

# IONOSPHERIC DATA IN JAPAN

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« Real Time Ionograms on the Web .....[http://wdc.nict.go.jp/index\\_eng.html](http://wdc.nict.go.jp/index_eng.html) »



NATIONAL INSTITUTE OF INFORMATION  
AND COMMUNICATIONS TECHNOLOGY  
TOKYO, JAPAN

# INTRODUCTION

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

National Institute of Information and Communications Technology, Japan.

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

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

## IONOSPHERE

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

### A1. Automatic Scaling

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

The published data consist of tabulations of hourly values of three factors (  $f_oF2$ ,  $fEs$ ,  $fmin$  ) and monthly medians of two factors (  $h'Es$ ,  $h'F$  ), daily Summary Plots and monthly medians plot of  $f_oF2$ .

#### a. Characteristics of Ionosphere

|   |   |
|---|---|
| <b><math>f_oF2</math></b>                           | Ordinary wave critical frequency for the <b><math>F2</math></b> layer   |
| <b><math>fEs</math></b>                             | Highest frequency of the <b><math>Es</math></b> layer whether it may be ordinary or extraordinary                         |
| <b><math>fmin</math></b>                            | Lowest frequency which shows vertical iono-spheric reflections  |
| <b><math>h'Es</math></b><br><b><math>h'F</math></b> | Minimum virtual height on the ordinary wave for the <b><math>Es</math></b> and <b><math>F</math></b> 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

|   |   |
|---|---|
| <b><math>fxl</math></b>   | Top frequency of spread <b><math>F</math></b> trace   |
| <b><math>f_oF2</math></b><br><b><math>f_oF1</math></b><br><b><math>f_oE</math></b><br><b><math>f_oEs</math></b> | Ordinary wave critical frequency for the <b><math>F2</math></b> , <b><math>F1</math></b> , <b><math>E</math></b> , and <b><math>Es</math></b> (including particle type <b><math>E</math></b> ) layers, respectively |
| <b><math>fbEs</math></b>  | Blanketing frequency of the <b><math>Es</math></b> layer, e.g. the lowest ordinary wave frequency visible through <b><math>Es</math></b>  |
| <b><math>fmin</math></b>  | Lowest frequency that shows vertical ionospheric reflections  |
| <b><math>M(3000)F2</math></b><br><b><math>M(3000)F1</math></b>  | Maximum usable frequency factor for a path of 3000 km for transmission by the <b><math>F2</math></b> and <b><math>F1</math></b> layers, respectively  |
| <b><math>h'F2</math></b><br><b><math>h'F</math></b><br><b><math>h'E</math></b><br><b><math>h'Es</math></b>      | Minimum virtual height on the ordinary wave for the <b><math>F2</math></b> , whole <b><math>F</math></b> , <b><math>E</math></b> and <b><math>Es</math></b> layers, respectively                                    |
| <b>Types of <math>Es</math></b>   | 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 ( CNT )** is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

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

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



## HOURLY VALUES OF fof2 AT Wakkanai

MAR. 2016

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

## HOURLY VALUES OF fEs AT Wakkanai

MAR. 2016

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1     | 29 | 24 | G  | G  | 24 | 24 | G  | G  | G  | G  | 48 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  |
| 2     | G  | G  | G  | G  | G  | G  | G  | 33 | 33 | G  | G  | G  | G  | 42 | G  | G  | 37 | 29 | G  | G  | G  | G  | G  | 33 |
| 3     | 36 | G  | G  | G  | G  | G  | G  | 46 | 34 | 66 | 62 | 48 | 41 | G  | G  | 34 | G  | G  | 29 | G  | 43 | 26 | 29 | 23 |
| 4     | 27 | 29 | 24 | G  | 23 | G  | G  | 31 | 34 | 37 | 60 | 43 | 40 | 40 | G  | 36 | G  | 31 | G  | 32 | G  | 25 | G  | G  |
| 5     | G  | G  | G  | G  | G  | 38 | 27 | G  | 33 | 40 | 55 | 60 | 39 | 50 | 50 | 35 | 31 | 31 | 54 | 50 | 28 | G  | G  | G  |
| 6     | G  | G  | G  | G  | G  | G  | G  | 30 | 52 | 36 | N  | G  | G  | G  | G  | 35 | 33 | G  | 24 | 33 | 28 | 32 | 24 | 26 |
| 7     | 25 | G  | G  | G  | G  | G  | G  | 33 | 34 | 40 | G  | G  | G  | G  | G  | 35 | 31 | G  | G  | G  | G  | G  | G  | G  |
| 8     | G  | G  | G  | G  | G  | G  | G  | G  | 33 | 36 | 38 | 39 | G  | G  | 37 | G  | G  | G  | G  | G  | G  | G  | G  | G  |
| 9     | G  | G  | G  | G  | G  | G  | G  | G  | G  | 37 | C  | C  | C  | C  | C  | C  | C  | G  | G  | G  | G  | G  | G  | G  |
| 10    | G  | G  | G  | G  | G  | G  | G  | 43 | 35 | 37 | 40 | G  | G  | G  | G  | 36 | 34 | G  | G  | G  | G  | G  | G  | G  |
| 11    | G  | G  | G  | G  | G  | G  | G  | 34 | G  | G  | G  | 39 | G  | G  | G  | G  | 35 | G  | G  | 33 | G  | 27 | G  | G  |
| 12    | G  | G  | G  | G  | G  | G  | G  | 34 | 34 | 37 | G  | G  | 52 | G  | G  | G  | 32 | G  | 42 | G  | 32 | 29 | 26 | G  |
| 13    | G  | G  | G  | G  | G  | G  | G  | 46 | G  | 41 | 54 | 39 | 40 | G  | 46 | 35 | 50 | 36 | 25 | 29 | G  | G  | G  | G  |
| 14    | G  | G  | G  | G  | G  | G  | G  | 31 | G  | G  | G  | G  | G  | G  | G  | G  | 32 | G  | G  | G  | G  | G  | G  | G  |
| 15    | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 32 | 34 | G  | 27 | 30 | G  | G  | G  |
| 16    | G  | G  | G  | G  | G  | G  | G  | 48 | 39 | 46 | G  | G  | G  | G  | G  | G  | 33 | G  | 27 | G  | G  | G  | G  | G  |
| 17    | G  | G  | G  | G  | G  | G  | 28 | 33 | 34 | G  | G  | G  | G  | G  | G  | G  | 33 | G  | G  | G  | G  | G  | G  | G  |
| 18    | G  | G  | G  | G  | G  | G  | 32 | 36 | G  | G  | G  | G  | G  | G  | G  | G  | 32 | G  | G  | G  | G  | G  | G  | G  |
| 19    | G  | G  | G  | G  | G  | G  | G  | G  | G  | 54 | G  | G  | G  | G  | 46 | 52 | 35 | 29 | G  | G  | 11 | G  | G  | G  |
| 20    | 28 | G  | G  | G  | G  | G  | 29 | 38 | G  | 43 | 53 | G  | 40 | G  | G  | G  | 33 | 27 | 28 | 25 | 40 | 27 | G  | G  |
| 21    | G  | G  | G  | 26 | 43 | G  | G  | G  | 40 | G  | G  | G  | G  | G  | G  | 36 | 34 | 34 | 30 | G  | 33 | 27 | 30 | 28 |
| 22    | 28 | G  | 27 | G  | G  | 27 | 33 | G  | 38 | G  | G  | G  | 40 | G  | 36 | 34 | 48 | 26 | 24 | 26 | 32 | G  | G  | G  |
| 23    | G  | G  | G  | G  | G  | G  | G  | 38 | G  | G  | 40 | 41 | 40 | 38 | 36 | G  | 33 | 27 | G  | G  | G  | G  | G  | 33 |
| 24    | G  | 26 | 24 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 33 | G  | G  | G  | G  | G  | G  | G  | G  |
| 25    | G  | G  | G  | G  | G  | G  | G  | 32 | G  | G  | 41 | G  | G  | G  | G  | 38 | 40 | 37 | G  | G  | 34 | G  | G  | 26 |
| 26    | 24 | G  | G  | G  | G  | G  | 39 | G  | 35 | 43 | G  | G  | G  | G  | G  | G  | 34 | G  | G  | G  | G  | G  | 29 | G  |
| 27    | G  | G  | G  | G  | G  | G  | 39 | 33 | G  | G  | G  | G  | G  | G  | G  | G  | 34 | G  | G  | G  | G  | G  | G  | G  |
| 28    | G  | G  | G  | G  | G  | G  | 35 | 33 | G  | G  | 46 | 42 | G  | N  | G  | G  | 33 | 30 | 28 | 26 | G  | 30 | 26 | G  |
| 29    | G  | G  | G  | G  | G  | G  | G  | 32 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 30 | G  | G  | G  | G  | G  | G  |
| 30    | G  | G  | G  | G  | G  | G  | 29 | 36 | G  | G  | G  | G  | G  | G  | G  | G  | 33 | 32 | G  | G  | G  | G  | G  | 22 |
| 31    | G  | G  | G  | G  | G  | G  | G  | G  | 44 | 48 | G  | G  | G  | G  | G  | G  | G  | 28 | 28 | 27 | 25 | 28 | 25 | 26 |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT   | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 29 | 30 | 30 | 29 | 30 | 29 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED   | G  | G  | G  | G  | G  | G  | G  | 32 | G  | 36 | G  | G  | G  | G  | G  | G  | 33 | G  | G  | G  | G  | G  | G  | G  |
| U Q   | G  | G  | G  | G  | G  | G  | 27 | 34 | 34 | 40 | 43 | 39 | G  | G  | G  | 35 | 34 | 31 | 27 | 26 | 28 | 27 | G  | 22 |
| L Q   | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 31 | G  | G  | G  | G  | G  | G  | G  |

HOURLY VALUES OF fmin AT Wakkanai

MAR. 2016

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

HOURLY VALUES OF fof2 AT Kokubunji

MAR. 2016

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                                    | 36 | 37 | 39 | 39 | 47 | 31 | 34 | 58 | 68 | 71  | 76  | 85  | 100 | 98  | 100 | 96  | 82  | 66  | 58 | 45 | 38 | 36 | 32 | 34 |    |
| 2                                    | 35 | 34 | 34 | 34 | 37 | 32 | 42 | 59 | 62 | 77  | 77  | 86  | 96  | 100 | 90  | 78  | 77  | 75  | 54 | 39 | 38 | 39 | 39 | 38 |    |
| 3                                    | 38 | 39 | 38 | 42 | 37 | 36 | 44 | 69 | 77 | 81  | 82  | 86  | 91  | 91  | 92  | 87  | 74  | 74  | 63 | 49 | 39 | 36 | 39 | 36 |    |
| 4                                    | 39 | 41 | 42 | 43 | 45 | 42 | 45 | 61 | 76 | 82  | 97  | 97  | 97  | 101 | 100 | 94  | 86  | 76  | 66 | 48 | 43 | A  | 31 | 37 |    |
| 5                                    | 37 | 36 | 32 | 36 | 38 | 37 | 45 | 64 | 69 | 82  | 77  | 82  | 90  | 91  | 92  | 82  | 78  | 71  | 60 | 44 | A  | 37 | 39 | 38 |    |
| 6                                    | 38 | 38 | 39 | 39 | 39 | 36 | 44 | 65 | 79 | 78  | 78  | 85  | 81  | 90  | 85  | 82  | 78  | 62  | 61 | 47 | 44 | 43 | 43 | 42 |    |
| 7                                    | 39 | 38 | 43 | 41 | 42 | 39 | 45 | 81 | 59 | 85  | 97  | 108 | 115 | 101 | 85  | 96  | 104 | 97  | 64 | 48 | 52 | 50 | A  | 52 |    |
| 8                                    | 54 | 51 | 53 | 53 | 32 | 30 | 44 | 63 | 75 | 91  | 101 | 95  | 104 | 97  | 92  | 95  | 81  | 72  | 66 | 54 | 52 | 52 | 49 | 50 |    |
| 9                                    | 52 | 52 | 52 | 54 | 42 | 35 | 42 | 67 | 75 | 85  | 101 | 86  | 91  | 106 | 94  | 86  | 74  | 72  | 76 | 55 | 48 | 44 | 43 | 46 |    |
| 10                                   | 46 | 45 | 34 | 43 | 42 | 39 | 45 | 65 | 81 | 80  | 80  | 69  | 84  | 88  | 82  | 75  | 72  | 78  | 80 | 54 | 47 | 44 | 42 | 42 |    |
| 11                                   | 43 | 39 | 38 | 43 | 40 | 31 | 47 | 65 | 77 | 81  | 82  | 90  | 98  | 105 | 86  | 86  | 75  | 77  | 76 | 61 | 54 | 52 | 48 | 47 |    |
| 12                                   | 43 | 43 | 47 | 54 | 32 | 30 | 42 | 59 | 87 | 101 | 106 | 86  | 97  | 92  | 88  | 82  | 81  | 85  | 84 | 47 | 38 | 38 | 37 | 39 |    |
| 13                                   | 41 | 39 | 38 | 27 | 37 | 38 | 48 | 60 | 72 | 78  | 78  | 95  | 110 | 97  | 90  | 91  | 77  | 73  | 67 | 52 | 47 | 46 | 40 | 44 |    |
| 14                                   | 44 | 43 | 42 | 42 | 42 | 36 | 48 | 64 | 69 | 67  | 76  | 90  | 101 | 95  | 87  | 81  | 82  | 77  | 81 | 69 | 51 | 38 | 36 | 36 |    |
| 15                                   | 31 | 38 | 33 | 37 | 34 | 30 | 45 | 61 | 78 | 96  | 101 | 87  | 87  | 81  | 81  | 104 | 105 | 118 | 86 | 64 | 49 | 36 | 28 | 34 |    |
| 16                                   | 36 | 35 | 38 | N  | 38 | 37 | 49 | 59 | 65 | 69  | 97  | 92  | 101 | 112 | 100 | 85  | 72  | 75  | 88 | 77 | 71 | 39 | 43 | 39 |    |
| 17                                   | 45 | 46 | 48 | 38 |    | 28 | 48 | 74 | 76 | 92  | 73  | 91  | 88  | 88  | 91  | 91  | 90  | 92  | 78 | 67 | 52 | 53 | 51 | 51 |    |
| 18                                   | 59 | 46 | 42 | 38 | 36 | 37 | 51 | 71 | 80 | 78  | 73  | 91  | 96  | 84  | 92  | 93  | 87  | 77  | 67 | 59 | 61 | 59 | 51 | 46 |    |
| 19                                   | 45 | 44 | 49 | 48 | N  | N  | 45 | 70 | 81 | 82  | 90  | 91  | 96  | 78  | 88  | 81  | 78  | 81  | 82 | 77 | 75 | 47 | 46 | 44 |    |
| 20                                   | 46 | 31 | 36 | 32 | 34 | 32 | 54 | 65 | 82 | 80  | 86  | 98  | 95  | 89  | 80  | 73  | 77  | 75  | 77 | 53 | 44 | 45 | 44 | 47 |    |
| 21                                   | 46 | 46 | 43 | 42 | 30 | 37 | 42 | 62 | 77 | 86  | 92  | 100 | 91  | 92  | 75  | 66  | 78  | 81  | 77 | 67 | 44 | 43 | 44 | 42 |    |
| 22                                   | 44 | 49 | 47 | 46 | 42 | A  | 49 | 67 | 81 | 82  | 81  | 77  | 86  | 85  | 82  | 74  | 72  | 71  | 75 | 55 | 46 | 45 | 44 | 48 |    |
| 23                                   | 42 | 44 | 48 | 49 | 48 | 45 | 54 | 72 | 82 | 83  | 90  | 75  | 74  | 85  | 84  | 72  | 72  | 71  | 76 | 74 | 52 | 41 | 41 | 42 |    |
| 24                                   | 41 | 39 | 39 | 37 | 36 | 28 | 51 | 75 | 78 | 96  | 77  | 67  | 78  | 82  | 82  | 80  | C   | C   | N  | 66 | 47 | 42 | 38 | 39 |    |
| 25                                   | 41 | 38 | 39 | 38 | 38 | 27 | 46 | 62 | 64 | 72  | C   | C   | C   | C   | C   | C   | 72  | 68  | 67 | 54 | 45 | A  | 42 | 42 |    |
| 26                                   | 44 | 42 | 38 | 41 | 35 | 30 | 46 | 68 | 67 | 69  | 69  | 76  | 82  | 85  | 76  | 69  | 71  | 75  | 74 | 64 | 49 | 42 | 34 | 39 |    |
| 27                                   | 38 | 39 | 38 | 39 | 36 | 32 | 48 | 59 | 67 | 68  | 78  | 86  | 84  | 86  | 77  | 66  | 68  | 75  | 81 | 69 | 47 | 47 | 47 | 46 |    |
| 28                                   | 43 | 43 | 42 | 42 | 42 | 39 | 54 | 54 | 65 | 76  | 76  | 81  | 100 | 95  | 85  | 74  | 77  | 80  | 76 | 51 | 35 | 39 | 39 | 41 |    |
| 29                                   | 41 | 42 | 42 | 43 | 36 | 34 | 51 | 71 | 78 | 76  | 81  | 82  | 85  | 92  | 86  | 81  | 82  | 74  | 72 | 66 | 53 | 46 | 44 | 48 |    |
| 30                                   | 49 | 51 | 43 | 44 | 44 | 45 | 58 | 67 | 67 | 69  | 72  | 86  | 85  | 77  | 81  | 82  | 81  | 80  | 81 | 74 | 67 | 54 | 47 | 48 |    |
| 31                                   | 50 | 49 | 43 | 41 | 44 | 46 | 63 | 71 | 68 | 68  | 74  | 82  | 85  | 91  | 96  | 88  | 84  | 81  | 78 | 67 | 54 | 47 | 43 | A  |    |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |    |
| CNT                                  | 31 | 31 | 31 | 30 | 29 | 29 | 31 | 31 | 31 | 31  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30 | 30 | 31 | 30 | 29 | 30 | 30 |
| MED                                  | 43 | 42 | 42 | 42 | 38 | 36 | 46 | 65 | 76 | 80  | 80  | 86  | 91  | 91  | 86  | 82  | 78  | 75  | 76 | 55 | 48 | 44 | 42 | 42 |    |
| U Q                                  | 46 | 46 | 43 | 43 | 42 | 38 | 51 | 70 | 79 | 85  | 92  | 91  | 98  | 97  | 92  | 91  | 82  | 80  | 80 | 67 | 52 | 47 | 44 | 47 |    |
| L Q                                  | 38 | 38 | 38 | 38 | 36 | 30 | 44 | 61 | 67 | 72  | 76  | 82  | 85  | 85  | 82  | 75  | 74  | 72  | 66 | 49 | 44 | 39 | 39 | 39 |    |



HOURLY VALUES OF fEs AT Kokubunji

MAR. 2016

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1     | G  | G  | G  | G  | 31 | G  | G  | 47 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  |
| 2     | G  | G  | G  | G  | G  | G  | G  | 46 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 36 | G  | G  | G  | G  | G  | G  |
| 3     | G  | G  | G  | G  | G  | G  | G  | 47 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 29 | G  | G  | G  | G  | G  | 24 |
| 4     | 29 | 29 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 48 | 53 | 47 | G  | G  | G  | G  | G  | G  | 25 | 48 | G  | G  |
| 5     | G  | G  | G  | G  | G  | G  | G  | G  | 35 | 47 | 49 | 43 | 55 | 46 | 39 | 31 | 27 | 27 | 40 | G  | G  | 30 | G  | G  |
| 6     | 23 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 47 | 52 | 50 | 42 | 33 | G  | G  | G  | 33 | G  | G  | G  |
| 7     | G  | G  | G  | G  | G  | G  | 29 | G  | 35 | 44 | 47 | G  | G  | G  | 47 | 46 | 37 | G  | G  | G  | G  | G  | 35 | G  |
| 8     | G  | G  | G  | G  | G  | G  | 24 | G  | G  | G  | G  | 41 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  |
| 9     | G  | G  | G  | G  | G  | G  | G  | G  | 43 | G  | G  | G  | G  | G  | G  | G  | 34 | 29 | G  | G  | G  | G  | G  | G  |
| 10    | G  | G  | G  | G  | G  | G  | G  | 33 | G  | G  | G  | G  | 49 | 40 | G  | 42 | G  | G  | G  | 26 | G  | G  | G  | G  |
| 11    | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 50 | 50 | G  | 47 | G  | G  | G  | G  | 24 | G  | G  | G  | G  | G  |
| 12    | G  | G  | G  | G  | G  | G  | G  | 36 | 35 | G  | 40 | 57 | 53 | 61 | G  | G  | G  | 49 | G  | G  | G  | G  | 24 | 29 |
| 13    | 29 | G  | G  | 25 | G  | G  | G  | G  | G  | 43 | G  | G  | 42 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 29 | G  |
| 14    | G  | G  | G  | G  | G  | G  | 39 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 34 | 50 | G  | G  | G  | G  | G  |
| 15    | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 31 | G  | G  | G  | 29 | G  | G  |
| 16    | G  | G  | G  | G  | 24 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 30 | G  | G  | G  | G  | G  | G  |
| 17    | G  | G  | G  | G  | G  | 25 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 34 | G  | G  | G  | G  | G  | G  | G  |
| 18    | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 36 | G  | G  | G  | G  | G  | G  |
| 19    | G  | G  | G  | G  | G  | G  | 29 | 34 | G  | G  | G  | G  | G  | G  | 43 | G  | G  | G  | 28 | 27 | 27 | G  | 33 | G  |
| 20    | G  | G  | G  | G  | G  | G  | 25 | G  | G  | G  | G  | G  | 52 | 45 | G  | G  | G  | 30 | G  | G  | 33 | 41 | 26 | G  |
| 21    | G  | 26 | G  | G  | G  | G  | G  | G  | G  | 46 | G  | 45 | G  | G  | G  | G  | G  | 34 | 25 | 25 | G  | G  | G  | G  |
| 22    | G  | 49 | G  | 33 | 34 | 34 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 42 | 53 | 57 | 45 | 69 | 32 | 29 | G  |
| 23    | 27 | G  | 34 | G  | G  | G  | G  | G  | G  | G  | G  | 46 | G  | 43 | 43 | G  | G  | 42 | 38 | 28 | 25 | 24 | G  | G  |
| 24    | G  | G  | G  | G  | G  | G  | G  | 41 | G  | 43 | C  | C  | C  | C  | C  | C  | C  | C  | 84 | 38 | G  | G  | G  | G  |
| 25    | G  | G  | G  | G  | G  | G  | G  | 51 | G  | 51 | C  | C  | C  | C  | C  | C  | 43 | 47 | 24 | 31 | 26 | 46 | 26 | 33 |
| 26    | 36 | 28 | G  | G  | G  | G  | 27 | 34 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 22 | G  | G  |
| 27    | G  | G  | G  | G  | G  | G  | 28 | G  | G  | G  | G  | 43 | G  | G  | G  | G  | G  | 41 | 39 | G  | G  | G  | G  | G  |
| 28    | 25 | G  | G  | G  | G  | G  | 47 | G  | 79 | G  | G  | 42 | 49 | G  | G  | G  | G  | G  | 31 | G  | G  | G  | G  | G  |
| 29    | G  | G  | G  | G  | G  | G  | 37 | G  | G  | G  | G  | G  | 42 | 43 | G  | G  | G  | G  | 28 | G  | G  | G  | G  | G  |
| 30    | G  | G  | G  | G  | G  | G  | 45 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  |
| 31    | G  | G  | G  | 24 | 34 | 28 | 27 | G  | G  | G  | G  | G  | G  | G  | 41 | G  | G  | 34 | 26 | 27 | G  | 28 | 30 | 54 |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT   | 31 | 31 | 31 | 31 | 30 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED   | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 29 | G  | G  | G  | G  | G  | G  |
| U Q   | G  | G  | G  | G  | G  | G  | 27 | 33 | G  | G  | G  | 41 | 43 | 43 | G  | G  | G  | 34 | 28 | 26 | 25 | 22 | 26 | G  |
| L Q   | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  |

## HOURLY VALUES OF fmin AT Kokubunji

MAR. 2016

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

## HOURLY VALUES OF fof2 AT Yamagawa

MAR. 2016

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                                    | 34 | 34 | 36 | 34 | 43 | 34 | N  | 47 | 63 | 67  | 72 | 88  | 100 | 99  | 96  | 99  | 103 | 80  | 81  | 72 | 50 | 43 | 40 | 34 |
| 2                                    | 32 | A  | A  | 34 | 37 | 36 | 28 | 52 | 66 | 71  | 82 | 77  | 97  | 109 | 80  | 77  | 81  | 80  | 70  | 54 | 47 | 42 | 38 | 40 |
| 3                                    | 38 | 42 | 40 | 41 | 41 | 34 | 36 | 60 | 65 | 72  | 77 | 85  | 94  | 95  | 87  | 104 | 90  | 85  | 73  | 62 | 48 | 43 | 41 | 40 |
| 4                                    | 42 | 40 | 40 | 40 | 46 | 40 | 32 | 54 | 60 | 77  | 86 | 96  | 90  | 109 | 114 | 114 | 100 | 86  | 84  | 78 | 54 | 54 | 47 | 42 |
| 5                                    | 42 | 38 | 40 | 40 | 43 | 38 | 59 | 54 | 67 | 75  | 76 | 90  | 90  | 95  | 96  | 96  | 92  | 72  | 63  | 51 | 51 | 50 | 43 | 41 |
| 6                                    | 40 | 42 | 42 | 38 | 42 | 37 | 34 | 54 | 71 | 84  | 72 | 88  | 95  | 96  | 100 | 92  | 82  | 76  | 72  | 71 | 50 | 52 | 43 | 42 |
| 7                                    | A  | 41 | 42 | 40 | 38 | 36 | 32 | 67 | 62 | 73  | 90 | 112 | 116 | 96  | 87  | 97  | 110 | 104 | 75  | 48 | 54 | 54 | 54 | 52 |
| 8                                    | 52 | 54 | 51 | 57 | 40 | N  | 28 | 52 | 72 | 78  | 90 | 97  | 97  | 98  | 97  | 107 | 84  | 76  | 72  | 62 | 51 | 54 | 48 | 44 |
| 9                                    | 46 | 43 | 50 | 52 | 44 | 30 | 30 | 54 | 78 | 84  | 84 | 88  | 95  | 108 | 94  | 86  | 86  | 82  | 78  | 64 | 52 | 52 | 51 | 51 |
| 10                                   | 41 | 47 | 46 | 47 | 43 | 34 | 34 | 73 | 77 | C   | C  | C   | C   | C   | C   | C   | C   | 86  | 86  | 72 | 54 | 51 | 47 | 40 |
| 11                                   | 37 | 35 | 40 | 44 | 43 | 30 | 32 | 54 | 70 | 87  | 87 | 87  | 95  | 98  | 102 | 90  | 82  | 72  | 77  | 76 | 67 | 58 | 50 | 43 |
| 12                                   | 47 | 41 | 51 | 50 | 31 | 28 | 29 | 48 | 81 | 118 | 86 | 81  | 90  | 95  | 104 | 102 | 82  | 82  | 88  | 72 | 44 | 40 | 40 | 37 |
| 13                                   | 34 | 40 | 38 | 36 | 36 | 36 | 37 | 66 | 67 | 75  | 81 | 95  | 103 | 111 | 106 | 87  | 83  | 84  | 78  | 66 | 53 | 50 | 48 | 43 |
| 14                                   | 43 | 42 | 43 | 42 | 45 | 38 | 32 | 50 | 70 | 82  | 71 | 85  | 100 | 107 | 112 | 95  | 95  | 94  | 88  | 77 | 52 | 51 | 43 | 40 |
| 15                                   | 40 | 42 | 38 | 38 | 44 | 34 | 29 | 52 | 77 | 86  | 86 | 78  | 92  | 90  | 88  | 96  | 111 | 115 | 108 | 81 | 66 | 47 | 31 | 32 |
| 16                                   | 34 | 38 | 40 | 38 | 40 | 38 | 23 | 52 | 70 | 68  | 87 | 91  | 96  | 112 | 110 | 87  | 75  | 77  | 88  | 90 | 67 | 51 | 47 | 42 |
| 17                                   | 50 | 48 | 46 | 37 | N  | B  | 30 | 61 | 75 | 72  | 71 | 86  | 96  | 95  | 95  | 95  | 90  | 90  | 95  | 78 | 62 | 54 | 60 | 54 |
| 18                                   | 52 | 46 | 38 | 36 | B  | 34 | 38 | 61 | 66 | 76  | 77 | 95  | 98  | N   | 96  | 97  | 90  | 90  | 80  | 72 | 54 | 54 | 54 | 47 |
| 19                                   | 43 | 47 | 47 | 42 | N  | N  | 29 | 55 | 85 | 84  | 80 | 83  | 95  | 96  | 89  | 86  | 87  | 86  | 90  | 78 | 73 | 53 | 54 | A  |
| 20                                   | 47 | 38 | 40 | 38 | 34 | 34 | 38 | 58 | 70 | 81  | 86 | 99  | 94  | 91  | 92  | 84  | 82  | 86  | 92  | 72 | 43 | 42 | 47 | 48 |
| 21                                   | 48 | 47 | 43 | 40 | 36 | 37 | 34 | 63 | 77 | 86  | 90 | 107 | 108 | 97  | 86  | 75  | 87  | 92  | 92  | 78 | 63 | 48 | 50 | 48 |
| 22                                   | 48 | 46 | 42 | 42 | 41 | 30 | 34 | 51 | 74 | 84  | 84 | 96  | 95  | 97  | 97  | 88  | 71  | 77  | 81  | 66 | 47 | 44 | 42 | 44 |
| 23                                   | 44 | 47 | 43 | 44 | 44 | 42 | 40 | 54 | 67 | 74  | 81 | 86  | 87  | 95  | 97  | 94  | 90  | 90  | 88  | 77 | 60 | 47 | 43 | 43 |
| 24                                   | 48 | 50 | 47 | 40 | 31 | 26 | 34 | 63 | 80 | 84  | 72 | 75  | 83  | 90  | 94  | 96  | 78  | 82  | 81  | A  | 54 | 47 | 40 | 42 |
| 25                                   | 42 | 42 | 42 | 38 | 37 | 36 | 34 | 52 | 68 | 68  | 72 | 80  | 92  | 96  | 98  | 98  | 108 | 87  | 81  | 78 | 64 | 48 | 47 | 32 |
| 26                                   | 50 | 54 | 51 | 50 | 46 | 38 | 40 | 58 | 67 | 68  | 68 | 72  | 82  | 86  | 87  | 82  | 81  | 86  | 84  | 75 | 54 | 37 | 37 | 40 |
| 27                                   | 36 | 40 | 37 | 36 | 34 | 32 | 37 | 58 | 71 | 70  | 73 | 82  | 87  | 90  | 97  | 88  | 86  | 92  | 85  | 72 | 44 | 49 | 47 | 42 |
| 28                                   | 38 | 42 | 41 | 41 | 41 | 38 | 42 | 52 | 65 | 75  | 78 | 88  | 98  | 108 | 98  | 87  | 93  | 87  | 81  | A  | A  | 42 | 44 | 42 |
| 29                                   | 42 | 42 | 38 | 42 | 41 | 34 | 38 | 60 | 80 | 77  | 74 | 74  | 86  | 96  | N   | 88  | 72  | 80  | 80  | 64 | 39 | 50 | 43 | 46 |
| 30                                   | 50 | 50 | 40 | 40 | 34 | 36 | 48 | 60 | 67 | 67  | 68 | 76  | 94  | 86  | 79  | 86  | 84  | 88  | 90  | 87 | 80 | 51 | 42 | 43 |
| 31                                   | 48 | 48 | 48 | 45 | 44 | 47 | 55 | 67 | 67 | 65  | 75 | 78  | 90  | 97  | 96  | 95  | 95  | 96  | 88  | 86 | 72 | 47 | 43 | 41 |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09  | 10 | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT                                  | 30 | 30 | 30 | 31 | 28 | 28 | 30 | 31 | 31 | 30  | 30 | 30  | 30  | 29  | 29  | 30  | 30  | 31  | 31  | 29 | 30 | 31 | 31 | 30 |
| MED                                  | 42 | 42 | 42 | 40 | 41 | 36 | 34 | 54 | 70 | 76  | 79 | 86  | 95  | 96  | 96  | 93  | 86  | 86  | 81  | 72 | 54 | 50 | 44 | 42 |
| U Q                                  | 48 | 47 | 46 | 44 | 43 | 38 | 38 | 61 | 77 | 84  | 86 | 95  | 97  | 103 | 99  | 97  | 93  | 90  | 88  | 78 | 63 | 52 | 48 | 44 |
| L Q                                  | 38 | 40 | 40 | 38 | 36 | 34 | 30 | 52 | 67 | 71  | 72 | 80  | 90  | 95  | 88  | 87  | 82  | 80  | 78  | 65 | 50 | 44 | 42 | 40 |

HOURLY VALUES OF fEs AT Yamagawa

MAR. 2016

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |
|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1     | G  | G  | G  | G  | G  | 11 | G  | 34 | G  | G  | G  | G  | 47 | G  | G  | 43 | 42 | G  | G  | G  | G  | G  | 29 | 25 |    |
| 2     | G  | 30 | 33 | G  | G  | G  | G  | 27 | G  | 36 | G  | G  | 42 | G  | G  | G  | 42 | 36 | G  | G  | G  | 24 | G  | G  |    |
| 3     | G  | G  | G  | G  | G  | G  | G  | 26 | G  | G  | 46 | 40 | G  | 41 | G  | G  | G  | G  | G  | G  | G  | G  | 29 | G  |    |
| 4     | G  | G  | G  | G  | G  | G  | 25 | 40 | 51 | G  | 42 | G  | G  | 48 | G  | G  | G  | G  | G  | G  | G  | 24 | 28 | G  |    |
| 5     | 33 | 27 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 50 | 46 | 48 | G  | G  | 38 | 32 | G  | G  | 41 | 25 | G  |    |
| 6     | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 47 | G  | G  | 36 | 32 | 30 | 55 | G  | G  | 28 | 26 |    |
| 7     | 24 | G  | G  | G  | G  | G  | G  | 26 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  |    |
| 8     | G  | 30 | 25 | G  | G  | G  | G  | 28 | G  | G  | G  | G  | G  | G  | G  | 42 | 38 | 33 | G  | G  | G  | G  | G  | G  |    |
| 9     | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 42 | 44 | G  | G  | G  | G  | G  | G  | G  | 23 | G  | G  |    |
| 10    | G  | G  | G  | G  | G  | G  | G  | 27 | G  | C  | C  | C  | C  | C  | C  | C  | C  | 42 | 27 | 35 | G  | G  | G  | G  |    |
| 11    | G  | G  | G  | G  | G  | G  | G  | G  | G  | 36 | 41 | G  | 50 | 40 | 44 | 37 | 33 | G  | G  | G  | G  | G  | G  | G  |    |
| 12    | G  | G  | G  | G  | G  | G  | G  | 27 | G  | G  | 39 | 51 | 51 | 57 | 79 | 52 | 51 | 42 | 56 | 30 | G  | G  | G  | G  |    |
| 13    | G  | G  | G  | G  | G  | G  | G  | 48 | G  | G  | G  | G  | G  | G  | 40 | 53 | G  | 37 | G  | G  | G  | G  | G  | G  |    |
| 14    | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 41 | 45 | 39 | 33 | 30 | 82 | 23 | 32 | G  | G  |    |
| 15    | G  | G  | G  | G  | G  | G  | G  | 30 | G  | 38 | 39 | 43 | G  | G  | 46 | G  | G  | 37 | 33 | 11 | G  | 28 | 36 | G  |    |
| 16    | 27 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 33 | G  | G  | 11 | 24 | G  | G  |    |
| 17    | 25 | G  | G  | G  | G  | B  | G  | 30 | 54 | G  | G  | G  | G  | G  | G  | G  | G  | 34 | G  | G  | G  | G  | G  | G  |    |
| 18    | G  | G  | G  | G  | B  | G  | G  | 30 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 40 | 34 | G  | G  | G  | G  | G  |    |
| 19    | G  | G  | G  | G  | G  | G  | G  | G  | 35 | G  | G  | G  | G  | G  | G  | G  | G  | 37 | 32 | 26 | 31 | 25 | G  | 43 |    |
| 20    | 38 | 27 | 26 | G  | G  | G  | G  | 30 | G  | G  | G  | G  | 49 | 49 | 46 | G  | G  | G  | G  | G  | G  | 54 | 39 | G  |    |
| 21    | 32 | G  | 31 | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 39 | 31 | 25 | 32 | 28 | G  | 51 |    |
| 22    | G  | G  | G  | G  | G  | G  | G  | 29 | 34 | G  | G  | G  | G  | G  | 53 | 48 | G  | 36 | 28 | G  | G  | G  | G  | G  |    |
| 23    | G  | G  | G  | G  | G  | G  | G  | 43 | 34 | G  | G  | G  | 44 | 44 | G  | G  | 44 | 38 | 30 | G  | 27 | G  | G  | G  |    |
| 24    | G  | G  | G  | G  | G  | G  | G  | 29 | 34 | 37 | 47 | 46 | G  | 47 | 45 | G  | G  | 74 | 70 | 83 | 58 | 46 | G  | G  |    |
| 25    | G  | G  | G  | G  | G  | G  | G  | 30 | 42 | 49 | 51 | 46 | 48 | 50 | 50 | 54 | 42 | 43 | 32 | 34 | 25 | 35 | 28 | 26 |    |
| 26    | 44 | 34 | G  | 34 | 32 | 24 | G  | G  | 35 | 37 | G  | G  | G  | G  | 47 | G  | G  | 34 | 30 | 26 | 27 | G  | G  | G  |    |
| 27    | G  | G  | G  | G  | G  | G  | G  | 29 | G  | N  | G  | G  | 51 | 43 | 43 | 41 | 45 | 47 | 45 | 48 | 49 | G  | G  | G  |    |
| 28    | G  | G  | G  | G  | G  | G  | G  | 49 | G  | G  | G  | 51 | G  | 42 | G  | 47 | 54 | 80 | 53 | 60 | 48 | 24 | G  | G  |    |
| 29    | G  | G  | G  | G  | G  | G  | G  | G  | 34 | G  | G  | G  | G  | G  | 41 | G  | 64 | 38 | 39 | 50 | 25 | 23 | G  | G  |    |
| 30    | G  | G  | G  | G  | G  | G  | G  | 48 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 33 | 29 | G  | 27 | G  | G  | G  |    |
| 31    | G  | G  | G  | G  | G  | G  | G  | 50 | G  | G  | 40 | G  | 43 | G  | 42 | G  | G  | 37 | 31 | 26 | G  | G  | G  | G  |    |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |
| CNT   | 31 | 31 | 31 | 31 | 30 | 30 | 31 | 31 | 31 | 29 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED   | G  | G  | G  | G  | G  | G  | G  | 28 | G  | G  | G  | G  | G  | G  | G  | G  | G  | 36 | 30 | G  | G  | G  | G  | G  |    |
| U Q   | G  | G  | G  | G  | G  | G  | G  | 30 | 34 | G  | 39 | G  | 43 | 46 | 45 | 43 | 42 | 39 | 32 | 34 | 27 | 25 | 25 | G  |    |
| L Q   | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | G  | 33 | G  | G  | G  | G  | G  | G  |    |

## HOURLY VALUES OF fmin AT Yamagawa

MAR. 2016

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 | 15 | 15 | 14 | 15 | 15 | 15 | 14 | 15 | 18 | 18 | 23 | 21 | 18 | 17 | 15 | 14 | 18 | 14 | 15 | 14 | 14 | 14 |    |    |    |
| 2                                    | 15 | 15 | 15 | 14 | 15 | 15 | 14 | 18 | 14 | 15 | 15 | 20 | 23 | 24 | 15 | 16 | 16 | 14 | 16 | 15 | 15 | 14 | 15 | 16 |    |    |    |
| 3                                    | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 18 | 14 | 15 | 17 | 24 | 21 | 40 | 27 | 18 | 17 | 14 | 17 | 14 | 15 | 15 | 14 | 15 |    |    |    |
| 4                                    | 15 | 14 | 15 | 15 | 14 | 15 | 15 | 14 | 14 | 15 | 16 | 16 | 20 | 18 | 18 | 18 | 15 | 16 | 20 | 15 | 14 | 15 | 15 | 16 |    |    |    |
| 5                                    | 14 | 15 | 15 | 15 | 15 | 14 | 15 | 20 | 14 | 14 | 16 | 16 | 18 | 18 | 17 | 18 | 16 | 16 | 14 | 15 | 18 | 14 | 16 | 15 |    |    |    |
| 6                                    | 16 | 15 | 16 | 16 | 14 | 15 | 14 | 17 | 14 | 14 | 17 | 18 | 45 | 20 | 27 | 16 | 15 | 14 | 15 | 14 | 14 | 15 | 15 | 15 |    |    |    |
| 7                                    | 15 | 15 | 15 | 17 | 16 | 15 | 15 | 14 | 14 | 14 | 15 | 18 | 20 | 21 | 21 | 18 | 15 | 14 | 17 | 15 | 15 | 17 | 14 | 15 |    |    |    |
| 8                                    | 14 | 15 | 16 | 14 | 15 | 15 | 17 | 14 | 14 | 14 | 16 | 18 | 40 | 27 | 23 | 23 | 15 | 14 | 16 | 15 | 14 | 15 | 15 | 15 |    |    |    |
| 9                                    | 15 | 17 | 15 | 20 | 15 | 15 | 15 | 20 | 15 | 14 | 16 | 20 | 41 | 21 | 20 | 18 | 16 | 14 | 18 | 14 | 15 | 15 | 16 | 15 |    |    |    |
| 10                                   | 15 | 14 | 15 | 15 | 15 | 15 | 14 | 14 | 14 |    |    |    |    |    |    |    |    |    |    |    | 15 | 14 | 14 | 15 | 15 | 15 | 15 |
| 11                                   | 14 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 18 | 18 | 20 | 18 | 21 | 18 | 14 | 14 | 20 | 15 | 16 | 16 | 16 | 16 | 16 | 16 |    |
| 12                                   | 17 | 16 | 17 | 14 | 15 | 15 | 17 | 15 | 14 | 16 | 20 | 21 | 26 | 18 | 18 | 15 | 16 | 15 | 14 | 14 | 15 | 15 | 16 | 16 | 18 | 18 |    |
| 13                                   | 17 | 15 | 15 | 18 | 15 | 16 | 15 | 21 | 14 | 15 | 17 | 22 | 23 | 22 | 17 | 15 | 14 | 15 | 15 | 14 | 15 | 15 | 15 | 16 | 16 | 16 |    |
| 14                                   | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 16 | 20 | 20 | 45 | 45 | 22 | 22 | 17 | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 |    |
| 15                                   | 16 | 15 | 15 | 15 | 14 | 15 | 16 | 17 | 16 | 20 | 20 | 24 | 26 | 23 | 21 | 20 | 16 | 14 | 14 | 14 | 16 | 14 | 14 | 16 | 16 | 16 |    |
| 16                                   | 15 | 16 | 15 | 18 | 15 | 14 | 14 | 21 | 15 | 15 | 18 | 20 | 22 | 18 | 18 | 20 | 17 | 16 | 18 | 14 | 15 | 15 | 15 | 15 | 15 | 15 |    |
| 17                                   | 15 | 14 | 16 | 15 | 15 |    | 15 | 17 | 14 | 17 | 21 | 20 | 39 | 24 | 40 | 22 | 16 | 14 | 18 | 14 | 15 | 15 | 15 | 15 | 15 | 15 |    |
| 18                                   | 15 | 14 | 14 | 15 |    | 16 | 14 | 16 | 14 | 15 | 16 | 20 | 17 | 35 | 21 | 21 | 17 | 14 | 17 | 14 | 14 | 15 | 15 | 15 | 15 | 15 |    |
| 19                                   | 16 | 15 | 15 | 14 | 15 | 16 | 15 | 14 | 14 | 15 | 15 | 20 | 22 | 45 | 21 | 21 | 16 | 14 | 15 | 14 | 15 | 15 | 14 | 14 | 14 | 14 |    |
| 20                                   | 14 | 14 | 14 | 15 | 14 | 15 | 14 | 17 | 17 | 16 | 20 | 20 | 21 | 27 | 28 | 17 | 16 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 |    |
| 21                                   | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 22 | 14 | 15 | 18 | 18 | 18 | 26 | 21 | 22 | 15 | 14 | 14 | 15 | 14 | 15 | 15 | 14 | 14 | 14 |    |
| 22                                   | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 16 | 22 | 22 | 26 | 18 | 18 | 16 | 14 | 14 | 15 | 15 | 15 | 16 | 15 | 15 | 15 |    |
| 23                                   | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 23 | 14 | 15 | 17 | 20 | 22 | 45 | 41 | 20 | 18 | 14 | 15 | 14 | 14 | 15 | 15 | 15 | 15 | 15 |    |
| 24                                   | 16 | 16 | 14 | 15 | 15 | 16 | 15 | 15 | 14 | 15 | 18 | 17 | 20 | 32 | 20 | 18 | 16 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 |    |
| 25                                   | 15 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 16 | 22 | 28 | 20 | 32 | 30 | 18 | 15 | 15 | 14 | 15 | 14 | 14 | 15 | 15 | 15 |    |
| 26                                   | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 17 | 14 | 14 | 20 | 18 | 21 | 21 | 18 | 17 | 15 | 14 | 15 | 14 | 14 | 15 | 15 | 16 | 16 | 16 |    |
| 27                                   | 16 | 14 | 14 | 15 | 16 | 15 | 14 | 16 | 14 | 15 | 18 | 20 | 18 | 44 | 21 | 18 | 15 | 14 | 15 | 14 | 15 | 15 | 15 | 16 | 16 | 16 |    |
| 28                                   | 15 | 15 | 15 | 14 | 15 | 14 | 14 | 14 | 15 | 15 | 18 | 20 | 24 | 23 | 21 | 18 | 16 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 |    |
| 29                                   | 16 | 18 | 17 | 20 | 14 | 15 | 15 | 14 | 14 | 18 | 18 | 18 | 45 | 55 | 16 | 21 | 16 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 |    |
| 30                                   | 15 | 15 | 15 | 14 | 14 | 16 | 14 | 18 | 14 | 16 | 17 | 20 | 18 | 23 | 24 | 17 | 15 | 14 | 16 | 15 | 15 | 15 | 15 | 16 | 16 | 16 |    |
| 31                                   | 18 | 16 | 15 | 15 | 17 | 14 | 15 | 21 | 15 | 15 | 18 | 18 | 21 | 20 | 35 | 17 | 14 | 14 | 14 | 15 | 14 | 15 | 20 | 14 | 14 | 14 |    |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |    |    |
| CNT                                  | 31 | 31 | 31 | 31 | 30 | 30 | 31 | 31 | 31 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |    |    |
| MED                                  | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 14 | 15 | 18 | 20 | 22 | 23 | 21 | 18 | 16 | 14 | 15 | 14 | 15 | 15 | 15 | 15 | 15 |    |    |
| U Q                                  | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 18 | 14 | 15 | 18 | 20 | 26 | 32 | 24 | 21 | 16 | 15 | 17 | 15 | 15 | 15 | 15 | 16 | 16 |    |    |
| L Q                                  | 15 | 14 | 14 | 14 | 14 | 15 | 14 | 14 | 14 | 15 | 16 | 18 | 20 | 20 | 18 | 17 | 15 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 |    |    |

## HOURLY VALUES OF fof2 AT Okinawa

MAR. 2016

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                                    | 36 | 40 | 46 | 53 | 65 | 41 | B  | 44 | 62 | 65  | 76  | 102 | 108 | 120 | 120 | 127 | 133 | 129 | 132 | 138 | 110 | 80  | 73 | 67 |    |
| 2                                    | 43 | 53 | 52 | 50 | 47 | 44 | 36 | 54 | 81 | 63  | 71  | 88  | 97  | 117 | 102 | 77  | 95  | 101 | 92  | 86  | 72  | 50  | 44 | 43 |    |
| 3                                    | 43 | 48 | 42 | 42 | 43 | 32 | 34 | 52 | 65 | 67  | 81  | 92  | 97  | 104 | 107 | 119 | 116 | 93  | 107 | 84  | 77  | 52  | 51 | 47 |    |
| 4                                    | 42 | 42 | 40 | 44 | 43 | 34 | 29 | 50 | 70 | 78  | 91  | 95  | 101 | 120 | 130 | 134 | 125 | 130 | 130 | 132 | 130 | 107 | 72 | 54 |    |
| 5                                    | 55 | 54 | 47 | 44 | 44 | 34 | 26 | 52 | 66 | 70  | 86  | 90  | 100 | 105 | 122 | 119 | 106 | 78  | 81  | 74  | 71  | 73  | 64 | 54 |    |
| 6                                    | 43 | 47 | 48 | 47 | 46 | 38 | 34 | 52 | 74 | 81  | 85  | 100 | 107 | 108 | 117 | 101 | 88  | 93  | 85  | 88  | 87  | 71  | 66 | 53 |    |
| 7                                    | 44 | 41 | 46 | 43 | 32 | 38 | A  | 54 | 75 | 75  | 85  | 134 | 118 | 127 | 110 | 110 | 138 | 120 | 84  | 68  | 63  | 54  | 63 | 52 |    |
| 8                                    | 52 | 67 | 67 | 67 | 37 | B  | B  | 47 | 73 | 86  | 92  | 102 | 110 | 110 | 110 | 110 | 101 | 91  | 84  | 74  | 63  | 54  | 54 | 53 |    |
| 9                                    | 52 | 52 | 48 | 52 | 40 | B  | B  | 52 | 71 | 87  | 86  | 88  | 110 | 111 | 105 | 96  | 101 | 100 | 77  | 67  | 67  | 65  | 62 | 54 |    |
| 10                                   | 52 | 50 | 48 | 47 | 47 | B  | B  | 78 | 73 | 87  | 100 | 90  | 98  | 105 | 111 | 90  | 78  | 87  | 92  | 78  | 73  | 52  | 52 | 42 |    |
| 11                                   | 59 | 42 | N  | 50 | 32 | B  |    | 29 | 54 | 75  | 84  | 98  | 106 | 108 | 118 | 120 | 111 | 97  | 86  | 84  | 87  | 87  | 54 | 54 | 67 |
| 12                                   | 67 | 51 | 62 | 67 | 45 | 29 | 29 | 50 | 81 | 111 | 105 | 86  | 100 | 117 | 130 | 141 | 130 | 107 | 104 | 87  | 80  | 57  | 46 | 42 |    |
| 13                                   | 40 | 42 | 40 | 37 | 34 | 34 | 37 | 67 | 65 | 81  | 90  | 105 | 110 | 123 | 123 | 110 | 117 | 100 | 88  | 88  | 83  | 54  | 53 | 50 |    |
| 14                                   | 44 | 42 | 42 | 40 | 42 | 40 | 26 | 54 | 72 | 76  | 84  | 86  | 116 | 141 | 148 | 146 | 146 | 145 | 138 | 89  | 85  | 82  | 77 | 63 |    |
| 15                                   | 53 | 50 | 50 | 54 | 63 | 42 | 30 | 58 | 79 | 75  | 86  | 86  | 91  | 110 | 108 | 126 | 138 | 138 | 130 | 108 | 86  | 68  | 53 | 42 |    |
| 16                                   | 39 | 47 | 51 | 48 | 43 | 19 |    | 51 | 67 | 92  | 87  | 106 | 90  | 112 | 120 | 100 | 90  | 88  | 105 | 105 | 72  | 53  | 53 | 52 |    |
| 17                                   | 52 | 61 | 42 | 30 | 28 | 28 | N  | 54 | 77 | 81  | C   | C   | C   | C   | C   | C   | C   |     | 97  | 106 | 88  | 76  | 67 | 52 | 67 |
| 18                                   | 52 | 48 | 34 | 32 | B  | 31 | 34 | 59 | 62 | 72  | 96  | 98  | 108 | 112 | 108 | 111 | 111 | 111 | 100 | 86  | 66  | 72  | 54 | 48 |    |
| 19                                   | 48 | 47 | 49 | 42 |    | B  | 26 | 55 | 88 | 102 | 84  | 84  | 101 | 107 | 102 | 94  | 98  | 102 | 104 | 76  | 76  | 67  | 52 | 54 |    |
| 20                                   | 53 | A  | 38 | 47 | B  | B  | 34 | 52 | 68 | 90  | 107 | 98  | 101 | 105 | 100 | 91  | 92  | 98  | 97  | 86  | 50  | 46  | 47 | 42 |    |
| 21                                   | 52 | 52 | 47 | 32 | 32 | 32 | A  | 54 | 76 | 91  | 95  | 116 | 126 | 116 | 107 | 95  | 96  | 104 | 97  | 89  | 78  | 52  | 51 | 46 |    |
| 22                                   | 46 | 43 | 43 | 39 | 34 | N  |    | 52 | 74 | 93  | 90  | 110 | 125 | 130 | 118 | 107 | 92  | 84  | 88  | 67  | 51  | 44  | 41 | 38 |    |
| 23                                   | 40 | 42 | 40 | 43 | 44 | 34 |    | 54 | 64 | 77  | 85  | 100 | 110 | 116 | 143 | 145 | 144 | 146 | 135 | 110 | 90  | 87  | 67 | 74 |    |
| 24                                   | 82 | 83 | 73 | 52 | 34 | 29 | 29 | 54 | 75 | 85  | 77  | 82  | 91  | 106 | 131 | 110 | 97  | 90  | 90  | 77  | 74  | A   | 41 | 39 |    |
| 25                                   | 42 | 42 | 48 | 48 | 46 | 41 | 31 | 54 | 68 | 77  | 80  | 88  | 106 | 123 | 142 | 147 | 147 | 147 | 121 | 104 | 106 | 85  | 72 | 54 |    |
| 26                                   | 66 | 72 | 66 | 66 | 52 | 47 | 40 | 58 | 63 | 71  | 76  | 77  | 92  | 106 | 111 | 118 | 108 | 108 | 114 | 82  | 48  | 44  | 43 | A  |    |
| 27                                   | 43 | 44 | 45 | 46 | 44 | 32 | 89 | 54 | 67 | 80  | 77  | 91  | 110 | 131 | 144 | 146 | 145 | 141 | 110 | 88  | 62  | A   | 51 | 50 |    |
| 28                                   | 43 | 41 | 41 | 44 | 40 | 38 | 39 | 54 | 69 | 78  | 84  | 97  | 110 | 123 | 130 | 118 | 114 | 98  | 102 | 70  | 51  | 46  | 52 | 53 |    |
| 29                                   | 42 | 47 | 44 | 48 | 44 | 36 | 36 | 61 | 77 | 84  | 72  | 81  | 97  | 119 | 128 | 106 | 88  | 88  | 88  | 78  | 60  | 52  | A  | 47 |    |
| 30                                   | 52 | 54 | 46 | 38 | 34 | 40 | 45 | 55 | 67 | 71  | 72  | 82  | 92  | 93  | 100 | 100 | 96  | 94  | 102 | 98  | 80  | A   | 38 | 40 |    |
| 31                                   | 40 | 41 | 42 | 37 | 37 | 40 | 43 | 61 | 67 | 70  | 74  | 86  | 99  | 108 | 111 | 118 | 130 | 131 | 128 | 120 | 90  | 66  | 48 | 46 |    |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22 | 23 |    |
| CNT                                  | 31 | 30 | 30 | 31 | 28 | 24 | 21 | 31 | 31 | 31  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 31  | 31  | 31  | 31  | 28  | 30 | 30 |    |
| MED                                  | 46 | 47 | 46 | 46 | 43 | 35 | 34 | 54 | 71 | 80  | 85  | 92  | 104 | 114 | 118 | 110 | 107 | 100 | 102 | 87  | 76  | 56  | 52 | 51 |    |
| U Q                                  | 52 | 52 | 49 | 50 | 45 | 40 | 38 | 55 | 75 | 87  | 91  | 102 | 110 | 120 | 130 | 126 | 130 | 129 | 114 | 98  | 86  | 71  | 63 | 54 |    |
| L Q                                  | 42 | 42 | 42 | 40 | 34 | 32 | 29 | 52 | 67 | 72  | 77  | 86  | 97  | 107 | 108 | 100 | 96  | 91  | 88  | 77  | 63  | 52  | 48 | 43 |    |

HOURLY VALUES OF fEs AT Okinawa

MAR. 2016

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

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

## HOURLY VALUES OF fmin AT Okinawa

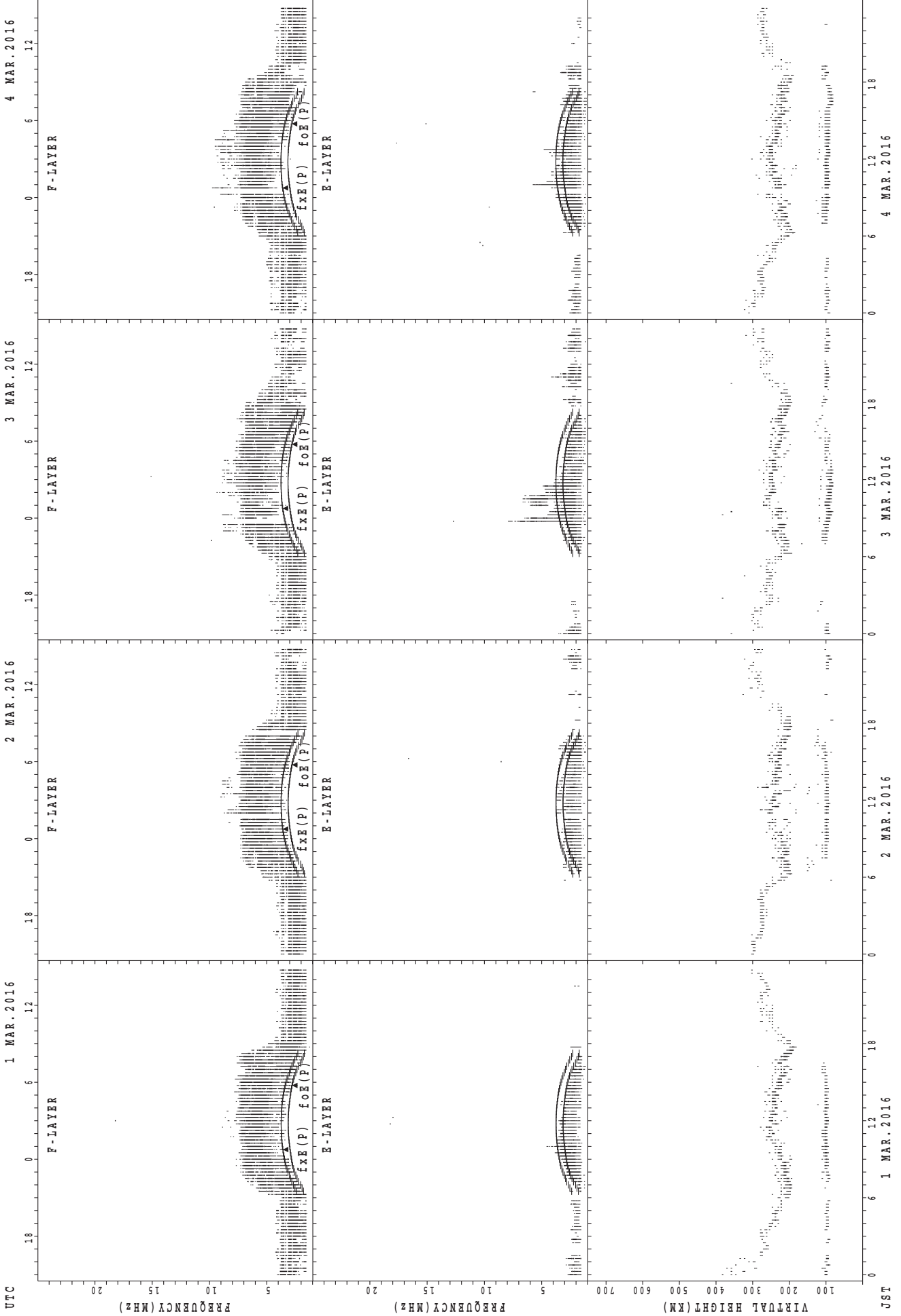
MAR. 2016

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                                    | 17 | 18 | 15 | 15 | 15 | 14 | B  | 18 | 14 | 18 | 26 | 42 | 45 | 27 | 41 | 20 | 15 | 16 | 21 | 17 | 15 | 16 | 15 | 15 |
| 2                                    | 16 | 16 | 15 | 21 | 18 | 16 | 15 | 18 | 14 | 16 | 21 | 23 | 26 | 38 | 27 | 20 | 16 | 14 | 17 | 15 | 15 | 15 | 15 | 20 |
| 3                                    | 15 | 15 | 20 | 17 | 15 | 16 | 15 | 17 | 14 | 15 | 21 | 45 | 46 | 45 | 42 | 44 | 18 | 27 | 21 | 14 | 18 | 15 | 15 | 18 |
| 4                                    | 16 | 15 | 14 | 16 | 15 | 17 | 15 | 15 | 14 | 15 | 18 | 20 | 48 | 38 | 33 | 30 | 21 | 17 | 15 | 15 | 15 | 14 | 14 | 16 |
| 5                                    | 15 | 15 | 15 | 14 | 16 | 21 | 15 | 20 | 14 | 17 | 20 | 18 | 30 | 27 | 26 | 24 | 18 | 18 | 15 | 17 | 15 | 14 | 15 | 15 |
| 6                                    | 17 | 15 | 14 | 16 | 14 | 16 | 17 | 18 | 15 | 17 | 24 | 26 | 26 | 47 | 44 | 42 | 20 | 16 | 21 | 15 | 15 | 15 | 17 | 15 |
| 7                                    | 26 | 22 | 14 | 15 | 17 | 15 | 66 | 15 | 14 | 16 | 18 | 24 | 34 | 42 | 41 | 23 | 18 | 16 | 17 | 14 | 17 | 17 | 15 | 16 |
| 8                                    | 26 | 17 | 15 | 15 | 14 | B  | B  | 21 | 15 | 15 | 18 | 43 | 18 | 49 | 42 | 23 | 21 | 17 | 22 | 15 | 15 | 20 | 16 | 16 |
| 9                                    | 15 | 15 | 15 | 16 | 16 | B  | B  | 18 | 14 | 17 | 20 | 35 | 46 | 30 | 30 | 24 | 17 | 16 | 20 | 15 | 17 | 15 | 14 | 15 |
| 10                                   | 15 | 16 | 16 | 15 | 16 | B  | B  | 20 | 16 | 17 | 23 | 41 | 47 | 38 | 27 | 20 | 21 | 18 | 20 | 14 | 15 | 16 | 17 | 15 |
| 11                                   | 17 | 15 | 15 | 15 | 16 | B  | 17 | 20 | 14 | 17 | 17 | 44 | 29 | 26 | 28 | 22 | 18 | 15 | 22 | 15 | 15 | 15 | 15 | 16 |
| 12                                   | 18 | 21 | 14 | 15 | 14 | 17 | 16 | 20 | 14 | 17 | 34 | 24 | 37 | 36 | 35 | 33 | 23 | 15 | 15 | 15 | 15 | 14 | 18 | 15 |
| 13                                   | 18 | 14 | 21 | 15 | 15 | 16 | 17 | 20 | 16 | 17 | 20 | 26 | 24 | 22 | 41 | 44 | 21 | 14 | 15 | 15 | 15 | 15 | 18 | 17 |
| 14                                   | 15 | 17 | 15 | 16 | 15 | 15 | 16 | 20 | 15 | 18 | 36 | 34 | 35 | 34 | 45 | 28 | 21 | 15 | 14 | 14 | 21 | 15 | 15 | 16 |
| 15                                   | 15 | 16 | 15 | 15 | 14 | 14 | 17 | 21 | 15 | 17 | 20 | 43 | 42 | 41 | 42 | 22 | 21 | 17 | 15 | 15 | 16 | 14 | 16 | 20 |
| 16                                   | 15 | 16 | 15 | 15 | 15 | 16 | 18 | 17 | 15 | 20 | C  | C  | C  | C  | C  | C  | C  | 17 | 21 | 15 | 15 | 15 | 16 | 15 |
| 17                                   | 14 | 15 | 14 | 16 | 17 | 16 | 16 | 15 | 14 | 18 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 18                                   | 15 | 15 | 15 | 15 | B  | 15 | 18 | 15 | 15 | 18 | 21 | 40 | 45 | 44 | 43 | 40 | 20 | 16 | 15 | 14 | 20 | 15 | 15 | 15 |
| 19                                   | 15 | 15 | 15 | 15 | 66 | B  | 16 | 21 | 15 | 18 | 18 | 22 | 44 | 45 | 42 | 28 | 26 | 16 | 14 | 15 | 15 | 15 | 15 | 15 |
| 20                                   | 14 | 15 | 17 | 15 | B  | B  | 15 | 22 | 14 | 18 | 43 | 36 | 42 | 34 | 32 | 37 | 21 | 17 | 22 | 15 | 23 | 16 | 20 | 17 |
| 21                                   | 14 | 15 | 15 | 20 | 15 | 14 | 14 | 21 | 15 | 20 | 22 | 40 | 43 | 43 | 43 | 34 | 20 | 16 | 15 | 14 | 15 | 15 | 15 | 15 |
| 22                                   | 18 | 17 | 15 | 14 | 14 | 16 | 18 | 21 | 15 | 21 | 34 | 44 | 27 | 45 | 43 | 26 | 20 | 17 | 14 | 14 | 16 | 22 | 15 | 16 |
| 23                                   | 14 | 15 | 23 | 14 | 15 | 15 | 17 | 15 | 14 | 18 | 20 | 22 | 46 | 46 | 46 | 41 | 35 | 15 | 15 | 14 | 14 | 15 | 14 | 15 |
| 24                                   | 17 | 17 | 14 | 16 | 15 | 18 | 16 | 15 | 15 | 17 | 20 | 20 | 48 | 45 | 42 | 34 | 21 | 14 | 14 | 14 | 14 | 14 | 15 | 15 |
| 25                                   | 15 | 14 | 15 | 15 | 15 | 14 | 16 | 15 | 15 | 18 | 23 | 32 | 35 | 35 | 34 | 30 | 20 | 14 | 15 | 14 | 14 | 14 | 14 | 14 |
| 26                                   | 14 | 15 | 14 | 14 | 15 | 14 | 15 | 14 | 18 | 20 | 21 | 27 | 45 | 23 | 20 | 18 | 15 | 14 | 14 | 15 | 15 | 16 | 15 | 14 |
| 27                                   | 16 | 16 | 17 | 17 | 15 | 17 | 14 | 22 | 15 | 18 | 23 | 26 | 44 | 45 | 44 | 21 | 17 | 14 | 14 | 17 | 16 | 14 | 15 | 14 |
| 28                                   | 15 | 18 | 14 | 15 | 15 | 18 | 15 | 22 | 16 | 20 | 24 | 45 | 45 | 40 | 44 | 39 | 21 | 15 | 16 | 15 | 15 | 14 | 14 | 17 |
| 29                                   | 17 | 18 | 16 | 15 | 15 | 15 | 15 | 22 | 17 | 20 | 23 | 45 | 40 | 46 | 44 | 35 | 18 | 14 | 14 | 14 | 14 | 14 | 18 | 15 |
| 30                                   | 14 | 14 | 16 | 15 | 15 | 14 | 16 | 15 | 17 | 20 | 23 | 26 | 48 | 44 | 30 | 24 | 18 | 14 | 14 | 15 | 14 | 15 | 18 | 15 |
| 31                                   | 15 | 14 | 15 | 18 | 18 | 15 | 15 | 21 | 16 | 18 | 21 | 45 | 45 | 45 | 35 | 43 | 33 | 17 | 14 | 15 | 14 | 17 | 18 | 18 |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT                                  | 31 | 31 | 31 | 31 | 29 | 25 | 27 | 31 | 31 | 31 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED                                  | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 20 | 15 | 18 | 21 | 34 | 44 | 42 | 42 | 29 | 20 | 16 | 15 | 15 | 15 | 15 | 15 | 15 |
| U Q                                  | 17 | 17 | 16 | 16 | 16 | 16 | 17 | 21 | 15 | 18 | 24 | 43 | 45 | 45 | 43 | 37 | 21 | 17 | 20 | 15 | 16 | 16 | 17 | 16 |
| L Q                                  | 15 | 15 | 14 | 15 | 15 | 14 | 15 | 15 | 14 | 17 | 20 | 24 | 34 | 34 | 32 | 23 | 18 | 14 | 14 | 14 | 15 | 14 | 15 | 15 |

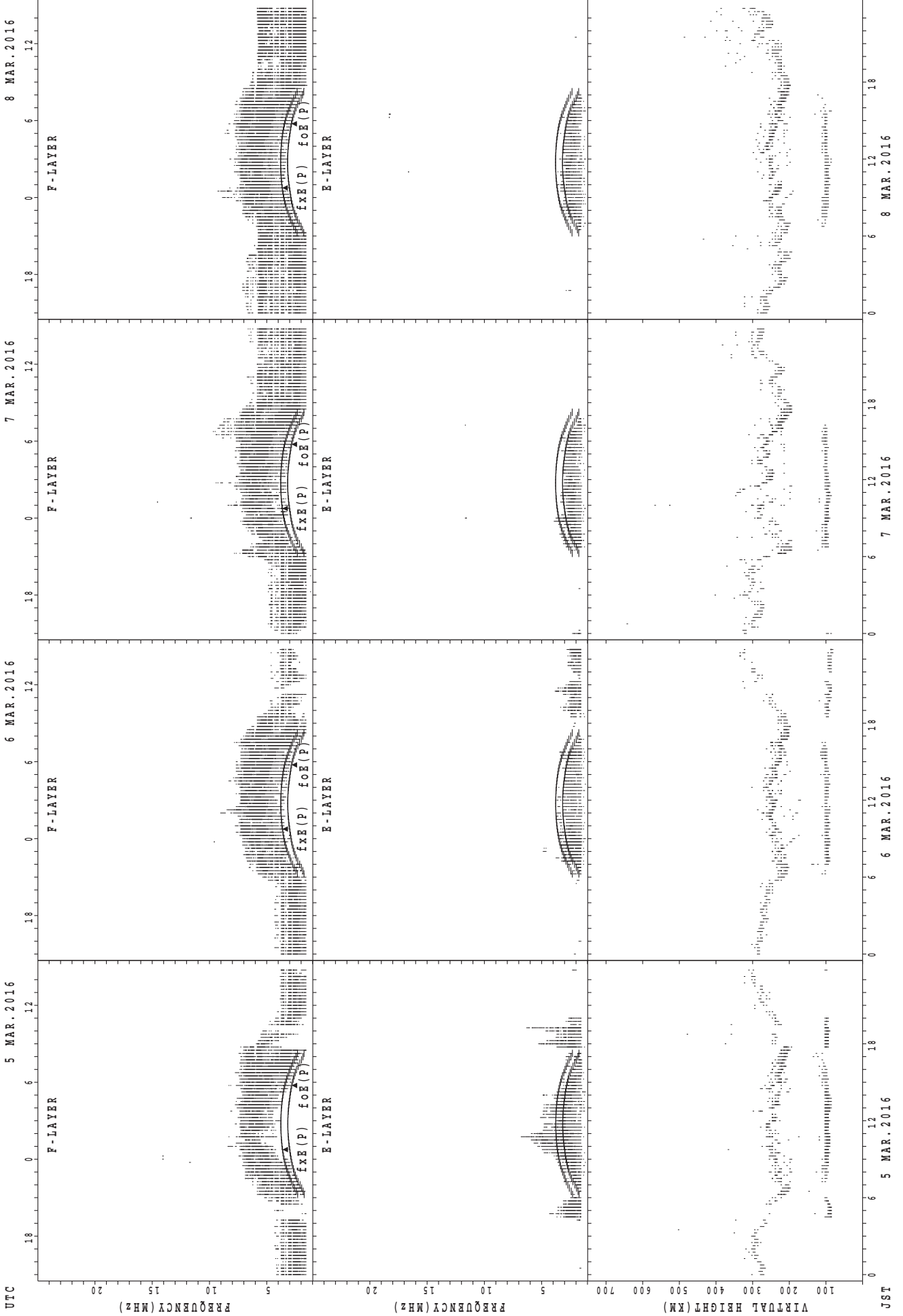


SUMMARY PLOTS AT Wakkanai



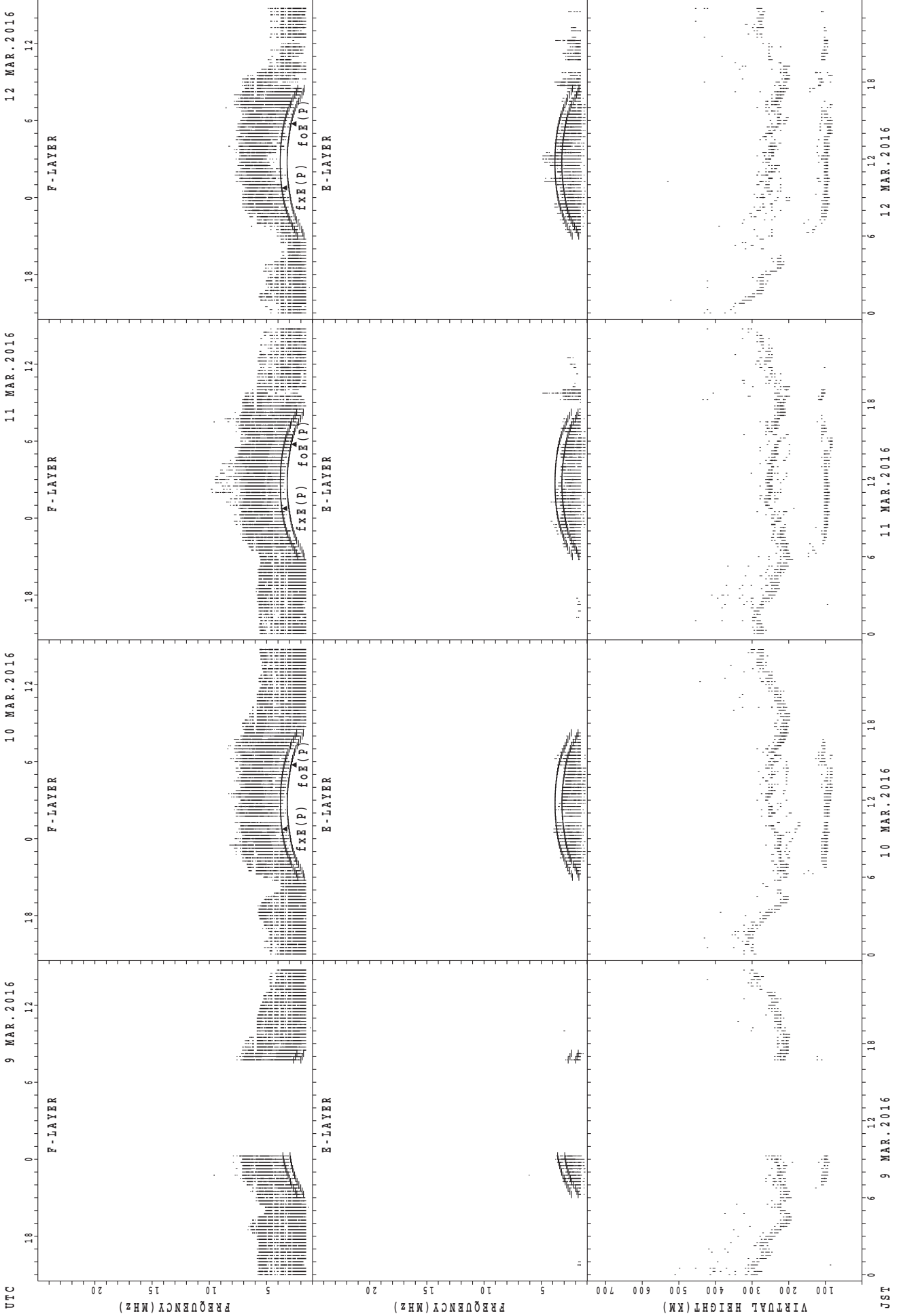
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



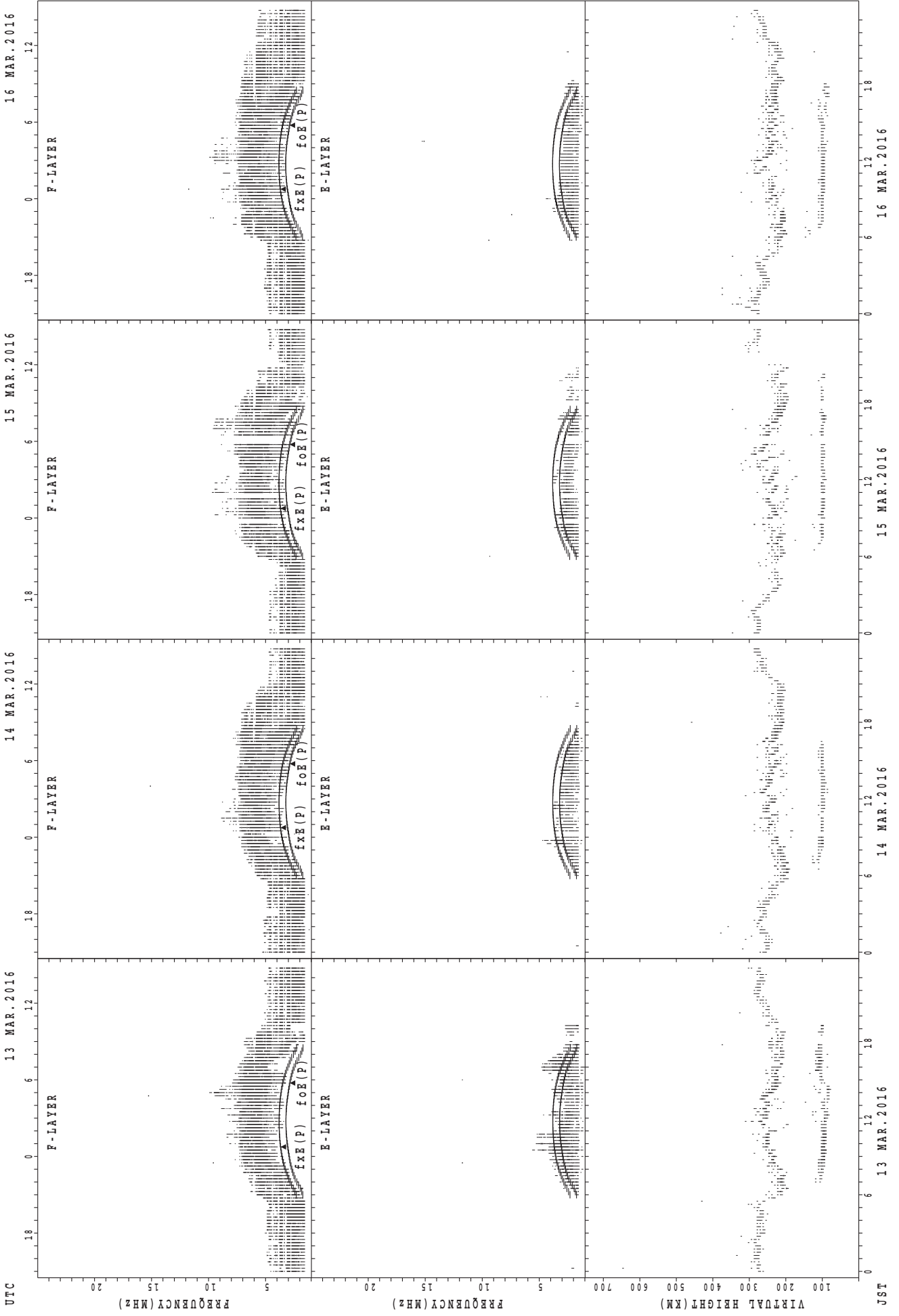
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



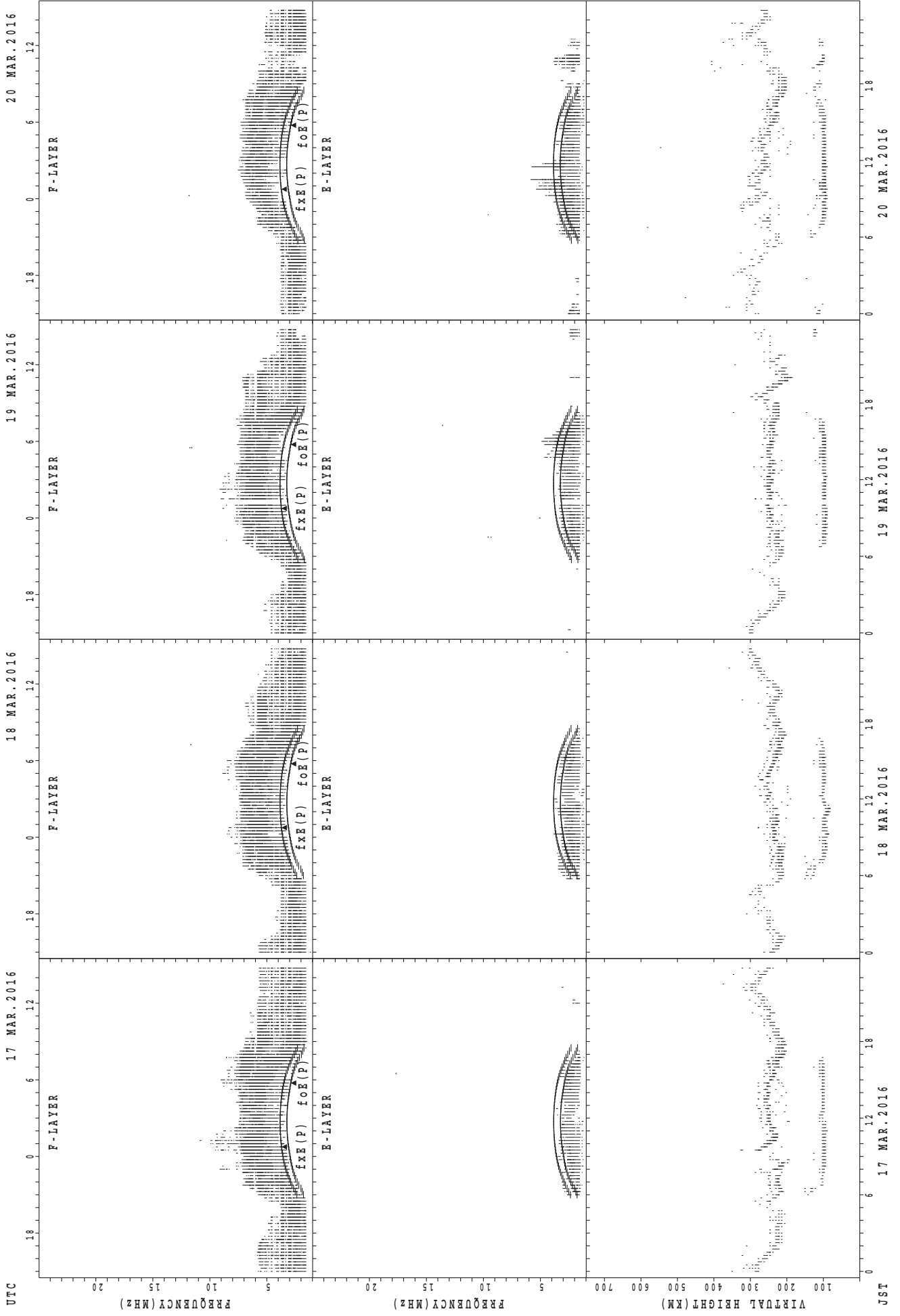
foE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai

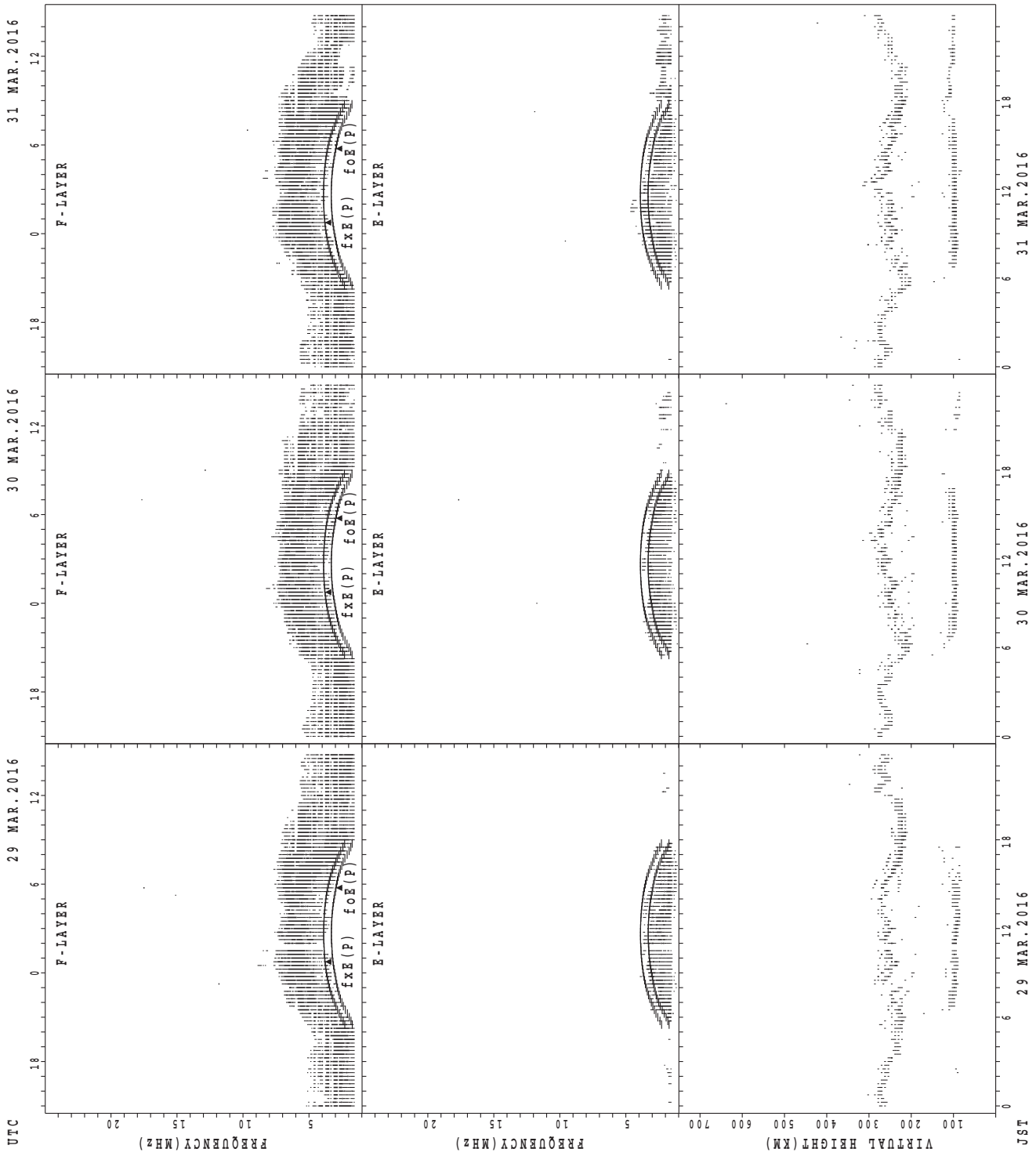


fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE



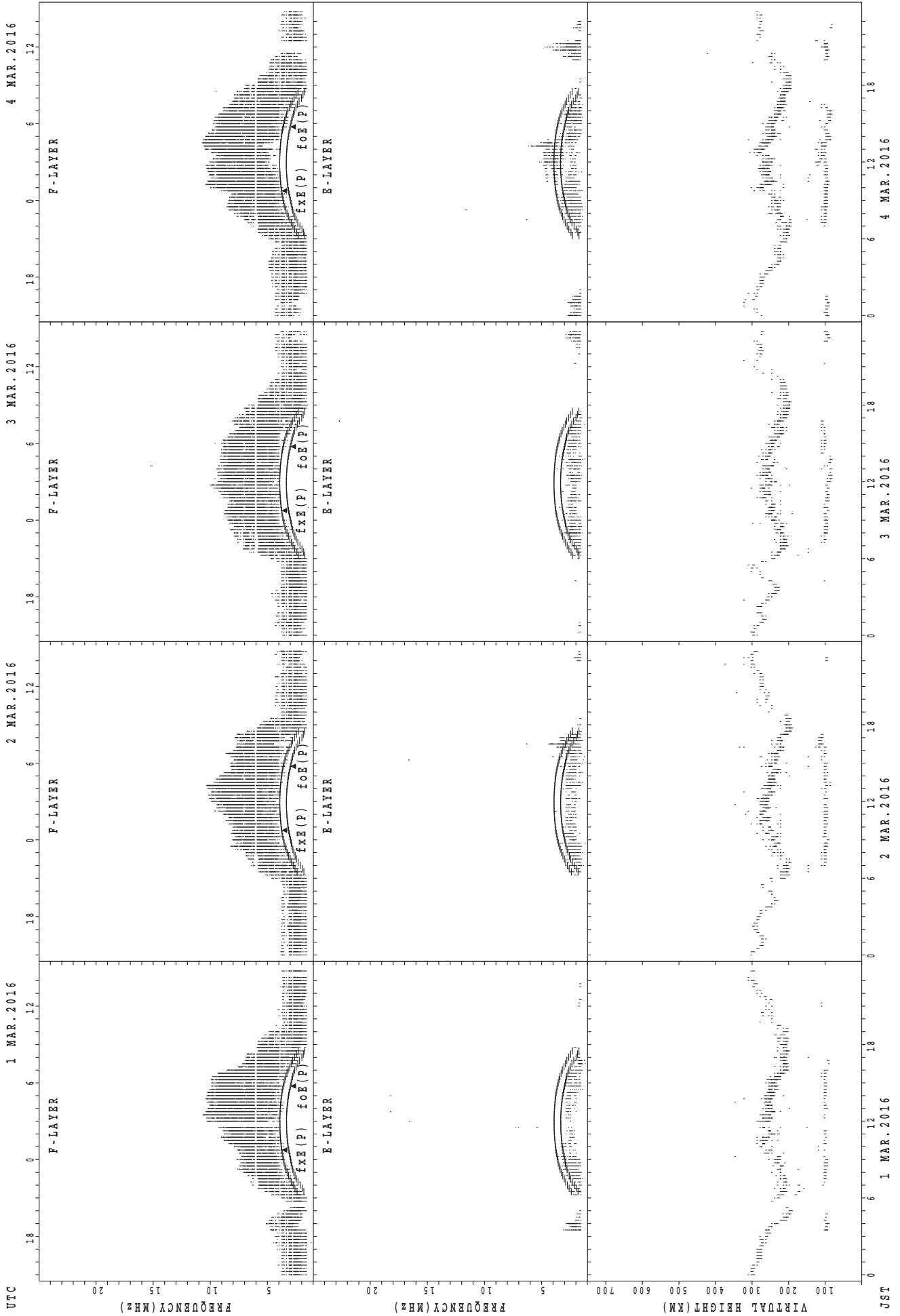


SUMMARY PLOTS AT Wakkanai



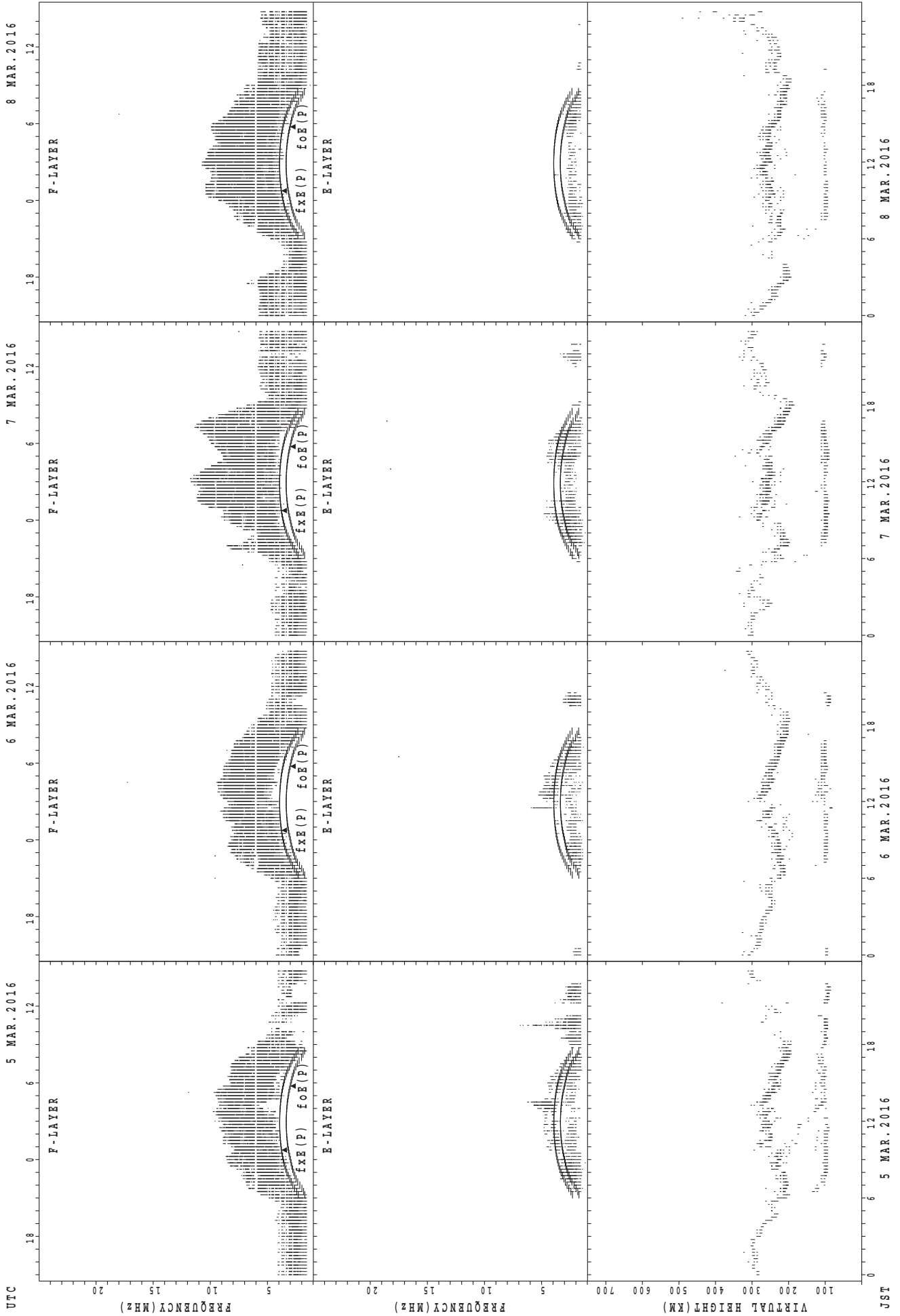


SUMMARY PLOTS AT Kokubunji



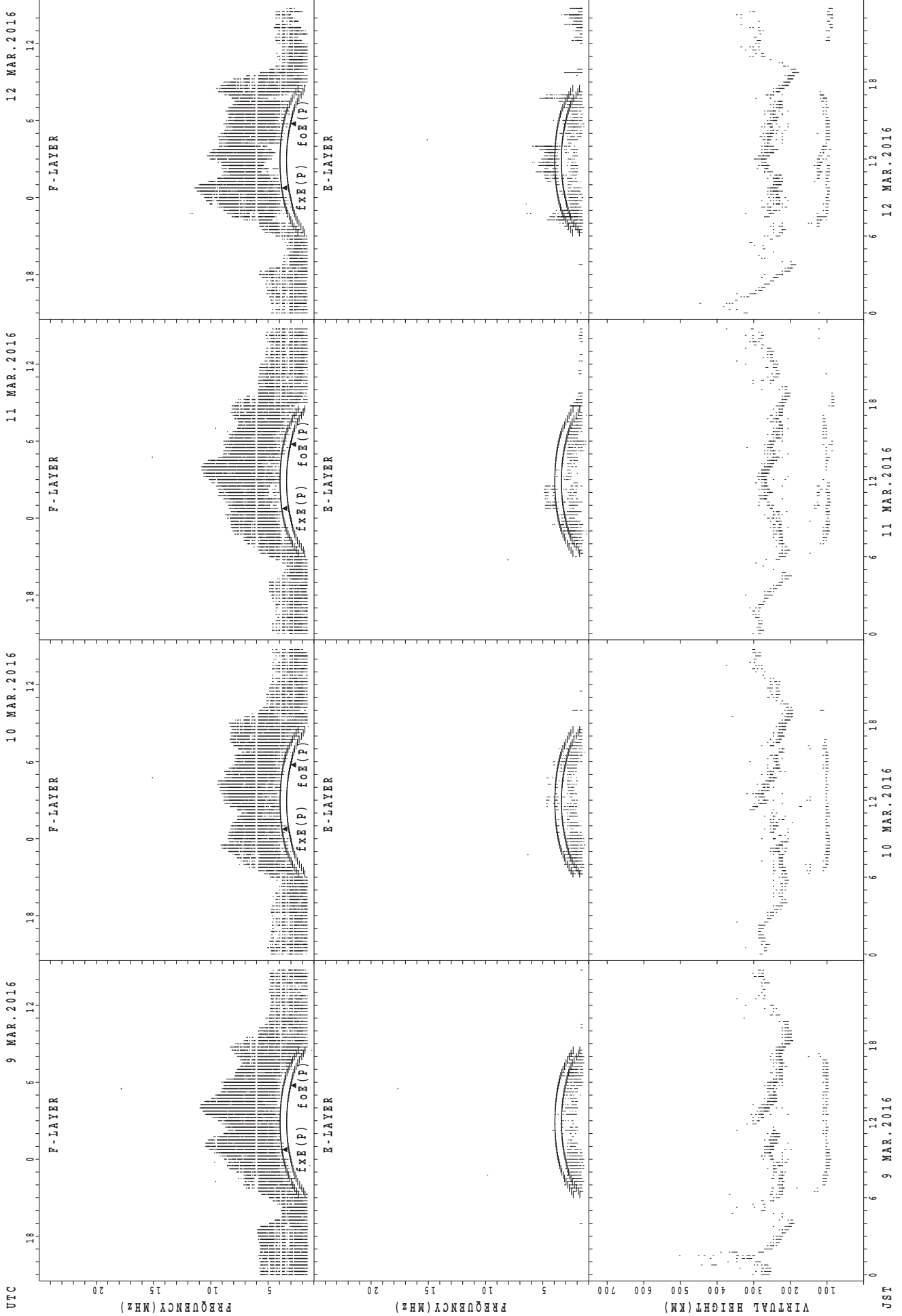
foF2(P); PREDICTED VALUE FOR foF2  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



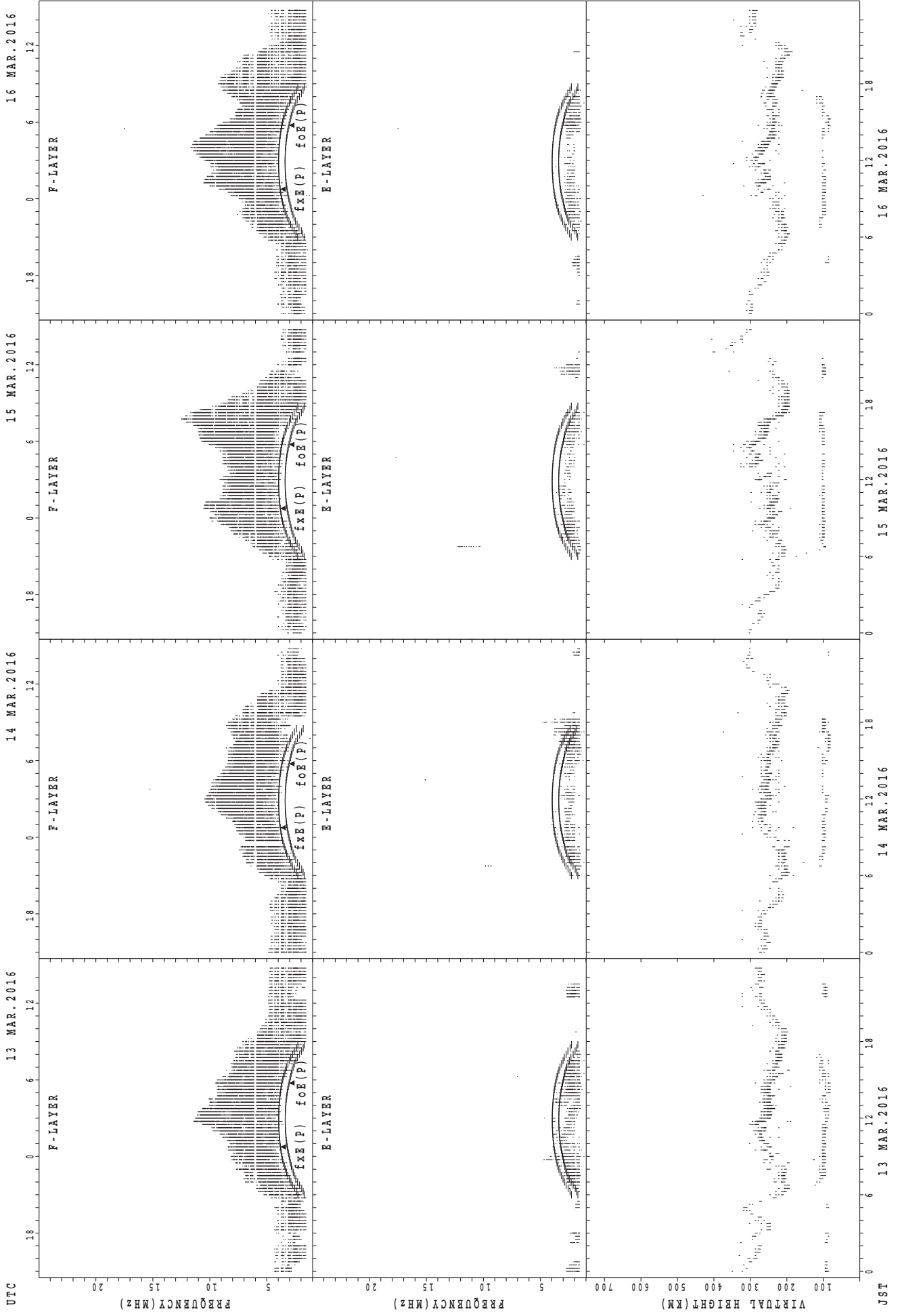
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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

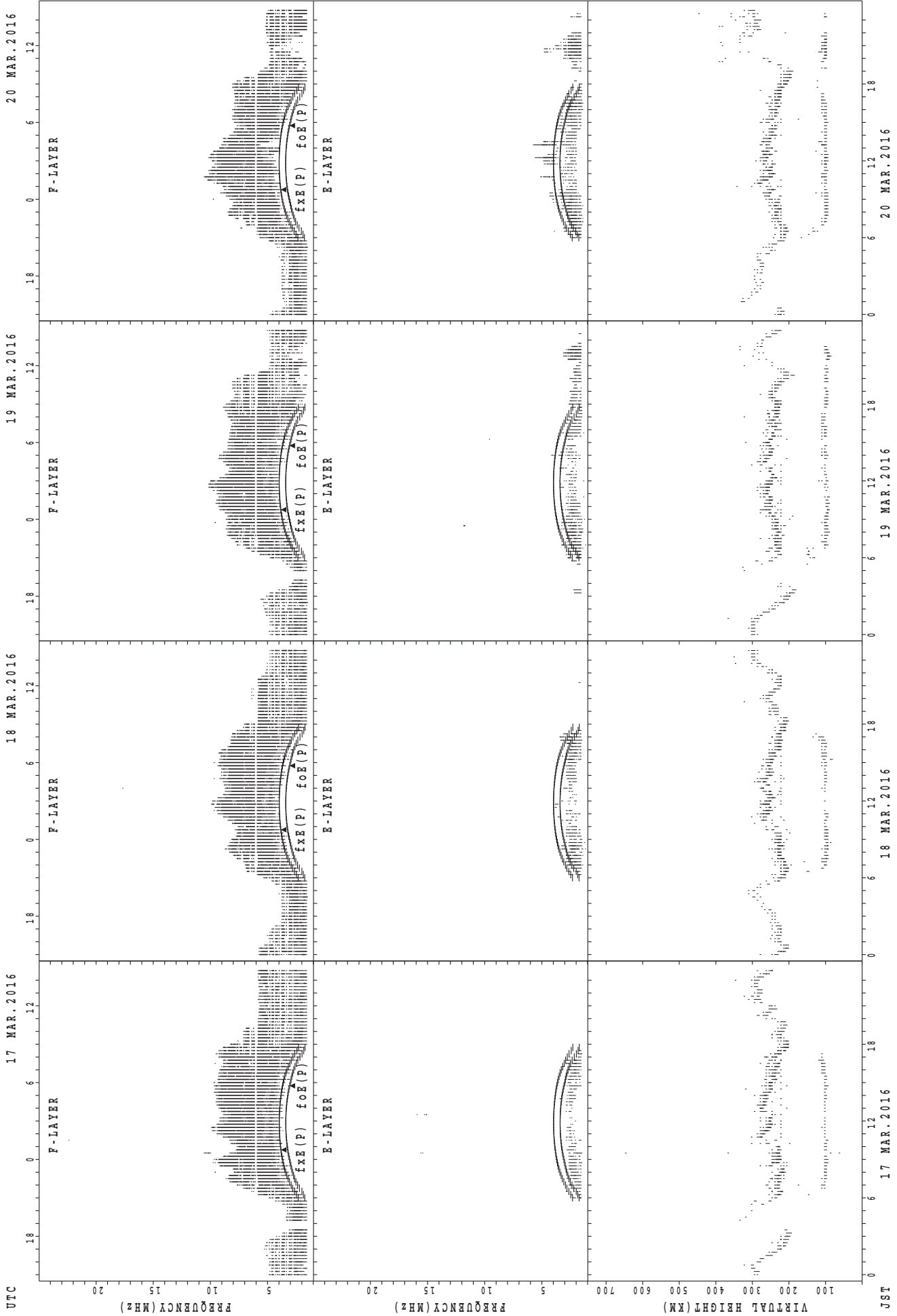
SUMMARY PLOTS AT Kokubunji



foF2(P); PREDICTED VALUE FOR fxe  
foE2(P); PREDICTED VALUE FOR foE

JST

SUMMARY PLOTS AT Kokubunji



UTC  
17 MAR. 2016  
18 MAR. 2016  
19 MAR. 2016  
20 MAR. 2016

F-LAYER  
F-LAYER  
F-LAYER  
F-LAYER

fxE(P) foE(P)  
fxE(P) foE(P)  
fxE(P) foE(P)  
fxE(P) foE(P)

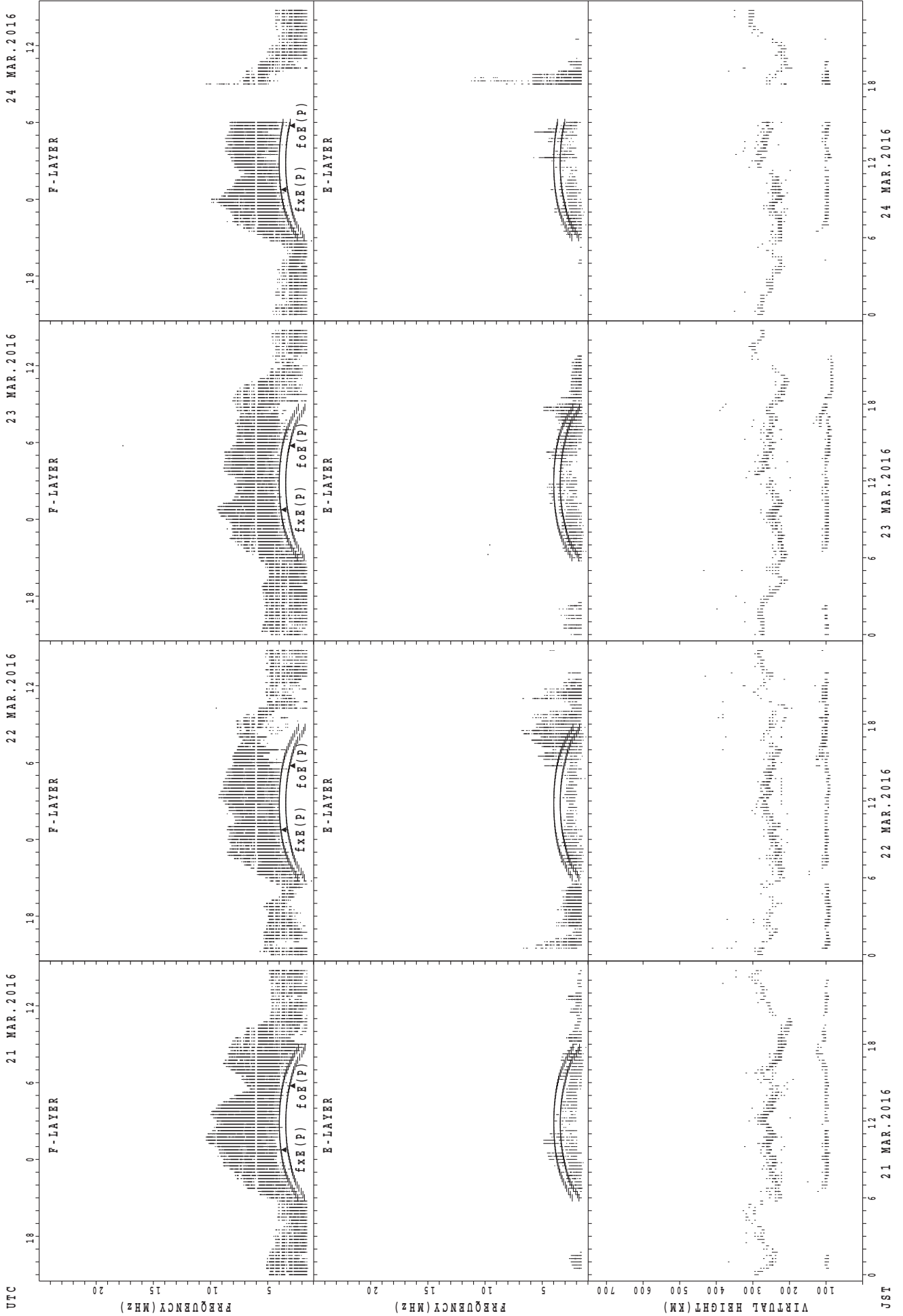
E-LAYER  
E-LAYER  
E-LAYER  
E-LAYER

VIRTUAL HEIGHT (KM)  
VIRTUAL HEIGHT (KM)  
VIRTUAL HEIGHT (KM)  
VIRTUAL HEIGHT (KM)

JST  
17 MAR. 2016  
18 MAR. 2016  
19 MAR. 2016  
20 MAR. 2016

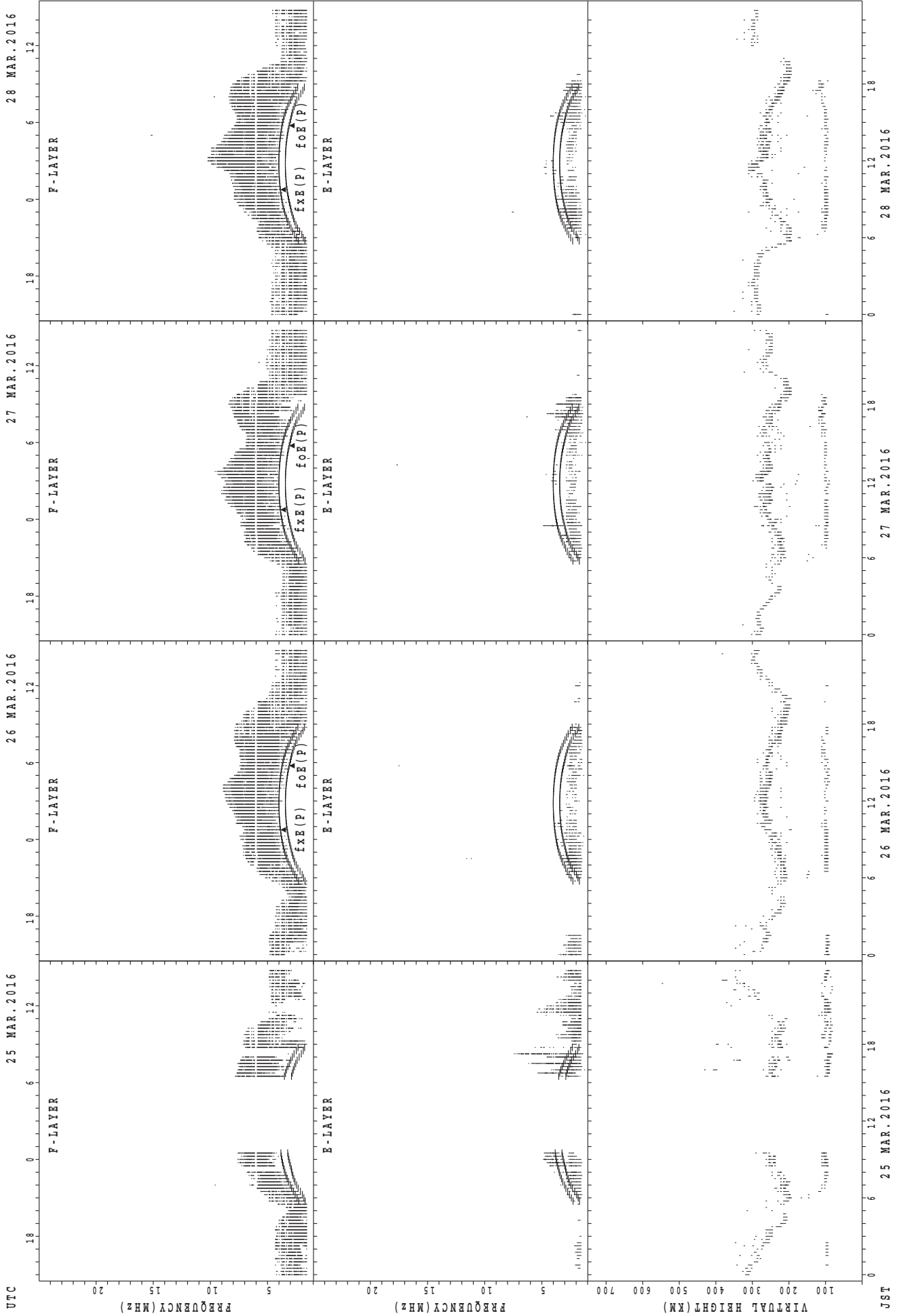
fxE(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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

SUMMARY PLOTS AT Kokubunji

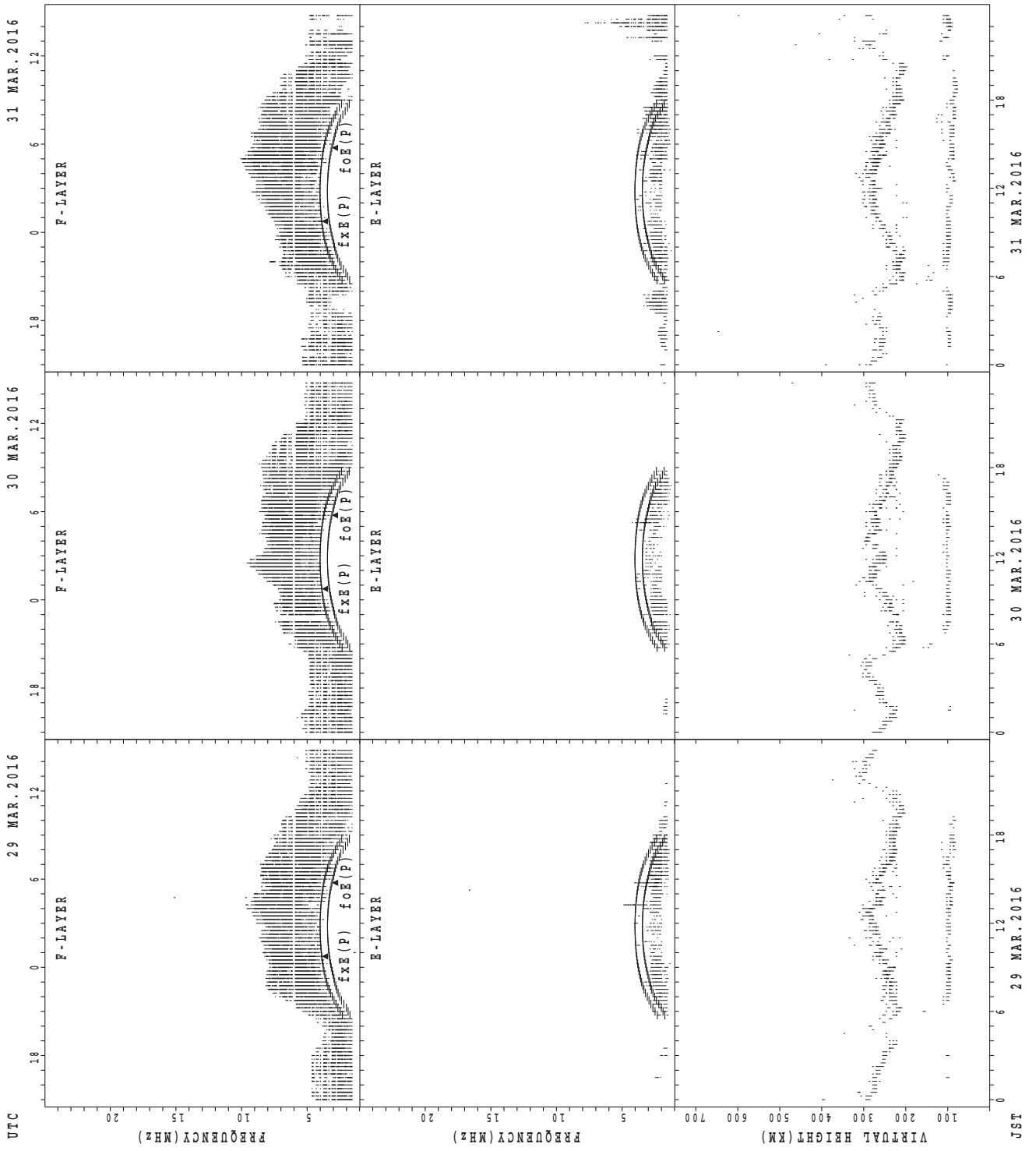


UTC  
25 MAR. 2016  
26 MAR. 2016  
27 MAR. 2016  
28 MAR. 2016

JST  
25 MAR. 2016  
26 MAR. 2016  
27 MAR. 2016  
28 MAR. 2016

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

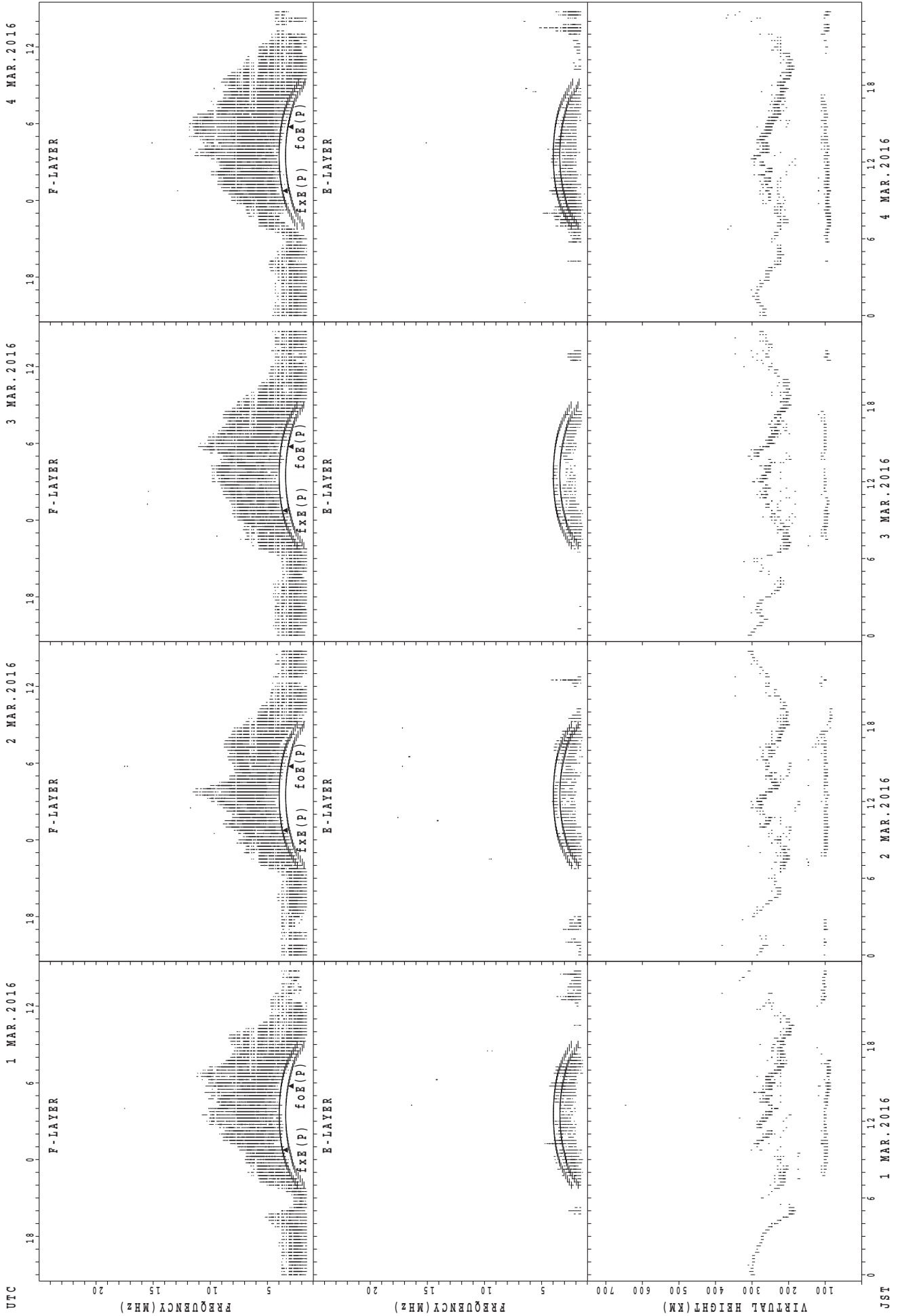
SUMMARY PLOTS AT Kokubunji



f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
foE(P); PREDICTED VALUE FOR foE



