	86	86	86	86	G	G	150	G	G	150	G	138	G	G	G	B	86	86	86	104	B
13	B	82	82	82	B	B	B	B	G	104	110	102	102	G	G	G	110	B	86	86	86	86	86	86
14	B	86	86	B	B	B	B	118	118	118	118	98	96	96	90	88	88	88	88	88	88	88	B	B
15	B	88	88	86	86	106	106	106	106	106	100	92	92	92	92	92	92	82	80	80	80	80	80	80
16	B	88	88	B	88	94	94	94	146	130	102	96	96	94	94	94	94	90	90	90	90	90	90	90
17	90	90	90	90	90	90	90	110	118	102	96	96	96	94	92	90	90	90	90	90	90	90	90	90
18	90	90	90	B	B	90	B	G	G	96	G	122	G	116	102	G	90	90	90	90	B	B	B	90
19	B	B	B	B	B	B	B	B	134	G	134	124	122	G	84	138	84	84	84	B	B	B	B	B
20	84	B	92	B	90	90	88	B	G	162	96	96	96	G	94	94	142	142	B	88	B	B	B	B
21	B	88	B	88	88	88	86	84	84	136	114	96	96	G	96	86	86	86	86	86	86	86	86	86
22	86	86	86	86	B	B	B	B	G	156	150	94	94	94	94	86	86	86	86	86	86	86	86	86
23	86	86	86	86	86	86	86	86	G	92	92	92	G	92	G	92	G	92	92	92	92	92	92	92
24	92	B	84	B	B	B	B	B	128	122	G	160	G	G	G	G	G	94	94	94	94	B	94	94
25	78	82	82	B	B	B	B	B	G	G	G	G	G	148	148	136	94	88	B	B	B	B	B	B
26	B	B	B	B	B	B	B	130	130	140	136	112	112	112	G	G	86	86	86	86	86	B	86	B
27	B	B	B	B	B	86	86	G	G	G	G	88	116	148	148	G	G	72	72	B	B	88	88	88
28	B	88	88	88	B	B	B	B	142	124	130	124	102	100	100	G	92	88	84	84	84	84	84	B
29	B	84	84	84	B	B	B	B	122	122	96	96	96	96	G	92	92	92	92	92	92	92	92	84
30	92	86	86	94	B	B	94	86	142	154	116	96	96	96	90	90	90	90	80	80	80	80	B	90
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	23	22	20	18	19	15	17	22	27	25	27	25	22	21	24	23	24	26	26	24	23	20	21
MED	90	88	86	88	88	88	88	116	124	122	102	96	96	96	94	94	92	90	89	88	88	88	90	90
U Q	92	90	88	90	90	90	94	135	134	136	117	112	99	100	99	97	98	92	92	92	92	92	92	92
L Q	84	84	84	86	86	86	86	90	114	104	96	96	94	94	91	90	88	86	86	86	86	86	86	86

NOV.2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

NOV. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	78	83	89	X	X	X	X													133	159	141	130	101	
2	X	X	X	X	X	X	X														54	60	62	55	48
3	X	X	X	X	X	X	X														X	X	X	X	X
4	X	X	X	X	X	X	X														84	68	58	47	42
5	X	X	X	X	X	X	X														X	X	X	X	X
6	X	X	X	X	X	X	X														116	104	90	63	82
7	X	X	X	X	X	X	X														X	X	X	X	X
8	X	X	X	X	X	X	X														X	X	X	X	X
9	A	A	A	X	X	X	X														X	X	X	X	X
10	X	X	X	X	X	X	X														X	X	X	X	X
11	46	44	45	44	46	51	34														65	56	54	45	44
12	X	X	X	X	X	X	X														X	X	X	X	X
13	X	X	X	X	X	X	X														90	84	80	64	59
14	X	X	X	X	X	X	X														X	X	X	X	X
15	X	X	X	X	X	X	X														45	44	49	41	37
16	X	X	X	X	X	X	X														51	47	51	43	41
17	X	X	X	X	X	X	X														X	X	X	X	X
18	X	X	X	X	X	X	X														48	48	50	49	41
19	X	X	X	X	X	X	X														57	53	56	41	39
20	X	X	X	X	X	X	X														X	A	A	X	X
21	X	X	X	X	X	X	X														60		40	41	
22	X	X	X	X	X	X	X														X	X	X	X	X
23	X	X	X	X	X	X	X														60	56	54	53	45
24	X	X	X	X	X	X	X														X	X	X	X	X
25	X	X	X	X	X	X	X														67	61	61	58	55
26	X	X	X	X	X	X	X														X	X	X	X	X
27	X	X	X	X	X	X	X														47	37	41	40	32
28	X	X	X	X	X	X	X														X	X	X	X	X
29	X	X	X	X	X	X	X														47	49	45	44	38
30	X	X	X	X	X	X	X														58	58	48	49	44
31	X	X	X	X	X	X	X														X	X	X	X	X
	X	X	X	X	X	X	X														54	64	58	54	54
	X	X	X	X	X	X	X														77	72	53	48	46
	X	X	X	X	X	X	X														X	X	X	X	X
	X	X	X	X	X	X	X														80	62	55	38	35
	X	X	X	X	X	X	X														45	44	40	37	34
	X	X	X	X	X	X	X														X	X	X	X	X
	X	X	X	X	X	X	X														56	57	36	31	34
	X	X	X	X	X	X	X														X	X	X	X	X
	X	X	X	X	X	X	X														58	56	47	45	38
	X	X	X	X	X	X	X														X	X	X	X	X
	X	X	X	X	X	X	X														48	54	45	44	44
	X	X	X	X	X	X	X														X	X	X	X	X
	X	X	X	X	X	X	X														59	56	38	38	40
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	30	30	29			1	1	1									30	29	29	30	29
MED	X	X	X	X	X	X	X														X	X	X	X	X
U Q	41	38	39	39	42	37	31			135	120	105									58	58	54	46	43
L Q	X	X	X	X	X	X	X														X	X	X	X	X
	48	46	44	44	48	42	34														68	64	60	50	47
	X	X	X	X	X	X	X														X	X	X	X	X
	37	36	37	37	40	32	28														51	51	46	41	38

NOV.2021 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	F	F	F	58	53	31	25	52	74	85	95	86	74	90	109	119	112	109	102	126	U R	152	135	F	F	
2	R	64	J R	51	46	24	25	56	69	82	88	103	93	88	98	102	101	76	59	48	54	56	49	42		
3	46	51	35	31	34	33	34	55	63	72	85	90	76	93	100	101	96	90	82	78	62	51	40	36		
4	34	35	35	35	34	34		A	48	60	81	164	71	61	105	171	153	122	108	100	110	98	84	57	76	
5	58	57	54	65	67	68	70	90		F	F	F	90	94	75	85	93		A		A	48	55	58	36	38
6	39	31	30	31	37	31	22	52	80	88	101	120	124	R	127	140	143	105	74	63	60	52	59	42	37	
7	37	35	34	36	52	20	25	52	63	69	83	95	88	110	137	153	124	R	104	75	72	65	54	42	40	
8	35	32	31	31	36	33	24	52	61	68	78	91	76	79	101	123	132	111	63	44	37	38	36		A	
9	A	A	A	31	36	34	29	51	65	69	70	78	72	81	110	131	128	123	99	62	56	51	44	37		
10	40	38	38	38	41	H	45	28	45	68	81	73	74	69	78	107	122	118	104	79	59	50	48	39	38	
11	37	36	37	38	41	40	28	46	66	74	78	86	87	95	105	121	132	106	J R	99	84	78	74	58	52	
12	R	50	43	48	50	48	41	30	54	64	60	80	90	80	88	98	87	81	76	62	38	37	43	35	31	
13	31	32	32	33	35	33	27	45	59	60	70	70	84	70	66	70	74	63	56	45	41	45	37	35		
14	33	32	34	33	35	27	25	44	61	63	70	69	76	77	75	84	78	70	58	42	41	44	43	35		
15	30	31	31	31	35	36	26	49	60	65	71	73	81	85	96	111	108	100	80	51	47	50	35	33		
16	31	28	30	32	41	24	22	39	58	76	77	69	73	96	101	100	87	68		A	54		A	A	34	35
17	35	33	36		A	30	26	21	48	67	74	93	100	106	108	R	117	144	148	117	84	54	50	48	47	39
18	36	32	35	34	33	25	24	47	66	59	68	82	105	106	116	121	95	96	71	61	55	55	52	49		
19	53	52	54	57	52	42	25	46	54	57	70	87	75	80	83	82	67	57	47	41	31	35	34	26		
20	26	26	28	30	34	22	22	44	68	66	83	89	90	112	114	119	120	99	85	55	58	47	42	45		
21	42	42	41	38	47	43	23	44	60	70	67	77	72	79	100	78	65	60	50	41	43	39	38	32		
22	31	33	32	29	31	30	33	44	58	72	91	87	84	R	84	77	86	R	84	73	68	52	52	42	43	38
23	36	32	33	33	31	26	22	44	57	65	70	72	79	82	95	85	81	76	67	48	58	52	48	48		
24	42	33	33	30	34	25	21	41	63	80	81	82	91	H	108	118	139	138	110	R	84	71	66	47	42	40
25	32	31	32	36	41	26	23	44	55	73	70	80	69	74	114	121	111	112	102	74	56	49	32	29		
26	30	30	30	36	29	21	22	41	54	64	68	73	67	72	70	62	68	66	50	39	38	34	31	28		
27	28	29	30	31	34	26	24	42	64	74	85	84	86	100	112	104	83	65	54	50	51	30	25	28		
28	26	29	31	31	33	29	26	44	64	70	70	70	68	88	92	83	80	74	72	52	50	40	39	32		
29	29	30	33	30	36	36	28	46	66	79	75	78	76	86	91	82	89	85	54	42	48	39	38	38		
30	35	28	31	32	32	34	23	42	60	72	75	75	88	78	92	100	86	85	60	53	50	32	32	34		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	28	29	29	30	30	29	30	29	29	30	30	30	30	30	29	30	30	28	30	29	29	29	29		
MED	35	32	33	33	36	31	25	46	63	72	78	82	78	87	100	104	96	85	70	52	52	48	39	37		
U Q	41	37	38	38	41	36	28	52	66	78	85	90	88	100	114	122	120	106	84	62	58	54	44	41		
L Q	31	30	31	31	34	26	22	44	60	65	70	73	73	79	92	84	81	73	58	45	45	40	35	32		

NOV.2021 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										L	L	L	A	A	L	L	L								
2										L	L	L	L	L	L	U	L	L							
3										L	U	L	L	L	L	U	L	L							
4										L	L	L	L	L	L	L	L	L							
5										L	L	L	L	L	L	A	A	A	A	A					
6										L	L	L	L	L	L	L	L	L							
7										L	A	L	A	L	A	A	A	A							
8										U	L	L	L	L	L	L	L	L							
9										L	L	L	L	L	L	A	A	A							
10										L	L	L	L	L	L	A	L	L							
11										L	L	L	L	L	L	L	L	L							
12										L	L	L	L	L	L	L	L	L	A	A					
13										L	A	A	A	L	A	L	A	L							
14										L	L	A	A	A	L	L	L	L							
15										L	L	L	L	L	L	A	A	A							
16										L	L	L	L	L	L	L	L	L	A						
17										A	A	L	L	L	L	L	L	L							
18										U	L	L	L	L	L	L	L	L							
19										L	L	L	L	L	L	L	L	L	A						
20										L	L	L	L	L	L	L	L	L							
21										L	L	L	L	L	L	L	L	L							
22										L	L	L	L	L	L	L	L	L							
23										L	L	L	L	L	L	L	L	L							
24										L	L	L	L	L	L	L	L	L							
25										L	L	L	L	L	L	L	L	L							
26										L	L	L	L	L	L	L	L	L							
27										L	L	L	L	L	L	L	L	L							
28										L	L	L	L	L	L	L	L	L							
29										L	L	L	L	L	L	L	L	L							
30										L	L	L	L	L	L	L	L	L	A						
31										L	L	L	L	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									1	5	15	22	21	23	25	13	1								
MED									304	384	440	456	460	464	452	428	324								
U Q										L	L	L	L	L	L	L	L								
L Q										U	L	L	L	L	L	L	L								

NOV.2021 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A		A	A				A	A		A	B					
2								A	256		A	376	356	336			268			B				
3								A		288	A	A	A	A	A		308	268	196					
4								A	232	288	308	332		A	320	312		A	176	B				
5								A	240	276	308	320	328	312		A	284	248	192	B				
6								A	236	276	308		A	A		A	A	A	A					
7								A	244	280	304	316	328	324	304	288	244		A	B				
8								A	220	280	304	316	332	320		A	280	A	A	A				
9							184	A	216	276		A	328		A	A	A	A	A	A				
10								A		A	A							A	A	A				
11								A	236	264	300	320	328		A	A	A	A	A	B				
12								A	196	272	304	316		A		A	A	A	A					
13								A	204	280		A	A		324	312	288		A	A	A			
14								A	240	276	300	324	328	320	308	288		A	A	B				
15								A	240	272	308	316	324	316	300	280		A	A	A				
16								A		A	A				308		A	A	A	A				
17								B	204	276	308	320		A	A	A	A	A	A					
18								A	232	280	300		A	A		A	A	A	A	A				
19								A		A		A					A	A	A	A				
20								A	268	296		A	328	328			A	A	A	A				
21								A	268	288	320	328	320	308			A	A	A	A				
22								A	232	280	304	316	320		A	308		A	A	A				
23								A	232	280	300		A	A		A	A	A	A	A				
24								A	220		A	A	A		A	A	268		A	A	A			
25								B	A	A		A					A	A	A	A				
26								B	260		A	320	332	316	300		A	A	A	A				
27								B	268	296	316	320	312		A	268		A	196	B				
28								B	224	272	300	320	328	308	296	272		A	A	A				
29								A	268	304	320		A	A	A		292	272	A	A				
30								B	232	288	300		A	A	A	A	A	A	A	A				
31								A	A	268	A	320	320		A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	18	24	23	21	15	16	11	13	5	4						
MED								184	232	276	304	320	328	320	308	284	268	194						
U Q									240	280	308	322	332	324	312	290	270	196						
L Q									220	268	300	316	324	314	300	270	246	184						

NOV.2021 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV.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

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

IONOSPHERIC DATA STATION Okinawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	E 16	E 16	B 25	B 18		E 17	E 16	B 16									G 20		E 16	E 16	B 16	B 16	B 16	B 16			
2	E 16	E 16	B 16	B 16	B 16	B 16	B 21	E 16								G 22			E 16	B 16	B 16	B 16	B 16	B 16			
3	E 16	E 16	B 16	B 16	B 16	B 16	B 16	B 16							G 32				E 16	B 16	B 16	B 16	B 16	B 16			
4	E 16	E 16	B 16	B 16	B 16	B 16	B 16	B 63									G 20		G 16	B 16	B 16		24	27	18	34	
5	26	31	E 16	B 34	42	35	E 16								A 45	A 90			A 54	A 59	22	E 16	B 16	B 16	B 16		
6	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16												E 16	B 16	B 16		E 16	B 16	B 16	
7	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																E 16	B 16	B 16	
8	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 20													E 16	B 16	B 16	B 16	B 16	B 16	
9	A 51	A 50	A 52	A 16	E 16	B 16	B 16	B 16													E 16	B 16		E 16	B 16	B 16	
10	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16													E 16	B 16		E 16	B 16	B 16	
11	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16													E 16	B 16	B 16		E 16	B 16	B 16
12	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16													E 16	B 16	B 16	B 16	B 16	B 16	
13	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16													E 16	B 16	B 16	B 16	B 16	B 16	
14	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16													E 16	B 16	B 16	B 16	B 16	B 16	
15	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16													E 16	B 16	B 16	18	18	E 16	B 16
16	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16													A 91	A 22	A 69	A 63	26	22	
17	22	E 16	B 16	B 16	B 16	B 16	B 16	B 16															E 16	B 16	29	E 16	B 16
18	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
19	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
20	19	E 16	B 16	B 16	B 16	B 16	B 16	B 16																			
21	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
22	22	E 16	B 16	B 16	B 16	B 16	B 16	B 16																			
23	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
24	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
25	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
26	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
27	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
28	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
29	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
30	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			
U Q	16	16	16	16	16	16	16	16																			
L Q	E 16	B 16	B 16	B 16	B 16	B 16	B 16	B 16																			

NOV.2021 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV.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

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

NOV.2021 fmin (0.1MHz)

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	F	F	F	320	350	377	379	296	334	360	350	349	340	317	301	316	328	333	342	328	311	U R	298	319	F	F
2	R	J	R	305	371	350	318	371	362	352	338	350	346	310	305	298	337	355	351	281	292	318	300	280		
3	305	370	327	310	325	328	347	378	368	345	335	346	310	314	322	333	342	352	341	331	343	308	336	300		
4	307	312	310	342	328	374	A	361	362	290	386	376	268	242	314	336	310	306	292	321	322	329	255	338		
5	311	297	273	292	257	271	272	296	F	F	F	344	355	332	324	337	A	350	353	A	300	322	357	352	318	
6	347	316	312	318	361	391	294	335	366	357	336	337	324	R	300	322	346	367	344	333	328	289	339	320	318	
7	289	307	323	325	387	399	327	354	357	359	348	359	324	312	332	340	R	344	311	328	294	311	309	268	291	A
8	307	307	306	315	343	384	340	381	385	359	363	370	357	309	292	337	362	390	374	361	280	288	312			
9	A	A	A	332	319	358	H	332	368	367	378	372	364	346	292	311	344	345	355	379	325	314	297	274	284	
10	274	293	288	295	330	334	368	354	369	385	389	363	350	303	324	345	356	361	J R	349	319	294	307	316	305	
11	297	288	306	320	324	365	353	369	364	369	370	355	337	313	324	333	360	368	279	317	310	336	305	288		
12	R	255	304	270	314	327	328	355	378	366	378	337	366	341	352	359	331	362	357	352	344	305	338	331	322	
13	318	318	325	326	323	344	366	376	379	371	369	333	365	357	341	351	358	354	341	336	316	342	329	340		
14	321	307	312	337	338	345	345	371	371	375	361	357	344	352	332	362	366	366	355	353	302	319	335	341		
15	309	304	310	324	336	391	345	370	362	374	345	360	333	308	319	339	338	369	313	340	308	354	324	286		
16	279	293	311	326	356	370	355	341	354	355	373	318	352	316	322	347	341	381	A	347	A	A	290	307		
17	328	304	322	A	339	357	299	356	387	346	354	345	342	317	R	286	339	366	329	362	383	273	289	289	285	
18	317	322	340	358	395	340	328	359	396	371	343	320	347	345	354	359	348	343	346	329	273	318	341	284		
19	283	273	313	311	338	416	330	382	394	384	346	375	343	336	350	379	365	388	376	374	298	323	352	334		
20	299	300	317	328	355	408	335	348	380	363	368	357	351	312	314	332	337	363	384	331	360	353	307	322		
21	308	318	316	296	353	401	308	355	372	368	358	378	353	337	343	349	369	366	360	340	341	309	312	310		
22	291	324	354	302	315	321	351	373	377	347	364	351	349	R	342	317	348	R	327	368	372	315	296	317	296	304
23	286	291	337	325	360	363	330	384	403	385	372	363	338	349	354	350	356	388	359	283	321	290	310	326		
24	292	295	309	324	355	400	316	346	371	366	331	346	332	317	322	337	346	369	R	310	347	340	316	308	328	
25	310	304	317	342	392	363	372	360	372	364	372	375	342	306	341	332	347	316	334	262	312	321	314	313		
26	310	301	318	361	365	319	346	360	376	369	358	381	332	358	350	363	370	388	358	327	335	324	363	333		
27	328	310	323	341	393	365	318	349	366	365	375	359	341	325	339	356	341	351	361	290	355	369	299	331		
28	299	307	323	332	338	330	321	361	369	388	372	384	315	362	338	343	345	336	351	339	310	311	316	320		
29	309	298	289	330	329	364	314	347	360	358	382	362	341	339	338	330	348	367	379	322	319	311	322	314		
30	310	333	320	310	298	347	349	366	355	362	375	352	355	343	349	346	342	311	346	341	341	308	320	333		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	28	29	29	30	30	29	30	29	29	30	30	30	30	30	29	30	30	28	30	29	29	29	29		
MED	307	304	316	325	338	363	332	360	369	365	362	358	342	317	328	343	348	356	351	328	311	318	314	316		
U Q	310	314	323	334	361	384	350	371	378	374	372	366	349	343	341	350	362	368	362	341	328	337	330	330		
L Q	290	296	310	310	327	340	317	349	362	356	345	346	332	309	317	333	341	343	334	315	297	308	300	296		

NOV.2021 M(3000)F2 (0.01)

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	A	A	L	L	L							
2										L	L	L	L	L	L	U	L	L						
3										L	L	L	L	L	L	L	L	L						
4										L	L	L	L	L	L	L	L	L						
5										L	L	L	L	L	A	A	A	A	A	A				
6										L	L	L	L	L	L	L	L	L						
7										L	A	A	A	L	A	A	A	A						
8										U	L	L	L	L	L	L	L	L						
9										L	L	L	L	L	L	L	A	A						
10										L	L	L	L	U	L	A	L	L						
11										L	L	L	L	L	L	L	L	L						
12										L	L	L	L	L	L	L	L	L	A	A				
13										L	A	A	A	A	A	L	A	L						
14										L	A	A	A	A	L	L	L	L						
15										L	A	A	A	A	A	A	A	A						
16										L	A	A	A	A	A	A	A	A	A					
17										A	A	L	L	L	L	L	L	L						
18										U	L	L	L	L	L	L	L	L						
19										L	L	L	L	L	L	L	L	L	A					
20										L	L	L	L	L	L	L	L	L	L	L				
21										L	L	L	L	L	L	L	L	L	L					
22										L	L	L	L	L	L	L	L	L	L					
23										L	L	L	L	L	L	L	L	L	L					
24										L	L	L	L	L	L	L	L	L	L					
25										L	L	L	L	L	L	L	L	L	L					
26										L	L	L	L	L	L	L	L	L	L					
27										L	L	L	L	L	L	L	L	L	L					
28										L	L	L	L	L	L	L	L	L	L					
29										L	L	L	L	L	L	L	L	L	L					
30										L	L	L	L	L	L	L	L	L	L					
31										L	L	L	L	L	L	L	L	L	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	5	14	21	19	22	24	12	1							
MED									433	426	392	396	398	388	382	386	440							
U Q									U	L	L	L	U	L	L	L	L							
L Q									L	L	L	L	L	L	L	L	L							

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1										246	248	258	252	308	276	260	246									
2										242	252	250	230	254	266	256	238									
3									206	220	274	246	244	290	266	240	242									
4										302	216	222	388	396	262	226	230									
5									244	226	238	238	252	282	262	A	238	228	A							
6										232	250	256	238	262	262	224										
7										236	254	238	266	288	252	230	216									
8										228	244	232	238	250	294	258	224									
9										228	232	240	256	302	286	246	228									
10										222	216	240	262	306	274	242	228									
11									226	232	226	246	268	262	264	254	226									
12									216	214	228	232	254	236	244	220	226	218	186							
13									218	222	230	244	228	248	254	238	234									
14										248	250	274	242	266	230	220										
15										230	260	238	256	246	266	252	224									
16										246	228	252	250	288	256	240	232		A							
17										258	246	240	252	232	260	246	210									
18										220	256	296	246	238	238	218	216									
19											262	220	236	238	244	226	214									
20										230	246	230	234	230	242	230	204									
21										234	234	228	256	254	244	220										
22										246	228	240	238	230	258	244	228									
23										218	230	230	264	234	242	238	226									
24										244	250	244	240	254	246	226	214									
25										242	228	228	254	330	246	230	220									
26										228	244	226	230	254	254	220	236									
27										238	228	240	238	242	244	222										
28										216	236	220	256	244	236	238	218									
29										244	220	242	252	256	242	242	236									
30										226	228	246	242	248	248	242	250									
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT									5	28	30	30	30	30	30	29	27	2	1							
MED									218	231	237	240	252	254	255	238	226	223	186							
U Q									235	243	250	246	256	288	266	245	236									
L Q									211	224	228	230	238	242	244	226	218									

NOV.2021 h'F2 (KM)

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NOV. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	326 ^Q	274 ^Q	236	210	208	192	246	212	226	214	214	E A 244	A	A	242	228	212	224	214	198	202	192	200 ^Q	232	
2	236	252	214	200	202	E A 294	242	208	218	226	210	188	A	200	192	202	230	202	196	236	252	222	238	302	
3	268	204	238	264	252	258	218	200	200	184	204	E A 220	192	184	182	218	222	220	208	188	204	192	218	254	
4	258	258	240	220	246	202	A	202	220	224	200	204	196	202	218	218	220	210	230	224	218	200	274	246	
5	216	244	256	264	E A 352	E A 330	318	254	214	212	204	208	212	248	A	A	A	A	A	246	238	206	204	250	
6	226	244	258	260	226	200	284	218	226	204	198	198	194	212	212	210	206	208	200	200	230	222	200	238	
7	256	274	246	250	204	200	E A 254	210	210	216	A	A	A	226	A	A	A	228	200	202	206	216	236	244 ^A	
8	240	254	258	260	236	196	E A 254	206	206	186	198	224	200	170	176	228	218	200	186	174	208	246	248		
9	A	A	A	252	244	210	186	204	208	212	204	186	208	E A 270	E A 244	A	A	212	192	176	210	200	230	274	
10	262	256	260	272	234	192	210	198	216	216	208	A	A	212	208	A	168	220	208	192	204	230	214	234	252
11	270	274	274	254	236	208	218	202	210	216	A	A	204	184	184	182	218	194	182	186	218	196	214	240	
12	262	248	256	202	208	192	206	208	200	200	210	188	166	196	208	204	A	A	A	186	244	222	226	254	
13	256	260	244	244	238	196	204	210	202	A	A	A	A	A	204	A	222	206	190	196	222	208	224	226	
14	238	264	258	224	214	190	224	200	214	224	E A 212	A	A	A	E A 210	E A 200	214	202	196	188	224	236	214	214	
15	246	270	268	238	240	198	232	208	212	192	242	E A 200	A	A	A	216	A	220	190	184	232	206	216	268	
16	280	290	278	240	210	194	218	178	226	218	198	A	A	A	A	A	A	204	220	A	A	E A 340	E A 268		
17	E A 250	268	250	A	230	224	288	220	212	A	A	208	206	200	178	186	A	194	192	202	E A 244	E A 230	E A 260	240	
18	246	270	234	210	186	236	246	220	208	180	186	188	218	180	208	206	A	196	180	176	264	220	214	246	
19	248	248	242	196	200	176	216	204	206	210	200	200	176	190	H 178	220	A	200	202	194	264	234	220	234	
20	E A 318	302	252	248	208	196	256	224	224	212	A	210	E A 220	E A 176	176	224	198	198	204	212	204	190	254	244	
21	260	242	230	244	210	192	260	222	208	204	194	206	182	E A 220	216	206	220	210	196	198	210	240	192	246	
22	E A 320	254	212	264	E A 262	262	214	190	218	212	196	182	196	206	190	192	220	206	198	184	E A 236	234	226	236	
23	266	284	252	234	212	204	240	202	202	204	194	184	178	212	206	212	210	206	194	186	226	208	226	216	
24	230	290	274	256	216	182	264	222	210	220	E A 220	192	178	176	204	A	200	194	202	184	202	186	222	202	
25	264	278	256	226	200	190	202	206	210	224	208	168	206	164	204	212	208	216	186	184	186	198	238	254	
26	252	276	252	218	196	244	236	210	212	216	210	202	196	194	224	206	224	206	186	196	208	220	200	232	
27	246	270	254	216	196	212	262	220	222	186	216	200	220	176	230	202	216	206	192	194	204	202	242	246	
28	312	278	240	250	242	234	254	216	204	192	198	190	180	192	208	206	202	212	204	208	206	224	246	224	
29	256	262	262	220	234	218	256	204	214	206	210	200	202	190	204	216	220	208	194	220	E A 234	E A 246	236	248	
30	226	222	258	262	242	218	208	214	202	196	188	184	A	A	A	206	A	212	198	200	208	204	250	234	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	30	30	29	30	30	28	25	24	22	24	25	23	20	28	27	30	29	29	30	29	
MED	254	264	252	244	217	200	238	208	211	212	202	198	197	193	205	206	218	206	196	196	214	211	226	244	
U Q	267	275	258	258	240	224	256	218	218	216	210	207	208	210	216	218	220	212	202	204	235	227	242	253	
L Q	243	250	240	219	208	192	215	202	206	198	198	188	182	182	187	202	209	201	190	186	206	200	214	233	

NOV. 2021 h'F (KM)

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NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A		A	A				A	A		A	B					
2								A	106		A	106	102	104	A		110		B					
3								A		104		A	A	A	A		104	110	106					
4								A	106	104	104	104		104	104			A	108					
5								A	104	104	104	104	104	104		A	100	104	110					
6								A	104	104	104		A	A		A	A	A	A					
7								A	106	104	104	102	102	100	100	102	104		A	B				
8								A	104	100	102	102	102	102		A	A	A	A					
9								126	104	106		106		A	A	A	A	A	A					
10								A		A		102	102	102	102	104	104		A	A	A			
11								A	104	104	104	102	102		A	A	A	A	A	B				
12								A	102	102	102	102		A	A	A	A	A	A					
13								A	102	102		A	A		102	110	104		A	A	B			
14								A	98	102	102	102	100	100	100	104		A	A	A				
15								A	106	104	102	102	102	102	102	102		A	A	A				
16								B		A			A	A	A	A	A	A	A					
17								A	108	108	102	102		A	A	A	A	A	A					
18								A	108	104	104		A		A	A	A	A	A					
19								A		104	104		104	104		A	A	A	A					
20								A		104	104	106	106	106	104		A	A	A	A				
21								A	104	104	104	104	102		102		A	A	A	A				
22								B	A	A			A	A	A	A	A	A	A					
23								A		A	A	A	A	A	A		102		A	A	A			
24								A	104		A		A	A	A	A	A	A	A					
25								B	A		A					A	A	A	A					
26								B		102		102	102	102		A		A	B					
27								B		106	106	102	102	102		102		112						
28								A	104	100	104	102	102	100	100	104		A	A					
29								B		A	108	104	102		A	A	104	108						
30								A	106	106	104		A	A	A	A	A	A	A					
31								A		A		A		A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	18	24	23	21	15	16	11	13	5	4						
MED								126	104	104	104	102	102	102	102	102	108	109						
U Q									106	105	104	104	104	104	104	104	110	111						
L Q									104	103	102	102	102	102	100	102	104	107						

NOV.2021 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV.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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	104	92	92	88	88	88	96	146	160	138	132	130	124	110	120	136	98	122	B	B	B	B	82	100
2	B	86	92	84	96	96	96	136	96	144	96	116	112	94	94	92	202	86	86	140	108	98	B	B
3	B	B	B	96	92	90	100	92	138	136	114	116	98	118	G	112	110	106	B	104	98	98	B	92
4	B	B	96	92	100	94	92	94	118	104	112	112	108	104	104	172	98	G	86	84	108	106	120	110
5	108	104	106	100	100	102	98	110	106	110	114	118	98	200	102	94	94	90	112	114	116	94	92	98
6	90	90	92	92	92	92	94	108	110	108	108	108	104	106	106	106	110	104	100	96	94	B	94	92
7	88	90	94	90	B	B	152	124	120	114	104	106	108	106	102	100	98	96	98	92	94	86	86	90
8	B	B	B	B	100	98	96	136	132	128	114	110	112	106	98	96	84	92	88	86	B	100	96	86
9	86	84	82	86	86	82	86	84	138	124	114	108	114	172	110	104	96	98	94	94	90	86	86	86
10	84	82	80	96	90	B	B	116	120	106	116	102	102	102	96	98	170	96	92	94	94	90	86	88
11	90	90	120	98	B	92	92	116	122	110	106	102	102	108	102	102	98	100	104	98	92	90	88	86
12	B	B	B	B	B	B	B	128	130	110	130	100	98	168	158	144	184	96	96	96	B	98	B	B
13	B	B	B	B	B	B	B	164	G	110	110	108	110	104	106	104	104	104	102	104	100	B	B	94
14	90	86	B	B	B	B	B	134	G	118	118	108	106	106	108	104	106	104	98	98	98	96	B	B
15	94	88	94	90	96	104	118	110	108	106	104	104	100	102	98	98	98	96	96	94	94	94	92	90
16	92	86	86	B	B	B	96	96	162	96	120	108	100	98	96	94	98	94	92	94	94	90	88	88
17	88	90	102	96	96	92	98	136	110	104	102	104	102	110	102	98	96	94	92	90	88	90	88	88
18	86	86	82	B	B	B	B	134	162	150	132	106	172	G	112	100	98	94	92	92	86	86	86	86
19	86	B	B	B	B	B	B	136	144	164	146	140	134	154	86	122	84	82	82	88	86	B	B	B
20	94	90	B	86	90	84	B	174	170	158	118	116	102	104	G	186	170	136	130	114	104	94	94	88
21	90	94	94	96	92	90	92	94	160	138	112	108	102	102	106	104	102	142	98	96	96	94	B	94
22	92	90	90	94	90	94	94	94	174	162	172	106	148	108	100	98	120	96	92	88	86	88	92	98
23	88	86	86	90	94	92	94	108	138	96	104	102	100	98	102	104	102	98	96	98	86	86	98	94
24	92	92	86	B	B	B	B	134	142	126	112	108	106	98	100	96	98	96	96	B	B	B	88	102
25	90	92	92	90	B	B	B	152	148	128	116	166	G	142	150	102	98	92	B	B	86	B	B	
26	B	B	B	B	B	B	B	162	152	158	132	116	114	108	106	106	104	90	96	90	88	88	88	B
27	B	B	B	B	B	B	B	170	G	160	G	178	108	168	158	G	92	90	88	92	96	88	90	B
28	96	94	88	94	92	92	86	146	132	140	142	170	108	106	100	G	100	98	92	92	92	88	84	B
29	B	B	96	90	B	90	92	92	174	G	102	166	104	102	102	96	96	94	94	92	90	88	88	84
30	B	104	96	92	92	92	96	166	182	G	104	134	96	98	98	96	92	96	92	92	88	86	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	21	21	20	17	18	19	28	28	27	30	29	30	28	28	29	30	29	28	27	25	25	21	21
MED	90	90	92	92	92	92	96	126	138	124	114	108	106	106	102	104	98	96	94	94	94	90	88	90
U Q	93	92	96	96	96	94	98	136	161	144	130	116	114	109	107	117	106	102	98	98	98	95	93	96
L Q	88	86	86	90	90	90	92	102	120	108	106	106	102	102	99	97	96	94	92	92	88	87	86	87

NOV.2021 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 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	F	F	F	F	F	F	F	HL	H	H	H	H	C	C	CLH	HL	L	CL					F	F		
2	F	F	F	F	F	F	F	HL	L	HL	LH	CL	CL	L	L	L	HC	L	L	L	F	F	F			
3				F	F	F	F	LH	HL	H	H	C	C	C		C	C	C		F	F	F		F		
4			F	F	F	F	F	L	C	C	C	C	C	C	C	H	L		L	F	F	F	F	F	F	
5	F	F	F	F	F	F	F	C	C	C	C	CL	L	H	C	L	L	L	CL	FF	FF	F	F	F	F	
6	F	F	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	C	L	F	F	F	F	F	F	
7	F	F	F	F			F	C	C	C	C	C	C	C	C	C	L	L	LQ	F	F	F	F	F	F	
8				F	F	F	HL	HL	CL	CL	C	C	C	C	L	L	L	L	L	F	F		F	F	F	
9	F	F	F	F	F	F	LH	HL	CL	C	C	C	C	HC	C	C	L	L	L	F	F	F	F	F	F	
10	F	F	F	F	F		C	C	CH	C	C	C	C	C	L	L	HC	L	L	FQ	F	F	F	F	F	
11	F	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	L	LH	C	F	F	F	F	F	F	
12							H	H	C	HC	C	C	L	H	HL	H	HC	L	L	F		F				
13							H		C	C	C	C	C	C	C	C	C	C	C	C	F	F			F	
14	F	F					H		C	C	C	C	C	C	C	C	C	C	L	F	F	F	F			
15	F	F	F	F	F	F	C	C	C	C	C	C	C	C	L	L	L	L	L	F	F	F	F	F	F	
16	F	F	F				F	L	HL	LH	CL	C	C	L	L	L	L	L	L	F	F	F	F	F	F	
17	F	F	F	F	F	F	H	C	C	C	C	CQ	CQ	CQ	C	L	L	L	L	F	F	F	F	F	F	
18	F	F	F				H	HC	HC	H	C	H	H		C	L	L	L	L	F	F	F	F	F	F	
19	F						H	HC	H	HL	H	H	H	L	L	CL	L	L	L	F	F	F				
20	F	F		F	F	F	H	H	H	C	C	C	C	C		HC	HC	H	H	FF	FF	F	F	F	F	
21	F	F	F	F	F	F	L	HL	H	C	C	C	C	C	C	C	HL	L	L	F	F	F	F	F	F	
22	F	F	F	F	F	F	L	HCL	HC	H	C	HC	C	C	L	CL	L	L	F	F	F	F	F	F	F	
23	F	F	F	F	F	F	C	H	L	C	C	C	LH	C	C	C	L	L	F	F	F	F	F	F	F	
24	F	F	F				HC	HC	CL	C	C	C	L	C	L	L	L	L	L					F	F	
25	F	F	F	F			HC	H	CL	C	HL		HC	HCL	C	L	L	L					F			
26							HC	HL	HL	CL	CL	CL	CL	CL	CL	CL	CL	L	L	F	F	F	F	F	F	
27							H		HL		H	C	HC	HC	HC	L	LH	L	F	F	F	F	F	F	F	
28	F	F	F	F	FF	F	H	HC	H	H	HC	CQ	C	C	CQ		L	L	L	FQ	F	F	F	F	F	
29			F	F	F	F	L	H		C	HC	C	C	C	C	L	L	L	L	F	F	F	F	F	F	
30		F	F	F	F	F	H	HC		CH	HC	L	L	L	L	L	L	L	L	F	F	F	F			
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT																										
MED																										
U Q																										
L Q																										

NOV. 2021 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
⬡	f _o F ₂ , f _o F ₁ , f _o E
×	f _x F ₂
*	DOUBTFUL f _o F ₂ , f _o F ₁ , f _o E
⊗	f _b E _s
└	ESTIMATED f _o F ₁
†, ‡	f _{min}
^	GREATER THAN
∨	LESS THAN

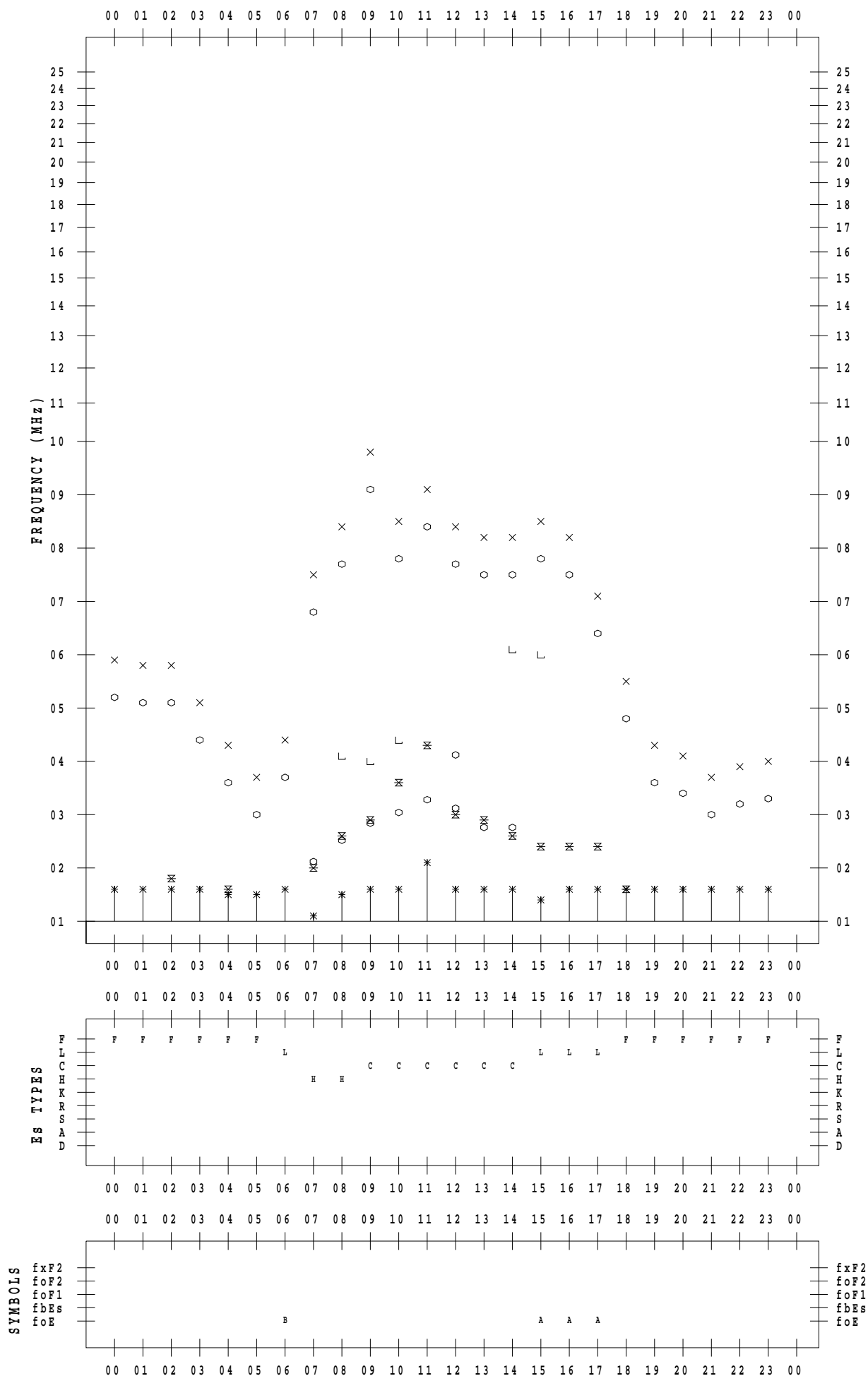
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 1

135 ° E MEAN TIME



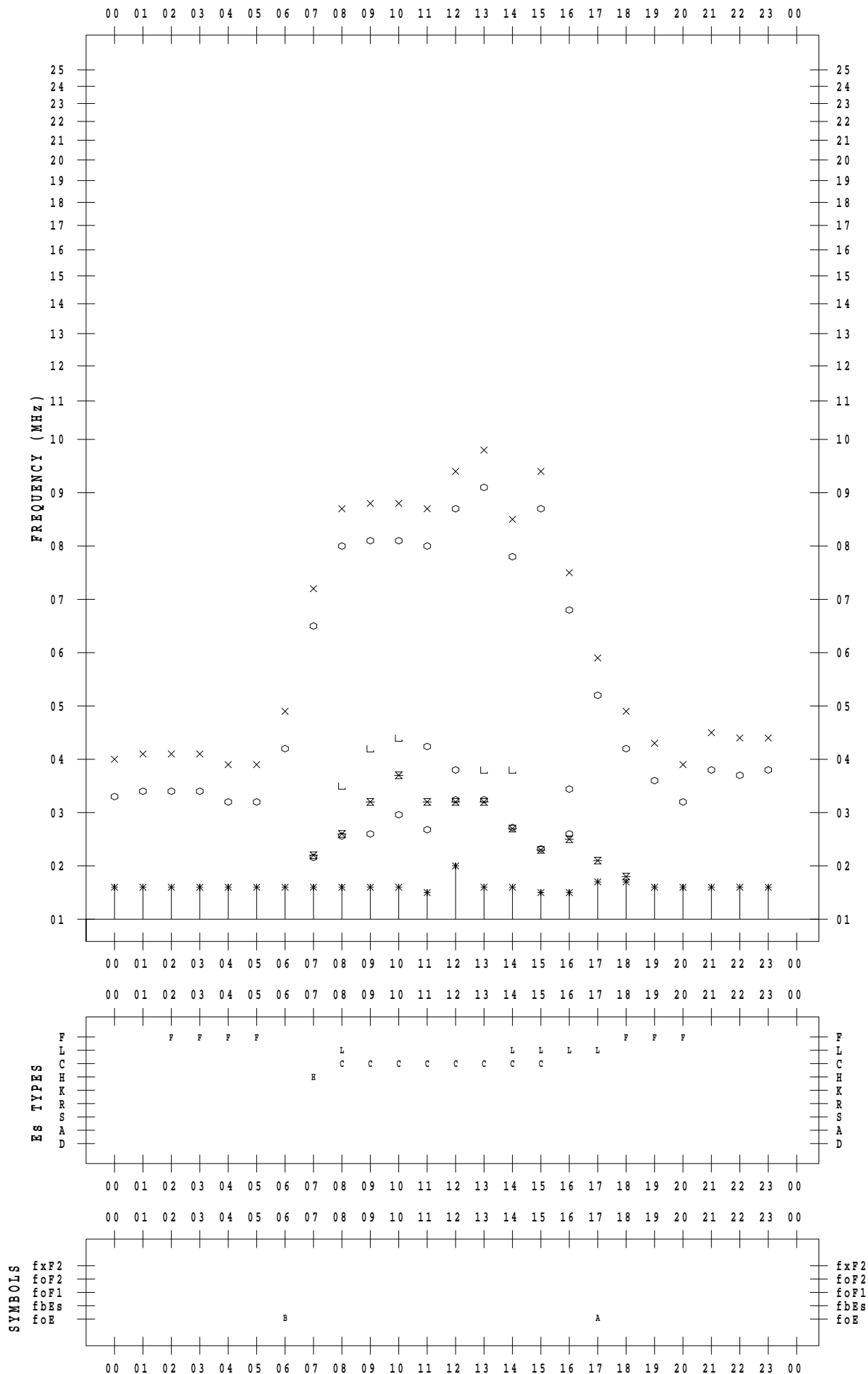
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 2

135 ° E MEAN TIME



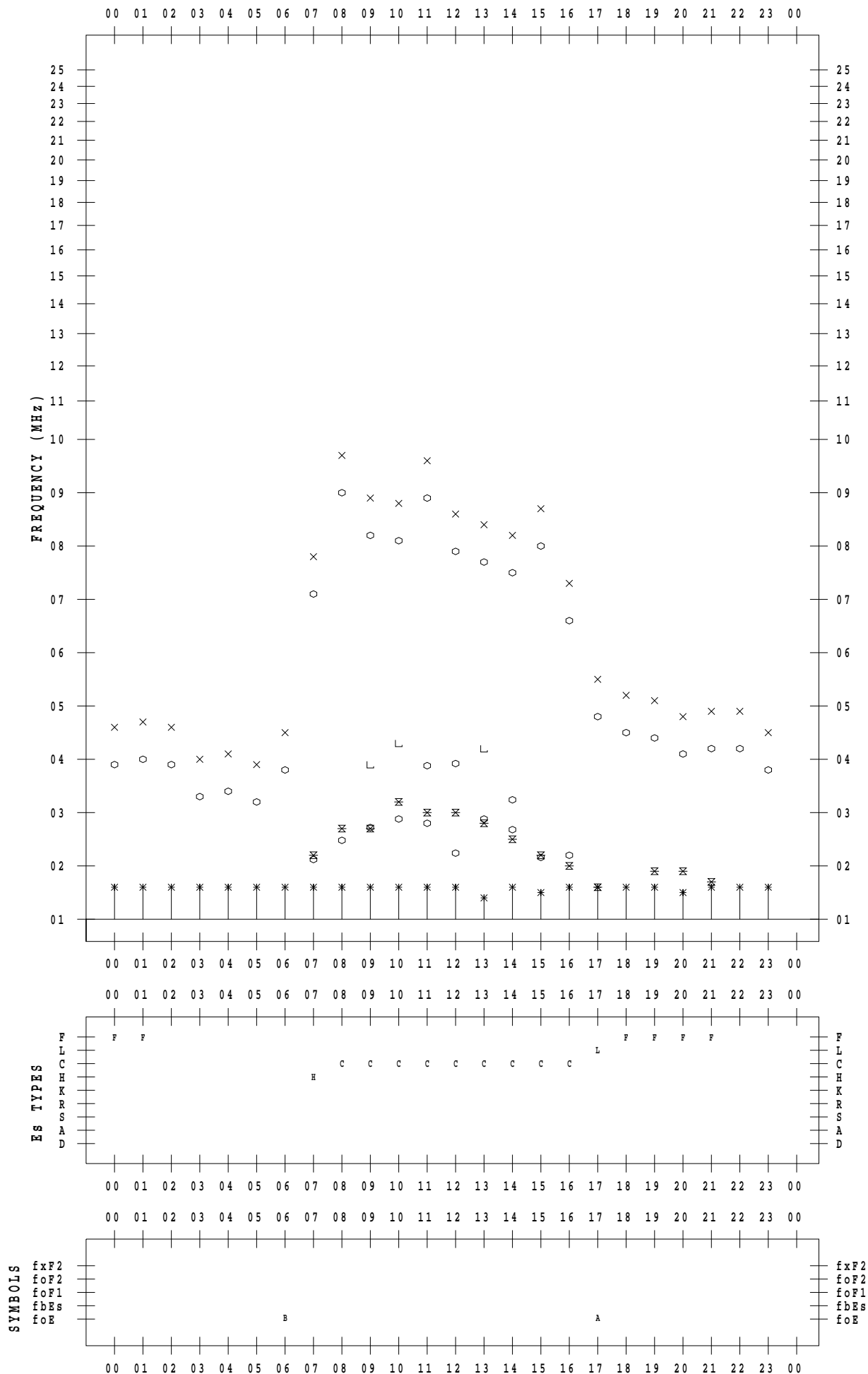
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 3

135 ° E MEAN TIME



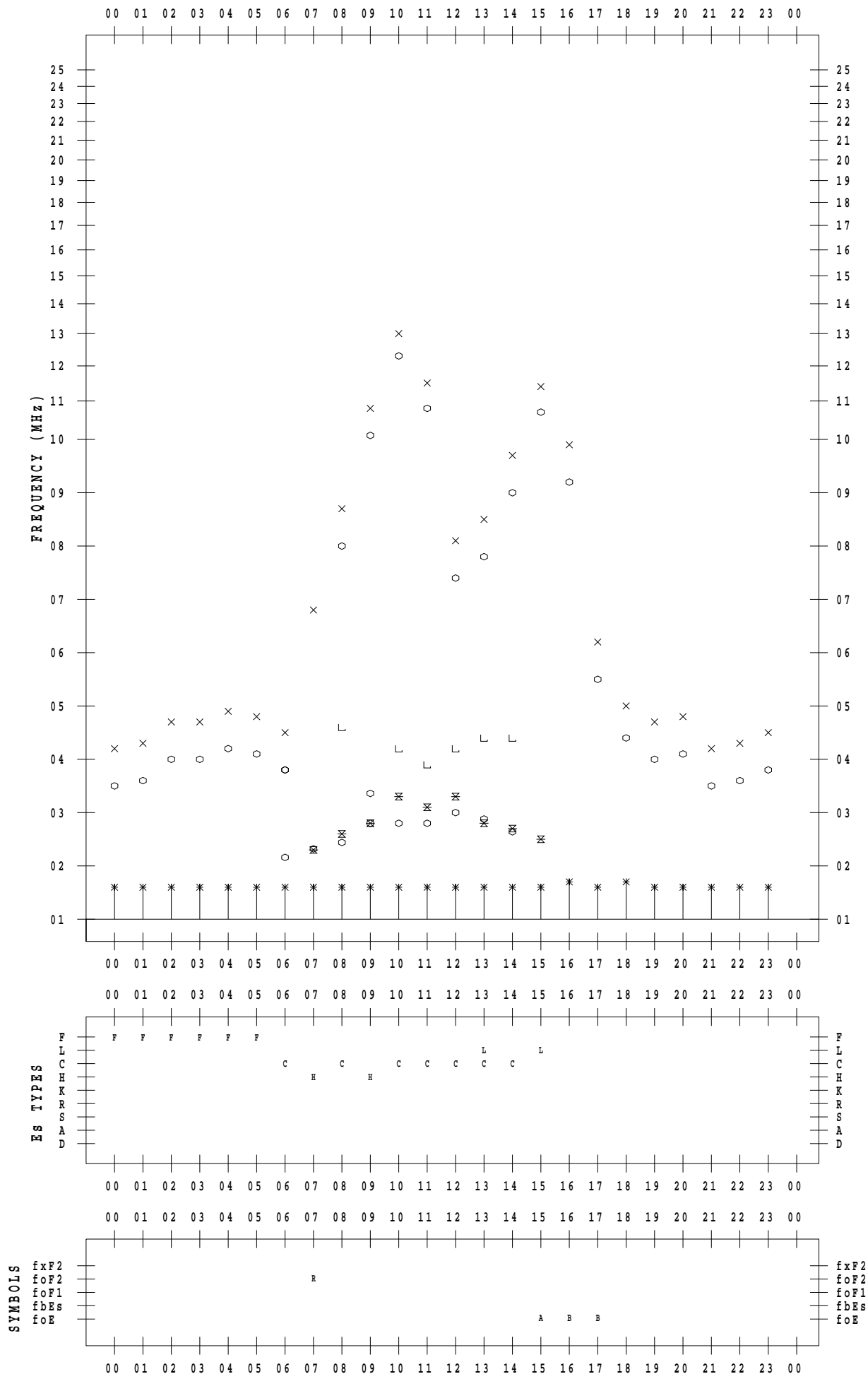
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 4

135 ° E MEAN TIME



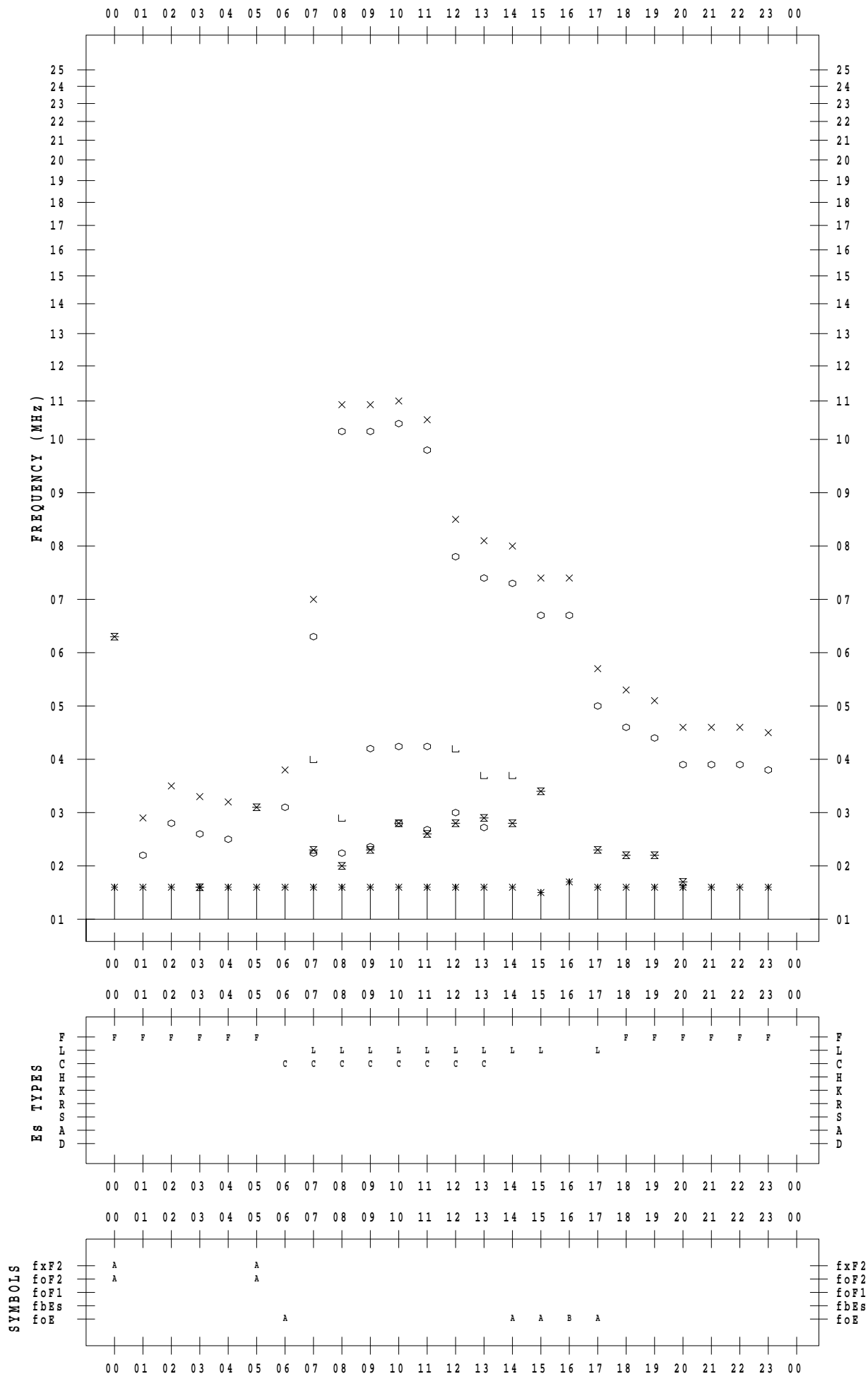
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 5

135 ° E MEAN TIME



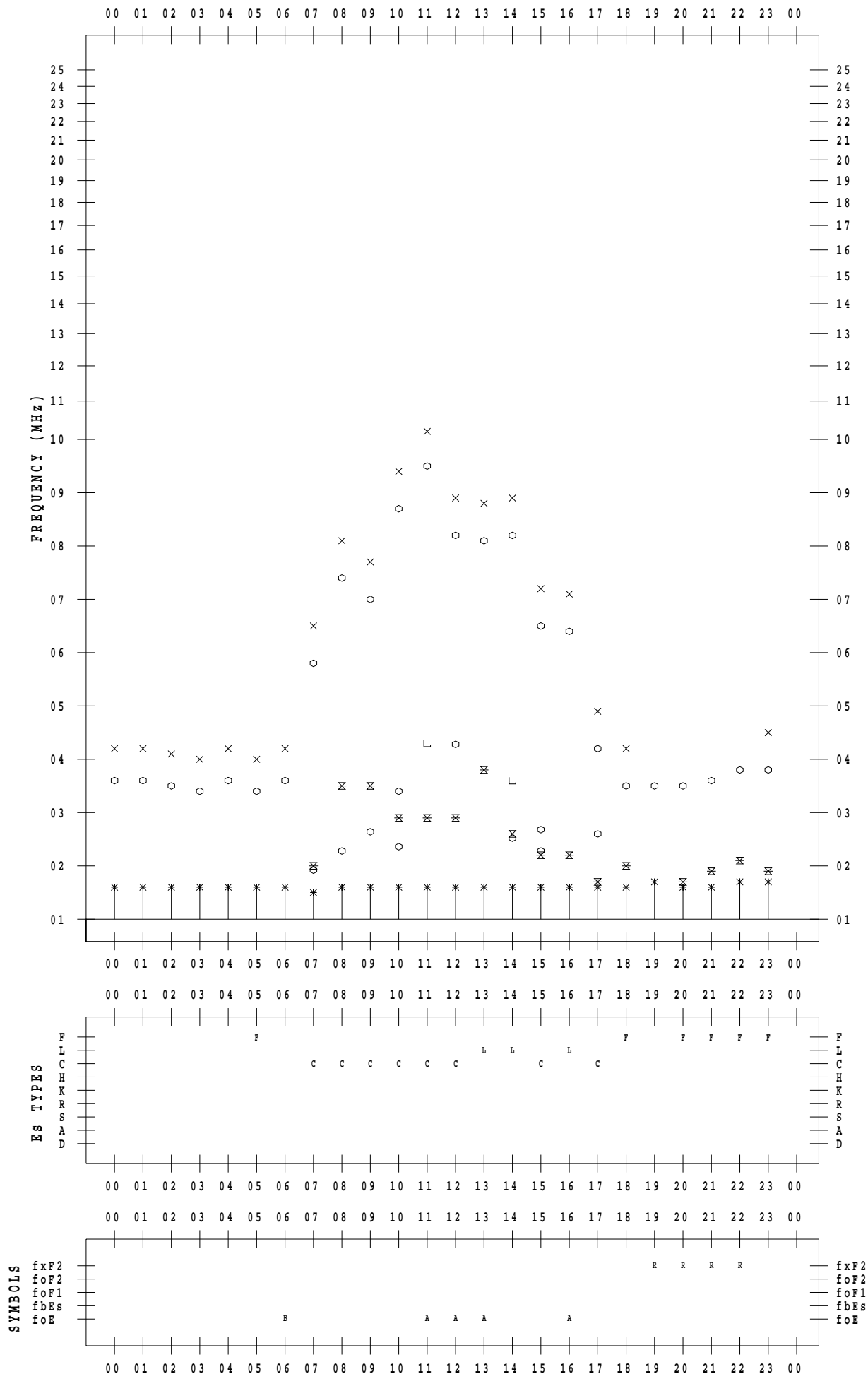
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 6

135 ° E MEAN TIME



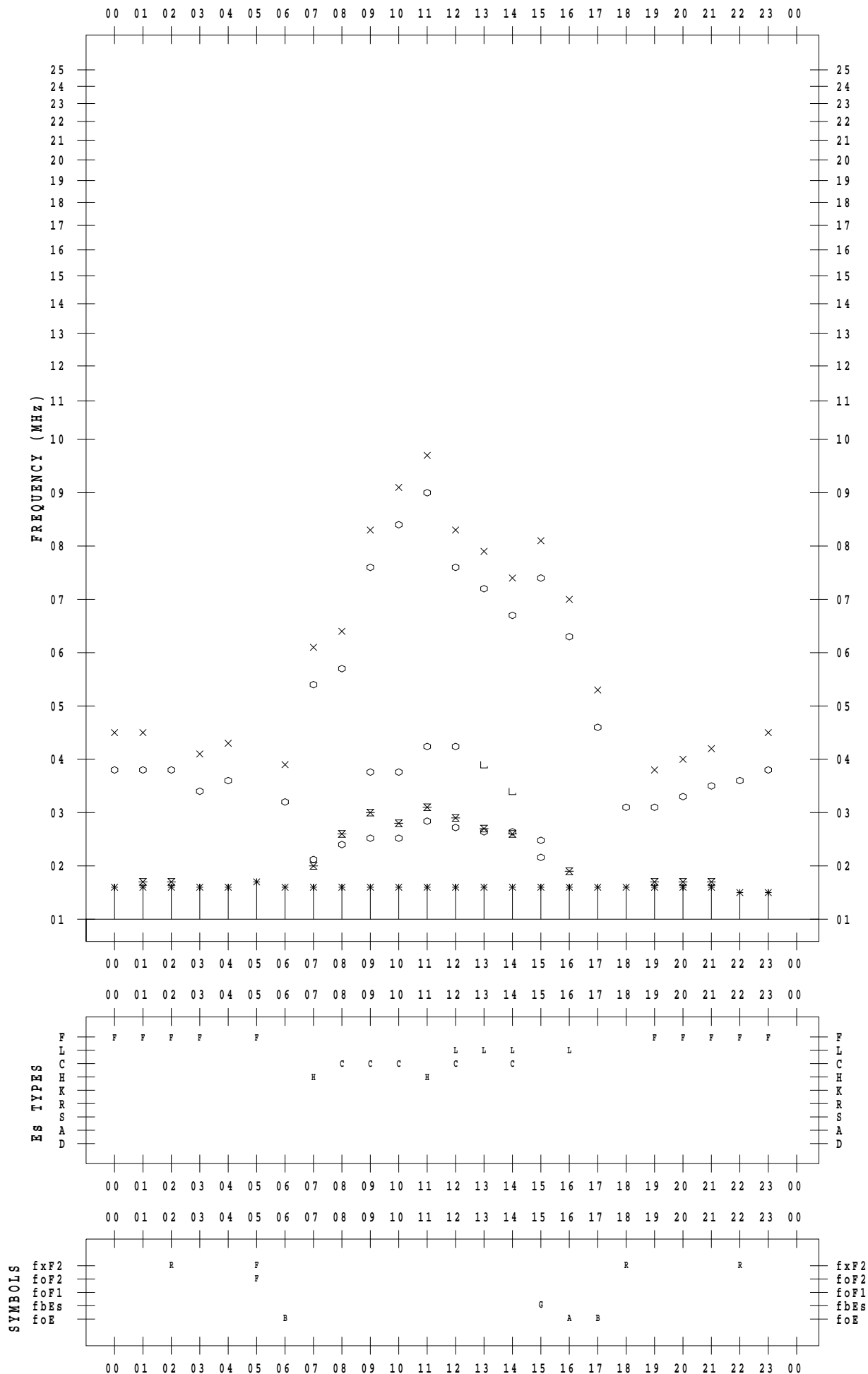
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 7

135 ° E MEAN TIME



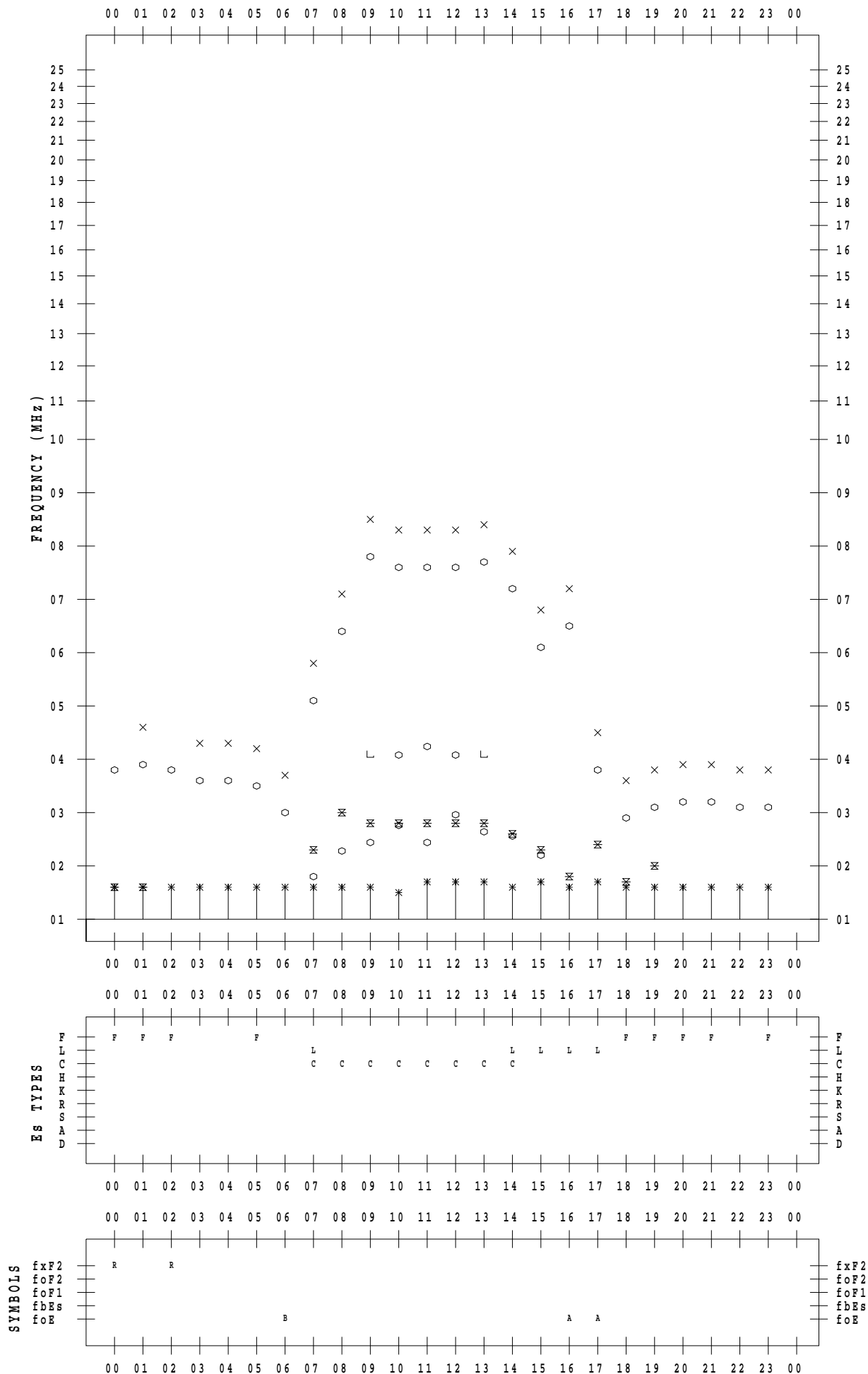
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 8

