

# 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>F2</b> layer  |
| <b><math>fEs</math></b>                       | Highest frequency of the <b>Es</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><br/><math>h'F</math></b> | Minimum virtual height on the ordinary wave for the <b>Es</b> and <b>F</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>F</b> trace   |
| <b><math>f_oF2</math><br/><math>f_oF1</math><br/><math>f_oE</math><br/><math>f_oEs</math></b> | Ordinary wave critical frequency for the <b>F2</b> , <b>F1</b> , <b>E</b> , and <b>Es</b> (including particle type <b>E</b> ) layers, respectively |
| <b><math>fbEs</math></b>  | Blanketing frequency of the <b>Es</b> layer, e.g. the lowest ordinary wave frequency visible through <b>Es</b>                                     |
| <b><math>fmin</math></b>  | Lowest frequency that shows vertical ionospheric reflections   |
| <b><math>M(3000)F2</math><br/><math>M(3000)F1</math></b>                                      | Maximum usable frequency factor for a path of 3000 km for transmission by the <b>F2</b> and <b>F1</b> layers, respectively                         |
| <b><math>h'F2</math><br/><math>h'F</math><br/><math>h'E</math><br/><math>h'Es</math></b>      | Minimum virtual height on the ordinary wave for the <b>F2</b> , whole <b>F</b> , <b>E</b> and <b>Es</b> layers, respectively                       |
| <b>Types of Es</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

SEP. 2018

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     | 36 | 34 | 32 | 29 | 28 | 34 | 37 | 32 | 41 | 47 | A  | 52  |     | 47  | 49 | 49 | 46 | 44 | 42 | 51 | 47 | 44 | 41 | 42 |    |
| 2     | A  | A  | A  | 32 | 30 | 32 | 40 | 44 | 49 | 46 | 49 | 48  | 50  | 49  | 48 | 50 | 45 | 47 | 43 | 51 | 46 | 42 | 43 | 40 |    |
| 3     | 34 | 34 | 34 | 34 | 34 | 47 | 42 | 44 | 46 | 49 | 57 | 46  | 49  | 54  | 48 | 55 | 48 | 47 | 44 | 51 | 48 | 43 | A  | 38 |    |
| 4     | 40 | 36 | 35 | 34 | 34 | 34 | 46 | 48 | 44 | 51 | 50 |     | 53  | 52  | 51 | 48 | 42 | 47 | 51 | N  | 54 | 48 | 44 | A  |    |
| 5     | 40 | 36 | 30 | 38 | 37 | 38 | 42 | 35 | A  | A  | 42 | 50  | A   | 47  | 51 | 51 | 47 | 48 | 55 | 63 | 54 |    | 48 | 36 |    |
| 6     | 41 | 40 | 32 | 34 | C  | C  | C  | C  | C  | C  | C  | C   | C   | C   | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  |    |
| 7     | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C   | C   | C   | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  |    |
| 8     |    |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |    |
| 9     |    |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |    |
| 10    |    |    |    |    |    |    |    |    |    |    |    | A   |     | A   |    | 52 | 49 | 45 | 47 | 55 | 52 | 48 | 43 | A  | 40 |
| 11    |    | 34 | 34 | 34 | 36 | 40 | A  | A  | 51 | 53 | A  | A   | 54  | 51  | 49 | A  | 54 | 52 | 58 | 52 | 54 | 47 | 47 | 32 |    |
| 12    | 32 | A  | A  | A  | A  | A  | 52 | 51 | A  | 89 | 45 | A   | A   | 42  | A  | 46 | 42 | 45 | 51 | 54 | 54 | 51 | A  | A  |    |
| 13    | 38 | 32 | 59 | 59 | 34 | 32 | 40 | 50 | 49 | A  | 52 | 48  | 50  | 50  | 47 | 49 | 45 | 47 | 49 | 50 | 48 | 51 | 34 | 40 |    |
| 14    | 43 | 40 | 34 | 34 | 34 | 31 | 42 | 49 | 60 | A  | 54 | A   | A   | 129 | 55 | 51 | 46 | 42 | 45 | A  | A  | A  | A  | A  |    |
| 15    | A  | A  | 32 | 32 | 32 | 34 | 37 | 50 | 47 | 51 | A  | 139 | 109 | 79  | 68 | A  | A  |    | A  | 48 | 43 | 34 | A  | A  |    |
| 16    | A  | A  | A  | A  | 32 | 34 | 42 | 52 | A  | 51 | A  | A   | A   | A   | A  | A  | A  | A  | A  | A  |    | 49 | 43 | 42 |    |
| 17    | A  | A  | A  | A  | A  | A  | A  | A  | 48 | 55 | 55 | 52  | 51  | 51  | 55 | 48 | 52 | 54 | 49 | A  |    | 47 | 44 | 42 |    |
| 18    | 37 | 36 | 34 | 34 | 34 | A  | 48 | 47 | 51 | 53 | 55 | 50  | 54  | 59  | 49 | 54 | 51 | 50 | 58 | 55 | 51 | 54 |    | 36 |    |
| 19    | 32 | 34 | 34 | A  | 34 | 36 | 47 | 44 | 44 | 51 | 59 | 56  | 52  | 54  | 51 | 51 | 46 | A  | 57 | 55 | 50 | 40 | A  | A  |    |
| 20    | 34 | 36 | 35 | 34 | 34 | 34 | 44 | 49 | 49 | 54 | 55 | 57  | 55  | 52  | 54 | 49 | 48 | 47 | 55 | 51 | 51 | 49 | 42 | 34 |    |
| 21    | 34 | 34 | 34 | 34 | 34 | 34 | 51 | 47 | 50 | 54 | 58 | 54  | 53  | 48  | A  | 51 | 49 | 53 | 55 | 54 | 51 | 43 | 41 | 34 |    |
| 22    | 34 | 34 | 34 | 34 | 34 | 36 | 49 | 47 | 51 | 51 | 64 | 55  | 60  | 51  | 55 | 60 | 65 | 65 | 55 | 58 | 55 | 50 | 46 | 50 |    |
| 23    | 40 | 42 | 31 | A  | A  | 31 | 34 | 25 | A  | A  |    | 111 |     | A   | A  | 56 | 84 | 45 | 46 | 34 | 40 | 40 | 35 | 36 |    |
| 24    | 34 | 34 | 43 | 48 | 37 | 34 | 40 | 49 | 52 | 54 | 49 | 56  | 61  | 55  | 55 | 54 | 49 | A  | 63 | 58 | 51 | 50 | 34 | 28 |    |
| 25    | 32 | 32 | 34 | 34 | 34 | A  | 46 | 51 | 51 |    | 62 | 56  | 58  | 54  | 55 | 56 | 55 | 58 | 54 | 51 | 48 | 46 | A  | 26 |    |
| 26    | 34 | 28 | A  | A  | 34 | 34 | 45 | 55 | 58 | 55 | 60 | 60  | 54  | 55  | 55 | 50 | 54 | 54 | 53 | 51 | 52 | 38 | 40 | 34 |    |
| 27    | 37 | 35 | 34 | 34 | 34 | 44 | 42 | 47 | 47 |    | 51 | 59  | 58  | 51  | 54 | 52 | 51 | 51 | 52 | 48 | 43 | 47 | 35 | 34 |    |
| 28    | 36 | 34 | 37 | 36 | 39 | 34 | 42 | 43 | 43 | 51 | 53 | 55  | 56  | 54  | 52 | 48 | 48 | 47 | 48 | A  | 45 | 47 | 40 | 34 |    |
| 29    | 41 | 42 | 38 | 38 | 40 | 32 | 40 | 45 | 42 | 55 | 57 | 59  | 56  | A   | A  | 52 | 48 | 54 | 52 | A  | A  | A  | A  | 40 |    |
| 30    | 40 | 34 | 34 | 40 | 34 | 32 | 26 | 42 | 46 | 54 | 53 | 58  | 54  | 54  | 51 | 51 | 50 | 49 | 44 | 42 | 43 | 43 | 39 | 42 |    |
| 31    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |    |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11  | 12  | 13  | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |
| CNT   | 21 | 21 | 21 | 20 | 22 | 21 | 23 | 23 | 21 | 19 | 20 | 20  | 19  | 22  | 21 | 23 | 24 | 22 | 24 | 20 | 24 | 23 | 17 | 19 |    |
| MED   | 36 | 34 | 34 | 34 | 34 | 34 | 42 | 47 | 49 | 53 | 54 | 56  | 54  | 52  | 52 | 51 | 48 | 48 | 52 | 51 | 48 | 44 | 41 | 36 |    |
| U Q   | 40 | 36 | 35 | 37 | 34 | 36 | 46 | 50 | 51 | 54 | 57 | 58  | 58  | 54  | 55 | 54 | 51 | 53 | 55 | 54 | 51 | 49 | 43 | 40 |    |
| L Q   | 34 | 34 | 33 | 34 | 34 | 32 | 40 | 44 | 45 | 51 | 50 | 51  | 52  | 50  | 49 | 49 | 46 | 47 | 47 | 50 | 46 | 43 | 37 | 34 |    |

HOURLY VALUES OF fEs AT Wakkanai

SEP. 2018

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     | 28 | 26 | G  | G  | G   | G   | 109 | 38  | 28  | 42  | 126 | 47  |     | 71  | 38  | 36 | 40  | 34  | 28 | 29 | 33 | 30 | 31 | 34 |    |    |
| 2     | 45 | 43 | 40 | 34 | 28  | 27  | 29  | 113 | 51  | 136 | 44  | 95  | 51  | 57  | 45  | 43 | 32  | 25  | G  | G  | G  | G  | G  | G  |    |    |
| 3     | G  | G  | G  | G  | G   | G   |     | 28  | 33  | 41  | 68  | 36  | 48  | 38  | 39  | 45 | 35  | 134 | 30 | 32 | G  | G  | G  | G  |    |    |
| 4     | G  |    | G  | G  | G   |     | 30  | 30  | 33  | 35  | 93  | 112 |     | 38  | 43  | 38 | 33  | 34  | 41 | 35 | G  |    |    |    |    |    |
| 5     | 38 | 30 | 28 | G  | 110 | G   | 27  | 36  | 56  | 48  | 38  | 43  | 40  | 36  | 38  | 46 | 43  | 40  | 43 | 43 | 40 |    | G  | G  |    |    |
| 6     | G  | G  | 24 | 31 | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C   | C   | C  | C  | C  | C  | C  | C  |    |    |
| 7     | C  | C  | C  | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C   | C   | C  | C  | C  | C  | C  | C  |    |    |
| 8     |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |     |     |    |    |    |    |    |    |    |    |
| 9     |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |     |     |    |    |    |    |    |    |    |    |
| 10    |    |    |    |    |     |     |     |     |     |     |     |     | 56  |     | 31  | 38 | 50  | 60  | 36 | 59 | 38 | 34 | 34 | 53 | 32 |    |
| 11    |    | 29 | 35 | 29 | G   | 112 | 40  | 45  | 48  | 48  | 48  | 62  | 45  | 84  | 38  | 70 | 47  | 34  | 29 | G  | G  | G  | G  | 38 |    |    |
| 12    | 29 | 60 | 42 | 34 | 89  | 90  | 32  | 38  | 124 | 84  | 60  | 48  | 46  | 38  | 35  | 32 | 37  | 41  | 40 | 34 | 39 | 81 | 59 | 36 |    |    |
| 13    | 34 | G  | G  | 25 | G   | G   |     | 23  | 35  | 41  | 68  | 46  | 38  | 47  | 44  | 36 | 33  | 39  | 45 | 36 | G  | G  | 28 | 25 | 28 |    |
| 14    | 28 | G  | G  | G  | G   | G   |     | 39  | 34  | 48  | 51  | 54  | 65  | 95  | 108 | 38 | 33  | 35  | 32 | 32 | 40 | 52 | 83 | 58 | 59 |    |
| 15    | 57 | 40 | 34 | 26 | 28  | G   |     | 39  | 33  | 38  | 44  | 69  | 92  | 88  | 55  | 84 | 110 | 124 |    | 93 | 34 | 25 | 39 | 39 | 60 |    |
| 16    | 58 | 70 | 49 | 58 | 35  | 37  | 31  | 56  | 55  | 53  | 91  | 70  | 79  | 107 | 93  | 71 | 90  | 84  | 61 | 60 | 40 | 33 | 60 | 62 |    |    |
| 17    | 86 | 70 | 59 | 50 | 70  | 59  | 115 | 106 | 38  | 40  | 66  | 36  | 41  | 40  | 76  | 28 | 35  | G   | 40 | 59 | 39 | 30 | 30 |    |    |    |
| 18    | 26 | 27 | 29 | 26 | 26  | 124 | 37  | 32  | 91  | 36  | 44  | 48  | 43  | 31  | 45  | 38 | 28  | 31  | 26 | G  | G  | 45 | 34 | 56 |    |    |
| 19    | G  | 25 | G  | 29 | G   | G   |     | 28  | 35  | 40  | 34  | 39  | 38  | 38  | 43  | 28 | 28  | 34  | 58 | G  | G  | 24 | 26 | 35 | 32 |    |
| 20    | 34 | 33 | 24 | G  | 24  | G   |     | 21  | 32  | 38  | 38  | 40  | 33  | 40  | 35  | 34 | 28  | 31  | G  | G  | 23 | 31 | 11 | G  |    |    |
| 21    | G  | G  | G  | G  | G   | G   |     | 28  | 32  | 39  | 37  | 60  | 46  | 44  | 41  | 56 | 27  | 36  | 34 | 36 | 32 | 30 | G  | G  | G  |    |
| 22    | G  | G  | G  | G  | G   | G   |     | 48  | 28  | 33  | 46  | 32  | 117 | 38  | 34  | 33 | 42  | 34  | 47 | 33 | G  | G  | G  | G  | G  |    |
| 23    | G  | G  | G  | 35 | 39  | G   |     | 35  | 35  | 40  | 95  |     | 64  |     | 68  | 46 | 60  | 61  | 45 | 29 | 38 | 24 | 24 | 27 | 27 |    |
| 24    | G  | G  | G  | G  | 28  | 69  | 30  | 38  | 40  | 38  | 40  | 37  | 35  | 52  | 40  | 33 | 36  | 49  | 41 | 40 | 48 | 34 | 26 | G  |    |    |
| 25    | G  | G  | G  | G  | 28  | 32  | 130 | 38  | 41  |     | 39  | 40  | 46  | 33  | 38  | 34 | 32  | G   | G  | G  | G  | 33 | 34 | 50 | 28 |    |
| 26    | 27 | 24 | 34 | 83 | 27  | G   |     | 160 | 29  | 53  | 40  | 94  | 48  | 38  | 61  | 24 | G   | G   | G  | G  | G  | G  | G  | G  | G  |    |
| 27    | 29 | 28 | G  | G  | G   | G   |     | 20  | 39  | 153 |     | 38  | 46  | 50  | 103 | 37 | 40  | 38  | 34 | 35 | 44 | 33 | 34 | G  | G  |    |
| 28    | G  | G  | G  | 24 | G   | G   |     | 34  | 40  | 42  | 76  | 45  | 56  | 38  | 38  | 39 | 27  | 40  | 40 | 60 | 35 | G  | 27 | 26 |    |    |
| 29    | 29 | 26 | 26 | G  | G   | G   |     | 24  | 70  | 145 | 82  | 70  | 52  | 40  | 60  | 69 | 63  | 39  | 33 | 30 | 69 | 86 | 59 | 59 | 60 | 28 |
| 30    | 26 | G  | G  | 69 | G   | G   |     | 33  | 37  | 29  | 166 | 107 | 28  | 39  | 39  | 21 | G   | G   |    | 28 | 27 | 31 | G  | G  | G  |    |
| 31    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |     |     |    |    |    |    |    |    |    |    |
|       | 00 | 01 | 02 | 03 | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15 | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |    |    |
| CNT   | 25 | 26 | 26 | 26 | 25  | 25  | 25  | 25  | 25  | 23  | 24  | 25  | 23  | 26  | 26  | 26 | 26  | 25  | 26 | 26 | 26 | 25 | 25 | 25 |    |    |
| MED   | 27 | 26 | G  | 24 | G   | G   | 30  | 35  | 40  | 48  | 47  | 48  | 45  | 42  | 38  | 36 | 36  | 34  | 35 | 33 | 33 | 30 | 27 | 28 |    |    |
| U Q   | 34 | 30 | 34 | 34 | 28  | 34  | 39  | 42  | 53  | 68  | 67  | 67  | 51  | 68  | 46  | 43 | 43  | 43  | 40 | 40 | 40 | 34 | 51 | 37 |    |    |
| L Q   | G  | G  | G  | G  | G   | G   | 25  | 33  | 38  | 38  | 39  | 40  | 38  | 38  | 38  | 32 | 32  | 27  | 28 | G  | 24 | G  | G  | G  |    |    |

HOURLY VALUES OF fmin AT Wakkanai

SEP. 2018

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

HOURLY VALUES OF fof2 AT Kokubunji

SEP. 2018

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15  | 16 | 17  | 18  | 19 | 20 | 21  | 22 | 23 |
|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|-----|-----|----|----|-----|----|----|
| 1     | 35 | 32 | 30 | 30 | 26 |    | 46 | 39 | N  | A  | A  |    | A  | A  |    | A   | 47 | 49  | 54  | 54 | 49 | 49  | 42 | 36 |
| 2     | 26 | 31 | 30 | 27 | A  | 26 | 38 | 44 | A  | A  | A  | A  | A  | 74 | A  | A   | A  | 105 | 110 | A  | 51 | 43  | 44 | 38 |
| 3     | 37 | 32 | 48 | C  | C  | C  | C  | C  | C  | C  | C  | C  |    | 52 | 51 | 49  | 55 | 51  | 55  | 54 | 54 | 47  | 43 | 44 |
| 4     | 34 | 26 | 31 | 30 | 31 | 30 | 44 | 52 | 54 | 48 | 51 | A  | 54 | 55 | 54 | 49  | 49 | 46  | 56  | 67 | 45 | 189 | 36 | A  |
| 5     | A  | 34 | 34 | 30 | 31 | 34 | 44 | N  | 49 | 49 | A  | A  | 58 | 59 | 54 | 52  | 59 | 66  | 57  | 54 | A  | 44  | 36 | 36 |
| 6     | 36 | 32 | 31 | 31 | 28 | 30 | 42 | 51 | 59 | 52 | C  | C  | C  | C  | C  | C   | C  | 56  | 66  | 67 | 54 | A   | 36 | 34 |
| 7     | 27 | 32 | A  | A  | A  | A  | 46 | 62 | 55 | 46 |    |    | 38 | 54 | 53 | 49  | 52 | 47  | 55  | 54 | 54 | 44  | 34 | 36 |
| 8     | 34 | 34 | 32 | 32 | 30 | 28 | 45 | 54 | 50 | 65 | 48 | A  | A  | 54 |    | 49  | 56 | 67  | 66  | 64 | 51 | A   | 37 | 32 |
| 9     | 32 | A  | 30 | 27 | N  | A  | 40 | 52 | 58 | 64 | 49 | 51 | 54 |    | 54 | 55  | 47 | A   | 51  | 65 | 49 | 36  | 34 | A  |
| 10    | A  | A  | A  | A  | A  | 30 | A  | 49 | 55 | 57 | 54 | 55 | 49 | A  | A  | 109 | 55 | 52  | 55  | 55 | 44 | 32  | A  | A  |
| 11    | 36 | A  | A  | A  | A  | A  | 39 | 48 | 54 | 56 | 46 | 64 | 58 | 53 | 49 | A   | 59 | 66  | 55  | 54 | 54 | 54  | 49 | 49 |
| 12    | 30 | 27 | 31 | 31 | 32 | 32 | 24 | 54 | 75 | 68 | A  |    | 48 | 44 |    | 47  | A  | A   | 64  | 50 | 50 | 50  |    | A  |
| 13    | 36 | A  | A  | A  | 28 | 58 | 43 | 53 | 59 | 56 | 51 | A  | 54 | A  | 51 | 49  | 49 | 52  | 67  | 55 | A  | 37  | 36 | 38 |
| 14    | 34 | 48 | 34 | A  | A  | 30 | 42 | 52 | 54 | 57 | 49 | 58 | 51 | 47 |    | 56  | 51 | 51  | 55  | 58 | 54 | A   | A  | A  |
| 15    | A  | 51 | A  | A  | A  | 30 | 44 | 53 | 55 | 53 | 54 | 48 |    | A  | 63 | 65  | 58 | 49  | 55  | 58 | 48 | 32  | 34 | A  |
| 16    | A  | A  | A  | A  | A  | A  | 39 | 50 | A  | 53 | 61 | 68 | A  | A  | 53 | 58  | 57 | A   | 63  | 43 | 54 | 52  | A  | A  |
| 17    | 30 | 30 | 31 | 31 | 27 | 27 | 42 | 51 | 51 | 62 | 56 | 56 | 51 | A  | 52 | 55  | 50 | 54  | 57  | 51 | 47 | 39  | 37 | 37 |
| 18    | A  | 31 | 31 | 26 | A  | N  | 42 | 44 | 51 | 55 | 55 | 59 | 54 | 56 | 57 | 48  | 51 | 55  | 66  | 71 | 73 | 54  | 25 | A  |
| 19    | A  | 34 | A  | 31 | 31 | 28 | 45 | 52 | 51 | 61 | 54 | 51 | 49 | 54 | 54 | 51  | 51 |     |     | 71 | A  | A   | A  | A  |
| 20    | A  | 34 | 34 | A  | A  | 27 | 45 | 43 | 46 | 62 | 58 | 52 | 56 |    | 55 | 50  | 49 | 49  | 58  | 66 | 49 | 43  |    |    |
| 21    | A  | 31 | A  | A  | 26 | 26 | 44 | 53 | 54 | 59 | 55 | 54 | 54 | 48 | 57 | 45  | 47 | 40  | 69  | 67 | 53 | 37  | 34 | 34 |
| 22    | 34 | 36 | 35 | 32 | 28 | 31 | 47 | 54 | 44 | 52 | 48 | 52 | 65 | 62 | 50 | 58  | 77 | 91  | 74  | 56 | 50 | 55  | 51 | 42 |
| 23    | 39 | 39 | 42 | 36 | 28 | A  | 26 | A  | 63 | 56 | A  | A  |    | 58 | 51 | 49  | 39 | 58  | 55  | 46 | A  | 39  | A  | A  |
| 24    | 36 | 34 | 34 | 34 | 32 | 27 | 47 | 49 | 56 | 55 | 59 | 61 | 59 | 62 | 55 | 36  | 55 | 63  | 71  | 72 | 54 | 45  | A  | 34 |
| 25    | 32 | 32 | 31 | 31 | 25 | 28 | 45 | 53 | 71 | 58 | 64 | 56 | 61 | 59 | 55 | 55  | 57 | 65  | 77  | 55 | 25 | A   | A  | 36 |
| 26    | 32 | 32 | 27 | 28 | 27 | A  | 47 | 64 | 80 | 66 | 64 | 56 | 56 | 55 | 58 | 56  | 48 | 55  | 64  | 67 | 46 | 28  | 30 | 31 |
| 27    | 30 | 34 | 28 |    | 31 | 30 | 43 | 53 | 51 | 56 | 56 | A  | 56 | 66 | 51 | 54  | 58 | 64  | 71  | 64 | A  | 42  | A  | A  |
| 28    | A  | 31 | 32 | 30 | 27 | 28 | 41 | 53 | 51 | 54 | 53 | 67 | 69 | 66 | 59 | 36  | 51 | C   | C   | C  | C  | C   | C  | C  |
| 29    | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C   | C   | C  | C  | C   | C  | C  |
| 30    | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C   | C   | C  | C  | C   | C  | C  |
| 31    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |    |     |     |    |    |     |    |    |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15  | 16 | 17  | 18  | 19 | 20 | 21  | 22 | 23 |
| CNT   | 19 | 23 | 20 | 17 | 17 | 19 | 26 | 25 | 24 | 25 | 20 | 17 | 21 | 18 | 22 | 24  | 25 | 23  | 26  | 26 | 22 | 22  | 17 | 15 |
| MED   | 34 | 32 | 31 | 31 | 28 | 30 | 44 | 52 | 54 | 56 | 54 | 56 | 54 | 56 | 54 | 50  | 51 | 55  | 60  | 57 | 50 | 44  | 36 | 36 |
| U Q   | 36 | 34 | 34 | 31 | 31 | 30 | 45 | 53 | 58 | 61 | 57 | 60 | 58 | 62 | 55 | 55  | 57 | 65  | 67  | 67 | 54 | 50  | 42 | 38 |
| L Q   | 30 | 31 | 30 | 29 | 27 | 27 | 41 | 49 | 51 | 53 | 50 | 52 | 51 | 54 | 51 | 49  | 49 | 49  | 55  | 54 | 48 | 37  | 34 | 34 |



HOURLY VALUES OF fEs AT Kokubunji

SEP. 2018

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     | 37 | 23 | G  | 26 | G  |    | 27 | 26 | 41  | 35 | 42 | 40  | 53 | 49  | 37 | 35  | 26 | 23  | 29  | 39 | 33 | G   | 30 | 31 |    |    |
| 2     | G  | G  | G  | G  |    | 36 | 22 | 31 | 35  | 53 | 61 | 55  | 64 | 62  | 55 | 38  | 55 | 53  | 70  | 94 | 59 | 29  | 34 | G  | G  |    |
| 3     | G  | G  | G  | C  | C  | C  | C  | C  | C   | C  | C  | C   |    | 38  | G  | 28  | 28 | 28  | 31  | G  | G  | G   | G  | G  | G  |    |
| 4     | G  | G  | G  | G  | G  | G  |    | 31 | 37  | 32 | 37 | 39  | 32 | 31  | 32 | 34  | 29 | 29  | 28  | G  | G  |     |    | G  | 49 |    |
| 5     | 45 | 29 | G  | G  | G  | G  |    | 29 | 37  | 29 | 43 | 53  | 45 | 102 | 34 | 31  | 28 | 38  | 56  | 49 | 60 | 94  | 34 | 28 | G  |    |
| 6     | G  | 28 | 24 | G  | G  | G  |    | 33 | 34  | 29 | 29 | C   | C  | C   | C  | C   | C  | G   | G   |    | 69 | 35  | 45 | G  | G  |    |
| 7     | 28 | 29 | 37 | 31 | 34 | 29 | 27 | 32 | 27  | G  |    |     | 29 | 29  | 32 | 29  | 33 | 32  | 38  |    | G  | 32  | 34 | G  | G  |    |
| 8     | G  | G  | G  | G  | G  | G  |    | 31 | 37  | 41 | 41 | 45  | 53 | 72  | 36 |     | 31 | 28  | 25  | 28 | 35 | 35  | 34 | 24 | 30 |    |
| 9     | 34 | 42 | G  | 28 | 27 | 27 | 31 | 34 | 39  | 38 | 42 | 126 | 31 |     | 36 | 33  | 46 | 52  | 49  | 39 | 40 | 30  | 42 | 39 |    |    |
| 10    | 41 | 57 | 38 | 43 | 33 | 29 | 32 | 41 | 33  | 45 | 48 | 43  | 45 | 43  | 71 | 116 | 53 | 31  | 28  | G  | G  | 34  | G  | 73 | 57 |    |
| 11    | G  | 85 | 78 | 34 | 34 | 32 | 28 | 29 | 172 | 29 | 47 | 40  | 42 | G   | 31 | 33  | 34 | 32  | G   | G  |    | 29  | 36 | G  | G  |    |
| 12    | G  | G  | G  | G  | G  | G  |    | 30 | 34  | 52 | 57 |     | G  |     | 37 | 79  | 43 | 63  | 60  | 50 | 86 | 122 | 34 | 57 | 35 |    |
| 13    | 31 | 41 | 59 | 55 | 24 | G  | G  |    | 35  | 51 | 50 | 47  | 38 | 53  | 52 | 34  | 34 | 36  | 37  | 33 | 28 | 40  | 38 | G  | G  |    |
| 14    | 29 | 29 | 27 | 55 | 57 | 34 | 30 | 40 | 47  | 55 | 44 | 45  | 31 | 36  | 28 | 35  |    | G   | 31  | 31 | G  |     | 24 | 34 | 33 | 56 |
| 15    | 50 | 55 | 81 | 43 | 32 | G  |    | 84 | 47  | 60 | 79 | 41  | 40 |     | 55 | 40  | 38 | 45  | 47  | 36 | 40 | 31  | 26 | 32 | 55 |    |
| 16    | 42 | 56 | 58 | 60 | 55 | 54 | 40 | 40 | 65  | 90 | 55 | 75  | 78 | 78  | 41 | 46  | 71 | 146 | 114 | 48 | 35 | 59  | 29 | 29 |    |    |
| 17    | G  | G  | G  | G  | G  | G  |    | 31 | 29  | N  | 49 | 35  | 43 | G   | 25 | 34  | N  | 150 | 31  | G  | G  | 26  | 28 | G  | G  |    |
| 18    | 26 | 26 | G  | 30 | 44 | 24 | 38 | 37 | 33  | 40 | 38 | 89  | G  | G   |    | 28  | 27 | 24  | 33  | 28 | G  |     | 24 | 24 | 31 | 33 |
| 19    | 36 | 29 | 24 | 27 | 29 | G  | G  |    | 35  | 42 | 43 | 50  | 43 | 43  | 40 | 38  | 40 | 36  |     |    | 29 | 54  | 60 | 34 | 37 |    |
| 20    | 43 |    | 31 | 39 | 37 | G  |    | 30 | 33  | 32 | 34 | G   | 40 | 30  |    | 37  | 32 | 28  | G   |    | 40 | 33  | 47 | G  | 43 |    |
| 21    | 42 | 27 | 32 | 26 | 25 | G  |    | 31 | 44  | 37 | 43 | 42  | 36 | 43  | 44 | 37  | 42 | 36  | 32  | 45 | 90 | 55  | 32 | G  | G  |    |
| 22    | G  | G  | 26 | 23 | G  | G  |    | 38 | 32  | 30 | 44 | 40  | 39 | G   | G  |     | 29 | 33  | 25  | 28 | 24 | 39  | 55 | G  | G  | G  |
| 23    | G  | G  | G  | G  | G  | 26 |    | 32 | 31  | 54 | 37 | 31  | G  | G   |    | 36  | 28 | 41  | 34  | 32 | 28 | 27  | 56 | 31 | 81 | 60 |
| 24    | 54 | 29 | 31 | 24 | G  | G  |    | 28 | 28  | 31 | G  | 27  | G  | G   |    | 28  | 29 | 29  | 29  | 29 | 29 | 29  | 34 | 34 | 34 |    |
| 25    | 29 | G  | G  | G  | G  | G  |    | 35 | 37  | 37 | 36 | 32  | 38 | 39  | 45 | 39  | 54 | 35  | 33  | 33 | 56 | 60  | 56 | 37 |    |    |
| 26    | 26 | G  | G  | G  | G  | 28 | 35 | 34 | 34  | 34 | 31 | 39  | 37 | 36  | 38 | 34  | 31 | 31  | 33  | 27 | 43 | G   | G  | G  |    |    |
| 27    | G  | G  | G  | G  | G  | G  |    | 26 | 37  | 42 | 31 | 45  | 38 | 38  | 38 | 37  | 34 | 42  | G   | G  |    | 24  | 77 | 34 | 57 | 40 |
| 28    | 34 | 29 | 28 | G  | 26 | G  |    | 27 | 33  | 33 | 34 | 42  | G  | G   |    | 27  | 29 | 27  | 30  | C  | C  | C   | C  | C  | C  | C  |
| 29    | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C  | C   | C  | C   | C  | C   | C  | C   | C   | C  | C  | C   | C  | C  | C  | C  |
| 30    | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C  | C   | C  | C   | C  | C   | C  | C   | C   | C  | C  | C   | C  | C  | C  | C  |
| 31    |    |    |    |    |    |    |    |    |     |    |    |     |    |     |    |     |    |     |     |    |    |     |    |    |    |    |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08  | 09 | 10 | 11  | 12 | 13  | 14 | 15  | 16 | 17  | 18  | 19 | 20 | 21  | 22 | 23 |    |    |
| CNT   | 28 | 28 | 28 | 27 | 27 | 26 | 27 | 27 | 26  | 27 | 25 | 24  | 26 | 25  | 27 | 26  | 27 | 26  | 26  | 27 | 27 | 27  | 27 | 27 | 27 |    |
| MED   | 28 | 26 | 12 | 24 | 24 | G  | 30 | 35 | 36  | 41 | 42 | 40  | 38 | 36  | 34 | 34  | 34 | 32  | 30  | 29 | 35 | 34  | 29 | 31 |    |    |
| U Q   | 39 | 29 | 31 | 34 | 34 | 27 | 32 | 37 | 42  | 50 | 47 | 45  | 45 | 43  | 38 | 40  | 46 | 37  | 40  | 40 | 55 | 34  | 42 | 40 |    |    |
| L Q   | G  | G  | G  | G  | G  | G  | 27 | 32 | 32  | 34 | 37 | 37  | G  | 27  | 29 | 29  | 28 | 28  | G   | G  | 29 | 24  | G  | G  |    |    |

HOURLY VALUES OF fmin AT Kokubunji

SEP. 2018

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

HOURLY VALUES OF foF2 AT Yamagawa

SEP. 2018

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     | 36 | 34 | 34 | 28 | 28 | 26 | 42 | 41 | A  | 54 | A   | 47 | 55 | 54 | 49 | 52 | 54 | 52 | 52 | 66 | 49 | 47 | A  | 32 |  |
| 2     | A  | A  | N  | 28 | 25 | N  | 32 | 43 | 48 | 56 | 62  | 51 | 58 | 48 | 48 | 46 | 51 | A  | 54 | 39 | 52 | 42 | 36 | 36 |  |
| 3     | 42 | 42 | 36 | 36 |    | A  | 35 | 40 | 51 | 55 | A   | 46 | 51 | 52 | 48 | 52 | 48 | 54 | 53 | 54 | 52 | 51 | 36 | 42 |  |
| 4     | 40 | 34 | 34 | 34 | 34 | N  | 34 | 48 | 51 | 50 | 51  | 56 | 63 | 57 | 55 | 53 | 52 | B  | 55 | 72 | 76 | 36 | A  | 30 |  |
| 5     | 30 | 34 | 31 | 28 | 26 | 28 | 40 | 48 | 50 | 48 | 52  | A  | 60 | 58 | 57 | 55 | 70 | 77 | 66 | 44 | A  | A  | A  | A  |  |
| 6     | A  | 34 | A  | 31 | 34 | A  | A  | 52 | 54 | 51 | 53  | 54 | 45 | 55 | 51 | 58 | 64 | 64 | 54 | 73 | 52 | A  | A  | A  |  |
| 7     | 30 | 31 | 28 | 26 | A  | A  | 32 | 51 | 42 | 48 | 50  | 51 | 54 | 54 | 57 | 54 | 54 | 48 | 67 | 52 | 54 | 34 | 37 | 32 |  |
| 8     | 32 | 31 | A  | 28 | 28 | 28 | 36 | 51 | 53 | 53 | 52  | A  | A  | 49 | 53 | A  | 58 | 75 | 84 | 75 | 36 | 25 | 28 | 28 |  |
| 9     | B  | 28 | B  | A  | N  | B  | B  | 49 | 41 | 50 | 50  | A  | 51 | 59 | 58 | 58 | 49 | A  | A  | 78 | 29 | A  | 26 | A  |  |
| 10    | A  | 29 | A  | A  | A  | A  | 34 | 51 | 50 | 53 | 59  | 48 | 54 | 61 | 53 | 58 | 54 | 54 | 53 | 46 | 52 | A  | A  | 28 |  |
| 11    | 32 | 32 | 28 | 29 | 28 | A  | A  | 52 | A  | 54 | A   | A  | 65 | 54 | 55 | 56 | 53 | 80 | 52 | 58 | 52 | 53 | 28 | 46 |  |
| 12    | A  | 34 | 34 | 34 | 32 | A  | B  | 53 | 79 | 53 | 68  | 44 | 54 | 54 | A  | 54 | 58 | 67 | 78 | 80 | 52 | 51 | A  | A  |  |
| 13    | A  | 34 | A  | A  | A  | 29 | 32 | 51 | N  | 54 | 189 | 48 | 57 | 55 | A  | 50 | 57 | 55 | 78 | 75 | 44 | 36 | 34 | 34 |  |
| 14    | A  | A  | A  | A  | A  | 29 | 39 | 42 | 50 | 48 | 53  | 60 | 55 | 50 | A  | 55 | 54 | 55 | 63 | 75 | 52 | A  | A  | A  |  |
| 15    | A  | 30 | 29 | A  | 26 | 26 | 34 | 53 | 66 | 46 | 46  | 47 | 54 | 62 | 70 | 72 | 68 | 58 | 66 | 72 | A  | A  | 31 | 49 |  |
| 16    | 32 | 34 | 34 | 34 | 26 | 26 | 34 | 42 | 54 | 55 | 54  | A  | 57 | 54 | 60 | 66 | 58 | 55 | 55 | 75 | N  | 29 | 34 | 27 |  |
| 17    | 31 | 29 | 31 | 34 | B  | A  | 30 | 45 | 58 | 62 | A   | 49 | 51 | 51 | 57 | 56 | 54 | 58 | 55 | 54 | 53 | 38 | 34 | 34 |  |
| 18    | 34 | 34 | 34 | 34 | N  | 30 | 31 | 29 | 50 | 62 | 49  | 58 | 56 | 55 | 60 | 55 | 56 | 55 | 55 | 72 | 83 | 34 | 59 | B  |  |
| 19    | A  | 31 | 31 | 31 | 30 | 26 | 36 | 53 | 51 | 68 | 62  | 55 | 55 | 57 | 59 | 55 | 60 | 73 | 85 | N  | A  | A  | A  | A  |  |
| 20    | 32 | 31 | 30 | 29 | 30 | A  | 32 | 44 | 51 | 52 | 52  | 54 | 60 | 54 | 55 | 54 | 54 | 55 | 66 | 71 | 80 | A  | 25 | A  |  |
| 21    | 28 |    | A  | A  | 30 | B  | 31 | 48 | 53 | 61 | 51  | 56 | 60 | 55 | 52 | 45 | 51 | 66 | 74 | 66 | N  | A  | A  | A  |  |
| 22    | 29 | 30 | 49 | 28 | 29 | A  | 34 | 29 | 50 | 48 | A   | 56 | 56 | 64 | 55 | 54 | 82 | 97 | 54 | 35 | 54 | 50 | 51 | 35 |  |
| 23    | 35 | 34 | 36 |    | B  | A  | B  | 48 | 53 | 47 | 48  | 52 | 62 | 67 | 57 | 58 | 62 | 67 | 75 | 54 | 36 | 32 | A  | A  |  |
| 24    | A  | A  | A  | 34 | B  | B  | 35 | 54 | 49 | 61 | 48  | 64 | 68 | 66 | 54 | 55 | 55 | 66 | 80 | 73 | 48 | 37 | 33 | 29 |  |
| 25    | N  | A  | A  | 29 | 26 | N  | 30 | 53 | 72 | 66 | 58  | 58 | 64 | 67 | 59 | 51 | 42 | 71 | 86 | 64 | 42 | 28 | A  | 30 |  |
| 26    | 31 | 34 | 28 | 28 | N  | 28 | 34 | 53 | 41 | 74 | 71  | 60 | 55 | 68 | 74 | 63 | 51 | 50 | 70 | 75 | A  | A  | A  | A  |  |
| 27    | 30 | 30 | 59 | 30 | 36 | N  | 34 | 47 | 52 | 56 | 55  | 56 | 56 | 62 | 72 | 68 | 58 | 72 | 86 | 67 | 43 | 38 | A  | 34 |  |
| 28    | A  | A  | A  | 29 | A  | 59 | 34 | 50 | 55 | 67 | 57  | 62 | 67 | 78 | 72 | 55 | 54 | 59 | 55 | 51 | 34 | A  | 32 | A  |  |
| 29    | A  | 36 | 30 | 32 | B  | 29 | 32 | 48 | 54 | 55 | 55  | 63 | 71 | 50 | 66 | 60 | 67 | 65 | 70 | 54 | 40 | 36 | 34 | A  |  |
| 30    | 34 | 35 | 34 | 49 | 29 | N  | 30 | 54 | 53 | 52 | 55  | 65 | 76 | 75 | 56 | 56 | 56 | 55 | 55 | 49 | 36 | 32 | 34 | 35 |  |
| 31    |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10  | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |  |
| CNT   | 17 | 24 | 19 | 23 | 17 | 12 | 25 | 30 | 27 | 30 | 25  | 25 | 29 | 30 | 27 | 29 | 30 | 27 | 29 | 29 | 24 | 19 | 17 | 17 |  |
| MED   | 32 | 34 | 34 | 30 | 29 | 28 | 34 | 48 | 51 | 54 | 53  | 55 | 56 | 55 | 57 | 55 | 54 | 59 | 66 | 66 | 52 | 36 | 34 | 34 |  |
| U Q   | 34 | 34 | 34 | 34 | 31 | 29 | 35 | 52 | 54 | 61 | 58  | 59 | 62 | 62 | 60 | 58 | 58 | 71 | 76 | 74 | 52 | 47 | 36 | 35 |  |
| L Q   | 30 | 30 | 30 | 28 | 26 | 26 | 32 | 44 | 50 | 50 | 50  | 48 | 54 | 54 | 53 | 53 | 53 | 55 | 54 | 53 | 41 | 32 | 29 | 29 |  |

HOURLY VALUES OF fEs AT Yamagawa

SEP. 2018

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  | 28 | G  | 23 | G  | 48  | 38 | 54 | 53 | 61 | 48 | 44 | 44 | 53 | 41  | 29 | 31 | 40  | 27 | 29 | 35 | 38 | G  |    |
| 2     | 46 | 46 | 59 | G  | G  | G  | 111 | 30 | 32 | 46 | 42 | 46 | 55 | 45 | 43 | 40  | 37 | 59 | 52  | 50 | G  | 46 | 27 | G  |    |
| 3     | G  | G  | 25 | G  |    | 40 | 32  | 35 | 40 | 34 | 47 | 48 | 39 | 42 | 46 | 36  | 32 | 36 | 28  | G  | G  | G  | G  | G  |    |
| 4     | G  | G  | G  | G  | G  | G  | 27  | 32 | 34 | 35 | 38 | 47 | 32 | 46 | 31 | 44  | 39 | B  | 27  | G  |    | 26 | 35 | 27 | G  |
| 5     | G  | G  | 24 | G  | G  | G  | G   |    | 38 | 38 | 44 | 39 | 45 | 46 | 44 | 44  | 41 | 40 | 44  | 39 | 54 | 69 | 72 | 50 | 46 |
| 6     | 40 | 26 | 43 | 38 | 28 | 38 | 39  | 54 | 44 | 40 | 41 | 40 | 48 | 40 | 46 | 43  | 40 | 36 | 28  | G  |    | 21 | 41 | 32 | 35 |
| 7     | 29 | G  | G  | 25 | 40 | 26 | G   | 36 | 35 | 35 | 38 | G  | 38 | 46 | 45 | 45  | 35 | 38 | 33  | 38 | 35 | 40 | G  | G  |    |
| 8     | 25 | 27 | 28 | G  | G  | G  | G   | 32 | 39 | 35 | 40 | 48 | 41 | 41 | 40 | 125 | 40 | 35 | 28  | 11 | 40 | 28 | G  | G  |    |
| 9     | B  | G  | B  | 28 | G  | B  | B   | 34 | 33 | 30 | 48 | 48 | 41 | 47 | 45 | 35  | 40 | 53 | 85  | 70 | 58 | 35 | 28 | 40 |    |
| 10    | 26 | 58 | 49 | 47 | 43 | 33 | G   | 49 | 28 | 40 | 43 | 43 | 48 | 50 | 45 | 45  | 50 | 40 | 33  | 41 | 32 | 60 | 35 | 26 |    |
| 11    | G  | G  | G  | G  | 60 | 35 | 39  | 54 | 50 | 46 | 62 | 84 | 51 | 54 | 56 | 58  | 35 | 36 | 44  | 28 | G  | G  |    | 24 | 56 |
| 12    | 41 | G  | G  | G  | 24 | 27 | B   | 28 | 38 | 33 | 34 | 48 | 33 | 38 | 31 | 29  | 40 | 36 | 53  | 41 | 52 | 58 | 60 | 59 |    |
| 13    | 41 | 39 | 49 | 50 | 32 | G  | G   | 36 | 43 | 50 | 48 | 48 | 48 | 46 | 60 | 41  | 41 | 58 | 47  | 50 | 40 | 27 | 29 | 29 |    |
| 14    | 48 | 27 | 56 | 45 | 46 | 28 | 27  | 44 | 33 | 44 | 46 | 39 | 46 | 29 | 30 | 29  | N  | 23 | G   | 27 | 25 | 35 | 35 | 30 |    |
| 15    | 40 | 29 | G  | 44 | 26 | G  | G   | 34 | 40 | 56 | 59 | 48 | 47 | 39 | 36 | 29  | 32 | 31 | 40  | 46 | 54 | 29 | G  | G  |    |
| 16    | G  | G  | G  | G  | G  | G  | G   | 33 | 44 | 45 | 68 | 56 | 49 | 55 | 50 | 43  | 31 | 31 | 26  | G  | 84 | 40 | 28 | G  |    |
| 17    | G  | G  | G  | G  | B  | 60 | 27  | 32 | 44 | 62 | 58 | 44 | 48 | 47 | 38 | 41  | 35 | 28 | G   | G  | 11 | G  | G  | G  |    |
| 18    | G  | G  | G  | G  | G  | G  | G   | 39 | 41 | 39 | 44 | 46 | 38 | 32 | 36 | 28  | 27 | 27 | 71  | 23 | 34 | 36 | G  | B  |    |
| 19    | 48 | G  | G  | G  | G  | G  | G   | 50 | 38 | 47 | 47 | 44 | 45 | 45 | 49 | 31  | 40 | 40 | 35  | 40 | 57 | 41 | 46 | 43 |    |
| 20    | G  | 27 | G  | G  | 25 | 57 | 26  | 27 | 33 | 40 | 40 | 47 | 32 | 31 | 32 | 31  | 31 | 40 | 49  | 41 | 27 | 35 | 26 | 59 |    |
| 21    | 27 | G  | 28 | 35 | 33 | B  | G   | 37 | 60 | 33 | 47 | 41 | 42 | 44 | 41 | 38  | 40 | 40 | 32  | G  | 48 | 41 | 32 | 40 |    |
| 22    | G  | G  | G  | G  | 28 | 34 | 25  | 49 | 40 | 33 | 45 | 39 | 34 | 24 | 32 | 28  | 27 | 28 | 29  | 44 | G  | 39 | 53 | G  |    |
| 23    | 28 | 28 | 27 | G  | B  | B  | B   | 28 | 37 | 40 | 44 | 30 | 30 | 31 | 33 | 29  | 34 | 38 | G   | 19 | 11 | 54 | 55 | 35 |    |
| 24    | 40 | 40 | 46 | 34 | B  | B  | G   | 29 | 36 | 34 | 47 | 40 | 32 | 32 | 43 | 29  | 26 | G  | G   | 11 | 11 | G  | G  | G  |    |
| 25    | G  | 30 | 39 | G  | G  | G  | G   | 29 | 36 | 43 | 40 | 39 | 45 | 46 | 38 | 38  | 35 | 40 | G   | 48 | 40 | G  | 55 | 24 |    |
| 26    | G  | G  | G  | G  | G  | G  | 23  | 36 | 46 | 45 | 45 | 43 | 48 | 46 | 38 | 30  | 32 | 33 | 150 | 26 | 43 | 41 | 33 | 41 |    |
| 27    | 25 | G  | G  | G  | 33 | G  | G   | 30 | 33 | 37 | 38 | 36 | 36 | 30 | 45 | 40  | 36 | 24 | G   | 21 | 24 | 28 | 39 | 37 |    |
| 28    | 39 | 39 | 44 | 40 | 25 | G  | G   | 36 | 46 | 44 | 48 | 48 | 34 | 46 | G  | 31  | 34 | 25 | 25  | 23 | 28 | 31 | G  | 47 |    |
| 29    | 45 | G  | G  | G  | B  | G  | G   | 34 | 54 | 48 | 44 | 44 | 67 | 56 | 54 | 44  | 42 | 41 | 30  | 35 | 26 | G  | 27 | 27 |    |
| 30    | G  | 26 | G  | 24 | 23 | G  | G   | 35 | 41 | 48 | 42 | 35 | 40 | 31 | 43 | 29  | 32 | 46 | 39  | 31 | G  | G  | G  | 26 |    |
| 31    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |     |    |    |     |    |    |    |    |    |    |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15  | 16 | 17 | 18  | 19 | 20 | 21 | 22 | 23 |    |
| CNT   | 29 | 30 | 29 | 30 | 25 | 27 | 27  | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30  | 29 | 29 | 30  | 30 | 30 | 30 | 30 | 29 |    |
| MED   | 25 | G  | G  | G  | 24 | G  | G   | 35 | 40 | 42 | 44 | 44 | 43 | 44 | 43 | 38  | 35 | 36 | 32  | 28 | 28 | 35 | 28 | 27 |    |
| U Q   | 40 | 28 | 41 | 34 | 32 | 33 | 27  | 38 | 44 | 46 | 48 | 48 | 48 | 46 | 46 | 43  | 40 | 40 | 44  | 41 | 43 | 41 | 38 | 40 |    |
| L Q   | G  | G  | G  | G  | G  | G  | G   | 32 | 35 | 35 | 40 | 40 | 36 | 32 | 36 | 29  | 32 | 29 | 26  | 11 | 11 | 27 | G  | G  |    |

HOURLY VALUES OF fmin AT Yamagawa

SEP. 2018

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                                    | 14 | 23 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 16 | 22 | 24 | 21 | 22 | 24 | 22 | 17 | 15 | 15 | 15 | 15 | 14 | 14 | 18 |
| 2                                    | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 20 | 22 | 21 | 26 | 28 | 18 | 18 | 14 | 14 | 14 | 14 | 15 | 14 | 15 |
| 3                                    | 16 | 14 | 14 | 14 |    | 14 | 14 | 15 | 14 | 15 | 16 | 20 | 26 | 23 | 22 | 20 | 16 | 15 | 14 | 15 | 17 | 15 | 20 | 16 |
| 4                                    | 15 | 15 | 17 | 14 | 14 | 20 | 15 | 14 | 15 | 20 | 21 | 20 | 22 | 21 | 18 | 16 | 16 | B  | 15 | 18 | 15 | 14 | 15 | 15 |
| 5                                    | 14 | 14 | 15 | 14 | 15 | 14 | 15 | 14 | 14 | 17 | 20 | 18 | 22 | 21 | 21 | 18 | 18 | 15 | 15 | 14 | 15 | 14 | 14 | 14 |
| 6                                    | 15 | 15 | 14 | 15 | 14 | 14 | 14 | 14 | 17 | 16 | 18 | 21 | 23 | 21 | 21 | 20 | 15 | 15 | 14 | 14 | 15 | 14 | 15 | 14 |
| 7                                    | 14 | 18 | 15 | 14 | 15 | 15 | 15 | 14 | 16 | 17 | 18 | 43 | 22 | 18 | 22 | 21 | 16 | 15 | 15 | 14 | 14 | 15 | 15 | 21 |
| 8                                    | 14 | 14 | 17 | 15 | 18 | 15 | 16 | 14 | 15 | 16 | 18 | 18 | 15 | 22 | 22 | 20 | 17 | 15 | 14 | 14 | 15 | 14 | 14 | 20 |
| 9                                    | B  | 15 | B  | 14 | 15 | B  | B  | 15 | 16 | 15 | 18 | 18 | 18 | 18 | 18 | 15 | 15 | 16 | 15 | 14 | 15 | 16 | 15 | 14 |
| 10                                   | 14 | 14 | 14 | 14 | 14 | 14 | 16 | 15 | 15 | 15 | 15 | 20 | 27 | 21 | 21 | 18 | 20 | 15 | 16 | 15 | 14 | 14 | 14 | 15 |
| 11                                   | 14 | 16 | 15 | 15 | 15 | 14 | 14 | 14 | 15 | 16 | 20 | 20 | 22 | 30 | 16 | 16 | 16 | 15 | 14 | 20 | 15 | 15 | 15 | 14 |
| 12                                   | 17 | 20 | 20 | 15 | 15 | 14 | B  | 15 | 15 | 16 | 20 | 20 | 18 | 21 | 21 | 22 | 15 | 14 | 15 | 15 | 14 | 14 | 14 | 15 |
| 13                                   | 15 | 14 | 14 | 15 | 14 | 15 | 22 | 15 | 15 | 15 | 17 | 21 | 22 | 20 | 21 | 18 | 15 | 15 | 15 | 14 | 14 | 14 | 15 | 15 |
| 14                                   | 14 | 14 | 14 | 15 | 15 | 15 | 14 | 14 | 15 | 18 | 17 | 22 | 21 | 21 | 21 | 18 | 17 | 15 | 17 | 14 | 15 | 14 | 15 | 14 |
| 15                                   | 14 | 14 | 17 | 14 | 15 | 15 | 17 | 15 | 15 | 16 | 17 | 20 | 21 | 21 | 20 | 17 | 15 | 14 | 14 | 14 | 15 | 15 | 20 | 14 |
| 16                                   | 14 | 15 | 14 | 21 | 15 | 16 | 15 | 16 | 15 | 15 | 16 | 18 | 21 | 18 | 17 | 17 | 20 | 15 | 15 | 15 | 14 | 14 | 14 | 21 |
| 17                                   | 15 | 14 | 15 | 17 | B  | 14 | 17 | 14 | 15 | 17 | 18 | 21 | 18 | 17 | 17 | 17 | 15 | 15 | 16 | 14 | 14 | 14 | 15 | 15 |
| 18                                   | 16 | 21 | 15 | 14 | 15 | 15 | 15 | 14 | 15 | 16 | 17 | 18 | 18 | 18 | 20 | 20 | 15 | 14 | 16 | 15 | 15 | 15 | 15 | B  |
| 19                                   | 15 | 17 | 21 | 14 | 15 | 16 | 14 | 14 | 15 | 16 | 21 | 23 | 20 | 22 | 18 | 21 | 15 | 14 | 14 | 14 | 15 | 14 | 14 | 15 |
| 20                                   | 18 | 15 | 14 | 14 | 15 | 14 | 16 | 14 | 15 | 20 | 15 | 15 | 21 | 20 | 21 | 20 | 18 | 15 | 15 | 15 | 14 | 15 | 15 | 15 |
| 21                                   | 15 | 20 | 15 | 15 | 15 | B  | 14 | 15 | 15 | 16 | 18 | 22 | 21 | 20 | 20 | 18 | 14 | 15 | 14 | 15 | 15 | 14 | 14 | 15 |
| 22                                   | 14 | 14 | 15 | 15 | 15 | 17 | 15 | 14 | 14 | 16 | 20 | 18 | 22 | 15 | 23 | 14 | 17 | 15 | 14 | 14 | 16 | 14 | 15 | 14 |
| 23                                   | 15 | 15 | 15 | 21 | B  | 15 | B  | 15 | 15 | 17 | 20 | 21 | 22 | 22 | 20 | 21 | 15 | 15 | 15 | 15 | 14 | 16 | 15 | 15 |
| 24                                   | 15 | 14 | 14 | 15 | B  | B  | 20 | 14 | 15 | 15 | 20 | 20 | 20 | 22 | 21 | 20 | 18 | 17 | 16 | 15 | 15 | 14 | 15 | 15 |
| 25                                   | 17 | 14 | 18 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 20 | 21 | 21 | 21 | 21 | 17 | 15 | 15 | 18 | 24 | 14 | 15 | 14 | 14 |
| 26                                   | 15 | 15 | 17 | 18 | 16 | 17 | 14 | 14 | 15 | 17 | 21 | 18 | 23 | 22 | 20 | 16 | 15 | 16 | 14 | 15 | 14 | 15 | 15 | 15 |
| 27                                   | 15 | 15 | 15 | 14 | 15 | 15 | 14 | 15 | 18 | 17 | 17 | 27 | 21 | 22 | 20 | 17 | 15 | 14 | 16 | 15 | 14 | 14 | 14 | 15 |
| 28                                   | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 18 | 20 | 21 | 22 | 22 | 33 | 21 | 16 | 22 | 16 | 14 | 14 | 15 | 14 | 15 |
| 29                                   | 15 | 14 | 15 | 15 | B  | 15 | 15 | 15 | 15 | 17 | 20 | 22 | 24 | 22 | 22 | 20 | 17 | 15 | 14 | 14 | 14 | 14 | 15 | 14 |
| 30                                   | 22 | 15 | 15 | 15 | 15 | 17 | 15 | 14 | 14 | 15 | 18 | 20 | 21 | 22 | 22 | 18 | 16 | 15 | 15 | 14 | 15 | 14 | 15 | 15 |
| 31                                   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                      | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT                                  | 29 | 30 | 29 | 30 | 25 | 27 | 27 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 29 | 30 | 30 | 30 | 30 | 30 | 29 |
| MED                                  | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 16 | 18 | 20 | 21 | 21 | 21 | 18 | 16 | 15 | 15 | 14 | 15 | 14 | 15 | 15 |
| U Q                                  | 15 | 15 | 16 | 15 | 15 | 15 | 16 | 15 | 15 | 17 | 20 | 22 | 22 | 22 | 22 | 20 | 17 | 15 | 16 | 15 | 15 | 15 | 15 | 15 |
| L Q                                  | 14 | 14 | 14 | 14 | 15 | 14 | 14 | 14 | 15 | 15 | 17 | 18 | 21 | 20 | 20 | 17 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 14 |

HOURLY VALUES OF foF2 AT Okinawa

SEP. 2018

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     | 30 | 30 | 26 | N  | N  | B  | 31 | 48  | 54 | A  | A  | A   | 57 | 71  | 62  | 56  | 57  | 65  | 67  | 80  | 67 | 34 | A  | A  |  |
| 2     | A  | 59 | 25 | 25 | 26 |    | 28 | 40  | 53 | 57 | 64 | 62  | 67 | 65  | 64  | 52  | 51  | 60  | 74  | 85  | 60 | 54 | 40 | 41 |  |
| 3     | 42 | 38 | 35 | 39 | 31 | B  | 28 | 43  | 42 | 51 | 54 | A   | 50 | 56  | 62  | 61  | 50  | 51  | 61  | 66  | 67 | 52 | 40 | 40 |  |
| 4     | 38 | 34 | 34 | 34 | 28 | B  | B  | 50  | 51 | 50 | 51 | 60  | 74 | 75  | 67  | 65  | 66  | 72  | 84  | 87  | 66 | 36 | 28 | 28 |  |
| 5     | 29 | 29 | 28 | 29 | 26 | N  | 30 | 51  | 51 | 51 | 54 | 54  | 60 | 72  | 68  | 72  | 70  | 78  | 75  | 66  | 48 | 27 | 30 | A  |  |
| 6     | A  | A  | 30 | N  | 30 | A  | A  | A   | 50 | A  | 57 | 51  | 57 | 62  | 66  | 68  | 77  | 86  | 72  | 78  | 53 | 20 | A  | A  |  |
| 7     | A  | 30 | A  | B  | B  | A  | A  | 51  | 65 | 50 | 55 | 52  | 54 | 58  | 61  | 64  | 65  | 64  | 74  | 71  | A  | 35 | 32 | 34 |  |
| 8     | 34 | 32 | A  | A  | 29 | B  | 32 | 54  | 38 | A  | A  | A   | 65 | 65  | 65  | 60  | 71  | 91  | 111 | 90  | A  | A  | A  | 28 |  |
| 9     | 30 | 29 | 28 | A  | A  | B  | 26 | 53  | 62 | 52 |    | 50  | 57 | 54  | 54  | 45  | 60  | 78  | 85  | 77  | A  | A  | A  | A  |  |
| 10    | A  | A  | A  | 25 | A  |    | 26 | 46  | 32 | 58 | 53 | 52  | 61 | 72  | 78  | 76  | 77  | 78  | 85  | 87  | N  | 48 | A  | A  |  |
| 11    | A  | A  | A  | 29 | A  | A  | 32 | 44  | A  | A  | A  | 58  | 70 | 65  | 65  | 72  | 70  | 80  | 67  | 67  | A  | 42 | 43 | 42 |  |
| 12    | 42 | 38 |    | 31 | 29 | 26 | 34 | 67  | 78 | A  | 54 | 55  | 61 | 60  | 55  | 59  | 70  | 81  | 84  | 86  | 51 | 38 | A  | A  |  |
| 13    | A  | A  | A  | A  | A  | 26 | A  | 54  | 49 | 64 | 54 | 56  | 51 | 64  | 64  | 64  | 78  | 86  | 88  | 104 | A  | A  | A  | A  |  |
| 14    | 41 | 39 | 34 | A  | A  | 30 | 32 | 51  | 46 | A  | 52 | 149 | 59 | 61  | 55  | 55  | 66  | 68  | 75  | 85  | 55 | 25 | A  | A  |  |
| 15    | A  | A  | A  | A  | N  | N  | 31 | 51  | 69 | 44 | 50 | 48  | 56 | 66  | 71  | 76  | 81  | 88  | 97  | 92  | 67 | N  | B  | A  |  |
| 16    | 28 | 30 | 30 | 28 | B  | N  | 28 | 48  | 59 | 44 | 45 | 57  | 62 | 70  | 62  | 67  | 60  | 67  | 85  | 86  | 67 | 34 | A  | A  |  |
| 17    | 31 | 31 | 31 | 34 | A  | B  | N  | 52  | 49 | 62 | 59 | A   | 71 | 65  | 60  | 62  | 69  | 60  | 67  | 75  | 67 | 36 | 28 | 59 |  |
| 18    | 30 | 49 | 30 | 30 | 28 | B  | B  | 48  | 54 | 62 | 60 | 54  | 56 | 66  | 64  | 67  | 66  | 66  | 80  | 87  | 84 | 28 | A  | 28 |  |
| 19    | A  | 28 | 29 | 28 | 26 | N  | 30 | 50  | 50 | 90 | 56 | 56  | 65 | 71  | 67  | 71  | 81  | 189 | 86  | 70  | 53 | 40 | A  | A  |  |
| 20    | 37 | 34 | 34 | 40 | 34 | B  | 28 | 50  | 55 | 53 | 55 | 57  | 56 | 58  | 58  | 55  | A   | 101 | 86  | 86  | 67 | A  | A  | A  |  |
| 21    | 30 | 31 | 30 | 30 | 59 | B  | N  | 50  | 65 | 57 | 64 | 46  | 59 | 60  | 50  | 44  | 59  | 80  | 82  | 52  | 47 | B  | A  | 30 |  |
| 22    | 29 | 28 | A  | 29 | N  | N  | 29 | 43  | 46 | 51 | 51 | 56  | 52 | 68  | 63  | 55  | 92  | 109 | 70  | 51  | 53 | 48 | A  | 30 |  |
| 23    | 30 | 31 | A  | 39 | A  | A  |    | 63  | 51 | A  | A  | A   | 86 | 98  | 81  | A   | 84  | 90  | 90  | 50  | A  | A  | 31 | 31 |  |
| 24    | 34 | 35 | 59 | 26 | A  | A  | A  | 54  | 60 | 64 | 56 | 48  | 74 | 71  | 58  | 52  | 149 | 89  | 86  | 62  | 44 | 38 | 32 | 29 |  |
| 25    | 28 | 26 | 28 | B  | N  |    | N  | 53  | 67 | 72 | 72 | 75  | 74 | 74  | 59  | 54  | 64  | 91  | 89  | 54  | 37 | B  | B  | 28 |  |
| 26    | 30 | 30 | 28 | N  | 49 | N  | 29 | 61  | 64 | 70 | 71 | 71  | 87 | 122 | 122 | 107 | 90  | 77  | 87  | 87  | 34 | 28 | B  | A  |  |
| 27    | A  | A  | A  | 31 | 59 | N  | N  | 50  | 52 | 54 | 57 | 61  | 56 | 65  | 75  | 78  | 75  | 90  | 97  | 80  | 51 | 35 | 32 | A  |  |
| 28    | A  | A  | 28 | 28 | N  | N  | 28 | 54  | 65 | 64 | 61 | 70  | 82 | 104 | 111 | 111 | 90  | 86  | 82  | 54  | A  | A  | A  | A  |  |
| 29    | 32 | 34 | 32 | 33 | 25 | B  | 26 | 53  | 54 | A  | 62 | 64  | 81 | 85  | 78  | 84  | 91  | 91  | 90  | 34  | 37 | 31 | A  | 31 |  |
| 30    | 31 | 32 | 34 | 26 | N  | B  | N  | 109 | 51 | 55 | 61 | 68  | 87 | 120 | 117 | 107 | 105 | 101 | A   | 53  | 52 | 32 | 34 | 41 |  |
| 31    |    |    |    |    |    |    |    |     |    |    |    |     |    |     |     |     |     |     |     |     |    |    |    |    |  |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08 | 09 | 10 | 11  | 12 | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |  |
| CNT   | 20 | 23 | 20 | 20 | 14 | 3  | 18 | 29  | 29 | 22 | 25 | 25  | 30 | 30  | 30  | 29  | 29  | 30  | 29  | 30  | 22 | 21 | 11 | 15 |  |
| MED   | 30 | 31 | 30 | 30 | 29 | 26 | 29 | 51  | 53 | 56 | 56 | 56  | 61 | 66  | 64  | 64  | 70  | 80  | 84  | 78  | 53 | 35 | 32 | 31 |  |
| U Q   | 35 | 35 | 34 | 33 | 34 | 30 | 31 | 54  | 63 | 64 | 61 | 63  | 74 | 72  | 71  | 74  | 82  | 90  | 87  | 86  | 67 | 41 | 40 | 41 |  |
| L Q   | 30 | 30 | 28 | 28 | 26 | 26 | 28 | 48  | 49 | 51 | 53 | 52  | 56 | 62  | 60  | 55  | 64  | 68  | 74  | 62  | 48 | 29 | 30 | 28 |  |

HOURLY VALUES OF fEs AT Okinawa

SEP. 2018

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  | B  |    | 24  | 34 | 67  | 74 | 69  | 56  | 47  | 47 | 48 | 43 | 37  | 36 | 39  | 40  | 28  | 26  | 72  | 71 |
| 2     | 59  | G  | G  | 27  | 26 |    | G  | 30  | 38 | 39  | 46 | 50  | 46  | 47  | 46 | 60 | 38 | 42  | 45 | 51  | 44  | 40  | 32  | 30  |    |
| 3     | 25  | 41 | 28 | 28  | G  | B  | G  | 40  | 46 | 52  | 64 | 72  | 40  | 112 | 44 | 36 | 41 | 37  | 28 | 27  | G   | 21  | G   | 23  |    |
| 4     | G   | G  | G  | G   | G  | B  | B  | 43  | 36 | 39  | 47 | 49  | 46  | 48  | 46 | 45 | 42 | 46  | 48 | 60  | 50  | 26  | G   | G   |    |
| 5     | G   | G  | G  | G   | G  | G  | G  | 32  | 40 | 37  | 45 | 45  | 44  | 46  | 48 | 52 | 46 | 35  | 27 | G   | 40  | 23  | G   | 60  |    |
| 6     | 48  | 49 | G  | 159 | 71 | 44 | 65 | 79  | 54 | 58  | 43 | 54  | 42  | 41  | 47 | 40 | 40 | 42  | 43 | 36  | 92  | G   | 60  | 39  |    |
| 7     | 40  | 49 | 25 | B   | B  | 59 | 58 | 27  | 31 | 35  | 46 | 46  | 47  | 47  | 46 | 48 | 42 | 40  | 42 | 45  | 40  | 45  | G   | G   |    |
| 8     | 131 | G  | 32 | 26  | G  | B  | G  | 32  | 47 | 62  | 64 | 50  | 58  | 42  | 57 | 51 | 40 | 52  | 62 | 61  | 45  | 40  | 32  | G   |    |
| 9     | G   | G  | G  | 25  | 30 | B  | G  | 31  | 36 | 36  |    | 146 | 44  | 48  | 47 | 44 | 40 | 49  | 54 | 67  | 107 | 46  | 28  | 50  |    |
| 10    | 32  | 48 | 39 | 23  | 33 | G  | G  | 39  | 42 | 53  | 63 | 50  | 48  | 47  | 38 | 54 | 50 | 46  | 58 | 45  | 25  | 32  | 79  | 35  |    |
| 11    | 40  | 50 | 30 | 26  | 28 | 28 | G  | 38  | 87 | 60  | 76 | 51  | 64  | 53  | 57 | 70 | 48 | 60  | 66 | 58  | 150 | 28  | 40  | 26  |    |
| 12    | 24  | 25 |    | 26  | G  | G  |    | 24  | 28 | 43  | 61 | 44  | 46  | 46  | 38 | 93 | 44 | 41  | 42 | 51  | 43  | 26  | 28  | 70  | 58 |
| 13    | 49  | 46 | 39 | 35  | 28 | G  |    | 32  | 34 | 54  | 48 | 47  | 64  | 46  | 46 | 47 | 40 | 46  | 44 | 71  | 70  | 108 | 144 | 130 | 93 |
| 14    | 59  | 29 | 34 | 59  | 45 | 28 | 93 | 145 | 52 | 144 | 48 | 40  | 109 | 46  | 36 | 36 | 36 | 28  | 28 | 28  | 26  | 28  | B   | 36  | 37 |
| 15    | 38  | 35 | 30 | 29  | 26 | G  | G  | 32  | 44 | 50  | 56 | 50  | 47  | 47  | 38 | 36 | 35 | 44  | 61 | 39  | 64  | 23  |     | 32  |    |
| 16    | G   | G  | G  | 179 | B  | G  | G  | 32  | 34 | 48  | 40 | 48  | 48  | 50  | 44 | 54 | 35 | 38  | 36 | 33  | 60  | 39  | 46  | 36  |    |
| 17    | 24  | 29 | G  | G   | 31 | B  | 96 | 49  | 32 | 42  | 46 | 78  | 60  | 53  | 43 | 46 | 39 | 36  | 40 | 30  | 24  | 40  | G   | G   |    |
| 18    | G   | G  | G  | G   | 11 | B  | B  | 34  | 33 | 43  | 55 | 62  | 46  | 71  | 45 | 37 | 34 | 30  | G  | G   | 48  |     | 39  | 28  |    |
| 19    | 27  | G  | 26 | G   | 24 | G  | G  | 32  | 46 | 43  | 50 | 45  | 45  | 40  | 52 | 53 | 67 | 81  | 54 | 70  | 39  | 72  | 69  | 46  |    |
| 20    | 45  | G  | G  | G   | 24 | B  | 61 | 59  | 40 | 40  | 44 | 46  | 47  | 36  | 91 | 45 | 69 | 164 | 58 | 175 | 59  | 113 | 59  | 30  |    |
| 21    | 28  | 28 | 32 | 58  | G  | B  | G  | 33  | 37 | 42  | 56 | 49  | 92  | 50  | 46 | 39 | 45 | 36  | 24 | 43  | 25  | B   | 27  | 27  |    |
| 22    | 40  | 26 | 28 | 24  | G  | G  |    | 24  | 46 | 46  | 41 | 50  | 51  | 46  | 46 | 42 | 40 | 38  | 46 | 28  | 27  | 38  | 41  | 92  | 27 |
| 23    | 27  | G  | 40 | 32  | 32 | 32 |    | 29  | 39 | 56  | 71 | 75  | 63  | 70  | 71 | 76 | 64 | 60  | 56 | 50  | 45  | 35  | G   | 25  |    |
| 24    | 34  | 30 | G  | 39  | 53 | 47 | 54 | 30  | 48 | 38  | 36 | 40  | 39  | 37  | 36 | 36 | 96 | 48  | 38 | 39  | 25  | G   | G   | G   |    |
| 25    | G   | G  | G  | B   | G  | G  | G  | 32  | 40 | 46  | 47 | 43  | 49  | 46  | 40 | 34 | 36 | 41  | 30 | 22  | 24  | B   | B   | G   |    |
| 26    | G   | G  | G  | G   | G  | G  | G  | 34  | 43 | 52  | 47 | 49  | 48  | 46  | 44 | 36 | 36 | 42  | 45 | 52  | 33  | G   | B   | 57  |    |
| 27    | 45  | 55 | 35 | G   | 31 |    | G  | 48  | 37 | 52  | 46 | 45  | 44  | 36  | 37 | 42 | 44 | 36  | 25 | 29  | 29  | 30  | 30  | 35  |    |
| 28    | 29  | 30 | 34 | G   | G  | G  |    | 24  | 35 | 44  | 68 | 56  | 49  | 47  | 44 | 41 | 36 | 37  | 34 | 33  | 35  | 43  | 56  | 47  | 39 |
| 29    | 27  | 33 | G  | 28  | G  | B  | G  | 29  | 47 | 59  | 52 | 49  | 59  | 44  | 45 | 45 | 46 | 53  | 66 | 40  | 45  | 28  | 35  | G   |    |
| 30    | 32  | 24 | G  | G   | G  | B  | G  | 32  | 40 | 47  | 44 | 35  | 46  | 39  | 43 | 39 | 34 | 44  | 61 | 63  | 32  | G   | 28  | G   |    |
| 31    |     |    |    |     |    |    |    |     |    |     |    |     |     |     |    |    |    |     |    |     |     |     |     |     |    |
|       | 00  | 01 | 02 | 03  | 04 | 05 | 06 | 07  | 08 | 09  | 10 | 11  | 12  | 13  | 14 | 15 | 16 | 17  | 18 | 19  | 20  | 21  | 22  | 23  |    |
| CNT   | 30  | 30 | 29 | 28  | 28 | 17 | 28 | 30  | 30 | 30  | 29 | 30  | 30  | 30  | 30 | 30 | 30 | 30  | 30 | 30  | 30  | 28  | 27  | 30  |    |
| MED   | 28  | 26 | G  | 26  | 18 | G  | G  | 34  | 42 | 48  | 47 | 49  | 47  | 46  | 46 | 44 | 40 | 42  | 44 | 42  | 40  | 29  | 35  | 30  |    |
| U Q   | 40  | 35 | 32 | 30  | 30 | 30 | 28 | 40  | 47 | 58  | 56 | 54  | 49  | 48  | 48 | 51 | 46 | 48  | 58 | 58  | 50  | 40  | 60  | 39  |    |
| L Q   | G   | G  | G  | G   | G  | G  | G  | 32  | 37 | 41  | 45 | 46  | 46  | 42  | 42 | 37 | 37 | 36  | 30 | 30  | 26  | 23  | G   | G   |    |

HOURLY VALUES OF fmin AT Okinawa

SEP. 2018

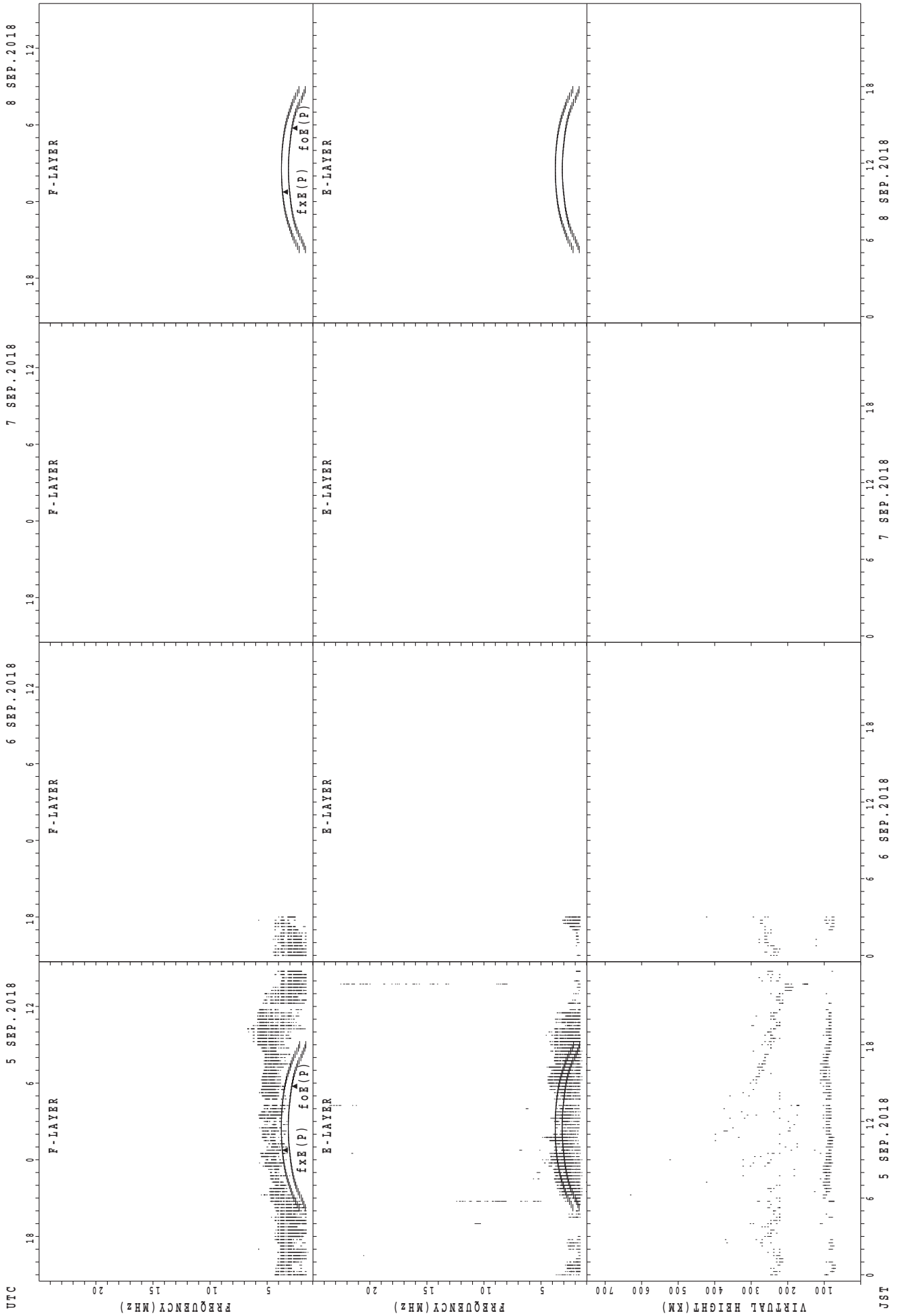
LAT. 26°41.0' N LON. 128°09.0' E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

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

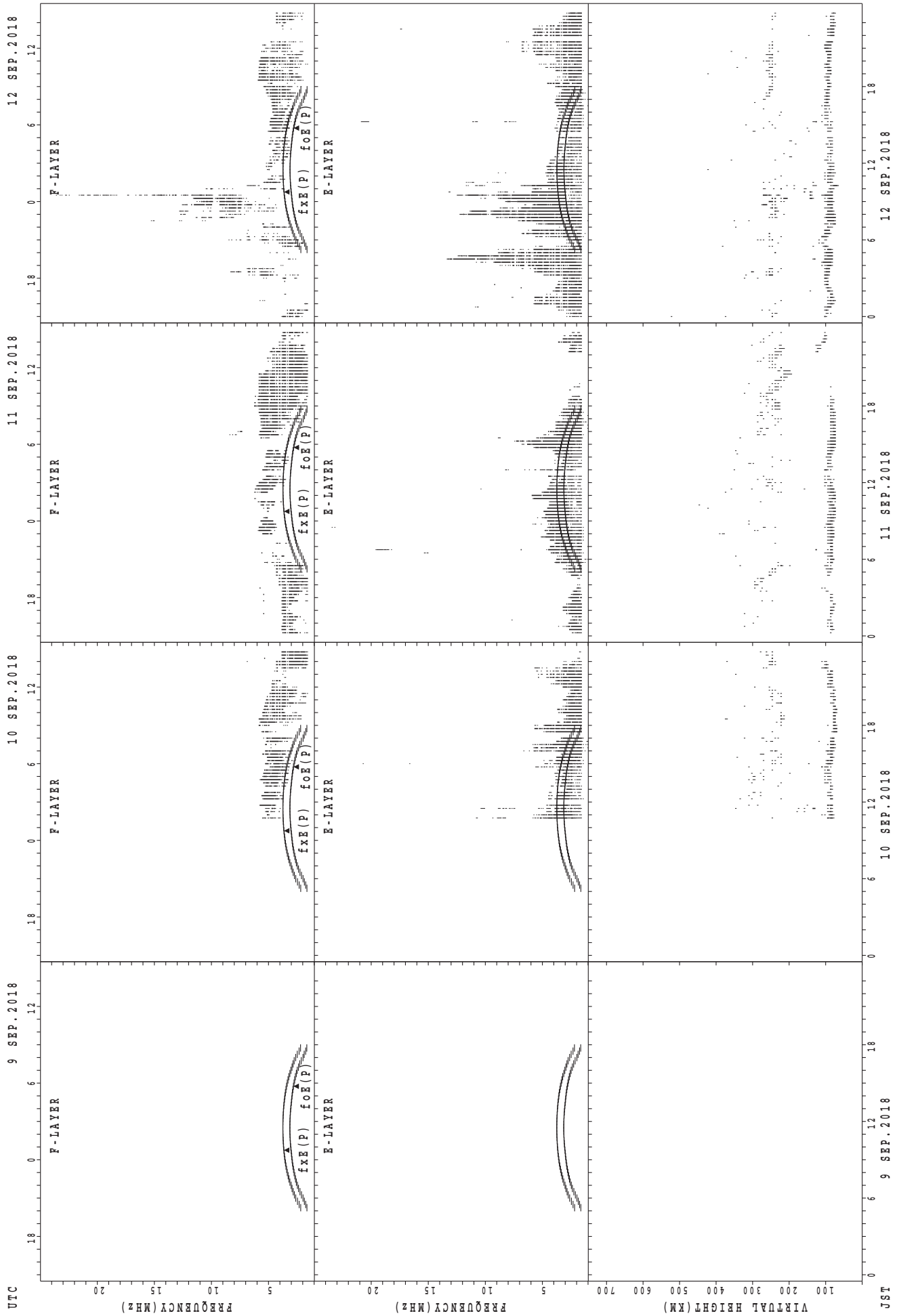




SUMMARY PLOTS AT Wakkanai

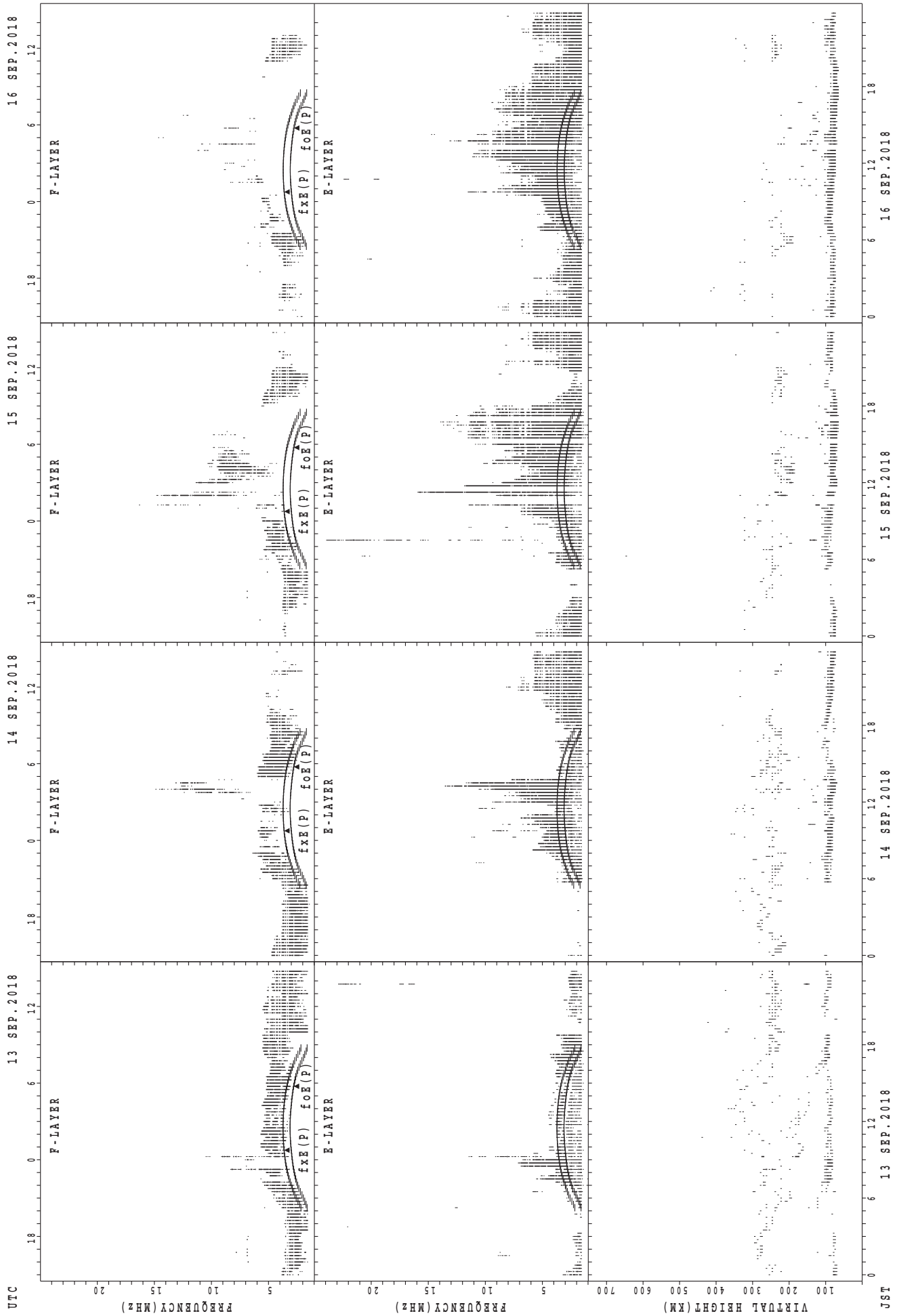


SUMMARY PLOTS AT Wakkanai



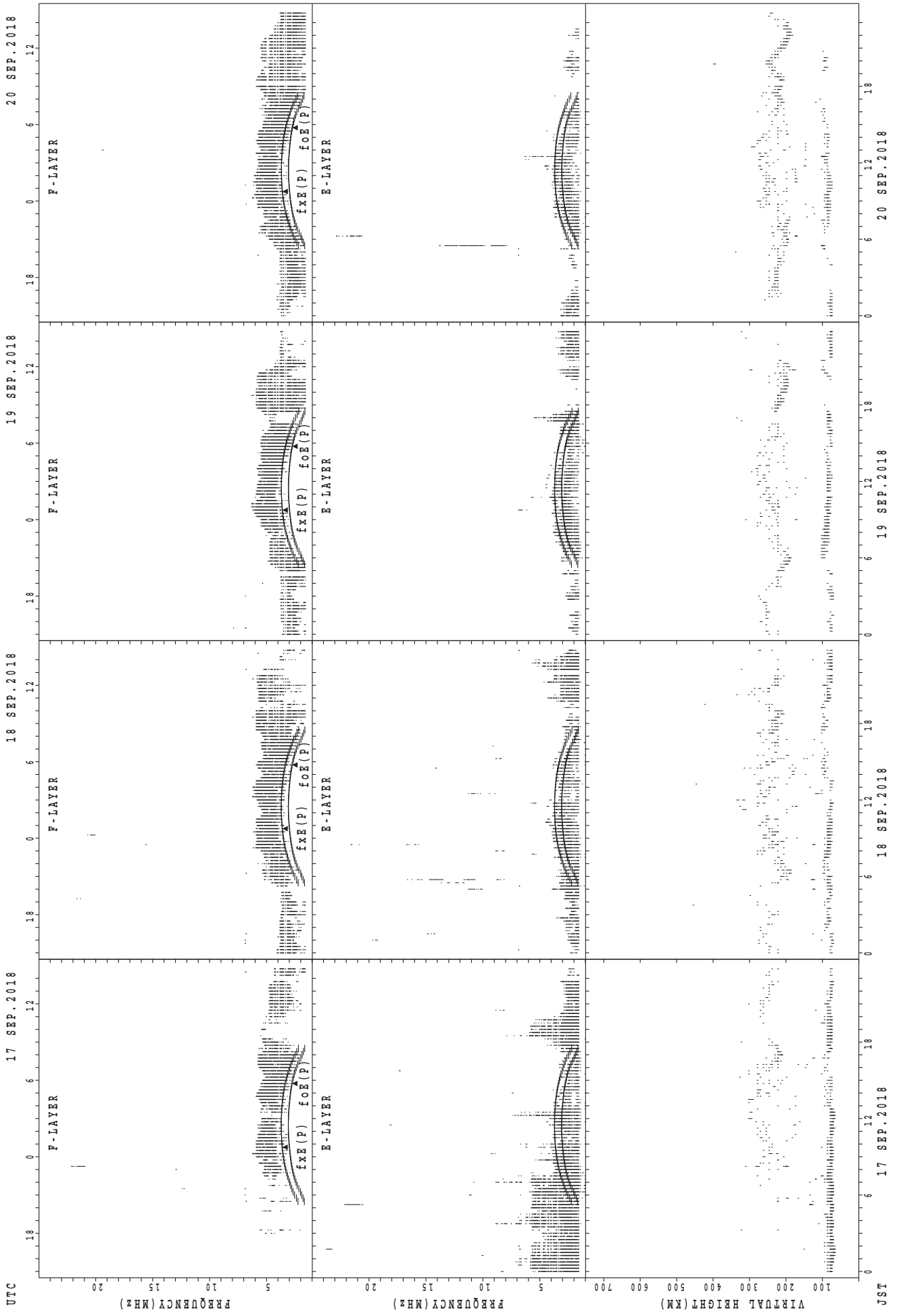
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai

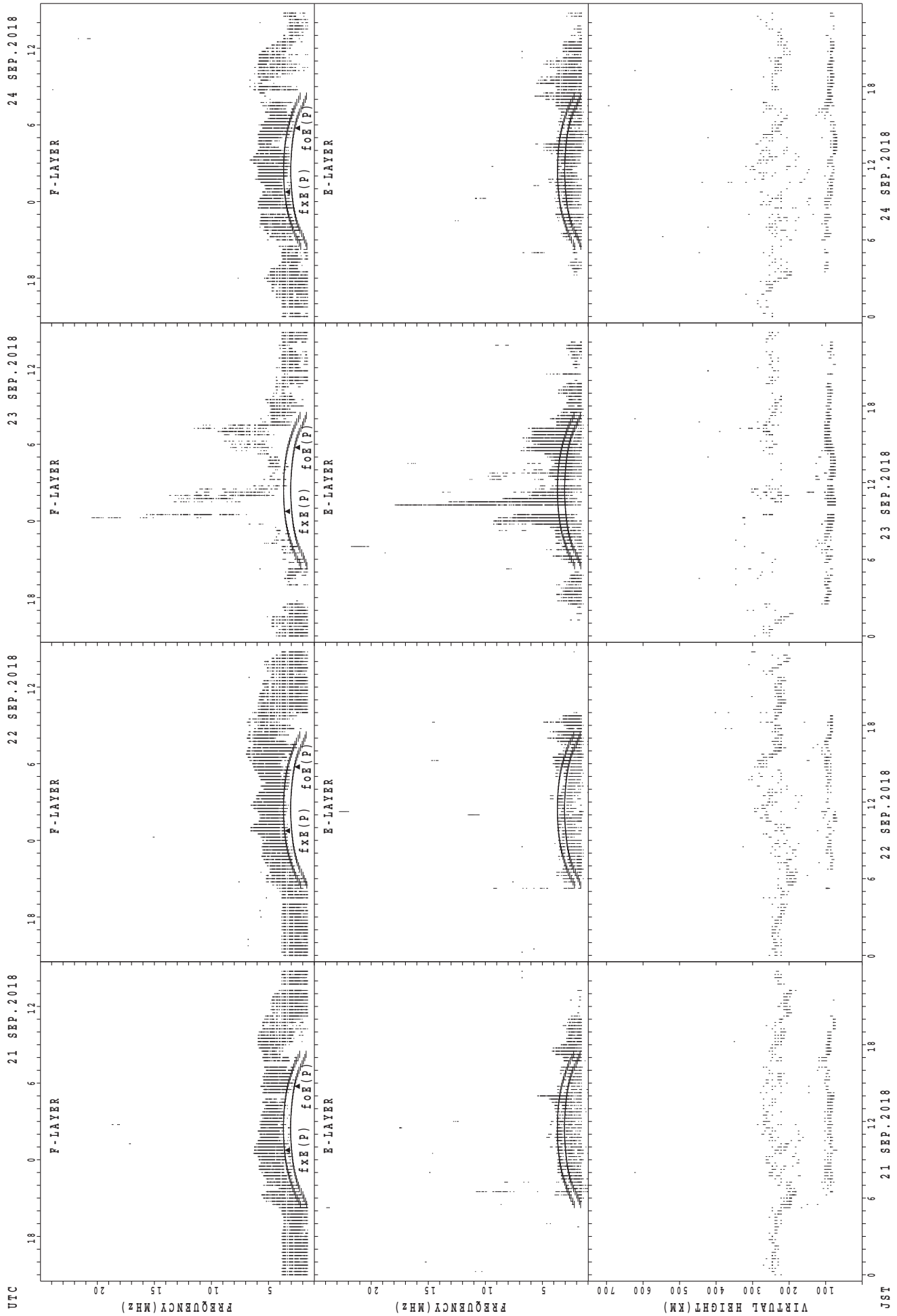


UTC  
17 SEP.2018  
18 SEP.2018  
19 SEP.2018  
20 SEP.2018

JST  
17 SEP.2018  
18 SEP.2018  
19 SEP.2018  
20 SEP.2018

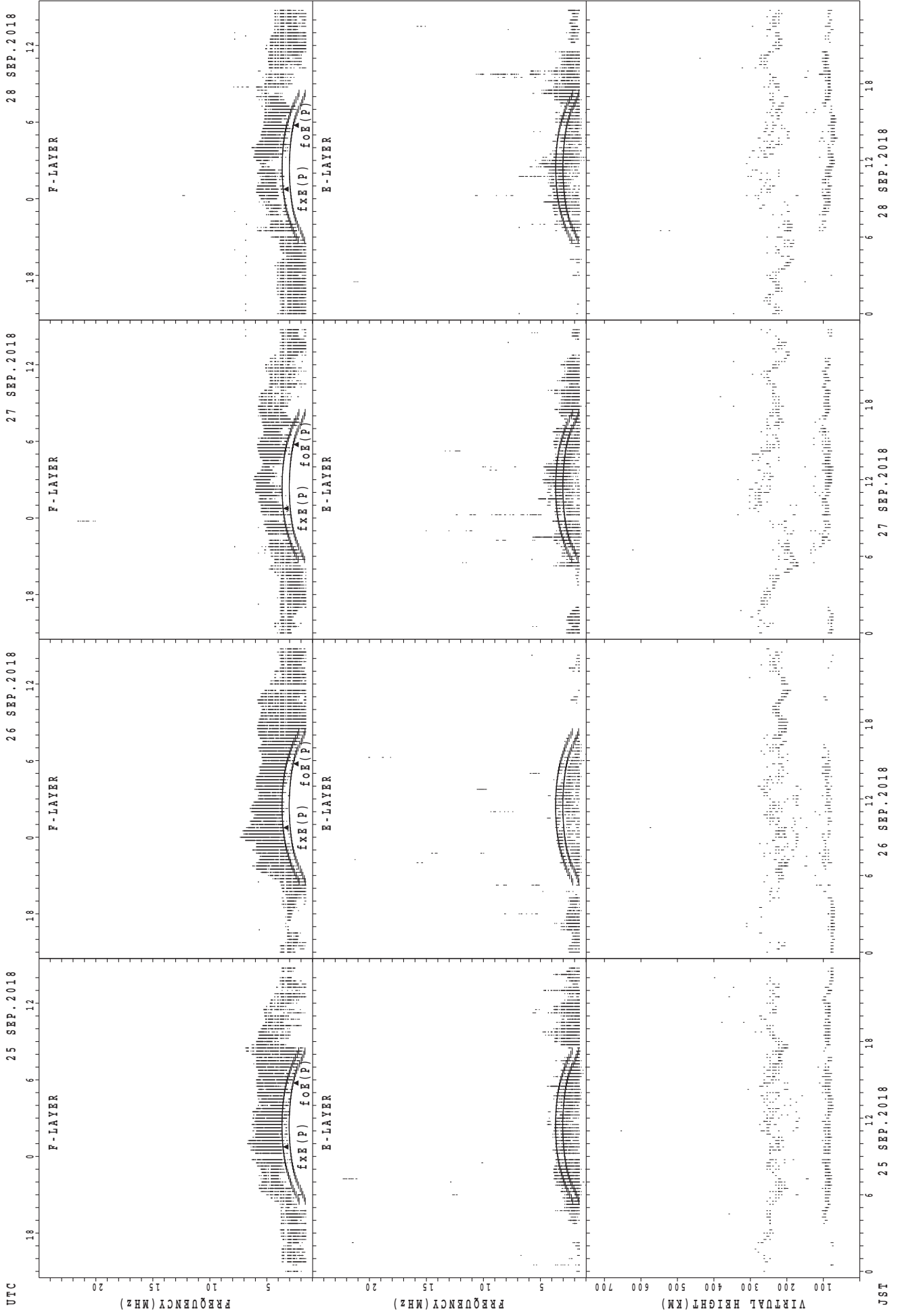
foF2(P); PREDICTED VALUE FOR foF2  
foF2(O); OBSERVED VALUE FOR foF2  
foE(P); PREDICTED VALUE FOR foE  
foE(O); OBSERVED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai



UTC  
 25 SEP. 2018  
 26 SEP. 2018  
 27 SEP. 2018  
 28 SEP. 2018

Virtual Height (KM)  
 1000  
 800  
 600  
 400  
 200  
 0

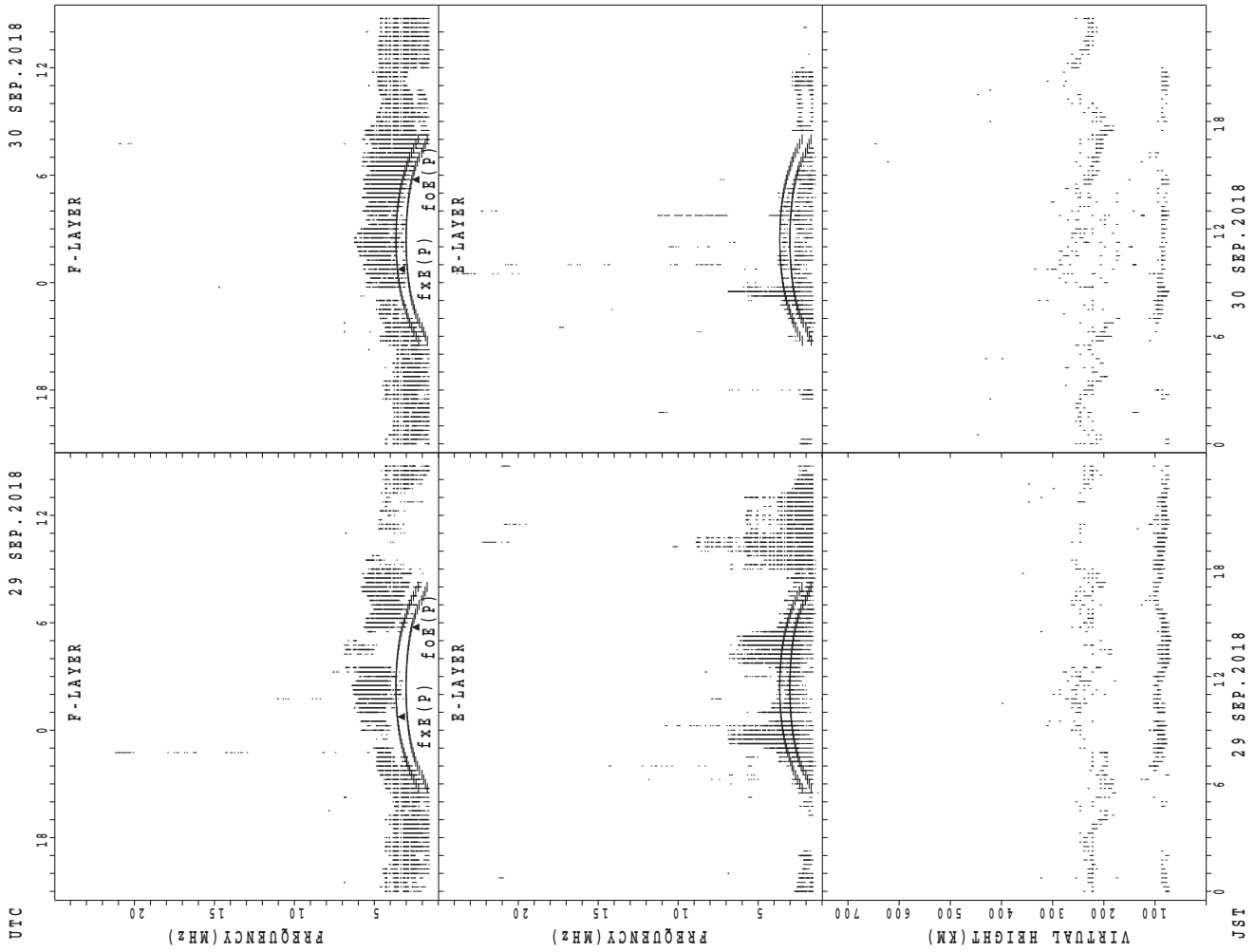
Frequency (MHz)  
 20  
 15  
 10  
 5  
 0

Virtual Height (KM)  
 180  
 160  
 140  
 120  
 100  
 80  
 60  
 40  
 20  
 0

UTC  
 25 SEP. 2018  
 26 SEP. 2018  
 27 SEP. 2018  
 28 SEP. 2018

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

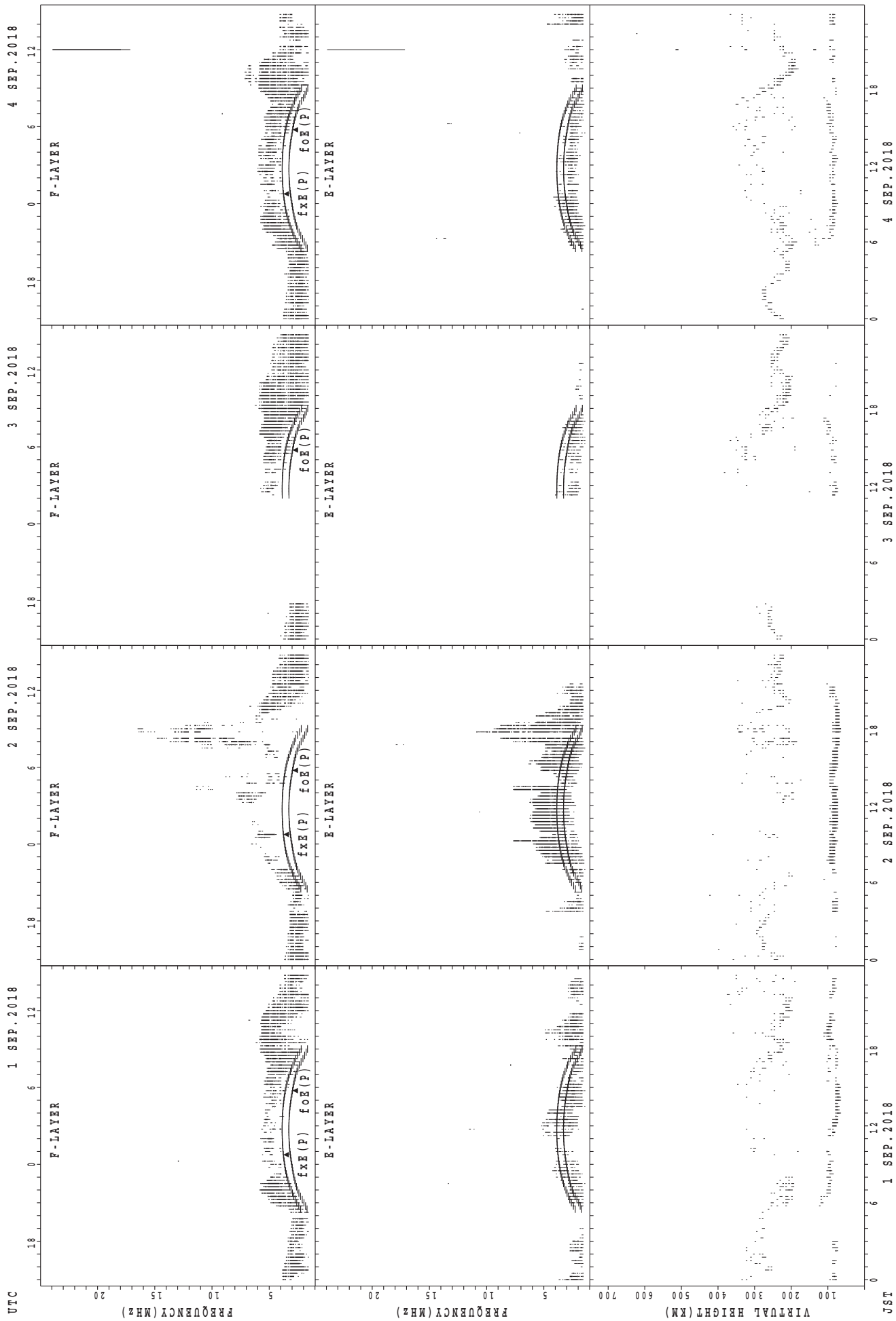
SUMMARY PLOTS AT Wakkanai



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

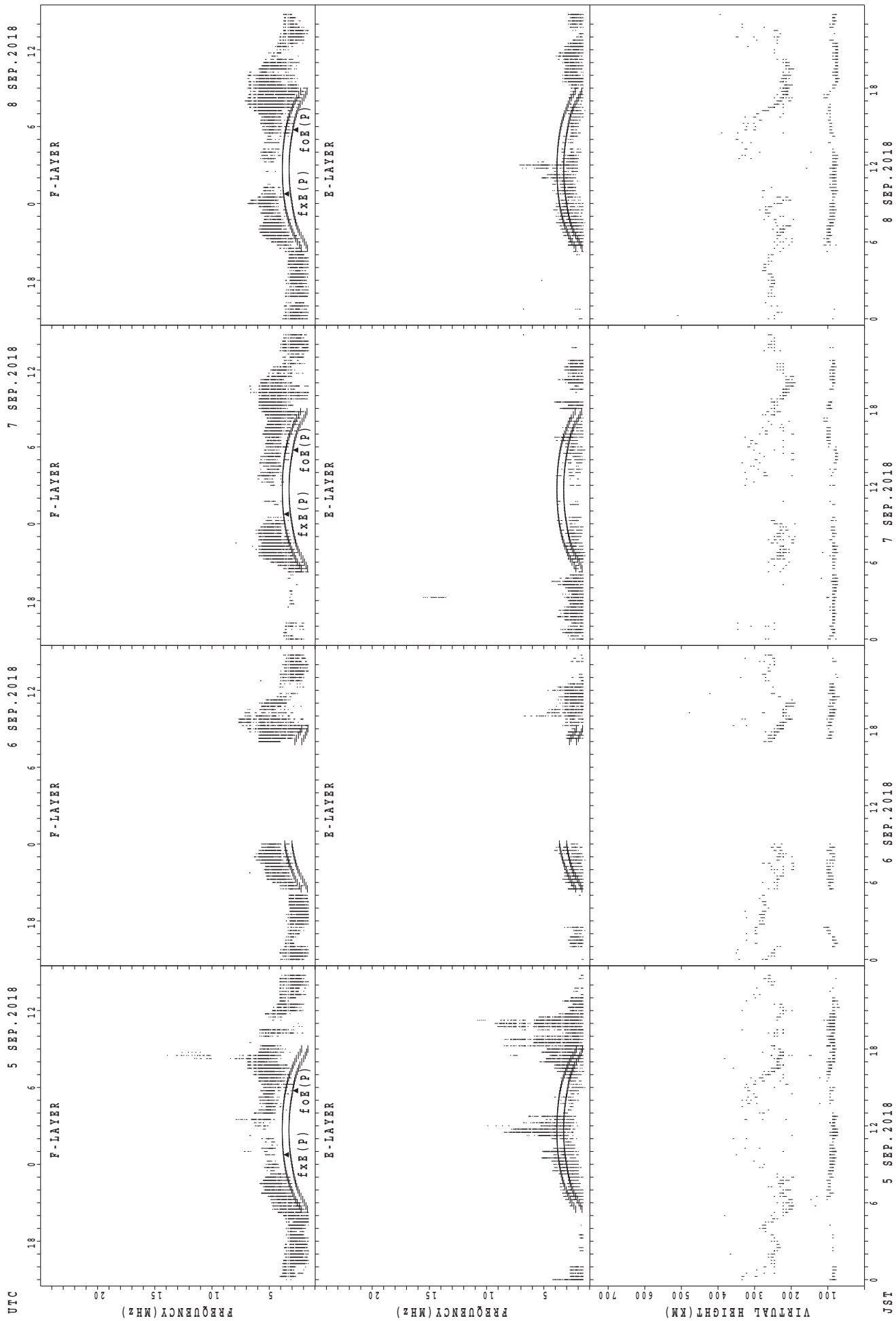


SUMMARY PLOTS AT Kokubunji



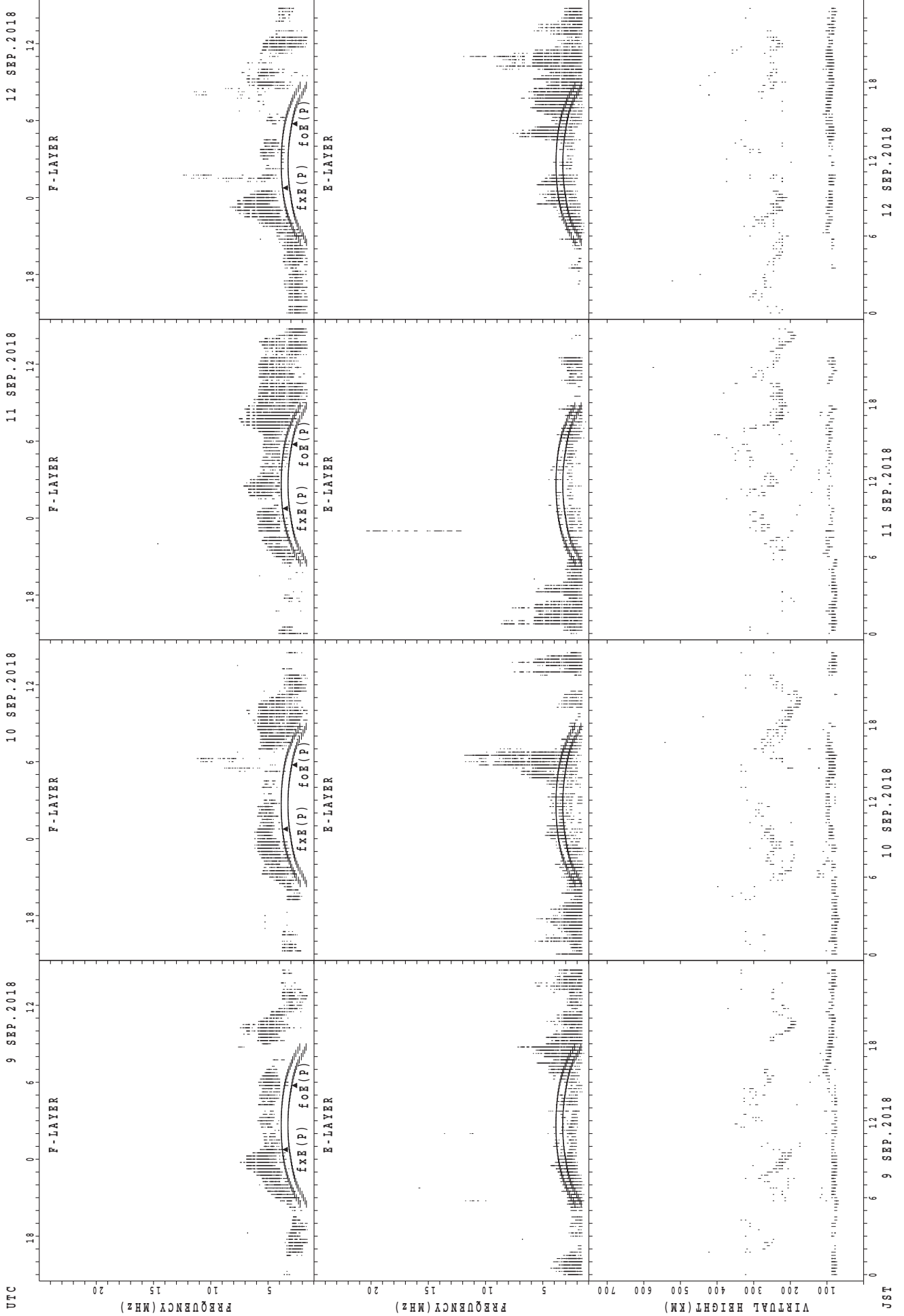
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



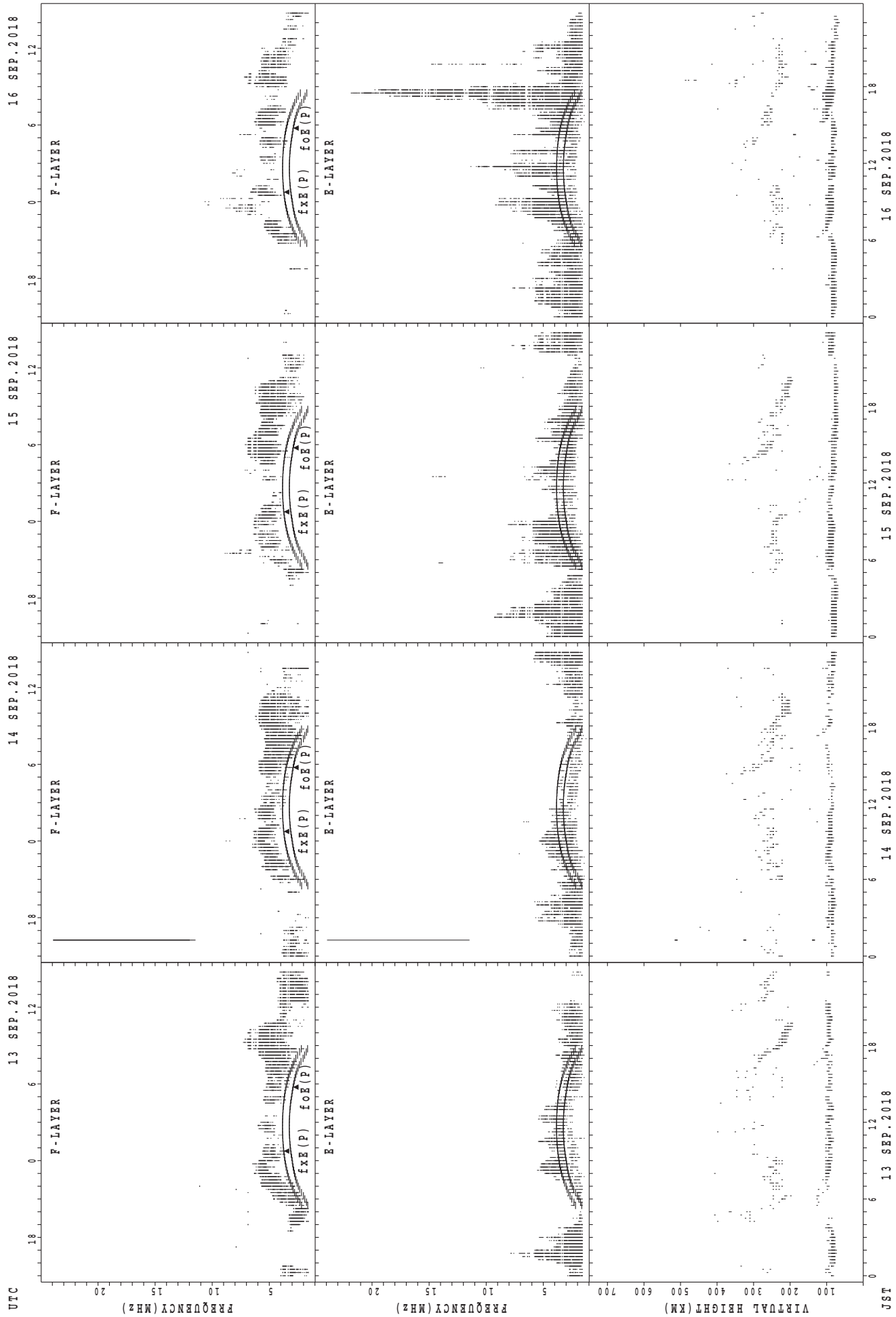
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



