

IONOSPHERIC DATA IN JAPAN

FOR JUNE 2012

VOL. 64 NO. 6

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« Real Time Ionograms on the Webhttp://wdc.nict.go.jp/index_eng.html »



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

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

National Institute of Information and Communications Technology, Japan.

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

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

A. 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 (f_oF2 , fEs , $fmin$) and monthly medians of two factors ($h'Es$, $h'F$), daily Summary Plots and monthly medians plot of f_oF2 .

a. Characteristics of Ionosphere

f_oF2	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 f_oF2).
- 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 f_oF2 , 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 f_xE and f_oE 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
f_oF2 f_oF1 f_oE f_oEs	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 as-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.

B. SOLAR RADIO EMISSION

Solar radio observations at 200, 500 and 2800 MHz are carried out at Hiraiso. The observation equipment consists of three parabolic antennas, one with 10-meter diameter for 200 MHz Measurement, one with 6-meter diameter for 500 MHz measurements and one with 2-meter diameter for 2800 MHz measurements, each being equipped with a pair of crossed doublet antennas as a primary radiator, and three appropriate receivers. Each pair of the crossed doublet antennas is used as a polarimeter. Observations are continuously carried out almost from sunrise to sunset.

B1. Outstanding Occurrences at Hiraiso

The table is a list of outstanding occurrences of solar radio

emission bursts observed at 200, 500 and 2800 MHz during a month.

Listed in the table are the date, frequencies, the type of event, the start time and the time of maximum, both in U.T. expressed in hours, minutes and tenths of a minute, the duration in minutes, the peak and mean flux densities in $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$ unit, and the polarization.

The type of event is expressed by a combination of a numerical code and a letter symbol in accordance with the "Descriptive Text of Solar Geophysical Data, NOAA" as defined by H. Tanaka in the "Instruction Manual for Monthly Report of Solar Radio Emission, WDC-C2" in January 1975:

SGD Code	Letter Symbol	Morphological Classification
1	S	Simple 1
2	S/F	Simple 1F
3	S	Simple 2
4	S/F	Simple 2F
5	S	Simple
6	S	Minor
7	C	Minor+
8	S	Spike
20	GRF	Simple 3
21	GRF	Simple 3A
22	GRF	Simple 3F
23	GRF	Simple 3AF
24	R	Rise
25	R	Rise A
26	FAL	Fall
27	RF	Rise and Fall
28	PRE	Precursor
29	PBI	Post Burst Increase
30	PBI	Post Burst Increase A
31	ABS	Post Burst Decrease
32	ABS	Absorption
40	F	Fluctuations
41	F	Group of Bursts
42	SER	Series of Bursts
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
SGD Code	Letter Symbol	Morphological Classification
45	C	Complex
46	C	Complex F

47	GB	Great Burst
48	C	Major
49	GB	Major+

The polarization is expressed by the polarization degree and sense as follows:

R or L	right or left-handed polarization,
W, M or S	weak, moderate or strong polarization,
0	almost zero or unable to detect polarization due to small increase of flux,
00	polarization degree of less than 1

One of the following symbols may be attached after numerical values, if necessary.

D	greater than, or later than,
E	less than or earlier than,
U	approximate, or uncertain.

B2. Summary Plots of F10.7 at Hiraiso

The 10.7 cm solar radio flux at Hiraiso is plotted over a one month period. The 10.7 cm flux ($F_{10.7}$) is determined by adjusting the 10.7 cm radio flux measured at Hiraiso to the Pentincton 10.7 cm radio flux. The figure on the right-hand side shows the $F_{10.7}$ index estimated at Hiraiso.

The following symbols are used in the $F_{10.7}$ index:

*	Measurement made not at 3h U.T..
B	Measurement affected by bursts.

HOURLY VALUES OF foF2 AT Wakkanai

JUN. 2012

LAT. 45° 10.0' N LON. 141° 45.0' 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	63	54	54	58	52	54	65	67	A	66	63		A	61	61	A	64	67	A	A	52	66	66	65		
2	66	64	62	54	62	67	64		64	60	60	66	63	67	A	64	66	67	A	71	65	66	66	64		
3	64	66	63	52	63	65	67	67	65						59	66	A	A	A	66		67	65	67		
4	64	61	64	52	60	61	66	65	A	A		A	A	A	A	A	61	A	68	67	66	66	64	64		
5	54	65	34	52	51	59	55		A					A	A	A	A	62	A	64	67	64	65	62		
6	65	62	51	54	54	60	64	66	A	A					64	A	A	A	A	A	65	A	64	A		
7	A	A	A		61	58	63		A	A									A	A	A		66	65	66	
8	63	66	64	62	62	67	65		64	A			A	A		57	A	A			A	66	65	68		
9	64	A	A		66		68		A	A	A				61		64	68	67	66	64	64	65	67		
10	63	65	26	64	67	65	66	49	67	64		61	59	67	A	A	67	A	A	A	67	66	65	54		
11	64	63	62	66	64	64	65	67	67	67	70	69	68	70	66	62	65	70	70		69	65	67	53		
12	66	54	63	63	62	62	62	64	39	49	60		A	A	61	64	A	A	A	A	A	A		65	67	
13	54	58	34	53	53	63		66	A	A	A	A	A	A	64	63	A	A	A	A	A		64	64	A	
14	A	A		34	54	59	62		A	A				60	65	64	A	65	65	67	66	66	65	67		
15	A	66		62	66	67	62	64	61			61	65	65	60	61	67	67	70	67	66	67	66	67		
16	63	61	61	62	66	71	64	66	66	64	63	66		62	64	63	66	65	65	67	63	67	64	65		
17	64	67	51	53	61	61	58		59	A	A				63	62	66	62	67	66	66	65	64	A		
18	A	46	A	A		32			A	A	A	A	A	A			A	52	A	58		A	A	58	54	
19	54	54	32	47	46	54		A	A	A					A	A	A	57	A	64	66	67	64	63		
20	52	53	63	60	64	70	57	56	61		56	64	64			A	A	A		62	62		62	66		
21	54	63	52	58	61	60		A	A		65	67	64	70	64	62	64	60	63	61	66	65	65	66	67	63
22	61	63	52	60	63	60	63	69	66	67	65		62	63	62	64	61	62	A	65	67	65	66	60		
23	53	34	58	53	58	61	66		A	A		60	63		61		56	A	63	62	67	32	64	60		
24	A	54	53	53	52	58	68	63	64		A		61		58	64	60	56	51	58	63	65	62	54	A	
25	A	A	A		48				A	A	A	A	A		A	A	A	58	A	A	A	A	A	A	54	
26	52	54	54	47		46			A	A	A	A	A	A			A	56	60	58	61	66	62	65	64	
27	65	50	52	51		A	A	A	A	A	A	A	A	A	A	A	A		61	62	62	63	67	64	54	
28	52	A	53	51	58	64	63		A	A	A	A	A	A	A	A		60	60	A	A		67	66	64	64
29	64	52	58	54	52	52	56		60		A	A				A		62	62	62	64		64	67	63	
30	A	52	54	62	58	49	62	64		A		67	66				66	66	66	A	71	66	67	63	66	
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	23	25	25	29	26	27	20	14	15	10	10	10	8	12	15	13	19	20	15	21	21	26	27	26		
MED	63	61	54	54	60	62	64	66	64	65	63	65	64	62	64	63	64	62	66	65	66	66	65	64		
U Q	64	64	62	62	63	65	65	67	66	67	65	66	64	66	64	64	66	66	67	66	67	66	66	66		
L Q	54	53	51	52	53	59	62	64	61	62	60	61	61	61	61	60	60	60	62	62	65	64	64	60		

HOURLY VALUES OF fEs AT Wakkanai

JUN. 2012

LAT. 45° 10.0' N LON. 141° 45.0' E SWEEP 1.0 MHz TO 30.0 MHz 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	32	G	24	26	27	34	43	50	69	57	56	G	75	55	54	72	71	46	79	117	42	27	53	G	
2	G	G	G	G	G	G	G		61	56	50	G	G	72	124	101	58	68	86	79	50	29	G	26	
3	G	37	26	G	G	35	46	54	65	G	G	G	G	G	G	G	104	124	69	54	45	43	G	G	
4	G	G	G	24	30	35	43	56	50	52	G	52	48	54	60	53	50	65	45	G	G	25	G	24	
5	G	G	G	G	32	G	39	55	G	G	G		G	75	92	71	87	G	61	48	44	34	34	34	
6	28	G	G	G	33	40	48	58	65	54	G		G		G	64	85	92	92	92	71	59	55	70	
7	59	72	92	58	56	70	82	73	60	64	G	G	G	44		41	G	G	60	68	72	70	51	34	
8	G	G	34	26	G	40	64	80	71	66	G		64	45	47	70	70	118	58	72	72	67	72	27	
9	40	104	71	68	82	70	73	70	74	61	68	58	69	58	52	70	40	57	56	54	42	37	52	71	
10	38	32	27	G	G	40	52	39	50	G		G	G	G	72	72	54	127	180	92	70	79	38	26	
11	24	38	G	G	G	39	36	60	49	45	70	44		G	G	G	G	G	48		44	60	48	24	
12	24	32	G	G	31	38	44	49	G	50	53	62	52		G	48	76	64	95	117	70	95	71	58	32
13	32	28	28	G	G	39	60	39	68	52	61	72	90	70	G	51	69	90	71	71	60	45	43	70	
14	73	65	29	37	33	40	73	108	49		49	G	70	G	G	67	46	48	38	34	34	29	34	49	
15	38	G		G	G	36	35	58	62		57		G	G	G	G	G	36	43	29	G	G	G	50	
16	28	G	G	G	G	34	G	G	G	51	G	54	70		G	G	54	58	54	50	52	44	32	G	G
17	G	36	G	G	G	38	43		53	70	63	G	57		G	G	G	G	G	27	G	G	33	44	
18	59	69	72	70	G	G	G	60	54	44	156	82	64	44		G	G	39	G	41	46	44	57	26	40
19	38	G	G	G	G	40	60	73	65	G	G	73	76	62	70	41	57	61	72	43	44	32	G	G	
20	28	G	G	G	G	34	45	62	56	67	62	54	52	G		52	62	76	63	36	48	45	39	60	G
21	26	44	41	49	56	42	72	89	71	53	60	50	54	52		G	G	G	38	42	31	28	34	38	33
22	G	G	G	G	G	G	40	45	44		G	G	G	G	G	G	G	58	48	64	58	60	27	33	G
23	G	G	23	24	G	34	54		74	73	53	53			G	G	40	44	39	38	39	47	26	25	
24	27	33	G	G	G	40	56	57	61	68	65	G		G	G	G	45	G	G	28	G	34	26	72	
25	70	72	50	39	52	54	63	73	72	73	51	54	G	49	60	56	40	75	74	130	72	70	69	57	
26	32	G	G	G		35	G	57	51	60	72	61	52	G	G	60	39	50	48	52	34	59	51	70	
27	54	33	32	39	73	60	69	94	77	118	104	101	106	52	68	70	76	G	51	50	67	54	43	35	33
28	38	59	58	41	36	43	55	76	58	120	54	76	80	92	68	93	G	45	76	93	58	48	54	28	
29	G	33	40	38	G	36	51	66	52	G	62	56	G	54	G	55	58	39	50	51	73	58	50	48	
30	60	40	33	32	33	32	45	61	72	72	58	66	73	97	102	72	G	59	124	G	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	30	29	30	29	30	30	27	30	28	28	27	29	28	30	30	30	30	30	29	30	30	30	30	
MED	28	32	24	G	G	38	47	60	60	55	54	54	52	44	G	56	52	50	57	52	44	41	36	32	
U Q	38	40	37	38	33	40	60	73	69	67	62	62	70	56	60	70	69	68	74	71	60	59	52	49	
L Q	G	G	G	G	G	34	40	54	50	44	G	G	G	G	G	G	39	38	43	36	34	29	26	24	

HOURLY VALUES OF fmin AT Wakkanai

JUN. 2012

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	14	14	15	14	14	14	14	14	17	24	17	21	18	23	36	17	17	15	14	14	14	15	14	14
2	15	15	15	16	16	14	14		18	24	26	52	30	26	21	15	15	15	14	14	14	14	14	15
3	17	14	14	14	14	14	14	16	18	16	18	20	21	24	24	21	14	14	14	14	14	14	14	14
4	14	15	15	14	14	14	14	14	16	14	21	44	21	39	21	15	14	15	14	18	15	14	14	16
5	15	15	15	15	15	14	14	14	14	21	21		20	30	20	17	15	14	14	14	14	14	14	14
6	14	14	15	15	14	14	15	14	15	16	24		33		17	17	15	14	14	14	14	14	14	14
7	14	14	14	14	14	14	14	14	14	17	16	22	22	18	17	17	14	15	14	14	14	14	14	14
8	15	15	14	14	16	15	14	15	17	16	22		28	28	20	15	16	14	14	14	14	15	14	15
9	14	14	14	14	14	14	14	15	18	15	17	17	21	21	21	17	14	14	14	14	14	14	15	14
10	15	14	14	14	17	14	14	14	15	18		52	26	23	18	18	20	14	14	14	14	14	15	15
11	14	15	14	14	17	14	14	14	15	17	22	35	17	24	21	15	14	14	14		15	14	14	15
12	15	14	15	15	14	14	14	14	17	28	20	39	32	52	24	20	15	18	14	14	15	14	15	15
13	14	14	14	15	21	14	14	15	15	20	38	21	39	22	26	18	16	15	14	14	14	14	14	14
14	15	15	15	14	14	14	14	17	15		24	24	24	22	24	17	14	15	14	14	14	14	14	14
15	14	14		15	16	14	15	14	21			21	54	28	21	21	16	15	14	14	14	14	15	14
16	17	14	14	14	16	14	14	17	18	20	27	20	26	22	21	23	15	14	14	14	15	14	15	14
17	14	15	15	16	16	14	14		17	15	16	21	24	18	18	17	16	14	14	14	15	15	14	15
18	15	14	14	14	16	14	14	15	15	21	18	23	35	17	18	15	15	14	14	14	14	14	17	14
19	14	14	16	15	14	14	14	15	16	18	20	21	18	20	20	17	15	16	14	14	14	14	17	15
20	15	14	15	18	17	14	14	14	17	16	17	30	24	22	26	20	15	14	14	14	14	14	14	16
21	14	15	14	14	14	14	14	14	17	22	22	21	24	17	21	18	15	14	14	14	15	14	14	14
22	15	15	15	14	18	14	14	14	15	16	21	22	21	22	21	20	15	14	14	14	14	16	14	14
23	14	14	14	15	15	14	14		14	20	21	18			18	15	14	15	14	14	14	14	14	15
24	15	14	14	15	15	14	14	14	14	14	16	15	17	16	14	15	14	14	14	16	14	15	14	14
25	14	14	14	14	14	14	14	14	14	18	20	20	18	17	15	14	14	14	14	14	14	14	14	15
26	14	14	14	14		14	14	14	14	21	20	17	20	18	15	15	14	14	14	14	14	15	14	14
27	14	14	14	14	14	14	14	14	18	18	20	18	21	23	20	15	15	14	14	14	14	14	14	15
28	15	14	14	14	14	14	14	14	15	15	18	30	20	23	20	17	15	15	14	14	14	14	14	14
29	14	14	14	14	16	14	14	14	15	18	17	29	21	20	18	16	14	14	14	14	14	14	15	15
30	14	15	15	14	14	14	14	15	17	22	18	28	22	24	18	15	15	14	14	15	14	14	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	29	30	29	30	30	27	30	28	28	27	29	28	30	30	30	30	30	29	30	30	30	30
MED	14	14	14	14	15	14	14	14	16	18	20	21	22	22	20	17	15	14	14	14	14	14	14	14
U Q	15	15	15	15	16	14	14	15	17	21	22	30	27	24	21	18	15	15	14	14	14	14	15	15
L Q	14	14	14	14	14	14	14	14	15	16	17	20	20	19	18	15	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

JUN. 2012

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	73	75	67	59	59	62	64	73	75	72	A	74	72	69	69	72	73	78	77	81	81	76	67	65	
2		A	54	55	54	54	73	86	88	77	66	73	A	74	80	84	87	87	91	91	86	77	75	74	
3	74	66	73	66	59	66	77	67	64	A	A	A	A	A		74	77	73	A	72	A	A	73	A	
4	72	66	A	67	62	67	76	A	A	A	A	A	A		100	A	A	76	82	74	54	71	73	73	
5	77	52	67	51	46	63	84	A	57	61	A	A	A	A		69	74	75	74	67	52	A	74	A	
6	67	A	53	A	60	55	A	A	67	A	A		A		48		76	A	A	100	A	77	74	77	
7	76	78	75	75	64	59	66	72	66	A	A				67	62	64	71	72	64	A	74	54	76	
8	74	72	54	59	61	67	75	80	81	A	A	A		68	73	73	73	A	74	76	A	87	81	87	
9	52	54	52	52	57	65	75	97	97	91	80		A	A	A	74	80	83	101	A	88	87	77	86	
10	77	79	A	A	75	79	85	A	179	A	A	77	76		A	A	78	78	78	A	A	76	86	80	
11	76	74	76	76	75	77	75	87	85	90	90	A	92	90	91	97	94	103	111	105	86	80	78	86	
12	88	78	80	84	87	78	80	78	68	A	A	A	A		74	70	A	A	78	A	A	A	67	76	
13	75	N	73	A	66	53	66	72	80	73	A	A	73	74	A		72	68	48	74	A	A	60	72	
14	73	72		67	63	75	72	82	81	A	A	A	A		72	73	74	71	69	74	76	78	76	82	
15	86	78	75	77	65	63	70	80	81	76	75	76	76	84	A		77	79	84	91	88	A	72	54	
16	74	73	69	65	66	63	58	65	72	77	A	74	77	78	80	83	90	94	91	87	86	83	67	81	
17	78	73	N	54	49	54		64			A		A	A	A		75	80	77	76	78	76	74	52	
18	53	A	87	52	54	N	59	51		A		A	A	A			A		56	58	56	53	52	A	
19	51	A	A	A	A	A	56	56	108	A	A	68	A	A	A		68	71	78	90	88	A	52	67	
20	54	66	54	52	45	53	108	A	A	A	A	A	A		73	81	90	91	84	91	47	A	54		
21	67	52	62	54	54	49	61	64		A	A	A	A		67	68		80	A	A	A	85	53	64	
22	52	54	59	52	53	62	73	90	84		69	A	A	69	72	71	78	75	86		80	66	A	A	
23	A	A	A	53	52	66	61	A	A	A	A	A	A	A	A		99			107	A	A	A	54	
24	52	A	44	A	44	A		A	A	74		A		A	67	65	64	A	66	A	A	56	A	A	
25	54	A	A	A	A	A		61	78	A	A	A	A	A	A		69	71	66	62	74	71	54	54	
26	52		67	54	51	A	A	58	A	A	A	A	A	A	A		A	63	56	A	59	55	72	54	
27	A	53	45	45	43	46	57	A	A		67	A					63	67	64	67	80	78	67	51	
28	52	52	52	54	58	61	61	A	68	72	A	67	A	66	A		65	69	69	76	74	A	A	43	
29	A	A	54	64	A	51		A	86	65	A	A	A	A		72	67		72	63		67	54	74	
30	54	54	66	48	48	51	67	72	75	A	69	76	A		81	99	90	76		90	77	53	77	74	
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	20	23	24	27	25	24	20	21	11	7	8	7	13	17	24	24	23	24	22	18	23	25	21	
MED	72	69	66	54	58	62	71	72	80	74	69	74	76	74	73	74	75	75	77	76	78	74	67	74	
U Q	76	74	73	66	64	66	75	81	85	77	80	76	77	79	80	80	79	84	90	88	85	77	76	77	
L Q	53	54	54	52	51	53	61	64	68	72	67	70	72	68	69	68	70	69	69	74	55	66	54	54	

HOURLY VALUES OF fEs AT Kokubunji

JUN. 2012

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	29	50	51	42	28	31	G	48	49	53	78	G	61	G	G	G	G	G	40	52	60	71	57	53	
2		72	G	G	G	G	G	45	51	50	52	68	83	50	50	61	55	54	54	41	57	58	58	49	
3	G	G	G	G	G	G	G	51	53	68	68	51	64	90		G	61	59	68	30	82	95	69	59	
4	24	43	58	40	31	40	50	84	135	79	85	70	93		103	136	148	84	61	39	51	44	51	50	
5	29	34	47	36	29	50	96	116	49	51	70	60	74	60	G	43	G	G	39	57	57	49	53	53	
6	39	54	50	53	32	65	70	72	60	115	194		59	47		70	83	89	124	81	54	49	45	58	
7	58	58	34	G	31	G	50	53	63	67	53				G	G	G	50	66	39	57	59	46	59	
8	70	46	59	52	40	G	G	46	54	71	79	58		60	65	48	53	70	62	55	60	59	38	51	
9	46	29	33	35	G	G	55	88	70	69	79	66	64	102	62	53	50	107	127	64	84	60	60	G	
10	53	67	92	121	72	G	43	111	170	107	148	46	64	82	78	71	G	62	152	92	58	40	34	50	
11	39	59	58	34	G	G	40	45	68	61	86	135	G	52	67	G	47	63	69	68	70	26	34	59	
12	50	49	42	41	29	35	43	89	83	105	124	123	148	G	G	84	129	117	62	72	60	48	70	35	
13	59	58	46	43	35	G	34	60	60	59	61	83	G	G	121	57	78	55	58	80	83	45		30	
14	29	28		29	40	53	45	57	65	47	137	100	92	67	51	G	G	G	54	53	40	41	50	G	
15	G	25	29	27	31	G	G	45	G	49	G	G	G	47	84	80	74	81	50	70	50	G	29	G	
16	35	29	G	G	29	45	G	G	43	71	64	50	51	79	G	50	G	G	30	65	28	55	G	36	
17	31	G	G	G	G	G	G	44			48		50	71	52		G	G	G	G	30	G	43	G	
18	36	59	57	53	30	40	46	50	G	50		51	69	53			51	43	57	39	50	69	58	51	
19	44	80	69	69	50	59	37		94	176	109	55	65	59	77	65	50	52	43	32	86	24	33	54	
20	80	39	59	28	24	36	99	78	82	107	77	62	70	74	60	59	52	50	G	G	40	32	29		
21	G	49	48	36	G	G	G	70	94	95	73	102	49	55	49	73	60	96	132	93	53	41	35	31	
22	G	43	G	G	G	48	40	70	72	104	61	116	82	53	G	G	59	105	115		23	33	57	83	
23	57	51	50	32	43	56	58	64	79	71	138	86	130	102	82	138	113	81	103	129	116	103	69	29	
24	59	59	57	46	50	51		69	116	70		46		73	60	50	56	88	103	103	70	50	37	60	
25	40	60	59	57	60	69	71	53	62	88	153	122	121	127	150	G	46	G	31	G	24	34	49	53	
26	57		34	35	G	52	50	65	92	67	103	74	179	87	90	73	52	46	49	32	52	29	37	40	
27	28	27	29	G	G	31	G	53	104		G	48				G	53	57	40	46	60	37	G	G	
28	G	G	44	40	34	27	42	70	62	G	68	50	51	60	64	G	G	54	61	60	79	59	32	70	
29	79	59	53	50	62	59	92	80	59	68	116	122	67	48	65	62	63	54	54	82		46	49	42	
30	46	47	33	30	28	33	G	45	48	105	G	48	49	61	64	80	70		50	58	34	33	50	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	29	29	29	30	30	30	29	30	28	28	28	27	26	27	26	28	30	29	30	29	29	30	29	29	
MED	39	49	47	36	30	34	42	58	64	70	78	62	64	60	63	55	52	55	58	57	57	46	46	50	
U Q	57	59	57	46	40	51	52	72	87	99	112	100	83	79	78	72	63	82	69	76	70	59	57	56	
L Q	28	29	31	27	G	G	G	46	53	56	61	50	51	50	49	G	G	44	43	39	45	33	34	30	

HOURLY VALUES OF fmin AT Kokubunji

JUN. 2012

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	14	14	14	13	13	13	14	21	33	36	37	53	40	54	52	47	43	39	13	13	13	13	13	13	
2		14	14	13	13	22	14	21	37	38	40	40	40	42	38	38	34	28	13	13	13	15	15	13	
3	13	14	14	15	14	33	14	21	33	39	36	40	37	36		50	33	15	13	13	21	17	13	14	
4	14	13	13	13	13	13	14	21	31	36	36	37	39		38	37	30	13	14	13	14	14	14	13	
5	14	13	13	13	13	14	14	15	34	37	42	37	38	39	60	36	43	37	20	15	13	14	14	14	
6	14	13	13	14	15	15	18	30	34	37	36		39	39		39	33	18	13	14	13	14	14	13	
7	14	14	13	18	14	22	15	18	36	37	38				54	47	49	29	13	13	17	13	14	17	
8	14	14	14	14	14	22	13	33	35	42	43	40		39	39	38	35	17	15	22	22	14	14	17	
9	14	13	15	14	14	14	15	21	36	37	37	38	40	39	42	42	35	17	15	13	13	14	14	14	
10	13	17	17	13	14	14	14	35	34	39	39	55	40	39	40	37	44	33	14	13	14	13	14	14	
11	14	15	13	13	14	33	18	31	34	34	37	39	59	38	39	54	51	33	20	13	14	14	14	14	
12	13	15	15	13	14	14	37	31	35	36	38	43	42	54	55	38	34	30	14	13	14	14	14	14	
13	13	15	14	14	13	18	15	38	36	42	40	40	56	53	42	38	38	29	14	15	14	14		14	
14	13	13		15	13	13	14	33	33	40	37	38	36	36	37	51	44	14	14	13	14	13	14	14	
15	20	15	13	17	14	21	18	34	45	36	53	56	59	55	37	39	40	17	13	22	14	15	15	20	
16	17	14	17	40	13	13	14	37	43	39	38	39	39	38	53	51	48	17	13	14	17	13	15	14	
17	15	21	14	15	15	22	14	20			39		38	40	36		42	40	18	23	14	20	14	17	
18	14	13	14	15	13	14	14	33		39		38	38	40			28	14	14	14	13	15	14	14	
19	13	13	14	14	13	13	13	21	33	39	39	40	42	42	40	37	33	14	18	21	17	15	14	14	
20	15	14	13	13	14	14	17	17	39	36	36	38	38	38	37	38	31	20	14	37	13	13	15		
21	40	15	14	14	15	15	14	33	34	37	38	38	35	36	36	31	30	14	13	17	14	13	14	13	
22	14	14	13	15	14	14	13	20	18	35	36	36	34	31	54	44	31	13	13		17	14	14	14	
23	13	13	14	15	13	13	13	18	36	35	37	38	38	34	36	33	29	28	14	13	14	13	14	14	
24	15	14	14	13	13	13		15	34	33		36		37	39	38	34	21	14	36	14	14	14	13	
25	13	14	14	14	14	13	13	15	35	36	35	39	36	38	36	49	33	40	15	14	14	14	14	15	
26	14		13	14	21	14	15	33	34	35	37	39	39	39	33	33	30	30	14	13	13	14	14	14	
27	13	14	13	15	15	13	14	33	36		62	38				47	34	30	13	20	20	13	13	14	
28	15	13	13	13	13	13	22	17	35	55	40	38	37	38	37	44	46	34	14	14	13	13	15	14	
29	13	14	13	13	14	14	17	28	35	36	38	39	39	37	39	39	38	30	20	15		13	13	13	
30	14	13	13	13	14	13	17	17	42	37	53	42	42	38	40	37	34		21	13	13	17	14	13	
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	30	30	30	29	30	28	28	28	27	26	27	26	28	30	29	30	29	29	30	29	29	
MED	14	14	14	14	14	14	14	21	35	37	38	39	39	39	39	38	34	28	14	14	14	14	14	14	
U Q	14	14	14	15	14	18	17	33	36	39	40	40	40	40	42	47	43	31	15	18	15	14	14	14	
L Q	13	13	13	13	13	13	14	18	34	36	37	38	38	37	37	37	33	16	13	13	13	13	14	13	

HOURLY VALUES OF foF2 AT Yamagawa

JUN. 2012

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	54	52	52	58	54	66	68	78	A	A	A	69	70	72	69	87	86	91	76	76	49	54	52	
2	67	67	54	52	55	52	67	79	79	70	72	70	A	A	52	80	A	88	87	74	A	A	A	A	
3	52	53	53	56	55	52	63	63	77	67	A	A	A	64	67	76	60	78	A	66	A	A	A	A	
4	52	A	67	66	54	52	69	72	A	A	A	A	A	68	A	76	A	75	75	72	A	52	A	A	
5	53	52	67	52	45	46	66	77	A	A	74	77	69	A	69	69	86	63	A	A	A	A	A	59	
6	A	A	A	62	60	52	A	48	71	60	49	A	A	A	A	76	72	71	71	67	55	54	54	A	
7	52	N	66	55	55	54	72	69	A	64	63	A	A	A	A	A	63	74	68	68	55	54	67	54	
8	67	A	66	55	52	52	74	66	67	68	A	62	A	A	68	76	78	A	83	75	66	65	A	A	
9	A	A	A	55	58	52	67	74	86	A	64	A	69	77	59	59	91	46	88	67	55	A	A	72	
10	66	67	A	71	66	64	80	A	89	A	A	70	67	A	A	A	A	90	77	72	A	A	53	71	
11	67	67	67	67	72	75	69	80	90	91	85	69	73	A	84	A	N	89	N	81	71	A	82	52	
12	53	39	74	74	87	64	82	67	A	A	67	B	A	A	53	69	78	A	A	83	A	54	55	54	52
13	52	A	71	72	66	66	66	70	74	72	69	A	A	A	72	70	A	80	90	89	A	53	A	67	
14	65	67	49	67	55	52	63	84	61	72	A	A	A	59	68	72	A	77	73	A	54	67	54	53	
15	53	67	48	65	56	52	70	72	72	72	A	A	A	A	N	N	N	91	88	54	76	54	A	49	
16	54	53	67	67	57	51	58	66	74	74	67	A	A	71	A	69	69	62	63	39	54	54	66	54	
17	53	46	86	55	52	45	55	66	58	A	A	A	A	A	A	A	76	64	93	67	64	54	72	66	
18	A	A	44	A	A	29	54	A	A	A	A	A	A	A	A	A	A	A	57	54	A	54	A	A	
19	A	52	52	53	54	54	61	57	60	A	A	A	69	A	A	A	A	91	A	54	N	66	53	A	
20	A	52	52	64	54	52	63	A	A	A	A	A	A	A	A	52	59	87	88	87	54	54	54	54	
21	53	65	52	54	52	53	63	66	78	72	A	A	A	A	A	69	77	59	90	N	54	66	64	54	
22	64	65	54	48	54	A	66	86	63	A	74	A	A	A	66	64	79	86	A	71	67	54	36	54	
23	54	52	A	65	57	64	54	47	67	120	A	A	A	67	62	70	75	76	72	A	A	A	A	A	
24	A	53	52	50	A	41	56	64	74	A	A	A	A	A	64	A	81	A	69	A	A	A	64	52	
25	53	A	A	42	42	42	57	47	77	A	109	A	A	A	A	69	66	78	73	58	N	54	52		
26	52	53	54	62	A	62	54	57	60	A	A	A	59	A	A	A	A	56	58	64	54	64	54	A	
27	A	53	42	52	A	45	50	59	75	66	A	A	A	A	63	66	67	67	67	77	54	52	53	A	
28	A	52	44	52	54	51	63	72	70	70	63	A	A	A	A	72	68	90	86	A	45	A	54	55	
29	52	53	52	52	A	A	A	66	81	A	A	A	A	A	65	99	A	A	A	A	54	72	A	50	
30	52	A	54	47	A	40	47	63	67	A	A	67	65	74	60	80	73	78	59	89	55	64	A	46	
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	21	25	29	24	28	28	27	24	14	12	6	8	9	16	21	18	25	24	22	19	21	18	19	
MED	53	53	54	55	55	52	63	66	74	71	68	70	69	68	66	70	74	78	76	70	55	54	54	54	
U Q	64	66	67	65	58	54	68	72	78	72	74	70	69	72	69	76	79	87	88	76	66	64	64	59	
L Q	52	52	52	52	54	48	56	63	67	67	63	67	66	61	62	69	67	65	68	64	54	54	53	52	

HOURLY VALUES OF fEs AT Yamagawa

JUN. 2012

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	59	47	46	46	49	54	39	50	61	73	73	118	61	63	G	G	G	G	35	G	G	22	50	39	
2	27	33	47	40	40	35	34	35	46	G	G	48	69	48	G	68	93	51	52	44	60	60	60	59	
3	G	24	G	G	G	G	33	44	52	53	49	G	45	52	G	54	50	47	81	44	72	58	73	59	
4	46	71	44	31	27	G	42	53	61	116	69	74	G	51	52	94	85	38	37	32	54	43	60	30	
5	40	G	26	G	30	42	49	49	77	68	58	G	56	70	64	56	55	48	78	92	80	73	58	58	
6	72	72	59	57	60	51	153	44	42	42	55	G	G	G	G	G	56	44	62	31	25	G	G	31	
7	27	40	26	36	G	G	34	61	62	50	50	84	71	56	G	52	56	42	40	27	46	27	G	54	
8	53	69	49	30	33	31	43	48	57	75	65	55	76	75	46	62	64	84	50	34	32	35	73	72	
9	58	59	81	46	49	27	34	51	70	88	52	60	G	47	G	52	G	44	69	70	60	53	45	56	
10	48	49	69	59	G	G	47	92	82	95	68	76	71	75	107	92	73	78	G	35	71	58	41	51	
11	28	45	33	59	70	59	48	51	46	G	G	59	63	57	55	84	44	G	36	33	G	59	50	31	
12	44	51	51	51	68	40	30	44	79	76	64	B	48	54	G	70	79	97	65	58	28	34	38	46	
13	40	59	58	52	38	32	38	44	52	G	64	75	74	95	G	51	48	54	67	42	45	34	58	43	
14	G	28	44	40	29	31	48	47	54	55	67	74	64	60	56	63	88	72	61	61	34	G	33	59	
15	40	G	G	28	G	G	G	41	52	49	86	82	76	53	G	G	G	G	38	41	60	34	26	27	
16	38	58	52	59	47	46	G	N	48	60	49	58	69	51	G	G	G	G	G	G	G	G	36	33	
17	40	33	33	G	G	G	32	36	G	42	52	54	G	G	58	58	46	44	55	47	54	41	53	32	
18	56	78	56	106	59	23	58	60	72	58	60	56	63	66	58	46	G	G	46	34	71	39	82	71	
19	69	39	58	46	40	39	30	G	G	64	73	74	59	96	70	58	102	71	116	58	60	70	40	67	
20	70	35	34	40	32	48	58	67	90	101	174	96	52	150	64	52	G	53	38	34	G	34	28	28	
21	G	43	G	G	30	G	35	44	68	70	85	78	51	53	57	G	50	50	65	51	37	36	24	69	
22	36	36	32	37	53	94	53	43	44	66	77	53	67	52	49	57	63	58	94	69	30	32	43	40	
23	32	33	73	55	46	29	40	42	50	130	182	151	72	G	60	56	61	44	73	94	69	58	69	59	
24	83	51	34	32	74	43	40	59	71	88	92	133	121	77	45	49	52	92	71	78	84	70	34	35	
25	41	57	46	37	36	40	38	41	73	101	95	113	117	114	68	G	60	G	G	G	25	G	G	G	
26	35	40	45	44	73	34	33	G	G	G	G	54	G	93	66	55	G	G	44	34	31	33	G	58	
27	46	40	26	26	53	33	33	37	69	50	76	50	45	63	G	44	53	56	56	52	28	32	59	40	
28	48	36	44	34	31	32	34	44	64	60	52	143	81	68	66	60	50	63	128	131	32	G	46	49	
29	47	28	29	48	82	109	59	44	72	113	95	148	148	96	65	118	94	88	94	78	43	67	59	40	
30	39	46	29	36	46	30	43	55	47	G	48	46	G	G	G	54	58	50	36	G	G	28	49	32	
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	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	
MED	40	42	44	40	40	32	38	44	59	62	64	74	63	58	50	54	54	48	56	44	36	34	46	44	
U Q	53	57	52	51	53	43	48	52	71	88	77	90	72	75	64	62	64	63	71	61	60	58	59	59	
L Q	35	33	29	31	30	23	33	41	47	49	52	53	45	51	G	46	46	38	37	32	28	27	33	32	

HOURLY VALUES OF fmin AT Yamagawa

JUN. 2012

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	14	14	15	15	14	15	17	20	34	30	29	35	35	30	53	20	17	16	14	15	16	14	14
2	15	14	14	15	15	14	14	16	21	28	55	33	41	42	55	36	32	17	14	14	14	14	15	15
3	14	14	14	16	15	14	14	15	17	23	29	29	38	40	35	38	26	18	17	15	15	14	14	15
4	14	14	14	14	14	18	17	14	17	21	22	39	101	43	39	36	22	15	14	14	15	14	14	14
5	15	14	14	21	14	14	14	16	17	21	35	35	35	35	30	36	35	20	14	14	17	14	14	14
6	15	14	14	14	14	14	16	15	18	21	36	91	81	71	91	24	22	17	15	14	16	14	17	14
7	15	14	14	14	15	15	17	15	17	23	22	34	36	33	26	24	20	17	14	14	15	14	16	15
8	14	14	14	15	14	14	14	15	20	27	26	44	40	38	38	38	23	20	15	15	14	15	14	14
9	15	14	14	16	15	15	14	17	18	28	34	34	34	29	59	38	53	20	17	14	16	15	16	14
10	15	14	16	17	14	15	15	16	22	33	34	43	40	43	39	37	35	20	18	15	15	14	14	15
11	15	14	14	14	15	15	14	16	18	28	33	35	35	33	32	27	22	15	14	14	16	14	14	14
12	14	14	15	16	15	14	15	16	22	21	23	B	42	42	57	38	26	15	14	14	15	14	15	14
13	14	15	15	17	15	14	16	15	17	62	38	42	40	39	55	36	23	20	18	14	15	14	15	15
14	15	15	14	15	14	14	15	17	24	27	34	35	34	30	33	26	21	18	14	16	15	20	15	15
15	14	17	15	15	14	15	15	17	26	29	44	36	39	38	64	32	20	15	15	14	15	14	15	14
16	15	14	14	14	17	15	20	17	17	24	26	35	30	29	91	24	35	42	17	18	17	16	14	15
17	14	15	15	15	15	20	16	16	21	24	38	38	101	38	36	22	28	16	14	14	14	15	15	14
18	14	15	15	14	14	16	14	14	18	23	35	34	34	34	33	28	24	53	16	15	14	14	16	14
19	15	15	14	14	14	14	14	18	16	23	35	35	38	38	39	35	30	16	15	14	15	15	15	15
20	14	15	14	14	14	16	15	18	30	20	36	36	34	34	35	35	26	20	14	17	14	15	15	15
21	16	14	16	17	15	16	17	15	16	29	18	33	32	33	28	22	18	15	14	14	15	17	20	14
22	14	14	14	15	14	15	14	14	17	21	30	22	35	38	26	22	33	17	14	14	15	14	15	15
23	15	15	14	14	14	14	14	18	16	23	33	21	32	54	22	27	21	18	15	14	14	14	14	15
24	14	14	14	14	16	15	14	14	14	22	20	27	29	28	50	36	26	18	15	14	15	15	15	14
25	15	15	14	14	14	14	14	15	16	21	26	35	24	22	36	24	21	18	14	17	17	15	15	22
26	16	14	15	14	14	14	15	15	16	22	27	36	50	38	35	22	21	16	14	14	14	14	15	17
27	15	15	15	14	14	14	14	14	17	20	28	29	27	29	52	52	33	14	15	14	14	16	15	15
28	14	15	15	14	14	15	14	14	17	22	22	38	36	34	34	21	21	20	15	14	14	16	15	14
29	14	15	15	14	17	16	14	15	20	21	22	35	32	35	42	22	26	21	17	14	14	14	14	14
30	16	15	14	15	14	15	14	16	22	26	23	34	101	56	52	35	17	24	14	17	15	15	15	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	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	14	14	14	14	15	14	16	18	23	30	35	36	36	37	34	24	18	15	14	15	14	15	14
U Q	15	15	15	15	15	15	15	17	21	28	35	37	40	40	52	36	30	20	16	15	15	15	15	15
L Q	14	14	14	14	14	14	14	15	17	21	23	33	34	33	33	24	21	16	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Okinawa

JUN. 2012

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	80	81	72	63	60	62	A	76	92	A	A	A	A	87	96	105	102	102	88	88	85	76	72	73
2	74	78	75	65	63	65	74	88	78	71	77	80	76	84	90	90	99	108	110	105	83	78	62	77
3	52	72	66	66	58	46	60	78	74	66	67	A	84	A	83	88	100	87	A	40	70	67	30	54
4	72	66	72	72	52	50	60	66	58	A	90	93	88	88	92	90	A	87	88	A	67	66	72	67
5	66	72	66	55	53	52	A	A	A	A	A	77	A	90	97	101	104	107	106	88	78	A	67	A
6	A	A	66	A	57	52	54	63	60	71	62	A	70	78	92	85	80	A	76	80	77	77	80	
7	87	87	79	80	83	54	66	78	78	81	A	69	75	76	70	79	90	81	76	67	67	67	72	54
8	72	67	A	54	55	61	74	58	A	72	A	68	78	84	88	98	97	101	96	A	89	72	64	66
9	62	81	64	52	63	60	62	85	A	A	76	A	84	88	102	100	101	106	115	A	93	85	80	78
10	78	46	78	71	72	62	78	68	77	81	A	73	A	76	A	A	90	102	106	89	84	75	77	81
11	80	82	84	72	72	A	73	82	90	98	91	86	85	88	N	104	115	121	110	90	88	87	85	A
12	88	83	83	87	86	A	67	78	87	84	74	78	93	110	111	102	94	91	101	89	A	72	54	72
13	80	81	78	78	63	57	54	76	82	87	84	A	72	80	86	81	94	108	110	78	67	77	80	88
14	86	88	88	46	66	54	66	81	73	82	85	75	75	A	A	86	90	90	81	76	76	58	71	76
15	67	80	82	57	52	54	66	68	66	A	78	88	A	108	111	111	110	116	117	110	86	54	76	74
16	82	86	85	67	52	54	54	72	81	74	82	82	84	90	101	107	108	110	110	103	86	86	80	76
17	86	104	97	52	47	52	56	68	72	59	66	59	A	A	A	A	91	106	86	67	54	54	67	78
18	74	76	72	55	52	46	45	A	A	A	A	A	A	B	A	A	63	66	65	58	52	52	A	A
19	54	52	52	51	51	50	52	60	63	66	A	81	87	A	98	102	103	102	102	100	84	78	64	72
20	72	81	82	66	52	50	A	76	77	A	A	A	A	83	101	110	115	117	122	A	A	A	82	84
21	88	104	81	76	72	67	67	73	77	88	76	109	A	A	A	85	98	102	104	88	87	78	54	54
22	52	52	67	63	54	57	65	82	66	72	73	76	80	92	90	101	98	87	A	88	A	73	64	67
23	66	63	67	78	58	52	55	83	67	A	A	A	70	82	88	92	91	84	83	88	87	A	A	A
24	A	A	53	A	A	A	A	65	70	74	A	69	A	67	72	82	90	102	106	88	77	A	62	64
25	67	54	47	A	A	A	A	A	88	A	A	71	75	81	75	86	100	100	89	88	86	65	67	67
26	54	52	62	52	51	45	52	71	46	57	A	67	73	75	78	65	61	57	67	78	83	66	67	72
27	72	74	67	61	53	52	56	66	83	50	58	61	64	71	69	68	71	81	94	81	67	A	54	54
28	53	66	58	50	52	52	61	73	67	79	A	B	A	65	80	87	101	112	92	75	73	A	48	54
29	52	72	A	56	52	52	51	72	A	67	A	68	73	82	85	81	A	70	A	88	88	A	67	62
30	52	52	52	52	47	39	48	A	A	69	73	68	75	84	93	96	101	105	108	A	74	83	84	76
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	28	27	28	26	25	26	24	21	16	21	19	24	24	27	28	30	26	25	27	23	28	26
MED	72	75	72	63	54	52	60	73	76	72	76	75	76	84	89	92	98	102	102	88	83	73	67	72
U Q	80	81	81	72	63	57	66	78	81	81	83	81	84	88	97	102	101	107	110	89	86	78	77	77
L Q	58	64	65	52	52	50	54	68	66	66	70	68	73	76	79	85	90	87	88	76	70	66	63	64

HOURLY VALUES OF fEs AT Okinawa

JUN. 2012

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	50	58	50	G	G	30	60	50	57	87	81	83	82	66	G	G	G	G	G	G	G	G	G	70	
2	40	G	26	G	49	G	52	61	50	49	50	56	58	53	G	52	76	65	80	61	41	59	58	71	
3	58	54	G	24	28	36	44	35	54	58	57	68	72	99	62	88	71	83	114	73	G	29	29	24	
4	G	43	56	44	36	G	G	39	154	116	58	G	48	G	62	60	134	50	34	104	69	56	69	58	
5	34	58	51	54	G	28	70	88	59	78	95	87	152	94	55	G	57	52	54	67	45	106	60	81	
6	83	104	67	60	51	59	37	44	60	66	54	G	50	G	47	57	58	55	94	29	G	G	25	24	
7	G	28	28	28	G	G	G	40	49	78	94	50	64	48	48	48	G	G	35	38	38	26	28	27	
8	G	34	59	45	58	56	41	69	74	58	79	67	G	G	G	52	64	80	94	94	57	72	48	36	
9	40	59	39	35	27	36	54	58	125	114	50	122	61	G	G	G	64	49	77	126	67	58	51	38	
10	G	30	G	63	36	57	52	38	50	90	87	69	78	67	93	116	68	54	G	54	84	24	51	59	
11	49	25	34	27	51	68	37	43	45	70	78	G	G	G	72	84	58	53	37	G	42	G	55	60	
12	44	34	G	52	39	73	50	34	44	G	G	G	G	56	G	64	54	54	66	60	73	59	50	39	
13	46	58	38	59	28	24	31	43	45	48	67	90	53	56	G	G	G	G	46	38	28	42	34	49	30
14	27	28	36	G	30	52	34	39	48	58	65	52	68	82	101	70	63	44	46	45	38	28	G	G	
15	54	G	73	33	40	G	G	36	45	80	68	64	105	92	G	52	59	58	51	74	78	26	29	45	
16	36	48	27	28	G	27	G	G	40	46	G	49	55	94	62	G	G	G	41	27	G	G	G	33	
17	40	50	68	27	36	38	35	G	G	48	60	50	72	112	88	87	54	72	52	27	G	27	24	23	
18	G	23	G	26	30	34	44	60	50	53	72	63	G	B	77	79	47	65	42	34	G	G	59	61	
19	34	36	25	48	48	44	47	54	48	65	72	58	49	101	59	G	51	67	66	50	59	39	26	26	
20	26	24	57	60	49	25	60	56	69	78	116	136	128	55	96	103	95	76	87	136	114	59	49	34	
21	G	29	G	G	G	G	34	41	54	66	72	105	112	148	126	86	82	77	58	37	36	34	32	G	
22	49	41	37	G	G	G	27	37	58	63	61	63	62	52	50	53	63	115	113	61	70	73	27	57	
23	G	29	28	G	G	G	34	85	51	62	89	86	50	50	G	48	G	120	G	33	59	58	93	71	
24	67	69	65	90	109	69	59	60	68	68	62	72	52	G	G	G	G	G	48	56	85	81	78	47	43
25	34	33	44	51	59	50	69	112	70	58	64	67	G	G	G	G	G	G	40	47	54	39	36	G	
26	G	G	G	G	G	G	35	39	51	58	71	61	G	G	57	64	46	59	60	38	26	25	39	34	
27	45	33	26	32	G	28	48	48	46	53	52	48	G	G	46	G	52	54	52	53	60	84	59	G	
28	46	G	24	G	31	34	28	38	61	52	81	B	67	58	60	G	G	G	40	G	39	34	37	34	
29	40	G	79	33	G	27	57	70	113	90	68	65	97	66	52	58	76	76	138	60	90	60	49	50	
30	33	27	33	36	30	30	G	68	84	54	53	49	50	46	47	62	65	83	77	113	52	30	78	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	30	30	30	30	30	30	30	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30	
MED	38	33	35	32	30	30	39	44	52	62	68	63	56	56	51	52	56	54	53	52	48	34	48	35	
U Q	46	50	56	51	48	50	52	60	68	78	79	77	72	87	62	64	65	76	77	73	69	59	55	58	
L Q	G	25	25	G	G	G	31	38	48	53	57	49	48	G	G	G	G	46	38	33	36	26	28	26	

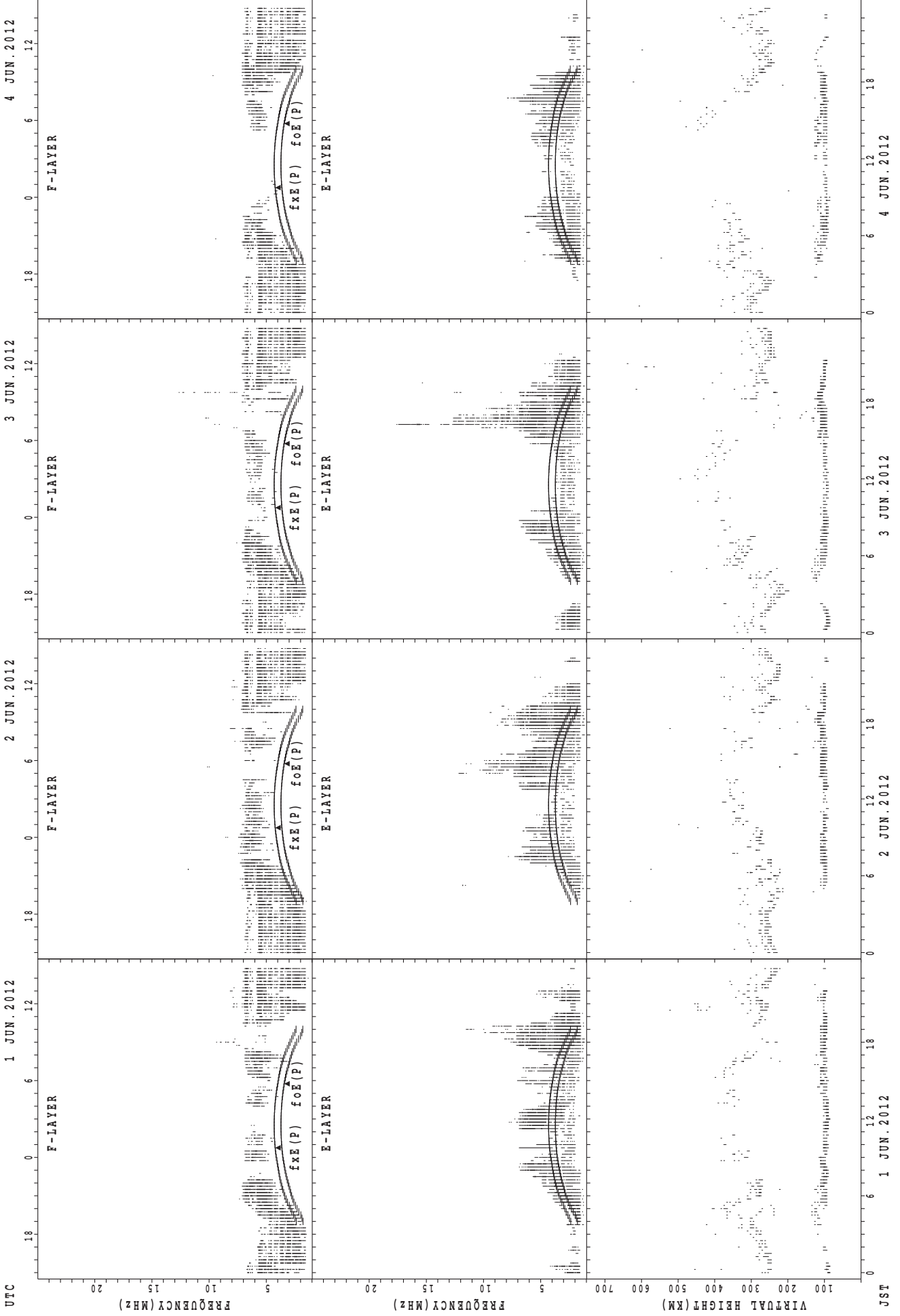
HOURLY VALUES OF fmin AT Okinawa

JUN. 2012

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	15	14	18	20	18	15	14	15	21	22	34	38	38	35	54	54	20	17	17	18	15	15	30	15
2	14	15	15	21	14	18	14	18	26	27	29	42	42	36	58	38	35	22	14	16	17	14	14	14
3	14	15	15	15	14	14	18	15	20	24	36	40	39	39	40	39	34	21	17	14	15	14	14	15
4	17	14	14	14	14	18	16	15	18	33	34	53	50	58	42	39	20	18	17	15	16	14	15	14
5	15	14	14	14	14	15	14	14	20	29	30	38	40	42	40	42	34	18	17	16	14	15	14	14
6	14	15	14	14	14	14	15	15	21	24	36	71	43	91	44	39	38	20	14	15	15	16	14	18
7	15	14	15	14	16	14	21	15	18	26	36	36	36	36	71	30	24	18	14	14	14	14	14	15
8	15	14	14	14	14	14	15	16	21	29	30	32	54	54	56	39	34	21	20	14	15	14	14	15
9	14	14	15	15	14	14	15	14	18	23	30	30	36	58	56	49	24	21	14	21	15	15	14	14
10	15	17	15	14	16	15	17	17	26	28	40	43	42	42	39	39	38	29	27	14	15	15	14	15
11	14	17	15	16	17	15	14	15	20	20	33	52	61	34	34	28	22	18	14	15	14	14	14	14
12	15	15	15	14	15	15	18	20	24	39	53	56	62	43	60	29	27	17	14	16	15	15	17	14
13	14	14	16	14	17	15	22	15	20	45	38	39	42	42	55	50	53	16	15	14	14	14	16	15
14	15	15	14	20	15	14	15	15	21	24	33	38	36	38	35	29	24	17	14	15	14	14	43	14
15	14	39	14	14	14	17	22	18	23	29	38	40	40	43	50	54	28	17	14	14	15	14	14	14
16	14	14	15	14	16	14	22	17	21	22	51	35	33	36	30	27	54	16	14	14	17	15	17	14
17	14	15	14	14	14	14	14	14	18	26	35	39	40	42	39	33	30	20	14	17	16	14	14	15
18	20	16	14	15	14	15	14	18	22	29	35	38	28	B	35	28	21	18	15	14	17	18	14	15
19	14	15	14	16	14	14	14	16	20	36	39	40	62	40	39	53	21	20	14	14	15	16	14	15
20	14	14	15	15	15	15	16	16	18	23	36	36	39	46	41	36	22	22	14	14	14	16	14	15
21	15	14	15	16	15	15	15	14	20	24	30	36	34	39	30	29	21	18	14	14	18	14	14	15
22	15	15	14	15	15	15	15	14	14	20	22	36	39	35	43	39	18	16	15	15	14	14	17	15
23	17	15	15	30	14	14	14	15	20	20	20	34	36	38	52	53	22	40	14	14	14	14	15	14
24	14	14	14	14	14	14	14	14	18	22	23	38	43	50	50	50	48	20	14	15	14	15	14	14
25	15	15	15	14	14	15	14	15	17	22	27	32	54	52	53	51	18	20	15	14	14	14	15	29
26	16	21	23	22	32	15	14	14	18	26	29	27	50	53	39	39	47	20	15	15	16	39	14	15
27	14	15	14	14	40	14	14	14	15	21	33	28	52	52	52	50	36	22	15	14	15	15	14	14
28	14	18	15	14	15	14	14	14	17	22	35	B	42	39	40	26	20	18	14	16	15	14	14	14
29	15	15	16	17	20	14	14	15	16	22	30	39	38	38	44	35	35	21	15	14	14	15	14	15
30	15	15	21	15	16	14	20	15	21	22	27	39	30	32	32	39	27	21	16	15	15	14	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	30	30	30	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	14	15	14	15	15	20	24	34	38	40	42	42	39	27	20	14	14	15	14	14	15
U Q	15	15	15	16	16	15	17	16	21	29	36	40	50	51	53	50	35	21	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	18	22	30	35	36	37	39	30	21	18	14	14	14	14	14	14

SUMMARY PLOTS AT Wakkanai



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

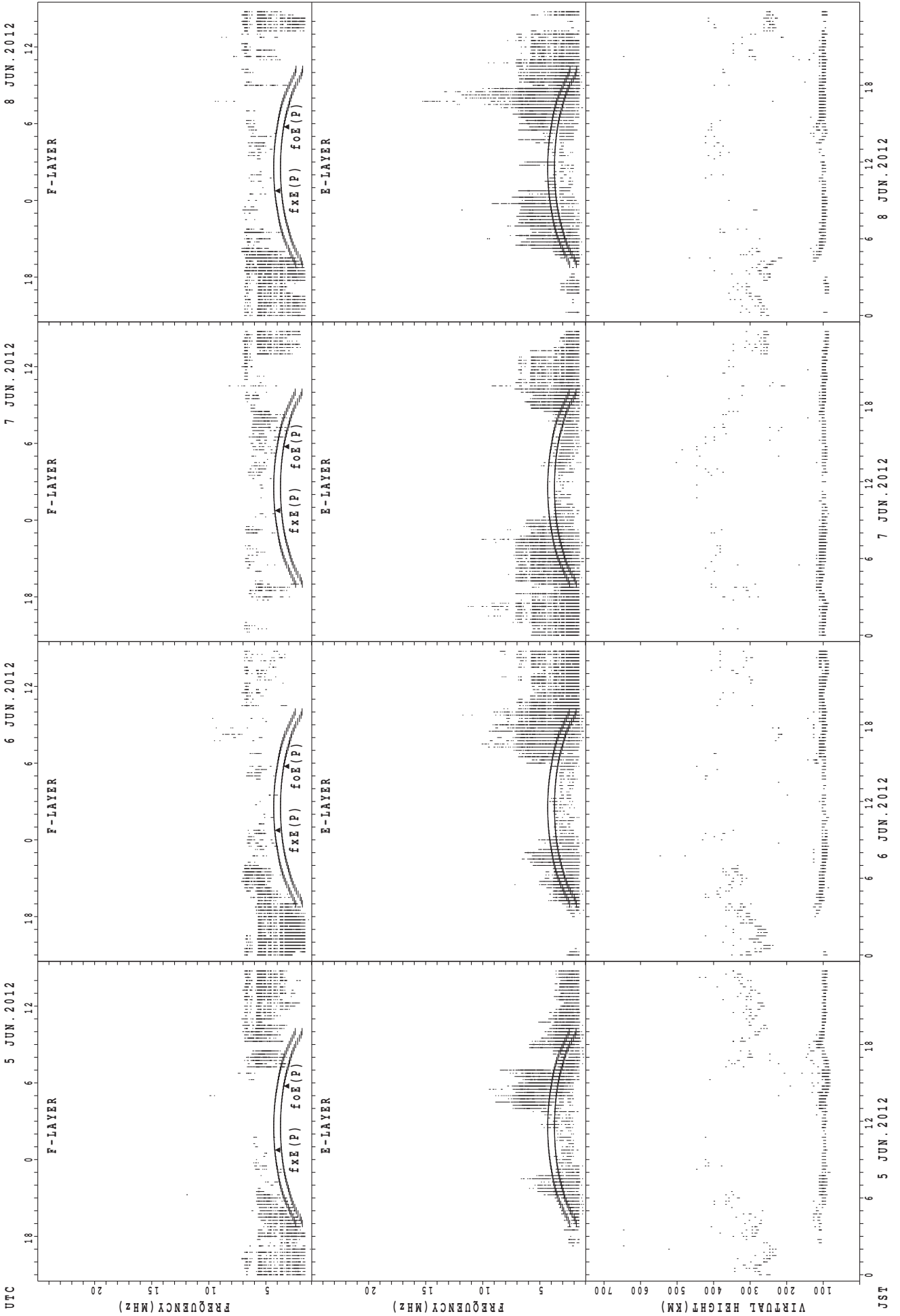
JST 1 JUN. 2012

2 JUN. 2012

3 JUN. 2012

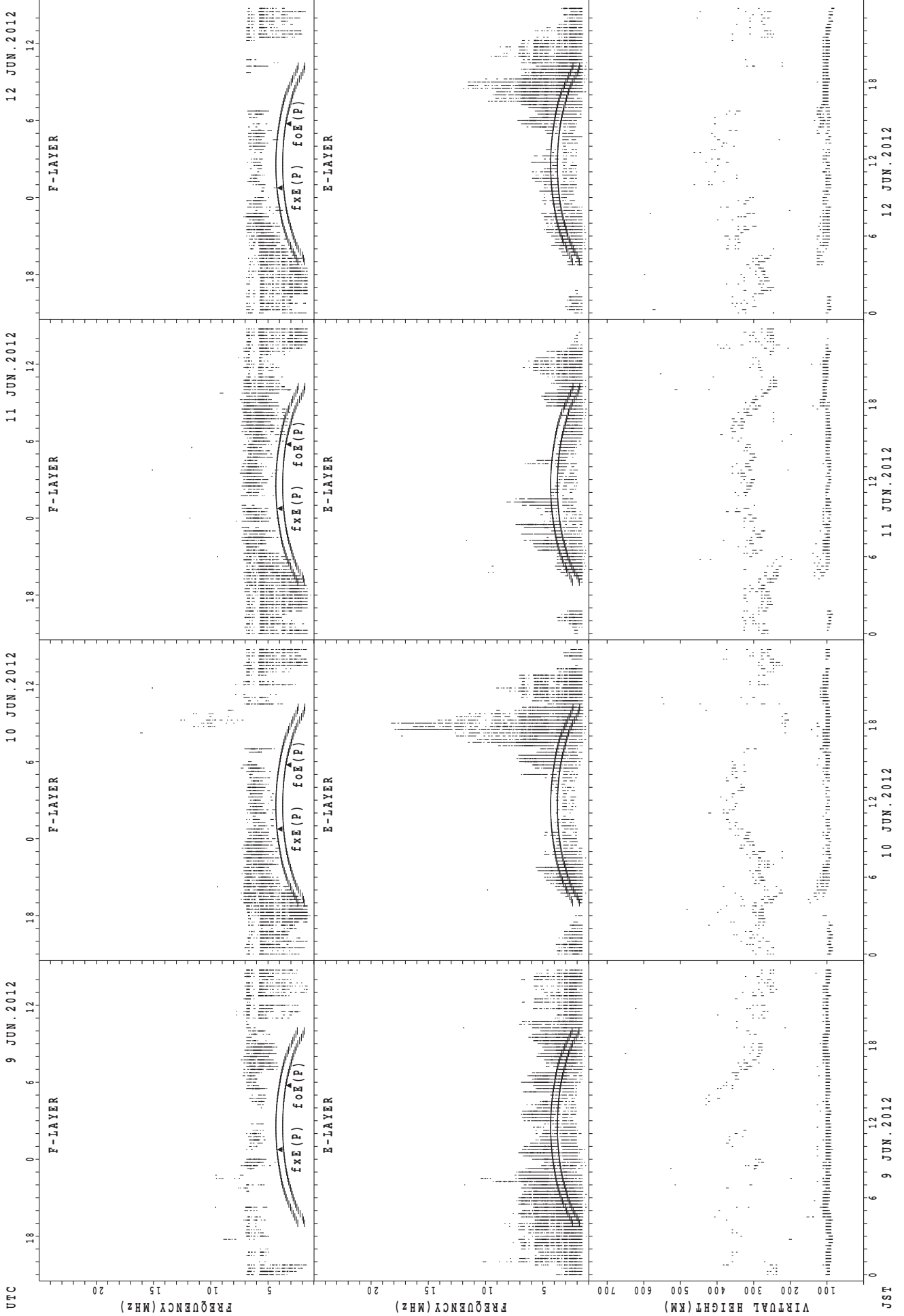
4 JUN. 2012

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai



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

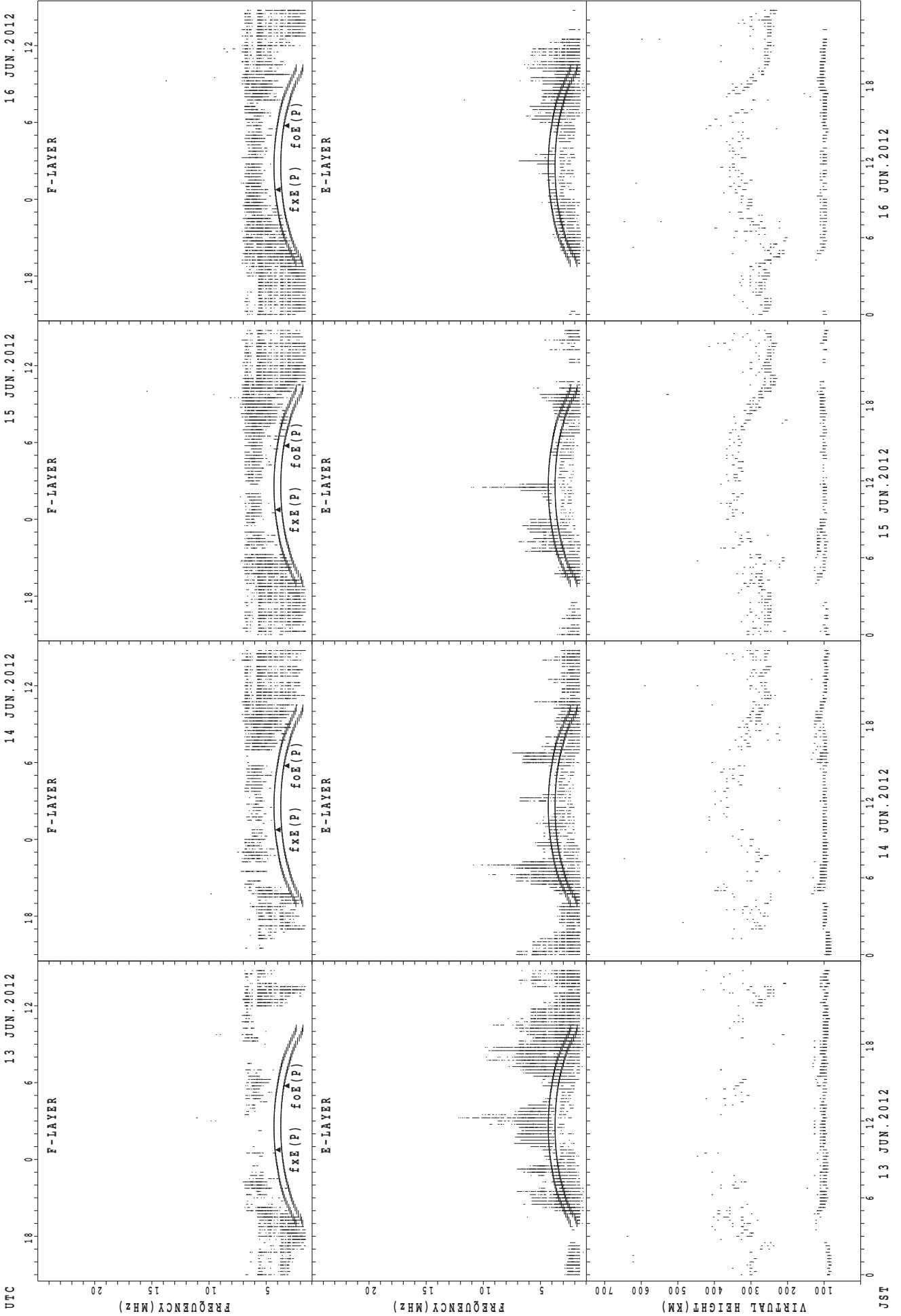
JST 9 JUN. 2012

10 JUN. 2012

11 JUN. 2012

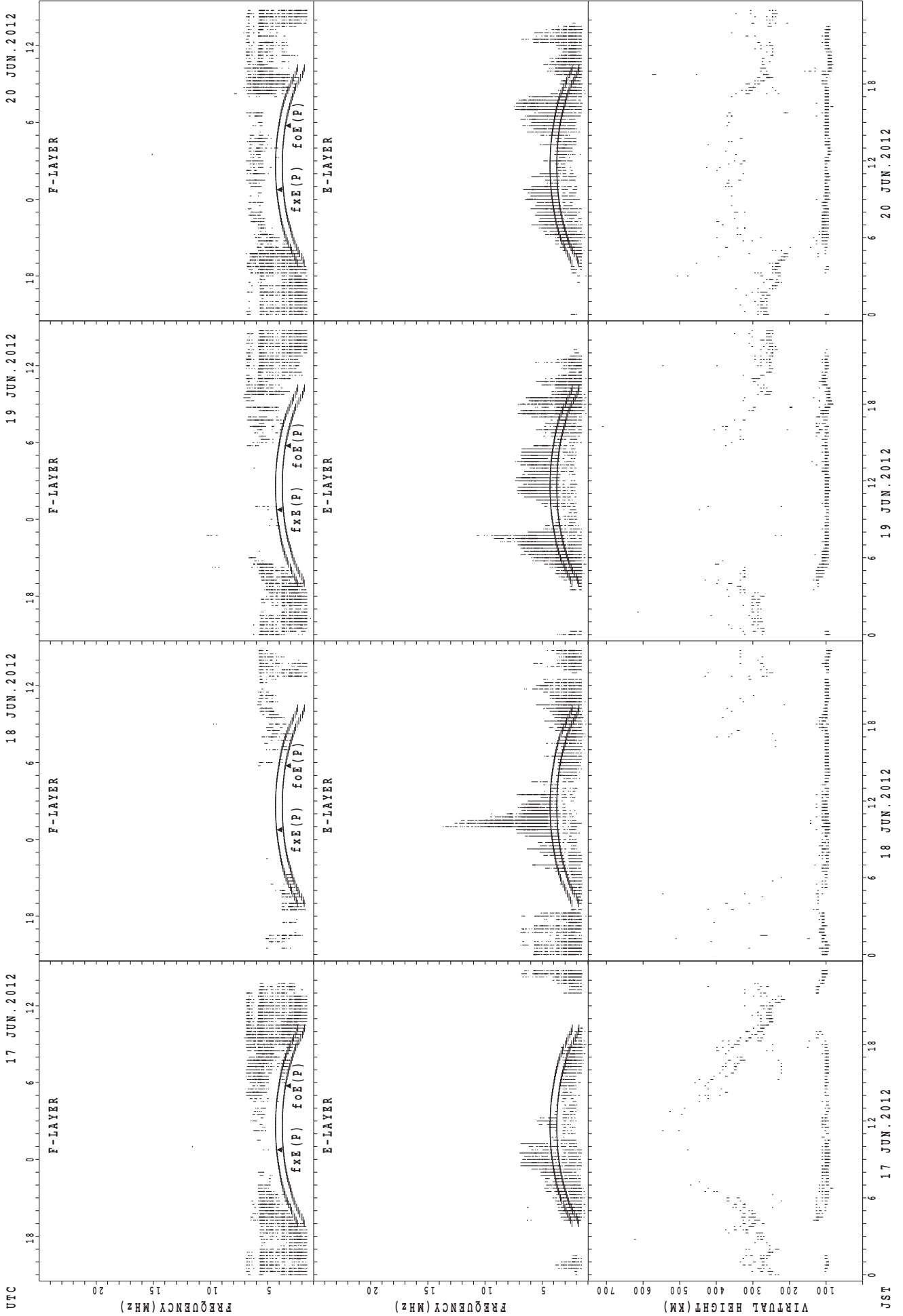
12 JUN. 2012

SUMMARY PLOTS AT Wakkanai



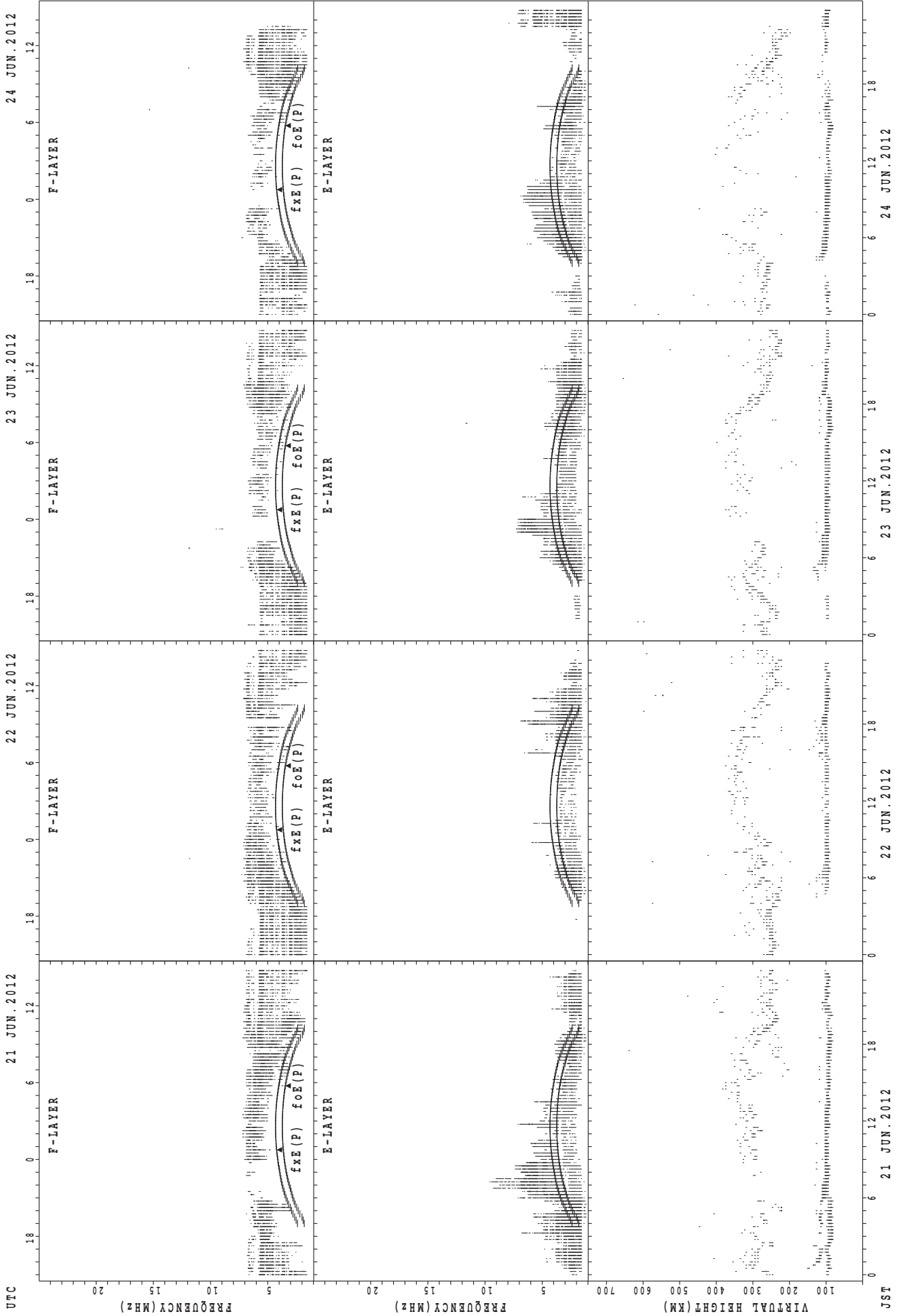
f_xE (P) ; PREDICTED VALUE FOR f_xE
foE (P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



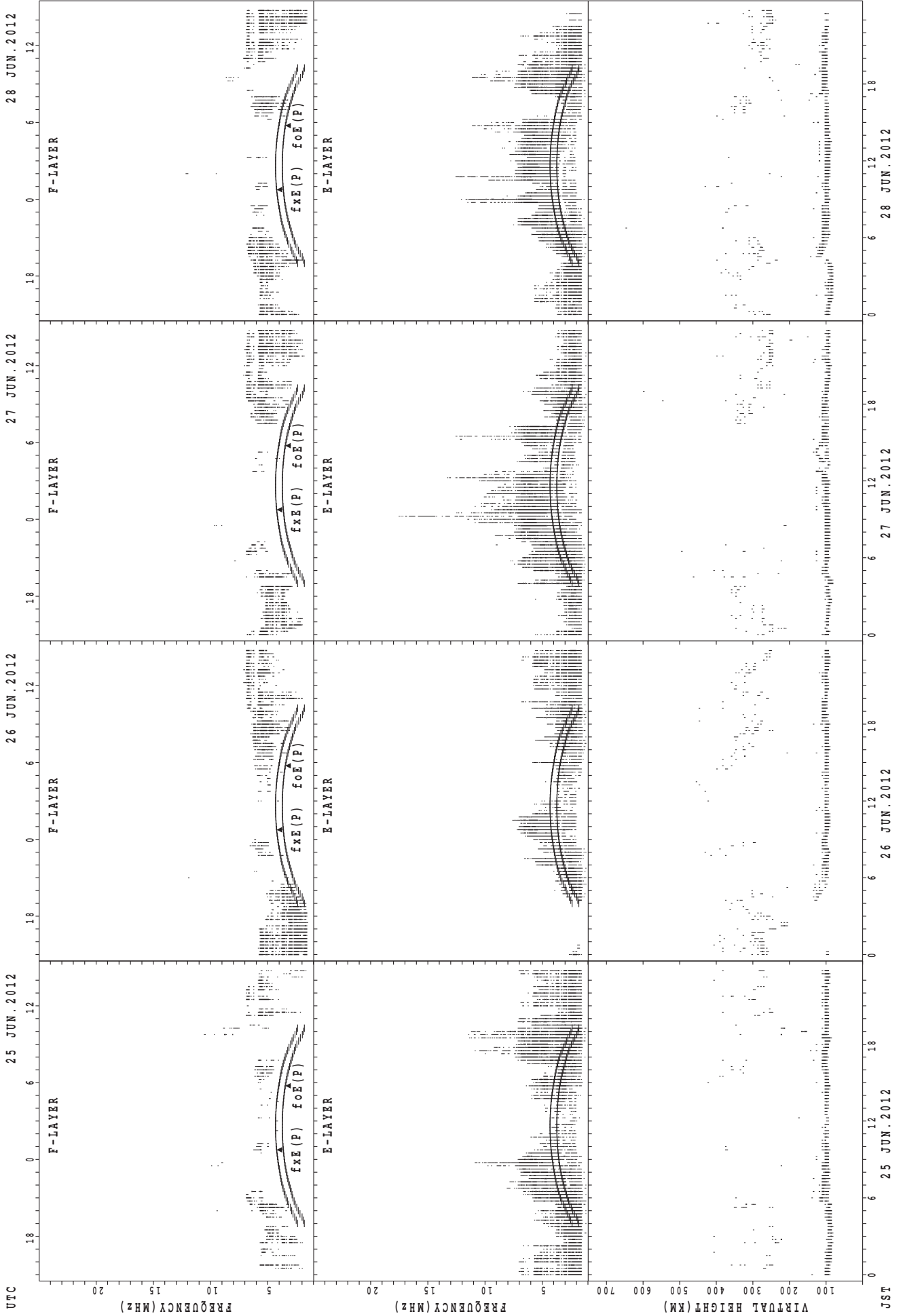
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



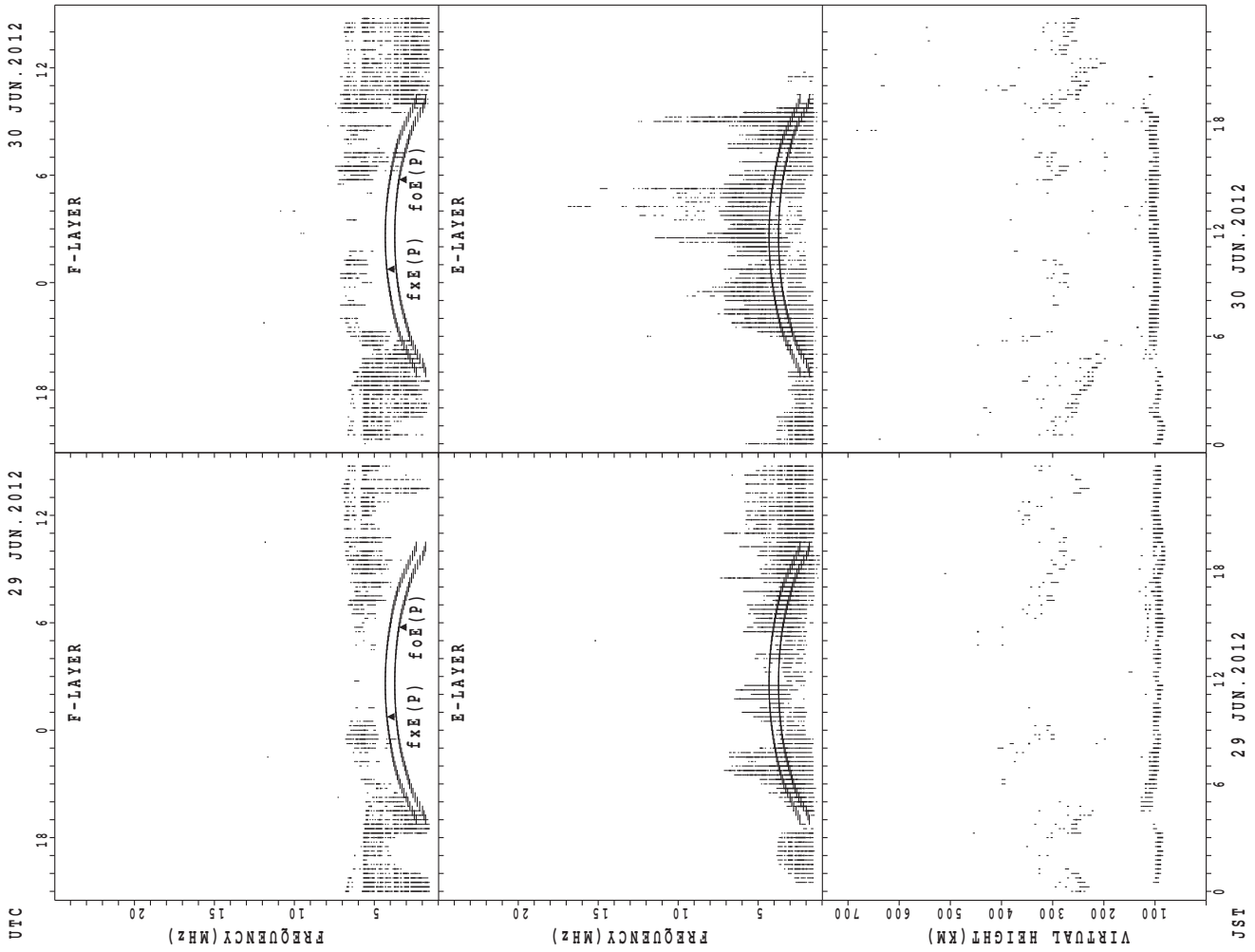
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



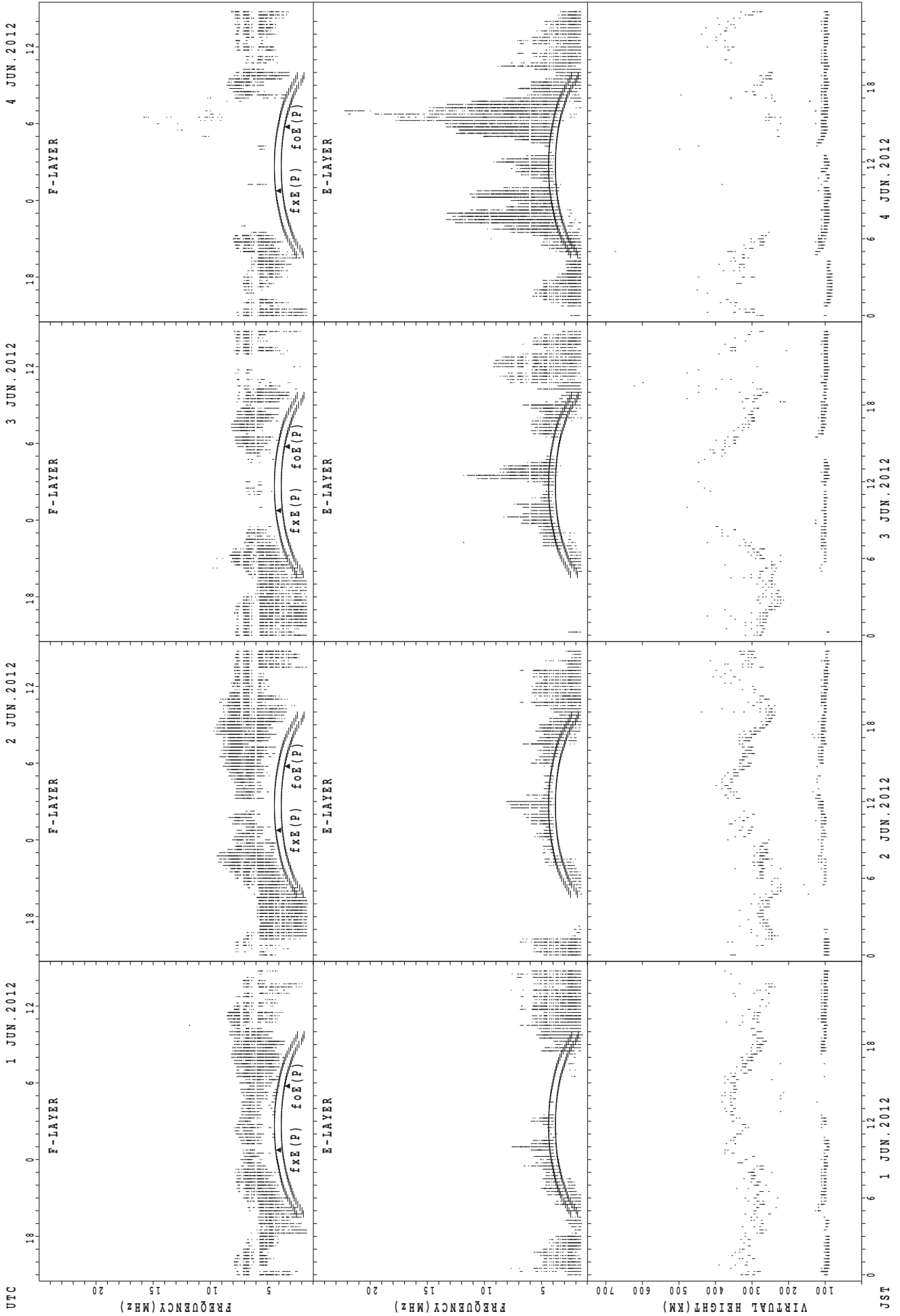
UTC
25 JUN. 2012
26 JUN. 2012
27 JUN. 2012
28 JUN. 2012
JST
F-LAYER
E-LAYER
VIRTUAL HEIGHT (KM)
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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

1 JUN. 2012

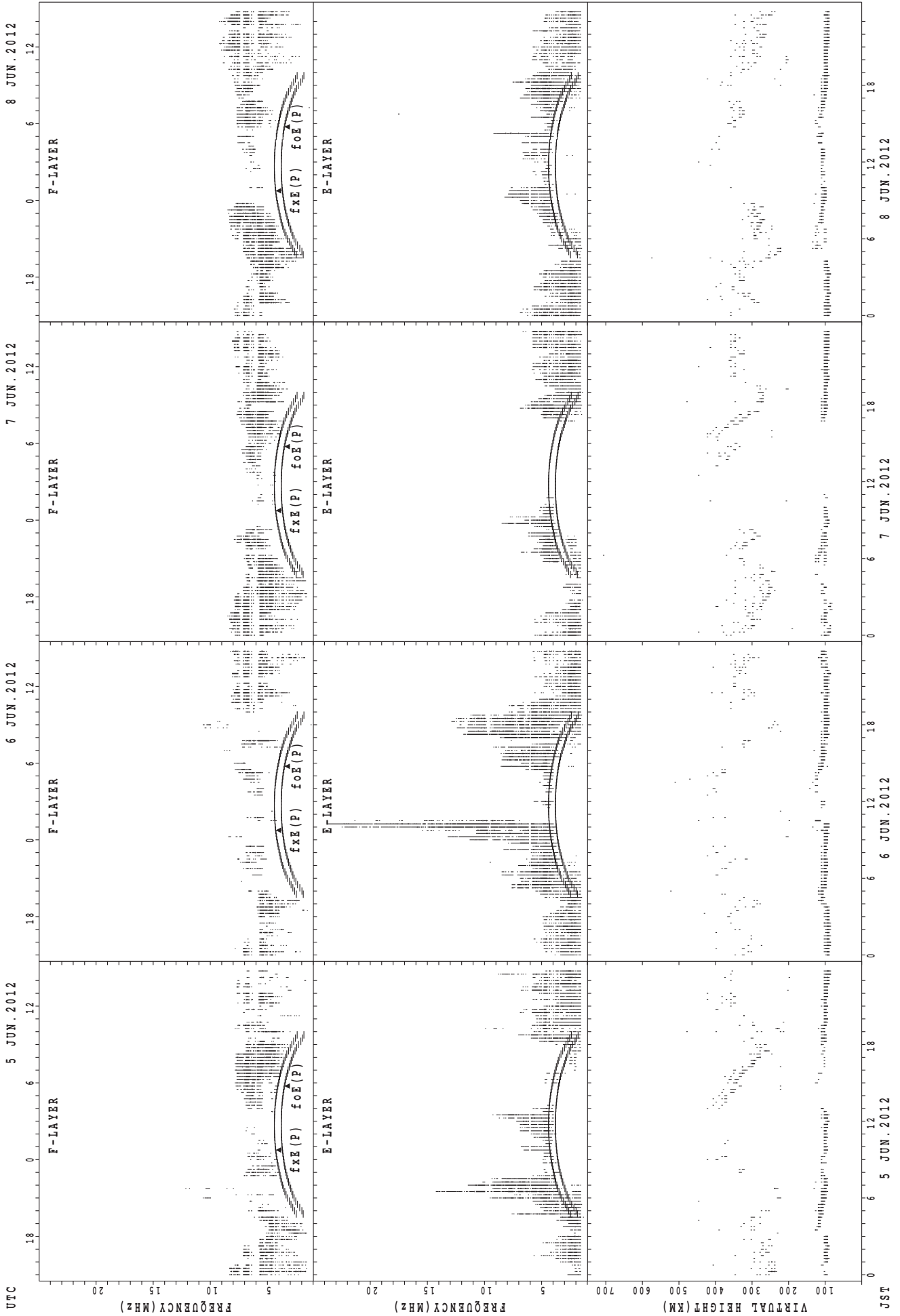
2 JUN. 2012

3 JUN. 2012

4 JUN. 2012

JST

SUMMARY PLOTS AT Kokubunji



fx E(P); PREDICTED VALUE FOR fx E
fo E(P); PREDICTED VALUE FOR fo E

5 JUN. 2012

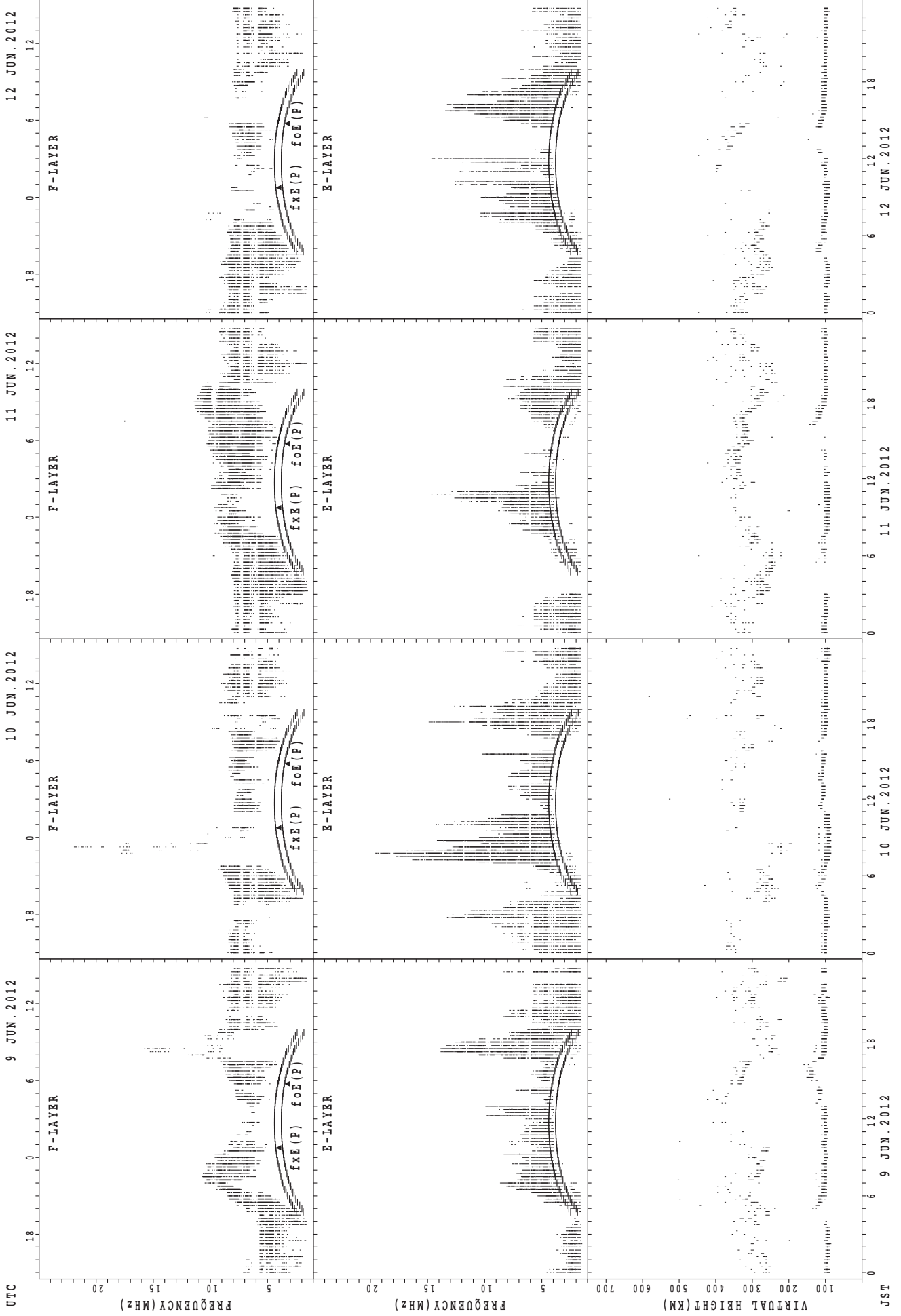
6 JUN. 2012

7 JUN. 2012

8 JUN. 2012

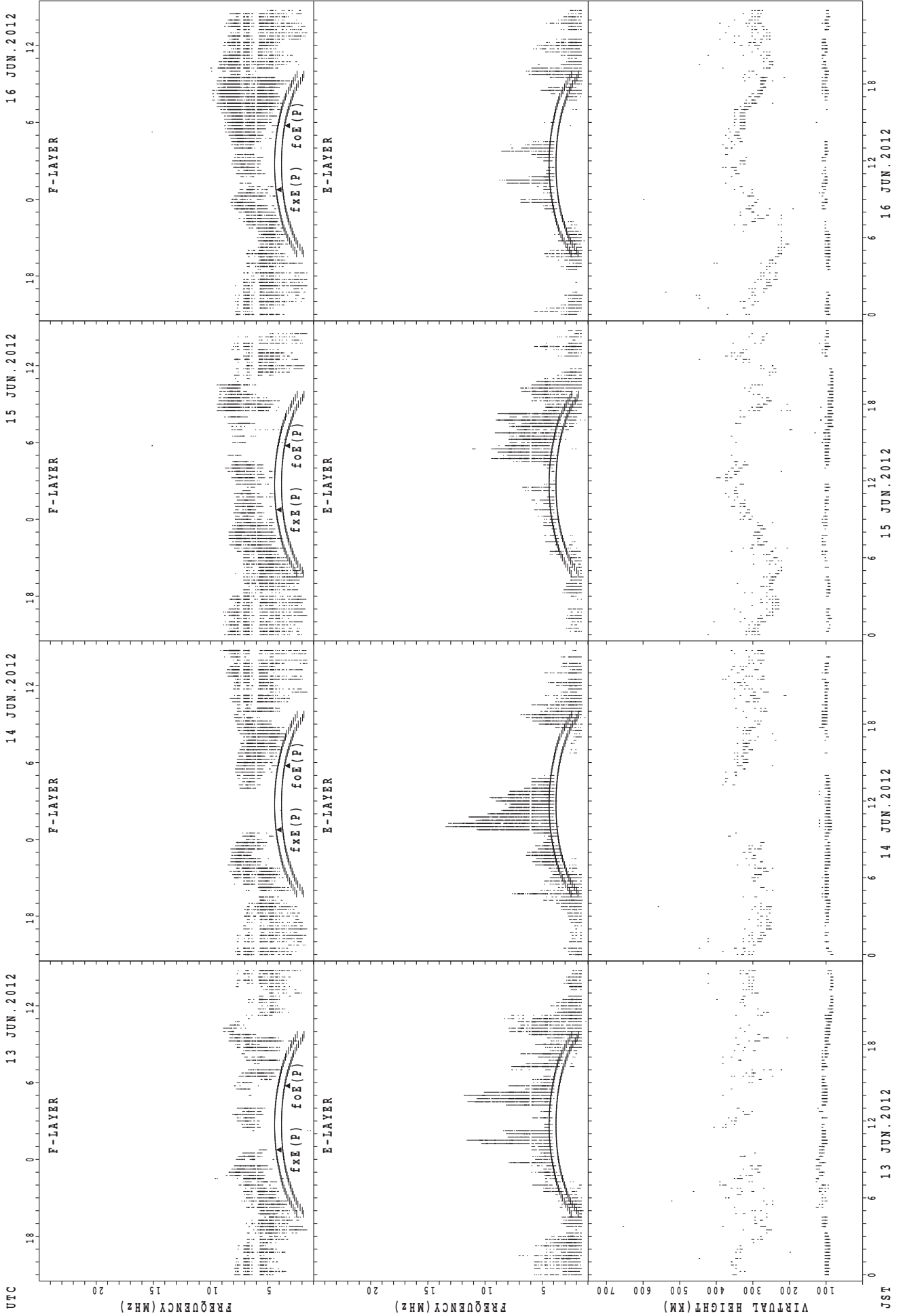
JST

SUMMARY PLOTS AT Kokubunji



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

SUMMARY PLOTS AT Kokubunji

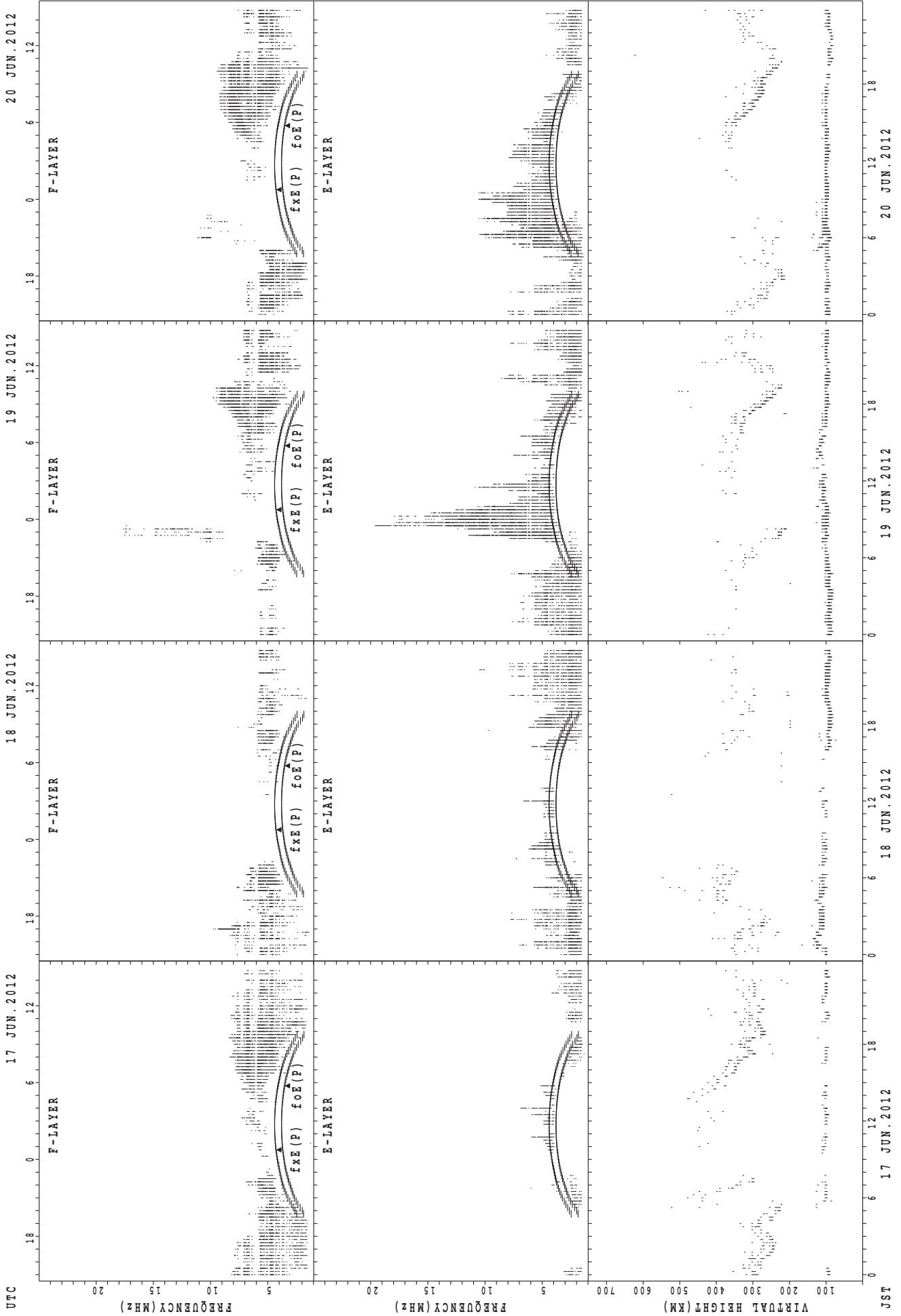


UTC
13 JUN. 2012
14 JUN. 2012
15 JUN. 2012
16 JUN. 2012

JST
13 JUN. 2012
14 JUN. 2012
15 JUN. 2012
16 JUN. 2012

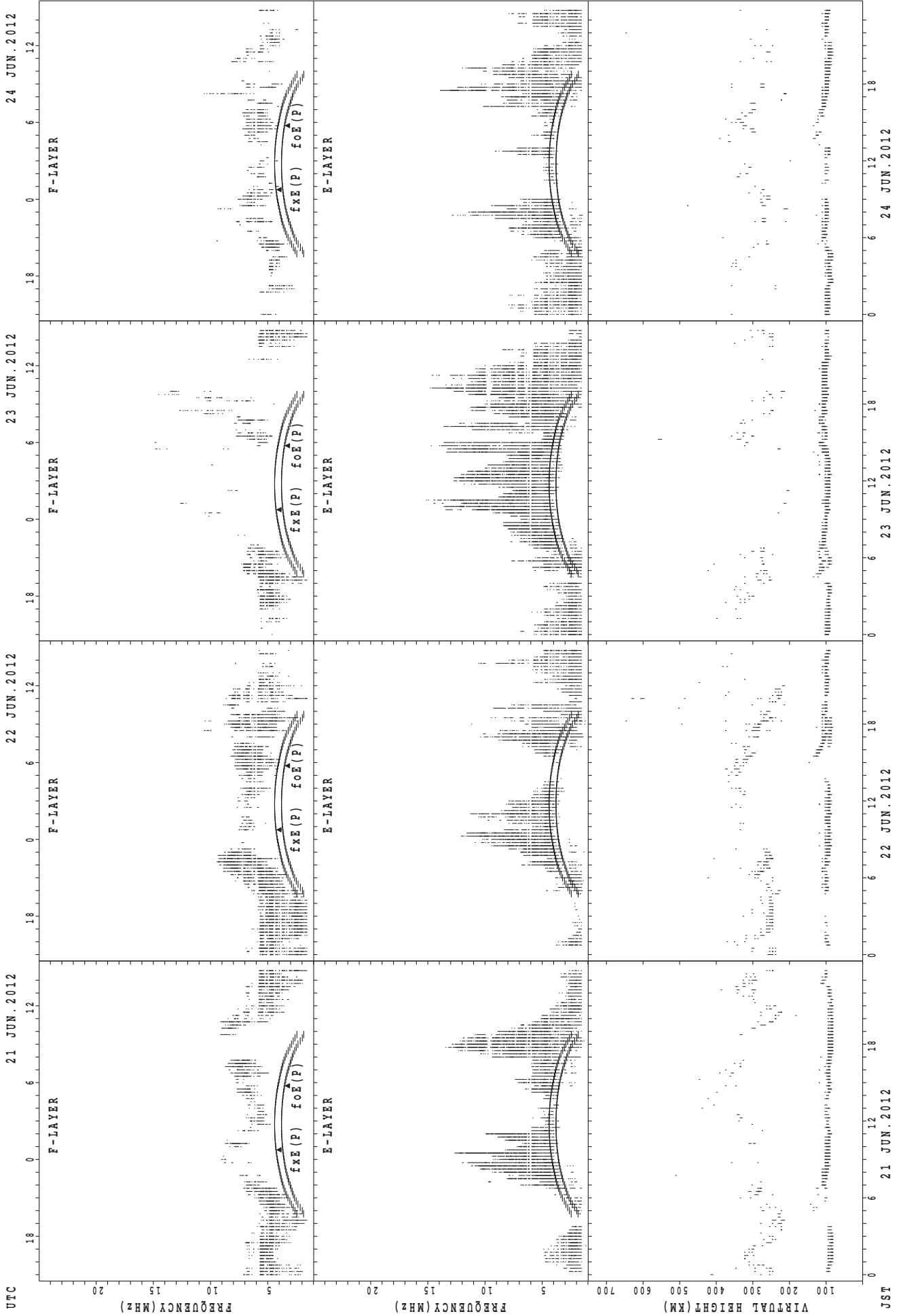
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