135 ° E MEAN TIME



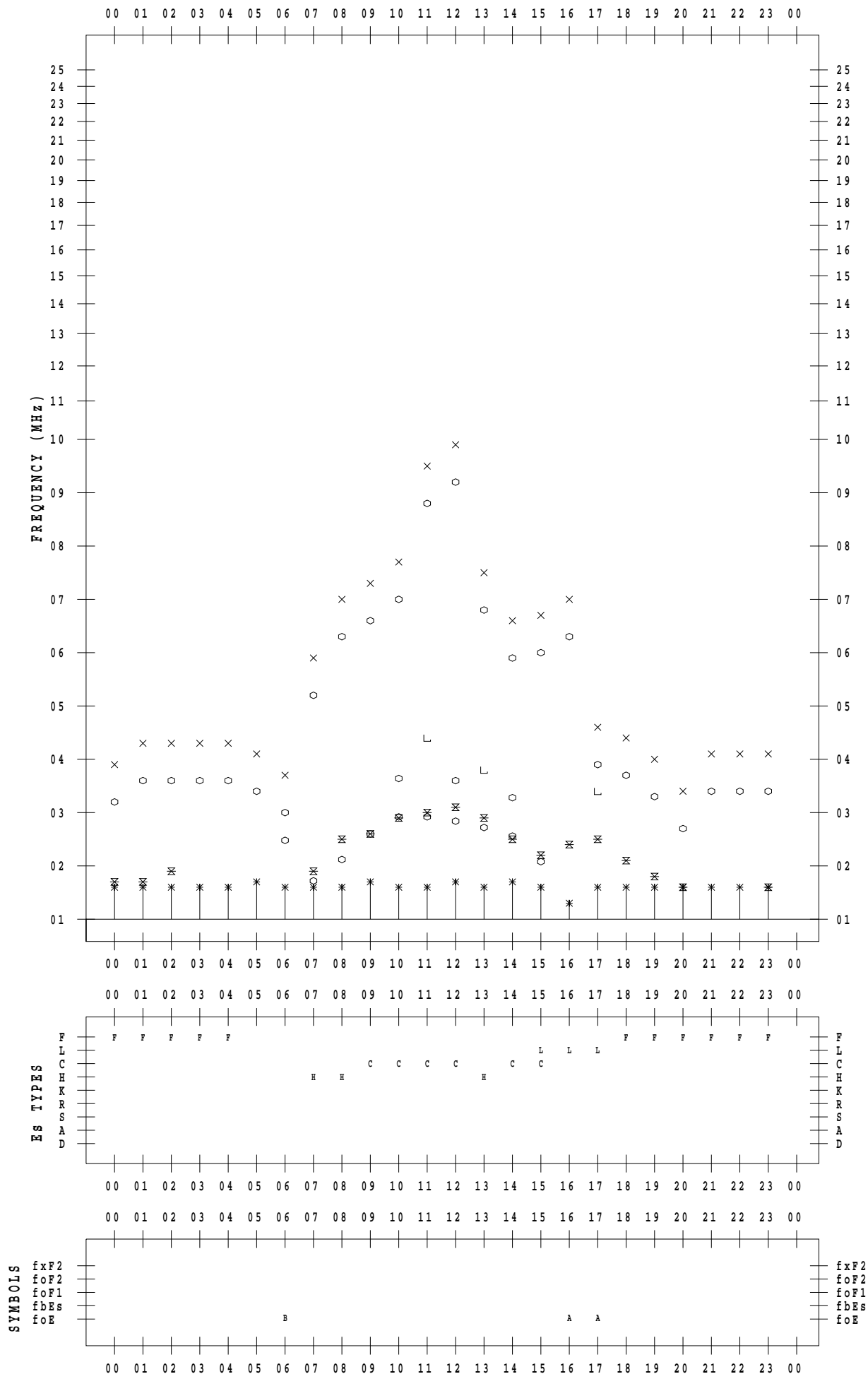
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/ 9

135 ° E MEAN TIME



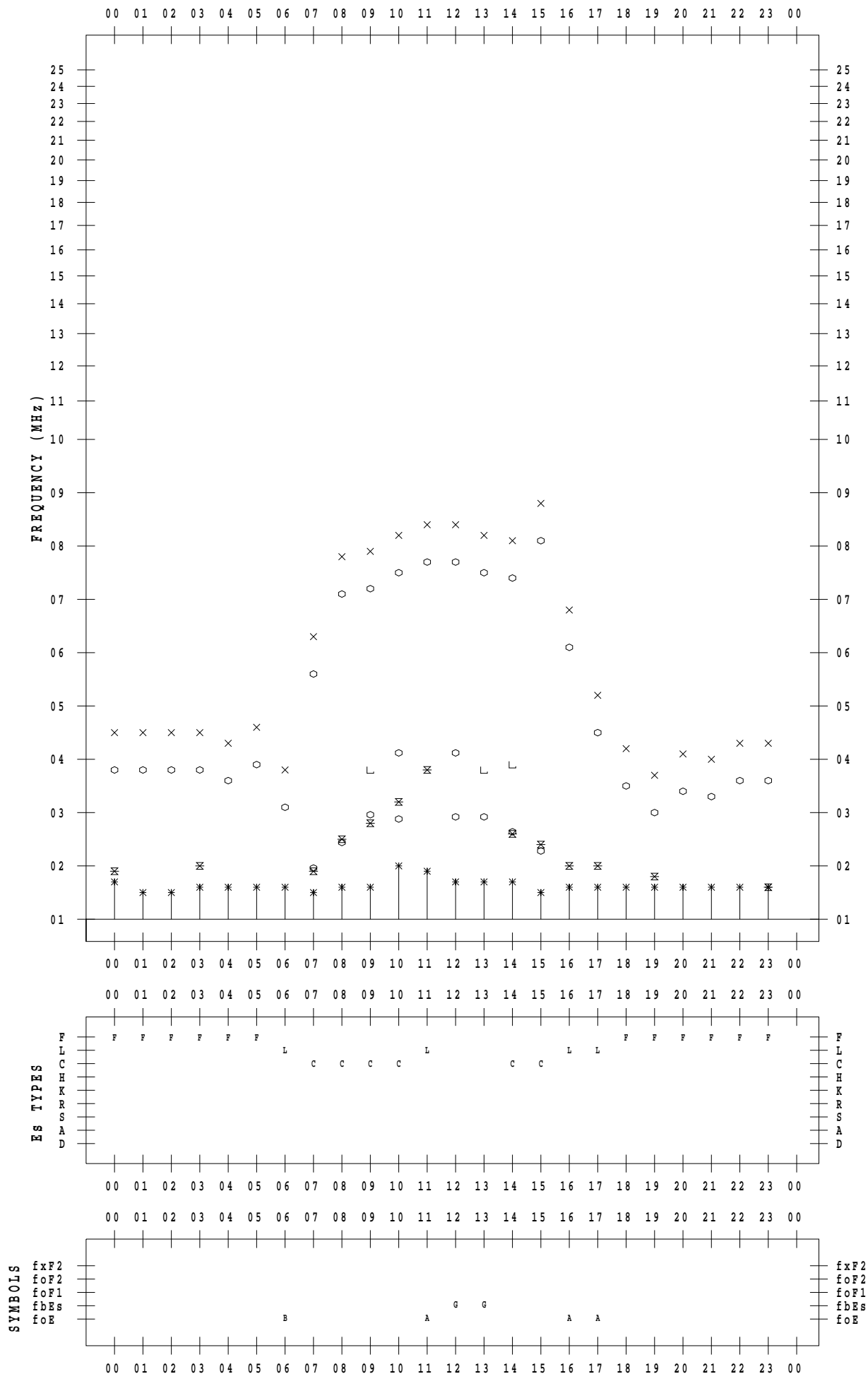
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/10

135 ° E MEAN TIME



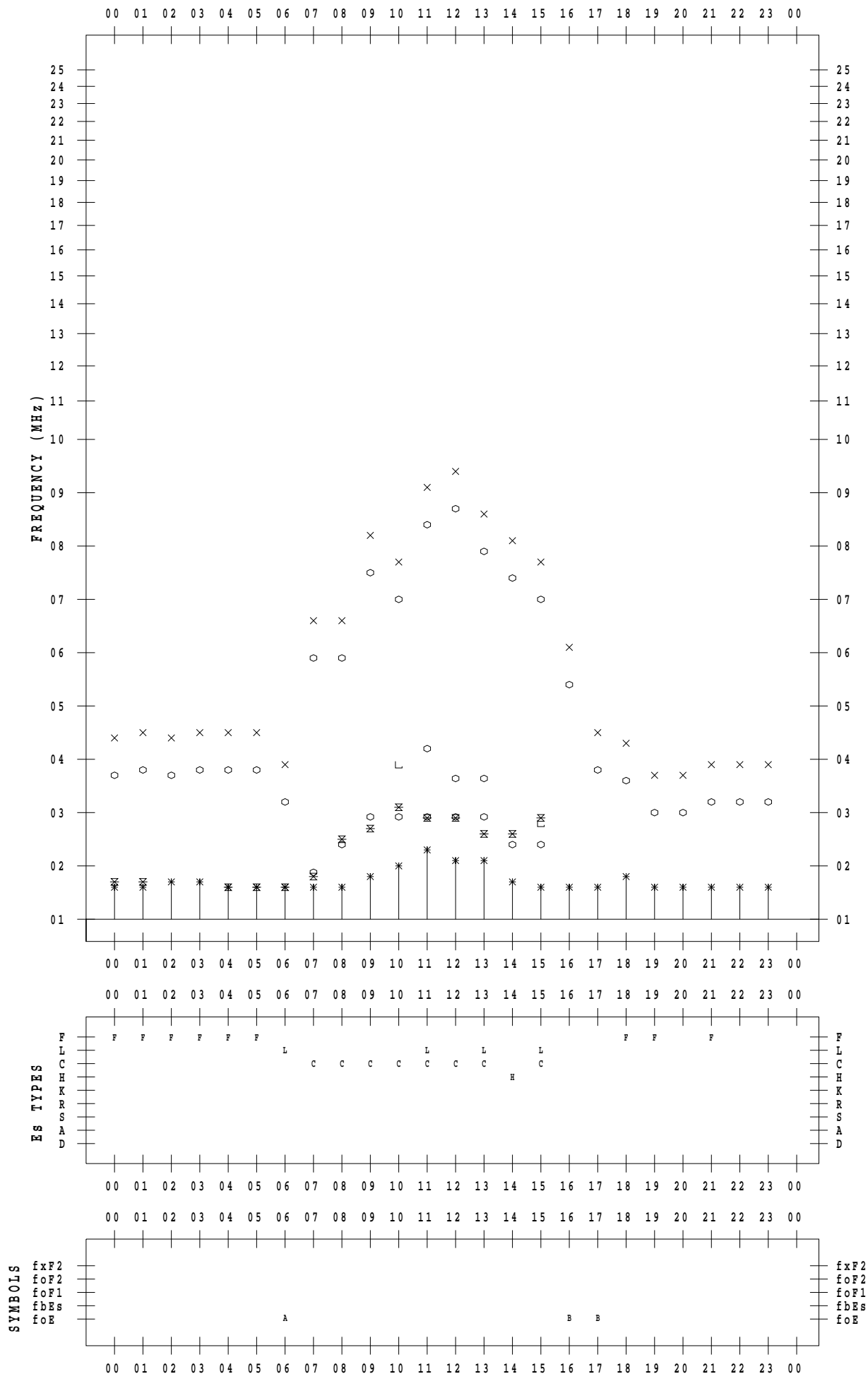
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/11

135 ° E MEAN TIME



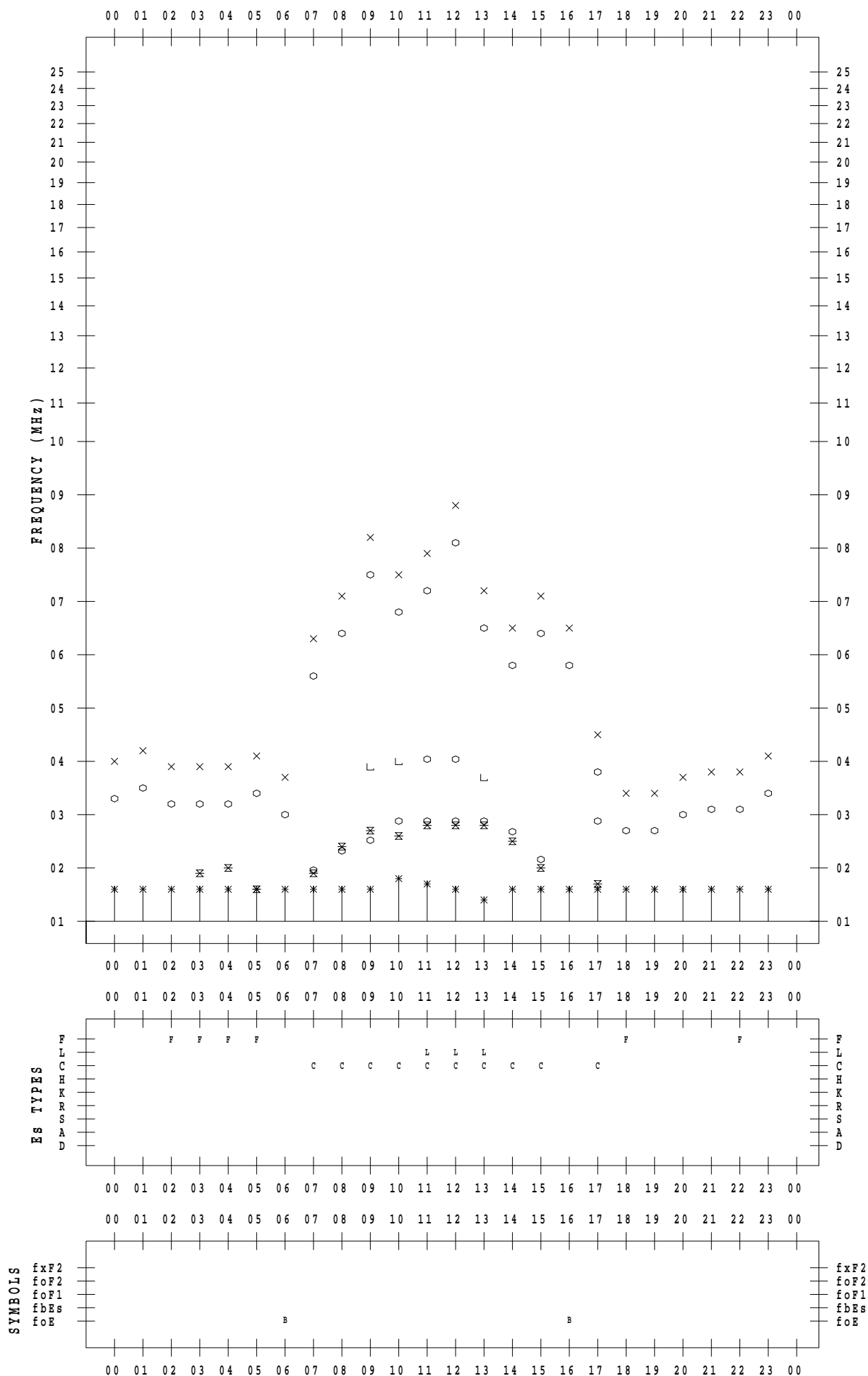
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/12

135 ° E MEAN TIME



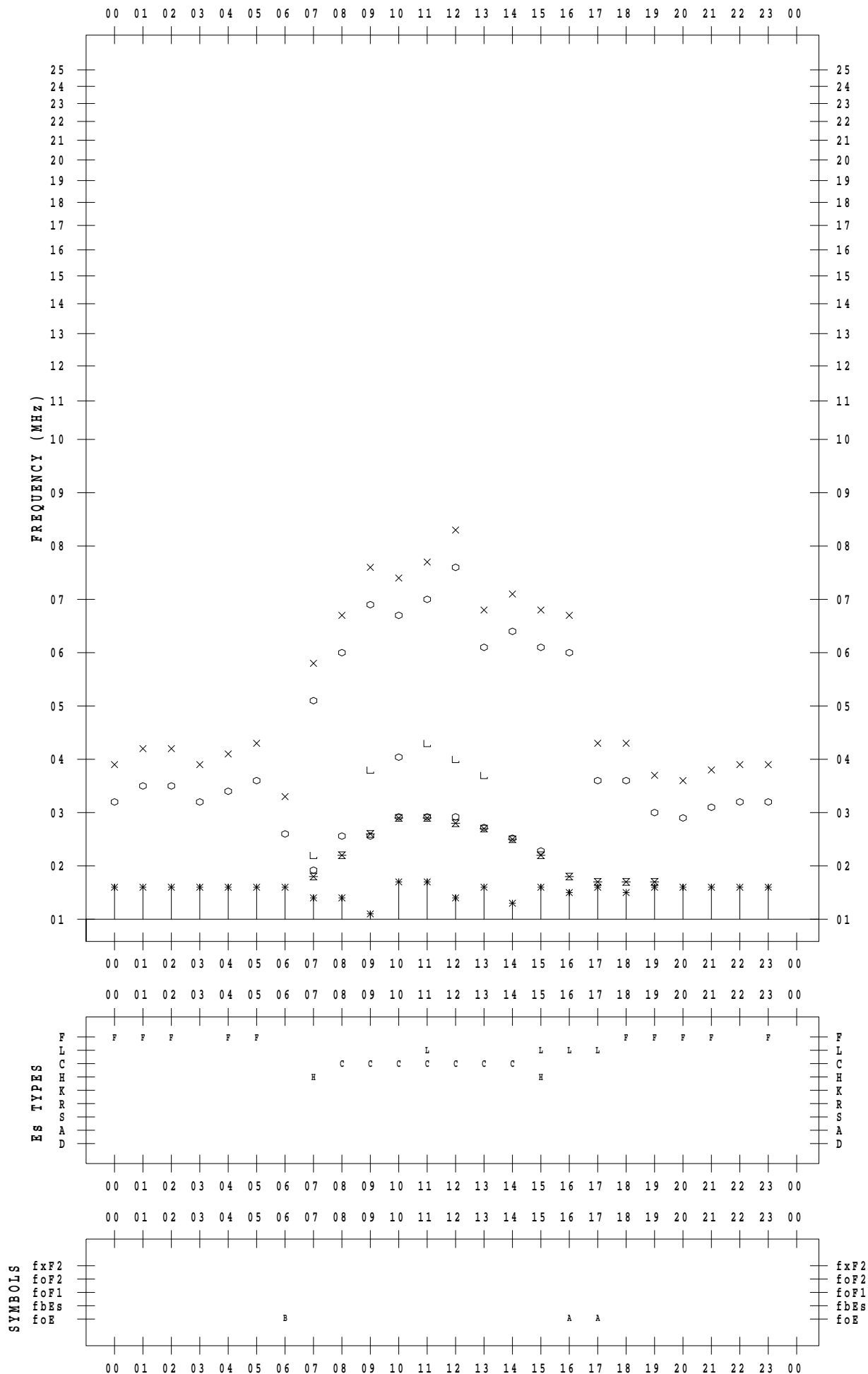
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/13

135 ° E MEAN TIME



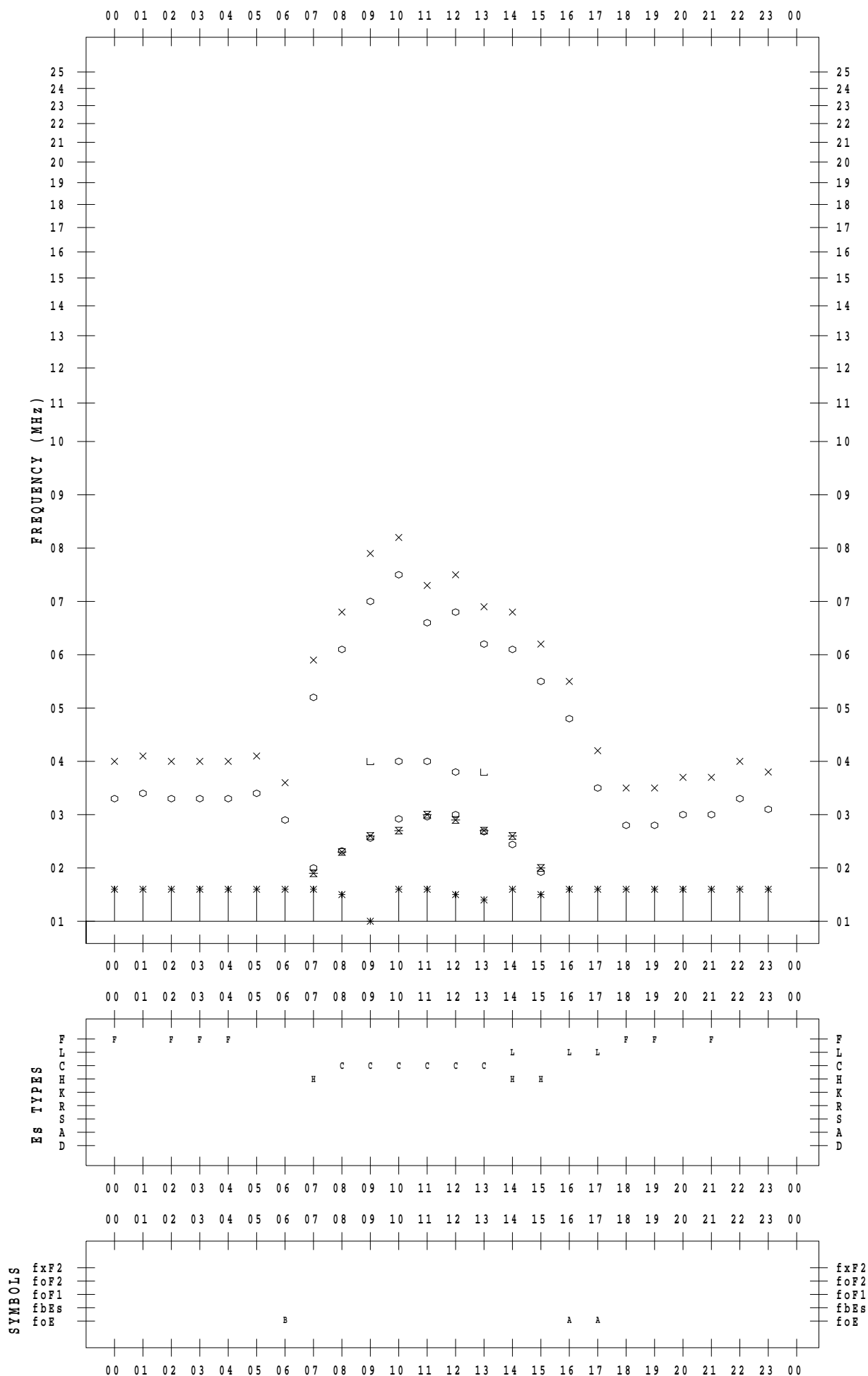
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/14

135 ° E MEAN TIME



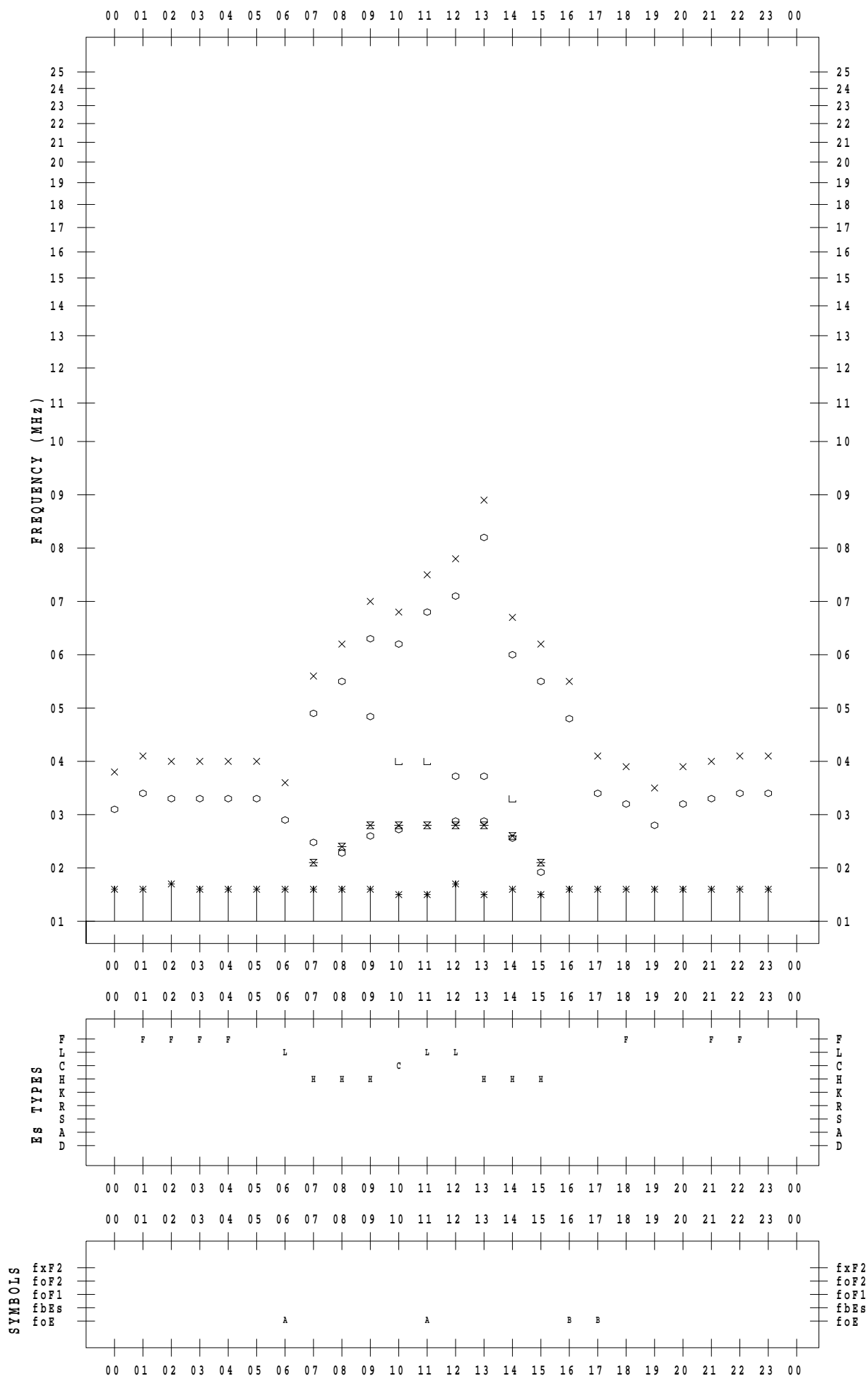
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/15

135 ° E MEAN TIME



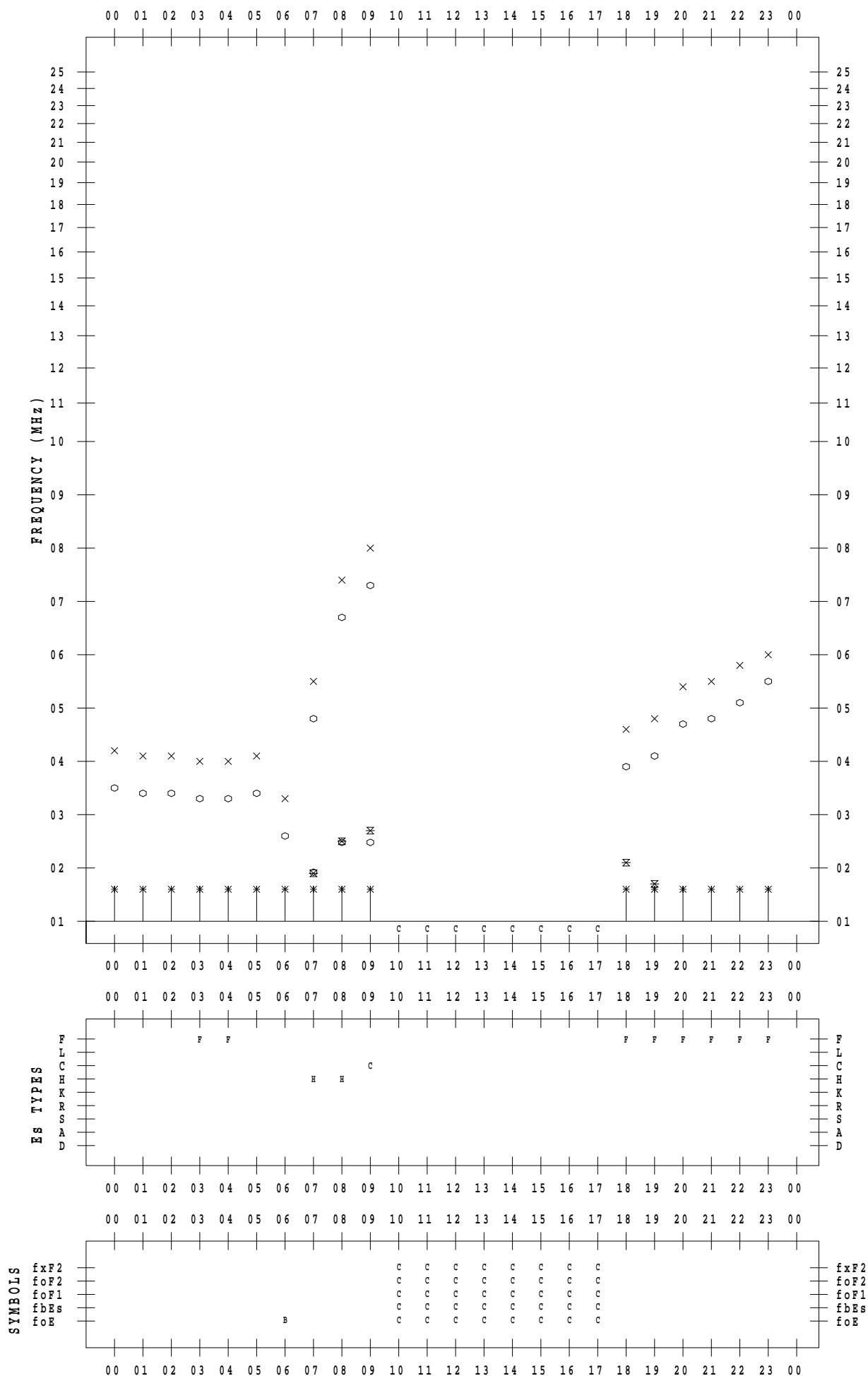
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/16

135 ° E MEAN TIME



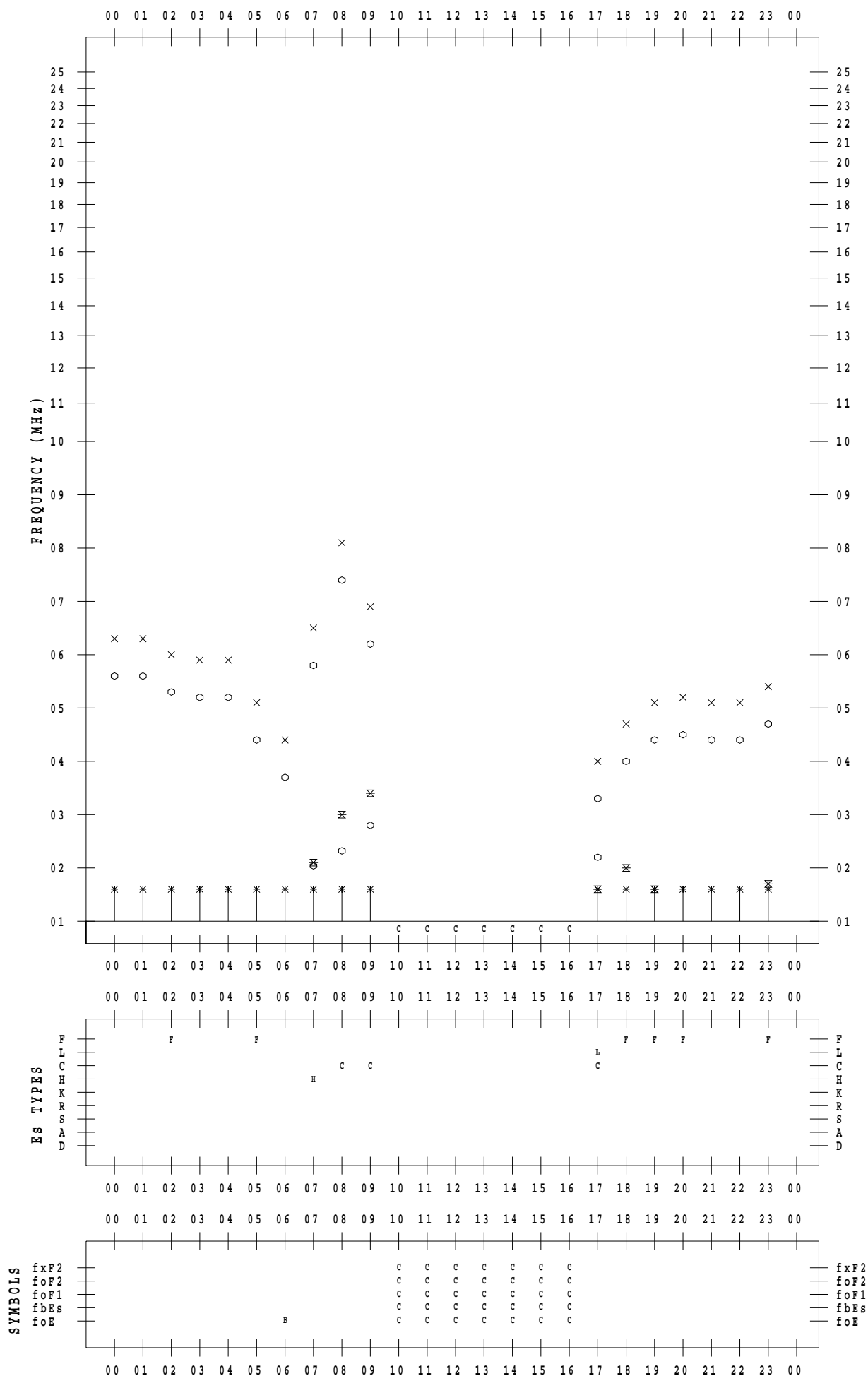
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/17

135 ° E MEAN TIME



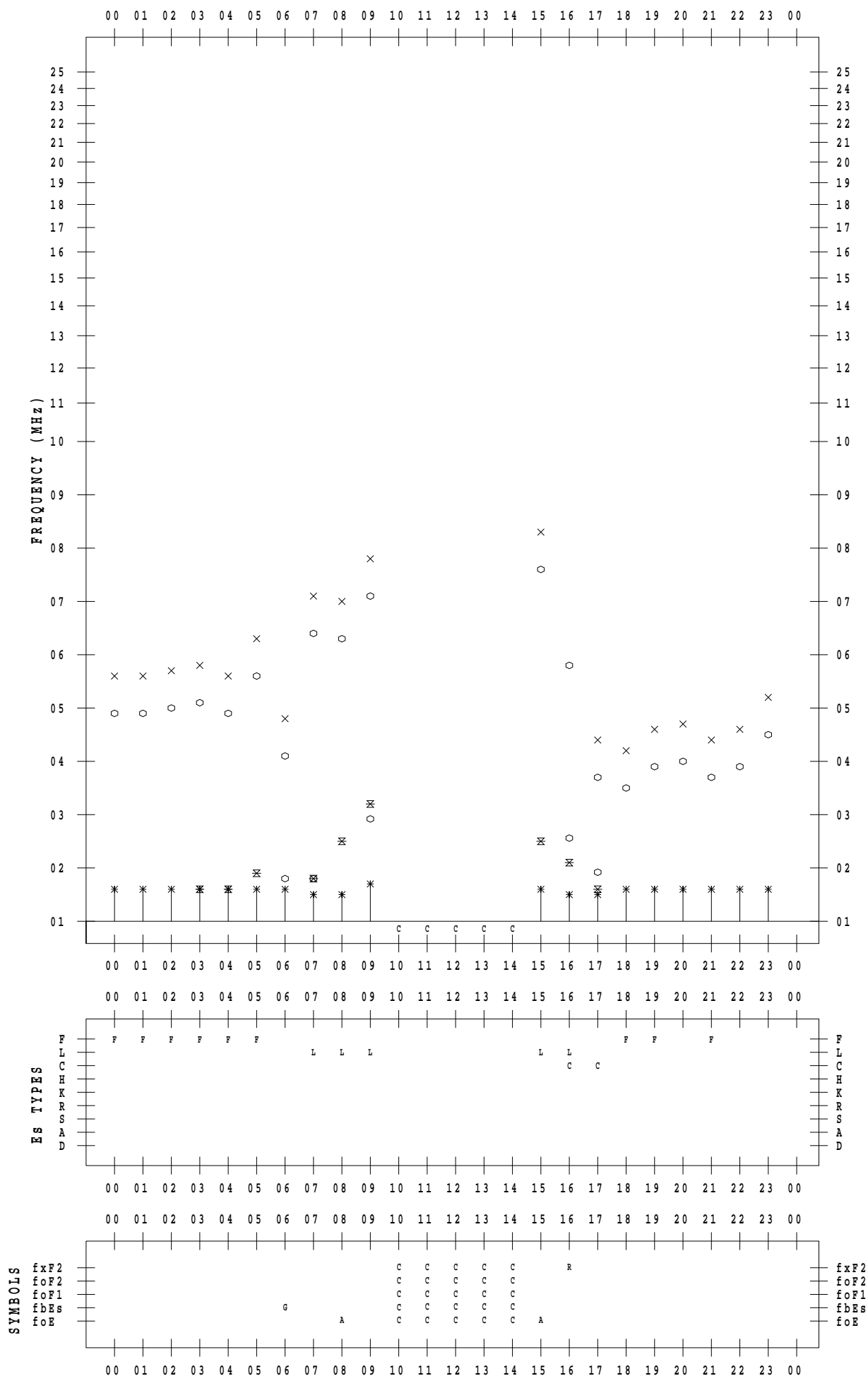
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/18

135 ° E MEAN TIME



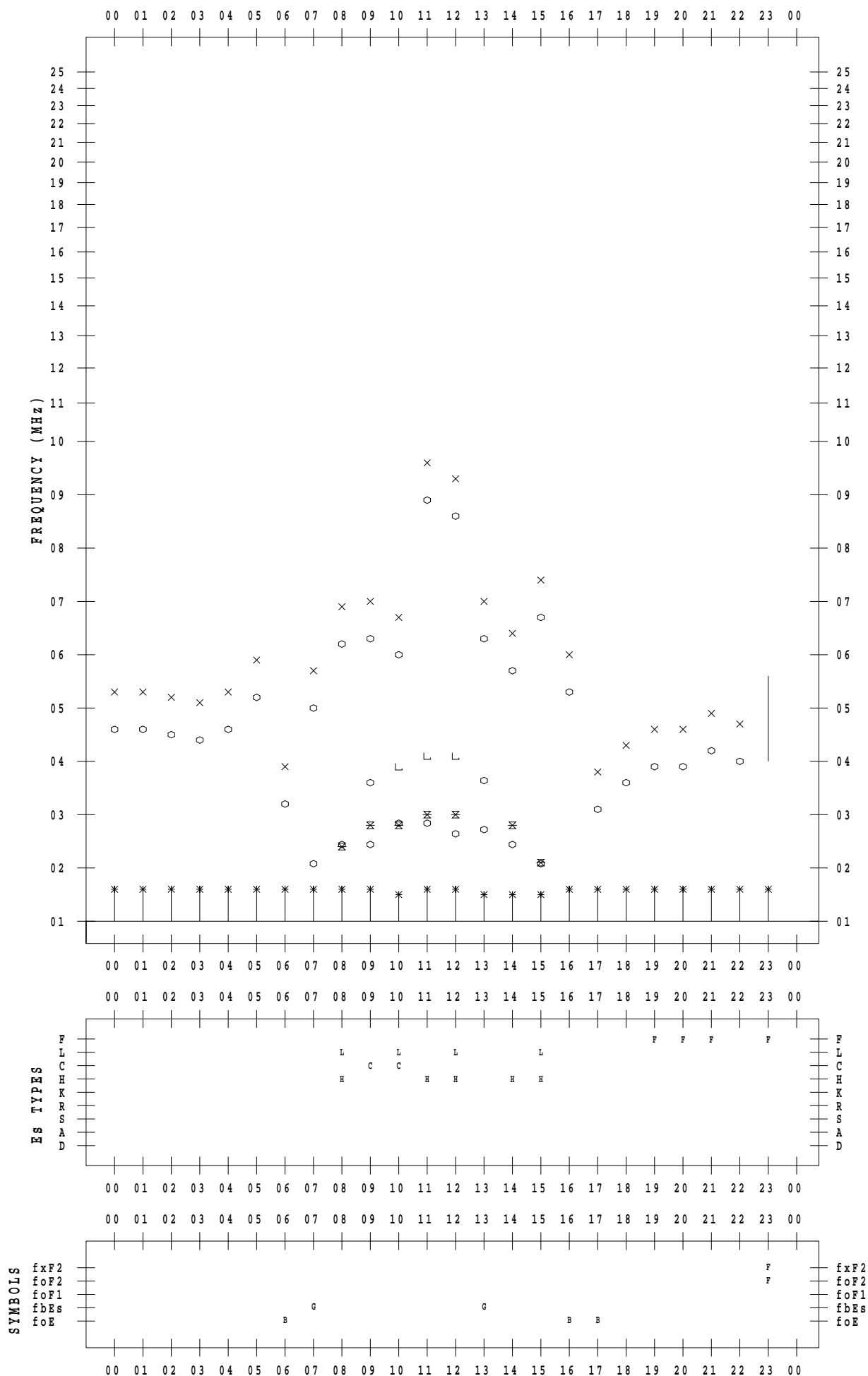
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/19

135 ° E MEAN TIME



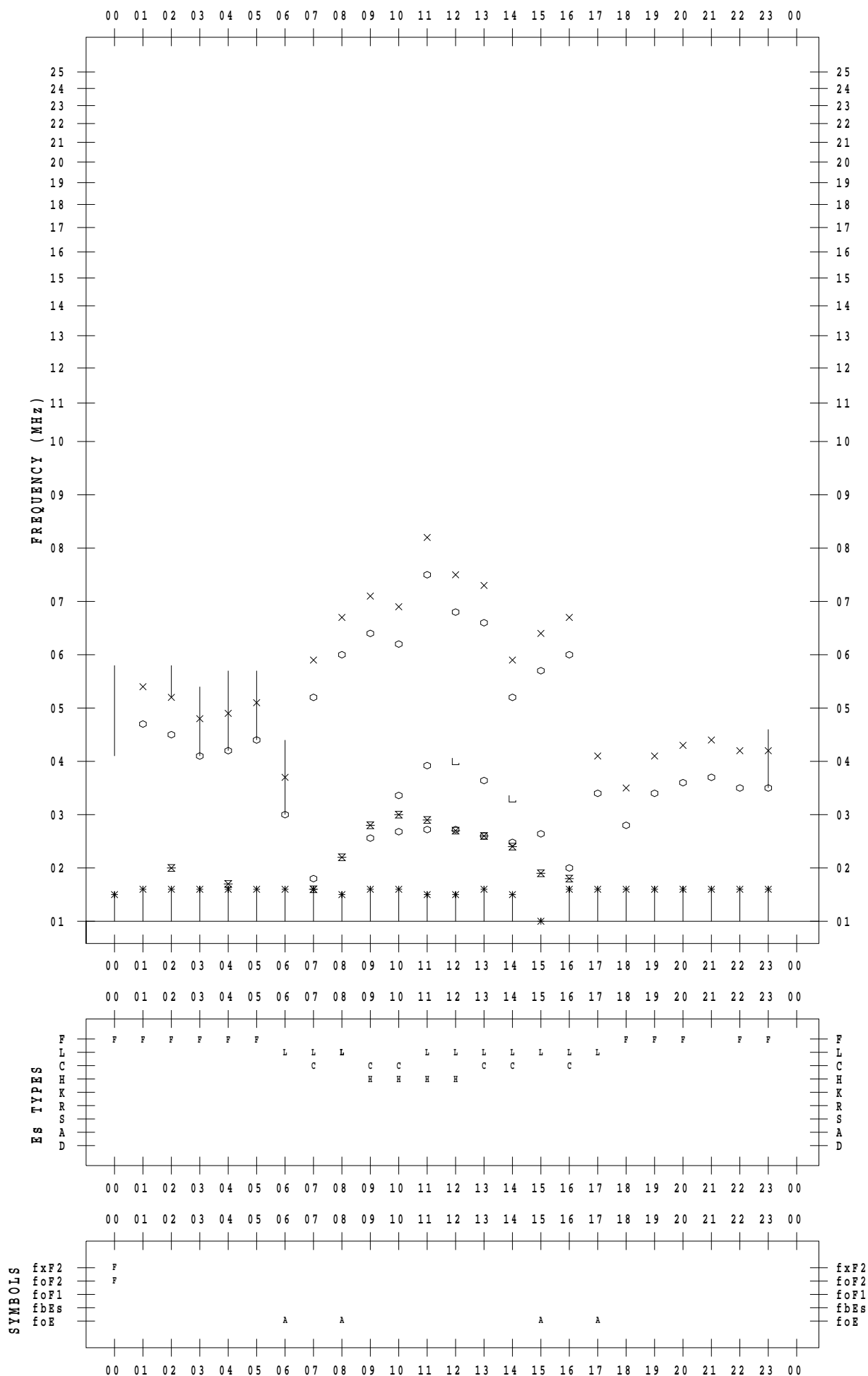
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/20

135 ° E MEAN TIME



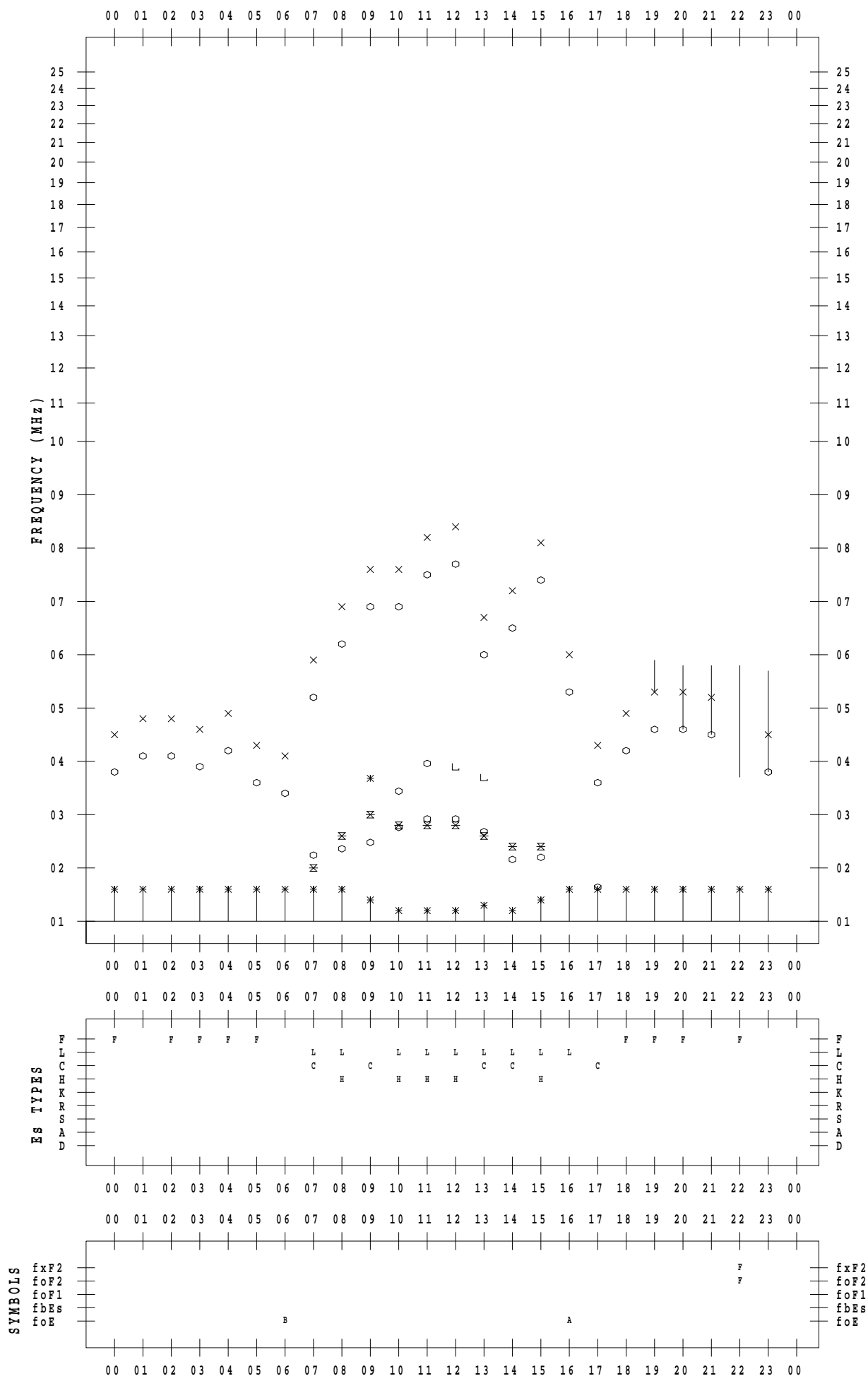
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/21

135 ° E MEAN TIME



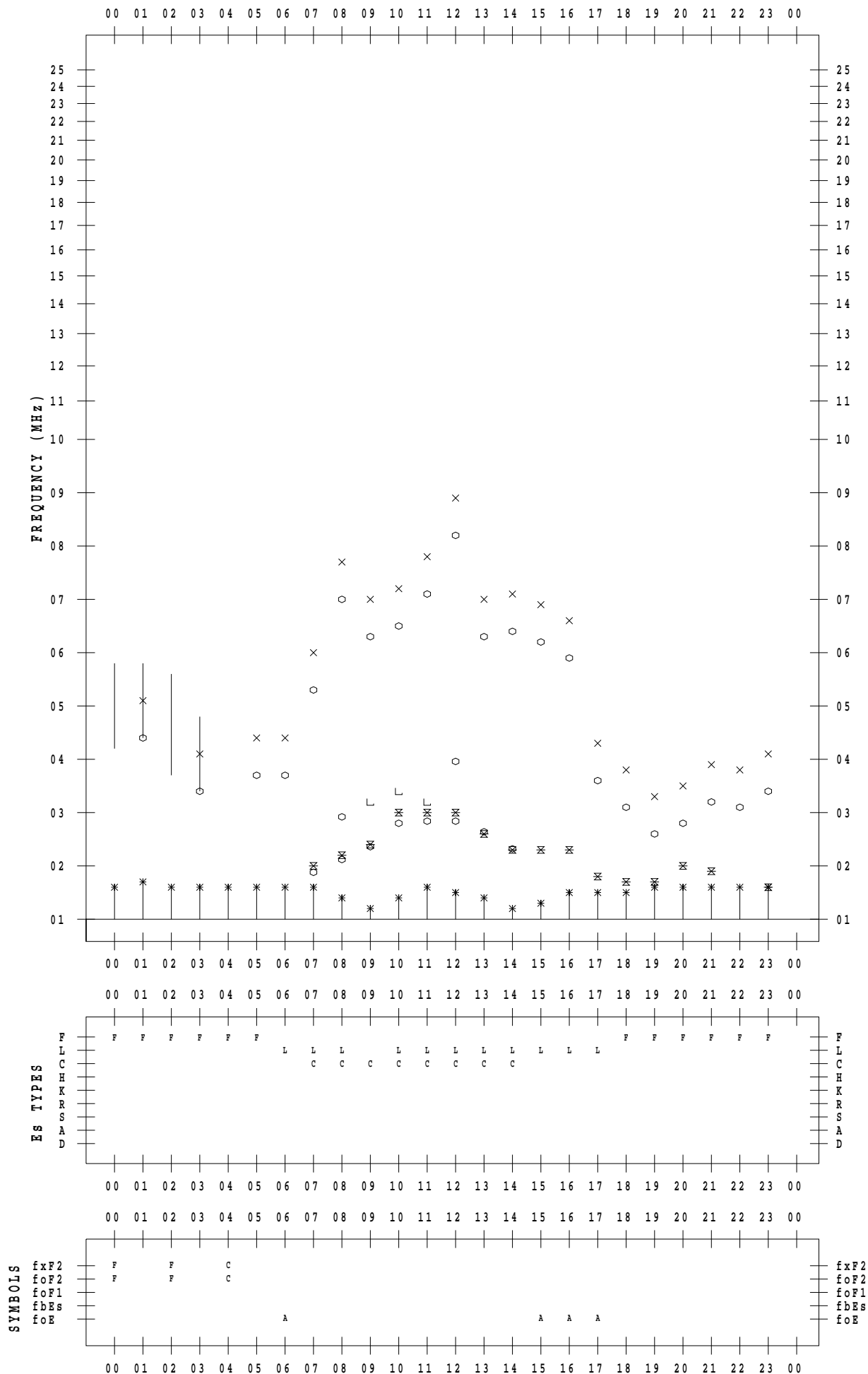
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/22

135 ° E MEAN TIME



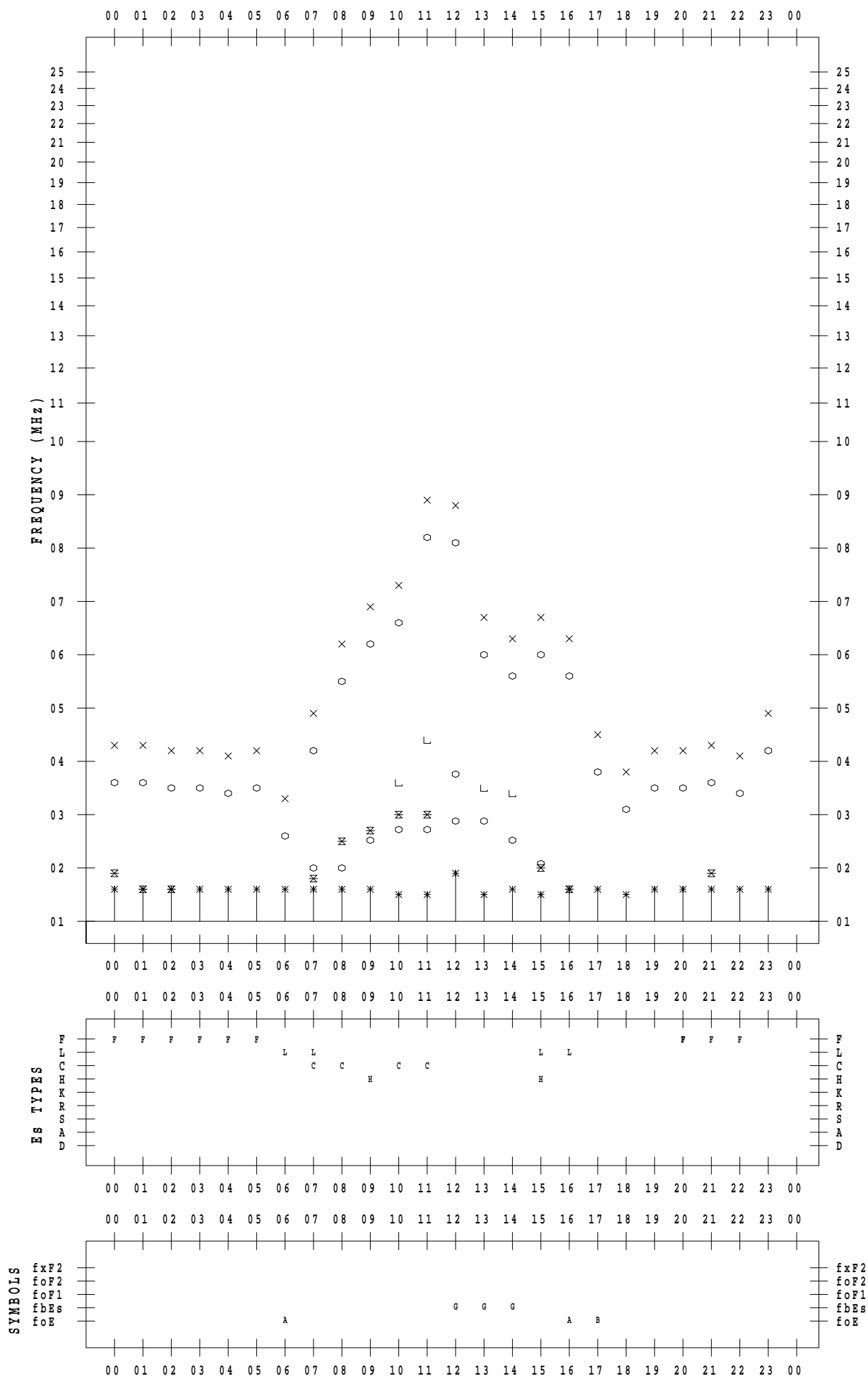
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/23

135 ° E MEAN TIME



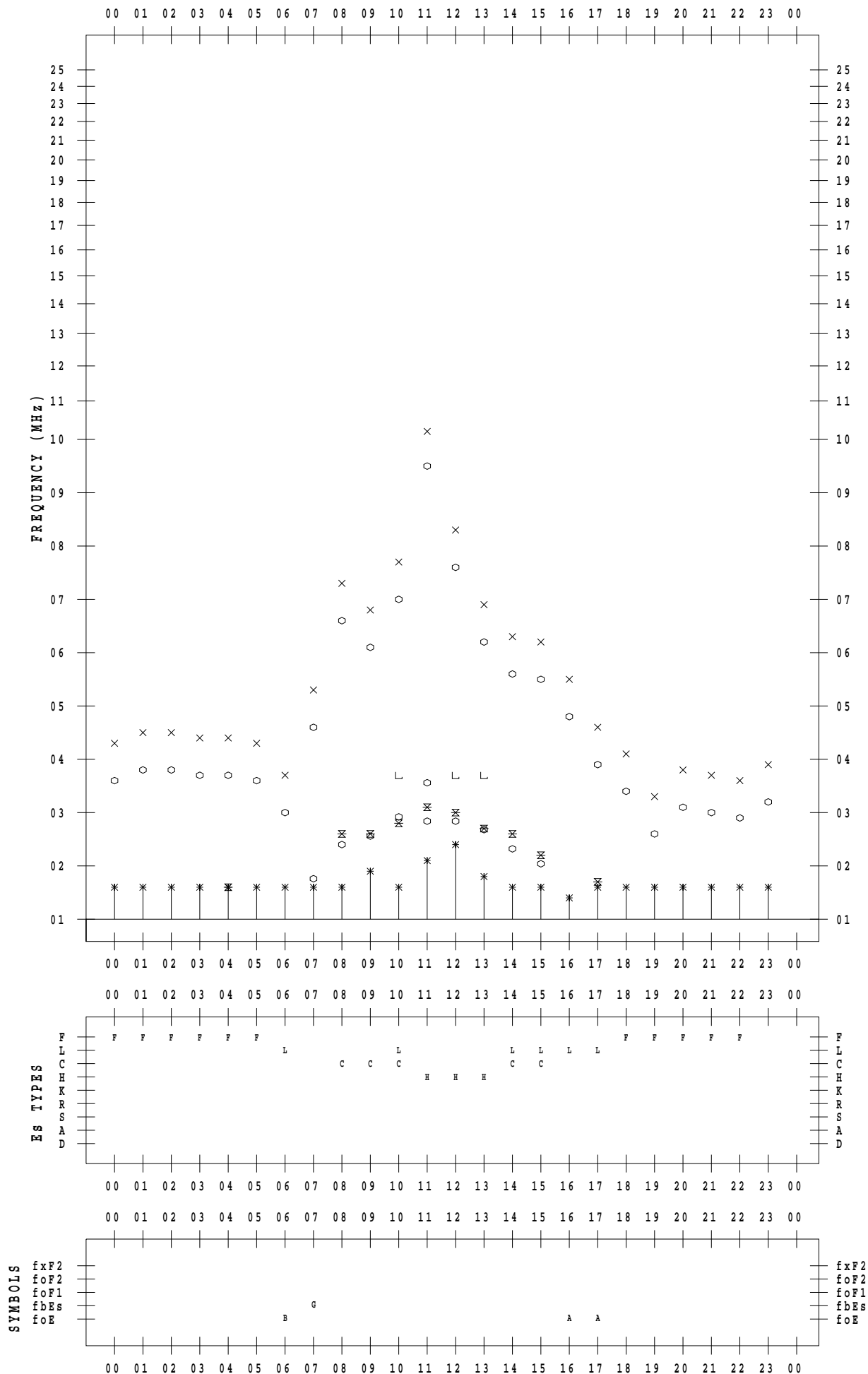
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/24

135 ° E MEAN TIME



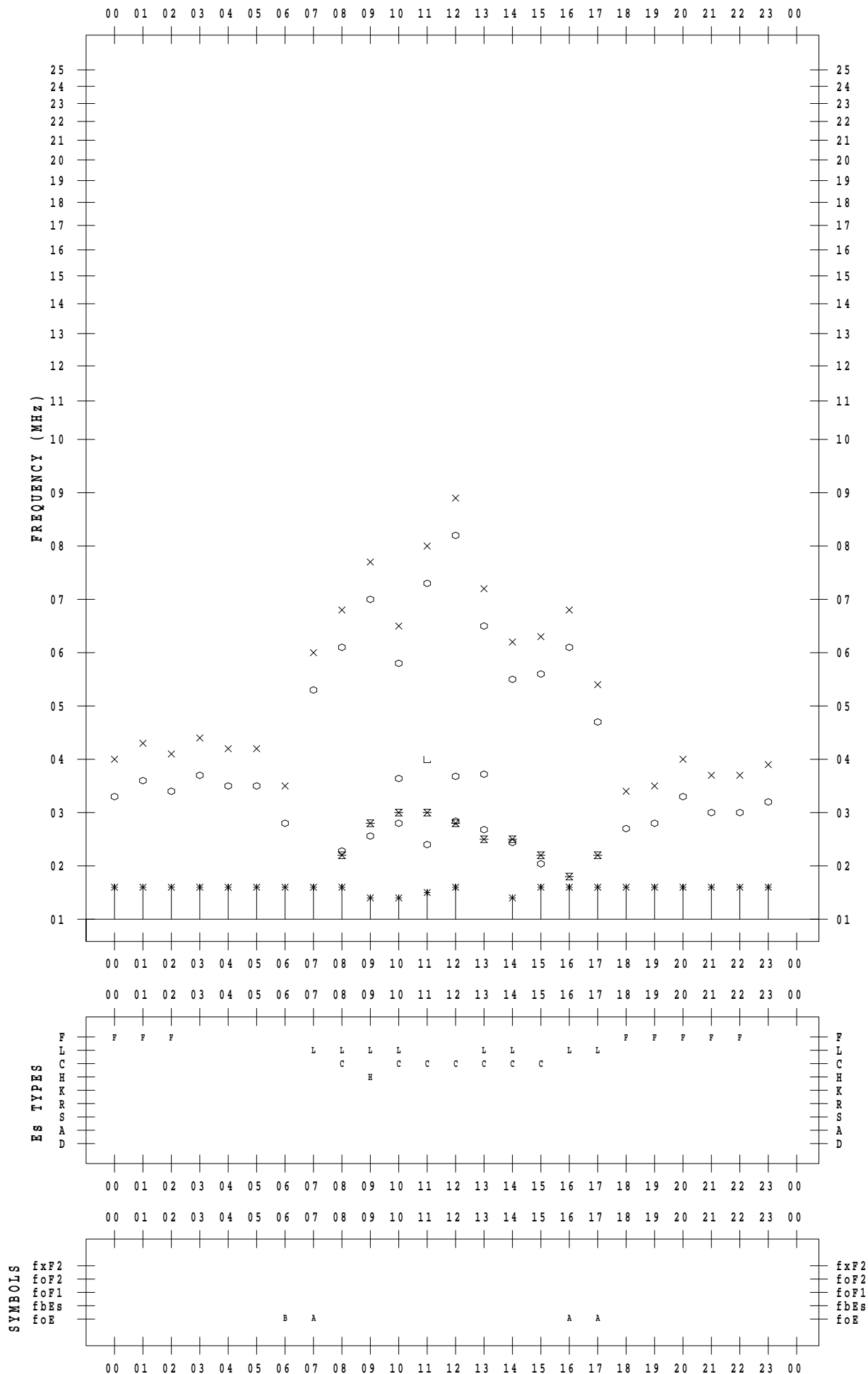
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/25

135 ° E MEAN TIME



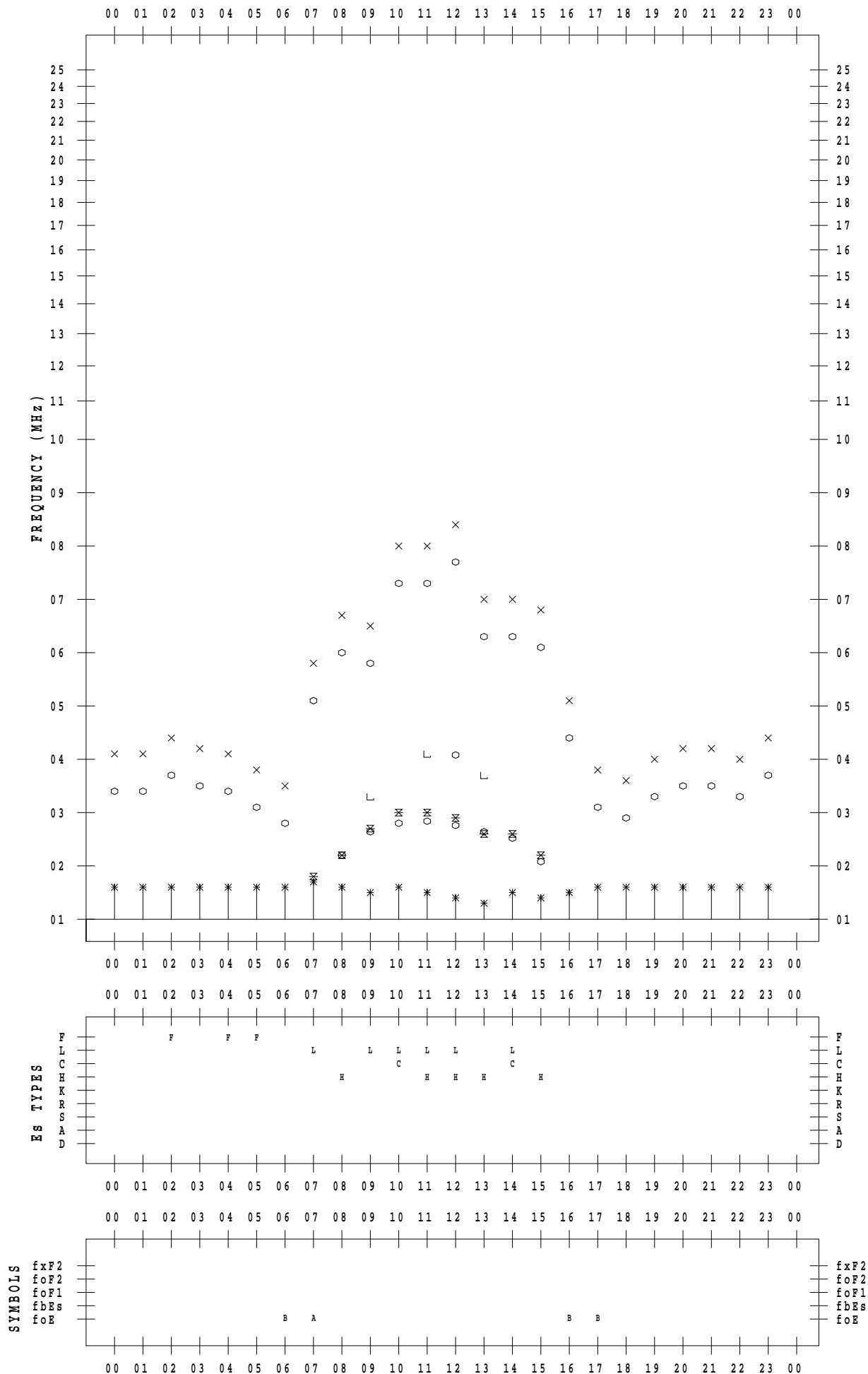
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/26