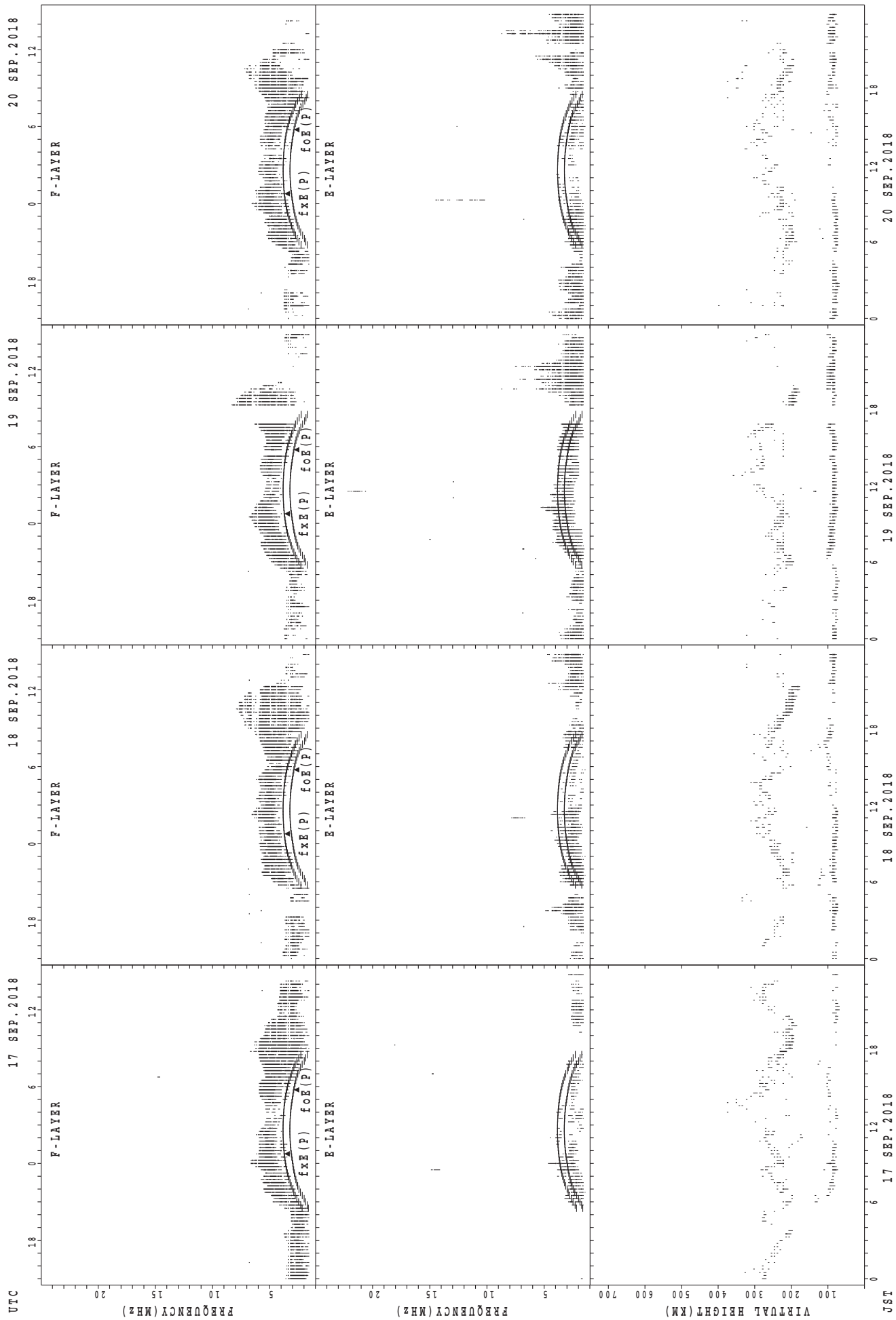
fx(P); PREDICTED VALUE FOR fx  
fo(P); PREDICTED VALUE FOR fo

SUMMARY PLOTS AT Kokubunji



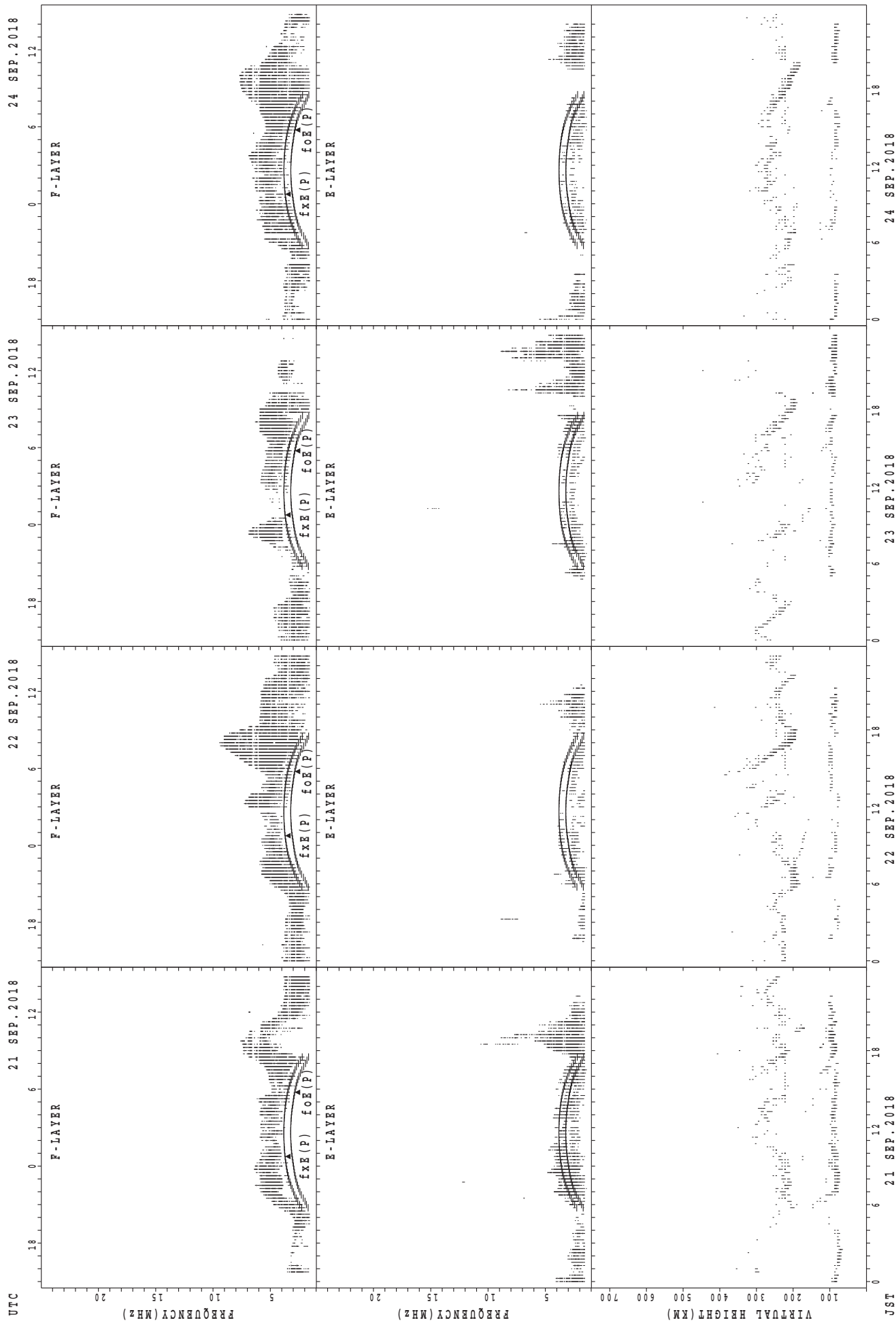
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



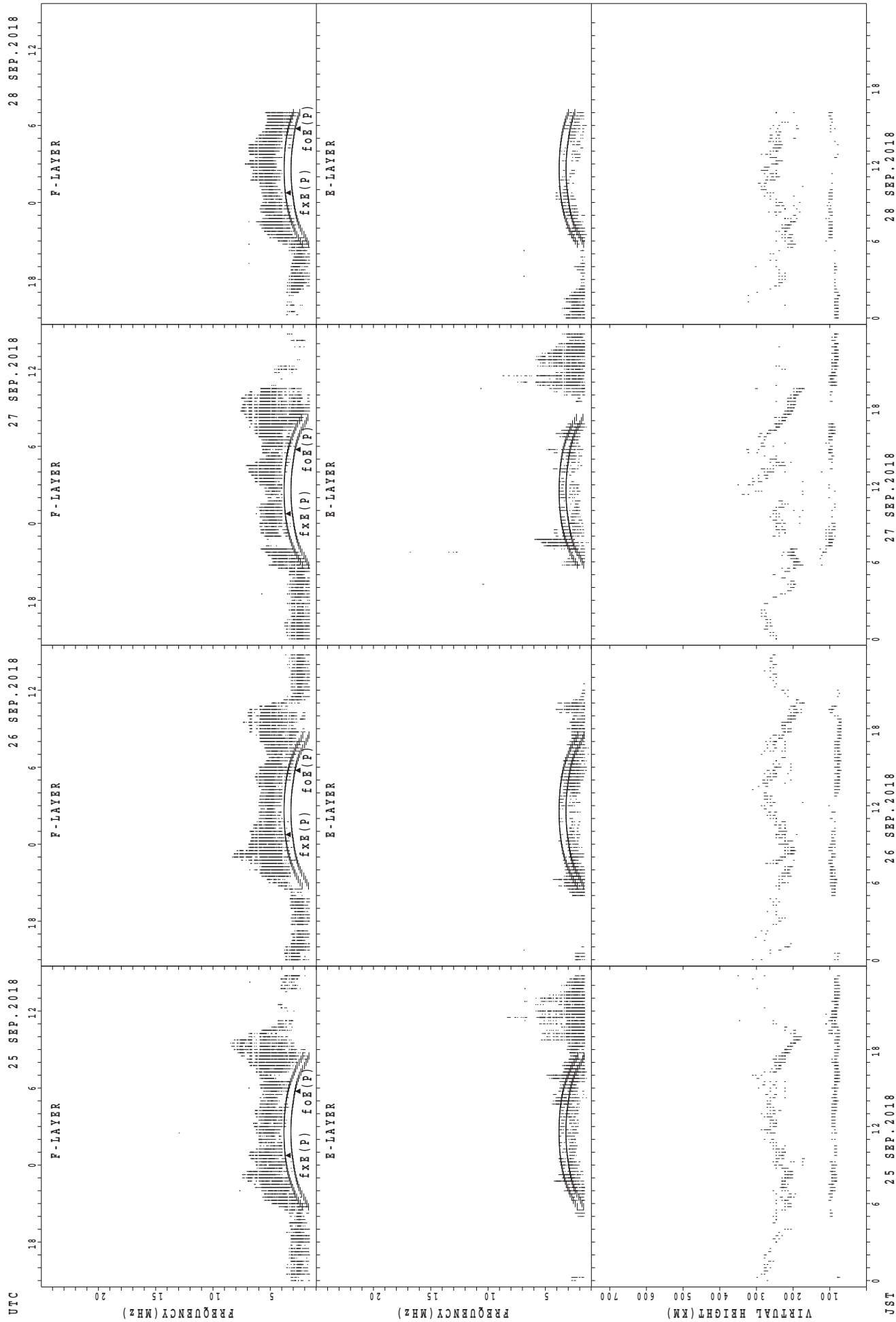
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



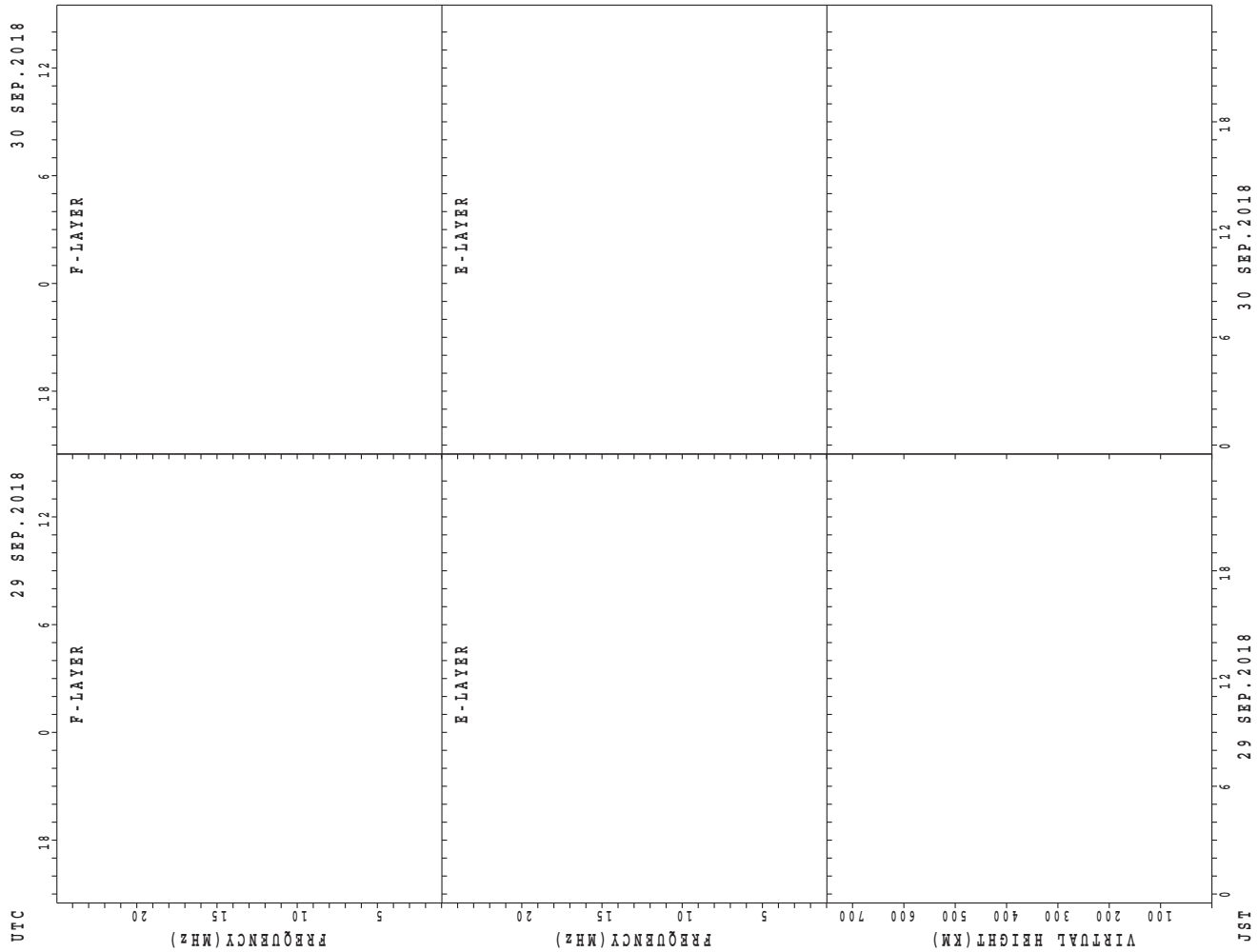
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
 f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Kokubunji



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

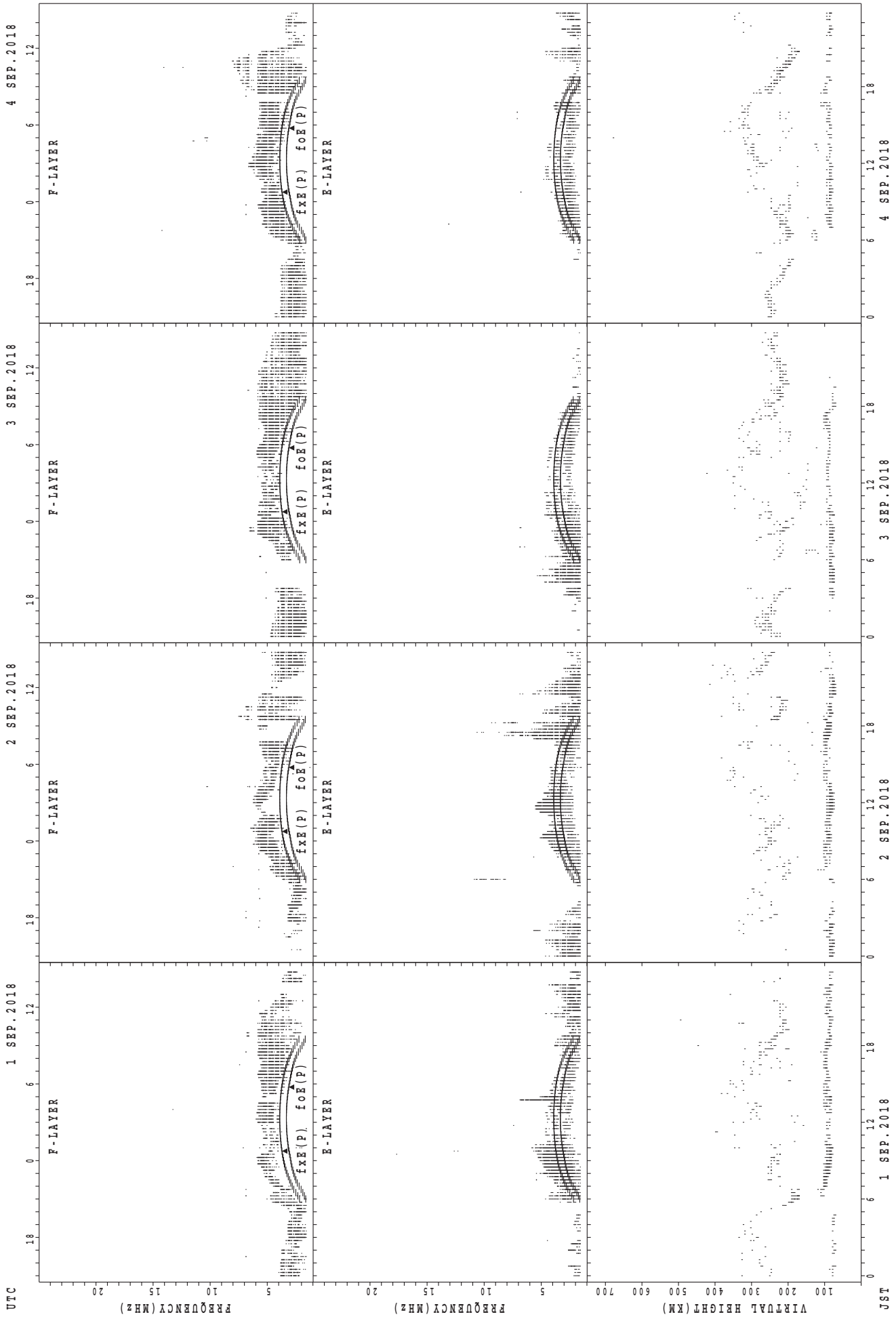
SUMMARY PLOTS AT Kokubunji



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

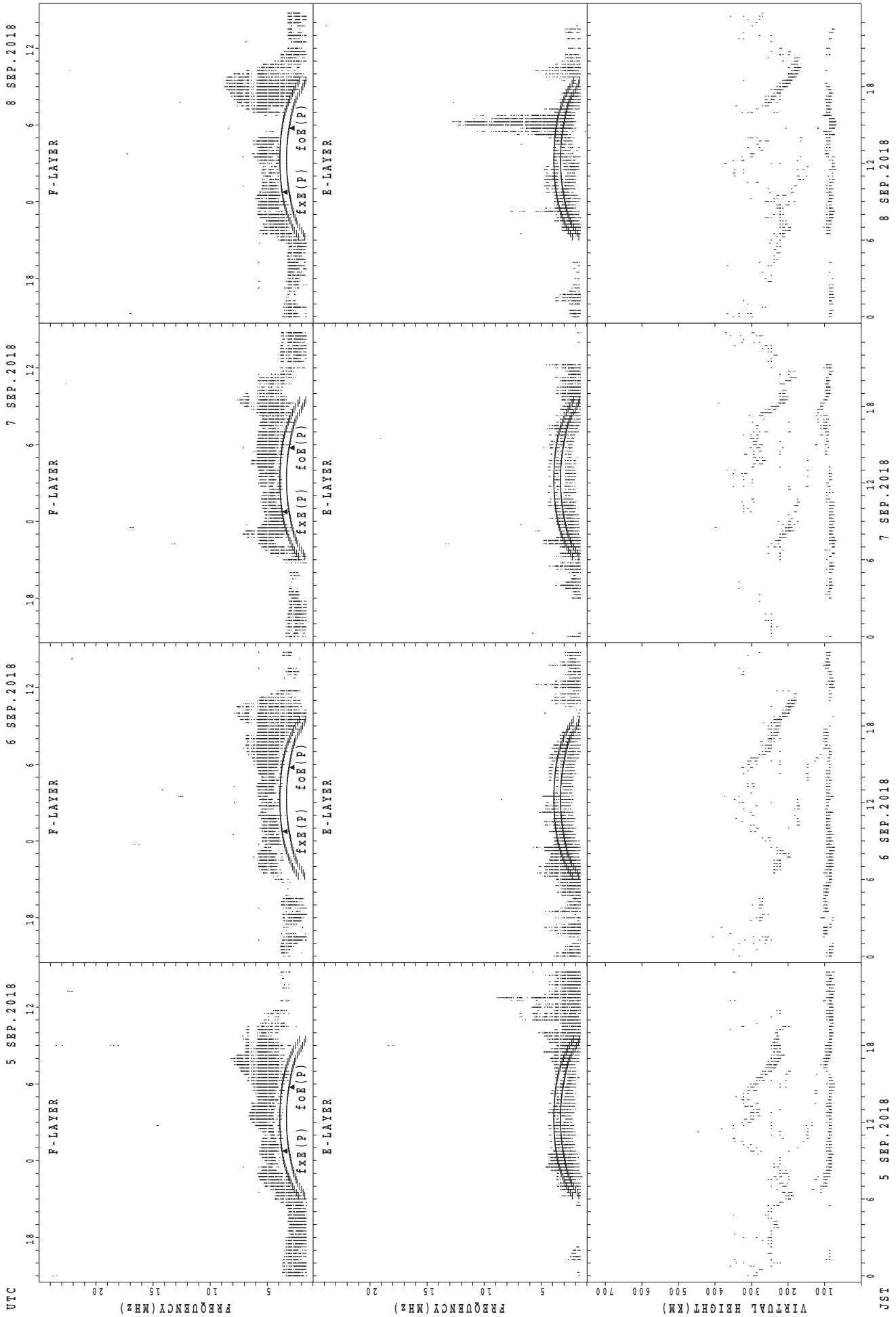


SUMMARY PLOTS AT Yamagawa



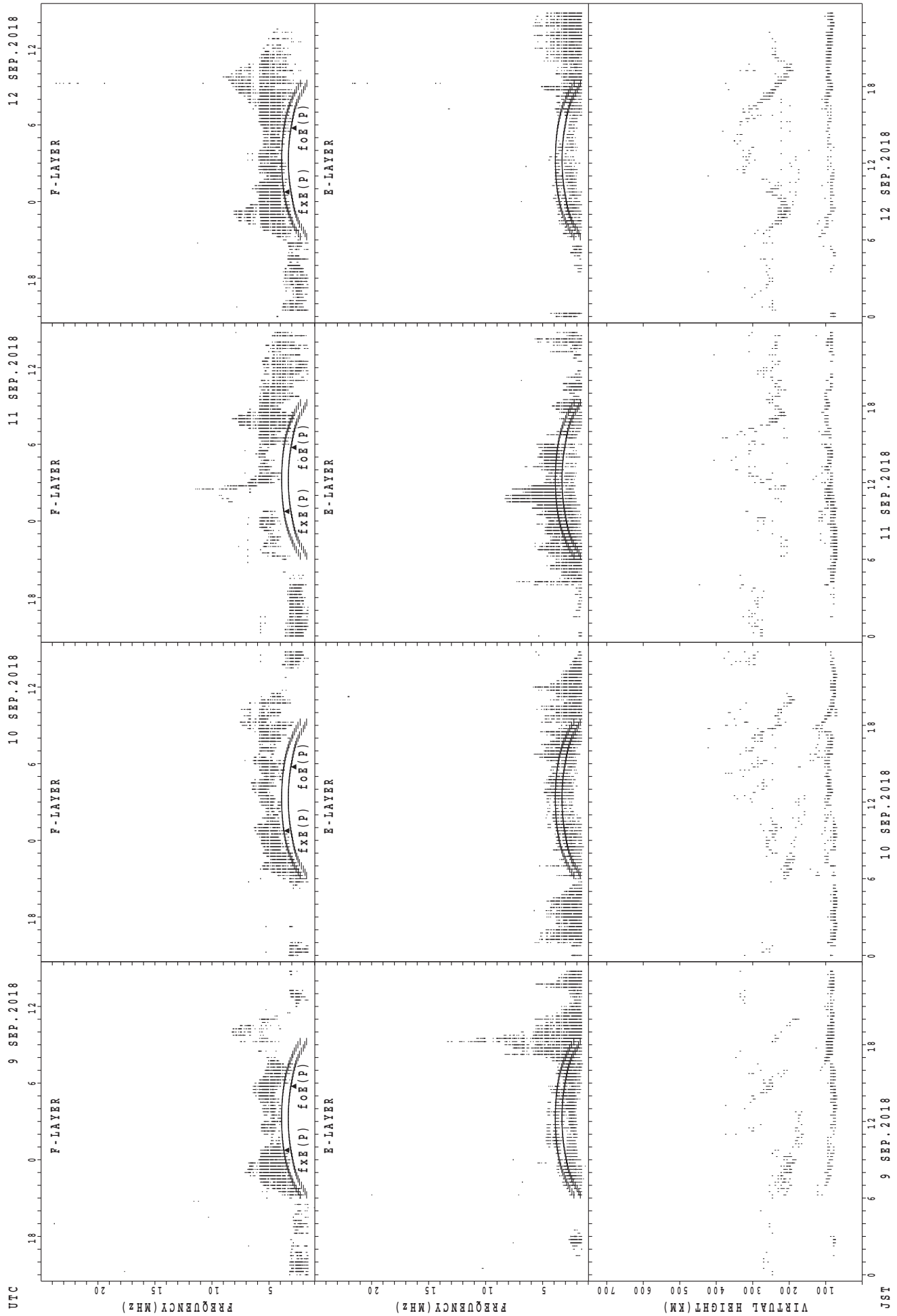
fxE(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



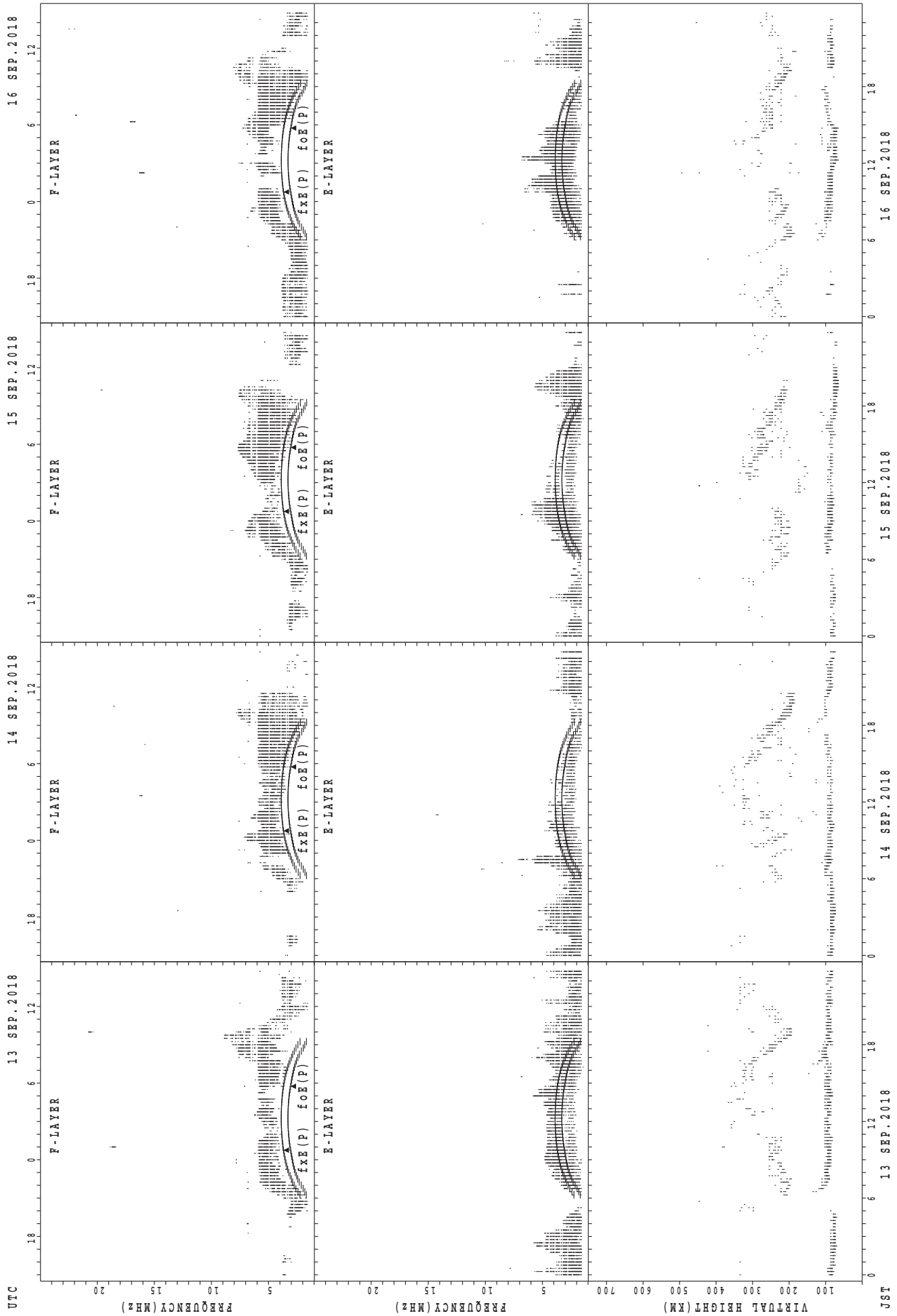
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



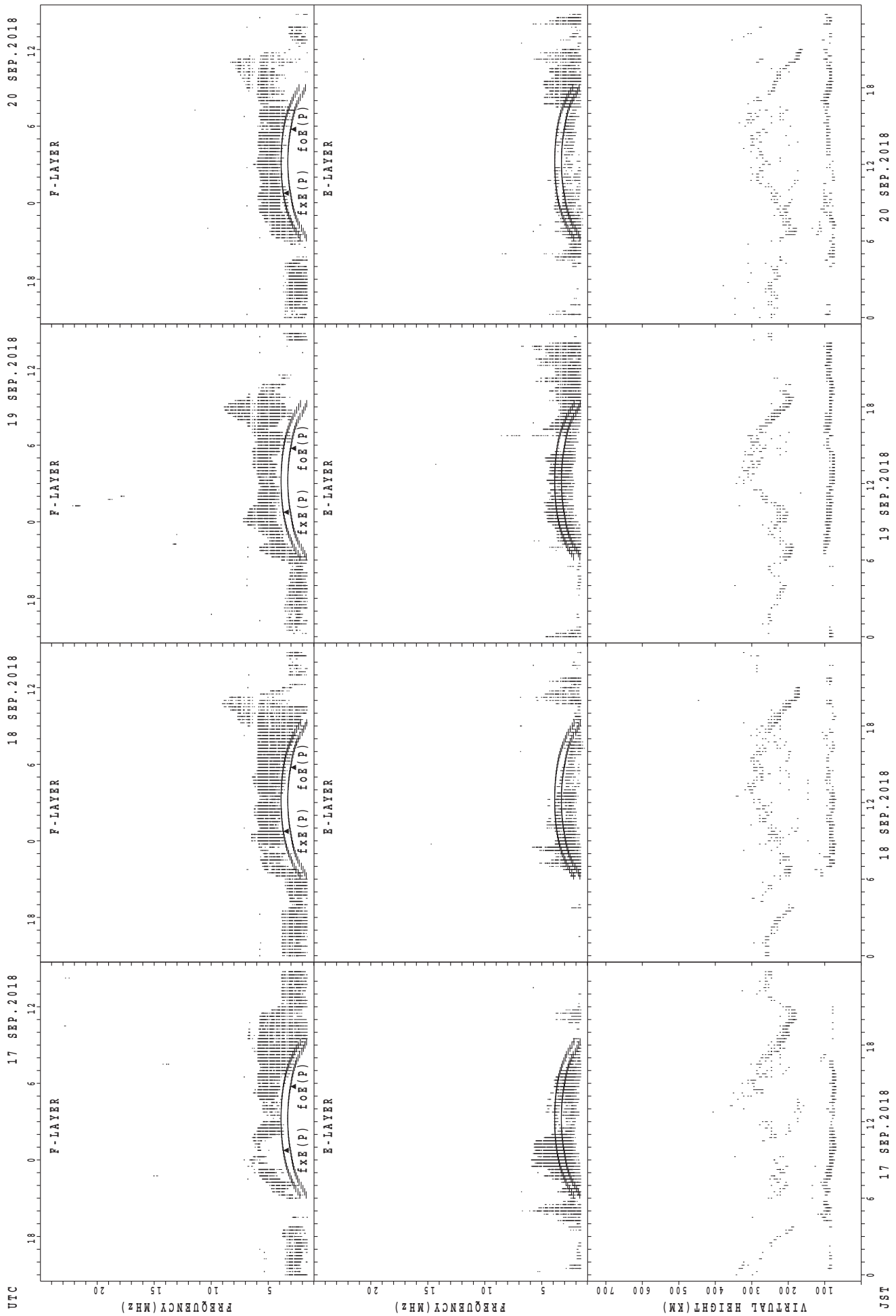
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



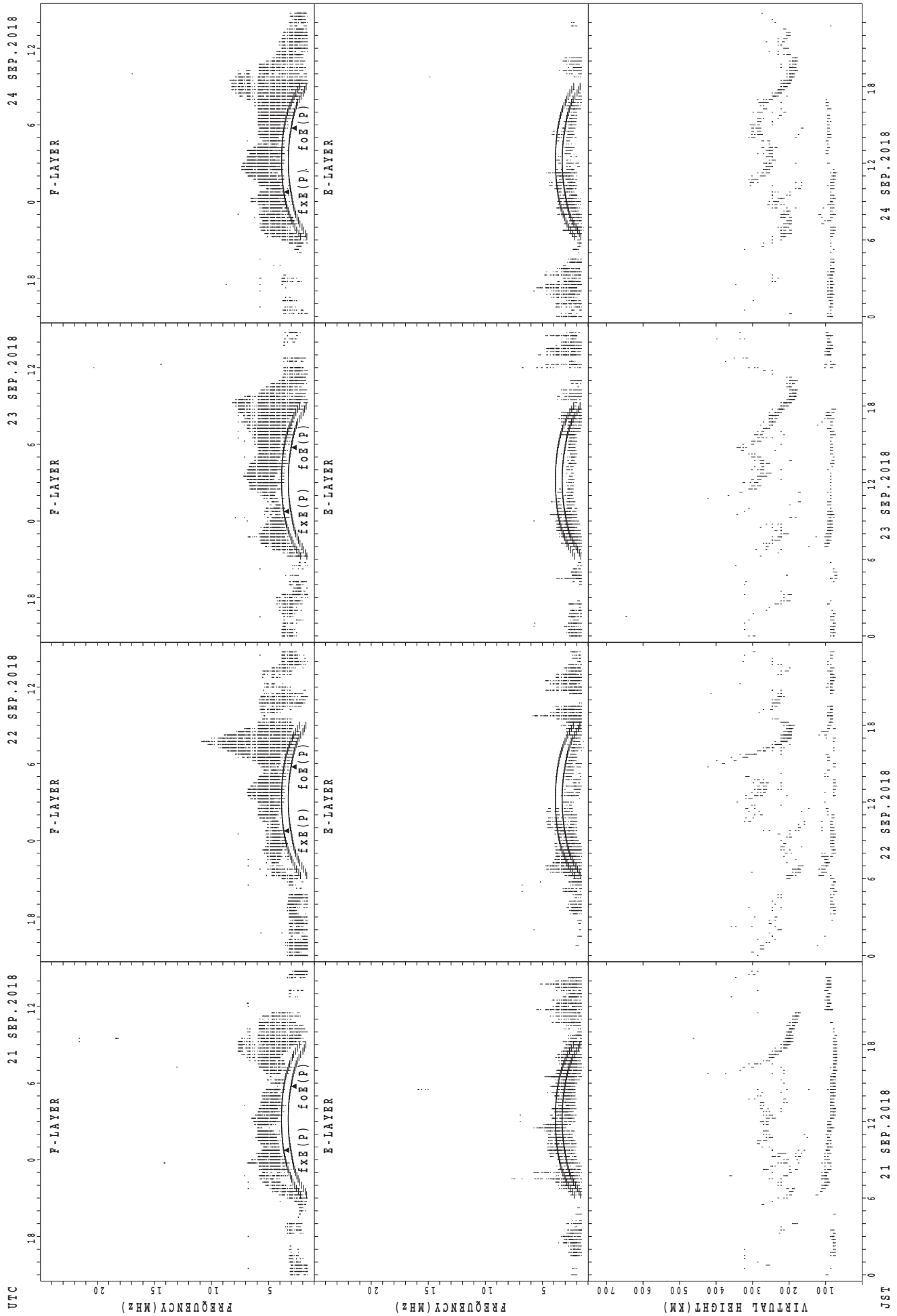
fxe(p); PREDICTED VALUE FOR fxe  
foe(p); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Yamagawa



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

SUMMARY PLOTS AT Yamagawa

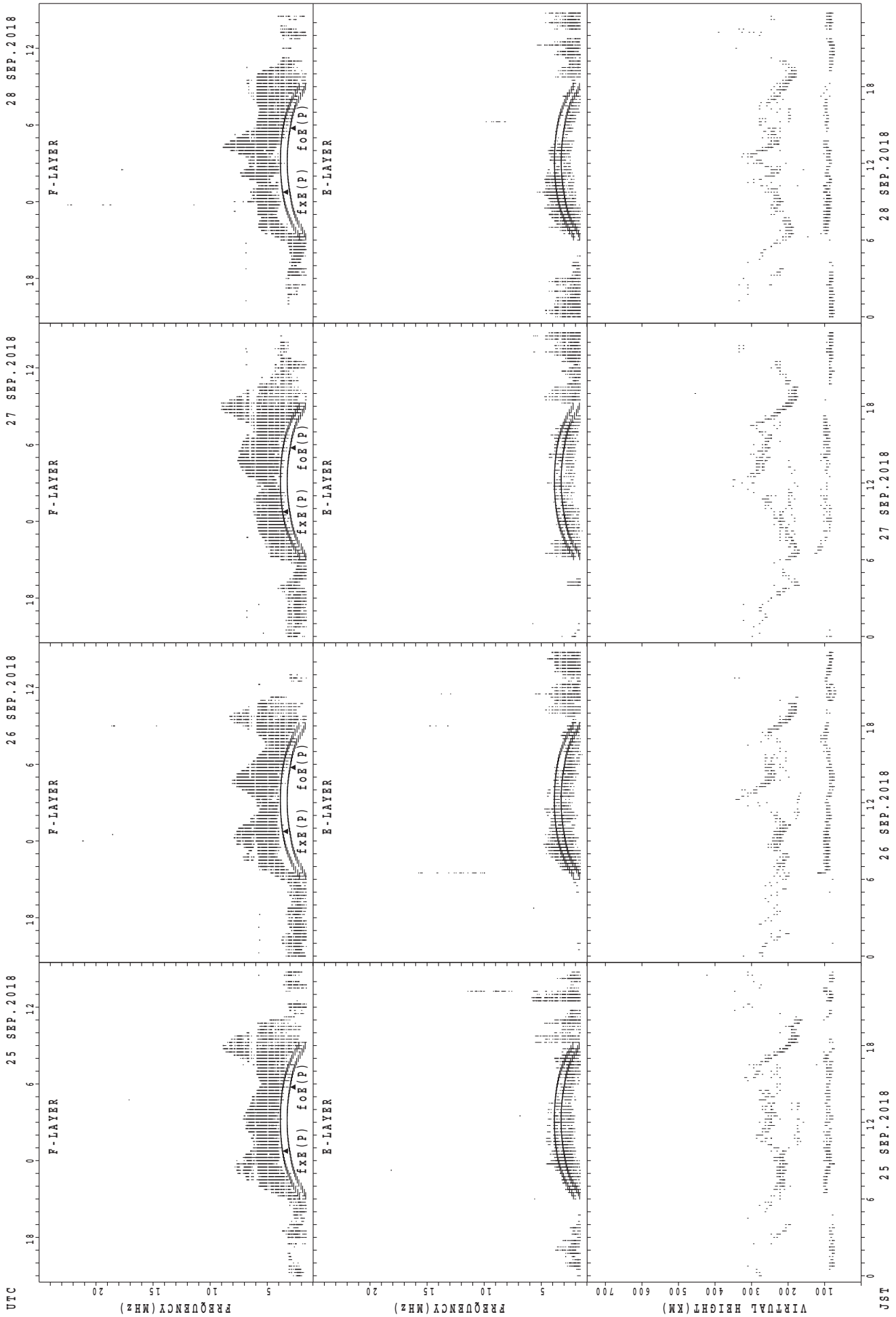


UTC  
JST

21 SEP.2018  
22 SEP.2018  
23 SEP.2018  
24 SEP.2018

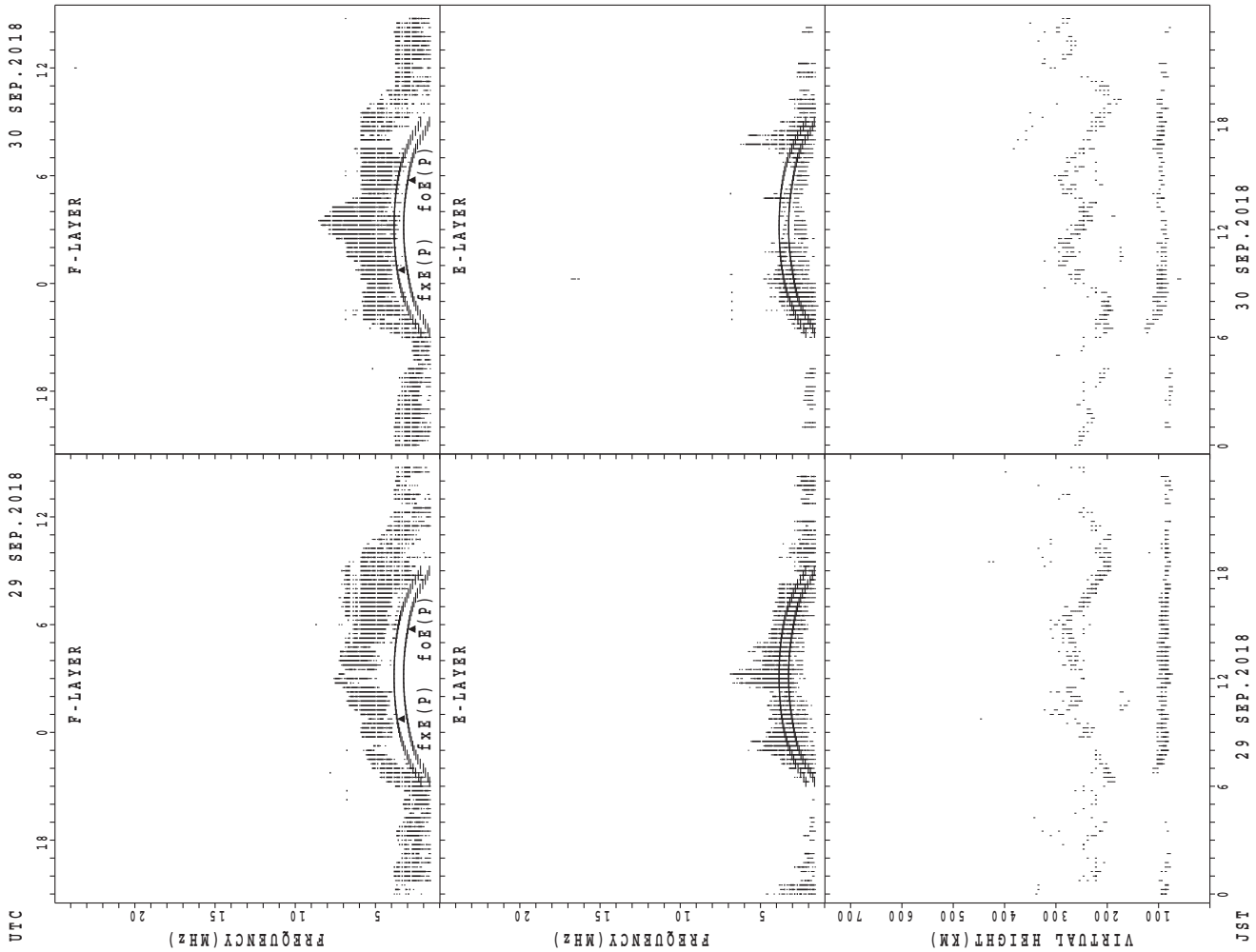
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Yamagawa



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

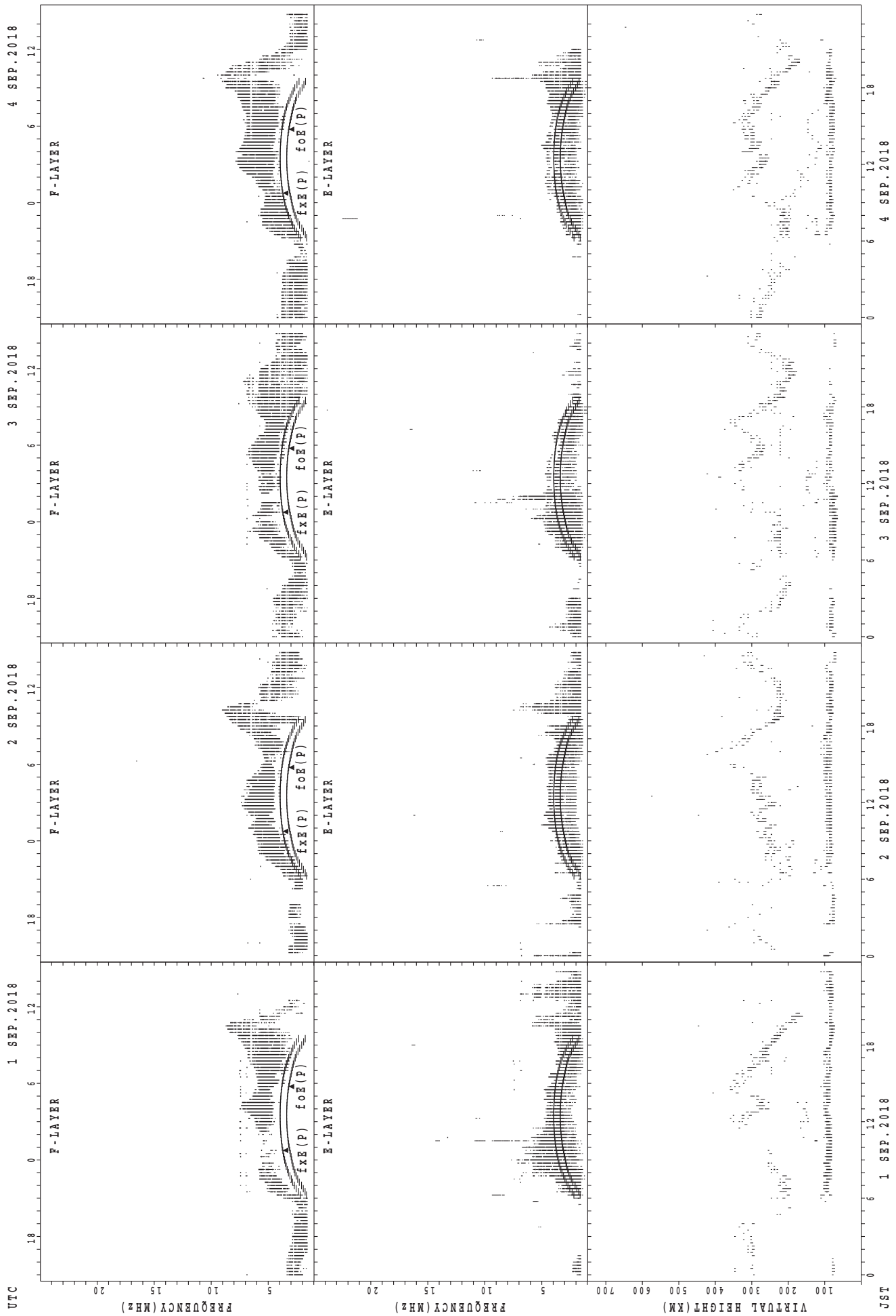
SUMMARY PLOTS AT Yamagawa



f\_xE(P); PREDICTED VALUE FOR f\_xE  
foE(P); PREDICTED VALUE FOR foE

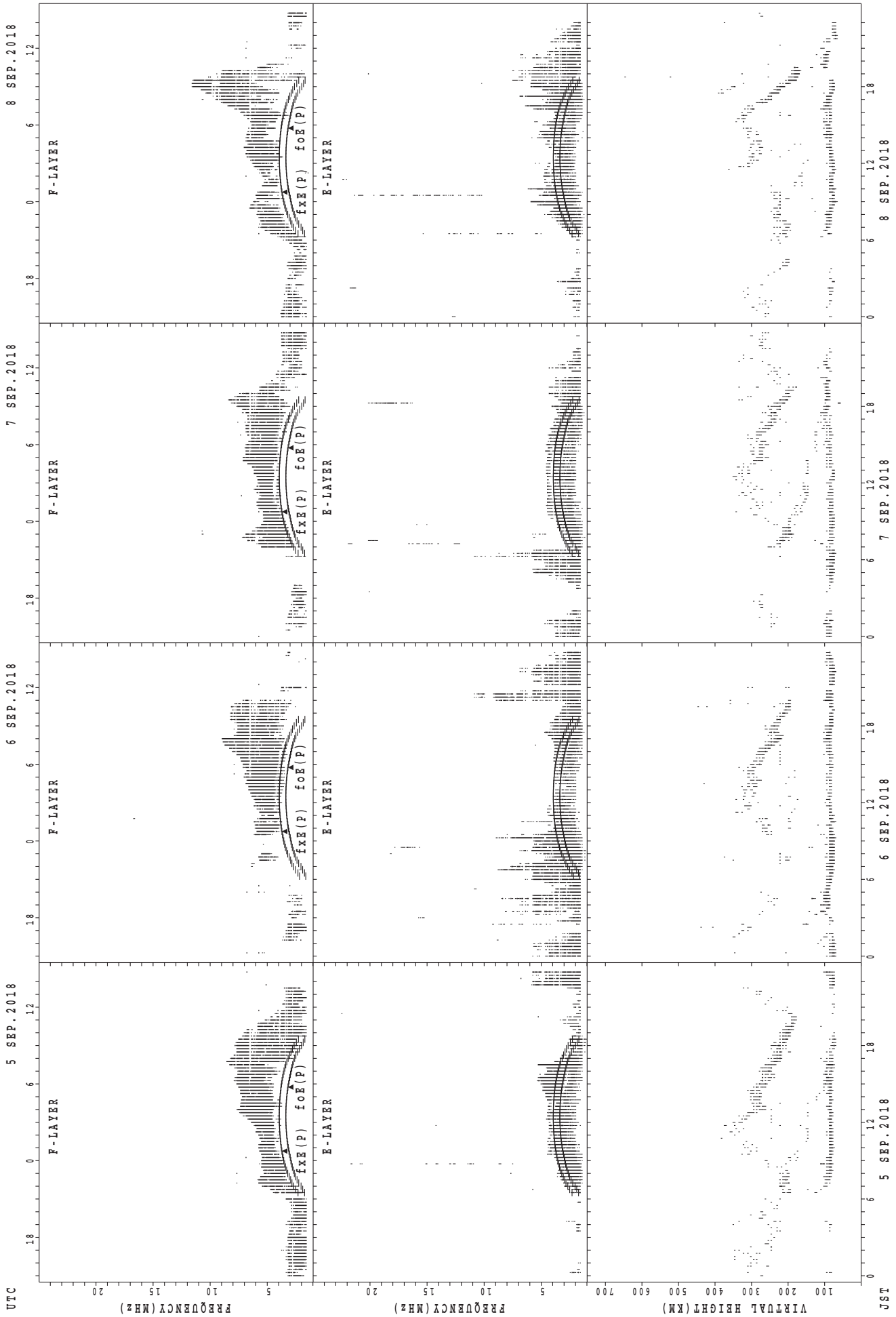


SUMMARY PLOTS AT Okinawa



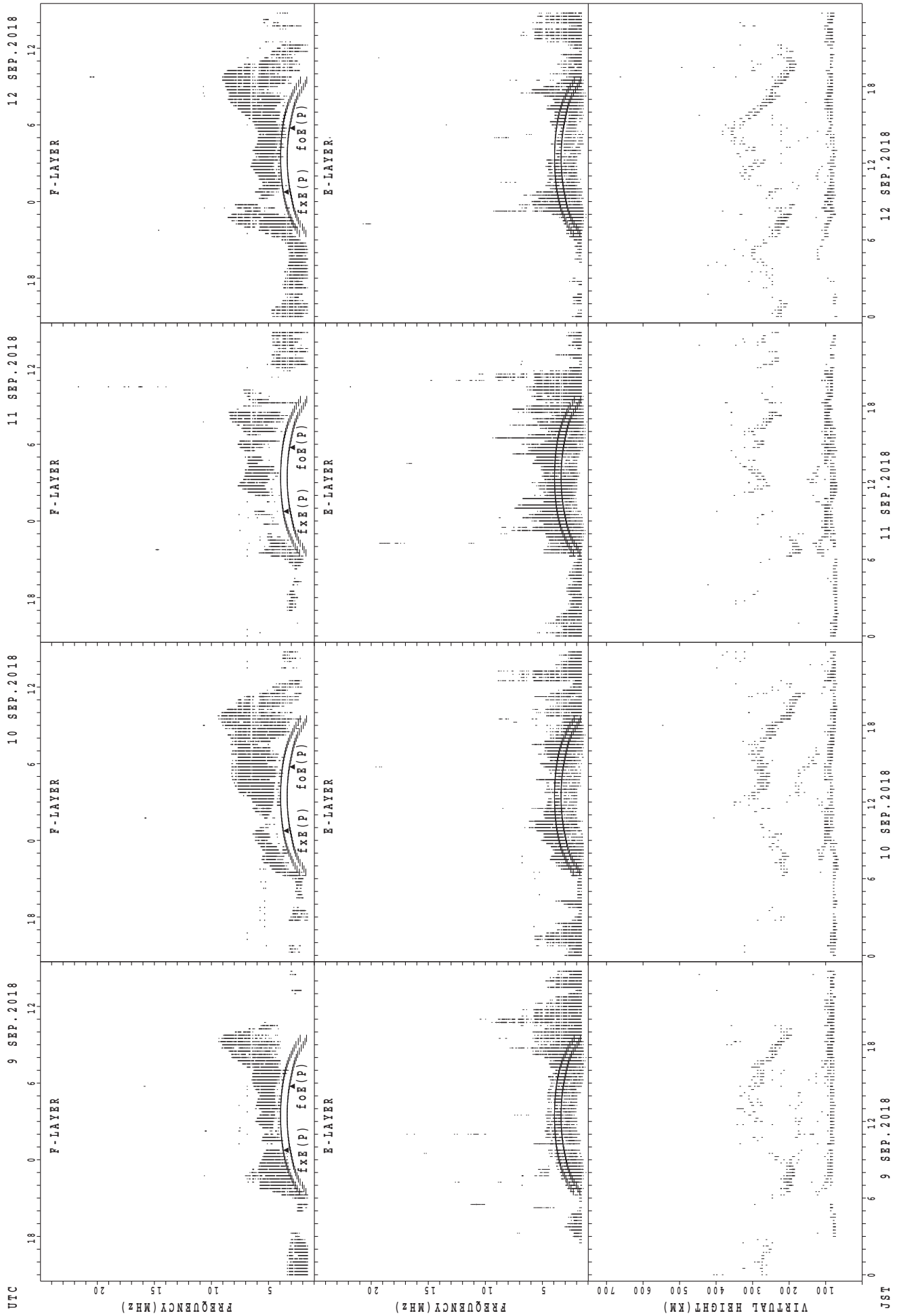
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



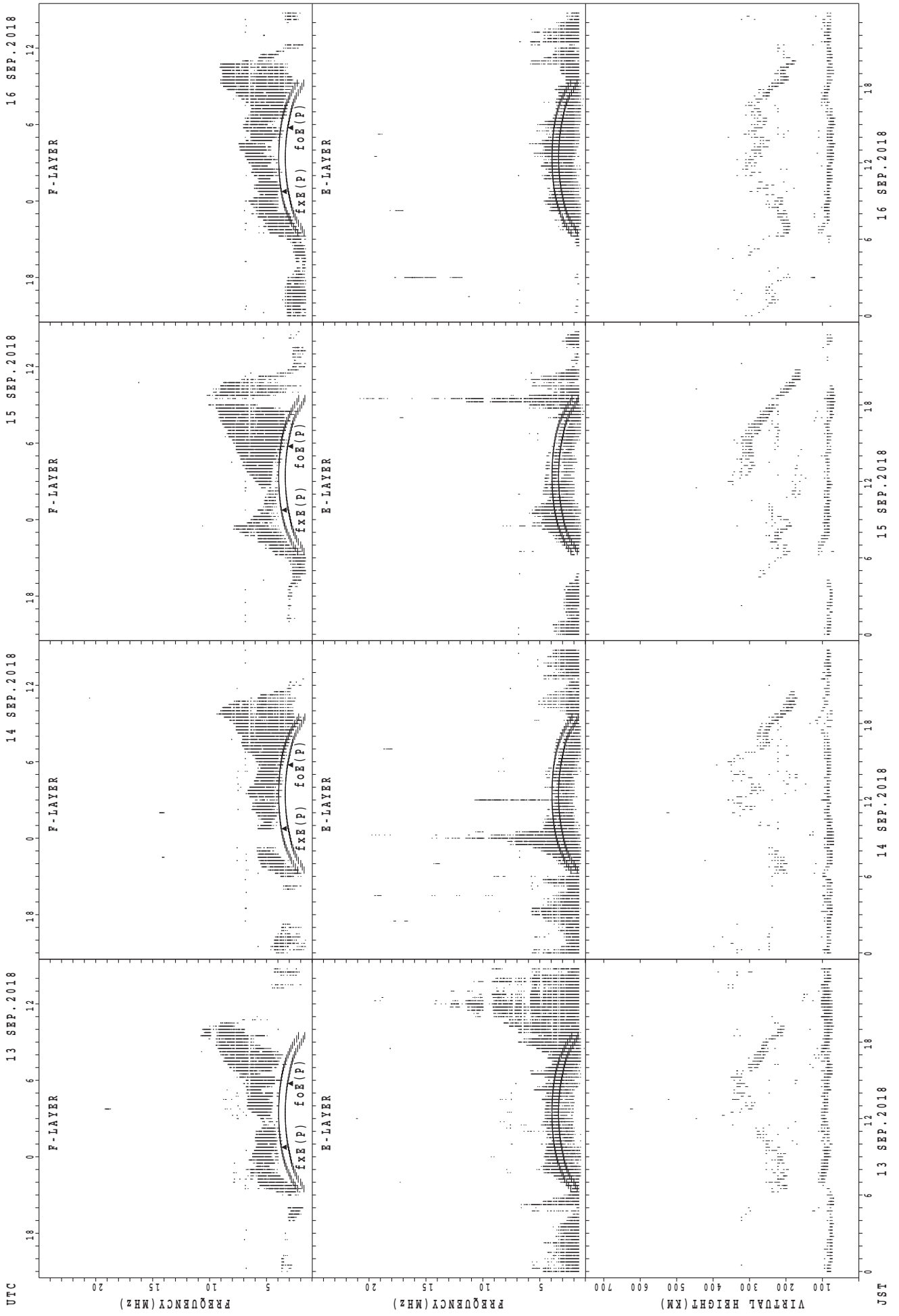
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
 f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Okinawa



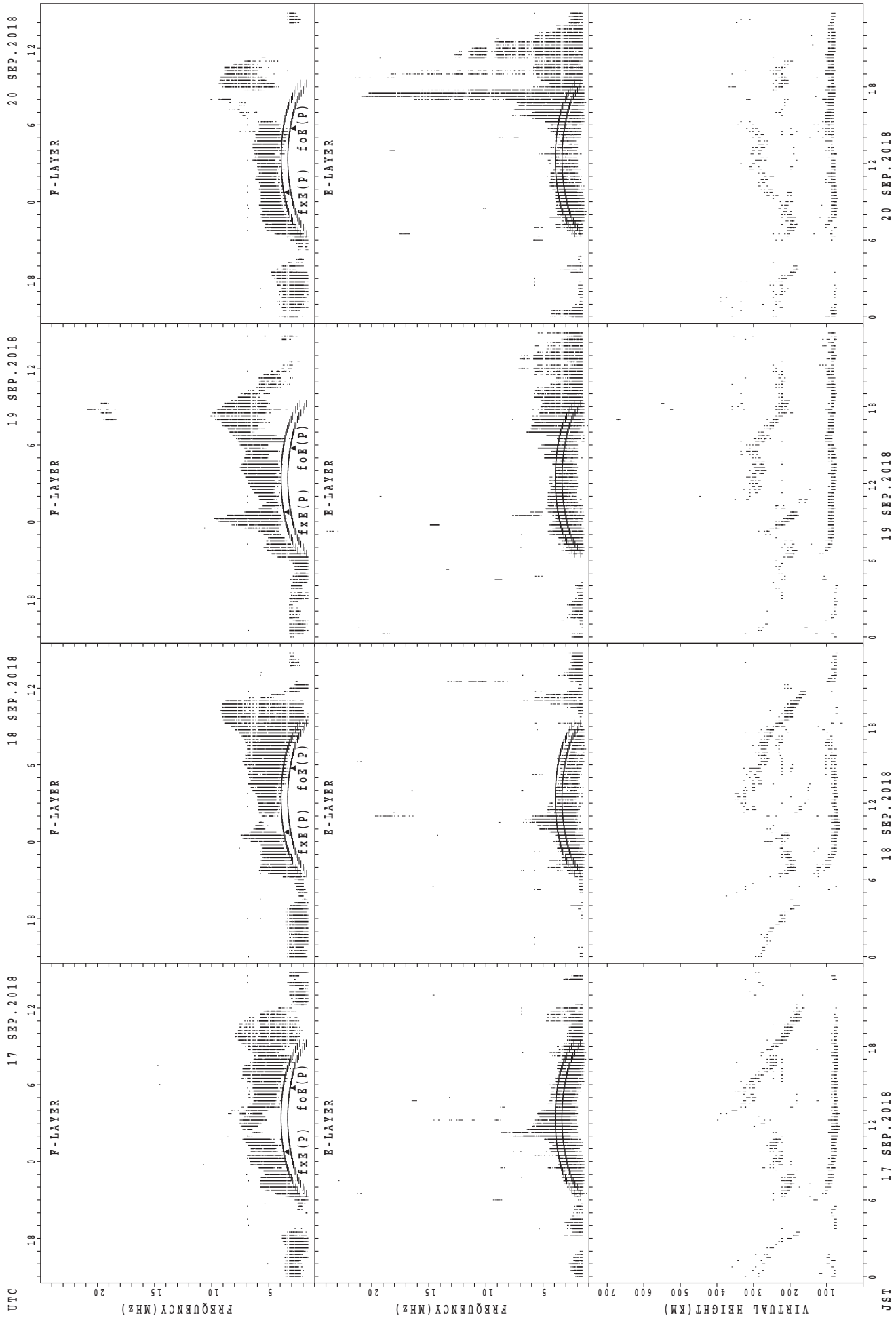
fxe(P); PREDICTED VALUE FOR fxe  
foe(P); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Okinawa



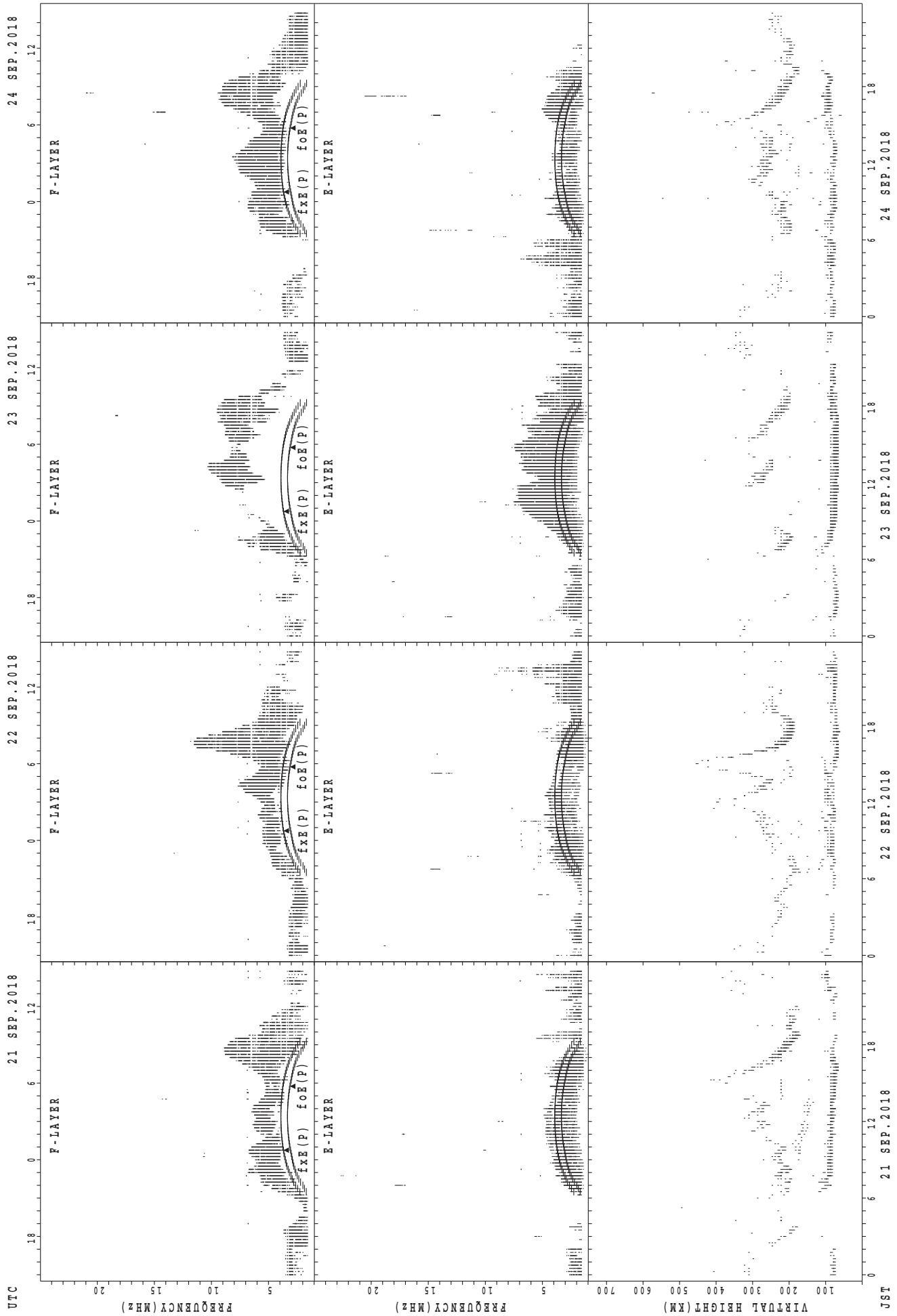
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Okinawa



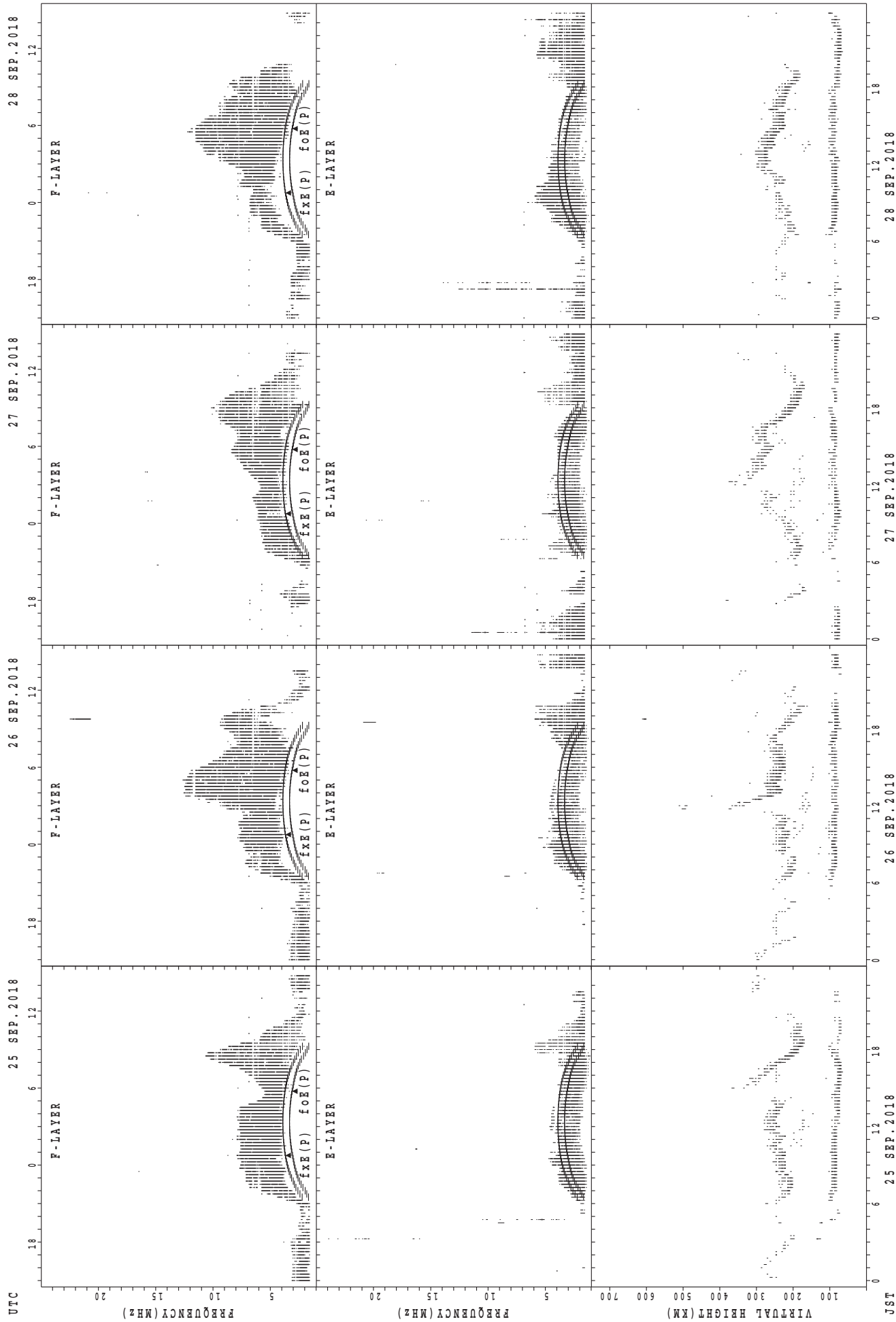
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
 f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Okinawa



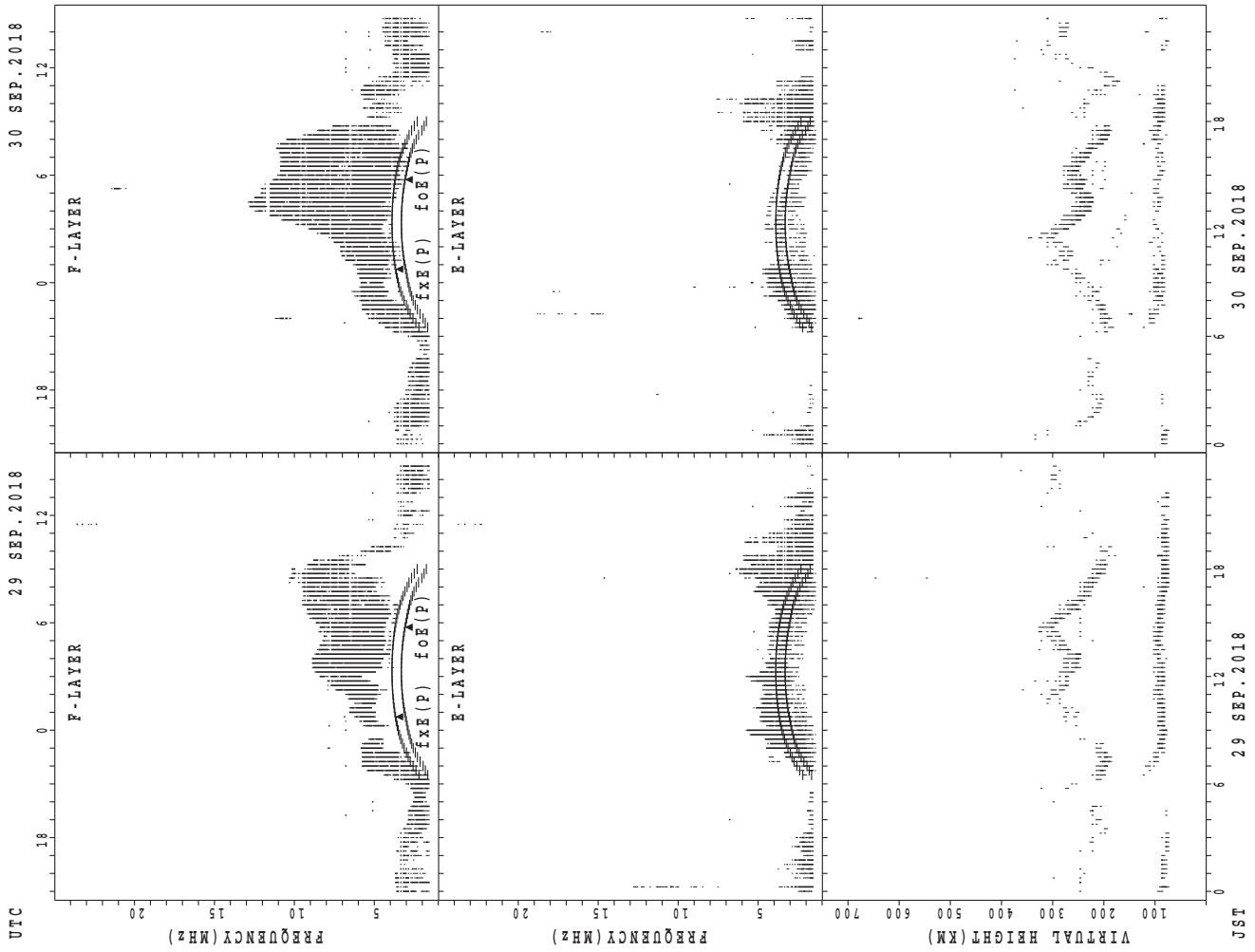
fxE(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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



MONTHLY MEDIANS OF h'F AND h'Es  
 SEP. 2018 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   |    | 1   | 3   | 6   | 6   | 4   | 4   | 1   | 1   | 1   | 1   |    |    |    |    |    |    |
| MED |    |    |    |    |    |    | 286 |    | 232 | 208 | 243 | 258 | 260 | 220 | 392 | 242 | 262 | 206 |    |    |    |    |    |    |
| U Q |    |    |    |    |    |    | 143 |    | 116 | 296 | 256 | 272 | 265 | 252 | 196 | 121 | 131 | 103 |    |    |    |    |    |    |
| L Q |    |    |    |    |    |    | 143 |    | 116 | 206 | 232 | 212 | 226 | 191 | 196 | 121 | 131 | 103 |    |    |    |    |    |    |

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 | 15  | 15 | 12 | 14 | 12 | 10 | 21  | 25  | 24  | 22 | 24  | 25  | 23  | 26  | 25  | 26  | 24  | 20 | 22 | 17 | 20 | 16 | 16 | 15 |
| MED | 83  | 81 | 83 | 88 | 88 | 90 | 107 | 101 | 95  | 92 | 91  | 97  | 93  | 95  | 95  | 96  | 107 | 95 | 91 | 89 | 89 | 89 | 89 | 85 |
| U Q | 103 | 83 | 85 | 89 | 97 | 99 | 135 | 113 | 113 | 99 | 133 | 136 | 155 | 121 | 145 | 119 | 116 | 96 | 99 | 94 | 94 | 97 | 91 | 99 |
| L Q | 81  | 77 | 78 | 81 | 80 | 83 | 93  | 90  | 89  | 89 | 89  | 89  | 85  | 89  | 88  | 83  | 95  | 87 | 87 | 84 | 83 | 86 | 84 | 81 |

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 |    |    |    |    |    |    |    |    | 8   | 14  | 8   | 6   | 5   | 8   | 3   | 3   | 1   | 4   | 6   | 8   |    |    | 1   |    |
| MED |    |    |    |    |    |    |    |    | 237 | 241 | 249 | 276 | 272 | 266 | 284 | 274 | 268 | 224 | 230 | 220 |    |    | 326 |    |
| U Q |    |    |    |    |    |    |    |    | 266 | 250 | 261 | 294 | 280 | 295 | 330 | 304 | 134 | 241 | 234 | 227 |    |    | 163 |    |
| L Q |    |    |    |    |    |    |    |    | 225 | 232 | 243 | 262 | 255 | 245 | 264 | 224 | 134 | 200 | 226 | 213 |    |    | 163 |    |

h'Es

|     | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08 | 09  | 10  | 11  | 12  | 13  | 14 | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
|-----|----|----|----|----|----|----|-----|-----|----|-----|-----|-----|-----|-----|----|-----|-----|-----|----|----|----|----|----|----|
| CNT | 17 | 16 | 14 | 15 | 14 | 10 | 22  | 27  | 26 | 25  | 24  | 22  | 19  | 20  | 26 | 25  | 26  | 23  | 19 | 18 | 26 | 21 | 16 | 16 |
| MED | 83 | 88 | 84 | 83 | 83 | 87 | 113 | 101 | 91 | 91  | 94  | 94  | 95  | 91  | 90 | 95  | 99  | 101 | 89 | 89 | 91 | 89 | 89 | 87 |
| U Q | 87 | 89 | 89 | 87 | 83 | 93 | 129 | 113 | 97 | 101 | 173 | 159 | 123 | 103 | 99 | 111 | 103 | 109 | 95 | 97 | 97 | 90 | 90 | 89 |
| L Q | 82 | 83 | 81 | 81 | 81 | 83 | 91  | 91  | 89 | 88  | 87  | 89  | 85  | 83  | 85 | 82  | 91  | 87  | 83 | 81 | 89 | 85 | 84 | 83 |

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 |    |    |    |    |    |    |    |    | 9   | 10  | 5   | 9   | 14  | 11  | 10  | 9   | 9   | 12  | 10  | 8   | 5   |    |    |    |
| MED |    |    |    |    |    |    |    |    | 218 | 236 | 242 | 276 | 280 | 288 | 292 | 306 | 282 | 259 | 229 | 224 | 210 |    |    |    |
| U Q |    |    |    |    |    |    |    |    | 228 | 242 | 255 | 297 | 312 | 300 | 298 | 322 | 313 | 267 | 250 | 231 | 214 |    |    |    |
| L Q |    |    |    |    |    |    |    |    | 214 | 224 | 216 | 246 | 254 | 264 | 260 | 262 | 275 | 245 | 214 | 211 | 199 |    |    |    |

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 | 16 | 13 | 14 | 11 | 15  | 11 | 11  | 30  | 30  | 30 | 30 | 29  | 29  | 30  | 29  | 30  | 29  | 28  | 23 | 22 | 22 | 23 | 21 | 18 |
| MED | 87 | 83 | 84 | 83 | 85  | 81 | 87  | 98  | 92  | 89 | 91 | 95  | 107 | 92  | 93  | 95  | 95  | 97  | 91 | 89 | 89 | 89 | 89 | 89 |
| U Q | 89 | 90 | 89 | 89 | 101 | 95 | 121 | 119 | 101 | 95 | 99 | 167 | 172 | 145 | 130 | 101 | 110 | 102 | 99 | 95 | 99 | 95 | 91 | 91 |
| L Q | 83 | 80 | 81 | 81 | 81  | 77 | 83  | 93  | 87  | 87 | 87 | 91  | 89  | 89  | 87  | 89  | 91  | 91  | 89 | 85 | 87 | 87 | 86 | 87 |

MONTHLY MEDIANS OF h'F AND h'Es  
 SEP. 2018 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 |    |    |    |    |    |    |    |    | 9   | 9   | 10  | 7   | 18  | 24  | 19  | 16  | 17  | 23  | 25  | 19  | 5   |    |    |    |
| MED |    |    |    |    |    |    |    |    | 218 | 228 | 261 | 262 | 280 | 273 | 286 | 273 | 266 | 240 | 230 | 218 | 202 |    |    |    |
| U Q |    |    |    |    |    |    |    |    | 234 | 233 | 274 | 272 | 314 | 306 | 304 | 299 | 302 | 256 | 247 | 232 | 226 |    |    |    |
| L Q |    |    |    |    |    |    |    |    | 207 | 217 | 228 | 236 | 270 | 256 | 260 | 259 | 248 | 222 | 209 | 208 | 195 |    |    |    |

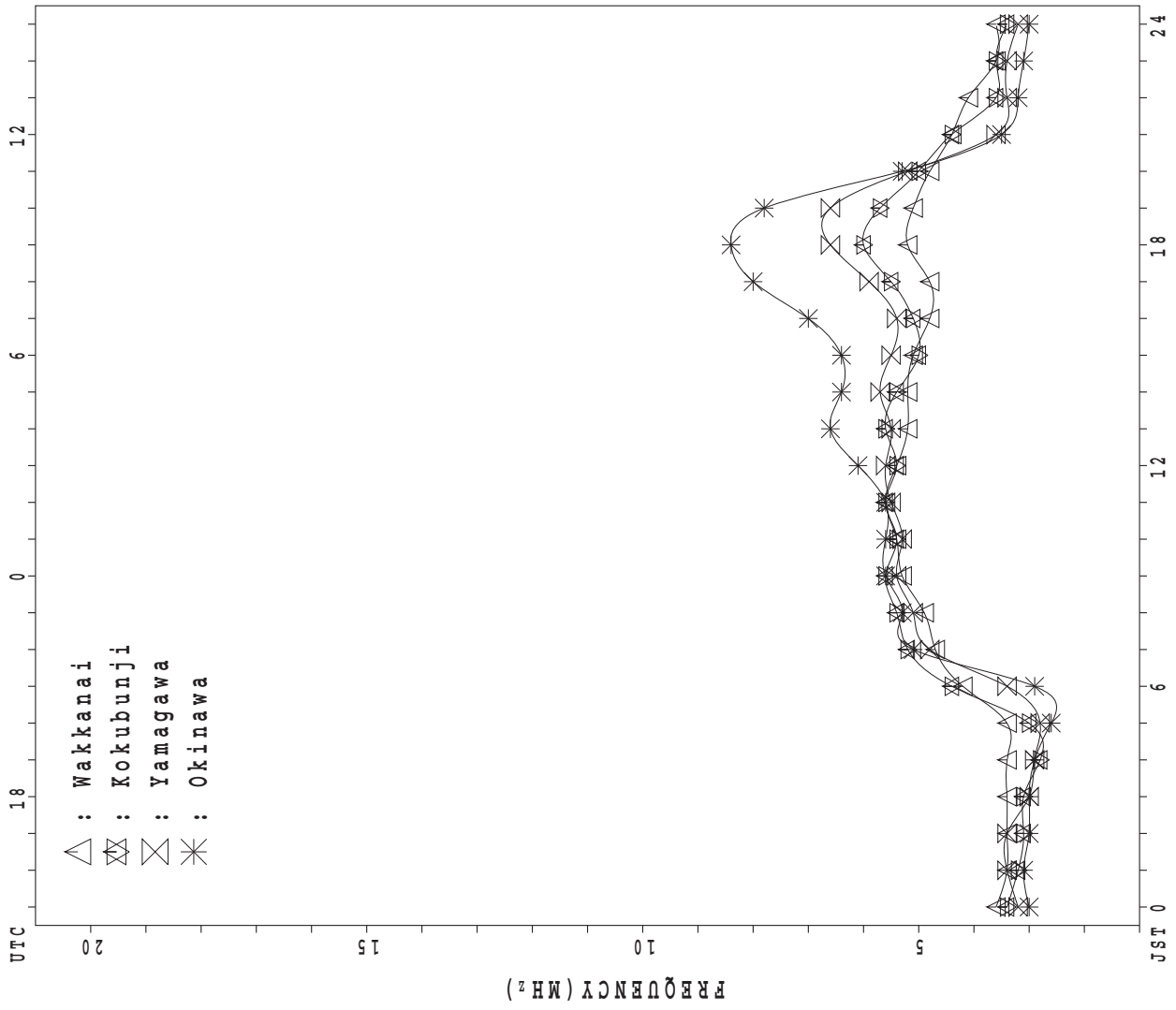
h'Es

|     | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08  | 09 | 10 | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
|-----|----|----|----|----|----|----|-----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|
| CNT | 22 | 17 | 14 | 17 | 13 | 6  | 11  | 30  | 30  | 30 | 29 | 30  | 30  | 30  | 30  | 30  | 30  | 29  | 28 | 28 | 29 | 23 | 20 | 22 |
| MED | 86 | 83 | 84 | 81 | 81 | 86 | 89  | 107 | 93  | 89 | 89 | 90  | 104 | 95  | 95  | 91  | 95  | 95  | 87 | 87 | 89 | 89 | 87 | 87 |
| U Q | 91 | 89 | 87 | 89 | 94 | 95 | 111 | 125 | 107 | 97 | 96 | 107 | 161 | 155 | 131 | 113 | 107 | 101 | 91 | 93 | 99 | 93 | 92 | 89 |
| L Q | 83 | 81 | 81 | 79 | 78 | 81 | 87  | 95  | 89  | 85 | 83 | 87  | 91  | 83  | 89  | 89  | 89  | 87  | 82 | 81 | 83 | 85 | 83 | 81 |

MONTHLY MEDIANS PLOT OF fOF2

SEP. 2018

AUTOMATIC SCALING



# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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>40 | X<br>38 | X<br>35 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>52 | X<br>50 | X<br>48 | X<br>48 |         |
| 2      | X<br>42 | X<br>37 | X<br>37 | X<br>36 | 36      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>51 | X<br>50 | X<br>48 | X<br>44 |         |
| 3      | X<br>41 | X<br>40 | X<br>40 | X<br>40 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>53 | X<br>49 | X<br>46 | X<br>45 |         |
| 4      | X<br>44 | X<br>41 | X<br>40 | X<br>40 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>58 | X<br>54 | X<br>49 | X<br>44 |         |
| 5      | X<br>44 | X<br>42 | X<br>41 | X<br>44 | 47      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>65 | X<br>57 | X<br>52 | X<br>43 |         |
| 6      | X<br>46 | X<br>46 | X<br>46 | X<br>45 | C       | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C       | C       | C       | C       |         |
| 7      | C       | C       | C       | C       | C       | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C       | C       | C       | C       |         |
| 8      | C       | C       | C       | C       | C       | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C       | C       | C       | C       |         |
| 9      | C       | C       | C       | C       | C       | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C       | C       | C       | C       |         |
| 10     | C       | C       | C       | C       | C       | C  | C  | C  | C  | C  | C  |    |    |    |    |    |    |    |    |    | X<br>53 | X<br>49 | X<br>45 | X<br>44 |         |
| 11     | X<br>39 | X<br>39 | X<br>40 | X<br>40 | X<br>41 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>65 | X<br>66 | X<br>52 | X<br>51 |         |
| 12     | X<br>39 | X<br>38 | X<br>33 | X<br>39 | A       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>63 | X<br>60 | X<br>56 | X<br>55 |         |
| 13     | X<br>43 | X<br>37 | X<br>38 | X<br>36 | X<br>37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>55 | X<br>54 | X<br>54 | X<br>47 |         |
| 14     | X<br>50 | X<br>46 | X<br>39 | X<br>39 | X<br>41 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>53 | X<br>51 | X<br>50 | X<br>40 |         |
| 15     | X<br>38 | X<br>39 | X<br>39 | X<br>37 | X<br>37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>53 | X<br>47 | X<br>45 | X<br>40 |         |
| 16     | X<br>39 | X<br>39 | X<br>37 | X<br>37 | X<br>36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>55 | X<br>51 | X<br>48 | X<br>44 |         |
| 17     | A       | A       | X<br>38 | X<br>38 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>57 | X<br>51 | X<br>48 | X<br>49 |         |
| 18     | X<br>43 | X<br>40 | X<br>40 | X<br>38 | X<br>37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>61 | X<br>58 | X<br>62 | X<br>58 |         |
| 19     | X<br>38 | X<br>38 | X<br>40 | X<br>39 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>64 | X<br>62 | X<br>45 | X<br>39 |         |
| 20     | X<br>39 | X<br>41 | X<br>42 | X<br>42 | X<br>40 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>57 | X<br>56 | X<br>57 | X<br>51 |         |
| 21     | X<br>39 | X<br>40 | X<br>40 | X<br>40 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>59 | X<br>56 | X<br>50 | X<br>47 |         |
| 22     | X<br>40 | X<br>41 | X<br>41 | X<br>41 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>67 | X<br>62 | X<br>56 | X<br>51 |         |
| 23     |         | X<br>51 | X<br>38 | X<br>33 | X<br>34 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>49 | X<br>45 | X<br>45 | X<br>43 |         |
| 24     | X<br>40 | X<br>40 | X<br>50 | X<br>52 | X<br>40 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>64 | X<br>63 | X<br>54 | X<br>39 |         |
| 25     | X<br>38 | X<br>38 | X<br>39 | X<br>39 | X<br>38 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>56 | X<br>52 | X<br>49 | X<br>45 |         |
| 26     | X<br>40 | X<br>35 | X<br>36 | X<br>36 | X<br>37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>57 | X<br>57 | X<br>51 | X<br>46 |         |
| 27     | X<br>43 | X<br>42 | X<br>41 | X<br>41 | X<br>41 | 48 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>51 | X<br>49 | X<br>53 | X<br>42 |         |
| 28     | X<br>41 | X<br>40 | X<br>44 | X<br>41 | X<br>43 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>49 | X<br>49 | X<br>52 | X<br>45 |         |
| 29     | X<br>48 | X<br>47 | X<br>45 | X<br>44 | X<br>45 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>54 | X<br>51 | X<br>46 | X<br>46 |         |
| 30     | X<br>45 | X<br>40 | X<br>39 | X<br>46 | X<br>39 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>46 | X<br>48 | X<br>58 | X<br>51 |         |
| 31     |         |         |         |         |         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |         |         |         |         |         |
|        | 00      | 01      | 02      | 03      | 04      | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20      | 21      | 22      | 23      |         |
| CNT    | 24      | 25      | 26      | 26      | 21      | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 20      | 26      | 25      | 26      | 25      |
| MED    | X<br>41 | X<br>40 | X<br>40 | X<br>40 | X<br>39 | 48 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>56 | X<br>53 | X<br>51 | X<br>47 | X<br>43 |
| U Q    | X<br>44 | X<br>42 | X<br>41 | X<br>41 | X<br>41 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>62 | X<br>58 | X<br>55 | X<br>51 | X<br>46 |
| L Q    | X<br>39 | X<br>38 | X<br>38 | X<br>37 | X<br>37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>53 | X<br>51 | X<br>48 | X<br>45 | X<br>40 |

SEP. 2018 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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

| D \ H | 00              | 01              | 02 | 03              | 04              | 05              | 06 | 07 | 08 | 09              | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18  | 19 | 20 | 21              | 22              | 23              |
|-------|-----------------|-----------------|----|-----------------|-----------------|-----------------|----|----|----|-----------------|----|----|----|----|----|----|----|----|-----|----|----|-----------------|-----------------|-----------------|
| 1     | 35              | 33              | 31 | 28              | 26              | 32              | 35 | 38 | 44 | 44              | 51 | 51 | 47 | 47 | 48 | 47 | 45 | 41 | 40  | 50 | 45 | 43              | 41              | 38 <sup>F</sup> |
| 2     | 35              | 30              | 30 | 29              | 27 <sup>F</sup> | 32              | 44 | 44 | 47 | 52              | 46 | 48 | 48 | 46 | 48 | 48 | 51 | 45 | 42  | 47 | 44 | 43              | 41              | 37              |
| 3     | 34              | 33              | 33 | 33              | 32              | 38              | 40 | 42 | 44 | 48              | 56 | 51 | 49 | 51 | 45 | 52 | 46 | 45 | 42  | 48 | 46 | 42              | 39              | 38              |
| 4     | 37              | 34              | 33 | 33              | 32              | 34              | 44 | 48 | 50 | 50              | 44 | 50 | 50 | 52 | 50 | 47 | 41 | 46 | 50  | 58 | 51 | 47              | 42              | 37              |
| 5     | 37              | 35              | 34 | 33 <sup>F</sup> | 33 <sup>F</sup> | 34              | 42 | 40 | 42 | 45              | 45 | 47 | 49 | 48 | 48 | 49 | 47 | 47 | 54  | 60 | 58 | 50              | 45              | 36              |
| 6     | 39              | 39              | 39 | 38              | C               | C               | C  | C  | C  | C               | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C  | C               | C               | C               |
| 7     | C               | C               | C  | C               | C               | C               | C  | C  | C  | C               | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C  | C               | C               | C               |
| 8     | C               | C               | C  | C               | C               | C               | C  | C  | C  | C               | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C  | C               | C               | C               |
| 9     | C               | C               | C  | C               | C               | C               | C  | C  | C  | C               | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C  | C               | C               | C               |
| 10    | C               | C               | C  | C               | C               | C               | C  | C  | C  | C               | C  | C  | C  | C  | C  | C  | C  | C  | C   | C  | C  | C               | C               | 32 <sup>F</sup> |
| 11    | 32              | 32              | 33 | 33              | 34              | 36              | 38 | 38 | 47 | 51              | 47 | 50 | 53 | 47 | 47 | 45 | 52 | 51 | 58  | 58 | 59 | 45              | 44              | 35              |
| 12    | 32              | 31              | 27 | 32              | A               | 30              | 39 | 48 | A  | R               | E  | G  | E  | G  | E  | G  | 44 | 42 | 151 | 50 | 56 | 53              | 48              | 38              |
| 13    | 36              | 30              | 31 | 29              | 30              | 30              | 38 | 48 | 47 | 46              | 52 | 52 | 48 | 48 | 46 | 46 | 44 | 46 | 48  | 48 | 47 | 47 <sup>D</sup> | 40              | 39              |
| 14    | 38 <sup>F</sup> | 39              | 32 | 32              | 34              | 29              | 40 | 47 | 58 | 46              | 51 | 50 | 50 | A  | 54 | 48 | 44 | 43 | 44  | 46 | 44 | 42              | 33 <sup>A</sup> |                 |
| 15    | 32              | 32              | 32 | 30              | 30              | 32              | 36 | 46 | 45 | 50              | 55 | 48 | A  | 48 | 50 | 53 | 51 | A  | 49  | 46 | 40 | 38              | 33              | A               |
| 16    | 32              | 32              | 30 | 30              | 29              | 32              | 47 | A  | 43 | 50              | 54 | 56 | 48 | 49 | 50 | 50 | A  | 51 | 50  | 48 | 44 | 41              | 37              | 32              |
| 17    | A               | A               | F  | 26              | 31              | 32              | A  | A  | 46 | 46 <sup>R</sup> | 53 | 53 | 50 | 50 | 49 | 53 | 48 | 51 | 52  | 46 | 50 | 44              | 42              | 36              |
| 18    | 36              | 33              | 33 | 31              | 30              | 31              | 46 | 44 | 50 | 54              | 53 | 48 | 53 | 56 | 48 | 52 | 50 | 48 | 57  | 54 | 51 | 55              | 51              | 34              |
| 19    | 31              | 31              | 33 | 32              | 32              | 35              | 41 | 42 | 44 | 50              | 58 | 54 | 52 | 52 | 48 | 49 | 44 | 43 | 56  | 57 | 55 | 38              | 32              | 31              |
| 20    | 32              | 34              | 35 | 35              | 33              | 34              | 43 | 48 | 46 | 51              | 54 | 55 | 52 | 51 | 52 | 48 | 46 | 46 | 53  | 50 | 49 | 50              | 44              | 34              |
| 21    | 32              | 33              | 33 | 33              | 32              | 34              | 49 | 46 | 48 | 53              | 57 | 53 | 52 | 48 | 48 | 50 | 47 | 50 | 54  | 52 | 49 | 43              | 40              | 35              |
| 22    | 33              | 34              | 34 | 34              | 32              | 36              | 47 | 46 | 48 | 50              | 60 | 53 | 58 | 50 | 52 | 60 | 63 | 63 | 60  | 60 | 55 | 49              | 44              | 48              |
| 23    | 38              | 44 <sup>V</sup> | 31 | 26              | 27              | 29              | 33 | 37 | E  | G               | A  | 44 | 44 | 43 | 45 | 42 | A  | E  | G   | 43 | 44 | 42              | 38              | 35              |
| 24    | 33              | 33              | 43 | 45              | 33              | 30              | 38 | 48 | 52 | 52              | 48 | 54 | 58 | 53 | 52 | 52 | 47 | 47 | 60  | 57 | 56 | 47              | 32              | 29              |
| 25    | 31              | 31              | 32 | 32              | 31              | 32              | 44 | 48 | 50 | 55              | 62 | 54 | 56 | 50 | 52 | 53 | 53 | 58 | 56  | 49 | 45 | 42              | 38              | 33              |
| 26    | 33              | 28              | 29 | 29              | 30              | 31              | 44 | 55 | 57 | 68              | 58 | 58 | 53 | 55 | 53 | 50 | 52 | 52 | 52  | 50 | 50 | 44              | 39              | 36              |
| 27    | 36              | 35              | 34 | 34              | 34              | 38 <sup>F</sup> | 40 | 44 | 45 | 45              | 50 | 54 | 56 | 50 | 51 | 51 | 48 | 50 | 50  | 44 | 42 | 46              | 34              | 32              |
| 28    | 34              | 33              | 37 | 34              | 36              | 31              | 40 | 41 | E  | G               | 50 | 52 | 52 | 54 | 58 | 51 | 48 | 46 | 45  | 46 | 42 | 42              | 45              | 39              |
| 29    | 41              | 40              | 38 | 37              | 38              | 31              | 38 | 43 | 44 | 52              | 56 | 58 | 54 | E  | G  | 50 | 50 | 46 | 52  | 50 | 47 | 44              | 39              | 39              |
| 30    | 38              | 33              | 32 | 39              | 32              | 31              | 41 | 41 | 44 | 50              | 51 | 56 | 54 | 52 | 50 | 50 | 48 | 48 | 42  | 39 | 41 | 44 <sup>F</sup> | 44              | 42              |
| 31    |                 |                 |    |                 |                 |                 |    |    |    |                 |    |    |    |    |    |    |    |    |     |    |    |                 |                 |                 |
|       | 00              | 01              | 02 | 03              | 04              | 05              | 06 | 07 | 08 | 09              | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18  | 19 | 20 | 21              | 22              | 23              |
| CNT   | 25              | 25              | 26 | 26              | 24              | 24              | 24 | 24 | 24 | 25              | 24 | 26 | 25 | 24 | 26 | 26 | 24 | 25 | 26  | 26 | 26 | 25              | 26              | 25              |
| MED   | 34              | 33              | 33 | 32              | 32              | 32              | 40 | 45 | 46 | 50              | 52 | 52 | 52 | 50 | 50 | 49 | 47 | 47 | 50  | 50 | 46 | 44              | 40              | 36              |
| U Q   | 37              | 34              | 34 | 34              | 33              | 34              | 44 | 48 | 49 | 52              | 56 | 54 | 54 | 52 | 52 | 51 | 51 | 52 | 54  | 56 | 51 | 47              | 44              | 38              |
| L Q   | 32              | 32              | 31 | 30              | 30              | 31              | 38 | 42 | 44 | 48              | 50 | 48 | 48 | 48 | 48 | 47 | 46 | 45 | 46  | 47 | 44 | 42              | 38              | 33              |

SEP. 2018 f<sub>o</sub>F<sub>2</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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   | L   |     |    |    |    |    |    |    |
| 2      |    |    |    |    |          | L  | L   | L   | L   | L   | L   | L   | 416 | L   | L   | L   | 272 | L   |    |    |    |    |    |    |
| 3      |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 4      |    |    |    |    | L        | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   | 396 | L   | L   |    |    |    |    |    |    |
| 5      |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 6      |    |    |    |    | C        | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 7      |    |    |    |    | C        | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 8      |    |    |    |    | C        | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 9      |    |    |    |    | C        | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 10     |    |    |    |    | C        | C  | C   | C   | C   | C   | C   | L   | L   | C   | L   | L   | 308 | L   |    |    |    |    |    |    |
| 11     |    |    |    |    |          |    |     | 380 | A   | A   | 404 | A   | L   | L   | L   | A   | L   | L   |    |    |    |    |    |    |
| 12     |    |    |    |    | 6<br>213 | L  | L   | A   | A   | L   | L   | 420 | 416 | 412 | 412 | 364 | 364 | A   |    |    |    |    |    |    |
| 13     |    |    |    |    |          |    |     | L   | L   | 396 | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |
| 14     |    |    |    |    |          |    | L   | L   | L   | A   | A   | L   | L   | A   | L   | L   | L   | 244 |    |    |    |    |    |    |
| 15     |    |    |    |    |          |    |     | L   | L   | 400 | L   | L   | A   | A   | A   | A   | L   | A   |    |    |    |    |    |    |
| 16     |    |    |    |    |          |    | L   | A   | A   | L   | L   | A   | A   | A   | L   | L   | A   |     |    |    |    |    |    |    |
| 17     |    |    |    |    |          | A  | A   |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | 200 |    |    |    |    |    |    |
| 18     |    |    |    |    |          | A  |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 19     |    |    |    |    |          |    | L   |     | L   | L   | L   | L   | 416 | L   | L   | L   |     |     |    |    |    |    |    |    |
| 20     |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | 372 | L   | L  |    |    |    |    |    |
| 21     |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | A   | L   |     |    |    |    |    |    |    |
| 22     |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 23     |    |    |    |    |          |    | L   | L   | L   | A   | A   | A   | L   | L   | L   | A   | A   | L   |    |    |    |    |    |    |
| 24     |    |    |    |    |          |    | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | A   |    |    |    |    |    |    |
| 25     |    |    |    |    |          |    |     | L   | L   | L   | L   | 416 | L   | L   | 388 | L   | L   |     |    |    |    |    |    |    |
| 26     |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |
| 27     |    |    |    |    |          |    |     |     | L   | L   | L   | L   | L   | 404 | L   | L   | L   |     |    |    |    |    |    |    |
| 28     |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   |     |    |    |    |    |    |    |
| 29     |    |    |    |    |          |    |     |     | L   | L   | L   | L   | L   | 532 | B   | L   | L   |     |    |    |    |    |    |    |
| 30     |    |    |    |    |          |    |     | L   | L   | L   | L   | L   | L   | L   | L   | L   |     |     |    |    |    |    |    |    |
| 31     |    |    |    |    |          |    |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04       | 05 | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |          | 1  |     | 1   |     | 3   | 1   | 3   | 4   | 3   | 2   | 3   | 3   | 2   |    |    |    |    |    |    |
| MED    |    |    |    |    | 213      |    | 380 |     | 396 | 404 | 416 | 416 | 412 | 400 | 372 | 308 | 222 |     |    |    |    |    |    |    |
| U Q    |    |    |    |    |          |    |     |     | 400 |     | 420 | 416 | 532 |     | 396 | 364 |     |     |    |    |    |    |    |    |
| L Q    |    |    |    |    |          |    |     |     | 388 |     | 344 | 416 | 404 |     | 364 | 272 |     |     |    |    |    |    |    |    |

SEP. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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      |    |    |    |    | A   | B   | 200 | 244 | 268 | 288 | 288 | 304 | 288 | 320 | 292 | 268 | 248 | 188 |     | A   | A  |    |    |    |
| 2      |    |    |    |    | B   | A   | 200 | 244 | 268 | 288 | 284 |     | A   | 268 | A   | 300 | 276 | 280 | 208 |     | A  | B  |    |    |
| 3      |    |    |    |    | B   | B   | 220 | 272 | 256 | 312 | 304 | 328 | 320 | 312 | 300 | 276 | 268 |     | A   |     | B  |    |    |    |
| 4      |    |    |    |    | B   | A   | 196 | 264 | 280 |     | A   | 316 | 324 | 324 | 308 | 304 | 336 | 268 |     | A   |    | B  |    |    |
| 5      |    |    |    |    | B   | B   | 192 | 256 | 280 |     | A   | 316 |     | A   | 320 | 308 | 300 | 272 | 244 | 208 |    | A  | A  |    |
| 6      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  |
| 7      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  |
| 8      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  |
| 9      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  |
| 10     |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | A   |     |     |     |     |     |     |     |     |    | A  |    |    |
| 11     |    |    |    |    |     | A   | A   |     |     |     |     |     | 316 | 252 | 316 | 260 | 236 | 220 | 248 |     |    |    |    |    |
| 12     |    |    |    |    | 8   |     | 208 | 268 | 268 | 268 | 292 | 292 | 312 | 304 | 256 |     | A   |     | 204 |     |    |    |    |    |
| 13     |    |    |    |    | 172 | 192 | 244 | 268 | 276 | 300 | 304 | 316 | 292 | 300 | 272 | 228 | 176 |     |     |     | A  |    |    |    |
| 14     |    |    |    |    | B   |     | 188 | 244 | 264 | 288 | 304 | 308 | 308 | 296 | 268 | 256 | 232 | 172 |     |     |    |    |    |    |
| 15     |    |    |    |    | B   |     | 208 | 244 | 260 | 280 | 296 | 312 | 288 | 284 | 248 | 264 | 244 | 176 |     |     |    |    |    |    |
| 16     |    |    |    |    | 204 |     | 248 | 276 | 288 | 324 |     | A   | A   | A   | U A | A   | A   | A   | A   |     |    |    |    |    |
| 17     |    |    |    |    | A   |     | 196 | 240 | 264 | 296 | 300 | 312 | 268 | 268 |     | A   | A   | A   | A   |     |    |    |    |    |
| 18     |    |    |    |    | A   | A   |     | 280 | 296 | 288 |     | A   |     | 272 | 284 | 268 | 232 | 180 |     |     | B  | B  |    |    |
| 19     |    |    |    |    | A   |     | 248 |     | 288 | 288 | 304 | 308 | 308 | 292 | 264 | 232 |     |     |     |     | A  | A  |    |    |
| 20     |    |    |    |    |     | 184 | 236 | 264 | 280 |     | A   | A   |     | 296 | 296 | 240 | 240 |     |     |     | A  | B  |    |    |
| 21     |    |    |    |    | 228 | 192 | 176 | 272 | 272 | 308 | 312 | 316 | 320 | 284 | 256 | 232 |     |     |     |     | A  | B  |    |    |
| 22     |    |    |    |    | B   |     | 184 | 236 | 256 | 264 | 288 | 316 | 304 | 284 | 264 | 268 | 224 | 188 |     |     |    | A  | B  |    |
| 23     |    |    |    |    | B   | A   | 176 | 244 | 272 | 296 | 296 | 312 | 316 | 308 | 288 | 268 | 232 |     |     |     |    | A  | A  |    |
| 24     |    |    |    |    |     | 220 | 252 | 276 | 276 |     | A   |     | 300 |     | 328 | 248 | 216 |     |     |     |    | A  | A  |    |
| 25     |    |    |    |    | 240 | 240 | 240 | 256 | 300 | 316 | 312 | 312 | 296 | 284 | 236 | 224 |     |     |     |     |    | A  | A  |    |
| 26     |    |    |    |    | A   | A   |     | 160 | 288 | 300 | 312 | 312 | 304 | 296 | 260 | 232 | 160 |     |     |     |    |    | A  |    |
| 27     |    |    |    |    | B   |     | 196 | 224 | 248 | 280 | 300 | 316 | 304 | 296 | 288 | 256 | 220 | 268 |     |     | B  |    |    |    |
| 28     |    |    |    |    | B   | A   | 228 | 252 | 292 | 300 | 304 | 244 |     | A   | 280 | 252 | 220 |     |     |     | A  | A  |    |    |
| 29     |    |    |    |    | B   |     | 176 | 228 | 256 | 260 | 264 | 276 | 296 | 284 | 284 | 264 | 220 |     |     |     | A  | A  |    |    |
| 30     |    |    |    |    | B   |     | 188 | 228 | 248 | 304 | 260 | 280 |     | A   | A   | A   | A   | 208 |     |     | A  | B  |    |    |
| 31     |    |    |    |    |     | 192 | 216 | 264 | 296 |     | A   | 296 | 304 |     | A   | 280 | 268 | 224 | 224 |     | B  | A  |    |    |
|        | 00 | 01 | 02 | 03 | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |     | 4   | 18  | 23  | 24  | 23  | 23  | 19  | 22  | 20  | 24  | 23  | 23  | 13  | 3   |     |    |    |    |    |
| MED    |    |    |    |    |     | 216 | 192 | 240 | 264 | 288 | 300 | 312 | 306 | 296 | 290 | 264 | 232 | 188 | 184 |     |    |    |    |    |
| U Q    |    |    |    |    |     | 234 | 200 | 244 | 270 | 296 | 304 | 312 | 316 | 308 | 300 | 268 | 244 | 214 | 248 |     |    |    |    |    |
| L Q    |    |    |    |    |     | 188 | 188 | 228 | 256 | 276 | 288 | 304 | 292 | 284 | 282 | 256 | 224 | 176 | 176 |     |    |    |    |    |

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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      | 30  | 25  | 19  | 22  | 19  | 22  | 23  | 32  | 32  | J A | J A | G   | 40  | 40  | 40  | 37  | 33  | 32  | J A | J A | J A | 34  | 30  | 30  | J A |     |
| 2      | J A | J A | J A | J A | J A | J A | 23  | J A | J A | J A | J A | J A | J A | J A | J A | 31  | G   | 25  | J A | E B | 16  | 21  | 18  | J A | E B |     |
| 3      | 20  | E B | E B | E B | 28  | E B | 26  | 33  | 41  | 35  | 16  |     | 36  | 33  | 34  | 31  | J A | J A | 23  | 26  | E B | 17  | 21  | 51  | 28  |     |
| 4      | 20  | J A | E B | E B | 16  | 22  | 30  | 23  | J A | J A | J A | J A | J A | J A | J A | 34  | J A | J A | J A | J A | E B | J A | J A | J A | J A |     |
| 5      | J A | J A | J A | J A | 11  | J A | 24  | 30  | J A | J A | J A | J A | J A | J A | J A | 38  | J A | J A | J A | J A | J A | 35  | 24  | 24  | 24  |     |
| 6      | 21  | 21  | 25  | J A | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |
| 7      | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |
| 8      | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |
| 9      | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |
| 10     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | J A | J A | D C |     | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 11     | 22  | 28  | J A | 28  | 22  | J A | 41  | J A | J A | J A | J A | J A | J A | J A | J A | 39  | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 12     | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | 35  | 32  | 30  | J A | J A | J A | J A | J A | J A | J A |     |
| 13     | 34  | 21  | 24  | 25  | 20  | E B | 26  | 29  | 35  | 68  | 34  | 34  | 34  |     | 33  | 33  | 31  | 37  | 29  | 22  | 21  | 32  | 25  | 28  |     |     |
| 14     | J A | 22  | E B | E B | 22  | 22  | 31  | 34  | 48  | 46  | 47  | 58  | 65  | 109 | 30  | 32  | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 15     | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 16     | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 17     | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 18     | 25  | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 19     | 23  | 38  | 20  | 29  | 24  | J A | 21  | 26  | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | E B | 16  | 24  | 26  | 36  | J A |     |
| 20     | J A | 33  | 25  | 23  | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | E B | 16  | 24  | 30  | 21  | E B | E B |
| 21     | E B | E B | E B | 18  | J A | E B | 20  | J A | J A | J A | J A | E B | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 22     | E B | E B | E B | E B | E B | E B | 21  | J A | 51  | 32  | 33  | 35  |     | 34  | 33  | 35  | 27  | J A | 34  | 26  | 24  | 16  | 16  | 29  | J A |     |
| 23     | E B | E B | E B | 20  | J A | 32  | 34  | 28  | 32  | J A | J A | 64  | 39  | J A | 41  | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 24     | E B | E B | E B | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 25     | 30  | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 26     | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 27     | J A | J A | J A | E B | E B | E B | 26  | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 28     | 20  | J A | E B | E B | E B | E B | 20  | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 29     | 30  | 26  | 26  | 16  | 16  | 24  | 61  | 139 | 48  | 65  | 52  | 33  | 53  | 61  | 63  | 40  | 25  | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 30     | 25  | E B | E B | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| 31     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 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  |     |     |
| CNT    | 26  | 26  | 26  | 26  | 25  | 25  | 25  | 25  | 25  | 25  | 25  | 26  | 26  | 26  | 26  | 26  | 26  | 26  | 26  | 26  | 26  | 26  | 26  | 26  | 26  |     |
| MED    | 24  | 26  | 22  | 24  | 23  | 23  | 26  | J A | J A | J A | J A | 38  | 38  | 37  | 39  | 35  | 34  | 30  | J A | J A | J A | J A | J A | J A | J A |     |
| U Q    | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |
| L Q    | E B | E B | E B | E B | E B | E B | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A | J A |     |



# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10 | 11  | 12  | 13  | 14  | 15 | 16  | 17  | 18  | 19    | 20  | 21  | 22  | 23  |     |     |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| 1     | 16  | E B | E B | E B | E B | E B | 21  | 28  | 29  | 34  | 37 | 33  | 32  | 31  | 31  | 30 | 28  | 24  | 15  | 20    | 17  | 16  | 16  | 16  |     |     |
| 2     | 22  | 17  | 18  | 16  | 16  | 17  | 22  | 28  | 35  | 32  | 34 | 33  | 34  | 32  | 31  | 28 | G   | 22  | 15  | E B   | 16  | 16  | 16  | E B | E B |     |
| 3     | E B | E B | E B | E B | E B | E B | 24  | 26  | 31  | 32  | 16 | G   | 34  | 31  | 33  | 28 | 26  | 20  | 17  | E B   | E B | 17  | 16  | 16  | E B |     |
| 4     | E B | 16  | E B | E B | E B | 16  | 16  | 21  | 28  | 32  | 32 | 29  | G   | 36  | 32  | 33 | 31  | 29  | 26  | 24    | 18  | 16  | 24  | 16  | 16  | 19  |
| 5     | 16  | E B | E B | E B | 16  | E B | 17  | 20  | 27  | 31  | 33 | 32  | 34  | 34  | 34  | 32 | 33  | 33  | 29  | 24    | 16  | 20  | 16  | 16  | E B |     |
| 6     | E B | E B | E B | E B | C   | C   | C   | C   | C   | C   | C  | C   | C   | C   | C   | C  | C   | C   | C   | C     | C   | C   | C   | C   | C   |     |
| 7     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C   | C   | C   | C   | C  | C   | C   | C   | C     | C   | C   | C   | C   | C   |     |
| 8     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C   | C   | C   | C   | C  | C   | C   | C   | C     | C   | C   | C   | C   | C   |     |
| 9     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C   | C   | C   | C   | C  | C   | C   | C   | C     | C   | C   | C   | C   | C   |     |
| 10    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C   | G   | C   |     |    |     |     |     | G E B |     |     |     | E B | 16  |     |
| 11    | E B | E B | E B | E B | E B | 20  | 17  | 24  | A   | 40  | 38 | A   | 32  | 37  | 30  | G  | A   | 24  | 20  | 16    | 16  | 16  | 16  | 16  | 23  |     |
| 12    | 23  | E B | 17  | 16  | A A | G   | 22  | 23  | 123 | A   | 36 | 33  | 34  | 32  | 33  | 32 | 28  | 28  | 23  | 20    | 18  | 18  | 18  | 18  | 18  |     |
| 13    | 18  | E B | E B | E B | E B | E B | 22  | 26  | 32  | 34  | 33 | 32  | 32  | G   | 31  | 31 | 30  | 26  | 21  | E B   | E B | 16  | 16  | 16  | 17  |     |
| 14    | E B | E B | E B | E B | E B | E B | 20  | 26  | 34  | 35  | 40 | 34  | 32  | A A | 109 | 28 | 27  | 26  | 19  | 16    | 20  | 22  | A A | 22  | 22  |     |
| 15    | 22  | 16  | 17  | E B | E B | E B | 25  | 24  | 28  | 34  | 34 | 37  | A A | A   | A   | A  | 24  | A A | 99  | 23    | 22  | 17  | 20  | 18  | 59  |     |
| 16    | E B | E B | E B | E B | 16  | 18  | 18  | 51  | 35  | 35  | 35 | 42  | A   | A   | 34  | 23 | A A | A   | A   | 26    | 26  | 21  | 18  | 16  | 24  |     |
| 17    | A A | A A | A   | 16  | 17  | 23  | A A | A A | 24  | 28  | 32 | 34  | 33  | 33  | 34  | 28 | G   | G   | 26  | 16    | 21  | 22  | 22  | 16  | 21  |     |
| 18    | E B | E B | E B | E B | E B | 20  | 22  | 24  | 29  | 32  | 32 | 34  | 34  | 34  | 30  | 30 | 26  | 19  | 16  | 16    | E B | E B | 22  | 16  | 19  | 19  |
| 19    | 16  | E B | E B | E B | 18  | 17  | E B | G   | G   | 22  | 29 | 32  | 32  | 30  | 30  | G  | 27  | G   | 24  | 23    | 17  | E B | E B | E B | E B |     |
| 20    | 22  | 20  | 16  | E B | E B | G   | 19  | 19  | 30  | 31  | 33 | 32  | 34  | 33  | 30  | 29 | 25  | 18  | 16  | 16    | E B | E B | E B | E B | E B |     |
| 21    | E B | E B | E B | E B | E B | E B | 17  | 23  | 29  | 30  | 31 | 16  | E B | 32  | 34  | 42 | 27  | 26  | 26  | 24    | 17  | E B | E B | E B | E B |     |
| 22    | E B | E B | E B | E B | E B | E B | 19  | 26  | 29  | 30  | 33 | 35  | G   | 32  | 32  | 32 | 25  | 25  | 24  | 16    | E B | E B | E B | E B | E B |     |
| 23    | E B | E B | E B | E B | A E | E B | 19  | 24  | 28  | A A | A  | 183 | 36  | 31  | 31  | 29 | G   | A A | A   | 61    | 24  | 19  | 20  | 16  | 16  | 17  |
| 24    | E B | E B | E B | E B | 19  | 16  | 20  | 24  | 27  | 30  | 30 | 30  | 32  | 30  | 27  | 28 | G   | G   | 25  | 28    | 23  | 24  | 19  | 17  | 16  | 16  |
| 25    | E B | E B | E B | E B | E B | E A | 20  | 17  | 28  | 28  | 31 | 34  | 32  | 30  | 30  | 25 | G   | G   | 24  | E B   | 17  | 22  | 21  | 17  | 17  | 17  |
| 26    | 16  | 16  | 16  | E B | E B | E B | 20  | 23  | 27  | G   | 29 | 34  | 31  | 27  | 31  | 26 | G   | G   | 22  | G     | E B | E B | E B | E B | E B |     |
| 27    | 17  | 19  | E B | E B | E B | E B | 19  | 26  | 26  | 31  | 32 | 34  | 34  | 33  | 30  | 28 | G   | G   | 23  | 23    | 22  | 20  | 17  | 19  | 16  | 16  |
| 28    | E B | E B | E B | E B | E B | E B | 19  | 26  | 32  | 31  | 33 | 33  | 32  | 30  | 28  | 25 | G   | G   | 25  | 19    | 20  | 22  | 17  | E B | E B | E B |
| 29    | 19  | E B | E B | E B | E B | E B | 18  | 26  | 30  | 32  | 29 | 30  | 36  | 45  | 40  | 28 | 23  | 16  | 16  | E B   | 21  | 16  | 18  | 18  | 16  |     |
| 30    | E B | E B | E B | E B | E B | E B | 18  | 26  | 29  | G   | 31 | 33  | 31  | 34  | 28  | G  | G   | E B | E B | E B   | E B | 18  | E B | E B | E B |     |
| 31    |     |     |     |     |     |     |     |     |     |     |    |     |     |     |     |    |     |     |     |       |     |     |     |     |     |     |
| 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  |     |     |
| CNT   | 26  | 26  | 26  | 25  | 25  | 25  | 25  | 25  | 24  | 23  | 25 | 25  | 25  | 23  | 25  | 23 | 26  | 25  | 26  | 26    | 26  | 26  | 26  | 26  | 26  |     |
| MED   | E B | E B | E B | E B | E B | E B | 20  | 26  | 29  | 32  | 33 | 33  | 32  | 32  | 31  | 28 | 26  | 23  | 20  | 16    | 17  | 16  | 16  | 16  | E B |     |
| U Q   | 19  | 16  | 16  | 16  | 16  | 18  | 22  | 26  | 32  | 34  | 34 | 34  | 34  | 34  | 32  | 30 | 26  | 26  | 23  | 21    | 19  | 18  | 18  | 18  | 19  |     |
| L Q   | E B | E B | E B | E B | E B | E B | G   | G   | 28  | 30  | 31 | 32  | G   | 31  | 30  | 27 | 24  | 19  | 16  | 16    | E B | E B | E B | E B | E B |     |

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| H<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      | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 17 | 17 | 17 | 17 | 17 | 17 | 16 | 16 | 16 | 14 | 15 | 16 | 16 | 15 | 15 | 15 |
| 2      | 16  | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | 16 | 16 | 17 | 16 | 15 | 15 | 16 | 16 | 16 | 10 | 16 | 16 | 16 | 16 | 17 |
| 3      | 16  | 15 | 16 | 16 | 16 | 16 | 13 | 16 | 15 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 16 | 17 | 15 | 15 | 15 |
| 4      | 16  | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 16 | 16 | 16 | 16 | 15 | 16 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 5      | 16  | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 15 | 15 | 16 | 18 | 16 | 16 | 16 | 15 | 15 | 16 | 15 | 15 | 16 | 16 | 16 | 15 |
| 6      | 15  | 16 | 16 | 16 | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  |
| 7      | C   | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  |
| 8      | C   | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  |
| 9      | C   | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  |
| 10     | C   | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 11     | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 16 | 16 | 15 | 14 | 19 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 12     | 16  | 16 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 17 | 15 | 16 | 11 | 16 | 16 | 16 | 16 | 16 | 16 |
| 13     | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 15 | 15 | 17 | 16 | 15 | 16 | 16 | 16 | 17 | 16 | 16 | 15 | 16 | 16 | 16 |
| 14     | 16  | 16 | 16 | 16 | 16 | 17 | 16 | 15 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 |
| 15     | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 16 | 16 | 16 | 17 | 14 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 16 |
| 16     | 201 | 16 | 16 | 16 | 16 | 16 | 14 | 15 | 15 | 15 | 17 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 17     | 15  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 16 | 16 | 17 | 16 | 14 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 18     | 16  | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 |
| 19     | 16  | 16 | 16 | 16 | 16 | 16 | 12 | 17 | 16 | 16 | 16 | 22 | 16 | 16 | 16 | 11 | 17 | 16 | 16 | 16 | 16 | 15 | 15 | 16 |
| 20     | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 22 | 16 | 19 | 17 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 21     | 16  | 16 | 16 | 16 | 16 | 16 | 15 | 14 | 16 | 14 | 16 | 16 | 17 | 16 | 16 | 17 | 16 | 15 | 15 | 16 | 16 | 16 | 16 | 16 |
| 22     | 16  | 16 | 16 | 16 | 16 | 16 | 13 | 16 | 16 | 16 | 16 | 15 | 21 | 16 | 16 | 16 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 |
| 23     | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | 17 | 15 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 24     | 16  | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 15 | 16 | 16 | 16 | 16 | 16 | 16 |
| 25     | 16  | 16 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 15 | 15 | 16 | 17 | 17 | 15 | 15 | 14 | 11 | 16 | 17 | 16 | 16 | 16 | 16 |
| 26     | 16  | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | 16 | 17 | 16 | 16 | 16 | 16 | 12 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 27     | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 15 | 16 | 16 | 15 | 16 | 16 | 16 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 28     | 16  | 16 | 16 | 16 | 16 | 16 | 14 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 29     | 16  | 16 | 14 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 20 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 30     | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 16 | 16 | 16 | 15 | 16 | 15 | 16 | 16 | 16 | 16 | 16 | 16 |
| 31     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|        | 00  | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    | 26  | 26 | 26 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| MED    | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| U Q    | 16  | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| L Q    | 16  | 16 | 16 | 16 | 16 | 16 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 |

SEP. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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     | 316              | 304 | 300 | 319              | 320              | 355              | 392 | 361 | 365 | 318 | 364 | 346 | 359 | 296 | 321 | 325 | 353 | 345 | 321 | 315 | 334 | 319 | 332 | 308 <sup>F</sup> |     |
| 2     | 361              | 319 | 294 | 307              | 313 <sup>F</sup> | 318              | 348 | 331 | 326 | 377 | 342 | 347 | 329 | 311 | 312 | 320 | 347 | 358 | 323 | 325 | 321 | 325 | 343 | 330              |     |
| 3     | 330              | 328 | 328 | 302              | 305              | 360              | 374 | 358 | 370 | 315 | 368 | 337 | 318 | 340 | 333 | 365 | 335 | 349 | 348 | 329 | 340 | 331 | 309 | 318              |     |
| 4     | 340              | 331 | 328 | 328              | 319              | 338              | 379 | 377 | 385 | 310 | 385 | 344 | 326 | 330 | 310 | 329 | 345 | 321 | 319 | 341 | 327 | 327 | 332 | 312              |     |
| 5     | 312              | 330 | 311 | 304 <sup>F</sup> | 300 <sup>F</sup> | 332              | 355 | 320 | 292 | 331 | 312 | 320 | 306 | 299 | 347 | 336 | 352 | 339 | 328 | 312 | 308 | 328 | 352 | 309              |     |
| 6     | 317              | 313 | 326 | 316              | C                | C                | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C                |     |
| 7     | C                | C   | C   | C                | C                | C                | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C                |     |
| 8     | C                | C   | C   | C                | C                | C                | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C                |     |
| 9     | C                | C   | C   | C                | C                | C                | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C                |     |
| 10    | C                | C   | C   | C                | C                | C                | C   | C   | C   | C   | C   | 342 | 344 | C   | 339 | 332 | 366 | 322 | 355 | 338 | 324 | 313 | 293 | 318 <sup>F</sup> |     |
| 11    | 315              | 314 | 307 | 307              | 298              | 331              | 364 | 328 | 301 | 333 | 296 | 234 | 358 | 321 | 339 | 314 | 322 | 319 | 321 | 296 | 302 | 304 | 325 | 364              |     |
| 12    | 350              | 328 | 288 | 324              | A                | 243              | 328 | 318 | A   | R   | 219 | 361 | G   | 334 | G   | G   | 318 | 306 | 92  | 319 | 308 | 299 | 330 | 315              | 329 |
| 13    | 330              | 317 | 313 | 326              | 313              | 317              | 360 | 346 | 347 | 329 | 336 | 336 | 344 | 297 | 323 | 343 | 308 | 320 | 338 | 328 | 317 | 334 | 358 | 309              |     |
| 14    | 312 <sup>F</sup> | 309 | 301 | 301              | 315              | 291              | 310 | 368 | 384 | 314 | 344 | 336 | 361 | A   | 326 | 353 | 353 | 328 | 317 | 311 | 341 | A   | 335 | 236              |     |
| 15    | 317              | 312 | 306 | 326              | 301              | 334              | 349 | 327 | A   | 327 | 351 | 368 | 317 | A   | 291 | 320 | 215 | 344 | A   | 346 | 336 | 334 | 352 | 312              |     |
| 16    | 311              | 323 | 301 | 328              | 294              | 338              | 360 | A   | 376 | 336 | 362 | 365 | 258 | 341 | 344 | 366 | A   | 384 | 238 | 324 | 336 | 305 | 339 | 281              |     |
| 17    | A                | A   | F   | 314              | 326              | 346              | A   | A   | 354 | 353 | 356 | 386 | 359 | 341 | 330 | 347 | 335 | 336 | 349 | 323 | 320 | 313 | 314 | 314              | 301 |
| 18    | 313              | 329 | 309 | 352              | 294              | 313              | 381 | 375 | 336 | 361 | 346 | 325 | 316 | 364 | 327 | 360 | 327 | 322 | 325 | 316 | 304 | 336 | 371 | 341              |     |
| 19    | 319              | 319 | 313 | 317              | 349              | 343              | 397 | 357 | 338 | 351 | 371 | 367 | 346 | 346 | 340 | 338 | 349 | 319 | 340 | 343 | 358 | 342 | 318 | 321              |     |
| 20    | 329              | 327 | 333 | 333              | 351              | 347              | 378 | 365 | 345 | 350 | 343 | 369 | 374 | 360 | 355 | 349 | 343 | 327 | 340 | 325 | 324 | 351 | 356 | 329              |     |
| 21    | 326              | 322 | 322 | 322              | 334              | 334              | 390 | 371 | 366 | 364 | 392 | 341 | 370 | 343 | 343 | 347 | 338 | 351 | 338 | 346 | 342 | 333 | 357 | 318              |     |
| 22    | 327              | 317 | 339 | 343              | 338              | 346              | 386 | 370 | 370 | 331 | 379 | 333 | 371 | 341 | 323 | 311 | 345 | 346 | 332 | 320 | 325 | 324 | 306 | 347              |     |
| 23    | 289              | 324 | 273 | 222              | 317              | 316              | 330 | 260 | G   | 342 | A   | 354 | 313 | 278 | 294 | 300 | A   | G   | 338 | 335 | 312 | 312 | 314 | 309              |     |
| 24    | 318              | 307 | 309 | 333              | 374              | 353              | 365 | 342 | 312 | 347 | 327 | 353 | 331 | 347 | 344 | 351 | 341 | 313 | 339 | 339 | 344 | 360 | 330 | 316              |     |
| 25    | 326              | 327 | 318 | 333              | 338              | 359              | 363 | 380 | 355 | 357 | 364 | 359 | 368 | 372 | 360 | 352 | 328 | 337 | 352 | 322 | 318 | 331 | 332 | 347              |     |
| 26    | 336              | 320 | 308 | 308              | 323              | 333              | 347 | 373 | 365 | 388 | 353 | 367 | 333 | 335 | 348 | 320 | 361 | 356 | 343 | 322 | 351 | 336 | 328 | 326              |     |
| 27    | 321              | 308 | 312 | 314              | 340              | 383 <sup>F</sup> | 370 | 372 | 367 | 354 | 337 | 357 | 351 | 351 | 346 | 346 | 336 | 357 | 352 | 342 | 309 | 339 | 342 | 337              |     |
| 28    | 337              | 320 | 340 | 325              | 373              | 353              | 366 | 398 | G   | 338 | 381 | 356 | 338 | 364 | 343 | 365 | 366 | 356 | 348 | 311 | 291 | 311 | 320 | 329              |     |
| 29    | 335              | 337 | 327 | 337              | 352              | 324              | 390 | 388 | 374 | 379 | 356 | 355 | 342 | G   | 258 | 355 | 342 | 355 | 337 | 297 | 319 | 320 | 313 | 324              |     |
| 30    | 334              | 311 | 323 | 326              | 322              | 336              | 386 | 330 | 329 | 346 | 344 | 344 | 363 | 340 | 320 | 347 | 363 | 359 | 322 | 315 | 297 | 311 | 309 | 331              |     |
| 31    |                  |     |     |                  |                  |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                  |     |
| CNT   | 25               | 25  | 26  | 26               | 24               | 24               | 24  | 24  | 24  | 25  | 24  | 26  | 25  | 24  | 26  | 26  | 24  | 25  | 26  | 26  | 26  | 25  | 26  | 25               |     |
| MED   | 326              | 320 | 312 | 324              | 321              | 335              | 366 | 360 | 350 | 346 | 358 | 345 | 342 | 338 | 336 | 340 | 344 | 339 | 338 | 323 | 322 | 328 | 329 | 321              |     |
| U Q   | 334              | 328 | 326 | 328              | 343              | 350              | 384 | 372 | 368 | 356 | 370 | 357 | 360 | 346 | 344 | 352 | 352 | 356 | 343 | 336 | 336 | 336 | 342 | 330              |     |
| L Q   | 316              | 312 | 306 | 308              | 309              | 321              | 352 | 330 | 326 | 330 | 342 | 336 | 328 | 298 | 320 | 320 | 336 | 320 | 322 | 315 | 309 | 314 | 314 | 309              |     |

SEP. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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   | L   |     |    |    |    |    |    |    |
| 2      |    |    |    |    |    | L  | L  | L   | L  | L   | L   | L   | 420 | L   | L   | L   | 505 | L   |    |    |    |    |    |    |
| 3      |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 4      |    |    |    |    | L  | L  | L  | L   | L  | L   | L   | L   | L   | L   | L   | 379 | L   | L   |    |    |    |    |    |    |
| 5      |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 6      |    |    |    |    | C  | C  | C  | C   | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 7      |    |    |    |    | C  | C  | C  | C   | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 8      |    |    |    |    | C  | C  | C  | C   | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 9      |    |    |    |    | C  | C  | C  | C   | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  |    |    |    |
| 10     |    |    |    |    | C  | C  | C  | C   | C  | C   | C   | L   | L   | C   | L   | L   | 356 | L   |    |    |    |    |    |    |
| 11     |    |    |    |    |    |    |    | 329 | A  | A   | 382 | A   | L   | L   | L   | A   | L   | L   |    |    |    |    |    |    |
| 12     |    |    |    |    | A  | L  | L  | A   | A  | L   | 390 | 375 | 397 | 369 | 376 | 376 | 376 | A   |    |    |    |    |    |    |
| 13     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 14     |    |    |    |    |    |    |    | L   | L  | L   | A   | A   | L   | L   | A   | L   | L   | L   |    |    |    |    |    |    |
| 15     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | A   | A   | A   | A   | L   | A   |    |    |    |    |    |    |
| 16     |    |    |    |    |    |    |    | L   | A  | A   | L   | L   | A   | A   | A   | L   | L   | A   |    |    |    |    |    |    |
| 17     |    |    |    |    |    | A  | A  |     | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 18     |    |    |    |    |    | A  |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 19     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | 411 | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 20     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | 379 | L   | L  |    |    |    |    |    |
| 21     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | A   | L   | L   |    |    |    |    |    |    |
| 22     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 23     |    |    |    |    |    |    |    | L   | L  | L   | A   | A   | A   | L   | L   | L   | A   | A   | L  |    |    |    |    |    |
| 24     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   | A  |    |    |    |    |    |
| 25     |    |    |    |    |    |    |    |     |    | L   | L   | L   | 390 | L   | L   | 376 | L   | L   |    |    |    |    |    |    |
| 26     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 27     |    |    |    |    |    |    |    |     |    | L   | L   | L   | L   | L   | 384 | L   | L   | L   |    |    |    |    |    |    |
| 28     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 29     |    |    |    |    |    |    |    |     |    | L   | L   | L   | L   | L   | 367 | B   | L   | L   |    |    |    |    |    |    |
| 30     |    |    |    |    |    |    |    | L   | L  | L   | L   | L   | L   | L   | L   | L   | L   | L   |    |    |    |    |    |    |
| 31     |    |    |    |    |    |    |    |     |    |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08 | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 1   |    | 3   | 1   | 3   | 4   | 3   | 2   | 3   | 3   | 2   |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 329 |    | 398 | 382 | 390 | 395 | 384 | 372 | 379 | 376 | 378 |    |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |    |     |    | 418 |     | 476 | 416 | 397 |     | 379 | 505 |     |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    |     |    | 370 |     | 390 | 377 | 367 |     | 376 | 356 |     |    |    |    |    |    |    |

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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      |    |    |    |    |     |     |     | 256 | 274 | 324   | 282 | 300 | 288 | 360 | 318 | 318 | 258 |     |     |    |    |    |    |    |
| 2      |    |    |    |    |     | 280 | 232 | 308 | 320 | 256   | 300 | 284 | 326 | 360 | 338 | 322 | 274 | 234 |     |    |    |    |    |    |
| 3      |    |    |    |    |     |     |     | 264 | 256 | 330   | 246 | 290 | 320 | 282 | 350 | 276 | 294 | 248 |     |    |    |    |    |    |
| 4      |    |    |    |    |     | 258 | 242 | 218 | 226 | 300   | 232 | 276 | 300 | 274 | 322 | 296 | 254 | 296 |     |    |    |    |    |    |
| 5      |    |    |    |    |     |     |     | 316 | 320 | 316   | 368 | 366 | 366 | 376 | 316 | 294 | 282 |     |     |    |    |    |    |    |
| 6      |    |    |    |    | C   | C   | C   | C   | C   | C     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  | C  |
| 7      |    |    |    |    | C   | C   | C   | C   | C   | C     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  | C  |
| 8      |    |    |    |    | C   | C   | C   | C   | C   | C     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  | C  |
| 9      |    |    |    |    | C   | C   | C   | C   | C   | C     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  | C  |
| 10     |    |    |    |    | C   | C   | C   | C   | C   | C     | C   |     |     |     |     |     |     |     |     |    |    |    |    |    |
| 11     |    |    |    |    |     |     |     | A   |     |       |     |     | A   |     |     |     |     |     |     |    |    |    |    |    |
| 12     |    |    |    |    | E A |     |     | 322 | 358 | 306   | 382 |     | G   |     | G   | G   |     |     |     |    |    |    |    |    |
| 13     |    |    |    |    |     |     |     | 266 | 296 | 316   | 298 | 298 | 314 | 358 | 314 | 294 | 300 |     |     |    |    |    |    |    |
| 14     |    |    |    |    |     |     |     | 326 | 234 | 226   | 362 | 270 | 306 | 278 | A   | 298 | 264 | 242 | 254 |    |    |    |    |    |
| 15     |    |    |    |    |     |     |     | 244 | 320 | 284   | 260 | 328 |     | A   | 404 | 328 | 620 | 270 |     |    |    |    |    |    |
| 16     |    |    |    |    |     |     |     | A   |     |       |     |     |     |     |     |     |     |     |     |    |    |    |    |    |
| 17     |    |    |    |    |     | 238 |     | A   |     |       |     |     |     |     |     |     |     |     |     |    |    |    |    |    |
| 18     |    |    |    |    |     |     |     | 284 | 280 | 258   | 276 | 306 | 296 | 274 | 270 | 278 | 236 |     |     |    |    |    |    |    |
| 19     |    |    |    |    |     | 268 |     | 234 | 272 | 260   | 268 | 284 | 336 | 254 | 298 | 254 | 256 | 280 |     |    |    |    |    |    |
| 20     |    |    |    |    |     |     |     | 216 |     | 312   | 296 | 238 | 258 | 276 | 276 | 278 | 278 |     |     |    |    |    |    |    |
| 21     |    |    |    |    |     |     |     | 228 | 274 | 276   | 264 | 264 | 256 | 262 | 274 | 254 | 278 | 258 |     |    |    |    |    |    |
| 22     |    |    |    |    |     |     |     | 234 | 256 | 260   | 228 | 276 | 266 | 294 | 278 | 266 |     |     |     |    |    |    |    |    |
| 23     |    |    |    |    |     |     |     | 222 | 256 | 240   | 226 | 274 | 254 | 264 | 302 | 280 | 244 |     |     |    |    |    |    |    |
| 24     |    |    |    |    |     |     |     | 278 | 308 | G E A | A   | 232 | 354 | 422 | 332 | 374 |     |     |     |    |    |    |    |    |
| 25     |    |    |    |    |     |     |     | 238 | 262 | 308   | 268 | 280 | 264 | 276 | 276 | 276 | 252 | 266 | E A |    |    |    |    |    |
| 26     |    |    |    |    |     |     |     |     |     |       |     |     |     |     |     |     |     |     |     |    |    |    |    |    |
| 27     |    |    |    |    |     |     |     | 264 | 246 | 248   | 272 | 258 | 256 | 258 | 262 | 262 |     |     |     |    |    |    |    |    |
| 28     |    |    |    |    |     |     |     | 222 | 234 | 230   | 252 | 246 | 242 | 274 | 262 | 296 |     |     |     |    |    |    |    |    |
| 29     |    |    |    |    |     |     |     | 262 | 274 | 292   | 280 | 262 | 268 | 282 | 258 |     |     |     |     |    |    |    |    |    |
| 30     |    |    |    |    |     |     |     | 218 |     | G     | 300 | 258 | 266 | 304 | 256 | 270 | 260 | 242 |     |    |    |    |    |    |
| 31     |    |    |    |    |     |     |     |     |     |       |     |     |     |     |     |     |     |     |     |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04  | 05  | 06  | 07  | 08  | 09    | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |     | 4   | 8   | 19  | 23  | 25    | 24  | 25  | 25  | 24  | 26  | 25  | 19  | 12  |     |    |    |    |    |    |
| MED    |    |    |    |    |     | 268 | 240 | 256 | 274 | 280   | 266 | 276 | 288 | 279 | 298 | 276 | 266 | 257 |     |    |    |    |    |    |
| U Q    |    |    |    |    |     | 374 | 284 | 308 | 320 | 314   | 285 | 296 | 318 | 360 | 322 | 301 | 282 | 273 |     |    |    |    |    |    |
| L Q    |    |    |    |    |     | 263 | 235 | 228 | 256 | 260   | 250 | 265 | 260 | 270 | 276 | 261 | 254 | 250 |     |    |    |    |    |    |

SEP. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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     | 248 | 256 | 276 | 258 | 276 | 236 | 224 | 196 | 196 | 196 | 196 | 186 | 186 | 186 | 196 | 212 | 222 | 242 | 224 | 248 | 248 | 232 | 232 | Q   |
| 2     | 204 | 208 | 280 | 264 | 264 | 220 | 202 | 196 | 204 | 204 | 196 | 200 | 186 | 186 | 176 | 196 | 216 | 198 | 230 | 236 | 250 | 230 | 236 | 232 |
| 3     | 240 | 240 | 240 | 262 | 230 | 208 | 212 | 200 | 204 | 198 | 198 | 194 | 204 | 198 | 182 | 244 | 200 | 200 | 236 | 236 | 228 | 234 | 252 | 258 |
| 4     | 228 | 250 | 252 | 252 | 246 | 216 | 202 | 194 | 198 | 196 | 186 | 216 | 180 | 202 | 196 | 200 | 200 | 214 | 272 | 218 | 242 | 226 | 234 | Q   |
| 5     | 250 | 224 | 236 | 252 | 238 | 252 | 230 | 196 | 196 | 200 | 190 | 204 | 196 | 202 | 202 | 242 | 232 | 254 | 240 | 240 | 240 | 212 | 226 | 246 |
| 6     | 246 | 262 | 254 | 254 | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 7     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 8     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 9     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 10    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 11    | 260 | 270 | 288 | 266 | 288 | 252 | 202 | 216 | A   | A   | 382 | A   | 198 | 226 | 210 | A   | 198 | 216 | 242 | 264 | 236 | 236 | 238 | 238 |
| 12    | 238 | 248 | 318 | 252 | A   | A   | 214 | 208 | A   | A   | 220 | 210 | 204 | 200 | 196 | 212 | 218 | A   | 238 | 252 | 256 | 230 | 230 | 244 |
| 13    | 244 | 256 | 268 | 268 | 254 | 246 | 200 | 200 | 200 | 188 | 186 | 194 | 192 | 192 | 196 | 210 | 210 | 266 | 226 | 234 | 252 | 238 | 246 | 232 |
| 14    | 252 | 214 | 256 | 258 | 278 | 252 | 216 | 216 | 204 | A   | A   | 198 | 184 | A   | A   | 226 | 202 | 202 | 232 | 248 | 258 | 240 | A   | A   |
| 15    | 250 | 222 | 246 | 258 | 258 | 246 | 226 | 212 | 202 | 216 | 168 | H   | 200 | A   | A   | A   | A   | 178 | A   | 234 | 232 | 230 | 220 | 244 |
| 16    | 244 | 276 | 260 | 202 | 254 | 234 | 200 | A   | A   | 210 | 202 | A   | A   | A   | A   | 202 | 202 | A   | A   | 200 | 210 | 228 | 242 | A   |
| 17    | A   | A   | Q   | 258 | 210 | A   | A   | 212 | 192 | 192 | 200 | 186 | 184 | 190 | 224 | 202 | 206 | 206 | 250 | 250 | 250 | 260 | 260 | 260 |
| 18    | 234 | 256 | 260 | 244 | 280 | A   | 206 | 198 | 198 | 188 | 200 | 168 | 210 | 212 | 194 | 230 | 202 | 232 | 222 | 230 | 262 | 234 | 206 | 198 |
| 19    | 242 | 266 | 252 | 260 | 228 | 228 | 194 | 220 | 202 | 218 | 198 | 190 | H   | 156 | 176 | 198 | 198 | 238 | 262 | 238 | 222 | 218 | Q   |     |
| 20    | 270 | 258 | 240 | 230 | 230 | 204 | 218 | 202 | 200 | 196 | 186 | 192 | 202 | 208 | 202 | 204 | 222 | 216 | 232 | 236 | 242 | 228 | 202 | 206 |
| 21    | 244 | 244 | 244 | 244 | 238 | 234 | 212 | 190 | 198 | 194 | 174 | 174 | 198 | 204 | A   | 204 | 234 | 248 | 222 | 226 | 226 | 226 | 212 | 228 |
| 22    | 238 | 222 | 238 | 228 | 214 | 224 | 202 | 192 | 192 | 192 | 184 | 196 | 180 | 212 | 230 | 232 | 224 | 224 | 240 | 246 | 236 | 236 | 258 | 222 |
| 23    | 280 | 240 | 248 | A   | 270 | 272 | 230 | 210 | 210 | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | 236 | 260 | 238 | 248 | 248 |
| 24    | 250 | 272 | 262 | Q   | 224 | 218 | 224 | 208 | 196 | 204 | 204 | 196 | 192 | 202 | 198 | 198 | 220 | 208 | A   | 238 | 238 | 238 | 208 | 222 |
| 25    | 256 | 264 | 266 | 244 | 244 | 238 | 230 | 206 | 198 | 192 | 190 | 200 | 192 | 200 | 200 | 200 | 210 | 238 | 210 | 240 | 258 | 224 | 246 | 214 |
| 26    | 250 | 228 | 262 | 258 | 248 | 248 | 236 | 198 | 196 | 190 | 196 | 196 | 182 | 186 | 206 | 202 | 244 | 236 | 220 | 232 | 212 | 212 | 240 | 240 |
| 27    | 262 | 270 | 270 | 258 | 240 | 208 | 204 | 214 | 192 | 192 | 182 | 218 | 216 | 196 | 202 | 202 | 252 | 242 | 226 | 236 | 254 | 232 | 204 | 222 |
| 28    | 240 | 256 | 234 | 246 | 200 | 230 | 234 | 200 | 200 | 194 | 212 | 200 | 194 | 196 | 190 | 192 | 216 | 214 | 216 | 252 | 266 | Q   | 228 | 240 |
| 29    | 226 | 238 | 238 | 242 | 204 | 244 | 212 | 220 | 220 | 210 | 198 | 200 | 218 | 250 | B   | 224 | 208 | 226 | 216 | 264 | Q   | Q   | 256 | 236 |
| 30    | 236 | 230 | 254 | 234 | 230 | 246 | 206 | 190 | 196 | 208 | 186 | 198 | 198 | 200 | 194 | 240 | 240 | 218 | 210 | 234 | 268 | 270 | 244 | 232 |
| 31    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| CNT   | 25  | 25  | 26  | 25  | 24  | 22  | 24  | 24  | 22  | 21  | 23  | 23  | 24  | 22  | 23  | 23  | 24  | 23  | 25  | 26  | 26  | 25  | 26  | 23  |
| MED   | 244 | 250 | 254 | 252 | 242 | 235 | 212 | 200 | 199 | 196 | 196 | 196 | 195 | 199 | 198 | 204 | 213 | 226 | 232 | 236 | 241 | 230 | 237 | 238 |
| U Q   | 251 | 263 | 268 | 258 | 261 | 246 | 225 | 212 | 204 | 206 | 200 | 200 | 202 | 204 | 206 | 224 | 228 | 242 | 240 | 248 | 252 | 243 | 246 | 246 |
| L Q   | 238 | 229 | 244 | 243 | 229 | 224 | 202 | 196 | 196 | 192 | 186 | 190 | 184 | 192 | 194 | 200 | 202 | 214 | 221 | 232 | 230 | 225 | 226 | 228 |

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| H<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      |    |    |    |    | A   | B   | 112 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 100 | 102 | 102 | 102 | A   | A  |    |    |    |    |
| 2      |    |    |    |    | B   | A   | 116 | 102 | 102 | 102 | 102 | A   | 102 | A   | 100 | 102 | 102 | 102 | A   | B  |    |    |    |    |
| 3      |    |    |    |    | B   | B   | 102 | 102 | 102 | 102 | 102 | 100 | 100 | 108 | 108 | 108 | A   | 136 | B   |    |    |    |    |    |
| 4      |    |    |    |    | B   | A   | 122 | 108 | 100 | A   | 106 | 106 | 106 | 106 | 106 | 102 | 100 | A   | 112 | B  |    |    |    |    |
| 5      |    |    |    |    | B   | B   | 92  | 110 | 110 | A   | 110 | A   | 110 | 110 | 110 | 110 | 96  | 96  | A   | A  |    |    |    |    |
| 6      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  |    |    |    |    |
| 7      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  |    |    |    |    |
| 8      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  |    |    |    |    |
| 9      |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  |    |    |    |    |
| 10     |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | A   | 104 | 98  | 108 | 104 | 114 | 114 | 102 | A  |    |    |    |    |
| 11     |    |    |    |    | A   | A   | 98  | 96  | 96  | 96  | 90  | 96  | 110 | 104 | 104 | A   | 104 | A   |     |    |    |    |    |    |
| 12     |    |    |    |    | A   | 118 | 100 | 100 | 102 | 102 | 102 | 100 | 108 | 108 | 108 | 104 | 104 | A   |     |    |    |    |    |    |
| 13     |    |    |    |    | B   | 122 | 114 | 102 | 102 | 102 | 108 | 108 | 104 | 104 | 104 | 104 | 132 | A   |     |    |    |    |    |    |
| 14     |    |    |    |    | B   | 116 | 116 | 104 | 104 | 104 | 104 | 104 | 102 | 102 | 102 | 114 | 102 | A   |     |    |    |    |    |    |
| 15     |    |    |    |    | 112 | B   | 112 | 104 | 106 | 104 | A   | A   | A   | 94  | A   | A   | A   | A   | A   |    |    |    |    |    |
| 16     |    |    |    |    | A   | 90  | 104 | 104 | 102 | 96  | 88  | 92  | 92  | A   | A   | A   | A   | A   | A   |    |    |    |    |    |
| 17     |    |    |    |    | A   | A   | A   | 94  | 90  | 90  | A   | A   | 88  | 102 | 94  | 118 | 98  | A   |     |    |    |    |    |    |
| 18     |    |    |    |    | A   | A   | 102 | A   | 102 | 102 | 102 | 98  | 98  | 106 | 106 | 114 | B   | B   |     |    |    |    |    |    |
| 19     |    |    |    |    | A   | 110 | 102 | 108 | 110 | A   | A   | A   | 110 | 100 | 92  | 100 | A   | A   |     |    |    |    |    |    |
| 20     |    |    |    |    | 88  | 126 | 102 | 106 | 106 | 106 | 98  | 114 | 102 | 100 | 106 | 98  | A   | B   |     |    |    |    |    |    |
| 21     |    |    |    |    | B   | 124 | 108 | 108 | 96  | 100 | 106 | 106 | 100 | 100 | 108 | 108 | 108 | A   | B   |    |    |    |    |    |
| 22     |    |    |    |    | B   | 106 | 106 | 112 | 108 | 94  | 94  | 102 | 102 | 98  | 104 | 110 | A   | B   |     |    |    |    |    |    |
| 23     |    |    |    |    | B   | A   | 100 | 104 | 106 | 102 | A   | 102 | A   | 102 | 102 | 112 | A   | A   |     |    |    |    |    |    |
| 24     |    |    |    |    | 112 | 112 | 112 | 110 | 110 | 110 | 110 | 110 | 92  | 92  | 92  | 114 | A   | A   |     |    |    |    |    |    |
| 25     |    |    |    |    | A   | A   | A   | A   | 106 | 106 | 106 | 106 | 106 | 106 | 108 | 102 | 102 | 102 | A   |    |    |    |    |    |
| 26     |    |    |    |    | B   | 126 | 116 | 106 | 106 | 102 | 102 | 98  | 106 | 106 | 106 | 98  | 142 | B   |     |    |    |    |    |    |
| 27     |    |    |    |    | B   | A   | 122 | 116 | 116 | 116 | 116 | 106 | A   | 106 | 106 | 110 | A   | A   |     |    |    |    |    |    |
| 28     |    |    |    |    | B   | 128 | 110 | 110 | 110 | 102 | 102 | 94  | 104 | 100 | 98  | 102 | A   | A   |     |    |    |    |    |    |
| 29     |    |    |    |    | B   | A   | 124 | 112 | 100 | 102 | 102 | 108 | A   | A   | A   | A   | 108 | A   | B   |    |    |    |    |    |
| 30     |    |    |    |    | B   | 108 | 104 | 104 | 104 | 104 | 104 | 104 | A   | 106 | 106 | 114 | B   | A   |     |    |    |    |    |    |
| 31     |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |     | 3   | 18  | 23  | 23  | 23  | 24  | 19  | 22  | 20  | 24  | 23  | 23  | 12  | 3   |    |    |    |    |    |
| MED    |    |    |    |    |     | 112 | 116 | 106 | 104 | 104 | 102 | 104 | 104 | 103 | 103 | 104 | 108 | 103 | 112 |    |    |    |    |    |
| U Q    |    |    |    |    |     | 112 | 124 | 112 | 108 | 106 | 105 | 106 | 106 | 106 | 106 | 106 | 114 | 111 | 136 |    |    |    |    |    |
| L Q    |    |    |    |    |     | 88  | 108 | 102 | 102 | 102 | 102 | 102 | 100 | 99  | 100 | 102 | 102 | 102 | 102 |    |    |    |    |    |

SEP. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| 1     | 96  | 90  | 90  | 90  | 90  | 90  | 136 | 100 | 100 | 100 | 96  | 106 | 100 | 182 | 106 | 164 | 110 | 110 | 110 | 100 | 100 | 100 | 100 | 100 |  |
| 2     | 90  | 96  | 90  | 90  | 90  | 90  | 154 | 100 | 100 | 104 | 104 | 104 | 96  | 96  | 96  | 96  | G   | 112 | 96  | B   | 90  | 90  | 90  | B   |  |
| 3     | 96  | B   | B   | B   | 96  | B   | 146 | 100 | 106 | 130 | B   | G   | 162 | 114 | 160 | 144 | 108 | 108 | 160 | B   | B   | 88  | 98  | 92  |  |
| 4     | 92  | 86  | B   | B   | 102 | 92  | 132 | 102 | 84  | 98  | 96  | 138 | 100 | 158 | 108 | 108 | 104 | 92  | 96  | B   | 102 | 102 | 102 | 98  |  |
| 5     | 98  | 98  | 94  | 92  | 108 | 92  | 136 | 116 | 104 | 108 | 98  | 98  | 100 | 100 | 156 | 120 | 120 | 110 | 102 | 102 | 102 | 102 | 102 | 92  |  |
| 6     | 92  | 110 | 94  | 108 | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |  |
| 7     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |  |
| 8     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |  |
| 9     | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |  |
| 10    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | 104 | 98  | 96  | 104 | 104 | 104 | 94  | 94  | 94  | 100 | 100 | 100 | 110 |  |
| 11    | 98  | 102 | 96  | 96  | 114 | 106 | 94  | 98  | 98  | 98  | 98  | 98  | 102 | 108 | 106 | 98  | 92  | 92  | 96  | 100 | B   | 86  | B   | 116 |  |
| 12    | 114 | 102 | 110 | 114 | 104 | 104 | 146 | 94  | 100 | 104 | 104 | 104 | 104 | 194 | 160 | 132 | 116 | 112 | 102 | 102 | 106 | 108 | 106 | 98  |  |
| 13    | 86  | 86  | 86  | 94  | 94  | B   | 130 | 118 | 98  | 104 | 104 | 112 | 110 | G   | 154 | 144 | 122 | 112 | 112 | 112 | 84  | 114 | 108 | 104 |  |
| 14    | 110 | 120 | B   | B   | 92  | 104 | 104 | 104 | 108 | 108 | 104 | 116 | 108 | 100 | 100 | 98  | 136 | 116 | 114 | 108 | 104 | 104 | 104 | 104 |  |
| 15    | 96  | 96  | 96  | 96  | 96  | 112 | 104 | 124 | 108 | 114 | 124 | 108 | 94  | 98  | 98  | 96  | 100 | 92  | 100 | 92  | 102 | 102 | 102 | 102 |  |
| 16    | 104 | 98  | 98  | 98  | 98  | 98  | 92  | 102 | 102 | 106 | 104 | 104 | 102 | 102 | 102 | 96  | 92  | 92  | 94  | 94  | 106 | 96  | 104 | 100 |  |
| 17    | 98  | 92  | 92  | 92  | 92  | 92  | 92  | 96  | 102 | 96  | 94  | 86  | 86  | 104 | 104 | G   | 156 | 132 | 104 | 96  | 98  | 98  | 98  | 92  |  |
| 18    | 90  | 90  | 96  | 96  | 96  | 94  | 94  | 102 | 94  | 118 | 102 | 112 | 134 | 140 | 126 | 142 | 122 | 116 | 102 | 102 | 98  | 98  | 94  | 94  |  |
| 19    | 94  | 94  | 94  | 92  | 92  | 92  | 110 | 110 | 110 | 170 | 96  | 96  | 96  | 158 | G   | 116 | 98  | 98  | 98  | B   | 86  | 102 | 92  | 92  |  |
| 20    | 90  | 90  | 98  | 98  | 90  | 104 | 140 | 100 | 130 | 130 | 130 | 102 | 166 | 150 | 150 | 196 | 186 | 120 | B   | 110 | 106 | 112 | B   | B   |  |
| 21    | B   | B   | 126 | 126 | 98  | B   | 124 | 114 | 106 | 108 | 106 | B   | 106 | 106 | 100 | 130 | 120 | 120 | 106 | 100 | 90  | 90  | 90  | 96  |  |
| 22    | B   | B   | B   | B   | B   | B   | 166 | 134 | 110 | 122 | 122 | 104 | G   | 150 | 132 | 112 | 130 | 106 | 98  | 98  | 104 | B   | B   | 88  |  |
| 23    | B   | B   | 130 | 110 | 110 | 102 | 102 | 122 | 112 | 106 | 110 | 102 | 102 | 94  | 102 | 112 | 112 | 106 | 106 | 106 | 104 | 86  | 102 | 102 |  |
| 24    | B   | B   | B   | 122 | 108 | 108 | 108 | 104 | 102 | 154 | 154 | 114 | 136 | 106 | 88  | 142 | 118 | 106 | 100 | 100 | 100 | 100 | 100 | 86  |  |
| 25    | 92  | 92  | 90  | 96  | 104 | 104 | 104 | 104 | 104 | 114 | 102 | 102 | 104 | 114 | 106 | 92  | 102 | 116 | 106 | 108 | 98  | 104 | 98  | 90  |  |
| 26    | 90  | 88  | 88  | 88  | 88  | 100 | 106 | 130 | 130 | G   | 148 | 162 | 112 | 102 | 110 | 102 | 126 | G   | B   | B   | 104 | B   | 98  | 80  |  |
| 27    | 88  | 92  | 100 | 104 | B   | B   | 128 | 114 | 118 | 104 | 104 | 116 | 96  | 96  | 160 | 124 | 114 | 108 | 108 | 108 | 108 | 102 | 102 | 98  |  |
| 28    | 96  | 94  | B   | 94  | B   | B   | 142 | 122 | 104 | 104 | 102 | 102 | 98  | 106 | 86  | 86  | 136 | 104 | 98  | 102 | 102 | 100 | 100 | 96  |  |
| 29    | 96  | 96  | 96  | B   | B   | 96  | 98  | 108 | 106 | 116 | 100 | 108 | 100 | 94  | 94  | 94  | 126 | 106 | 108 | 106 | 106 | 106 | 104 | 94  |  |
| 30    | 86  | B   | B   | 100 | 96  | 96  | 100 | 102 | 102 | G   | 96  | 160 | 98  | 92  | 92  | G   | 118 | B   | 98  | 98  | 96  | 96  | 94  | B   |  |
| 31    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| CNT   | 22  | 20  | 19  | 20  | 22  | 19  | 25  | 25  | 25  | 23  | 24  | 24  | 25  | 25  | 25  | 24  | 25  | 24  | 24  | 21  | 24  | 24  | 23  | 23  |  |
| MED   | 95  | 94  | 96  | 96  | 96  | 98  | 110 | 104 | 104 | 108 | 104 | 104 | 102 | 106 | 106 | 112 | 118 | 108 | 102 | 102 | 102 | 100 | 100 | 96  |  |
| U Q   | 98  | 98  | 98  | 104 | 104 | 104 | 138 | 117 | 109 | 118 | 108 | 113 | 109 | 145 | 141 | 137 | 126 | 114 | 107 | 107 | 104 | 103 | 102 | 102 |  |
| L Q   | 90  | 90  | 90  | 92  | 92  | 92  | 101 | 100 | 100 | 104 | 98  | 102 | 98  | 97  | 99  | 97  | 104 | 101 | 98  | 98  | 98  | 96  | 98  | 92  |  |

SEP. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



# IONOSPHERIC DATA STATION Wakkanai

SEP. 2018 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     | F2 | F2   | F1   | F1   | L1 | L1   | C2   | C2   | C1   | C2   | C2   | C2   | C2   | C2   | C1   | C1   | C3   | L1   | L3    | F3   | F3   | F4   | F3   |    |  |
| 2     | C3 | FQ31 | FQ31 | F3   | F2 | L1   | C2   | C3   | C3   | C2   | LC21 | L2   | L2   | L2   | C2   | LC11 |      | C2   | L1    |      | F1   | F1   | F1   |    |  |
| 3     | F1 |      |      |      | F1 |      | C2   | C2   | C2   | CL12 |      |      | HL11 | CL11 | HL11 | HL11 | C2   | L2   | H1    |      |      | F1   | F4   | F1 |  |
| 4     | F1 | F2   |      |      | C1 | L2   | CL21 | LC21 | LC22 | L2   | LC11 | C1   | C2   | C1   | CL21 | C1   | C2   | C2   | LCQ11 |      | F3   | F3   | F3   | F3 |  |
| 5     | F1 | F1   | F2   | F1   | L1 | C1   | CL22 | CL22 | CL21 | L3   | LC21 | L2   | C1   | C1   | HL11 | C2   | C4   | C3   | L3    | L3   | F4   | F1   | F1   | F1 |  |
| 6     | F1 | F2   | F3   | FF32 |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| 7     |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| 8     |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| 9     |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| 10    |    |      |      |      |    |      |      |      |      |      |      | L2   | C2   | C1   | C1   | C1   | L2   | L2   | L4    | L4   | F4   | F4   | F6   | F2 |  |
| 11    | F3 | F3   | F3   | F2   | F2 | L5   | L5   | C3   | C4   | C4   | C4   | C4   | C2   | C2   | C1   | C4   | C3   | L3   | L2    | L1   |      | F1   |      | F7 |  |
| 12    | F3 | F3   | F5   | F4   | F8 | L5   | H2   | L2   | L5   | L5   | CL31 | C2   | C2   | C1   | C1   | C2   | C2   | C4   | L4    | F3   | F4   | F2   | F4   | F3 |  |
| 13    | F4 | F2   | F2   | F1   | F1 |      | C2   | C2   | C2   | C2   | C1   | C2   | C1   |      | C1   | H1   | C2   | C4   | L5    | L1   | F3   | F1   | F1   | F3 |  |
| 14    | F2 | F1   |      |      | F1 | L1   | L2   | L1   | C2   | C2   | C3   | C1   | C1   | C4   | C2   | C2   | C2   | C2   | L1    | F5   | F7   | F7   | F6   | F7 |  |
| 15    | F5 | F7   | F3   | F2   | F1 | LC11 | C3   | CL11 | C1   | C2   | CQ21 | LQ32 | LQ42 | L3   | CQ72 | LQ52 | LQ31 | L3   | LQ41  | L4   | F2   | F6   | F7   | F9 |  |
| 16    | F6 | F3   | F4   | F6   | F3 | LQ21 | L2   | C4   | C3   | C3   | C2   | C4   | C5   | C5   | L4   | L4   | L5   | L4   | L4    | F6   | FQ31 | FQ21 | FQ21 | F5 |  |
| 17    | F8 | F5   | F3   | F3   | F4 | L7   | L5   | LQ52 | C2   | C2   | C1   | L2   | L2   | C1   | C1   |      | C1   | H1   | L3    | F7   | FQ21 | FQ21 | FQ21 | F3 |  |
| 18    | F2 | F4   | F3   | F3   | F2 | L4   | L3   | LC21 | CC12 | CC11 | C2   | C1   | H1   | H1   | C1   | H1   | C2   | C3   | L1    | F1   | F6   | F3   | F6   | F4 |  |
| 19    | F2 | F2   | F1   | F3   | F1 | L2   | C2   | C2   | C1   | H1   | L2   | L2   | F2   | H1   |      | C1   | L2   | L2   | L1    |      | F2   | F1   | F7   | F2 |  |
| 20    | F3 | F3   | F2   | F1   | F2 | C1   | C1   | C1   | CL11 | CL12 | CL12 | LC11 | C1   | C1   | HC11 | C1   | HL11 | C1   |       | F1   | F4   | F1   |      |    |  |
| 21    |    |      | F1   | F1   | F1 |      | C2   | C2   | C2   | C1   |      |      | C1   | C2   | C4   | HL11 | CL21 | C3   | L3    | F2   | F2   | F1   | F1   | F1 |  |
| 22    |    |      |      |      |    |      | HL11 | HL11 | C1   | C1   | C1   | CL12 |      | C1   | C2   | C2   | C2   | C4   | L5    | F2   | F1   |      |      | F1 |  |
| 23    |    |      | F1   | F7   | F4 | L1   | L2   | C1   | C1   | C4   | CQ52 | L2   | C2   | C3   | C2   | C3   | C7   | C6   | C3    | F4   | F2   | F2   | F2   | F2 |  |
| 24    |    |      |      | F1   | F1 | L2   | C4   | LC12 | C1   | CL12 | CL12 | C1   | C1   | LC21 | LC21 | HL11 | C2   | L3   | L3    | L5   | L4   | L4   | L1   | L1 |  |
| 25    | L1 | L1   | L1   | F1   | F2 | L3   | L2   | L3   | L2   | LC21 | CL21 | LC21 | LC11 | CL11 | L1   | C2   | LC11 | LC11 | L5    | F4   | F3   | F2   | F4   | F3 |  |
| 26    | F4 | F2   | F2   | F3   | F2 | L1   | LC11 | CL21 | C1   |      | HL11 | HL11 | CL11 | C1   | C1   | C2   |      |      |       |      | F1   |      | F1   | F1 |  |
| 27    | F3 | F4   | F1   |      | F1 | L1   | C2   | C1   | LC11 | LC11 | C2   | C2   | C2   | C3   | CL21 | C2   | C2   | L2   | L1    | FQ32 | FQ31 | FQ41 | F1   | F1 |  |
| 28    | F2 | F1   |      | F2   |    | C1   | C2   | C2   | C2   | C2   | C2   | C2   | C2   | C2   | C2   | C2   | C2   | L3   | L3    | F5   | F3   | F1   | F2   | F3 |  |
| 29    | F3 | F3   | F2   |      | L1 | L1   | C1   | C3   | C1   | C2   | C2   | LC11 | L4   | L4   | L3   | C2   | L3   | L2   | F3    | F3   | F3   | FQ31 | FQ21 |    |  |
| 30    | F2 |      |      | F1   | F1 | L1   | L1   | C2   | C2   |      | L1   | H1   | LC11 | L2   | LC11 |      | C1   |      | L1    | F2   | F2   | F1   | F1   |    |  |
| 31    |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| 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 |  |
| CNT   |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| MED   |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| U Q   |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |
| L Q   |    |      |      |      |    |      |      |      |      |      |      |      |      |      |      |      |      |      |       |      |      |      |      |    |  |

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 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     | 40 | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | 43  |    |
| 2     | 39 | 37 | 35 | 34 | 35 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | 47  |    |
| 3     | X  | X  | X  | C  | C  | C  | C  | C  | C  | C  | C  | C  |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 4     | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 5     | 42 | 40 | 37 | 37 | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 6     | X  | X  | X  | 37 | 37 | 34 |    |    |    |    | C  | C  | C  | C  | C  | C  | C  | C  |    |    | X  | X  | X  | 44  |    |
| 7     | 40 | 39 | A  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 8     | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 9     | 40 | 35 | 34 | 32 | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 10    | 41 | X  | X  | X  | X  | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | O X |    |
| 11    | 43 | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 12    | X  | X  | X  | X  | X  |    |    |    |    |    |    | C  |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 13    | 41 | 40 | A  | 35 | 38 | 35 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 14    | X  | X  | X  | X  | A  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 15    | A  | A  | A  | A  | 37 |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 16    | 40 | 36 | 35 | 32 | 35 |    | 51 |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 17    | X  | 36 | 41 | 36 | 37 | 33 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 18    | X  | X  | X  | X  | X  | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 19    | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    | C  | C  | X  | X  | A  | X   |    |
| 20    | 38 | 38 | 39 | 37 | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 21    | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 22    | 41 | 40 | 41 | 38 | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 23    | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | A  | X   |    |
| 24    | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 25    | 38 | 38 | 37 | 37 | 37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 26    | 39 | 40 | 35 | 34 | 33 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 27    | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   |    |
| 28    | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    | C  | C  | C  | C  | C   |    |
| 29    | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C   |    |
| 30    | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C  | C   |    |
| 31    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |    |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23  |    |
| CNT   | 27 | 27 | 25 | 26 | 26 | 3  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    | 26 | 27 | 26 | 26  | 27 |
| MED   | X  | X  | X  | X  | X  |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   | X  |
| U Q   | 41 | 40 | 38 | 37 | 37 | 36 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 71 | 60 | 48 | 42  | 41 |
| L Q   | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X   | X  |
|       | 39 | 38 | 36 | 34 | 33 | 35 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 66 | 52 | 44 | 40  | 38 |

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

SEP. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 f<sub>o</sub>F1 (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       |         |             | U L U L U L |             |             | U L U L     | U L U L     | U L U L     | U L         | L           |     |     |     |     |     |     |     |     |
| 2      |    |    |    |    |    |     | U L U L | U L U L | A A         | A A         | A A         | A A         | A A         | A U L       | U L         | A A         | A A         | A A | A A |     |     |     |     |     |     |
| 3      |    |    |    |    |    | C   | C       | C       | C           | C           | C           | C           | U L         | U L         | U L         | U L         | U L         | L   |     |     |     |     |     |     |     |
| 4      |    |    |    |    |    |     | L       |         |             | U L         |             |             | U L         | U L         | U L         | U L         | U L         | U L | U L |     |     |     |     |     |     |
| 5      |    |    |    |    |    |     |         |         |             | L U L       | A A         | A A         | A U L       | U L         | U L         | U L         | U L         | A   |     |     |     |     |     |     |     |
| 6      |    |    |    |    |    |     | L       | L       |             |             | C           | C           | C           | C           | C           | C           | C           | C   | C   |     |     |     |     |     |     |
| 7      |    |    |    |    |    |     | L       | L       | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | L   |     |     |     |     |     |     |     |
| 8      |    |    |    |    |    |     |         |         | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L | L   |     |     |     |     |     |     |
| 9      |    |    |    |    |    |     |         |         | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | A   | A   | A   |     |     |     |     |     |
| 10     |    |    |    |    |    |     |         |         | L           | U L         | A U L       | U L         | U L         | U L         | U L         | U L         | U L         | L   | L   |     |     |     |     |     |     |
| 11     |    |    |    |    |    |     |         |         | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L |     |     |     |     |     |     |     |
| 12     |    |    |    |    |    | 280 |         |         | L           | U L         | A           | C           | U L U L     | U L U L     | U L U L     | U L U L     | U L U L     | A   | A   |     |     |     |     |     |     |
| 13     |    |    |    |    |    |     |         |         | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L   | L   |     |     |     |     |     |     |
| 14     |    |    |    |    |    |     |         |         | A           | A           | A           | U L         | U L         | U L         | U L         | U L         | U L         | L   | L   |     |     |     |     |     |     |
| 15     |    |    |    |    |    |     |         |         | L           | A           | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | U L U L U L | A   |     |     |     |     |     |     |     |
| 16     |    |    |    |    |    | A   |         |         | L           | A           | A           | A           | U L         | U L         | U L         | U L         | U L         | L   | A   |     |     |     |     |     |     |
| 17     |    |    |    |    |    |     |         |         | U L         | A           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L   | L   |     |     |     |     |     |     |
| 18     |    |    |    |    |    |     |         |         | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L   |     |     |     |     |     |     |     |
| 19     |    |    |    |    |    |     |         |         | L           | U L         | A U L       | U L         | U L         | U L         | U L         | U L         | U L         | C   | C   |     |     |     |     |     |     |
| 20     |    |    |    |    |    |     |         |         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L   | L   |     |     |     |     |     |     |
| 21     |    |    |    |    |    |     |         |         | A           | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L   |     |     |     |     |     |     |     |
| 22     |    |    |    |    |    |     |         |         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L   |     |     |     |     |     |     |     |
| 23     |    |    |    |    |    |     |         |         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L   |     |     |     |     |     |     |     |
| 24     |    |    |    |    |    |     |         |         |             | L           | U L         | U L         | U L         | U L         | U L         | U L         | L           | L   |     |     |     |     |     |     |     |
| 25     |    |    |    |    |    |     |         |         | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L           | L   |     |     |     |     |     |     |     |
| 26     |    |    |    |    |    |     |         |         | L           | U L         | U L         | U L         | U L         | U L         | U L         | U L         | L           | L   |     |     |     |     |     |     |     |
| 27     |    |    |    |    |    |     |         |         |             | L           | U L         | U L         | U L         | U L         | U L         | U L         | L           | L   |     |     |     |     |     |     |     |
| 28     |    |    |    |    |    |     |         |         |             | L           | U L         | U L         | U L         | U L         | U L         | U L         | L           | L   | C   | C   |     |     |     |     |     |
| 29     |    |    |    |    |    | C   | C       | C       | C           | C           | C           | C           | C           | C           | C           | C           | C           | C   | C   | C   |     |     |     |     |     |
| 30     |    |    |    |    |    | C   | C       | C       | C           | C           | C           | C           | C           | C           | C           | C           | C           | C   | C   | C   |     |     |     |     |     |
| 31     |    |    |    |    |    |     |         |         |             |             |             |             |             |             |             |             |             |     |     |     |     |     |     |     |     |
|        | 00 | 01 | 02 | 03 | 04 | 05  | 06      | 07      | 08          | 09          | 10          | 11          | 12          | 13          | 14          | 15          | 16          | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |
| CNT    |    |    |    |    |    |     | 2       | 2       | 14          | 19          | 19          | 21          | 24          | 23          | 20          | 17          | 10          | 1   |     |     |     |     |     |     |     |
| MED    |    |    |    |    |    |     | U L     | U L     | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L         | U L | U L | U L | U L | U L | U L | U L | U L |
| U Q    |    |    |    |    |    |     | 340     | 372     | 396         | 408         | 416         | 420         | 416         |             |             |             |             |     |     |     |     |     |     |     |     |
| L Q    |    |    |    |    |    |     |         |         |             |             |             |             |             |             |             |             |             |     |     |     |     |     |     |     |     |

SEP. 2018 f<sub>o</sub>F1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 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      |    |    |    |    |    |    | BUR      | UR       | R        | A        | A        | A        | R        | A        | A        | A        | A        | R        | A        | A        | B        |          |          |          |
| 2      |    |    |    |    |    |    | BUR      | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        |          |          |          |          |
| 3      |    |    |    |    |    |    | C        | C        | C        | C        | C        | C        | R        | R        |          | UR       | UR       | R        | A        | B        |          |          |          |          |
| 4      |    |    |    |    |    |    | B        | A        | A        | A        | A        | R        | R        | R        | RU       | AUR      | UR       | UR       | B        |          |          |          |          |          |
| 5      |    |    |    |    |    |    | BUR      | A        | A        | R        | A        | A        | A        | A        | A        | A        | R        | R        | A        | B        |          |          |          |          |
| 6      |    |    |    |    |    |    | B        | B        | AUR      | R        | C        | C        | C        | C        | C        | C        | C        | C        | C        | B        |          |          |          |          |
| 7      |    |    |    |    |    |    | B        | B        | AUR      | R        | R        |          | UR       | R        | R        |          | A        | A        | A        |          |          |          |          |          |
| 8      |    |    |    |    |    |    | B        | A        | A        | A        | A        | A        | A        | AUR      | A        | R        | UR       | A        | B        |          |          |          |          |          |
| 9      |    |    |    |    |    |    | B        | AUR      | A        | A        | R        | R        | R        | A        | R        |          | A        | A        | B        |          |          |          |          |          |
| 10     |    |    |    |    |    |    | BUR      | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | B        |          |          |          |          |
| 11     |    |    |    |    |    |    | B        | UR       | R        | R        | R        | AUR      | A        | A        | R        | UR       | AUR      | UR       | A        | B        |          |          |          |          |
| 12     |    |    |    |    |    |    | B        | B        | A        | A        | A        | C        | A        | A        | A        | A        | A        | A        | A        | B        |          |          |          |          |
| 13     |    |    |    |    |    |    | B        | AUR      | A        | A        | A        | A        | A        | A        | A        | AUR      | AUR      | A        | A        | B        |          |          |          |          |
| 14     |    |    |    |    |    |    | BUR      | A        | A        | A        | A        | AUR      | A        | A        | R        | UR       | UR       | UR       | A        | B        |          |          |          |          |
| 15     |    |    |    |    |    |    | B        |          | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | B        |          |          |          |          |
| 16     |    |    |    |    |    |    | B        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | B        |          |          |          |          |
| 17     |    |    |    |    |    |    | B        | BUR      |          | A        | R        | R        | R        | R        | R        | UR       | AUR      | UR       | A        | B        |          |          |          |          |
| 18     |    |    |    |    |    |    | B        | A        | A        | A        | 332      | A        | UR       | A        | A        | UR       | R        | A        | B        |          |          |          |          |          |
| 19     |    |    |    |    |    |    | B        | B        | A        | A        | A        | A        | A        | A        | A        | A        | A        | A        | C        | C        |          |          |          |          |
| 20     |    |    |    |    |    |    | BUR      | UR       | AUR      | AUR      | A        | A        | UR       | A        | R        | R        | R        | AUR      | R        | B        |          |          |          |          |
| 21     |    |    |    |    |    |    | B        | B        | A        | A        | A        | A        | A        | AUR      | A        | A        | A        | A        | A        | B        |          |          |          |          |
| 22     |    |    |    |    |    |    | BUR      | A        | A        | R        | A        | R        |          | R        | R        |          | AUR      | UR       | R        | B        |          |          |          |          |
| 23     |    |    |    |    |    |    | B        | B        | AUR      | UR       | UR       | UR       | UR       | UR       | UR       | UR       | A        | A        | B        | B        |          |          |          |          |
| 24     |    |    |    |    |    |    | B        | B        | A        | A        | R        | R        | R        | R        | R        | R        | R        | A        | B        | B        |          |          |          |          |
| 25     |    |    |    |    |    |    | BUR      | A        | A        | A        | AUR      | A        | R        | A        | A        | A        | A        | A        | A        | B        |          |          |          |          |
| 26     |    |    |    |    |    |    | B        | A        | A        | A        | R        |          | UR       | A        | A        | AUR      | A        | A        | A        | B        |          |          |          |          |
| 27     |    |    |    |    |    |    | B        | BUR      | AUR      | AUR      | AUR      | A        | R        | A        | A        | A        | A        | A        | A        | B        |          |          |          |          |
| 28     |    |    |    |    |    |    | B        | A        | A        | A        | AUR      | A        | R        | R        | A        | AUR      | UR       | C        | C        |          |          |          |          |          |
| 29     |    |    |    |    |    |    | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        |          |          |          |          |
| 30     |    |    |    |    |    |    | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        | C        |          |          |          |          |
| 31     |    |    |    |    |    |    |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06       | 07       | 08       | 09       | 10       | 11       | 12       | 13       | 14       | 15       | 16       | 17       | 18       | 19       | 20       | 21       | 22       | 23       |
| CNT    |    |    |    |    |    |    | 9        | 7        | 5        | 2        | 2        | 4        | 6        | 5        | 3        | 11       | 10       | 6        |          |          |          |          |          |          |
| MED    |    |    |    |    |    |    | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR |
| UQ     |    |    |    |    |    |    | 212280   | 300      |          |          |          | 326      | 336      | 332      | 316      | 288      | 264      | 200      |          |          |          |          |          |          |
| LQ     |    |    |    |    |    |    | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR | URURURUR |

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00        | 01        | 02        | 03        | 04        | 05        | 06        | 07        | 08        | 09        | 10        | 11        | 12        | 13        | 14        | 15        | 16        | 17         | 18         | 19        | 20         | 21        | 22        | 23        |           |
|-------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|------------|-----------|-----------|-----------|-----------|
| 1     | J A<br>33 | 22        | 21        | J A<br>25 | J A<br>21 | E B<br>14 | G         | G         | J A<br>37 | 36        | 40        | G         | J A<br>49 | J A<br>45 | 36        | 34        | G         | 25         | J A<br>25  | J A<br>42 | J A<br>38  | 24        | J A<br>30 | J A<br>28 |           |
| 2     | E B<br>16 | 22        | E B<br>19 | E B<br>15 | J A<br>36 | 22        | G         | 30        | J A<br>51 | 59        | 50        | J A<br>59 | J A<br>56 | J A<br>50 | 37        | J A<br>48 | J A<br>48 | J A<br>67  | J A<br>105 | J A<br>57 | J A<br>31  | J A<br>36 | E B<br>16 | E B<br>15 |           |
| 3     | 20        | E B<br>16 | E B<br>16 | C         | C         | C         | C         | C         | C         | C         | C         | C         | G         | G         | G         | G         | G         | J A<br>27  | E B<br>14  | 22        | 23         | 20        | E B<br>16 | E B<br>16 |           |
| 4     | E B<br>16 | E B<br>16 | E B<br>16 | E B<br>16 | E B<br>16 | 24        | 24        | 30        | 34        | 37        | G         | G         | 40        | G         | 36        | G         | G         | G          | 23         | E B<br>16 | J A<br>16  | J A<br>25 | J A<br>31 | E B<br>15 | J A<br>45 |
| 5     | J A<br>42 | J A<br>27 | 20        | 19        | 20        | J A<br>23 | 24        | 30        | G         | J A<br>42 | 48        | 42        | J A<br>56 | J A<br>36 | 38        | G         | 32        | J A<br>55  | J A<br>43  | J A<br>68 | J A<br>98  | J A<br>43 | J A<br>28 | J A<br>25 |           |
| 6     | 22        | J A<br>31 | J A<br>23 | E B<br>16 | E B<br>16 | 20        | J A<br>27 | J A<br>30 | G         | G         | C         | C         | C         | C         | C         | C         | C         | C          | J A<br>22  | J A<br>66 | J A<br>37  | J A<br>49 | E B<br>22 | E B<br>16 |           |
| 7     | J A<br>31 | J A<br>28 | J A<br>34 | J A<br>27 | J A<br>30 | J A<br>26 | 20        | 30        | G         | G         | G         | 40        | G         | 38        | G         | 34        | 32        | 27         | J A<br>34  | E B<br>15 | J A<br>26  | J A<br>37 | J A<br>27 | J A<br>25 |           |
| 8     | 22        | 22        | E B<br>15 | E B<br>16 | 20        | 23        | J A<br>26 | J A<br>32 | J A<br>36 | J A<br>38 | 44        | 47        | J A<br>68 | J A<br>38 | 38        | G         | 31        | G          | 25         | J A<br>31 | J A<br>30  | J A<br>30 | J A<br>31 | J A<br>24 | J A<br>27 |
| 9     | J A<br>36 | J A<br>40 | 22        | J A<br>29 | J A<br>24 | J A<br>23 | 24        | 30        | J A<br>37 | J A<br>35 | G         | G         | G         | J A<br>37 | G         | 33        | J A<br>43 | J A<br>49  | J A<br>42  | J A<br>38 | J A<br>36  | J A<br>25 | J A<br>36 | J A<br>41 |           |
| 10    | J A<br>40 | J A<br>53 | J A<br>36 | J A<br>40 | J A<br>31 | J A<br>28 | 27        | 34        | J A<br>33 | J A<br>39 | J A<br>43 | 40        | 38        | 38        | 66        | 81        | J A<br>36 | J A<br>27  | J A<br>25  | J A<br>23 | J A<br>26  | E B<br>16 | J A<br>71 | J A<br>55 |           |
| 11    | J A<br>30 | J A<br>87 | J A<br>73 | J A<br>30 | J A<br>32 | J A<br>32 | 25        | G         | G         | G         | G         | 40        | 41        | 39        | G         | 32        | G         | 26         | J A<br>22  | J A<br>22 | J A<br>24  | J A<br>39 | E B<br>25 | J A<br>17 |           |
| 12    | E B<br>16 | E B<br>16 | E B<br>16 | 21        | 24        | 23        | 22        | 30        | 34        | J A<br>49 | J A<br>52 | C         | 38        | 38        | 74        | 37        | J A<br>60 | J A<br>55  | J A<br>50  | J A<br>84 | J A<br>120 | J A<br>37 | J A<br>52 | J A<br>37 |           |
| 13    | J A<br>32 | J A<br>39 | J A<br>54 | J A<br>51 | J A<br>26 | 21        | 22        | 29        | J A<br>49 | J A<br>47 | J A<br>42 | 38        | J A<br>49 | J A<br>48 | 35        | 35        | 31        | J A<br>32  | J A<br>32  | J A<br>26 | J A<br>35  | J A<br>37 | E B<br>16 | E B<br>16 |           |
| 14    | J A<br>26 | J A<br>24 | J A<br>25 | J A<br>54 | J A<br>56 | J A<br>32 | G         | J A<br>37 | J A<br>45 | J A<br>51 | J A<br>41 | 40        | 38        | 36        | G         | G         | 29        | 25         | J A<br>27  | J A<br>22 | 25         | J A<br>33 | J A<br>31 | J A<br>50 |           |
| 15    | J A<br>53 | J A<br>51 | J A<br>89 | J A<br>48 | J A<br>37 | J A<br>32 | 78        | 48        | J A<br>54 | J A<br>56 | 38        | J A<br>42 | J A<br>43 | J A<br>48 | 38        | 34        | 41        | 46         | J A<br>33  | J A<br>39 | J A<br>29  | J A<br>24 | J A<br>34 | J A<br>54 |           |
| 16    | J A<br>46 | J A<br>52 | J A<br>53 | J A<br>67 | J A<br>56 | J A<br>54 | 37        | 32        | J A<br>61 | J A<br>85 | J A<br>53 | J A<br>70 | J A<br>87 | J A<br>71 | J A<br>37 | J A<br>42 | J A<br>63 | J A<br>143 | J A<br>111 | J A<br>48 | J A<br>39  | J A<br>62 | J A<br>28 | J A<br>27 |           |
| 17    | 20        | E B<br>16 | E B<br>16 | E B<br>16 | E B<br>16 | E B<br>26 | 22        | 30        | 34        | J A<br>45 | G         | G         | G         | G         | 36        | 32        | G         | 24         | E B<br>15  | E B<br>16 | 22         | J A<br>24 | J A<br>25 | J A<br>28 |           |
| 18    | J A<br>28 | J A<br>25 | 21        | J A<br>33 | J A<br>47 | J A<br>23 | 37        | 31        | J A<br>33 | J A<br>38 | 39        | 39        | 37        | 34        | G         | G         | G         | J A<br>28  | J A<br>27  | J A<br>23 | J A<br>24  | J A<br>24 | J A<br>31 | J A<br>30 |           |
| 19    | J A<br>50 | J A<br>30 | J A<br>25 | J A<br>23 | J A<br>25 | 23        | 25        | J A<br>31 | J A<br>37 | J A<br>40 | J A<br>46 | J A<br>42 | J A<br>39 | J A<br>38 | J A<br>34 | J A<br>36 | J A<br>31 | C          | C          | J A<br>27 | J A<br>51  | J A<br>54 | J A<br>37 | J A<br>36 |           |
| 20    | J A<br>41 | 23        | J A<br>26 | J A<br>34 | J A<br>32 | 21        | J G<br>21 | 29        | 33        | 26        | 36        | G         | 38        | G         | G         | G         | 29        | G          | J A<br>33  | J A<br>29 | J A<br>44  | J A<br>23 | J A<br>50 | J A<br>39 |           |
| 21    | J A<br>42 | J A<br>27 | J A<br>28 | J A<br>31 | J A<br>24 | J A<br>22 | 24        | J A<br>42 | J A<br>34 | J A<br>44 | J A<br>39 | J A<br>39 | J A<br>41 | J A<br>42 | J A<br>36 | J A<br>35 | 30        | 24         | J A<br>43  | J A<br>87 | J A<br>79  | J A<br>29 | J A<br>26 | J A<br>17 |           |
| 22    | E B<br>16 | E B<br>16 | J A<br>23 | J A<br>23 | J A<br>23 | 20        | G         | 29        | 33        | G         | 36        | G         | 36        | G         | G         | 33        | G         | G          | J A<br>25  | J A<br>32 | J A<br>53  | J A<br>23 | E B<br>16 | E B<br>15 |           |
| 23    | E B<br>16 | E B<br>16 | E B<br>16 | 20        | 20        | J A<br>24 | J A<br>22 | 29        | G         | G         | G         | G         | G         | G         | 36        | 34        | 34        | 30         | J A<br>26  | J A<br>23 | J A<br>28  | J A<br>52 | J A<br>28 | J A<br>76 | J A<br>55 |
| 24    | J A<br>52 | J A<br>29 | J A<br>27 | J A<br>23 | E B<br>16 | 23        | 21        | 28        | 31        | G         | G         | G         | G         | G         | G         | G         | 28        | 28         | J A<br>26  | E B<br>16 | E B<br>16  | J A<br>29 | J A<br>37 | J A<br>34 | J A<br>33 |
| 25    | J A<br>26 | E B<br>16 | E B<br>15 | E B<br>16 | E B<br>16 | 24        | G         | J A<br>32 | J A<br>34 | J A<br>37 | J A<br>37 | 40        | 28        | J A<br>35 | J A<br>39 | J A<br>38 | J A<br>50 | J A<br>31  | J A<br>27  | J A<br>29 | J A<br>52  | J A<br>64 | J A<br>67 | J A<br>35 |           |
| 26    | J A<br>26 | 22        | E B<br>15 | E B<br>16 | 20        | J A<br>24 | J A<br>30 | J A<br>30 | J A<br>34 | J A<br>37 | G         | G         | 40        | G         | J A<br>36 | J A<br>31 | J A<br>32 | J A<br>30  | J A<br>27  | J A<br>23 | J A<br>24  | J A<br>19 | E B<br>16 | E B<br>16 |           |
| 27    | E B<br>15 | E B<br>16 | E B<br>16 | E B<br>16 | E B<br>16 | E B<br>16 | 19        | 31        | 37        | G         | 37        | 38        | G         | 39        | 38        | 34        | J A<br>38 | J A<br>23  | E B<br>16  | 23        | J A<br>71  | J A<br>49 | J A<br>50 | J A<br>38 |           |
| 28    | J A<br>34 | J A<br>28 | J A<br>29 | J A<br>21 | J A<br>24 | 22        | 21        | J A<br>28 | 34        | 34        | 36        | 38        | G         | G         | 34        | 32        | G         | C          | C          | C         | C          | C         | C         | C         | C         |
| 29    | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C          | C          | C         | C          | C         | C         | C         | C         |
| 30    | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C         | C          | C          | C         | C          | C         | C         | C         | C         |
| 31    |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |            |            |           |            |           |           |           |           |
| 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        |           |
| CNT   | 28        | 28        | 28        | 27        | 27        | 27        | 27        | 27        | 27        | 27        | 26        | 25        | 27        | 27        | 27        | 27        | 27        | 27         | 25         | 26        | 27         | 27        | 27        | 27        | 27        |
| MED   | J A<br>29 | J A<br>24 | 22        | 23        | J A<br>24 | 23        | 22        | 30        | 34        | J A<br>37 | 38        | 39        | 38        | 37        | 35        | 33        | 30        | J A<br>27  | J A<br>27  | J A<br>28 | J A<br>35  | J A<br>31 | J A<br>28 | J A<br>28 |           |
| U Q   | J A<br>40 | J A<br>30 | J A<br>28 | J A<br>33 | J A<br>32 | J A<br>26 | J A<br>26 | J A<br>32 | J A<br>37 | J A<br>45 | J A<br>43 | J A<br>41 | J A<br>43 | J A<br>39 | J A<br>37 | J A<br>35 | J A<br>38 | J A<br>39  | J A<br>34  | J A<br>42 | J A<br>52  | J A<br>39 | J A<br>37 | J A<br>39 |           |
| L Q   | E B<br>20 | E B<br>16 | E B<br>16 | E B<br>16 | E B<br>20 | 22        | G         | 29        | G         | G         | G         | G         | G         | G         | G         | G         | G         | G          | E B<br>24  | E B<br>23 | E B<br>22  | J A<br>25 | E B<br>24 | E B<br>22 | E B<br>17 |

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 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      | 22  | E B | E B | E B | E B | E B | G  | G  | 34 | 34 | 38  | G   | 27  | 37 | 33  | 32  | G  | 23  | 21  | 19  | E B | E B | E B | 18  |    |
| 2      | E B | E B | E B | E B | E B | E B | G  | 26 | 39 | 54 | 44  | A A | A A | 47 | 34  | A A | 48 | 39  | A A | A A | 30  | 18  | E B | E B | 15 |
| 3      | E B | E B | E B | C   | C   | C   | C  | C  | C  | C  | C   | C   | G   | G  | G   | G   | G  | 22  | 14  | 16  | 16  | 16  | 16  | 16  |    |
| 4      | E B | E B | E B | E B | E B | E B | 23 | 28 | 31 | 34 | G   | G   | 38  | 34 | G   | G   | G  | E B | E B | E B | 16  | 22  | E B | 20  |    |
| 5      | E B | E B | E B | E B | E B | E B | 22 | 29 | G  | 36 | 41  | 38  | 41  | 34 | 34  | G   | 30 | 40  | 22  | 34  | 39  | 20  | E B | 16  |    |
| 6      | E B | E B | E B | E B | E B | E B | 20 | 26 | G  | G  | C   | C   | C   | C  | C   | C   | C  | C   | E B | E B | 16  | 20  | 24  | E B |    |
| 7      | E B | 18  | A A | 20  | 22  | 17  | 19 | 24 | G  | G  | G   | 38  | 37  | G  | G   | 32  | 28 | 24  | 28  | 15  | 18  | E B | E B | 16  |    |
| 8      | E B | E B | E B | E B | E B | E B | 22 | 26 | 32 | 34 | 37  | 35  | 39  | 36 | G   | 30  | G  | 22  | 18  | 23  | 21  | 21  | E B | 16  |    |
| 9      | 20  | 19  | E B | E B | E B | 17  | 22 | 25 | G  | 30 | 33  | G   | G   | G  | G   | 32  | 35 | A A | A A | 39  | 27  | 24  | 19  | 22  |    |
| 10     | 24  | 18  | 20  | 23  | 20  | E B | 23 | 31 | 31 | 35 | 39  | 36  | 38  | 37 | A A | 66  | 32 | 28  | 25  | 19  | E B | E B | E B | 25  |    |
| 11     | E B | 22  | 20  | 21  | 18  | E B | 19 | G  | G  | G  | G   | 38  | 38  | 36 | G   | 31  | G  | 24  | 16  | 16  | 20  | 22  | E B | 17  |    |
| 12     | E B | E B | E B | E B | E B | E B | 20 | 27 | 31 | 38 | A A | 52  | C   | 35 | 36  | A A | 74 | 34  | A A | 60  | 40  | 24  | 36  | 25  |    |
| 13     | E B | 22  | A A | 54  | 18  | E B | 20 | 27 | 36 | 40 | 38  | 38  | 34  | 39 | 33  | 33  | 28 | 26  | 25  | 21  | 24  | 24  | E B | 16  |    |
| 14     | E B | E B | E B | E B | A A | A A | G  | 30 | 37 | 44 | 36  | 35  | 35  | 35 | G   | G   | 27 | 23  | 22  | E B | E B | 15  | 27  | 20  |    |
| 15     | A A | A A | A A | A A | A A | E B | 22 | 30 | 40 | 36 | 36  | 36  | 38  | 40 | 32  | 30  | 35 | 32  | 24  | 20  | 22  | E B | E B | 15  |    |
| 16     | E B | 22  | 19  | 19  | 17  | A A | 21 | 30 | 46 | 43 | 45  | 48  | 37  | 44 | 32  | 38  | 29 | 44  | 26  | 40  | 28  | 24  | 24  | 20  |    |
| 17     | E B | E B | E B | E B | E B | E B | 21 | 28 | 32 | 39 | G   | G   | G   | G  | 35  | 31  | G  | 23  | E B | E B | E B | E B | E B | 18  |    |
| 18     | 18  | 18  | E B | 18  | E B | E B | 21 | 28 | 29 | 33 | 38  | 35  | G   | 36 | 34  | G   | G  | 23  | 17  | E B | E B | E B | E B | 16  |    |
| 19     | E B | E B | E B | E B | E B | E B | 20 | 26 | 32 | 33 | 40  | 36  | 34  | 34 | 30  | 30  | 28 | C   | C   | 23  | 29  | A A | E B | 16  |    |
| 20     | E B | E B | E B | 20  | 23  | 18  | 18 | 26 | 31 | 24 | 36  | G   | 37  | G  | G   | G   | 26 | G   | 22  | 21  | 34  | E B | 18  | 20  |    |
| 21     | E B | 15  | 20  | 19  | E B | E B | 22 | 35 | 30 | 34 | 35  | 37  | 36  | 38 | 34  | 33  | 28 | 23  | 22  | 45  | E B | E B | E B | 17  |    |
| 22     | E B | E B | E B | E B | E B | E B | G  | 26 | 30 | G  | 34  | G   | 35  | G  | G   | 31  | G  | G   | E B | 16  | 24  | 17  | E B | 15  |    |
| 23     | E B | E B | E B | E B | E B | E B | 19 | 28 | G  | G  | G   | G   | G   | 35 | 32  | 32  | 27 | 24  | E B | E B | 18  | 22  | A A | 30  |    |
| 24     | E B | 18  | 21  | E B | E B | E B | 18 | 26 | 29 | G  | G   | G   | G   | G  | G   | G   | 23 | 26  | 19  | E B | E B | E B | E B | 16  |    |
| 25     | E B | E B | E B | E B | E B | E B | G  | 26 | 29 | 32 | 33  | 37  | 26  | 32 | 36  | 29  | 29 | 22  | 20  | 20  | 21  | 20  | E B | 16  |    |
| 26     | E B | E B | E B | E B | E B | E B | 21 | 24 | 28 | 34 | G   | G   | 37  | G  | 32  | 23  | 27 | 19  | 18  | E B | E B | E B | E B | 16  |    |
| 27     | E B | E B | E B | E B | E B | E B | 18 | 30 | 34 | G  | 35  | 35  | G   | 35 | 34  | 31  | 32 | 19  | E B | E B | 24  | 21  | 21  | 20  |    |
| 28     | 22  | 18  | E B | E B | E B | E B | 18 | 24 | 30 | 32 | 35  | 36  | G   | G  | 32  | 29  | G  | C   | C   | C   | C   | C   | C   | C   |    |
| 29     | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  | C   | C   | C   | C  | C   | C   | C  | C   | C   | C   | C   | C   | C   | C   |    |
| 30     | C   | C   | C   | C   | C   | C   | C  | C  | C  | C  | C   | C   | C   | C  | C   | C   | C  | C   | C   | C   | C   | C   | C   | C   |    |
| 31     |     |     |     |     |     |     |    |    |    |    |     |     |     |    |     |     |    |     |     |     |     |     |     |     |    |
|        | 00  | 01  | 02  | 03  | 04  | 05  | 06 | 07 | 08 | 09 | 10  | 11  | 12  | 13 | 14  | 15  | 16 | 17  | 18  | 19  | 20  | 21  | 22  | 23  |    |
| CNT    | 28  | 28  | 28  | 27  | 27  | 27  | 27 | 27 | 27 | 27 | 26  | 25  | 27  | 27 | 27  | 27  | 27 | 25  | 26  | 27  | 27  | 27  | 27  | 27  |    |
| MED    | E B | E B | E B | E B | E B | E B | 20 | 26 | 31 | 34 | 36  | 35  | 35  | 35 | 32  | 31  | 27 | 23  | 20  | 19  | 18  | 19  | E B | 16  |    |
| U Q    | 19  | 18  | 20  | 19  | 17  | 16  | 22 | 29 | 34 | 36 | 38  | 38  | 38  | 37 | 34  | 32  | 29 | 29  | 24  | 24  | 24  | 22  | 19  | 20  |    |
| L Q    | E B | E B | E B | E B | E B | E B | G  | G  | G  | G  | G   | G   | G   | G  | G   | G   | G  | E B | E B | E B | E B | E B | E B | E B |    |

SEP. 2018 fbEs (0.1MHz)  
 NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 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

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

SEP. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1     | F   | 323 | 292 | 324 | 327 | 306 | 371 | 411 | 404 | 331 | 346 | 370 | 354 | 321 | 296 | 309 | 334 | 342 | 341 | 311 | 346 | 349 | 365 | F   |     |
| 2     | F   | F   | 313 | 298 | F   | 346 | 359 | 347 | 370 | 344 | 352 | A   | A   | 385 | 327 | A   | 336 | A   | A   | 329 | 344 | 317 | 328 | 326 |     |
| 3     | 322 | 321 | 317 | C   | C   | C   | C   | C   | C   | C   | C   | C   | 346 | 315 | 332 | 323 | 350 | 338 | 329 | 340 | 339 | 318 | 316 | 330 |     |
| 4     | 325 | 313 | 309 | 333 | 368 | 353 | 388 | 379 | 381 | 342 | 326 | 303 | 346 | 336 | 323 | 311 | 338 | 313 | 321 | 348 | 378 | 339 | 322 | 332 |     |
| 5     | F   | 322 | 327 | 329 | F   | 312 | 347 | 385 | 384 | 391 | 348 | 320 | 336 | 331 | 338 | 323 | 318 | 345 | 350 | 346 | 335 | F   | 332 | 306 | 319 |
| 6     | 308 | 322 | 304 | F   | 305 | 315 | 352 | 369 | 392 | 385 | C   | C   | C   | C   | C   | C   | C   | C   | C   | 347 | 373 | 366 | 293 | 300 | F   |
| 7     | F   | F   | A   | 322 | 323 | 339 | 349 | 382 | 377 | 387 | 325 | 333 | 322 | 348 | 336 | 323 | 351 | 336 | 326 | 345 | 380 | 346 | 321 | 304 |     |
| 8     | 323 | 326 | 305 | 325 | 328 | 339 | 351 | 383 | 365 | 372 | 369 | 298 | 337 | 348 | 309 | 330 | 333 | 354 | 354 | 351 | 350 | 313 | F   | 289 |     |
| 9     | F   | 318 | 323 | 299 | 284 | 333 | 345 | 352 | 366 | 390 | 374 | 339 | 355 | 316 | 365 | 363 | 356 | A   | 318 | 371 | 385 | 332 | 318 | 326 |     |
| 10    | F   | 307 | 323 | 322 | 328 | F   | 359 | 367 | 356 | 365 | 358 | 367 | 329 | 347 | A   | 349 | 329 | 339 | 345 | 372 | 364 | 332 | F   | 313 |     |
| 11    | F   | 273 | F   | 330 | 316 | 299 | 353 | 361 | 351 | 342 | 336 | 333 | 363 | 346 | 314 | 306 | 316 | 350 | 344 | 310 | 296 | 318 | 322 | 362 |     |
| 12    | 337 | 316 | 321 | 314 | 321 | 330 | 331 | 347 | 375 | 387 | A   | C   | 308 | 319 | A   | 323 | A   | 342 | 328 | 327 | 330 | F   | F   | F   |     |
| 13    | F   | 315 | A   | 290 | F   | F   | 369 | 362 | 375 | 383 | 370 | 267 | 361 | 324 | 319 | 336 | 327 | 326 | 335 | 357 | 357 | 302 | 288 | 322 |     |
| 14    | 319 | 331 | 333 | 306 | A   | 316 | 369 | 370 | 353 | 350 | 366 | 353 | 320 | 367 | 294 | 339 | 346 | 349 | 340 | 353 | 350 | 364 | 312 | 296 |     |
| 15    | A   | A   | A   | A   | F   | 312 | 390 | 352 | 375 | 377 | 346 | 316 | 297 | 319 | 331 | 343 | 335 | 333 | 345 | 362 | 400 | 313 | 308 | F   |     |
| 16    | F   | 317 | 327 | 349 | F   | A   | 386 | 371 | 381 | 362 | 386 | 328 | 325 | 321 | 341 | 345 | 356 | 335 | 353 | 359 | 347 | 325 | 342 | 321 |     |
| 17    | 311 | F   | 338 | 372 | 352 | 322 | 386 | 371 | 378 | 383 | 373 | 357 | 346 | 310 | 320 | 342 | 330 | 335 | 362 | 342 | 351 | 318 | 305 | 320 |     |
| 18    | 322 | 339 | 341 | 360 | 319 | F   | 359 | 378 | 363 | 364 | 355 | 339 | 351 | 365 | 354 | 356 | 328 | 325 | 320 | 343 | 363 | 368 | 318 | 320 |     |
| 19    | 328 | 328 | 331 | 334 | 353 | 337 | 382 | 372 | 362 | 372 | 403 | 363 | 341 | 330 | 340 | 338 | 330 | C   | C   | 382 | 398 | A   | 342 | 329 |     |
| 20    | F   | 328 | 354 | 355 | 379 | 353 | 390 | 371 | 339 | 396 | 389 | 344 | 374 | 352 | 348 | 329 | 350 | 329 | 327 | 348 | 382 | 329 | 327 | F   |     |
| 21    | 311 | 317 | 318 | 339 | 352 | 339 | 376 | 377 | 380 | 382 | 379 | 338 | 348 | 354 | 352 | 364 | 327 | 340 | 366 | 358 | F   | F   | F   | F   |     |
| 22    | 328 | 345 | 329 | 346 | 325 | 337 | 397 | 402 | 401 | 381 | 358 | 335 | 327 | 377 | 339 | 312 | 323 | 364 | 369 | 332 | 314 | 309 | 332 | 313 |     |
| 23    | 306 | 295 | 327 | 321 | 294 | 319 | 357 | 269 | 343 | 398 | 322 | 284 | 323 | 330 | 337 | 344 | 341 | 367 | 370 | 342 | 296 | F   | A   | 324 |     |
| 24    | 323 | 313 | 315 | 369 | 347 | 325 | 370 | 372 | 380 | 349 | 346 | 330 | 335 | 367 | 332 | 347 | 333 | 341 | 340 | 362 | 363 | 350 | 328 | 333 |     |
| 25    | 322 | 322 | 319 | 315 | 358 | 342 | 350 | 360 | 385 | 357 | 381 | 344 | 362 | 357 | 352 | 343 | 334 | 331 | 348 | 383 | 331 | F   | 317 | 300 |     |
| 26    | 295 | 342 | 297 | 346 | 332 | 322 | 384 | 384 | 378 | 376 | 385 | 374 | 358 | 340 | 352 | 360 | 329 | 339 | 348 | 380 | 386 | 332 | 319 | 325 |     |
| 27    | 322 | 321 | 310 | 321 | 361 | 334 | 416 | 409 | 366 | 387 | 379 | 359 | 329 | 360 | 353 | 344 | 338 | 344 | 364 | 376 | 349 | 322 | 349 | 335 |     |
| 28    | 316 | 303 | 309 | 337 | 335 | 344 | 365 | 388 | 368 | 377 | 351 | 365 | 367 | 352 | 361 | 363 | 348 | C   | C   | C   | C   | C   | C   | C   |     |
| 29    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |
| 30    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |
| 31    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 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  |     |
| CNT   | 17  | 24  | 24  | 25  | 22  | 23  | 27  | 27  | 27  | 27  | 25  | 24  | 26  | 27  | 25  | 26  | 26  | 23  | 25  | 27  | 25  | 22  | 22  | 21  |     |
| MED   | 322 | 321 | 320 | 329 | 328 | 334 | 369 | 371 | 375 | 376 | 358 | 338 | 344 | 346 | 336 | 340 | 334 | 339 | 345 | 351 | 351 | 327 | 320 | 322 |     |
| U Q   | 324 | 327 | 328 | 346 | 352 | 342 | 386 | 383 | 381 | 385 | 379 | 358 | 355 | 357 | 352 | 347 | 346 | 349 | 354 | 371 | 379 | 339 | 328 | 330 |     |
| L Q   | 311 | 314 | 310 | 318 | 319 | 319 | 353 | 361 | 363 | 350 | 346 | 329 | 327 | 321 | 322 | 323 | 329 | 333 | 328 | 340 | 342 | 317 | 312 | 313 |     |

SEP. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 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   |     |     | U L | U L | U L | U L | U L | U L | U L | U L | L   |     |     |     |     |     |     |     |
| 2      |    |    |    |    |    |     | U L | U L | A   | A   | A   | A   | A   | A   | U L | A   | A   | A   | A   |     |     |     |     |     |     |
| 3      |    |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | U L | U L | U L | U L | U L | L   |     |     |     |     |     |     |     |
| 4      |    |    |    |    |    |     | L   |     |     | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L |     |     |     |     |     |     |
| 5      |    |    |    |    |    |     |     |     |     | L   | L   | A   | A   | A   | U L | U L | U L | U L | A   |     |     |     |     |     |     |
| 6      |    |    |    |    |    |     | L   | L   |     |     | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |     |     |     |     |     |
| 7      |    |    |    |    |    |     | L   | L   | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | L   |     |     |     |     |     |     |
| 8      |    |    |    |    |    |     |     |     | L   |     | U L | U L | U L | U L | U L | U L | U L | U L | L   |     |     |     |     |     |     |
| 9      |    |    |    |    |    |     |     |     | L   |     | U L | U L | U L | U L | U L | U L | U L | A   | A   | A   |     |     |     |     |     |
| 10     |    |    |    |    |    |     |     |     | L   | U L | A   | U L | U L | U L | A   |     | L   | L   |     |     |     |     |     |     |     |
| 11     |    |    |    |    |    |     |     |     | L   | U L | U L | U L | U L | U L | U L | U L | U L | U L |     |     |     |     |     |     |     |
| 12     |    |    |    |    |    | 386 |     |     | L   | A   | A   | C   | U L | U L | A   |     | A   | A   |     |     |     |     |     |     |     |
| 13     |    |    |    |    |    |     |     |     | L   |     | A   | U L | U L | U L | U L | U L | U L | L   | L   |     |     |     |     |     |     |
| 14     |    |    |    |    |    |     |     |     | A   | A   | A   |     | U L | U L | U L | U L | U L | L   | L   |     |     |     |     |     |     |
| 15     |    |    |    |    |    |     |     |     | L   | A   | U L | U L | U L | U L | A   |     | A   |     |     |     |     |     |     |     |     |
| 16     |    |    |    |    |    | A   |     |     | L   | A   | A   | A   | U L | A   | U L | A   | L   | A   |     |     |     |     |     |     |     |
| 17     |    |    |    |    |    |     |     |     | U L | A   |     |     | U L | U L | U L | U L | U L | L   | L   |     |     |     |     |     |     |
| 18     |    |    |    |    |    |     |     |     | L   | U L | U L | U L | U L | A   |     | L   | U L | L   |     |     |     |     |     |     |     |
| 19     |    |    |    |    |    |     |     |     | L   | U L | A   | U L | U L | U L | U L | U L | U L | C   | C   |     |     |     |     |     |     |
| 20     |    |    |    |    |    |     |     |     | U L | U L | U L | U L | U L | U L | U L | U L | L   | L   |     |     |     |     |     |     |     |
| 21     |    |    |    |    |    |     |     |     | A   | L   | U L | U L | U L | U L | U L | U L | U L | L   |     |     |     |     |     |     |     |
| 22     |    |    |    |    |    |     |     |     | U L | U L | U L | U L | U L | U L | U L | U L | U L | L   |     |     |     |     |     |     |     |
| 23     |    |    |    |    |    |     |     |     | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L |     |     |     |     |     |     |     |
| 24     |    |    |    |    |    |     |     |     |     | L   | U L | U L | U L | U L | U L | L   | L   | L   | L   |     |     |     |     |     |     |
| 25     |    |    |    |    |    |     |     |     | L   | U L | U L | U L | U L | U L | A   | L   | L   | L   |     |     |     |     |     |     |     |
| 26     |    |    |    |    |    |     |     |     | L   | U L | U L | U L | U L | U L | L   | L   | L   | L   |     |     |     |     |     |     |     |
| 27     |    |    |    |    |    |     |     |     |     | L   | U L | U L | U L | U L | L   | L   | A   |     |     |     |     |     |     |     |     |
| 28     |    |    |    |    |    |     |     |     |     | L   | U L | U L | U L | U L | U L | L   | L   | C   | C   |     |     |     |     |     |     |
| 29     |    |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |     |     |     |     |
| 30     |    |    |    |    |    | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |     |     |     |     |     |
| 31     |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|        | 00 | 01 | 02 | 03 | 04 | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |
| CNT    |    |    |    |    |    |     | 2   | 2   | 14  | 19  | 19  | 21  | 24  | 23  | 20  | 17  | 10  | 1   |     |     |     |     |     |     |     |
| MED    |    |    |    |    |    |     | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L |
| U Q    |    |    |    |    |    |     | 418 | 368 | 398 | 408 | 425 | 430 | 414 | 406 | 396 | 377 | 368 | 356 |     |     |     |     |     |     |     |
| L Q    |    |    |    |    |    |     |     |     | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L | U L |
|        |    |    |    |    |    |     | 391 | 403 | 404 | 406 | 398 | 396 | 386 | 363 | 362 |     |     |     |     |     |     |     |     |     |     |

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 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      |    |    |    |    |    |    | 262 |            |     | 326        | 288        | 290 | 272        | 340 | 298 | 294        | 302        | 286        |            |    |    |    |    |    |
| 2      |    |    |    |    |    |    | 250 | 292        | 266 | E A<br>310 | E A<br>278 | A   | A          | 258 | 334 | A          | E A<br>292 | A          | A          |    |    |    |    |    |
| 3      |    |    |    |    |    | C  | C   | C          | C   | C          | C          | C   | 288        | 348 | 304 | 326        | 282        | 270        |            |    |    |    |    |    |
| 4      |    |    |    |    |    |    | 248 | 242        | 278 | 330        | 356        | 280 | 296        | 302 | 330 | 290        | 330        |            |            |    |    |    |    |    |
| 5      |    |    |    |    |    |    |     | 248        | 288 | 330        | 314        | 292 | 284        | 302 | 316 | 272        | 230        |            |            |    |    |    |    |    |
| 6      |    |    |    |    |    |    | 280 | 254        | 230 | 236        | C          | C   | C          | C   | C   | C          | C          | C          |            |    |    |    |    |    |
| 7      |    |    |    |    |    |    | 272 | 240        | 240 | 234        | 314        | 338 | 324        | 272 | 290 | 320        | 278        | 280        |            |    |    |    |    |    |
| 8      |    |    |    |    |    |    |     | 278        | 238 | 276        | 386        | 316 | 288        | 344 | 296 | 300        | 234        |            |            |    |    |    |    |    |
| 9      |    |    |    |    |    |    | 264 | 240        | 228 | 248        | 302        | 278 | 344        | 276 | 258 | E A<br>248 | A          | E A<br>282 |            |    |    |    |    |    |
| 10     |    |    |    |    |    |    | 250 | 254        | 244 | 256        | 270        | 316 | 302        | A   | 290 | 276        | 274        |            |            |    |    |    |    |    |
| 11     |    |    |    |    |    |    |     | 274        | 278 | 280        | 300        | 276 | 246        | 292 | 330 | 320        | 308        |            |            |    |    |    |    |    |
| 12     |    |    |    |    |    |    | 248 | 284        | 244 | 224        | A          | C   | 352        | 318 | A   | 324        | A          | E A<br>284 |            |    |    |    |    |    |
| 13     |    |    |    |    |    |    | 256 |            | 232 | 270        | 386        | 282 | 338        | 316 | 314 | 318        | 298        |            |            |    |    |    |    |    |
| 14     |    |    |    |    |    |    | 252 | 262        | 262 | 256        | 284        | 328 | 286        | 404 | 292 | 280        | 272        |            |            |    |    |    |    |    |
| 15     |    |    |    |    |    |    |     | 272        | 258 | 234        | 282        | 354 | 406        | 338 | 298 | 260        | 254        |            |            |    |    |    |    |    |
| 16     |    |    |    |    |    | A  | 250 | E A<br>254 | 240 | 224        | E A<br>306 | 322 | E A<br>308 | 298 | 266 | 260        | E A<br>264 |            |            |    |    |    |    |    |
| 17     |    |    |    |    |    |    |     | 248        | 226 | 242        | 266        | 276 | 370        | 330 | 276 | 294        | 268        |            |            |    |    |    |    |    |
| 18     |    |    |    |    |    |    |     | 242        | 250 | 264        | 274        | 288 | 266        | 266 | 280 | 312        | 280        |            |            |    |    |    |    |    |
| 19     |    |    |    |    |    |    | 254 | 260        | 248 | 222        | 258        | 298 | 310        | 286 | 292 | 310        |            | C          | C          |    |    |    |    |    |
| 20     |    |    |    |    |    |    |     | 292        | 238 | 238        | 296        | 242 | 278        | 280 | 310 | 286        | 286        |            |            |    |    |    |    |    |
| 21     |    |    |    |    |    |    | 232 | 234        | 238 | 228        | 296        | 284 | 280        | 268 |     | 312        | 270        |            |            |    |    |    |    |    |
| 22     |    |    |    |    |    |    |     | 220        | 246 | 254        | 306        | 282 | 238        | 286 | 312 | 268        |            |            |            |    |    |    |    |    |
| 23     |    |    |    |    |    |    | 422 | 268        | 224 | 398        | 402        | 344 | 308        | 288 | 270 | 278        |            |            |            |    |    |    |    |    |
| 24     |    |    |    |    |    |    |     | 238        | 280 | 272        | 274        | 266 | 248        | 262 | 280 | 284        | 262        |            |            |    |    |    |    |    |
| 25     |    |    |    |    |    |    | 252 | 224        | 242 | 232        | 262        | 262 | 260        | 268 | 268 | 282        | 258        |            |            |    |    |    |    |    |
| 26     |    |    |    |    |    |    | 240 | 242        | 226 | 234        | 248        | 262 | 270        | 270 | 252 | 284        | 268        |            |            |    |    |    |    |    |
| 27     |    |    |    |    |    |    |     | 262        | 240 | 242        | 284        | 318 | 264        | 254 | 286 | 270        |            |            |            |    |    |    |    |    |
| 28     |    |    |    |    |    |    |     | 246        | 230 | 268        | 244        | 244 | 250        | 242 | 248 | 264        |            | C          | C          |    |    |    |    |    |
| 29     |    |    |    |    |    | C  | C   | C          | C   | C          | C          | C   | C          | C   | C   | C          | C          | C          | C          |    |    |    |    |    |
| 30     |    |    |    |    |    | C  | C   | C          | C   | C          | C          | C   | C          | C   | C   | C          | C          | C          | C          |    |    |    |    |    |
| 31     |    |    |    |    |    |    |     |            |     |            |            |     |            |     |     |            |            |            |            |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07         | 08  | 09         | 10         | 11  | 12         | 13  | 14  | 15         | 16         | 17         | 18         | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    | 5   | 17         | 25  | 27         | 25         | 24  | 26         | 27  | 25  | 25         | 26         | 18         | 1          |    |    |    |    |    |
| MED    |    |    |    |    |    |    | 262 | 254        | 247 | 239        | 260        | 290 | 286        | 287 | 290 | 292        | 282        | 270        | E A<br>282 |    |    |    |    |    |
| U Q    |    |    |    |    |    |    | 276 | 273        | 262 | 262        | 285        | 326 | 318        | 318 | 310 | 315        | 300        | 284        |            |    |    |    |    |    |
| L Q    |    |    |    |    |    |    | 249 | 249        | 240 | 232        | 240        | 272 | 272        | 266 | 269 | 269        | 272        | 264        |            |    |    |    |    |    |

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135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H   | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | E A | 268 | 250 | 270 | 264 | 264 | 240 | 210 | 212 | 196 | 186 | 192 | 182 | 196 | 196 | 196 | 192 | 200 | 206 | 220 | 226 | 200 | 206 | 206 | E A | 274 |
| 2   | E B | 222 | 256 | 278 | 260 | 242 | 246 | 184 | 194 | A   | A   | A   | A   | A   | A   | 190 | A   | A   | A   | A   | E A | 250 | 214 | 224 | E B | 226 |
| 3   | E B | 218 | 248 | 250 | C   | C   | C   | C   | C   | C   | C   | C   | C   | 176 | 182 | 192 | 188 | 234 | 208 | 222 | 214 | 206 | 228 | E B | 216 |     |
| 4   | E B | 210 | 256 | 266 | 234 | 206 | 212 | 196 | 212 | 204 | 188 | 182 | 192 | 188 | 184 | 196 | 196 | 202 | 212 | 232 | 212 | 192 | 212 | 230 | 230 |     |
| 5   | E A | 294 | 244 | 244 | 234 | 258 | 224 | 206 | 210 | 196 | 196 | A   | A   | A   | 218 | 192 | 200 | 212 | A   | 220 | 226 | E A | 258 | 210 | E B | 248 |
| 6   | E B | 256 | 234 | 278 | 266 | 264 | 256 | 212 | 192 | 192 | 192 | C   | C   | C   | C   | C   | C   | C   | C   | 228 | 194 | 188 | E A | E B | E B | 232 |
| 7   | E B | 234 | 242 | A   | 246 | 286 | 252 | 202 | 204 | 196 | 186 | 184 | 224 | 204 | 192 | 194 | 222 | 194 | 208 | 230 | 212 | 200 | 194 | E B | E B | 246 |
| 8   | E B | 238 | 236 | 248 | 242 | 260 | 240 | 206 | 216 | 192 | 196 | 186 | 182 | 188 | 228 | 188 | 212 | 202 | 202 | 208 | 206 | 204 | 224 | 222 | E B | 274 |
| 9   | E A | 256 | 280 | 262 | 244 | 294 | 262 | 208 | 200 | 190 | 202 | 186 | 176 | 180 | 184 | 168 | 196 | A   | A   | A   | 212 | 192 | 202 | 234 | 234 |     |
| 10  | E A | 272 | 258 | 274 | 274 | 274 | 242 | 218 | 202 | 192 | 190 | A   | 190 | 202 | 198 | A   | 202 | 212 | 212 | 216 | 194 | 182 | 220 | E A | 290 |     |
| 11  | E B | 256 | 338 | 298 | 284 | 308 | 310 | 210 | 198 | 198 | 190 | 184 | 228 | A   | 194 | 200 | 204 | 188 | 224 | 214 | 220 | 264 | 238 | 240 | 194 |     |
| 12  | E B | 224 | 274 | 254 | 254 | 246 | 220 | 202 | 228 | 214 | A   | A   | C   | 196 | 214 | A   | 202 | A   | A   | 232 | 232 | 218 | 218 | E B | 268 |     |
| 13  | E B | 252 | 276 | A   | 300 | 292 | 280 | 220 | 216 | 214 | A   | 194 | 194 | 202 | 238 | 186 | 214 | 226 | 236 | 226 | 210 | 196 | 280 | E B | 254 |     |
| 14  | E B | 218 | 236 | 230 | E A | 298 | E A | 266 | 218 | A   | A   | A   | 198 | 194 | 200 | 196 | 190 | 186 | 200 | 224 | 226 | 210 | 198 | 214 | E A | 310 |
| 15  | A   | A   | A   | A   | E A | 272 | 228 | 214 | 204 | A   | A   | A   | 206 | 188 | 180 | 214 | 212 | 214 | A   | 242 | 218 | 206 | 202 | E B | 278 |     |
| 16  | E B | 296 | 242 | 248 | 246 | 224 | A   | 202 | 214 | A   | A   | A   | A   | 186 | A   | 190 | A   | A   | A   | 214 | 212 | 210 | 206 | 214 | E A | 274 |
| 17  | E B | 254 | 248 | 236 | 222 | 212 | 250 | 212 | 222 | 202 | A   | 198 | 196 | 184 | 186 | 212 | 198 | 198 | 208 | 206 | 200 | 196 | 228 | E B | 248 |     |
| 18  | E A | 254 | 242 | 238 | 222 | 266 | 288 | 208 | 214 | 194 | 186 | 192 | 202 | 230 | A   | 202 | 204 | 210 | 218 | 234 | 214 | 200 | 184 | 224 | E B | 262 |
| 19  | 232 | 232 | E A | 246 | 212 | 230 | 208 | 214 | 198 | 198 | A   | 182 | 182 | 182 | 182 | 214 | 218 | C   | C   | 190 | 200 | A   | 232 | E B | 252 |     |
| 20  | E B | 254 | 220 | 224 | 250 | 212 | 218 | 206 | 198 | 190 | 204 | 186 | 184 | 192 | 190 | 186 | 194 | 208 | 206 | 224 | 222 | 200 | 214 | E A | 270 |     |
| 21  | E A | 282 | 264 | 270 | 254 | 238 | 236 | 196 | A   | 204 | 188 | 178 | 178 | 194 | 190 | 200 | 212 | 218 | 218 | 212 | 216 | 186 | 218 | E B | 258 |     |
| 22  | E B | 228 | 218 | 236 | 220 | 228 | 226 | 196 | 196 | 188 | 188 | 182 | 170 | 198 | 198 | 192 | 206 | 218 | 208 | 200 | 222 | 228 | 238 | 206 | E B | 238 |
| 23  | E B | 250 | 284 | 234 | 212 | 262 | 266 | 228 | 222 | 222 | 182 | 176 | 216 | 206 | 206 | 210 | 210 | 212 | 232 | 210 | 202 | E A | E A | E A | 326 |     |
| 24  | E B | 238 | 244 | 270 | 204 | 210 | 228 | 218 | 202 | 198 | 190 | 190 | 186 | 190 | 190 | 190 | 206 | 216 | 214 | 220 | 204 | 188 | 202 | 220 | 230 |     |
| 25  | E B | 244 | 260 | 252 | 234 | 216 | 228 | 210 | 198 | 196 | 190 | 178 | 206 | 180 | 178 | A   | 198 | 212 | 210 | 216 | 190 | 206 | 214 | E A | 262 |     |
| 26  | E B | 258 | 206 | 264 | 222 | 226 | 250 | 210 | 204 | 212 | 194 | 196 | 190 | 208 | 182 | 184 | 194 | 206 | 214 | 216 | 200 | 182 | 208 | E B | 240 |     |
| 27  | E B | 234 | 246 | 264 | 264 | 206 | 230 | 194 | 200 | 194 | 194 | 182 | 180 | 190 | 216 | 198 | 200 | A   | 212 | 208 | 192 | 216 | 214 | E A | 230 |     |
| 28  | E A | 288 | 256 | 262 | 222 | 222 | 232 | 208 | 206 | 190 | 188 | 188 | 212 | 198 | 194 | 198 | 196 | 204 | C   | C   | C   | C   | C   | C   | C   | C   |
| 29  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 30  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 31  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|     |     | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |     |
| CNT |     | 27  | 27  | 25  | 26  | 26  | 26  | 27  | 25  | 23  | 21  | 20  | 22  | 24  | 23  | 24  | 25  | 22  | 20  | 24  | 27  | 27  | 26  | 26  | 27  |     |
| MED |     | E B | E B | E B | E B | E B | E B | 240 | 208 | 204 | 196 | 190 | 186 | 190 | 195 | 193 | 192 | 202 | 211 | 212 | 219 | 210 | 200 | 214 | E B | E B |
| U Q |     | 258 | 260 | 270 | 264 | 266 | 256 | 212 | 214 | 204 | 196 | 192 | 202 | 202 | 206 | 199 | 211 | 216 | 221 | 226 | 220 | 214 | 228 | 248 | E A | 274 |
| L Q |     | 232 | 236 | 241 | 222 | 216 | 228 | 202 | 199 | 192 | 188 | 182 | 182 | 187 | 184 | 189 | 196 | 202 | 208 | 212 | 200 | 192 | 210 | 230 | 232 |     |

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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  | 114 | 114 | A   | A   | A   | 114 | A   | A   | A   | 110 | 110 | 110 | A  | B  |    |    |    |    |
| 2      |    |    |    |    |    | B  | 110 | 118 | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A  |    |    |    |    |    |
| 3      |    |    |    |    |    | C  | C   | C   | C   | C   | C   | C   | 108 | 108 | 106 | 106 | 104 | A   | B  |    |    |    |    |    |
| 4      |    |    |    |    |    | B  | 118 | 118 | 110 | 110 | 104 | 110 | 110 | 108 | 106 | 110 | 110 | 116 | B  |    |    |    |    |    |
| 5      |    |    |    |    |    | B  | 116 | 116 | 110 | A   | A   | A   | A   | A   | 110 | 110 | 110 | A   | B  |    |    |    |    |    |
| 6      |    |    |    |    |    | B  | B   | A   | 112 | 110 | C   | C   | C   | C   | C   | C   | C   | C   | B  |    |    |    |    |    |
| 7      |    |    |    |    |    | B  | B   | A   | 110 | 110 | 106 | 108 | 108 | 108 | 106 | 106 | 108 | 116 | A  |    |    |    |    |    |
| 8      |    |    |    |    |    | B  | 116 | A   | A   | A   | A   | A   | A   | 110 | 108 | 108 | 112 | 114 | B  |    |    |    |    |    |
| 9      |    |    |    |    |    | B  | 114 | 114 | A   | A   | 114 | 112 | 112 | A   | 112 | 110 | 108 | A   | B  |    |    |    |    |    |
| 10     |    |    |    |    |    | B  | 116 | 110 | 110 | A   | A   | A   | A   | A   | A   | A   | A   | A   | B  |    |    |    |    |    |
| 11     |    |    |    |    |    | B  | 110 | 112 | 110 | 108 | 108 | 108 | 110 | 110 | 110 | 110 | 110 | 108 | B  |    |    |    |    |    |
| 12     |    |    |    |    |    | B  | B   | 110 | 110 | A   | A   | C   | 110 | 110 | A   | 110 | A   | A   | B  |    |    |    |    |    |
| 13     |    |    |    |    |    | B  | 118 | 118 | A   | A   | A   | A   | A   | A   | A   | 110 | 110 | 114 | B  |    |    |    |    |    |
| 14     |    |    |    |    |    | B  | 114 | A   | A   | A   | A   | A   | 112 | 110 | 110 | 110 | 110 | 112 | B  |    |    |    |    |    |
| 15     |    |    |    |    |    | B  | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | B  |    |    |    |    |    |
| 16     |    |    |    |    |    | B  | A   | 116 | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | B  |    |    |    |    |    |
| 17     |    |    |    |    |    | B  | B   | 118 | 106 | A   | 116 | 108 | 108 | 108 | 112 | 112 | 112 | 112 | B  |    |    |    |    |    |
| 18     |    |    |    |    |    | B  | A   | 122 | 112 | A   | 110 | A   | 108 | 108 | 108 | 108 | 108 | A   | B  |    |    |    |    |    |
| 19     |    |    |    |    |    | B  | B   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | C   | C  |    |    |    |    |    |
| 20     |    |    |    |    |    | B  | 116 | 112 | 112 | 114 | 108 | 108 | 108 | 110 | 110 | 108 | 114 | 116 | B  |    |    |    |    |    |
| 21     |    |    |    |    |    | B  | B   | 114 | 112 | A   | A   | A   | A   | A   | 114 | 112 | 112 | 114 | B  |    |    |    |    |    |
| 22     |    |    |    |    |    | B  | 114 | 116 | 118 | 116 | 110 | 110 | 112 | 116 | 116 | 116 | 116 | 116 | B  | B  |    |    |    |    |
| 23     |    |    |    |    |    | B  | B   | 112 | 112 | 112 | 114 | 112 | 118 | 110 | 96  | 108 | 108 |     |    |    |    |    |    |    |
| 24     |    |    |    |    |    | B  | B   | 118 | 118 | 110 | 112 | 112 | 112 | 112 | 108 | 108 | 108 | B   | B  |    |    |    |    |    |
| 25     |    |    |    |    |    | B  | 108 | A   | A   | A   | A   | 112 | 112 | A   | A   | A   | A   | A   | B  |    |    |    |    |    |
| 26     |    |    |    |    |    | B  | A   | A   | A   | A   | 116 | 114 | 114 | 108 | A   | 108 | A   | A   | B  |    |    |    |    |    |
| 27     |    |    |    |    |    | B  | B   | 116 | A   | 110 | 112 | 114 | 114 | 116 | 116 | 116 | A   | A   | B  |    |    |    |    |    |
| 28     |    |    |    |    |    | B  | 114 | A   | A   | A   | A   | 114 | 108 | 108 | 108 | 108 | 108 | C   | C  |    |    |    |    |    |
| 29     |    |    |    |    |    | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  |    |    |    |    |    |
| 30     |    |    |    |    |    | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C  |    |    |    |    |    |
| 31     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    | 14  | 18  | 14  | 9   | 12  | 14  | 17  | 16  | 17  | 21  | 18  | 12  |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    | 114 | 116 | 111 | 110 | 111 | 112 | 110 | 110 | 110 | 110 | 110 | 114 |    |    |    |    |    |    |
| U Q    |    |    |    |    |    |    | 116 | 118 | 112 | 113 | 114 | 114 | 112 | 110 | 112 | 110 | 112 | 116 |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    | 114 | 112 | 110 | 110 | 108 | 108 | 108 | 108 | 107 | 108 | 108 | 112 |    |    |    |    |    |    |