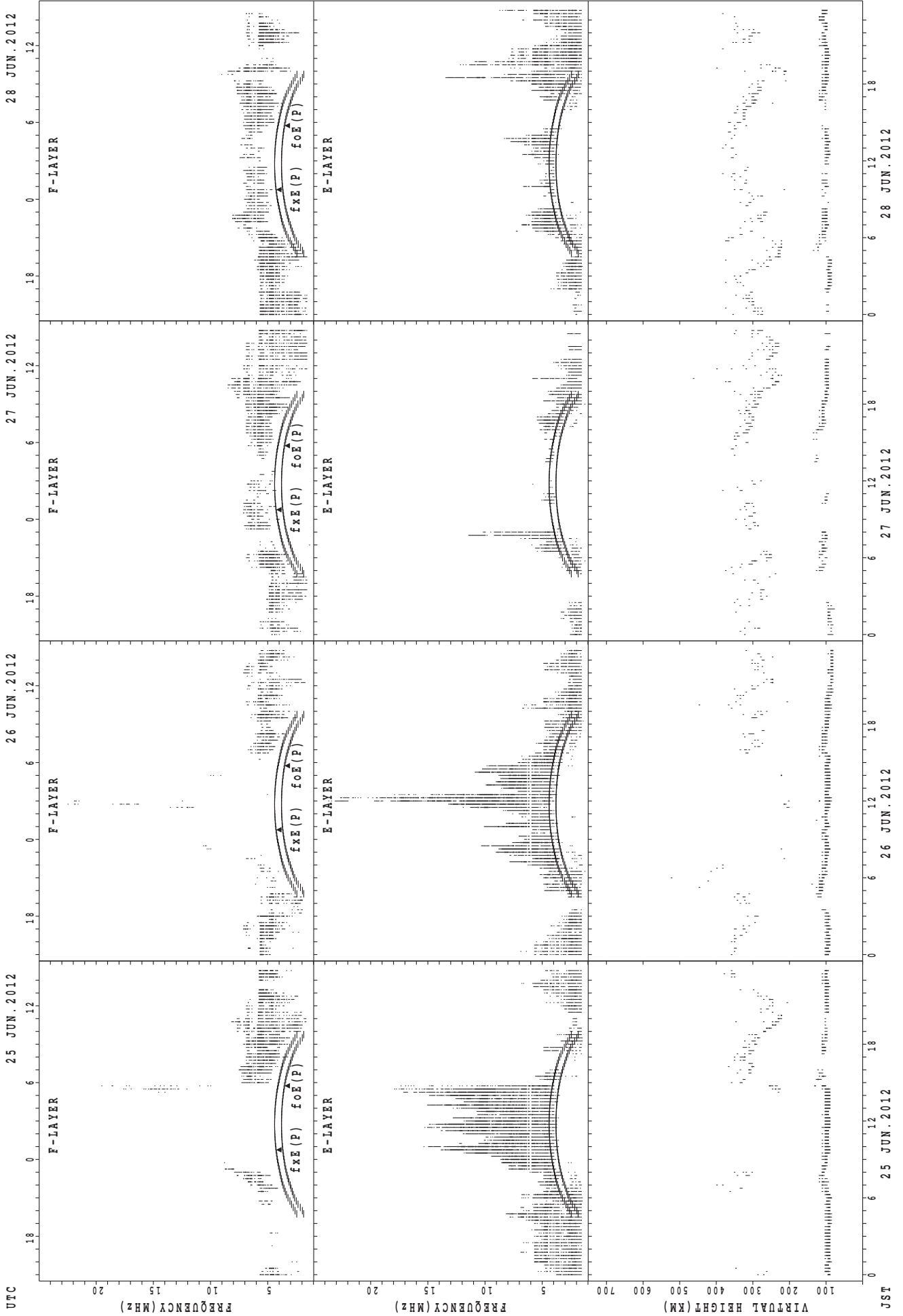
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



JST 21 JUN. 2012 22 JUN. 2012 23 JUN. 2012 24 JUN. 2012
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

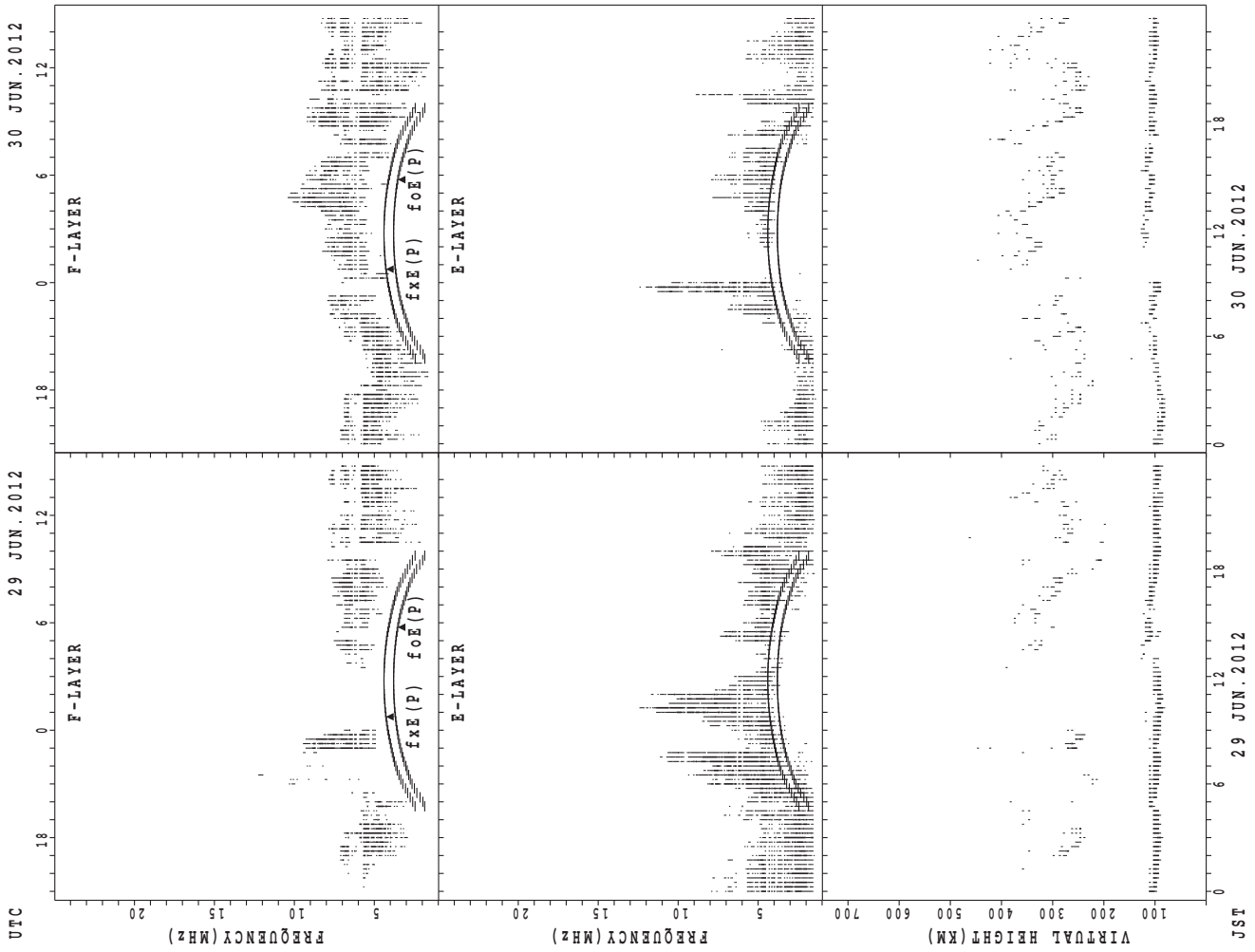


UTC
 25 JUN. 2012
 26 JUN. 2012
 27 JUN. 2012
 28 JUN. 2012

JST
 25 JUN. 2012
 26 JUN. 2012
 27 JUN. 2012
 28 JUN. 2012

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

SUMMARY PLOTS AT Kokubunji

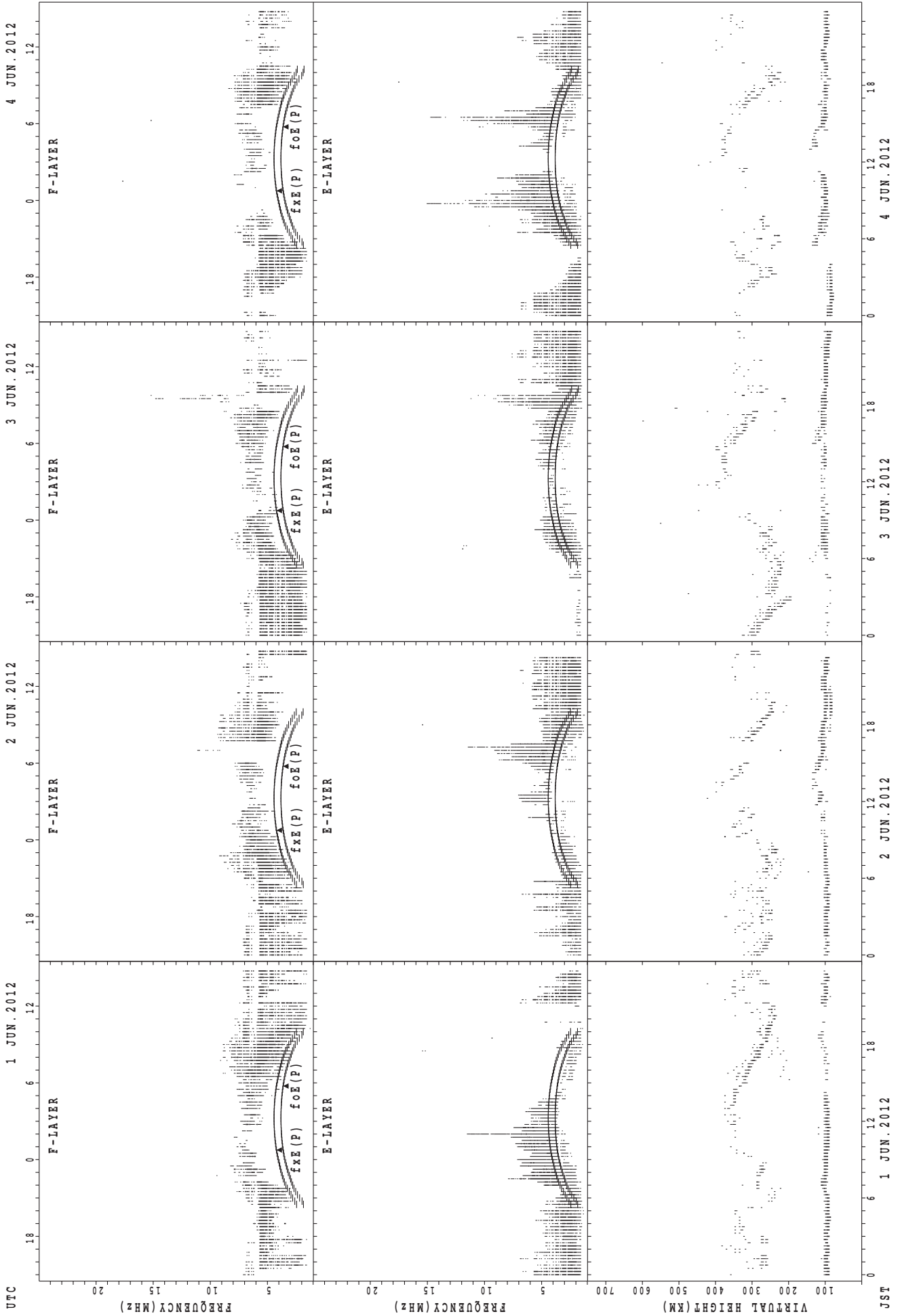


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

UTC

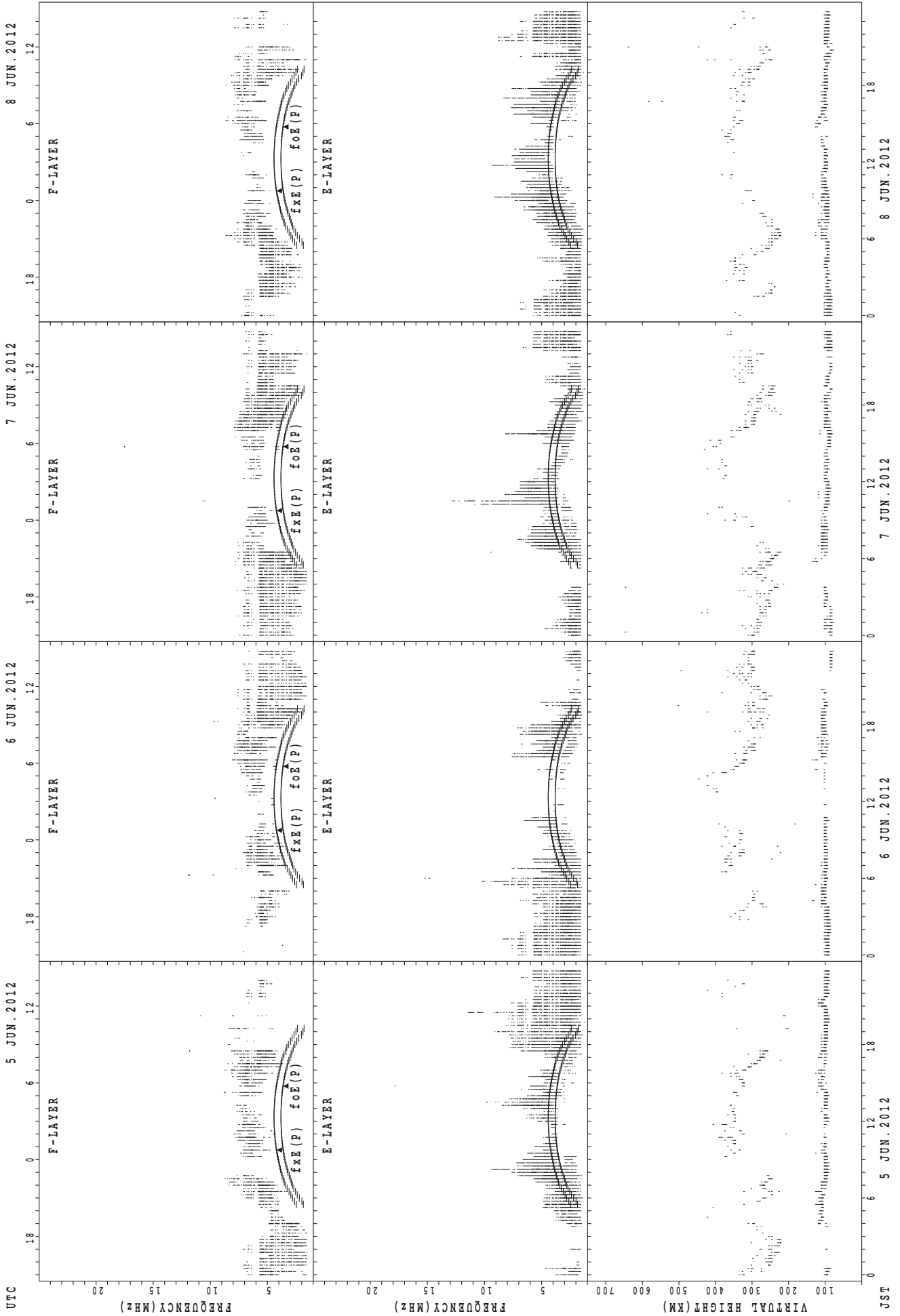
JST

SUMMARY PLOTS AT Yamagawa



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

SUMMARY PLOTS AT Yamagawa



fx E(P); PREDICTED VALUE FOR fx E
foE(P); PREDICTED VALUE FOR foE

5 JUN. 2012

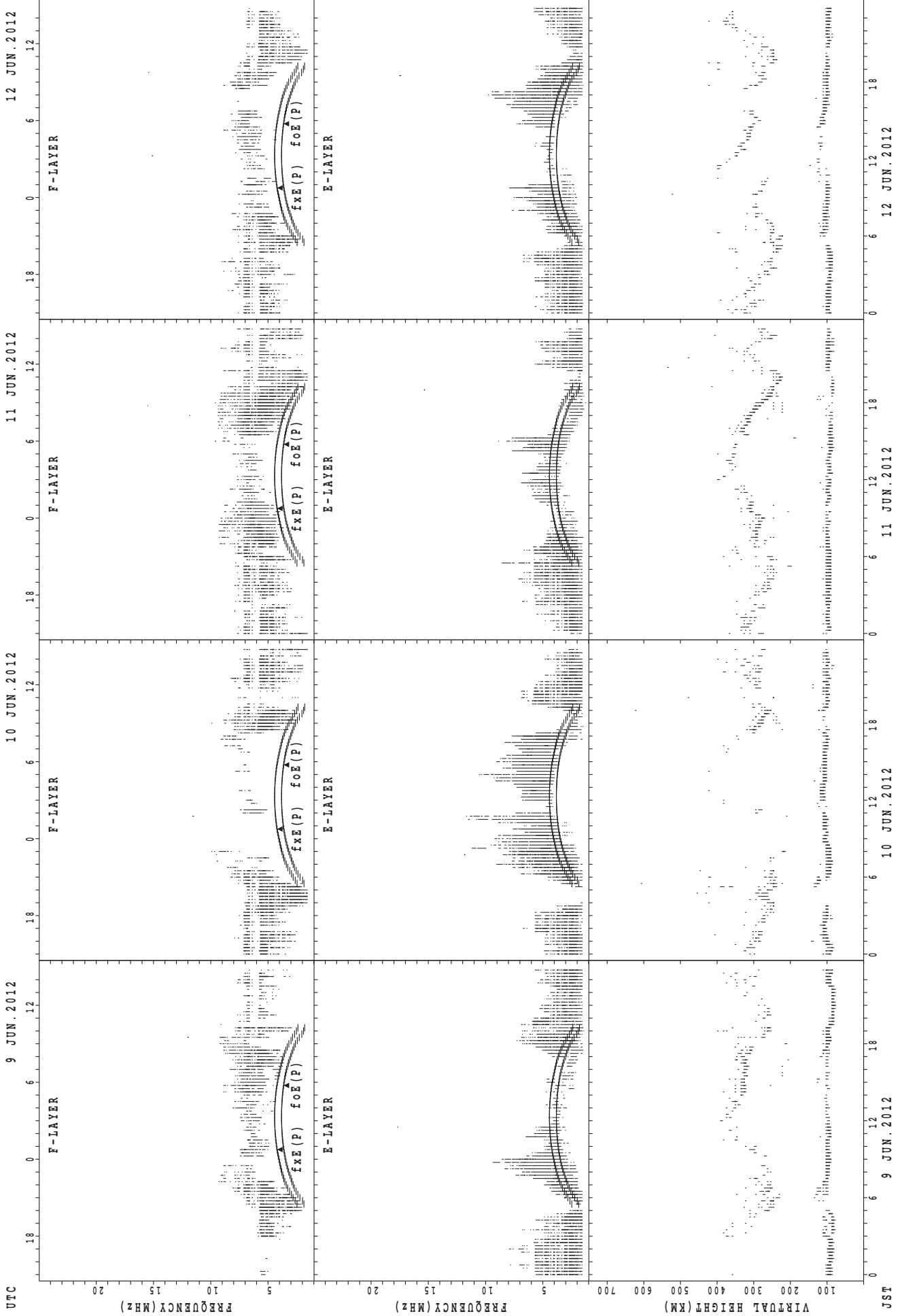
6 JUN. 2012

7 JUN. 2012

8 JUN. 2012

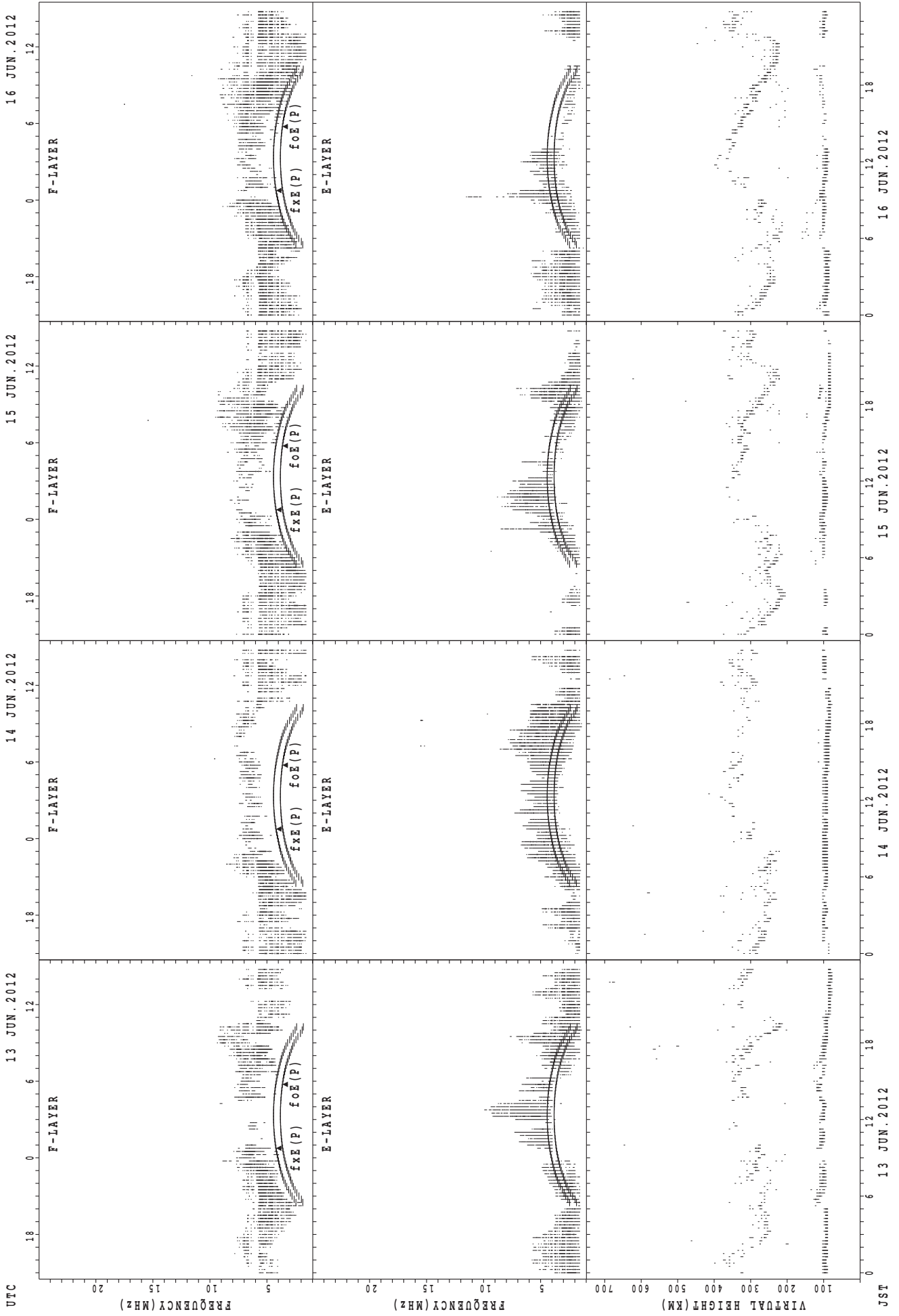
JST

SUMMARY PLOTS AT Yamagawa



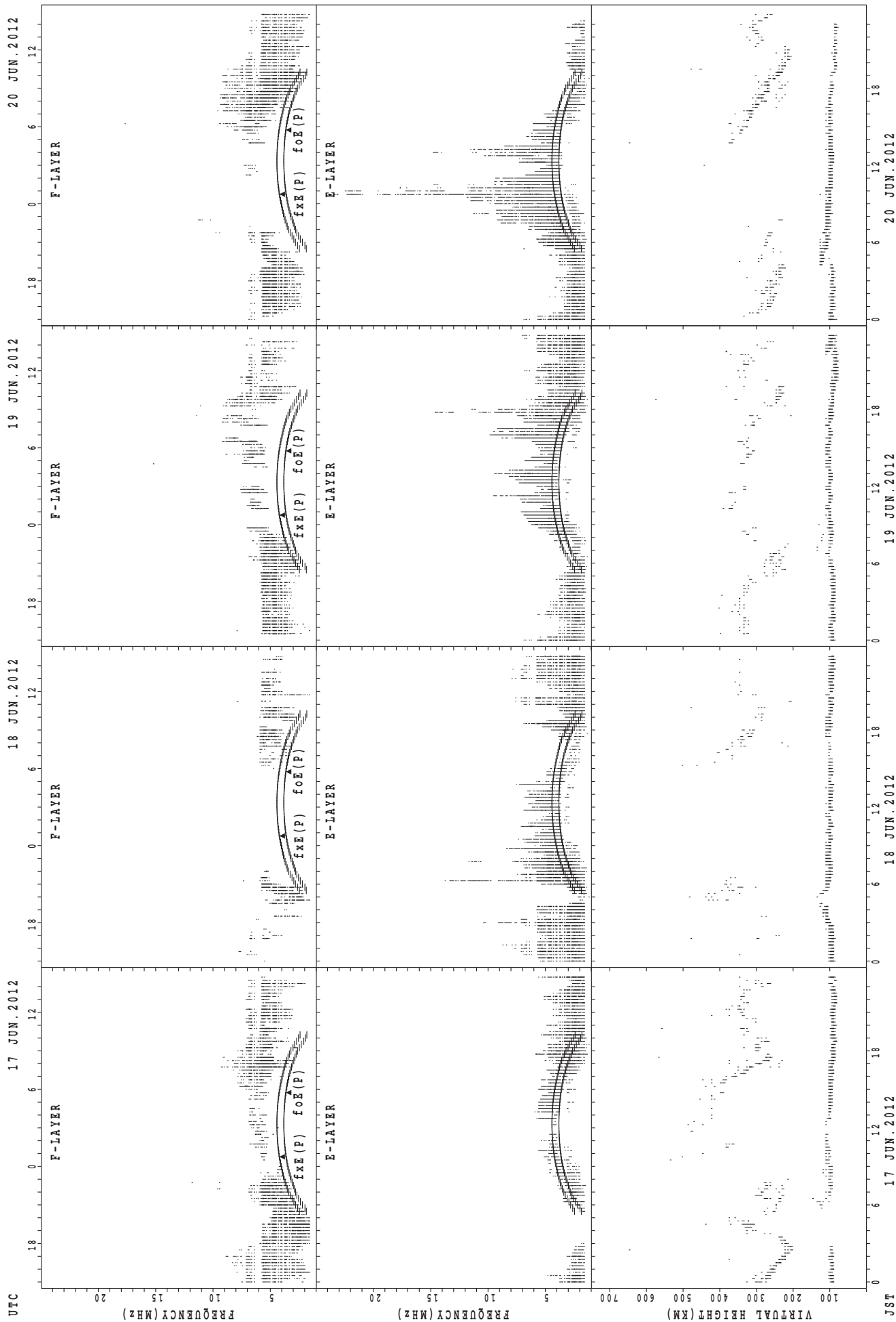
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



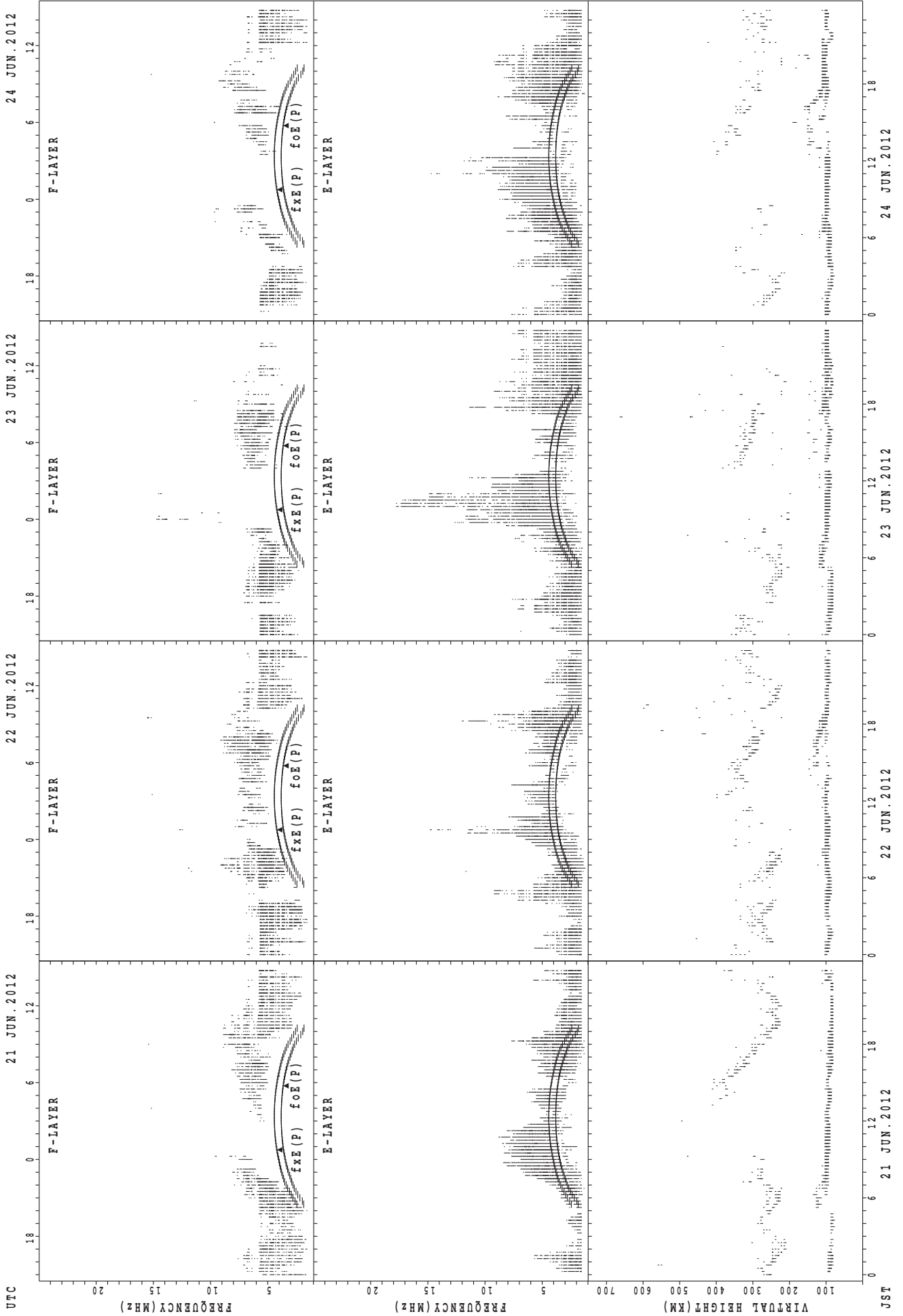
JST
 13 JUN. 2012
 14 JUN. 2012
 15 JUN. 2012
 16 JUN. 2012
 $f_{x E}(P)$; PREDICTED VALUE FOR $f_{x E}$
 $f_{o E}(P)$; PREDICTED VALUE FOR $f_{o E}$

SUMMARY PLOTS AT Yamagawa



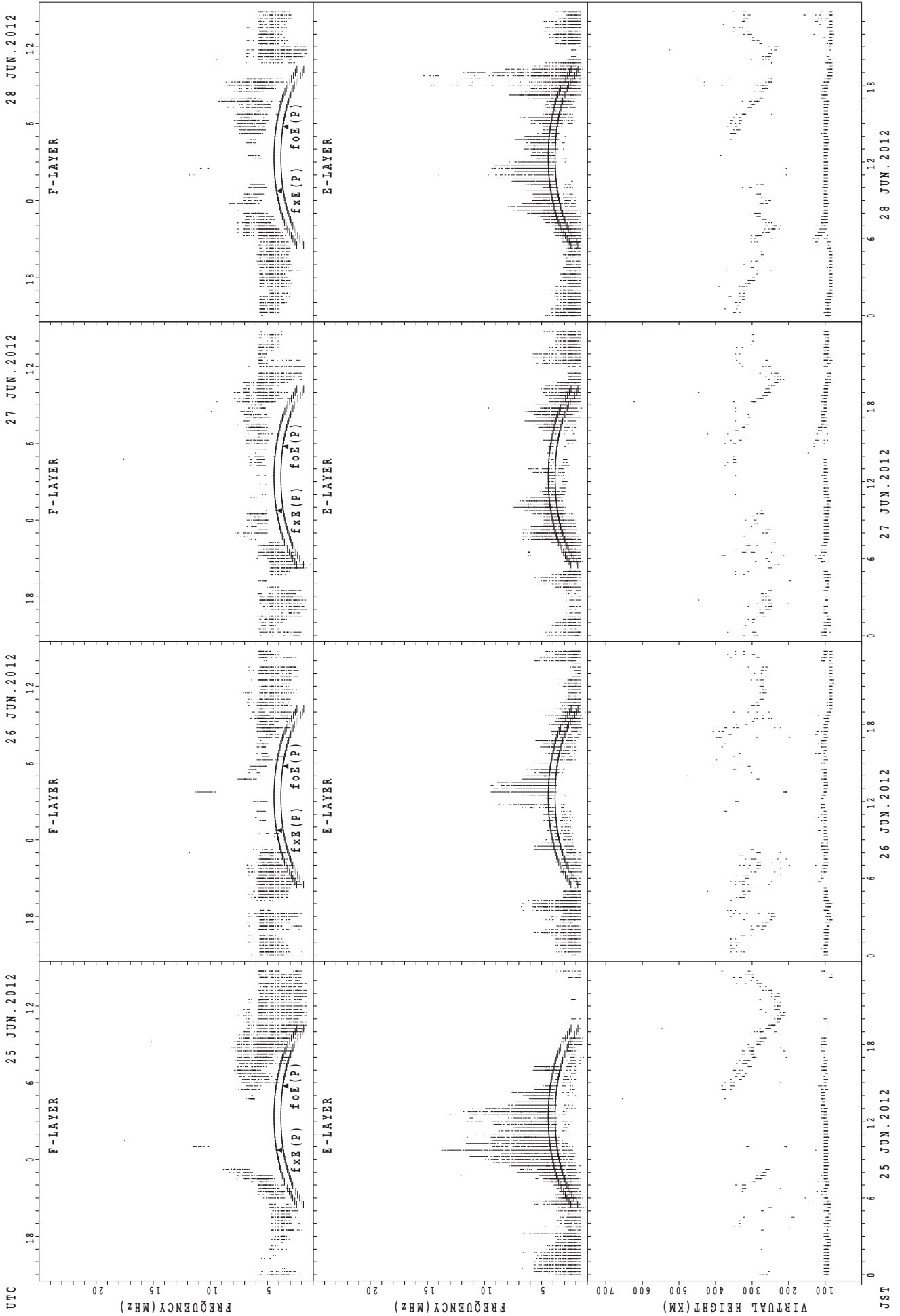
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



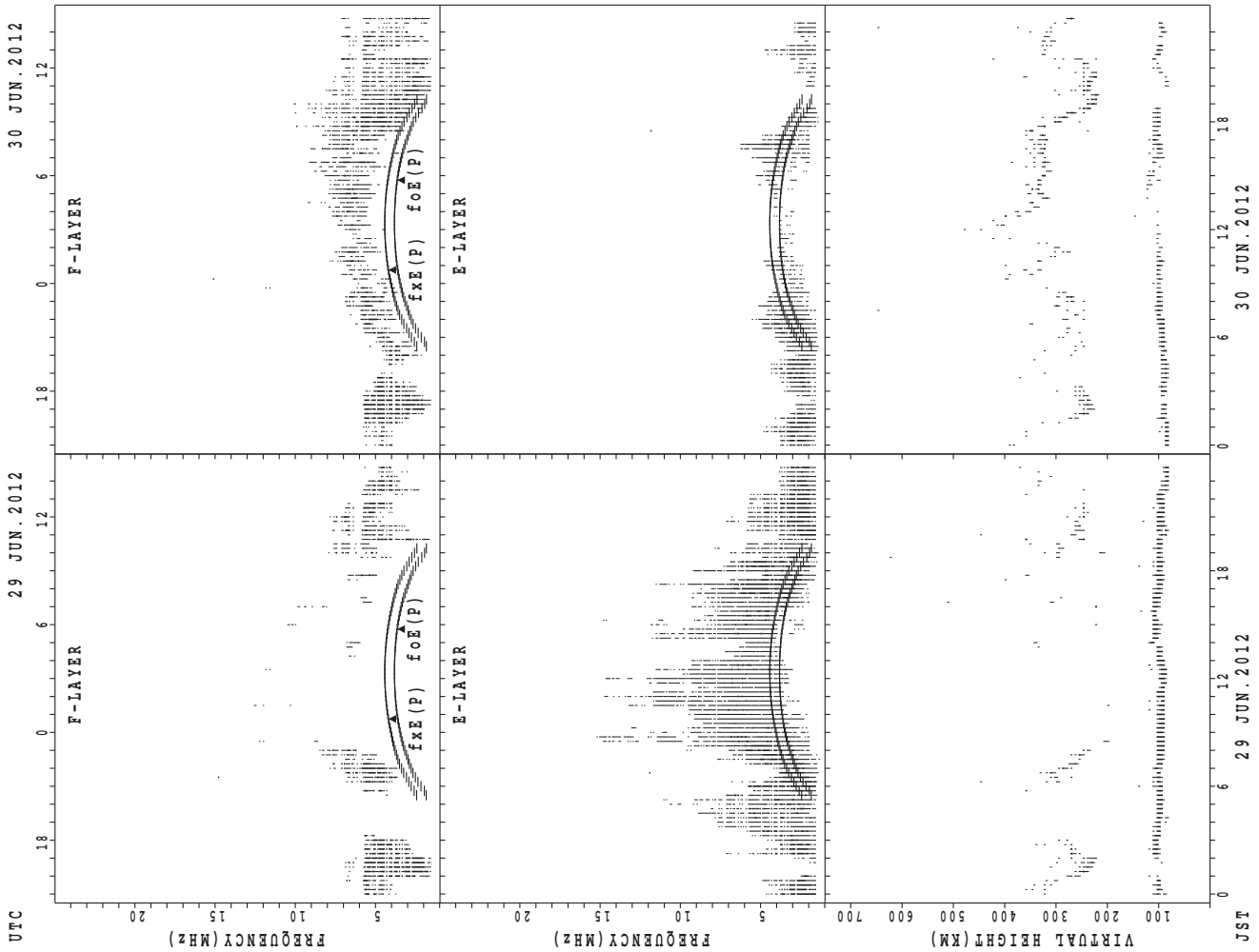
JST 21 JUN. 2012 22 JUN. 2012 23 JUN. 2012 24 JUN. 2012
f_{x E}(P); PREDICTED VALUE FOR f_{x E}
f_{o E}(P); PREDICTED VALUE FOR f_{o E}

SUMMARY PLOTS AT Yamagawa



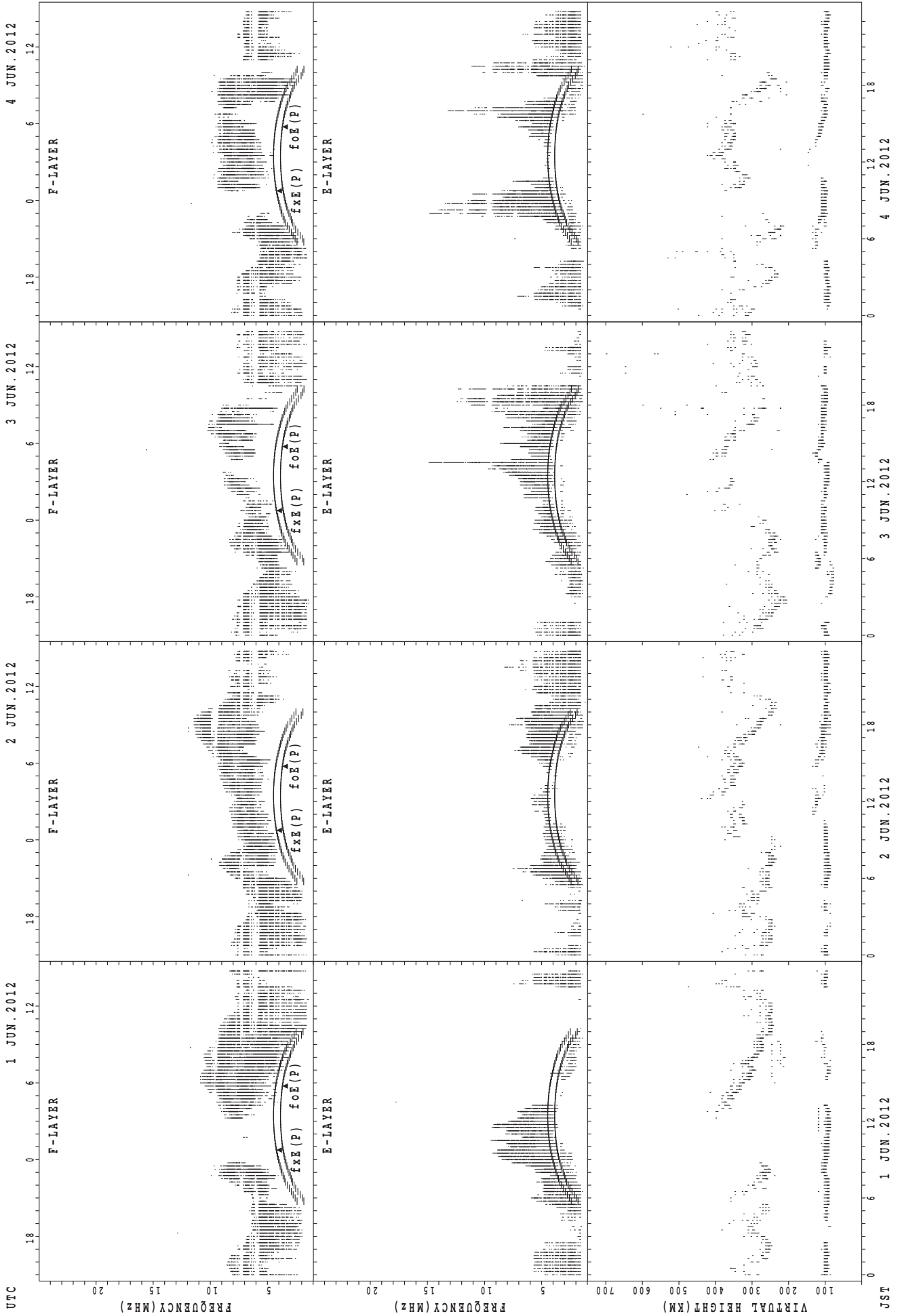
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



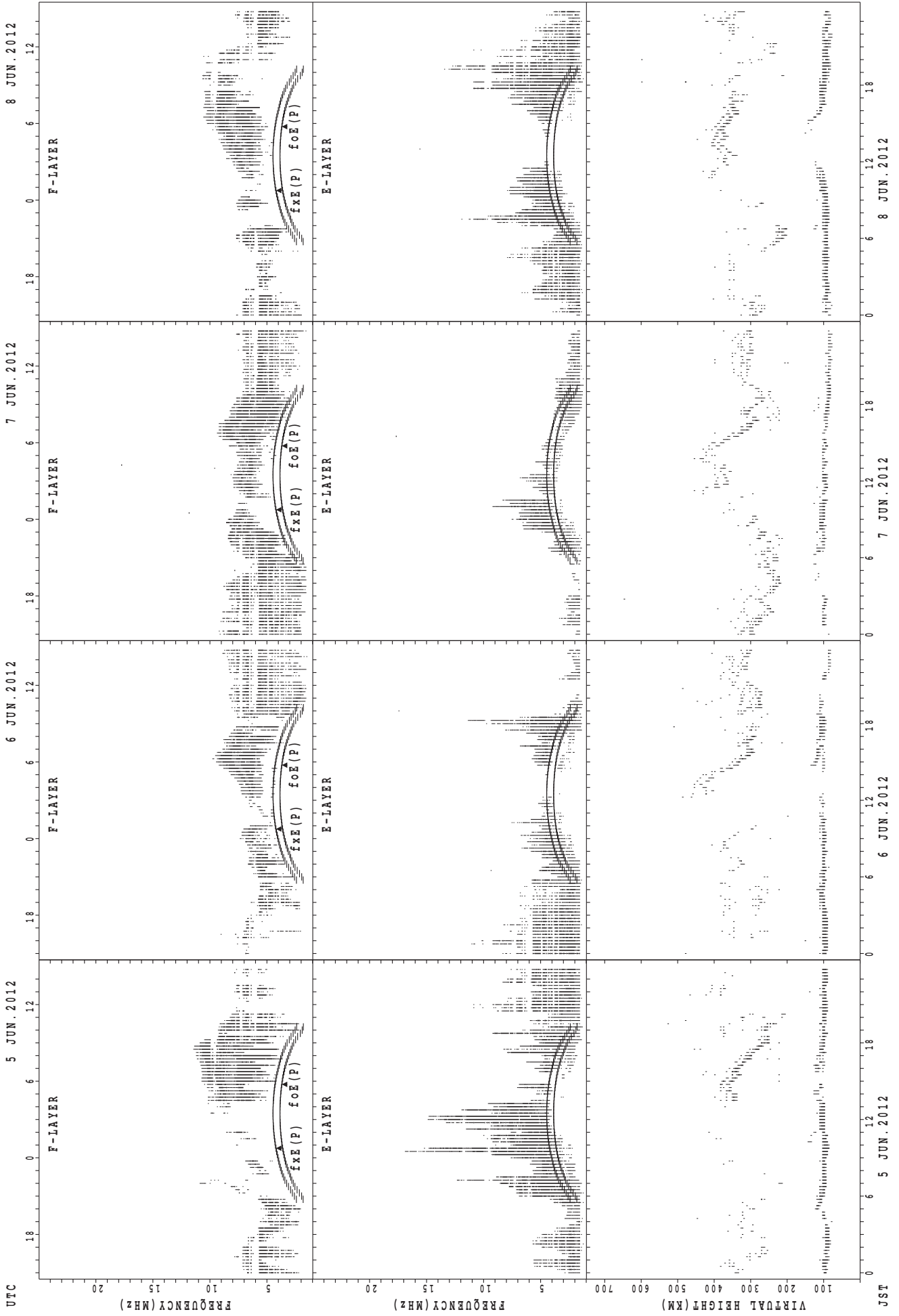
foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



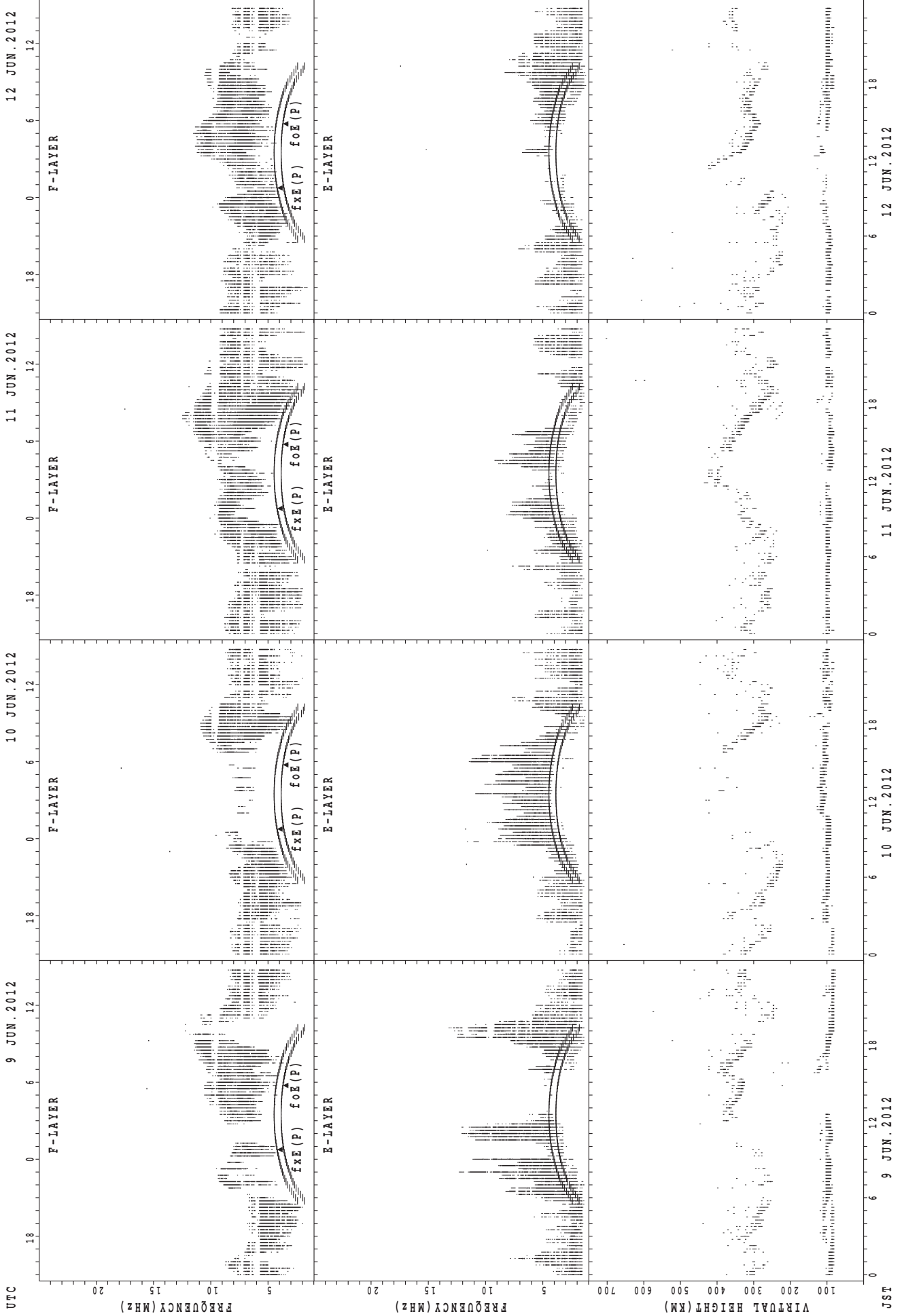
JST 1 JUN.2012 2 JUN.2012 3 JUN.2012 4 JUN.2012
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

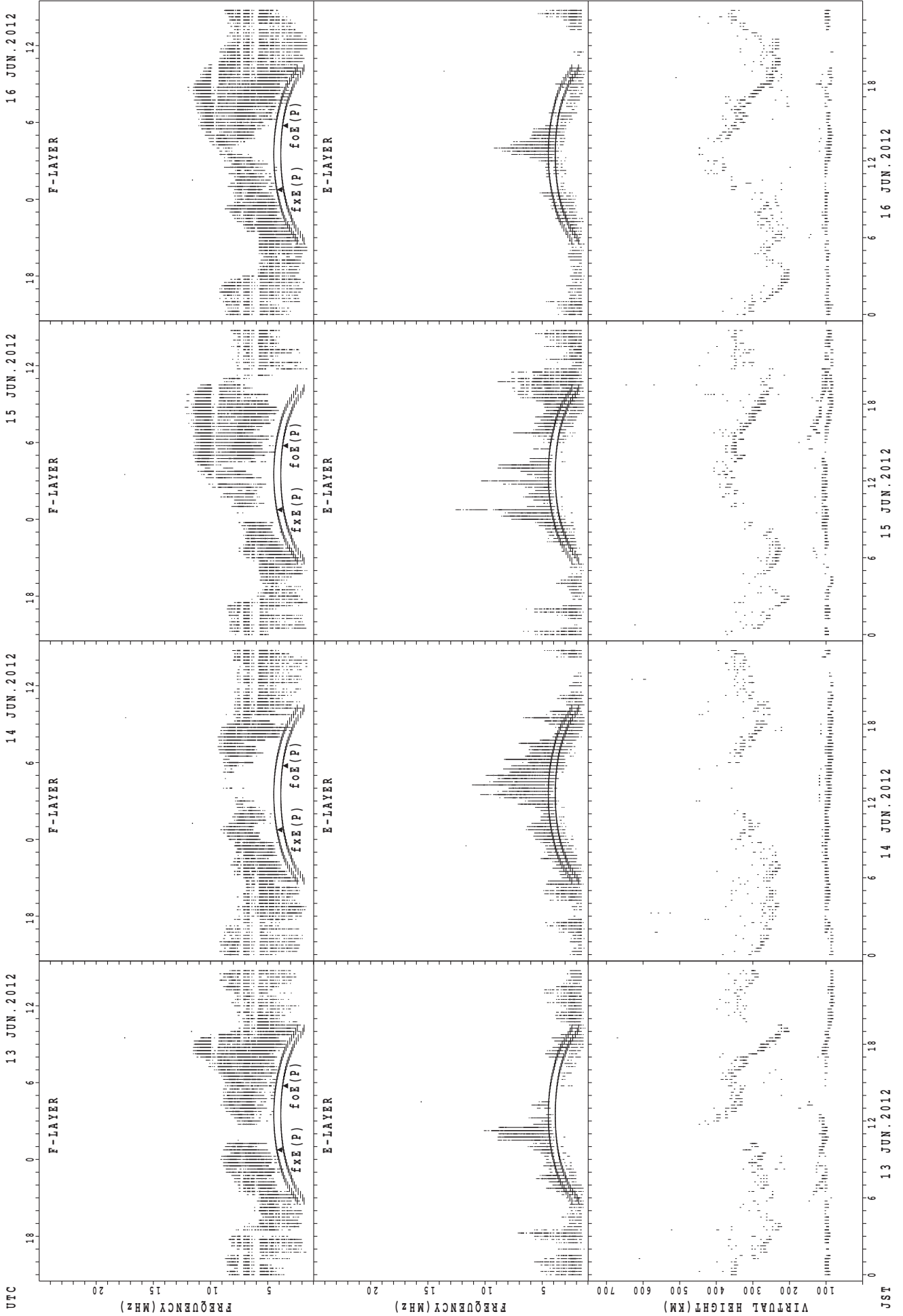
SUMMARY PLOTS AT Okinawa



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

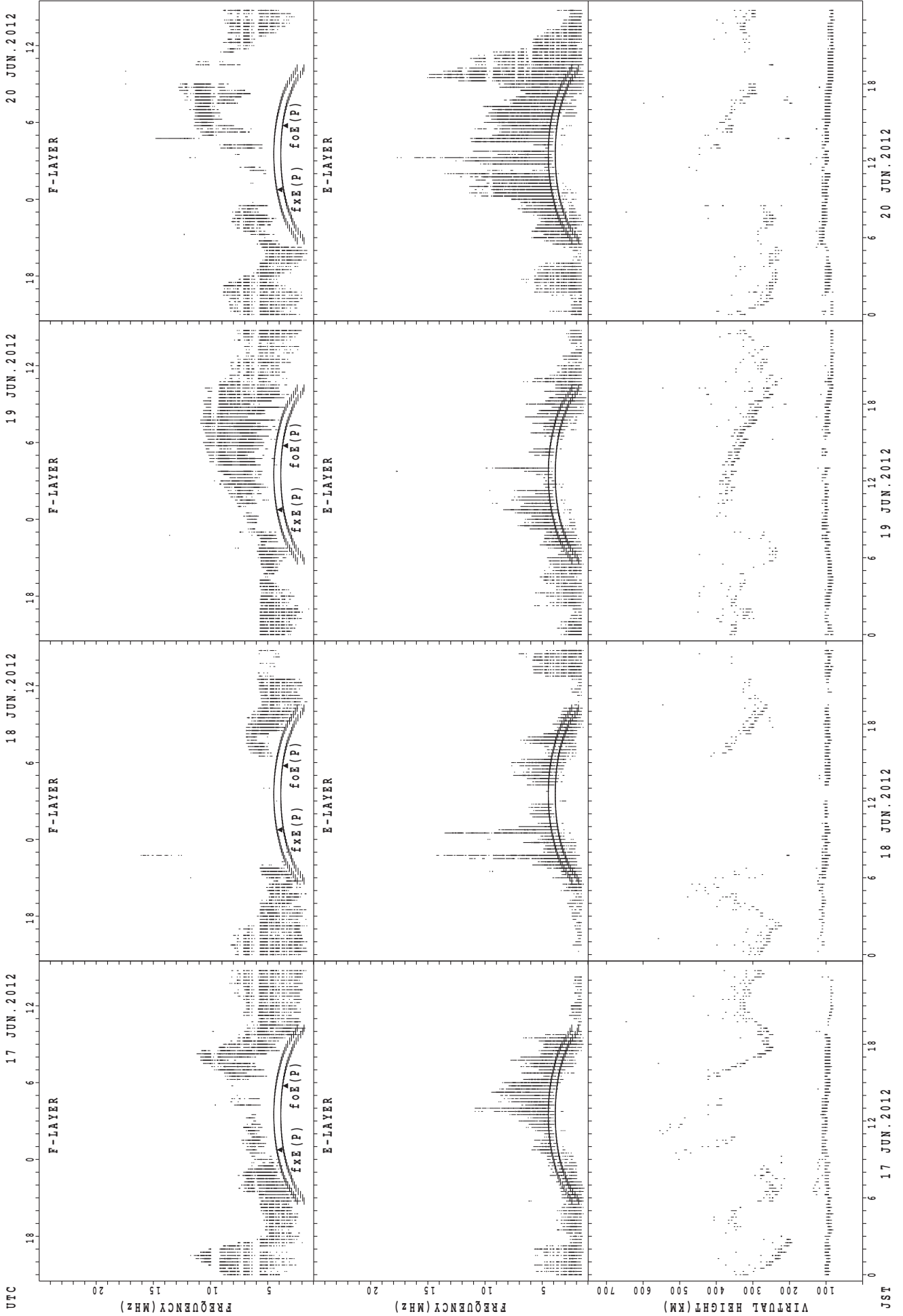
JST

SUMMARY PLOTS AT Okinawa



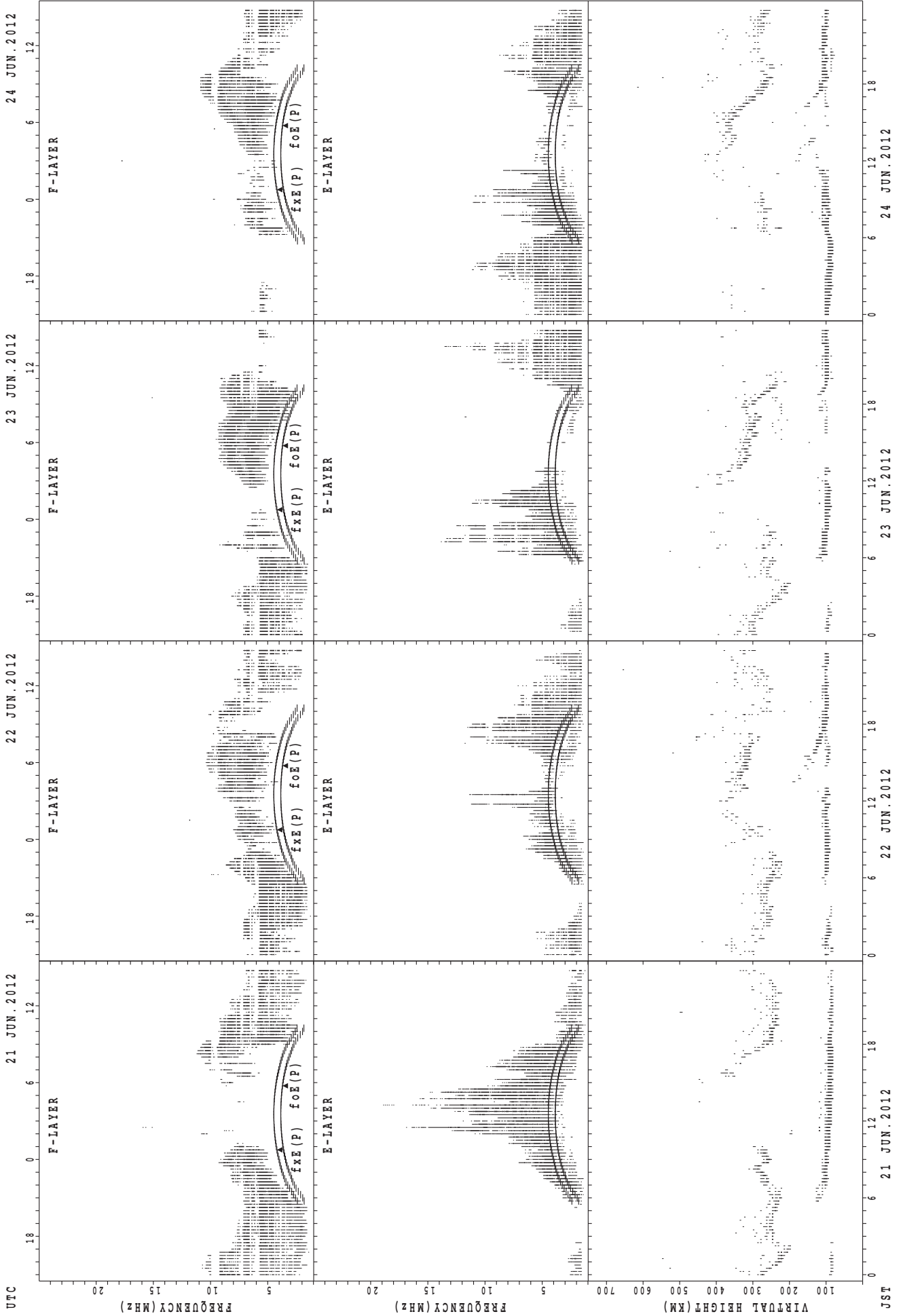
JST 13 JUN. 2012 14 JUN. 2012 15 JUN. 2012 16 JUN. 2012
 $f_{x E}(P)$; PREDICTED VALUE FOR $f_{x E}$
 $f_{o E}(P)$; PREDICTED VALUE FOR $f_{o E}$

SUMMARY PLOTS AT Okinawa



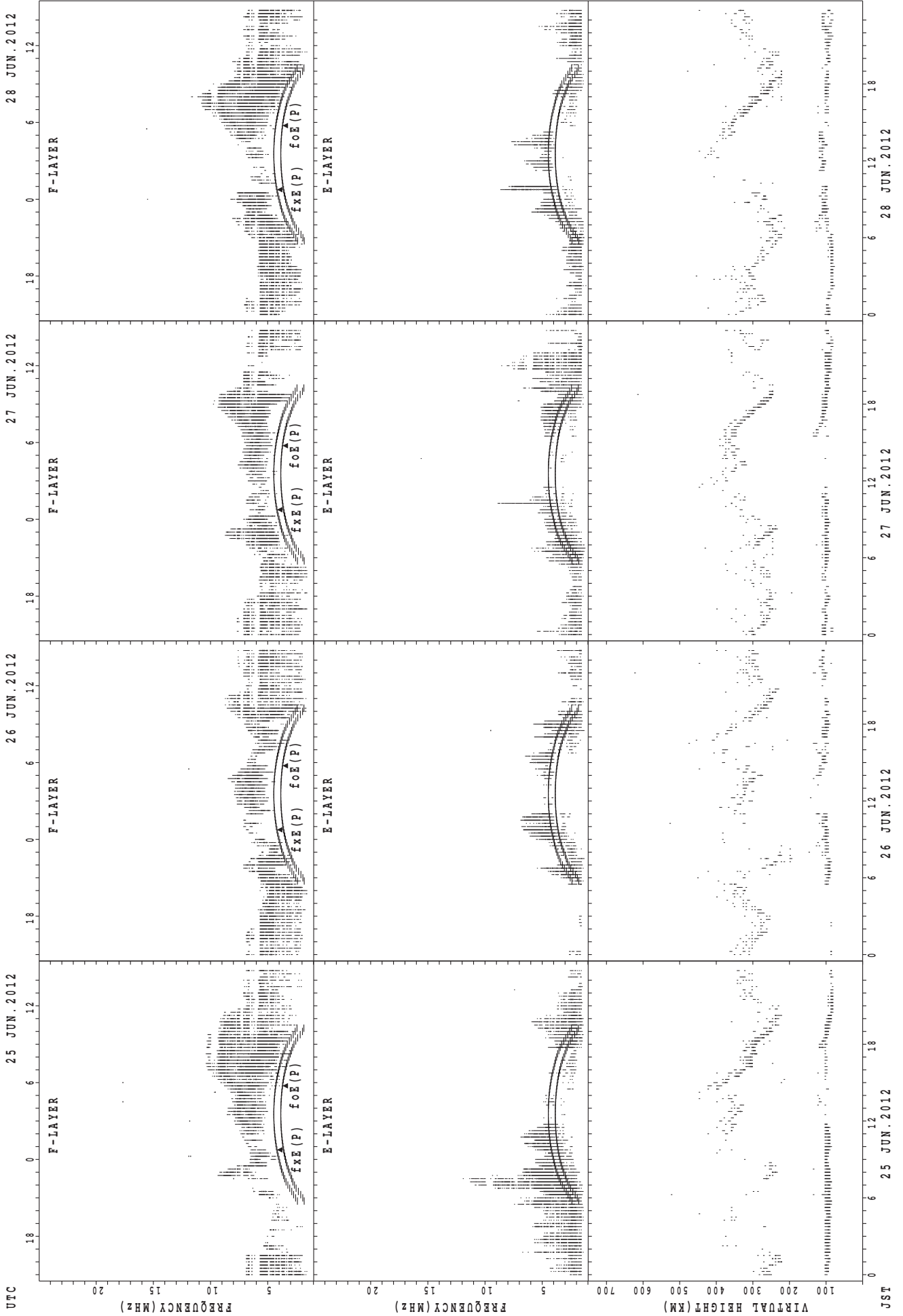
JST
 17 JUN. 2012
 18 JUN. 2012
 19 JUN. 2012
 20 JUN. 2012
 $f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

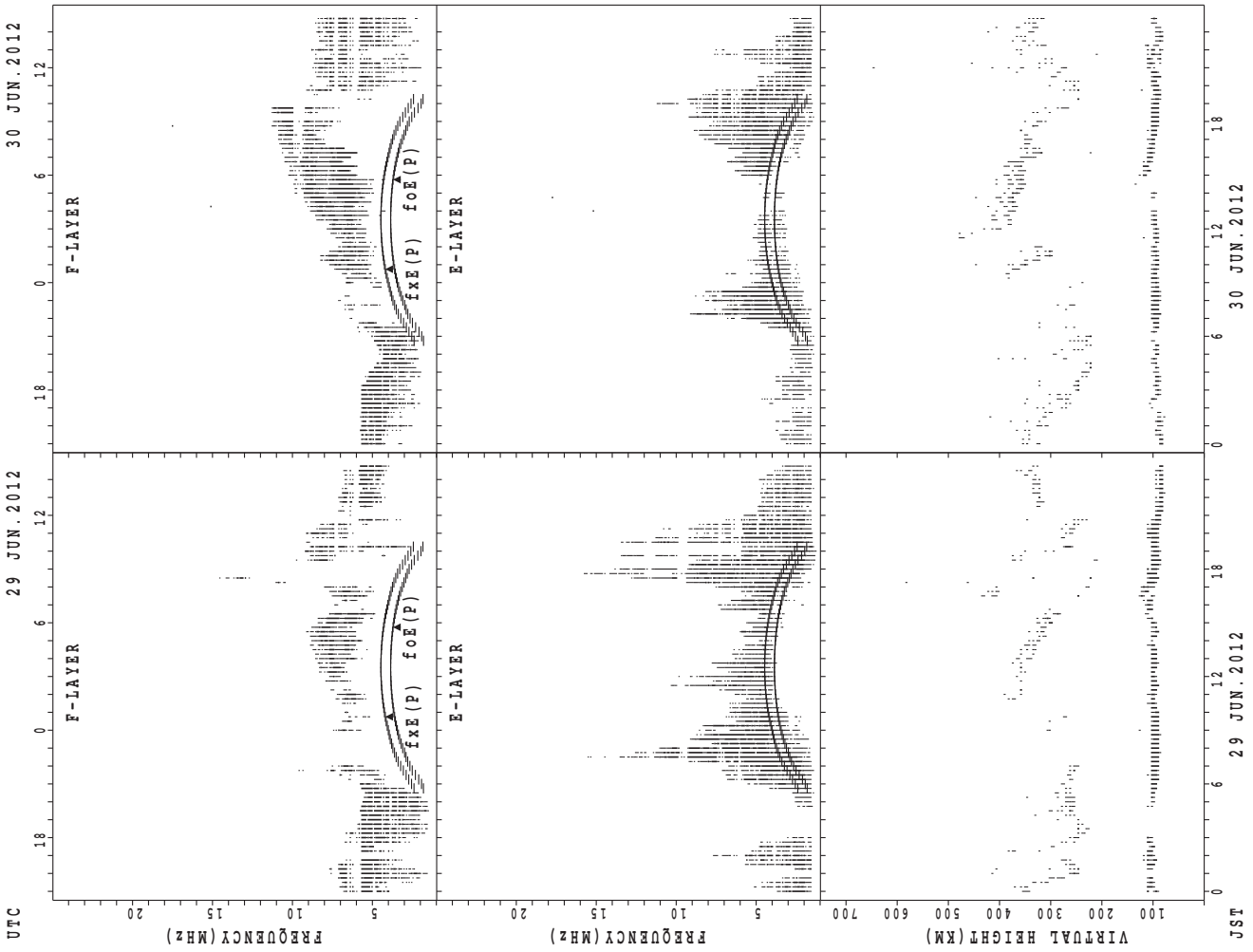
SUMMARY PLOTS AT Okinawa



UTC
25 JUN. 2012
26 JUN. 2012
27 JUN. 2012
28 JUN. 2012
JST

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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es
 JUN. 2012 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	2	2	4	10	10									7	8	6	10	11	12	12	9
MED	338		315	336	295	294	292	320									342	336	312	298	284	291	306	304
U Q	169		330	338	304	319	348	356									354	347	316	320	296	301	318	315
L Q	169		300	334	286	279	280	296									326	322	312	294	274	274	292	290

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	17	16	14	13	26	26	26	27	22	19	18	17	16	14	21	23	24	28	27	25	27	23	23
MED	97	97	98	96	101	115	111	105	103	105	103	103	103	103	108	107	107	107	105	105	103	103	101	101
U Q	102	100	106	107	111	119	111	107	109	105	105	105	106	107	113	113	111	111	111	113	105	105	105	103
L Q	95	94	94	91	94	113	107	105	101	103	101	99	97	96	101	102	99	101	102	103	98	99	97	97

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	9	7	6	4	2	4	9	13									18	15	14	14	9	10	7	7
MED	336	336	328	322	315	297	306	286									315	312	275	278	292	325	362	336
U Q	354	342	358	336	350	324	312	336									328	328	288	292	318	336	380	354
L Q	304	314	312	312	280	274	248	275									304	302	224	218	263	296	340	308

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	24	26	24	23	21	19	19	28	27	27	25	25	23	24	20	19	22	23	28	26	29	28	27	24
MED	100	97	96	97	97	111	111	107	103	103	103	103	101	102	105	111	111	103	103	103	101	101	103	101
U Q	103	101	97	97	103	119	115	111	111	105	108	105	105	110	115	121	115	109	107	103	105	105	103	105
L Q	95	95	94	95	95	103	99	103	103	97	96	98	95	97	99	103	107	103	99	97	99	99	97	97

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	7	7	9	4	2	7	15	17								5	22	18	16	9	5	5	5
MED	340	322	296	282	285	251	272	272	272								320	298	287	263	272	288	344	336
U Q	354	338	312	308	305	264	298	286	283								327	316	306	284	280	337	350	353
L Q	320	300	264	251	269	238	252	246	258								302	292	278	251	252	273	329	328

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	27	28	27	26	25	23	28	27	27	25	27	26	24	26	18	24	24	24	27	25	26	25	25	28
MED	97	97	95	97	95	95	111	107	103	103	103	100	99	101	103	111	105	104	103	101	94	97	99	97
U Q	99	99	97	99	99	101	114	111	105	106	105	105	103	107	115	120	113	113	107	105	103	103	99	102
L Q	95	93	93	93	93	95	95	101	101	99	97	95	96	97	97	100	98	100	97	90	89	89	91	94

MONTHLY MEDIANS OF h'F AND h'Es
 JUN. 2012 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	10	14	9	8	4		5	18	18	12							15	28	25	19	13	7	6	6
MED	354	306	294	297	306		274	257	267	280							324	301	270	270	270	278	354	340
U Q	376	336	342	305	340		378	278	288	306							334	312	284	308	289	354	354	346
L Q	326	296	250	266	262		241	250	254	264							300	288	255	262	254	276	348	336

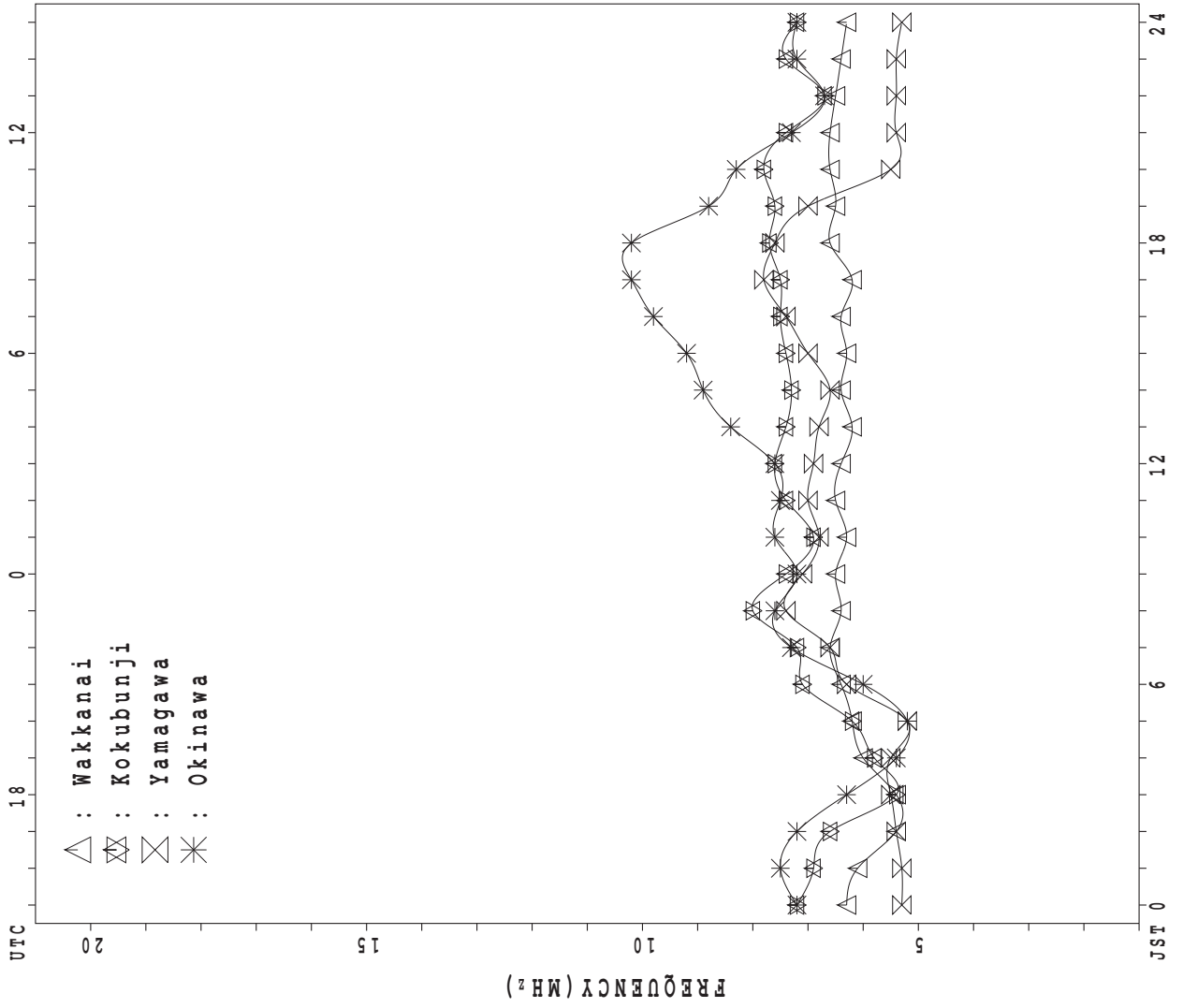
h'Es

	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	22	25	24	22	20	22	25	28	29	29	28	25	23	21	20	20	22	25	26	27	24	25	27	26
MED	97	97	97	97	96	97	99	101	103	101	103	103	103	101	106	105	110	105	103	99	97	95	95	95
U Q	103	101	100	101	101	101	109	107	109	107	105	108	111	113	120	121	115	113	103	103	101	100	103	103
L Q	95	90	92	95	90	95	95	96	96	97	95	98	97	95	97	96	97	99	97	95	91	87	89	87

MONTHLY MEDIANS PLOT OF fOF2

JUN . 2012

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 f_{XI} (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	71	X	X	X																	X	X	X	X
2	77	X	X	X																	X	X	X	X
3	79	X	X	X																	X	X	X	X
4	79	X	X	X																	X	X	X	X
5	75	X	X	X																	X	X	X	X
6	73	X	X	X																	X	X	X	X
7	76	X	X	X																	X	X	X	X
8	75	X	X	X	69																X	X	X	X
9	76	X	X	X	72																X	X	X	X
10	76	X	X	X	71																X	X	X	X
11	78	X	X	X	73																X	X	X	X
12	81	X	X	X	73																A	X	X	X
13	72		X	X	62																X	X	X	X
14	66	A	X	X	67																X	X	X	X
15	79	X	X	X	72																X	X	X	X
16	76	X	X	X	69																0	X	X	X
17	74	X	X	X	65																X	X	X	X
18	A	X	A	A						Y					Y						X	A	X	X
19	63	X	X	X	55																X	X	X	X
20	73	X	X	X	66																X	X	X	X
21	69	X	X	X	68	68															X	X	X	X
22	73	X	X	X	66																X	X	X	X
23	66	X	X	X	61																X	X	X	X
24	63	X	X	X	59																X	X	X	X
25	A	X	X	X	52																X	X	X	X
26	66	X	X	X	50																X	X	X	X
27	71	X	X	X	60																X	X	X	X
28	65	X	X	X	63																X	X	X	X
29	71	X	X	X	60																X	X	X	X
30	68	X	X	X	67																X	X	X	X
31																					X	X	X	X
	00	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	4																29	29	30	30
MED	X	X	X	X	68																X	X	X	X
U Q	76	74	70	70	70																84	85	83	81
L Q	X	X	X	X	60																X	X	X	X
	68	65	64	60	60																78	78	76	71

JUN. 2012 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 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	F 64	56	53	51	49	56	70	66	A	R 65	62	61	62	62	62	U R 56	63	65	U A 62	72	74	78	F 77	76	
2	70	65	63	63	60	V 68	70	J R U 87 73	U R 73	R 82	72	70	69	69	A	66	68	66	A	85	R 76	R 81	R 79	74	
3	72	72	70	R 66	62	62	70	72	70	R 56	59	60	R 61	63	65	67	A	R 53	66	R 75	76	84	R 78	76	
4	72	69	71	61	60	66	70	67	U R 54	E G 51	49	A	55	55	56	60	63	66	68	74	74	72	72	69	
5	F 68	73	60	52	50	51	54	50	U R 58	54	55	J R E G 55 45	56	48	62	61	A	A	63	59	71	71	F 69	F 64	
6	F 66	60	57	56	55	62	68	65	55	61	59	R 56	56	48	62	61	A	64	A	63	68	71	71	70	
7	69	67	63	F 63	V 57	62	66	68	64	56	56	J R 57	56	60	59	59	58	A	62	64	73	F 74	71	71	
8	69	65	64	F 58	F 58	65	64	U R 64	A	68	62	55	61	60	61	60	62	63	A	65	72	85	87	92	84
9	70	61	60	F 64	65	68	A	74	A	70	64	64	62	59	62	69	68	69	67	68	72	72	77	76	
10	70	64	62	F 61	66	69	73	R 74	70	68	65	66	66	70	70	70	69	A	A	A	79	80	73	72	
11	71	69	68	66	68	69	71	75	75	74	U R U R 75 76	74	77	71	68	71	74	R 85	J R J R 91 87	J R 74	82	75	75		
12	74	68	65	66	63	62	63	64	U R 63	58	62	J R 61	63	65	64	A	62	A	A J R 65	A	72	72	71		
13	65	A	58	55	54	62	61	64	U Y 58	57	62	A U R 65	67	62	64	62	J R U 67	61	74	69	70	66	66		
14	59	A	61	60	R 56	61	70	A	R 75	68	60	62	64	65	65	63	64	64	66	71	75	75	75	76	
15	72	71	68	65	66	65	68	68	68	67	66	68	68	68	66	65	67	68	73	74	74	75	76	71	
16	70	66	63	63	67	72	67	69	71	70	70	69	69	65	64	64	66	64	72	J R 85	R U R 80 79	75	75	75	
17	67	67	62	58	59	57	57	54	54	A	R 57	59	60	59	64	62	R 65	63	68	72	75	76	70	R 51	
18	A	44	A	A	U R U R 36 40 45	A	A	Y	A	A	A	A	E G 50 44	Y	52	50	50	46	52	59	A	56	52		
19	56	56	R 55	48	48	R 51	60	A	A U R 48	56	57	A	60	62	62	R 50	A	62	64	69	Z 74	74	74	69	
20	66	65	61	59	62	U R 55	54	57	59	62	62	65	66	61	62	63	A	64	68	70	73	72	69	68	
21	62	61	F 59	F 56	F 56	56	58	A	R 72	71	71	75	70	69	66	66	64	60	63	73	76	76	76	70	
22	66	64	60	58	61	Z 62	68	71	68	69	66	60	64	63	62	63	62	63	A	72	81	78	75	60	
23	U R 59	59	58	54	52	58	63	58	A	A	59	64	64	59	59	54	54	56	62	69	75	71	70	61	
24	56	55	54	52	49	55	59	63	64	58	59	60	R 59	62	59	56	53	55	62	75	71	62	49		
25	A	58	F 50	48	U R 46	51	62	A	A	A	U R E G 58 53 45	A	51	54	56	A	A	U A 58	67	66	66	66	55		
26	F 56	52	50	44	42	44	43	A	54	56	A	60	U R U R 54 52	55	62	58	56	57	58	65	68	F 61	F 70		
27	F 60	R 49	F 49	48	R 53	56	63	57	A	A	A	A	A	J R 58	54	A	58	58	61	67	71	73	69	F 63	
28	58	F 57	F 54	56	56	61	61	A	58	57	A	A	A	62	A	55	57	57	A	A	75	71	71	66	
29	64	F 58	58	53	49	48	51	57	57	61	57	55	61	57	J R 57	59	61	61	61	61	63	F 64	69	64	
30	F 62	61	60	60	56	47	60	68	76	74	71	A	62	A	68	U R 75	69	66	U R 65	74	R 83	82	74	71	
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	23	23	24	27	25	25	28	26	28	26	26	23	28	29	29	30	30	
MED	66	62	60	58	56	61	63	66	64	62	59	61	62	61	62	62	63	63	65	70	74	74	72	70	
U Q	70	67	63	63	62	65	69	71	71	70	66	66	66	65	65	66	66	65	68	74	76	78	76	74	
L Q	61	58	56	52	50	55	58	58	58	57	57	58	56	58	59	59	58	58	61	64	72	71	69	64	

JUN. 2012 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 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	360	416	436		A	488	496	500		A	U	A	496	484	U	L	U	L	A	A
2						L	L	A		U	A	484	496	496	508	504	508		A	U	L	A	A		
3						U	L		A	A	468	496	496	496	496	484	472		A	U	L	A	A		
4						L	L	A			L	A	A		U	A	A		A	A	A	L			
5						276	388	404		448	448	488			U	Y	A	A	A	A	A	L	A		
6						U	L		A	A	R	U	R		U	Y	A	A	A	A	A	L	A		
7						272	360	424		A	A	R	488	488	496	484	452	472	468		A	L	A		
8						L	A	A	A		476	484	488	492	492	492	480	480	444	444	448	A			
9							A	A	U	A	A	U	A	R	R	U	R		A	U	A	L	A	A	
10						L	L		456	484	500	520	516	528	496		A	L		472	A	A	A		
11						U	L	A	L		U	A	500	512	508	504		A	A	A	L	A			
12						L	U	L	L		468	480	492	524	520	516	512	516	512	484	464	A	A	A	A
13						L	U	L		484	488	484		A	A	U	A	R	L	L	A	A	A	A	
14						U	A	A	A		488	488	504	508	504	500	500		L	A		L	L	L	
15						L	L		420	460	464	516		504	508	480	480	468		L	U	R	L	L	L
16						L	L		U	L	L	U	A	A	Y	L		A	U	L	A				
17						U	L	L	U	A	A	A		476	484	456	448	448	448	436	384	L			
18						L	328	368		A	A	Y	A	A	A		Y		U	L					
19						304	344		A	A	A	444	464		A	U	A	A	468	432	392	A			
20							L		A	A	A		U	A	U	A		U	A	A		436	392		
21								A	A	U	A	U	A	476	468	472	484	488		L	U	U	L	L	L
22							U	L		456	476	488	488	488	488	488	464	448	404		U	A	A		
23						280	336		A	A	A	A		U	A		U	L	L		U	L			
24							A	A	A	A	A	A		444	464	460	464	460	400	408	388	L			L
25							A	A	A	A		440	464	452		A	U	A	U	A		A	A		A
26						U	L		A	R	A	A	A		464	448	448		A	U	A				
27						A	A	A	A	A	A	A	A		468		A	A	A		U	L			
28							A	A	A	A	U	A	A		A	A	A		444	436		A	A		A
29						L	U	A		A	R	A	U	Y	A	U	R	U	A	U	A	L	A	A	
30						L	L	A	A	A	R	A	A		A	A	A		432	A	A	A	L		L
31						320	440				464											280			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT					7	14	15	9	14	17	21	19	21	25	21	20	21	18	6	1					
MED					276	360	416	452	476	488	488	484	484	484	480	470	452	436	388	280					
U Q					284	368	424	456	484	492	502	500	504	500	494	482	472	448	392						
L Q					268	336	400	436	452	464	468	472	466	464	466	458	438	408	384						

JUN. 2012 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 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					A	232	268	300	328	356	U A	A	A	A	U A	U A	A	320	276	236	B				
2					B	240	272	328	332	U A	U A	A	A	A	368	344	316	268	220	A					
3					A	236	272	316	352	A	360	356	360	364	U A	U R	A	A	240	A					
4						184	220	268	296	324	344	352	388	388	364	344	320	280	216	184					
5					A	224	264	292	328	U A	U R	R	A	A	U A	A	A	308	280	240	A				
6					U A	156	216	284	328	U A	U A	A	U A	348	372	356	344	320	276	U A	A				
7					B	236	288	316	340	A	A	A	U R	380	364	356	348	328	292	252	164				
8						172	236	272	308	332	A	352	U A	U A	A	364	360	324	284	232	A				
9							276	312	332	356	372	A	A	A	U A	A	A	U R	U A	A	A				
10						188	224	292	316	348	356	356	360	U R	A	340	332	284	220	U A	A				
11						160	236	288	328	344	364	U A	U A	A	A	A	A	A	292	248	A				
12					A	240	276	324	336	352	U A	U A	A	U R	A	360	348	336	316	244	A				
13						176	232	280	312	U A	352	356	368	376	A	368	360	332	288	212	A				
14					A	248	284	324	U A	U A	A	A	A	R	A	A	360	328	292	244	A				
15						180	232	284	320	344	356	U R	U R	U R	360	348	332	324	292	228	A				
16					U R	164	236	284	308	352	356	U R	A	R	R	320	312	A	240	A					
17						172	228	276	320	344	360	U A	U A	U R	364	356	344	312	280	236	A				
18						172	208	256	308	328	336	U A	A	372	356	352	A	308	284	232	A				
19					A	240	268	312	U A	U A	340	A	U A	A	A	A	U A	336	292	A	A				
20						160	200	284	308	336	348	U A	U A	A	A	U A	336	320	A	A	A				
21					A	220	268	304	332	344	360	U A	A	A	A	A	A	320	A	A	A				
22						168	248	280	304	312	332	332	A	U R	356	348	348	320	276	224	A				
23						160	216	U A	280	304	328	U A	344	352	A	A	336	292	A	A	A				
24					U A	168	196	264	292	312	328	U A	A	A	A	A	U A	292	272	244	180				
25					A		264	300	336	348	352	U A	356	356	344	A	U A	324	280	A	A				
26						164	208	264	300	316	336	A	A	A	360	348	332	A	A	A	A				
27					U A	252	A	A	U A	U A	U A	A	A	A	356	352	332	308	276	236	A				
28					A	228	280	304	328	340	356	A	A	A	A	A	A	324	280	232	A				
29						156	228	268	312	324	344	A	A	R	A	R	A	A	304	A	A				
30					A	240	284	316	332	352	U A	A	A	A	A	348	340	324	300	U A	U A	176			
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	28	29	29	30	27	23	17	14	17	21	19	27	23	24	4					
MED					168	232	276	312	332	348	360	U A	362	360	356	344	320	284	234	178					
U Q					174	238	284	318	340	356	364	U R	370	376	364	362	348	328	292	242	182				
L Q					160	220	268	304	328	336	352	U A	356	356	356	348	336	312	276	222	170				

JUN. 2012 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN.2012 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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	30	J A	J A	J A	18	27	35	J A	J A	J A	J A		J A	J A	J A	J A	J A		J A	J A	J A	J A	J A	J A	J A
2	E B	B E	B E	B E	B E	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
3	E B	J A	J A	J A	20	27	39	J A	J A								J A	J A	J A	J A	J A	J A	J A	J A	J A
4	E B	B E	J A	J A	23	26	36	J A	J A								J A	J A	J A	J A	J A	J A	J A	J A	J A
5	E B	J A	J A	J A	J A	25	27	33	J A								J A	J A	J A	J A	J A	J A	J A	J A	J A
6	28	E B	B E	J A	23	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	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	J A	J A	J A	J A
8	21	J A	J A	J A	G	35	63	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	J A	J A	J A	J A	J A	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	31	33	21	19	G	30	J A	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	G	33	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
12	J A	J A	J A	J A	G	30	37	J A	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	G	31	53	J A	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	38	66	J A	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	19	30	34	J A	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	B E	B E	B E	18	26	32	35	35	44	41	50	62	44			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	G	30	34	J A	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	19	25	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
19	J A	J A	J A	J A	20	34	J A	J A	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	18	25	39	J A	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
22	E B	B E	B E	B E	G	18	34	J A	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	E B	J A	J A	J A	G	27	J A	J A	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	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	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	J A	J A	J A	J A	J A
26	J A	J A	J A	J A	G	27	30	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	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
29	E B	J A	J A	J A	G	26	J A	J A	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	J A	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																									
H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	30	30	30	30	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	19	30	40	J A	J A	J A	J A	46	47	48	44	42	52	46	44	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	J A
L Q	E B	B E	B E	B E	G	27	34	46	42	41	41	40	40	40	40	39	36	35	37	30	J A	J A	J A	J A	J A

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 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	18	E B	E B	E B	17	26	32	36	A A	47	46	41	54	49	42	43	39	35	56	55	31	17	28	E B				
2	E B	E B	E B	E B	15	G	28	50	43	50	44	40	40	51	A A	41	49	44	A A	41	22	18	E B	E B				
3	E B	13	21	19	13	18	26	33	44	51	39	38	U Y	G	G	38	38	A A	104	30	59	49	38	30	E B	E B		
4	E B	E B	E B	E B	G	13	24	29	44	41	39	G A	A U	Y	45	48	U Y	44	40	53	38	G E	E B	E B	E B			
5	E B	E B	E B	E B	16	25	28	42	36	35	G	G	U Y	38	49	99	52	A A	78	30	48	38	36	22	18	E B		
6	12	E B	E B	E B	20	30	36	49	49	42	40	40	40	U Y	G	40	A A	77	48	A A	44	35	23	26	24			
7	41	51	30	20	20	40	42	58	40	40	39	38	38	42	41	40	G	32	46	50	51	51	21	20				
8	E B	E B	18	15	G	28	41	48	55	55	38	38	48	44	44	50	53	A A	113	26	53	30	46	51	E B			
9	16	15	41	34	31	52	A A	66	46	A A	71	49	49	44	44	44	48	36	49	41	42	28	23	14	17			
10	22	17	16	E B	G	27	39	37	40	40	40	U Y	39	39	39	54	44	38	A A	A A	A A	A A	E B	16	16			
11	13	16	12	12	G	29	30	47	40	40	52	44	37	38	38	36	32	31	38	30	26	26	22	E B				
12	E B	E B	E B	E B	18	24	32	37	37	40	43	43	43	G	42	A A	67	48	88	115	61	A A	98	50	18	18		
13	18	18	13	G	27	29	35	35	42	52	55	A A	90	56	U Y	40	40	40	52	58	48	48	31	19	22			
14	42	A A	E B	19	20	36	65	A A	98	40	38	43	39	41	G	38	56	39	39	29	20	20	20	20	18			
15	22	E B	E B	E B	G	28	32	37	46	50	42	54	U Y	40	24	37	37	34	31	31	20	E B	E B	E B	E B			
16	22	E B	E B	E B	G	G	G	G	G	27	43	40	48	60	U Y	G	41	42	41	41	36	33	16	E B	E B			
17	E B	E B	E B	E B	G	27	32	41	45	A A	63	45	40	43	40	37	G	32	G	G	20	18	14	14	22	38		
18	A A	87	17	A A	A A	22	24	53	47	A U	Y A	A A	A A	90	49	39	38	37	25	26	28	29	36	55	12	12		
19	17	E B	E B	E B	17	26	48	A A	A A	A A	39	39	52	A A	67	46	58	41	36	39	43	30	30	21	E B	E B		
20	E B	E B	E B	E B	16	24	33	44	46	54	54	48	47	40	42	49	A A	69	37	25	39	35	26	41	E B			
21	E B	13	18	18	26	25	25	47	A A	90	60	46	50	41	44	41	34	34	G	22	26	28	20	18	19	18	22	
22	E B	E B	E B	E B	G	G	14	29	32	32	35	36	36	35	38	39	22	34	38	A A	47	39	16	18	E B			
23	E B	E B	E B	E B	G	24	43	43	A A	A A	A A	41	46	G	34	33	28	G	G	24	29	29	26	28	18	17	16	
24	E B	12	16	12	14	28	41	44	47	51	51	39	39	U Y	39	39	34	33	30	26	19	E B	12	20	17	20		
25	A A	E B	14	15	18	38	30	53	A A	A A	A A	A A	40	41	G A	A A	50	44	44	33	A A	A A	A A	50	50	42	41	34
26	18	E B	E B	E B	G	23	24	49	37	46	A A	65	52	38	38	38	54	34	37	36	36	18	44	26	26			
27	20	20	17	14	48	48	59	48	A A	A A	A A	A A	A A	A A	45	53	A A	64	52	32	28	31	30	30	18	17		
28	20	41	26	26	24	32	44	67	A A	48	115	47	74	A A	71	56	A A	62	51	23	30	A A	A A	A A	40	18	25	17
29	E B	14	17	24	23	24	35	44	40	38	48	48	34	U G	49	40	45	45	36	39	42	51	27	42	15			
30	41	20	E B	15	16	17	26	36	50	59	50	43	A A	68	54	A A	97	49	50	33	42	43	21	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	29	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	E B	E B	E B	G	26	34	45	46	44	43	44	42	41	40	42	37	37	41	38	30	22	18	16				
U Q	22	18	18	18	20	29	43	A A	A A	A A	A A	A A	50	52	49	49	49	50	48	48	59	49	39	30	25	20		
L Q	E B	E B	E B	E B	G	24	29	41	40	40	40	39	38	38	38	37	G	33	30	29	26	E B	E B	E B	E B			

JUN. 2012 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 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	13	12	12	12	12	12	11	11	11	14	14	14	14	14	14	14	14	16	10	11	11	11	11	11
2	13	13	13	13	15	15	14	14	16	15	15	15	15	15	15	15	17	16	16	16	12	11	11	11
3	13	13	13	13	13	12	12	12	12	15	16	15	14	14	14	14	14	14	12	12	12	12	12	12
4	13	15	15	15	12	12	12	13	13	13	15	15	15	15	15	14	14	14	14	14	14	14	14	14
5	12	12	12	12	12	12	12	12	12	12	20	18	17	26	20	16	16	14	11	11	11	11	11	14
6	12	13	13	13	12	11	10	13	12	12	17	16	16	16	16	15	15	12	10	10	10	13	12	12
7	13	12	13	12	12	12	12	12	14	14	14	15	15	16	15	15	15	12	12	11	11	12	11	11
8	15	15	15	15	13	14	14	14	13	13	20	22	14	27	20	16	16	16	12	12	12	12	12	12
9	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	13	12	12	11	12	14	14	14	14
10	14	15	14	14	14	14	14	14	15	15	17	16	16	18	18	17	19	14	15	14	14	14	15	15
11	12	13	12	12	12	12	12	14	16	16	16	16	16	15	15	15	17	16	15	14	14	14	12	11
12	15	15	15	15	14	14	13	12	11	13	17	15	19	18	17	18	15	15	15	15	13	12	12	12
13	13		13	13	13	14	14	14	14	16	16	16	27	18	17	17	17	15	15	13	15	15	15	16
14	13	13	13	13	14	14	14	14	14	15	16	21	21	21	18	16	16	15	13	10	11	11	12	13
15	14	14	14	14	15	13	13	12	16	16	16	15	15	15	15	16	15	15	11	11	15	15	15	14
16	15	15	13	14	14	14	14	14	15	13	13	13	16	18	17	17	16	14	17	12	12	12	12	12
17	12	12	12	15	12	12	12	13	12	12	13	13	13	18	14	14	14	14	15	14	14	14	14	14
18	15	15	15	12	13	13	11	12	12	13	14	14	19	18	16	12	12	14	10	11	12	12	12	12
19	14	14	14	14	14	14	14	14	12	16	17	16	18	18	17	17	16	11	12	12	13	13	13	13
20	12	12	12	12	11	11	12	12	14	14	14	20	20	21	16	16	16	16	14	14	13	12	14	14
21	13	12	12	14	12	12	12	12	14	12	12	14	19	16	16	17	17	15	14	14	14	14	14	14
22	14	14	14	14	11	11	11	11	12	12	19	16	19	19	18	16	15	15	15	13	11	11	13	13
23	15	15	15	15	12	12	12	12	14	11	22	16	14	14	14	14	14	14	15	13	13	12	12	12
24	12	12	12	14	14	14	14	14	11	16	15	15	12	12	12	12	12	12	12	13	12	12	12	12
25	13	14	14	14	14	12	12	12	12	11	16	19	18	15	15	15	15	15	12	16	14	14	14	14
26	12	12	12	12	12	12	12	12	10	17	18	15	16	15	13	13	12	11	13	13	13	13	13	16
27	15	15	14	14	14	14	14	14	14	12	12	14	18	16	16	16	16	15	12	14	13	13	13	15
28	14	14	14	14	14	14	14	14	13	12	13	17	16	18	18	18	17	16	14	9	10	13	13	13
29	14	14	14	12	12	12	12	13	16	15	14	14	14	14	14	14	12	12	12	12	13	12	12	12
30	13	12	15	14	14	14	13	13	16	16	16	24	17	18	15	15	15	15	9	12	12	12	12	12
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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	13	13	13	14	13	12	12	13	13	14	16	15	16	16	16	15	15	14	12	12	13	12	12	13
U Q	14	15	14	14	14	14	14	14	14	15	17	16	18	18	17	16	16	15	15	14	14	14	14	14
L Q	13	12	12	12	12	12	12	12	12	12	14	14	14	15	14	14	14	14	12	11	12	12	12	12

JUN. 2012 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 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

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 295	296	288	279	288	273	322	328	A	R 317	292	280	305	305	307	U R 314	295	308	A	296	307	286	F 289	294	
2	299	296	294	300	292	V 302	307	R	U R 344	R 336	309	302	296	303	A	293	309	299	A	304	R 341	R 303	R 318	288	
3	288	287	300	R 318	290	284	311	302	284	R 296	260	293	R 267	277	283	300	A	R 316	R 295	R 295	313	293	R 303	297	
4	272	274	297	276	261	267	274	286	U R 281	299	G		271	243	253	284	273	291	298	306	289	286	281	267	
5	281	307	304	281	292	284	302	332	U R 255	R 282	Y J R 251	282	G	274	A	287	A	314	286	300	288	290	F 280	F 276	
6	F 272	287	290	262	269	272	294	310	273	293	R 303	265	273	278	300	280	A	278	A	287	277	280	282	287	
7	288	298	288	F 289	V 274	275	282	300	292	253	251	R	273	286	281	275	277	281	295	309	289	F 286	301	299	
8	291	292	283	F 308	F 310	305	310	U R 320	302	315	242	293	250	280	286	300	296	A	287	290	284	279	297	307	
9	302	292	295	F 298	F 292	282	A	306	R	316	312	315	291	276	278	294	296	299	A	305	297	294	293	287	304
10	301	287	275	F 278	F 300	304	323	351	R	336	309	296	298	300	301	305	307	310	A	A	A	290	298	313	299
11	289	289	294	292	295	291	305	308	U R 327	U R 327	U R 336	321	R	317	306	312	285	297	R 293	284	R	R	305	300	308
12	277	274	275	279	291	267	292	270	U R 256	Y 348	275	R	292	304	276	A	289	A	A	R	A	307	292	292	
13	281		281	276	281	269	273	298	278	278	307	302	A	304	325	316	301	306	R	R	301	297	299	277	
14	275	A	281	283	R 285	274	305	A	R 332	321	322	306	283	293	302	293	302	303	308	291	312	301	302	297	
15	290	303	296	300	297	288	330	303	307	295	295	313	313	308	288	304	307	303	305	321	315	313	308	306	
16	290	285	294	295	317	330	296	328	312	313	301	307	314	309	307	308	319	R 286	R 293	J R 313	R 322	U R 322	R 301	296	
17	298	279	305	293	292	304	294	272	256	A	Y 247	248	265	250	283	267	R 283	286	276	296	309	307	275	R 266	
18	A	284	A	A	U R 289	U R 263	276	A	A	Y	A	A	242	G	Y	296	282	297	284	282	288	A	299	297	
19	278	284	R 281	290	274	R 301	301	A	A	U R 256	287	301	A	310	288	297	R 331	A	309	311	308	Z 304	305	295	296
20	281	286	304	312	345	U R 354	307	290	318	R 337	297	307	309	292	303	297	A	295	306	297	313	311	294	297	
21	299	295	F 307	F 323	F 332	Z 330	320	A	R 353	324	318	316	313	314	291	293	303	293	306	302	332	325	326	300	
22	307	300	298	304	318	300	305	324	306	331	323	317	310	312	301	313	313	307	A	293	302	314	312	297	
23	293	U R 297	305	292	290	319	315	332	A	A	322	326	R 324	294	306	290	311	305	317	307	306	310	309	306	
24	296	298	281	288	305	307	296	308	336	319	315	338	302	315	318	314	309	314	307	314	315	325	279		
25	A	309	F 328	292	323	293	314	A	A	A	305	244	U R 270	U R 296	U R 264	295	298	311	A	A	305	295	294	306	
26	F 274	280	332	310	281	335	251	A	291	322	A	270	U R 296	U R 264	295	298	310	315	313	287	287	277	F 309	F 321	
27	F 327	R 284	F 286	279	295	R 289	327	326	A	A	A	A	A	A	323	A	294	307	292	305	304	312	306	F 309	
28	298	284	F 289	286	293	319	314	A	308	A	294	A	A	A	329	A	299	313	314	A	A	312	303	304	304
29	305	314	F 302	306	316	299	297	303	289	327	285	261	296	286	J R 286	314	312	307	311	333	304	F 294	295	316	
30	F 286	287	299	319	323	367	299	286	326	327	328	A	287	A	296	U R 328	305	294	U R 339	289	317	320	280	295	
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	22	23	24	27	23	25	28	25	28	26	26	21	24	28	29	30	30	
MED	290	288	294	292	292	296	305	307	306	316	297	302	292	298	295	298	304	303	305	298	304	303	300	297	
U Q	298	298	303	305	310	307	314	326	327	327	315	315	310	307	306	308	311	308	311	307	313	312	308	306	
L Q	281	284	284	280	288	275	294	298	281	296	275	280	269	278	284	292	295	293	290	292	290	292	292	292	

JUN. 2012 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L	337	355	370		A	A	A		A	A		A	U	L	U	L	A	A	
2							L	L	A		379	A	403	395	398		A	A	371	A	A	A			
3						U	L		A	A		414	382	382	400	R	358	367	372		A	U	L	A	A
4						286	332	351	A		369	L	388		A	A		A	A		357	A	A	L	
5							346		A	U	R	U	R		U	Y	A	A	A	A	L	A			
6						U	L	A	A	A	A	R		395	389	398		A		373	370	A	L	A	
7						L	A	A	A			R		397	372	348	375	372	375	L	U	L	A	A	
8							L	A	A	A	A		398	399	425	372	355		A	A	A	L			
9							A	A	A	A	A	A		421	R	A	U	R	A	A	L	A	A		
10						L	L				L	L			L		A	L			A	A	A		
11							U	L	A	L		A		380	383	386	370	362	338	330	L	A			
12						L	U	L		L		A		L		A	A	A	A	A	A	A	A		
13						L	U	L		R		A		A	A	A		R	L	A	A	A	A		
14							A	A	A								L	A			L	L	L		
15						L	L			A	A	R		A		Y	L	A	A	U	L	A			
16							L	L	U	L		L		A	A	Y	L	A	A	U	L	A			
17						U	L	L	L	A	A	A		372	414	406	384	362	356	334	322	L			
18						L	347	347		A	A	Y	A		A	A	Y		401	368	379				
19						310	357		A	A	A	400	394		A	A	A	A	A	L	A	A			
20							L		A	A	A	A	A		A	A	A	A	A	A	A	A			
21									A	A	A	A	U	R	A				L	U	L	U	L	L	
22							U	L			R		406	366	379	364	357	356	351	351	A	A			
23						308	353		A	A	A	A	376	A	405	387	379	376	358	339	353	U	L		
24							335		A	A	A	A	A	R	Y			U	L	U	L	L	L		
25									A	A	A	A	419	367	432				A	A	A	A			
26						U	L		A	A	A	A	A		A		A		A	A	U	L			
27						304	379	363		352				381	394	394		361			U	L			
28						A	A	A	A	A	A	A	A	A	A	A	A	A	A	345	347	A	A		
29						L	A		A		R	A	A	U	Y	A	U	R	A	A	A	A	A		
30						L	L		A	A	A	A	A	A	A	A	A	A	A	329	A	A	L		
31						427	327					386						400					369		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						7	13	15	6	13	13	18	16	18	18	19	14	20	15	6	1				
MED						310	347	353	372	379	393	391	396	398	382	375	370	361	345	344	369				
U Q						U	L		L			R	U								U	L			
L Q						304	336	345	346	365	376	376	381	380	372	367	362	354	334	341					

JUN. 2012 M(3000)F1 (0.01)

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JUN. 2012 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					L 328	370	282	282		A 314	372	386	360	360	360	360	354	296		A 302				
2						H 218	224	246	272	272	300	346	346	346		A 326	308	318		A				
3							328	330	342	346	378	482	392	446	402	376	348		A	E 356	A 382	A 308		
4							356	358	332	332	404	380		L 468	526	510	406	406	358	298	282			
5								A 328	312	542	410	E 554	Y 414		G 424	A	A 404		A	308	362			
6							322	358	322	322	418	392	378	454	438	438	386	378		A	L 368			
7							A 348	A 348	A 348	A 348	368	514		Y 512	472	392	400	414	L 344	A 364	A 326			A
8								A 286	A 280	A 302	A 346	A 346	576	378	Y 562	412	412	378	E 358	A				A 344
9							E 348	A	A 310		A 290	320	328	Y 376	Y 444	400	352	334	A 290	A 290				
10																								
11																								
12																								
13																								
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30																								
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					14	25	25	23	23	24	26	24	26	28	25	28	26	26	20	10				
MED					322	308	322	312	341	312	358	364	392	373	357	354	336	334	310	290				
U Q					366	356	335	344	402	379	416	434	452	418	398	388	356	350	328	304				
L Q					312	280	289	284	292	293	320	335	336	335	329	328	322	314	300	282				

JUN. 2012 h'F2 (KM)