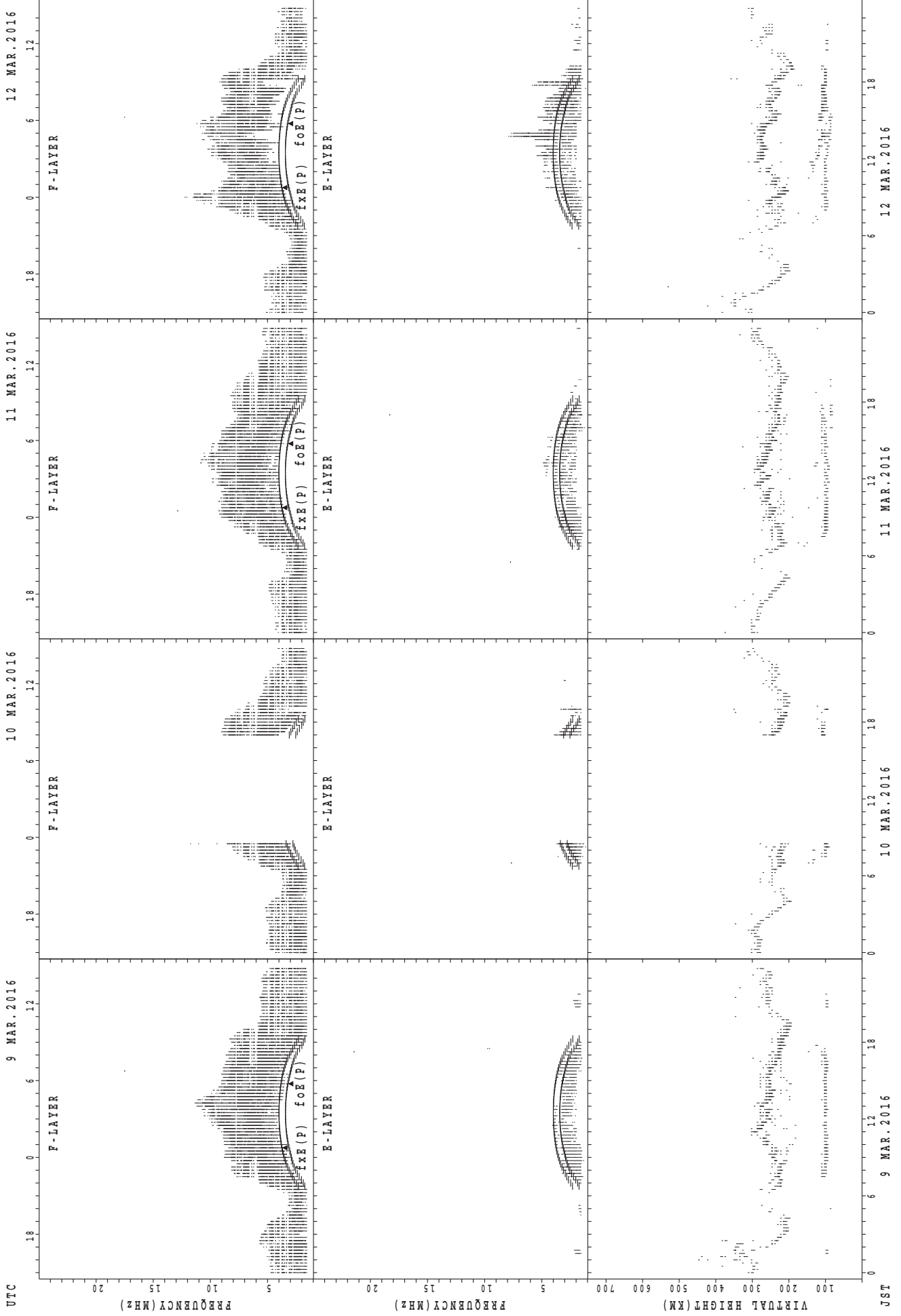
SUMMARY PLOTS AT Yamagawa



JST



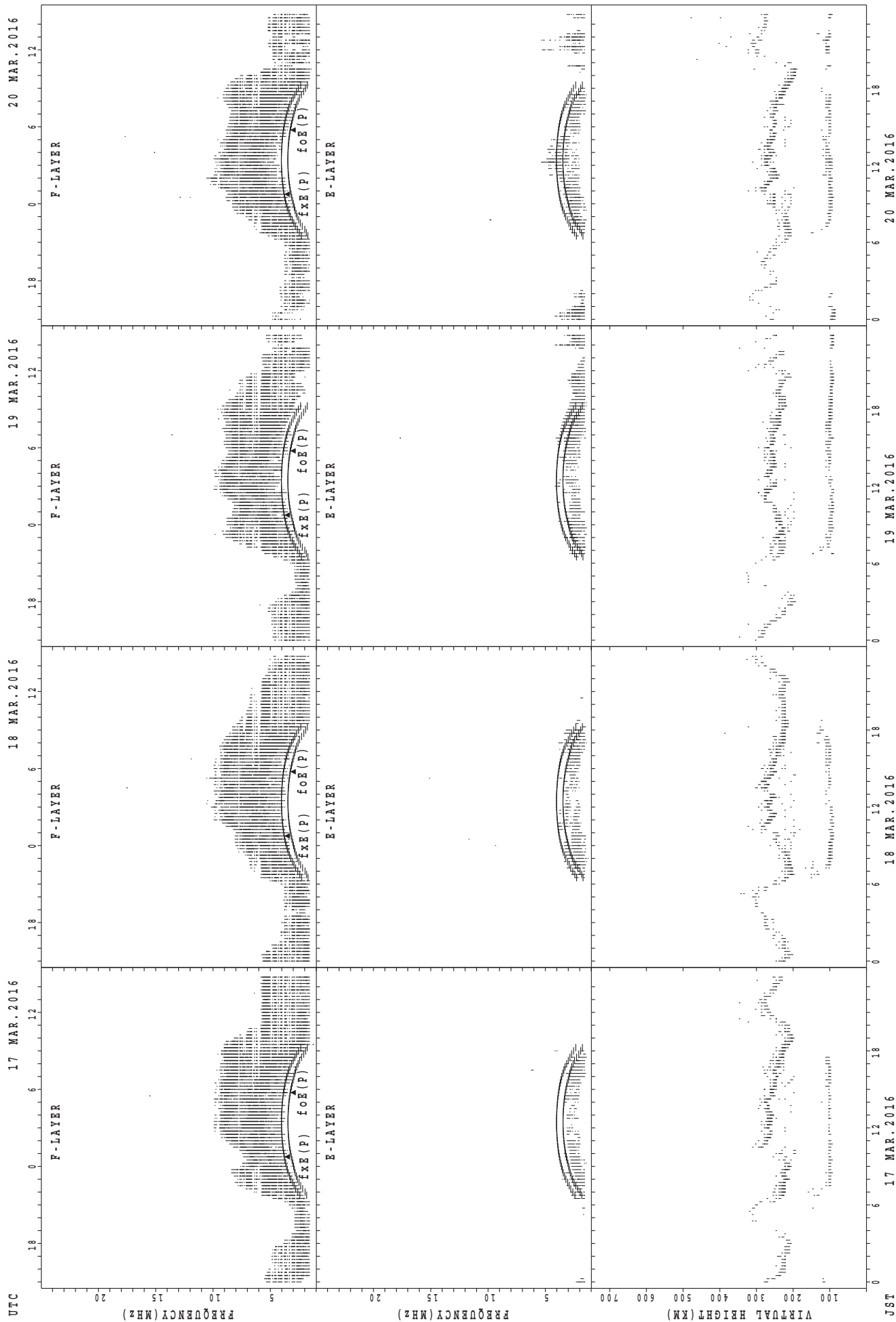
SUMMARY PLOTS AT Yamagawa



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



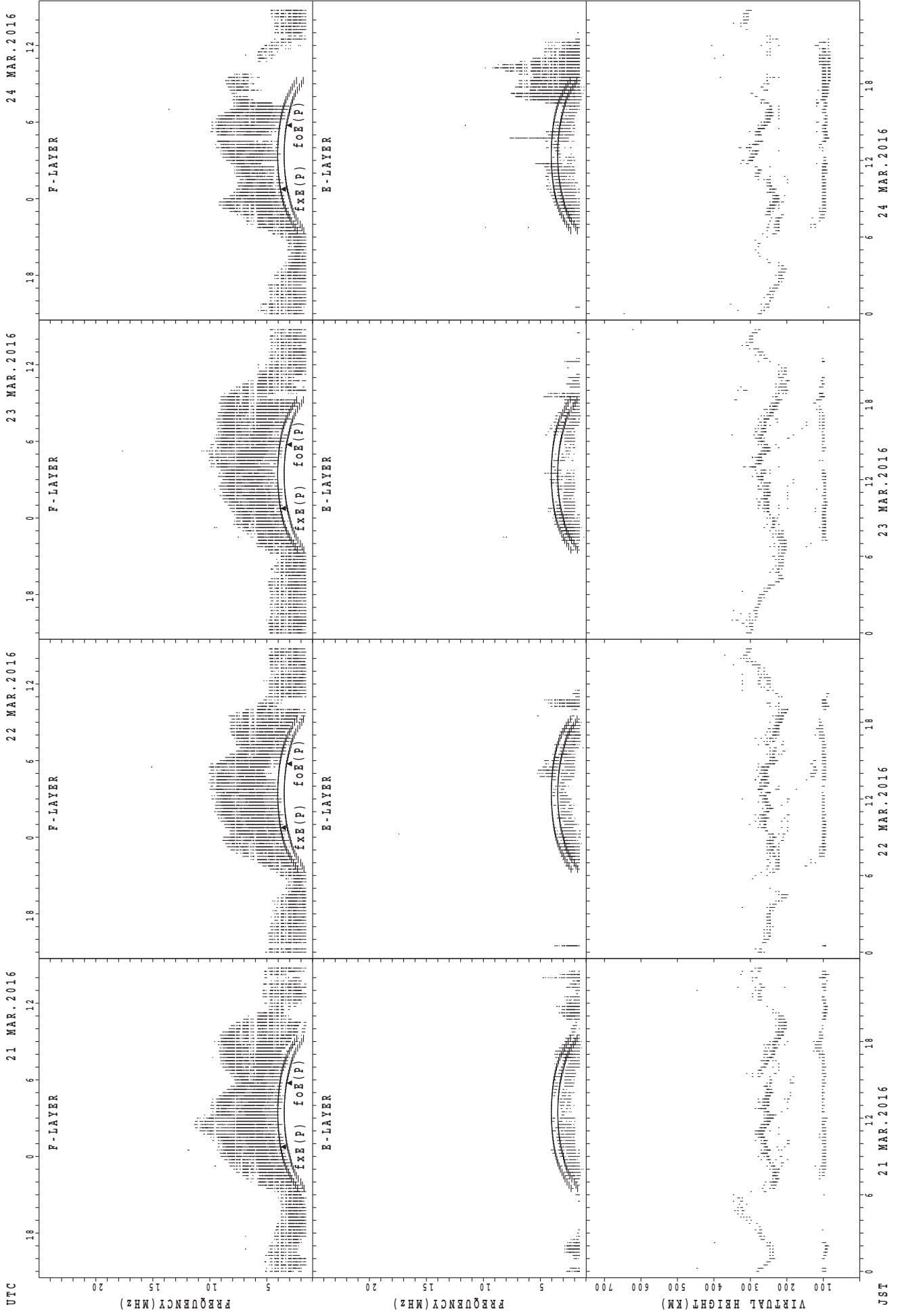
SUMMARY PLOTS AT Yamagawa



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

JST

SUMMARY PLOTS AT Yamagawa

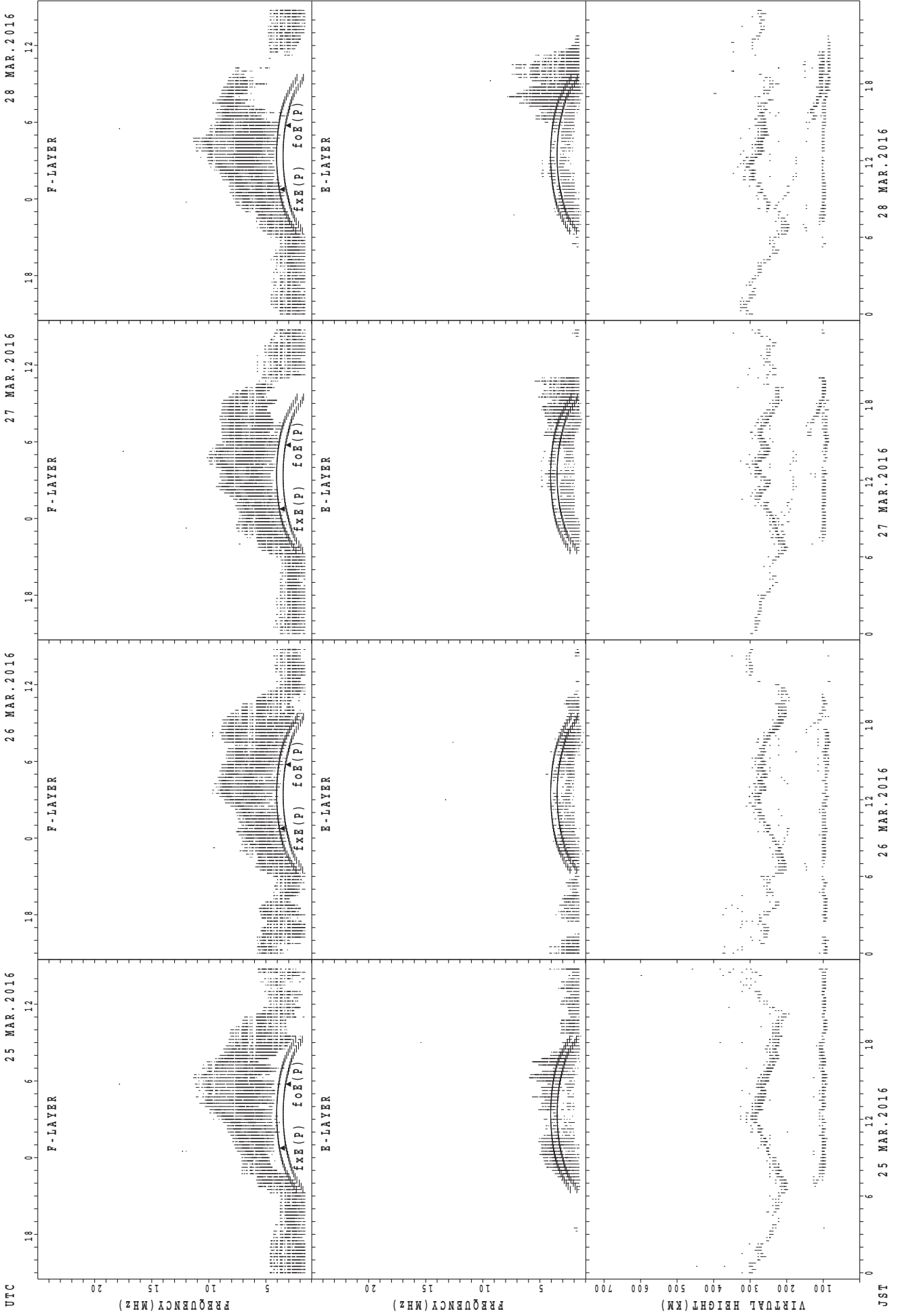


UTC  
 21 MAR. 2016  
 22 MAR. 2016  
 23 MAR. 2016  
 24 MAR. 2016

JSR  
 18 0 6 12 18  
 18 0 6 12 18  
 18 0 6 12 18  
 18 0 6 12 18

f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
 f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Yamagawa



UTC  
 25 MAR. 2016  
 26 MAR. 2016  
 27 MAR. 2016  
 28 MAR. 2016

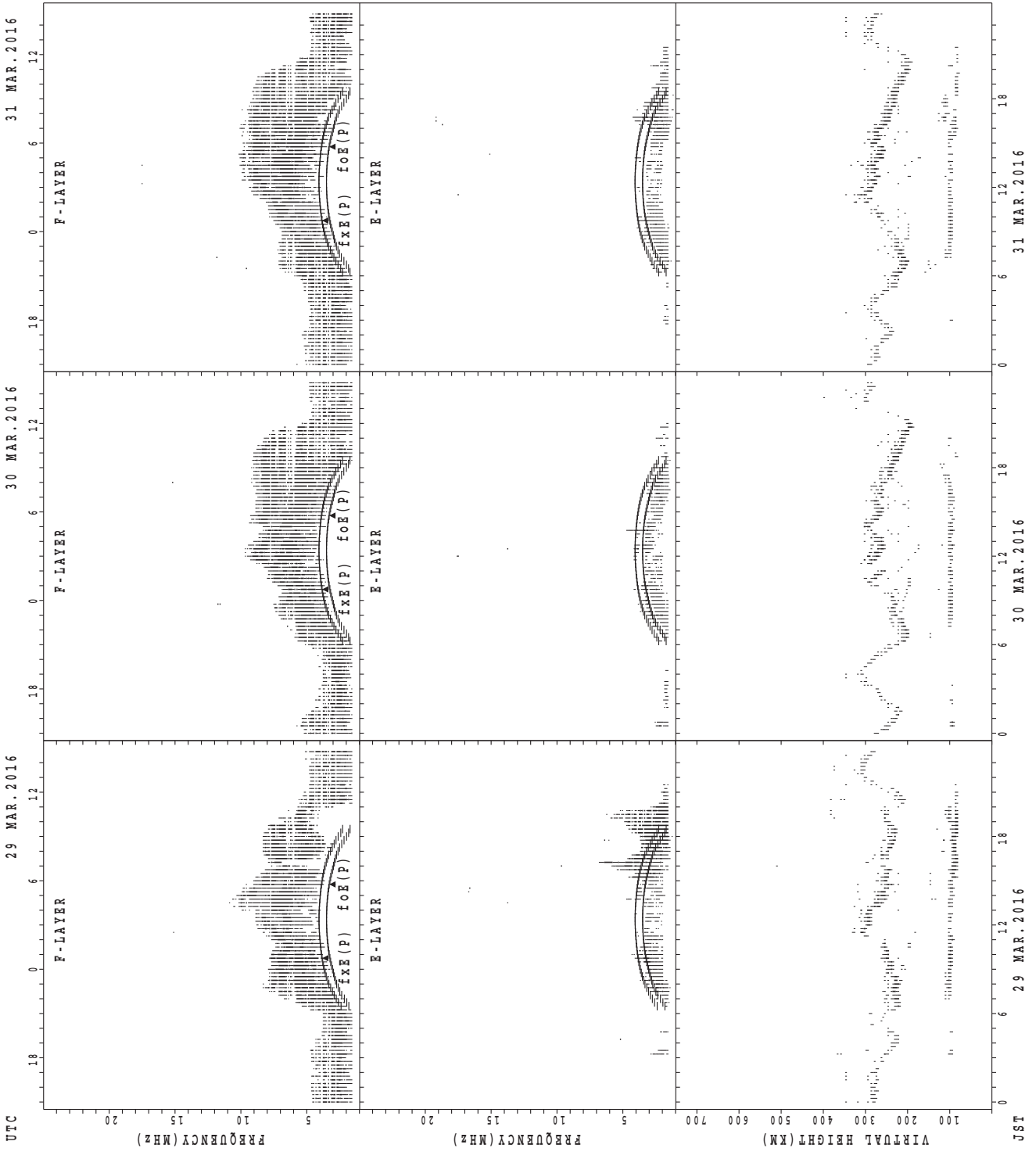
F-LAYER  
 E-LAYER  
 FREQUENCY (MHz)  
 FREQUENCY (MHz)  
 VIRTUAL HEIGHT (KM)  
 VIRTUAL HEIGHT (KM)

foE(P)  
 fxe(P)  
 foE(P)  
 fxe(P)  
 foE(P)  
 fxe(P)  
 foE(P)  
 foE(P)  
 fxe(P)  
 foE(P)  
 foE(P)  
 fxe(P)  
 foE(P)  
 foE(P)  
 fxe(P)  
 foE(P)

JST  
 25 MAR. 2016  
 26 MAR. 2016  
 27 MAR. 2016  
 28 MAR. 2016

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

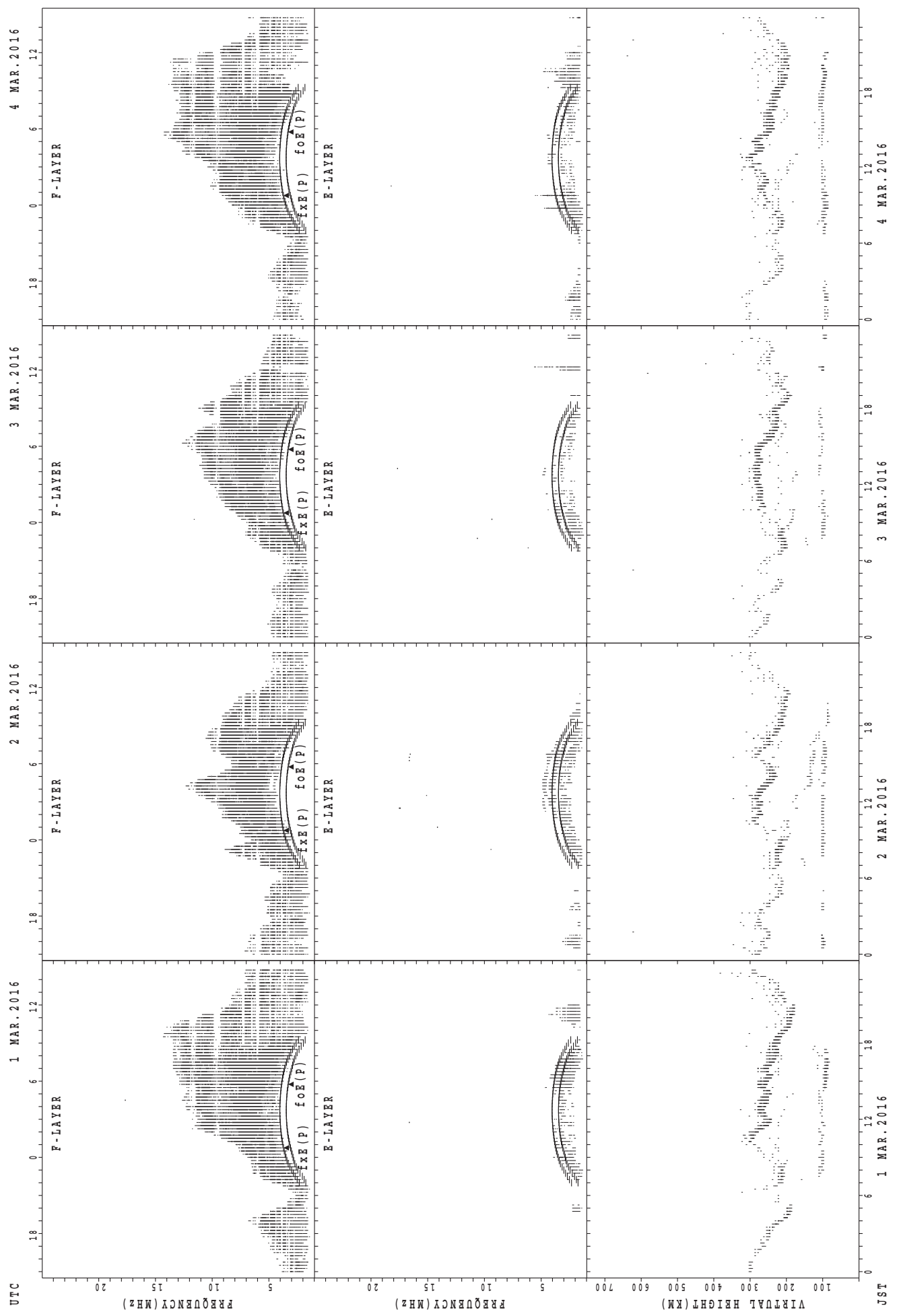
SUMMARY PLOTS AT Yamagawa



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

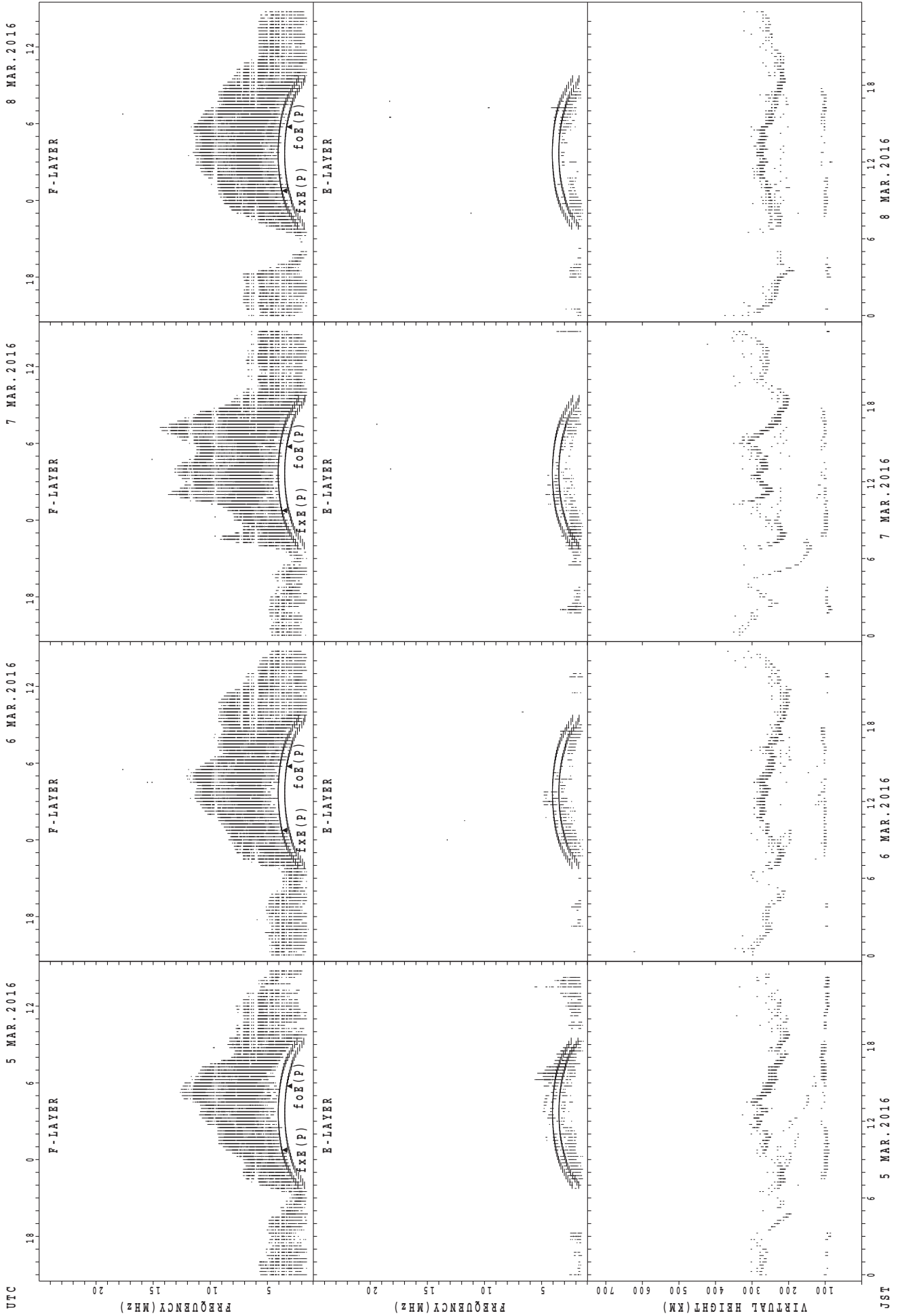


SUMMARY PLOTS AT Okinawa



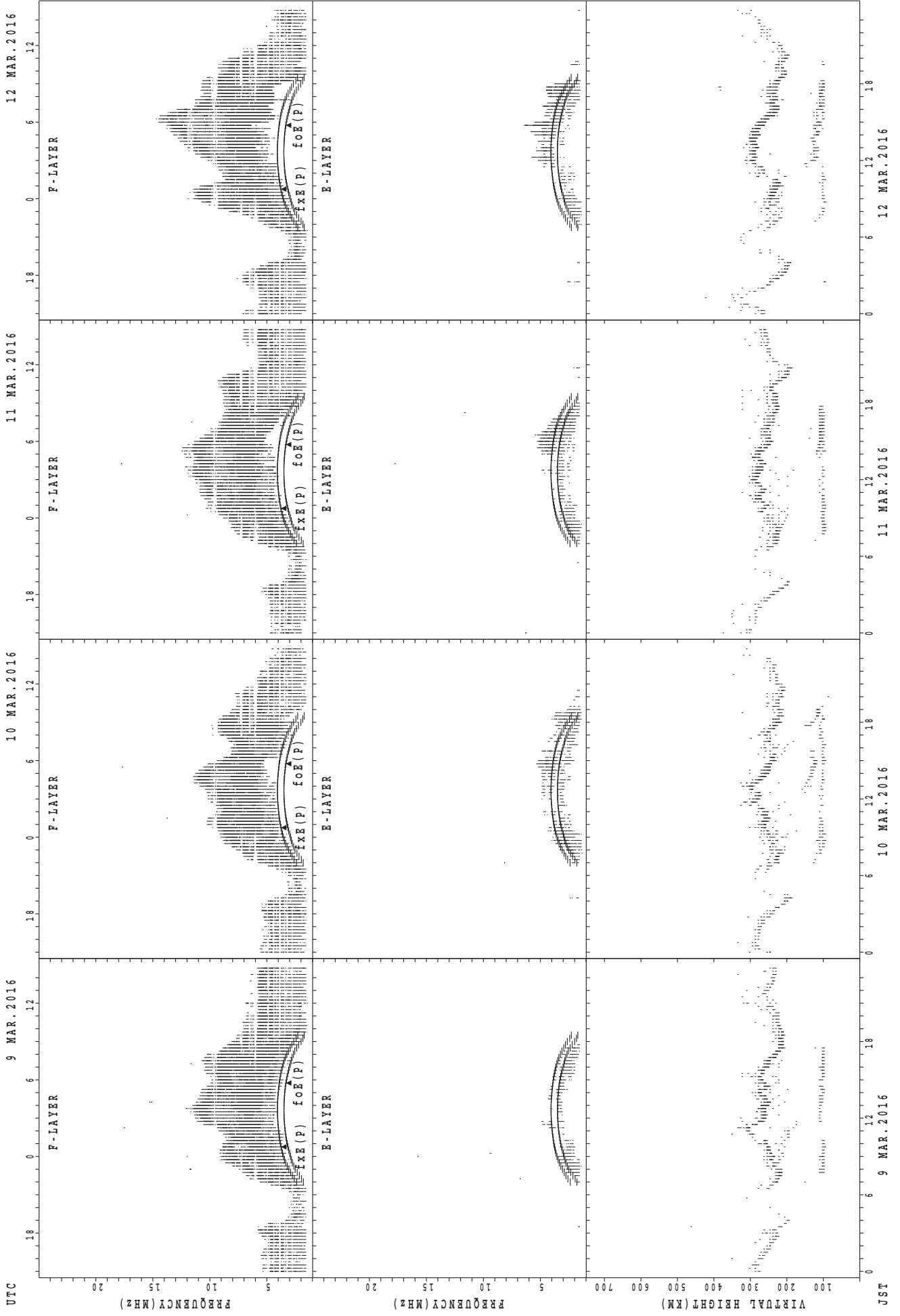
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



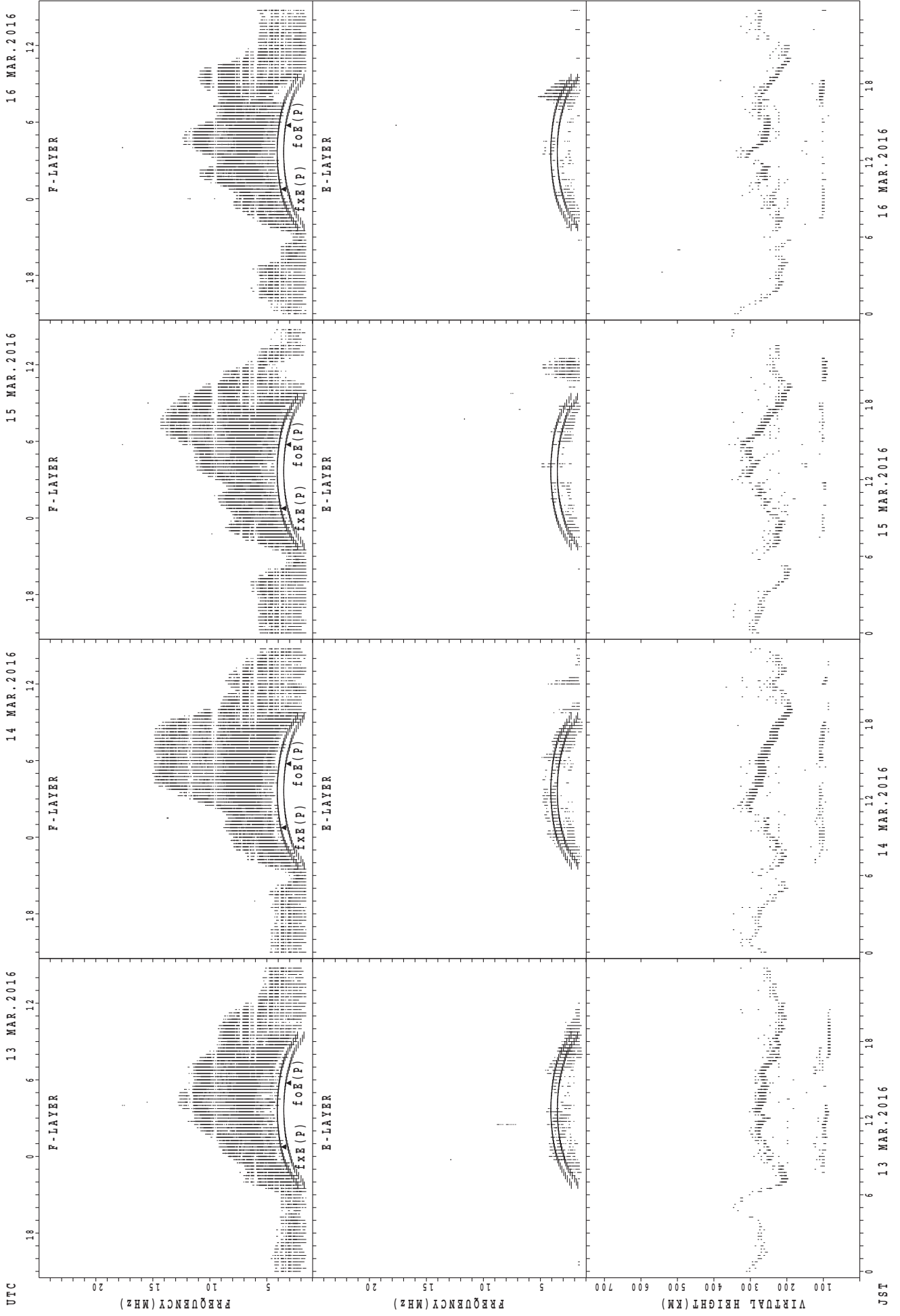
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



JSJ  
 9 MAR. 2016  
 10 MAR. 2016  
 11 MAR. 2016  
 12 MAR. 2016  
 fxe(P); PREDICTED VALUE FOR fxe  
 foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



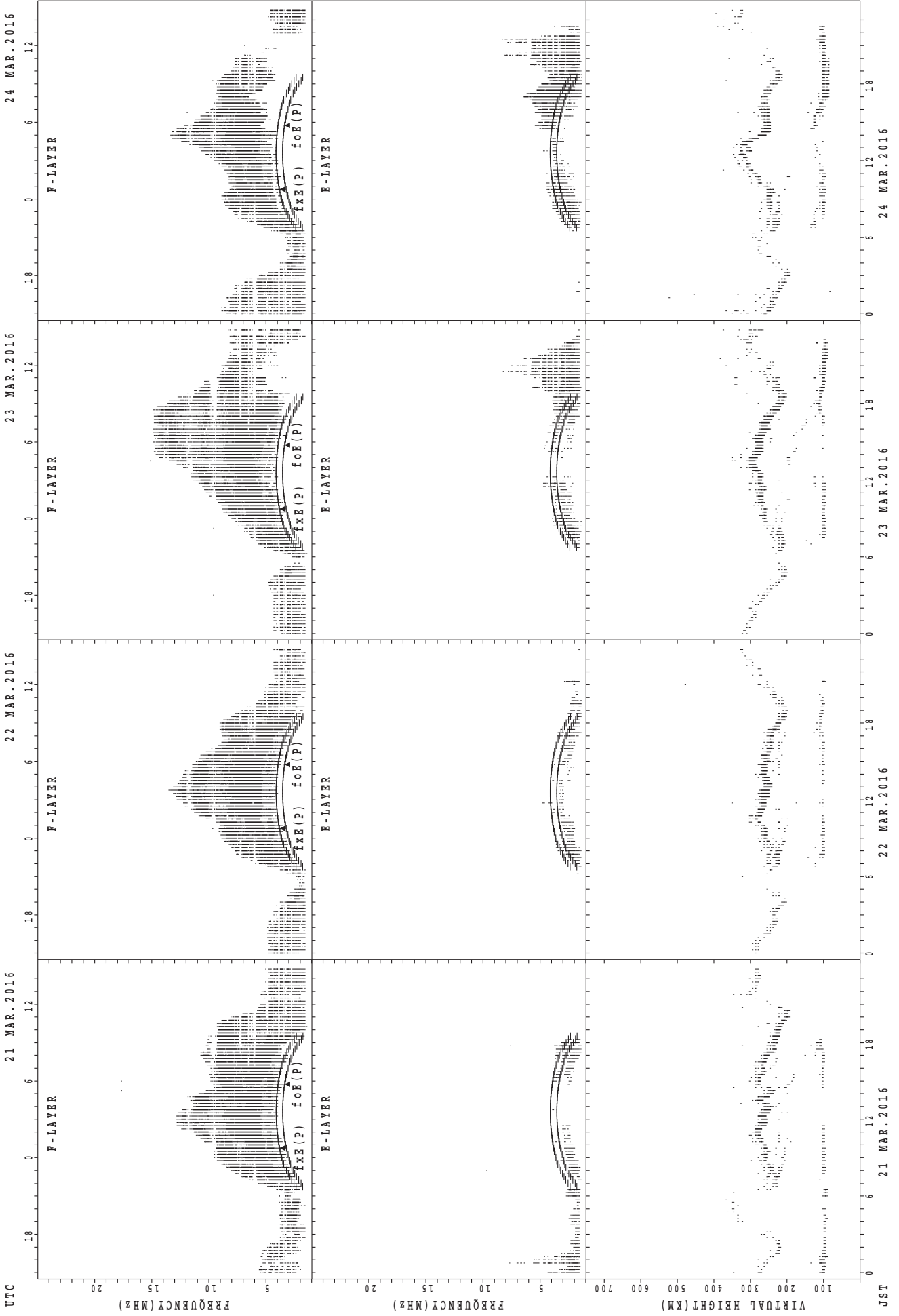
UTC  
 13 MAR. 2016  
 14 MAR. 2016  
 15 MAR. 2016  
 16 MAR. 2016

JST  
 13 MAR. 2016  
 14 MAR. 2016  
 15 MAR. 2016  
 16 MAR. 2016

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

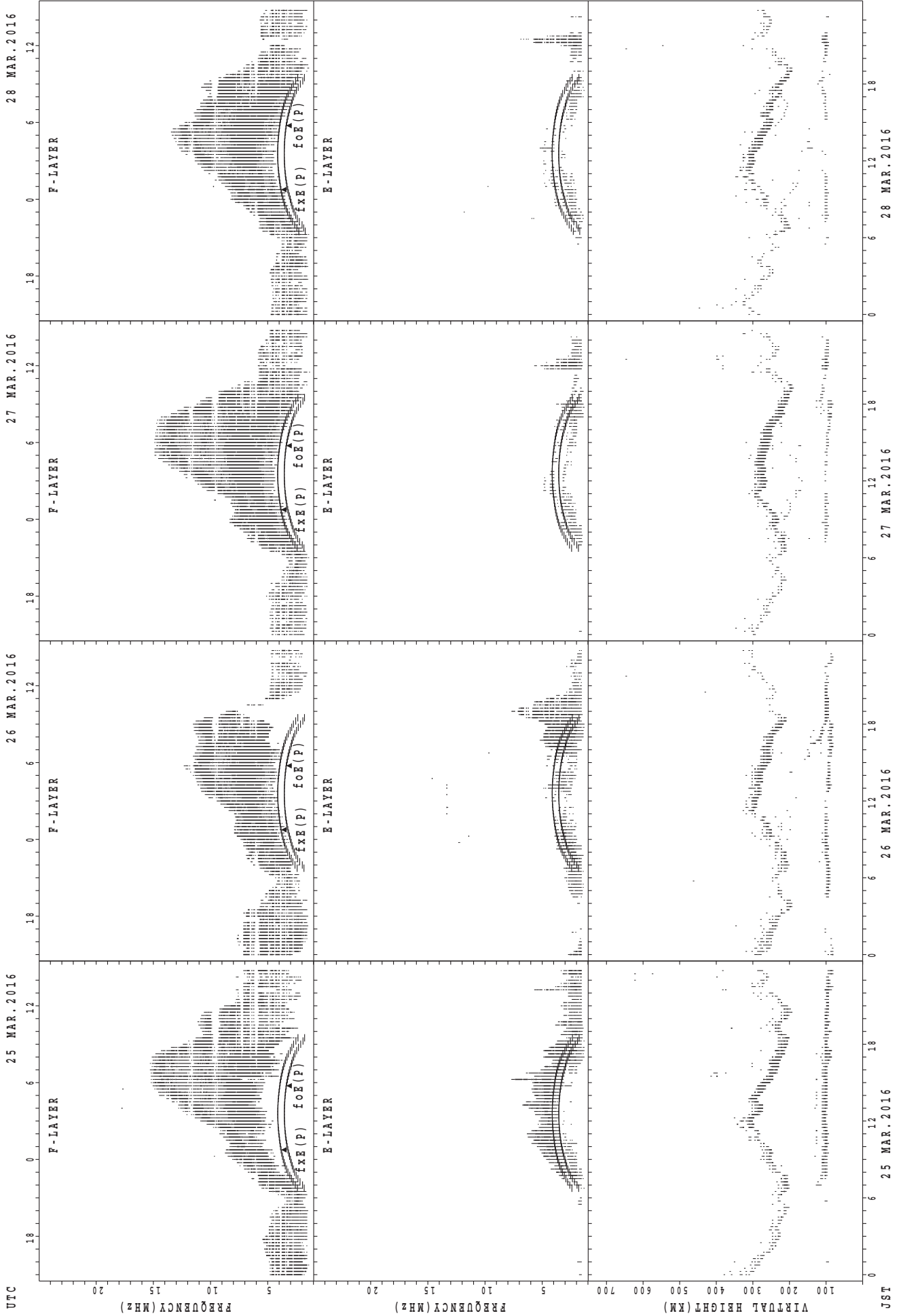


SUMMARY PLOTS AT Okinawa



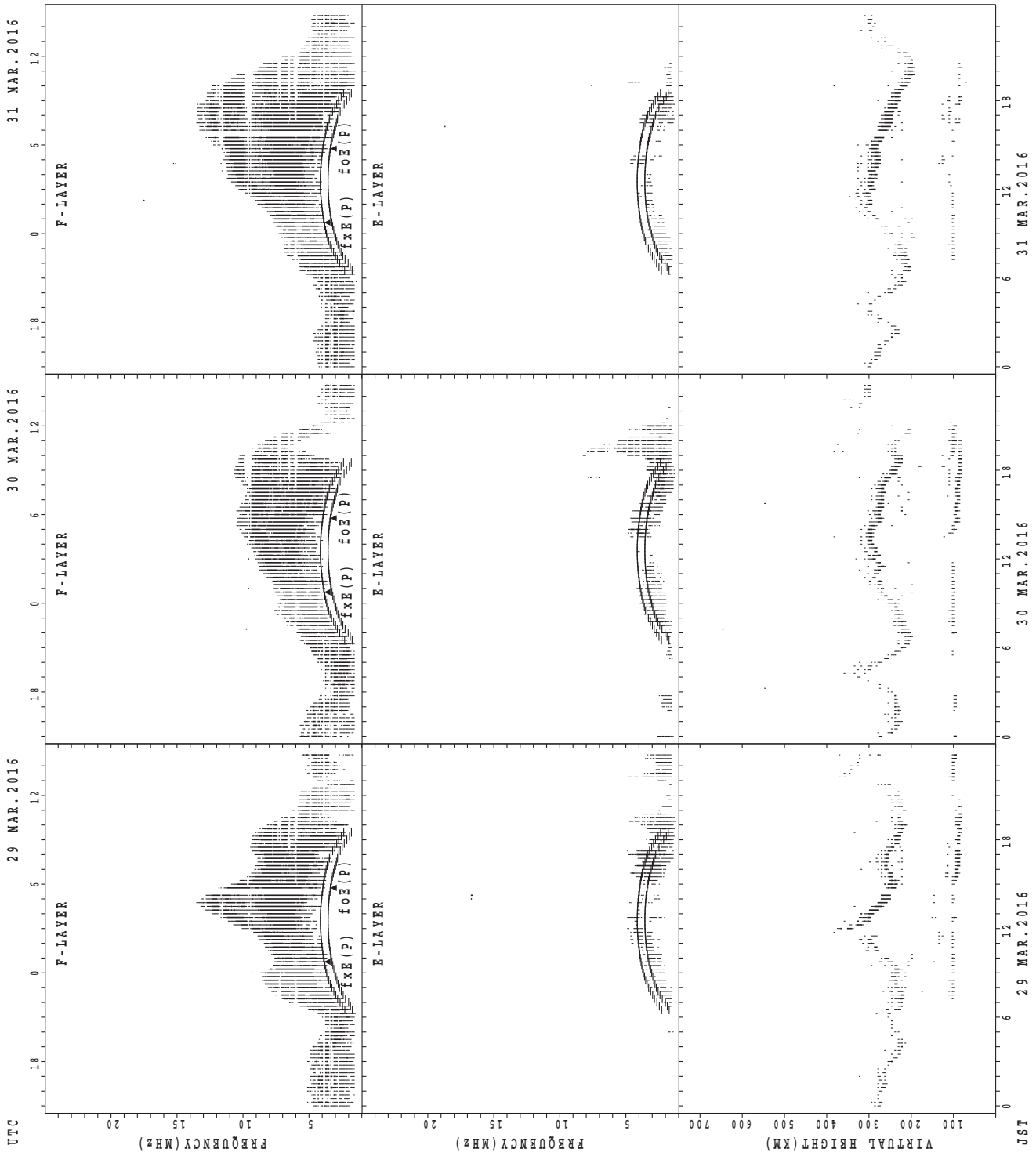
fxe(P); PREDICTED VALUE FOR fxe  
foe(P); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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



MONTHLY MEDIANS OF h'F AND h'Es  
 MAR. 2016 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   |    |    |    |    | 5   | 25  | 15  |    |    |    |    | 4   | 29  | 27  | 24  | 15  | 1   | 2   |    |    |    |
| MED |    |    | 276 |    |    |    |    | 240 | 246 | 240 |    |    |    |    | 241 | 248 | 252 | 236 | 246 | 278 | 261 |    |    |    |
| U Q |    |    | 138 |    |    |    |    | 251 | 259 | 254 |    |    |    |    | 247 | 259 | 258 | 245 | 252 | 139 | 300 |    |    |    |
| L Q |    |    | 138 |    |    |    |    | 226 | 233 | 236 |    |    |    |    | 236 | 240 | 238 | 230 | 234 | 139 | 222 |    |    |    |

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 | 7   | 3   | 3  | 1  | 3  | 2  | 9   | 20  | 14  | 16  | 10  | 9   | 7   | 5   | 5   | 12  | 23  | 15  | 12  | 10  | 10  | 9   | 7   | 8   |
| MED | 95  | 95  | 95 | 97 | 97 | 93 | 143 | 128 | 105 | 101 | 102 | 97  | 99  | 95  | 103 | 103 | 105 | 113 | 107 | 106 | 104 | 103 | 99  | 98  |
| U Q | 103 | 103 | 99 | 48 | 99 | 95 | 149 | 152 | 107 | 107 | 105 | 137 | 111 | 131 | 105 | 107 | 107 | 137 | 114 | 113 | 107 | 105 | 101 | 102 |
| L Q | 93  | 89  | 93 | 48 | 97 | 91 | 137 | 113 | 101 | 99  | 99  | 95  | 95  | 95  | 95  | 101 | 103 | 97  | 102 | 97  | 97  | 94  | 91  | 91  |

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 |    |    |    |    |    |    | 1   | 18  | 28  | 14  |    |    |    |    |    | 24  | 28  | 30  | 20  | 7   | 1   |    |    |    |
| MED |    |    |    |    |    |    | 234 | 241 | 238 | 245 |    |    |    |    |    | 246 | 243 | 240 | 237 | 246 | 246 |    |    |    |
| U Q |    |    |    |    |    |    | 117 | 246 | 247 | 254 |    |    |    |    |    | 257 | 252 | 248 | 247 | 264 | 123 |    |    |    |
| L Q |    |    |    |    |    |    | 117 | 230 | 231 | 238 |    |    |    |    |    | 238 | 231 | 226 | 232 | 238 | 123 |    |    |    |

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 | 6  | 4  | 2   | 2  | 4  | 2   | 12  | 8   | 6   | 4   | 5   | 8   | 11  | 9   | 5   | 4   | 7   | 16  | 13  | 9   | 8   | 8   | 9   | 4   |
| MED | 96 | 96 | 100 | 94 | 95 | 99  | 157 | 151 | 107 | 106 | 119 | 133 | 147 | 113 | 107 | 112 | 105 | 112 | 103 | 99  | 100 | 103 | 101 | 97  |
| U Q | 97 | 98 | 105 | 95 | 95 | 103 | 172 | 161 | 119 | 116 | 130 | 176 | 169 | 118 | 149 | 129 | 113 | 118 | 106 | 107 | 103 | 105 | 110 | 100 |
| L Q | 95 | 95 | 95  | 93 | 93 | 95  | 143 | 149 | 99  | 103 | 99  | 112 | 113 | 105 | 102 | 104 | 103 | 107 | 92  | 88  | 90  | 98  | 95  | 93  |

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 |    |    |    |    |    |    |    | 1   | 18  | 28  |    |    |    |    |    |    | 29  | 29  | 27  | 14  | 2   |    |    |    |
| MED |    |    |    |    |    |    |    | 214 | 250 | 247 |    |    |    |    |    |    | 254 | 242 | 238 | 232 | 235 |    |    |    |
| U Q |    |    |    |    |    |    |    | 107 | 258 | 254 |    |    |    |    |    |    | 262 | 246 | 248 | 246 | 248 |    |    |    |
| L Q |    |    |    |    |    |    |    | 107 | 236 | 233 |    |    |    |    |    |    | 241 | 235 | 232 | 230 | 222 |    |    |    |

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 | 7  | 5   | 4  | 1  | 1  | 1   | 1  | 21  | 9   | 6  | 8   | 7   | 10  | 13  | 14  | 10  | 12  | 25  | 19  | 13  | 11  | 14  | 8   | 5   |
| MED | 97 | 97  | 97 | 97 | 95 | 103 | 95 | 149 | 103 | 99 | 102 | 125 | 176 | 109 | 122 | 110 | 109 | 107 | 109 | 101 | 103 | 97  | 101 | 101 |
| U Q | 99 | 101 | 99 | 48 | 47 | 51  | 47 | 158 | 113 | 99 | 114 | 167 | 185 | 157 | 139 | 117 | 124 | 113 | 119 | 105 | 105 | 113 | 105 | 108 |
| L Q | 93 | 91  | 96 | 48 | 47 | 51  | 47 | 137 | 100 | 99 | 97  | 103 | 113 | 105 | 109 | 93  | 102 | 103 | 101 | 95  | 99  | 95  | 96  | 92  |

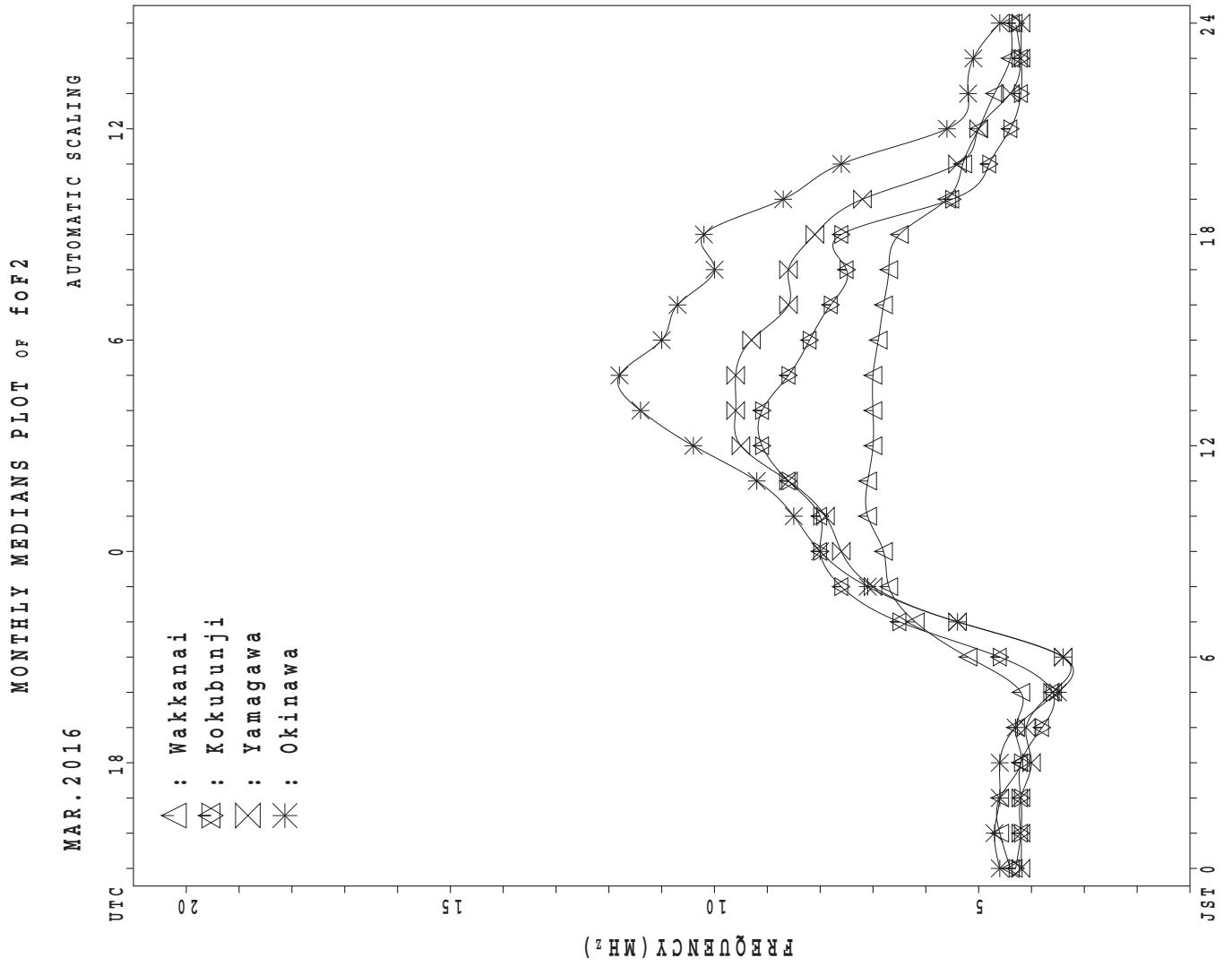
MONTHLY MEDIANS OF h'F AND h'Es  
 MAR. 2016 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

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 | 1   | 2   | 2   |    |    |    |    | 1   | 21  | 28  | 4   |    |    |    |    |    | 30  | 31  | 31  | 23  | 14  | 5   | 1   | 1   |
| MED | 312 | 304 | 273 |    |    |    |    | 214 | 244 | 254 | 271 |    |    |    |    |    | 254 | 242 | 230 | 232 | 233 | 256 | 268 | 362 |
| U Q | 156 | 322 | 292 |    |    |    |    | 107 | 251 | 263 | 287 |    |    |    |    |    | 262 | 256 | 238 | 240 | 240 | 260 | 134 | 181 |
| L Q | 156 | 286 | 254 |    |    |    |    | 107 | 235 | 246 | 263 |    |    |    |    |    | 248 | 232 | 222 | 220 | 224 | 228 | 134 | 181 |

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 | 4   | 4   | 3  | 2  | 1  | 3   | 3   | 8   | 8   | 9   | 10  | 10  | 8   | 12  | 11  | 12  | 15  | 21  | 20  | 15  | 11  | 13  | 8   | 6  |
| MED | 99  | 97  | 93 | 92 | 97 | 99  | 97  | 124 | 104 | 111 | 115 | 119 | 121 | 144 | 113 | 113 | 109 | 107 | 103 | 103 | 103 | 101 | 100 | 96 |
| U Q | 103 | 105 | 97 | 93 | 48 | 101 | 163 | 140 | 113 | 125 | 179 | 161 | 163 | 156 | 137 | 127 | 113 | 113 | 110 | 107 | 107 | 106 | 105 | 97 |
| L Q | 92  | 92  | 87 | 91 | 48 | 97  | 97  | 99  | 103 | 105 | 103 | 101 | 112 | 116 | 111 | 111 | 105 | 104 | 98  | 91  | 99  | 98  | 96  | 95 |



## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 f<sub>XI</sub> (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<br>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<br>42 | X<br>43 | X<br>44 | X<br>43 | X<br>45 | X<br>42 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>46 | X<br>45 | X<br>44 | X<br>44 | X<br>43 |
| 2      | X<br>43 | X<br>44 | X<br>45 | X<br>45 | X<br>47 | X<br>47 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>48 | X<br>44 | X<br>46 | X<br>46 | X<br>46 |
| 3      | X<br>47 | X<br>46 | X<br>47 | X<br>47 | X<br>47 | X<br>47 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>58 | X<br>47 | X<br>47 | X<br>47 | X<br>47 |
| 4      | X<br>47 | X<br>49 | X<br>50 | X<br>49 | X<br>51 | X<br>50 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>55 | X<br>45 | X<br>47 | X<br>46 | X<br>47 |
| 5      | X<br>46 | X<br>46 | X<br>46 | X<br>46 | X<br>47 | X<br>47 |    |    |    |    |    |    |    |    |    |    |    |    | X<br>67 | X<br>56 | X<br>46 | X<br>46 | X<br>44 | X<br>46 |
| 6      | X<br>45 | X<br>46 | X<br>46 | X<br>46 | X<br>46 | X<br>45 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>54 | X<br>50 | X<br>50 | X<br>50 | X<br>47 |
| 7      | X<br>47 | X<br>50 | X<br>49 | X<br>47 | X<br>52 | X<br>52 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>65 | X<br>71 | X<br>61 | X<br>64 | X<br>67 |
| 8      | X<br>69 | X<br>70 | X<br>77 | X<br>69 | X<br>69 |         | 46 |    |    |    |    |    |    |    |    |    |    |    |         | X<br>64 | X<br>59 | X<br>64 | X<br>64 | X<br>64 |
| 9      | 64      | 64      | 64      | 68      | 68      | 54      |    |    |    |    | C  | C  | C  | C  | C  | C  | C  |    |         | X<br>63 | X<br>59 | X<br>56 | X<br>53 | X<br>43 |
| 10     | X<br>54 | X<br>57 | X<br>56 | X<br>57 | X<br>55 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>68 | X<br>64 | X<br>58 | X<br>57 | X<br>56 |
| 11     | X<br>55 | X<br>58 | X<br>60 | X<br>61 | X<br>61 | 60      |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>66 | X<br>62 | X<br>59 | X<br>58 | X<br>57 |
| 12     | X<br>47 | X<br>55 | X<br>52 | X<br>53 | X<br>49 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>59 | X<br>50 | X<br>50 | X<br>49 | X<br>49 |
| 13     | X<br>50 | X<br>51 | X<br>51 | X<br>52 | X<br>53 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>57 | X<br>54 | X<br>51 | X<br>52 | X<br>52 |
| 14     | X<br>55 | X<br>52 | X<br>53 | X<br>56 | X<br>49 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>75 | X<br>64 | X<br>54 | X<br>45 | X<br>52 |
| 15     | X<br>52 | X<br>49 | X<br>47 | X<br>50 | X<br>47 |         |    |    |    |    |    |    |    |    |    |    |    |    | X<br>86 | X<br>67 | X<br>59 | X<br>43 | X<br>47 | X<br>52 |
| 16     | X<br>51 | X<br>54 | X<br>58 | X<br>56 | X<br>56 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>73 | X<br>70 | X<br>60 | X<br>61 | X<br>60 |
| 17     | X<br>57 | X<br>61 | X<br>58 | X<br>53 | X<br>49 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>67 | X<br>67 | X<br>61 | X<br>58 | X<br>60 |
| 18     | X<br>61 | X<br>56 | X<br>46 | X<br>46 | X<br>45 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>71 | X<br>67 | X<br>59 | X<br>55 | X<br>52 |
| 19     | X<br>52 | X<br>53 | X<br>53 | X<br>49 | X<br>40 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>80 | X<br>79 | X<br>56 | X<br>47 | X<br>45 |
| 20     | X<br>39 | X<br>42 | X<br>43 | X<br>42 | X<br>43 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>60 | X<br>55 | X<br>54 | X<br>52 | X<br>52 |
| 21     | X<br>47 | X<br>47 | X<br>47 | X<br>46 | X<br>50 | X<br>47 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>64 | X<br>61 | X<br>58 | X<br>56 | X<br>55 |
| 22     | X<br>54 | X<br>57 | X<br>57 | X<br>56 | X<br>52 | X<br>50 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>59 | X<br>60 | X<br>57 | X<br>55 | X<br>56 |
| 23     | X<br>61 | X<br>55 | X<br>54 | X<br>54 | X<br>52 | X<br>52 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>71 | X<br>65 | X<br>52 | X<br>51 | X<br>55 |
| 24     | X<br>53 | X<br>53 | X<br>52 | X<br>53 | X<br>50 | X<br>46 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>63 | X<br>63 | X<br>52 | X<br>56 | X<br>55 |
| 25     | X<br>55 | X<br>56 | X<br>54 | X<br>53 | X<br>53 | X<br>47 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>62 | X<br>59 | X<br>57 | X<br>56 | X<br>52 |
| 26     | X<br>53 | X<br>50 | X<br>50 | X<br>47 | X<br>46 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>68 | X<br>60 | X<br>57 | X<br>54 | X<br>51 |
| 27     | X<br>53 | X<br>52 | X<br>52 | X<br>52 | X<br>51 |         |    |    |    |    |    |    |    |    |    |    |    |    | X<br>78 | X<br>67 | X<br>67 | X<br>63 | X<br>59 | X<br>57 |
| 28     | X<br>54 | X<br>54 | X<br>55 | X<br>51 | X<br>50 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>58 | X<br>56 | X<br>53 | X<br>54 | X<br>55 |
| 29     | X<br>56 | X<br>56 | X<br>55 | X<br>52 | X<br>51 | X<br>51 |    |    |    |    |    |    |    |    |    |    |    |    |         |         |         | X<br>59 | X<br>57 | X<br>58 |
| 30     | X<br>56 | X<br>57 | X<br>52 | X<br>52 | X<br>50 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |         | X<br>71 | X<br>62 | X<br>61 | X<br>59 |
| 31     | X<br>57 | X<br>56 | X<br>54 | X<br>52 | X<br>52 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |         | X<br>63 | X<br>55 | X<br>50 | X<br>50 |
|        | 00      | 01      | 02      | 03      | 04      | 05      | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18      | 19      | 20      | 21      | 22      | 23      |
| CNT    | 31      | 31      | 31      | 31      | 31      | 15      | 1  |    |    |    |    |    |    |    |    |    |    |    | 3       | 28      | 30      | 31      | 31      | 31      |
| MED    | X<br>53 | X<br>53 | X<br>52 | X<br>52 | X<br>50 | X<br>47 | 46 |    |    |    |    |    |    |    |    |    |    |    | X<br>78 | X<br>64 | X<br>60 | X<br>56 | X<br>54 | X<br>52 |
| U Q    | X<br>56 | X<br>56 | X<br>55 | X<br>54 | X<br>52 | X<br>52 |    |    |    |    |    |    |    |    |    |    |    |    | X<br>86 | X<br>68 | X<br>65 | X<br>59 | X<br>57 | X<br>57 |
| L Q    | X<br>47 | X<br>49 | X<br>47 | X<br>47 | X<br>47 | X<br>47 |    |    |    |    |    |    |    |    |    |    |    |    | X<br>67 | X<br>58 | X<br>54 | X<br>50 | X<br>47 | X<br>47 |

MAR. 2016 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 f<sub>o</sub>F<sub>2</sub> (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<br>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      | 35                | 36                | 37                | 36                | 38                | 35                | 38 <sup>S</sup>   | 57 | 68 | 72                | 72                 | 78                | J <sup>R</sup> 81 | 78                | 76                | 76 | 66                | 72 | 44 | 39 | 38 | 37                | 37                | 36                |    |
| 2      | 36                | 37                | 38                | 38                | 40                | 40                | 48                | 62 | 69 | J <sup>R</sup> 71 | 84                 | 83                | J <sup>R</sup> 83 | 86                | 77                | 72 | 69                | 63 | 50 | 41 | 37 | 39                | 39                | 39                |    |
| 3      | 40                | 39                | 40                | 40                | 40                | 40                | 47                | 61 | 83 | Y                 | 73                 | 89                | 87                | 84                | 76                | 73 | 65                | 71 | 63 | 51 | 40 | 40                | 40                | 40                |    |
| 4      | 40                | 42                | 44                | 42                | 44                | 43                | 52                | 63 | 78 | J <sup>R</sup> 79 | J <sup>R</sup> 89  | 74                | J <sup>R</sup> 89 | J <sup>R</sup> 90 | J <sup>R</sup> 83 | 77 | 72                | 74 | 68 | 48 | 38 | 40                | 39                | 40                |    |
| 5      | 39                | 39                | 39                | 39                | 40                | 40                | 47                | 56 | 66 | 70                | 79                 | 74                | R <sup>Y</sup> 74 | 86                | 70                | 74 | 72                | 72 | 61 | 50 | 40 | 40                | 38                | 40                |    |
| 6      | 39                | 40                | 40                | 40                | 40                | 39                | 50                | 60 | 66 | 68                | 76                 | 86                | 75                | 78                | 76                | 72 | 70                | 66 | 58 | 47 | 43 | 43                | 43                | 40                |    |
| 7      | 40                | 43                | 42                | 40                | 40                | 40 <sup>F</sup>   | 58                | 57 | 62 | 66                | J <sup>R</sup> 82  | 69                | 88                | 71                | 76                | 81 | 90                | 79 | 60 | 58 | 64 | 55                | 57                | 60                |    |
| 8      | 63                | 64                | 70                | 62                | 63                | 55                | 41                | 56 | 67 | 88                | 72                 | 80                | 78                | Y <sup>J</sup> 76 | J <sup>R</sup> 83 | 76 | 73                | 70 | 60 | 57 | 52 | F <sup>F</sup> 51 | F <sup>F</sup> 47 | F <sup>F</sup> 51 |    |
| 9      | F <sup>F</sup> 44 | F <sup>F</sup> 47 | F <sup>F</sup> 48 | F <sup>F</sup> 54 | F <sup>F</sup> 55 | F <sup>F</sup> 42 | 52                | 61 | 76 | 73                | Y                  | C                 | C                 | C                 | C                 | C  | C                 | 73 | 66 | 56 | 52 | 49                | 46                | 36                |    |
| 10     | 35                | F <sup>F</sup> 34 | F <sup>F</sup> 42 | 50                | 48                | V <sup>V</sup> 32 | 47                | 62 | 73 | 73                | Y                  | Y                 | 78                | 73                | 74                | 75 | J <sup>R</sup> 84 | 74 | 67 | 61 | 57 | 51                | 50                | 49                |    |
| 11     | 48                | 52                | 44                | F <sup>F</sup> 49 | F <sup>F</sup> 49 | F <sup>F</sup> 49 | 49                | 58 | 70 | 76                | 85                 | 94                | J <sup>R</sup> 93 | 84                | 78                | 72 | R <sup>R</sup> 73 | 80 | 76 | 59 | 55 | 52                | 51                | 50                |    |
| 12     | 40                | 48                | 45                | 46                | 42                | 30                | 39                | 55 | 64 | 70                | 69                 | 80                | 80                | 78                | 78                | 69 | 73                | 76 | 72 | 52 | 43 | 43                | 42                | 42                |    |
| 13     | 43                | 44                | 44                | 45                | 46                | 42                | 51                | 59 | 64 | 72                | 78                 | 75                | 78                | 85                | 98                | 76 | 74                | 62 | 63 | 50 | 47 | 44                | 45                | 45                |    |
| 14     | 48                | 45                | 46                | 49                | 42                | 40                | 53                | 60 | 67 | 72                | 80                 | 81                | 75                | Y                 | 77                | 68 | 68                | 76 | 71 | 68 | 57 | 47                | 45                | 45                |    |
| 15     | 45                | 43                | 40                | 43                | 40                | 33                | 51                | 65 | 72 | J <sup>R</sup> 80 | 85                 | 96                | 92                | 75                | 80                | 90 | 94                | 91 | 79 | 60 | 52 | 36                | 40                | 45                |    |
| 16     | 44                | 47                | F <sup>F</sup> 46 | F <sup>F</sup> 44 | 42                | 43                | 59                | 78 | 64 | J <sup>R</sup> 84 | 78                 | J <sup>R</sup> 83 | Y <sup>J</sup> 96 | J <sup>R</sup> 94 | 76                | 76 | 70                | 73 | 72 | Y  | 66 | 64                | 54                | 55                | 53 |
| 17     | 50                | 54                | 52                | 46                | 42                | 38                | 52                | 70 | 92 | 67                | J <sup>R</sup> 108 | 86                | 78                | 76                | 78                | 85 | 79                | 76 | 66 | 60 | 60 | 54                | 51                | 53                |    |
| 18     | 54                | 49                | 39                | 39                | 38                | 40                | 53                | 68 | 72 | 78                | 82                 | R <sup>R</sup> 76 | 77                | 76                | 84                | 80 | 68                | 61 | 61 | 64 | 60 | 52                | 48                | 45                |    |
| 19     | 45                | 46                | 46                | 42                | 33                | 28                | 47                | 63 | 66 | 80                | 86                 | J <sup>R</sup> 89 | J <sup>R</sup> 84 | J <sup>R</sup> 78 | 72                | 71 | 68                | 70 | 63 | 73 | 72 | 49                | 40                | 38                |    |
| 20     | 33                | 35                | 36                | 35                | 36                | 33                | 41                | 52 | 52 | 63                | 64                 | 71                | 72                | 66                | 70                | 68 | 64                | 62 | 57 | 53 | 48 | 47                | 45                | 45                |    |
| 21     | 40                | 40                | 40                | 39                | 40                | F <sup>F</sup> 36 | F <sup>F</sup> 51 | 58 | 66 | 75                | 77                 | 70                | 69                | 67                | 70                | 74 | 74                | 63 | 60 | 57 | 54 | 51                | 49                | 48                |    |
| 22     | 47                | 51                | 50                | 49                | 45                | F <sup>F</sup> 37 | 54                | 56 | 62 | 70                | 78                 | 86                | 76                | 72                | 70                | 70 | 68                | 72 | 63 | 52 | 53 | 50                | 48                | 49                |    |
| 23     | 54                | 48                | 47                | 47                | 45                | 45                | 55                | 60 | 69 | 75                | 69                 | J <sup>R</sup> 80 | 75                | 70                | 70                | 70 | 60                | 63 | 70 | 64 | 58 | 45                | 44                | 48                |    |
| 24     | 46                | 46                | 45                | 46                | 43                | 39                | 43                | 50 | 59 | 62                | 69                 | 74                | Y                 | 72                | 72                | 70 | 68                | 65 | 66 | 68 | 56 | 56                | 45                | 49                | 48 |
| 25     | 48                | 49                | 47                | 46                | 46                | 40                | 46                | 54 | 66 | 69                | 72                 | 76                | 74                | 74                | 75                | 68 | 60                | 60 | 65 | 56 | 52 | 50                | 49                | 45                |    |
| 26     | 46                | 43                | 43                | 40                | 39                | 38                | 50                | 57 | 60 | 65                | 72                 | 69                | 68                | 66                | 63                | 68 | 62                | 64 | 65 | 61 | 53 | 50                | 47                | 44                |    |
| 27     | 46                | 45                | 45                | 45                | 44                | 45                | 50                | 56 | 58 | 73                | 71                 | R <sup>R</sup> 82 | 70                | 70                | 64                | 65 | 65                | 62 | 71 | 60 | 60 | 56                | 52                | 50                |    |
| 28     | 47                | 47                | 48                | 44                | 43                | 43                | 47                | 60 | 58 | 61                | 70                 | 74                | 79                | 69                | 65                | 66 | 70                | 76 | 75 | 51 | 49 | 46                | 47                | 48                |    |
| 29     | 49                | 49                | 48                | 45                | 44                | 44                | 50                | 64 | 62 | 78                | 79                 | 74                | 74                | 68                | 71                | 73 | 73                | 69 | 66 | 64 | 60 | 52                | 50                | 51                |    |
| 30     | 49                | 50                | 45                | 45                | 43                | 46                | 58                | 61 | 67 | 74                | 80                 | 72                | 74                | 69                | 75                | 71 | 66                | 66 | 72 | 66 | 64 | 56                | 54                | 52                |    |
| 31     | 50                | 49                | 47                | 45                | 45                | 49                | 49                | 58 | 64 | Y                 | Y                  | 74                | 74                | 69                | Y                 | 74 | 75                | 67 | 68 | 70 | 62 | 56                | 48                | 43                | 44 |
|        | 00                | 01                | 02                | 03                | 04                | 05                | 06                | 07 | 08 | 09                | 10                 | 11                | 12                | 13                | 14                | 15 | 16                | 17 | 18 | 19 | 20 | 21                | 22                | 23                |    |
| CNT    | 31                | 31                | 31                | 31                | 31                | 31                | 31                | 31 | 31 | 30                | 30                 | 30                | 30                | 29                | 30                | 30 | 30                | 31 | 31 | 31 | 31 | 31                | 31                | 31                |    |
| MED    | 45                | 46                | 45                | 45                | 42                | 40                | 50                | 60 | 66 | 72                | 78                 | 77                | 78                | 76                | 76                | 72 | 70                | 70 | 66 | 57 | 53 | 49                | 47                | 45                |    |
| U Q    | 48                | 49                | 47                | 46                | 45                | 43                | 52                | 62 | 70 | 77                | 82                 | 83                | 83                | 81                | 78                | 76 | 73                | 74 | 71 | 62 | 60 | 52                | 50                | 50                |    |
| L Q    | 40                | 40                | 40                | 40                | 40                | 37                | 47                | 56 | 62 | 69                | 72                 | 74                | 74                | 70                | 70                | 69 | 66                | 63 | 61 | 51 | 47 | 43                | 42                | 40                |    |

MAR. 2016 f<sub>o</sub>F<sub>2</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 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<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |  |
|--------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|--|
| 1      |    |    |    |    |    |    | L  |     |     | L   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 2      |    |    |    |    |    |    |    |     | L   | L   | L   | 404 | L   | L   | 444 | L   |     |     |    |    |    |    |    |    |  |
| 3      |    |    |    |    |    |    |    |     | L   | A   | L   | L   | 472 | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 4      |    |    |    |    |    |    |    | L   | L   | L   | L   | 460 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 5      |    |    |    |    |    |    |    |     |     | L   |     |     | L   | 460 | L   | L   | L   |     |    |    |    |    |    |    |  |
| 6      |    |    |    |    |    |    |    | L   | L   | L   | L   | 432 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 7      |    |    |    |    |    |    |    | 276 |     | 440 | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 8      |    |    |    |    |    |    |    | 268 | L   | L   |     | 444 | 448 | L   | 436 | L   |     |     |    |    |    |    |    |    |  |
| 9      |    |    |    |    |    |    |    |     | L   | L   | C   | C   | C   | C   | C   | C   | C   |     |    |    |    |    |    |    |  |
| 10     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 11     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | 472 | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 12     |    |    |    |    |    |    |    | L   | 420 | L   | L   | L   | L   | L   | 408 | L   | 308 |     |    |    |    |    |    |    |  |
| 13     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   |     |     |    |    |    |    |    |    |  |
| 14     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   | L   |     |     |    |    |    |    |    |    |  |
| 15     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | 440 | L   | 476 | 392 |     |     |    |    |    |    |    |    |  |
| 16     |    |    |    |    |    |    |    |     |     | L   | L   | 476 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 17     |    |    |    |    |    |    |    | 288 | L   | 400 | 424 | L   | L   | 448 | 428 | L   |     |     |    |    |    |    |    |    |  |
| 18     |    |    |    |    |    |    |    |     | L   | L   | 440 | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |  |
| 19     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |  |
| 20     |    |    |    |    |    |    |    | L   |     | L   | L   | L   | L   | L   | 424 | L   | L   | 248 |    |    |    |    |    |    |  |
| 21     |    |    |    |    |    |    |    |     | L   | 432 | 452 | L   | L   | L   | L   | L   | 340 |     |    |    |    |    |    |    |  |
| 22     |    |    |    |    |    |    |    |     |     | L   | L   | 448 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 23     |    |    |    |    |    |    |    |     | 436 | L   | 444 | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 24     |    |    |    |    |    |    |    |     | L   | 440 | L   | 436 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 25     |    |    |    |    |    |    |    |     | L   | L   | 448 | L   | L   | 416 | L   | L   | L   | 224 |    |    |    |    |    |    |  |
| 26     |    |    |    |    |    |    |    |     | L   | 432 | L   | 448 | 448 | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 27     |    |    |    |    |    |    |    |     | L   | 436 | 472 | 468 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 28     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | 448 | 448 | L   | L   |     |    |    |    |    |    |    |  |
| 29     |    |    |    |    |    |    |    | L   |     | L   | L   | L   | 464 | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 30     |    |    |    |    |    |    |    |     | 424 | 428 | 448 | L   | 456 | L   | 436 | L   | L   |     |    |    |    |    |    |    |  |
| 31     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | 464 | 464 | L   | 408 | L   |     |    |    |    |    |    |    |  |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |  |
| CNT    |    |    |    |    |    |    |    | 3   | 5   | 8   | 8   | 10  | 8   | 5   | 8   | 2   | 2   | 2   |    |    |    |    |    |    |  |
| MED    |    |    |    |    |    |    |    | 276 | 420 | 432 | 448 | 448 | 460 | 448 | 436 | 400 | 324 | 236 |    |    |    |    |    |    |  |
| U Q    |    |    |    |    |    |    |    | 288 | 430 | 438 | 452 | 460 | 468 | 462 | 446 |     |     |     |    |    |    |    |    |    |  |
| L Q    |    |    |    |    |    |    |    | 268 | 370 | 428 | 442 | 436 | 448 | 432 | 426 |     |     |     |    |    |    |    |    |    |  |

MAR. 2016 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 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<br>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      |     |    |    |    |    |    | 216 | 208 | 248 | 300 | 296 | 324 | 324 | 304 | 300 | 272 | 240 | 180 |     | B   |    |    |    |    |
| 2      |     |    |    |    |    |    | B   | 184 | 252 | 288 | 312 | 308 | R   | 316 | 312 | 304 | 276 | 244 | 172 |     | B  |    |    |    |
| 3      | 144 |    |    |    |    |    | B   | 204 | 232 |     | A   | 316 | A   | A   | 316 | 300 | 276 | 248 | 180 |     | A  |    |    |    |
| 4      |     |    |    |    |    |    | B   | 208 | 256 | 296 | 280 | 280 | A   | A   | 304 | 280 | 228 |     | A   | A   |    |    |    |    |
| 5      |     |    |    |    |    |    | A   | 196 | 248 | 256 | 280 | A   | A   | A   |     | 280 | 248 | 164 |     |     |    |    |    |    |
| 6      |     |    |    |    |    |    | B   | 208 | 264 | 292 | 320 | 320 | 328 | 328 | 312 | 288 | 252 | 200 |     | A   |    |    |    |    |
| 7      |     |    |    |    |    |    | B   | 220 | 224 | 240 | 292 | 324 | 312 | 320 | 308 | 280 | 232 | 188 |     | B   |    |    |    |    |
| 8      |     |    |    |    |    | B  | B   | 208 | 252 | 252 | 292 | 308 | 320 | 320 | 304 | 284 | 248 | 188 |     | B   |    |    |    |    |
| 9      |     |    |    |    |    | B  | A   | 212 | 260 | 288 |     | C   | C   | C   | C   | C   | C   |     | A   |     |    |    |    |    |
| 10     |     |    |    |    |    | B  | A   | 216 | 272 | 304 | 312 | 312 | 324 | 328 |     | A   | 288 | 252 | 196 |     | B  |    |    |    |
| 11     |     |    |    |    |    | B  | U R | 180 | 216 | 260 | 284 | 304 | 268 | 312 | 316 | 320 | 288 | 248 | 188 |     | A  |    |    |    |
| 12     |     |    |    |    |    | B  | B   | 184 | 220 | 272 | 292 | 304 | 328 | 308 | 324 | 304 | 280 | 240 | 196 |     | A  |    |    |    |
| 13     |     |    |    |    |    | B  | U A | 192 | 220 | 272 | 280 | A   | R   | 308 | 320 | 320 | 312 | 292 | 248 | 176 |    | B  |    |    |
| 14     |     |    |    |    |    | B  | B   | 180 | 228 | 292 | 288 | 324 | 328 | 320 | 324 | 312 | 284 | 236 | 204 |     | B  |    |    |    |
| 15     |     |    |    |    |    | B  | B   | 180 | 232 | 264 | 292 | 304 | 332 | 332 | 312 | 308 | 284 | 252 |     | A   |    |    |    |    |
| 16     |     |    |    |    |    | B  | B   | 184 | 216 | 272 | 304 | 312 | 336 | 336 | 316 | 316 | 288 | 248 | 188 |     | A  |    |    |    |
| 17     |     |    |    |    |    | B  | B   | 200 | 216 | 252 | 288 | 304 | 304 | 304 | 316 | 316 | 296 | 252 | 192 |     | B  |    |    |    |
| 18     |     |    |    |    |    | B  | B   | 244 | 212 | 256 | 288 | 324 | 324 | 324 | 324 | 308 | 292 | 248 | 192 |     | B  |    |    |    |
| 19     |     |    |    |    |    | A  | B   | 188 | 208 | 260 | 288 | 316 | 316 | 316 | 324 | 304 | 268 | 240 | 208 |     | B  |    |    |    |
| 20     |     |    |    |    |    | B  | B   | 224 | 272 | 300 | 304 | 324 |     | A   | 312 | 296 | 280 | 244 | 180 | 180 |    | A  |    |    |
| 21     |     |    |    |    |    |    | B   | 196 | 236 | 264 | 296 | 308 | 296 | 328 | 308 | 312 | 280 | 244 | 184 |     |    |    |    |    |
| 22     |     |    |    |    |    | B  | B   | 188 | 240 | 280 | 304 | 312 | 320 | 300 | 332 | 308 | 296 | 248 | 204 | 176 |    |    |    |    |
| 23     |     |    |    |    |    |    | B   | 188 | 256 | 276 | 308 | 308 | 324 | 332 | 328 | 308 | 292 | 252 | 200 | 180 |    |    |    |    |
| 24     |     |    |    |    |    | B  | B   | 200 | 232 | 268 | 316 | A   | 328 | 328 | 328 | 304 | 292 | 248 | 188 |     | B  |    |    |    |
| 25     |     |    |    |    |    |    | B   | 192 | 244 | 268 | 292 | 292 | 328 | 328 | 328 | 308 | 292 | A   | 208 |     | B  |    |    |    |
| 26     |     |    |    |    |    | B  | B   | 224 | 240 | 276 | 300 | 308 | 328 | 336 | 320 | 308 | 300 | 252 | 216 |     | B  |    |    |    |
| 27     |     |    |    |    |    | B  | B   | 172 | 248 | 288 | 316 | 308 | 324 | 332 | 332 | 312 | 292 | 268 | 212 |     |    |    |    |    |
| 28     |     |    |    |    |    | A  | B   | 208 | 244 | 284 | 304 | 304 | A   | 320 | 320 | 320 | 300 | 248 | 208 |     | A  |    |    |    |
| 29     |     |    |    |    |    |    | B   | 200 | 228 | 288 | 300 | 312 | A   | 340 | 324 | 312 | 304 | 272 | 212 |     | A  | B  | B  |    |
| 30     |     |    |    |    |    | B  | B   | 176 | 244 | 280 | 308 | 332 | 344 | 352 | 328 | 316 | 296 | 260 | 212 |     | A  | A  |    |    |
| 31     |     |    |    |    |    | B  | B   | 208 | 252 | 268 | 300 | 312 | 324 | 328 | 320 | 296 | 296 | 256 | 200 | 200 |    | A  |    |    |
|        | 00  | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |
| CNT    | 1   |    |    |    |    |    | 21  | 31  | 31  | 30  | 28  | 26  | 27  | 28  | 28  | 30  | 29  | 29  | 4   |     |    |    |    |    |
| MED    | 144 |    |    |    |    |    | 192 | 220 | 268 | 294 | 308 | 324 | 324 | 320 | 308 | 288 | 248 | 196 | 180 |     |    |    |    |    |
| U Q    |     |    |    |    |    |    | 204 | 240 | 276 | 304 | 312 | 328 | 332 | 328 | 312 | 292 | 252 | 206 | 190 |     |    |    |    |    |
| L Q    |     |    |    |    |    |    | 182 | 208 | 256 | 288 | 304 | 308 | 316 | 316 | 304 | 280 | 244 | 186 | 178 |     |    |    |    |    |

MAR. 2016 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 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<br>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      | 29  | 23  | E B | 26  | 22  | 28  | 27  | G   | 34  | 34  | J A | 36  | 37  | 30  | 33  | 23  | 31  | 20  | E B | E B | E B | E B | E B | E B |     |
| 2      | E B | E B | E B | E B | E B | 14  | 24  | E B | 26  | 30  | 32  | 38  | G   | 36  | 35  | 32  | 32  | 32  | 21  | 23  | 24  | E B | E B | E B |     |
| 3      | J A | 31  | 22  | 22  | 24  | 14  | 27  | E B | 14  | 25  | 35  | 66  | J A | J A | J A | G   | 27  | 26  | J A | 20  | 21  | 24  | J A | J A |     |
| 4      | J A | J A | J A | 22  | 24  | 24  | E B | E B | J A | 31  | 26  | 34  | J A | J A | J A | J A | J A | J A | J A | 25  | 24  | 26  | 33  | E B | E B |
| 5      | E B | E B | E B | E B | E B | 26  | 38  | J A | 20  | 22  | 32  | 39  | 48  | 54  | 40  | 43  | 46  | 29  | 25  | 23  | 54  | 48  | J A | E B | E B |
| 6      | 24  | E B | E B | E B | 22  | 22  | 14  | J A | J A | J A | J A | 37  | 35  | 20  | 38  | G   | 21  | 32  | 32  | G   | J A | 30  | 28  | J A | J A |
| 7      | J A | 24  | 18  | 20  | E B | E B | 14  | J A | 19  | 26  | 27  | 34  | 32  | 34  | 23  | 20  | 20  | G   | J A | 25  | G   | E B | E B | E B |     |
| 8      | E B | J A | E B | E B | E B | E B | E B | J A | J A | J A | J A | J A | J A | J A | G   | J A | 28  | 26  | 31  | 36  | 22  | 19  | E B | E B |     |
| 9      | E B | 14  | 19  | 18  | E B | E B | E B | 14  | 15  | 21  | 25  | 31  | 39  | C   | C   | C   | C   | C   | J A | 21  | 22  | 14  | 14  | 15  | 17  |
| 10     | E B | E B | E B | E B | E B | E B | E B | J A | 14  | 27  | 25  | 30  | J A | G   | G   | G   | 31  | 36  | 33  | 22  | 14  | 14  | 14  | 14  | 15  |
| 11     | E B | E B | E B | 20  | 20  | 14  | 15  | G   | 24  | 30  | 34  | 35  | 33  | 33  | 34  | 38  | 29  | 29  | 22  | 26  | 32  | 22  | 19  | E B | 20  |
| 12     | E B | E B | E B | E B | E B | E B | E B | G   | 25  | 32  | 34  | 37  | 37  | 50  | 38  | 33  | 30  | 25  | 24  | J A | 35  | 24  | 32  | 29  | 27  |
| 13     | 20  | 14  | 24  | 29  | E B | E B | E B | G   | 26  | 32  | 35  | 48  | 40  | 40  | 35  | 39  | 34  | J A | J A | J A | J A | E B | E B | E B |     |
| 14     | E B | 14  | 17  | 19  | E B | E B | E B | G   | J A | 23  | 32  | 21  | 24  | 34  | G   | 33  | G   | J A | J A | J A | G   | 18  | 18  | 14  | 15  |
| 15     | E B | E B | E B | E B | E B | E B | E B | G   | G   | 21  | 34  | 34  | 34  | 30  | 30  | 28  | 21  | 18  | J A | J A | 27  | 24  | J A | 32  | J A |
| 16     | E B | E B | E B | E B | E B | E B | E B | G   | 25  | 33  | 38  | 34  | 26  | 20  | 25  | G   | 21  | 27  | J A | J A | E B | 22  | 14  | 23  | 14  |
| 17     | 22  | E B | 14  | 21  | 23  | E B | E B | 27  | 25  | 28  | 32  | 35  | 34  | 33  | G   | G   | G   | 33  | G   | E B | E B | E B | E B | E B | E B |
| 18     | E B | E B | E B | E B | E B | E B | E B | 31  | 28  | 30  | 33  | 37  | 36  | 26  | 29  | 34  | 30  | 23  | 17  | 15  | 14  | 14  | 14  | 14  | 14  |
| 19     | E B | E B | E B | E B | E B | E B | E B | J A | 27  | 20  | 25  | 26  | 51  | 36  | 37  | 36  | 36  | 39  | J A | J A | J A | G   | E B | E B | E B |
| 20     | J A | 20  | 18  | 14  | 14  | 14  | 14  | 23  | 29  | 32  | 36  | 46  | 24  | 35  | 35  | 34  | 29  | 28  | 22  | J A | 21  | 20  | J A | J A | E B |
| 21     | E B | 14  | 20  | 20  | 25  | E B | G   | 28  | 33  | 35  | 35  | 32  | 28  | G   | 35  | 34  | 34  | 28  | 26  | J A | 23  | 25  | 32  | J A | J A |
| 22     | 27  | 18  | 27  | 22  | 19  | 19  | 25  | 27  | 30  | 33  | 38  | 38  | 35  | J A | J A | J A | 36  | 28  | 25  | J A | 19  | 18  | 19  | 24  | 21  |
| 23     | E B | E B | E B | E B | E B | E B | G   | G   | 32  | 34  | 35  | 37  | 42  | J A | 33  | 37  | 37  | 30  | 25  | J A | 19  | 22  | 24  | 21  | 18  |
| 24     | E B | 14  | 26  | 24  | 18  | E B | E B | G   | 26  | 31  | G   | J A | G   | G   | G   | G   | 27  | 30  | 21  | J A | 15  | 20  | 22  | 14  | 14  |
| 25     | E B | E B | E B | E B | E B | E B | E B | G   | 28  | 30  | 33  | 44  | 33  | J A | J A | J A | J A | J A | J A | E B | J A | 16  | 34  | 14  | 14  |
| 26     | 24  | 21  | 20  | 20  | E B | E B | J A | 18  | 27  | 32  | 36  | 34  | 29  | G   | G   | G   | 20  | 23  | G   | G   | E B | E B | 21  | 20  | J A |
| 27     | 26  | E B | E B | J A | E B | E B | 14  | 21  | 27  | 31  | G   | 33  | 27  | G   | G   | G   | G   | J A | 26  | G   | 23  | 21  | 18  | 14  | 18  |
| 28     | E B | E B | 14  | 19  | E B | 25  | 22  | 22  | 27  | 31  | 34  | 40  | J A | 46  | 34  | 36  | 26  | 22  | 28  | 24  | J A | J A | 19  | 21  | 34  |
| 29     | 18  | E B | 15  | 18  | E B | E B | E B | G   | 26  | 34  | 35  | 31  | 29  | J A | G   | J A | 34  | 18  | 17  | 24  | 24  | 14  | 15  | 14  | 13  |
| 30     | 18  | E B | E B | E B | E B | E B | E B | 21  | 29  | 31  | 35  | 31  | G   | G   | G   | G   | 38  | 37  | 33  | J A | J A | E B | 14  | 22  | 22  |
| 31     | E B | E B | E B | E B | E B | E B | E B | G   | 27  | 31  | 37  | 37  | J A | 40  | 38  | 35  | 35  | 35  | 26  | 26  | J A | J A | 24  | J A | J A |
|        | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |
| CNT    | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 31  | 31  | 31  | 31  | 31  | 31  | 31  |
| MED    | E B | E B | E B | E B | E B | E B | G   | 26  | 31  | 34  | 36  | 33  | 33  | G   | 33  | 29  | 28  | 22  | 21  | 19  | 21  | 14  | 14  | 19  |     |
| U Q    | 22  | 19  | 20  | 23  | 19  | 15  | 21  | 27  | 32  | 36  | J A | 40  | 37  | 36  | 35  | 34  | 34  | 31  | 25  | 23  | 24  | 24  | 20  | 21  | 23  |
| L Q    | E B | E B | E B | E B | E B | E B | E B | G   | 24  | 30  | 33  | 34  | G   | G   | G   | G   | G   | G   | G   | E B | E B | E B | E B | E B | E B |

MAR. 2016 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 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<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |   |
|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| 1      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 2      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 3      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 4      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 5      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 6      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 7      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 8      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 9      | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 10     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 11     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 12     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 13     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 14     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 15     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 16     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 17     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 18     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 19     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 20     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 21     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 22     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 23     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 24     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 25     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 26     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 27     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 28     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 29     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 30     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| 31     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | 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    | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |   |
| MED    | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| UQ     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |
| LQ     | E  | B  | E  | B  | E  | B  | E  | B  | E  | B  | G  |    |    |    | G  |    | G  |    | E  | B  | E  | B  | E  | B  | E  | B |

MAR. 2016 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 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

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

MAR. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |     |     |     |     |
|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   |   | 270 | 283 | 307 | 299 | 317 | 327 | 338 | 369 | 368 | 365 | 322 | 342 |     | R   | 359 | 350 | 355 | 335 | 365 | 342 | 308 | 309 | 316 | 316 | 302 |     |     |     |     |
| 2   |   | 292 | 283 | 310 | 307 | 291 | 291 | 350 | 376 | 350 |     | R   | 304 | 333 | J R | 328 | 333 | 348 | 343 | 335 | 345 | 358 | 318 | 301 | 285 | 285 | 291 |     |     |     |
| 3   |   | 283 | 299 | 303 | 304 | 301 | 285 | 338 | 352 | 349 |     | Y   | 326 | 350 | 334 | 332 | 341 | 356 | 342 | 352 | 348 | 329 | 328 | 300 | 303 | 306 |     |     |     |     |
| 4   |   | 294 | 296 | 292 | 296 | 308 | 310 | 365 | 360 | 351 | J R | 327 |     | R   | Y   |     | R   | 302 | 344 | 328 | 351 | 365 | 330 | 320 | 308 | 303 | 301 |     |     |     |
| 5   |   | 303 | 299 | 282 | 282 | 306 | 308 | 342 | 345 | 367 | 354 | 354 | 354 |     | R   | Y   |     | 342 | 344 | 359 | 355 | 348 | 330 | 323 | 309 | 296 | 315 | 275 |     |     |
| 6   |   | 302 | 292 | 293 | 293 | 295 | 301 | 341 | 362 | 365 | 340 | 335 | 340 | 354 | 339 | 349 | 360 | 332 | 343 | 335 | 321 | 300 | 281 | 281 | 285 |     |     |     |     |     |
| 7   |   | 296 | 275 | 288 | 280 | 283 | 279 | F   | 302 | 361 | 311 | 331 |     | R   | 293 | 337 | 314 | 328 | 324 | 326 | 347 | 317 | 302 | 307 | 283 | 271 | 286 |     |     |     |
| 8   |   | 290 | 285 | 311 | 315 | 319 | 280 | 331 | 339 | 346 | 348 | 339 | 341 | 336 |     | Y   | R   |     | 342 | 347 | 346 | 326 | 306 | 292 | 279 | F   | F   | F   |     |     |
| 9   |   | F   | F   | F   | F   | F   | F   | F   | F   | F   | Y   | C   |     | C   |     | C   |     | C   |     | C   |     | C   |     | 347 | 333 | 304 | 310 | 290 | 259 | 289 |
| 10  |   | 273 | 279 | 279 | 279 | 323 | 309 | V   | 340 | 355 | 348 | 371 |     | Y   | Y   |     |     |     |     | R   |     | 343 | 327 | 312 | 292 | 293 | 260 | 279 |     |     |
| 11  |   | 282 | 270 | 287 | 277 | 284 | 299 | F   | 342 | 357 | 349 | 351 | 318 | 330 | J R | 347 | 332 | 350 | 330 | 332 | 346 | 334 | 313 | 306 | 295 | 292 | 295 |     |     |     |
| 12  |   | 261 | 273 | 283 | 308 | 331 | 286 | 314 | 300 | 318 | 330 | 335 | 351 | 333 | Y   | 352 | 355 | 335 | 333 | 353 | 342 | 334 | 301 | 315 | 285 | 294 |     |     |     |     |
| 13  |   | 295 | 288 | 288 | 300 | 284 | 272 | 330 | 361 | 342 | 354 | 345 | 357 |     | Y   | 329 | 345 | 363 | 353 | 343 | 337 | 319 | 305 | 299 | 294 | 293 |     |     |     |     |
| 14  |   | 295 | 301 | 294 | 296 | 305 | 327 | 369 | 357 | 359 | 354 | 356 | 335 | 353 |     | Y   | 352 | 326 | 326 | 349 | 329 | 332 | 335 | 326 | 291 | 291 |     |     |     |     |
| 15  |   | 291 | 301 | 310 | 321 | 321 | 308 | 352 | 352 | 340 |     | R   | 331 | 348 | 347 | 338 | 322 | 322 | 318 | 346 | 340 | 326 | 322 | 308 | 285 | 284 |     |     |     |     |
| 16  |   | 287 | 273 | 280 | F   | F   | 287 | 314 | 353 | 358 | 361 |     | 342 |     | R   | Y   | R   |     | 344 | 344 | 326 | 328 |     | 295 | 312 | 318 | 292 | 282 |     |     |
| 17  |   | 288 | 295 | 319 | 315 | 315 | 287 | 338 | 355 | 343 | 323 |     | 340 | 341 | 325 | 337 | 338 | 326 | 340 | 319 | 303 | 312 | 294 | 278 | 291 |     |     |     |     |     |
| 18  |   | 312 | 333 | 322 | 295 | 292 | 304 | 350 | 359 | 349 | 344 | 359 | 340 | R   | 352 | 328 | 339 | 350 | 352 | 341 | 324 | 310 | 328 | 304 | 298 | 293 |     |     |     |     |
| 19  |   | 282 | 297 | 317 | 344 | 306 | 311 | 347 | 351 | 338 | 333 | 333 |     | R   | J R | 346 | 323 | 329 | 343 | 334 | 341 | 324 | 327 | 359 | 296 | 301 | 308 |     |     |     |
| 20  |   | 307 | 293 | 289 | 279 | 292 | 321 | 341 | 341 | 310 | 340 | 334 | 341 | 336 | 339 | 341 | 354 | 350 | 349 | 338 | 320 | 305 | 295 | 273 | 303 |     |     |     |     |     |
| 21  |   | 310 | 303 | 283 | 280 | 264 | F   | F   | 283 | 349 | 311 | 328 | 341 | 349 | 343 | 329 | 350 | 306 | 350 | 354 | 348 | 348 | 314 | 299 | 293 | 297 | 298 |     |     |     |
| 22  |   | 299 | 275 | 279 | 313 | 301 | 299 | F   | 374 | 350 | 352 | 347 | 348 | 337 | R   | 337 | 348 | 339 | 341 | 344 | 350 | 359 | 302 | 302 | 303 | 287 | 292 |     |     |     |
| 23  |   | 277 | 295 | 299 | 299 | 307 | 333 | 355 | 354 | 346 | 356 | 333 |     | 350 | 331 | 335 | 340 | 347 | 326 | 328 | 334 | 332 | 312 | 305 | 307 |     |     |     |     |     |
| 24  |   | 295 | 301 | 305 | 314 | 301 | 307 | 340 | 336 | 329 | 326 | 355 | 349 | 331 | 332 | 345 | 348 | 344 | 346 | 336 | 330 | 319 | 319 | 290 | 298 |     |     |     |     |     |
| 25  |   | 291 | 286 | 280 | 289 | 318 | 329 | 340 | 349 | 348 | 360 | 329 |     | Y   | 336 | 333 | 348 | 353 | 343 | 339 | 344 | 324 | 294 | 306 | 296 | 313 |     |     |     |     |
| 26  |   | 301 | 308 | 296 | 320 | 327 | 318 | 357 | 371 | 349 | 357 | 340 | 346 | 338 | 347 | 324 | 335 | 349 | 342 | 347 | 329 | 308 | 323 | 300 | 318 |     |     |     |     |     |
| 27  |   | 302 | 288 | 305 | 303 | 324 | 307 | 366 | 349 | 339 | 351 | 331 | 344 | R   | 361 | 345 | 332 | 330 | 335 | 318 | 339 | 339 | 309 | 315 | 305 | 307 |     |     |     |     |
| 28  |   | 304 | 301 | 293 | 292 | 300 | 300 | 354 | 334 | 348 | 340 | 322 | 332 | 346 | 332 | 328 | 324 | 342 | 346 | 344 | 325 | 312 | 303 | 294 | 284 |     |     |     |     |     |
| 29  |   | 290 | 288 | 296 | 303 | 312 | 304 | 342 | 342 | 318 | 324 | 340 | 341 | 343 | 323 | 323 | 336 | 336 | 347 | 333 | 323 | 322 | 288 | 310 | 292 |     |     |     |     |     |
| 30  |   | 296 | 296 | 307 | 288 | 296 | 316 | 359 | 355 | 347 | 339 | 357 | 331 | 347 | 312 | 336 | 331 | 341 | 335 | 329 | 315 | 329 | 300 | 297 | 298 |     |     |     |     |     |
| 31  |   | 296 | 321 | 296 | 306 | 306 | 313 | 340 | 349 | 353 |     | Y   | Y   | 347 | 306 |     | Y   | 326 | 336 | 332 | 343 | 334 | 339 | 327 | 313 | 312 | 307 |     |     |     |
|     |   | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |     |     |     |     |
| CNT |   | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 25  | 25  | 24  | 25  | 25  | 29  | 30  | 29  | 31  | 30  | 31  | 31  | 31  | 31  | 31  |     |     |     |     |     |
| MED |   | 294 | 293 | 294 | 299 | 306 | 307 | 342 | 352 | 348 | 344 | 335 | 341 | 338 | 333 | 339 | 342 | 336 | 346 | 336 | 321 | 309 | 300 | 294 | 293 |     |     |     |     |     |
| U Q |   | 301 | 301 | 307 | 308 | 318 | 314 | 355 | 359 | 351 | 354 | 348 | 348 | 347 | 344 | 346 | 350 | 347 | 348 | 344 | 329 | 322 | 313 | 303 | 303 |     |     |     |     |     |
| L Q |   | 283 | 283 | 283 | 289 | 292 | 291 | 340 | 345 | 339 | 332 | 330 | 336 | 334 | 328 | 328 | 335 | 332 | 341 | 329 | 310 | 302 | 293 | 285 | 286 |     |     |     |     |     |

MAR. 2016 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| H<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |  |
|--------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|--|
| 1      |    |    |    |    |    |    | L  |     |     | L   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 2      |    |    |    |    |    |    |    |     | L   | L   | L   | 428 | L   | L   | 373 | L   |     |     |    |    |    |    |    |    |  |
| 3      |    |    |    |    |    |    |    |     | L   | A   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 4      |    |    |    |    |    |    |    | L   | L   | L   | L   | 376 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 5      |    |    |    |    |    |    |    |     |     | L   |     |     | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 6      |    |    |    |    |    |    |    | L   | L   | L   | L   | 400 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 7      |    |    |    |    |    |    |    | 418 |     | 343 | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 8      |    |    |    |    |    |    |    | 409 | L   | L   | L   | 378 | 387 | L   | 384 | L   |     |     |    |    |    |    |    |    |  |
| 9      |    |    |    |    |    |    |    |     | L   | L   | C   | C   | C   | C   | C   | C   | C   |     |    |    |    |    |    |    |  |
| 10     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 11     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | 368 | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 12     |    |    |    |    |    |    |    | L   | 358 | L   | L   | L   | L   | L   | 389 | L   |     |     |    |    |    |    |    |    |  |
| 13     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   |     |     |    |    |    |    |    |    |  |
| 14     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   | L   |     |     |    |    |    |    |    |    |  |
| 15     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | 394 | L   | 353 | 389 |     |     |    |    |    |    |    |    |  |
| 16     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 17     |    |    |    |    |    |    |    | 397 | L   | 409 | 387 | L   | L   | 378 | 386 | L   |     |     |    |    |    |    |    |    |  |
| 18     |    |    |    |    |    |    |    |     | L   | L   | 392 | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |  |
| 19     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |  |
| 20     |    |    |    |    |    |    |    | L   |     | L   | L   | L   | L   | L   | 378 | L   | L   | 389 |    |    |    |    |    |    |  |
| 21     |    |    |    |    |    |    |    |     | L   | 368 | 367 | L   | L   | L   | L   | L   | 375 |     |    |    |    |    |    |    |  |
| 22     |    |    |    |    |    |    |    |     |     | L   | L   | 376 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 23     |    |    |    |    |    |    |    |     | 362 | L   | 386 | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 24     |    |    |    |    |    |    |    |     | L   | 386 | L   | 389 | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 25     |    |    |    |    |    |    |    |     | L   | L   | 382 | L   | L   | 408 | L   | L   | L   | 379 |    |    |    |    |    |    |  |
| 26     |    |    |    |    |    |    |    |     | L   | 376 | L   | 387 | 388 | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 27     |    |    |    |    |    |    |    |     | L   | 374 | 368 | 372 | L   | L   | L   | L   |     |     |    |    |    |    |    |    |  |
| 28     |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | 388 | 372 | L   | L   |     |    |    |    |    |    |    |  |
| 29     |    |    |    |    |    |    |    | L   |     | L   | L   | L   | 370 | L   | L   | L   | L   |     |    |    |    |    |    |    |  |
| 30     |    |    |    |    |    |    |    |     | 361 | 390 | 373 | L   | 366 | L   | 372 | L   | L   |     |    |    |    |    |    |    |  |
| 31     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | 381 | 366 | L   | 379 | L   |     |    |    |    |    |    |    |  |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |  |
| CNT    |    |    |    |    |    |    |    | 3   | 5   | 8   | 8   | 10  | 8   | 5   | 8   | 2   | 1   | 2   |    |    |    |    |    |    |  |
| MED    |    |    |    |    |    |    |    | 409 | 362 | 375 | 380 | 377 | 376 | 378 | 376 | 384 | 375 | 384 |    |    |    |    |    |    |  |
| U Q    |    |    |    |    |    |    |    | 418 | 383 | 388 | 386 | 389 | 388 | 398 | 385 |     |     |     |    |    |    |    |    |    |  |
| L Q    |    |    |    |    |    |    |    | 397 | 360 | 361 | 370 | 372 | 368 | 362 | 372 |     |     |     |    |    |    |    |    |    |  |

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 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<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
|--------|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|
| 1      |    |    |    |    |    |    | 248 |     |     | 248 | 244 | 266 | 270 | 262 | 256 | 246 | 246 |     |    |    |    |    |    |    |
| 2      |    |    |    |    |    |    |     |     | 232 | 264 | 264 | 280 | 260 | 290 | 272 | 260 |     |     |    |    |    |    |    |    |
| 3      |    |    |    |    |    |    |     |     | 260 | 232 | 252 | 260 | 268 | 270 | 268 | 242 | 246 |     |    |    |    |    |    |    |
| 4      |    |    |    |    |    |    |     | 230 | 248 | 260 | 234 | 252 | 294 | 276 | 260 | 262 | 240 |     |    |    |    |    |    |    |
| 5      |    |    |    |    |    |    |     |     | 248 | 256 |     |     | 262 | 260 | 252 | 246 | 246 |     |    |    |    |    |    |    |
| 6      |    |    |    |    |    |    |     | 238 | 248 | 270 | 266 | 272 | 260 | 286 | 266 | 250 | 256 |     |    |    |    |    |    |    |
| 7      |    |    |    |    |    |    |     | 232 |     | 294 | 304 | 346 | 274 | 294 | 282 | 284 | 242 |     |    |    |    |    |    |    |
| 8      |    |    |    |    |    |    |     | 236 | 256 | 274 |     | 260 | 268 | 280 | 272 | 258 |     |     |    |    |    |    |    |    |
| 9      |    |    |    |    |    |    |     |     | 248 | 246 |     | C   | C   | C   | C   | C   | C   |     |    |    |    |    |    |    |
| 10     |    |    |    |    |    |    |     |     |     | 242 | 268 | 262 | 286 | 266 | 262 | 266 | 258 |     |    |    |    |    |    |    |
| 11     |    |    |    |    |    |    |     |     | 254 | 240 | 274 | 260 | 268 | 274 | 256 | 250 | 260 |     |    |    |    |    |    |    |
| 12     |    |    |    |    |    |    |     | 346 | 300 | 294 | 284 | 266 | 282 | 260 | 268 | 262 | 272 |     |    |    |    |    |    |    |
| 13     |    |    |    |    |    |    |     |     | 244 | 248 | 262 | 246 | 264 | 260 | 260 | 244 |     |     |    |    |    |    |    |    |
| 14     |    |    |    |    |    |    |     | 216 | 236 | 236 | 254 | 274 | 242 | 260 | 262 | 246 |     |     |    |    |    |    |    |    |
| 15     |    |    |    |    |    |    |     | 250 | 264 | 256 | 250 | 248 | 256 | 284 | 308 | 286 |     |     |    |    |    |    |    |    |
| 16     |    |    |    |    |    |    |     |     |     | 264 | 246 | 310 | 290 | 264 | 248 |     | 254 |     |    |    |    |    |    |    |
| 17     |    |    |    |    |    |    |     | 250 | 250 | 252 | 256 | 262 | 272 | 268 | 270 | 266 |     |     |    |    |    |    |    |    |
| 18     |    |    |    |    |    |    |     |     | 242 | 268 | 250 | 262 | 276 | 280 | 280 | 260 | 244 | 232 |    |    |    |    |    |    |
| 19     |    |    |    |    |    |    |     | 254 | 244 | 264 | 274 | 264 | 264 | 276 | 276 | 262 | 270 | 252 |    |    |    |    |    |    |
| 20     |    |    |    |    |    |    |     | 294 |     | 304 | 306 | 294 | 284 | 286 | 274 | 258 | 268 | 240 |    |    |    |    |    |    |
| 21     |    |    |    |    |    |    |     |     | 270 | 270 | 268 | 264 | 284 | 280 | 272 | 262 | 254 |     |    |    |    |    |    |    |
| 22     |    |    |    |    |    |    |     |     |     | 262 | 274 | 272 | 264 | 264 | 270 | 270 | 260 |     |    |    |    |    |    |    |
| 23     |    |    |    |    |    |    |     |     | 276 | 254 | 242 | 250 | 260 | 270 | 272 | 258 | 262 |     |    |    |    |    |    |    |
| 24     |    |    |    |    |    |    |     |     | 280 | 298 | 264 | 268 | 272 | 276 | 276 | 272 | 262 |     |    |    |    |    |    |    |
| 25     |    |    |    |    |    |    |     |     | 272 | 278 | 294 | 278 | 282 | 284 | 272 | 258 |     | 254 |    |    |    |    |    |    |
| 26     |    |    |    |    |    |    |     |     | 270 | 276 | 284 | 268 | 284 | 272 | 274 | 278 | 254 |     |    |    |    |    |    |    |
| 27     |    |    |    |    |    |    |     |     | 256 | 256 | 290 | 274 | 232 | 272 | 280 | 280 |     |     |    |    |    |    |    |    |
| 28     |    |    |    |    |    |    |     | 272 | 262 | 262 | 304 | 280 | 276 | 272 | 286 | 286 | 260 |     |    |    |    |    |    |    |
| 29     |    |    |    |    |    |    |     | 268 | 256 | 290 | 272 | 260 | 264 | 302 | 292 | 278 | 270 |     |    |    |    |    |    |    |
| 30     |    |    |    |    |    |    |     |     | 264 | 268 | 264 | 284 | 278 | 290 | 284 | 268 | 270 |     |    |    |    |    |    |    |
| 31     |    |    |    |    |    |    |     |     | 272 | 268 | 260 | 268 | 292 | 280 | 288 | 268 | 268 |     |    |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    | 1   | 12  | 25  | 31  | 28  | 29  | 30  | 30  | 30  | 29  | 22  | 4   |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    | 248 | 250 | 256 | 264 | 265 | 266 | 271 | 275 | 272 | 262 | 259 | 246 |    |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |     | 270 | 270 | 274 | 279 | 276 | 282 | 284 | 280 | 271 | 268 | 253 |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |     | 234 | 248 | 252 | 253 | 260 | 264 | 266 | 262 | 254 | 246 | 236 |    |    |    |    |    |    |

MAR. 2016 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00               | 01               | 02  | 03  | 04               | 05  | 06  | 07  | 08               | 09  | 10  | 11                 | 12               | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20               | 21               | 22               | 23               |
|-------|------------------|------------------|-----|-----|------------------|-----|-----|-----|------------------|-----|-----|--------------------|------------------|-----|-----|-----|-----|-----|-----|-----|------------------|------------------|------------------|------------------|
| 1     | 322 <sup>Q</sup> | 294 <sup>Q</sup> | 272 | 272 | 256              | 236 | 204 | 222 | 234              | 196 | 184 | 192                | 192 <sup>H</sup> | 202 | 202 | 202 | 198 | 230 | 218 | 250 | 270              | 270              | 270              | 278              |
| 2     | 298              | 298              | 278 | 278 | 278              | 278 | 242 | 236 | 216              | 202 | 202 | 186                | 208              | 194 | 198 | 202 | 240 | 230 | 216 | 252 | 266              | 294              | 294              | 294              |
| 3     | 304              | 298              | 290 | 268 | 264              | 276 | 252 | 234 | 222              |     | 200 | 242 <sup>E A</sup> | 210              | 216 | 216 | 204 | 206 | 238 | 228 | 230 | 234              | 284              | 280              | 288              |
| 4     | 290              | 288              | 276 | 292 | 272              | 256 | 230 | 200 | 212              | 204 | 212 | 198                | 184              | 210 | 206 | 206 | 206 | 242 | 226 | 226 | 266              | 266              | 278              | 292              |
| 5     | 290              | 290              | 320 | 320 | 278              | 278 | 236 | 228 | 194              | 194 | 272 | 254                | 230              | 204 | 204 | 206 | 230 | 236 | 230 | 230 | 222              | 276              | 276              | 312              |
| 6     | 294              | 294              | 286 | 278 | 278              | 254 | 244 | 198 | 198 <sup>H</sup> | 192 | 214 | 194                | 202              | 198 | 206 | 210 | 212 | 232 | 246 | 210 | 256              | 292              | 296              | 310              |
| 7     | 324              | 302              | 296 | 334 | 312 <sup>Q</sup> | 306 | 292 | 196 | 250              | 214 | 208 | 204                | 200              | 214 | 214 | 210 | 232 | 226 | 242 | 234 | 264              | 244              | 284              | 308              |
| 8     | 294              | 282              | 256 | 246 | 242              | 226 | 254 | 202 | 220              | 216 | 238 | 170                | 192              | 192 | 214 | 220 | 242 | 232 | 232 | 232 | 242 <sup>Q</sup> | 242 <sup>Q</sup> | 272 <sup>Q</sup> | 272 <sup>Q</sup> |
| 9     | 304              | 292              | 270 | 250 | 220              | 224 | 230 | 236 | 220              | 202 |     |                    |                  |     |     |     |     |     |     |     |                  |                  |                  |                  |
| 10    | 294              | 314              | 300 | 266 | 240              | 226 | 238 | 238 | 230              | 198 | 212 | 198                | 206              | 206 | 206 | 208 | 236 | 236 | 236 | 236 | 224 <sup>Q</sup> | 266              | 266              | 278              |
| 11    | 282              | 292              | 292 | 260 | 254              | 222 | 238 | 230 | 216              | 204 | 198 | 224                | 210              | 212 | 212 | 206 | 218 | 240 | 242 | 220 | 260              | 286              | 282              | 282              |
| 12    | 368              | 322              | 274 | 272 | 244              | 270 | 256 | 234 | 220              | 202 | 212 | 226                | 226              | 200 | 188 | 202 | 216 | 244 | 232 | 230 | 240              | 254              | 280              | 280              |
| 13    | 286              | 292              | 292 | 284 | 270              | 306 | 246 | 232 | 198              | 210 | 222 | 212                | 200              | 206 | 226 | 218 | 226 | 230 | 242 | 228 | 256              | 256              | 272              | 272              |
| 14    | 272              | 264              | 274 | 264 | 250              | 246 | 230 | 194 | 194              | 190 | 186 | 194                | 194              | 194 | 204 | 204 | 252 | 252 | 228 | 240 | 240              | 240              | 274              | 282              |
| 15    | 286              | 286              | 286 | 266 | 230              | 246 | 246 | 196 | 210              | 214 | 206 | 206                | 188              | 200 | 204 | 204 | 262 | 230 | 226 | 218 | 244              | 214              | 296              | 282              |
| 16    | 282              | 298              | 262 | 272 | 272              | 244 | 240 | 230 | 224              | 214 | 198 | 198                | 198              | 214 | 198 | 200 | 224 | 252 | 246 | 246 | 238              | 238              | 280              | 290              |
| 17    | 298              | 286              | 258 | 246 | 246              | 254 | 262 | 208 | 212              | 196 | 196 | 214                | 198              | 198 | 202 | 224 | 252 | 232 | 242 | 242 | 266              | 276              | 316              | 286              |
| 18    | 258              | 236              | 262 | 282 | 282              | 290 | 234 | 242 | 224              | 210 | 198 | 198                | 196              | 200 | 224 | 218 | 218 | 200 | 252 | 260 | 240              | 246              | 286              | 302              |
| 19    | 302              | 294              | 252 | 220 | 230              | 294 | 248 | 214 | 198              | 206 | 210 | 210                | 210              | 206 | 220 | 224 | 214 | 224 | 254 | 260 | 216              | 236              | 252              | 276              |
| 20    | 258              | 302              | 284 | 318 | 284              | 270 | 260 | 240 | 246              | 230 | 236 | 198                | 212              | 206 | 206 | 206 | 204 | 228 | 234 | 252 | 240              | 278              | 296              | 274              |
| 21    | 272              | 302              | 300 | 304 | 308              | 296 | 244 | 256 | 220              | 224 | 218 | 194                | 200              | 200 | 200 | 234 | 212 | 250 | 242 | 238 | 244              | 268              | 288              | 288              |
| 22    | 290              | 276              | 296 | 244 | 244              | 226 | 218 | 222 | 244              | 200 | 200 | 190                | 194              | 204 | 204 | 210 | 226 | 236 | 224 | 234 | 268              | 266              | 290              | 284              |
| 23    | 278              | 278              | 264 | 264 | 260              | 242 | 232 | 244 | 206              | 206 | 198 | 178                | 182              | 198 | 210 | 216 | 216 | 240 | 248 | 236 | 228              | 244              | 282              | 276              |
| 24    | 276              | 282              | 282 | 262 | 224              | 252 | 254 | 260 | 230              | 196 | 214 | 192                | 192              | 200 | 188 | 212 | 218 | 248 | 236 | 232 | 240              | 230              | 274              | 274              |
| 25    | 294              | 286              | 280 | 262 | 236              | 238 | 222 | 240 | 220              | 200 | 192 | 192                | 198              | 190 | 190 | 208 | 232 | 212 | 240 | 226 | 252              | 270              | 266              | 266              |
| 26    | 278              | 278              | 280 | 240 | 248              | 238 | 224 | 246 | 220              | 200 | 200 | 200                | 194              | 194 | 194 | 206 | 216 | 256 | 232 | 228 | 244              | 244              | 244              | 272              |
| 27    | 282              | 294              | 276 | 276 | 260              | 248 | 222 | 248 | 202              | 202 | 196 | 196                | 188              | 198 | 198 | 192 | 250 | 248 | 248 | 238 | 264              | 236              | 270              | 258              |
| 28    | 286              | 286              | 290 | 272 | 286              | 278 | 238 | 222 | 222              | 210 | 198 | 198                | 198              | 198 | 198 | 206 | 220 | 252 | 228 | 228 | 242              | 242              | 282              | 296              |
| 29    | 286              | 274              | 274 | 274 | 250              | 250 | 246 | 196 | 200              | 200 | 200 | 210                | 206              | 190 | 188 | 226 | 226 | 248 | 246 | 242 | 270              | 270              | 270              | 294              |
| 30    | 294              | 266              | 276 | 278 | 260              | 260 | 226 | 244 | 196              | 198 | 198 | 190                | 190              | 196 | 208 | 216 | 216 | 258 | 240 | 246 | 240              | 270              | 266              | 280              |
| 31    | 292              | 268              | 276 | 290 | 250              | 260 | 230 | 242 | 210              | 224 | 198 | 216                | 196              | 212 | 212 | 212 | 212 | 256 | 240 | 248 | 248              | 238              | 274              | 286              |
|       | 00               | 01               | 02  | 03  | 04               | 05  | 06  | 07  | 08               | 09  | 10  | 11                 | 12               | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20               | 21               | 22               | 23               |
| CNT   | 31               | 31               | 31  | 31  | 31               | 31  | 31  | 31  | 31               | 30  | 30  | 30                 | 30               | 30  | 30  | 30  | 30  | 31  | 31  | 31  | 31               | 31               | 31               | 31               |
| MED   | 290              | 290              | 278 | 272 | 256              | 254 | 238 | 232 | 220              | 202 | 200 | 198                | 198              | 200 | 204 | 208 | 219 | 238 | 236 | 234 | 244              | 256              | 278              | 282              |
| U Q   | 298              | 298              | 290 | 282 | 278              | 278 | 248 | 242 | 224              | 210 | 212 | 210                | 206              | 206 | 212 | 216 | 232 | 248 | 242 | 246 | 264              | 270              | 286              | 292              |
| L Q   | 282              | 278              | 272 | 262 | 244              | 238 | 230 | 208 | 202              | 198 | 198 | 192                | 192              | 198 | 198 | 204 | 214 | 230 | 228 | 228 | 240              | 242              | 270              | 274              |

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## IONOSPHERIC DATA STATION Wakkanai

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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<br>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      |    |    |    |    |    |     | 94  | 112 | 116 | 116 | 116 | 116 | 116 | 114 | 114 | 122 | 122 | 140 |     | B   |    |    |    |    |
| 2      |    |    |    |    |    |     | B   | 112 | 114 | 114 | 114 | 114 | 114 | 114 | 120 | 120 | 120 | 118 |     | B   |    |    |    |    |
| 3      |    |    |    |    |    |     | B   | 130 | 108 |     | A   |     | A   |     | 104 | 118 | 120 | 132 | 128 |     | A  |    |    |    |
| 4      |    |    |    |    |    |     | B   | 118 | 120 | 112 | 112 | 112 |     | A   | 112 | 112 | 112 | 112 |     | A   | A  |    |    |    |
| 5      |    |    |    |    |    |     | A   | 118 | 120 | 120 | 120 |     | A   |     | A   | A   |     | 116 | 124 | 124 |    |    |    |    |
| 6      |    |    |    |    |    |     | B   | 120 | 120 | 116 | 116 | 116 | 116 | 112 | 112 | 112 | 114 | 138 |     | A   |    |    |    |    |
| 7      |    |    |    |    |    |     | B   | 116 | 116 | 110 | 114 | 114 | 114 | 114 | 106 | 112 | 116 | 132 |     | B   |    |    |    |    |
| 8      |    |    |    |    |    | B   | B   | 118 | 112 | 112 | 112 | 114 | 114 | 114 | 116 | 116 | 120 | 128 |     | B   |    |    |    |    |
| 9      |    |    |    |    |    | B   | A   | 120 | 120 | 120 |     | C   | C   | C   | C   | C   | C   |     |     | A   |    |    |    |    |
| 10     |    |    |    |    |    | B   | A   | 124 | 120 | 120 | 112 | 110 | 110 | 110 |     | A   | 126 | 126 | 140 |     | B  |    |    |    |
| 11     |    |    |    |    |    | B   | 146 | 132 | 126 | 108 | 104 | 104 | 114 | 114 | 114 | 110 | 120 | 134 |     | A   |    |    |    |    |
| 12     |    |    |    |    |    | B   | 138 | 122 | 122 | 114 | 114 | 114 | 114 | 114 | 112 | 112 | 112 | 140 |     | A   |    |    |    |    |
| 13     |    |    |    |    |    | B   | 166 | 116 | 120 | 112 |     | A   | 110 | 110 | 110 | 104 | 112 | 106 | 106 |     | B  |    |    |    |
| 14     |    |    |    |    |    | B   | E   | 160 | 122 | 120 | 116 | 110 | 116 | 116 | 104 | 120 | 116 | 116 | 144 |     | B  |    |    |    |
| 15     |    |    |    |    |    | B   | 144 | 124 | 124 | 118 | 112 | 112 | 112 | 114 | 112 | 112 | 132 |     | A   |     |    |    |    |    |
| 16     |    |    |    |    |    | B   | 132 | 118 | 118 | 118 | 108 | 116 | 114 | 114 | 112 | 120 | 120 | 106 |     | A   |    |    |    |    |
| 17     |    |    |    |    |    | B   | 144 | 126 | 118 | 114 | 110 | 110 | 106 | 106 | 114 | 116 | 116 | 122 |     | B   |    |    |    |    |
| 18     |    |    |    |    |    | B   | 144 | 118 | 116 | 116 | 116 | 102 | 110 | 112 | 114 | 114 | 128 | 136 |     | B   |    |    |    |    |
| 19     |    |    |    |    |    | 122 | 150 | 118 | 118 | 118 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 122 |     | B   |    |    |    |    |
| 20     |    |    |    |    |    | B   | B   | 122 | 122 | 116 | 112 | 112 |     | A   | 116 | 116 | 126 | 118 | 118 | 122 |    |    |    |    |
| 21     |    |    |    |    |    |     | 144 | 124 | 126 | 116 | 108 | 108 | 116 | 108 | 114 | 116 | 116 | 116 |     | A   |    |    |    |    |
| 22     |    |    |    |    |    | B   | 124 | 124 | 120 | 120 | 114 | 114 | 114 | 114 | 114 | 118 | 124 | 124 | 118 |     |    |    |    |    |
| 23     |    |    |    |    |    |     | 140 | 114 | 114 | 114 | 108 | 118 | 114 | 118 | 112 | 112 | 112 | 120 | 120 |     |    |    |    |    |
| 24     |    |    |    |    |    | B   | 144 | 112 | 112 | 112 |     | A   | 108 | 108 | 108 | 108 | 106 | 118 | 118 |     | B  |    |    |    |
| 25     |    |    |    |    |    |     | 144 | 124 | 122 | 112 | 110 | 116 | 112 | 112 | 112 | 112 |     | A   | 112 |     | B  |    |    |    |
| 26     |    |    |    |    |    | B   | 108 | 112 | 112 | 118 | 118 | 118 | 112 | 112 | 112 | 112 | 118 | 118 |     | B   |    |    |    |    |
| 27     |    |    |    |    |    | B   | 112 | 112 | 114 | 114 | 114 | 114 | 114 | 108 | 108 | 112 | 124 | 118 |     |     |    |    |    |    |
| 28     |    |    |    |    |    | A   | 124 | 120 | 120 | 116 | 116 |     | A   | 116 | 116 | 114 | 114 | 108 | 108 |     | A  |    |    |    |
| 29     |    |    |    |    |    |     | 122 | 118 | 118 | 118 | 108 |     | A   | 108 | 108 | 108 | 108 | 116 | 116 |     | A  | B  | B  |    |
| 30     |    |    |    |    |    | B   | 116 | 116 | 122 | 112 | 116 | 116 | 116 | 116 | 116 | 116 | 118 | 116 |     | A   | A  |    |    |    |
| 31     |    |    |    |    |    | B   | 126 | 126 | 110 | 116 | 114 | 114 | 114 | 114 | 116 | 116 | 116 | 110 | 124 |     | A  |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    | 1   | 21  | 31  | 31  | 30  | 28  | 26  | 27  | 29  | 28  | 30  | 29  | 29  | 4   |     |    |    |    |    |
| MED    |    |    |    |    |    | 122 | 139 | 118 | 120 | 116 | 114 | 114 | 114 | 114 | 114 | 114 | 118 | 122 | 121 |     |    |    |    |    |
| U Q    |    |    |    |    |    |     | 144 | 124 | 120 | 118 | 116 | 116 | 116 | 114 | 115 | 116 | 123 | 135 | 123 |     |    |    |    |    |
| L Q    |    |    |    |    |    |     | 123 | 116 | 114 | 112 | 110 | 110 | 112 | 109 | 112 | 112 | 115 | 116 | 119 |     |    |    |    |    |