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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     | 94 | 92 | 92 | 90  | 88  | B   | G   | G   | 106 | 98  | 100 | G   | 96  | 86  | 86  | 114 | G   | 110 | 90  | 110 | 110 | 104 | 98  | 98  |
| 2     | B  | 92 | B  | B   | 92  | 90  | G   | 124 | 100 | 100 | 96  | 86  | 86  | 88  | 92  | 92  | 92  | 88  | 82  | 82  | 82  | 88  | B   | B   |
| 3     | 88 | B  | B  | C   | C   | C   | C   | C   | C   | C   | C   | C   | G   | G   | G   | G   | G   | B   | B   | 92  | 92  | 88  | B   | B   |
| 4     | B  | B  | B  | B   | B   | 96  | 126 | 128 | 130 | 118 | G   | G   | 132 | G   | 146 | G   | G   | G   | 90  | B   | 90  | 90  | B   | 94  |
| 5     | 94 | 94 | 94 | 94  | 94  | 106 | 122 | 122 | G   | 98  | 98  | 98  | 92  | 92  | 120 | G   | 114 | 96  | 96  | 96  | 96  | 96  | 92  | 90  |
| 6     | 86 | 94 | 94 | B   | B   | 102 | 100 | 100 | G   | G   | C   | C   | C   | C   | C   | C   | C   | C   | 98  | 98  | 96  | 96  | 90  | B   |
| 7     | 90 | 90 | 90 | 90  | 90  | 90  | 90  | 90  | G   | G   | G   | 140 | G   | 140 | G   | G   | 118 | 116 | 114 | 108 | B   | 100 | 100 | 100 |
| 8     | 92 | 92 | B  | B   | 92  | 98  | 110 | 102 | 98  | 98  | 92  | 92  | 92  | 146 | G   | 136 | G   | 116 | 98  | 90  | 86  | 86  | 96  | 96  |
| 9     | 90 | 90 | 90 | 86  | 84  | 82  | 122 | 86  | 92  | 88  | G   | G   | G   | 92  | G   | 130 | 114 | 106 | 98  | 96  | 94  | 94  | 94  | 92  |
| 10    | 90 | 90 | 90 | 96  | 88  | 86  | 114 | 116 | 110 | 94  | 94  | 96  | 96  | 94  | 94  | 94  | 98  | 114 | 96  | 96  | 96  | B   | 90  | 90  |
| 11    | 94 | 92 | 86 | 86  | 86  | 90  | 104 | G   | G   | G   | G   | 146 | 128 | 118 | G   | 142 | G   | 124 | 90  | 112 | 102 | 86  | 88  | B   |
| 12    | B  | B  | B  | 92  | 92  | 92  | 162 | 122 | 116 | 100 | 98  | C   | 114 | 136 | 96  | 108 | 100 | 100 | 100 | 96  | 96  | 96  | 96  | 96  |
| 13    | 96 | 92 | 90 | 90  | 96  | 98  | 130 | 122 | 104 | 104 | 102 | 102 | 102 | 98  | 98  | 134 | 122 | 118 | 104 | 102 | 102 | 102 | B   | 96  |
| 14    | 96 | 92 | 92 | 94  | 94  | 94  | G   | 100 | 102 | 100 | 100 | 96  | 118 | 128 | G   | G   | 138 | 136 | 108 | 100 | 100 | 100 | 100 | 94  |
| 15    | 90 | 90 | 90 | 88  | 86  | 110 | 90  | 98  | 96  | 96  | 96  | 94  | 94  | 90  | 90  | 88  | 86  | 84  | 84  | 82  | 80  | 90  | 90  | 90  |
| 16    | 90 | 88 | 88 | 88  | 88  | 86  | 88  | 110 | 102 | 96  | 96  | 96  | 92  | 90  | 94  | 90  | 104 | 98  | 98  | 98  | 94  | 92  | 90  | 82  |
| 17    | 86 | B  | B  | B   | B   | 94  | 132 | 136 | 144 | 94  | G   | G   | G   | G   | 140 | 150 | G   | 130 | B   | B   | 86  | 86  | 86  | 86  |
| 18    | 86 | 86 | 86 | 86  | 86  | 86  | 98  | 120 | 112 | 96  | 150 | 88  | G   | 130 | 120 | G   | G   | 106 | 106 | 100 | 100 | 98  | 98  | 94  |
| 19    | 94 | 92 | 92 | 90  | 90  | 90  | 92  | 104 | 104 | 100 | 92  | 92  | 92  | 92  | 92  | 90  | 90  | C   | C   | 94  | 94  | 98  | 98  | 98  |
| 20    | 90 | 88 | 88 | 88  | 88  | 86  | 86  | 134 | 132 | 92  | 118 | G   | 140 | G   | G   | G   | 118 | G   | 102 | 102 | 96  | 96  | 96  | 96  |
| 21    | 92 | 92 | 84 | 84  | 84  | 106 | 128 | 112 | 112 | 96  | 96  | 96  | 94  | 100 | 144 | 114 | 120 | 114 | 96  | 100 | 104 | 102 | 106 | B   |
| 22    | B  | B  | 96 | 90  | 90  | 90  | G   | 126 | 118 | G   | 114 | G   | 144 | G   | G   | 112 | G   | G   | 98  | 98  | 92  | 94  | B   | B   |
| 23    | B  | B  | B  | 112 | 112 | 110 | 108 | 116 | G   | G   | G   | G   | G   | 136 | 122 | 116 | 118 | 106 | 98  | 98  | 98  | 96  | 94  | 94  |
| 24    | 94 | 94 | 88 | 88  | B   | 100 | 102 | 112 | 110 | G   | G   | G   | G   | G   | G   | 90  | 122 | 104 | B   | B   | 104 | 94  | 92  | 92  |
| 25    | 94 | B  | B  | B   | B   | 102 | G   | 102 | 98  | 98  | 98  | 152 | 96  | 96  | 94  | 94  | 90  | 96  | 96  | 96  | 94  | 94  | 86  | 86  |
| 26    | 86 | 88 | B  | B   | B   | 102 | 102 | 100 | 100 | 96  | 96  | G   | 162 | G   | 88  | 86  | 86  | 86  | 84  | 84  | 90  | 88  | B   | B   |
| 27    | B  | B  | B  | B   | B   | B   | 118 | 118 | 106 | G   | 118 | 118 | G   | 120 | 112 | 118 | 98  | 98  | B   | 98  | 98  | 98  | 92  | 92  |
| 28    | 96 | 92 | 90 | 90  | 90  | 90  | 126 | 100 | 100 | 100 | 98  | 150 | G   | G   | 110 | 108 | G   | C   | C   | C   | C   | C   | C   | C   |
| 29    | C  | C  | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 30    | C  | C  | C  | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   | C   |
| 31    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|       | 00 | 01 | 02 | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |
| CNT   | 22 | 20 | 18 | 19  | 21  | 25  | 22  | 25  | 22  | 20  | 18  | 16  | 18  | 19  | 18  | 21  | 18  | 22  | 22  | 23  | 27  | 26  | 21  | 19  |
| MED   | 91 | 92 | 90 | 90  | 90  | 94  | 109 | 112 | 105 | 98  | 98  | 96  | 96  | 98  | 97  | 112 | 109 | 106 | 98  | 98  | 96  | 95  | 94  | 94  |
| U Q   | 94 | 92 | 92 | 92  | 93  | 102 | 126 | 122 | 112 | 100 | 102 | 129 | 128 | 130 | 120 | 124 | 118 | 114 | 100 | 100 | 100 | 98  | 98  | 96  |
| L Q   | 90 | 90 | 88 | 88  | 87  | 90  | 98  | 100 | 100 | 96  | 96  | 93  | 92  | 92  | 92  | 91  | 92  | 98  | 90  | 94  | 92  | 90  | 90  | 90  |

SEP. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

SEP. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06   | 07   | 08   | 09 | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18 | 19 | 20 | 21 | 22 | 23 |  |
|-------|----|----|----|----|----|----|------|------|------|----|------|------|------|------|------|------|------|------|----|----|----|----|----|----|--|
| 1     | F3 | F2 | F2 | F2 | F1 |    |      |      | L1   | L2 | L1   |      | L2   | L2   | L2   | CL13 |      | CL12 | L2 | L2 | F2 | F1 | F1 | F2 |  |
| 2     |    | F2 |    |    | F2 | L2 |      | C2   | L4   | L3 | L2   | L3   | L3   | L3   | L2   | L3   | L4   | L4   | L6 | F7 | F2 | F2 |    |    |  |
| 3     | F2 |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      | L2   |    | F1 | F1 | F2 |    |    |  |
| 4     |    |    |    |    |    | L1 | C2   | C2   | C2   | C2 |      |      | H1   |      | H1   |      |      |      | L2 |    | F3 | F3 |    | F5 |  |
| 5     | F6 | F4 | F2 | F2 | F2 | L1 | C2   | C2   |      | L2 | L3   | L2   | L2   | L2   | C1   |      | C2   | L5   | L4 | F6 | F6 | F3 | F3 | F2 |  |
| 6     | F2 | F2 | F2 |    |    | L1 | L4   | L2   |      |    |      |      |      |      |      |      |      |      | L3 | F2 | F3 | F5 | F2 |    |  |
| 7     | F2 | F4 | F8 | F6 | F6 | L5 | L2   | L2   |      |    |      | H1   |      | H1   |      | C1   | C1   | C2   | L3 |    | F5 | F2 | F1 | F1 |  |
| 8     | F3 | F1 |    |    | F2 | L2 | C2   | L2   | L2   | L2 | L2   | L2   | L2   | HL12 |      | H1   |      | C1   | L2 | F5 | F5 | F4 | F2 | F4 |  |
| 9     | F4 | F4 | F2 | F2 | F2 | L2 | CL22 | L2   | L2   | L2 |      |      |      | L2   |      | H1   | C2   | L4   | L4 | F7 | F4 | F3 | F3 | F4 |  |
| 10    | F4 | F4 | F4 | F3 | F4 | L3 | CL22 | CL22 | CL12 | L3 | L2   | L2   | L2   | L2   | L3   | L2   | L3   | C2   | L2 | F1 | F2 |    | F4 | F3 |  |
| 11    | F2 | F5 | F5 | F8 | F6 | L2 | L3   |      |      |    |      | H1   | C1   | C1   |      | H1   |      | CL22 | L2 | F1 | F3 | F3 | F1 |    |  |
| 12    |    |    |    | F2 | F3 | L3 | H1   | C2   | C1   | L2 | L2   |      | C1   | C1   | L3   | C2   | L4   | L5   | L5 | F8 | F4 | F3 | F2 | F3 |  |
| 13    | F2 | F5 | F4 | F3 | F2 | L2 | C2   | L1   | L3   | L2 | L2   | L2   | L2   | L2   | L2   | H1   | C2   | C3   | L3 | F3 | F6 | F4 |    |    |  |
| 14    | F4 | F3 | F3 | F6 | F5 | L3 |      | L4   | L2   | L3 | L2   | L2   | C1   | C1   |      |      | H1   | C1   | L2 | F2 | F2 | F6 | F5 | F4 |  |
| 15    | F4 | F8 | F5 | F7 | F4 | C1 | L4   | L3   | L3   | L2 | L2   | L1   | CL12 | L2   | L2   | L2   | L3   | L3   | L4 | F3 | F3 | F2 | F2 | F2 |  |
| 16    | F2 | F4 | F4 | F3 | F3 | L4 | L2   | C2   | L3   | L3 | L2   | L2   | L2   | L2   | L2   | L3   | L3   | L4   | L4 | F5 | F7 | F5 | F3 | F3 |  |
| 17    | F1 |    |    |    |    | L1 | C2   | H2   | H1   | L2 |      |      |      |      | H1   | H1   |      | H2   |    |    | F3 | F3 | F2 | F2 |  |
| 18    | F2 | F2 | F2 | F3 | F4 | L2 | L3   | CL22 | CL12 | L2 | HL12 | L2   |      | H1   | C1   |      |      | L3   | L2 | F1 | F2 | F2 | F3 | F2 |  |
| 19    | F4 | F3 | F3 | F2 | F4 | L2 | L1   | L2   | L2   | L2 | L3   | L2   | L2   | L2   | L2   | L2   | L3   |      |    | F3 | F6 | F6 | F4 | F3 |  |
| 20    | F2 | F3 | F3 | F3 | F3 | L2 | L2   | CL13 | CL12 | L2 | C1   |      | H1   |      |      | C1   |      | L5   | F3 | F6 | F6 | F1 | F3 | F2 |  |
| 21    | F2 | F2 | F2 | F2 | F2 | L2 | C2   | CL23 | CL22 | L2 | L2   | L2   | L1   | L2   | HL11 | CL11 | CL11 | CL22 | L6 | F6 | F3 | F5 | F2 |    |  |
| 22    |    |    | F3 | F3 | F3 | L1 |      | C2   | C1   |    | C1   |      | H1   |      |      | C1   |      |      | L1 | F4 | F3 | F2 |    |    |  |
| 23    |    |    |    | F1 | F2 | L4 | L2   | C2   |      |    |      |      |      | H1   | C1   | C2   | C2   | L3   | L1 | F2 | F2 | F4 | F6 | F7 |  |
| 24    | F2 | F3 | F3 | F3 |    | L1 | L1   | C2   | C1   |    |      |      |      |      |      | L2   | CL12 | L3   |    |    | F1 | F2 | F2 | F2 |  |
| 25    | F2 |    |    |    |    | L2 |      | L3   | L3   | L2 | L2   | HL11 | L1   | L2   | L2   | L2   | L2   | L2   | L4 | F3 | F3 | F3 | F4 | F2 |  |
| 26    | F2 | F1 |    |    | F1 | L4 | L3   | L3   | L2   | L1 |      |      | H1   |      | L3   | L2   | L3   | L2   | L3 | F2 | F2 | F2 |    |    |  |
| 27    |    |    |    |    |    | C2 | C3   | L2   |      |    | C1   | C1   |      | C1   | C1   | C2   | L3   | L2   |    | F1 | F5 | F4 | F6 | F4 |  |
| 28    | F5 | F4 | F2 | F1 | F2 | F1 | C2   | L3   | L2   | L2 | L1   | H1   |      |      | C1   | C1   |      |      |    |    |    |    |    |    |  |
| 29    |    |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      |      |    |    |    |    |    |    |  |
| 30    |    |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      |      |    |    |    |    |    |    |  |
| 31    |    |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      |      |    |    |    |    |    |    |  |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06   | 07   | 08   | 09 | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18 | 19 | 20 | 21 | 22 | 23 |  |
| CNT   |    |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      |      |    |    |    |    |    |    |  |
| MED   |    |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      |      |    |    |    |    |    |    |  |
| U Q   |    |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      |      |    |    |    |    |    |    |  |
| L Q   |    |    |    |    |    |    |      |      |      |    |      |      |      |      |      |      |      |      |    |    |    |    |    |    |  |

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 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

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

SEP. 2018 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

SEP. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 f<sub>o</sub>F1 (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      |    |    |    |    |    |    |    |       | A       | A       |         |         |         |         |     | A       | U L U L | U L |    |    |    |    |    |    |  |
| 2      |    |    |    |    |    |    |    | 268   | 376     | L U L   | 412 432 | 436 428 | A       | 436 432 | 420 | 420     | 396     | A   | A  |    |    |    |    |    |  |
| 3      |    |    |    |    |    |    |    |       | 388     | U L U L | 440 448 | 428 424 | 420 416 | 416     | 384 | U L     | L       | L   |    |    |    |    |    |    |  |
| 4      |    |    |    |    |    |    |    |       | L       | L U L   | 428 444 | 428 436 | 424 424 | 404     | U L | C       | L       |     |    |    |    |    |    |    |  |
| 5      |    |    |    |    |    |    |    |       | A       |         | U L     | 428 436 | 420 424 | 420 408 | 396 |         | A       |     |    |    |    |    |    |    |  |
| 6      |    |    |    |    |    |    |    | A     |         | U L     | 444 424 | 424 440 | 424 424 | 416 396 |     |         | L       | L   |    |    |    |    |    |    |  |
| 7      |    |    |    |    |    |    |    | L     | L       | L U L   | 432 432 | 432 432 | 432 412 |         |     | L       | L       |     |    |    |    |    |    |    |  |
| 8      |    |    |    |    |    |    |    |       | L U L   | 412 420 | 464 440 | 432 432 |         |         | A   | U L     | 376     |     |    |    |    |    |    |    |  |
| 9      |    |    |    |    |    |    |    | L     | A       | L       |         | 436 440 | 424 424 | 408 412 | 380 | U L U L |         | A   |    |    |    |    |    |    |  |
| 10     |    |    |    |    |    |    |    | L U L | 388 404 | 420 428 | 436 424 | 428 408 |         |         | A   | U L     | 416     |     |    |    |    |    |    |    |  |
| 11     |    |    |    |    |    |    | A  |       | A       | A       | A       | A       | A       |         |     | 412 404 |         |     |    |    |    |    |    |    |  |
| 12     |    |    |    |    |    |    |    | L     | L       | U L U L | 412 424 | 460 448 | 448 444 | 424 420 | 360 | U L     |         |     |    |    |    |    |    |    |  |
| 13     |    |    |    |    |    |    |    |       | A       | A       | U L U L | 436 436 | 436     |         |     | A       | 412 412 |     |    |    |    |    |    |    |  |
| 14     |    |    |    |    |    |    |    |       | 404     | U L U L | 420 428 | 436 436 | 436 420 |         |     | L       | L       | L   |    |    |    |    |    |    |  |
| 15     |    |    |    |    |    |    |    |       | A       | A U L   | 428     | 436 416 | 432 420 | 400     |     | L       |         |     |    |    |    |    |    |    |  |
| 16     |    |    |    |    |    |    |    |       | A       | L       | U L U L | 452 436 | 416 416 |         |     | L       | L       |     |    |    |    |    |    |    |  |
| 17     |    |    |    |    |    |    |    |       | L       |         | U L     | 432 440 | 432 400 |         |     | L       | L       |     |    |    |    |    |    |    |  |
| 18     |    |    |    |    |    |    |    |       | L       | U L U L | 428 424 | 436 440 | 432 424 | 400     |     | L       | L       |     |    |    |    |    |    |    |  |
| 19     |    |    |    |    |    |    |    |       | L       | 412 412 | 436 440 | 440     |         |         |     | 376     |         |     |    |    |    |    |    |    |  |
| 20     |    |    |    |    |    |    |    |       | L       | L       | 444 436 | 436 432 | 424 400 |         |     | A       | A       |     |    |    |    |    |    |    |  |
| 21     |    |    |    |    |    |    |    |       | 416     | U L     | 424 424 | 432 432 | 432 384 |         |     |         |         |     |    |    |    |    |    |    |  |
| 22     |    |    |    |    |    |    |    |       | L U L   | 420 416 | 472 444 | 432 408 | 388     |         |     | U L     |         |     |    |    |    |    |    |    |  |
| 23     |    |    |    |    |    |    |    | L     | A       | L U L   | 424 424 | 432 436 | 416 408 | 388     |     | U L     | L       |     |    |    |    |    |    |    |  |
| 24     |    |    |    |    |    |    |    |       | L       |         | 436 436 | 448 428 | 408     |         |     | L       | L       |     |    |    |    |    |    |    |  |
| 25     |    |    |    |    |    |    |    |       | L       | L       | 448 436 | 428 428 | 456     |         |     | L       | L       |     |    |    |    |    |    |    |  |
| 26     |    |    |    |    |    |    |    |       | L       | L       | 440 448 | 448 428 | 424     |         |     | L       | L       |     |    |    |    | A  |    |    |  |
| 27     |    |    |    |    |    |    |    |       | L       | L       | U L     | 440 436 | 432 432 | 416     |     | L       | L       |     |    |    |    |    |    |    |  |
| 28     |    |    |    |    |    |    |    |       | U L     | 416 416 | 412 440 | 432 428 | 428     |         |     | L       | L       |     |    |    |    |    |    |    |  |
| 29     |    |    |    |    |    |    |    |       | A       | A       | U L     | 412 420 | 432 432 |         |     | L       | A       |     |    |    |    |    |    |    |  |
| 30     |    |    |    |    |    |    |    |       | L U L   | 448 424 | 432 440 | 440 428 |         |         |     | L       | A       |     |    |    |    |    |    |    |  |
| 31     |    |    |    |    |    |    |    |       |         |         |         |         |         |         |     |         |         |     |    |    |    |    |    |    |  |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07    | 08      | 09      | 10      | 11      | 12      | 13      | 14  | 15      | 16      | 17  | 18 | 19 | 20 | 21 | 22 | 23 |  |
| CNT    |    |    |    |    |    |    |    | 1     | 3       | 9       | 20      | 28      | 27      | 28      | 26  | 28      | 18      | 5   |    |    |    |    |    |    |  |
| MED    |    |    |    |    |    |    |    | 268   | 388     | U L U L | 412 424 | 436 436 | 432 432 | 432 416 | 398 | 380     |         |     |    |    |    |    |    |    |  |
| U Q    |    |    |    |    |    |    |    | 388   | 416     | 428 442 | 440 438 | 432 424 | 404 412 |         |     |         |         |     |    |    |    |    |    |    |  |
| L Q    |    |    |    |    |    |    |    | 376   | 408     | 420 424 | 432 428 | 424 408 | 388     | 368     |     |         |         |     |    |    |    |    |    |    |  |

SEP. 2018 f<sub>o</sub>F1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 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   | A   | A   | A   | A   | R   | A   | A   | A   | U   | A   | R   | B  |    |    |    |    |
| 2      |    |    |    |    |    |    | B  | U   | R   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | B  |    |    |    |    |
| 3      |    |    |    |    |    |    | B  | U   | A   | U   | A   | U   | R   | R   | A   | R   | U   | R   | A   | B  |    |    |    |    |
| 4      |    |    |    |    |    |    | B  | U   | R   | U   | A   | U   | R   | R   | R   | U   | A   | R   | U   | A  | C  | B  |    |    |
| 5      |    |    |    |    |    |    | B  | U   | A   | A   | A   | A   | U   | A   | A   | A   | U   | A   | A   | A  | B  |    |    |    |
| 6      |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | U   | A   | U   | R   | U   | A   | A   | A  | B  |    |    |    |
| 7      |    |    |    |    |    |    | B  | A   | U   | R   | U   | R   | R   | R   | A   | A   | U   | A   | U   | A  | B  |    |    |    |
| 8      |    |    |    |    |    |    |    | A   | A   | U   | A   | A   | A   | R   | R   | R   | A   | A   | A   | A  | B  |    |    |    |
| 9      |    |    |    |    |    |    | B  | U   | A   | A   | A   | B   | R   | R   | A   | U   | A   | R   | U   | A  | B  |    |    |    |
| 10     |    |    |    |    |    |    | B  | U   | A   | A   | U   | R   | A   | A   | A   | U   | A   | A   | A   | B  |    |    |    |    |
| 11     |    |    |    |    |    |    | B  |     | A   | U   | A   | A   | A   | A   | A   | A   | U   | A   | A   | B  |    |    |    |    |
| 12     |    |    |    |    |    |    | B  | U   | A   | U   | A   | A   | A   | A   | U   | A   | R   | R   | U   | A  | B  |    |    |    |
| 13     |    |    |    |    |    |    | B  | U   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | B  |    |    |    |    |
| 14     |    |    |    |    |    |    | B  | A   | U   | R   | A   | A   | U   | R   | U   | R   | R   | U   | R   | U  | U  | R  |    |    |
| 15     |    |    |    |    |    |    | B  | B   | A   | A   | A   | A   | U   | R   | R   | U   | A   | A   | A   | B  |    |    |    |    |
| 16     |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | A   | A   | A   | U   | A   | U   | U   | R  | B  |    |    |    |
| 17     |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | U   | R   | R   | U   | R   | A   | U   | U  | R  |    |    |    |
| 18     |    |    |    |    |    |    | B  | U   | A   | A   | U   | A   | U   | R   | R   | R   | U   | U   | R   | U  | U  | R  |    |    |
| 19     |    |    |    |    |    |    | B  | U   | A   | A   | A   | A   | A   | A   | A   | U   | R   | A   | A   | B  |    |    |    |    |
| 20     |    |    |    |    |    |    | B  | U   | R   | A   | A   | A   | R   | R   | R   | U   | A   | A   | R   | U  | A  | B  |    |    |
| 21     |    |    |    |    |    |    | B  | A   | A   | U   | R   | A   | A   | A   | A   | A   | A   | A   | A   |    |    |    |    |    |
| 22     |    |    |    |    |    |    | B  | A   | A   | U   | A   | A   | U   | R   | A   | A   | R   | U   | A   |    |    |    |    |    |
| 23     |    |    |    |    |    |    | B  | A   | A   | A   | U   | R   | U   | R   | R   | R   | U   | U   | A   | B  |    |    |    |    |
| 24     |    |    |    |    |    |    | B  | B   | A   | U   | R   | A   | U   | R   | R   | R   | U   | A   | U   | R  | B  |    |    |    |
| 25     |    |    |    |    |    |    | B  | U   | R   | A   | A   | R   | U   | R   | U   | R   | A   | A   | A   | B  |    |    |    |    |
| 26     |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | R   | U   | R   | R   | U   | R   | A   | B  |    | A  | A  |    |
| 27     |    |    |    |    |    |    | B  | U   | A   | U   | A   | A   | U   | R   | A   | A   | A   | U   | R   | B  |    |    |    |    |
| 28     |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | A   | A   | U   | R   | U   | A   | A   | B  |    |    |    |    |
| 29     |    |    |    |    |    |    | B  | U   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | B  |    |    |    |    |
| 30     |    |    |    |    |    |    | B  | U   | A   | U   | A   | A   | A   | R   | R   | A   | U   | A   | A   | B  |    |    |    |    |
| 31     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 15  | 7   | 10  | 2   | 4   | 11  | 6   | 9   | 12  | 18  | 11  | 3   |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    | U   | A   | U   | A   | U   | R   | U   | R   | U   | R   | U   | U   | R  |    |    |    |    |
| U Q    |    |    |    |    |    |    |    | 220 | 272 | 304 | 318 | 326 | 336 | 332 | 320 | 308 | 280 | 228 | 176 |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    | U   | R   | U   | R   | U   | R   | U   | R   | U   | R   | U   | U   | R  |    |    |    |    |
|        |    |    |    |    |    |    |    | 228 | 276 | 316 |     | 332 | 344 | 340 | 328 | 310 | 284 | 232 | 180 |    |    |    |    |    |
|        |    |    |    |    |    |    |    | U   | A   | U   | A   | A   | U   | R   | U   | A   | U   | U   | U   | R  |    |    |    |    |
|        |    |    |    |    |    |    |    | 216 | 248 | 300 |     | 322 | 328 | 324 | 314 | 298 | 272 | 220 | 172 |    |    |    |    |    |

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

SEP. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 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 | B 19 | B 16 | E 16 | E 16 | E 16 | B 27 | 38 | 39 | 36   | 34   | G  | 34 | 41   | 35    | 30 | G    | 30   | 17   | 20   | 19   | 19   | E 15 |      |
| 2      | A 42 | 22   | E 15 | E 16 | E 16 | E 15 | E 16 | G    | 31 | 31 | 34   | 37   | 45 | 35 | 35   | 32    | 30 | 34   | 46   | 31   | E 16 | 27   | 16   | E 16 |      |
| 3      | E 16 | E 16 | E 16 | E 16 | 26   | A 41 | A 17 | 27   | 30 | 32 | G    | 34   | G  | 36 | 37   | 34    | G  | 27   | 20   | 16   | E 15 | E 15 | E 16 | E 16 |      |
| 4      | E 16 | E 16 | E 15 | E 15 | E 16 | E 16 | 18   | G    | 21 | 30 | G    | G    | G  | 38 | G    | G     | 30 | C    | 20   | 18   | E 16 | E 16 | E 16 | E 16 |      |
| 5      | E 16 | E 16 | E 16 | E 16 | E 16 | E 15 | E 15 | 28   | 29 | 36 | 32   | 36   | 37 | 36 | 36   | 34    | 31 | 35   | 29   | 36   | 36   | 23   | A 55 | 17   |      |
| 6      | 20   | E 16 | E 16 | E 16 | E 16 | 24   | 28   | 34   | 33 | 33 | 34   | 34   | 39 | 39 | 37   | 34    | 32 | 28   | 20   | E 16 | E 15 | 22   | 21   | 21   |      |
| 7      | 20   | E 16 | E 16 | 15   | 19   | E 15 | E 15 | 23   | 22 | G  | G    | G    | 37 | 37 | 37   | 35    | 30 | 28   | 19   | 31   | 20   | 18   | E 16 | 17   |      |
| 8      | 16   | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 24   | 25 | 32 | 33   | G    | G  | G  | A 33 | A 120 | 30 | 27   | 19   | E 15 | E 15 | E 16 | E 16 | E 15 |      |
| 9      | E 15 | E 15 | 15   | 18   | E 15 | E 15 | E 16 | 25   | 30 | 31 | G    | G    | G  | 32 | 34   | G     | G  | A 27 | A 27 | 79   | 36   | 20   | 15   | E 16 | E 16 |
| 10     | E 16 | E 16 | 20   | 20   | A 43 | A 23 | E 16 | 24   | 28 | G  | 34   | 35   | 35 | 35 | 37   | 37    | 39 | 28   | 24   | 35   | 20   | 31   | 22   | E 16 |      |
| 11     | E 15 | E 15 | E 16 | E 16 | E 16 | 18   | 24   | 32   | 34 | 37 | A 56 | A 79 | 40 | 41 | 43   | 32    | 31 | 28   | 30   | 28   | 16   | 16   | 16   | 24   |      |
| 12     | 31   | E 17 | E 16 | E 16 | E 16 | E 16 | E 16 | 23   | 29 | 32 | 34   | 36   | 36 | 36 | G    | G     | 30 | 30   | 41   | 30   | 30   | 24   | 22   | A 66 |      |
| 13     | 22   | 20   | A 44 | A 47 | 20   | E 16 | 15   | 27   | 34 | 40 | 40   | 38   | 38 | 38 | 46   | 32    | 32 | 48   | 41   | 41   | 19   | E 16 | 16   | E 16 |      |
| 14     | 28   | 18   | 21   | 21   | E 21 | E 16 | 19   | 20   | G  | 32 | 35   | 36   | G  | G  | G    | G     | 31 | 24   | G    | 18   | E 16 | 22   | 22   | E 16 |      |
| 15     | 24   | 23   | E 15 | 22   | E 15 | E 16 | E 16 | 21   | 30 | 38 | 37   | 36   | G  | G  | 36   | 31    | 29 | 26   | 21   | 22   | 35   | 18   | E 16 | E 16 |      |
| 16     | E 16 | E 15 | E 16 | E 16 | E 16 | E 16 | E 16 | 25   | 33 | 33 | 37   | 40   | 36 | 45 | 37   | 32    | 29 | G    | 18   | E 15 | 24   | 28   | 15   | E 15 |      |
| 17     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 18   | 24   | 27 | 52 | 48   | 35   | G  | G  | G    | 34    | G  | G    | E 15 | 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 | 23   | 30 | 32 | 32   | G    | G  | G  | 34   | G     | G  | G    | E 16 | E 16 | E 16 | E 16 | E 16 | E 17 |      |
| 19     | 20   | E 16 | E 17 | E 16 | E 15 | E 16 | E 16 | 24   | 27 | 33 | 35   | 35   | 36 | 35 | 38   | G     | 30 | 30   | 26   | 28   | A 54 | 26   | 27   | E 16 |      |
| 20     | E 16 | E 16 | E 16 | E 16 | E 16 | 44   | 16   | G    | 29 | 31 | 34   | G    | G  | G  | 36   | 31    | G  | 32   | 39   | 32   | 22   | 22   | E 16 | E 16 |      |
| 21     | E 16 | E 16 | 19   | 20   | E 15 | E 15 | E 15 | 20   | 29 | G  | 33   | 33   | 35 | 36 | 33   | 33    | 27 | 28   | 19   | E 16 | E 16 | A 50 | 20   | 20   |      |
| 22     | E 16 | E 16 | E 16 | E 16 | E 16 | 19   | 19   | 29   | 32 | 30 | 36   | 34   | G  | 34 | 34   | G     | G  | 24   | 19   | 34   | E 16 | E 16 | 20   | E 16 |      |
| 23     | 20   | 19   | E 16 | E 16 | E 16 | 18   | 16   | 23   | 33 | 32 | G    | G    | 36 | G  | G    | G     | 29 | 26   | E 17 | E 16 | E 16 | E 16 | 21   | 23   |      |
| 24     | 23   | E 17 | 20   | 21   | A 32 | 21   | 20   | 19   | 28 | G  | 34   | G    | G  | G  | G    | G     | 28 | G    | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 25     | E 16 | E 16 | 39   | E 16 | E 16 | E 15 | E 16 | G    | 25 | 32 | G    | G    | G  | G  | G    | 29    | 29 | 26   | 15   | E 15 | E 15 | E 15 | E 17 | E 16 |      |
| 26     | E 16 | E 16 | E 15 | E 15 | E 15 | E 16 | E 16 | 22   | 30 | 34 | 34   | 34   | G  | G  | G    | G     | G  | 27   | 18   | E 16 | 29   | 42   | 18   | 23   |      |
| 27     | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 23   | 27 | 31 | G    | 34   | 35 | G  | 35   | 33    | 30 | G    | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 28     | 19   | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 19   | 29 | 34 | 34   | 34   | 35 | 36 | 34   | G     | 29 | 24   | 16   | 16   | 18   | 18   | E 15 | 20   |      |
| 29     | E 16 | E 16 | E 16 | 18   | E 16 | E 16 | E 16 | 22   | 43 | 37 | 34   | 34   | 42 | 38 | 34   | 33    | 31 | 30   | 19   | E 16 | E 16 | E 16 | E 16 | 20   |      |
| 30     | E 20 | E 16 | E 16 | E 16 | E 18 | E 15 | E 16 | 25   | 30 | 31 | 33   | 32   | G  | G  | 34   | 34    | 30 | 30   | 21   | E 16 | E 16 | E 16 | E 16 | E 16 |      |
| 31     |      |      |      |      |      |      |      |      |    |    |      |      |    |    |      |       |    |      |      |      |      |      |      |      |      |
|        | 00   | 01   | 02   | 03   | 04   | 05   | 06   | 07   | 08 | 09 | 10   | 11   | 12 | 13 | 14   | 15    | 16 | 17   | 18   | 19   | 20   | 21   | 22   | 23   |      |
| CNT    | 30   | 30   | 30   | 30   | 30   | 30   | 30   | 30   | 30 | 30 | 30   | 30   | 30 | 30 | 30   | 30    | 30 | 29   | 30   | 30   | 30   | 30   | 30   | 30   |      |
| MED    | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | 23   | 30 | 32 | 34   | 34   | G  | 34 | 34   | 32    | 30 | 27   | 20   | 16   | 16   | 18   | E 16 | E 16 |      |
| U Q    | 20   | 16   | 17   | 18   | 16   | 18   | 17   | 25   | 32 | 34 | 35   | 36   | 36 | 36 | 37   | 34    | 30 | 30   | 29   | 31   | 20   | 23   | 21   | 20   |      |
| L Q    | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | E 16 | G    | G  | G  | G    | G    | G  | G  | G    | G     | G  | G    | G    | E 16 | E 16 | E 16 | E 16 | E 16 |      |

SEP. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

SEP. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23    |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 1     | 295 | 337 | 323 | 294 | 291 | 299 | 411 | 389 | 402 | 396 | 378 | 317 | 330 | 342 | 330 | 326 | 320 | 320 | 338 | 352 | 354 | 361 |     | F 320 |
| 2     | A   | 317 | F   | 317 | F   | F   | 380 | 398 | 358 | 372 | 381 | 347 | 358 | 351 | 340 | 320 | 314 | 318 | 331 | 333 | 333 | 334 | F   | F     |
| 3     | F   | F   | 317 | 328 | 388 | A   | 382 | 373 | 375 | 397 | 327 | 323 | 327 | 327 | 336 | 344 | 323 | 341 | 329 | 340 | 333 | 337 | 321 | 313   |
| 4     | 327 | 323 | 318 | 330 | 375 | 328 | 361 | 389 | 392 | 385 | 363 | 344 | 361 | 324 | 339 | 331 | 326 | C   | 324 | 337 | 388 | 405 | 314 | 302   |
| 5     | 302 | 348 | 327 | F   | 320 | 327 | 396 | 400 | 406 | 344 | 348 | 285 | 330 | 332 | 312 | 335 | 358 | 373 | 347 | 354 | 365 | 356 | A   | F     |
| 6     | F   | 325 | F   | 313 | F   | 322 | 354 | 376 | 393 | 367 | 359 | 361 | 321 | 341 | 307 | 335 | 343 | 351 | 339 | 364 | 388 | 319 | 312 | 338   |
| 7     | 336 | 330 | 331 | 310 | 325 | 325 | 333 | 367 | 408 | 378 | 341 | 349 | 344 | 314 | 341 | 354 | 359 | 333 | 355 | 370 | 388 | 335 | 327 | 304   |
| 8     | F   | 297 | 305 | 322 | 334 | 362 | 353 | 391 | 395 | 378 | 372 | 310 | 312 | 353 | 343 | A   | 329 | 345 | 366 | 388 | 369 | 391 | 318 | 317   |
| 9     | 317 | 318 | 316 | 339 | 344 | 323 | 352 | 363 | 403 | 399 | 385 | 335 | 351 | 352 | 332 | 359 | 344 | 323 | A   | 384 | 375 | 303 | 298 | 314   |
| 10    | 317 | 353 | 354 | 355 | A   | 363 | 372 | 394 | 389 | 381 | 384 | 350 | 345 | 359 | 325 | 347 | 332 | 336 | 351 | 352 | 333 | 349 | 298 | F     |
| 11    | F   | 309 | 308 | F   | F   | F   | 352 | 404 | 386 | 363 | A   | A   | 338 | 322 | 335 | 354 | 324 | 356 | 354 | 343 | 314 | 313 | 319 | 322   |
| 12    | 308 | 339 | 315 | 323 | 327 | 328 | 321 | 365 | 377 | 392 | 375 | 320 | 335 | 321 | 287 | 316 | 306 | 319 | 345 | 370 | 353 | 328 | 310 | A     |
| 13    | 319 | 317 | A   | A   | F   | 297 | 345 | 368 | 387 | 385 | 386 | 361 | 313 | 334 | 312 | 318 | 313 | 326 | 341 | 375 | 360 | 314 | 299 | 308   |
| 14    | 371 | 338 | 333 | 316 | F   | 298 | 368 | 373 | 370 | 382 | 378 | 366 | 332 | 319 | 281 | 318 | 328 | 335 | 349 | 363 | 377 | 355 | 302 | 324   |
| 15    | 329 | 353 | 301 | 294 | 311 | 322 | 357 | 377 | 379 | 403 | 391 | 375 | 304 | 337 | 325 | 336 | 317 | 329 | 349 | 369 | 394 | 348 | 323 | 298   |
| 16    | 347 | 348 | 307 | 317 | 329 | 324 | 368 | 384 | 381 | 382 | 385 | 348 | 352 | 329 | 341 | 364 | 349 | 326 | 333 | 352 | 371 | 359 | 310 | 315   |
| 17    | 316 | 306 | 325 | 356 | 339 | 302 | 342 | 372 | 385 | 396 | 381 | 379 | 384 | 327 | 326 | 334 | 334 | 338 | 346 | 354 | 382 | 351 | 297 | 306   |
| 18    | 323 | 323 | 323 | 343 | 341 | 315 | 334 | 393 | 369 | 376 | 380 | 360 | 344 | 350 | 345 | 345 | 343 | 319 | 327 | 339 | 396 | R   | 419 | 310   |
| 19    | 311 | 335 | 345 | 353 | 368 | 335 | 363 | 388 | 361 | 394 | 384 | 354 | 339 | 327 | 347 | 339 | 348 | 348 | 374 | 370 | A   | 326 | 318 | 313   |
| 20    | 337 | F   | F   | F   | F   | A   | 370 | 378 | 379 | 380 | 378 | 351 | 360 | 363 | 350 | 316 | 341 | 332 | 334 | 358 | 395 | 383 | 320 | 319   |
| 21    | 314 | 312 | 313 | 325 | 408 | 335 | 355 | 383 | 389 | 396 | 370 | 360 | 356 | 353 | 350 | 281 | 327 | 340 | 367 | 363 | 391 | A   | 304 | F     |
| 22    | F   | F   | F   | F   | F   | F   | 378 | 428 | 414 | 392 | 358 | 354 | 288 | 351 | 322 | 291 | 316 | 391 | 371 | 304 | 333 | 291 | 349 | 307   |
| 23    | 299 | 292 | 325 | 362 | 304 | 288 | 303 | 335 | 413 | 387 | 336 | 306 | 326 | 320 | 325 | 323 | 336 | 348 | 366 | 378 | 364 | F   | 280 | 312   |
| 24    | 294 | 315 | 326 | 369 | A   | 316 | 363 | 387 | 372 | 366 | 342 | 341 | 360 | 350 | 317 | 343 | 336 | 333 | 340 | 370 | 366 | 339 | 350 | 325   |
| 25    | 321 | 314 | A   | 337 | 376 | 318 | 357 | 367 | 377 | 376 | 361 | 345 | 354 | 363 | 366 | 323 | 332 | 327 | 365 | 364 | 349 | 278 | 301 | 302   |
| 26    | 306 | 342 | 342 | 348 | 349 | 359 | 369 | 383 | 384 | 363 | 389 | 384 | 350 | 330 | 358 | 356 | 362 | 333 | 342 | 391 | 394 | A   | 299 | 302   |
| 27    | 332 | 319 | 319 | 334 | 313 | 339 | 377 | 415 | 386 | 379 | 366 | 372 | 337 | 335 | 342 | 345 | 322 | 323 | 378 | 375 | 361 | 324 | F   | F     |
| 28    | 333 | 323 | 310 | 330 | 328 | 326 | 365 | 392 | 359 | 368 | 382 | 362 | 332 | 334 | 346 | 331 | 352 | 363 | 363 | 375 | 352 | 327 | 299 | F     |
| 29    | F   | 345 | 339 | 335 | 345 | 337 | 354 | 385 | 387 | 379 | 335 | 350 | 344 | 335 | 343 | 328 | 329 | 342 | 357 | 372 | 364 | 321 | 312 | 288   |
| 30    | 322 | 320 | 348 | 319 | 401 | 333 | 347 | 379 | 398 | 346 | 331 | 349 | 339 | 349 | 341 | 332 | 337 | 357 | 371 | 379 | 359 | 301 | 294 | 299   |
| 31    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| CNT   | 23  | 27  | 24  | 25  | 21  | 25  | 30  | 30  | 30  | 30  | 29  | 29  | 30  | 30  | 30  | 29  | 30  | 29  | 29  | 30  | 29  | 27  | 26  | 23    |
| MED   | 319 | 323 | 323 | 330 | 339 | 325 | 359 | 384 | 386 | 380 | 375 | 350 | 339 | 335 | 338 | 334 | 332 | 335 | 349 | 364 | 365 | 335 | 310 | 312   |
| U Q   | 332 | 339 | 332 | 346 | 372 | 335 | 370 | 392 | 395 | 392 | 383 | 361 | 352 | 351 | 343 | 345 | 343 | 348 | 366 | 375 | 388 | 356 | 319 | 319   |
| L Q   | 308 | 315 | 314 | 317 | 322 | 316 | 352 | 373 | 377 | 372 | 353 | 338 | 330 | 327 | 325 | 322 | 323 | 326 | 338 | 352 | 352 | 319 | 299 | 302   |

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09      | 10  | 11  | 12  | 13  | 14  | 15  | 16      | 17  | 18  | 19  | 20  | 21 | 22 | 23 |
|-----|---|----|----|----|----|----|----|----|-----|-----|---------|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|----|----|----|
| 1   |   |    |    |    |    |    |    |    |     | A   | A       |     |     |     |     | A   |     | U L U L |     |     |     |     |    |    |    |
| 2   |   |    |    |    |    |    |    |    | 458 | 427 | L       | U L | 442 | 429 | 430 | 435 | 398 | 368     | 355 |     |     |     |    |    |    |
| 3   |   |    |    |    |    |    |    |    |     |     | U L U L | 436 | 430 | 415 | 434 | 449 | 412 | 373     | 404 |     |     |     |    |    |    |
| 4   |   |    |    |    |    |    |    |    |     |     | L       | U L | 416 | 404 | 434 | 426 | 397 | 389     | 374 |     |     |     |    |    |    |
| 5   |   |    |    |    |    |    |    |    |     | A   |         | U L | 413 | 394 | 410 | 425 | 422 | 402     | 415 |     |     |     |    |    |    |
| 6   |   |    |    |    |    |    |    |    |     | A   | U L     | 379 | 422 | 423 | 394 | 410 | 422 | 393     | 386 |     |     |     |    |    |    |
| 7   |   |    |    |    |    |    |    |    | L   | L   | L       | U L | 420 | 425 | 427 | 385 | 385 | 404     |     |     |     |     |    |    |    |
| 8   |   |    |    |    |    |    |    |    |     |     | L       | U L | 410 | 441 | 432 | 421 | 429 | 422     |     |     |     |     |    |    |    |
| 9   |   |    |    |    |    |    |    |    | L   | A   | L       |     |     |     |     |     |     | U L U L |     |     |     |     |    |    |    |
| 10  |   |    |    |    |    |    |    |    | L   | U L | U L     | 419 | 428 | 423 | 451 | 443 | 450 | 404     | 398 |     |     |     |    |    |    |
| 11  |   |    |    |    |    |    |    | A  |     | A   | A       | A   | A   | A   | A   | A   |     | 373     | 378 |     |     |     |    |    |    |
| 12  |   |    |    |    |    |    |    |    | L   | L   | U L     | U L | 400 | 415 | 402 | 428 | 407 | 372     | 383 | 358 | 370 |     |    |    |    |
| 13  |   |    |    |    |    |    |    |    |     | A   | A       | A   | U L | 437 | 442 | 393 |     | 399     | 350 |     |     |     |    |    |    |
| 14  |   |    |    |    |    |    |    |    |     |     | U L     | U L | 437 | 422 | 405 | 399 | 404 | 392     | 371 |     |     |     |    |    |    |
| 15  |   |    |    |    |    |    |    |    |     | A   | A       | U L |     |     |     | U L | 438 | 430     | 441 | 375 | 374 | 363 |    |    |    |
| 16  |   |    |    |    |    |    |    |    |     | A   | L       | U L | U L | 380 | 411 |     | 401 | 369     |     |     |     |     |    |    |    |
| 17  |   |    |    |    |    |    |    |    |     |     | L       |     |     | U L | 407 | 437 | 431 | 420     | 417 |     |     |     |    |    |    |
| 18  |   |    |    |    |    |    |    |    |     |     | L       | U L | 430 | 450 | 417 | 393 | 400 | 376     | 367 |     |     |     |    |    |    |
| 19  |   |    |    |    |    |    |    |    |     | L   | 404     | 459 | 421 | 418 | 401 |     |     |         |     |     |     |     |    |    |    |
| 20  |   |    |    |    |    |    |    |    |     |     | L       |     |     | 406 | 421 | 405 | 385 | 393     | 377 |     |     |     |    |    |    |
| 21  |   |    |    |    |    |    |    |    |     |     | U L     | 416 | 442 | 443 | 430 | 399 | 381 | 374     | 378 |     |     |     |    |    |    |
| 22  |   |    |    |    |    |    |    |    |     |     | L       | U L | 457 | 447 | 360 | 383 | 394 | 359     | 369 |     |     |     |    |    |    |
| 23  |   |    |    |    |    |    |    |    | L   | A   | L       | U L | 392 | 419 | 381 | 379 | 409 | 371     | 385 |     |     |     |    |    |    |
| 24  |   |    |    |    |    |    |    |    |     |     | L       |     |     | 395 | 395 | 405 | 414 | 375     |     |     |     |     |    |    |    |
| 25  |   |    |    |    |    |    |    |    |     | L   | L       | L   | 412 | 423 | 418 | 408 | 358 |         |     |     |     |     |    |    |    |
| 26  |   |    |    |    |    |    |    |    |     |     | L       | L   | 424 | 406 | 406 | 397 | 368 |         |     |     |     |     |    |    | A  |
| 27  |   |    |    |    |    |    |    |    |     | L   | L       | U L | 411 | 428 | 401 | 380 | 376 |         |     |     |     |     |    |    |    |
| 28  |   |    |    |    |    |    |    |    |     | U L | 399     | 410 | 442 | 422 | 415 | 389 | 390 |         |     |     |     |     |    |    |    |
| 29  |   |    |    |    |    |    |    |    |     | A   | A       | U L | 424 | 448 |     | 389 | 389 | 369     |     |     |     |     |    |    |    |
| 30  |   |    |    |    |    |    |    |    |     |     | L       | U L | 395 | 419 | 391 | 399 | 390 | 387     |     |     |     |     |    |    |    |
| 31  |   |    |    |    |    |    |    |    |     |     |         |     |     |     |     |     |     |         |     |     |     |     |    |    |    |
|     |   | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09      | 10  | 11  | 12  | 13  | 14  | 15  | 16      | 17  | 18  | 19  | 20  | 21 | 22 | 23 |
| CNT |   |    |    |    |    |    |    |    | 1   | 3   | 9       | 20  | 28  | 27  | 28  | 26  | 28  | 18      | 5   |     |     |     |    |    |    |
| MED |   |    |    |    |    |    |    |    | 458 | 419 | 410     | 422 | 420 | 422 | 406 | 398 | 379 | 376     | 356 |     |     |     |    |    |    |
| U Q |   |    |    |    |    |    |    |    | 427 | 432 | 440     | 439 | 430 | 428 | 412 | 396 | 385 | 376     |     |     |     |     |    |    |    |
| L Q |   |    |    |    |    |    |    |    | 390 | 400 | 414     | 406 | 406 | 399 | 389 | 372 | 368 | 345     |     |     |     |     |    |    |    |

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| H<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      |    |    |    |    |    |    |            |            | 240 | 238 | 238 | 328 | 314 | 304        | E A<br>304 | 312 | 310      | 304                |     |    |    |    |    |    |
| 2      |    |    |    |    |    |    |            | 226        | 274 | 254 | 254 | 314 | 266 | 278        | 318        | 326 | 324      | E A E A<br>312 282 |     |    |    |    |    |    |
| 3      |    |    |    |    |    |    |            |            | 254 | 228 | 348 | 334 | 322 | 322        | 322        | 286 | 314      | 292                | 276 |    |    |    |    |    |
| 4      |    |    |    |    |    |    |            |            | 250 | 248 | 264 | 298 | 266 | 294        | 304        | 306 | 308      | C<br>260           |     |    |    |    |    |    |
| 5      |    |    |    |    |    |    |            |            | 218 |     | 284 | 388 | 310 | 290        | 316        | 288 | 250      | 238                |     |    |    |    |    |    |
| 6      |    |    |    |    |    |    |            | 230        |     | 258 | 262 | 280 | 324 | 304        | 364        | 288 | 264      | 258                | 258 |    |    |    |    |    |
| 7      |    |    |    |    |    |    |            | 260        | 224 | 244 | 314 | 308 | 300 | 344        | 284        | 274 | 272      | 272                |     |    |    |    |    |    |
| 8      |    |    |    |    |    |    |            |            | 242 | 248 | 250 | 360 | 360 | 280        | 286        |     | A<br>298 | 256                |     |    |    |    |    |    |
| 9      |    |    |    |    |    |    |            | 256        | 208 | 216 | 236 | 332 | 268 | 300        | 300        | 256 | 290      | 322                |     | A  |    |    |    |    |
| 10     |    |    |    |    |    |    |            | 224        | 242 | 250 | 244 | 280 | 290 | 286        | 312        | 286 | 286      | 290                |     |    |    |    |    |    |
| 11     |    |    |    |    |    |    | E A<br>256 |            | 242 | 248 | A   | A   | 274 | 302        | 310        | 272 | 290      |                    |     |    |    |    |    |    |
| 12     |    |    |    |    |    |    |            | 270        | 232 | 232 | 248 | 414 | 316 | 314        | 356        | 338 | 326      | 270                |     |    |    |    |    |    |
| 13     |    |    |    |    |    |    |            |            | 228 | 236 | 236 | 288 | 326 | 308        | E A<br>346 | 336 | 316      | 284                | 264 |    |    |    |    |    |
| 14     |    |    |    |    |    |    |            |            | 246 | 246 | 262 | 298 | 330 | 396        | 320        | 300 | 280      | 270                |     |    |    |    |    |    |
| 15     |    |    |    |    |    |    |            |            | 222 | 222 | 238 |     | 378 | 290        | 290        | 272 | 274      | 264                |     |    |    |    |    |    |
| 16     |    |    |    |    |    |    |            |            | 236 | 256 | 240 | 294 | 280 | E A<br>278 | 292        | 256 | 256      | 272                |     |    |    |    |    |    |
| 17     |    |    |    |    |    |    |            |            | 236 |     |     | 250 | 260 | 326        | 312        | 296 | 286      | 270                |     |    |    |    |    |    |
| 18     |    |    |    |    |    |    |            |            |     | 250 | 250 | 258 | 280 | 298        | 280        | 284 | 272      | 278                | 276 |    |    |    |    |    |
| 19     |    |    |    |    |    |    |            |            | 270 | 228 | 228 | 252 | 308 | 318        | 278        | 278 | 278      | 244                |     |    |    |    |    |    |
| 20     |    |    |    |    |    |    |            |            |     | 244 | 256 | 280 | 262 | 274        | 288        | 328 | 296      | 280                | 234 |    |    |    |    |    |
| 21     |    |    |    |    |    |    |            |            |     | 226 | 268 | 264 | 264 | 264        | 278        | 402 | 336      | 252                |     |    |    |    |    |    |
| 22     |    |    |    |    |    |    |            |            |     | 236 | 270 | 272 | 348 | 266        | 298        | 382 | 276      |                    |     |    |    |    |    |    |
| 23     |    |    |    |    |    |    |            | 276        | 222 | 236 | 310 | 362 | 298 | 280        | 282        | 304 | 276      | 258                |     |    |    |    |    |    |
| 24     |    |    |    |    |    |    |            |            |     | 240 |     | 270 | 258 | 258        | 298        | 288 | 286      | 262                |     |    |    |    |    |    |
| 25     |    |    |    |    |    |    |            |            | 240 | 240 | 240 | 270 | 254 | 254        | 254        | 312 | 282      | 262                |     |    |    |    |    |    |
| 26     |    |    |    |    |    |    |            |            |     | 234 | 232 | 240 | 268 | 292        | 246        | 246 | 274      | 276                |     |    |    | A  |    |    |
| 27     |    |    |    |    |    |    |            |            | 232 | 232 | 232 | 238 | 298 | 280        | 268        | 268 | 280      | 262                |     |    |    |    |    |    |
| 28     |    |    |    |    |    |    |            |            |     | 238 | 238 | 238 | 278 | 278        | 236        | 284 | 274      | 264                |     |    |    |    |    |    |
| 29     |    |    |    |    |    |    |            | E A<br>228 | 238 | 288 | 264 | 260 | 268 | 268        | 290        | 262 | 240      |                    |     |    |    |    |    |    |
| 30     |    |    |    |    |    |    |            |            |     | 272 | 294 | 282 | 252 | 252        | 274        | 286 | 282      | 222                |     |    |    |    |    |    |
| 31     |    |    |    |    |    |    |            |            |     |     |     |     |     |            |            |     |          |                    |     |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06         | 07         | 08  | 09  | 10  | 11  | 12  | 13         | 14         | 15  | 16       | 17                 | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    | 1          | 7          | 20  | 28  | 27  | 28  | 30  | 30         | 30         | 29  | 30       | 27                 | 8   |    |    |    |    |    |
| MED    |    |    |    |    |    |    | E A<br>256 | 256        | 236 | 239 | 250 | 280 | 285 | 290        | 292        | 288 | 284      | 267                | 264 |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |            | 270        | 242 | 248 | 270 | 321 | 314 | 304        | 312        | 316 | 300      | 280                | 276 |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |            | 226        | 226 | 233 | 238 | 263 | 266 | 278        | 278        | 276 | 274      | 258                | 259 |    |    |    |    |    |

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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   |   | 220     | E B E A | E B E B | E B E B | E B E B | E B E B |         |     | A   | A   | 186 | 186 | 176 | 176 |     | 188 | 204 | 216 | 234 | 212 | 204 | 202 | 318     | 218     |         |         |         |     |
| 2   |   |         | A E A E | B E B E | B E B E | 232     | 278     | 208     | 184 | 186 | 220 | 208 | 208 | A   | 198 | 182 | 180 | 180 |     | A   | A   | 214 | 208 | E A E A | E B E B | 250     |         |         |     |
| 3   |   | 214     | E B E B | E B E B | 232     | 208     |         | 208     | 206 | 206 | 202 | 178 | 178 | 178 | 178 | 198 | 198 | 198 | 212 | 206 | 218 | 210 | 210 | 232     | E B E B | 230     |         |         |     |
| 4   |   | E B E B | E B E B | 242     | 214     | 206     | 242     | 210     | 202 | 196 | 186 | 186 | 186 | 178 | 192 | 190 | 188 | 200 |     | C   | 200 | 220 | 196 | 184     | E B E B | 268     |         |         |     |
| 5   |   | E B     | E B     | E B     | E B     | E B     | E B     | E B     | E B | A   |     | 200 | 174 | 170 | 194 | 194 | 194 | 192 | 186 |     | A   | 226 | 222 | 222     | 206     | E A E A | 262     |         |     |
| 6   |   | E A E A | E B E B | E B E B | E B E B | E B E B | E B E B | E A E A | A   |     | 208 | 196 | 196 | 190 | 230 | 214 | 208 | 208 | 210 | 210 | 206 | 204 | 188 | E A E A | E A E A | 278     |         |         |     |
| 7   |   | E A E A | E B E B | E B E B | E B E B | E B E B | E B E B | E B E B |     |     | 200 | 180 | 180 | 186 | 186 | 242 | 226 | 202 | 200 | 200 | 222 | 210 | 198 | 214     | 224     | E B E B | 246     |         |     |
| 8   |   | E B E B | E B E B | E B E B | E B E B | E B E B | E B E B | E B E B | 216 | 204 | 204 | 196 | 180 | 180 | 178 | 178 | 178 |     | A   | 200 | 206 | 206 | 190 | 190     | 190     | E B E B | 242     |         |     |
| 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 E B |     | A   |     | 186 | 186 | 182 | 182 | 174 | 174 | 198 | 198 | 216 |     | 214 | 190 | 250     | 302     | E B E B | 286     |         |     |
| 10  |   | E B E B | E B E B | E A E A | E A E A |         | E A E A |         |     |     | 208 | 190 | 190 | 190 | 188 | 188 | 182 | 216 | 214 |     | A   |     | 194 | 220     | 220     | E A E A | E B E B | 282     |     |
| 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 E B | A   |     | A   | A   | A   | A   | A   | A   |     | 202 | 202 | 234 | 226 | 226 | 226 | 246     | 236     | E B E B | 220     | A       |     |
| 12  |   | E A E A | E B E B | E B E B | E B E B | E B E B | E B E B | E B E B | 236 | 226 | 200 | 200 | 186 | 186 | 186 | 186 | 202 | 202 | 202 | 202 | 218 | 218 | 214 | 216     | 228     |         | E B E B | 270     |     |
| 13  |   | E A E A | E A E A | E B E B | E B E B | E B E B | E B E B | E B E B |     | A   | A   |     | 190 | 182 | 200 |     | 208 | 220 |     | A   | A   | 200 | 200 | 226     | 274     | E A E A | E B E B | 270     |     |
| 14  |   | E A E A | E A E A | E A E A | E A E A | E B E B | E B E B | E B E B | 226 | 226 | 202 | 190 | 188 | 186 | 172 | 184 | 190 | 188 | 202 | 210 | 220 | 208 | 198 | 198     | 302     | E A E A | E B E B | 244     |     |
| 15  |   | E A E A | E A E A | E B E B | E B E B | E B E B | E B E B | E B E B | 240 | 214 | 212 |     | 180 | 180 | 180 | 180 | 218 | 190 | 190 | 196 | 220 | 210 | 202 | 210     | 250     | E B E B | E B E B | 250     |     |
| 16  |   | 216     | 222     | 244     | 222     | 208     | 258     | 218     | 206 |     | A   | 200 | 196 | 216 | 190 |     | 212 | 212 | 200 | 200 | 222 | 212 | 212 | 210     | 208     | E B E B | E B E B | 252     |     |
| 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 E B | 212 | 212 | 222 | 250 | 204 | 188 | 184 | 174 | 196 | 208 | 208 | 214 | 206 | 194 | 194 | 240     | 240     | E B E B | E B E B | 242     |     |
| 18  |   | E B E B | E B E B | E B E B | E B E B | E B E B | E B E B | E B E B | 216 | 204 | 206 | 196 | 190 | 174 | 174 | 192 | 192 | 210 | 196 | 212 | 216 | 216 | 196 | 182     | 250     | E B E B | E B E B | 258     |     |
| 19  |   | E A E A | E B E B | E B E B | 222     | 214     | 222     | 216     | 198 | 198 | 198 | 186 | 182 | 182 | 182 |     | A   | 190 | 198 |     | A   | 210 | 206 |         | E A E A | E A E A | E B E B | 258     |     |
| 20  |   | E A E A | E B E B | E B E B | E B E B |         | A       | 216     | 202 | 210 | 196 | 196 | 188 | 188 | 188 | 212 | 204 | 204 |     | A   | A   | 206 | 200 | 200     | 282     | E B E B | E B E B | 266     |     |
| 21  |   | E B E B | E B E B | E A E A | E A E A |         | E B E B | 204     | 204 | 200 | 184 | 174 | 172 | 172 | 202 | 202 | 202 | 202 |     | A   | 206 | 204 | 190 |         | E A E A | E A E A | E A E A | 316     |     |
| 22  |   | E B E B | E B E B | 222     | 222     | 222     | 252     | 196     | 186 | 194 | 182 | 182 | 182 | 190 | 190 | 190 | 188 | 210 | 206 | 206 | 258 | 232 | 248 | 218     | E B E B | E B E B | 218     |         |     |
| 23  |   | E A E A | E A E A | E B E B | E B E B | E B E B | E A E A |         | A   |     | 186 | 186 | 186 | 206 | 206 | 204 | 204 | 212 | 210 | 210 | 192 | 192 | 256 | 330     | E B E B | E A E A | E A E A | 308     |     |
| 24  |   | E A     | E A     | E A     | 232     |         | E A E A | 242     | 226 | 216 | 214 | 188 | 188 | 182 | 182 | 182 | 182 | 186 | 210 | 210 | 212 | 206 | 194 | 206     | 204     | E B E B | E A E A | 226     |     |
| 25  |   | E B E B | E B E B | A       |         | E B E B |         | 220     | 212 | 206 | 200 | 186 | 186 | 178 | 178 | 188 | 194 | 214 | 214 | 210 | 188 | 180 | 284 | 294     | E B E B | E A E A | E B E B | 280     |     |
| 26  |   | E B E B | E B E B | 208     | 230     | 226     | 226     | 216     | 216 | 216 | 206 | 198 | 192 | 188 | 170 | 186 | 186 | 204 | 204 | 218 | 190 | 200 |     | 286     | 352     | E A E A | E A E A | 352     |     |
| 27  |   | E B E B | E B E B | E B E B | E B E B | 190     | 202     | 202     | 188 | 190 | 194 | 194 | 192 | 186 | 186 | 188 | 188 | 204 | 206 | 206 | 196 | 196 | 214 | 254     | E A E A | E A E A | E B E B | 254     |     |
| 28  |   | E A E A | E B E B | E B E B | E B E B | 226     | 246     | 216     | 202 | 202 | 192 | 192 | 184 | 184 | 184 | 194 | 194 | 194 | 194 | 202 | 206 | 202 | 202 | 222     | E A E A | E B E B | E A E A | 240     |     |
| 29  |   | E B     | 216     | 216     | 234     | 198     | 204     | 204     | 204 |     | A   | A   | 188 | 186 |     | A   | 198 | 198 | 200 | 204 |     | A   | 204 | 196     | 196     | 214     | E B E B | E A E A | 298 |
| 30  |   | 254     | E B E B | E B E B | 230     | 202     | E B E B | 208     | 208 | 206 | 198 | 192 | 190 | 190 | 190 | 190 | 192 | 214 |     | A   | 214 | 200 | 198 | 268     | E B E B | E B E B | E B E B | 268     |     |
| 31  |   |         |         |         |         |         |         |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |         |         |         |         |     |
|     |   | 00      | 01      | 02      | 03      | 04      | 05      | 06      | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22      | 23      |         |         |         |     |
| CNT |   | 29      | 30      | 28      | 29      | 28      | 28      | 29      | 29  | 21  | 25  | 28  | 29  | 27  | 28  | 26  | 29  | 29  | 21  | 26  | 30  | 29  | 28  | 29      | 29      |         |         |         |     |
| MED |   | E       | E B E B | E B E B | E B E B | U       | E B     | 250     | 214 | 204 | 202 | 196 | 186 | 186 | 184 | 186 | 193 | 196 | 202 | 208 | 213 | 206 | 198 | 203     | E       | E B E B | E B E B | 258     |     |
| U Q |   | 270     | 262     | 264     | 257     | 266     | 278     | 219     | 212 | 207 | 200 | 193 | 190 | 188 | 196 | 204 | 203 | 209 | 212 | 220 | 216 | 206 | 249 | 296     | E B E B | E A E A | E A E A | 279     |     |
| L Q |   | 241     | 240     | 237     | 226     | 207     | 240     | 208     | 200 | 197 | 187 | 184 | 182 | 178 | 181 | 188 | 188 | 198 | 202 | 206 | 200 | 194 | 204 | 235     | 242     |         |         |         |     |

SEP. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 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   | A   | A   | A   | 108 | A   | A   | A   | 108 | 110 |     |     |    |    |    |    |
| 2      |    |    |    |    |    |    | B   | 110 | 112 | A   | A   | A   | A   | A   | A   | 112 | 112 | A   | B   |     |    |    |    |    |
| 3      |    |    |    |    |    |    | B   | 112 | 114 | 114 | 114 | 112 | 112 | 110 | 110 | 110 | 110 |     | A   | B   |    |    |    |    |
| 4      |    |    |    |    |    |    | B   | 118 | 118 | 118 | 112 | 112 | 112 | 112 | 112 | 110 | 110 |     | C   | B   |    |    |    |    |
| 5      |    |    |    |    |    |    | B   | 110 | A   | A   | A   | A   | 110 | A   | 110 | 110 | 110 |     | A   | B   |    |    |    |    |
| 6      |    |    |    |    |    |    | B   | A   | A   | A   | A   | A   | 110 | 110 | 110 | 110 | 110 | 110 |     |     | B  |    |    |    |
| 7      |    |    |    |    |    |    | B   | A   | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |     |     | B  |    |    |    |
| 8      |    |    |    |    |    |    | 110 | 110 | 110 |     | 110 | 110 | 110 | 110 | A   | A   | A   | A   |     | B   |    |    |    |    |
| 9      |    |    |    |    |    |    | B   | 110 | 110 | 112 | 112 | 108 | 108 | A   | 108 | 108 | 108 |     | A   | B   |    |    |    |    |
| 10     |    |    |    |    |    |    | B   | 108 | 112 | 112 | 112 | 110 | A   | A   | 122 | 122 | 122 |     | A   | B   |    |    |    |    |
| 11     |    |    |    |    |    |    | B   | A   | 122 |     | A   | A   | 118 | A   | A   | 118 | 118 | 118 |     |     | B  |    |    |    |
| 12     |    |    |    |    |    |    | B   | 110 | 110 | 110 | 108 | 110 | 110 | 108 | 108 | 108 | 108 | 108 |     |     | B  |    |    |    |
| 13     |    |    |    |    |    |    | B   | 110 | A   | A   | A   | A   | A   | A   | A   | A   |     | 110 | 110 |     |    |    |    |    |
| 14     |    |    |    |    |    |    | B   | A   | 110 | A   | A   | 110 | 110 | 108 | 108 | 108 | 108 | 108 | 108 | 122 |    |    |    |    |
| 15     |    |    |    |    |    |    | B   | B   | A   | A   | A   | A   | 114 | 108 | 108 | 110 | 110 | 110 |     |     | B  |    |    |    |
| 16     |    |    |    |    |    |    | B   | 110 | A   | A   | A   | A   | 110 | 110 | 110 | 110 | 110 |     |     | B   |    |    |    |    |
| 17     |    |    |    |    |    |    | B   | A   | A   | A   | A   | A   | 110 | 110 | 110 | A   | 112 | 112 | 112 |     |    |    |    |    |
| 18     |    |    |    |    |    |    | B   | 112 | A   | 114 | A   | 114 | 108 | 108 | 108 | 108 | 110 | 110 | 110 |     |    |    |    |    |
| 19     |    |    |    |    |    |    | B   | 118 | A   | A   | A   | A   | A   | A   | A   | 112 | 110 |     | A   | B   |    |    |    |    |
| 20     |    |    |    |    |    |    | B   | 110 | 110 | A   | A   | 108 | 108 | 108 | 110 | A   | 110 | 110 |     |     | B  |    |    |    |
| 21     |    |    |    |    |    |    | B   | A   | A   | 110 | A   | A   | A   | A   | A   | 110 | A   | A   |     |     |    |    |    |    |
| 22     |    |    |    |    |    |    | B   | A   | 110 | 110 | 110 | 106 | 112 | 112 | 114 | 112 | 110 | 110 |     |     |    |    |    |    |
| 23     |    |    |    |    |    |    | B   | 114 | 114 | A   | 114 | 112 | 112 | 114 | 114 | 114 | 114 |     |     | B   |    |    |    |    |
| 24     |    |    |    |    |    |    | B   | B   | A   | 114 | 114 | A   | 110 | 110 | 110 | 110 | 110 | 110 |     |     | B  |    |    |    |
| 25     |    |    |    |    |    |    | B   | 114 | A   | A   | 114 | 114 | 112 | 112 | 112 | A   | A   | A   |     |     | B  |    |    |    |
| 26     |    |    |    |    |    |    | B   | A   | A   | A   | A   | A   | 112 | 112 | 112 | 112 | 112 | 112 |     |     | B  | A  | A  |    |
| 27     |    |    |    |    |    |    | B   | 114 | 114 | 114 | 116 | 116 | 116 | 118 | 118 | A   | A   | 118 |     |     | B  |    |    |    |
| 28     |    |    |    |    |    |    | B   | A   | A   | A   | A   | A   | A   | A   | A   | 118 | 118 | 114 | 116 |     |    | B  |    |    |
| 29     |    |    |    |    |    |    | B   | 116 | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   |     |     | B  |    |    |    |
| 30     |    |    |    |    |    |    | B   | 116 | 116 | A   | A   | A   | 116 | 116 | A   | 116 | 114 |     |     | B   |    |    |    |    |
| 31     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |     | 18  | 13  | 13  | 11  | 14  | 22  | 18  | 21  | 22  | 25  | 17  | 3   |     |    |    |    |    |
| MED    |    |    |    |    |    |    |     | 111 | 112 | 112 | 112 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 112 |     |    |    |    |    |
| U Q    |    |    |    |    |    |    |     | 114 | 114 | 114 | 114 | 112 | 112 | 112 | 113 | 112 | 112 | 112 | 122 |     |    |    |    |    |
| L Q    |    |    |    |    |    |    |     | 110 | 110 | 110 | 110 | 110 | 110 | 108 | 109 | 110 | 110 | 110 | 110 |     |    |    |    |    |

SEP. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |    |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| 1     | 94  | 86  | 88  | 88  | 88  | 88  | 120 | 104 | 104 | 102 | 100 | 100 | G   | 100 | 100 | 100 | 130 | G   | 96  | 96  | 96  | 96  | 96  | 104 |    |
| 2     | 96  | 88  | 88  | 88  | 88  | B   | B   | G   | 108 | 104 | 102 | 102 | 94  | 94  | 94  | 108 | 114 | 114 | 100 | 98  | 98  | 90  | 90  | 90  |    |
| 3     | 90  | 82  | 92  | 90  | 88  | 88  | 88  | 120 | 126 | 126 | G   | 110 | G   | 126 | 126 | 126 | G   | 92  | 92  | 90  | B   | 90  | 90  | B   |    |
| 4     | B   | B   | B   | B   | 90  | 90  | 118 | 100 | 128 | G   | G   | G   | G   | 126 | G   | G   | 124 | C   | 118 | 102 | 102 | 100 | 100 | 100 |    |
| 5     | 98  | B   | 98  | 98  | B   | 98  | 98  | 108 | 100 | 100 | 96  | 96  | 130 | 98  | 122 | 118 | 118 | 104 | 104 | 90  | 90  | 90  | 90  | 90  |    |
| 6     | 90  | 90  | 98  | 100 | 100 | 100 | 98  | 98  | 98  | 98  | 94  | 94  | 140 | 140 | 136 | 132 | 116 | 112 | 104 | 98  | 96  | 96  | 96  | 96  |    |
| 7     | 96  | B   | B   | 96  | 96  | 96  | 96  | 90  | 88  | G   | G   | G   | 130 | 130 | 122 | 122 | 120 | 120 | 120 | 100 | 100 | 100 | B   | 100 |    |
| 8     | 98  | 90  | 90  | 90  | 90  | B   | B   | 116 | 98  | 118 | 102 | G   | G   | G   | 102 | 88  | 92  | 92  | 92  | 92  | B   | 92  | 90  | B   |    |
| 9     | B   | B   | 90  | 90  | 90  | B   | B   | 116 | 116 | 116 | G   | G   | G   | 90  | 112 | G   | 84  | 96  | 96  | 96  | 96  | 96  | 96  | 96  |    |
| 10    | 96  | 96  | 90  | 88  | 84  | 82  | 82  | 132 | 120 | G   | 112 | 108 | 104 | 104 | 146 | 144 | 132 | 120 | 120 | 106 | 96  | 96  | 86  | 86  |    |
| 11    | 86  | 86  | 86  | B   | 94  | 90  | 86  | 86  | 84  | 110 | 110 | 94  | 108 | 108 | 100 | 108 | 114 | 118 | 108 | 108 | 108 | B   | 96  | 96  |    |
| 12    | 96  | B   | 96  | B   | 90  | 90  | B   | 130 | 118 | 118 | 116 | 108 | 114 | 122 | G   | G   | 122 | 118 | 98  | 98  | 98  | 98  | 98  | 92  |    |
| 13    | 94  | 94  | 94  | 90  | 88  | 88  | B   | 112 | 106 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 136 | 116 | 102 | 102 | 102 | 102 | 102 | 102 |    |
| 14    | 102 | 100 | 96  | 96  | 92  | 92  | 92  | 104 | G   | 104 | 102 | 122 | G   | G   | G   | G   | 154 | 150 | G   | 106 | 106 | 100 | 100 | 96  |    |
| 15    | 92  | 92  | 92  | 90  | 90  | 90  | 100 | 98  | 96  | 96  | 98  | 98  | G   | G   | 152 | 150 | 118 | 116 | 82  | 82  | 82  | 82  | 84  | 84  |    |
| 16    | 86  | B   | 90  | 90  | B   | B   | 114 | 114 | 96  | 96  | 96  | 96  | 92  | 104 | 112 | 130 | 142 | G   | 104 | 98  | 94  | 94  | 94  | 94  |    |
| 17    | B   | 90  | 90  | 90  | 90  | 96  | 102 | 104 | 102 | 94  | 92  | 92  | G   | G   | G   | 90  | 90  | G   | G   | 90  | 90  | 90  | 90  | B   |    |
| 18    | B   | B   | B   | B   | B   | 114 | B   | 116 | 84  | 130 | 94  | G   | G   | G   | 120 | G   | G   | G   | G   | 96  | 96  | B   | 94  | 92  |    |
| 19    | 92  | 92  | 92  | 92  | 92  | 92  | B   | 108 | 100 | 100 | 100 | 100 | 98  | 98  | 86  | G   | 98  | 98  | 98  | 98  | 92  | 94  | 94  | 94  |    |
| 20    | 124 | 102 | 102 | B   | 96  | 96  | 96  | B   | 118 | 104 | 104 | G   | G   | 156 | 106 | G   | 116 | 98  | 98  | 98  | 98  | 98  | 98  | 98  |    |
| 21    | 102 | 102 | 94  | 94  | B   | B   | B   | 100 | 100 | G   | 100 | 100 | 98  | 92  | 92  | 118 | 80  | 80  | 80  | 80  | 90  | 94  | 98  | 96  |    |
| 22    | 126 | 124 | 96  | 90  | 88  | 88  | 88  | 100 | 112 | 128 | 114 | 114 | G   | 112 | 112 | G   | G   | 120 | 106 | 100 | 100 | 104 | 94  | 94  |    |
| 23    | 92  | 90  | 90  | 90  | 90  | 90  | 90  | 120 | 114 | 98  | G   | G   | 142 | G   | G   | G   | 142 | 106 | 106 | 92  | 90  | 90  | 92  | 92  |    |
| 24    | 92  | 92  | 92  | 92  | 92  | 92  | 92  | 92  | 110 | G   | G   | 90  | G   | G   | G   | G   | 122 | G   | B   | B   | B   | B   | B   | 102 |    |
| 25    | 90  | 90  | 90  | 90  | 90  | 100 | 100 | G   | 100 | 100 | G   | G   | G   | G   | G   | 100 | 100 | 100 | B   | B   | 100 | 110 | 102 | 102 |    |
| 26    | B   | 80  | B   | B   | B   | B   | B   | 80  | 80  | 92  | 96  | 94  | 94  | 94  | G   | G   | G   | G   | 118 | 112 | 104 | 98  | 98  | 98  | 98 |
| 27    | 98  | 98  | 92  | B   | B   | B   | B   | 124 | 124 | 118 | G   | 112 | 112 | G   | 108 | 108 | 104 | G   | B   | 104 | 102 | 96  | 96  | 96  |    |
| 28    | 96  | 90  | 90  | 90  | 90  | 90  | 90  | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 148 | G   | 118 | 118 | 112 | 104 | 100 | 100 | 100 | 100 |    |
| 29    | 100 | 100 | 100 | 98  | 98  | B   | B   | 114 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 100 | 100 | 98  | 98  | 98  | 96  |    |
| 30    | B   | 96  | 94  | 94  | 90  | B   | 122 | 122 | 122 | 104 | 104 | 104 | G   | G   | 104 | 154 | 136 | 102 | 102 | 102 | B   | 102 | B   | 102 |    |
| 31    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|       | 00  | 01  | 02  | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |    |
| CNT   | 24  | 23  | 26  | 23  | 24  | 22  | 20  | 27  | 29  | 25  | 22  | 22  | 15  | 18  | 22  | 19  | 25  | 23  | 24  | 28  | 26  | 27  | 27  | 27  |    |
| MED   | 96  | 92  | 92  | 90  | 90  | 90  | 96  | 108 | 102 | 102 | 101 | 100 | 104 | 103 | 112 | 108 | 118 | 114 | 102 | 98  | 98  | 96  | 96  | 96  |    |
| U Q   | 98  | 98  | 96  | 94  | 92  | 96  | 101 | 116 | 117 | 117 | 104 | 108 | 130 | 122 | 126 | 130 | 131 | 118 | 107 | 102 | 100 | 100 | 98  | 100 |    |
| L Q   | 92  | 90  | 90  | 90  | 89  | 88  | 89  | 100 | 98  | 99  | 96  | 96  | 98  | 98  | 100 | 100 | 101 | 100 | 97  | 94  | 94  | 92  | 90  | 92  |    |

SEP. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Yamagawa

SEP. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H  | 00 | 01 | 02 | 03 | 04 | 05   | 06   | 07   | 08   | 09   | 10 | 11 | 12   | 13   | 14   | 15   | 16   | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|-----|----|----|----|----|----|----|------|------|------|------|------|----|----|------|------|------|------|------|----|----|----|----|----|----|----|
| 1   | F2 | F2 | F3 | F2 | F2 | F2 | C1   | L3   | L4   | L4   | L3   | L2 |    | L2   | L2   | L1   | C1   |      | L4 | F3 | F4 | F6 | F8 | F2 |    |
| 2   | F6 | F6 | F2 | F2 | F2 |    |      |      | C1   | L2   | L1   | L3 | L3 | L2   | L2   | C1   | C1   | L4   | L9 | F5 | F2 | F6 | F2 | F1 |    |
| 3   | F2 | F1 | F2 | F2 | F4 | F5 | F4   | C3   | CL22 | HL12 |      | C1 |    | C2   | C1   | C1   |      | L2   | L3 | F2 |    | F2 | F2 |    |    |
| 4   |    |    |    |    | F1 | F2 | C3   | L2   | CL12 |      |      |    |    | C1   |      |      | C2   |      | C1 | F2 | F1 | F3 | F3 | F2 |    |
| 5   | F2 |    | F4 | F1 |    | F2 | L1   | L3   | L2   | L2   | L2   | L1 | C1 | LC21 | C2   | C1   | C1   | L3   | L7 | F9 | F9 | F6 | F8 | F4 |    |
| 6   | F6 | F6 | F5 | F3 | F3 | F8 | L9   | L7   | L5   | L3   | L1   | L1 | H1 | H1   | H1   | H1   | C1   | C2   | L2 | L1 | F1 | F5 | F6 | F8 |    |
| 7   | F8 |    |    | F6 | F5 | F3 | L2   | L4   | L2   |      |      |    | H1 | H1   | C1   | C1   | C1   | C2   | C4 | F8 | F3 | F6 |    | F2 |    |
| 8   | F2 | F4 | F2 | F2 | F2 |    |      | C2   | L3   | C1   | L1   |    |    |      | L1   | L5   | L1   | L4   | L2 | F1 |    | F1 | F1 |    |    |
| 9   |    |    | F1 | F3 | F2 |    |      | C2   | C2   | C1   |      |    |    | L2   | CL12 |      | L2   | L4   | L7 | F6 | F3 | F2 | F3 | F2 |    |
| 10  | F2 | F2 | F6 | F6 | F8 | F7 | F1   | C3   | C2   |      | C2   | C1 | L1 | L2   | HL12 | HL22 | HL22 | CL22 | C3 | F7 | F3 | F4 | F5 | F2 |    |
| 11  | F2 | F1 | F2 |    | F2 | F6 | L8   | L4   | L4   | C2   | CL53 | L5 | C2 | L2   | L2   | C2   | C2   | C2   | L4 | F3 | F2 |    | F3 | F6 |    |
| 12  | F4 |    | F1 |    | F5 | F3 |      | C2   | C2   | C1   | C2   | C2 | C2 | H2   |      |      | H2   | C2   | L4 | F3 | F7 | F6 | F7 | F5 |    |
| 13  | F5 | F7 | F8 | F9 | F9 | F2 |      | C3   | L3   | L2   | L3   | L2 | L2 | L2   | L3   | L2   | H2   | C6   | L8 | F8 | F4 | F3 | F2 | F2 |    |
| 14  | F7 | F5 | F8 | F7 | F6 | F5 | F4   | L2   | L2   | L2   | L1   |    |    |      |      |      | H1   | H2   |    | F3 | F2 | F4 | F5 | F5 |    |
| 15  | F5 | F5 | F2 | F3 | F2 | F2 | F2   | L3   | L3   | L3   | L3   | L2 |    |      | H1   | H1   | C1   | CL13 | L4 | F4 | F5 | F2 | F2 | F2 |    |
| 16  | F1 |    | F1 | F1 |    | C1 | C2   | L3   | L3   | L2   | L2   | L3 | L2 | CL12 | HL12 | H1   | H1   | L1   | L1 | F5 | F3 | F2 | F2 | F2 |    |
| 17  |    | F2 | F2 | F2 | F3 | F6 | L1   | L3   | L3   | L4   | L4   | L2 |    |      |      | L4   | L3   |      |    | F1 | F1 | F1 | F1 |    |    |
| 18  |    |    |    |    | F1 |    | CL22 | L4   | C2   | L2   |      |    |    |      | C1   |      |      |      |    | F2 | F3 |    | F1 | F1 |    |
| 19  | F4 | F1 | F1 | F1 | F2 | F2 |      | C2   | L2   | L3   | L2   | L2 | L2 | L3   | L2   |      | L2   | L3   | L3 | F6 | F6 | F6 | F6 | F5 |    |
| 20  | F1 | F2 | F1 |    | F3 | F6 | F3   |      | CL21 | L1   | L1   |    |    |      | H1   | L2   |      | C4   | L7 | F7 | F5 | F2 | F2 | F3 |    |
| 21  | F2 | F2 | F2 | F3 |    |    |      | L2   | L2   |      | L1   | L1 | L2 | L2   | L2   | CL12 | LL32 | L4   | L4 | F2 | F1 | F8 | F6 | F5 |    |
| 22  | F1 | F1 | F1 | F2 | F2 | F2 | L3   | L4   | CL21 | CL11 | CL21 | C1 |    | C1   | C1   |      |      | C1   | L3 | F8 | F2 | F2 | F3 | F1 |    |
| 23  | F4 | F3 | F3 | F1 | F1 | F3 | F1   | HL22 | C2   | L2   |      |    | H1 |      |      |      | HL12 | L2   | L2 | F1 | F1 | F2 | F3 | F7 |    |
| 24  | F6 | F3 | F5 | F5 | F5 | F2 | L2   | L3   | CL23 |      |      | L2 |    |      |      |      | C1   |      |    |    |    |    |    | L2 |    |
| 25  | F2 | F4 | F6 | F3 | F1 | F1 | L1   |      | L2   | L2   |      |    |    |      |      | L2   | L2   | L2   |    |    | F2 | F1 | F5 | F2 |    |
| 26  |    | F2 |    |    |    | F2 | L4   | L4   | L3   | L2   | L1   | L1 |    |      |      |      |      | C1   | L3 | F3 | F3 | F2 | F2 | F6 |    |
| 27  | F3 | F1 | F1 |    |    |    |      | C2   | C2   | C1   |      | C1 | C1 |      | C1   | L1   | L2   |      |    | F1 | F2 | F6 | F6 | F4 |    |
| 28  | F8 | F6 | F6 | F6 | F3 | F2 | F1   | L2   | L2   | L2   | L2   | L2 | L2 | L2   | H1   |      | C1   | C3   | L2 | F1 | F3 | F4 | F1 | F3 |    |
| 29  | F3 | F1 | F2 | F3 | F3 |    |      | C3   | L7   | L3   | L2   | L2 | L2 | L2   | L2   | L2   | L2   | L3   | L3 | F1 | F1 | F1 | F2 | F5 |    |
| 30  |    | F2 | F2 | F3 | F2 |    | C1   | C3   | C3   | L1   | L1   | L1 |    |      | L2   | H1   | H2   | L4   | L4 | F2 |    | F1 |    | F1 |    |
| 31  |    |    |    |    |    |    |      |      |      |      |      |    |    |      |      |      |      |      |    |    |    |    |    |    |    |
|     |    | 00 | 01 | 02 | 03 | 04 | 05   | 06   | 07   | 08   | 09   | 10 | 11 | 12   | 13   | 14   | 15   | 16   | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT |    |    |    |    |    |    |      |      |      |      |      |    |    |      |      |      |      |      |    |    |    |    |    |    |    |
| MED |    |    |    |    |    |    |      |      |      |      |      |    |    |      |      |      |      |      |    |    |    |    |    |    |    |
| U Q |    |    |    |    |    |    |      |      |      |      |      |    |    |      |      |      |      |      |    |    |    |    |    |    |    |
| L Q |    |    |    |    |    |    |      |      |      |      |      |    |    |      |      |      |      |      |    |    |    |    |    |    |    |

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 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>34 | X<br>34 | X<br>32 | X<br>31 | X<br>31 | X<br>33 |         |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>73 | X<br>40 | A       | X<br>33 |         |         |
| 2      | X<br>32 | X<br>30 | X<br>34 | X<br>36 | X<br>34 | X<br>28 | X<br>32 |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>67 | X<br>63 | X<br>50 | X<br>44 |         |
| 3      | X<br>47 | X<br>38 | X<br>47 | X<br>47 | X<br>38 | X<br>28 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>74 | X<br>59 | X<br>45 | X<br>45 |         |
| 4      | X<br>44 | X<br>42 | X<br>39 | X<br>39 | X<br>32 | X<br>24 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>73 | X<br>42 | X<br>33 | X<br>34 |         |
| 5      | X<br>34 | X<br>34 | X<br>34 | X<br>32 | X<br>30 | X<br>32 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>54 | X<br>39 | X<br>36 | A       |         |
| 6      | X<br>37 | X<br>36 | X<br>33 | X<br>32 | X<br>34 | X<br>34 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>74 | X<br>44 | X<br>35 | X<br>35 |         |
| 7      | X<br>34 | X<br>34 | X<br>31 | X<br>30 | X<br>28 | X<br>28 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>49 | X<br>40 | X<br>39 | X<br>39 |         |
| 8      | X<br>39 | X<br>38 | X<br>35 | X<br>34 | X<br>34 | X<br>29 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>42 | X<br>31 | X<br>30 | X<br>32 |         |
| 9      | X<br>36 | X<br>34 | X<br>33 | X<br>32 | X<br>30 | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>45 | X<br>30 | X<br>30 | X<br>33 |         |
| 10     | X<br>32 | A       | X<br>32 | X<br>31 | A       | X<br>27 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>78 | X<br>48 | X<br>38 | X<br>36 |         |
| 11     | X<br>34 | A       | X<br>33 | X<br>33 | X<br>30 | X<br>29 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | A       | X<br>53 | X<br>50 | X<br>48 |         |
| 12     | X<br>49 | X<br>43 | X<br>38 | X<br>36 | X<br>33 | X<br>32 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>62 | X<br>44 | X<br>43 | A       |         |
| 13     | X<br>47 | X<br>39 | X<br>36 | X<br>34 | X<br>32 | X<br>32 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>63 | X<br>48 | X<br>48 | X<br>58 |         |
| 14     | X<br>48 | X<br>45 | X<br>38 | X<br>32 | X<br>32 | X<br>34 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>67 | X<br>33 | X<br>33 | X<br>34 |         |
| 15     | X<br>34 | X<br>34 | X<br>33 | X<br>33 | X<br>31 | X<br>30 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>75 | X<br>29 | X<br>29 | X<br>32 |         |
| 16     | X<br>34 | X<br>36 | X<br>33 | X<br>33 | X<br>24 | X<br>27 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>74 | X<br>40 | X<br>33 | X<br>36 |         |
| 17     | X<br>36 | X<br>36 | X<br>36 | X<br>40 | A       | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>75 | X<br>43 | X<br>34 | X<br>35 |         |
| 18     | X<br>35 | X<br>36 | X<br>36 | X<br>36 | X<br>33 | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>90 | X<br>34 | X<br>31 | X<br>34 |         |
| 19     | X<br>34 | X<br>35 | X<br>34 | X<br>34 | X<br>32 | X<br>30 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>65 | X<br>44 | A       | X<br>38 |         |
| 20     | X<br>47 | X<br>45 | X<br>44 | X<br>46 | X<br>39 | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>74 | A       | X<br>29 | X<br>32 |         |
| 21     | X<br>38 | X<br>34 | X<br>34 | X<br>28 | X<br>21 | X       |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>52 | X<br>32 | X<br>31 | X<br>39 |         |
| 22     | X<br>40 | X<br>33 | X<br>34 | X<br>33 | X<br>29 | X<br>30 |         |    |    |    |    |    |    |    |    |    |    |    |    |    | X<br>58 | X<br>58 | X<br>54 | X<br>45 | X<br>37 |         |
| 23     | X<br>37 | X<br>37 | X<br>38 | X<br>44 | X<br>28 | X<br>30 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>65 | X<br>47 | X<br>34 | X<br>37 | X<br>36 |
| 24     | X<br>38 | X<br>39 | X<br>37 | X<br>33 | X<br>25 | A       |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>67 | X<br>52 | X<br>48 | X<br>38 | X<br>36 |
| 25     | X<br>33 | X<br>32 | X<br>33 | X<br>33 | X<br>26 | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>60 | X<br>42 | X<br>30 | X<br>32 | X<br>34 |
| 26     | X<br>35 | X<br>36 | X<br>34 | X<br>32 | X<br>33 | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>92 | X<br>48 | X<br>32 | X<br>28 | X<br>30 |
| 27     | X<br>33 | X<br>34 | X<br>33 | X<br>35 | X<br>32 | X<br>21 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>87 | X<br>56 | X<br>39 | X<br>38 | X<br>37 |
| 28     | X<br>36 | X<br>36 | X<br>33 | X<br>34 | X<br>28 | X<br>28 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>66 | X<br>38 | A       | A       | X<br>36 |
| 29     | X<br>37 | X<br>38 | X<br>37 | X<br>36 | X<br>31 | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>62 | X<br>43 | X<br>38 | X<br>38 | X<br>38 |
| 30     | X<br>36 | X<br>38 | X<br>38 | X<br>32 | X<br>31 | X<br>24 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>59 | X<br>60 | X<br>41 | X<br>44 | X<br>47 |
| 31     |         |         |         |         |         |         |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         |         |         |         |         |         |
|        | 00      | 01      | 02      | 03      | 04      | 05      | 06      | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20      | 21      | 22      | 23      |         |         |
| CNT    | 30      | 28      | 30      | 30      | 28      | 29      | 1       |    |    |    |    |    |    |    |    |    |    |    |    |    | 9       | 29      | 28      | 27      | 28      |         |
| MED    | X<br>36 | X<br>36 | X<br>34 | X<br>34 | X<br>31 | X<br>28 | X<br>32 |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>65 | X<br>62 | X<br>40 | X<br>36 | X<br>36 |
| U Q    | X<br>39 | X<br>38 | X<br>37 | X<br>36 | X<br>33 | X<br>30 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>77 | X<br>74 | X<br>46 | X<br>43 | X<br>38 |
| L Q    | X<br>34 | X<br>34 | X<br>33 | X<br>32 | X<br>28 | X<br>26 |         |    |    |    |    |    |    |    |    |    |    |    |    |    |         | X<br>60 | X<br>48 | X<br>34 | X<br>31 | X<br>34 |

SEP. 2018 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00   | 01   | 02   | 03   | 04   | 05     | 06 | 07 | 08 | 09 | 10 | 11     | 12       | 13   | 14  | 15  | 16  | 17  | 18  | 19  | 20   | 21   | 22   | 23   |
|-------|------|------|------|------|------|--------|----|----|----|----|----|--------|----------|------|-----|-----|-----|-----|-----|-----|------|------|------|------|
| 1     | 28   | 28   | F 25 | F 22 | F 22 | 23     | 31 | 45 | 52 | 51 | 48 | 50     | 57       | 68   | 60  | 55  | 57  | 64  | 68  | 79  | 67   | 34   | A    | 27   |
| 2     | 26   | 24   | F 25 | F 26 | F 25 | 22     | 26 | 39 | 52 | 56 | 62 | 58     | 66       | 63   | 60  | 51  | 51  | 59  | 74  | 84  | 61   | 57   | 44   | 38   |
| 3     | F 35 | 32   | F 32 | F 36 | F 30 | 22     | 26 | 42 | 58 | 55 | 52 | E G 48 | 52       | 55   | 62  | 60  | 50  | 50  | 59  | 66  | 68   | 53   | 39   | 39   |
| 4     | 38   | 36   | 33   | 33   | 26   | 18     | 28 | 48 | 54 | 49 | 50 | 60     | 72       | 74   | 67  | 64  | 66  | 71  | 83  | 88  | 67   | 36   | 27   | 28   |
| 5     | 29   | 28   | 28   | 26   | 24   | F 22   | 28 | 50 | 48 | 51 | 52 | 53     | 60       | 72   | 68  | 73  | 71  | 78  | 73  | 66  | 48   | 33   | 30   | A    |
| 6     | 31   | 30   | 27   | 26   | 28   | 28     | A  | 63 | 51 | 48 | 56 | 51     | 56       | 61   | 64  | 67  | 76  | 85  | 71  | 78  | 68   | 38   | 29   | 29   |
| 7     | 28   | 28   | 25   | 24   | 22   | 22     | 24 | 50 | 65 | 49 | 54 | 51     | 52       | 57   | 66  | 64  | 64  | 62  | 73  | 70  | 43   | 34   | 33   | 33   |
| 8     | 33   | 32   | 29   | 28   | 28   | 23     | 30 | 50 | 55 | 57 | 51 | 50     | 59       | 63   | 63  | 60  | 70  | 90  | 113 | 85  | 36   | 25   | 24   | 26   |
| 9     | F 27 | F 26 | 27   | 26   | 24   | 20     | 25 | 54 | 60 | 51 | 49 | 48     | 56       | 53   | 54  | 59  | 60  | 79  | 86  | 74  | 39   | 24   | 24   | 27   |
| 10    | 26   | A    | 26   | 25   | A    | 21     | 26 | 45 | 50 | 57 | 53 | 52     | 60       | 73   | 76  | 74  | 74  | 78  | 84  | 90  | 72   | 42   | 32   | 30   |
| 11    | 28   | A    | 27   | 27   | 24   | 24     | 30 | 45 | 45 | 51 | A  | 58     | 68       | 64   | 64  | 72  | 68  | 79  | 67  | 68  | A    | 47   | 44   | 42   |
| 12    | 43   | 37   | 32   | 30   | 27   | 26     | 32 | 65 | 78 | 58 | 54 | 54     | 60       | 59   | 54  | 58  | 70  | 81  | 83  | 84  | 56   | 38   | R 37 | A    |
| 13    | F 34 | F 33 | 30   | 28   | 26   | 26     | 26 | 54 | 62 | 58 | 54 | 55     | 52       | 63   | 64  | 65  | 78  | 85  | 93  | 103 | 57   | R 42 | F 38 | F 39 |
| 14    | F 38 | F 35 | 32   | 26   | 26   | 28     | 33 | 51 | 55 | 61 | 50 | 55     | 57       | 59   | 54  | 54  | 64  | 68  | 76  | 90  | 61   | 27   | 27   | 28   |
| 15    | 28   | 28   | 27   | 27   | 25   | 24     | 30 | 48 | 70 | 59 | 49 | E G 45 | 55       | 65   | 70  | 75  | 80  | 88  | 95  | 91  | 69   | 23   | 23   | 26   |
| 16    | 28   | 30   | 27   | 27   | 18   | 21     | 26 | 47 | 59 | 61 | 56 | 56     | 60       | 68   | 61  | 66  | 60  | 67  | 83  | 85  | 68   | 34   | 27   | 30   |
| 17    | 30   | 30   | 30   | 34   | A    | 20     | 24 | 52 | 50 | 62 | 61 | 68     | H 70     | H 64 | 59  | 62  | 70  | 60  | 67  | 75  | 69   | 37   | 28   | 29   |
| 18    | 29   | 30   | 30   | 30   | 27   | 20     | 24 | 54 | 52 | 61 | 58 | 53     | 55       | 60   | 62  | 67  | 65  | 68  | 80  | 87  | 84   | 28   | 25   | 28   |
| 19    | 28   | 29   | 28   | 28   | 26   | 24     | 29 | 49 | 48 | 89 | 54 | 55     | 63       | 70   | 67  | 70  | 80  | 92  | 86  | 69  | 59   | 38   | A    | 32   |
| 20    | F 31 | F 31 | F 32 | 38   | 33   | 20     | 26 | 49 | 51 | 52 | 53 | 56     | 56       | 58   | 57  | 53  | 57  | A   | 85  | 83  | 68   | A    | 23   | 26   |
| 21    | F 28 | 28   | 28   | 28   | 22   | J B 15 | 24 | 48 | 62 | 58 | 60 | 52     | 58       | 59   | 50  | 48  | 58  | 79  | 81  | 54  | 46   | 26   | 25   | F 28 |
| 22    | F 26 | 27   | 28   | 27   | 23   | 24     | 27 | 41 | 45 | 50 | 50 | 54     | 53       | 68   | 62  | 55  | 92  | 109 | 68  | 52  | 52   | 48   | 39   | 31   |
| 23    | 32   | 31   | 32   | 38   | 22   | 24     | 22 | 62 | 55 | 52 | A  | A      | 87       | 98   | 84  | 77  | 84  | 88  | 92  | 59  | 41   | 28   | 31   | 30   |
| 24    | 32   | 33   | 31   | 27   | 19   | A      | 24 | 52 | 59 | 61 | 55 | 66     | 73       | 70   | 58  | 52  | 70  | 89  | 86  | 61  | 47   | 42   | 32   | 30   |
| 25    | 27   | 26   | 27   | 27   | 20   | 20     | 24 | 56 | 66 | 72 | 72 | 75     | 73       | 74   | 57  | 52  | 64  | 90  | 93  | 54  | 36   | 24   | 26   | 28   |
| 26    | 29   | 30   | 28   | 26   | 27   | 20     | 27 | 58 | 62 | 69 | 70 | 69     | H J R 77 | 122  | 122 | 106 | 88  | 77  | 87  | 86  | 42   | 26   | 22   | 24   |
| 27    | 27   | 28   | 27   | 29   | 26   | E B 16 | 24 | 51 | 51 | 55 | 56 | 60     | 54       | 66   | 74  | 77  | 74  | 88  | 96  | 81  | 50   | 33   | 32   | 31   |
| 28    | 30   | 30   | 27   | 28   | 22   | 22     | 27 | 53 | 61 | 62 | 60 | 68     | 81       | 105  | 112 | 110 | 91  | 82  | 77  | 60  | 32   | A    | A    | 30   |
| 29    | 31   | 32   | 31   | 30   | 25   | 20     | 24 | 53 | 54 | 52 | 61 | 64     | 78       | 84   | 79  | 83  | 90  | 92  | 89  | 56  | 37   | 32   | 32   | 32   |
| 30    | 30   | 32   | 32   | 26   | 25   | 18     | 25 | 50 | 54 | 54 | 60 | 70     | J R 87   | 122  | 117 | 107 | 104 | 100 | 58  | 53  | R 54 | 35   | 38   | 41   |
| 31    |      |      |      |      |      |        |    |    |    |    |    |        |          |      |     |     |     |     |     |     |      |      |      |      |
| 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   |
| CNT   | 30   | 28   | 30   | 30   | 28   | 29     | 29 | 30 | 30 | 30 | 28 | 29     | 30       | 30   | 30  | 30  | 30  | 29  | 30  | 30  | 29   | 28   | 27   | 28   |
| MED   | 29   | 30   | 28   | 27   | 25   | 22     | 26 | 50 | 54 | 56 | 54 | 55     | 60       | 66   | 64  | 64  | 70  | 79  | 83  | 76  | 56   | 34   | 30   | 30   |
| U Q   | 32   | 32   | 31   | 30   | 26   | 24     | 28 | 54 | 61 | 61 | 60 | 62     | 72       | 73   | 70  | 74  | 80  | 88  | 87  | 85  | 68   | 40   | 37   | 32   |
| L Q   | 28   | 28   | 27   | 26   | 22   | 20     | 24 | 48 | 51 | 51 | 52 | 52     | 56       | 60   | 59  | 55  | 64  | 68  | 73  | 61  | 42   | 28   | 25   | 28   |

SEP. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 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   | U   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 2      |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     |    | A  |    |    |    |    |
| 3      |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     | L  |    |    |    |    |    |
| 4      |    |    |    |    |    |    |    | L   | L   | U   | L   | U   | L   |     |     |     |     |     | A  |    | A  |    |    |    |
| 5      |    |    |    |    |    |    |    |     | U   | L   | U   | L   |     |     |     |     |     |     | L  |    | L  |    |    |    |
| 6      |    |    |    |    |    |    | A  | A   | A   | U   | L   | U   | L   |     |     |     |     |     | L  |    |    |    |    |    |
| 7      |    |    |    |    |    |    |    | L   | L   | U   | L   | U   | L   |     |     |     |     |     | A  |    |    |    |    |    |
| 8      |    |    |    |    |    |    |    |     | L   | A   | U   | L   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 9      |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     | A  |    |    |    |    |    |
| 10     |    |    |    |    |    |    |    |     | L   | A   |     |     |     |     |     |     |     |     | L  |    |    |    |    |    |
| 11     |    |    |    |    |    |    |    |     |     | A   |     |     |     |     |     |     |     |     | L  |    |    |    |    |    |
| 12     |    |    |    |    |    |    |    | L   |     | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 13     |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 14     |    |    |    |    |    |    |    |     | U   | L   | A   | U   | L   | U   | L   |     |     |     | L  |    | L  |    |    |    |
| 15     |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 16     |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 17     |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 18     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 19     |    |    |    |    |    |    |    |     | U   | L   | U   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 20     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 21     |    |    |    |    |    |    |    |     | L   | U   | L   | U   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 22     |    |    |    |    |    |    |    | A   | L   | U   | L   | L   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 23     |    |    |    |    |    |    |    |     | L   | L   | A   | A   | A   |     |     |     |     |     |    |    |    |    |    |    |
| 24     |    |    |    |    |    |    |    |     | L   | U   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 25     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 26     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 27     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 28     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 29     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 30     |    |    |    |    |    |    |    |     | L   | L   | L   | L   |     |     |     |     |     |     |    |    |    |    |    |    |
| 31     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 1   | 7   | 18  | 27  | 28  | 27  | 28  | 27  | 26  | 26  | 18  |    |    |    |    |    |    |
| MED    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  | L  | L  | L  |
| U Q    |    |    |    |    |    |    |    | 296 | 380 | 412 | 428 | 438 | 436 | 436 | 432 | 422 | 400 | 370 |    |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  | L  | L  | L  |

SEP. 2018 f<sub>o</sub>F<sub>1</sub> (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 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      |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | A   | A   | 332 | 320 | 288 | 252 | A   | A   |    |    |    |    |
| 2      |    |    |    |    |    |    |    | 192 | A   | 272 | A   | U   | A   | U   | A   | A   | 296 | A   | A   | A   |    |    |    |    |
| 3      |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | A   | 340 | 332 | 312 | 288 | 248 | A   | B   |    |    |    |    |
| 4      |    |    |    |    |    |    | B  | 212 | 256 | A   | 308 | 332 | 348 | 336 | 336 | 312 | 288 | 240 | A   | A   |    |    |    |    |
| 5      |    |    |    |    |    |    | B  | 216 | A   | 292 | A   | A   | A   | A   | A   | 308 | 280 | 240 | A   | B   |    |    |    |    |
| 6      |    |    |    |    |    |    | A  | A   | A   | A   | A   | A   | 340 | 332 | 328 | 312 | 292 | 240 | A   | A   |    |    |    |    |
| 7      |    |    |    |    |    |    | B  | 208 | 260 | 288 | 320 | 332 | 332 | A   | 328 | 304 | 288 | 244 | A   | A   |    |    |    |    |
| 8      |    |    |    |    |    |    | B  | A   | A   | A   | A   | 336 | 348 | A   | A   | A   | 288 | 256 | A   | B   |    |    |    |    |
| 9      |    |    |    |    |    |    | B  | 204 | 260 | 300 | 328 | 332 | 340 | 336 | 328 | 308 | 284 | 260 | U   | A   | A  | A  |    |    |
| 10     |    |    |    |    |    |    | B  | A   | 264 | 296 | A   | 336 | 340 | 344 | 332 | 320 | 296 | A   | A   | A   |    |    |    |    |
| 11     |    |    |    |    |    |    | B  | A   | 256 | 304 | 316 | A   | A   | 336 | 332 | 312 | 288 | 244 | 164 | A   |    |    |    |    |
| 12     |    |    |    |    |    |    | B  | 204 | A   | 284 | A   | 328 | 332 | 336 | 324 | 308 | 280 | 240 | A   | A   |    |    |    |    |
| 13     |    |    |    |    |    |    | B  | 196 | A   | 288 | 300 | 324 | 328 | 324 | U   | A   | A   | A   | A   | A   |    |    |    |    |
| 14     |    |    |    |    |    |    | B  | A   | A   | A   | A   | 316 | A   | A   | 328 | 308 | 276 | 232 | A   | A   |    |    |    |    |
| 15     |    |    |    |    |    |    | B  | 204 | 264 | 280 | A   | 332 | A   | 332 | 324 | 304 | 280 | A   | A   | A   |    |    |    |    |
| 16     |    |    |    |    |    |    | B  | 196 | 252 | A   | A   | A   | 336 | A   | 316 | A   | 276 | 240 | A   | A   |    |    |    |    |
| 17     |    |    |    |    |    |    | B  | 208 | 264 | 288 | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   |    |    |    |    |
| 18     |    |    |    |    |    |    | B  | 212 | 248 | A   | A   | A   | 344 | 332 | 320 | 308 | 280 | 232 | A   | B   |    |    |    |    |
| 19     |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | 336 | A   | A   | A   | 276 | 236 | A   | A   |    |    |    |    |
| 20     |    |    |    |    |    |    | B  | 208 | A   | 292 | 312 | A   | 332 | 320 | 320 | 316 | 276 | 248 | U   | A   | A  | A  |    |    |
| 21     |    |    |    |    |    |    | B  | A   | U   | A   | U   | A   | A   | A   | A   | A   | A   | A   | A   | B   |    |    |    |    |
| 22     |    |    |    |    |    |    | B  | 200 | A   | U   | A   | 332 | 332 | 332 | U   | A   | A   | A   | A   | A   |    |    |    |    |
| 23     |    |    |    |    |    |    | B  | 216 | U   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   | A   |    |    |    |    |
| 24     |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | 316 | 328 | 336 | 324 | 312 | 304 | 272 | 216 | A  |    |    |    |
| 25     |    |    |    |    |    |    | B  | A   | A   | A   | A   | A   | 344 | 336 | A   | 312 | 288 | A   | A   | A   |    |    |    |    |
| 26     |    |    |    |    |    |    | B  | A   | A   | A   | 320 | A   | 336 | 324 | 320 | 300 | A   | 224 | A   | A   |    |    |    |    |
| 27     |    |    |    |    |    |    | B  | 192 | 248 | 296 | A   | A   | 324 | 320 | 312 | 292 | A   | A   | A   | A   |    |    |    |    |
| 28     |    |    |    |    |    |    | B  | A   | A   | A   | U   | A   | A   | A   | U   | A   | A   | A   | A   | A   |    |    |    |    |
| 29     |    |    |    |    |    |    | B  | 220 | U   | A   | U   | A   | A   | A   | A   | A   | A   | A   | A   | A   |    |    |    |    |
| 30     |    |    |    |    |    |    | B  | A   | A   | 296 | 316 | 324 | 328 | 328 | 300 | 268 | 212 | A   |     |     |    |    |    |    |
| 31     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |    | 16  | 14  | 16  | 13  | 13  | 19  | 18  | 22  | 19  | 21  | 21  | 1   |     |    |    |    |    |
| MED    |    |    |    |    |    |    |    | 206 | 256 | 290 | 316 | 332 | 336 | 332 | 324 | 308 | 284 | 240 | 164 |     |    |    |    |    |
| U Q    |    |    |    |    |    |    |    | 212 | 260 | 296 | 320 | 332 | 340 | 336 | 328 | 312 | 288 | 246 |     |     |    |    |    |    |
| L Q    |    |    |    |    |    |    |    | 198 | 248 | 284 | 306 | 324 | 332 | 324 | 316 | 304 | 276 | 232 |     |     |    |    |    |    |

SEP. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D   | H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17  | 18 | 19 | 20 | 21  | 22 | 23 |    |
|-----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|----|----|-----|----|----|----|
| 1   | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 26 | 32 | 36 | 35 | 37 | 35 | 36 | 38 | 35 | 29 | 29  | 30 | 29 | 16 | 16  | 65 | 23 |    |
| 2   | E | 18 | 16 | 17 | 16 | 16 | 16 | 16 | 22 | 32 | 33 | 38 | 41 | 38 | 38 | 37 | 36 | 31 | 29  | 38 | 28 | 20 | 20  | 18 | 16 |    |
| 3   | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 28 | 33 | 32 | 36 | 40 | 38 | 39 | 36 | 35 | 32 | 28  | 20 | 16 | 16 | 16  | 16 | 16 |    |
| 4   | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 24 | 29 | 31 | 36 | 42 | 39 | 39 | 38 | 37 | 35 | 38  | 40 | 24 | 16 | 16  | 16 | 16 |    |
| 5   | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 23 | 30 | G  | 33 | 38 | 38 | 38 | 40 | 44 | 38 | 27  | 20 | 16 | 16 | 16  | 16 | 53 |    |
| 6   | E | 20 | 16 | 16 | 16 | 16 | 18 | 60 | 52 | 40 | 36 | 35 | 36 | G  | 36 | G  | 23 | 32 | 35  | 35 | 28 | 20 | 16  | 20 | 16 |    |
| 7   | E | 18 | 16 | 16 | 16 | 16 | 16 | 16 | G  | 28 | 26 | 39 | 38 | 39 | 40 | 38 | 38 | 33 | 32  | 26 | 28 | 26 | 16  | 16 | 16 |    |
| 8   | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 23 | 29 | 46 | 39 | 26 | G  | 29 | 36 | 39 | 39 | 32  | 39 | 52 | 16 | 21  | 16 | 16 |    |
| 9   | E | 16 | 16 | 16 | 16 | 19 | 17 | 16 | 24 | 29 | G  | G  | 27 | 36 | 35 | 36 | G  | 32 | 39  | 32 | 39 | 30 | 16  | 16 | 16 |    |
| 10  | E | 18 | 49 | 20 | 16 | 28 | 16 | 16 | 29 | 33 | 42 | 40 | 41 | 40 | 37 | 35 | 46 | 26 | 33  | 24 | 22 | 16 | 16  | 16 | 16 |    |
| 11  | E | 16 | 46 | 16 | 16 | 16 | 16 | 16 | 29 | 40 | 46 | 69 | 37 | 43 | 44 | 46 | 42 | 33 | 30  | 52 | 56 | 53 | 16  | 16 | 16 |    |
| 12  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 23 | 32 | 34 | 34 | 38 | 39 | 36 | 35 | 36 | 33 | 29  | 28 | 19 | 16 | 16  | 22 | 52 |    |
| 13  | E | 16 | 22 | 18 | 19 | 16 | 16 | 16 | 25 | 29 | 38 | 36 | 38 | 37 | 38 | 39 | 37 | 35 | 35  | 61 | 56 | 48 | 21  | 16 | 16 |    |
| 14  | E | 18 | 16 | 16 | 19 | 16 | 16 | 16 | 25 | 35 | 51 | 35 | G  | 36 | 35 | 39 | 34 | 31 | 26  | 21 | 18 | 16 | 16  | 20 | 16 |    |
| 15  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 25 | 33 | 33 | 37 | G  | 36 | 35 | G  | G  | G  | 25  | 36 | 18 | 16 | 16  | 16 | 16 |    |
| 16  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 24 | 28 | 37 | 33 | 35 | 40 | 37 | 36 | 34 | 18 | 30  | 27 | 24 | 31 | 16  | 24 | 16 |    |
| 17  | E | 16 | 16 | 16 | 16 | 16 | 26 | 16 | 23 | G  | 27 | 36 | 49 | 47 | 42 | 34 | 31 | 29 | 25  | 20 | 18 | 16 | 16  | 16 | 16 |    |
| 18  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 25 | 29 | 32 | 41 | 38 | 38 | 37 | 35 | G  | 30 | 25  | 19 | 16 | 16 | 16  | 16 | 16 |    |
| 19  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 22 | 31 | 32 | 40 | 34 | 31 | 34 | 43 | 32 | 58 | 53  | 45 | 48 | 22 | 22  | 64 | 16 |    |
| 20  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 32 | 32 | 35 | 37 | 36 | 36 | 35 | 34 | 45 | 160 | 30 | 36 | 35 | 109 | 16 | 16 |    |
| 21  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 25 | 29 | 32 | 33 | 34 | 34 | 40 | 35 | 33 | 32 | 28  | 17 | 16 | 16 | 16  | 16 | 16 |    |
| 22  | E | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 31 | 34 | 37 | 41 | 37 | 38 | 34 | 32 | 28 | 26  | 21 | 18 | 29 | 31  | 28 | 16 |    |
| 23  | E | 16 | 16 | 26 | 23 | 19 | 16 | 16 | G  | 31 | 44 | 63 | 68 | 50 | 58 | 59 | 65 | 50 | 45  | 47 | 42 | 26 | 22  | 16 | 16 |    |
| 24  | E | 16 | 19 | 18 | 16 | 16 | 43 | 16 | 22 | 34 | 32 | 25 | G  | G  | 35 | 34 | 36 | 44 | 40  | 29 | 18 | 16 | 16  | 16 | 16 |    |
| 25  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 24 | 31 | 32 | 33 | 35 | G  | 35 | 34 | 24 | 25 | 25  | 17 | 16 | 16 | 16  | 16 | 16 |    |
| 26  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 25 | 32 | 34 | 35 | 36 | G  | G  | 25 | 33 | 28 | 34  | 36 | 28 | 20 | 16  | 16 | 16 |    |
| 27  | E | 21 | 20 | 18 | 16 | 16 | 16 | 16 | 22 | 27 | 33 | 34 | 36 | 36 | 36 | 34 | 33 | 30 | 26  | 18 | 22 | 18 | 16  | 16 | 16 |    |
| 28  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 24 | 32 | 35 | 36 | 40 | 38 | 36 | 35 | 32 | 29 | 26  | 23 | 25 | 28 | 50  | 38 | 19 |    |
| 29  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | G  | 36 | 48 | 42 | 39 | 39 | 36 | 35 | 35 | 33 | 44  | 52 | 28 | 16 | 16  | 16 | 16 |    |
| 30  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 23 | 30 | 36 | 35 | 34 | G  | 35 | 36 | 33 | 29 | 30  | 26 | 16 | 16 | 16  | 16 | 16 |    |
| 31  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |    |    |    |     |    |    |    |
|     |   | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17  | 18 | 19 | 20 | 21  | 22 | 23 |    |
| CNT |   | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30  | 30 | 30 | 30 | 30  | 30 | 30 | 30 |
| MED | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 24 | 31 | 34 | 36 | 37 | 37 | 36 | 36 | 34 | 32 | 30  | 28 | 23 | 17 | 16  | 16 | 16 |    |
| UQ  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 25 | 33 | 37 | 39 | 40 | 39 | 38 | 38 | 37 | 33 | 38  | 38 | 28 | 26 | 16  | 20 | 16 |    |
| LQ  | E | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 22 | 29 | 32 | 34 | 34 | 34 | 35 | 34 | 32 | 29 | 26  | 21 | 18 | 16 | 16  | 16 | 16 |    |