135 ° E MEAN TIME



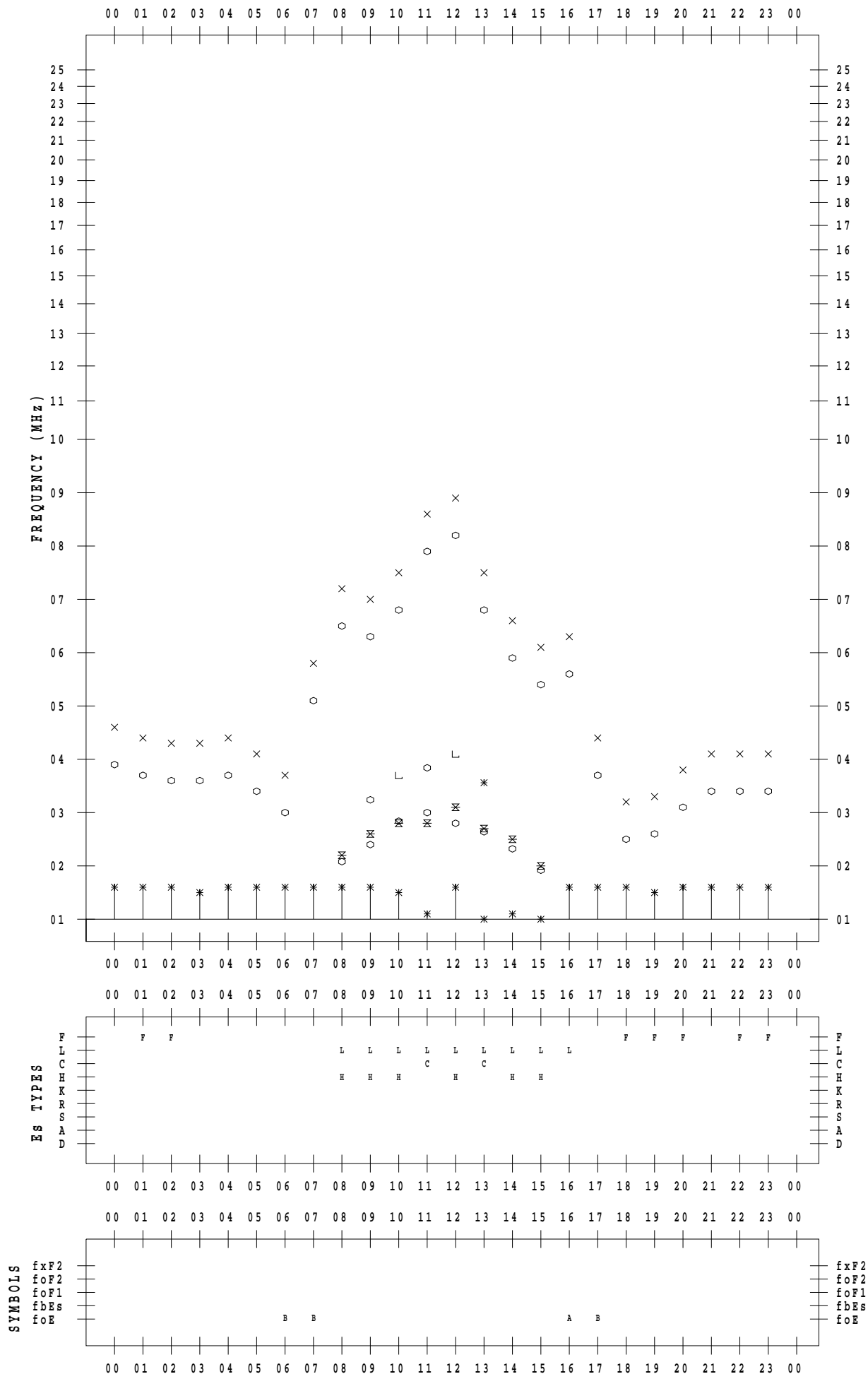
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/27

135 ° E MEAN TIME



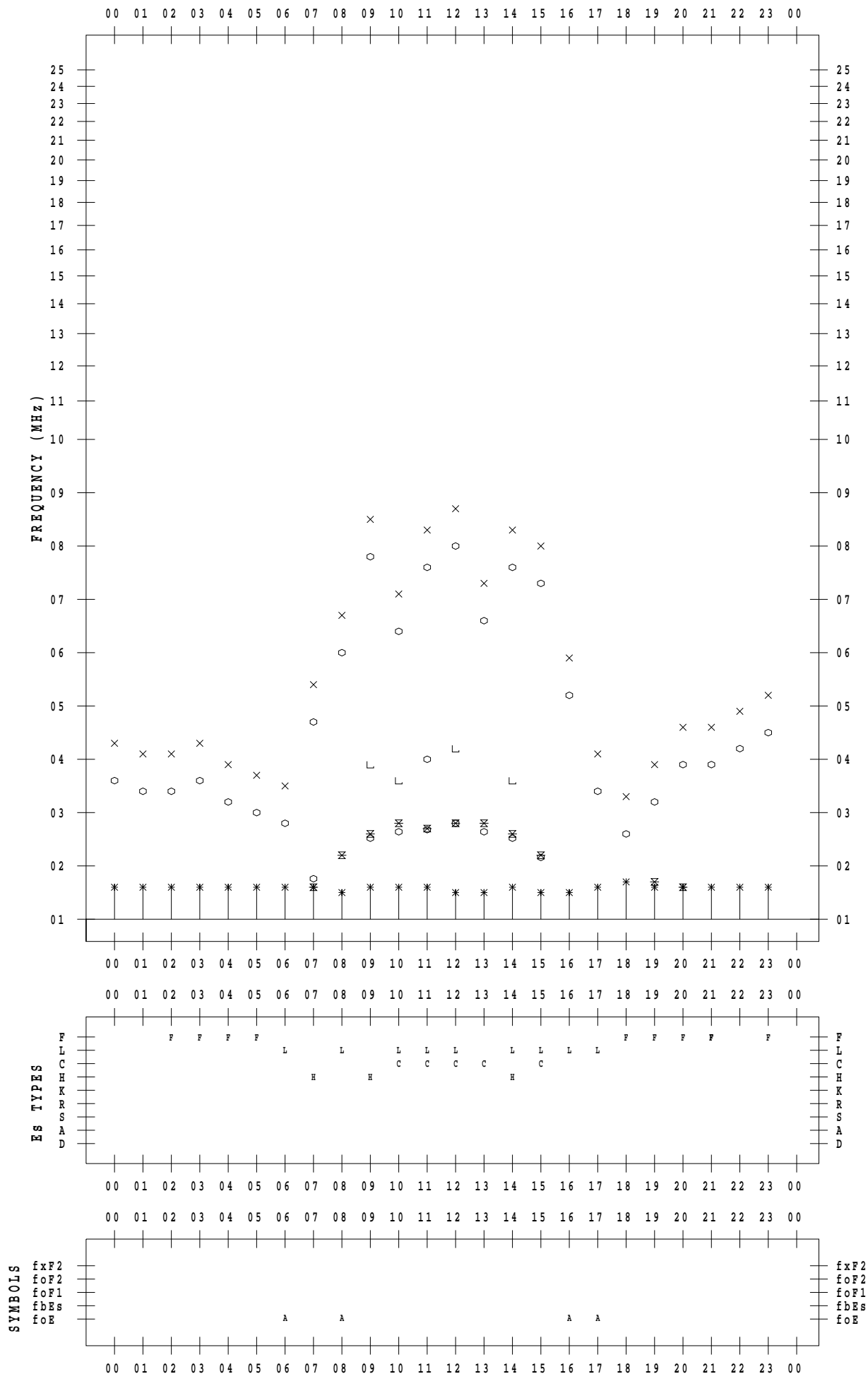
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/28

135 ° E MEAN TIME



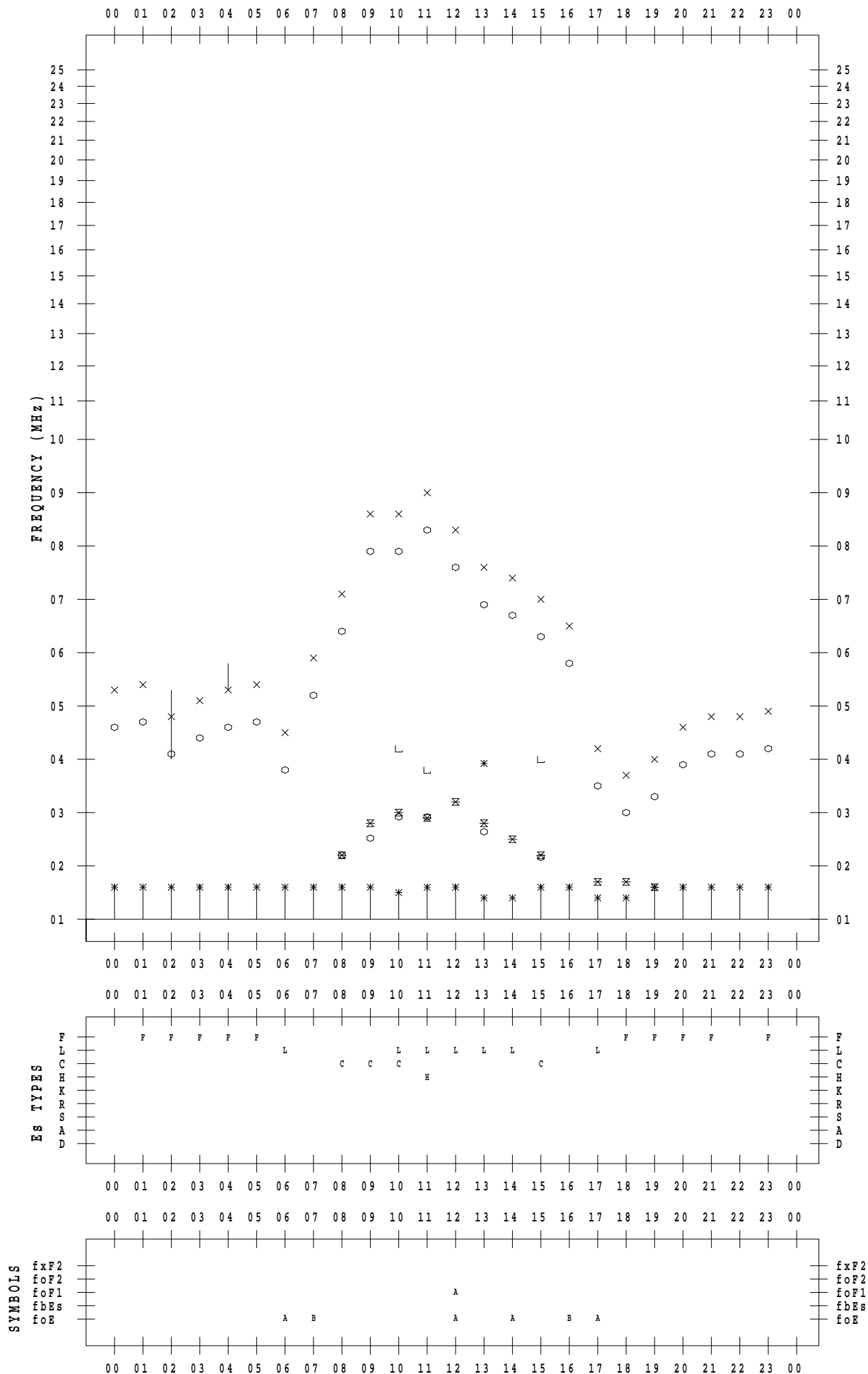
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/29

135 ° E MEAN TIME



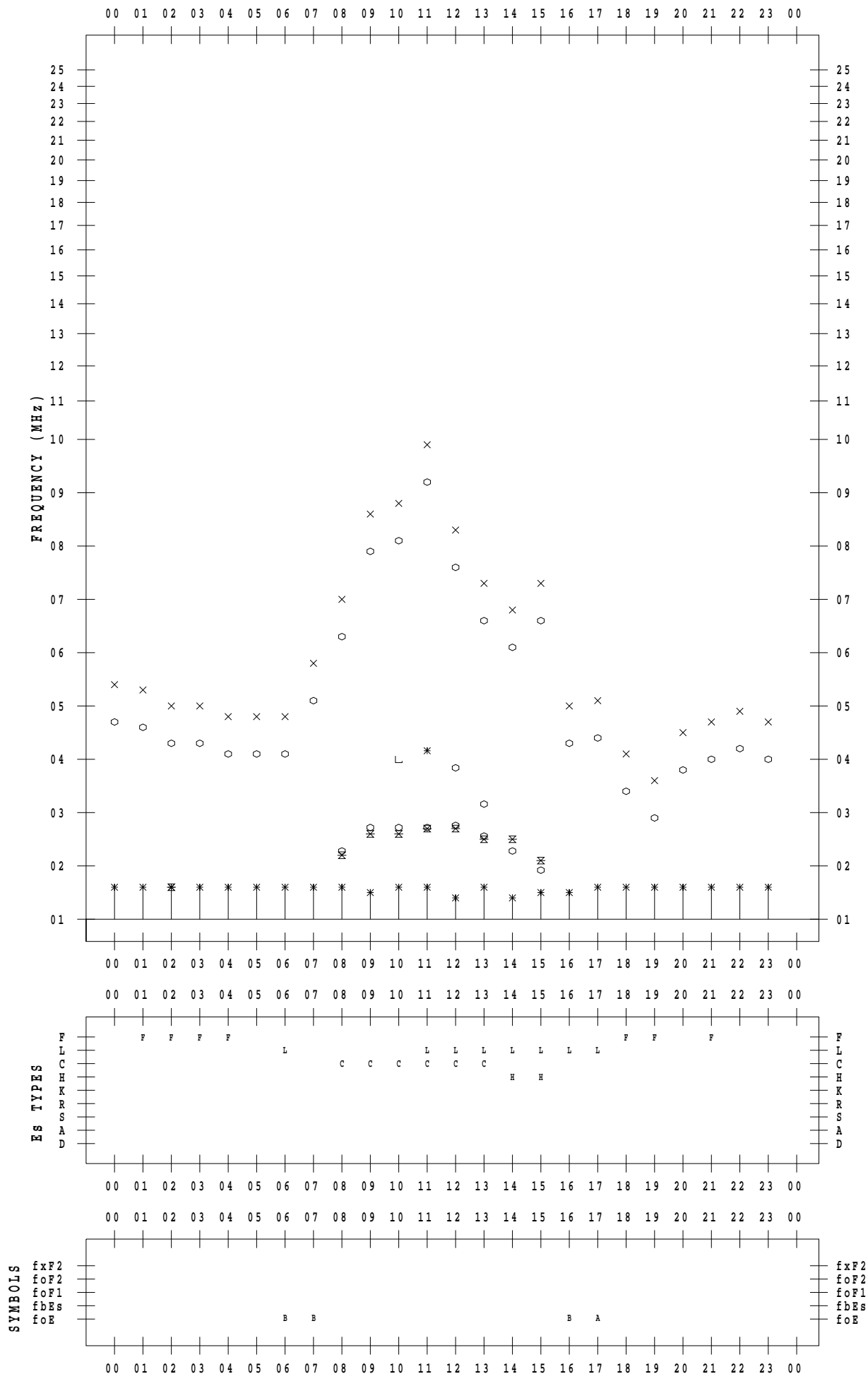
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2021/11/30

135 ° E MEAN TIME



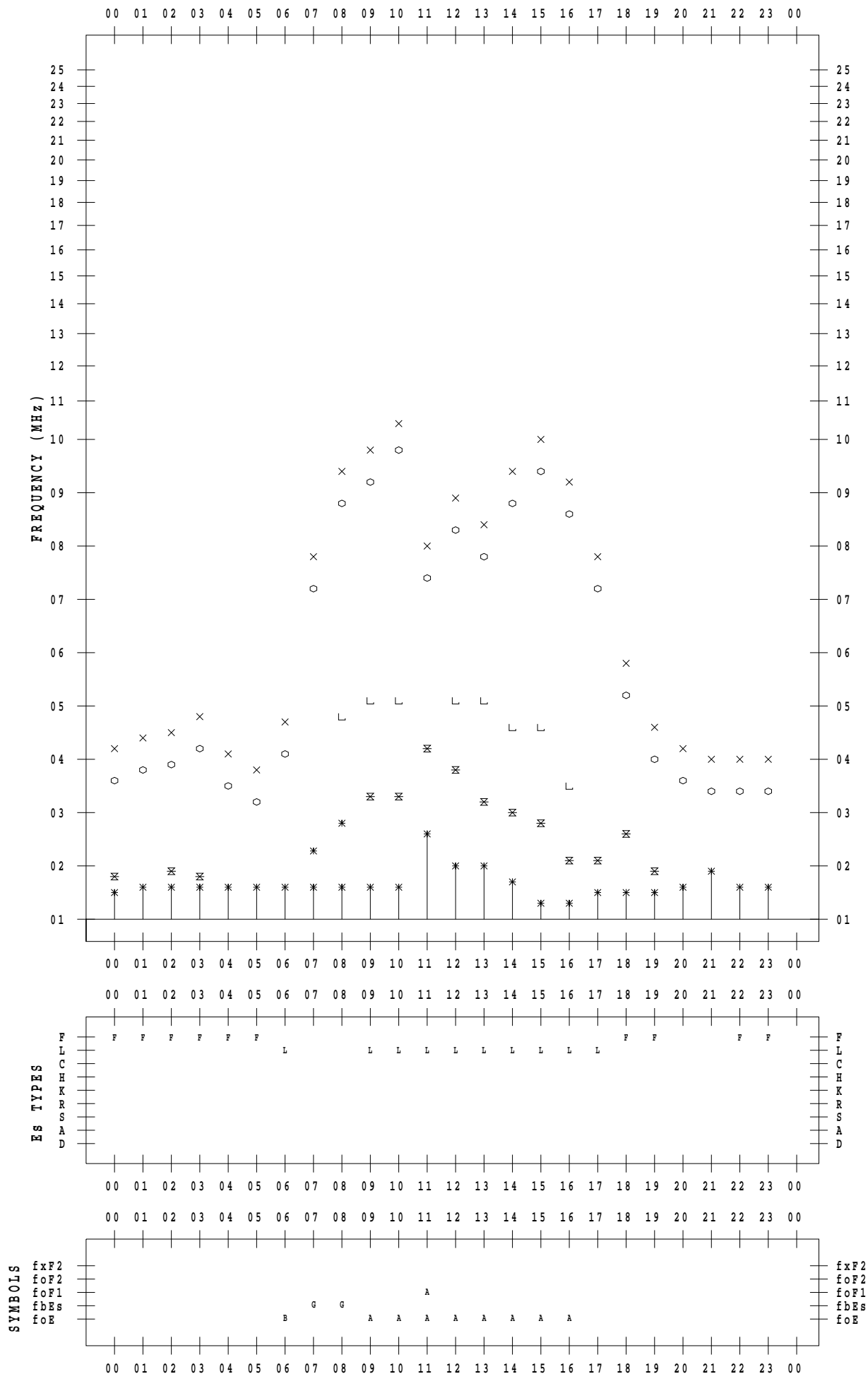
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 1

135 ° E MEAN TIME



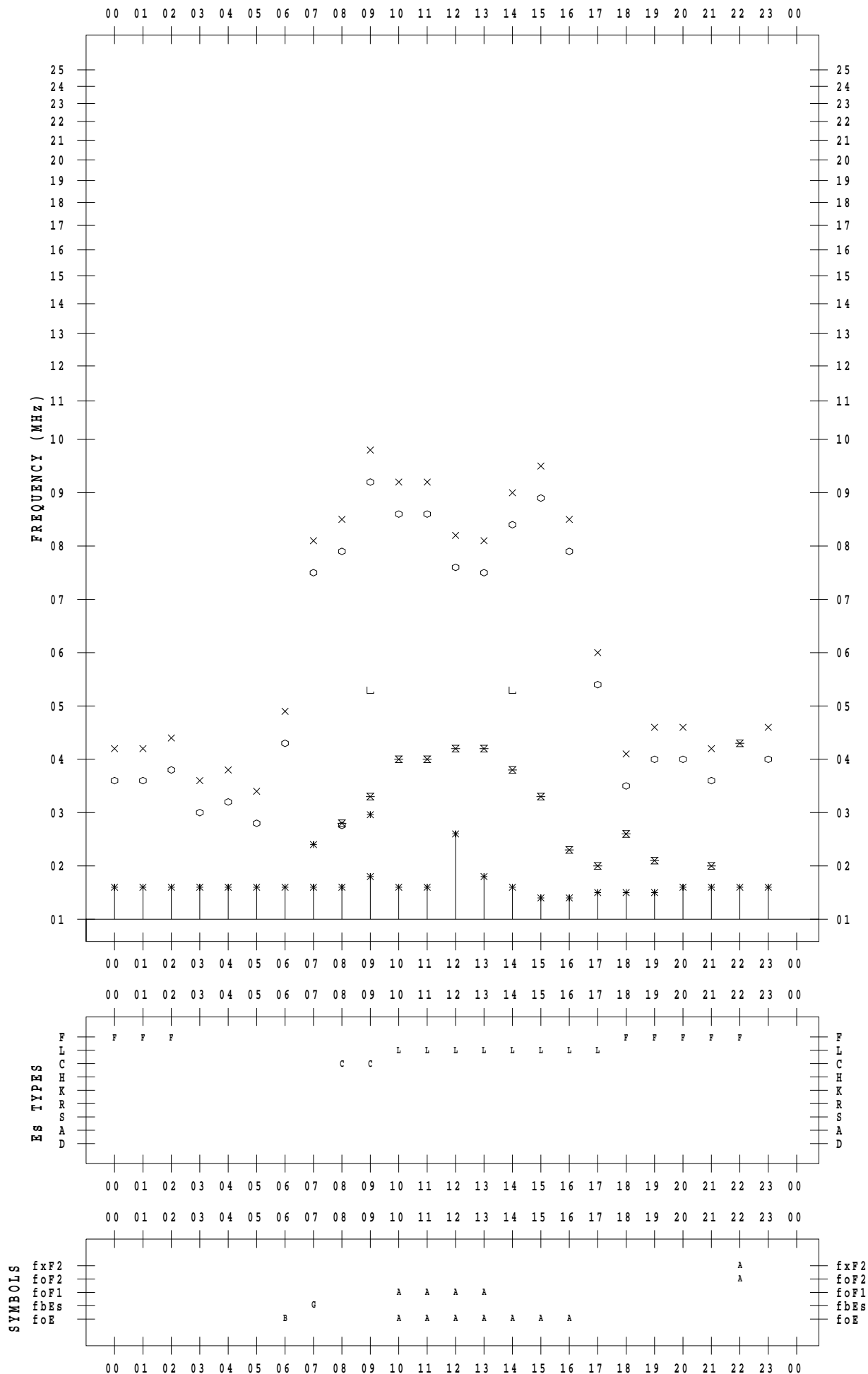
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 2

135 ° E MEAN TIME



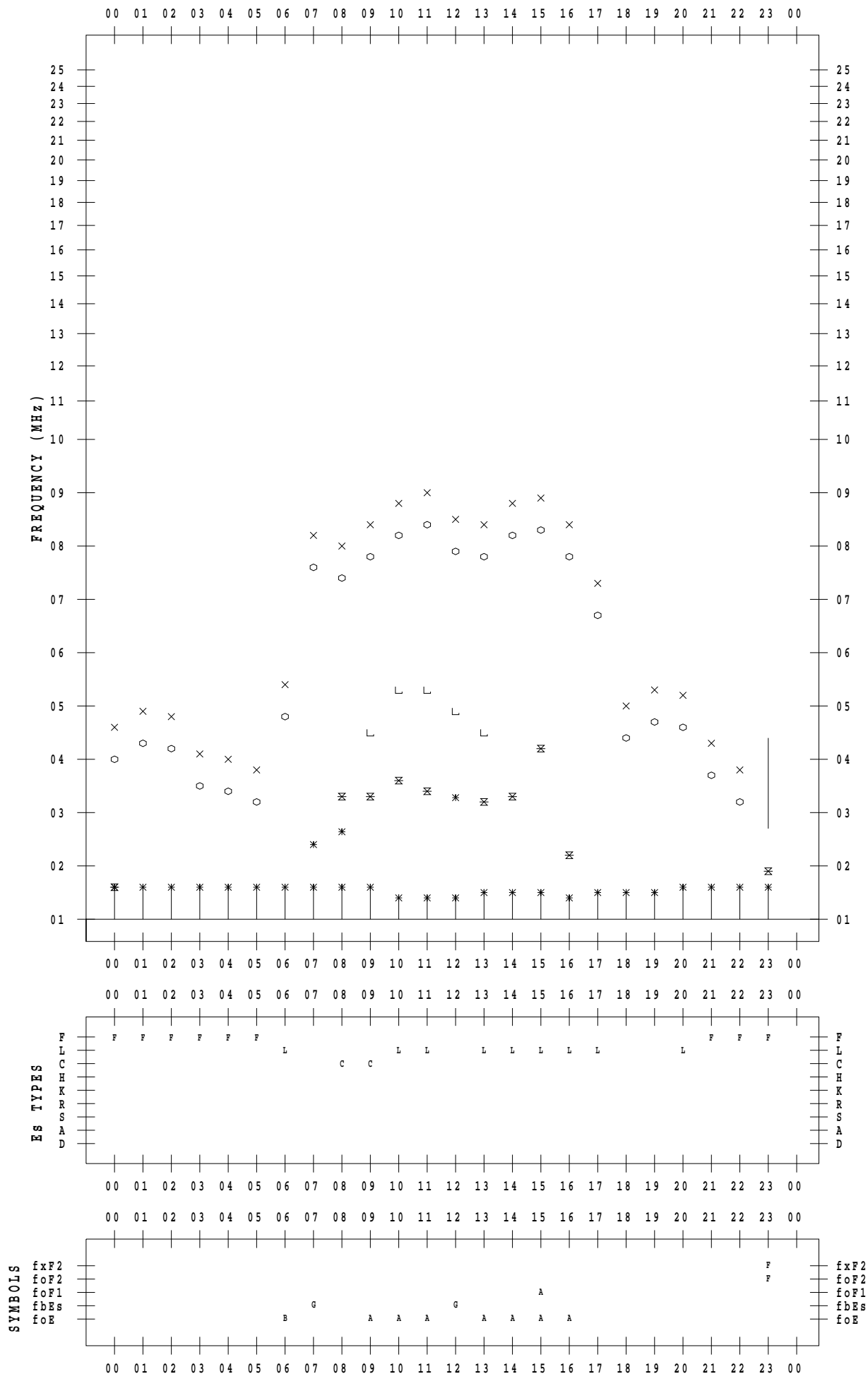
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 3

135 ° E MEAN TIME



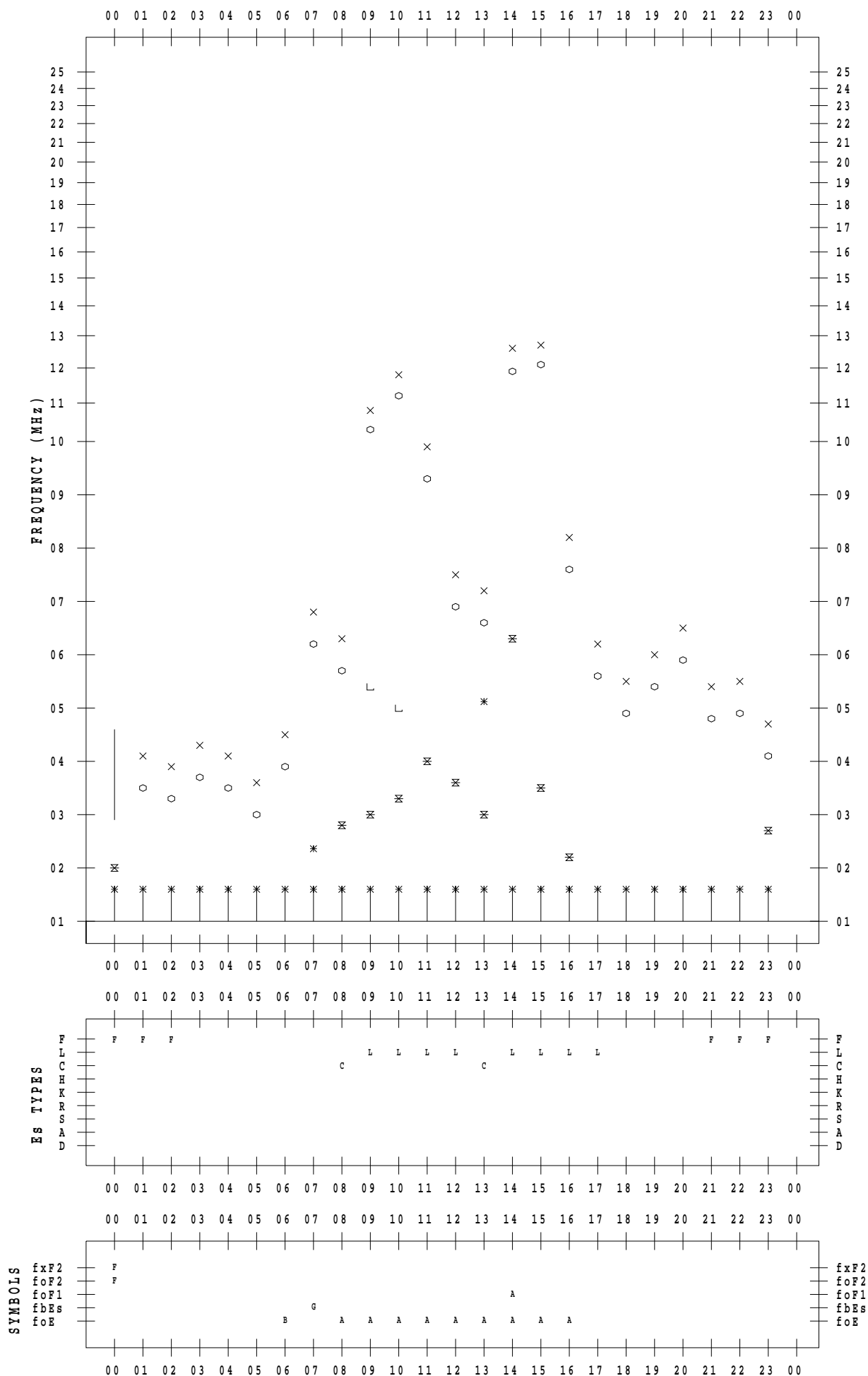
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 4

135 ° E MEAN TIME



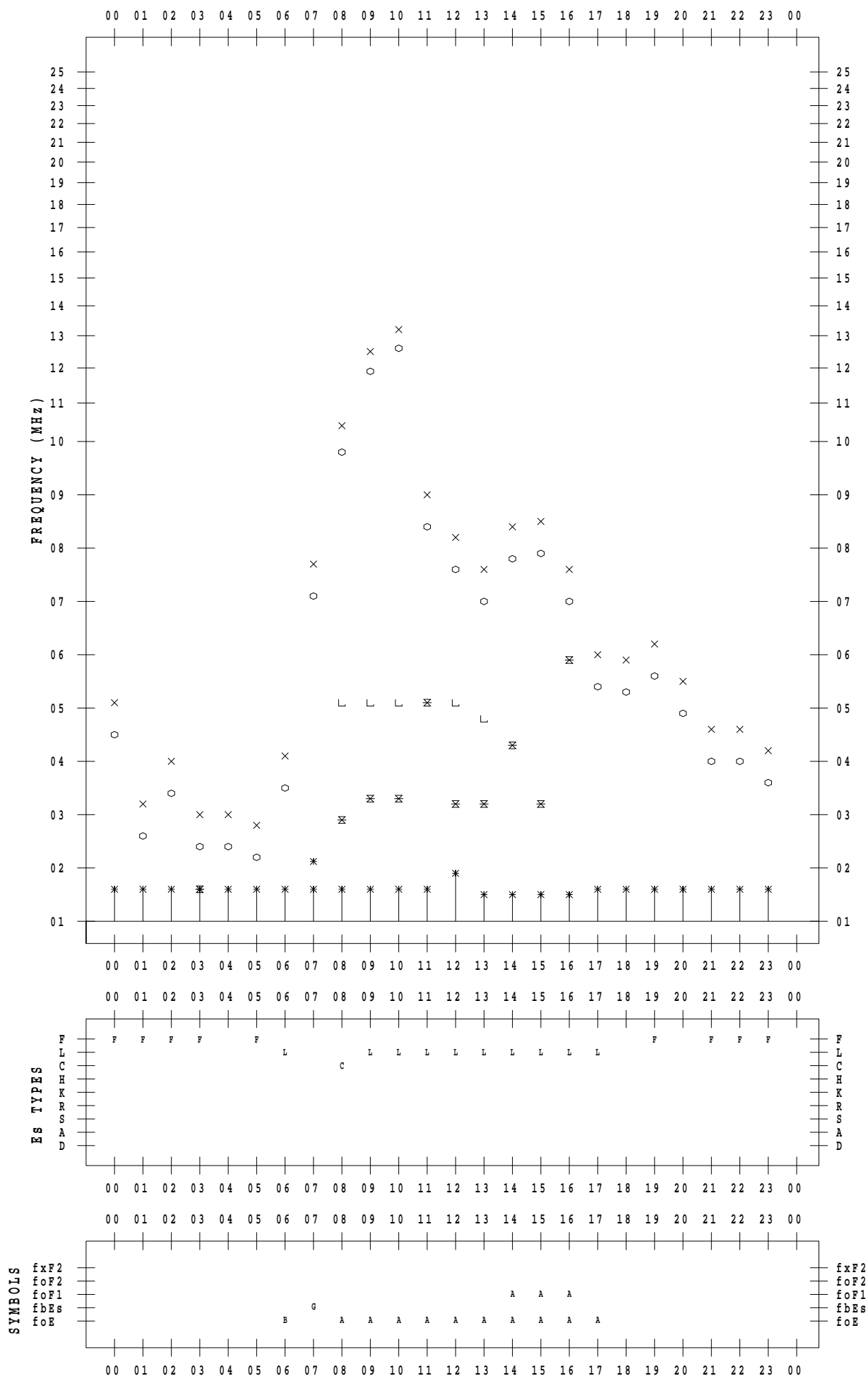
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 5

135 ° E MEAN TIME



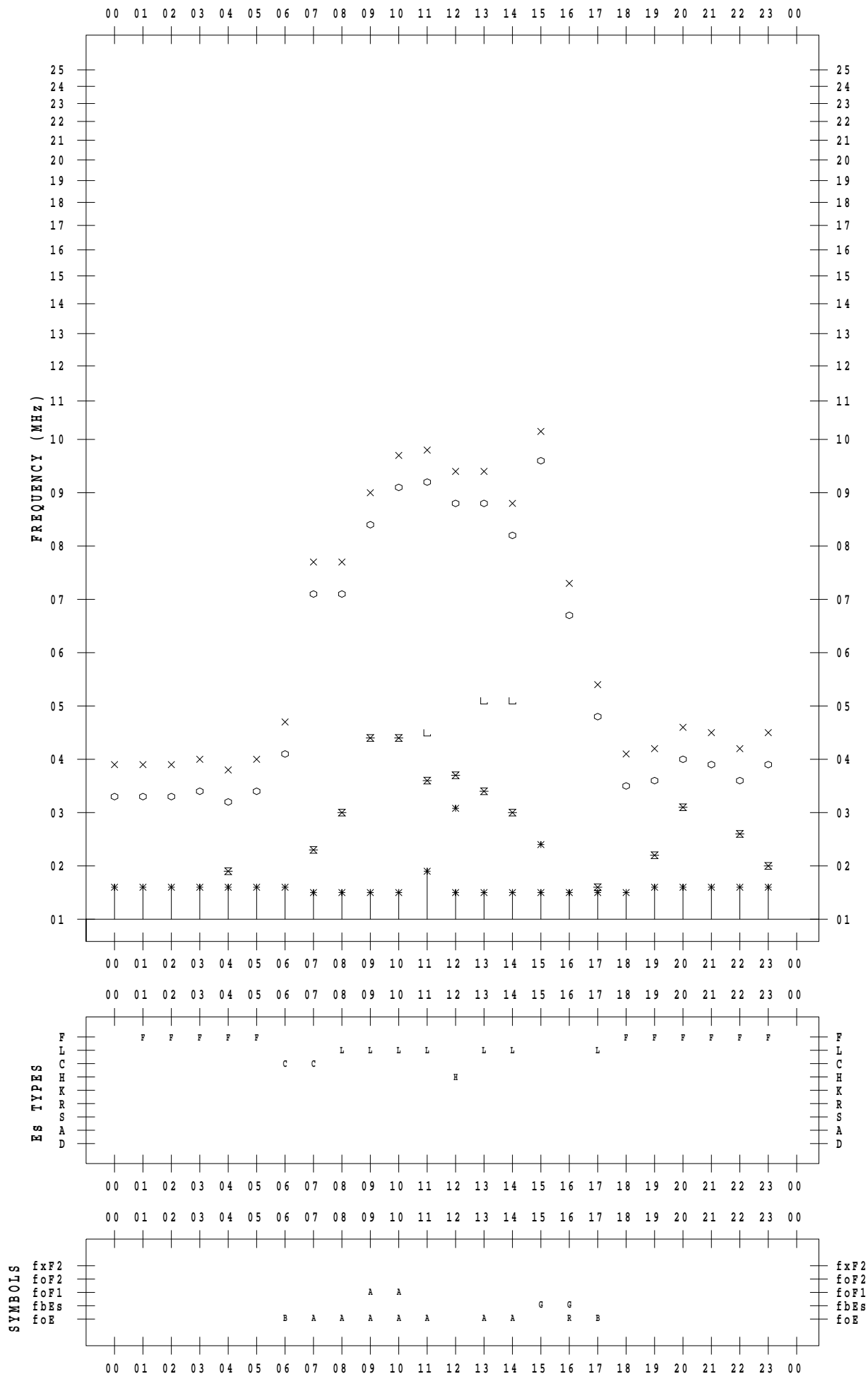
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 6

135 ° E MEAN TIME



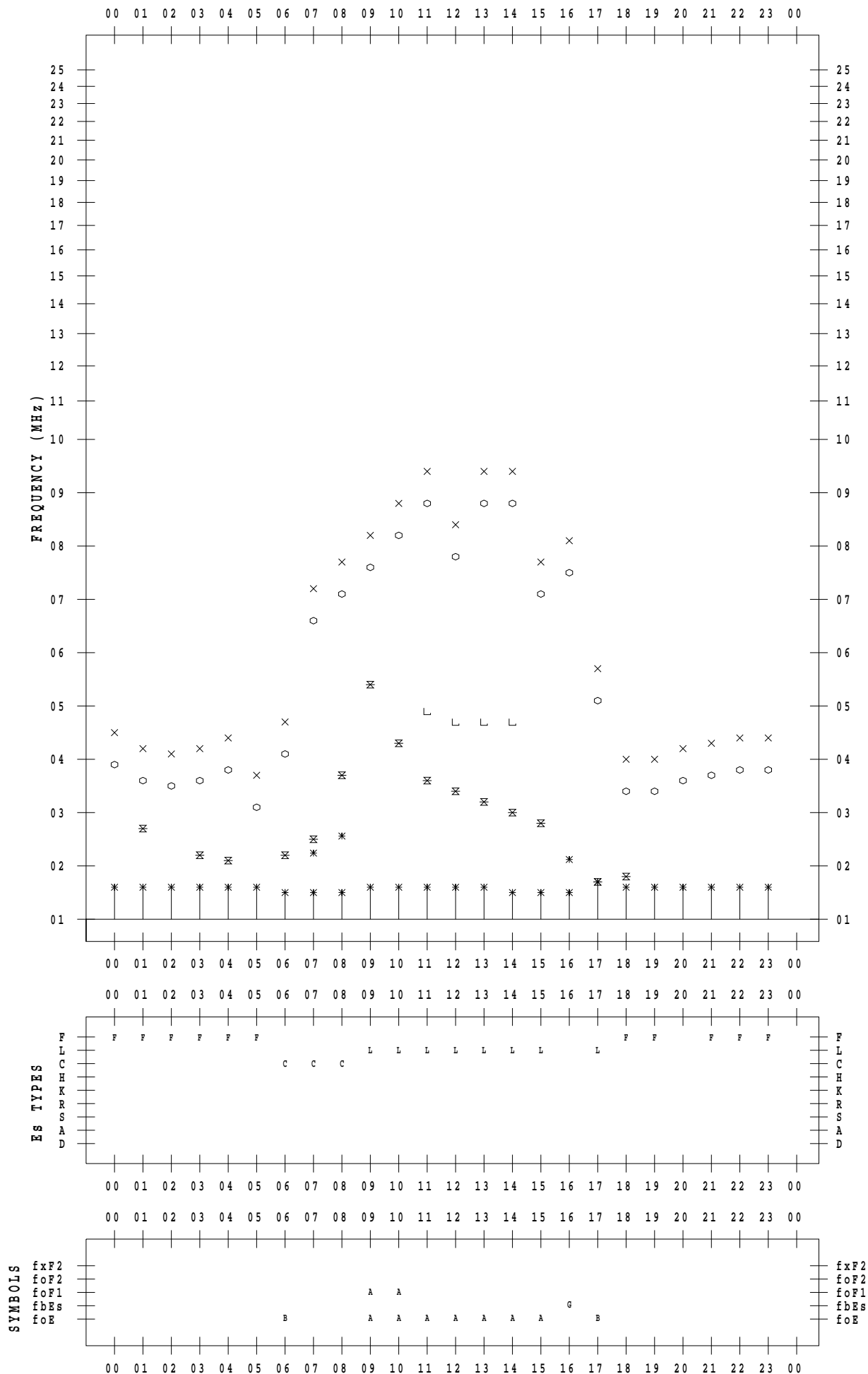
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 7

135 ° E MEAN TIME



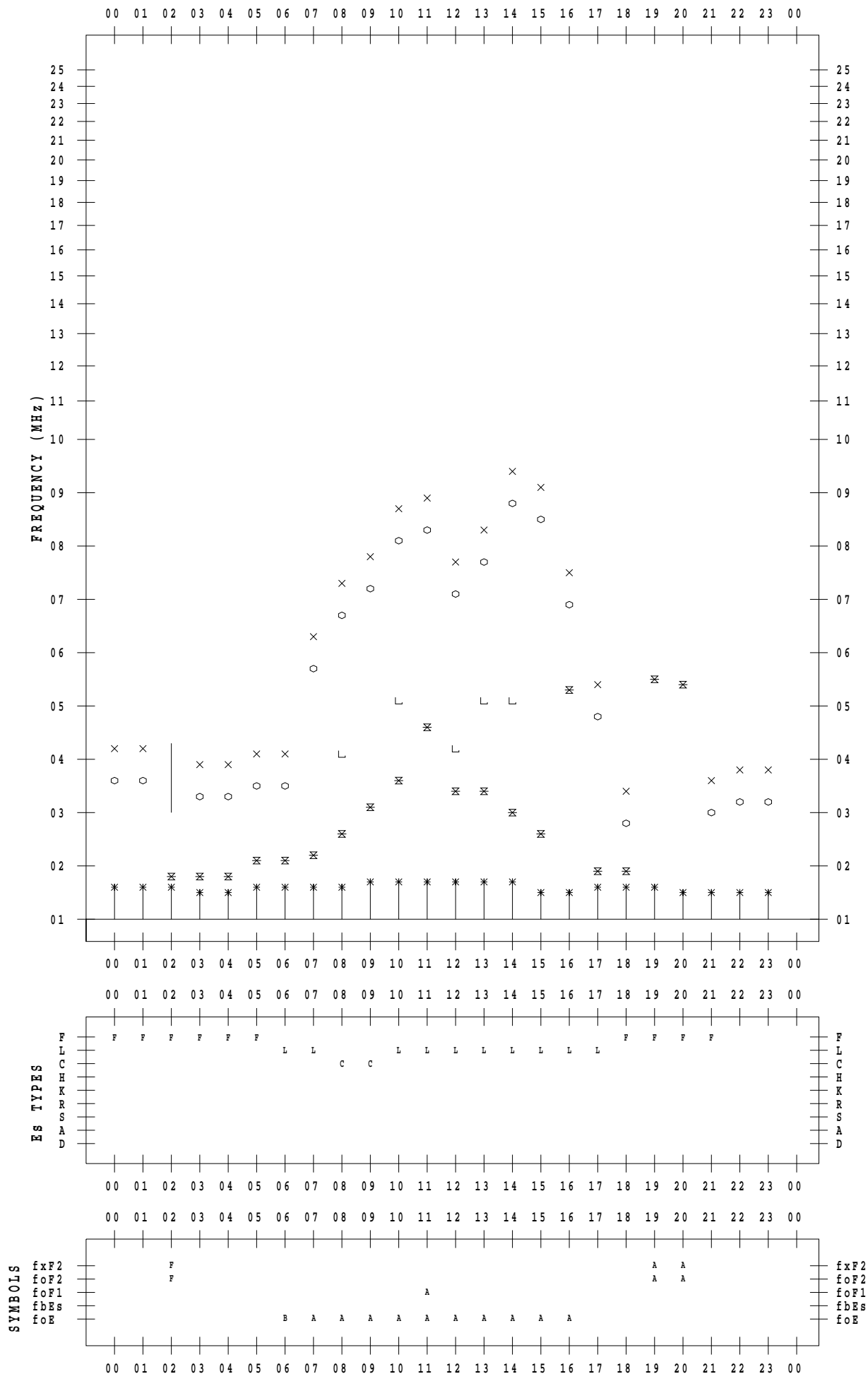
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 8

135 ° E MEAN TIME



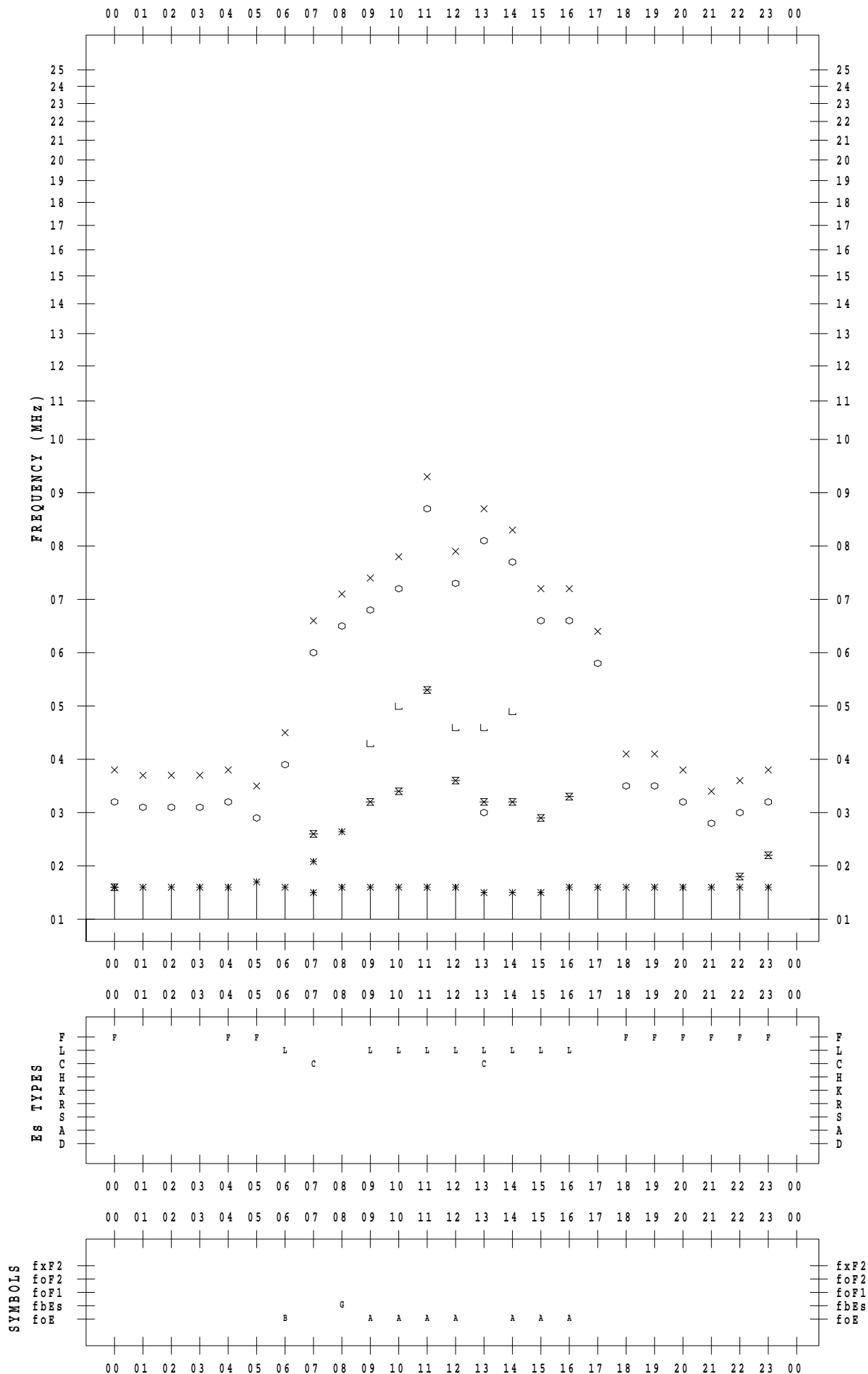
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/ 9

135 ° E MEAN TIME



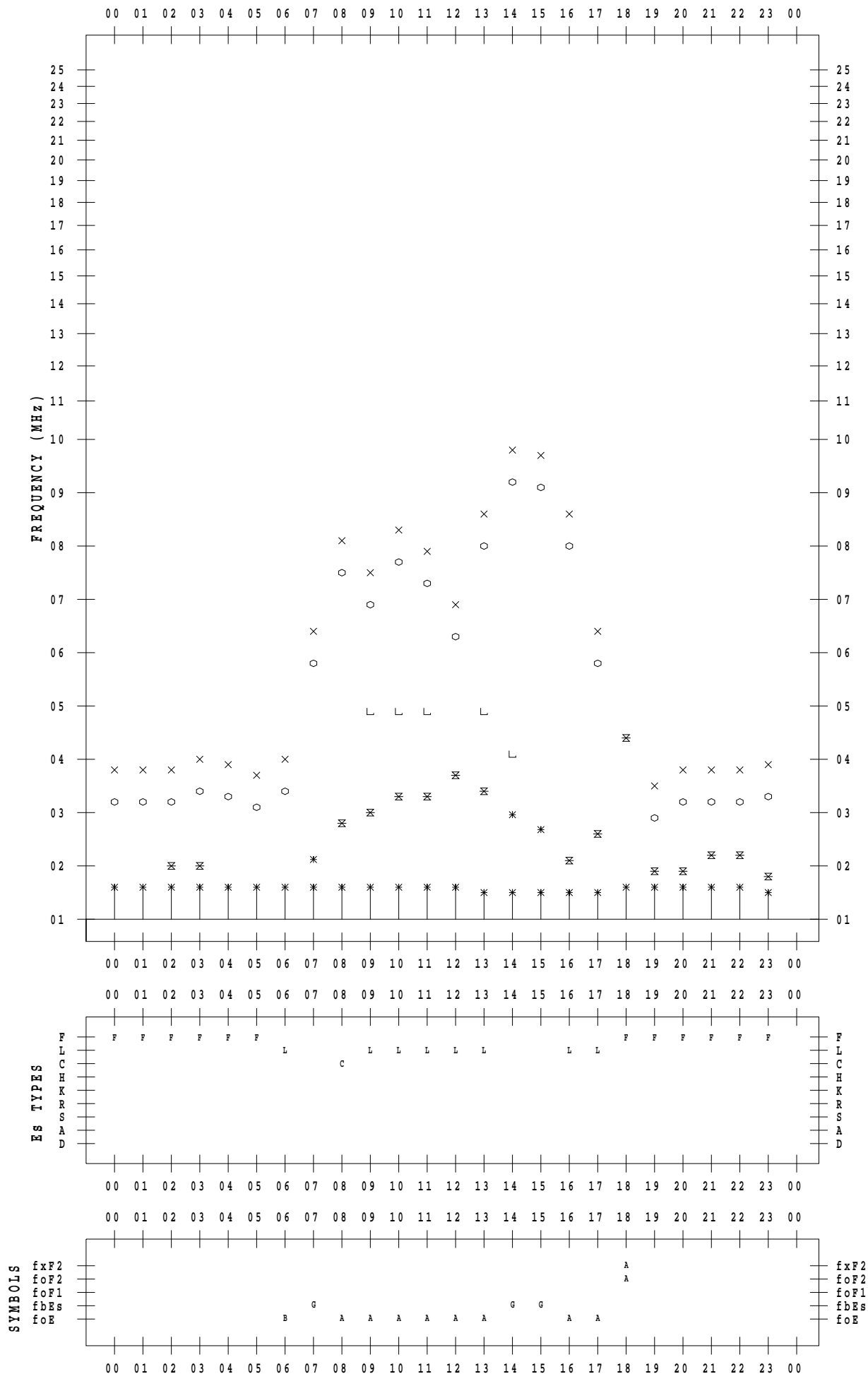
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/10

135 ° E MEAN TIME



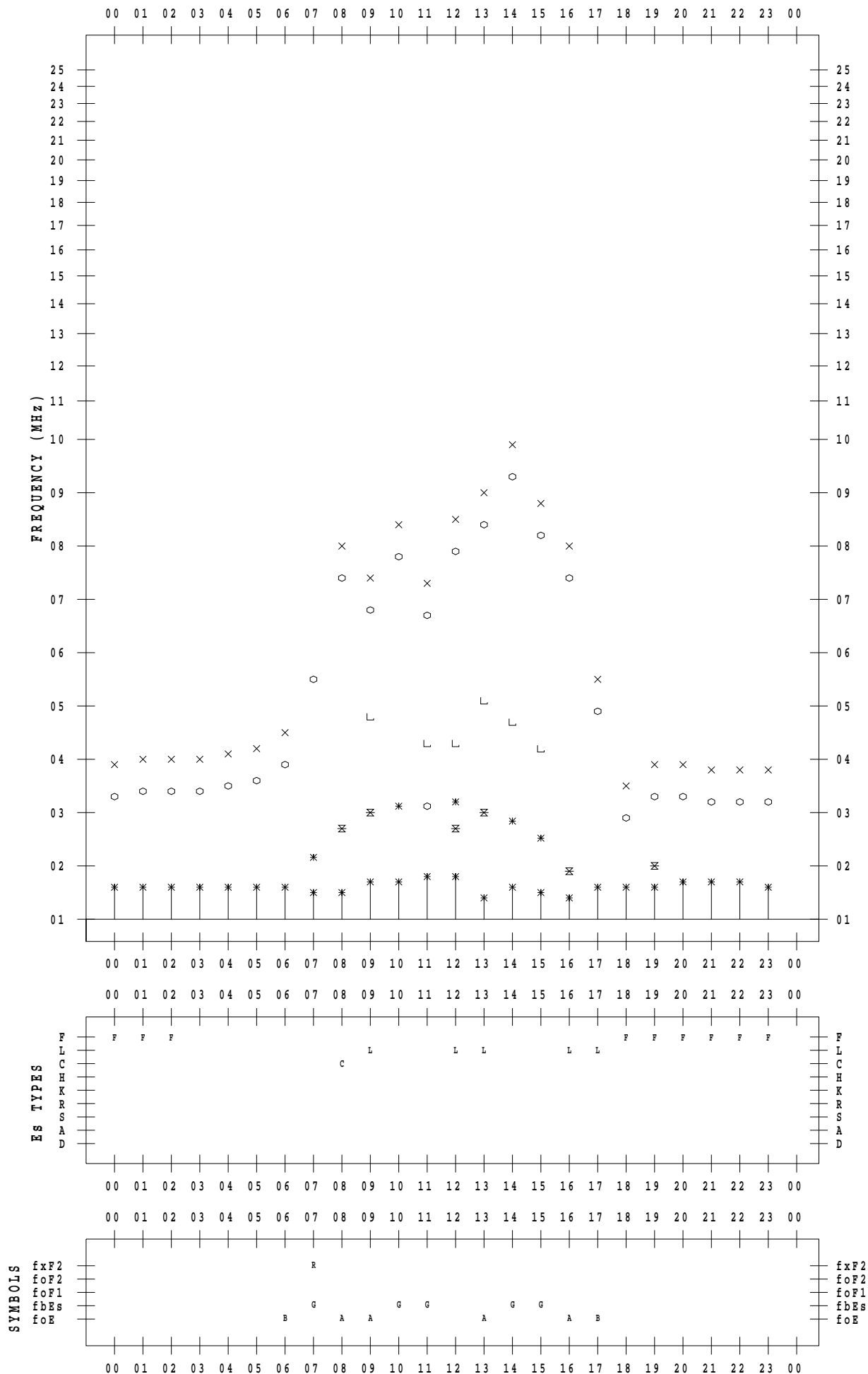
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/11

135 ° E MEAN TIME



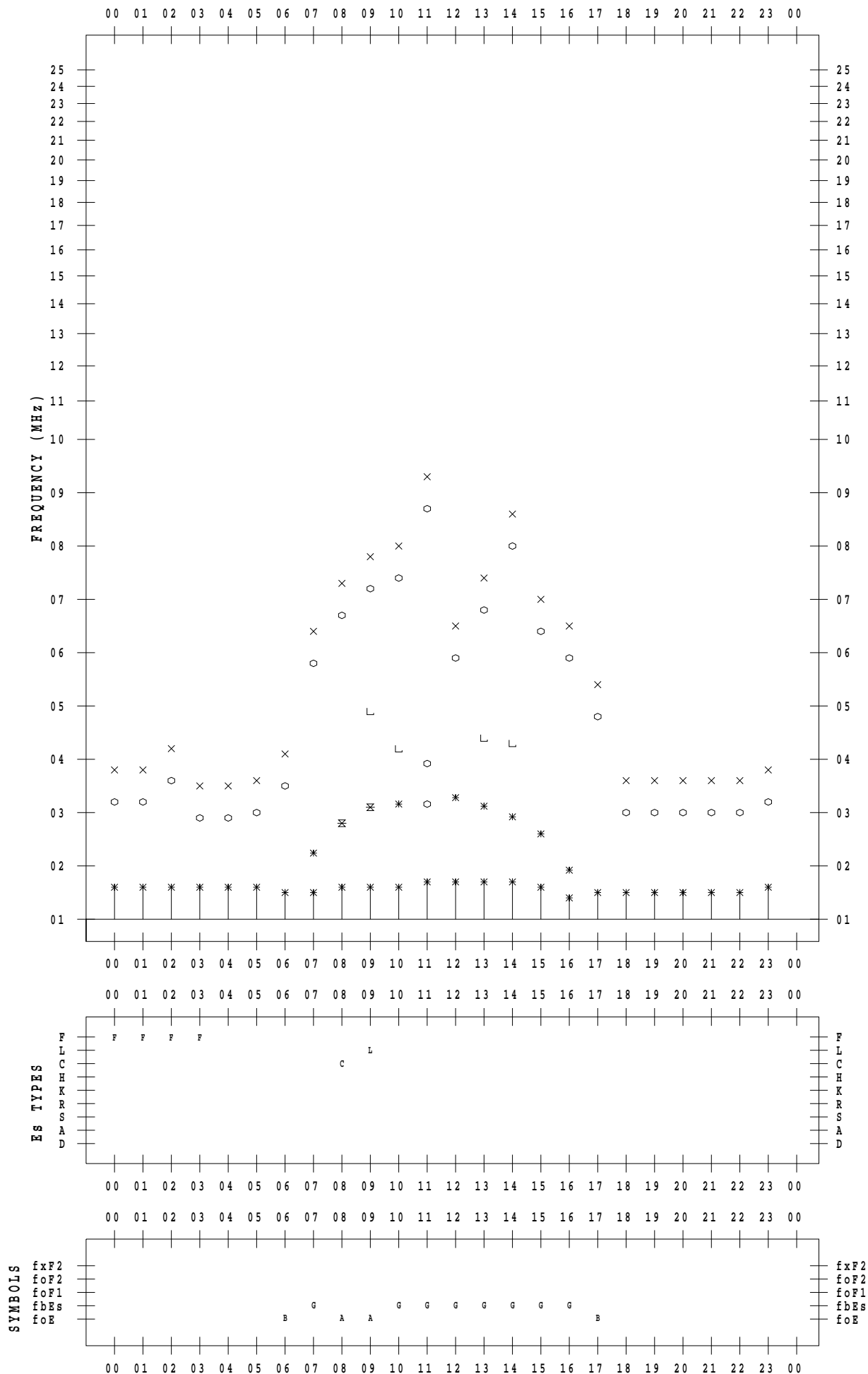
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/12

135 ° E MEAN TIME



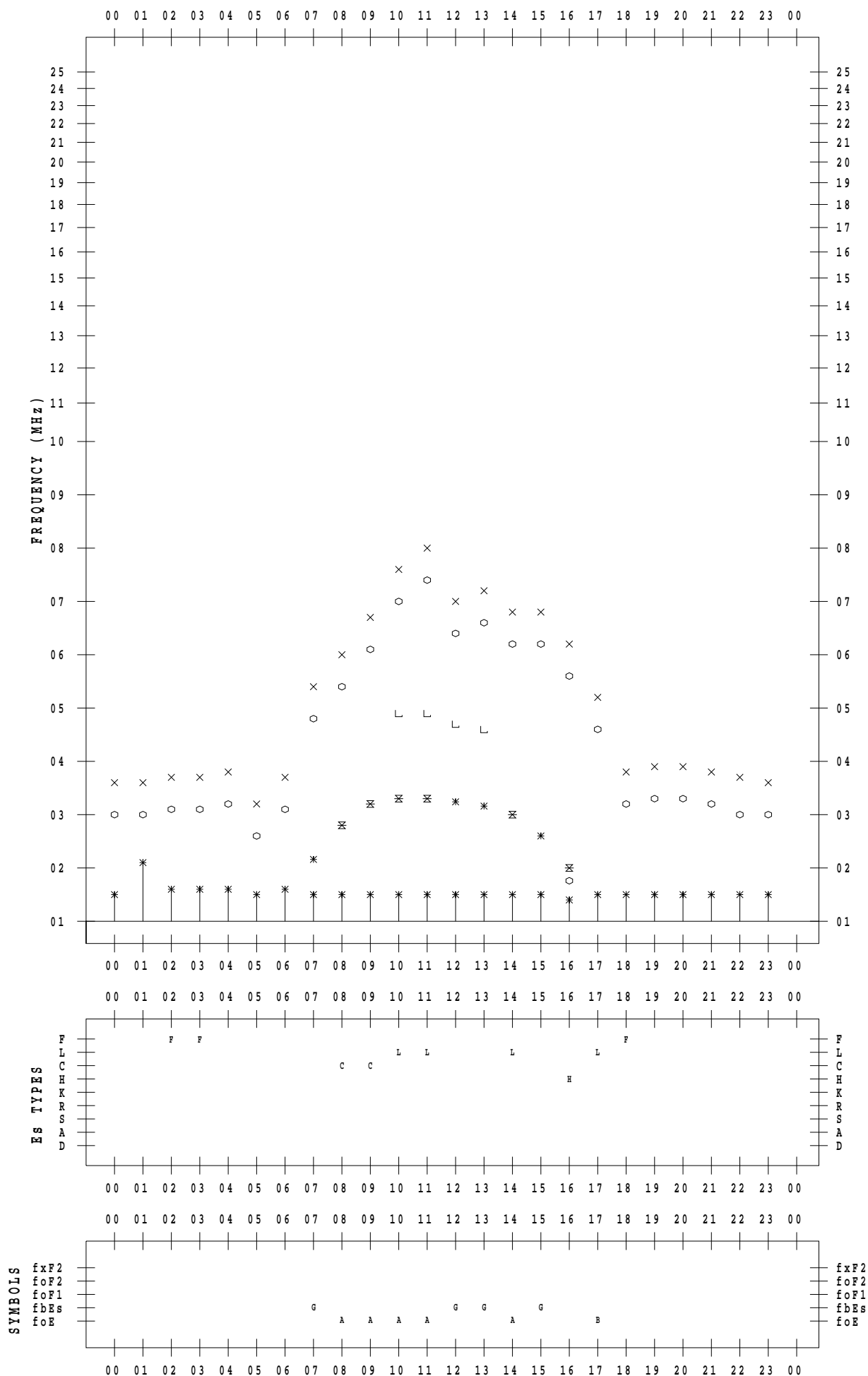
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/13