MAR. 2016 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |
|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   |   | 114 | 114 | B   | 114 | 108 | 108 | 100 | 100 | 122 | 112 | 112 | 196 | 104 | 104 | 152 | 112 | 112 | 160 | B   | B   | B   | B   | B   | B   |
| 2   |   | B   | B   | B   | B   | B   | 110 | B   | 146 | 138 | 138 | 112 | G   | 164 | 152 | 152 | 152 | 120 | 124 | 92  | 92  | B   | B   | B   | 100 |
| 3   |   | 110 | 110 | 102 | 122 | B   | 116 | B   | 162 | 112 | 106 | 114 | 100 | 100 | 170 | 124 | 116 | 146 | 132 | 118 | 100 | 110 | 110 | 112 | 112 |
| 4   |   | 106 | 106 | 100 | 110 | 106 | B   | B   | 114 | 112 | 112 | 108 | 110 | 110 | 110 | 104 | 108 | 148 | 92  | 112 | 114 | B   | B   | B   | 104 |
| 5   |   | B   | B   | B   | B   | 138 | 110 | 116 | 156 | 112 | 112 | 112 | 112 | 112 | 104 | 108 | 116 | 116 | 132 | 108 | 108 | 108 | B   | B   | B   |
| 6   |   | 108 | B   | B   | 94  | 104 | B   | 120 | 106 | 124 | 118 | 166 | 100 | 166 | 100 | 126 | 120 | G   | 104 | 104 | 104 | 104 | 104 | 104 | 104 |
| 7   |   | 100 | 100 | 102 | 102 | B   | B   | 118 | 114 | 106 | 106 | 136 | 106 | 100 | 104 | 104 | G   | 100 | G   | B   | B   | 132 | B   | B   | B   |
| 8   |   | B   | 94  | 106 | B   | B   | B   | 118 | 118 | 118 | 118 | 114 | 104 | 96  | 118 | 126 | 108 | 110 | B   | B   | B   | B   | B   | B   | B   |
| 9   |   | B   | 96  | 98  | B   | B   | B   | 106 | 106 | 156 | 116 | C   | C   | C   | C   | C   | C   | 160 | 128 | B   | B   | B   | B   | 96  | B   |
| 10  |   | B   | B   | B   | B   | 92  | B   | 98  | 114 | 150 | 112 | 180 | 102 | 100 | 96  | 102 | 114 | 118 | 90  | B   | B   | B   | B   | B   | B   |
| 11  |   | B   | B   | 100 | 100 | B   | B   | G   | 146 | 144 | 108 | 118 | 118 | 140 | 120 | 114 | 92  | 150 | 152 | 134 | 118 | 118 | 114 | B   | 140 |
| 12  |   | B   | B   | B   | B   | B   | B   | G   | 150 | 150 | 132 | 126 | 126 | 116 | 126 | 98  | 98  | 98  | 154 | 124 | 116 | 116 | 116 | 110 | 122 |
| 13  |   | 116 | B   | 96  | 122 | B   | B   | G   | 154 | 126 | 110 | 108 | 106 | 116 | 154 | 128 | 126 | 118 | 118 | 118 | 118 | B   | B   | B   | 98  |
| 14  |   | B   | 92  | 92  | B   | B   | B   | G   | 124 | 108 | 108 | 108 | 132 | 120 | 120 | 150 | 120 | 150 | 92  | 92  | B   | B   | B   | B   | B   |
| 15  |   | B   | B   | B   | B   | B   | B   | G   | 116 | 142 | 134 | 108 | 106 | 106 | 106 | 102 | 102 | 112 | 108 | 110 | 110 | 104 | 100 | B   | B   |
| 16  |   | B   | B   | B   | B   | B   | B   | G   | 152 | 138 | 122 | 122 | 106 | 100 | 100 | G   | G   | 106 | 156 | 90  | 100 | 96  | B   | B   | 98  |
| 17  |   | 98  | B   | 98  | 96  | B   | B   | 160 | 160 | 142 | 144 | 114 | 114 | 112 | G   | G   | G   | 112 | G   | B   | B   | B   | B   | B   | B   |
| 18  |   | B   | B   | B   | B   | B   | B   | 146 | 146 | 146 | 148 | 116 | 94  | 102 | 108 | 170 | 120 | 116 | 128 | B   | B   | B   | B   | B   | B   |
| 19  |   | B   | B   | B   | B   | B   | 110 | 138 | 162 | 110 | 108 | 120 | 110 | 110 | 120 | 114 | 112 | 118 | 162 | 148 | B   | 122 | B   | B   | 138 |
| 20  |   | 126 | 110 | B   | B   | B   | B   | 138 | 128 | 132 | 126 | 118 | 104 | 106 | 112 | 112 | 130 | 152 | 152 | 118 | 118 | 118 | 118 | B   | B   |
| 21  |   | B   | 114 | 108 | 108 | 108 | B   | G   | 174 | 128 | 124 | 118 | 190 | H   | H   | 128 | 128 | 152 | 152 | 126 | 114 | 114 | 114 | 114 | 110 |
| 22  |   | 110 | 108 | 108 | 102 | 102 | 104 | 104 | 134 | 132 | 130 | 116 | 106 | 108 | 110 | 110 | 120 | 174 | 136 | 124 | 116 | 116 | 112 | 136 | 106 |
| 23  |   | B   | B   | B   | 102 | 102 | B   | G   | 112 | 112 | 108 | 110 | 102 | 102 | 100 | 100 | 122 | 122 | 116 | 116 | 106 | 96  | 96  | 106 | B   |
| 24  |   | B   | 98  | 98  | 102 | B   | B   | G   | 156 | 138 | 110 | 102 | 98  | 98  | 98  | 92  | 112 | 134 | 126 | 122 | 110 | B   | B   | B   | B   |
| 25  |   | B   | B   | B   | B   | B   | B   | G   | 148 | 130 | 116 | 108 | 108 | 102 | 94  | 102 | 102 | 104 | 110 | B   | 118 | 118 | B   | B   | 108 |
| 26  |   | 108 | 108 | 108 | 108 | B   | B   | 106 | 156 | 132 | 116 | 108 | 106 | 104 | 104 | 108 | 108 | G   | G   | B   | B   | 116 | 116 | 110 | 100 |
| 27  |   | 100 | B   | B   | 100 | 88  | B   | 154 | 218 | 154 | 116 | 106 | 100 | 100 | 100 | 100 | 116 | 116 | 136 | 116 | 98  | B   | 98  | B   | B   |
| 28  |   | B   | B   | 98  | 92  | 92  | 148 | 162 | 136 | 116 | 110 | 98  | 110 | 162 | 106 | 106 | 106 | 148 | 102 | 102 | 94  | 108 | 108 | B   | B   |
| 29  |   | 102 | B   | 102 | 102 | B   | B   | G   | 124 | 112 | 114 | 108 | 96  | 96  | 118 | 100 | 100 | 132 | 96  | B   | 110 | B   | B   | B   | B   |
| 30  |   | 100 | B   | B   | B   | B   | B   | 150 | 140 | 140 | 116 | 104 | 106 | 106 | 106 | 112 | 116 | 116 | 150 | 122 | 112 | B   | 100 | 100 | 106 |
| 31  |   | B   | B   | B   | 124 | B   | B   | G   | 150 | 130 | 116 | 116 | 116 | 118 | 168 | 176 | 110 | 122 | 134 | 134 | 122 | 120 | 112 | 112 | 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 |   | 13  | 12  | 14  | 16  | 11  | 7   | 15  | 30  | 29  | 29  | 30  | 29  | 30  | 27  | 27  | 26  | 29  | 26  | 22  | 20  | 21  | 13  | 12  | 16  |
| MED |   | 108 | 107 | 100 | 104 | 102 | 110 | 120 | 146 | 132 | 116 | 114 | 106 | 106 | 106 | 112 | 112 | 118 | 132 | 118 | 115 | 110 | 112 | 109 | 106 |
| U Q |   | 112 | 110 | 102 | 112 | 108 | 110 | 148 | 156 | 142 | 125 | 118 | 113 | 116 | 126 | 124 | 120 | 134 | 150 | 126 | 118 | 118 | 115 | 112 | 112 |
| L Q |   | 100 | 97  | 98  | 101 | 92  | 104 | 106 | 118 | 120 | 112 | 108 | 105 | 102 | 100 | 102 | 102 | 112 | 118 | 108 | 106 | 104 | 102 | 99  | 102 |

MAR. 2016 h'Es (KM)

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## IONOSPHERIC DATA STATION Wakkanai

MAR. 2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

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

MAR. 2016 TYPES OF Es  
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 f<sub>XI</sub> (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H  | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |   |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| 1   | X  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X  |   |
|     | 43 | 43 | 46 | 46 | 52 | 40 | 42 |    |    |    |    |    |    |    |    |    |    |    | 64 | 51 | 44 | 42 | 40 | 41 | 41 |   |
| 2   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | 60 | 46 | 47 | 47 | 46 | 45 | X |
|     | 42 | 41 | 42 | 41 | 44 | 40 |    |    |    |    |    |    |    |    |    |    |    |    |    | 70 | 57 | 46 | 42 | 45 | 46 | X |
| 3   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 46 | 47 | 46 | 48 | 44 | 42 |    |    |    |    |    |    |    |    |    |    |    |    |    | 70 | 57 | 46 | 42 | 45 | 46 | X |
| 4   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 47 | 47 | 47 | 48 | 51 | 48 |    |    |    |    |    |    |    |    |    |    |    |    |    | 71 | 55 | 50 | 42 | 42 | 44 | X |
| 5   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 44 | 44 | 43 | 44 | 44 | 44 |    |    |    |    |    |    |    |    |    |    |    |    |    | 66 | 48 | 51 | 44 | 45 | 44 | X |
| 6   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 44 | 45 | 46 | 46 | 46 | 44 |    |    |    |    |    |    |    |    |    |    |    |    |    | 68 | 54 | 50 | 48 | 48 | 49 | X |
| 7   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 47 | 47 | 49 | 48 | 47 | 45 |    |    |    |    |    |    |    |    |    |    |    |    |    | 70 | 57 | 58 | 61 | 60 | 59 | X |
| 8   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 60 | 64 | 65 | 60 | 41 | 40 |    |    |    |    |    |    |    |    |    |    |    |    |    | 72 | 63 | 64 | 60 | 55 | 57 | X |
| 9   | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 58 | 62 | 65 | 66 | 53 | 44 |    |    |    |    |    |    |    |    |    |    |    |    |    | 81 | 64 | 54 | 51 | 52 | 52 | X |
| 10  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 51 | 51 | 49 | 48 | 47 | 46 |    |    |    |    |    |    |    |    |    |    |    |    |    | 87 | 60 | 56 | 52 | 49 | 48 | X |
| 11  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 49 | 47 | 47 | 49 | 51 | 39 |    |    |    |    |    |    |    |    |    |    |    |    |    | 82 | 67 | 63 | 60 | 56 | 54 | X |
| 12  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 51 | 51 | 54 | 59 | 41 | 37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 52 | 44 | 46 | 46 | 46 | X |
| 13  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 46 | 46 | 46 | 46 | 45 | 45 |    |    |    |    |    |    |    |    |    |    |    |    |    | 74 | 60 | 53 | 52 | 52 | 51 | X |
| 14  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 51 | 49 | 48 | 49 | 49 | 42 |    |    |    |    |    |    |    |    |    |    |    |    |    | 87 | 76 | 64 | 45 | 43 | 44 | X |
| 15  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 42 | 44 | 42 | 45 | 40 | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    | 92 | 70 | 56 | 44 | 37 | 40 | X |
| 16  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 42 | 43 | 44 | 46 | 44 | 44 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 84 | 77 | 51 | 49 | 51 | X |
| 17  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 51 | 51 | 56 | 46 | 35 | 35 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 75 | 63 | 61 | 64 | 63 | X |
| 18  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 65 | 55 | 48 | 45 | 42 | 43 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 66 | 67 | 66 | 56 | 52 | X |
| 19  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 52 | 52 | 56 | 56 | 32 | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 82 | 81 | 53 | 51 | 51 | X |
| 20  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 53 | 39 | 41 | 42 | 41 | 42 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 58 | 51 | 51 | 51 | 52 | X |
| 21  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 52 | 51 | 48 | 46 | 44 | 44 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 73 | 51 | 49 | 50 | 51 | X |
| 22  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 54 | 54 | 54 | 51 | 53 | 40 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 68 | 52 | 56 | 54 | 55 | X |
| 23  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 56 | 56 | 56 | 55 | 55 | 51 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 80 | 59 | 48 | 46 | 47 | X |
| 24  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | C  | C  | X  | X  | X  | X  | X |
|     | 47 | 47 | 46 | 44 | 43 | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 72 | 55 | 49 | 46 | 45 | X |
| 25  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    | C  | C  | C  | C  | C  | C  |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 46 | 46 | 44 | 44 | 44 | 32 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 70 | 52 | 49 | 51 | 54 | X |
| 26  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 50 | 49 | 46 | 46 | 42 | 37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 71 | 57 | 48 | 47 | 48 | X |
| 27  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 47 | 46 | 45 | 46 | 41 | 39 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 76 | 54 | 54 | 54 | 52 | X |
| 28  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 49 | 50 | 48 | 48 | 48 | 47 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 64 | 42 | 45 | 46 | 46 | X |
| 29  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 46 | 48 | 47 | 47 | 44 | 43 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 71 | 60 | 52 | 52 | 54 | X |
| 30  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 56 | 56 | 52 | 51 | 49 | 50 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 81 | 74 | 62 | 55 | 55 | X |
| 31  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X |
|     | 55 | 55 | 56 | 50 | 50 | 51 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 73 | 65 | 54 | 52 | 51 | 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 |    | 31 | 31 | 31 | 31 | 31 | 31 | 1  |    |    |    |    |    |    |    |    |    |    |    | 14 | 31 | 31 | 31 | 31 | 31 |   |
| MED |    | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  |   |
| U Q |    | 49 | 48 | 47 | 47 | 44 | 42 | 42 |    |    |    |    |    |    |    |    |    |    |    | 72 | 67 | 55 | 51 | 50 | 51 |   |
| L Q |    | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  |   |
|     |    | 53 | 52 | 54 | 50 | 49 | 45 |    |    |    |    |    |    |    |    |    |    |    |    | 82 | 73 | 63 | 54 | 54 | 54 |   |
|     |    | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  |   |
|     |    | 46 | 46 | 46 | 46 | 42 | 39 |    |    |    |    |    |    |    |    |    |    |    |    | 68 | 57 | 51 | 46 | 46 | 46 |   |

MAR. 2016 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 f<sub>o</sub>F<sub>2</sub> (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| $\begin{matrix} H \\ D \end{matrix}$ | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
|--------------------------------------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|
| 1                                    | 37 | 37 | 40 | 40 | 46 | 34 | 36 | 58 | 69 | 72  | 76  | 84  | 97  | 98  | 98  | 95  | 81  | 64  | 58 | 45 | 38 | 36 | 34 | 35 |
| 2                                    | 36 | 35 | 36 | 35 | 38 | 33 | 42 | 60 | 68 | 77  | 77  | 86  | 94  | 98  | 88  | 78  | 76  | 74  | 54 | 40 | 41 | 41 | 40 | 39 |
| 3                                    | 40 | 41 | 40 | 42 | 38 | 36 | 44 | 69 | 75 | 80  | 82  | 85  | 90  | 90  | 88  | 87  | 74  | 74  | 64 | 51 | 40 | 36 | 39 | 40 |
| 4                                    | 41 | 41 | 41 | 42 | 45 | 42 | 46 | 60 | 75 | 80  | 98  | 97  | 98  | 100 | 99  | 92  | 85  | 76  | 65 | 48 | 44 | 36 | 36 | 38 |
| 5                                    | 38 | 38 | 37 | 38 | 38 | 38 | 46 | 63 | 70 | 82  | 77  | 83  | 86  | 89  | 91  | 79  | 78  | 70  | 60 | 42 | 45 | 38 | 39 | 38 |
| 6                                    | 38 | 39 | 40 | 40 | 40 | 38 | 44 | 64 | 78 | 77  | 78  | 86  | 82  | 89  | 85  | 82  | 78  | 69  | 62 | 48 | 44 | 42 | 42 | 42 |
| 7                                    | 41 | 41 | 43 | 42 | 41 | 39 | 46 | 81 | 58 | 84  | 98  | 106 | 112 | 99  | 84  | 94  | 105 | 98  | 64 | 51 | 52 | 55 | 54 | 53 |
| 8                                    | 54 | 58 | 59 | 54 | 35 | 34 | 44 | 62 | 74 | 92  | 100 | 94  | 102 | 96  | 93  | 94  | 79  | 72  | 66 | 57 | 58 | 54 | 49 | 51 |
| 9                                    | 52 | F  | F  | F  | F  | F  | 45 | 66 | 73 | 84  | 99  | 86  | 90  | 106 | 92  | 86  | 73  | 73  | 75 | 57 | 48 | 45 | 46 | 46 |
| 10                                   | 44 | 45 | 43 | 42 | 41 | 40 | 44 | 67 | 81 | 82  | 78  | 71  | 84  | 89  | 82  | 75  | 72  | 78  | 81 | 54 | 50 | 46 | 43 | 42 |
| 11                                   | 43 | 41 | 41 | 43 | 45 | 33 | 47 | 64 | 78 | 82  | 82  | 89  | 97  | 103 | 86  | 85  | 74  | 76  | 76 | 61 | 57 | 54 | 50 | 48 |
| 12                                   | 45 | 45 | 48 | 53 | 35 | 31 | 41 | 60 | 87 | 102 | 106 | 86  | 97  | 90  | 87  | 82  | 80  | 84  | 86 | 46 | 38 | 39 | 40 | 40 |
| 13                                   | 40 | 40 | 40 | 40 | 39 | 39 | 49 | 64 | 73 | 79  | 79  | 93  | 108 | 97  | 89  | 91  | 77  | 72  | 68 | 54 | 47 | 46 | 46 | 45 |
| 14                                   | 45 | 43 | 42 | 43 | 43 | 36 | 49 | 63 | 70 | 66  | 76  | 90  | 101 | 94  | 87  | 81  | 79  | 76  | 80 | 70 | 58 | 39 | 36 | 38 |
| 15                                   | 36 | 38 | 36 | 39 | 34 | 30 | 44 | 61 | 78 | 96  | 102 | 87  | 87  | 82  | 86  | 102 | 106 | 118 | 86 | 64 | 50 | 38 | 31 | 34 |
| 16                                   | 36 | 37 | 38 | 40 | 38 | 38 | 50 | 61 | 70 | 71  | 97  | 95  | 100 | 112 | 100 | 84  | 73  | 77  | 88 | 78 | 71 | 45 | 43 | 45 |
| 17                                   | 45 | 45 | 50 | 40 | 29 | 29 | 47 | 73 | 76 | 94  | 74  | 92  | 88  | 88  | 92  | 91  | 89  | 89  | 78 | 69 | 57 | 55 | 58 | 57 |
| 18                                   | 59 | 49 | 42 | 39 | 36 | 36 | 50 | 65 | 79 | 78  | 72  | 91  | 94  | 83  | 87  | 89  | 86  | 77  | 66 | 60 | 60 | 60 | 50 | 46 |
| 19                                   | 46 | 46 | 50 | 50 | 26 | 24 | 45 | 72 | 80 | 83  | 90  | 91  | 96  | 78  | 88  | 81  | 78  | 80  | 82 | 76 | 75 | 47 | 45 | 45 |
| 20                                   | 47 | 33 | 35 | 36 | 35 | 36 | 52 | 64 | 82 | 79  | 86  | 97  | 95  | 89  | 80  | 74  | 76  | 74  | 76 | 52 | 45 | 45 | 45 | 46 |
| 21                                   | 46 | 45 | 42 | 40 | 38 | 38 | 48 | 67 | 75 | 85  | 92  | 98  | 91  | 92  | 74  | 67  | 78  | 80  | 77 | 67 | 45 | 43 | 44 | 45 |
| 22                                   | 48 | 48 | 47 | 45 | 47 | 34 | 49 | 66 | 81 | 80  | 81  | 77  | 86  | 84  | 82  | 76  | 72  | 70  | 74 | 62 | 46 | 50 | 48 | 49 |
| 23                                   | 50 | 50 | 50 | 49 | 48 | 45 | 54 | 71 | 76 | 82  | 89  | 73  | 72  | 84  | 83  | 73  | 72  | 71  | 76 | 74 | 53 | 42 | 40 | 42 |
| 24                                   | 41 | 41 | 40 | 38 | 37 | 30 | 50 | 74 | 78 | 95  | 78  | 68  | 78  | 82  | 82  | 78  | C   | C   | 71 | 66 | 49 | 43 | 40 | 39 |
| 25                                   | 40 | 40 | 38 | 38 | 37 | 26 | 46 | 61 | 64 | 72  | C   | C   | C   | C   | C   | C   | 72  | 69  | 68 | 64 | 46 | 42 | 45 | F  |
| 26                                   | 44 | 43 | 40 | 40 | 36 | 31 | 48 | 60 | 67 | 69  | 69  | 76  | 82  | 84  | 75  | 70  | 70  | 75  | 73 | 65 | 51 | 42 | 41 | 42 |
| 27                                   | 41 | 40 | 39 | 40 | 35 | 33 | 48 | 64 | 66 | 68  | 77  | 86  | 83  | 86  | 76  | 65  | 68  | 74  | 80 | 70 | 48 | 48 | 48 | 46 |
| 28                                   | 43 | 44 | 42 | 42 | 42 | 41 | 54 | 55 | 66 | 75  | 76  | 81  | 99  | 94  | 83  | 74  | 76  | 80  | 77 | 58 | 36 | 39 | 40 | 40 |
| 29                                   | 40 | 42 | 41 | 41 | 38 | 36 | 50 | 67 | 77 | 75  | 80  | 83  | 85  | 92  | 85  | 80  | 82  | 73  | 72 | 65 | 54 | 46 | 46 | 48 |
| 30                                   | 50 | 50 | 46 | 45 | 43 | 44 | 60 | 65 | 68 | 69  | 72  | 85  | 84  | 76  | 81  | 82  | 80  | 79  | 82 | 75 | 68 | 56 | 49 | 49 |
| 31                                   | 49 | 49 | 50 | 44 | 44 | 45 | 60 | 74 | 68 | 68  | 74  | 82  | 84  | 91  | 96  | 88  | 83  | 80  | 79 | 67 | 59 | 47 | 46 | 45 |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT                                  | 31 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 31 | 31 | 31 | 31 | 31 | 30 |
| MED                                  | 43 | 42 | 41 | 40 | 38 | 36 | 47 | 64 | 75 | 80  | 80  | 86  | 90  | 90  | 86  | 82  | 78  | 76  | 75 | 61 | 49 | 45 | 44 | 45 |
| U Q                                  | 47 | 45 | 46 | 43 | 43 | 39 | 50 | 67 | 78 | 84  | 92  | 92  | 97  | 97  | 91  | 89  | 81  | 80  | 80 | 67 | 57 | 48 | 48 | 46 |
| L Q                                  | 40 | 40 | 40 | 40 | 36 | 33 | 44 | 61 | 68 | 72  | 76  | 83  | 84  | 84  | 82  | 76  | 73  | 72  | 66 | 51 | 45 | 39 | 40 | 40 |

MAR. 2016 f<sub>o</sub>F<sub>2</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 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<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|--------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|
| 1      |    |    |    |    |    |    |    |    | L   | L   | L   | L   | 484 | U L | U L | L   |    |    |    |    |    |    |    |    |
| 2      |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | U L | U L | U L | A  |    |    |    |    |    |    |    |
| 3      |    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 4      |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 5      |    |    |    |    |    |    |    |    | L   | L   | L   | U L | A   | A   | L   | A   | A  |    |    |    |    |    |    |    |
| 6      |    |    |    |    |    |    |    |    | L   | L   | L   | U L | L   | A   | A   | L   |    |    |    |    |    |    |    |    |
| 7      |    |    |    |    |    |    |    |    | U L | L   | L   | L   | L   | L   | L   | A   | L  |    |    |    |    |    |    |    |
| 8      |    |    |    |    |    |    |    |    | L   | L   | L   | U L | L   | L   | L   | L   |    |    |    |    |    |    |    |    |
| 9      |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |    |    |
| 10     |    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |    |    |
| 11     |    |    |    |    |    |    |    |    |     | L   | A   | L   | U L | L   | L   | L   | L  |    |    |    |    |    |    |    |
| 12     |    |    |    |    |    |    |    |    |     | L   | L   | A   | 496 | A   | L   | A   |    | L  |    |    |    |    |    |    |
| 13     |    |    |    |    |    |    |    |    | L   | A   | L   | U L | A   | U L | L   | L   |    |    |    |    |    |    |    |    |
| 14     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | L   | L   | L   |    |    |    |    |    |    |    |    |
| 15     |    |    |    |    |    |    |    |    |     | L   |     | L   | L   | U L | U L | U L | L  |    |    |    |    |    |    |    |
| 16     |    |    |    |    |    |    |    |    | L   |     | L   | U L | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 17     |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | U L | U L | L   |    |    |    |    |    |    |    |    |
| 18     |    |    |    |    |    |    |    |    |     | L   | L   | U L | L   | L   | U L | L   |    |    |    |    |    |    |    |    |
| 19     |    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | U L | U L | L   |    |    |    |    |    |    |    |    |
| 20     |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 21     |    |    |    |    |    |    |    |    | L   | L   | L   | L   | U L | L   | L   | L   | L  |    |    |    |    |    |    |    |
| 22     |    |    |    |    |    |    |    |    | L   | L   | U L | U L | L   | L   | L   | L   | A  |    |    |    |    |    |    |    |
| 23     |    |    |    |    |    |    |    |    | L   | L   | L   | U L | L   | L   | L   | A   | L  |    |    |    |    |    |    |    |
| 24     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | U L | L   | L   | C  | C  |    |    |    |    |    |    |
| 25     |    |    |    |    |    |    |    |    |     | A   | C   | C   | C   | C   | C   | C   | L  | A  |    |    |    |    |    |    |
| 26     |    |    |    |    |    |    |    |    |     | L   | L   | U L | U L | U L | U L | L   | L  | L  |    |    |    |    |    |    |
| 27     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | U L | L   | L   | L  | A  |    |    |    |    |    |    |
| 28     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | A   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 29     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | L   | L   | L   | L  |    |    |    |    |    |    |    |
| 30     |    |    |    |    |    |    |    |    |     | L   | U L | U L | U L | U L | L   | L   | L  |    |    |    |    |    |    |    |
| 31     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | U L | U L | L   |    |    |    |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    |    |     | 2   | 8   | 12  | 11  | 13  | 10  | 2   |    |    |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    |    |     | U L | U L | U L | U L | U L | U L | U L |    |    |    |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |    |    |     | 472 | 468 | 480 | 492 | 480 | 466 | 430 |    |    |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    |    |     | U L | U L | U L | U L | U L | U L |     |    |    |    |    |    |    |    |    |
|        |    |    |    |    |    |    |    |    |     | 480 | 494 | 496 | 488 | 468 |     |     |    |    |    |    |    |    |    |    |
|        |    |    |    |    |    |    |    |    |     | U L | U L | U L | U L | U L |     |     |    |    |    |    |    |    |    |    |
|        |    |    |    |    |    |    |    |    |     | 462 | 466 | 484 | 472 | 452 |     |     |    |    |    |    |    |    |    |    |

MAR. 2016 foF1 (0.01MHz)

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## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 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<br>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      |    |    |    |    |    |    |     | U R<br>196 | U R<br>280 | A          | A          | R   | R          | R   | R   | U R<br>312 | U R<br>268 | 172        |            |    |    |    |    |    |  |
| 2      |    |    |    |    |    |    | B   | 188        | R          | R          | R          |     | 352        | R   | R   | R          |            | 264        | A          |    |    |    |    |    |  |
| 3      |    |    |    |    |    |    | B   | 196        |            | R          | U R<br>316 | R   | R          | A   | R   | U R<br>320 |            | R          | 184        |    |    |    |    |    |  |
| 4      |    |    |    |    |    |    | B   | 196        | 280        | R          | A          | A   | A          | A   | A   | R          |            | U R<br>196 |            |    |    |    |    |    |  |
| 5      |    |    |    |    |    |    | B   | 220        | U R<br>300 | A          | A          | A   |            | 364 | A   | A          | A          | A          | A          |    |    |    |    |    |  |
| 6      |    |    |    |    |    |    | B   | U R<br>184 | U R<br>284 | U R<br>316 | A          | A   | A          | A   | A   | A          | A          | A          | R          |    |    |    |    |    |  |
| 7      |    |    |    |    |    |    | B   | U R<br>236 | U R<br>296 |            | A          | A   | R          | A   | R   | A          | A          | A          | U R<br>200 |    |    |    |    |    |  |
| 8      |    |    |    |    |    |    | B   | 220        | U R<br>284 | R          | R          | R   | R          | R   | R   | R          | R          | R          | U A<br>188 |    |    |    |    |    |  |
| 9      |    |    |    |    |    |    | B   | 228        | 284        | R          | R          | A   | A          | R   | R   | R          | U R<br>276 | U R<br>216 |            |    |    |    |    |    |  |
| 10     |    |    |    |    |    |    | B   | 212        |            | R          | A          | R   | R          |     | A   | A          | A          | A          |            |    |    |    |    |    |  |
| 11     |    |    |    |    |    |    | B   | 220        | 292        | 324        |            | A   | A          | A   | A   | R          | U R<br>308 | U R<br>208 |            |    |    |    |    |    |  |
| 12     |    |    |    |    |    |    | B   | A          | A          | R          | A          | A   | A          | A   | A   | A          | U R<br>276 | A          | B          |    |    |    |    |    |  |
| 13     |    |    |    |    |    |    | B   | 240        | R          | A          | R          | R   |            | 376 | R   | A          | R          | U R<br>212 |            |    |    |    |    |    |  |
| 14     |    |    |    |    |    |    | B   | 240        | R          | R          | R          | R   | A          | R   | R   | R          | U R<br>268 | A          |            |    |    |    |    |    |  |
| 15     |    |    |    |    |    |    | B   | U R<br>236 | R          | R          | R          | A   | R          | R   | R   | U R<br>312 | R          | R          | A          |    |    |    |    |    |  |
| 16     |    |    |    |    |    |    | B   | U R<br>240 | R          | A          | A          | A   | R          | A   | R   | R          | R          | U R<br>216 | B          |    |    |    |    |    |  |
| 17     |    |    |    |    |    |    | B   | 240        | R          | R          | R          | R   | R          | R   | R   | R          | A          | U R<br>280 | U R<br>208 | B  |    |    |    |    |  |
| 18     |    |    |    |    |    |    | B   | U R<br>248 | U R<br>308 | A          | A          | A   | R          | R   | R   | U R<br>312 | U R<br>264 | U R<br>208 | B          |    |    |    |    |    |  |
| 19     |    |    |    |    |    |    | B   | 224        | 284        | 320        |            | A   | R          | A   | A   | A          | R          | R          | R          | B  |    |    |    |    |  |
| 20     |    |    |    |    |    |    | B   | 240        | U R<br>296 | A          | A          | A   | A          | A   | A   | A          |            | A          | U A<br>220 | B  |    |    |    |    |  |
| 21     |    |    |    |    |    |    | B   | 232        | R          | A          | A          | A   | R          | R   | R   | U R<br>288 | 272        | A          | B          |    |    |    |    |    |  |
| 22     |    |    |    |    |    |    | B   | 240        | A          | A          | R          | R   | R          | R   | R   | R          | A          | A          | A          | B  |    |    |    |    |  |
| 23     |    |    |    |    |    |    | B   | 244        | U R<br>292 | A          | A          | A   | A          | A   | A   | A          | A          | U A<br>280 | U A<br>212 | B  |    |    |    |    |  |
| 24     |    |    |    |    |    |    | B   | 256        | A          | A          | A          | R   | A          | R   | A   | U R<br>320 | C          | C          | B          |    |    |    |    |    |  |
| 25     |    |    |    |    |    |    | B   | 244        | A          | A          | C          | C   | C          | C   | C   | C          | C          | A          | A          | B  |    |    |    |    |  |
| 26     |    |    |    |    |    |    | B   | 244        | A          | R          | A          | A   | A          | R   | R   | R          | U R<br>280 | U R<br>228 | B          |    |    |    |    |    |  |
| 27     |    |    |    |    |    |    | B   | U R<br>272 | A          | A          | R          | R   | R          | R   | R   | R          | R          | A          | B          |    |    |    |    |    |  |
| 28     |    |    |    |    |    |    |     | 172        | 252        | 300        | A          | A   | 356        | 368 | 336 | R          | 308        | A          | U A<br>216 | B  |    |    |    |    |  |
| 29     |    |    |    |    |    |    | B   | 244        | 296        | R          | R          | R   | R          | A   | R   | R          | U R<br>296 | A          | B          |    |    |    |    |    |  |
| 30     |    |    |    |    |    |    | B   | U R<br>248 | U R<br>304 | A          | A          | A   | U R<br>360 | R   | R   | U R<br>316 | U R<br>268 | 224        | B          |    |    |    |    |    |  |
| 31     |    |    |    |    |    |    | B   | A          | 288        | R          | A          | R   | R          | A   | R   | R          | 280        | A          | B          |    |    |    |    |    |  |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07         | 08         | 09         | 10         | 11  | 12         | 13  | 14  | 15         | 16         | 17         | 18         | 19 | 20 | 21 | 22 | 23 |  |
| CNT    |    |    |    |    |    |    | 1   | 29         | 16         | 3          | 1          | 2   | 5          | 1   |     | 10         | 14         | 17         |            |    |    |    |    |    |  |
| MED    |    |    |    |    |    |    | 172 | 240        | 292        | 320        | U R<br>316 | 354 | 364        | 336 |     |            | U R<br>312 | U R<br>276 | U R<br>212 |    |    |    |    |    |  |
| U Q    |    |    |    |    |    |    |     | 244        | U R<br>298 | 324        |            |     | 372        |     |     |            | U R<br>316 | U R<br>280 | U R<br>218 |    |    |    |    |    |  |
| L Q    |    |    |    |    |    |    |     | 220        | U R<br>284 | 316        |            |     | 362        |     |     |            | U R<br>308 | U R<br>268 | U R<br>198 |    |    |    |    |    |  |

MAR. 2016 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| H<br>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 15   | E 15   | E 14   | E 15   | J A 26 | E B 21 | G 16 | G  | G  | 37     | 37     | 28     | G      | G      | G 31   | G 29 | G      | G      | 21     | 20      | E 15   | E B 20 | E B 15 | E B 16 |        |
| 2      | E 16   | E 16   | E 15   | E 15   | E 15   | E 14   | E 15 | 26 | G  | G      | G      | 40     | G      | G      | G      | G    | 31     | 29     | 21     | 19      | E 15   | E B 15 | E B 16 | 22     |        |
| 3      | E 16   | 20     | E 15   | E 16   | E 15   | E 15   | E 15 | 24 | 24 | 25     | 29     | 26     | 26     | 41     | 23     | G    | G      | G      | 22     | E 15    | E B 15 | E B 14 | 20     | J A 24 |        |
| 4      | J A 32 | J A 26 | 20     | E 14   | E 14   | E 19   | E 14 | 22 | G  | G      | 39     | 42     | J A 48 | 42     | 40     | 24   | 25     | G      | E 15   | E B 14  | J A 19 | J A 52 | E B 14 | 22     |        |
| 5      | E 14   | E 16   | E 15   | E 15   | E 15   | E 15   | E 15 | G  | G  | 35     | 40     | 40     | 44     | 49     | 38     | 41   | 34     | 25     | J A 22 | J A 26  | J A 43 | E B 16 | J A 23 | E B 15 |        |
| 6      | 22     | 20     | E 15   | E 15   | E 15   | E 15   | E 15 | 24 | 24 | 34     | 38     | 39     | 42     | J A 46 | J A 44 | 36   | G      | G      | E 15   | E B 15  | J A 30 | E B 15 | E B 14 | 16     |        |
| 7      | E 13   | E 14   | E 14   | E 15   | E 15   | E 14   | E 18 | G  | 33 | J A 42 | J A 45 | G      | 40     | G      | J A 42 | 38   | 30     | G      | E 15   | E B 15  | E B 15 | J A 19 | J A 30 | 20     |        |
| 8      | E 15   | E 15   | E 14   | E 14   | E 14   | E 15   | E 18 | 27 | G  | G      | G      | G      | G      | G      | G      | G    | G      | 23     | E 14   | E B 14  | 20     | E B 14 | E B 16 | 15     |        |
| 9      | 19     | E 14   | E 15   | E 15   | E 14   | E 14   | E 15 | 28 | 32 | G      | G      | 39     | 37     | G      | G      | G    | G      | G      | E 15   | E B 19  | E B 14 | E B 15 | E B 14 | 15     |        |
| 10     | 19     | E 15   | E 15   | E 15   | E 15   | E 15   | E 14 | 27 | G  | 35     | G      | G      | 42     | 40     | 38     | 36   | 34     | 26     | E B 15 | J A 21  | E B 15 | E B 14 | E B 16 | 16     |        |
| 11     | E 15   | E 14   | E 15   | E 15   | E 15   | E 14   | E 15 | 27 | 34 | 37     | 44     | 44     | 40     | 42     | G      | G    | G      | G      | J A 21 | E B 21  | E B 15 | E B 15 | 19     | 19     |        |
| 12     | 19     | E 16   | E 14   | E 15   | E 14   | E 15   | E 16 | 30 | 36 | G      | J A 40 | J A 45 | J A 55 | 38     | 36     | G    | G      | J A 43 | E B 15 | E B 15  | E B 15 | 18     | J A 20 | J A 26 |        |
| 13     | J A 24 | E 15   | E 15   | J A 23 | E 15   | E 22   | E 16 | 28 | G  | 39     | 33     | 31     | 42     | 25     | 39     | G    | G      | G      | E B 15 | E B 15  | E B 16 | E B 15 | E B 24 | 15     |        |
| 14     | E 15   | 19     | E 15   | E 15   | E 15   | E 15   | E 15 | 29 | G  | 28     | 30     | 40     | 40     | 30     | G      | G    | J A 22 | 26     | 33     | J A 44  | E B 14 | E B 14 | E B 15 | 14     | 20     |
| 15     | J A 24 | 19     | E 15   | E 15   | J A 17 | E 15   | E 16 | G  | G  | 29     | 32     | 39     | G      | G      | G      | G    | G      | 24     | E 14   | E B 15  | 21     | J A 23 | 19     | E B 16 |        |
| 16     | E 15   | 20     | E 15   | J A 19 | J A 22 | E 19   | E 16 | G  | G  | 35     | 37     | 39     | G      | 39     | 26     | 27   | G      | G      | E 15   | E B 15  | E B 15 | E B 15 | E B 15 | E B 16 |        |
| 17     | E 14   | E 15   | E 15   | E 14   | E 14   | E 14   | E 19 | 28 | G  | G      | G      | G      | G      | G      | G      | G    | 36     | G      | E 14   | E B 15  | E B 15 | E B 16 | E B 15 | 15     |        |
| 18     | E 15   | E 15   | E 14   | E 14   | E 15   | E 15   | E 16 | 21 | 24 | 35     | 40     | 39     | G      | G      | G      | G    | G      | 30     | E 14   | E B 14  | E B 14 | E B 14 | E B 15 | 15     |        |
| 19     | E 16   | E 15   | E 16   | E 15   | E 14   | E 15   | E 22 | 28 | 32 | 35     | 38     | G      | 40     | 39     | 37     | G    | G      | G      | J A 23 | J A 22  | J A 22 | J A 22 | J A 33 | 15     |        |
| 20     | E 16   | E 15   | E 15   | E 15   | E 15   | E 15   | 19   | 29 | 34 | 36     | 39     | 39     | J A 46 | 39     | 40     | 38   | 32     | 25     | 18     | E B 15  | J A 27 | J A 41 | J A 28 | J A 18 |        |
| 21     | E 16   | J A 22 | E 15   | E 20   | E 15   | E 16   | 20   | 27 | G  | 39     | 40     | 42     | G      | G      | G      | G    | 34     | 28     | 18     | J A 20  | 20     | 22     | 21     | 21     |        |
| 22     | 18     | J A 54 | 22     | J A 28 | J A 33 | J A 30 | 20   | 27 | 33 | 36     | 30     | 32     | 30     | 31     | 26     | 38   | 36     | J A 47 | J A 52 | J A 39  | J A 71 | J A 39 | E B 24 | 15     |        |
| 23     | J A 24 | J A 18 | J A 36 | E 15   | E 14   | E 15   | 20   | 30 | G  | 37     | 38     | 42     | J A 36 | J A 36 | 39     | 36   | 33     | 34     | J A 34 | J A 23  | 21     | E B 21 | E B 15 | 15     |        |
| 24     | E 15   | E 15   | E 15   | E 15   | 18     | 20     | 20   | 30 | 35 | 37     | 40     | G      | J A 41 | G      | 41     | 23   | G      | C      | C      | J A 109 | J A 32 | E B 19 | E B 16 | E B 22 |        |
| 25     | E 16   | E 15   | 22     | 19     | E 15   | E 15   | 21   | 28 | 34 | J A 46 | C      | C      | C      | C      | C      | C    | J A 39 | J A 41 | J A 42 | J A 26  | 20     | J A 43 | J A 27 | J A 28 |        |
| 26     | J A 30 | J A 28 | E 15   | E 15   | E 15   | E 15   | 21   | 28 | 32 | 30     | 38     | 39     | 37     | G      | G      | 25   | G      | G      | J A 22 | J A 22  | 19     | 22     | E B 15 | 15     |        |
| 27     | E 15   | E 15   | E 15   | E 15   | E 15   | E 15   | 22   | G  | 33 | 37     | 28     | 28     | 31     | G      | G      | G    | 34     | 37     | J A 34 | J A 21  | E B 16 | E B 16 | E B 15 | 15     |        |
| 28     | J A 20 | E 16   | E 15   | E 14   | E 14   | E 15   | 22   | 32 | 35 | J A 38 | 38     | 42     | 43     | 40     | 26     | 36   | 33     | 26     | J A 26 | J A 20  | E B 16 | E B 15 | E B 15 | 15     |        |
| 29     | E 15   | E 15   | E 15   | J A 19 | E 15   | E 14   | 22   | 28 | 33 | G      | G      | G      | J A 31 | J A 32 | 43     | 28   | G      | G      | 27     | J A 24  | J A 22 | 20     | E B 16 | E B 16 | 16     |
| 30     | E 15   | 20     | 21     | E 15   | E 15   | E 15   | 22   | 29 | G  | 36     | 40     | 38     | G      | G      | 27     | G    | G      | G      | E 15   | E B 15  | E B 15 | E B 14 | E B 14 | 14     |        |
| 31     | 22     | 20     | 23     | 19     | J A 29 | J A 27 | 21   | 28 | 31 | G      | 38     | 26     | G      | G      | 36     | 25   | 24     | 34     | 28     | J A 23  | J A 23 | 22     | 24     | J A 51 | J A 55 |
|        | 00     | 01     | 02     | 03     | 04     | 05     | 06   | 07 | 08 | 09     | 10     | 11     | 12     | 13     | 14     | 15   | 16     | 17     | 18     | 19      | 20     | 21     | 22     | 23     |        |
| CNT    | 31     | 31     | 31     | 31     | 31     | 31     | 31   | 31 | 31 | 31     | 30     | 30     | 30     | 30     | 30     | 30   | 30     | 30     | 30     | 31      | 31     | 31     | 31     | 31     |        |
| MED    | E 16   | E 16   | E 15   | E 15   | E 15   | E 15   | 18   | 27 | G  | 35     | 38     | 39     | 36     | G      | G      | G    | G      | 24     | 18     | 19      | E 16   | E B 16 | E B 16 | E B 16 |        |
| UQ     | J A 20 | 20     | 15     | 16     | J A 15 | 16     | 21   | 28 | 33 | 37     | 40     | 40     | 42     | 40     | 38     | 36   | 33     | 29     | J A 24 | J A 22  | 21     | 22     | 23     | 21     |        |
| LQ     | E 15   | E 15   | E 15   | E 15   | E 14   | E 15   | E 15 | 22 | G  | G      | G      | G      | G      | G      | G      | G    | G      | G      | E 15   | E B 15  | E B 15 | E B 15 | E B 15 | E B 15 |        |

MAR. 2016 foEs (0.1MHz)

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MAR. 2016 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

MAR. 2016 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

MAR. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| H<br>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      | 295 | 295 | 291 | 311 | 354 | 349 | 333 | 368 | 347 | 357 | 326 | 349 | 335 | 339 | 341 | 343 | 378 | 356 | 355 | 339 | 310 | 316 | 306 | 289 |
| 2      | 288 | 302 | 296 | 305 | 321 | 310 | 346 | 372 | 356 | 353 | 333 | 326 | 331 | 342 | 343 | 352 | 359 | 360 | 332 | 296 | 310 | 302 | 303 | 291 |
| 3      | 294 | 298 | 285 | 318 | 308 | 304 | 319 | 369 | 365 | 347 | 352 | 342 | 339 | 334 | 339 | 342 | 362 | 359 | 342 | 323 | 331 | 289 | 300 | 300 |
| 4      | 293 | 290 | 298 | 308 | 326 | 337 | 346 | 365 | 347 | 355 | 323 | 324 | 333 | 325 | 334 | 340 | 352 | 361 | 349 | 322 | 323 | 300 | 311 | 309 |
| 5      | 295 | 288 | 298 | 292 | 308 | 325 | 343 | 371 | 355 | 352 | 322 | 324 | 325 | 341 | 343 | 347 | 354 | 367 | 358 | 329 | 323 | 306 | 295 | 297 |
| 6      | 288 | 298 | 293 | 309 | 311 | 307 | 344 | 354 | 364 | 352 | 349 | 325 | 315 | 341 | 344 | 355 | 350 | 365 | 341 | 318 | 318 | 305 | 296 | 291 |
| 7      | 283 | 283 | 308 | 292 | 298 | 273 | 329 | 377 | 369 | 319 | 308 | 325 | 327 | 338 | 308 | 308 | 327 | 347 | 344 | 273 | 283 | 289 | 278 | 269 |
| 8      | 280 | 309 | 328 | 372 | 295 | 296 | 326 | 351 | 333 | 319 | 333 | 326 | 332 | 334 | 329 | 350 | 357 | 357 | 339 | 303 | 309 | 312 | 299 | 257 |
| 9      | 294 | F   | F   | F   | F   | F   | 328 | 366 | 338 | 332 | 341 | 331 | 303 | 324 | 337 | 348 | 352 | 343 | 353 | 330 | 296 | 294 | 300 | 296 |
| 10     | 302 | 299 | 295 | 309 | 340 | 339 | 343 | 357 | 350 | 346 | 359 | 317 | 334 | 335 | 331 | 343 | 322 | 343 | 347 | 330 | 304 | 319 | 295 | 283 |
| 11     | 288 | 301 | 297 | 310 | 339 | 321 | 345 | 357 | 348 | 341 | 333 | 325 | 320 | 333 | 326 | 348 | 346 | 337 | 332 | 311 | 309 | 305 | 300 | 292 |
| 12     | 275 | 263 | 297 | 344 | 308 | 299 | 324 | 300 | 326 | 334 | 356 | 323 | 334 | 323 | 339 | 348 | 348 | 329 | 356 | 330 | 295 | 296 | 289 | 293 |
| 13     | 292 | 293 | 307 | 321 | 310 | 290 | 352 | 370 | 344 | 357 | 323 | 328 | 335 | 336 | 335 | 343 | 343 | 347 | 344 | 313 | 316 | 304 | 296 | 301 |
| 14     | 298 | 301 | 291 | 301 | 335 | 329 | 364 | 362 | 378 | 343 | 328 | 317 | 339 | 332 | 327 | 333 | 351 | 339 | 346 | 339 | 343 | 323 | 297 | 288 |
| 15     | 298 | 312 | 299 | 319 | 334 | 339 | 355 | 343 | 336 | 349 | 338 | 332 | 336 | 309 | 308 | 310 | 314 | 355 | 339 | 327 | 332 | 323 | 270 | 277 |
| 16     | 296 | 292 | 303 | 305 | 316 | 348 | 354 | 365 | 356 | 303 | 314 | 326 | 308 | 329 | 340 | 353 | 329 | 317 | 322 | 323 | 337 | 316 | 288 | 295 |
| 17     | 294 | 293 | 342 | 363 | 282 | 300 | 338 | 350 | 353 | 357 | 319 | 321 | 325 | 324 | 330 | 333 | 332 | 331 | 340 | 322 | 286 | 288 | 281 | 285 |
| 18     | 322 | 312 | 323 | 307 | 298 | 299 | 352 | 368 | 363 | 366 | 333 | 335 | 337 | 329 | 331 | 337 | 351 | 345 | 342 | 311 | 300 | 314 | 312 | 289 |
| 19     | 290 | 285 | 317 | 358 | 336 | 304 | 337 | 351 | 350 | 341 | 332 | 328 | 341 | 316 | 342 | 341 | 339 | 337 | 338 | 316 | 335 | 298 | 304 | 306 |
| 20     | 340 | 289 | 305 | 305 | 311 | 315 | 351 | 340 | 355 | 333 | 313 | 336 | 324 | 337 | 345 | 339 | 348 | 348 | 350 | 345 | 296 | 277 | 278 | 281 |
| 21     | 270 | 302 | 311 | 298 | 283 | 282 | 320 | 342 | 335 | 339 | 329 | 327 | 331 | 335 | 361 | 321 | 335 | 343 | 343 | 345 | 307 | 298 | 303 | 296 |
| 22     | 283 | 312 | 309 | 307 | 362 | 313 | 336 | 353 | 366 | 353 | 356 | 331 | 335 | 332 | 343 | 350 | 368 | 344 | 340 | 348 | 287 | 294 | 306 | 294 |
| 23     | 292 | 292 | 277 | 309 | 331 | 305 | 348 | 370 | 359 | 344 | 367 | 353 | 335 | 338 | 335 | 333 | 331 | 335 | 330 | 343 | 342 | 304 | 300 | 308 |
| 24     | 301 | 299 | 317 | 318 | 335 | 312 | 356 | 360 | 345 | 372 | 363 | 322 | 331 | 329 | 330 | 338 | C   | C   | 334 | 350 | 335 | 325 | 299 | 294 |
| 25     | 296 | 297 | 284 | 297 | 315 | 327 | 385 | 386 | 358 | 354 | C   | C   | C   | C   | C   | C   | 343 | 350 | 334 | 347 | 339 | 302 | 304 | F   |
| 26     | 299 | 311 | 308 | 327 | 345 | 308 | 360 | 367 | 368 | 352 | 333 | 335 | 338 | 340 | 347 | 340 | 341 | 352 | 338 | 338 | 338 | 316 | 301 | 296 |
| 27     | 299 | 292 | 300 | 318 | 328 | 307 | 362 | 358 | 376 | 346 | 340 | 340 | 329 | 340 | 330 | 330 | 327 | 342 | 343 | 349 | 314 | 302 | 301 | 308 |
| 28     | 301 | 302 | 299 | 295 | 299 | 304 | 371 | 366 | 351 | 346 | 330 | 302 | 327 | 318 | 342 | 339 | 341 | 346 | 349 | 352 | 279 | 291 | 295 | 296 |
| 29     | 299 | 300 | 312 | 316 | 303 | 301 | 350 | 347 | 352 | 354 | 339 | 323 | 314 | 323 | 315 | 327 | 345 | 353 | 340 | 334 | 319 | 310 | 285 | 290 |
| 30     | 300 | 327 | 305 | 301 | 295 | 303 | 377 | 373 | 352 | 347 | 314 | 319 | 340 | 317 | 323 | 328 | 337 | 337 | 336 | 327 | 327 | 326 | 287 | 295 |
| 31     | 278 | 308 | 309 | 305 | 300 | 322 | 367 | 380 | 354 | 341 | 320 | 316 | 325 | 319 | 331 | 331 | 332 | 343 | 346 | 335 | 345 | 307 | 281 | 300 |
|        | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |
| CNT    | 31  | 30  | 30  | 30  | 30  | 30  | 31  | 31  | 31  | 31  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 31  | 31  | 31  | 31  | 31  | 30  |
| MED    | 294 | 298 | 302 | 309 | 313 | 308 | 346 | 365 | 353 | 347 | 333 | 326 | 332 | 332 | 335 | 340 | 344 | 346 | 342 | 330 | 316 | 304 | 299 | 294 |
| U Q    | 299 | 302 | 309 | 318 | 335 | 325 | 356 | 370 | 363 | 354 | 341 | 332 | 335 | 338 | 342 | 348 | 352 | 355 | 347 | 343 | 335 | 316 | 303 | 297 |
| L Q    | 288 | 292 | 296 | 305 | 300 | 301 | 336 | 351 | 347 | 341 | 323 | 323 | 325 | 324 | 330 | 333 | 332 | 339 | 338 | 318 | 300 | 296 | 288 | 289 |

MAR. 2016 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 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<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|--------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|
| 1      |    |    |    |    |    |    |    |    | L   | L   | L   | L   | 394 | U L | U L | L   |    |    |    |    |    |    |    |    |
| 2      |    |    |    |    |    |    |    |    |     |     | L   | L   | L   | U L | U L | U L | A  |    |    |    |    |    |    |    |
| 3      |    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 4      |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | U L | L   | L   |    |    |    |    |    |    |    |    |
| 5      |    |    |    |    |    |    |    |    | L   | L   | L   | U L | A   | A   | L   | A   | A  |    |    |    |    |    |    |    |
| 6      |    |    |    |    |    |    |    |    | L   | L   | L   | U L | L   | A   | A   | L   |    |    |    |    |    |    |    |    |
| 7      |    |    |    |    |    |    |    |    | U L | L   | L   | L   | L   | L   | L   | A   | L  |    |    |    |    |    |    |    |
| 8      |    |    |    |    |    |    |    |    | L   | L   | L   | U L | L   | L   | L   | L   |    |    |    |    |    |    |    |    |
| 9      |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |    |    |
| 10     |    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |    |    |
| 11     |    |    |    |    |    |    |    |    | L   | A   | L   | U L | L   | L   | L   | L   | L  |    |    |    |    |    |    |    |
| 12     |    |    |    |    |    |    |    |    | L   | L   | A   | L   | A   | L   | A   |     | L  |    |    |    |    |    |    |    |
| 13     |    |    |    |    |    |    |    |    | L   | A   | L   | U L | A   | U L | L   | L   |    |    |    |    |    |    |    |    |
| 14     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | L   | L   | L   |    |    |    |    |    |    |    |    |
| 15     |    |    |    |    |    |    |    |    |     | L   |     | L   | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 16     |    |    |    |    |    |    |    |    | L   |     | L   | U L | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 17     |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | U L | L   | L   |    |    |    |    |    |    |    |    |
| 18     |    |    |    |    |    |    |    |    |     | L   | L   | U L | L   | L   | U L | L   |    |    |    |    |    |    |    |    |
| 19     |    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | U L | U L | L   |    |    |    |    |    |    |    |    |
| 20     |    |    |    |    |    |    |    |    |     | L   | L   | L   | L   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 21     |    |    |    |    |    |    |    |    | L   | L   | L   | L   | U L | L   | L   | L   | L  |    |    |    |    |    |    |    |
| 22     |    |    |    |    |    |    |    |    | L   | L   | U L | U L | L   | L   | L   | L   | A  |    |    |    |    |    |    |    |
| 23     |    |    |    |    |    |    |    |    | L   | L   | L   | U L | L   | L   | L   | A   | L  |    |    |    |    |    |    |    |
| 24     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | U L | L   | L   | C  | C  |    |    |    |    |    |    |
| 25     |    |    |    |    |    |    |    |    |     | A   | C   | C   | C   | C   | C   | C   | L  | A  |    |    |    |    |    |    |
| 26     |    |    |    |    |    |    |    |    | L   | L   | L   | U L | U L | U L | L   | L   | L  |    |    |    |    |    |    |    |
| 27     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | U L | L   | L   | L  | A  |    |    |    |    |    |    |
| 28     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | A   | U L | U L | L   | L  |    |    |    |    |    |    |    |
| 29     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | L   | L   | L   | L  |    |    |    |    |    |    |    |
| 30     |    |    |    |    |    |    |    |    |     | L   | L   | U L | U L | U L | L   | L   | L  |    |    |    |    |    |    |    |
| 31     |    |    |    |    |    |    |    |    | L   | L   | U L | L   | U L | U L | U L | L   |    |    |    |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    |    |     | 2   | 8   | 12  | 11  | 13  | 10  | 2   |    |    |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    |    |     | U L | U L | U L | U L | U L | U L | U L |    |    |    |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |    |    |     | 376 | 404 | 394 | 377 | 381 | 378 | 376 |    |    |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    |    |     | U L | U L | U L | U L | U L | U L |     |    |    |    |    |    |    |    |    |
|        |    |    |    |    |    |    |    |    |     | 412 | 405 | 394 | 393 | 384 |     |     |    |    |    |    |    |    |    |    |
|        |    |    |    |    |    |    |    |    |     | U L | U L | U L | U L | U L |     |     |    |    |    |    |    |    |    |    |
|        |    |    |    |    |    |    |    |    |     | 388 | 384 | 371 | 372 | 370 |     |     |    |    |    |    |    |    |    |    |

MAR. 2016 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 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<br>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      |    |    |    |    |    |    |    |    | 242 | 242 | 276 | 248 | 264 | 250 | 248 | 246 |     |     |     |    |    |    |    |    |
| 2      |    |    |    |    |    |    |    |    |     | 252 | 260 | 282 | 266 | 258 | 252 | 252 | 234 |     |     |    |    |    |    |    |
| 3      |    |    |    |    |    |    |    |    | 226 | 244 | 256 | 256 | 242 | 260 | 264 | 260 | 242 |     |     |    |    |    |    |    |
| 4      |    |    |    |    |    |    |    |    |     | 250 | 276 | 262 | 258 | 276 | 250 | 250 |     |     |     |    |    |    |    |    |
| 5      |    |    |    |    |    |    |    |    | 226 | 238 | 264 | 258 | 264 | 248 | 260 | 244 | 232 |     |     |    |    |    |    |    |
| 6      |    |    |    |    |    |    |    |    | 244 | 246 | 256 | 260 | 274 | 256 | 248 | 248 |     |     |     |    |    |    |    |    |
| 7      |    |    |    |    |    |    |    |    |     | 288 | 296 | 266 | 266 | 256 | 274 | 268 | 256 |     |     |    |    |    |    |    |
| 8      |    |    |    |    |    |    |    |    |     | 266 | 256 | 266 | 258 | 258 | 260 | 246 |     |     |     |    |    |    |    |    |
| 9      |    |    |    |    |    |    |    |    |     | 258 | 258 | 246 | 302 | 270 | 246 | 248 |     |     |     |    |    |    |    |    |
| 10     |    |    |    |    |    |    |    |    | 250 | 250 | 236 | 260 | 278 | 270 | 260 | 250 |     |     |     |    |    |    |    |    |
| 11     |    |    |    |    |    |    |    |    |     | 260 | 266 | 262 | 270 | 260 | 252 | 256 | 246 |     |     |    |    |    |    |    |
| 12     |    |    |    |    |    |    |    |    |     | 246 | 240 | 254 | 278 | 256 | 262 | 248 |     | 258 |     |    |    |    |    |    |
| 13     |    |    |    |    |    |    |    |    | 262 | 252 | 272 | 270 | 260 | 252 | 252 | 254 |     |     |     |    |    |    |    |    |
| 14     |    |    |    |    |    |    |    |    | 228 | 250 | 272 | 264 | 250 | 258 | 256 | 262 |     |     |     |    |    |    |    |    |
| 15     |    |    |    |    |    |    |    |    |     | 248 |     | 246 | 276 | 304 | 288 | 282 | 270 |     |     |    |    |    |    |    |
| 16     |    |    |    |    |    |    |    |    | 232 |     | 286 | 264 | 292 | 264 | 242 | 244 | 258 |     |     |    |    |    |    |    |
| 17     |    |    |    |    |    |    |    |    |     | 242 | 246 | 280 | 252 | 276 | 268 | 260 |     |     |     |    |    |    |    |    |
| 18     |    |    |    |    |    |    |    |    |     | 236 | 254 | 266 | 260 | 280 | 258 | 262 |     |     |     |    |    |    |    |    |
| 19     |    |    |    |    |    |    |    |    | 242 | 246 | 256 | 260 | 248 | 256 | 258 | 260 |     |     |     |    |    |    |    |    |
| 20     |    |    |    |    |    |    |    |    |     | 260 | 266 | 254 | 268 | 252 | 246 | 270 | 244 |     |     |    |    |    |    |    |
| 21     |    |    |    |    |    |    |    |    | 260 | 252 | 262 | 246 | 272 | 252 | 246 | 262 | 270 |     |     |    |    |    |    |    |
| 22     |    |    |    |    |    |    |    |    | 240 | 248 | 234 | 264 | 272 | 260 | 260 | 256 | 232 |     |     |    |    |    |    |    |
| 23     |    |    |    |    |    |    |    |    | 244 | 248 | 238 | 244 | 260 | 268 | 268 | 252 | 266 |     |     |    |    |    |    |    |
| 24     |    |    |    |    |    |    |    |    | 248 | 230 | 232 | 258 | 278 | 274 | 268 | 266 |     | C   | C   |    |    |    |    |    |
| 25     |    |    |    |    |    |    |    |    |     | 256 |     | C   | C   | C   | C   | C   |     | 248 | 234 |    |    |    |    |    |
| 26     |    |    |    |    |    |    |    |    |     | 248 | 272 | 262 | 272 | 268 | 256 | 264 | 264 |     |     |    |    |    |    |    |
| 27     |    |    |    |    |    |    |    |    | 250 | 260 | 268 | 256 | 274 | 256 | 260 | 260 | 278 | 252 |     |    |    |    |    |    |
| 28     |    |    |    |    |    |    |    |    | 258 | 260 | 268 | 288 | 282 | 266 | 264 | 264 | 266 |     |     |    |    |    |    |    |
| 29     |    |    |    |    |    |    |    |    | 248 | 240 | 260 | 284 | 288 | 288 | 276 | 272 | 250 |     |     |    |    |    |    |    |
| 30     |    |    |    |    |    |    |    |    |     | 250 | 290 | 280 | 254 | 294 | 272 | 274 | 262 |     |     |    |    |    |    |    |
| 31     |    |    |    |    |    |    |    |    | 246 | 246 | 272 | 276 | 270 | 286 | 276 | 258 |     |     |     |    |    |    |    |    |
|        | 00 | 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  | 30  | 29  | 30  | 30  | 30  | 30  | 30  | 17  | 3   |     |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    |    | 244 | 249 | 262 | 262 | 269 | 260 | 260 | 259 | 256 | 252 |     |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |    |    | 250 | 256 | 272 | 266 | 276 | 274 | 268 | 264 | 266 | 258 |     |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    |    | 236 | 246 | 255 | 256 | 260 | 256 | 252 | 250 | 243 | 234 |     |    |    |    |    |    |

MAR. 2016 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 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<br>D | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |   |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| 1      | E   | B   | E   | B   | E   | B   | E   | B   | H   |     |     |     |     |     |     |     |     |     |     |     |     |     | E   | B   | E   | B |
| 2      | 294 | 286 | 272 | 260 | 226 | 196 | 226 | 180 | 186 | 206 | 196 | 216 | 188 | 196 | 204 | 200 | 208 | 208 | 208 | 206 | 226 | 228 | 260 | 260 | 288 |   |
| 3      | 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 |
| 4      | 270 | 286 | 278 | 266 | 232 | 218 | 214 | 200 | 218 | 214 | 202 | 208 | 206 | 198 | 212 | 196 | 220 | 218 | 204 | 204 | 214 | 276 | 272 | 262 | 262 |   |
| 5      | 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 |
| 6      | 268 | 278 | 278 | 282 | 260 | 230 | 214 | 210 | 192 | 198 | 198 | 186 |     |     | 204 |     |     | 210 | 204 | 210 | 232 | 230 | 278 | 280 | 280 |   |
| 7      | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 8      | 288 | 292 | 266 | 274 | 276 | 290 | 216 | 212 | 212 | 206 | 196 | 226 | 216 | 218 | 208 |     | 220 | 214 | 192 | 234 | 250 | 258 | 300 | 300 | 300 |   |
| 9      | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 10     | 280 | 256 | 234 | 204 | 204 | 238 | 236 | 220 | 220 | 202 | 202 | 188 | 224 | 204 | 210 | 208 | 220 | 208 | 208 | 216 | 228 | 220 | 228 | 318 | 318 |   |
| 11     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 12     | 258 | 278 | 252 | 228 | 196 | 238 | 230 | 220 | 212 | 206 | 192 | 206 | 186 | 216 | 204 | 212 | 212 | 230 | 208 | 200 | 214 | 244 | 256 | 258 | 258 |   |
| 13     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 14     | 260 | 268 | 272 | 250 | 214 | 214 | 214 | 218 | 212 | 192 | 192 | 198 | 224 | 224 | 206 | 206 | 216 | 222 | 214 | 200 | 228 | 228 | 258 | 278 | 278 |   |
| 15     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 16     | 278 | 276 | 282 | 250 | 216 | 226 | 218 | 222 | 222 | 222 |     | 220 | 196 | 204 | 204 | 212 | 206 | 226 | 218 | 208 | 242 | 234 | 246 | 282 | 282 |   |
| 17     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 18     | 310 | 334 | 268 | 224 | 198 | 248 | 228 | 222 | 226 | 200 | 206 |     | 234 |     | 216 |     | 218 | 214 | 208 | 190 | 254 | 274 | 274 | 270 | 270 |   |
| 19     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 20     | 290 | 280 | 260 | 264 | 256 | 288 | 212 | 206 | 204 |     | 198 | 192 |     | 190 | 208 | 194 | 200 | 222 | 208 | 204 | 236 | 256 | 272 | 266 | 266 |   |
| 21     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 22     | 264 | 246 | 264 | 262 | 218 | 212 | 202 | 208 | 196 | 188 | 178 | 218 | 210 | 208 | 204 | 210 | 226 | 232 | 218 | 208 | 206 | 216 | 248 | 288 | 288 |   |
| 23     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 24     | 286 | 264 | 270 | 250 | 210 | 214 | 212 | 218 | 224 | 220 | 216 | 210 | 206 | 208 | 204 | 212 | 222 | 216 | 198 | 196 | 206 | 210 | 316 | 316 | 316 |   |
| 25     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 26     | 294 | 286 | 276 | 254 | 244 | 216 | 204 | 206 | 192 | 204 | 206 | 186 | 226 | 208 | 202 | 208 | 210 | 232 | 230 | 214 | 210 | 204 | 290 | 282 | 282 |   |
| 27     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 28     | 282 | 282 |     | 224 | 206 | 220 | 266 | 234 | 228 | 212 | 200 | 200 | 208 | 202 | 206 | 198 | 218 | 218 | 236 | 208 | 216 | 230 | 274 | 280 | 280 |   |
| 29     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 30     | 232 | 210 | 220 | 234 | 256 | 272 | 218 | 214 | 218 | 202 | 202 | 188 | 218 | 206 | 198 | 216 | 228 | 222 | 214 | 224 | 248 | 218 | 228 | 280 | 280 |   |
| 31     | 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 |
| 00     | 286 | 284 | 238 | 208 | 204 | 278 | 230 | 222 | 210 | 196 | 204 | 208 | 212 | 208 | 206 | 210 | 222 | 232 | 224 | 236 | 204 | 232 | 256 | 258 | 258 |   |
| 01     | 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 |
| 02     | 218 | 296 | 276 | 270 | 270 | 238 | 210 | 212 | 218 | 210 | 200 | 202 | 208 | 202 | 206 | 220 | 222 | 224 | 214 | 196 | 248 | 280 | 300 | 284 | 284 |   |
| 03     | 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 |
| 04     | 282 | 236 | 238 | 270 | 274 | 286 | 224 | 232 | 216 | 218 | 204 | 204 | 190 | 192 | 206 | 192 | 230 | 228 | 216 | 204 | 202 | 242 | 262 | 278 | 278 |   |
| 05     | 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 |
| 06     | 272 | 266 | 232 | 230 | 218 | 220 | 220 | 218 | 206 | 208 | 200 | 198 | 216 | 208 | 206 | 212 |     | 234 | 226 | 222 | 232 | 258 | 250 | 268 | 268 |   |
| 07     | 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 |
| 08     | 268 | 266 | 268 | 254 | 218 | 222 | 220 | 220 | 212 | 208 | 208 | 204 | 190 | 200 | 238 |     | 222 | 236 | 226 | 212 | 204 | 236 | 268 | 274 | 274 |   |
| 09     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 10     | 268 | 266 | 244 | 234 | 216 | 230 | 222 | 220 | 208 | 208 | 198 | 190 | 186 | 190 | 206 | 214 |     |     | 218 | 212 | 204 | 216 | 266 | 288 | 288 |   |
| 11     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 12     | 304 | 284 | 272 | 246 | 214 | 216 | 200 | 208 | 214 |     |     |     |     |     |     |     | 210 |     | 222 | 212 | 204 | 306 | 282 | 310 | 310 |   |
| 13     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 14     | 294 | 258 | 256 | 234 | 212 | 228 | 214 | 216 | 216 | 198 | 188 | 184 | 194 | 202 | 198 | 202 | 216 | 228 | 214 | 208 | 202 | 234 | 264 | 280 | 280 |   |
| 15     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 16     | 284 | 270 | 270 | 238 | 226 | 228 | 212 | 218 | 210 | 210 | 200 | 208 | 184 | 182 | 198 | 180 | 220 |     | 222 | 198 | 202 | 250 | 252 | 246 | 246 |   |
| 17     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 18     | 264 | 272 | 278 | 284 | 284 | 254 | 200 | 198 | 212 | 184 | 190 | 218 |     | 216 | 206 | 222 | 228 | 230 | 212 | 202 | 202 | 274 | 282 | 286 | 286 |   |
| 19     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 20     | 284 | 264 | 262 | 246 | 216 | 252 | 216 | 224 | 212 | 200 | 198 | 214 | 186 | 214 | 212 | 212 | 214 | 224 | 226 | 218 | 204 | 216 | 292 | 290 | 290 |   |
| 21     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 22     | 262 | 230 | 234 | 250 | 278 | 270 | 210 | 216 | 212 | 196 | 188 | 178 | 198 | 202 | 198 | 200 | 224 | 226 | 226 | 214 | 210 | 208 | 246 | 270 | 270 |   |
| 23     | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B   | E   | B |
| 24     | 270 | 252 | 242 | 254 | 288 | 254 | 208 | 216 | 202 | 206 | 196 | 188 | 212 | 196 | 196 | 202 | 228 | 226 | 212 | 208 | 208 | 244 | 274 | 330 | 330 |   |
| 00     | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |   |
| CNT    | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 29  | 29  | 29  | 27  | 27  | 29  | 26  | 27  | 28  | 31  | 31  | 31  | 31  | 31  | 31  | 31  |   |
| MED    | 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 |
| UQ     | 282 | 272 | 268 | 250 | 215 | 238 | 215 | 216 | 212 | 204 | 198 | 204 | 206 | 204 | 204 | 210 | 220 | 224 | 214 | 208 | 209 | 236 | 268 | 280 | 280 |   |
| LQ     | 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 |
|        | 288 | 284 | 272 | 264 | 256 | 266 | 224 | 220 | 216 | 209 | 203 | 210 | 216 | 208 | 207 | 212 | 222 | 230 | 222 | 216 | 236 | 258 | 278 | 288 | 288 |   |
|        | 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 |
|        | 268 | 262 | 242 | 234 | 214 | 220 | 212 | 208 | 204 | 198 | 194 | 189 | 190 | 196 | 200 | 202 | 212 | 215 | 208 | 202 | 204 | 220 | 256 | 270 | 270 |   |

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

| H<br>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 | 112 | 108 | 112 | 118 | 122 | 118 | 118 | 110 | 110 | 110 |     |    |    |    |    |    |
| 2      |    |    |    |    |    |    | B          | 110 | 110 | 112 | 112 | 112 | 112 | 110 | 110 | 112 |     | A   |     |    |    |    |    |    |
| 3      |    |    |    |    |    |    | B          | 112 | 112 | 114 | 116 | 114 | 112 | 116 | 110 | 114 | 114 | 110 |     |    |    |    |    |    |
| 4      |    |    |    |    |    |    | B          | 110 | 112 | 112 | A   | 114 | 114 | 110 | 114 | 116 | 116 | 120 |     |    |    |    |    |    |
| 5      |    |    |    |    |    |    | B          | 112 | 112 | 112 | 112 | 112 | 108 | 112 | 114 | 116 | 116 | 116 |     |    |    |    |    |    |
| 6      |    |    |    |    |    |    | B          | 110 | 116 | 116 | 116 | 114 | 110 | 112 | 110 |     | A   | 114 | 114 |    |    |    |    |    |
| 7      |    |    |    |    |    |    | B          | 118 | 116 | A   | A   | 110 | 112 | 118 | A   | A   | A   | 118 |     |    |    |    |    |    |
| 8      |    |    |    |    |    |    | B          | 120 | 108 | 110 | 114 | 112 | 112 | 112 | 112 | 112 | 116 | 118 |     |    |    |    |    |    |
| 9      |    |    |    |    |    |    | B          | 118 | 118 | 110 | 110 | 112 | A   | 112 | 112 | 112 | 112 | 114 |     |    |    |    |    |    |
| 10     |    |    |    |    |    |    | B          | 112 | 112 | 112 | 112 | 112 | 112 | 114 | 114 | 112 | 112 | 114 |     |    |    |    |    |    |
| 11     |    |    |    |    |    |    | B          | 110 | 112 | 112 | 114 | 114 | 114 | 114 | 112 | 112 | 110 | 110 |     |    |    |    |    |    |
| 12     |    |    |    |    |    |    | B          | 120 | 118 | 110 | 112 | 118 | 116 | 116 | 116 | 110 | 112 | 110 |     | B  |    |    |    |    |
| 13     |    |    |    |    |    |    | B          | 110 | 110 | 110 | 114 | 114 | 114 | 112 | A   | 108 | 112 | 114 |     |    |    |    |    |    |
| 14     |    |    |    |    |    |    | B          | 116 | 110 | 120 | 116 | 120 | A   | 114 | 118 | 112 | 110 |     | A   |    |    |    |    |    |
| 15     |    |    |    |    |    |    | B          | 112 | 112 | 116 | 116 | A   | 116 | 116 | 116 | 116 | 112 |     |     |    |    |    |    |    |
| 16     |    |    |    |    |    |    | B          | 110 | 112 | A   | A   | A   | 112 | A   | 116 | 112 | 110 | 114 |     | B  |    |    |    |    |
| 17     |    |    |    |    |    |    | B          | 110 | 116 | 112 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 |     | B  |    |    |    |    |
| 18     |    |    |    |    |    |    | B          | 118 | 118 | 116 | 116 | A   | 116 | 112 | 112 | 112 | 112 | 112 |     | B  |    |    |    |    |
| 19     |    |    |    |    |    |    | B          | 108 | 114 | 110 | A   | 110 | 110 | 112 | 112 | 114 | 114 | 112 |     | B  |    |    |    |    |
| 20     |    |    |    |    |    |    | B          | 116 | 112 | 110 | 112 | A   | 114 | 112 | 112 | 112 | 112 | 116 |     | B  |    |    |    |    |
| 21     |    |    |    |    |    |    | B          | 116 | 114 | A   | A   | A   | 118 | 116 | 110 | 110 | 108 | 118 |     | B  |    |    |    |    |
| 22     |    |    |    |    |    |    | B          | 120 | A   | A   | 118 | 120 | 114 | 114 | 114 | 116 | 116 |     | A   | B  |    |    |    |    |
| 23     |    |    |    |    |    |    | B          | 112 | 114 | 114 | 112 | A   | A   | A   | A   | A   |     | 112 | 112 |    | B  |    |    |    |
| 24     |    |    |    |    |    |    | B          | 110 | 112 | 112 | A   | 110 | A   | A   | A   | 110 | C   | C   |     | B  |    |    |    |    |
| 25     |    |    |    |    |    |    | B          | 112 | 112 | A   | C   | C   | C   | C   | C   | C   | A   | A   |     | B  |    |    |    |    |
| 26     |    |    |    |    |    |    | B          | 114 | 116 | 118 | A   | A   | A   | 114 | 112 | 112 | 110 | 110 |     | B  |    |    |    |    |
| 27     |    |    |    |    |    |    | B          | 114 | 114 | 114 | 110 | 114 | 114 | 114 | 110 | 110 | 110 | 116 |     | B  |    |    |    |    |
| 28     |    |    |    |    |    |    | E B<br>150 | 110 | 114 | A   | A   | 114 | 112 | 114 | 118 | 118 | 110 | 114 |     | B  |    |    |    |    |
| 29     |    |    |    |    |    |    | B          | 110 | 110 | 116 | 114 | 114 | 114 | A   | 114 | 114 | 114 | 112 |     | B  |    |    |    |    |
| 30     |    |    |    |    |    |    | B          | 112 | 112 | 112 | 112 | A   | 114 | 114 | 110 | 110 | 110 | 110 |     | B  |    |    |    |    |
| 31     |    |    |    |    |    |    | B          | 110 | 110 | 110 | 110 | 112 | 112 | A   | 114 | 114 | 114 | 118 |     | B  |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06         | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    | 1          | 31  | 30  | 25  | 22  | 22  | 24  | 26  | 26  | 27  | 28  | 25  |     |    |    |    |    |    |
| MED    |    |    |    |    |    |    | E B<br>150 | 112 | 112 | 112 | 113 | 114 | 114 | 114 | 113 | 112 | 112 | 114 |     |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |            | 116 | 114 | 115 | 116 | 114 | 114 | 114 | 114 | 114 | 114 | 116 |     |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |            | 110 | 112 | 110 | 112 | 112 | 112 | 112 | 112 | 110 | 110 | 111 |     |    |    |    |    |    |

MAR. 2016 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 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<br>D | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1      | B   | B   | B   | B   | 98  | 98  | B   | G   | G   | 118 | 114 | 100 | G   | 102 | 102 | G   | G   | 144 | 96  | B   | B   | B   | B   | B   |     |
| 2      | B   | B   | B   | B   | B   | B   | B   | 142 | G   | G   | G   | G   | G   | G   | G   | G   | 134 | 106 | 94  | 94  | B   | B   | B   | 100 |     |
| 3      | B   | 92  | B   | B   | B   | B   | B   | 152 | 102 | 102 | 98  | 100 | 94  | 132 | 92  | G   | G   | 136 | B   | B   | B   | B   | 106 | 104 |     |
| 4      | 102 | 98  | 98  | B   | B   | 110 | B   | 146 | G   | G   | 104 | 128 | 126 | 118 | 118 | 100 | 96  | G   | B   | B   | 100 | 102 | B   | 90  |     |
| 5      | B   | B   | B   | B   | B   | B   | B   | G   | G   | 122 | 124 | 120 | 142 | 126 | 134 | 124 | 122 | 122 | 110 | 102 | 102 | B   | 100 | B   |     |
| 6      | 96  | 98  | B   | B   | B   | B   | B   | 130 | 106 | 130 | 124 | 126 | 122 | 116 | 116 | 104 | G   | G   | B   | B   | 96  | B   | B   | B   |     |
| 7      | B   | B   | B   | B   | B   | B   | B   | 160 | G   | 150 | 104 | 104 | G   | 132 | G   | 104 | 104 | 102 | G   | B   | B   | B   | 112 | 106 | 104 |
| 8      | B   | B   | B   | B   | B   | B   | B   | 140 | 168 | G   | G   | G   | G   | G   | G   | G   | G   | G   | 118 | B   | B   | 106 | B   | B   | B   |
| 9      | 124 | B   | B   | B   | B   | B   | B   | B   | 158 | 168 | G   | G   | G   | G   | G   | G   | G   | G   | B   | B   | 92  | B   | B   | B   | B   |
| 10     | 96  | B   | B   | B   | B   | B   | B   | 146 | G   | 130 | G   | G   | 142 | 128 | 128 | 126 | 128 | 150 | B   | 122 | B   | B   | B   | B   |     |
| 11     | B   | B   | B   | B   | B   | B   | B   | 158 | 156 | 140 | 130 | 126 | 128 | 124 | G   | 96  | G   | G   | 88  | 94  | B   | B   | 128 | 122 |     |
| 12     | 118 | B   | B   | B   | B   | B   | B   | 132 | 128 | G   | 130 | 118 | 122 | 116 | 118 | 118 | G   | 114 | B   | B   | B   | 100 | 100 | 94  |     |
| 13     | 96  | B   | B   | 94  | B   | 94  | B   | 158 | G   | 126 | 104 | 104 | 150 | 94  | 96  | G   | G   | G   | B   | B   | B   | B   | 100 | B   |     |
| 14     | B   | 92  | B   | B   | B   | B   | B   | 146 | G   | 104 | 100 | 144 | 98  | 102 | G   | 96  | 92  | 92  | 104 | B   | B   | B   | B   | 104 |     |
| 15     | 94  | 96  | B   | B   | 106 | B   | B   | G   | G   | 110 | 102 | 104 | G   | 106 | G   | G   | G   | 106 | B   | B   | 106 | 102 | 102 | B   |     |
| 16     | B   | 102 | B   | 102 | 98  | 94  | B   | G   | G   | 100 | 102 | 104 | G   | 104 | 104 | 94  | G   | G   | B   | B   | B   | B   | B   | B   |     |
| 17     | B   | B   | B   | B   | B   | B   | B   | 150 | 162 | G   | G   | G   | G   | G   | G   | 118 | G   | G   | B   | B   | B   | B   | B   | B   |     |
| 18     | B   | B   | B   | B   | B   | B   | B   | 104 | 104 | 124 | 116 | 106 | G   | G   | G   | G   | 140 | G   | 124 | B   | B   | B   | B   | B   |     |
| 19     | B   | B   | B   | B   | B   | B   | B   | 138 | 142 | 160 | 146 | 102 | G   | 116 | 116 | 112 | G   | G   | G   | 104 | 102 | 102 | 100 | 98  |     |
| 20     | B   | B   | B   | B   | B   | B   | B   | 142 | 146 | 148 | 120 | 116 | 106 | 106 | 118 | 124 | 158 | 120 | 146 | 118 | B   | 110 | 110 | 106 | 112 |
| 21     | B   | 106 | B   | 106 | B   | B   | B   | 162 | 154 | G   | 102 | 104 | 102 | G   | G   | G   | G   | 154 | 122 | 116 | 110 | 108 | 106 | 102 | 102 |
| 22     | 108 | 100 | 102 | 102 | 100 | 98  | 130 | 146 | 102 | 102 | 102 | 100 | 98  | 96  | 94  | 126 | 120 | 106 | 106 | 104 | 106 | 106 | 104 | B   | B   |
| 23     | 104 | 110 | 108 | B   | B   | B   | 140 | 146 | G   | 126 | 118 | 104 | 104 | 104 | 104 | 100 | 142 | 116 | 104 | 92  | 92  | 92  | B   | B   |     |
| 24     | B   | B   | B   | B   | 96  | 106 | 122 | 138 | 124 | 116 | 102 | G   | 106 | G   | 104 | 100 | C   | C   | 100 | 100 | 104 | B   | B   | 112 |     |
| 25     | B   | B   | 94  | 94  | B   | B   | 144 | 138 | 120 | 106 | C   | C   | C   | C   | C   | C   | 98  | 98  | 100 | 102 | 104 | 102 | 112 | 104 |     |
| 26     | 98  | 98  | B   | B   | B   | B   | 136 | 150 | 142 | 104 | 104 | 106 | 106 | G   | 96  | G   | G   | G   | 100 | 100 | 102 | 102 | B   | B   |     |
| 27     | B   | B   | B   | B   | B   | B   | 138 | G   | 126 | 118 | 102 | 102 | 98  | G   | G   | G   | 136 | 122 | 114 | 110 | B   | B   | B   | B   |     |
| 28     | 100 | B   | B   | B   | B   | B   | 162 | 162 | 162 | 102 | 102 | 164 | 152 | 154 | 100 | 162 | 138 | 136 | 114 | 92  | B   | B   | B   | B   |     |
| 29     | B   | B   | B   | B   | B   | B   | 152 | 162 | 148 | G   | G   | 100 | 104 | 100 | 100 | G   | G   | 112 | 96  | 96  | 96  | B   | B   | B   |     |
| 30     | B   | 102 | 98  | B   | B   | B   | 140 | 148 | G   | 122 | 110 | 106 | G   | G   | 106 | G   | 102 | G   | B   | B   | B   | B   | B   | B   |     |
| 31     | 104 | 104 | 100 | 100 | 100 | 102 | 142 | 142 | 140 | G   | 118 | 96  | G   | 94  | 100 | 98  | 134 | 126 | 112 | 88  | 88  | 108 | 120 | 104 |     |
|        | 00  | 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  | 12  | 6   | 7   | 6   | 7   | 16  | 25  | 17  | 23  | 24  | 24  | 20  | 19  | 20  | 17  | 15  | 19  | 17  | 16  | 15  | 13  | 13  | 12  |     |
| MED    | 101 | 99  | 99  | 100 | 99  | 98  | 141 | 146 | 140 | 118 | 104 | 106 | 111 | 116 | 104 | 104 | 122 | 122 | 104 | 100 | 102 | 102 | 104 | 104 |     |
| U Q    | 106 | 103 | 102 | 102 | 100 | 106 | 151 | 158 | 153 | 126 | 117 | 123 | 130 | 124 | 117 | 126 | 136 | 136 | 113 | 103 | 106 | 107 | 109 | 108 |     |
| L Q    | 96  | 97  | 98  | 94  | 98  | 94  | 138 | 142 | 113 | 104 | 102 | 102 | 104 | 102 | 100 | 99  | 102 | 106 | 98  | 93  | 96  | 101 | 100 | 101 |     |

MAR. 2016 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

MAR. 2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

| H<br>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 | F1 |    |    |      |      | C1   | C2   | L2   |      | L1   | L2   |      |      | H1   | F1   |      |    | F1 |      |    |  |
| 2      |    |    |    |    |    |    |    | H2   |      |      |      | H1   |      |      |      |      | H1   | L2   | F1   | F2   |    |    |      | F2 |  |
| 3      |    | F1 |    |    |    |    |    | H2   | L2   | L2   | L2   | L2   | L2   | CL12 | L2   |      |      | H1   |      |      |    |    | F1   | F2 |  |
| 4      | F3 | F2 | F2 |    | F1 |    |    | H2   |      |      | L2   | CL12 | CL12 | CL22 | CL12 | L2   | L3   |      |      |      | F3 | F5 |      | F1 |  |
| 5      |    |    |    |    |    |    |    |      |      | C1   | C2   | C1   | H1   | C2   | C2   | C1   | C1   | C2   | F3   | F3   | F3 |    | F3   |    |  |
| 6      | F2 | F1 |    |    |    |    |    | H1   | L2   | HL12 | CL12 | CL12 | CL22 | CL22 | CL12 | L2   |      |      |      |      | F5 |    |      |    |  |
| 7      |    |    |    |    |    |    | H2 |      | H2   | L2   | L2   |      | C1   |      | L2   | L2   | L2   |      |      |      |    | F2 | F5   | F1 |  |
| 8      |    |    |    |    |    |    | H3 | H2   |      |      |      |      |      |      |      |      |      | C2   |      |      | F1 |    |      |    |  |
| 9      | F1 |    |    |    |    |    |    | H2   | H1   |      |      | C1   | L1   |      |      |      |      |      |      | F1   |    |    |      |    |  |
| 10     | F1 |    |    |    |    |    |    | H2   |      | C1   |      |      | H1   | C1   | C1   | C1   | C1   | H1   |      | F2   |    |    |      |    |  |
| 11     |    |    |    |    |    |    |    | H1   | H1   | H1   | CL22 | CL12 | CL12 | CL12 |      | L2   |      |      | F2   | F1   |    |    | F1   | F2 |  |
| 12     | F2 |    |    |    |    |    |    | C2   | C3   |      | C1   | CL21 | CL21 | CL21 | CL21 | C1   |      | C2   |      |      |    | F2 | F2   | F2 |  |
| 13     | F2 |    |    | F1 |    | F2 |    | H1   |      | C1   | L2   | L2   | HL12 | L1   | L1   |      |      |      |      |      |    |    | F2   |    |  |
| 14     |    | F1 |    |    |    |    |    | H2   |      | L2   | L2   | HL11 | L2   | L2   |      | L2   | L2   | L4   | F3   |      |    |    |      | F1 |  |
| 15     | F1 | F1 |    |    | F1 |    |    |      |      | L1   | L1   | L1   |      | L1   |      |      |      | L2   |      |      | F1 | F3 | F1   |    |  |
| 16     |    | F2 |    | F2 | F1 | F1 |    |      |      | L2   | L2   | L2   |      | L1   | L2   | L2   |      |      |      |      |    |    |      |    |  |
| 17     |    |    |    |    |    |    | H2 | H2   |      |      |      |      |      |      |      | C1   |      |      |      |      |    |    |      |    |  |
| 18     |    |    |    |    |    |    |    | L2   | L2   | CL11 | CL12 | L2   |      |      |      | H1   |      | C2   |      |      |    |    |      |    |  |
| 19     |    |    |    |    |    |    | H3 | H2   | H2   | H1   | L2   |      | C2   | C2   | C1   |      |      |      | L3   | F3   | F1 | F2 | F4   | F2 |  |
| 20     |    |    |    |    |    |    | H1 | H2   | H2   | C1   | C1   | L1   | L2   | CL12 | CL22 | HL12 | C1   | H2   | C2   |      | F3 | F2 | F2   | F2 |  |
| 21     |    | F3 |    | F1 |    |    | H3 | H1   |      | L2   | L2   | L2   |      |      |      |      | H1   | C2   | C3   | F2   | F1 | F2 | F2   | F2 |  |
| 22     | F1 | F2 | F2 | F3 | F3 | F2 | H2 | H2   | L2   | L2   | L2   | L2   | L2   | L2   | L2   | CL11 | CL21 | L5   | L5   | F5   | F3 | F3 | F2   |    |  |
| 23     | F2 | F1 | F1 |    |    |    | H1 | H2   |      | C1   | C1   | L2   | L2   | L2   | L2   | L2   | HL12 | CL32 | L4   | F3   | F3 | F2 |      |    |  |
| 24     |    |    |    | F2 | F1 |    | H2 | H2   | C2   | C2   | L2   |      |      |      | L2   |      |      |      | L4   | F4   | F2 |    |      | F1 |  |
| 25     |    |    | F2 | F1 |    |    | H2 | H1   | C1   | L2   |      |      |      |      |      |      | L3   | L4   | L3   | FF13 | F2 | F3 | FF22 | F3 |  |
| 26     | F3 | F2 |    |    |    |    | H2 | HL22 | HL12 | L2   | L2   | L2   |      |      | L2   |      |      |      | L1   | F1   | F1 | F2 |      |    |  |
| 27     |    |    |    |    |    |    | F2 |      | CL12 | CL12 | L1   | L1   | L2   |      |      |      | H1   | C2   | C4   | F1   |    |    |      |    |  |
| 28     | F3 |    |    |    |    |    | H1 | H1   | H1   | L1   | L1   | HL12 | HL22 | HL22 | L2   | HL12 | C1   | H1   | C3   | F1   |    |    |      |    |  |
| 29     |    |    |    | F2 |    |    | H2 | H1   | H1   |      |      | L2   | L2   | L2   | L2   |      |      | CL12 | L2   | F2   | F1 |    |      |    |  |
| 30     |    | F1 | F2 |    |    |    | H2 | H1   |      | C1   | C2   | L2   |      |      | L2   |      | L2   |      |      |      |    |    |      |    |  |
| 31     | F2 | F1 | F2 | F1 | F4 | F3 | H2 | H2   | H1   |      | C1   | L1   |      | L2   | L1   | L2   | HL12 | CL22 | CL22 | F3   | F2 | F2 | F1   | F5 |  |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07   | 08   | 09   | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20 | 21 | 22   | 23 |  |
| CNT    |    |    |    |    |    |    |    |      |      |      |      |      |      |      |      |      |      |      |      |      |    |    |      |    |  |
| MED    |    |    |    |    |    |    |    |      |      |      |      |      |      |      |      |      |      |      |      |      |    |    |      |    |  |
| U Q    |    |    |    |    |    |    |    |      |      |      |      |      |      |      |      |      |      |      |      |      |    |    |      |    |  |
| L Q    |    |    |    |    |    |    |    |      |      |      |      |      |      |      |      |      |      |      |      |      |    |    |      |    |  |

MAR. 2016 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 f<sub>XI</sub> (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<br>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<br>41 | X<br>41 | X<br>41 | X<br>42 | X<br>50 | X<br>41 | X<br>30 |    |    |    |    |    |    |    |    |    |    |    |    | X<br>80 | X<br>56  | X<br>50 | X<br>44 | X<br>40 |         |
| 2      | X<br>43 | X<br>43 | X<br>41 | X<br>42 | X<br>43 | X<br>42 | X<br>40 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>60  | X<br>52 | X<br>48 | X<br>46 | X<br>46 |
| 3      | X<br>46 | X<br>48 | X<br>46 | X<br>47 | X<br>47 | X<br>40 | X<br>42 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>68  | X<br>54 | X<br>49 | X<br>47 | X<br>47 |
| 4      | X<br>48 | X<br>46 | X<br>46 | X<br>47 | X<br>51 | X<br>44 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>84  | X<br>72 | X<br>61 | X<br>48 | X<br>47 |
| 5      | X<br>48 | X<br>46 | X<br>45 | X<br>46 | X<br>47 | X<br>44 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>63  | X<br>58 | X<br>54 | X<br>48 | X<br>46 |
| 6      | X<br>46 | X<br>48 | X<br>49 | X<br>46 | X<br>47 | X<br>42 | X<br>40 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>76  | X<br>63 | X<br>58 | X<br>49 | X<br>47 |
| 7      | X<br>46 | X<br>46 | X<br>47 | X<br>46 | X<br>45 | X<br>42 | X<br>40 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>54  | X<br>60 | X<br>62 | X<br>61 | X<br>59 |
| 8      | X<br>60 | X<br>63 | X<br>63 | X<br>62 | X<br>46 | X<br>32 | X<br>32 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>68  | X<br>63 | X<br>61 | X<br>55 | X<br>51 |
| 9      | X<br>51 | X<br>51 | X<br>56 | X<br>56 | X<br>49 | X<br>36 | X<br>36 |    |    |    | C  | C  | C  | C  | C  | C  | C  |    |    | X<br>75 | X<br>60  | X<br>58 | X<br>57 | X<br>57 |         |
| 10     | X<br>52 | X<br>52 | X<br>51 | X<br>54 | X<br>49 | X<br>39 | X<br>39 |    |    |    | C  | C  | C  | C  | C  | C  | C  |    |    | X<br>78 | X<br>61  | X<br>56 | X<br>52 | X<br>46 |         |
| 11     | X<br>46 | X<br>47 | X<br>47 | X<br>50 | X<br>48 | X<br>48 | X<br>38 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>82  | X<br>72 | X<br>65 | X<br>58 | X<br>56 |
| 12     | X<br>54 | X<br>49 | X<br>56 | X<br>55 | X<br>38 | X<br>34 | X<br>35 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>78  | X<br>52 | X<br>46 | X<br>46 | X<br>44 |
| 13     | X<br>46 | X<br>46 | X<br>44 | X<br>43 | X<br>42 | X<br>43 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>73  | X<br>59 | X<br>56 | X<br>56 | X<br>52 |
| 14     | X<br>49 | X<br>49 | X<br>49 | X<br>47 | X<br>50 | X<br>45 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>83  | X<br>64 | X<br>56 | X<br>50 | X<br>46 |
| 15     | X<br>45 | X<br>48 | X<br>47 | X<br>47 | X<br>49 | X<br>39 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>89  | X<br>72 | X<br>52 | X<br>39 | X<br>39 |
| 16     | X<br>42 | X<br>44 | X<br>43 | X<br>44 | X<br>45 | X<br>44 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>103 | X<br>76 | X<br>58 | X<br>52 | X<br>54 |
| 17     | X<br>57 | X<br>54 | X<br>52 | X<br>44 | X<br>32 | X<br>32 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>84  | X<br>69 | X<br>67 | X<br>67 | X<br>65 |
| 18     | X<br>65 | X<br>53 | X<br>44 | X<br>42 | X<br>40 | X<br>40 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>77  | X<br>70 | X<br>69 | X<br>61 | X<br>54 |
| 19     | X<br>52 | X<br>52 | X<br>52 | X<br>48 | X<br>31 | X<br>31 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>84  | X<br>79 | X<br>59 | X<br>60 | X<br>52 |
| 20     | X<br>56 | X<br>43 | X<br>44 | X<br>44 | X<br>41 | X<br>42 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>78  | X<br>49 | X<br>51 | X<br>53 | X<br>54 |
| 21     | X<br>53 | X<br>53 | X<br>49 | X<br>45 | X<br>43 | X<br>42 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>87  | X<br>69 | X<br>55 | X<br>56 | X<br>54 |
| 22     | X<br>53 | X<br>53 | X<br>50 | X<br>48 | X<br>47 | X<br>36 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>72  | X<br>54 | X<br>52 | X<br>52 | X<br>51 |
| 23     | X<br>51 | X<br>52 | X<br>50 | X<br>49 | X<br>51 | X<br>48 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>84  | X<br>67 | X<br>52 | X<br>50 | X<br>50 |
| 24     | X<br>56 | X<br>55 | X<br>53 | X<br>46 | X<br>37 | X<br>34 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | A        | X<br>70 | X<br>54 | X<br>46 | X<br>46 |
| 25     | X<br>48 | X<br>46 | X<br>47 | X<br>46 | X<br>42 | X<br>41 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>84  | X<br>71 | X<br>53 | X<br>53 | X<br>54 |
| 26     | X<br>54 | X<br>56 | X<br>54 | X<br>55 | X<br>51 | X<br>43 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>81  | X<br>61 | X<br>44 | X<br>44 | X<br>46 |
| 27     | X<br>46 | X<br>45 | X<br>44 | X<br>44 | X<br>41 | X<br>39 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>79  | X<br>56 | X<br>54 | X<br>54 | X<br>48 |
| 28     | X<br>45 | X<br>47 | X<br>47 | X<br>46 | X<br>46 | X<br>45 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>73  | X<br>50 | X<br>50 | X<br>52 | X<br>50 |
| 29     | X<br>49 | X<br>48 | X<br>48 | X<br>48 | X<br>46 | X<br>41 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>77  | X<br>64 | X<br>55 | X<br>50 | X<br>52 |
| 30     | X<br>54 | X<br>55 | X<br>46 | X<br>43 | X<br>42 | X<br>44 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>94  | X<br>86 | X<br>58 | X<br>49 | X<br>52 |
| 31     | X<br>53 | X<br>55 | X<br>56 | X<br>51 | X<br>51 | X<br>54 |         |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>94  | X<br>78 | X<br>52 | X<br>49 | X<br>46 |
|        | 00      | 01      | 02      | 03      | 04      | 05      | 06      | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19      | 20       | 21      | 22      | 23      |         |
| CNT    | 31      | 31      | 31      | 31      | 31      | 31      | 12      |    |    |    |    |    |    |    |    |    |    |    |    | 30      | 31       | 31      | 31      | 31      |         |
| MED    | X       | X       | X       | X       | X       | X       | X       |    |    |    |    |    |    |    |    |    |    |    |    | X       | X        | X       | X       | X       |         |
| U Q    | X       | X       | X       | X       | X       | X       | X       |    |    |    |    |    |    |    |    |    |    |    |    | X       | X        | X       | X       | X       |         |
| L Q    | X       | X       | X       | X       | X       | X       | X       |    |    |    |    |    |    |    |    |    |    |    |    | X       | X        | X       | X       | X       |         |
|        | 46      | 46      | 45      | 44      | 42      | 39      | 36      |    |    |    |    |    |    |    |    |    |    |    |    | 73      | 56       | 52      | 48      | 46      |         |

MAR. 2016 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 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

| $\begin{matrix} H \\ D \end{matrix}$ | 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                                    | 35 | 35 | 35              | 36              | 44              | 35 | 24 | 47 | 63 | 66  | 72 | 89  | 100             | 100 <sup>R</sup> | 97               | 100                | 104 <sup>R</sup> | 79                 | 78  | 74 | 48 | 44 | 38 | 34              |
| 2                                    | 37 | 37 | 35              | 36              | 37              | 36 | 34 | 52 | 67 | 71  | 83 | 78  | 96              | 109 <sup>R</sup> | 78               | 77                 | 81               | 80                 | 70  | 54 | 46 | 42 | 40 | 40              |
| 3                                    | 40 | 42 | 40 <sup>R</sup> | 41              | 41 <sup>R</sup> | 34 | 36 | 59 | 65 | 72  | 78 | 85  | 95              | 96               | 89               | 106 <sup>U R</sup> | 88               | 84                 | 73  | 62 | 48 | 43 | 41 | 41              |
| 4                                    | 42 | 40 | 40              | 41              | 45              | 38 | 33 | 55 | 64 | 77  | 86 | 97  | 94              | 108 <sup>R</sup> | 115              | 116                | 100              | 86                 | 84  | 78 | 66 | 55 | 42 | 41              |
| 5                                    | 42 | 40 | 39              | 40              | 41              | 38 | 33 | 55 | 68 | 74  | 76 | 91  | 89              | 96               | 96               | 96                 | 92               | 73                 | 63  | 57 | 52 | 48 | 42 | 40              |
| 6                                    | 40 | 42 | 43              | 40              | 41              | 36 | 34 | 55 | 71 | 84  | 72 | 90  | 95              | 98               | 101              | 86                 | 82               | 76                 | 72  | 70 | 57 | 52 | 43 | 41              |
| 7                                    | 40 | 40 | 41              | 40              | 39              | 36 | 34 | 69 | 61 | 73  | 96 | 112 | 118             | 109              | 93               | 98                 | 113              | 104                | 75  | 48 | 54 | 56 | 55 | 53              |
| 8                                    | 54 | 57 | 57              | 56              | 40              | 26 | 26 | 53 | 72 | 78  | 92 | 98  | 97              | 105              | 101              | 107                | 84               | 76                 | 72  | 62 | 57 | 55 | 49 | 45              |
| 9                                    | 45 | 45 | 50              | 50              | 43              | 30 | 30 | 54 | 77 | 84  | 84 | 89  | 102             | 108              | 100              | 88                 | 85               | 82                 | 79  | 69 | 54 | 52 | 51 | 51              |
| 10                                   | 46 | 46 | 45              | 48              | 43              | 33 | 33 | 58 | 76 |     |    |     |                 |                  |                  |                    |                  |                    |     |    |    |    |    |                 |
| 11                                   | 40 | 41 | 41              | 44              | 42              | 31 | 32 | 54 | 70 | 88  | 87 | 88  | 95              | 104              | 102              | 92                 | 83               | 72                 | 77  | 76 | 66 | 59 | 52 | 50              |
| 12                                   | 48 | 43 | 50              | 49              | 32              | 28 | 29 | 48 | 80 | 119 | 86 | 81  | 93              | 98               | 105              | 103                | 83               | 82                 | 89  | 72 | 46 | 40 | 40 | 38              |
| 13                                   | 40 | 40 | 38              | 37              | 36              | 37 | 38 | 66 | 69 | 75  | 81 | 97  | 104             | 113              | 107              | 94                 | 84               | 83                 | 78  | 67 | 53 | 50 | 50 | 46              |
| 14                                   | 43 | 43 | 43              | 41              | 44              | 39 | 33 | 56 | 70 | 82  | 70 | 85  | 100             | 111              | 110              | 96                 | 96               | 95                 | 95  | 77 | 58 | 50 | 44 | 40              |
| 15                                   | 39 | 42 | 41              | 41              | 43              | 33 | 29 | 52 | 79 | 87  | 87 | 82  | 88              | 91               | 93               | 108                | 118              | 122 <sup>U R</sup> | 109 | 83 | 66 | 46 | 33 | 33              |
| 16                                   | 36 | 38 | 37              | 38 <sup>R</sup> | 39              | 38 | 24 | 52 | 70 | 68  | 89 | 94  | 99              | 116              | 110 <sup>R</sup> | 89                 | 75               | 78                 | 93  | 97 | 70 | 52 | 46 | 48              |
| 17                                   | 51 | 48 | 46              | 38              | 26              | 26 | 31 | 61 | 75 | 72  | 72 | 86  | 98              | 96               | 99               | 97                 | 91               | 91                 | 97  | 78 | 63 | 61 | 61 | 59              |
| 18                                   | 59 | 47 | 38              | 36              | 34              | 34 | 40 | 60 | 66 | 76  | 77 | 95  | 102             | 95               | 101              | 99                 | 94               | 90                 | 80  | 71 | 64 | 63 | 55 | 48              |
| 19                                   | 46 | 46 | 46              | 42              | 25              | 25 | 30 | 60 | 85 | 84  | 79 | 83  | 96              | 96               | 89               | 86                 | 86               | 85                 | 92  | 78 | 73 | 53 | 54 | 46              |
| 20                                   | 50 | 37 | 38              | 38              | 35              | 36 | 37 | 58 | 70 | 81  | 88 | 105 | 95              | 92               | 89               | 84                 | 81               | 86                 | 85  | 72 | 43 | 45 | 47 | 48              |
| 21                                   | 47 | 47 | 43              | 39              | 37              | 36 | 36 | 62 | 76 | 87  | 91 | 108 | 108             | 97               | 86               | 76                 | 86               | 90                 | 92  | 81 | 63 | 49 | 50 | 48              |
| 22                                   | 47 | 47 | 44              | 42              | 41              | 30 | 33 | 56 | 78 | 83  | 84 | 95  | 95              | 100              | 97               | 88                 | 70               | 77                 | 78  | 66 | 48 | 46 | 46 | 45              |
| 23                                   | 45 | 46 | 44              | 43              | 45              | 42 | 39 | 57 | 67 | 74  | 81 | 86  | 88              | 96               | 107              | 94                 | 91               | 92                 | 90  | 78 | 61 | 46 | 44 | 44              |
| 24                                   | 50 | 49 | 47              | 40              | 31              | 28 | 34 | 60 | 80 | 84  | 72 | 75  | 83              | 93               | 96               | 97                 | 79               | 76                 | 82  |    |    |    |    |                 |
| 25                                   | 42 | 40 | 41              | 40              | 36              | 35 | 35 | 54 | 67 | 67  | 74 | 80  | 88              | 102              | 106              | 107                | 106              | 86                 | 79  | 78 | 65 | 47 | 47 | 48 <sup>R</sup> |
| 26                                   | 48 | 50 | 48              | 47 <sup>F</sup> | 45              | 37 | 38 | 58 | 66 | 68  | 68 | 72  | 84              | 92               | 88               | 82                 | 80               | 86                 | 83  | 75 | 55 | 38 | 38 | 40              |
| 27                                   | 40 | 39 | 38              | 38              | 35              | 33 | 37 | 56 | 70 | 70  | 72 | 83  | 88              | 92               | 102              | 88                 | 85               | 87                 | 85  | 73 | 50 | 48 | 48 | 42              |
| 28                                   | 39 | 41 | 41              | 40              | 40              | 39 | 40 | 52 | 64 | 75  | 79 | 90  | 104             | 109              | 107 <sup>R</sup> | 94                 | 89               | 88                 | 80  | 67 | 44 | 44 | 46 | 44              |
| 29                                   | 43 | 42 | 42              | 42              | 40              | 35 | 38 | 62 | 79 | 76  | 74 | 75  | 87              | 104              | 103              | 87                 | 74               | 79                 | 79  | 71 | 58 | 49 | 44 | 46              |
| 30                                   | 48 | 49 | 40              | 37              | 36              | 38 | 48 | 60 | 67 | 68  | 68 | 76  | 94              | 87               | 86               | 86                 | 85               | 89                 | 90  | 88 | 80 | 52 | 43 | 46              |
| 31                                   | 47 | 49 | 50              | 45              | 45              | 48 | 56 | 68 | 66 | 65  | 75 | 80  | 94 <sup>R</sup> | 98               | 103              | 95                 | 100              | 96                 | 88  | 88 | 72 | 46 | 43 | 40 <sup>V</sup> |
|                                      | 00 | 01 | 02              | 03              | 04              | 05 | 06 | 07 | 08 | 09  | 10 | 11  | 12              | 13               | 14               | 15                 | 16               | 17                 | 18  | 19 | 20 | 21 | 22 | 23              |
| CNT                                  | 31 | 31 | 31              | 31              | 31              | 31 | 31 | 31 | 31 | 30  | 30 | 30  | 30              | 30               | 30               | 30                 | 30               | 31                 | 31  | 30 | 31 | 31 | 31 | 31              |
| MED                                  | 43 | 42 | 41              | 40              | 40              | 35 | 34 | 56 | 70 | 76  | 79 | 87  | 95              | 98               | 100              | 94                 | 86               | 86                 | 82  | 72 | 57 | 49 | 46 | 44              |
| U Q                                  | 48 | 47 | 46              | 43              | 43              | 38 | 38 | 60 | 76 | 84  | 86 | 95  | 100             | 108              | 105              | 99                 | 94               | 90                 | 90  | 78 | 65 | 52 | 50 | 48              |
| L Q                                  | 40 | 40 | 39              | 38              | 36              | 31 | 31 | 54 | 66 | 71  | 72 | 81  | 89              | 96               | 93               | 87                 | 82               | 79                 | 78  | 67 | 50 | 46 | 42 | 40              |

MAR. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 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<br>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      |    |    |    |    |    |    |    | 200 | 292 | 332 | L   | L   | 484 | 488 | 476 | 476 | 424 | L   | L   |     |    |    |    |    |  |
| 2      |    |    |    |    |    |    |    | 200 |     | L   | L   | 472 | 492 | L   | L   | 488 | L   | L   | L   | L   |    |    |    |    |  |
| 3      |    |    |    |    |    |    |    | 188 | 256 | 348 | L   | L   | 488 | 516 | L   | 508 | L   | L   | L   |     |    |    |    |    |  |
| 4      |    |    |    |    |    |    |    |     |     | L   | L   | 496 | L   | L   | 496 | 496 | L   | L   | 260 | 204 |    |    |    |    |  |
| 5      |    |    |    |    |    |    |    | 192 | 320 | 436 | L   | L   | 492 | 500 | 500 | L   | 468 | L   | L   |     |    |    |    |    |  |
| 6      |    |    |    |    |    |    |    | 184 | 260 | L   | L   | L   | 500 | 508 | L   | 464 | 464 | L   | L   |     |    |    |    |    |  |
| 7      |    |    |    |    |    |    |    | 216 |     | L   | L   | L   | L   | L   | 496 | 488 | L   | L   | L   |     |    |    |    |    |  |
| 8      |    |    |    |    |    |    |    | 216 | 280 | 396 | 432 | 492 | L   | L   | 496 | L   | L   | L   | L   |     |    |    |    |    |  |
| 9      |    |    |    |    |    |    |    | 200 | 280 | L   | L   | 480 | 516 | L   | L   | 488 | L   | 440 | L   |     |    |    |    |    |  |
| 10     |    |    |    |    |    |    |    | 208 | 276 | C   | C   | C   | C   | C   | C   | C   | C   | C   | A   | U   | L  |    |    |    |  |
| 11     |    |    |    |    |    |    |    | 208 | 288 | L   | L   | L   | 484 | 468 | 508 | L   | L   | L   | L   |     |    |    |    |    |  |
| 12     |    |    |    |    |    |    |    |     | L   | L   | L   | 480 | L   | A   | A   | L   | L   | L   |     |     |    |    |    |    |  |
| 13     |    |    |    |    |    |    |    | 220 | 272 | 408 | 476 | 460 | 488 | 488 | 488 | L   | L   | L   | L   |     |    |    |    |    |  |
| 14     |    |    |    |    |    |    |    | 240 | L   | L   | L   | L   | L   | L   | 488 | L   | L   | L   | L   |     |    |    |    |    |  |
| 15     |    |    |    |    |    |    |    | 236 | L   | L   | L   | L   | 476 | 488 | 496 | L   | 488 | 444 | L   |     |    |    |    |    |  |
| 16     |    |    |    |    |    |    |    | 216 | 360 | L   | L   | 484 | 520 | L   | 484 | L   | L   | 316 | 188 |     |    |    |    |    |  |
| 17     |    |    |    |    |    |    |    | 228 | 288 | 328 | 416 | L   | L   | 492 | L   | L   | 400 | L   | 204 |     |    |    |    |    |  |
| 18     |    |    |    |    |    |    |    | 236 | 284 | L   | L   | L   | 484 | 508 | 492 | 500 | L   | L   | L   |     |    |    |    |    |  |
| 19     |    |    |    |    |    |    |    | 220 | L   | L   | L   | L   | 500 | 452 | L   | L   | 464 | L   | L   |     |    |    |    |    |  |
| 20     |    |    |    |    |    |    |    | 232 | L   | L   | L   | L   | 476 | L   | L   | 476 | 460 | L   | L   |     |    |    |    |    |  |
| 21     |    |    |    |    |    |    |    | 220 | L   | L   | L   | L   | 468 | L   | L   | 476 | L   | L   | L   |     |    |    |    |    |  |
| 22     |    |    |    |    |    |    |    | 236 | L   | L   | L   | L   | 476 | 488 | 484 | 488 | L   | L   | L   |     |    |    |    |    |  |
| 23     |    |    |    |    |    |    |    | 236 | 296 | L   | L   | L   | 468 | 484 | 472 | 520 | 488 | 456 | 432 | L   | L  |    |    |    |  |
| 24     |    |    |    |    |    |    |    | 232 | L   | L   | L   | L   | 460 | 488 | 492 | 512 | 480 | 456 | L   | A   | A  |    |    |    |  |
| 25     |    |    |    |    |    |    |    | 216 | L   | L   | L   | L   | 472 | 488 | 500 | 496 | L   | L   | L   | L   |    |    |    |    |  |
| 26     |    |    |    |    |    |    |    | 236 | L   | L   | L   | L   | 460 | 480 | 480 | 484 | 464 | 464 | 440 | L   |    |    |    |    |  |
| 27     |    |    |    |    |    |    |    | 224 | L   | L   | L   | L   | 476 | 488 | 476 | L   | 472 | 468 | 444 | L   |    |    |    |    |  |
| 28     |    |    |    |    |    |    |    | 252 | L   | L   | L   | L   | 480 | L   | L   | 496 | 484 | 472 | 476 | 468 | A  |    |    |    |  |
| 29     |    |    |    |    |    |    |    | 240 | L   | L   | L   | L   | 464 | L   | L   | 500 | 508 | L   | A   | L   |    |    |    |    |  |
| 30     |    |    |    |    |    |    |    | 240 | L   | L   | L   | L   | 480 | L   | L   | 480 | 500 | 468 | 444 | L   | L  |    |    |    |  |
| 31     |    |    |    |    |    |    |    | 244 | L   | L   | L   | L   | 440 | 484 | 500 | 480 | L   | 480 | 480 | L   | L  |    |    |    |  |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |  |
| CNT    |    |    |    |    |    |    |    | 29  | 13  | 9   | 16  | 22  | 19  | 21  | 19  | 15  | 8   | 3   | 7   |     |    |    |    |    |  |
| MED    |    |    |    |    |    |    |    | 220 | 284 | 396 | 472 | 488 | 488 | 492 | 484 | 464 | 442 | 316 | 204 |     |    |    |    |    |  |
| U Q    |    |    |    |    |    |    |    | 236 | 294 | 438 | 478 | 492 | 500 | 504 | 496 | 476 | 444 | 388 | 208 |     |    |    |    |    |  |
| L Q    |    |    |    |    |    |    |    | 208 | 274 | 330 | 462 | 480 | 480 | 484 | 476 | 460 | 436 | 260 | 188 |     |    |    |    |    |  |

MAR. 2016 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| H<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |  |  |  |
|--------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|--|--|--|
| 1      |    |    |    |    |    |    |    | B   |     |     |     | A   | U A |     |     |     |     | A   | B   |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    |     | 236 | 300 | 332 | 336 | 348 | 360 | 340 | 324 | 288 | 228 |     |     |    |    |    |    |  |  |  |
| 2      |    |    |    |    |    |    |    | B   |     |     |     | R   | R   |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    |     | 236 | 296 | 332 | 348 | 352 | 356 | 336 | 324 | 292 | 244 | 184 |     |    |    |    |    |  |  |  |
| 3      |    |    |    |    |    |    |    | A   |     |     |     | R   |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    |     | 224 | 280 | 312 | 340 | 388 | 356 | 340 | 324 | 296 | 244 |     |     |    |    |    |    |  |  |  |
| 4      |    |    |    |    |    |    |    | A   | A   |     |     | R   |     | A   | U A |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    |     | 284 | 312 | 344 | 340 | 336 | 332 | 324 | 304 | 256 | 180 |     |     |    |    |    |    |  |  |  |
| 5      |    |    |    |    |    |    |    | U A |     |     | U R | R   |     |     |     |     |     | A   | A   |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 220 | 244 | 288 | 328 | 348 | 356 | 364 | 356 | 328 | 304 | 256 |     |     |    |    |    |    |  |  |  |
| 6      |    |    |    |    |    |    |    | A   | A   |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    |     | 304 | 328 | 344 | 352 | 368 | 352 | 328 | 296 | 248 |     |     |     |    |    |    |    |  |  |  |
| 7      |    |    |    |    |    |    |    | U A |     |     | U A | R   | U A | U A | U A | U A |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 188 | 256 | 292 | 328 | 336 | 360 | 324 | 328 | 312 | 292 | 248 |     |     |    |    |    |    |  |  |  |
| 8      |    |    |    |    |    |    |    | U A |     |     | R   |     |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 168 | 244 | 292 | 312 | 348 | 356 | 348 | 340 | 320 | 308 | 256 |     |     |    |    |    |    |  |  |  |
| 9      |    |    |    |    |    |    |    |     | 256 | 268 | 300 | 316 | 324 | 344 | 352 | 348 | 328 | 296 | 240 | 180 |    |    |    |    |  |  |  |
| 10     |    |    |    |    |    |    |    |     |     | C   | C   | C   | C   | C   | C   | C   | C   |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 216 | 228 |     |     |     |     |     |     |     |     | 248 |     |     |    |    |    |    |  |  |  |
| 11     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    |     | 260 | 304 | 336 | 356 | 360 | 352 | 344 | 328 | 312 | 260 | 180 |     |    |    |    |    |  |  |  |
| 12     |    |    |    |    |    |    |    |     | 212 | 256 | 304 | 324 | 356 | 360 | 360 | 348 | 328 | U A | A   |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | B   | A   |     |     |     |     |     | A   | R   | A   |     |     |     |    |    |    |    |  |  |  |
| 13     |    |    |    |    |    |    |    | 188 | 216 | 300 | 332 | 336 | 352 | 340 | 348 |     |     | 292 | 252 |     |    |    |    |    |  |  |  |
| 14     |    |    |    |    |    |    |    | B   |     |     |     |     | A   | A   |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 208 | 272 | 300 | 312 | 312 | 324 | 324 | 360 | 328 | 284 | 256 | 172 |     |    |    |    |    |  |  |  |
| 15     |    |    |    |    |    |    |    | B   |     | U A | U A | A   |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 176 | 244 | 292 | 300 |     |     | 356 | 352 | 332 | 308 | 236 |     |     |    |    |    |    |  |  |  |
| 16     |    |    |    |    |    |    |    | B   |     |     |     |     |     | U R |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 184 | 264 | 304 | 316 | 332 | 328 | 320 | 344 | 320 | 308 | 256 |     |     |    |    |    |    |  |  |  |
| 17     |    |    |    |    |    |    |    | A   |     |     |     | R   | U R |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 180 | 232 | 288 | 316 | 344 | 344 | 332 | 344 | 336 | 304 | 252 |     |     |    |    |    |    |  |  |  |
| 18     |    |    |    |    |    |    |    | B   | A   |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 184 | 256 | 296 | 324 | 332 | 348 | 348 | 348 | 332 | 308 | 256 | 180 |     |    |    |    |    |  |  |  |
| 19     |    |    |    |    |    |    |    | B   | A   |     |     |     |     | U A | A   | A   | U A | A   |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 192 | 272 | 300 | 308 | 340 | 352 | 376 | 324 | 324 | 308 | 248 |     |     |    |    |    |    |  |  |  |
| 20     |    |    |    |    |    |    |    | B   |     |     |     |     | A   | A   |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 188 | 256 | 296 | 328 | 344 | 348 | 348 | 340 | 328 | 304 | 244 | 184 |     |    |    |    |    |  |  |  |
| 21     |    |    |    |    |    |    |    | A   |     |     |     |     | U A | A   |     | U R |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 176 | 260 | 300 | 324 | 332 | 312 | 300 | 336 | 336 | 296 | 272 | 180 |     |    |    |    |    |  |  |  |
| 22     |    |    |    |    |    |    |    | B   |     | U A |     |     |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 188 | 284 | 300 | 324 | 340 | 352 | 352 | 352 | 328 | 308 | 260 | 180 |     |    |    |    |    |  |  |  |
| 23     |    |    |    |    |    |    |    | B   | B   |     |     |     | A   | R   |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    |     | 272 | 304 | 328 | 336 | 336 | 340 | 344 | 320 | 304 | 260 | 176 |     |    |    |    |    |  |  |  |
| 24     |    |    |    |    |    |    |    | B   |     |     |     | A   |     |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 208 | 264 | 300 | 324 | 344 | 320 | 332 |     | 332 | 308 | 260 | 184 |     |    |    |    |    |  |  |  |
| 25     |    |    |    |    |    |    |    | B   | A   |     |     |     |     |     |     |     | U A | U A | U A |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 212 | 268 | 296 | 320 | 320 | 336 | 340 | 328 | 308 | 292 | 252 | 176 |     |    |    |    |    |  |  |  |
| 26     |    |    |    |    |    |    |    | B   |     | A   |     |     | A   | R   |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 192 | 272 | 320 | 324 | 324 | 344 | 340 | 324 | 304 | 264 | 180 |     |     |    |    |    |    |  |  |  |
| 27     |    |    |    |    |    |    |    | A   |     | U A | U A |     | R   | U R | U R |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 180 | 252 | 300 | 308 | 308 | 348 | 348 | 336 | 336 | 304 | 256 | 180 |     |    |    |    |    |  |  |  |
| 28     |    |    |    |    |    |    |    | B   |     |     |     | R   | R   |     |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 192 | 284 | 308 | 332 | 352 | 392 | 368 | 348 | 340 | 300 | 268 | 188 |     |    |    |    |    |  |  |  |
| 29     |    |    |    |    |    |    |    | B   |     |     |     |     | A   | R   |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 204 | 280 | 320 | 340 | 340 |     |     | 348 | 328 |     | 268 | 212 |     |    |    |    |    |  |  |  |
| 30     |    |    |    |    |    |    |    | A   |     |     |     | R   | U A | R   |     |     |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 212 | 280 | 304 | 336 | 344 | 300 | 356 | 336 | 328 | 296 | 248 | 196 |     |    |    |    |    |  |  |  |
| 31     |    |    |    |    |    |    |    | A   |     |     |     | R   |     | U R | R   | U R |     |     |     |     |    |    |    |    |  |  |  |
|        |    |    |    |    |    |    |    | 208 | 264 | 304 | 316 | 344 | 324 | 356 | 316 | 324 | 296 | 256 | 192 |     |    |    |    |    |  |  |  |
|        | 00 | 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  | 29  | 30  | 30  | 29  | 27  | 29  | 29  | 29  | 29  | 31  | 18  |     |    |    |    |    |  |  |  |
| MED    |    |    |    |    |    |    |    | 192 | 260 | 300 | 324 | 340 | 348 | 348 | 344 | 328 | 304 | 256 | 180 |     |    |    |    |    |  |  |  |
| U Q    |    |    |    |    |    |    |    | 210 | 272 | 304 | 328 | 344 | 356 | 356 | 348 | 330 | 308 | 260 | 184 |     |    |    |    |    |  |  |  |
| L Q    |    |    |    |    |    |    |    | 184 | 244 | 296 | 316 | 332 | 336 | 338 | 336 | 324 | 296 | 248 | 180 |     |    |    |    |    |  |  |  |