SEP. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 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

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

SEP. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00               | 01               | 02               | 03               | 04               | 05               | 06  | 07  | 08               | 09  | 10  | 11  | 12               | 13               | 14               | 15  | 16  | 17  | 18  | 19  | 20  | 21               | 22  | 23  |     |     |     |   |  |
|-------|------------------|------------------|------------------|------------------|------------------|------------------|-----|-----|------------------|-----|-----|-----|------------------|------------------|------------------|-----|-----|-----|-----|-----|-----|------------------|-----|-----|-----|-----|-----|---|--|
| 1     | 322              | 314              | 313 <sup>F</sup> | 300 <sup>F</sup> | 290 <sup>F</sup> | 365              | 359 | 382 | 397              | 379 | 352 | 313 | 311              | 336              | 330              | 317 | 322 | 333 | 321 | 348 | 395 | 390              |     | A   | 276 |     |     |   |  |
| 2     | 336              | 318              | 301 <sup>F</sup> | 300 <sup>F</sup> | 316 <sup>F</sup> | 315              | 366 | 353 | 373              | 368 | 357 | 332 | 360              | 311              | 346              | 308 | 295 | 306 | 320 | 347 | 346 | 324              | 309 | 288 |     |     |     |   |  |
| 3     | 291 <sup>F</sup> | 322              | 329 <sup>F</sup> | 380 <sup>F</sup> | 348 <sup>F</sup> | 311              | 339 | 384 | 375              | 387 | 342 |     | G                | 307              | 313              | 332 | 343 | 328 | 303 | 327 | 330 | 358              | 356 | 320 | 297 |     |     |   |  |
| 4     | 298              | 312              | 324              | 331              | 338              | 350              | 352 | 390 | 388              | 369 | 309 | 324 | 325              | 280              | 303              | 310 | 303 | 298 | 337 | 352 | 384 | 351              | 313 | 305 | A   |     |     |   |  |
| 5     | 310              | 320              | 341              | 349              | 352              | 347 <sup>F</sup> | 353 | 385 | 377              | 354 | 332 | 307 | 304              | 333              | 327              | 332 | 340 | 365 | 356 | 363 | 352 | 327              | 320 |     | A   |     |     |   |  |
| 6     | 301              | 319              | 293              | 299              | 358              | 338              |     | A   | 384              | 390 | 347 | 361 | 326              | 337              | 320              | 310 | 324 | 329 | 363 | 340 | 360 | 387              | 348 | 309 | 336 |     |     |   |  |
| 7     | 289              | 340              | 325              | 327              | 317              | 329              | 331 | 364 | 406              | 370 | 348 | 325 | 333              | 320              | 345              | 347 | 335 | 356 | 361 | 379 | 351 | 337              | 304 | 316 |     |     |     |   |  |
| 8     | 314              | 321              | 315              | 329              | 375              | 335              | 365 | 382 | 380              | 397 | 354 | 296 | 326              | 326              | 329              | 315 | 297 | 336 | 368 | 397 | 401 | 360              | 287 | 310 |     |     |     |   |  |
| 9     | 293 <sup>F</sup> | 302 <sup>F</sup> | 328              | 318              | 331              | 302              | 351 | 401 | 396              | 386 | 334 | 316 | 349              | 320              | 316              | 339 | 315 | 316 | 360 | 392 | 392 | 332              | 313 | 295 |     |     |     |   |  |
| 10    | 309              |                  | A                | 336              | 356              |                  | A   | 337 | 346              | 378 | 388 | 387 | 365              | 312              | 297              | 330 | 326 | 320 | 308 | 324 | 331 | 376              | 393 | 364 | 314 | 301 |     |   |  |
| 11    | 310              |                  | A                | 309              | 310              | 289              | 308 | 332 | 423              | 405 | 332 |     | A                | 299              | 331              | 322 | 299 | 334 | 305 | 342 | 356 | 343              |     | A   | 294 | 316 | 304 |   |  |
| 12    | 341              | 355              | 305              | 320              | 319              | 305              | 336 | 355 | 403              | 396 | 385 | 326 | 342              | 332              | 314              | 307 | 311 | 336 | 347 | 371 | 381 | 345              | 292 |     | R   | A   |     |   |  |
| 13    | 328 <sup>F</sup> | 316 <sup>F</sup> | 314              | 327              | 291              | 310              | 322 | 367 | 392              | 392 | 360 | 339 | 272              | 329              | 302              | 291 | 303 | 319 | 336 | 359 | 397 | 340              | 320 | 309 |     | R   | F   |   |  |
| 14    | 324 <sup>F</sup> | 327 <sup>F</sup> | 362              | 312              | 299              | 322              | 372 | 395 | 376              | 388 | 361 | 307 | 318              | 343              | 319              | 302 | 324 | 340 | 328 | 378 | 400 | 331              | 307 | 319 |     |     | F   |   |  |
| 15    | 330              | 324              | 330              | 328              | 325              | 330              | 356 | 370 | 387              | 406 | 396 |     | G                | 308              | 318              | 305 | 301 | 313 | 319 | 353 | 370 | 410              | 324 | 316 | 306 |     |     |   |  |
| 16    | 295              | 346              | 355              | 390              | 302              | 319              | 335 | 390 | 391              | 386 | 361 | 340 | 332              | 325              | 336              | 343 | 332 | 319 | 341 | 355 | 405 | 361              | 302 | 314 |     |     |     |   |  |
| 17    | 305              | 318              | 324              | 374              |                  | A                | 312 | 336 | 397              | 376 | 374 | 359 | 377              | 318              | H                | H   | 326 | 311 | 321 | 338 | 338 | 357              | 387 | 417 | 302 | 299 |     |   |  |
| 18    | 313              | 323              | 326              | 364              | 401              | 305              | 318 | 406 | 394              | 352 | 358 | 369 | 318              | 327              | 328              | 330 | 332 | 322 | 327 | 362 | 404 | 382              | 299 | 309 |     | A   |     |   |  |
| 19    | 322              | 327              | 331              | 356              | 341              | 347              | 360 | 397 | 337              | 388 | 406 | 321 | 318              | 318              | 322              | 314 | 323 | 350 | 366 | 372 | 363 | 371              |     | 304 |     |     |     |   |  |
| 20    | 364 <sup>F</sup> | 322 <sup>F</sup> | 350 <sup>F</sup> | 343              | 393              | 358              | 340 | 397 | 392              | 388 | 365 | 362 | 324              | 337              | 339              | 322 | 320 |     | A   | 352 | 373 | 400              |     | 309 | 309 |     | F   |   |  |
| 21    | 306 <sup>F</sup> | 320 <sup>F</sup> | 321              | 355              | 381              |                  | B   | 333 | 383              | 399 | 369 | 390 | 299              | 346              | 346              | 326 | 306 | 315 | 348 | 382 | 364 | 379              | 350 | 306 | 301 |     |     | F |  |
| 22    | 299              | 326              | 332              | 356              | 351              | 356              | 385 | 417 | 357              | 371 | 367 | 358 | 287              | 334              | 328              | 261 | 327 | 385 | 378 | 314 | 327 | 345              | 332 | 357 |     |     |     |   |  |
| 23    | 298              | 295              | 307              | 377              | 280              | 301              | 300 | 361 | 403              | 331 |     |     | A                | A                | 323              | 326 | 296 | 295 | 326 | 352 | 371 | 383              | 361 | 331 | 283 | 280 |     |   |  |
| 24    | 287              | 319              | 332              | 358              | 319              |                  | A   | 347 | 390              | 375 | 373 | 331 | 339              | 342              | 353              | 354 | 299 | 326 | 356 | 363 | 348 | 345              | 364 | 342 | 331 |     |     |   |  |
| 25    | 320              | 318              | 343              | 366              | 334              | 352              | 336 | 380 | 385              | 372 | 372 | 344 | 349              | 343              | 362              | 311 | 332 | 344 | 390 | 384 | 383 | 330              | 307 | 311 |     |     |     |   |  |
| 26    | 301              | 323              | 338              | 333              | 355              | 305              | 356 | 389 | 378 <sup>R</sup> | 374 | 368 | 377 | 258 <sup>H</sup> | 315 <sup>J</sup> | 336 <sup>R</sup> | 349 | 328 | 291 | 338 | 392 | 372 | 360              | 322 | 317 |     |     |     |   |  |
| 27    | 313              | 307              | 314              | 339              | 411              |                  | B   | 342 | 405              | 394 | 380 | 353 | 363              | 308              | 313              | 315 | 330 | 314 | 343 | 378 | 384 | 387              | 376 | 324 | 341 |     |     |   |  |
| 28    | 323              | 337              | 314              | 346              | 339              | 345              | 361 | 388 | 384              | 381 | 352 | 348 | 307              | 293              | 318              | 336 | 306 | 331 | 346 | 394 | 396 |                  | A   | A   | 300 |     |     |   |  |
| 29    | 323              | 339              | 326              | 366              | 356              | 357              | 349 | 403 | 391              | 366 | 357 | 323 | 325              | 332              | 301              | 306 | 324 | 352 | 386 | 384 | 346 | 308              | 295 | 302 |     |     |     |   |  |
| 30    | 301              | 326              | 363              | 342              | 359              | 340              | 351 | 389 | 384              | 367 | 327 | 304 | 321              | J                | R                | 331 | 320 | 343 | 375 | 390 | 355 | 406 <sup>R</sup> | 308 | 289 | 304 |     |     |   |  |
| 31    |                  |                  |                  |                  |                  |                  |     |     |                  |     |     |     |                  |                  |                  |     |     |     |     |     |     |                  |     |     |     |     |     |   |  |
| 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  |     |     |     |   |  |
| CNT   | 30               | 28               | 30               | 30               | 28               | 27               | 29  | 30  | 30               | 30  | 28  | 29  | 30               | 30               | 30               | 30  | 30  | 29  | 30  | 30  | 29  | 28               | 27  | 28  |     |     |     |   |  |
| MED   | 310              | 322              | 326              | 342              | 338              | 330              | 347 | 388 | 388              | 374 | 358 | 325 | 322              | 326              | 326              | 316 | 322 | 338 | 352 | 367 | 387 | 346              | 309 | 306 |     |     |     |   |  |
| U Q   | 323              | 326              | 336              | 358              | 357              | 347              | 358 | 397 | 394              | 387 | 366 | 346 | 333              | 333              | 332              | 332 | 328 | 352 | 368 | 383 | 398 | 362              | 320 | 315 |     |     |     |   |  |
| L Q   | 299              | 318              | 314              | 327              | 316              | 310              | 336 | 380 | 377              | 368 | 350 | 307 | 308              | 318              | 314              | 306 | 311 | 319 | 337 | 355 | 360 | 330              | 302 | 300 |     |     |     |   |  |

SEP. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
|-------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|
| 1     |    |    |    |    |    |    |    | L   | L   | U   | L   | U   | L   |     |     |     |     |     |    |    |    |    |    |    |
| 2     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 3     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 4     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 5     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 6     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 7     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 8     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 9     |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 10    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 11    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 12    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 13    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 14    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 15    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 16    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 17    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 18    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 19    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 20    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 21    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 22    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 23    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 24    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 25    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 26    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 27    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 28    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 29    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 30    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| 31    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
|       | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT   |    |    |    |    |    |    |    | 1   | 7   | 18  | 27  | 25  | 27  | 28  | 26  | 25  | 25  | 16  |    |    |    |    |    |    |
| MED   |    |    |    |    |    |    |    | L   | L   | L   |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
| U Q   |    |    |    |    |    |    |    | 441 | 388 | 405 | 419 | 418 | 425 | 416 | 396 | 376 | 375 | 374 |    |    |    |    |    |    |
| L Q   |    |    |    |    |    |    |    | U   | L   |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
|       |    |    |    |    |    |    |    | 413 | 409 | 433 | 428 | 435 | 426 | 411 | 386 | 384 | 382 |     |    |    |    |    |    |    |
|       |    |    |    |    |    |    |    | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L   | L  | L  | L  | L  | L  | L  |
|       |    |    |    |    |    |    |    | 385 | 398 | 400 | 406 | 411 | 407 | 386 | 369 | 370 | 368 |     |    |    |    |    |    |    |

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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SEP. 2018 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      |    |    |    |    |    |    |     | 232 | 222      | 240        | 278 | 366 | 338 | 270 | 298 | 332        | 316 | 278 |     |    |    |    |    |    |
| 2      |    |    |    |    |    |    |     |     | 252      | 254        | 264 | 298 | 252 | 300 | 280 | 348        | 370 | 322 | 264 |    |    |    |    |    |
| 3      |    |    |    |    |    |    |     |     | 234      | 230        | 284 | G   | 358 | 346 | 298 | 282        | 308 | 342 | 276 |    |    |    |    |    |
| 4      |    |    |    |    |    |    |     | 214 | 224      | 256        | 362 | 308 | 278 | 314 | 306 | 308        | 306 | 296 | 254 |    |    |    |    |    |
| 5      |    |    |    |    |    |    |     |     |          | 266        | 302 | 360 | 338 | 278 | 290 | 274        | 266 | 230 | 234 |    |    |    |    |    |
| 6      |    |    |    |    |    |    | A   | 226 | 220      | L<br>264   | 268 | 292 | 292 | 314 | 300 | 290        | 270 | 234 |     |    |    |    |    |    |
| 7      |    |    |    |    |    |    |     | 252 | 204      | 256        | 290 | 330 | 314 | 316 | 270 | 270        | 276 | 250 |     |    |    |    |    |    |
| 8      |    |    |    |    |    |    |     | 232 | 226      | 266        | 402 | 302 | 292 | 296 | 314 | 316        | 258 |     |     |    |    |    |    |    |
| 9      |    |    |    |    |    |    |     | 204 | 234      | 320        | 356 | 290 | 340 | 328 | 288 | 282        | 258 |     |     |    |    |    |    |    |
| 10     |    |    |    |    |    |    |     | 228 | 230      | 256        | 356 | 346 | 278 | 272 | 272 | 290        | 264 | 254 |     |    |    |    |    |    |
| 11     |    |    |    |    |    |    |     |     | A<br>298 | A          | 366 | 276 | 304 | 326 | 276 | 310        | 252 |     |     |    |    |    |    |    |
| 12     |    |    |    |    |    |    |     | 242 |          | 204        | 230 | 318 | 288 | 306 | 336 | 340        | 298 | 252 |     |    |    |    |    |    |
| 13     |    |    |    |    |    |    |     |     | 210      | 228        | 252 | 270 | 448 | 302 | 330 | 336        | 294 | 274 |     |    |    |    |    |    |
| 14     |    |    |    |    |    |    |     |     | 234      | 226        | 260 | 354 | 326 | 282 | 330 | 354        | 278 | 264 | 254 |    |    |    |    |    |
| 15     |    |    |    |    |    |    |     |     | 224      | 208        | 232 | G   | 350 | 312 | 306 | 308        | 288 | 266 |     |    |    |    |    |    |
| 16     |    |    |    |    |    |    |     |     | 222      | 226        | 268 | 300 | 298 | 282 | 276 | 276        | 286 | 278 |     |    |    |    |    |    |
| 17     |    |    |    |    |    |    |     |     | 242      | 254        | 238 | 262 | 344 | 310 | 314 | 274        | 266 | 252 |     |    |    |    |    |    |
| 18     |    |    |    |    |    |    |     |     | 216      | 268        | 256 | 252 | 334 | 312 | 298 | 280        | 274 | 272 | 248 |    |    |    |    |    |
| 19     |    |    |    |    |    |    |     |     | 278      | 222        | 216 | 322 | 306 | 280 | 296 | 298        | 276 |     |     |    |    |    |    |    |
| 20     |    |    |    |    |    |    |     |     |          | 220        | 268 | 260 | 316 | 294 | 294 | 318        | 316 | A   |     |    |    |    |    |    |
| 21     |    |    |    |    |    |    |     |     | 218      | 236        | 226 | 384 | 276 | 282 | 314 | 378        | 314 | 242 |     |    |    |    |    |    |
| 22     |    |    |    |    |    |    |     | 206 | 198      | 222        | 256 | 264 | 282 | 406 | 278 | 292        | 464 | 276 | 214 |    |    |    |    |    |
| 23     |    |    |    |    |    |    |     | 226 | 212      | E A<br>300 | A   | A   | 288 | 258 | 286 | E A<br>330 | 270 | 246 |     |    |    |    |    |    |
| 24     |    |    |    |    |    |    |     |     |          | 230        | 270 | 280 | 264 | 260 | 260 | 370        | 284 | 238 | 220 |    |    |    |    |    |
| 25     |    |    |    |    |    |    |     |     | 216      | 234        | 232 | 250 | 256 | 256 | 256 | 350        | 290 | 246 |     |    |    |    |    |    |
| 26     |    |    |    |    |    |    |     | 210 | 208      | 234        | 230 | 228 | 350 | 252 | 256 | 238        | 248 | 258 |     |    |    |    |    |    |
| 27     |    |    |    |    |    |    |     |     | 212      | 230        | 266 | 262 | 344 | 316 | 298 | 266        | 290 | 248 |     |    |    |    |    |    |
| 28     |    |    |    |    |    |    |     |     | 224      | 234        | 270 | 250 | 284 | 288 | 270 | 240        | 236 | 236 |     |    |    |    |    |    |
| 29     |    |    |    |    |    |    |     |     | A<br>266 | 266        | 306 | 284 | 266 | 292 | 306 | 266        | 238 |     |     |    |    |    |    |    |
| 30     |    |    |    |    |    |    |     |     | 232      | 244        | 302 | 286 | 288 | 244 | 246 | 262        | 248 |     |     |    |    |    |    |    |
| 31     |    |    |    |    |    |    |     |     |          |            |     |     |     |     |     |            |     |     |     |    |    |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08       | 09         | 10  | 11  | 12  | 13  | 14  | 15         | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    | 1   | 8   | 23       | 30         | 28  | 29  | 30  | 30  | 30  | 30         | 30  | 27  | 9   |    |    |    |    |    |
| MED    |    |    |    |    |    |    | 206 | 226 | 222      | 234        | 266 | 306 | 300 | 290 | 296 | 304        | 285 | 258 | 254 |    |    |    |    |    |
| U Q    |    |    |    |    |    |    |     | 237 | 232      | 256        | 274 | 358 | 338 | 312 | 306 | 336        | 306 | 272 | 259 |    |    |    |    |    |
| L Q    |    |    |    |    |    |    |     | 212 | 212      | 228        | 253 | 266 | 284 | 278 | 276 | 276        | 274 | 242 | 241 |    |    |    |    |    |

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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     | 282              | 272              | 296 | 302              | 312 | 206              | 220 | 200 | 204 | 196 | 180 | 166                | 156 | 162                | 204                | 214                | 206 | 194 | 258 | 220 | 182 | 184 |     | A E A            |     |
| 2     | 270              | 252              | 274 | 258 <sup>Q</sup> | 256 | 270              | 204 | 206 | 212 | 188 | 190 | 250 <sup>E A</sup> | 198 | 186                | 202                | 210                | 208 | 240 | A   | 222 | 186 | 216 | 246 | 300              |     |
| 3     | 276 <sup>Q</sup> | 264              | 248 | 208              | 194 | 268 <sup>Q</sup> | 236 | 222 | 206 | 188 | 174 | 188                | 178 | 182                | 204                | 218                | 206 | 208 | 220 | 224 | 208 | 198 | 230 | 280              |     |
| 4     | 280              | 270              | 244 | 242              | 214 | 262              | 206 | 210 | 206 | 200 | 180 | A                  | 198 | 216                | 220                | 232                | 226 | A   | A   | 226 | 182 | 216 | 258 | 288              |     |
| 5     | 276              | 278              | 252 | 232              | 226 | 254              | 222 | 220 | 200 | 192 | 168 | 194                | 236 | 220                | 264 <sup>E A</sup> | A                  | A   | 188 | 212 | 208 | 186 | 210 | 264 | A                |     |
| 6     | 302              | 246              | 284 | 304              | 226 | 246              |     | A   | A   | A   | 200 | 186                | 182 | 190                | 192                | 198                | 204 | 212 | A   | 244 | 208 | 194 | 194 | 288              | 238 |
| 7     | 324              | 230              | 254 | 268              | 274 | 294              | 234 | 212 | 196 | 188 | 212 | 206                | 196 | 234 <sup>E A</sup> | 224 <sup>E A</sup> | 246 <sup>E A</sup> | 212 | 222 | 234 | 204 | 206 | 216 | 282 | 264              |     |
| 8     | 256              | 254              | 274 | 252              | 206 | 240              | 214 | 204 | 204 |     | 184 | 170                | 158 | 186                | 240                | 250 <sup>E A</sup> | 204 | A   | 224 | 184 | 188 | 216 | 322 | 272              |     |
| 9     | 260 <sup>Q</sup> | 270 <sup>Q</sup> | 258 | 254              | 270 | 310              | 230 | 202 | 194 | 188 | 186 | 174                | 184 | 176                | 176                | 166                | 220 | A   | 232 | 200 | 212 | 220 | 292 | 314              |     |
| 10    | 298              | A E A            | 276 | 218              | A   | 248              | 230 | 220 | 208 | A   | 212 | 196                | 216 | 174                | 178                | A                  | 232 | E A | 256 | 226 | 196 | 188 | 190 | 248              | 292 |
| 11    | 302              | A                | 284 | 284              | 318 | 298              | 232 | 190 | 214 | A   | A   | 194                | A   | A                  | A                  | A                  | 226 | 212 | 240 | 268 | A   | 268 | 238 | 258              | A   |
| 12    | 224              | 218              | 264 | 234              | 248 | 280              | 238 | 214 | 212 | 198 | 186 | 182                | 208 | 230                | 190                | 224                | 234 | 212 | 242 | 204 | 188 | 196 | 328 | A                |     |
| 13    | 248              | 274              | 264 | 264              | 292 | 284 <sup>Q</sup> | 244 | 214 | 204 | 216 | 188 | 198                | 176 | 190                | 246                | 238                | 226 | A   | 256 | 216 | 222 | 252 | 244 | 274 <sup>Q</sup> |     |
| 14    | 266              | 244              | 232 | 288              | 292 | 262              | 206 | 216 | 210 | A   | 180 | 166                | 200 | 184                | 232                | 216                | 208 | 208 | 230 | 200 | 184 | 222 | 308 | 264              |     |
| 15    | 250              | 254              | 248 | 254              | 254 | 254              | 218 | 214 | 216 | 198 | 192 | 180                | 176 | 170                | 170                | 214                | 208 | 220 | 234 | 200 | 178 | 202 | 282 | 300              |     |
| 16    | 268              | 238              | 246 | 196              | 382 | 276              | 234 | 208 | 212 | 216 | 182 | 176                | 198 | 170                | 204                | 194                | 214 | 224 | 240 | 210 | 186 | 190 | 380 | 270              |     |
| 17    | 270              | 264              | 256 | 204              | A   | 298              | 242 | 216 | 202 | 182 | 194 | A                  | A   | A                  | 222                | 174                | 172 | 212 | 218 | 236 | 204 | 184 | 170 | 292              | 276 |
| 18    | 280              | 256              | 256 | 214              | 182 | 326              | 258 | 200 | 208 | 204 | 232 | 194                | 222 | 186                | 190                | 198                | 218 | 224 | 226 | 206 | 186 | 202 | 310 | 280              |     |
| 19    | 276              | 258              | 244 | 222              | 226 | 224              | 206 | 206 | 206 | 218 | 190 | 168                | 162 | 166                | A                  | 200                | A   | 242 | 224 | 218 | 208 | 212 | A   | 308              |     |
| 20    | 232              | 232              | 220 | 216              | 182 | 246              | 226 | 200 | 210 | 200 | 194 | 178                | 180 | 190                | 200                | 222                | A   | A   | 226 | 214 | 196 |     | 310 | 296              |     |
| 21    | 282              | 264              | 252 | 218              | 184 | B                | 234 | 208 | 196 | 190 | 180 | 174                | 162 | 268                | 198                | 210                | 214 | 212 | 208 | 182 | 182 | 192 | 278 | 278              |     |
| 22    | 290              | 258              | 248 | 228              | 220 | 218              | A   | 178 | 184 | 216 | 182 | A                  | 182 | 218                | 200                | 190                | 220 | 210 | 204 | 234 | 240 | 238 | 254 | 208              |     |
| 23    | 292              | 312              | E A | 334              | 208 | E A              | 362 | 316 | 284 | 218 | 204 | A                  | A   | A                  | A                  | A                  | A   | A   | A   | 216 | 208 | 208 | 292 | 310              | 306 |
| 24    | 298              | 270              | 228 | 206              | 310 | A                | 244 | 208 | 230 | 210 | 192 | 170                | 188 | 206                | 198                | 216                | A   | A   | A   | 186 | 210 | 196 | 220 | 238              |     |
| 25    | 256              | 274              | 244 | 208              | 256 | 246              | 248 | 220 | 204 | 202 | 198 | 188                | 170 | 170                | 190                | 184                | 222 | 212 | 202 | 186 | 180 | 222 | 288 | 296              |     |
| 26    | 302              | 258              | 232 | 246              | 210 | 312              | 226 | 202 | 198 | 208 | 190 | 182                | 168 | 162                | 224                | 216                | 212 | 234 | 234 | 198 | 180 | 198 | 284 | 334              |     |
| 27    | 336              | 316              | 268 | 236              | 176 | B                | 230 | 194 | 188 | 212 | 194 | 204                | 196 | 194                | 194                | 210                | 216 | 214 | 210 | 190 | 182 | 196 | 252 | 236              |     |
| 28    | 258              | 222              | 268 | 236              | 238 | 244              | 212 | 208 | 212 | 194 | 200 | 200                | 178 | 180                | 228                | 190                | 216 | 214 | 224 | 188 | 218 | A   | A   | A E A            | 312 |
| 29    | 252              | 232              | 236 | 212              | 208 | 232              | 232 | 204 | 214 | A   | A   | 196                | 224 | 182                | 210                | 210                | 210 | A   | 206 | 190 | 204 | 244 | 290 | 282              |     |
| 30    | 288              | 248              | 214 | 230              | 216 | 274              | 226 | 202 | 216 | 222 | 204 | 192                | 178 | 166                | 220                | 212                | 208 | 208 | 196 | 218 | 186 | 226 | 288 | 270              |     |
| 31    |                  |                  |     |                  |     |                  |     |     |     |     |     |                    |     |                    |                    |                    |     |     |     |     |     |     |     |                  |     |
| CNT   | 30               | 28               | 30  | 30               | 28  | 27               | 28  | 29  | 29  | 24  | 27  | 26                 | 27  | 28                 | 27                 | 26                 | 25  | 21  | 27  | 30  | 29  | 28  | 27  | 28               |     |
| MED   | 276              | 258              | 252 | 233              | 229 | 262              | 230 | 208 | 206 | 200 | 189 | 184                | 184 | 184                | 201                | 210                | 214 | 213 | 226 | 205 | 188 | 208 | 281 | 278              |     |
| U Q   | 292              | 270              | 268 | 254              | 283 | 294              | 237 | 215 | 212 | 211 | 194 | 196                | 198 | 211                | 224                | 218                | 221 | 224 | 236 | 218 | 208 | 222 | 308 | 300              |     |
| L Q   | 258              | 245              | 244 | 214              | 209 | 246              | 219 | 202 | 201 | 191 | 182 | 174                | 176 | 172                | 190                | 198                | 208 | 209 | 212 | 196 | 183 | 196 | 252 | 267              |     |

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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   | A   | A   | A   | A   | A   | A   | A   |     | 104 | 104 | 104 | 104 |     | A   | A  |    |    |
| 2      |    |    |    |    |    |    |     | 104 |     | A   | 102 | 102 | 102 | 102 | 102 |     | A   |     | A   | A   | A   |    |    |    |
| 3      |    |    |    |    |    |    | B   | A   | A   | A   | A   | A   | A   |     | 100 | 108 | 104 | 104 | 104 |     | A   | B  |    |    |
| 4      |    |    |    |    |    |    | B   |     |     | A   |     |     |     |     |     |     |     |     |     |     | A   | A  |    |    |
|        |    |    |    |    |    |    |     | 116 | 116 |     | 110 | 106 | 106 | 106 | 104 | 104 | 104 | 104 |     |     |     |    |    |    |
| 5      |    |    |    |    |    |    | B   |     | A   |     | A   | A   | A   | A   |     |     |     |     |     |     | A   | B  |    |    |
|        |    |    |    |    |    |    |     | 104 |     | 104 |     |     |     |     |     |     | 106 | 102 | 106 |     |     |    |    |    |
| 6      |    |    |    |    |    |    | A   | A   | A   | A   | A   | A   |     | 104 | 102 | 102 | 98  | 100 | 104 |     | A   | A  |    |    |
|        |    |    |    |    |    |    | B   |     |     |     |     |     |     |     | A   |     |     |     |     |     | A   | A  |    |    |
| 7      |    |    |    |    |    |    | 108 | 106 | 106 | 106 | 106 | 102 | 102 |     | 102 | 102 | 108 | 106 |     |     | A   | A  |    |    |
| 8      |    |    |    |    |    |    | B   | A   | A   | A   | A   |     | 102 | 102 |     | A   | A   | A   |     | 102 | 102 |    |    |    |
|        |    |    |    |    |    |    | B   |     |     |     |     |     |     |     |     |     |     |     |     |     | A   | A  |    |    |
| 9      |    |    |    |    |    |    | 108 | 108 | 104 | 106 | 106 | 106 | 106 | 104 | 104 | 108 | 108 | 106 |     |     | A   | A  |    |    |
| 10     |    |    |    |    |    |    | B   | A   |     | 104 | 102 |     | 102 | 102 | 102 | 102 | 106 |     |     | A   | A   | A  |    |    |
|        |    |    |    |    |    |    | B   | A   |     |     |     |     | A   | A   |     |     |     |     |     |     |     |    |    | A  |
| 11     |    |    |    |    |    |    |     | 108 | 108 | 108 |     |     |     | 108 | 104 | 102 | 102 | 102 | 102 |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     | A   |     | A   |     |     |     |     |     |     |     |     |     | A   | A  |    |    |
| 12     |    |    |    |    |    |    | 106 |     | 104 |     | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     | A   |     |     |     |     |     |     | A   | A   |     |     |     | A   | A  |    |    |
| 13     |    |    |    |    |    |    | 104 |     | 104 | 104 | 106 | 106 | 106 | 100 |     |     |     | 100 |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   | A   | A   | A   | A   |     | A   | A   |     |     |     |     |     |     | A   | A  |    |    |
| 14     |    |    |    |    |    |    |     |     |     |     | 100 |     |     |     | 102 | 102 | 100 | 102 |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     |     |     | A   |     | A   |     |     |     |     |     |     |     | A   | A  |    |    |
| 15     |    |    |    |    |    |    | 116 | 110 | 104 |     | 104 |     |     | 104 | 104 | 102 | 102 |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     |     | A   | A   | A   |     | A   |     |     | A   |     |     |     | A   | A  |    |    |
| 16     |    |    |    |    |    |    | 110 | 106 |     |     |     |     | 106 |     | 106 |     | 102 | 102 |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     |     | A   | A   | A   |     | A   | A   |     | A   |     |     |     | A   | A  |    |    |
| 17     |    |    |    |    |    |    | 102 | 102 | 104 |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     |     | A   | A   | A   |     |     |     |     |     |     |     |     |     |    |    |    |
| 18     |    |    |    |    |    |    | 114 | 102 |     |     |     |     | 104 | 104 | 100 | 100 | 100 | 106 |     |     | A   | B  |    |    |
|        |    |    |    |    |    |    | B   | A   | A   | A   | A   | A   |     | 106 |     |     |     | 102 | 102 |     |     | A  | A  |    |
| 19     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     | A   |     | A   |     |     |     |     |     |     |     |     |     | A   | A  |    |    |
| 20     |    |    |    |    |    |    | 110 |     | 110 | 108 |     | 106 | 106 | 106 | 106 | 106 | 106 | 106 |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   | A   |     |     | A   | A   | A   | A   | A   | A   | A   |     |     |     | A   | B  |    |    |
| 21     |    |    |    |    |    |    |     | 106 | 106 | 100 |     |     |     |     |     |     |     | 106 |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     | A   |     |     |     |     |     |     |     | A   | A   |     |     | A   |    |    |    |
| 22     |    |    |    |    |    |    | 112 |     | 104 | 104 | 106 | 102 | 102 | 102 |     |     |     | 100 |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     |     | A   | A   | A   | A   | A   |     | A   | A   | A   | A   |     |     |    |    |    |
| 23     |    |    |    |    |    |    | 112 | 102 |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   | A   |     | A   |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
| 24     |    |    |    |    |    |    |     | 100 |     | 100 | 100 | 100 | 102 | 100 | 100 | 100 | 100 | 100 |     |     | A   |    |    |    |
|        |    |    |    |    |    |    | B   | A   | A   | A   | A   | A   |     |     |     | A   |     |     |     |     |     |    |    |    |
| 25     |    |    |    |    |    |    |     |     |     |     |     |     | 102 | 108 |     | 106 | 106 |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   | A   | A   | A   |     | A   |     |     |     |     | A   |     |     |     | A   |    |    |    |
| 26     |    |    |    |    |    |    |     |     |     | 100 |     |     | 98  | 102 | 102 | 102 |     |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     |     | A   | A   |     |     |     |     |     | A   |     |     |     | A   | A  |    |    |
| 27     |    |    |    |    |    |    | 108 | 108 | 114 |     |     |     | 104 | 104 | 104 | 104 |     |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   | A   | A   | A   |     | A   | A   | A   |     | A   | A   | A   | A   |     |     |    |    |    |
| 28     |    |    |    |    |    |    |     |     |     | 104 |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   |     |     |     | A   | A   | A   | A   |     | A   | A   | A   | A   |     |     |    |    |    |
| 29     |    |    |    |    |    |    | 114 | 106 | 106 | 106 |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|        |    |    |    |    |    |    | B   | A   | A   |     | 110 | 108 | 104 | 106 | 106 | 106 | 106 | 104 | 104 |     |     |    |    |    |
| 30     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     | A   |    |    |    |
| 31     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|        | 00 | 01 | 02 | 03 | 04 | 05 | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21 | 22 | 23 |
| CNT    |    |    |    |    |    |    |     | 16  | 14  | 16  | 13  | 13  | 19  | 18  | 22  | 19  | 21  | 21  | 1   |     |     |    |    |    |
| MED    |    |    |    |    |    |    |     | 109 | 106 | 104 | 106 | 104 | 104 | 104 | 104 | 104 | 102 | 104 | 102 |     |     |    |    |    |
| U Q    |    |    |    |    |    |    |     | 113 | 108 | 107 | 108 | 106 | 106 | 106 | 104 | 106 | 105 | 106 |     |     |     |    |    |    |
| L Q    |    |    |    |    |    |    |     | 105 | 102 | 104 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 |     |     |     |    |    |    |

SEP. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00  | 01  | 02 | 03 | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |    |
|-------|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| 1     | 90  | 90  | B  | B  | B   | B   | 116 | 108 | 106 | 100 | 100 | 102 | 102 | 108 | 104 | 108 | 120 | 110 | 102 | 94  | 94  | 94  | 94  | 100 |    |
| 2     | 102 | B   | B  | 90 | 90  | 90  | 96  | 126 | 96  | 146 | 102 | 100 | 102 | 106 | 106 | 106 | 144 | 116 | 100 | 100 | 94  | 94  | 94  | 88  |    |
| 3     | 84  | 94  | 94 | 88 | 94  | 94  | 92  | 126 | 88  | 90  | 86  | 86  | 86  | 140 | 128 | 124 | 112 | 104 | 98  | 94  | 86  | 90  | 94  | 80  |    |
| 4     | 82  | B   | B  | B  | B   | 98  | 100 | 146 | 132 | 148 | 126 | 168 | 124 | 124 | 136 | 150 | 126 | 110 | 102 | 102 | 96  | 94  | B   | B   |    |
| 5     | 94  | 84  | B  | 96 | 94  | B   | 100 | 148 | 140 | G   | 94  | 150 | 140 | 132 | 124 | 112 | 110 | 112 | 86  | 86  | 94  | 82  | 80  | 88  |    |
| 6     | 94  | 114 | 94 | 94 | 116 | 102 | 98  | 94  | 94  | 94  | 96  | 92  | G   | 158 | G   | 94  | 130 | 110 | 98  | 94  | 94  | 94  | 90  | 98  |    |
| 7     | 98  | 98  | 96 | B  | 94  | 94  | 94  | G   | 160 | 94  | 176 | 148 | 146 | 142 | 136 | 124 | 120 | 116 | 104 | 104 | 100 | 98  | 98  | B   |    |
| 8     | 90  | 90  | 90 | 90 | 92  | 92  | 108 | 100 | 98  | 88  | 90  | 92  | 92  | 94  | 96  | 102 | 106 | 106 | 92  | 128 | 110 | 110 | 82  | 82  |    |
| 9     | B   | B   | B  | 88 | 88  | 88  | 88  | 126 | 152 | G   | G   | 94  | 122 | 134 | 120 | G   | 128 | 102 | 100 | 96  | 96  | 98  | 96  | 94  |    |
| 10    | 94  | 90  | 88 | 88 | 86  | 86  | 86  | 86  | 122 | 110 | 110 | 112 | 114 | 152 | 116 | 136 | 98  | 96  | 94  | 90  | 90  | 110 | 92  | 92  |    |
| 11    | 92  | 88  | 88 | 84 | 86  | 86  | 86  | 122 | 112 | 114 | 110 | 92  | 92  | 122 | 112 | 112 | 116 | 106 | 102 | 102 | 98  | 94  | 94  | 92  |    |
| 12    | 88  | 86  | 86 | 92 | 144 | 130 | 118 | 156 | 122 | 110 | 102 | 118 | 120 | 120 | 140 | 120 | 116 | 110 | 100 | 96  | 96  | 96  | 96  | 96  |    |
| 13    | 92  | 92  | 92 | 88 | 88  | 88  | 88  | 106 | 106 | 104 | 168 | 108 | 108 | 102 | 100 | 172 | 96  | 118 | 102 | 98  | 98  | 98  | 102 | 94  |    |
| 14    | 94  | 94  | 94 | 92 | 94  | 94  | 106 | 90  | 90  | 94  | 94  | G   | 100 | 92  | 182 | 172 | 164 | 150 | 128 | 112 | 100 | 98  | 96  | 96  |    |
| 15    | 96  | 92  | 92 | 88 | 92  | B   | B   | 108 | 102 | 100 | 100 | G   | 134 | 136 | G   | G   | G   | 116 | 90  | 88  | B   | 94  | 94  | 92  |    |
| 16    | 92  | 86  | B  | 86 | 86  | 100 | 94  | 112 | 114 | 102 | 98  | 92  | 112 | 90  | 114 | 84  | 88  | 102 | 98  | 98  | 94  | 92  | 96  | 96  |    |
| 17    | 90  | 110 | 88 | B  | 88  | 88  | 102 | 172 | G   | 94  | 94  | 90  | 90  | 88  | 88  | 88  | 88  | 88  | 86  | 86  | 86  | 86  | B   | B   |    |
| 18    | 80  | 80  | B  | 88 | B   | 88  | 86  | 122 | 130 | 88  | 88  | 88  | 158 | 158 | 152 | G   | 158 | 134 | 110 | 86  | 90  | B   | 90  | 90  |    |
| 19    | 90  | 86  | 90 | 86 | 86  | B   | B   | 120 | 104 | 102 | 100 | 98  | 94  | 92  | 94  | 96  | 106 | 100 | 100 | 96  | 96  | 96  | 92  | 96  |    |
| 20    | 100 | 84  | 86 | 90 | 88  | 88  | 96  | 84  | 92  | 112 | 110 | 104 | 152 | 110 | 144 | 128 | 110 | 102 | 100 | 106 | 100 | 100 | 96  | 96  |    |
| 21    | 92  | 90  | 90 | 96 | B   | 96  | B   | 110 | 106 | 102 | 100 | 92  | 92  | 92  | 162 | 158 | 84  | 114 | 86  | 86  | 86  | 86  | 86  | 100 |    |
| 22    | 96  | 94  | 90 | 90 | 88  | 88  | 88  | 90  | 98  | 162 | 106 | 102 | 104 | 104 | 106 | 102 | 82  | 84  | 82  | 98  | 88  | 88  | 88  | 88  |    |
| 23    | 88  | 86  | 84 | 82 | 82  | 90  | 90  | G   | 100 | 92  | 90  | 90  | 86  | 86  | 88  | 88  | 88  | 104 | 100 | 96  | 96  | 90  | B   | 96  |    |
| 24    | 92  | 88  | 92 | 92 | 92  | 92  | 96  | 110 | 102 | 90  | 88  | G   | G   | 142 | 116 | 160 | 114 | 108 | 106 | 106 | 112 | 80  | B   | B   |    |
| 25    | B   | 90  | B  | 94 | 92  | 88  | 108 | 100 | 102 | 102 | 98  | 98  | G   | G   | 144 | 136 | 88  | 88  | 88  | 102 | 84  | 82  | 82  | 88  | 88 |
| 26    | B   | B   | 90 | 86 | 104 | 112 | 110 | 106 | 100 | 104 | 108 | 102 | G   | G   | 90  | 152 | 100 | 106 | 94  | 94  | 94  | 80  | 80  | 94  |    |
| 27    | 94  | 90  | 90 | 98 | 92  | 90  | 92  | 138 | 132 | 170 | 108 | 90  | 110 | 114 | 112 | 104 | 104 | 100 | 102 | 96  | 96  | 96  | 96  | 92  |    |
| 28    | 92  | 88  | 96 | 92 | 96  | 98  | 110 | 110 | 102 | 98  | 102 | 100 | 100 | 100 | 102 | 102 | 104 | 104 | 96  | 92  | 92  | 88  | 88  | 88  |    |
| 29    | 102 | 90  | 90 | 90 | 90  | 88  | B   | G   | 104 | 100 | 100 | 102 | 102 | 102 | 102 | 102 | 100 | 94  | 94  | 92  | 92  | 94  | 90  | B   |    |
| 30    | 92  | 92  | 90 | 92 | B   | 94  | 96  | 142 | 114 | 106 | 108 | 112 | 96  | 112 | 150 | 164 | 148 | 108 | 102 | 98  | 98  | B   | 92  | 84  |    |
| 31    |     |     |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
| CNT   | 27  | 26  | 22 | 26 | 25  | 26  | 26  | 27  | 29  | 28  | 29  | 27  | 26  | 29  | 28  | 27  | 29  | 30  | 30  | 30  | 29  | 28  | 26  | 25  |    |
| MED   | 92  | 90  | 90 | 90 | 92  | 91  | 96  | 110 | 104 | 102 | 100 | 100 | 103 | 112 | 115 | 112 | 110 | 106 | 100 | 96  | 94  | 94  | 93  | 92  |    |
| U Q   | 94  | 92  | 92 | 92 | 94  | 96  | 106 | 126 | 122 | 110 | 108 | 108 | 122 | 138 | 136 | 150 | 123 | 112 | 102 | 100 | 98  | 97  | 96  | 96  |    |
| L Q   | 90  | 86  | 88 | 88 | 88  | 88  | 90  | 100 | 99  | 94  | 94  | 92  | 94  | 97  | 102 | 102 | 97  | 102 | 94  | 92  | 91  | 88  | 88  | 88  |    |

SEP. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Okinawa

SEP. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

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

## 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   |

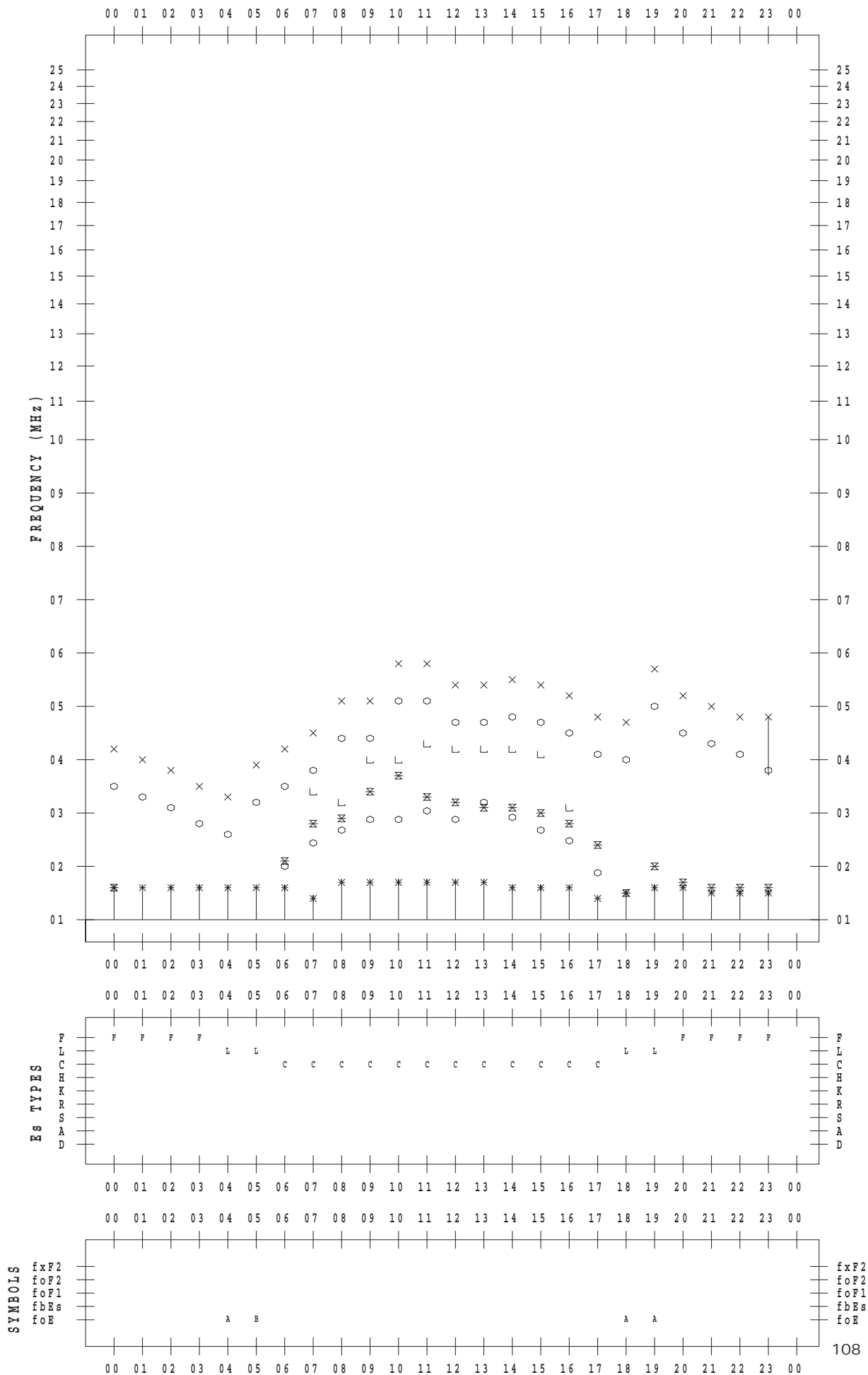
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 1

135 ° E MEAN TIME



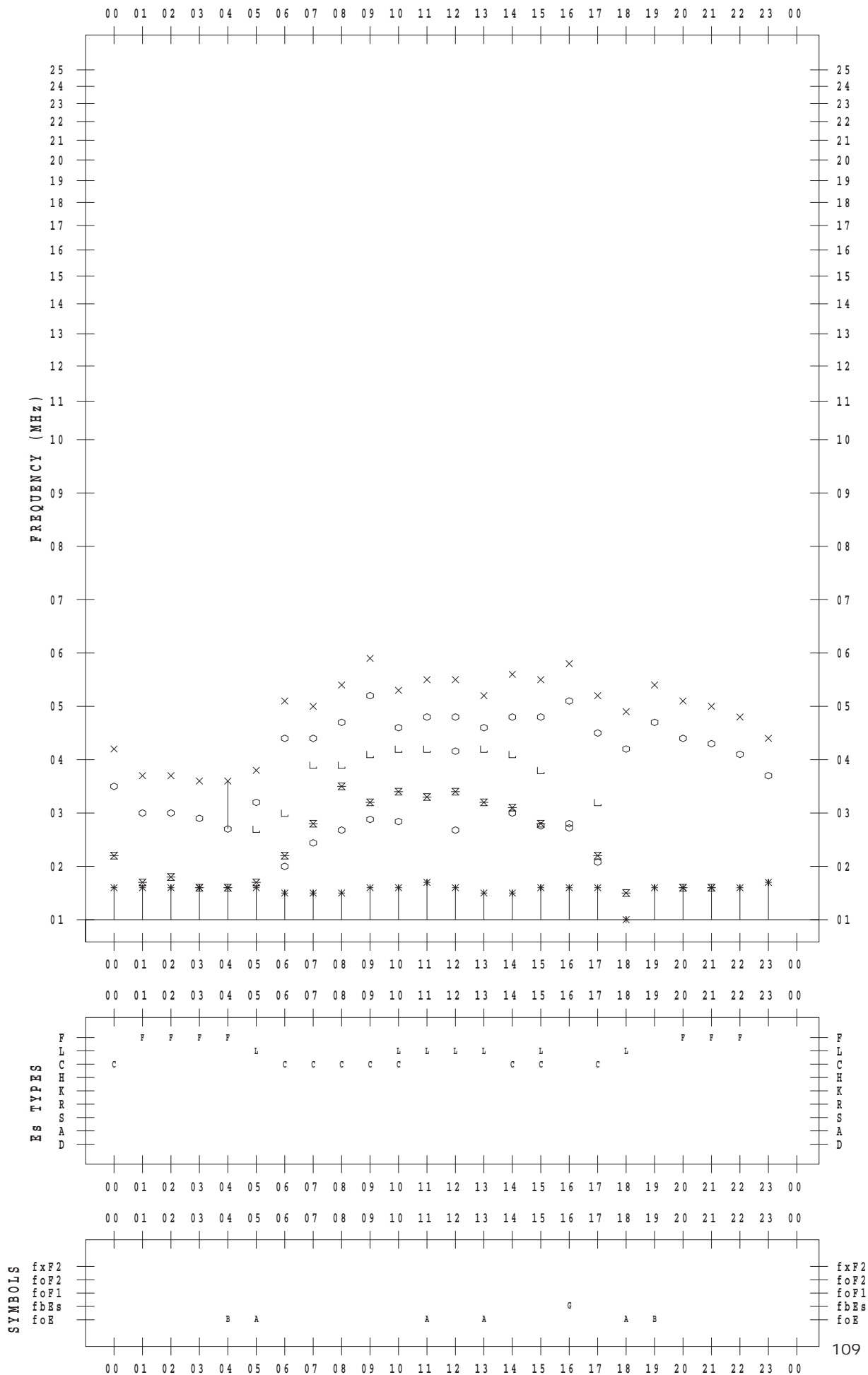
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 2

135 ° E MEAN TIME



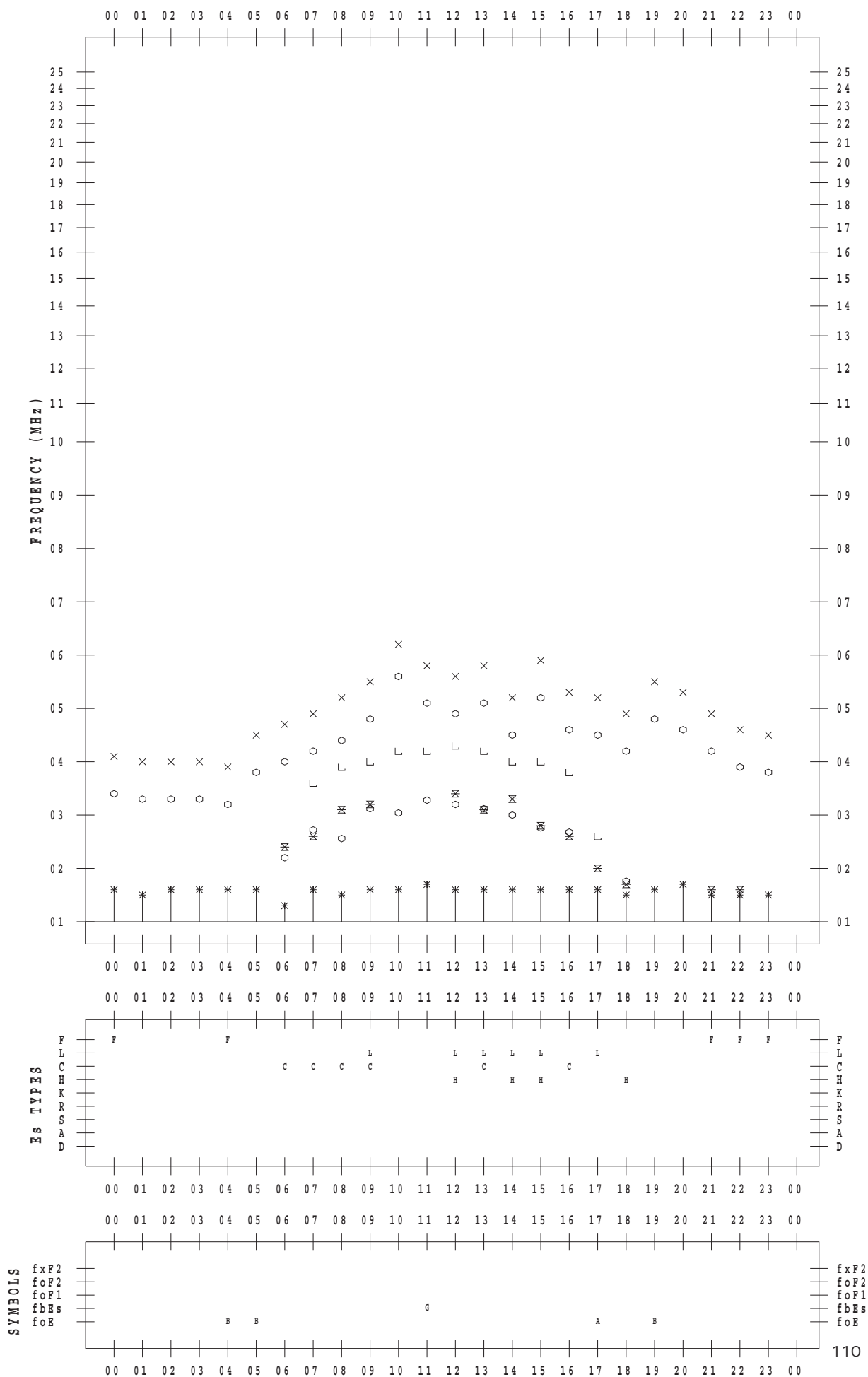
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 3

135 ° E MEAN TIME



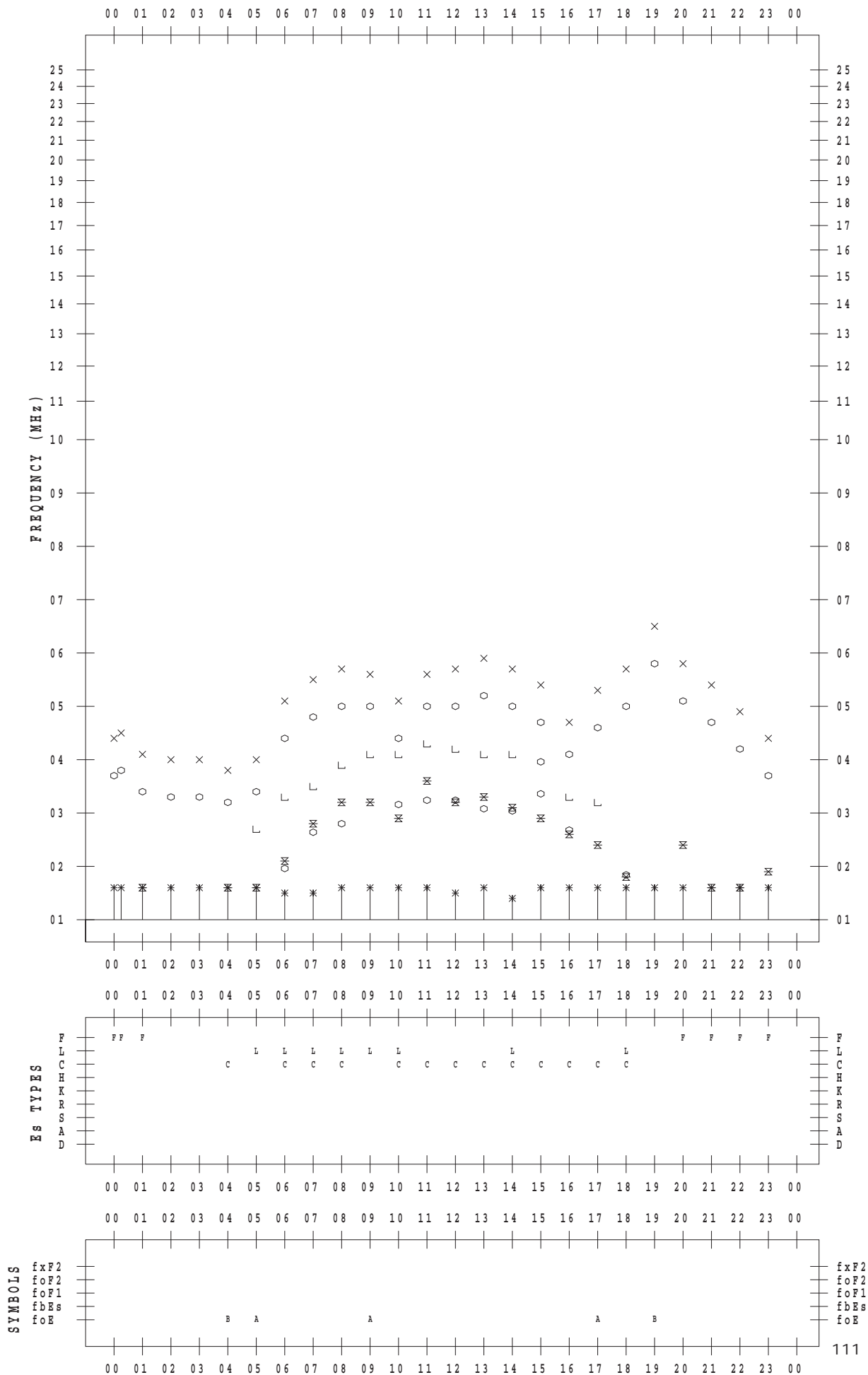
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 4

135 ° E MEAN TIME





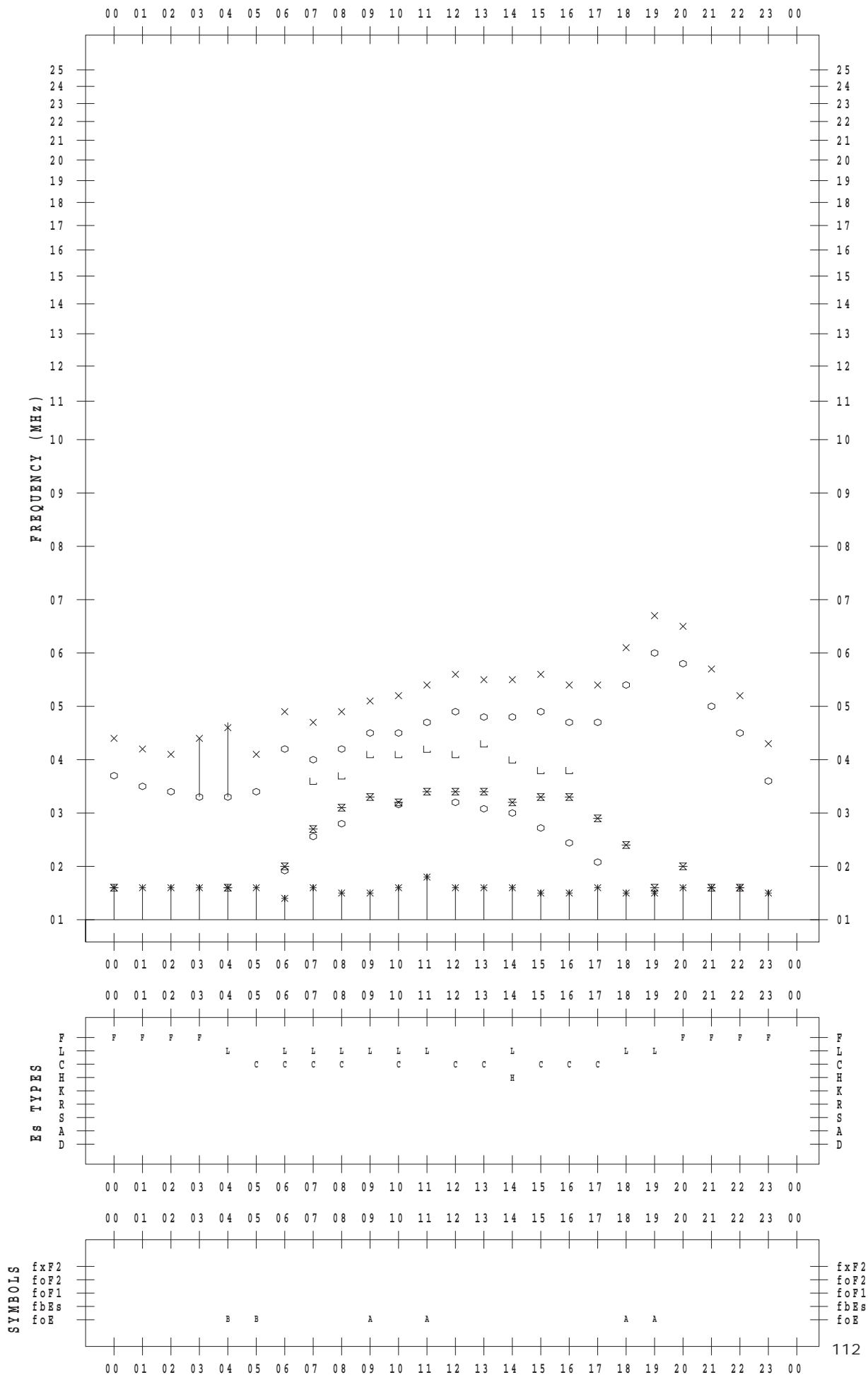
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 5

135 ° E MEAN TIME



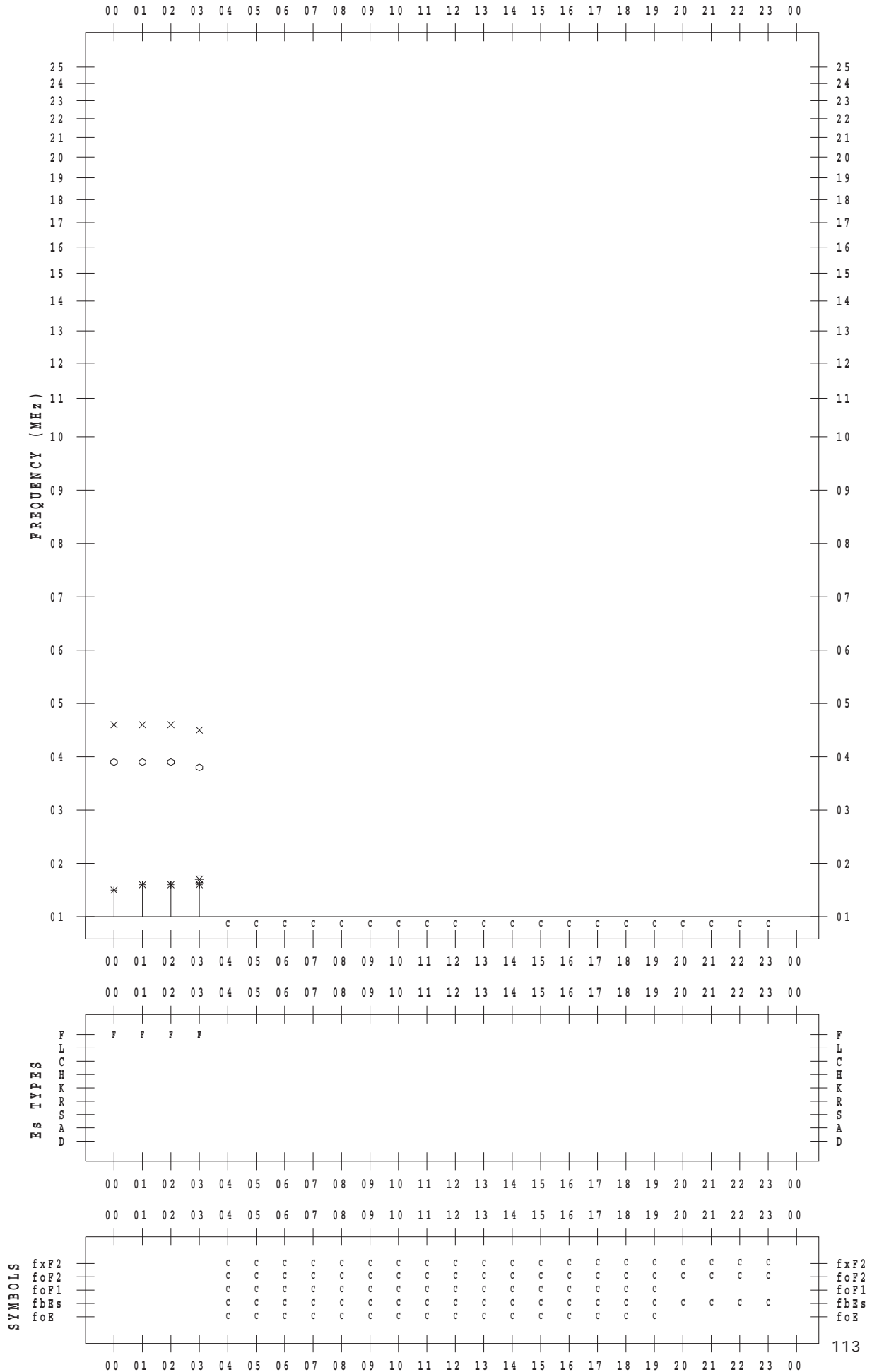
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 6

135 ° E MEAN TIME



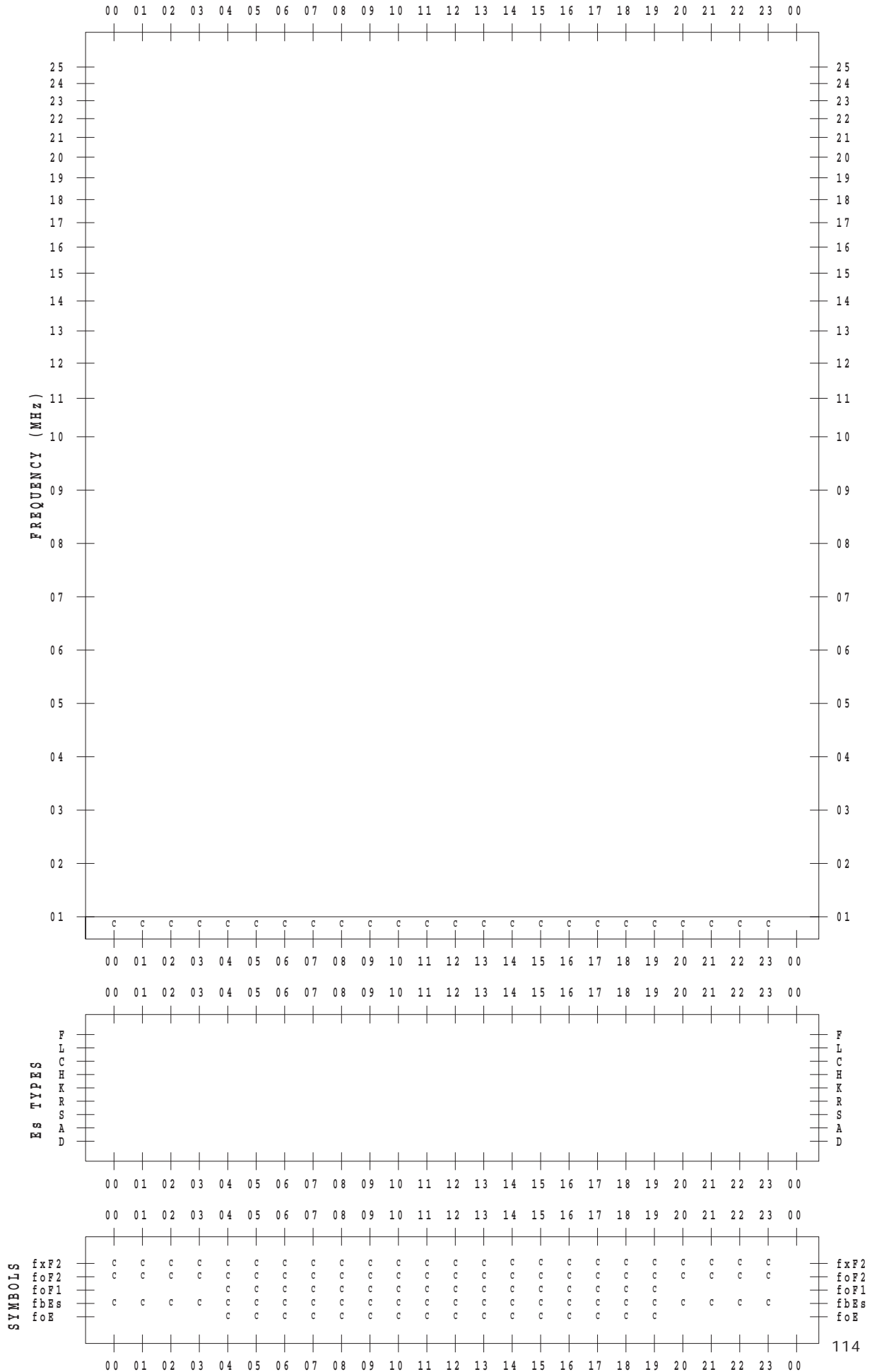
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 7

135 ° E MEAN TIME



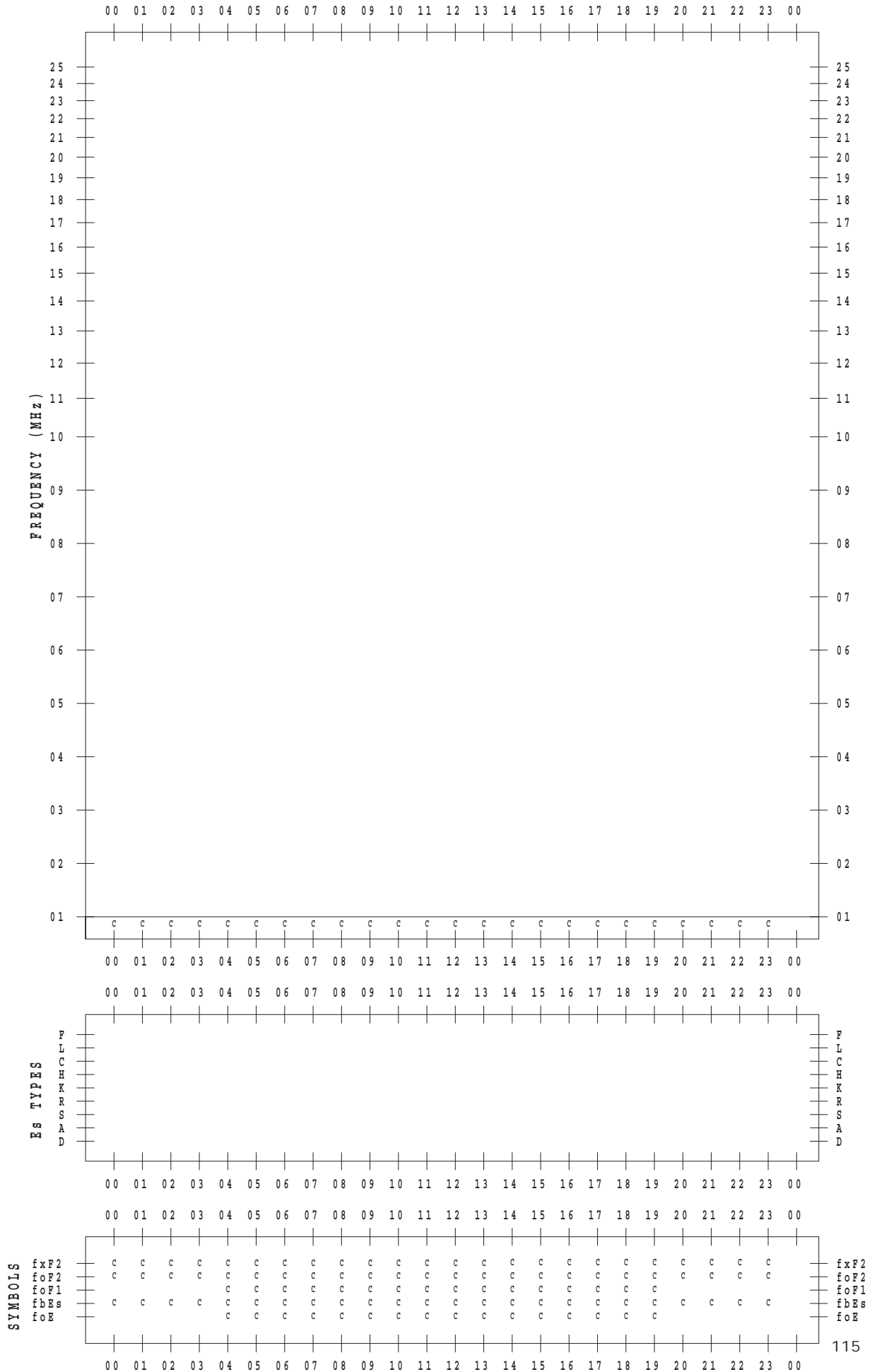
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 8

135 ° E MEAN TIME



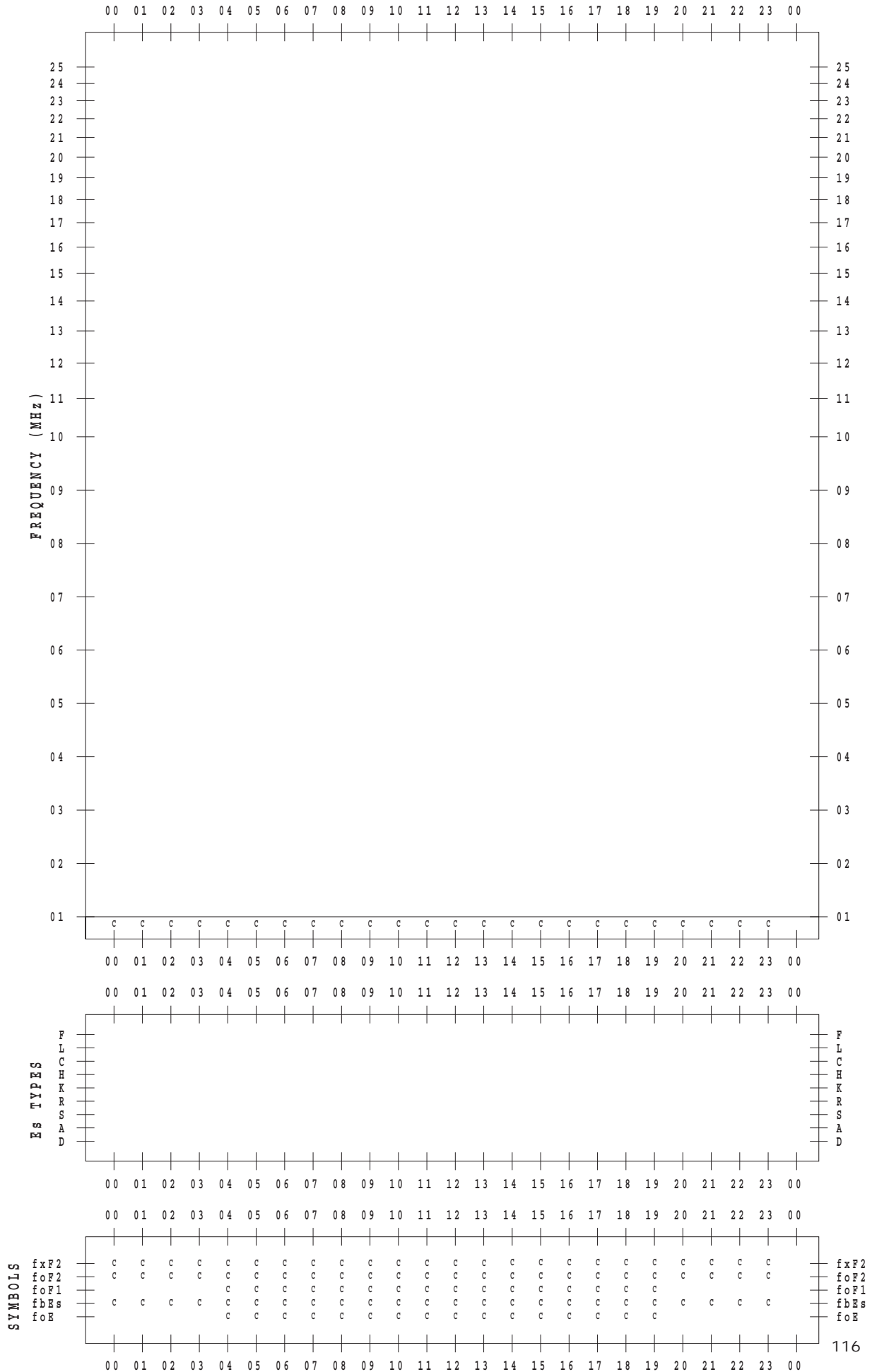
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 9

135 ° E MEAN TIME



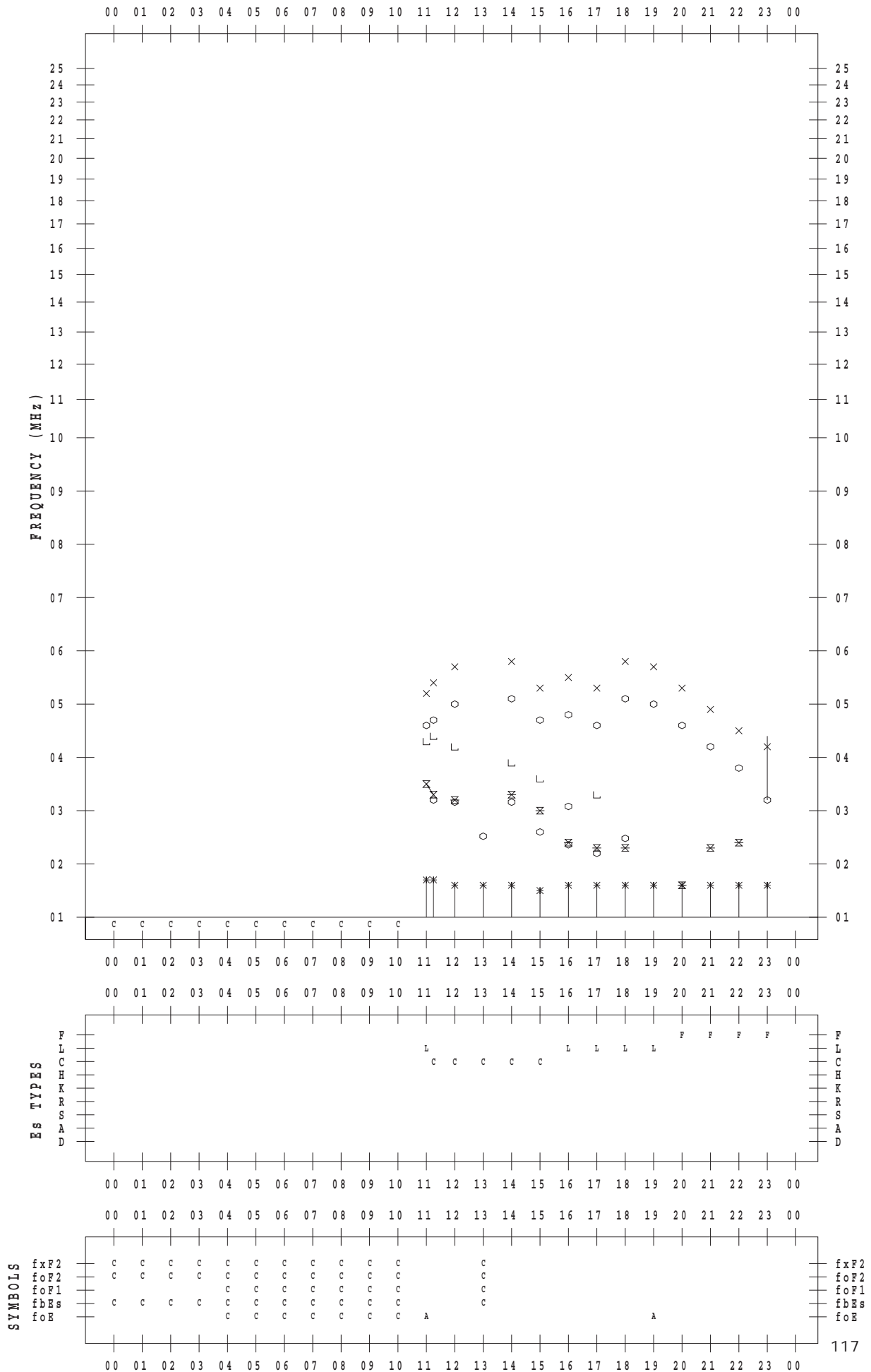
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 10

135 ° E MEAN TIME



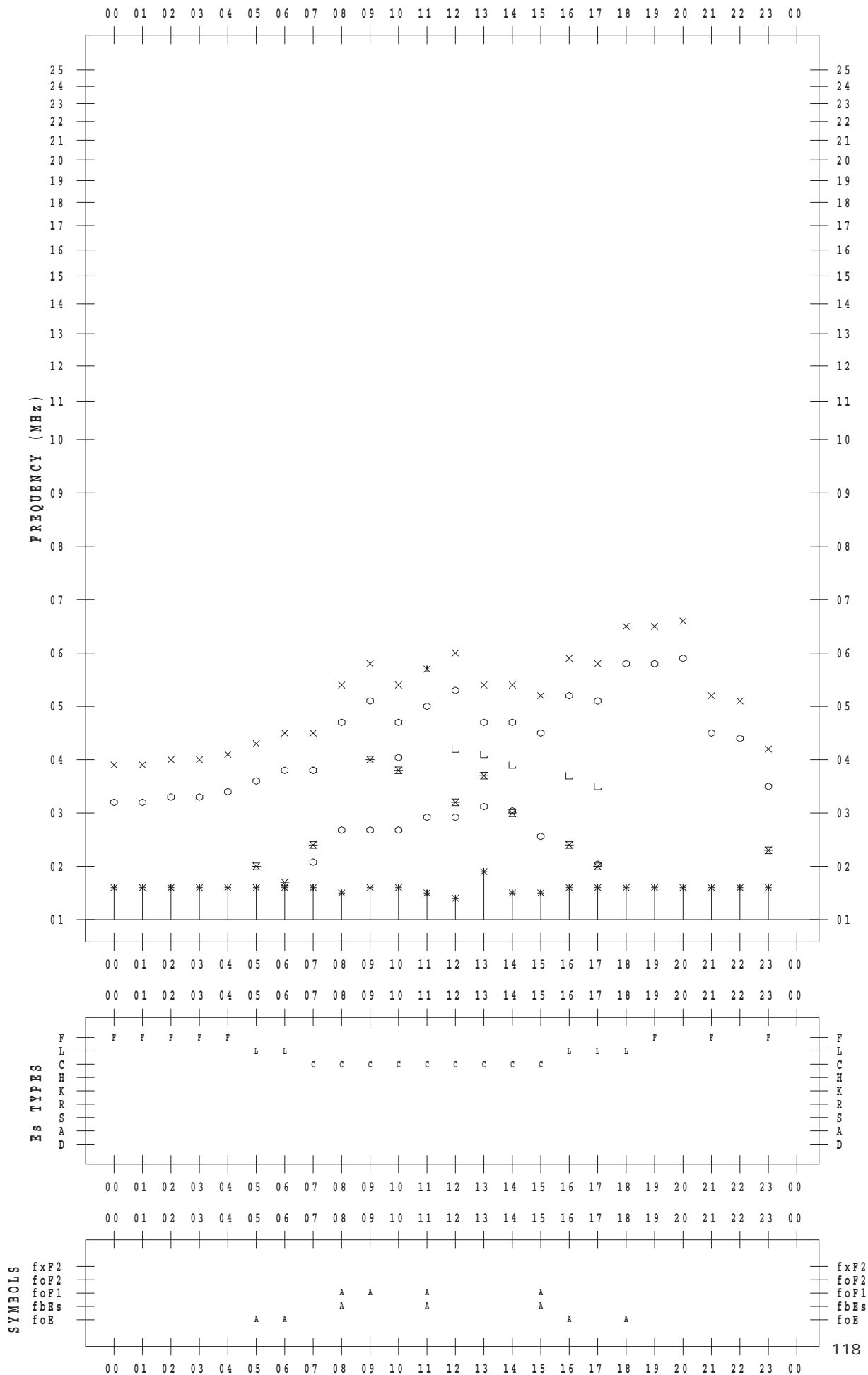
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 11

135 ° E MEAN TIME



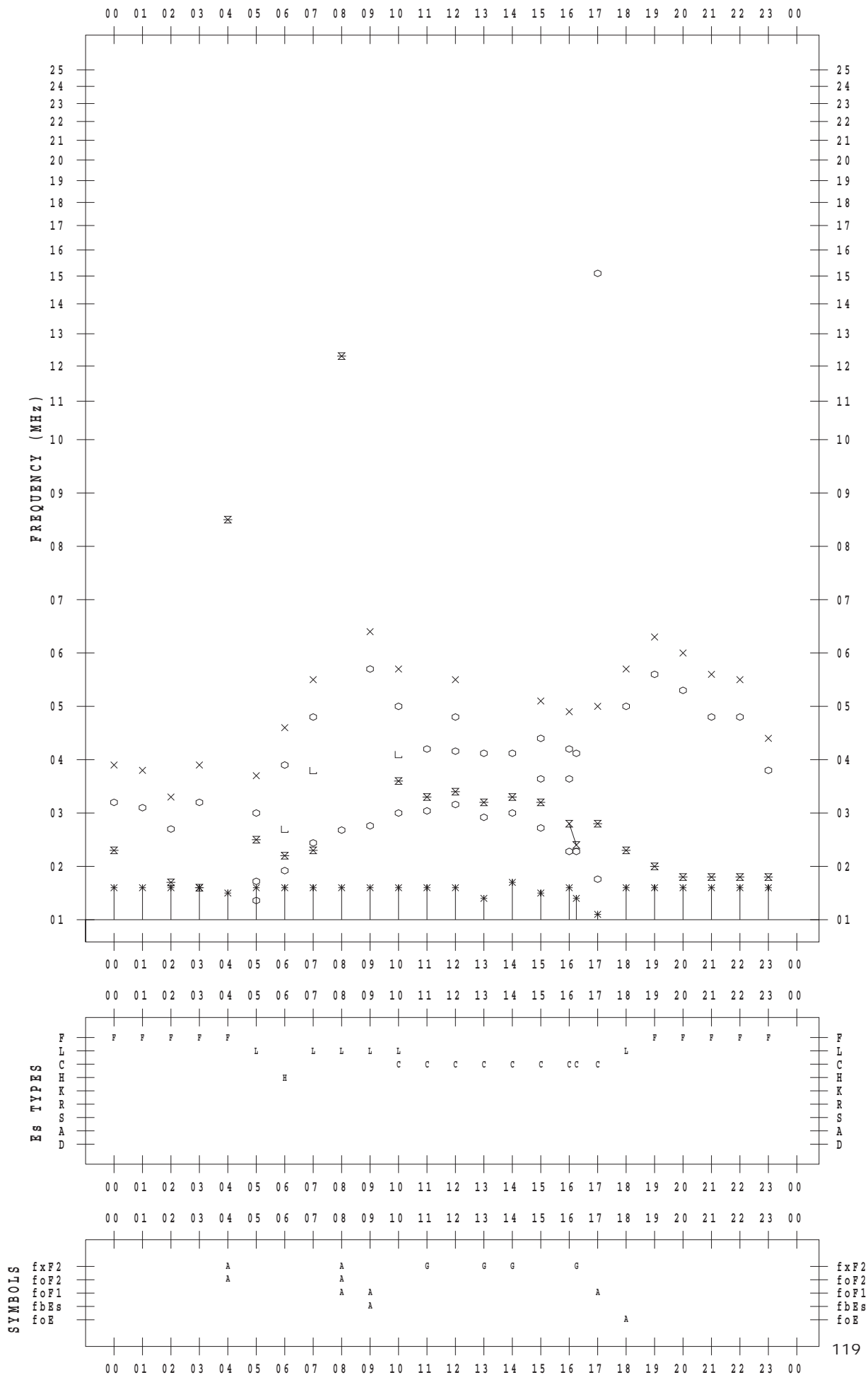
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 12

135 ° E MEAN TIME





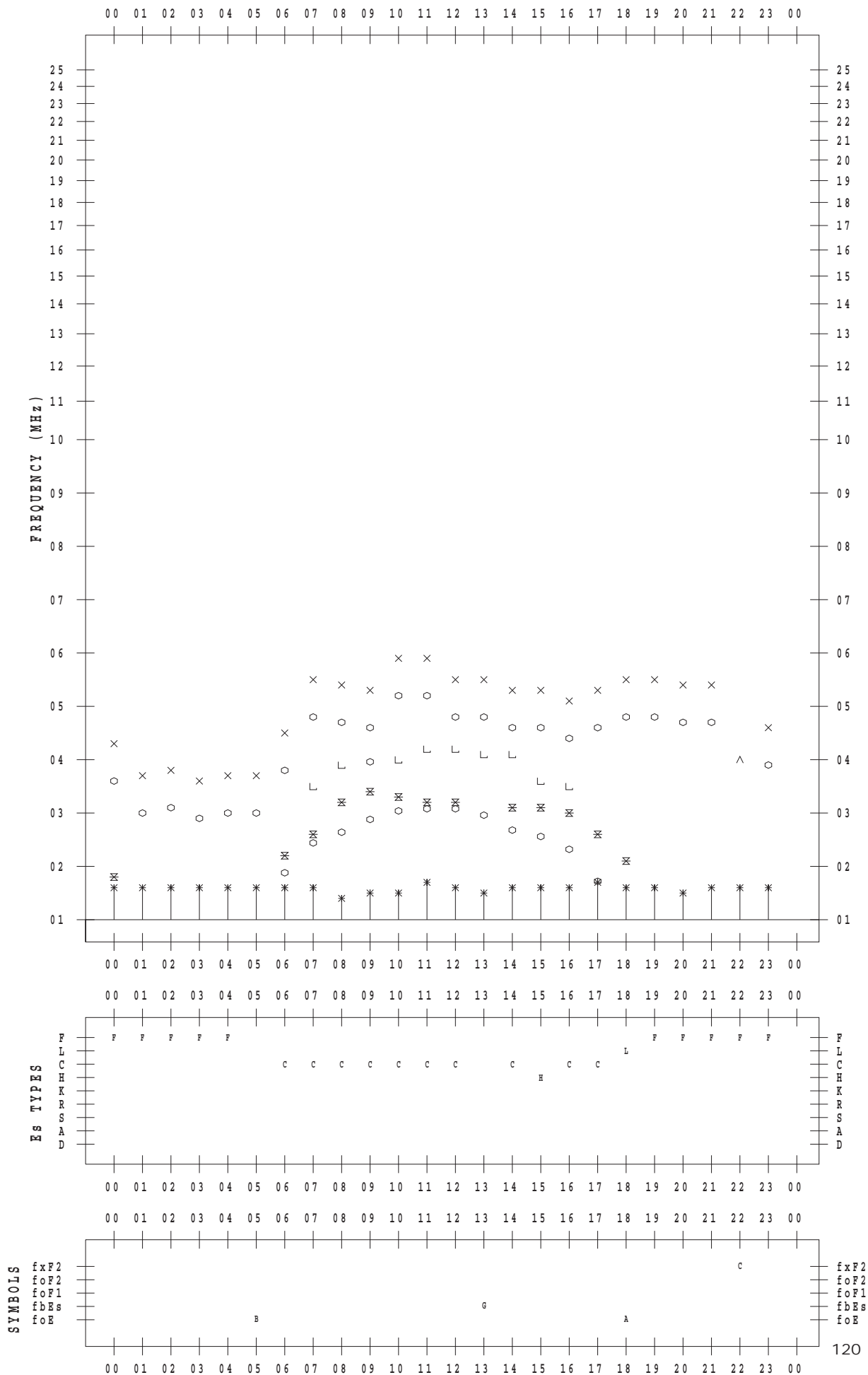
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 13

135 ° E MEAN TIME



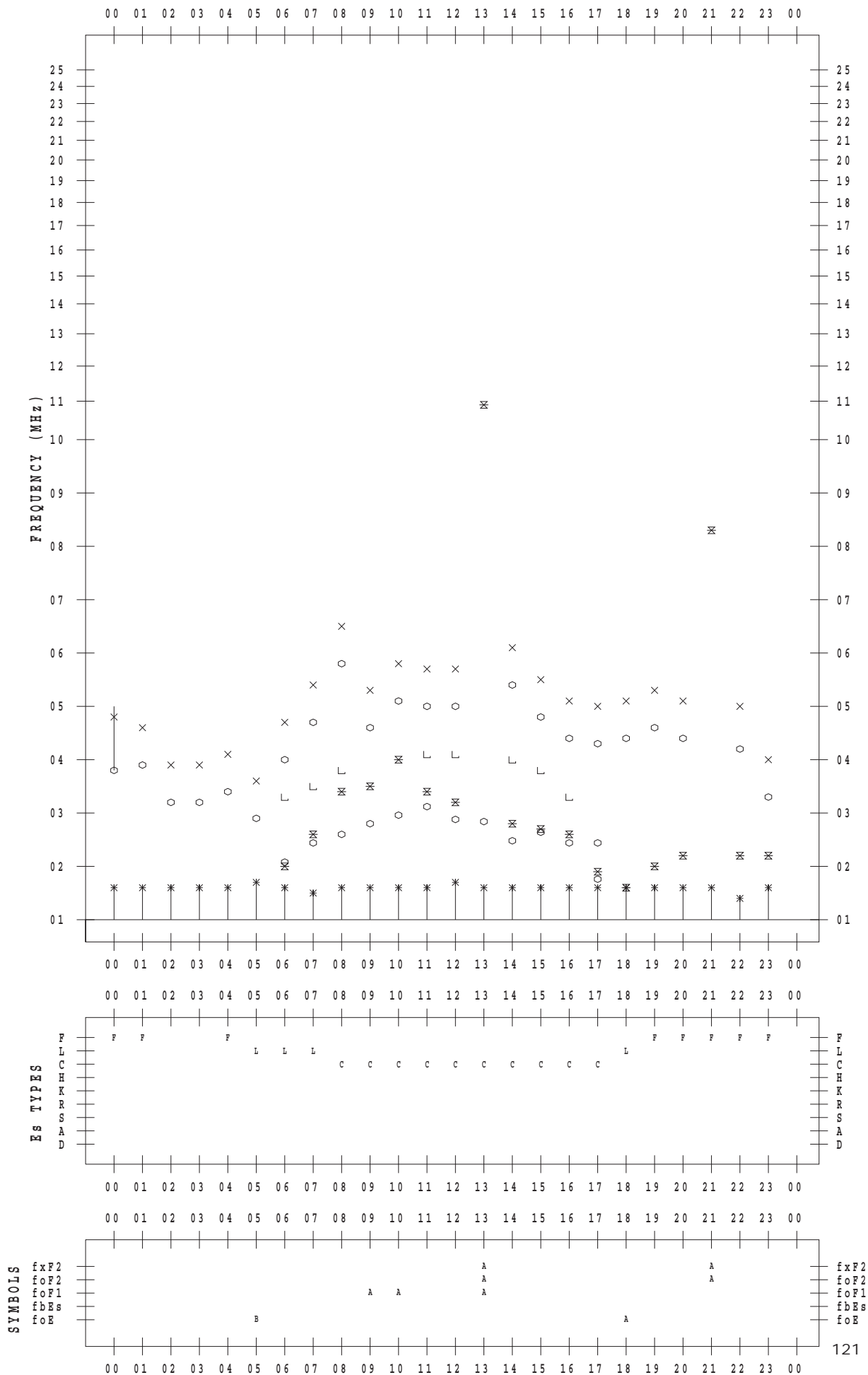
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 14

135 ° E MEAN TIME



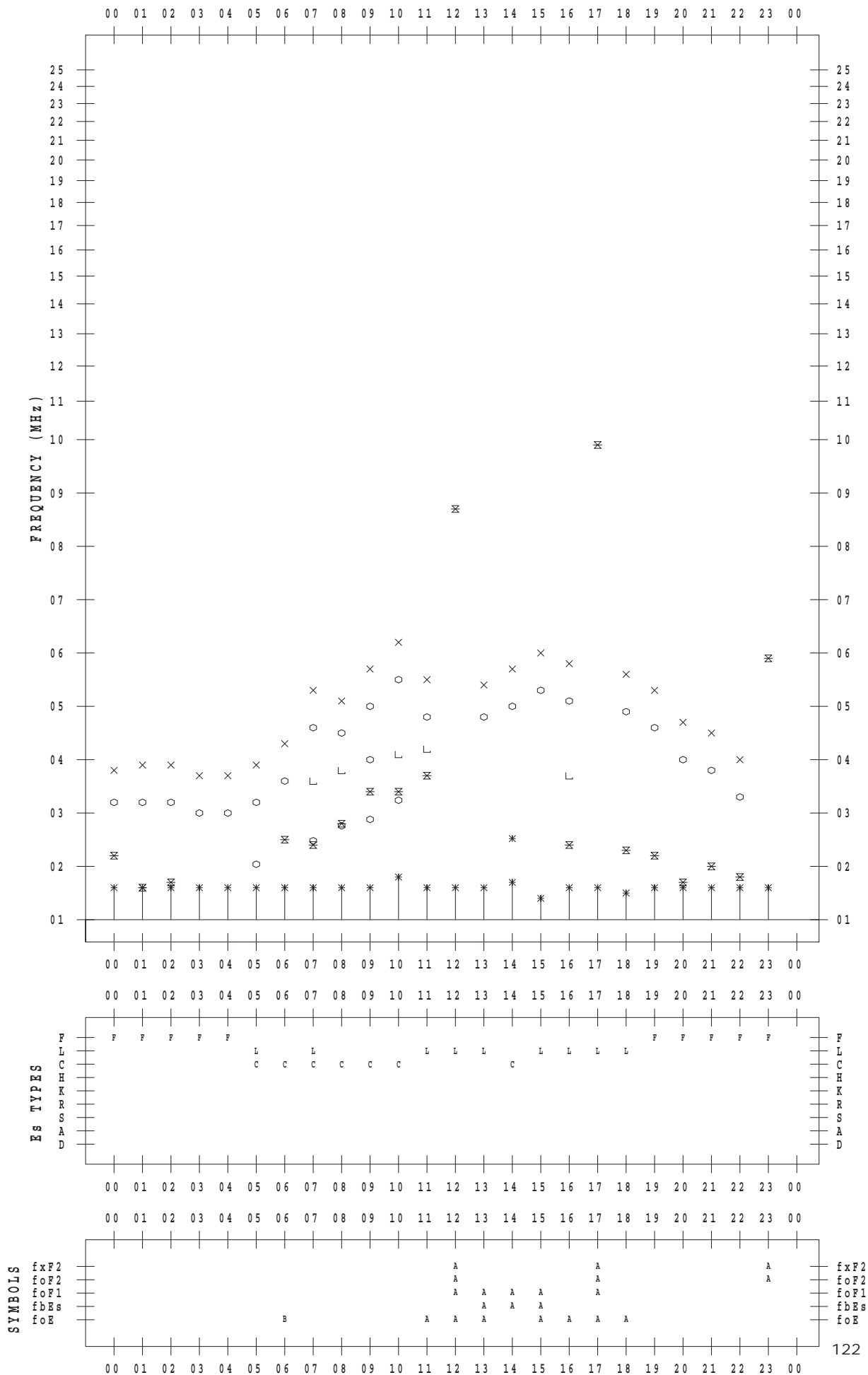
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 15

135 ° E MEAN TIME



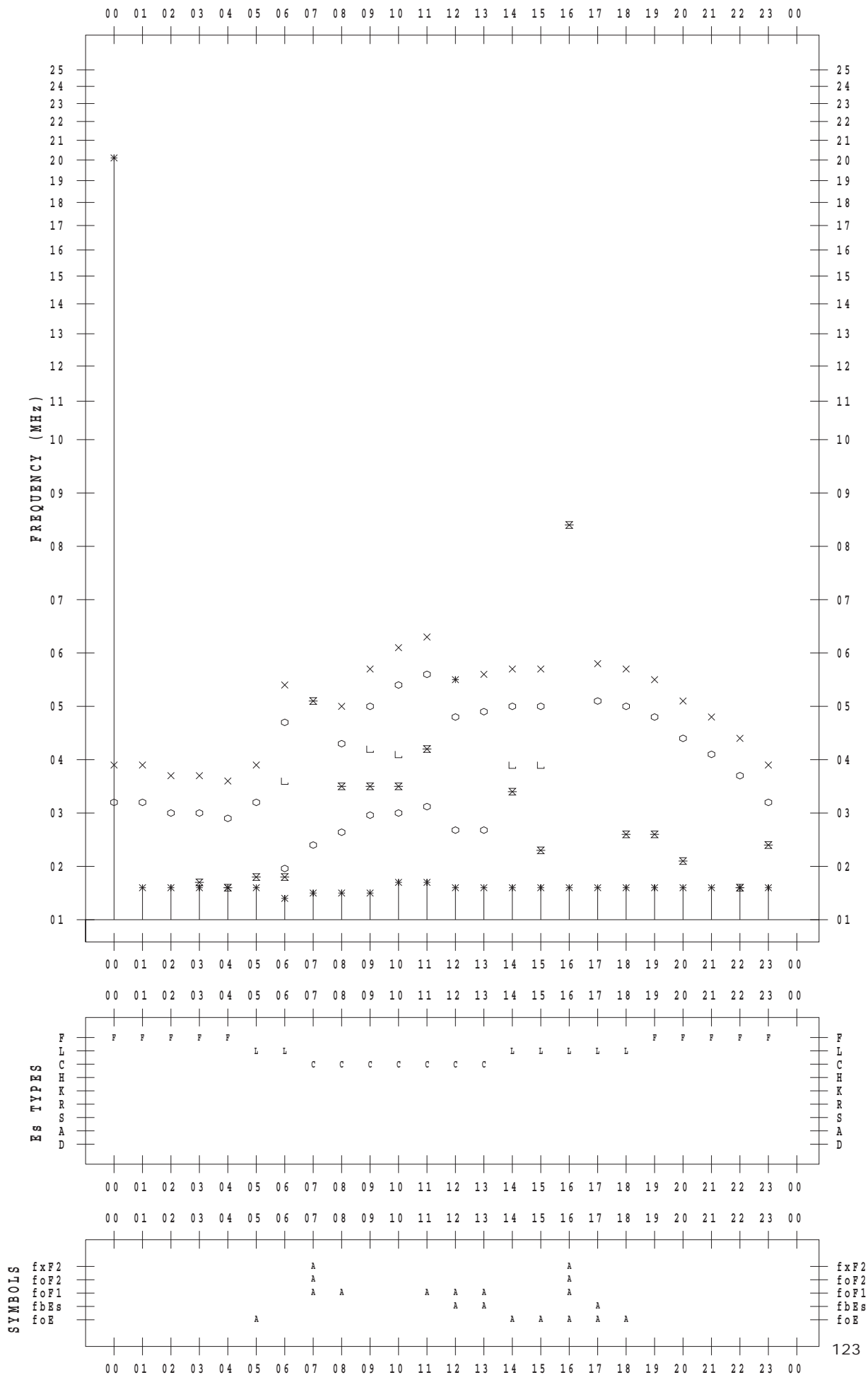
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 16

135 ° E MEAN TIME



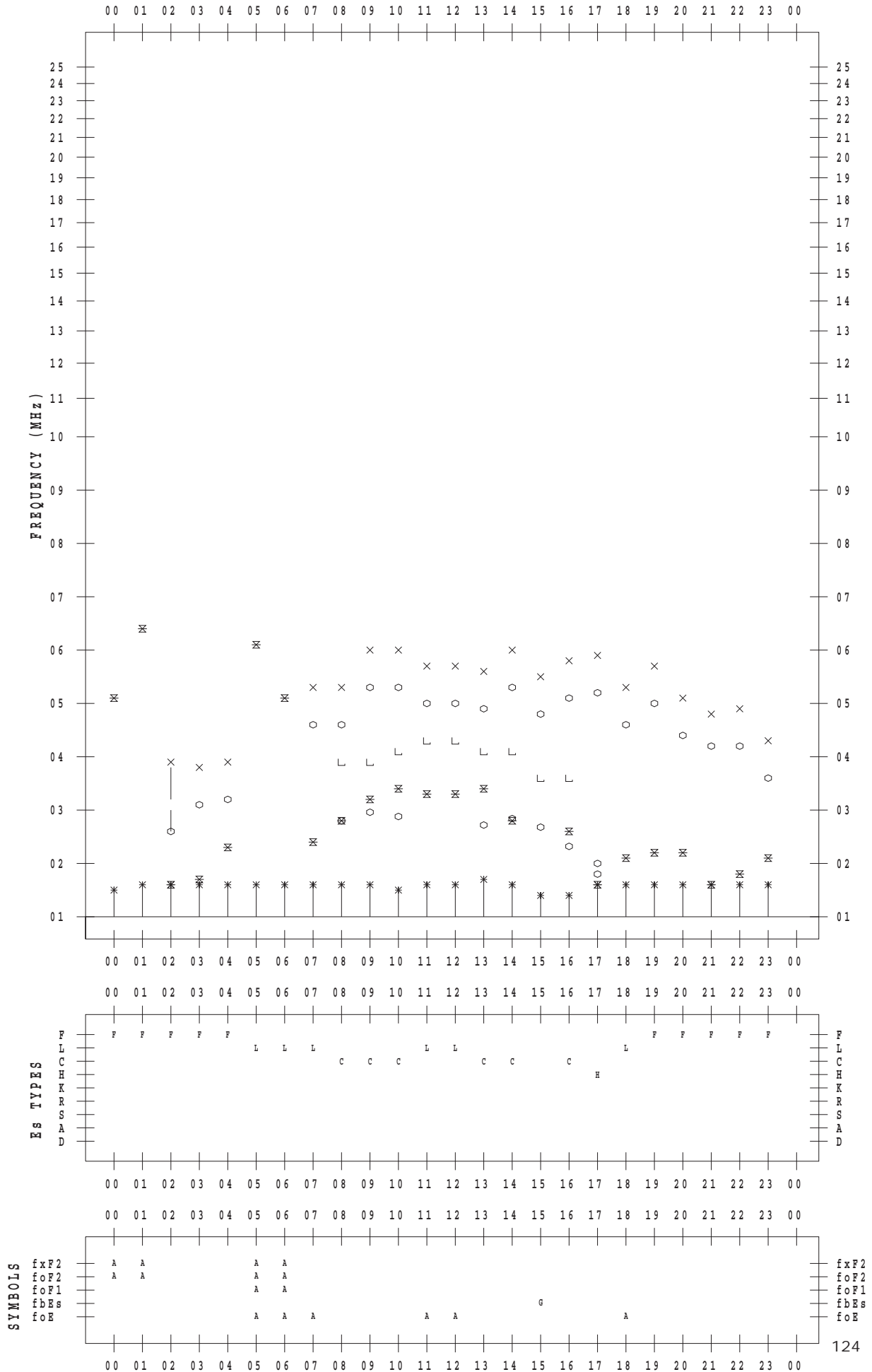
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 17

135 ° E MEAN TIME



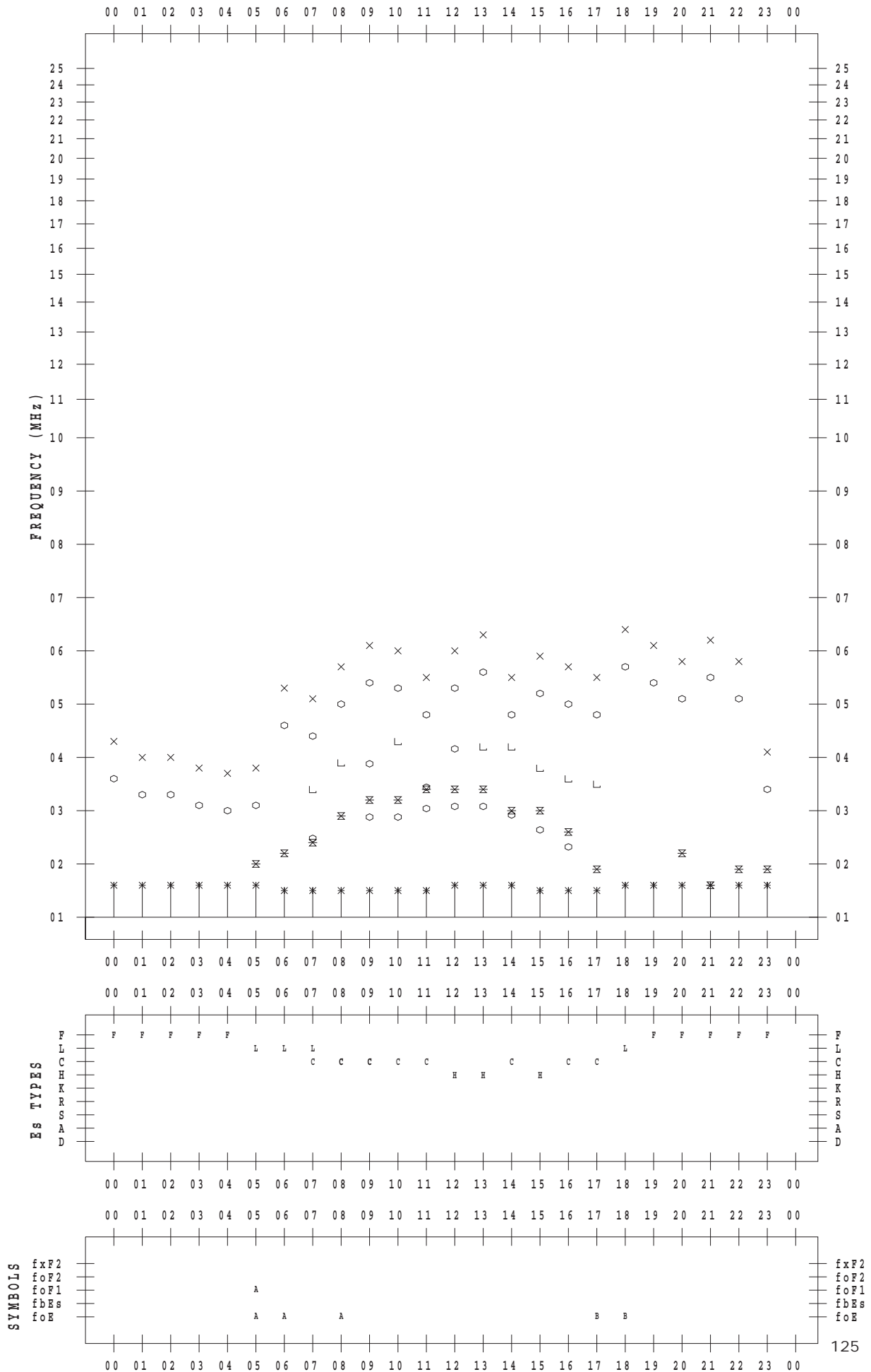
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 18

135 ° E MEAN TIME



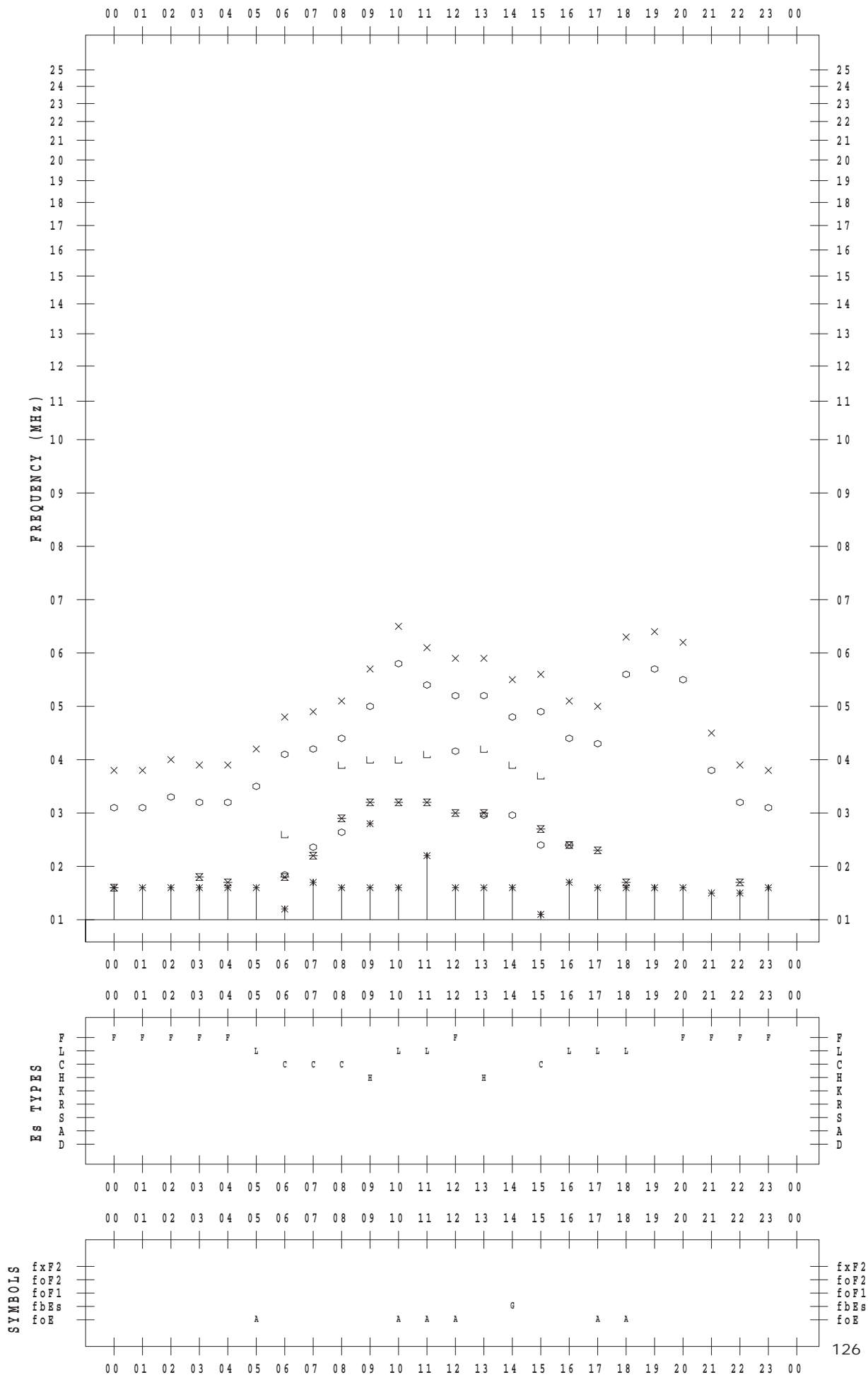
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 19