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IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 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	262	260	260	268	268	262	262	A	A	A	A	A	A	A	A	A	A	A	A	A	A	262	262	282	240
2	242	242	246	252	252	200	218	A	A	A	A	244	186	186	A	A	A	A	A	A	266	242	242	230	246
3	258	274	260	224	230	230	266	A	A	A	196	214	214	202	216	222	234	A	A	A	274	274	252	252	
4	282	282	268	268	308	248	248	A	A	A	272	232	204	A	A	A	A	A	A	A	282	266	260	260	304
5	252	258	246	284	284	242	242	A	A	A	226	212	196	196	224	A	A	A	A	A	274	282	282	282	290
6	304	280	280	300	288	288	288	A	A	A	242	190	190	190	A	216	236	A	A	A	312	316	298	298	290
7	A	A	318	272	284	A	A	A	A	A	222	206	200	200	200	284	226	226	226	226	A	A	A	A	256
8	270	270	298	272	260	260	A	A	A	A	220	210	210	240	280	A	A	A	A	A	272	322	298	250	
9	238	256	336	288	284	A	A	A	A	A	A	212	A	256	A	A	A	A	A	A	298	268	268	266	264
10	262	264	264	270	268	232	268	226	216	208	208	208	230	204	A	A	A	A	A	A	286	270	254	254	
11	254	264	264	264	262	248	230	A	230	212	A	212	212	212	208	208	208	248	A	A	252	252	274	252	252
12	254	272	268	268	A	260	248	248	230	230	272	266	244	282	282	A	A	A	A	A	A	A	A	A	280
13	280	A	268	302	290	268	238	238	224	272	A	A	A	A	A	266	252	284	A	A	284	284	264	286	
14	A	A	290	276	270	A	A	A	A	A	212	194	214	190	210	210	A	A	A	A	256	256	262	262	
15	262	256	256	256	270	228	224	A	A	A	222	A	222	208	208	208	208	208	206	258	258	242	246	246	
16	282	276	276	272	270	212	212	212	212	212	212	A	A	Y	210	A	A	A	A	A	264	262	254	254	
17	252	262	256	258	264	264	238	A	A	A	A	238	212	216	216	220	220	228	244	272	270	266	264	A	
18	A	304	A	A	318	260	252	A	A	Y	A	A	A	A	A	222	220	214	214	258	330	328	260	274	
19	274	274	278	278	278	262	A	A	A	A	208	208	A	A	A	A	268	226	A	A	244	294	258	258	258
20	274	274	256	236	236	236	248	A	A	A	A	A	A	A	A	212	A	A	A	A	248	252	252	312	246
21	250	264	264	264	262	218	A	A	A	A	A	218	218	204	204	204	204	212	248	268	246	246	246	246	
22	262	256	256	256	250	236	234	232	232	214	214	188	188	204	194	206	206	A	A	304	282	232	232	232	
23	256	256	256	264	264	252	A	A	A	A	A	A	192	192	192	192	200	238	244	248	248	248	240	238	
24	258	270	270	270	268	262	A	A	A	A	A	194	A	254	224	224	224	224	224	238	238	238	228	282	
25	A	262	262	252	252	248	A	A	A	A	230	196	A	A	A	A	228	A	A	A	338	306	306	302	
26	294	294	264	264	264	234	234	A	A	A	A	A	A	A	A	A	230	A	284	284	270	312	302	284	
27	248	270	272	286	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	266	264	262	262	
28	286	A	308	308	270	A	A	A	A	A	A	A	A	A	A	A	226	264	A	A	264	264	272	258	
29	248	248	296	282	258	256	A	A	A	A	242	204	A	A	A	A	A	A	A	A	346	310	310	260	
30	A	274	270	250	226	212	A	A	A	A	A	256	A	A	A	A	202	A	A	A	220	236	232	272	272
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	28	25	17	6	12	14	16	16	17	18	18	14	20	15	11	20	28	29	30	30	
MED	262	267	266	268	267	242	238	234	226	212	212	209	210	214	213	218	222	230	246	266	266	263	262	258	
U Q	282	275	279	280	281	261	257	238	236	230	222	216	223	254	226	236	229	250	258	283	283	291	282	282	
L Q	253	259	258	257	259	231	232	226	219	206	206	192	194	210	208	208	208	214	244	250	252	250	252	250	

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JUN. 2012 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						110	110	110	100	100	100	100		A	100	100	100	100	100	B				
2					B	106	100	100	100	100	100	100	100		100	100	100	100	100	A				
3						106	106	106	106	A	106	104	104	104	104	104	104		104	A				
4					126	126	106	106	106	106	106	106	106	106	106	106	106	106	106	118				
5					A	106	106	106	106	106	106	106	106		A	A			106	106	A			
6					108	108	108	108	108	108	108		108	106	106	106	106	106	106					
7					B	106	106	106	106	A			106	106	106	106	104	104	104	108				
8					124	124	106	106	106		106	106	106	106	106	106	106	106	106					
9						106	108	106	106	106				A	106	A	108	A	108	A				
10					136	128	112	112	112	108	108	108	108	108	108	108	108	108	108	A				
11					124	124	112	110	110	108	108	108		A				108	108					
12					A	108	108	108	108	108	108	108		108	108	112	112	112	112	A				
13					118	118	116	112	112	112	112	112	112	112	112	112	112	112	112	A				
14						112	112	112	108	108	A	A	A	108		108	108	108	108	A				
15					146	126	110	110	108	108	108	108	108	108	108	108	108	108	108					
16					130	130	122	116	114	110	110	110		110	110	110	110		110	A				
17					132	132	102	102	102	102	102	102	102	102	102	102	102	102	120					
18					140	126	112	108	108	110	108		A	108	108	108	108	108	108					
19						108	108	108	108	108			A	106		A	106	106						
20					120	120	118	114	114	108	108	108		A	A	108	A	108	A	A				
21					A	108	108	110	104	104	104		A				114	A		A				
22					130	130	118	116	112	114	108	108	108	110	110	110	110	110	110	A				
23					134	134	114	114	108	108	A	108	108	108	108	108	108		A		A			
24					120	120	118	108	108	108	108		A	A	108		108	108	108	120				
25						120	108	108	108	108	108	108	108	108	108		108	108		A				
26					116	116	116	116	106	106			A	A	106	106	106			A				
27						106	A		106	106	106		A	A	106	112	110	110	112	112	A			
28					A	114	112	110	112	108	108		A	A	A			110	114	114	A			
29					114	114	114	110	110	108	108		A	A	108		A	108						
30					A	126	116	110	108	108	108			A	108	108	108	108	108	114				
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	27	29	29	30	27	25	18	16	19	23	20	26	23	23	4				
MED					125	118	112	108	108	108	108	108	107	108	108	108	108	108	108	116				
U Q					133	126	116	112	110	108	108	108	108	108	108	109	110	108	110	119				
L Q					119	108	106	107	106	106	106	104	106	106	106	106	106	106	106	111				

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JUN. 2012 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

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	100	100	124	124	124	124	112	114	114	108	108	98	98	108	108	108	108	108	108	108	108	108	B
2	B	B	B	B	B	G	180	114	114	114	114	114	110	108	108	108	108	108	114	124	118	118	B	102
3	B	102	102	B	132	132	116	116	112	112	116	G	G	G	116	144	114	114	118	118	118	114	114	B
4	B	B	132	126	124	134	120	116	116	116	G	128	130	126	118	118	118	108	108	G	B	B	B	108
5	B	120	120	120	118	118	118	112	112	112	G	G	112	112	112	112	112	144	132	120	114	114	110	110
6	94	B	B	120	120	120	114	112	112	104	104	104	104	126	G	126	118	116	108	138	100	122	122	122
7	116	114	108	108	108	108	108	108	108	108	108	108	120	120	120	120	G	120	118	116	112	110	110	106
8	102	102	102	102	G	118	118	118	106	106	106	106	106	118	128	122	122	114	114	104	102	102	102	102
9	102	102	102	100	100	112	112	112	106	106	106	106	106	106	106	102	102	108	108	108	108	108	108	108
10	108	106	100	106	G	120	120	120	120	120	120	120	120	120	108	108	108	108	108	108	112	112	112	112
11	102	102	B	B	G	134	134	112	112	112	112	112	110	110	110	110	110	120	120	120	118	118	108	108
12	100	100	102	102	124	124	120	118	118	118	110	110	110	G	124	124	124	120	118	118	118	114	106	102
13	98	98	B	G	118	118	118	118	118	118	112	112	108	108	110	114	114	114	114	104	104	104	104	104
14	96	96	102	102	102	112	112	108	108	108	108	108	108	G	108	116	116	116	138	128	106	106	106	106
15	102	B	102	B	120	120	122	122	122	116	116	114	114	104	108	178	142	112	112	120	B	B	108	108
16	110	B	B	B	116	116	132	132	108	108	122	112	112	118	G	118	112	112	112	112	112	108	B	B
17	108	102	94	B	G	110	114	114	114	114	114	114	114	114	114	G	114	G	114	124	B	B	124	120
18	114	114	116	116	116	132	132	114	114	114	114	108	108	108	114	114	114	126	122	120	104	102	102	102
19	102	B	124	148	132	132	120	114	110	110	110	110	110	110	110	110	114	122	96	96	100	100	100	100
20	96	B	B	96	96	136	112	112	112	104	104	104	104	104	104	104	102	102	102	122	94	94	94	B
21	94	124	124	92	114	120	118	114	114	114	112	112	108	108	108	104	102	102	102	102	102	116	114	100
22	106	B	B	B	G	106	116	116	116	116	112	112	112	156	172	98	142	130	114	112	112	112	106	106
23	B	106	102	102	G	120	116	116	116	102	102	102	G	102	102	102	102	102	100	108	108	108	108	108
24	96	96	96	104	G	104	104	104	104	104	104	186	174	162	104	112	112	184	178	124	122	108	108	108
25	108	106	100	110	106	106	110	110	110	110	110	110	G	110	110	130	130	118	118	156	110	106	106	106
26	136	106	B	B	G	122	122	120	120	110	110	110	116	116	116	112	112	112	112	112	112	112	112	108
27	108	108	104	104	92	106	106	106	104	104	104	104	104	118	128	122	122	122	120	108	106	106	104	104
28	104	104	104	102	102	114	114	114	114	106	106	106	106	106	106	126	112	132	122	118	118	118	114	112
29	B	96	96	96	G	118	118	112	112	112	110	104	104	104	130	98	114	114	114	114	112	108	108	108
30	94	94	116	104	102	206	122	118	114	114	114	110	110	110	120	112	116	116	116	188	118	B	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	24	21	23	21	19	29	30	30	30	30	28	28	27	27	28	29	29	29	30	29	27	27	26	25
MED	102	102	102	104	116	120	118	114	113	112	110	110	110	110	110	112	114	114	114	118	112	108	108	108
U Q	108	107	116	118	124	128	122	118	116	114	114	112	114	118	119	122	118	121	118	123	118	114	112	108
L Q	97	100	100	102	102	112	114	112	110	106	106	106	106	106	108	108	109	108	108	108	104	106	106	103

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2012 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F5	F1	F1	FF11	C2	C2	C2	C2	C2	C2	C2	C2	C1	CQ21	CQ11	C1	C2	C2	C2	C4	L7	F8	FQ11	F6		
2							H1	C1	C1	C2	C1	C1	C1	C2	C2	C2	C2	C2	C4	C4	CLQ24	F2	F2		F2	
3		F4	F2		C2	C2	C2	C2	C2	C1	C1				C1	HC11	C2	CQ31	C3	C4	F5	F5	F1			
4			F1	F2	L2	CL21	CL21	C3	C1	C1		C1	C1	C1	C2	C2	C2	C3	C3			F1			F1	
5		F1	F1	F1	L2	C1	C1	C2	C1	C1			C1	CL21	CL32	CL22	CL22	HL22	C3	C3	F5	F3	F3	F3	F2	
6	F2			F1	C3	C3	C2	C2	C2	C1	C1	C1	C1	C1		C1	C2	C3	CQ61	HCQ13	F5	FQ21	FQ31	FQ23		
7	F4	F4	FQ41	F4	L3	C6	C2	C2	C1	C1	C1	C1	C1	C1	C1	C1		C2	C3	C3	F6	F5	F5	F5		
8	F1	F1	F2	FF11		C2	C2	C2	C3	C2	C1	C1	C1	C1	C1	C2	C3	C4	CQ31	C4	FQ31	F6	FQ41	F1		
9	F3	F3	F7	F4	FQ21	CL22	C3	C2	C2	C2	C2	C1	C1	C1	C1	CQ11	CH21	CL22	C3	C3	F5	FQ31	FQ31	F4		
10	F3	F3	F2	F1		C2	C3	C3	C1	C1	C1	C1	C1	C1	C2	C2	C1	C4	CQ41	L8	FF26	FQ41	F3	F2		
11	F2	F3				C2	C2	C2	C1	C1	C2	C2	C1	C1	C1	C1	C1	C1	C3	C3	F6	F31	F31	FQ11		
12	F2	F3	F1	F1	C2	C2	C2	C2	C1	C1	C1	C1	C1	C1	C1	C3	C3	C3	C4	C6	F5	F5	F3	F3		
13	F3		F2			C2	C2	C1	C1	C1	C2	C2	C2	C2	C1	C1	C2	C2	C4	C4	FF14	F4	F2	FF23		
14	F3	F3	F2	F3	C2	C2	C3	C4	C1	C1	C1	C1	C1	C1	C1	C2	C1	C2	C2	C3	F3	F3	F3	F3		
15	F3		F2		L1	CL11	C1	CL21	C1	C2	C1	C1	C1	C1	C1	HC11	H1	C1	C3	C3			F1	F3		
16	F3				L1	L1	HL21	HL11	L1	C1	C1	C1	C1	C1	C1		C2	C2	LQ31	C3	F4	F3				
17	FF11	F2	FF11			CL22	C2	C2	C2	C1	C1	C1	C1	C1	C1		C1		L1	LC11			F3	F5		
18	FFQ12	FFQ23	F3	F7	L1	C2	H1	C2	C2	C1	CLQ21	CQ11	C1	C1	C1	C1	LC11	CL11	CL32	C5	F5	F8	F2	F2		
19	F3		F1	FF11	C2	C3	C3	C3	C2	C1	C1	C2	C1	C2	C3	C2	C2	C2	L4	L3	F4	F3	F1	F1		
20	F1			F1	L1	CL11	C3	C2	C1	C2	C1	C1	C1	C1	C2	C2	C4	C2	CL22	CLQ43	F3	F4	F5			
21	F2	FF22	FF32	FF32	CL12	CL22	CL31	C2	C3	C1	C2	C1	C1	C1	C1	C1	L1	L1	L3	L3	F2	FF22	FF51	F3		
22	F1				L2	C2	C2	C2	C1	C1	C1	C1	C1	HL11	HL11	L1	H1	C3	C4	C4	F5	F3	F3	F1		
23		F1	F2	F1		CL21	C2	C2	C2	C2	C1	C1		C1	C1	L2	LC11	L2	L3	L4	F5	F3	F2	F2		
24	F2	F3	F1	F1		C3	C3	C2	C2	C2	C2	HL11	HL11	HL11	L2	CL11	CL21	HL11	HL11	L1	F1	F3	F1	FQ41		
25	FQ31	FQ31	F4	FF13	F3	L3	C2	C2	C3	C3	C1	C1		C1	C2	C1	CL11	CL12	C3	LQ41	HL25	F5	F5	F5		
26	FF11	F1				C2	C1	C2	C2	C2	CQ11	C1	C1	C1	C1	C2	C2	C2	CL23	C6	F3	F7	FQ41	FQ41		
27	F4	F3	F3	F2	L3	C3	C2	C2	C3	C2	C2	C2	CL31	C2	CL21	CL21	C2	C3	C3	C3	F4	F4	F3	F5		
28	F4	F6	F3	F5	L3	C4	C2	C2	CL21	C4	C1	C3	C2	L2	L2	HCQ12	L1	CL21	C6	C3	F5	FQ21	F3	F2		
29		F4	F5	F5		C1	C3	C2	C2	C1	C2	C3	L1	L1	HL12	L2	CL23	CL13	CL33	CL23	FF33	F4	F4	F3		
30	F5	F3	FF21	F4	L2	HL11	C2	C2	C2	CQ11	C1	LQ11	C2	C2	C1	C1	C1	C1	C2	CQ31	H1	F1				
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																										

JUN. 2012 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 f_{XI} (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	83	X 83	X 76	X 68	X 66															X 87	X 89	X 84	79	X 76	
2	80	81	68	68	67															X 96	X 92	X 84	84	X 82	
3	X 81	X 76	X 82	X 73	X 67															X 80	X 78	X 77	X 80	X 84	
4	X 79	X 73	X 76	X 74	X 69								A							X 80	X 73	X 81	83	82	
5	90	X 73	X 74	X 56	X 58															X 76	A	75	X 78	X 77	
6	X 75	X 76	X 65	X 63	68															X 78	X 85	X 82	X 85	X 84	
7	85	X 87	X 82	X 81	X 70															X 76	X 75	X 79	X 80	X 82	
8	X 80	79	76	71	68															X 87	X 97	X 96	X 94	96	
9	X 83	X 72	X 65	X 67	X 64															X 98	X 95	X 94	X 98	X 94	
10	94	96	88	83	86															A	X 94	X 94	X 93	X 84	
11	X 85	88	87	85	84															X 111	X 97	X 90	X 98	X 104	
12	109	100	102	101	93															X 84	X 81	X 82	X 77	X 82	
13	84	80	78	74	67															X 92	X 81	X 76	X 79	X 82	
14	X 81	X 81	X 82	X 74	X 68															X 82	X 87	X 88	X 90	X 94	
15	X 94	X 92	X 90	X 85	X 76															X 96	X 92	X 80	82	85	
16	X 80	X 78	X 76	X 74	X 73															X 102	X 97	X 94	X 94	X 89	
17	X 88	X 82	X 83	X 72	X 65															X 81	X 87	X 84	X 80	X 76	
18	X 76	85	103	65	72		68													X 62	X 64	X 67	X 64	X 63	
19	X 62	67	65	X 61	X 56															X 101	A	X 73	77	75	
20	74	74	76	66	56															X 96	X 88	X 74	X 72	X 73	
21	X 77	X 73	71	X 70	X 64															A	X 97	X 76	X 72	X 74	
22	X 72	65	69	X 63	X 60															0 84	X 92	X 72	X 67	X 61	
23	66	66	69	68	63															A	A	A	72	68	
24	66	66	64	54	54															A	X 80	X 67	X 60	A	
25	X 61	X 60	51	52	A															X 79	X 80	X 74	X 67	X 70	
26	72	72	73	69	62															X 66	X 72	X 77	X 76	X 69	
27	X 60	X 60	X 57	X 54	X 50															X 86	X 85	X 75	X 75	X 69	
28	X 65	X 64	X 64	67	64															X 78	X 75	X 69	X 71	X 73	
29	75	77	79	72	64															A	X 82	X 78	X 69	X 84	
30	80	X 72	X 72	X 67	X 54															0 94	X 90	X 84	X 80	X 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	30	30	30	30	29		1													25	27	29	30	29	
MED	X 80	X 76	76	X 68	X 66		68													X 84	X 87	X 79	X 79	X 82	
U Q	84	82	82	74	70															X 96	X 92	X 84	X 84	X 84	
L Q	X 72	72	68	X 65	X 61															X 78	X 80	X 74	X 72	X 73	

JUN. 2012 f_{XI} (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	77	70	61	59	59	68	73	74	72	A	73	72	70	69	71	74	78	78	81	83	78	F	70	
2	F	F	F	F	F	59	72	86	89	76	73	77	A	74	80	85	87	88	93	90	86	78	F	76	
3	75	70	F	67	61	65	76	71	66	A	60	63	64	A	68	72	76	74	71	74	72	71	74	78	
4	73	66	F	68	63	66	74	A	A	A	64	A	A	60	A	A	A	76	82	74	67	75	F	F	
5	F	67	68	50	52	62	A	A	65	62	65	64	A	62	70	74	74	72	65	70	A	F	72	71	
6	69	70	59	57	60	60	A	A	69	A	A	R	61	62	70	74	70	A	A	72	79	76	78	78	
7	F	81	76	74	64	60	66	72	71	A	R	61	62	66	69	64	64	72	72	70	69	72	74	76	
8	75	F	F	F	F	65	74	80	79	70	64	A	66	71	72	73	73	73	75	81	90	90	87	F	
9	76	66	58	F	58	64	81	94	97	94	80	69	A	71	74	81	87	A	A	92	89	88	F	F	
10	F	F	F	S	F	78	84	A	A	83	84	78	77	75	80	78	79	79	81	A	88	88	87	78	
11	79	F	F	F	F	75	74	86	91	91	89	94	92	93	94	97	98	105	110	105	91	84	91	F	
12	F	F	F	F	87	78	80	78	68	A	A	71	77	74	78	A	A	A	78	78	75	75	71	76	
13	F	74	72	68	61	61	67	72	82	70	64	A	73	72	A	75	68	67	76	86	74	70	73	76	
14	75	75	76	68	62	60	73	82	80	66	A	A	A	72	73	73	71	70	73	76	81	82	84	88	
15	88	86	84	79	70	66	71	81	82	73	76	77	78	84	82	78	79	85	92	90	86	74	F	79	
16	74	72	70	68	67	64	56	67	73	78	72	74	78	79	81	84	89	94	92	96	91	88	88	83	
17	82	76	77	66	59	56	53	64	54	56	62	62	68	63	65	70	74	80	76	75	81	78	74	70	
18	70	F	F	F	66	72	F	56	A	A	A	54	A	58	52	54	57	56	54	56	58	61	58	57	
19	56	F	F	55	50	48	56	54	A	A	A	68	72	64	70	70	70	78	88	95	A	67	F	69	
20	F	F	F	F	F	53	A	A	A	A	A	A	70	72	75	81	88	91	86	92	82	68	66	67	
21	71	66	F	64	58	52	59	69	A	84	82	A	68	64	70	74	80	A	A	A	91	70	66	F	
22	66	F	F	57	54	61	73	89	85	A	72	74	73	69	72	77	78	77	84	78	86	66	61	54	
23	F	F	F	F	F	66	60	60	A	A	A	A	A	A	A	69	A	74	A	A	A	A	F	F	
24	F	F	F	F	F	47	56	68	74	72	64	64	60	A	67	65	67	A	A	A	74	61	54	A	
25	55	54	F	F	A	A	57	60	77	84	A	A	A	A	A	70	70	66	67	72	74	68	61	F	
26	F	F	67	63	56	51	47	57	A	A	A	A	A	A	A	60	63	58	56	60	66	70	70	63	
27	54	54	51	48	44	48	68	65	64	66	68	63	66	55	62	63	66	64	68	80	79	68	69	63	
28	59	58	58	F	57	59	59	72	70	70	65	66	67	68	68	68	69	72	73	72	68	63	65	66	
29	F	F	F	F	F	50	A	79	91	76	A	A	A	64	72	66	71	73	64	A	76	72	F	F	
30	F	66	66	61	48	53	66	72	76	80	71	79	80	88	100	90	78	71	90	88	84	78	74	78	
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	17	17	14	17	20	29	25	25	22	20	18	19	20	25	25	28	27	25	26	25	27	28	22	21	
MED	73	70	69	64	59	60	68	72	75	72	70	69	71	70	72	73	74	74	76	78	81	73	72	76	
U Q	76	76	76	68	64	66	74	80	82	82	76	77	77	74	79	78	79	80	86	90	86	78	78	78	
L Q	62	66	59	57	55	53	58	64	69	70	64	63	66	64	68	68	69	70	68	72	74	68	66	66	

JUN. 2012 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 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	U	L	A		A	U	L	U	L	L	L	A					
2								L	L	U	L	A	A	A	A	A	A	A	A	A					
3								L	U	L	A	A	A	U	L	U	L	A	A	A					
4						A	A	A	A	A	A	A		U	L	A	A	A	A	A					
5						A	A	A			A	U	L	A	A			L	L	A					
6							A	A		A	A	U	L	A	A	A	A	A	A	A					
7							A	A	A	A		U	L	U	L	U	L	U	L	A	A				
8							L	L	A	A	A	A	U	L	A	A	U	L	A	A	A				
9							A	A	A	A	A	A	A	A	A	A	U	L	A	A	A				
10						L	A	A	A	A	A		A	A	A	A	U	L	A	A					
11								L	A	U	L	A	A			A	U	L	A	A	A				
12						L	A	A	U	L	A	A		A	516	516	A	A	A	A					
13							U	L	A	A	U	L	A	U	L	A	A	A	A	A					
14							A	A	A	A	A	A	A	A	U	L	516	500	L	L	A				
15							L	U	L	U	L	U	L	U	L	U	L	A	A	A	A				
16							U	L	U	L	A	U	L	A	U	L	516	492	480	468	436				
17							448	436	472	460	500	A	A	A	A	A	464	444	424	L					
18						A	A	A	A	A	A	A	A	A	U	L	A	444	404	A					
19						A	L		A	A	A	A	A	A	A	A	A	A	A	A					
20							A	A	A	A	A	A	A	A	A	A	A	A	A	L					
21						L	L	A	A	A	A	A	U	L		A	A	A	A	A					
22							L	A	A	A	A	A	A		U	L	460	A	A	A					
23								A	A	A	A	A	A	A	A	A	A	A	A	A					
24						U	L	A	A	A	A	U	L	U	L	A	A	A	A	A					
25							A	A	A	A	A	A	A	A	A	A	A	A	A	A					
26						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						U	L	U	L	A		U	L	U	L	A	A	A	A	A					
28							428	A	A	U	L	A		A	A	A	468	448	A	A					
29						A	A	A			A	A	A	A	A	A	A	A	A	A					
30							404	460	460	504	504	A	A	A	A	A	444	448	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						2	5	7	10	11	8	11	10	11	9	12	8	6							
MED						U	L	U	L	U	L	U	L	U	L	U	L	480	454	428					
U Q						464	500	496	540	516	524	548	520	512	494	468	436								
L Q						396	440	460	480	488	496	500	512	490	466	444	408								

JUN. 2012 foF1 (0.01MHz)

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JUN. 2012 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						A	A	A	A	A	A	A	A	A	R	A	R	A	A					
2						B	264	A	A	A	A	A	A	A	A	A	A	A	A					
3						U R	A	A	A	A	A	A	A	A	A	R	A	A	A					
4						216	A	A	A	A	A	A		A	A	A	A	A	B					
5						A	A	A	A	A	A	A	A	A	R	A	A	A	A					
6						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
7						A	A	A	A	A	A	A	R	R	R	R	R	R	A	A				
8						U A	A	A	A	A	A	A	A	A	A	A	A	A	A					
9						192	A	A	A	A	A	A	A	A	A	A	A	A	A					
10						204	A	A	A	A	A	A	A	A	A	A	A	A	A					
11						U A	A	A	A	A	A	A	A	A	A	R	U R	A	A					
12						188	A	A	A	A	A	A	A	R	A	A	404	A	A					
13						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
14						B	A	A	A	A	A	A	A	A	A	R	R	R	A					
15						R	R	A	A	A	A	A	R	A	A	A	A	A	A					
16						A	A	A	R	A	A	A	A	A	R	336	R	A	A					
17						U R	U R	A	A	A	A	A	A	A	A	R	A	A	A					
18						204	304	A	A	A	A	A	A	A	R	A	A	A	A					
19						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
20						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
21						212	268	A	A	A	A	A	A	A	A	A	A	A	A					
22						A	A	A	A	A	A	A	A	A	A	332	A	A	A					
23						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
24						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
25						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
26						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						B	U A	A	A	R	A	A	A	R	A	A	A	A	A					
28						244	A	A	A	A	A	A	A	A	A	A	A	A	A					
29						U R	A	A	A	A	A	A	A	A	A	A	A	A	A					
30						200	B	A	A	A	A	A	A	A	A	A	A	A	A					
31						A	A	A	A	A	R	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						7	4									2	1							
MED						U	204	266								334	U R	404						
U Q						212	286																	
L Q						U A	192	254																

JUN. 2012 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		20	38	36	31	20	24	31	39	39	43	A A	72	40	57	42	G	38	G	G	23	33	44	19	35	16	18
2		E B	32	37	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	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B
3		E B	15	14	15	15	15	G	30	40	46	61	52	42	42	99	44	G	44	42	57	29	39	16	54	E S	
4		E B	16	24	44	23	18	27	41	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
5		E B	19	15	30	20	19	38	93	112	38	42	58	47	70	50	G	40	35	33	30	39	A A	58	40	42	42
6		E B	32	43	33	38	18	48	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
7		E B	22	32	22	18	19	22	40	44	53	63	43	43	G	G	G	G	G	G	G	G	G	G	G	G	G
8		E B	41	24	31	30	30	22	30	37	45	63	54	55	47	51	54	45	43	60	54	42	60	32	29	37	
9		E B	29	18	28	24	15	24	45	78	57	58	51	57	61	57	52	39	46	A A	A A	A A	A A	A A	A A	A A	E B
10		E B	35	44	53	34	21	23	35	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
11		E B	26	32	28	15	15	22	32	36	52	43	61	73	44	44	58	G	45	56	56	57	33	E B	16	24	36
12		E B	40	39	15	30	20	26	37	42	44	99	145	45	64	G	42	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
13		E B	18	30	20	32	26	23	32	47	58	42	50	78	44	45	114	55	37	42	40	69	64	37	E B	15	20
14		E B	20	17	16	21	28	27	36	47	52	46	132	94	86	57	44	G	G	G	G	G	G	G	G	G	E B
15		E B	18	17	18	18	22	G	24	38	38	42	45	41	G	43	55	62	68	52	40	56	42	E B	15	20	E B
16		E B	25	18	15	15	18	41	28	31	G	68	42	50	46	43	G	42	25	33	30	44	20	40	E B	15	19
17		E B	21	17	15	14	14	G	21	35	36	38	44	43	50	54	48	38	35	30	26	17	E B	E B	E B	E B	E B
18		E B	25	20	32	21	18	35	36	41	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
19		E B	16	41	42	43	34	34	29	35	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
20		E B	34	21	21	17	16	30	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
21		E B	E B	30	32	22	15	22	30	56	A A	92	68	64	96	44	46	48	64	48	A A	A A	A A	A A	A A	A A	A A
22		E B	E B	18	15	15	14	22	31	49	62	101	50	60	53	44	39	38	54	40	34	34	20	24	35	47	
23		E B	36	33	34	21	19	35	32	51	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
24		E B	24	38	18	35	34	22	44	58	70	52	39	42	41	72	51	43	47	A A	84	36	99	56	26	35	69
25		E B	25	26	36	37	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
26		E B	33	39	25	21	E B	43	40	44	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
27		E B	20	20	25	E B	E B	22	30	44	56	G	42	40	38	G	44	42	44	46	30	36	46	30	E B	E B	E B
28		E B	E B	15	18	27	26	G	32	58	49	39	54	42	45	50	56	38	35	46	54	20	32	39	22	33	
29		E B	46	41	20	21	24	30	A A	111	60	40	41	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
30		E B	30	36	25	20	17	21	32	37	38	43	G	47	48	55	58	42	38	34	35	30	19	16	38	22	
31		E B																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		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	30
MED		24	28	25	21	18	24	32	45	52	58	56	52	55	48	52	44	44	42	44	37	34	28	30	29		
U Q		32	38	32	30	24	34	41	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A
L Q		E B	18	18	18	17	15	22	30	38	40	43	45	42	44	44	42	38	35	34	33	30	20	20	21	E B	17

JUN. 2012 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 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

$\frac{H}{D}$	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	15	14	14	15	13	14	13	14	16	18	22	19	20	26	20	20	17	15	13	13	14	14	15	14
2	15	15	15	14	15	15	15	17	20	20	24	30	22	20	25	21	19	13	15	15	14	15	15	15
3	15	14	15	15	15	14	14	13	19	22	22	25	22	25	23	16	13	14	14	14	15	14	14	15
4	16	14	15	14	14	14	14	17	17	20	24	21	24	25	22	25	17	14	14	13	14	15	14	14
5	14	15	15	16	15	14	14	14	22	20	24	22	20	21	16	18	13	17	12	13	14	15	16	16
6	16	14	14	14	15	15	19	16	20	26	26	26	21	24	24	20	22	13	14	13	14	15	14	14
7	16	16	14	13	14	14	15	16	17	20	21	20	21	23	18	18	19	13	14	15	13	14	15	15
8	15	15	14	15	14	14	14	14	17	26	24	19	26	22	19	20	18	14	17	14	14	15	15	15
9	14	15	14	14	15	14	15	16	20	20	22	23	25	23	23	19	16	14	14	15	15	15	14	15
10	15	15	15	15	14	14	14	17	17	24	23	24	20	26	24	22	21	19	15	13	14	14	14	14
11	14	15	15	14	15	14	14	18	18	24	26	27	20	24	22	20	18	15	14	14	15	16	15	15
12	14	15	15	14	15	14	14	15	16	24	23	21	29	22	17	16	20	16	14	14	15	15	15	15
13	15	15	15	15	14	14	14	14	22	18	22	24	20	26	26	20	17	15	16	14	14	15	15	14
14	16	14	14	14	14	13	14	18	19	24	30	28	23	18	23	18	16	14	12	14	14	14	15	14
15	15	15	15	14	13	12	13	16	18	20	20	17	22	17	19	23	21	14	13	12	13	15	13	15
16	16	13	15	15	15	14	15	14	17	24	21	24	19	24	22	18	18	13	13	15	14	15	15	15
17	14	17	15	14	14	12	13	17	20	19	21	24	19	18	17	17	15	14	14	14	15	14	15	15
18	14	15	14	14	14	13	13	12	16	16	14	14	15	20	18	16	17	14	13	14	15	15	14	15
19	14	14	15	15	14	14	14	16	19	18	19	19	22	20	19	19	18	14	14	14	15	14	14	15
20	15	14	15	14	15	13	14	15	16	24	22	22	23	25	22	23	15	14	13	15	15	15	15	15
21	16	15	15	15	15	15	13	16	19	21	28	25	24	19	21	18	20	15	14	14	15	15	15	15
22	16	16	16	15	14	14	16	14	19	18	21	22	21	18	17	18	15	13	16	15	15	15	14	14
23	15	15	15	14	14	14	13	14	16	18	23	22	24	21	22	15	15	15	14	14	14	14	15	14
24	14	14	13	14	14	13	15	14	14	17	20	18	20	20	18	20	17	17	14	14	13	14	14	15
25	15	15	15	14	14	14	13	11	13	20	21	23	24	24	23	18	14	15	14	14	15	15	15	15
26	16	15	14	14	16	14	14	15	20	18	19	21	23	25	18	18	16	13	12	14	15	15	14	15
27	15	14	15	14	14	14	14	16	16	16	14	19	19	22	20	18	16	16	14	13	16	15	14	14
28	16	15	14	15	16	13	14	13	16	23	22	23	21	24	24	20	16	14	14	14	15	14	14	16
29	14	14	15	14	14	15	12	14	20	20	19	26	26	24	18	20	19	19	13	14	15	14	14	14
30	15	15	14	14	14	15	13	16	20	22	21	19	20	20	26	23	20	16	14	15	15	16	15	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	15	15	15	14	14	14	14	15	18	20	22	22	22	22	22	19	17	14	14	14	15	15	15	15
U Q	16	15	15	15	15	14	14	16	20	24	24	24	24	24	23	20	19	15	14	14	15	15	15	15
L Q	14	14	14	14	14	14	13	14	16	18	21	19	20	20	18	18	16	14	13	14	14	14	14	14

JUN. 2012 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	284	286	290	297	310	303	319	329	317	A	307	309	301	292	297	305	300	312	302	289	319	F	285		
2	F	F	F	F	F	303	314	314	336	290	294	325	A	289	291	296	303	294	314	308	299	271	F	284		
3	284	284	F	296	302	292	319	304	286	A	263	277	283	A	286	297	301	297	299	295	271	276	274	289		
4	276	262	F	285	263	264	315	A	A	A	299	A	A	A	252	A	A	A	305	316	312	265	265	F	F	
5	F	301	314	289	287	325	A	A	314	287	286	272	A	300	300	289	297	309	315	297	A	F	270	264		
6	277	293	275	269	272	272	A	A	279	A	A	R	260	288	278	303	293	A	A	288	279	268	273	275		
7	F	289	281	290	284	321	294	296	310	A	R	261	269	291	294	296	285	303	304	304	275	278	274	278		
8	276	F	F	F	F	318	311	316	318	332	296	A	290	284	294	293	299	286	272	275	284	286	301	F	F	
9	294	284	286	F	279	287	292	294	313	315	309	322	A	292	290	298	283	A	A	294	303	280	F	F		
10	F	F	F	S	F	297	291	A	A	292	288	294	307	287	293	290	299	294	294	A	293	286	296	283	F	
11	282	F	F	F	F	321	288	298	295	289	300	279	279	275	274	291	279	282	304	309	297	275	279	F	F	
12	F	F	F	F	302	288	295	315	289	A	A	284	292	293	300	A	A	A	299	299	281	280	279	271	F	
13	F	275	283	297	293	308	278	285	326	296	301	A	303	307	A	330	311	305	297	312	310	273	279	287	F	
14	276	284	304	301	308	289	288	299	319	329	A	A	A	292	300	311	310	297	312	296	287	279	269	283	F	
15	287	286	309	312	306	308	301	324	317	319	309	299	281	292	304	298	293	299	310	301	319	280	F	284	F	
16	285	284	298	310	321	349	348	311	304	332	307	303	295	294	288	292	290	304	306	306	298	279	283	284	F	
17	285	283	319	303	285	349	266	301	287	260	268	253	280	264	263	270	289	290	279	297	278	265	278	271	F	
18	273	F	F	F	259	259	F	295	A	A	A	242	A	257	240	262	294	315	300	302	282	293	275	278	F	
19	265	F	F	F	269	299	308	319	313	A	A	A	309	308	296	285	301	297	292	309	337	A	274	F	284	
20	F	F	F	F	320	A	A	A	A	A	A	A	286	291	290	283	304	304	290	309	321	297	275	289	F	
21	292	288	F	310	313	317	317	327	A	312	313	A	301	270	283	279	290	A	A	A	335	318	285	F	F	
22	296	F	F	311	304	320	301	325	342	A	A	A	327	322	326	300	296	303	293	311	311	318	327	343	277	285
23	F	F	F	F	F	327	299	336	A	A	A	A	A	A	A	A	315	A	286	A	A	A	A	A	F	F
24	F	F	F	F	F	288	294	318	319	359	331	333	324	A	313	308	323	A	309	A	314	325	294	A	F	
25	318	298	F	F	A	A	340	294	312	325	A	A	A	A	A	A	305	316	297	301	302	319	324	294	F	
26	F	F	286	277	269	291	258	308	A	A	A	A	A	A	A	A	314	324	316	282	301	288	297	325	305	
27	295	294	297	306	287	298	342	282	319	322	332	306	350	310	308	320	319	307	299	301	330	296	304	299	F	
28	285	273	288	F	312	322	294	319	333	326	296	301	293	295	307	299	305	310	313	340	305	285	288	278	F	
29	F	F	F	F	F	304	A	302	334	313	A	A	A	295	316	301	298	312	328	A	305	303	F	F	F	
30	F	300	312	315	312	297	327	311	304	325	297	302	275	275	316	302	305	263	307	298	306	280	269	272	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		17	17	14	17	20	29	25	25	22	20	18	19	20	25	25	28	27	25	26	25	27	28	22	21	
MED		285	284	292	297	298	308	301	311	316	318	300	301	292	292	293	298	299	300	305	302	298	280	279	284	
U Q		293	294	309	310	307	320	318	318	326	328	309	309	308	296	302	304	305	308	312	309	314	297	294	286	
L Q		276	284	286	287	284	290	292	297	304	294	294	277	280	280	286	292	293	293	299	297	282	276	274	276	

JUN. 2012 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 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	U	L	A	A	A	U	L	U	L	L	L	A				
2								L	L	U	L	A	A	A	A	A	A	A	A	A				
3								L	U	L	A	A	A	U	L	U	L	A	A	A				
4						A	A	A	A	A	A	A	A	U	L	A	A	A	A	A				
5						A	A	A			A	U	L	A	A			L	L	A				
6							A	A			A	U	L	A	A	A	A	A	A	A				
7							A	A	A	A		U	L	U	L	U	L	U	L	A	A			
8							L	L	A	A	A	A	U	L	A	A	U	L	A	A	A			
9							A	A	A	A	A	A	A	A	A	A	U	L	A	A	A			
10						L	A	A	A	A	A		A	A	A	A	U	L	A	A				
11								L	A	U	L	A	A			A	U	L	A	A				
12						L	A	A	U	L	A	A			A	A	A	A	A	A				
13							U	L	A	A	U	L	A	U	L	A	A	A	A	A				
14							A	A	A	A	A	A	A	A	U	L	A	L	L	A				
15							L	U	L	U	L	U	L	U	L	A	A	A	A	A				
16							U	L	U	L	A	U	L	A	U	L	380	385	354	345	A			
17							333	365	382	U	L	353	A	A	A	A	U	L	L					
18						A	A	A	A	A	A	A	A	A	U	L	A	A	A	A				
19						A	L	365	A	A	A	A	A	A	A	A	A	A	A	A				
20							A	A	A	A	A	A	A	A	A	A	A	A	A	L				
21						L	L	A	A	A	A	U	L	380	331	A	A	A	A	A				
22							L	A	A	A	A	A	A	368	389	385		A	A	A				
23								A	A	A	A	A	A	A	A	A	A	A	A	A				
24						U	L	A	A	A	A	U	L	427	416	428	A	A	A	A				
25							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
26							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
27						U	L	U	L	A	U	L	U	L	U	L	A	A	A	A				
28							347	A	A	U	L	A	424	403	A	A	380	374	A	A				
29							A	A	A			A	A	A	A	A	A	A	A	A				
30								404	367	U	L	U	L	A	A	A	A		A					
31							361	391	416	350	377							377	345					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	5	7	10	11	8	11	10	11	9	12	8	6						
MED						U	L	U	L	U	L	U	L	U	L	U	L	U	L					
U Q						336	347	365	382	383	384	393	384	372	369	364	358	345						
L Q							360	391	404	393	403	405	423	388	380	382	369	358						
							332	359	368	360	368	378	367	362	362	355	348	343						

JUN. 2012 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 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						298	302	288	296	298	A	334	E A 324	344	358	346	306	310	276						
2							280	278	264	364	302	290	A 358	346	304	304	308	258							
3							268	314	382	A	E A 458	424	404	A 380	350	334	296	E A 318							
4						338	276	A	A	E A 372	A		482	A	A	A	310	272							
5						252	A	A	334	394	E A 416	434	A	380	370	342	326	292	264						
6							A	A	390	A	A	E A 386	420	398	390	E A 330	328	A	A						
7							326	314	282	A	488	432	448	398	364	338	382	314	E A 314						
8							296	286	280	E A 302	E A 338	A	390	382	356	358	330	E A 350	E A 346						
9							E A 306	E A 338	274	290	308	304	A	378	352	330	314	A	A						
10						282	262	A	E A 288	E A 370	E A 334	E A 314	364	E A 362	330	300	E A 314	E A 324							
11								310	296	306	296	E A 348	346	350	336	306	318	318	270						
12						294	284	270	328	A	A	E A 396	E A 364	356	330	A	A	E A 296							
13							370	E A 352	286	326	294	A	344	334	A	292	292	330	312						
14							296	272	304	270	A	A	E A 358	E A 338	320	308	298	282							
15							260	278	288	306	322	342	370	332	316	E A 322	E A 360	E A 298	260						
16								326	304	E A 294	330	340	320	340	340	324	324	284	268						
17							434	336	386	480	440	468	E A 400	E A 424	428	392	348	324	330						
18						376	362	378	A	A	A	E A 526	E A 438	E A 512	E A 468	366	308	E A 344							
19						E A 314	E A 308	338	A	A	A	342	E A 342	E A 356	E A 412	E A 344	328	326	270						
20							A	A	E A 314	E A A	A	E A 388	E A 358	E A 362	346	306	284	276							
21						286	316	E A 286	E A 318	E A 304	A	A	332	430	370	E A 394	E A 334	A	A						
22							300	262	250	A	284	E A 324	E A 294	336	348	322	E A 320	E A 294	286						
23							E A 282	A	A	A	A	A	A	A	A	310	E A 366	A	A						
24						342	E A 334	E A 322	E A 314	E A 254	294	308	318	A	342	322	294	A	272						
25							E A 276	E A 364	E A 306	E A 310	A	A	A	A	A	326	308	324	294						
26						E A 360	E A 460	E A 340	A	A	A	A	A	A	A	E A 344	E A 306	E A 320	E A 292						
27						352	260	384	E A 322	316	298	330	276	318	348	316	312	296	292						
28							E A 354	E A 294	266	294	E A 342	E A 352	356	354	324	336	320	298	E A 286						
29						E A 258	A	322	260	264	A	A	A	364	312	328	E A 332	E A 306	E A 256						
30							288	332	292	306	352	328	368	358	280	296	284	394	288						
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						12	23	25	22	20	19	20	20	25	25	28	27	25	26						
MED						298	298	301	292	301	313	340	344	358	349	328	317	308	278						
U Q						347	334	338	322	317	E A 372	410	389	390	370	345	332	324	E A 312						
L Q						284	276	284	280	292	298	329	322	347	337	321	306	297	270						

JUN. 2012 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

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 A E A E A E A E A	284	290	298	302	264	242	226	218	216	224	A	A	210	212	208	206	226	A E A E A E A E A	270	254	250	232	262				
2	E A E A E A E A E A	318	272	250	254	252	218	222	218	224	230	246	A	A	212	A	A	A	A E A E A E A E A	238	248	284	324	286				
3	E B E B E B E B E B	270	256	242	218	238	236	226	198	A	A	A	A	A	A	210	A	A	A E A E A E A E A	262	300	262	348	288				
4	E B E A E A E A E A	270	322	354	278	306	A	A	A	A	A	A	A	A	A	A	A	234	A E A E A E A E A	248	322	344	354	334				
5	E A E A E A E A E A	250	234	244	242	276	A	A	A	A	A	A	A	A	A	A	208	250	220	216	A E A	278	A E A E A E A	352	342	318		
6	E A E A E A E A E A	310	292	332	356	270	384	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	290	300	316	310	312				
7	E A E A E A E A E A	282	292	274	256	236	242	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	266	334	294	318	326				
8	E A E A E A E A E A	310	280	308	286	294	222	224	208	A	A	A	A	A	A	A	A	A	A E A E A E A E A	296	310	320	274	260	292			
9	E A E A E A E A E A	252	248	292	298	288	238	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	236	282	280	302	204				
10	E A E A E A E A E A	300	324	314	300	252	226	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	234	266	272	260	272				
11	E A E A E A E A E A	304	312	298	272	268	242	220	210	A	A	A	A	A	A	A	A	A	A E A E A E A E A	264	222	238	284	304				
12	E A E A E A E A E A	310	304	268	258	250	242	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	218	226	304	316	314	316	324		
13	E A E A E A E A E A	298	304	302	276	284	250	226	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	190	238	298	328	300	288	286		
14	E A E A E A E A E A	296	282	254	258	258	236	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	212	206	212	224	260	280	282	304	270
15	E A E A E A E A E A	278	270	230	236	242	218	208	210	192	206	224	202	202	192	A	A	A	A E A E A E A E A	A	A	288	246	236	316	260		
16	E A E A E A E A E A	288	274	256	228	238	218	214	208	184	A	214	A	A	204	200	228	224	210	A E A E A E A E A	262	234	282	252	262			
17	E A E B E B E B E B	274	274	238	248	272	222	216	214	204	204	276	E A	A	A	A	A	242	230	228	246	268	276	258	286	278		
18	E A E A E A E A E A	290	302	258	246	346	A	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	214	222	242	284	268	272	308	334	
19	E A E A E A E A E A	290	352	340	368	298	A	222	208	A	A	A	A	A	A	A	A	A	A E A E A E A E A	A	234	A E A E A E A E A	244	308	312			
20	E A E A E A E A E A	318	270	252	214	256	258	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	A	210	240	234	240	278	300		
21	E A E A E A E A E A	244	282	278	226	212	218	230	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	A	A	240	232	284	292			
22	E B E A E B E B E B	238	296	250	248	242	228	214	A	A	A	A	A	A	254	200	214	A	A	A E A E A E A E A	260	228	214	318	396			
23	E A E A E A E A E A	326	346	318	280	274	260	242	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	A	A	A E A E A E A E A	348	236			
24	E A E A E A E A E A	298	326	226	296	292	226	A	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	282	224	282	A	A			
25	E A E A E A E A E A	256	262	298	316	A	A	A	A	A	A	A	A	A	A	A	A	214	A E A E A E A E A	262	216	230	264	342				
26	E A E A E A E A E A	316	326	306	280	302	A	A	A	A	A	A	A	A	A	A	A	A	A E A E A E A E A	262	306	272	258	254				
27	E A E A E A E A E A	264	282	300	262	274	236	212	262	A	200	196	204	190	206	A	A	A	A E A E A E A E A	270	242	272	234	232				
28	E B E B E B E B E B	276	286	300	310	262	224	222	A	A	220	A	194	210	A	A	198	212	A	A	228	258	328	288	314			
29	E A E A E A E A E A	346	314	266	224	256	A	A	A	216	218	A	A	A	A	A	A	A	A E A E A E A E A	256	250	A	270	A				
30	E A E A E A E A E A	292	292	262	232	242	226	224	212	190	262	214	A	A	A	A	A	226	228	A E A E A E A E A	254	228	250	318	304			
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	23	16	11	10	11	8	11	10	11	9	12	10	9	2	25	27	29	29	29				
MED	E A E A E A E A E A	290	291	276	260	264	231	222	210	205	218	208	202	203	211	212	214	220	225	228	E A E A E A E A E A	264	266	272	302	292		
UQ	E A E A E A E A E A	310	312	302	296	286	242	226	218	220	224	235	220	210	238	214	239	226	231	A E A E A E A E A	283	300	289	318	316			
LQ	E A E A E A E A E A	270	274	252	242	246	222	215	208	192	206	203	194	190	204	204	209	212	215	A E A E A E A E A	257	240	242	271	266			

JUN. 2012 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 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						120	120		A	A	A	A	A	120	110		A	116	116					
2						B	122	118	116	116		A	A	A	116	118	122		A	A	A			
3						114	114	116											A	A	A			
4						122	118		A	A	A	A		120		A	A	A	A	B				
5						114		A	A	A	A	A		A		114	114		A		116			
6						A	A	A	A	A	A		120		A	116	116	116		A	A	A		
7						118	108		A	A	A	A		120	120	120	118	116		A	A			
8						118	108	110		A	A	A		A	A			116	118		A	A		
9						116	114		A	A	A	A		A		118	118	120		A	A			
10						116	112		A	A	A	A		A		A		A		A	A			
11						114	110		A	A	A	A		A		A		120	116	116				
12						116	114		A	A	A	A		A		118	118	120		A	A	A		
13						110		A												A	A	A		
14						B	A	A		114	120													
15						114	116		A	A	A		112		A	A		A	A	A				
16						A	A	A																
17						118	120	108	108	114		A	A	A	A		A		A	A				
18						112		114		A	A	A		A		116								
19						A	A	A	A	A	A													
20						118	114		A	A	A	A		A		120	120	118		A	A			
21						130	114	112																
22						A	A	A		A	A	A		A		A								
23						118	118	118		A	A	A		A		A								
24						A	A	A		A	A	A		A										
25						A	A		118	116														
26						114	114		A	A	A													
27						B	110		A	A		A												
28						120	110		A	A	A													
29						B	A	A		A	A													
30						A			A	A														
31						118	112																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						19	19	9	5	4	1	2	3	9	13	17	15	8	1					
MED						116	114	114	116	116	126	123	120	120	118	118	116	115	118					
U Q						118	118	118	119	118			124	120	119	120	118	116						
L Q						114	110	111	111	115			112	116	115	115	116	114						

JUN. 2012 h'E (KM)

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IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 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	102	98	98	98	98	116	116	104	104	102	100	104	104	120	G	108	G	104	106	104	102	102	102	102
2	98	100	100	B	B	136	146	114	114	110	104	104	108	120	120	112	108	106	104	104	104	104	102	102
3	100	B	B	B	B	G	122	116	104	104	106	106	106	102	104	G	108	104	102	102	102	100	100	S
4	102	98	94	90	90	122	118	102	98	98	96	98	100	120	108	102	106	102	102	102	102	102	100	100
5	102	104	102	100	118	114	104	102	102	106	102	104	102	104	G	122	104	130	106	104	102	100	100	98
6	98	98	96	96	106	108	104	104	104	102	96	G	106	136	122	114	108	102	100	100	100	98	112	112
7	98	104	104	106	106	130	124	106	102	98	100	98	G	G	G	G	G	104	102	102	102	100	100	98
8	96	94	94	94	98	128	122	118	106	108	102	106	108	106	116	122	116	106	102	100	98	98	98	98
9	94	100	96	96	94	134	120	106	102	102	102	104	104	104	114	126	136	104	104	104	104	104	110	B
10	106	104	100	100	100	124	118	104	98	98	96	96	106	106	106	106	122	108	102	100	100	98	100	100
11	100	104	104	102	B	126	116	104	102	102	100	98	98	100	100	G	166	120	102	104	104	104	102	102
12	108	100	102	102	100	122	116	106	102	104	100	102	104	G	136	114	106	106	104	104	102	102	100	100
13	98	98	98	100	104	128	106	106	118	120	106	106	106	118	104	108	108	104	102	102	90	88	88	86
14	92	98	98	98	98	98	100	98	96	96	96	98	98	102	102	G	104	102	102	106	104	102	102	102
15	98	94	94	94	94	G	100	104	106	104	102	102	G	104	100	100	92	92	92	88	88	88	100	100
16	100	98	96	B	92	96	100	104	G	104	110	104	104	106	G	130	100	102	104	100	108	102	102	98
17	96	B	B	B	B	G	102	116	116	118	106	106	102	102	104	116	104	104	126	120	104	B	102	102
18	102	122	116	114	116	116	108	114	104	106	106	106	106	114	G	108	100	114	98	88	96	100	100	96
19	96	92	92	92	96	96	100	104	106	104	100	106	108	118	118	116	118	102	100	100	100	100	100	100
20	94	100	102	96	98	124	116	104	104	104	104	106	106	102	102	106	106	106	102	96	92	92	92	94
21	98	96	96	94	92	136	134	116	104	102	100	98	102	102	102	98	98	98	94	90	90	90	90	108
22	B	102	102	100	100	102	104	104	102	96	96	96	96	100	104	138	120	112	102	106	106	102	100	100
23	100	98	94	94	92	114	122	118	104	104	96	100	100	96	96	114	108	108	104	104	104	106	100	100
24	98	98	98	92	94	92	108	106	102	102	104	102	104	98	128	122	116	106	102	98	98	90	100	100
25	92	94	94	94	94	96	98	114	114	106	102	104	94	98	98	106	116	116	106	106	102	102	102	102
26	102	98	96	96	142	114	116	104	102	102	102	104	100	100	98	96	108	106	102	98	98	94	90	88
27	88	88	96	92	B	114	116	108	104	G	108	100	100	G	124	126	124	106	104	102	104	100	B	B
28	98	98	96	96	96	G	114	104	104	106	102	104	104	100	102	106	106	116	106	100	100	106	106	110
29	106	104	100	98	98	106	104	100	100	100	98	94	96	126	122	116	120	106	100	98	94	92	94	100
30	100	94	88	94	98	106	122	122	108	98	G	120	118	114	108	108	118	114	106	106	106	110	102	102
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	28	28	26	25	26	30	30	29	29	29	29	28	27	25	26	28	30	30	30	30	29	29	27
MED	98	98	97	96	98	115	116	105	104	104	102	104	104	104	104	113	108	106	102	102	102	100	100	100
U Q	102	101	101	100	102	126	120	114	106	106	104	106	106	118	119	122	118	108	104	104	104	102	102	102
L Q	96	97	95	94	94	106	104	104	102	101	99	98	100	100	102	106	105	104	102	100	98	96	100	98

JUN. 2012 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2012 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F4	F5	F5	F4	F5	C2	CL11	L2	L2	L2	L2	L2	L2	L2	C2	L2	L2	L2	L2	F3	F3	F3	F2	F2		
2	F3	F5	F2			H1	HL11	CL21	CL21	L2	L2	L2	L2	L2	C1	C2	L2	L3	L3	F4	F3	F5	F5	F2		
3	F2						CL22	CL22	L2	L2	L2	L2	L2	L2	L2	L2	L2	L3	L4	F4	F4	F3	F5			
4	F2	F3	F3	F2	F2	C3	C2	L3	L3	L3	L2	L2	L2	L2	C2	L3	L3	L2	L3	F3	F5	F5	F4	F4		
5	F4	F2	F4	F3	F5	C3	L4	L4	L2	L2	L2	L2	L2	L2	L2	CL11	L1	CL11	L2	F3	F5	F4	F5	F4		
6	F4	F5	F3	F4	F3	L4	L3	L2	L2	L2	L2	L2	L2	L2	C1	C2	L3	L5	L4	F3	F4	F3	F23	F2		
7	F3	F3	F32	F2	F3	C2	C2	L3	L2	L2	L2	L2	L2					L2	L3	F3	F4	F3	F3	F4		
8	F5	F2	F2	F4	F4	C1	C2	C2	L2	L2	L2	L2	L2	L2	C2	C2	C2	L3	L3	F3	F5	F3	F4	F3		
9	F3	F2	F5	F3	F2	H2	C3	L3	L2	L2	L2	L2	L2	L2	C2	C2	C2	L4	L3	F3	F4	F3	F3			
10	F4	F5	F4	F3	F3	C3	C1	L3	L3	L3	L2	L2	L2	L2	L2	L2	C2	L2	L3	F3	F5	F3	F4	F3		
11	F4	F3	F4	F3		C1	C1	L2	L2	L2	L2	L2	L2	L2	L2	L2		H1	C3	L4	F5	F4	F3	F6	F5	
12	F5	F4	F3	F4	F3	C2	C2	L2	L2	L2	L3	L2	L2	L2	C2	C2	C2	L3	L4	L3	F4	F5	F3	F4		
13	F3	F3	F4	F5	F4	C2	L2	L2	C2	C2	L2	L2	L2	L2	C1	L2	L2	L2	L2	F4	F4	F4	F2	F2		
14	F2	F2	F3	F3	F6	L3	L2	L2	L2	L2	L3	L2	L2	L2	L2	L2	L2	L2	L2	F3	F3	F4	F2	F1		
15	F2	F2	F3	F2	F3		L1	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L3	L3	F5	F3	F2	F2	F2		
16	F3	F2	F2		F7	L3	L2	L2		L2	L2	L2	L2	L2	L2	L2	C1	L2	L2	L2	F3	F2	F5	F2	F3	
17	F3						L1	C2	C2	C2	L2	L2	L2	L2	L2	L2	C1	L1	L2	CL21	F1	F2	F6	F3		
18	F4	F3	F3	F3	F2	C3	L2	C2	L2	L2	L2	L2	L2	L2	C2	L2	L2	L2	CL22	L3	F3	F3	F2	F3	F2	
19	F2	F4	F3	F3	F3	L2	L2	L2	L3	L3	L2	L2	L2	L2	CL22	C2	C2	C2	L3	L3	F3	F4	F3	F3	F3	
20	F4	F3	F3	F2	F2	CL23	CL42	L3	L3	L3	L3	L2	L2	L3	L2	L2	L2	L3	L2	L2	F6	F3	F2	F3	F3	
21	F2	F4	F3	F2	F1	H1	H2	C3	L3	L3	L3	L3	L2	L2	L2	L2	L3	L3	L3	F4	F4	F3	F4	F4		
22		F3	F2	F1	F2	L2	L3	L3	L2	L2	L3	L2	L2	L2	L2	L2	H1	C2	CL32	LL22	F2	F2	F3	F5	F5	
23	F3	F4	F3	F3	F3	C3	CL22	CL32	L3	L3	L3	L2	L2	L2	L2	LC22	CL22	L3	L2	L3	F4	F5	F4	F4	F3	
24	F4	F4	F4	F3	F2	L2	L3	L3	L3	L2	L2	L2	L2	L2	L2	C1	C2	C2	L3	L3	F3	F3	F2	F2	F4	
25	F4	F5	F4	F3	F4	L4	L2	CL32	C2	L2	L3	L2	L3	L2	L3	L2	L2	L2	C1	L2	F3	F2	F5	F2	F4	
26	F4	F5	F5	F3	F2	C2	C2	L3	L3	L2	L3	L2	L3	L2	L3	L2	L2	L2	L2	L2	F3	F3	F2	F3	F3	
27	F2	F2	F2	F1		C2	C2	L2	L2		L1	L2	L2	L2		C1	C1	C2	L2	L2	F2	F3	F4			
28	F1	F2	F2	F3	F3		C2	L3	L3	L2	L2	L2	L2	L2	L2	L2	L2	L2	CL22	L4	F3	F4	F3	F5	F4	
29	F4	F5	F4	F3	F3	L3	L3	L3	L2	L2	L3	L2	L2	L2	CL12	C2	C2	CL22	L2	L3	F3	F3	F3	F3	F4	
30	F3	F2	F2	F2	F2	L3	C2	CL22	L2	L2		C2	C2	C2	L2	L2	C2	C2	L2	F3	F2	F2	F5	F3		
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																										

JUN. 2012 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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 81	78	71	70	68	66															X 86	X 69	X 81	X 81	
2	X 81	X 81	75	76	71	68	75															X 89	78	80	77
3	76	76	79	X 69	X 69																	O 69	X 77	X 74	X 76
4	76	76	X 79	X 80	X 68	68																O 67	X 75	X 76	X 76
5	X 75	X 78	X 77	X 62	52																	A	X 73	76	72
6	A	A	70	70	70	60																X 84	X 82	X 85	X 74
7	X 90	X 82	X 85	X 81	X 76																	X 74	X 76	X 74	X 76
8	76	76	X 75	66	66																	X 95	X 89	76	X 83
9	72	64	X A	X 62	65	66																O 93	X 95	X 83	X 84
10	85	82	X 86	X 85	80	77																X 96	X 85	X 85	X 94
11	X 86	77	82	X 90	X 90	X 85	76															X 98	X 95	X 96	X 97
12	X 90	X 90	X 91	X 98	X 98																	X 84	X 82	X 78	X 82
13	X 85	X 83	X 89	X 89	X 74	X 72																X 71	X 72	X 74	X 82
14	X 85	X 84	X 81	X 73	X 68																	X 82	X 84	X 84	X 89
15	X 89	X 90	X 94	X 78	X 68																	X 94	X 78	X 80	X 75
16	X 78	81	X 86	X 82	70	63																X 88	X 90	X 82	X 82
17	X 98	X 98	X 100	X 72	X 64	58															X 74	X 79	X 75	X 83	X 84
18	X 74	A	X 73	A	X 47	51	61															A	X 68	X 64	A
19	A	X 60	X 58	X 58	64																	X 87	X 82	X 87	80
20	80	79	O 75	X 76	67	62																X 95	X 73	X 72	X 76
21	X 76	X 87	X 74	X 61	X 60																	X 88	X 80	X 75	X 73
22	75	77	X 68	X 72	76	71	71															X 90	X 72	X 72	X 68
23	71	71	X 80	X 80	71																	A	X 73	X 64	A
24	X 71	74	65	X 58	X 44	51																A	X 64	X 68	X 70
25	X 71	66	59	51	50	50																X 87	X 78	X 69	X 65
26	69	73	75	77	A	71																X 79	X 76	X 73	X 72
27	X 67	X 66	X 67	X 60	X 51																	X 76	X 70	X 70	X 69
28	X 72	66	66	67	X 62																	X 77	X 74	X 69	68
29	72	77	70	68	A																	O 82	X 85	X 62	X 61
30	66	67	68	64	51	49																X 96	X 87	X 88	X 88
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	28	17	4													1	26	30	30	28	
MED	X 76	77	X 75	X 72	68	66	73														X 74	X 86	X 78	X 76	X 76
U Q	X 85	X 82	X 84	X 80	71	71	76															X 93	X 84	X 83	X 82
L Q	72	72	69	X 63	X 61	54	66															X 79	X 73	X 72	X 72

JUN. 2012 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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	75	F 67	F 62	F 62	F 58	F 60	65	75	86	80	77	A	R 75	77	80	87	87	88	88	84	80	U S 63	74	75	
2	75	75	F 61	F 64	F 62	F 60	F 65	83	88	73	77	77	A	74	86	U R 92	92	96	96	96	83	F 70	F 70	F 70	
3	F 70	F 68	F 70	63	62	58	62	76	77	71	E G 51	65	71	70	73	R 78	82	81	U R 80	70	63	71	68	70	
4	F 69	F 67	73	74	62	F 60	70	74	59	A	J R 77	77	72	74	U R 75	81	A	83	R 86	72	61	69	70	70	
5	69	71	71	56	42	V 46	67	R 83	A	66	75	81	79	80	86	86	90	89	81	A	A	67	F 65	F 64	
6	A	A	65	F 61	F 61	51	A	R 64	70	66	62	60	61	66	73	85	82	74	73	72	78	76	79	R 68	
7	J R 84	76	79	75	70	65	75	75	65	65	65	A	67	69	66	69	78	76	71	67	68	70	68	F 66	
8	F 71	F 68	69	F 58	F 58	58	79	72	72	72	65	68	72	78	78	R 85	88	84	84	89	R U 89	R 83	72	77	
9	F 62	58	A	56	F 56	F 58	72	R 82	92	A	73	72	77	83	J R 88	90	R 92	R 92	R U 96	R U 87	R U 87	R U 89	77	78	
10	F 80	80	80	79	70	F 66	78	82	74	A J R 69	R 77	R 72	R 75	A	A	83	92	92	90	90	90	79	R 79	R J R 88	
11	80	J R 69	76	84	84	79	F 65	90	U R 100	92	91	92	R 87	U R 83	89	J R 103	J R 107	J R 113	J R 114	98	92	89	90	J R 91	
12	R 84	R 83	85	92	92	R 80	82	78	79	A	76	70	R U 86	R 88	J R 88	89	82	A	84	83	78	76	72	76	
13	81	75	83	83	68	66	66	R 68	80	88	78	A	A	A	78	77	77	80	92	93	65	65	67	76	
14	79	R 79	R 75	67	62	58	62	84	66	74	R 79	76	73	76	76	R 79	A	82	79	74	76	78	78	83	
15	R 83	84	88	72	62	60	68	73	73	74	A	R 81	R 86	92	92	92	92	96	98	R 100	R 88	72	73	R 69	
16	F 73	F 73	80	76	F 60	56	61	68	79	79	73	73	75	82	90	95	R 95	R 97	R J 96	R 94	82	84	76	76	
17	92	92	94	66	58	F 44	53	69	56	U R 55	62	64	67	73	72	76	84	R 92	80	68	73	70	78	R 78	
18	U R 68	A	R 67	A	41	F 33	F 54	52	A	A	54	A	A	A	U R 52	54	59	59	58	56	A	63	58	A	
19	A	54	52	52	56	55	60	56	61	62	A	78	81	A	84	84	A	98	A	88	81	76	R 81	R 70	
20	F 70	F 70	69	F 68	F 54	52	62	64	A	A	A	A	R 71	A	R 84	94	95	98	97	98	R 89	67	66	70	
21	U R 69	R 81	68	55	54	R 55	63	R 64	78	81	U R 77	A	U R 56	R 66	74	77	86	R J 92	R 88	94	82	74	69	F 66	
22	F 64	F 65	62	F 61	F 65	F 63	F 64	86	69	66	79	73	67	U R 80	78	83	87	88	83	82	84	66	66	62	
23	F 60	F 62	73	74	64	64	54	51	66	A	A	A	A	A	J R 68	J R 71	J R 73	79	80	74	A	67	58	A	
24	65	F 64	52	R 51	38	F 40	52	67	74	R A	A	A	A	A	A	66	79	81	86	92	R 86	A	58	62	64
25	64	F 52	F 50	F 40	F 41	F 40	48	62	87	R A	A	A	A	A	A	71	79	86	82	R 84	80	81	72	R 59	
26	F 64	F 64	F 67	F 66	A	F 64	58	62	60	U R 52	U R 54	59	68	A	68	61	57	55	60	61	73	70	67	66	
27	61	60	61	54	44	44	51	56	76	66	J R 66	61	60	61	63	66	67	67	72	76	70	64	64	63	
28	66	F 58	F 58	58	56	54	62	78	76	76	70	A	A	70	74	79	86	92	92	A	71	68	63	F 63	
29	F 64	F 64	F 62	F 60	A	45	57	74	86	A	A	A	A	A	U A 71	U A 72	A	A	A	R U 68	R U 76	R V 78	56	F 51	
30	F 54	F 57	F 59	F 50	F 40	F 38	50	63	72	64	74	74	70	84	U R 86	89	U Y 89	92	J R 94	R 100	R 90	81	82	82	
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	28	30	29	30	27	20	23	19	22	22	29	29	26	28	28	27	26	30	30	28	
MED	70	68	69	63	59	58	62	72	74	72	73	73	72	76	76	81	86	88	85	84	80	70	70	70	
U Q	80	76	78	74	63	F 63	68	78	80	78	77	R 77	77	82	86	89	90	92	93	94	87	78	77	76	
L Q	F 64	F 63	62	56	54	F 46	56	64	66	66	65	65	67	70	71	76	81	80	80	72	73	67	65	65	

JUN. 2012 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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	A	A	A	A	A	U	A				L	U	L				
2							L	L	U	L	L	U	L	L	A	Y									
3								L	L	L					U	A	U	A							
4					L	L	L	A	A	A	A	A			Y	U	A	A							
5								U	L	A	A	A			R	U	A	U	A						
6							A	4	3	6	4	5	6	4	7	6	5	0	4						
7					L	L	A	A																	
8									A	A	A			A	A										
9									A	A	L	U	L												
10								A	A	A	A	L	A	A	A	A	A	A	A	A	U	L			
11								L	U	L	L	U	L	L	L										
12								U	L	A	A	A			U	L									
13								L	L																
14								L	A	L	A	A			U	A	U	A	A	A	A				
15								L	L	U	L	A	A		A	R									
16								L	L	U	L	L			A										
17					L			4	1	2		4	6	4	4	8	4	8	8	4	8	8	4	8	8
18								L	R	A	A	R	A	A											
19								L	L	L	A	A	A	U	A	A	A	A	A	A	A	A	A	A	A
20									A	A	A	A	A	R	A	U	A	U	A						
21									L	A	A	A	A	L	U	A									
22						A		U	L	U	L	A													
23								L	U	A	A	A	A												
24									A	A	A	A	A	A	U	A	R								
25								4	2	8															
26																									
27								L	L	A															
28								L	L	A	A														
29								U	L	L	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
30								U	L	L	A	A	A	A	A	A	A	A	A	A	A	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							2	11	8	10	13	13	15	18	22	23	21	19	13	1					
MED							3	6	8	4	5	2	4	9	4	5	0	4	4	6	8	4	6	4	2
U Q								U	L	L	L	L	L												
L Q								4	1	2	4	3	4	7	2	4	7	8	4	5	4	4	4	3	9

JUN. 2012 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 f_oE (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					A	A	A	276	324	A	A	A	A	A	A	352	328	304	252	A					
2						A	A	268	A	A	A	A	R	R	B	372	344	308	252	A					
3						B	216	276	320	348	360	368	376	372	A	364	348	308	244	A	B				
4						B	216	288	332	A	U	U	A	R	A	396	368	332	304	240	A				
5						A	U	A	U	A	A	A	A	A	A	356	344	320	256	A					
6						A	A	276	312	A	A	A	376	A	R	R	R	340	304	240	A				
7						B	220	272	324	340	A	A	A	A	A	A	A	A	A	A	A				
8						A	A	272	A	A	A	A	U	A	A	380	376	372	348	300	A				
9						A	228	296	324	U	A	A	A	A	A	372	336	320	232	A	A				
10						B	A	A	A	A	A	A	B	B	388	368	348	304	252	A					
11							A	A	A	A	A	A	A	A	A	A	A	A	296	260	A				
12						A	236	280	328	360	372	392	396	R	B	U	R	R	364	308	264	A			
13							U	A	A	A	A	U	R	A	A	396	372	352	308	A	A				
14						A	A	A	A	U	A	A	A	A	A	A	A	A	A	A	A				
15						B	244	280	324	360	A	A	A	A	A	A	A	A	312	A	A				
16						A	208	272	320	344	A	A	A	A	R	R	380	352	344	308	248	B			
17						B	216	284	316	A	U	A	376	376	A	A	A	A	A	A	A				
18						B	A	U	A	U	A	A	A	A	A	A	U	R	328	308	256	140			
19						A	R	236	272	304	A	A	A	A	A	A	348	324	A	A	A				
20						A	236	276	324	356	U	A	A	A	A	A	A	U	A	A	A	A			
21						A	U	A	212	280	324	336	348	A	A	A	R	A	A	A	A				
22						A	A	A	J	R	U	A	A	A	U	A	A	368	368	364	332	304	252	A	
23						A	U	A	212	268	300	A	A	A	A	A	A	A	U	A	A				
24						A	A	A	A	296	A	A	A	A	U	R	R	R	A	A	A				
25						A	A	A	300	A	A	A	U	U	U	A	R	368	384	368	348	328	304	248	168
26						A	192	276	304	332	368	372	376	R	A	U	A	356	340	296	A	A			
27						A	U	U	A	A	A	A	A	U	R	R	364	364	344	308	256	U	A	A	
28						A	U	A	216	268	308	336	340	U	A	A	A	A	A	308	A	A			
29						A	A	A	A	U	A	A	A	A	U	R	U	R	U	A	A	A			
30						A	A	A	A	A	A	A	A	A	R	392	360	352	304	256	U	A	A		
31															380	372	356	332	312	A	180				
	00	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	22	22	14	9	8	7	8	13	20	22	24	19	3					
MED							216	276	316	344	360	376	376	382	380	364	340	308	252	168					
U Q							232	280	324	356	370	382	400	390	390	370	348	308	256	180					
L Q							U	A	212	272	304	336	352	370	376	376	368	354	332	304	244	140			

JUN. 2012 f_oE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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	J A	J A	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	G	28	20	J A	J A	J A	J A
2	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
3	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
4	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A
12	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	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	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A
26	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	J A	J A	J A	J A	J A	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	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	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A

JUN. 2012 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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	27	18	18	18	21	20	25	38	51	70	64	112	54	53	39	G	G	G			E	B	E	B					
2	16	18	22	E	B	E	B	E	B			A	A	U	Y						11	11	36	19					
3	E	B	E	B	E	B	E	B				A	A	U	Y						47	47	54	18					
4	23	54	28	19	18	14	29	33	36	110	57	62		G	U	Y		A	A										
5	E	B	E	B	E	B			A	A					U	Y				A	A	A	A						
6	A	A	A	A	45	33	21	26	145	29	31	32	45	38	40	41	41	38	44	35	29	17	11	E	B				
7	20	20	20	27	E	B	E	B				A	A		U	Y							E	B					
8	23	29	28	18	E	B						A	A		U	Y							E	B					
9	30	23	A	A	21	21	17	24	39	60	81	41	46	42	42	40	43	37	35	61	30	41	40	32	40				
10	23	22	39	34	E	B	E	B			A	A			A	A	A	A											
11	14	18	24	33	33	28	27	29	32	34	39	39	43	46	46	61	38	32	27	23	E	B							
12	22	17	34	26	43	22	24	29	69	69	50	43	46	51	42	63	69	94	57	43	18	25	24	36					
13	E	B			27	25	22	22	31	35	44	52	69	68	90	41	43	42	43	60	36	34	24	38	31				
14	E	B	E	B	24	27	18	17	38	37	46	45	62	65	49	47	50	51	A	A	55	48	45	28	18	18	E	B	
15	18	E	B	E	B	15	E	B	E	B					A	A		U	Y	U	Y	24	28	42	23	19	18	15	
16	18	17	30	30	30	19	23	30	36	35	41	40	55	42	41	30	G	G	G		E	B	E	B	E	B	E	B	
17	17	17	14	14	E	B	E	B			G																		
18	A	A	30	A	A	E	B	E	B			A	A	A	A	A	A		G		A	A		A	A		A	A	
19	A	A	E	B	19	29	23	22	G		30	32	50	66	61	50	92	56	49	A	A	66	114	42	38	37	31	28	
20	31	24	22	20	20	30	39	58	A	A	A	A	A	A	A	A													
21	17	19	E	B	E	B	20	17	25	32	58	62	59	73	48	45	48	U	G										
22	22	17	18	17	17	46	34	33	34	54	43	43	47	47	47	48	38	42	58	56	19	18	24	26					
23	17	17	31	29	27	18	24	31	41	130	174	150	114	35	49	47	44	34	40	A	A	A	A						
24	22	21	19	18	18	20	29	47	58	84	87	142	115	70	45	43	37	80	62	62	88	38	12	12					
25	19	22	24	24	18	18	21	33	59	94	96	106	113	110	59	40	43		G										
26	E	B	20	20	20	A	A			G																			
27	17	19	18	17	33	18	22	29	48	38	54	44	44	53	43	46	45	45	38	31	18	18	41	28					
28	24	23	27	17	19	19	24	29	48	49	44	136	80	58	58	40	39	54	28	A	A	145	25	16	25	20			
29	E	B	E	B	A	A	25	29	29	54	106	90	143	141	92	58	64	95	83	90	44	30	22	22	22				
30	28	28	18	20	27	19	34	34	35	35	42	41	40	42	42	45	46	33	27			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	21	19	22	20	20	19	24	32	44	52	51	54	50	50	46	46	42	36	35	30	27	22	26	22					
U Q	24	23	28	29	27	22	29	38	58	81	64	80	65	70	51	50	51	54	58	43	41	35	36	31					
L Q	E	B	E	B	E	B	E	B																					

JUN. 2012 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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

$\begin{matrix} H \\ D \end{matrix}$	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	12	12	12	12	12	12	14	14	15	26	26	25	28	25	24	25	19	18	16	15	11	11	12	11
2	14	14	14	15	15	15	15	14	18	22	22	22	19	16	38	20	20	15	15	15	15	13	13	13
3	12	11	11	11	14	14	14	14	14	18	24	24	22	22	24	22	20	15	15	13	14	14	13	12
4	13	13	13	13	13	14	14	14	14	14	20	26	25	24	23	22	20	16	16	14	14	14	14	15
5	14	14	14	14	14	15	15	15	16	15	19	34	25	25	19	20	20	18	11	12	14	14	14	14
6	15	15	15	15	15	13	13	15	15	20	28	28	27	26	26	24	18	17	17	10	10	10	10	10
7	11	14	14	14	14	14	14	14	14	20	20	22	25	27	26	24	16	15	15	13	14	14	14	14
8	14	15	14	14	16	15	15	16	18	22	22	26	29	25	25	21	22	16	15	15	16	15	15	15
9	13	13	13	13	13	13	13	13	16	25	30	25	25	27	26	23	27	20	14	14	14	14	14	14
10	12	12	12	12	13	13	13	13	19	24	24	30	40	40	25	25	27	14	14	14	14	14	14	14
11	12	12	12	16	15	15	13	13	18	20	20	30	34	27	27	23	21	16	14	14	14	14	14	14
12	13	13	13	13	13	13	13	13	17	20	20	20	27	40	25	24	24	16	16	16	15	15	15	15
13	16	16	16	16	16	14	14	15	15	22	20	21	35	29	22	22	21	16	15	15	14	14	14	15
14	13	13	13	12	12	12	12	14	20	20	33	22	33	25	29	21	19	17	13	12	13	13	13	13
15	14	14	14	14	14	14	15	16	18	19	24	23	39	35	31	25	20	17	14	14	14	14	13	12
16	14	14	14	14	14	14	14	14	14	17	19	25	25	22	21	21	18	18	14	17	16	15	15	15
17	14	14	14	14	14	13	12	12	13	12	22	29	29	26	27	24	21	14	13	14	14	14	14	12
18	14	14	14	14	14	14	14	14	13	17	34	22	27	25	22	22	21	14	14	14	14	14	15	15
19	14	14	14	14	13	14	14	17	17	20	23	24	37	24	29	21	21	13	10	12	15	15	15	15
20	15	15	15	15	15	15	15	15	14	18	22	36	30	26	22	21	19	16	16	12	12	12	12	12
21	14	14	14	14	14	14	14	14	15	14	15	23	22	32	28	18	19	15	14	14	14	14	14	14
22	14	14	14	14	14	12	12	13	14	16	19	17	19	18	20	20	20	16	16	14	12	12	14	14
23	13	12	12	15	15	15	15	15	14	17	20	19	23	24	21	21	20	17	16	13	13	13	13	13
24	12	12	12	12	14	14	14	13	12	12	15	22	29	18	22	22	21	18	10	13	12	12	12	12
25	12	12	12	12	12	13	12	15	14	18	17	22	20	20	20	20	17	15	15	15	15	15	15	13
26	12	12	12	14	14	14	13	15	15	18	18	19	20	22	22	20	21	15	15	12	14	13	12	12
27	15	15	15	15	15	15	13	14	18	18	25	25	22	22	23	22	20	16	15	15	14	14	14	14
28	13	13	13	12	12	12	12	12	12	13	18	17	21	20	20	20	17	18	15	14	13	13	14	14
29	13	13	13	13	13	14	12	12	12	17	20	23	24	34	26	22	20	16	14	12	12	12	12	12
30	13	15	14	14	14	14	14	17	16	20	21	28	28	25	24	20	17	16	16	16	13	13	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	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	13	14	14	14	14	14	14	14	15	18	20	24	26	25	24	22	20	16	15	14	14	14	14	14
U Q	14	14	14	14	15	14	14	15	17	20	24	26	29	27	26	23	21	17	16	15	14	14	14	15
L Q	12	12	12	13	13	13	13	13	14	17	19	22	22	22	22	20	19	15	14	13	13	13	13	12

JUN. 2012 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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

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	287	302	284	282	293	290	293	305	316	286	302		304	292	289	303	301	309	309	305	307	340	276	291	
2	291	302	312	307	305	292	319	326	350	294	293	313		287	288	302	305	290	313	322	310	285	315	286	
3	275	304	329	311	317	325	335	352	344	314		277	281	285	286	291	300	303	301	299	291	307	266	301	
4	285	289	282	302	272	265	324	327	331		323		266	282	309	288		305	312	319	273	253	285	261	
5	283	302	301	290	303	282	324	331		299	290	305	307	303	287	301	298	324	306			273	281	288	
6			291	289	314	299		287	298	301	298	267	253	291	265	297	319	293	300	274	288	275	270	312	
7	287	309	311	292	301	289	344	323	311	311	292		282	286	283	285	309	305	300	308	272	280	286	286	
8	278	293	340	282	276	297	349	333	326	315	328	294	290	294	296	287	291	290	276	320	322	295	295		
9	289	289		285	296	291	307	299	330		303	268	271	299	318	293	289	291	305	336	343	317	287	290	
10	278	291	293	308	312	306	323	326	322			331	289	286			292	289	306	310	291	305	298		
11	289		313	293	320	315	309	282	325	307	288	286	269	297	281			289		308	306	291	285	295	
12	275	282	287	316	317	342	302	315	299		314	286	278	295		330	302		316	307	301	289	275	262	
13	283	278	302	311	296	290	276	306	331	334	335				310	293	314	297	312	355	268	276	288	285	
14	280	296	291	314	308	303	295	328	355	323	312	308	286	292	301	301		301	300	287	280	282	278	283	
15	280	292	320	338	298	299	313	333	331	306		304	271	288	302	297	293	301	322	329	320	284	284	282	
16	291	295	313	331	319	300	330	322	320	327	298	291	282	291	282	292	301	314	325		327	316	280	284	
17	301	314	350	332	271	267	293	316	318	276	264	263	244	267	260	268	285	344	308	308	285	267	284	283	
18	292		332		281	254	280	295			237				237	263	292	293	303	300		279	291		
19		273	276	273	273	294	333	337	292	316		271	301		299	291		304		324	303	292	273	315	
20	288	310	312	309	325	314	333	293					264		288	292	302	321	310	326	330	299	278	288	
21	325	323	337	301	293	299	328	332	329	335	343		260	263	284	276	285	294	294	321	337	313	298	286	
22	282	318	315	310	305	315	314	341	333	318	324	302	282	313	288	296	312	307	306	298	315	334	296	279	
23	302	296	289	324	311	311	339	337	354				294	306	314	311	299	304				291	288		
24	280	303	330	333	314	298	318	345	329						314	287	302	298	313	327		320	298	288	
25	299	330	329	265	287	296	323	310	328							289	280	284	309	302	311	330	316	302	
26	272	286	298	328		297	308	329	332	243	316	287	306		338	314	306	292	303	296	295	307	297	293	
27	291	301	315	297	305	293	307	325	340	331	337	313	290	306	308	304	301	307	295	315	309	299	296	279	
28	277	283	283	287	290	303	314	333	324	351	320			290	291	293	300	321	332		309	299	302	283	
29	298	319	322	296		305	295	335	345						309						308	339	330	321	
30	269	285	345	323	339	326	319	333	323	285	278	317	257	291	299	300	298	286		328	327	301	289	281	
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	27	29	29	28	30	29	30	27	20	22	18	22	22	28	27	25	28	26	26	26	30	30	27	
MED	286	296	312	307	304	298	318	326	329	312	302	292	282	291	290	293	301	301	306	309	308	299	288	286	
U Q	291	309	329	320	314	306	329	333	333	325	323	308	290	295	307	301	306	308	312	324	327	316	297	295	
L Q	279	289	291	290	292	291	304	310	320	296	290	277	266	286	285	288	292	292	301	300	291	282	280	283	

JUN. 2012 M(3000)F2 (0.01)

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JUN. 2012 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	A	A	A	A	A	A	375	381	351	339	336						
2							L	L	U	L	L	U	L	A	A	361	R	A	A	A					
3								L	L	L	L	L	L	A	A	A	A	A	A						
4					L	L	L	A	A	A	A	A	A	A	A	A	A	A	A	L					
5								U	L	A	A	A	A	R	A	A	A	A	L	A	A				
6							A	344	357	363	A	396	384	383	369	375	A	U	L	L	L				
7					L	L	A	A	A	A	A	A	A	A	A	A	A	A	L	L					
8								A	A	A	A	A	A	A	A	A	A	A	A	L	U	L			
9								A	A	L	U	L	L	L	R	A	A	L	A						
10							A	A	A	A	L	A	A	A	A	A	A	A	U	L					
11								L	U	L	L	U	L	L	A	A	A	A	A	L					
12								U	L	A	A	A	A	A	A	A	A	A	A	A					
13								L	L		A	A	A	A	A	A	A	L	A	A					
14								L	A	A	A	A	A	A	A	A	A	A	A						
15								L	L	A	A	A	A	A	R	A	L	A	A						
16								L	L	U	L	L	L	A	A	A	A	L	L						
17					L			357		386	A	A	403	399	R	A	A	U	L						
18								L	R	A	A	R	A	A	A	A	A	A	A						
19								L	L	L	A	A	A	A	A	A	A	A	A						
20								A	A	A	A	A	R	A	A	A	A	A	U	L					L
21								L	A	A	A	A	A	A	A	A	A	A	A						
22						A		U	L	U	L	A	A	L	R	A	A	A	A						
23								L	A	A	A	A	A	A	A	A	A	A	U	L	A				A
24								A	A	A	A	A	A	A	A	A	R	A	A	A					
25								343	A	A	A	A	A	A	A	A	407	A	A	L					L
26							340	359	388	385	U	R	A	A	A	A	A	L	L						L
27							L	L	A	A	A	A	A	A	A	A	A	A	A	A					
28								L	L	A	A	A	A	A	A	A	A	A	A	U	L				A
29								U	L	L	A	A	A	A	A	A	A	A	A	A					A
30								U	L	L	A	A	A	A	A	A	A	A	A	A					L
31								364	366	L	L	381	378	391	394	383									
	00	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	11	7	10	10	12	12	13	14	11	14	17	11	1					
MED							346	357	378	368	378	380	385	383	374	375	357	350	343	328					
U Q								U	L	U	L														
L Q								344	357	357	363	360	362	362	361	362	351	340	336						

JUN. 2012 M(3000)F1 (0.01)

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JUN. 2012 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								302	274	E A 378	A 334	A	346	362	356	328	E A 320	294	290					
2							300	268	242	L 292	346	300	A	366	356	328	E A 378	312	278					
3								242	268	314		388	388	388	386	358	A 330	E A 304	326					
4						354	288	262	254	A 254	322	352	420	390	368	368	A 320	304	260					
5								274	A E 408	A 324	330	346	346	346	326	326	292	A 292	A					
6							A 368	338	338	364	472	510	402	418	330	290	292	292	294					
7					304	248	276	A 276	348	380	A	A 408	390	390	390	342	300	300						
8								276	A 286	298	352	E A E 408	408	360	352	352	A 336	326	318					
9								268	A 268	298	388	392	362	340	332	332	332	332						
10								A 292	A 292	A 326	A 296	376	386	A	A	A 358	A 322	276						
11								312	306	286	296	310	402	360	360	358	344	310	288					
12								268	A 268	A 288	402	366	348	310	296		A 284							
13								318	290		282	A	A	A	330	342	312	324	306					
14								260	238	298	300	330	366	366	332	332	A 306							
15								258	266	314	A 338	A 384	346	330	330	330	318	286						
16								262	262	272	314	306	396	362	362	328	304	294	294					
17						356		296	E Y 508	A 450	A 450	A 484	A 424	A 424	410	370	300	300						
18							330	330	A 330	A 580	A 580	A			596	490	368	352	324					
19							264	262	L E A 328	A 326	A 376	A 342	A	A	342	342	A 324	A						
20									A A	A A	A A	A A	418		372	342	322	286	284	248				
21								276	276	276	280	A 480	438	368	382	346	326	278						
22						A 320		244	244	E A 326	298	314	396	326	330	342	298	298	298					
23								L 270	270	A 270	A 270	A 270	A 350	332	316	302	302	300						A
24									A 286	A 286	A 286	A 286	A 286	A 286	A 354	E Y 428	312	A 296						
25								328	284	A 284	A 284	A 284	A 284	A 284	E A 380	368	332	310	302	298				
26							308	298	294	566	E A 368	398	348	A	294	320	332	392	336	322				
27							276	280	266	288	E A 344	358	410	E A 358	358	356	346	324	318					
28							284	256	282	256	310	A 378	A 378	E A 378	366	344	314	282	272					A
29							322	294	246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246	A 246
30							300	280	280	370	304	444	358	344	334	328	328	304	240					
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	9	25	25	19	23	19	22	22	29	28	25	27	27	7				
MED						337	288	276	276	U 300	323	345	395	363	356	342	330	310	295	296				
U Q						355	315	301	288	E 348	368	388	418	390	370	363	346	324	306	318				
L Q						312	270	262	264	286	298	310	366	358	335	329	313	298	284	248				

JUN. 2012 h'F2 (KM)

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JUN. 2012 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

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	290	284	284	282	286	286	238		A	A	A	A	A	A	222	216	216	216	216	252	252	252	330	268				
2	296	278	278	278	274	274	242	242	216	216	198		A	A	A	230		A	A	A	248	260	348	342	304			
3	290	286	242	208	242	238	238	238	246	246	204	204	218	218		A	A	E	A	A	A	270	278	284	346	302		
4	304	396	306	264	264	264	246	236		A	A	A	A	218		A	A	A	A	218	230	230		A	368	364	332	
5	290	264	250	246	282	352	264	238		A	A	A	206	226		A	A	A	A	248		A	A	A	A	396	384	362
6		A	A	322	322	246	282		218	218	218		180	198	208	208	208		A		208	250	250	252	278	290	304	
7	290	286	284	284	224	280	252		A	A	222	222		A	A	254	212	262	236	236	236	242	330	312	290	290		
8	316	316	248	282	298	288	230	230		A	A	A	A	A	A	A	A	A	A	A	280	266	262	262	296	296		
9	298	300		324	290	282	248	248		A	A	198	278	228	222	222	250	226	226		262	262	262	276	292			
10	308	304	306	270	266	266	256		A	A	A	A	A	A	A	A	A	A	A		242	252	324	296	296	316		
11	272	288	288	288	274	256	256	242	216	200	200	200	246		246		A	A	234	234	234	246	244	274	290	264		
12	328	282	282	274	266	236	236	224		A	A	210		A	A	210		A	A	A	A	272	260	268	298	360		
13	286	330	272	258	258	264	258	236	226	270		A	A	A	206	208		A	A	A		218	240	316	350	310		
14	292	278	278	268	258	262	262	232		A	A	A	A	A	236		A	A	A	A	280	280	280	286	294	296		
15	296	272	240	218	240	252	246	212	E	A	A	A	A	A	E	A	254	224	224	204	204	216	252	236	240	286	288	
16	318	300	256	256	256	256	244	210	216	216	214	214		220	192	192	210	210	210	214	240	240	240	272	298			
17	290	274	230	230	306	282	270	238	238	236		A	A	210	210		A	A	210	224	254	256	330	332	334	298		
18	332		248		314	370	288	340		A	A	A	A	A	A	A	218	218	218	230		296		300	314	A		
19		A	320	320	346	322	266	244	216	216		A	A	A	A	A	A	A	A	A	A	248	262	278	290	290		
20	296	282	266	246	244	284	258		A	A	A	A	A	244		A	A	A	A		200	230	240	224	224	264	274	
21	250	250	222	222	260	260	234	234		A	A	A	A	A	A	A	A	E	A	A	A	252	250	244	250	262		
22	320	260	260	272	254		254	234	222		222	238	230	230		A	A	A	A	A	292	244	236	272	320			
23	284	284	310	232	232	214	218		A	A	A	A	A	A	200		A	A	A		202		A	A	A	A		
24	348	272	258	246	276	302	272	274		A	A	A	A	A	A	A	A	Y	E	A	A	A	A	A	A	256	256	256
25	278	282	282	334	296	286	252	246		A	A	A	A	A	A	A	200		A	A	204	210	236	236	236	284		
26	298	316	300	252		312	252	212	212	226	226		A	212		A	A	A	A	A	212	212	222	222	262	262	262	304
27	286	286	274	274	E	A	302	228	228		186		196	196	196		A	A	A	A	254	224	250	318	308			
28	324	324	322	278	278	278	254	220		A	A	A	A	A	A	A	220	220		A	220		A	244	244	296	298	
29	316	270	242	282		304	284	216		A	A	A	A	A	A	A	A	A	A	A		A	278	264	264	294		
30	362	328	246	246	258	258	276	248	234	198	198	206	206	206	212		A	A			212	222	222	230	230	296	296	
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	28	29	29	25	12	11	10	10	12	12	13	11	14	17	16	26	25	30	30	28				
MED	296	284	274	270	266	278	250	234	218	217	209	204	218	218	212	217	218	214	228	252	252	264	292	297				
U Q	317	310	294	282	288	287	260	242	236	236	222	214	229	233	223	224	236	232	246	266	270	300	330	306				
L Q	290	276	248	246	255	259	240	219	216	200	198	200	208	209	207	208	212	206	218	240	240	244	272	289				

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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					A	A	A	100	100	A	A	A	A		A	100	102	102	102	A					
2						A				A	A	A	106	106	B	106	106	106	106						
3						B	E	A							A	112	112	112	112	B					
4						B					110	110	110	110	110	110	108	108	108	A					
5						A				A		A				106	106	106	106						
6							A					106		106	106	106	106	106	106	A					
7						B					A	A		A	A	A	A								
8						A							116		112	108	108	108	108	A	A				
9						A				A		A					108	106	106	106	A				
10						B	A	A	A		A		B	B		104	104	104	104	A	A				
11							A	A	A	A	A	A	A	A		A	A		108	108	A				
12							108	108	108	108	108	108	108		B	A	108	108	108	108	A	A			
13							112	112	104		104	104			104	104	104	104		A	A				
14						A	A		A		A									A					
15						B					A				A				108	A					
16						A	A	A	A	A		A	A			116	110	110	110	110	B				
17						B													A	A					
18						B	A				A				A		A	110	110	110	A	A			
19								106	106	A	A	A			A					A	A				
20						A					A	A	A	A	A			112	112	112	A	A	A		
21						A						A					A	A			A				
22						A						A				A									
23							108	108	108		A					A				122	124				
24						A			A		A				A	110	110	110		110	A				
25								108			A	A	A	108	108	108	108	108	108	108	108				
26						A											102	102	102		A				
27							110	122	112	112	112	102	102				102	102	102		A				
28							112	112		A	A			106		106	106	106	106	106	A	A			
29							112	112	110	110	110	110		A	A				114		A	A			
30						A				A	108					108	108		108	108					
31						A	A			A	A	A	A			112	112	112	112	112		144			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							15	21	20	11	9	10	9	8	11	20	21	24	19	2					
MED							112	110	108	108	110	109	108	109	108	108	108	108	108	108	126				
U Q							116	114	110	112	111	112	111	112	110	110	110	110	110						
L Q							108	107	106	108	107	104	106	106	106	106	106	106	106						

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JUN. 2012 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	108	108	108	106	106	98	98	114	114	108	108	106	106	106	106	G	106	G	120	120	116	108	104	104
2	106	106	106	106	102	102	102	132	122	122	122	120	124	130	136	130	124	124	118	104	104	104	104	104
3	100	100	100	100	100	100	142	122	114	114	114	114	114	114	148	138	116	116	116	108	108	108	108	104
4	102	90	90	90	90	B	120	120	120	106	106	106	G	146	146	112	112	112	108	108	108	108	108	108
5	102	102	102	102	110	110	110	110	106	106	106	106	106	106	106	110	120	120	112	112	108	108	108	108
6	96	96	96	96	102	102	102	102	106	106	106	112	112	154	138	138	112	112	112	112	112	B	100	94
7	106	106	106	106	108	154	142	116	116	116	110	100	100	100	100	102	96	102	110	98	98	86	86	86
8	104	104	104	104	104	104	122	122	122	122	120	120	118	108	124	124	124	124	118	114	114	96	96	96
9	106	102	102	102	102	102	148	120	106	106	106	106	106	106	106	126	132	124	106	106	96	92	92	92
10	108	116	114	114	114	144	142	106	106	106	122	120	118	118	118	118	118	118	140	120	114	114	114	110
11	108	108	108	108	108	108	106	106	106	106	106	106	106	106	102	102	100	168	128	96	96	96	96	96
12	106	106	104	98	98	98	128	124	120	116	110	118	124	124	134	114	114	114	114	112	112	112	112	108
13	104	104	104	98	98	98	114	114	108	116	116	110	110	110	126	126	126	114	110	108	106	94	94	94
14	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	96	96
15	108	B	106	106	106	104	106	118	106	110	106	106	106	106	120	110	102	102	96	114	88	88	112	98
16	106	106	100	96	96	B	156	160	144	120	114	108	104	102	182	104	104	G	122	B	B	114	114	114
17	112	112	112	110	B	B	134	134	134	118	118	118	118	116	112	112	110	110	110	108	108	108	98	98
18	104	104	104	104	120	140	108	108	108	108	108	108	108	108	108	108	108	128	120	110	102	102	118	104
19	100	100	100	100	100	100	100	128	128	112	112	112	112	112	112	112	112	112	104	104	104	104	104	104
20	102	102	102	102	102	132	130	120	112	112	110	110	110	110	108	108	108	108	106	106	100	100	94	94
21	98	98	98	98	96	96	122	120	106	106	106	106	106	102	102	100	98	96	96	94	94	94	94	100
22	112	112	100	100	100	100	100	100	106	106	106	106	106	106	144	130	130	130	126	106	106	106	106	106
23	108	106	104	102	106	106	114	114	114	108	108	102	100	100	104	104	102	124	120	120	112	112	114	112
24	112	112	110	98	98	98	98	112	112	104	100	100	100	122	154	178	158	118	118	114	114	114	106	106
25	106	106	104	104	104	104	110	122	112	112	112	110	110	110	110	166	120	G	120	G	110	B	100	110
26	106	106	106	100	100	100	118	104	142	160	134	120	120	110	110	110	120	120	114	94	94	94	94	104
27	104	104	104	104	104	104	112	112	112	106	106	102	102	102	148	140	120	120	116	110	108	108	106	106
28	98	98	98	98	98	100	130	130	116	116	116	106	106	106	106	106	106	106	106	100	98	98	106	124
29	108	120	108	108	108	108	112	112	112	106	106	104	102	102	114	122	116	114	114	112	112	112	104	104
30	90	104	96	96	96	96	96	96	106	106	106	106	106	142	130	118	116	116	116	90	90	98	98	98
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	29	28	30	30	30	30	30	30	29	30	30	29	30	27	30	28	29	28	30	30
MED	106	104	104	102	102	102	113	115	112	108	108	106	106	108	113	112	113	116	114	108	106	104	104	104
U Q	108	107	106	106	106	107	130	122	120	116	114	112	113	116	136	128	120	124	120	112	112	108	108	108
L Q	102	101	100	98	98	98	102	108	106	106	106	106	105	106	106	107	106	110	108	102	97	96	96	96

JUN. 2012 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2012 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

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	F3	F2	F3	F2	L3	L4	L3	C3	C2	C3	C3	L1	L2	L2	L1		L1		C2	C2	F1	F1	F6	F3	
2	F2	F3	FO31	F2	F2	L2	L3	CL11	CL11	CL11	CL11	CL11	CL11	H1	H1	C1	C4	CL21	CL31	CL42	FF43	FF43	F8	F3	
3	F2	F2	F1	F1	L1	L1	CL21	CL21	C2	C1	C1	C1	C1	C1	HL11	H2	C2	C1	C3	C3	F3	F4	F4	F4	
4	FO21	FO41	FO21	FO21	F2		C2	C2	C2	C3	C2	C2		C2	C1	C2	C2	C2	C2	C2	F3	F7	F7	F3	
5	F2	F1	F2	F1	FF31	C2	C4	C3	C2	C2	C1	C1	C2	C1	C1	C1	C1	C1	C1	C1	L8	FO8	FO41	F5	
6	F6	F5	F5	F5	FO21	C6	L2	C1	C1	C1	C1	C1	C1	HC11	H1	H1	C2	C1	C2	C1	F2		F1	F3	
7	FF12	FF22	FF12	F4	F1	C1	C1	C2	C2	C2	C1	L3	L2	L1	L1	L2	L2	CL11	C2	C2	F3	F3	F1	FO21	
8	F2	FF33	F4	F2	F2	L4	CL21	CL21	CL21	CL21	CL11	L1	C2	C2	C1	C2	C2	C3	C2	C4	F3	F2	F3	F5	
9	F4	F3	FF33	FF12	FO31	L2	C2	C2	C4	C3	L1	L2	L1	L1	L1	C1	H1	C1	C1	L3	L4	F6	F4	F4	
10	FF22	F3	F4	FF31	F1	C1	CL22	C4	CL32	CL21	CL11	C1	C2	C2	C1	C1	C3	C3	H1	C2	F8	FO31	FO21	F5	
11	F2	F2	F4	F5	F3	F3	C3	C2	C1	C1	C1	L1	L2	L2	L1	L2	L1	HL11	CL11	L3	F2	F4	FF42	FF31	
12	F3	F3	F5	F3	L5	L4	C1	C1	C2	C2	C1	C1	C1	C1	HL11	C1	C2	C2	C4	C4	F2	F8	F3	F8	
13	F2	F4	F4	F6	F6	F2	F2	C1	C1	CL11	C2	C1	C1	C1	C1	C1	C1	C2	C5	L5	F3	F3	F3	F5	
14	F1	F3	F4	F6	F2	C2	C2	L2	L1	C2	L1	L2	L2	L1	L1	L2	L3	L2	L8	L7	F3	F1	F3	F2	
15	F2		F1	F3	F1	L1	L1	C1	C2	C2	L2	L2	L2	L1	CL11	L1	L1	LH21	L3	CL35	F3	F3	FF12	F1	
16	F2	F2	F4	F4	F5	L3	HCL11	HL11	HL11	CL11	C1	L1	L3	L2	L1	L1	L1		H1			F1	F2	F3	
17	F4	F2	F2	F1		C1	CL11	CL11	C1	C1	C1	C1	C1	C1	C1	C1	C1	C3	L3	L3	L4	L4	L5	FO31	
18	F6	F5	F5	F8	FF22	C1	C3	C3	C1	C2	L1	L1	L1	L1	L1	L1	L1	CL11	CL31	C4	F6	F3	F3	F4	
19	F5	F2	F4	F3	F4	L3	L2	CL11	CL11	CL21	C2	C2	C1	C2	C2	C2	CL51	C2	L5	L5	F4	F3	FF12	FF22	
20	FF22	F2	F3	F2	F2	CL51	CL51	C4	C3	C2	C2	C1	C2	C2	C2	C2	C1	L2	L2	L1	F4	F3	F2	F2	
21	F1	F2	F2	F1	F3	L1	C2	C2	C2	C2	C2	C2	L2	L2	L2	L1	L3	L3	L3	L4	F3	F3	F3	FF22	
22	FF41	FF12	FO21	F2	FF31	L4	L3	C3	C2	C3	C1	C2	C1	C1	HL11	HL11	H1	C3	CC15	C8	F3	F3	F3	F3	
23	F3	F2	F4	F3	FF12	F1	C3	C2	C2	C4	L2	L2	L2	L1	L2	LH21	L2	CL21	CL41	CL84	FF83	FF33	F5	F7	
24	F3	FF23	F3	F3	FF31	L3	LC31	CL32	C3	C2	C2	C2	C2	CL11	HL11	HCL11	H1	CL21	CL42	C4	F8	F3	F3	F2	
25	F2	FO21	F7	F3	F5	L3	CL12	CL12	C2	L2	L3	L2	C3	C2	C2	H1	C2		C2		F1		F1	FF11	
26	FF11	F2	F2	F2	FO31	LO21	C2	L1	HL11	HC11	C1	C1	C1	L2	C2	C2	C1	C1	C3	LC21	F2	F3	F3	FF31	
27	FF31	FF31	F2	F2	F6	L1	C2	C1	C3	C2	L2	L1	C1	C1	C1	C1	C1	C2	C2	L5	F1	F2	F4	F3	
28	F3	F4	F4	F5	F4	L2	CL21	CL21	C3	C2	C2	C3	C2	C3	C2	C1	C1	CL41	C3	L7	F4	F2	FF25	FF12	
29	FF21	FF21	FF11	FF41	FF61	L3	CL22	C2	C3	C3	C2	L2	L2	L2	L1	CC12	CL21	CL31	CL32	CL61	FF22	FF22	F3	F4	
30	F3	FF13	F3	F3	F4	L2	L3	L2	L2	C1	L2	L1	L1	H1	H1	H1	C1	C2	C2	LL11	F1	F1	F5	F3	
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																									

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 f_{XI} (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	X 86	X 88	79	70	67	67															X 92	X 82	X 79	X 86	
2	84	88	82	77	71	72	80														X 90	X 86	88	87	
3	88	86	83	77	X 65	57															X 77	X 80	X 81	X 81	
4	X 82	80	79	X 79	66	64	67														X 76	X 78	81	77	
5	73	80	X 76	X 66	X 58																X 88	X 78	X 81	X 88	
6	81	A	77	71	66	65															X 89	X 86	X 87	X 91	
7	X 97	X 103	X 88	X 86	X 91																X 75	X 76	X 78	X 77	
8	X 78	78	76	66	64																X 111	X 80	X 72	X 78	
9	88	X 94	X 74	X 70	X 71	70	71	91													X 116	X 93	X 88	X 86	
10	X 87	X 88	X 84	X 79	X 79	77															X 94	X 86	88	X 88	
11	X 93	92	X 89	X 82	X 81	78															X 107	X 107	X 98	X 101	
12	X 101	X 94	X 92	X 94	X 92																X 86	X 82	X 83	X 85	
13	X 87	X 90	X 82	X 85	X 70																X 78	X 86	X 94	X 102	
14	X 100	X 100	X 95	X 86	X 80	72	74														X 83	X 82	X 82	X 83	
15	84	86	X 91	X 67	X 58																X 93	X 82	87	X 85	
16	X 89	X 92	X 99	X 76	X 63																X 98	X 94	X 89	X 88	
17	96	X 110	X 104	X 61	X 55																X 74	X 76	X 84	X 94	
18	X 89	X 82	X 79	X 63	X 60	58	53														X 60	X 64	X 65	X 64	
19	66	64	61	60	62	56	60														X 89	X 86	X 79	X 76	
20	82	X 88	X 92	X 76	X 60	56															X 112	X 95	X 88	X 93	
21	X 104	X 112	X 91	X 84	X 79																X 96	X 86	X 76	X 71	
22	X 73	X 74	X 77	X 70	X 66	65	72														X 88	X 80	X 78	X 77	
23	80	78	X 75	X 86	X 66	65															X 92	X 67	X 63	X 66	
24	67	66	66	A	A																X 88	X 84	X 78	X 78	
25	78	71	54	56	56	51															X 97	X 78	X 77	X 75	
26	X 73	X 71	X 67	X 63	X 58	61	60														X 90	X 76	X 78	X 79	
27	X 78	X 81	X 74	X 67	X 65																X 74	X 75	X 71	X 69	
28	X 75	X 75	67	65	66															X 81	X 80	X 75	X 75	X 70	
29	X 76	80	68	70	64	59															X 104	X 78	X 76	X 76	
30	70	66	66	66	56	46															X 92	X 92	X 91	X 87	
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	18	8	1												1	30	30	30	30	
MED	X 83	X 86	X 79	X 70	X 66	X 64	X 69	X 91													X 81	X 90	X 82	X 81	X 82
U Q	X 89	X 92	X 89	X 80	X 71	X 70	X 73														X 96	X 86	X 88	X 88	
L Q	76	76	74	66	60	57	60														X 80	X 78	X 77	X 76	