MAR. 2016 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 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<br>D | 00   | 01   | 02   | 03   | 04   | 05   | 06   | 07   | 08   | 09   | 10   | 11   | 12   | 13   | 14   | 15   | 16 | 17   | 18   | 19   | 20   | 21   | 22   | 23   |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|------|------|------|------|------|------|------|------|
| 1      | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 24   | 32   | 36   | 36   | 36   | 37   | 37   | 36   | 31 | G 22 | E 16 | E 16 | E 16 | E 16 | E 18 | E 16 |      |
| 2      | E 16 | E 21 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 25   | 33   | 36   | 38   | 40   | 39   | 37   | 34   | 33 | 28   | 18   | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 3      | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 23   | 29   | 33   | 39   | 40   | 40   |      | 33   |    | G 24 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 4      | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 23   | 28   | 29   | 32   | 38   |      | 38   | 35   | 33 | G    | G    | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 5      | 19   | 18   | E 16 | E 16 | E 16 | E 16 | E 16 |      | G 26 |      | G 41 | 40   | 42   | 40   | 40   | 35   | 30 | G 29 | 24   | E 16 | E 16 | E 22 | E 16 | E 16 |      |
| 6      | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 |      | G 34 | 37   | 38   | 38   | 37   | 35   | 35   | 35 | 27   | 22   | E 16 | E 16 | E 16 | E 20 | E 17 |      |
| 7      | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 20   | 27   | 30   | 34   | 35   | 38   | 37   | 35   | 33 | 30   |      | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 8      | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 19   | 27   | 32   |      | 39   | 38   | 36   | 35   | 34 | G 31 |      | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 9      | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G    | G    | G    | G    | U 33 | U 34 | U 38 | U 36 |    | G 29 | 25   | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 10     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G 24 | C    | C    | C    | C    | C    | C    | C    | C  |      |      |      | E 16 | E 16 | E 16 | E 16 |      |
| 11     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 16   | 28   | 34   | 36   | 39   | 39   | 42   | 39   | 37 | 27   | G 26 | 21   | E 16 | E 16 | E 16 | E 16 |      |
| 12     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G 27 | 32   | 37   | 40   | 43   | 49   | 61   | 42   | 31 | 32   | 48   | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 13     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 20   | 23   | 32   |      | 36   |      | 36   | 38   | 35 | 31   | 28   | 19   | E 16 | E 16 | E 16 | E 16 |      |
| 14     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G 30 | U 32 | U 35 | U 34 | U 36 | U 36 | 40   | 36   | 31 | 28   | 22   | 36   | E 16 | E 18 | E 16 | E 16 |      |
| 15     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 20   | U 26 | 32   | 33   | 35   | 36   | 40   | 39   | 34 | 33   | 28   | 24   | E 16 | E 16 | E 16 | E 16 |      |
| 16     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G    | G    | G    | G    | G    | G    | U 25 | U 37 |    | G 31 | 27   | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 17     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 19   | 25   | 30   | 34   | 36   | 19   |      |      |    | G 26 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 18     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G 18 | 27   | 31   | 33   | 34   | 24   | 20   | 35   |    | 34   | 30   | 25   | E 16 | E 16 | E 16 | E 16 |      |
| 19     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 21   | 28   | 31   | U 33 | U 35 | U 30 | U 28 | 35   | 34 | 31   | 28   | 24   | 17   | E 20 | E 16 | E 35 |      |
| 20     | 31   | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 22   | 28   | 31   | 34   | 37   | 38   | 39   | 38   | 34 |      | G 25 | 19   | E 16 | E 16 | E 19 | E 16 |      |
| 21     | 18   | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 20   | 28   | 33   | 35   | 36   | 35   | 34   |      | 38 | 33   | 28   | 22   | E 16 | E 24 | E 18 | E 16 |      |
| 22     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 22   | 29   | 31   |      |      |      |      |      |    |      |      |      | E 16 | E 16 | E 16 | E 16 |      |
| 23     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 19   | 28   | 33   | 35   | 36   | 36   | 36   | 27   | 26 | 36   | 30   | 22   | E 16 | E 19 | E 16 | E 16 |      |
| 24     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 22   | 28   | 33   | 38   | 38   | 34   | 38   | 40   | 38 | 31   | 67   | 62   | A 76 | 42   | E 16 | E 16 | E 16 |
| 25     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G 19 | 34   | 40   | 40   | 38   | 38   | 39   | 42   | 43 | 35   | 36   | 22   | 24   | E 16 | E 23 | E 19 | E 18 |
| 26     | 17   | 22   | E 16 | E 16 | E 20 | E 16 | E 16 | E 16 | 23   | 30   | 32   | 34   | 37   | 36   | 36   | 38   | 36 | 34   | 29   | 22   | 16   | 17   | E 16 | E 16 | E 16 |
| 27     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 19   | U 28 | U 31 | U 33 | U 34 | 38   | 37   | 42   | 38 | 38   | 40   | 38   | 40   | 20   | E 16 | E 16 | E 16 |
| 28     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 23   | 31   | 34   | 36   | 43   | 43   | 41   | 37   | 38 | 44   | 74   | 44   | 61   | 31   | E 16 | E 16 | E 16 |
| 29     | E 16 | E 16 | E 16 | E 18 | E 16 | E 16 | E 16 | E 16 | 22   | 30   | 32   | 36   | 36   | U 30 |      | 40   | 36 | 49   | 112  | 31   | 33   | E 16 | E 16 | E 16 | E 16 |
| 30     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G 21 | 30   | 33   | 36   | 26   | 35   | 38   | 36   | 24 | G 30 | 26   | 21   | E 16 | E 16 | E 16 | E 16 | E 16 |
| 31     | E 16 | E 16 | E 16 | E 16 | E 17 | E 16 | E 16 | E 16 | 24   | 28   | 32   | U 34 | 38   |      | U 40 | U 18 | 36 | 31   | 29   | 24   | E 16 | E 16 | E 16 | E 16 | E 16 |
|        | 00   | 01   | 02   | 03   | 04   | 05   | 06   | 07   | 08   | 09   | 10   | 11   | 12   | 13   | 14   | 15   | 16 | 17   | 18   | 19   | 20   | 21   | 22   | 23   |      |
| CNT    | 31   | 31   | 31   | 31   | 31   | 31   | 31   | 31   | 31   | 30   | 30   | 30   | 30   | 30   | 30   | 30   | 30 | 30   | 31   | 31   | 31   | 31   | 31   | 31   | 31   |
| MED    | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 20   | 28   | 32   | 34   | 36   | 36   | 38   | 37   | 35 | 31   | 28   | 22   | E 16 | E 16 | E 16 | E 16 | E 16 |
| U Q    | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 22   | 28   | 33   | 36   | 38   | 38   | 39   | 40   | 37 | 34   | 30   | 24   | 17   | E 16 | E 16 | E 16 | E 16 |
| L Q    | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 19   | 25   | 31   | 33   | 35   |      | G 36 | G 35 | 33 |      |      |      | E 16 | E 16 | E 16 | E 16 | E 16 |

MAR. 2016 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 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                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 18 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 2                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 20 | 19 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 3                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 20 | 18 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 4                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 20 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 5                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 16 |
| 6                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 21 | 20 | 18 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 7                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 17 | 19 | 20 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 8                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 9                                    | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 18 | 16 | 16 | 18 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 10                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 |    | C  | C  | C  | C  | C  | C  | C  |    | 14 | 16 | 16 | 16 | 16 | 16 |
| 11                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 16 | 20 | 19 | 20 | 13 | 15 | 16 | 16 | 16 | 16 | 16 | 16 |
| 12                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 19 | 19 | 20 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |
| 13                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 18 | 20 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |
| 14                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 17 | 18 | 18 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 15                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 20 | 23 | 23 | 20 | 19 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |
| 16                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 16 | 19 | 18 | 16 | 19 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 17                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 20 | 18 | 17 | 22 | 18 | 20 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 18                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 17 | 16 | 18 | 19 | 18 | 18 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 19                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 18 | 21 | 20 | 18 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 16 |
| 20                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 19 | 16 | 19 | 20 | 19 | 17 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 21                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 19 | 17 | 21 | 20 | 16 | 16 | 13 | 14 | 16 | 16 | 16 | 16 |
| 22                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 19 | 23 | 19 | 18 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |
| 23                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 18 | 20 | 18 | 17 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |
| 24                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 18 | 20 | 16 | 17 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |
| 25                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 18 | 18 | 19 | 19 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 26                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 16 | 16 | 16 | 19 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |
| 27                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 19 | 19 | 20 | 20 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 28                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 19 | 18 | 21 | 21 | 20 | 16 | 16 | 16 | 13 | 16 | 16 | 16 | 16 | 16 |
| 29                                   | 16 | 16 | 16 | 18 | 16 | 16 | 16 | 16 | 16 | 17 | 18 | 17 | 20 | 18 | 16 | 16 | 16 | 11 | 2  | 14 | 16 | 16 | 16 | 16 |
| 30                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 20 | 20 | 19 | 17 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 31                                   | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 20 | 19 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT                                  | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED                                  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 18 | 19 | 18 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| U Q                                  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 18 | 20 | 20 | 19 | 18 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| L Q                                  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 17 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 |

MAR. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 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

| $\begin{matrix} H \\ D \end{matrix}$ | 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                                    | 297              | 298              | 304              | 311              | 348              | 402 | 334 | 355 | 380              | 360 | 320 | 338 | 341              | 346 <sup>R</sup> | 333              | 332                | 358 <sup>R</sup> | 344                | 332 | 343 | 318 | 318 | 330 | 289              |
| 2                                    | 304              | 317              | 301              | 299              | 321              | 342 | 322 | 364 | 361              | 375 | 342 | 317 | 328              | 358 <sup>R</sup> | 355              | 331                | 333              | 354                | 364 | 333 | 315 | 324 | 306 | 297              |
| 3                                    | 292              | 311              | 304 <sup>F</sup> | 321              | 349 <sup>R</sup> | 309 | 312 | 379 | 368              | 341 | 336 | 338 | 330              | 336              | 318              | 342 <sup>U R</sup> | 353              | 349                | 348 | 345 | 329 | 307 | 307 | 306              |
| 4                                    | 313              | 300              | 300              | 317              | 350              | 353 | 327 | 367 | 354              | 340 | 342 | 332 | 302              | 326 <sup>R</sup> | 330              | 344                | 350              | 353                | 343 | 348 | 316 | 318 | 301 | 294              |
| 5                                    | 302              | 298              | 302              | 299              | 321              | 363 | 328 | 373 | 365              | 346 | 341 | 341 | 322              | 324              | 341              | 350                | 374              | 378                | 351 | 344 | 310 | 320 | 314 | 301              |
| 6                                    | 290              | 298              | 307              | 310              | 337              | 319 | 315 | 363 | 349              | 363 | 324 | 324 | 327              | 329              | 350              | 346                | 364              | 347                | 350 | 332 | 327 | 334 | 309 | 293              |
| 7                                    | 280              | 289              | 302              | 301              | 291              | 289 | 277 | 343 | 369              | 320 | 310 | 322 | 328              | 334              | 310              | 305                | 317              | 348                | 353 | 285 | 282 | 300 | 284 | 276              |
| 8                                    | 289              | 312              | 328              | 365              | 356              | 313 | 287 | 344 | 362              | 332 | 336 | 333 | 319              | 335              | 322              | 349                | 350              | 344                | 343 | 325 | 307 | 314 | 312 | 295              |
| 9                                    | 289              | 273              | 322              | 335              | 363              | 316 | 310 | 349 | 370              | 356 | 334 | 314 | 316              | 324              | 343              | 326                | 347              | 346                | 345 | 349 | 299 | 300 | 311 | 310              |
| 10                                   | 299              | 287              | 297              | 326              | 362              | 334 | 332 | 361 | 357 <sup>C</sup> |     |     |     |                  |                  |                  |                    |                  |                    |     |     |     |     |     |                  |
| 11                                   | 295              | 305              | 311              | 327              | 370              | 311 | 312 | 361 | 351              | 348 | 332 | 340 | 343              | 329              | 339              | 341                | 345              | 329                | 335 | 322 | 319 | 325 | 302 | 283              |
| 12                                   | 288              | 280              | 316              | 349              | 330              | 323 | 303 | 331 | 323              | 362 | 354 | 341 | 327              | 325              | 327              | 353                | 324              | 350                | 344 | 357 | 324 | 293 | 318 | 304              |
| 13                                   | 296              | 308              | 305              | 305              | 304              | 290 | 309 | 367 | 377              | 354 | 321 | 331 | 318              | 325              | 343              | 346                | 346              | 348                | 347 | 345 | 335 | 312 | 330 | 311              |
| 14                                   | 305              | 302              | 303              | 308              | 337              | 344 | 337 | 366 | 367              | 370 | 343 | 318 | 324              | 328              | 325              | 330                | 335              | 345                | 348 | 355 | 336 | 319 | 316 | 296              |
| 15                                   | 292              | 297              | 304              | 308              | 355              | 372 | 313 | 364 | 347              | 363 | 344 | 306 | 322              | 316              | 297              | 303                | 335              | 339 <sup>U R</sup> | 343 | 342 | 333 | 326 | 296 | 274              |
| 16                                   | 287 <sup>F</sup> | 309              | 319              | 329 <sup>R</sup> | 338              | 362 | 399 | 359 | 352              | 317 | 318 | 335 | 305              | 329              | 336 <sup>R</sup> | 347                | 333              | 316                | 323 | 352 | 354 | 303 | 296 | 293              |
| 17                                   | 318              | 319              | 338              | 359              | 314              | 310 | 313 | 355 | 362              | 379 | 337 | 322 | 326              | 331              | 317              | 332                | 331              | 328                | 341 | 333 | 311 | 299 | 297 | 313              |
| 18                                   | 340              | 341              | 324              | 320              | 306              | 306 | 337 | 381 | 368              | 351 | 332 | 334 | 332              | 325              | 325              | 330                | 334              | 347                | 343 | 332 | 321 | 323 | 332 | 299              |
| 19                                   | 297              | 305              | 329              | 357              | 325              | 303 | 317 | 348 | 352              | 356 | 342 | 318 | 344              | 333              | 339              | 329                | 342              | 338                | 348 | 327 | 325 | 313 | 319 | 304              |
| 20                                   | 332              | 306              | 305              | 330              | 307              | 318 | 326 | 367 | 336              | 337 | 316 | 346 | 323              | 329              | 335              | 335                | 344              | 349                | 357 | 368 | 284 | 289 | 298 | 302              |
| 21                                   | 307              | 326              | 333              | 304              | 294              | 286 | 293 | 354 | 343              | 330 | 323 | 335 | 347              | 336              | 336              | 311                | 332              | 334                | 353 | 355 | 349 | 294 | 307 | 302              |
| 22                                   | 306              | 319              | 322              | 320              | 348              | 324 | 331 | 358 | 356              | 361 | 334 | 339 | 328              | 339              | 337              | 365                | 334              | 347                | 355 | 362 | 310 | 302 | 306 | 288              |
| 23                                   | 286              | 281 <sup>F</sup> | 299              | 306              | 344              | 343 | 345 | 377 | 354              | 355 | 345 | 336 | 319              | 317              | 329              | 321                | 320              | 334                | 348 | 348 |     |     |     |                  |
| 24                                   | 300              | 319              | 329              | 347              | 339              | 322 | 321 | 360 | 354              | 372 | 350 | 328 | 308              | 309              | 322              | 346                | 347              | 347                | 351 |     |     |     |     |                  |
| 25                                   | 298              | 316 <sup>F</sup> | 310              | 327              | 337              | 352 | 352 | 390 | 379              | 357 | 342 | 332 | 319              | 324              | 332              | 334                | 334              | 345                | 338 | 341 | 346 | 311 | 309 | 288 <sup>R</sup> |
| 26                                   | 289 <sup>F</sup> | 315              | 306 <sup>F</sup> | 318 <sup>F</sup> | 362              | 335 | 343 | 380 | 378              | 360 | 353 | 339 | 321              | 332              | 330              | 325                | 331              | 346                | 362 | 359 | 346 | 299 | 296 | 300              |
| 27                                   | 300              | 305              | 309              | 319              | 334              | 324 | 355 | 379 | 372              | 362 | 354 | 332 | 332              | 315              | 333              | 329                | 324              | 337                | 353 | 361 | 317 | 306 | 320 | 317              |
| 28                                   | 304              | 294              | 301              | 302              | 316              | 326 | 337 | 385 | 344              | 337 | 319 | 297 | 312              | 324              | 336 <sup>R</sup> | 333                | 333              | 346                | 352 | 368 | 305 | 301 | 308 | 307              |
| 29                                   | 305              | 310              | 308              | 316              | 338              | 308 | 316 | 357 | 374              | 363 | 353 | 306 | 309              | 323              | 335              | 343                | 327              | 341                | 350 | 339 | 335 | 311 | 293 | 294              |
| 30                                   | 310              | 351              | 326              | 305              | 295              | 302 | 346 | 383 | 368              | 362 | 337 | 329 | 333              | 330              | 313              | 334                | 327              | 330                | 336 | 338 | 352 | 352 | 287 | 290              |
| 31                                   | 298              | 302              | 324              | 307              | 290              | 324 | 346 | 388 | 371              | 349 | 334 | 316 | 318 <sup>R</sup> | 316              | 334              | 324                | 329              | 343                | 340 | 347 | 362 | 317 | 299 | 303 <sup>V</sup> |
|                                      | 00               | 01               | 02               | 03               | 04               | 05  | 06  | 07  | 08               | 09  | 10  | 11  | 12               | 13               | 14               | 15                 | 16               | 17                 | 18  | 19  | 20  | 21  | 22  | 23               |
| CNT                                  | 31               | 31               | 31               | 31               | 31               | 31  | 31  | 31  | 31               | 30  | 30  | 30  | 30               | 30               | 30               | 30                 | 30               | 31                 | 31  | 30  | 31  | 31  | 31  | 31               |
| MED                                  | 298              | 305              | 308              | 318              | 337              | 323 | 326 | 364 | 362              | 356 | 336 | 332 | 324              | 328              | 333              | 334                | 334              | 345                | 348 | 344 | 325 | 312 | 307 | 296              |
| U Q                                  | 305              | 316              | 324              | 329              | 349              | 343 | 337 | 379 | 370              | 362 | 343 | 338 | 330              | 333              | 337              | 346                | 347              | 348                | 352 | 355 | 339 | 320 | 316 | 304              |
| L Q                                  | 290              | 298              | 303              | 306              | 314              | 309 | 312 | 355 | 352              | 341 | 324 | 318 | 318              | 324              | 325              | 329                | 331              | 338                | 342 | 333 | 311 | 301 | 297 | 290              |

MAR. 2016 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR.2016 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<br>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      |    |    |    |    |    |    |    | 473 | 472 | 486 | L   | L   |     |    | U  | L  | U  | L  | L  |    |    |    |    |    |
| 2      |    |    |    |    |    |    |    | 496 |     | L   | L   | 386 | 378 |    | L  | U  | L  | L  | L  | L  |    |    |    |    |
| 3      |    |    |    |    |    |    |    | 508 | 522 | 444 | U   | L   | L   | U  | L  | L  | L  | L  | L  |    |    |    |    |    |
| 4      |    |    |    |    |    |    |    |     |     | L   | U   | L   | U   | L  | U  | L  | L  | L  | L  |    |    |    |    |    |
| 5      |    |    |    |    |    |    |    | 491 | 427 | 409 | L   | L   | U   | L  | U  | L  | L  | L  | L  |    |    |    |    |    |
| 6      |    |    |    |    |    |    |    | 518 | 544 |     | L   | L   | U   | L  | L  | U  | L  | L  | L  |    |    |    |    |    |
| 7      |    |    |    |    |    |    |    | 491 |     | L   | 452 | L   | L   |    | L  | U  | L  | U  | L  | L  |    |    |    |    |
| 8      |    |    |    |    |    |    |    | 487 | 497 | 403 | U   | L   | U   | L  | L  | U  | L  | L  | L  | L  |    |    |    |    |
| 9      |    |    |    |    |    |    |    | 480 | 475 |     | L   | U   | L   | L  | L  | U  | L  | L  | L  |    |    |    |    |    |
| 10     |    |    |    |    |    |    |    | 490 | 514 |     | C   | C   | C   | C  | C  | C  | C  | C  | A  | U  | L  |    |    |    |
| 11     |    |    |    |    |    |    |    | 507 | 461 |     | L   | L   | U   | L  | U  | L  | L  | L  | L  | L  |    |    |    |    |
| 12     |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   |    | A  | A  | L  | L  | L  |    |    |    |    |    |
| 13     |    |    |    |    |    |    |    | 487 | 501 | 410 | U   | L   | H   | U  | L  | U  | L  | L  | L  | L  |    |    |    |    |
| 14     |    |    |    |    |    |    |    | 456 |     | L   | L   | L   | L   |    | L  | L  | L  | L  | L  |    |    |    |    |    |
| 15     |    |    |    |    |    |    |    | 512 |     | L   | L   | U   | L   | U  | L  | L  | H  | U  | L  | L  |    |    |    |    |
| 16     |    |    |    |    |    |    |    | 507 | 416 |     | L   | U   | L   | U  | L  | L  | L  | U  | L  |    |    |    |    |    |
| 17     |    |    |    |    |    |    |    | 509 | 488 | 465 | U   | L   | L   | U  | L  | L  | L  | U  | L  |    |    |    |    |    |
| 18     |    |    |    |    |    |    |    | 497 | 499 |     | L   | U   | L   | U  | L  | L  | L  | L  | L  |    |    |    |    |    |
| 19     |    |    |    |    |    |    |    | 522 |     | L   | L   | U   | L   | L  | L  | U  | L  | L  | L  |    |    |    |    |    |
| 20     |    |    |    |    |    |    |    | 519 |     | L   | U   | L   | U   | L  | L  | L  | U  | L  | L  | L  |    |    |    |    |
| 21     |    |    |    |    |    |    |    | 473 |     | L   | L   | U   | L   | L  | U  | L  | L  | L  | L  |    |    |    |    |    |
| 22     |    |    |    |    |    |    |    | 512 |     | L   | U   | L   | L   | U  | L  | L  | L  | L  | L  |    |    |    |    |    |
| 23     |    |    |    |    |    |    |    | 469 | 472 |     | L   | U   | L   | L  | U  | L  | L  | L  | L  |    |    |    |    |    |
| 24     |    |    |    |    |    |    |    | 512 |     | L   | U   | L   | U   | L  | U  | L  | L  | L  | A  | A  |    |    |    |    |
| 25     |    |    |    |    |    |    |    | 378 |     | L   | U   | L   | U   | L  | L  | L  | L  | L  | L  | L  |    |    |    |    |
| 26     |    |    |    |    |    |    |    | 502 |     | L   | U   | L   | U   | L  | L  | U  | L  | U  | L  | L  |    |    |    |    |
| 27     |    |    |    |    |    |    |    | 514 |     | L   | L   | L   | L   |    | L  | U  | L  | U  | L  | L  |    |    |    |    |
| 28     |    |    |    |    |    |    |    | 455 |     | L   | U   | L   | L   | L  | U  | L  | L  | A  | A  |    |    |    |    |    |
| 29     |    |    |    |    |    |    |    | 440 |     | L   | L   | L   | L   | U  | L  | L  | L  | A  | L  |    |    |    |    |    |
| 30     |    |    |    |    |    |    |    | 514 |     | L   | L   | U   | L   | U  | L  | L  | L  | L  | L  | L  |    |    |    |    |
| 31     |    |    |    |    |    |    |    | 491 |     | L   | U   | L   | U   | L  | L  | L  | L  | L  | L  | L  |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 29  | 13  | 9   | 16  | 22  | 19  | 21 | 19 | 15 | 7  | 3  | 7  |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 496 | 488 | 410 | U   | L   | U   | L  | U  | L  | U  | L  | U  | L  |    |    |    |    |
| U Q    |    |    |    |    |    |    |    | 512 | 508 | 458 | U   | L   | U   | L  | U  | L  | U  | L  | U  | L  |    |    |    |    |
| L Q    |    |    |    |    |    |    |    | 476 | 466 | 403 | U   | L   | U   | L  | U  | L  | U  | L  | U  | L  |    |    |    |    |



## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 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

| $\frac{H}{D}$ | 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             |    |    |    |    |    |    |    | 218 | 212              | 210 <sup>H</sup> | 274 | 248 | 266 | 232 | 244 | 242 | 224 | 220 | 214 |    |    |    |    |    |
| 2             |    |    |    |    |    |    |    | 210 | 210              | 224 <sup>H</sup> | 266 | 266 | 276 | 232 | 248 | 260 | 246 | 224 | 202 |    |    |    |    |    |
| 3             |    |    |    |    |    |    |    | 200 | 202 <sup>H</sup> | 206 <sup>H</sup> | 256 | 262 | 274 | 256 | 284 | 242 | 230 | 236 |     |    |    |    |    |    |
| 4             |    |    |    |    |    |    |    |     |                  | 252              | 248 | 266 | 274 | 258 | 264 | 242 | 228 | 216 | 216 |    |    |    |    |    |
| 5             |    |    |    |    |    |    |    | 212 | 214              | 246              | 252 | 264 | 254 | 288 | 246 | 250 | 226 | 210 |     |    |    |    |    |    |
| 6             |    |    |    |    |    |    |    | 216 | 202              | 228              | 236 | 258 | 258 | 264 | 238 | 248 | 236 | 230 |     |    |    |    |    |    |
| 7             |    |    |    |    |    |    |    | 236 | 218              | 218              | 272 | 256 | 260 | 242 | 262 | 286 | 256 | 222 | 202 |    |    |    |    |    |
| 8             |    |    |    |    |    |    |    | 226 | 220              | 232 <sup>H</sup> | 256 | 262 | 262 | 258 | 274 | 242 | 236 | 226 | 212 |    |    |    |    |    |
| 9             |    |    |    |    |    |    |    | 224 | 222              | 236 <sup>H</sup> | 260 | 290 | 254 | 272 | 246 | 256 | 244 | 228 |     |    |    |    |    |    |
| 10            |    |    |    |    |    |    |    | 218 | 218 <sup>H</sup> | C                | C   | C   | C   | C   | C   | C   | C   | 242 | 218 |    |    |    |    |    |
| 11            |    |    |    |    |    |    |    | 212 | 218 <sup>H</sup> | 252              | 252 | 252 | 258 | 270 | 260 | 238 | 238 | 226 |     |    |    |    |    |    |
| 12            |    |    |    |    |    |    |    |     | 238              | 232              | 236 | 256 | 272 | 266 | 266 | 238 | 246 | 226 |     |    |    |    |    |    |
| 13            |    |    |    |    |    |    |    | 210 | 204              | 240              | 250 | 270 | 264 | 274 | 238 | 246 | 244 | 236 |     |    |    |    |    |    |
| 14            |    |    |    |    |    |    |    | 206 | 220              | 232              | 246 | 290 | 272 | 258 | 254 | 256 | 260 | 242 |     |    |    |    |    |    |
| 15            |    |    |    |    |    |    |    | 212 | 254              | 222              | 234 | 266 | 272 | 282 | 300 | 290 | 258 | 236 |     |    |    |    |    |    |
| 16            |    |    |    |    |    |    |    | 206 | 222              | 270              | 274 | 252 | 294 | 268 | 246 | 242 | 238 | 240 | 240 |    |    |    |    |    |
| 17            |    |    |    |    |    |    |    | 224 | 214              | 210              | 232 | 272 | 270 | 256 | 274 | 258 | 246 | 236 | 224 |    |    |    |    |    |
| 18            |    |    |    |    |    |    |    | 206 | 210              | 234              | 246 | 262 | 268 | 254 | 276 | 260 | 244 | 232 |     |    |    |    |    |    |
| 19            |    |    |    |    |    |    |    | 230 | 240              | 236              | 244 | 276 | 248 | 260 | 254 | 268 | 256 | 238 |     |    |    |    |    |    |
| 20            |    |    |    |    |    |    |    | 208 | 226              | 252              | 278 | 244 | 272 | 252 | 254 | 254 | 252 | 244 |     |    |    |    |    |    |
| 21            |    |    |    |    |    |    |    | 232 | 234              | 252              | 260 | 264 | 242 | 252 | 242 | 242 | 264 | 238 |     |    |    |    |    |    |
| 22            |    |    |    |    |    |    |    | 220 | 242              | 234              | 260 | 250 | 258 | 258 | 258 | 232 | 230 | 234 |     |    |    |    |    |    |
| 23            |    |    |    |    |    |    |    | 206 | 214              | 236              | 252 | 250 | 268 | 288 | 260 | 266 | 264 | 246 | 226 |    |    |    |    |    |
| 24            |    |    |    |    |    |    |    | 222 | 248              | 226              | 244 | 278 | 296 | 300 | 274 | 252 | 244 | 280 | 244 |    |    |    |    |    |
| 25            |    |    |    |    |    |    |    | 204 | 218              | 232              | 260 | 274 | 286 | 276 | 260 | 254 | 242 | 224 | 222 |    |    |    |    |    |
| 26            |    |    |    |    |    |    |    | 206 | 222              | 236              | 250 | 272 | 274 | 260 | 258 | 260 | 264 | 244 |     |    |    |    |    |    |
| 27            |    |    |    |    |    |    |    | 208 | 228              | 236              | 256 | 268 | 244 | 280 | 254 | 260 | 270 | 244 |     |    |    |    |    |    |
| 28            |    |    |    |    |    |    |    | 200 | 224              | 254              | 280 | 292 | 292 | 268 | 254 | 260 | 258 | 266 |     |    |    |    |    |    |
| 29            |    |    |    |    |    |    |    | 224 | 222              | 236              | 248 | 318 | 290 | 290 | 256 | 254 | 250 | 248 |     |    |    |    |    |    |
| 30            |    |    |    |    |    |    |    | 204 | 228              | 232              | 274 | 258 | 268 | 264 | 292 | 262 | 260 | 256 | 240 |    |    |    |    |    |
| 31            |    |    |    |    |    |    |    | 202 | 224              | 242              | 270 | 298 | 284 | 280 | 262 | 274 | 264 | 242 | 232 |    |    |    |    |    |
|               | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08               | 09               | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT           |    |    |    |    |    |    |    | 29  | 30               | 30               | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 31  | 13  |    |    |    |    |    |
| MED           |    |    |    |    |    |    |    | 212 | 221              | 235              | 254 | 265 | 269 | 264 | 258 | 254 | 246 | 236 | 222 |    |    |    |    |    |
| U Q           |    |    |    |    |    |    |    | 223 | 228              | 242              | 266 | 274 | 274 | 276 | 266 | 260 | 258 | 244 | 236 |    |    |    |    |    |
| L Q           |    |    |    |    |    |    |    | 206 | 214              | 228              | 246 | 256 | 258 | 256 | 248 | 242 | 238 | 226 | 213 |    |    |    |    |    |

MAR. 2016 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | 288 | 286 | 276 | 258 | 230 | 186 | 242 | 152 | 164 | 176 | H   | 204 | 206 | H   | H   | H   | 208 | 150 | H   | 166 | 194 | 196 | 232 | 220 | 304 |     |     |
| 2   | 276 | 268 | 276 | 280 | 246 | 220 | 232 | 138 | 194 | 206 | 194 | 200 | 168 | H   | E   | A   | 204 | 188 | 208 | 218 | A   | 196 | 208 | 232 | 252 | 280 |     |
| 3   | 292 | 262 | 268 | 250 | 216 | 252 | 268 | 134 | 142 | 178 | H   | 178 | 202 | 228 | 232 | 196 | 198 | 208 | H   | H   | 198 | 200 | 204 | 230 | 252 | 252 |     |
| 4   | 254 | 272 | 276 | 250 | 224 | 216 | 234 | 208 | 210 | 182 | H   | 172 | 208 | 182 | 192 | 188 | 202 | 214 | 194 | 206 | 196 | 190 | 216 | 238 | 280 |     |     |
| 5   | 284 | 284 | 278 | 278 | 242 | 202 | 234 | 160 | 196 | 190 | H   | 214 | 200 | 222 | 192 | 228 | 198 | 216 | 202 | 204 | 204 | 230 | 228 | 238 | 270 |     |     |
| 6   | 294 | 278 | 258 | 260 | 232 | 234 | 252 | 146 | 110 | 202 | 188 | 188 | 190 | 210 | H   | 196 | 194 | 210 | 204 | 208 | 208 | 200 | 224 | 258 | 294 |     |     |
| 7   | 316 | 292 | 274 | 276 | 294 | 226 | 238 | 168 | 210 | 200 | H   | 194 | 206 | 218 | H   | 200 | 200 | 220 | H   | E   | A   | H   | 274 | 260 | 274 | 296 |     |
| 8   | 278 | 256 | 244 | 206 | 194 | 248 | 306 | 156 | 160 | 200 | 190 | 208 | 186 | H   | 192 | 200 | 222 | 210 | 206 | E   | B   | 214 | 206 | 222 | 232 | 234 | 260 |
| 9   | 290 | 326 | 258 | 212 | 206 | 228 | 266 | 156 | 174 | 190 | 190 | 180 | 180 | H   | 198 | 198 | 204 | 202 | H   | 212 | 216 | 200 | 216 | 254 | 244 | 250 |     |
| 10  | 272 | 272 | 282 | 238 | 196 | 206 | 236 | 136 | 122 | C   | C   | C   | C   | C   | C   | C   | C   | C   | A   | 144 | 218 | 196 | 238 | 228 | 264 |     |     |
| 11  | 284 | 282 | 270 | 244 | 208 | 248 | 266 | 146 | 192 | 192 | H   | 212 | 212 | 196 | 234 | 218 | 212 | 210 | 204 | 226 | 222 | 204 | 224 | 248 | 278 |     |     |
| 12  | 290 | 332 | 254 | 208 | 210 | 236 | 290 | 214 | 204 | 220 | H   | 210 | 208 | 254 | A   | A   | A   | 220 | 222 | 234 | 192 | 202 | 268 | 246 | 276 |     |     |
| 13  | 294 | 260 | 272 | 266 | 272 | 298 | 262 | 178 | 130 | 192 | 186 | 190 | 176 | 186 | 202 | 188 | 208 | 210 | 216 | 200 | 204 | 246 | 224 | 248 |     |     |     |
| 14  | 266 | 266 | 272 | 264 | 234 | 212 | 214 | 186 | 202 | 190 | H   | 180 | 182 | 168 | 202 | 222 | 210 | H   | 180 | 228 | 218 | 210 | 210 | 220 | 230 | 260 |     |
| 15  | 290 | 274 | 262 | 262 | 216 | 204 | 270 | 146 | 166 | H   | 218 | 208 | 190 | H   | 232 | 224 | 200 | H   | 224 | 228 | 210 | 190 | 206 | 198 | 234 | 334 |     |
| 16  | 326 | 266 | 242 | 242 | 226 | 212 | 200 | 140 | 194 | 192 | H   | 192 | 190 | 190 | H   | 172 | 220 | 218 | 214 | 234 | 112 | 214 | 190 | 224 | 254 | 290 |     |
| 17  | 256 | 222 | 216 | 204 | 230 | 272 | 272 | 142 | 158 | 170 | 190 | 202 | 210 | 204 | 216 | 200 | 192 | 226 | 166 | 202 | 212 | 260 | 272 | 244 |     |     |     |
| 18  | 224 | 212 | 228 | 250 | 280 | 288 | 236 | 166 | 164 | 204 | 190 | 184 | 188 | H   | H   | 206 | 206 | 192 | H   | 228 | 228 | 222 | 220 | 220 | 224 | 214 | 268 |
| 19  | 282 | 268 | 220 | 192 | 224 | 296 | 266 | 152 | 216 | 204 | 200 | 196 | 176 | 216 | 210 | 202 | 222 | 212 | 226 | 220 | 222 | 214 | 238 | 332 |     |     |     |
| 20  | 248 | 234 | 280 | 232 | 262 | 250 | 216 | 146 | 210 | 208 | 204 | 198 | 200 | 214 | 208 | 212 | 200 | 208 | H   | 218 | 196 | 194 | 292 | 290 | 268 |     |     |
| 21  | 270 | 232 | 238 | 264 | 284 | 308 | 300 | 184 | 220 | 212 | 196 | 178 | 178 | H   | H   | 196 | 188 | 218 | 222 | 230 | 230 | 204 | 204 | 262 | 266 | 272 |     |
| 22  | 258 | 250 | 242 | 240 | 216 | 240 | 246 | 152 | 218 | 192 | 192 | 194 | 192 | 200 | 256 | A   | 204 | 220 | 218 | 198 | 206 | 242 | 256 | 300 |     |     |     |
| 23  | 298 | 282 | 272 | 260 | 214 | 214 | 204 | 140 | 188 | 212 | 202 | 196 | 180 | H   | H   | 182 | 200 | 236 | 240 | A   | 202 | 202 | 208 | 262 | 292 |     |     |
| 24  | 266 | 238 | 226 | 210 | 218 | 252 | 248 | 152 | 214 | 212 | 202 | 184 | 168 | H   | 202 | 216 | 228 | 218 | A   | A   | A   | 246 | 216 | 264 | 302 |     |     |
| 25  | 290 | 266 | 268 | 236 | 212 | 222 | 216 | A   | 216 | 220 | 214 | 196 | 194 | 192 | 248 | A   | 232 | A   | A   | A   | 216 | 202 | 246 | 272 | 286 |     |     |
| 26  | 296 | 262 | 246 | 248 | 206 | 222 | 230 | 164 | 214 | 206 | H   | 186 | 182 | 168 | 198 | 198 | 186 | 222 | 232 | A   | 216 | 202 | 194 | 216 | 286 | 294 |     |
| 27  | 282 | 272 | 262 | 252 | 228 | 234 | 218 | 134 | 210 | 176 | H   | 186 | 186 | 168 | H   | A   | 222 | 240 | A   | A   | 226 | 216 | 218 | 238 | 238 | 232 |     |
| 28  | 286 | 298 | 284 | 274 | 254 | 224 | 224 | 188 | 144 | 212 | 192 | 270 | 238 | 226 | 206 | 224 | A   | A   | A   | 222 | 268 | 268 | 266 | 264 | 254 |     |     |
| 29  | 274 | 268 | 262 | 254 | 222 | 232 | 254 | 196 | 220 | 206 | H   | 198 | 190 | 186 | 214 | 248 | 204 | A   | 230 | 232 | 232 | 208 | 212 | 292 | 294 |     |     |
| 30  | 264 | 226 | 236 | 266 | 294 | 276 | 222 | 148 | 210 | 210 | H   | 194 | 182 | H   | 194 | 192 | 206 | H   | H   | 208 | 218 | 234 | 218 | 206 | 190 | 266 | 290 |
| 31  | 278 | 266 | 236 | 254 | 284 | 244 | 226 | 166 | 210 | 198 | 184 | 200 | 184 | H   | 244 | 170 | 214 | H   | H   | 204 | 216 | 230 | 214 | 196 | 200 | 274 | 272 |
|     | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |     |     |
| CNT | 31  | 31  | 31  | 31  | 31  | 31  | 31  | 30  | 31  | 30  | 30  | 30  | 30  | 29  | 29  | 27  | 28  | 26  | 27  | 30  | 31  | 31  | 31  | 31  |     |     |     |
| MED | 282 | 268 | 262 | 250 | 226 | 234 | 238 | 152 | 196 | 201 | 193 | 196 | 186 | 202 | 206 | 202 | 212 | 218 | 217 | 205 | 206 | 230 | 254 | 278 |     |     |     |
| U Q | 290 | 282 | 274 | 264 | 254 | 252 | 266 | 168 | 210 | 210 | 202 | 202 | 196 | 217 | 221 | 214 | 222 | 228 | 226 | 216 | 218 | 246 | 266 | 294 |     |     |     |
| L Q | 266 | 256 | 242 | 236 | 214 | 216 | 224 | 146 | 164 | 190 | H   | 188 | 186 | 176 | 192 | 197 | 198 | 208 | 208 | 206 | 200 | 200 | 216 | 238 | 260 |     |     |

MAR. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| H<br>D | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |
|--------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|
| 1      |    |    |    |    |    |    |    | B   |     |     | A   |     |     |     |     |     | A   |     | B   |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 102 | 98  |     |     | 96  | 100 | 100 | 110 | 110 |     | 100 |     |     |    |    |    |    |
| 2      |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 98  | 98  | 96  | 98  | 104 | 104 | 98  | 98  | 98  | 102 | 102 |     |     |    |    |    |    |
| 3      |    |    |    |    |    |    |    | A   |     |     |     |     | A   |     |     |     |     |     |     | B   |    |    |    |    |
|        |    |    |    |    |    |    |    | 102 | 94  | 108 | 106 |     | 102 | 104 | 100 | 100 | 100 |     |     |     |    |    |    |    |
| 4      |    |    |    |    |    |    |    | A   | A   |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 110 | 110 | 110 | 94  | 94  | 94  | 98  | 98  | 106 | 126 |     |     |     |    |    |    |    |
| 5      |    |    |    |    |    |    |    | 126 | 98  | 98  | 96  | 96  | 104 | 98  | 98  | 98  | 100 | 106 |     | A   |    |    |    |    |
|        |    |    |    |    |    |    |    | A   | A   |     |     |     |     | A   |     |     |     |     |     | A   |    |    |    |    |
| 6      |    |    |    |    |    |    |    |     | 96  | 96  | 96  | 100 |     | 100 | 94  | 102 | 102 |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     | A   |     |     |     |     |     |     |     | B   |    |    |    |    |
| 7      |    |    |    |    |    |    |    | 144 | 96  | 96  | 96  | 96  |     | 96  | 96  | 100 | 100 | 102 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     | B   |    |    |    |    |
| 8      |    |    |    |    |    |    |    | 114 | 100 | 98  | 98  | 96  | 96  | 98  | 98  | 100 | 100 | 104 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     | A   | A   |     |     |     |     |     |     |    |    |    |    |
| 9      |    |    |    |    |    |    |    | 112 | 100 | 98  | 98  | 96  |     |     | 98  | 100 | 112 | 108 | 118 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     | C   | C   | C   | C   | C   | C   | C   | C   |     |     |     |    |    |    |    |
| 10     |    |    |    |    |    |    |    | 106 | 96  |     |     |     |     |     |     |     |     | 104 |     | B   |    |    |    |    |
|        |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 11     |    |    |    |    |    |    |    | 98  | 96  | 98  | 98  | 96  | 92  | 92  | 96  | 100 | 108 | 106 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     | A   |    |    |    |    |
| 12     |    |    |    |    |    |    |    | 130 | 98  | 98  | 96  | 98  | 98  | 96  | 94  | 98  | 98  | 104 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     | A   |     |     |     | B   |    |    |    |    |
| 13     |    |    |    |    |    |    |    | 128 | 94  | 118 | 96  | 94  | 96  | 94  | 106 |     | 102 | 104 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     | A   |     |     |     |     |     |    |    |    |    |
| 14     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     | E   | B   |    |    |    |    |
|        |    |    |    |    |    |    |    | 120 | 104 | 100 | 100 | 96  | 96  | 94  |     | 102 | 102 | 102 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     | A   | A   |     |     |     |     |     |     |     |    |    |    |    |
| 15     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     | A   |    |    |    |    |
|        |    |    |    |    |    |    |    | 118 | 102 | 100 | 100 |     |     | 96  |     | 100 | 100 | 100 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 16     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     | A   |    |    |    |    |
|        |    |    |    |    |    |    |    | 110 | 102 | 94  | 96  | 94  | 96  | 100 | 102 | 100 | 100 | 104 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 17     |    |    |    |    |    |    |    | A   |     |     |     |     |     |     |     |     |     |     |     | B   |    |    |    |    |
|        |    |    |    |    |    |    |    | 116 | 100 | 98  | 100 | 102 | 100 | 102 | 100 | 100 | 100 | 102 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 18     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 112 | 116 | 114 | 94  | 106 | 104 | 100 | 100 | 102 | 102 | 102 | 106 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 19     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 112 | 96  | 96  | 92  | 116 | 112 | 112 | 98  | 98  | 98  | 102 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 20     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 112 | 102 | 98  | 98  | 96  | 96  | 98  | 100 | 100 | 100 | 100 | 122 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 21     |    |    |    |    |    |    |    | A   |     |     |     |     |     |     |     |     |     |     |     | E   | B  |    |    |    |
|        |    |    |    |    |    |    |    | 110 | 98  | 96  | 96  | 96  | 96  | 96  | 100 | 98  | 98  | 100 | 114 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 22     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 118 | 98  | 98  | 98  | 100 | 100 | 102 | 98  | 98  | 98  | 100 | 104 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 23     |    |    |    |    |    |    |    | B   | B   |     | A   |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 100 |     |     |     |     | 98  | 98  | 108 | 104 | 102 | 102 | 112 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 24     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 124 | 96  | 96  | 96  | 92  | 96  | 98  |     | 114 | 110 | 102 | 102 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 25     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 112 | 98  | 96  | 96  | 96  | 94  | 96  | 96  | 96  | 104 | 104 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 26     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 112 | 114 | 104 | 102 | 94  |     | A   | 108 | 108 | 108 | 108 | 112 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 27     |    |    |    |    |    |    |    | A   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 104 | 98  | 96  | 96  | 96  |     | A   | 108 | 104 | 112 | 102 | 102 | 110 |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 28     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 104 | 100 | 98  | 98  | 98  | 98  | 98  | 98  | 98  | 104 | 104 |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 29     |    |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 102 | 98  | 98  | 98  | 96  |     | A   | 100 | 92  | 114 |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 30     |    |    |    |    |    |    |    | A   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 102 | 100 | 98  | 96  | 102 | 96  | 96  | 108 | 104 | 104 | 102 | 108 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
| 31     |    |    |    |    |    |    |    | A   |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        |    |    |    |    |    |    |    | 110 | 100 | 98  | 98  | 96  | 98  | 98  | 98  | 102 | 104 | 104 | 112 |     |    |    |    |    |
|        |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 24  | 29  | 29  | 28  | 28  | 23  | 28  | 27  | 29  | 28  | 31  | 15  |     |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 112 | 100 | 98  | 97  | 96  | 98  | 98  | 98  | 100 | 100 | 102 | 111 |     |    |    |    |    |
| U Q    |    |    |    |    |    |    |    | 119 | 102 | 98  | 98  | 99  | 100 | 101 | 104 | 103 | 103 | 104 | 114 |     |    |    |    |    |
| L Q    |    |    |    |    |    |    |    | 110 | 98  | 96  | 96  | 96  | 96  | 96  | 98  | 98  | 100 | 102 | 106 |     |    |    |    |    |

MAR. 2016 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1     | 96  | B   | B   | B   | B   | B   | B   | B   | 156 | 166 | 166 | 110 | 112 | 160 | 96  | 92  | 90  | 116 | B   | B   | B   | 116 | 104 | 104 |
| 2     | 104 | 100 | 100 | 100 | 106 | B   | B   | B   | 170 | 186 | 184 | 182 | 172 | 140 | 136 | 144 | 126 | 108 | 90  | 88  | 94  | 112 | 112 | B   |
| 3     | 94  | B   | 94  | B   | 88  | B   | 94  | 98  | 128 | 134 | 98  | 172 | 178 | 150 | G   | 182 | G   | 126 | B   | B   | B   | 112 | 94  | B   |
| 4     | B   | B   | B   | 94  | 94  | 98  | 94  | 90  | 90  | 92  | 96  | 166 | G   | 112 | 112 | 116 | G   | G   | G   | B   | B   | 94  | 124 | 96  |
| 5     | 90  | 112 | 90  | 96  | 92  | B   | B   | G   | 166 | G   | 182 | 154 | 136 | 156 | 128 | 112 | 116 | 110 | 100 | 104 | 104 | 108 | 104 | 118 |
| 6     | 98  | 88  | 98  | 90  | B   | B   | 100 | 100 | 100 | G   | 138 | 120 | 120 | 154 | 114 | 158 | 122 | 128 | 100 | B   | B   | 94  | 86  | 86  |
| 7     | 90  | 86  | 98  | 104 | B   | B   | 96  | 164 | 142 | 130 | 174 | 114 | 174 | 108 | 108 | 110 | 114 | G   | B   | B   | B   | 108 | 98  | B   |
| 8     | 104 | 104 | 94  | 102 | 98  | 92  | 92  | 144 | 150 | 168 | G   | 156 | 174 | 134 | 114 | 110 | 94  | G   | B   | B   | B   | 92  | B   | B   |
| 9     | B   | 100 | B   | B   | B   | 92  | 86  | 90  | G   | G   | G   | 104 | 104 | 160 | 188 | G   | 98  | 150 | G   | B   | 92  | 94  | B   |     |
| 10    | B   | B   | B   | B   | B   | B   | 148 | G   | 122 | C   | C   | C   | C   | C   | C   | C   | C   | 106 | 106 | 100 | 98  | B   | 92  | 92  |
| 11    | B   | B   | B   | B   | B   | B   | B   | B   | 190 | 160 | 148 | 132 | 130 | 122 | 118 | 116 | 88  | 86  | 88  | 96  | 106 | 98  | B   | B   |
| 12    | 118 | 128 | B   | B   | B   | 140 | B   | G   | 154 | 144 | 136 | 132 | 120 | 112 | 106 | 114 | 110 | 106 | 100 | 102 | B   | 96  | 106 | 90  |
| 13    | 90  | B   | 94  | B   | B   | B   | B   | 150 | 114 | 134 | G   | 104 | G   | 104 | 162 | 88  | 166 | 112 | 106 | 90  | 90  | B   | B   | B   |
| 14    | B   | B   | B   | B   | B   | B   | B   | G   | 190 | 122 | 112 | 108 | 108 | 108 | 134 | 108 | 104 | 170 | 124 | 112 | B   | 96  | 92  | 88  |
| 15    | B   | B   | B   | B   | B   | 102 | 138 | 122 | 100 | 100 | 96  | 96  | 96  | 152 | 142 | 174 | 158 | 102 | 98  | B   | B   | 96  | 96  | 104 |
| 16    | 96  | 98  | 92  | B   | B   | B   | B   | G   | G   | G   | G   | G   | G   | 92  | 170 | G   | 160 | 148 | 86  | 86  | B   | 150 | 132 | 122 |
| 17    | 116 | B   | B   | B   | B   | 154 | 90  | 92  | 128 | 140 | 120 | 184 | 90  | G   | G   | G   | G   | 112 | 122 | 132 | B   | B   | B   | B   |
| 18    | B   | B   | B   | B   | B   | 124 | B   | B   | 134 | 156 | 146 | 140 | 110 | 92  | 92  | 134 | G   | 188 | 132 | 120 | 120 | B   | B   | B   |
| 19    | B   | B   | B   | B   | B   | B   | B   | B   | 140 | 112 | 130 | 114 | 120 | 98  | 98  | 106 | 108 | 110 | 102 | 98  | 98  | 96  | 96  | 94  |
| 20    | 92  | 118 | 96  | 94  | 88  | 92  | B   | B   | 138 | 148 | 152 | 138 | 102 | 108 | 108 | 108 | 120 | G   | 184 | 124 | 116 | 112 | 108 | 106 |
| 21    | 98  | 110 | 92  | 122 | B   | 106 | 96  | 124 | 174 | 118 | 112 | 112 | 102 | 104 | G   | 182 | 142 | 106 | 106 | 104 | 98  | 110 | 110 | 106 |
| 22    | 100 | B   | B   | B   | B   | B   | B   | B   | 134 | 180 | 124 | G   | G   | G   | 158 | 122 | 122 | 118 | 132 | 106 | 108 | 90  | 92  | B   |
| 23    | B   | B   | B   | B   | B   | B   | B   | B   | 126 | 168 | 132 | 118 | 112 | 106 | 116 | 96  | 98  | 148 | 136 | 120 | 114 | 102 | 106 | B   |
| 24    | 100 | 86  | B   | B   | B   | 104 | B   | B   | 132 | 120 | 116 | 102 | 100 | 108 | 104 | 92  | 118 | 96  | 102 | 102 | 98  | 104 | 118 | 88  |
| 25    | B   | B   | B   | 96  | 96  | B   | B   | B   | 126 | 106 | 106 | 102 | 104 | 104 | 104 | 104 | 102 | 106 | 104 | 106 | 96  | 102 | 98  | 100 |
| 26    | 96  | 96  | 116 | 96  | 94  | 98  | 124 | 148 | 142 | 132 | 108 | 106 | 94  | 134 | 114 | 92  | 158 | 142 | 114 | 104 | 102 | 90  | 88  | 94  |
| 27    | 104 | B   | B   | B   | B   | B   | 94  | 128 | 144 | 118 | 100 | 100 | 124 | 142 | 164 | 158 | 132 | 122 | 110 | 98  | 102 | 88  | 110 | 100 |
| 28    | B   | B   | B   | B   | B   | B   | 102 | 152 | 144 | 126 | 132 | 158 | 162 | 140 | 170 | 136 | 130 | 110 | 108 | 104 | 102 | 84  | 88  | 88  |
| 29    | B   | 114 | 110 | B   | B   | 122 | B   | B   | 144 | 154 | 90  | 114 | 126 | 98  | G   | 130 | 138 | 88  | 116 | 90  | 86  | 104 | 86  | 90  |
| 30    | B   | 100 | 92  | 94  | 98  | B   | 100 | 158 | 150 | 126 | 110 | 96  | 102 | 166 | 98  | 94  | 92  | 114 | 122 | 90  | 100 | B   | 92  | 92  |
| 31    | B   | B   | B   | 92  | 92  | 98  | 98  | 148 | 174 | 118 | 102 | 162 | G   | 184 | 90  | 202 | 170 | 114 | 110 | 84  | 88  | 84  | 106 | 106 |
|       | 00  | 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  | 14  | 13  | 12  | 10  | 12  | 15  | 23  | 29  | 26  | 25  | 28  | 25  | 28  | 27  | 26  | 26  | 28  | 25  | 24  | 19  | 24  | 25  | 21  |
| MED   | 98  | 100 | 94  | 96  | 94  | 101 | 96  | 134 | 148 | 130 | 114 | 113 | 108 | 128 | 114 | 116 | 117 | 114 | 106 | 100 | 102 | 96  | 96  | 98  |
| U Q   | 104 | 112 | 99  | 101 | 98  | 123 | 102 | 148 | 167 | 144 | 139 | 155 | 133 | 153 | 136 | 144 | 148 | 132 | 117 | 106 | 104 | 109 | 107 | 106 |
| L Q   | 93  | 96  | 92  | 94  | 92  | 95  | 94  | 124 | 122 | 118 | 102 | 104 | 100 | 106 | 106 | 108 | 98  | 106 | 99  | 93  | 96  | 92  | 92  | 91  |

MAR. 2016 h'Es (KM)

IONOSPHERIC DATA STATION Yamagawa

MAR. 2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H    | 00    | 01    | 02   | 03    | 04   | 05   | 06   | 07   | 08   | 09   | 10   | 11   | 12   | 13    | 14   | 15   | 16   | 17   | 18   | 19    | 20   | 21   | 22    | 23    |
|-----|------|-------|-------|------|-------|------|------|------|------|------|------|------|------|------|-------|------|------|------|------|------|-------|------|------|-------|-------|
| 1   | F1   |       |       |      |       |      |      |      |      | H1   | H1   | HC11 | C1   | C1   | HC11  | L2   | L2   | L2   | CL11 |      |       |      | F1   | F5    | F3    |
| 2   | F2   | F2    | FFF21 | FF12 | FF11  |      |      |      |      | H1   | H1   | H1   | H1   | HL11 | HL11  | HL11 | H1   | C1   | C3   | L1   | F2    | F1   | F1   | F1    |       |
| 3   | F1   |       | F1    |      | F1    |      | F1   | L1   | C1   | H1   | L1   | HL11 | H1   | H1   |       | H1   |      | C1   |      |      |       |      | F1   | F3    |       |
| 4   |      |       |       | F1   | FFF11 | F1   | F3   | L5   | LQ31 | L3   | L2   | HL12 |      | C1   | C1    | C1   |      |      |      |      |       |      | F2   | FF12  | FFF11 |
| 5   | FQ21 | FF13  | FF21  | F1   | F1    |      |      |      |      | H1   |      | H1   | H1   | HL11 | H1    | C1   | C1   | C1   | C2   | L3   | F1    | F1   | FF24 | FFF31 | FFF11 |
| 6   | F1   | F1    | F1    | F1   |       |      | F1   | L1   | L1   |      | H1   | C1   | C1   | HC11 | C1    | H1   | C1   | C1   | L2   | L3   |       |      | F1   | F3    | F2    |
| 7   | F2   | FF21  | F1    | F1   |       |      | F1   | H1   | H2   | C1   | H1   | C1   | HC11 | C1   | C1    | C1   | C1   |      |      |      |       |      |      | F1    | F2    |
| 8   | F2   | FF21  | FF21  | F1   | F1    | F1   | F1   | H2   | H2   | H1   |      | H1   | H1   | H1   | C1    | C1   | L1   |      |      |      |       |      |      | F1    |       |
| 9   |      | F1    |       |      |       | F2   | F1   | L1   |      |      |      | C1   | CL11 | HL11 | H1    |      | L2   | HL11 |      | F1   |       |      | F2   | F1    |       |
| 10  |      |       |       |      |       | F1   |      |      | C2   |      |      |      |      |      |       |      |      | C5   | C2   | F5   | FF11  |      | F1   | F1    |       |
| 11  |      |       |       |      |       |      |      |      | H1   | H1   | H1   | H1   | C1   | C2   | C1    | C1   | L1   | L1   | L1   | FF11 | FF11  | F1   |      |       |       |
| 12  | F1   | F1    |       |      | F1    |      |      |      | H1   | H1   | H1   | H1   | C1   | C2   | C3    | CL21 | C1   | C3   | LH61 | F1   |       |      | F3   | FF11  | FF11  |
| 13  | F1   |       | F1    |      |       |      |      | HC11 | C2   | HC11 |      | C1   |      | C1   | HL12  | LQ21 | HL11 | CL21 | CL22 | L1   | F1    |      |      |       |       |
| 14  |      |       |       |      |       |      |      | H1   | C1   | C1   | C1   | C1   | C1   | C1   | HCL11 | CL11 | C1   | H1   | C2   | FF28 | F1    | FF22 | FF11 | FF21  |       |
| 15  |      |       |       |      |       |      | CH11 | H1   | CC11 | C1   | C1   | L1   | L1   | H1   | HC11  | H1   | H1   | C2   | L3   |      |       |      | FF31 | FF2   | F1    |
| 16  | F2   | F1    | F1    |      |       |      |      |      |      |      |      |      |      | L1   | HL11  |      | H1   | H1   | L1   | F1   |       |      | F3   | F1    | F1    |
| 17  | FF31 |       |       |      |       | F1   | L1   | LH12 | C1   | H1   | C1   | HL11 | L1   |      |       |      |      | C1   | C1   | F1   |       |      |      |       |       |
| 18  |      |       |       |      | F2    |      |      | HL21 | HL12 | HL12 | H1   | CL11 | L1   | L1   | H1    |      | H1   | H2   | C3   | F1   |       |      |      |       |       |
| 19  |      |       |       |      |       |      |      | H1   | C1   | C1   | C1   | CL11 | L1   | L1   | C1    | C1   | C1   | C2   | L3   | F3   | F4    | F2   | F1   | F7    |       |
| 20  | F6   | FFF11 | FQ11  | F1   | FF11  | F1   |      | H2   | H1   | H1   | H1   | C1   | C1   | C1   | C1    |      | H1   | C1   | F1   | F1   | F1    | FF21 | FF41 | F1    |       |
| 21  | F3   | FF12  | F3    | FF11 |       | F1   | L2   | C1   | H1   | C1   | C1   | C1   | C1   | C1   |       | H1   | H1   | C5   | F1   | F6   | FF23  | FF12 | FF21 |       |       |
| 22  | F1   |       |       |      |       |      |      | H2   | H1   | C1   |      |      |      | H1   | C1    | C1   | C1   | H2   | C2   | FF11 | F2    | F1   |      |       |       |
| 23  |      |       |       |      |       |      |      | CC11 | H1   | HL11 | CL11 | CL11 | C1   | C1   | L1    | L1   | H1   | H2   | C3   | F2   | F4    | F1   |      |       |       |
| 24  | F1   | F2    |       |      | F1    |      |      | H2   | C1   | C2   | C1   | C1   | C1   | C1   | L3    | CL11 | L1   | CL83 | CL84 | FF84 | FF33  | FF12 | F2   | F1    |       |
| 25  |      |       |       | F1   | F1    |      |      | C1   | C2   | C3   | C1   | C1   | C1   | C1   | C1    | C2   | CL21 | C5   | C4   | F3   | F4    | FF42 | FF5  | F2    |       |
| 26  | FQ21 | FFF21 | FF11  | F3   | F3    | FF21 |      | CL11 | HL22 | HL11 | HL11 | CL11 | C1   | LC11 | HL11  | CL11 | LH21 | HL13 | CL21 | FF11 | FF31  | FF1  | F1   | FF11  |       |
| 27  | FF11 |       |       |      |       |      |      | L1   | C1   | H1   | C1   | C1   | C1   | CL11 | HL11  | HL11 | HL13 | HL11 | CL61 | CL6  | FFF31 | FF2  | F1   | F1    |       |
| 28  |      |       |       |      |       |      |      | C1   | HL11 | H1   | C1   | H1   | H1   | H1   | H1    | H1   | H1   | CL11 | CL62 | CL44 | FF31  | FFF2 | F1   | F1    |       |
| 29  |      | FF11  | FF11  |      |       | FF11 |      | H1   | H1   | L1   | C1   | C1   | L1   | C1   | H1    | L1   | HL4  | L23  | LC34 | FF33 | FFF21 | FF3  | F1   | F1    |       |
| 30  |      | F1    | FF21  | F1   | F1    |      | L1   | HL21 | H1   | C1   | C1   | L1   | C1   | H1   | L1    | L1   | L2   | C3   | C21  | F1   |       |      | F1   | F1    |       |
| 31  |      |       |       | F2   | F1    | F1   | L1   | H2   | H1   | C1   | C1   | H1   |      | H1   | L1    | HL11 | HL12 | C2   | CL31 | F2   | FF11  | FF21 | FF11 | F1    |       |
|     | 00   | 01    | 02    | 03   | 04    | 05   | 06   | 07   | 08   | 09   | 10   | 11   | 12   | 13   | 14    | 15   | 16   | 17   | 18   | 19   | 20    | 21   | 22   | 23    |       |
| CNT |      |       |       |      |       |      |      |      |      |      |      |      |      |      |       |      |      |      |      |      |       |      |      |       |       |
| MED |      |       |       |      |       |      |      |      |      |      |      |      |      |      |       |      |      |      |      |      |       |      |      |       |       |
| U Q |      |       |       |      |       |      |      |      |      |      |      |      |      |      |       |      |      |      |      |      |       |      |      |       |       |
| L Q |      |       |       |      |       |      |      |      |      |      |      |      |      |      |       |      |      |      |      |      |       |      |      |       |       |

## IONOSPHERIC DATA STATION Okinawa

MAR. 2016 f<sub>XI</sub> (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<br>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<br>42 | X<br>46 | X<br>56 | X<br>59 | X<br>70 | X<br>46 | X<br>32 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>131 | X<br>93  | X<br>84  | X<br>78 |         |
| 2      | X<br>74 | X<br>78 | X<br>68 | X<br>55 | X<br>56 | X<br>52 | X<br>43 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>84  | X<br>62  | X<br>54 | X<br>49 |
| 3      | X<br>50 | X<br>53 | X<br>48 | X<br>47 | X<br>48 | X<br>39 | X<br>41 |    |    |    |    |    |    |    |    |    |    |    |    | X<br>93 | X<br>89  | X<br>66  | X<br>58  | X<br>54 |         |
| 4      | X<br>48 | X<br>48 | X<br>46 | X<br>51 | X<br>48 | X<br>42 | X<br>36 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>150 | X<br>132 | X<br>98 | X<br>70 |
| 5      | X<br>64 | X<br>59 | X<br>53 | X<br>52 | X<br>54 | X<br>42 | X<br>35 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>79  | X<br>82  | X<br>72 | X<br>60 |
| 6      | X<br>52 | X<br>54 | X<br>54 | X<br>54 | X<br>52 | X<br>44 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>96  | X<br>80  | X<br>72 | X<br>61 |
| 7      | X<br>52 | X<br>51 | X<br>53 | X<br>51 | X<br>43 | X<br>45 | X<br>33 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>70  | X<br>70  | X<br>70 | X<br>66 |
| 8      | X<br>69 | X<br>74 | X<br>72 | X<br>73 | X<br>43 | X<br>30 | X<br>27 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>69  | X<br>63  | X<br>62 | X<br>60 |
| 9      | X<br>56 | X<br>58 | X<br>55 | X<br>60 | X<br>44 | X<br>34 | X<br>34 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>73  | X<br>72  | X<br>69 | X<br>68 |
| 10     | X<br>60 | X<br>56 | X<br>56 | X<br>54 | X<br>53 | X<br>36 | X<br>37 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>80  | X<br>66  | X<br>58 | X<br>52 |
| 11     | X<br>50 | X<br>49 | X<br>52 | X<br>56 | X<br>40 | X<br>36 | X<br>36 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>93  | X<br>66  | X<br>65 | X<br>75 |
| 12     | X<br>74 | X<br>60 | X<br>69 | X<br>76 | X<br>51 | X<br>36 | X<br>36 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>89  | X<br>66  | X<br>51 | X<br>48 |
| 13     | X<br>46 | X<br>48 | X<br>46 | X<br>44 | X<br>42 | X<br>41 | X<br>44 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>96  | X<br>74  | X<br>59 | X<br>56 |
| 14     | X<br>52 | X<br>50 | X<br>48 | X<br>47 | X<br>47 | X<br>47 | X<br>34 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>96  | X<br>92  | X<br>87 | X<br>72 |
| 15     | X<br>63 | X<br>63 | X<br>63 | X<br>70 | X<br>72 | X<br>51 | X<br>37 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>98  | X<br>79  | X<br>65 | X<br>49 |
| 16     | X<br>46 | X<br>56 | X<br>78 | X<br>64 | X<br>50 | X<br>42 | X<br>28 |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>79  | X<br>65  | X<br>59 | X<br>60 |
| 17     | X<br>61 | X<br>66 | X<br>48 | X<br>37 | X<br>34 | X<br>34 | X<br>34 |    |    |    | C  | C  | C  | C  | C  | C  | C  |    |    |         | X<br>82  | X<br>75  | X<br>74  | X<br>75 |         |
| 18     | X<br>61 | X<br>54 | X<br>40 | X<br>40 | X<br>37 | X<br>38 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>84  | X<br>78  | X<br>62 | X<br>56 |
| 19     | X<br>54 | X<br>54 | X<br>54 | X<br>48 | X<br>29 | X<br>29 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>82  | X<br>75  | X<br>64 | X<br>62 |
| 20     | X<br>60 | X<br>51 | X<br>48 | X<br>53 | X<br>37 | X<br>36 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>57  | X<br>54  | X<br>54 | X<br>55 |
| 21     | X<br>57 | X<br>59 | X<br>52 | X<br>41 | X<br>40 | X<br>40 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>84  | X<br>59  | X<br>57 | X<br>54 |
| 22     | X<br>53 | X<br>51 | X<br>52 | X<br>49 | X<br>41 | X<br>30 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>57  | X<br>52  | X<br>48 | X<br>46 |
| 23     | X<br>46 | X<br>48 | X<br>47 | X<br>47 | X<br>50 | X<br>41 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>104 | X<br>94  | X<br>84 | X<br>84 |
| 24     | X<br>91 | X<br>92 | X<br>83 | X<br>59 | X<br>40 | X<br>35 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>78  | X<br>46  | X<br>48 | X<br>52 |
| 25     | X<br>57 | X<br>55 | X<br>56 | X<br>53 | X<br>51 | X<br>47 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>118 | X<br>91  | X<br>78 | X<br>76 |
| 26     | X<br>78 | X<br>82 | X<br>80 | X<br>72 | X<br>60 | X<br>52 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>57  | X<br>51  | X<br>49 | X<br>50 |
| 27     | X<br>51 | X<br>53 | X<br>54 | X<br>53 | X<br>50 | X<br>39 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>68  | X<br>64  | X<br>63 | X<br>54 |
| 28     | X<br>49 | X<br>48 | X<br>49 | X<br>50 | X<br>44 | X<br>44 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>68  | X<br>59  | X<br>58 | X<br>58 |
| 29     | X<br>54 | X<br>55 | X<br>52 | X<br>54 | X<br>50 | X<br>43 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>65  | X<br>60  | X<br>53 | X<br>54 |
| 30     | X<br>59 | X<br>57 | X<br>52 | X<br>44 | X<br>42 | X<br>46 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>86  | X<br>51  | X<br>45 | X<br>46 |
| 31     | X<br>48 | X<br>48 | X<br>49 | X<br>44 | X<br>43 | X<br>46 |         |    |    |    |    |    |    |    |    |    |    |    |    |         |          | X<br>102 | X<br>78  | X<br>57 | X<br>52 |
|        | 00      | 01      | 02      | 03      | 04      | 05      | 06      | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19      | 20       | 21       | 22       | 23      |         |
| CNT    | 31      | 31      | 31      | 31      | 31      | 31      | 17      |    |    |    |    |    |    |    |    |    |    |    |    | 1       | 31       | 31       | 31       | 31      |         |
| MED    | X<br>54 | X<br>54 | X<br>53 | X<br>53 | X<br>47 | X<br>41 | X<br>36 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>93  | X<br>84  | X<br>66  | X<br>62 | X<br>56 |
| U Q    | X<br>61 | X<br>59 | X<br>56 | X<br>59 | X<br>51 | X<br>46 | X<br>38 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>96  | X<br>79  | X<br>72  | X<br>68 |         |
| L Q    | X<br>50 | X<br>50 | X<br>48 | X<br>47 | X<br>41 | X<br>36 | X<br>34 |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>70  | X<br>60  | X<br>54  | X<br>52 |         |

MAR. 2016 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

MAR. 2016 f<sub>o</sub>F<sub>2</sub> (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                                    | 36              | 40              | 50              | 53 | 64               | 40              | 26 | 44 | 60 | 65  | 76  | 103 | 110 | 120 | 120              | 128              | 134              | 135              | 137 | 145               | 125             | 87                | 78              | 72 |
| 2                                    | 68              | 72              | 62              | 49 | 50               | 46              | 37 | 53 | 82 | 65  | 73  | 89  | 97  | 117 | 101              | 82               | 95               | 101              | 96  | 86                | 78              | 56                | 48              | 43 |
| 3                                    | 44              | 47              | 42              | 41 | 42               | 33              | 35 | 53 | 66 | 67  | 81  | 91  | 98  | 104 | 107              | 120              | 115              | 92               | 108 | 87                | 83 <sup>R</sup> | 60                | 52              | 48 |
| 4                                    | 42              | 42              | 40              | 45 | 42               | 36              | 30 | 49 | 67 | 78  | 92  | 94  | 100 | 119 | 130              | 135              | 125              | 129              | 134 | 143               | 144             | 126 <sup>RJ</sup> | 92 <sup>R</sup> | 64 |
| 5                                    | 58              | 53              | 47              | 46 | 48               | 36              | 29 | 53 | 71 | 70  | 86  | 90  | 100 | 106 | 122              | 119              | 105              | 79               | 81  | 76                | 73              | 76                | 66              | 54 |
| 6                                    | 46              | 48              | 48              | 48 | 46               | 38              | 33 | 53 | 73 | 82  | 85  | 99  | 109 | 111 | 117              | 101              | 88               | 91               | 87  | 93                | 90              | 74                | 66              | 55 |
| 7                                    | 46              | 45              | 47              | 45 | 37               | 39              | 27 | 55 | 74 | 75  | 87  | 133 | 118 | 128 | 116              | 117              | 140              | 120              | 84  | 71                | 64              | 64                | 64              | 60 |
| 8                                    | 63              | 68              | 66              | 67 | 37               | 24              | 21 | 48 | 72 | 86  | 94  | 102 | 110 | 112 | 110              | 113              | 101              | 88               | 85  | 75                | 63              | 57                | 56              | 54 |
| 9                                    | 50              | 52              | 49              | 54 | 38               | 28              | 28 | 52 | 71 | 88  | 87  | 90  | 112 | 115 | 104              | 96               | 101              | 99               | 78  | 69                | 67              | 66                | 63              | 62 |
| 10                                   | 54              | 50              | 50              | 48 | 47               | 30              | 31 | 56 | 73 | 88  | 99  | 92  | 98  | 105 | 112              | 91               | 79               | 87               | 93  | 78                | 74              | 60                | 52              | 46 |
| 11                                   | 44              | 43              | 46              | 50 | 34               | 30              | 30 | 54 | 74 | 85  | 99  | 106 | 112 | 118 | 120              | 111              | 97               | 86               | 84  | 87                | 87              | 60                | 59              | 69 |
| 12                                   | 68              | 54              | 63              | 70 | 45               | 30              | 30 | 50 | 81 | 112 | 105 | 86  | 99  | 117 | 129              | 142              | 130              | 106              | 104 | 98                | 83              | 60                | 45              | 42 |
| 13                                   | 40              | 42              | 40              | 38 | 36               | 35              | 38 | 67 | 65 | 81  | 90  | 105 | 111 | 124 | 123              | 114              | 118              | 100              | 88  | 92                | 90              | 68                | 55              | 50 |
| 14                                   | 46              | 44              | 42              | 41 | 41               | 41              | 28 | 56 | 72 | 76  | 83  | 87  | 118 | 141 | 154              | 152              | 152 <sup>R</sup> | 148              | 139 | 104 <sup>JR</sup> | 90              | 86                | 81              | 66 |
| 15                                   | 57              | 57              | 57              | 64 | 66 <sup>JR</sup> | 45 <sup>H</sup> | 31 | 58 | 79 | 75  | 86  | 86  | 92  | 110 | 113              | 126              | 140              | 138              | 129 | 114               | 92              | 73                | 59              | 43 |
| 16                                   | 40              | 50              | 72              | 58 | 44               | 36              | 22 | 51 | 68 | 74  | 87  | 106 | 92  | 116 | 120              | 100              | 91               | 91               | 104 | 106               | 73              | 58                | 53              | 54 |
| 17                                   | 55              | 60              | 42              | 31 | 28               | 28              | 28 | 56 | 78 | 81  |     |     |     |     |                  |                  |                  |                  |     |                   |                 |                   |                 |    |
| 18                                   | 55              | 48              | 34              | 34 | 31               | 32              | 36 | 60 | 62 | 72  | 96  | 98  | 108 | 112 | 111              | 112              | 113              | 113              | 100 | 86                | 78              | 72                | 56              | 50 |
| 19                                   | 48              | 48              | 48              | 42 | 23               | 23              | 26 | 53 | 87 | 103 | 83  | 83  | 102 | 108 | 102              | 94               | 97               | 102              | 103 | 77                | 76              | 69                | 58              | 56 |
| 20                                   | 54              | 45              | 42              | 47 | 31               | 30              | 34 | 52 | 65 | 92  | 108 | 99  | 101 | 105 | 102              | 92               | 92               | 98               | 97  | 85                | 51              | 48                | 48              | 49 |
| 21                                   | 51              | 53              | 46              | 35 | 34               | 34              | 30 | 53 | 76 | 92  | 96  | 115 | 126 | 119 | 107              | 95               | 95               | 103              | 98  | 96                | 78              | 53                | 51              | 48 |
| 22                                   | 47              | 45              | 46              | 43 | 35               | 24              | 26 | 52 | 73 | 85  | 89  | 110 | 125 | 129 | 120              | 108              | 92               | 84               | 87  | 68                | 51              | 46                | 42              | 40 |
| 23                                   | 40              | 42              | 41              | 41 | 44               | 35              | 27 | 53 | 63 | 76  | 85  | 99  | 110 | 122 | 144              | 147              | 147              | 152 <sup>R</sup> | 138 | 114               | 98              | 88                | 78              | 78 |
| 24                                   | 85              | 86              | 77              | 53 | 34               | 29              | 30 | 56 | 74 | 85  | 76  | 81  | 92  | 107 | 130              | 112              | 97               | 90               | 94  | 77                | 72              | 40                | 37              | 36 |
| 25                                   | 43 <sup>F</sup> | 46 <sup>F</sup> | 48 <sup>F</sup> | 47 | 44               | 41              | 32 | 55 | 64 | 76  | 80  | 88  | 105 | 125 | 144 <sup>R</sup> | 158 <sup>R</sup> | 160 <sup>R</sup> | 154              | 123 | 105               | 112             | 85                | 72              | 70 |
| 26                                   | 68 <sup>F</sup> | 74 <sup>F</sup> | 69 <sup>F</sup> | 66 | 54               | 46              | 40 | 58 | 62 | 70  | 75  | 76  | 94  | 106 | 113              | 118              | 109              | 108              | 114 | 83                | 51              | 45                | 43              | 44 |
| 27                                   | 45              | 47              | 48              | 47 | 44               | 33              | 32 | 56 | 68 | 78  | 76  | 91  | 113 | 132 | 146              | 150              | 146              | 141              | 112 | 93                | 62              | 58                | 57              | 48 |
| 28                                   | 43              | 42              | 43              | 44 | 38               | 38              | 38 | 53 | 63 | 78  | 84  | 98  | 112 | 125 | 130              | 119              | 109              | 99               | 102 | 73                | 62              | 53                | 52              | 52 |
| 29                                   | 48              | 49              | 46              | 48 | 44               | 37              | 36 | 62 | 77 | 83  | 73  | 82  | 97  | 119 | 128              | 107              | 88               | 87               | 90  | 79                | 59              | 54                | 47              | 48 |
| 30                                   | 53              | 51              | 46              | 38 | 36               | 39 <sup>F</sup> | 45 | 55 | 68 | 69  | 73  | 82  | 88  | 93  | 99               | 100              | 96               | 97               | 103 | 99                | 80              | 45                | 39              | 40 |
| 31                                   | 42              | 42              | 43              | 38 | 37               | 40              | 43 | 60 | 66 | 69  | 74  | 86  | 100 | 108 | 113              | 118              | 130              | 130              | 130 | 124               | 96              | 72                | 51              | 46 |
|                                      | 00              | 01              | 02              | 03 | 04               | 05              | 06 | 07 | 08 | 09  | 10  | 11  | 12  | 13  | 14               | 15               | 16               | 17               | 18  | 19                | 20              | 21                | 22              | 23 |
| CNT                                  | 31              | 31              | 31              | 31 | 31               | 31              | 31 | 31 | 31 | 31  | 30  | 30  | 30  | 30  | 30               | 30               | 30               | 31               | 31  | 31                | 31              | 31                | 31              | 31 |
| MED                                  | 48              | 48              | 47              | 47 | 41               | 35              | 30 | 53 | 71 | 78  | 86  | 92  | 104 | 116 | 118              | 114              | 107              | 100              | 102 | 87                | 78              | 60                | 56              | 50 |
| U Q                                  | 55              | 53              | 50              | 53 | 45               | 39              | 36 | 56 | 74 | 85  | 92  | 102 | 112 | 122 | 129              | 126              | 130              | 129              | 114 | 104               | 90              | 73                | 66              | 62 |
| L Q                                  | 43              | 44              | 42              | 41 | 35               | 30              | 28 | 52 | 65 | 72  | 76  | 86  | 98  | 108 | 110              | 100              | 95               | 91               | 88  | 77                | 64              | 54                | 48              | 46 |

MAR. 2016 f<sub>o</sub>F<sub>2</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

MAR. 2016 f<sub>o</sub>F<sub>1</sub> (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<br>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   | U   | L   | L   |     | L   | L   | U   | L   | L  |    |    |    |    |    |
| 2      |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | U   | L   | L  |    |    |    |    |    |
| 3      |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | U   | L   | L  |    |    |    |    |    |
| 4      |    |    |    |    |    |    |    | 184 | 280 |     | L   | U   | L   | L   |     | L   | U   | L   | L  |    |    |    |    |    |
| 5      |    |    |    |    |    |    |    |     |     |     | U   | L   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 6      |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 7      |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | U   | L   | L  |    |    |    |    |    |
| 8      |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | U   | L   | L  |    |    |    |    |    |
| 9      |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 10     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 11     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 12     |    |    |    |    |    |    |    |     |     |     | L   | L   | L   |     | L   | A   | A   | L   | L  |    |    |    |    |    |
| 13     |    |    |    |    |    |    |    |     |     |     | L   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 14     |    |    |    |    |    |    |    |     | L   | L   | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 15     |    |    |    |    |    |    |    |     | L   | L   | U   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 16     |    |    |    |    |    |    |    |     | L   | U   | L   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 17     |    |    |    |    |    |    |    |     |     |     | L   | C   | C   |     | C   | C   | C   | C   | L  |    |    |    |    |    |
| 18     |    |    |    |    |    |    |    |     |     |     | L   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 19     |    |    |    |    |    |    |    |     | L   | L   | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 20     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 21     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   |     | L   | U   | L   | L   | L  |    |    |    |    |    |
| 22     |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 23     |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 24     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   |     | U   | L   | L   | A   | A  |    |    |    |    |    |
| 25     |    |    |    |    |    |    |    |     |     |     | L   | L   | L   |     | A   | A   | A   | A   | L  |    |    |    |    |    |
| 26     |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 27     |    |    |    |    |    |    |    |     | L   | L   | U   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
| 28     |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 29     |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   |     | L   | L   | L   | L  |    |    |    |    |    |
| 30     |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   |     | L   | L   | L   | L  |    | L  |    |    |    |
| 31     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   |     | L   | L   | L   | L   | L  |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 2   | 2   | 1   | 16  | 26  | 28  | 25  | 24  | 15  | 14  | 1   |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 204 | 318 | 380 | 480 | 492 | 500 | 500 | 492 | 480 | 456 | 408 |    |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |    |     |     |     | U   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    |     |     |     | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |

MAR. 2016 f<sub>o</sub>F<sub>1</sub> (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



IONOSPHERIC DATA STATION Okinawa

MAR.2016 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<br>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      |    |    |    |    |    |    |    | 184 | 240 | 300 | 332 | 360 | 360 | 364 | 352 | 332 | A   | 272 | 192 | B   |    |    |    |    |
| 2      |    |    |    |    |    |    |    | 180 | 244 | 300 | 324 | 356 | 372 | 364 | 356 | 336 | 304 | 260 | 180 | B   |    |    |    |    |
| 3      |    |    |    |    |    |    |    | 172 | 224 | 292 | 320 | 368 | 376 | 376 | 360 | 348 | 312 | 272 | A   |     |    |    |    |    |
| 4      |    |    |    |    |    |    |    | A   | 220 | 296 | 348 | 360 | 368 | 360 | 340 | U A | A   | A   | A   | A   |    |    |    |    |
| 5      |    |    |    |    |    |    |    | 196 | 244 | 280 | 332 | 360 | U A | 372 | 380 | 360 | 340 | U A | A   | A   | A  |    |    |    |
| 6      |    |    |    |    |    |    |    | 176 | 256 | 304 | 340 | 352 | 356 | 360 | 332 | 328 | 308 | 272 | 192 | B   |    |    |    |    |
| 7      |    |    |    |    |    |    |    | A   | 248 | 292 | 336 | 344 | 344 | U A | U A | A   | 308 | 264 | 168 | B   |    |    |    |    |
| 8      |    |    |    |    |    |    |    | 196 | 236 | 288 | 316 | 364 | 364 | 364 | 348 | A   | A   | 268 | 180 | B   |    |    |    |    |
| 9      |    |    |    |    |    |    |    | A   | 256 | 292 | 324 | 340 | 384 | A   | A   | 336 | 308 | 260 | 188 | B   |    |    |    |    |
| 10     |    |    |    |    |    |    |    | 180 | A   | A   | A   | 364 | 380 | 380 | 368 | 340 | 312 | 268 | A   | A   |    |    |    |    |
| 11     |    |    |    |    |    |    |    | 200 | 260 | 304 | 328 | 352 | 364 | 372 | 360 | 344 | 308 | A   | A   | B   |    |    |    |    |
| 12     |    |    |    |    |    |    |    | 188 | 252 | 304 | 336 | 360 | 372 | 372 | 360 | 340 | 308 | 264 | A   | B   |    |    |    |    |
| 13     |    |    |    |    |    |    |    | 176 | 256 | 292 | 328 | A   | 356 | 364 | 360 | 340 | 304 | A   | A   | A   |    |    |    |    |
| 14     |    |    |    |    |    |    |    | 188 | 264 | 304 | 324 | 340 | 348 | 348 | 356 | 328 | 308 | A   | A   | B   |    |    |    |    |
| 15     |    |    |    |    |    |    |    | 184 | 272 | 308 | 320 | 352 | 380 | 388 | 376 | 340 | 304 | 264 | A   | B   |    |    |    |    |
| 16     |    |    |    |    |    |    |    | A   | 260 | 300 | 344 | 340 | 340 | 372 | 356 | 340 | 320 | 272 | A   | B   |    |    |    |    |
| 17     |    |    |    |    |    |    |    | A   | 252 | 300 | C   | C   | C   | C   | C   | C   | C   | A   | 184 | B   |    |    |    |    |
| 18     |    |    |    |    |    |    | B  | 220 | 268 | 300 | 328 | A   | 360 | A   | 352 | 352 | 316 | 264 | 188 | A   |    |    |    |    |
| 19     |    |    |    |    |    |    | B  | 180 | 232 | 312 | 320 | 348 | 356 | 352 | 336 | 340 | U A | A   | A   | B   |    |    |    |    |
| 20     |    |    |    |    |    |    | B  | 204 | 268 | 300 | B   | 352 | U R | 368 | 348 | U A | 320 | 324 | 308 | A   | A  |    |    |    |
| 21     |    |    |    |    |    |    | A  | 208 | 248 | 304 | 328 | 332 | 348 | 360 | 344 | 324 | 312 | 260 | U A | B   |    |    |    |    |
| 22     |    |    |    |    |    |    | B  | 200 | 264 | 308 | 332 | 344 | 388 | 368 | 360 | 340 | 312 | 276 | A   | A   |    |    |    |    |
| 23     |    |    |    |    |    |    | B  | 220 | 284 | 304 | A   | A   | 356 | 416 | R   | 364 | 340 | 312 | 268 | A   | A  |    |    |    |
| 24     |    |    |    |    |    |    | B  | A   | 252 | A   | A   | A   | 348 | 356 | 340 | 332 | 312 | 268 | A   | A   |    |    |    |    |
| 25     |    |    |    |    |    |    | B  | 200 | 260 | 300 | A   | 336 | 348 | 340 | 340 | 328 | 304 | A   | A   | A   |    |    |    |    |
| 26     |    |    |    |    |    |    | A  | 192 | 268 | A   | 332 | U A | 348 | 364 | A   | A   | 348 | 324 | 268 | A   | A  |    |    |    |
| 27     |    |    |    |    |    |    | B  | 204 | 248 | 296 | 348 | R   | R   | R   | U R | 324 | 316 | 268 | A   | A   |    |    |    |    |
| 28     |    |    |    |    |    |    | B  | 224 | 268 | 308 | 348 | 364 | 364 | 384 | 372 | 352 | 316 | 272 | 200 | B   |    |    |    |    |
| 29     |    |    |    |    |    |    | B  | 184 | 280 | 320 | 344 | 356 | 372 | 392 | 360 | A   | A   | A   | A   | A   |    |    |    |    |
| 30     |    |    |    |    |    |    | B  | A   | 280 | A   | A   | 348 | 360 | 368 | A   | 336 | 308 | 276 | A   | A   |    |    |    |    |
| 31     |    |    |    |    |    |    | B  | 192 | 264 | 300 | 328 | 364 | 368 | 364 | 356 | 328 | R   | 308 | 268 | 204 | 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    |    |    |    |    |    |    |    | 24  | 30  | 27  | 24  | 26  | 30  | 27  | 27  | 27  | 26  | 22  | 12  |     |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 192 | 256 | 300 | 330 | 352 | 364 | 364 | 356 | 340 | 308 | 268 | 188 |     |    |    |    |    |
| U Q    |    |    |    |    |    |    |    | 202 | 268 | 304 | 338 | 360 | 372 | 376 | 360 | 340 | 312 | 272 | 194 |     |    |    |    |    |
| L Q    |    |    |    |    |    |    |    | 182 | 248 | 296 | 324 | 344 | 356 | 360 | 340 | 328 | 308 | 264 | 182 |     |    |    |    |    |

MAR.2016 foE (0.01MHz)



IONOSPHERIC DATA STATION Okinawa

MAR.2016 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<br>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 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G    |      |      |      |      | G 26 | 38   | 31   | 21   | G 16 | E 14 | B 13 | E 13 | B 13 | E 13 |
| 2      | E 13 | B 24 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | 26   | G 26 | 40   | 44   | 44   | 41   | 39   | 36   | 29   | G 14 | E 14 | B 13 | E 13 | B 13 | E 13 |
| 3      | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G    | G 38 | 40   | 40   | 42   | 41   |      | 32   |      | G 20 | E 14 | B 13 | E 28 | B 13 | E 13 |
| 4      | 17   | E 13 | B 17 | E 13 | B 13 | E 13 | B 13 | E 13 | G    | 15   | G 16 | 34   | 36   | 38   | G 44 | 38   | 38   | 32   | 28   | 22   | 28   | 17   | 21   | E 13 |
| 5      | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | 27   | G 39 | 40   | 45   | 43   | 41   | 38   | 39   | 30   | 22   | 16   | E 13 | B 18 | 18   | 31   |
| 6      | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G    | G 39 | 40   | 44   | 40   | 39   | 37   | G 28 |      | G 14 | E 13 | B 13 | E 13 | B 18 | 13   |
| 7      | E 13 | B 13 | 27   | 17   | E 13 | B 13 | E 14 | B 23 | 27   | 32   | 37   | 40   | 39   | 40   | 36   | 36   | G 19 | G 14 | E 13 | B 13 | E 13 | B 13 | E 13 |      |
| 8      | 17   | E 13 | B 13 | 18   | E 13 | B 13 | E 13 | B 13 | G    | 28   | G 24 | 25   | 29   | G 37 | 35   | 32   | G 14 | G 13 | E 13 | B 13 | E 13 | B 13 | E 13 |      |
| 9      | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G 19 | G 43 | 39   | 38   | 31   | 29   | 23   | G 16 | G 14 | E 13 | B 13 | E 13 | B 13 | E 13 |      |
| 10     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | 20   | 27   | 34   | 36   | 42   | 43   | 44   | 43   | 33   | 34   | 28   | 19   | E 13 | B 13 | E 13 |
| 11     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G 19 | G 21 | G 38 | 40   | 39   | 44   | 46   | 36   | 27   | 18   | 14   | E 13 | B 13 | E 13 | B 13 |
| 12     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 14 | B 27 | 34   | 36   | 40   | 46   | 47   | 49   | 48   | 38   | 32   | 30   | 14   | E 13 | B 13 | E 13 | B 13 |      |
| 13     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | 28   | 37   | 36   | 37   | 40   | 29   | 41   | 39   | 35   | 31   | 24   | 19   | E 13 | B 13 | E 13 |
| 14     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G 14 | G 36 | G 36 | G 39 | G 43 | G 42 | G 40 | G 37 | G 34 | G 31 | G 21 | E 13 | B 13 | E 13 | B 13 |
| 15     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | 22   | G 24 | G 27 | G 41 | G 43 | G 39 | G 36 | G 33 | G 29 | G 22 | E 14 | 20   | 21   | E 13 | B 13 |
| 16     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G 23 | G 37 | G 41 | G 39 | G 37 | G 35 | G 44 | G 32 | G 13 | G 13 | E 13 | B 13 | E 13 | B 13 |      |
| 17     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | 22   | 28   | 33   | C    | C    | C    | C    | C    | C    | 28   | 21   | 14   | E 13 | B 13 | E 13 |
| 18     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G 27 | G 36 | G 39 | G 40 | G 40 | G 41 | G 36 | G 34 | G 32 | G 44 | E 13 | B 13 | E 13 | B 13 |      |
| 19     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | 22   | 27   | 21   | 34   | G 29 | G 28 | G 37 | G 37 | G 34 | G 30 | 21   | E 14 | B 14 | E 13 | B 13 |
| 20     | E 13 | B 26 | E 13 | B 13 | E 13 | B 13 | E 14 | B 18 | 38   | G 38 | G 38 | G 41 | G 39 | G 35 | G 34 | G 31 | G 24 | G 14 | E 20 | B 18 | E 13 | B 13 | E 13 |      |
| 21     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 20 | B 27 | 32   | 34   | G 40 | G 40 | G 40 | G 34 | G 31 | G 24 | G 14 | E 13 | B 13 | E 13 | B 13 | E 13 |      |      |
| 22     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 14 | B 28 | 32   | G 42 | G 39 | G 39 | G 36 | G 33 | G 29 | G 23 | G 17 | E 13 | B 13 | E 13 | B 13 | E 13 |      |      |
| 23     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 14 | B 33 | 35   | 38   | 39   | 45   | 44   | 40   | 36   | 31   | 32   | 41   | 28   | 26   | E 32 | B 13 | E 13 |      |
| 24     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 24 | 30   | 35   | 38   | 38   | 39   | 39   | 39   | 45   | 44   | 58   | 43   | 37   | 20   | 25   | E 13 | B 13 |
| 25     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 21 | 32   | 38   | 47   | 51   | 45   | 55   | 51   | 48   | 38   | 39   | 34   | 24   | 20   | 28   | 20   | 20   |
| 26     | 20   | E 13 | B 13 | E 13 | B 13 | E 20 | B 21 | 18   | 20   | 33   | 27   | 38   | G 38 | 44   | 41   | 38   | 43   | 36   | 70   | 30   | 15   | E 13 | B 20 |      |
| 27     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 22 | G 44 | G 43 | G 42 | R 34 | 38   | 35   | 30   | 24   | 17   | E 13 | B 24 | 18   | E 13 | B 13 |      |      |
| 28     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 14 | B 30 | 35   | 42   | 43   | 43   | 46   | 41   | 38   | G 29 | G 24 | E 14 | B 13 | 24   | E 13 | B 13 | E 13 |      |
| 29     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 22 | 30   | 34   | 36   | 40   | 44   | 42   | 41   | 36   | 33   | 32   | 25   | 20   | E 13 | B 13 | E 13 |      |
| 30     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 21 | 20   | 33   | 35   | 37   | 38   | 39   | 43   | 35   | G 24 | G 31 | 26   | 21   | 29   | 25   | E 13 | B 13 |
| 31     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 14 | B 22 | G 38 | G 40 | G 39 | G 40 | G 32 | G 32 | G 26 | G 14 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 |      |
|        | 00   | 01   | 02   | 03   | 04   | 05   | 06   | 07   | 08   | 09   | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   |
| CNT    | 31   | 31   | 31   | 31   | 31   | 31   | 31   | 31   | 31   | 31   | 30   | 30   | 30   | 30   | 30   | 30   | 30   | 31   | 31   | 31   | 31   | 31   | 31   | 31   |
| MED    | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G 32 | G 36 | G 38 | G 40 | G 40 | G 40 | G 38 | G 34 | G 30 | G 23 | E 14 | B 13 | E 13 | B 13 | E 13 |
| UQ     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 14 | B 22 | 28   | 34   | 38   | 40   | 43   | 43   | 41   | 40   | 36   | 32   | 28   | 20   | 14   | 21   | 13   | 13   |
| LQ     | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 | G    | G 36 | G 38 | G 39 | G 38 | G 36 | G 32 | G 28 | G 20 | G 14 | E 13 | B 13 | E 13 | B 13 | E 13 | B 13 |

MAR.2016 fbEs (0.1MHz)

## IONOSPHERIC DATA STATION Okinawa

MAR. 2016 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                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 15 | 13 | 16 | 18 | 21 | 22 | 21 | 24 | 20 | 14 | 13 | 14 | 14 | 13 | 13 | 13 | 13 |
| 2                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 16 | 20 | 23 | 24 | 24 | 24 | 21 | 15 | 13 | 14 | 14 | 13 | 13 | 13 | 13 |
| 3                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 13 | 14 | 15 | 18 | 23 | 24 | 21 | 21 | 16 | 18 | 14 | 14 | 13 | 13 | 13 | 13 |
| 4                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 13 | 14 | 16 | 20 | 22 | 21 | 16 | 20 | 18 | 15 | 15 | 14 | 13 | 13 | 13 | 13 |
| 5                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 19 | 18 | 21 | 20 | 21 | 23 | 18 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 6                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 21 | 20 | 22 | 22 | 23 | 24 | 21 | 16 | 14 | 14 | 13 | 13 | 13 | 13 |
| 7                                    | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 14 | 16 | 19 | 24 | 21 | 20 | 21 | 19 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 8                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 14 | 14 | 19 | 14 | 24 | 23 | 20 | 19 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 9                                    | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 21 | 24 | 30 | 29 | 24 | 22 | 18 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 10                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 16 | 21 | 22 | 24 | 24 | 22 | 20 | 21 | 19 | 14 | 14 | 13 | 13 | 13 | 13 |
| 11                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 18 | 24 | 25 | 23 | 22 | 22 | 15 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 12                                   | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 15 | 20 | 20 | 20 | 28 | 30 | 25 | 22 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 13                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 16 | 16 | 22 | 24 | 20 | 24 | 20 | 20 | 13 | 14 | 14 | 13 | 13 | 13 | 13 |
| 14                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 17 | 20 | 20 | 23 | 21 | 21 | 21 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 15                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 16 | 20 | 24 | 24 | 24 | 24 | 21 | 21 | 17 | 14 | 14 | 13 | 13 | 13 | 13 |
| 16                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 16 | 21 | 24 | 21 | 24 | 20 | 16 | 14 | 12 | 13 | 13 | 13 | 13 | 13 | 13 |
| 17                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 18 | C  | C  | C  | C  | C  | C  | C  | 15 | 15 | 14 | 13 | 13 | 13 | 13 |
| 18                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 20 | 21 | 22 | 23 | 24 | 20 | 12 | 14 | 14 | 13 | 13 | 13 | 13 | 13 |
| 19                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 15 | 18 | 20 | 23 | 22 | 22 | 24 | 21 | 15 | 14 | 14 | 14 | 13 | 13 | 13 |
| 20                                   | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 38 | 18 | 24 | 31 | 22 | 24 | 19 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 21                                   | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 16 | 14 | 15 | 20 | 20 | 24 | 24 | 24 | 21 | 19 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 22                                   | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 20 | 20 | 25 | 24 | 25 | 21 | 21 | 14 | 14 | 14 | 13 | 13 | 13 | 13 | 13 |
| 23                                   | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 20 | 20 | 24 | 28 | 25 | 23 | 16 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 24                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 16 | 20 | 20 | 22 | 22 | 24 | 20 | 17 | 14 | 13 | 13 | 13 | 13 | 13 | 13 |
| 25                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 21 | 22 | 30 | 24 | 22 | 23 | 18 | 13 | 15 | 14 | 13 | 13 | 13 | 13 |
| 26                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 18 | 20 | 21 | 21 | 23 | 20 | 19 | 14 | 14 | 12 | 13 | 13 | 13 | 13 | 13 |
| 27                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 15 | 20 | 21 | 21 | 25 | 24 | 20 | 17 | 14 | 13 | 14 | 13 | 13 | 13 | 13 |
| 28                                   | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 16 | 17 | 24 | 22 | 23 | 30 | 24 | 22 | 19 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| 29                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 15 | 18 | 21 | 21 | 22 | 24 | 23 | 22 | 19 | 14 | 14 | 13 | 13 | 13 | 13 | 13 |
| 30                                   | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 18 | 20 | 22 | 23 | 23 | 24 | 22 | 20 | 13 | 13 | 14 | 13 | 13 | 13 | 13 |
| 31                                   | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 14 | 20 | 21 | 32 | 24 | 20 | 22 | 14 | 13 | 13 | 14 | 13 | 13 | 13 | 13 |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT                                  | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED                                  | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 20 | 21 | 23 | 24 | 23 | 21 | 18 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| U Q                                  | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 15 | 16 | 21 | 22 | 24 | 24 | 24 | 22 | 19 | 14 | 14 | 14 | 13 | 13 | 13 | 13 |
| L Q                                  | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 18 | 20 | 22 | 22 | 21 | 20 | 15 | 13 | 14 | 14 | 13 | 13 | 13 | 13 |

MAR. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 2016 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

| $\begin{matrix} H \\ D \end{matrix}$ | 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                                    | 288              | 288              | 289              | 320 | 351 | 385                | 330              | 347 | 376 | 332 | 310 | 322 | 332 | 334 | 328 | 319              | 322              | 309              | 321 | 343                | 341              | 301              | 303                | 279 |
| 2                                    | 278              | 272              | 270              | 281 | 321 | 341                | 335              | 348 | 356 | 355 | 314 | 328 | 315 | 338 | 358 | 308              | 316              | 329              | 321 | 329                | 317              | 296              | 302                | 293 |
| 3                                    | 290              | 310              | 311              | 303 | 353 | 308                | 316              | 374 | 367 | 341 | 327 | 327 | 314 | 319 | 316 | 325              | 345              | 336              | 346 | 312                | 295 <sup>R</sup> | 305              | 293                | 301 |
| 4                                    | 302              | 293              | 300              | 324 | 357 | 348                | 332              | 352 | 347 | 341 | 330 | 325 | 311 | 315 | 311 | 330              | 325              | 321              | 329 | 321                | 323              | 316 <sup>R</sup> | 250 <sup>J R</sup> | 264 |
| 5                                    | 290              | 297              | 306              | 294 | 334 | 326                | 315              | 356 | 365 | 334 | 330 | 324 | 314 | 305 | 330 | 337              | 348              | 358              | 350 | 315                | 282              | 298              | 289                | 313 |
| 6                                    | 280              | 292              | 305              | 299 | 331 | 335                | 302              | 341 | 359 | 339 | 323 | 324 | 319 | 321 | 332 | 341              | 327              | 346              | 333 | 318                | 324              | 294              | 292                | 286 |
| 7                                    | 270              | 289              | 317              | 311 | 294 | 338                | 272              | 309 | 372 | 329 | 291 | 336 | 311 | 314 | 298 | 289              | 320              | 335              | 339 | 288                | 278              | 302              | 294                | 280 |
| 8                                    | 281              | 317              | 334              | 358 | 360 | 314                | 276              | 335 | 340 | 336 | 331 | 317 | 325 | 321 | 317 | 336              | 336              | 331              | 341 | 321                | 316              | 295              | 303                | 296 |
| 9                                    | 292              | 298              | 320              | 331 | 388 | 320                | 297              | 347 | 343 | 354 | 332 | 292 | 317 | 333 | 322 | 312              | 331              | 346              | 347 | 314                | 301              | 288              | 307                | 322 |
| 10                                   | 299              | 290              | 298              | 317 | 370 | 300                | 297              | 343 | 342 | 329 | 334 | 324 | 309 | 310 | 337 | 350              | 332              | 325              | 349 | 323                | 309              | 309              | 312                | 292 |
| 11                                   | 284              | 294              | 297              | 333 | 370 | 296                | 297              | 342 | 352 | 327 | 332 | 321 | 308 | 323 | 314 | 330              | 317              | 329              | 317 | 313                | 348              | 303              | 287                | 289 |
| 12                                   | 300              | 262              | 297              | 351 | 366 | 306                | 285              | 320 | 318 | 338 | 359 | 332 | 306 | 312 | 316 | 324              | 328              | 316              | 327 | 297                | 331              | 299              | 293                | 292 |
| 13                                   | 296              | 305              | 309              | 306 | 294 | 276                | 296              | 386 | 369 | 328 | 320 | 318 | 324 | 320 | 328 | 317              | 323              | 320              | 335 | 328                | 298              | 303              | 309                | 316 |
| 14                                   | 309              | 293              | 302              | 301 | 332 | 353                | 310              | 361 | 357 | 344 | 339 | 294 | 304 | 314 | 320 | 313              | 325 <sup>R</sup> | 327              | 347 | 319 <sup>J R</sup> | 298              | 295              | 313                | 288 |
| 15                                   | 274              | 282              | 290              | 272 | 324 | 332 <sup>J R</sup> | 298              | 356 | 358 | 340 | 331 | 336 | 294 | 309 | 299 | 300              | 317              | 330              | 329 | 332                | 305              | 300              | 293                | 260 |
| 16                                   | 270              | 288              | 280              | 315 | 360 | 352                | 369 <sup>H</sup> | 349 | 337 | 331 | 301 | 332 | 291 | 315 | 327 | 327              | 309              | 306              | 323 | 342                | 321              | 302              | 295                | 298 |
| 17                                   | 309              | 350              | 364              | 314 | 312 | 322                | 294              | 330 | 367 | 365 |     |     |     |     |     |                  |                  |                  |     |                    |                  |                  |                    |     |
| 18                                   | 325              | 346              | 315              | 310 | 290 | 290                | 338              | 382 | 357 | 318 | 329 | 312 | 322 | 315 | 307 | 314              | 326              | 335              | 338 | 332                | 324              | 334              | 328                | 293 |
| 19                                   | 291              | 306              | 340              | 378 | 326 | 306                | 297              | 326 | 344 | 357 | 348 | 316 | 320 | 327 | 334 | 329              | 328              | 333              | 345 | 328                | 308              | 334              | 293                | 316 |
| 20                                   | 318              | 310              | 301              | 347 | 297 | 314                | 329              | 361 | 317 | 319 | 337 | 315 | 308 | 321 | 316 | 327              | 323              | 337              | 354 | 369                | 289              | 285              | 286                | 302 |
| 21                                   | 307              | 330              | 343              | 310 | 284 | 277                | 260              | 335 | 341 | 330 | 312 | 318 | 324 | 304 | 335 | 311              | 319              | 335              | 336 | 341                | 343              | 294              | 292                | 297 |
| 22                                   | 297              | 310              | 315              | 322 | 358 | 332                | 303              | 345 | 356 | 340 | 318 | 323 | 320 | 330 | 322 | 330              | 335              | 342              | 359 | 337                | 314              | 313              | 293                | 290 |
| 23                                   | 286              | 292              | 303              | 307 | 355 | 371                | 307              | 365 | 362 | 340 | 325 | 322 | 317 | 306 | 317 | 312              | 323              | 333              | 340 | 341                | 329              | 327              | 285                | 268 |
| 24                                   | 305              | 310              | 307              | 363 | 348 | 311                | 304              | 338 | 357 | 351 | 328 | 310 | 285 | 293 | 331 | 330              | 322              | 332              | 351 | 346                | 355              | 316              | 264                | 265 |
| 25                                   | 291 <sup>F</sup> | 299 <sup>F</sup> | 327 <sup>F</sup> | 331 | 327 | 347                | 338              | 377 | 346 | 340 | 328 | 308 | 304 | 312 | 306 | 324 <sup>R</sup> | 337 <sup>R</sup> | 345 <sup>R</sup> | 334 | 314                | 334              | 339              | 304                | 311 |
| 26                                   | 295 <sup>F</sup> | 305 <sup>F</sup> | 316 <sup>F</sup> | 325 | 341 | 340                | 337              | 367 | 366 | 343 | 346 | 307 | 306 | 316 | 315 | 326              | 323              | 329              | 352 | 366                | 325              | 300              | 298                | 290 |
| 27                                   | 294              | 296              | 297              | 327 | 312 | 337                | 332              | 361 | 358 | 368 | 336 | 304 | 317 | 312 | 316 | 320              | 330              | 347              | 345 | 337                | 303              | 288              | 317                | 313 |
| 28                                   | 287              | 277              | 294              | 318 | 292 | 316                | 320              | 374 | 341 | 328 | 299 | 288 | 301 | 313 | 320 | 330              | 332              | 337              | 349 | 341                | 299              | 272              | 301                | 311 |
| 29                                   | 295              | 304              | 305              | 317 | 340 | 327                | 318              | 345 | 353 | 363 | 323 | 302 | 285 | 312 | 333 | 336              | 313              | 325              | 338 | 339                | 315              | 317              | 284                | 277 |
| 30                                   | 304              | 331              | 338              | 311 | 273 | 300 <sup>F</sup>   | 358              | 367 | 357 | 353 | 332 | 318 | 312 | 308 | 307 | 318              | 316              | 322              | 334 | 346                | 353              | 354              | 277                | 289 |
| 31                                   | 289              | 300              | 326              | 308 | 287 | 317                | 343              | 368 | 361 | 356 | 322 | 304 | 306 | 315 | 314 | 312              | 320              | 331              | 324 | 337                | 343              | 288              | 283                | 289 |
|                                      | 00               | 01               | 02               | 03  | 04  | 05                 | 06               | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15               | 16               | 17               | 18  | 19                 | 20               | 21               | 22                 | 23  |
| CNT                                  | 31               | 31               | 31               | 31  | 31  | 31                 | 31               | 31  | 31  | 31  | 30  | 30  | 30  | 30  | 30  | 30               | 30               | 31               | 31  | 31                 | 31               | 31               | 31                 | 31  |
| MED                                  | 292              | 298              | 306              | 317 | 332 | 322                | 310              | 349 | 357 | 340 | 328 | 318 | 312 | 315 | 318 | 324              | 324              | 331              | 339 | 332                | 316              | 301              | 293                | 292 |
| U Q                                  | 302              | 310              | 320              | 331 | 357 | 340                | 332              | 367 | 362 | 353 | 332 | 324 | 319 | 321 | 330 | 330              | 331              | 337              | 347 | 341                | 331              | 316              | 303                | 311 |
| L Q                                  | 286              | 290              | 297              | 307 | 297 | 306                | 297              | 341 | 343 | 330 | 320 | 308 | 306 | 312 | 314 | 313              | 320              | 325              | 329 | 318                | 300              | 295              | 287                | 286 |

MAR. 2016 M(3000)F2 (0.01)

IONOSPHERIC DATA STATION Okinawa

MAR. 2016 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<br>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   | U   | L   | L   |     |     | L   | L   | U   | L  | L  |    |    |    |    |
| 2      |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | L   |     | L   | U   | L   | U  | L  | L  |    |    |    |
| 3      |    |    |    |    |    |    |    |     |     |     | L   | U   | L   | U   | L   | L   | U   | L   | L  | L  | L  |    |    |    |
| 4      |    |    |    |    |    |    |    | 432 | 453 |     | L   | U   | L   | L   |     | L   | U   | L   | L  | L  | L  |    |    |    |
| 5      |    |    |    |    |    |    |    |     |     |     | U   | L   | U   | L   | U   | L   | L   | L   | L  | L  | L  |    |    |    |
| 6      |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 7      |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   | U   | L   | L   | L   | L  | L  | L  |    |    |    |
| 8      |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   | U   | L   | L   | L   | L  | L  | L  |    |    |    |
| 9      |    |    |    |    |    |    |    |     |     | L   | L   | U   | L   | L   | U   | L   | L   | L   | L  | L  | L  |    |    |    |
| 10     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 11     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 12     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | A   | A   | L   | L  | L  | L  |    |    |    |
| 13     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 14     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 15     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 16     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 17     |    |    |    |    |    |    |    |     |     |     | L   | C   | C   | C   | C   | C   | C   | C   | C  | C  | L  |    |    |    |
| 18     |    |    |    |    |    |    |    |     |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 19     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 20     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 21     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 22     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 23     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 24     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 25     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 26     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 27     |    |    |    |    |    |    |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 28     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 29     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 30     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
| 31     |    |    |    |    |    |    |    |     |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 2   | 2   | 1   | 16  | 26  | 27  | 24  | 24  | 15  | 14  | 1   |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 433 | 434 | 421 | 378 | 379 | 378 | 370 | 366 | 365 | 368 | 389 |    |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |    |     |     |     | 390 | 387 | 385 | 378 | 372 | 376 | 374 |     |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    |     |     |     | 374 | 365 | 368 | 365 | 358 | 357 | 358 |     |    |    |    |    |    |    |

MAR. 2016 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 2016 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<br>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      |    |    |    |    |    |    |    |     | 216 | 240 | 290              | 284          | 248          | 264          | 248          | 256          | 258          | 236 |     |    |    |    |    |    |  |
| 2      |    |    |    |    |    |    |    |     |     | 216 | 264              | 268          | 270          | 264          | 236          | 254          | 276          | 256 |     |    |    |    |    |    |  |
| 3      |    |    |    |    |    |    |    |     |     | 230 | 280              | 274          | 278          | 276          | 272          | 272          | 240          | 224 |     |    |    |    |    |    |  |
| 4      |    |    |    |    |    |    |    | 222 | 218 | 268 | 268              | 252          | 298          | 290          | 284          | 242          | 246          | 240 |     |    |    |    |    |    |  |
| 5      |    |    |    |    |    |    |    |     |     |     | 266              | 264          | 282          | 264          | 266          | 248          | 244          | 218 |     |    |    |    |    |    |  |
| 6      |    |    |    |    |    |    |    |     | 236 | 248 | 262              | 270          | 270          | 258          | 256          | 246          | 258          | 236 |     |    |    |    |    |    |  |
| 7      |    |    |    |    |    |    |    |     |     | 262 | 294              | 260          | 274          | 266          | 268          | 312          | 264          | 228 |     |    |    |    |    |    |  |
| 8      |    |    |    |    |    |    |    |     |     | 256 | 260              | 278          | 266          | 268          | 270          | 254          | 250          | 242 |     |    |    |    |    |    |  |
| 9      |    |    |    |    |    |    |    |     |     | 240 | 260              | 308          | 266          | 258          | 276          | 272          | 258          | 234 |     |    |    |    |    |    |  |
| 10     |    |    |    |    |    |    |    |     | 232 | 244 | 266              | 258          | 280          | 296          | 260          | 238          | 268          | 262 |     |    |    |    |    |    |  |
| 11     |    |    |    |    |    |    |    |     | 232 | 256 | 260              | 266          | 292          | 272          | 278          | 248          | 258          | 246 |     |    |    |    |    |    |  |
| 12     |    |    |    |    |    |    |    |     |     | 250 | 226              | 266          | 292          | 284          | 280          | 266          | 232          | 234 |     |    |    |    |    |    |  |
| 13     |    |    |    |    |    |    |    |     |     | 264 | 268              | 278          | 252          | 270          | 264          | 274          | 260          | 228 |     |    |    |    |    |    |  |
| 14     |    |    |    |    |    |    |    |     | 238 | 244 | 258              | 306          | 298          | 278          | 264          | 270          | 254          | 234 |     |    |    |    |    |    |  |
| 15     |    |    |    |    |    |    |    |     | 222 | 230 | 264              | 262          | 258          | 288          | 306          | 308          | 268          | 246 |     |    |    |    |    |    |  |
| 16     |    |    |    |    |    |    |    |     | 222 | 238 | 266 <sup>L</sup> | 262          | 278          | 286          | 258          | 250          | 280          |     |     |    |    |    |    |    |  |
| 17     |    |    |    |    |    |    |    |     |     | 236 | <sup>C</sup>     | <sup>C</sup> | <sup>C</sup> | <sup>C</sup> | <sup>C</sup> | <sup>C</sup> | <sup>C</sup> | 262 |     |    |    |    |    |    |  |
| 18     |    |    |    |    |    |    |    |     |     |     | 264              | 284          | 270          | 282          | 266          | 276          | 260          | 242 |     |    |    |    |    |    |  |
| 19     |    |    |    |    |    |    |    |     | 254 | 240 | 242              | 276          | 276          | 272          | 250          | 256          | 274          | 254 |     |    |    |    |    |    |  |
| 20     |    |    |    |    |    |    |    |     |     | 278 | 252              | 262          | 276          | 270          | 268          | 258          | 274          | 254 |     |    |    |    |    |    |  |
| 21     |    |    |    |    |    |    |    |     | 248 | 262 | 266              | 280          | 260          | 244          | 244          | 284          | 270          | 256 |     |    |    |    |    |    |  |
| 22     |    |    |    |    |    |    |    |     | 238 | 262 | 266              | 270          | 268          | 244          | 262          | 256          | 248          | 248 |     |    |    |    |    |    |  |
| 23     |    |    |    |    |    |    |    |     |     | 266 | 272              | 274          | 274          | 290          | 282          | 276          | 260          | 246 |     |    |    |    |    |    |  |
| 24     |    |    |    |    |    |    |    |     | 236 | 254 | 258              | 288          | 312          | 308          | 264          | 252          | 258          |     |     |    |    |    |    |    |  |
| 25     |    |    |    |    |    |    |    |     |     | 264 | 262              | 286          | 306          | 282          | 290          | 262          | 240          |     |     |    |    |    |    |    |  |
| 26     |    |    |    |    |    |    |    |     |     | 256 | 260              | 302          | 294          | 286          | 284          | 264          | 262          |     |     |    |    |    |    |    |  |
| 27     |    |    |    |    |    |    |    |     | 240 | 236 | 270              | 290          | 268          | 270          | 272          | 262          | 256          | 230 |     |    |    |    |    |    |  |
| 28     |    |    |    |    |    |    |    |     |     | 270 | 288              | 306          | 302          | 288          | 274          | 254          | 252          | 238 |     |    |    |    |    |    |  |
| 29     |    |    |    |    |    |    |    |     | 238 | 238 | 266              | 296          | 346          | 298          | 258          | 244          | 264          | 260 |     |    |    |    |    |    |  |
| 30     |    |    |    |    |    |    |    | 210 | 238 | 244 | 272              | 282          | 292          | 296          | 294          | 280          | 272          | 272 | 240 |    |    |    |    |    |  |
| 31     |    |    |    |    |    |    |    |     | 234 | 254 | 284              | 298          | 290          | 288          | 276          | 286          | 262          | 254 |     |    |    |    |    |    |  |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10               | 11           | 12           | 13           | 14           | 15           | 16           | 17  | 18  | 19 | 20 | 21 | 22 | 23 |  |
| CNT    |    |    |    |    |    |    |    | 2   | 16  | 29  | 30               | 30           | 30           | 30           | 30           | 30           | 30           | 27  | 1   |    |    |    |    |    |  |
| MED    |    |    |    |    |    |    |    | 216 | 236 | 250 | 266              | 277          | 277          | 277          | 268          | 260          | 259          | 242 | 240 |    |    |    |    |    |  |
| U Q    |    |    |    |    |    |    |    |     | 238 | 262 | 270              | 288          | 292          | 288          | 278          | 274          | 268          | 254 |     |    |    |    |    |    |  |
| L Q    |    |    |    |    |    |    |    |     | 227 | 239 | 260              | 266          | 268          | 266          | 260          | 252          | 252          | 234 |     |    |    |    |    |    |  |

MAR. 2016 h'F2 (KM)

## IONOSPHERIC DATA STATION Okinawa

MAR. 2016 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H | 00         | 01  | 02         | 03       | 04  | 05       | 06         | 07  | 08  | 09  | 10       | 11         | 12         | 13         | 14         | 15         | 16         | 17       | 18       | 19  | 20         | 21         | 22         | 23       |
|-----|---|------------|-----|------------|----------|-----|----------|------------|-----|-----|-----|----------|------------|------------|------------|------------|------------|------------|----------|----------|-----|------------|------------|------------|----------|
| 1   |   | 284        | 286 | 254        | 244      | 214 | 186      | 210        | 218 | 204 | 212 | 210      | 236        | 214        | 204        | 184        | 206        | 212        | 218      | 224      | 204 | 190        | 176        | 208        | 238      |
| 2   |   | 276        | 262 | 250        | 266      | 242 | 208      | 208        | 224 | 222 | 204 | 190      | 204        | 240        | E A<br>256 | A          | 212        | 198        | 216      | 216      | 212 | 204        | 200        | 234        | 276      |
| 3   |   | 282        | 254 | 256        | 266      | 212 | 248      | 248        | 204 | 218 | 190 | 214      | 220        | 202        | 230        | 228        | 218        | 212        | 210      | 230      | 192 | 208        | E A<br>248 | 246        | 238      |
| 4   |   | 278        | 278 | 284        | 244      | 204 | 208      | 212        | 192 | 186 | 222 | 214      | 214        | 192        | H<br>278   | 172        | 220        | 198        | 210      | 224      | 202 | 194        | 196        | 222        | 258      |
| 5   | Q | 266        | 262 | 260        | 272      | 228 | 204      | 216        | 226 | 220 | 196 | 218      | 208        | 230        | 228        | 214        | 228        | 236        | 210      | 224      | 202 | 200        | 218        | 236        | A<br>266 |
| 6   |   | 286        | 274 | 248        | 248      | 238 | 210      | 268        | 238 | 212 | 198 | 210      | 200        | 236        | 210        | 216        | 202        | 200        | 198      | 230      | 216 | 208        | 202        | 230        | 250      |
| 7   |   | 310        | 290 | E A<br>276 | 264      | 296 | 220      | 344        | 252 | 214 | 208 | 222      | 222        | 208        | 212        | 196        | 214        | 212        | 220      | 206      | 218 | 266        | 254        | 258        | 270      |
| 8   |   | 286        | 244 | 230        | 222      | 210 | 214      | 348        | 228 | 228 | 212 | 204      | 204        | 200        | 192        | H<br>198   | 198        | 216        | 208      | 222      | 222 | 214        | 238        | 238        | 254      |
| 9   |   | 274        | 268 | 242        | 226      | 194 | 238      | 264        | 232 | 218 | 182 | 210      | 194        | 222        | 212        | 198        | 202        | 200        | 228      | 216      | 216 | 220        | 228        | 250        | 232      |
| 10  |   | 240        | 272 | 266        | Q<br>236 | 200 | 226      | 262        | 226 | 208 | 200 | H<br>178 | 240        | 216        | 244        | E A<br>242 | A          | H<br>204   | 232      | 228      | 216 | 212        | 212        | 222        | 246      |
| 11  |   | 294        | 268 | 264        | 236      | 192 | 246      | 260        | 232 | 222 | 206 | 198      | 208        | H<br>194   | H<br>190   | 246        | A          | A<br>226   | 210      | 232      | 244 | 208        | 188        | 244        | 248      |
| 12  |   | 258        | 324 | 262        | 214      | 192 | 238      | 286        | 236 | 216 | 228 | 208      | 220        | E A<br>274 | A          | A          | A          | A<br>232   | 216      | 226      | 206 | 204        | 214        | 244        | 268      |
| 13  |   | 288        | 268 | 254        | 262      | 264 | 326      | 286        | 210 | 212 | 228 | 194      | 194        | 182        | 184        | 226        | 234        | 214        | 210      | 228      | 214 | 206        | 206        | 228        | 242      |
| 14  |   | 254        | 286 | 266        | 266      | 234 | 200      | 240        | 216 | 204 | 210 | 198      | 184        | 228        | 214        | 228        | 210        | 210        | 224      | 218      | 192 | 206        | 232        | 204        | 216      |
| 15  |   | 274        | 278 | 264        | 256      | 214 | 192      | 256        | 228 | 218 | 204 | 200      | 210        | 224        | 248        | 230        | 200        | 216        | 228      | 214      | 202 | 202        | 206        | 224        | 278      |
| 16  |   | 322        | 266 | 220        | 214      | 204 | 220      | E B<br>214 | 224 | 202 | 194 | 210      | H<br>190   | 190        | 228        | 220        | 222        | 230        | 264      | 248      | 222 | 192        | 200        | 258        | 270      |
| 17  |   | 256        | 220 | 192        | 248      | 242 | 236      | 264        | 236 | 218 | 212 | C        | C          | C          | C          | C          | C          | C          | 226      | 236      | 214 | 222        | 234        | 274        | 234      |
| 18  |   | 214        | 210 | 242        | 252      | 284 | 302      | 238        | 208 | 212 | 206 | 190      | 184        | 214        | 214        | 238        | 250        | 240        | 238      | 224      | 236 | 220        | 218        | 214        | 258      |
| 19  |   | 284        | 260 | 220        | 200      | 222 | 284      | 302        | 234 | 226 | 214 | 202      | 208        | 198        | 194        | 186        | 232        | 228        | 230      | 232      | 210 | 238        | 206        | 270        | 238      |
| 20  |   | E A<br>236 | 272 | 266        | 220      | 230 | 254      | 238        | 208 | 212 | 194 | 222      | 204        | H<br>192   | A<br>214   | 208        | 204        | 210        | 218      | 226      | 206 | 210        | 264        | 288        | 280      |
| 21  |   | 258        | 232 | 208        | 250      | 288 | 318      | A<br>356   | 232 | 214 | 214 | 200      | H<br>194   | 194        | 234        | 196        | H<br>190   | 232        | 234      | 232      | 224 | 200        | 224        | 284        | 270      |
| 22  |   | 272        | 266 | 234        | 224      | 204 | 224      | 282        | 226 | 218 | 212 | 192      | 182        | 222        | 194        | 214        | 210        | 220        | 208      | 224      | 204 | 212        | 236        | 270        | 292      |
| 23  |   | 306        | 290 | 278        | 250      | 218 | 202      | 238        | 212 | 220 | 214 | 200      | 202        | 198        | 282        | 278        | 244        | A<br>244   | A<br>238 | 220      | 216 | 216        | E A<br>224 | 280        | 298      |
| 24  | Q | 254        | 238 | 212        | 196      | 212 | 248      | 258        | 226 | 222 | 210 | 202      | 196        | 194        | 188        | 210        | A          | A          | 258      | 234      | 224 | 218        | E A<br>242 | E B<br>280 | Q<br>330 |
| 25  | Q | 306        | 276 | Q<br>242   | 226      | 222 | 208      | 218        | 210 | 206 | 228 | A        | A          | E A<br>264 | A          | A          | A          | E A<br>230 | 232      | 214      | 228 | 210        | 206        | 248        | 264      |
| 26  | Q | 272        | 250 | Q<br>238   | 230      | 196 | 218      | 230        | 212 | 214 | 208 | 198      | 192        | 178        | 258        | 276        | E A<br>260 | 236        | 254      | 224      | 240 | A<br>236   | 240        | 270        | 298      |
| 27  |   | 286        | 270 | 254        | 232      | 208 | 220      | 232        | 214 | 208 | 198 | 198      | E A<br>262 | A<br>240   | 232        | H<br>192   | 220        | 224        | 224      | 214      | 200 | 210        | A<br>266   | 238        | 248      |
| 28  |   | 280        | 306 | 270        | 252      | 274 | 234      | 246        | 206 | 218 | 214 | 248      | 264        | 248        | A<br>240   | 220        | 210        | 220        | A<br>228 | 198      | 216 | E A<br>278 | 258        | 246        |          |
| 29  |   | 262        | 258 | 256        | 246      | 214 | 230      | 250        | 224 | 216 | 214 | 196      | 196        | 252        | 234        | A<br>242   | 212        | 210        | 226      | A<br>234 | 220 | 210        | 224        | 278        | 304      |
| 30  |   | 262        | 224 | 226        | 242      | 300 | Q<br>264 | 216        | 208 | 218 | 216 | 192      | 206        | 192        | 178        | E A<br>262 | 216        | 210        | 234      | 234      | 220 | 216        | 202        | 302        | 292      |
| 31  |   | 286        | 270 | 238        | 238      | 290 | 244      | 210        | 214 | 212 | 200 | 196      | 192        | 226        | 212        | 218        | H<br>194   | 226        | 230      | 234      | 218 | 200        | 196        | 244        | 282      |
|     |   | 00         | 01  | 02         | 03       | 04  | 05       | 06         | 07  | 08  | 09  | 10       | 11         | 12         | 13         | 14         | 15         | 16         | 17       | 18       | 19  | 20         | 21         | 22         | 23       |
| CNT |   | 31         | 31  | 31         | 31       | 31  | 31       | 31         | 31  | 31  | 31  | 29       | 29         | 30         | 27         | 27         | 25         | 29         | 31       | 31       | 31  | 31         | 31         | 31         | 31       |
| MED |   | 276        | 268 | 252        | 244      | 218 | 226      | 248        | 224 | 216 | 210 | 200      | 204        | 210        | 214        | 216        | 213        | 215        | 224      | 226      | 216 | 210        | 215        | 245        | 264      |
| U Q |   | 286        | 278 | 264        | 252      | 242 | 248      | 268        | 232 | 218 | 214 | 210      | 217        | 230        | 234        | 240        | 225        | 230        | 232      | 232      | 222 | 216        | 238        | 270        | 280      |
| L Q |   | 258        | 254 | 234        | 226      | 204 | 208      | 218        | 210 | 212 | 200 | 196      | 194        | 194        | 194        | 198        | 203        | 210        | 210      | 220      | 204 | 204        | 202        | 230        | 246      |