135 ° E MEAN TIME



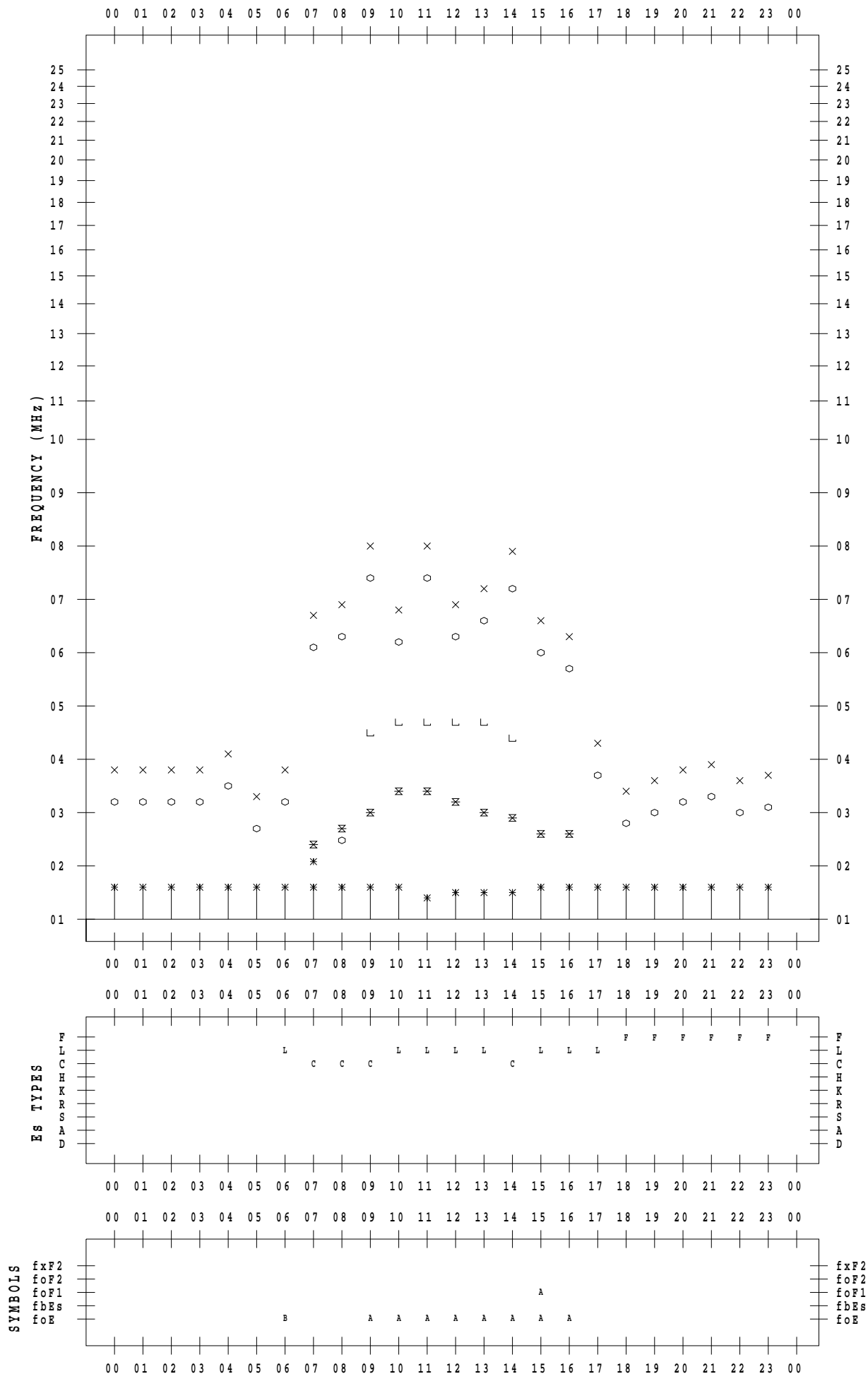
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/14

135 ° E MEAN TIME



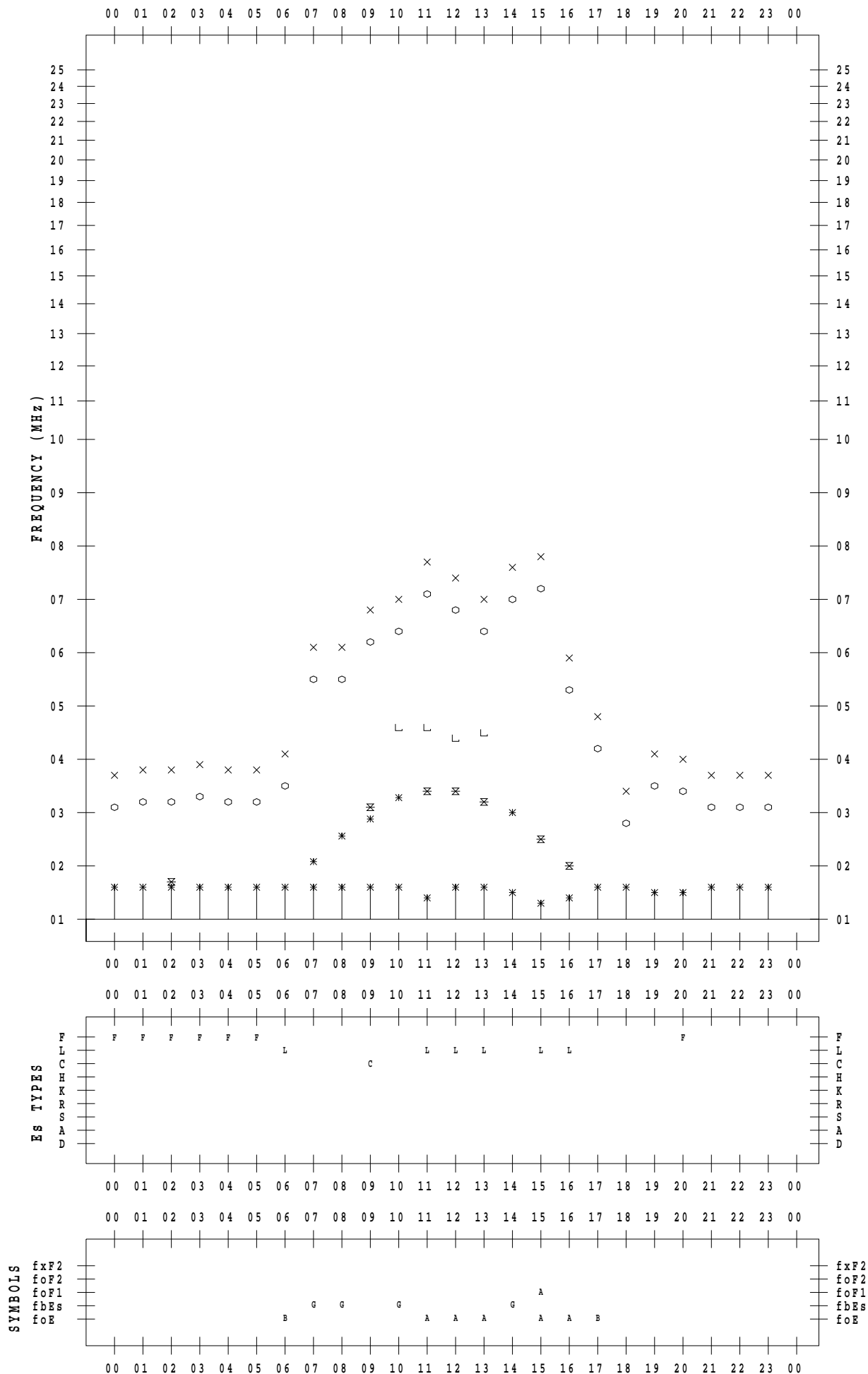
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/15

135 ° E MEAN TIME



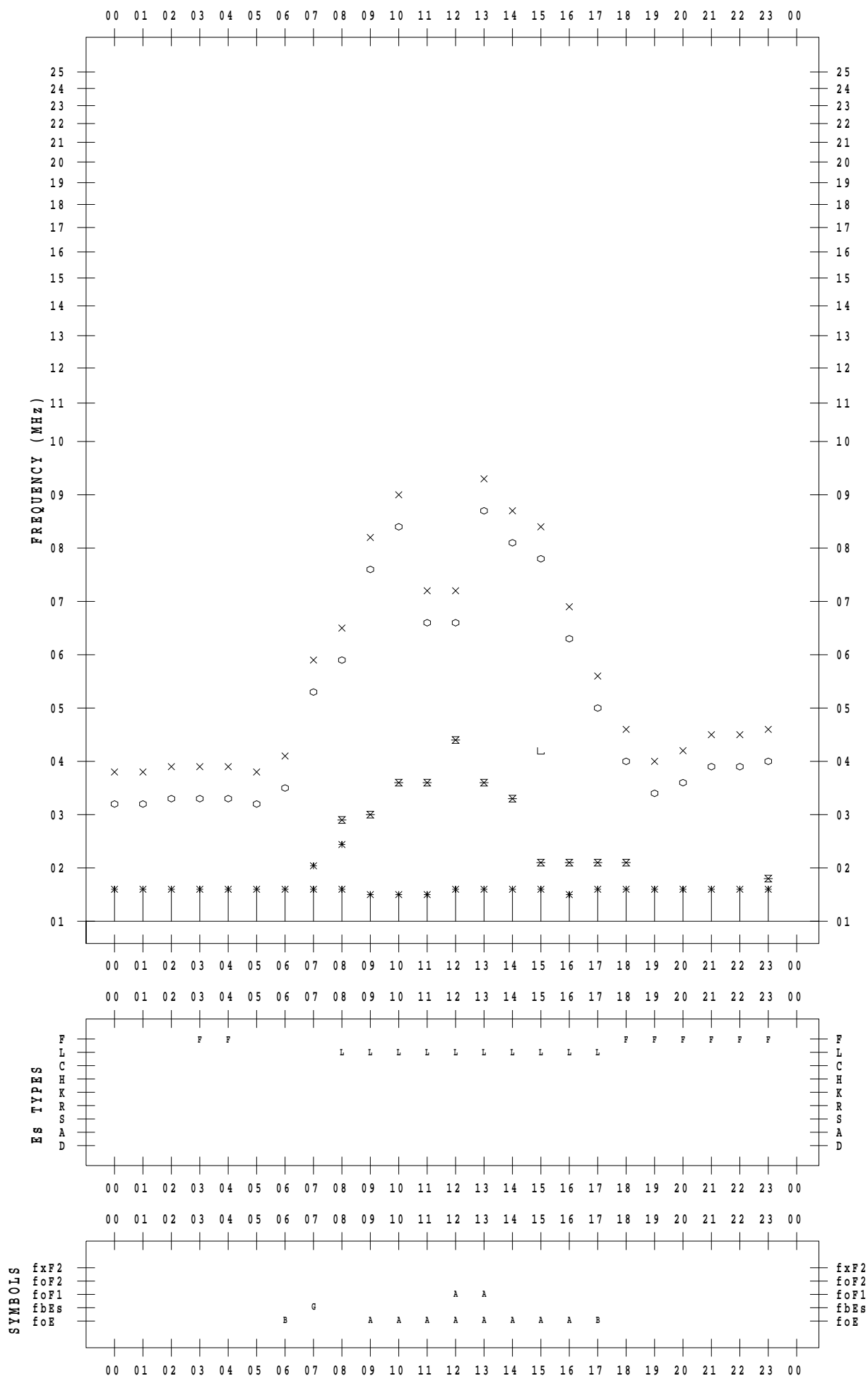
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/16

135 ° E MEAN TIME



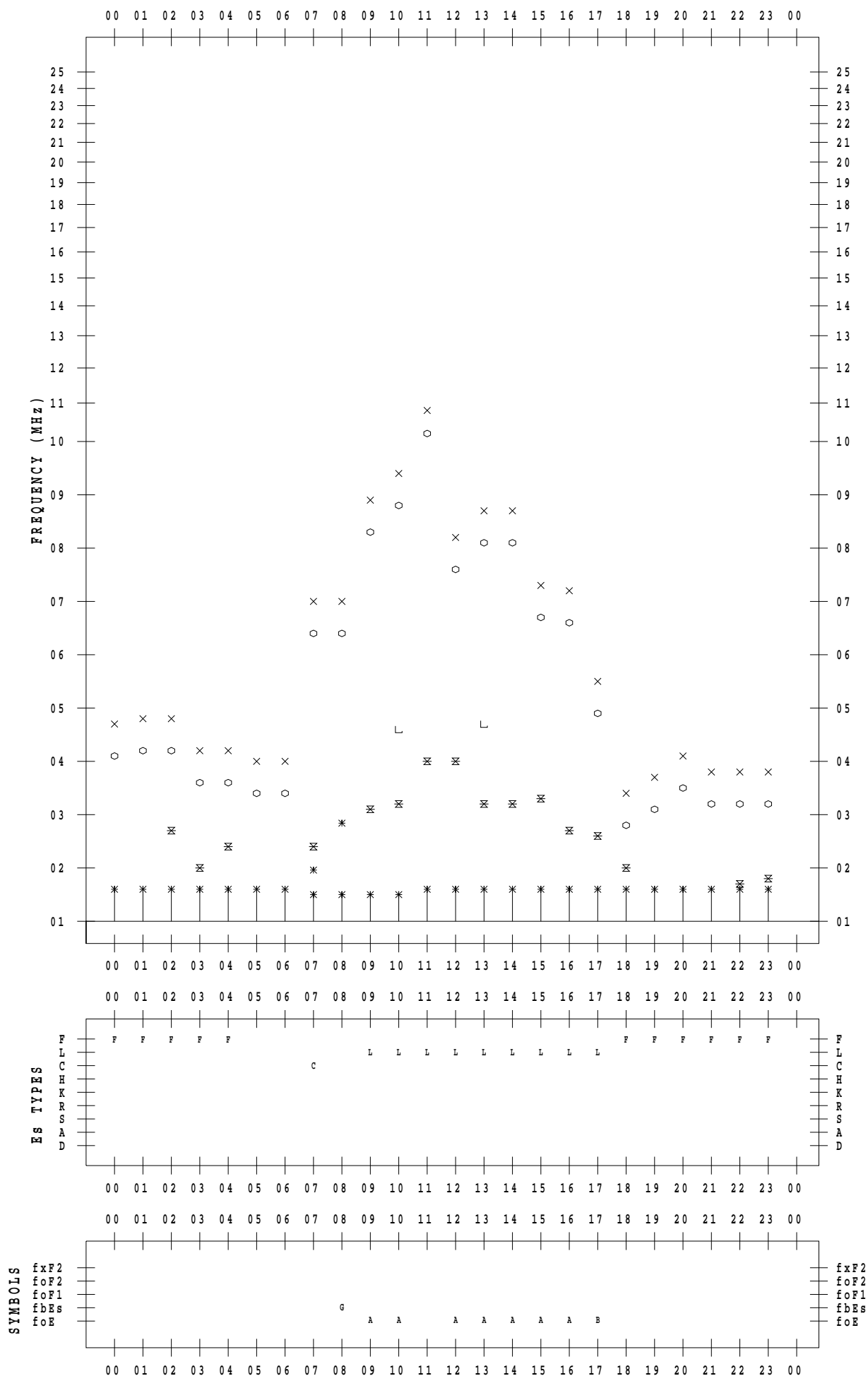
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/17

135 ° E MEAN TIME



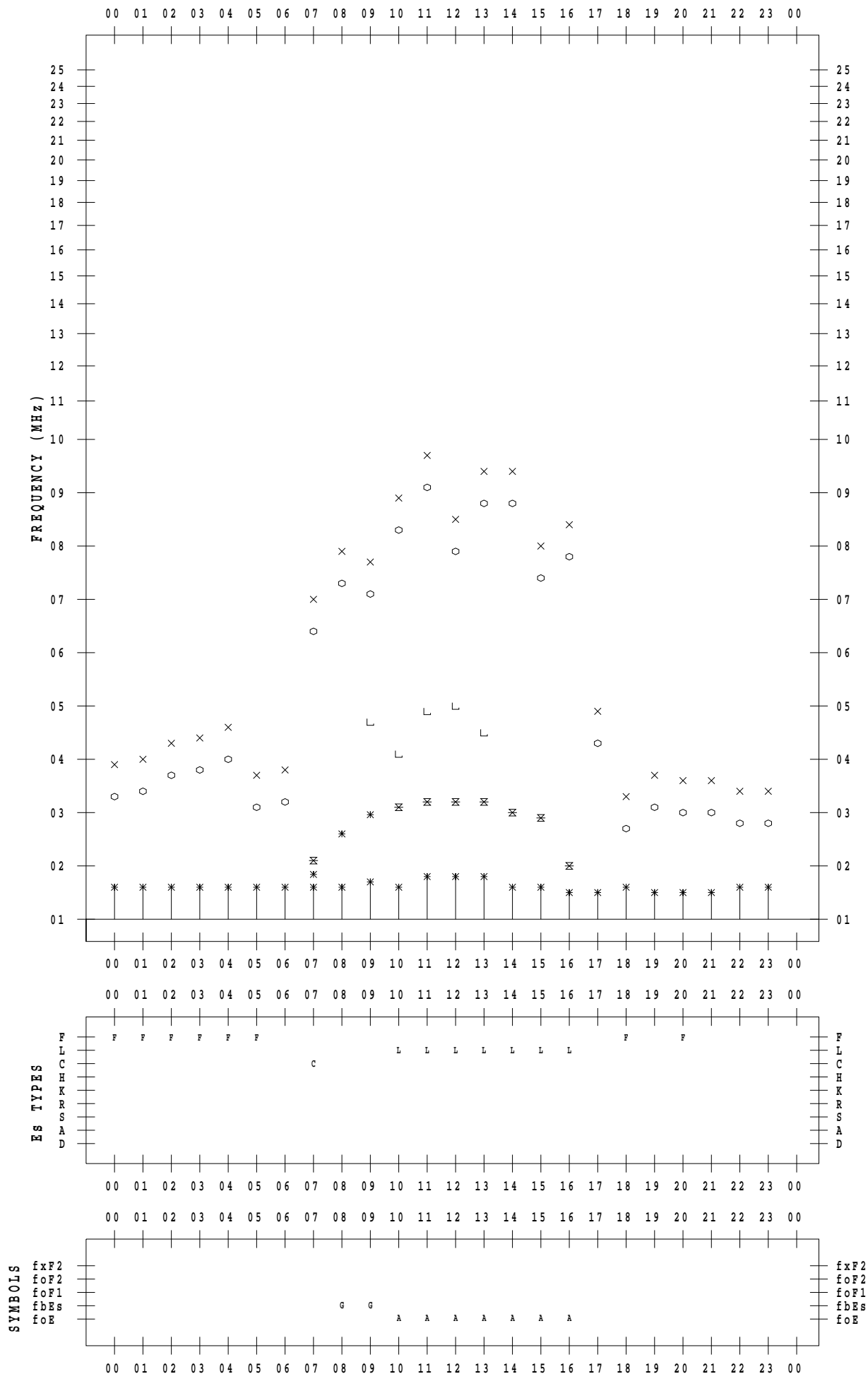
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/18

135 ° E MEAN TIME



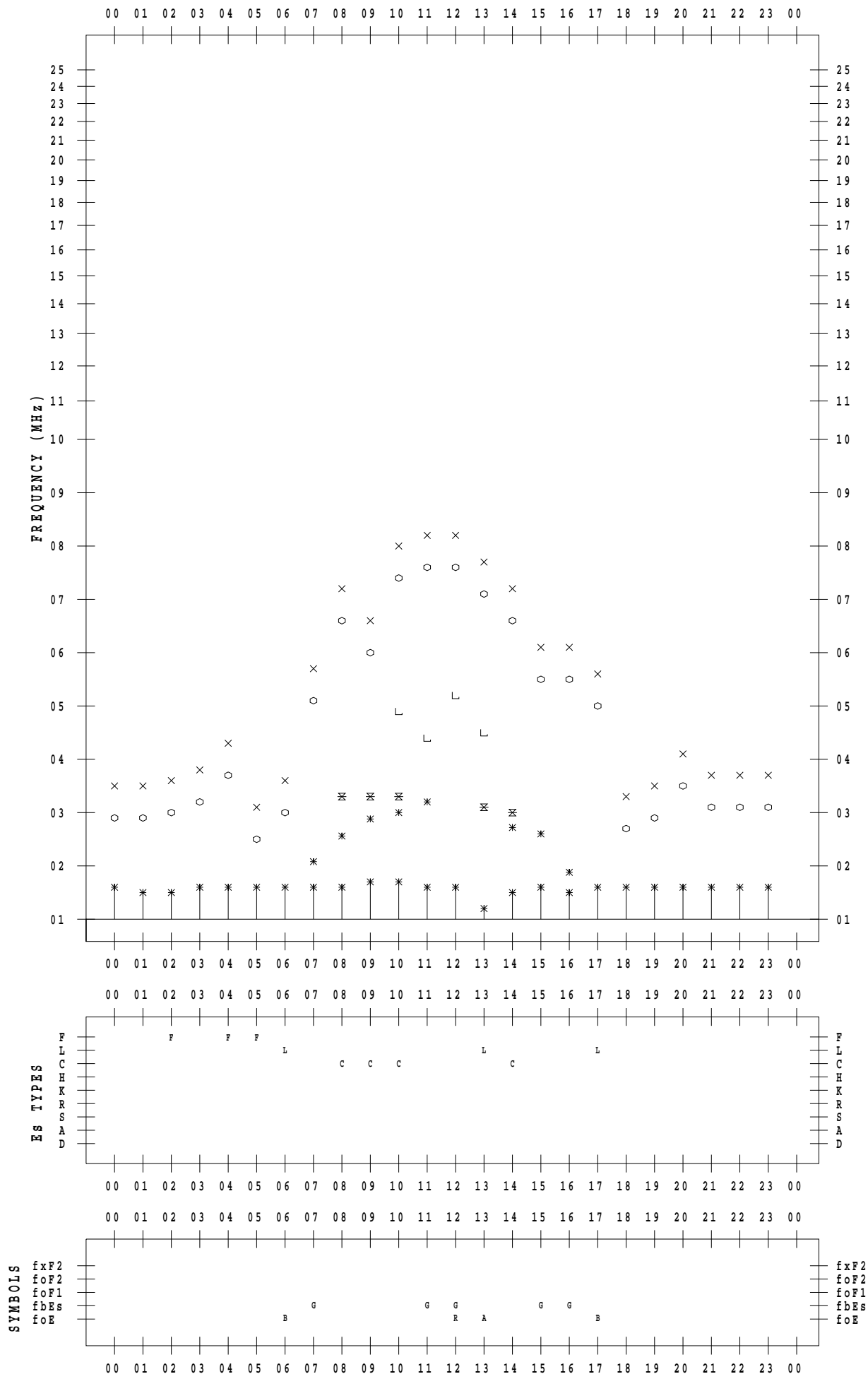
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/19

135 ° E MEAN TIME



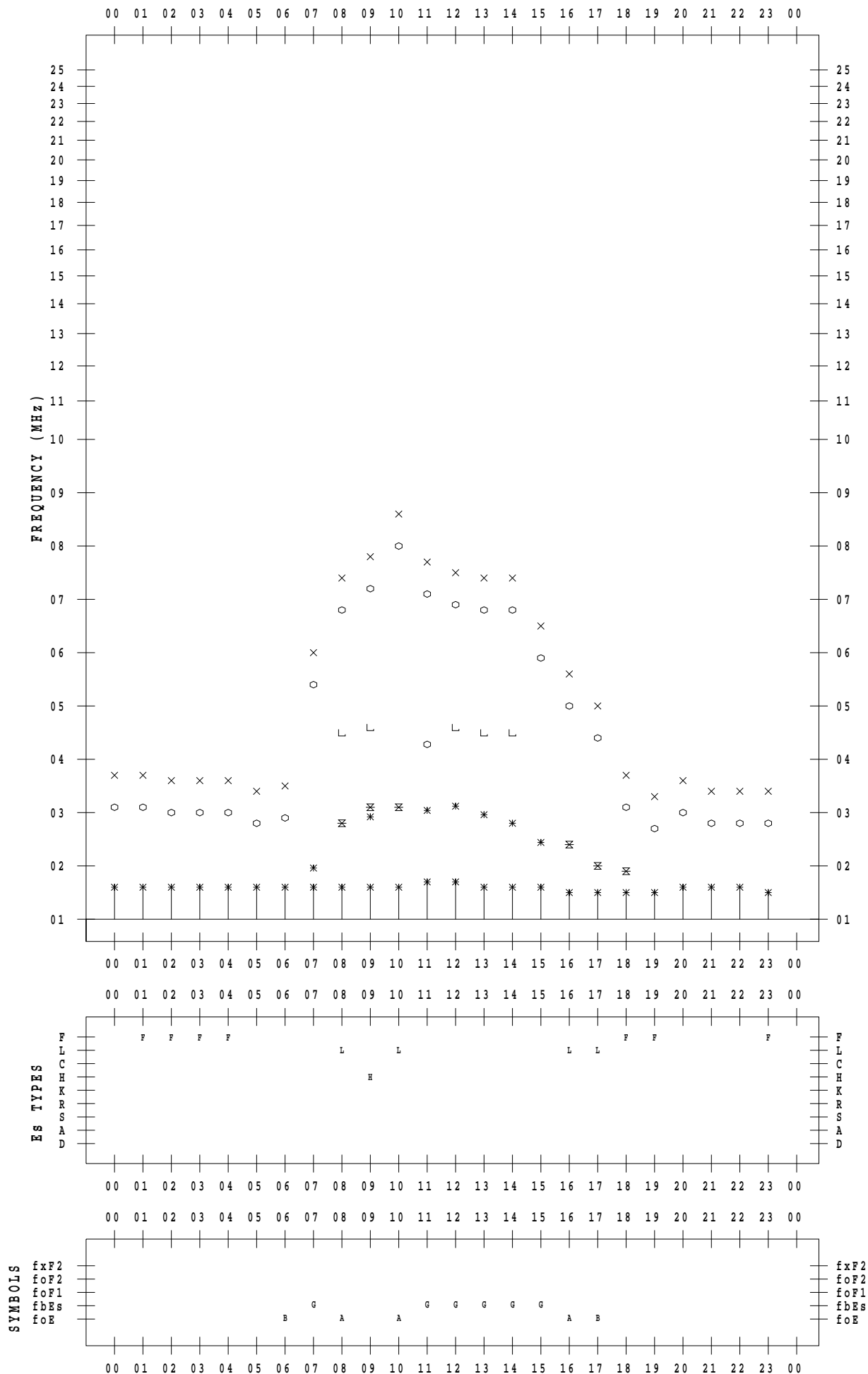
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/20

135 ° E MEAN TIME



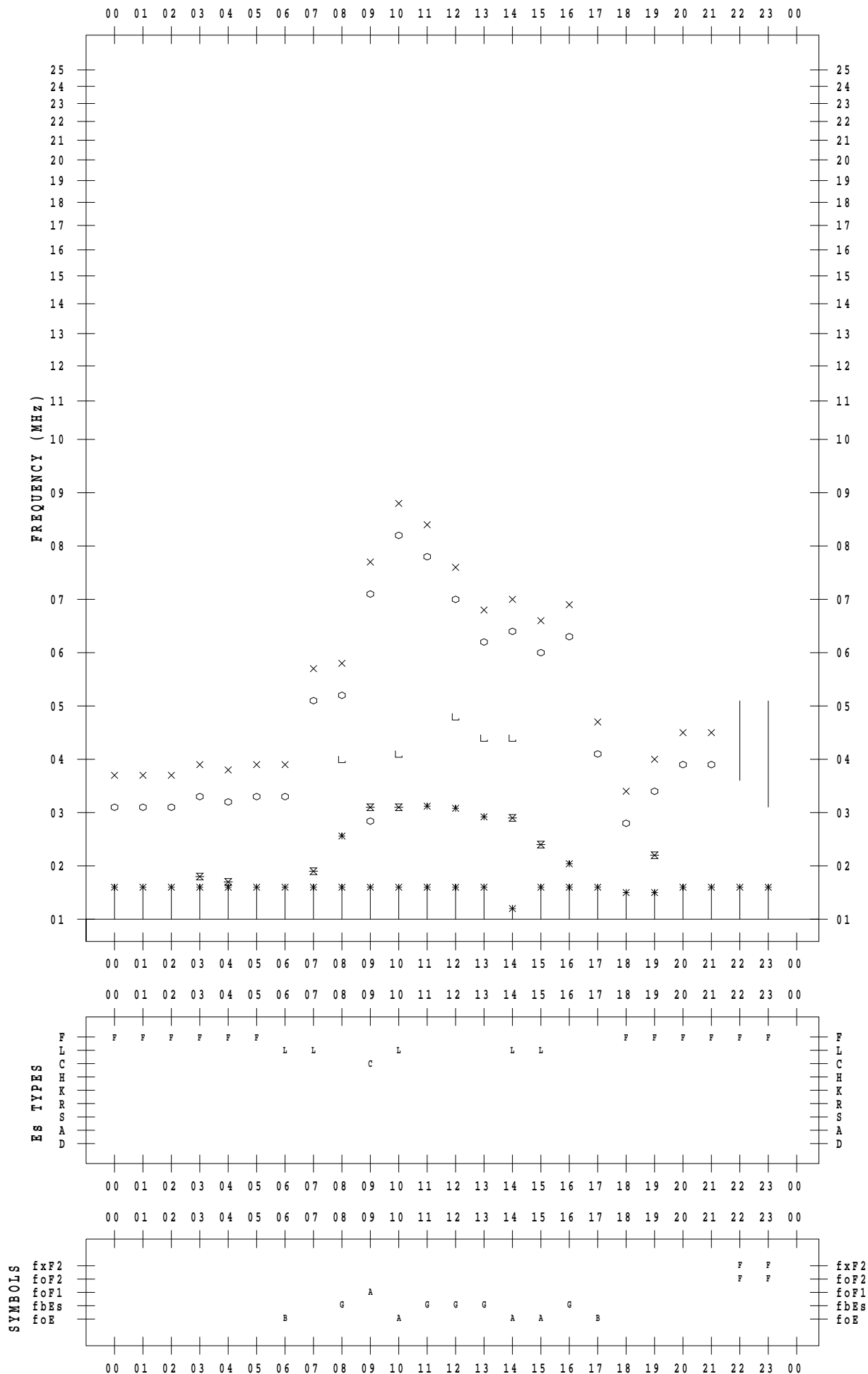
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/21

135 ° E MEAN TIME



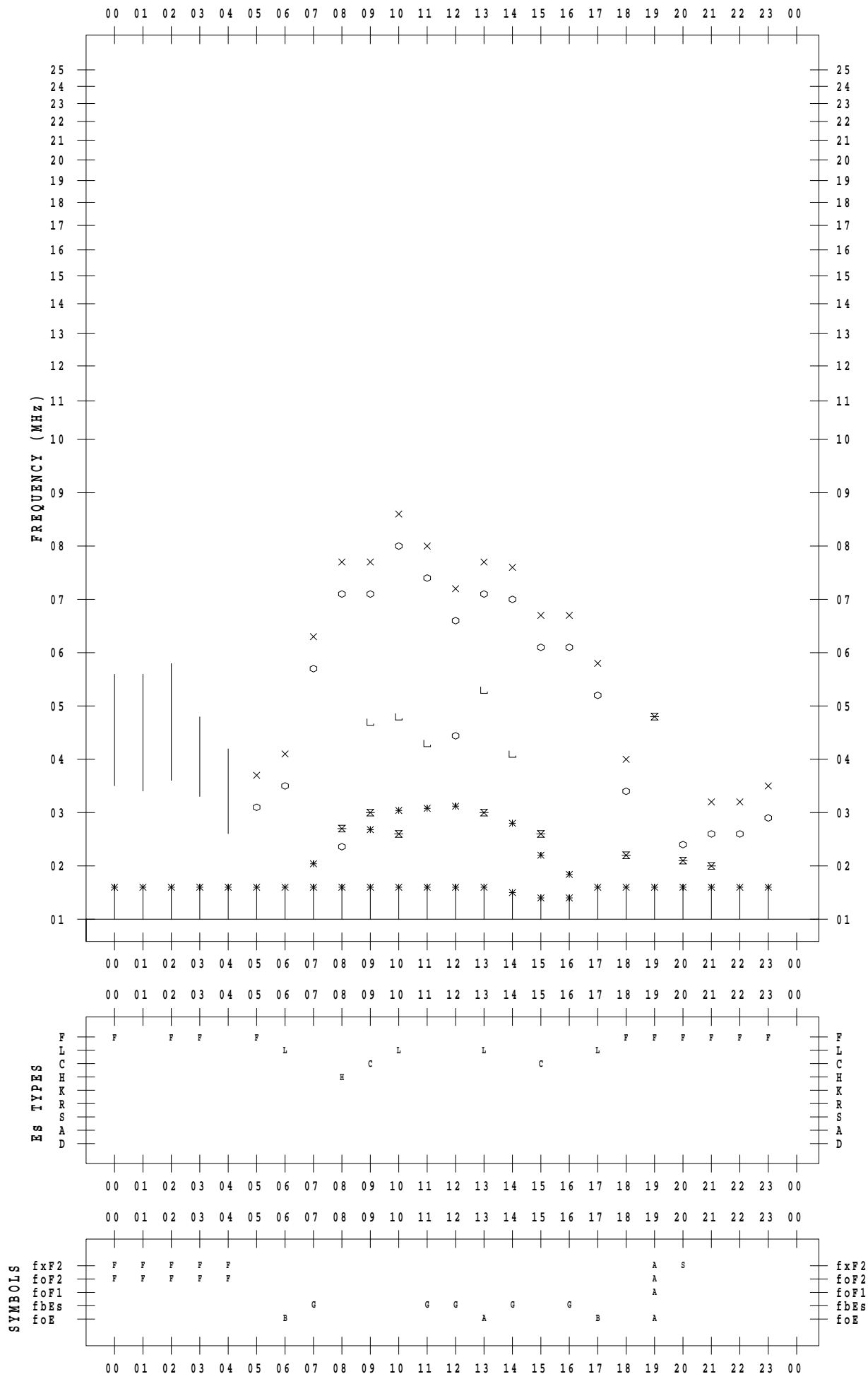
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/22

135 ° E MEAN TIME



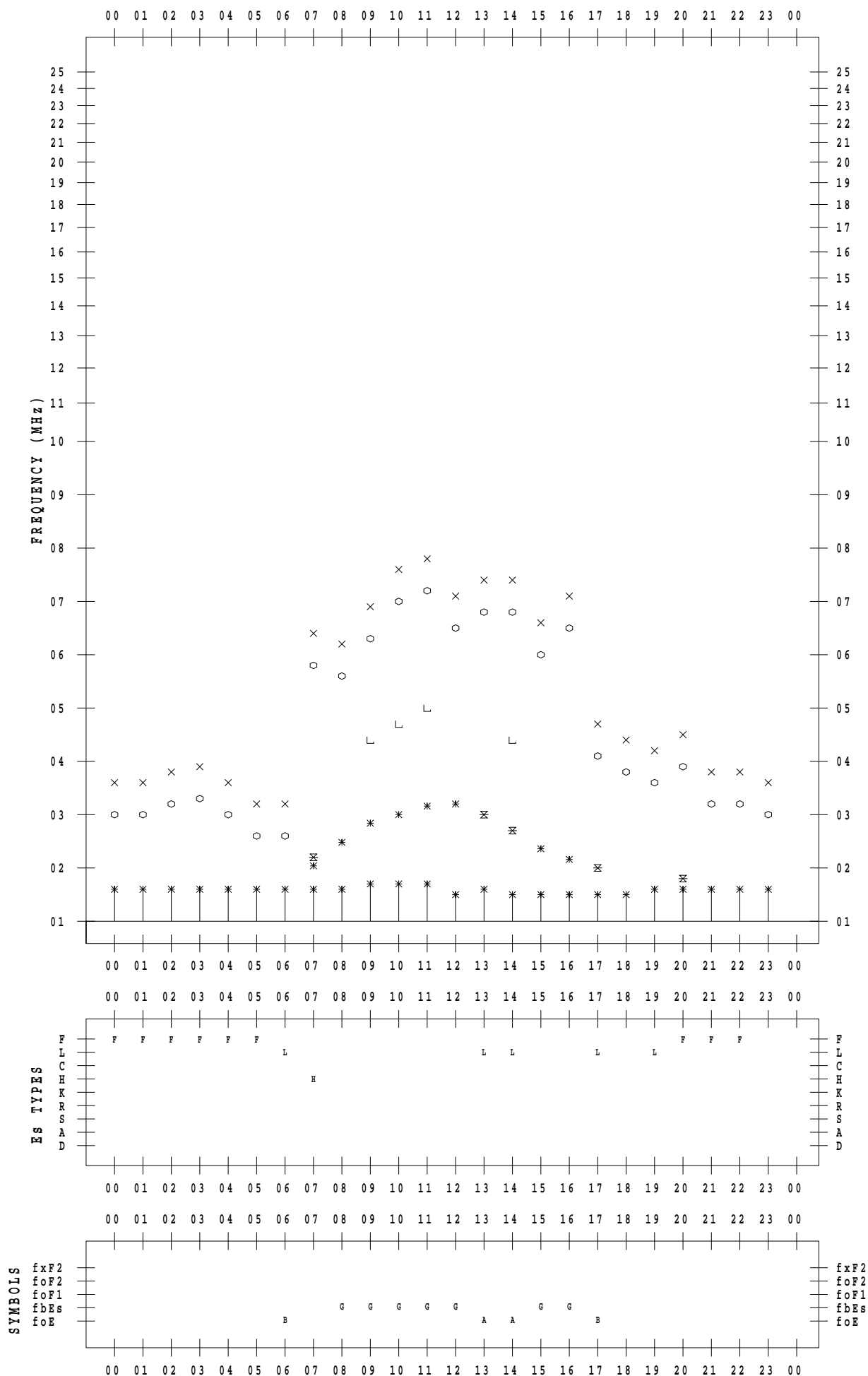
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/23

135 ° E MEAN TIME



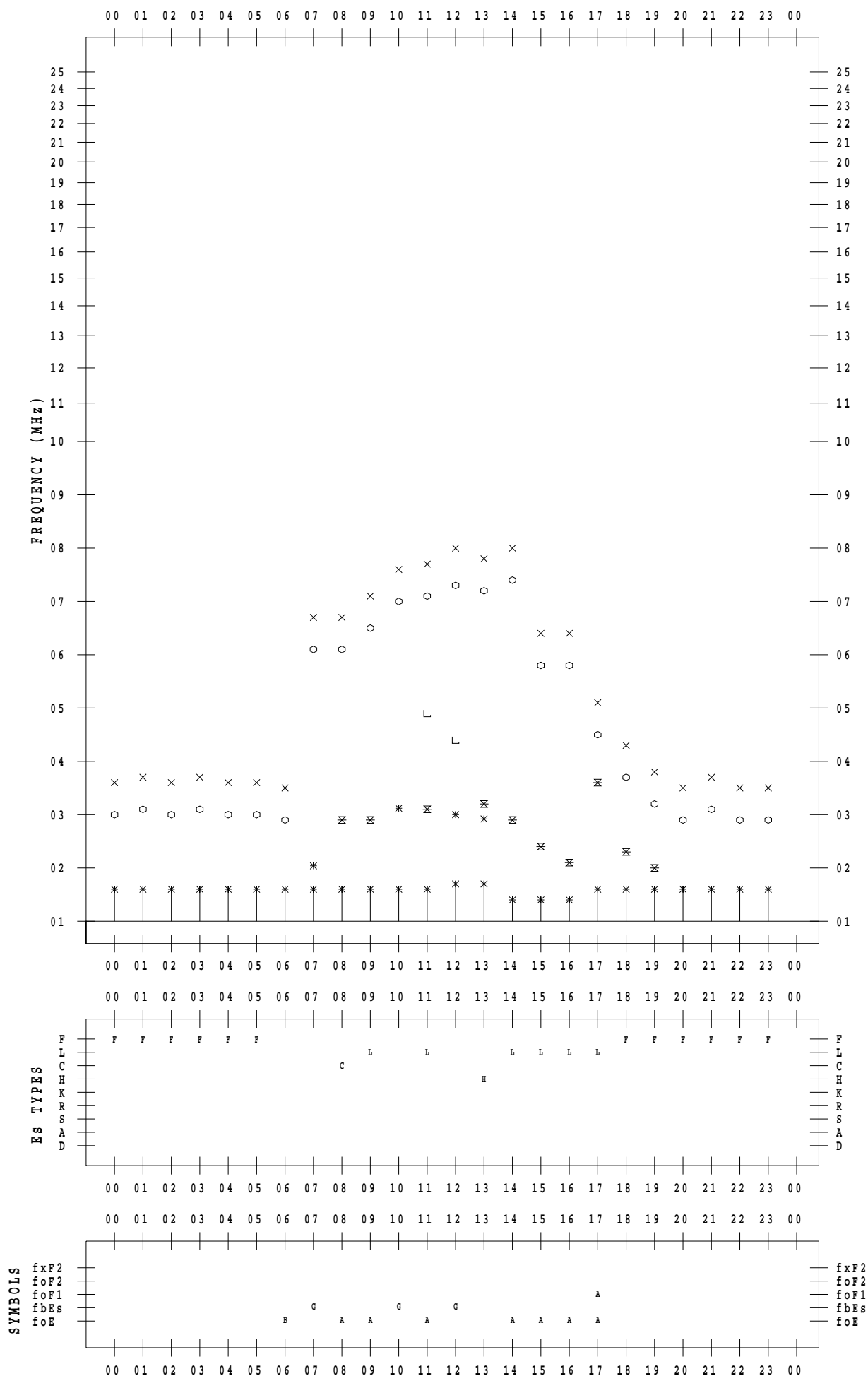
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/24

135 ° E MEAN TIME



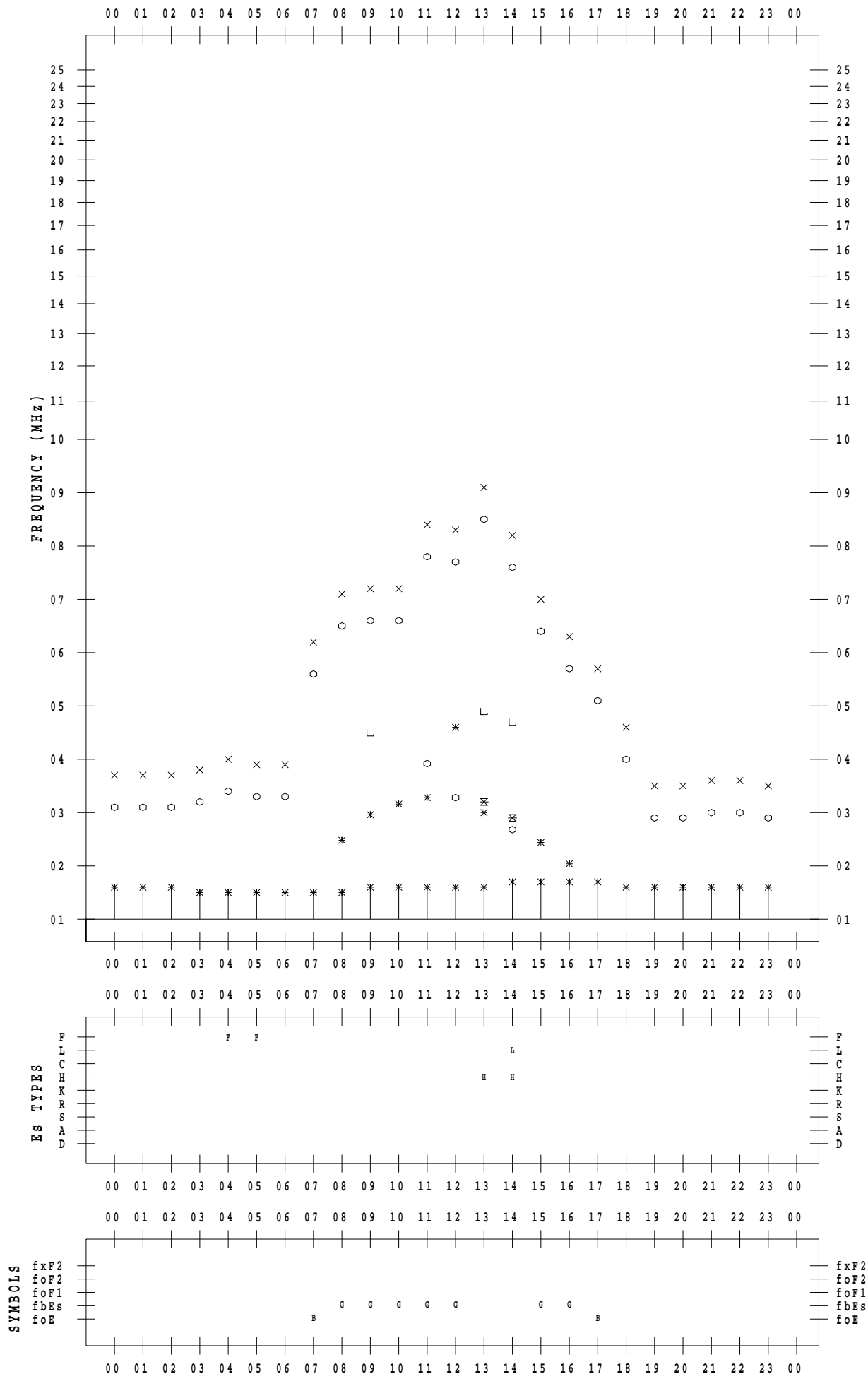
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/25

135 ° E MEAN TIME



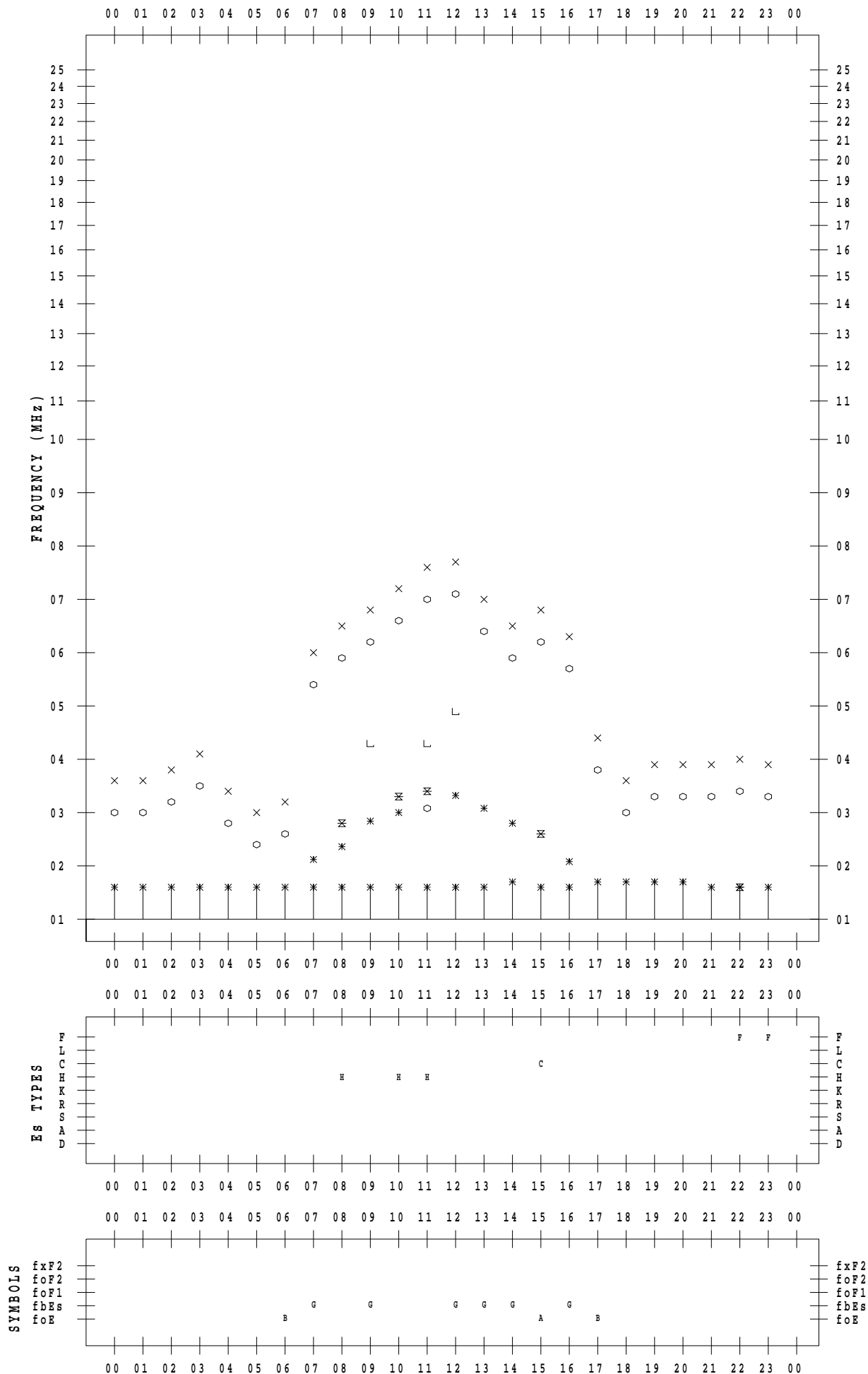
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/26

135 ° E MEAN TIME



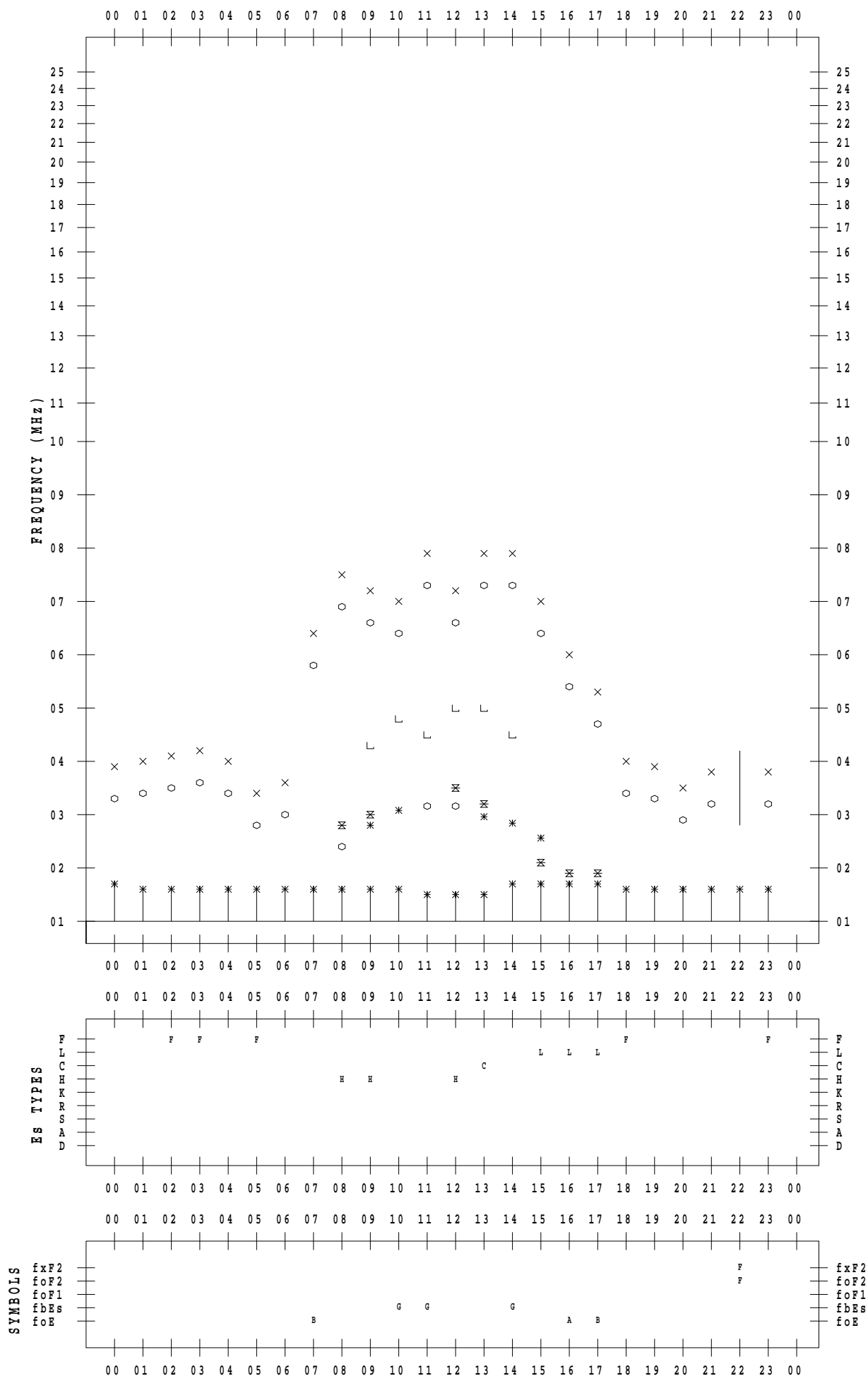
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/27

135 ° E MEAN TIME



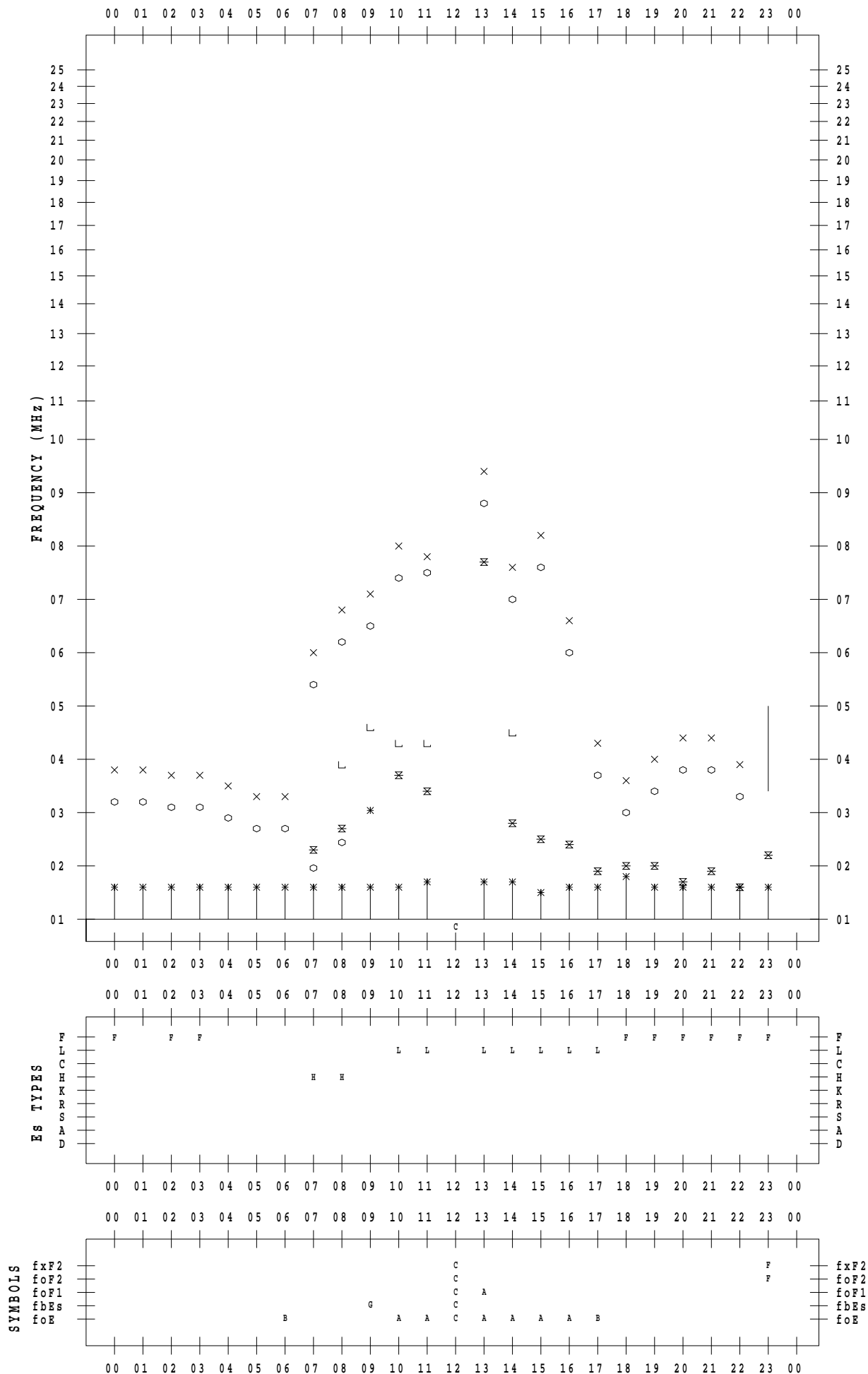
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/28

135 ° E MEAN TIME



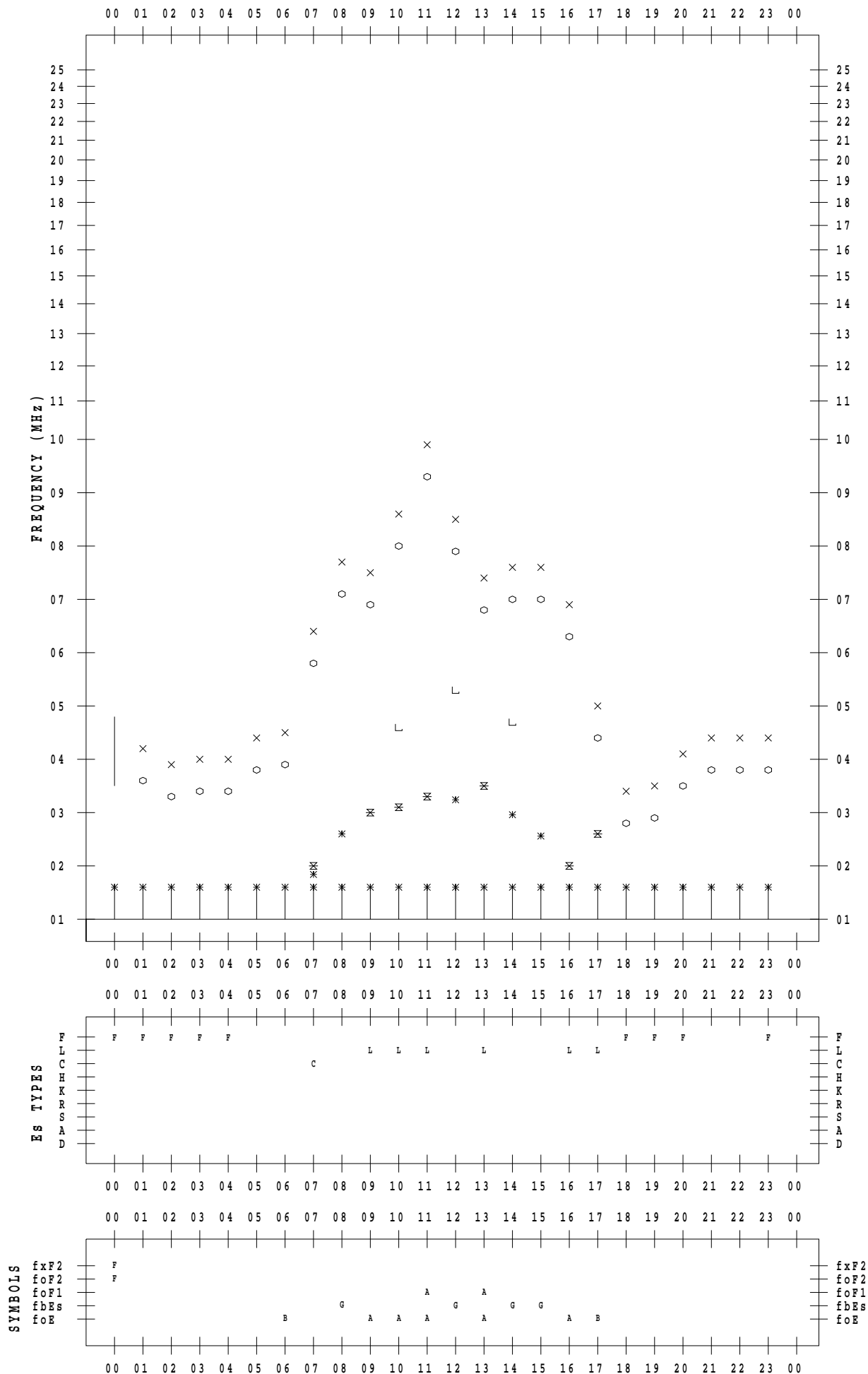
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/29

135 ° E MEAN TIME



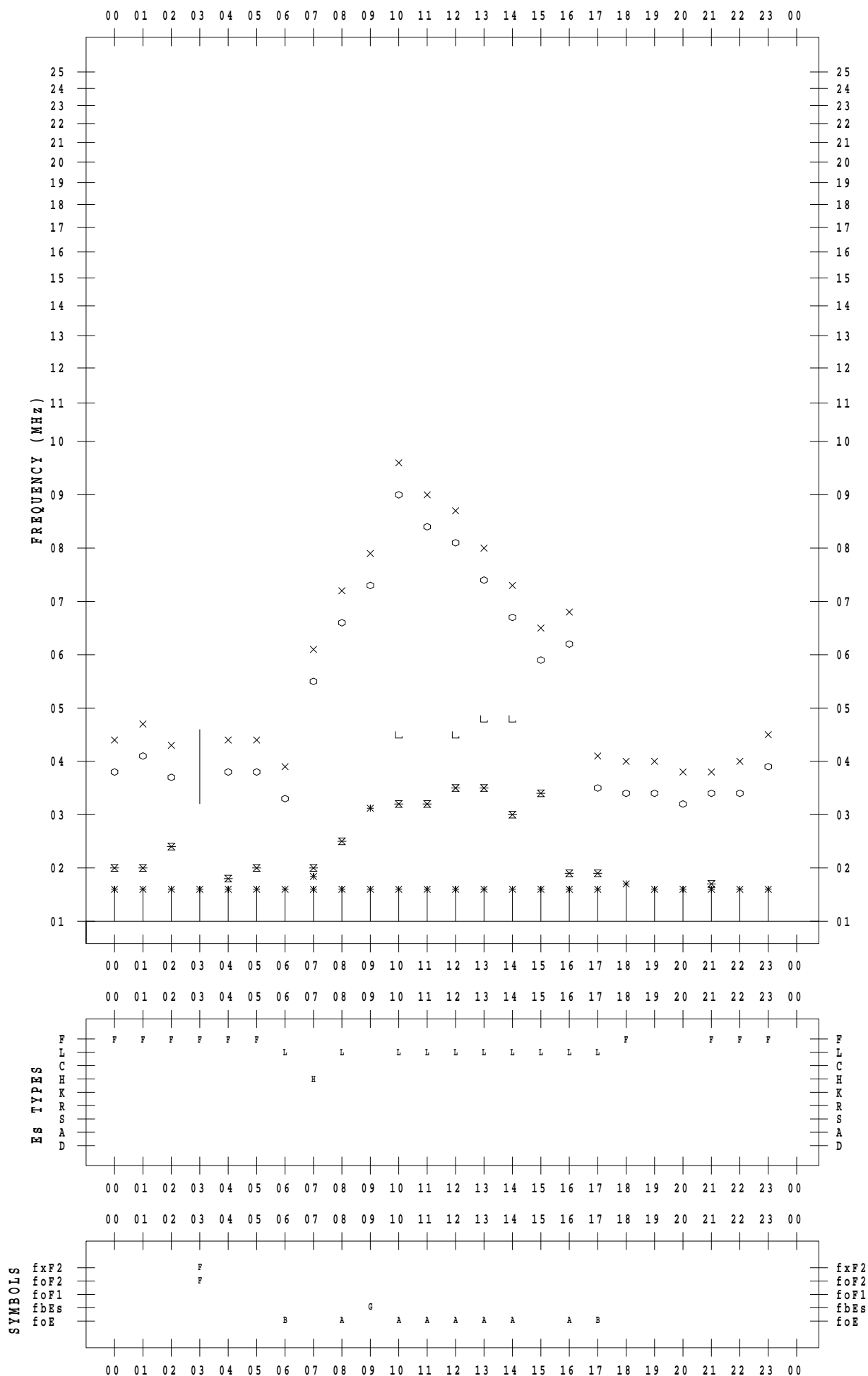
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2021/11/30

135 ° E MEAN TIME



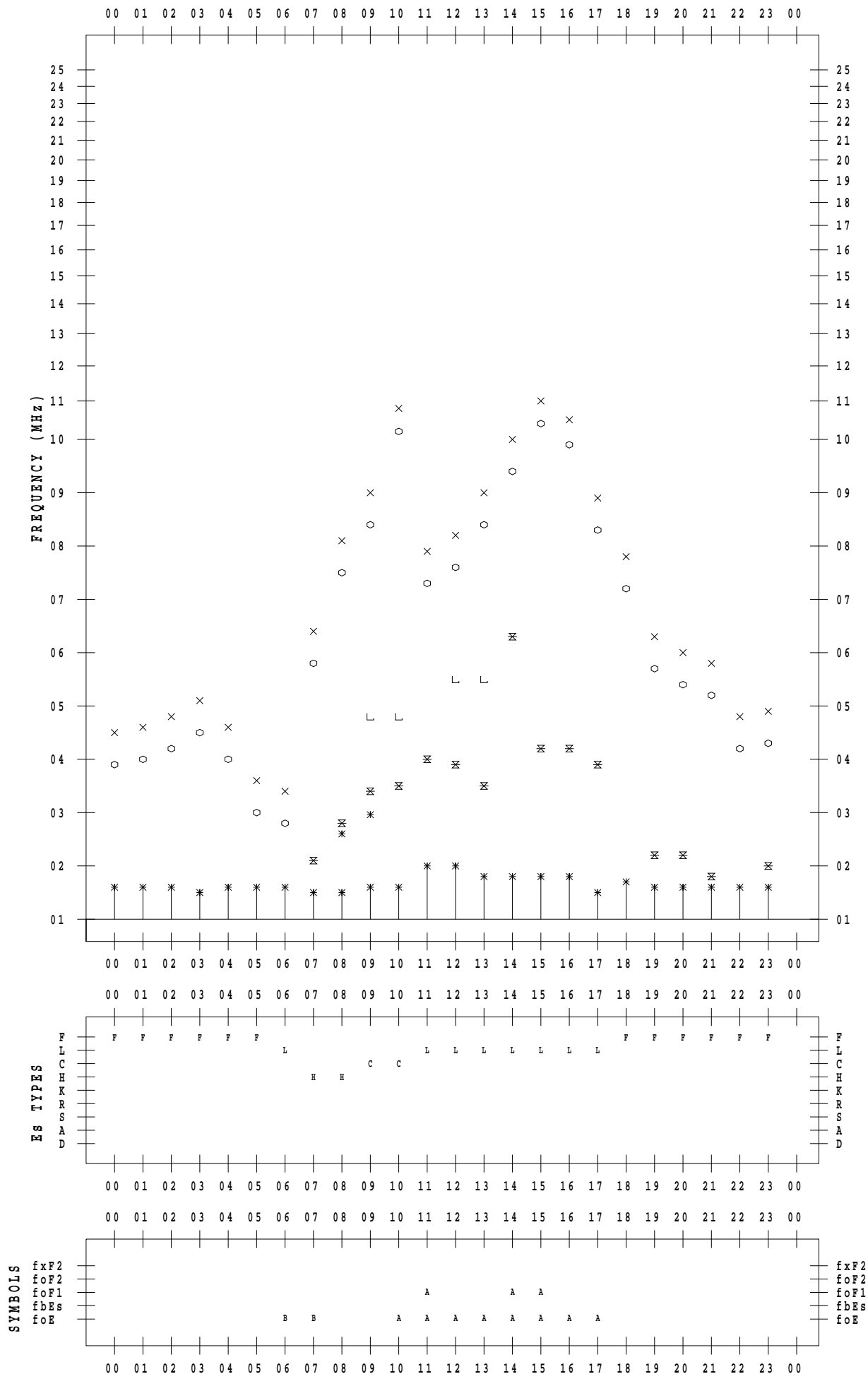
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 1