JUN. 2012 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		80	82 ^R	71	62 ^F	60 ^F	60 ^F	60	74	92	82	74		82	89	96	105	102	102	96	91	86	76	73	78 ^F	
2		76 ^F	78 ^F	74 ^F	67 ^F	64 ^F	65 ^F	72 ^F	88	80	72	80	80	78	86	92	95	99	109	112	105	84	80	78 ^F	78 ^F	
3		79 ^F	76 ^F	72 ^F	70 ^F	59	50 ^F	58	79	74	67 ^R	68	75	86		85	91	100	94		69	71	74	75	75 ^F	
4		76 ^F	72 ^F	71 ^F	73	58 ^F	54 ^F	59	69	60 ^R		91	94	89	95	95	94		92	96 ^U	68 ^R	70	72	74 ^F	70 ^F	
5		64 ^F	71 ^F	70	60	52	52 ^V	62		62 ^R	66	76	82		98	98	104	104	111	107	94	82	72	75	82	
6		74 ^F		69 ^F	62 ^F	60	53	54	63	64	71	62	59 ^U	64 ^R	70	78	92	86	80	72	76	83	80	81	85	
7		91	97	82	80	85	63	68	79	79	79	76	70	77	77	74	82	92	81	76	67	69	70	72	71 ^F	
8		72	68 ^F	66 ^F	59 ^F	56 ^F	61	74 ^U	54 ^R	67	71 ^H		70 ^R	79	86	91	99	100	101	100 ^R	102	105 ^R	74	66	67 ^F	
9		76 ^F	84 ^F	64 ^F	62 ^F	63 ^F	60 ^F	62 ^F	82 ^F			75		88	94	102 ^A	100 ^A	101	107	115	122	110 ^R	87	82	80	
10		81	82	78	71 ^F	71 ^F	68 ^F	79	69	77	81	76	75	74	78			95	103	106	98	88	80	82	82 ^F	
11		87	84 ^F	83	74 ^F	73 ^F	70	72	84	94	98	95	91	93	96	101	108	116	122	114	102	101	101	92	95 ^F	
12		95	88	86	88	86	78	67	81	89	85	76	83	98	112	113	102	94	94	100	102	80	76	77	77 ^F	
13		81	84	76	79	64	58 ^F	59 ^F	75	83	89	84		75	86	89	85	94	109	116	84	72	80	88	96	
14		94	94	89	80	74	64 ^F	69 ^F	82	72	81	86	78	78	86		88	90	90	82	77	77	76	76	77	
15		78 ^F	80	85	61	52	54	66	69	68		80	91		111	114	114	114	115	117	115	87	76	81	79	
16		83	86	93	70	57 ^V	56	58	72	81	77	83	84	87	93	101	108	109	114	116	104	92	88	83	82	
17		86 ^F	104	98	53	49	55	57	70	71	59	67	65 ^V	69	78	78	82	94	107	87	69	68	70	78	88	
18		83	76	73	57	54	49 ^F	44 ^F	51	46 ^R	44 ^G			54	57		57	63	66	65	59	54	58	59	58	
19		58 ^F	54 ^F	50 ^F	51 ^F	52 ^F	48 ^F	52 ^F	58	63	67	72	83	88		99	102	103	104	101	100	83	80	73	70	
20		74 ^F	82	86	70	52 ^F	48 ^F	59	75	75 ^U	69 ^R		69		91	104 ^A	112 ^A	115	119	128		106	89	82	87	
21		98	106	85	78	73	70	67	73	77	88	76					89	97	104	103	93	90	80	70	65	
22		67	67 ^F	69 ^F	63 ^F	60 ^F	58 ^F	64 ^F	81	67	72	74	76	84	93	96	101	99	88	91	94	82	74	72	71 ^R	
23		71 ^F	69 ^F	69	80	60	52 ^F	56	82	68	61			70	82	90	92	90	84	83	90	86	61	57	59 ^F	
24		60 ^F	59 ^F	55 ^F				48	66	70	72	64	62	61	68	74	83	93	103	106	94	82	78	66	68 ^F	
25		68 ^F	63 ^F	47 ^F	48 ^F	48 ^F	41 ^F	46		88	64	64	72	78	83	78	88	99	99	98	98	91	72	71	69	
26		67	65	61	56 ^F	51	54 ^F	52 ^F	68	54	57	68	67	74	76	79	65	61	60	70	79	84	70	72	73	
27		72	75	68	61	59	52	52	66	81	69	62	61	64	70	69	68	71	82	93	82	68	69	65	63	
28		64 ^F	69	59	55 ^F	58 ^F	56 ^F	60	72	67	79		59	63	71	80	88	101	107	90	75	74	69	69	64	
29		70	74 ^F	61 ^F	64 ^F	54 ^F	52 ^F	56	70		66	64	72	79	81	85	83		72 ^U	75 ^R		95	98	72	70 ^Z	68 ^F
30		62 ^F	57 ^F	56 ^F	56 ^F	48 ^F	38 ^F	47	61	68	62 ^R	76	70	78	87	96	99	101	106	110	106	86	86	85	81	
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	29	30	28	28	27	25	24	26	27	26	29	29	30	28	29	30	30	30	30	30
MED		76	76	71	63 ^F	59 ^F	55 ^F	59	72	72	71	76	74	78	86	92	92	99	102	100	94	84	76	74	76	
U Q		83	84	83	74	64	62	67	80	80	81	80	82	86	93	99	102	102	107	111	102	90	80	81	82	
L Q		68 ^F	68 ^F	64 ^F	58 ^F	52	52 ^F	54	67	67	66	68	68	70	77	79	84	91	88	88	76	74	72	70	68	

JUN. 2012 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 f_oF₁ (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	L	A	A	A	A	A	A	516	512	492	448	L	L					
2								A	L	L	516	548	U	L	A	520	504	496	A	A	A				
3								L	A	L	U	L	U	A	A	U	A	A	A	A	A				
4										A	532	528	508	540	A	A	A	U	L	L					
5								A	L	A	A	U	L	A	A			L	U	L		L			
6							U	L			440	484	480	500	516	516	520	508	500	496	464			L	
7									A			A							L	L					
8								A	A	A	A	U	A	U	L	U	L		A	A	A	A			
9								L	A	A	U	L	A	U	L	S		U	A		A				
10									L	U	L	A	U	A	A	A	A	A	A	L	L				
11								L	U	L	A	A	U	L	L	A	A		L	L					
12								U	L	U	L	U	L	L	U	A	L	L	U	L	L	L	A		
13								L	L		A	A													
14									L	U	L	A						A	U	L	L				
15									L	A	U	L	U	A	A	U	L		A	A	L				
16								L	U	L	L	U	L	U	L	A	U	A	U	L	L	L			
17								L	L				L	A	A	A	A	U	A	A	L				
18								L	R	A	A									U	L	L			
19									L	A	A									U	R	A			
20							A	A	A	A	A	L	A	A	A	A	A	A	A	A	A	A			
21								L	U	L	A	L	A	A	A	A	A	A	U	A	A	L			
22									A			L	U	A	U	A	L	U	A	A	A				
23								U	L	L	U	L	A	A				L	L		L				
24						A		A	L	U	A	A	A	U	A	U	A	U	L	U	L	A			
25								A	A	U	L	U	A							L	L				
26							U	L																	
27								L																	
28								408	440	456	492	492	484	488	480	484	464	440	L	L					
29								412		452					508	484	480	464	456						
30								A	A	A	A	500			500	488		440	A	A	A	A			
31										L															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							1	6	10	14	14	20	19	18	22	20	19	20	7						
MED							U	L	L	L	L	U													
U Q							352	410	466	478	516	530	516	502	506	502	476	466	416						
L Q								U	L	U	L	U	L	U	L	U	L	U	L	L	L				
								412	488	496	544	544	552	524	520	518	496	484	424						
								400	440	468	488	508	484	480	480	482	460	440	404						

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 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	U	A	U	A	U	A	A	R	U	R							
2						A	A	A	A	A	A	A	R	U	A	A	U	A	U	A					
3						A	U	A	A	A	U	A	A	A	A	U	R								
4						B	A	U	A	U	A	A	U	R	U	R	U	R	U	A					
5						A	A	260	316	A	A	A	A	A	U	R	U	R							
6						A	A	U	A	A	A	A	A	U	R		R	R							
7						B	A	U	A	U	A	A	A	A	A	A									
8						A	A	A	A	A	A	A	U	R	B	U	R	U	R						
9						A	A	A	A	A	A	A	A	U	S	U	R	U	R						
10						A	A	A	A	A	A	A	A	U	R	U	R	R							
11						A	A	A	A	A	A	A	A	A	A	A	A	A	A						
12						A	A	260		372	408	U	R	U	R	U	R	A	U	A					
13						A	200	280	316	352	364	376	392	384			U	R	U	R					
14						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
15						B	R	A	A	A	A	A	A	U	R	B	A								
16						B	188	260	312	A	A	A	A	A	A	A	A								
17						A	A	252	308	336	A	U	R	U	R	A	A	A	A	A					
18						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
19						A	A	A	A	340	A	A	A	A	A	A	A	A	A	A					
20						B	A	U	A	U	A	A	A	U	R	U	R	A	A	A	A				
21						B	A	264	304	A	A	A	A	A	A	A	A	A	A	A					
22						B	180		A	A	A	A	A	A	U	A									
23						B	A	252	300	U	A	A	A	A	U	R									
24						A	A	U	A	U	A	U	A	U	R		U	R							
25						A	A	A	A	A	A	A	A	U	R		R	A							
26						B	A	A		A	R	U	R	U	R	U	R								
27						B	A	U	A	A	A	A	U	R	U	R	U	R							
28						A	A	260	296	328	348	U	R	A	R	R	R								
29						B	A	A	A	A	A	A	A	A	A	A	U	A	U	A	U	A			
30						A		A	A	A	A	A	A	A	A	R									
31							176								392	380	336	296							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							8	14	14	10	7	8	9	14	15	18	24	22	14	1					
MED							186	260	308	338	356	378	392	388	384	372	340	304	248	200					
U Q							U	A	A	A	R	R	R	R	R	R									
L Q							180	260	300	336	348	366	380	376	376	364	336	296	240						

IONOSPHERIC DATA STATION Okinawa

JUN.2012 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	G	J	A	G	G	E	B	J	A	
2	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
3	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
4	J	A	J	A	J	A	J	A	E	B	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
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
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
8	J	A	J	A	J	A	J	A	J	A	J	A	J	A	E	B	J	A	J	A	J	A	J	A	J	A
9	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
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
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
12	J	A	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
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
15	J	A	E	B	J	A	J	A	J	A	J	A	J	A	J	A	E	B	J	A	J	A	J	A	J	A
16	J	A	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
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
19	J	A	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
21	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
22	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
23	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
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
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
26	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
27	J	A	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
29	J	A	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	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	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
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
LQ	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

JUN.2012 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 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	18	20	20	19	16	19	47	41	48	74	71	A A	76	74	60	U G	G	G	G		E B	E B	E B	E B						
2	E B	E B	E B	E B	E B	E B	18	34	44	41	41	42	48	52	47	45	48	67	56	56	52	34	45	32	32					
3	E B	E B	E B	E B	E B	E B	25	24	36	31	44	46	45	55	59	A A	92	54	77	61	56	A A	107	45	E B	E B	E B	E B		
4	E B	14	18	35	19	22	E B	22	31	44	A A	109	44	43	46	44	54	52	61	35	26	41	31	21	23	32				
5	20	21	31	38	17	18	47	A A	83	49	58	65	46	A A	154	77	48	40	47	40	41	21	35	52	32	54				
6	44	A A	105	41	38	18	22	27	35	42	38	42	42	44	43	46	50	47	40	33	22	E B	E B	E B	E B	E B				
7	E B	14	18	20	20	E B	E B	22	31	37	56	51	43	44	43	41	42	31	33	29	30	29	E B	13	19	19				
8	E B	14	20	24	29	35	22	32	32	60	50	A A	74	53	46	E B	43	47	45	56	70	73	66	39	39	23	23			
9	21	48	21	21	19	20	43	41	A A	118	A A	108	42	A A	116	54	G	G	42	52	41	67	80	46	38	27	26			
10	25	21	18	21	18	33	27	30	38	47	69	53	62	56	A A	A A	A A	A A	87	110	56	45	28	51	53	21	20	21		
11	E B	14	18	18	17	27	32	28	30	34	55	63	42	41	62	64	43	37	33	29	16	G	E B	34	14	37	38			
12	20	19	E B	14	21	28	54	40	29	35	G	G	G	45	50	44	46	46	47	57	50	52	41	21	20					
13	20	32	E B	14	20	20	18	23	36	38	41	59	A A	85	47	49	G	G	36	30	20	29	16	23	22					
14	23	19	21	16	20	20	23	32	40	50	53	44	59	70	A A	94	56	52	35	36	37	24	20	16	E B	14				
15	29	E B	14	31	E B	14	22	E B	14	23	30	37	A A	79	42	54	A A	98	E B	41	45	52	48	44	70	60	17	E B	14	19
16	20	20	18	17	17	E B	14	23	29	36	39	40	42	42	56	50	42	24	G	G	20	31	20	17	E B	E B	14	19		
17	21	20	21	E B	14	21	21	23	30	36	38	41	43	57	70	57	72	46	46	35	20	16	17	E B	E B	E B	14			
18	E B	E B	E B	E B	17	19	20	25	33	33	38	A A	A A	A A	66	63	42	42	A A	70	52	36	36	27	22	E B	E B	43	25	
19	20	20	E B	14	21	38	32	34	39	41	54	64	42	41	54	54	38	38	41	44	39	26	29	20	22					
20	17	18	20	30	20	E B	14	51	48	57	54	A A	110	43	A A	122	42	85	95	88	58	65	A A	134	86	41	27	20		
21	20	21	E B	E B	E B	E B	25	32	42	50	47	A A	A A	A A	A A	A A	57	73	47	31	22	26	26	20	E B	14				
22	17	22	22	14	14	14	21	28	48	46	41	54	43	45	48	46	47	42	67	55	40	19	14	20						
23	E B	14	18	14	14	14	14	26	38	38	41	A A	A A	A A	82	80	42	43	42	41	34	32	26	24	44	30	42	35		
24	32	44	36	89	A A	A A	A A	72	42	47	45	50	53	55	52	48	42	41	40	41	41	72	57	24	30	20				
25	E B	14	15	19	38	E B	14	20	32	A A	105	57	42	52	51	41	42	40	G	38	G	30	26	20	26	29	20			
26	20	E B	14	14	16	17	E B	14	21	26	33	40	51	48	43	42	48	53	38	43	30	16	E B	14	19	20	16			
27	20	17	E B	14	22	E B	E B	14	30	34	36	40	40	42	44	G	44	42	42	42	41	44	32	51	E B	E B	14	14		
28	31	E B	14	19	E B	14	21	21	20	30	48	43	A A	74	G	58	42	41	42	28	32	24	22	30	22	20	18			
29	E B	14	22	16	E B	E B	14	14	37	51	A A	108	55	54	48	55	53	44	49	57	38	A A	134	31	38	47	30	34		
30	28	21	23	23	20	21	G	15	51	55	40	41	42	44	41	42	53	55	69	52	88	38	18	22	21					
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	30	30	30		
MED	20	19	20	19	19	20	27	32	42	46	52	48	46	48	46	46	46	46	41	36	34	32	21	20	20					
U Q	23	21	22	22	22	22	36	41	48	55	A A	A A	A A	59	60	54	53	56	47	56	52	40	38	29	26					
L Q	E B	E B	E B	E B	E B	E B	23	30	37	40	42	42	43	42	42	42	42	G	37	35	29	22	E B	E B	E B	E B	E B			

JUN. 2012 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 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	14	13	14	14	14	14	14	14	15	20	29	34	30	23	30	24	20	17	14	14	14	14	14	14
2	14	14	14	14	14	14	14	16	21	22	25	24	25	26	24	24	20	17	13	14	14	14	14	13
3	13	13	13	14	14	14	14	15	19	20	23	31	24	32	26	22	20	20	16	14	14	14	14	14
4	14	14	14	14	14	14	14	14	18	22	22	32	29	26	23	24	21	16	14	14	14	13	14	14
5	14	14	14	14	14	14	14	14	16	22	22	32	30	32	24	24	21	16	16	14	14	13	14	14
6	14	14	13	13	14	13	14	14	18	21	23	22	25	32	32	21	21	18	14	14	14	14	14	14
7	14	14	14	14	14	14	14	15	16	21	22	25	25	24	30	26	24	18	14	13	13	13	14	14
8	14	14	13	13	13	14	14	14	18	22	24	31	31	43	26	24	23	17	14	13	12	14	13	14
9	14	14	14	14	14	14	14	13	19	21	24	24	31	30	30	26	20	19	14	15	13	14	14	14
10	14	14	14	14	14	14	14	16	22	23	31	32	32	29	31	22	36	23	14	12	13	13	14	14
11	14	14	14	14	14	13	14	14	16	21	23	30	32	29	25	26	23	16	12	15	14	14	14	14
12	14	14	14	13	14	14	14	14	20	23	23	24	24	31	26	24	22	18	14	14	13	14	14	13
13	14	14	14	13	13	14	12	14	20	23	25	25	31	25	28	25	23	16	13	14	13	14	14	14
14	13	14	14	14	14	14	14	14	20	21	24	26	24	30	30	25	17	16	13	14	13	13	13	14
15	14	14	14	14	14	14	15	19	21	24	28	31	32	29	41	24	23	18	13	14	14	14	14	14
16	14	14	14	14	14	14	15	15	15	20	22	24	23	32	29	22	22	17	13	12	14	14	14	14
17	14	14	14	14	14	14	12	14	16	17	23	24	27	29	22	22	24	17	13	15	13	13	13	14
18	14	14	13	14	14	14	14	16	17	22	22	24	24	29	30	22	20	17	15	14	14	14	14	14
19	14	14	14	13	13	14	14	16	18	21	24	31	25	31	22	22	21	17	13	12	14	14	14	14
20	14	13	14	14	14	14	14	14	16	20	24	30	25	29	24	29	21	17	14	14	14	14	14	14
21	14	14	14	14	14	14	14	14	15	20	23	27	22	23	25	23	20	17	13	13	14	14	14	14
22	14	14	14	14	14	14	14	12	14	16	21	24	26	34	24	22	19	14	13	14	14	14	14	14
23	14	14	14	14	14	14	14	14	17	20	20	32	24	22	23	23	20	20	14	14	14	14	13	14
24	14	14	14	13	14	13	13	14	14	22	19	22	23	22	24	21	21	18	15	14	13	14	13	13
25	14	14	14	14	14	14	14	15	16	21	20	22	24	22	24	23	20	20	16	14	14	14	14	14
26	14	14	14	14	14	14	14	14	17	21	23	21	24	31	25	22	21	14	14	14	14	14	14	14
27	14	14	14	14	14	14	12	14	14	20	22	23	23	24	23	21	21	18	14	14	14	14	14	14
28	14	14	14	14	14	12	13	14	16	21	24	24	22	24	23	20	20	16	14	14	14	14	14	14
29	14	14	14	14	14	14	14	14	17	21	23	35	30	32	31	24	21	20	14	12	13	14	14	14
30	14	14	14	14	14	14	14	14	16	21	24	23	24	32	31	22	22	18	14	14	14	14	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	14	14	14	14	14	14	14	17	21	23	25	25	29	26	23	21	17	14	14	14	14	14	14
U Q	14	14	14	14	14	14	14	15	19	22	24	31	30	32	30	24	22	18	14	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	16	20	22	24	24	24	24	22	20	16	13	14	13	14	14	14

JUN. 2012 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		293	316	305	298	282	299	286	312	338	336	288		266	270	278	290	305	303	301	302	300	288	282	275	
2		291	313	312	290	285	298	321	333	346	279	286	282	266	274	278	283	280	289	307	321	292	279	274	291	
3		292	295	319	333	311	311	314	340	346	319	298	256	290		272	277	286	317		296	269	269	264	268	
4		285	273	297	322	284	243	292	322	317		288	273	265	273	278	277		292	308	335	268	252	274	263	
5		270	293	304	303	282	284	331		251	305	280	261		281	275	273	279	297	319	302	283	288	263	276	
6		249		289	315	295	299	292	299	284	308	344	248	261	265	268	291	301	307	287	278	277	266	260	267	
7		269	295	298	297	336	315	294	317	329	326	287	264	283	275	271	275	306	296	308	305	273	279	282	282	
8		306	284	280	289	287	311	374	378	340	311		280	278	267	270	271	275	279	282	290	316	335	280	266	
9		288	324	304	293	302	303	313	326			292		272	271	281	279	267	278	295	299	325	311	276	277	
10		270	297	296	272	298	318	335	340	307	307	321	286	268	289			272	285	302	300	299	263	263	271	
11		276	278	306	306	294	303	303	288	295	293	284	261	257	259	266	269	283	297	296	277	285	297	279	295	
12		280	284	277	300	317	343	321	292	304	323	283	250	264	292	301	312	295	292	297	297	276	273	273	264	
13		268	285	292	316	301	276	283	321	309	314	316		275	291	287	268	285	293	326	345	268	265	265	274	
14		285	296	307	304	307	316	307	330	322	300	316	298	252	287		280	293	294	307	275	275	276	273	262	
15		270	296	324	311	288	307	338	345	342		285	271		278	277	281	285	298	311	325	337	274	270	273	
16		278	298	342	358	279	293	317	327	323	308	283	260	257	260	274	288	285	297	321	309	291	297	273	263	
17		282	332	372	280	265	271	310	333	353	258	277	237	246	268	256	254	272	311	327	297	260	265	260	269	
18		265	282	317	293	263	257	297	305	223				237	261		257	295	308	307	310	269	259	277	274	
19		268	281	284	280	302	313	345	326	309	290	275	276	273		281	289	288	298	295	297	300	297	299	289	
20		276	301	321	319	316	321	326	347	345	316		271		259	271	287	291	295	304		316	279	276	280	
21		292	323	320	297	302	312	344	331	330	350	340					268	285	298	316	311	323	315	308	298	
22		296	293	300	310	304	302	327	348	342	320	312	288	270	292	287	286	299	288	306	321	316	295	303	273	
23		282	292	301	340	317	299	327	336	360	340			292	291	301	298	297	297	296	320	338	288	281	278	
24		295	302	330				332	354	349	341	328	294	288	287	283	275	286	303	318	329	339	296	318	305	
25		310	326	302	316	311	319	315		361	309	270	279	270	279	266	271	294	293	301	317	319	320	288	286	
26		277	290	309	310	283	280	305	355	304	287	321	316	318	308	339	298	294	278	293	290	319	272	287	283	
27		284	304	308	318	301	295	311	318	349	323	293	312	296	304	301	291	292	303	322	327	295	294	289	301	
28		287	309	300	283	297	313	336	355	334	339		269	270	270	277	278	298	313	314	281	314	284	285	286	
29		275	321	308	314	301	307	332	357		302	293	283	295	295	300	312	249	262		302	322	309	294	289	
30		298	288	303	317	346	312	342	325	337	269	288	302	263	266	274	273	280	287	296	311	297	273	271	262	
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	29	30	28	28	27	25	24	26	27	26	29	29	30	28	29	30	30	30	30	
MED		282	296	304	306	301	303	319	330	332	309	288	274	270	275	278	279	286	296	306	302	298	282	276	276	
U Q		292	311	317	316	309	313	332	346	346	323	316	287	283	291	287	290	295	303	315	320	319	297	287	286	
L Q		270	286	298	293	284	294	305	320	308	293	284	261	263	267	271	272	280	289	296	296	276	272	271	268	

JUN. 2012 M(3000)F2 (0.01)

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 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							A	L	A	A	A	A	A	A	381	357	350	355	L	L				
2								A	L	L	401	336	U	L	A	380	368	A	A	A	A			
3								L	A	L	U	L	A	A	A	A	A	A	A	A				
4										A	361	376	387	360	A	A	A	U	L	L				
5								A	L	A	A	U	L	A	A	A	A	U	L	L				L
6								U	L	A	339	328	368	379	411	419	384	370	A	U	L	L		
7										A	377	A	A	332	401	382	393	361	363	L	L			
8								A	A	A	A	A	U	L	U	L	A	A	A	A	A			
9								L	A	A	U	L	A	A	S	393	356	A	A	A				
10									L	U	L	A	A	A	A	A	A	A	A	A	L			
11								L	U	L	A	A	U	L	L	A	A	389	360	345	L	L		
12								U	L	U	L	U	L	L	A	L	L	A	A	L	A			
13								L	L	L	A	A	A	A	A	352	354	349						
14								L	L	U	L	A	A	A	A	A	A	A	U	L	L			
15									L	A	U	L	A	A	A	U	L	A	A	A	L			
16								L	U	L	L	U	L	H	U	L	A	A	H	L	L			
17								L	L	L	382	402	L	A	A	A	A	A	A	A	L			
18								L	384	354	R	A	A	412	377	A	A	A	U	L	L			
19									L	A	A	A	R	A	A	H	388	380	U	R	A			
20							A	A	A	A	A	L	A	A	A	A	A	A	A	A	A			
21								L	A	A	A	A	A	A	A	A	A	A	A	A	L			
22								395	A	A	L	A	A	A	A	A	A	A	A	A	A			
23								A	L	U	L	A	A	441	414	386	378	H	L	L	L			
24					A			A	A	A	A	A	A	U	A	420	374	374	370	A	A			
25								A	A	U	L	A	A	429	407	424	387	367	358	351	L	L		
26							U	L	L	L	A	A	A	418	389	A	A	356	A	L	L			
27								L	362	383	411	U	L	401	401	416	417	402	342	352	A	A		
28								L	372	A	A	A	L	A	391	400	369	372	350	L	L			
29								A	A	A	A	A	A	A	398	A	A	A	A	A	L	L		
30								A	A	L	U	L	A	405	407	386	401	407	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							1	5	9	11	12	13	16	15	17	16	15	16	7					
MED							U	L	L	L	L	L	L	L	L	L	L	L	L	L	L			
U Q								384	384	382	401	397	417	407	399	376	372	358	367					
L Q								L	A	U	L	L	L	L	L	L	L	L	L	L	L			
								350	364	354	360	350	372	380	369	351	350	335	347					

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 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							E A 326	302	260	E A 300	E A 426		E A 446	362	356	328	298	294	278	258				
2								254	256	L 378	354	334	326	370	356	326	350	322	280					
3								254	246	A	338	452	344	A	376	378	326	292	A					
4										A	336	322	348	362	348	348	336	302	260					
5								A	L 520	L 330	E A 378	384	A	352	340	352	336	308		264				
6								324	382	336	290	528	458	426	408	332	300	292		320				
7									262	284	A 328	436	366	374	402	378	310	292	288					
8								204	E A 294	A 264	A	392	370	368	368	362	340	340	A 340	A 312				
9								280	A	A	336	A	376	368	340	332	368	336	302					
10									316	314	A 320	382	E A 406	352	A	A	358	320	278					
11								312	276	310	306	324	398	380	374	356	332	312	284					
12									290	262	346	L 398	378	322	314	292	312	306	288					
13								274	298	282	292	A	396	348	342	348	342	320	264					
14								260	286	338	292	324	442	358	A	A	342	330	310	272				
15									258	A	342	350	A	364	324	346	330	302	274					
16								284	288	L 280	346	400	402	406	366	330	340	302	258					
17								260	262	480	398	L 484	E A 486	E A 432	E A 406	E A 460	366	284	262					
18								322	U G 638	G	A	A	562	474	A	484	358	312	306	276				
19									336	362	E A 412	370	362	344	344	326	324	302	290					
20							E A 302	256	258	290	A	360	A	A	E A 394	E A 376	A 346	A 308	A 286	A				
21								278	280	260	276					A	382	354	308	266	254			
22								240	246	316	280	354	368	318	336	322	314	288	314					
23								260	246	290	A	A	358	338	312	314	304	282	302	258				
24					A			264	274	274	284	404	396	372	350	366	338	302	268					
25								A	238	318	432	368	370	340	348	372	326	310	296	258				
26							320	252	U G 352	390	312	328	306	320	280	368	374	400	332	290				
27								290	254	288	344	340	374	344	350	364	350	314	270					
28								250	250	266	A	L 438	L 442	418	364	356	316	292	256					
29								248	A	342	E A 366	E A 362	342	342	326	300	E A 414	E A 366	A	294				
30								E A 296	E A 282	L 416	350	318	402	376	366	362	336	334	308	298				
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	22	27	26	25	24	26	28	26	29	30	30	26	11				
MED							E A 320	261	275	312	329	369	374	362	350	350	336	308	282	276				
U Q							E A 326	290	298	342	E A 360	402	406	378	368	370	350	320	302	298				
L Q							E A 302	254	256	282	299	337	362	344	340	329	324	294	268	258				

JUN. 2012 h'F2 (KM)

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JUN. 2012 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	280	272	250	266	278	258		270							210	204	210	212	224	244	254	246	264	320		
2	268	250	248	254	282	266	258		244	192	196	284		236	246						238	248	322	320	310	
3	308	282	236	210	244	252	262	226			254										276	288	282	304	312	
4	304	316	288	236	270	350	242	220	246		222	220	244	218				220	228	254	314	364	322	310		
5	320	280	256	282	296	288	270		250			246			282	212		256	260	254	262	332	356	356		
6	380		286	272	258	250	252	258	294	220	214	186	184	212	252			262	256	268	276	296	324	308		
7	288	268	246	260	218	238	228	222	212			210	188	200	194	218	226	228	228	252	298	294	294	294		
8	284	280	294	292	302	264	218						246	206	276	268					270	230	306	334		
9	292	260	268	310	280	264	266	266			178				182	244		270		310	248	242	308	304		
10	314	280	250	304	264	256	240	222	228	264										230	272	284	262	328	330	
11	282	302	256	260	276	282	236	222	214			198	178			212	216	212	226	236	284	240	306	300		
12	288	278	286	252	230	246	232	220	210	212	216	206	242		232	262					266	316	346	310	344	
13	326	310	260	244	228	276	248	242	226	222			230		218	262	218	234	214	210	302	310	312	294		
14	288	268	254	238	234	234	244	214	220	292		194						218	248	268	286	294	304	316		
15	318	266	248	196	282	256	236	220	224		192				188	286					258	248	268	300	304	
16	306	268	226	204	218	258	214	206	208	228	192	206	198			228	194	204	210	242	230	230	290	330		
17	310	242	198	192	334	332	244	222	220	200	206	202									262	294	314	300	290	
18	276	254	234	264	318	346	260	244	198	242			204	238			212	242	218	258	286	300	348	318		
19	324	324	288	322	316	278	236	270	250			196	182			190	214	250		260	216	268	258	284		
20	316	260	240	226	240	224					210		186								290	268	298	298		
21	272	228	202	244	246	238	228	226	260												244	246	236	238	230	248
22	288	284	272	252	256	258	226	204			198		198	254							258	258	246	262	308	
23	288	288	268	222	204	256	248		224	232			178	202	234	236	206	200	212		230	246	366	354		
24	292	276	262			308								220	242	236	248			268	268	262	268	268		
25	254	216	224	328	284	280	278			214			166	216	190	192	218	218	236		232	230	294	296		
26	302	288	256	248	292	316	236	216	182	232			194	216			240		230	238	246	250	286	290		
27	294	260	248	242	262	258	262	244	212	192	180	194	196	178	230	276	274			242	262	322	286	258		
28	332	266	280	288	278	256	222	210				196		194	192	240	198	218	212	222	252	288	296	300		
29	338	250	264	238	234	254	264								202			226		284	248	282	290	316		
30	306	296	254	246	232	264	224			216	180	182	216	210	196						254	270	300	330		
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	29	28	21	19	14	12	15	16	15	17	16	13	16	16	25	30	30	30	30		
MED	298	272	255	250	264	258	240	221	219	218	196	200	197	211	214	226	215	219	228	258	261	269	300	308		
U Q	316	286	268	277	283	279	261	244	246	232	215	210	223	220	244	262	233	246	240	268	286	300	312	320		
L Q	288	260	246	237	234	253	230	218	212	212	186	194	183	200	193	212	208	215	216	242	248	246	290	294		

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JUN. 2012 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	A		112	110	110	110					
2						A	A	A	A	A	A	110	110		A	A	110	110	110	110		A			
3						A			A	A		A	A	A	A		110	110	110		A	A			
4						B					A									A	A				
						128	112	108	108		108	108	112	108	108	108	108	108	114						
5						A	A		A	A	A	A	A	A		110	110	114	110	110		A			
6						A	A		A	A	A	A	A		108	108	108	108	108		A	A			
7						B	A		A	A	A	A	A	A	A				A	A	A				
						108	108											112							
8						A	A	A	A	A	A	A		B		110	110	110	110		A	A			
9						A	A	A	A	A	A	A			110	108	108	108	108		A	A			
10						A	A	A	A	A	A	A			108	104	104		104	108		A			
						A	A	A	A	A	A	A	A	A	A	A	A	A	A						
11						A	A		A	A	A	A								112	106				
12						A	A		A											A	A				
							112		110	110	108	108		110			110	110							
13						A														A	A				
						130	122	110	110	108	108	108	108	108	108	108	108	108	108						
14						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
15						B	A	A	A	A	A	A	A		B	A	A		A	A					
														110				118							
16						B		A	A	A	A	A	A	A	A	A									
						148												110	110	116					
17						A	A		112	110	108		108	108		A	A	A	A	A	A				
18						A	A	A	A	A	A	A	A	A	A	A	A	A	A						
19						A	A	A	A											108					
									110																
20						B						A	A				A		A	A	A				
						126	108	110	110	110				110	108		108								
21						B	A			A	A	A	A	A	A	A	A	A	A	A	A				
								110	110																
22						B		A	A	A	A	A	A	A				A							
						122											116		110	110					
23						B	A			A	A	A	A	A											
								110	108						108	110	110	114	110						
24						A	A	A	A	A	A	A	A		A										
														112		112	110	110	110						
25						A	A	A	A	A	A	A	A			110	110	110	110	108	110				
26						B	A	A		A	A			A			108	108	108	108		A	A		
								110				110	110												
27						B	A		A	A	A														
								110					110	110	110	110	110	110	110	110					
28						A	A						A							A	A				
								110	110	110	110	108		108	108	112	112								
29						B	A	A	A	A	A	A	A	A	A				A						
																		112		112					
30						A		A	A	A	A	A	A	A						A	A				
								124									110	110	108						
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							7	13	11	8	6	7	8	11	14	18	21	20	13	1					
MED							126	110	110	110	110	108	108	110	108	110	110	110	110	110	106				
U Q							130	112	110	110	110	110	110	110	110	110	110	110	110	111					
L Q							122	108	108	109	108	108	108	108	108	108	108	108	108	110					

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JUN. 2012 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

$\begin{matrix} H \\ D \end{matrix}$	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	110	104	116	106	102	106	102	102	110	110	108	102	100	100	104	100	98	100	124	114	B	108	92	110	
2	104	B	102	98	108	108	104	102	102	102	102	134	126	128	140	124	116	116	112	110	106	106	106	106	
3	104	104	B	102	90	100	122	136	112	112	110	106	104	102	126	116	116	112	108	106	112	106	100	102	
4	102	104	100	100	104	B	126	128	114	112	114	116	148	138	122	114	108	112	110	108	102	106	108	108	
5	100	110	98	98	100	124	114	108	108	108	110	126	110	110	118	122	118	116	112	108	104	106	108	104	
6	104	104	104	106	110	112	110	106	106	106	108	108	106	162	136	118	116	114	110	114	114	110	104	92	
7	92	106	106	104	126	B	126	116	118	108	108	102	122	106	106	102	100	134	118	92	92	96	96	92	
8	110	106	100	102	100	100	100	100	100	100	114	118	122	B	162	140	112	110	110	108	114	104	104	96	
9	102	102	94	114	126	116	108	106	104	104	104	100	102	G	G	162	124	114	104	96	94	94	106	92	
10	96	94	92	110	116	108	104	104	104	104	104	120	116	120	116	110	110	110	156	100	114	B	96	112	112
11	108	102	108	104	104	106	104	104	106	100	100	106	104	100	98	98	100	154	124	98	104	B	104	106	
12	104	102	112	100	100	102	102	142	108	G	G	G	164	116	134	122	118	110	108	108	106	108	104	104	
13	104	104	100	100	106	104	142	120	118	122	116	116	116	176	G	G	G	120	106	102	96	92	106	92	
14	92	92	104	104	104	104	102	104	106	104	104	106	104	102	98	98	98	98	94	94	94	94	94	B	
15	108	B	104	100	92	100	124	104	112	112	110	110	106	110	B	170	134	120	96	112	112	92	104	102	
16	100	100	102	102	104	102	140	134	172	108	106	102	102	102	98	168	98	98	116	96	112	94	104	104	
17	104	102	102	98	98	98	98	122	118	114	112	110	110	114	108	104	102	102	102	102	96	94	94	94	
18	118	114	118	116	318	346	114	112	116	108	106	106	114	108	102	102	102	100	110	104	112	98	104	104	
19	102	110	102	102	96	98	102	100	116	112	108	108	112	104	108	106	112	108	108	100	98	106	92	94	
20	116	124	106	102	100	100	118	114	112	112	110	104	104	110	106	106	104	102	100	96	94	94	96	94	
21	94	94	92	92	B	B	118	114	112	108	102	102	102	100	98	98	98	98	98	98	94	94	94	94	
22	110	108	98	96	96	B	130	102	102	102	108	108	108	106	166	140	134	120	114	110	104	108	108	106	
23	106	100	100	96	94	B	118	112	112	106	102	102	108	102	150	140	138	124	114	114	108	108	108	112	
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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	27	29	30	29	24	30	30	30	29	29	28	30	27	27	28	29	29	30	30	29	29	30	29	
MED	104	104	102	102	102	103	106	106	111	108	108	106	110	110	120	117	112	112	110	104	104	104	104	104	
U Q	108	108	107	104	107	110	118	116	116	112	110	114	122	128	140	140	118	119	114	108	112	108	108	107	
L Q	100	100	99	98	97	100	102	102	104	104	103	102	104	102	106	105	102	105	106	100	97	94	96	94	

JUN. 2012 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2012 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

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	FF 22	F 3	FF 12	FF 12	F 2	L 3	L 3	L 2	C 2	C 2	C 6	L 2	L 2	L 3	L 1	L 1	L 1	L 1	C 1	C 2		FF 11	F 1	F 4	
2	F 2		F 2	F 1	FF 31	C 1	L 4	L 4	L 1	L 1	L 1	HL 11	CL 21	CL 11	HL 11	C 1	C 3	C 3	CL 61	CL 52	F 7	F 7	F 5	FO 51	
3	FO 51	F 2		FF 13	F 3	CL 23	C 2	HL 12	C 2	C 2	C 2	C 1	L 2	L 4	C 1	C 2	C 3	C 4	C 5	L 5	F 1	F 3	F 2	F 1	
4	F 2	F 3	FO 51	F 4	F 5		C 1	C 1	C 3	C 5	C 1	C 1	H 1	H 1	C 1	C 2	C 4	CL 21	C 1	C 6	F 5	F 3	FO 41	FO 51	
5	F 5	FF 22	F 3	F 3	FF 12	C 3	C 5	C 8	C 2	C 4	C 3	CL 11	LQ 31	L 3	C 1	C 1	CL 21	CL 21	C 4	C 3	FF 91	FO 51	FO 81	FO 51	
6	FO 51	FO 41	FO 41	F 9	F 3	CL 81	C 3	C 2	C 2	C 1	C 1	C 1	C 1	H 1	H 1	C 1	C 2	C 3	C 2	C 2	F 2	F 1	FF 22	F 2	
7	F 2	FO 21	F 5	F 3	F 1		C 1	C 1	C 1	C 3	C 3	C 1	CL 11	C 1	L 1	L 1	L 1	HL 11	CL 12	L 5	F 4	FF 22	F 3	F 3	
8	FF 22	FF 22	F 5	FO 31	F 9	L 6	L 4	LC 21	L 4	L 3	CL 32	CL 11	C 1		H 1	H 1	C 2	C 3	C 5	CL 81	FF 42	FF 42	FF 22	FF 21	
9	F 3	FF 42	F 2	FF 14	FF 12	CL 22	CL 81	CL 21	C 4	C 2	L 1	LQ 31	LQ 11			H 1	C 3	C 1	C 3	L 7	F 5	F 5	FF 13	F 4	
10	F 2	F 2	F 2	F 2	FF 21	C 6	C 1	L 1	C 1	C 2	C 3	C 1	C 2	C 2	C 4	C 4	C 1	C 2	HL 11	L 4	FF 82	F 2	FF 32	FO 2	
11	FF 21	F 3	FF 22	F 1	F 3	L 3	L 2	L 2	L 2	L 2	L 4	L 1	L 1	L 2	L 3	L 2	L 1	HL 11	CL 11	L 1	FF 52		F 7	F 5	
12	F 4	F 2	F 1	F 4	F 5	L 7	L 3	HL 11	C 1				H 1	CL 11	HL 11	CL 11	CL 21	C 2	CL 62	CL 71	FF 71	FF 51	FF 52	F 5	
13	FF 31	F 3	F 2	F 3	F 1	CL 21	HL 11	CL 11	C 1	CL 11	C 2	C 3	C 1	H 1				CL 11	C 1	L 2	F 4	F 4	FF 25	F 6	
14	F 2	F 3	FF 31	FF 11	F 1	L 3	L 2	C 1	C 2	C 2	C 1	C 2	C 2	L 2	L 3	L 2	L 3	L 2	L 4	L 2	F 3	F 2	F 1		
15	F 4		FO 31	F 2	F 3	L 1	CL 11	LC 11	CL 11	C 2	C 1	C 2	C 2	C 3		HL 11	HL 11	CL 31	L 2	CL 72	FF 73	F 1	FF 22	FF 31	
16	F 3	F 3	F 3	F 2	F 2	L 2	HC 11	HC 11	HCL 11	C 1	L 1	L 1	L 1	L 2	L 3	HL 11	L 1	L 1	CL 22	LC 31	FF 11	F 1	F 1	F 4	
17	FO 41	F 3	F 3	F 3	F 4	L 4	L 3	CL 11	CL 11	C 1	C 1	C 1	C 2	CL 32	C 3	C 4	L 2	L 3	L 3	LC 11	F 2	F 4	F 4	F 2	
18	F 1	F 1	F 1	F 2	F 2	C 2	C 3	C 2	C 2	CO 11	C 2	C 2	C 1	C 1	L 3	L 2	L 1	LQ 21	C 2	L 2	F 1	F 2	F 6	FF 51	
19	FFQ 51	FFQ 13	FO 3	F 4	F 5	LQ 51	L 3	LQ 31	CL 11	CL 31	C 3	C 1	CL 11	C 2	C 1	C 1	CL 11	CL 21	CL 61	CL 42	FF 34	FF 24	F 4	F 1	
20	FF 12	FF 12	FF 32	F 4	F 3	L 1	C 4	C 2	C 4	C 3	C 3	L 2	L 2	C 1	C 3	C 4	C 7	L 7	L 5	L 7	F 7	FO 61	FO 41	F 4	
21	F 4	F 3	F 1	F 1		C 3	C 1	C 2	C 3	L 2	L 4	L 3	LQ 41	LQ 31	L 3	L 3	LQ 31	L 2	L 3	F 9	F 5	F 3	F 2		
22	FF 21	F 3	F 4	F 1	F 1	HC 21	C 1	C 3	C 3	C 1	C 2	C 1	C 1	CH 11	HL 11	HL 11	HL 21	C 3	C 6	C 8	FO 61	F 3	FF 11	FF 31	
23	F 1	F 3	F 1	F 1	F 1	C 3	C 3	C 3	C 3	C 2	L 4	L 1	L 1	H 1	H 1	H 1	H 1	CL 11	C 1	C 2	FF 92	FF 42	FO 61	FO 61	
24	FO 51	FO 51	FO 31	F 6	FO 71	LQ 61	LQ 41	CL 43	CLH 22	CL 32	CL 31	CL 31	HL 11	HL 11	HL 11	HL 11	H 1	H 1	C 6	CL 81	FF 52	F 3	FF 18	FO 31	
25	F 2	F 3	FO 51	FO 91	F 3	L 4	L 4	LQ 41	L 4	C 1	L 2	L 2	C 1	H 1	C 1		C 1		C 1	L 3	F 3	F 5	F 3	F 1	
26	F 1		F 1	F 1	F 1	LQ 21	L 3	HL 11	CL 21	CL 11	CH 22	H 1	H 1	C 1	C 1	CL 21	CL 11	C 2	L 4	L 2	F 1	FF 22	FF 32	FF 21	
27	FF 41	F 3	F 2	FO 41	F 1	C 5	C 5	C 4	C 2	L 2	C 1	C 1	H 1		H 1	H 1	C 1	C 2	C 2	C 3	FF 31	FF 72	FF 32	FF 12	
28	F 3	F 2	F 2	F 3	F 2	L 4	L 2	C 2	C 2	C 1	C 3		C 1	C 1	C 1	HL 11	L 1	C 1	CL 11	L 2	F 5	F 5	FF 31	FFQ 22	
29	FF 22	FF 11	FF 51	F 2	F 1	C 3	C 5	C 5	L 5	CL 14	L 3	C 2	L 2	L 1	L 1	C 2	C 3	CL 41	CL 52	CL 42	F 3	FO 31	F 6	F 3	
30	F 3	FF 11	FF 11	F 3	F 2	L 3	L 1	L 5	L 4	L 2	L 1	L 1	L 1	L 1	HL 11	C 2	C 3	C 6	C 4	L 7	F 4	FF 23	FF 33	F 3	
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																									

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

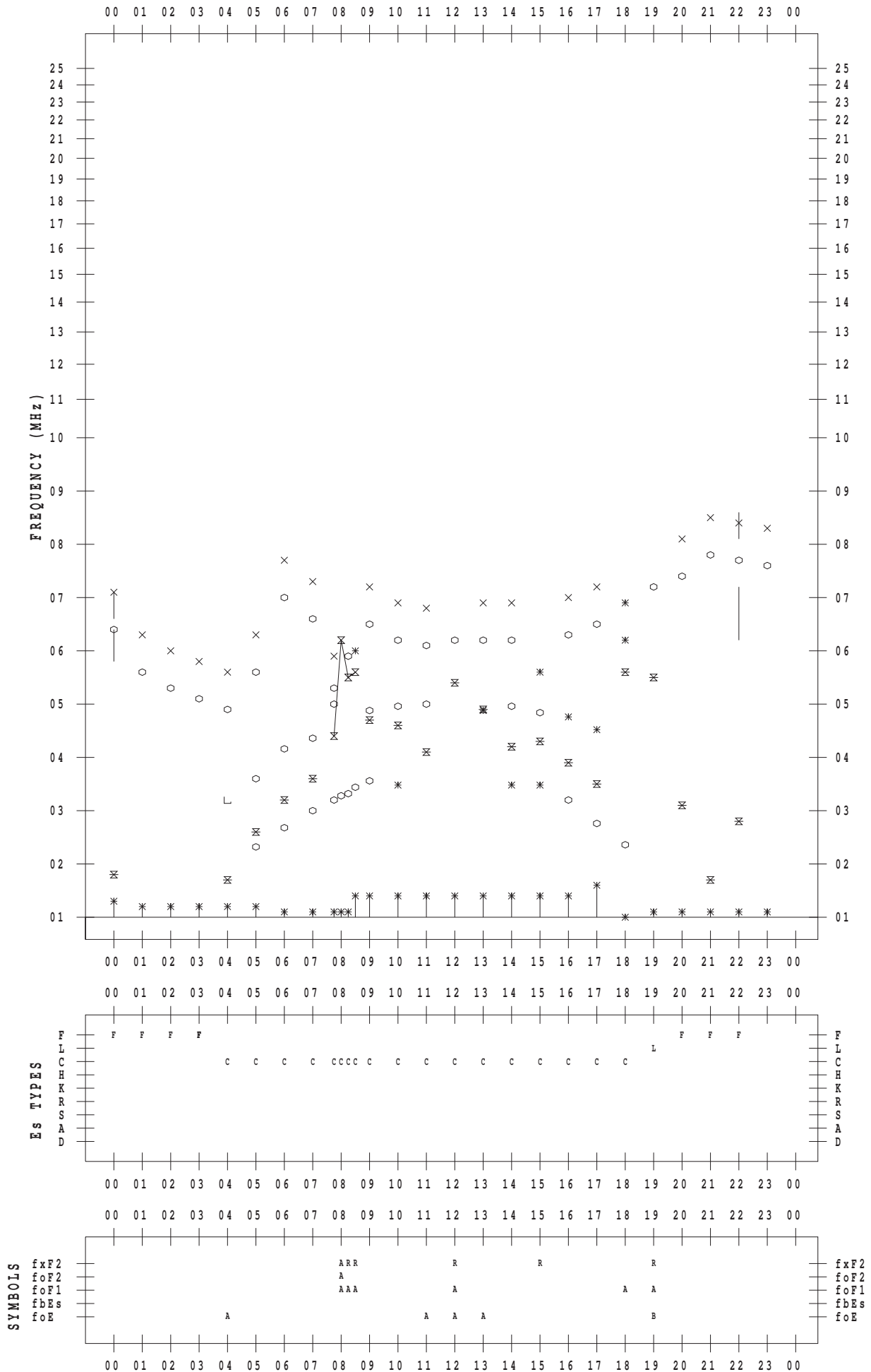
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 1

135 ° E MEAN TIME



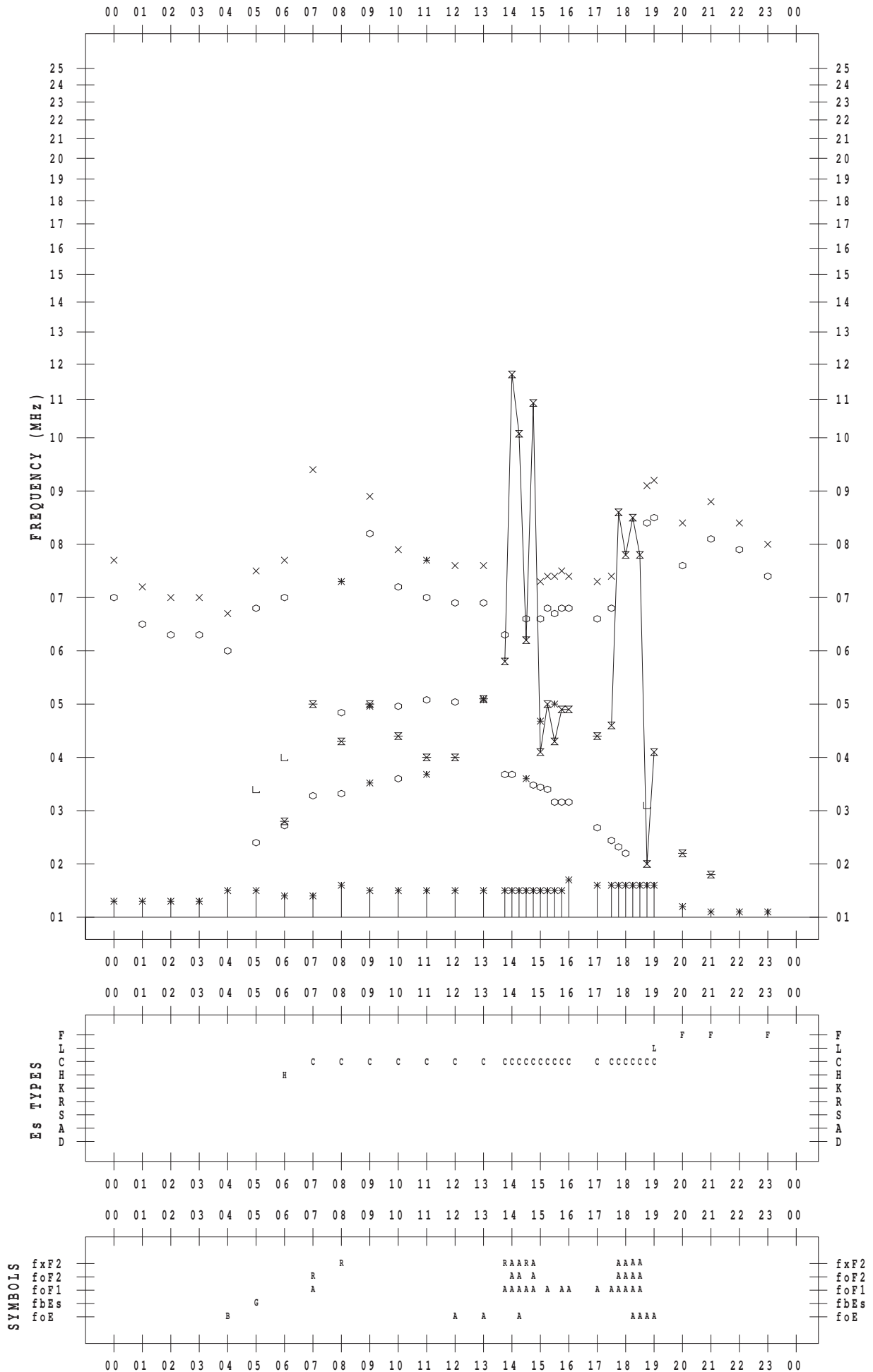
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 2

135 ° E MEAN TIME



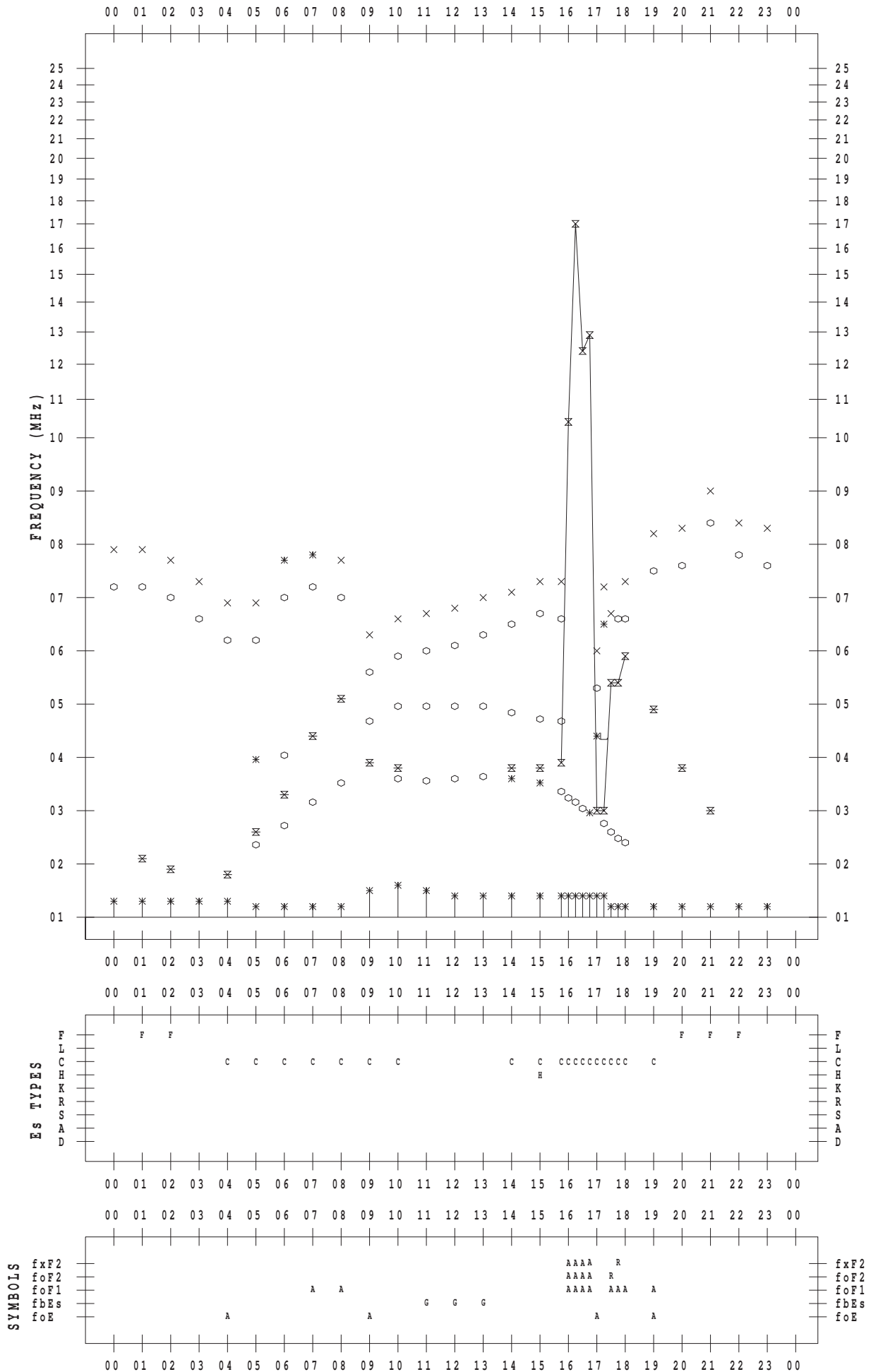
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 3

135 ° E MEAN TIME



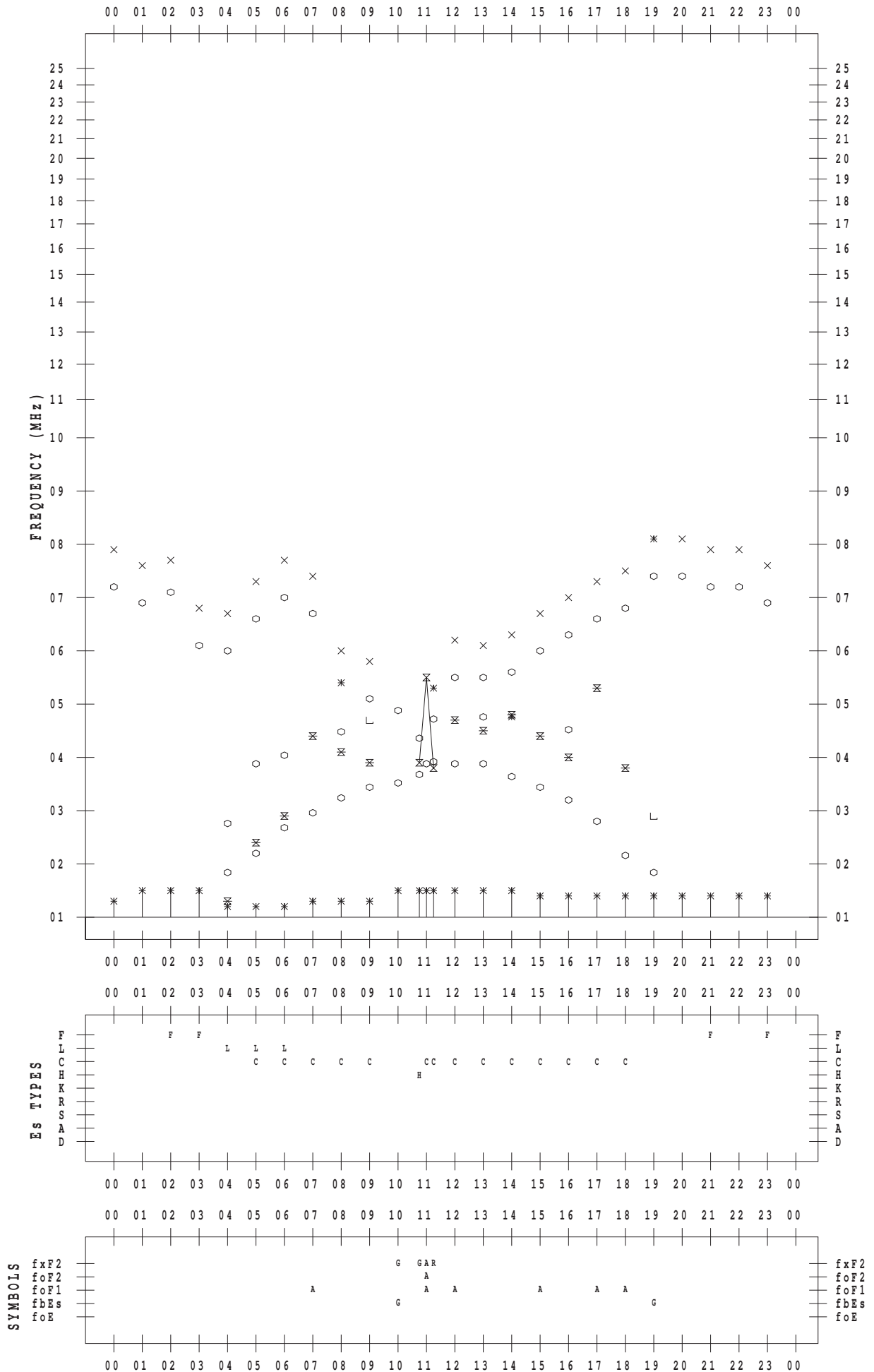
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 4

135 ° E MEAN TIME



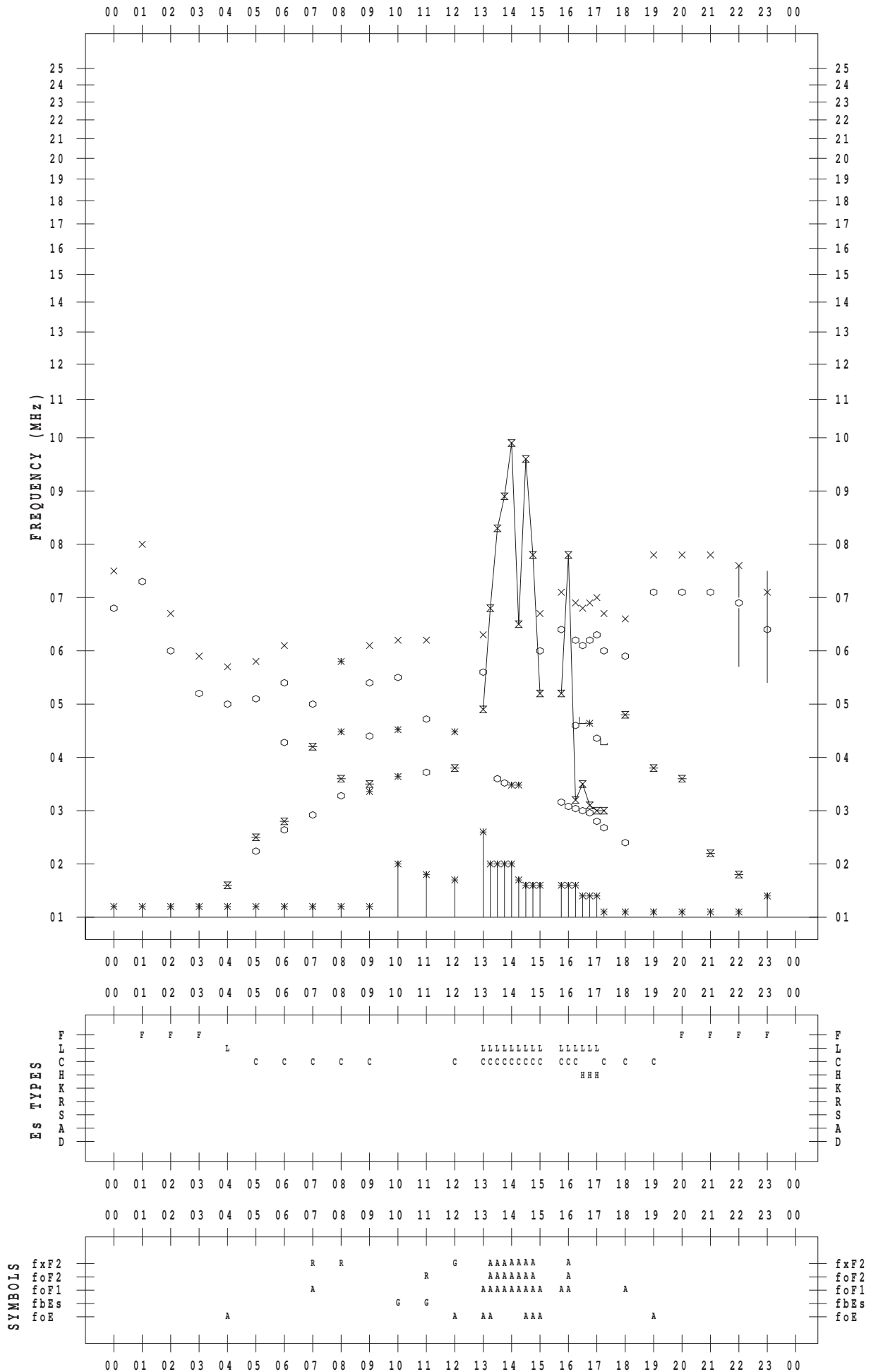
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 5

135 ° E MEAN TIME



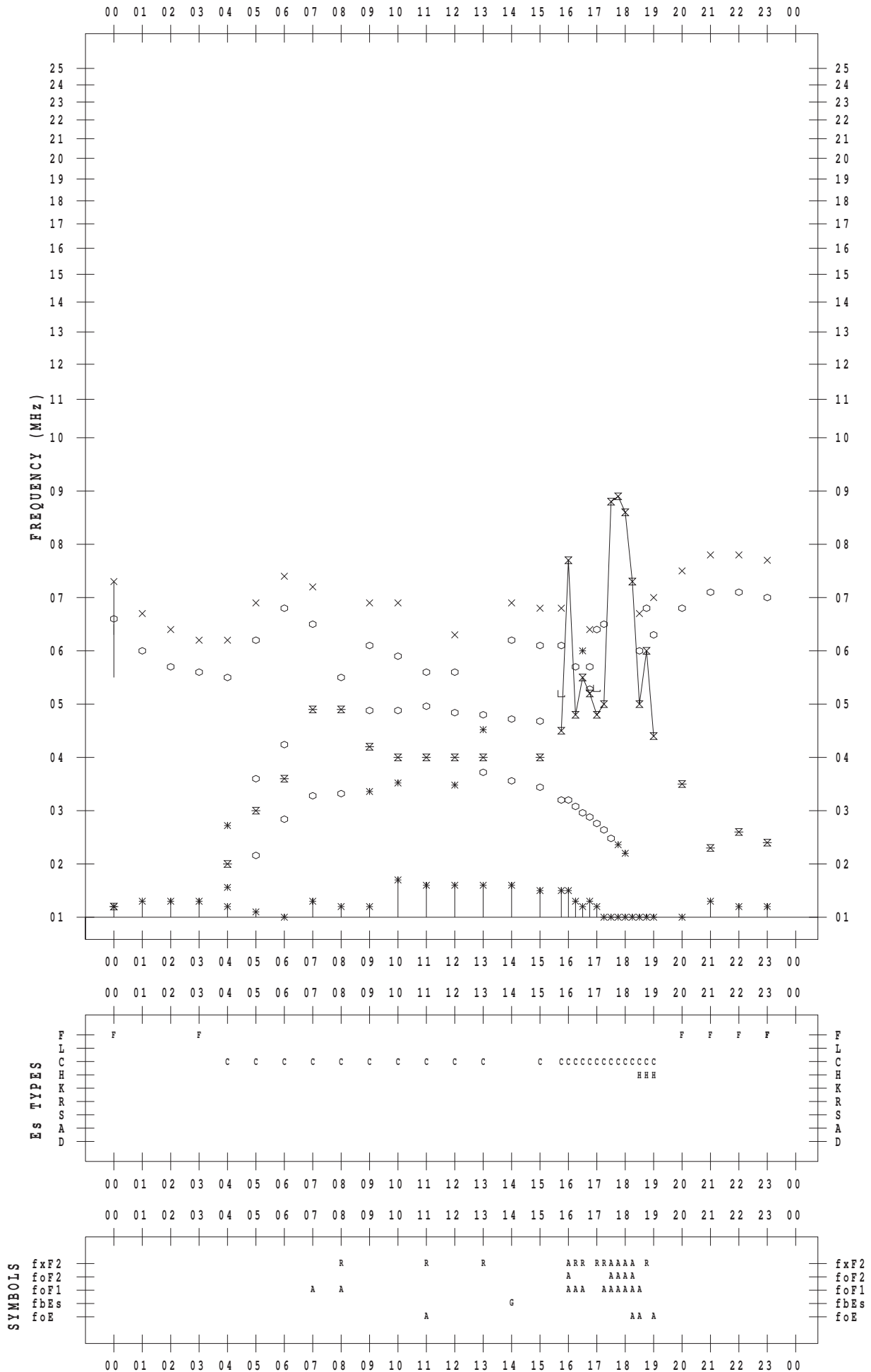
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 6

135 ° E MEAN TIME



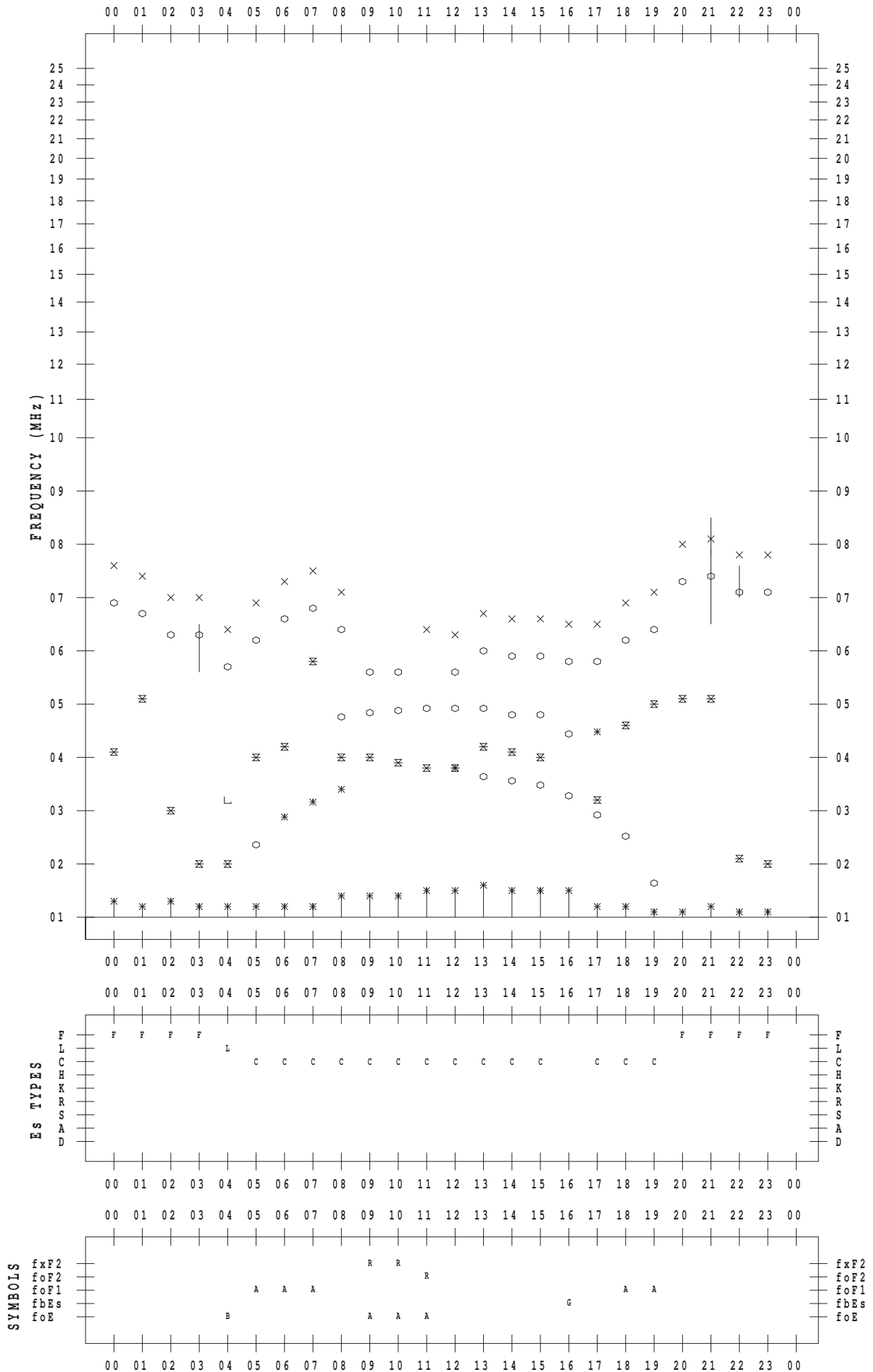
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 7

135 ° E MEAN TIME



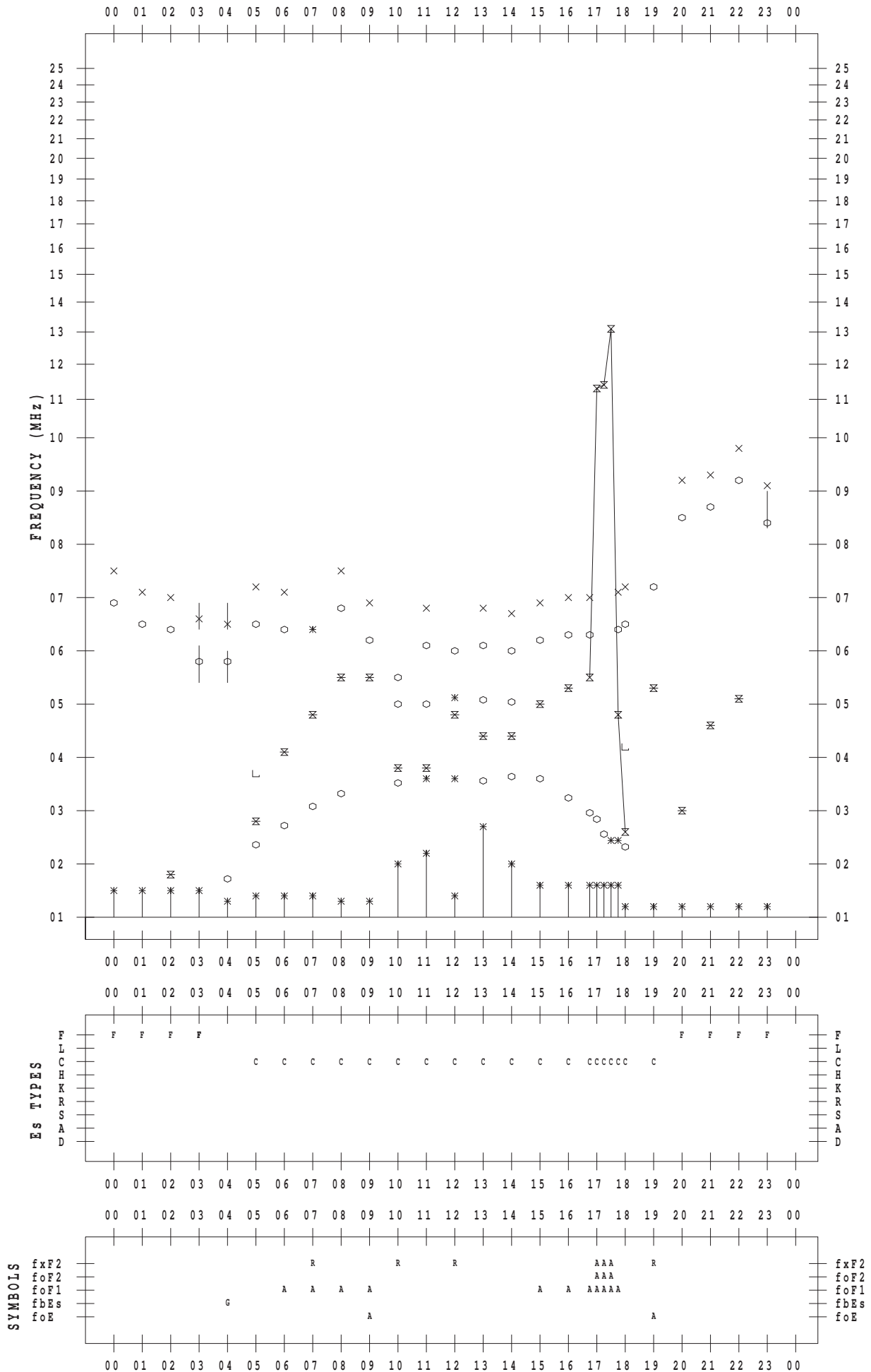
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STATION : Wakkanai

DATE : 2012 / 6 / 8

135 ° E MEAN TIME



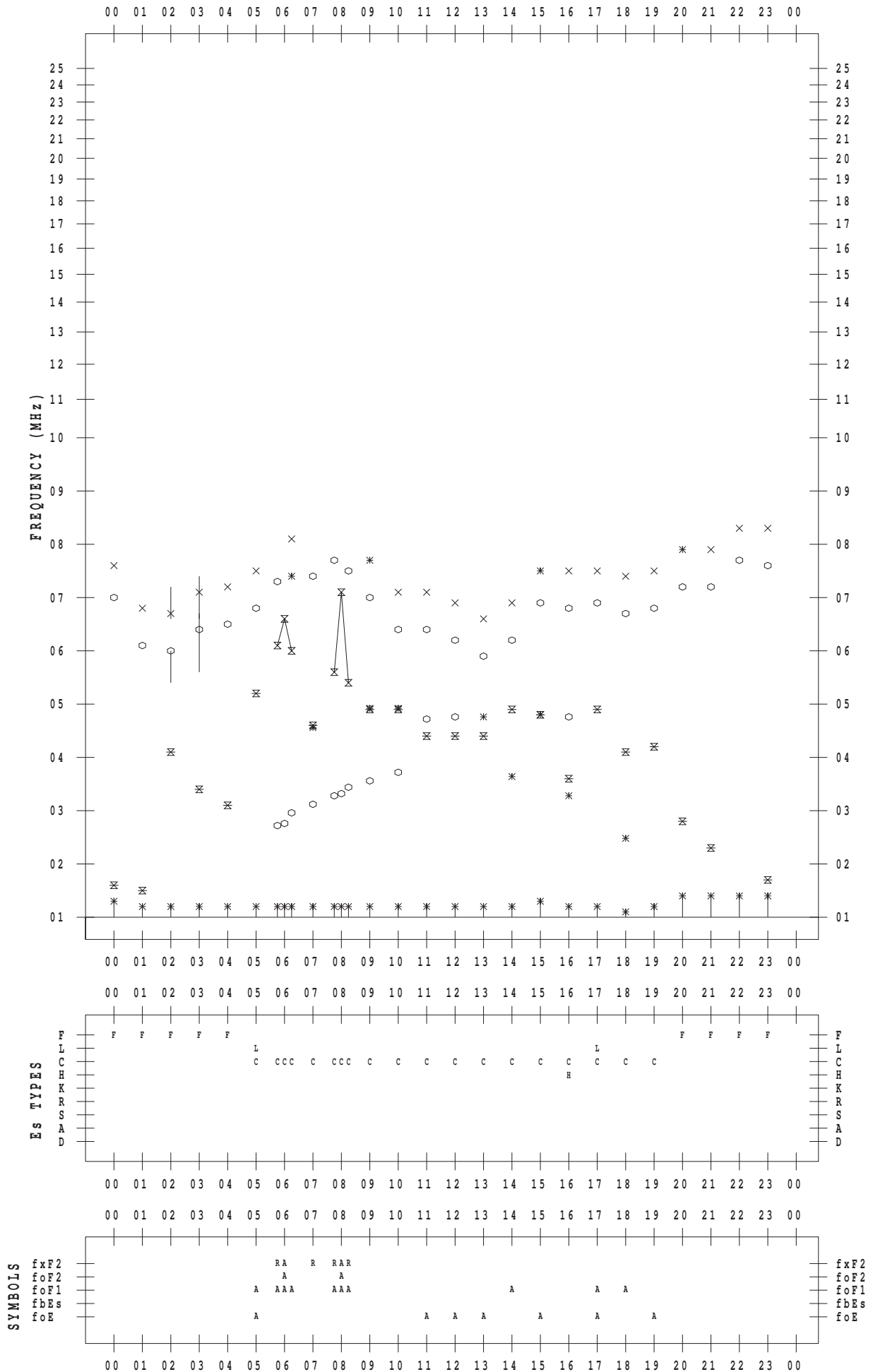
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 9

135 ° E MEAN TIME



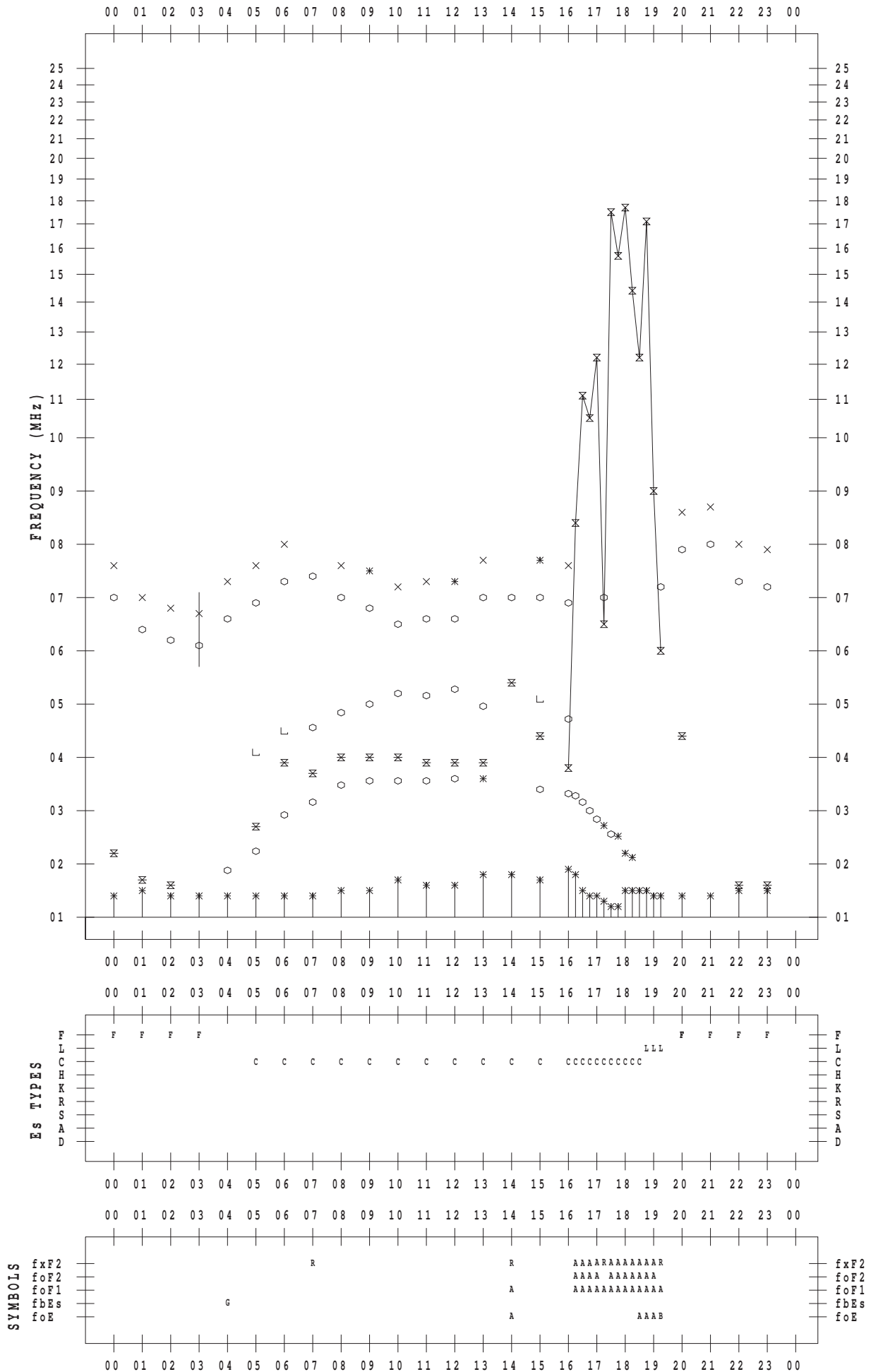
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 10

135 ° E MEAN TIME



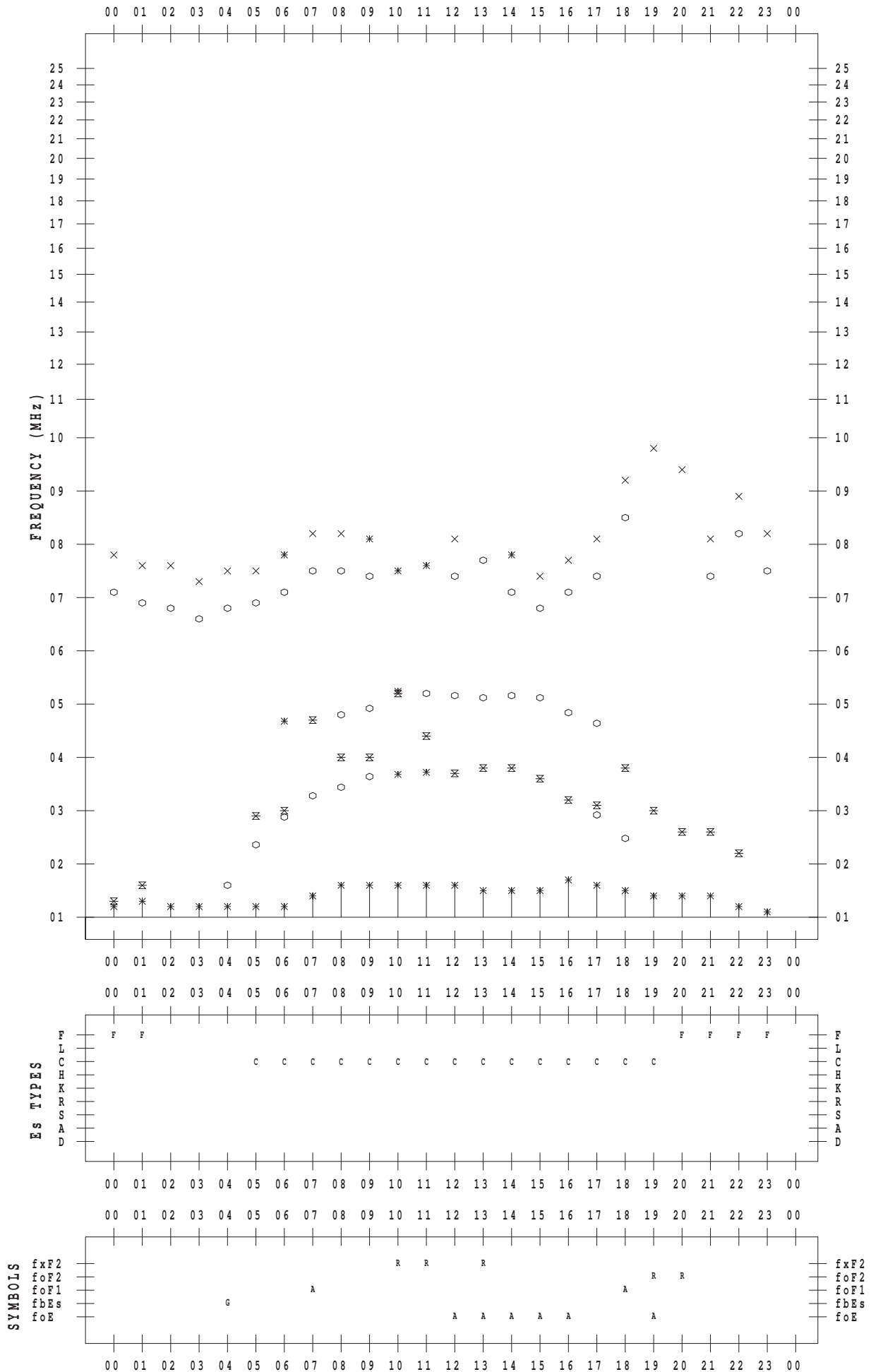
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 11

135 ° E MEAN TIME



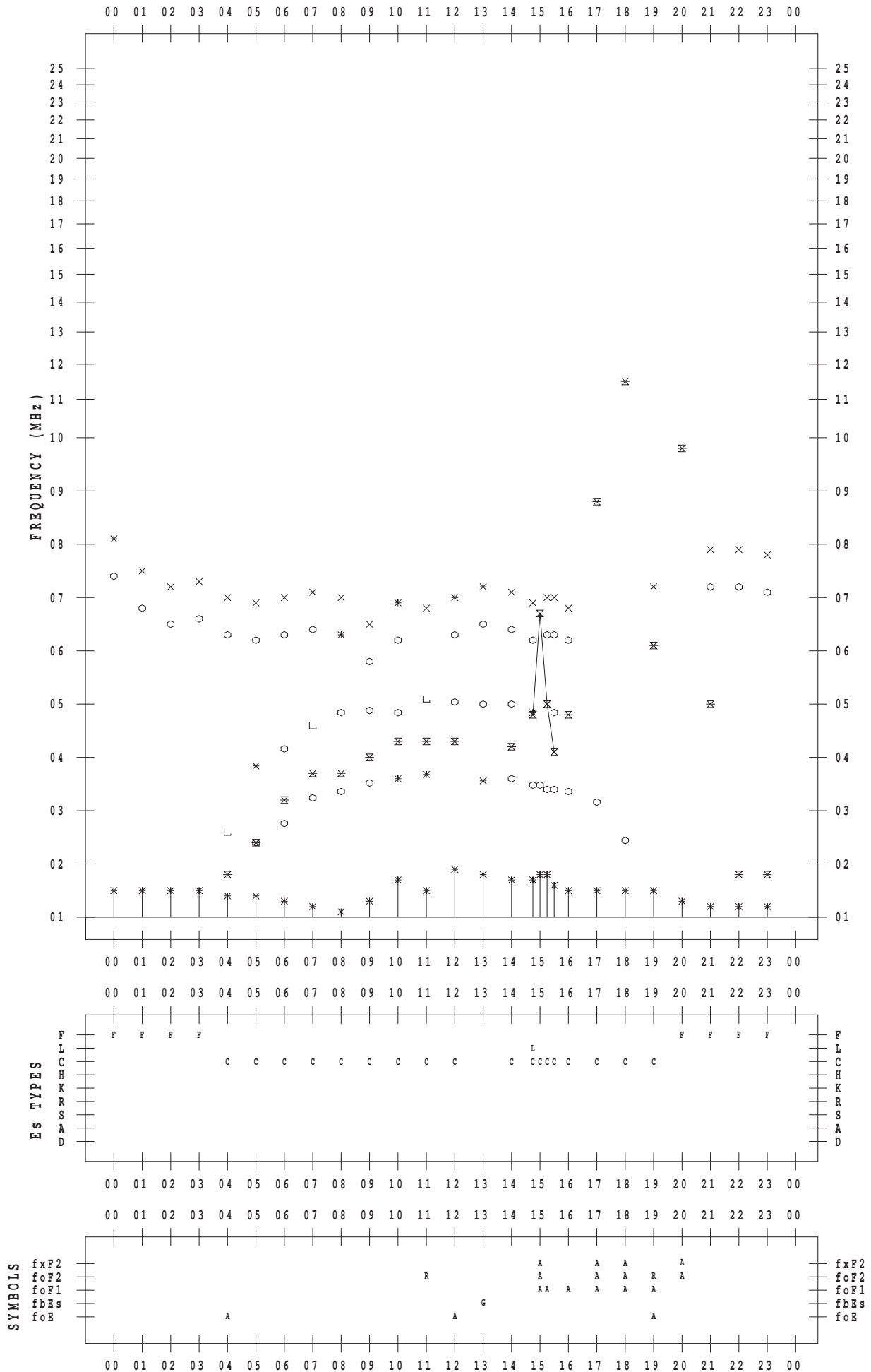
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 12

135 ° E MEAN TIME



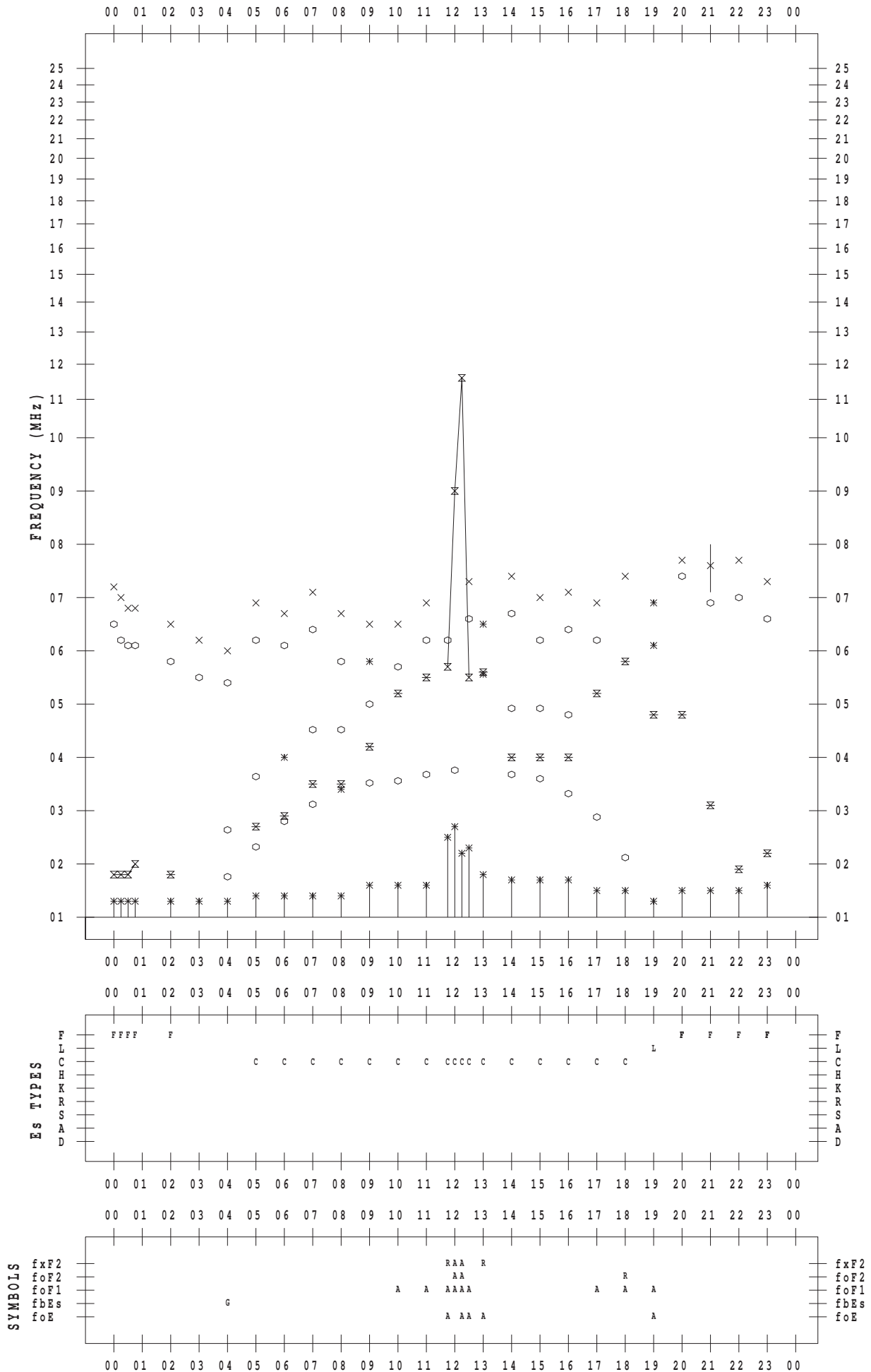
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 13

135 ° E MEAN TIME



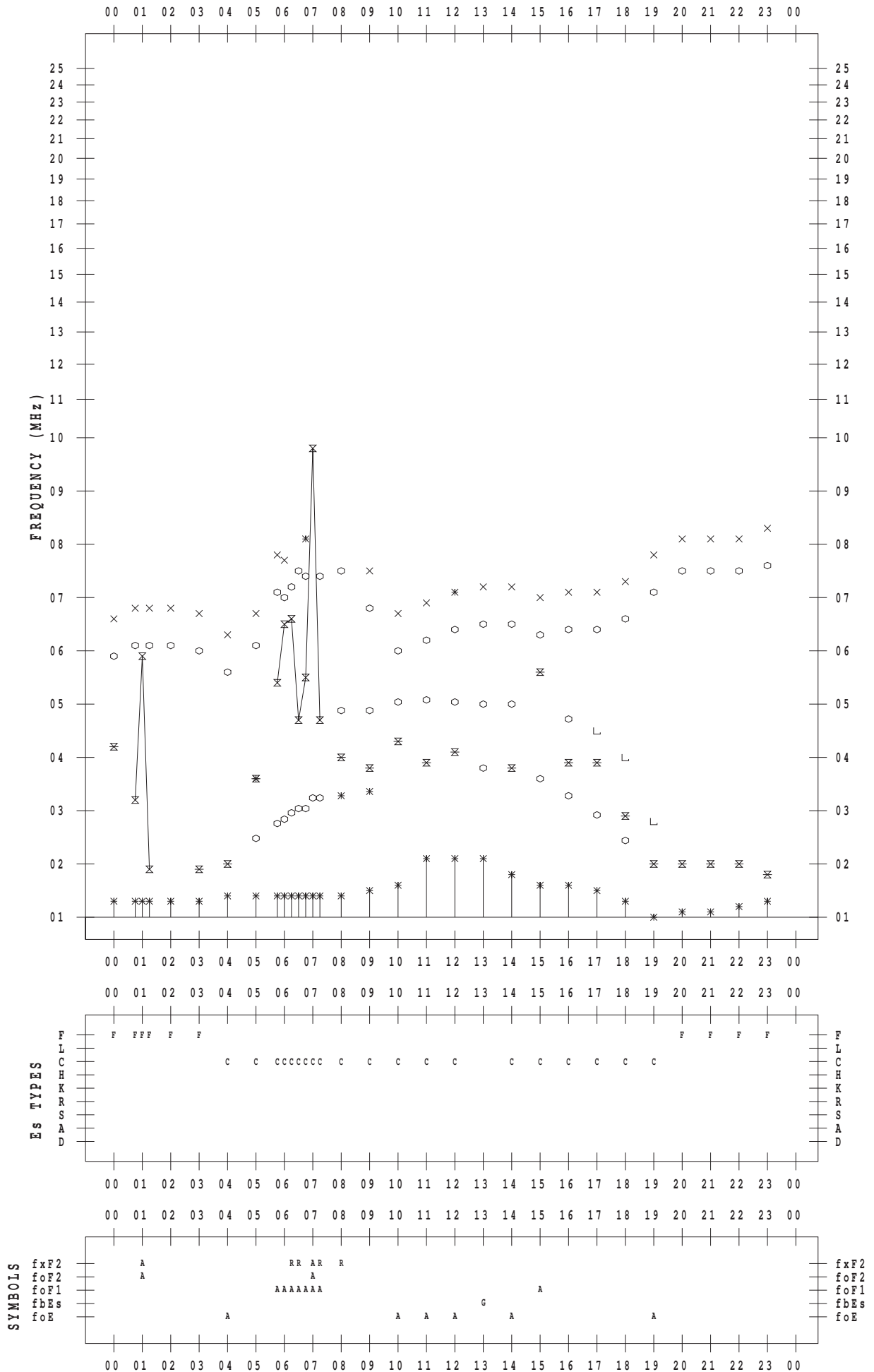
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 14

135 ° E MEAN TIME



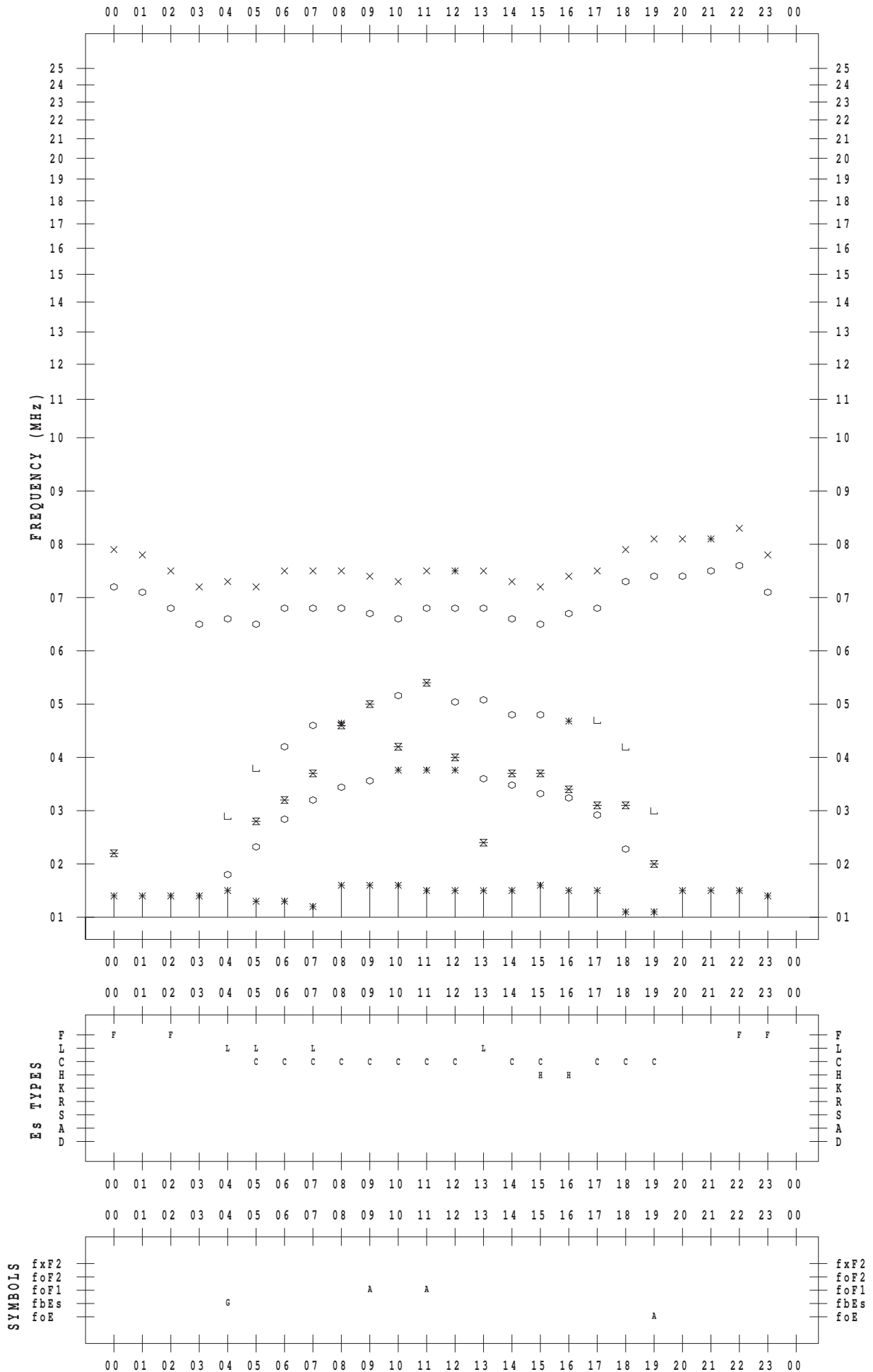
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 15

135 ° E MEAN TIME



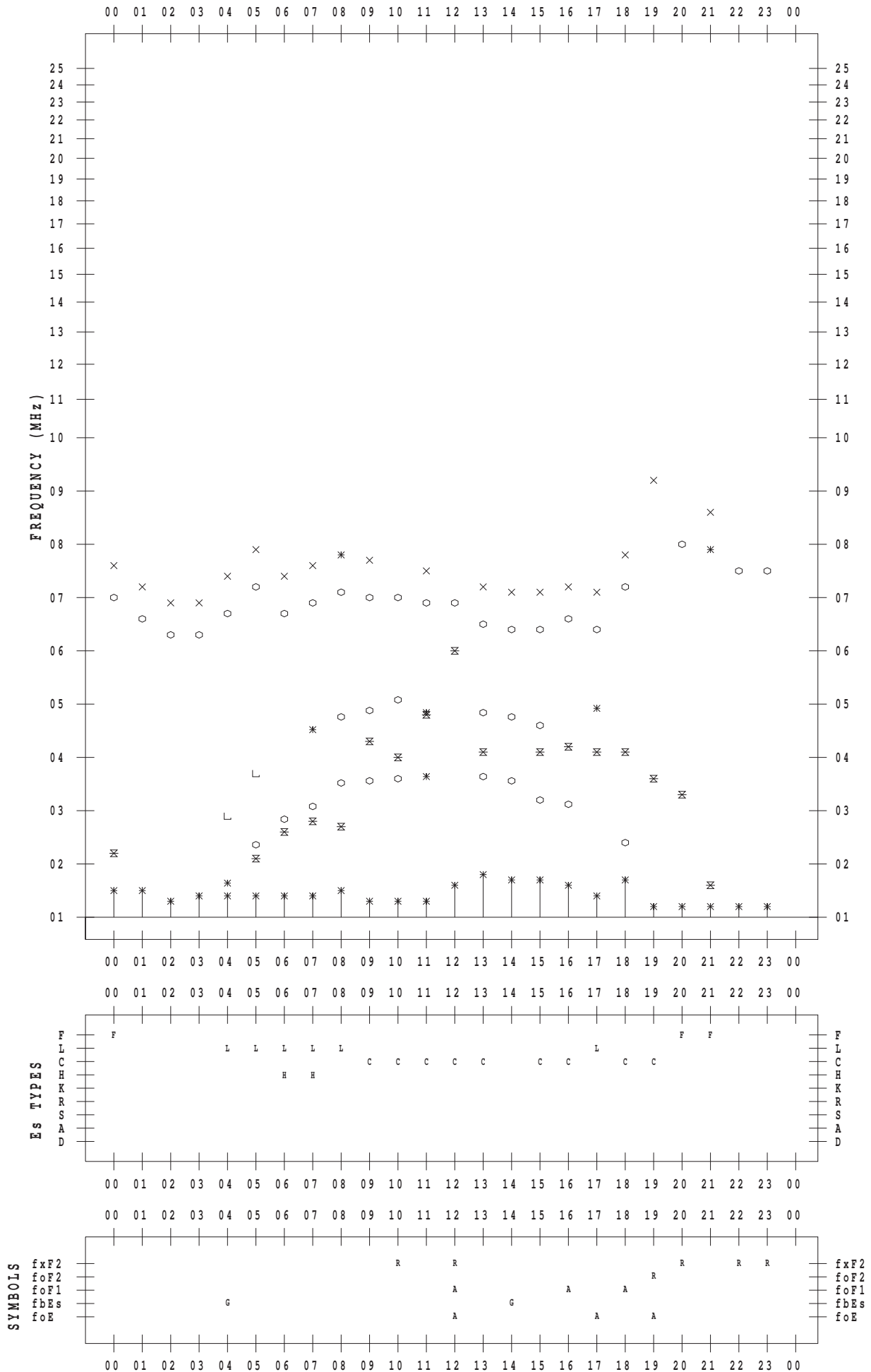
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 16