MAR. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



IONOSPHERIC DATA STATION Okinawa

MAR.2016 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<br>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      |    |    |    |    |    |    |    | 152 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | A   | 106 | 120 | B  |    |    |    |    |
| 2      |    |    |    |    |    |    |    | 146 | 108 | 106 | 112 | 108 | 108 | 108 | 108 | 108 | 112 | 112 | 114 | B  |    |    |    |    |
| 3      |    |    |    |    |    |    |    | 152 | 104 | 106 | 106 | 106 | 110 | 110 | 110 | 110 | 110 | 112 | A   |    |    |    |    |    |
| 4      |    |    |    |    |    |    |    | A   | 108 | 110 | 110 | 106 | 106 | 108 | 108 | 108 | A   | A   | A   | A  |    |    |    |    |
| 5      |    |    |    |    |    |    |    | 150 | 106 | 106 | 106 | 106 | 108 | 108 | 110 | 110 | 106 | A   | A   | A  |    |    |    |    |
| 6      |    |    |    |    |    |    |    | 168 | 110 | 108 | 106 | 106 | 106 | 106 | 106 | 106 | 108 | 112 | 112 | B  |    |    |    |    |
| 7      |    |    |    |    |    |    |    | A   | 108 | 106 | 110 | 110 | 110 | 108 | 108 | A   | 108 | 112 | 112 | B  |    |    |    |    |
| 8      |    |    |    |    |    |    |    | 154 | 106 | 106 | 106 | 112 | 112 | 108 | 108 | A   | A   | 108 | 114 | B  |    |    |    |    |
| 9      |    |    |    |    |    |    |    | A   | 108 | 108 | 108 | 108 | 110 | A   | A   | 110 | 120 | 114 | 122 | B  |    |    |    |    |
| 10     |    |    |    |    |    |    |    | 130 | A   | A   | A   | 110 | 110 | 110 | 110 | 106 | 106 | 108 | A   | A  |    |    |    |    |
| 11     |    |    |    |    |    |    |    | 138 | 116 | 112 | 108 | 108 | 108 | 108 | 110 | 110 | 110 | A   | A   | B  |    |    |    |    |
| 12     |    |    |    |    |    |    |    | 132 | 110 | 108 | 108 | 108 | 108 | 110 | 110 | 110 | 112 | 110 | A   | B  |    |    |    |    |
| 13     |    |    |    |    |    |    |    | 132 | 108 | 108 | 108 | A   | 108 | 114 | 120 | 110 | 110 | A   | A   | A  |    |    |    |    |
| 14     |    |    |    |    |    |    |    | 120 | 108 | 108 | 106 | 106 | 108 | 108 | 112 | 108 | 108 | A   | A   | B  |    |    |    |    |
| 15     |    |    |    |    |    |    |    | 126 | 106 | 106 | 106 | 118 | 112 | 112 | 112 | 112 | 112 | 110 | A   | B  |    |    |    |    |
| 16     |    |    |    |    |    |    |    | A   | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 108 | 108 | A   | B  |    |    |    |    |
| 17     |    |    |    |    |    |    |    | A   | 108 | 108 | C   | C   | C   | C   | C   | C   | C   | A   | 110 | B  |    |    |    |    |
| 18     |    |    |    |    |    |    | B  | 138 | 106 | 106 | 110 | A   | 116 | A   | 116 | 114 | 110 | 110 | 110 | A  |    |    |    |    |
| 19     |    |    |    |    |    |    | B  | 122 | 106 | 114 | 114 | 112 | 114 | 110 | 112 | 112 | 112 | A   | A   | B  |    |    |    |    |
| 20     |    |    |    |    |    |    | B  | 124 | 108 | 106 | B   | 106 | 106 | 114 | 110 | 110 | 110 | 110 | A   | A  |    |    |    |    |
| 21     |    |    |    |    |    |    | A  | 152 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 110 | 110 | 110 | B  |    |    |    |    |
| 22     |    |    |    |    |    |    | B  | 118 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | A   | A  |    |    |    |    |
| 23     |    |    |    |    |    |    | B  | 140 | 108 | A   | A   | A   | 108 | 108 | 108 | 108 | 108 | 108 | 114 | A  |    |    |    |    |
| 24     |    |    |    |    |    |    | B  | A   | 108 | A   | A   | A   | 108 | 106 | 106 | 106 | 106 | 110 | A   | A  |    |    |    |    |
| 25     |    |    |    |    |    |    | B  | 118 | 108 | 108 | A   | 106 | 110 | 106 | 106 | 106 | 108 | A   | A   | A  |    |    |    |    |
| 26     |    |    |    |    |    |    | A  | A   | 132 | 118 | 114 | 108 | 106 | A   | A   | 108 | A   | A   | A   | A  |    |    |    |    |
| 27     |    |    |    |    |    |    | B  | 128 | 106 | 108 | 108 | 108 | A   | 108 | A   | 116 | 114 | 110 | A   | A  |    |    |    |    |
| 28     |    |    |    |    |    |    | B  | 124 | 106 | 106 | 106 | 106 | 110 | 110 | 110 | 110 | 108 | 108 | 112 | B  |    |    |    |    |
| 29     |    |    |    |    |    |    | B  | 112 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | A   | A   | A   | A   | A  |    |    |    |    |
| 30     |    |    |    |    |    |    | B  | A   | 118 | A   | A   | 108 | 108 | 108 | A   | A   | 112 | 110 | A   | A  |    |    |    |    |
| 31     |    |    |    |    |    |    | B  | 110 | 108 | 108 | 108 | 108 | 112 | 110 | 108 | 108 | 108 | 108 | 108 | 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    |    |    |    |    |    |    |    | 24  | 30  | 26  | 24  | 26  | 29  | 27  | 26  | 26  | 25  | 21  | 12  |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 132 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 108 | 110 | 110 | 112 |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |    | 148 | 108 | 108 | 109 | 108 | 110 | 110 | 110 | 110 | 112 | 111 | 114 |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    | 123 | 106 | 106 | 106 | 106 | 108 | 108 | 108 | 108 | 108 | 108 | 110 |    |    |    |    |    |

MAR.2016 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

MAR. 2016 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| H<br>D | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1      | B   | B   | B   | B   | B   | B   | B   | G   | G   | 164 | 148 | 140 | 146 | 160 | 100 | 158 | 96  | 110 | 98  | B   | B   | B   | B   | B   |
| 2      | 98  | 104 | 92  | B   | 102 | 102 | B   | G   | 172 | G   | 104 | 180 | 162 | 140 | 134 | 128 | 126 | 122 | 90  | 92  | 90  | B   | B   | B   |
| 3      | B   | B   | B   | B   | B   | B   | B   | G   | G   | G   | 170 | 168 | 162 | 162 | 186 | G   | 162 | G   | 108 | B   | 108 | 106 | B   | 98  |
| 4      | 112 | 98  | 96  | 96  | 98  | 98  | 102 | 100 | 100 | 178 | 170 | 176 | G   | 172 | 112 | 112 | 112 | 104 | 104 | 104 | 106 | 96  | B   | 96  |
| 5      | 104 | 102 | 100 | 96  | 100 | B   | B   | G   | 172 | G   | 176 | 168 | 190 | 152 | 140 | 124 | 112 | 108 | 108 | 106 | 106 | 100 | 100 | 100 |
| 6      | 92  | B   | 102 | 102 | 98  | B   | 98  | G   | G   | G   | 184 | 152 | 114 | 114 | 154 | 138 | G   | 148 | G   | B   | 98  | 94  | 98  | 92  |
| 7      | 90  | B   | 96  | 96  | 98  | B   | 158 | 144 | 158 | 182 | 136 | 114 | 112 | 112 | 110 | 110 | G   | G   | 126 | B   | B   | B   | B   | B   |
| 8      | 102 | B   | B   | 96  | 98  | 98  | B   | G   | 174 | G   | 100 | 100 | 92  | G   | 120 | 112 | 106 | G   | G   | B   | B   | 96  | 94  | B   |
| 9      | B   | 122 | B   | B   | 94  | B   | B   | G   | G   | G   | G   | G   | 162 | 176 | 178 | 104 | 104 | 102 | 102 | B   | 102 | B   | B   | B   |
| 10     | B   | B   | B   | B   | B   | B   | B   | 162 | 136 | 112 | 112 | 156 | 180 | 136 | 130 | 120 | 132 | 160 | 134 | 120 | 92  | 92  | B   | B   |
| 11     | B   | B   | B   | B   | B   | B   | B   | G   | 100 | 100 | G   | 162 | 142 | 146 | 120 | 114 | 112 | 112 | 106 | B   | 90  | B   | B   | B   |
| 12     | 118 | 96  | B   | 100 | B   | B   | B   | G   | 188 | 188 | 158 | 160 | 128 | 120 | 120 | 116 | 114 | 112 | 108 | B   | B   | 98  | B   | B   |
| 13     | 94  | 94  | B   | B   | B   | B   | B   | G   | 162 | 114 | 118 | 124 | 122 | 98  | 144 | 182 | 118 | 104 | 92  | 92  | 92  | 88  | B   | B   |
| 14     | B   | B   | B   | B   | B   | B   | B   | G   | 96  | 110 | 116 | 112 | 110 | 168 | 156 | 112 | 110 | 102 | 102 | 92  | 96  | 102 | B   | 96  |
| 15     | 94  | 104 | B   | B   | B   | B   | B   | 158 | G   | G   | 102 | 100 | 162 | 148 | 162 | 158 | 146 | 170 | 108 | B   | 100 | 102 | B   | 104 |
| 16     | B   | 96  | B   | B   | B   | B   | B   | 148 | G   | G   | 186 | G   | G   | 146 | 150 | 168 | 146 | 112 | 108 | B   | B   | B   | B   | B   |
| 17     | 102 | B   | B   | B   | 140 | 142 | 136 | 150 | 148 | C   | C   | C   | C   | C   | C   | C   | C   | 112 | 168 | B   | B   | B   | B   | B   |
| 18     | B   | B   | B   | B   | B   | B   | B   | G   | G   | G   | 102 | 134 | 160 | 126 | 168 | 192 | 168 | 136 | 116 | 104 | 104 | 102 | B   | B   |
| 19     | B   | B   | B   | B   | B   | B   | B   | 142 | 126 | 104 | 126 | 102 | 102 | 102 | 116 | 114 | 112 | 104 | 104 | 104 | 98  | B   | B   | B   |
| 20     | B   | 98  | B   | B   | B   | B   | 102 | G   | G   | 96  | B   | 116 | 130 | 114 | 112 | 120 | G   | G   | 144 | 104 | 104 | B   | B   | 130 |
| 21     | 112 | 108 | 102 | 98  | 98  | 104 | 102 | G   | 160 | 140 | 136 | G   | G   | 170 | G   | G   | 162 | 120 | 110 | B   | B   | B   | B   | B   |
| 22     | B   | B   | B   | B   | B   | B   | B   | G   | 124 | 120 | G   | G   | 160 | 174 | 148 | 152 | 136 | 124 | 108 | 104 | 110 | 108 | B   | B   |
| 23     | B   | B   | B   | B   | B   | B   | B   | G   | G   | 146 | 144 | 136 | 126 | 212 | 198 | 176 | 160 | 118 | 120 | 114 | 128 | 106 | 102 | 102 |
| 24     | 106 | 104 | 90  | B   | B   | 102 | B   | 126 | 118 | 118 | 112 | 110 | 118 | 118 | 126 | 124 | 118 | 112 | 112 | 108 | 108 | 124 | 106 | B   |
| 25     | 100 | 100 | 102 | B   | B   | 108 | 104 | 116 | 110 | 112 | 108 | 108 | 106 | 110 | 108 | 108 | 110 | 110 | 108 | 108 | 108 | 102 | 102 | 100 |
| 26     | 94  | 94  | 102 | B   | 102 | 102 | 102 | 102 | 104 | 116 | 104 | 114 | G   | 100 | 194 | 164 | 150 | 122 | 114 | 106 | 104 | 104 | 108 | 92  |
| 27     | 96  | 96  | B   | B   | B   | B   | B   | 192 | G   | G   | G   | 176 | 160 | 178 | 102 | 176 | 152 | 138 | 92  | 112 | 110 | 108 | 104 | 98  |
| 28     | B   | B   | 94  | B   | B   | B   | 102 | G   | 158 | 132 | 174 | 178 | 172 | 140 | 148 | 140 | G   | 148 | 122 | 112 | 110 | 104 | 104 | 96  |
| 29     | B   | B   | B   | B   | 100 | 102 | 102 | 158 | 158 | 140 | 148 | 130 | 156 | 156 | 142 | 176 | 160 | 94  | 96  | 94  | 94  | 106 | 106 | 106 |
| 30     | 102 | B   | 102 | 108 | 106 | 106 | 100 | 102 | 108 | 108 | 108 | 120 | 128 | 126 | 116 | 174 | 98  | 194 | 92  | 108 | 108 | 108 | 108 | 108 |
| 31     | B   | B   | B   | B   | B   | B   | 106 | 150 | G   | G   | G   | 170 | 156 | 142 | 124 | G   | 186 | 118 | 114 | 92  | 108 | 90  | B   | 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    | 16  | 14  | 11  | 8   | 10  | 10  | 12  | 15  | 20  | 20  | 24  | 26  | 26  | 29  | 29  | 27  | 26  | 27  | 29  | 19  | 24  | 21  | 12  | 14  |
| MED    | 101 | 99  | 100 | 97  | 98  | 102 | 102 | 144 | 143 | 119 | 131 | 135 | 144 | 142 | 134 | 128 | 122 | 112 | 108 | 104 | 104 | 102 | 104 | 99  |
| U Q    | 105 | 104 | 102 | 101 | 100 | 106 | 106 | 158 | 161 | 147 | 164 | 168 | 162 | 165 | 155 | 168 | 152 | 136 | 115 | 108 | 108 | 106 | 107 | 104 |
| L Q    | 94  | 96  | 94  | 96  | 98  | 102 | 102 | 116 | 107 | 111 | 108 | 114 | 118 | 116 | 116 | 114 | 112 | 108 | 102 | 94  | 97  | 96  | 101 | 96  |

MAR. 2016 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H    | 00   | 01   | 02 | 03   | 04   | 05 | 06   | 07   | 08   | 09   | 10   | 11   | 12    | 13   | 14    | 15   | 16   | 17   | 18   | 19    | 20    | 21   | 22   | 23 |
|-----|------|------|------|----|------|------|----|------|------|------|------|------|------|-------|------|-------|------|------|------|------|-------|-------|------|------|----|
| 1   |      |      |      |    |      |      |    |      |      |      | H1   | H1   | H1   | HL11  | H1   | L1    | HL11 | L1   | CL11 | L1   |       |       |      |      |    |
| 2   | F1   | F4   | F1   |    | F1   | F1   |    |      |      | H1   |      | L1   | H1   | HL11  | HL11 | HL11  | C1   | CL21 | CL11 | L1   | L2    | F1    |      |      |    |
| 3   |      |      |      |    |      |      |    |      |      |      |      | HL11 | H1   | H1    | H1   | H1    |      | H1   |      | C1   |       | F1    | F4   |      | F1 |
| 4   | FF12 | FF21 | F2   | F2 | FF11 | FF11 | F2 | L1   | L1   | HL12 | HL11 | H1   |      | HCL11 | CL11 | CH11  | C1   | L1   | L1   | L4   | L4    | FQ31  | F3   |      | F1 |
| 5   | FQ11 | FQ11 | FQ11 | F2 | F1   |      |    |      | H1   |      |      | H1   | HL11 | HC11  | H1   | H1    | C1   | C1   | C1   | C2   | L1    | F1    | F3   | F2   | F5 |
| 6   | F1   |      | F1   | F1 | F2   |      | F2 |      |      |      |      | H1   | H1   | C1    | C1   | HCL11 | HC11 |      | H1   |      |       | F1    | F1   | F2   | F1 |
| 7   | F1   |      | F3   | F2 | F1   |      | F1 | H1   | H1   | H1   | HL11 | C1   | C1   | C1    | C1   | C1    |      |      |      | C1   |       |       |      |      |    |
| 8   | FQ11 |      |      | F3 | F2   | F1   |    |      | H1   |      |      | L1   | L1   | L1    |      | C1    | C1   | C1   |      |      |       |       | F1   | F1   |    |
| 9   |      | F1   |      |    | F1   |      |    | H1   |      |      |      |      |      | H1    | HC11 | HC11  | L1   | L1   | L1   | L1   |       | F1    |      |      |    |
| 10  |      |      |      |    |      |      |    | H1   | HC11 | C1   | C1   | H1   | H1   | H1    | H1   | C1    | H1   | H1   | HL11 | CL32 | F1    | F1    |      |      |    |
| 11  |      |      |      |    |      |      |    | L1   | L1   |      |      | H1   | H1   | H1    | CL11 | C1    | C1   | C1   | C1   | C1   |       | F1    |      |      |    |
| 12  | F1   | F1   |      | F1 |      |      |    | H1   | H1   | H1   | H1   | C1   | C1   | C1    | C1   | C1    | C1   | C1   | C1   | C1   |       |       | F1   |      |    |
| 13  | F1   | F1   |      |    |      |      |    | H1   | C1   | CL11 | CL11 | CL11 | CL11 | HL11  | HC11 | C1    | C1   | C1   | CL22 | L3   | L4    | F3    | F1   |      |    |
| 14  |      |      |      |    |      |      |    | LH11 | C1   | C1   | C1   | C1   | C1   | HC11  | HL11 | C1    | C1   | C1   | CL11 | CL11 | L1    | F1    | F3   |      | F2 |
| 15  | F1   | F1   |      |    |      |      |    | H1   |      |      |      | L1   | L1   | H1    | H1   | H1    | HC11 | HC11 | H1   | C1   |       | F3    | FQ31 |      | F1 |
| 16  |      | F1   |      |    |      |      |    | H2   |      |      |      | H1   |      |       | HL11 | H1    | H1   | HL11 | CL51 | C4   |       |       |      | F1   |    |
| 17  | F3   |      |      |    | F1   | F1   | H2 | H1   | H1   |      |      |      |      |       |      |       |      |      | C1   | H1   |       |       |      |      |    |
| 18  |      |      |      |    |      |      |    |      |      |      | L1   | HL11 | HL11 | CL11  | HC11 | H1    | HL11 | H2   | C3   | L8   | F1    | F1    |      |      |    |
| 19  |      |      |      |    |      |      | H2 | C1   | L1   | CL11 | L1   | L1   | L1   | CL11  | C1   | C1    | C1   | C1   | L2   | L1   | F1    |       |      |      |    |
| 20  |      | F4   |      |    |      |      | L1 |      | L1   |      |      | CL11 | H1   | C1    | C1   | C1    |      |      | HC11 | L11  | F1    |       |      | FF12 |    |
| 21  | F3   | F2   | F2   | F2 | F2   | F2   | L4 |      | H1   | H1   | H1   |      |      | H1    |      |       | H1   | C1   | C1   |      |       |       |      |      |    |
| 22  |      |      |      |    |      |      |    |      | C1   | C1   |      |      |      | H1    | H1   | H1    | H1   | H1   | C1   | C1   | L1    | F1    | F1   |      |    |
| 23  |      |      |      |    |      |      |    |      |      | HC11 | HC11 | HC11 | C1   | H1    | H1   | H1    | H1   | C1   | C1   | C1   | FF19  | FF5   | FQ91 | FQ41 |    |
| 24  | FQ11 | F1   | F1   |    | F1   |      | C2 | C1   | C1   | C1   | C1   | C1   | C1   | C1    | C1   | C1    | C1   | CL32 | CL32 | CL31 | FFQ41 | FFQ43 | FQ21 |      |    |
| 25  | F1   | F2   | F1   |    | F1   | L1   | C1 | C1   | C1   | C1   | C1   | C1   | C1   | C1    | C1   | C1    | C1   | CL21 | C5   | CL52 | F4    | F3    | F6   | F9   |    |
| 26  | FQ31 | FQ21 | F1   |    | F1   | F2   | L4 | LH11 | L1   | CL11 | LL11 | C1   |      | LH11  | HL11 | HL11  | HL12 | CL22 | CL51 | CL91 | FQ61  | F2    | FQ21 | F2   |    |
| 27  | F1   | F1   |      |    |      |      |    | H1   |      |      |      | H1   | HL11 | H1    | L1   | HL11  | HL11 | HL12 | L2   | CL21 | F1    | F4    | F3   | F2   |    |
| 28  |      |      | F1   |    |      |      | L1 |      | H1   | H1   | H1   | H1   | H1   | H1    | H1   | H1    | H1   | H1   | C1   | CL11 | FF11  | FF4   | F2   | F1   |    |
| 29  |      |      |      | F1 | F2   | L1   | H1 | H1   | H1   | H1   | H1   | H1   | HC11 | H1    | H1   | HL11  | HL11 | L3   | L3   | L4   | F3    | F1    | FQ11 | F3   |    |
| 30  | F3   |      | F3   | F1 |      | F1   | C1 | LH11 | L1   | CQ11 | C1   | C1   | C1   | C1    | CL11 | HL11  | L1   | HL12 | L4   | CL44 | FF42  | FF41  | F1   | F1   |    |
| 31  |      |      |      |    |      | L1   | H1 |      |      |      |      | H1   | H1   | H1    | C1   |       | HL11 | HL11 | CL33 | LC11 | FF11  | F1    |      |      |    |
|     |      | 00   | 01   | 02 | 03   | 04   | 05 | 06   | 07   | 08   | 09   | 10   | 11   | 12    | 13   | 14    | 15   | 16   | 17   | 18   | 19    | 20    | 21   | 22   | 23 |
| CNT |      |      |      |    |      |      |    |      |      |      |      |      |      |       |      |       |      |      |      |      |       |       |      |      |    |
| MED |      |      |      |    |      |      |    |      |      |      |      |      |      |       |      |       |      |      |      |      |       |       |      |      |    |
| U Q |      |      |      |    |      |      |    |      |      |      |      |      |      |       |      |       |      |      |      |      |       |       |      |      |    |
| L Q |      |      |      |    |      |      |    |      |      |      |      |      |      |       |      |       |      |      |      |      |       |       |      |      |    |

## f - PLOTS OF IONOSPHERIC DATA

| KEY OF f - PLOT |   |
|-----------------|---|
|                 | SPREAD  |
| ◊               | f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E          |
| ×               | f <sub>x</sub> F <sub>2</sub>   |
| *               | DOUBTFUL f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E |
| ⊗               | f <sub>b</sub> E <sub>s</sub>   |
| └               | ESTIMATED f <sub>o</sub> F <sub>1</sub>   |
| †, ‡            | f <sub>min</sub>  |
| ^               | GREATER THAN  |
| ∨               | LESS THAN   |

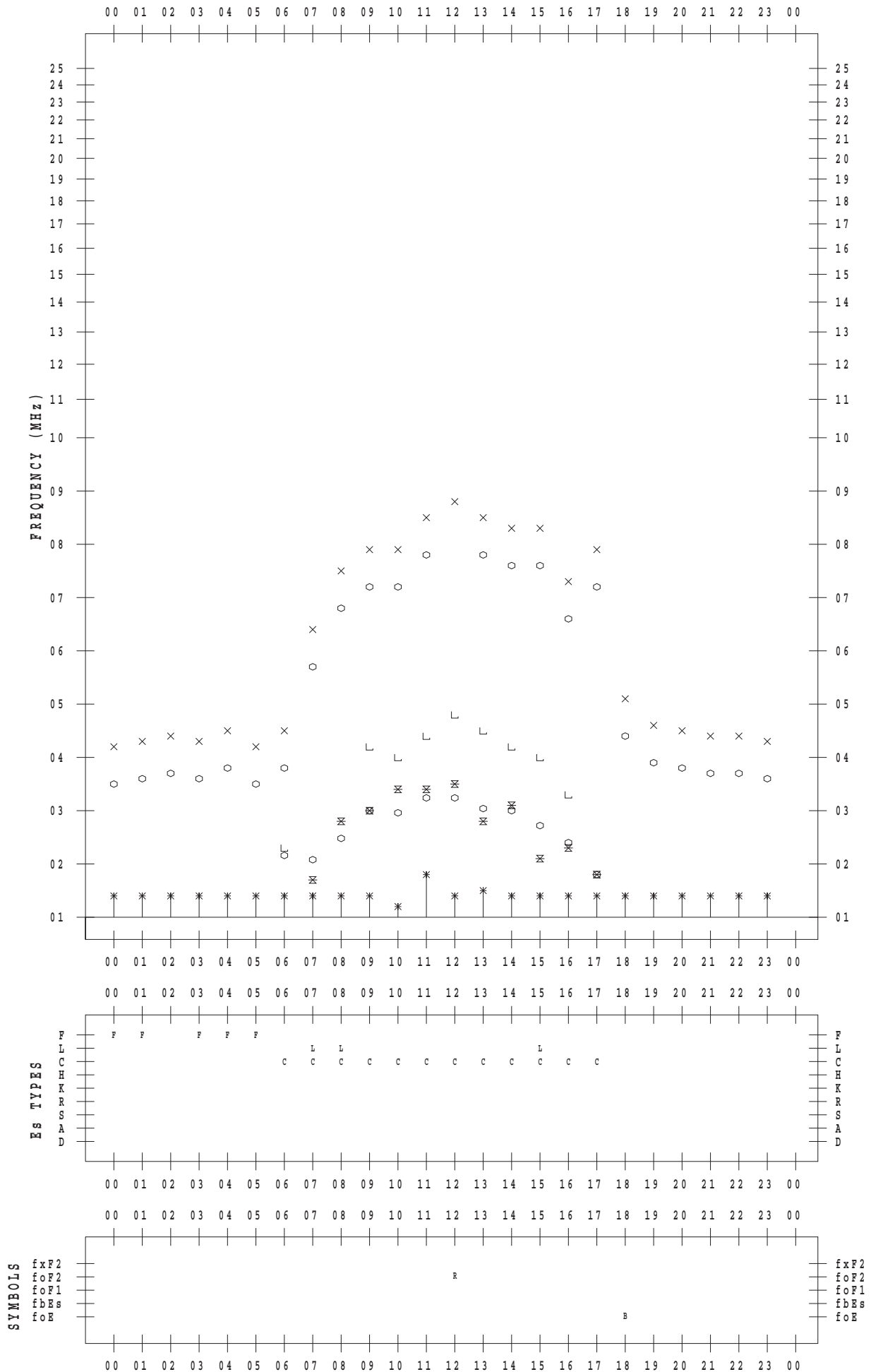
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016 / 3 / 1

135 ° E MEAN TIME



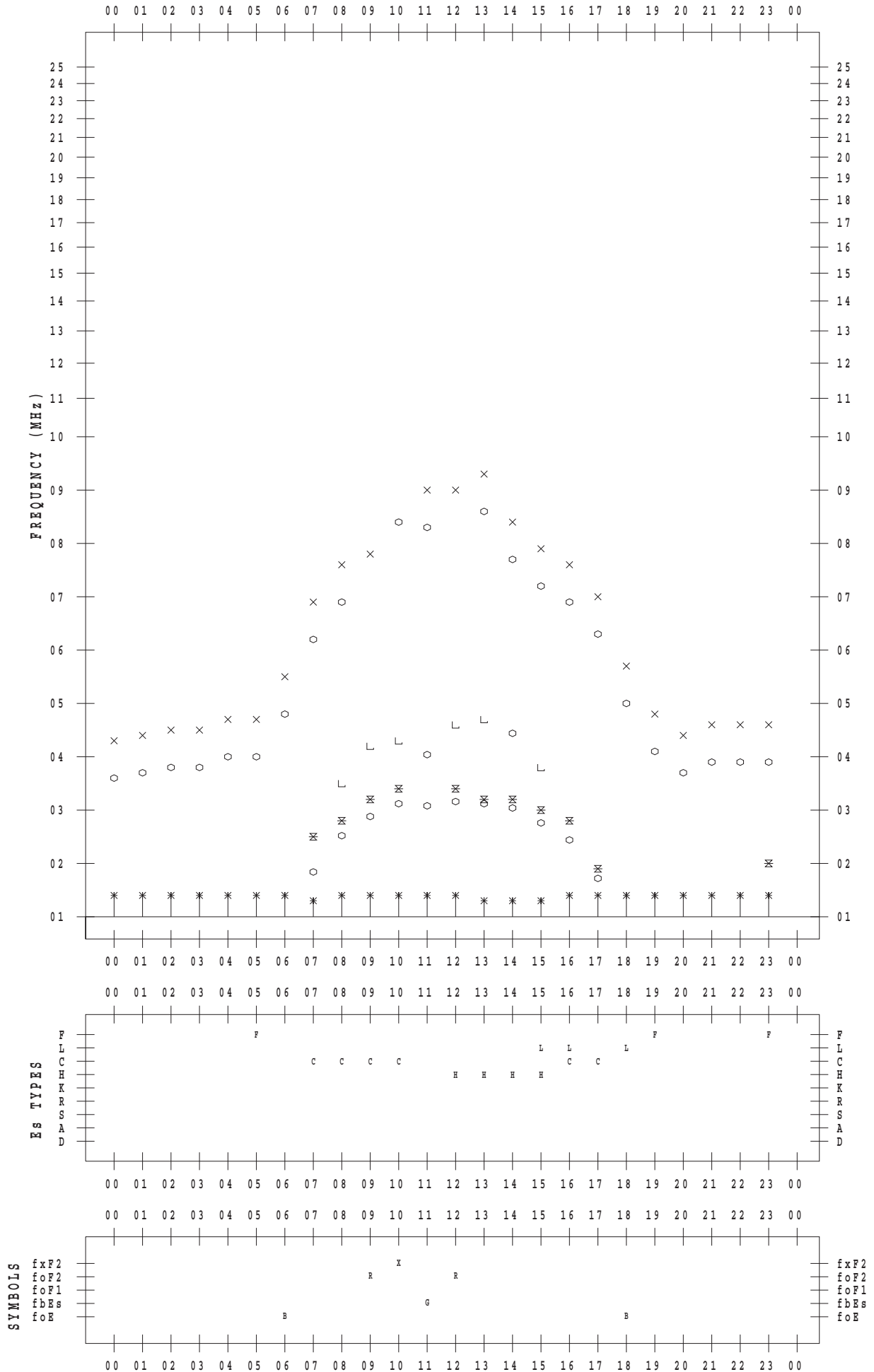
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STATION : Wakkanai

DATE : 2016 / 3 / 2

135 ° E MEAN TIME



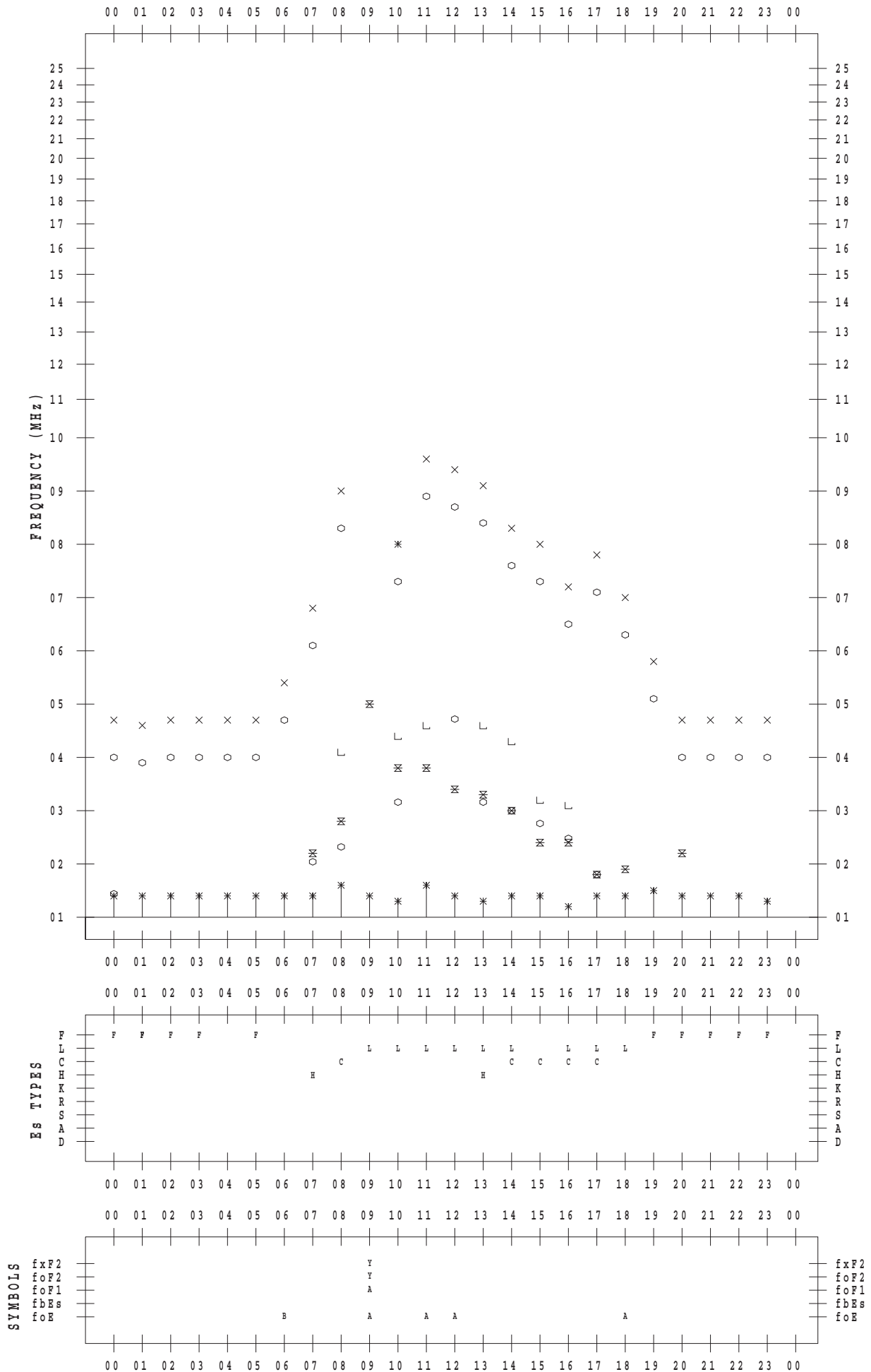
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STATION : Wakkanai

DATE : 2016 / 3 / 3

135 ° E MEAN TIME



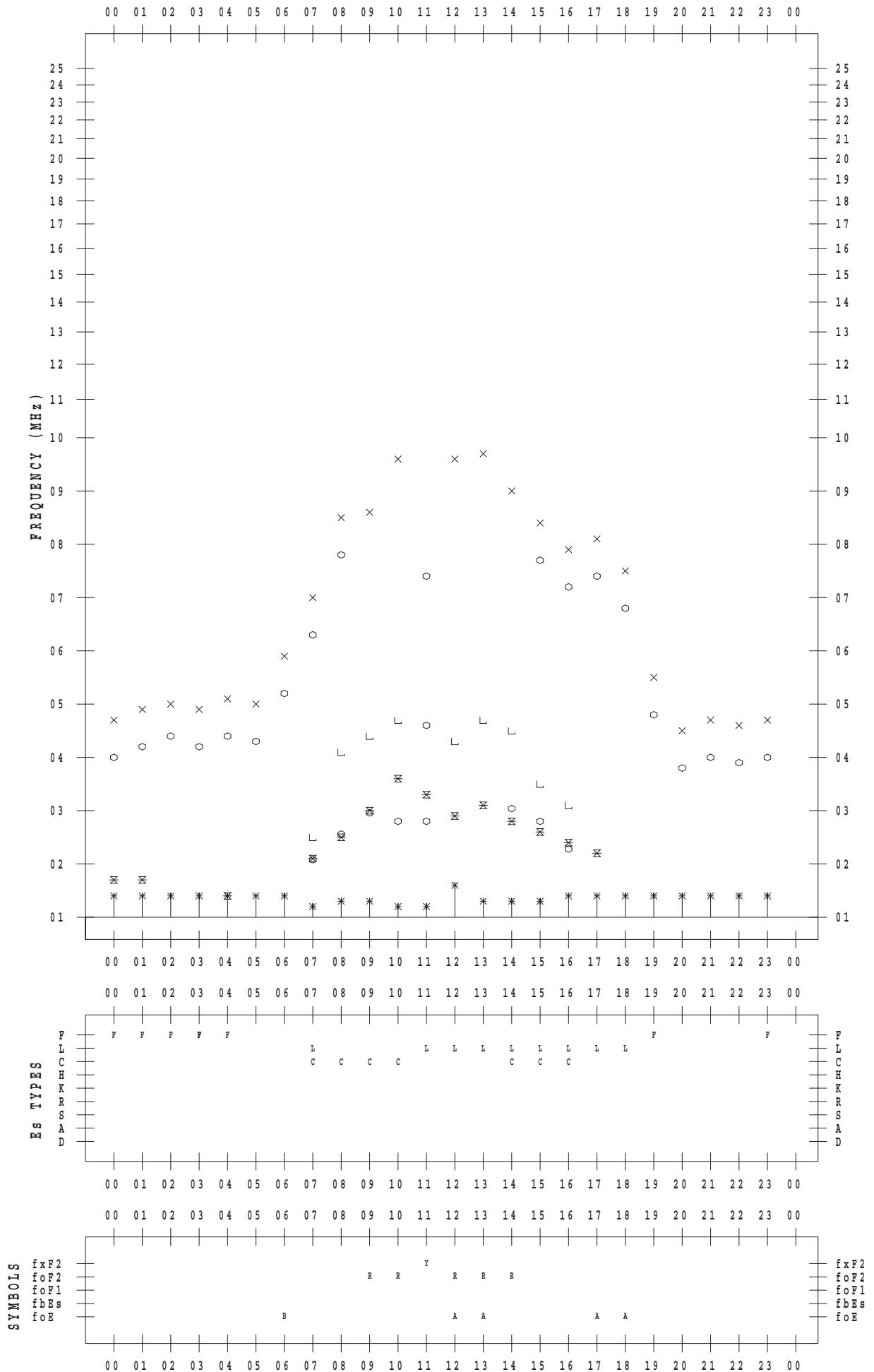
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STATION : Wakkanai

DATE : 2016 / 3 / 4

135 ° E MEAN TIME





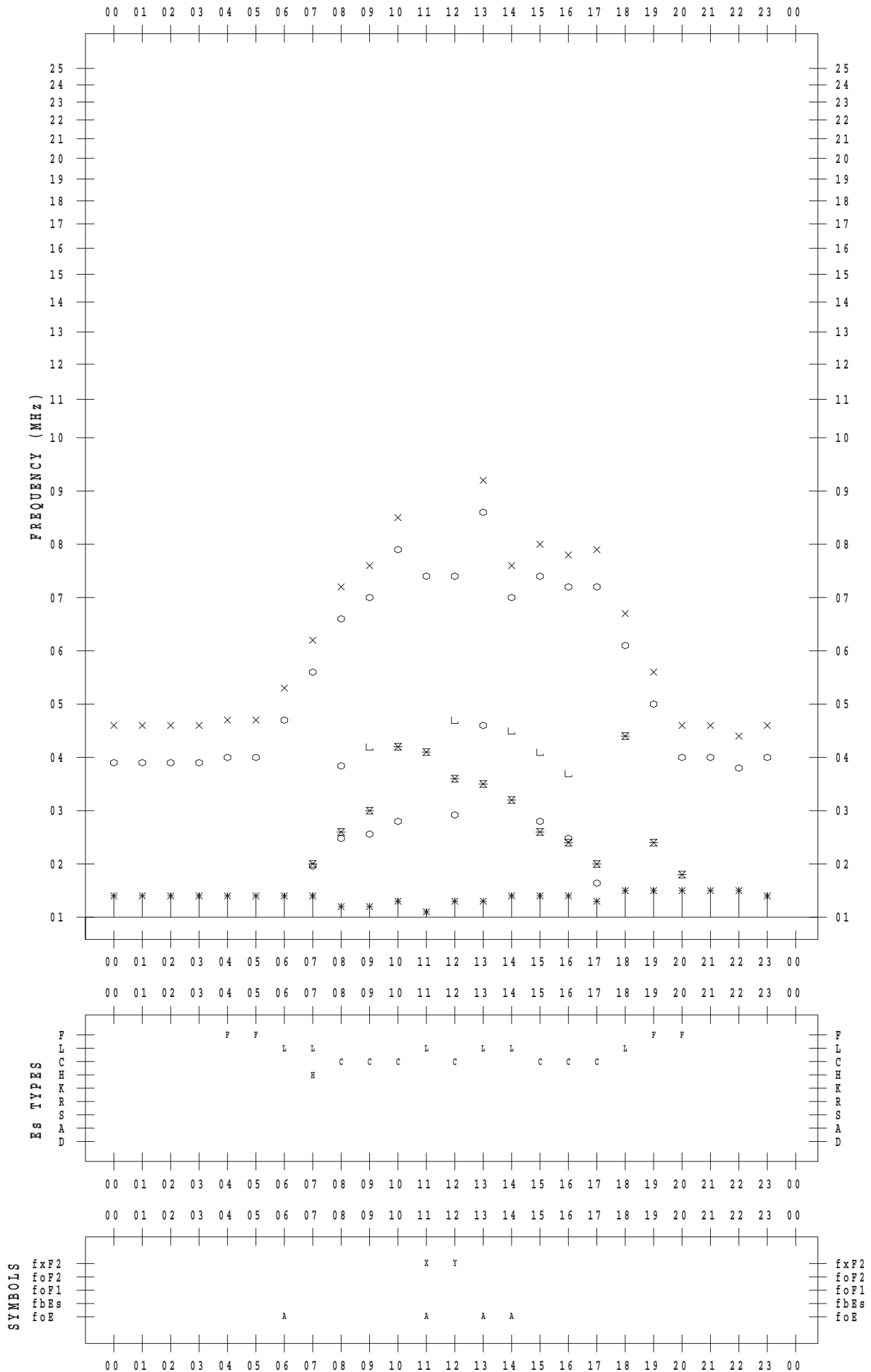
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STATION : Wakkanai

DATE : 2016 / 3 / 5

135 ° E MEAN TIME



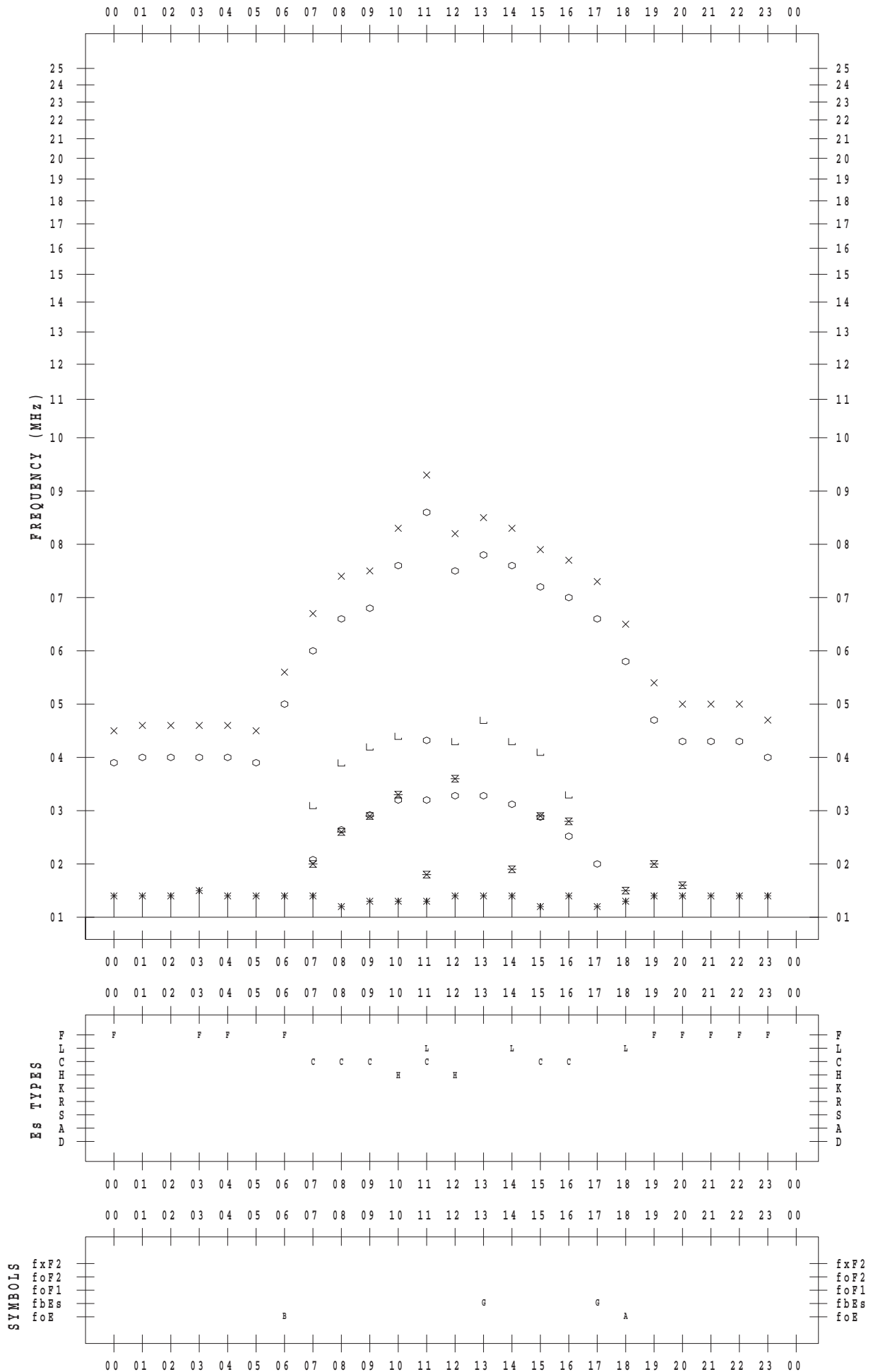
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STATION : Wakkanai

DATE : 2016 / 3 / 6

135 ° E MEAN TIME



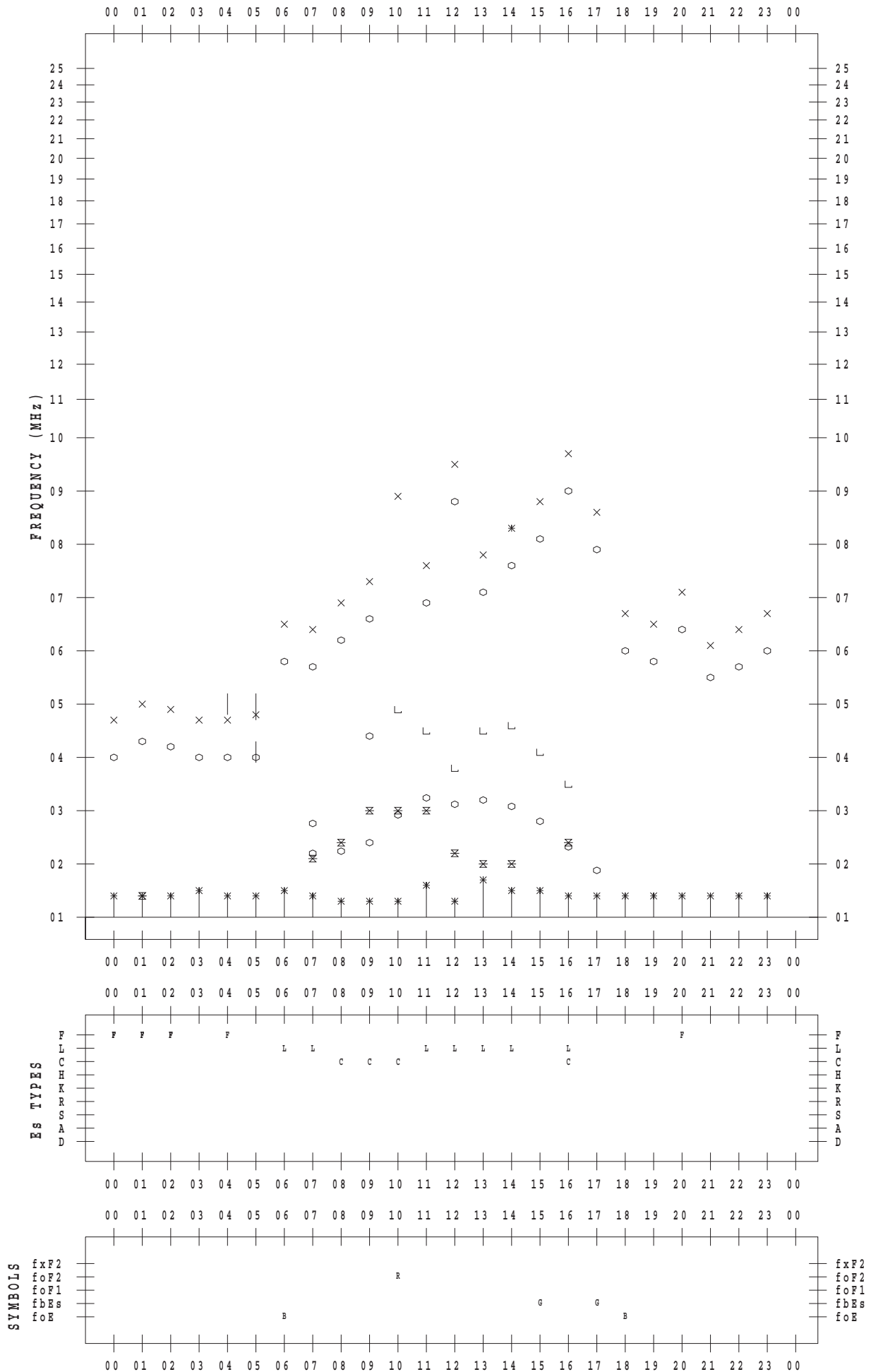
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DATE : 2016 / 3 / 7

135 ° E MEAN TIME



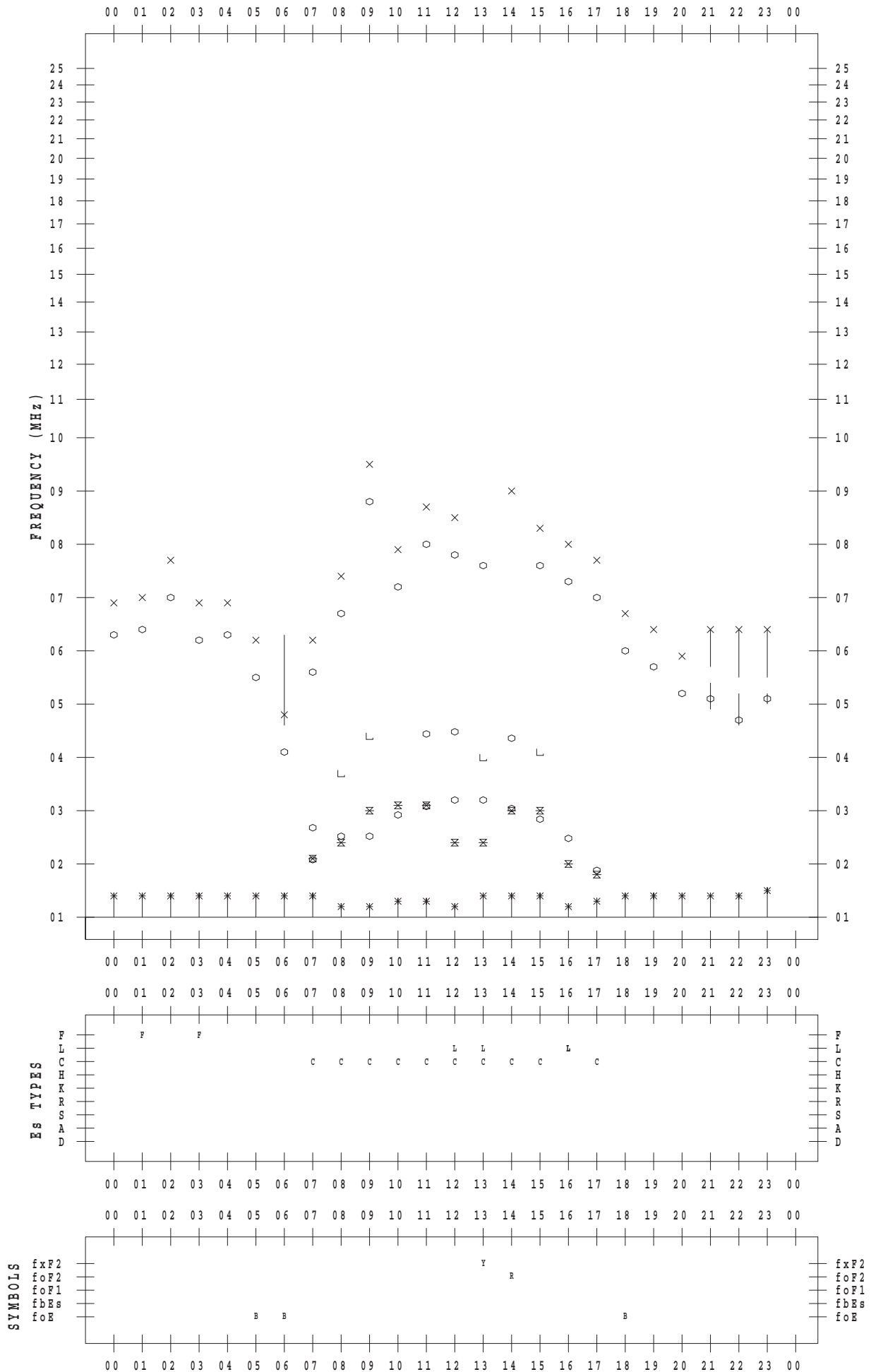
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DATE : 2016 / 3 / 8

135 ° E MEAN TIME



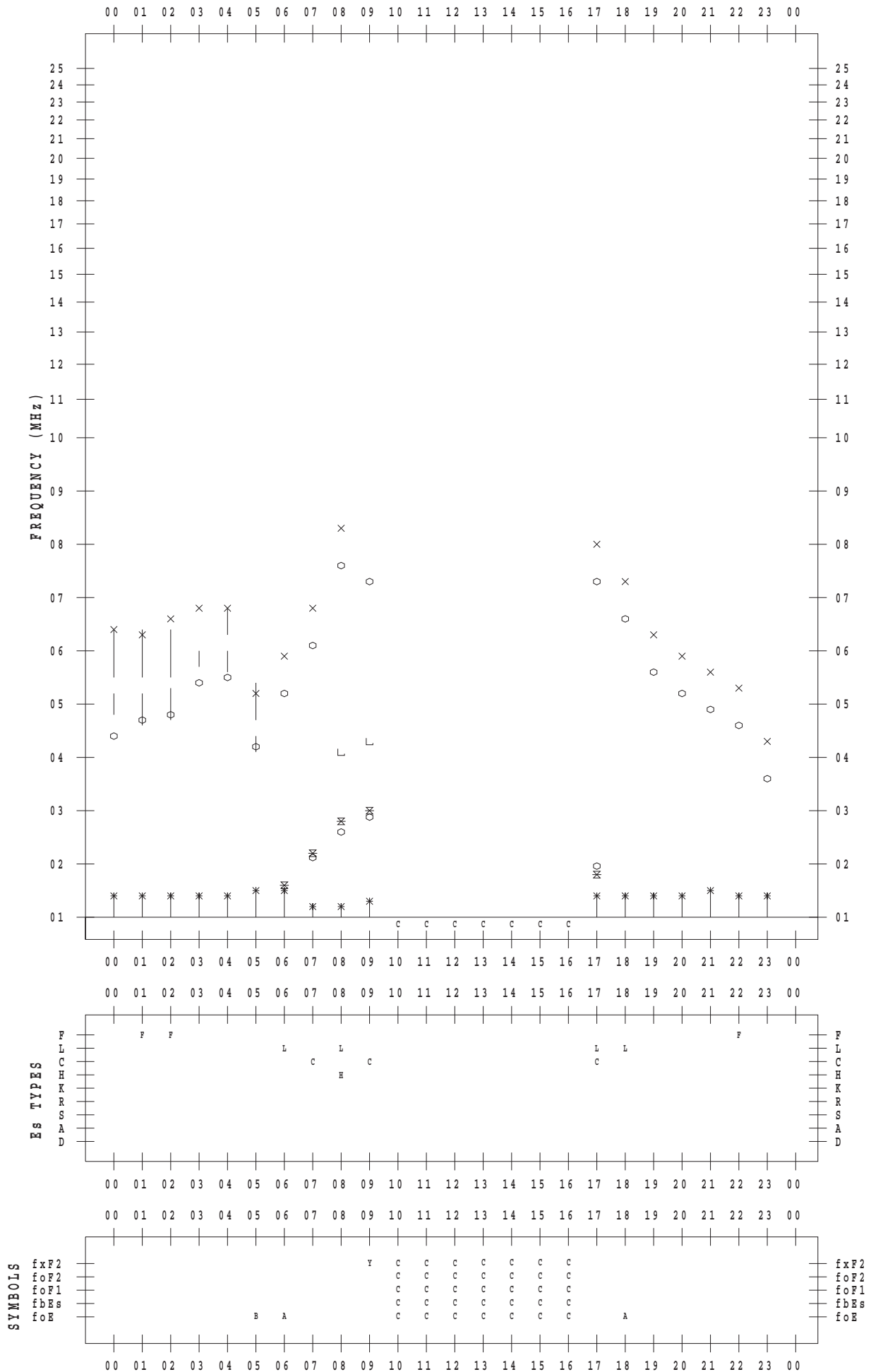
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DATE : 2016 / 3 / 9

135 ° E MEAN TIME



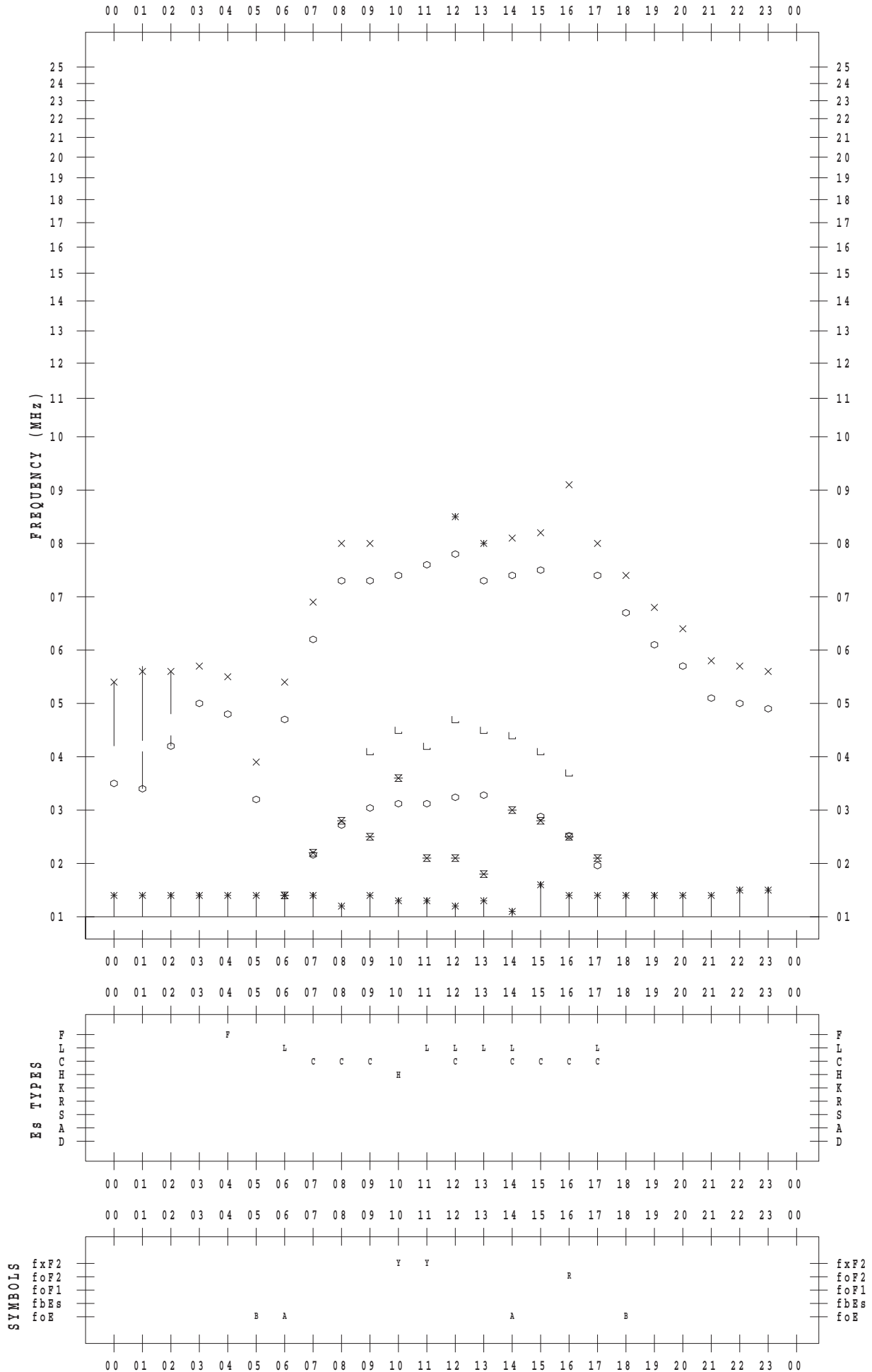
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DATE : 2016 / 3 / 10

135 ° E MEAN TIME



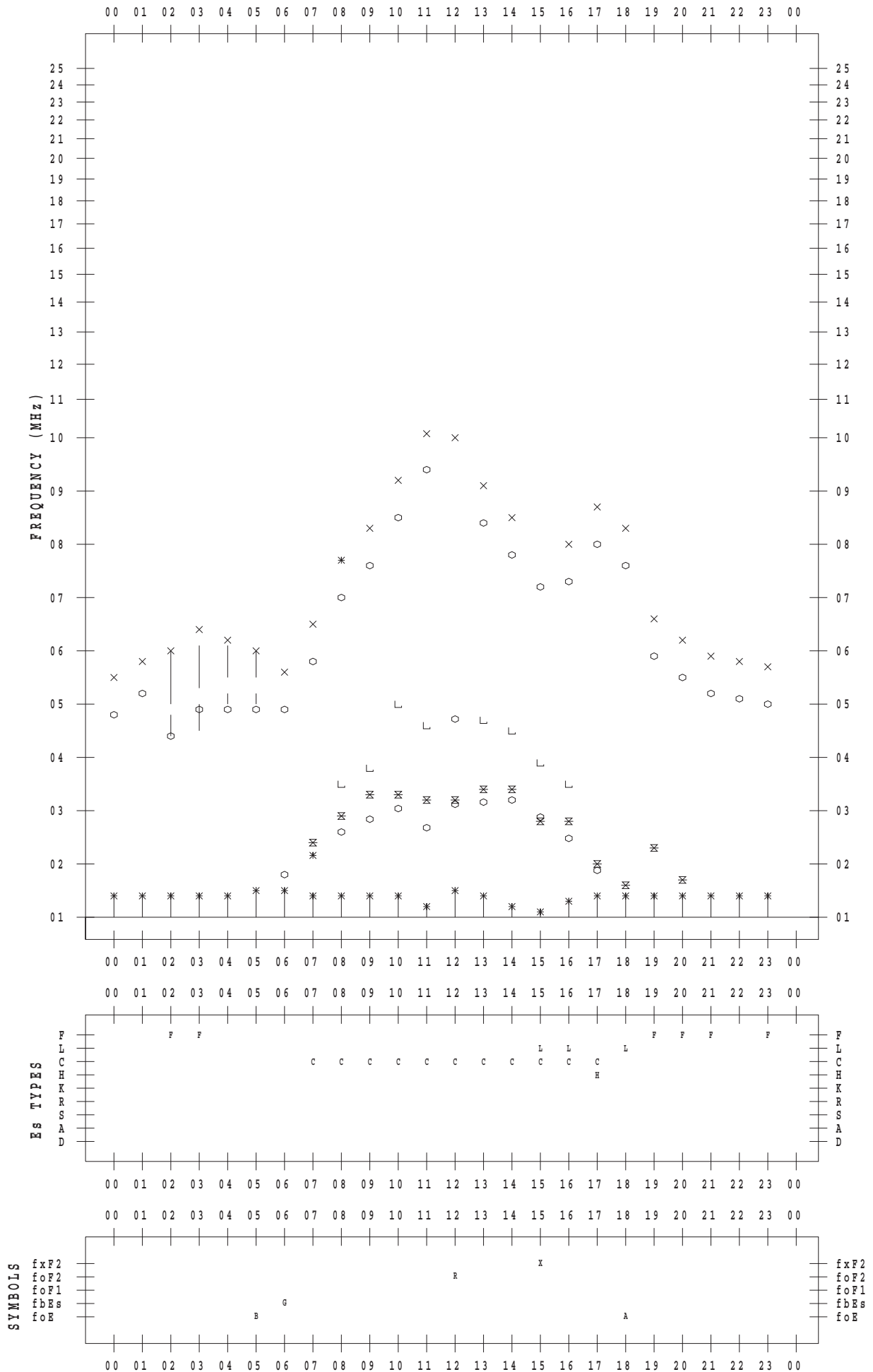
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DATE : 2016 / 3 / 11

135 ° E MEAN TIME



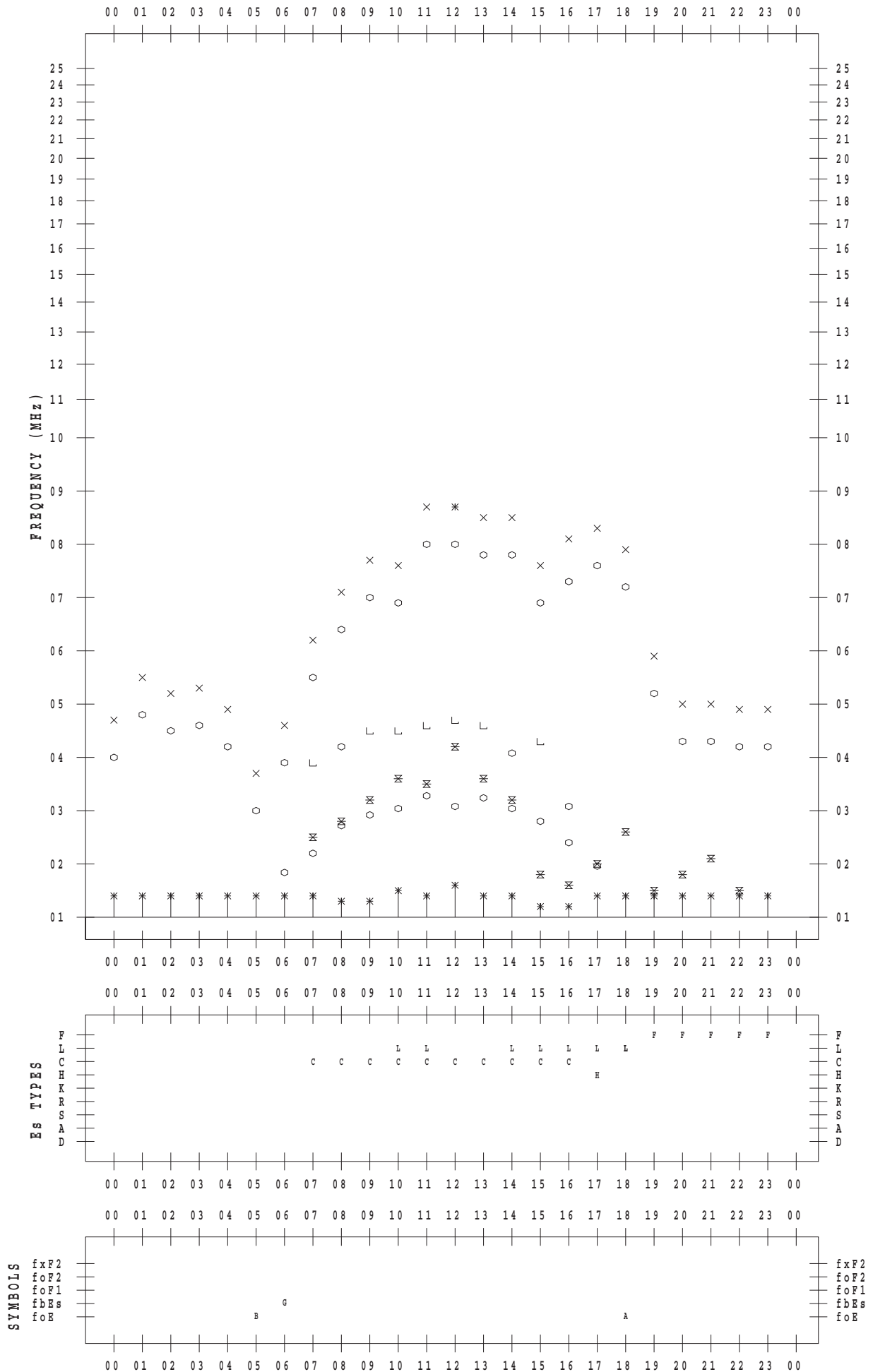
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DATE : 2016 / 3 / 12

135 ° E MEAN TIME





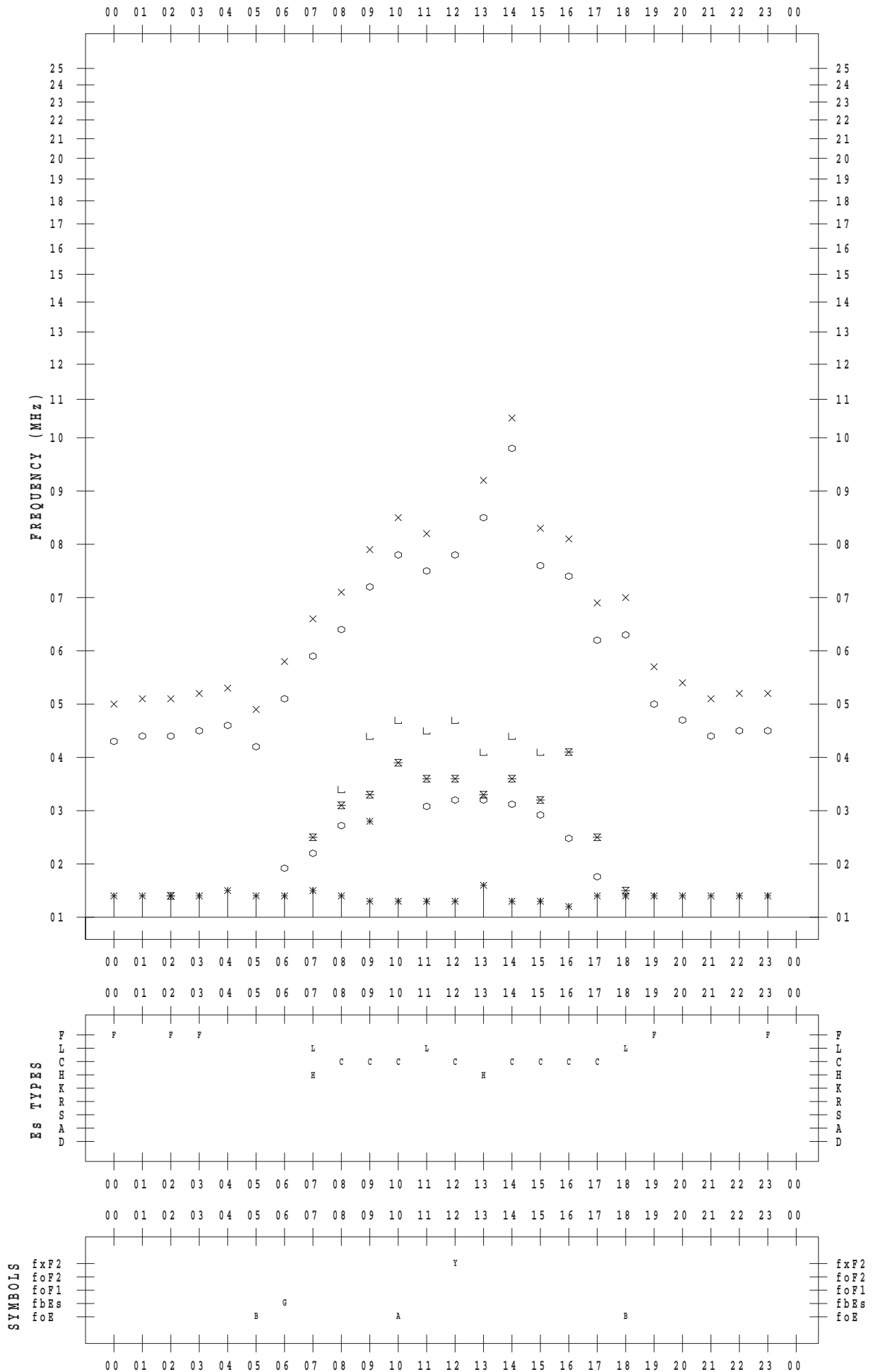
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STATION : Wakkanai

DATE : 2016 / 3 / 13

135 ° E MEAN TIME



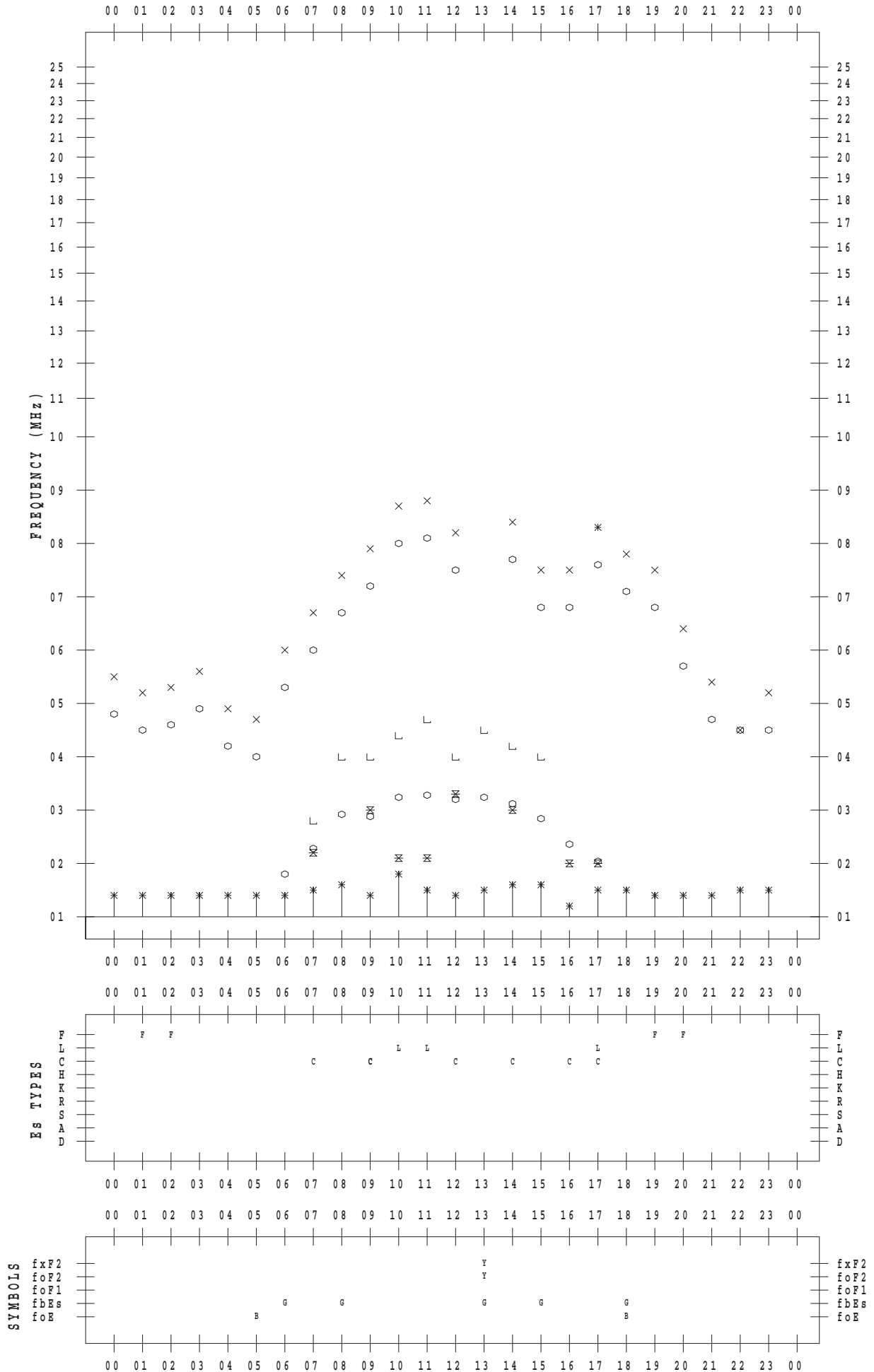
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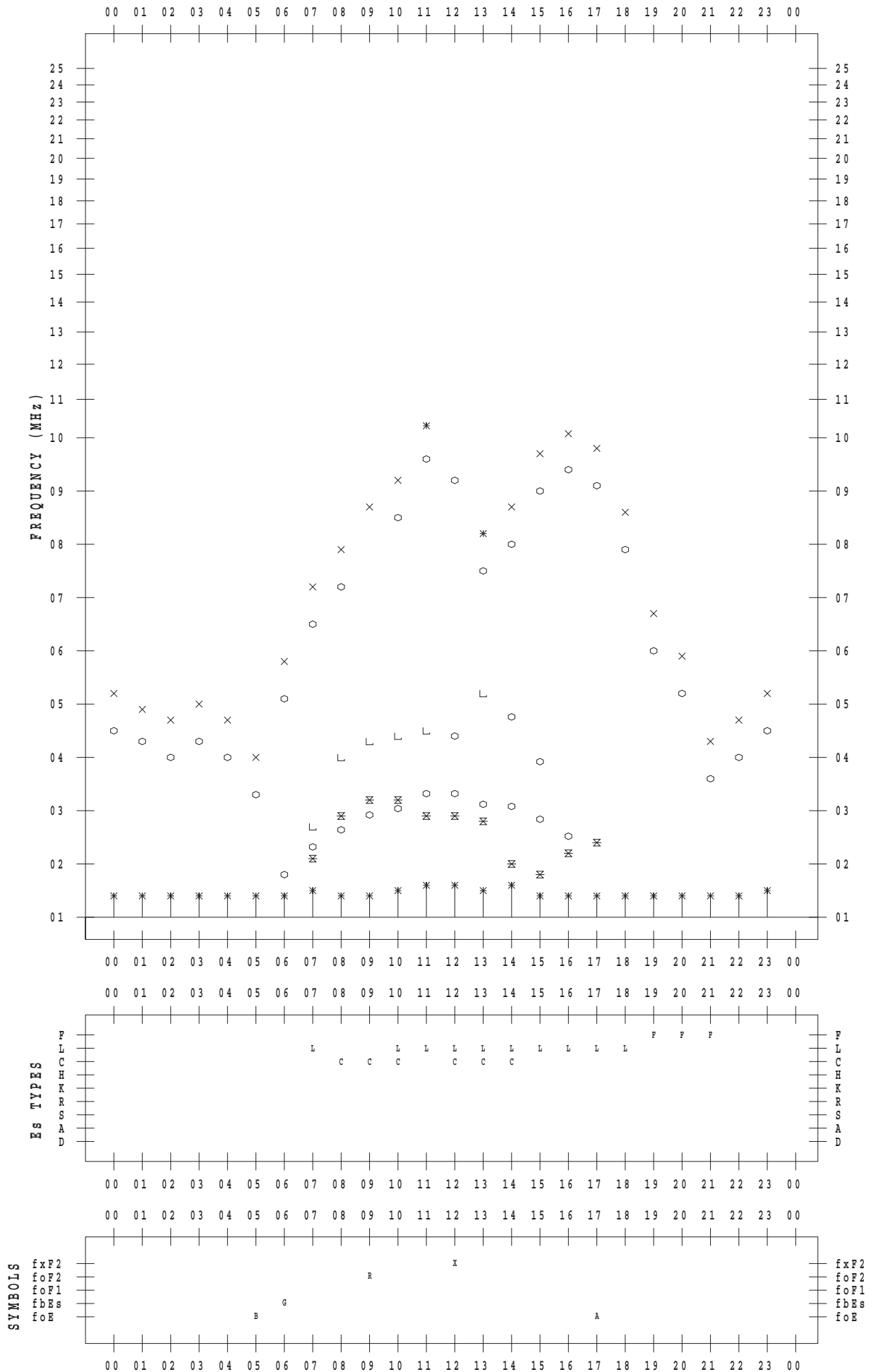
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STATION : Wakkanai

DATE : 2016 / 3 / 15

135 ° E MEAN TIME



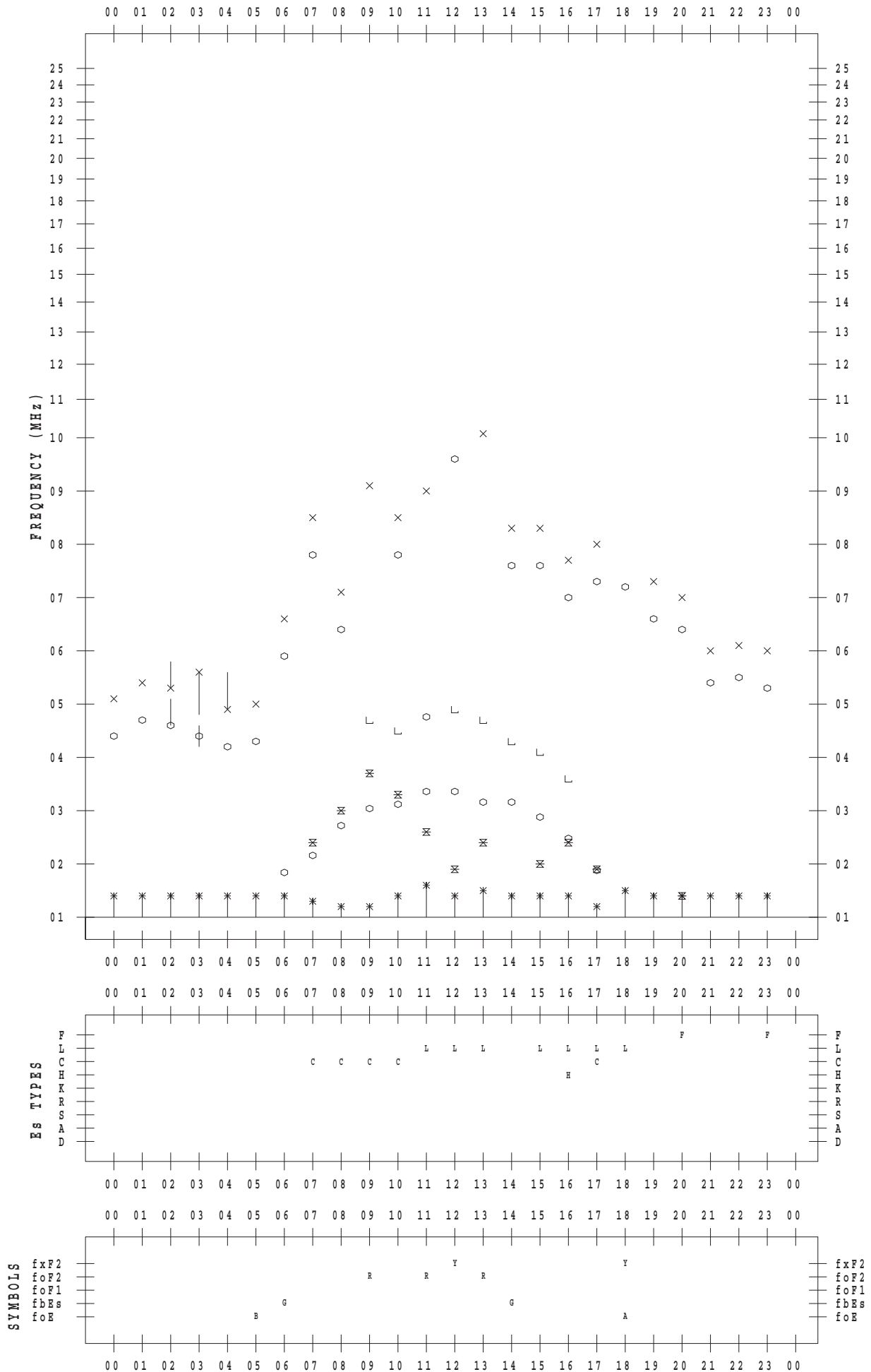
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DATE : 2016 / 3 / 16

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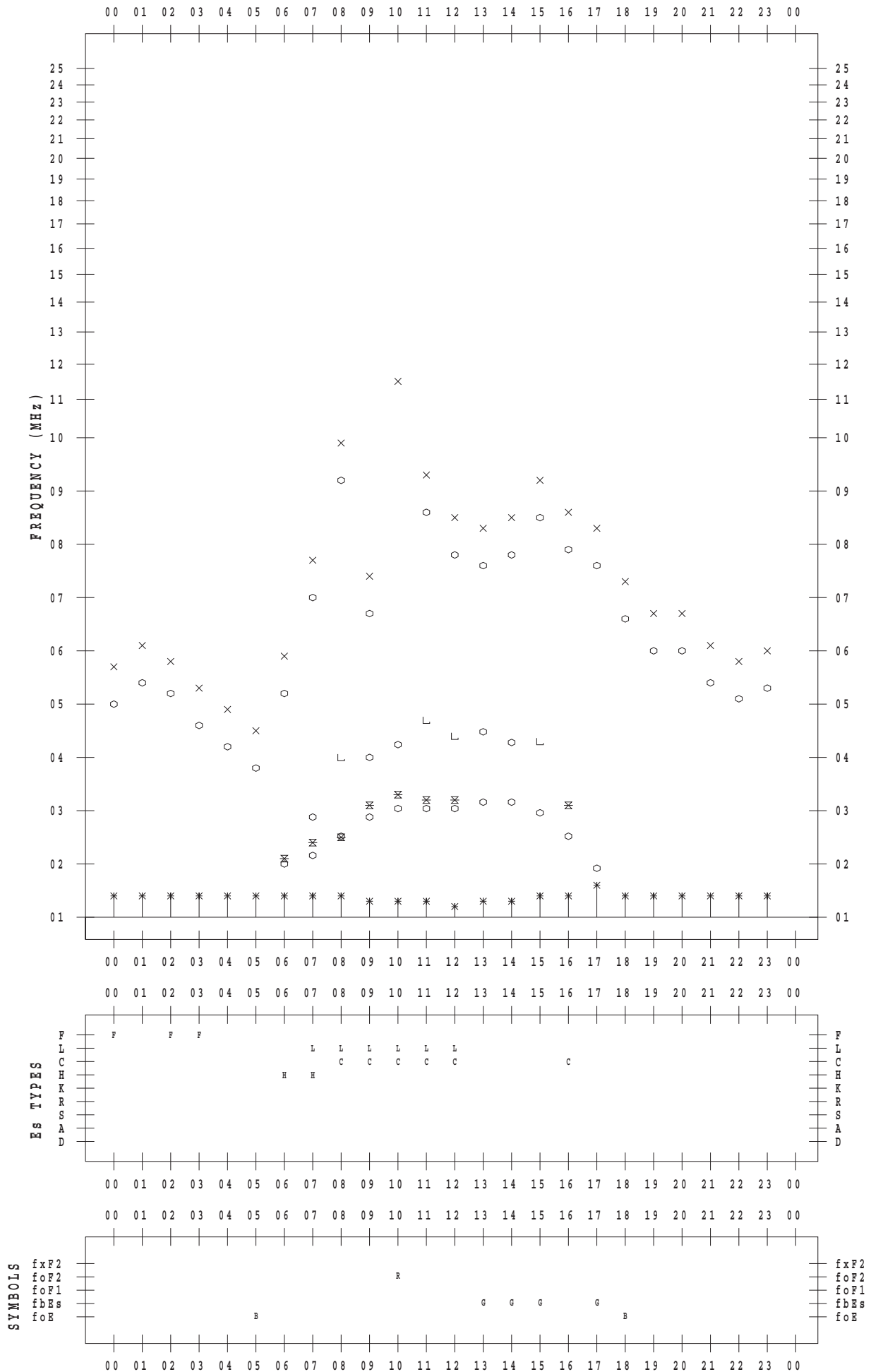
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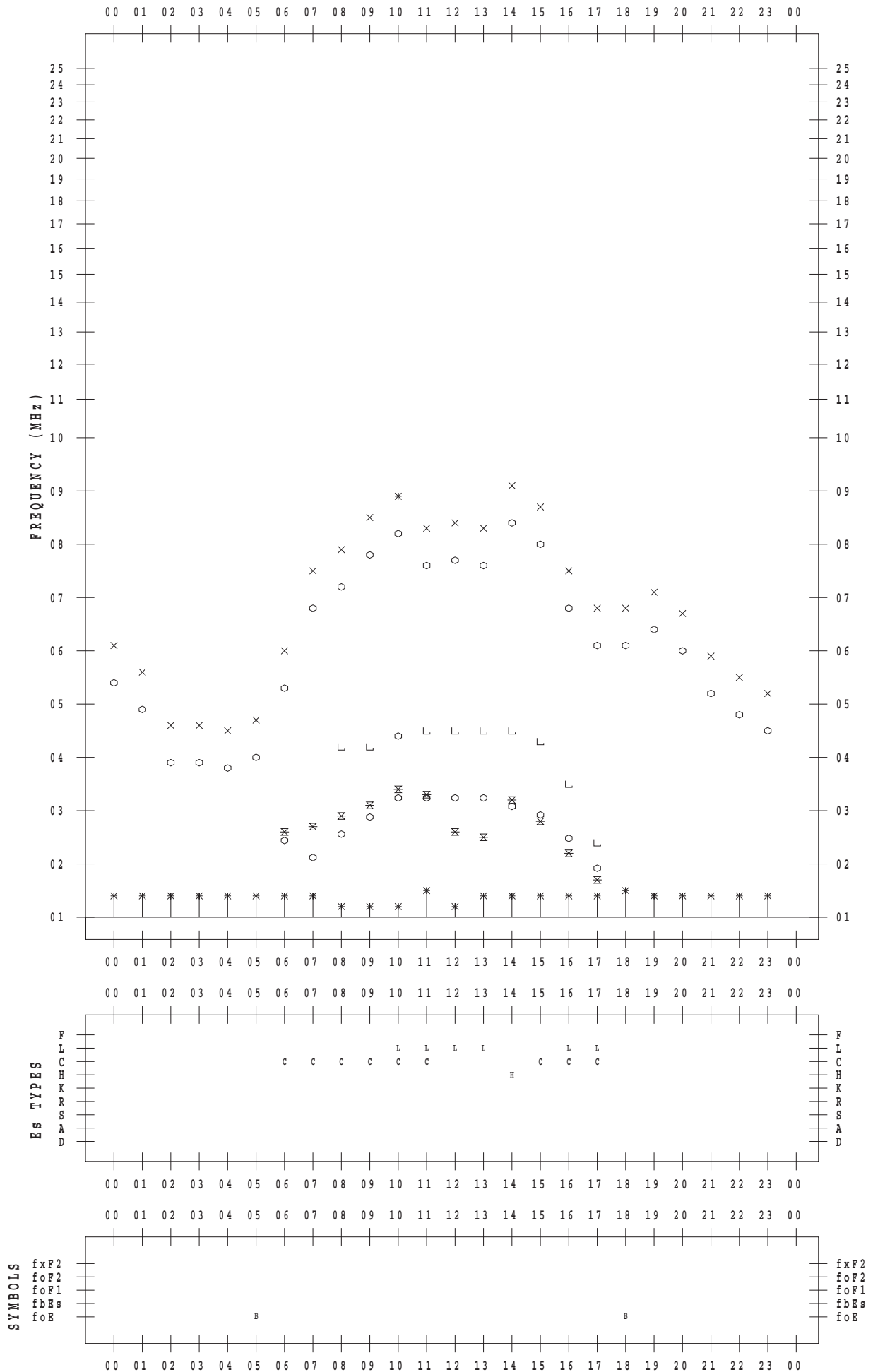
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DATE : 2016 / 3 / 18

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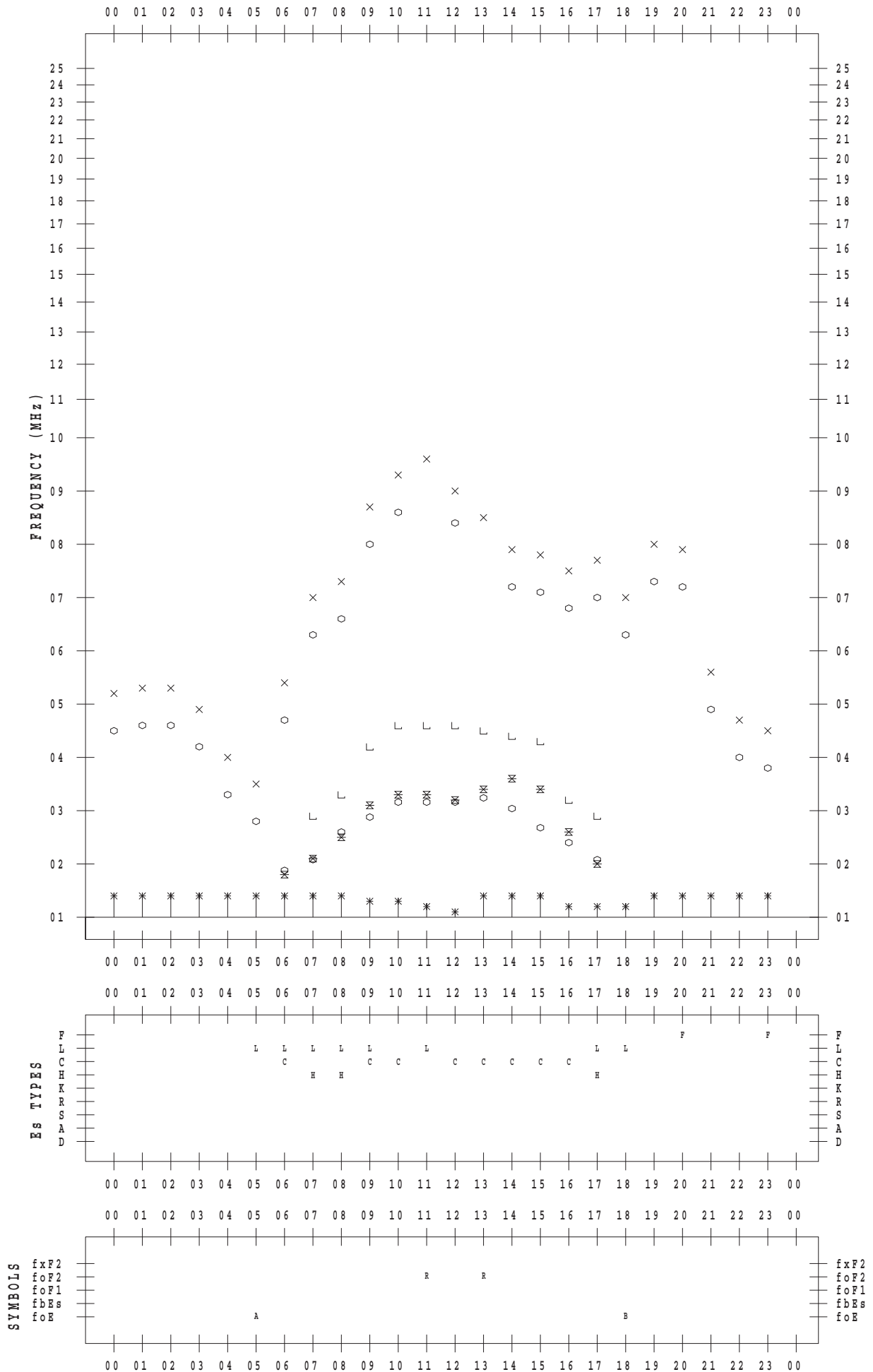
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DATE : 2016 / 3 / 19

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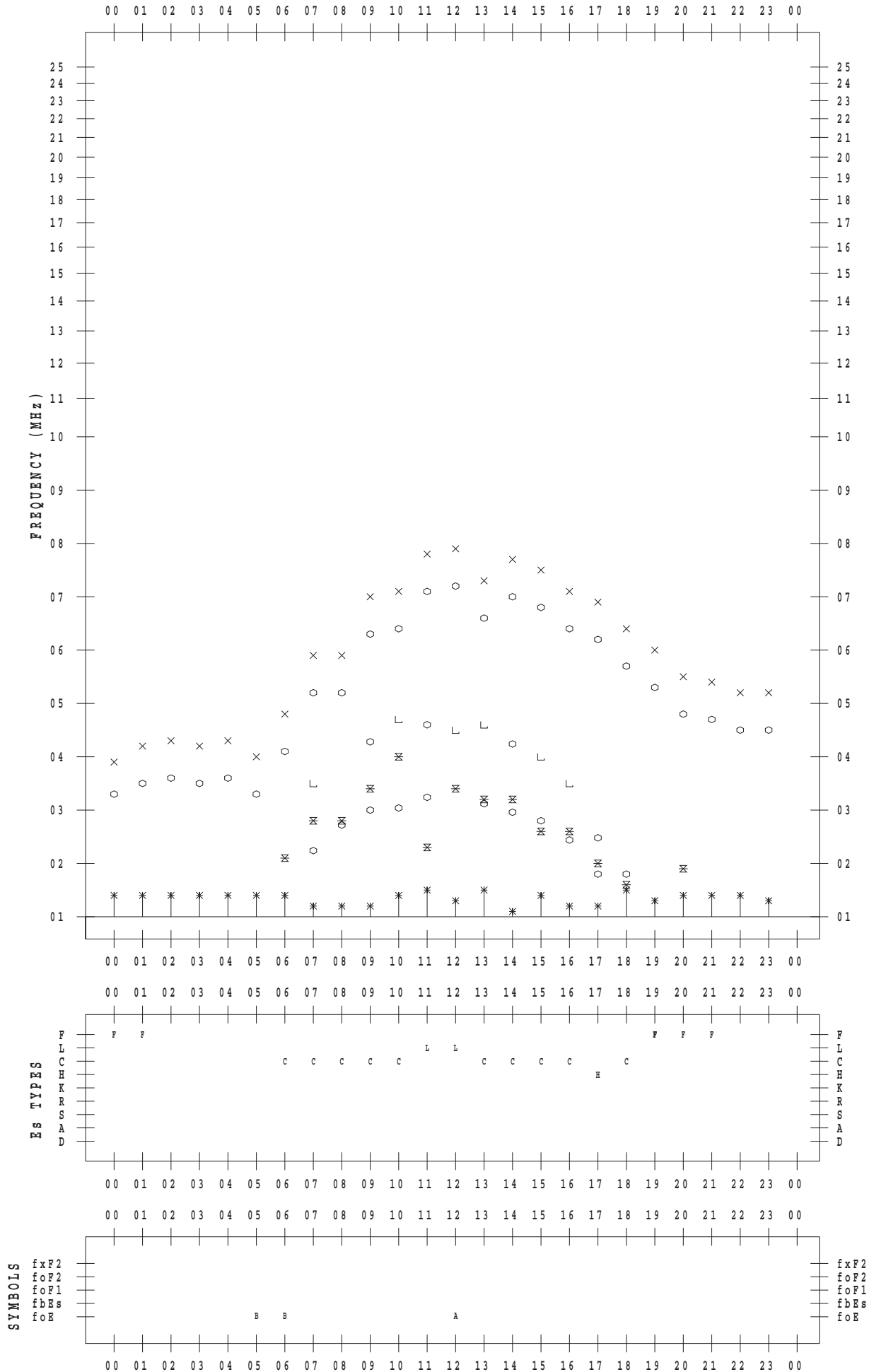
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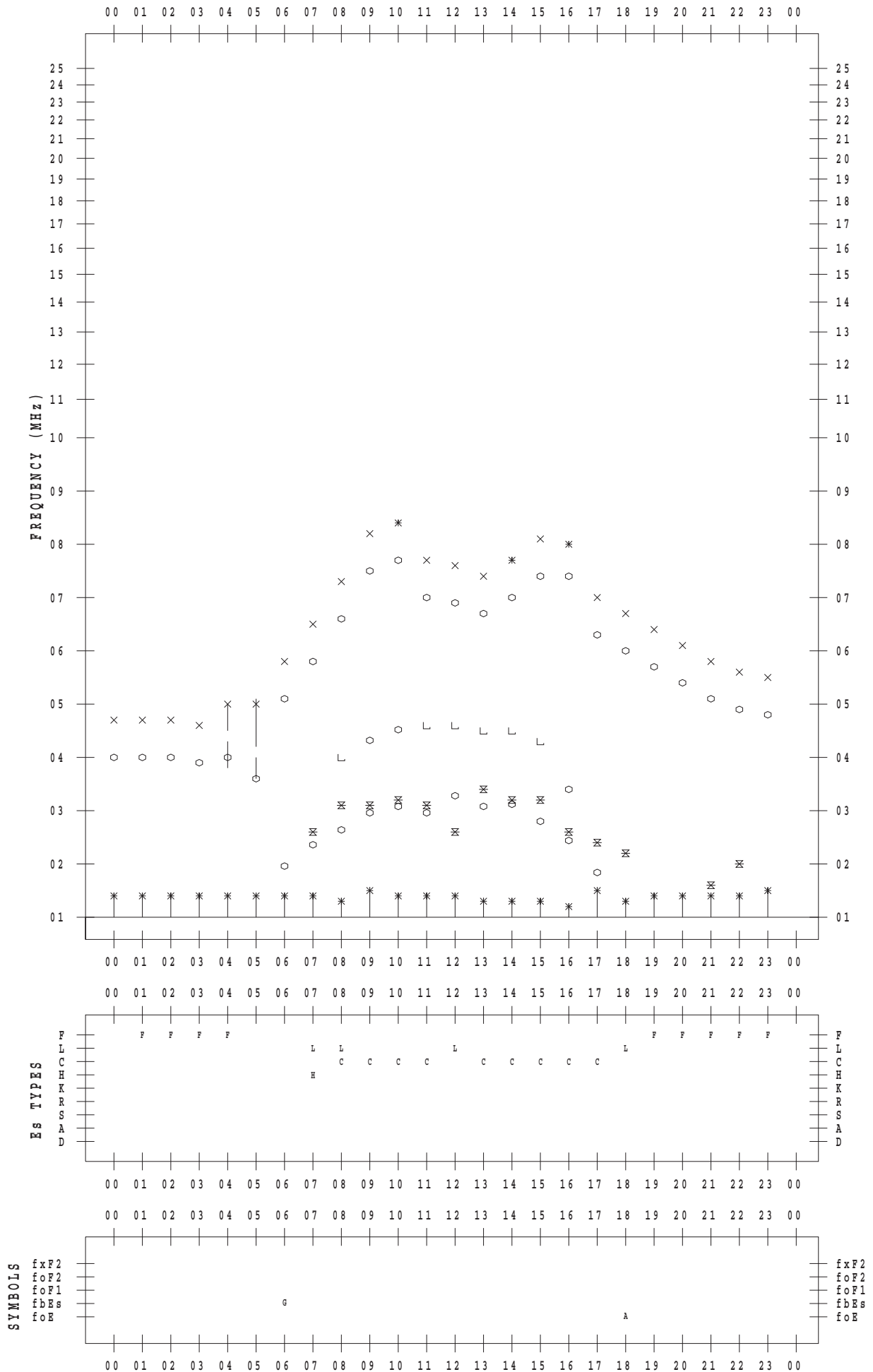
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DATE : 2016 / 3 / 21

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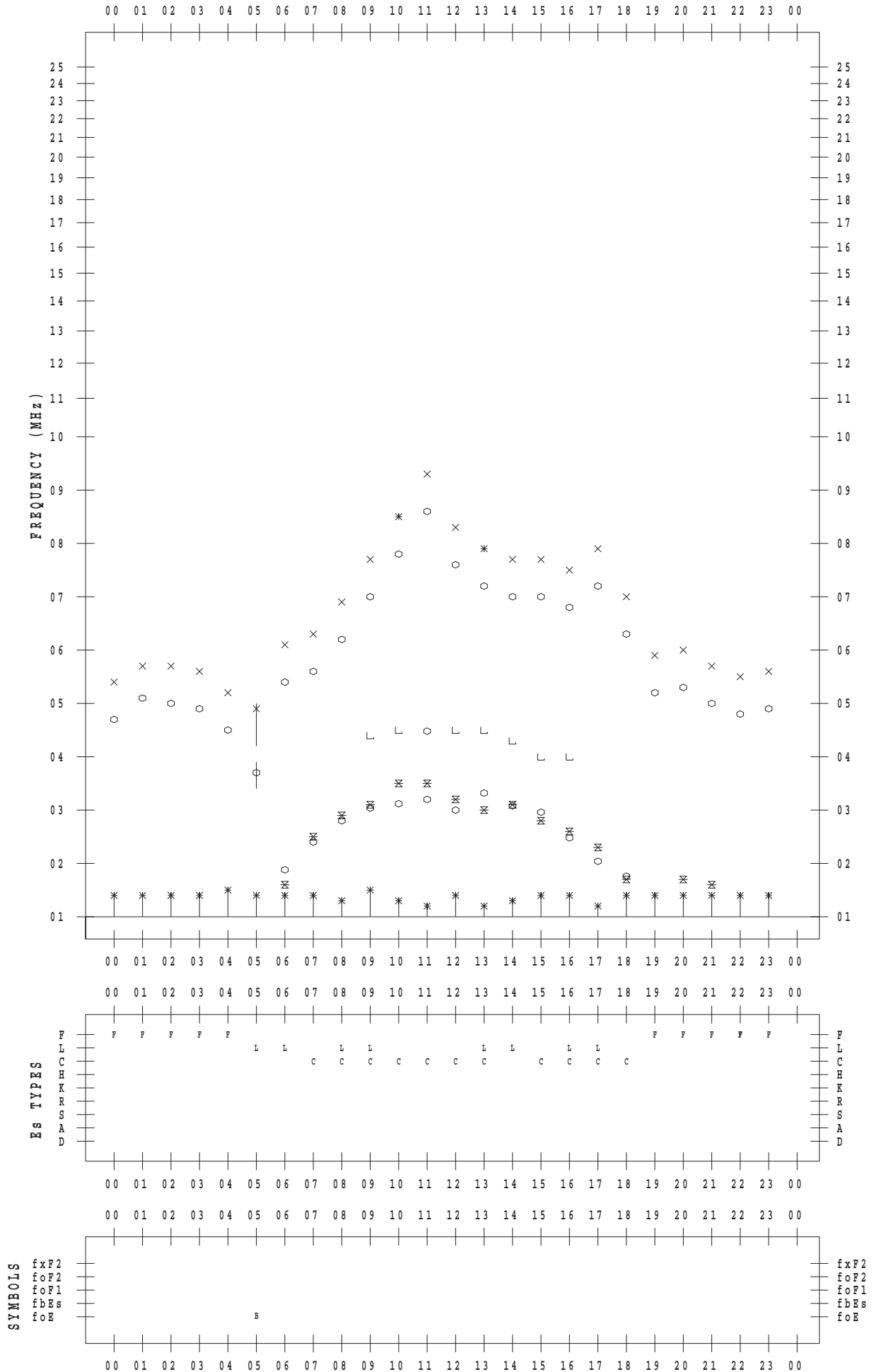
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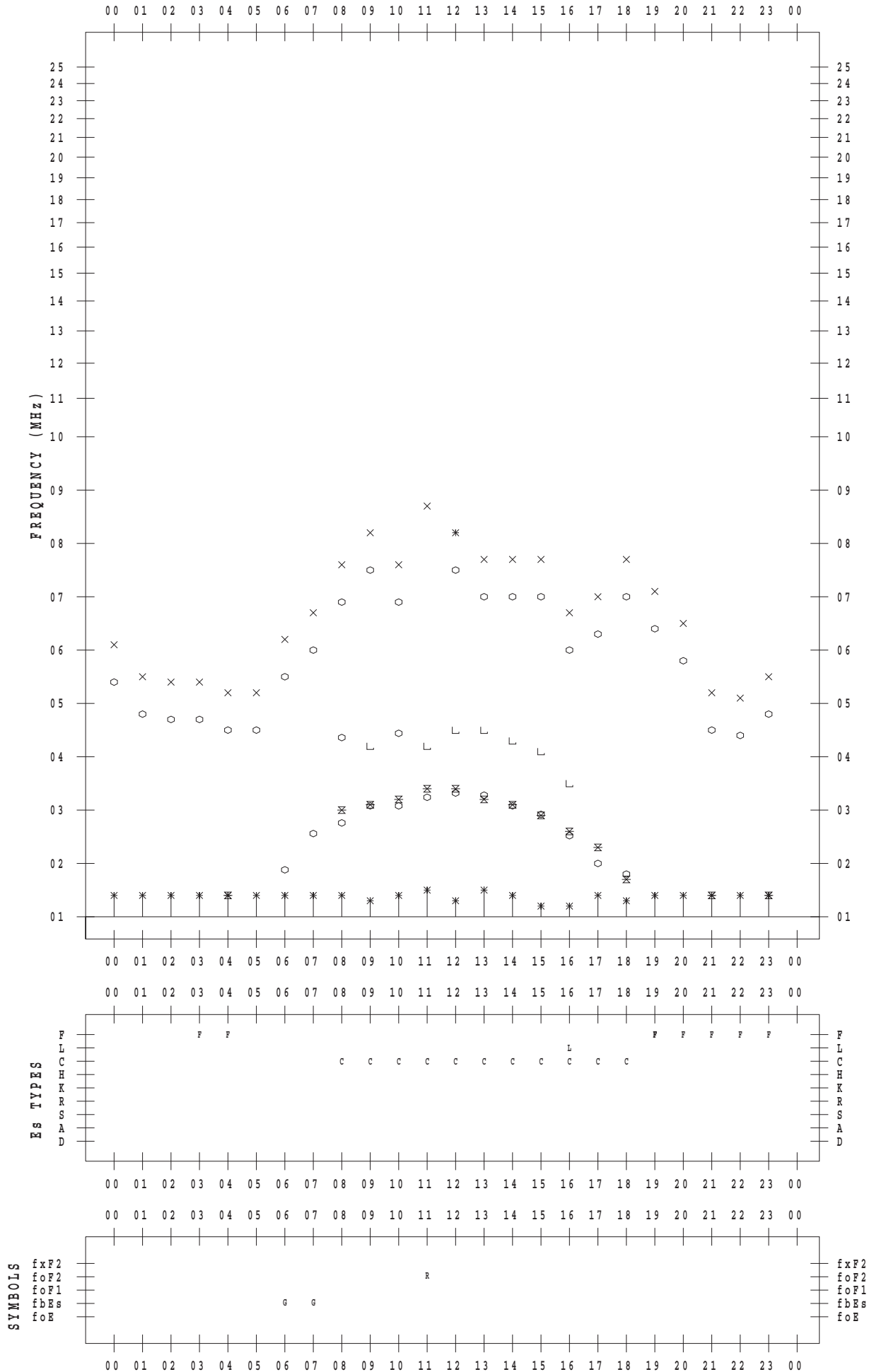
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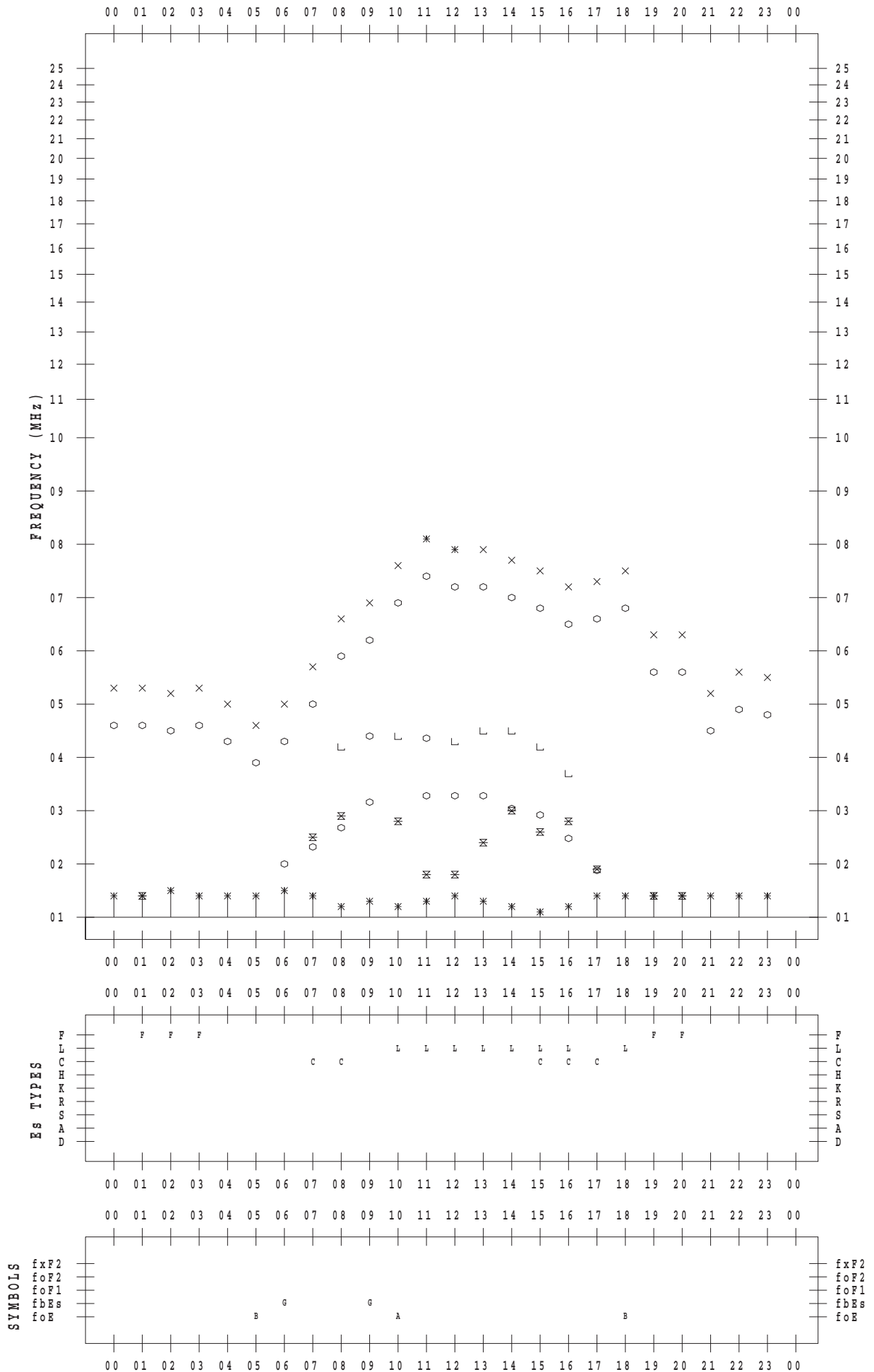
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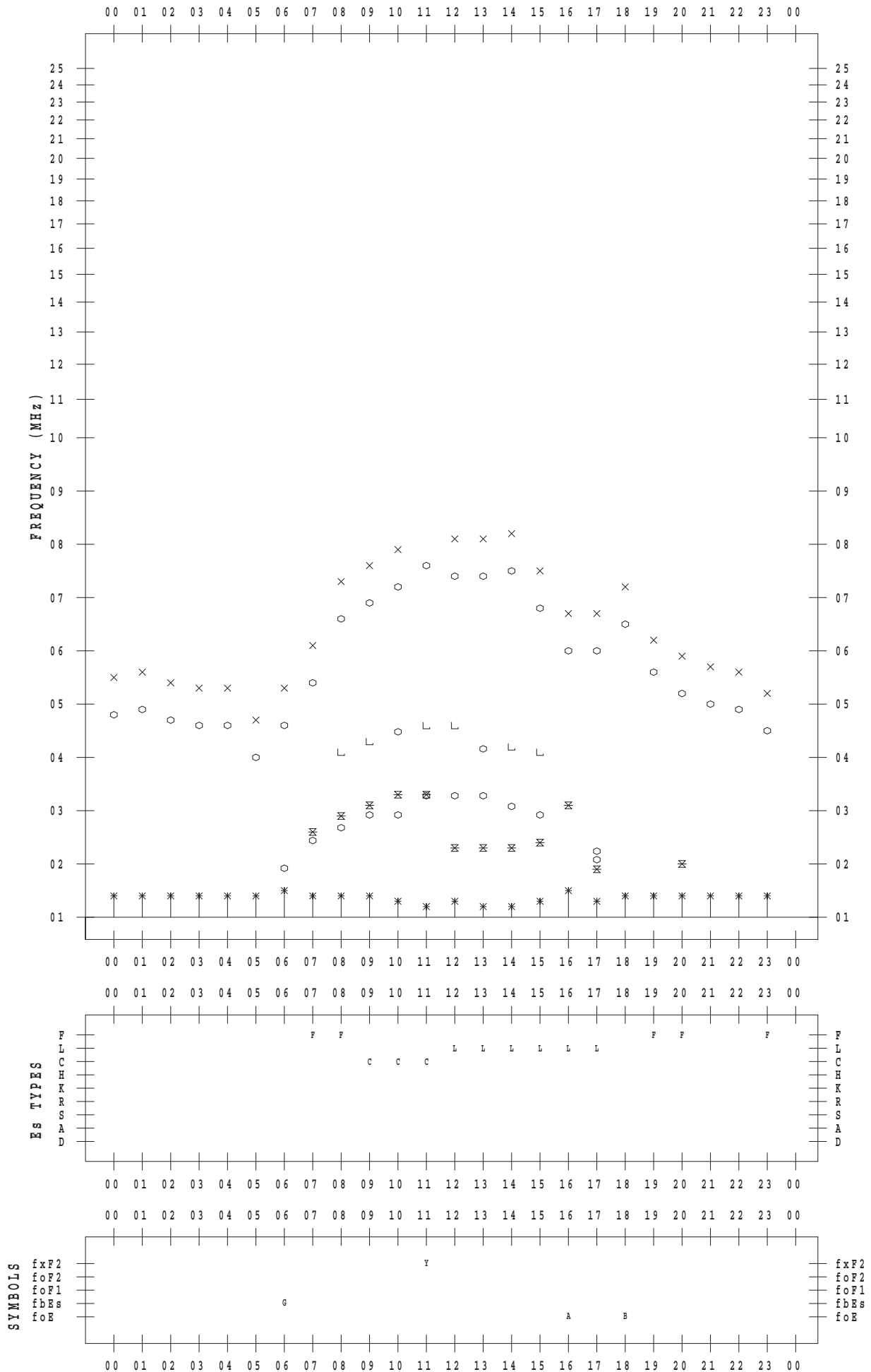
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STATION : Wakkanai

DATE : 2016 / 3 / 25

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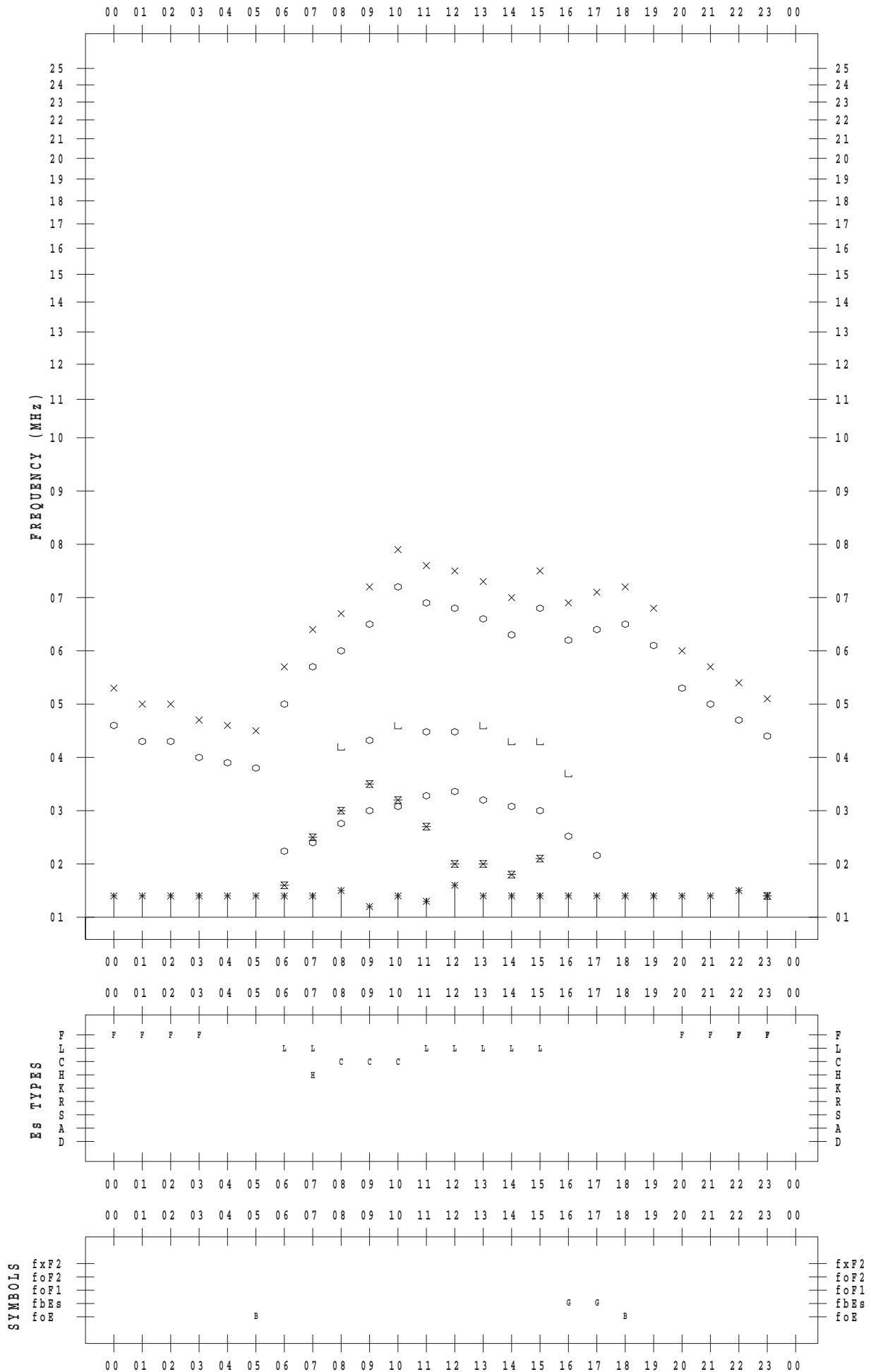
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DATE : 2016 / 3 / 26