135 ° E MEAN TIME



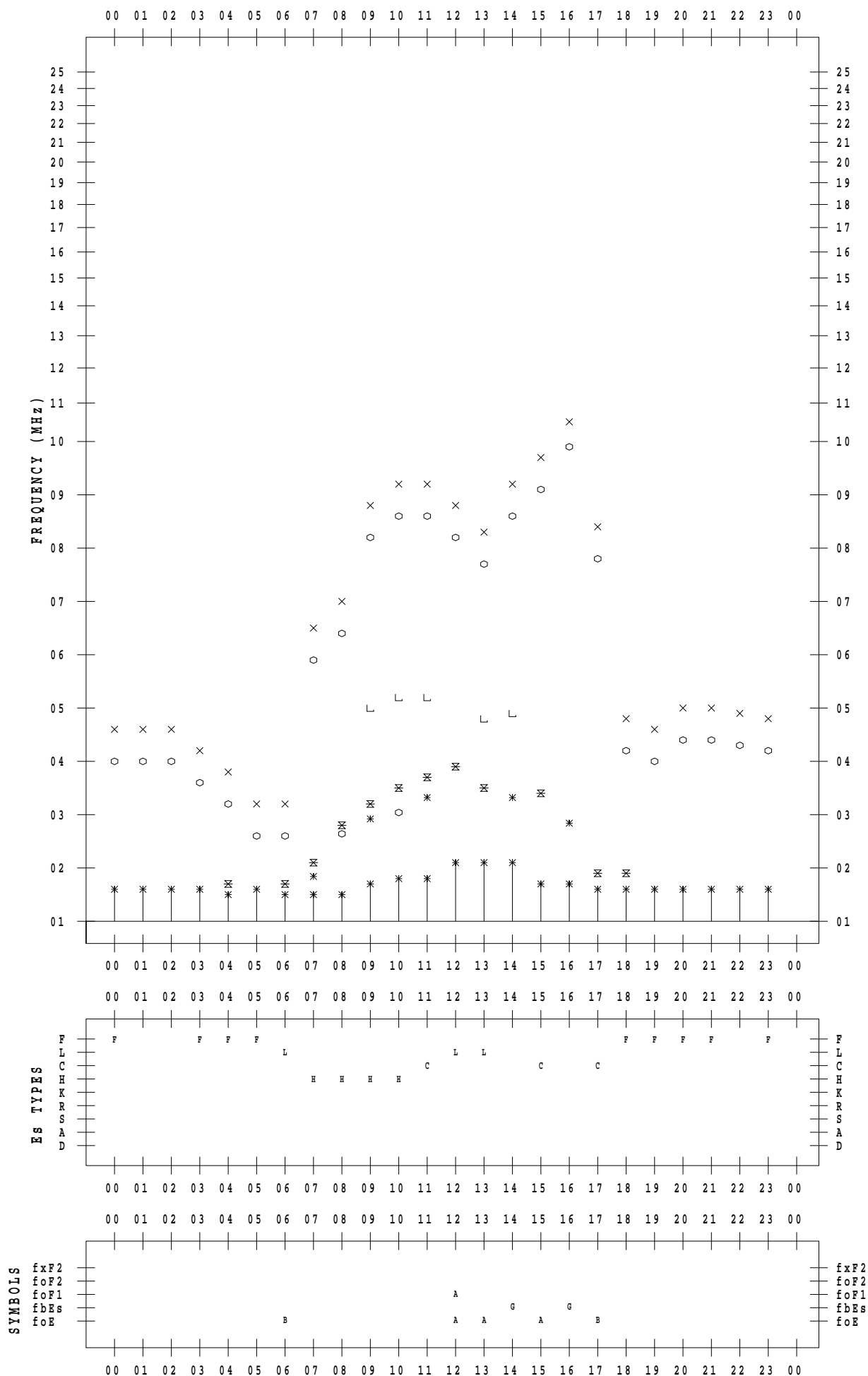
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 2

135 ° E MEAN TIME



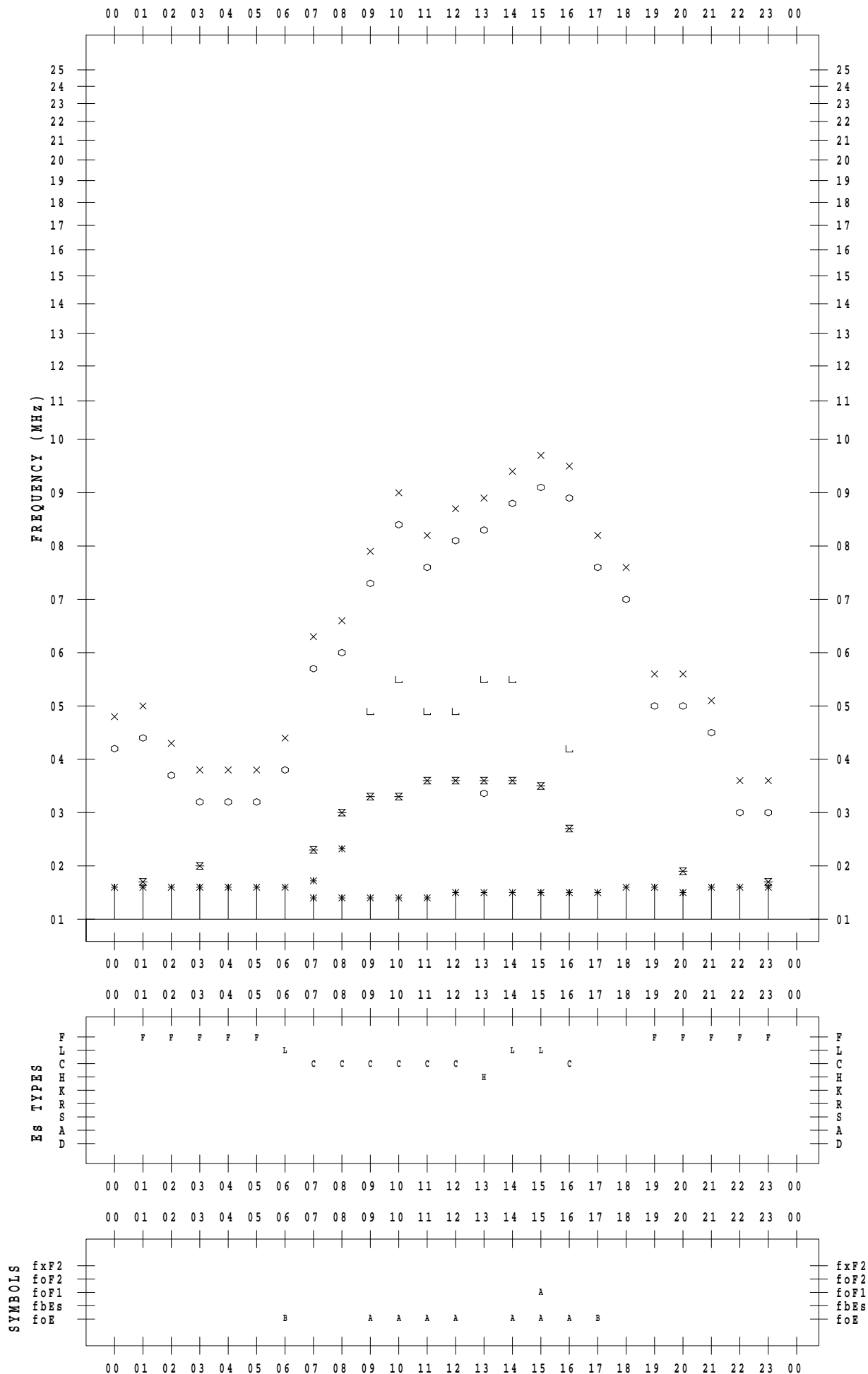
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 3

135 ° E MEAN TIME



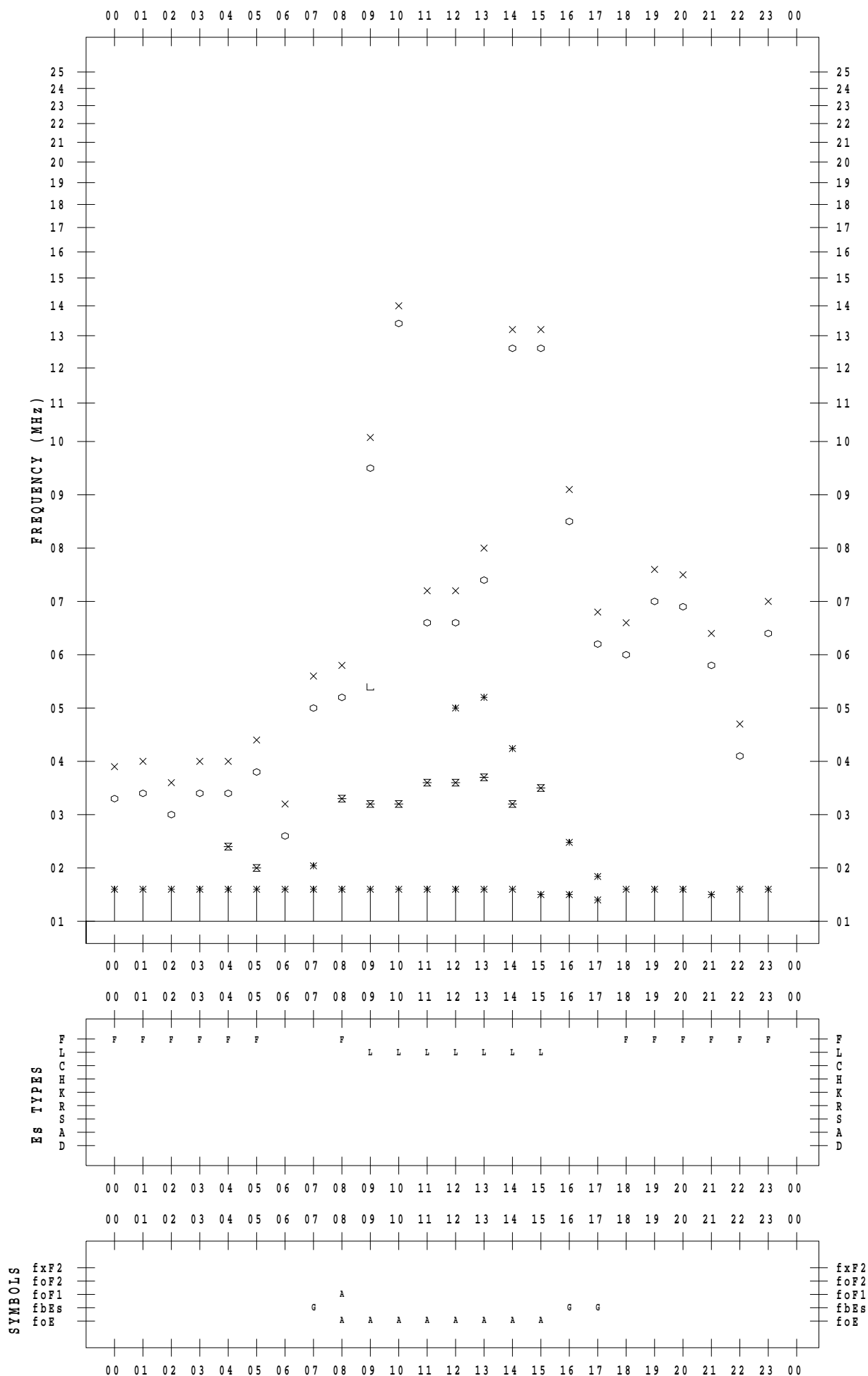
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 4

135 ° E MEAN TIME



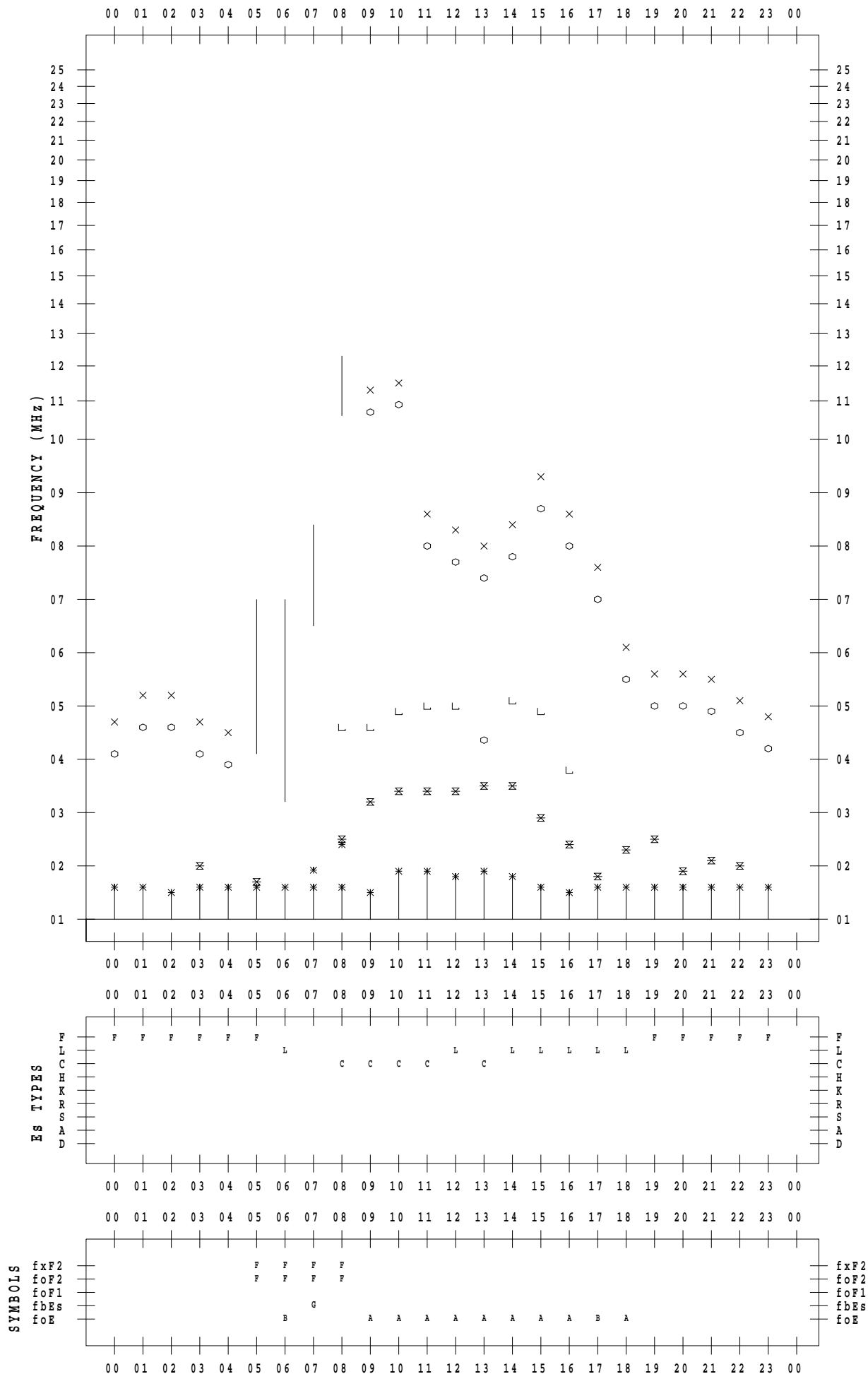
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 5

135 ° E MEAN TIME



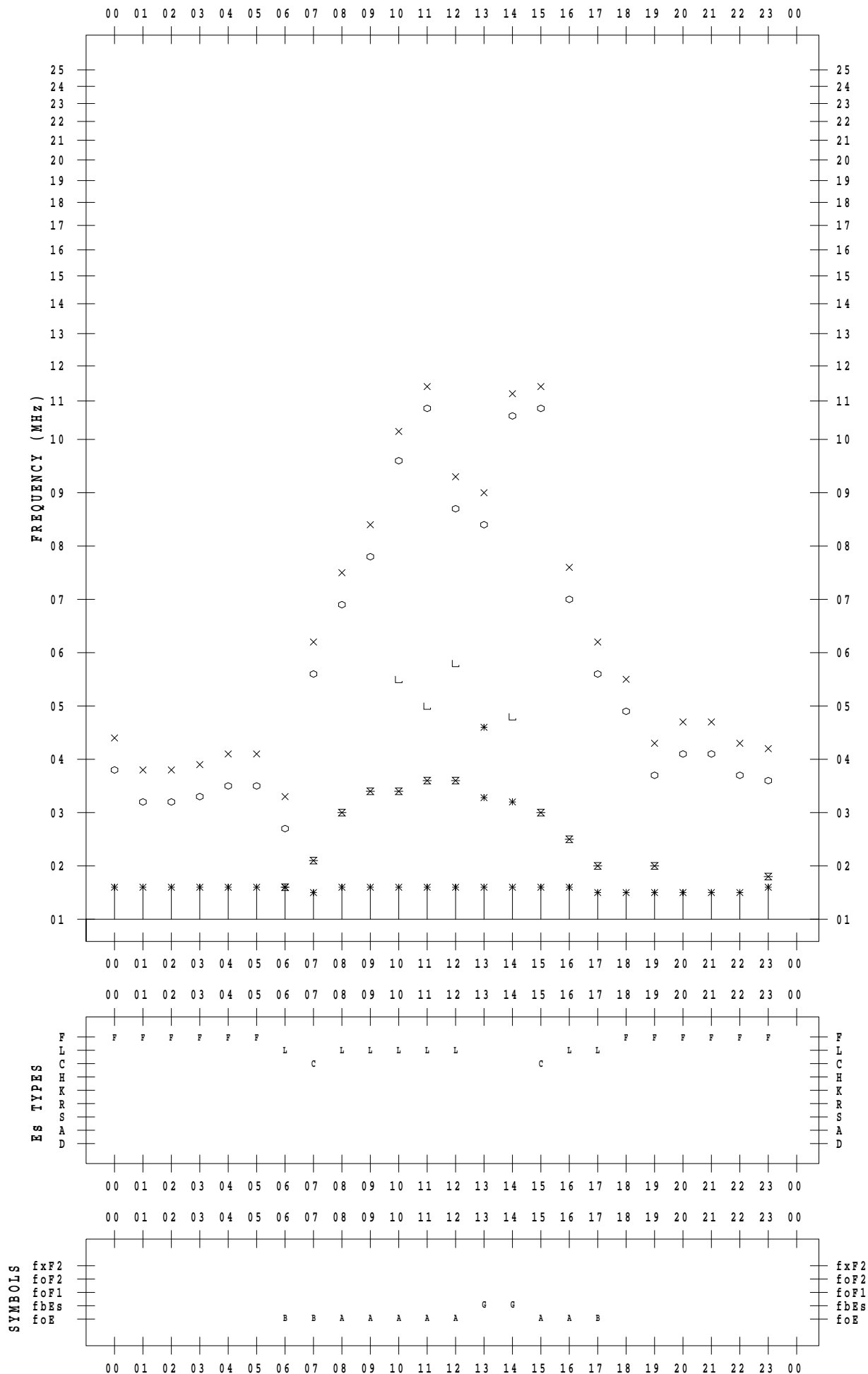
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 6

135 ° E MEAN TIME



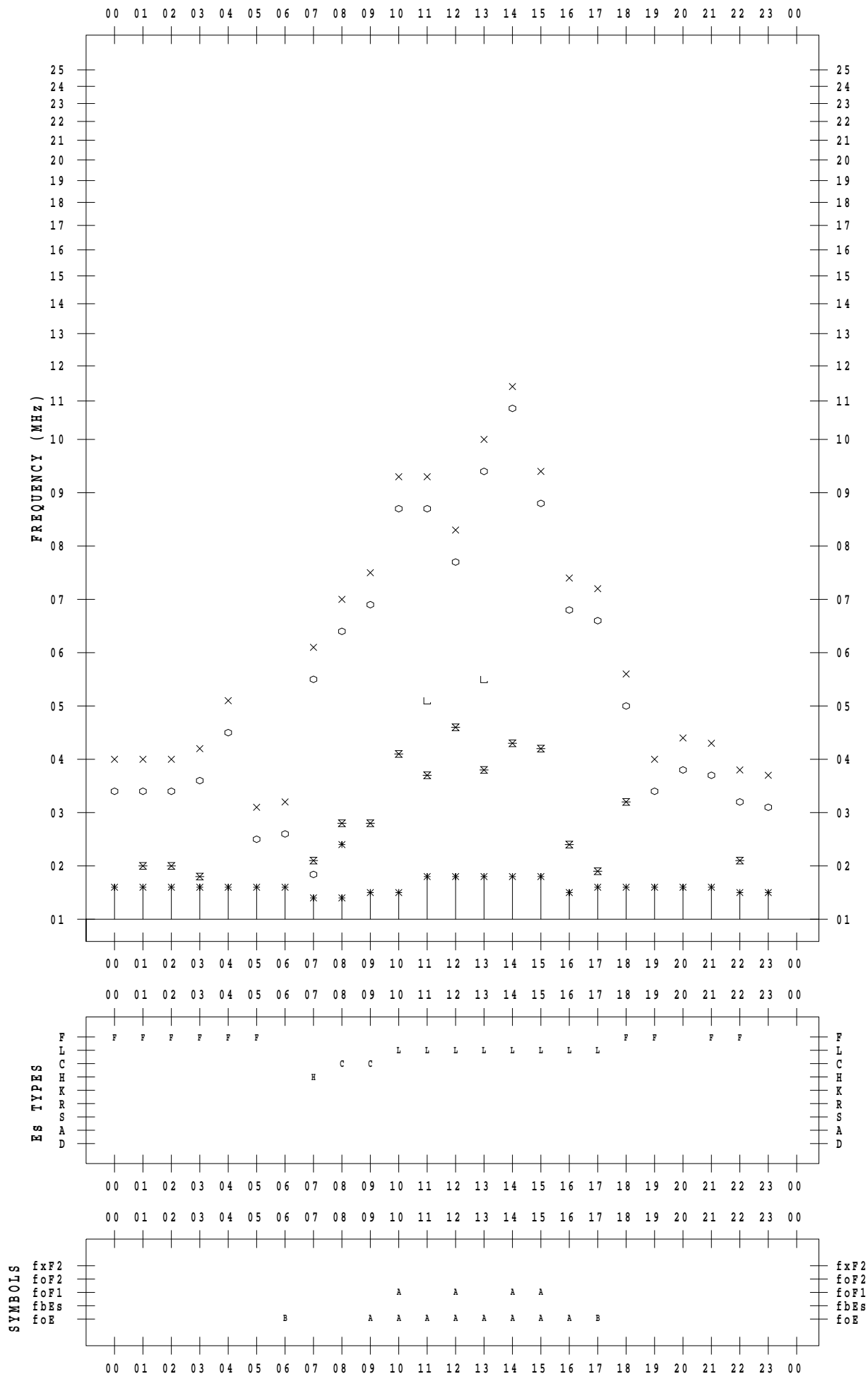
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 7

135 ° E MEAN TIME



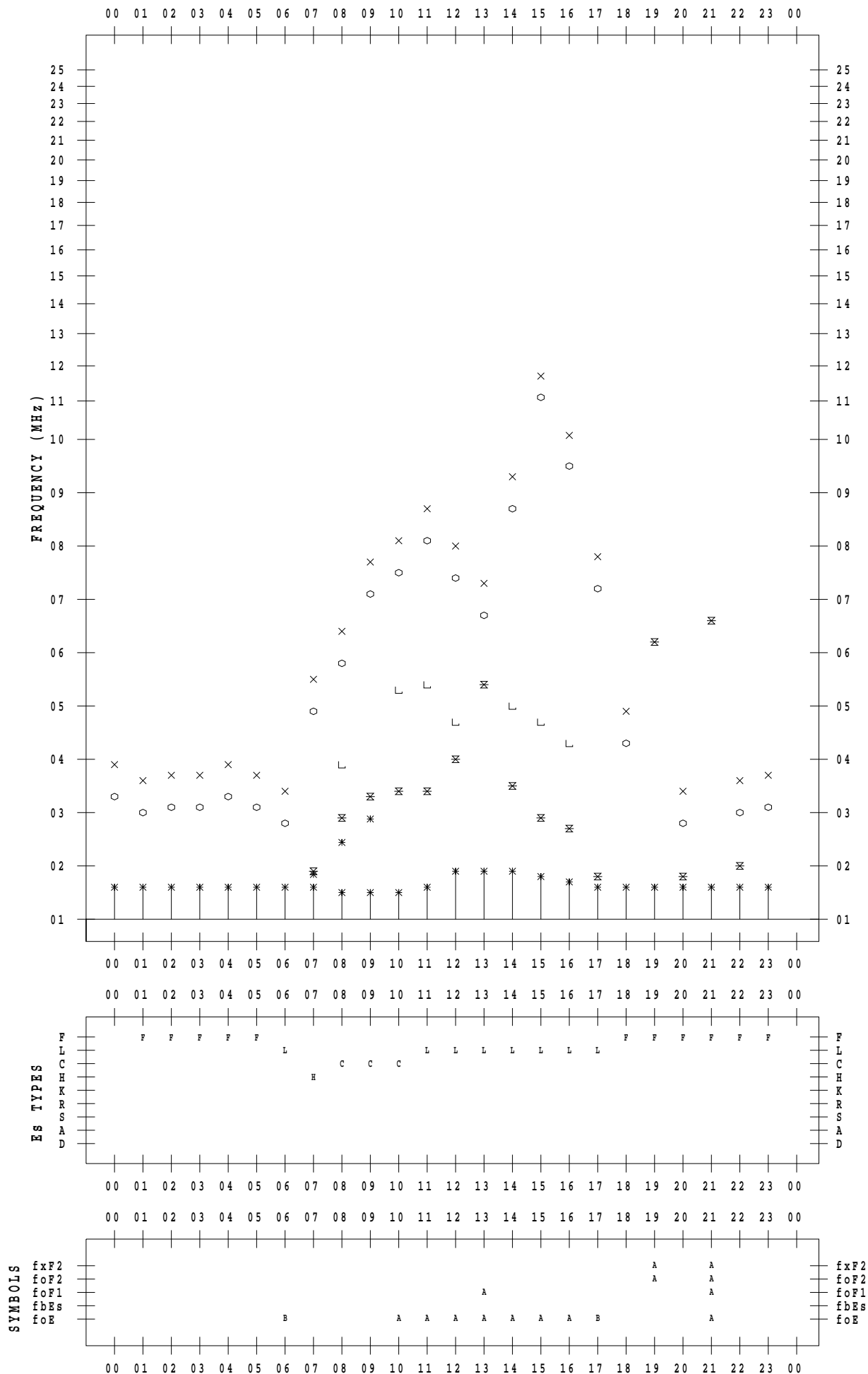
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 8

135 ° E MEAN TIME



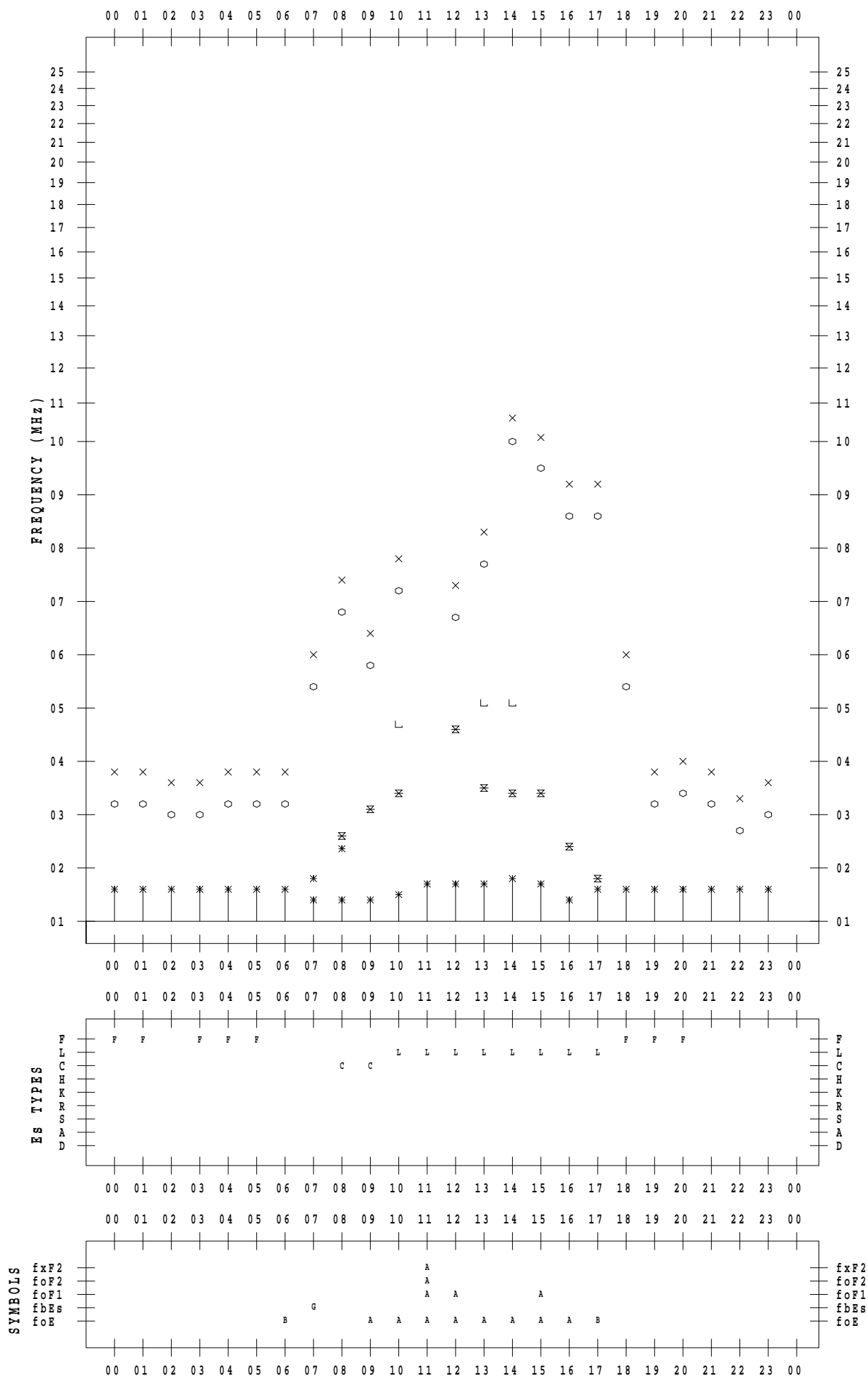
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/ 9

135 ° E MEAN TIME



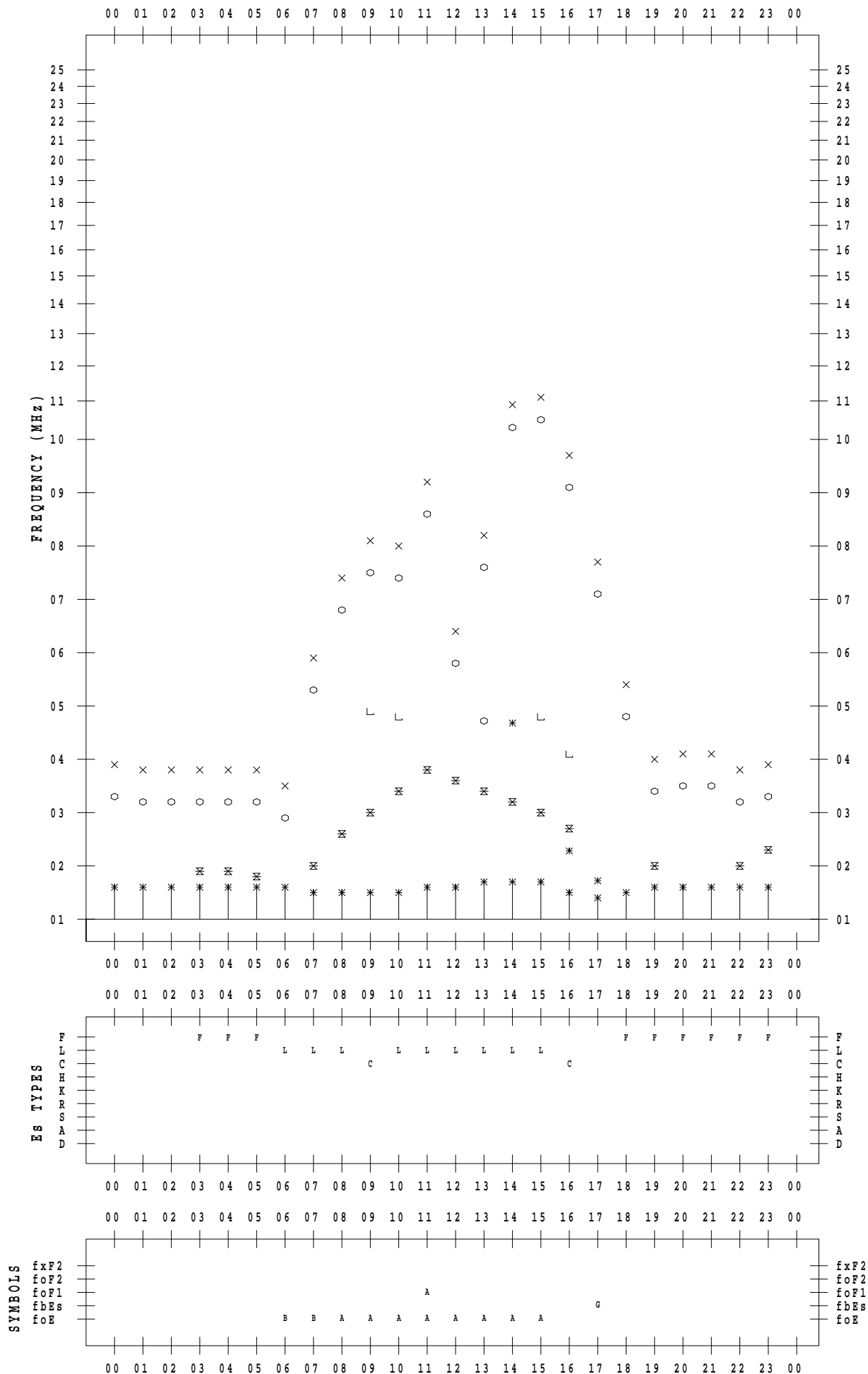
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/10

135 ° E MEAN TIME



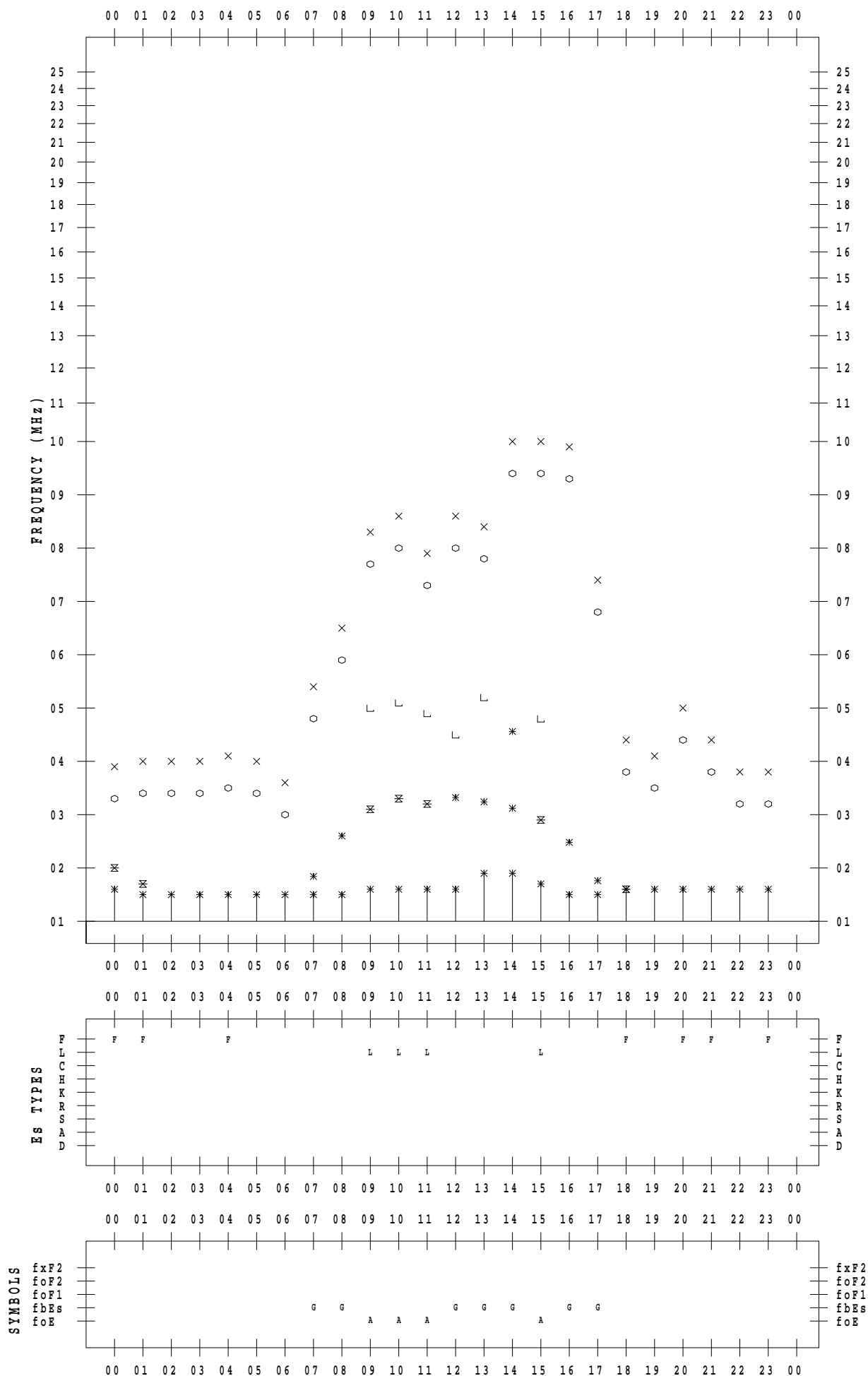
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/11

135 ° E MEAN TIME



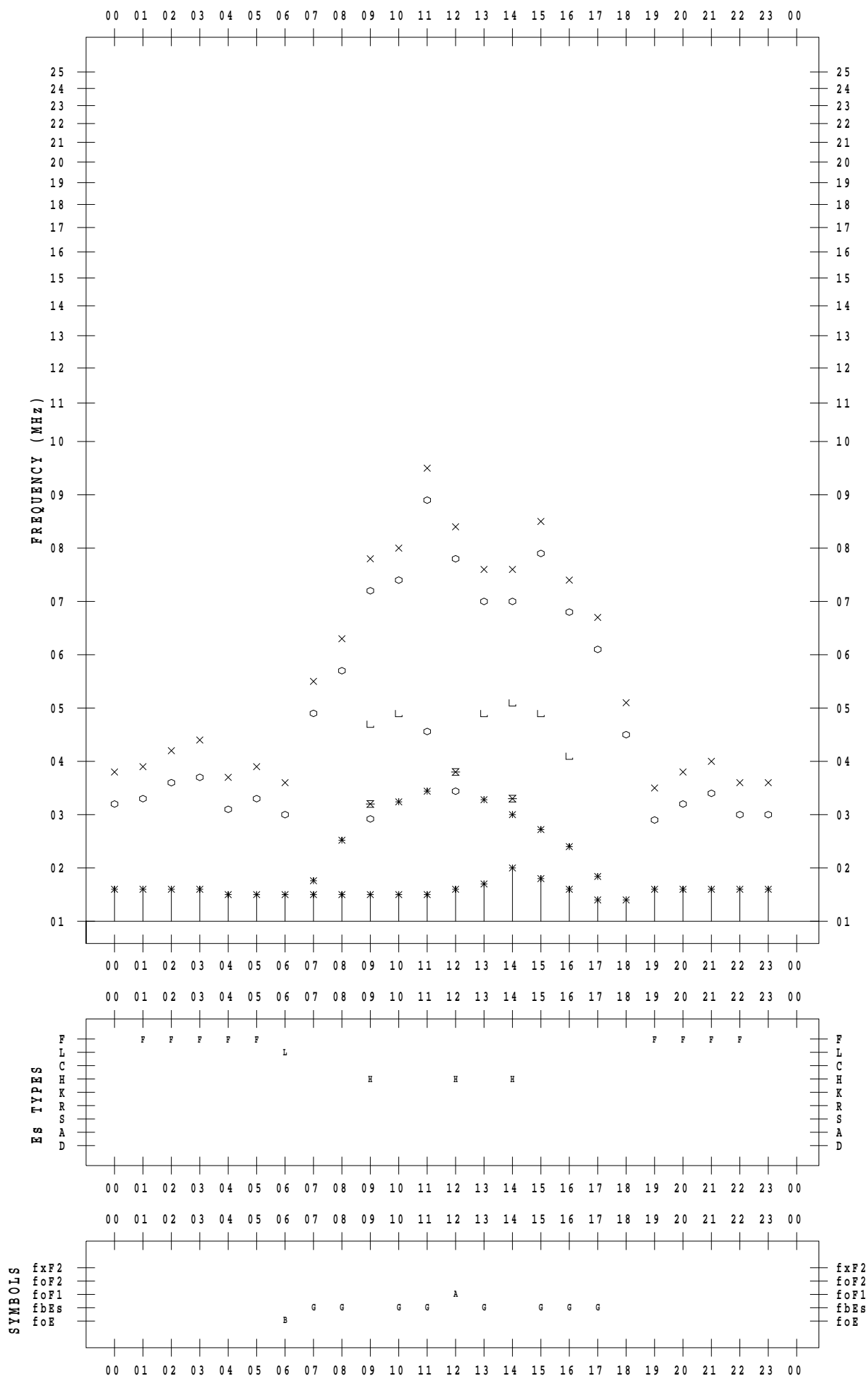
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/12

135 ° E MEAN TIME



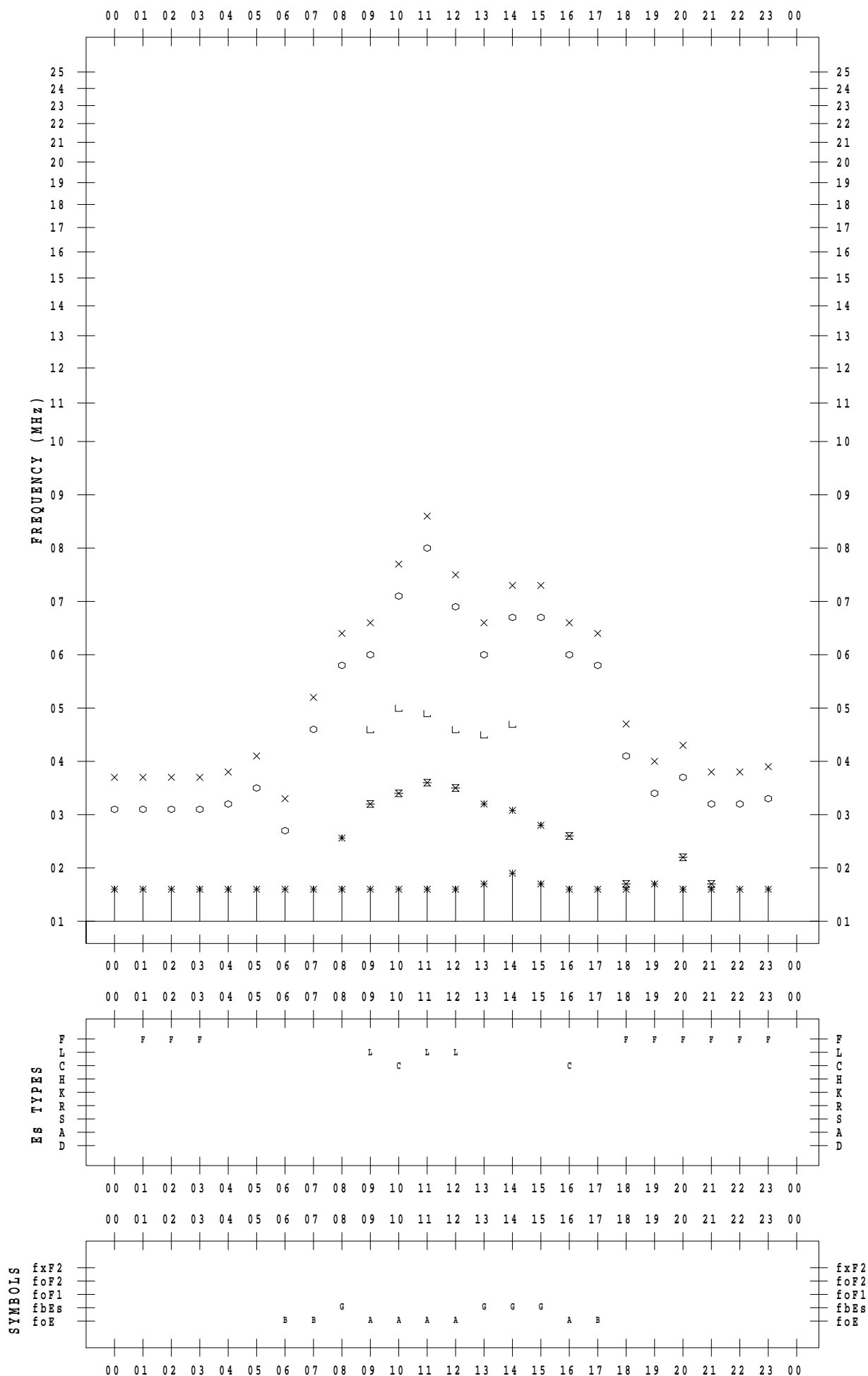
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/13

135 ° E MEAN TIME



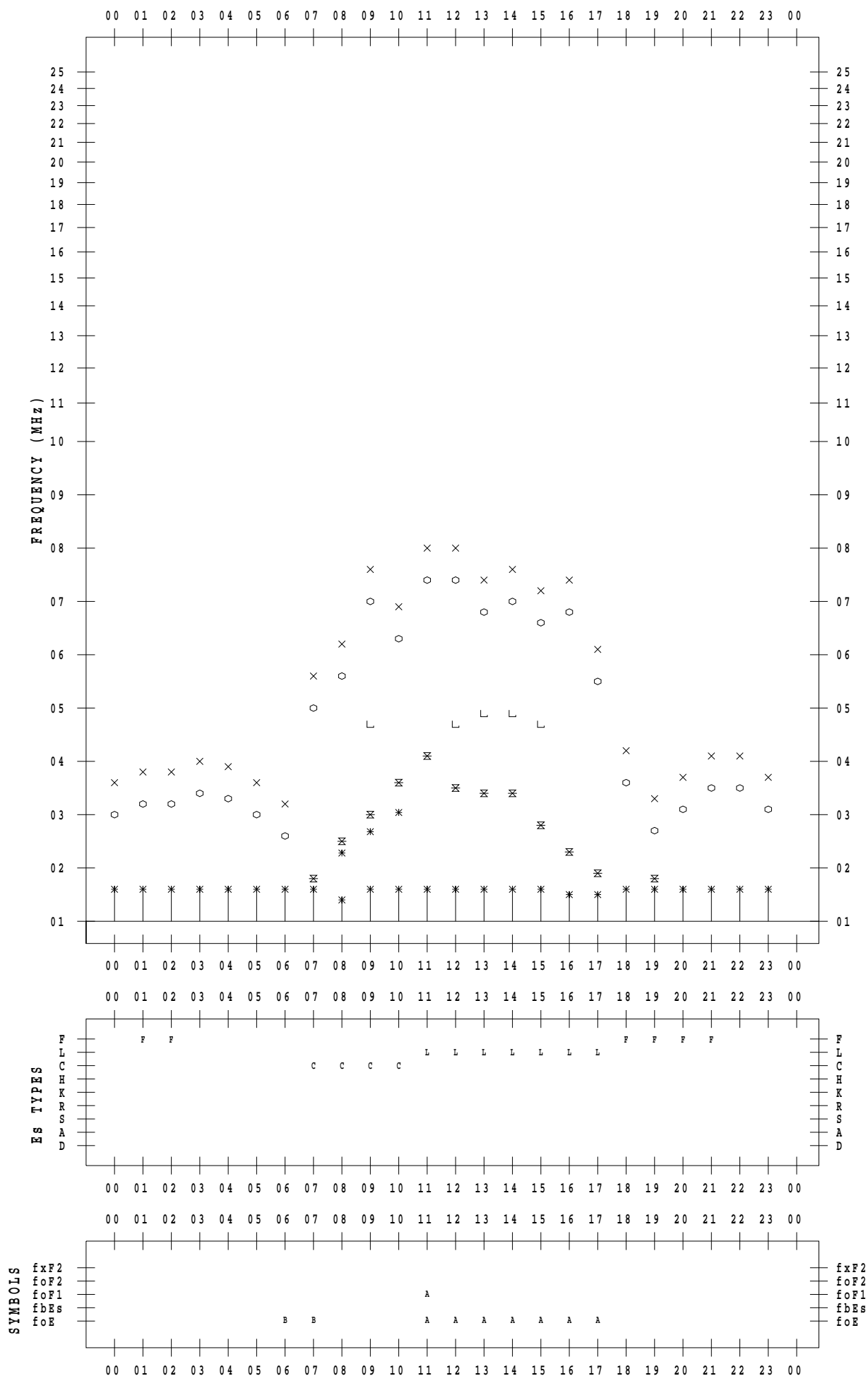
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/14

135 ° E MEAN TIME



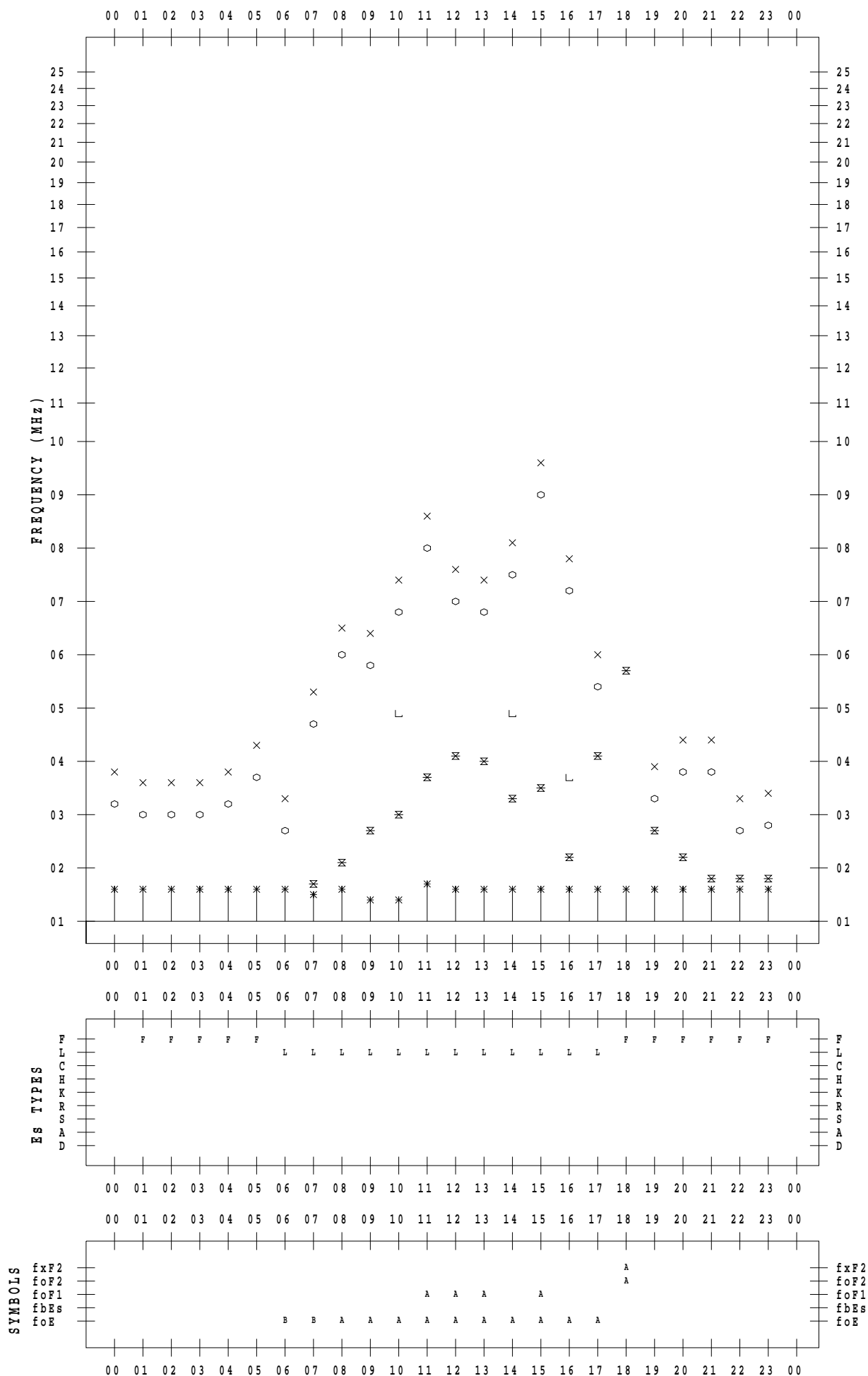
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/15

135 ° E MEAN TIME



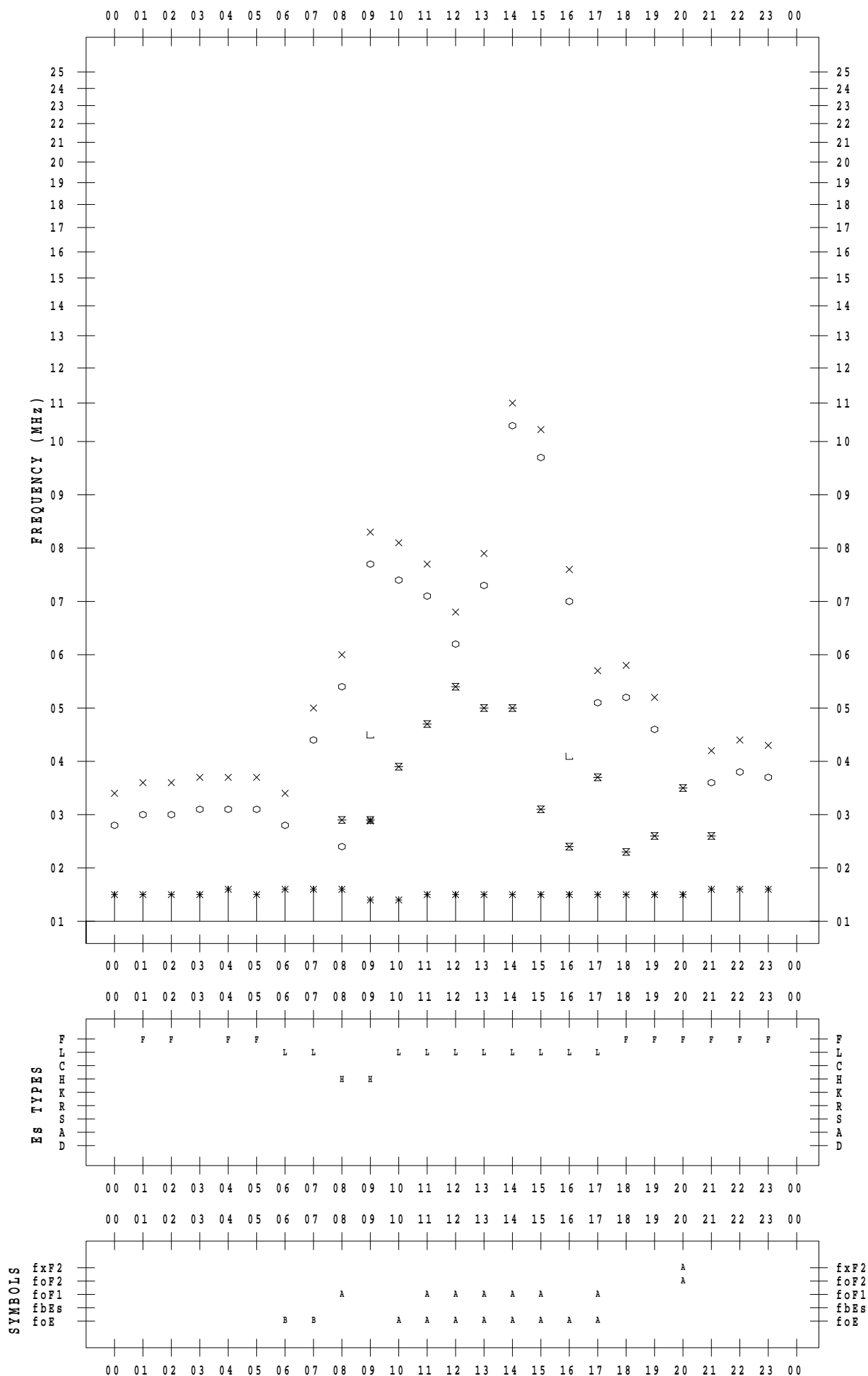
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/16

135 ° E MEAN TIME



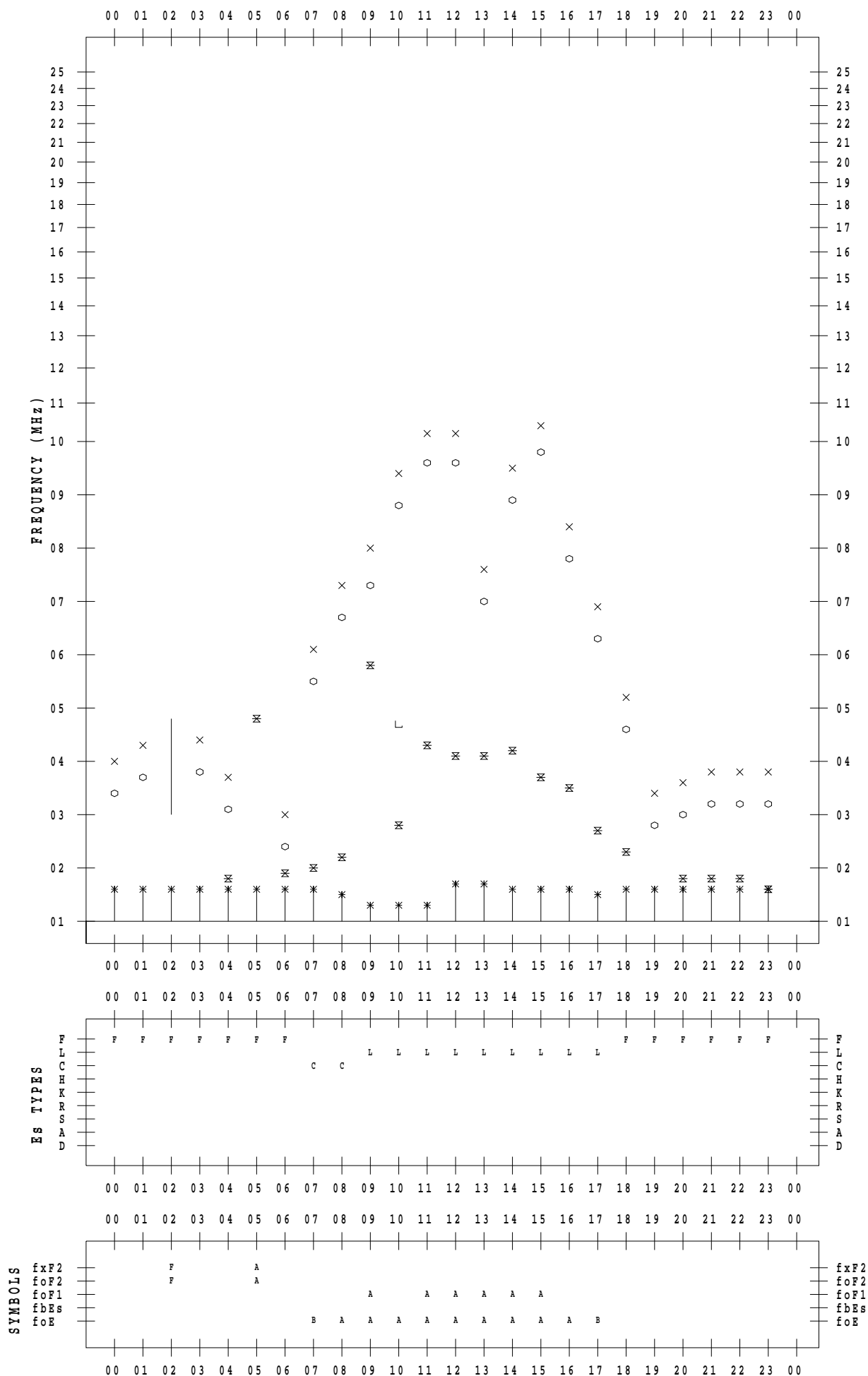
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/17

135 ° E MEAN TIME



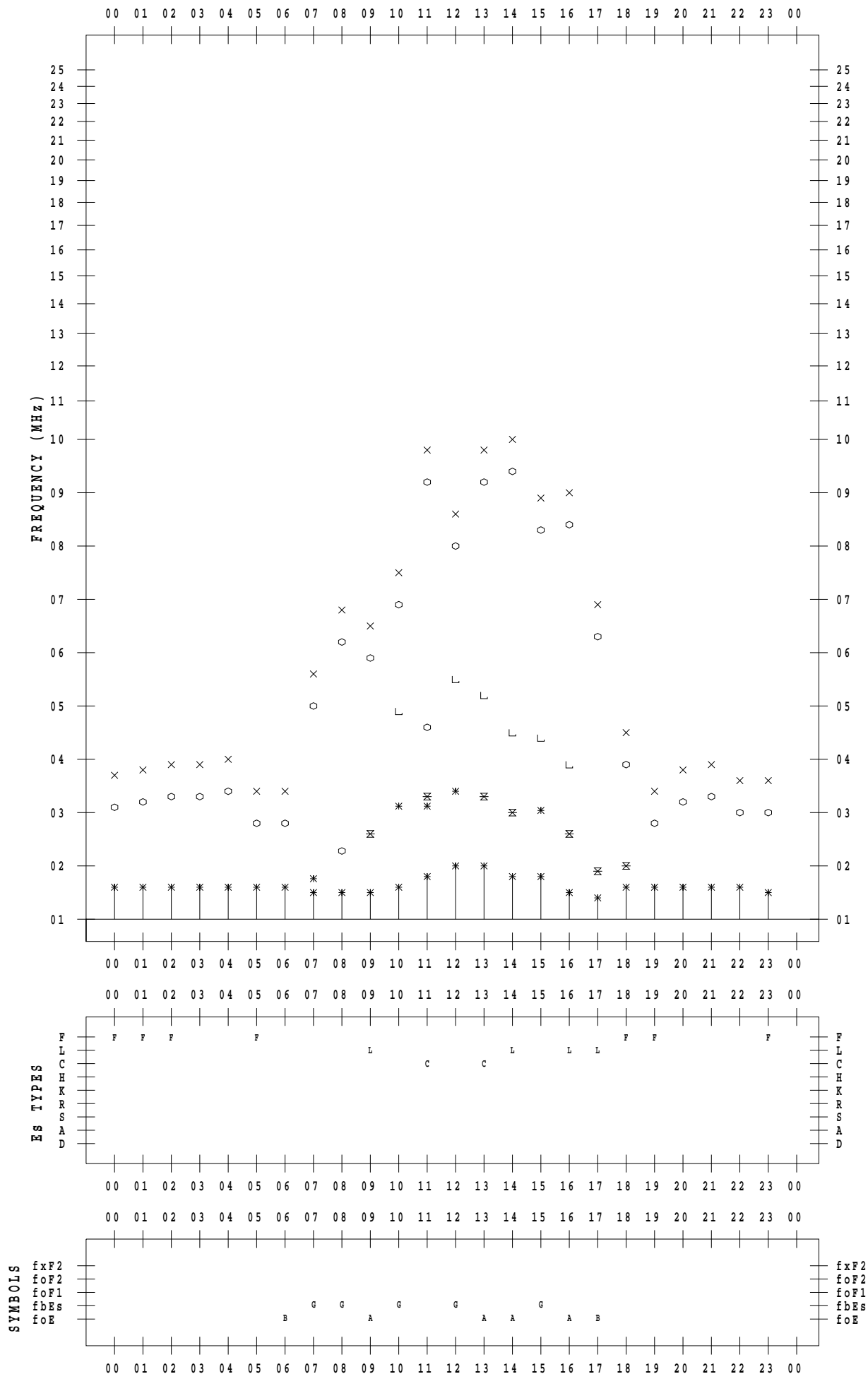
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/18

135 ° E MEAN TIME



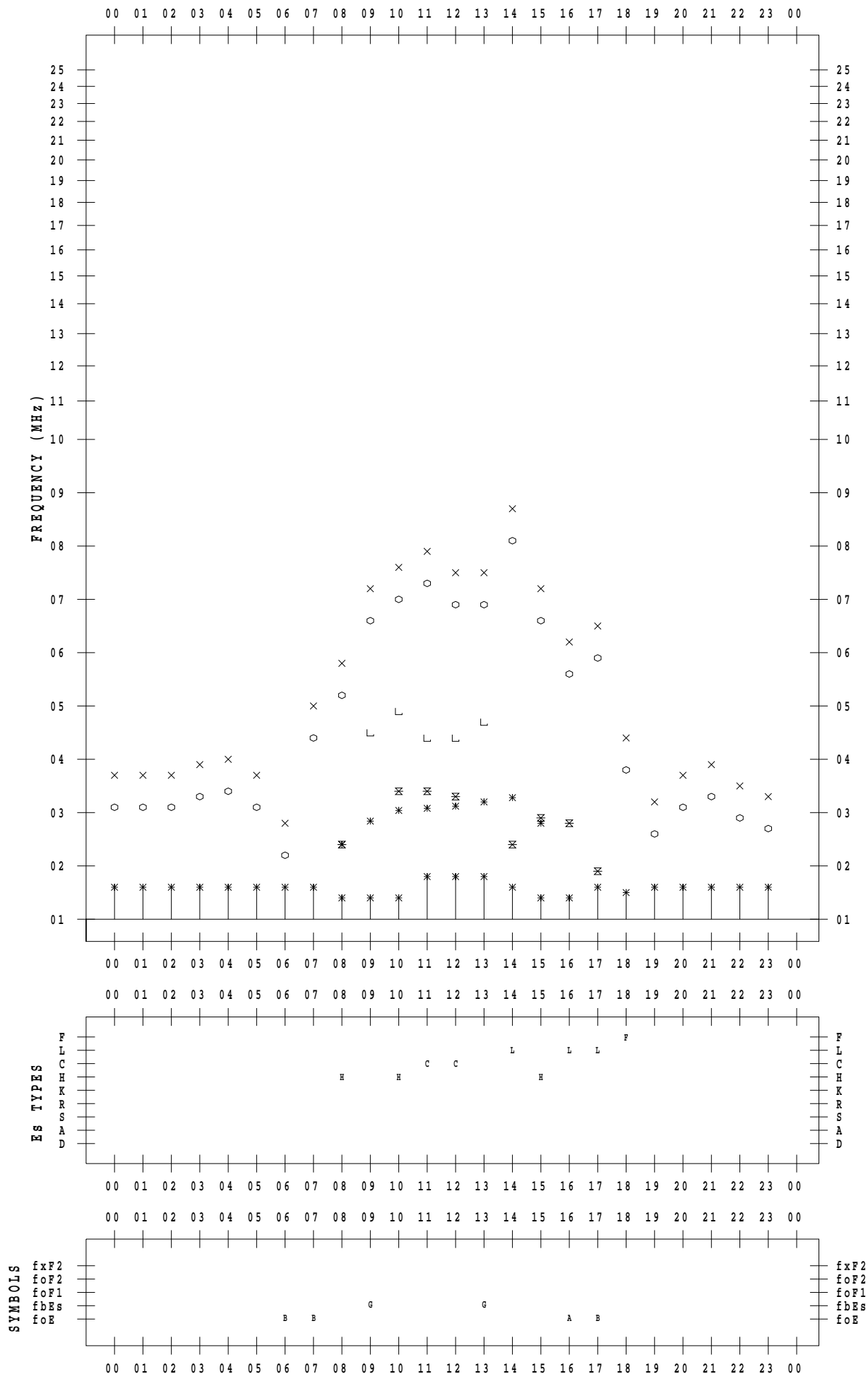
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/19