135 ° E MEAN TIME



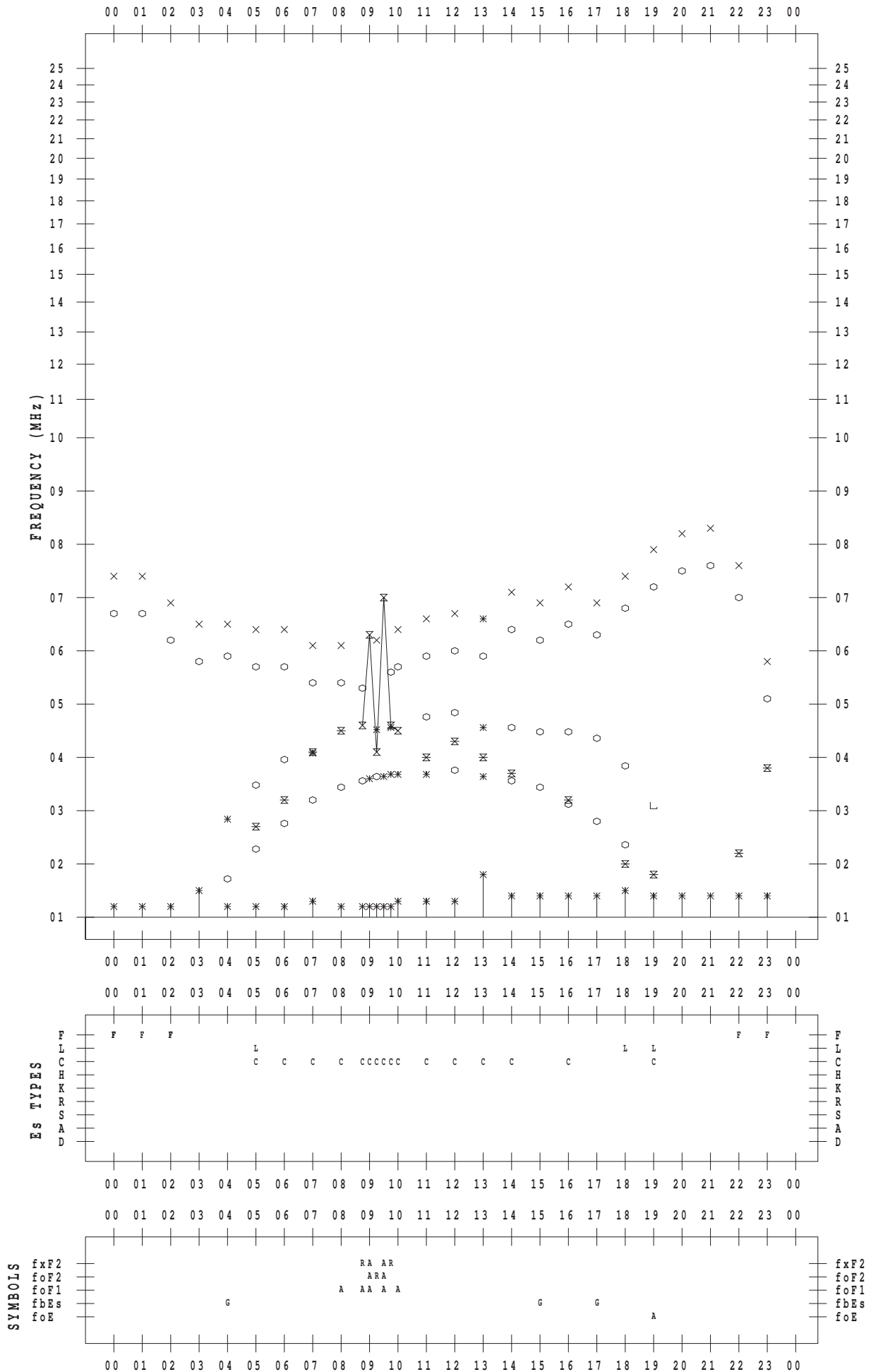
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 17

135 ° E MEAN TIME



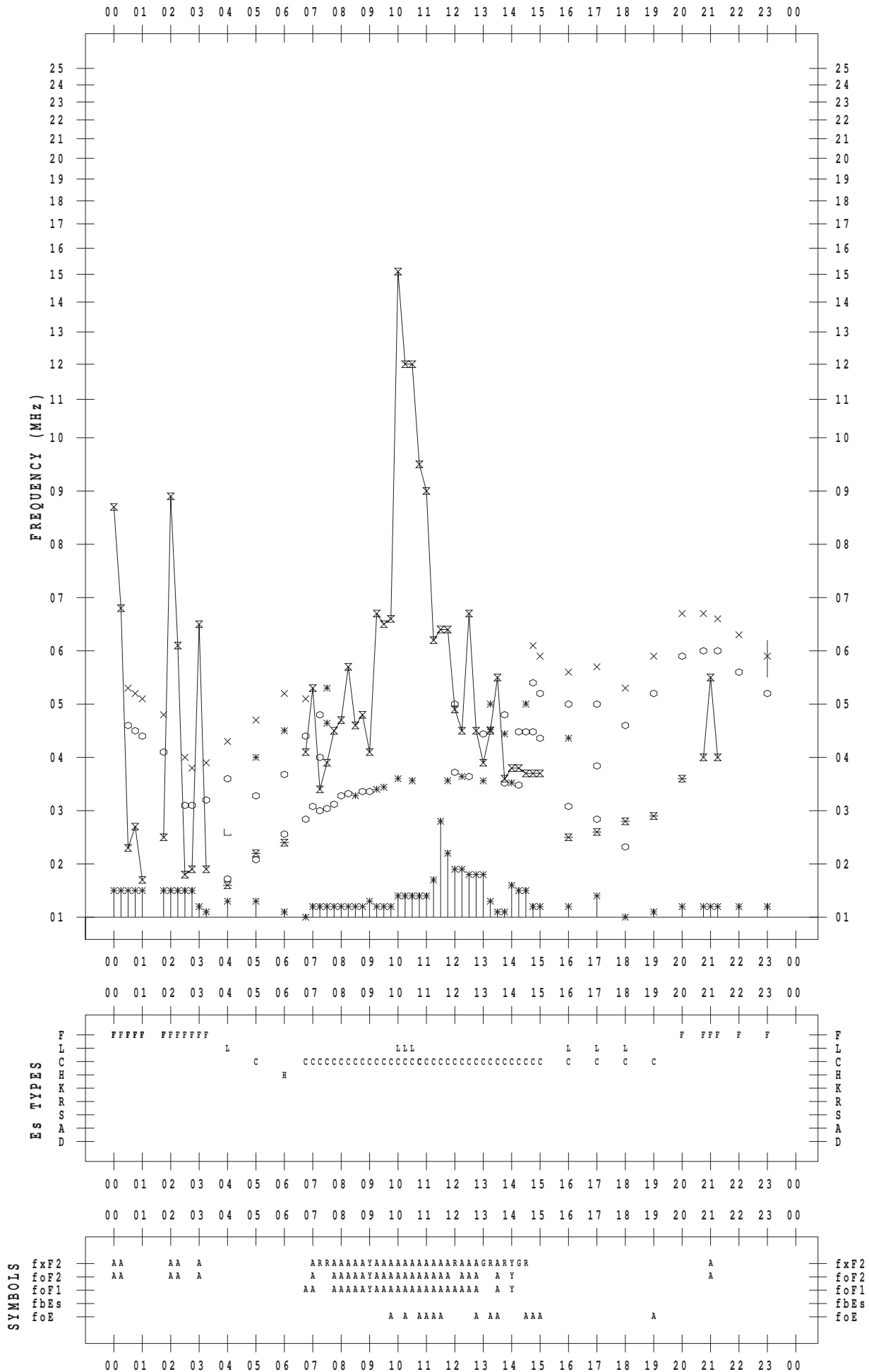
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 18

135 ° E MEAN TIME



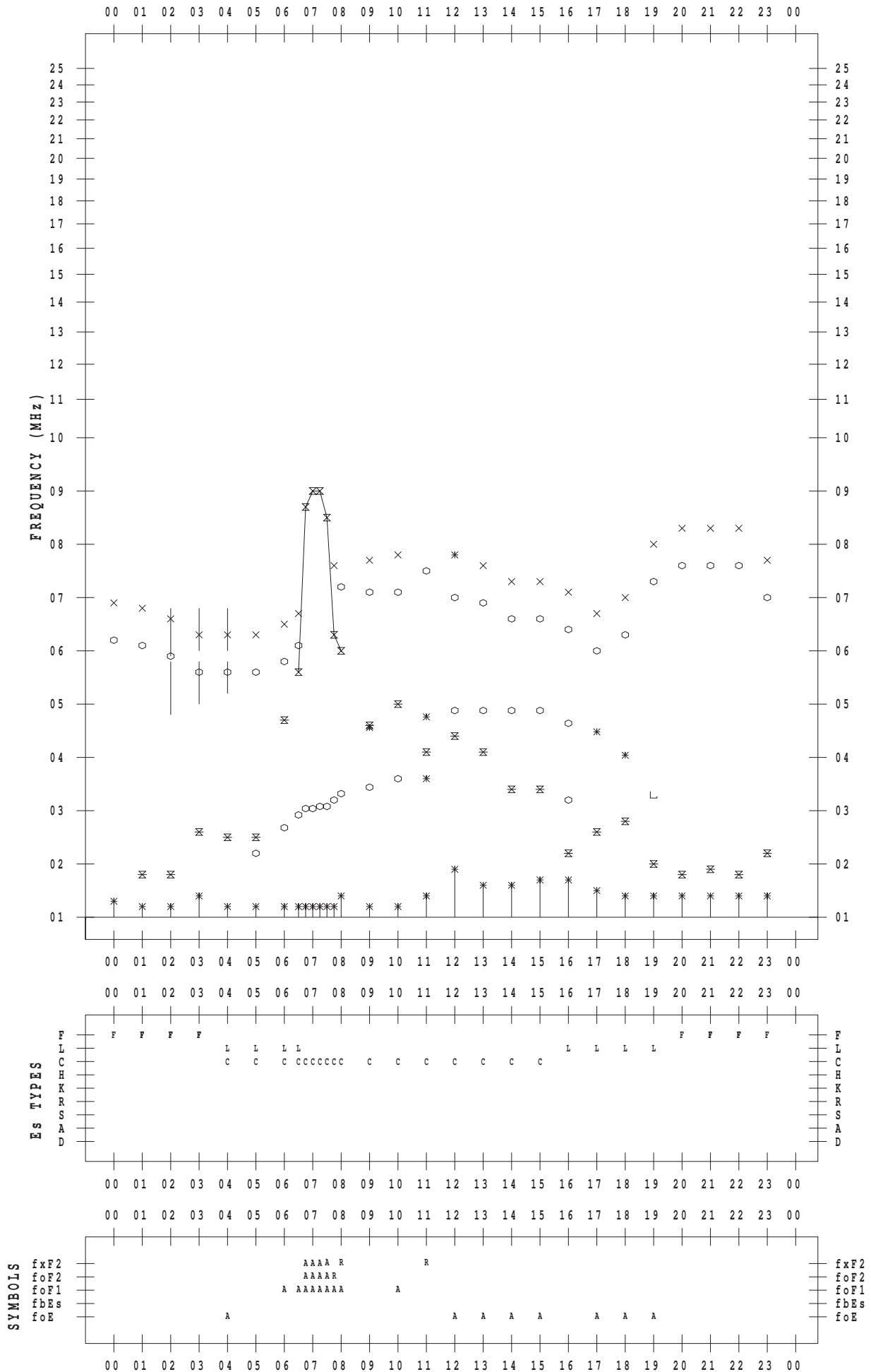
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 21

135 ° E MEAN TIME



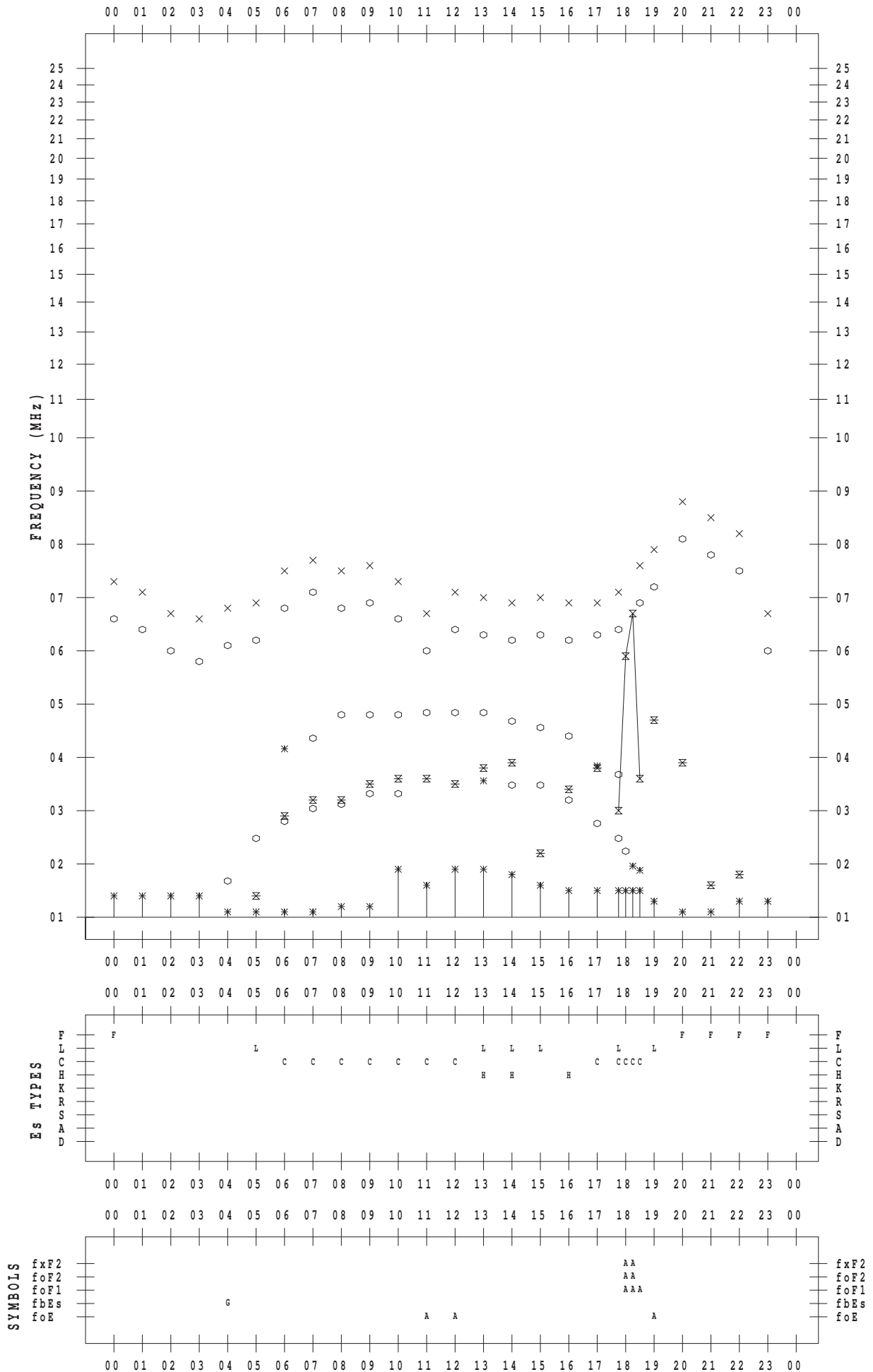
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 22

135 ° E MEAN TIME



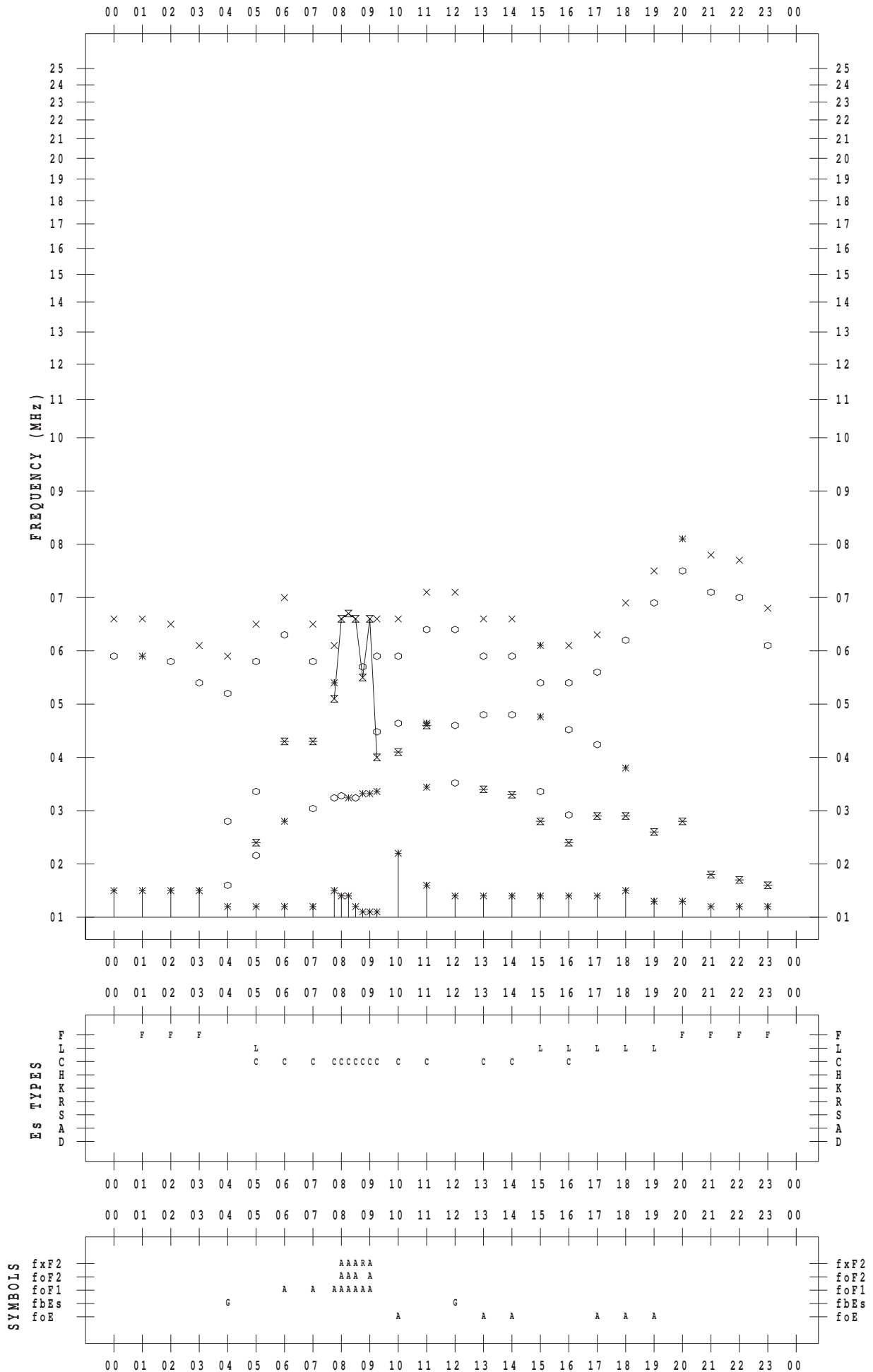
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 23

135 ° E MEAN TIME



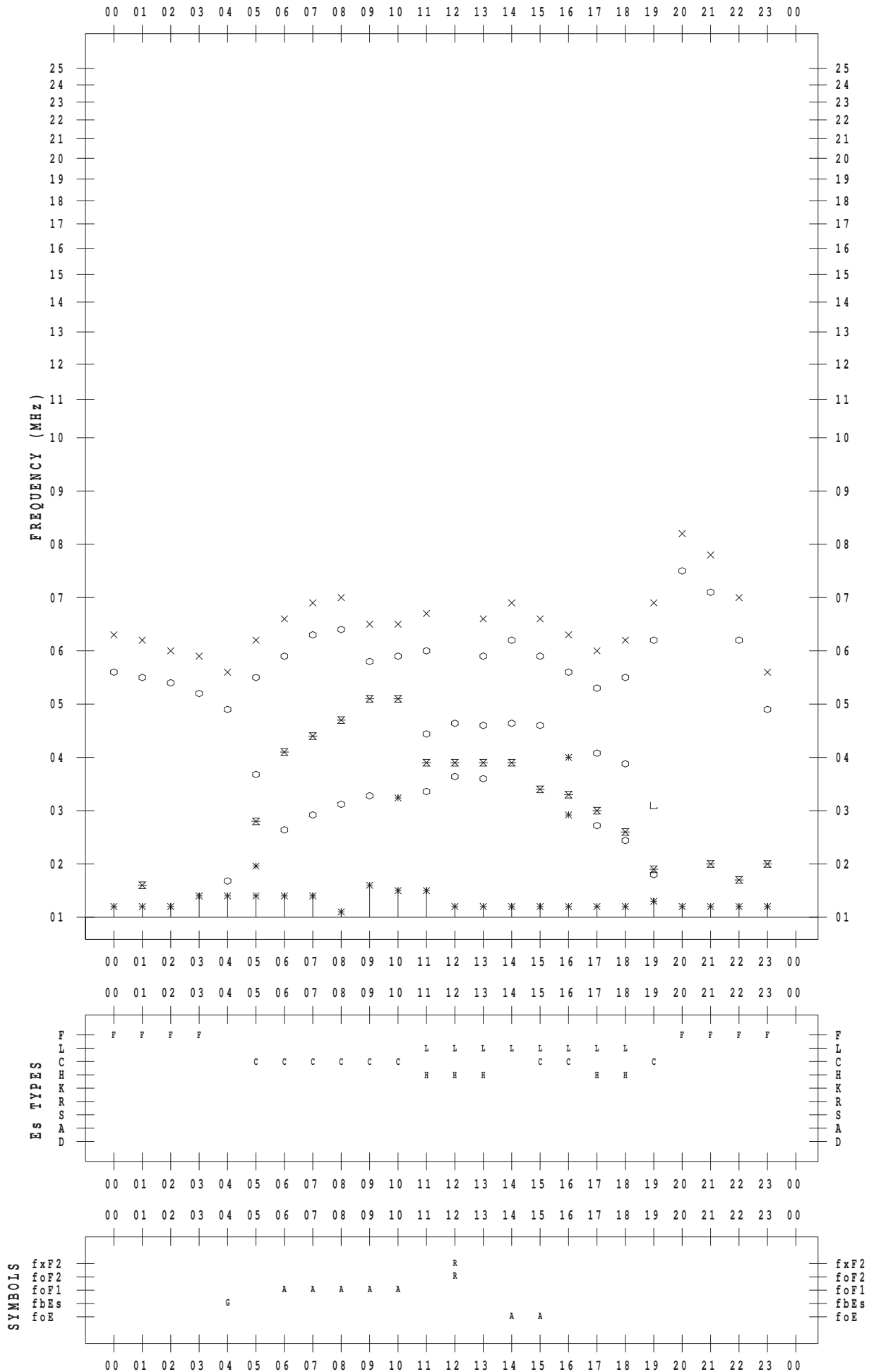
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STATION : Wakkanai

DATE : 2012 / 6 / 24

135 ° E MEAN TIME



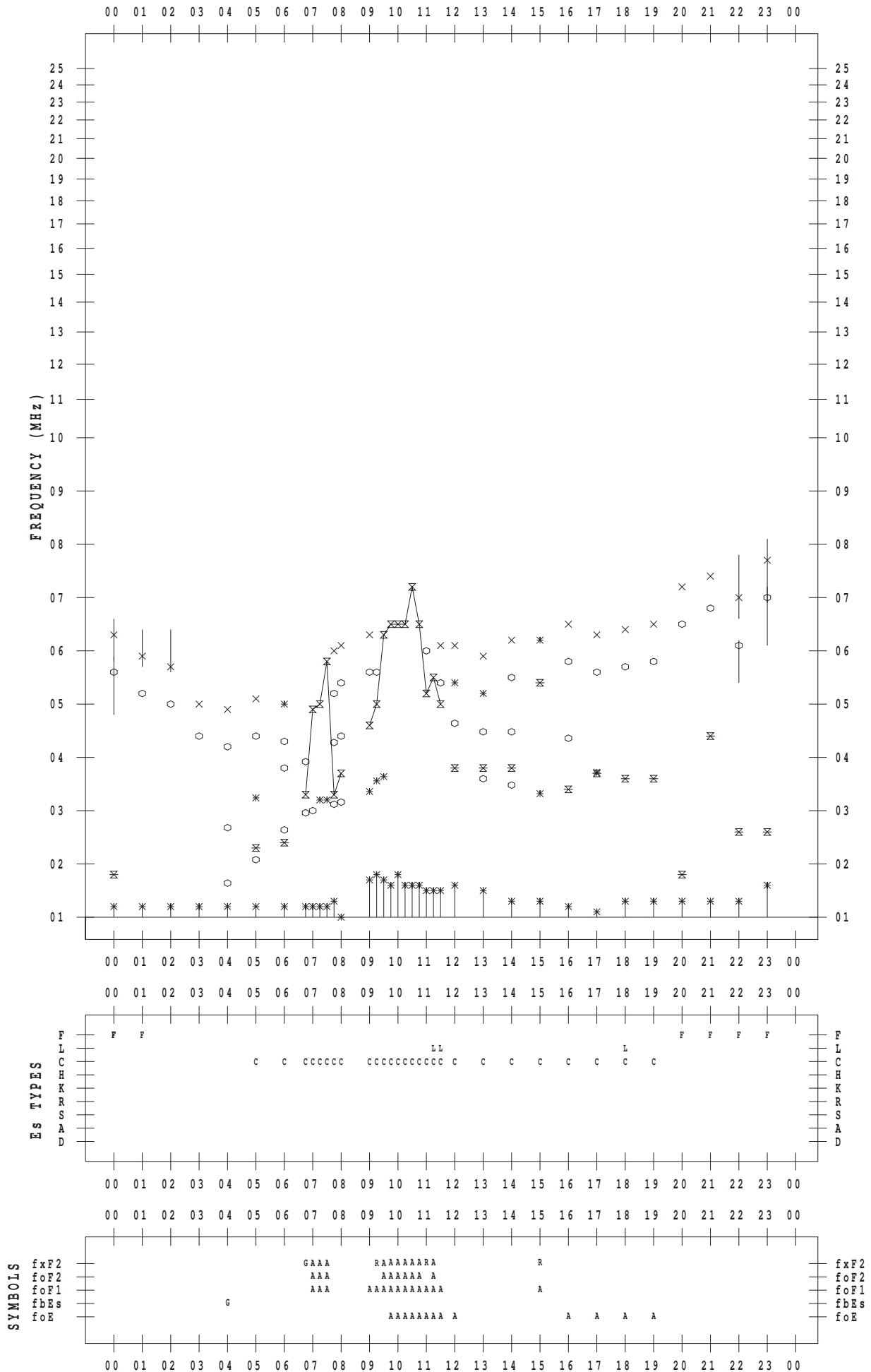
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STATION : Wakkanai

DATE : 2012 / 6 / 26

135 ° E MEAN TIME



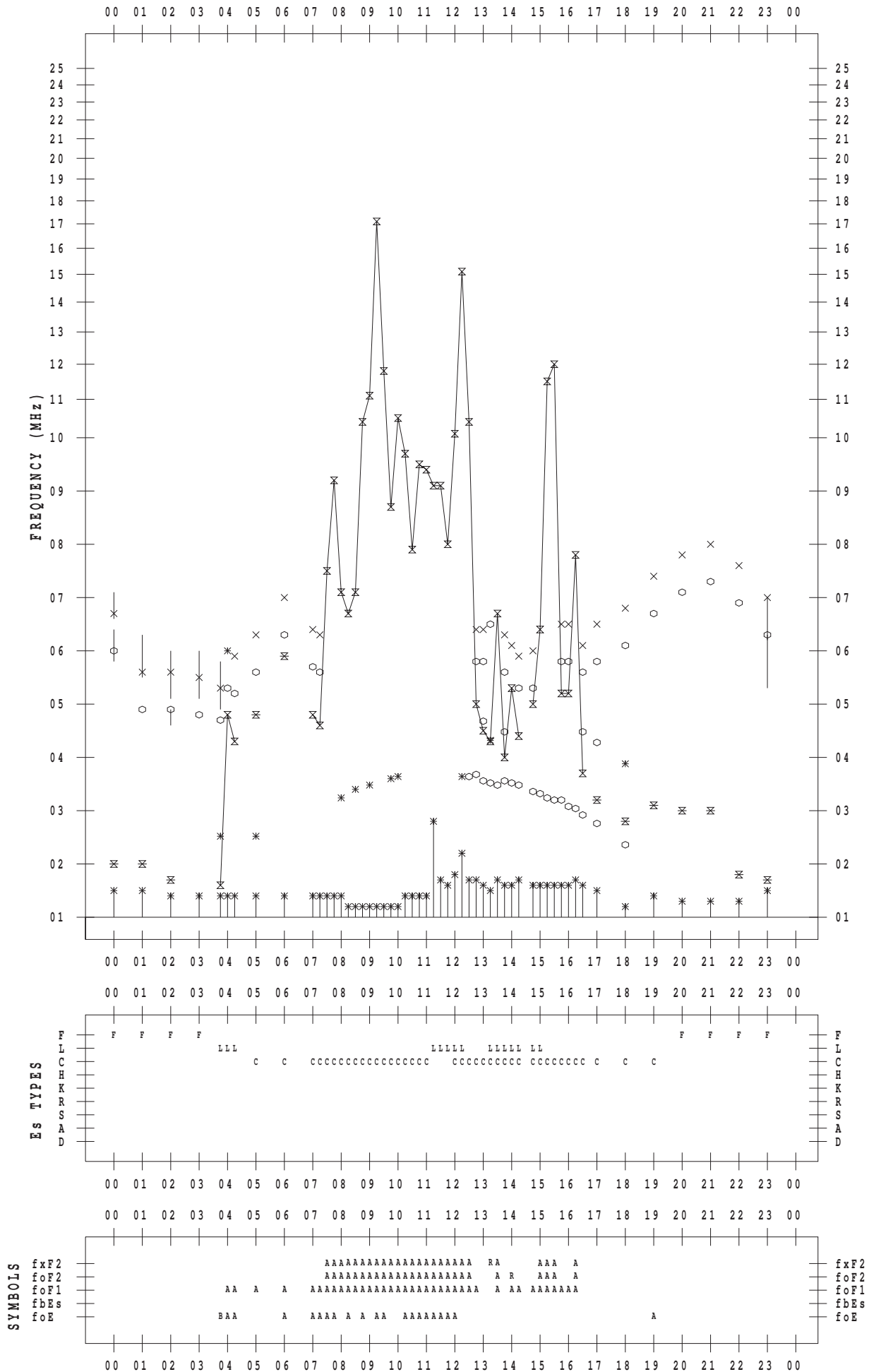
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 27

135 ° E MEAN TIME



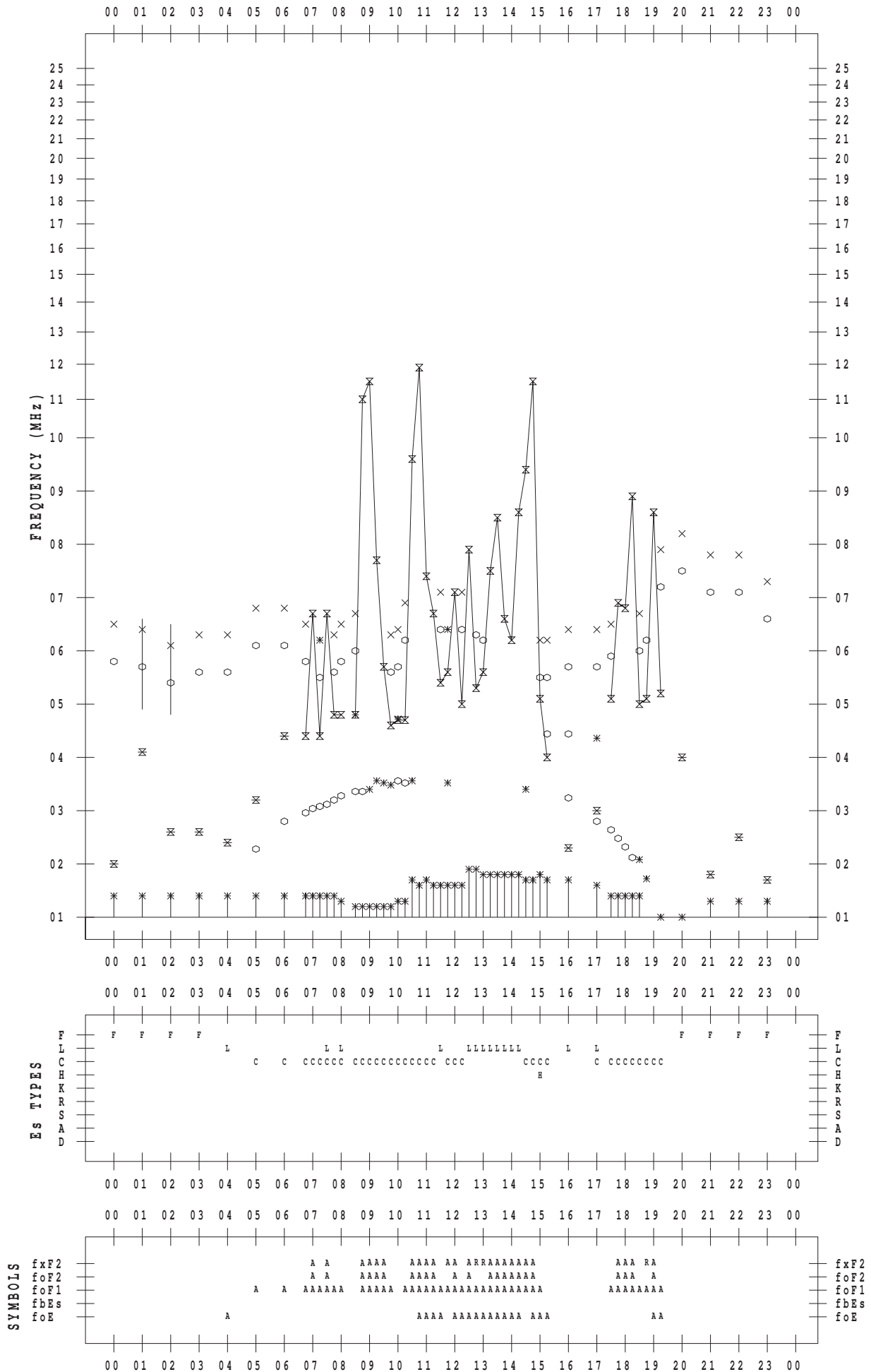
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 28

135 ° E MEAN TIME



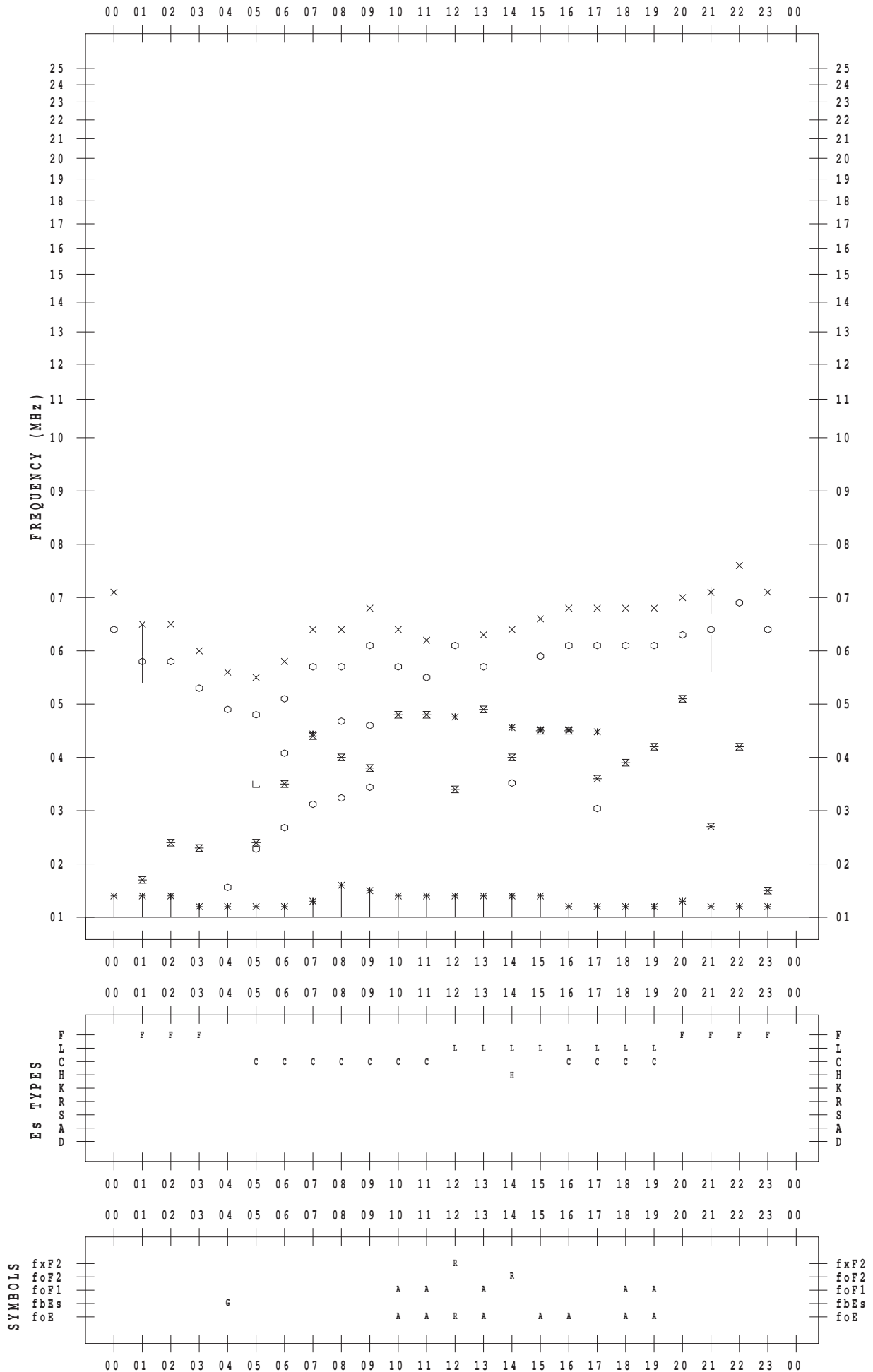
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 29

135 ° E MEAN TIME



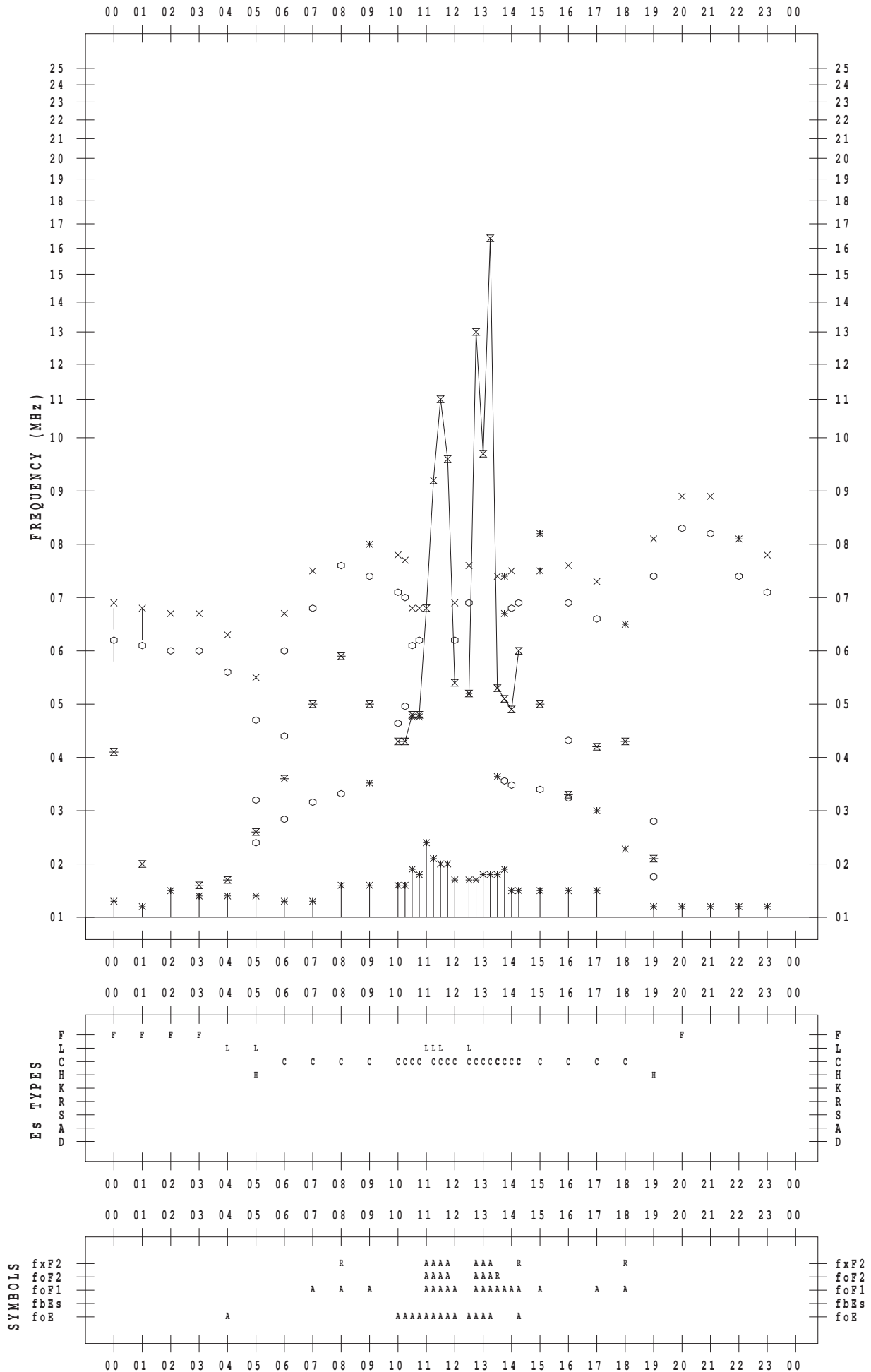
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012 / 6 / 30

135 ° E MEAN TIME



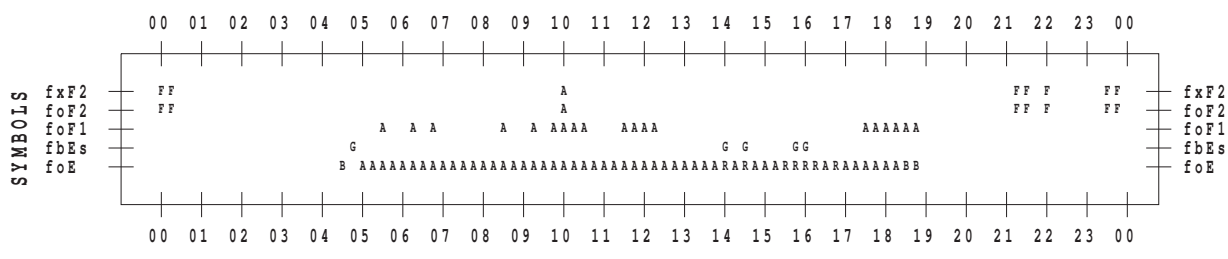
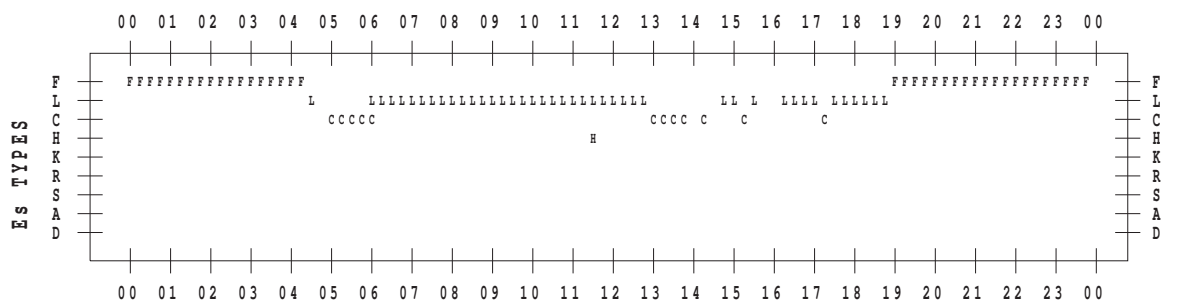
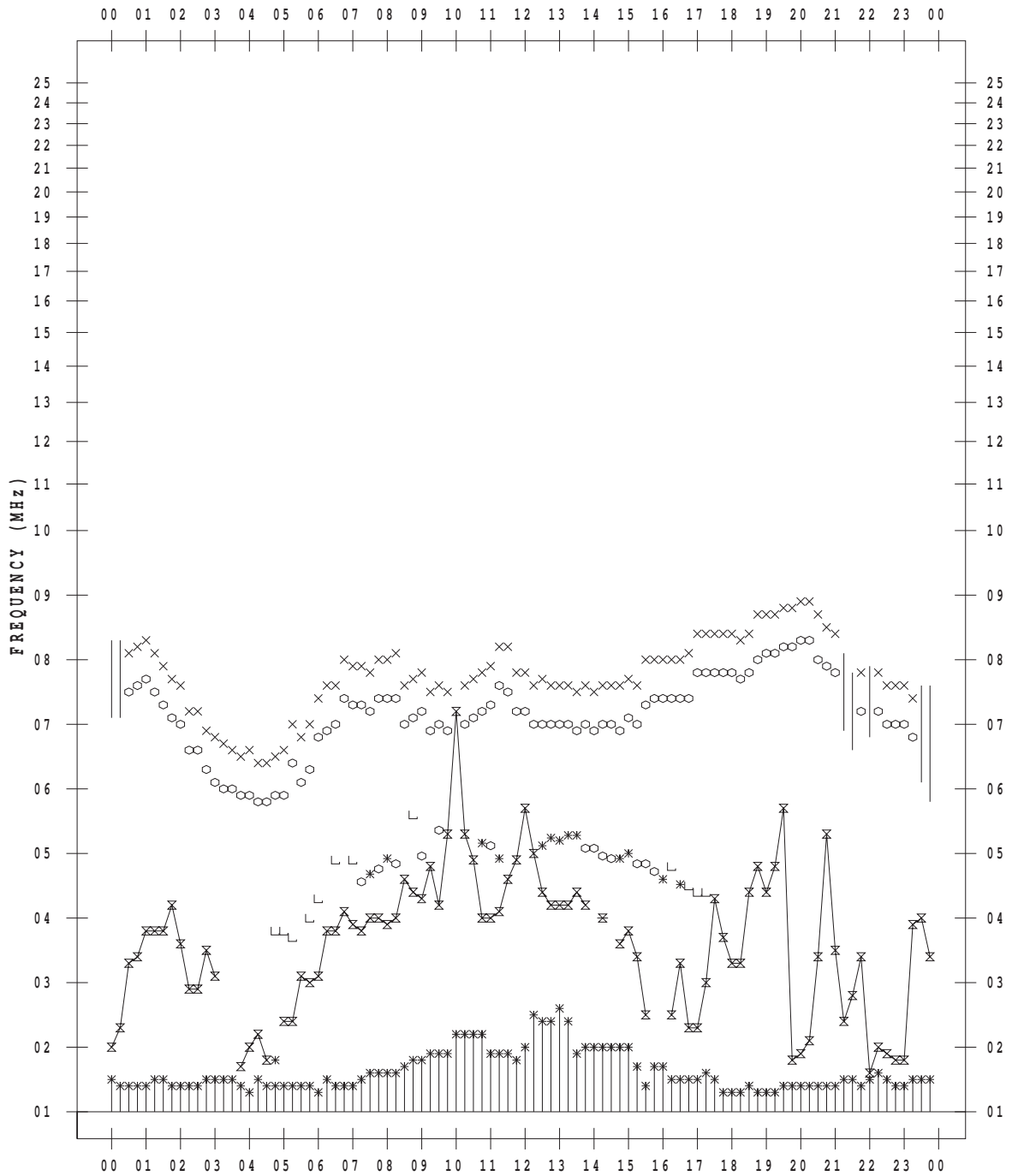
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 1

135 ° E MEAN TIME



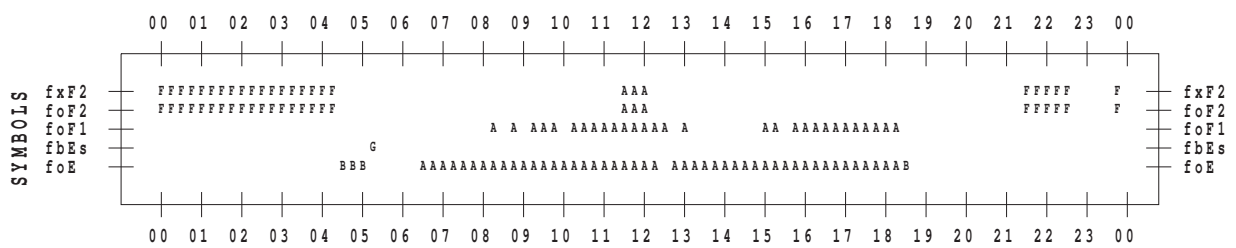
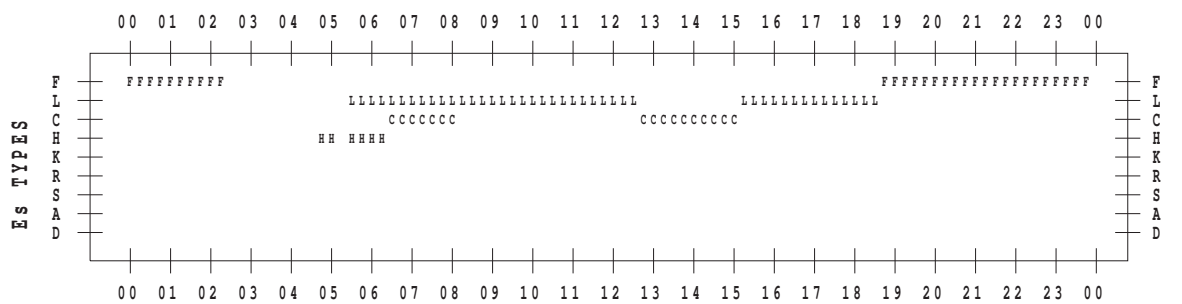
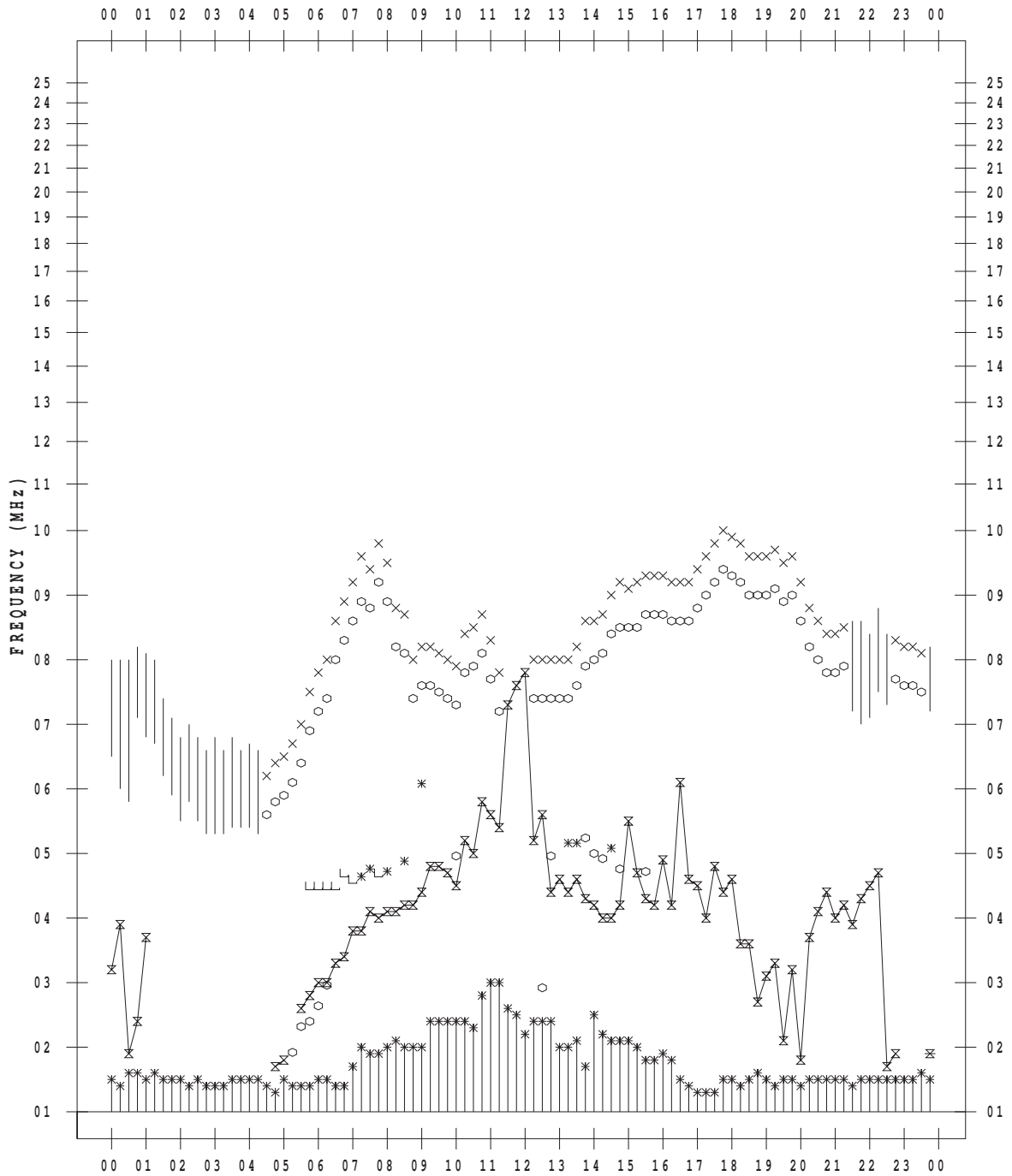
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 2

135 ° E MEAN TIME



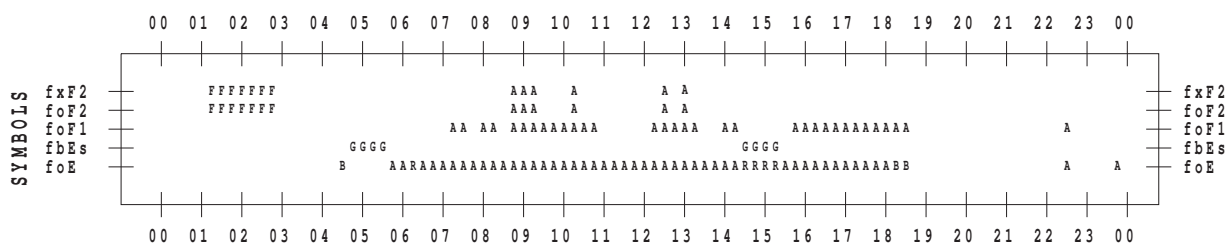
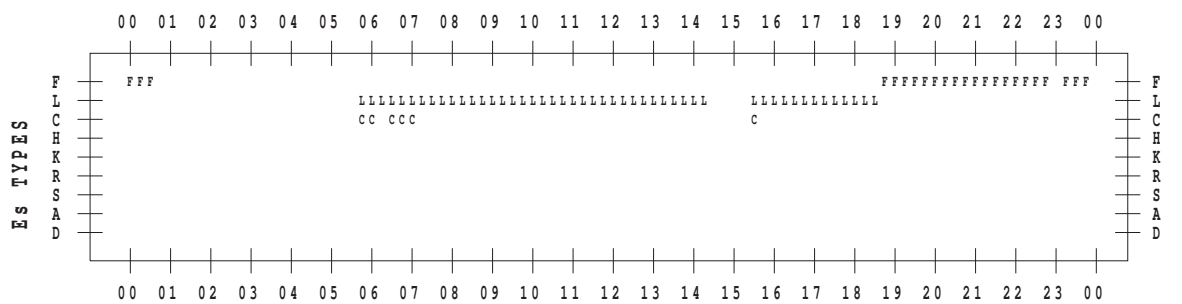
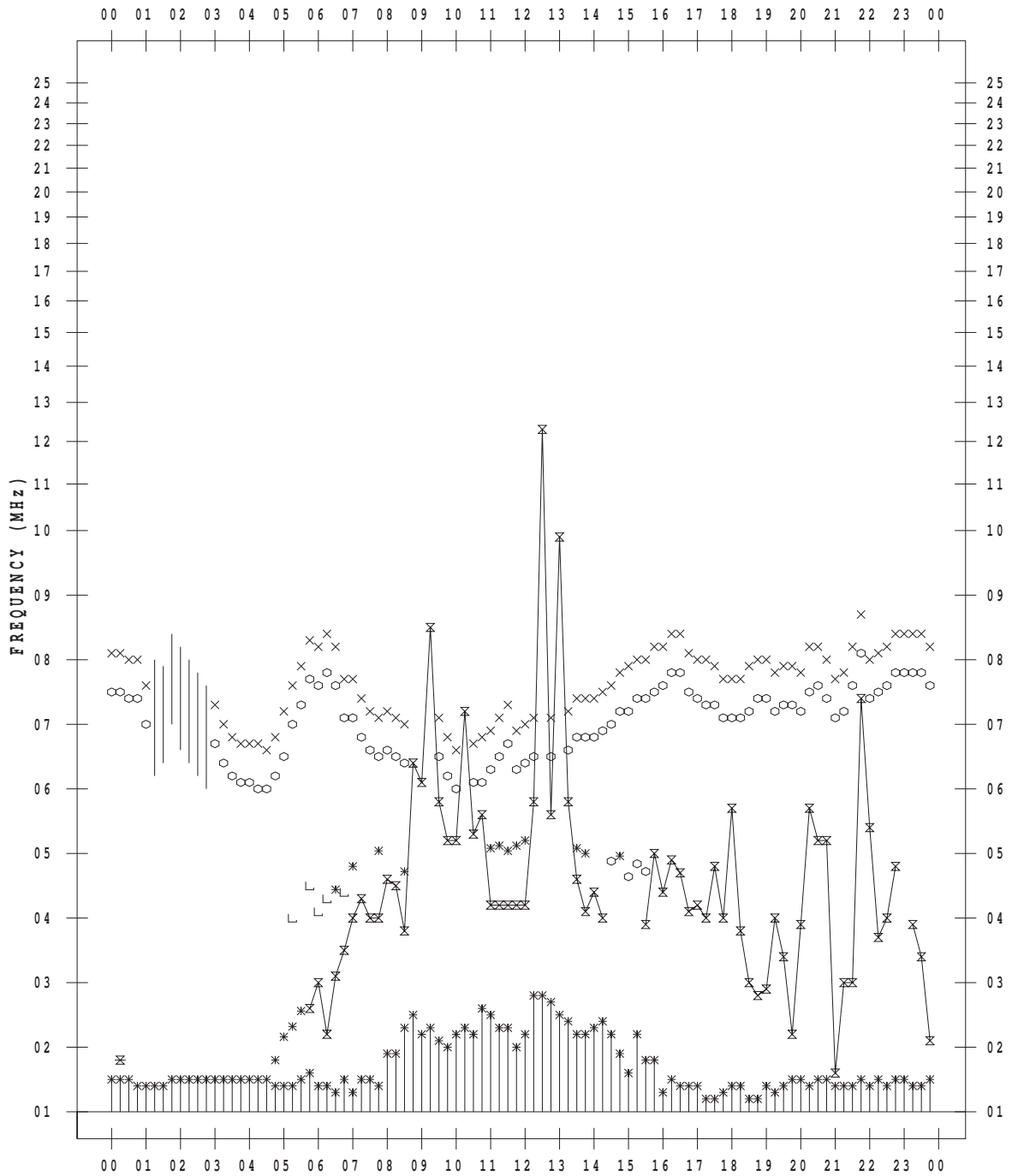
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 3

135 ° E MEAN TIME



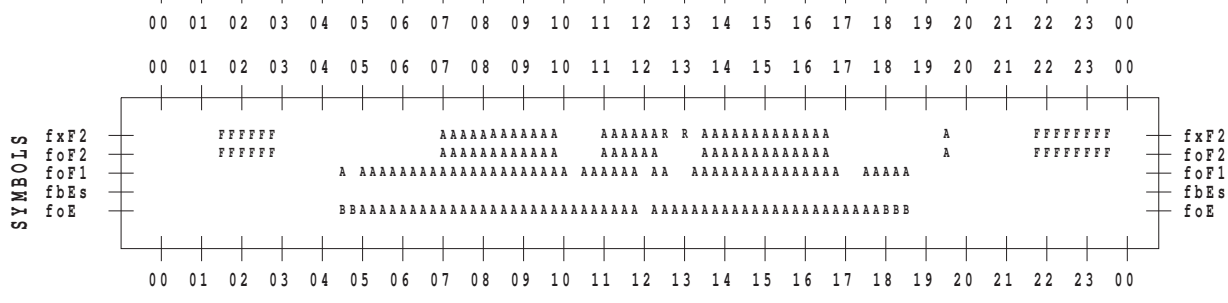
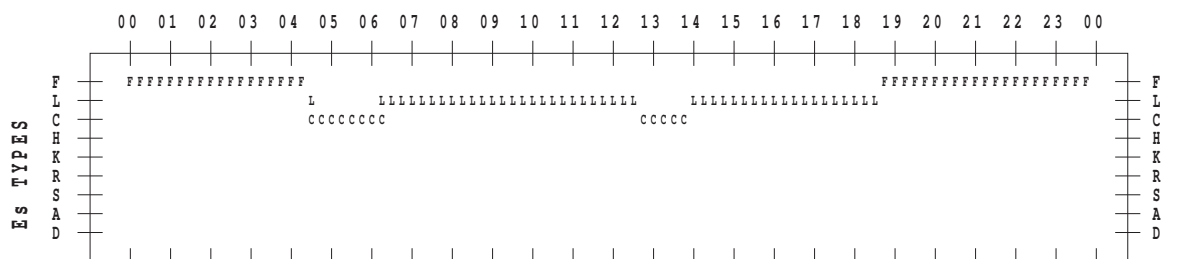
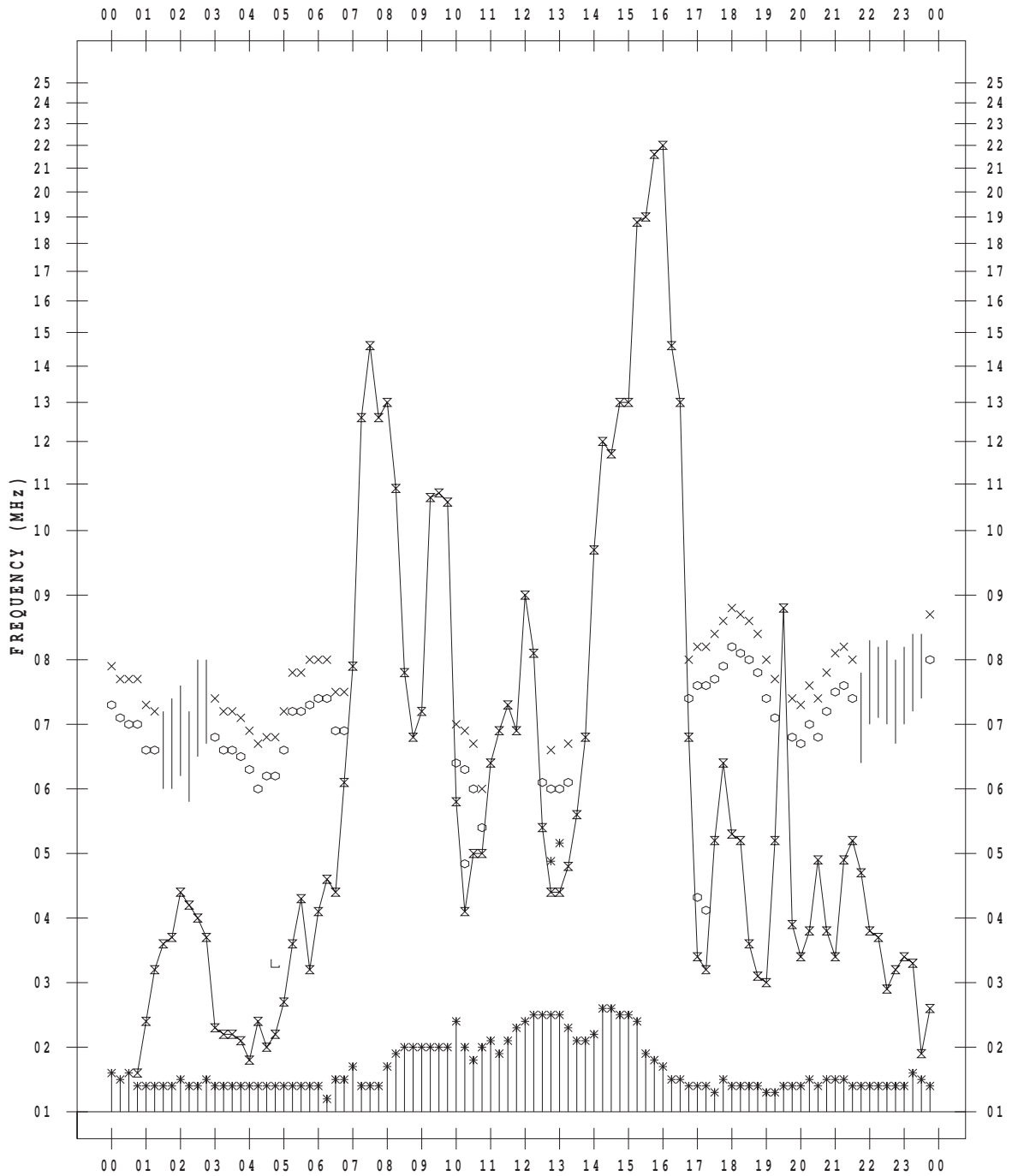
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 4

135 ° E MEAN TIME



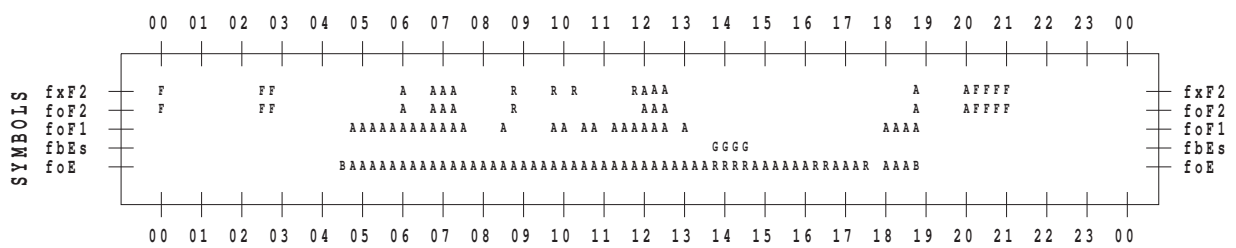
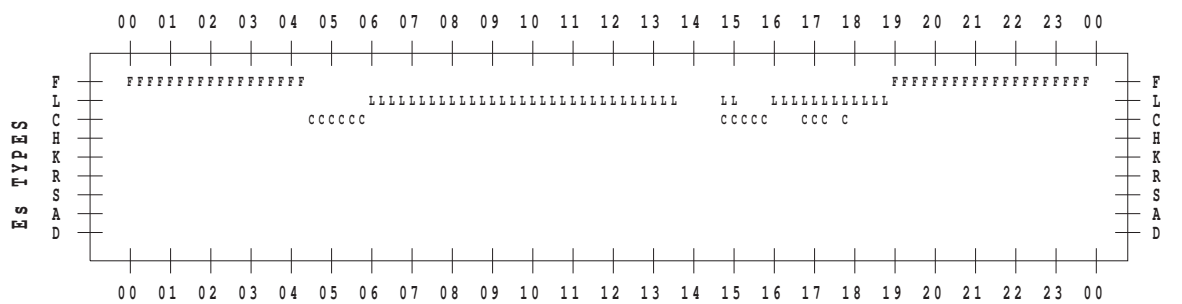
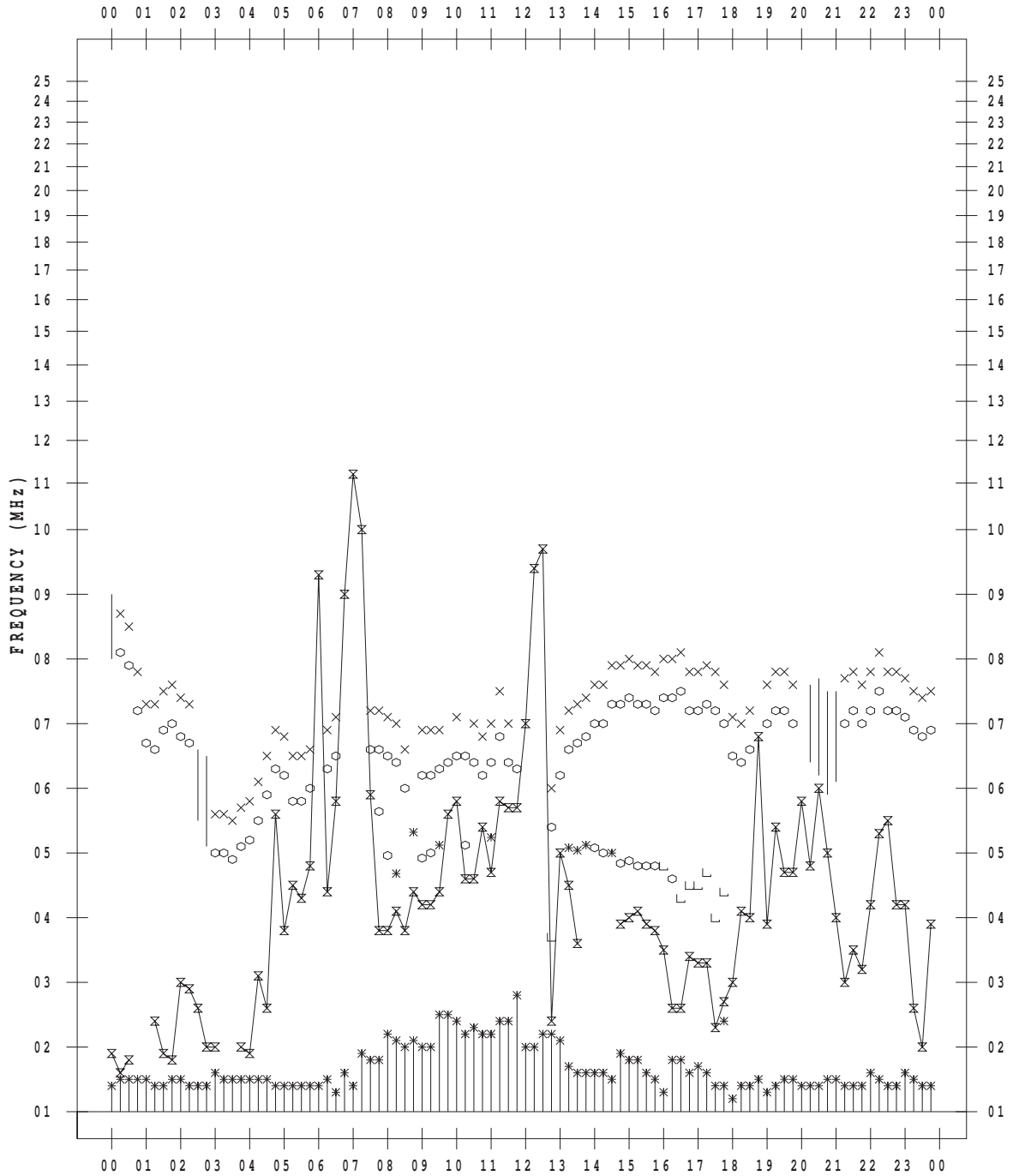
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 5

135 ° E MEAN TIME



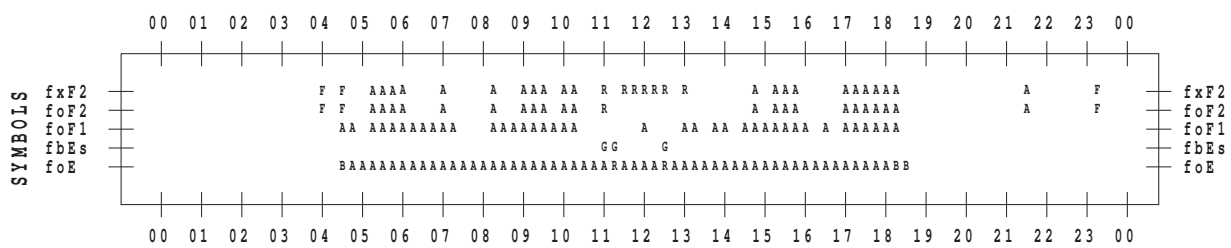
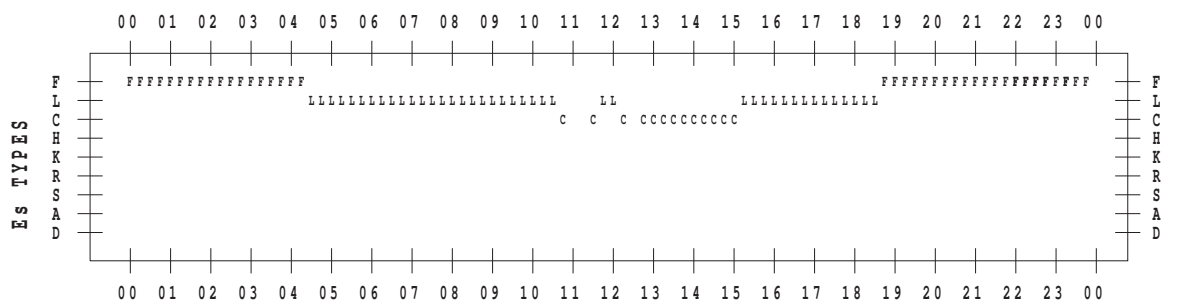
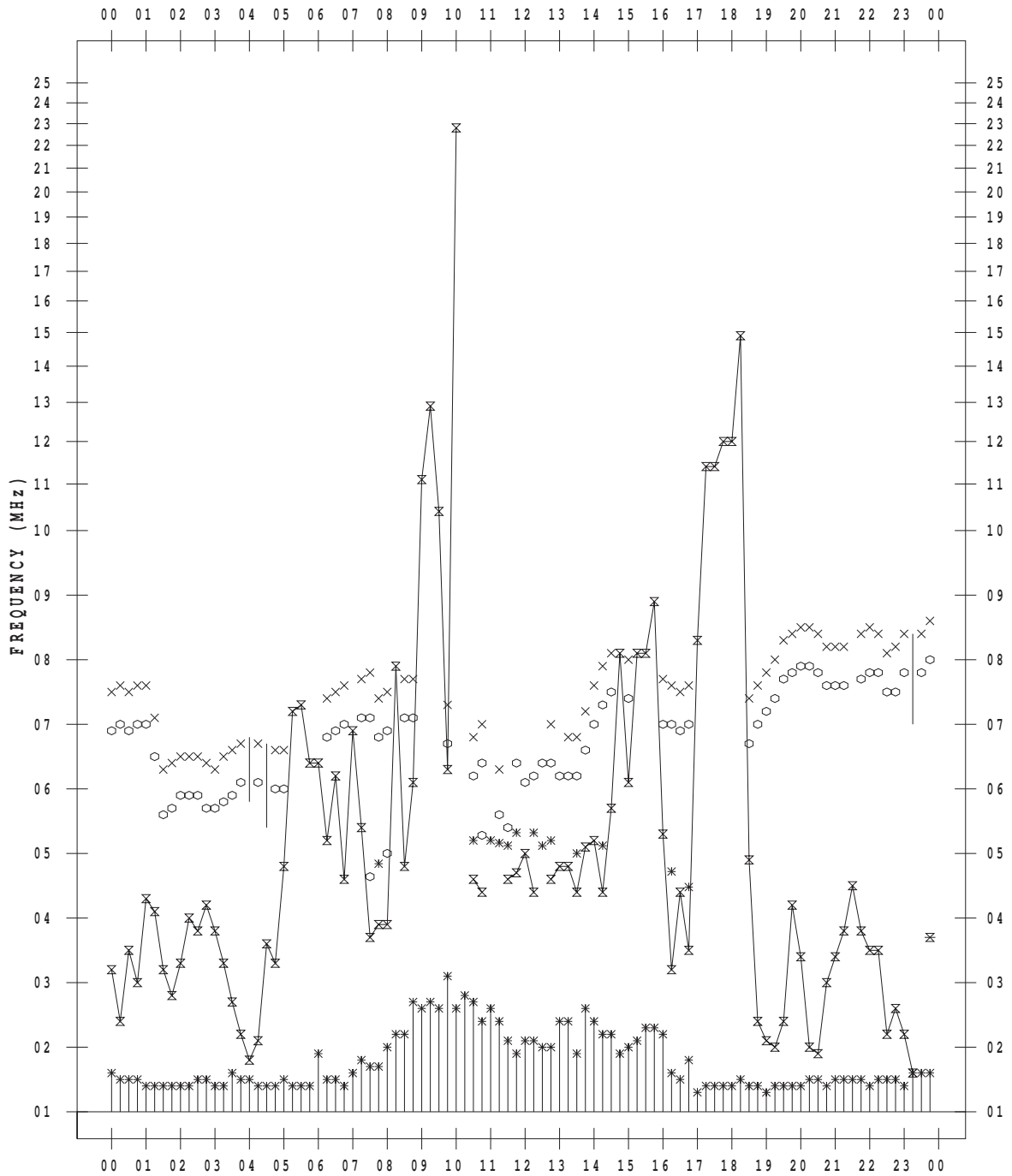
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 6

135 ° E MEAN TIME



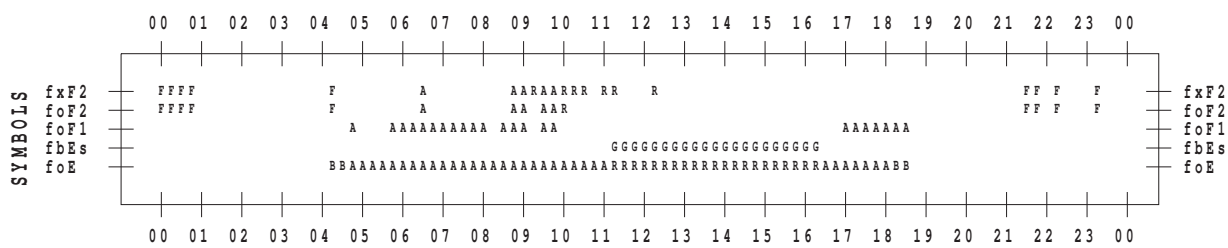
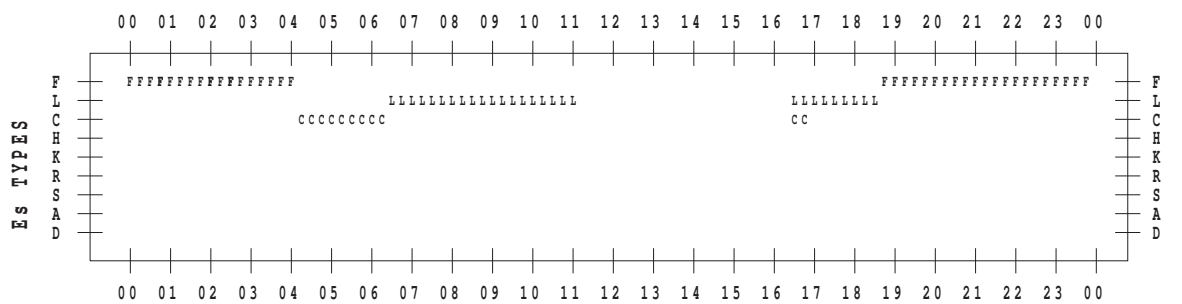
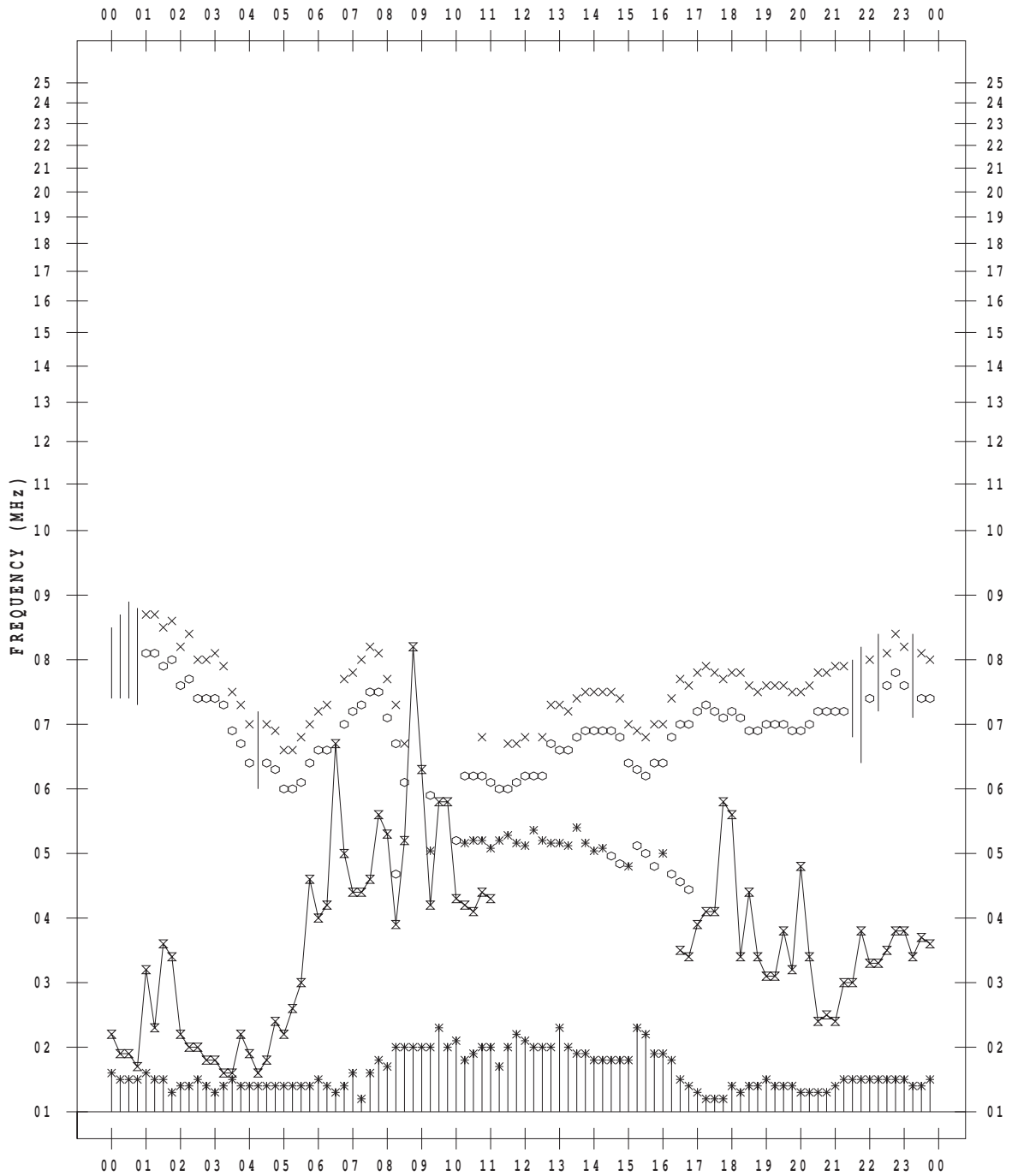
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 7

135 ° E MEAN TIME



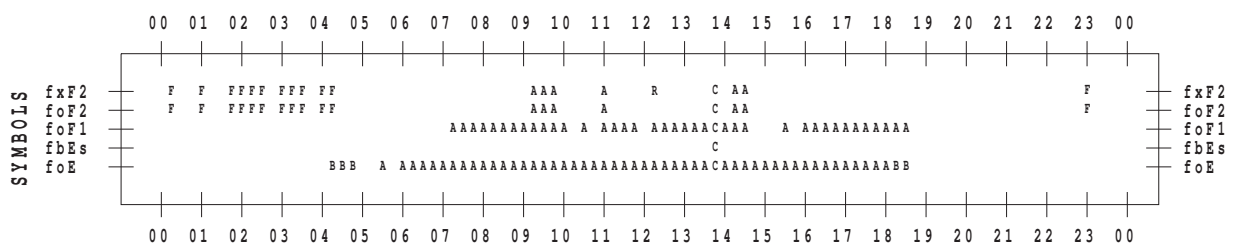
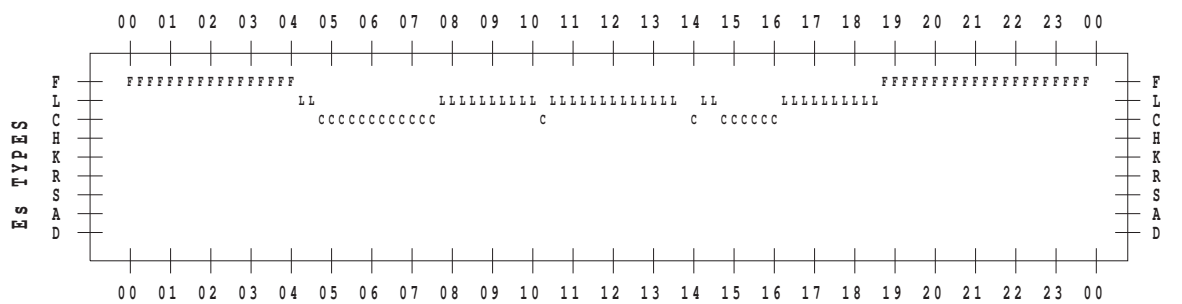
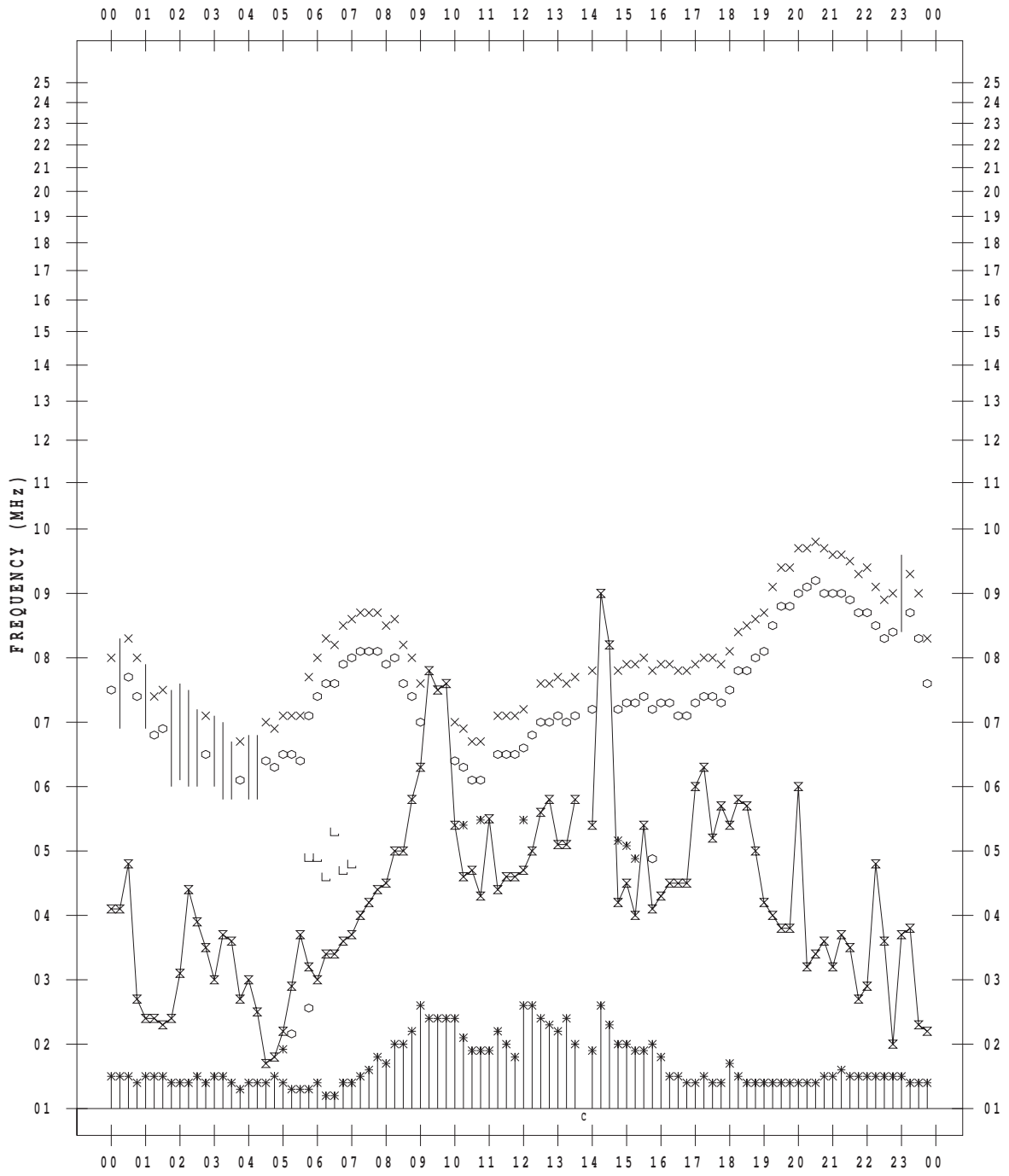
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 8

135 ° E MEAN TIME



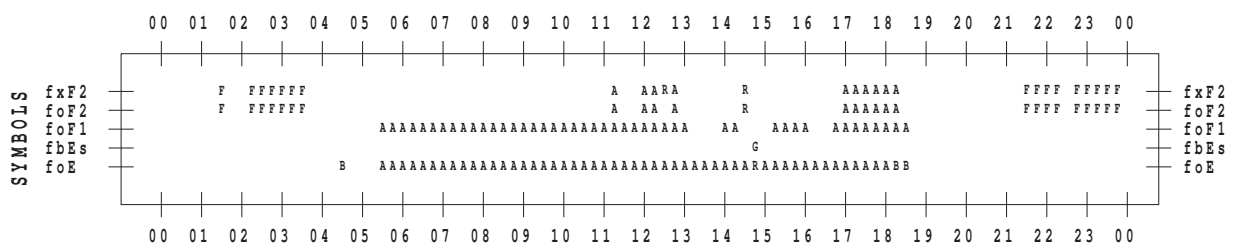
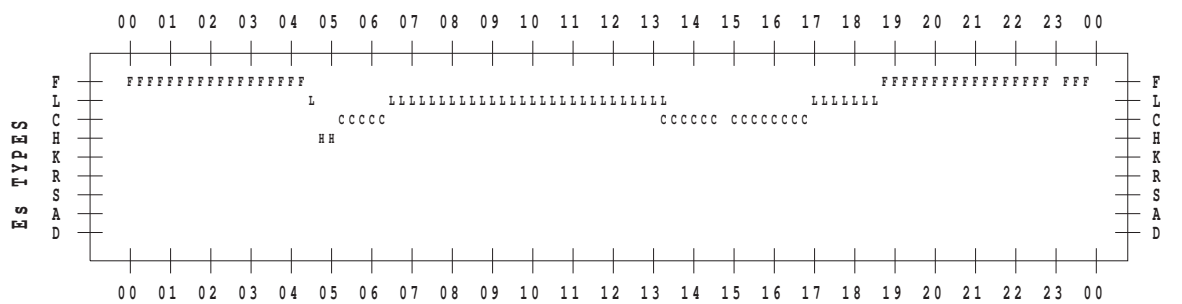
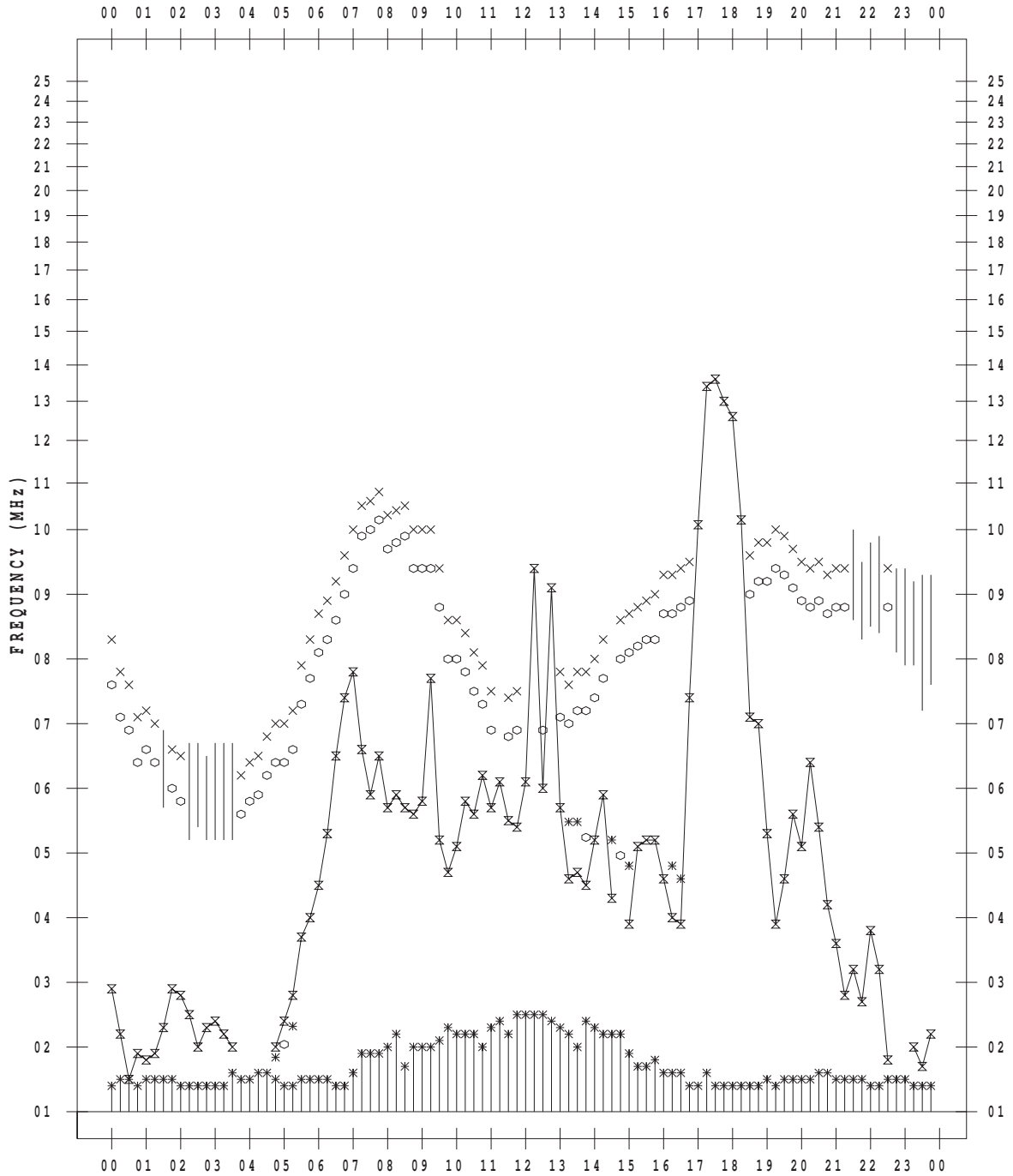
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 9

135 ° E MEAN TIME



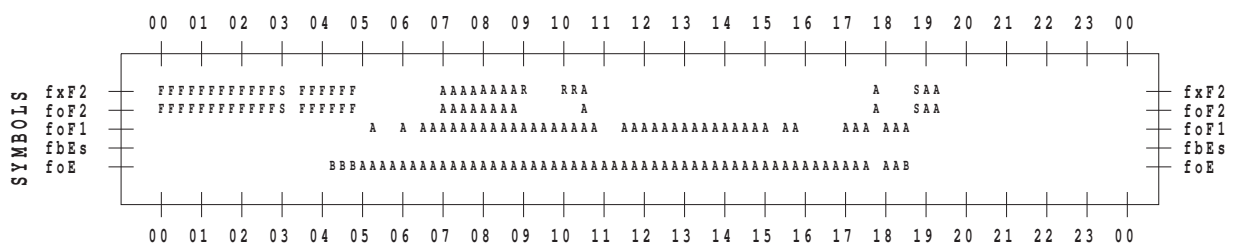
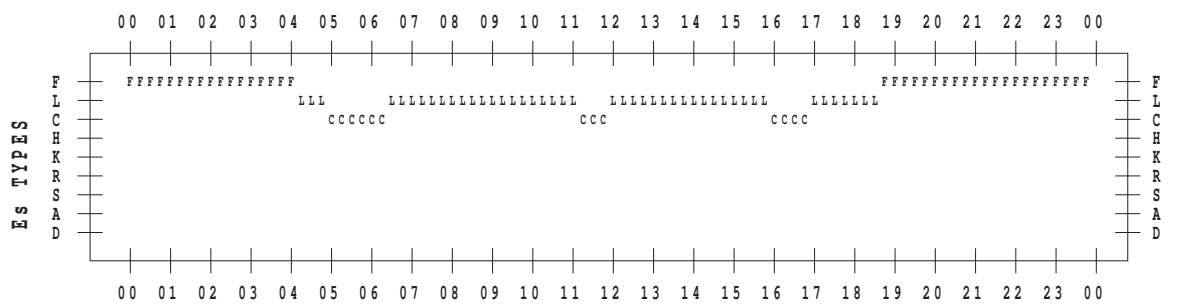
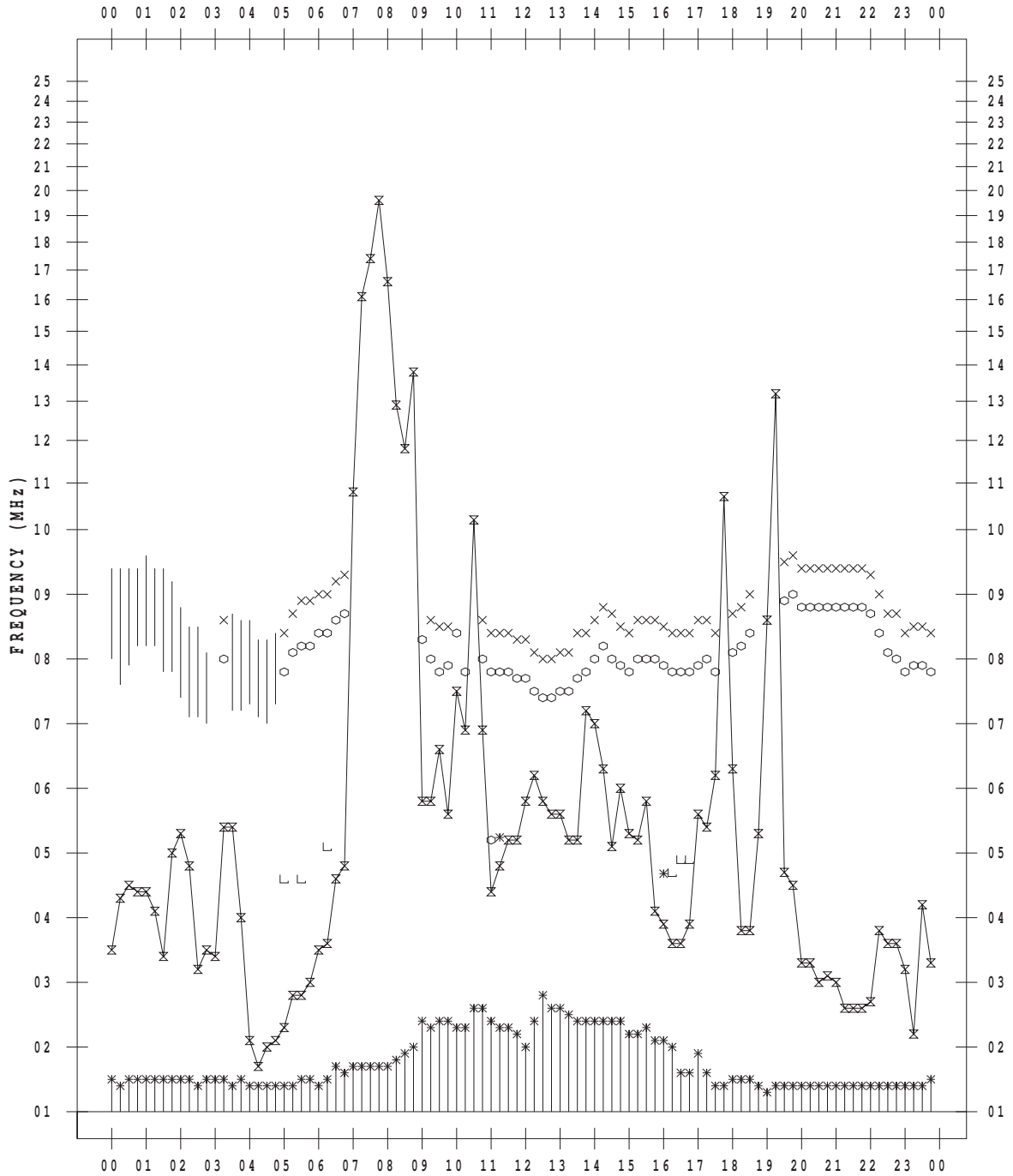
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 10

135 ° E MEAN TIME



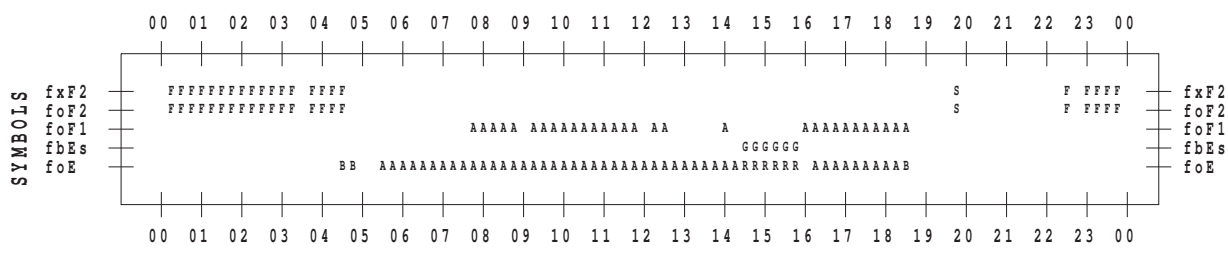
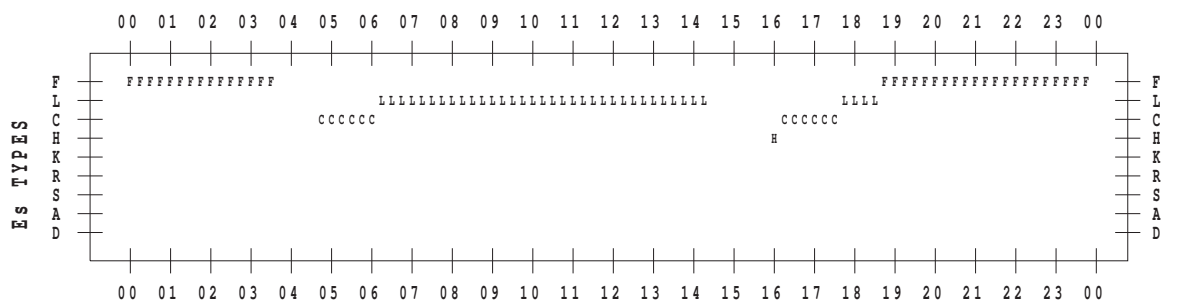
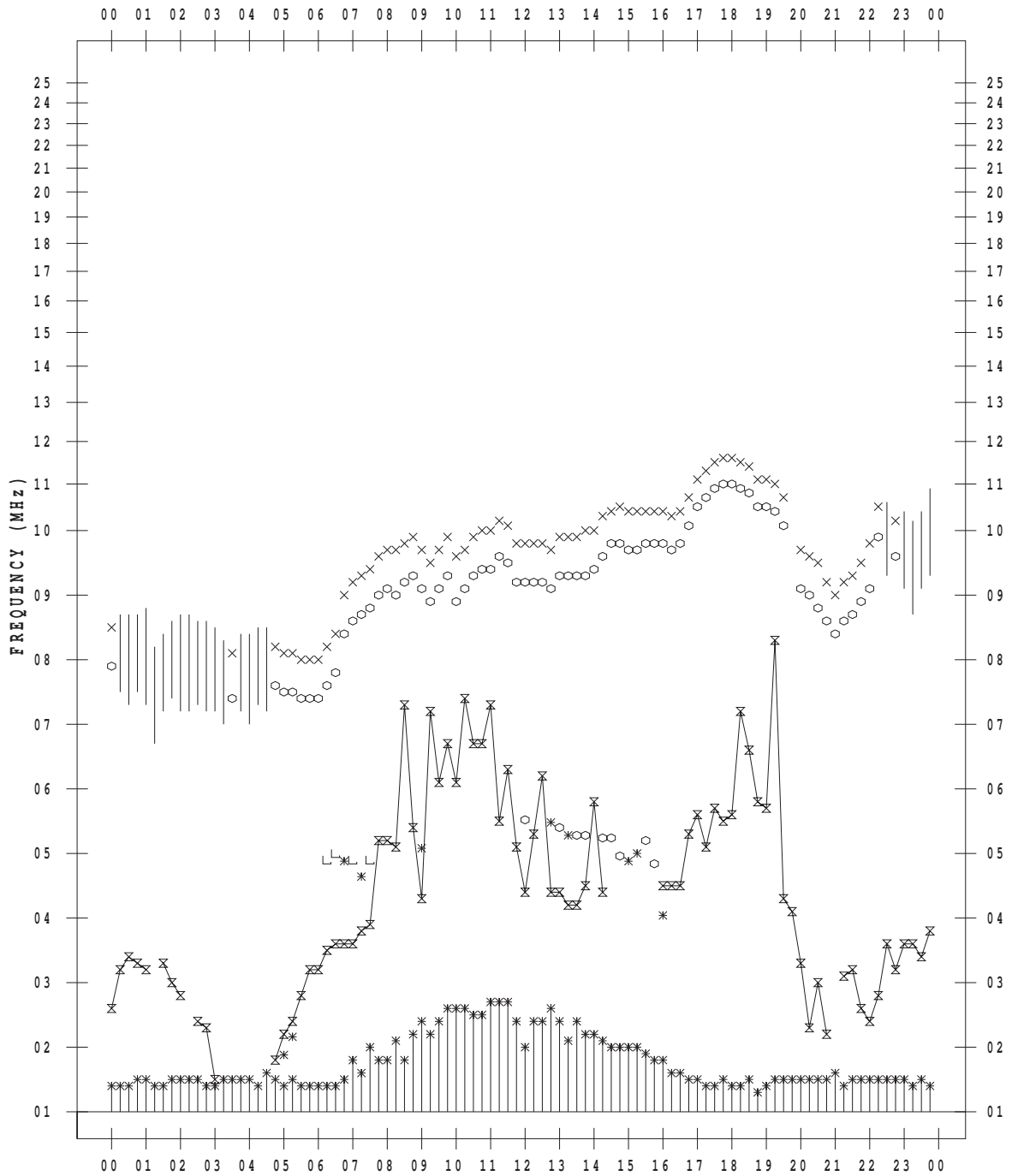
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 11