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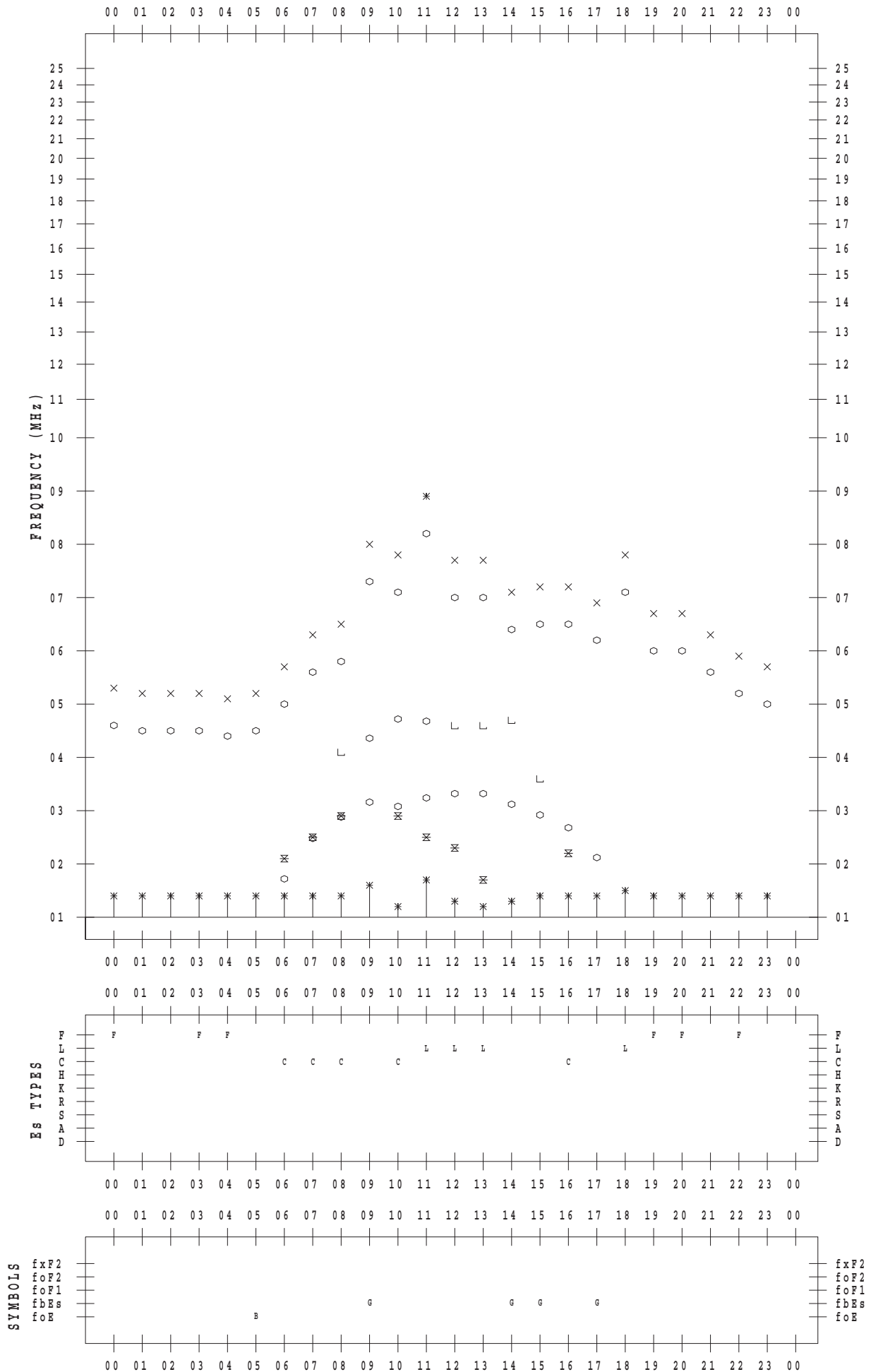
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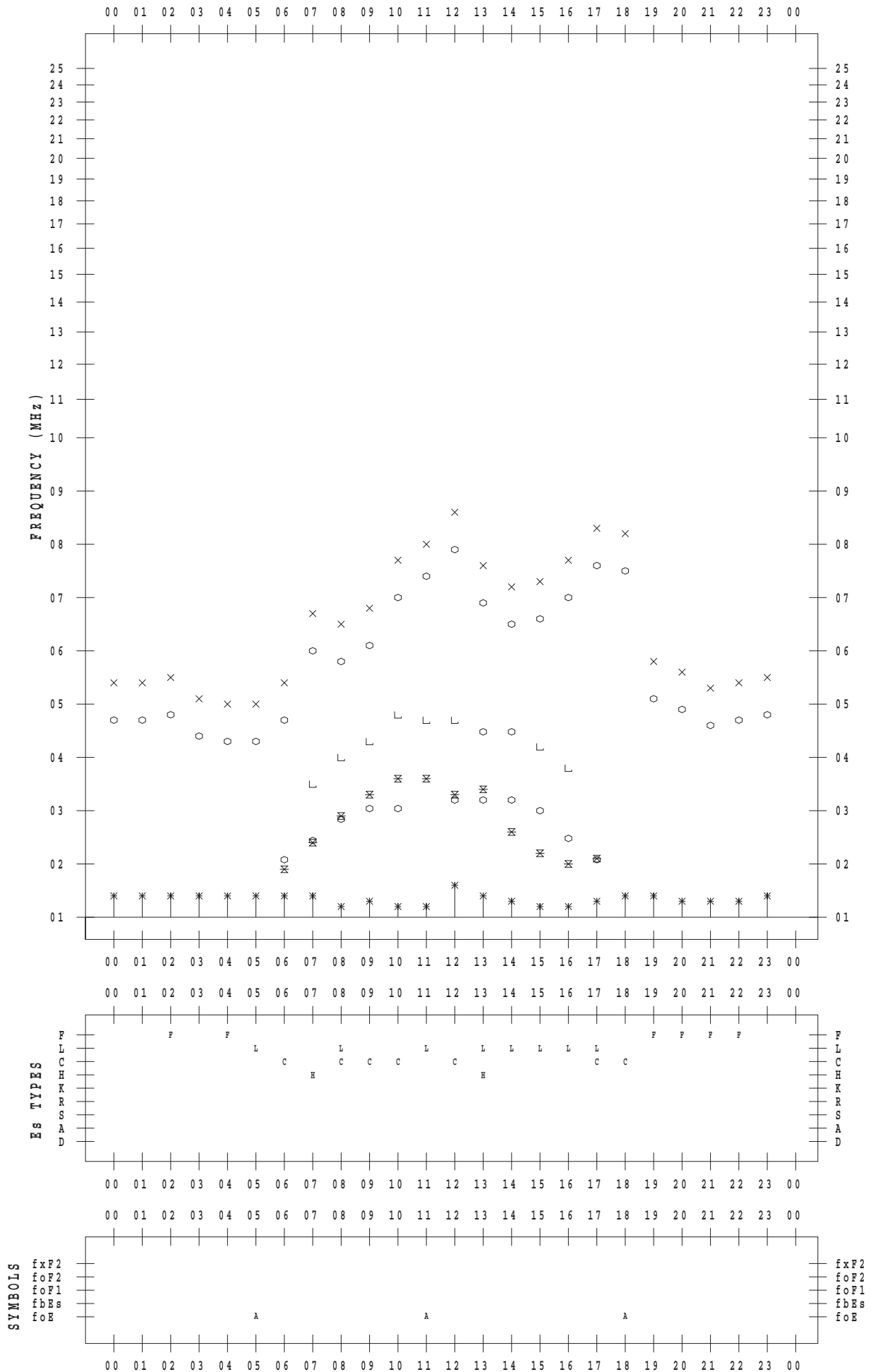
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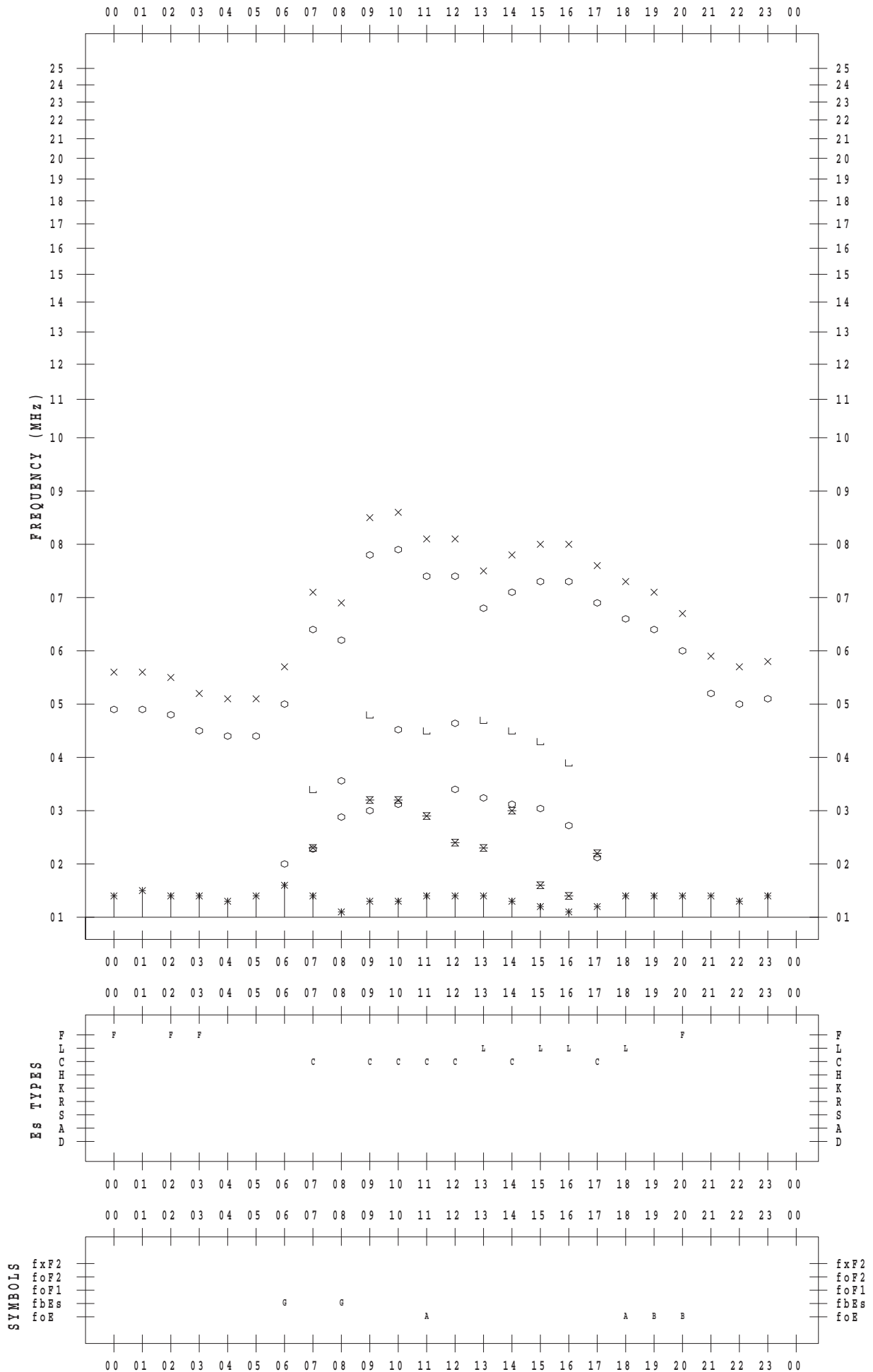
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STATION : Wakkanai

DATE : 2016 / 3 / 29

135 ° E MEAN TIME



Es TYPES

SYMBOLS

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foF2  
foF1  
fbEs  
foE

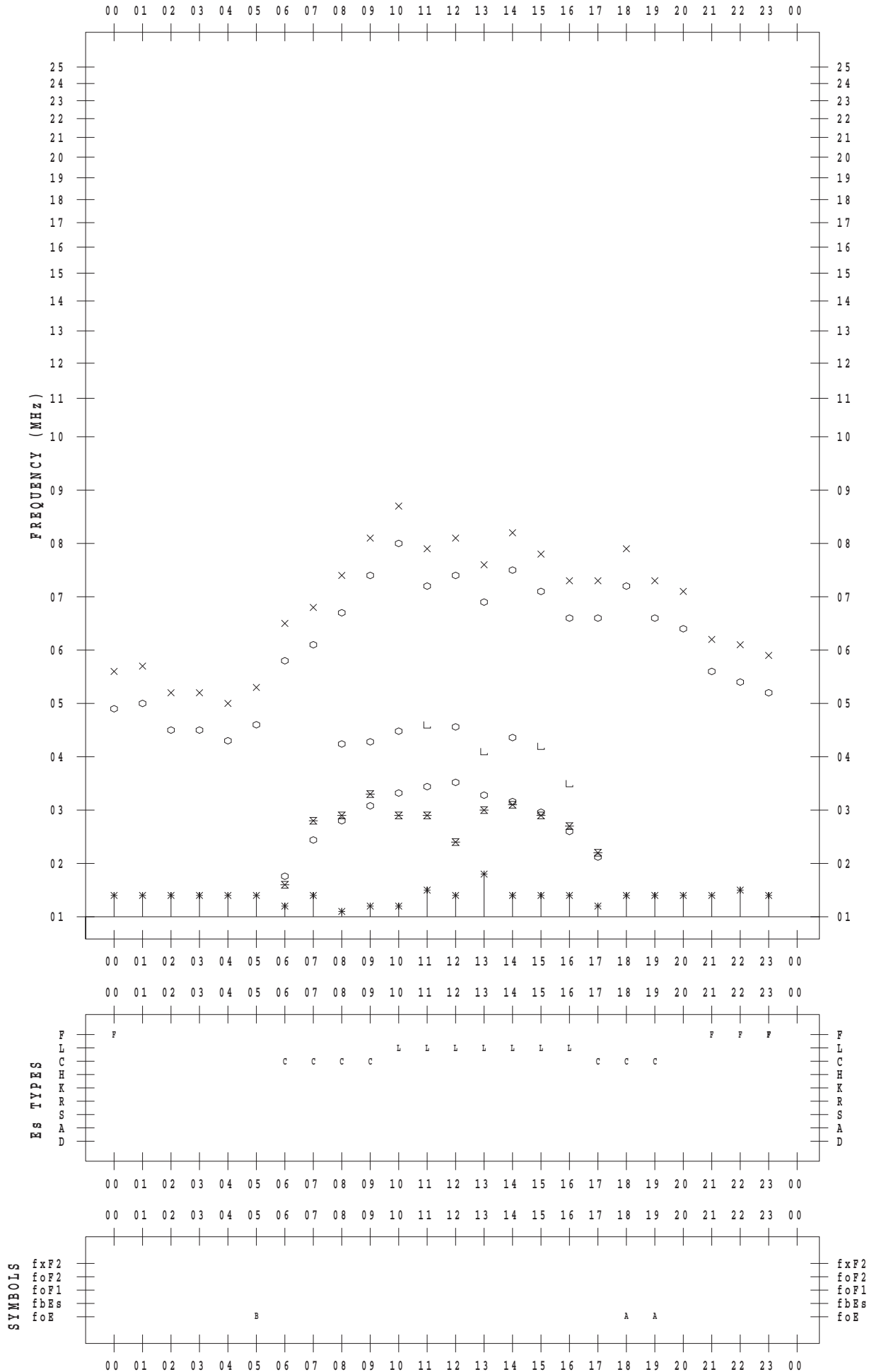
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DATE : 2016 / 3 / 30

135 ° E MEAN TIME



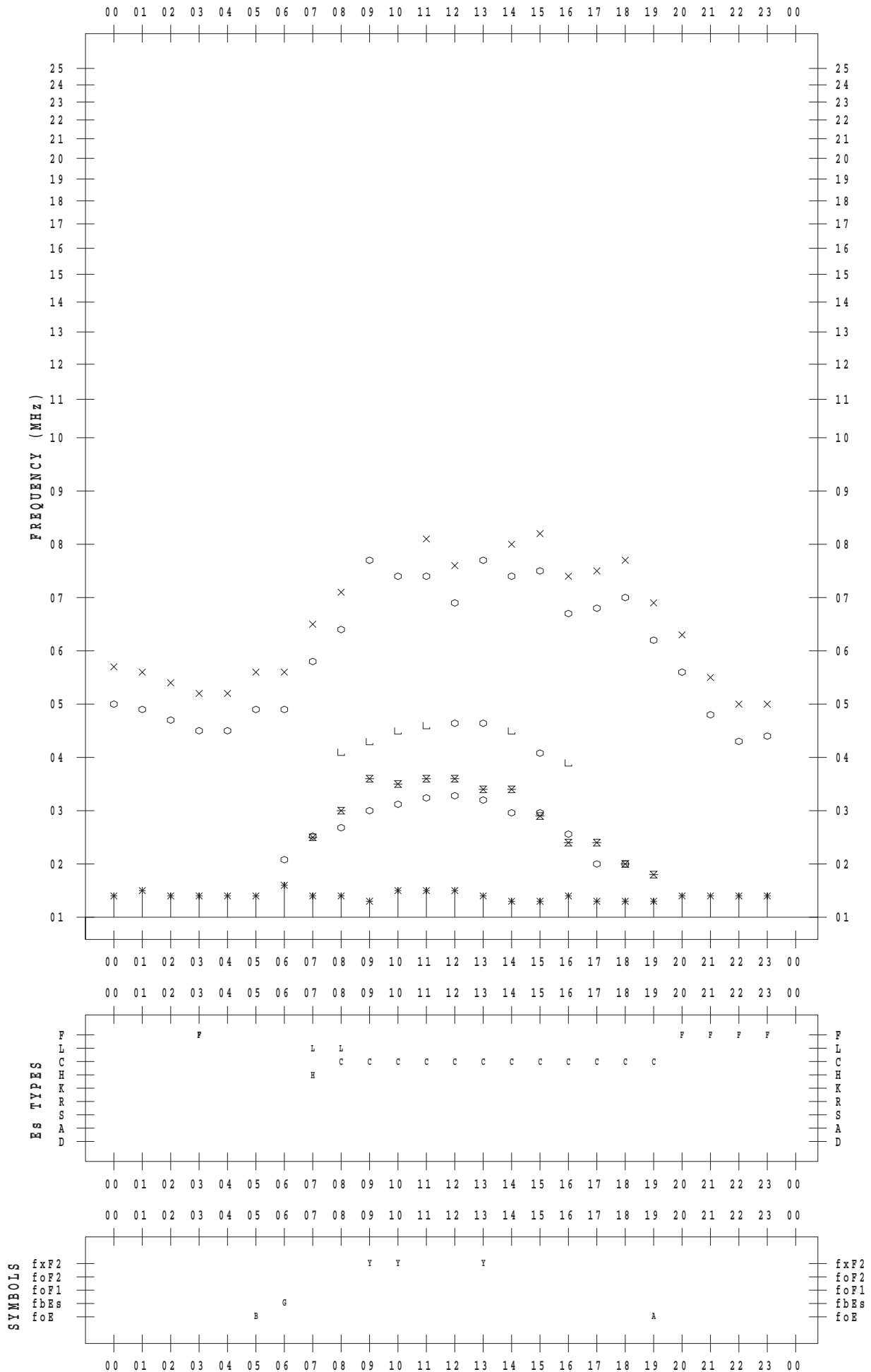
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STATION : Wakkanai

DATE : 2016 / 3 / 31

135 ° E MEAN TIME



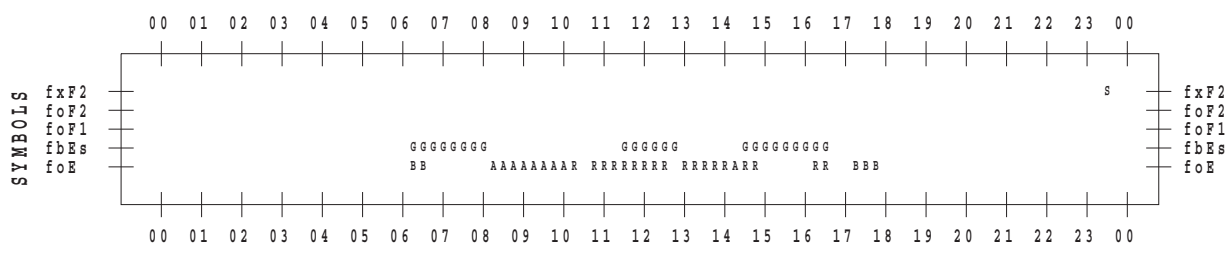
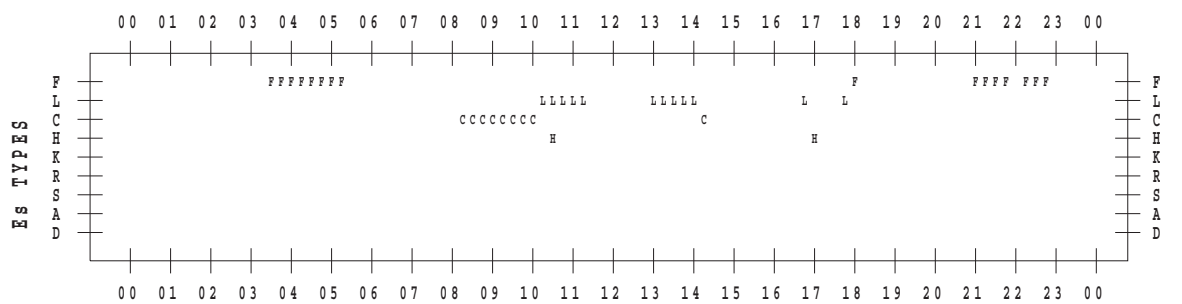
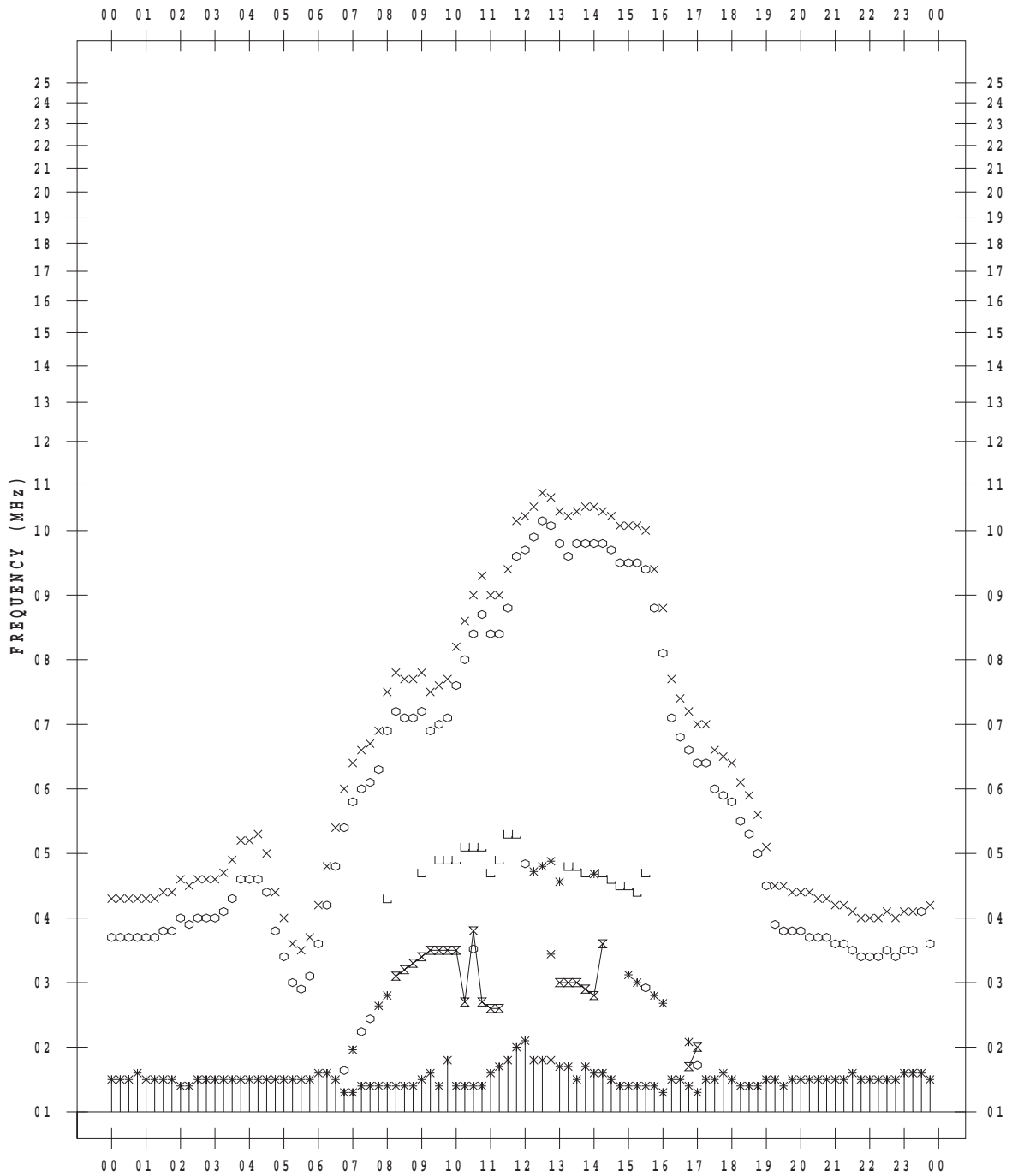
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 1

135 ° E MEAN TIME



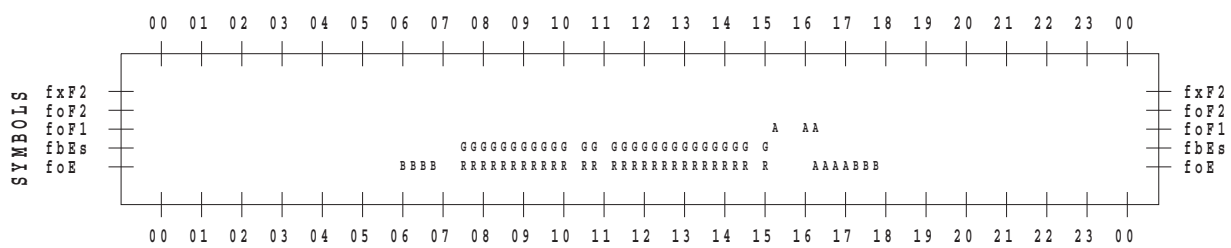
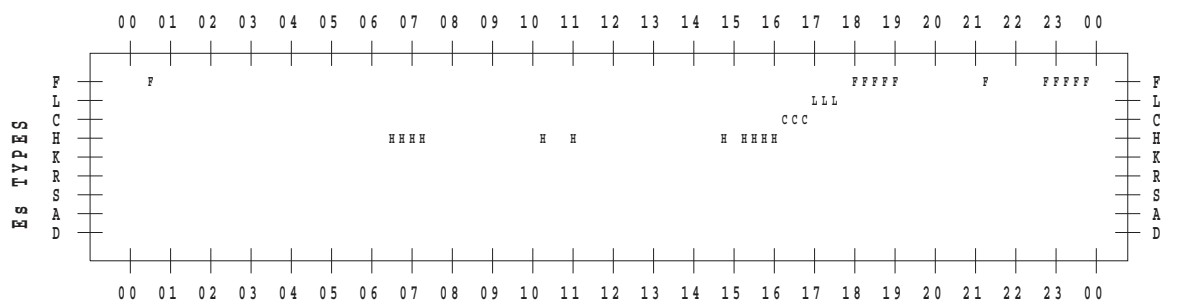
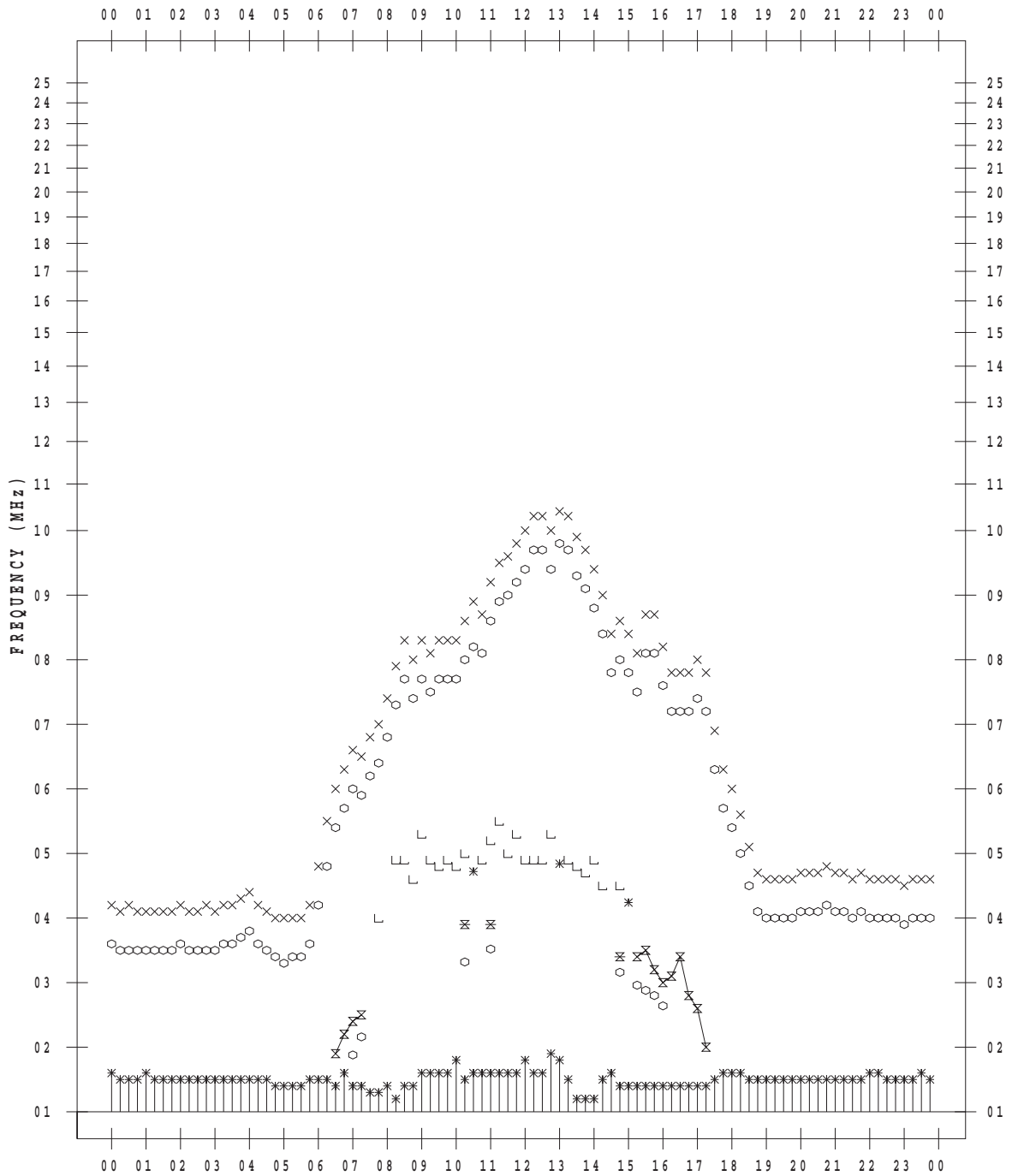
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 2

135 ° E MEAN TIME



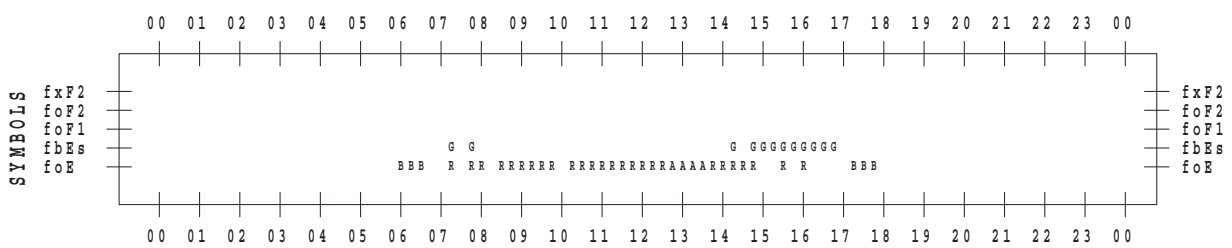
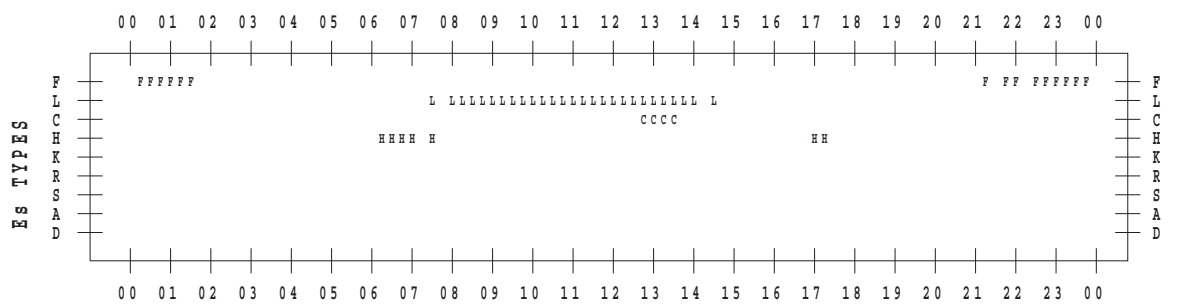
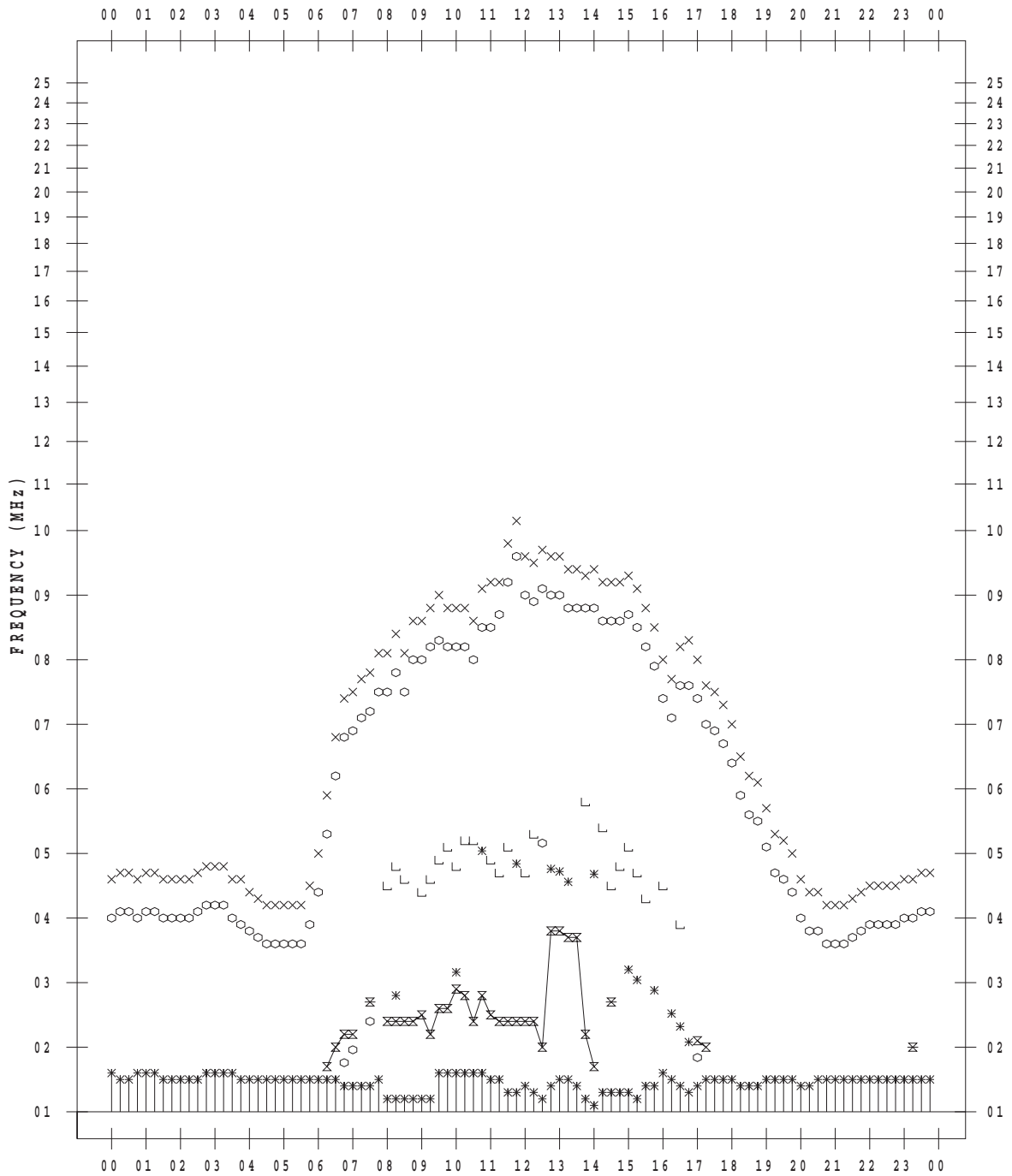
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 3

135 ° E MEAN TIME



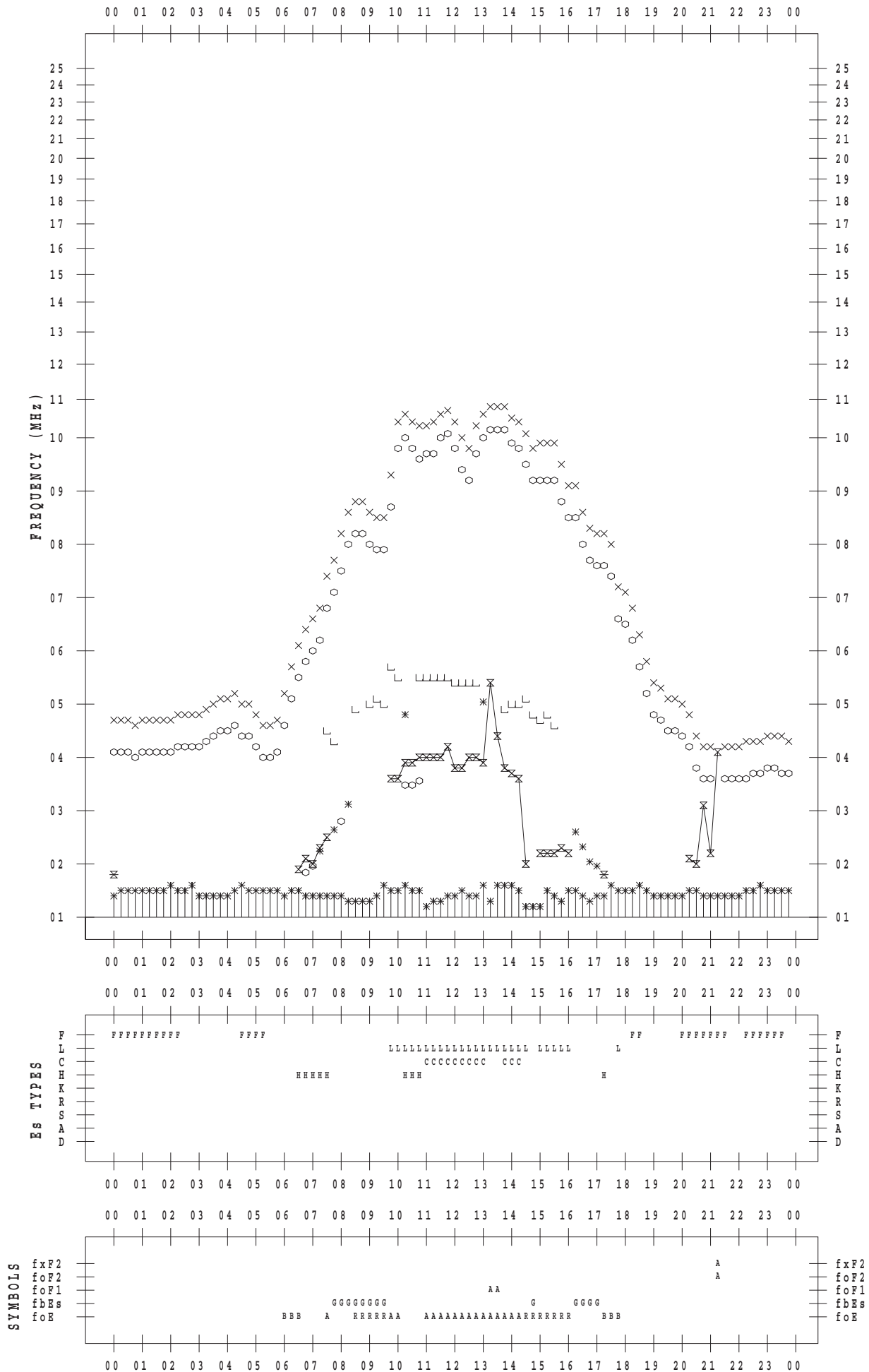
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 4

135 ° E MEAN TIME



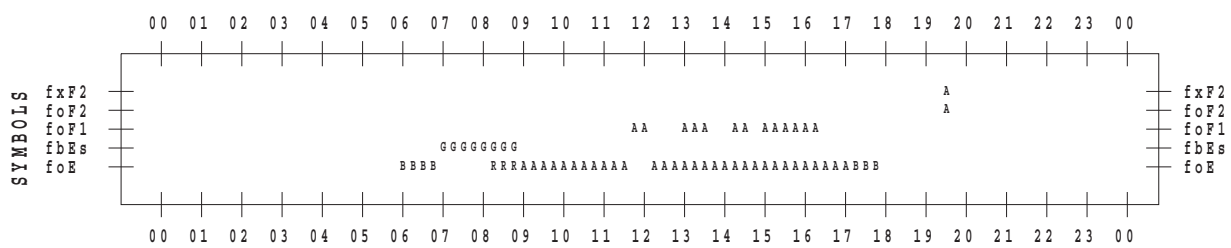
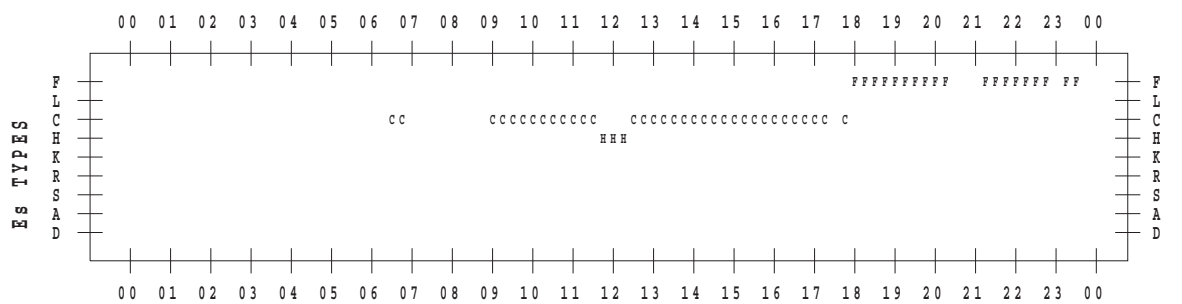
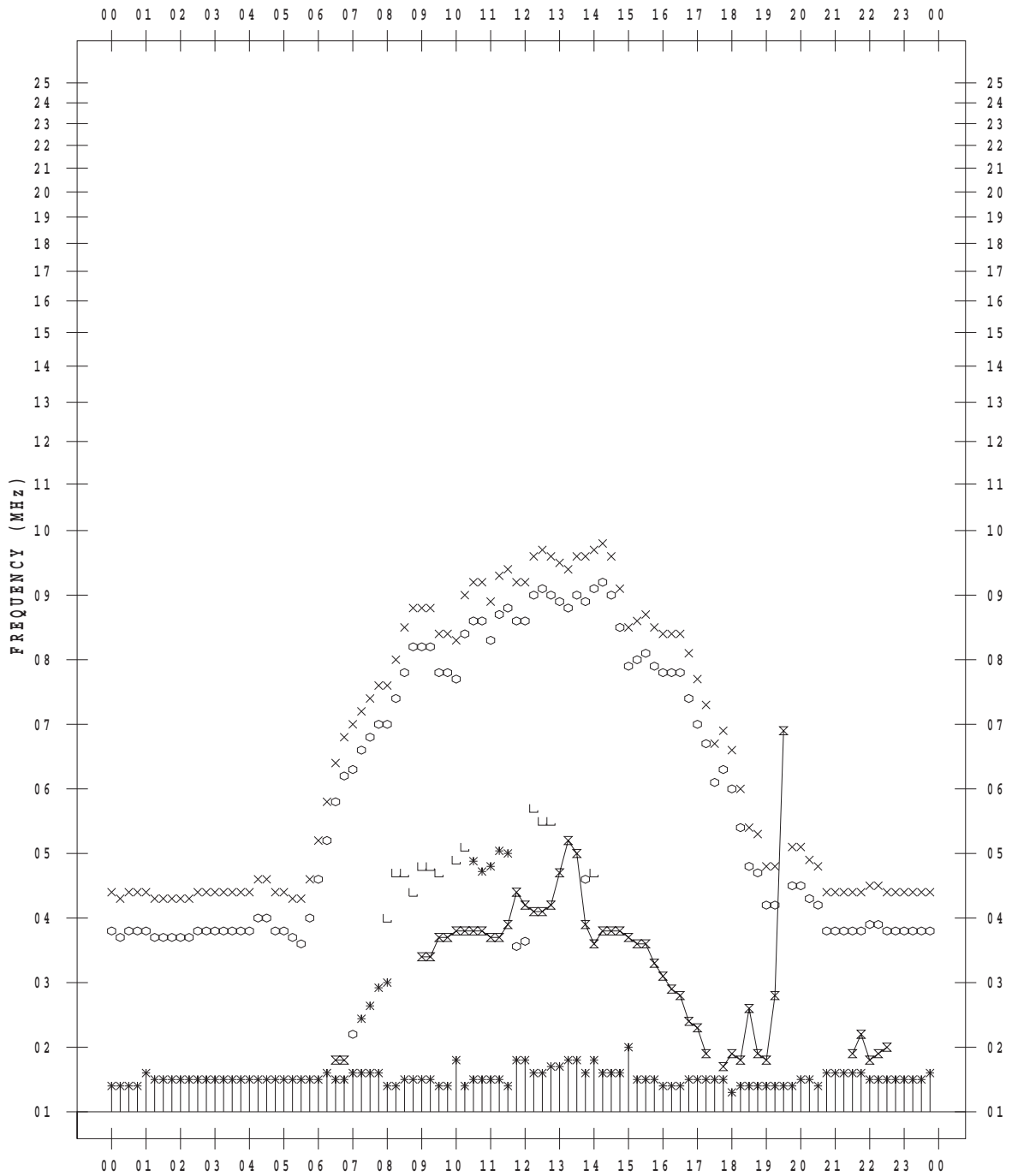
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 5

135 ° E MEAN TIME





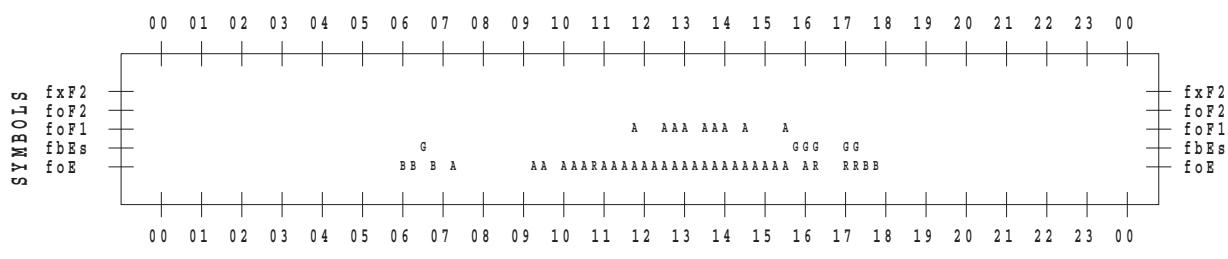
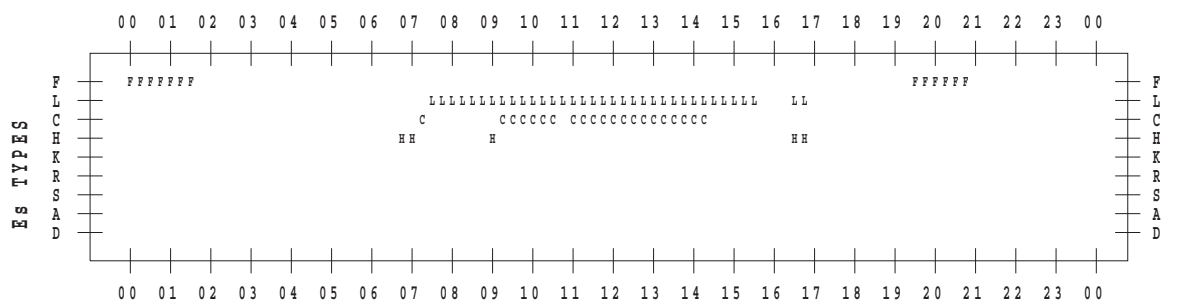
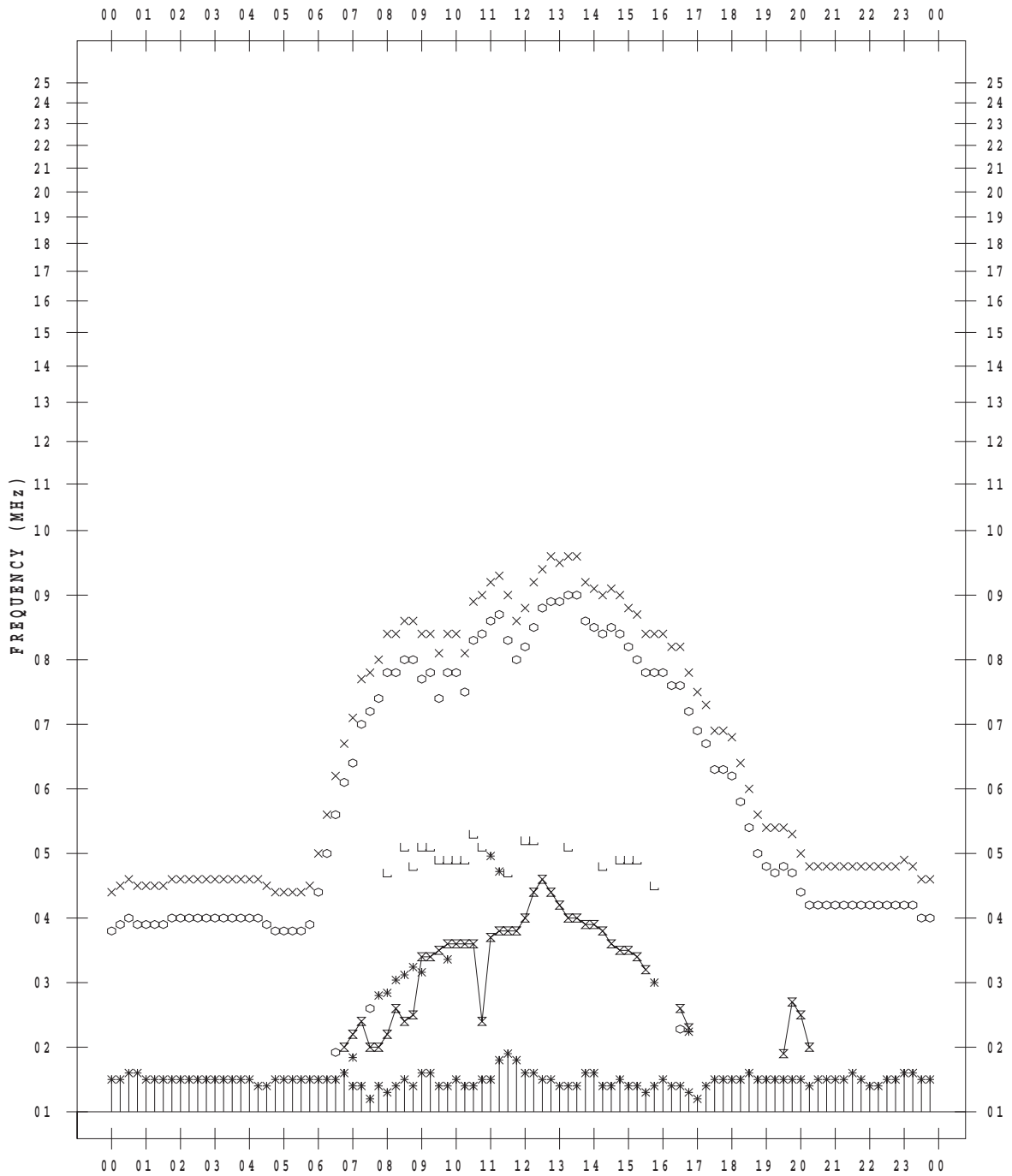
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 6

135 ° E MEAN TIME



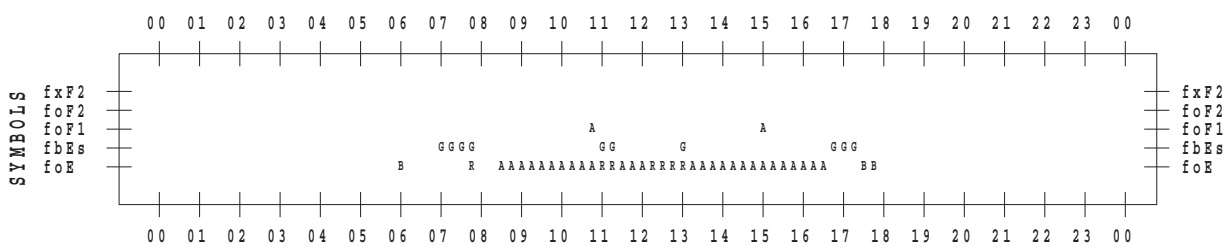
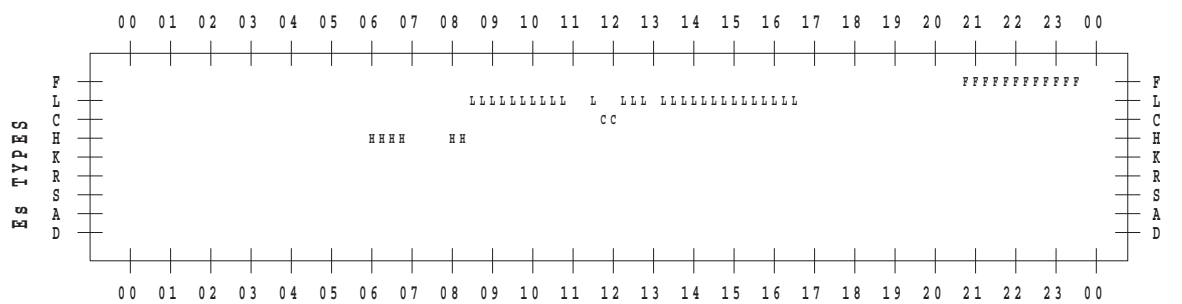
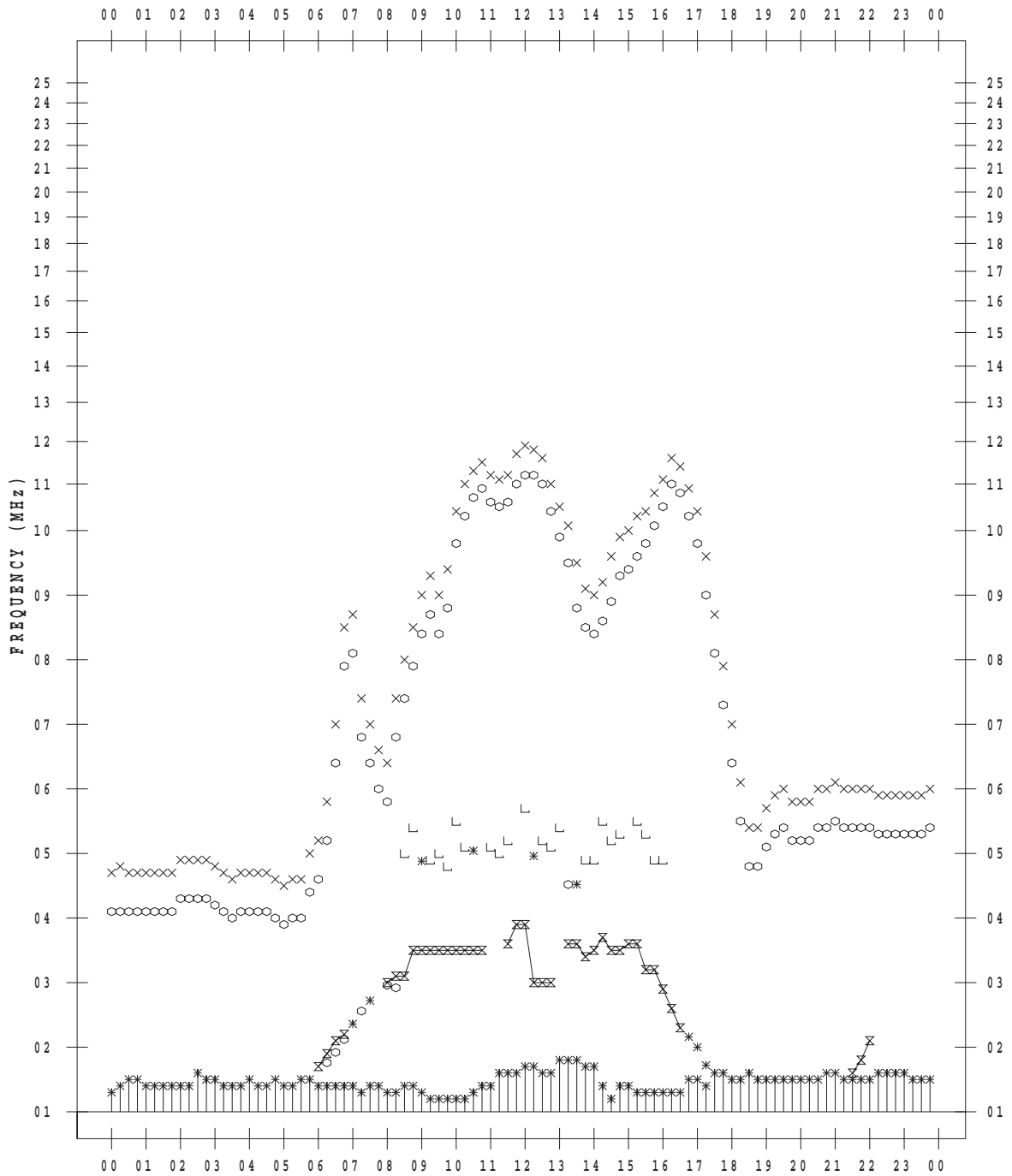
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 7

135 ° E MEAN TIME



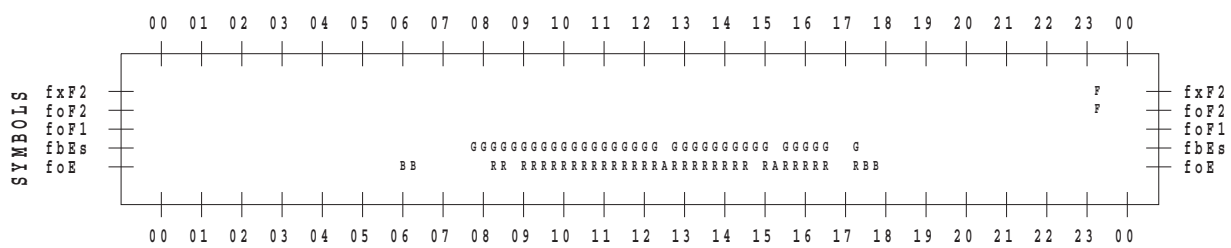
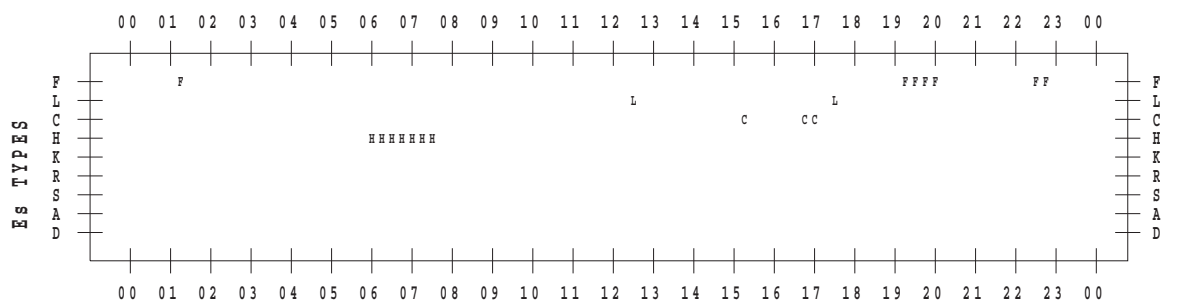
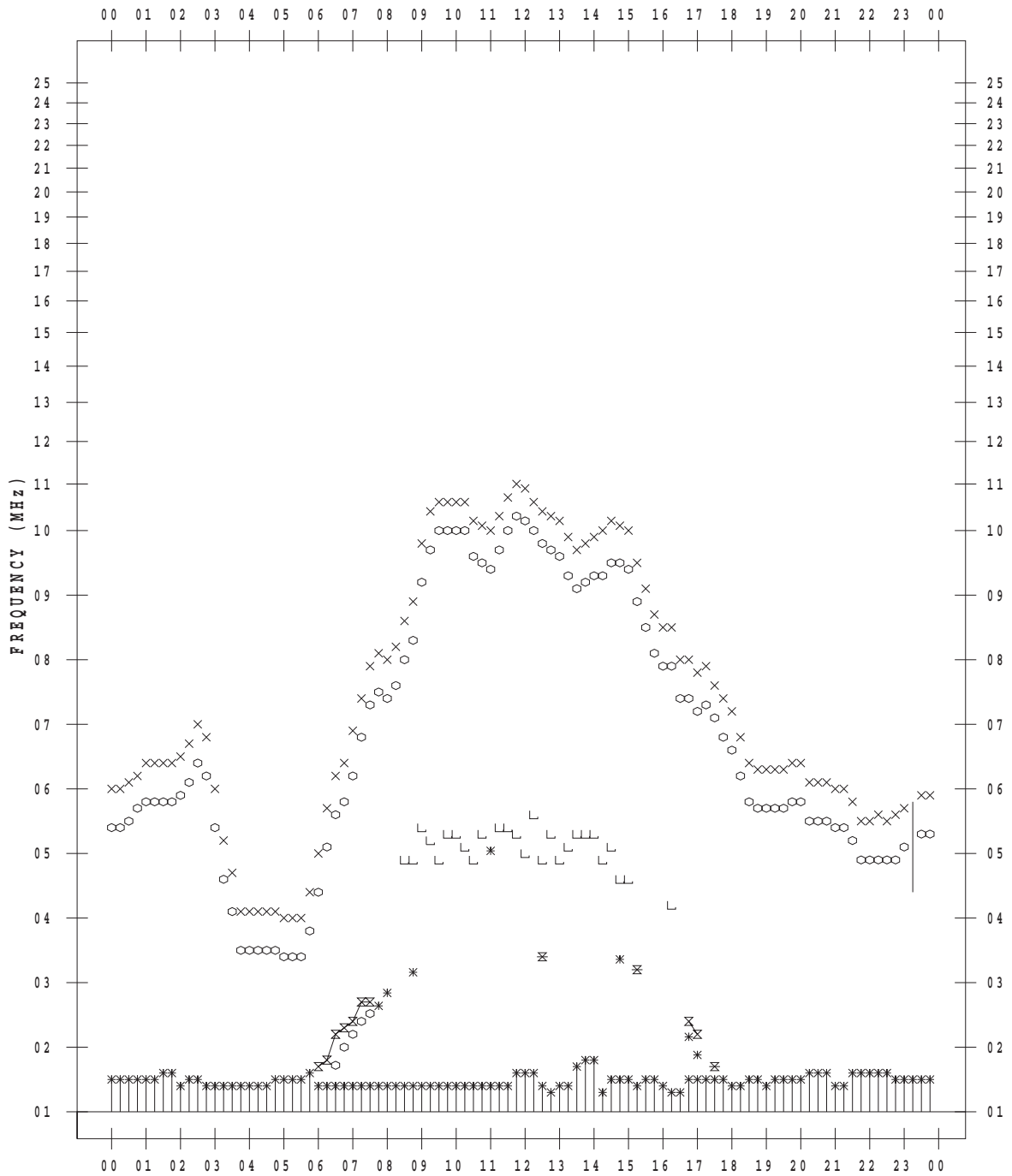
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 8

135 ° E MEAN TIME



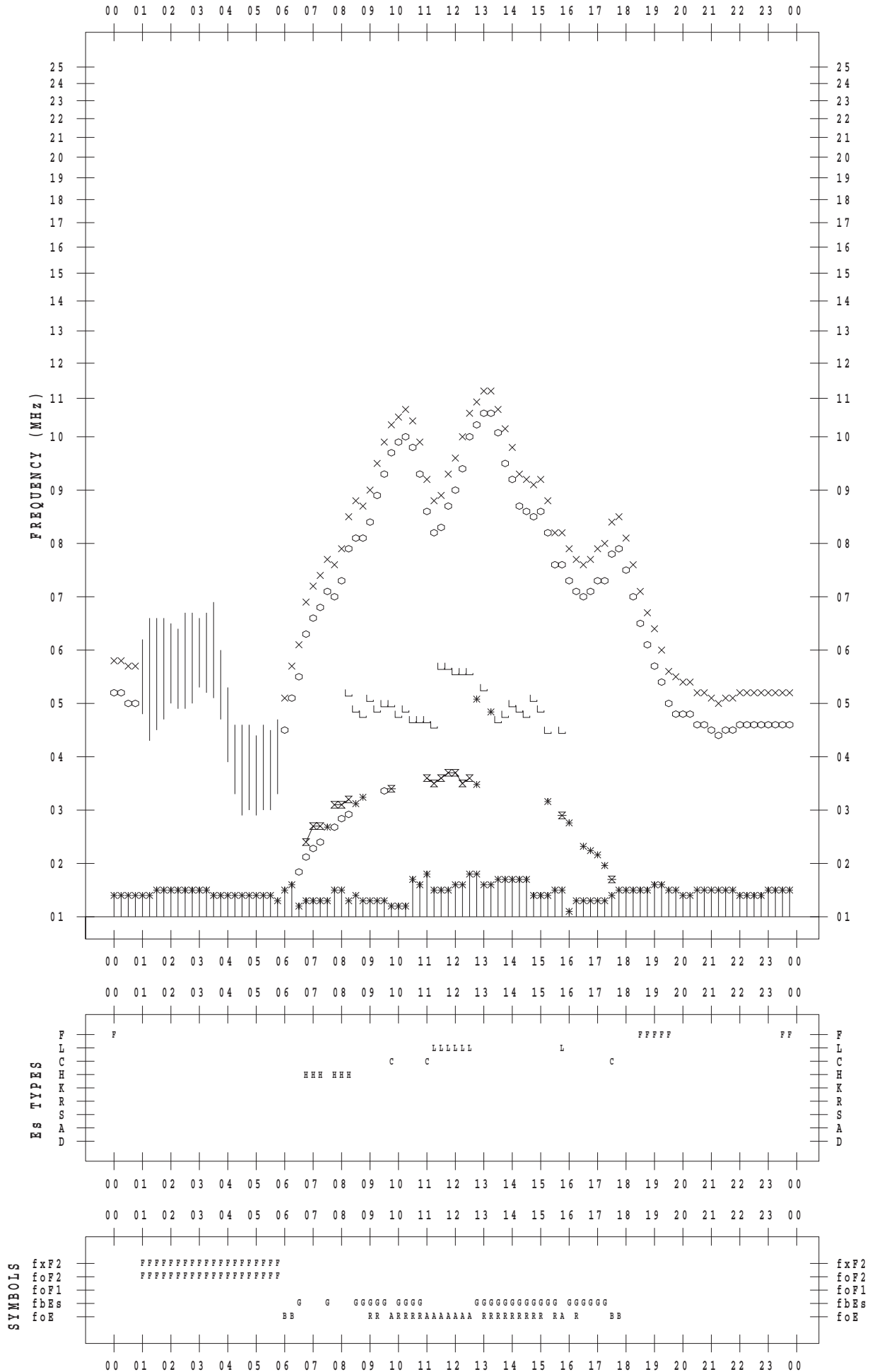
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 9

135 ° E MEAN TIME



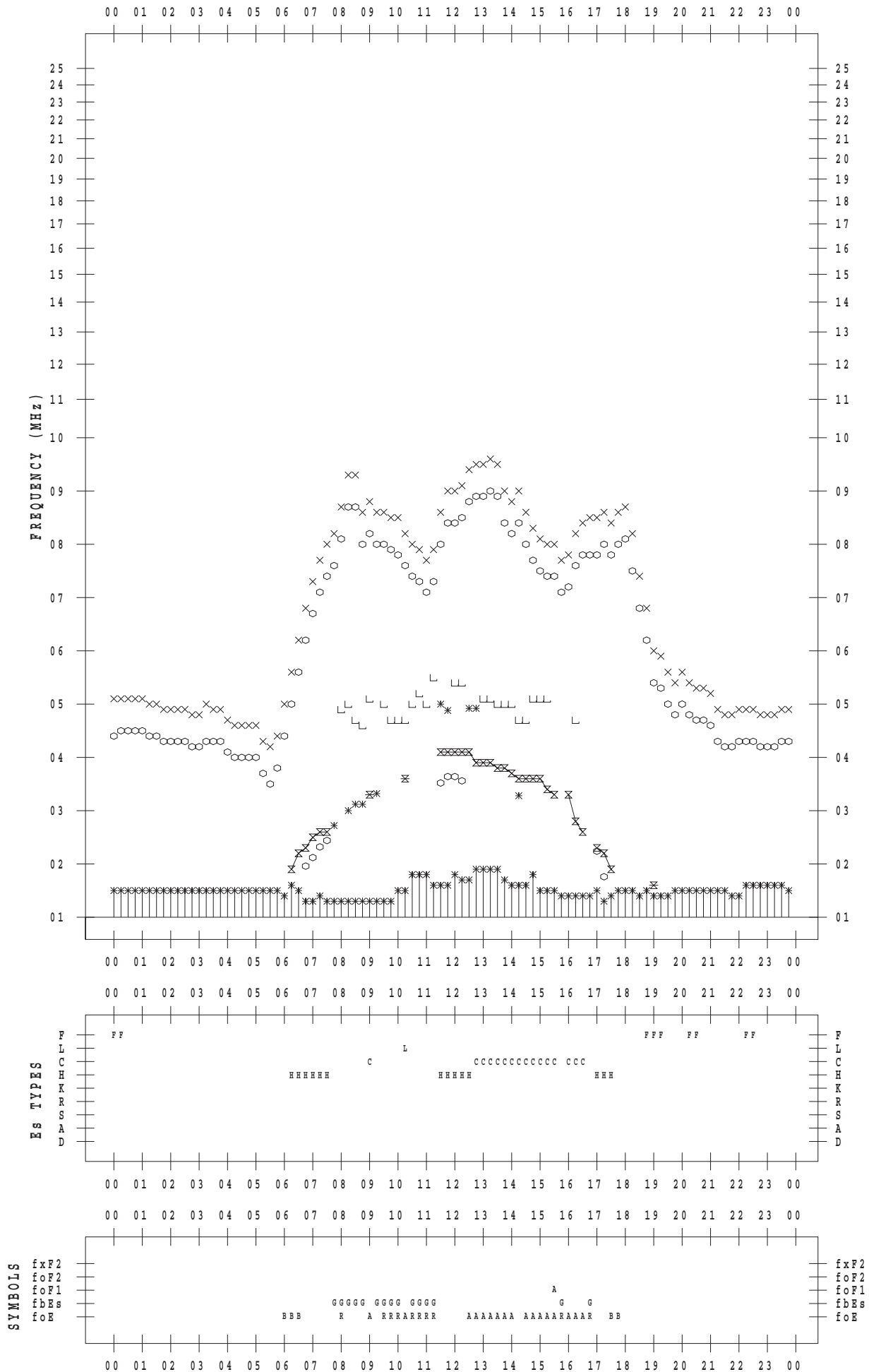
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 10

135 ° E MEAN TIME







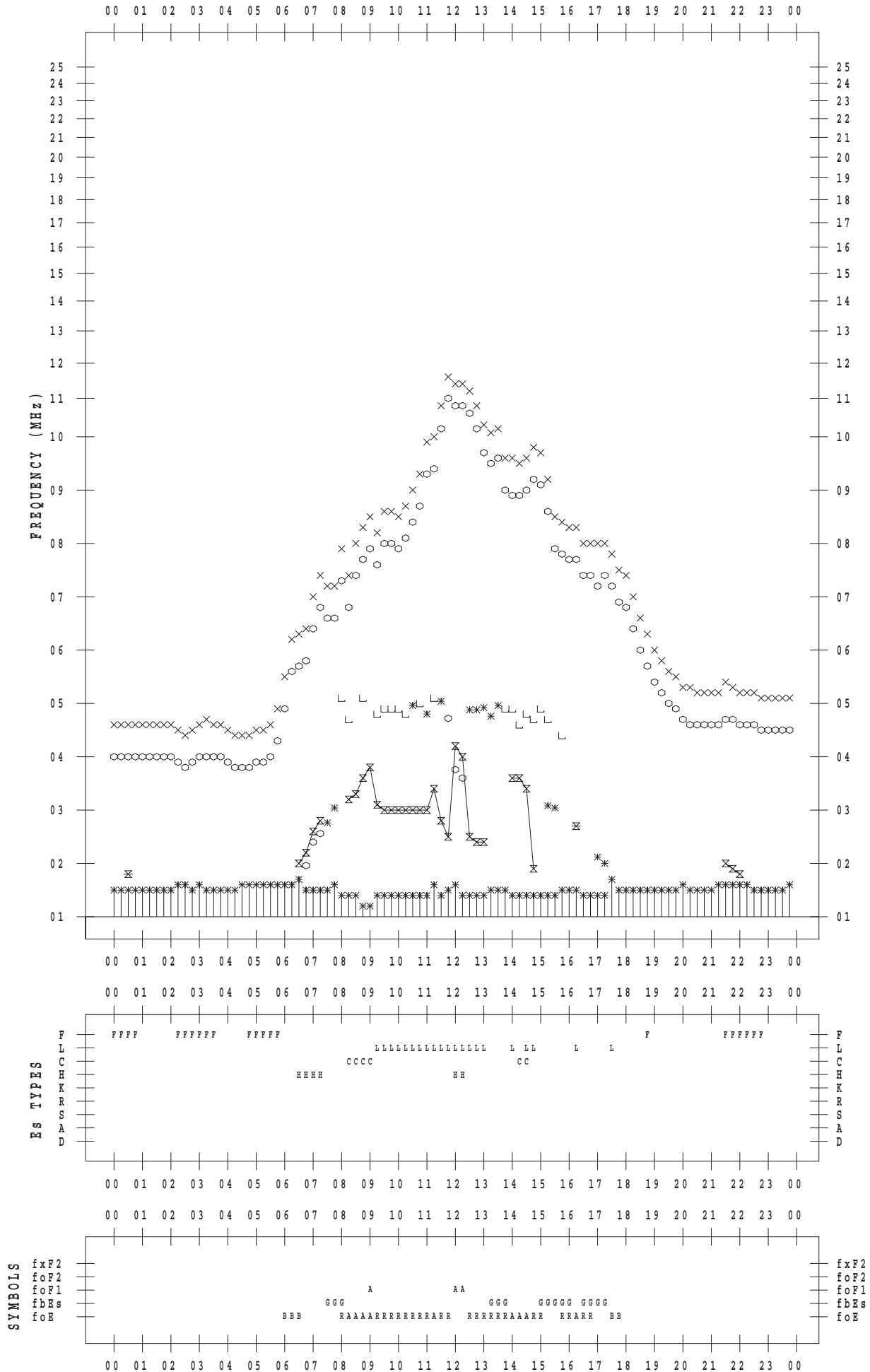
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 13

135 ° E MEAN TIME





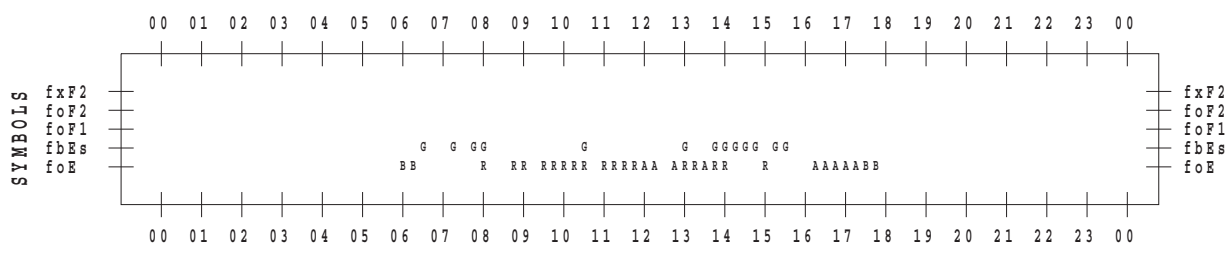
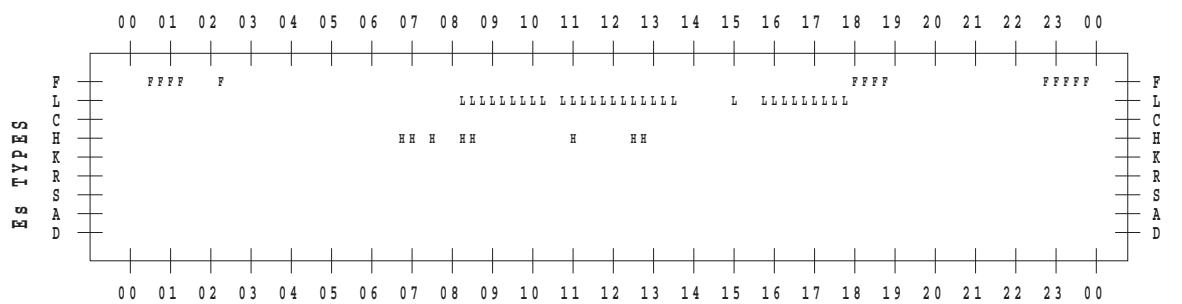
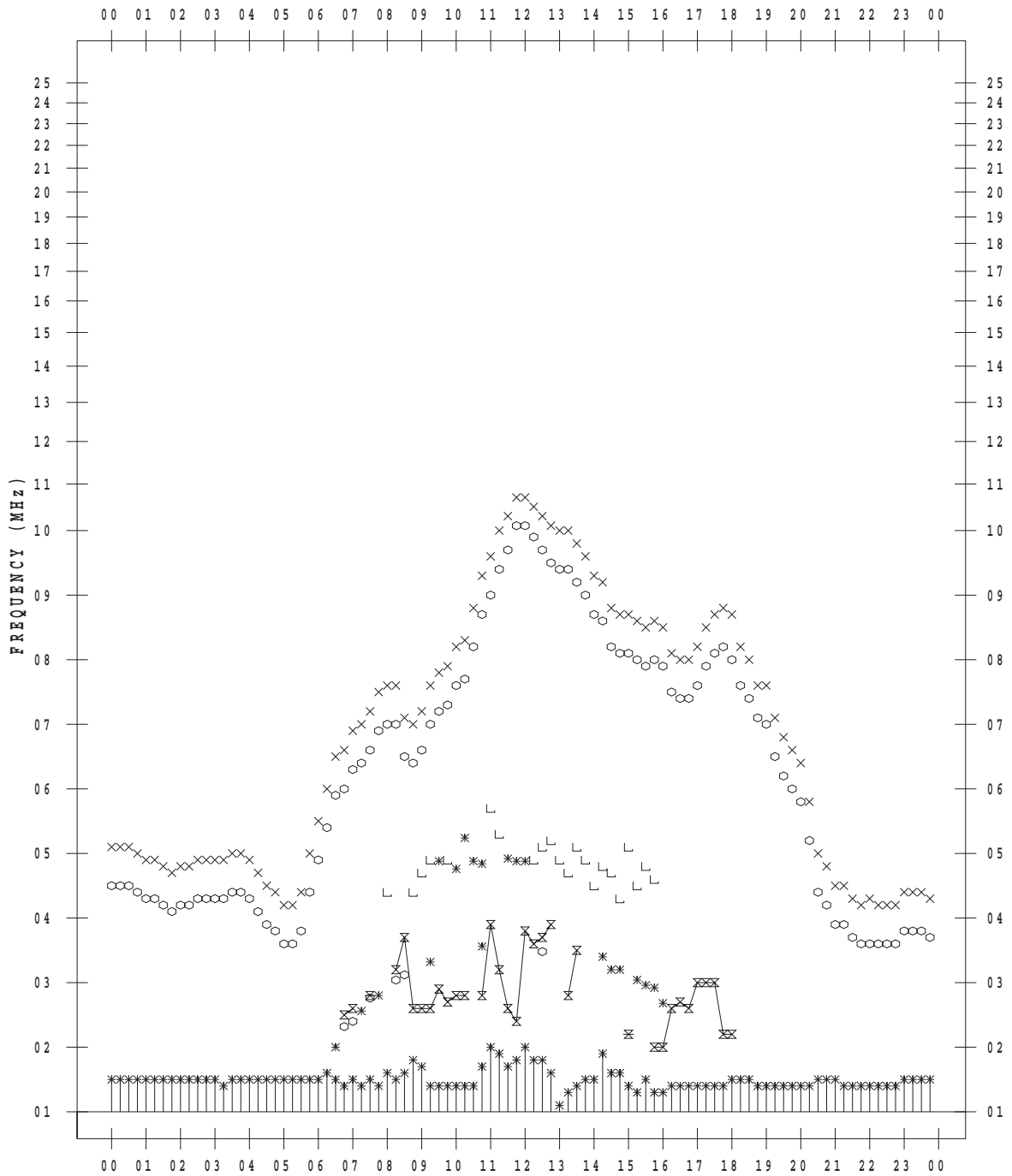
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 14

135 ° E MEAN TIME



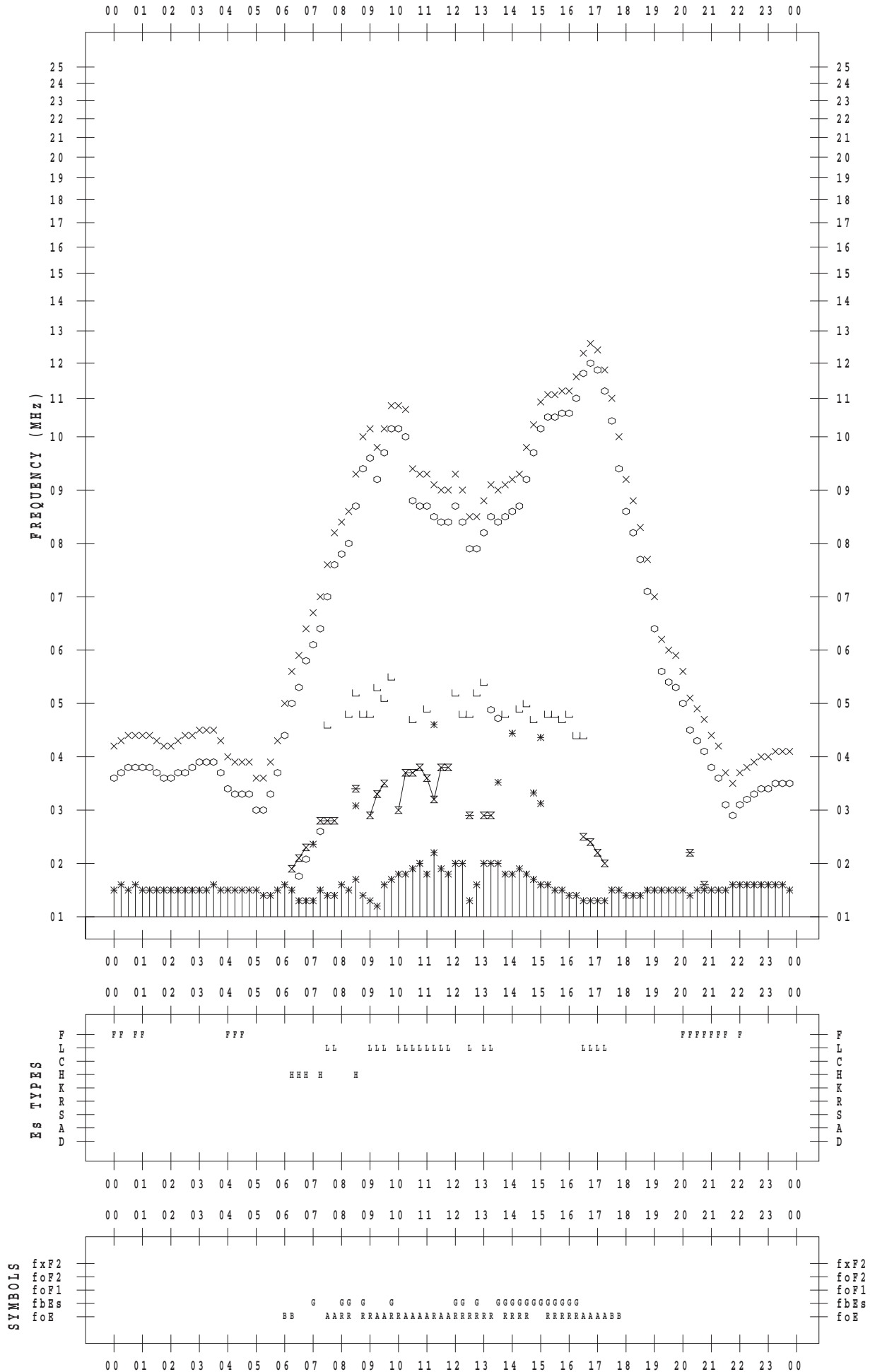
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 15

135 ° E MEAN TIME



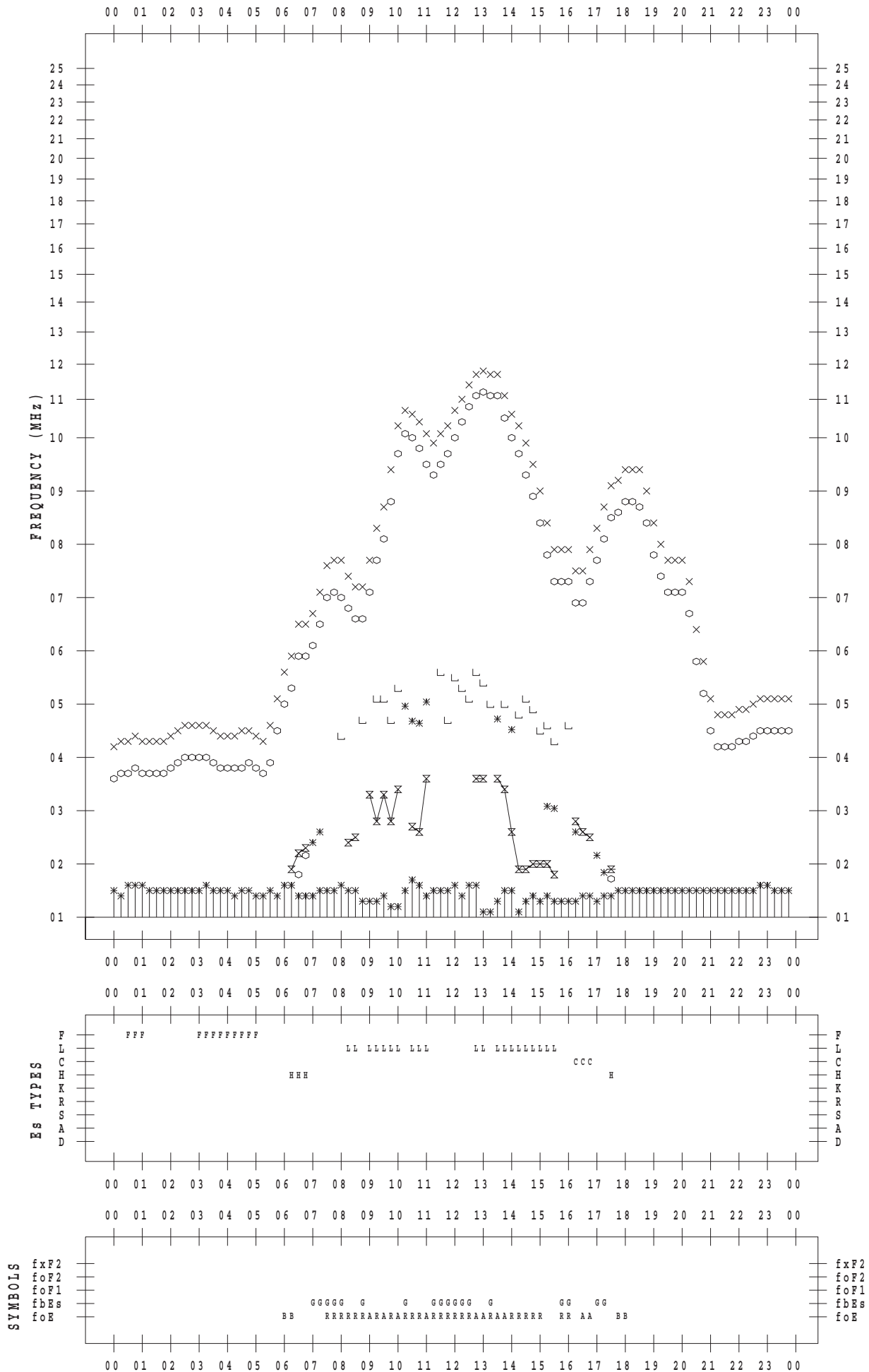
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 16

135 ° E MEAN TIME



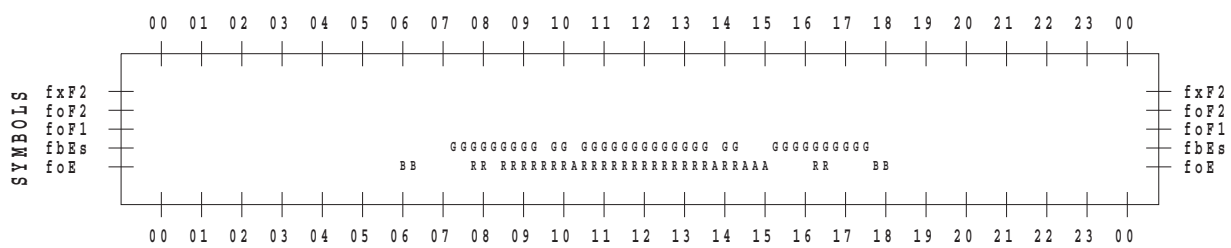
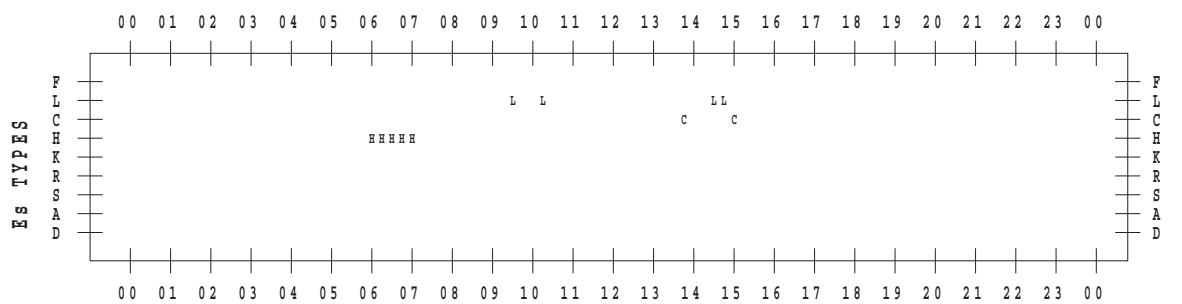
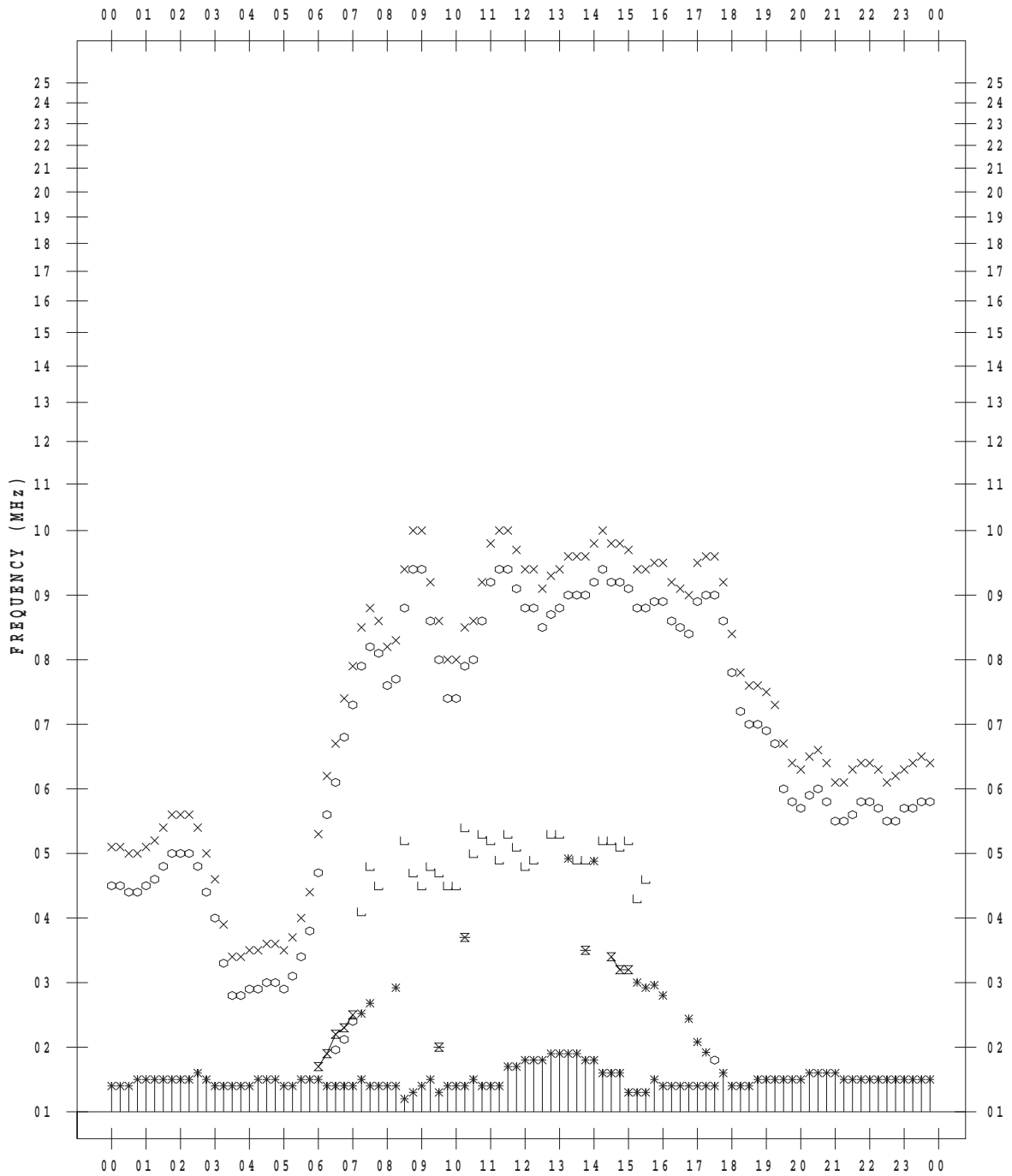
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 17

135 ° E MEAN TIME







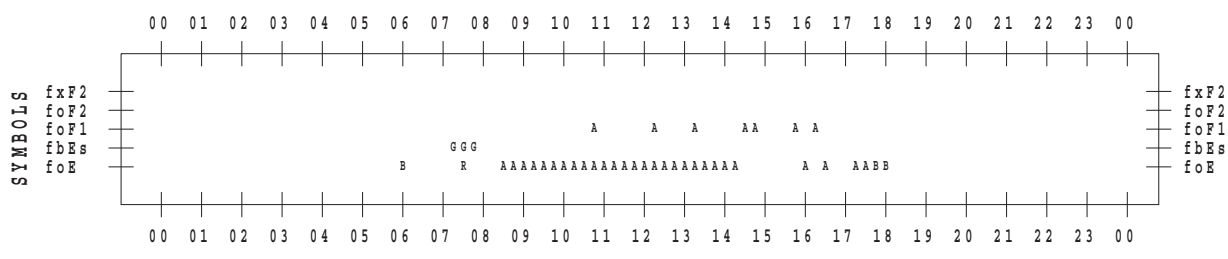
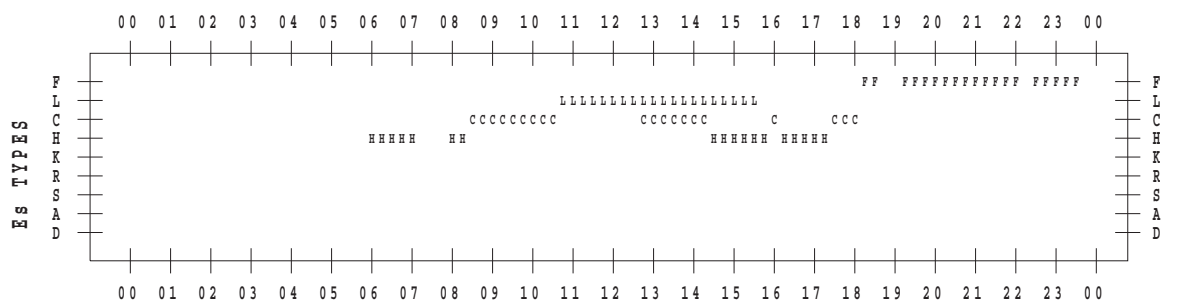
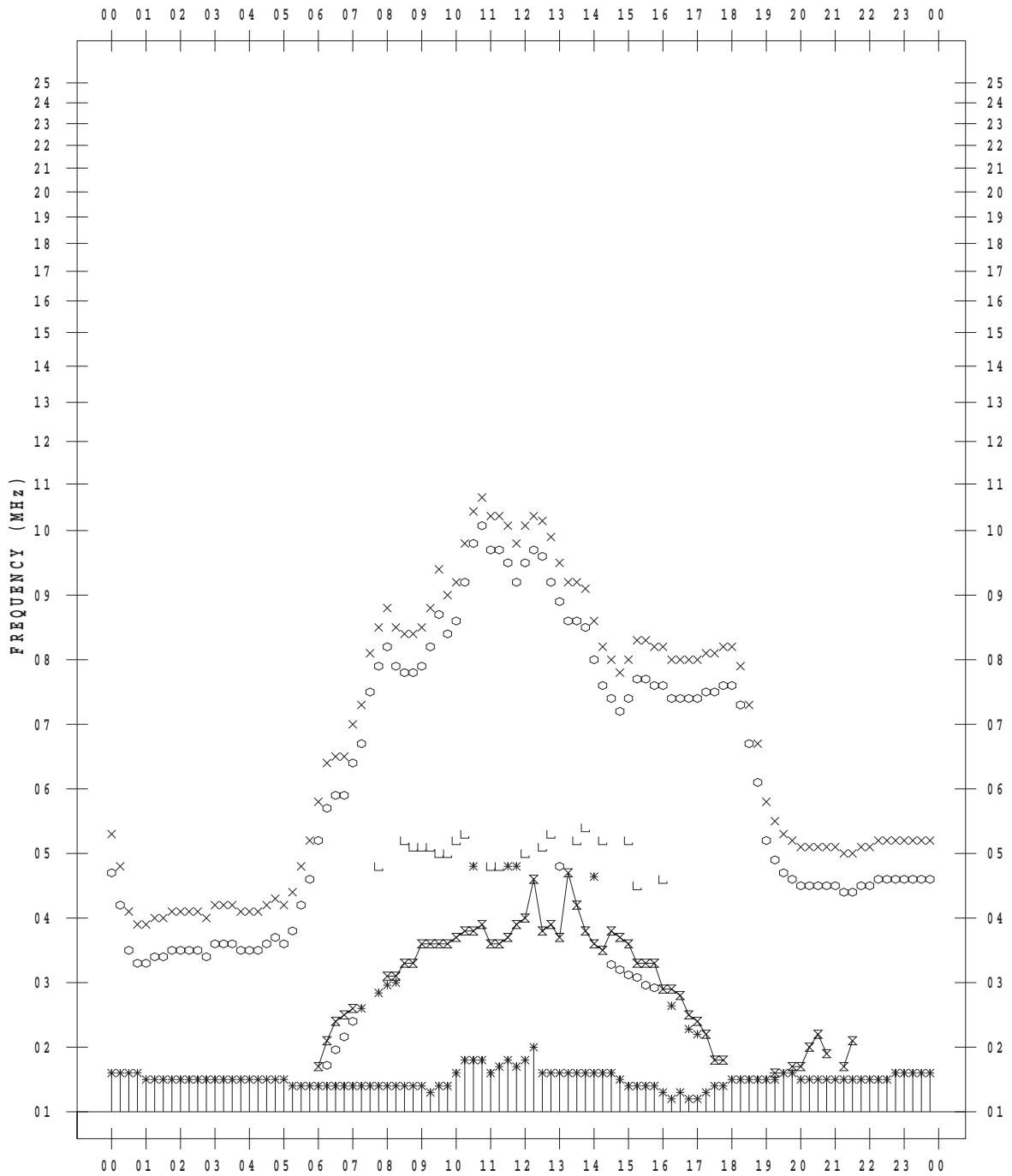
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 20

135 ° E MEAN TIME



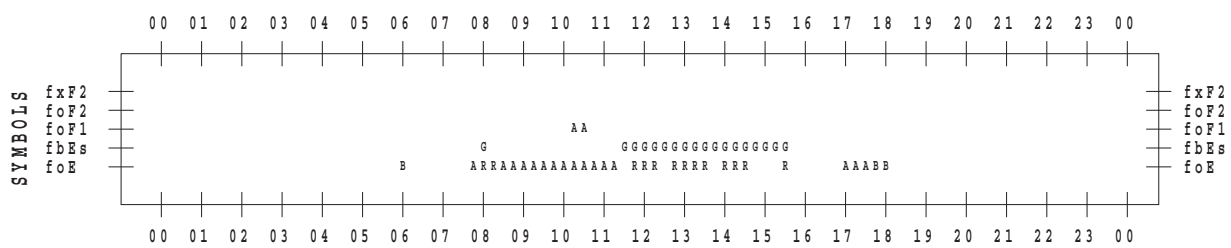
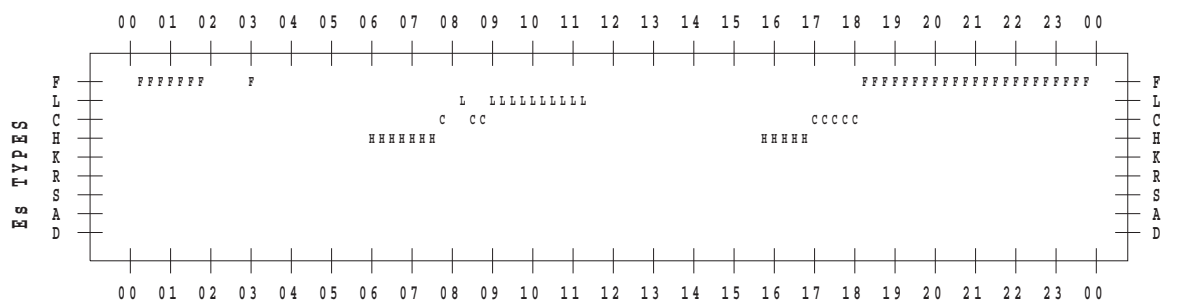
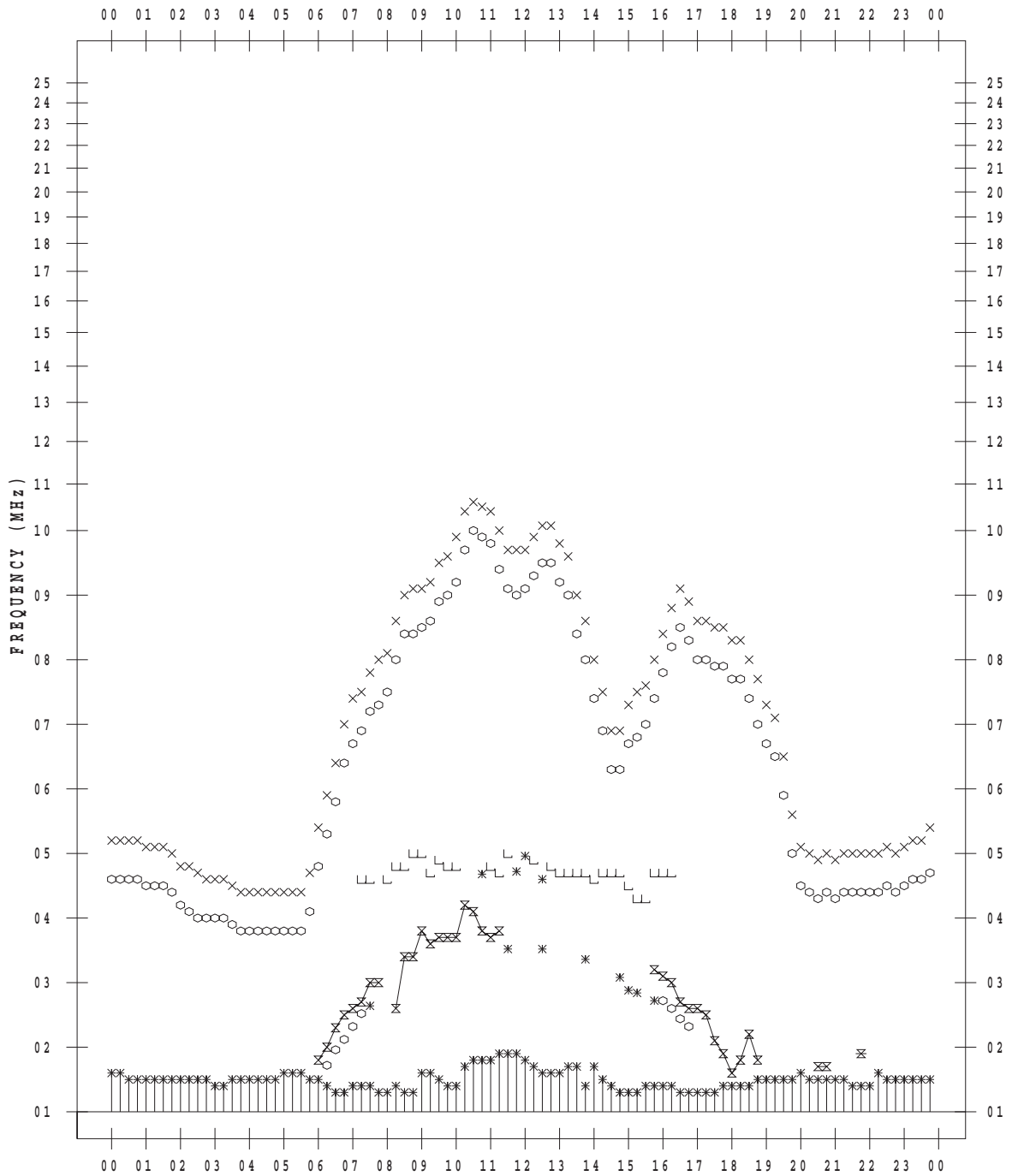
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 21

135 ° E MEAN TIME





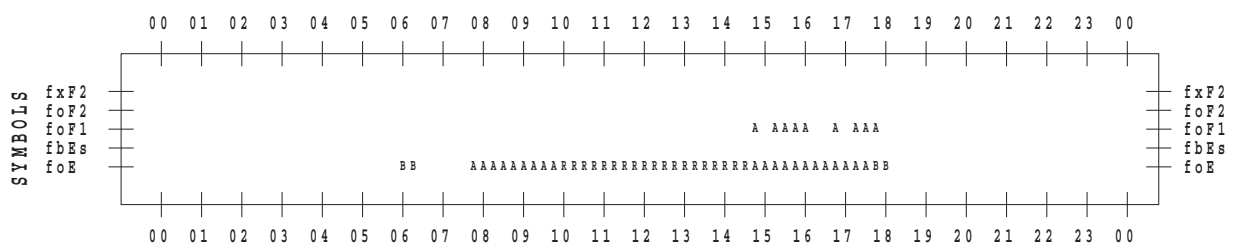
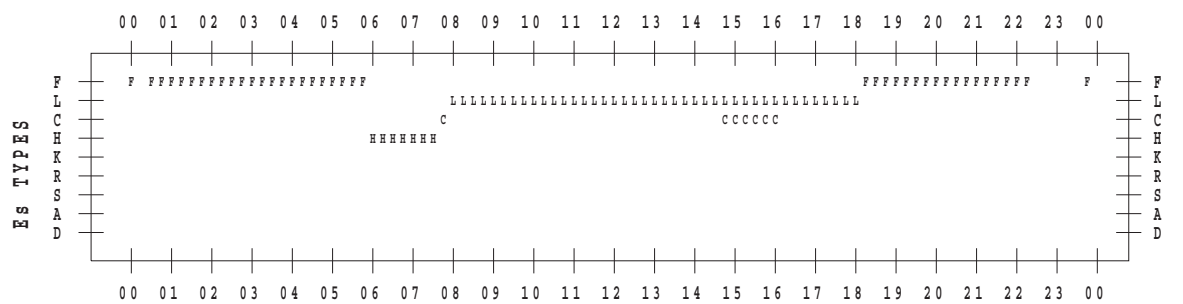
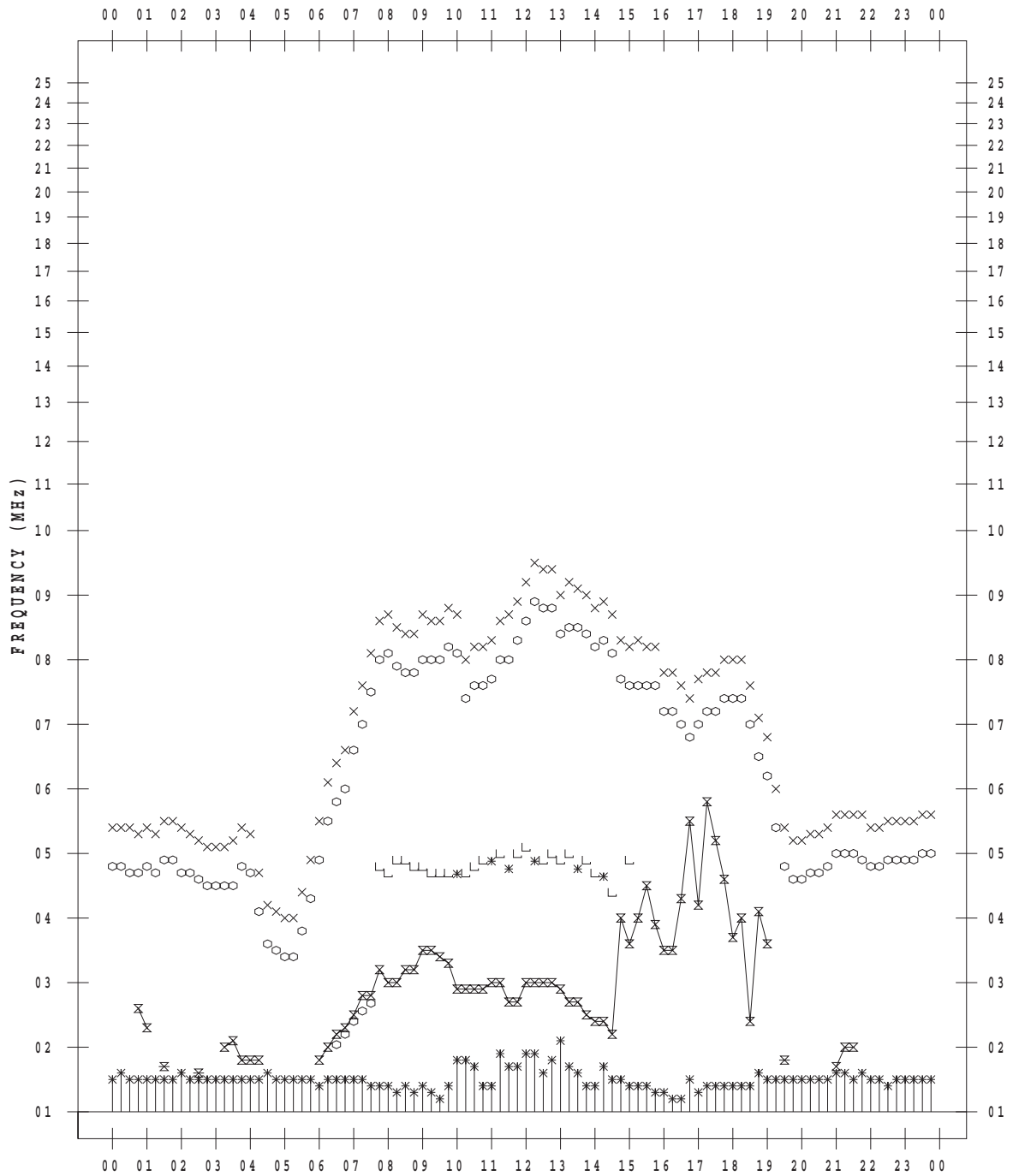
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 22

135 ° E MEAN TIME



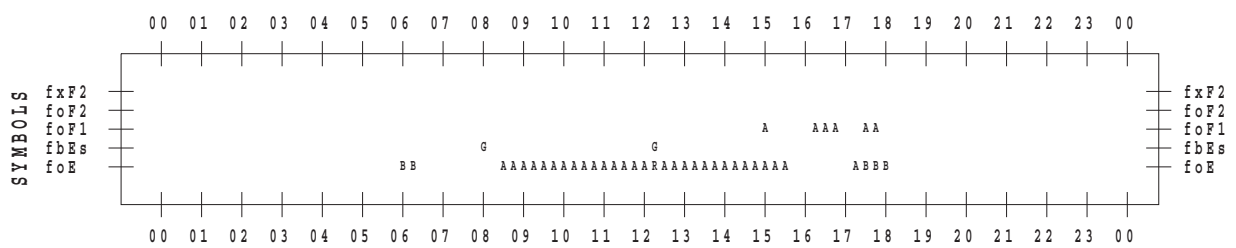
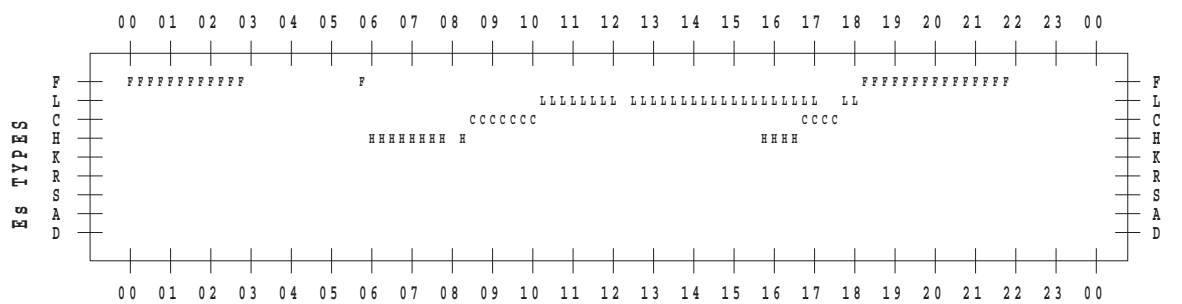
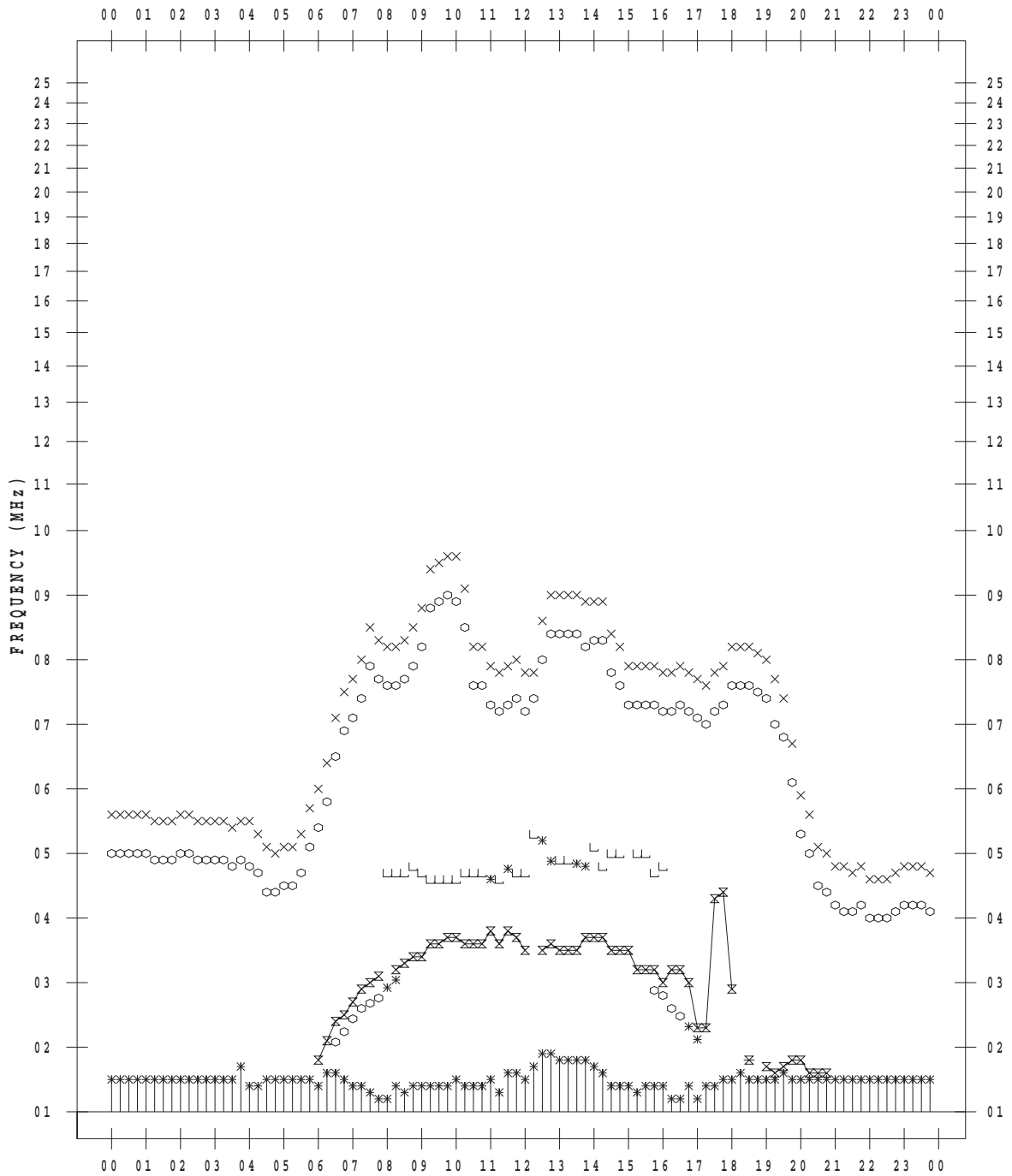
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 23

135 ° E MEAN TIME





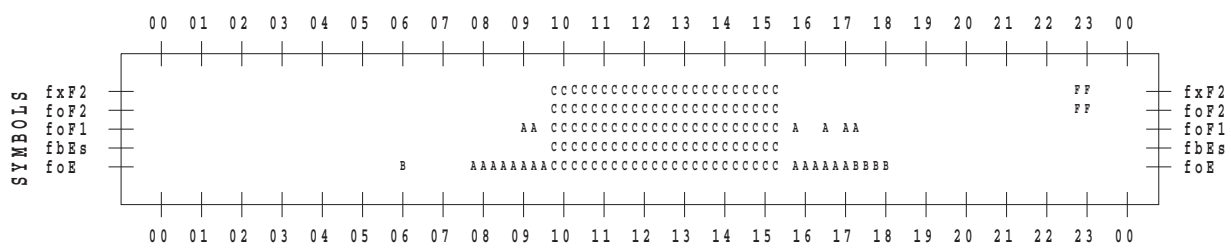
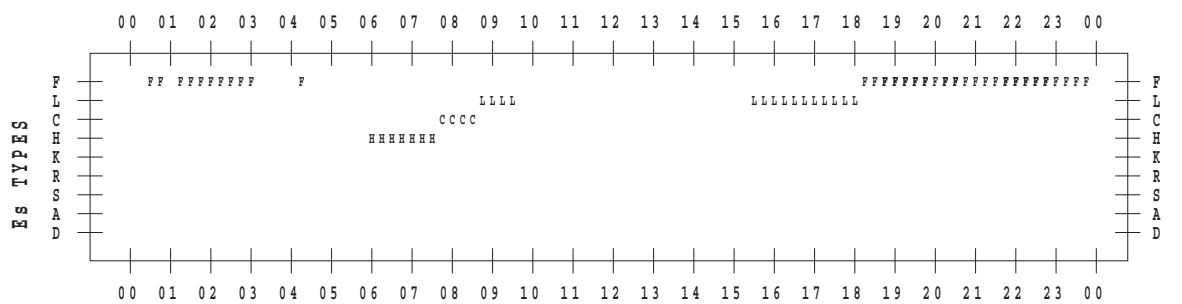
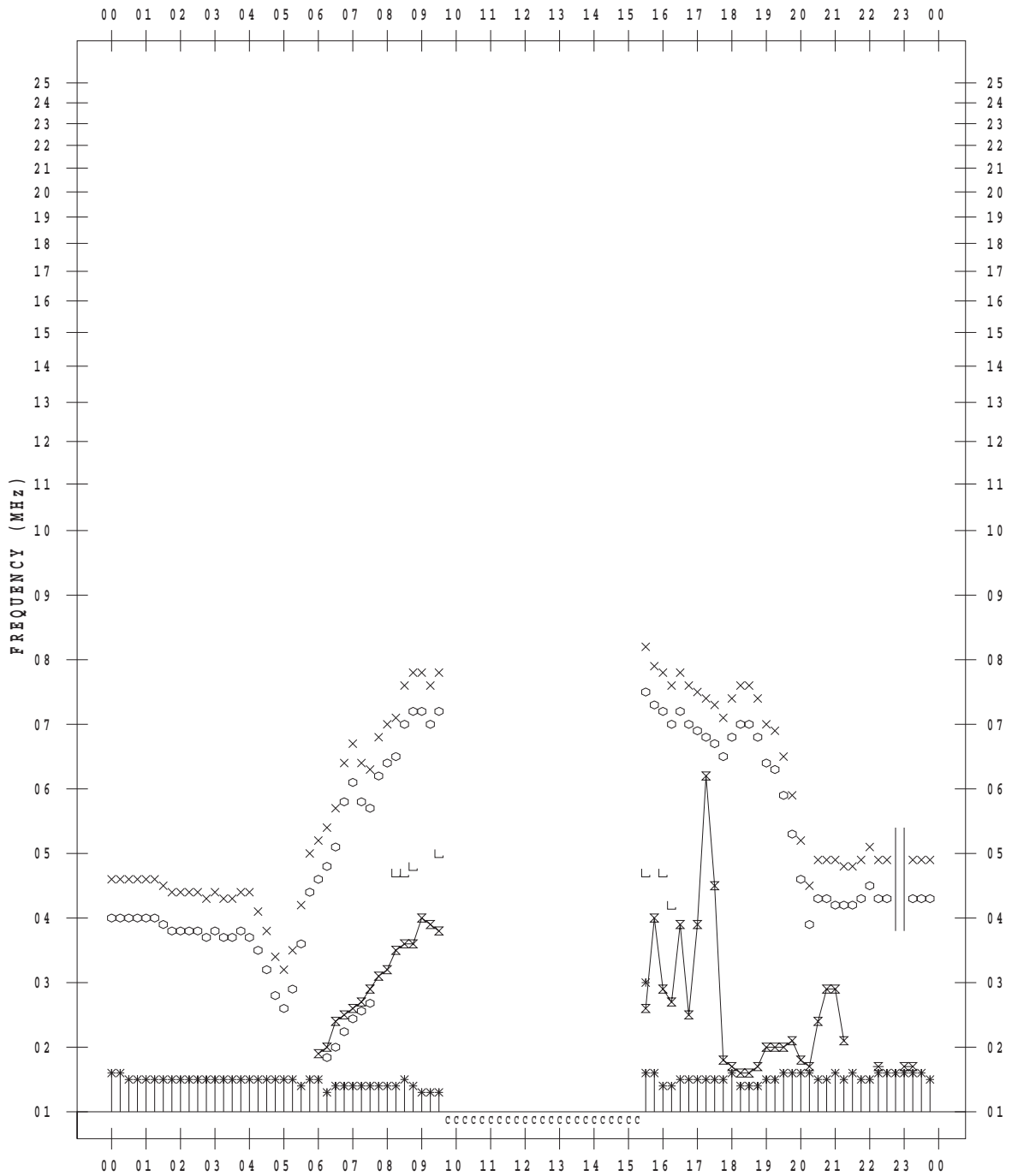
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 25