135 ° E MEAN TIME



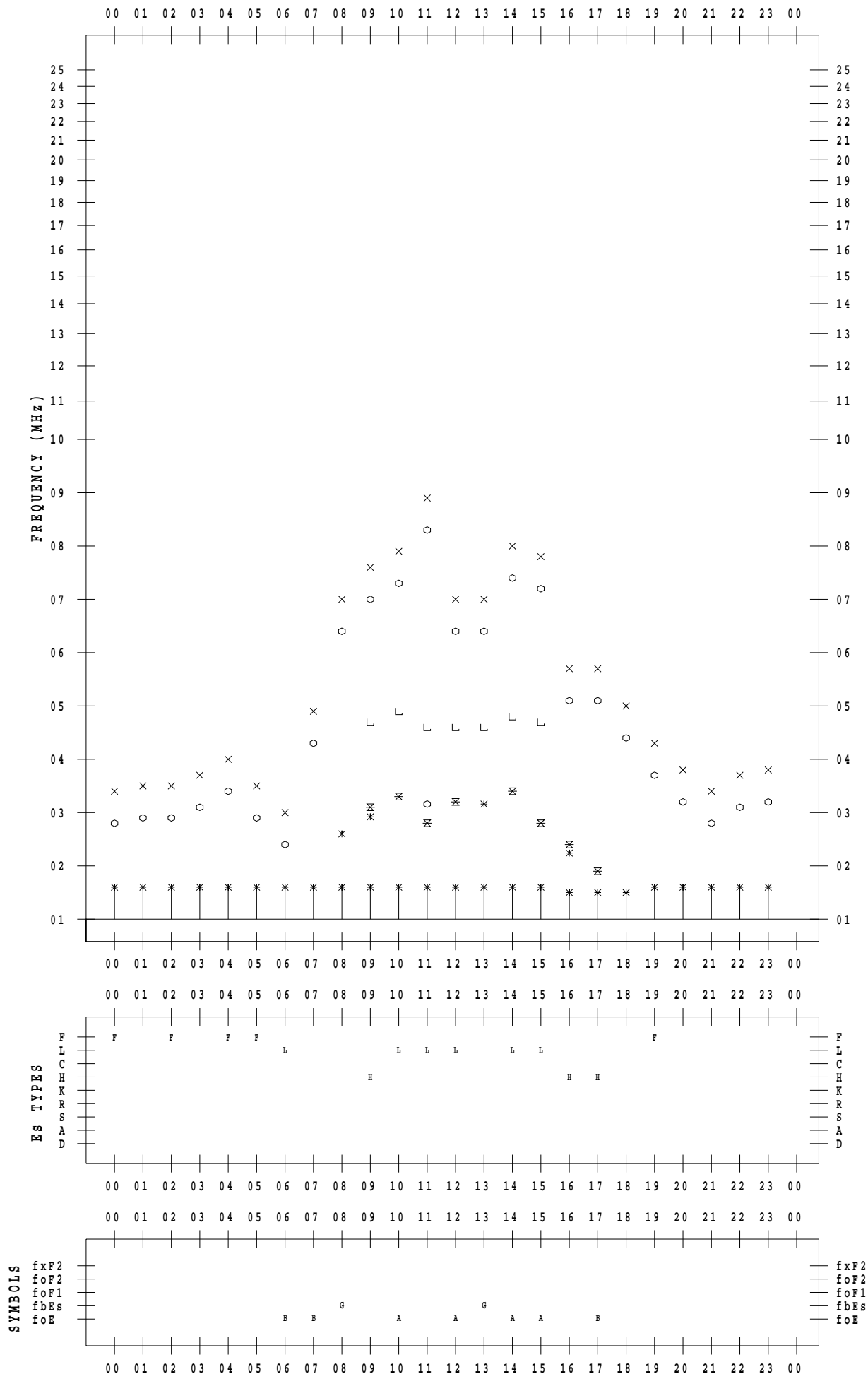
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/20

135 ° E MEAN TIME



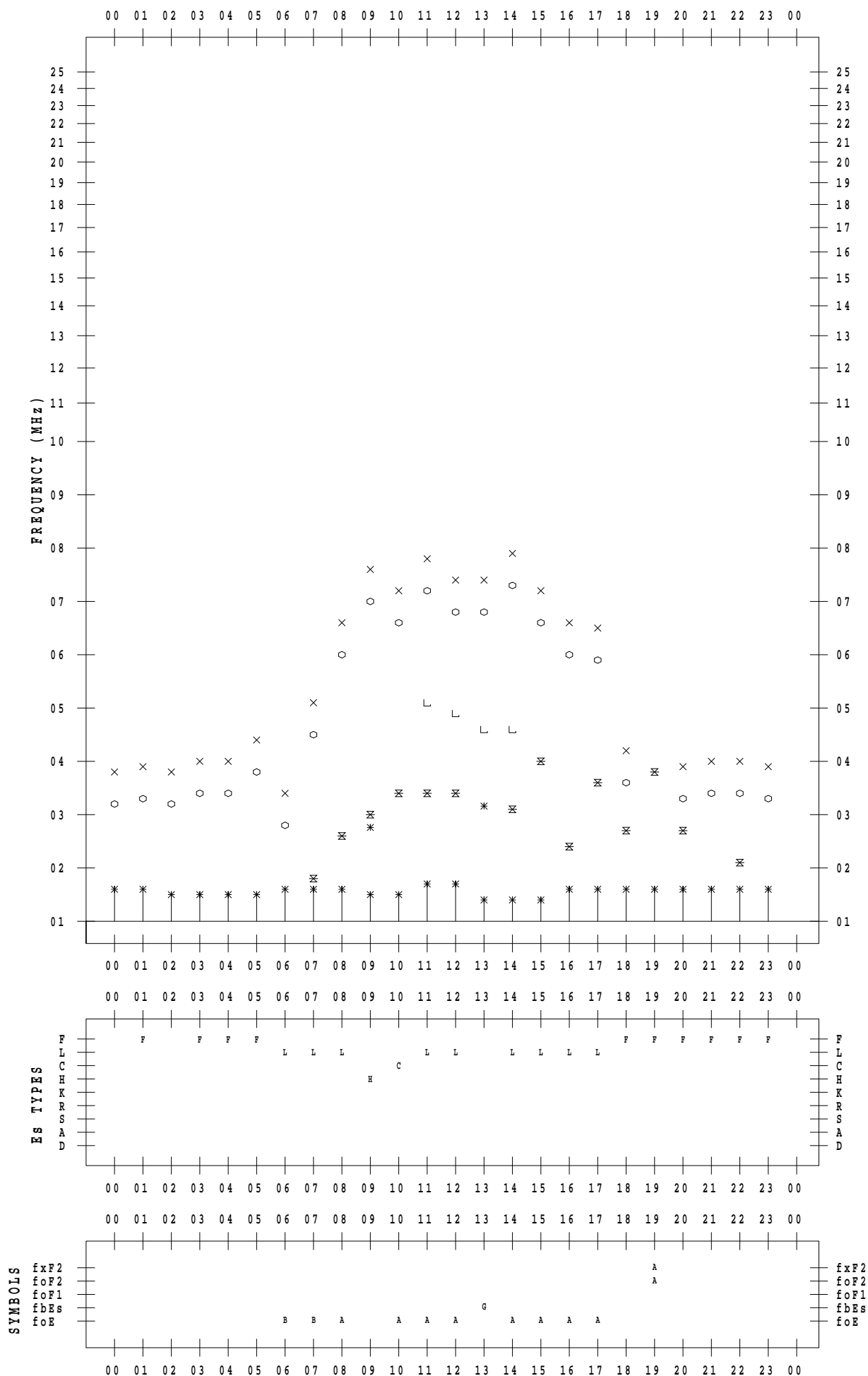
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/21

135 ° E MEAN TIME



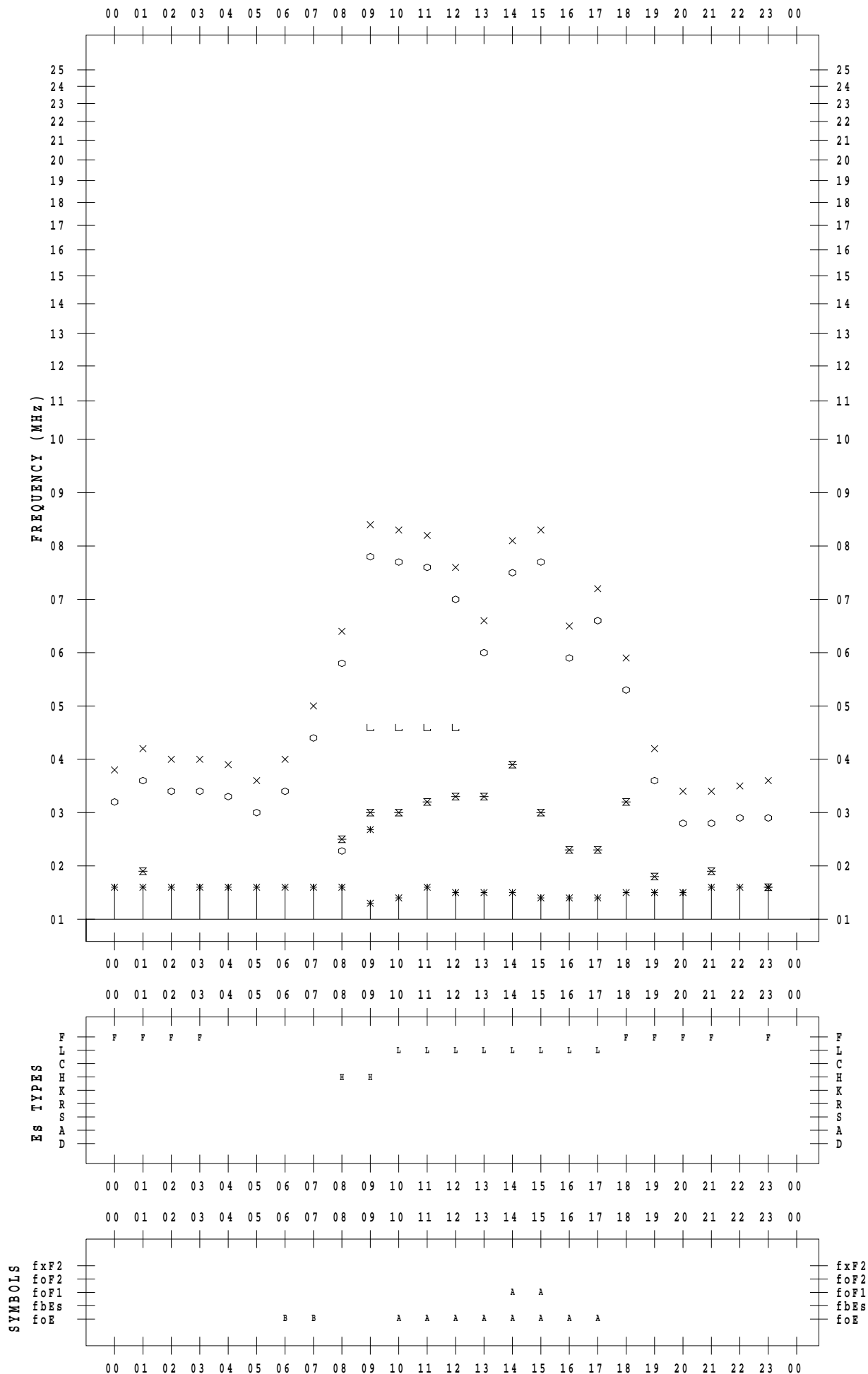
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/22

135 ° E MEAN TIME



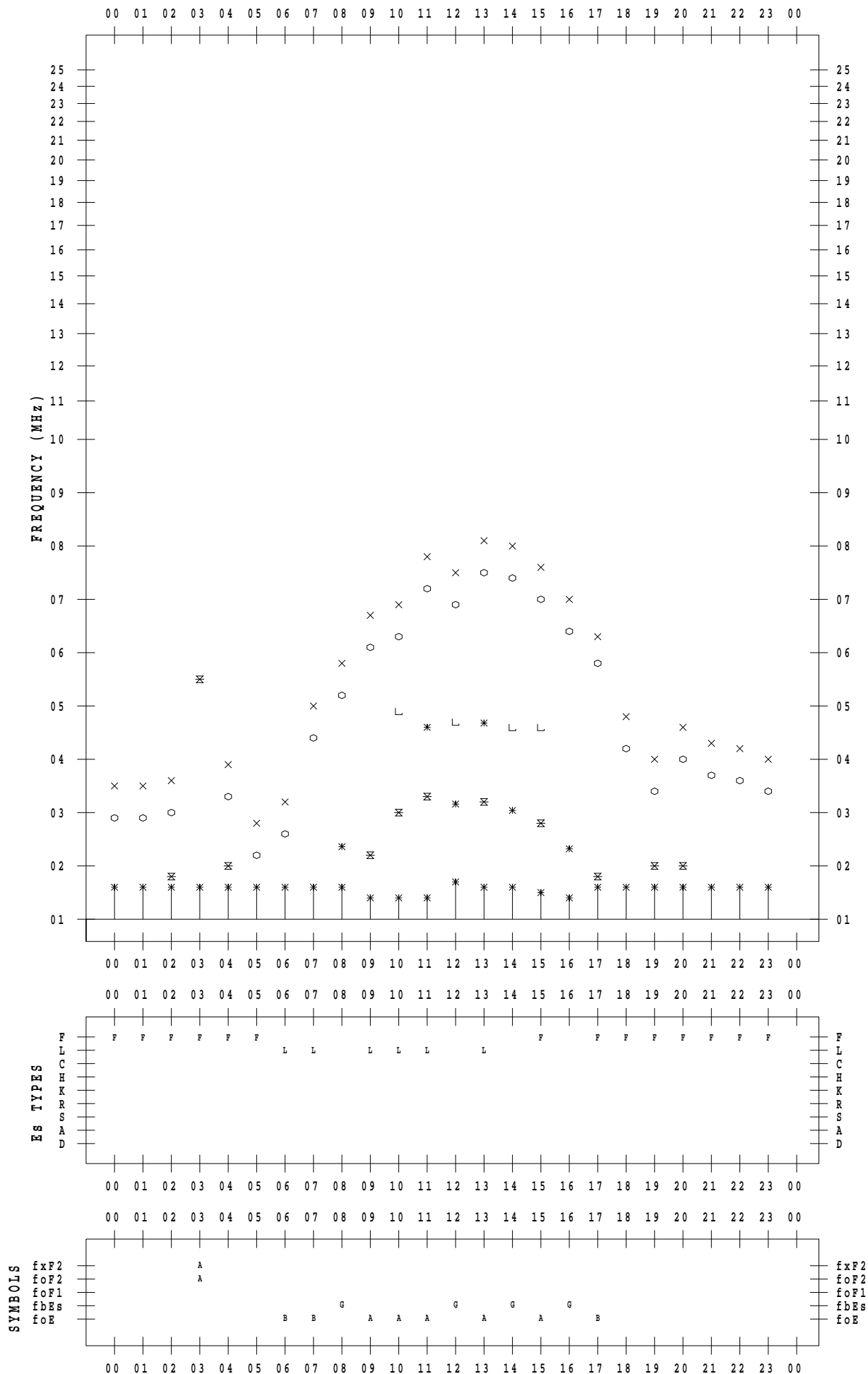
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/23

135 ° E MEAN TIME



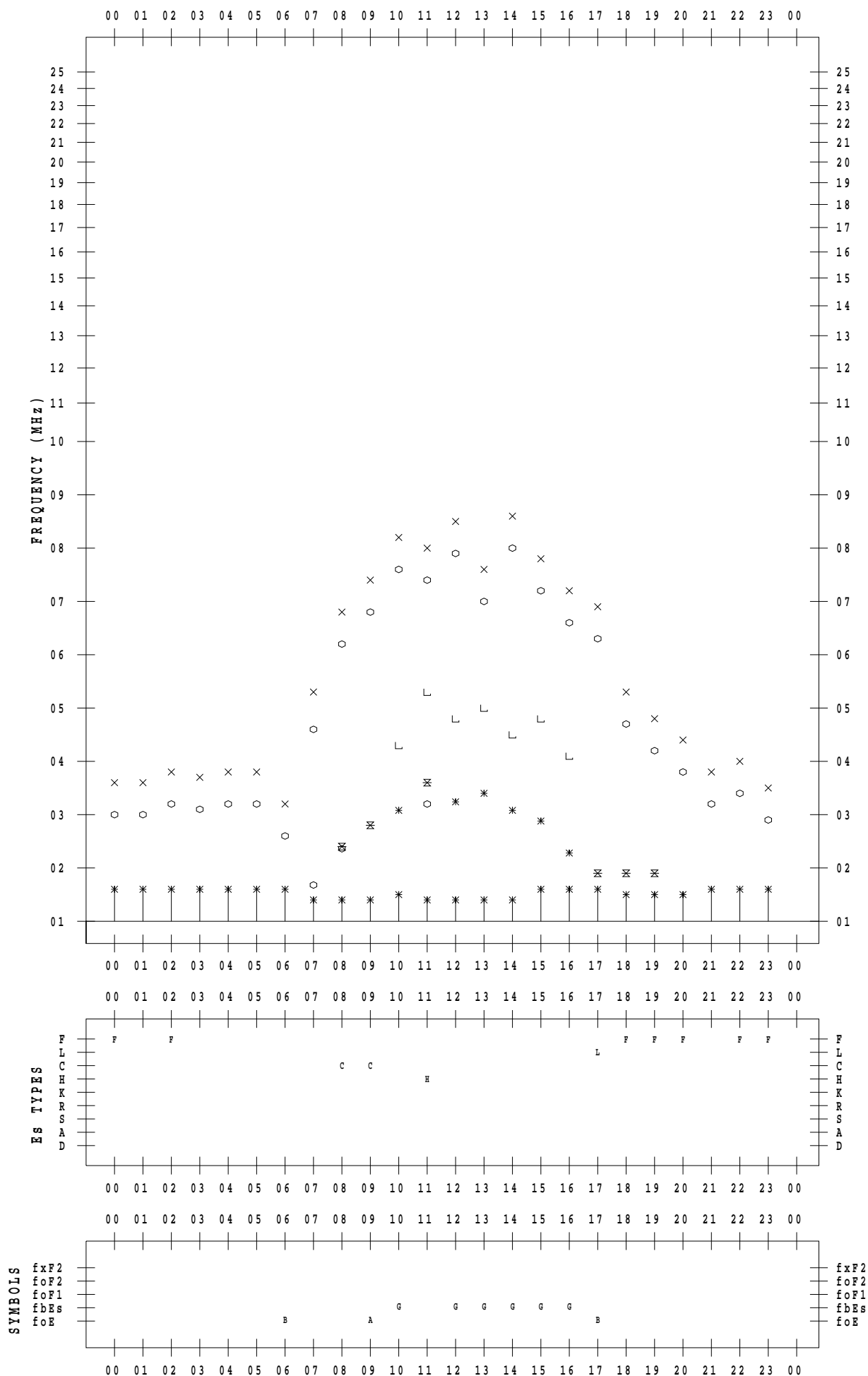
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/24

135 ° E MEAN TIME



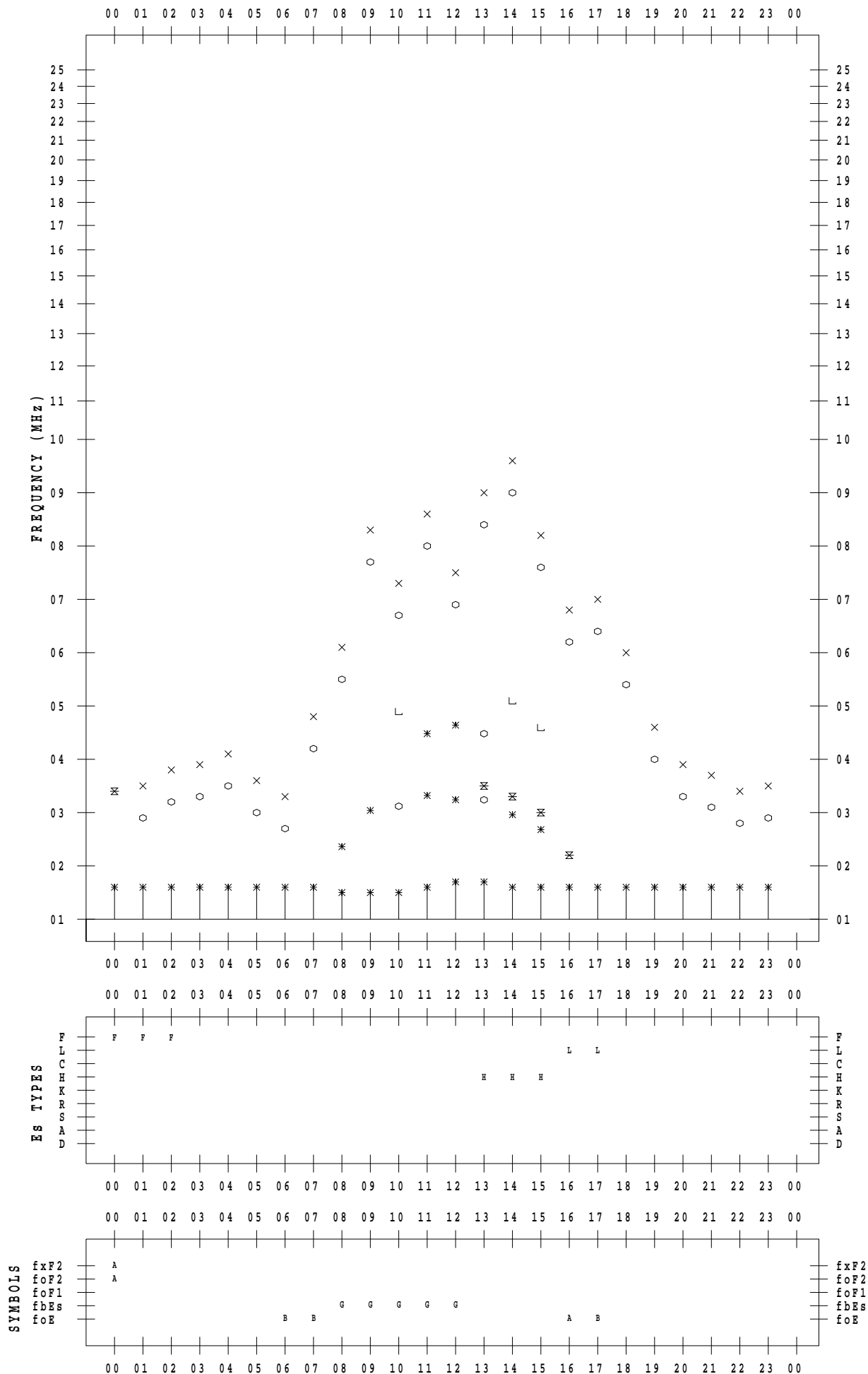
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/25

135 ° E MEAN TIME



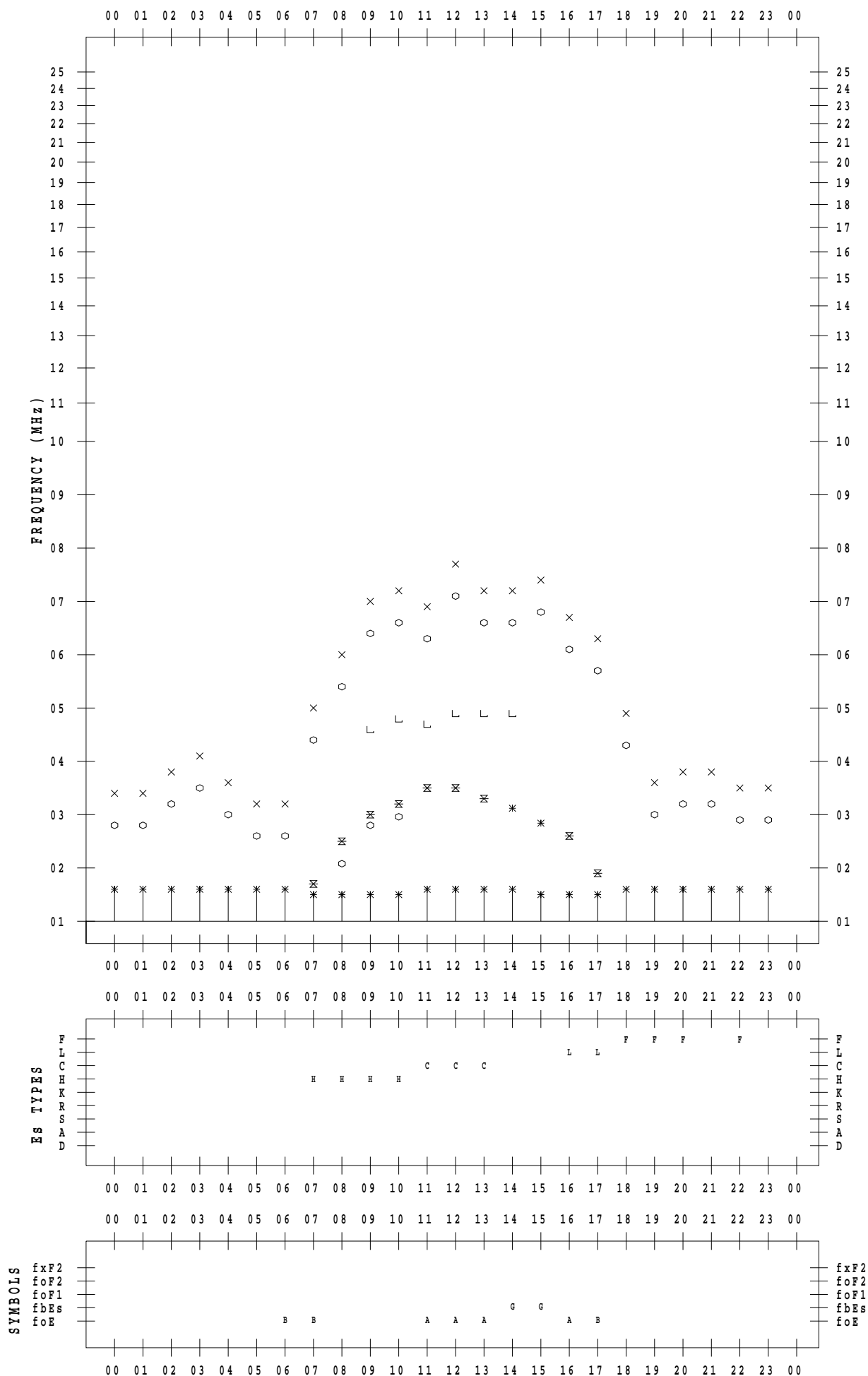
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/26

135 ° E MEAN TIME



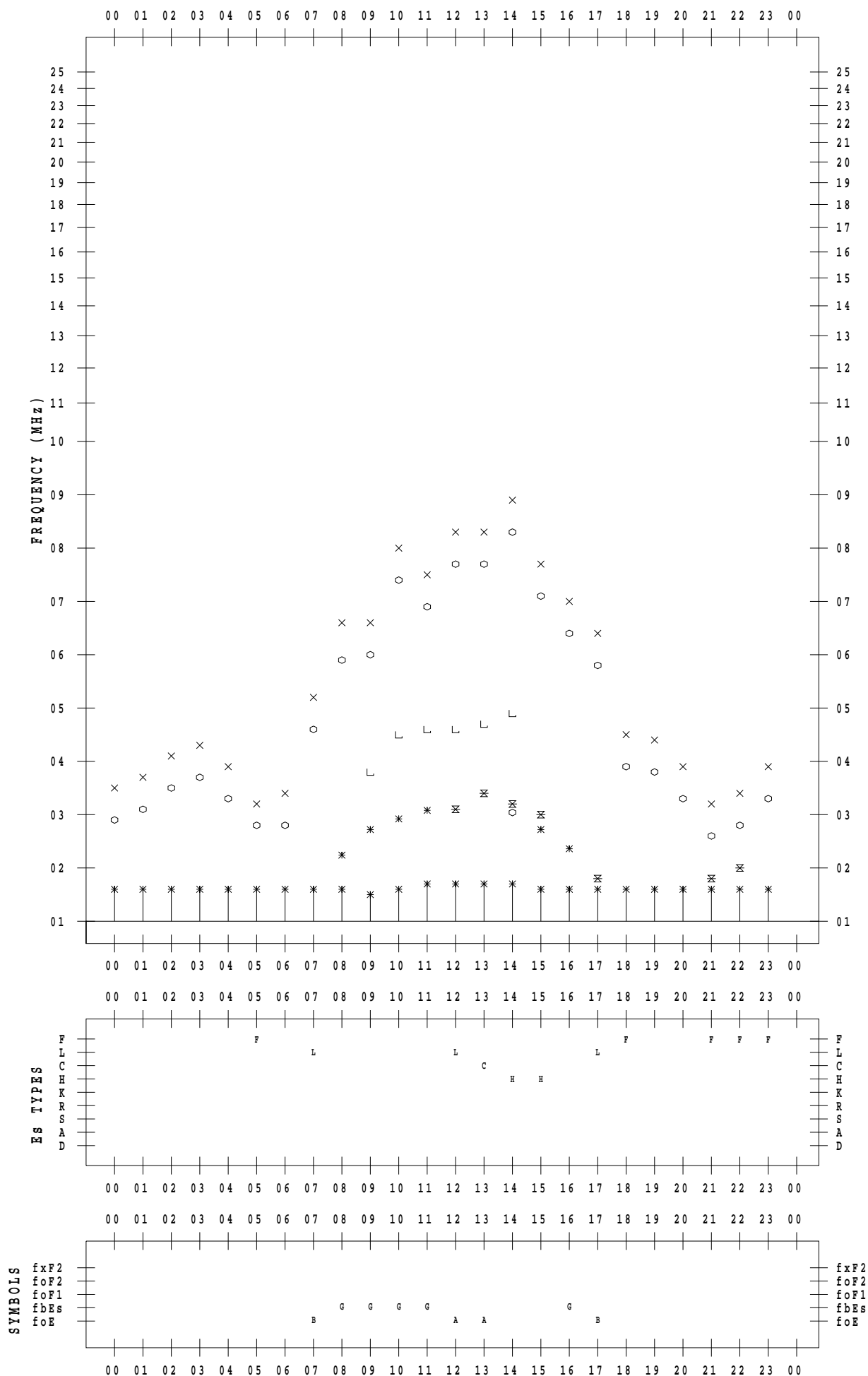
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/27

135 ° E MEAN TIME



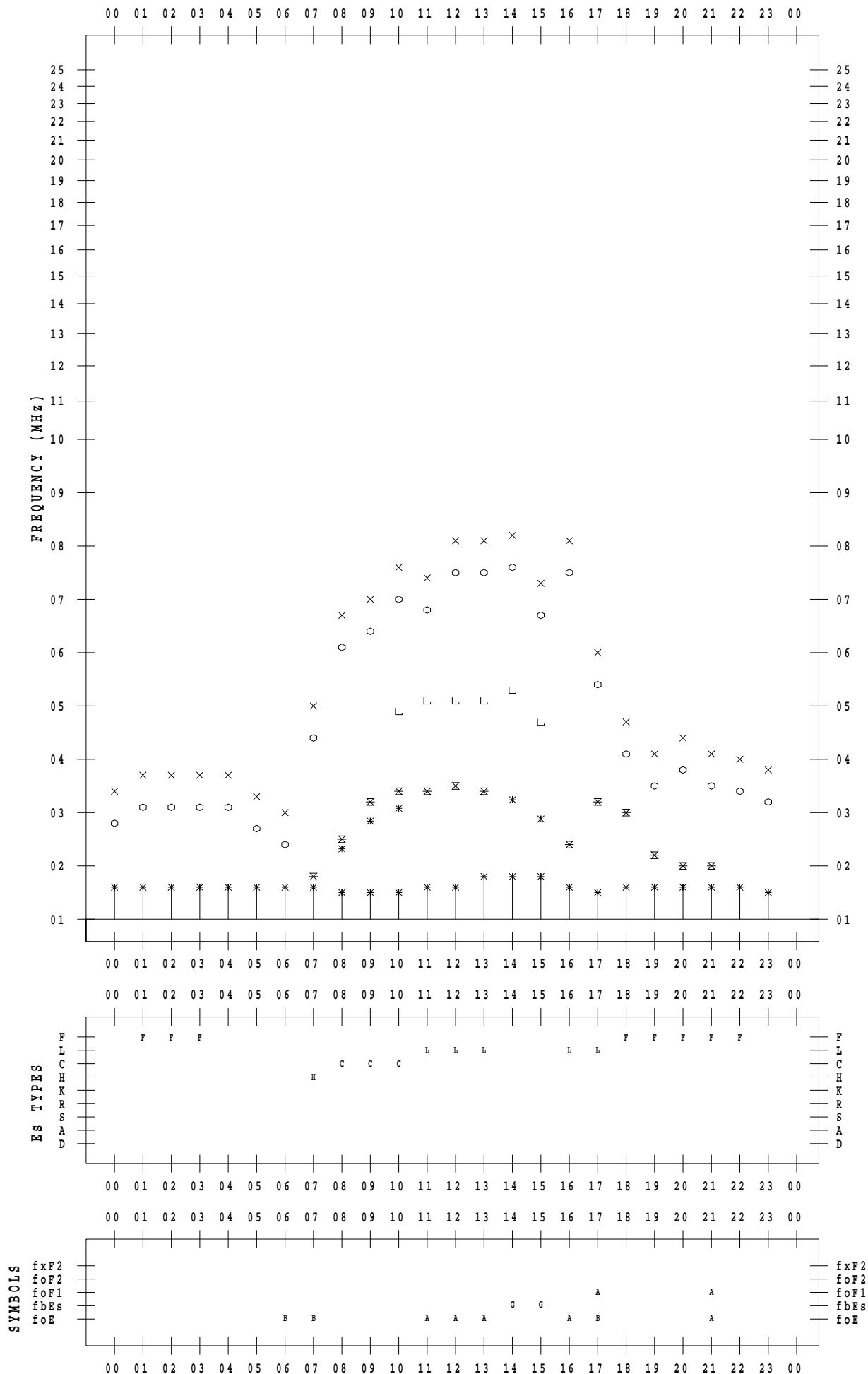
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/28

135 ° E MEAN TIME



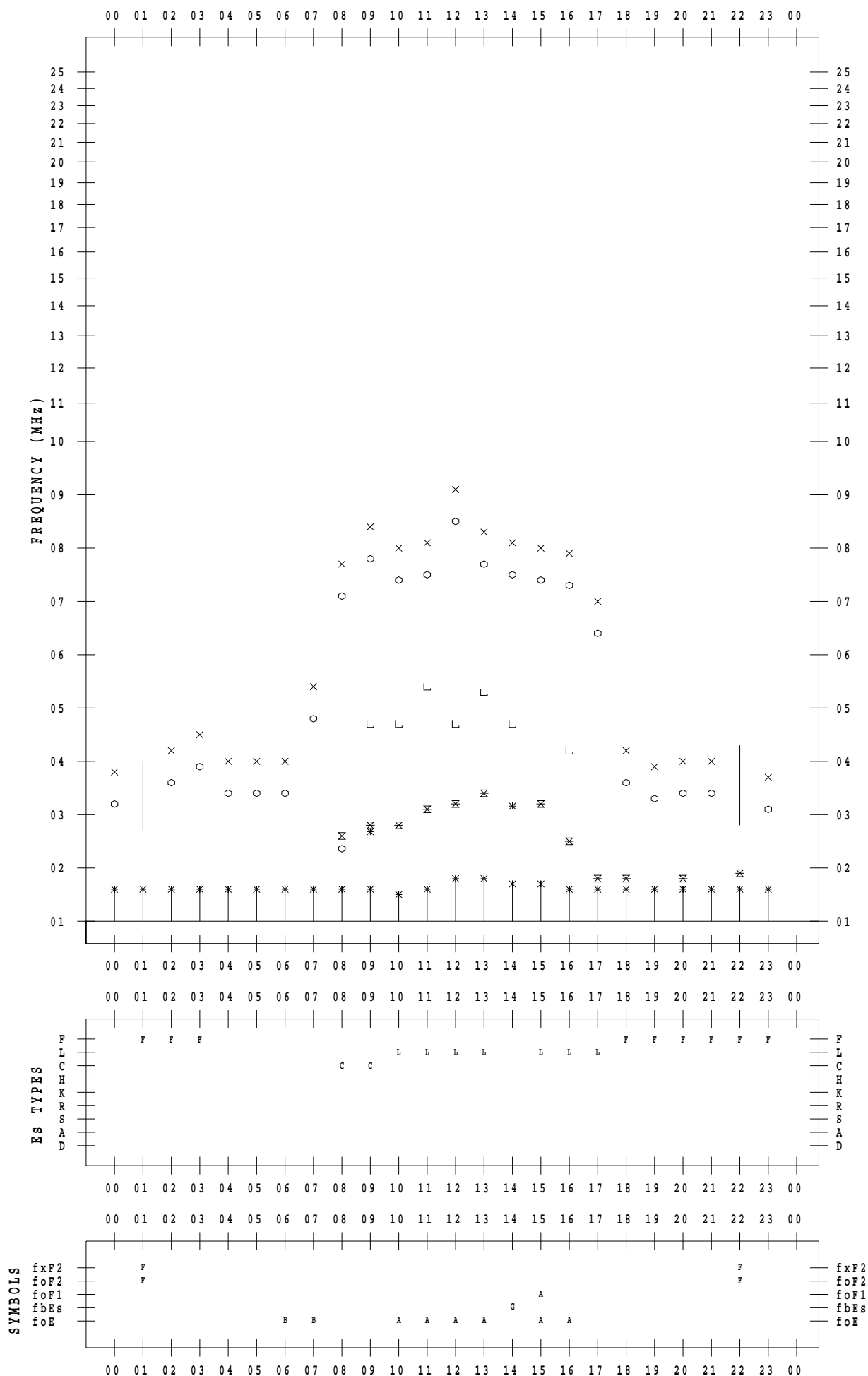
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/29

135 ° E MEAN TIME



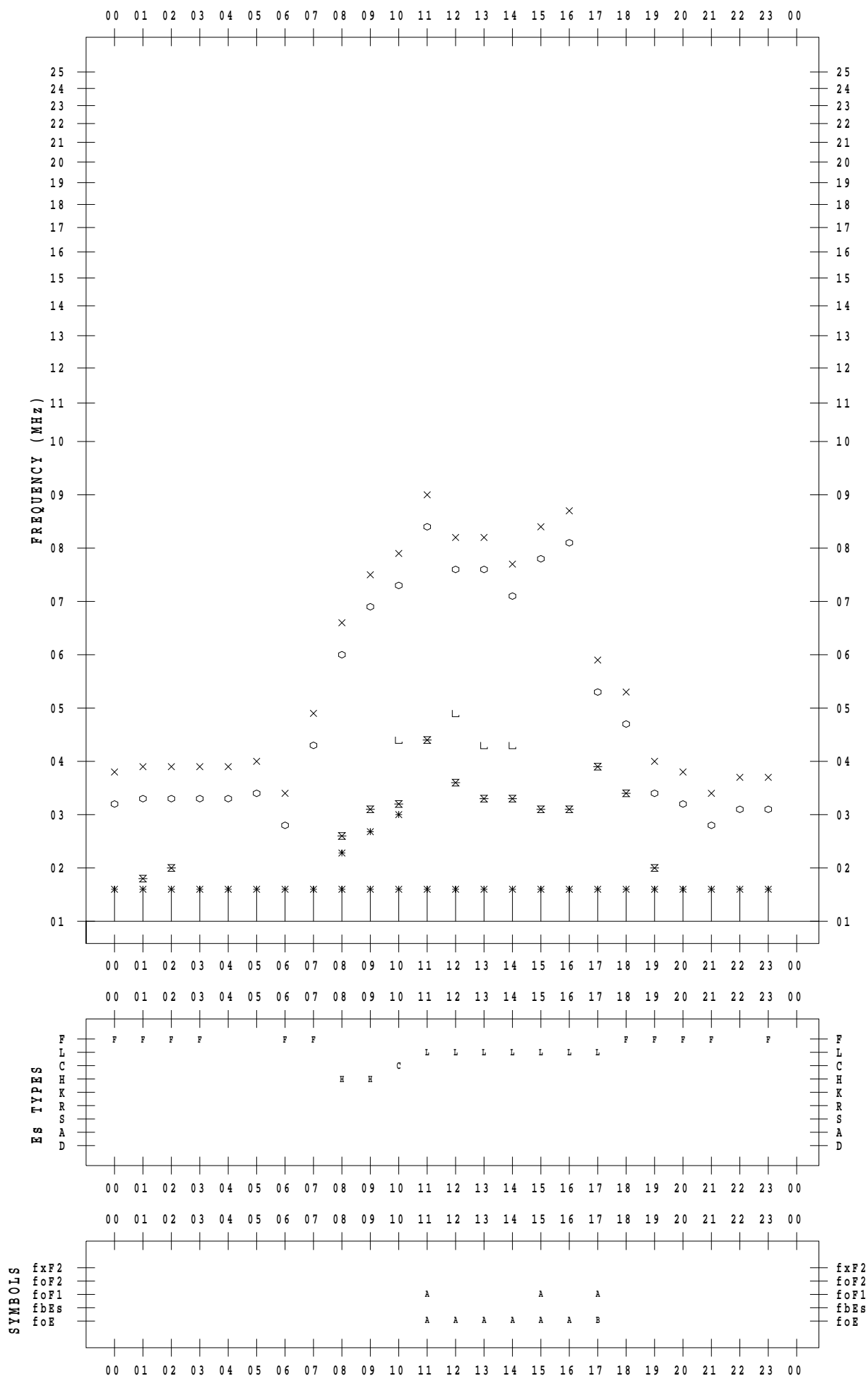
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2021/11/30

135 ° E MEAN TIME



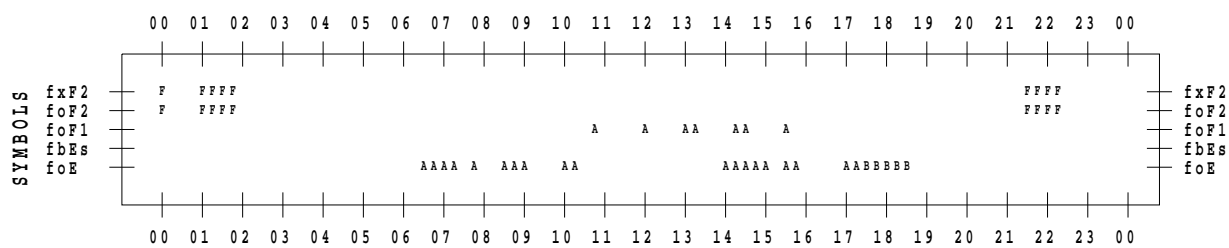
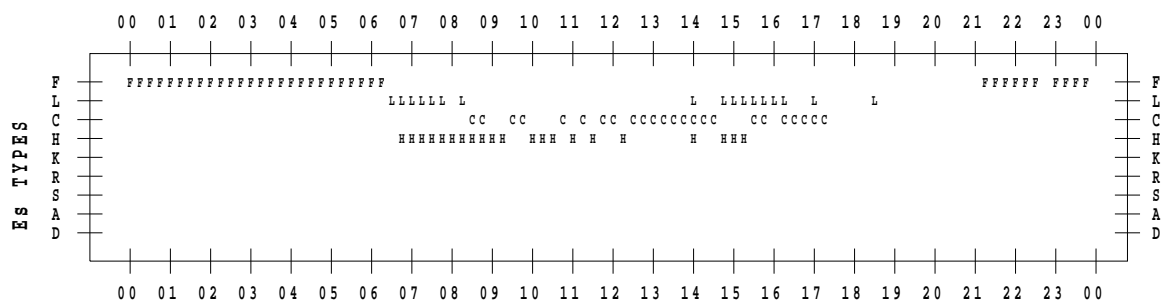
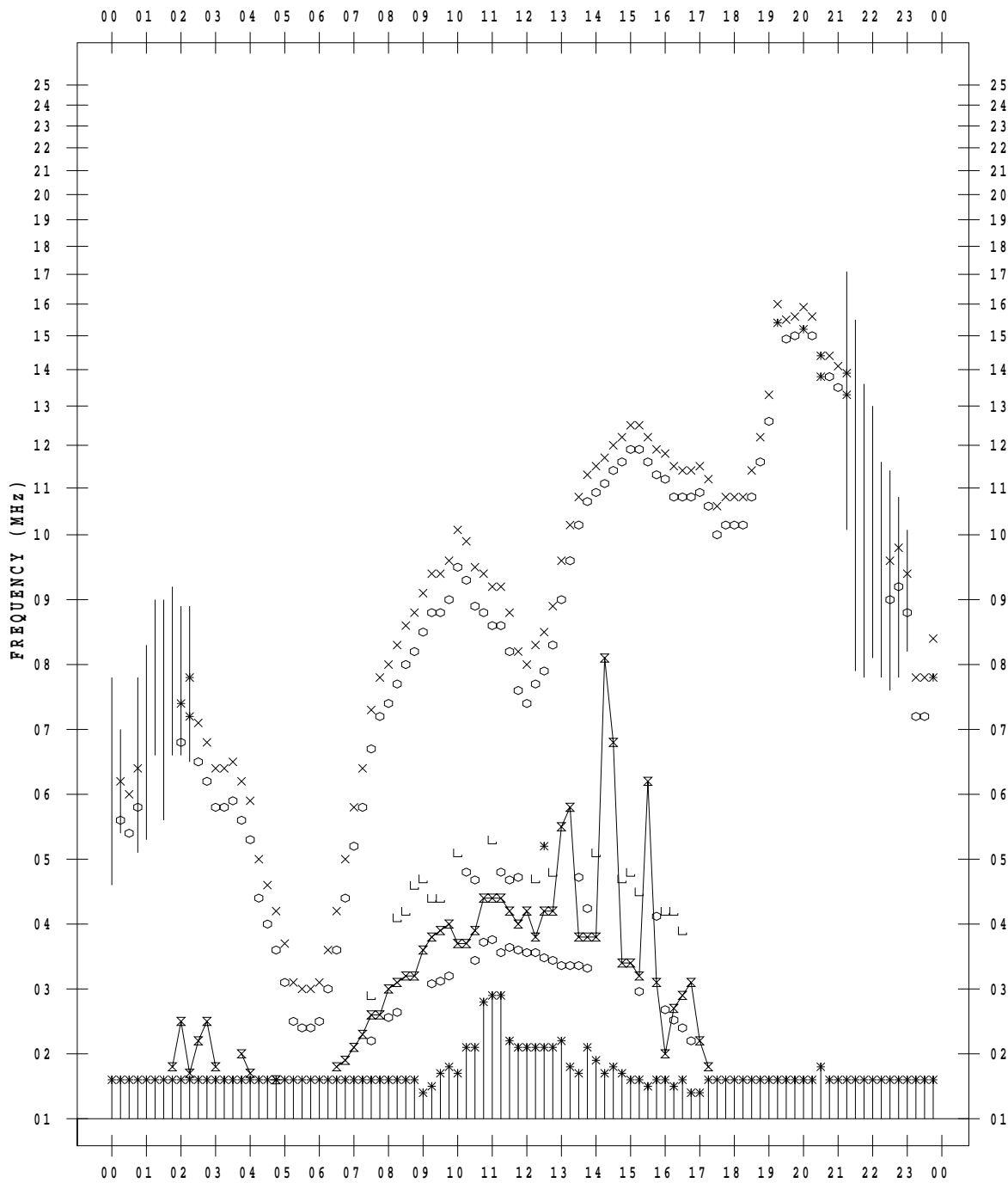
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 1

135 ° E MEAN TIME



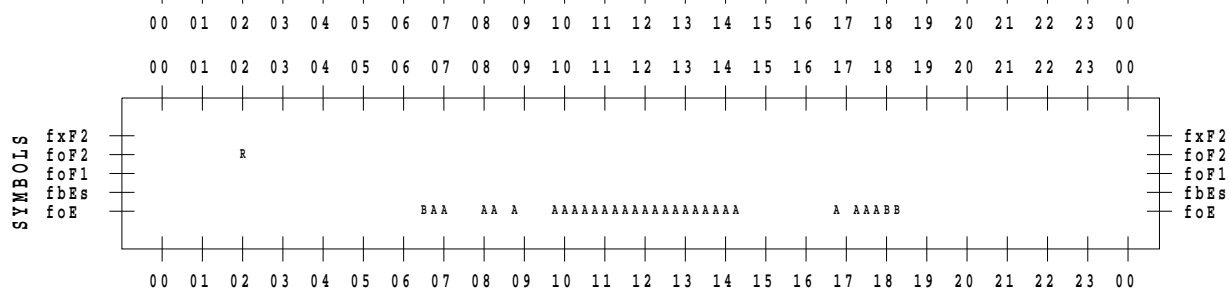
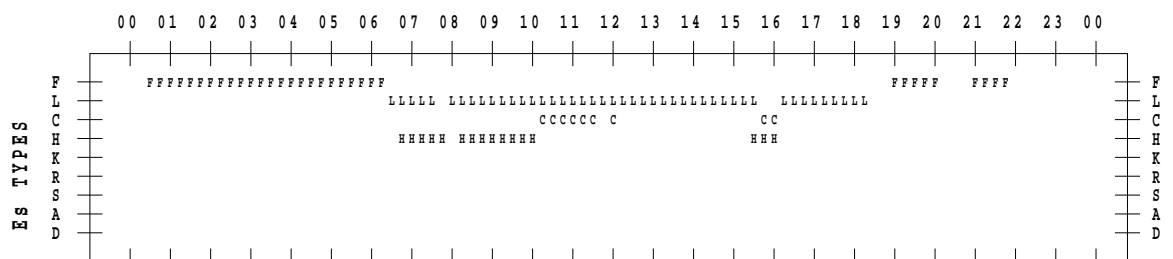
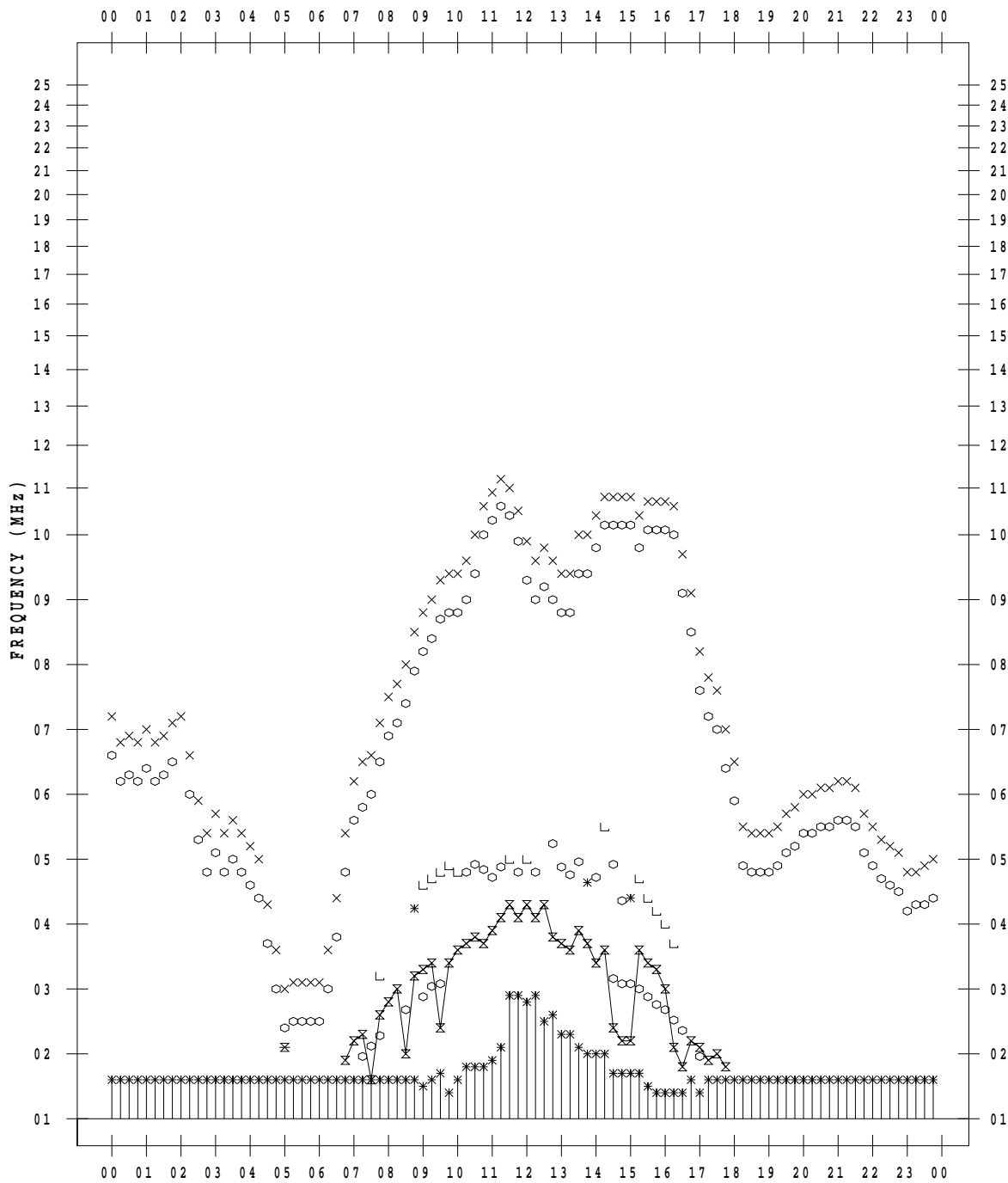
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 2

135 ° E MEAN TIME



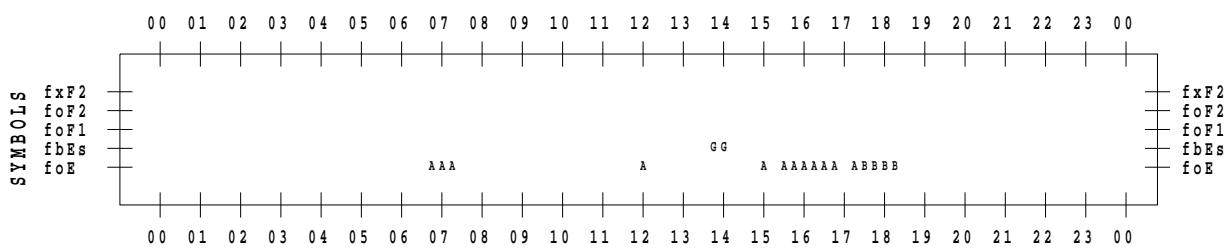
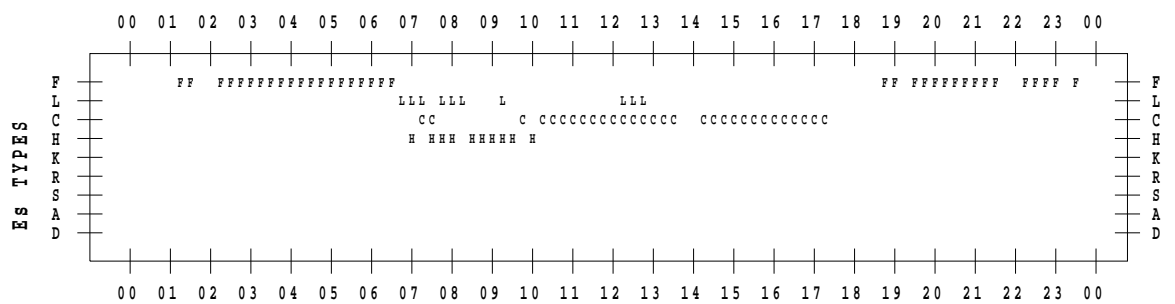
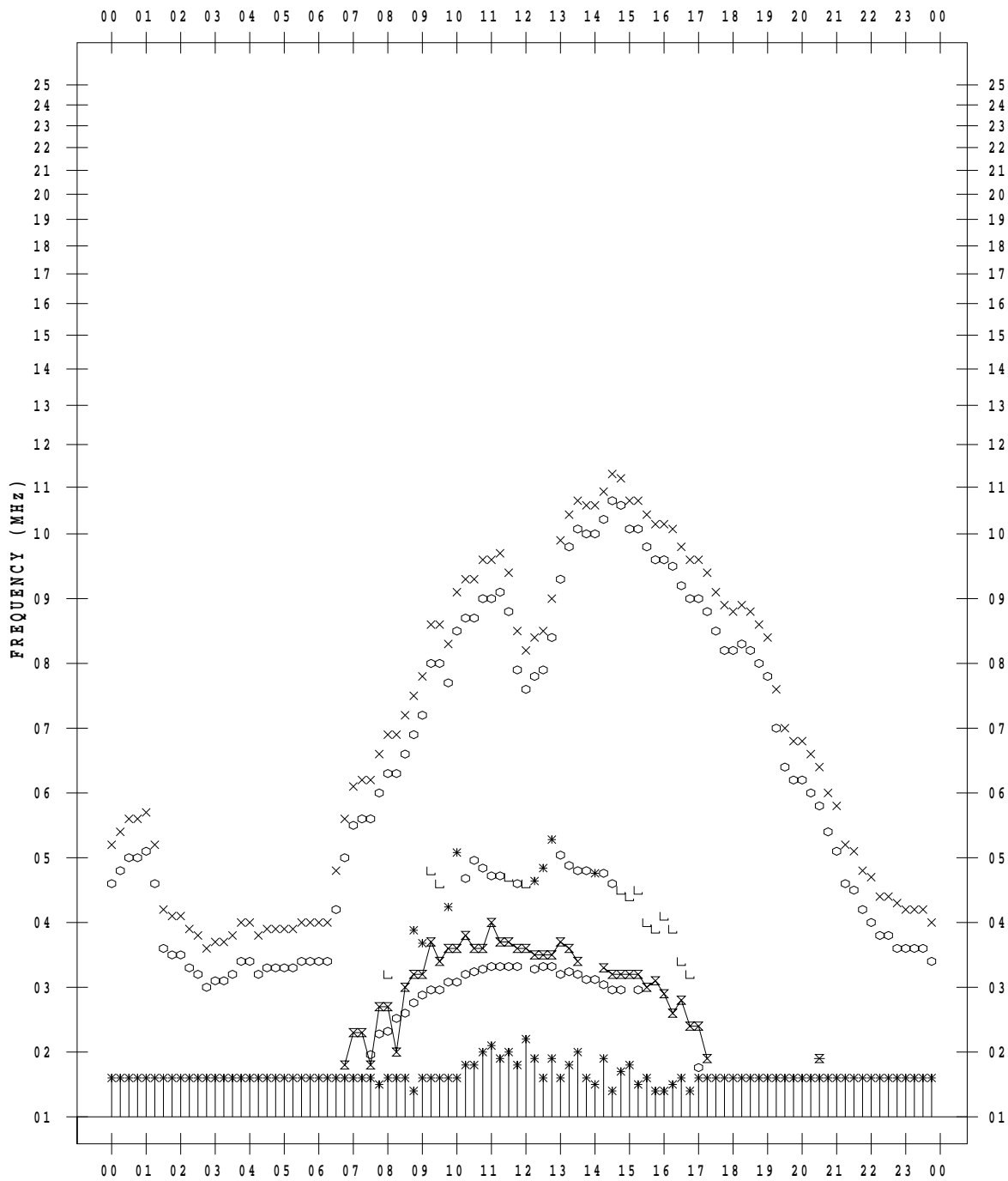
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 3

135 ° E MEAN TIME



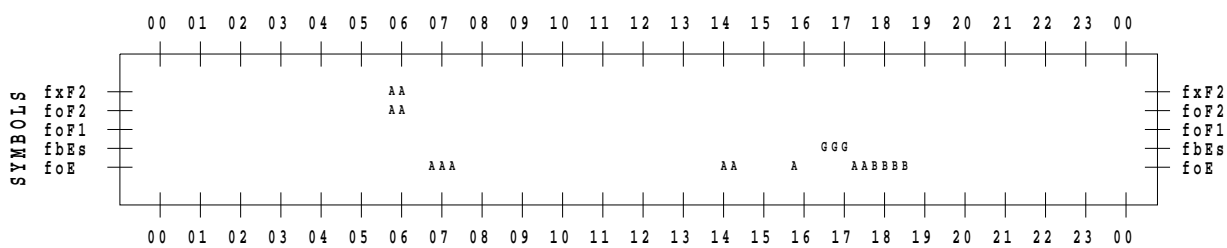
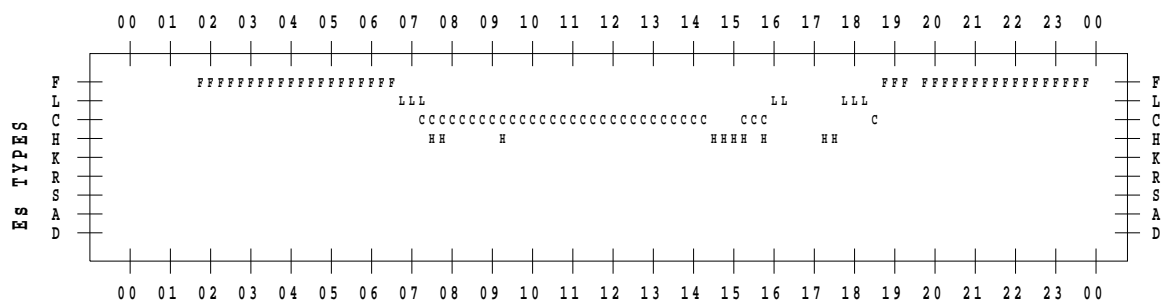
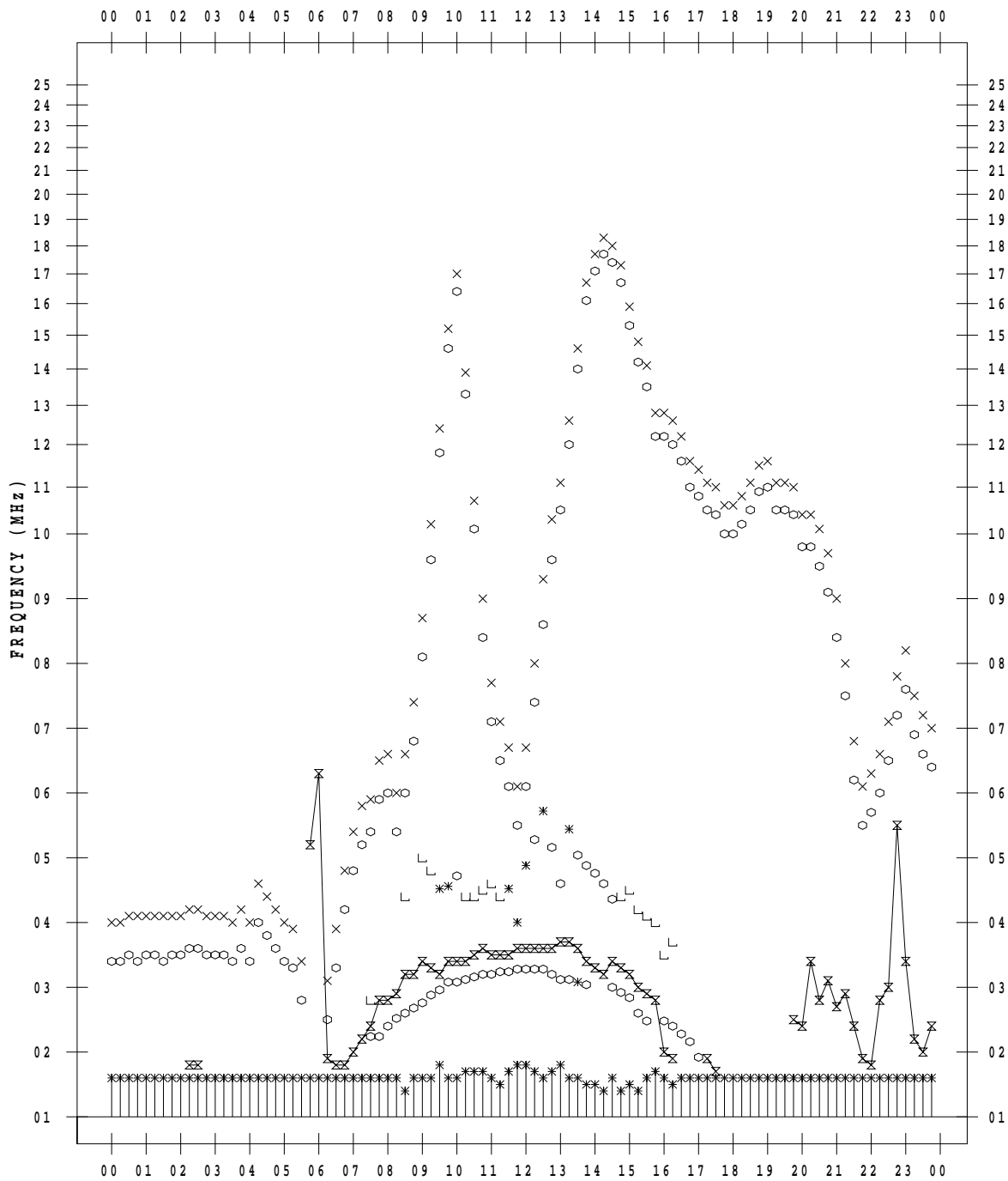
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 4

135 ° E MEAN TIME



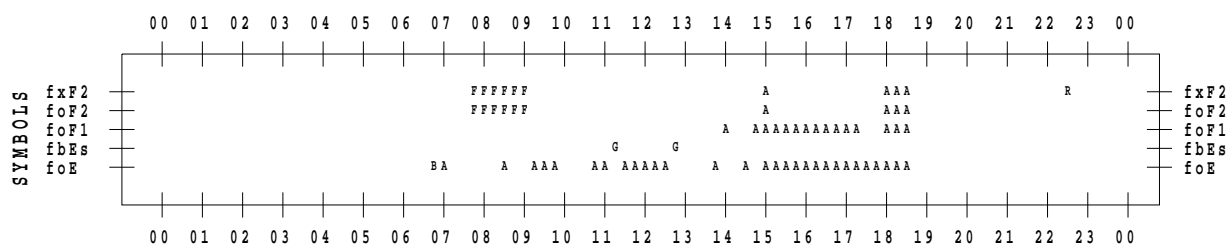
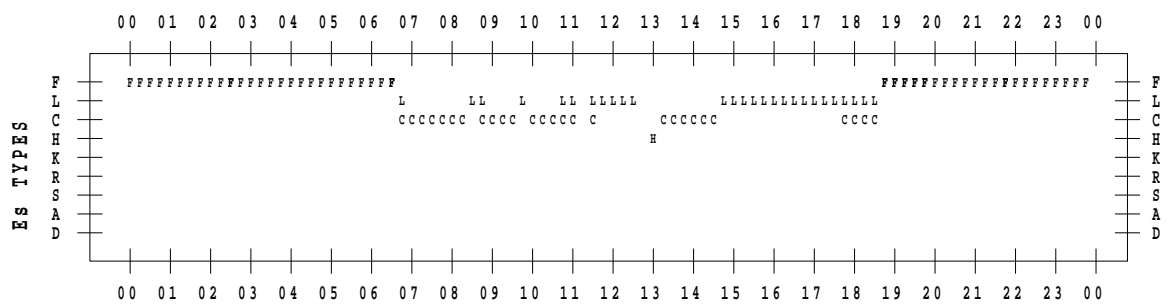
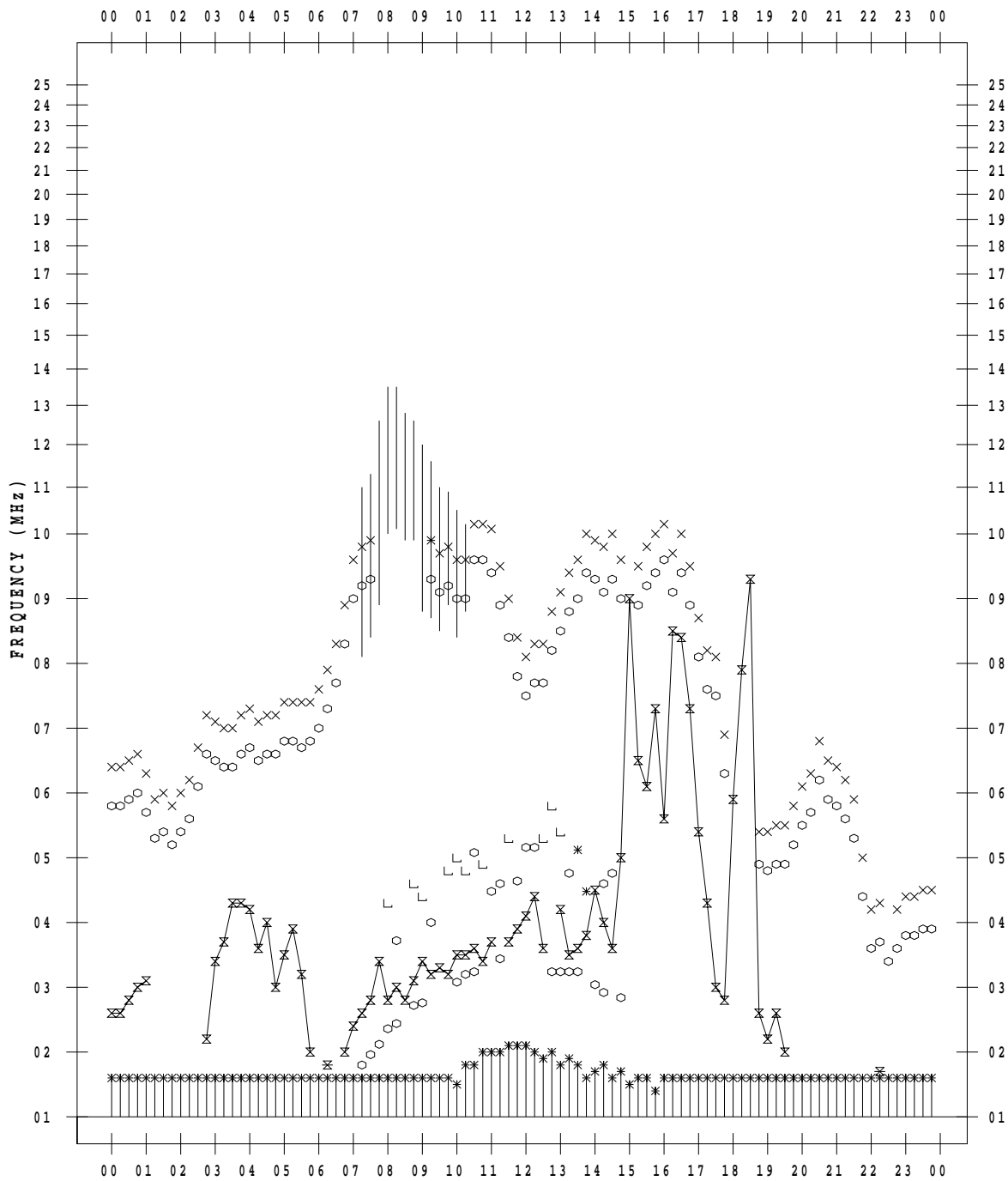
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 5