135 ° E MEAN TIME



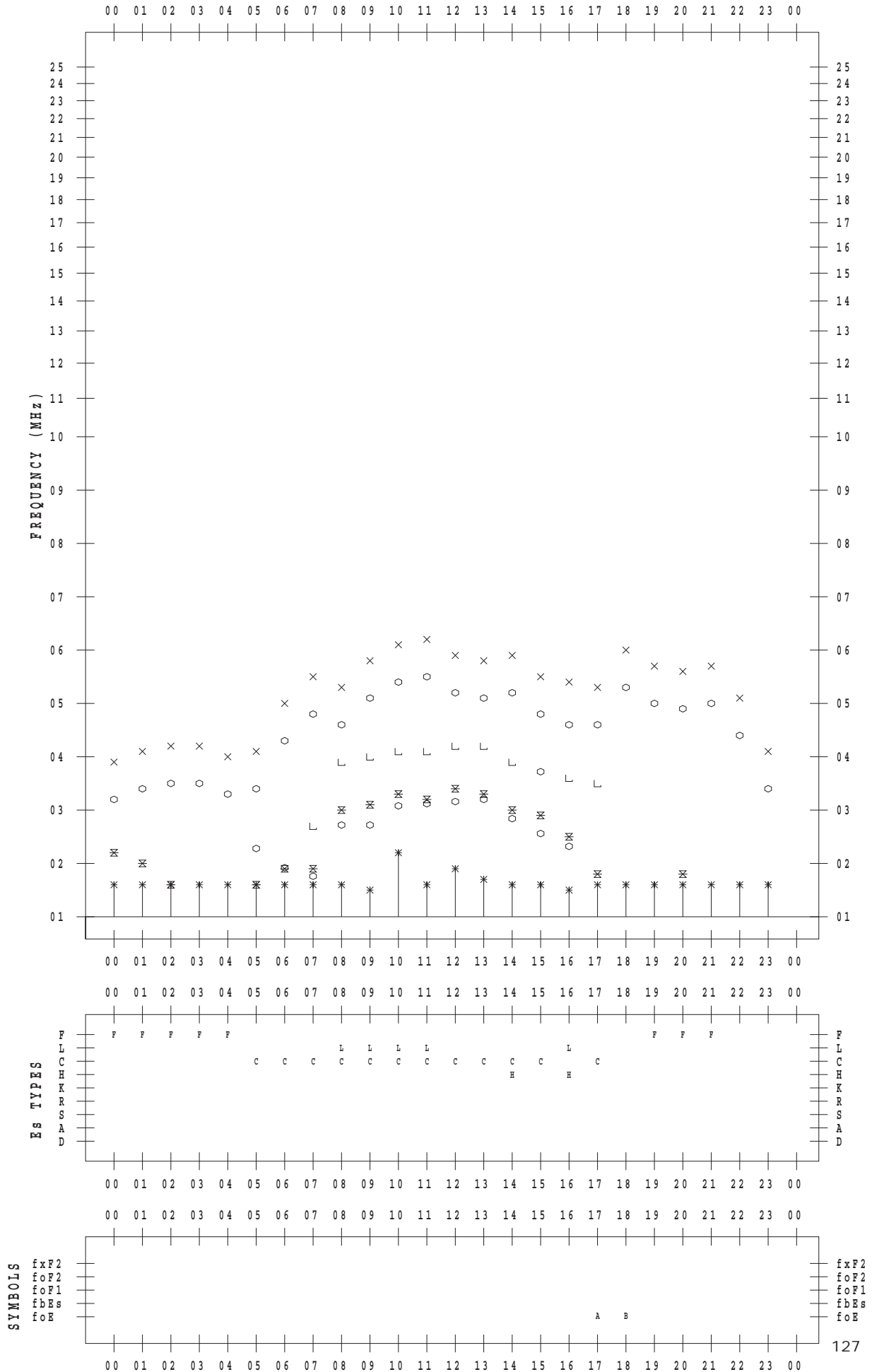
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 20

135 ° E MEAN TIME





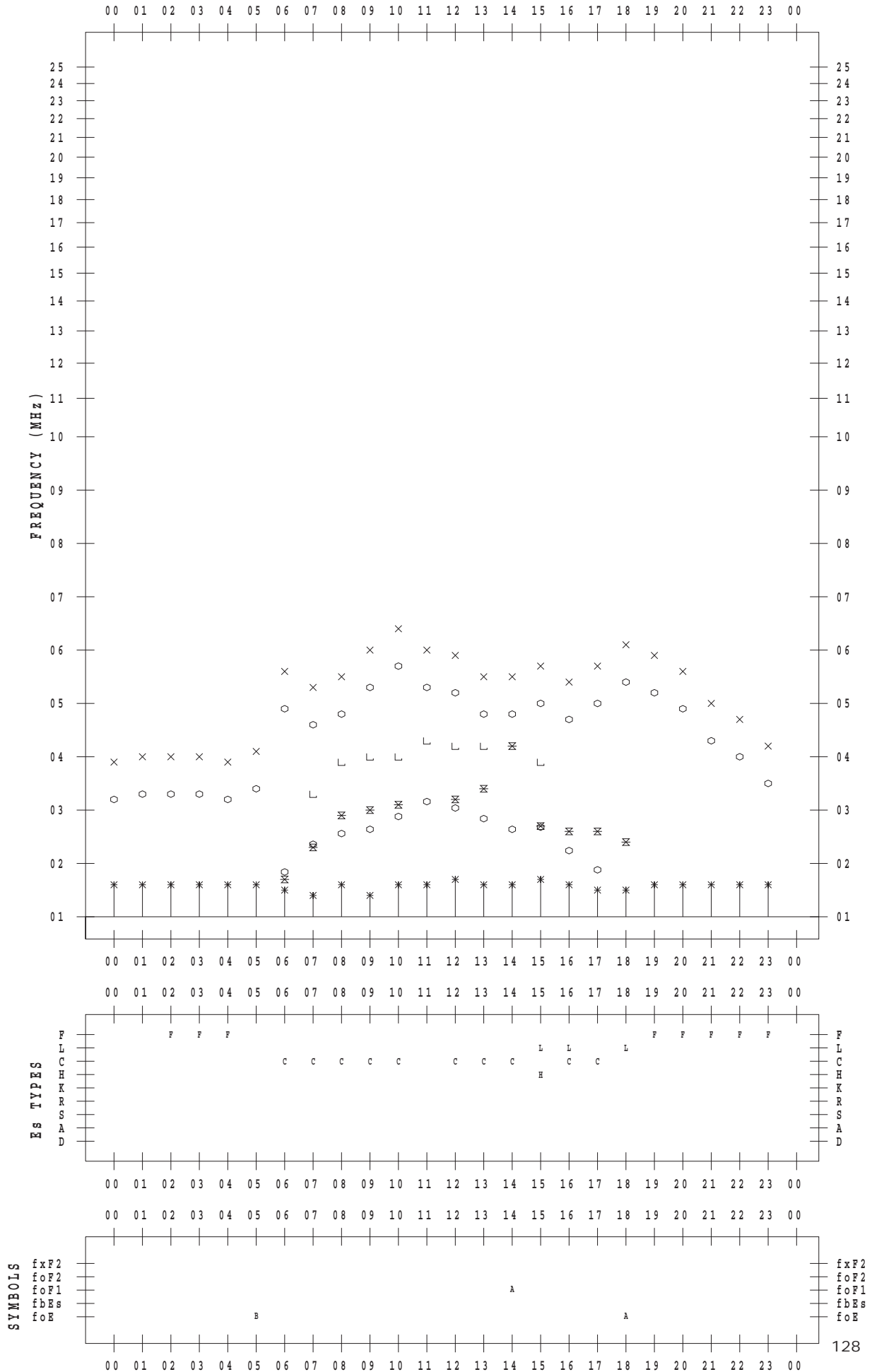
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 21

135 ° E MEAN TIME



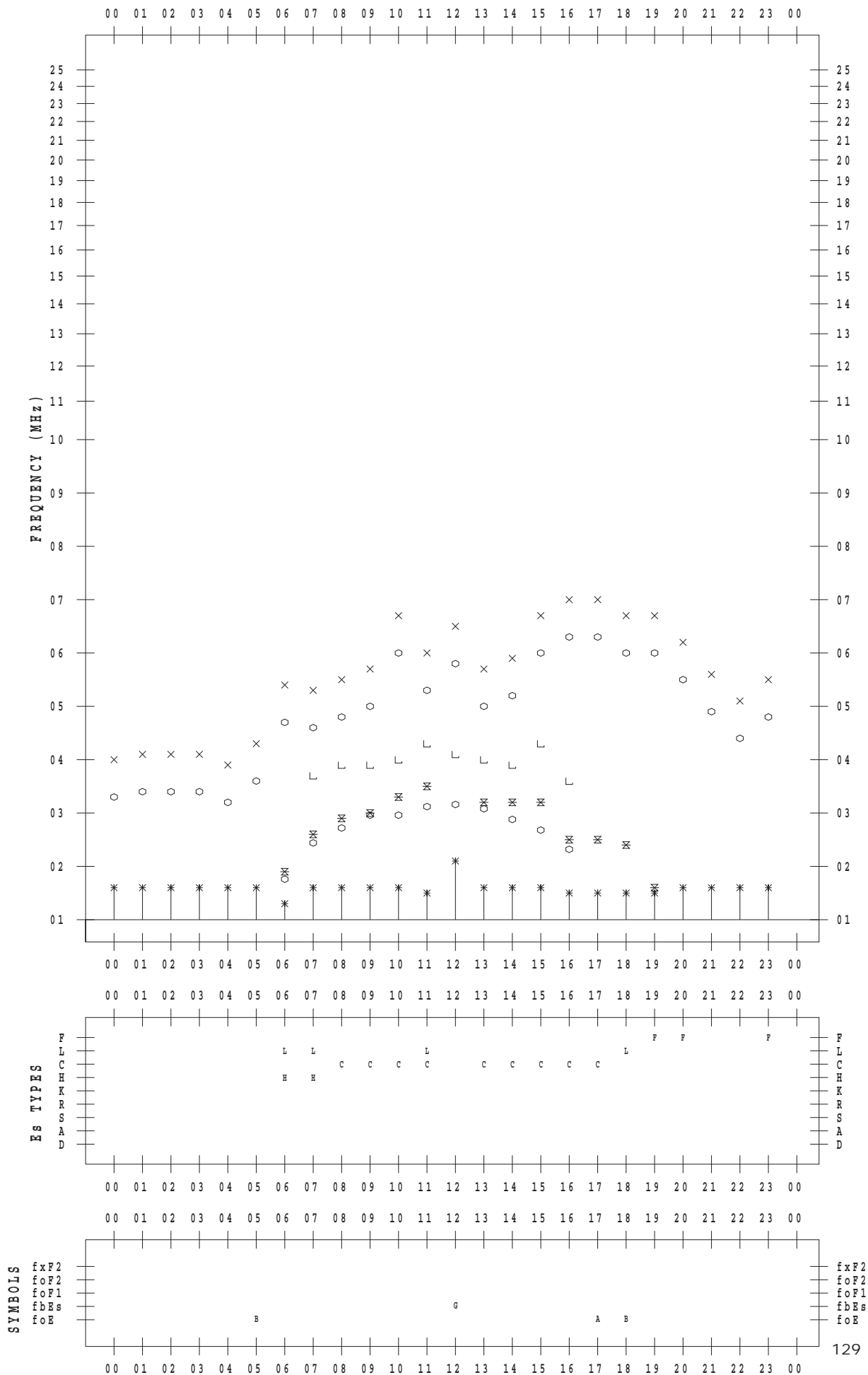
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 22

135 ° E MEAN TIME



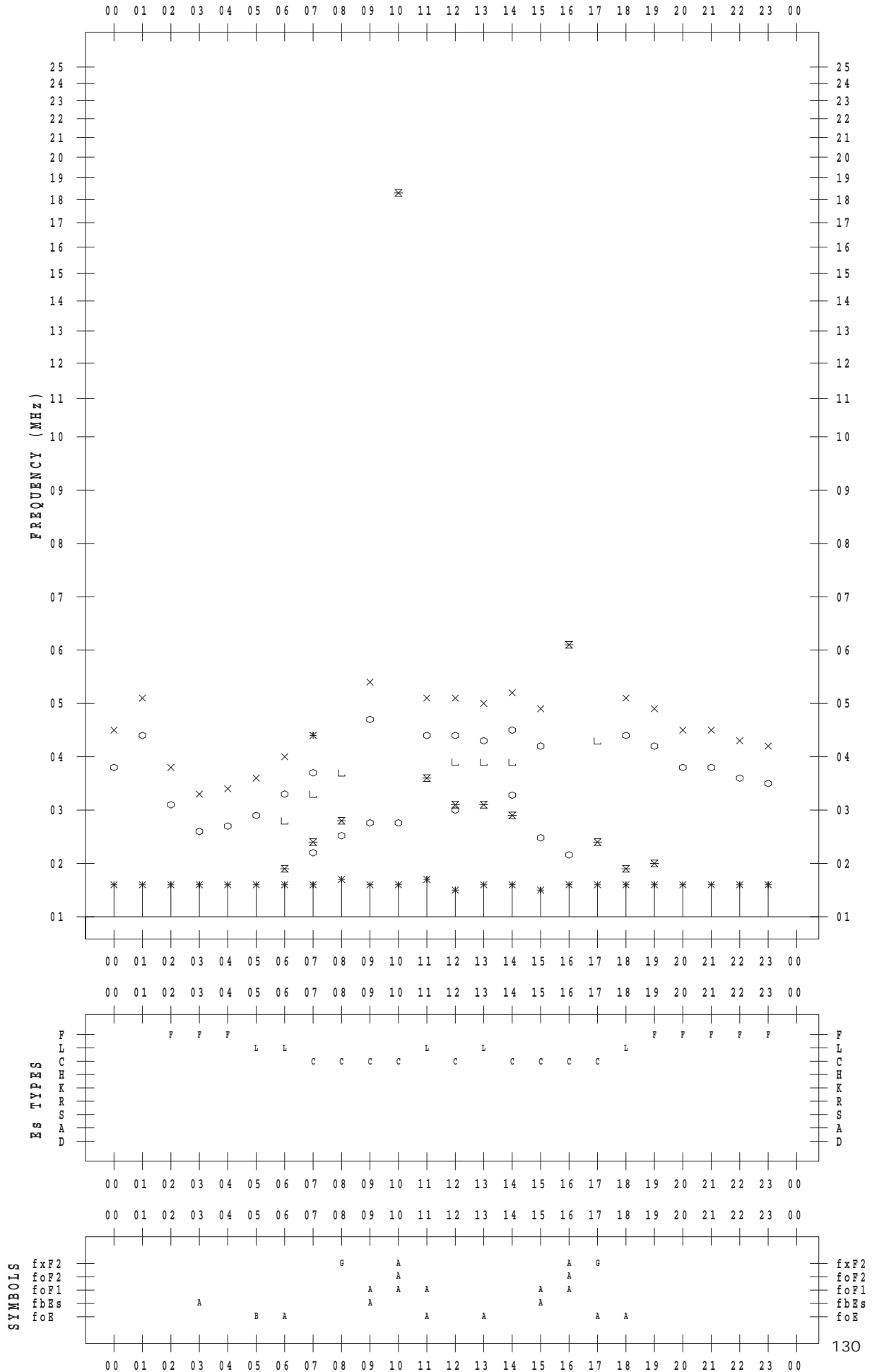
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 23

135 ° E MEAN TIME



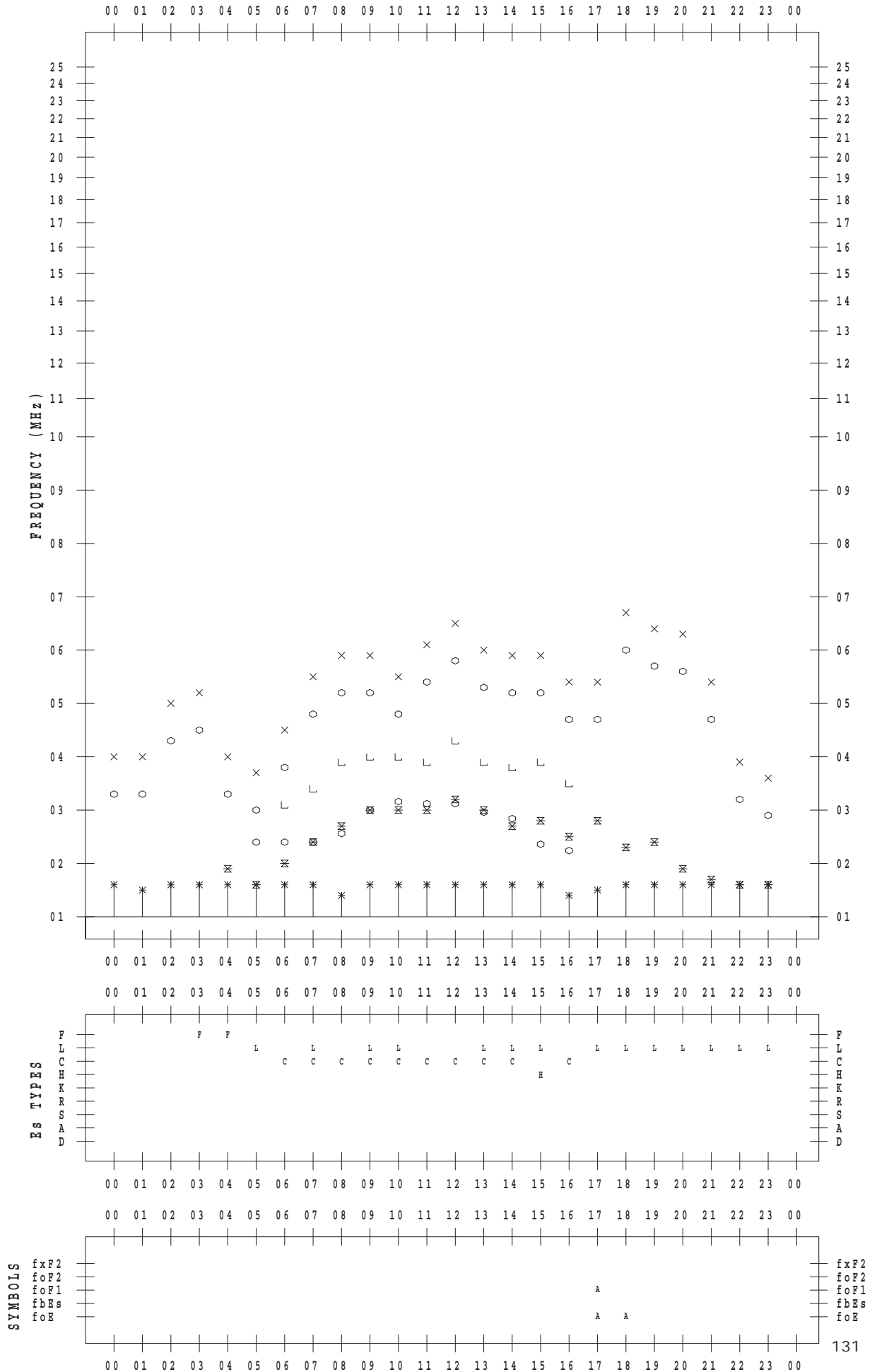
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 24

135 ° E MEAN TIME



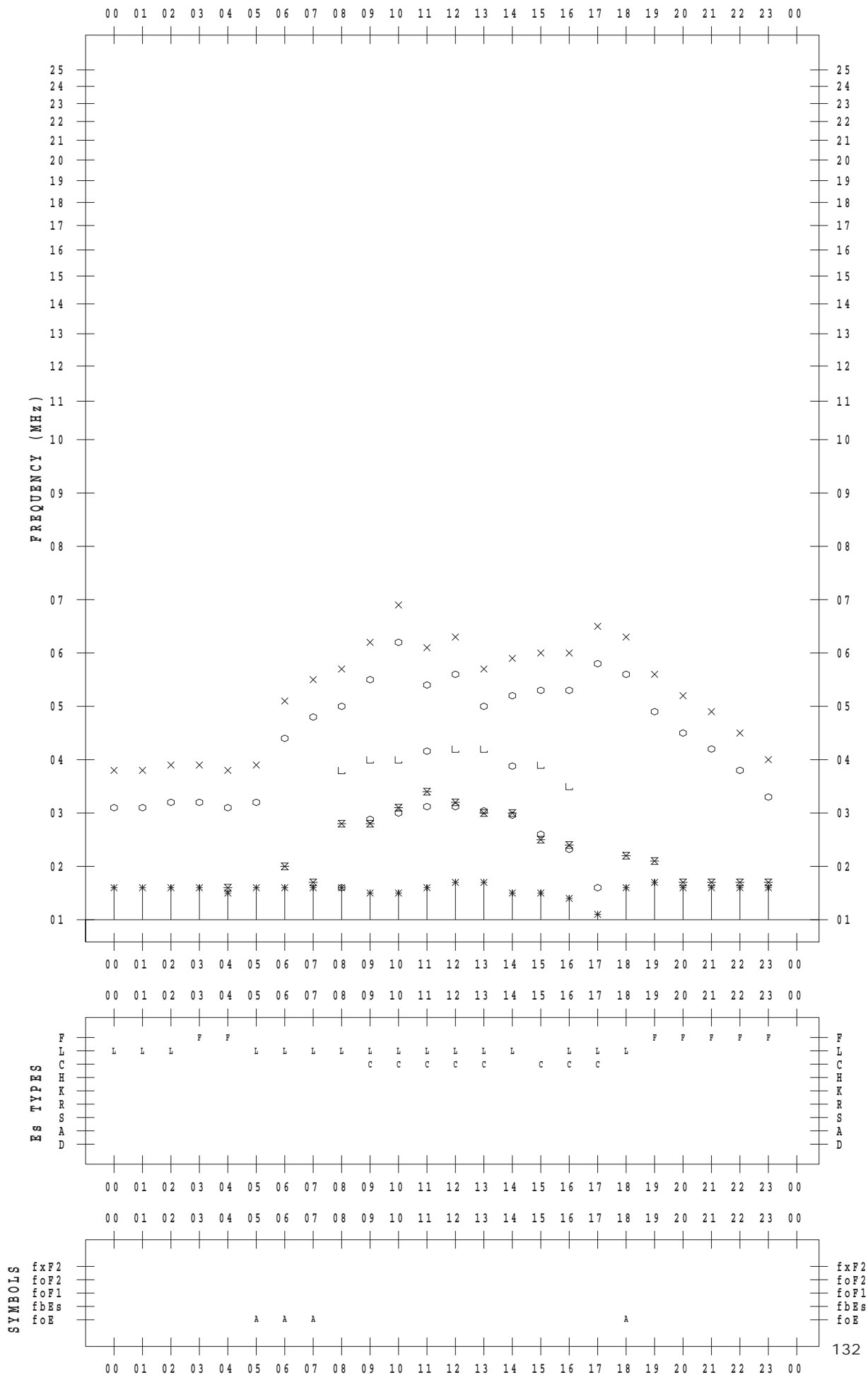
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 25

135 ° E MEAN TIME



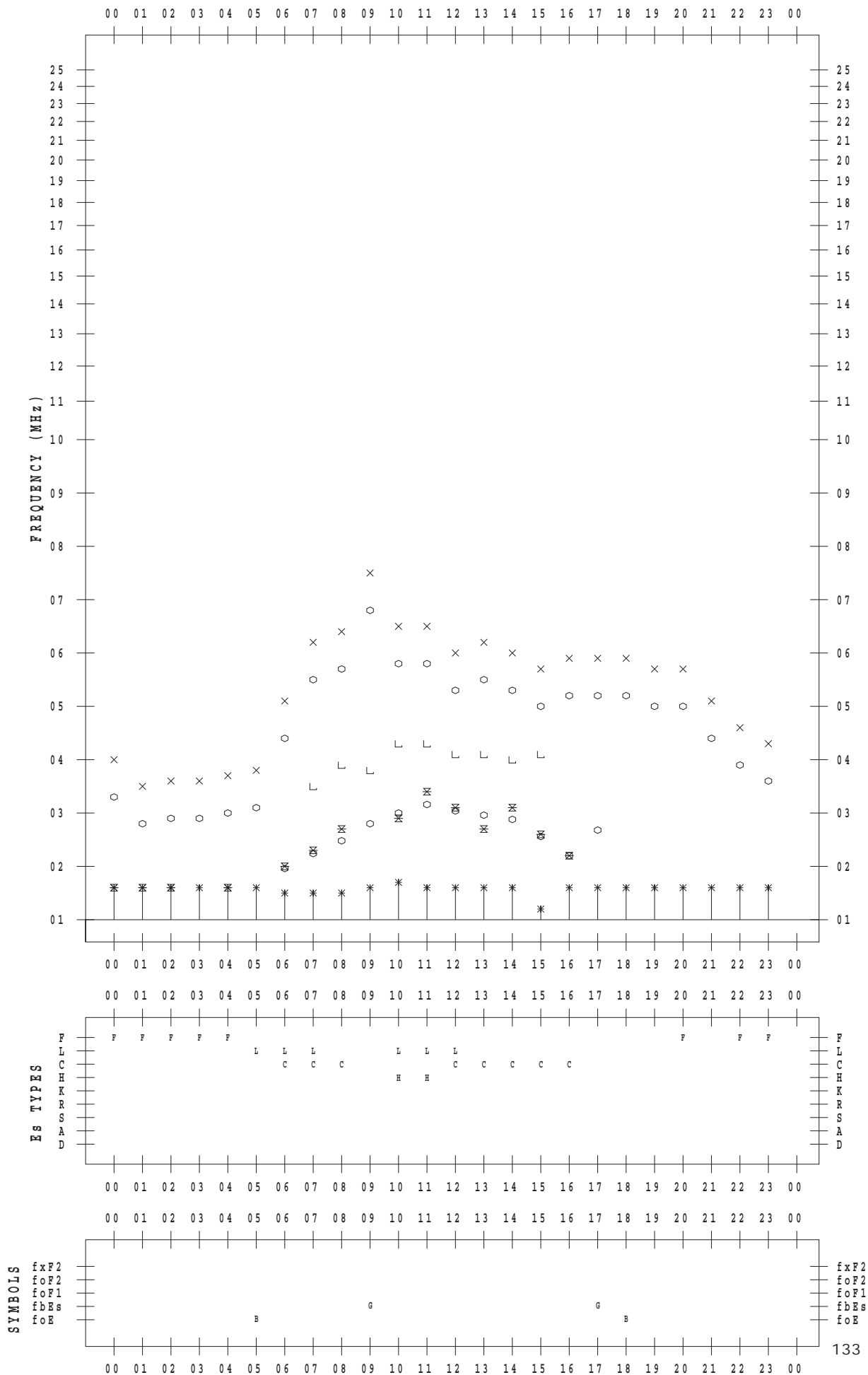
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 26

135 ° E MEAN TIME



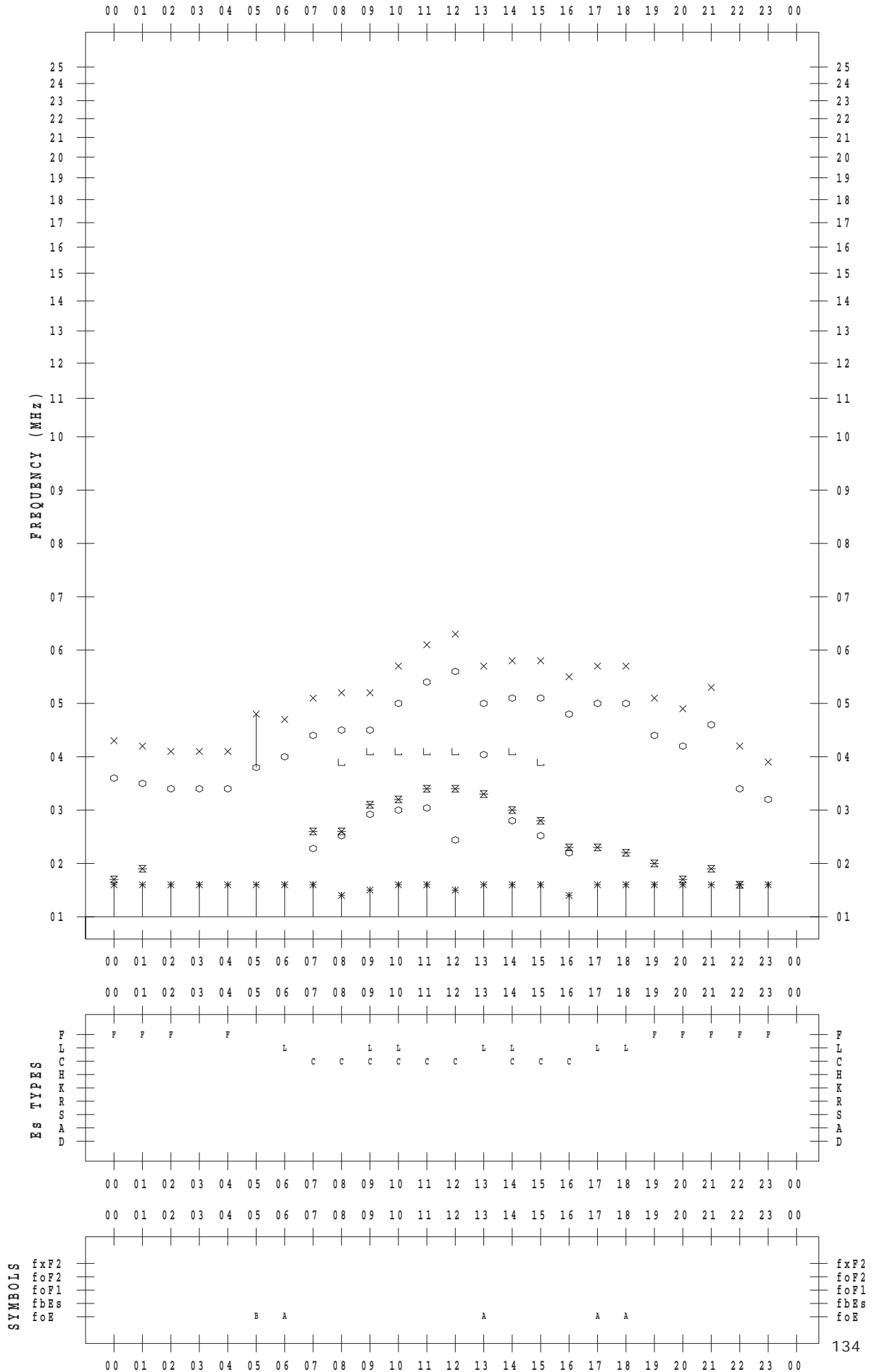
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 27

135 ° E MEAN TIME



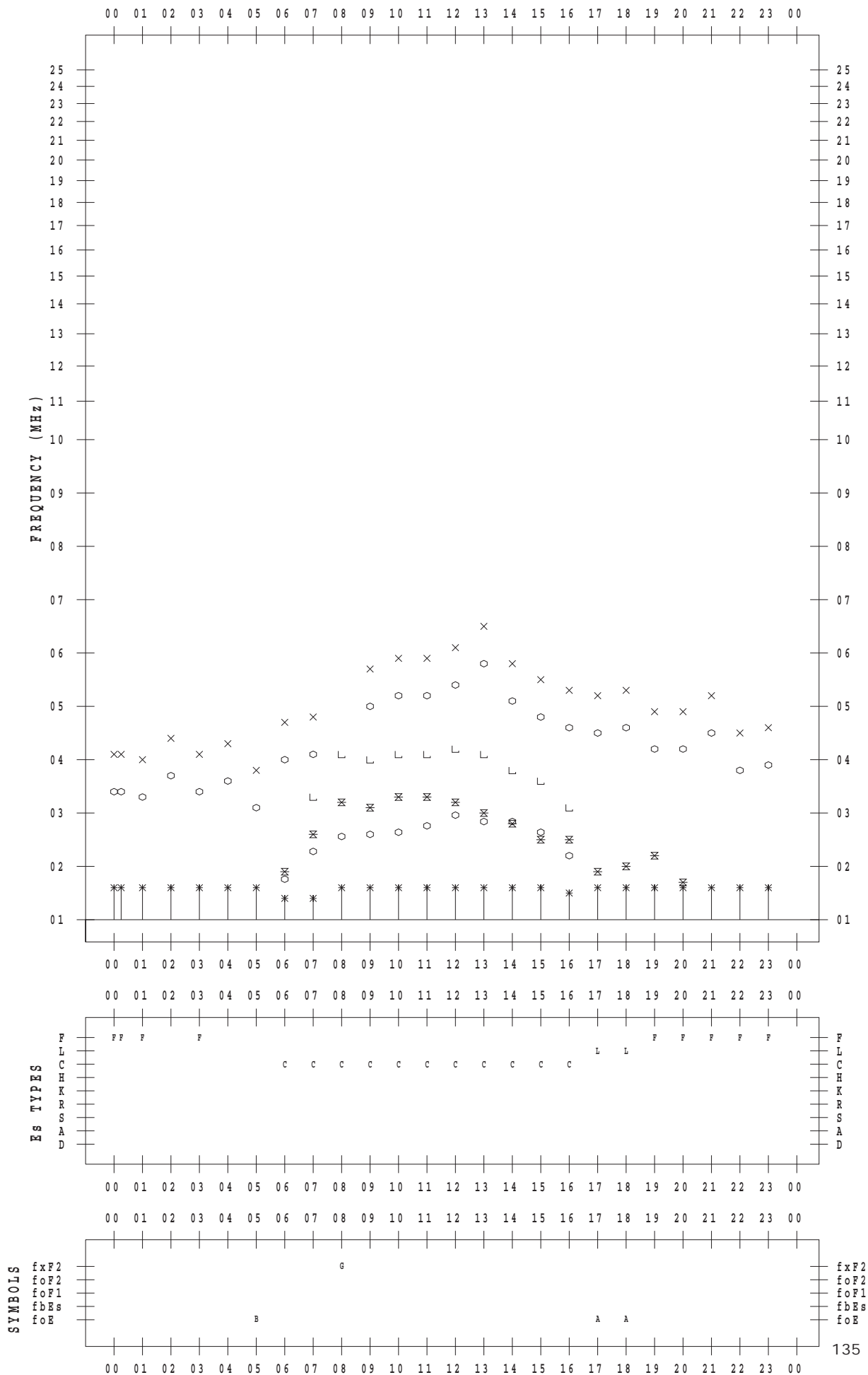
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 28

135 ° E MEAN TIME





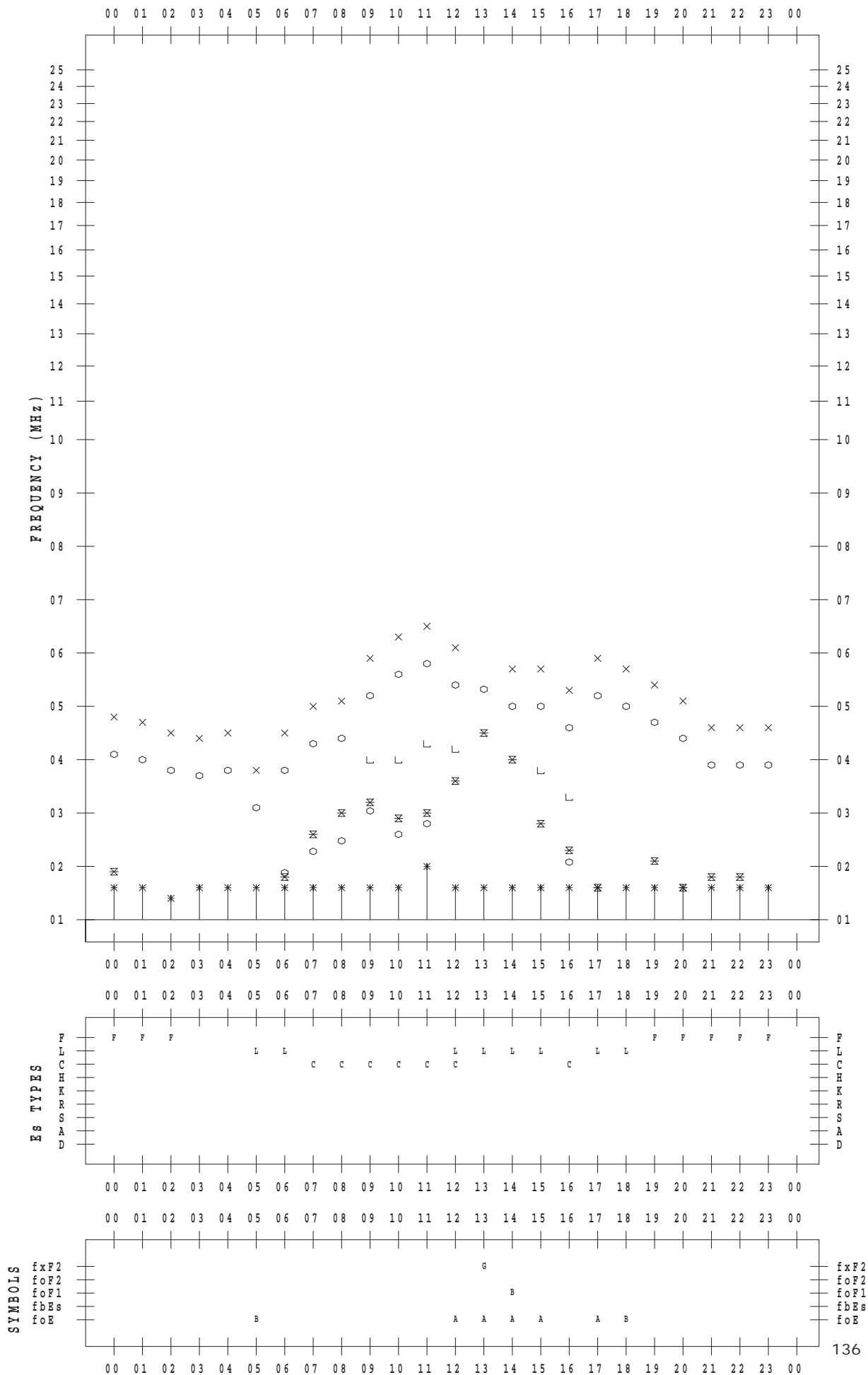
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 29

135 ° E MEAN TIME



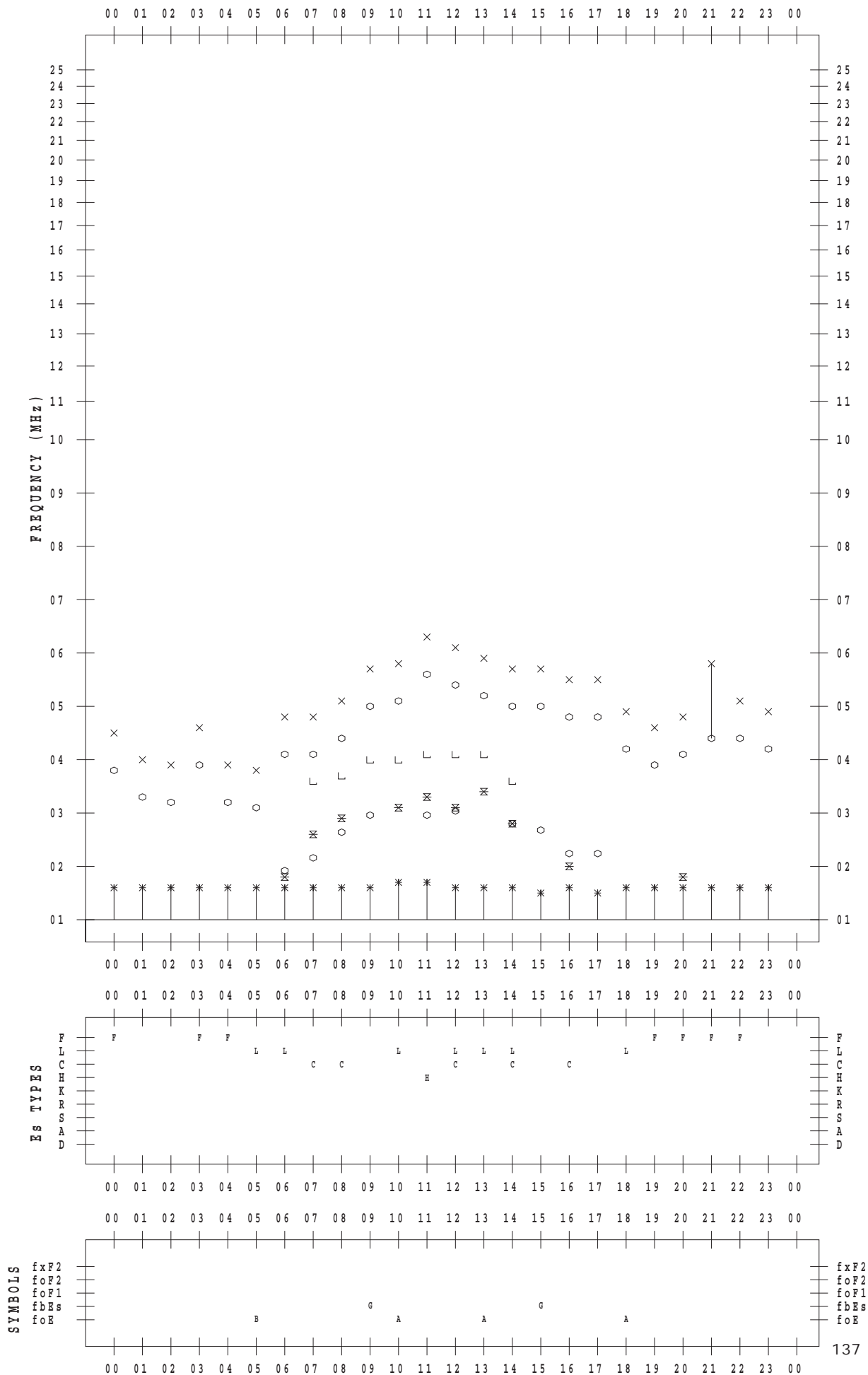
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 9 / 30

135 ° E MEAN TIME



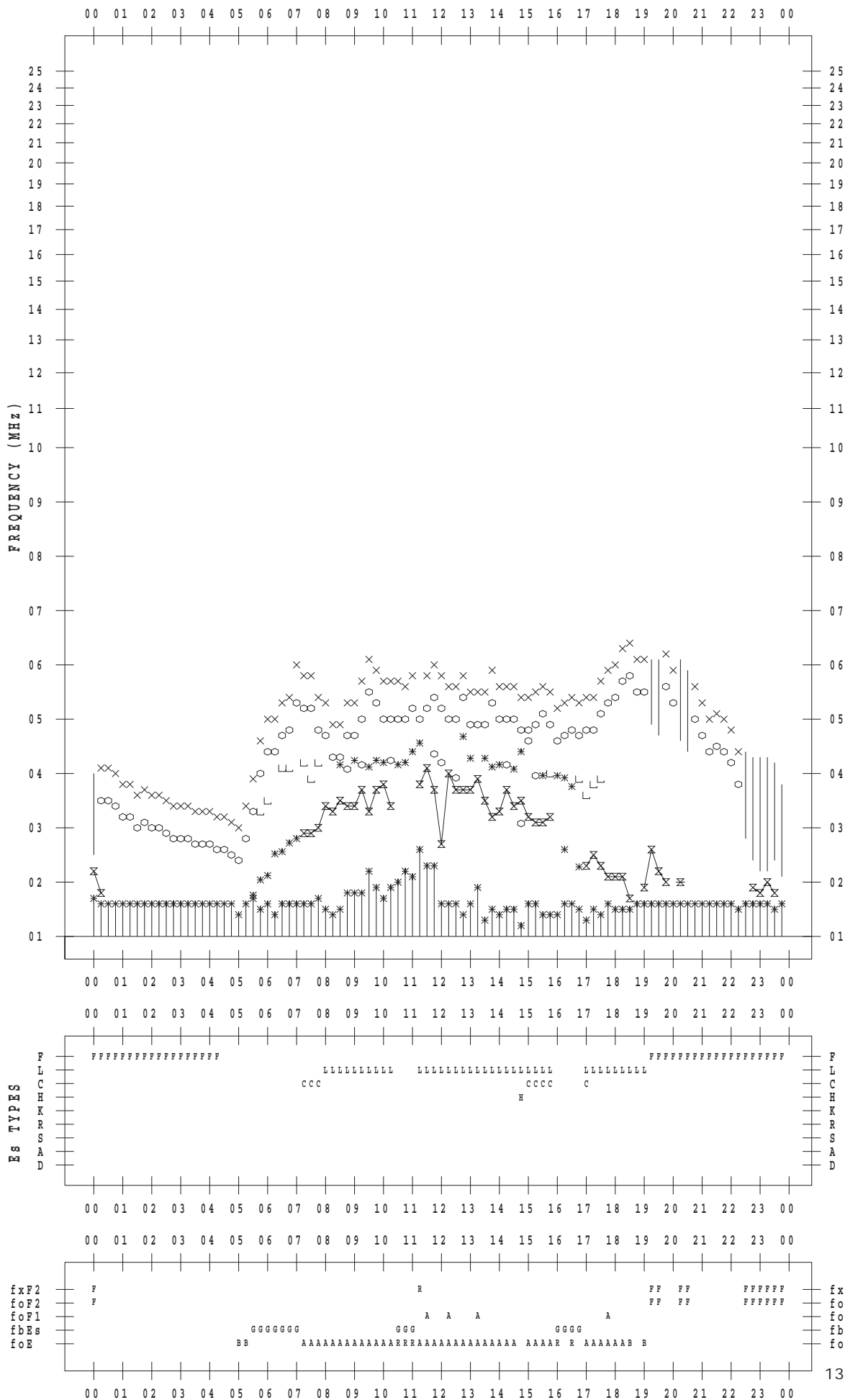
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 1

135 ° E MEAN TIME



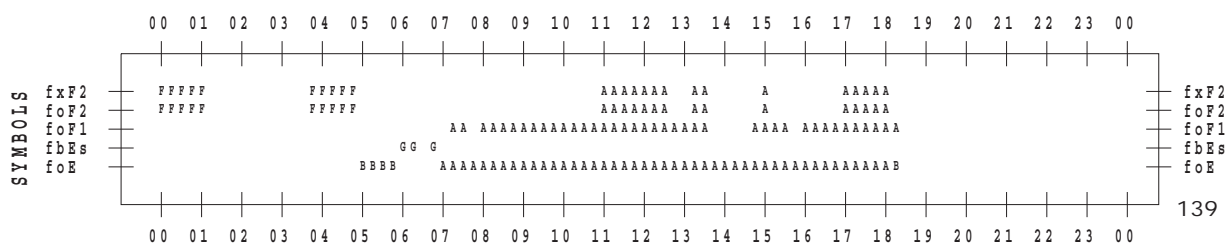
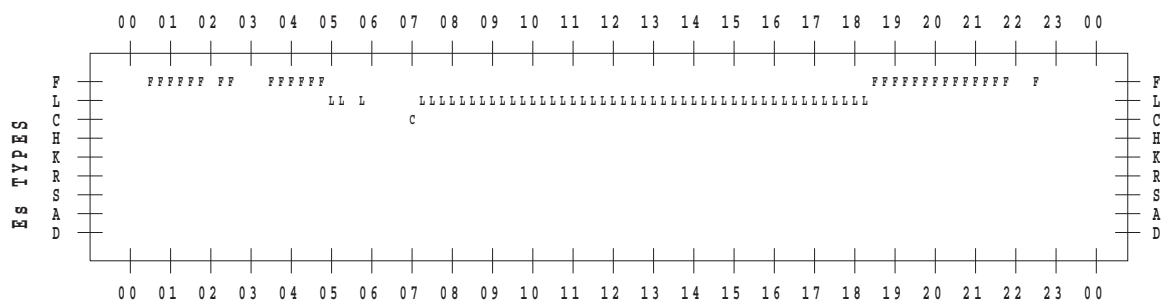
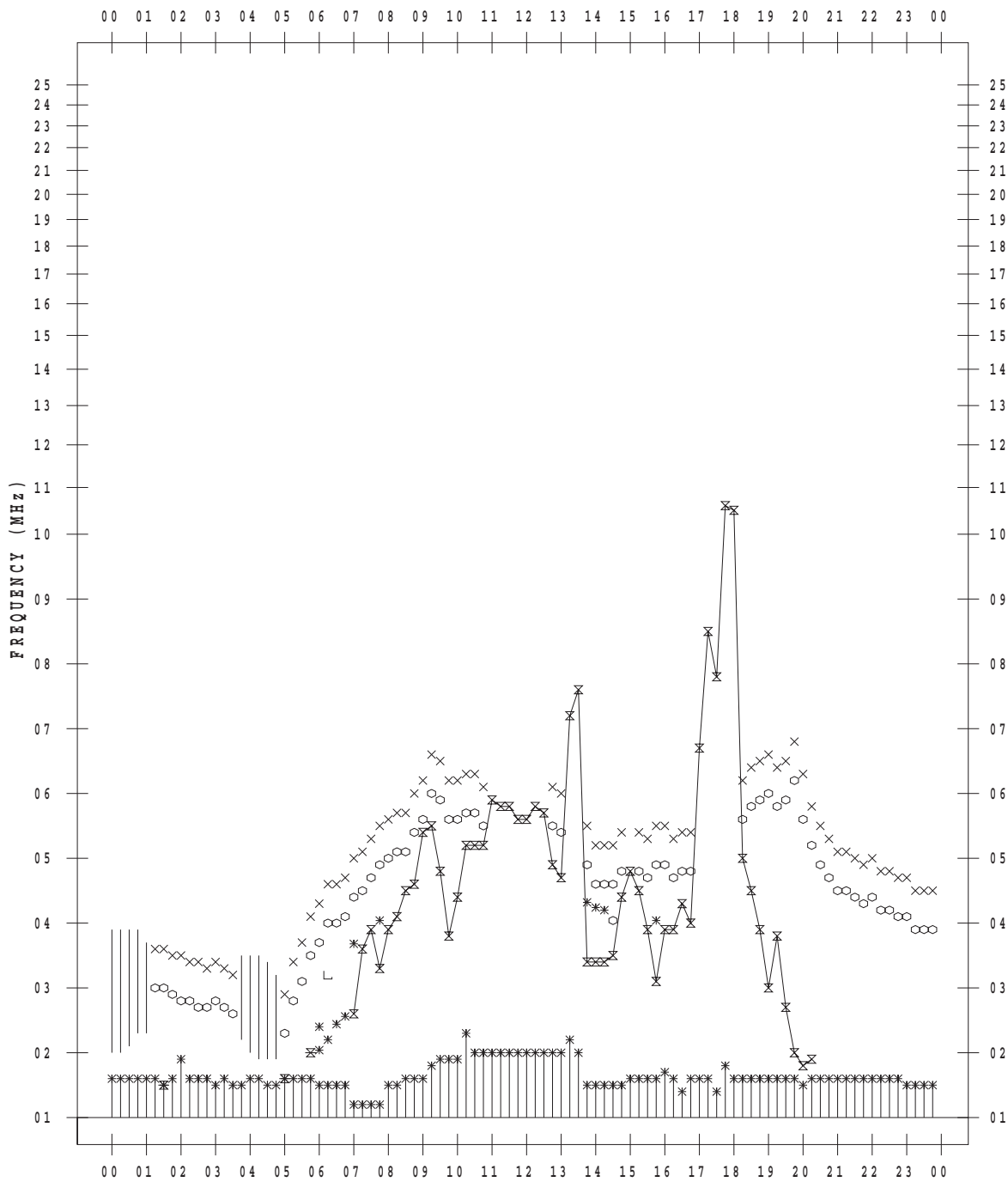
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 2

135 ° E MEAN TIME





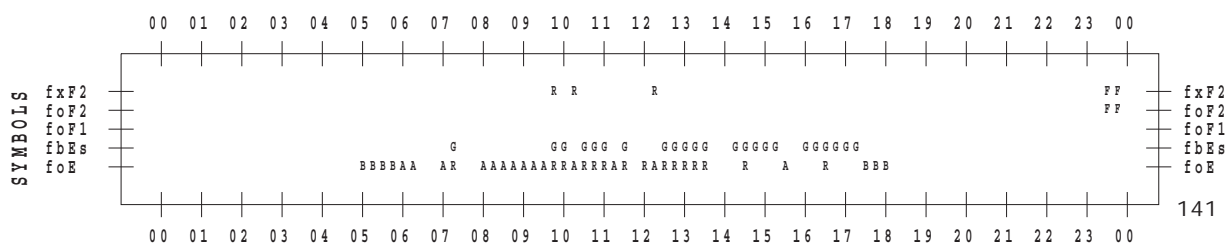
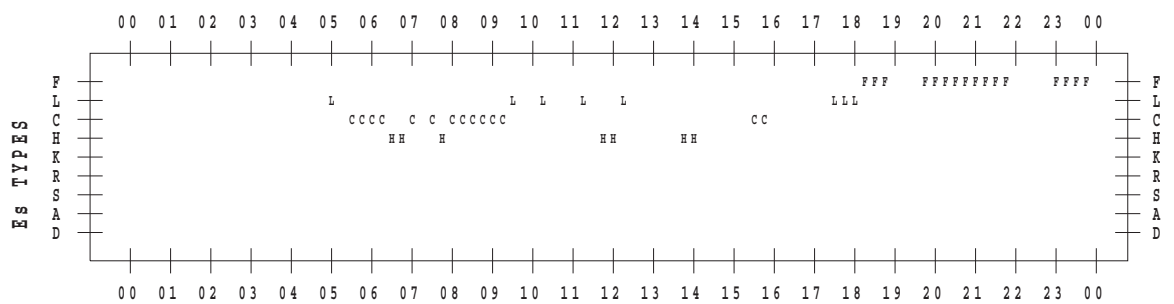
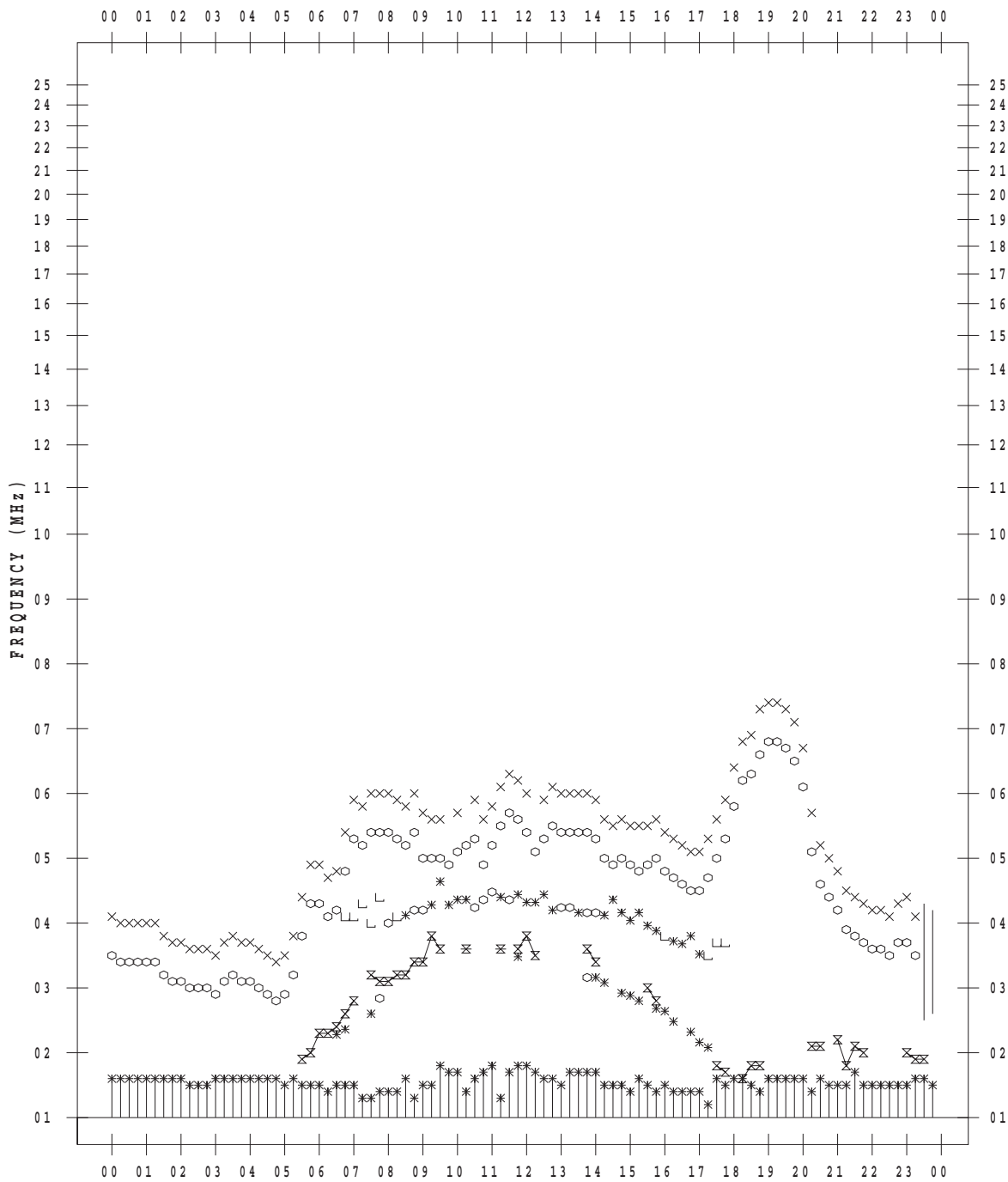
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 4

135 ° E MEAN TIME



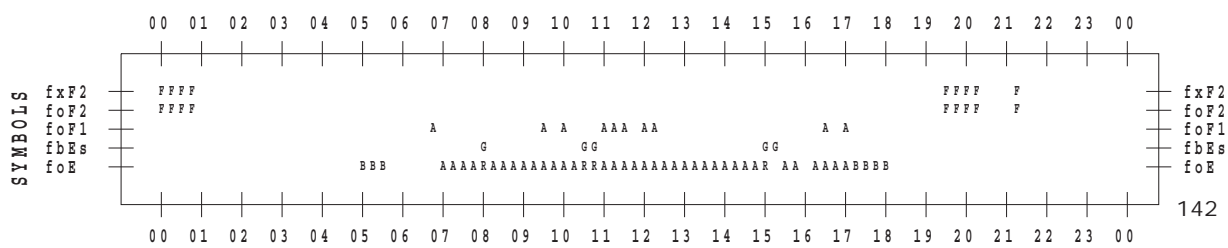
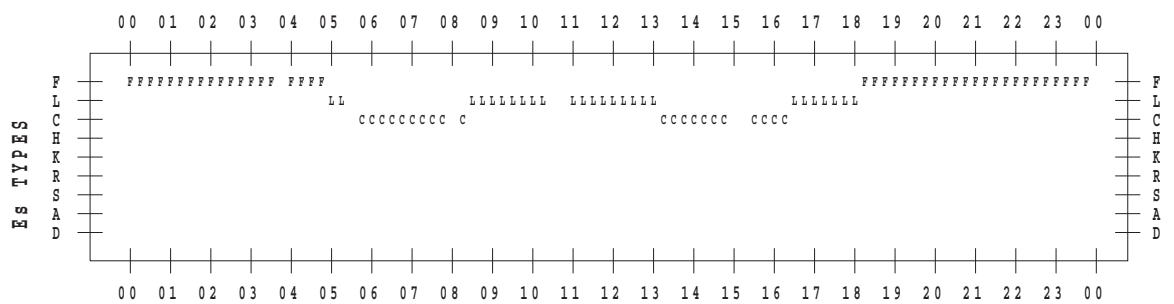
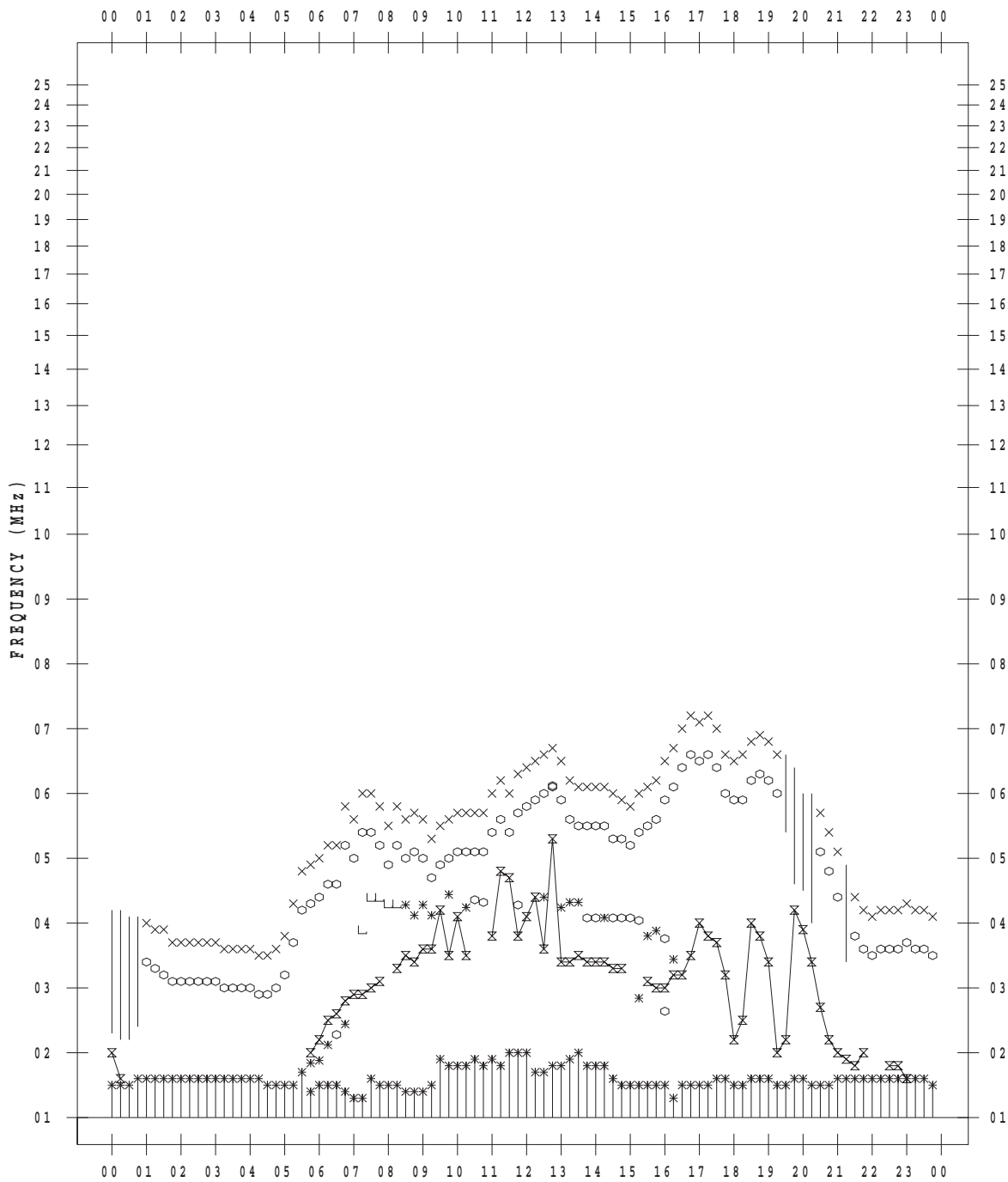
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 5

135 ° E MEAN TIME



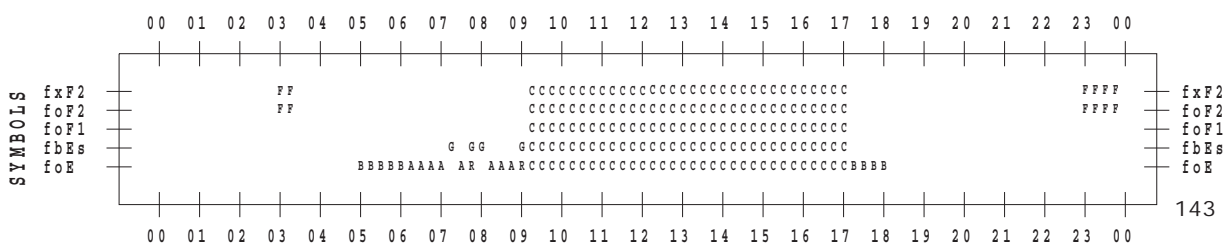
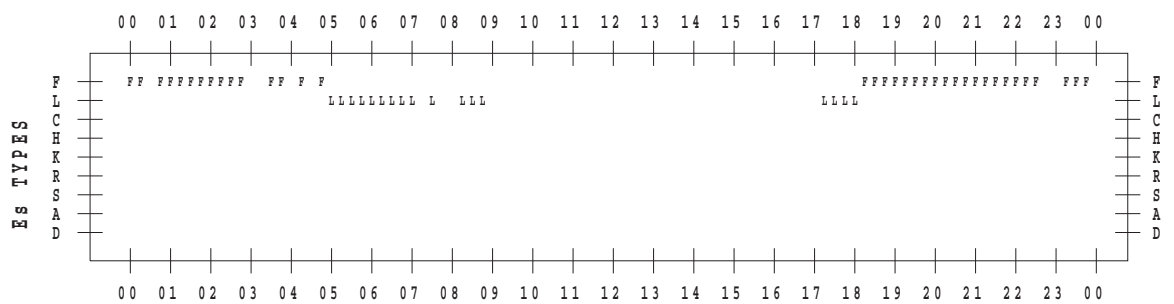
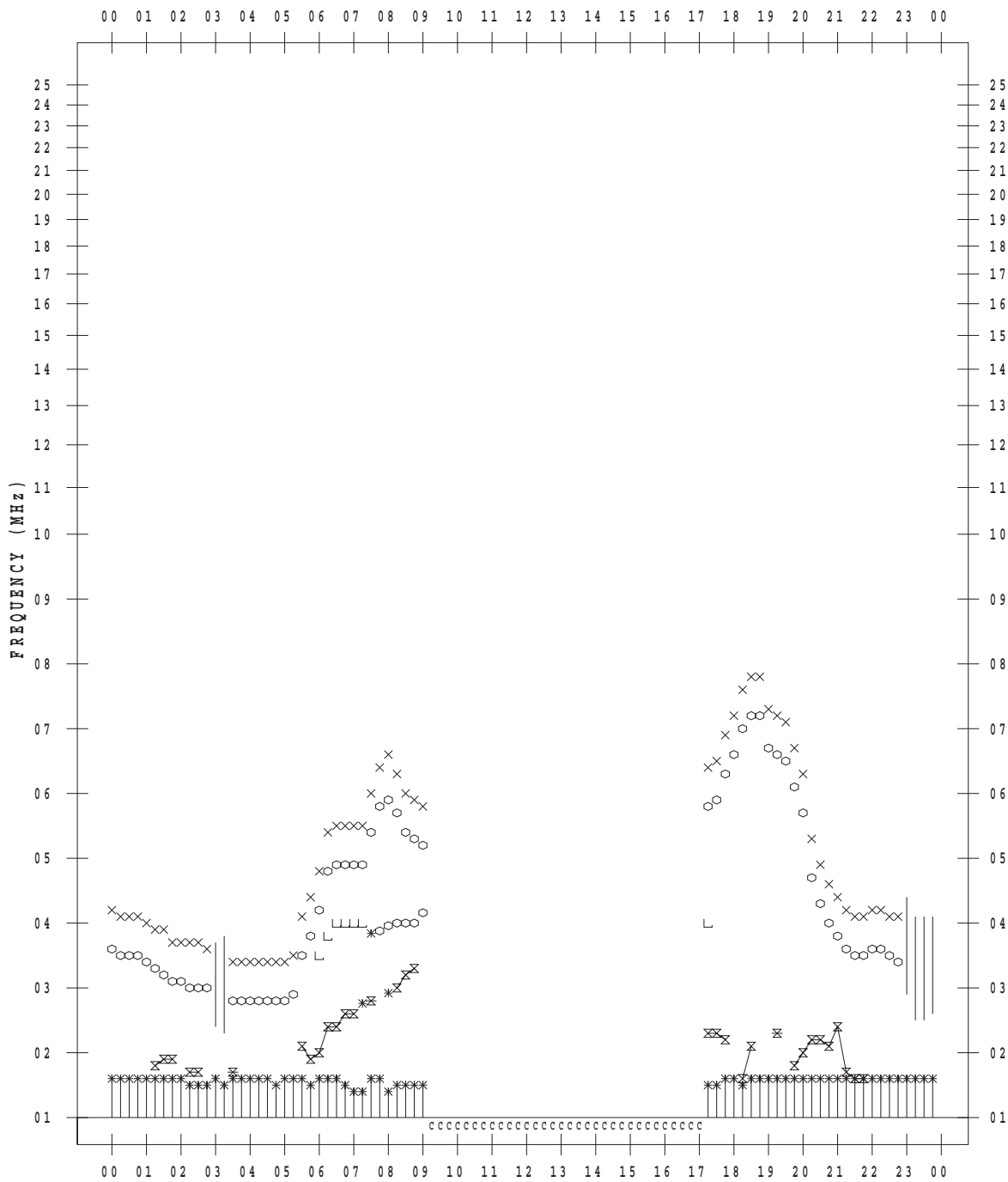
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 6

135 ° E MEAN TIME







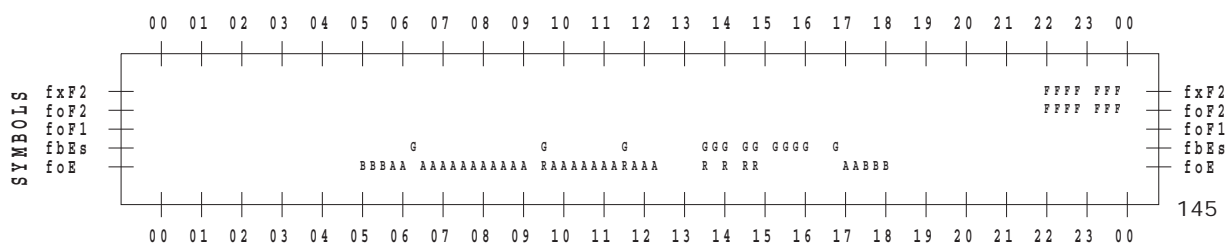
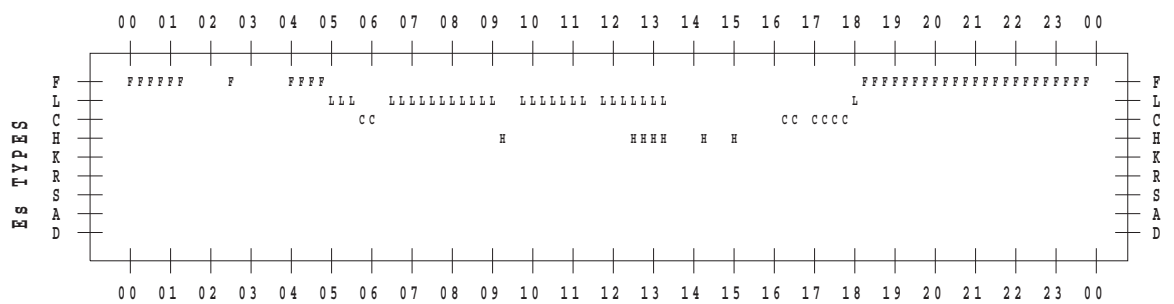
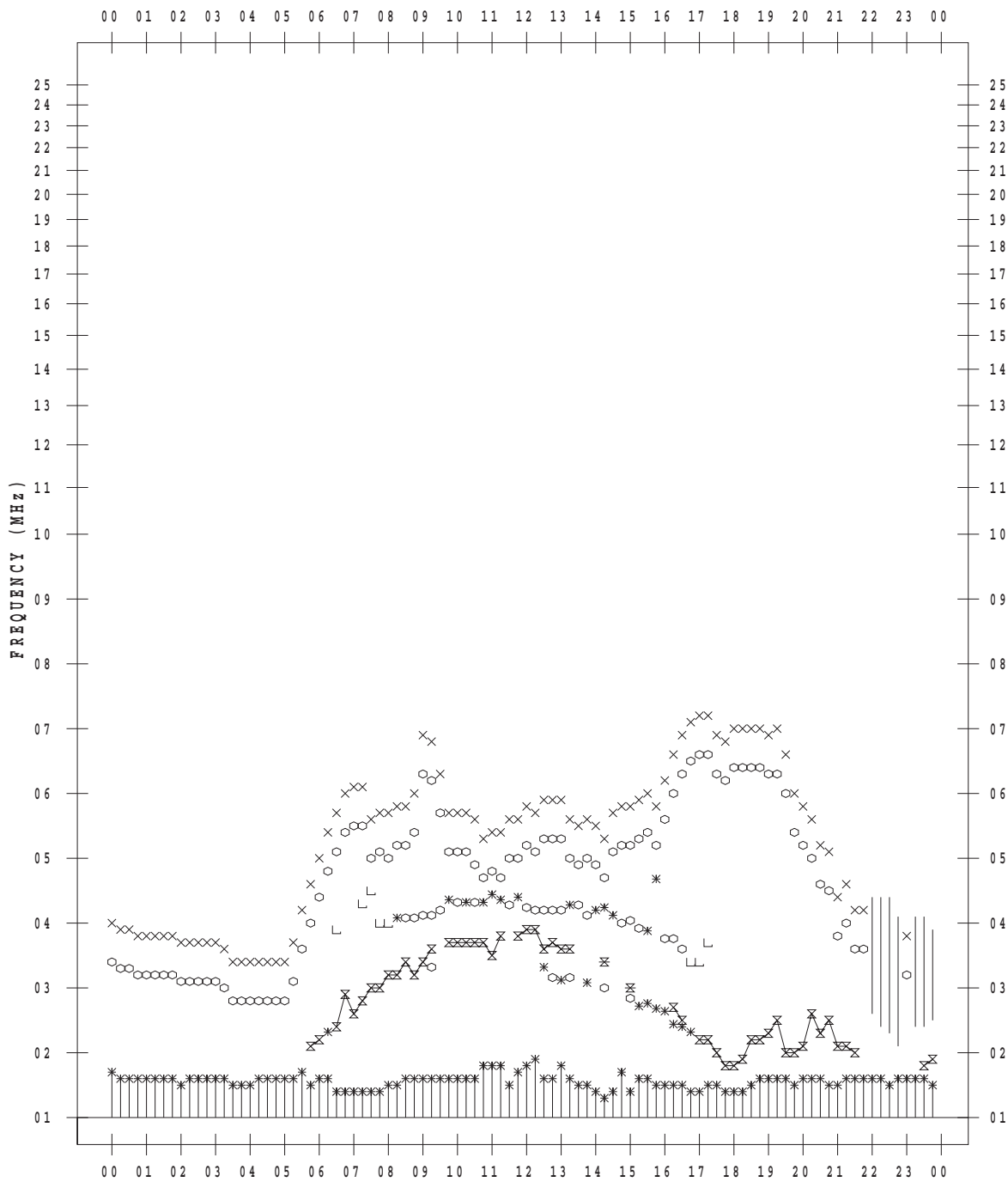
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 8

135 ° E MEAN TIME





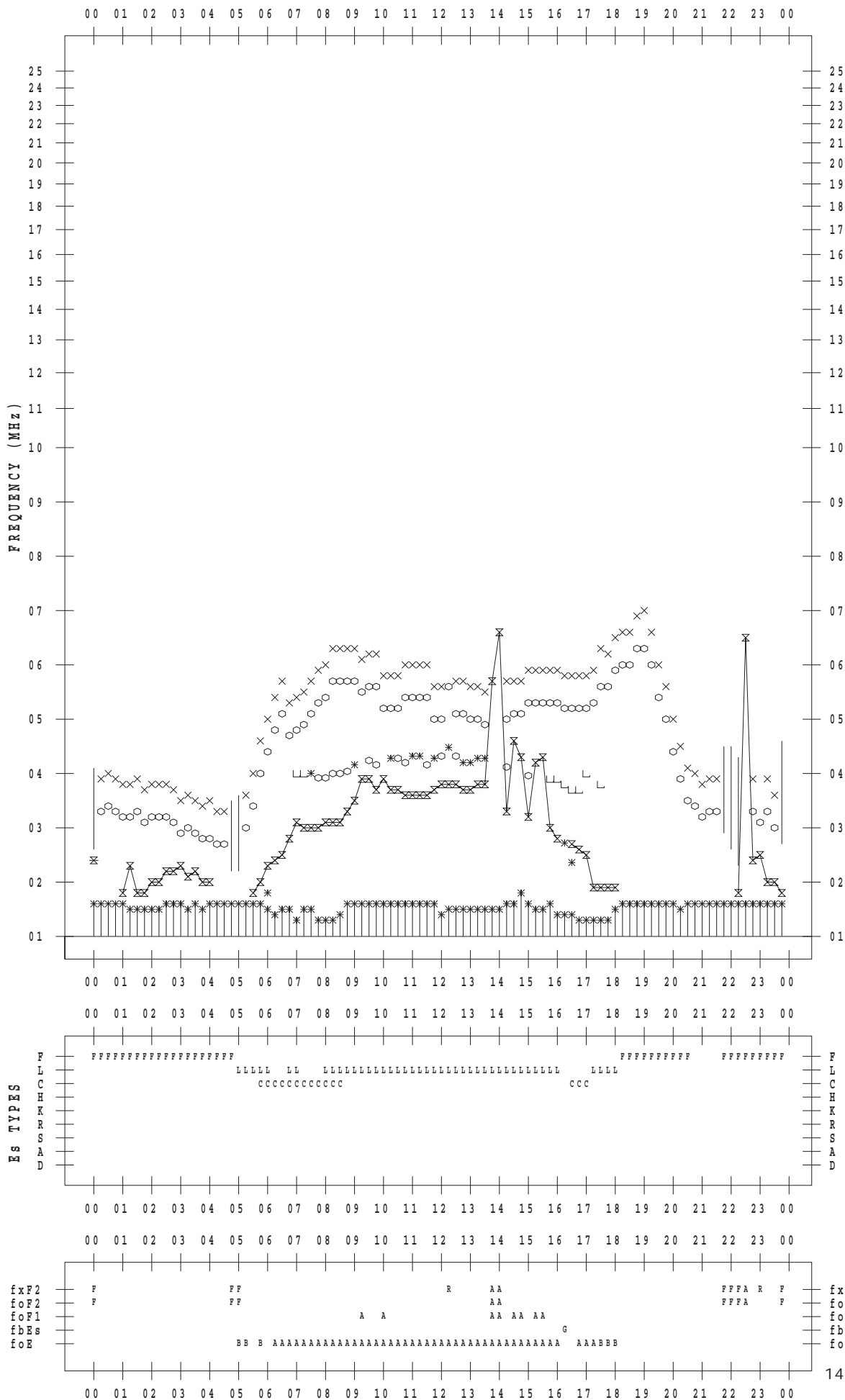
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 10

135 ° E MEAN TIME



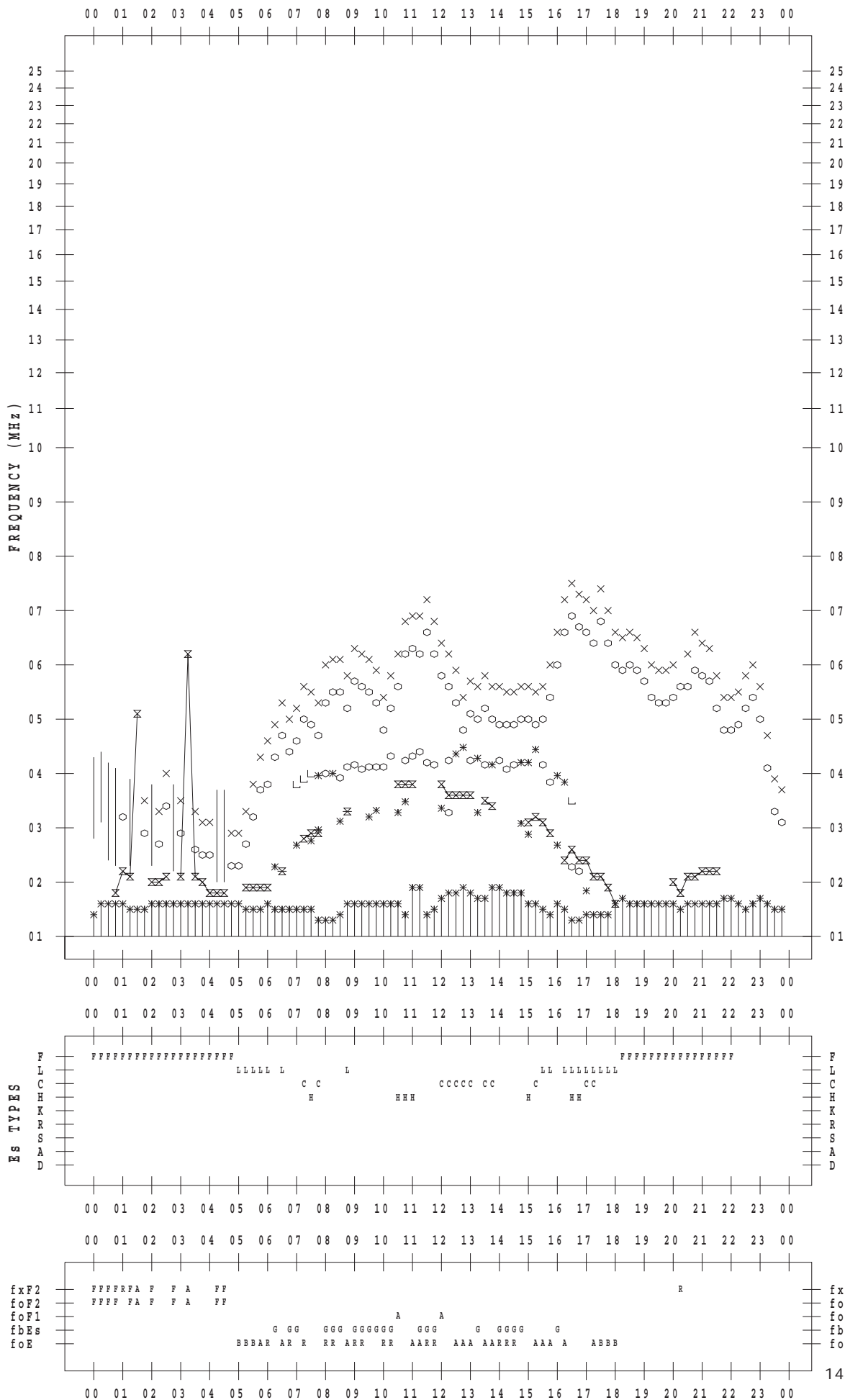
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 11

135 ° E MEAN TIME





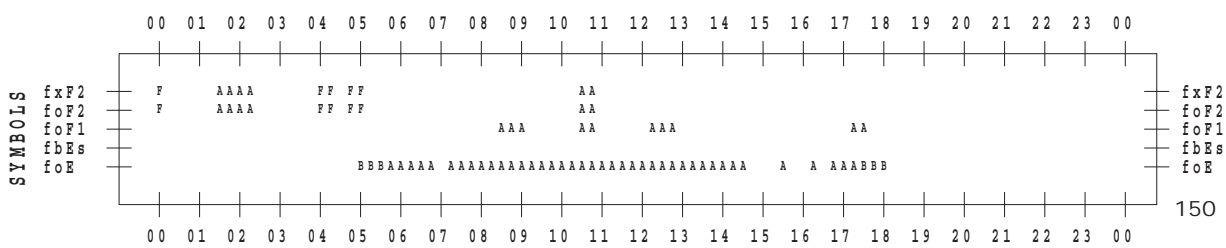
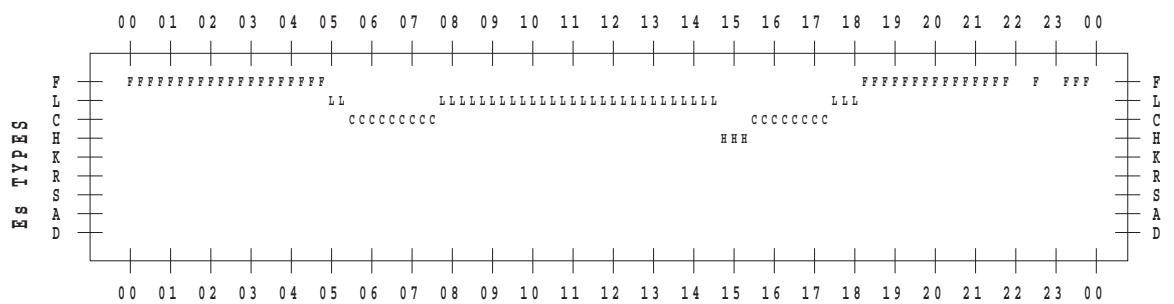
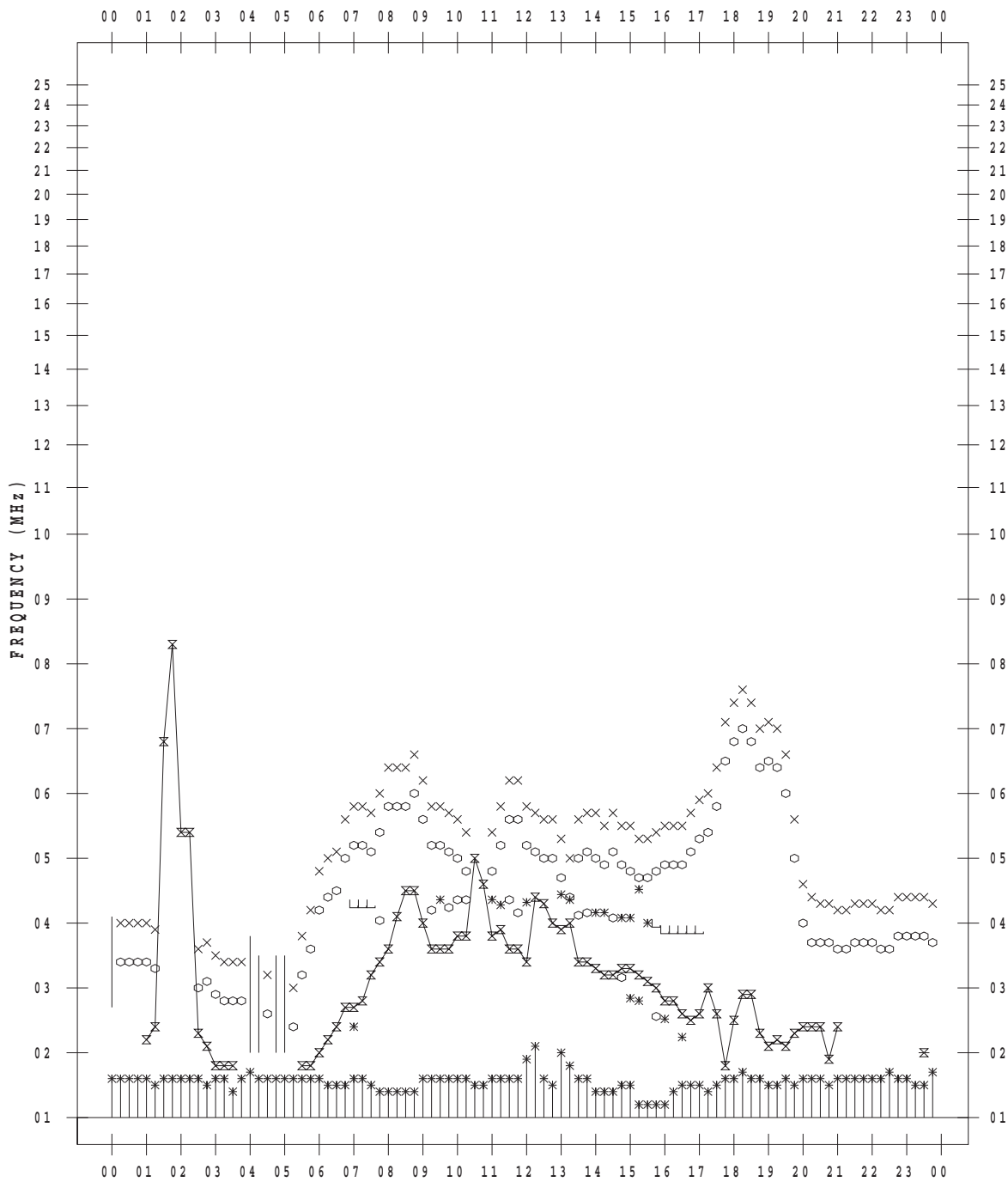
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 13

135 ° E MEAN TIME



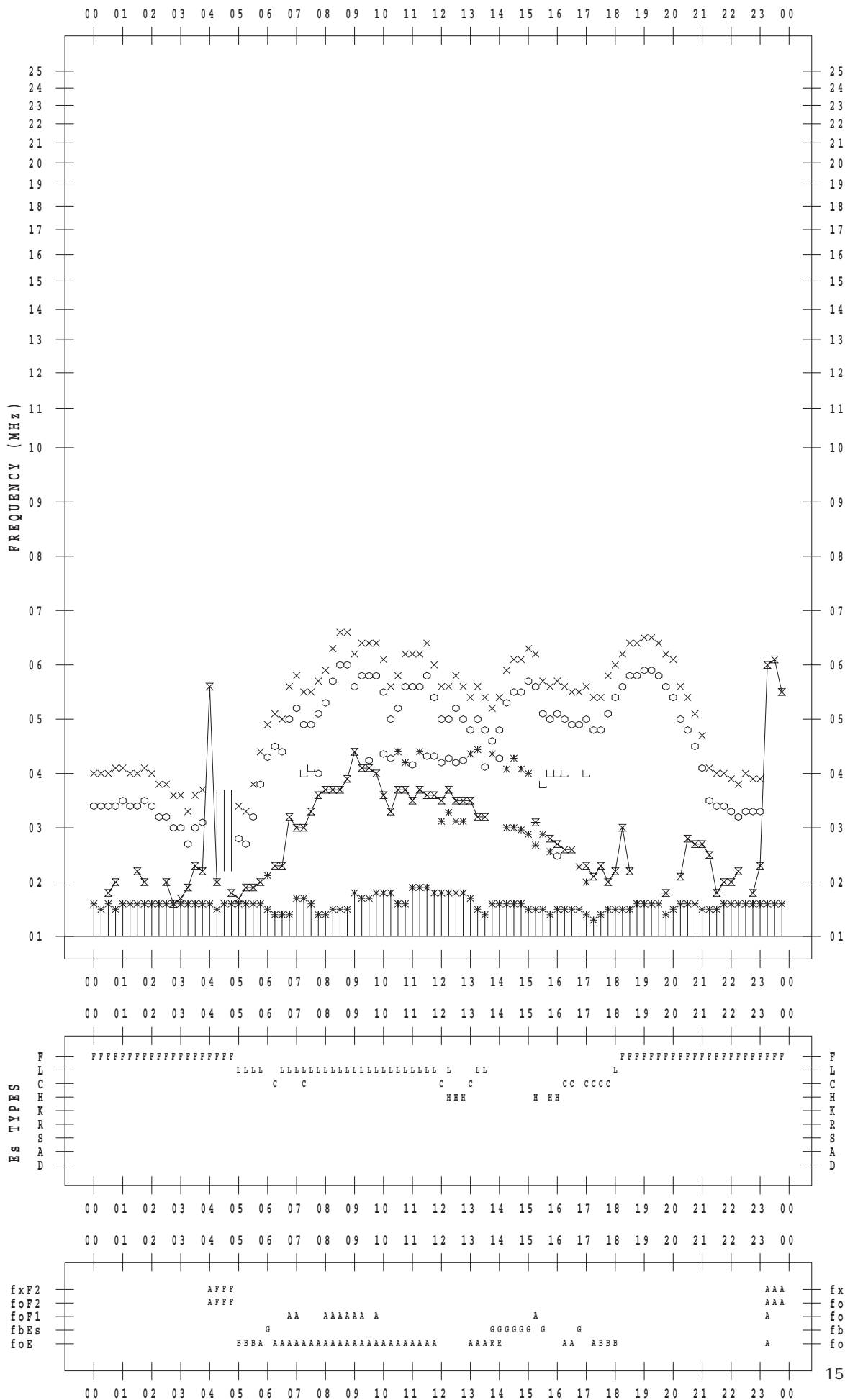
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 14

135 ° E MEAN TIME





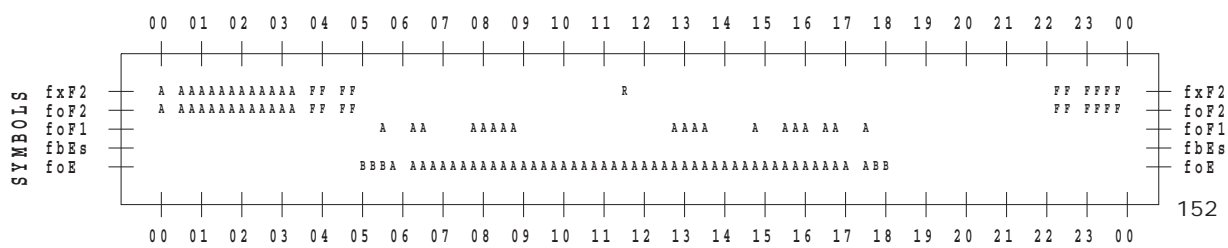
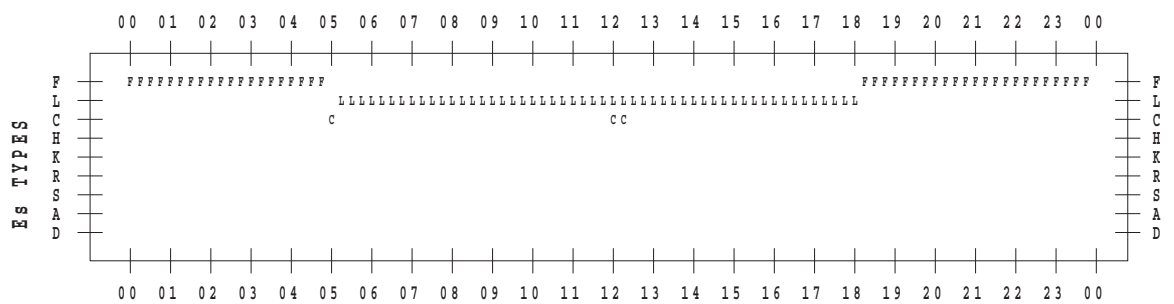
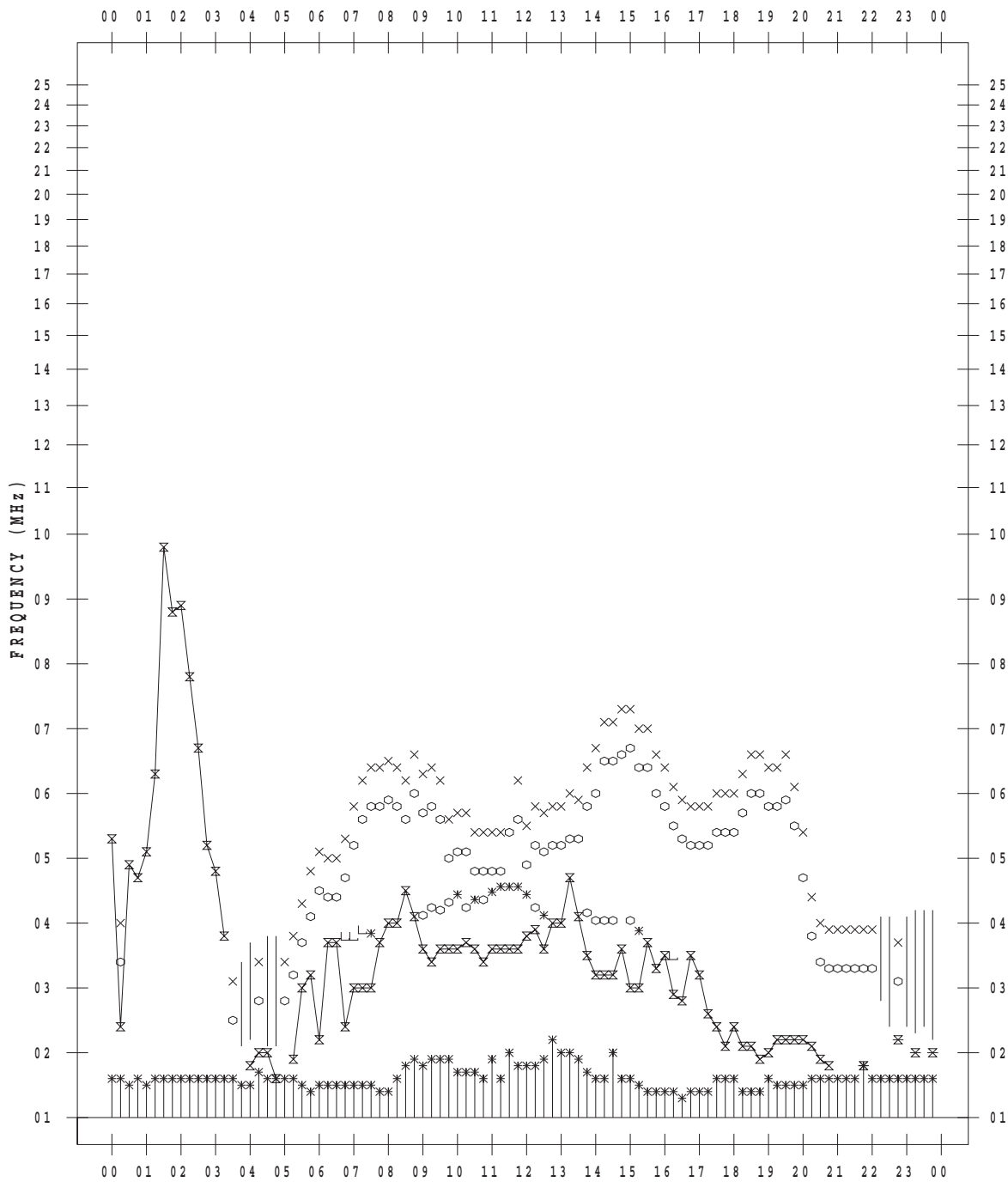
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 15

135 ° E MEAN TIME



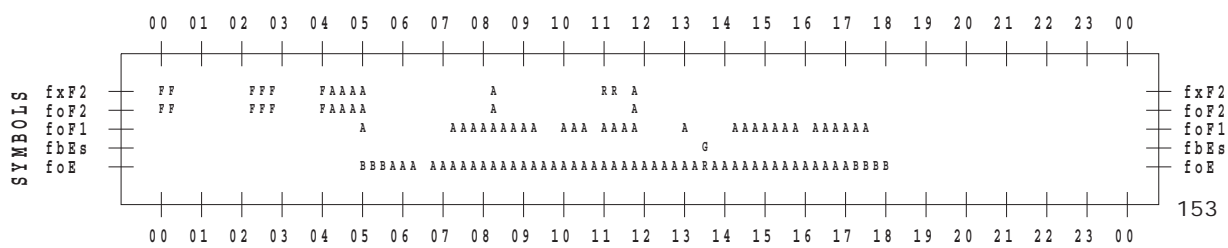
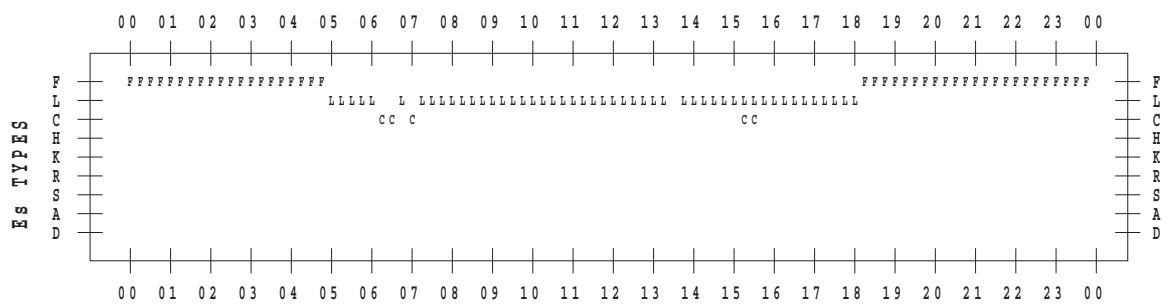
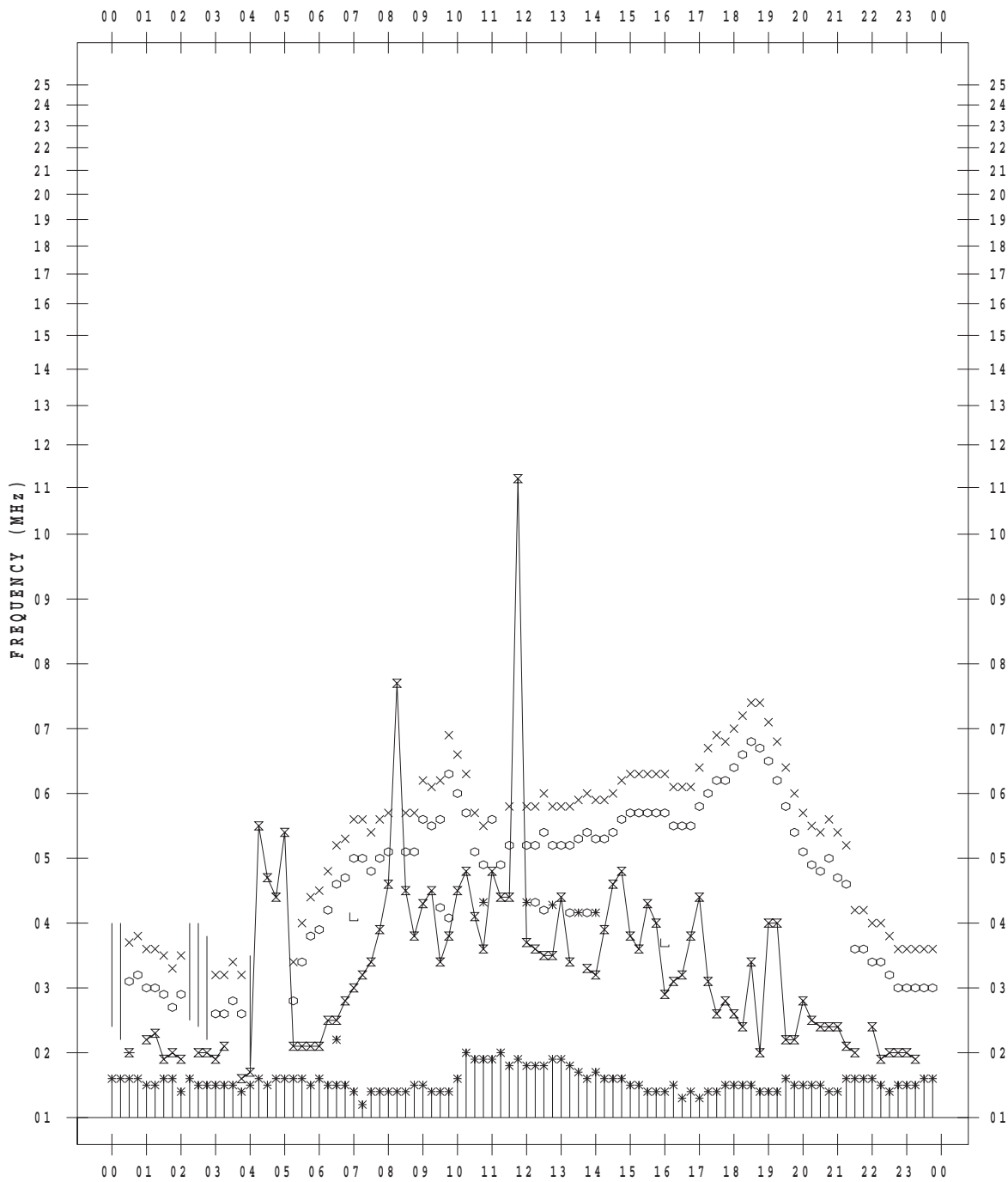
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 16

135 ° E MEAN TIME



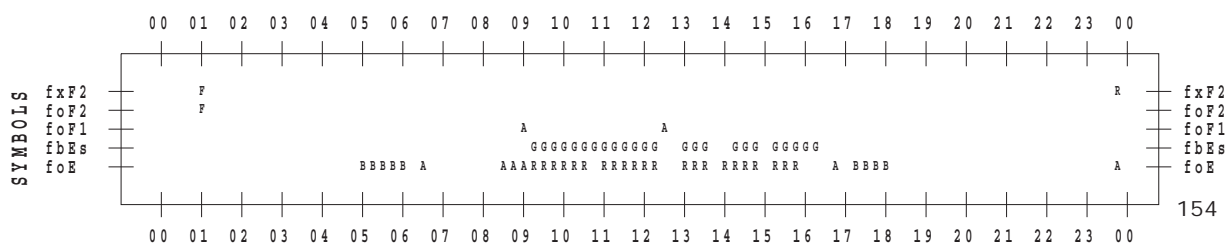
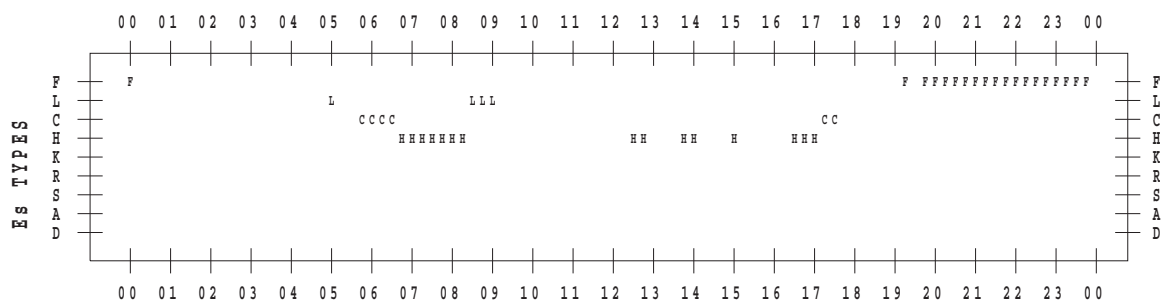
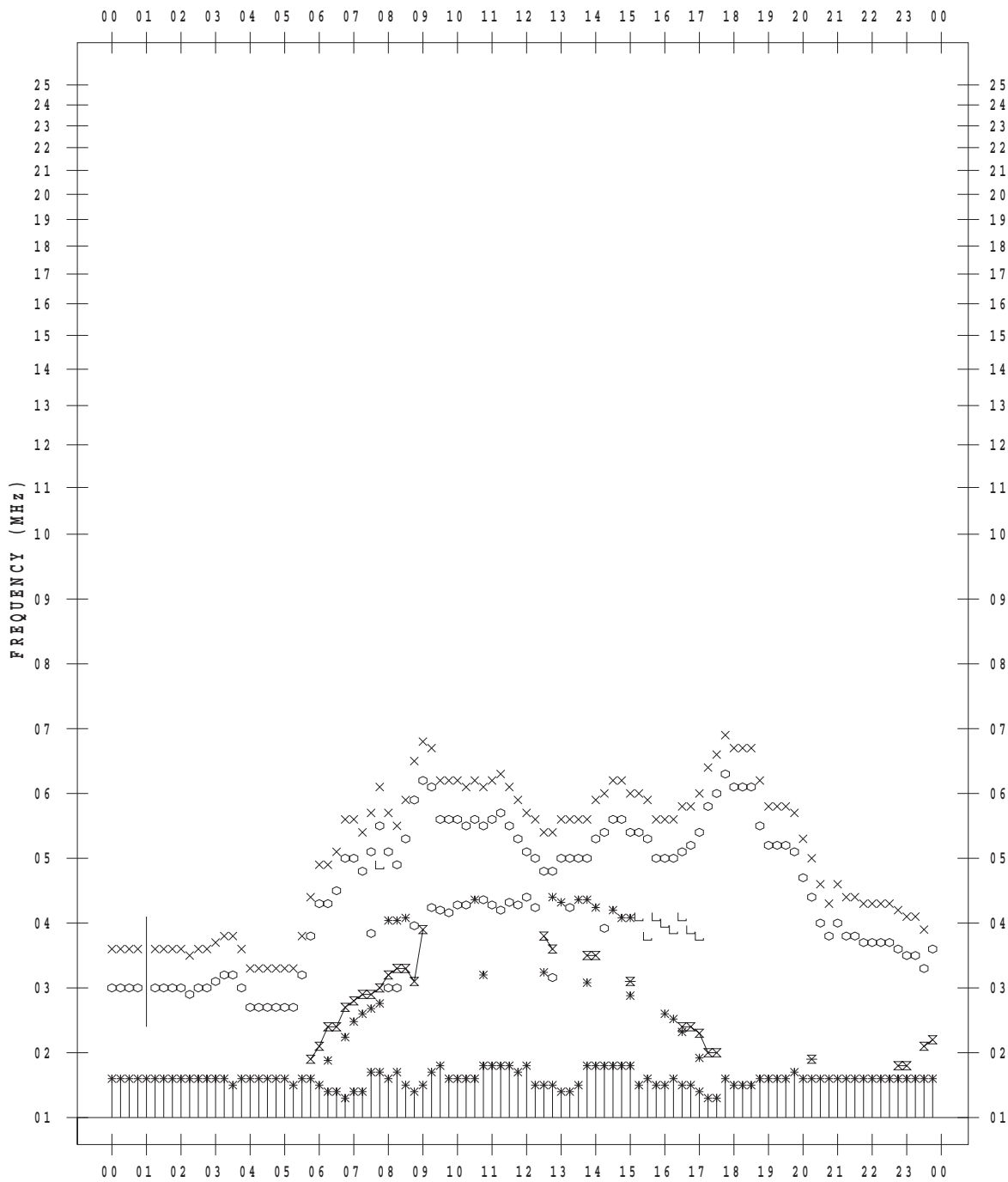
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 17

135 ° E MEAN TIME



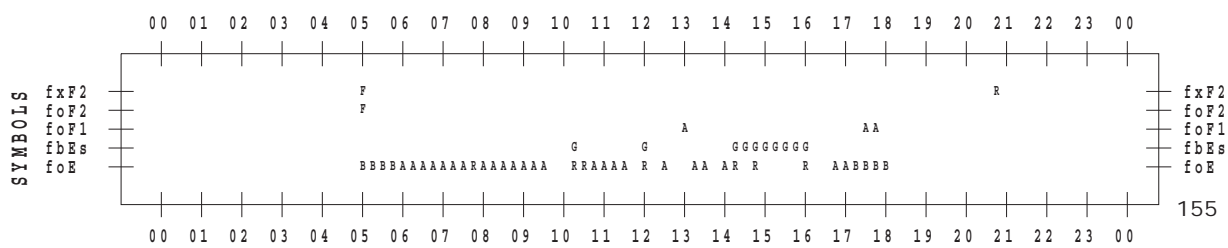
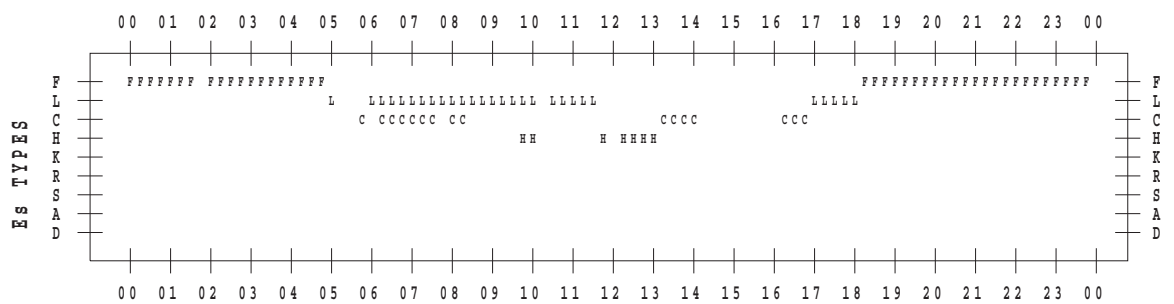
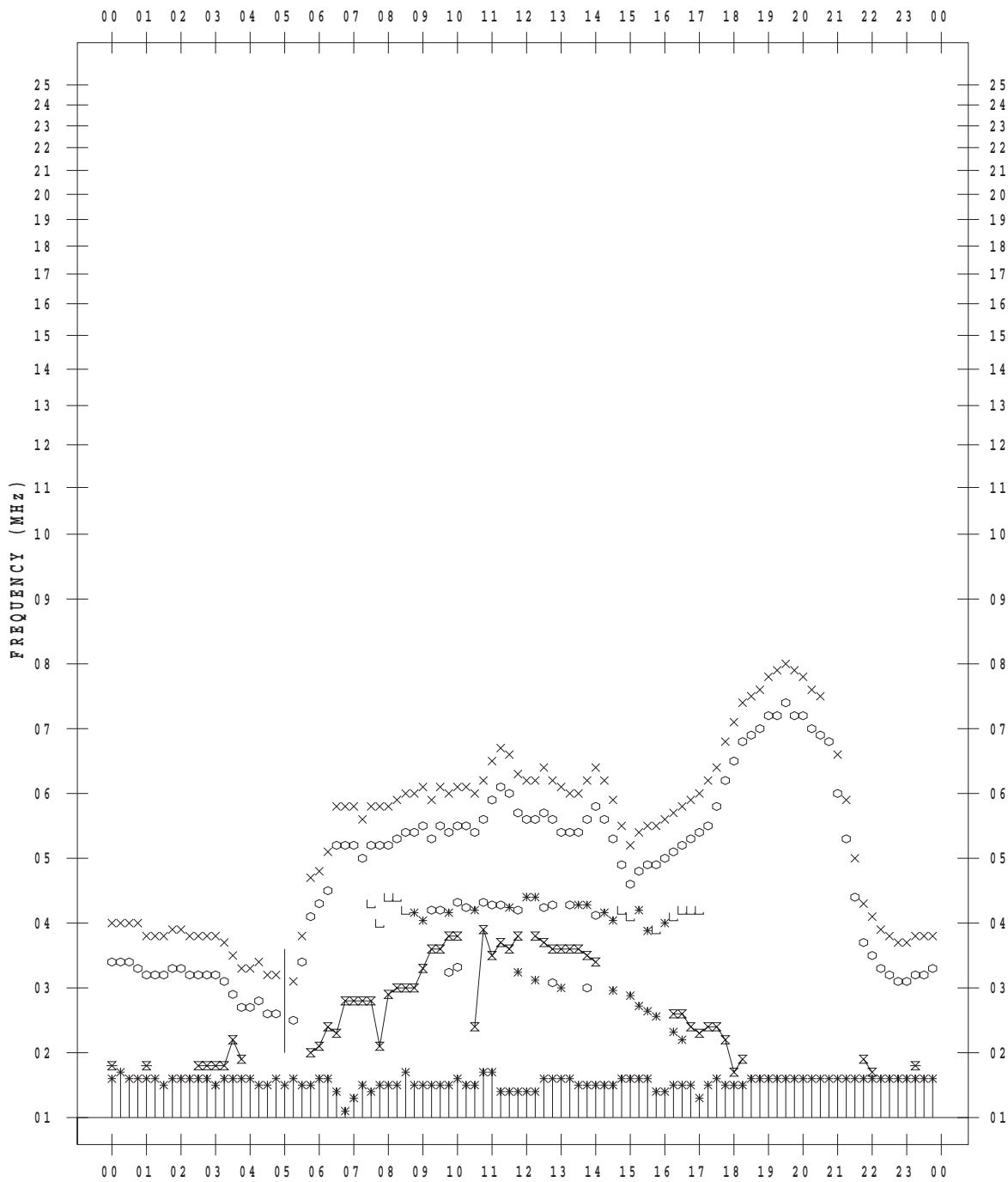
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 18