135 ° E MEAN TIME



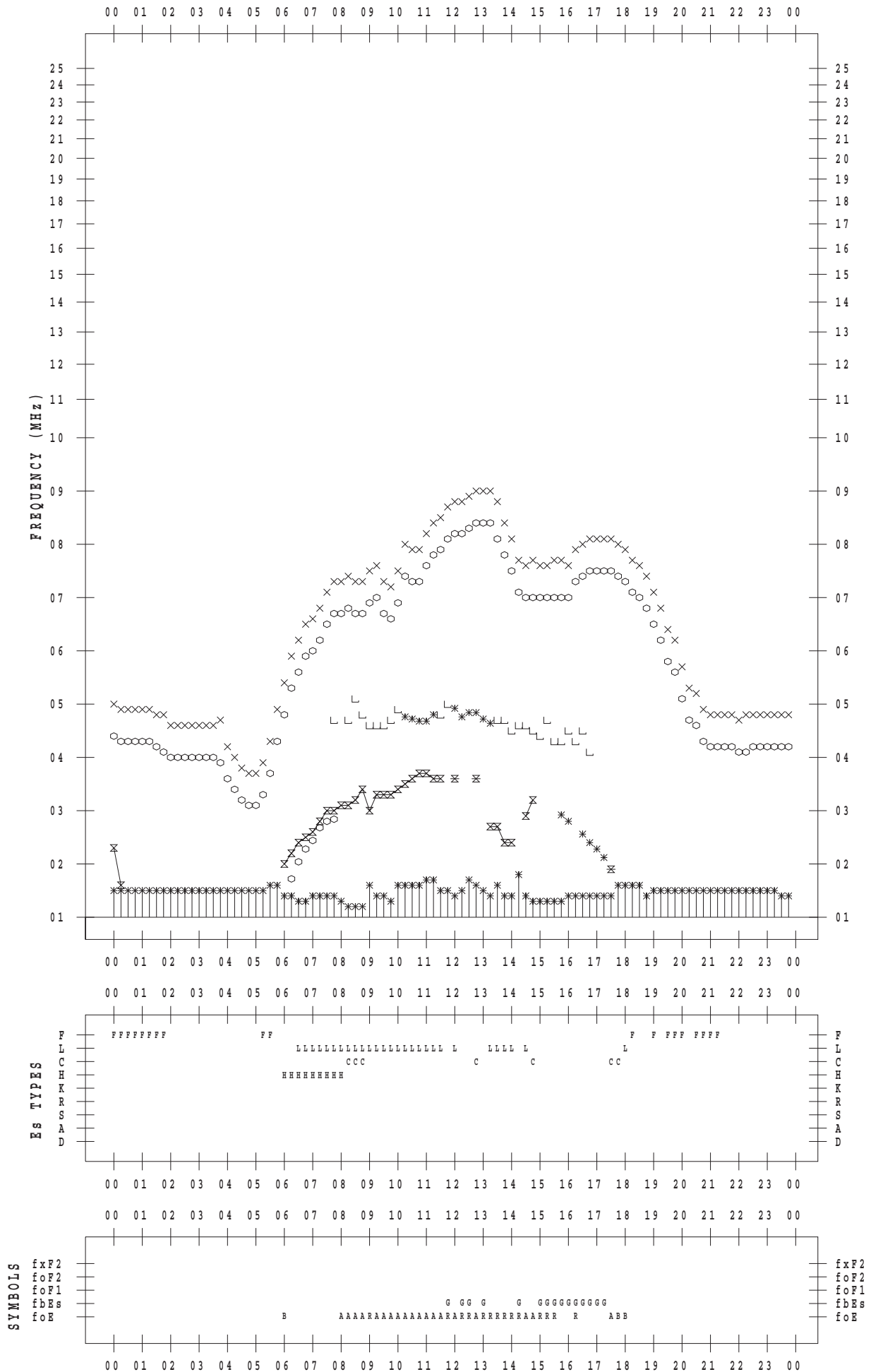
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 26

135 ° E MEAN TIME



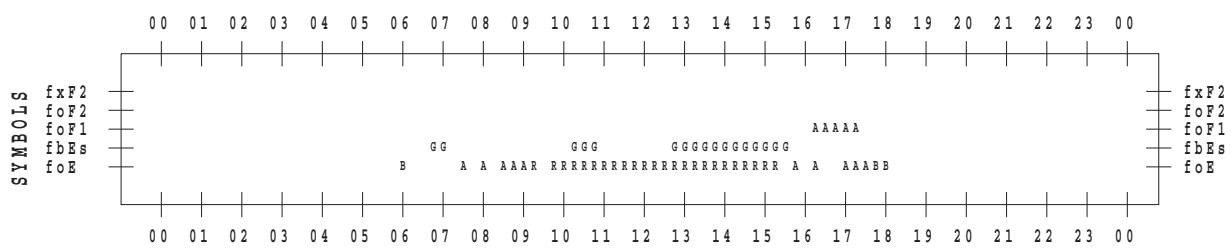
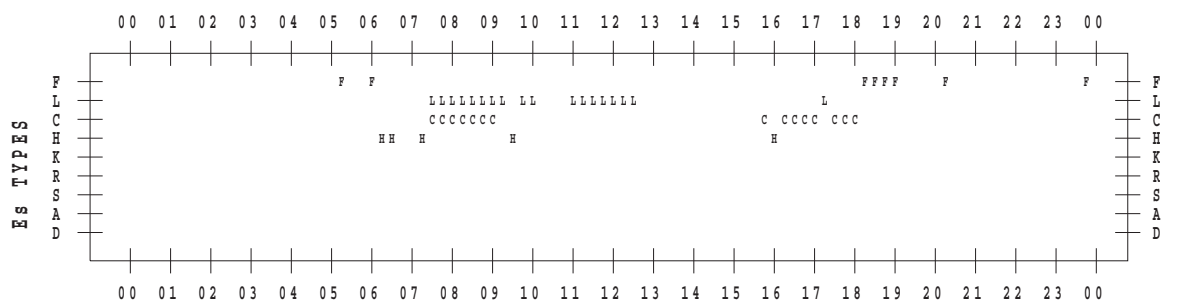
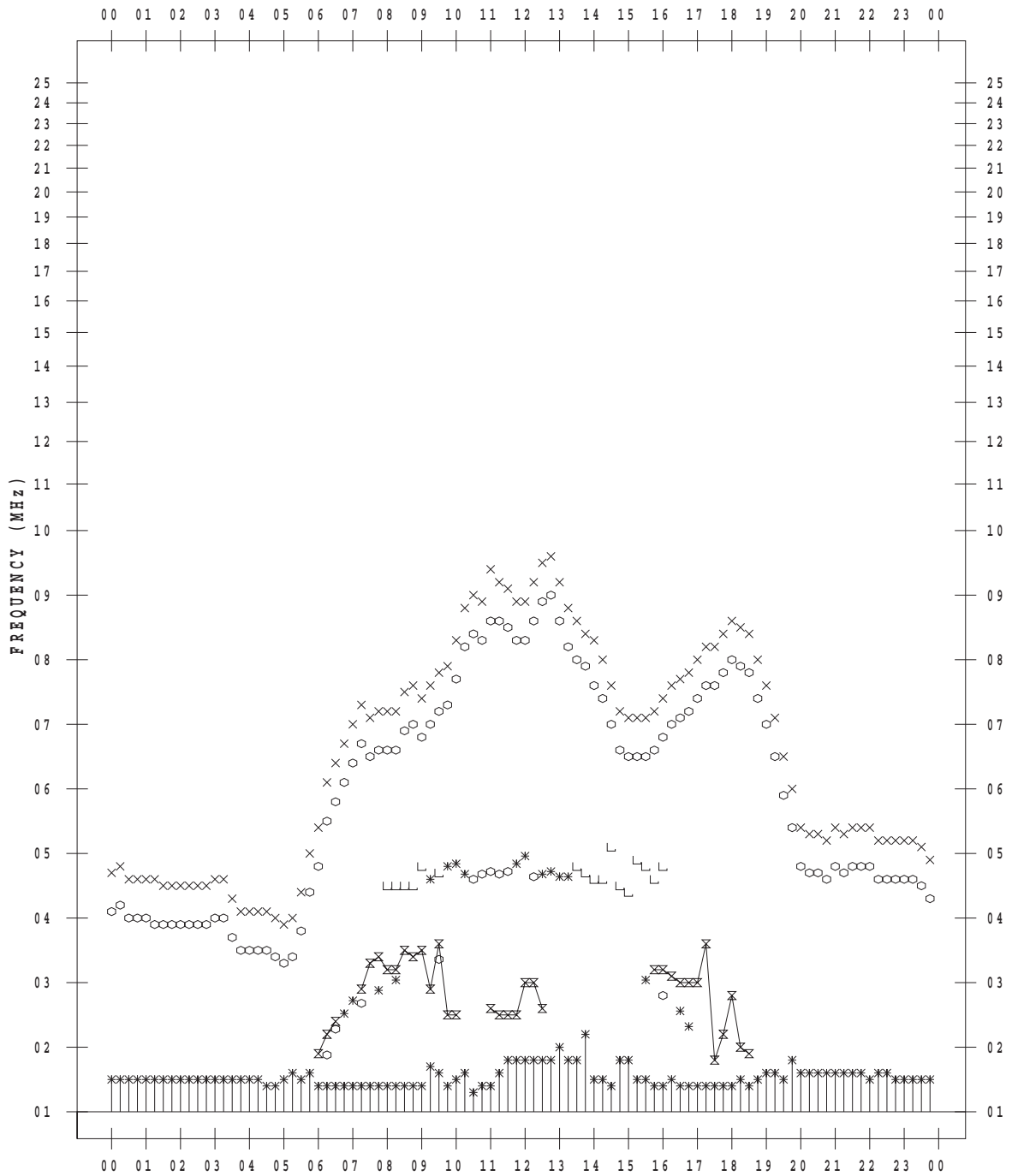
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 27

135 ° E MEAN TIME



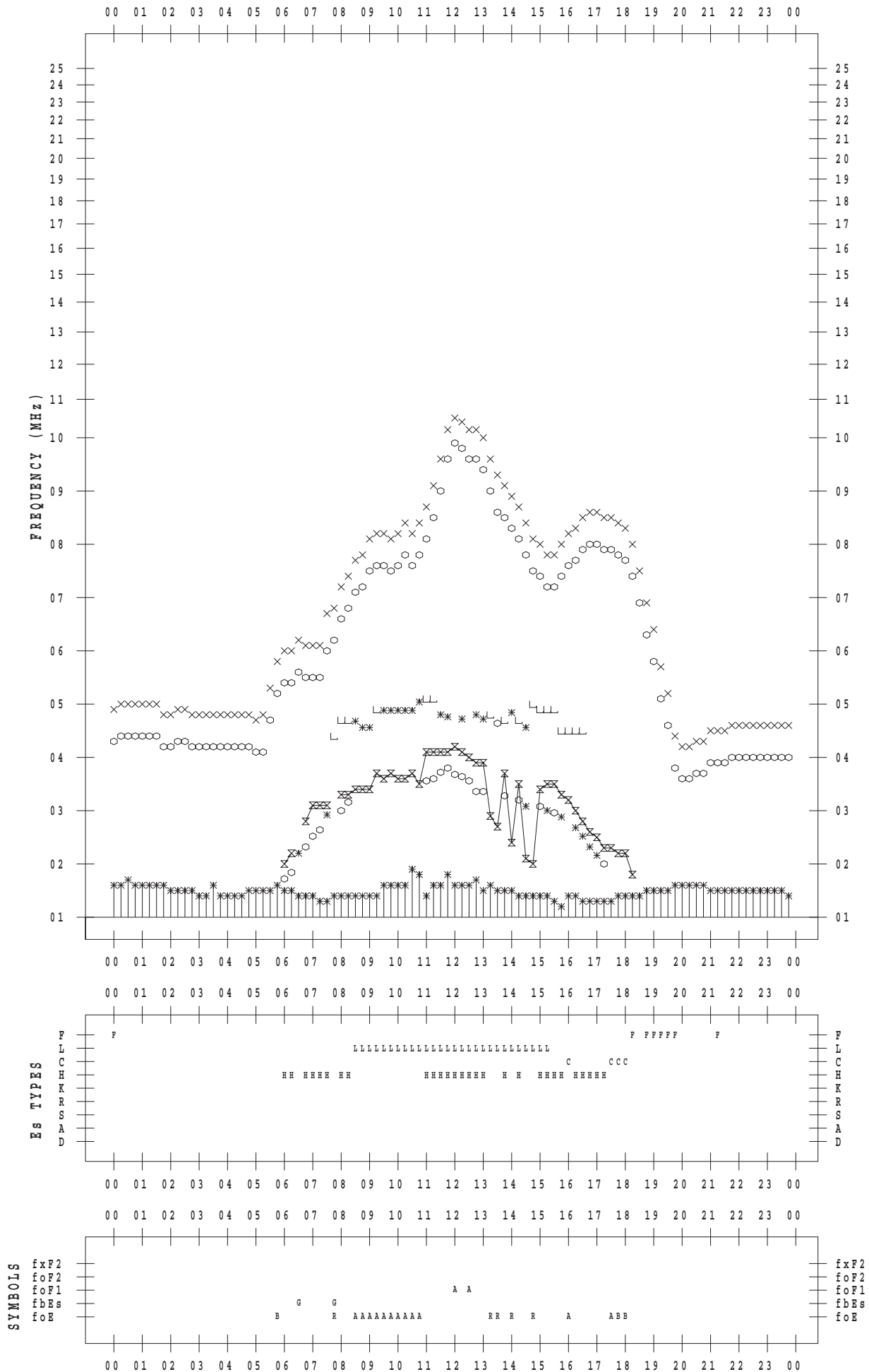
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 28

135 ° E MEAN TIME









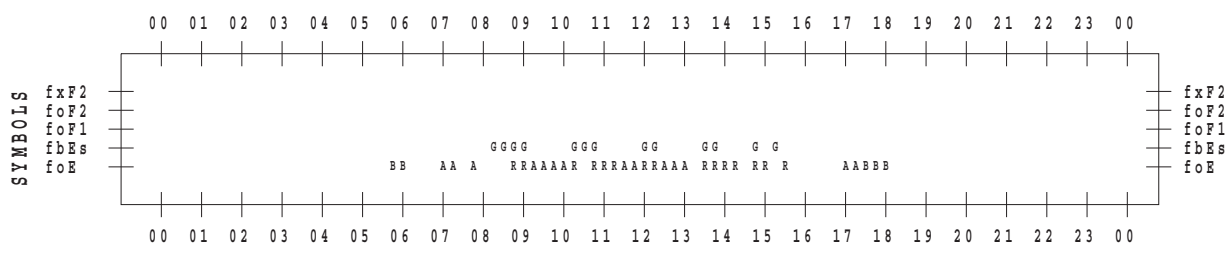
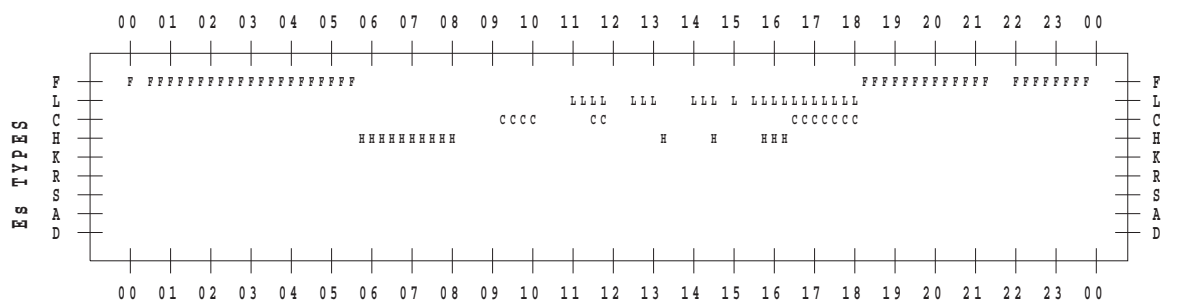
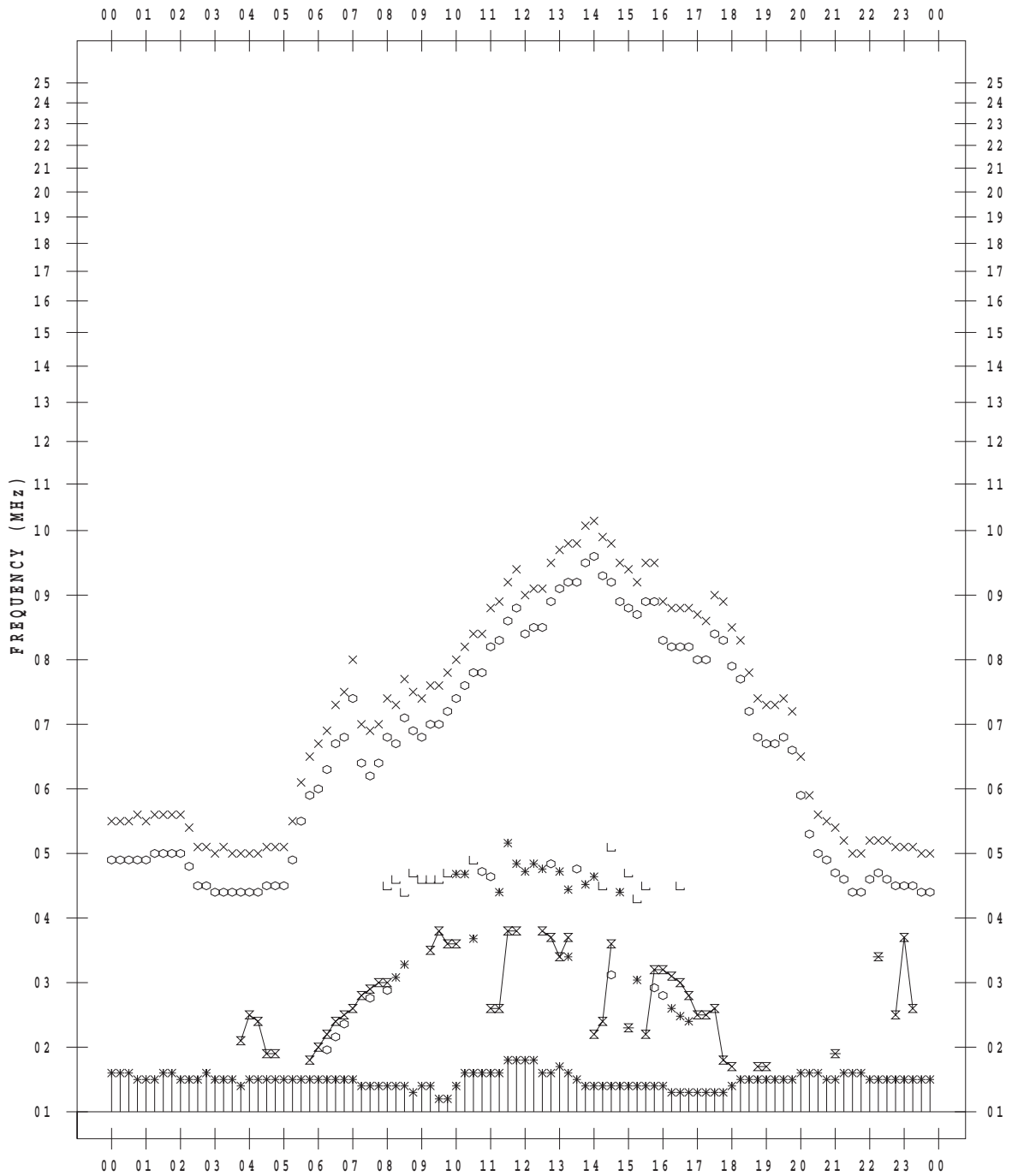
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016 / 3 / 31

135 ° E MEAN TIME



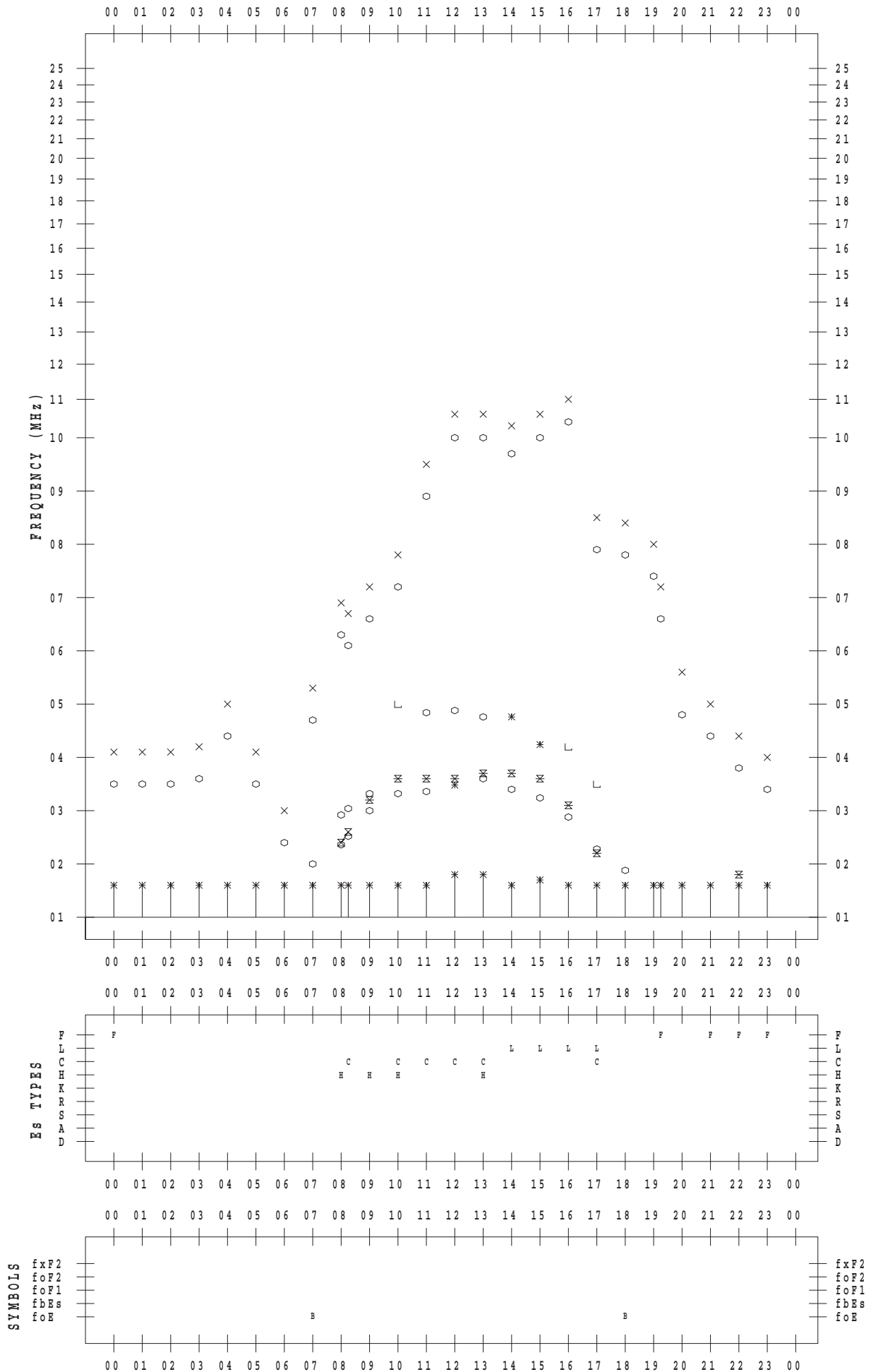
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 1

135 ° E MEAN TIME



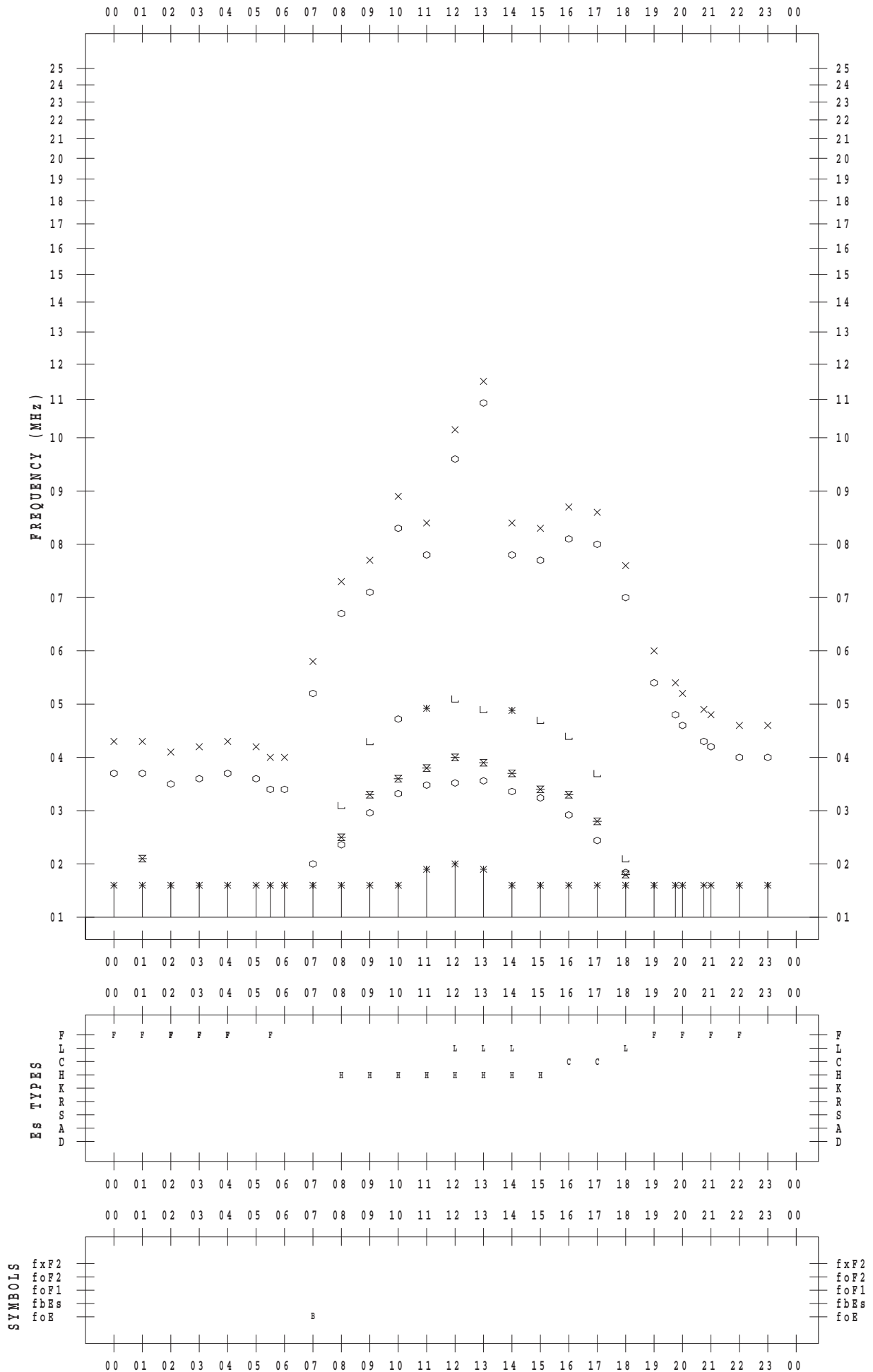
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 2

135 ° E MEAN TIME



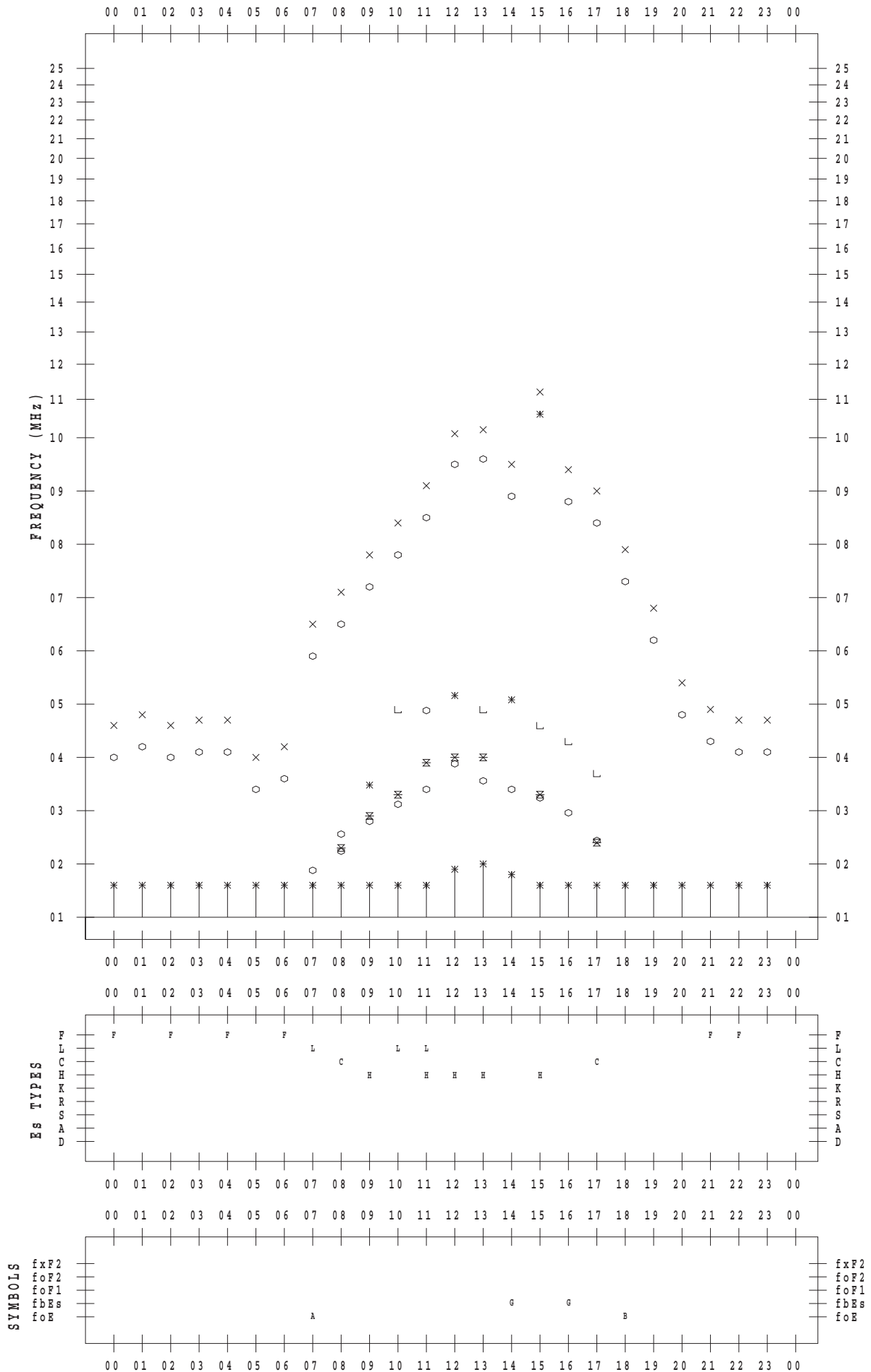
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 3

135 ° E MEAN TIME



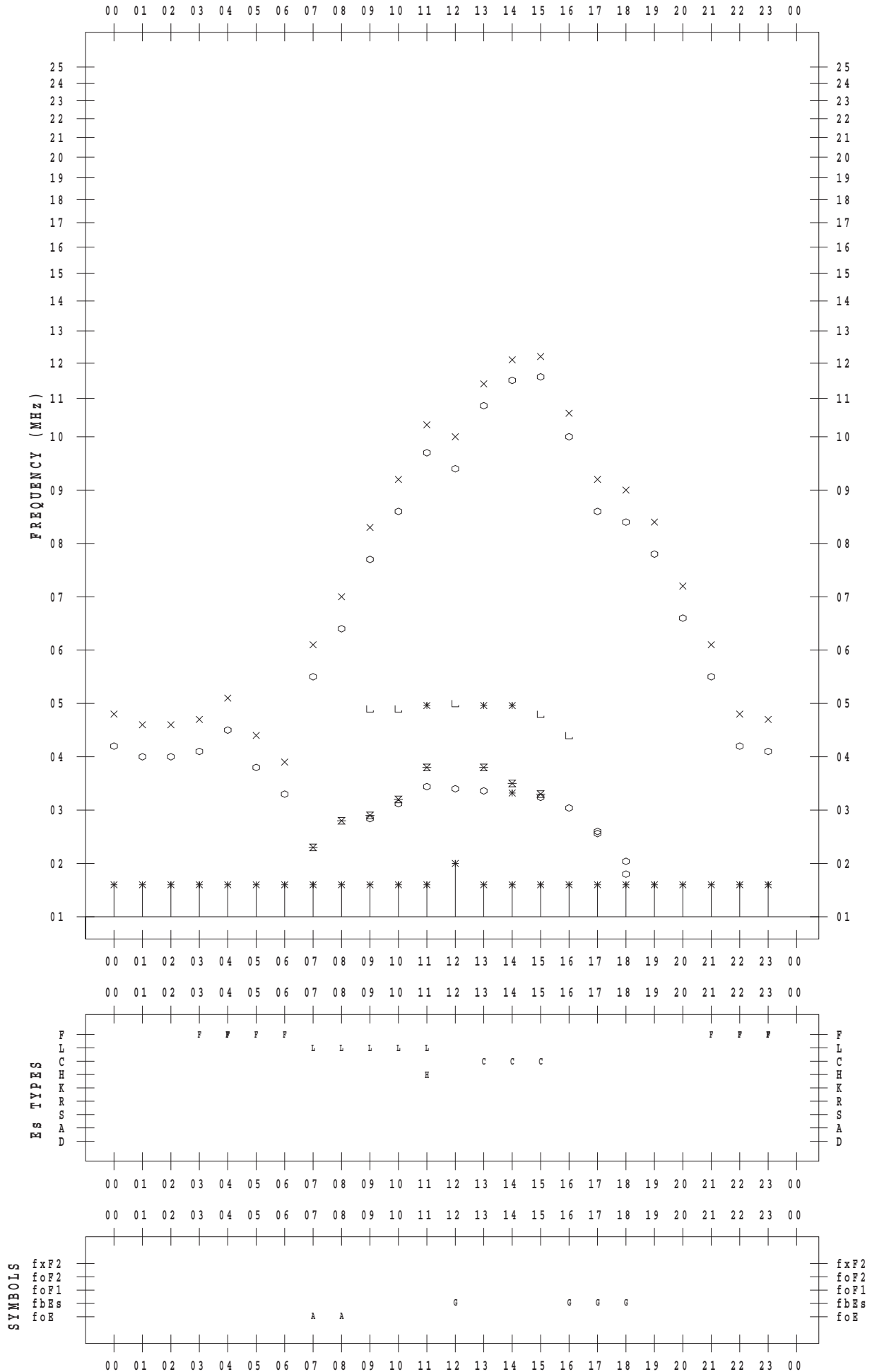
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 4

135 ° E MEAN TIME



Es TYPES

SYMBOLS

fxF2  
foF2  
foF1  
fbEs  
foE

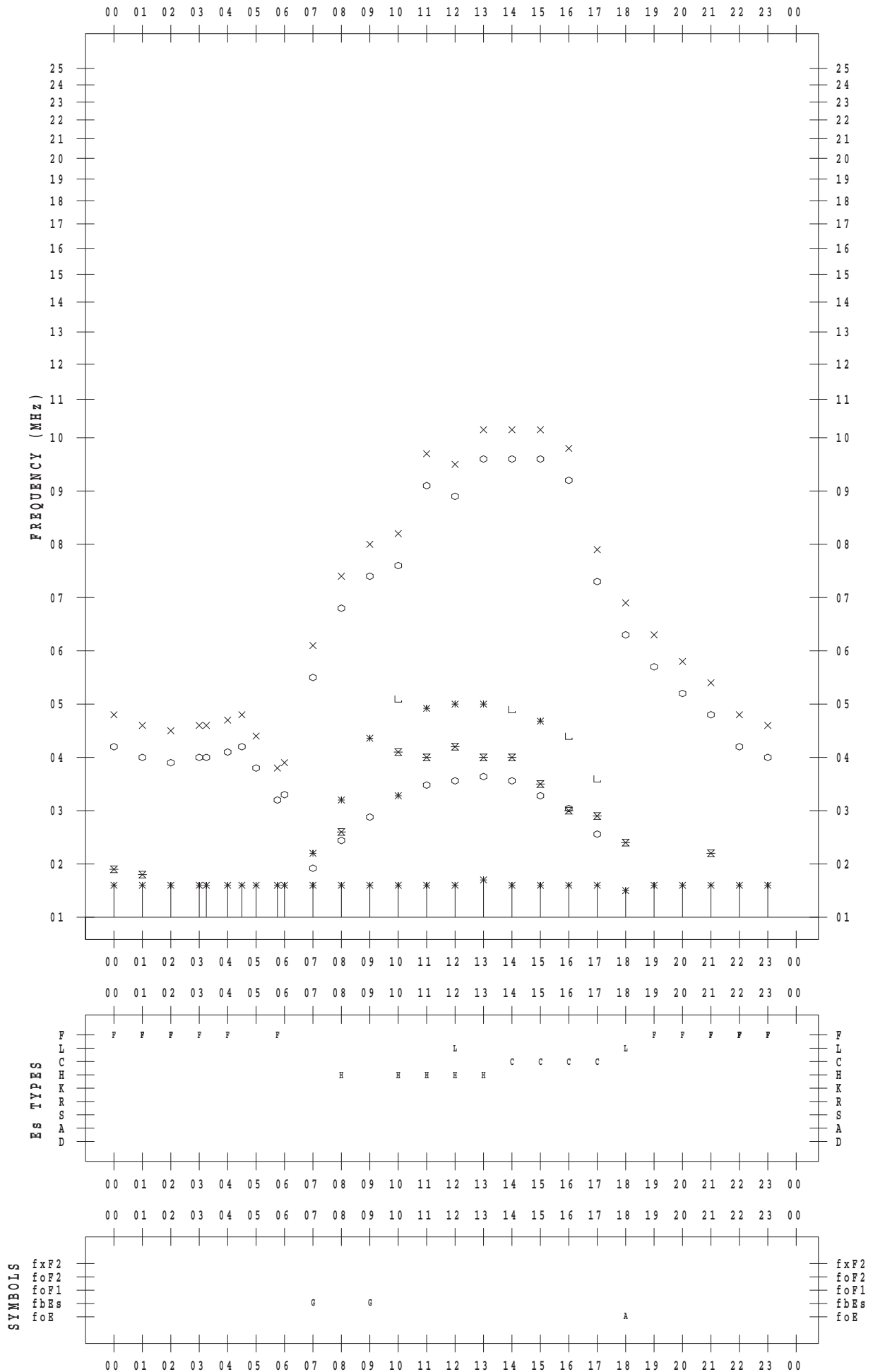
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 5

135 ° E MEAN TIME



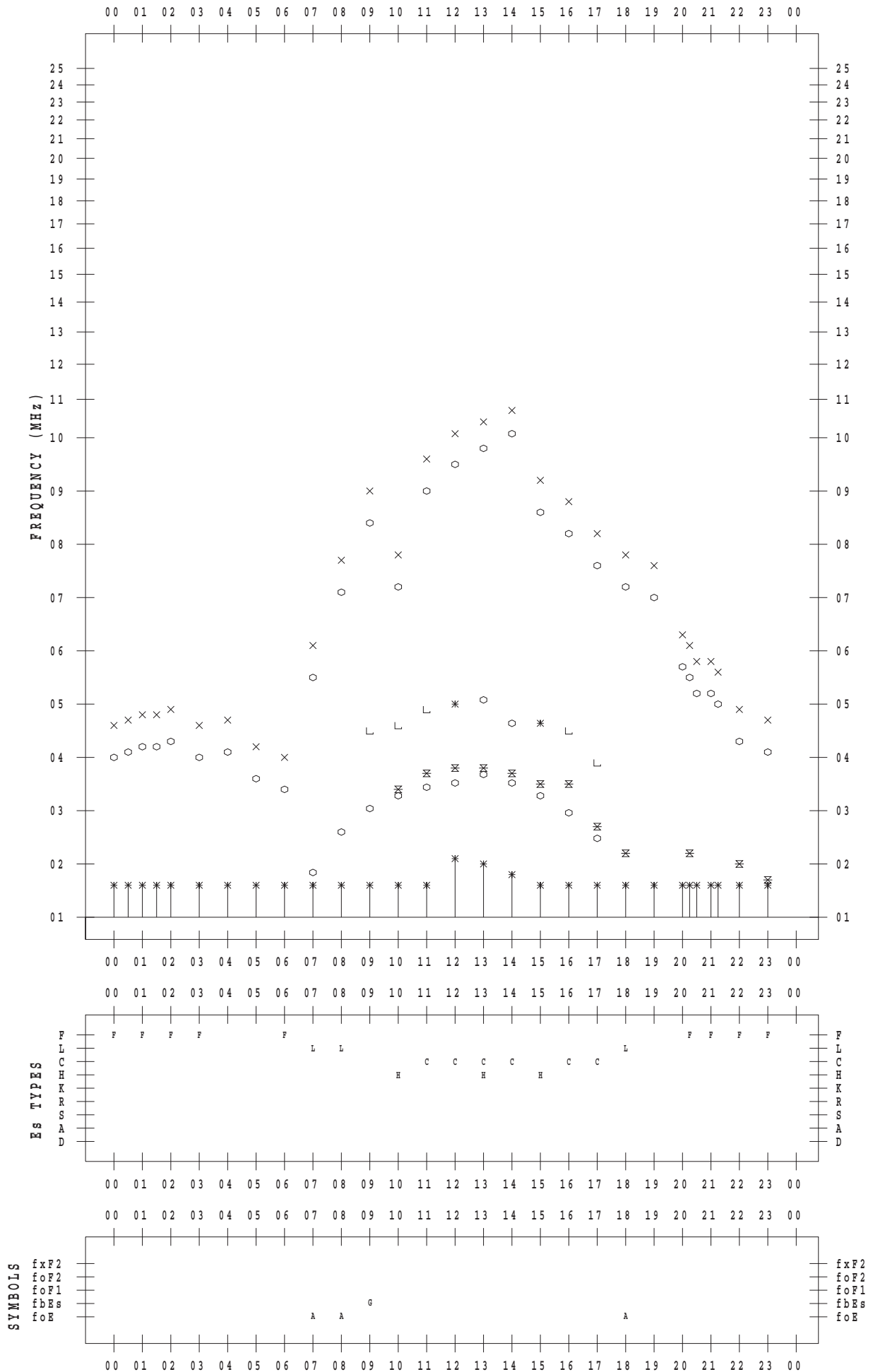
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 6

135 ° E MEAN TIME





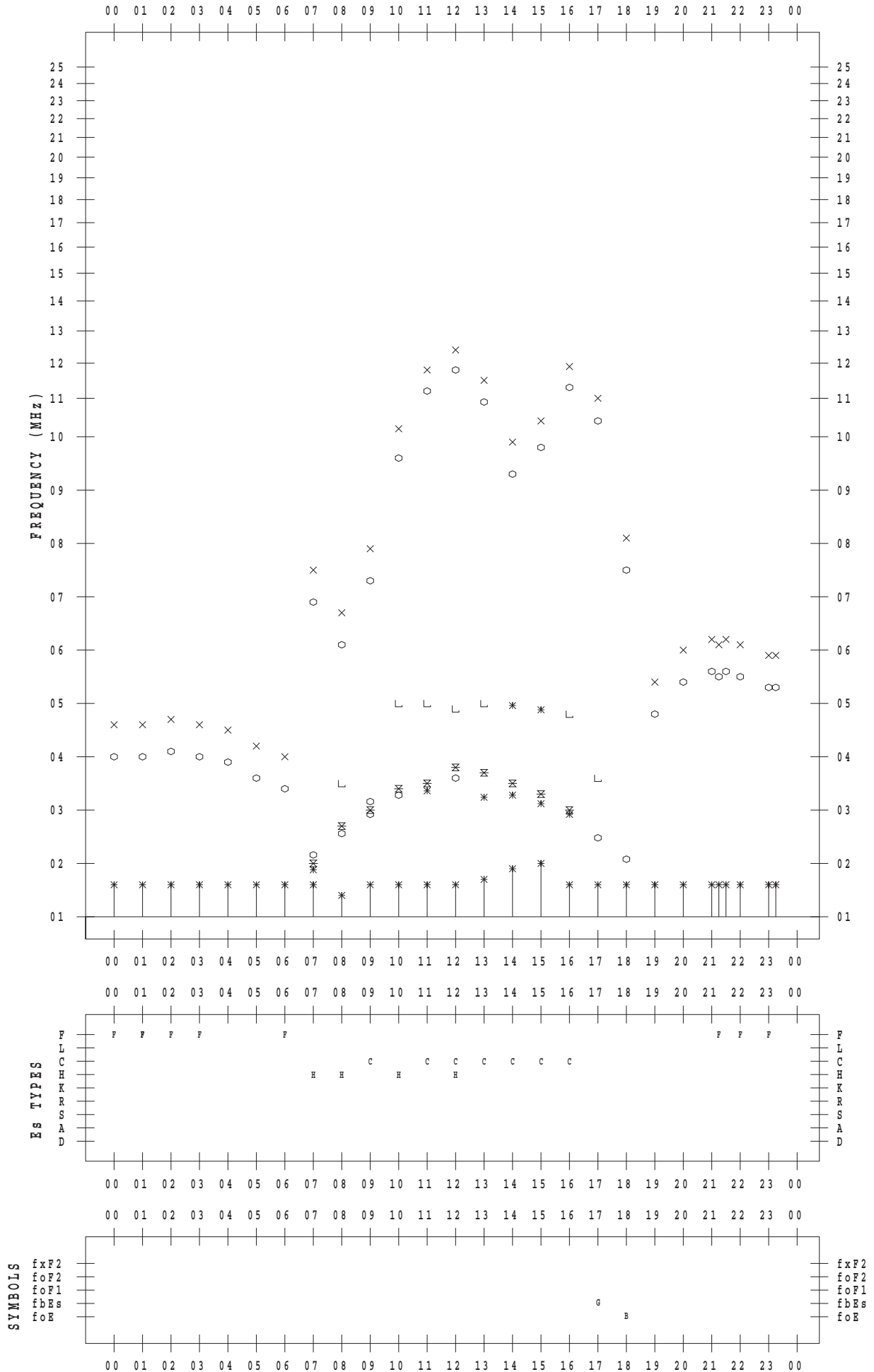
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 7

135 ° E MEAN TIME



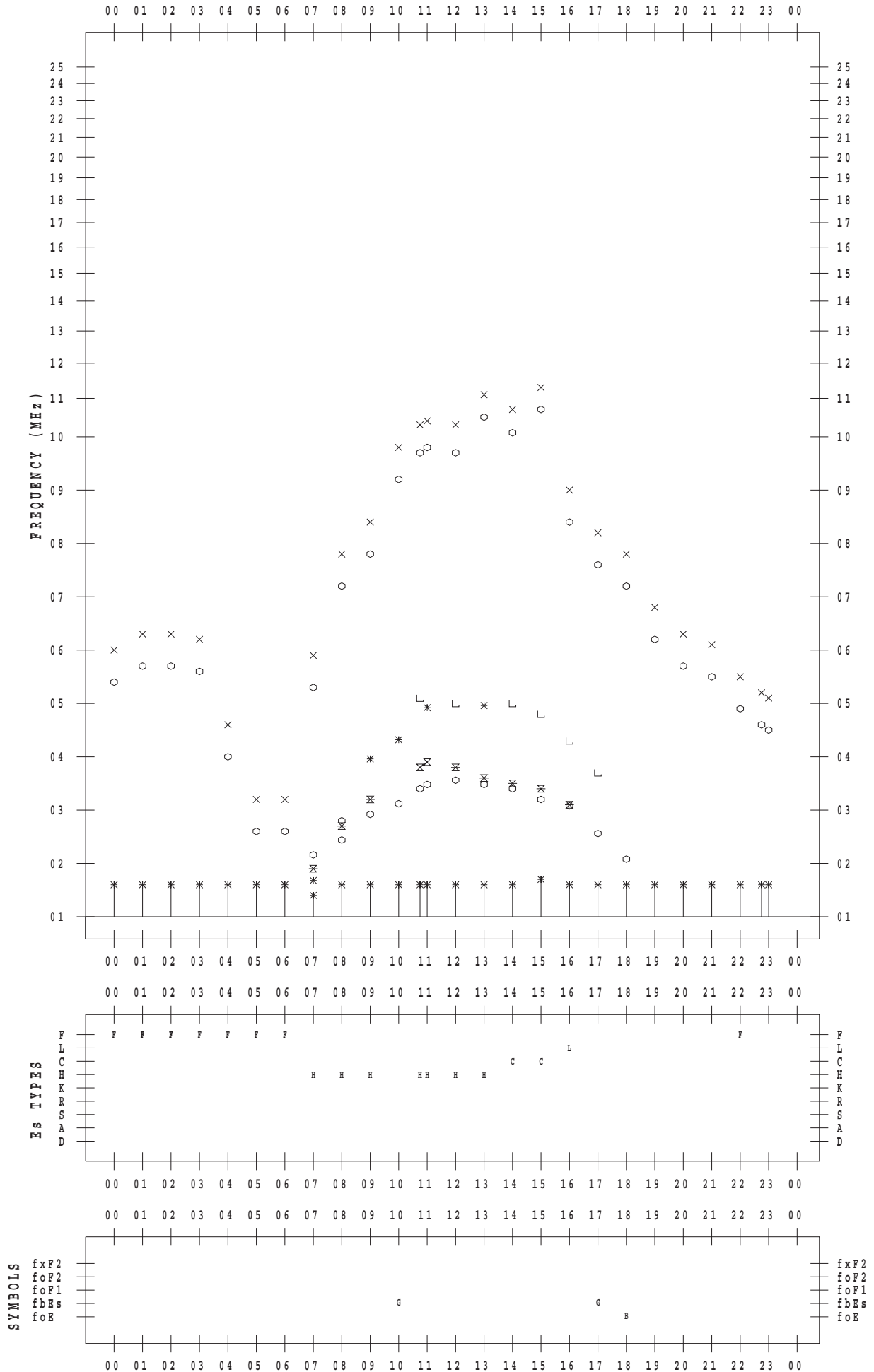
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 8

135 ° E MEAN TIME



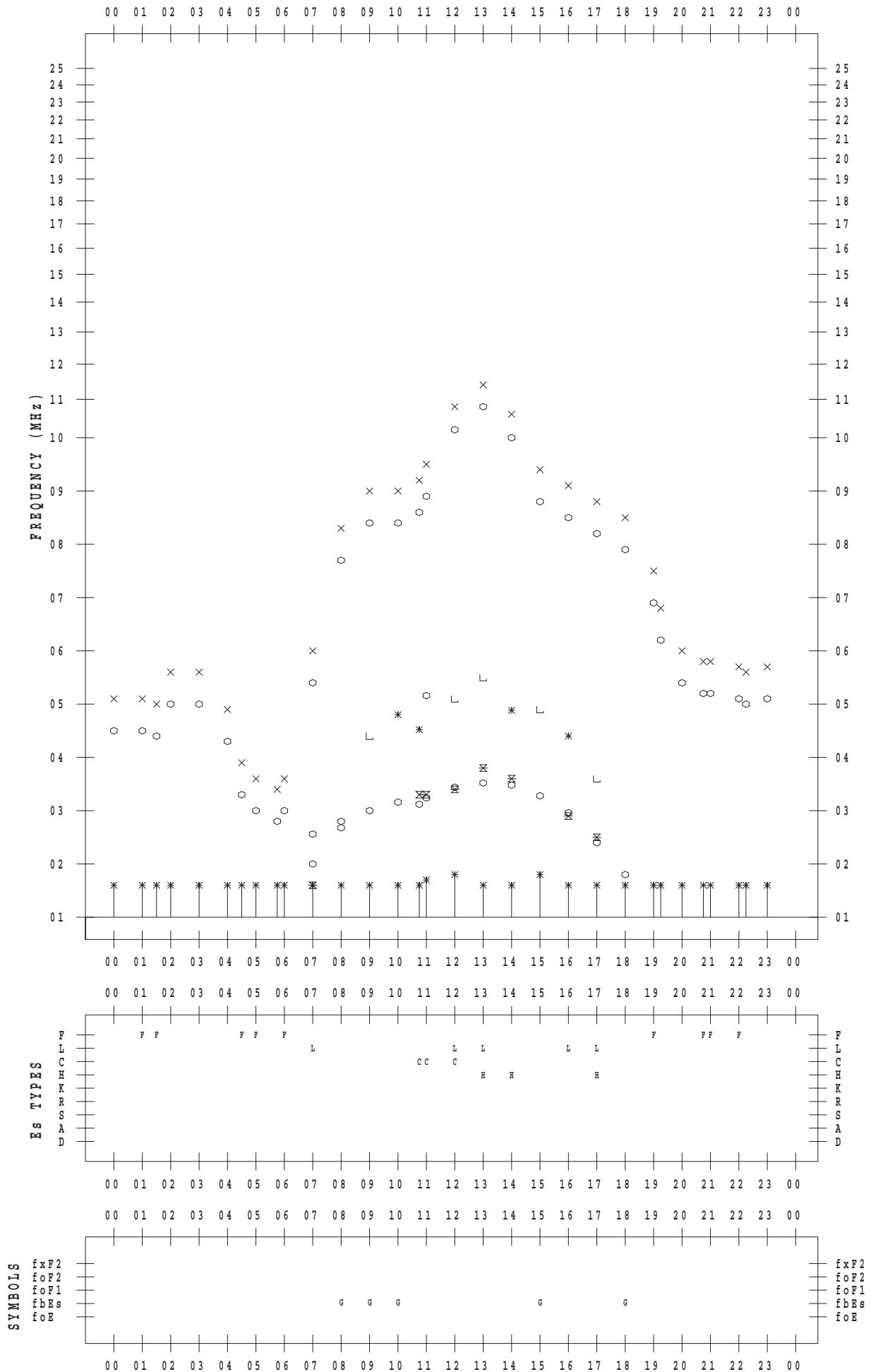
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 9

135 ° E MEAN TIME



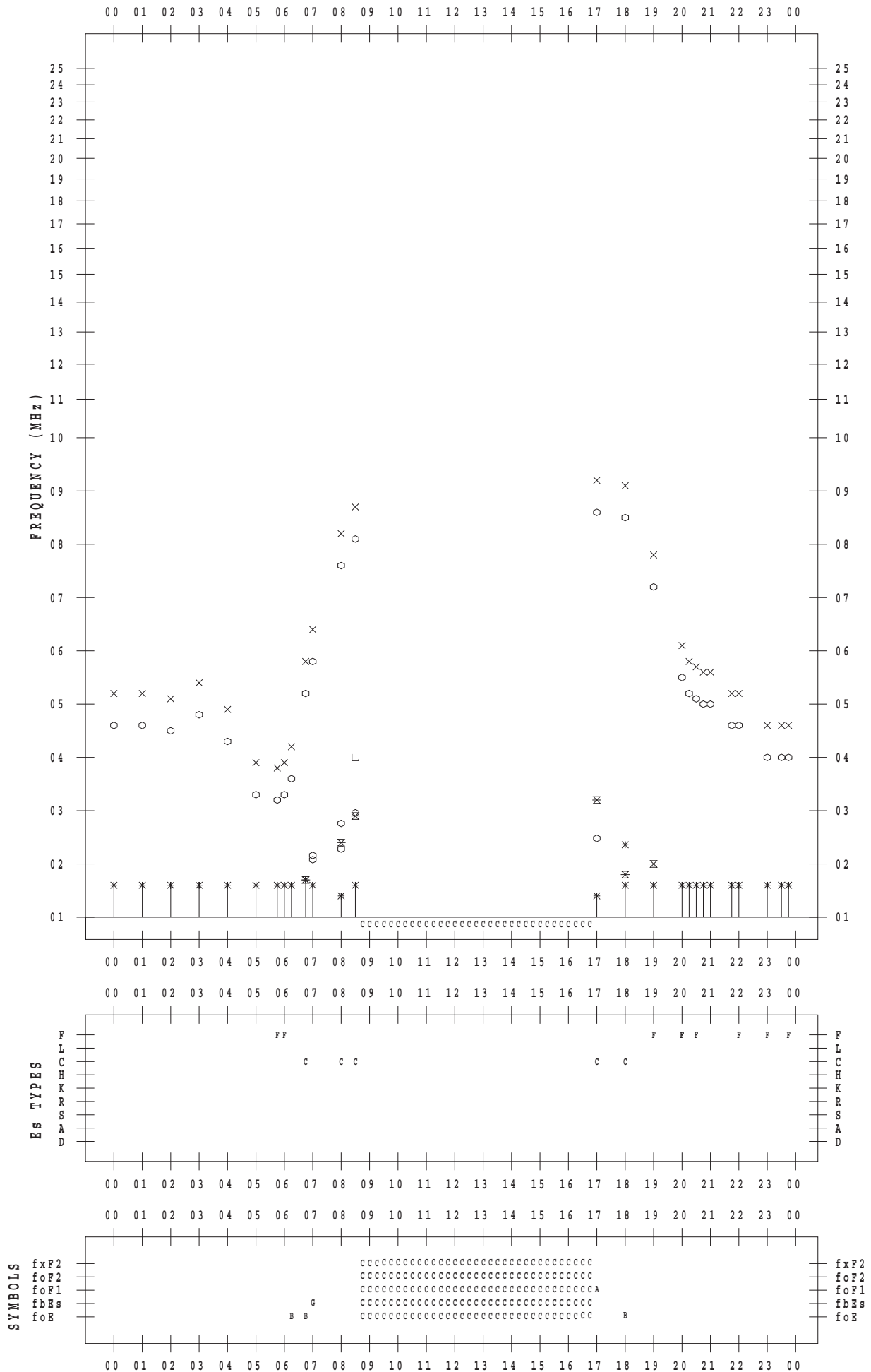
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 10

135 ° E MEAN TIME



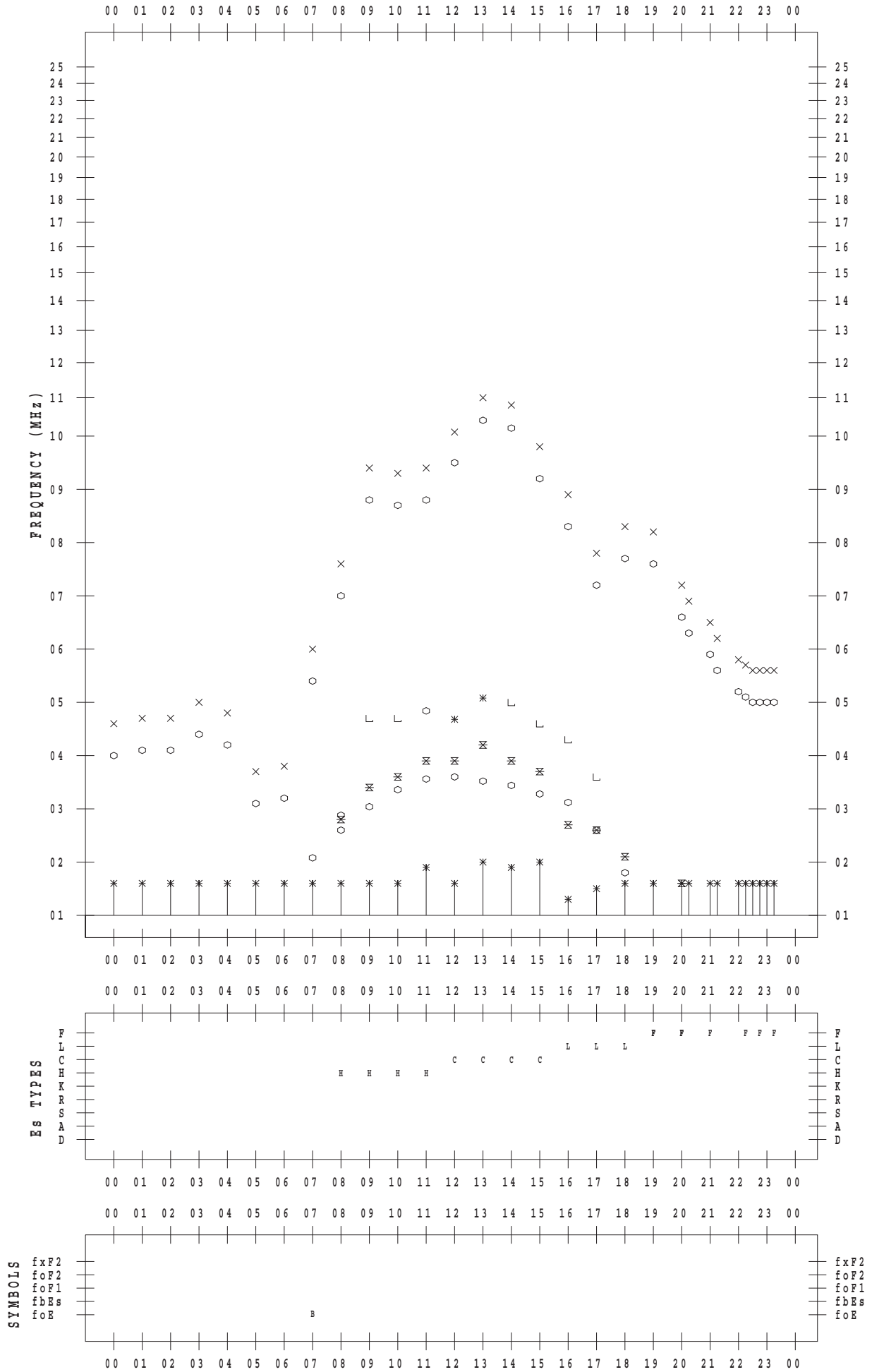
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 11

135 ° E MEAN TIME



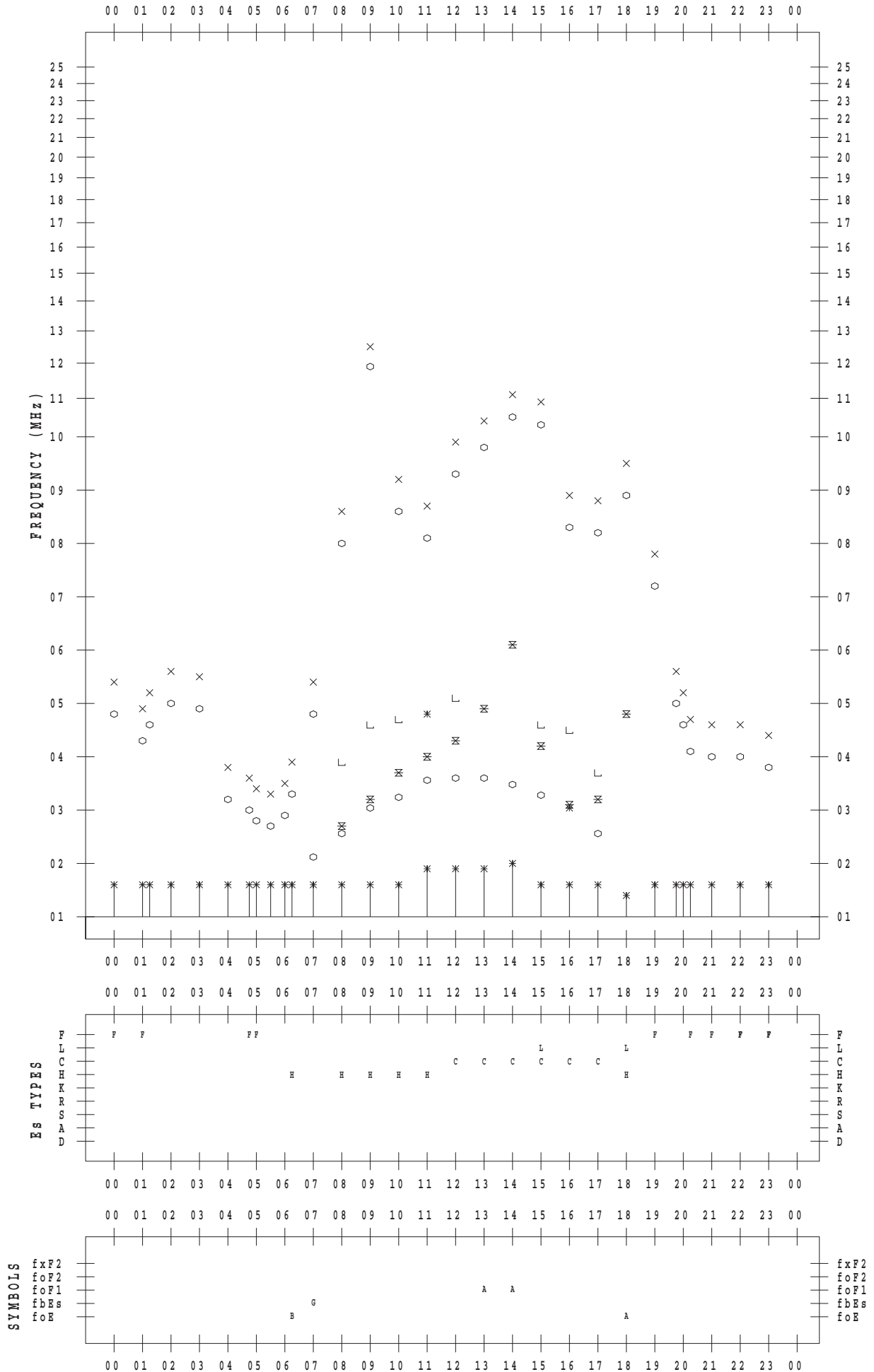
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 12

135 ° E MEAN TIME



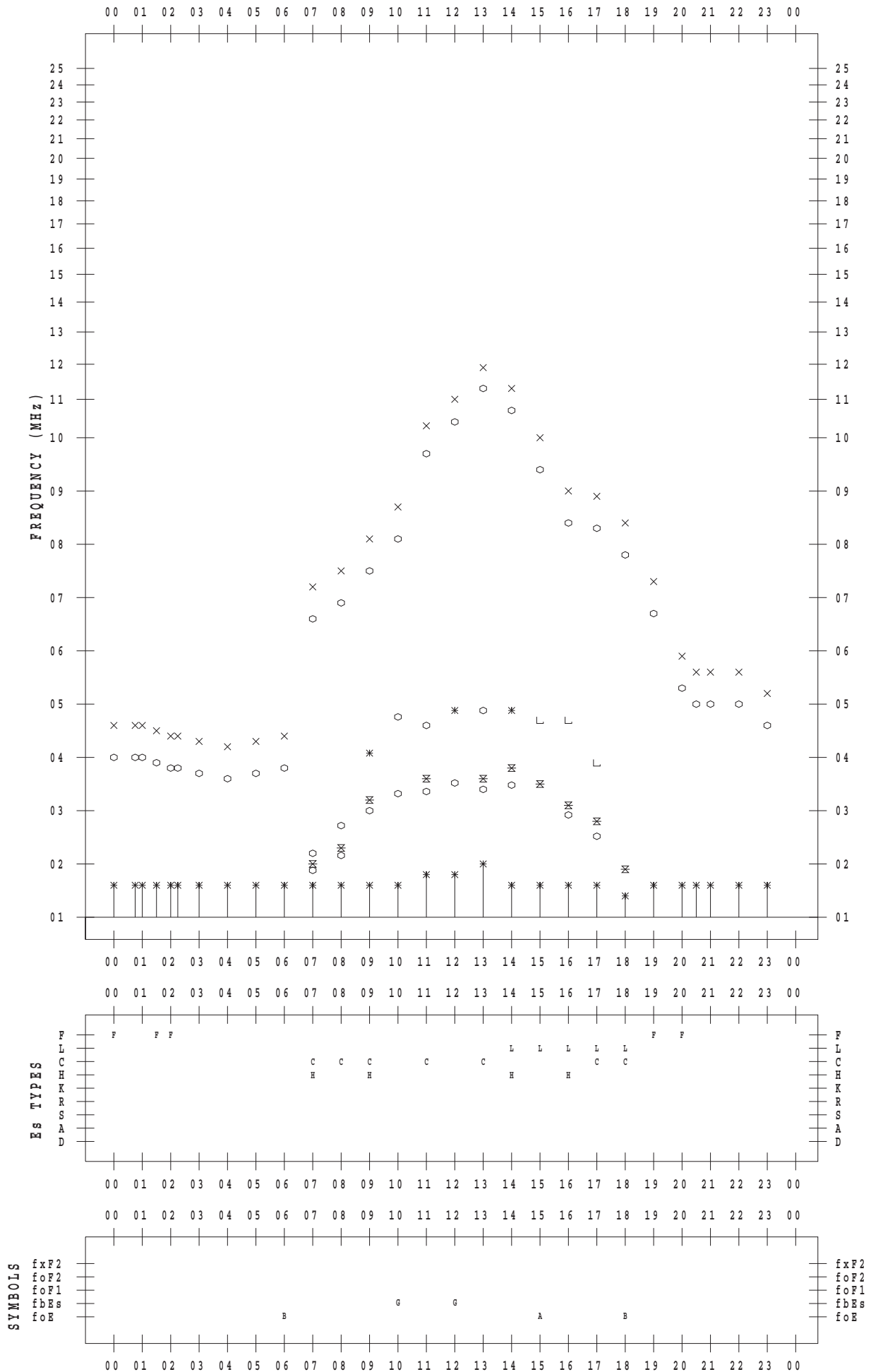
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 13

135 ° E MEAN TIME



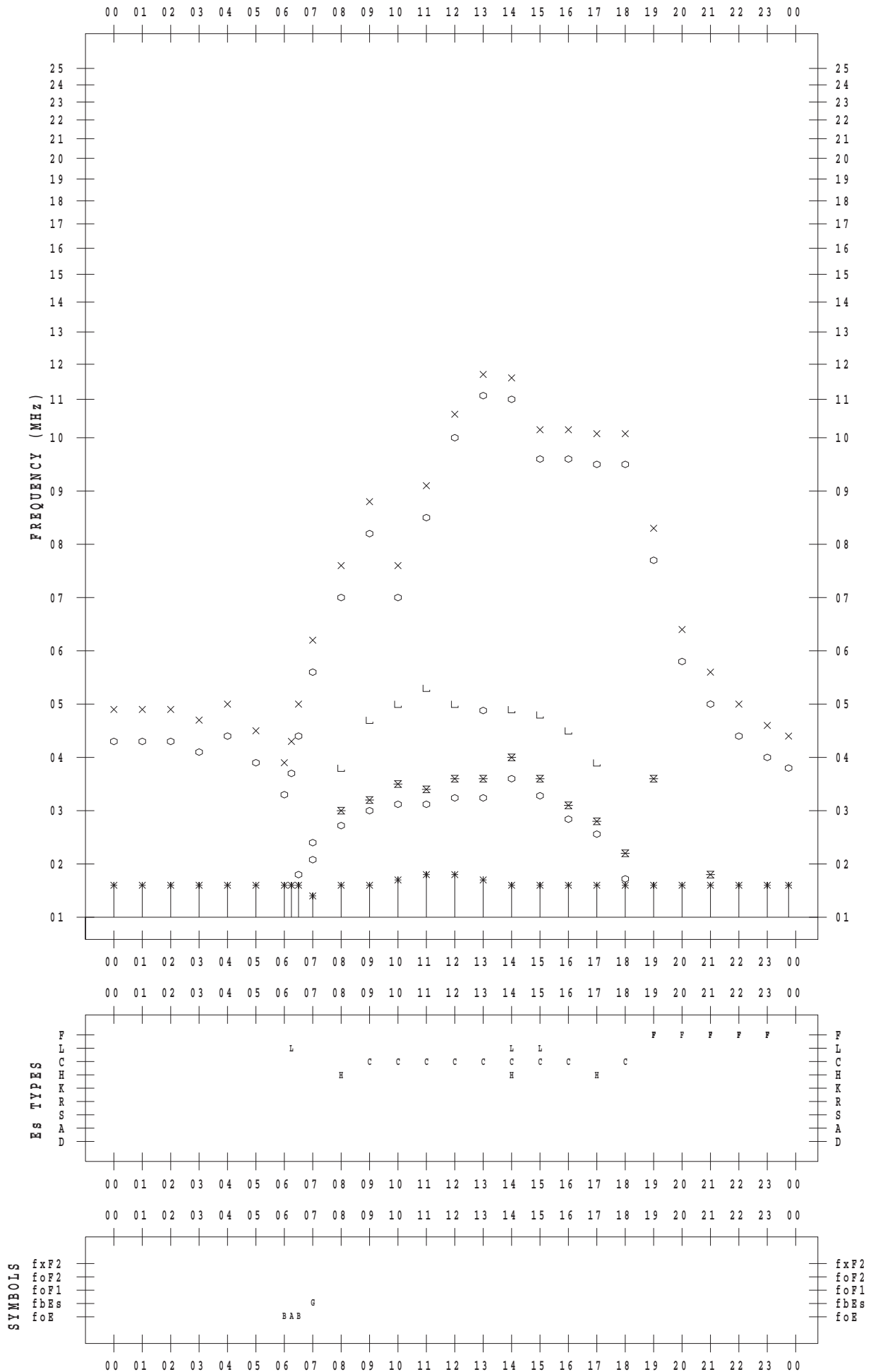
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 14

135 ° E MEAN TIME





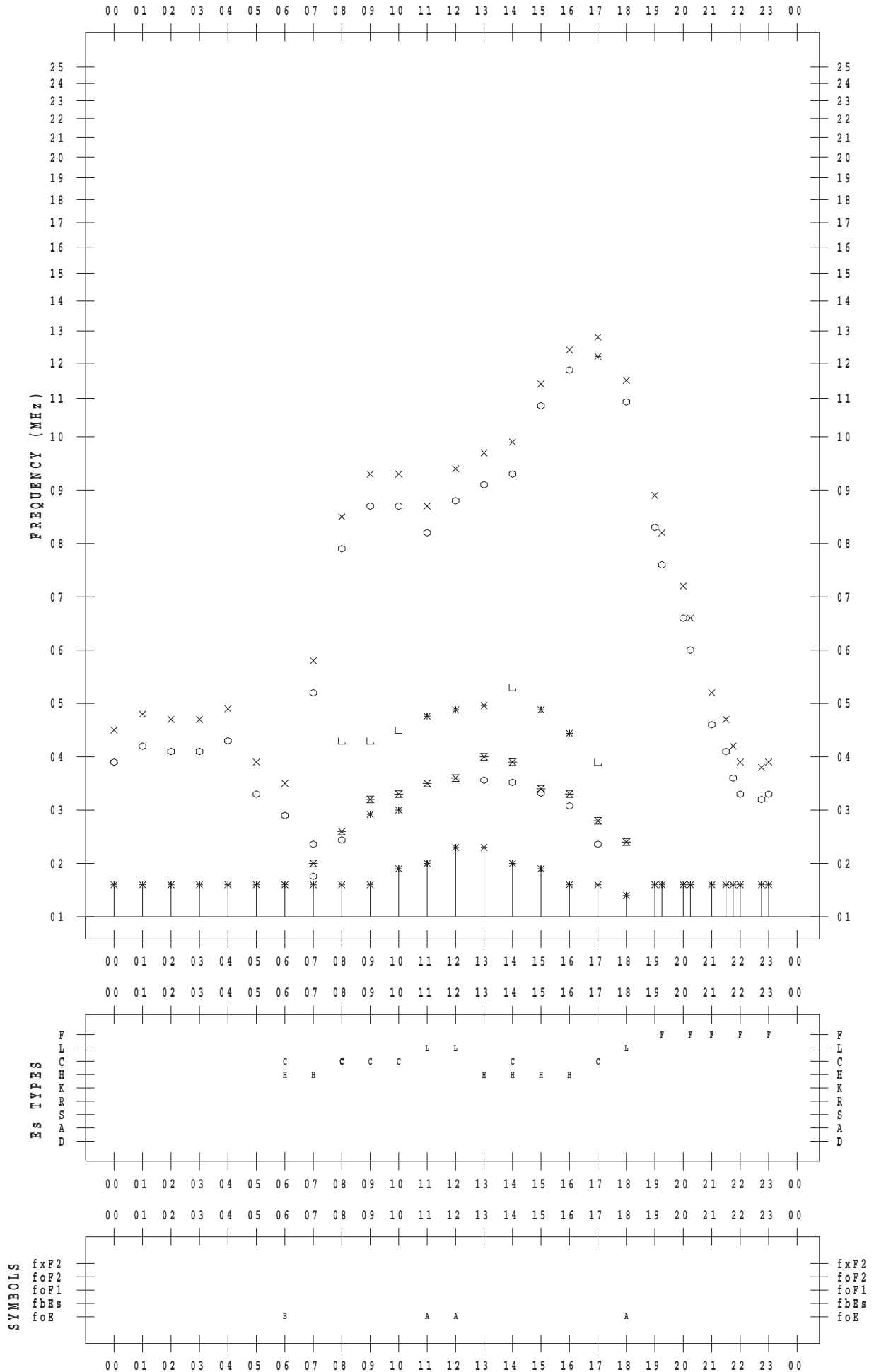
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 15

135 ° E MEAN TIME



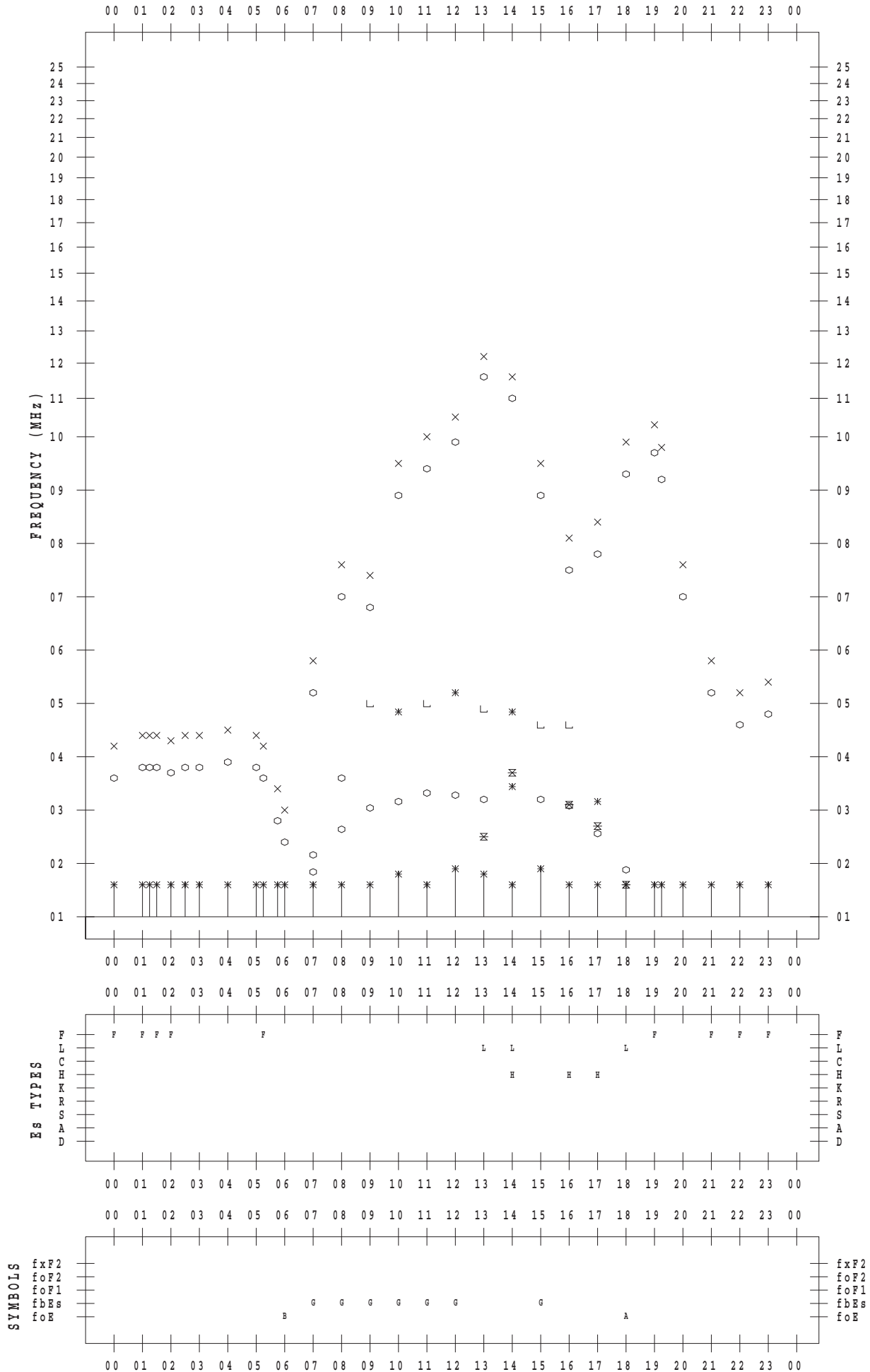
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 16

135 ° E MEAN TIME



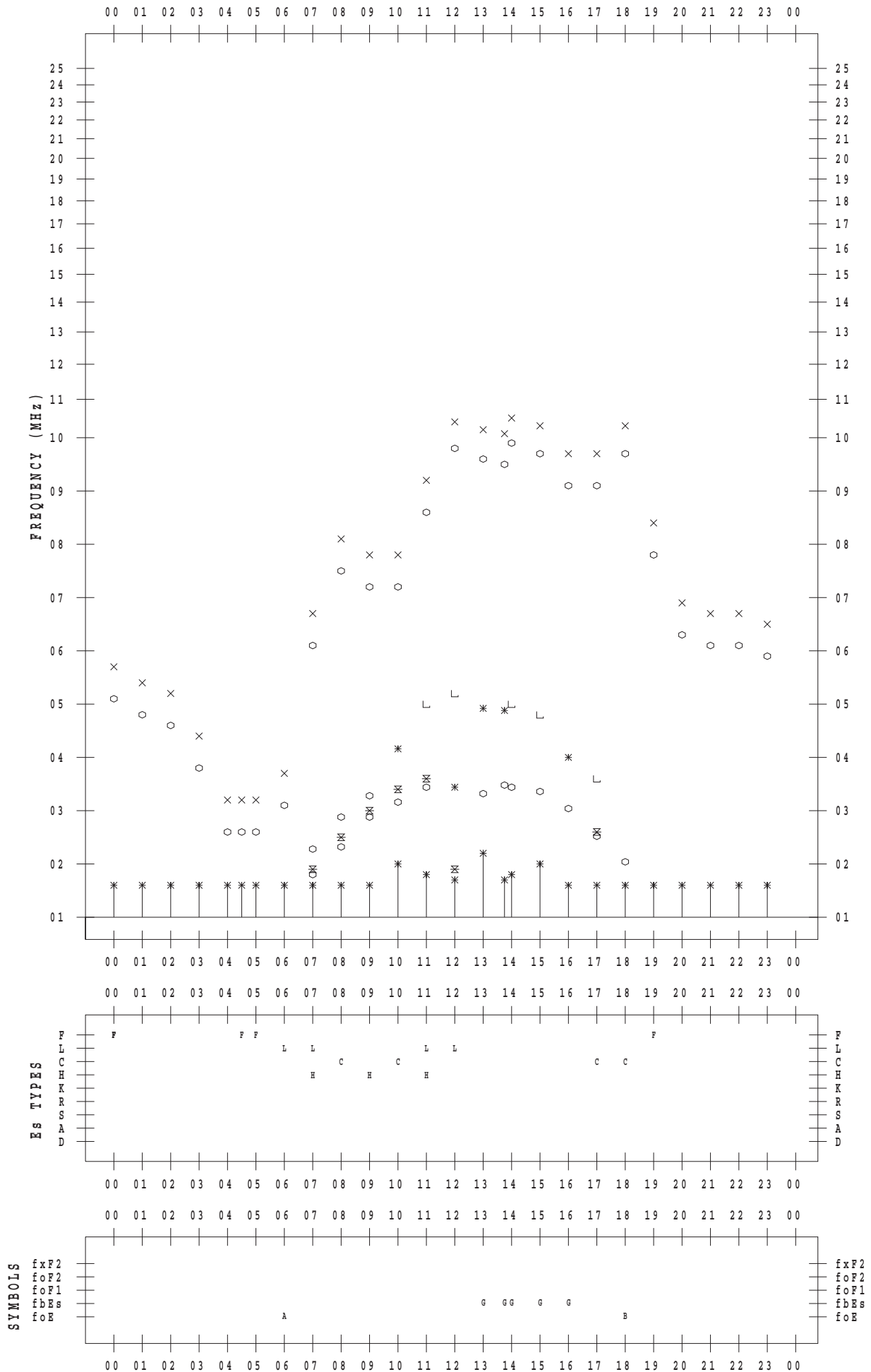
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 17

135 ° E MEAN TIME



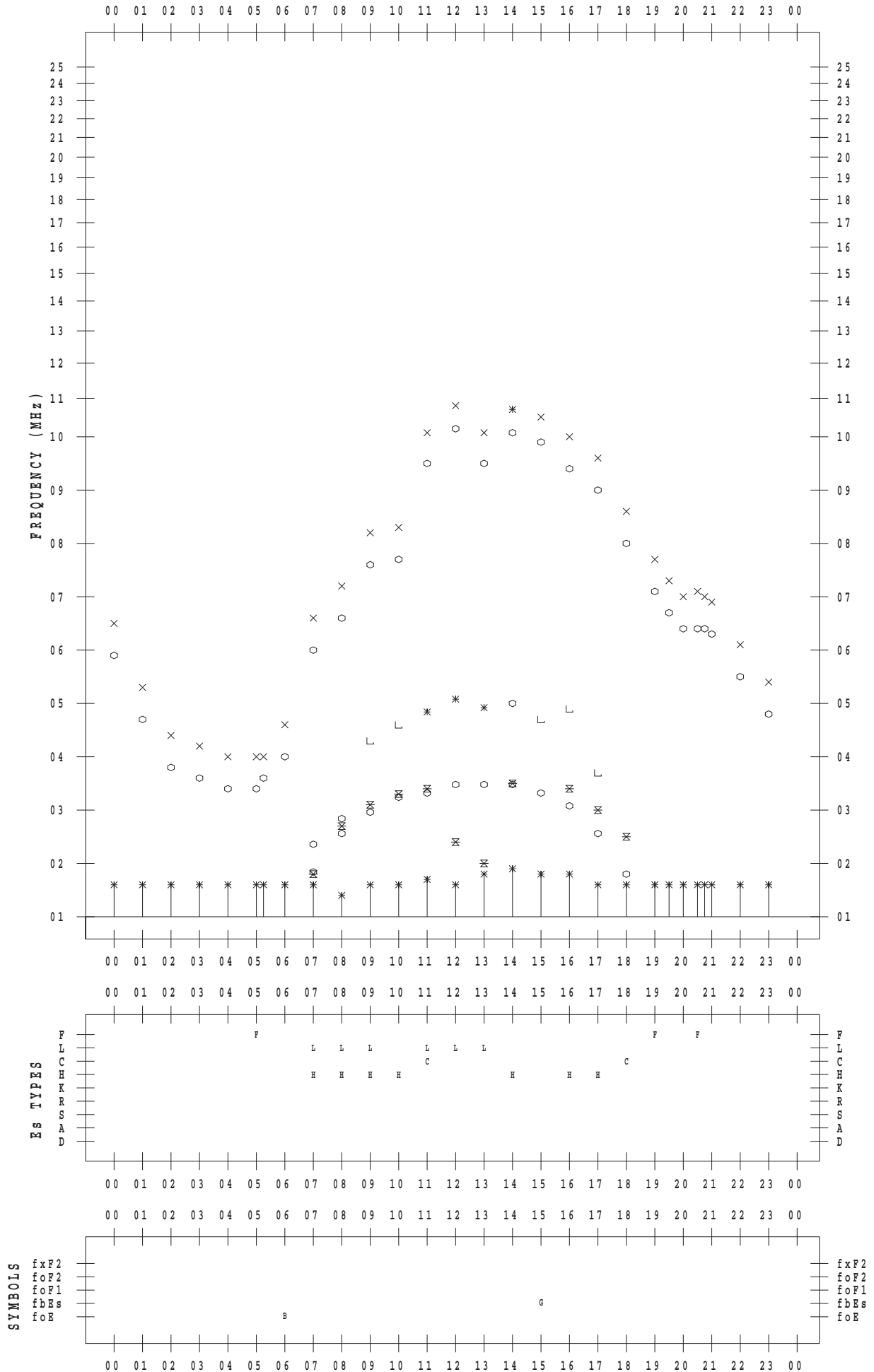
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 18

135 ° E MEAN TIME



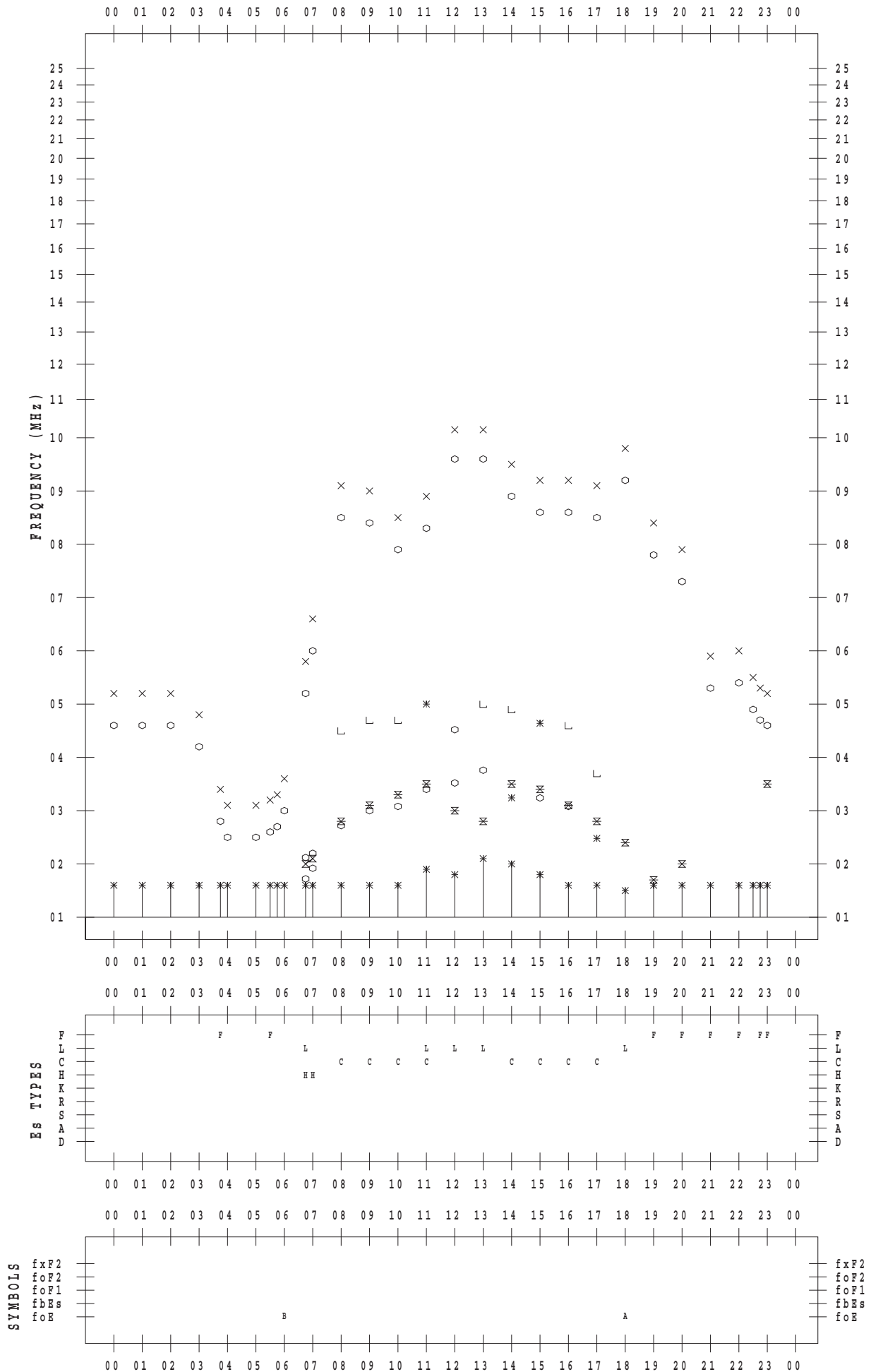
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 19

135 ° E MEAN TIME





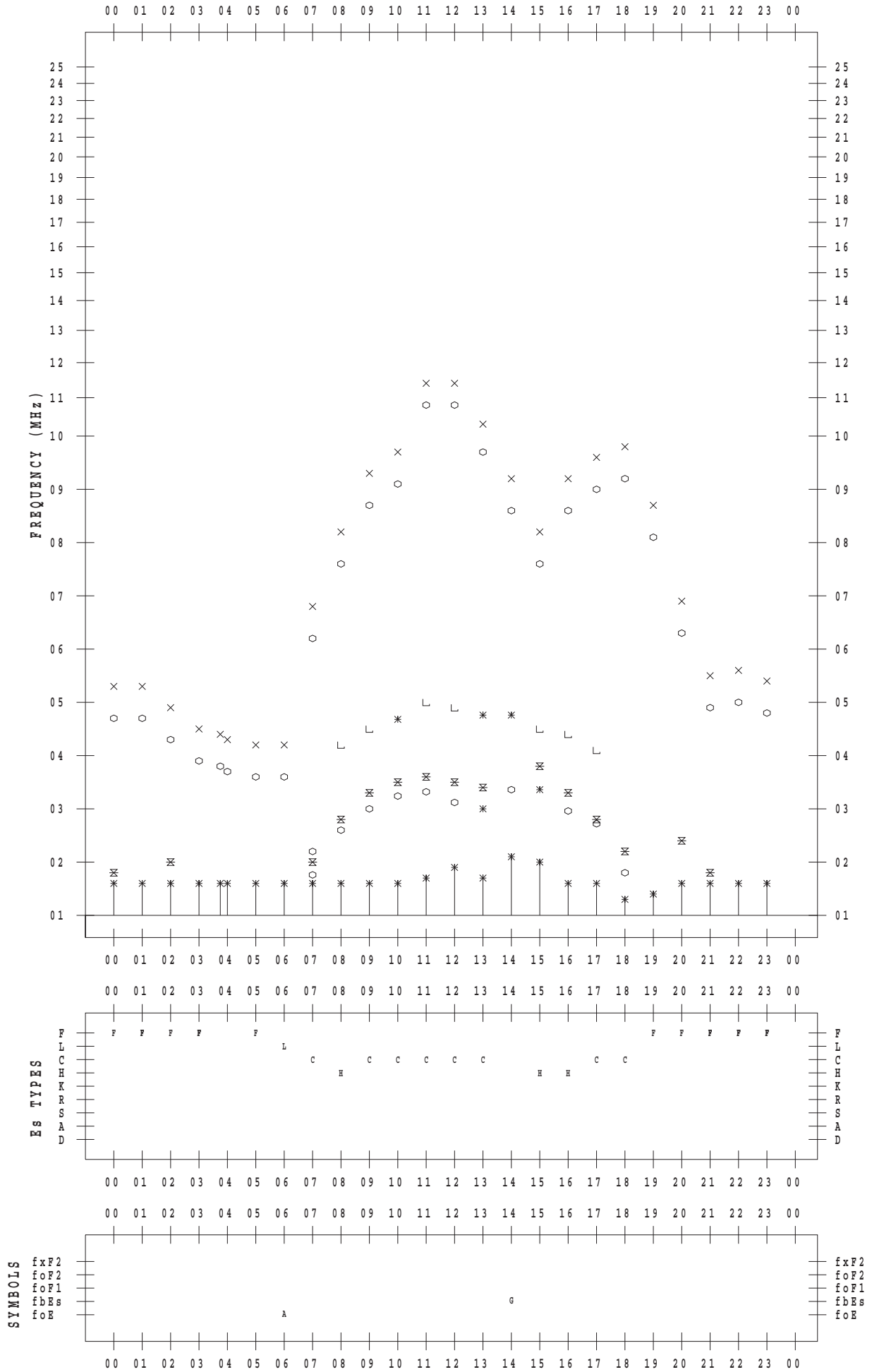
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 21

135 ° E MEAN TIME



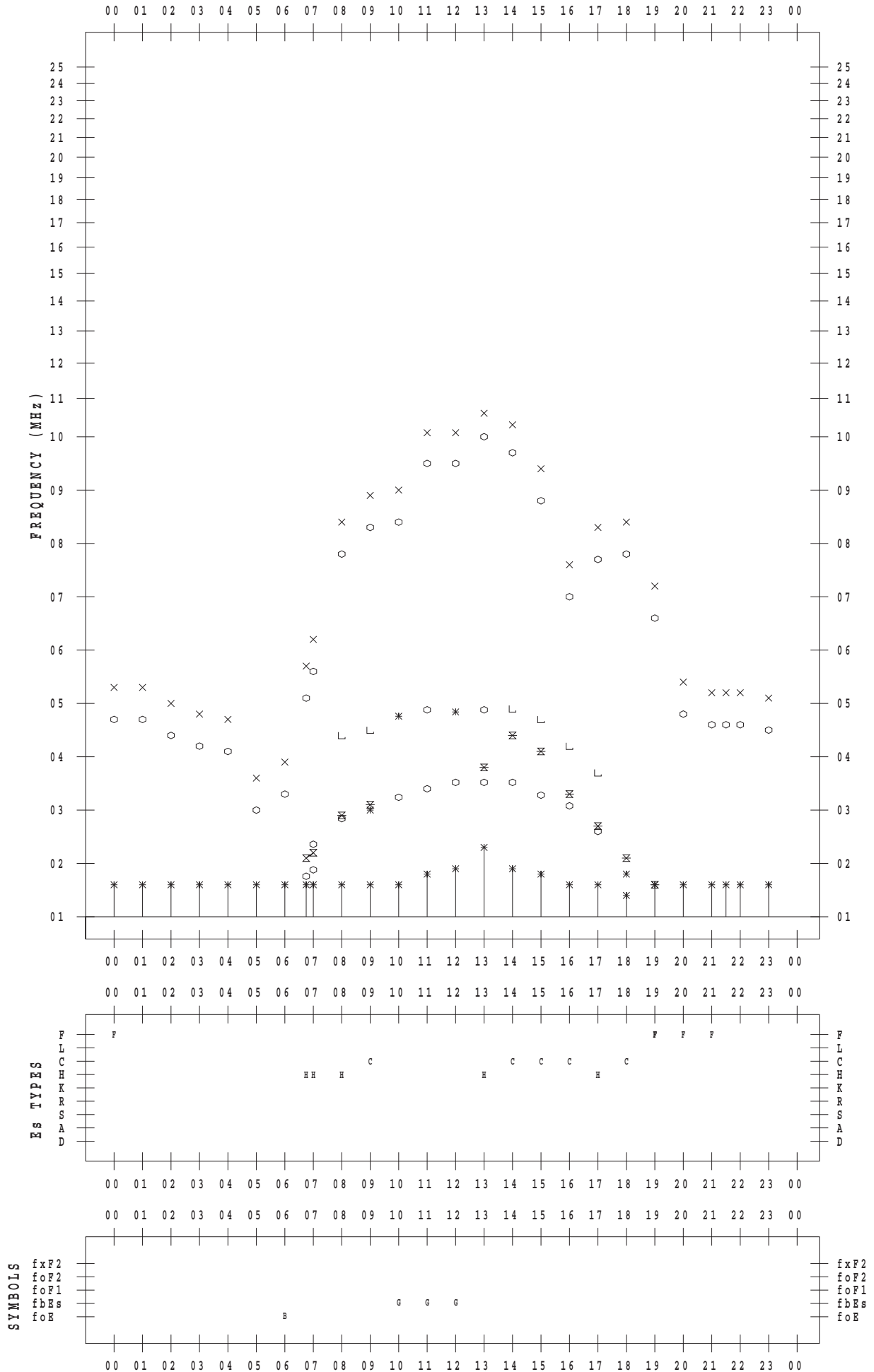
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 22

135 ° E MEAN TIME





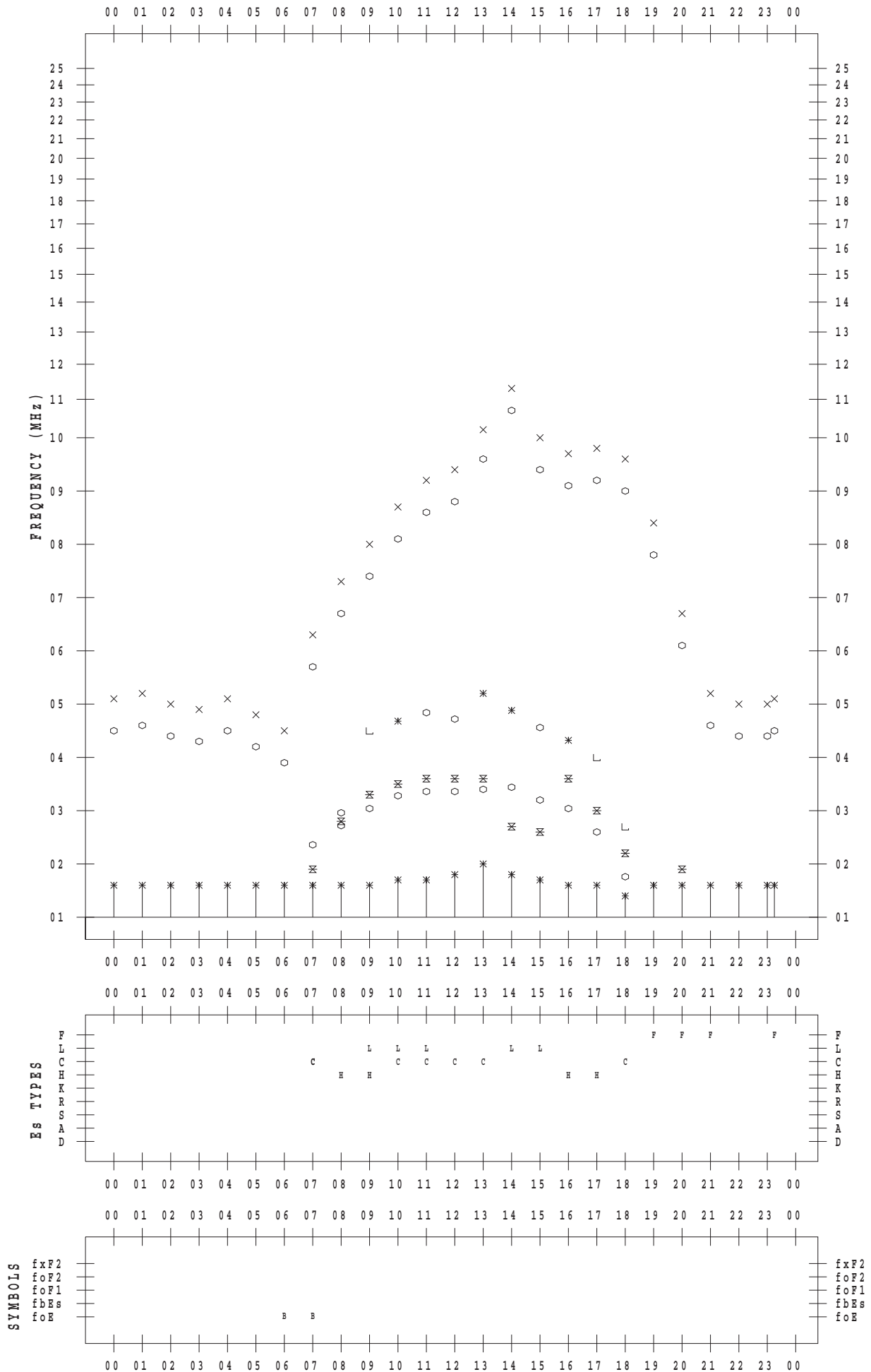
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 23

135 ° E MEAN TIME



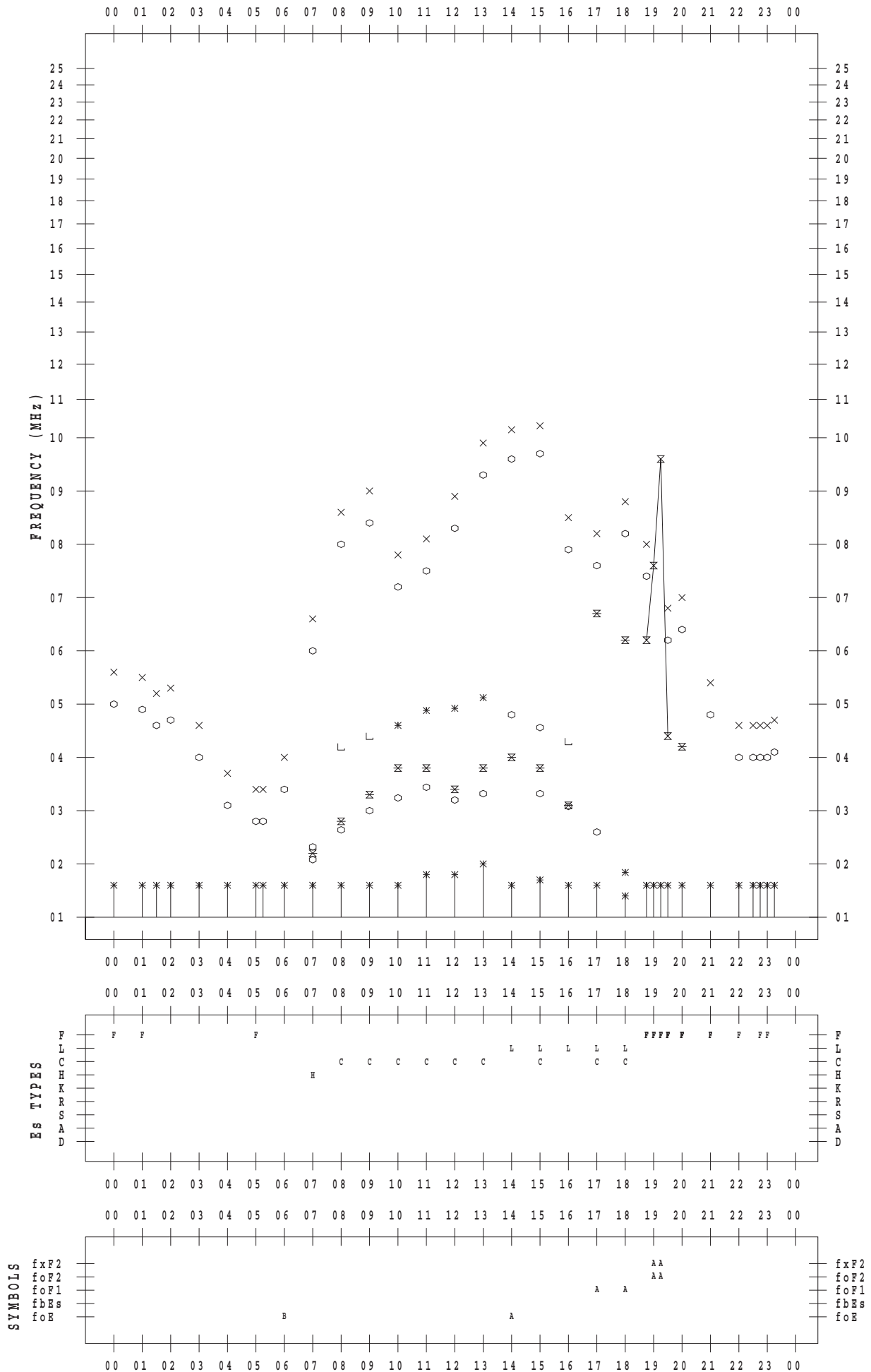
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 24

135 ° E MEAN TIME



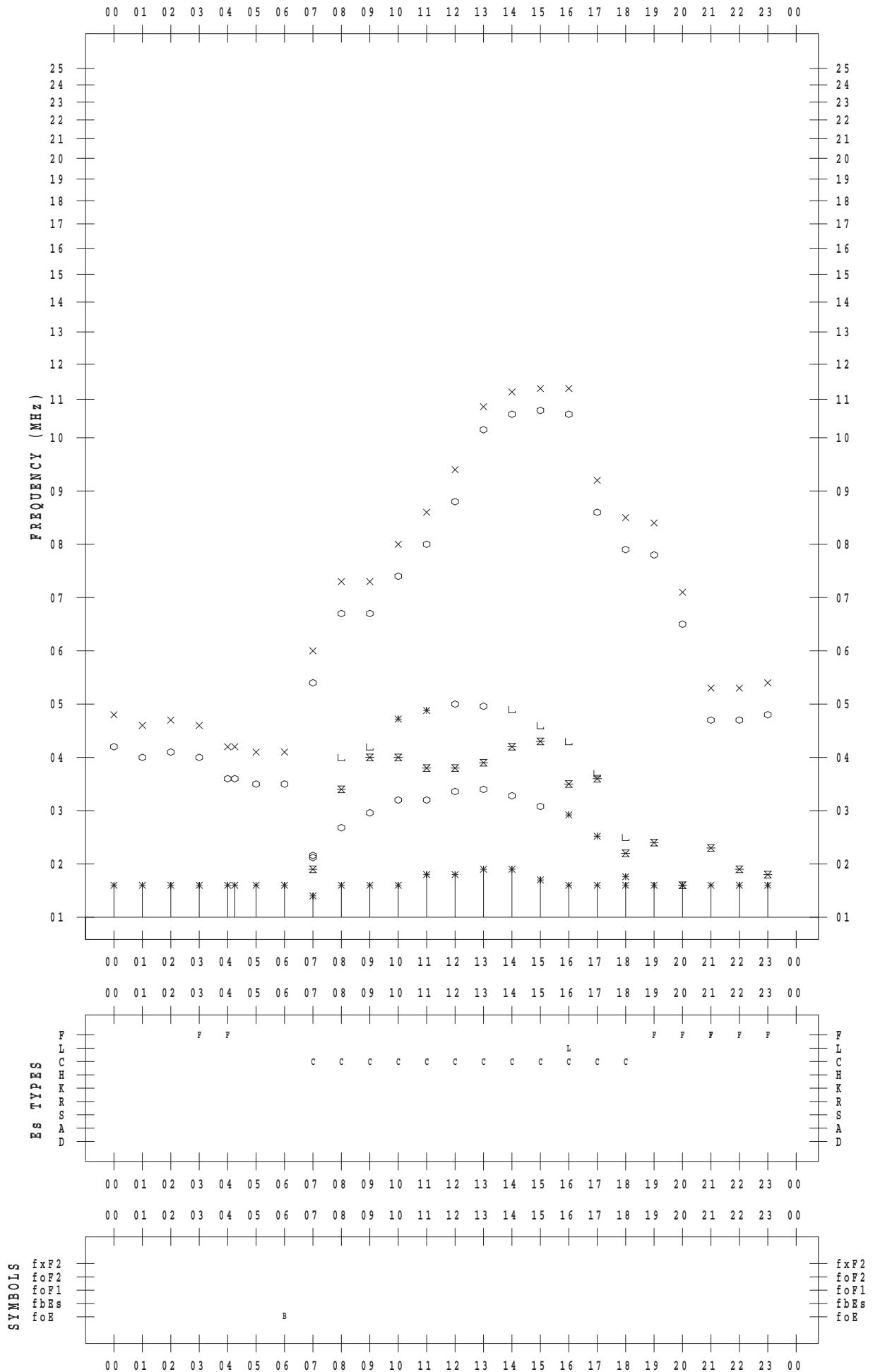
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 25

135 ° E MEAN TIME



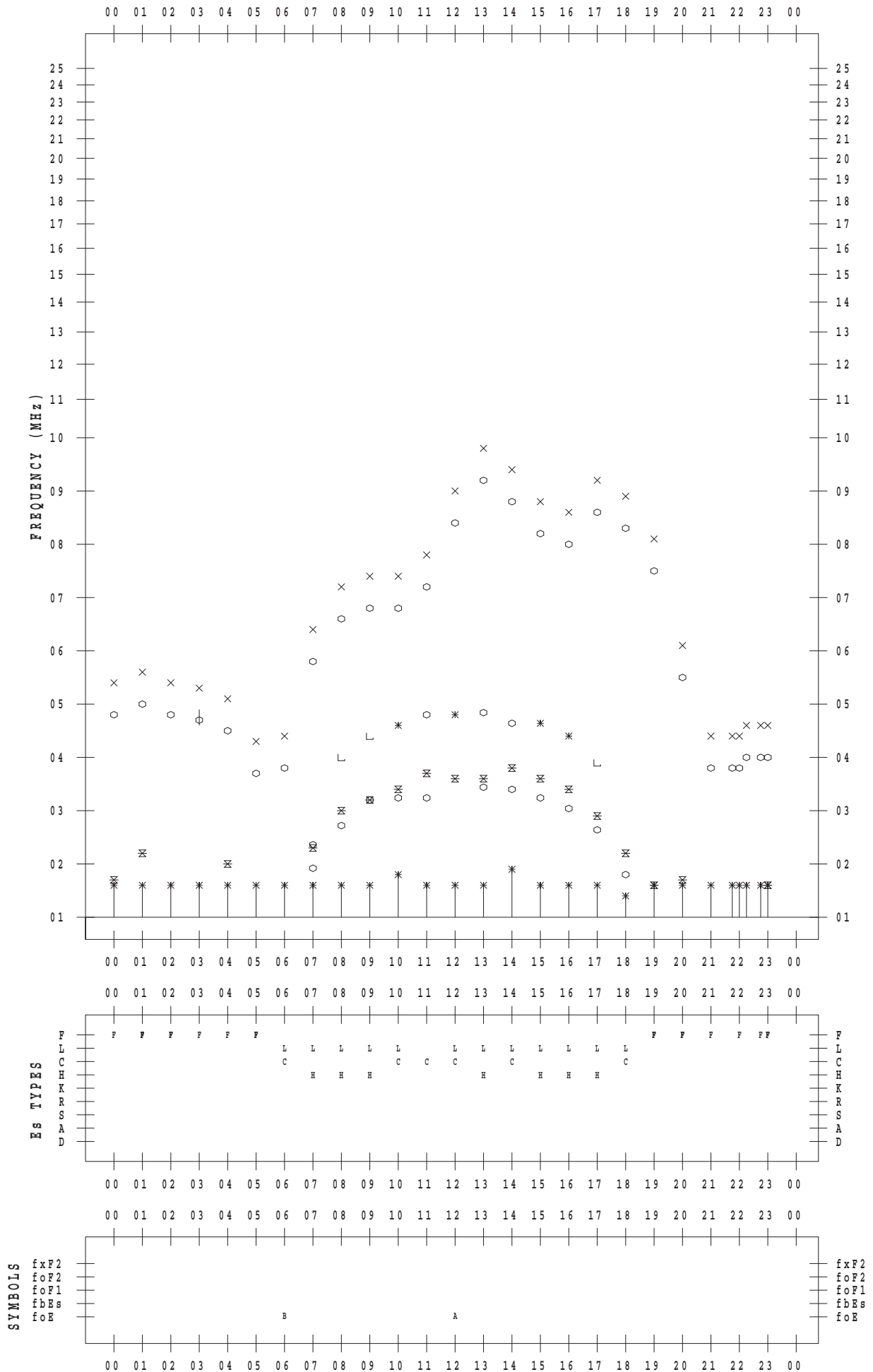
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 26

135 ° E MEAN TIME



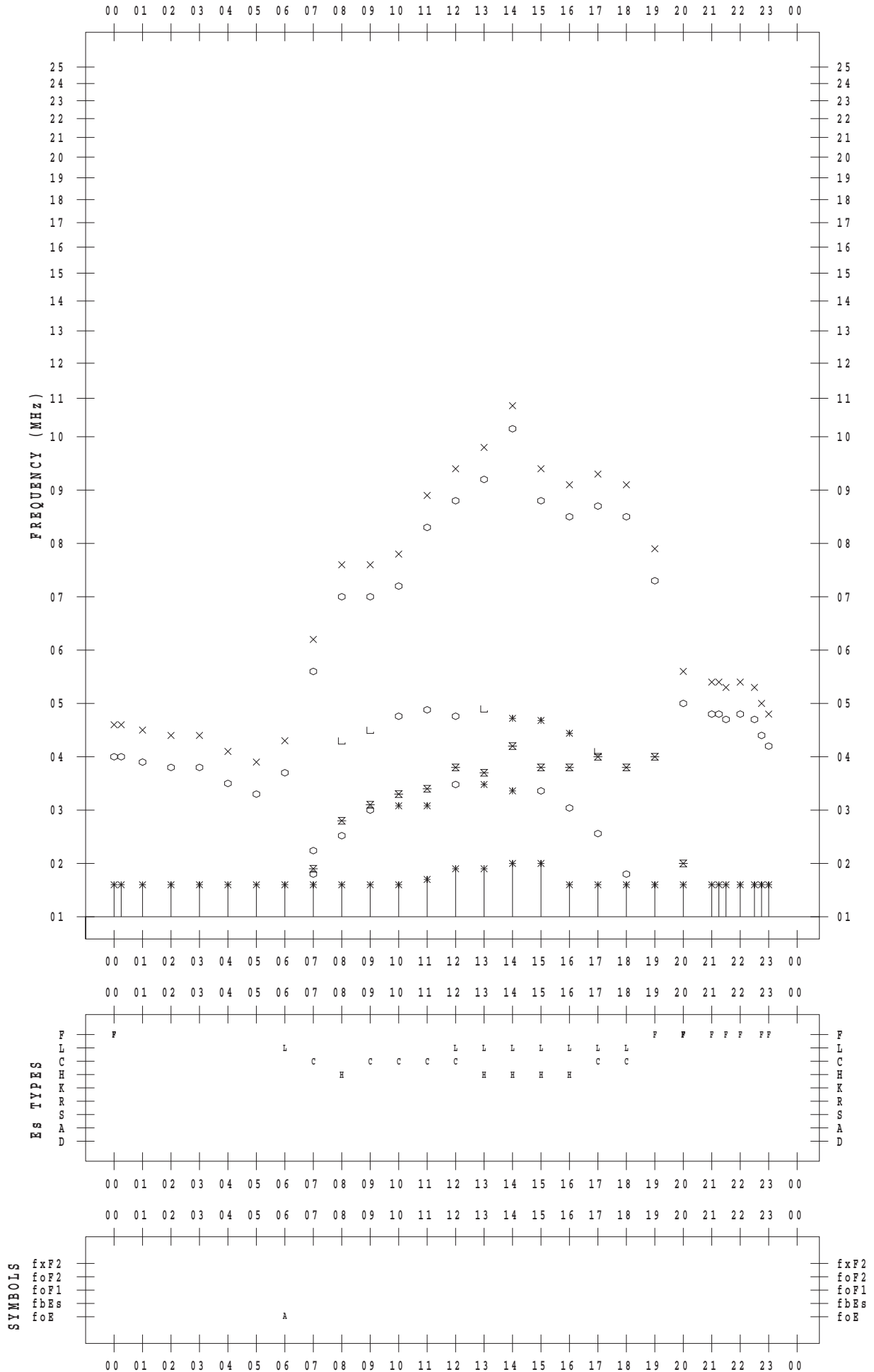
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 27

135 ° E MEAN TIME



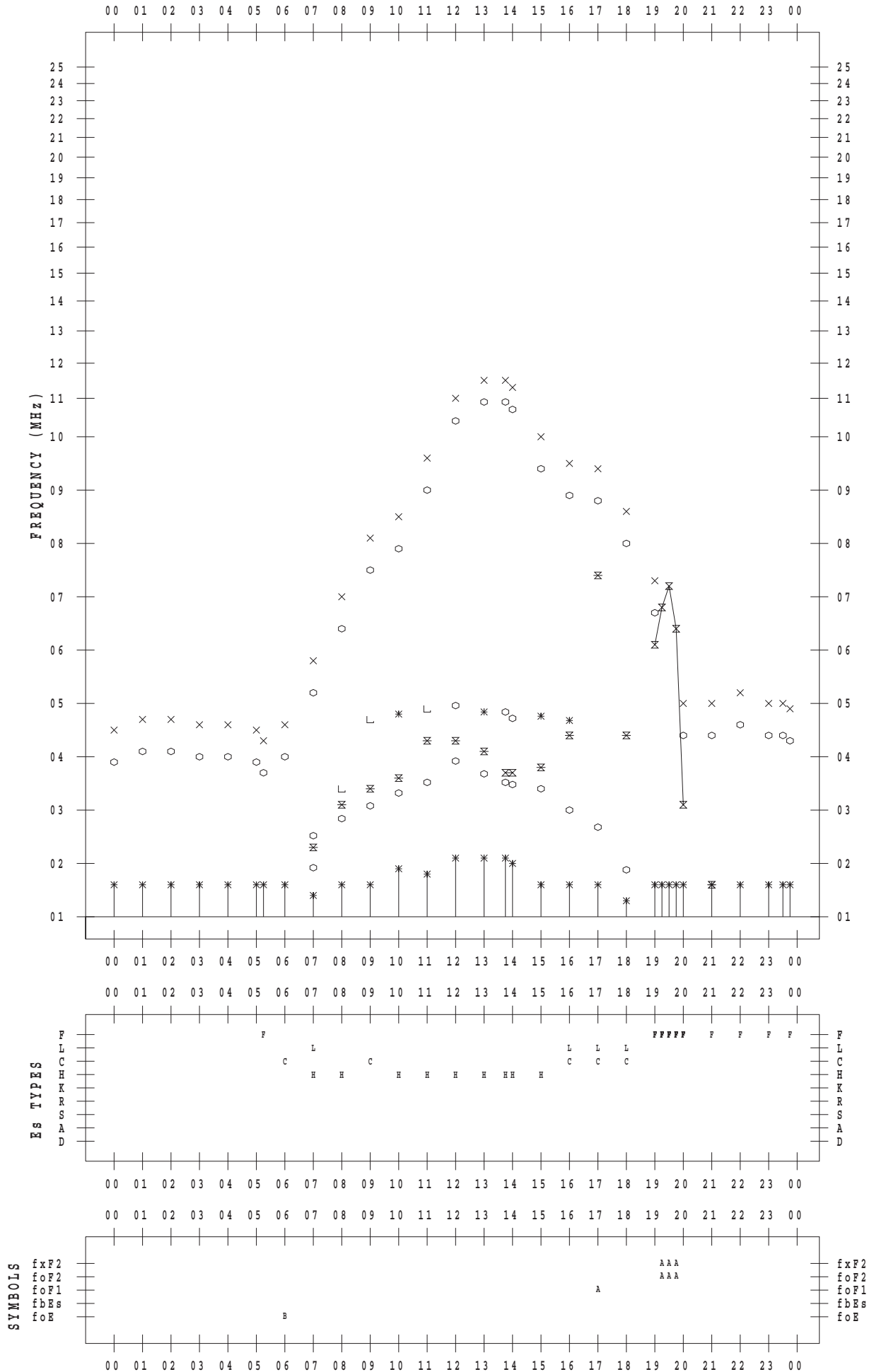
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 28