135 ° E MEAN TIME



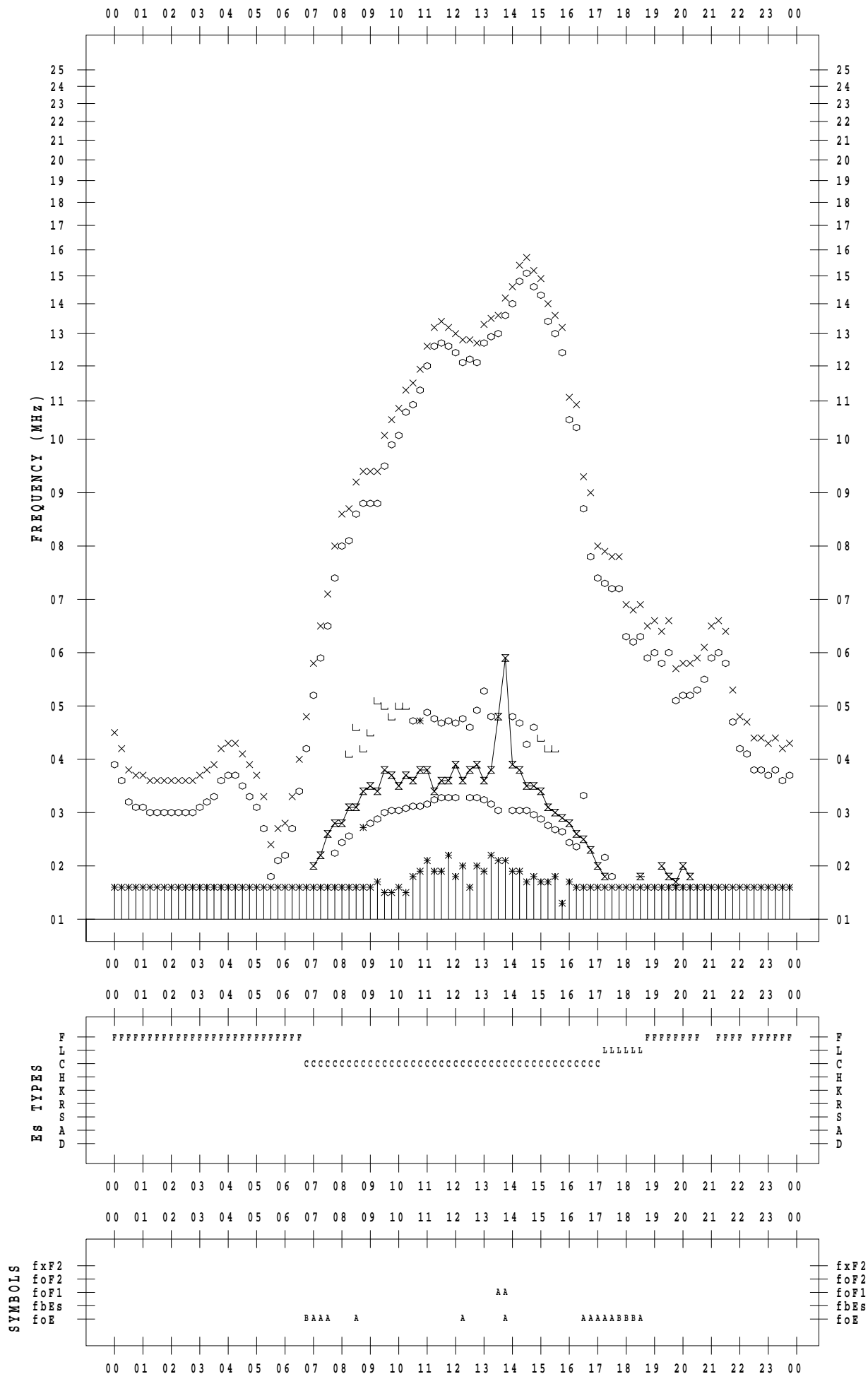
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 6

135 ° E MEAN TIME



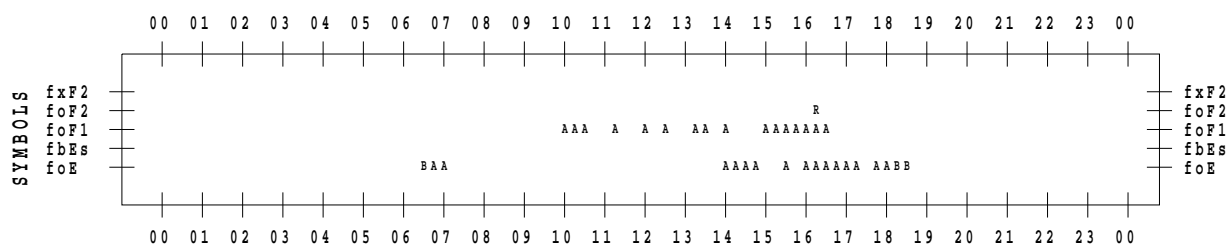
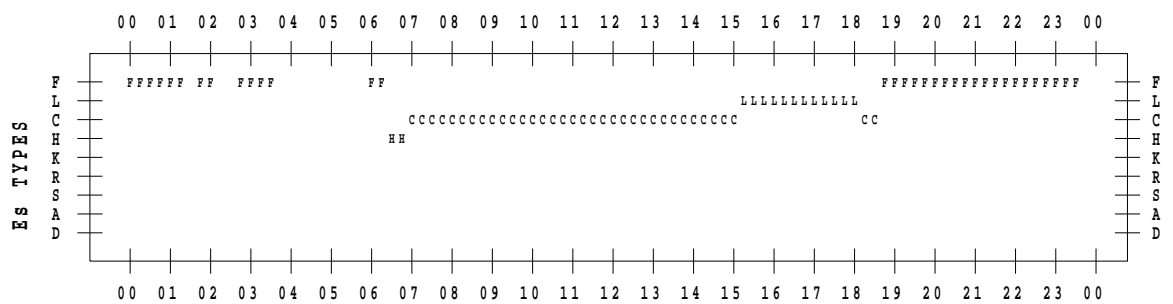
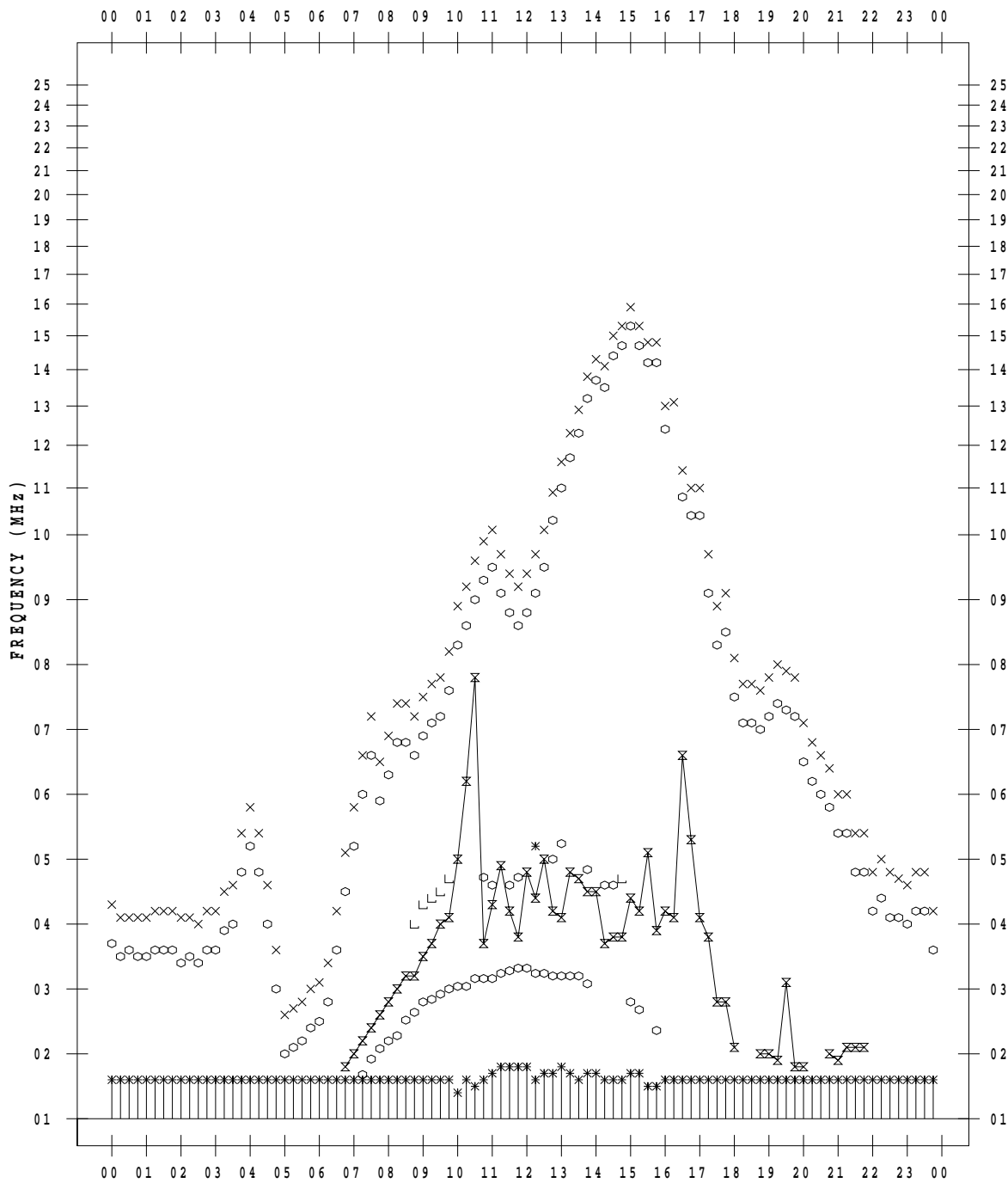
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 7

135 ° E MEAN TIME



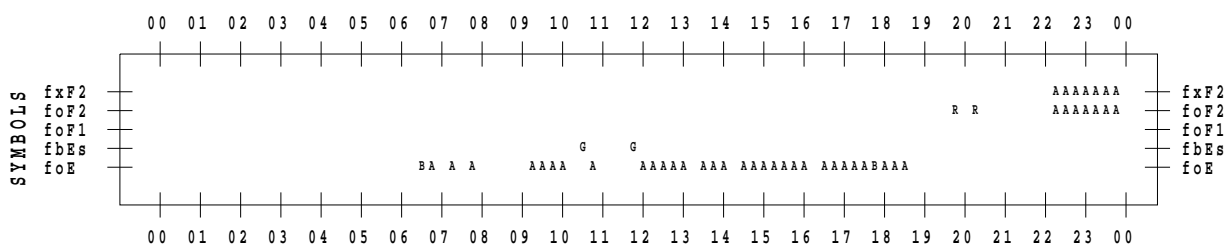
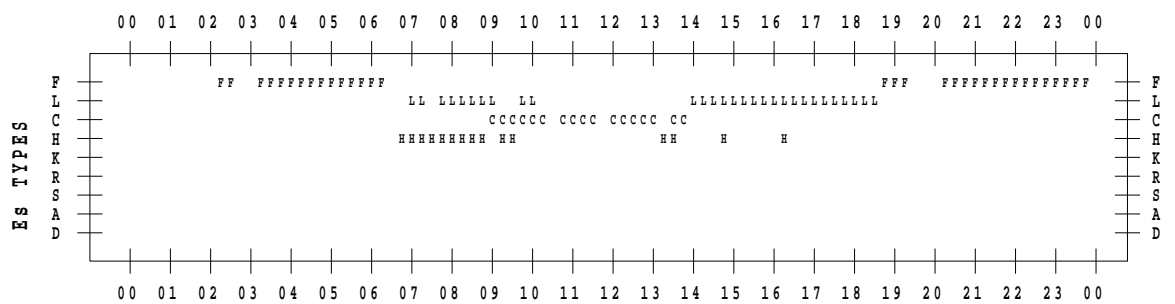
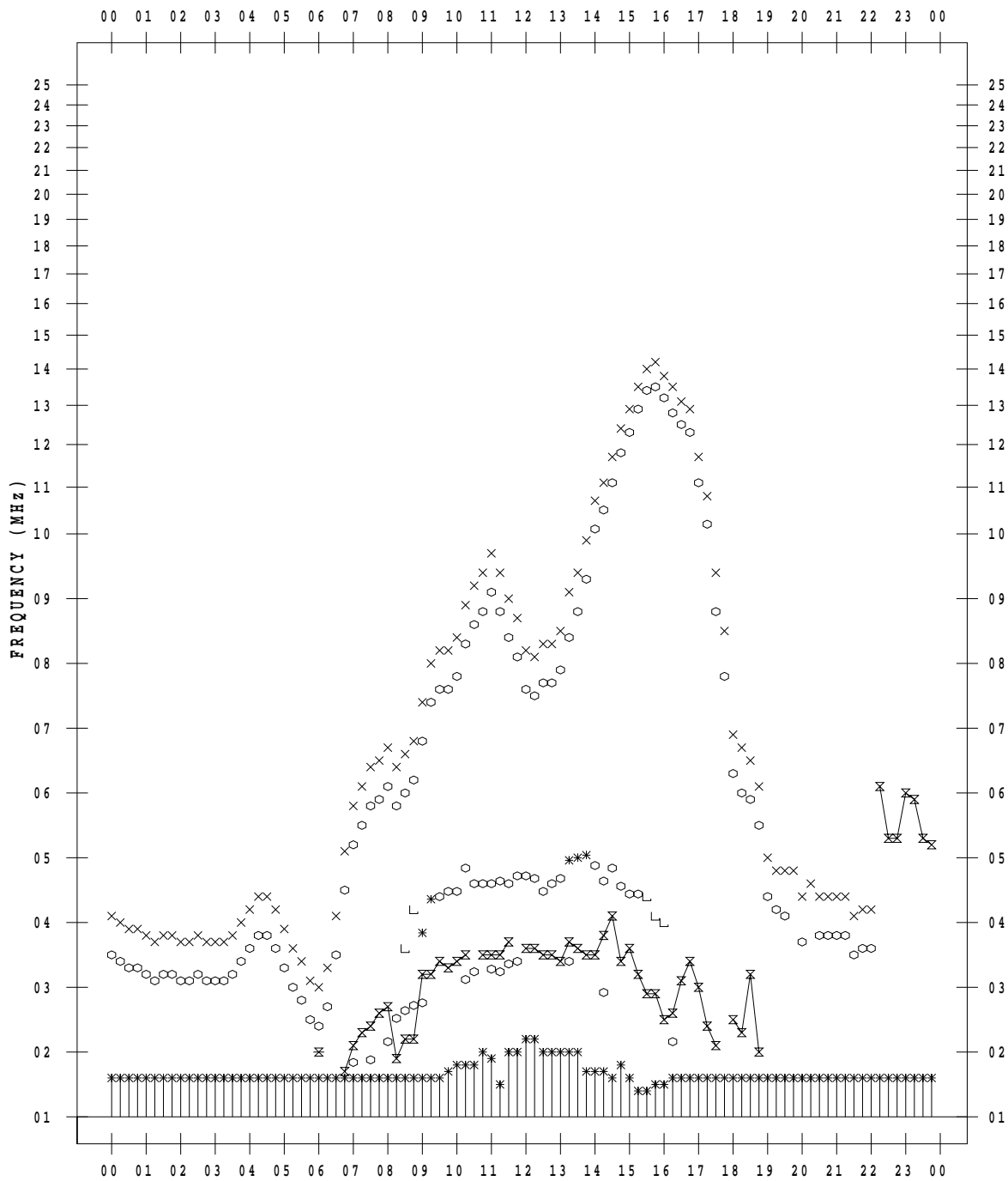
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 8

135 ° E MEAN TIME



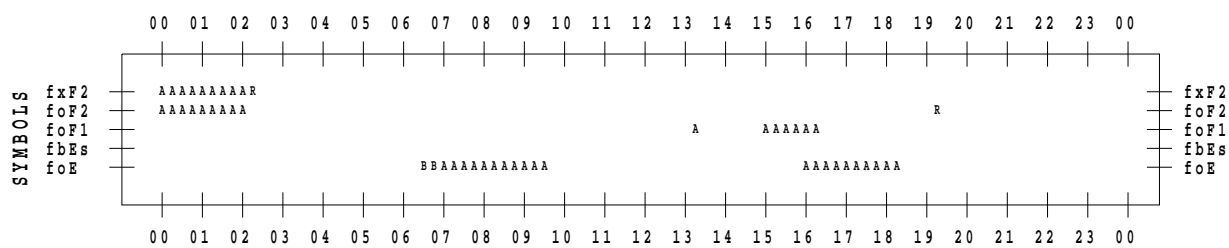
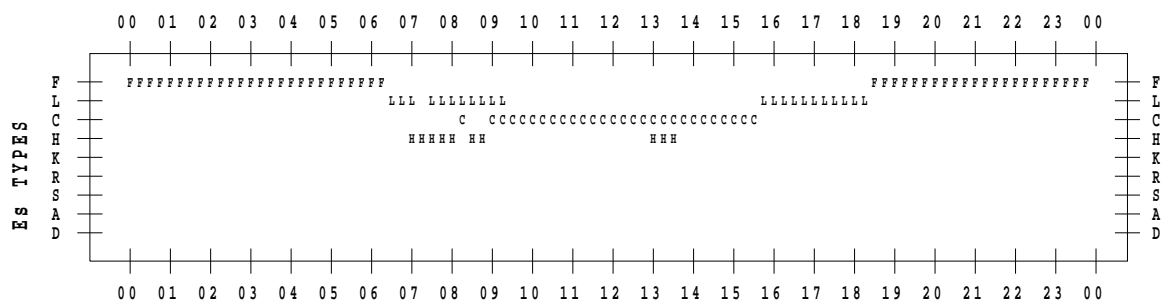
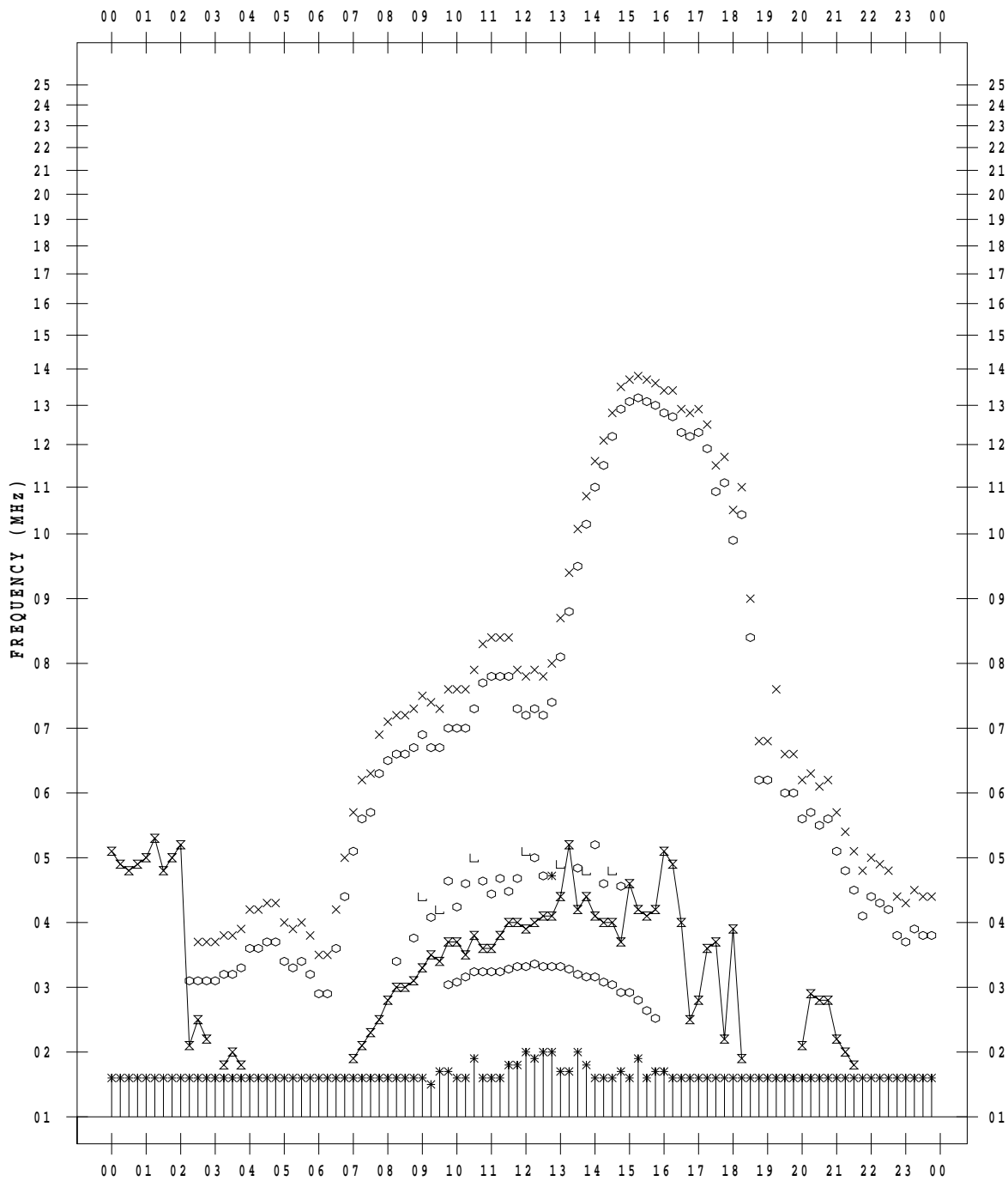
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/ 9

135 ° E MEAN TIME



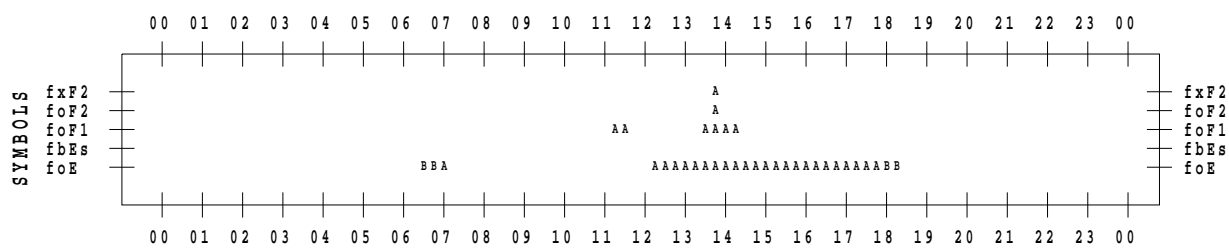
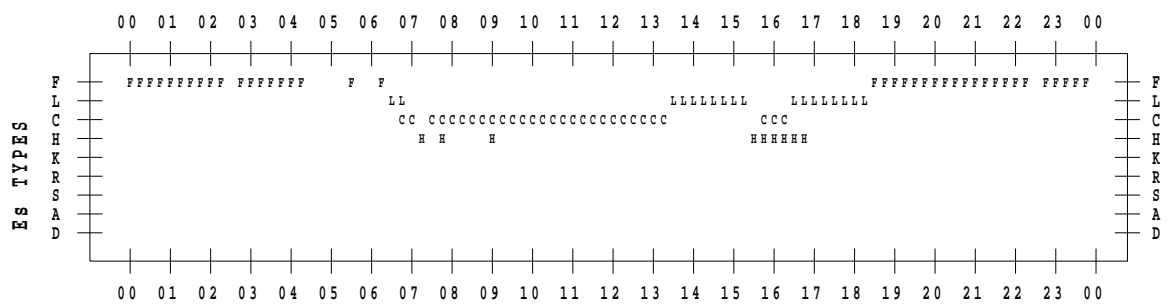
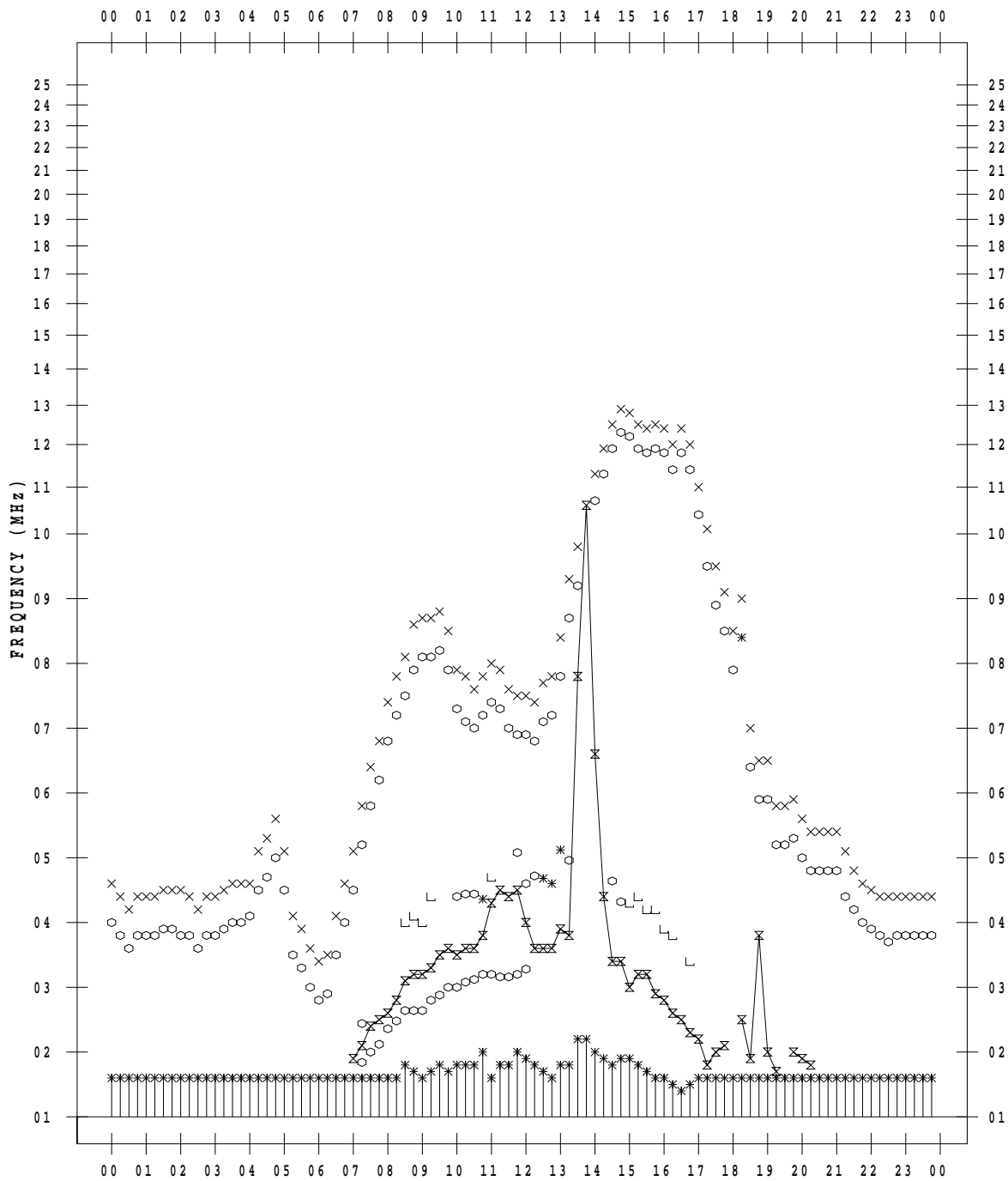
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/10

135 ° E MEAN TIME



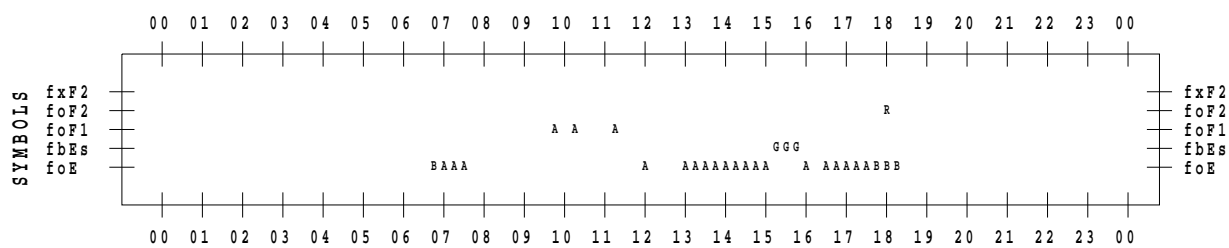
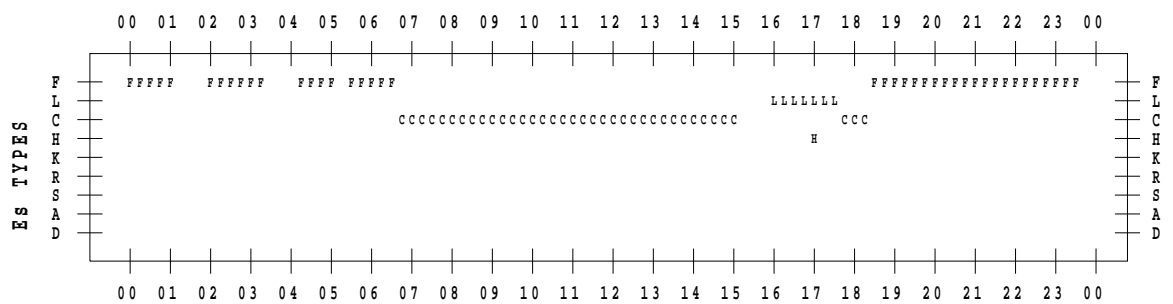
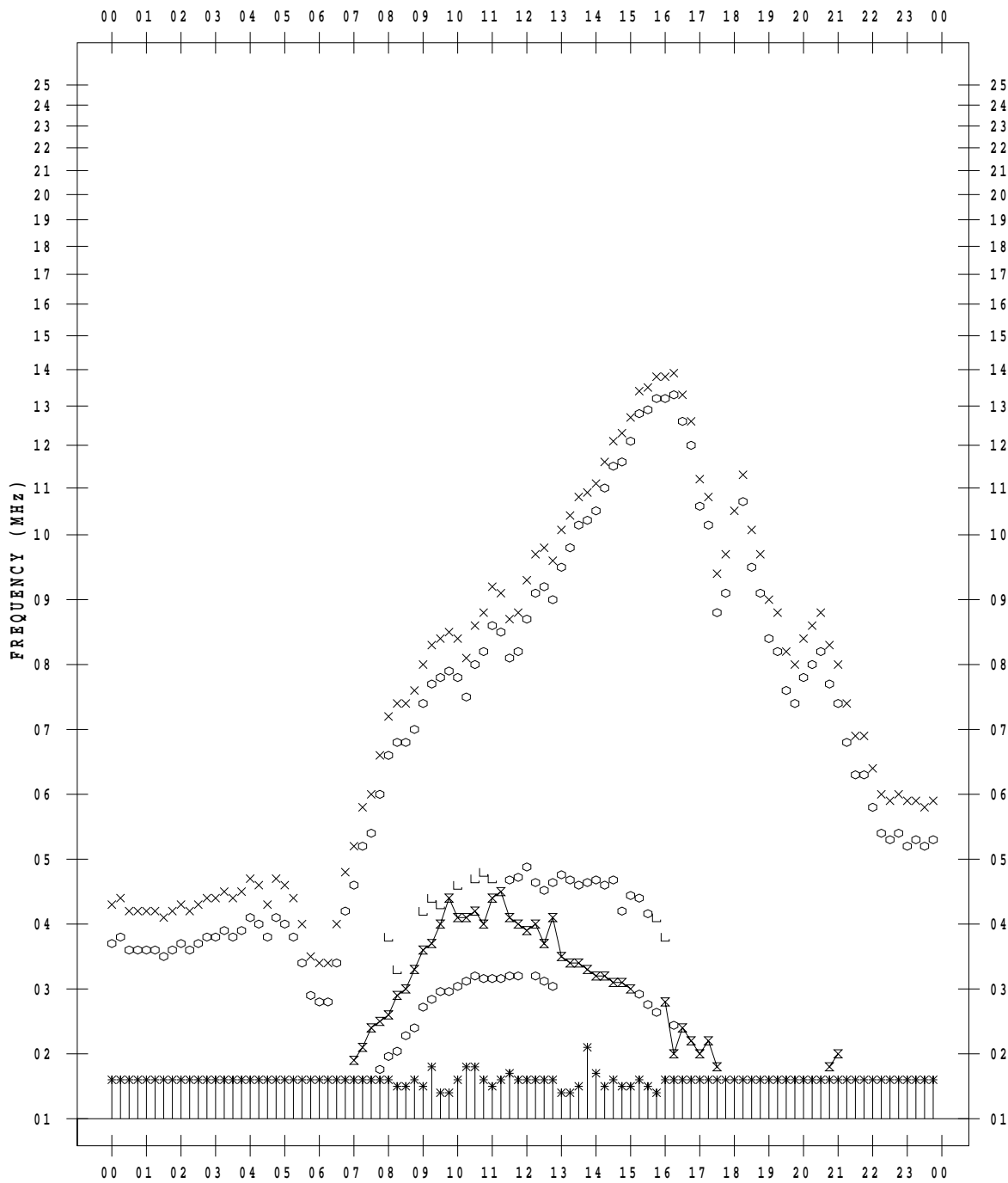
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/11

135 ° E MEAN TIME



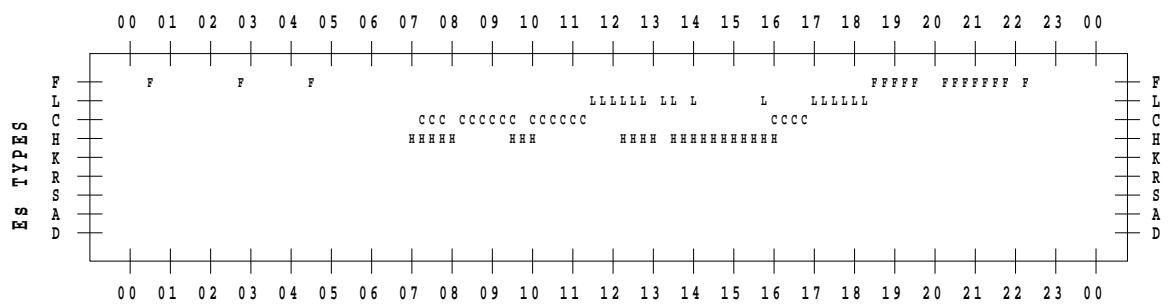
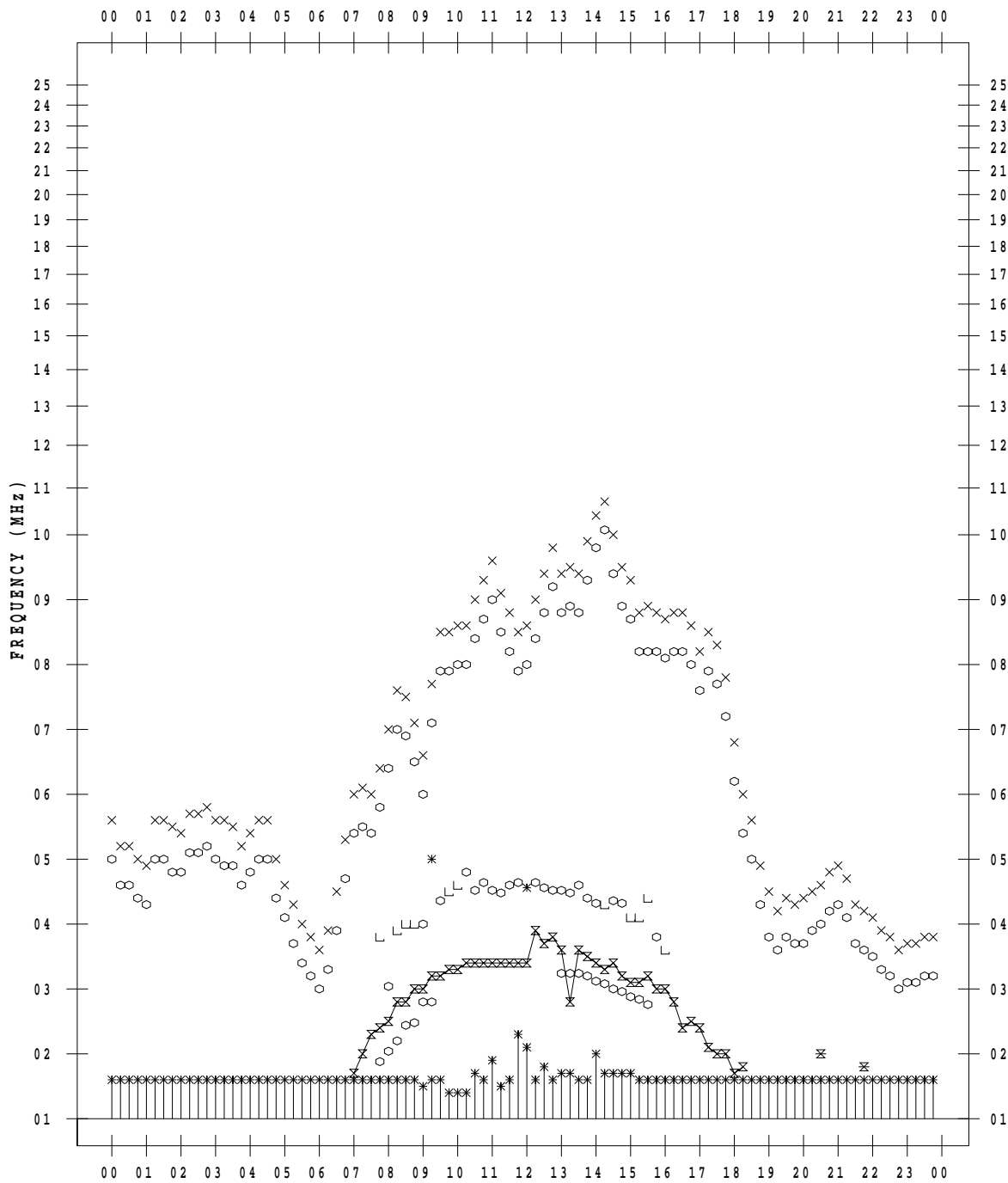
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/12

135 ° E MEAN TIME



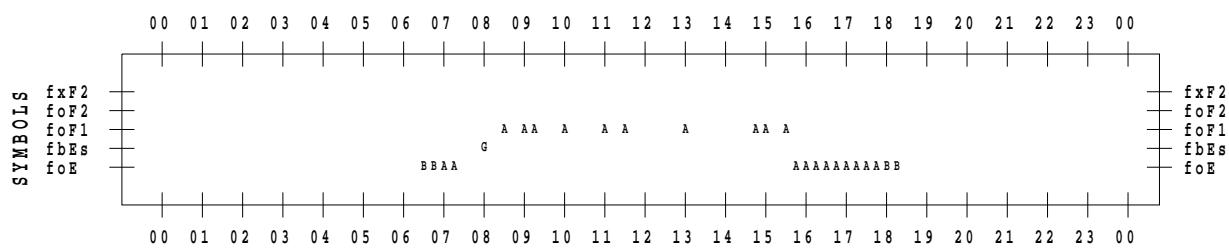
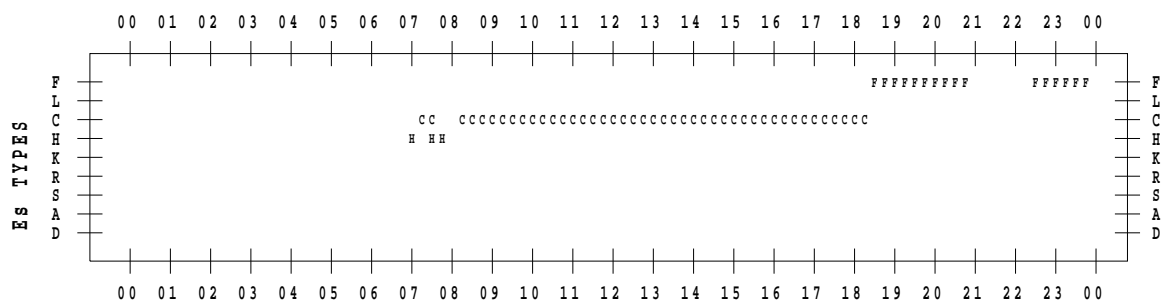
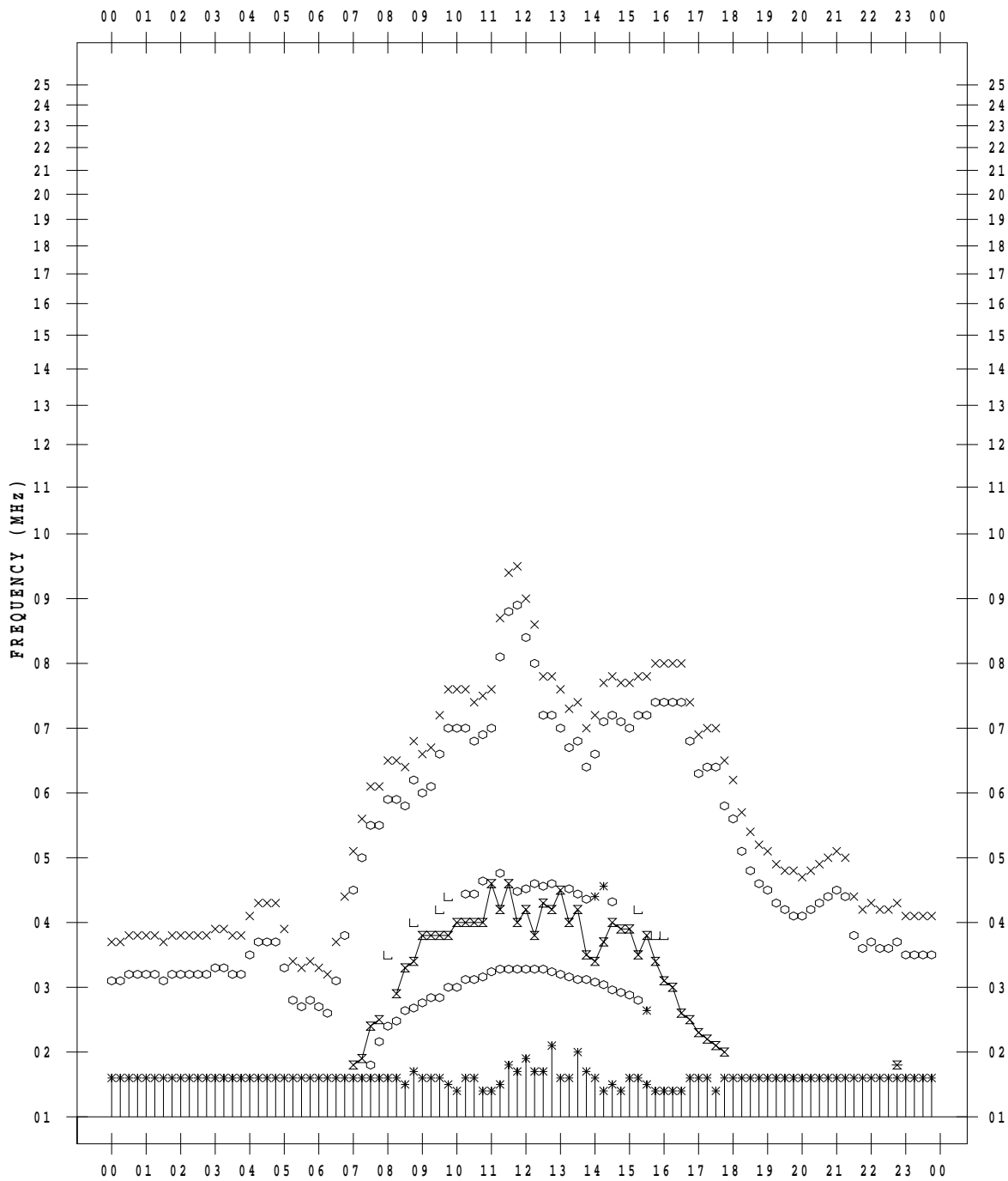
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/13

135 ° E MEAN TIME



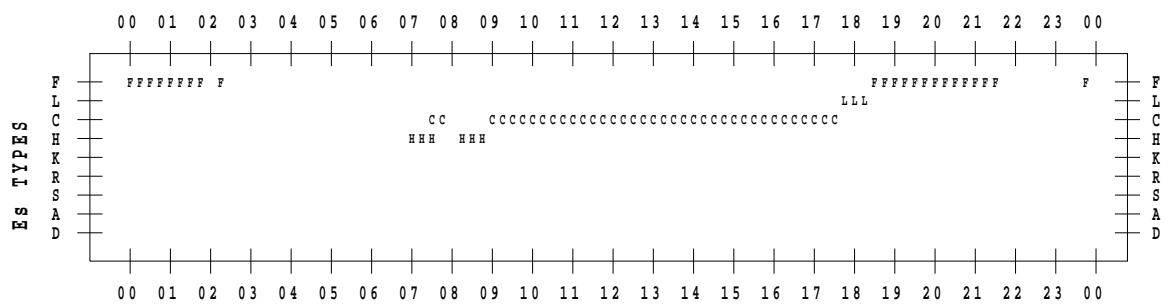
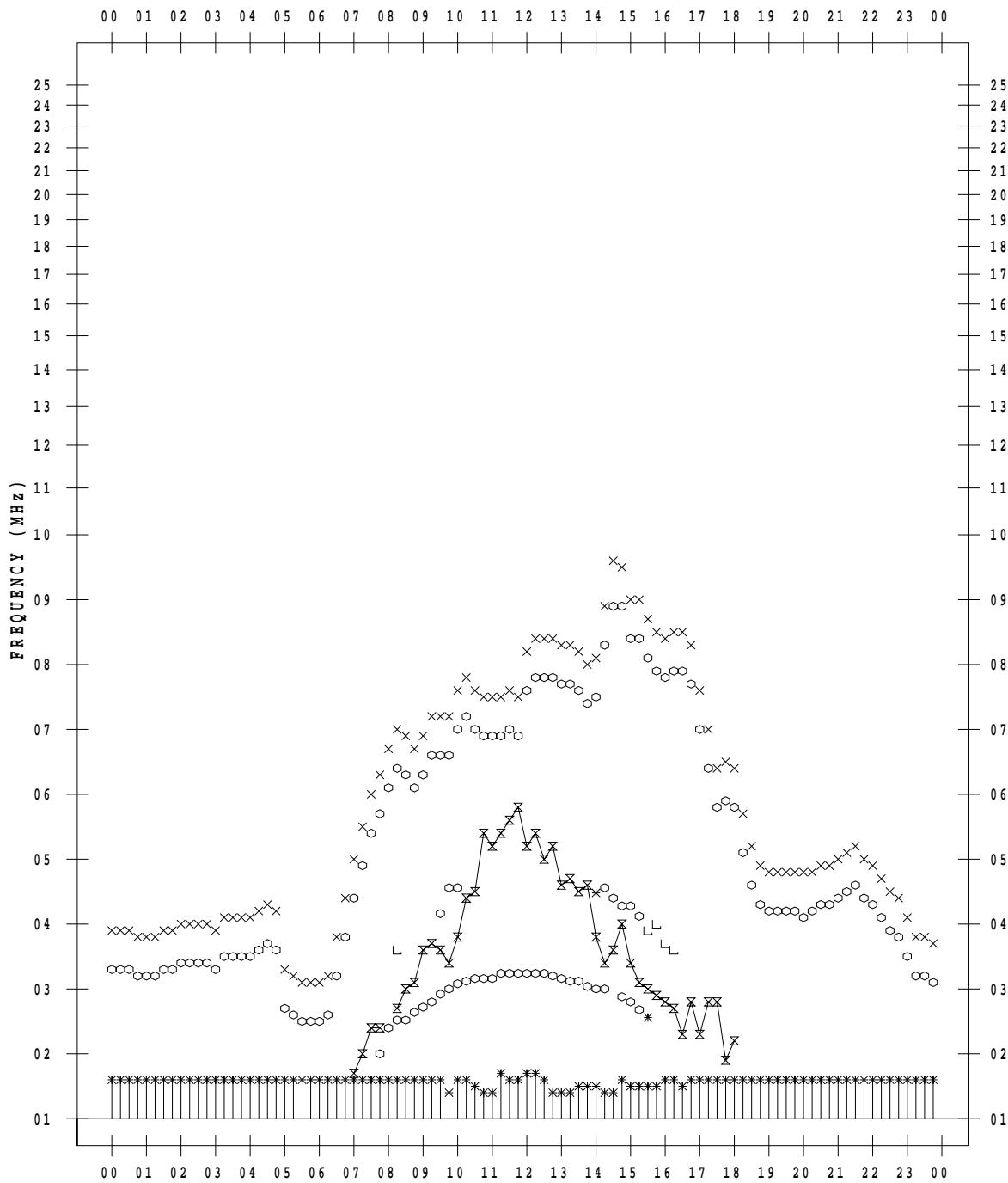
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/14

135 ° E MEAN TIME



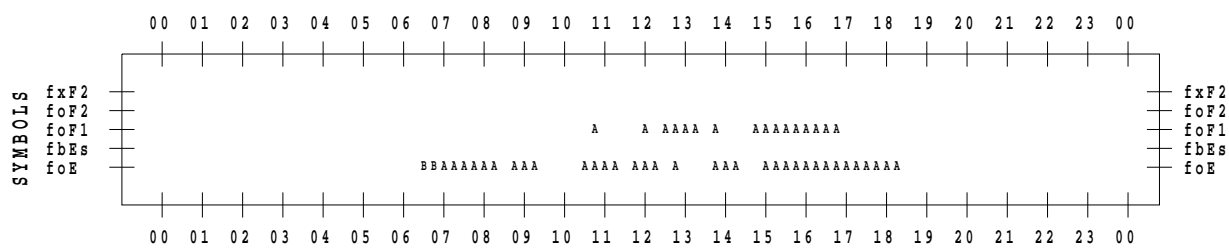
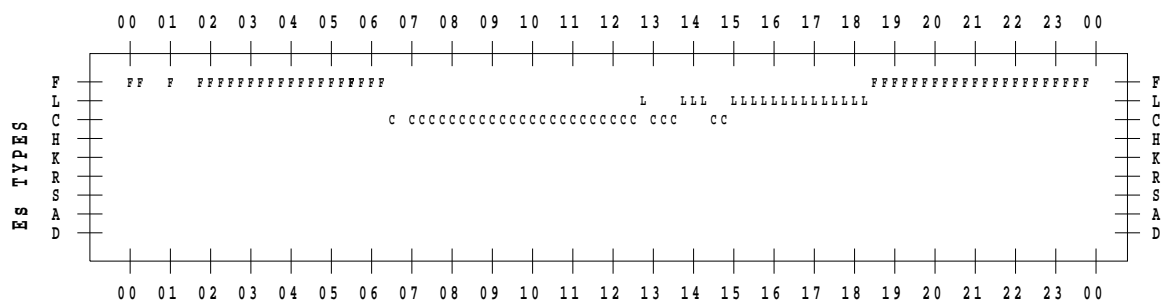
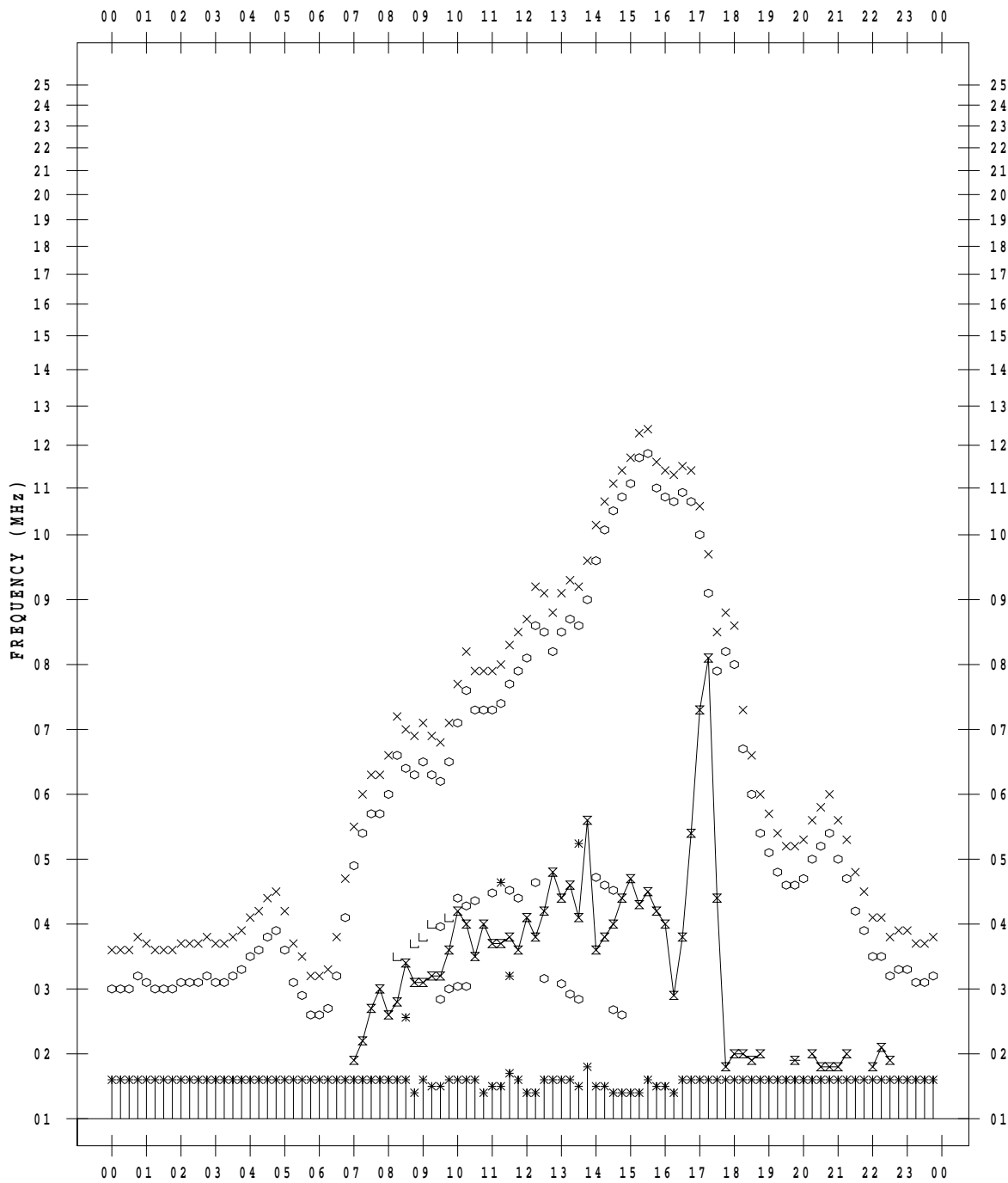
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/15

135 ° E MEAN TIME



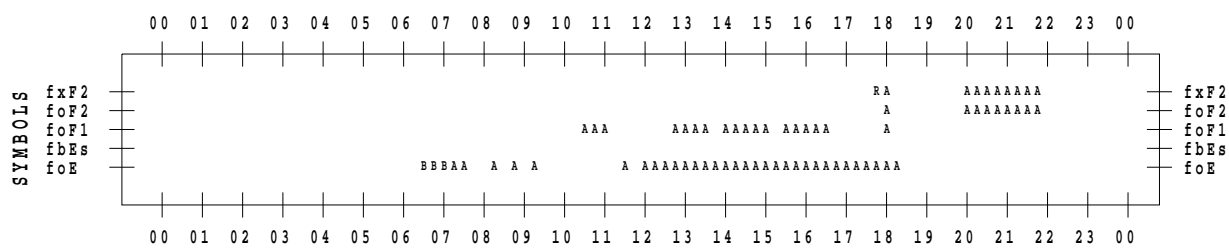
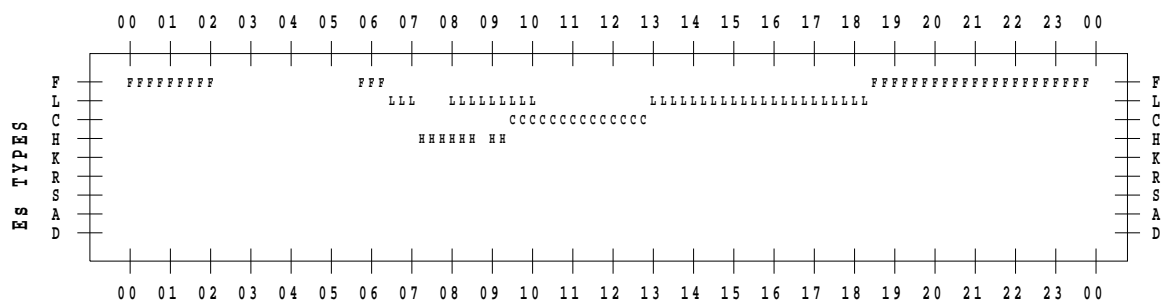
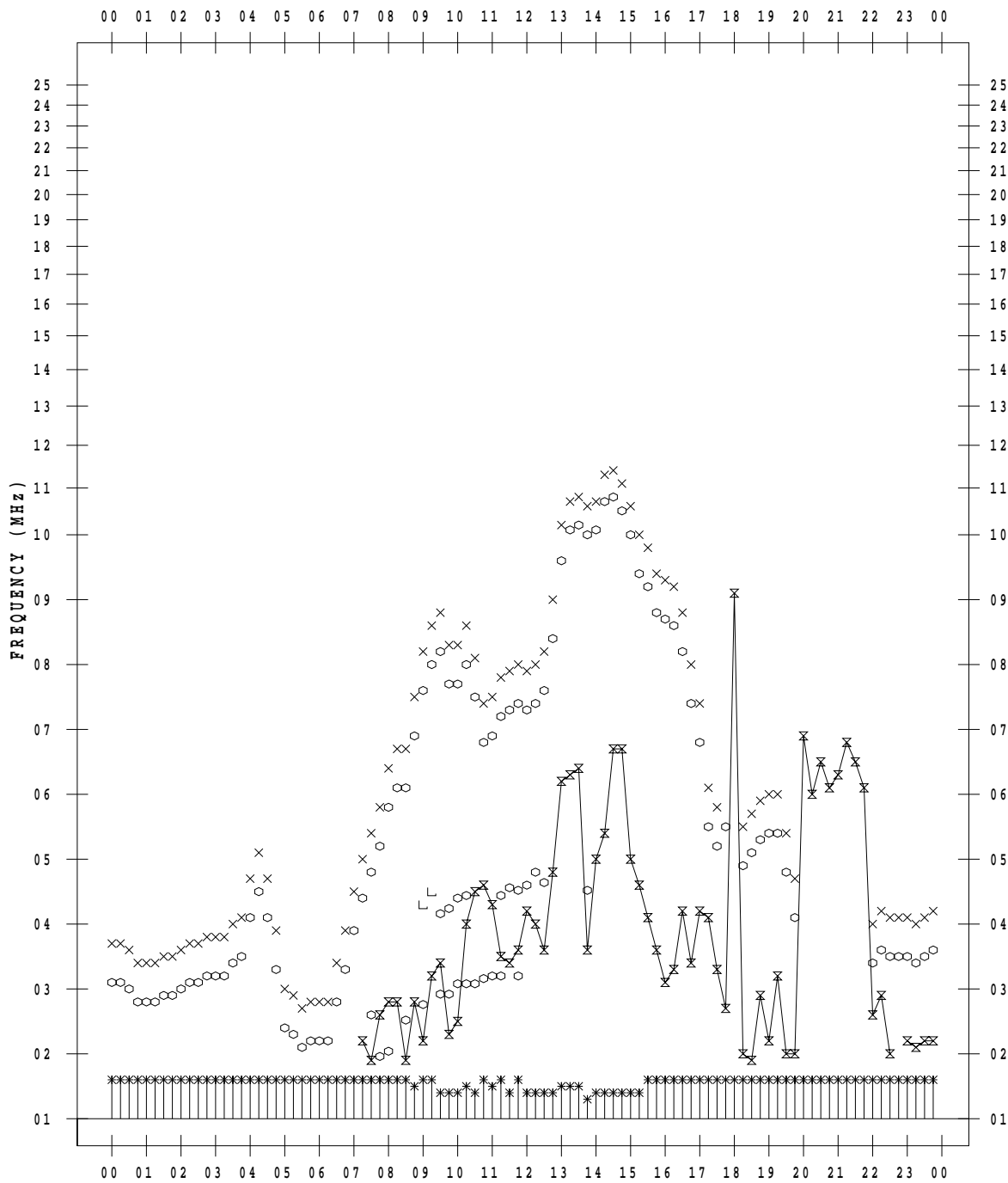
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/16

135 ° E MEAN TIME



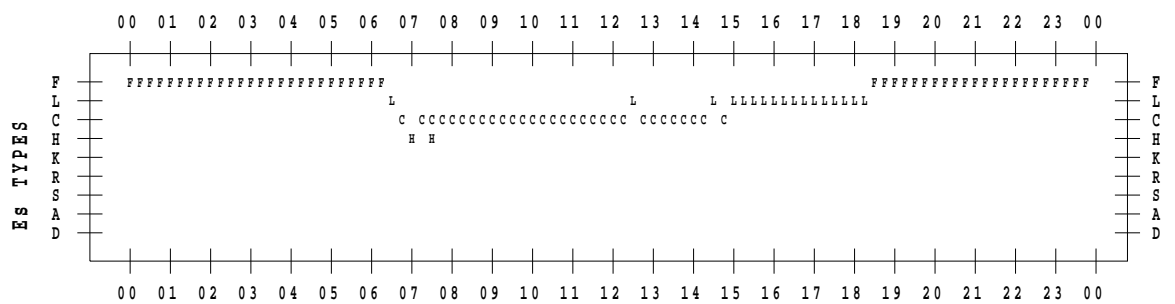
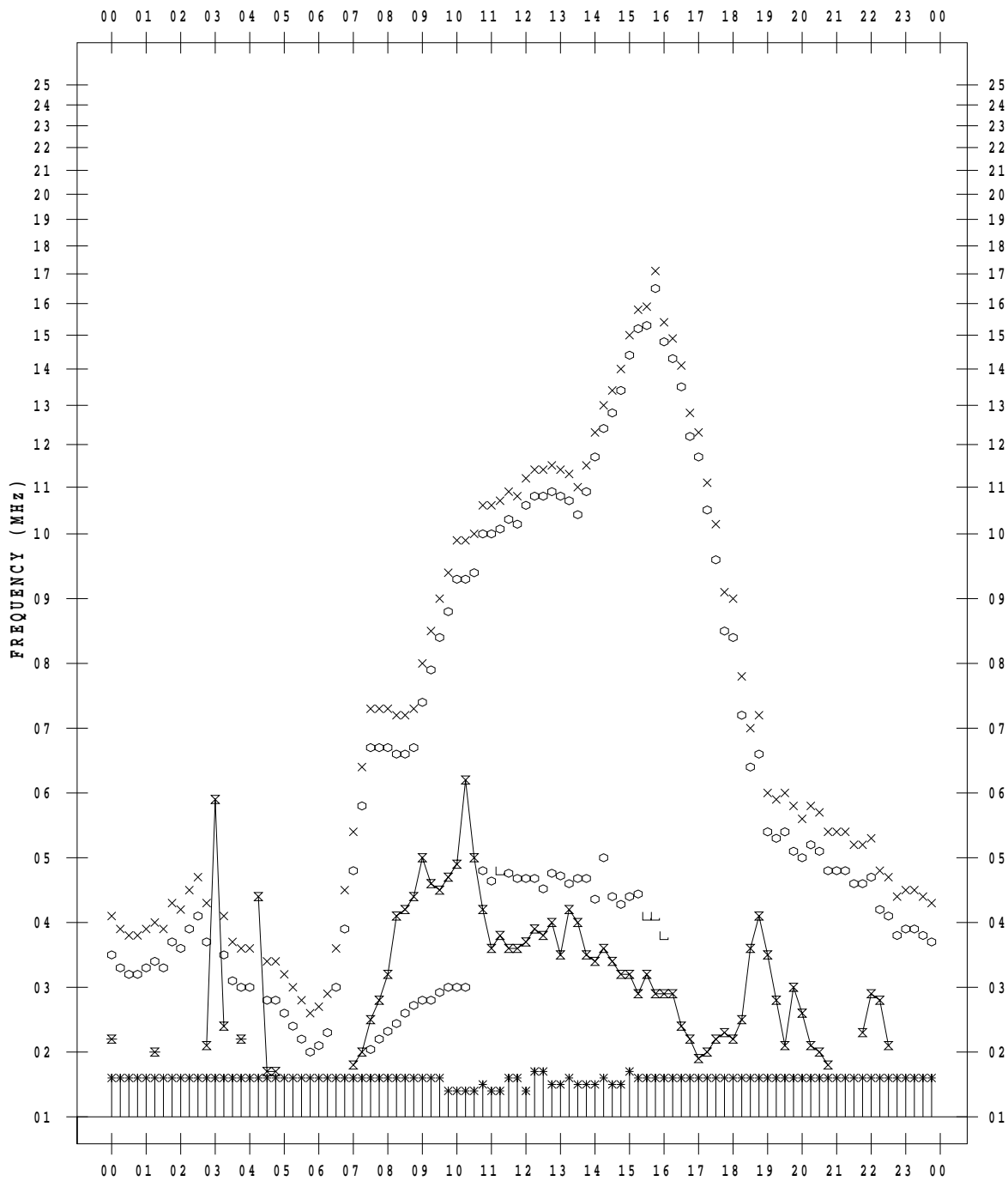
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/17