135 ° E MEAN TIME





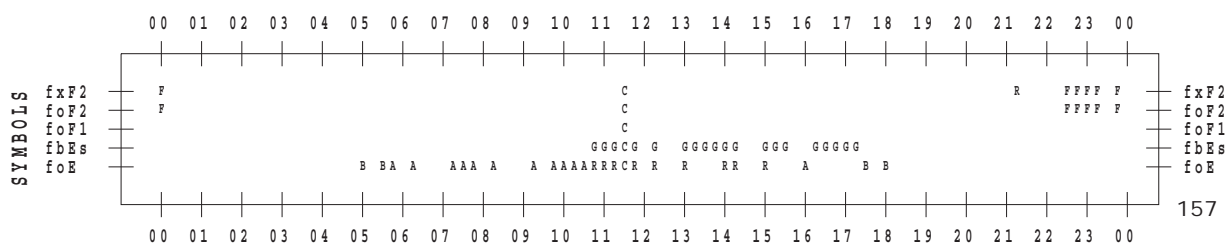
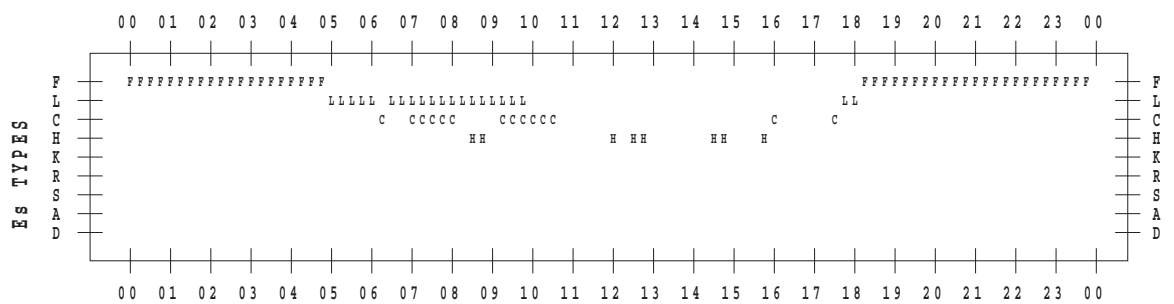
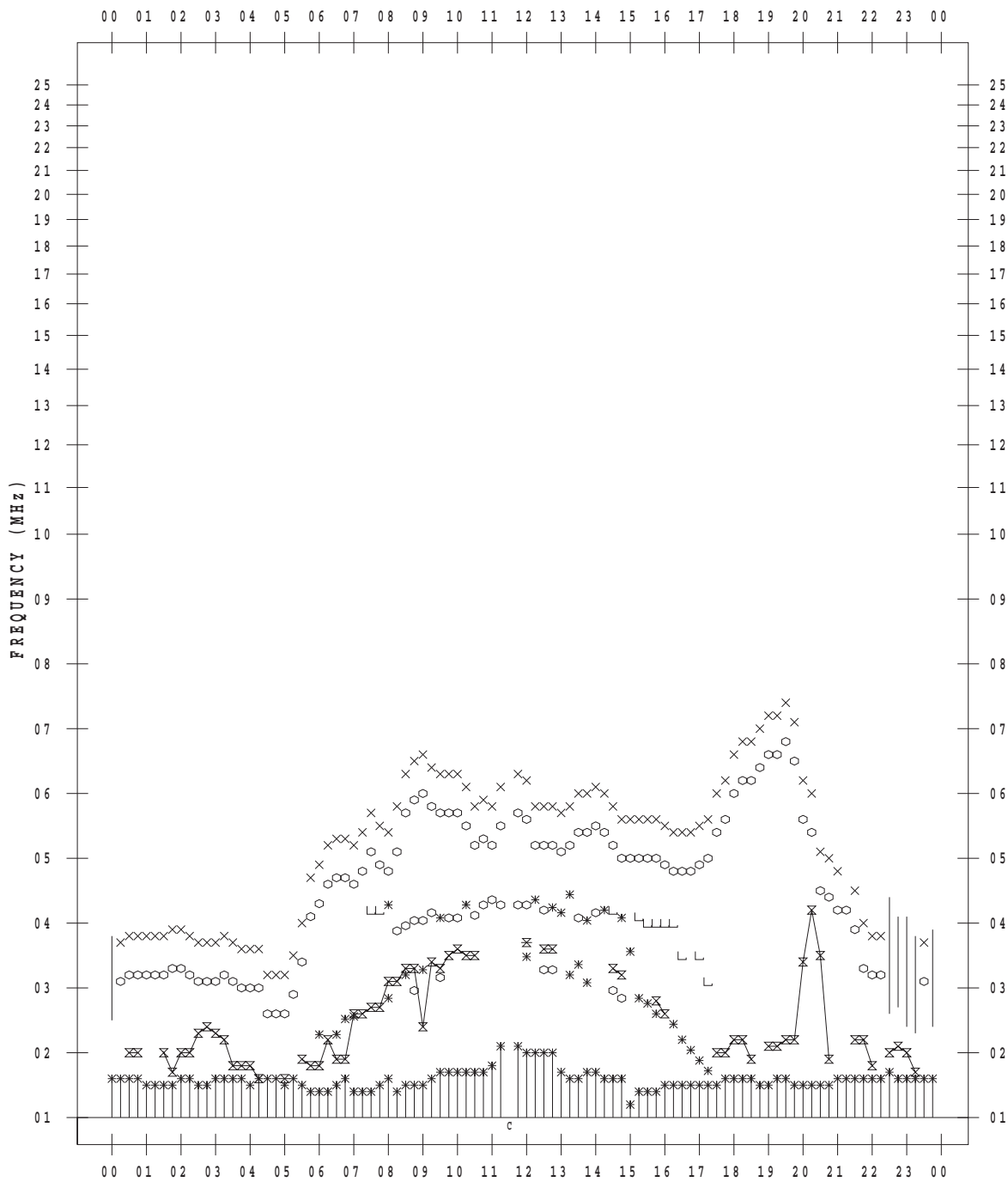
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 20

135 ° E MEAN TIME



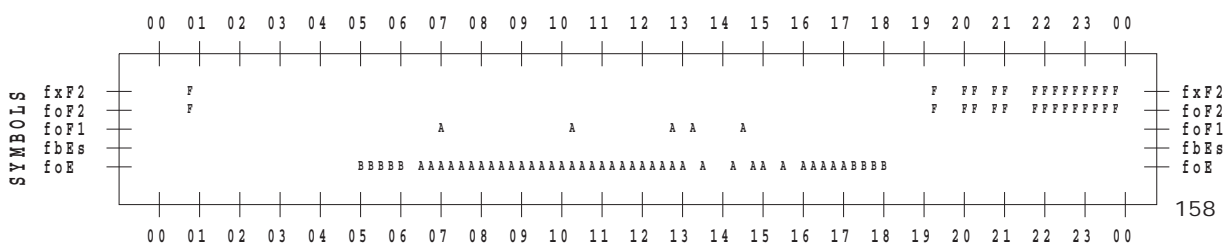
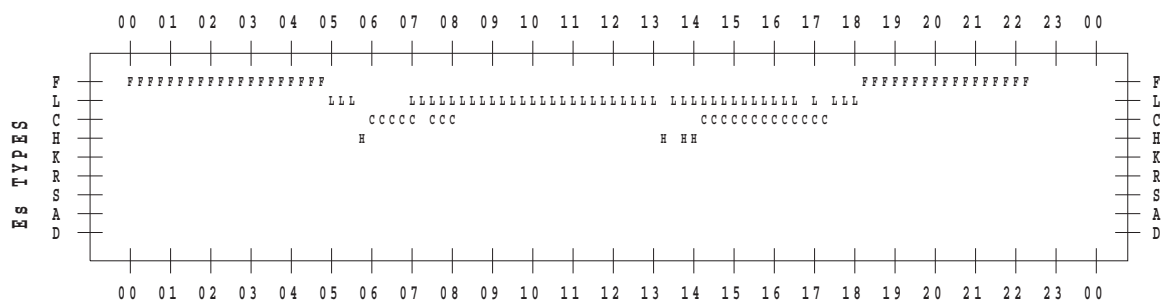
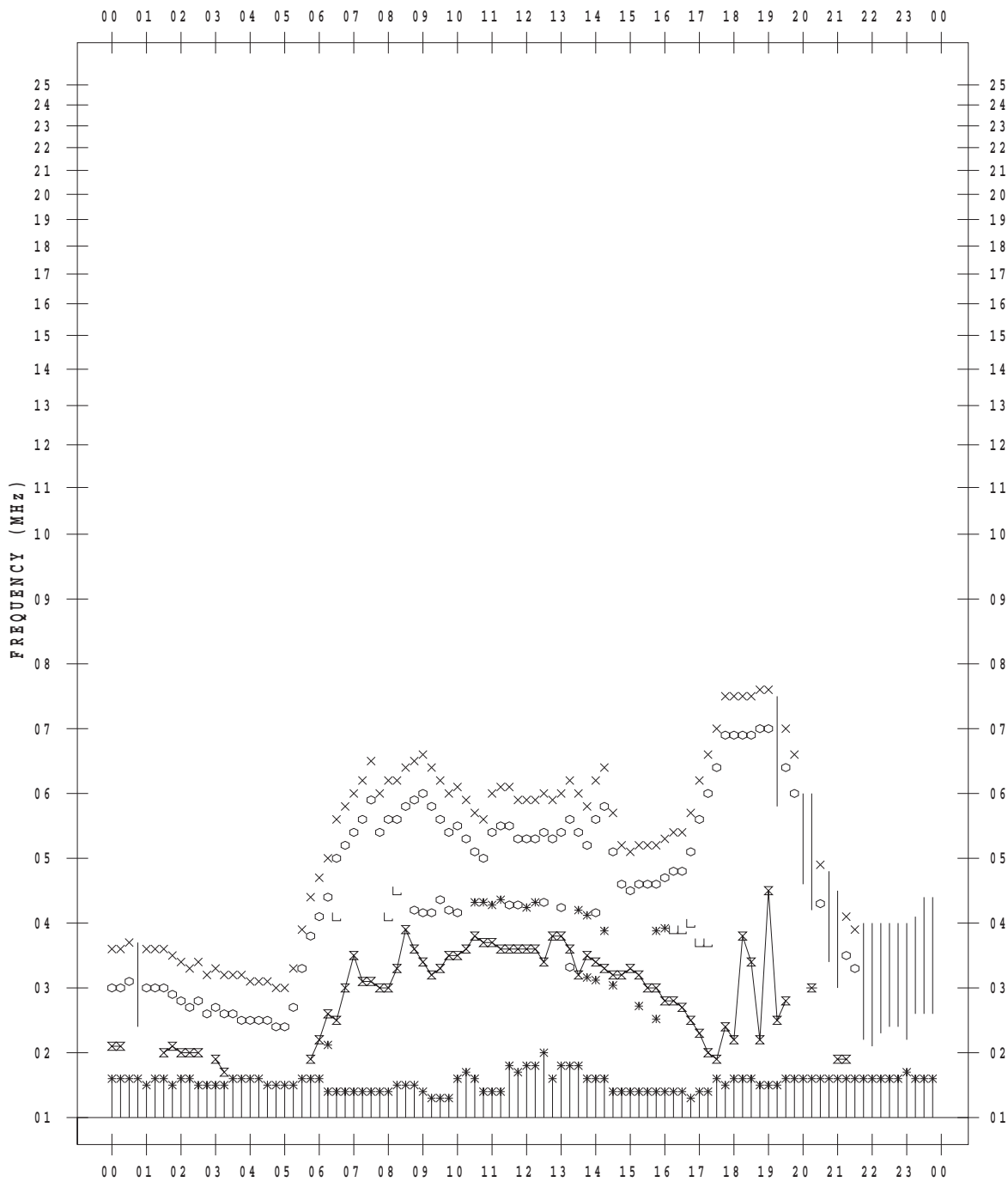
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 21

135 ° E MEAN TIME







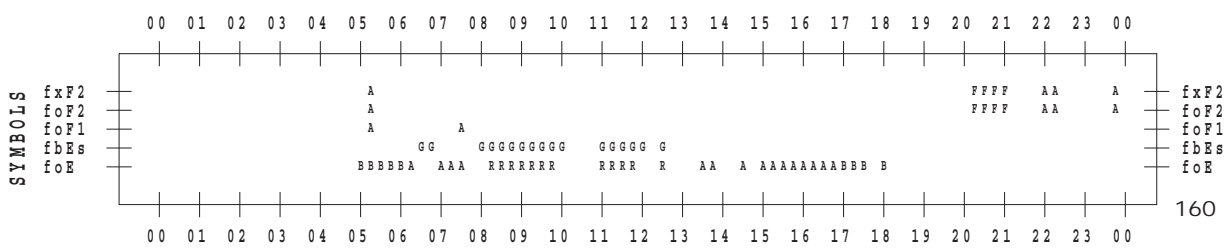
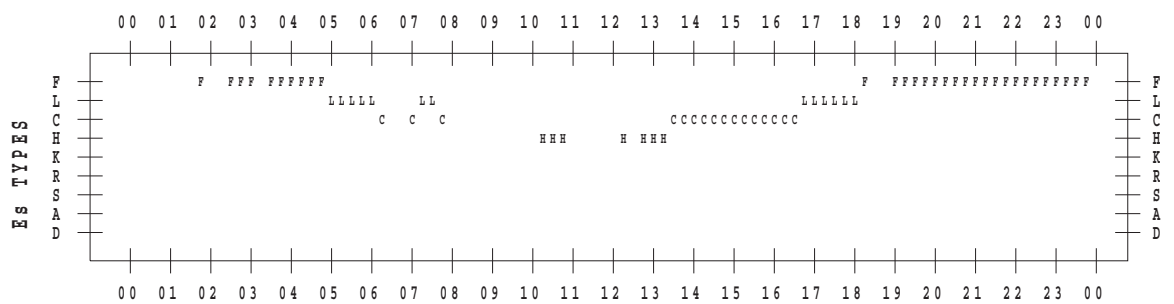
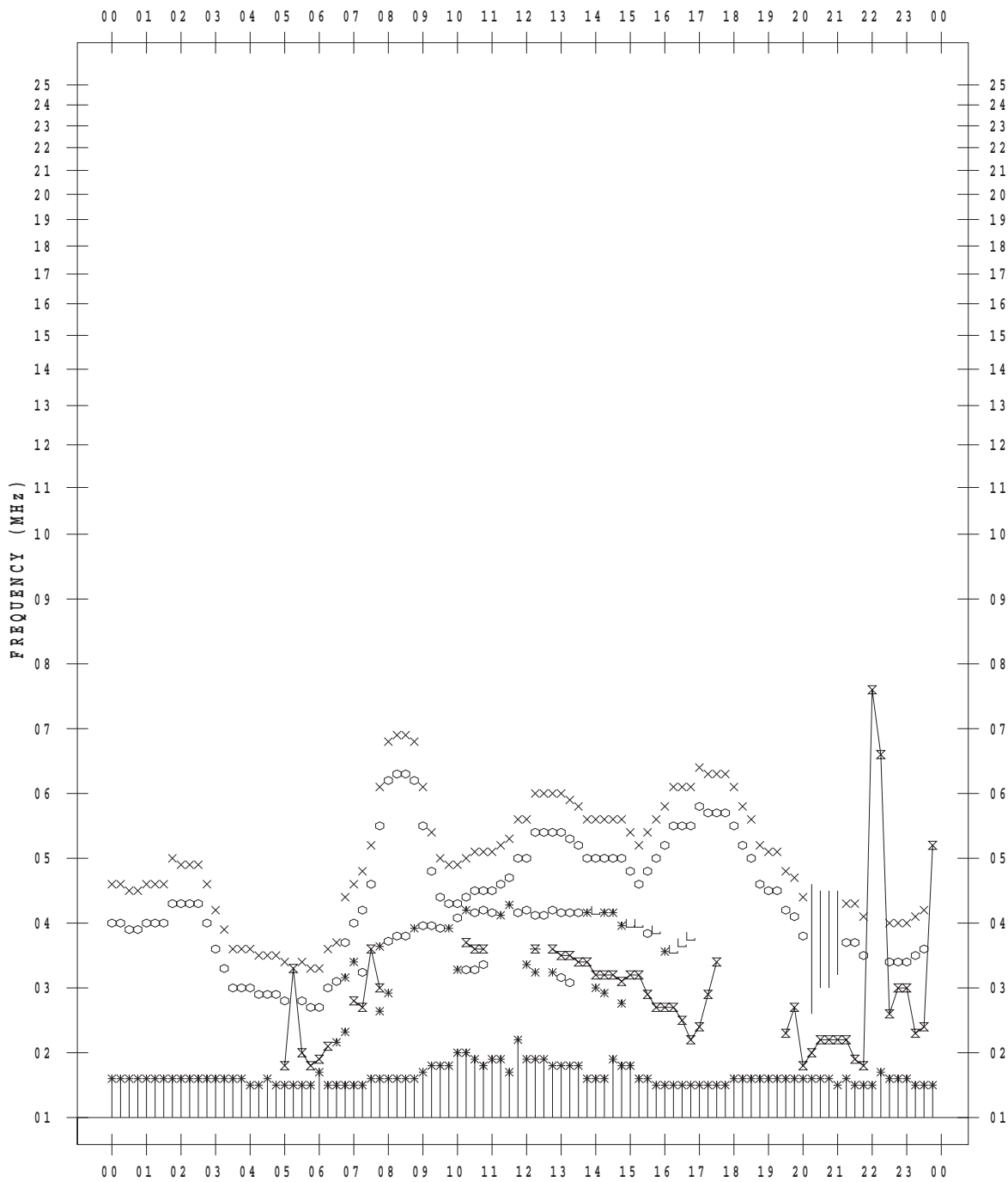
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 23

135 ° E MEAN TIME



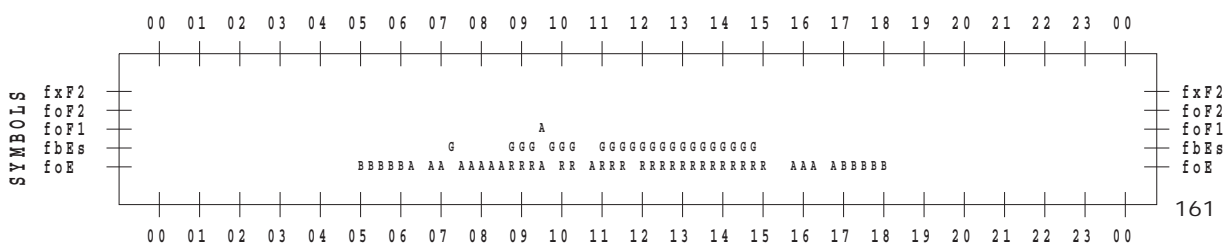
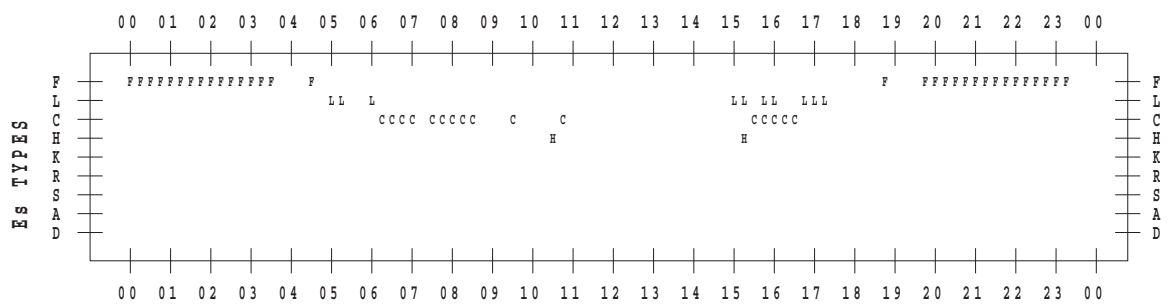
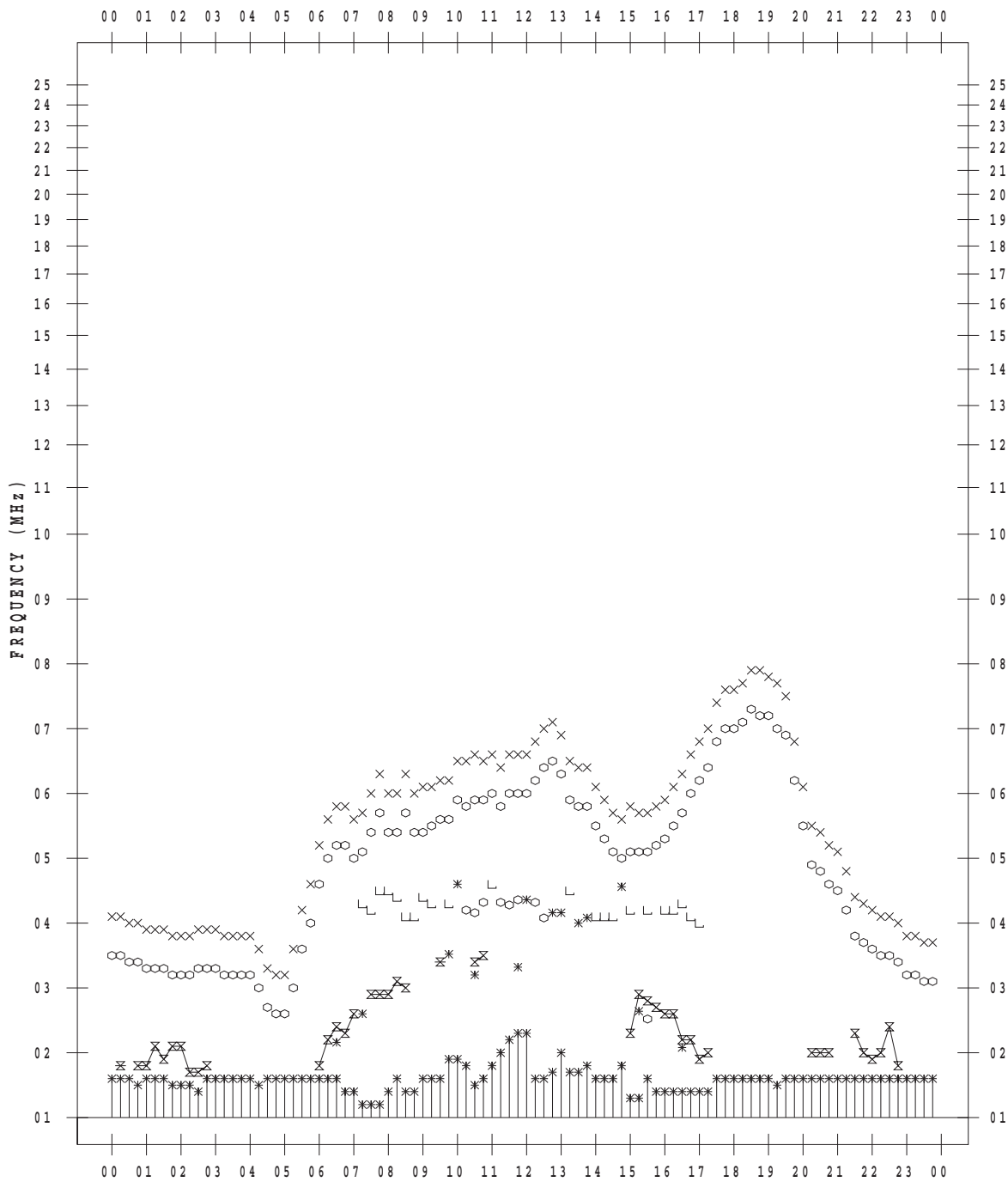
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 24

135 ° E MEAN TIME



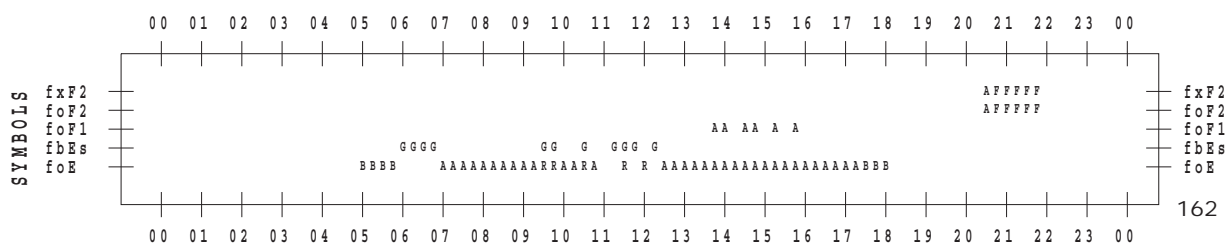
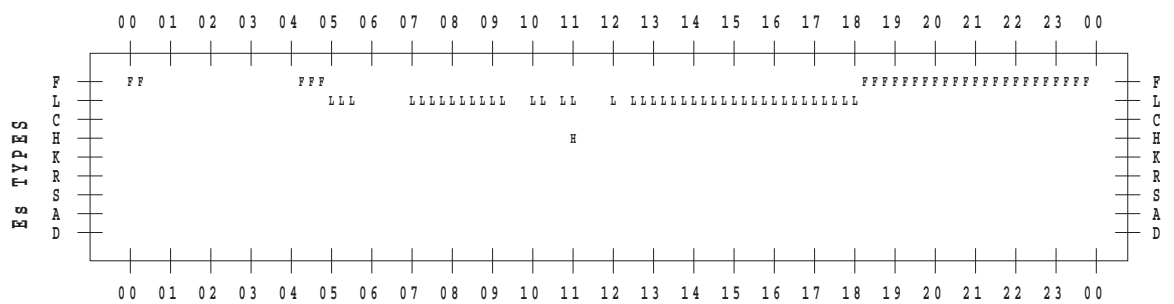
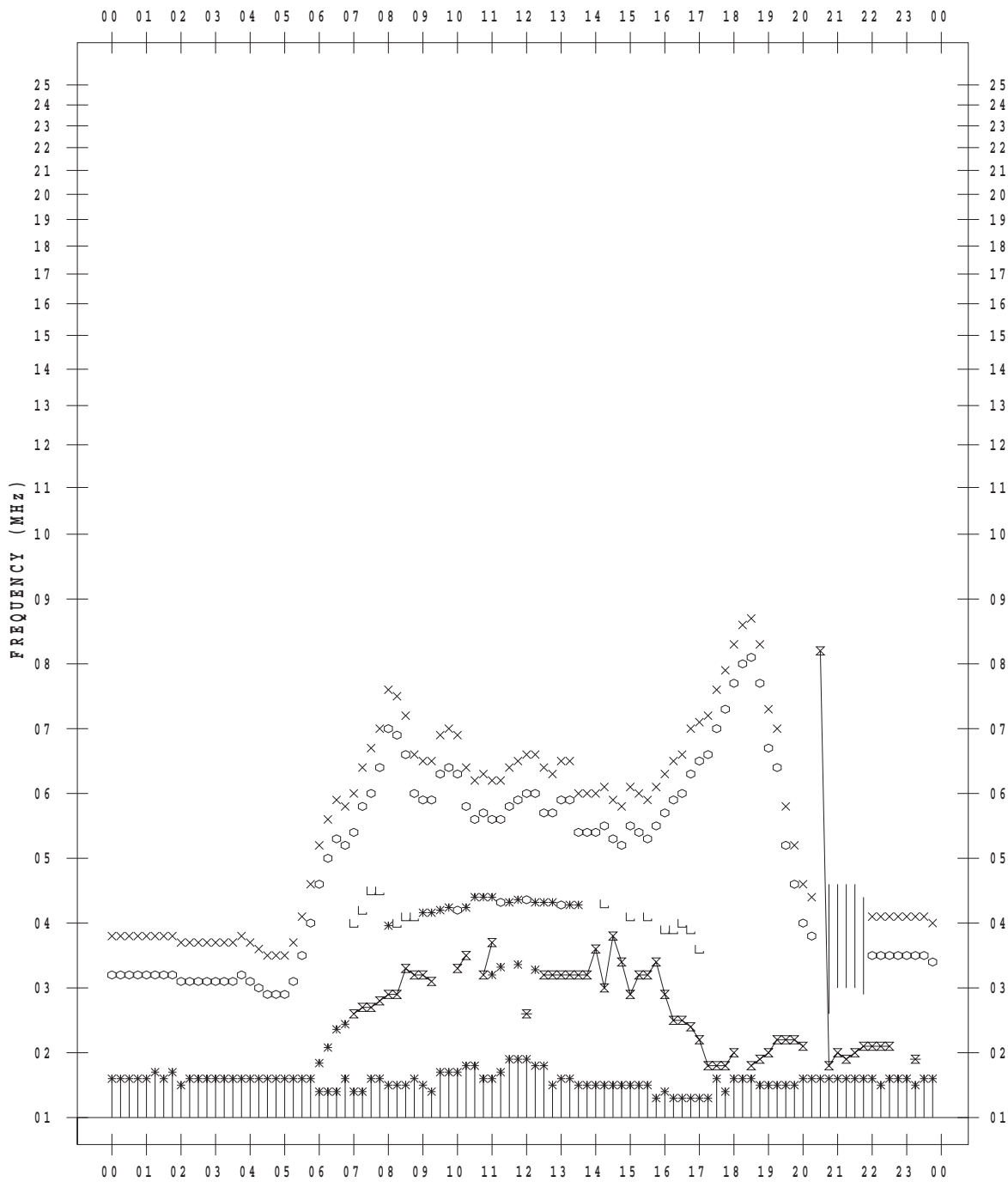
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 25

135 ° E MEAN TIME



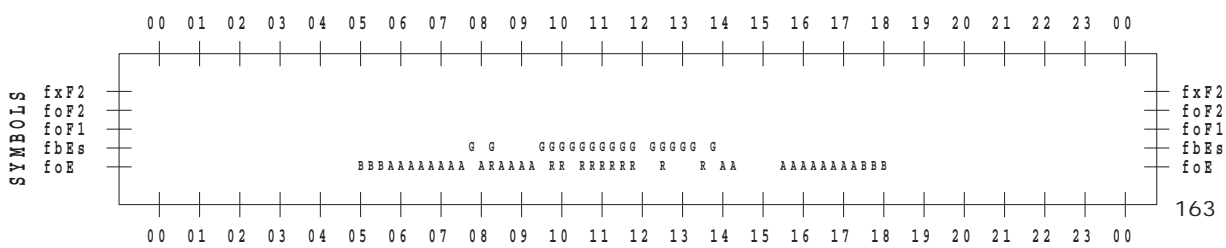
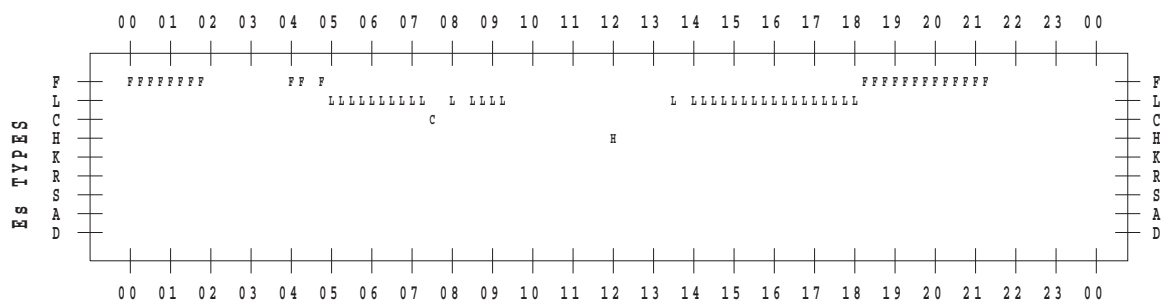
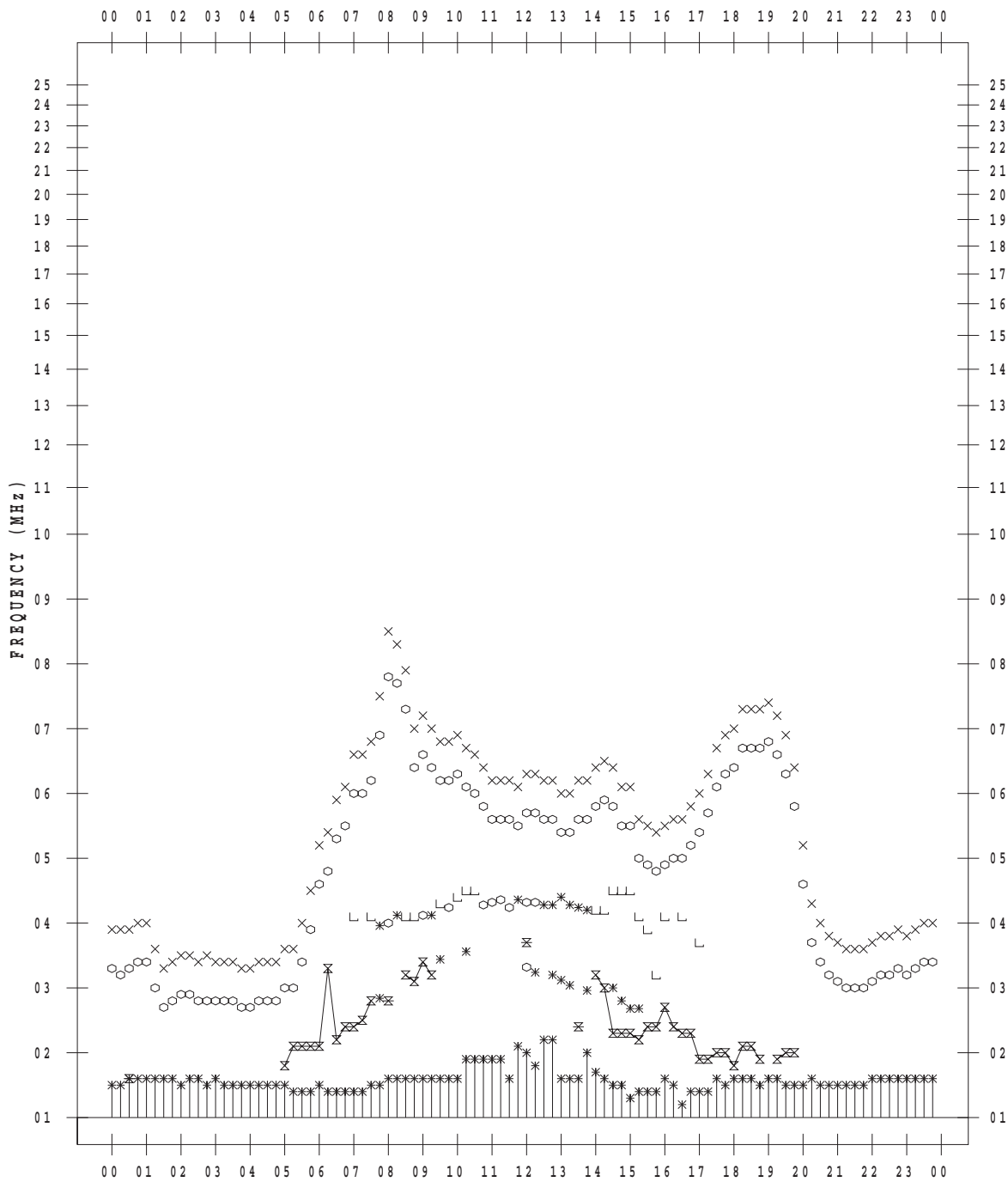
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 26

135 ° E MEAN TIME



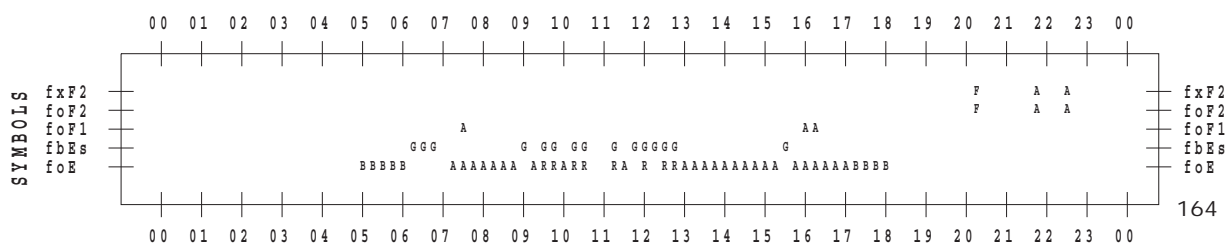
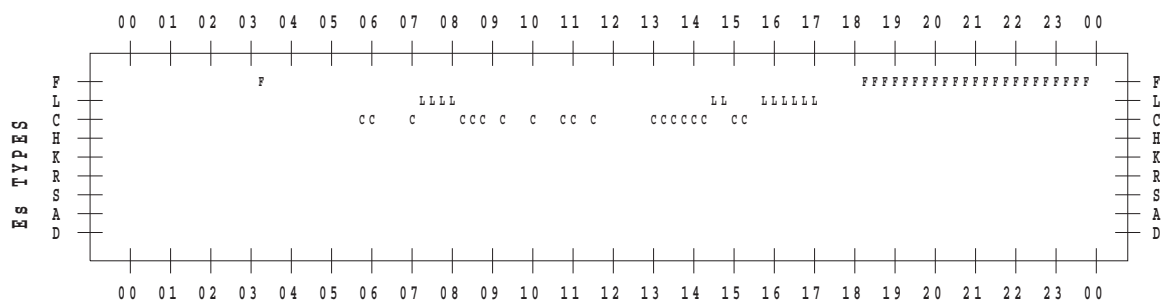
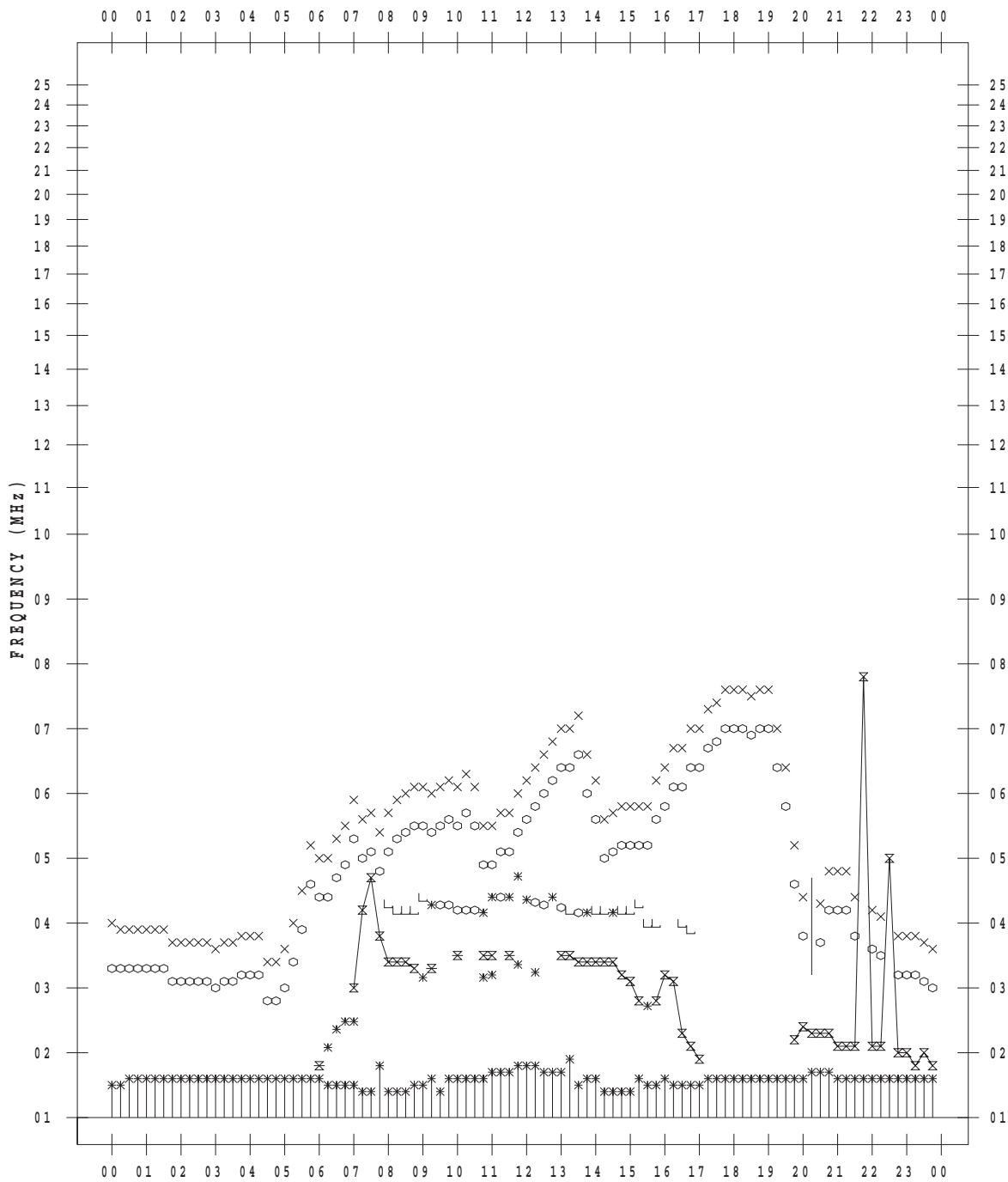
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 27

135 ° E MEAN TIME



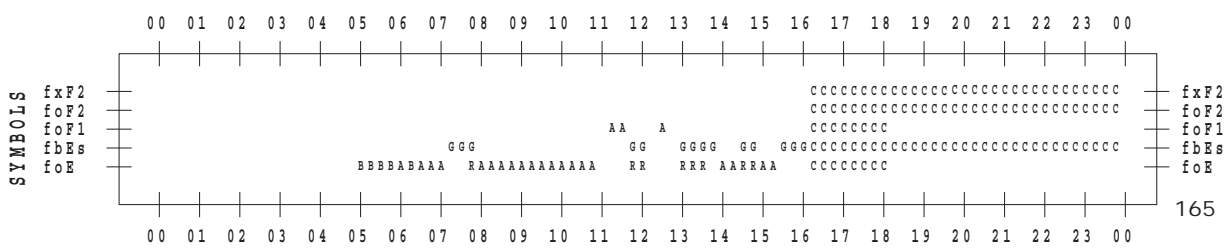
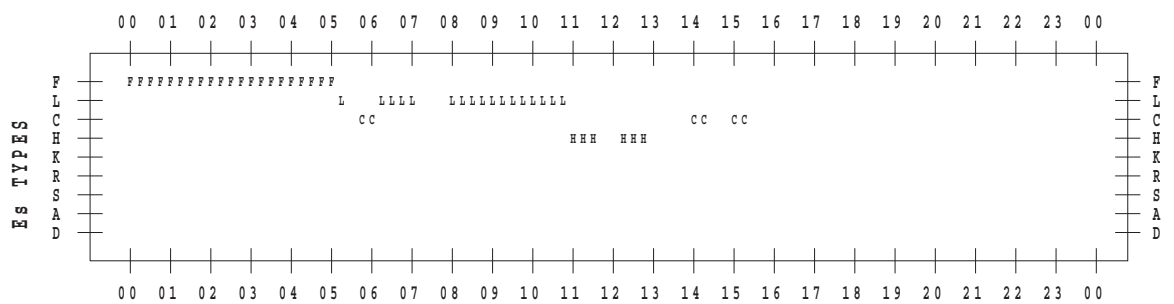
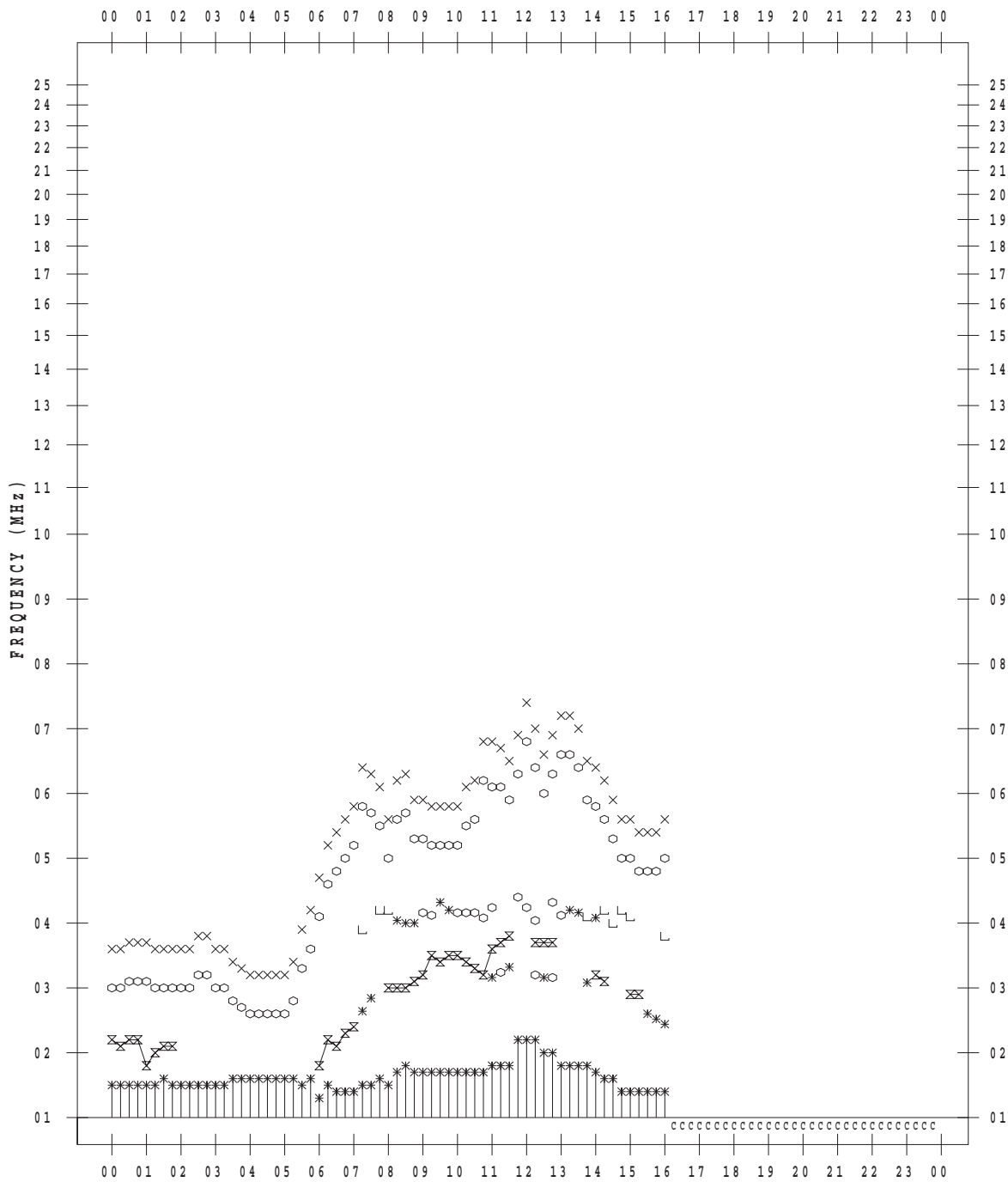
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 28

135 ° E MEAN TIME



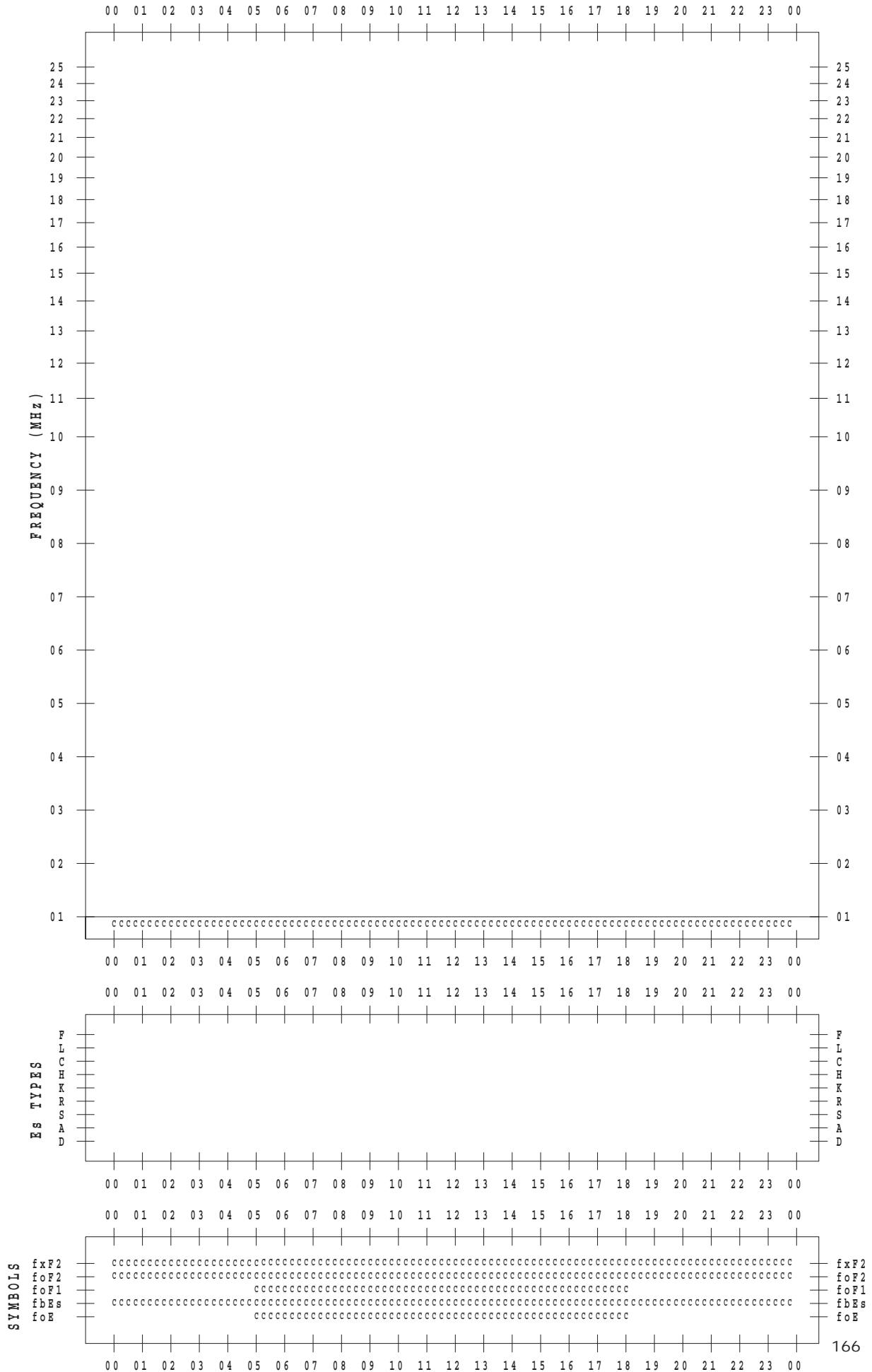
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 29

135 ° E MEAN TIME



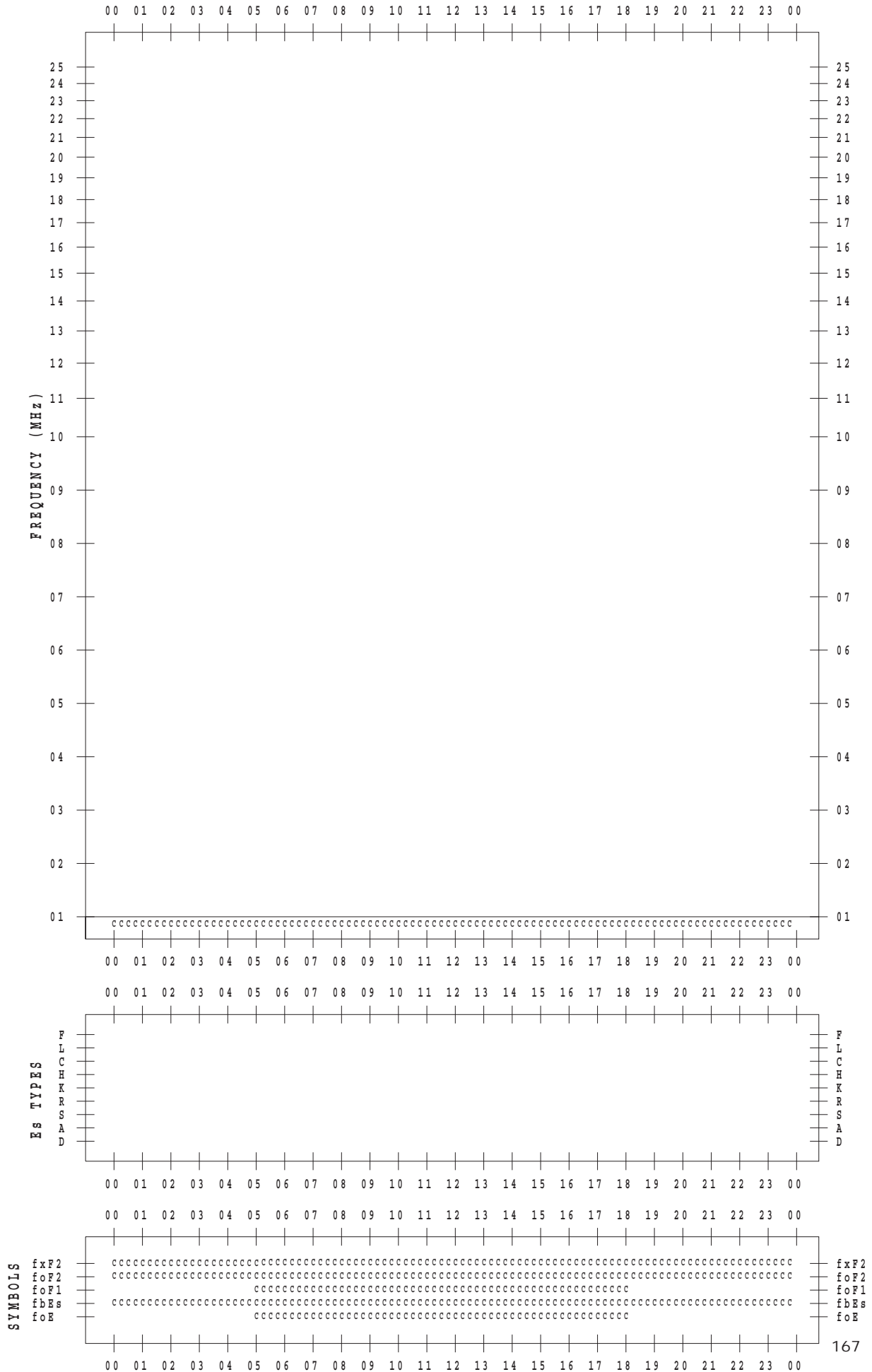
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 9 / 30

135 ° E MEAN TIME





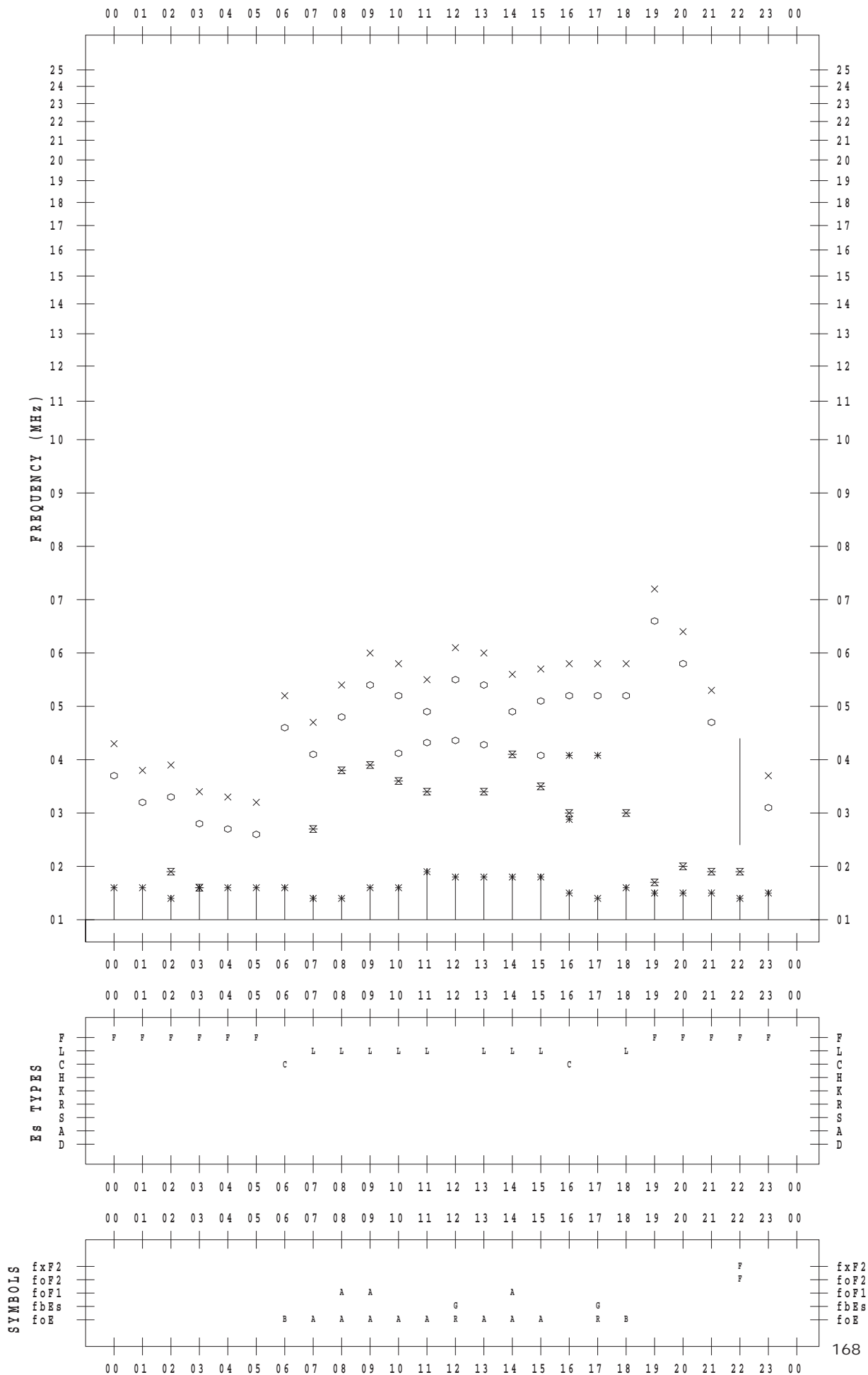
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 1

135 ° E MEAN TIME



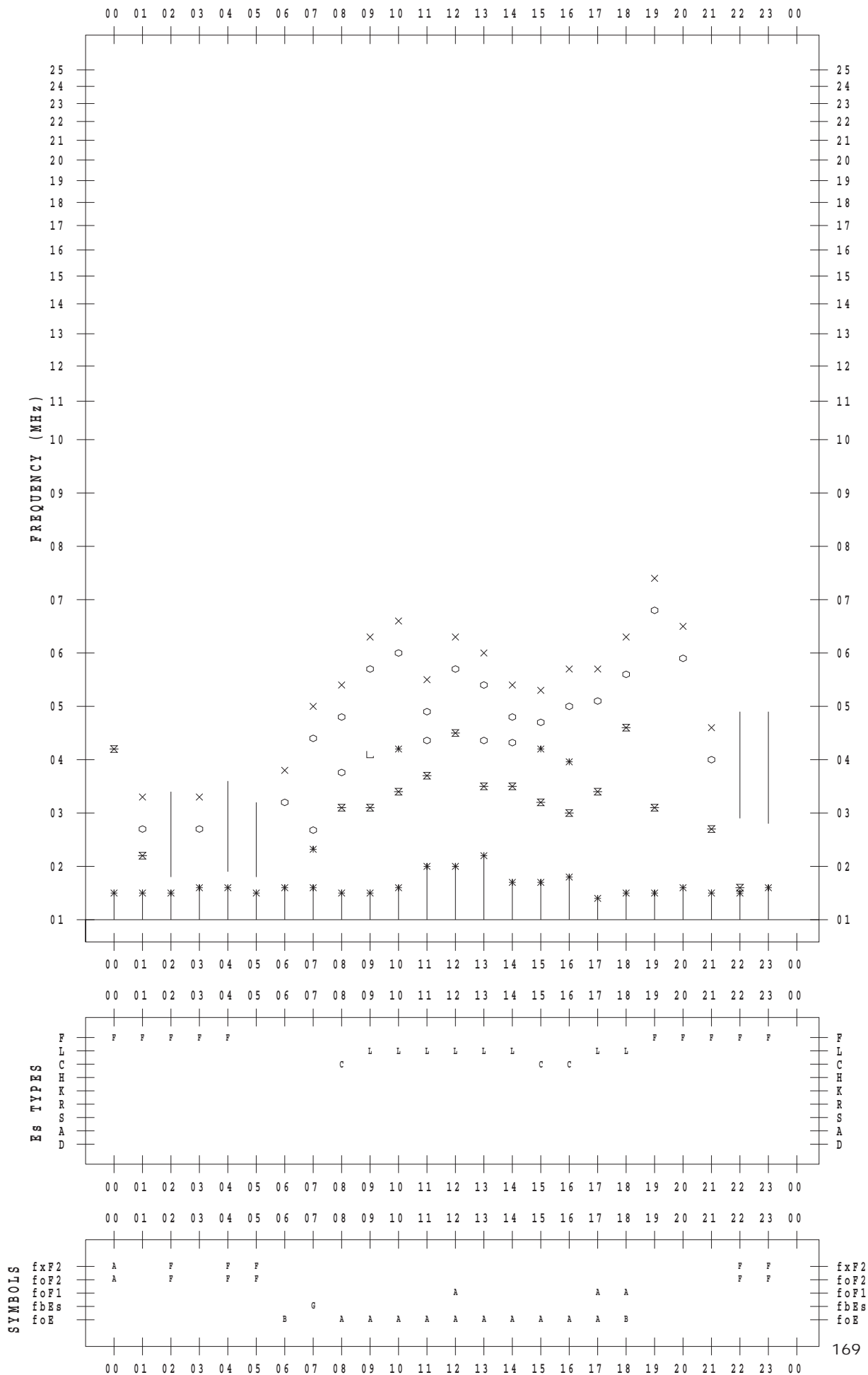
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 2

135 ° E MEAN TIME



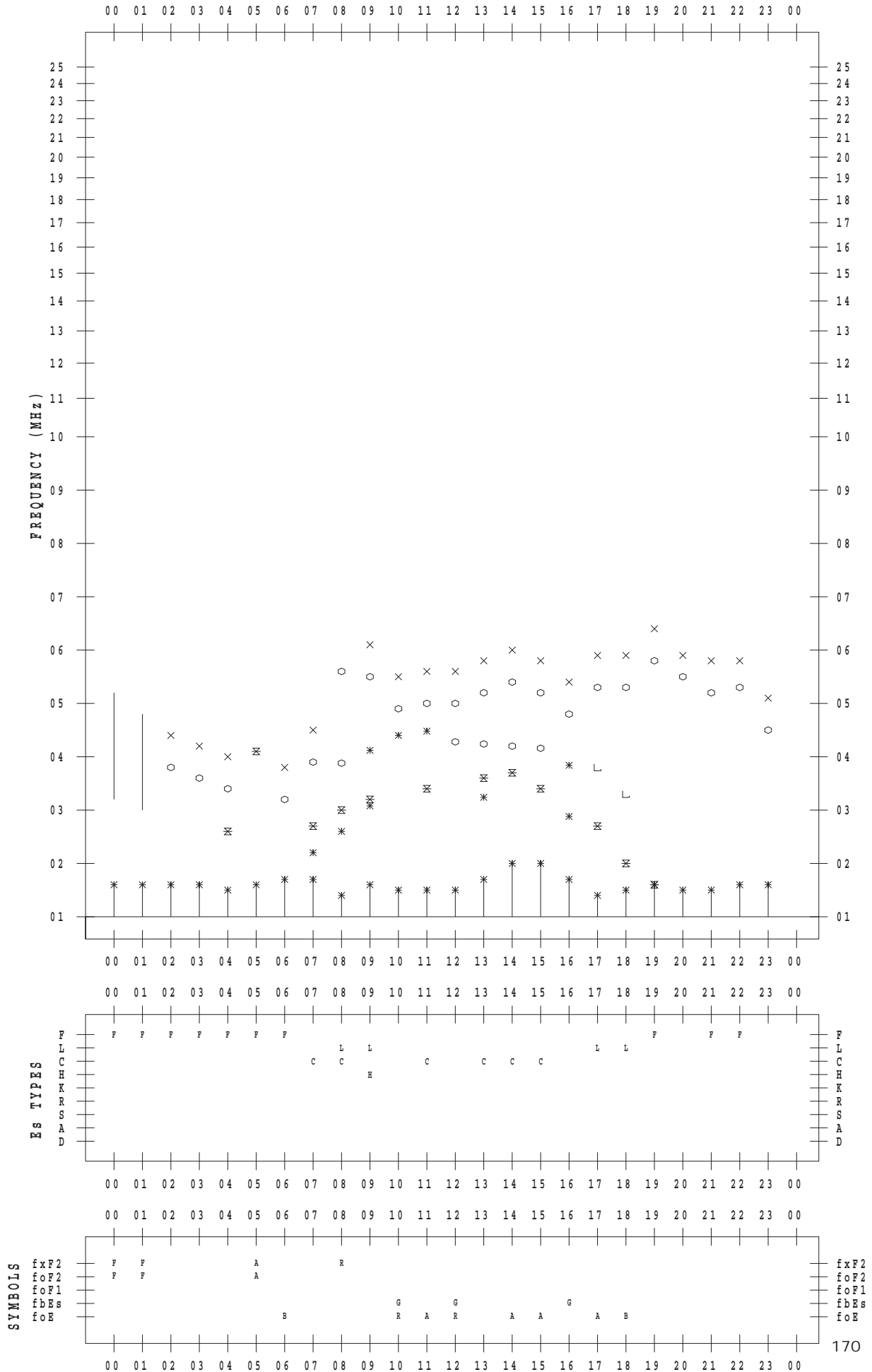
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 3

135 ° E MEAN TIME



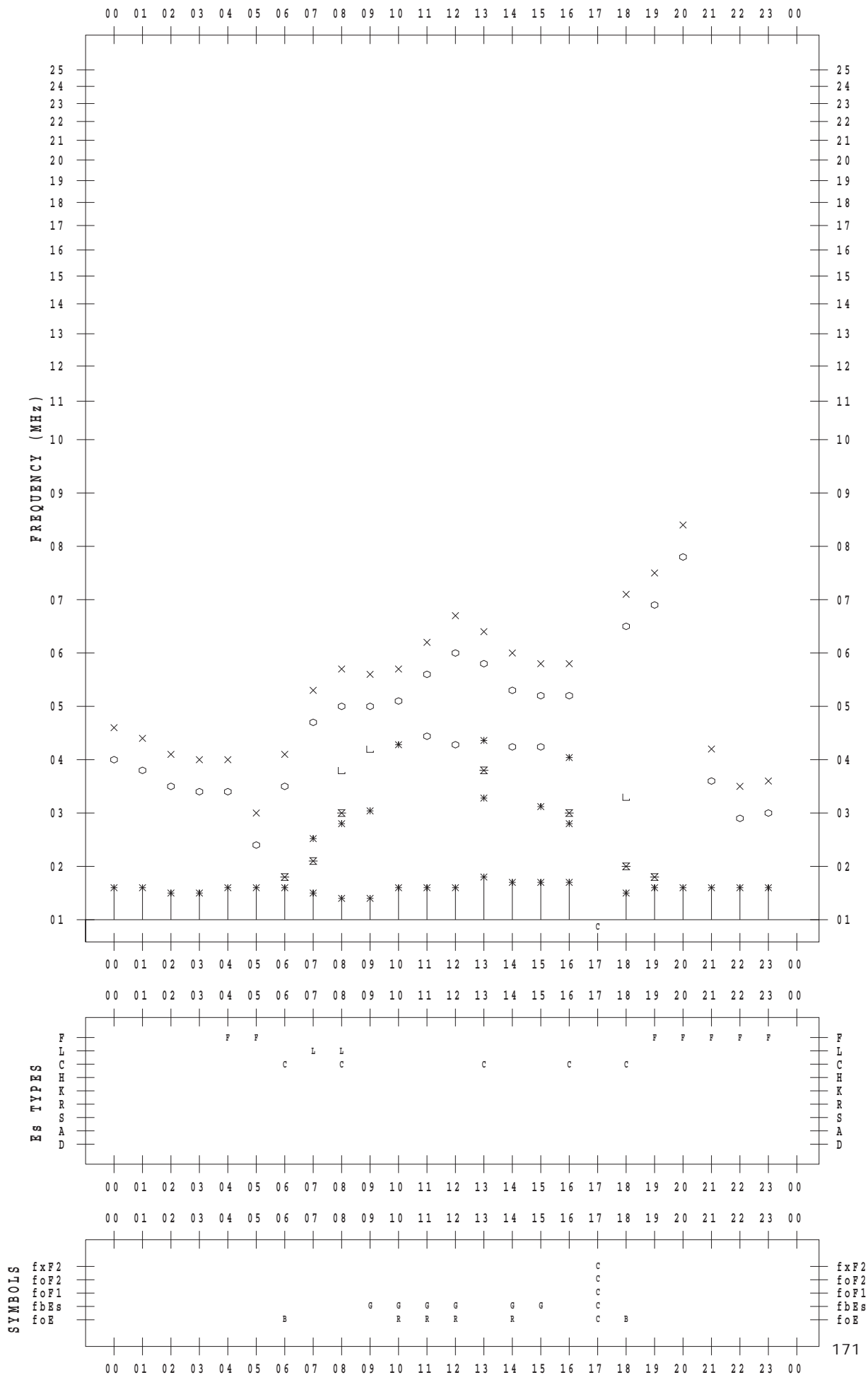
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 4

135 ° E MEAN TIME



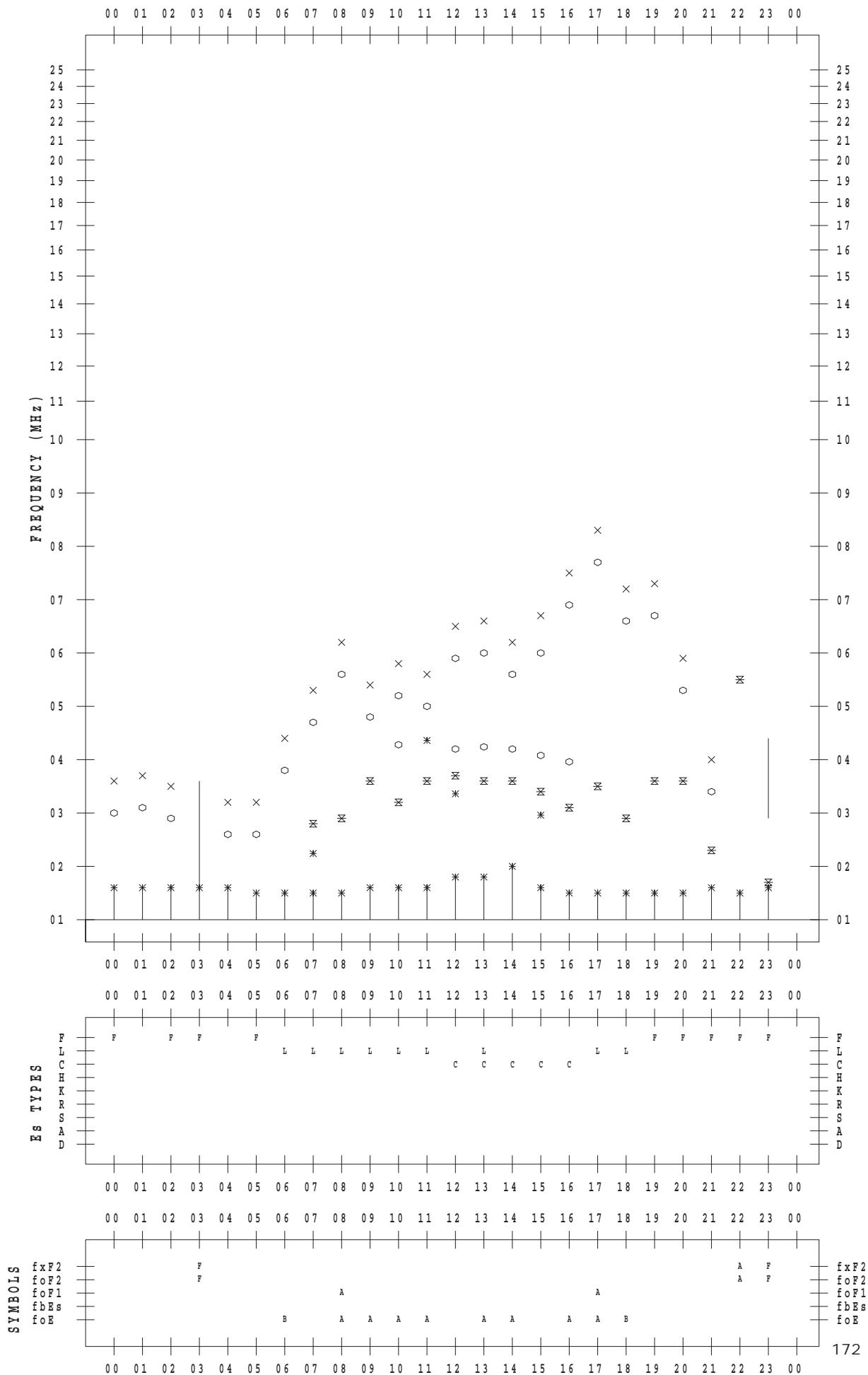
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 5

135 ° E MEAN TIME



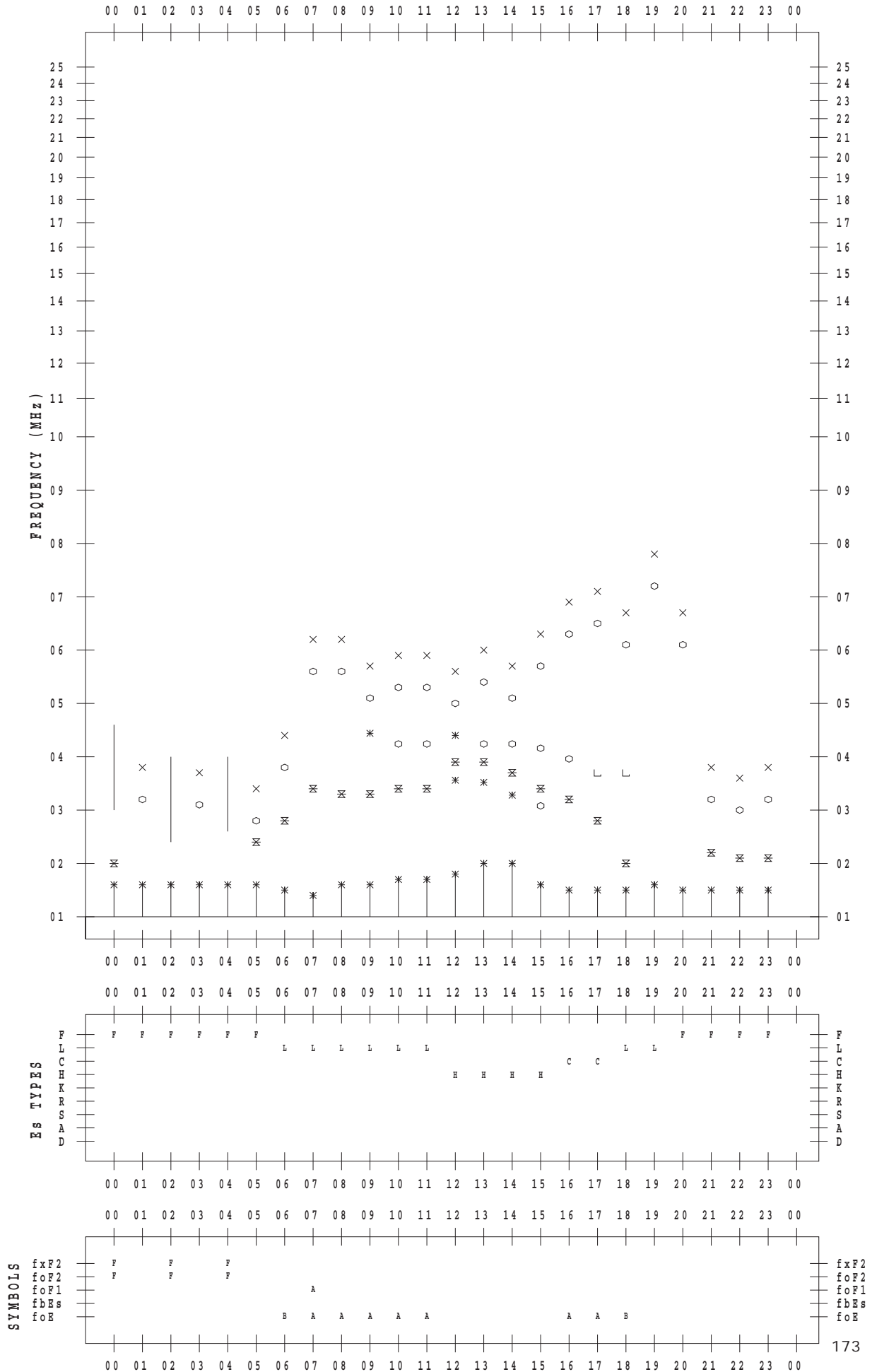
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 6

135 ° E MEAN TIME



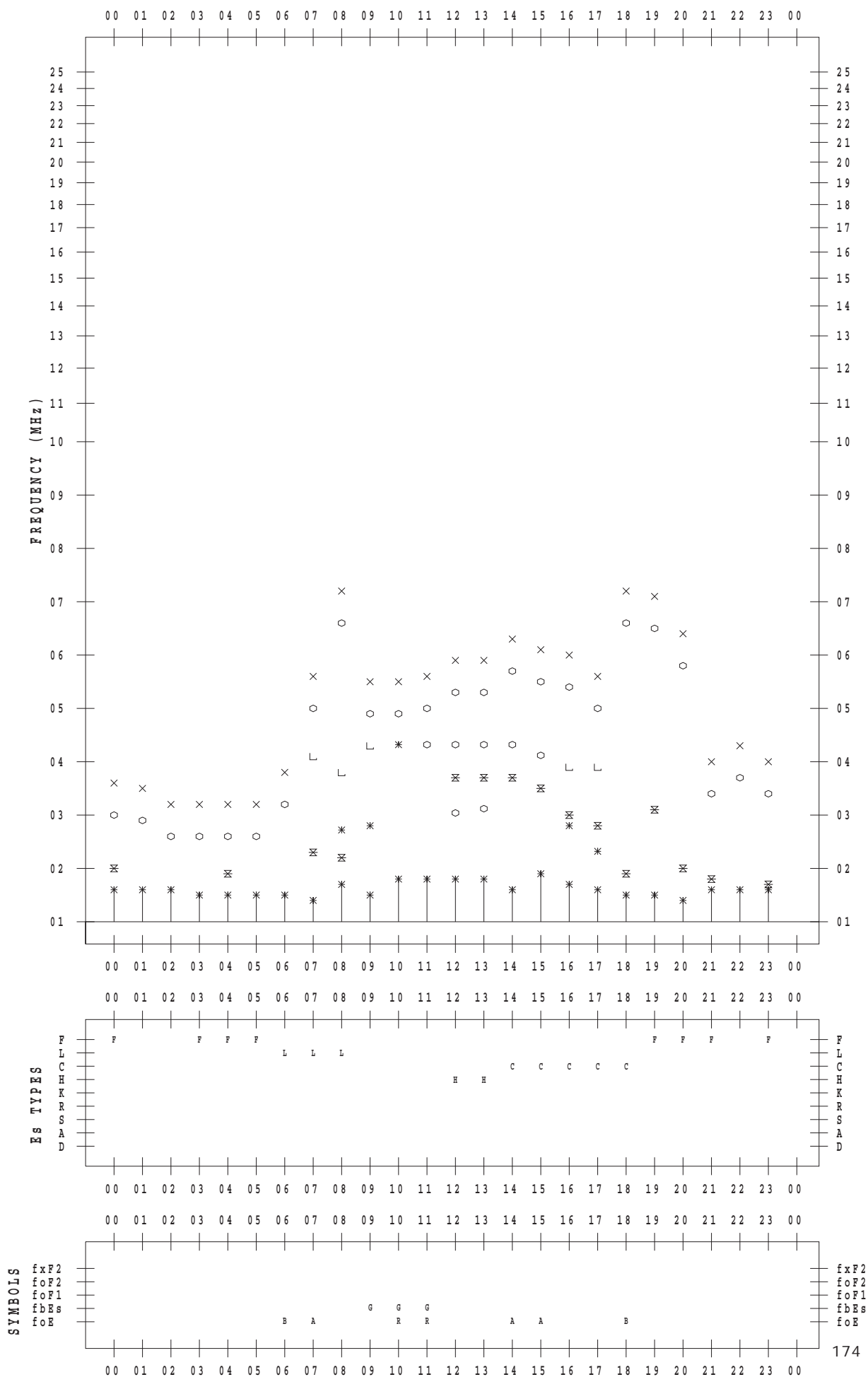
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 7

135 ° E MEAN TIME



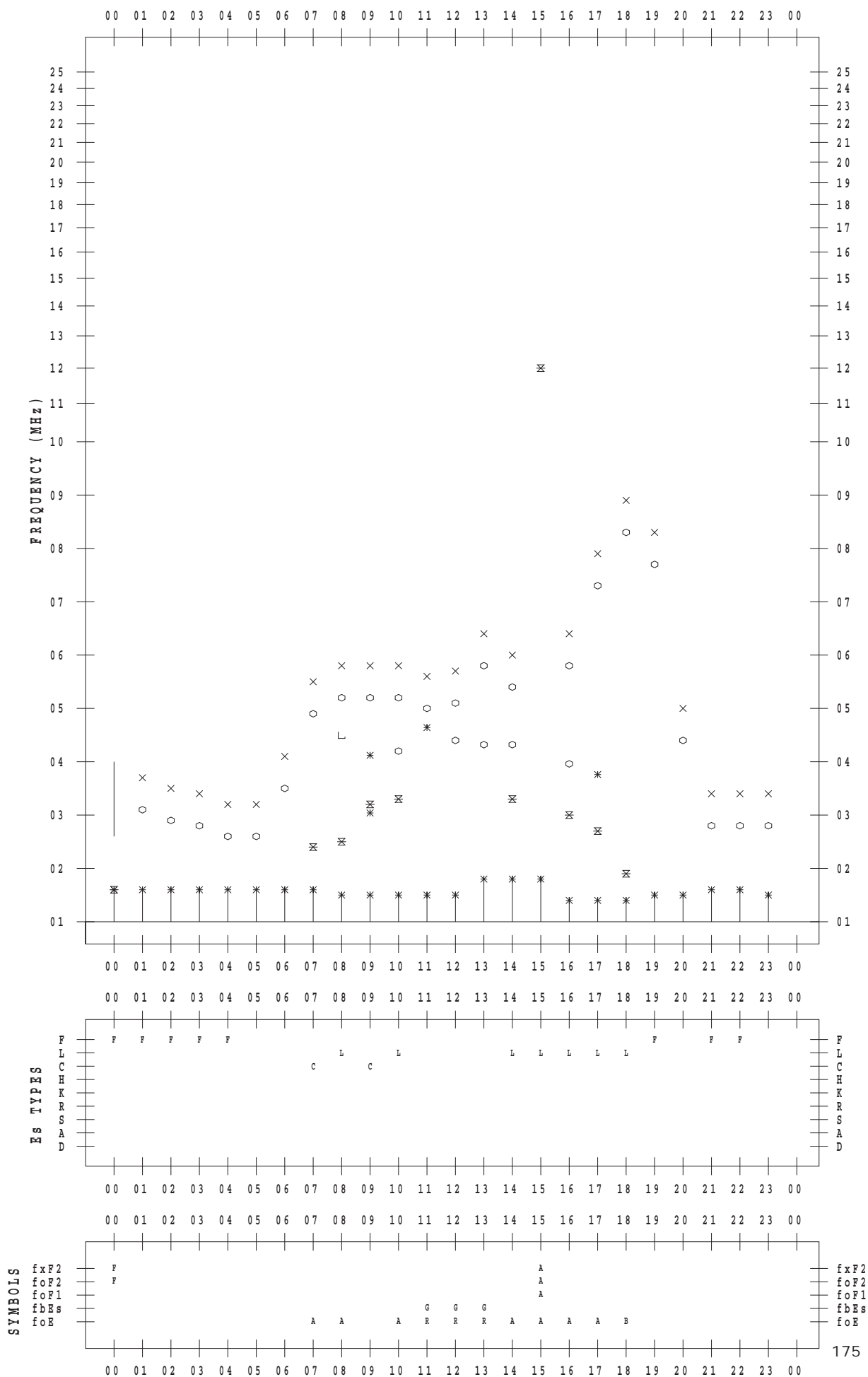
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 8

135 ° E MEAN TIME





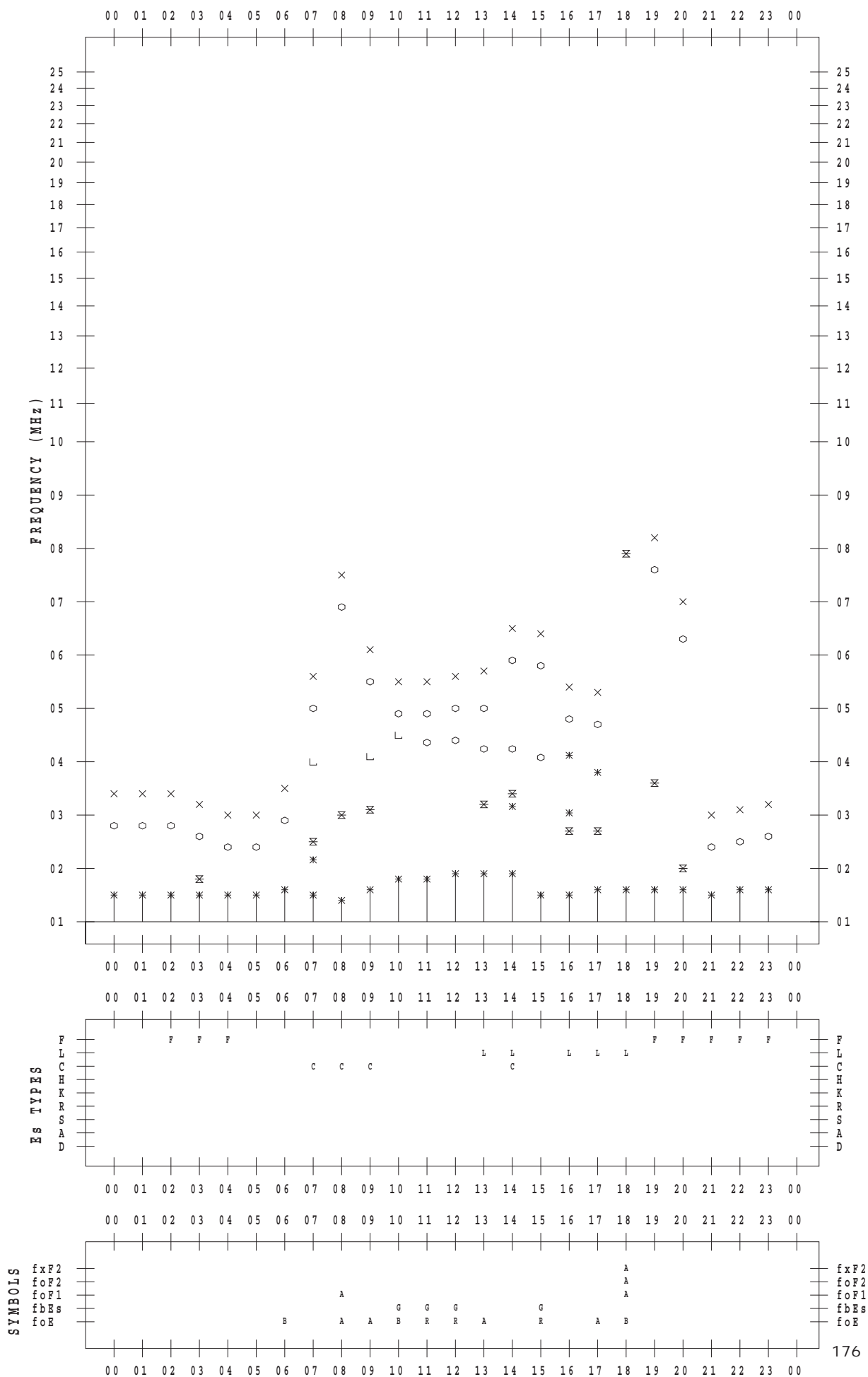
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 9

135 ° E MEAN TIME



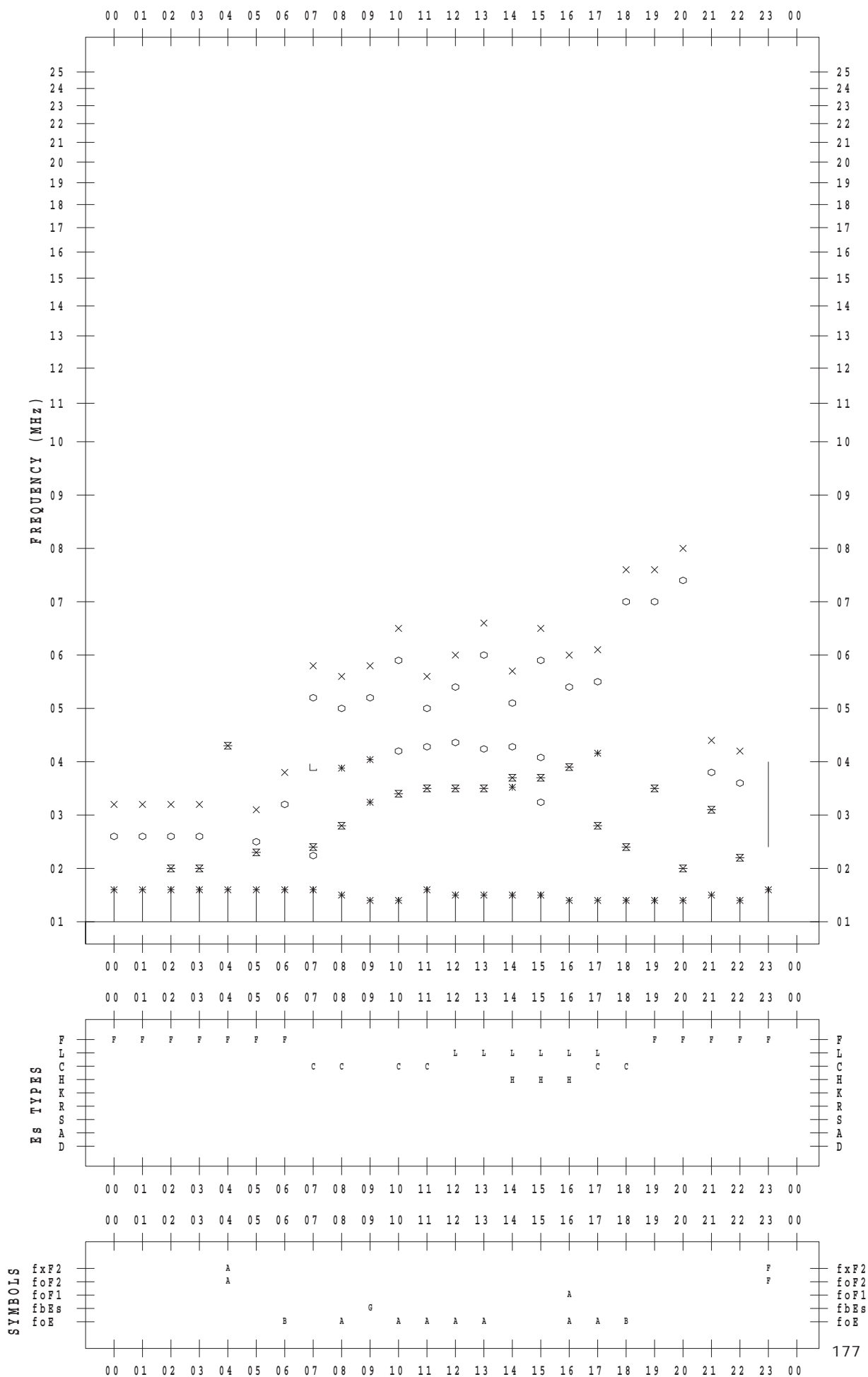
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 10

135 ° E MEAN TIME



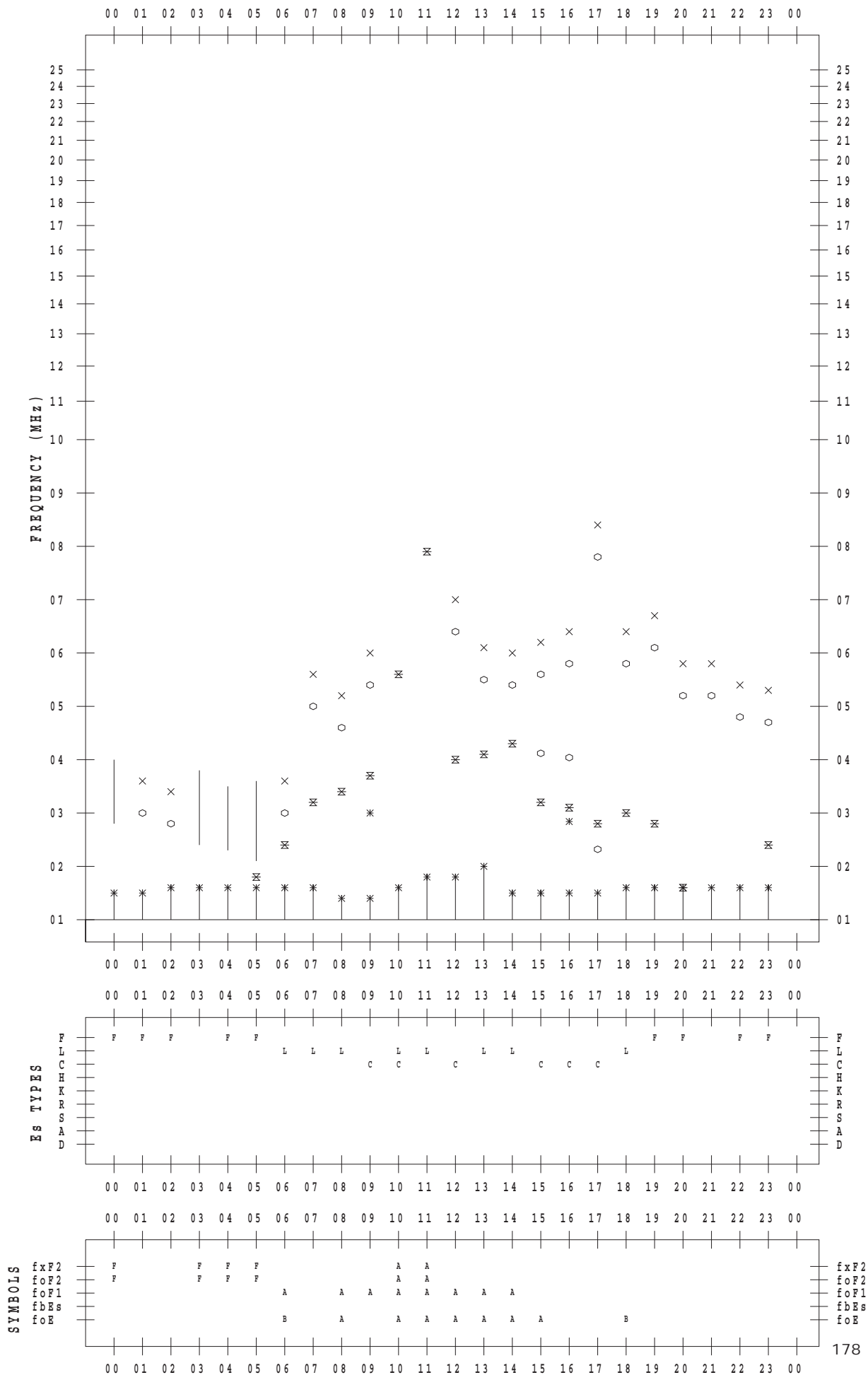
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 11

135 ° E MEAN TIME



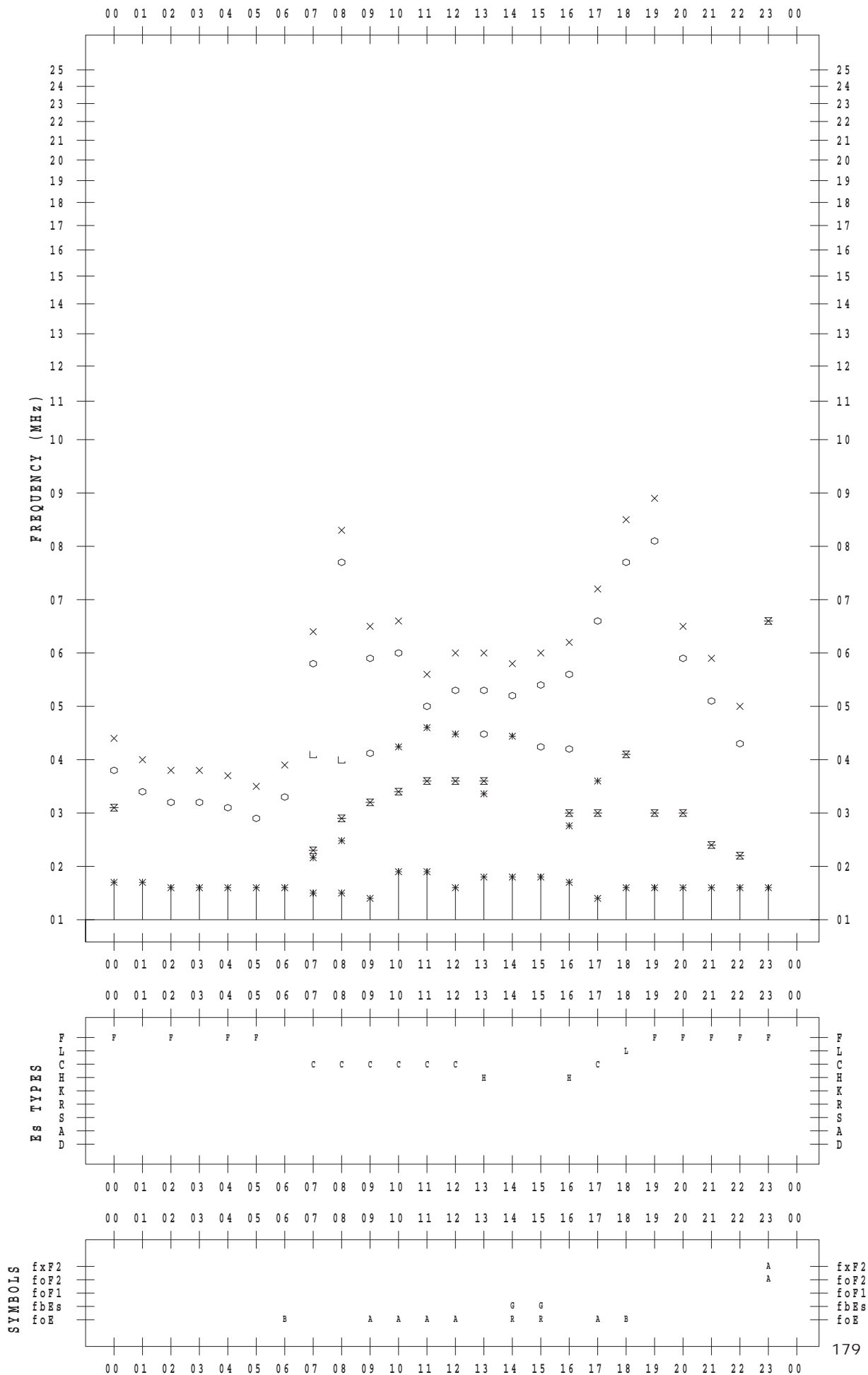
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 12

135 ° E MEAN TIME



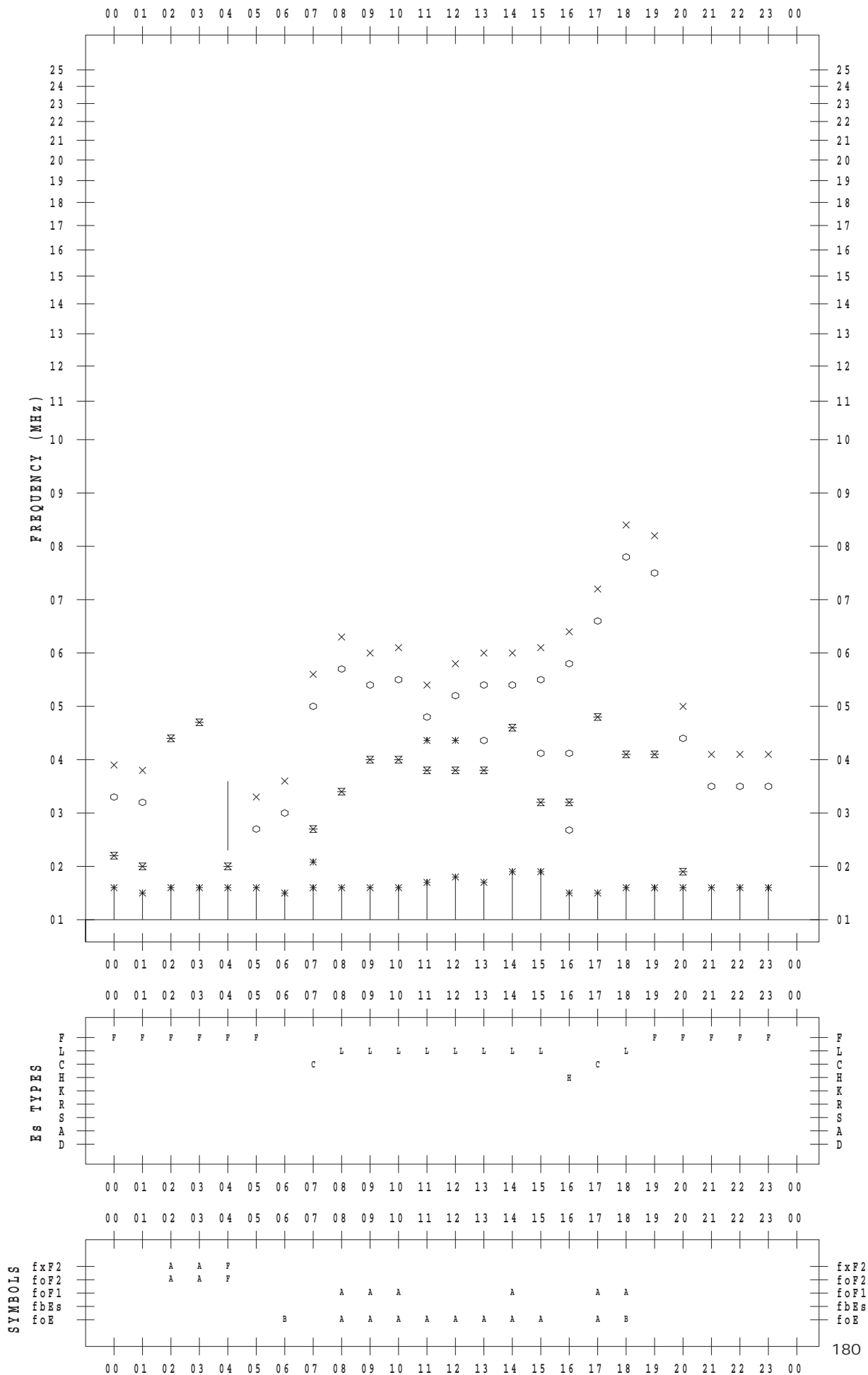
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 13

135 ° E MEAN TIME



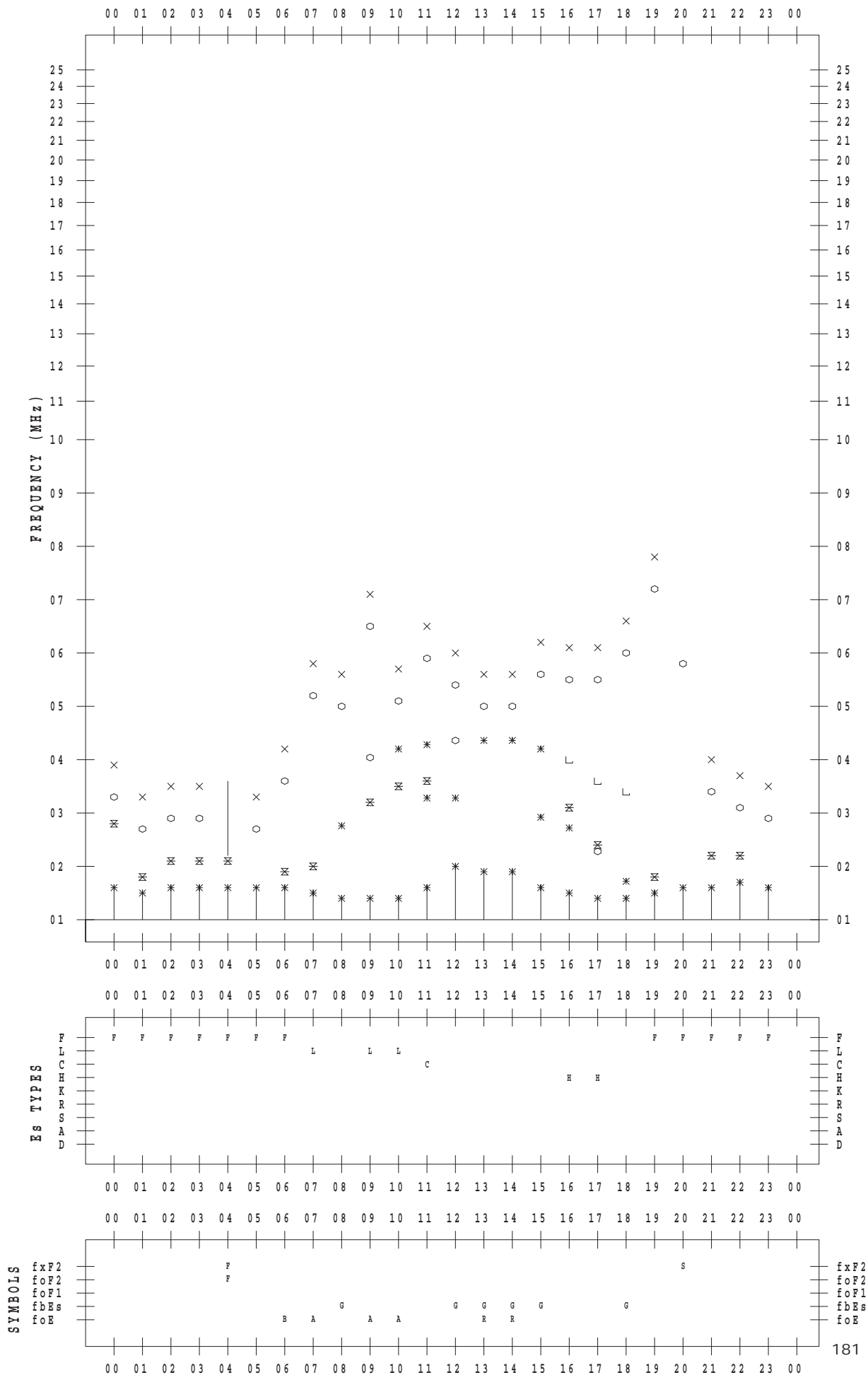
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 14

135 ° E MEAN TIME



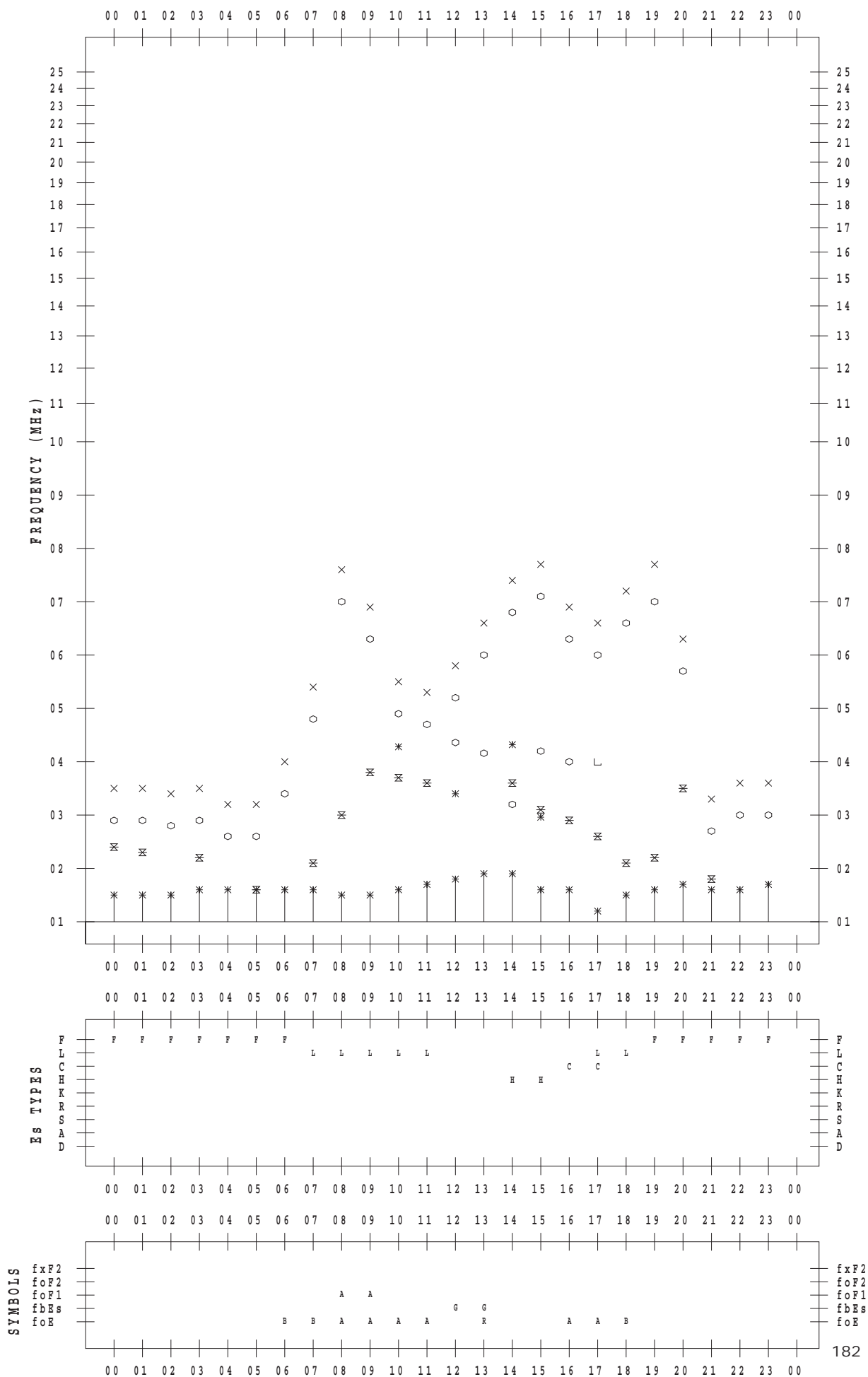
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 15

135 ° E MEAN TIME



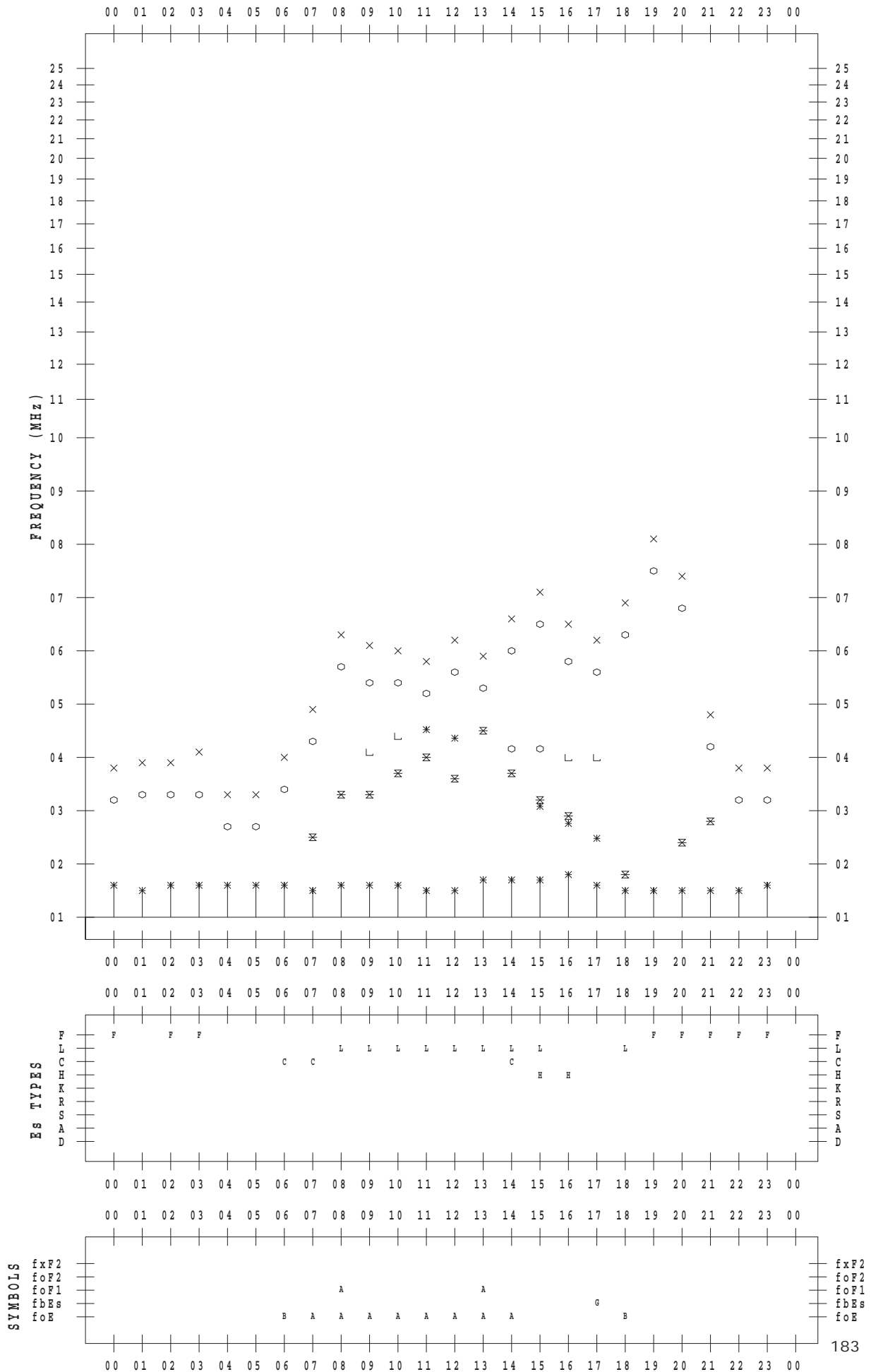
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 16

135 ° E MEAN TIME





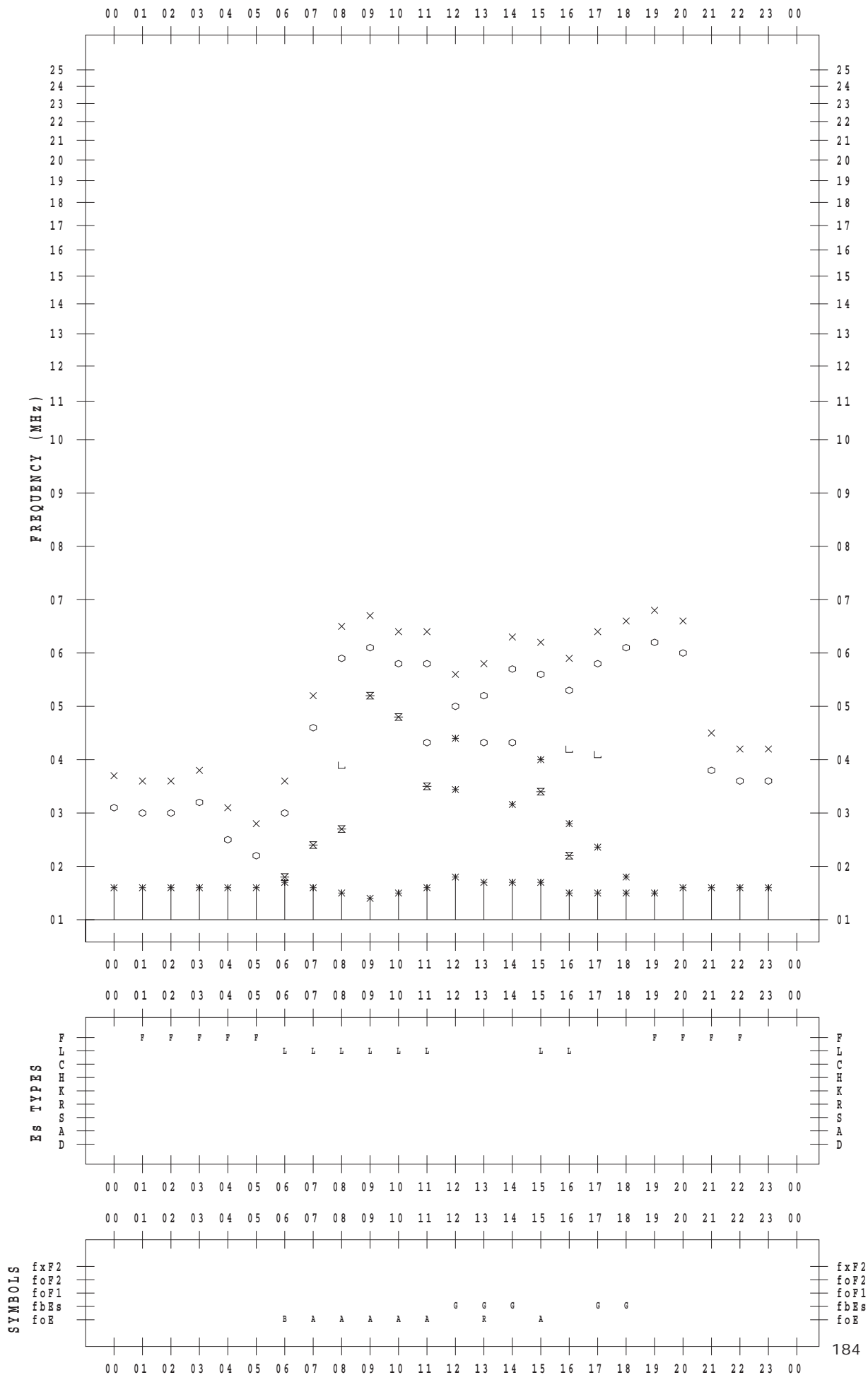
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 17