135 ° E MEAN TIME



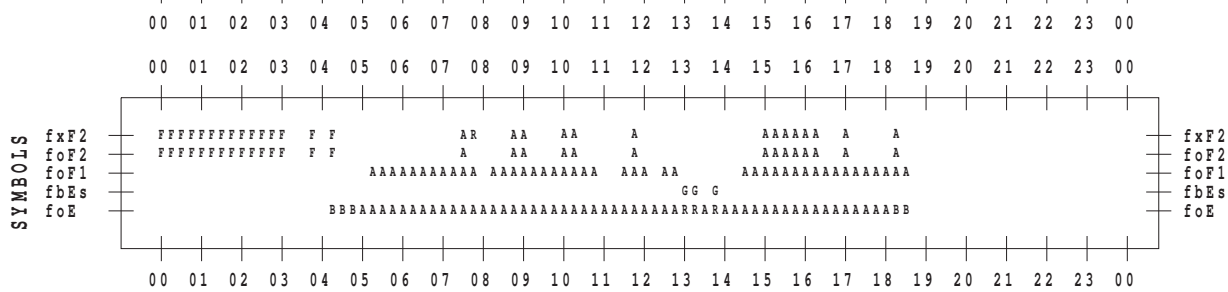
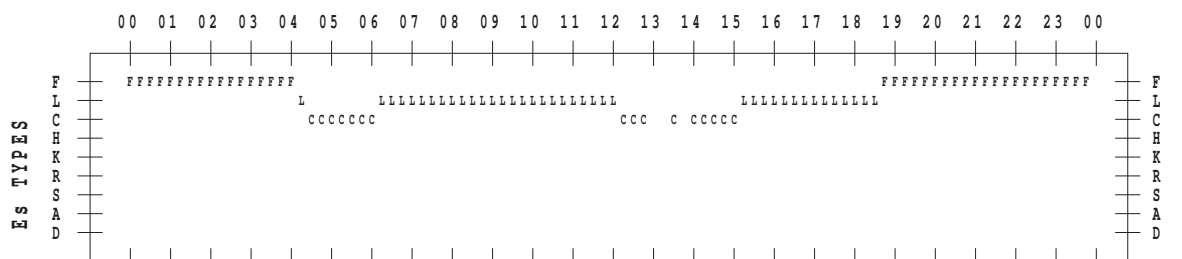
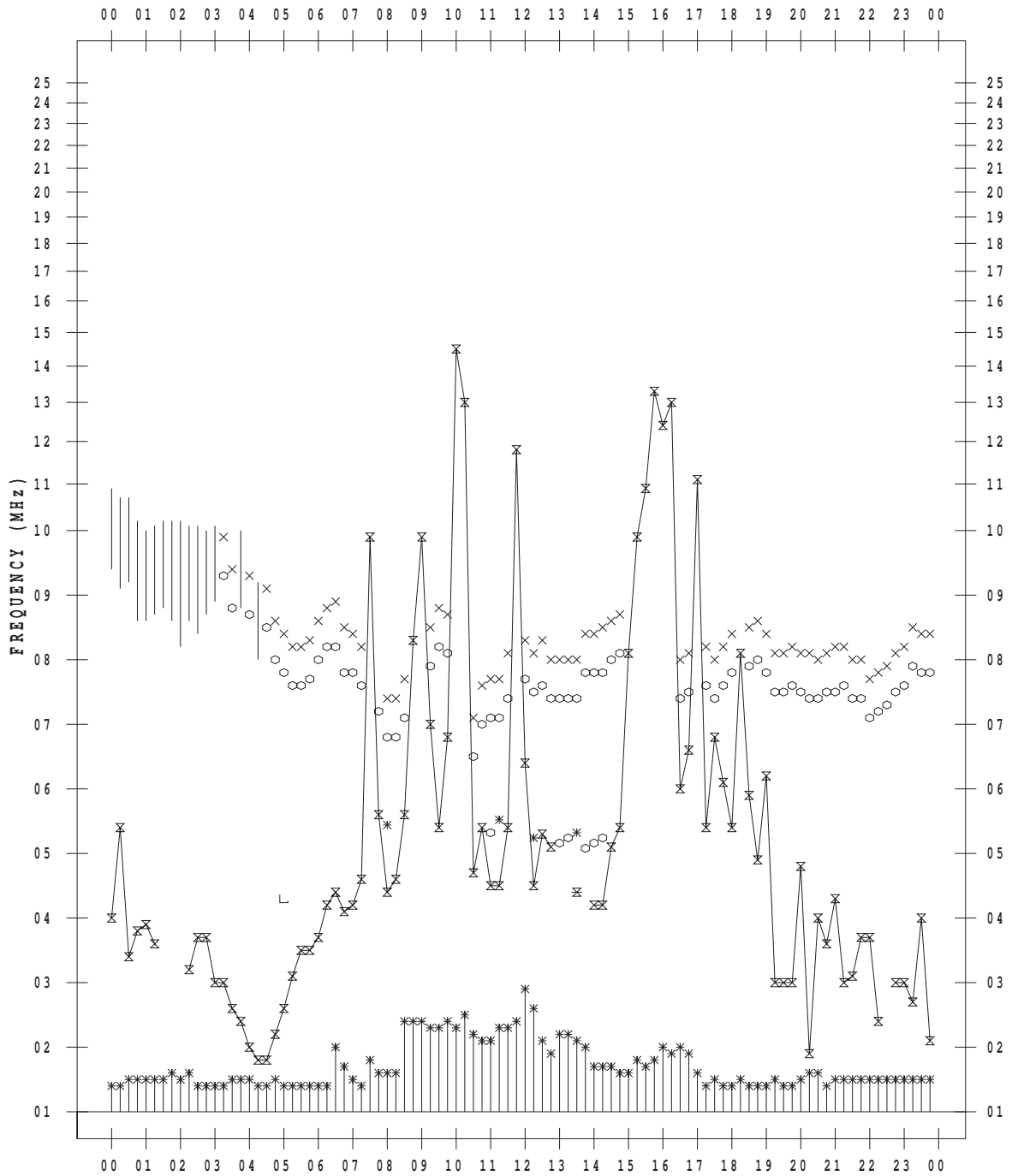
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 12

135 ° E MEAN TIME



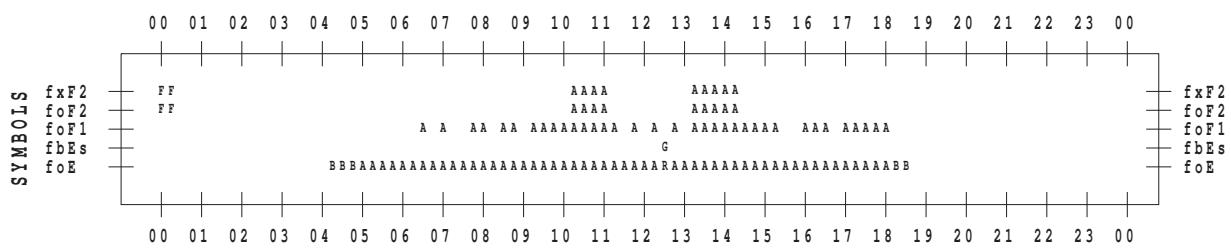
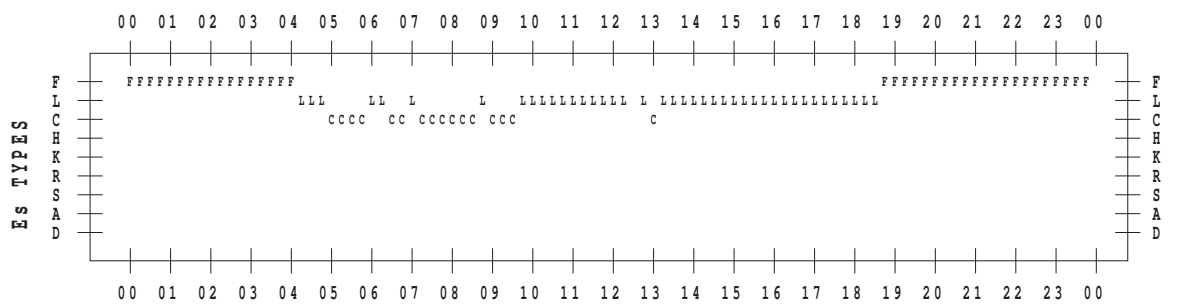
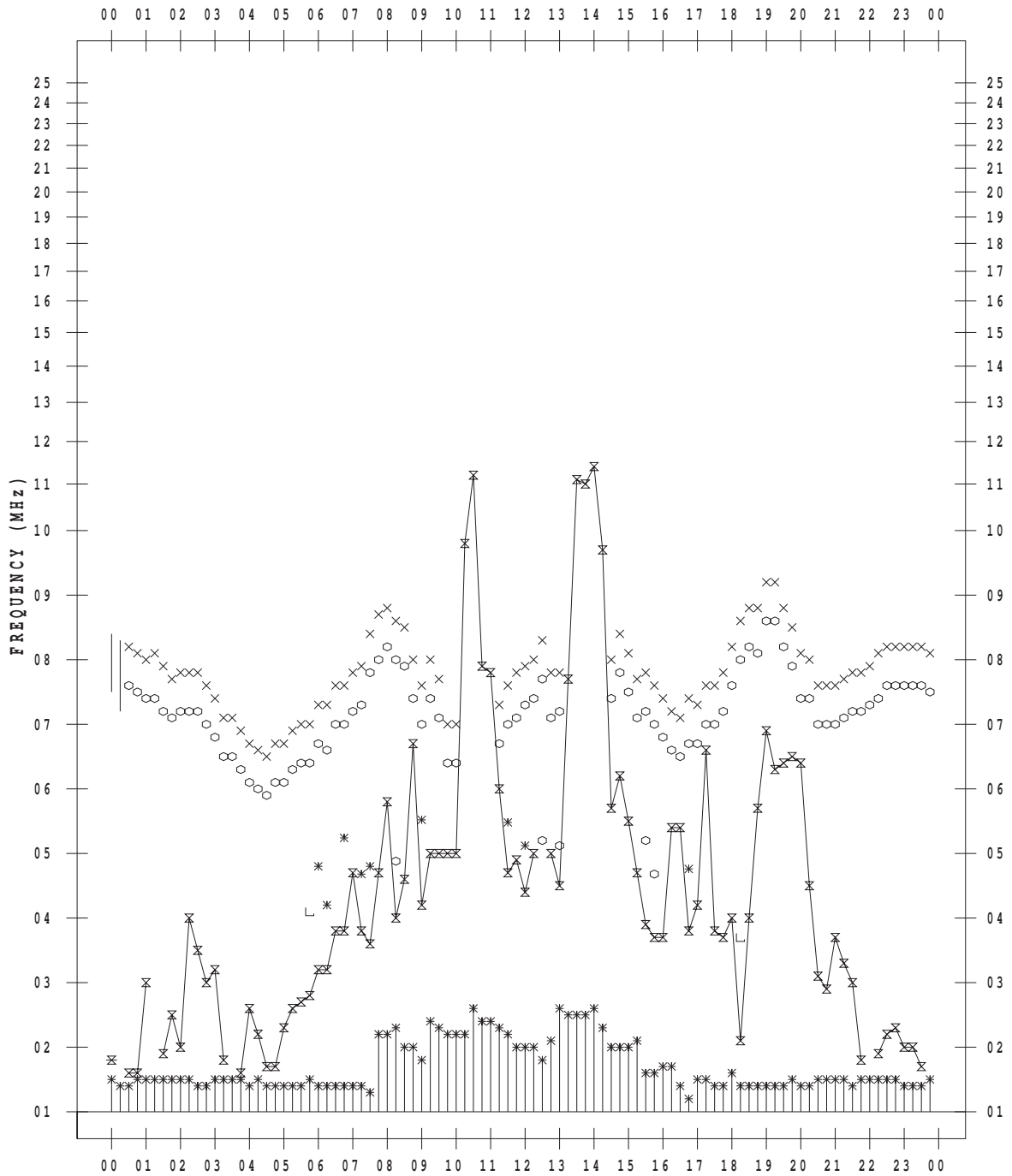
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/ 6/13

135 ° E MEAN TIME



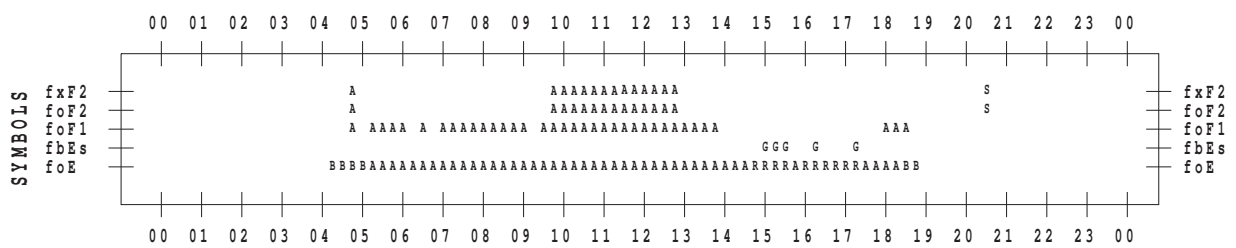
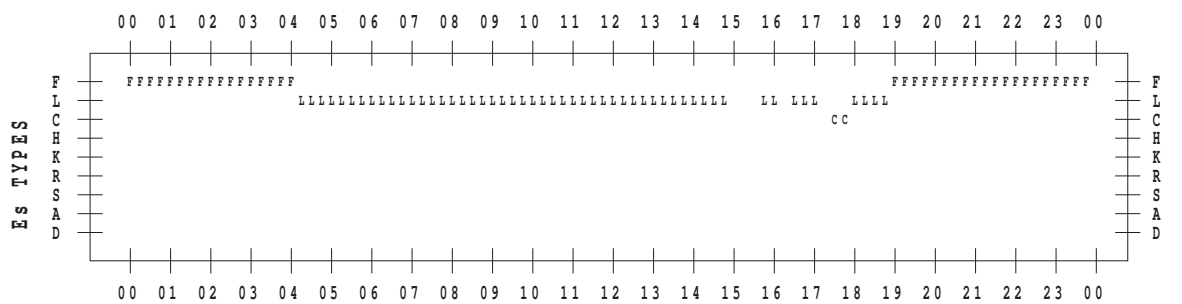
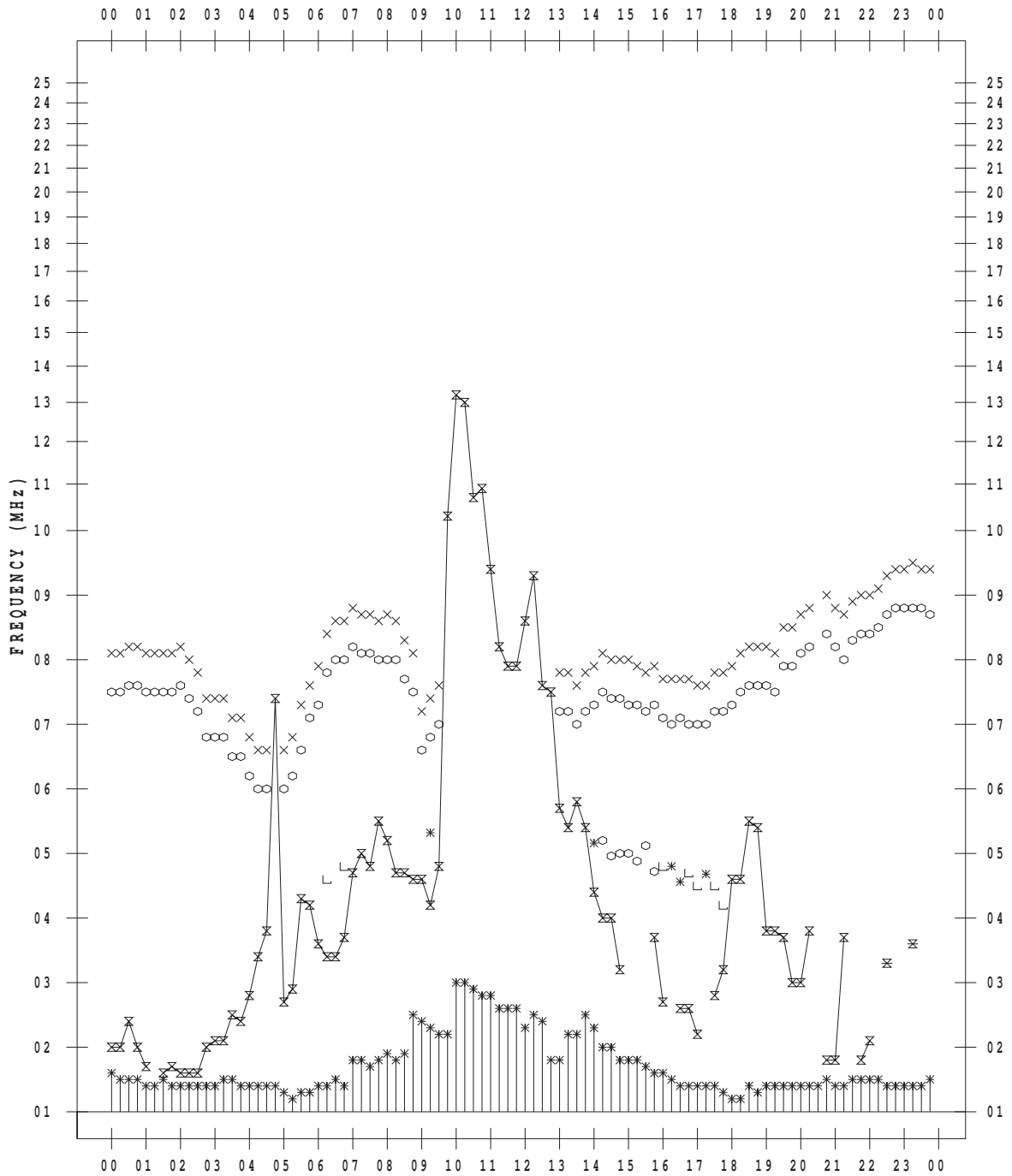
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/ 6/14

135 ° E MEAN TIME



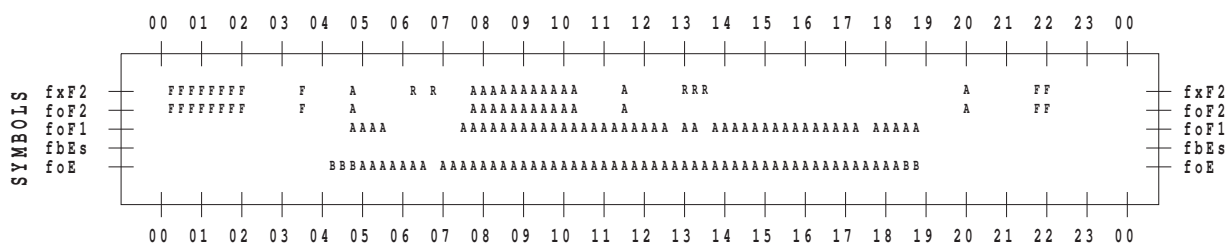
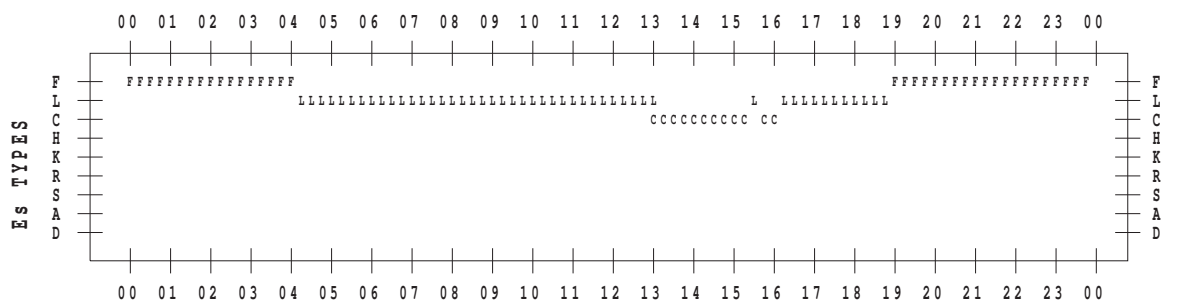
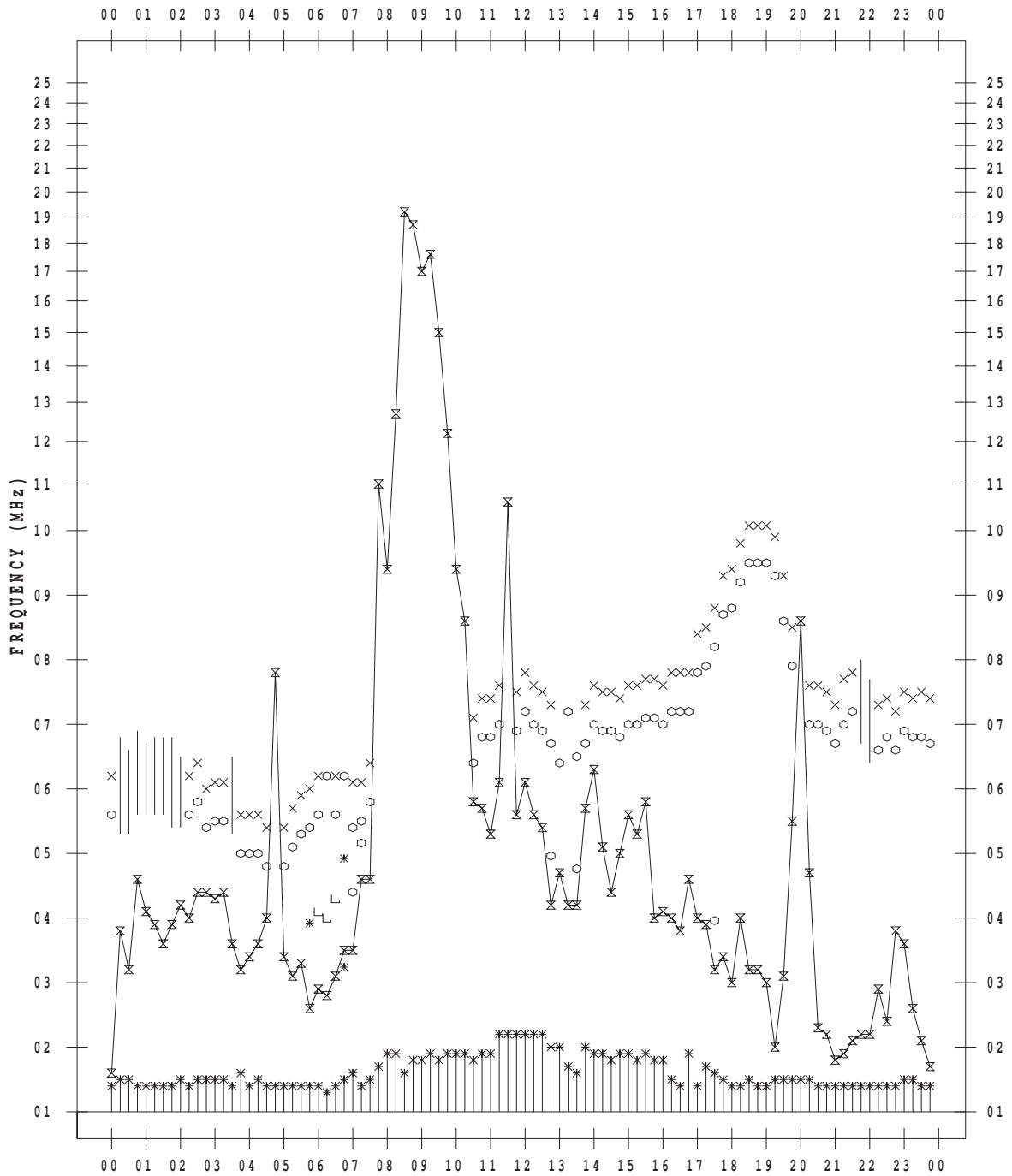
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/ 6/19

135 ° E MEAN TIME



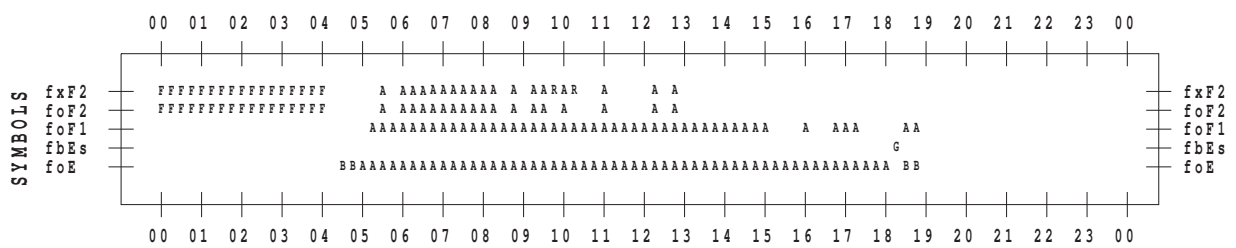
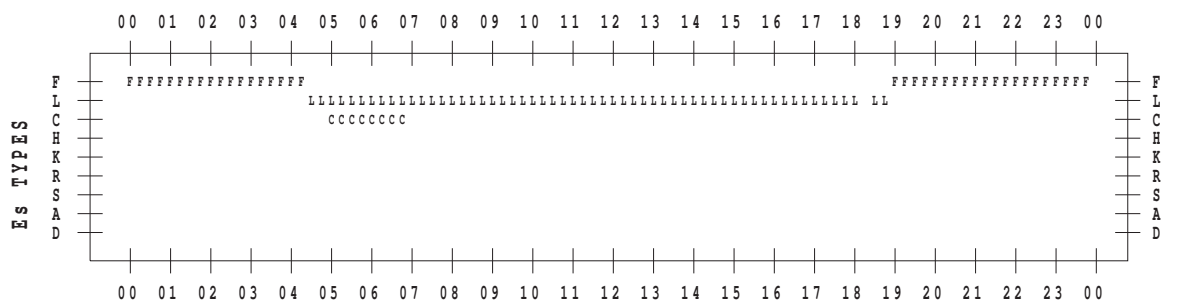
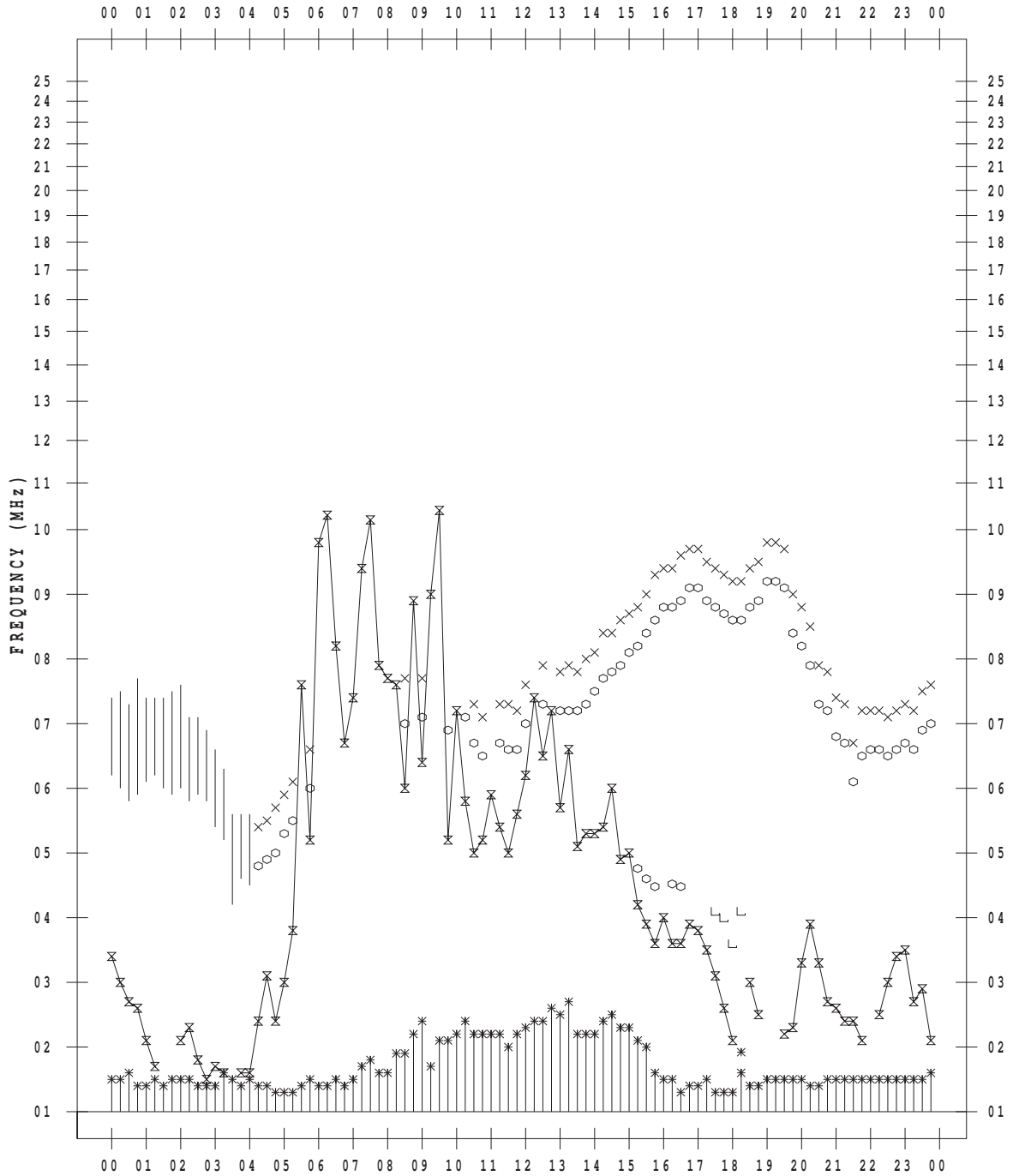
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 20

135 ° E MEAN TIME



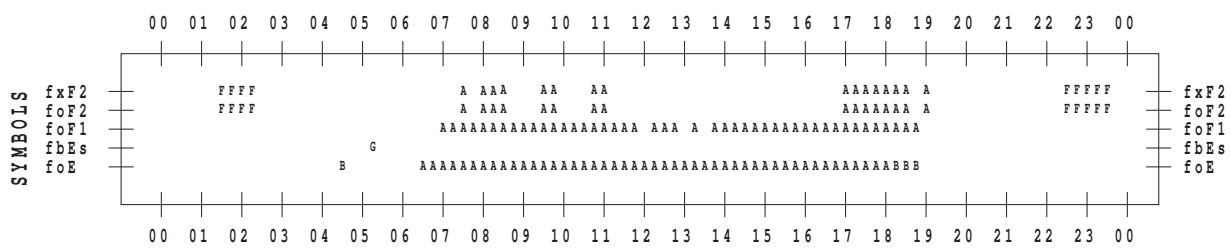
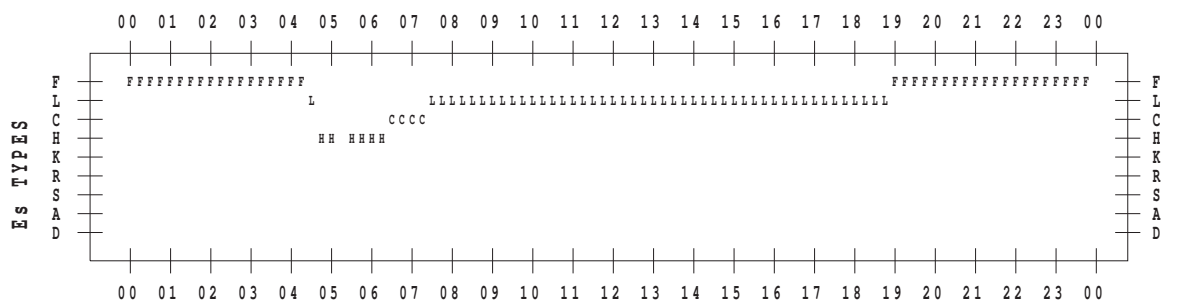
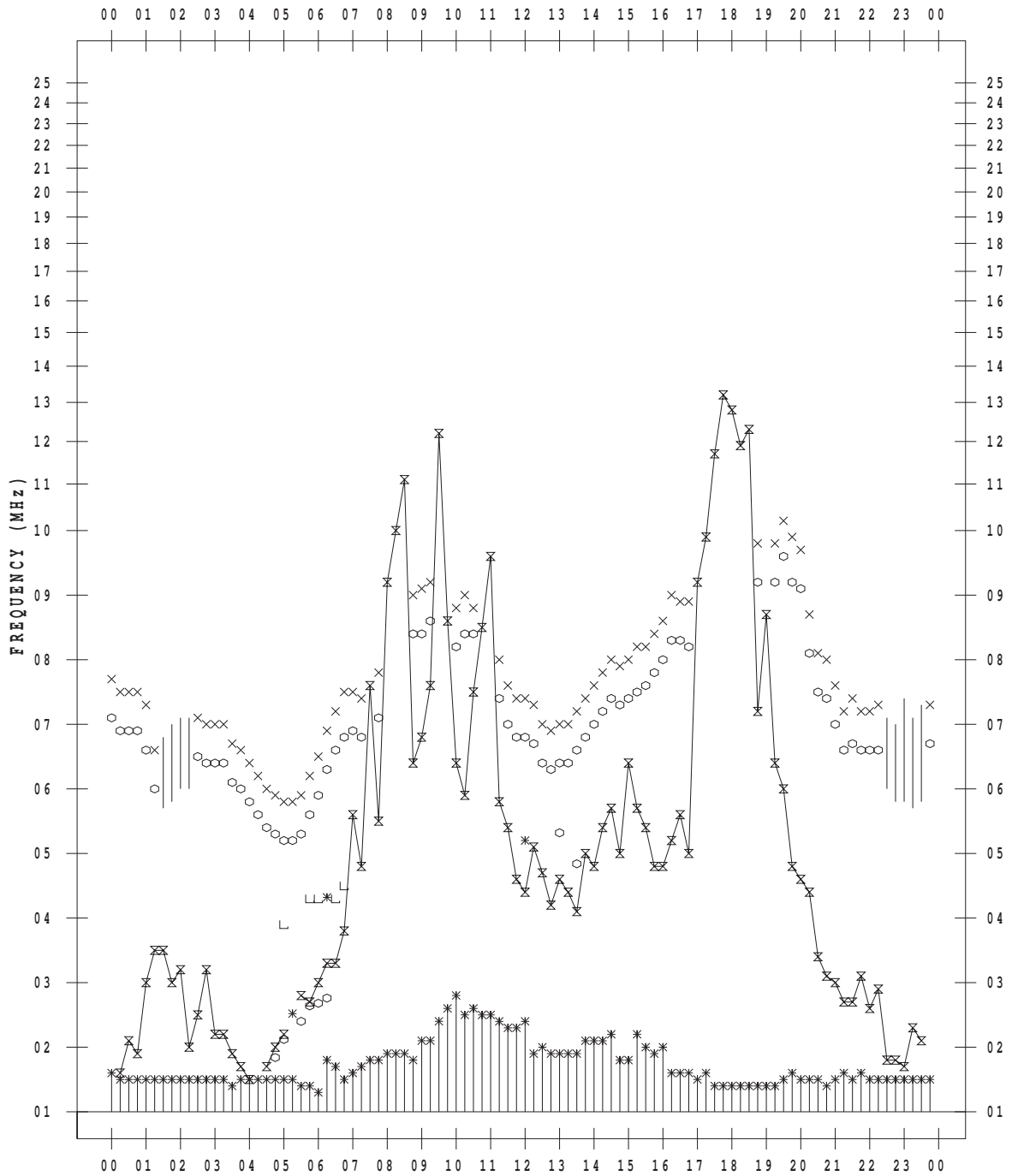
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 21

135 ° E MEAN TIME



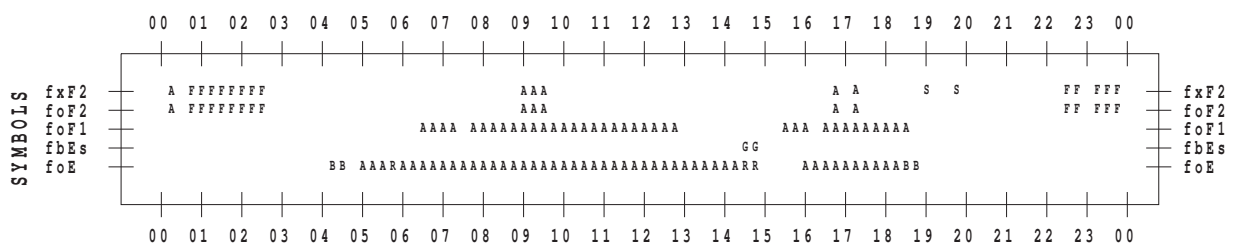
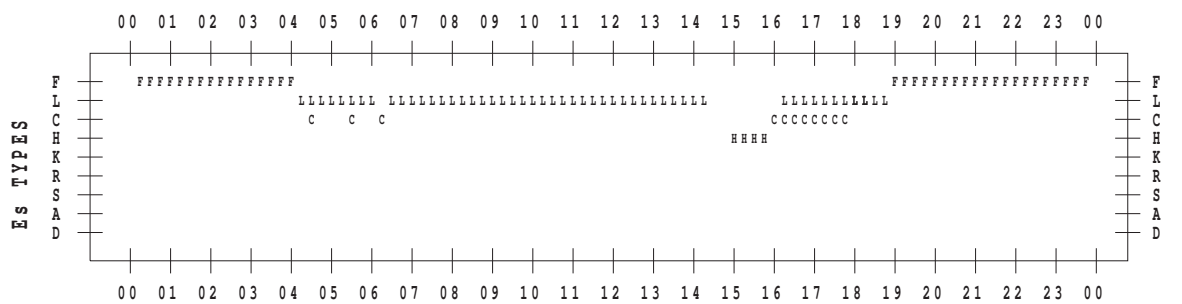
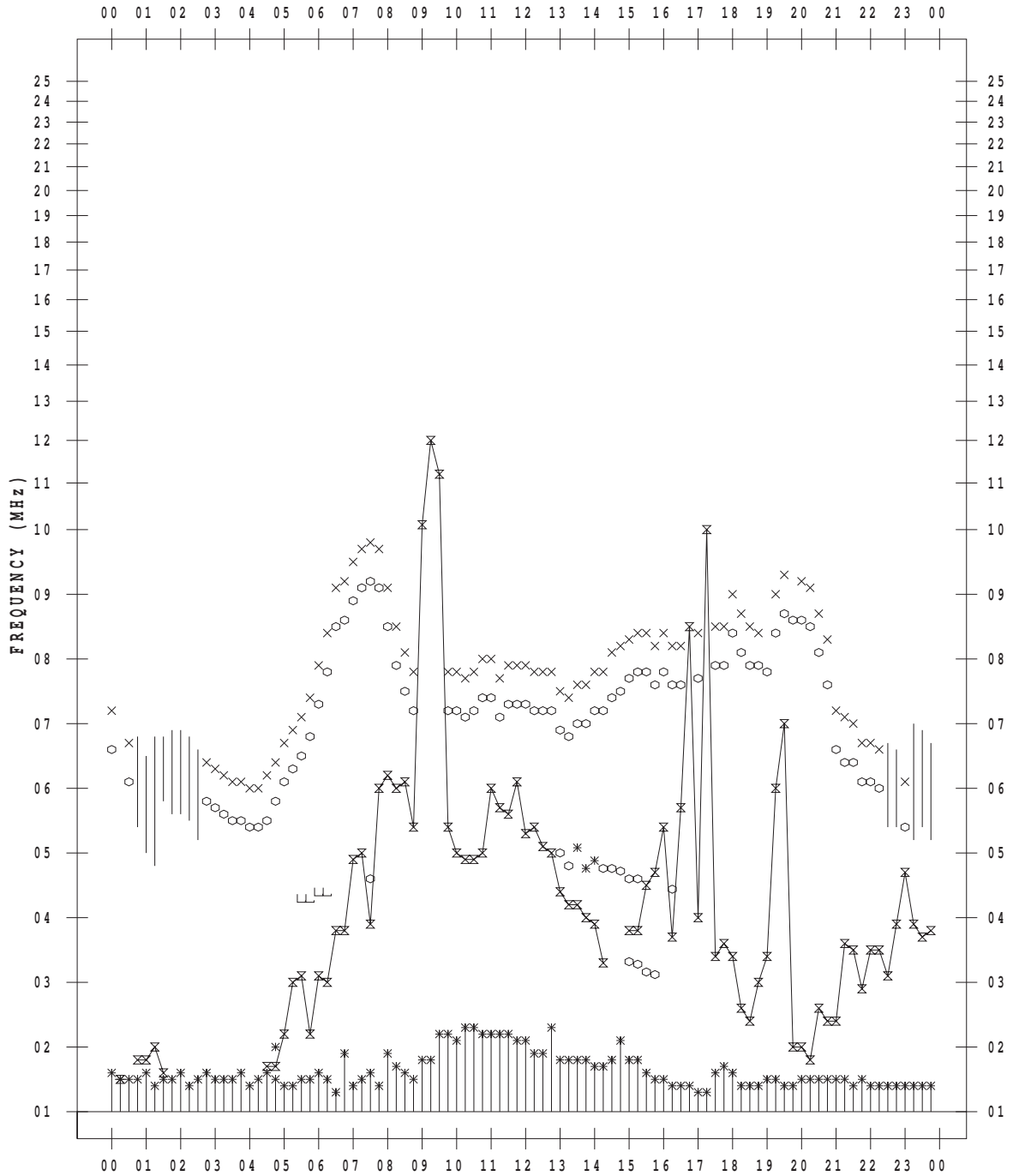
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 22

135 ° E MEAN TIME



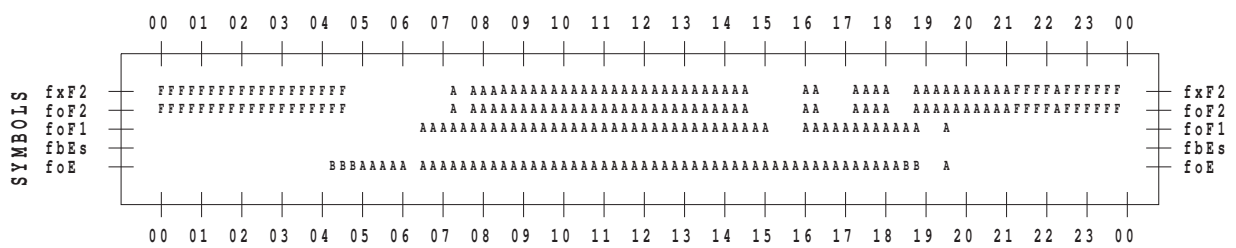
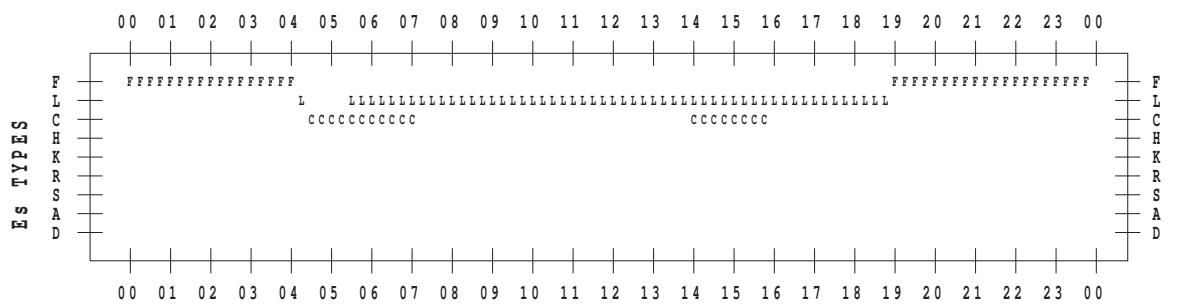
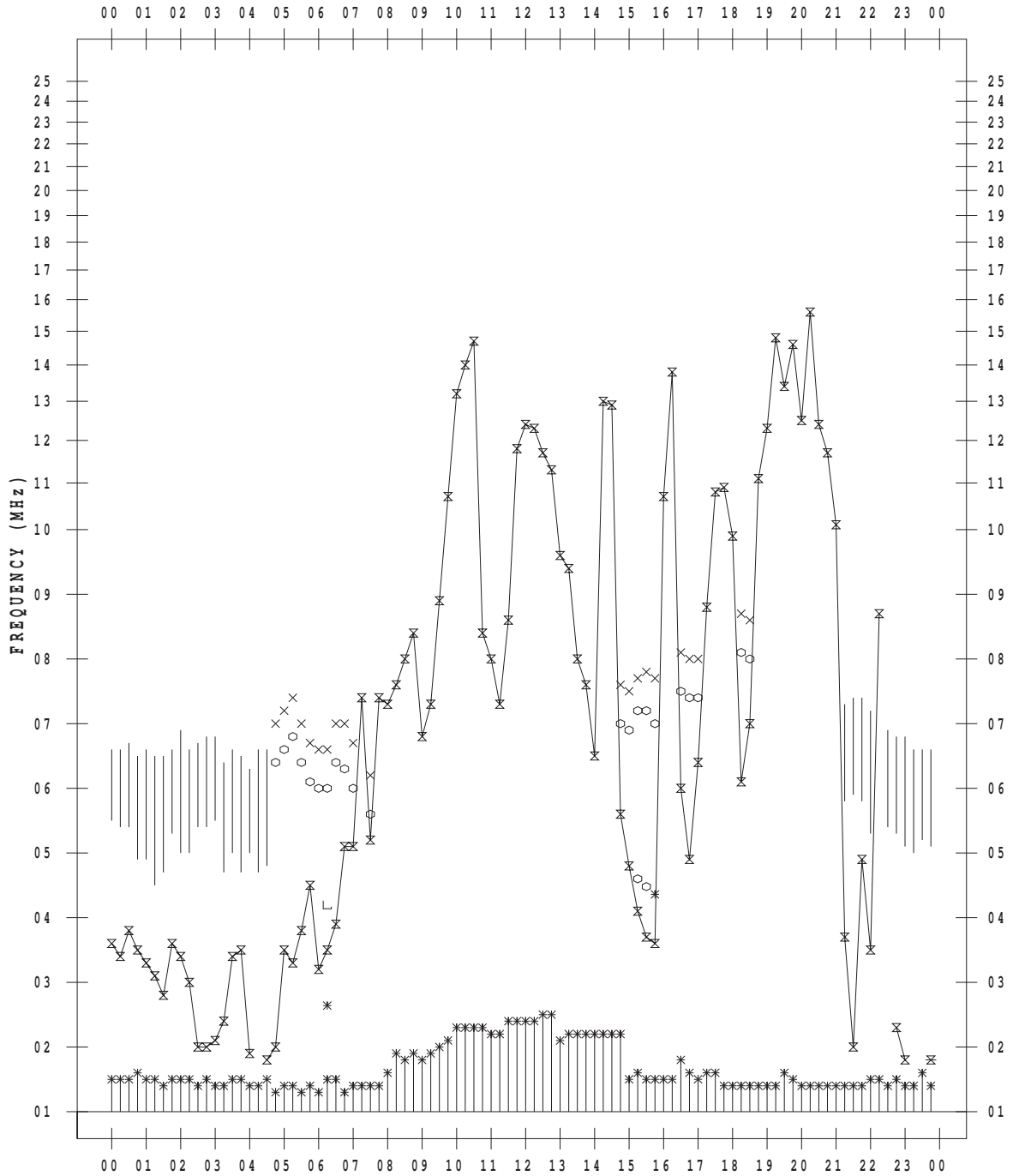
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 23

135 ° E MEAN TIME



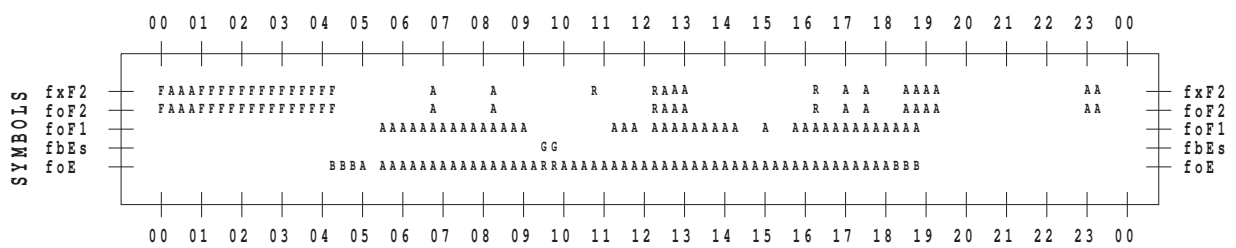
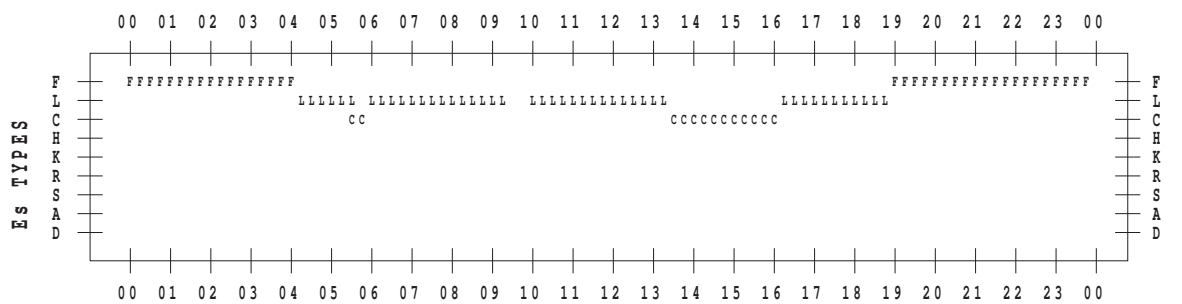
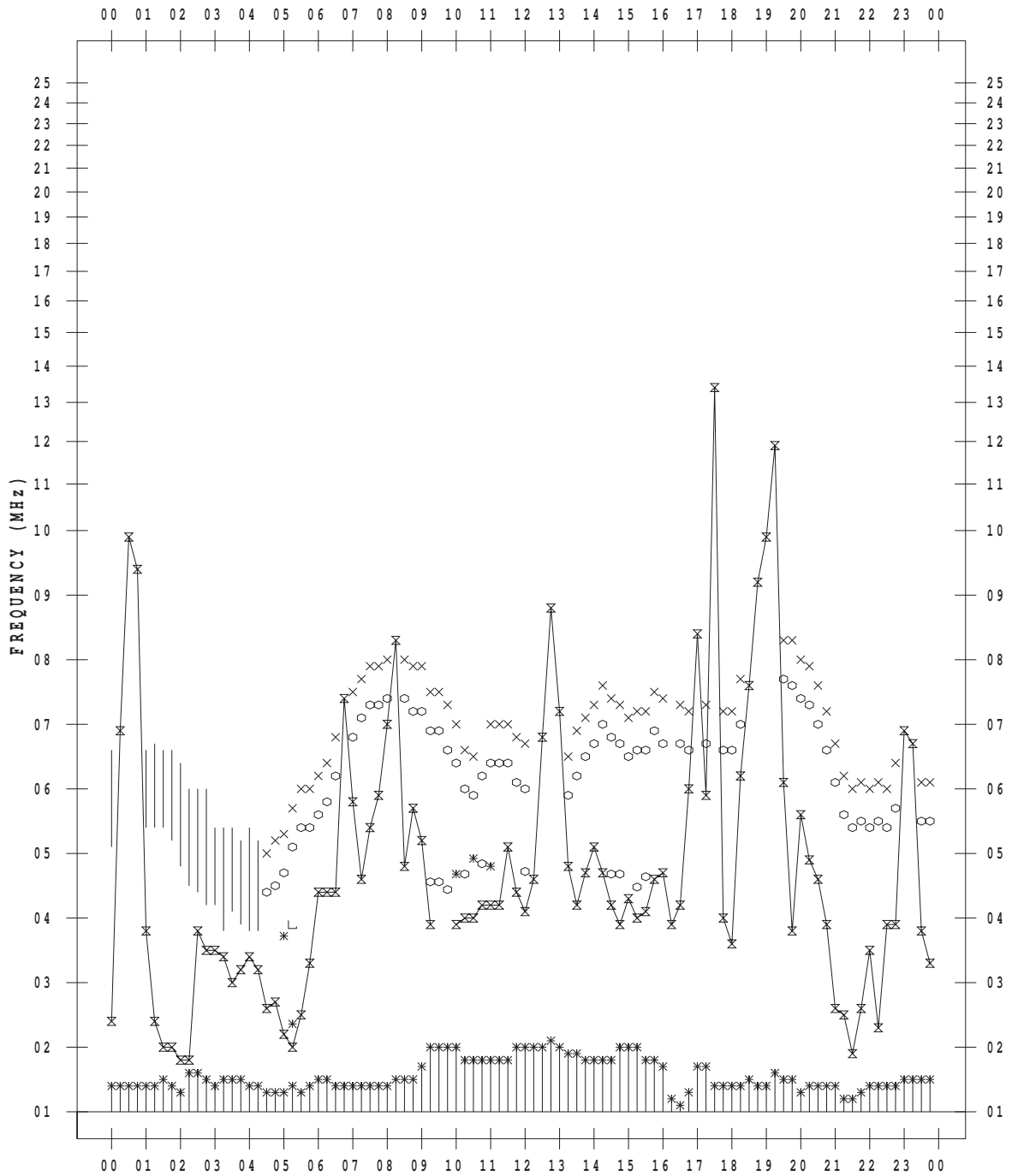
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/ 6/24

135 ° E MEAN TIME



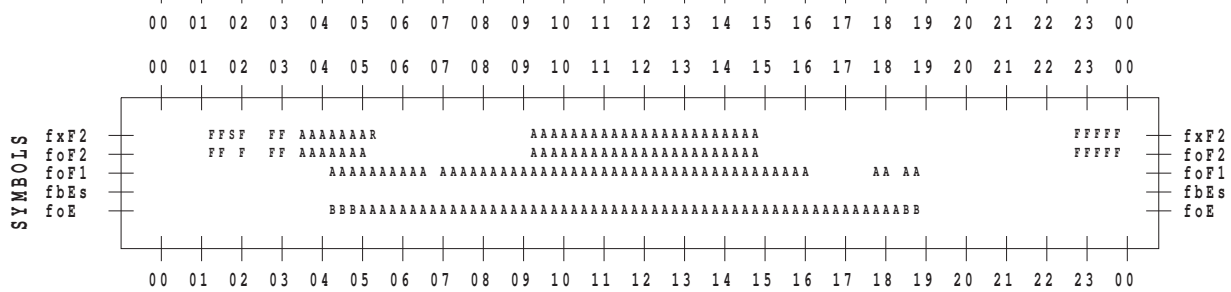
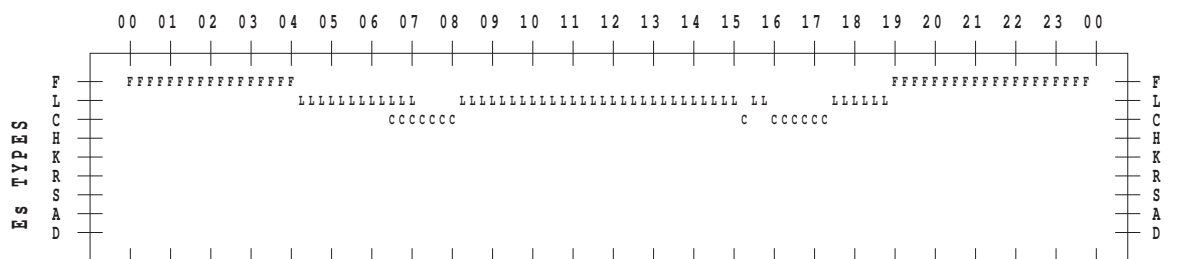
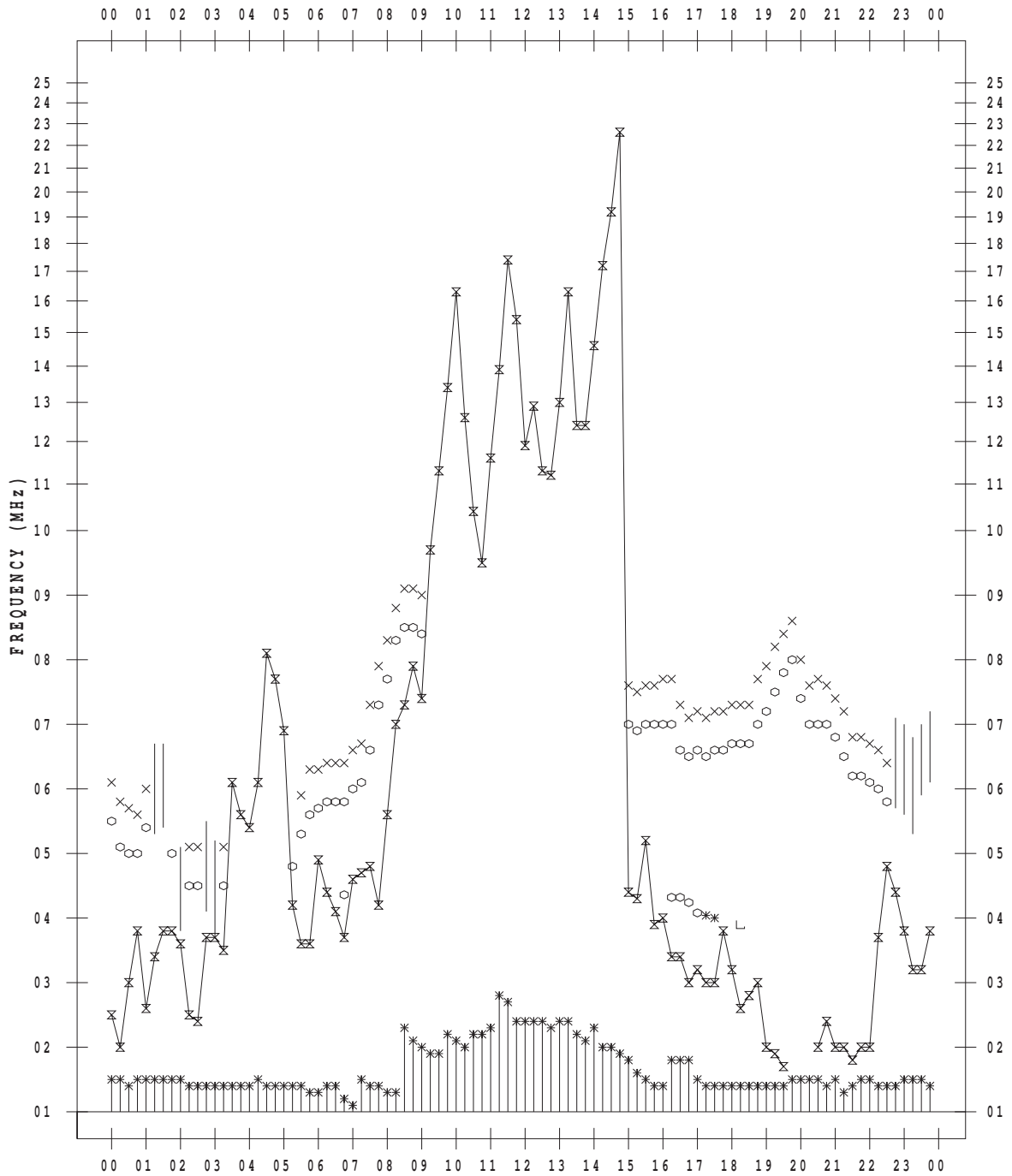
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 25

135 ° E MEAN TIME



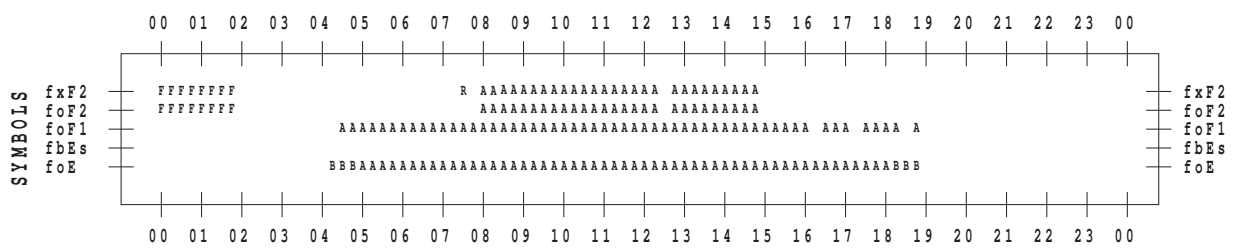
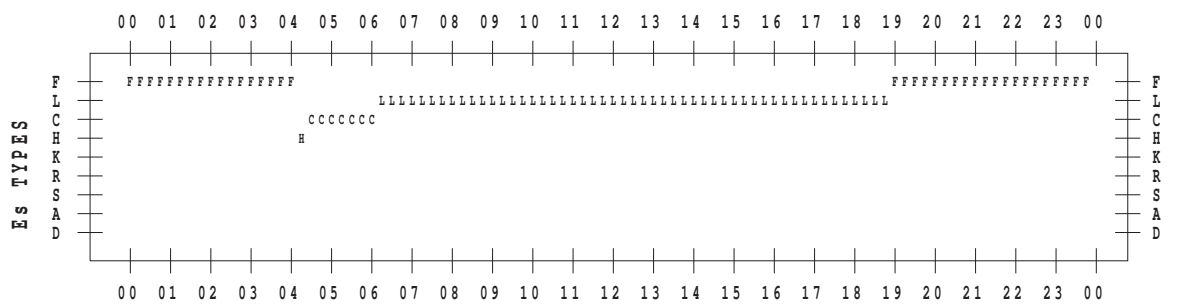
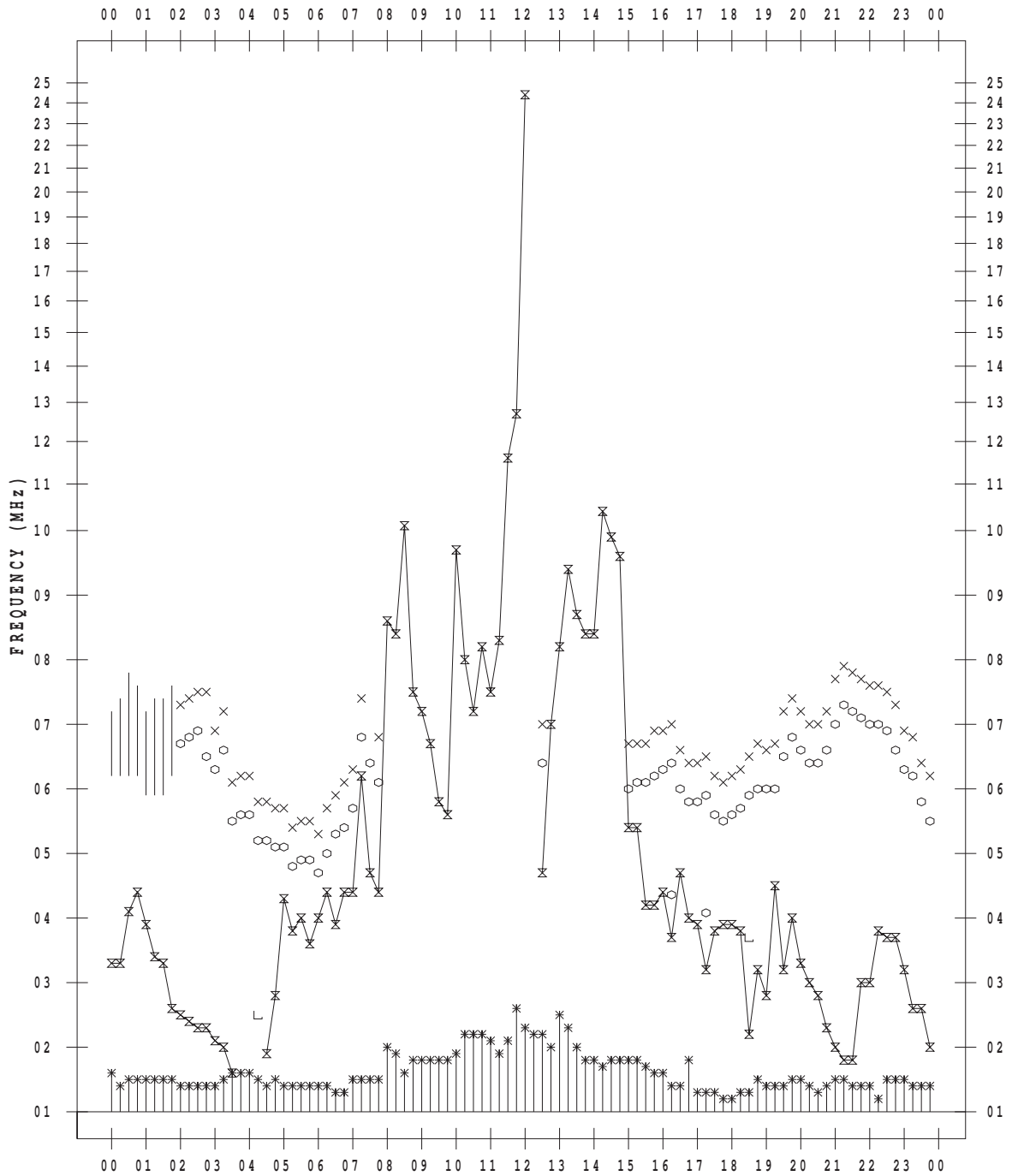
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 26

135 ° E MEAN TIME



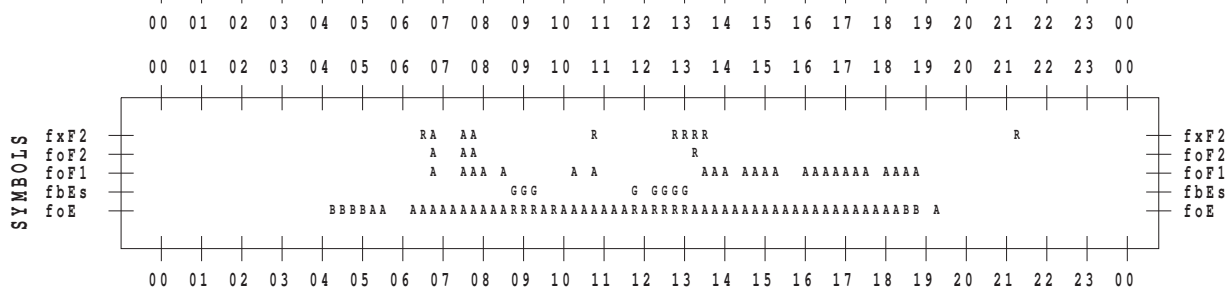
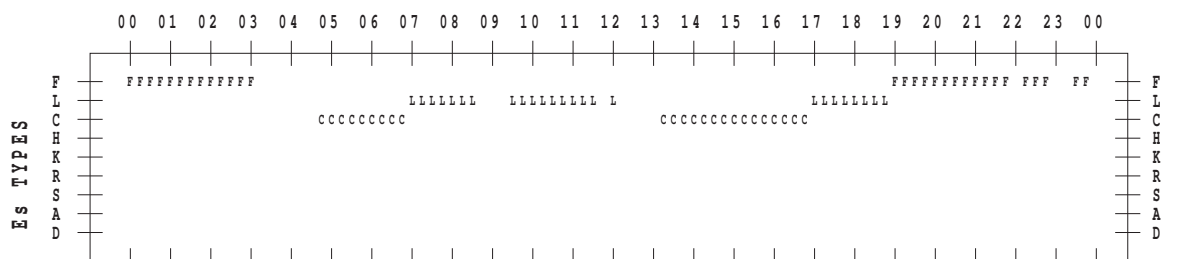
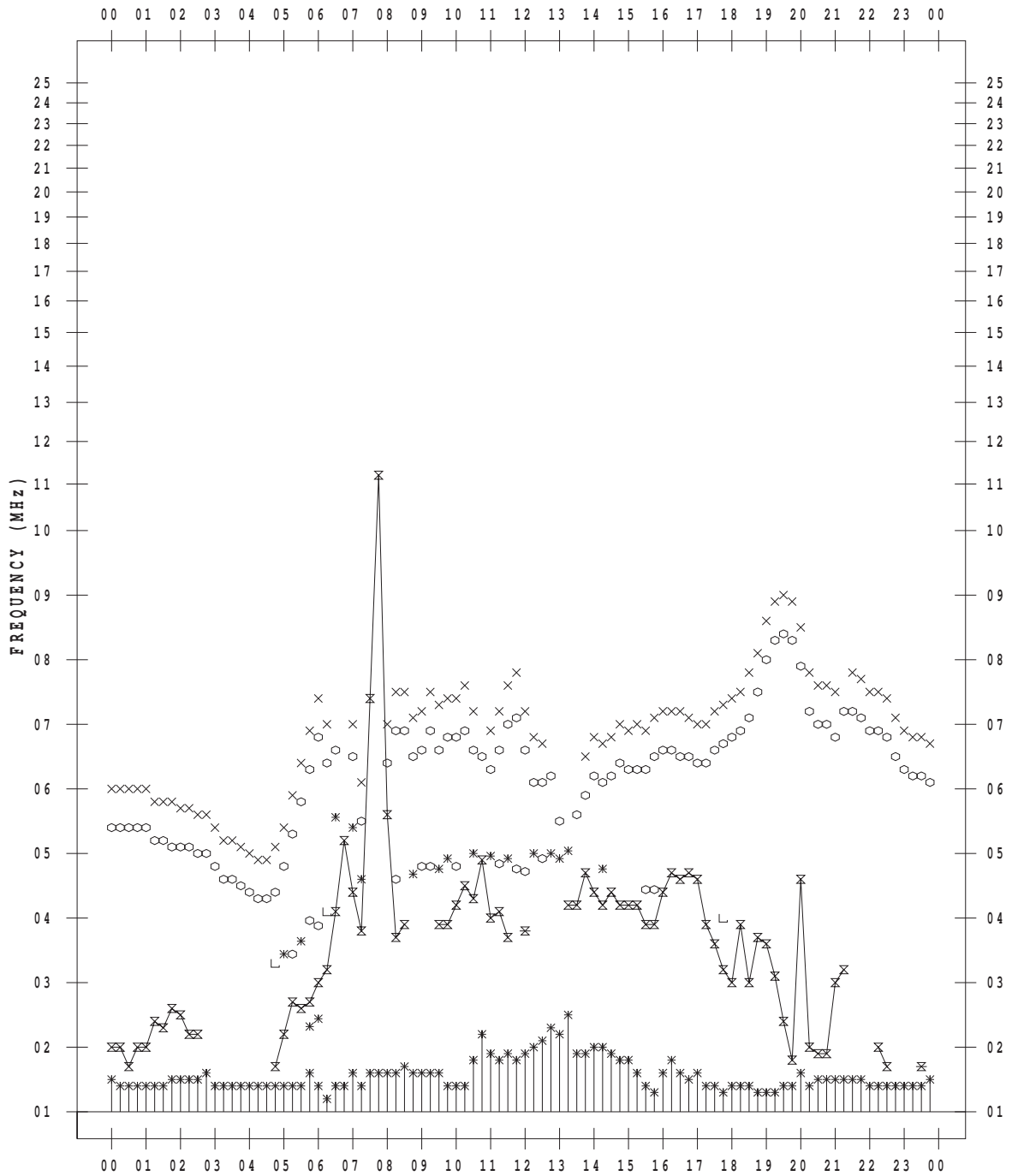
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 27

135 ° E MEAN TIME



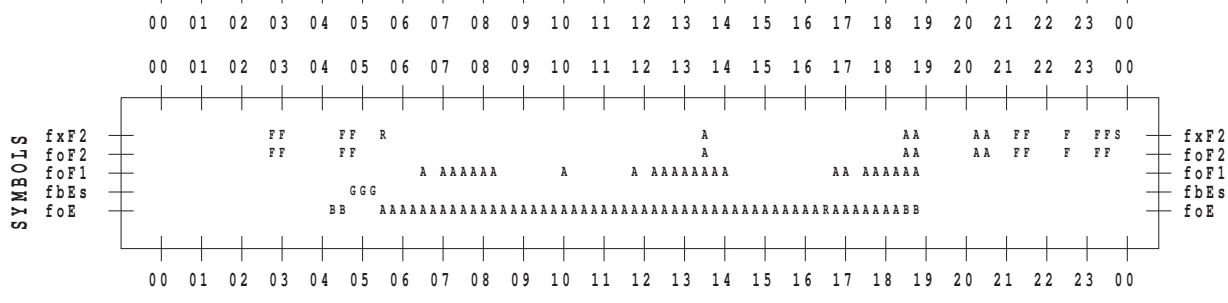
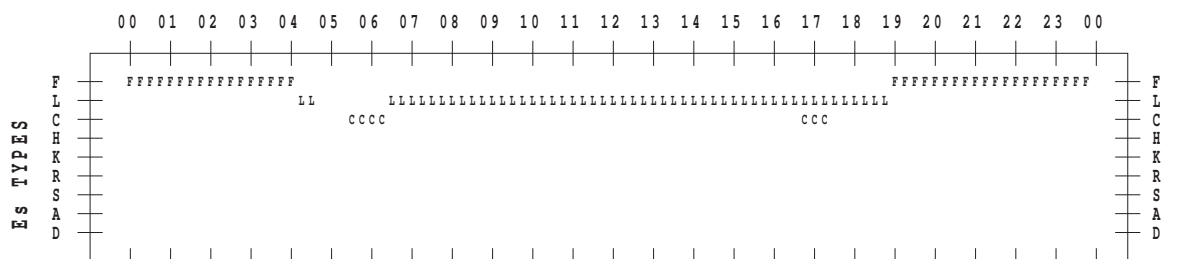
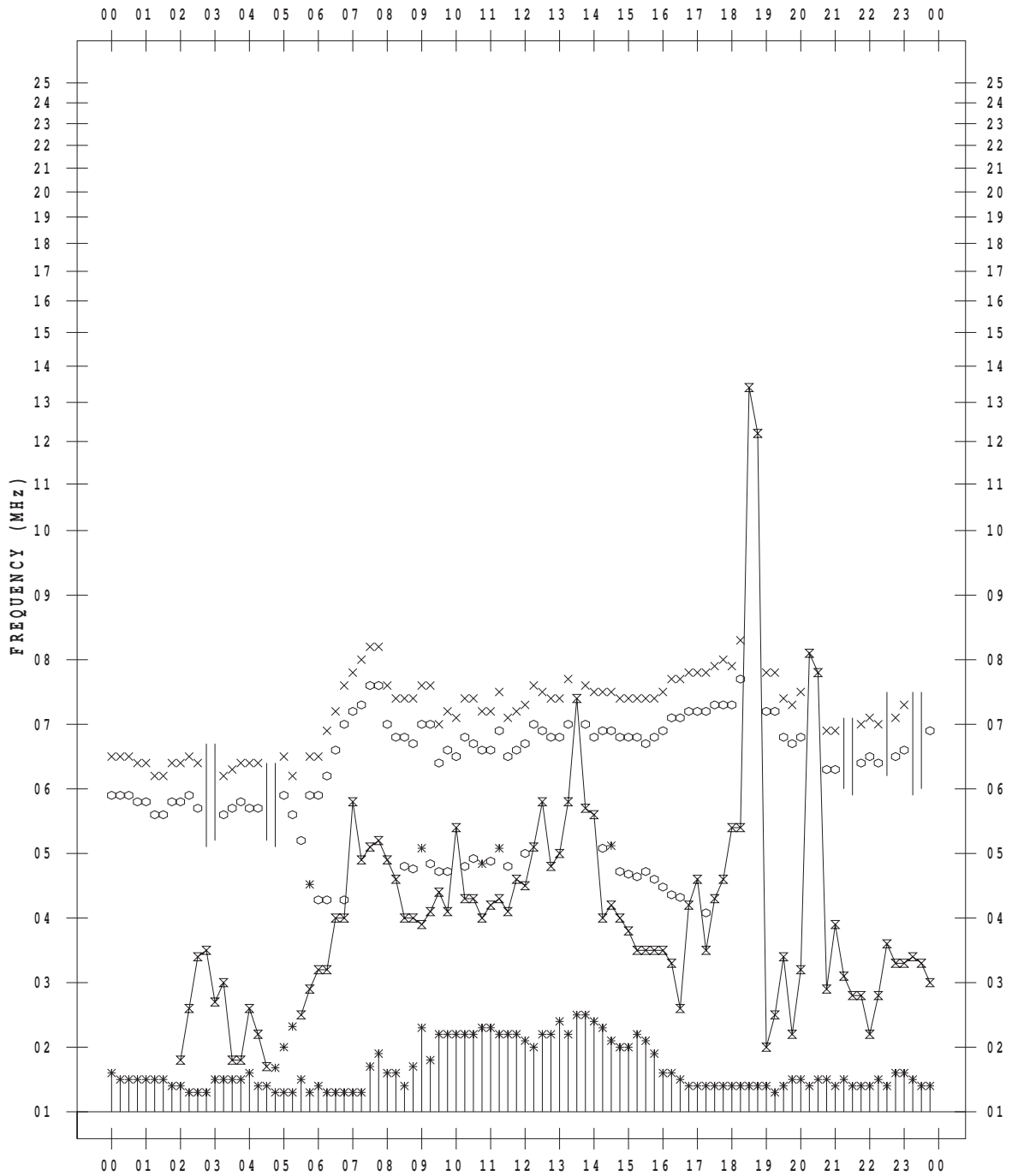
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 28

135 ° E MEAN TIME



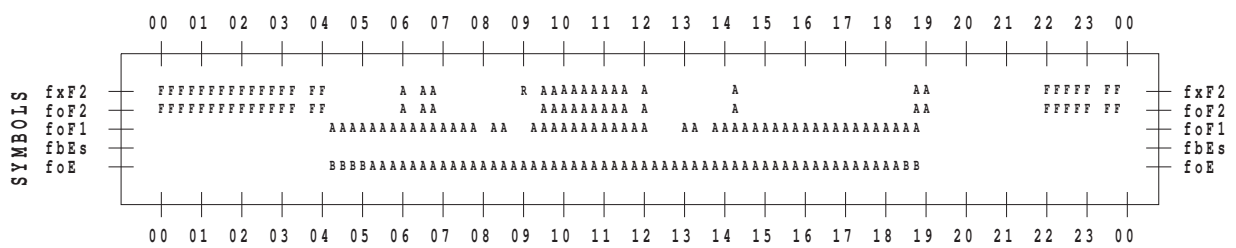
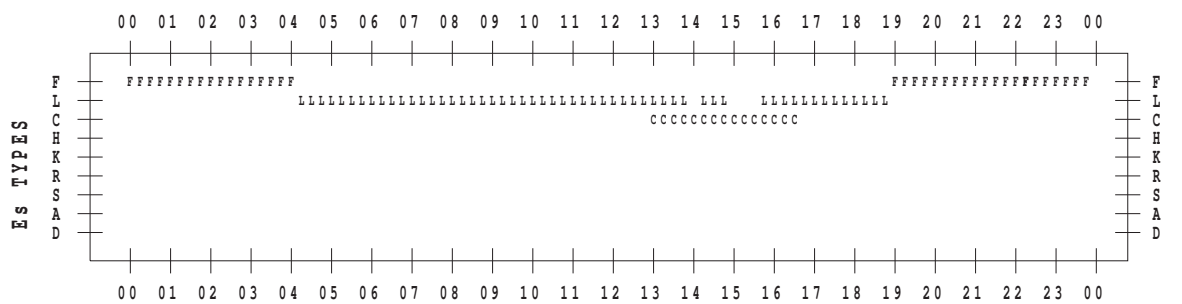
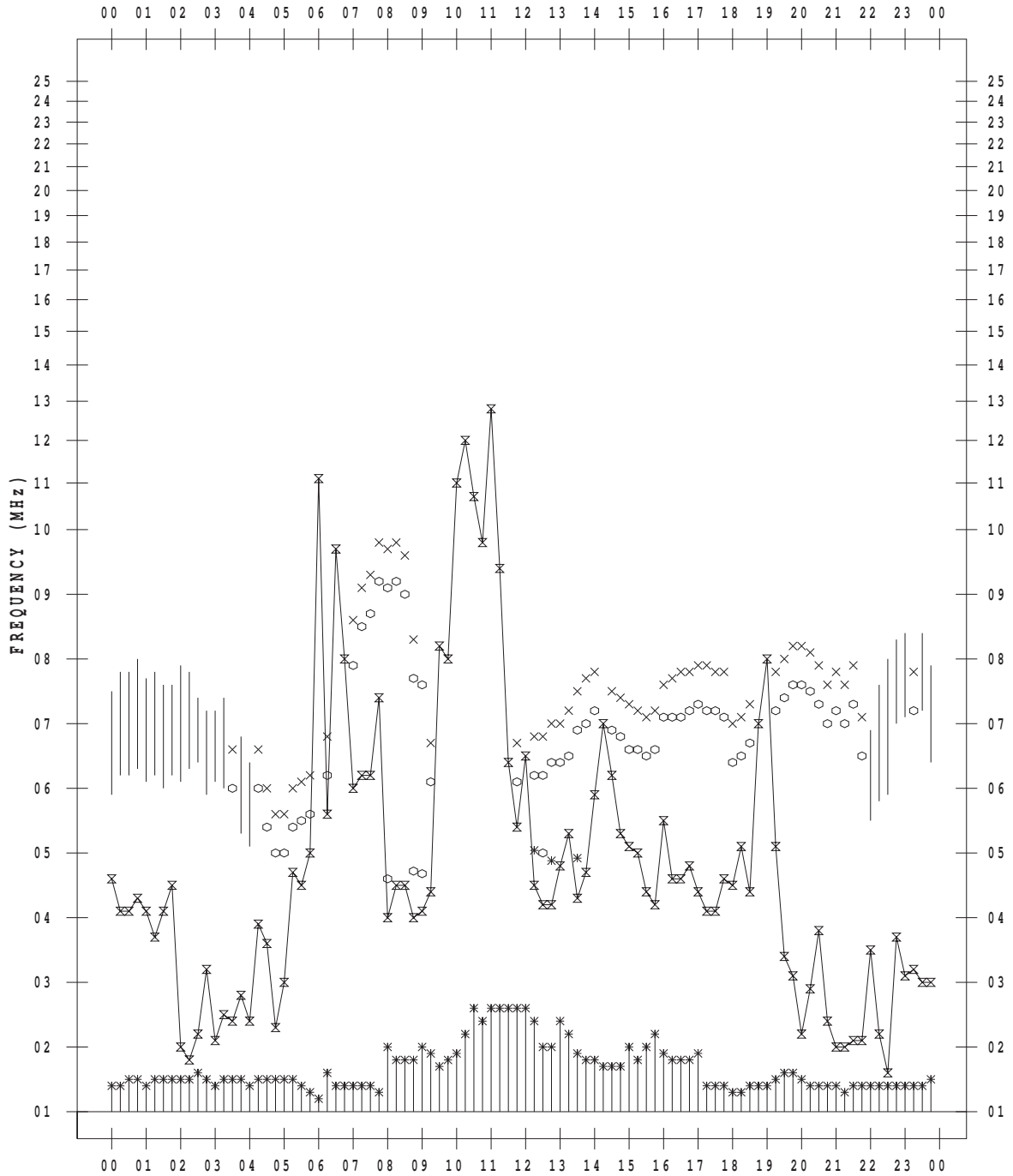
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 29

135 ° E MEAN TIME



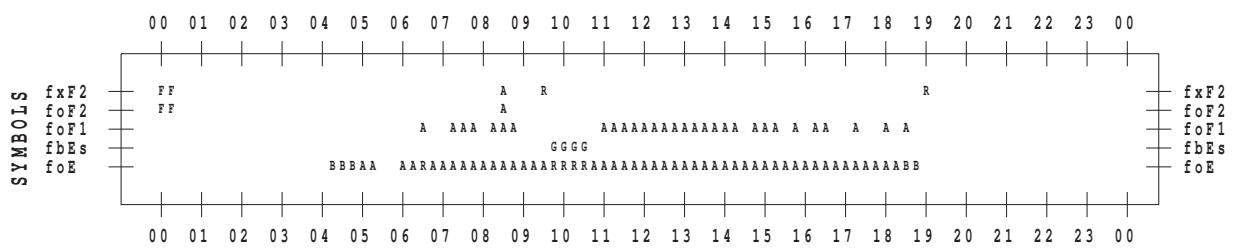
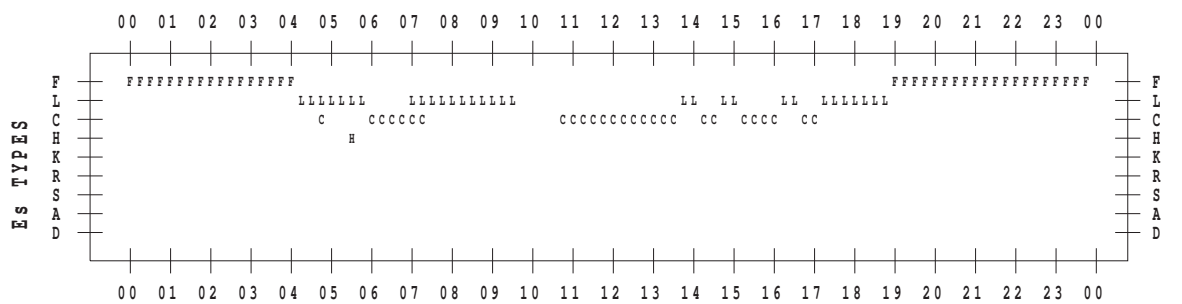
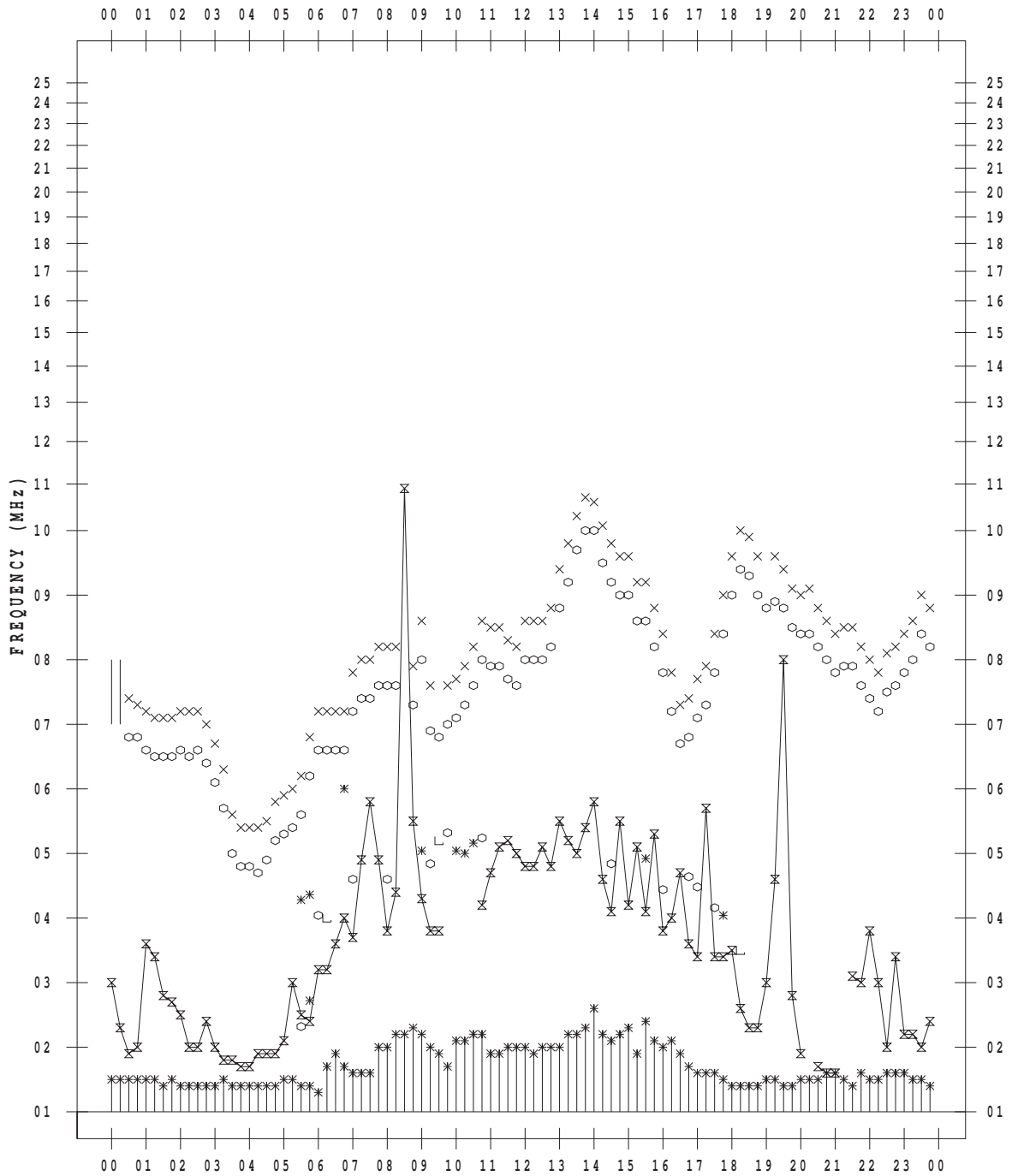
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012 / 6 / 30

135 ° E MEAN TIME



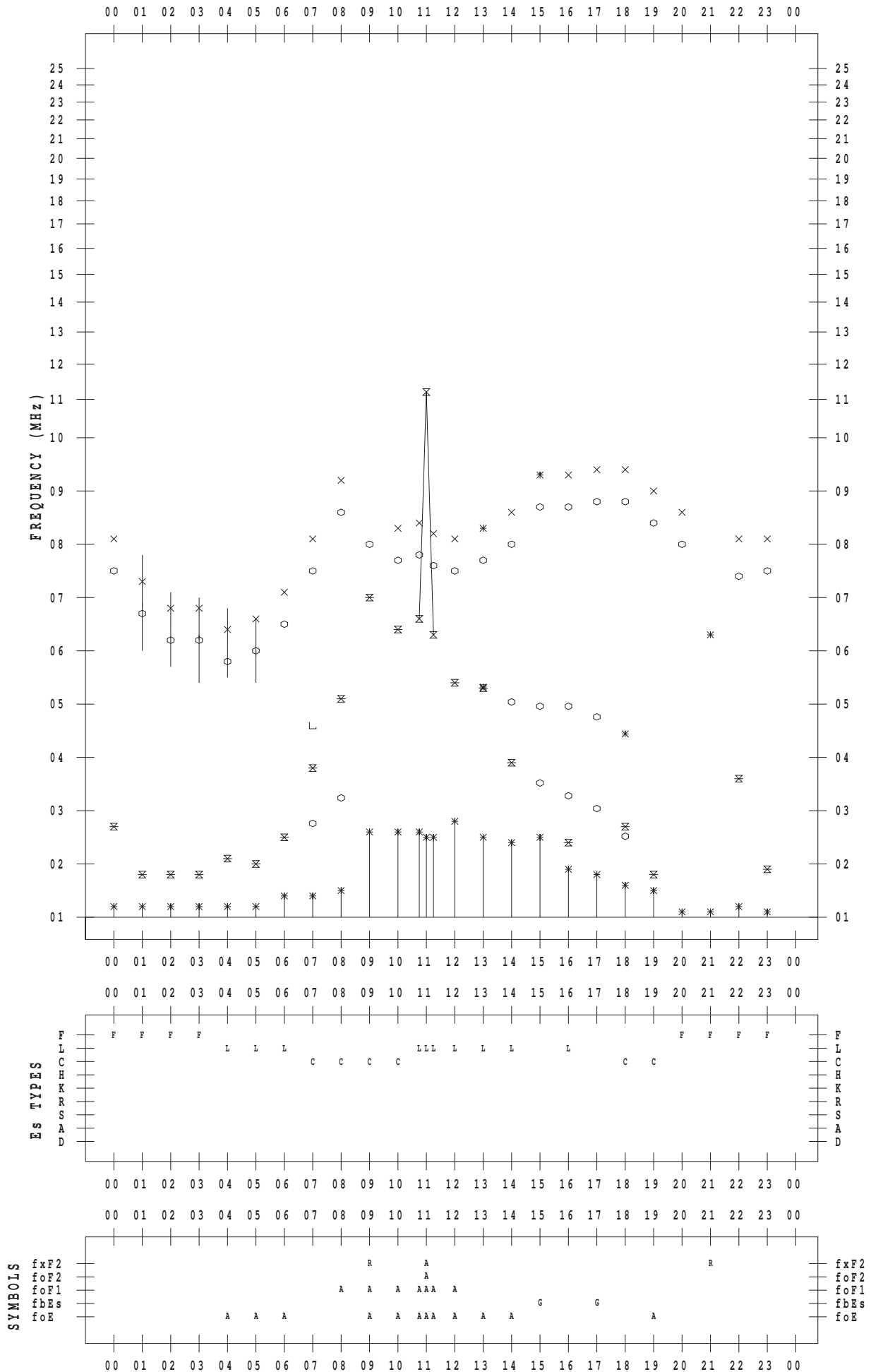
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 1

135 ° E MEAN TIME



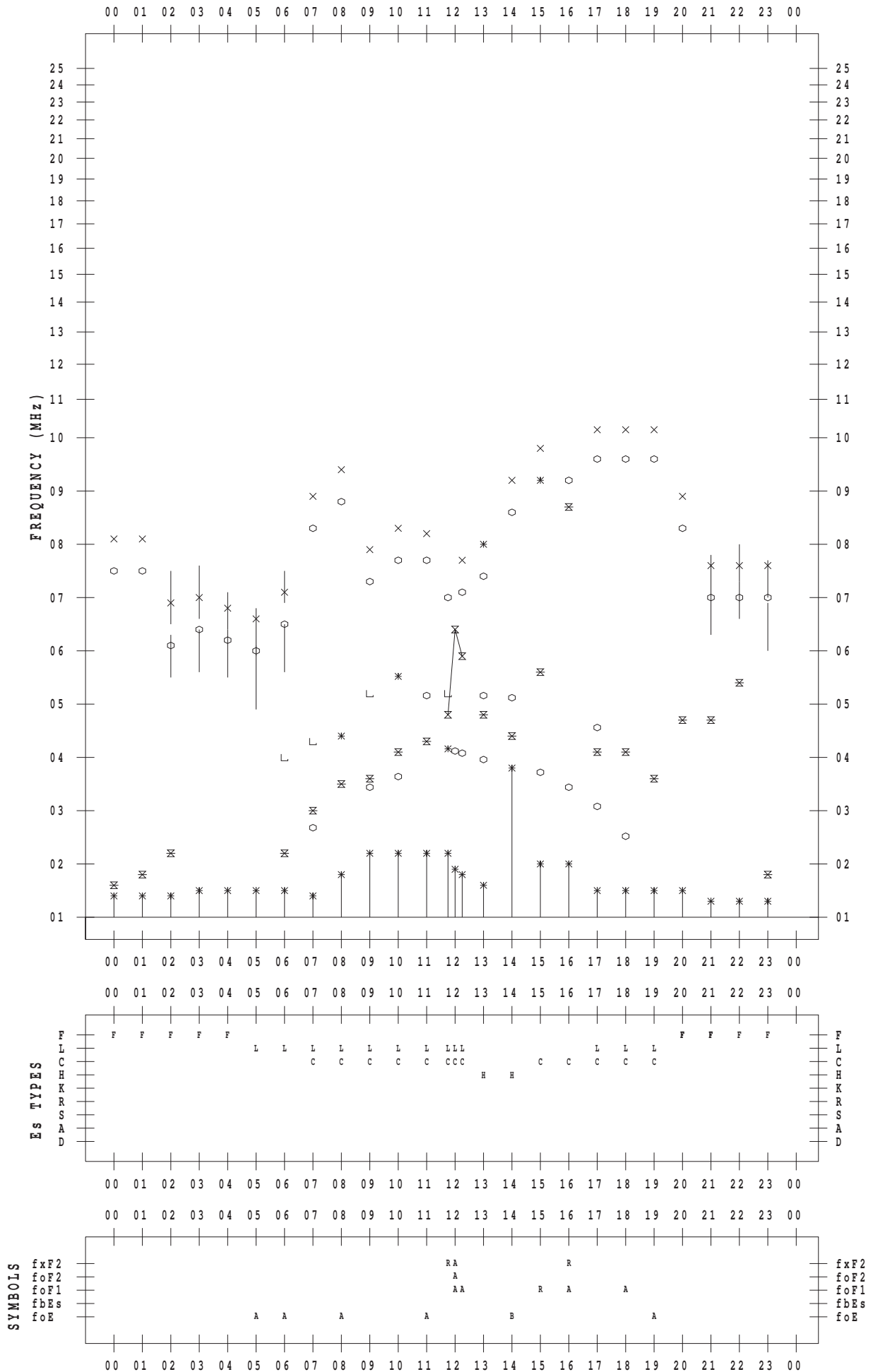
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 2

135 ° E MEAN TIME



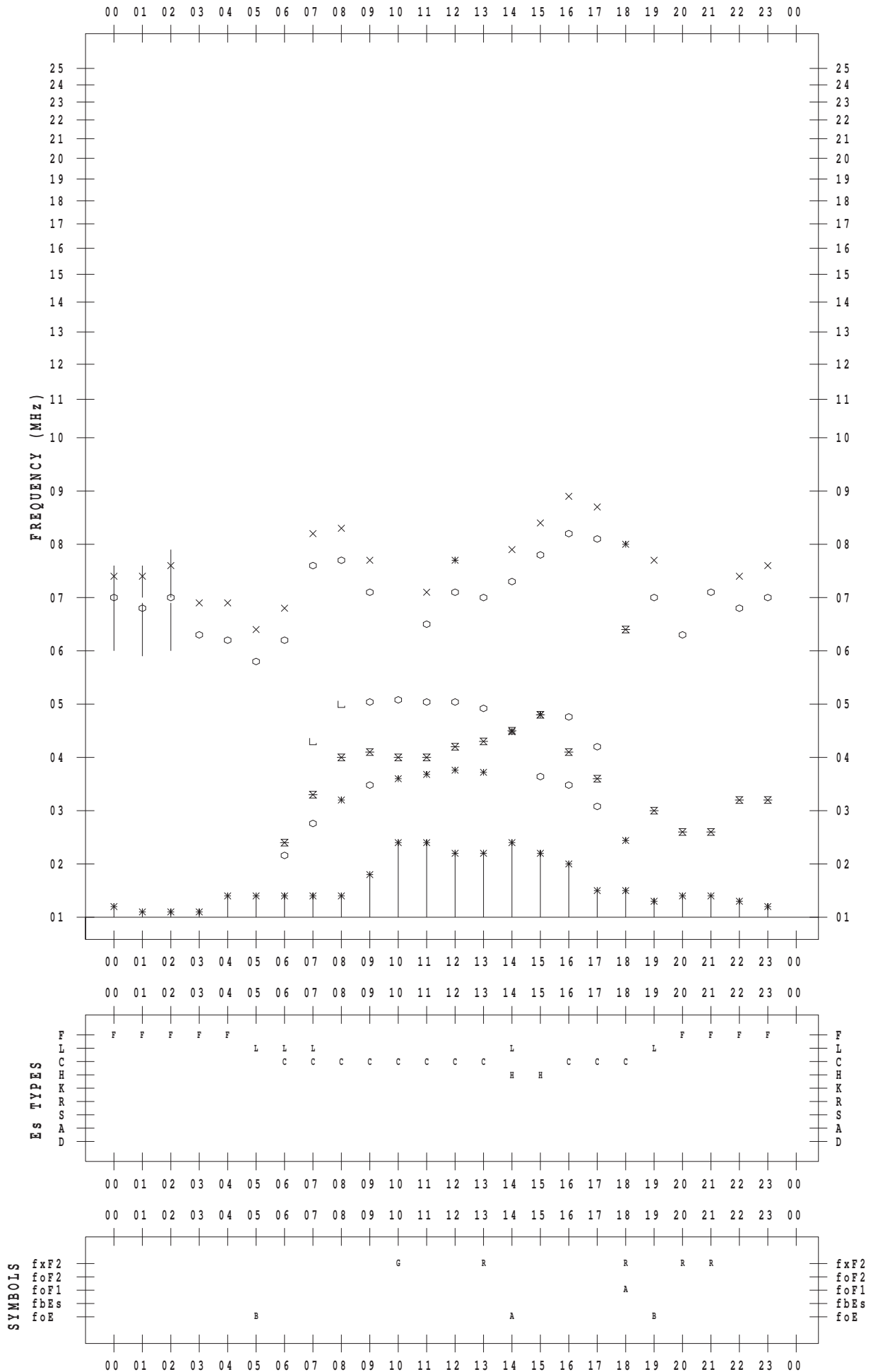
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 3

135 ° E MEAN TIME



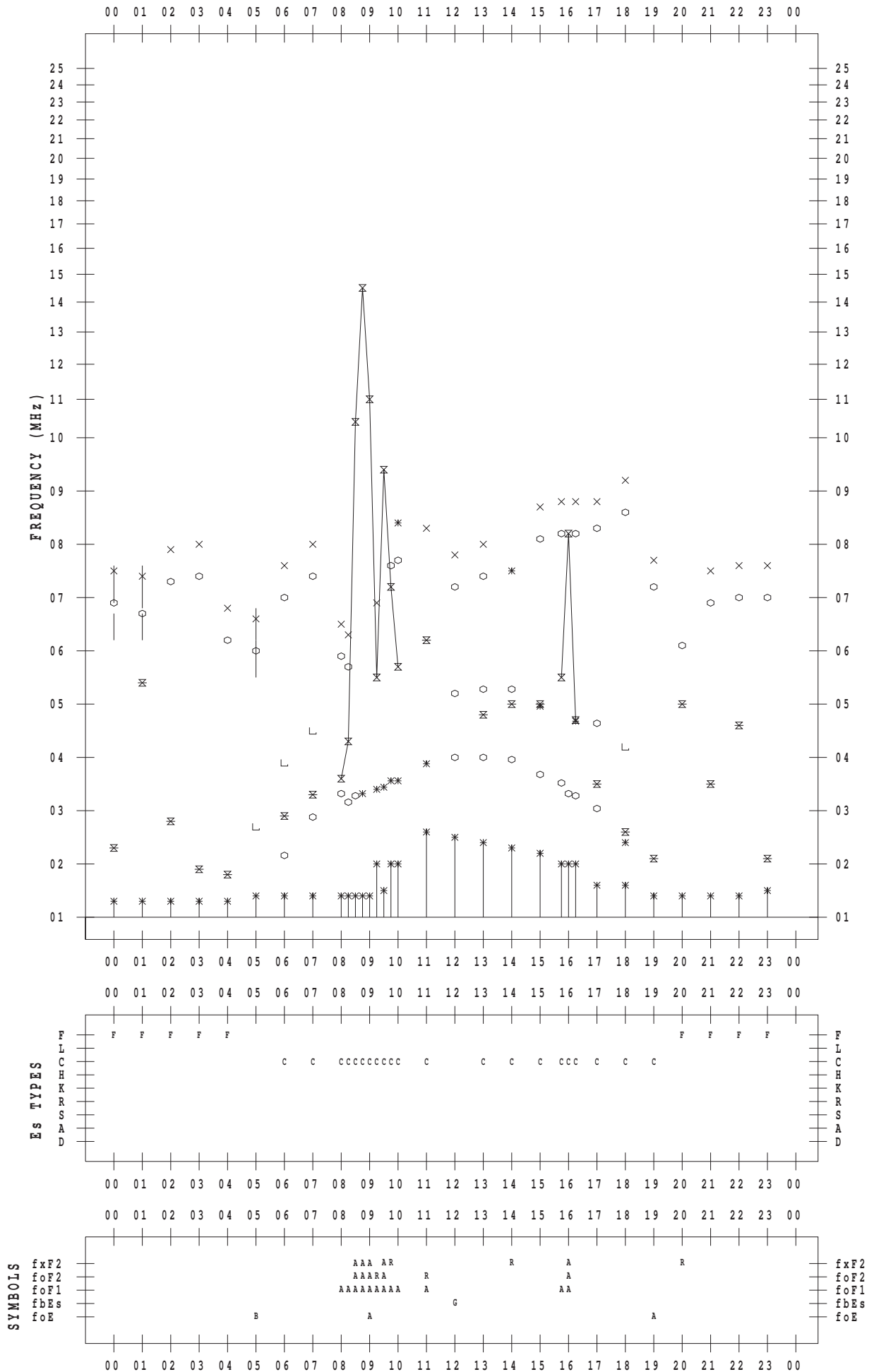
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 4

135 ° E MEAN TIME



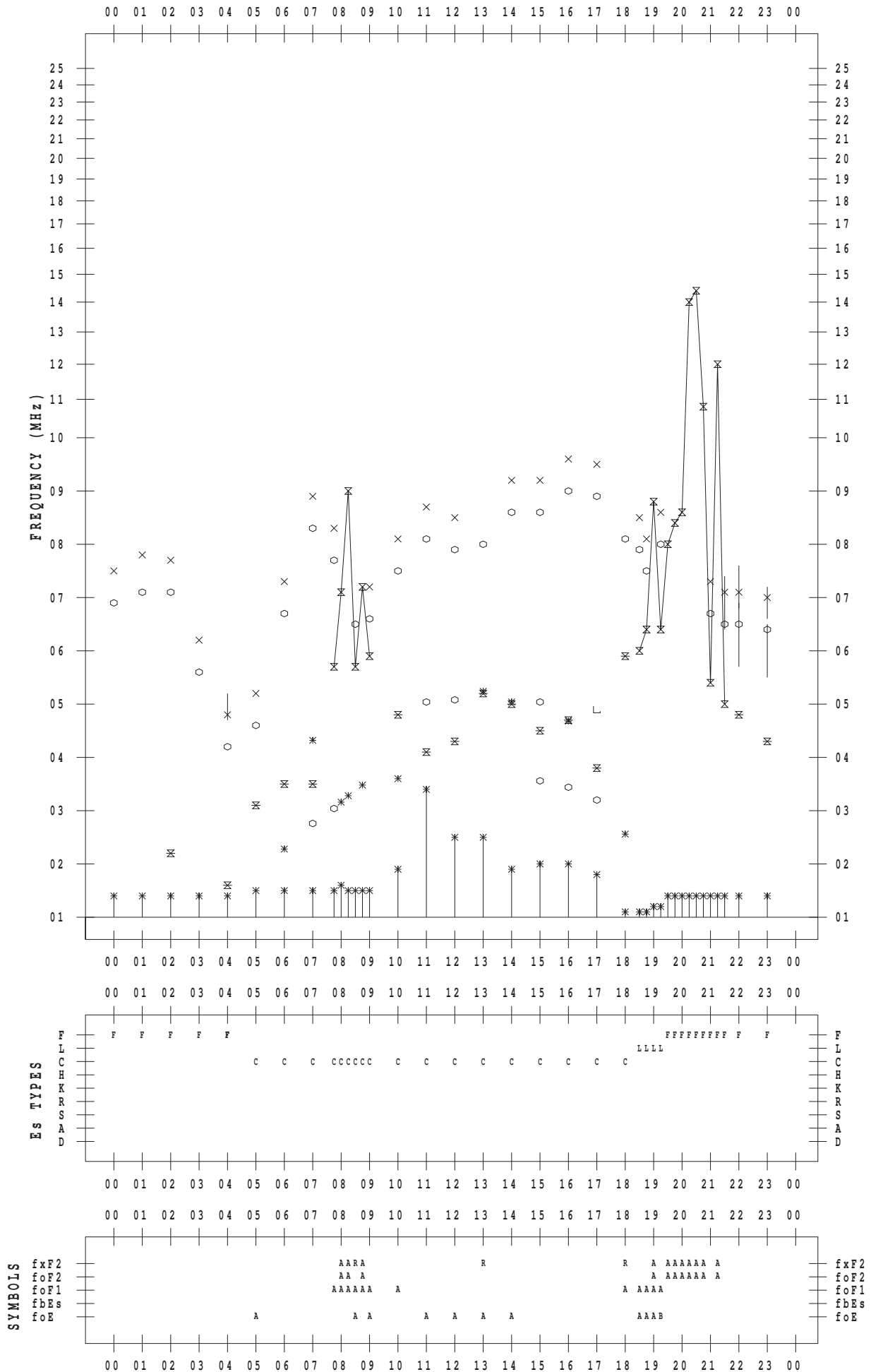
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 5