135 ° E MEAN TIME



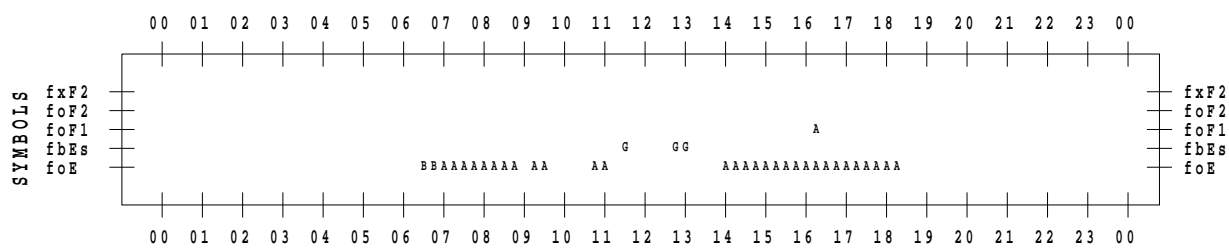
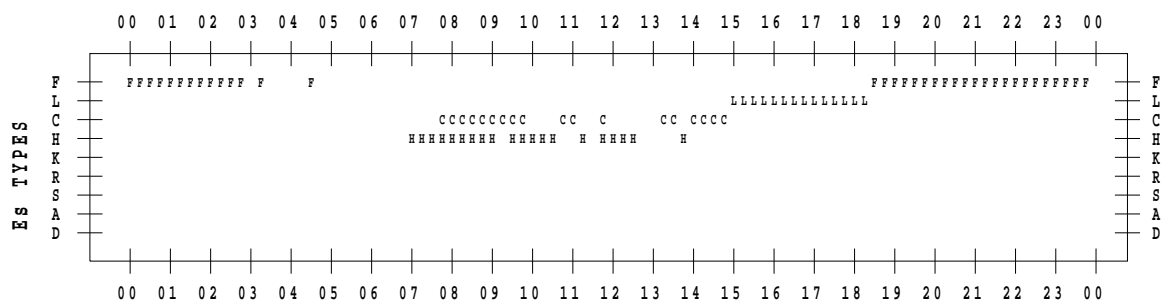
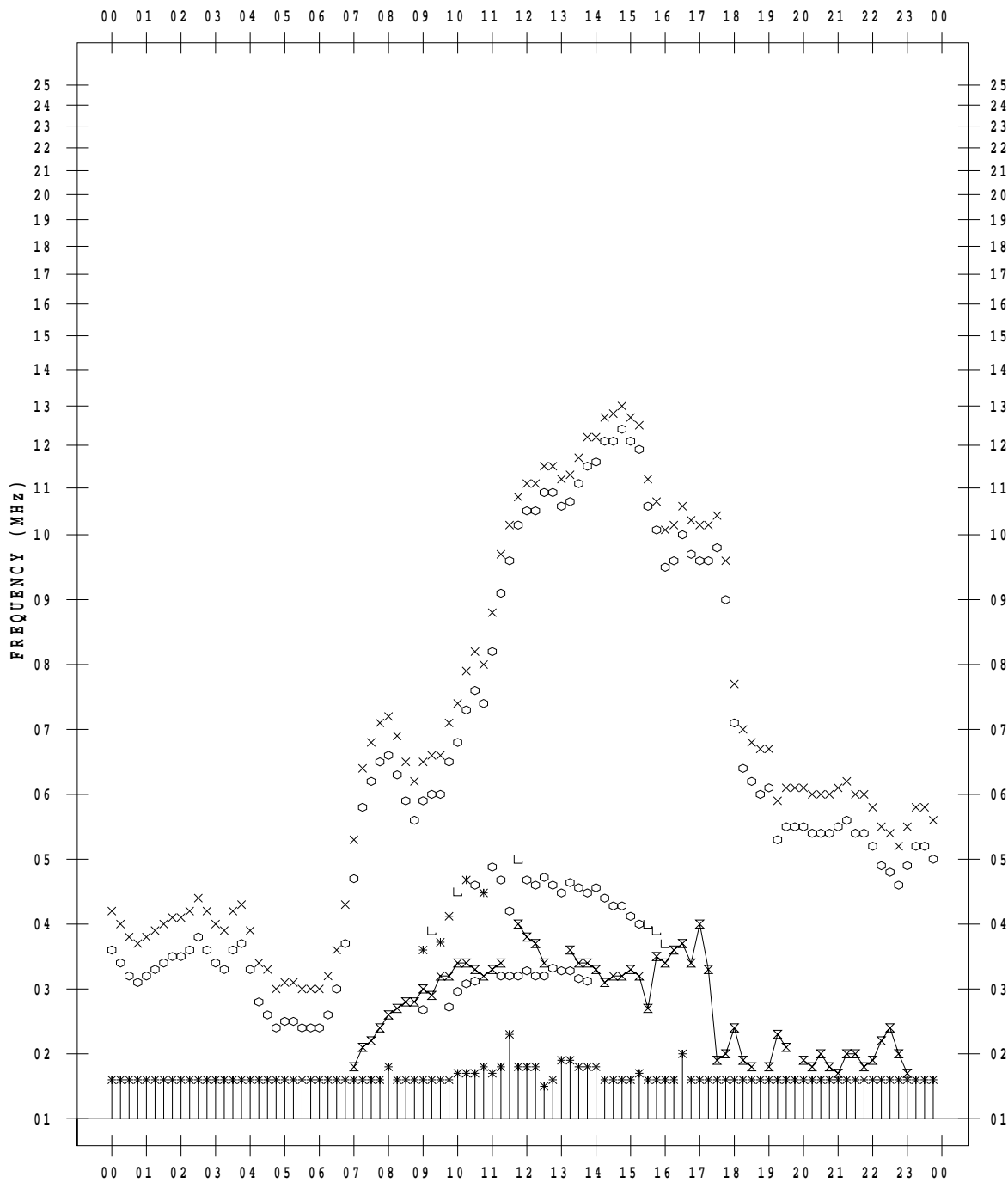
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/18

135 ° E MEAN TIME



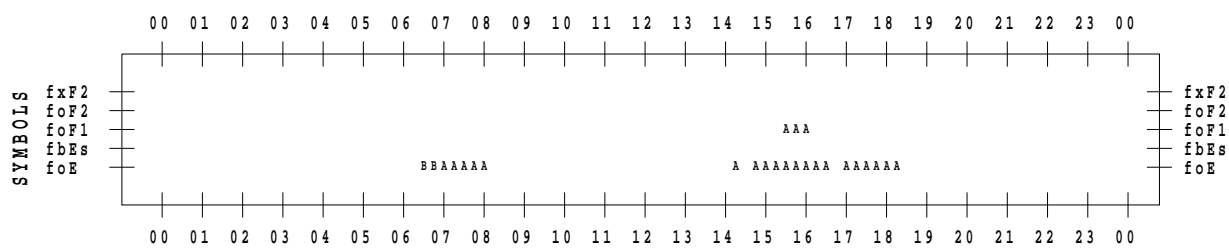
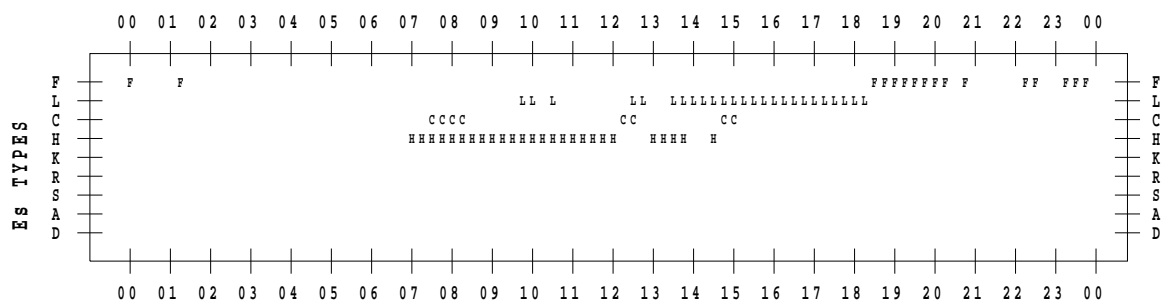
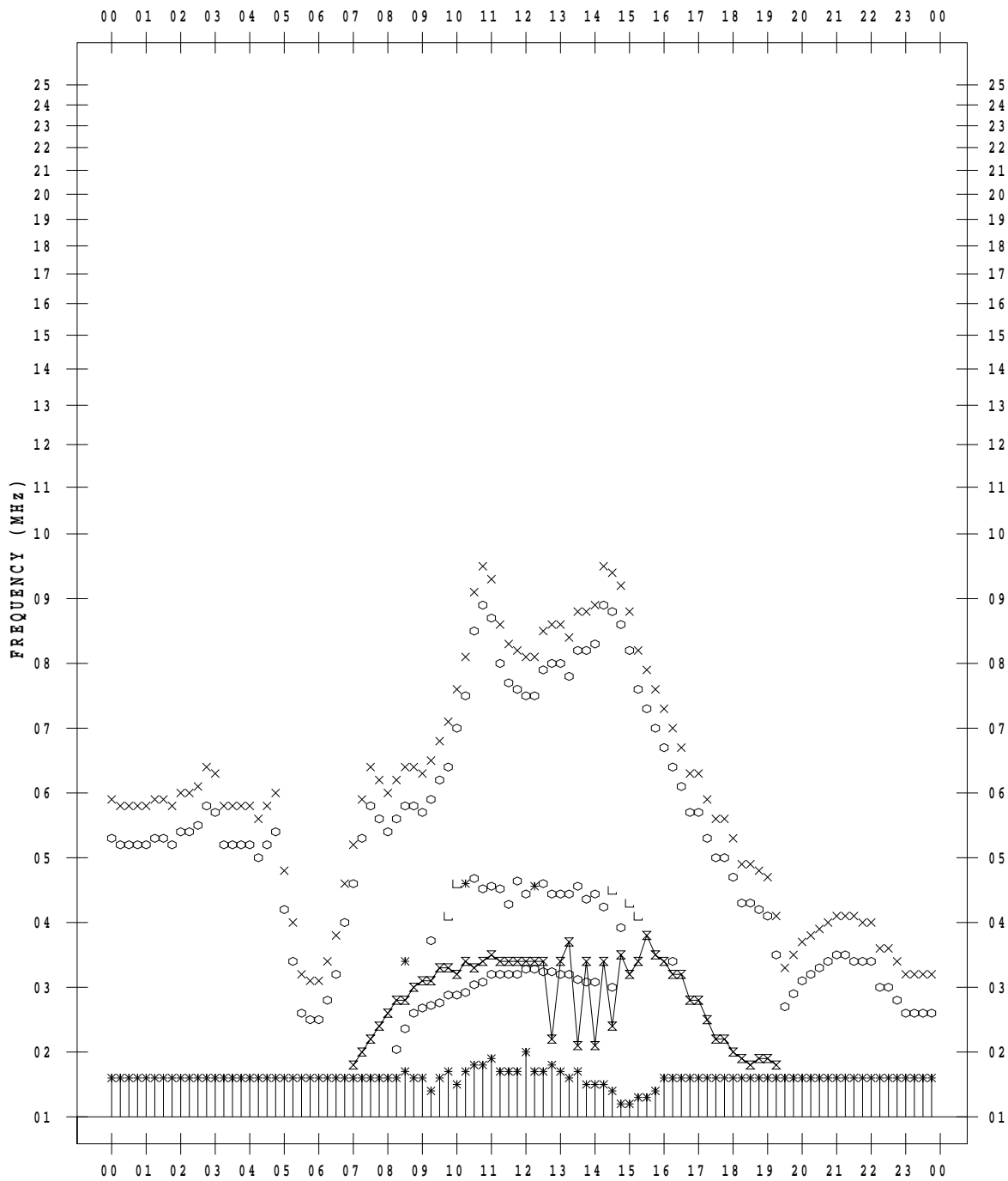
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/19

135 ° E MEAN TIME



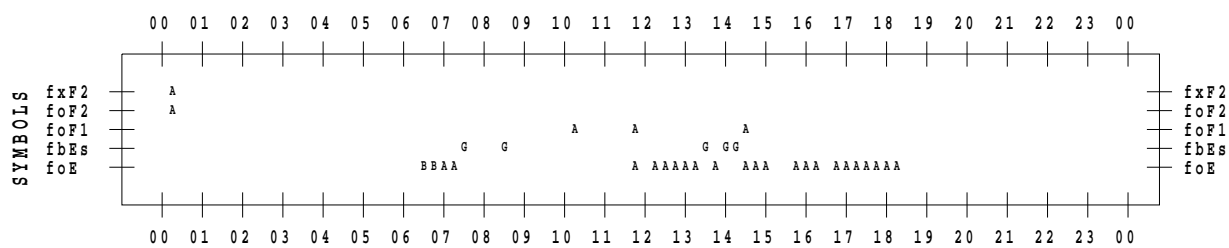
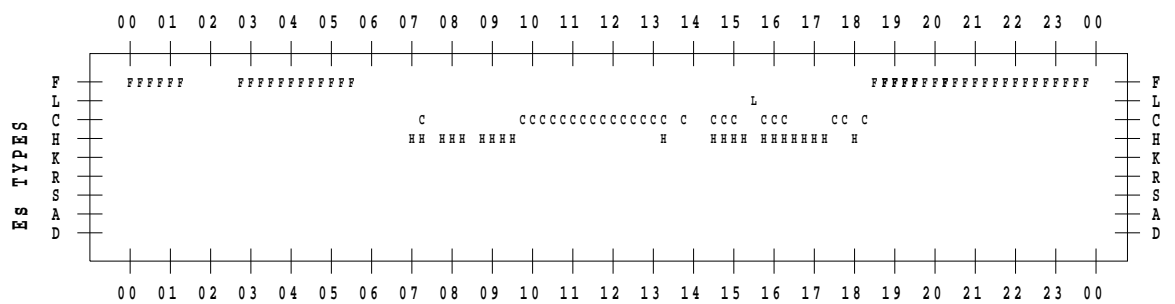
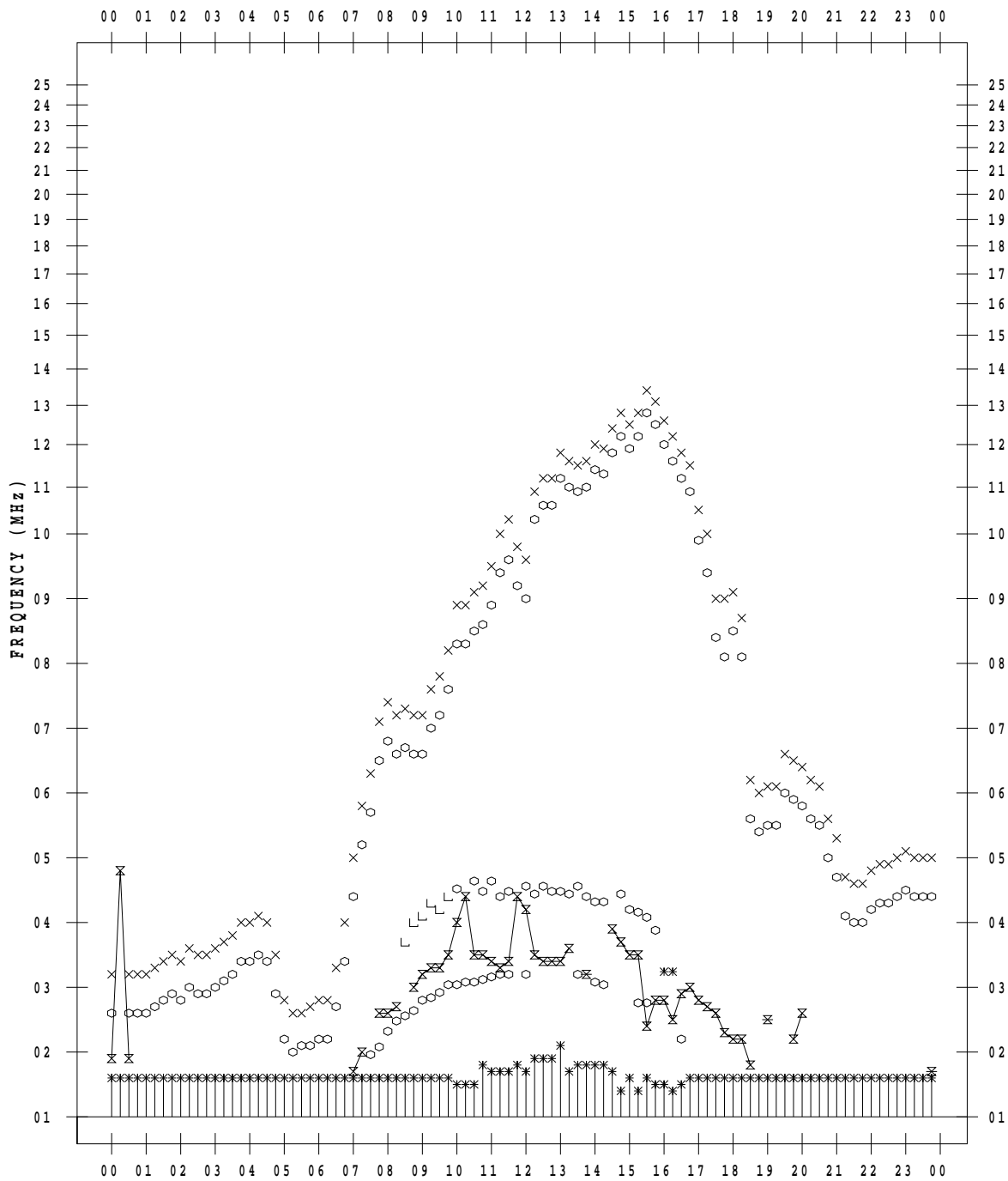
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/20

135 ° E MEAN TIME



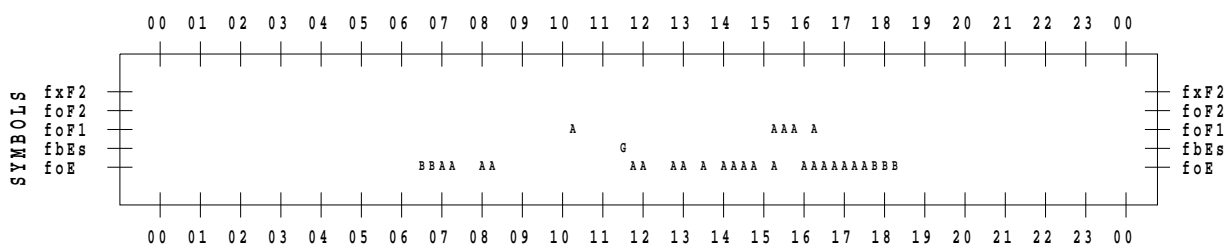
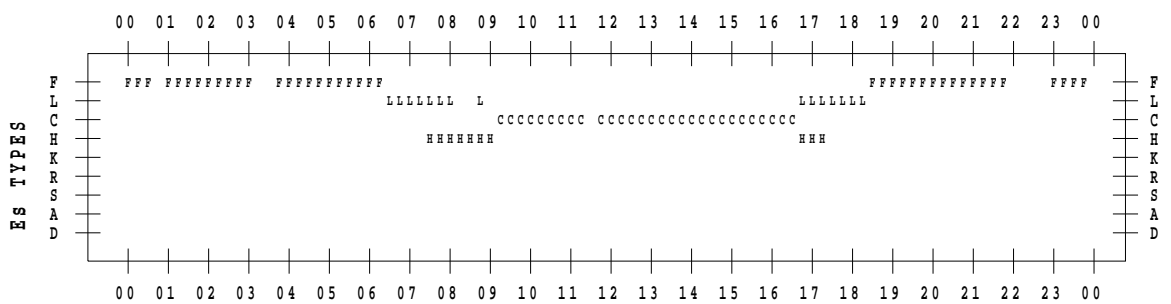
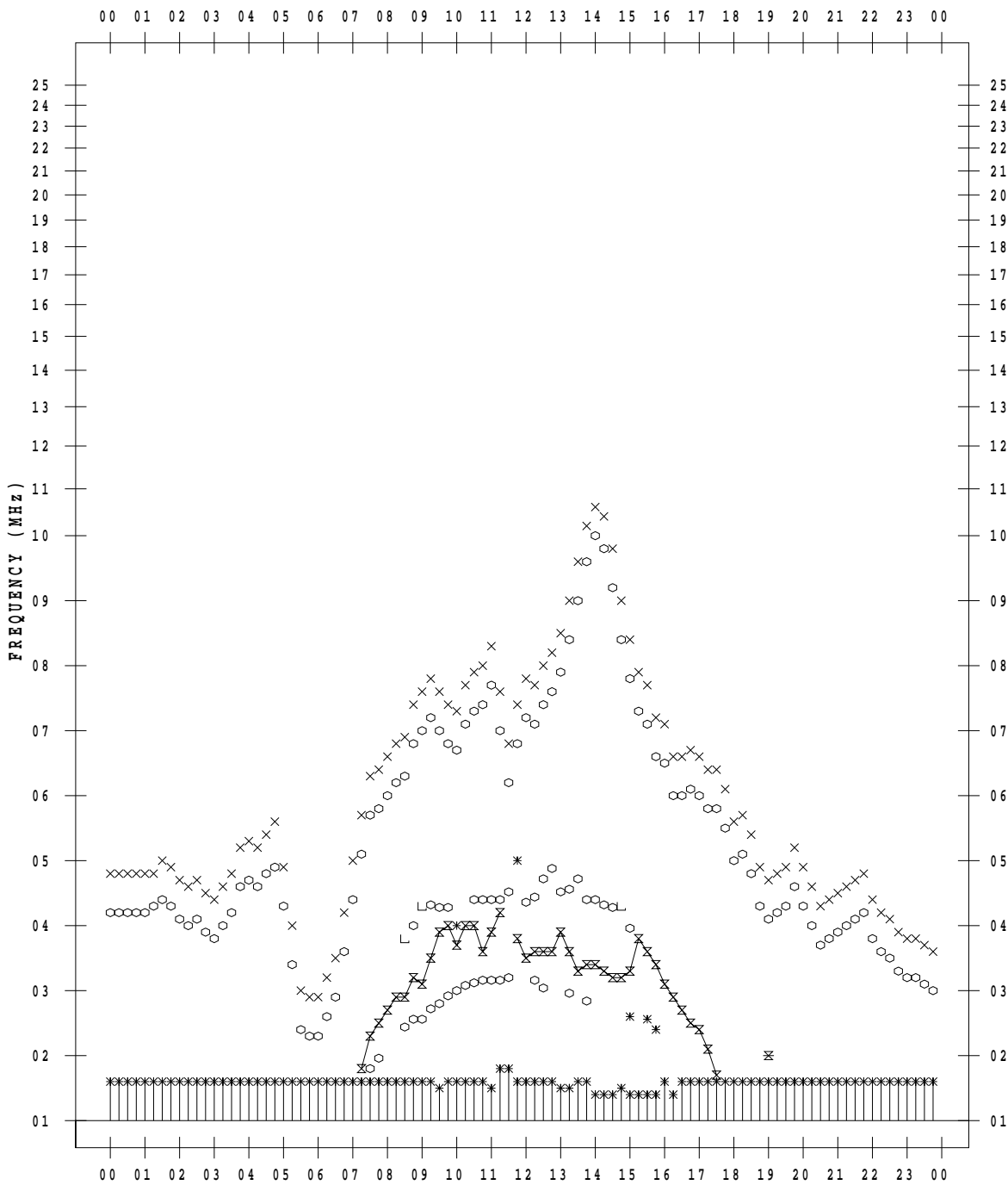
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/21

135 ° E MEAN TIME



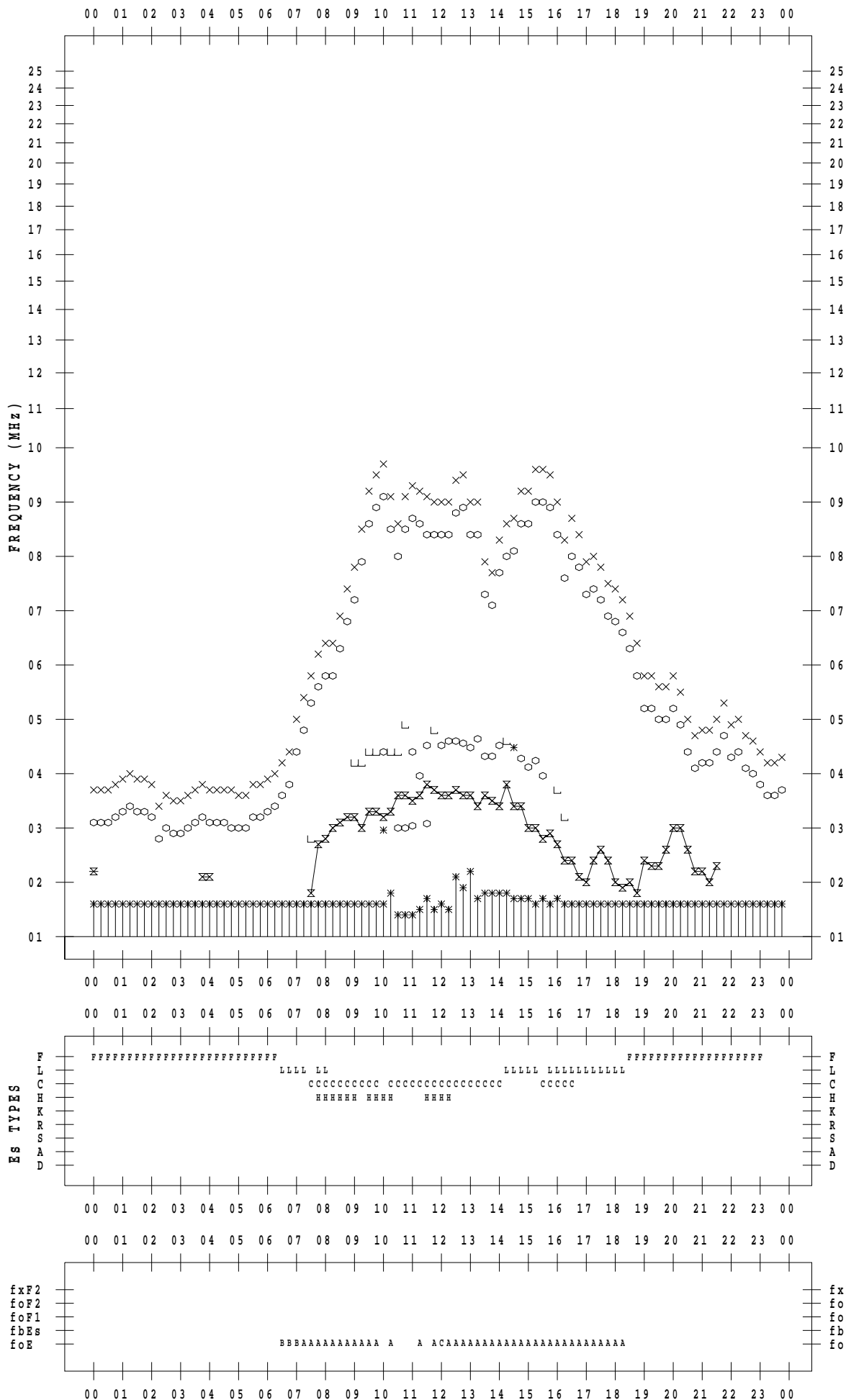
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/22

135 ° E MEAN TIME



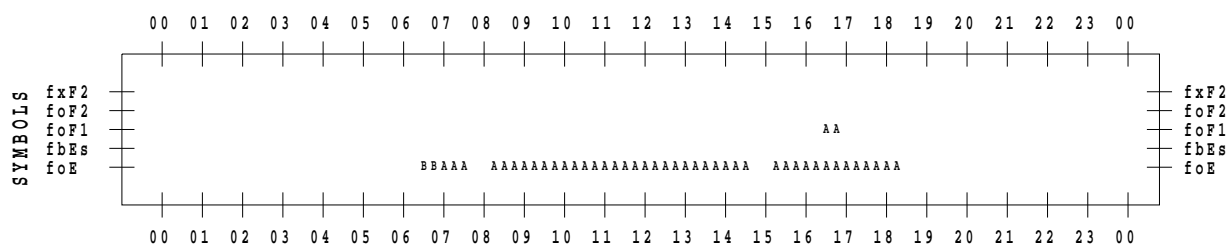
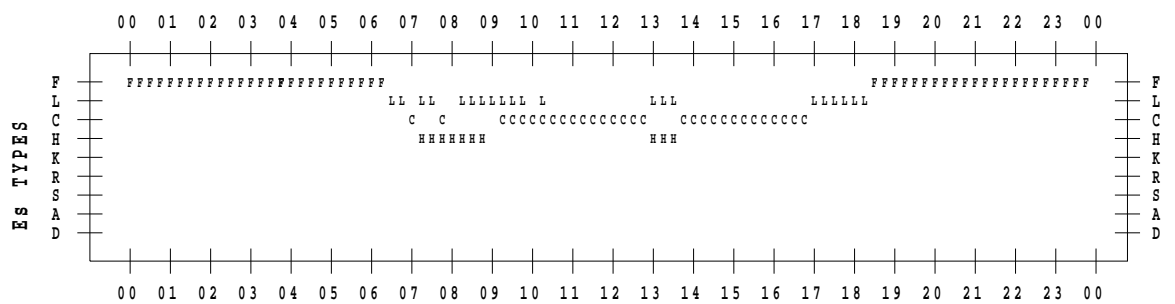
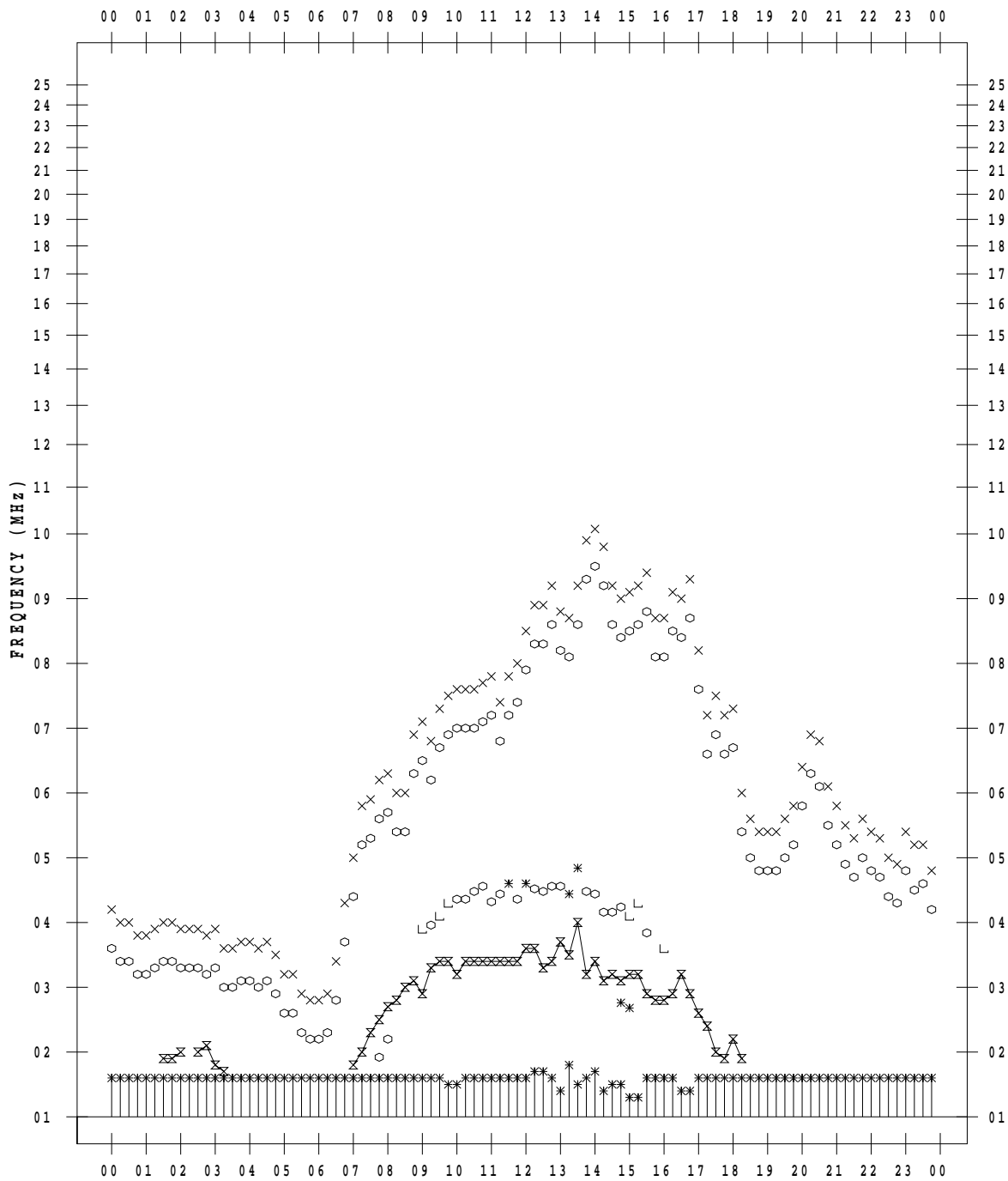
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/23

135 ° E MEAN TIME



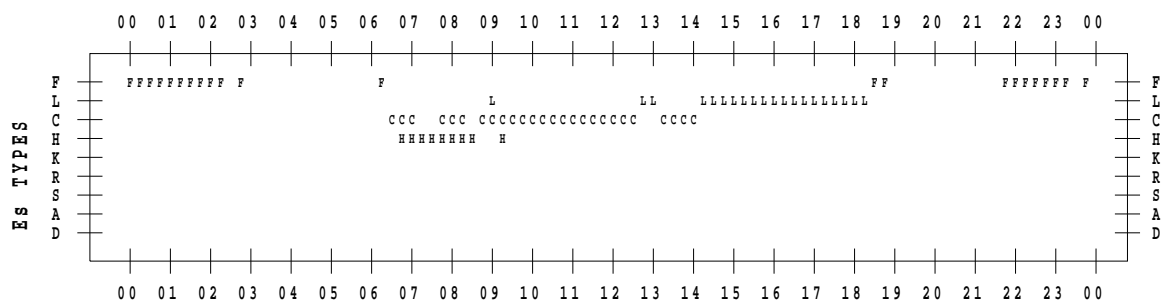
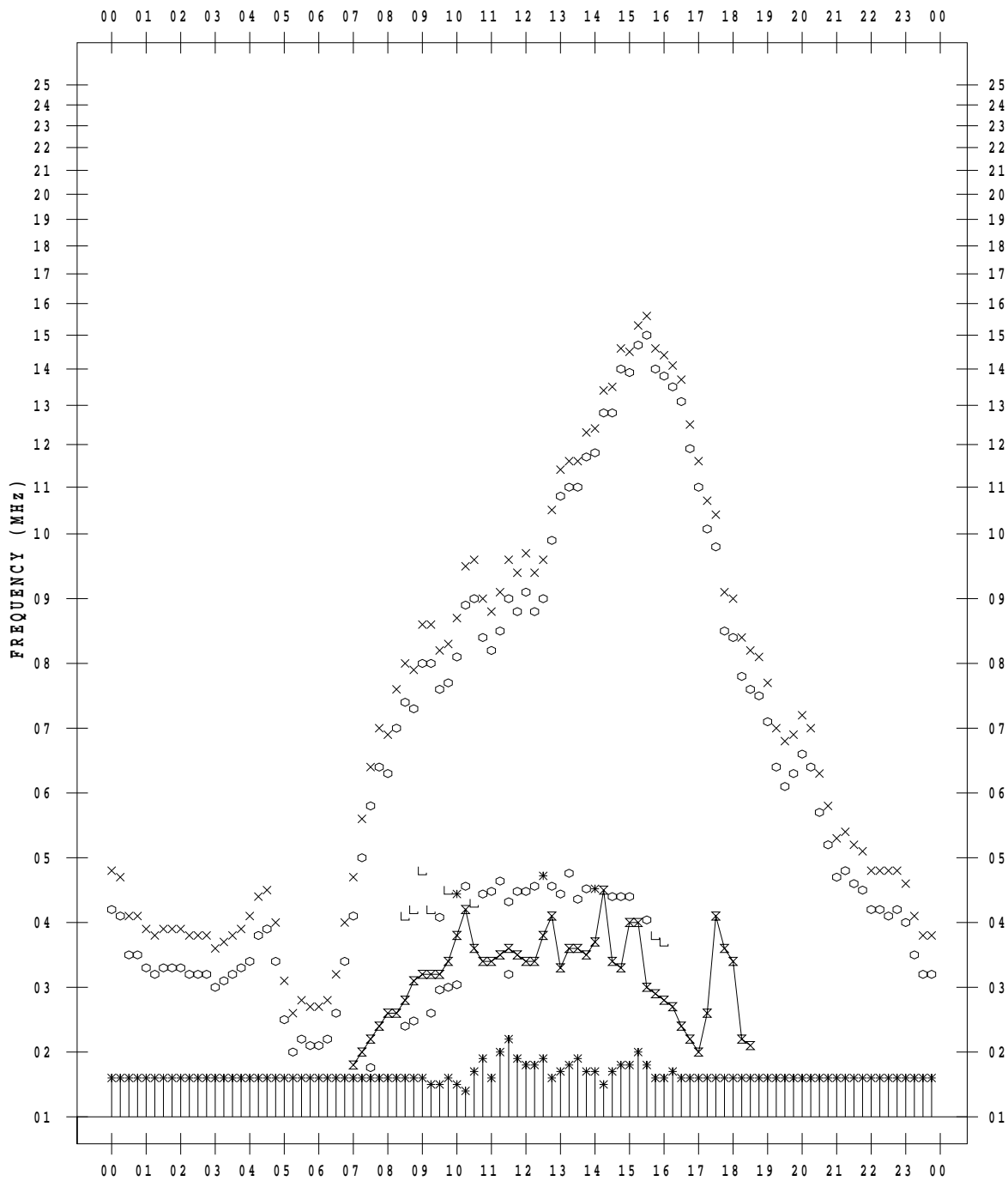
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/24

135 ° E MEAN TIME



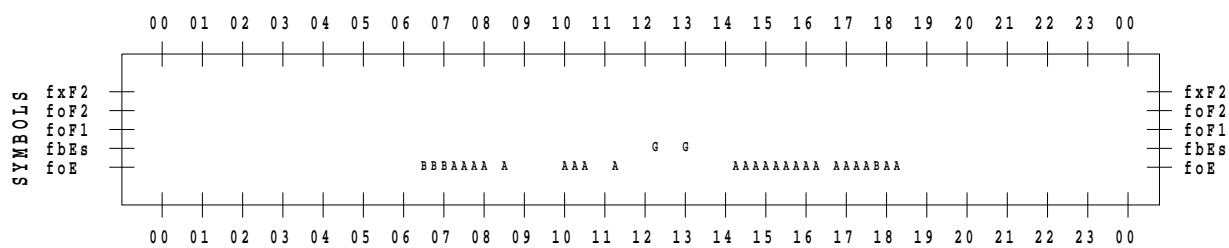
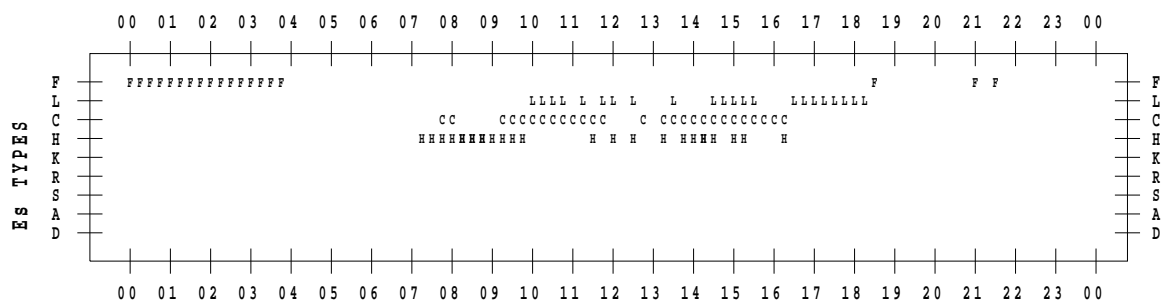
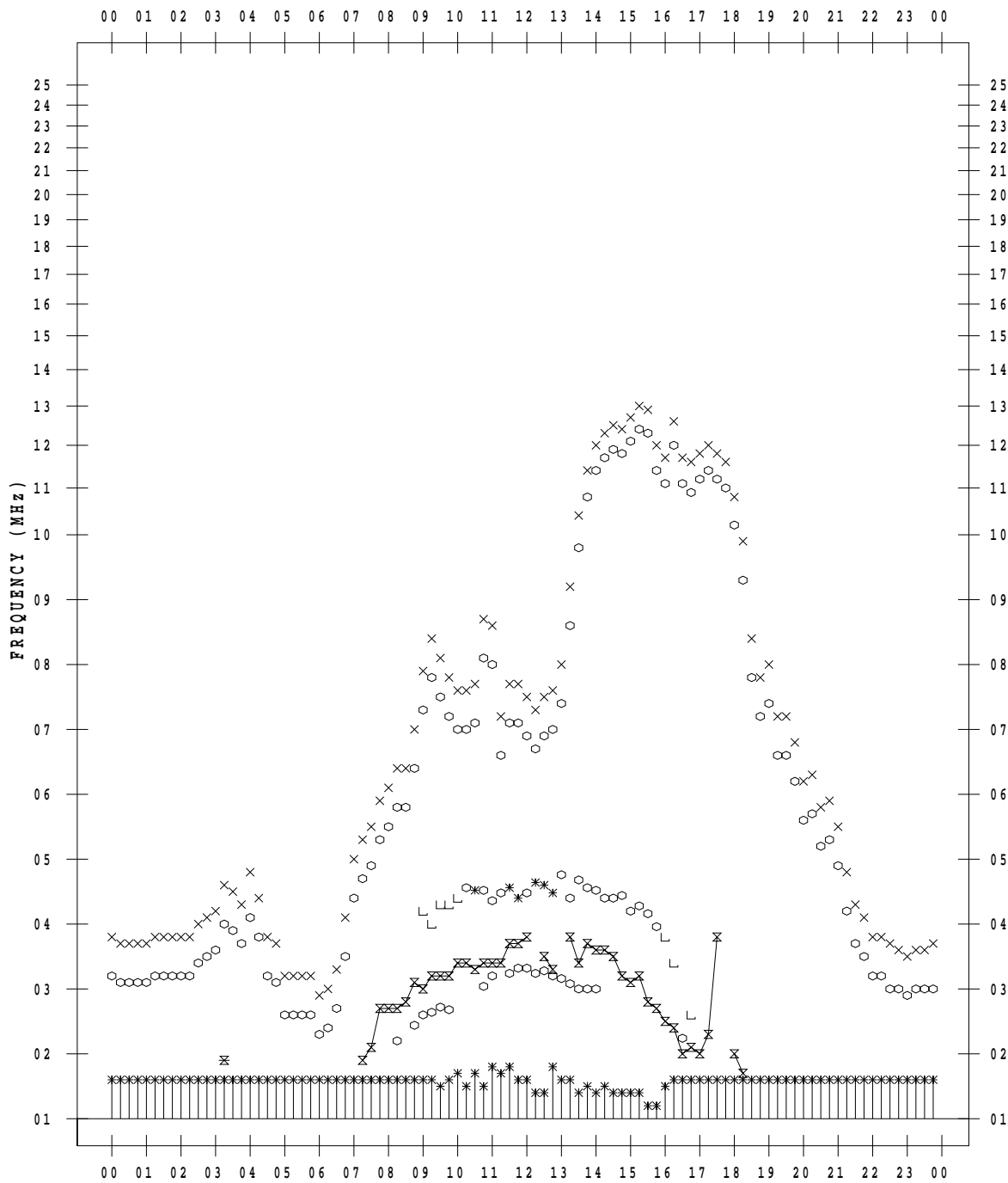
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/25

135 ° E MEAN TIME



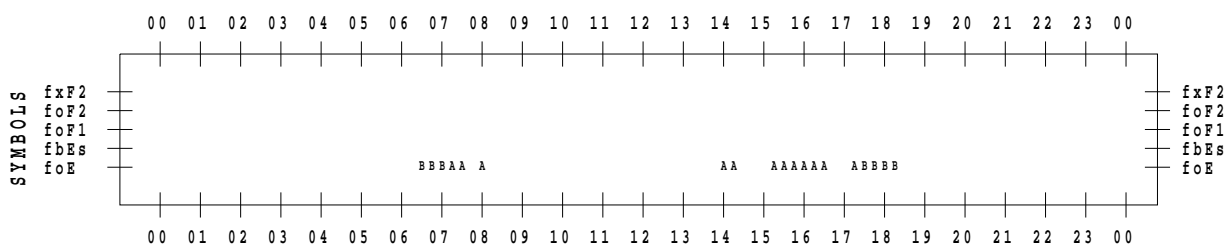
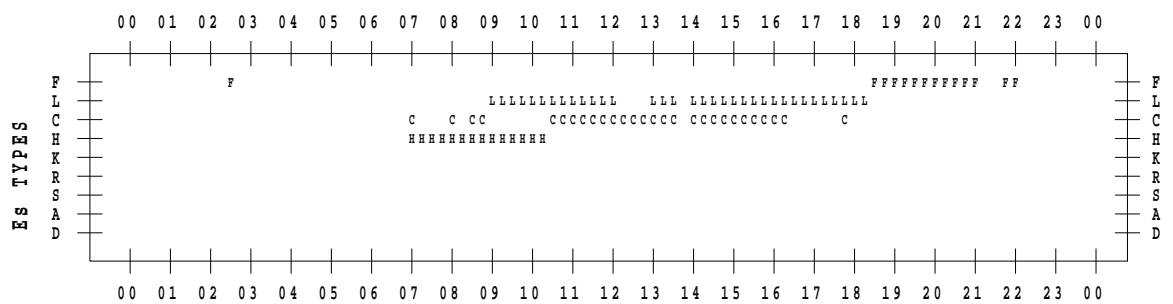
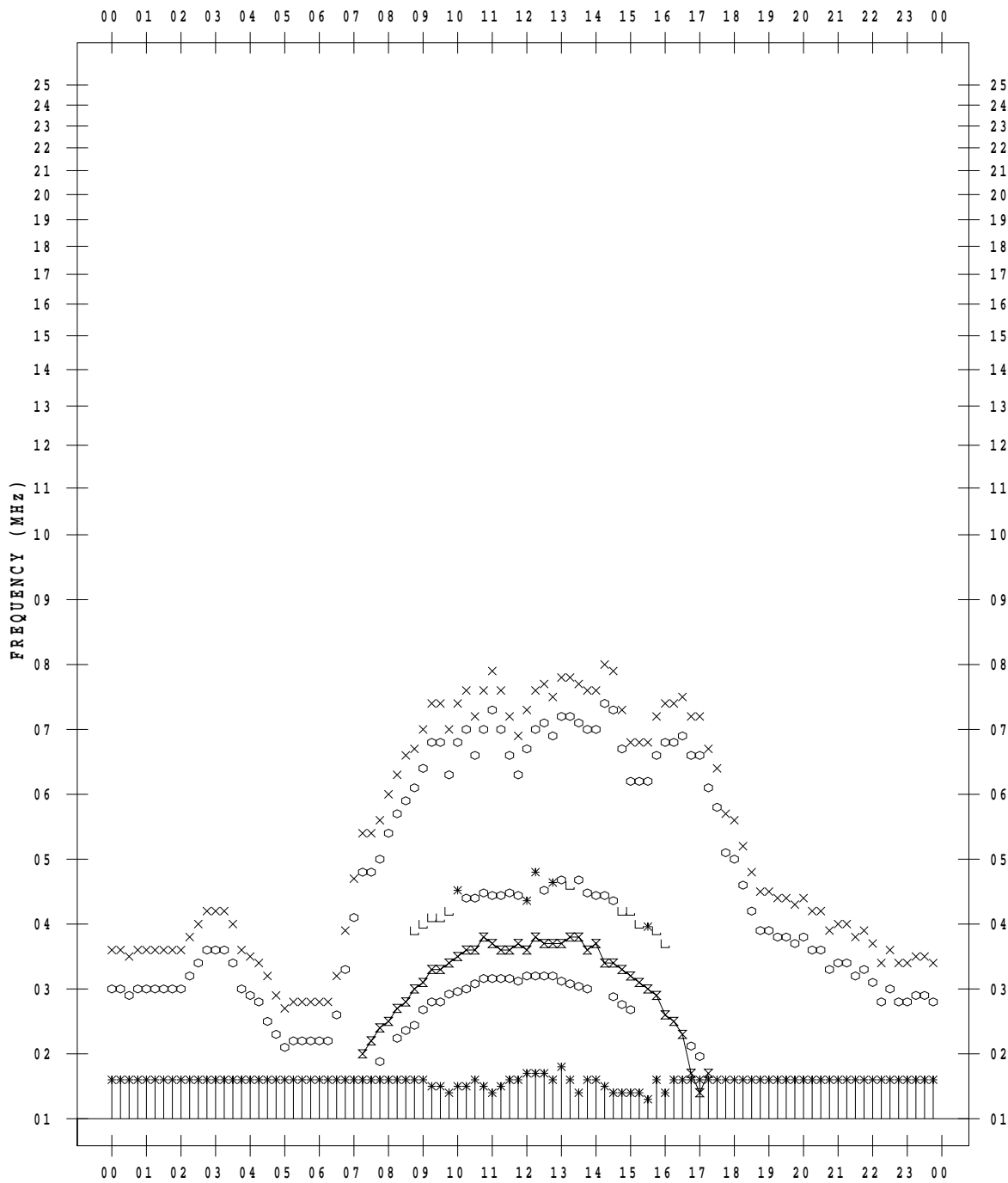
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/26

135 ° E MEAN TIME



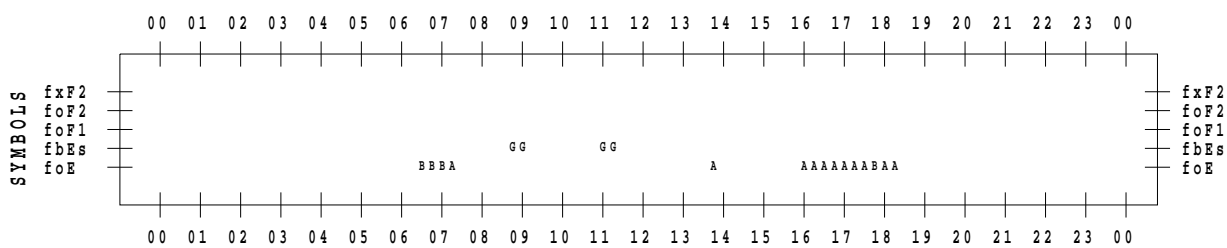
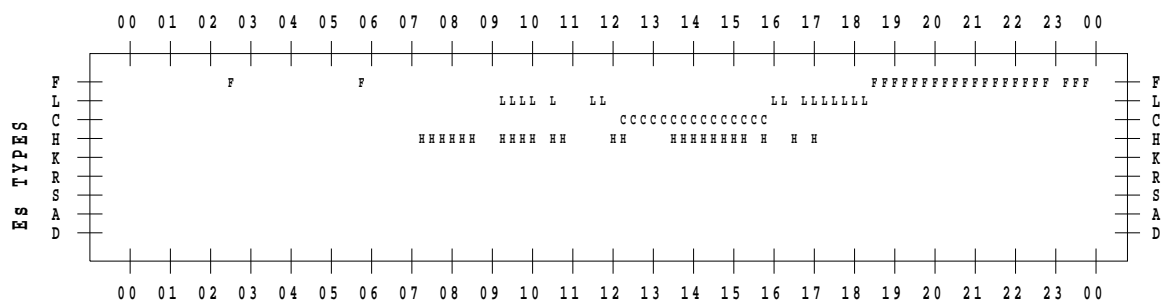
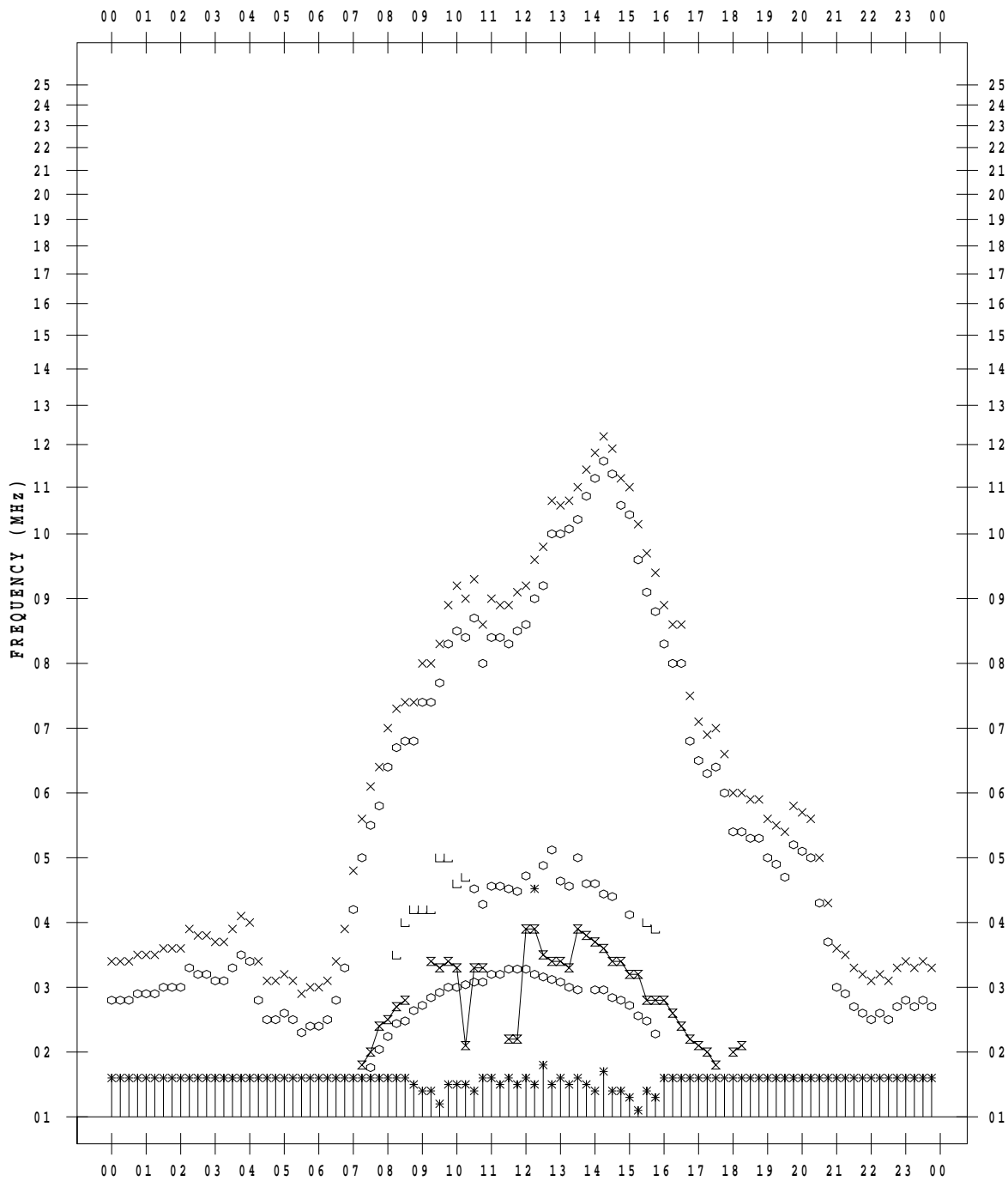
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/27

135 ° E MEAN TIME



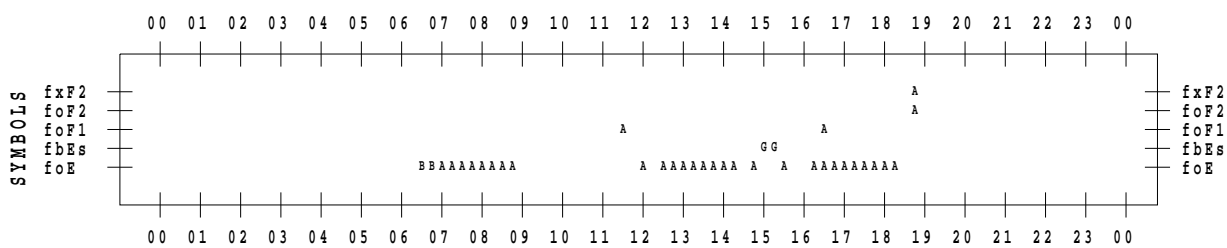
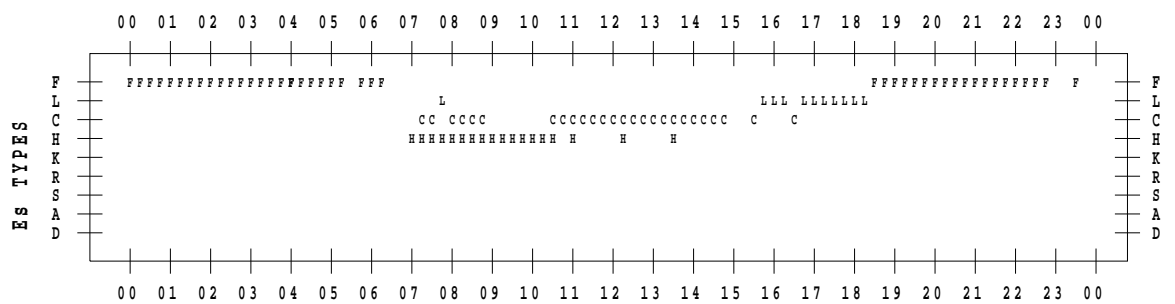
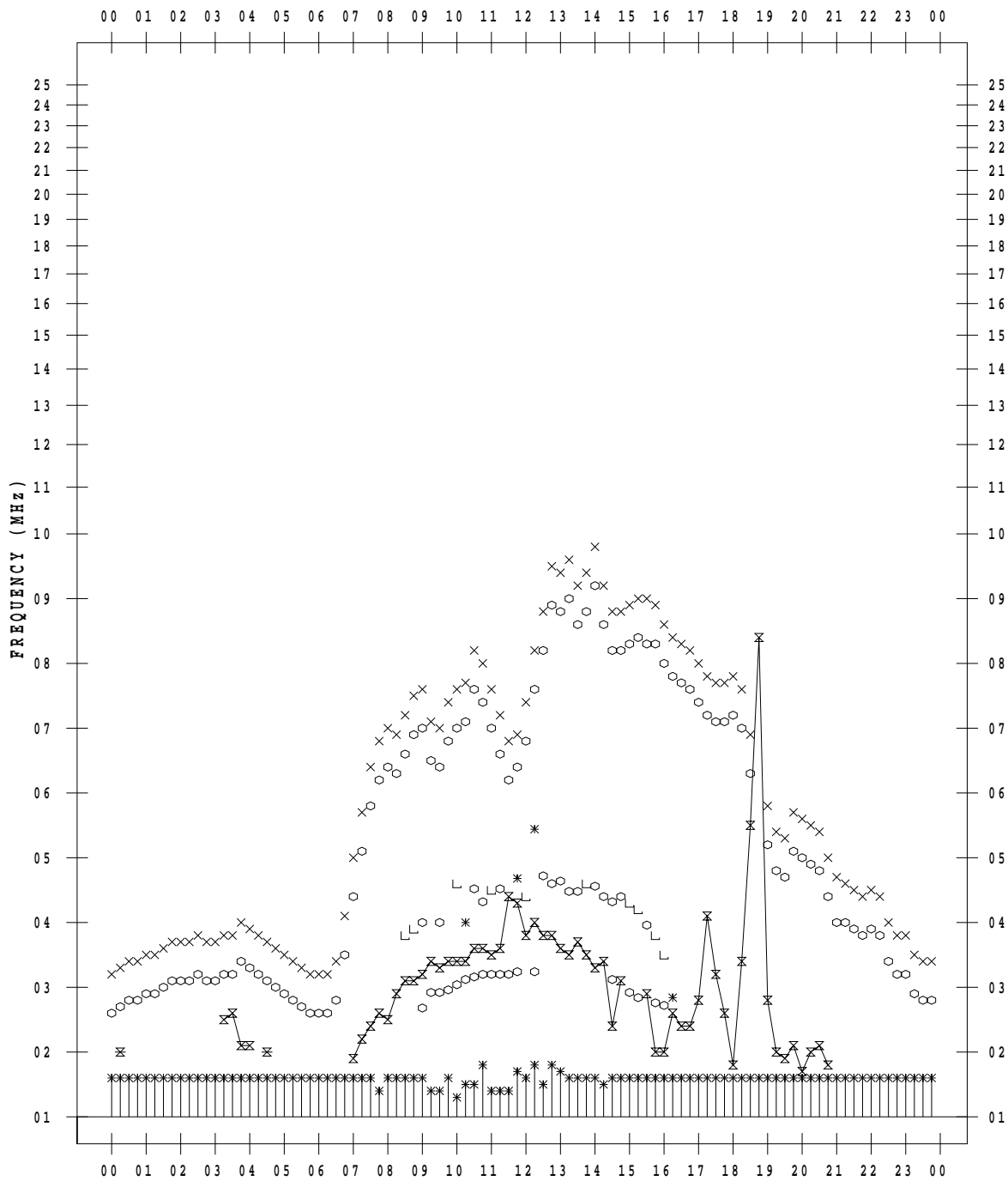
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/28

135 ° E MEAN TIME



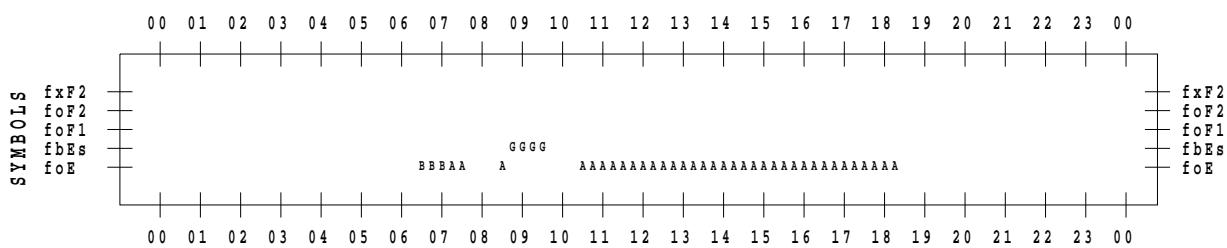
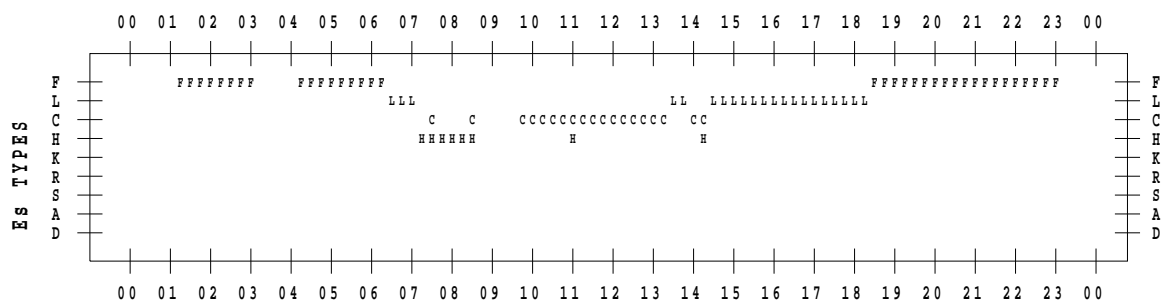
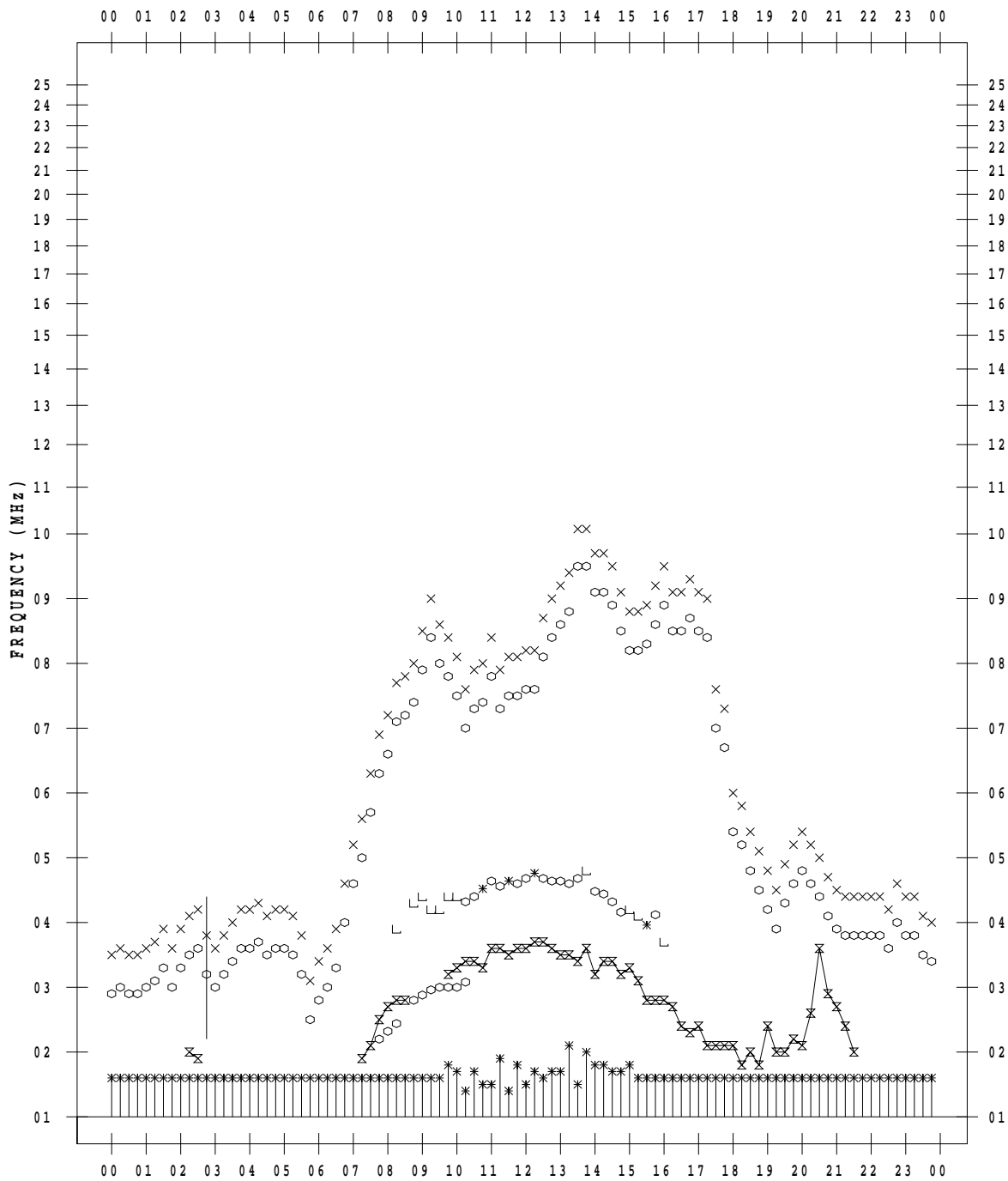
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/29

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2021/11/30

135 ° E MEAN TIME