135 ° E MEAN TIME



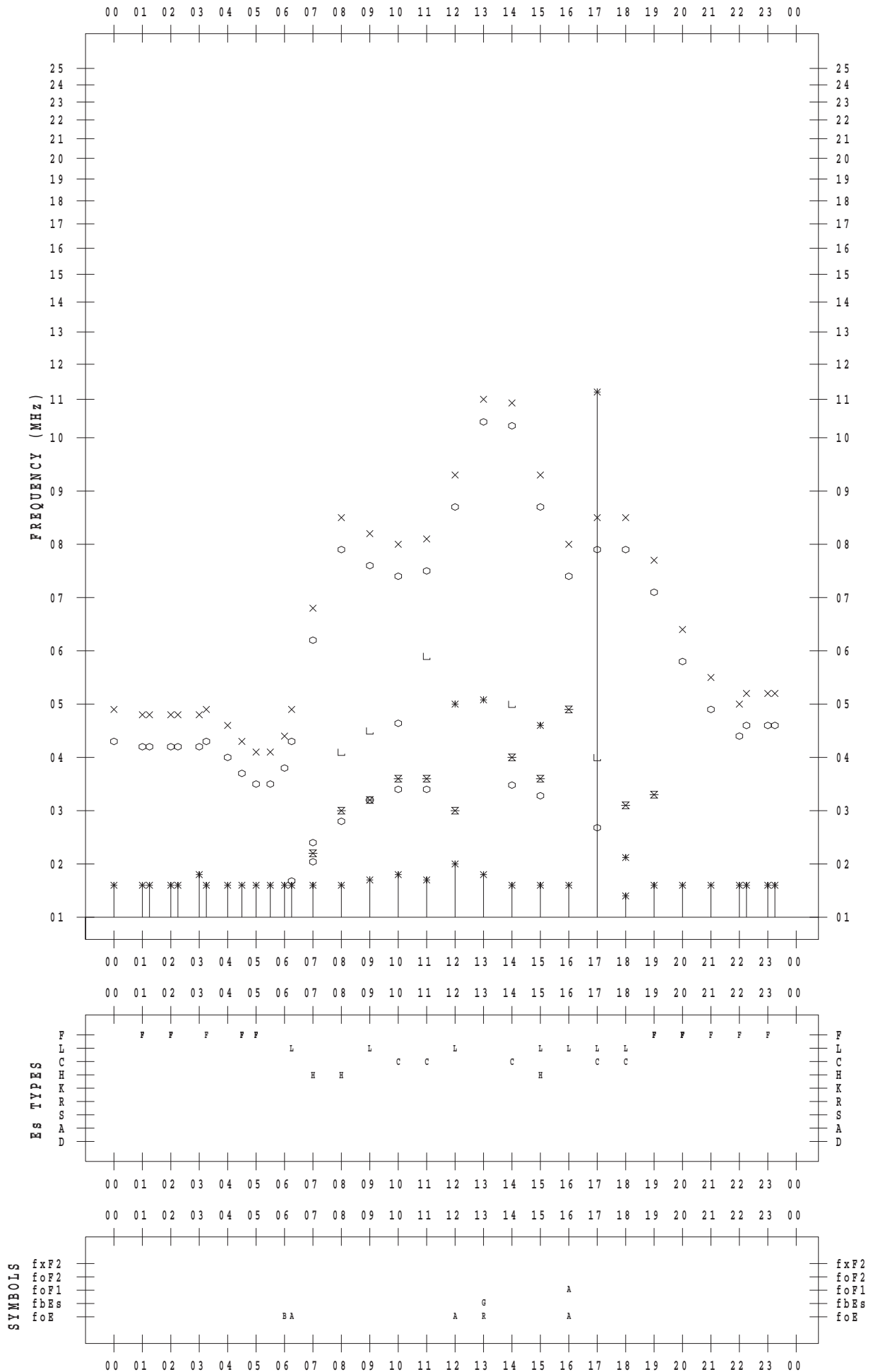
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 29

135 ° E MEAN TIME



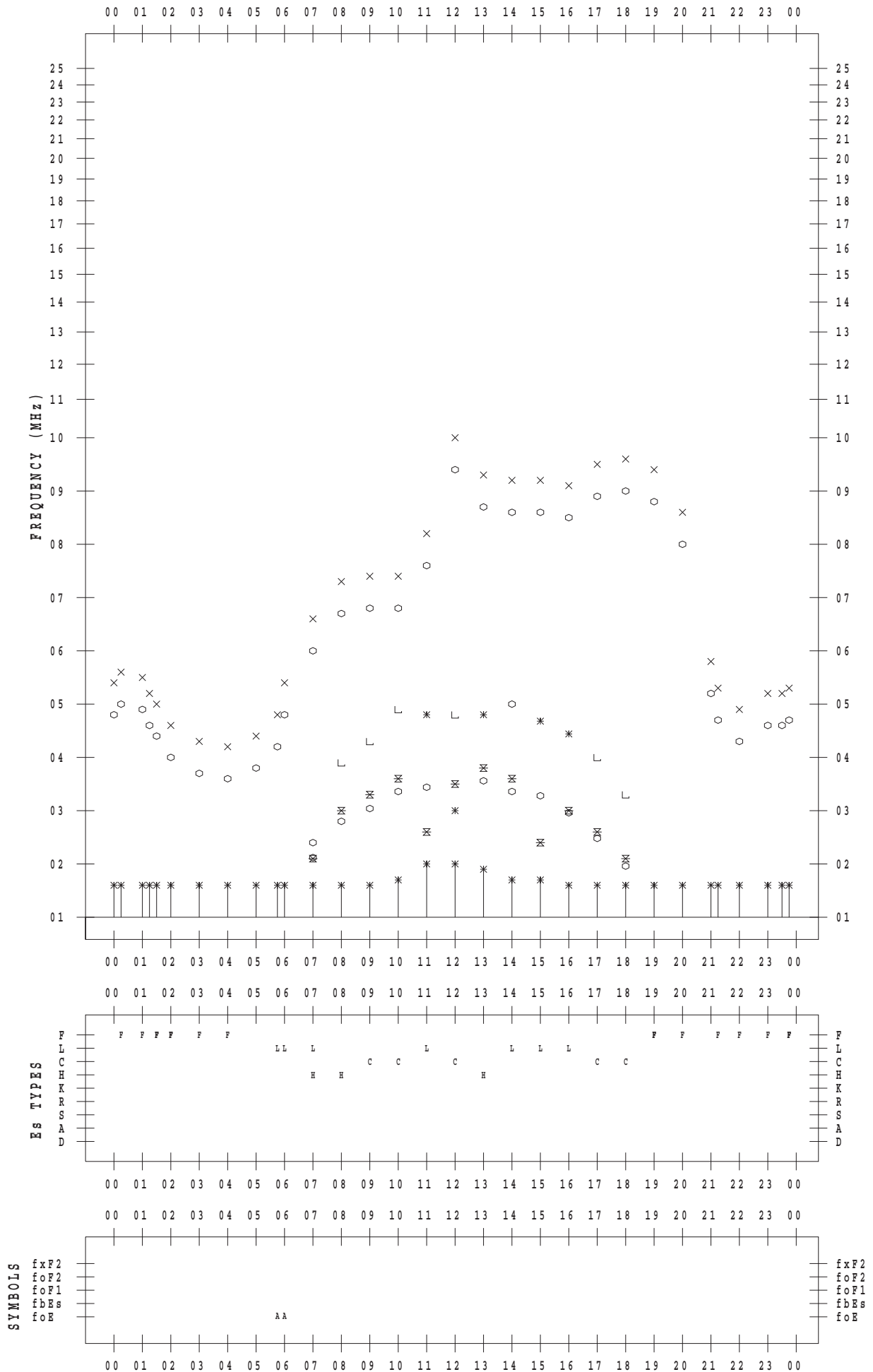
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 30

135 ° E MEAN TIME





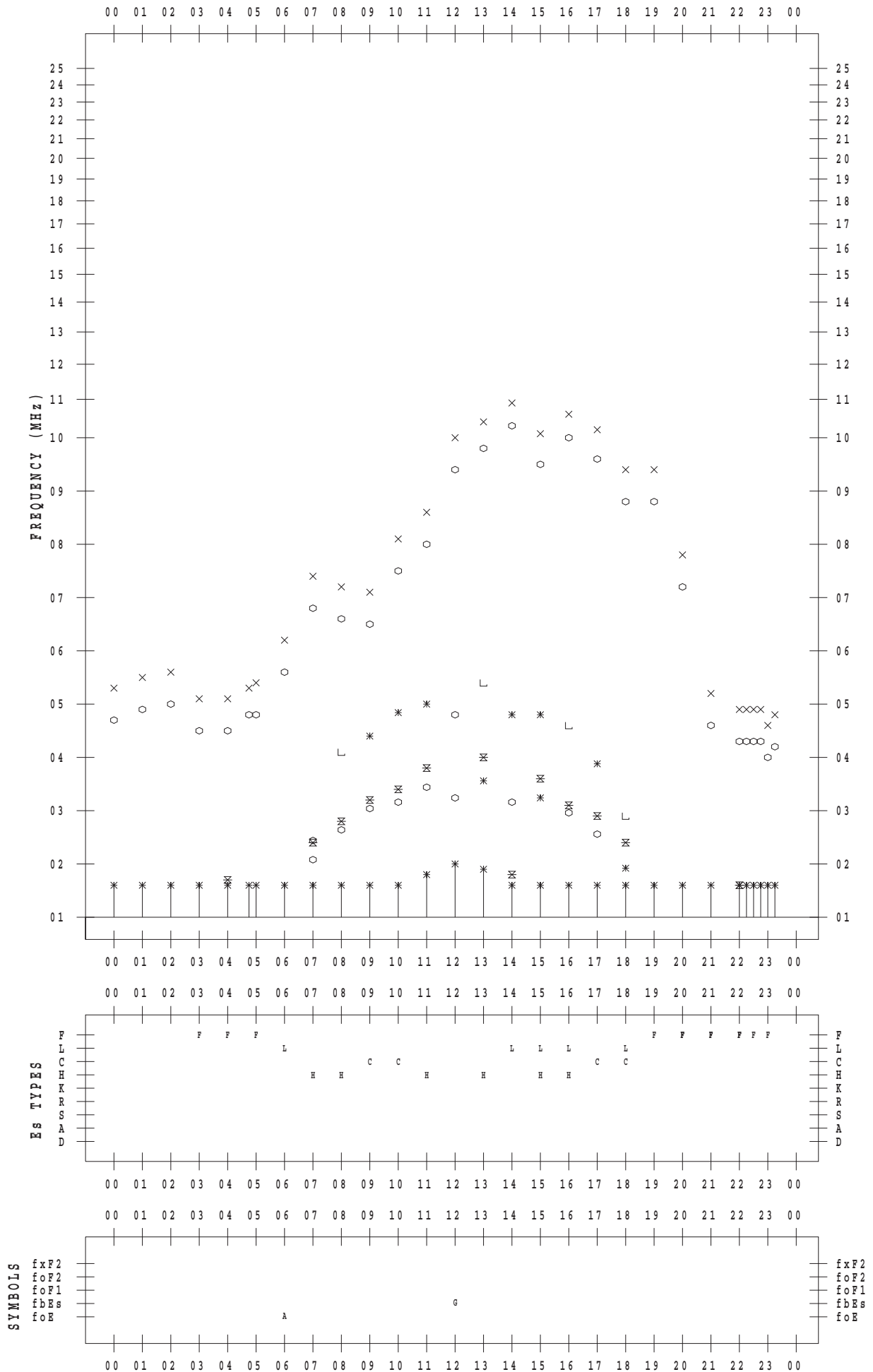
# f - PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2016 / 3 / 31

135 ° E MEAN TIME



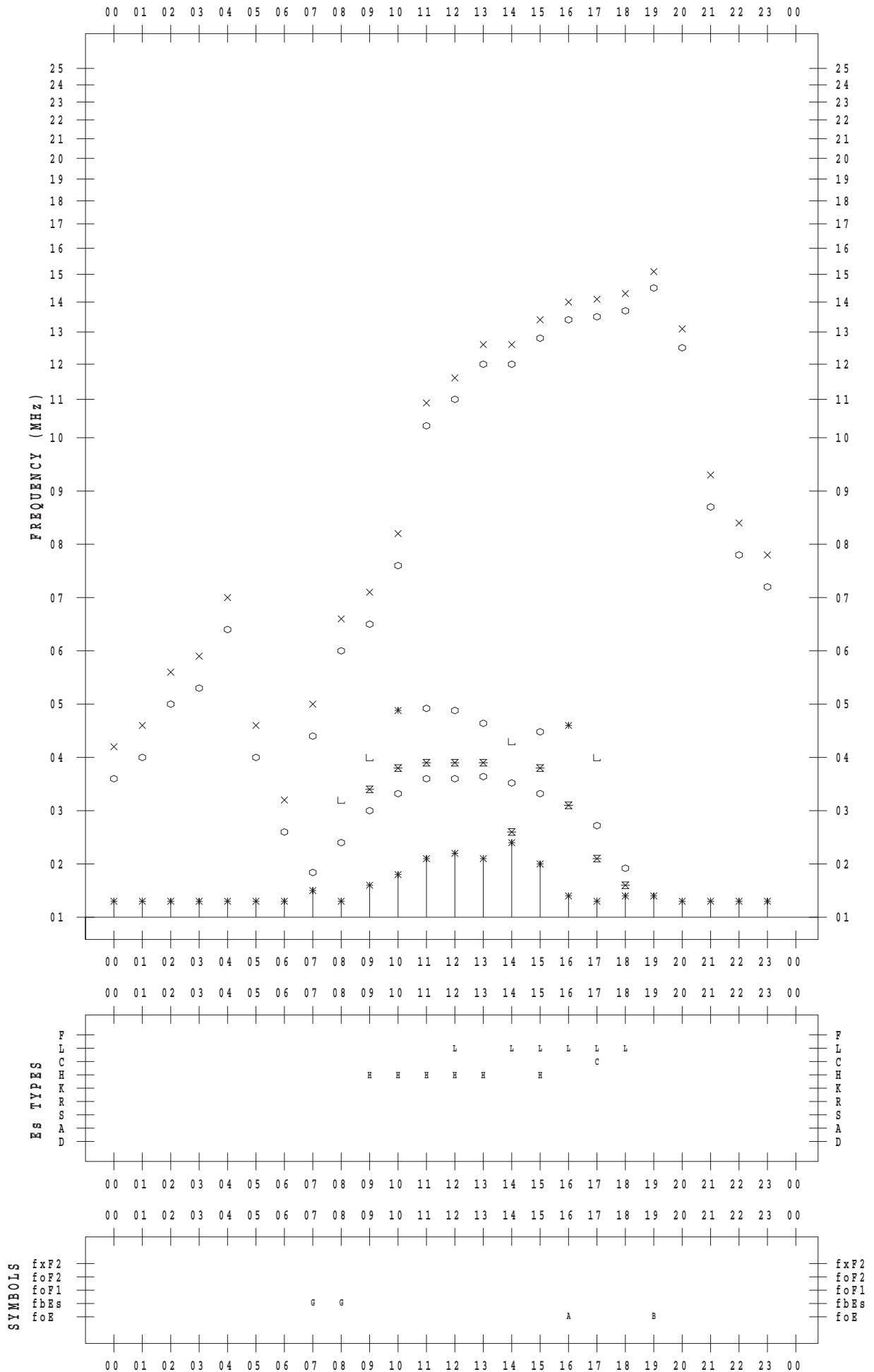
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 1

135 ° E MEAN TIME



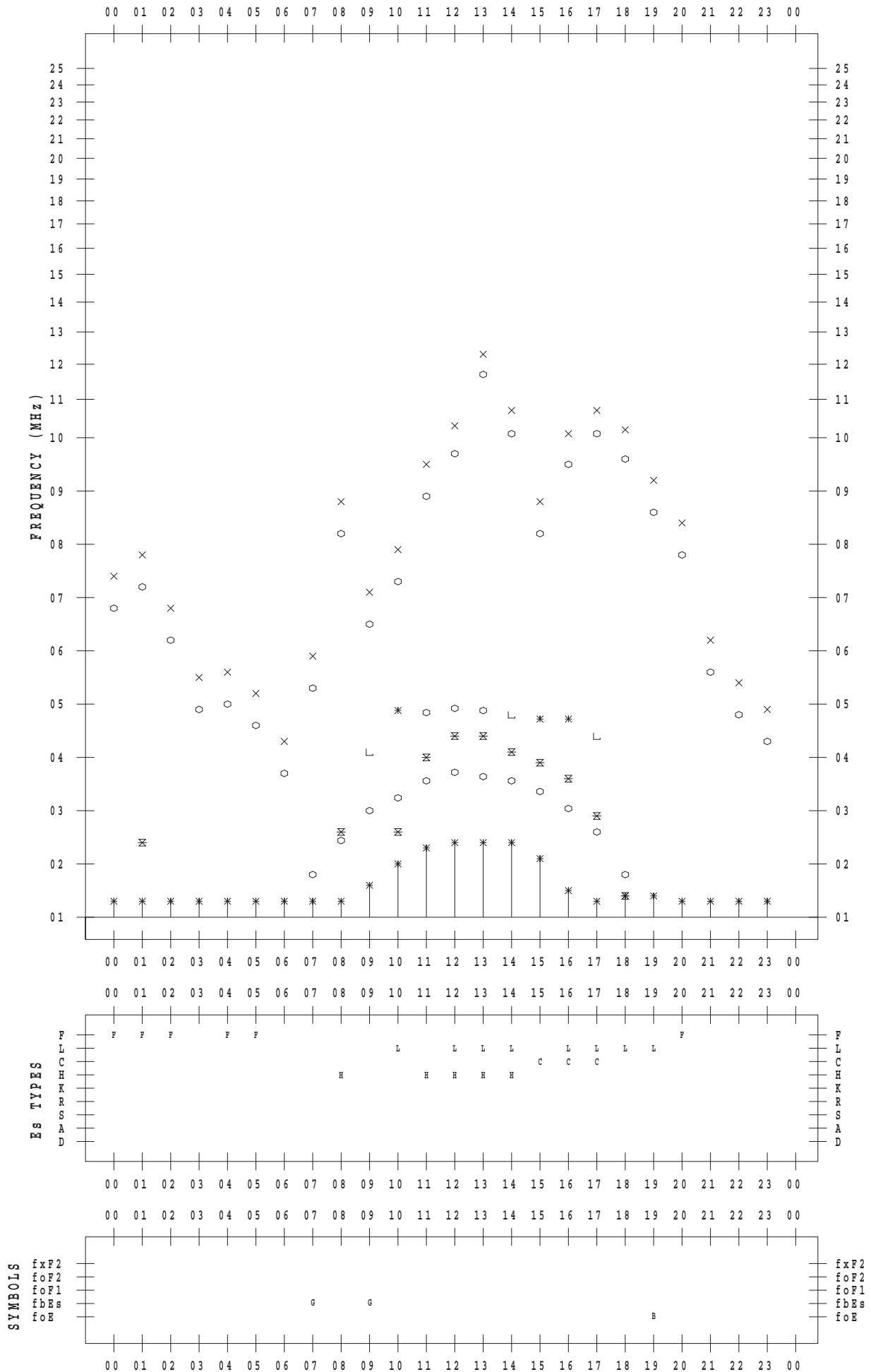
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 2

135 ° E MEAN TIME



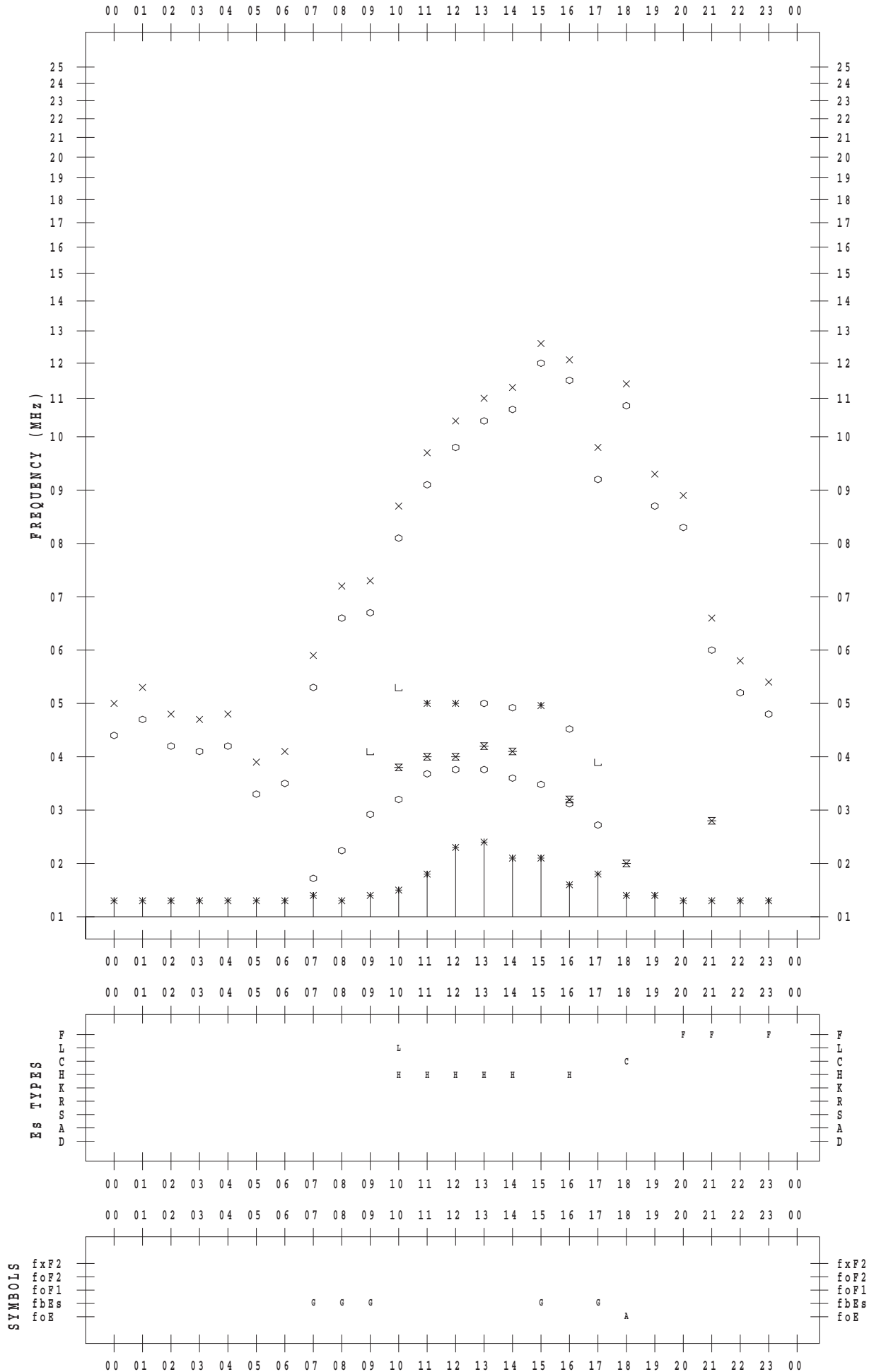
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 3

135 ° E MEAN TIME



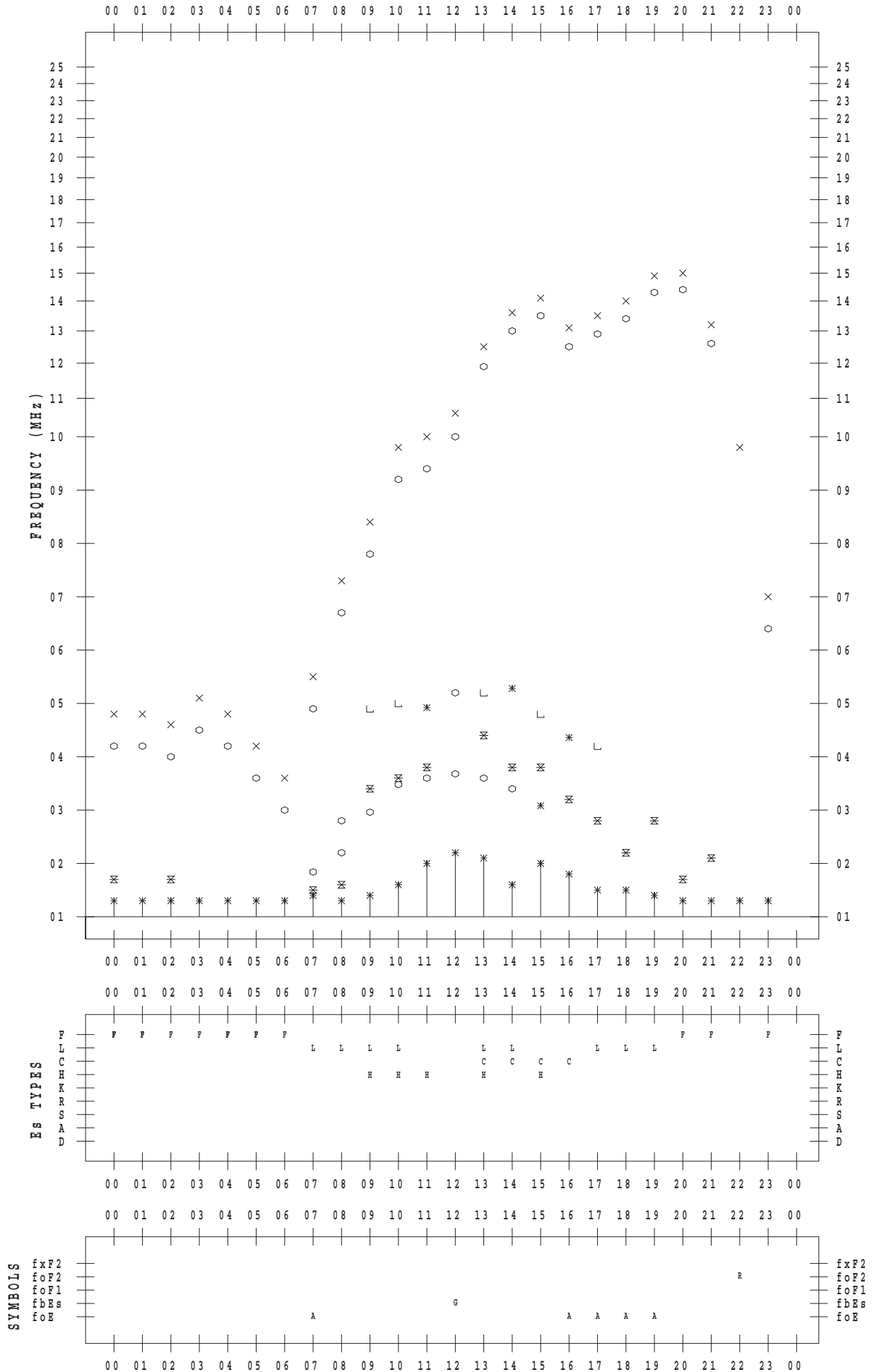
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 4

135 ° E MEAN TIME



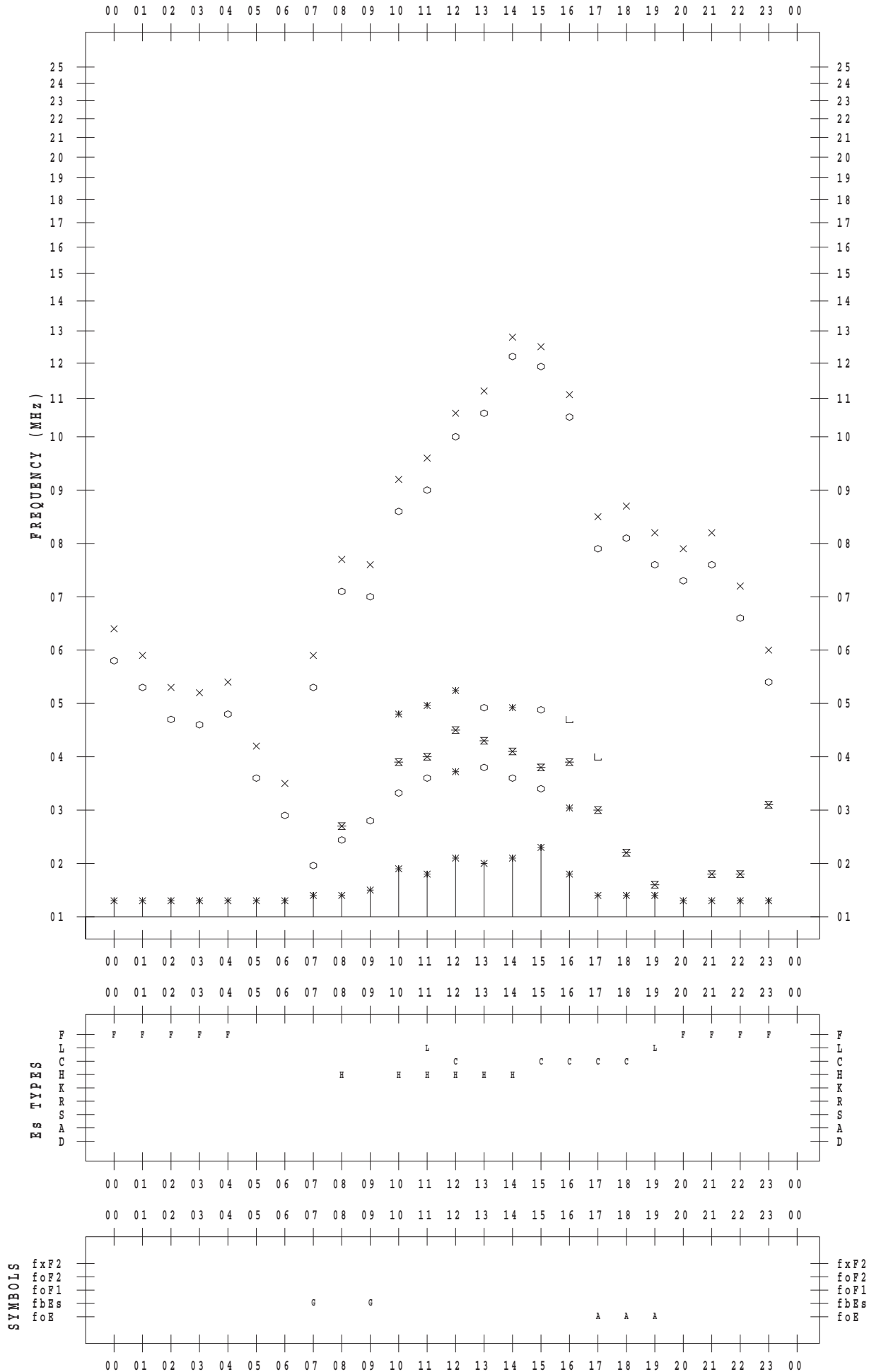
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 5

135 ° E MEAN TIME



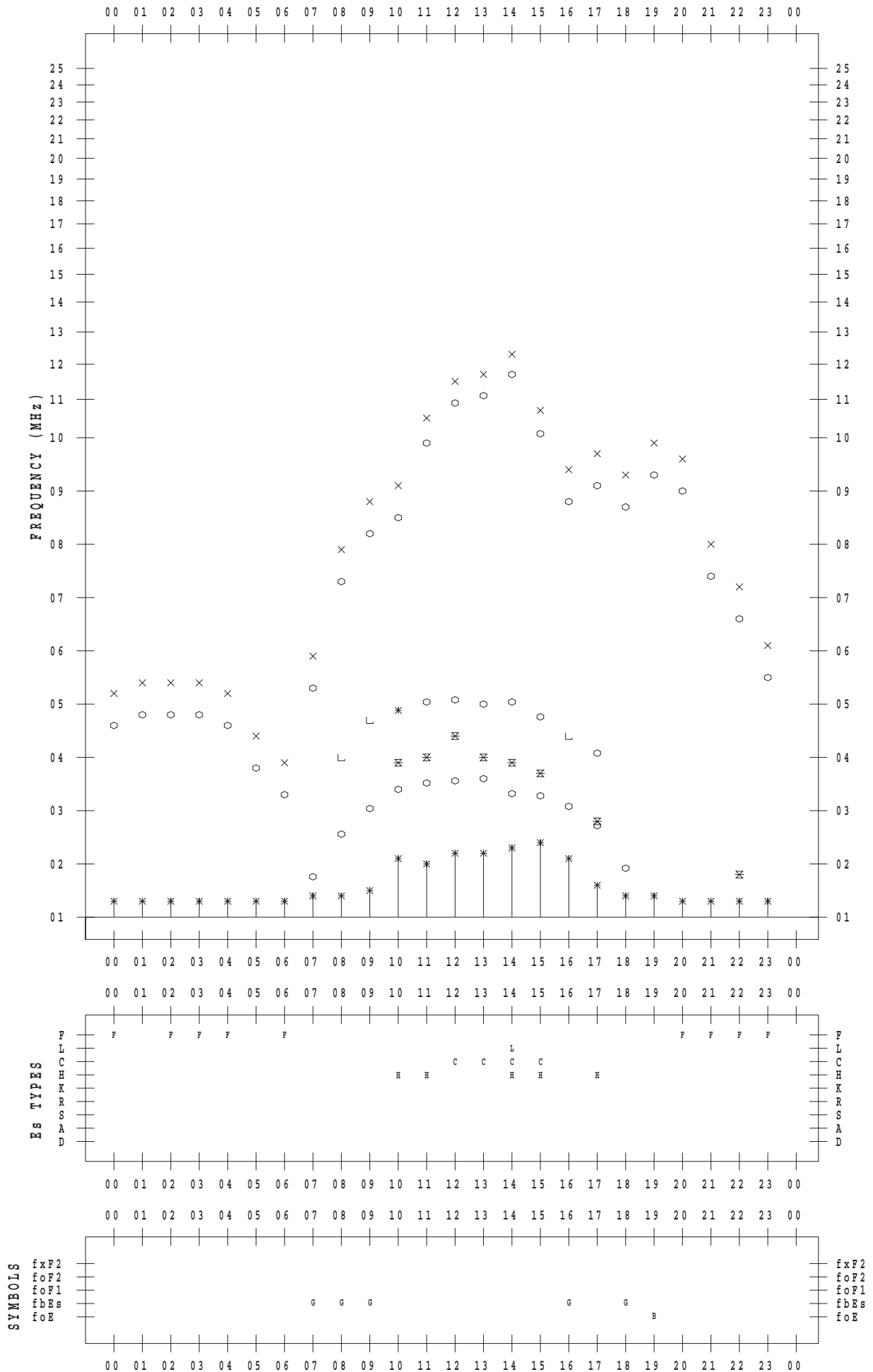
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 6

135 ° E MEAN TIME



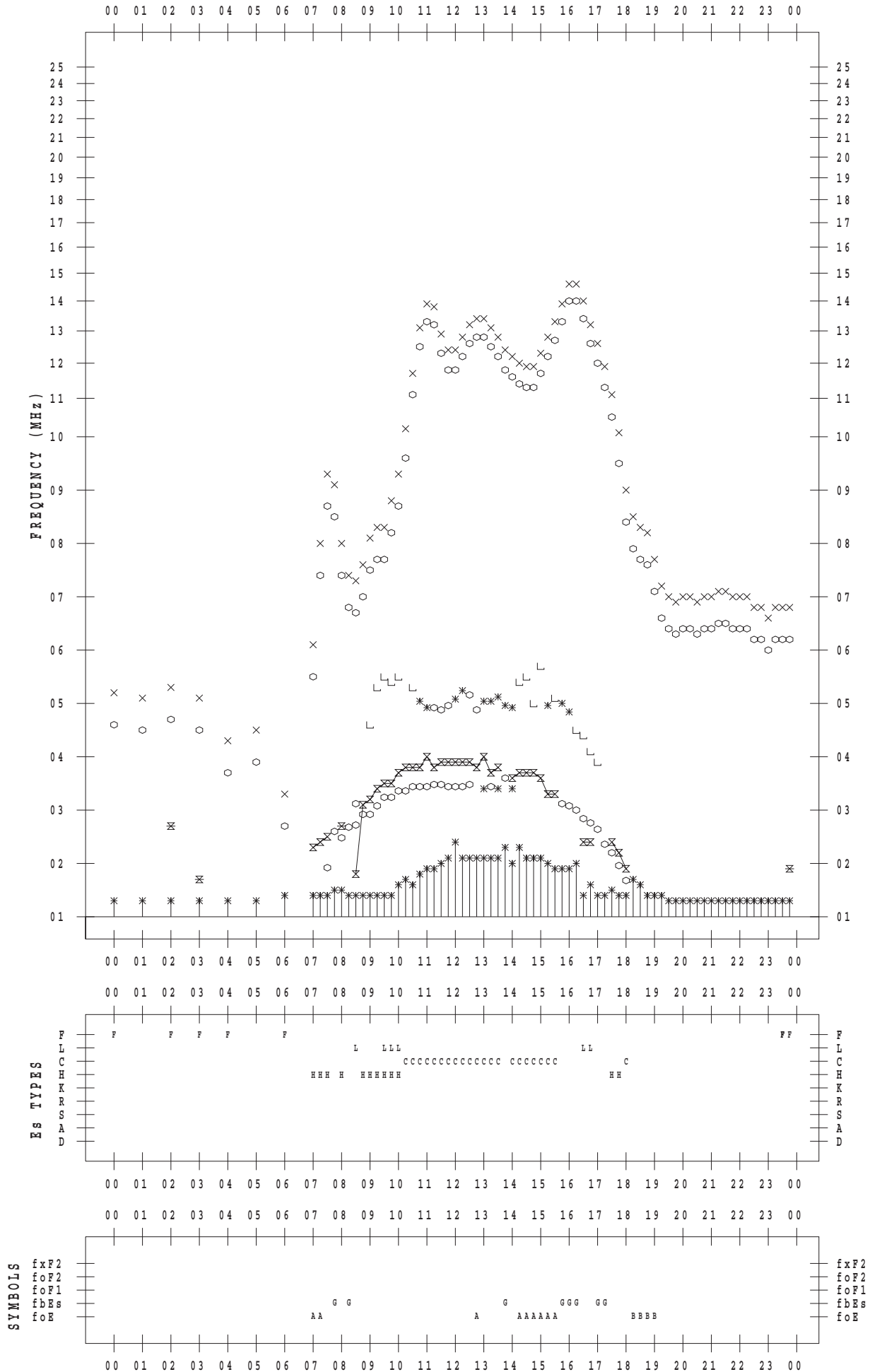
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 7

135 ° E MEAN TIME





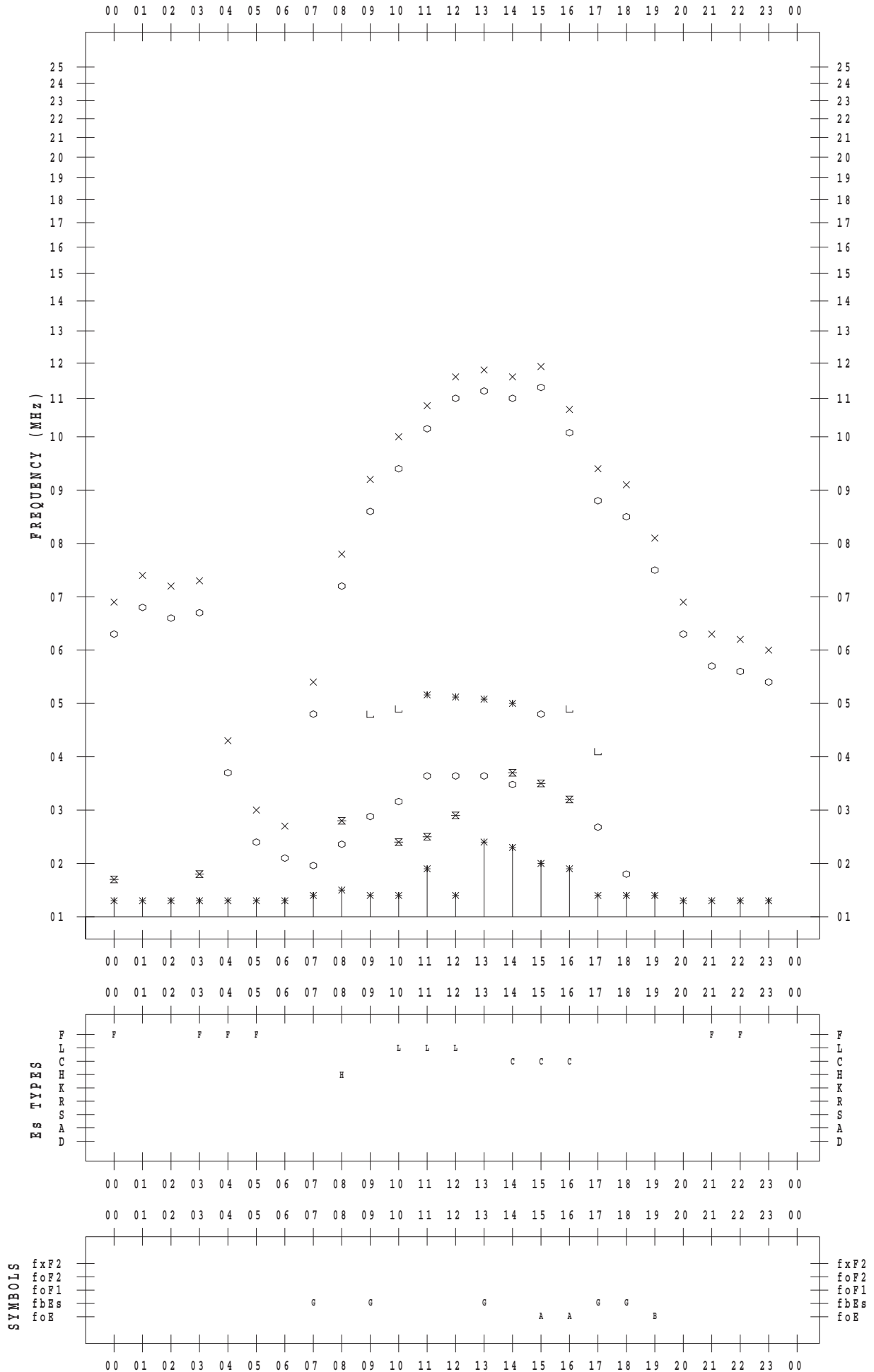
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 8

135 ° E MEAN TIME



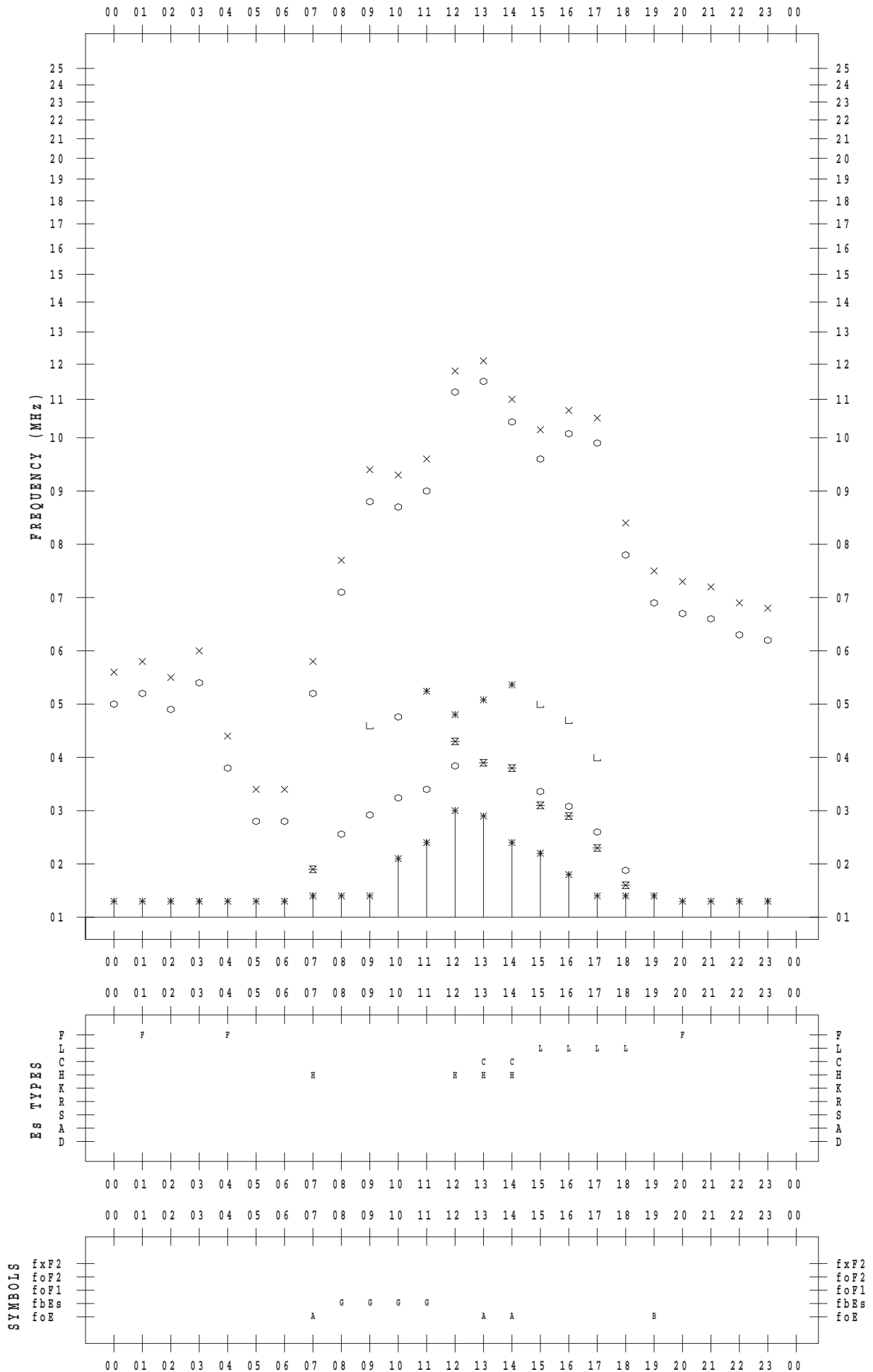
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 9

135 ° E MEAN TIME



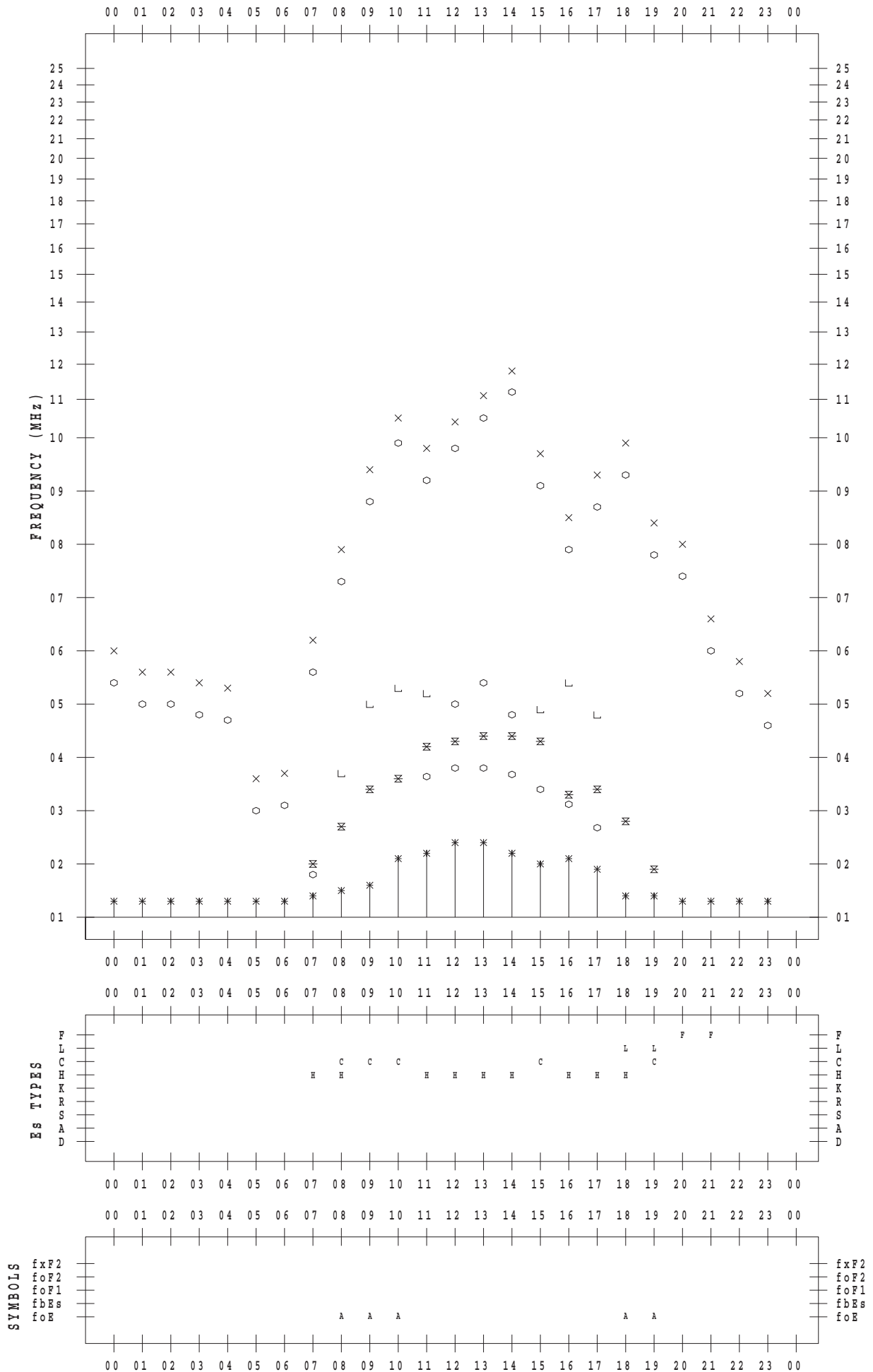
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 10

135 ° E MEAN TIME



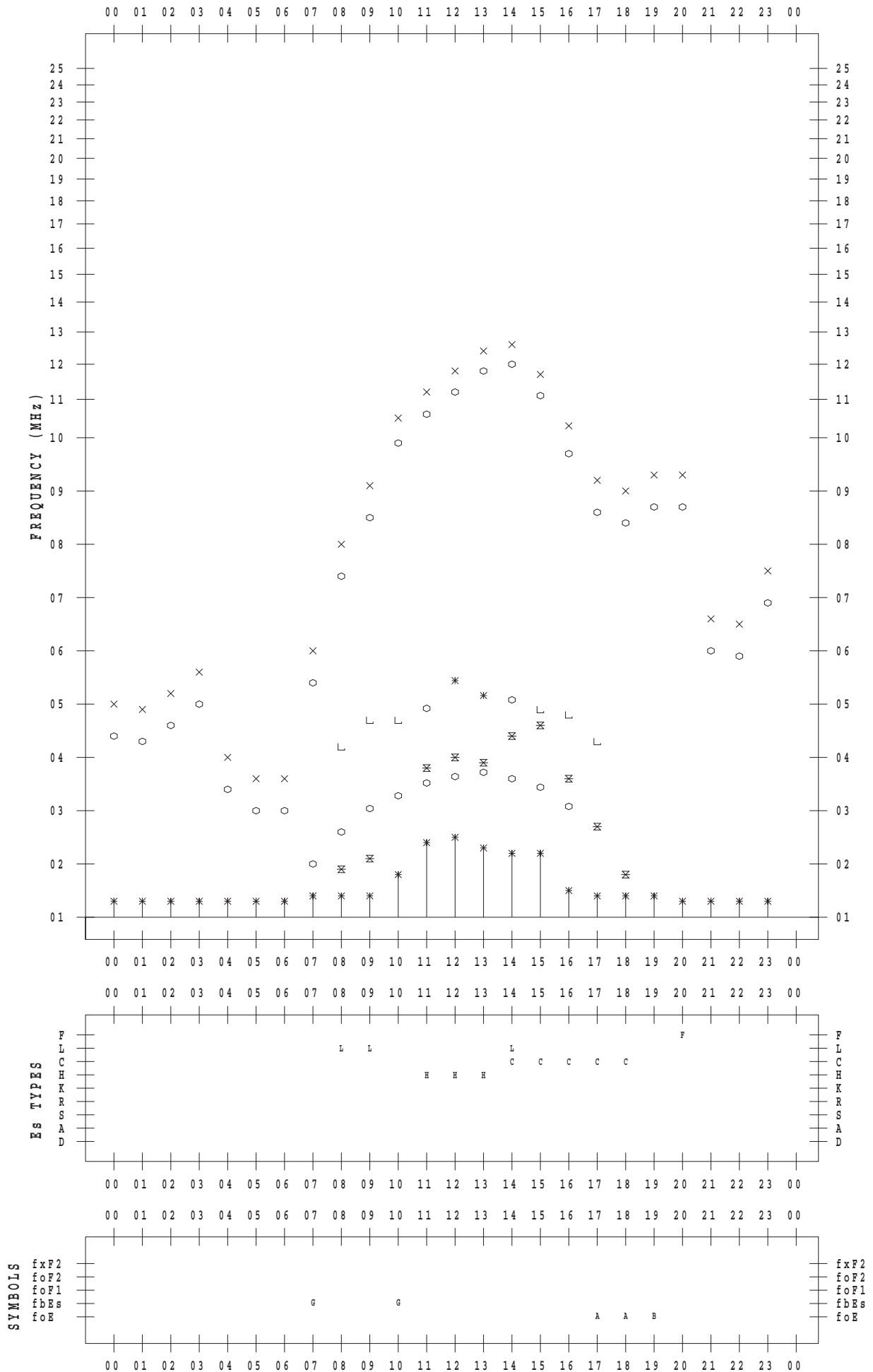
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 11

135 ° E MEAN TIME



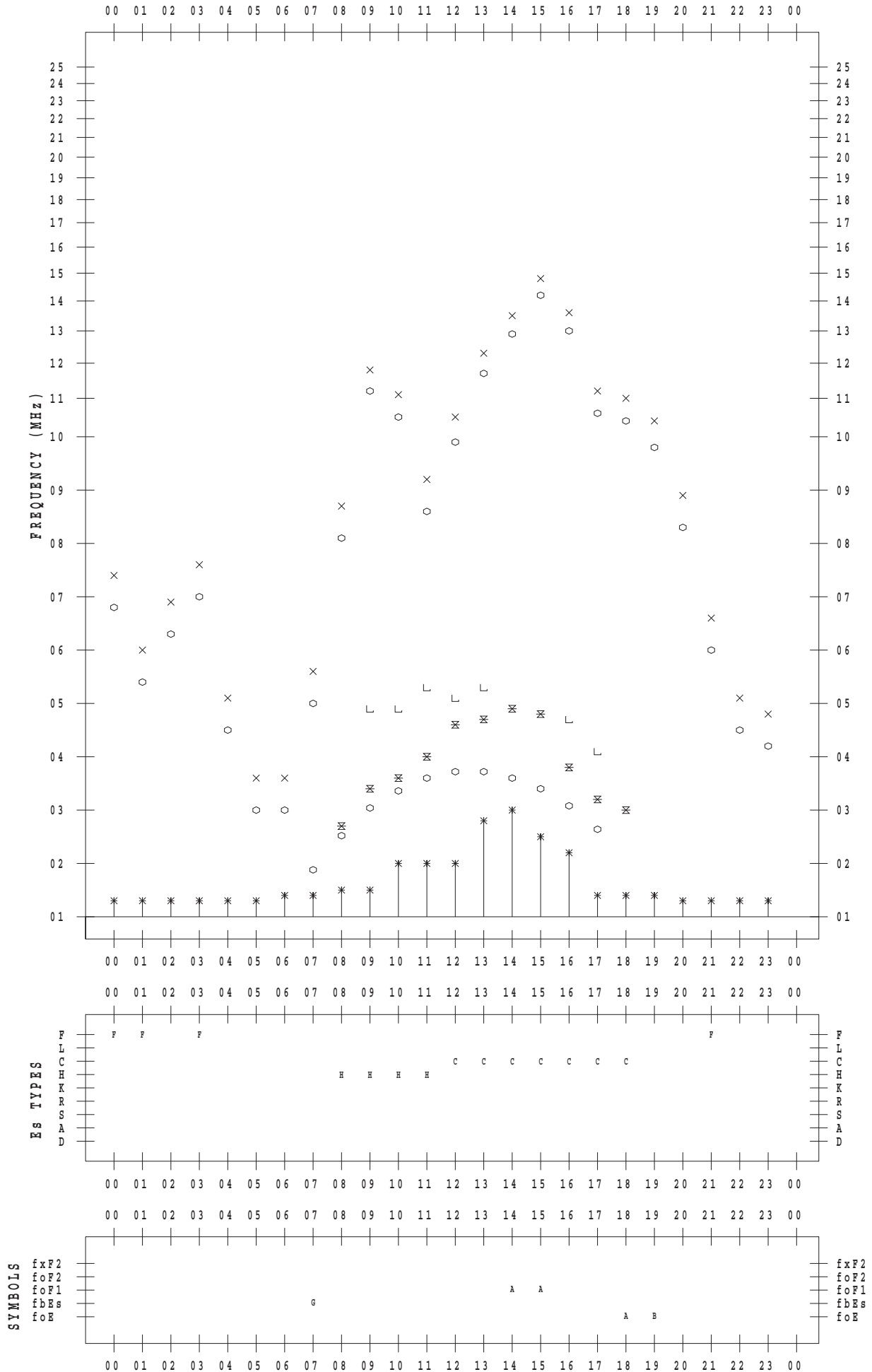
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 12

135 ° E MEAN TIME



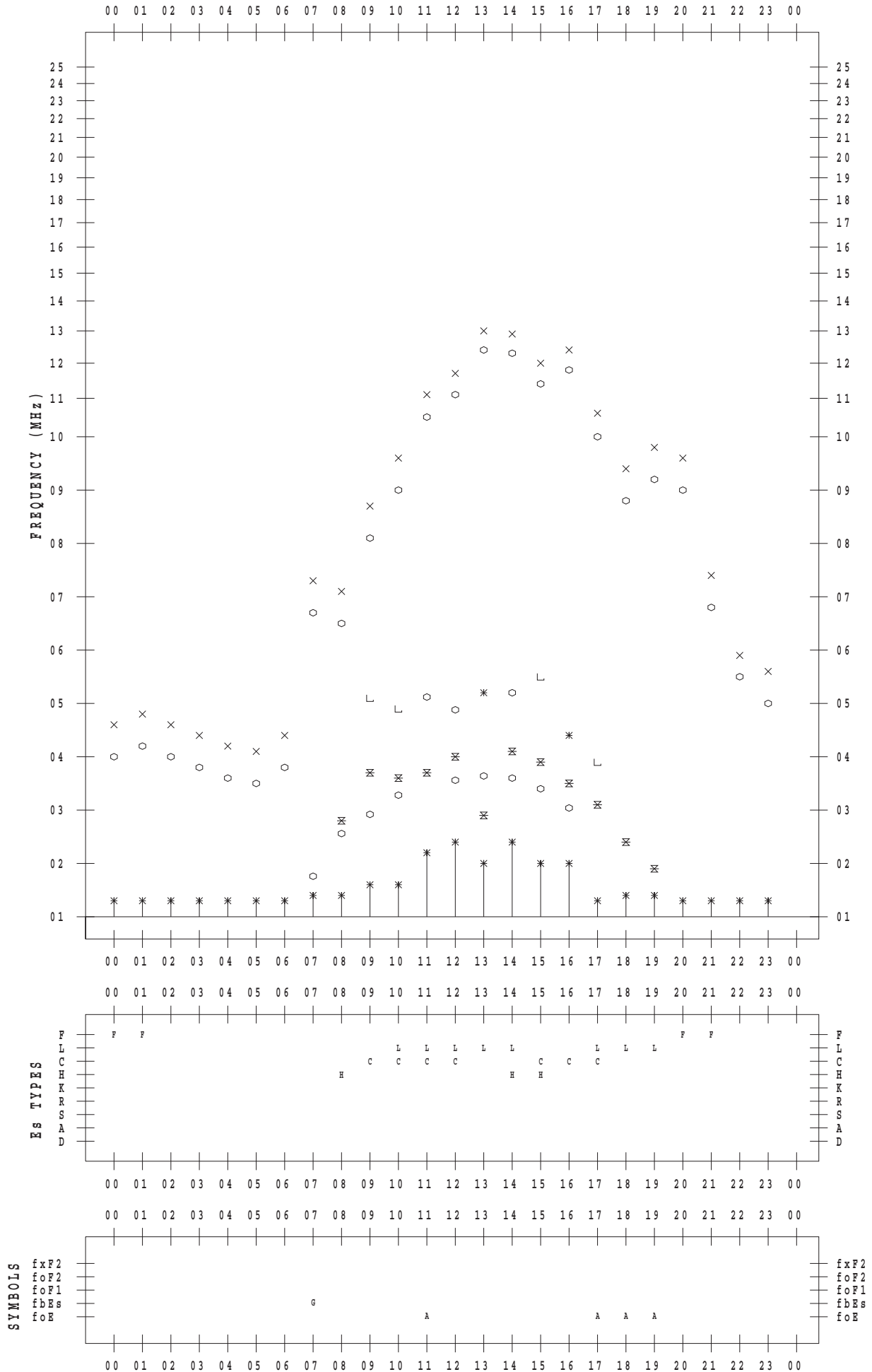
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 13

135 ° E MEAN TIME



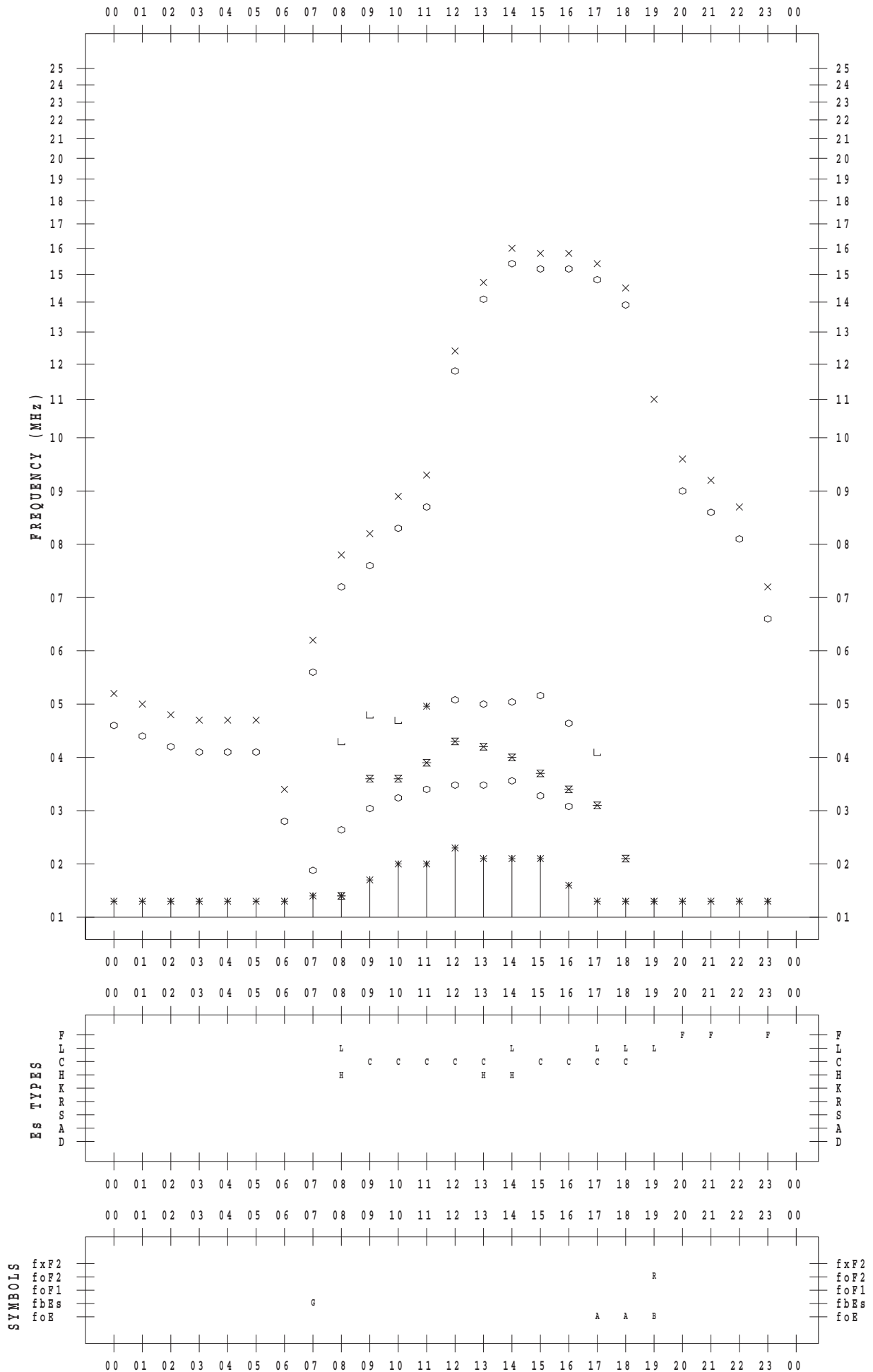
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 14

135 ° E MEAN TIME



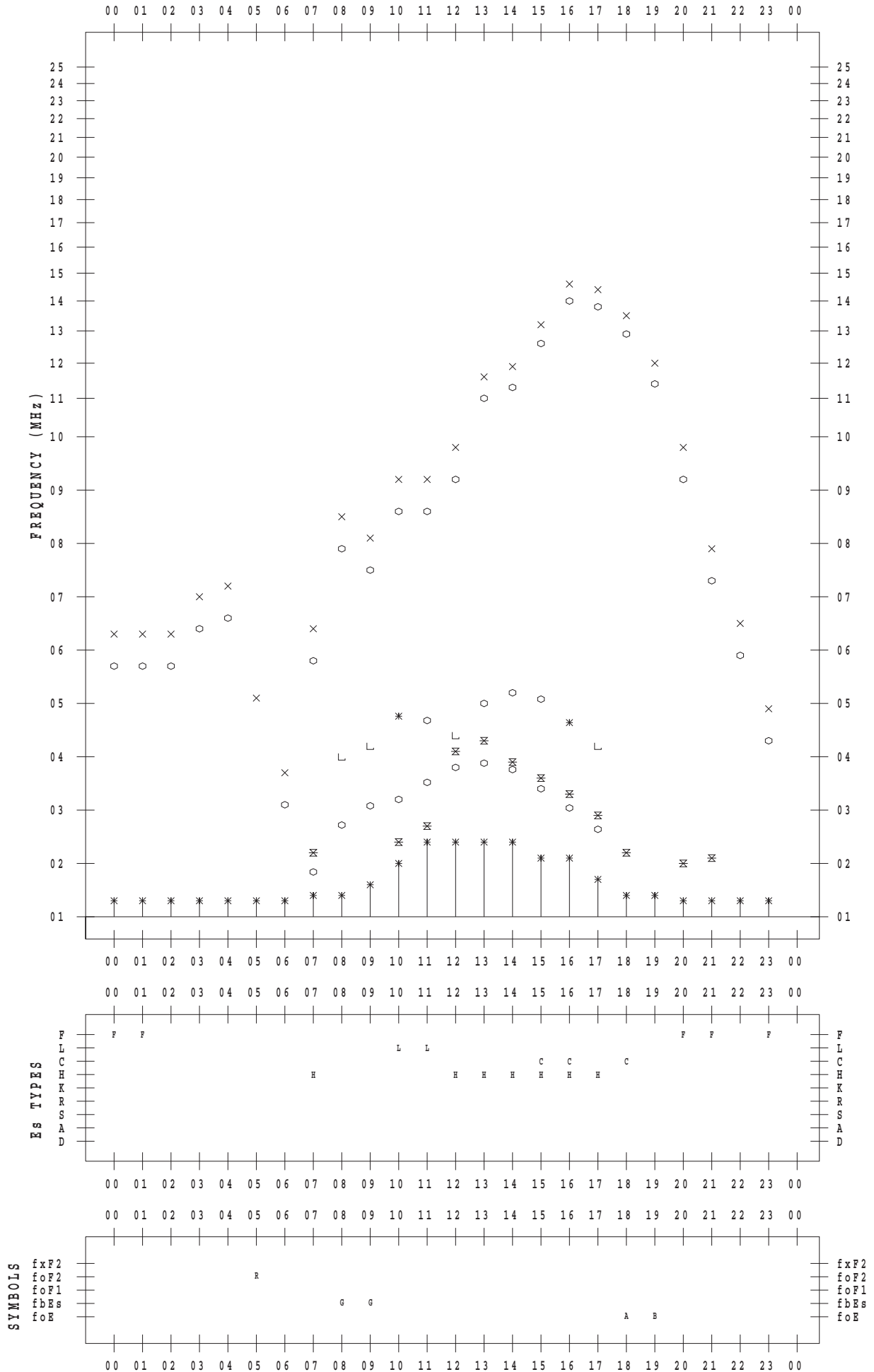
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 15

135 ° E MEAN TIME





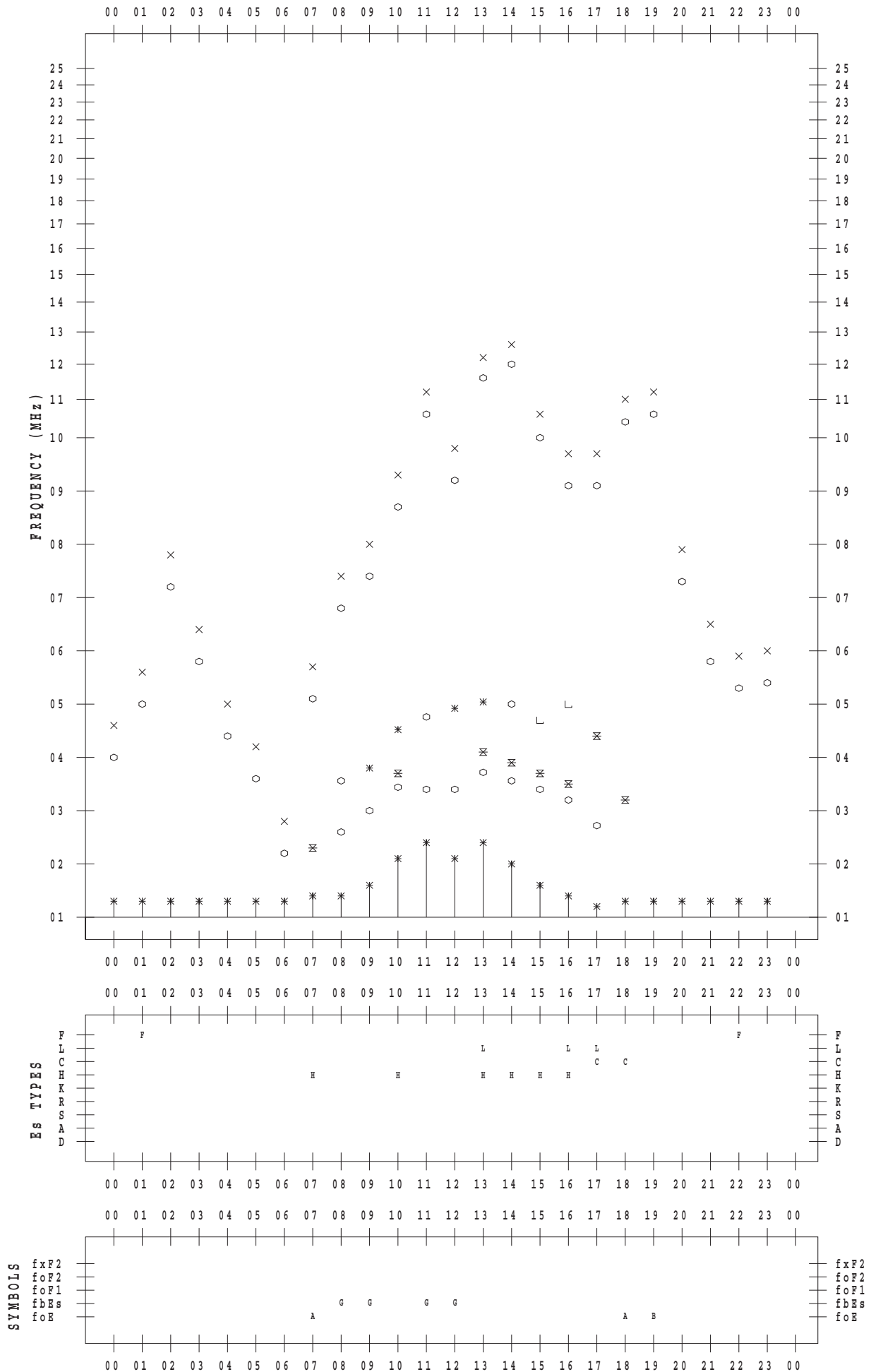
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 16

135 ° E MEAN TIME



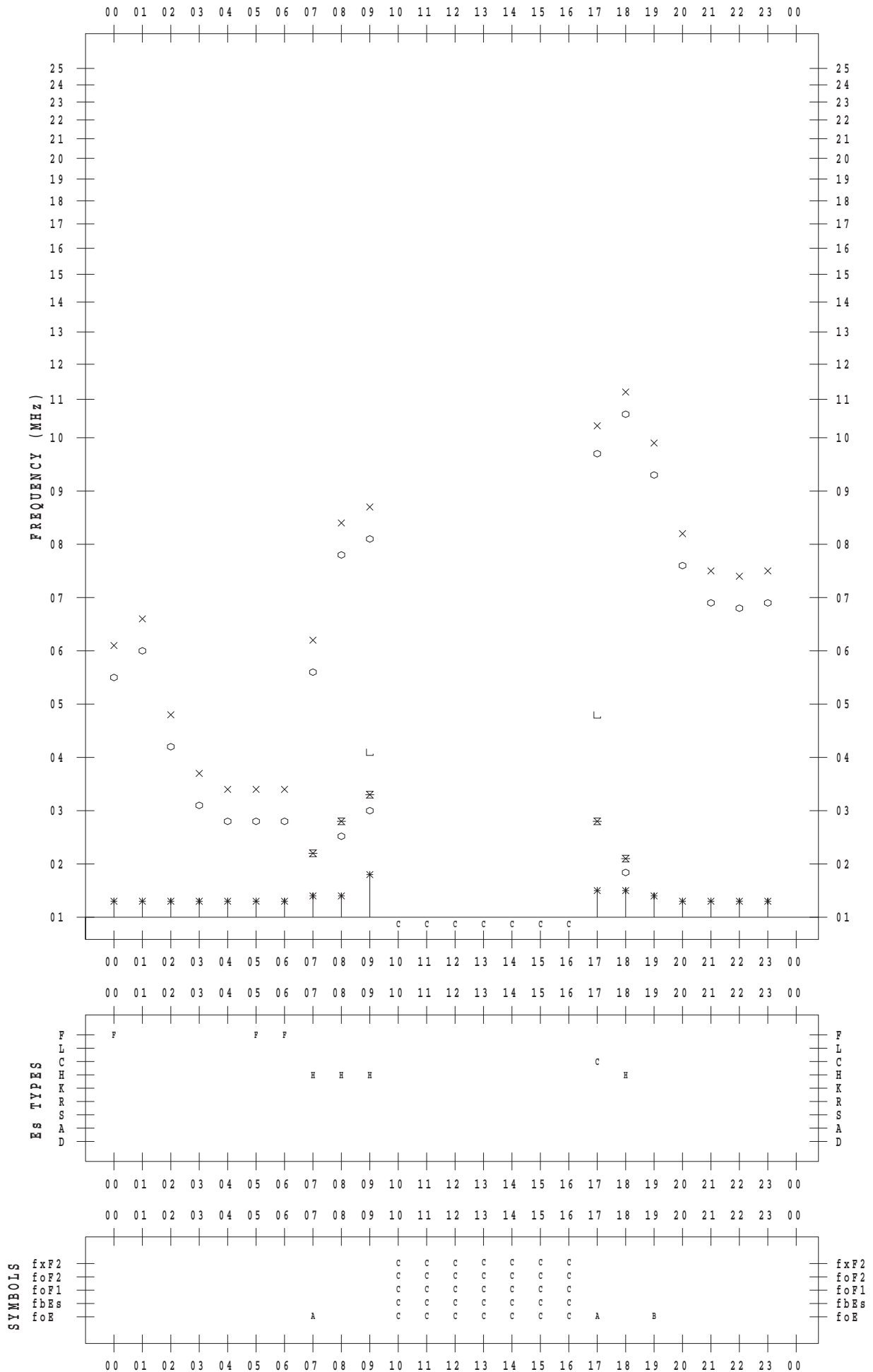
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 17

135 ° E MEAN TIME



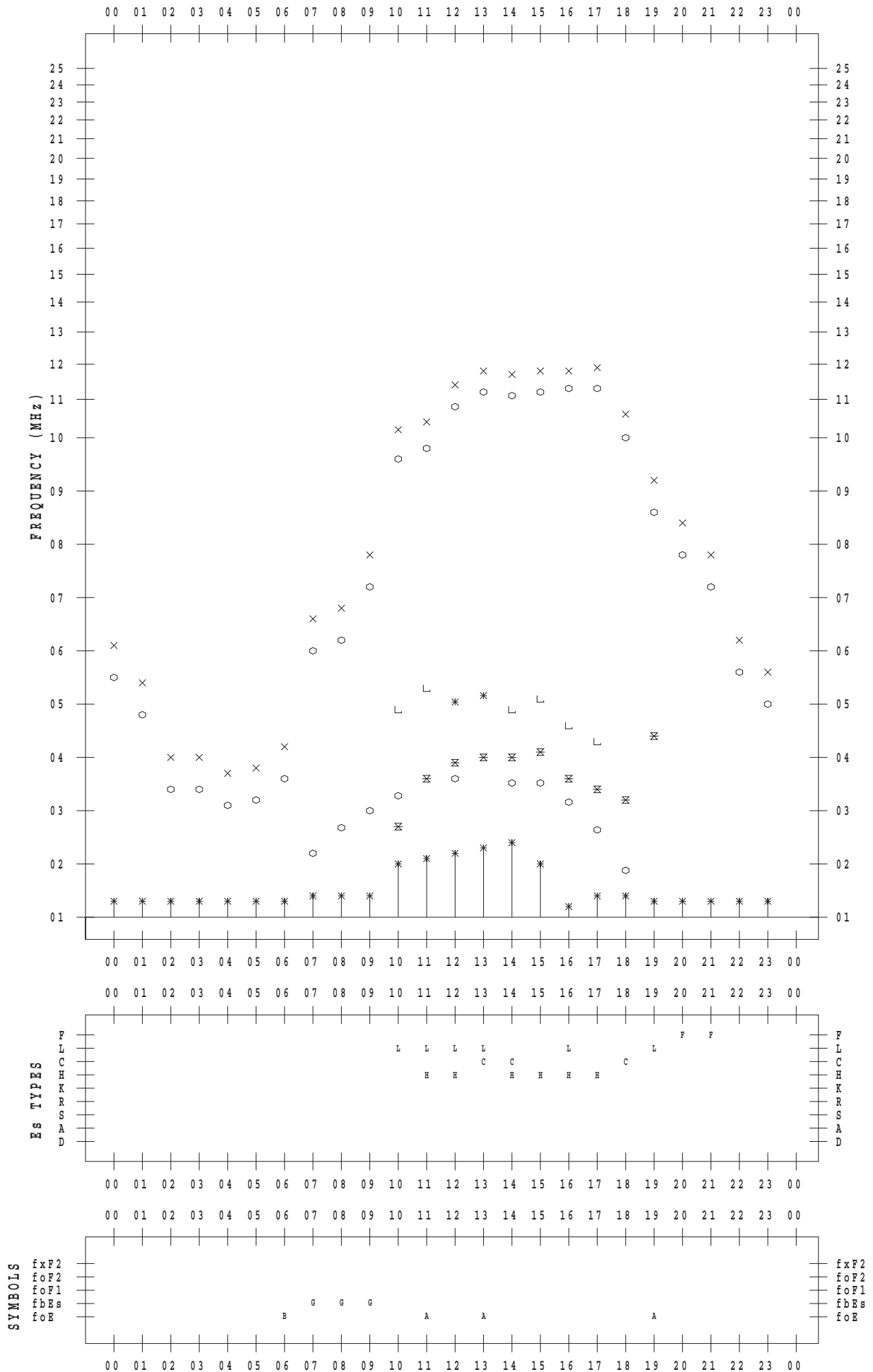
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 18

135 ° E MEAN TIME



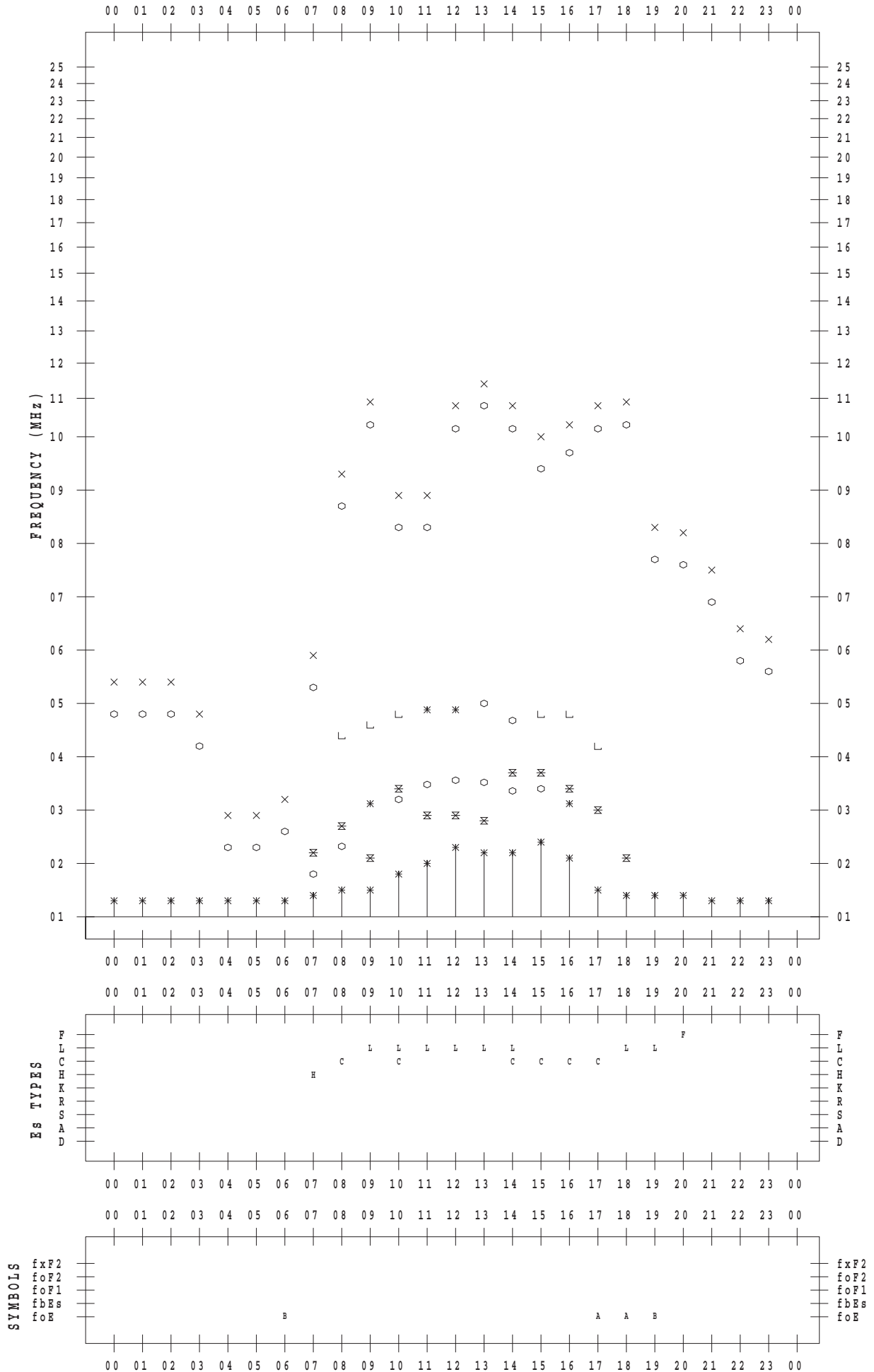
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 19

135 ° E MEAN TIME



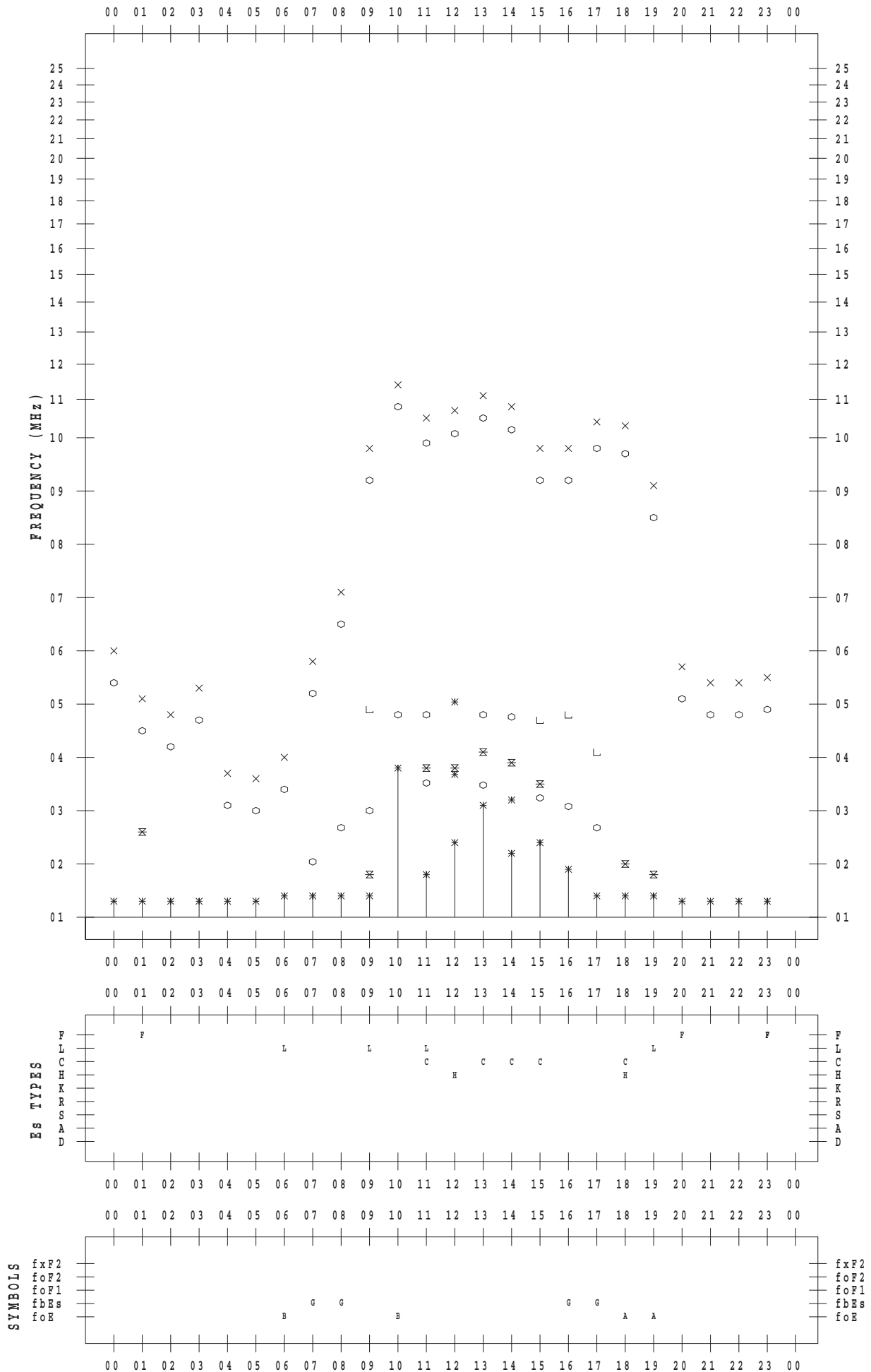
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 20

135 ° E MEAN TIME



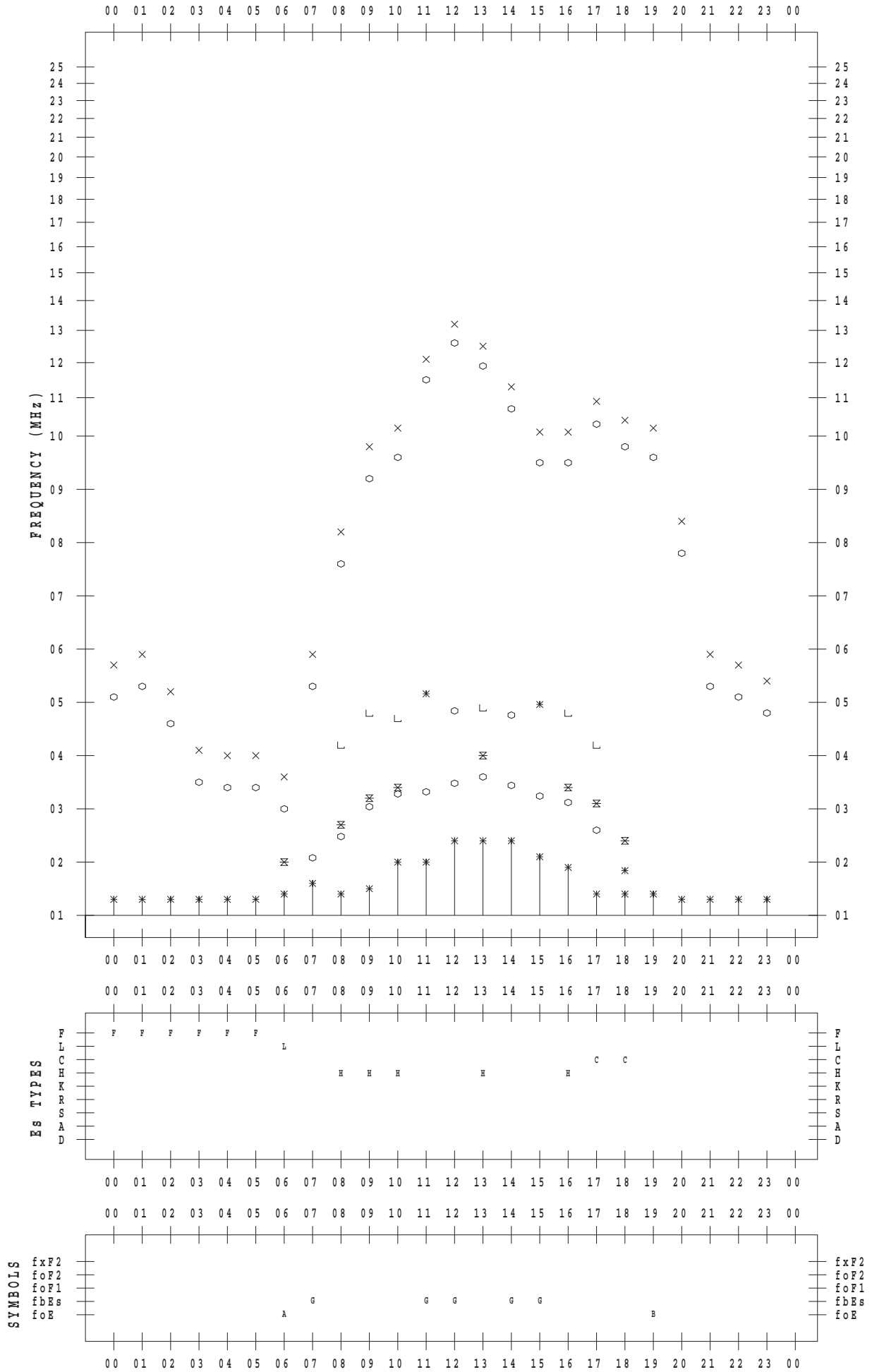
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 21

135 ° E MEAN TIME



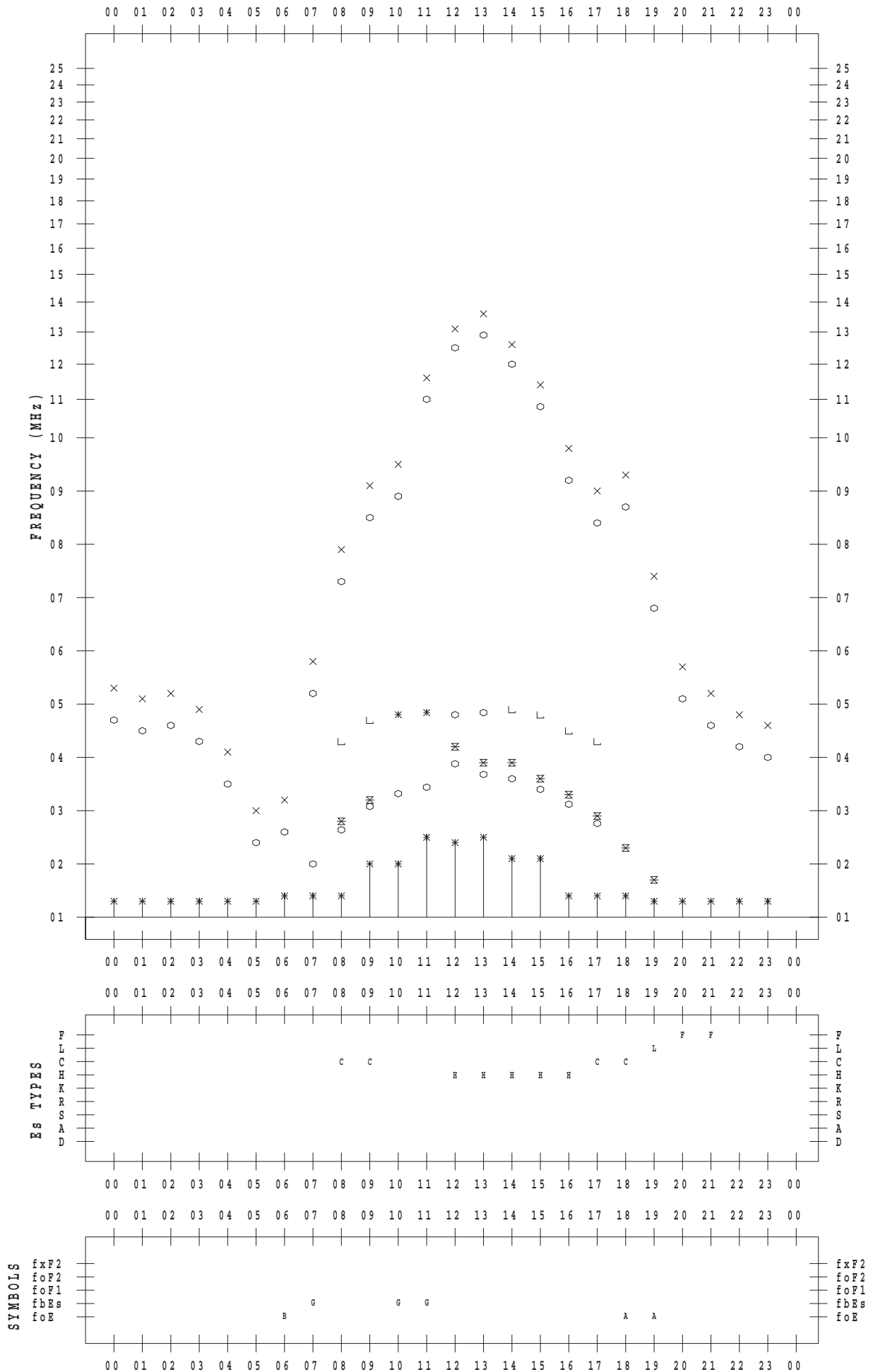
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 22

135 ° E MEAN TIME



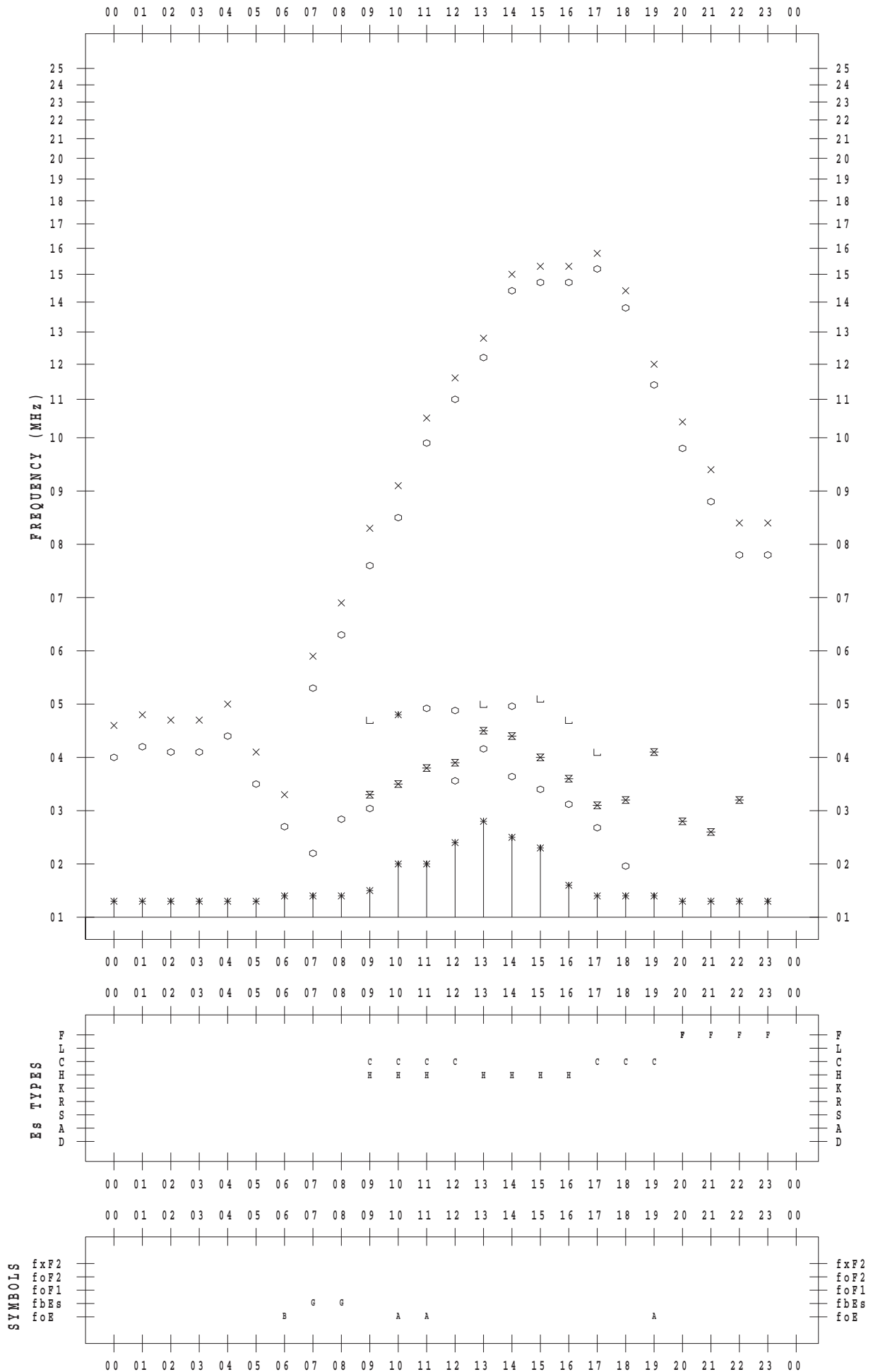
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 23

135 ° E MEAN TIME





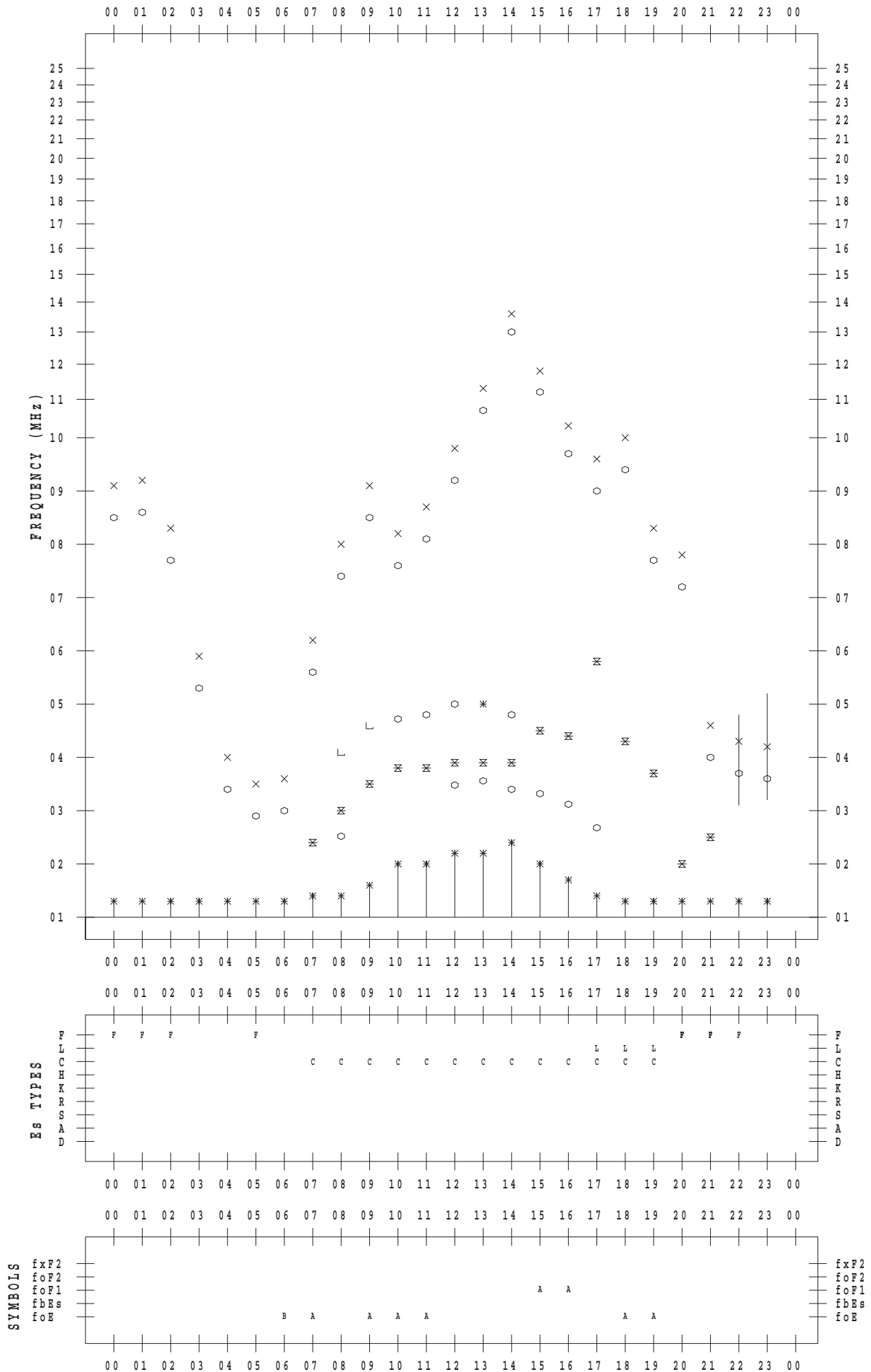
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 24

135 ° E MEAN TIME



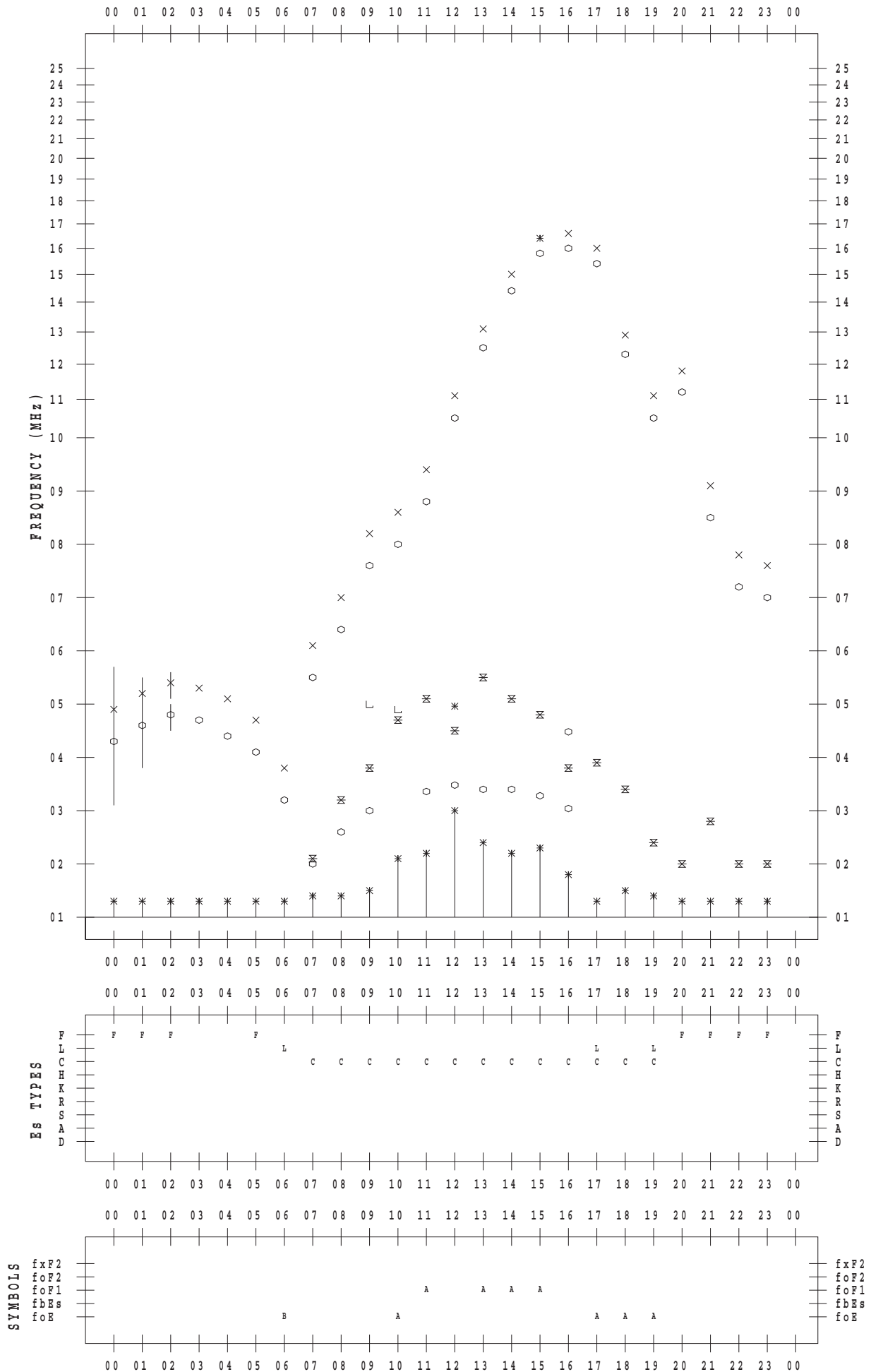
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 25

135 ° E MEAN TIME



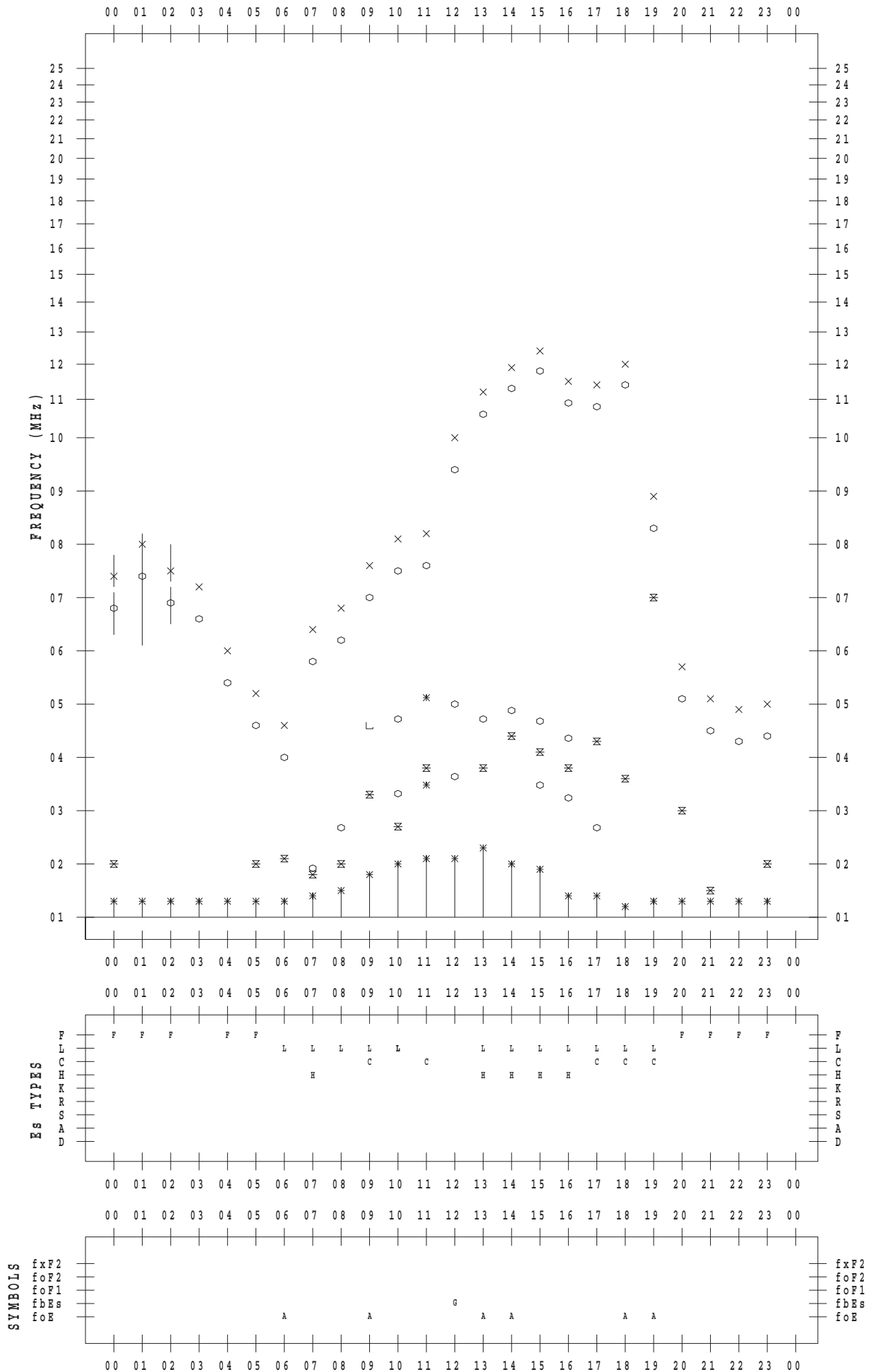
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 26

135 ° E MEAN TIME



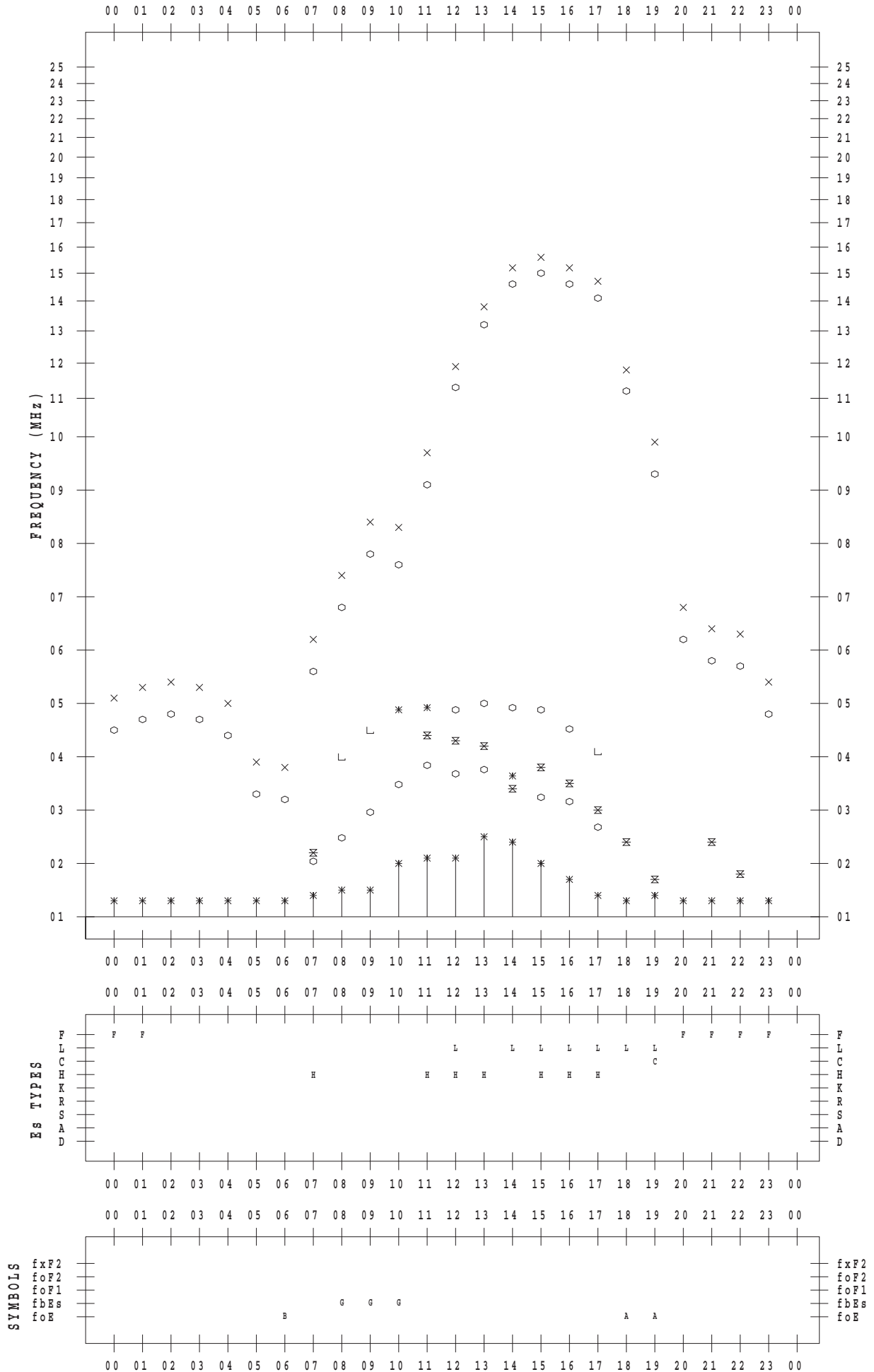
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 27

135 ° E MEAN TIME



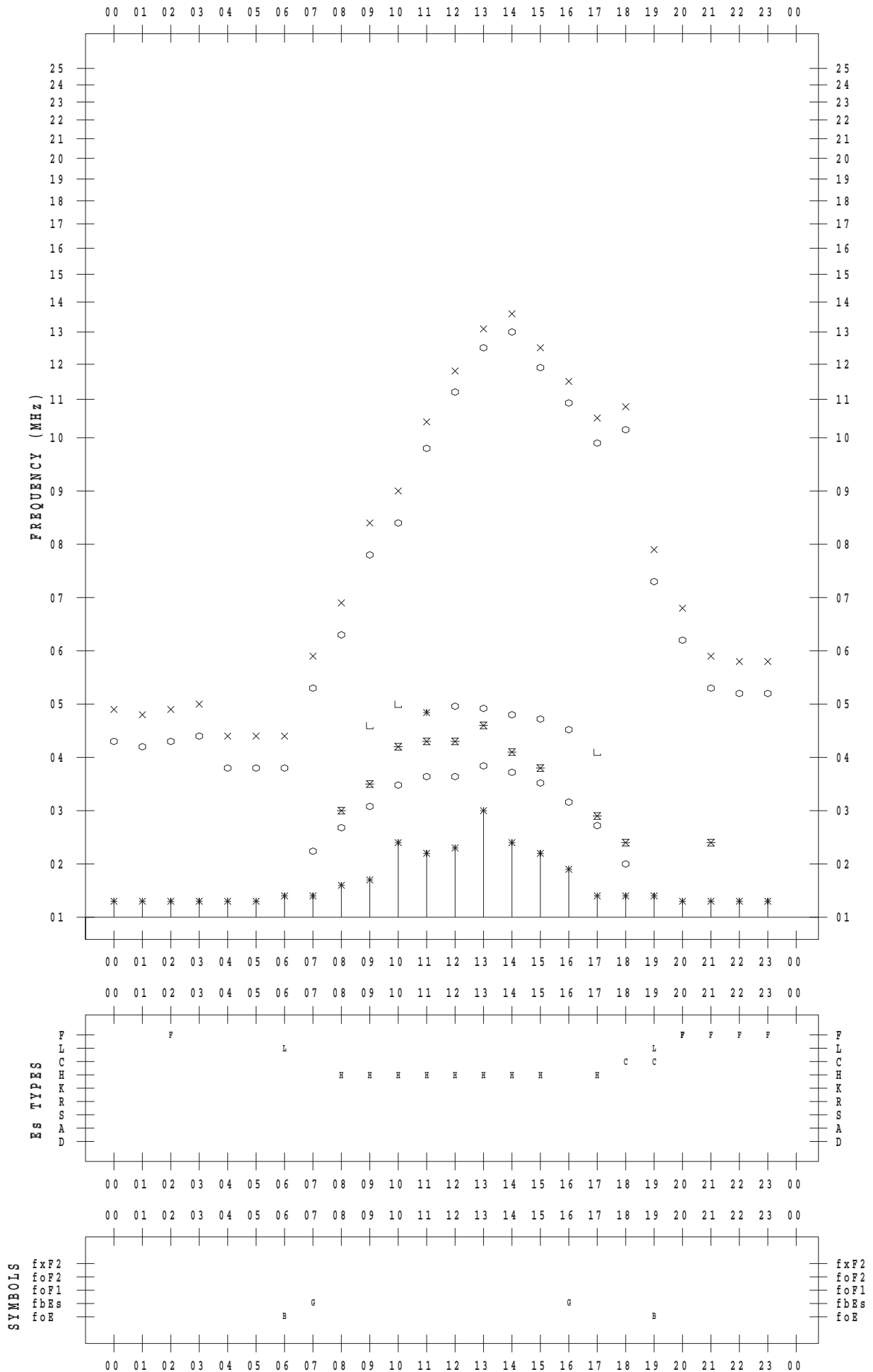
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 28

135 ° E MEAN TIME



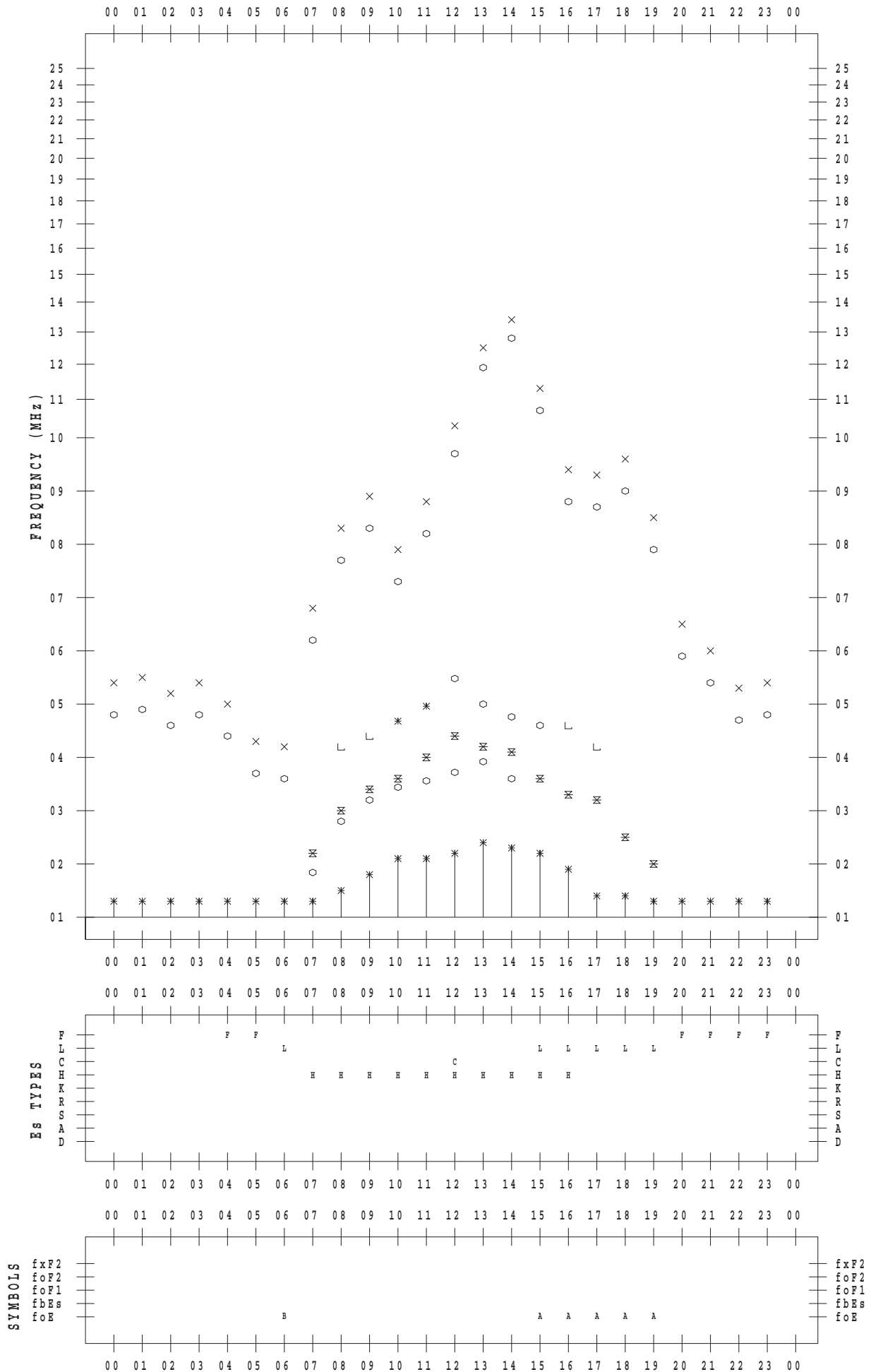
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 29

135 ° E MEAN TIME



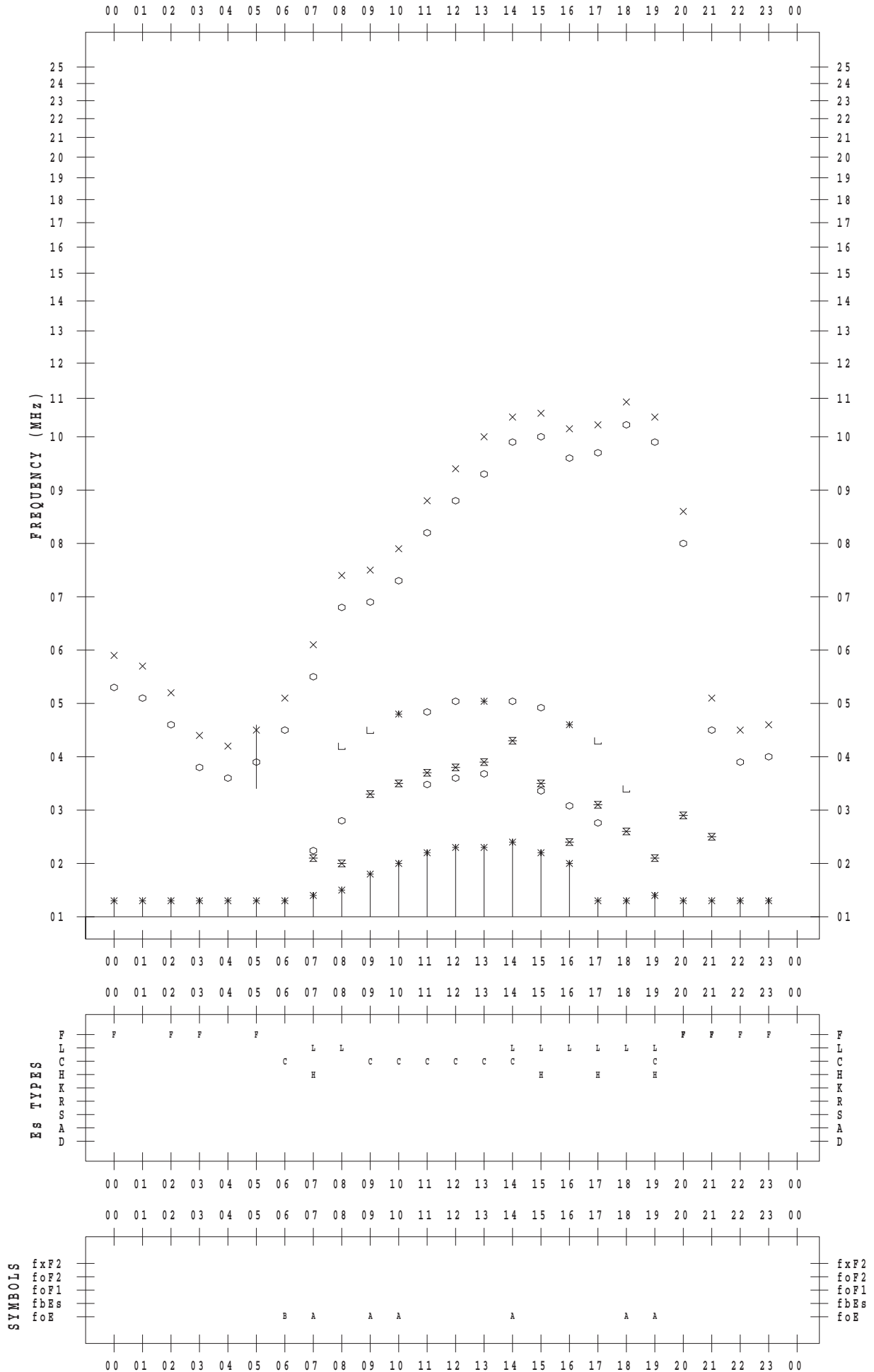
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 30

135 ° E MEAN TIME



# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016 / 3 / 31

135 ° E MEAN TIME