135 ° E MEAN TIME



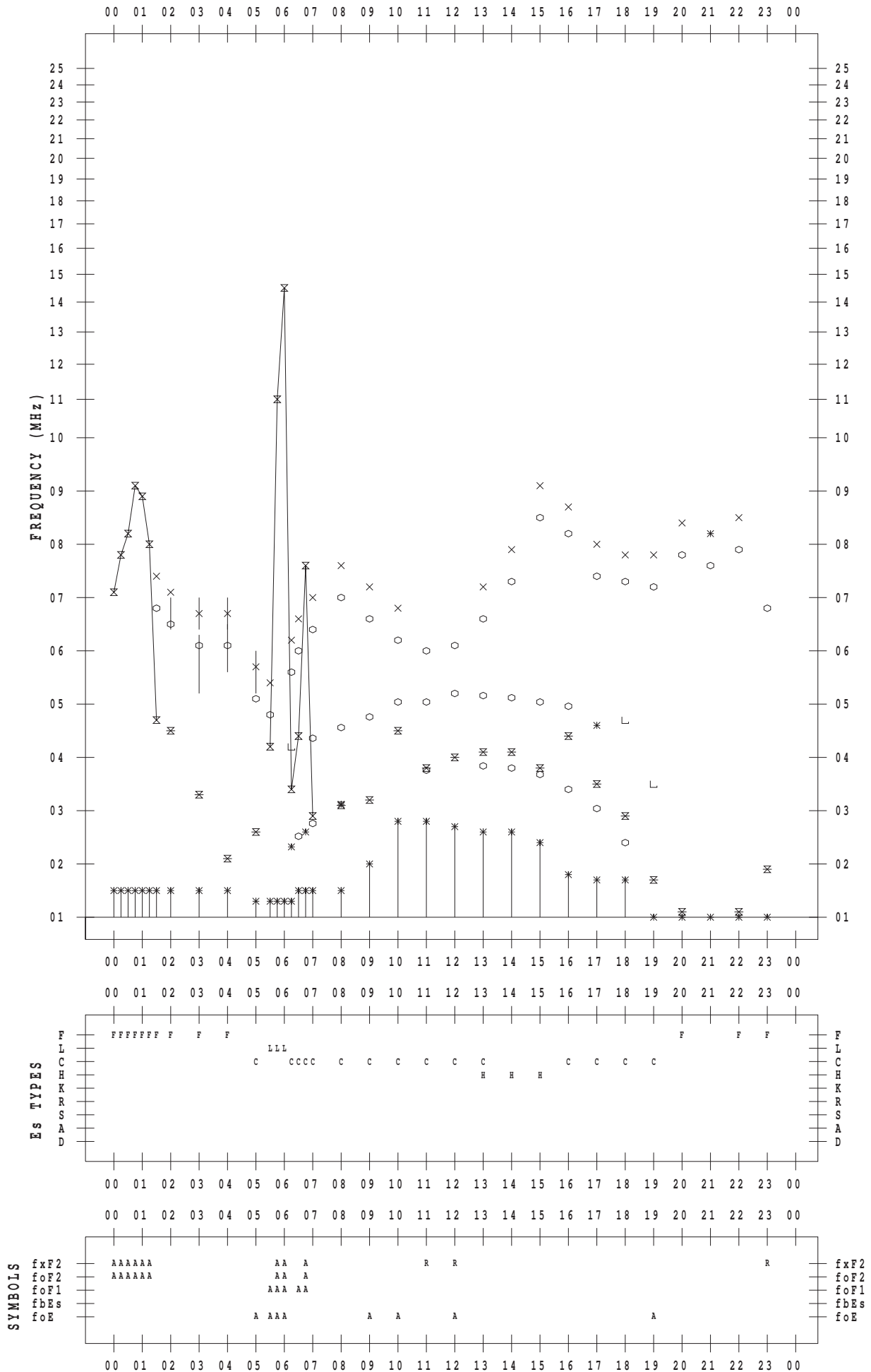
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 6

135 ° E MEAN TIME



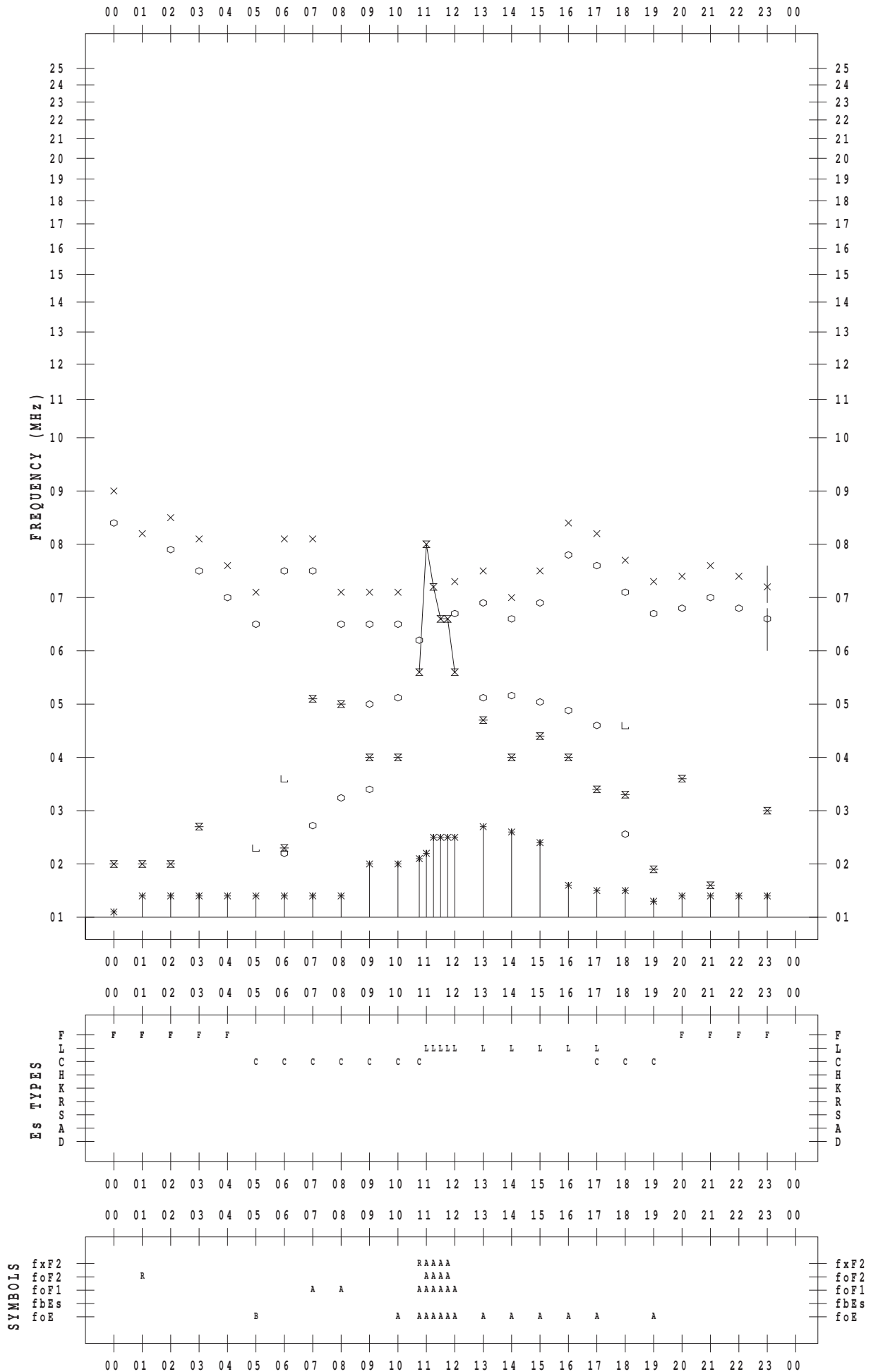
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 7

135 ° E MEAN TIME



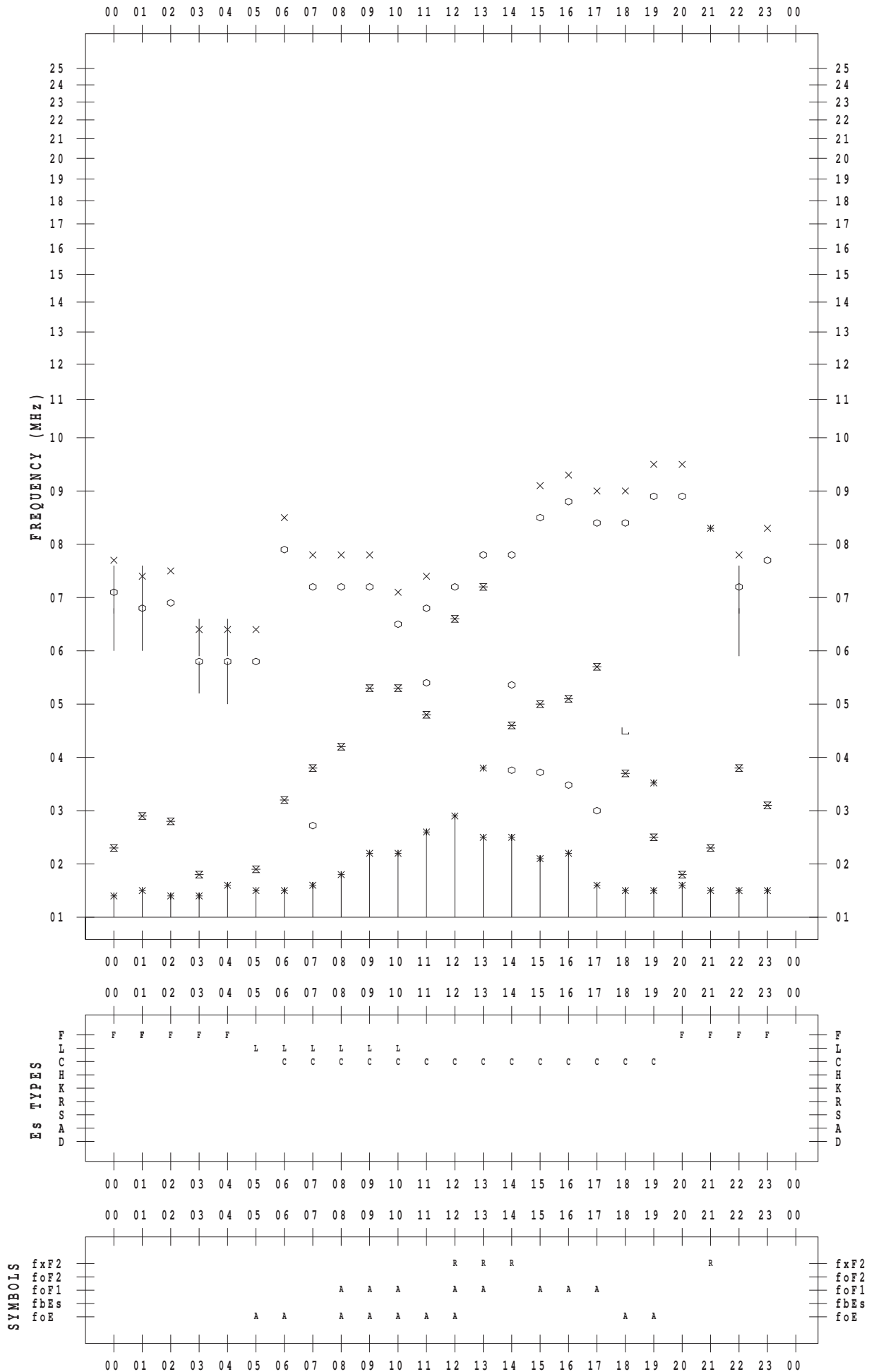
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 8

135 ° E MEAN TIME



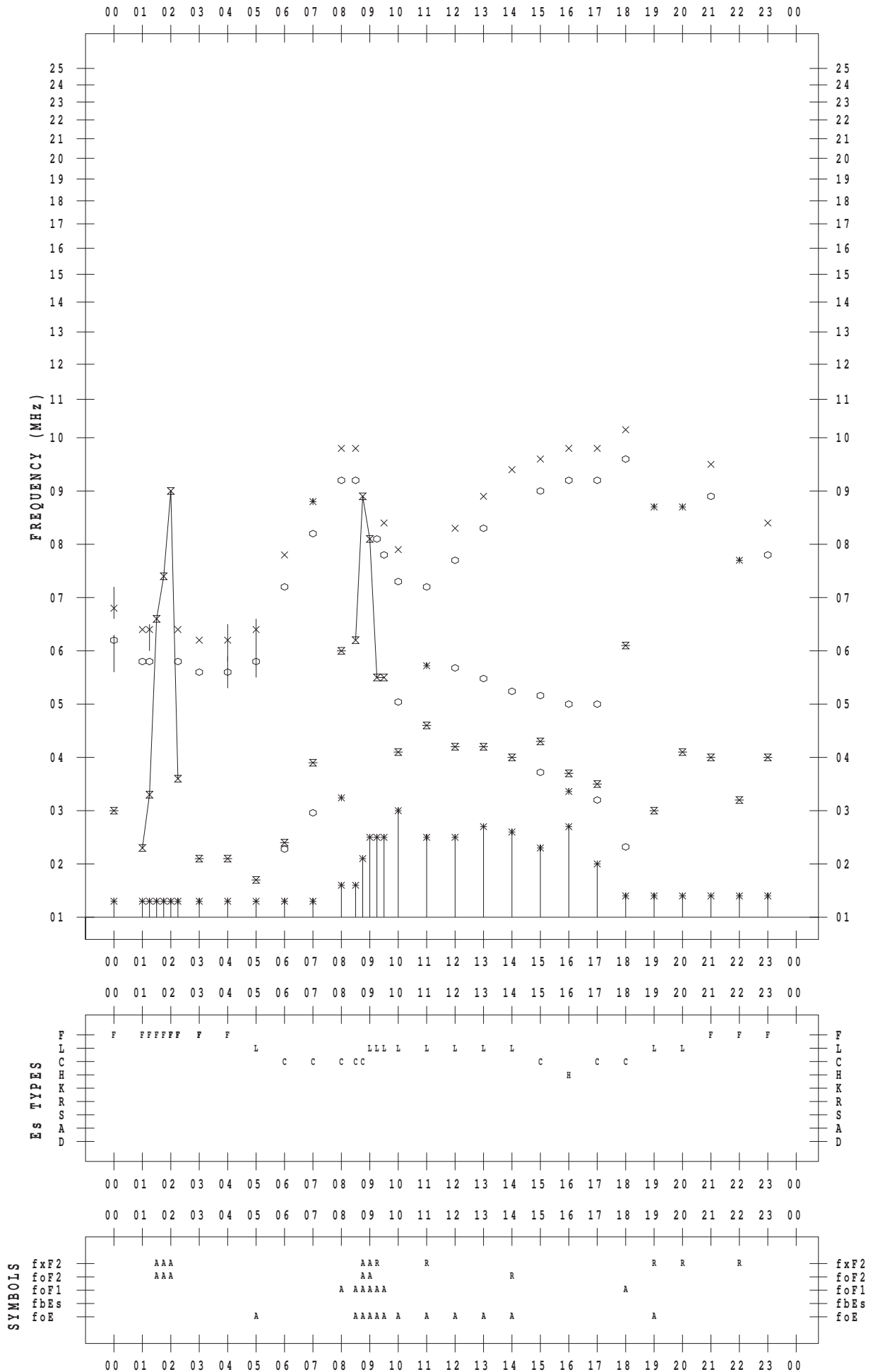
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 9

135 ° E MEAN TIME



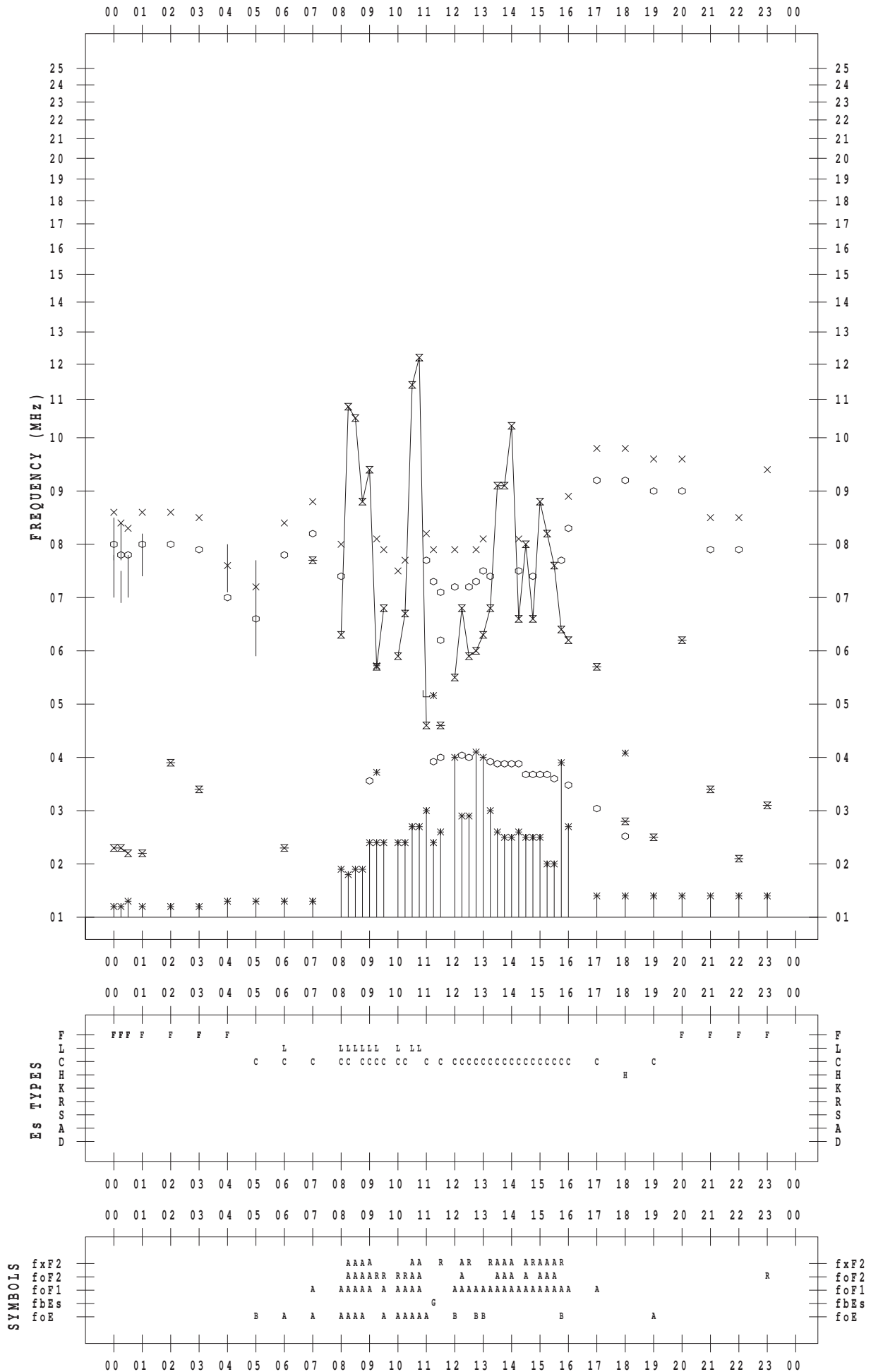
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 10

135 ° E MEAN TIME



Es TYPES

SYMBOLS

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foF2
foF1
fbEs
foE

fxF2
foF2
foF1
fbEs
foE

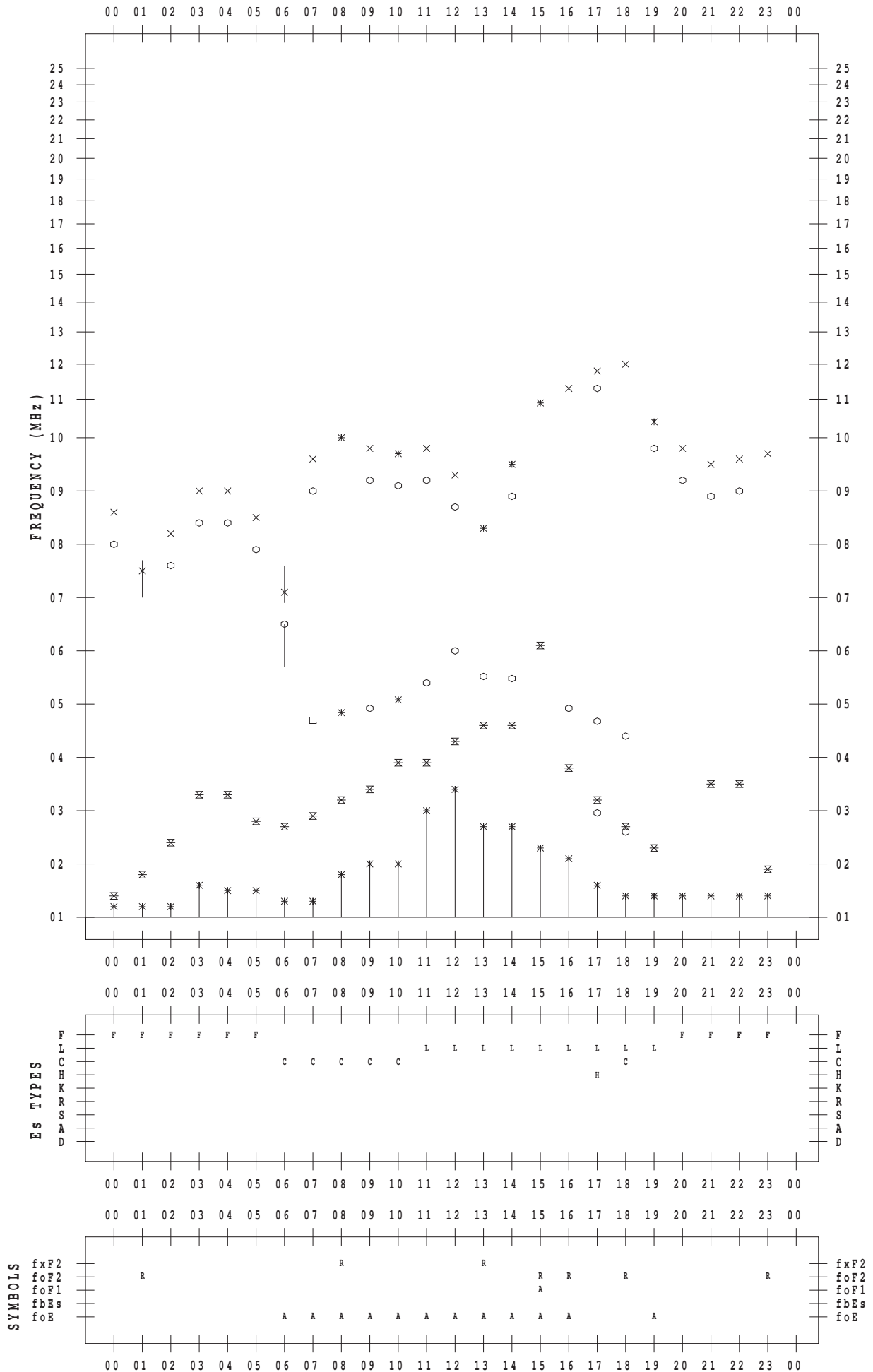
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 11

135 ° E MEAN TIME



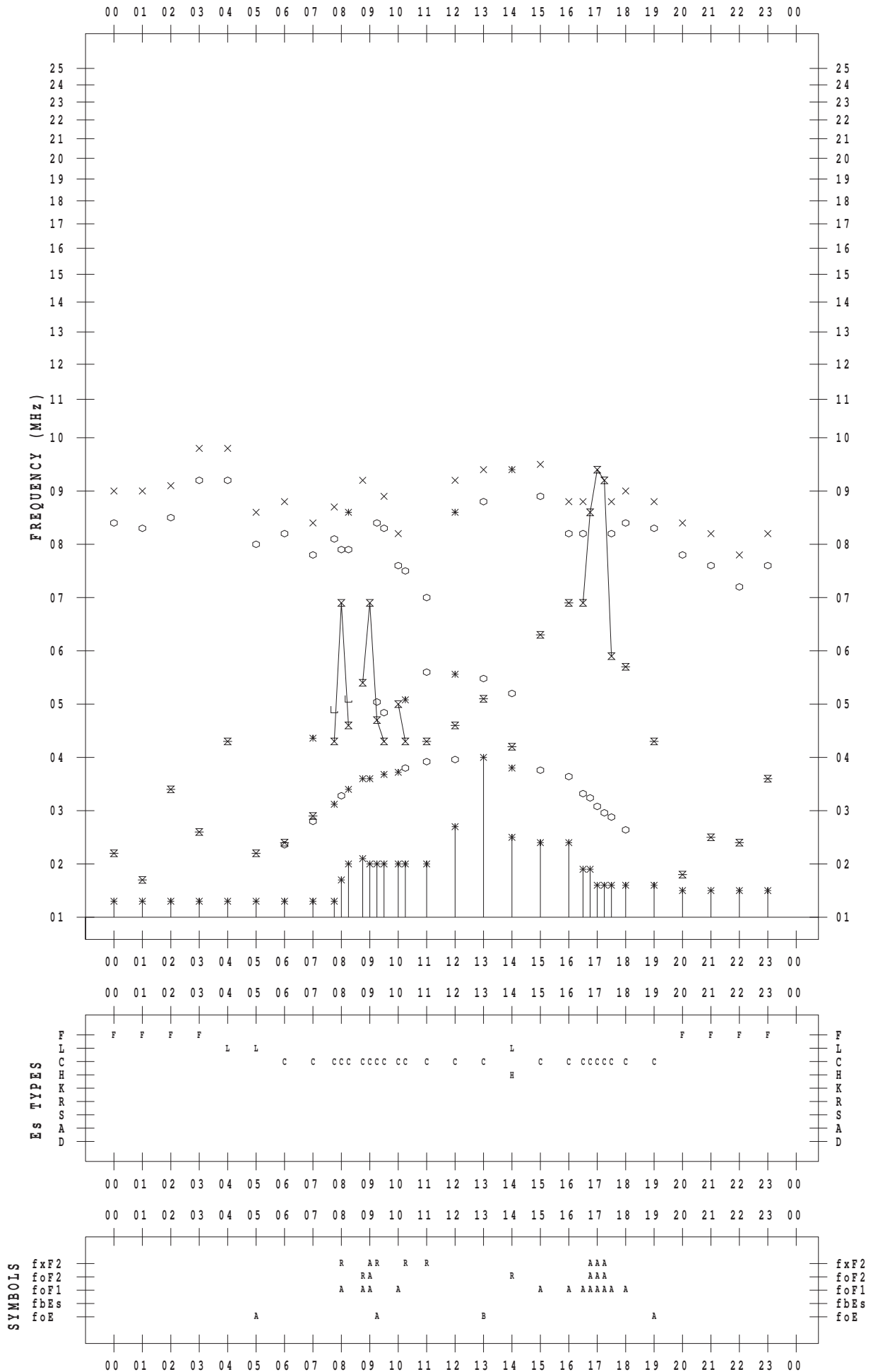
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STATION : Yamagawa

DATE : 2012 / 6 / 12

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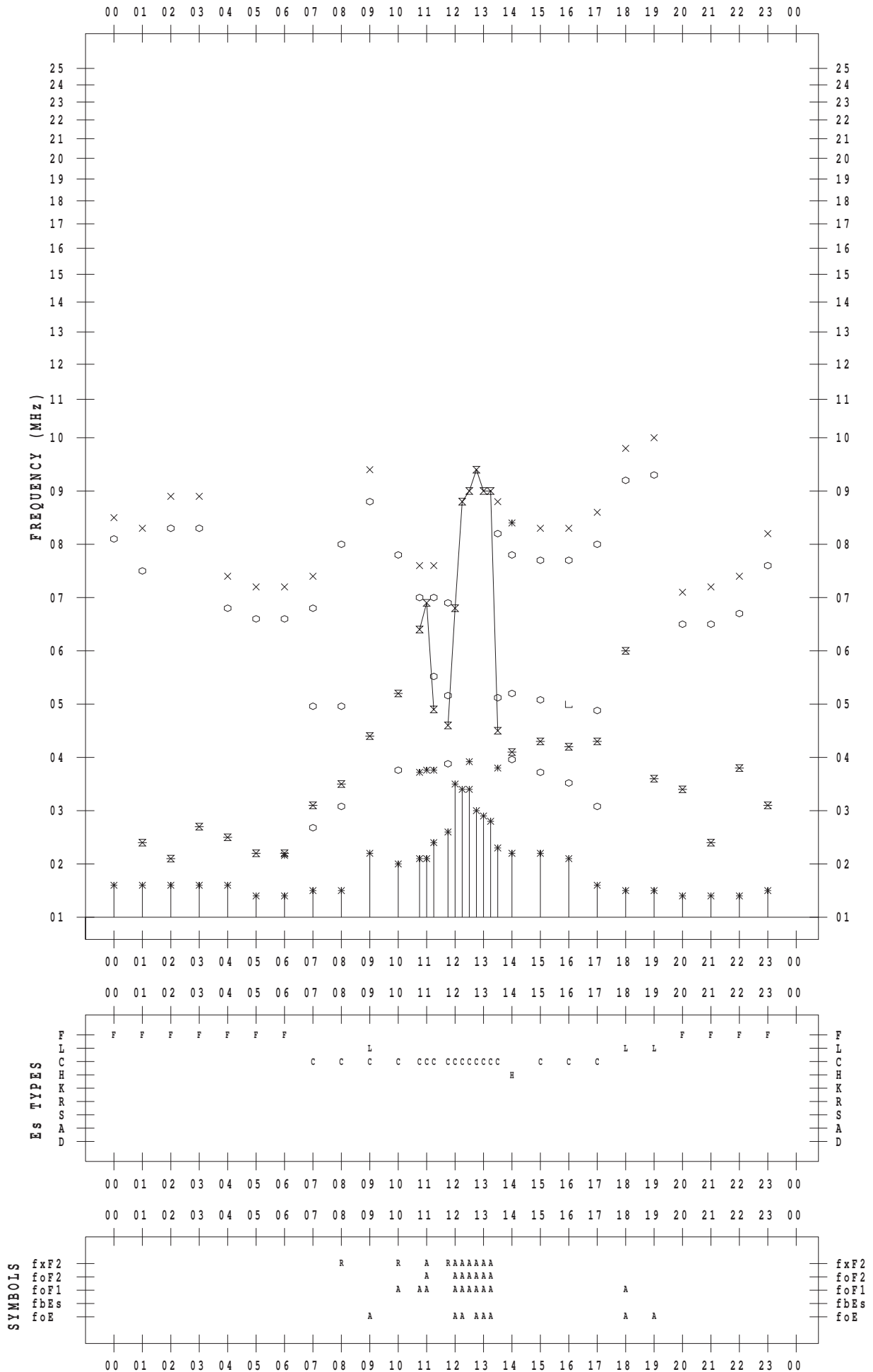
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STATION : Yamagawa

DATE : 2012 / 6 / 13

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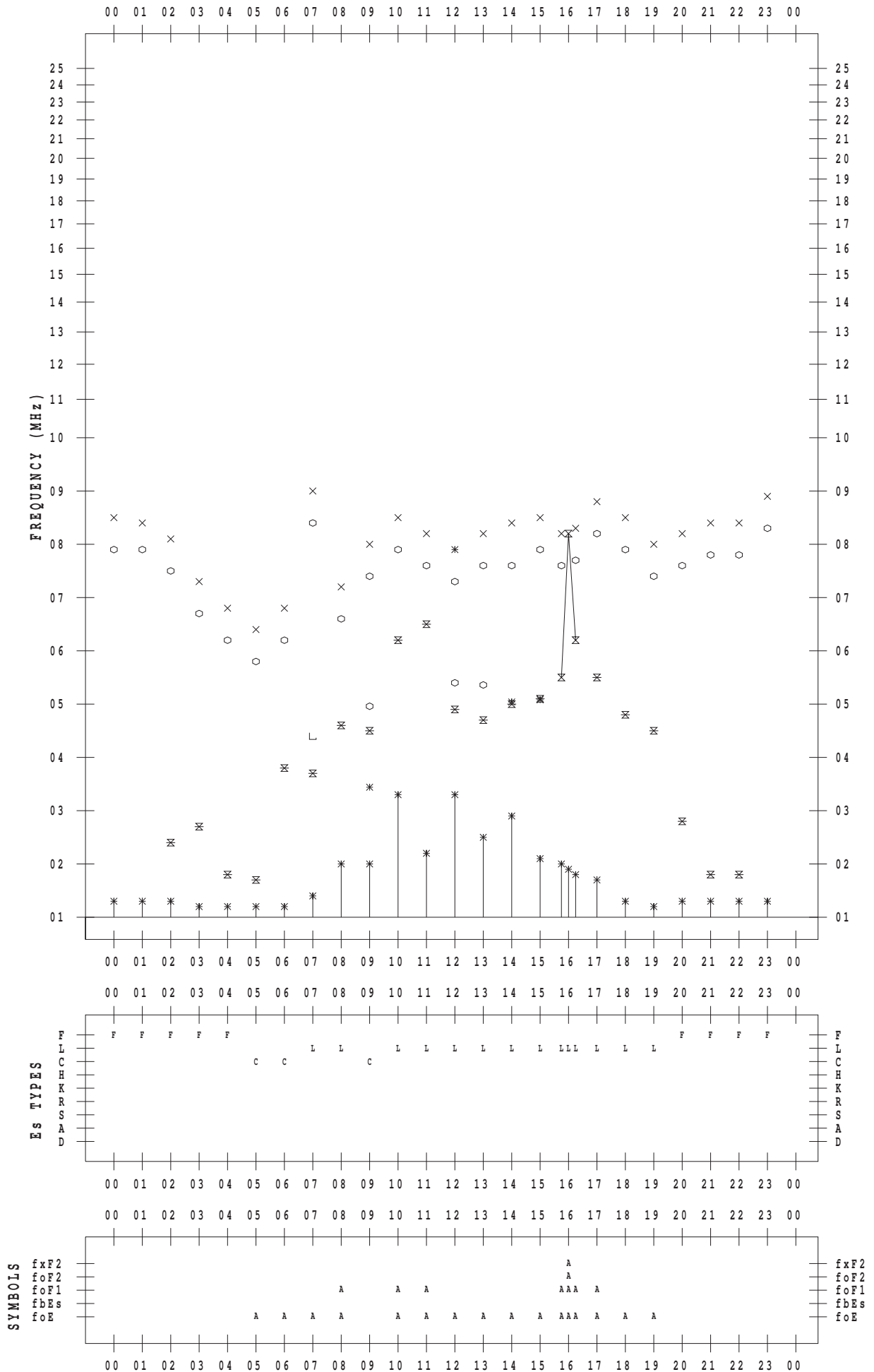
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STATION : Yamagawa

DATE : 2012 / 6 / 14

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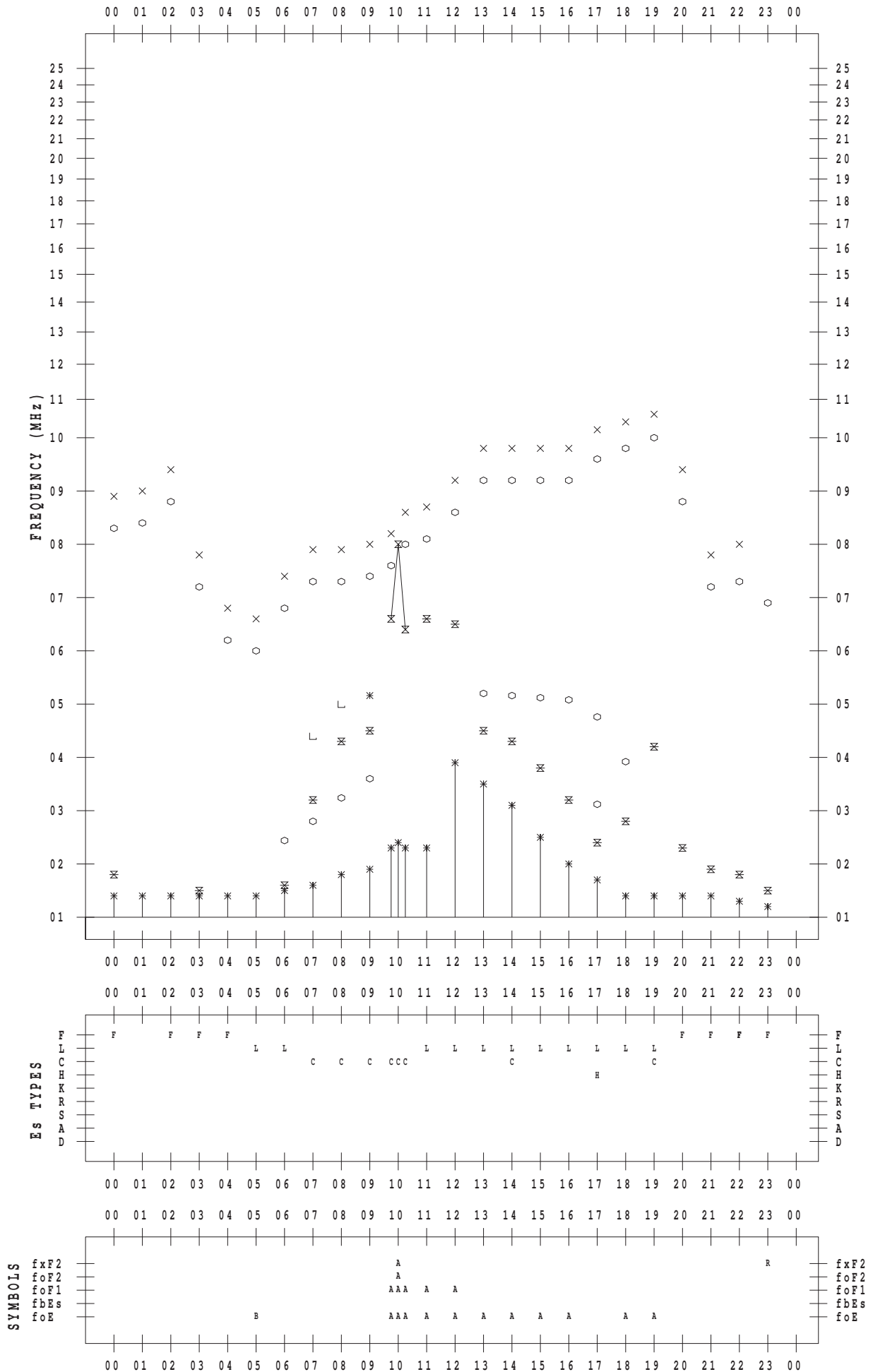
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STATION : Yamagawa

DATE : 2012 / 6 / 15

135 ° E MEAN TIME



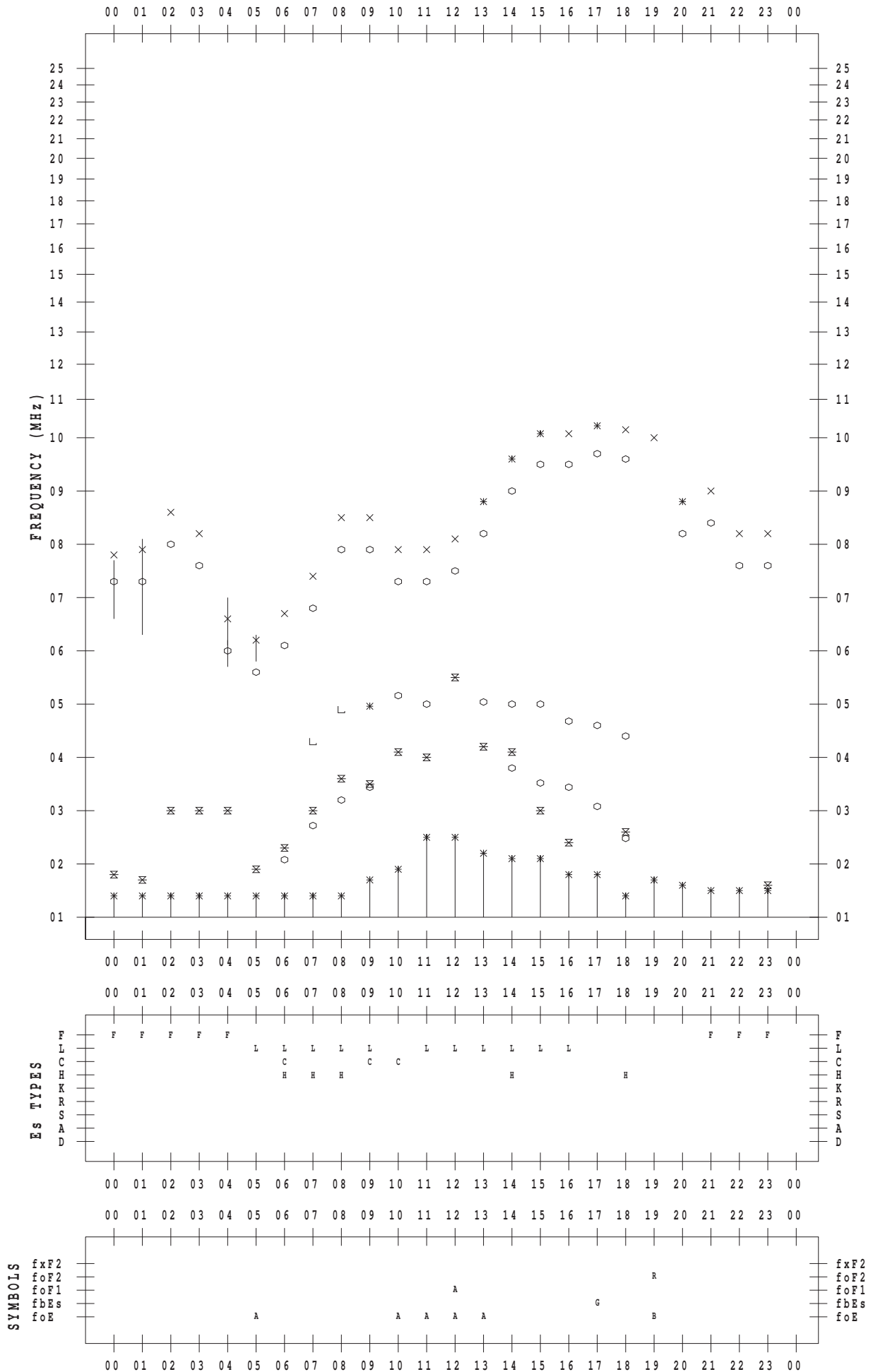
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STATION : Yamagawa

DATE : 2012 / 6 / 16

135 ° E MEAN TIME



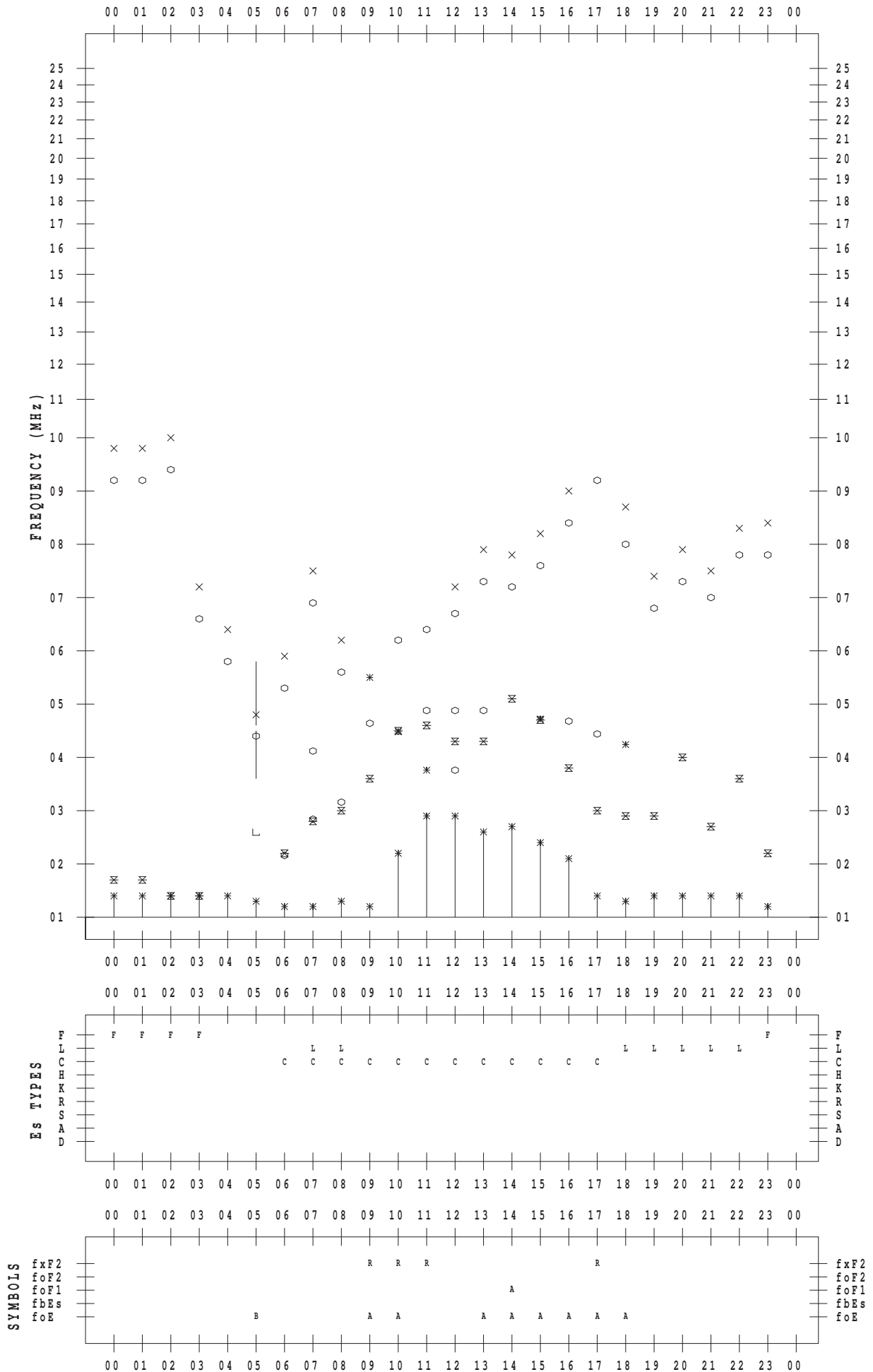
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STATION : Yamagawa

DATE : 2012 / 6 / 17

135 ° E MEAN TIME



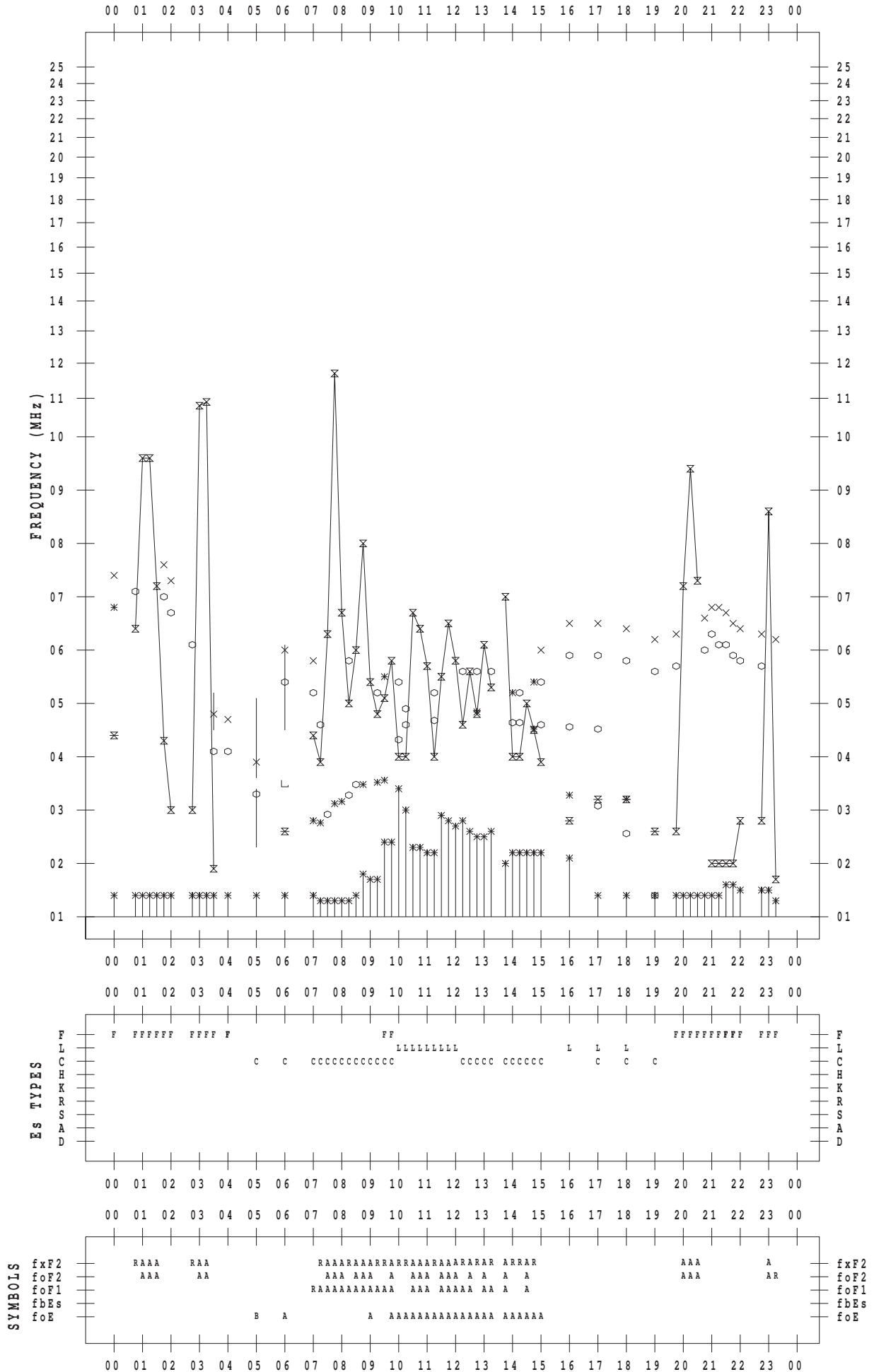
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STATION : Yamagawa

DATE : 2012 / 6 / 18

135 ° E MEAN TIME



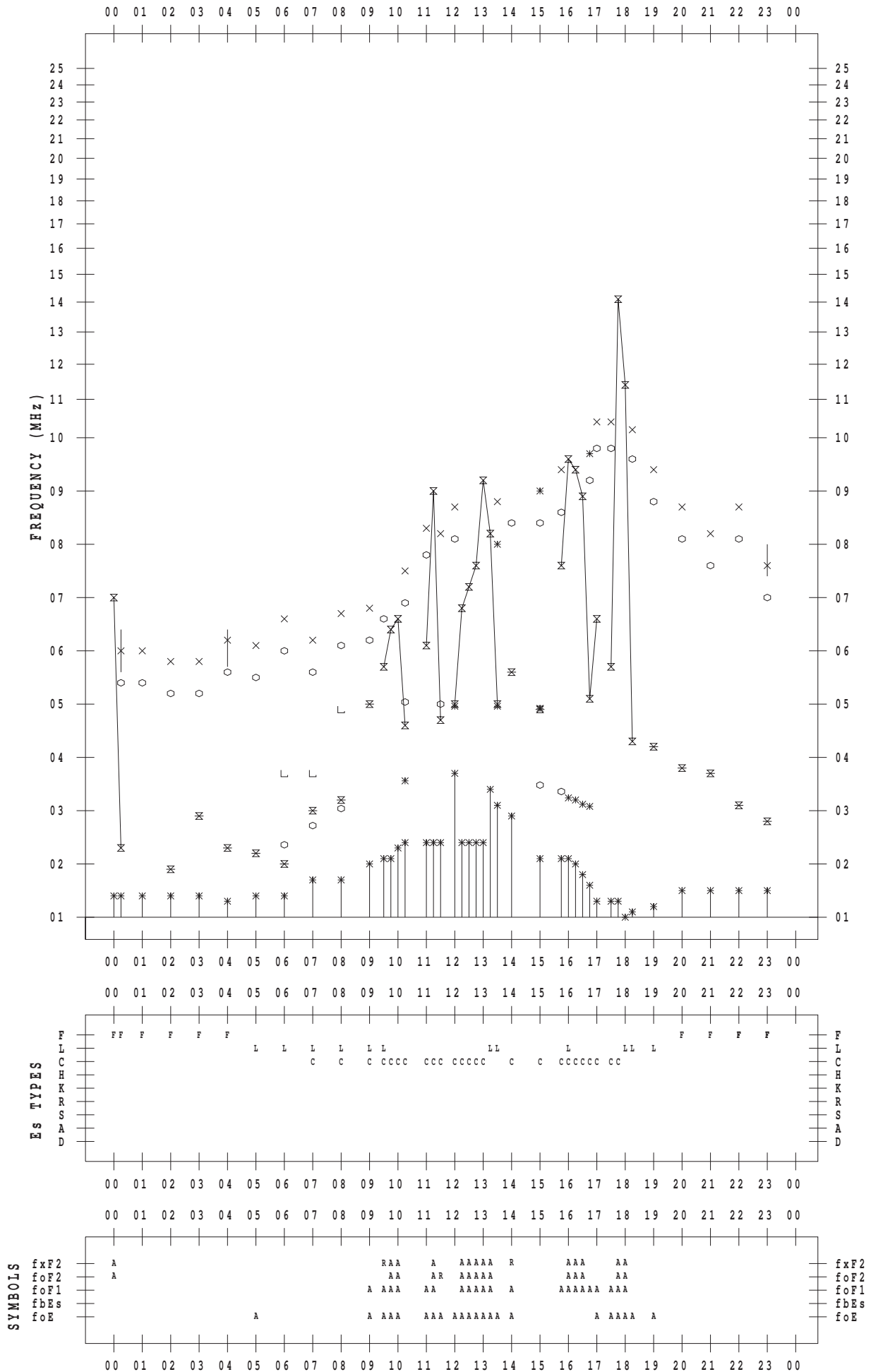
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STATION : Yamagawa

DATE : 2012 / 6 / 19

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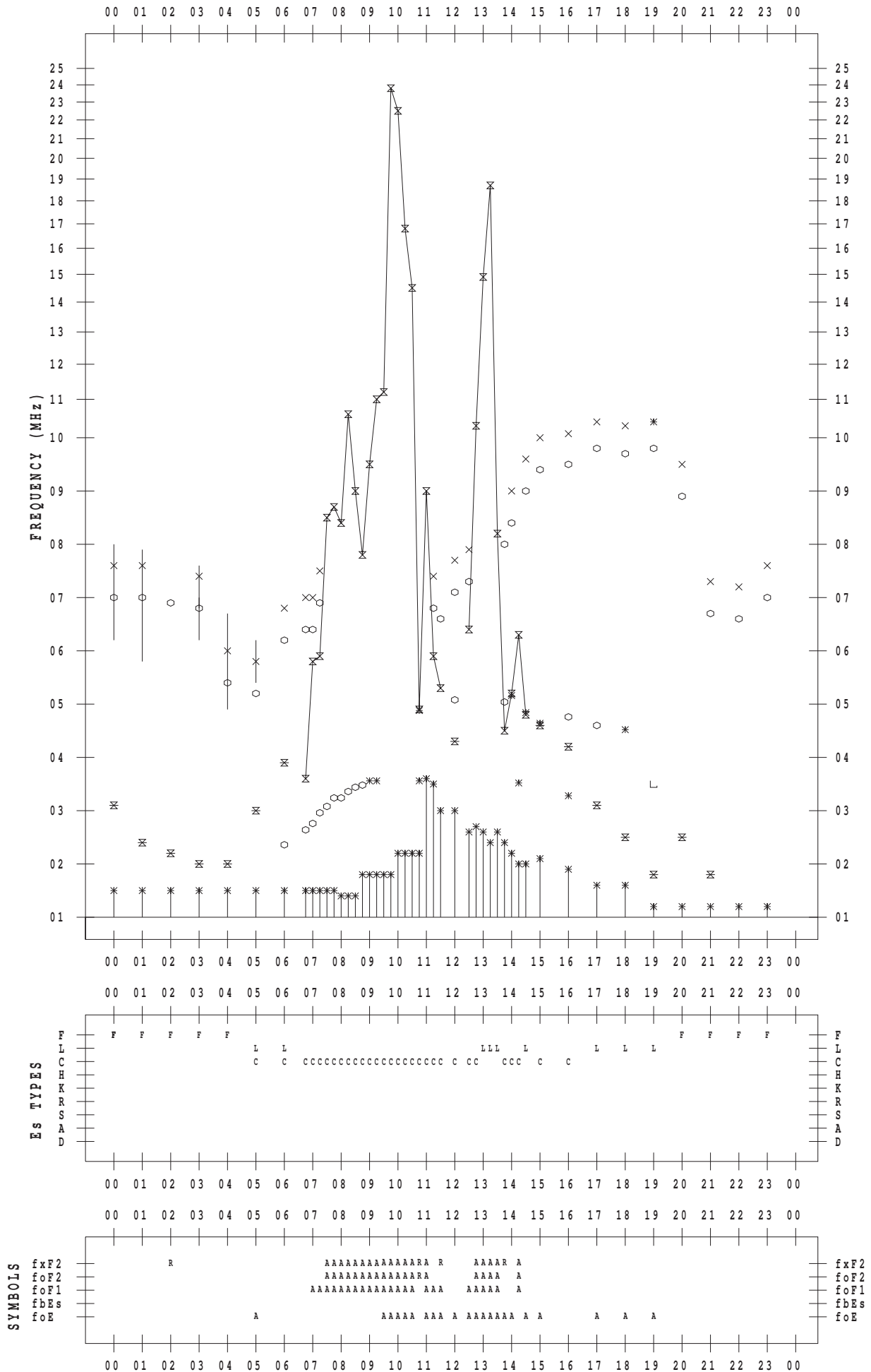
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DATE : 2012 / 6 / 20

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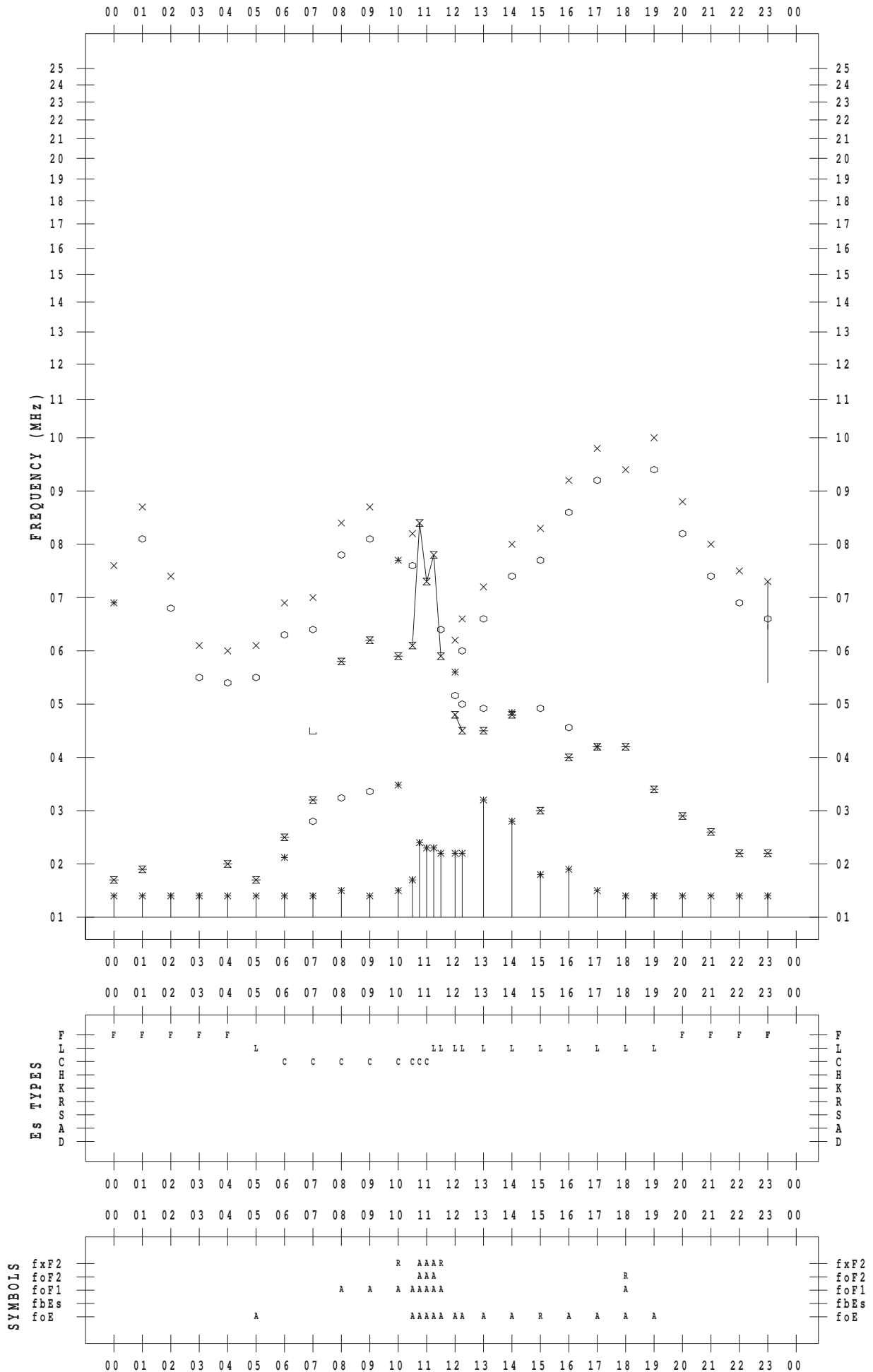
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STATION : Yamagawa

DATE : 2012 / 6 / 21

135 ° E MEAN TIME



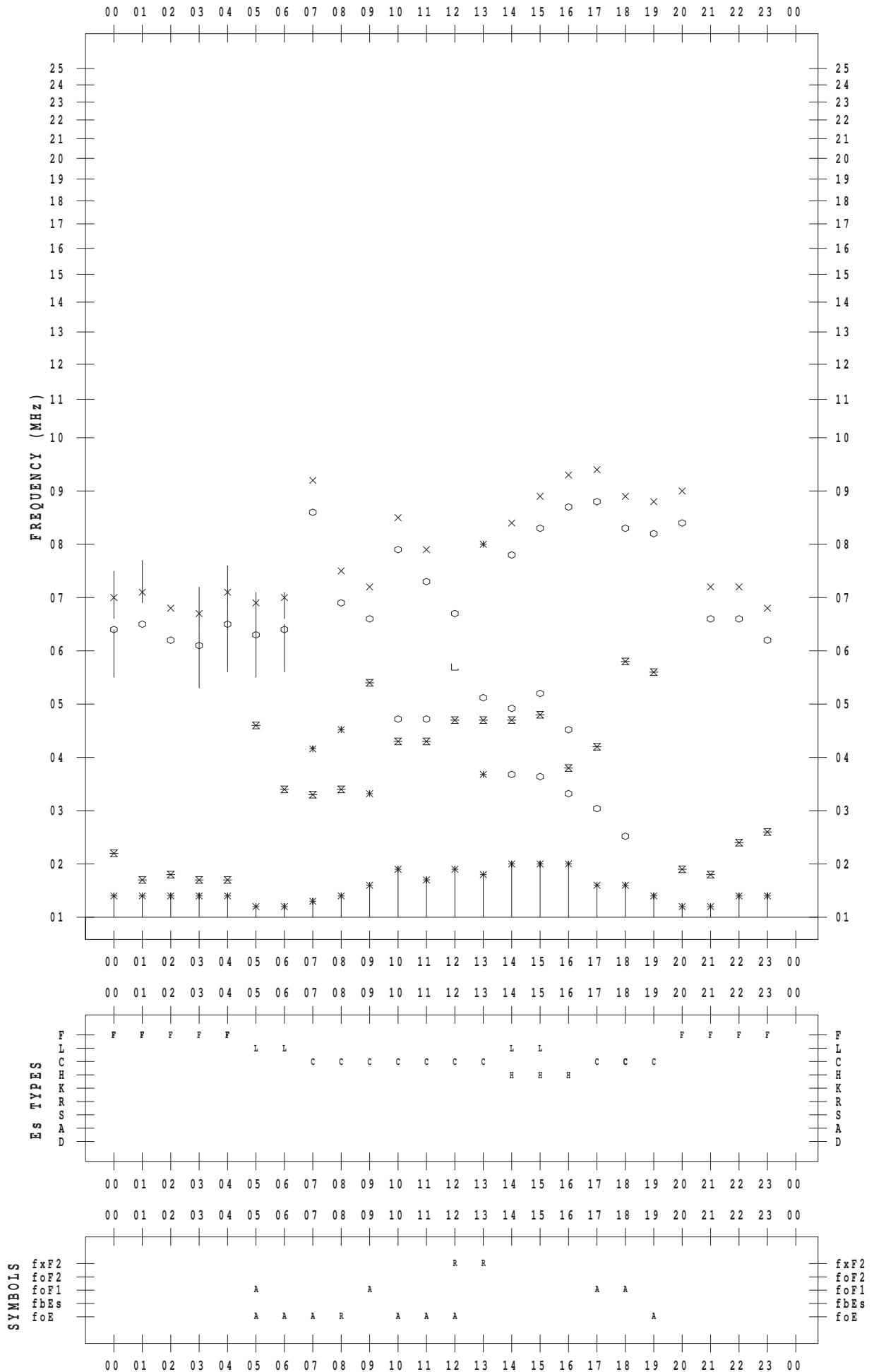
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STATION : Yamagawa

DATE : 2012 / 6 / 22

135 ° E MEAN TIME



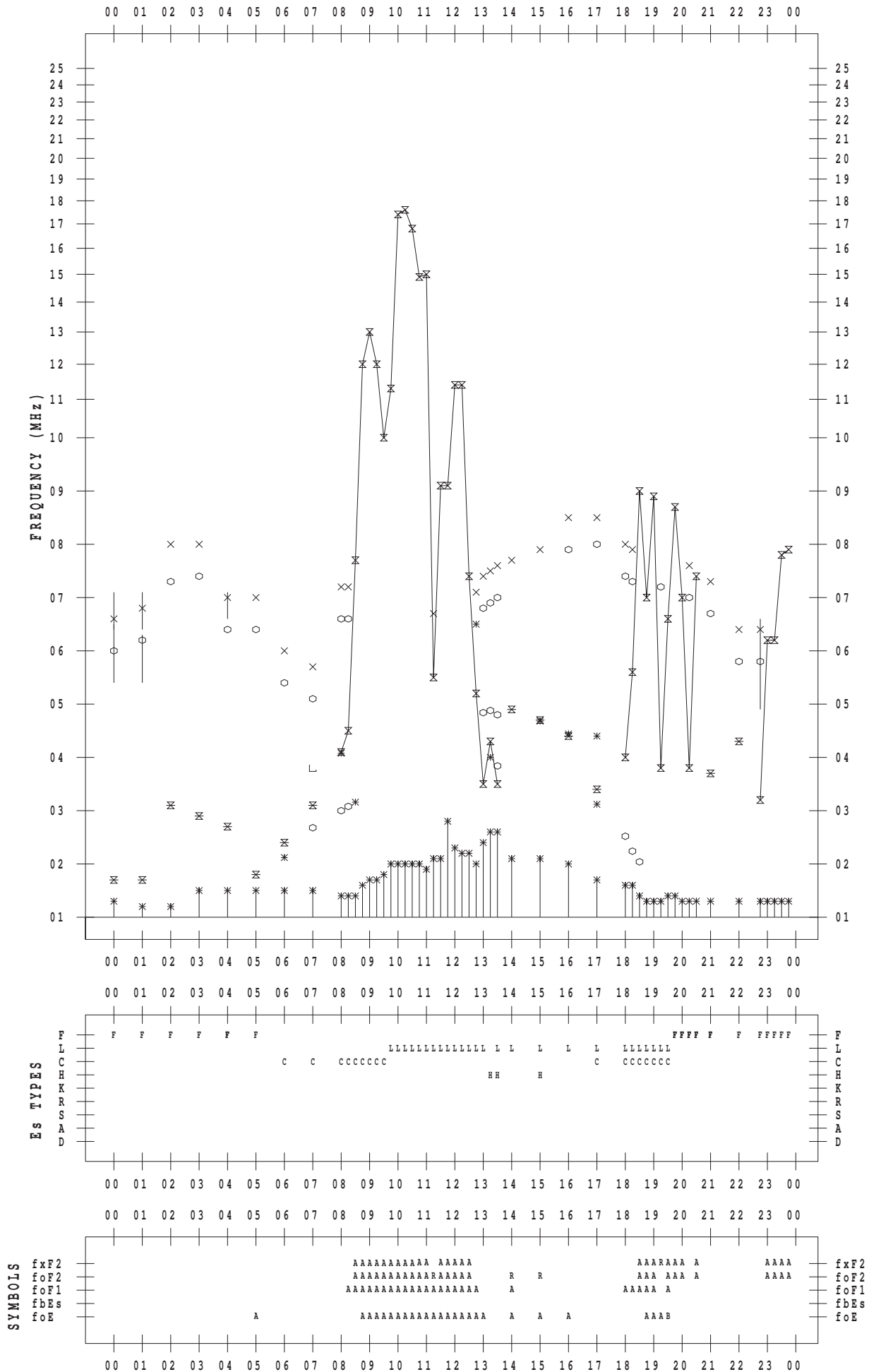
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 23

135 ° E MEAN TIME



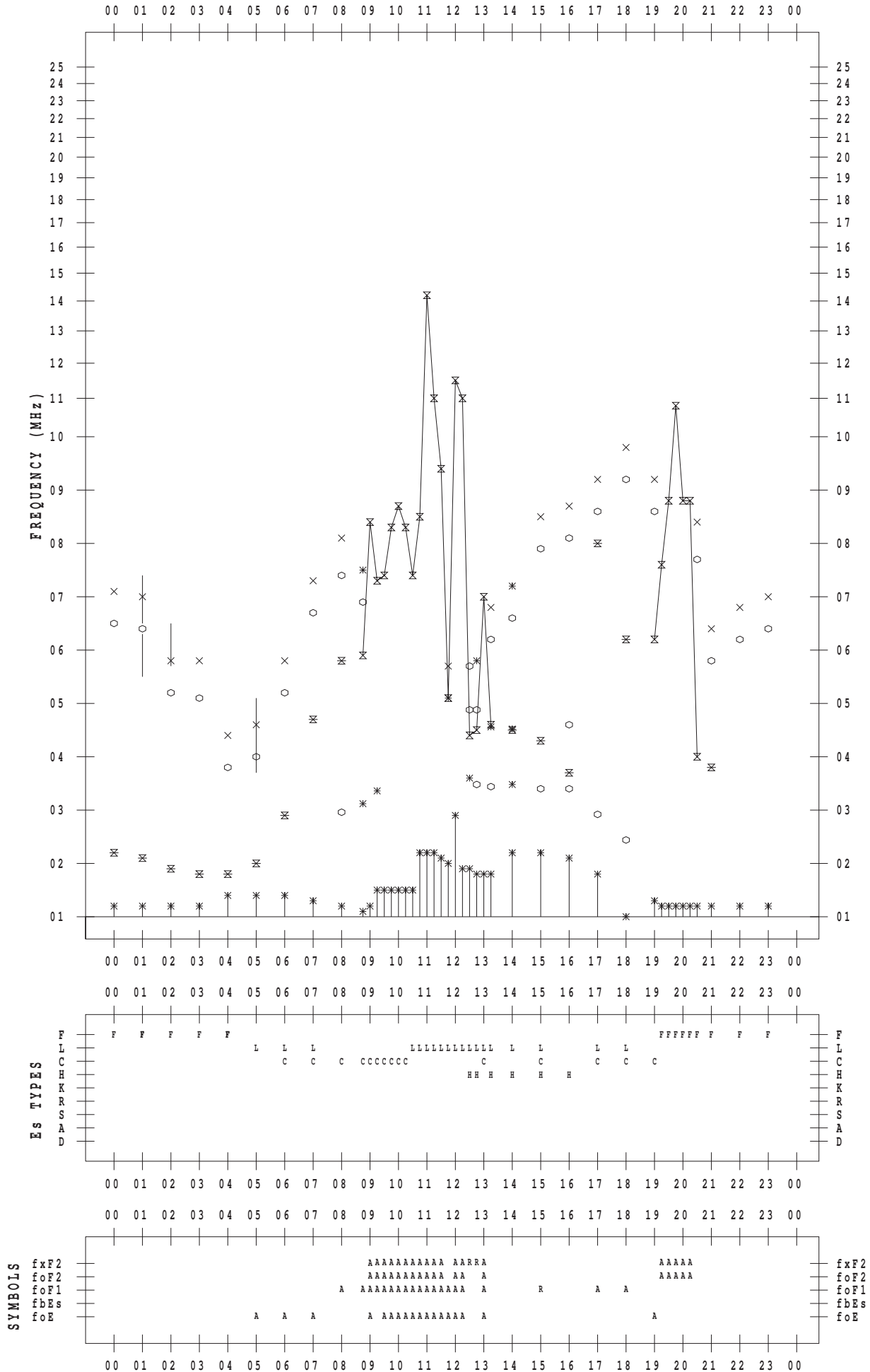
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 24

135 ° E MEAN TIME



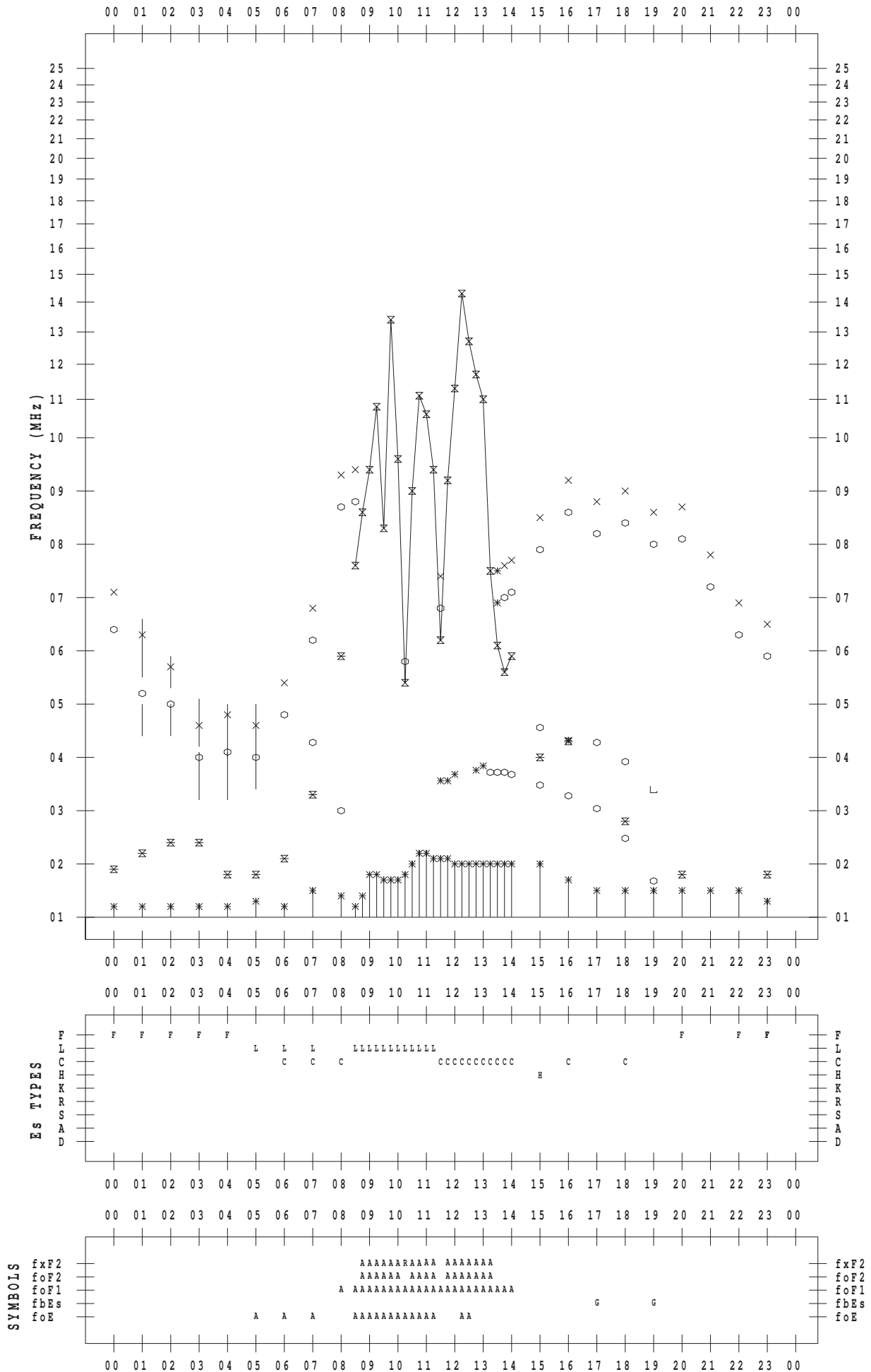
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 25

135 ° E MEAN TIME



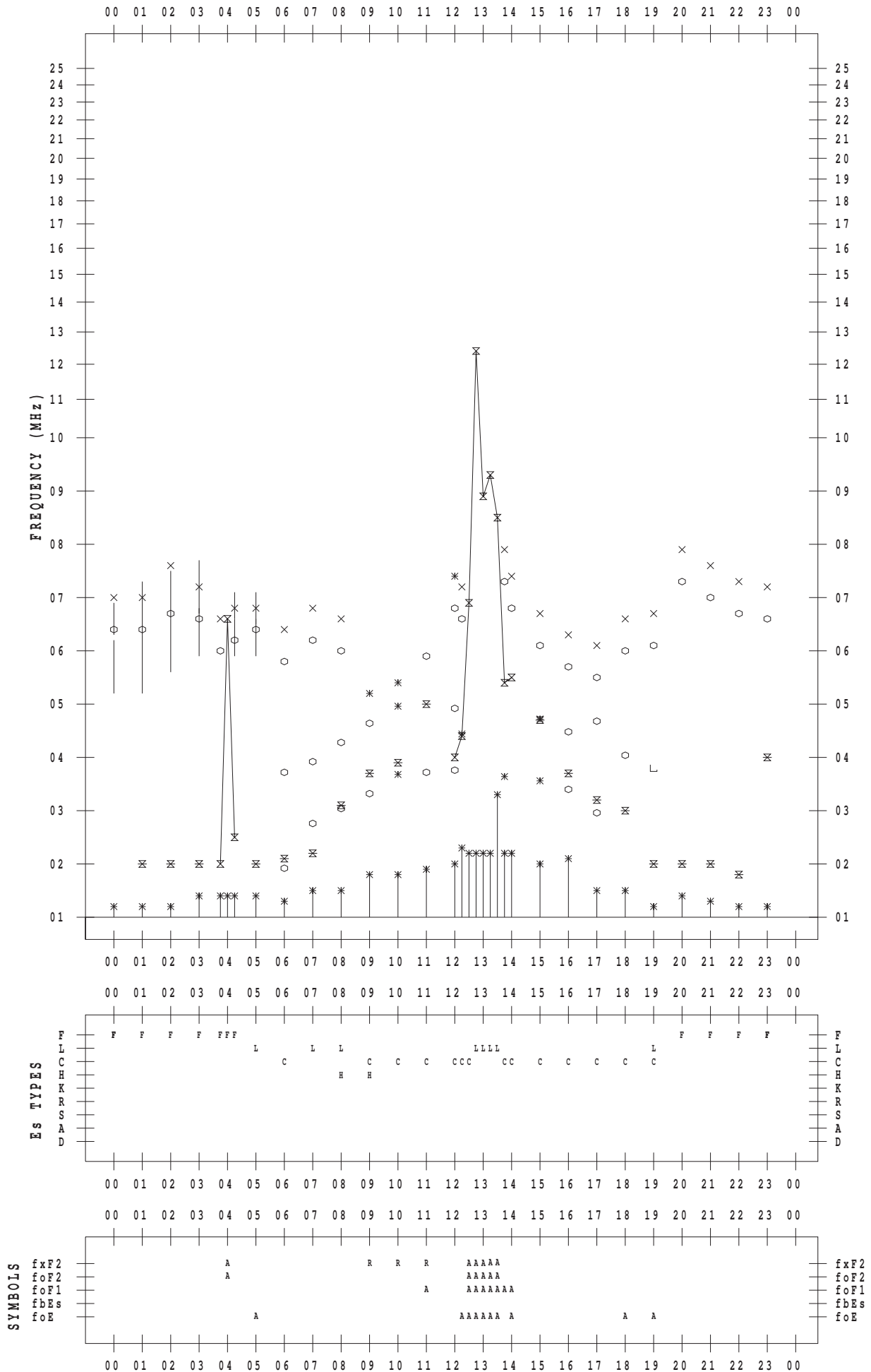
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 26

135 ° E MEAN TIME



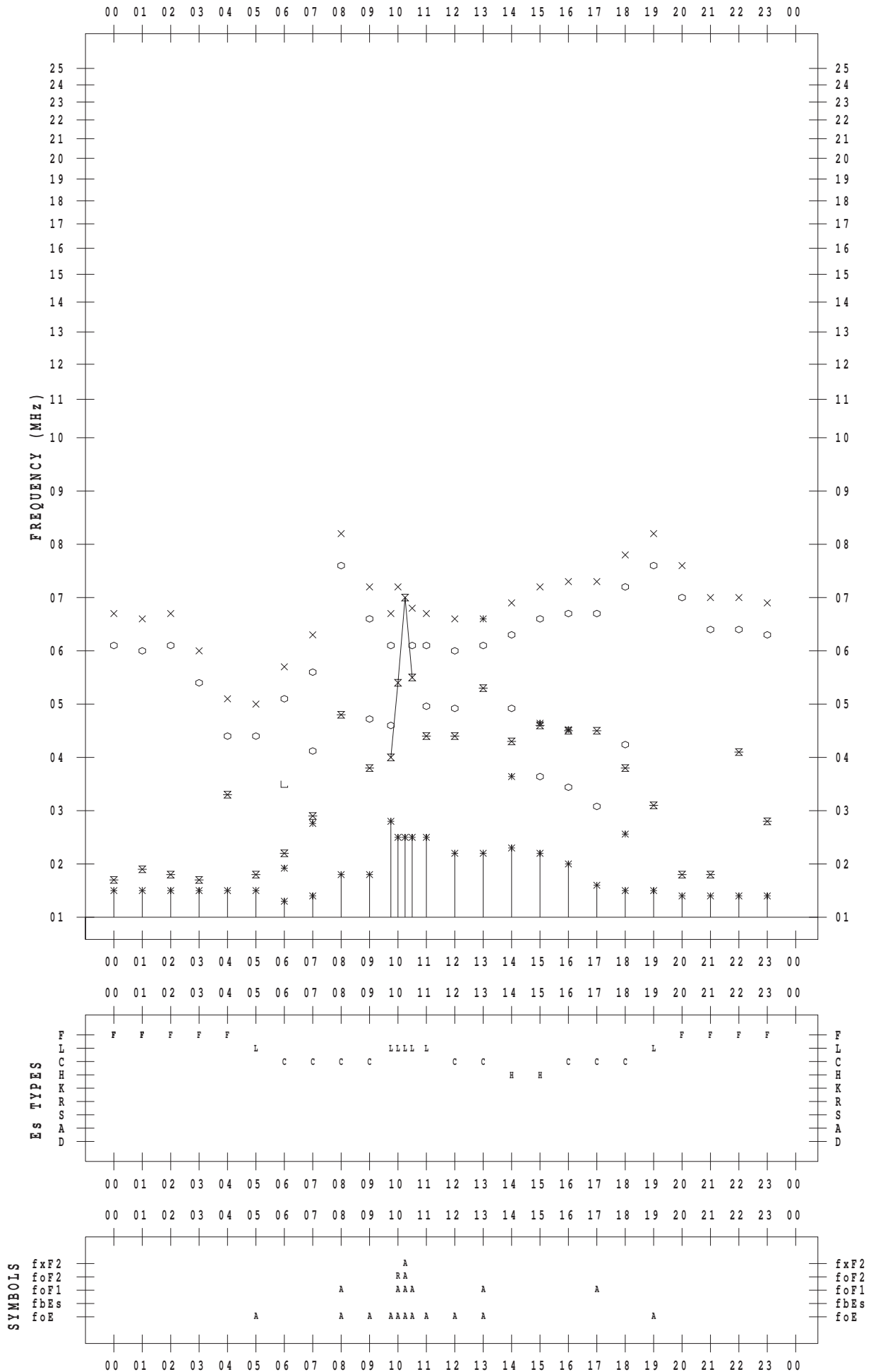
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 27

135 ° E MEAN TIME



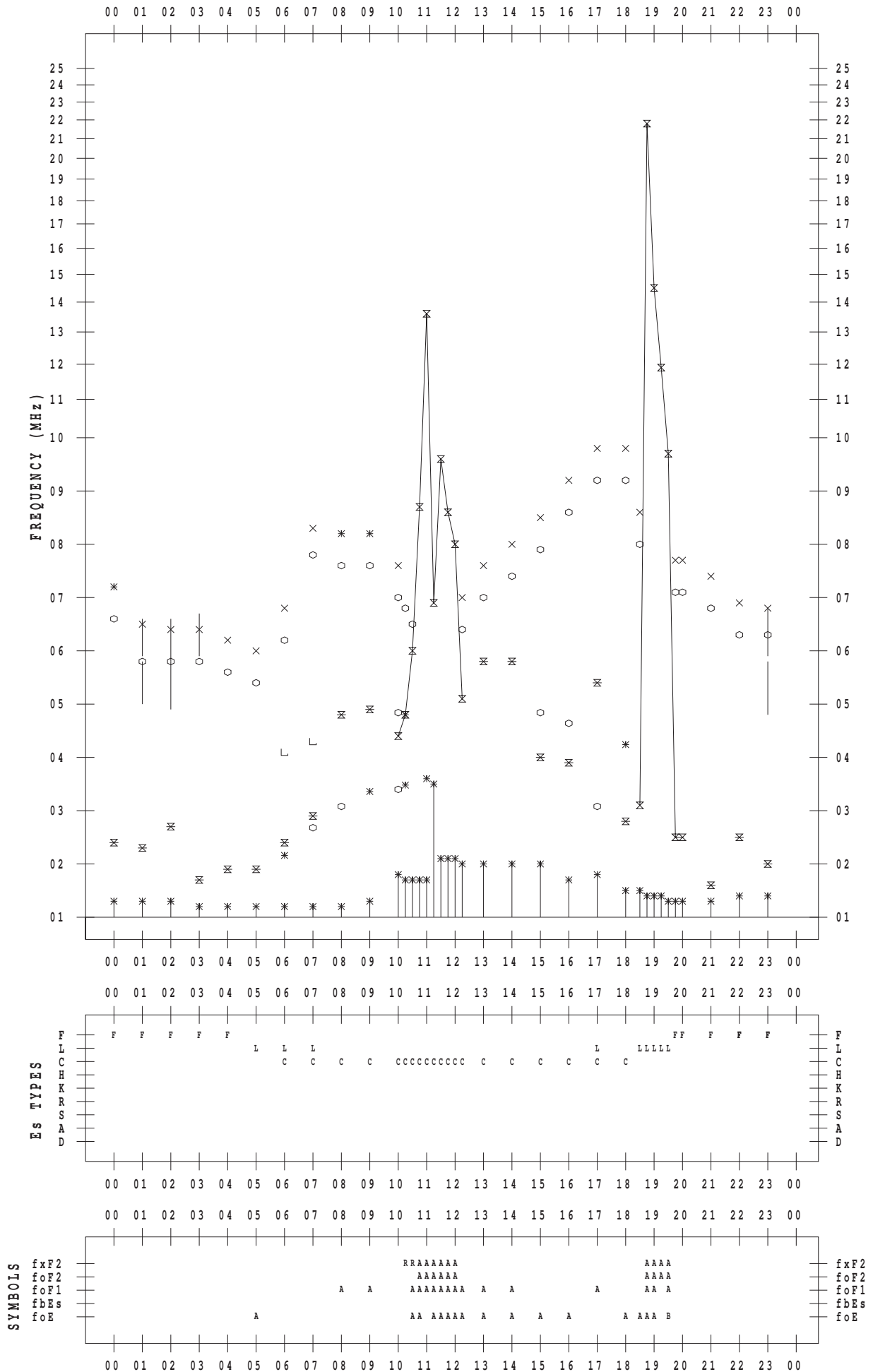
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 28

135 ° E MEAN TIME



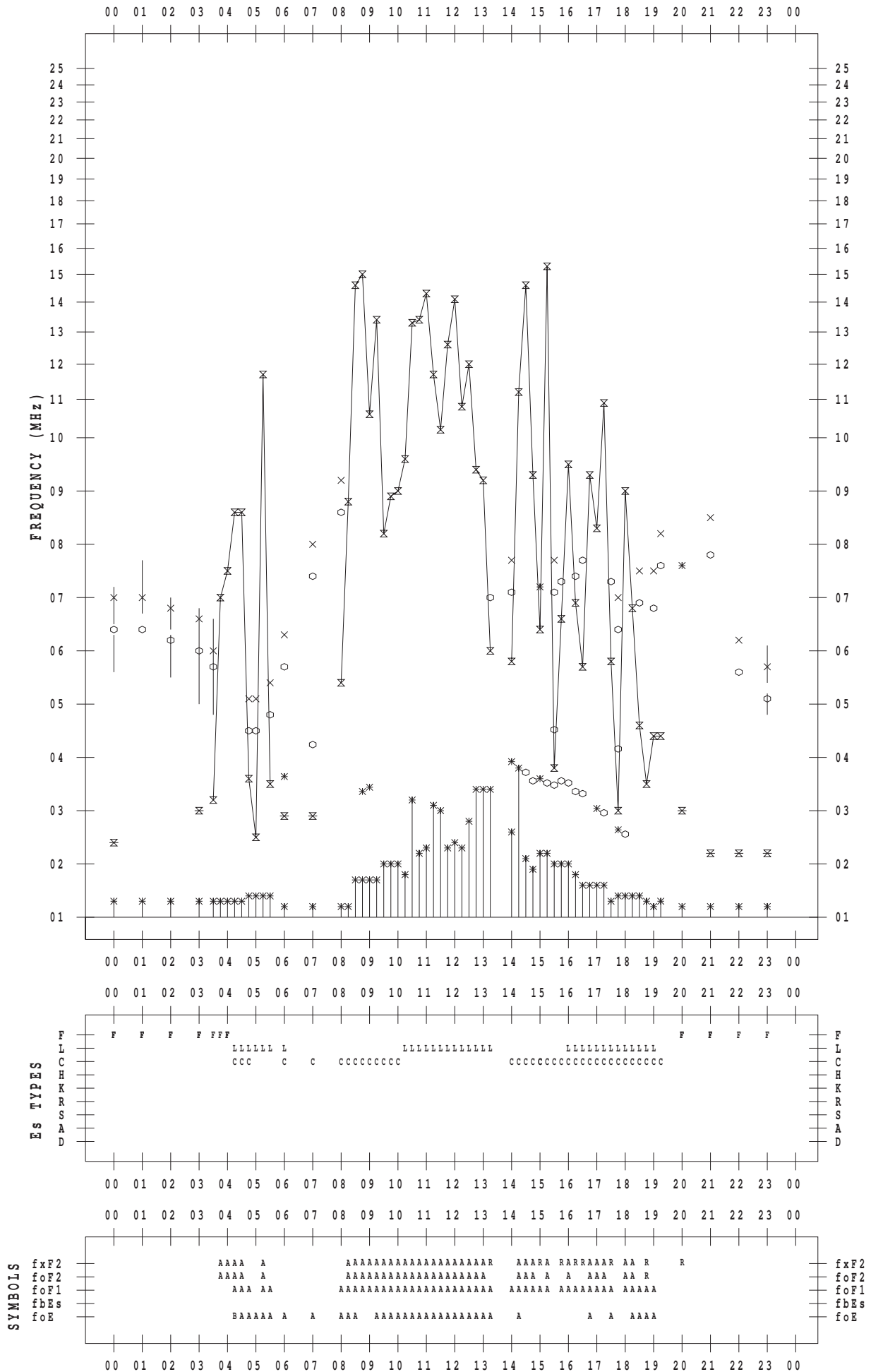
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012 / 6 / 29

135 ° E MEAN TIME



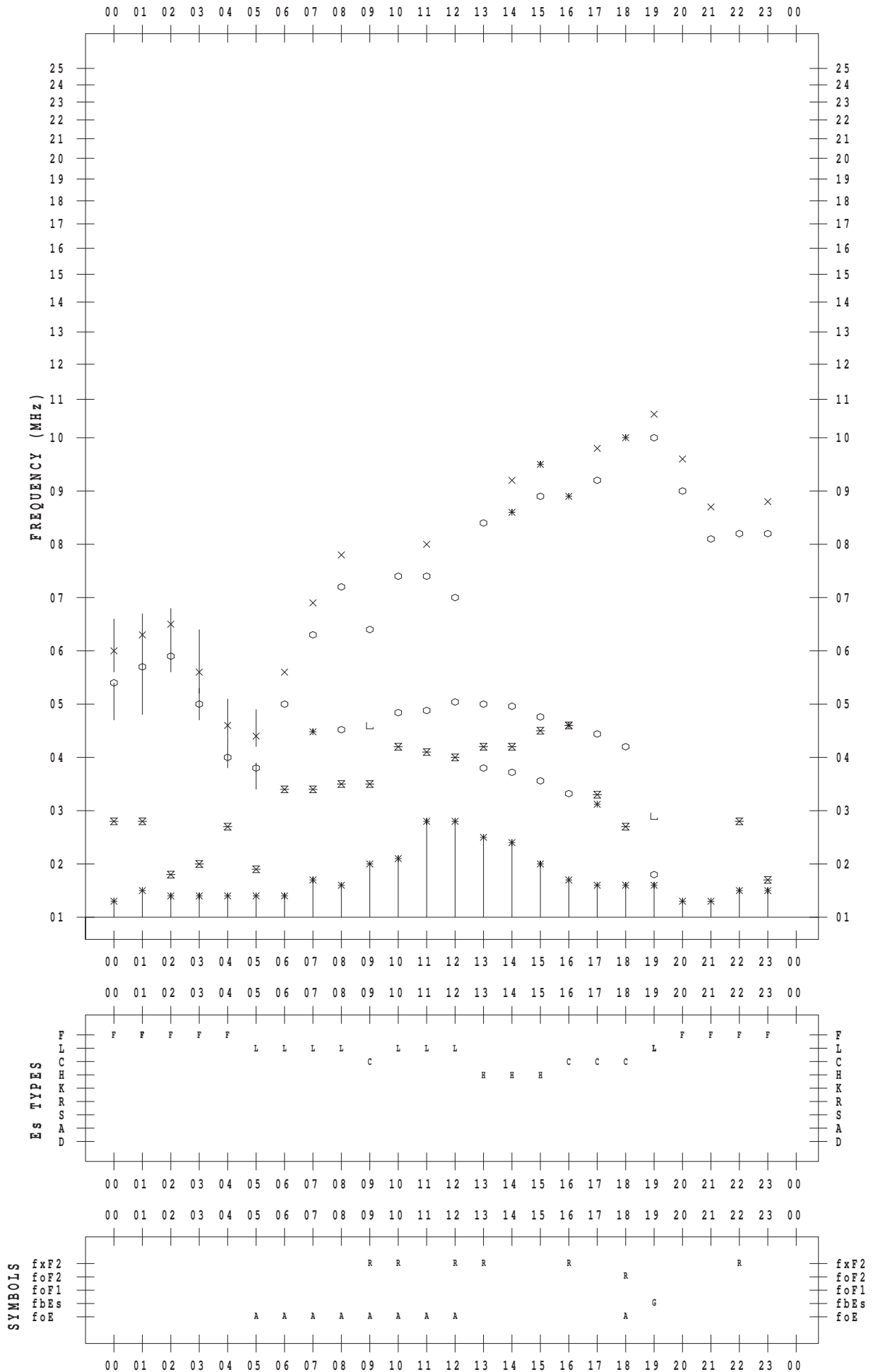
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STATION : Yamagawa

DATE : 2012 / 6 / 30

135 ° E MEAN TIME



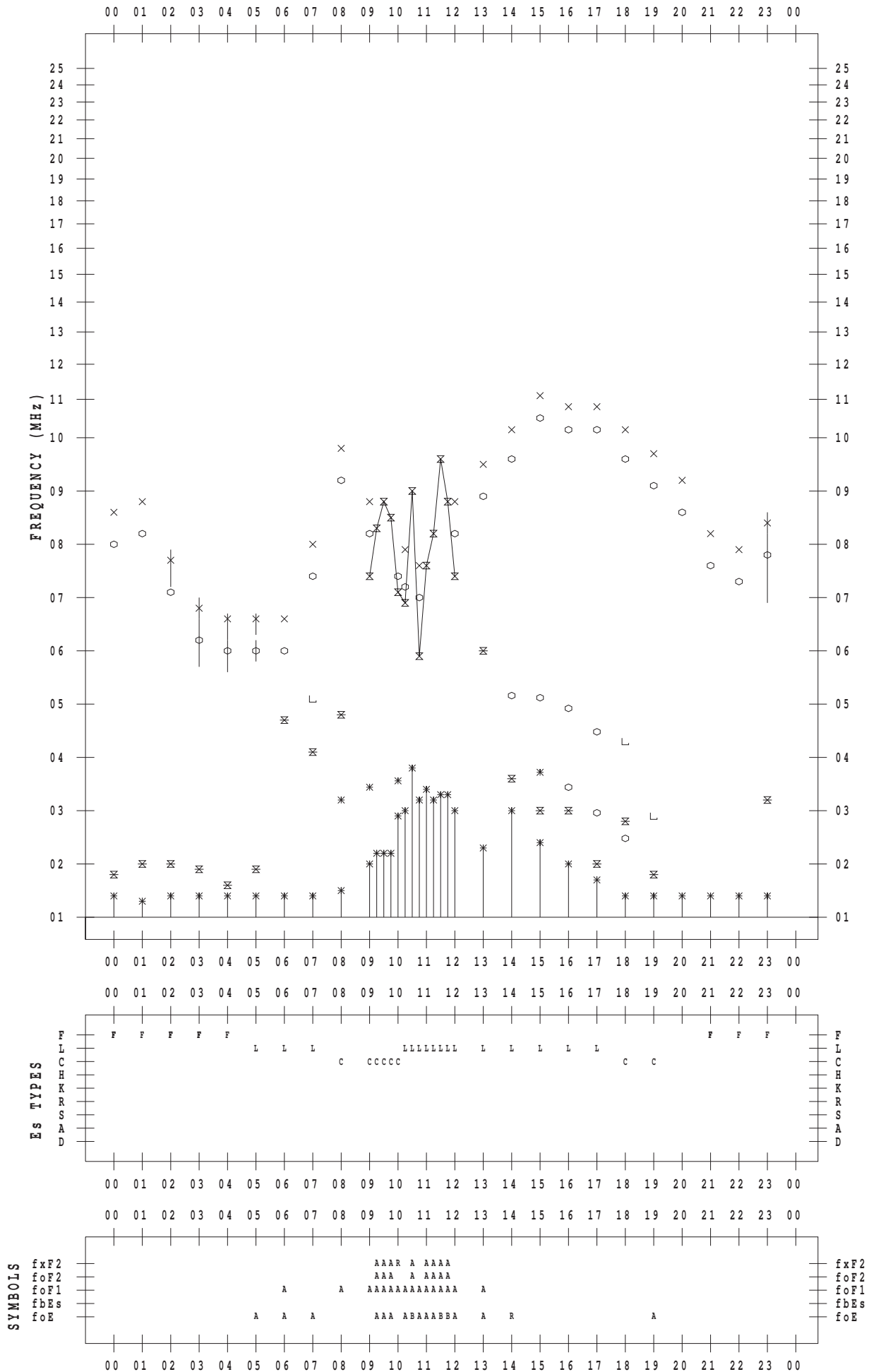
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 1

135 ° E MEAN TIME



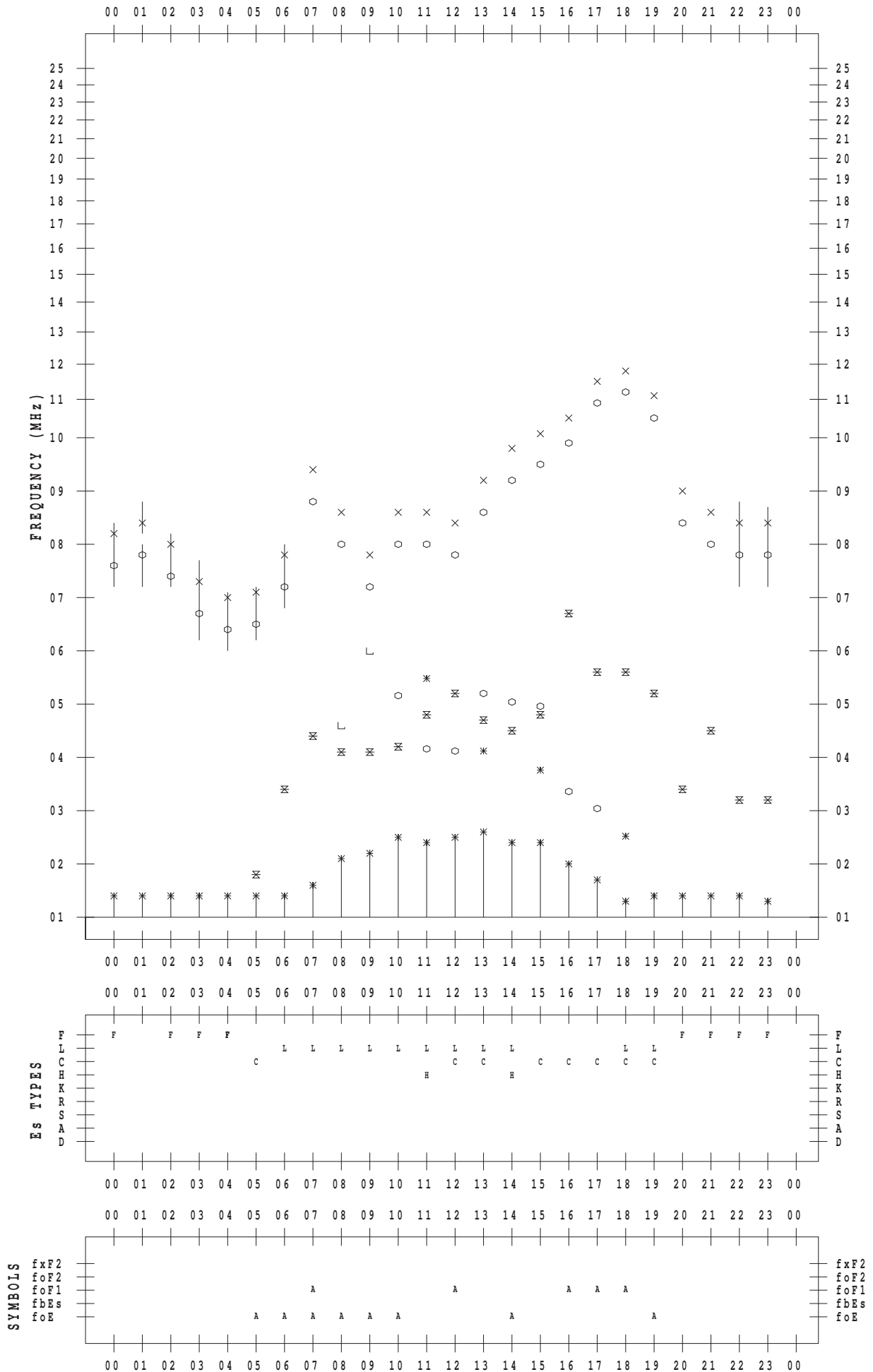
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DATE : 2012 / 6 / 2

135 ° E MEAN TIME



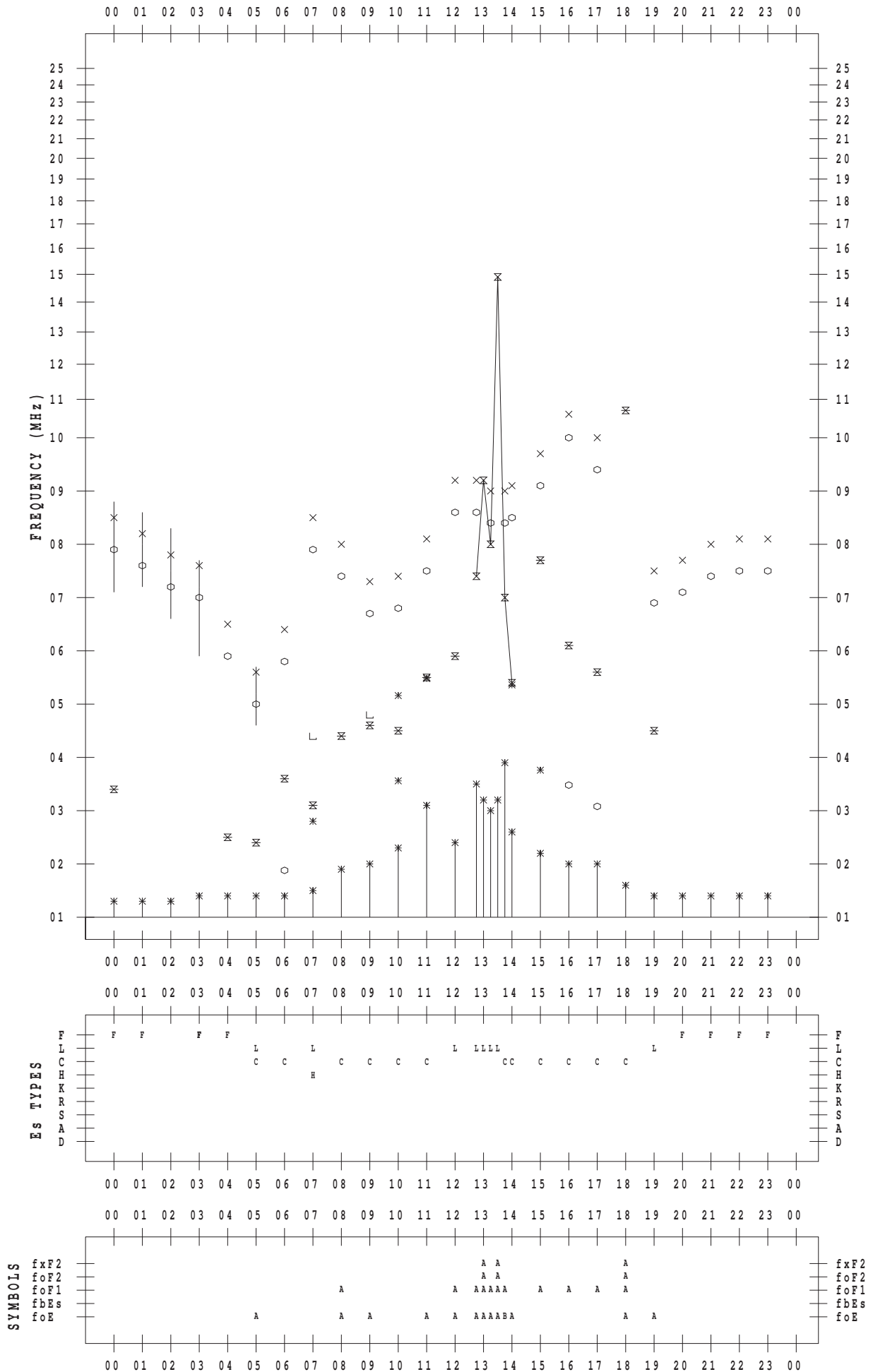
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STATION : Okinawa

DATE : 2012 / 6 / 3

135 ° E MEAN TIME



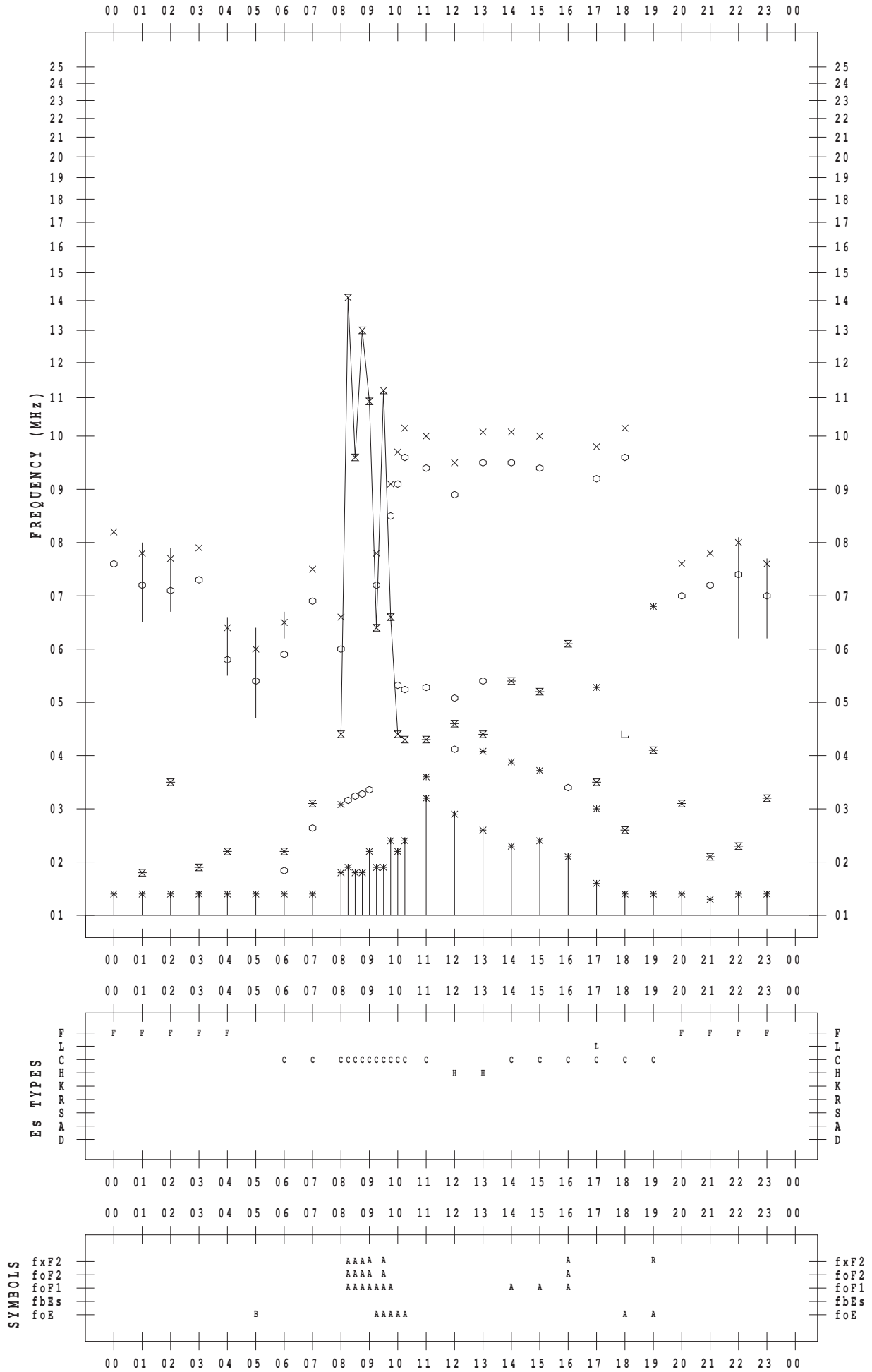
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 4

135 ° E MEAN TIME



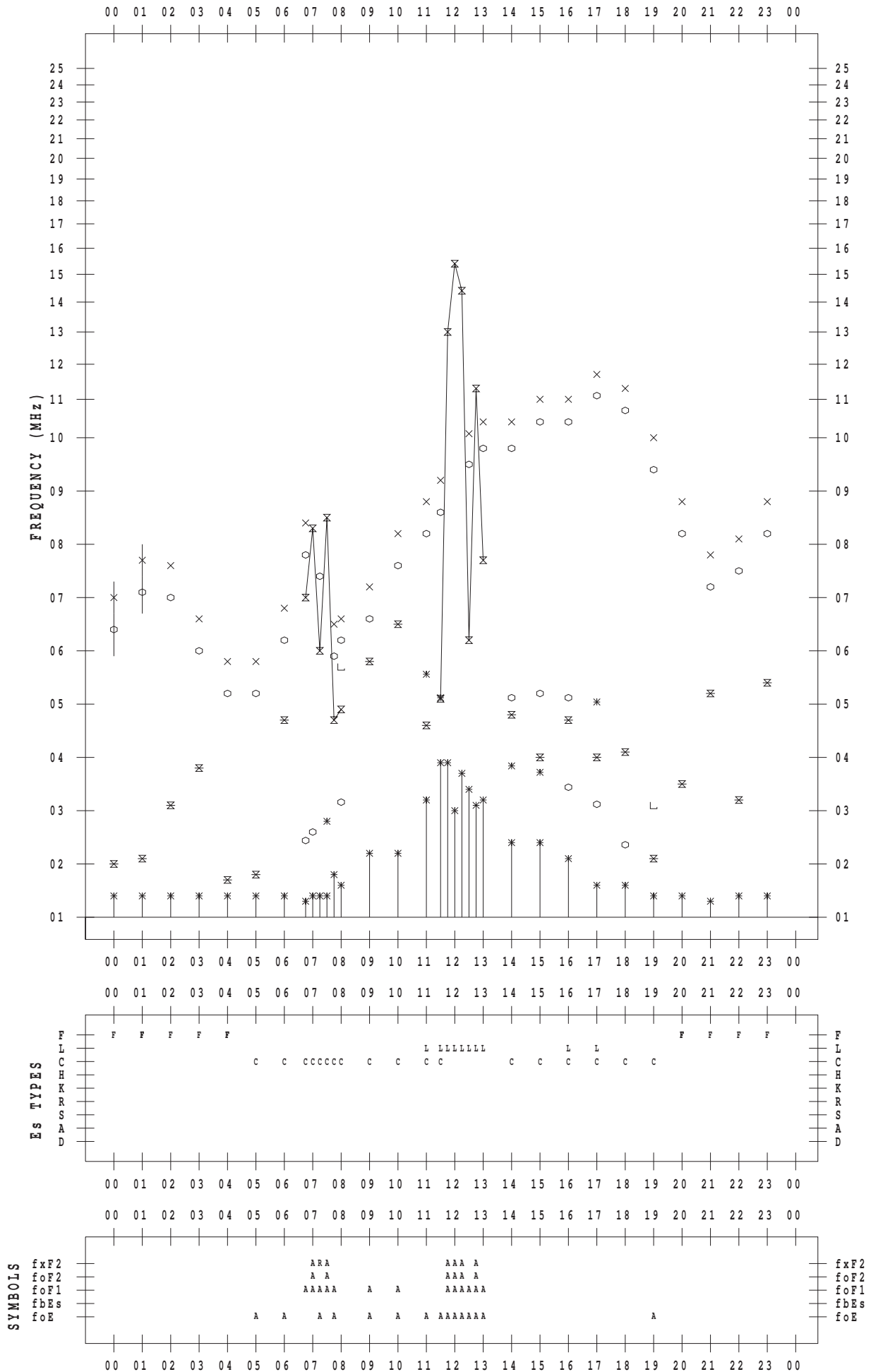
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 5

135 ° E MEAN TIME



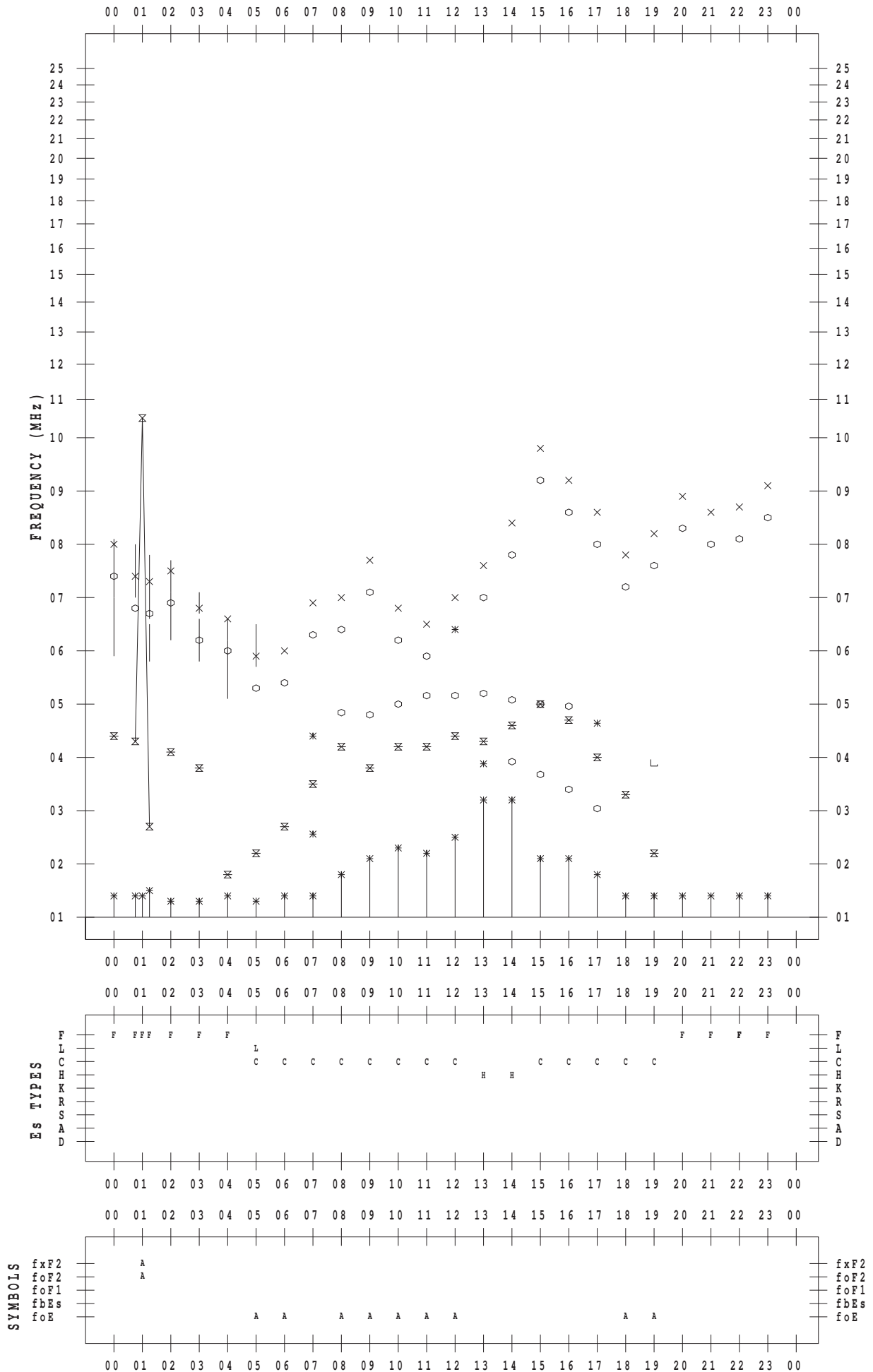
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 6

135 ° E MEAN TIME



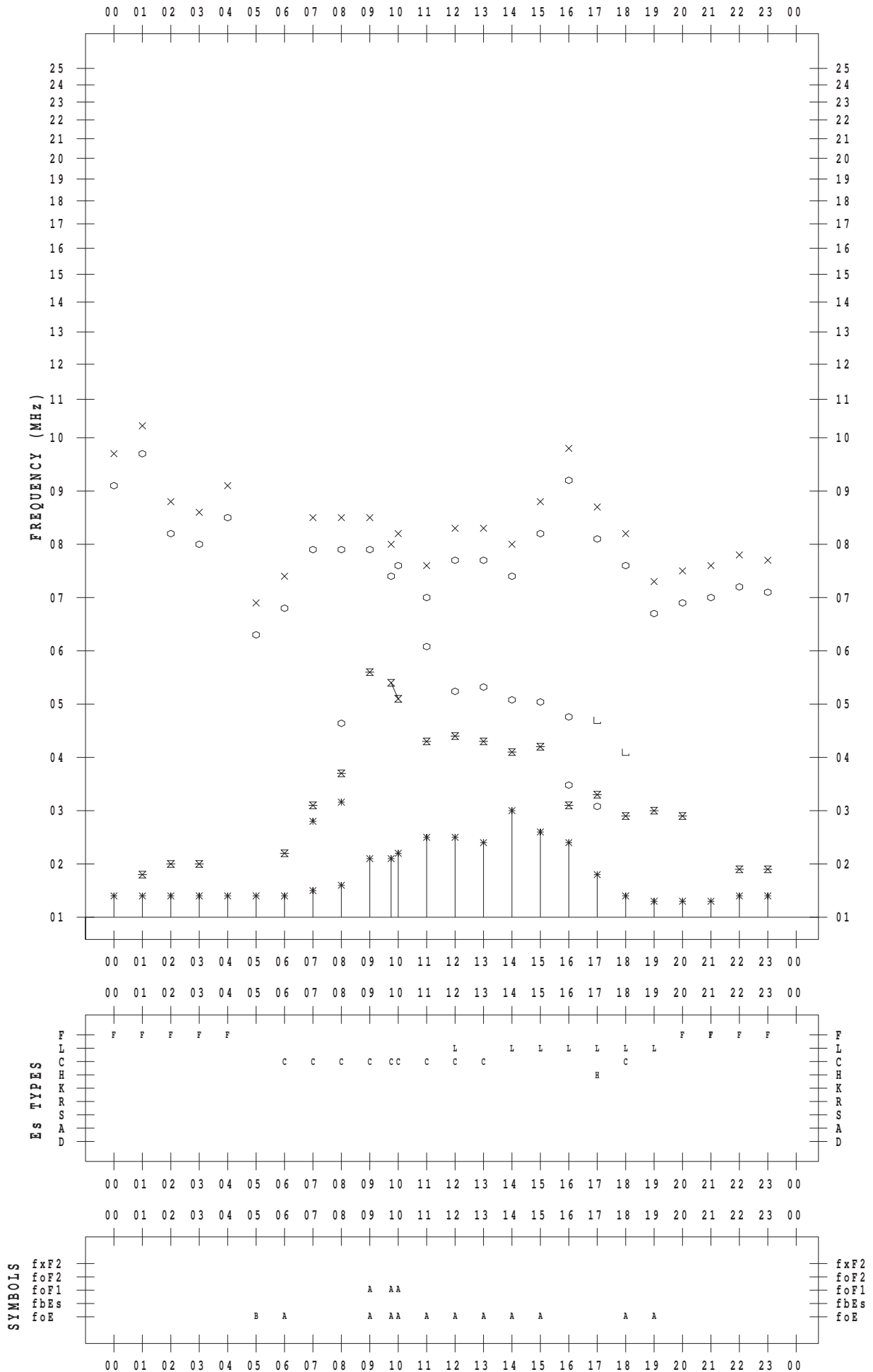
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 7

135 ° E MEAN TIME



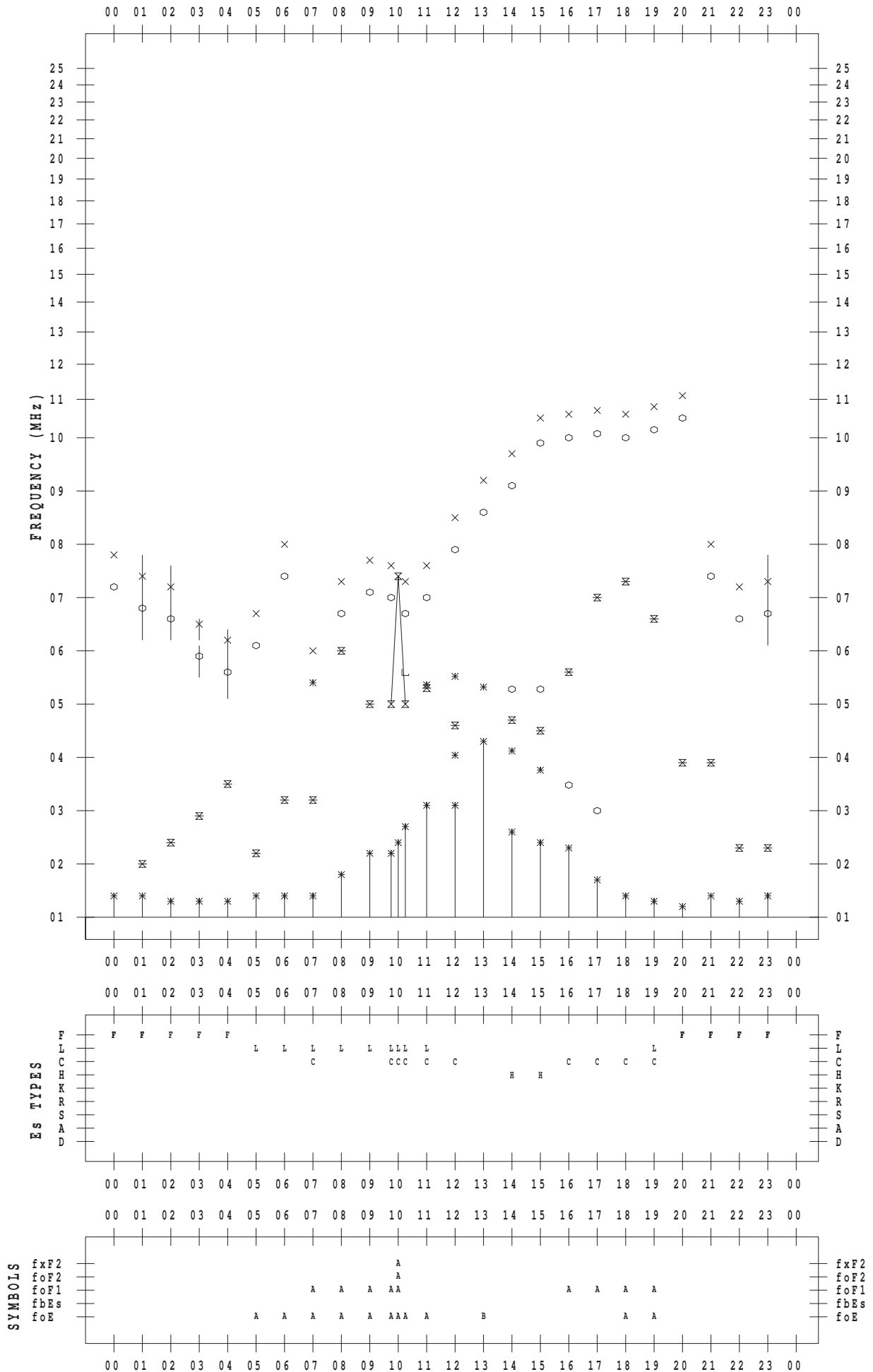
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STATION : Okinawa

DATE : 2012 / 6 / 8

135 ° E MEAN TIME



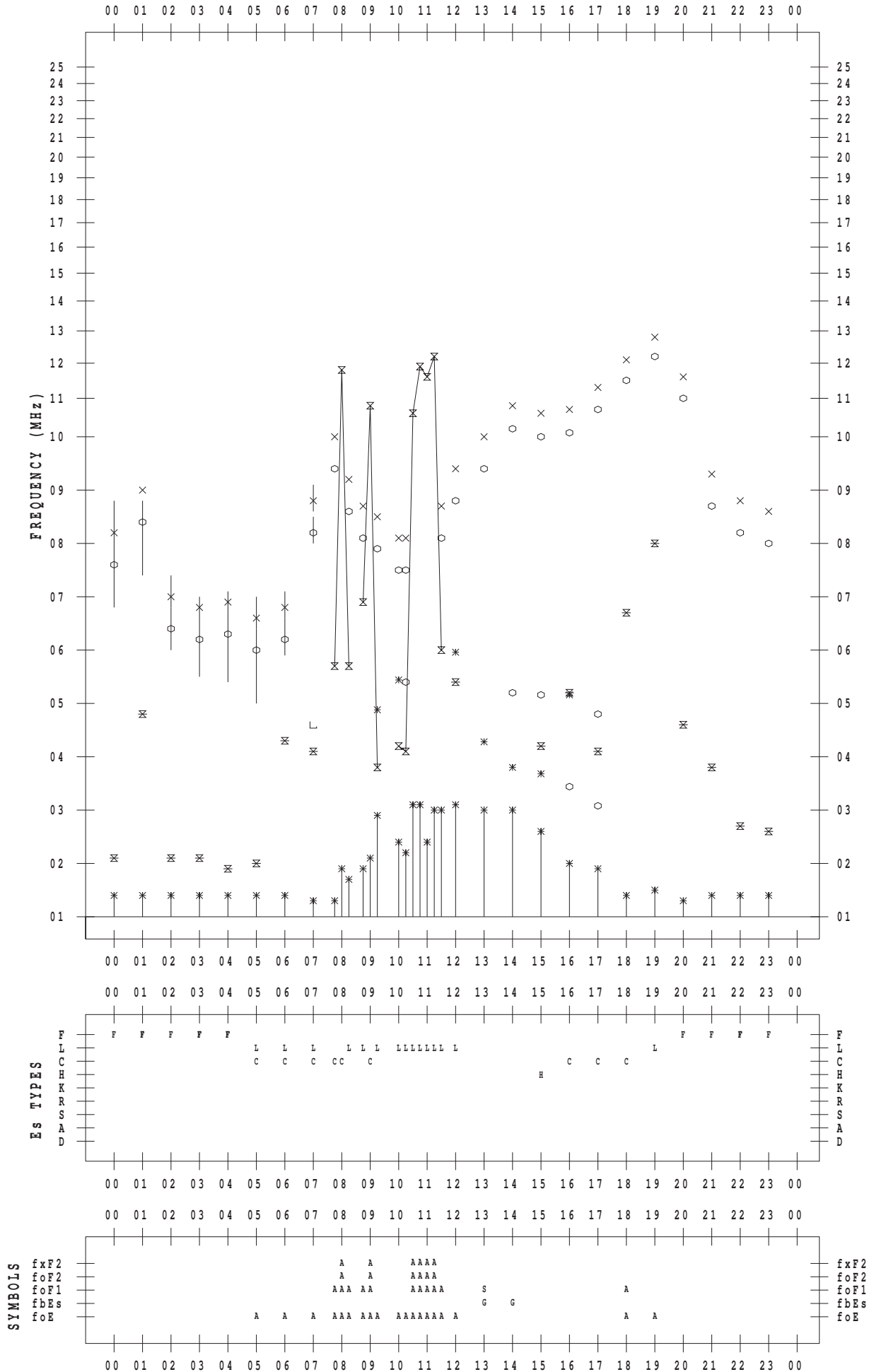
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STATION : Okinawa

DATE : 2012 / 6 / 9

135 ° E MEAN TIME



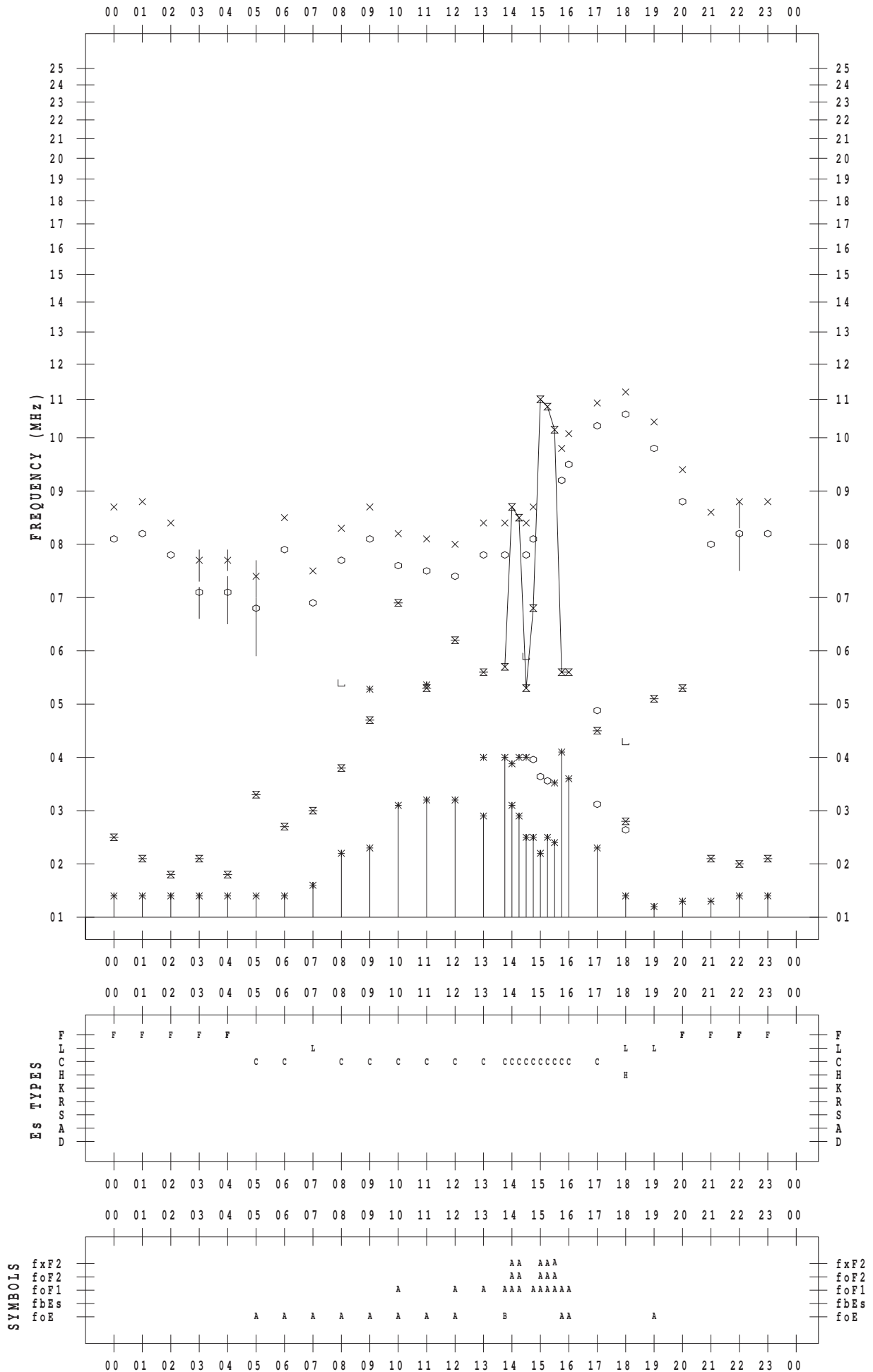
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 10

135 ° E MEAN TIME



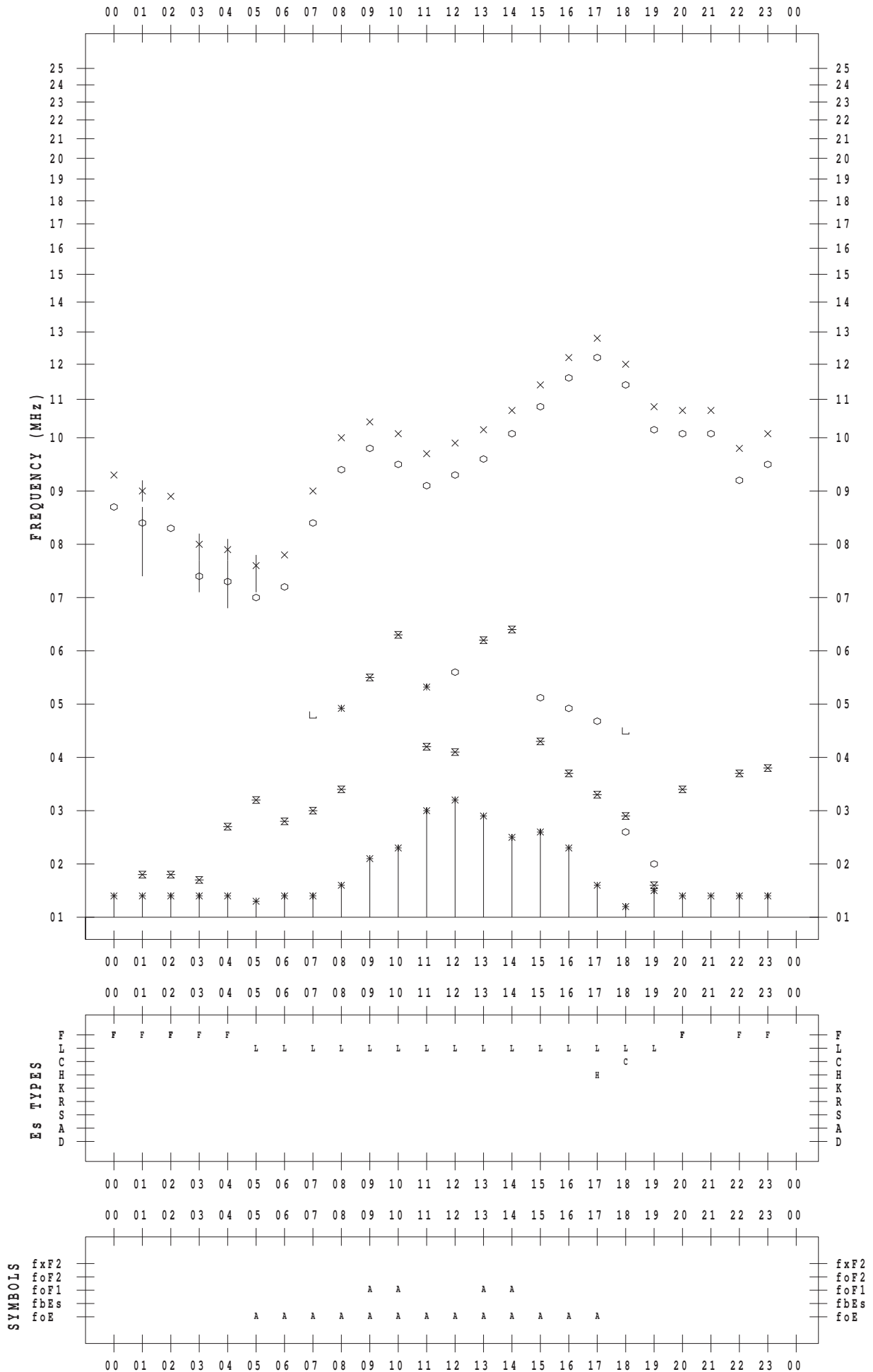
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 11

135 ° E MEAN TIME



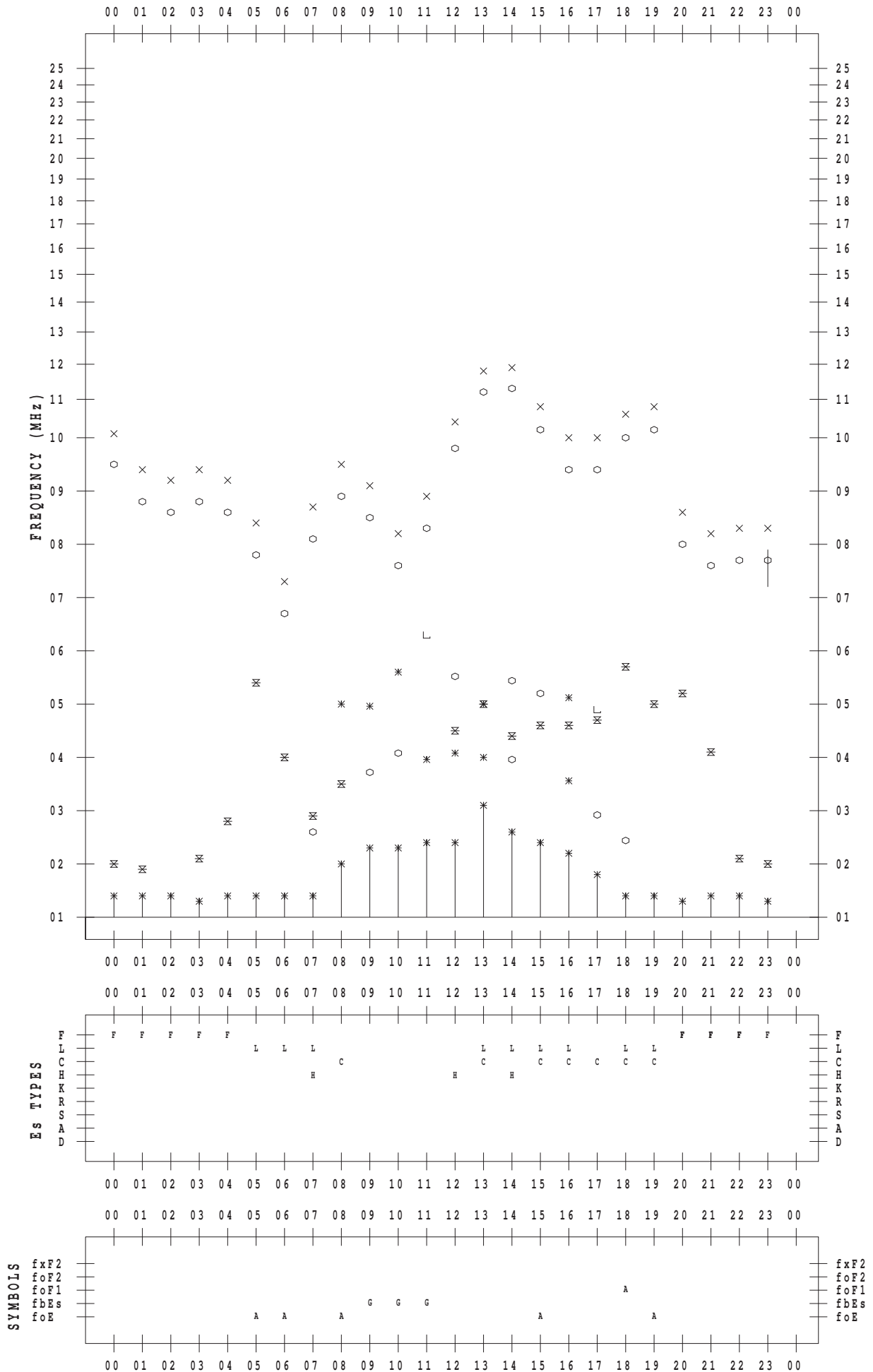
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 12

135 ° E MEAN TIME



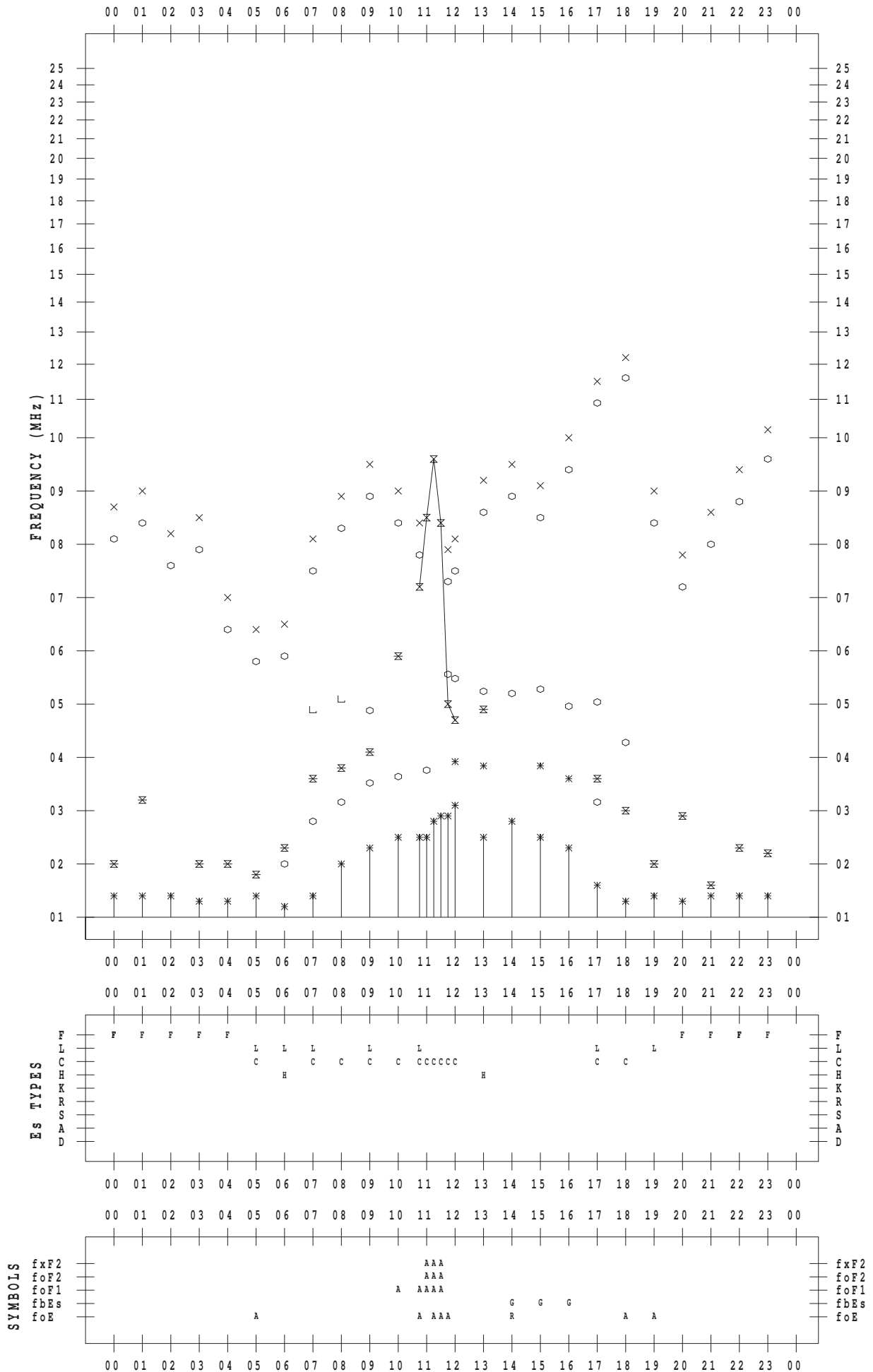
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/ 6/13

135 ° E MEAN TIME



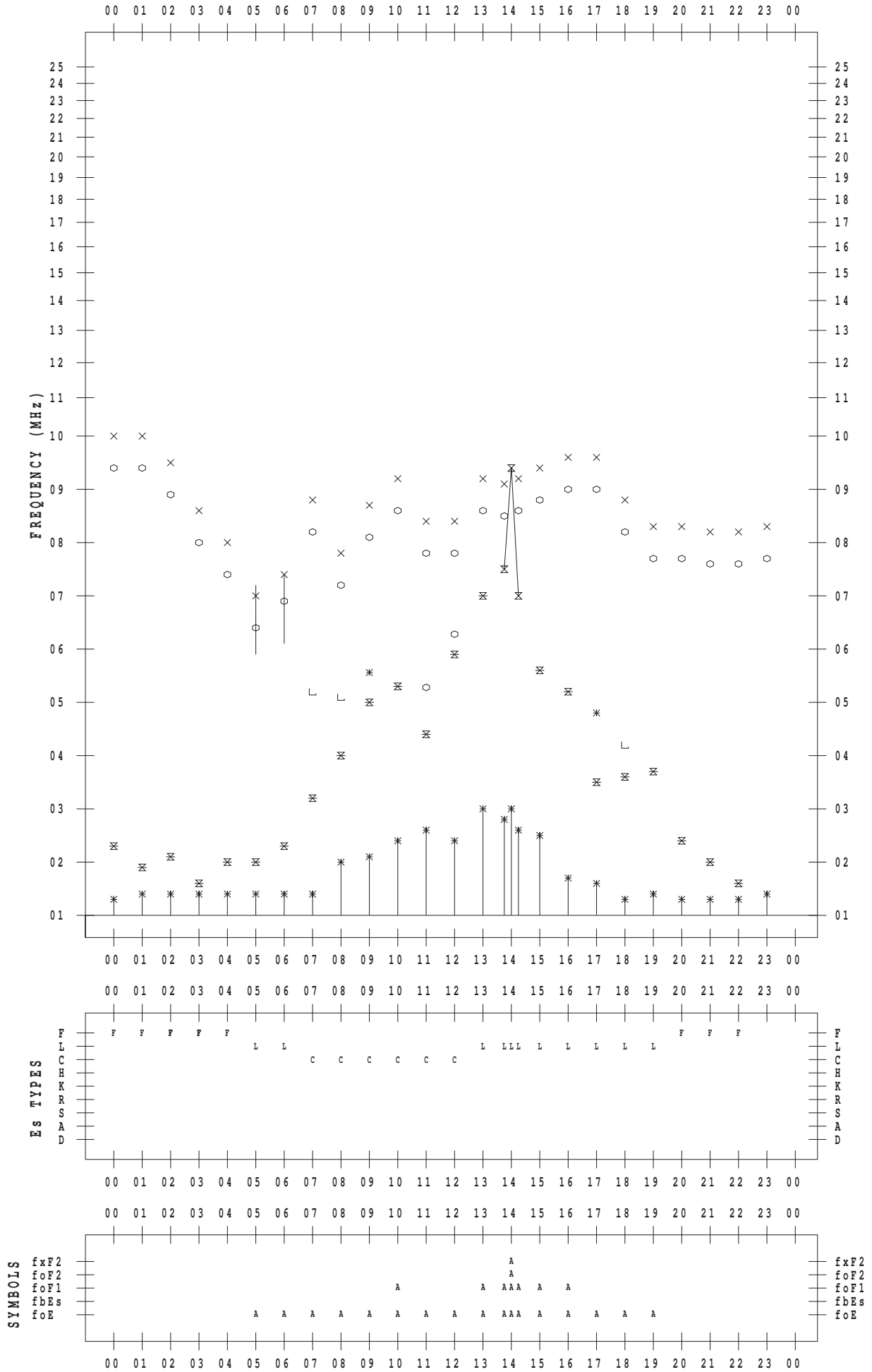
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 14

135 ° E MEAN TIME



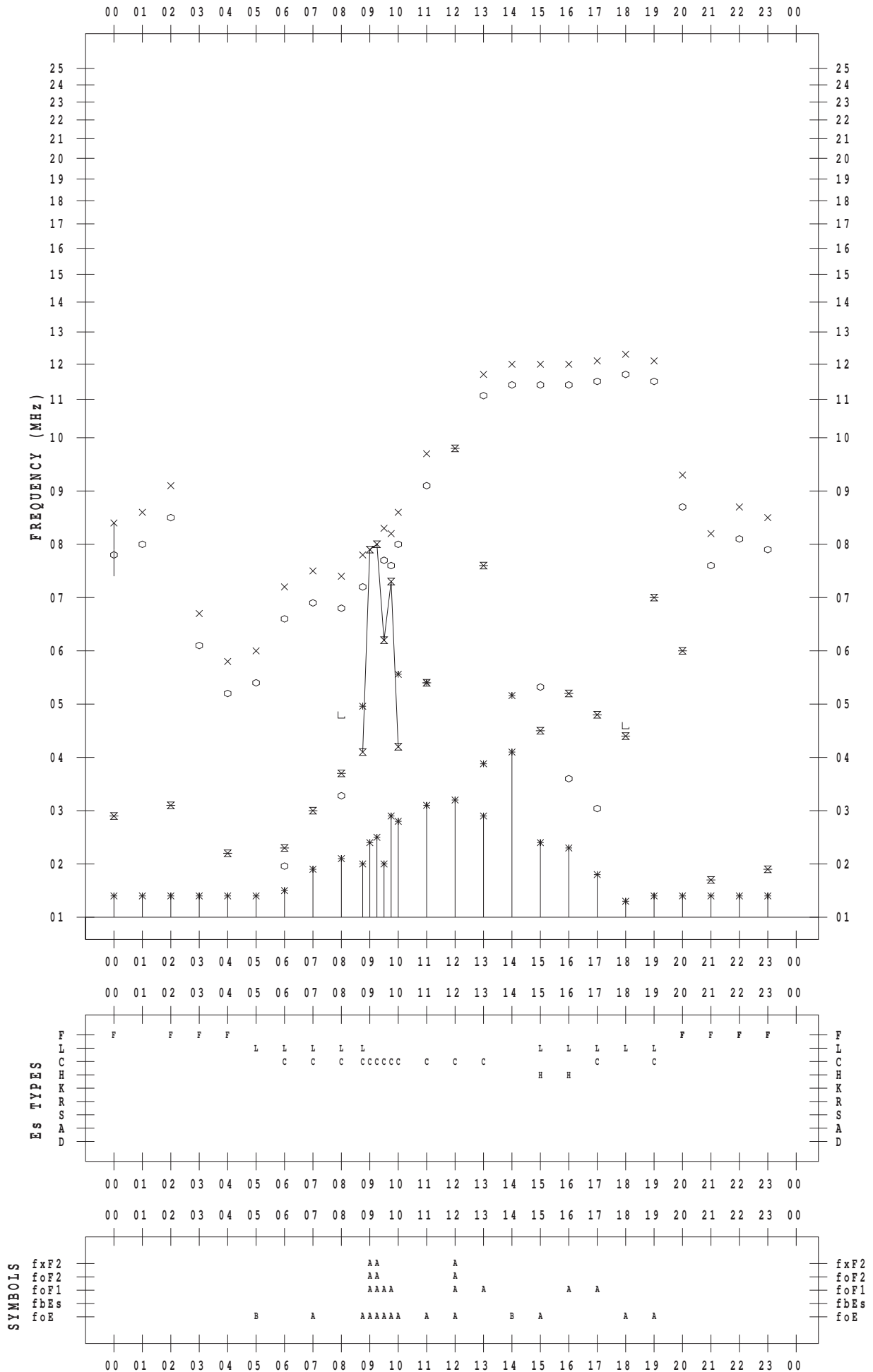
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 15

135 ° E MEAN TIME



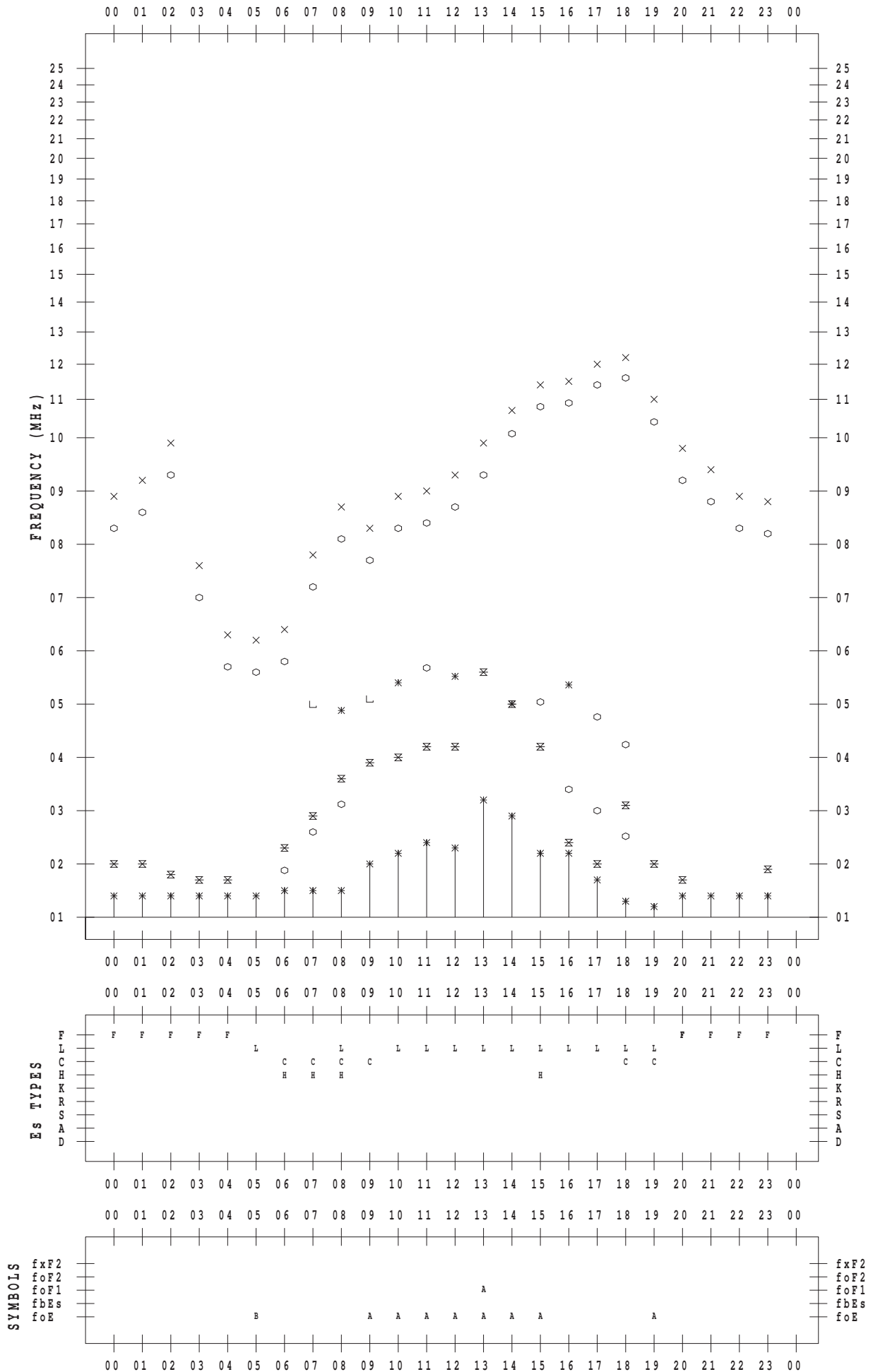
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/ 6/16

135 ° E MEAN TIME



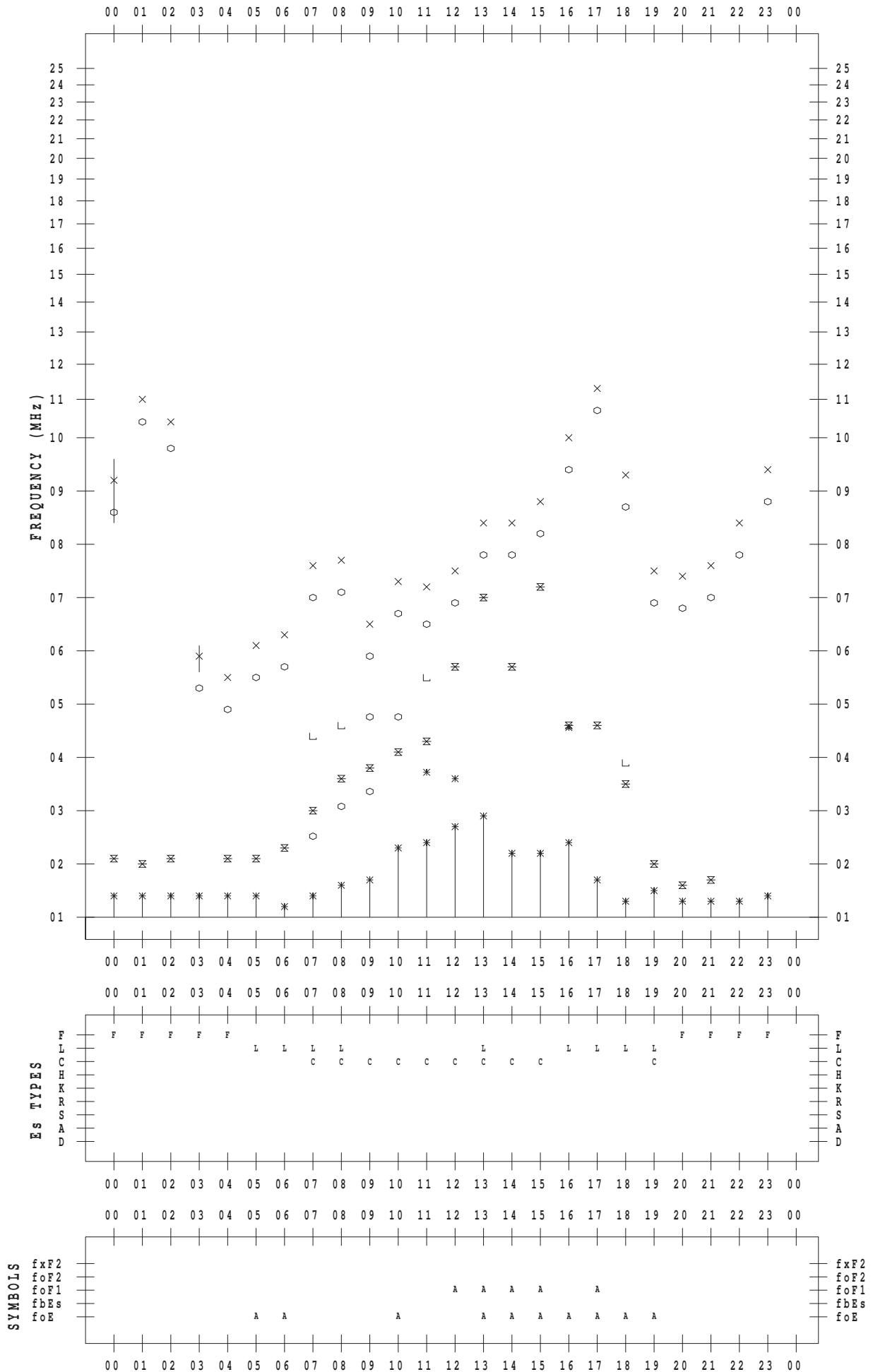
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 17

135 ° E MEAN TIME



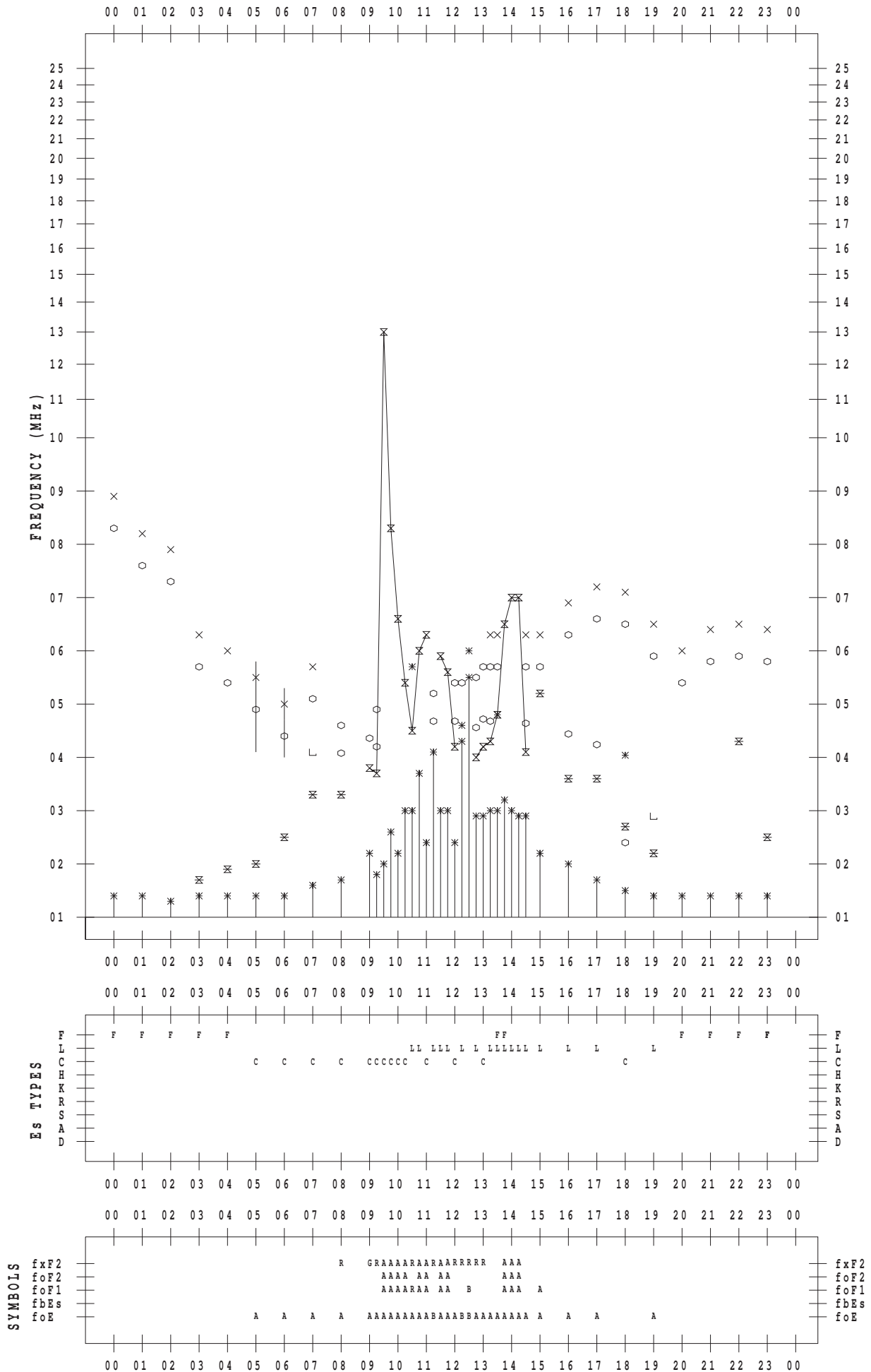
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STATION : Okinawa

DATE : 2012 / 6 / 18

135 ° E MEAN TIME



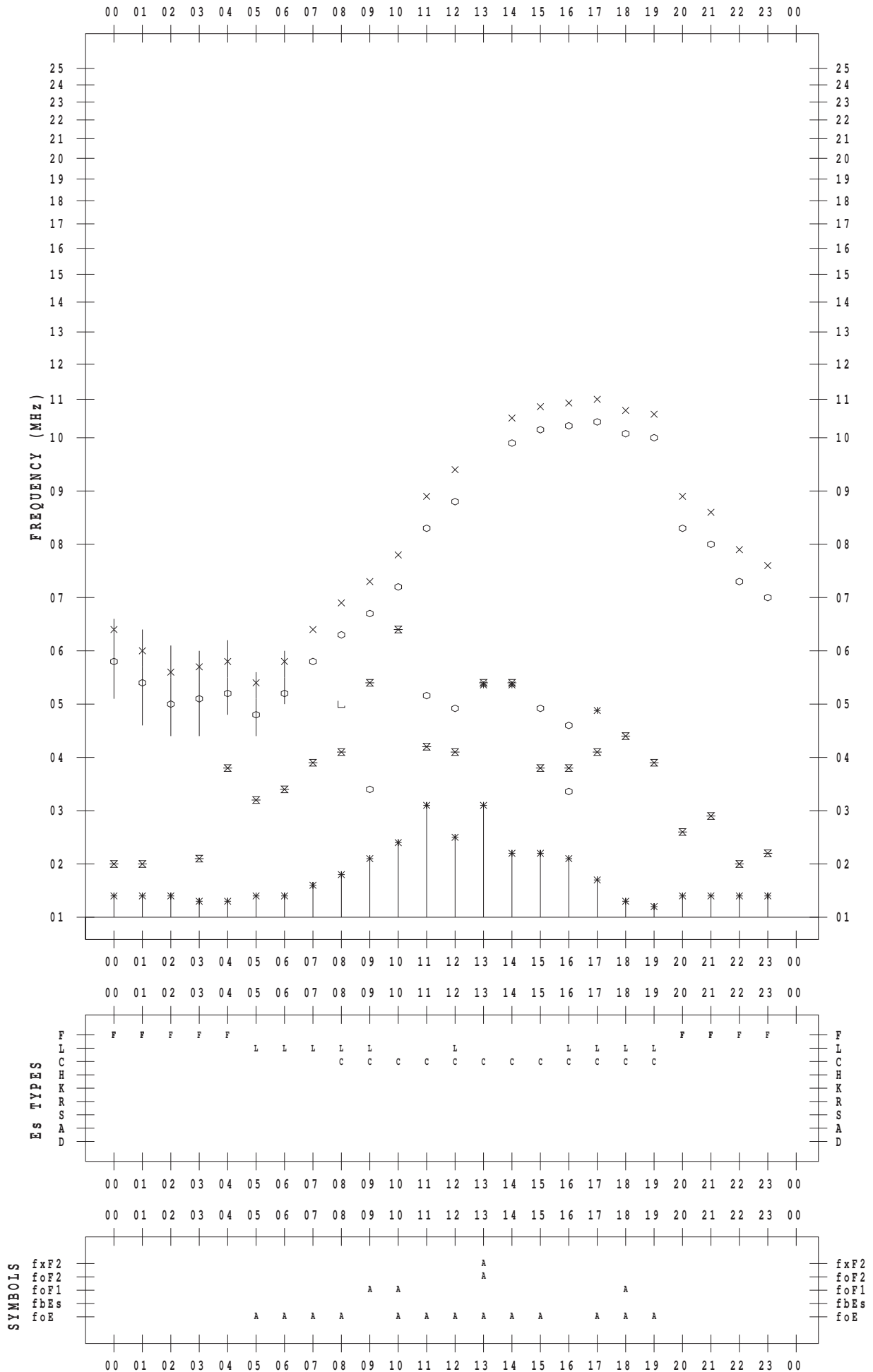
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STATION : Okinawa

DATE : 2012 / 6 / 19

135 ° E MEAN TIME



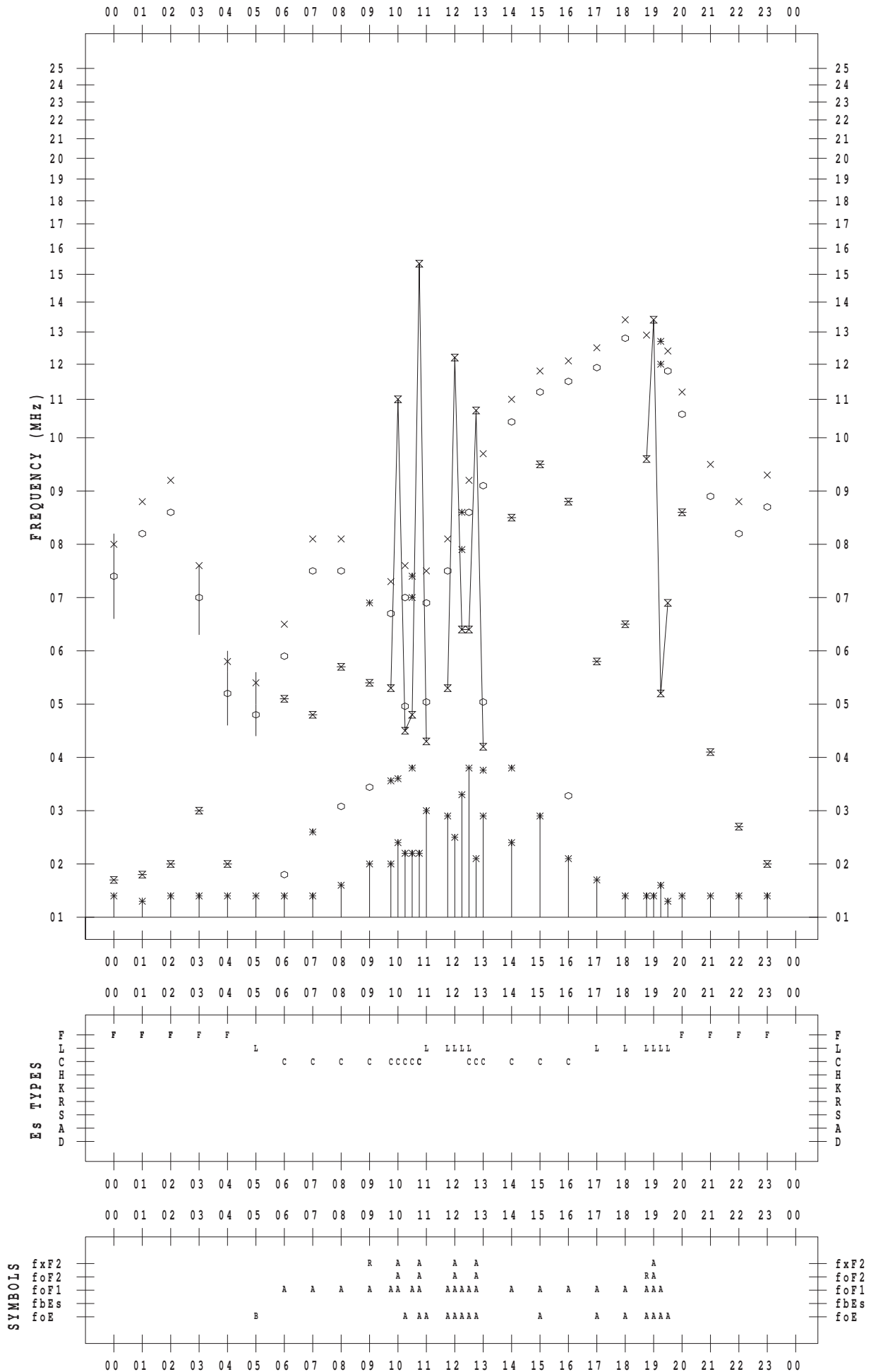
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DATE : 2012 / 6 / 20

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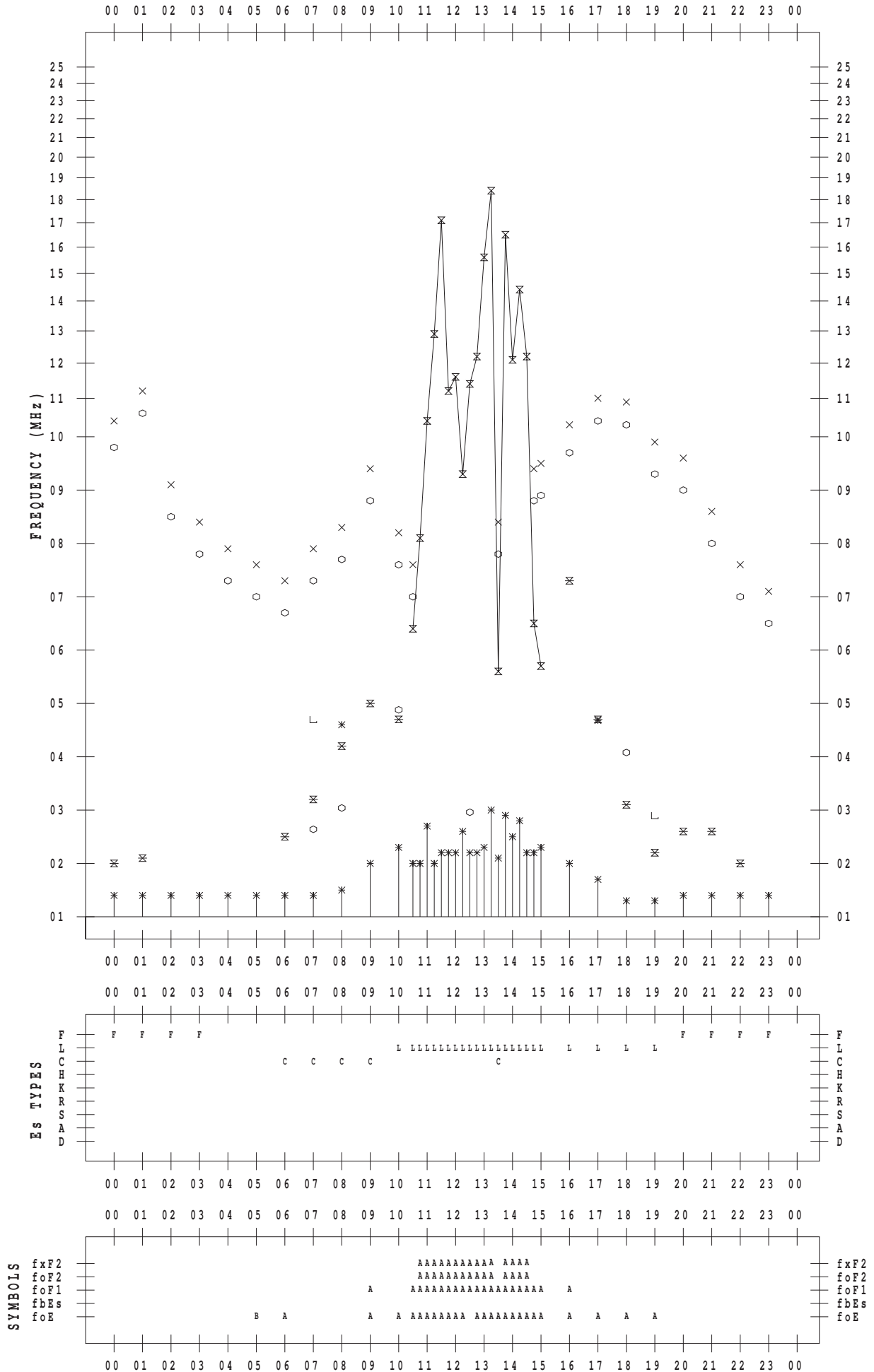
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STATION : Okinawa

DATE : 2012 / 6 / 21

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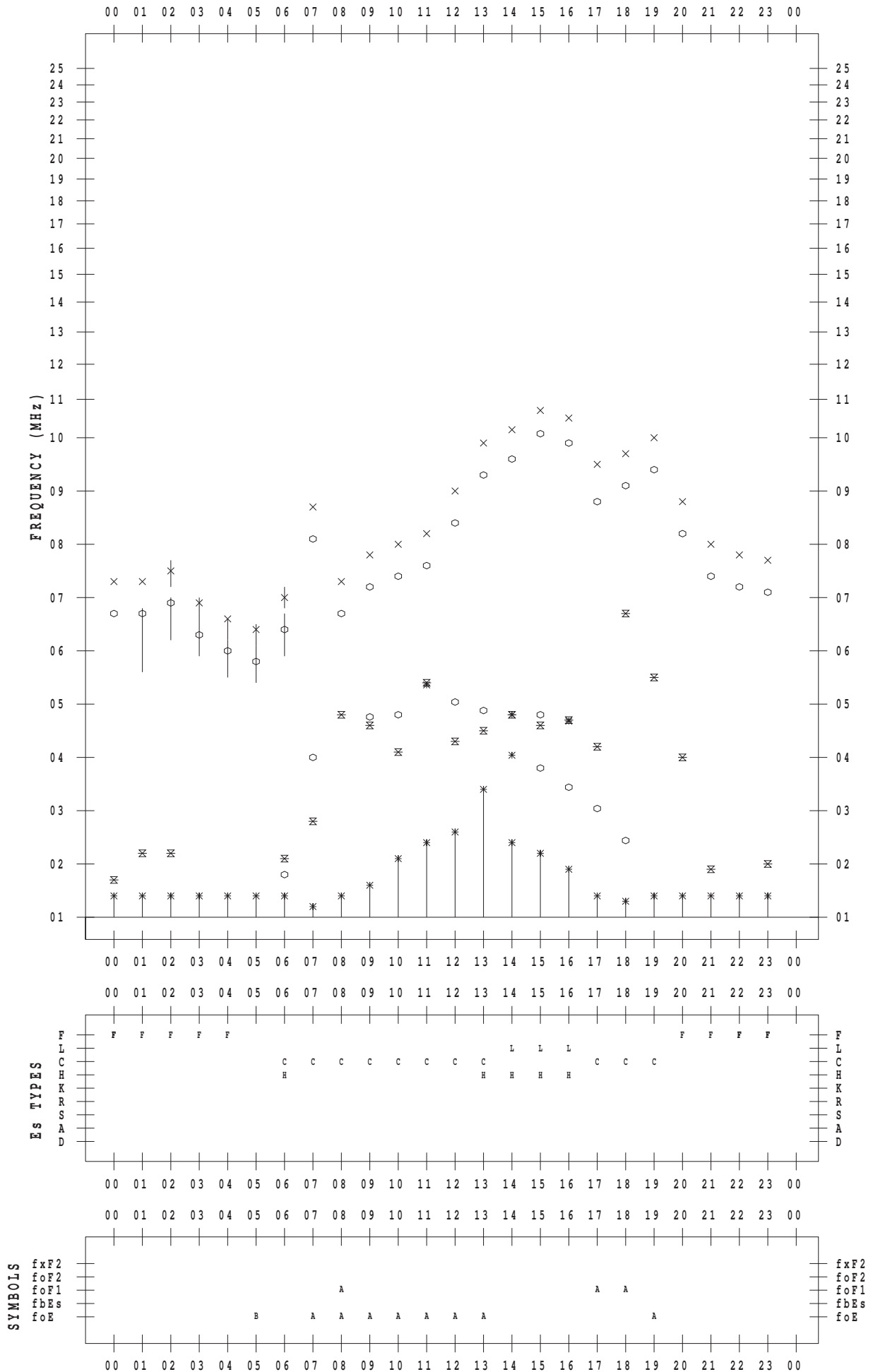
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 22

135 ° E MEAN TIME



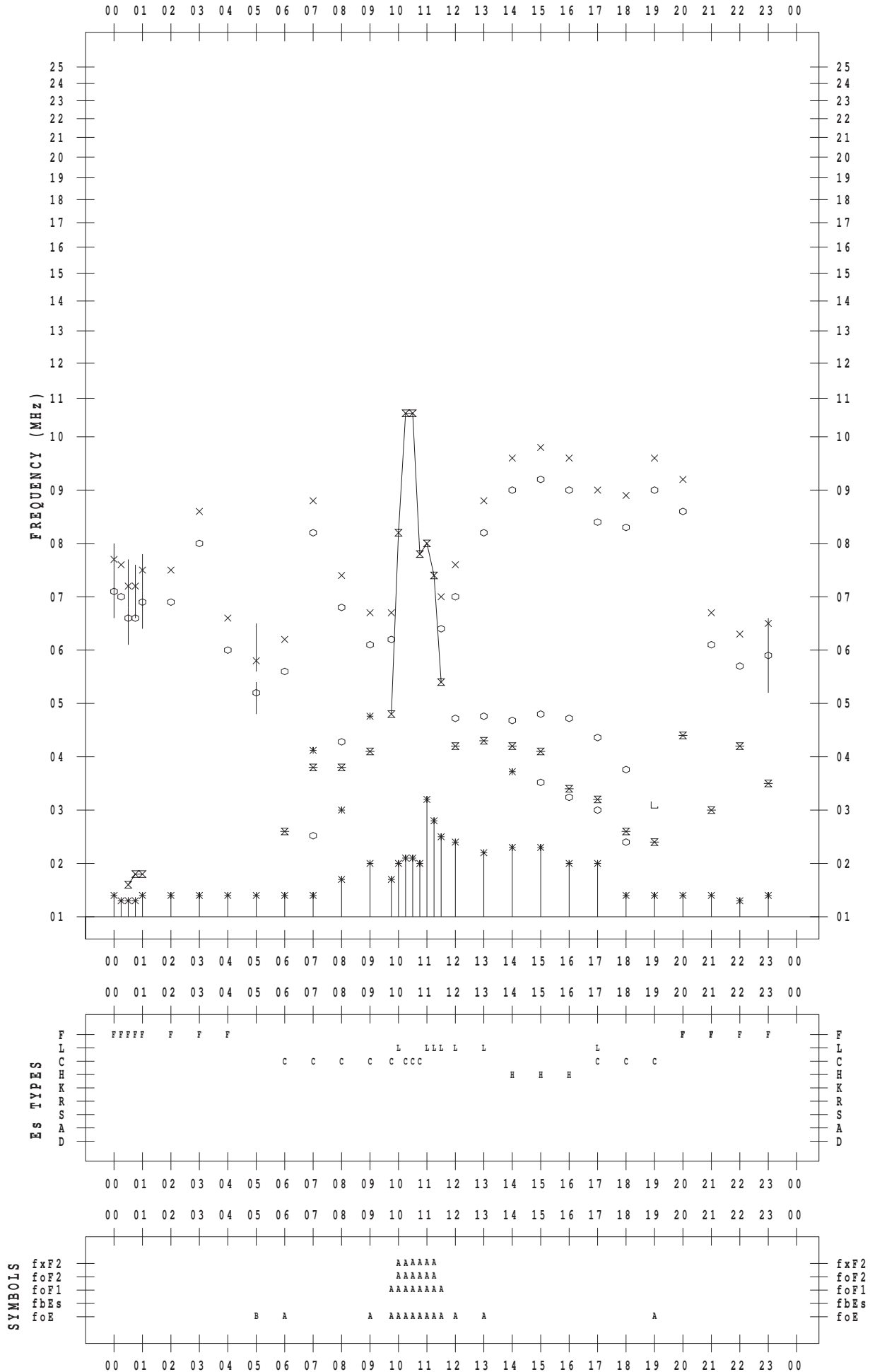
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STATION : Okinawa

DATE : 2012 / 6 / 23

135 ° E MEAN TIME



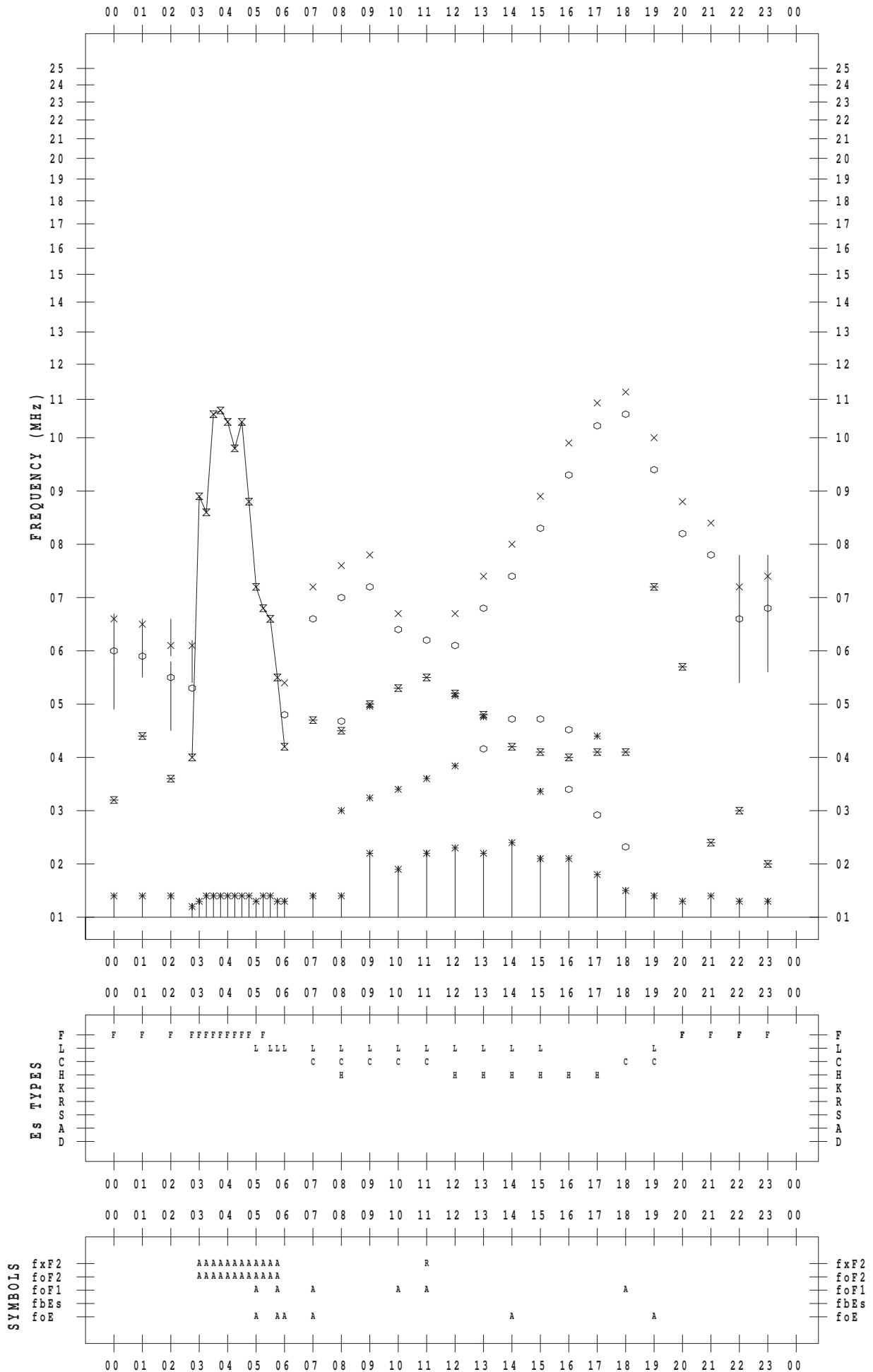
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 24

135 ° E MEAN TIME



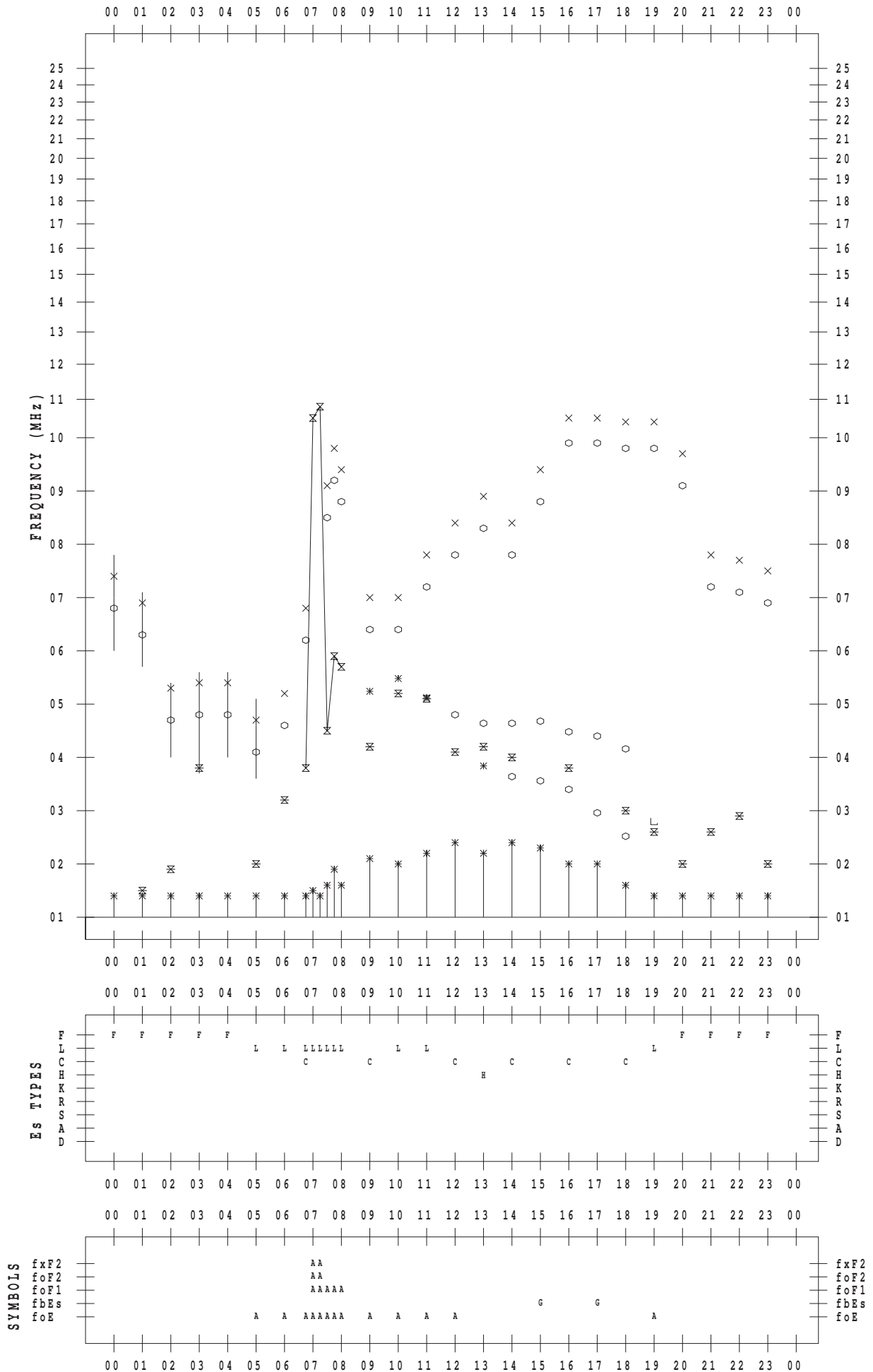
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STATION : Okinawa

DATE : 2012 / 6 / 25

135 ° E MEAN TIME



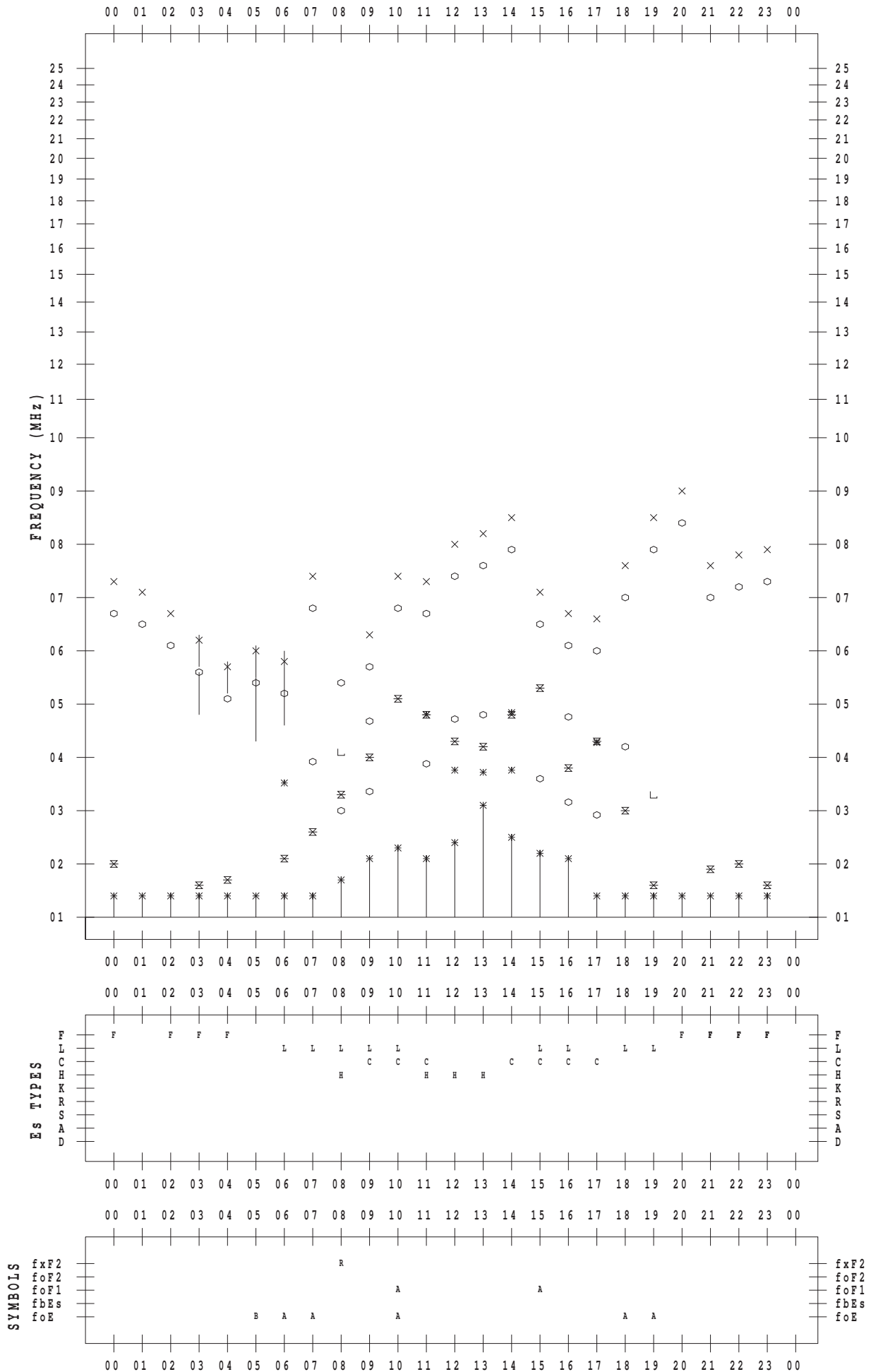
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DATE : 2012 / 6 / 26

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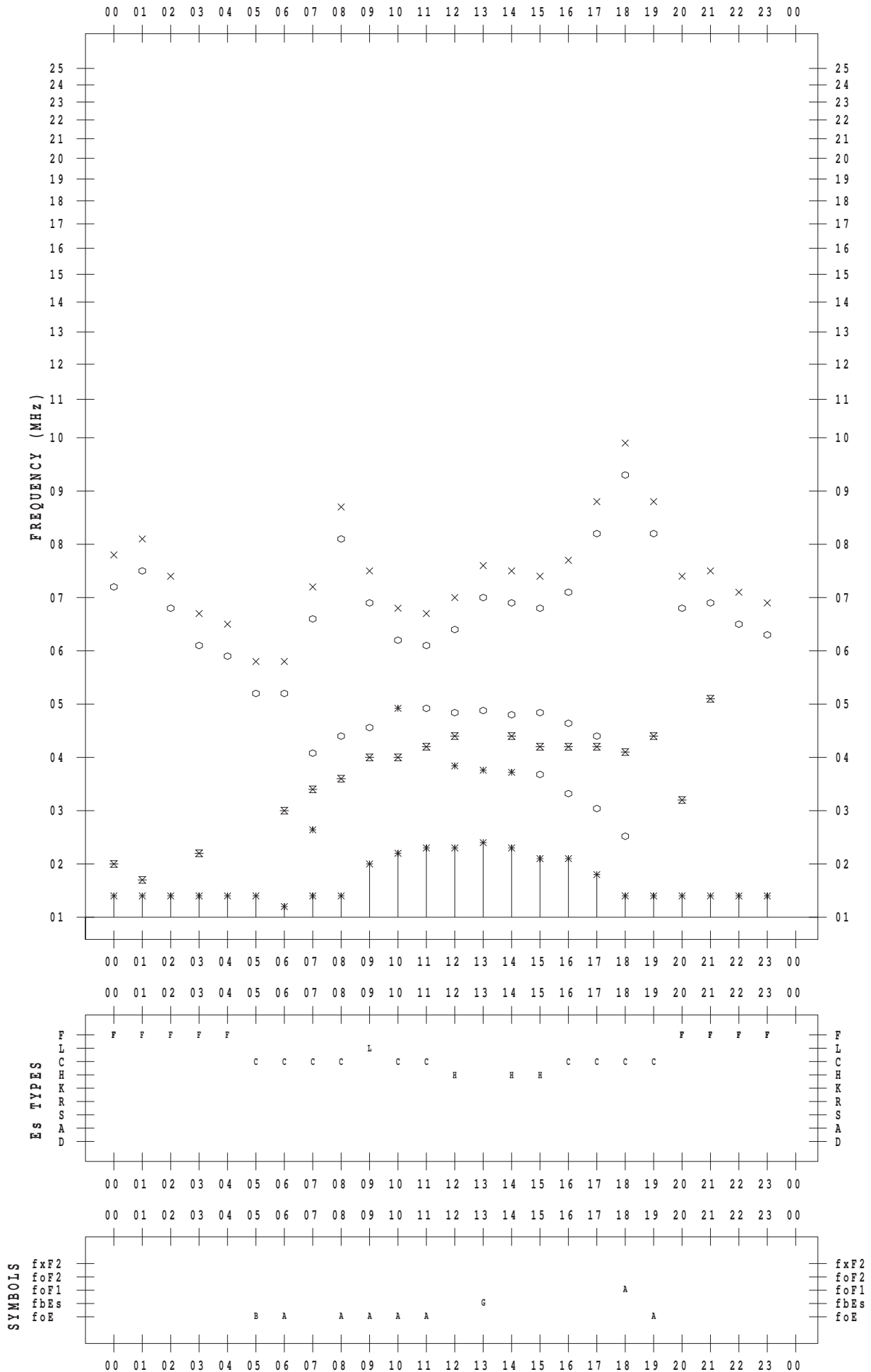
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DATE : 2012 / 6 / 27

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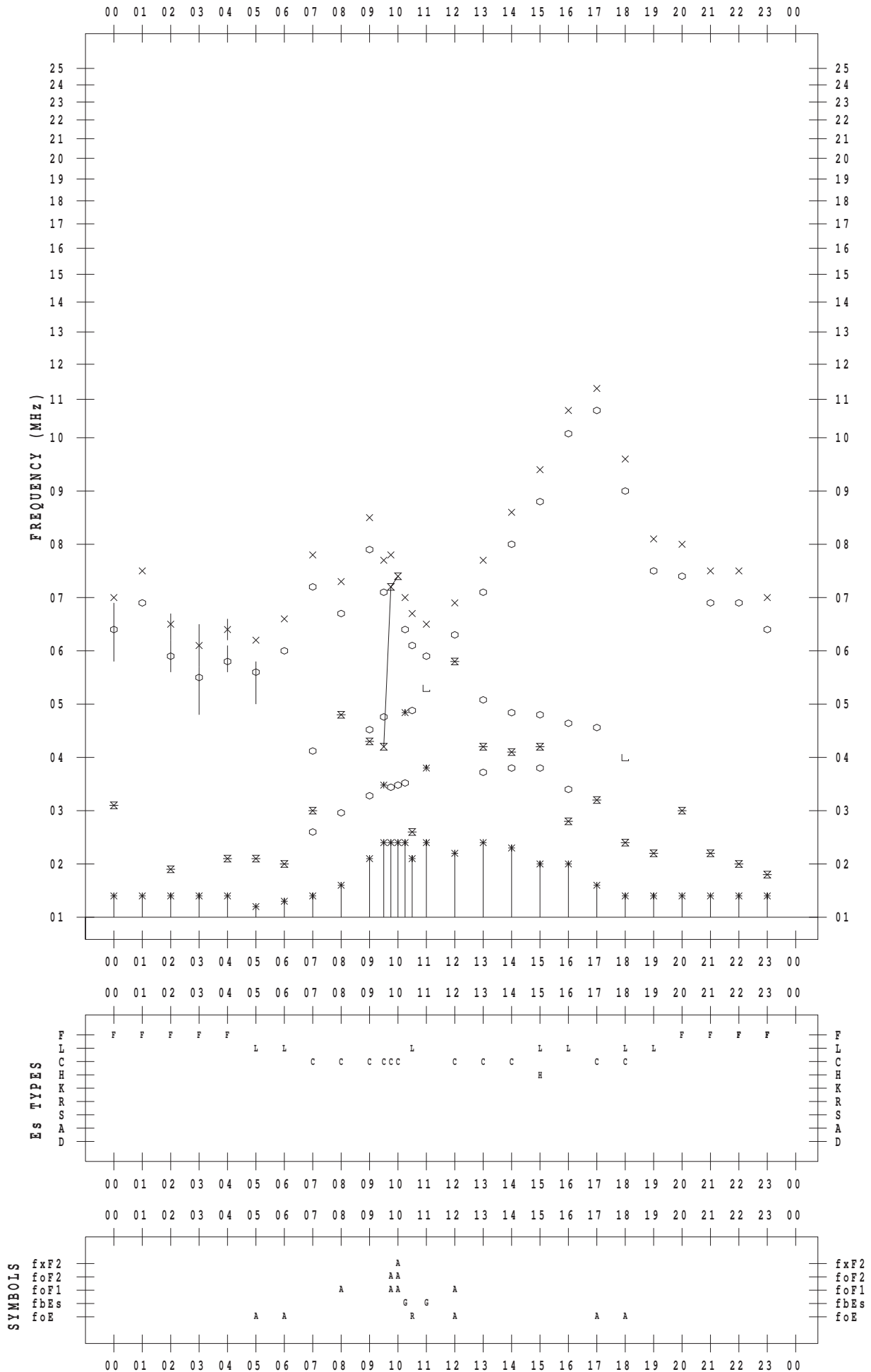
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STATION : Okinawa

DATE : 2012 / 6 / 28

135 ° E MEAN TIME



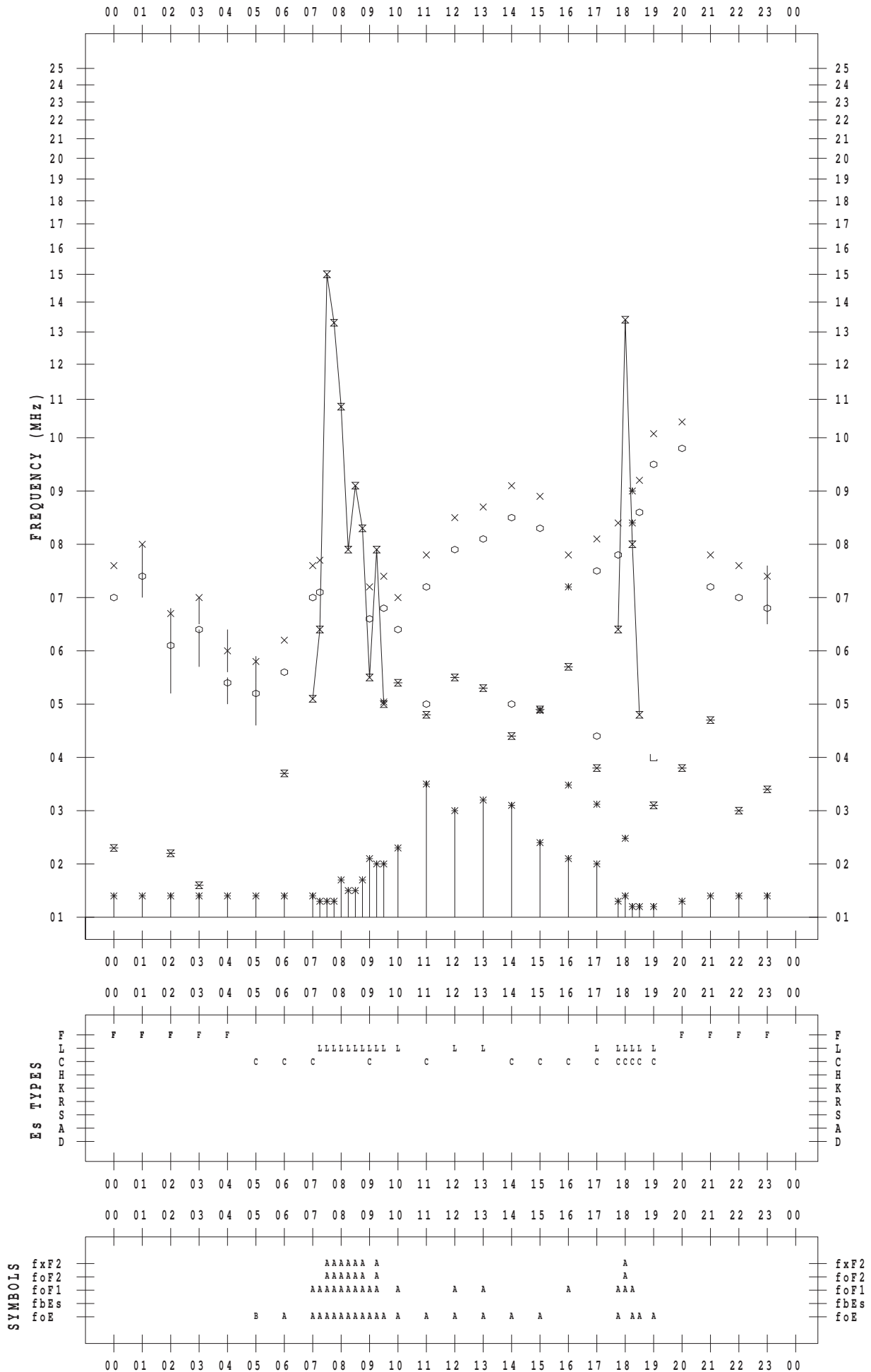
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STATION : Okinawa

DATE : 2012 / 6 / 29

135 ° E MEAN TIME



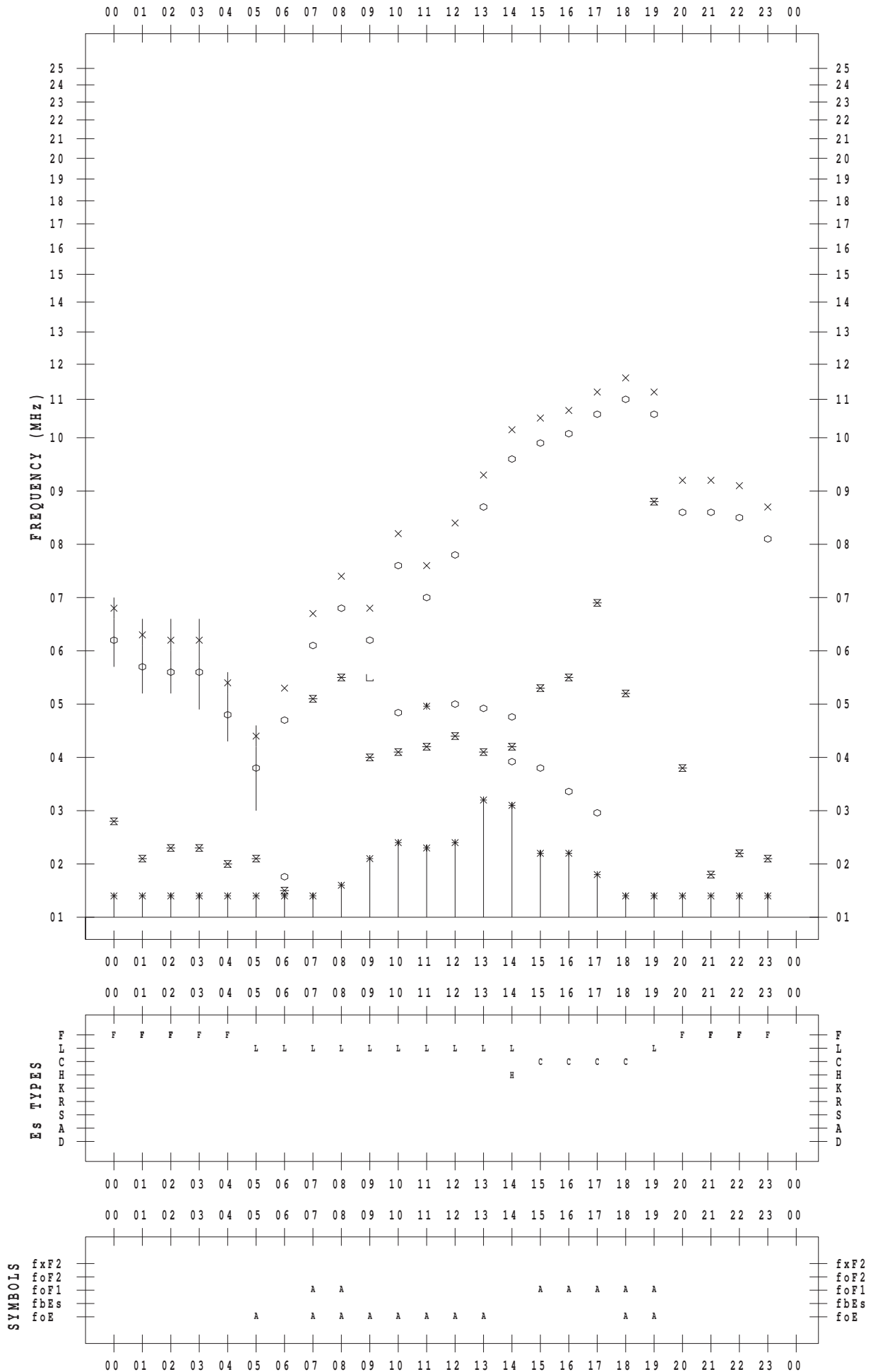
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012 / 6 / 30

135 ° E MEAN TIME



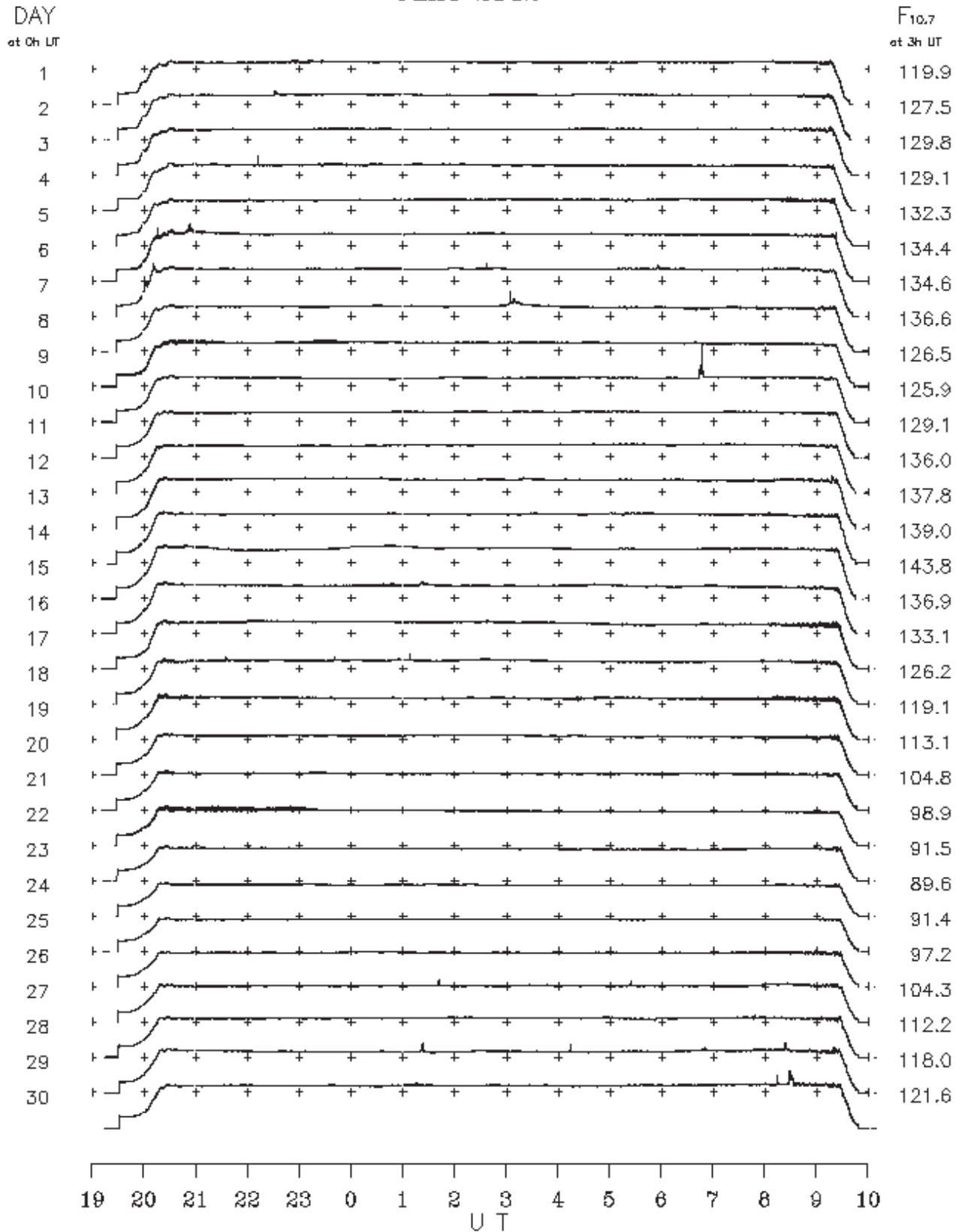
B. Solar Radio Emission
B1.Outstanding Occurrences at Hiraiso

Hiraiso

June 2012

Single-frequency observations								
Normal observing period: 1915 – 1005 U.T. (sunrise to sunset)								
JUN. 2012	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ($10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$)		POLARIZATION REMARKS
						PEAK	MEAN	
1	2800	1 S	2231.0	2232.0	5.0	10	–	
3	2800	8 S	2212.0	2213.0	1.0	20	–	
5	2800	8 S	2017.0	2017.0	1.0	25	–	
5	2800	8 S	2054.0	2054.0	1.0	20	–	
7	2800	8 S	0237.0	0237.0	1.0	10	–	
7	2800	1 S	0552.0	0555.0	5.0	10	–	
8	2800	7 C	0251.0	0304.0	56.0	35	–	
10	2800	7 C	0642.0	0646.0	6.0	85	–	
13	2800	1 S	0034.0	0035.0	2.0	5	–	
16	2800	1 S	0120.0	0123.0	9.0	5	–	
17	2800	8 S	2135.0	2136.0	2.0	10	–	
17	2800	8 S	2342.0	2342.0	1.0	5	–	
8	2800	4 S/F	0043.0	0109.0	34.0	15	–	
27	2800	8 S	0141.0	0142.0	2.0	15	–	
27	2800	1 S	0523.0	0524.0	2.0	10	–	
29	2800	1 S	0035.0	0035.0	1.0	5	–	
29	2800	7 C	0121.0	0123.0	3.0	20	–	
29	2800	8 S	0413.0	0413.0	1.0	20	–	
29	2800	4 S/F	0644.0	0647.0	8.0	5	–	
29	2800	1 S	0821.0	0822.0	6.0	20	–	
29	2800	1 S	2334.0	2335.0	8.0	5	–	
30	2800	8 S	0116.0	0116.0	1.0	10	–	
30	2800	8 S	0812.0	0813.0	1.0	25	–	
30	2800	7 C	0826.0	0827.0	6.0	35	–	
30	2800	1 S	2345.0	2345.0	1.0	10	–	

B.Solar Radio Emission
 B2. Summary Plots of $F_{10.7}$ at Hiraïso
 June 2012



Note: A vertical grid space corresponds to a 100 sfu.

Elevation angle range $\geq 6^\circ$

A link to the daily plot data directory : <http://sunbase.nict.go.jp/solar/denpa/hirasDB/2012/06/>