135 ° E MEAN TIME



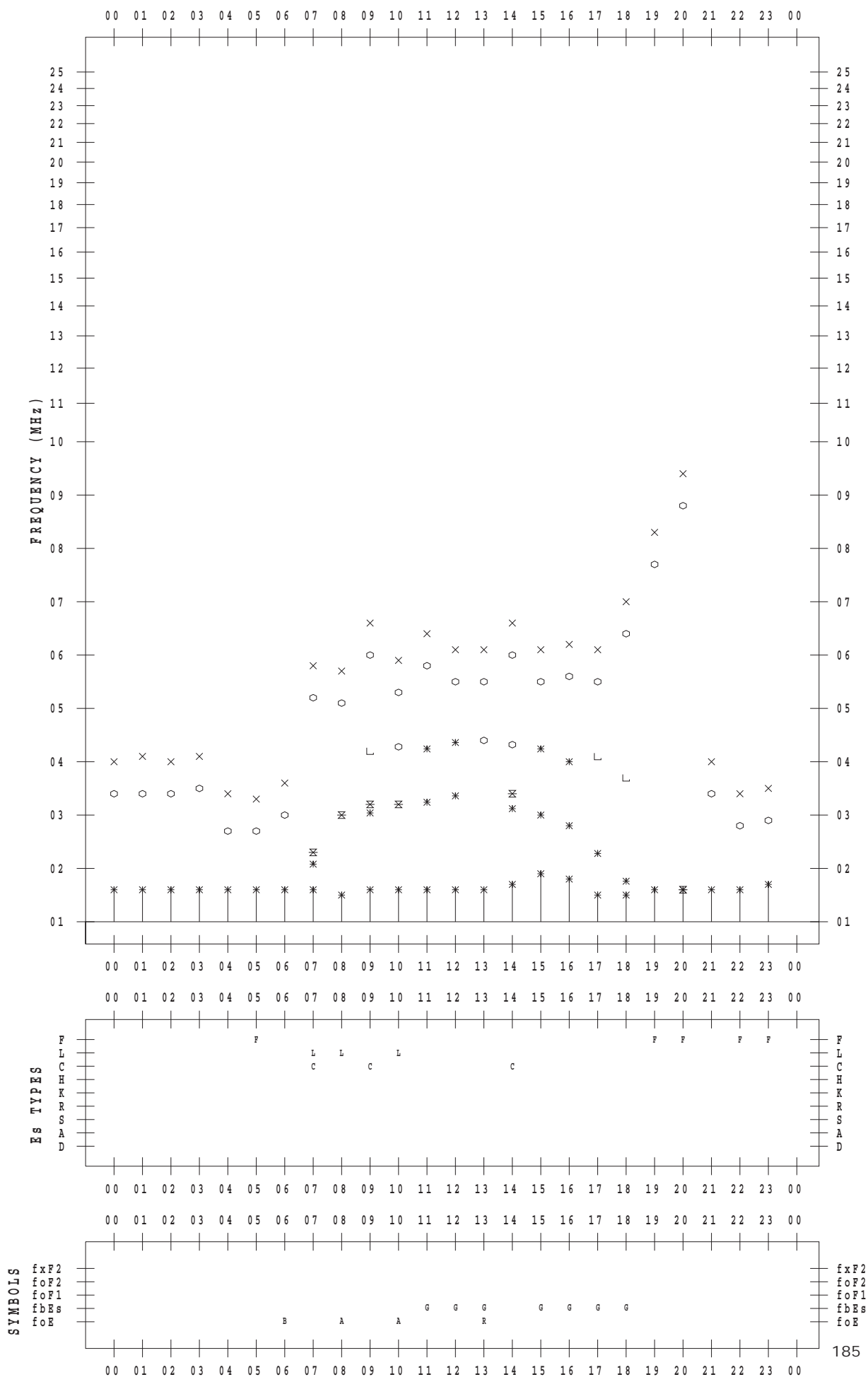
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 18

135 ° E MEAN TIME



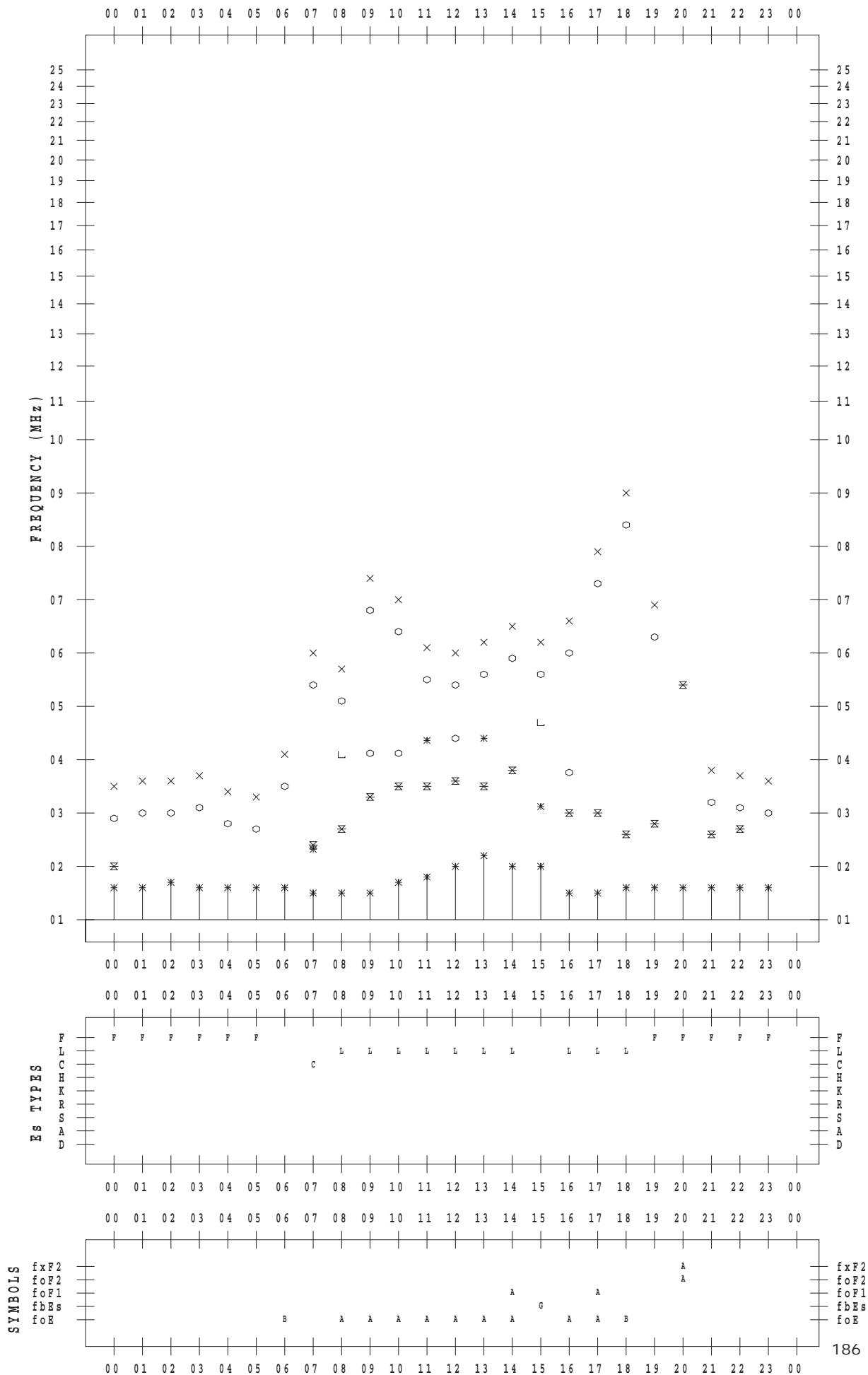
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 19

135 ° E MEAN TIME



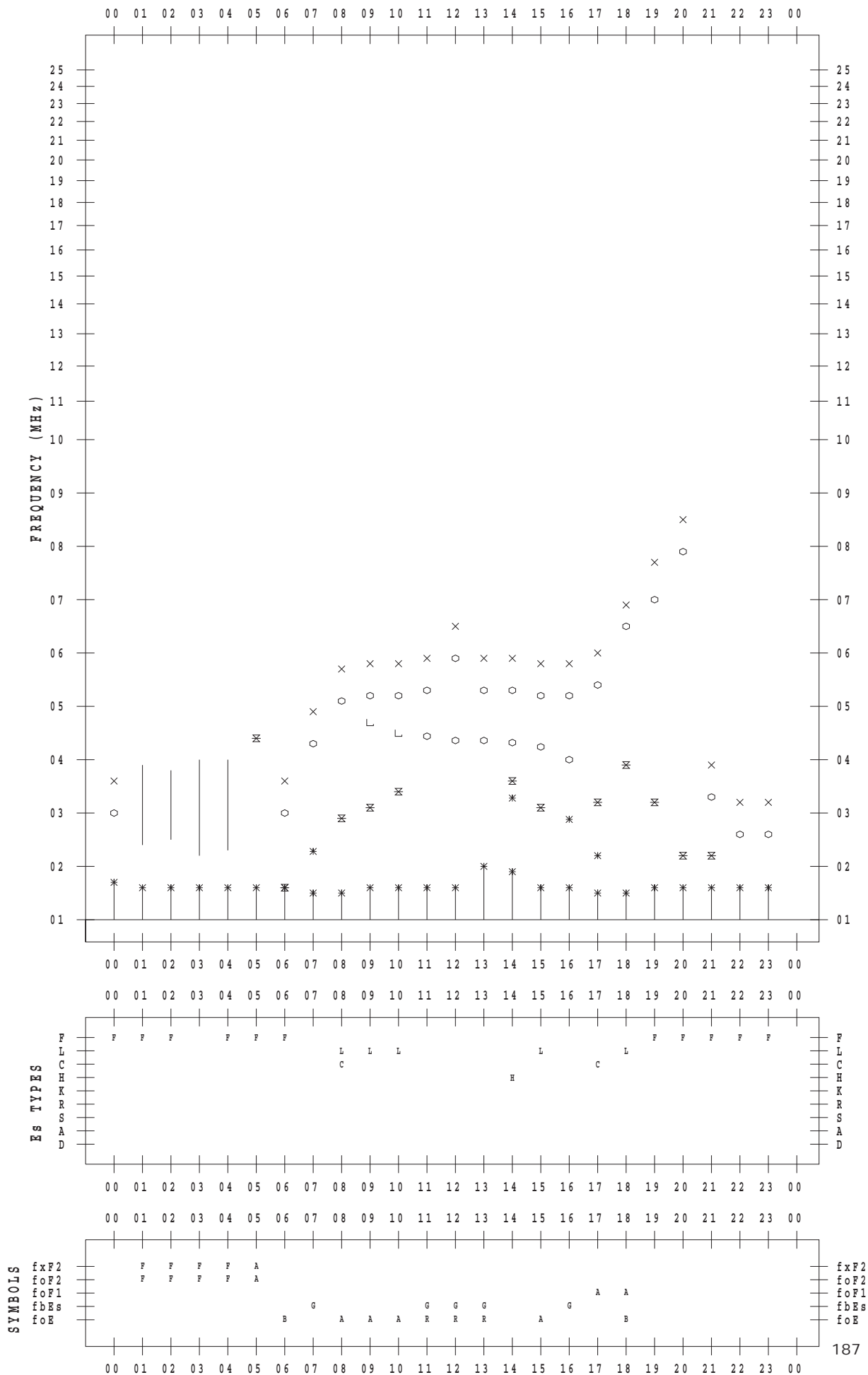
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 20

135 ° E MEAN TIME



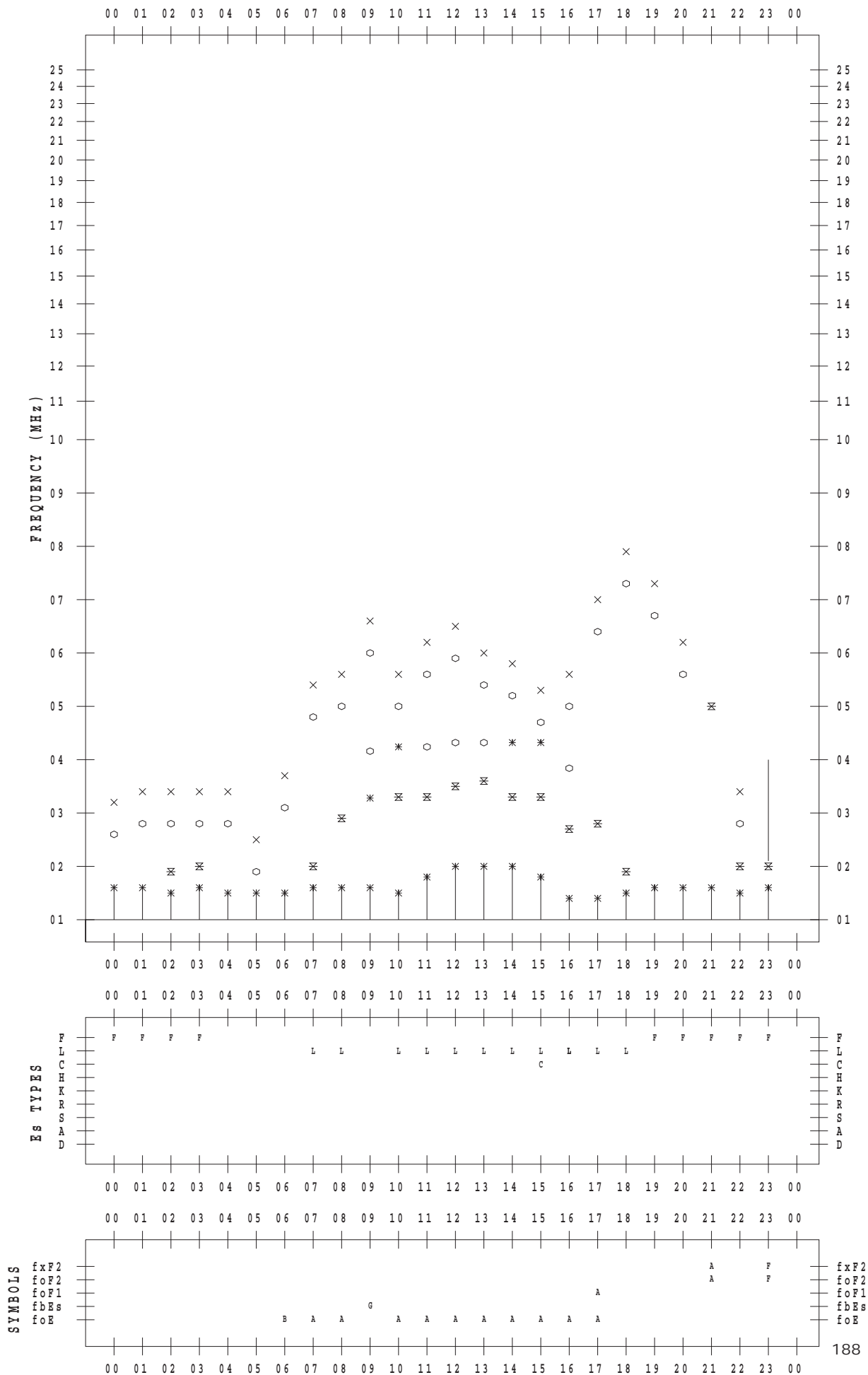
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 21

135 ° E MEAN TIME



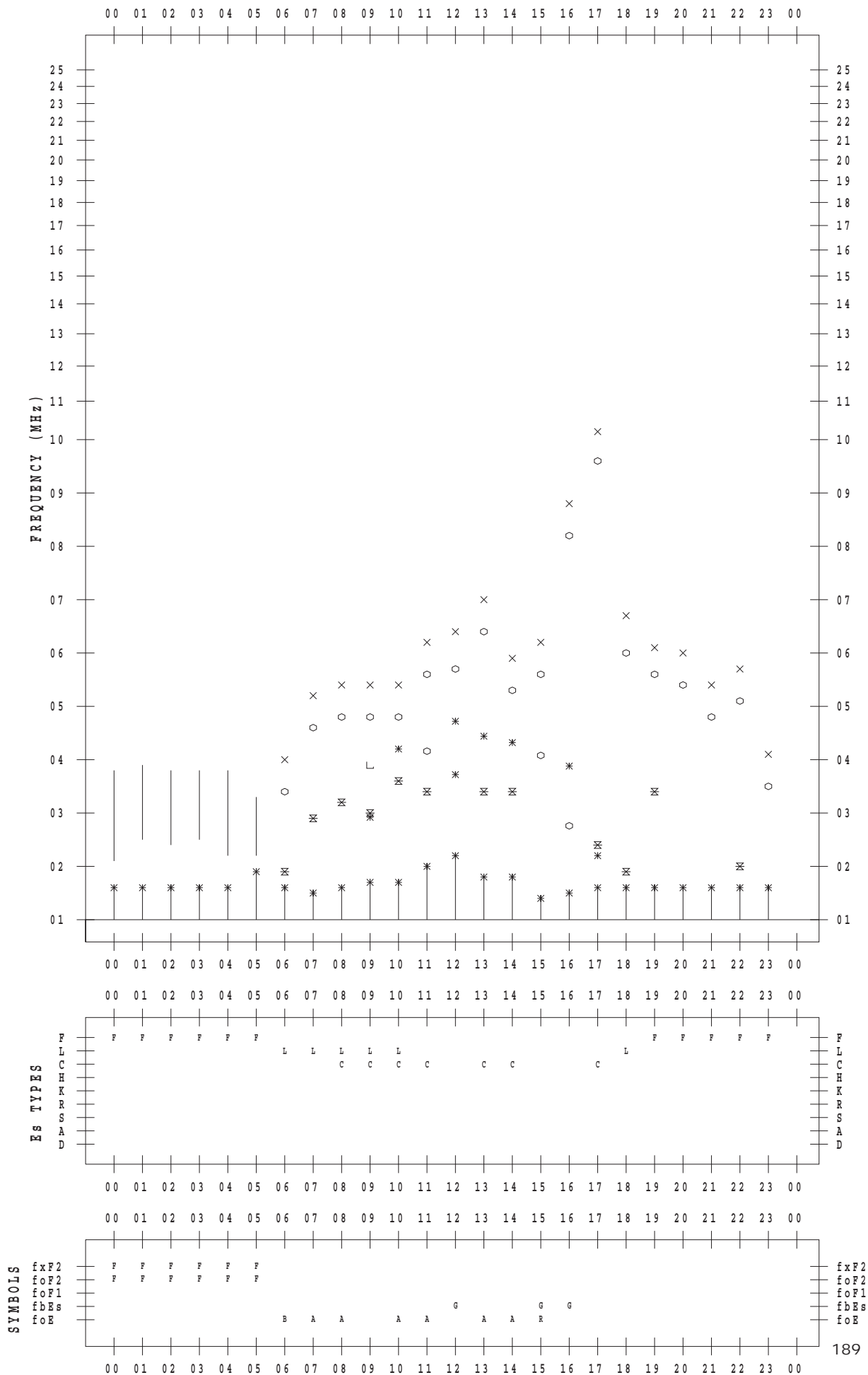
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 22

135 ° E MEAN TIME



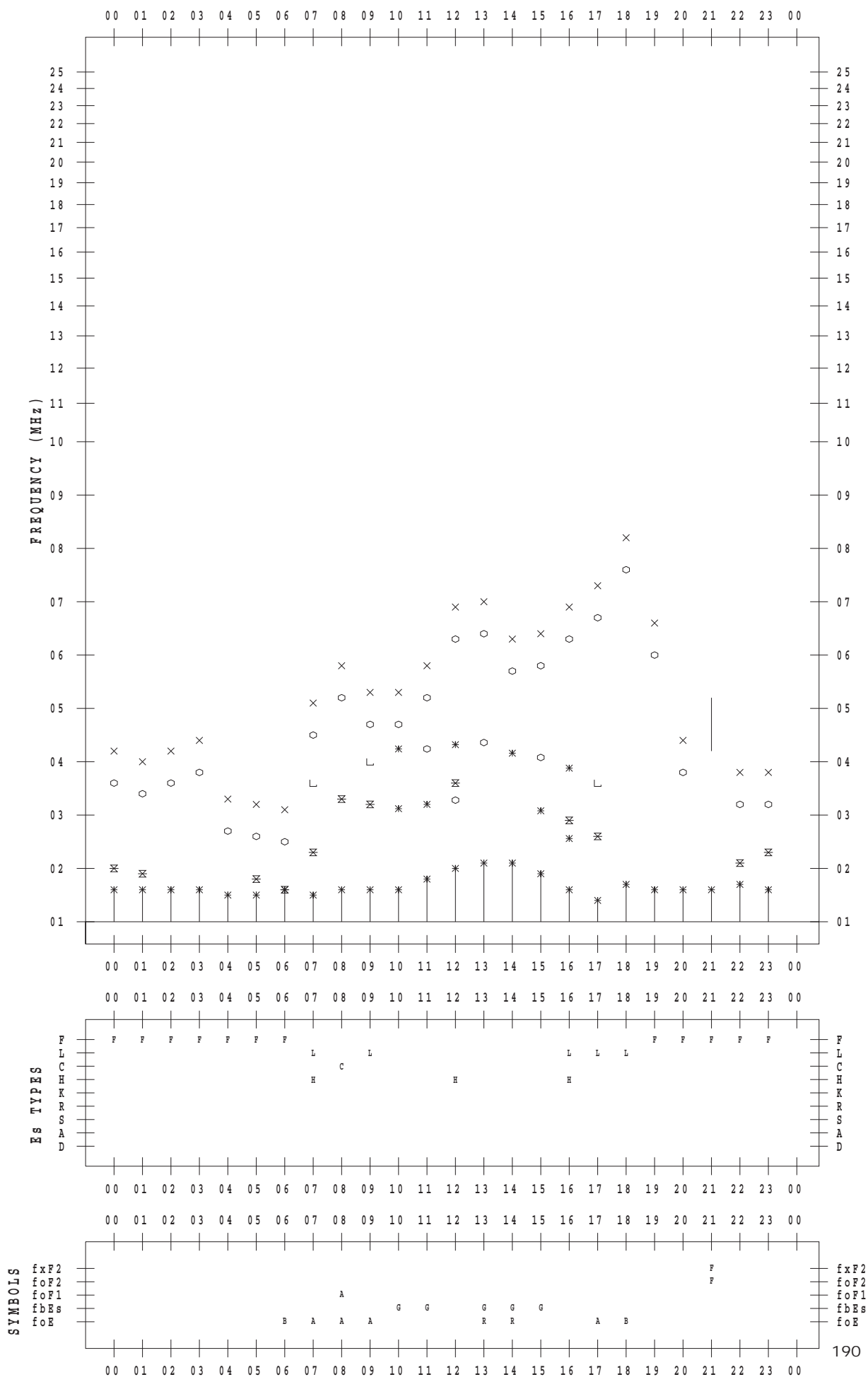
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 23

135 ° E MEAN TIME







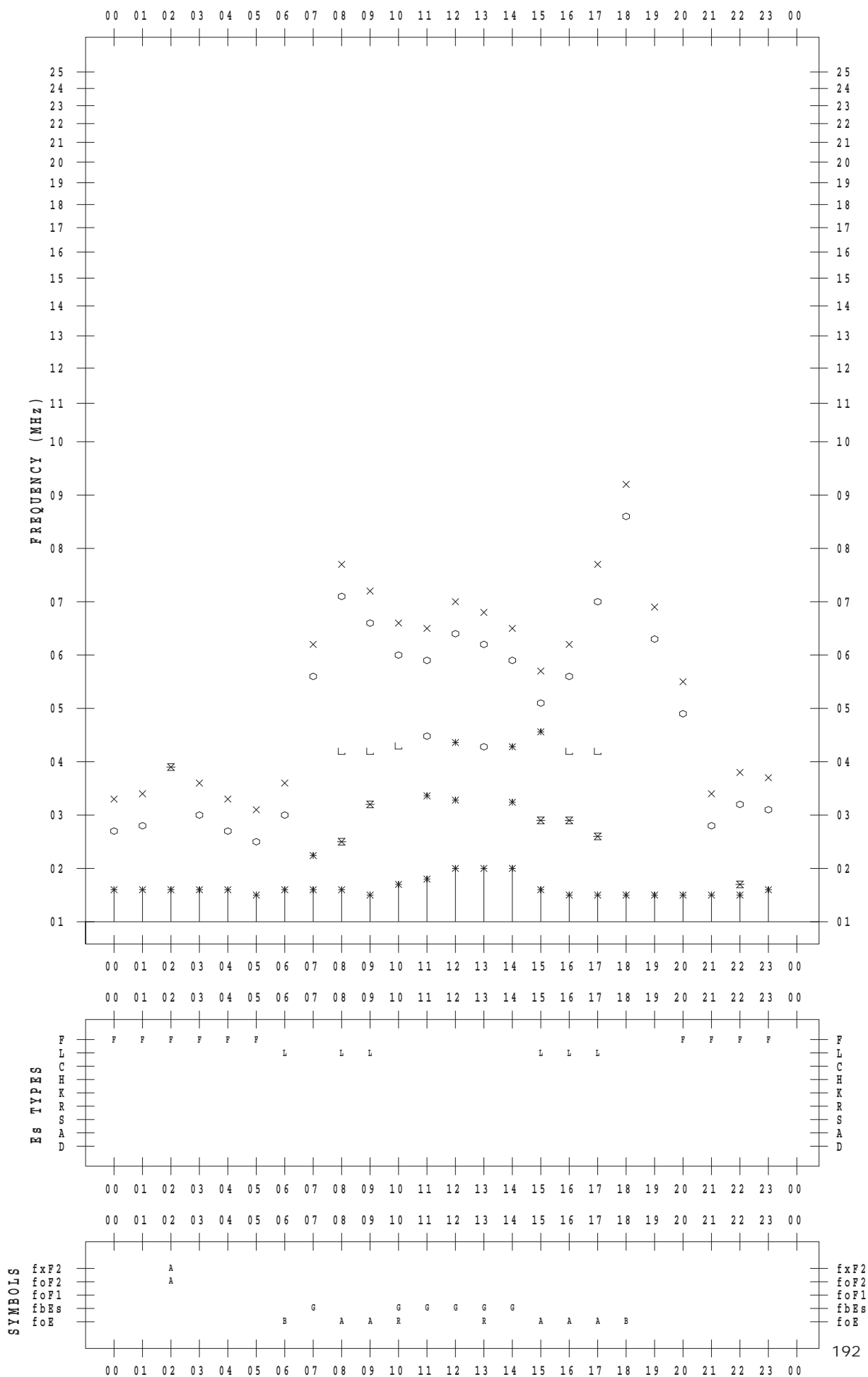
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 25

135 ° E MEAN TIME



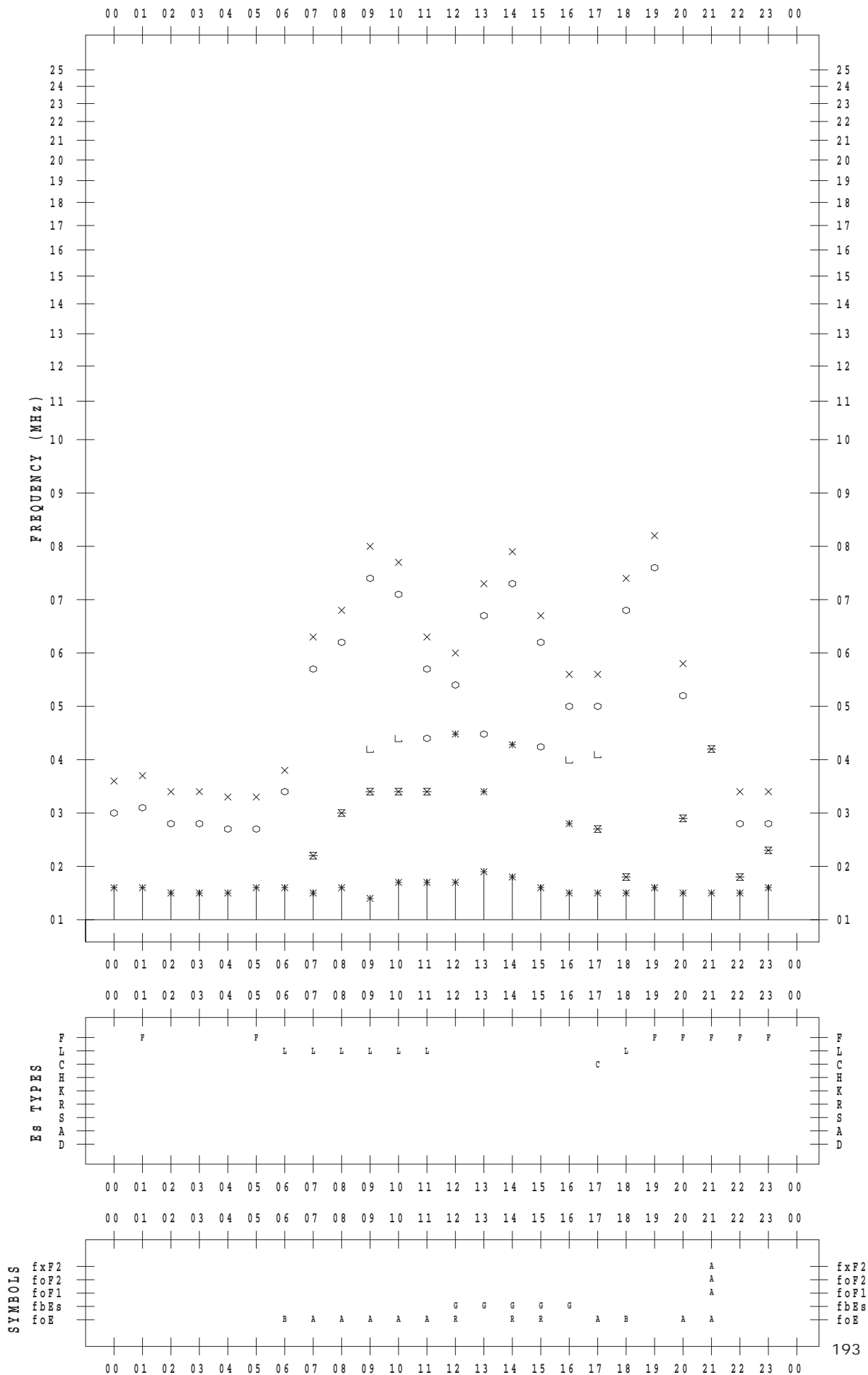
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 26

135 ° E MEAN TIME



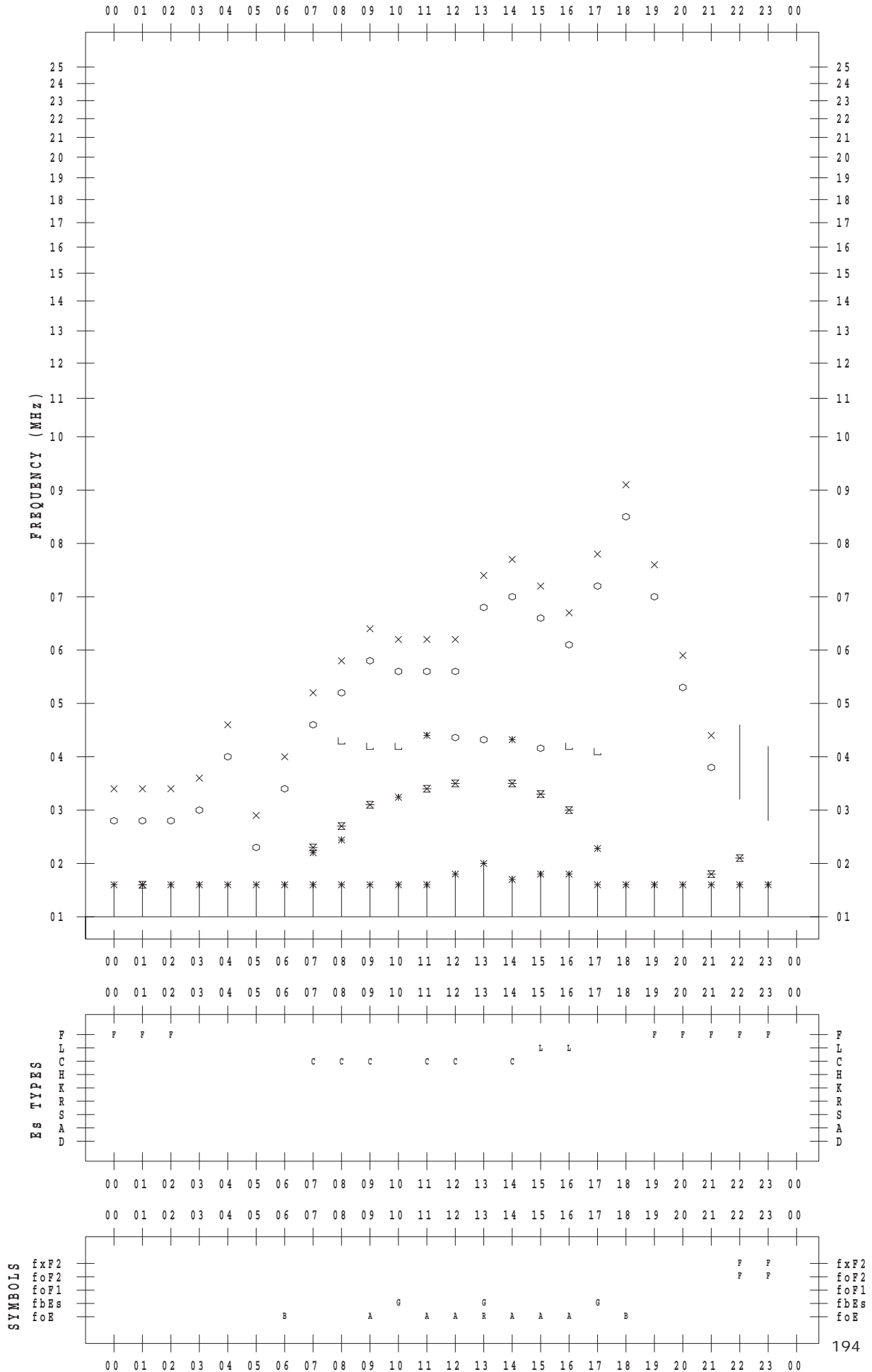
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 27

135 ° E MEAN TIME



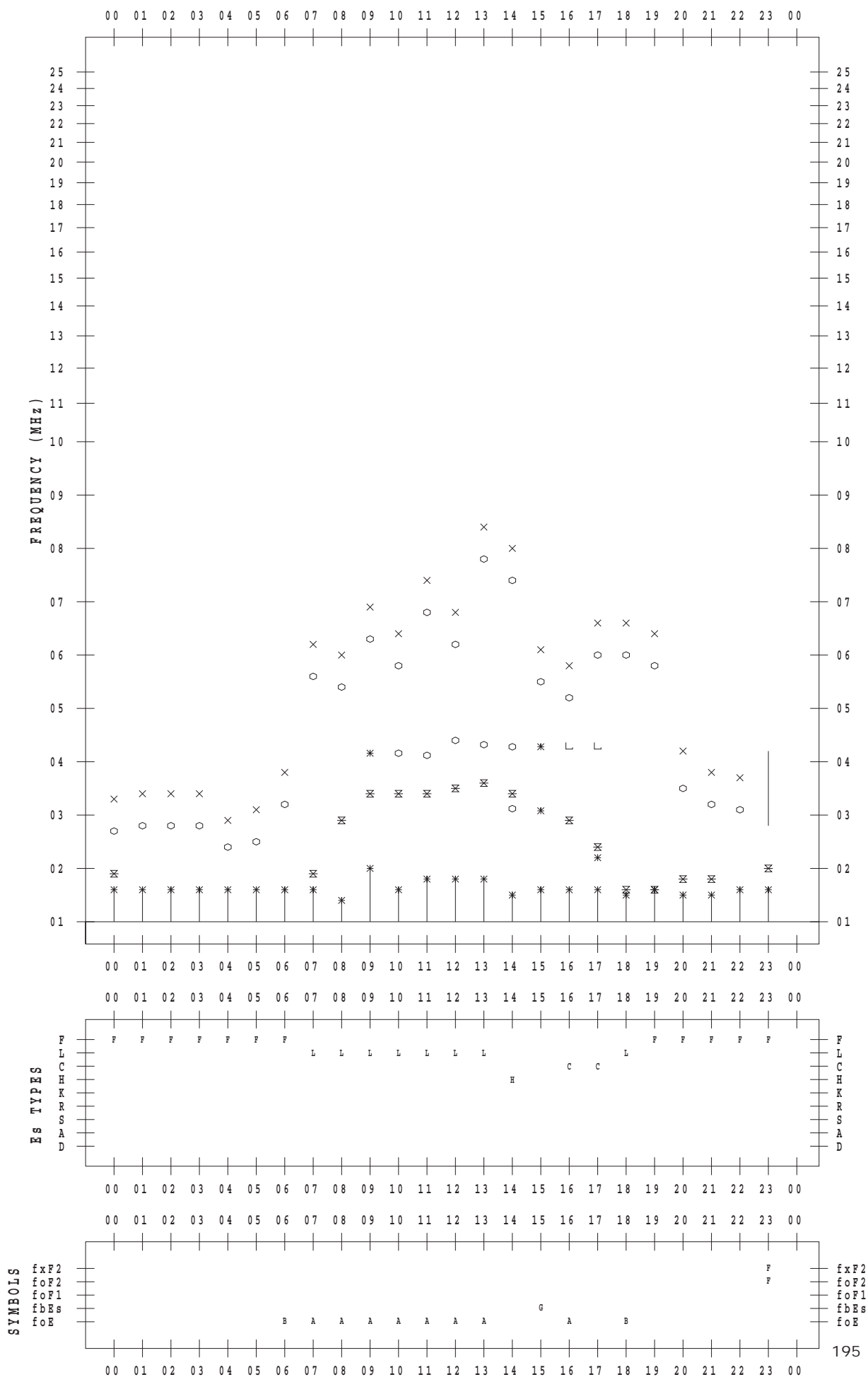
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 28

135 ° E MEAN TIME



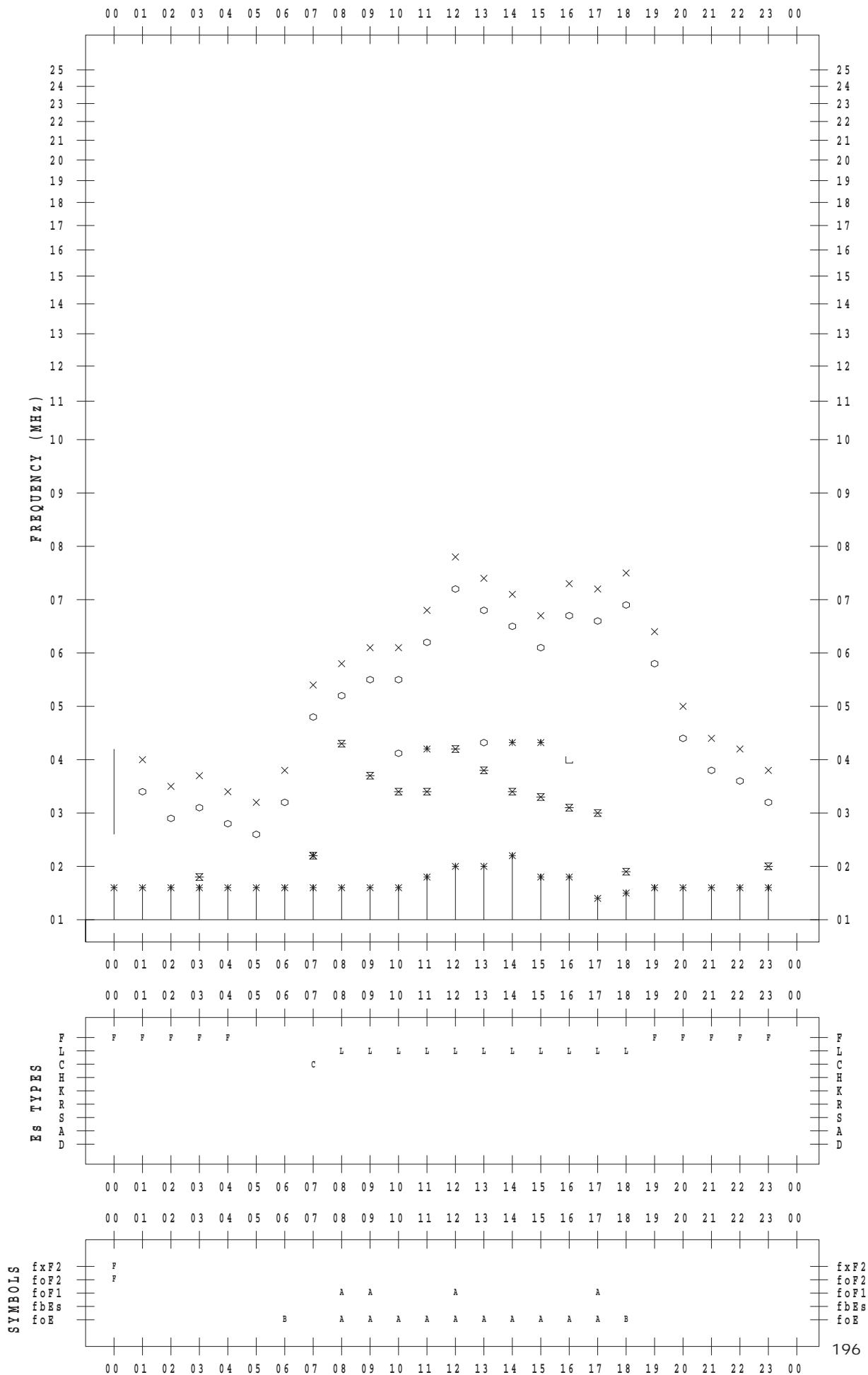
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 29

135 ° E MEAN TIME



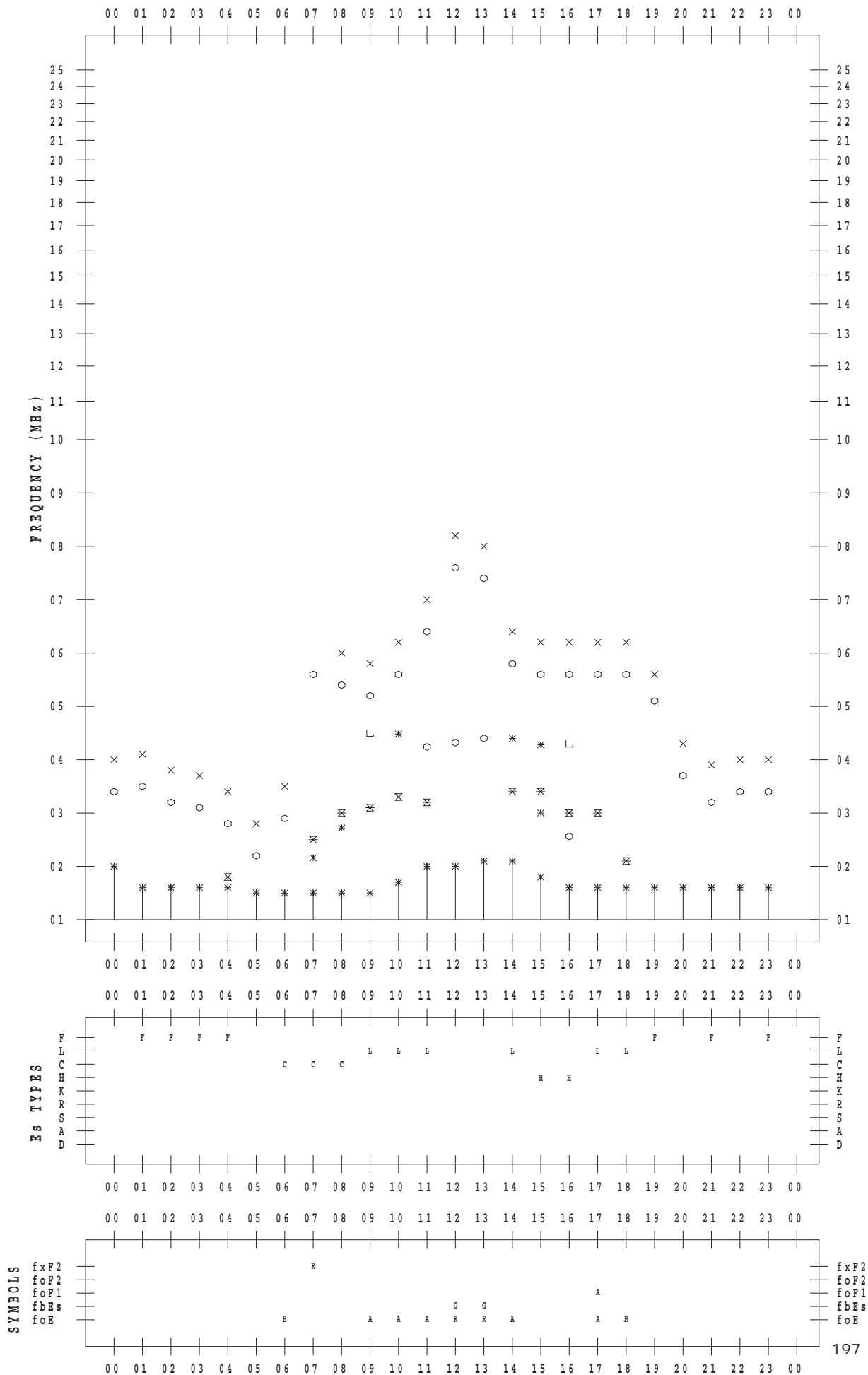
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 9 / 30

135 ° E MEAN TIME



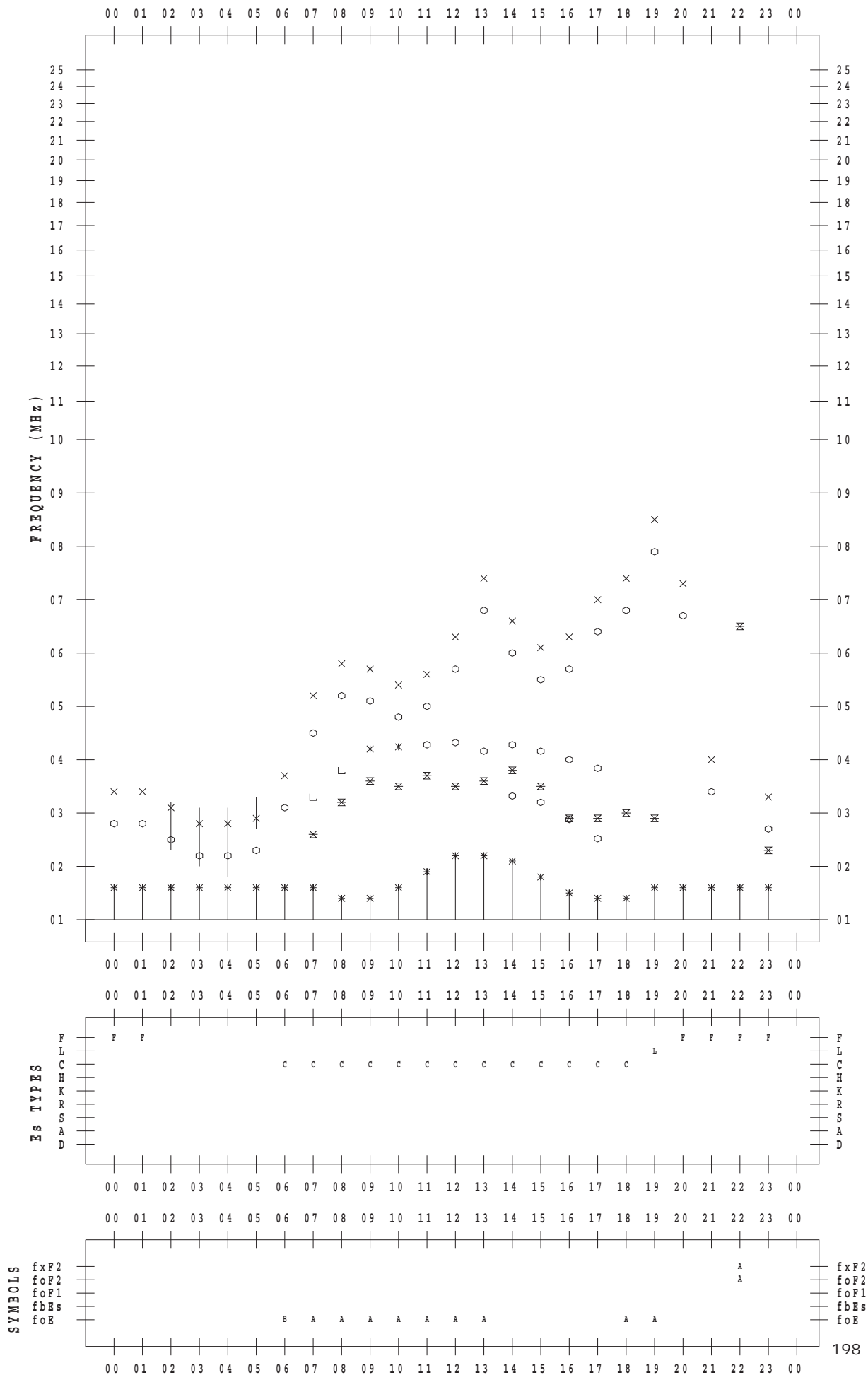
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 1

135 ° E MEAN TIME



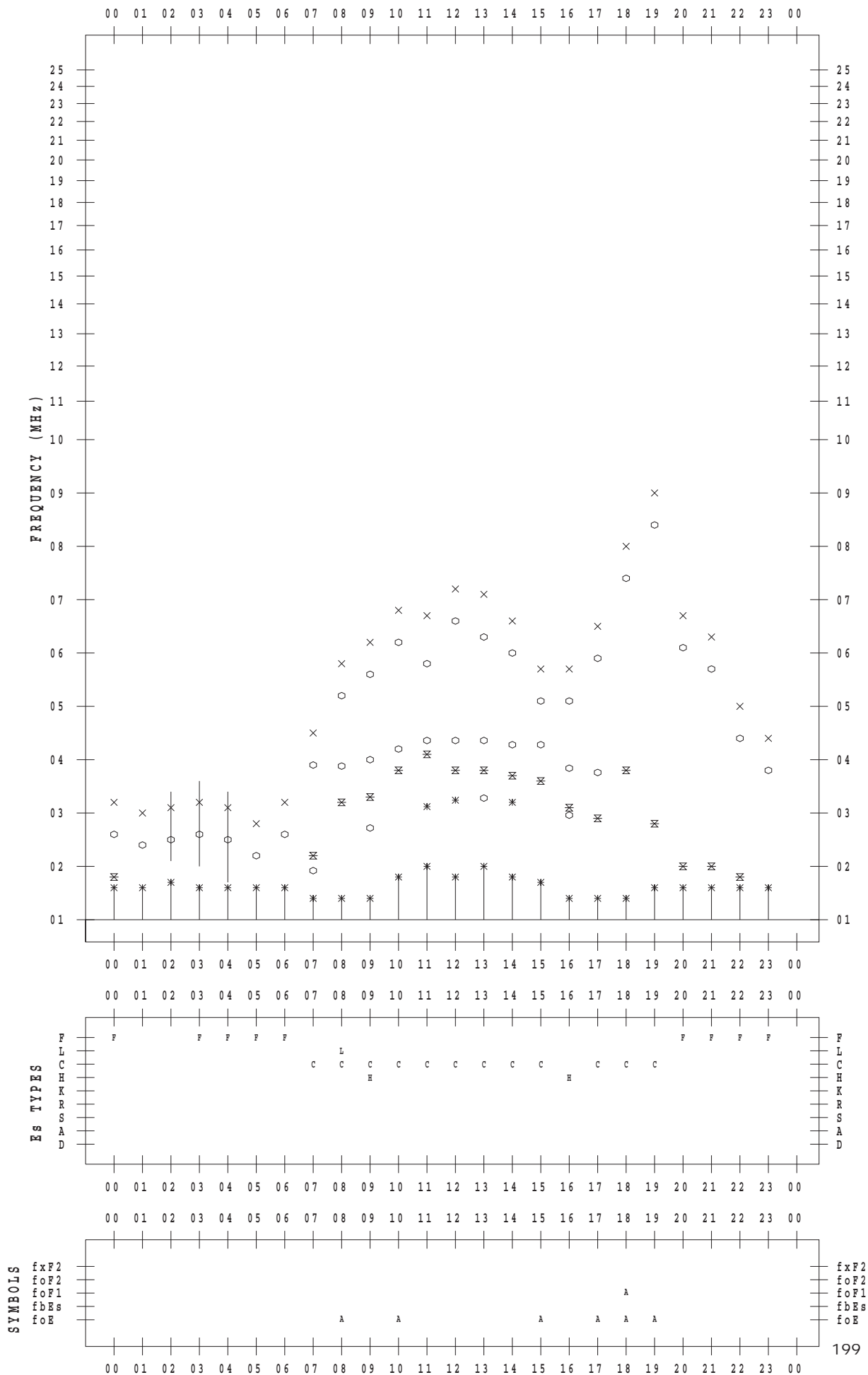
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 2

135 ° E MEAN TIME





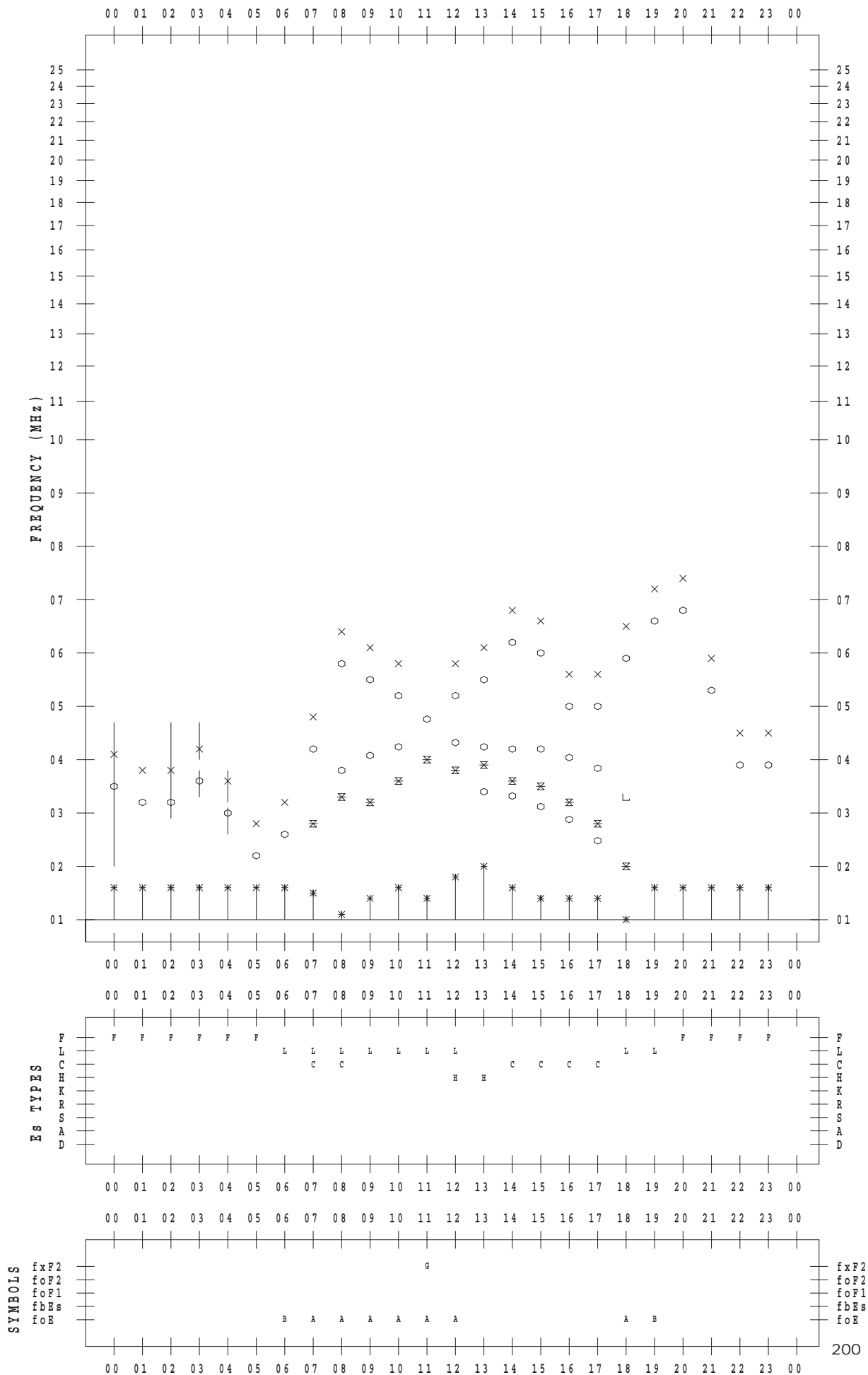
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 3

135 ° E MEAN TIME



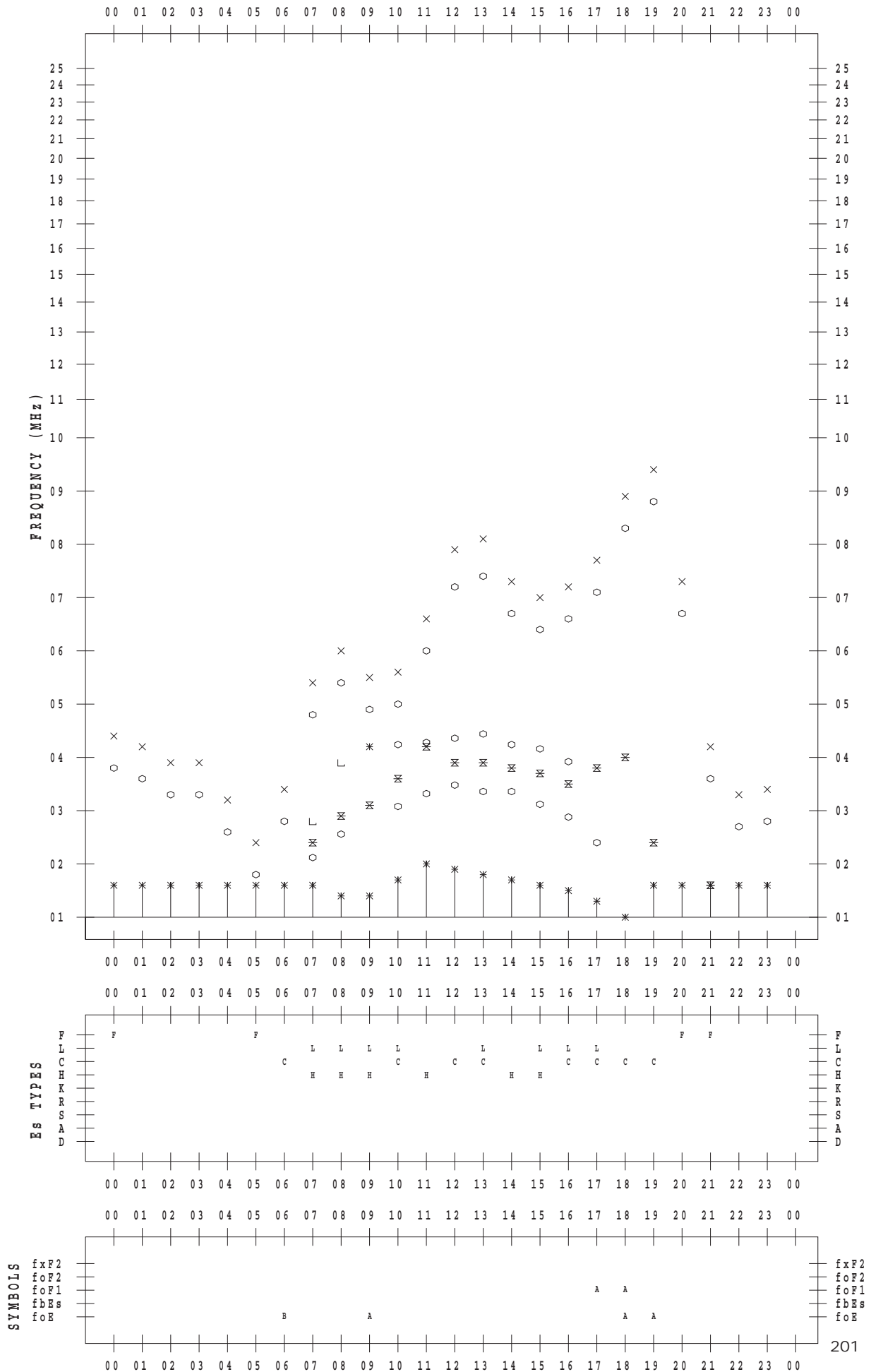
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 4

135 ° E MEAN TIME



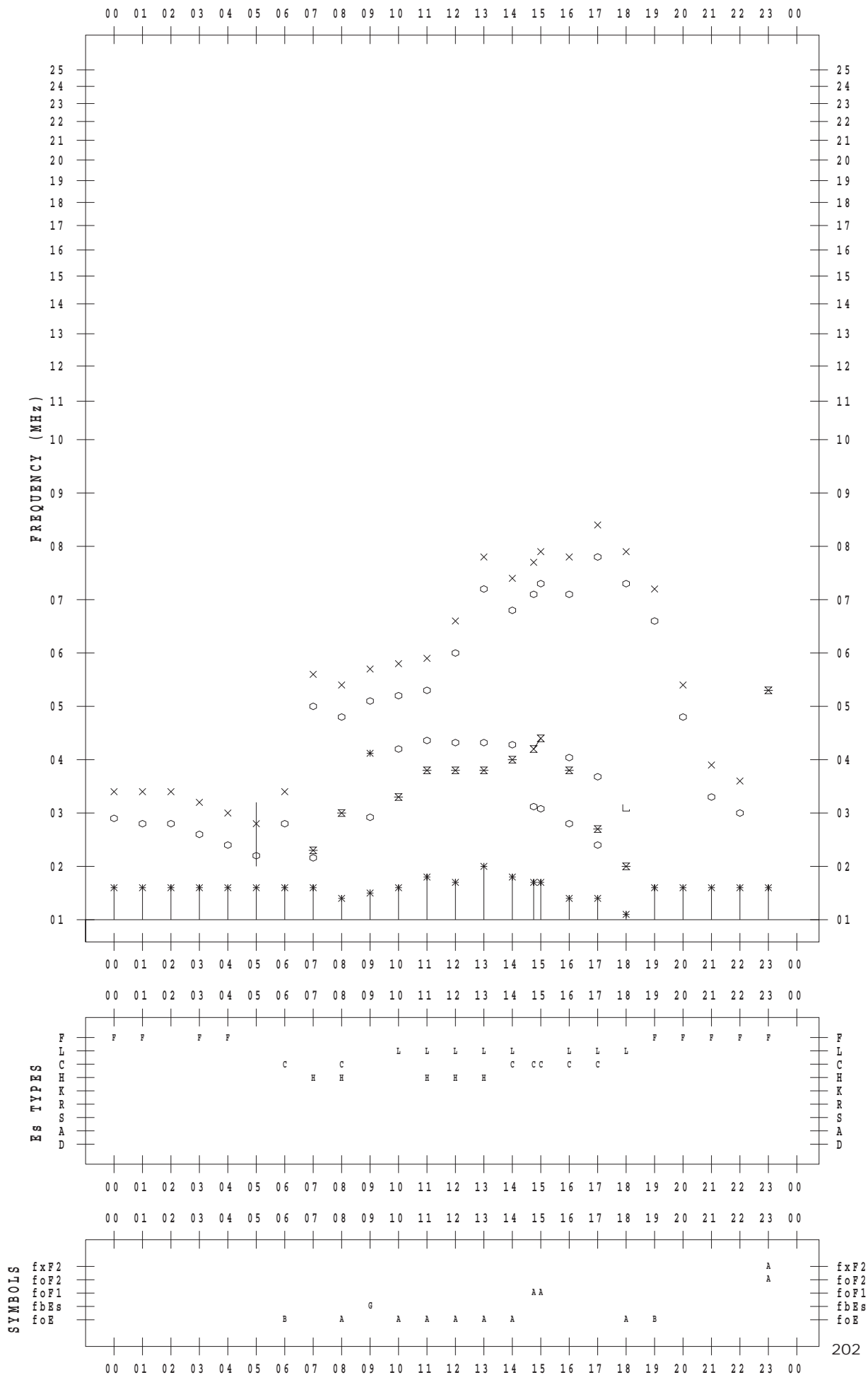
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 5

135 ° E MEAN TIME



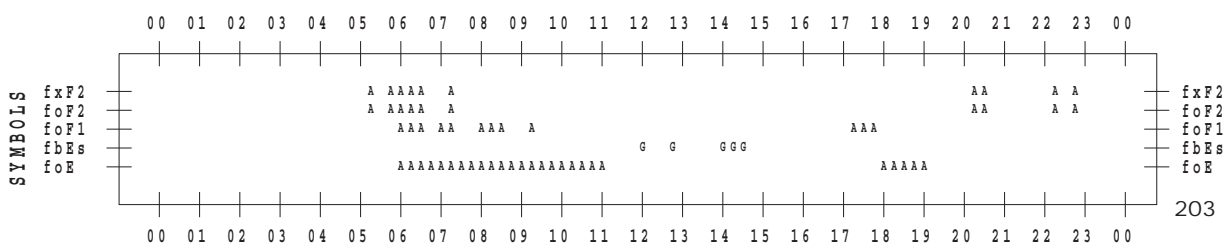
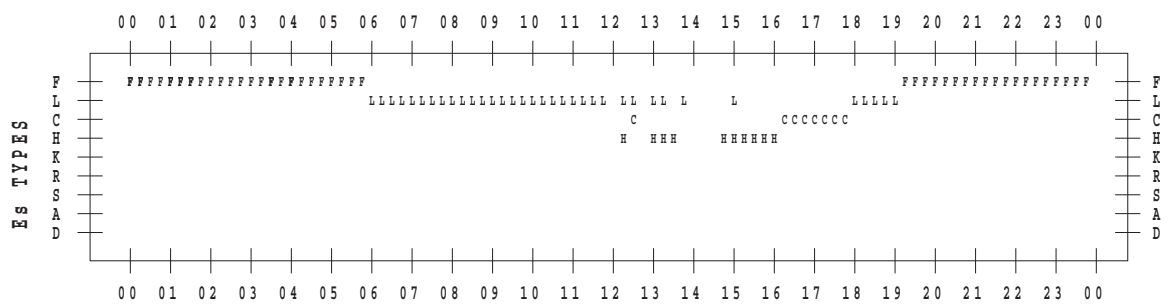
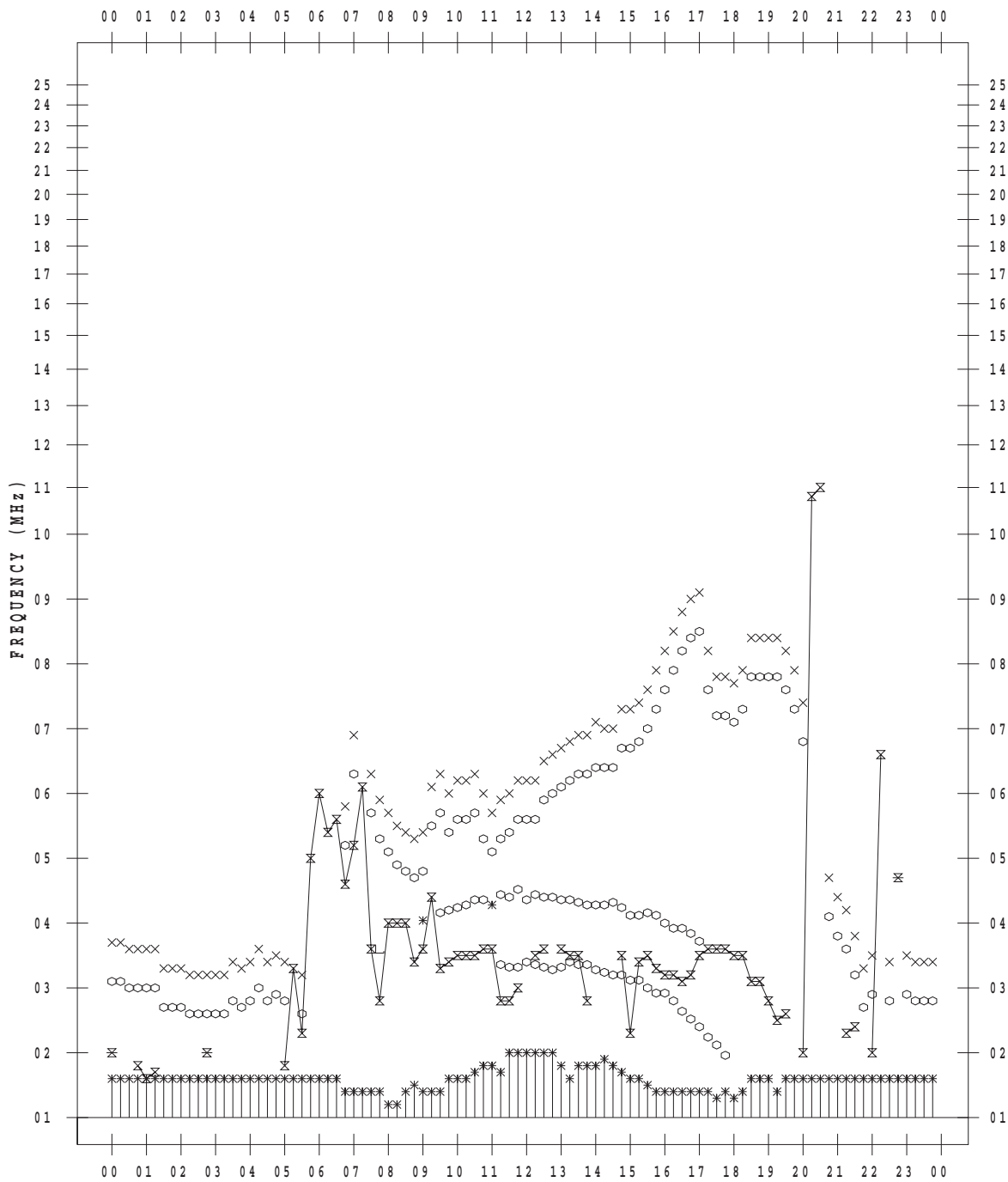
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 6

135 ° E MEAN TIME



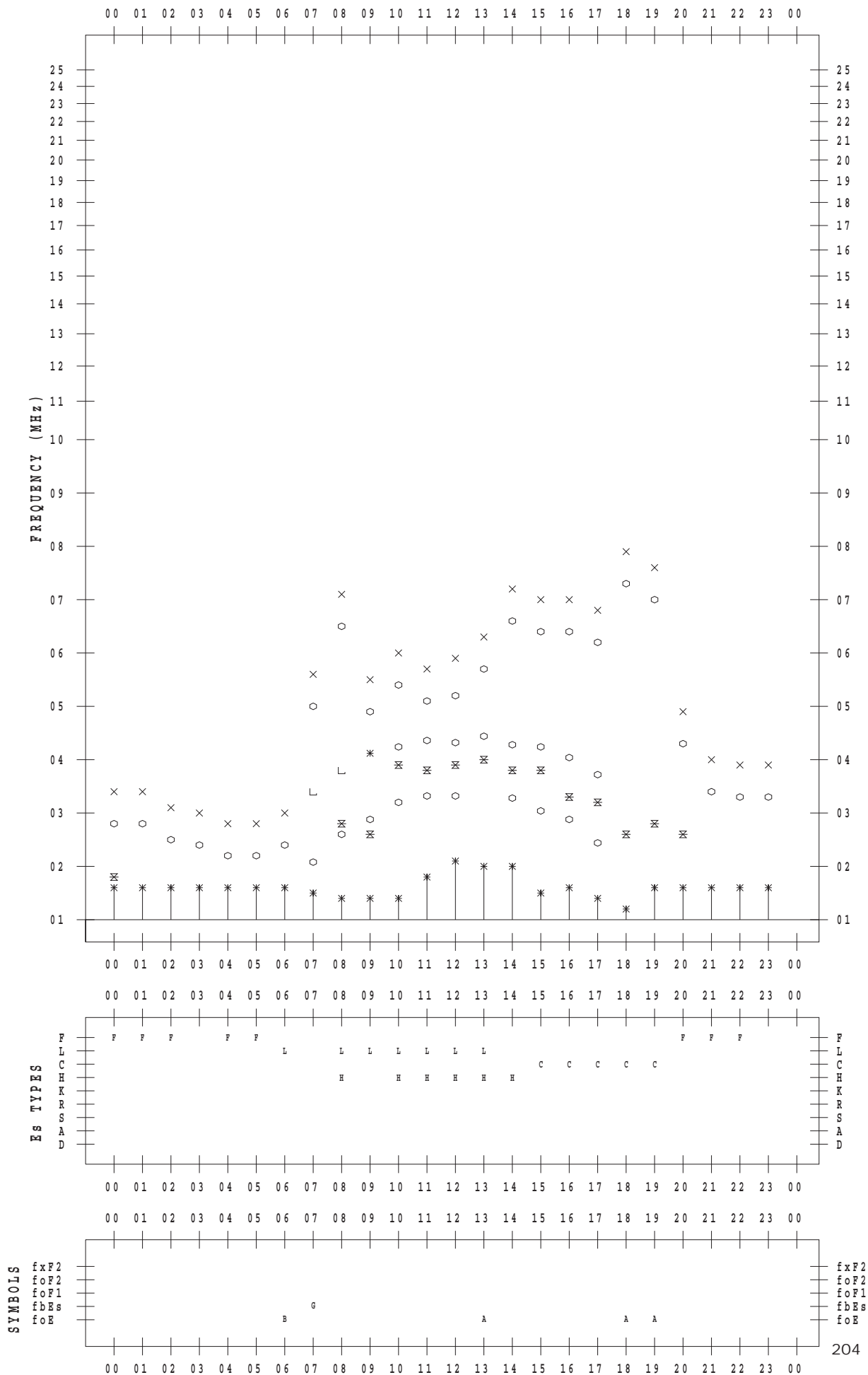
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 7

135 ° E MEAN TIME



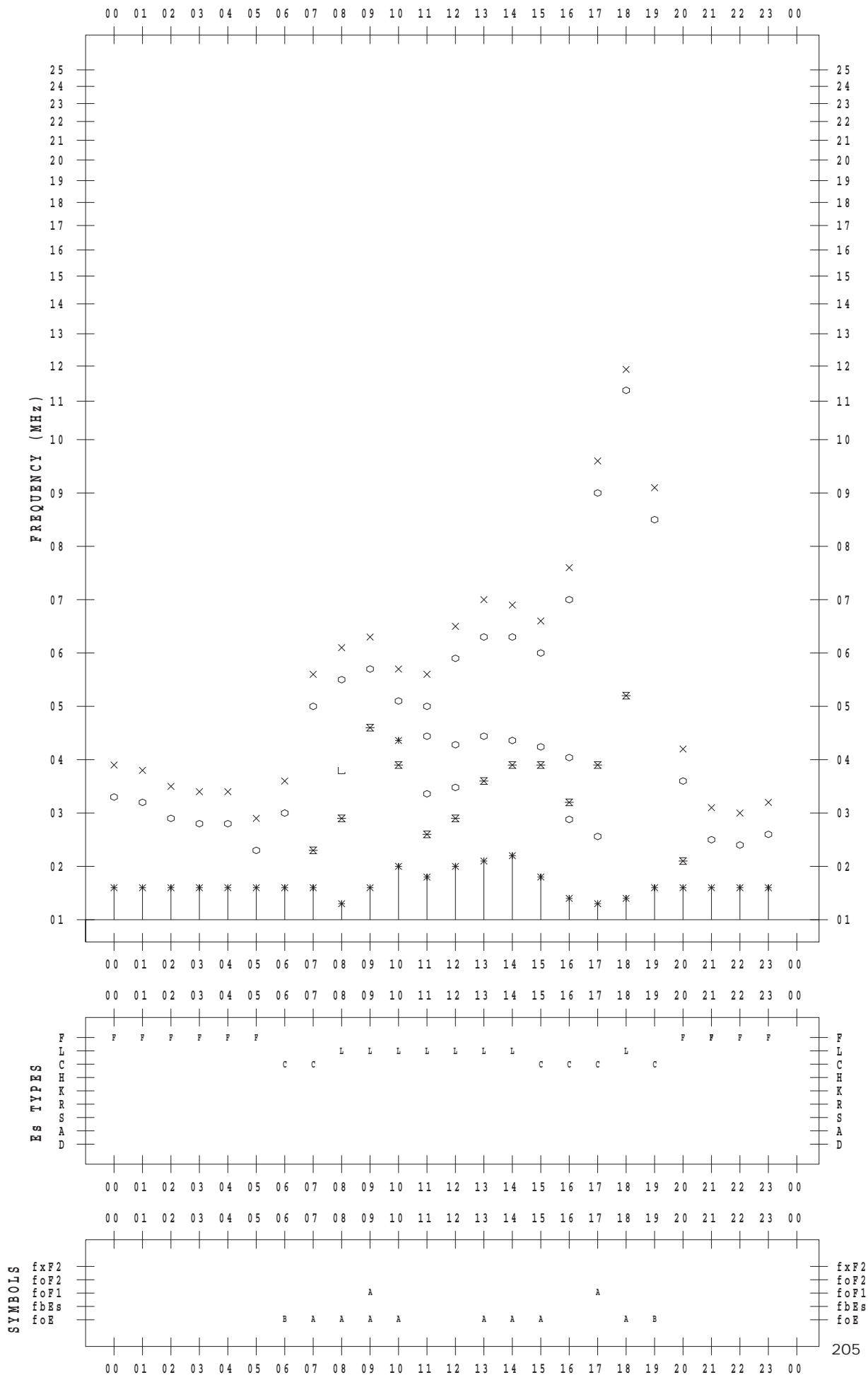
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 8

135 ° E MEAN TIME



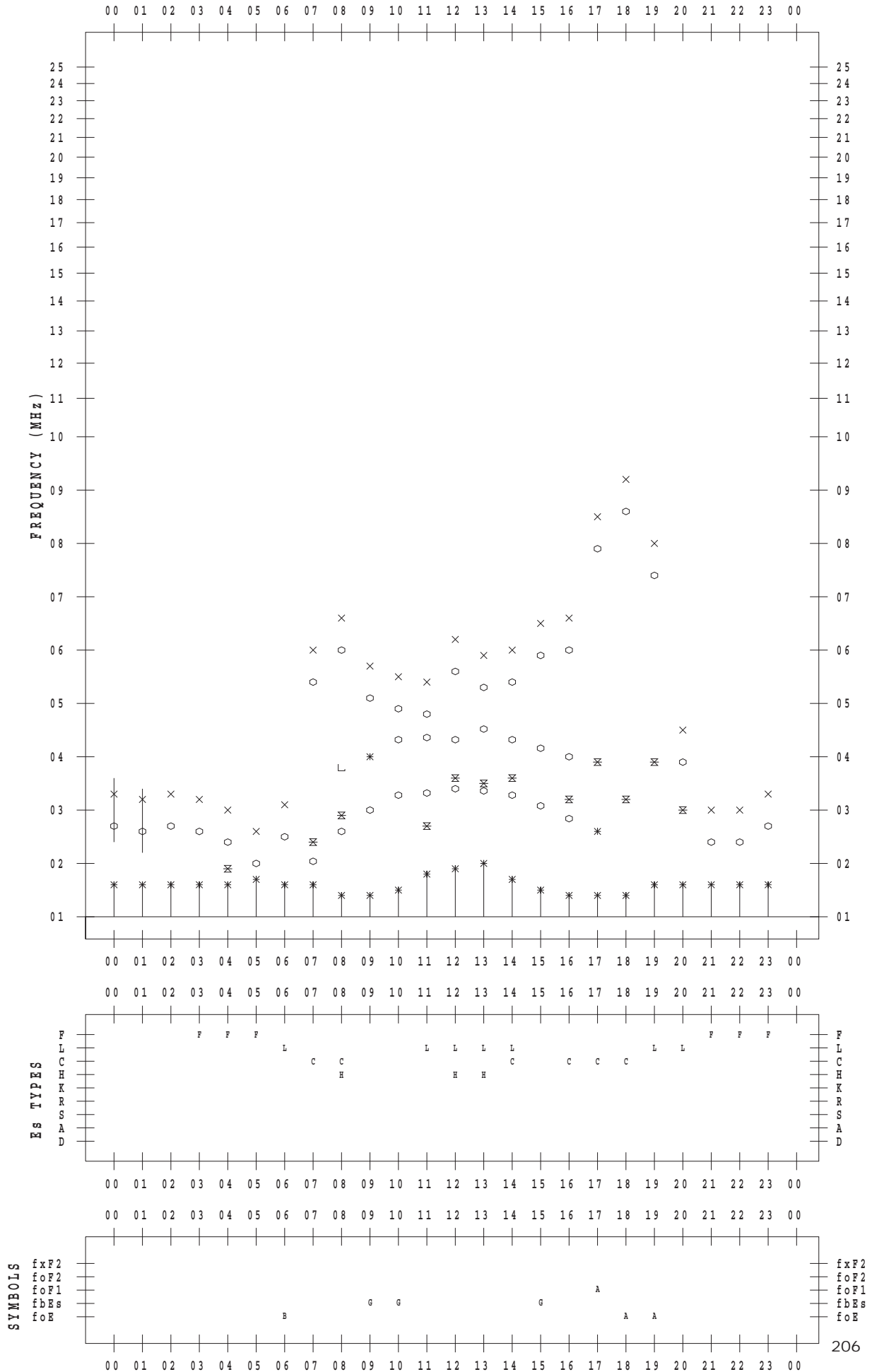
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 9

135 ° E MEAN TIME



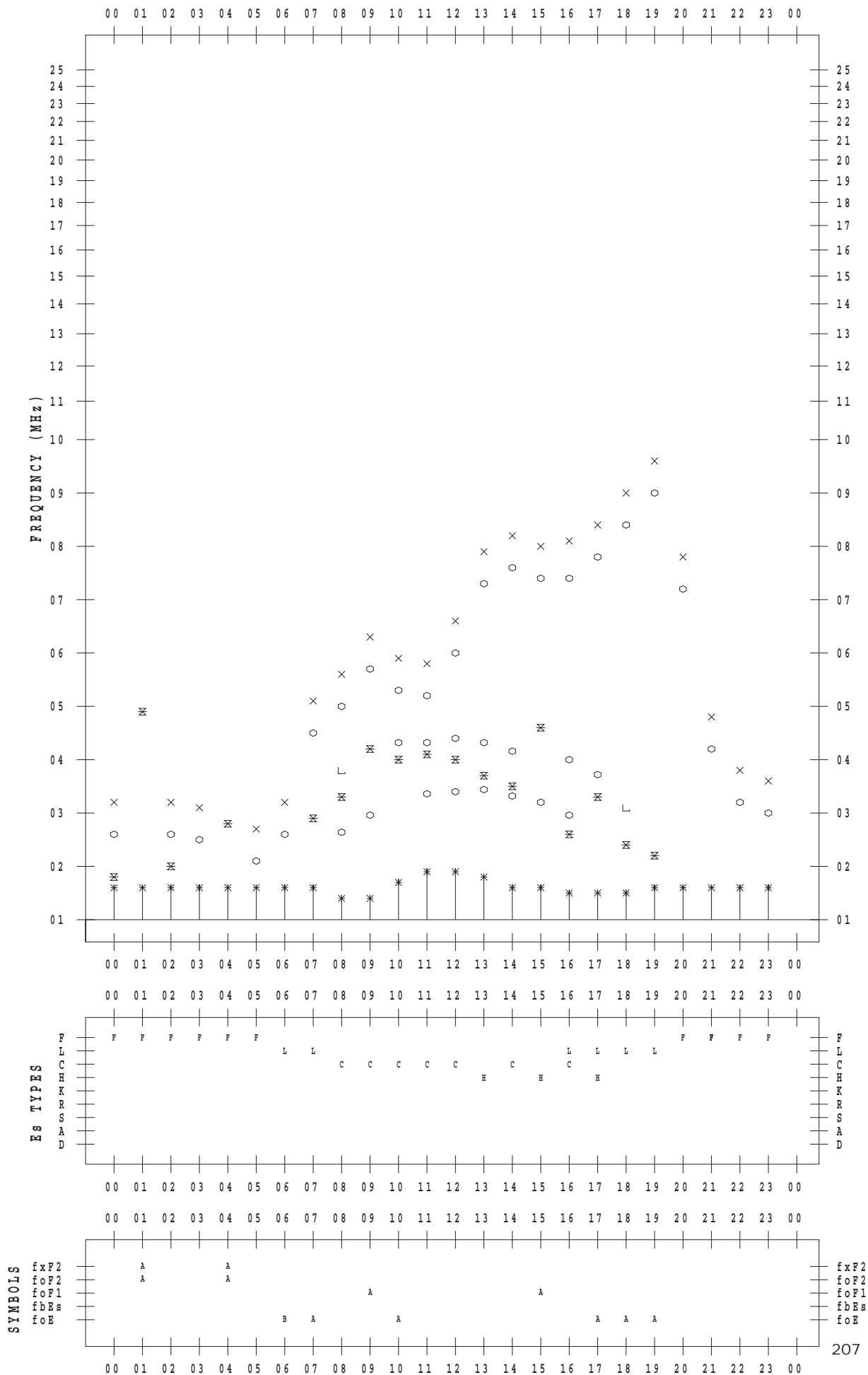
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 10

135 ° E MEAN TIME





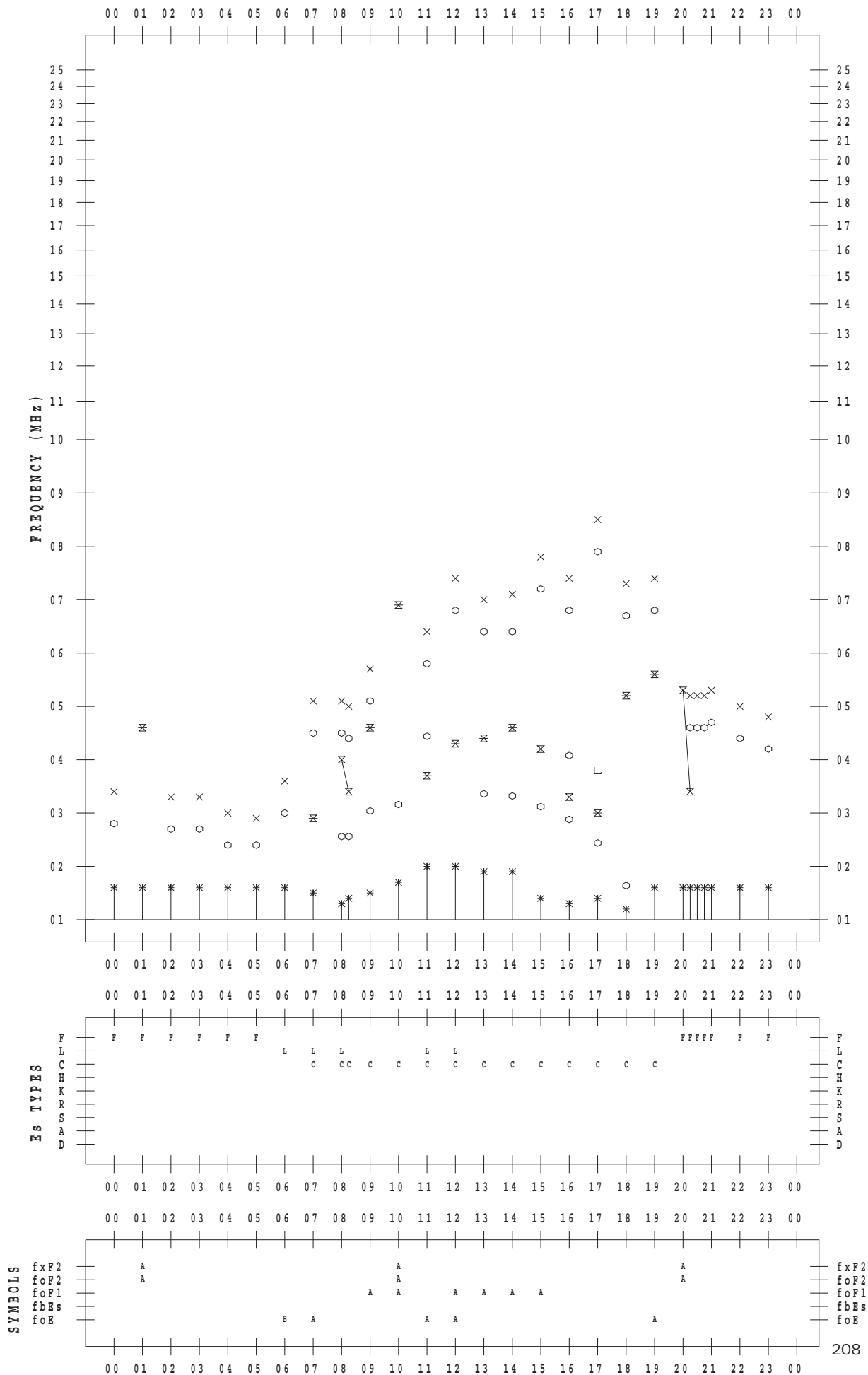
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 11

135 ° E MEAN TIME



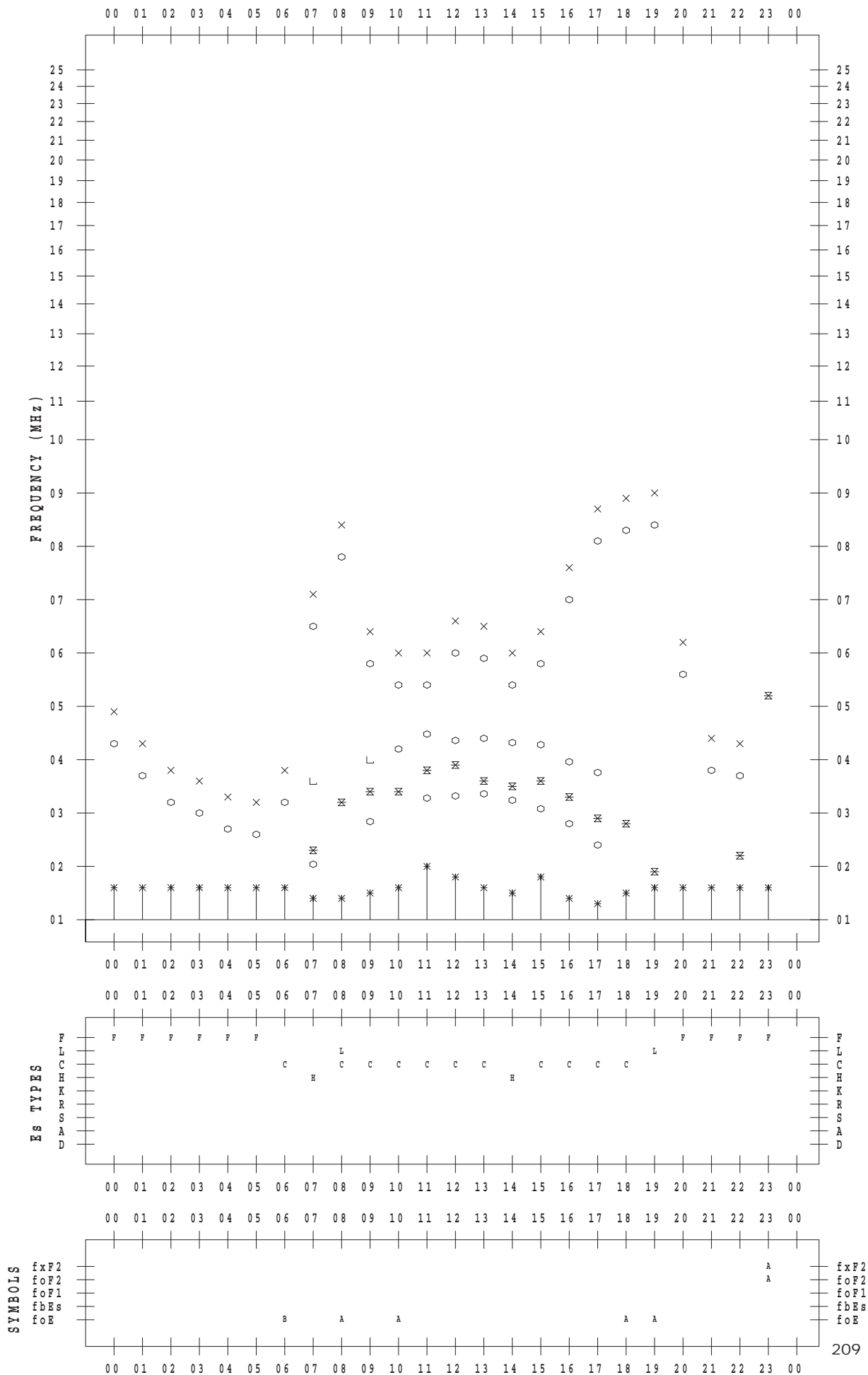
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 12

135 ° E MEAN TIME





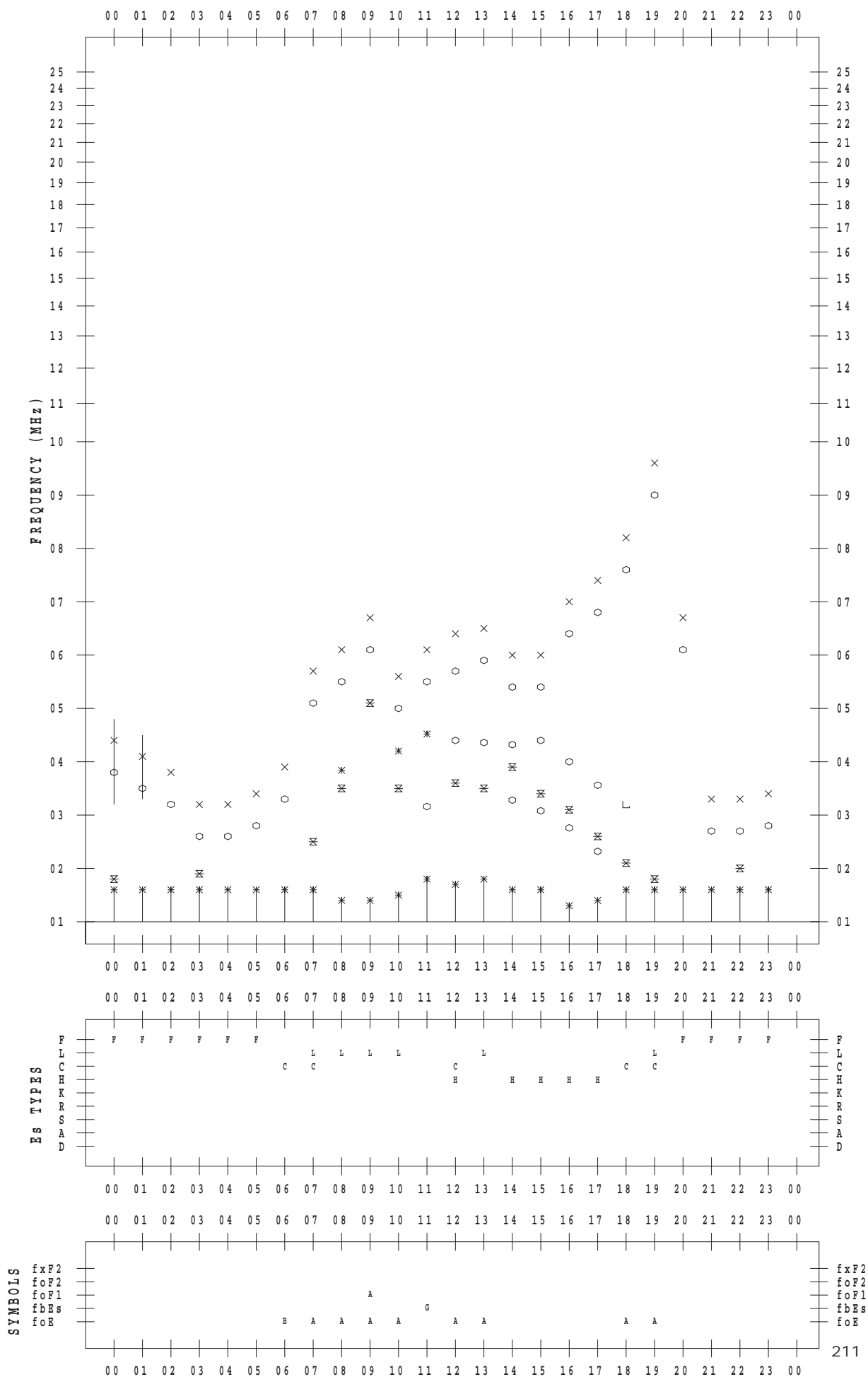
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 14

135 ° E MEAN TIME



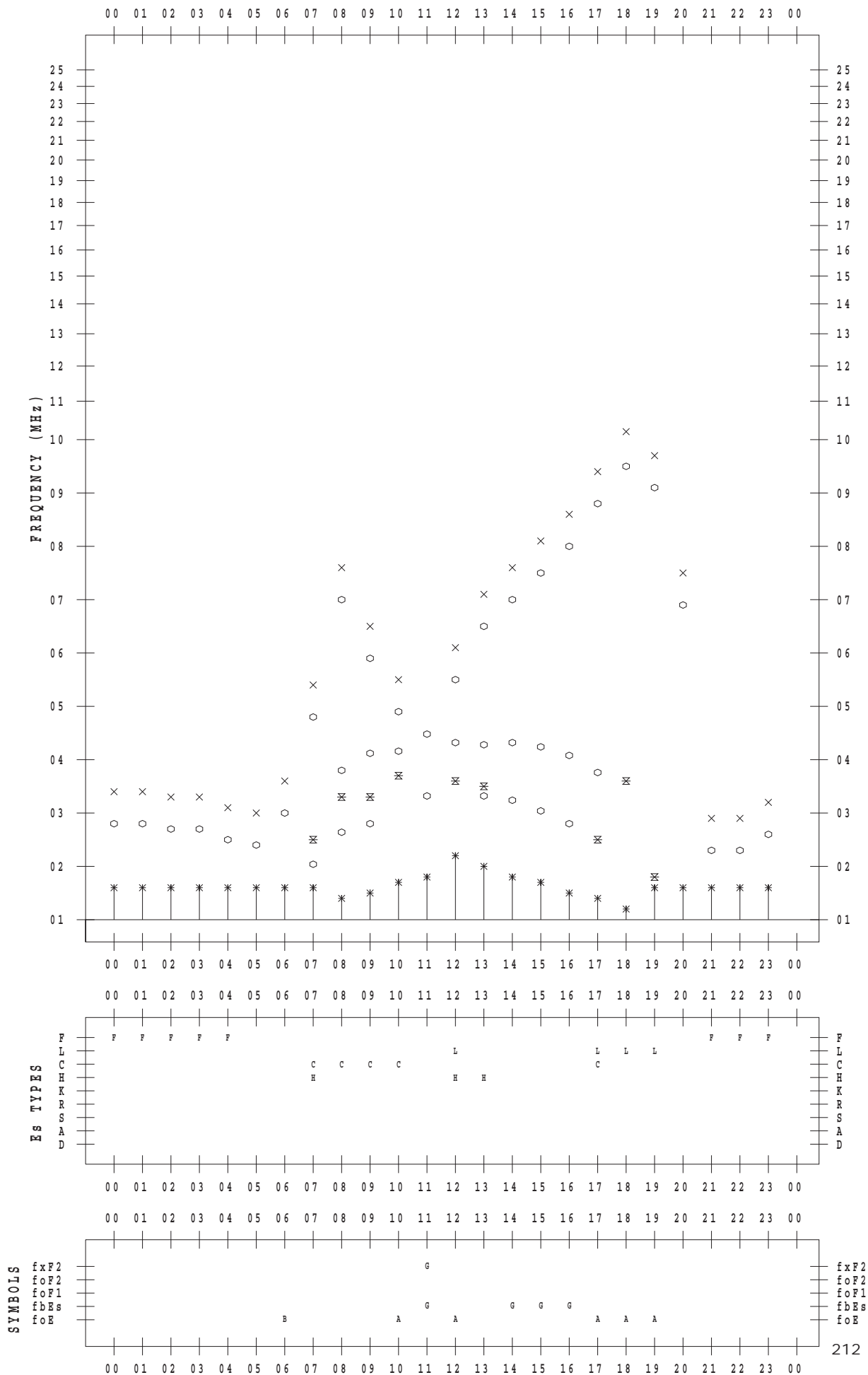
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 15

135 ° E MEAN TIME



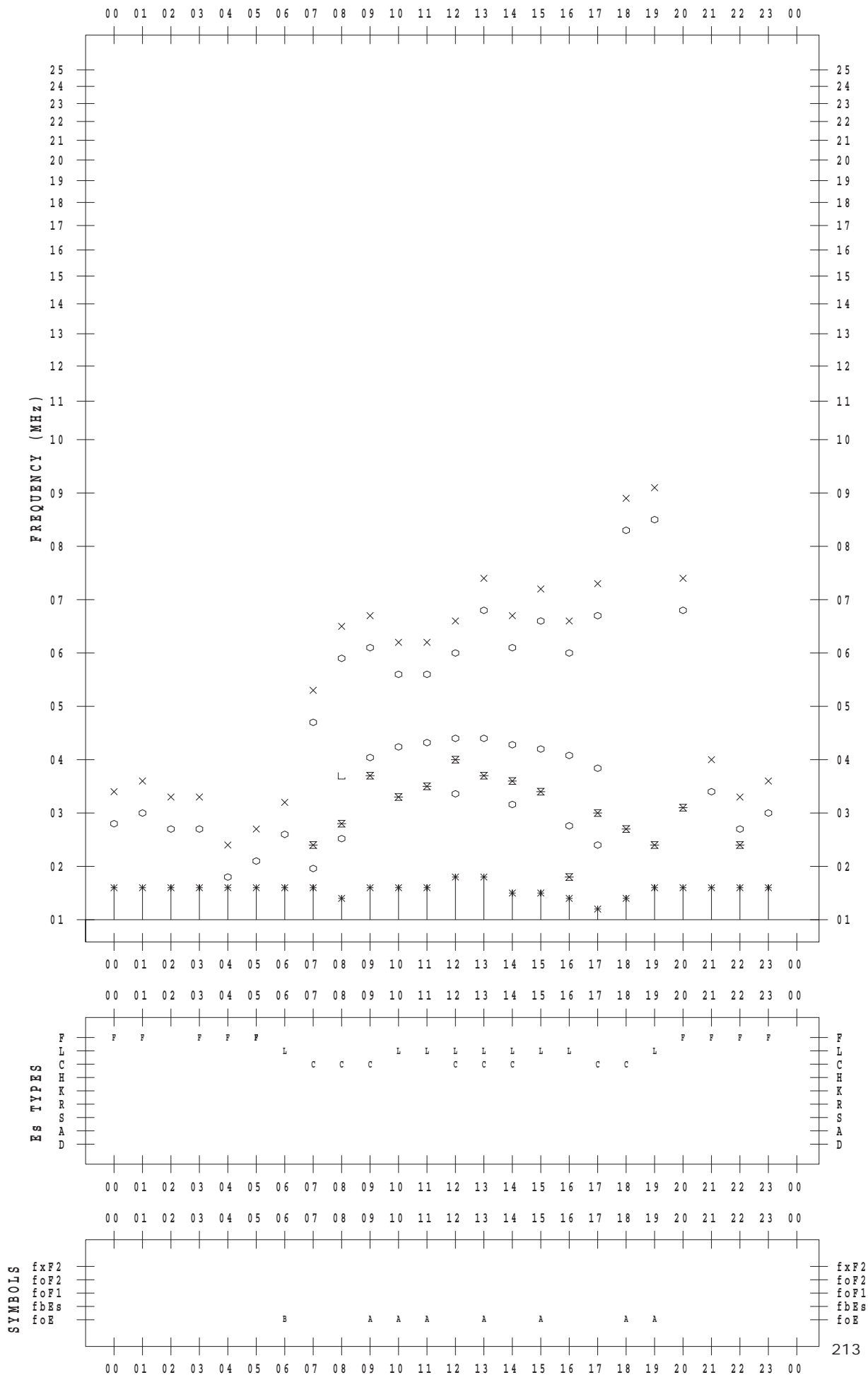
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 16

135 ° E MEAN TIME



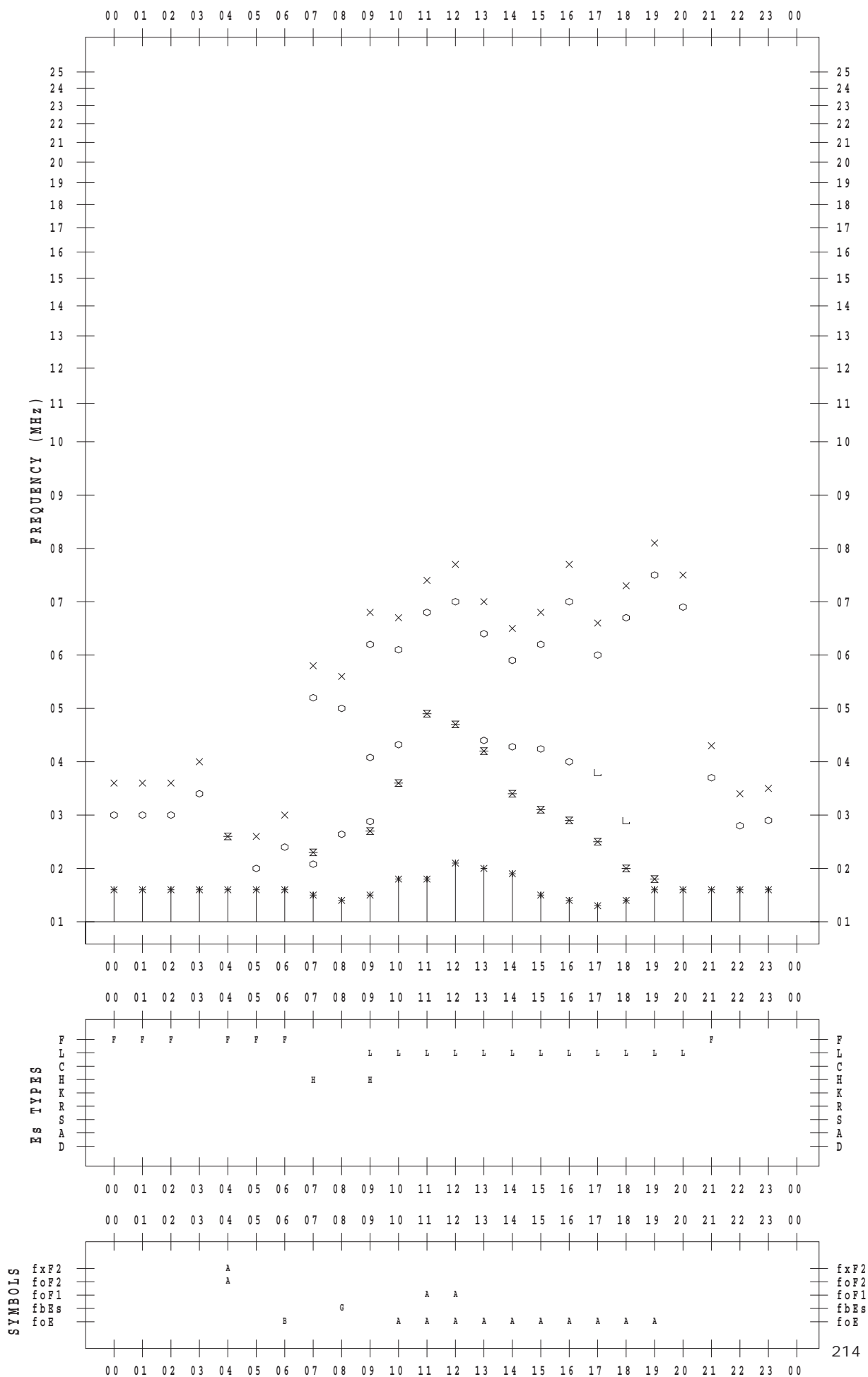
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 17

135 ° E MEAN TIME



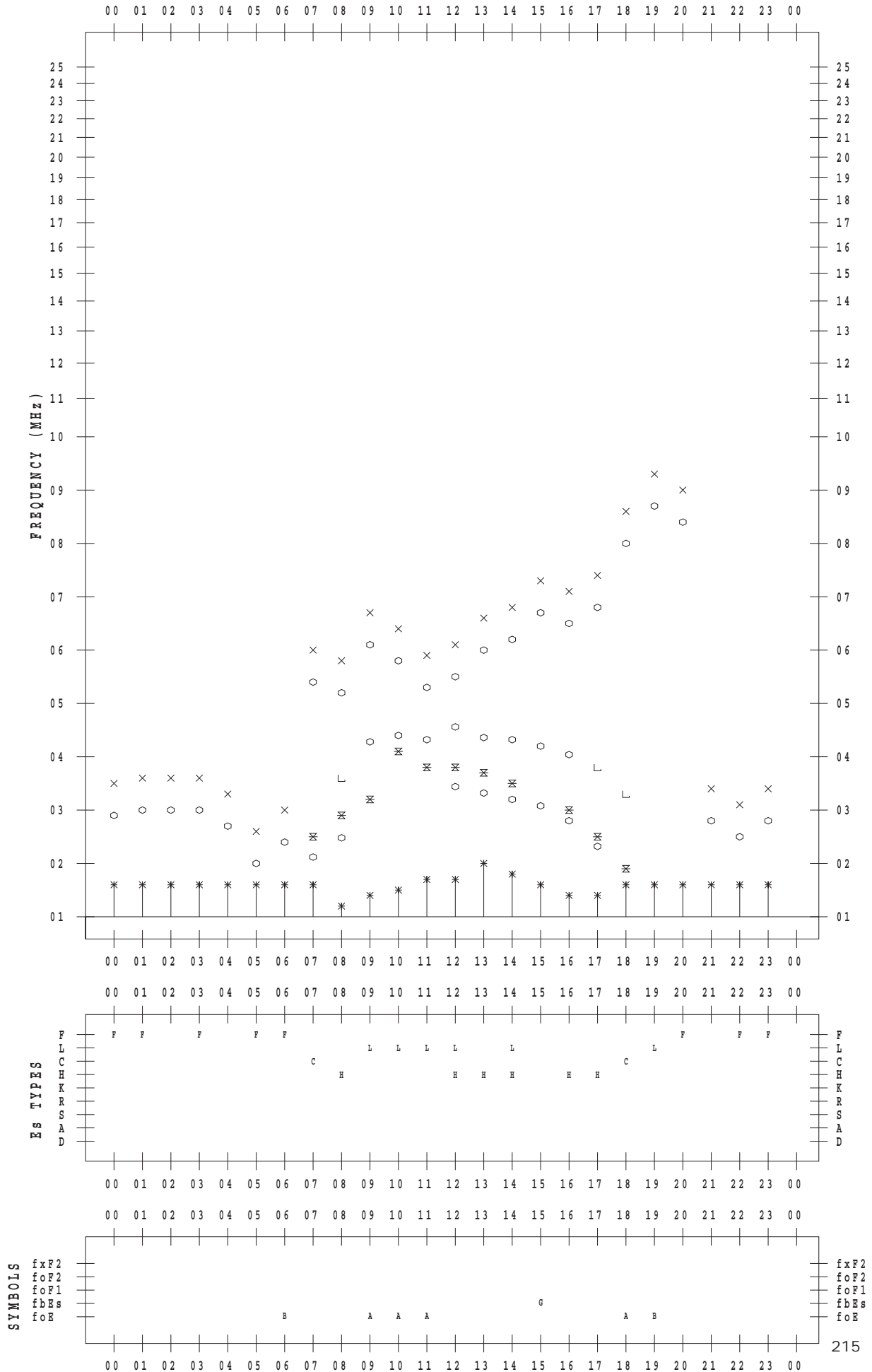
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 18

135 ° E MEAN TIME





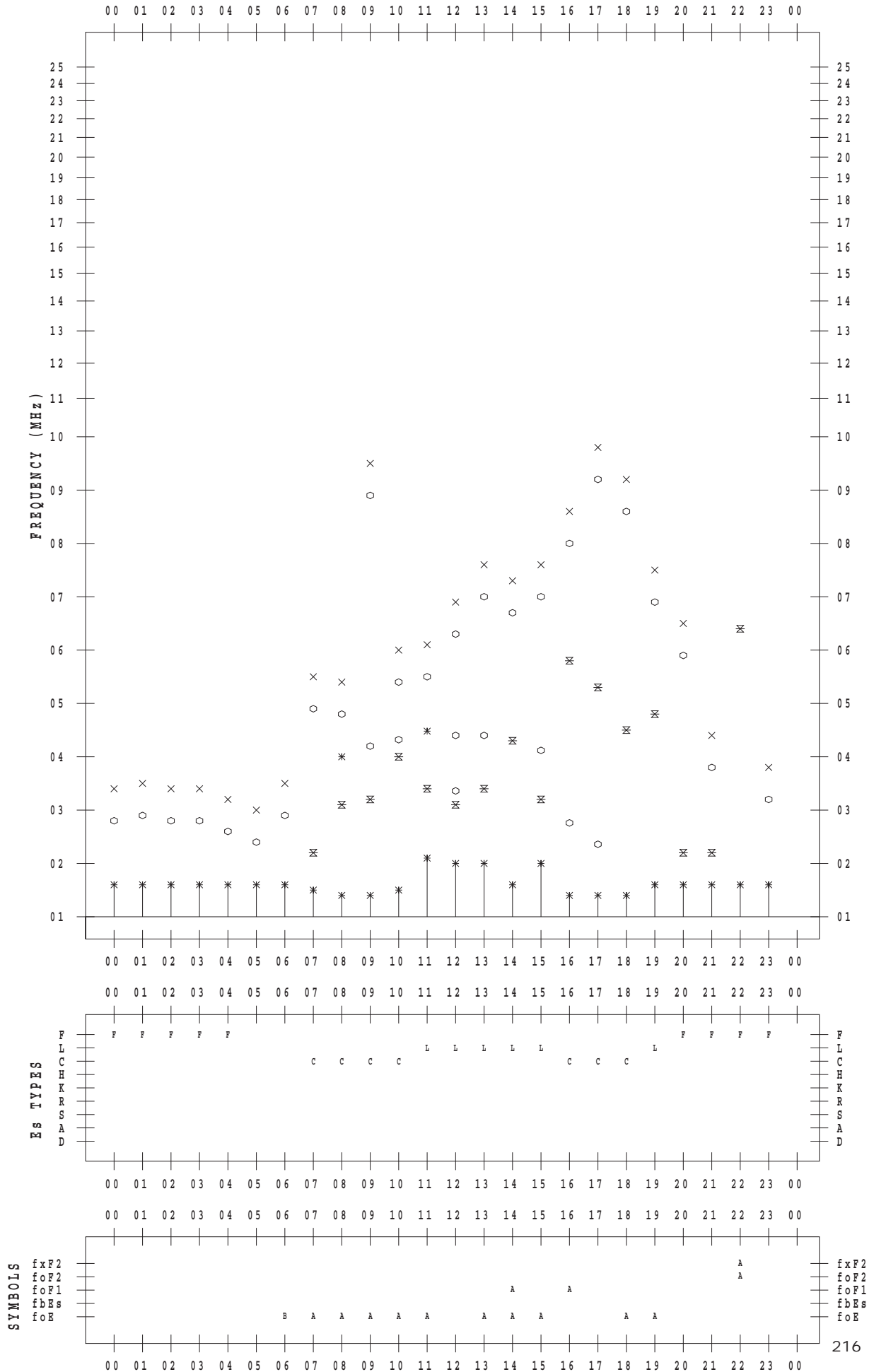
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 19

135 ° E MEAN TIME



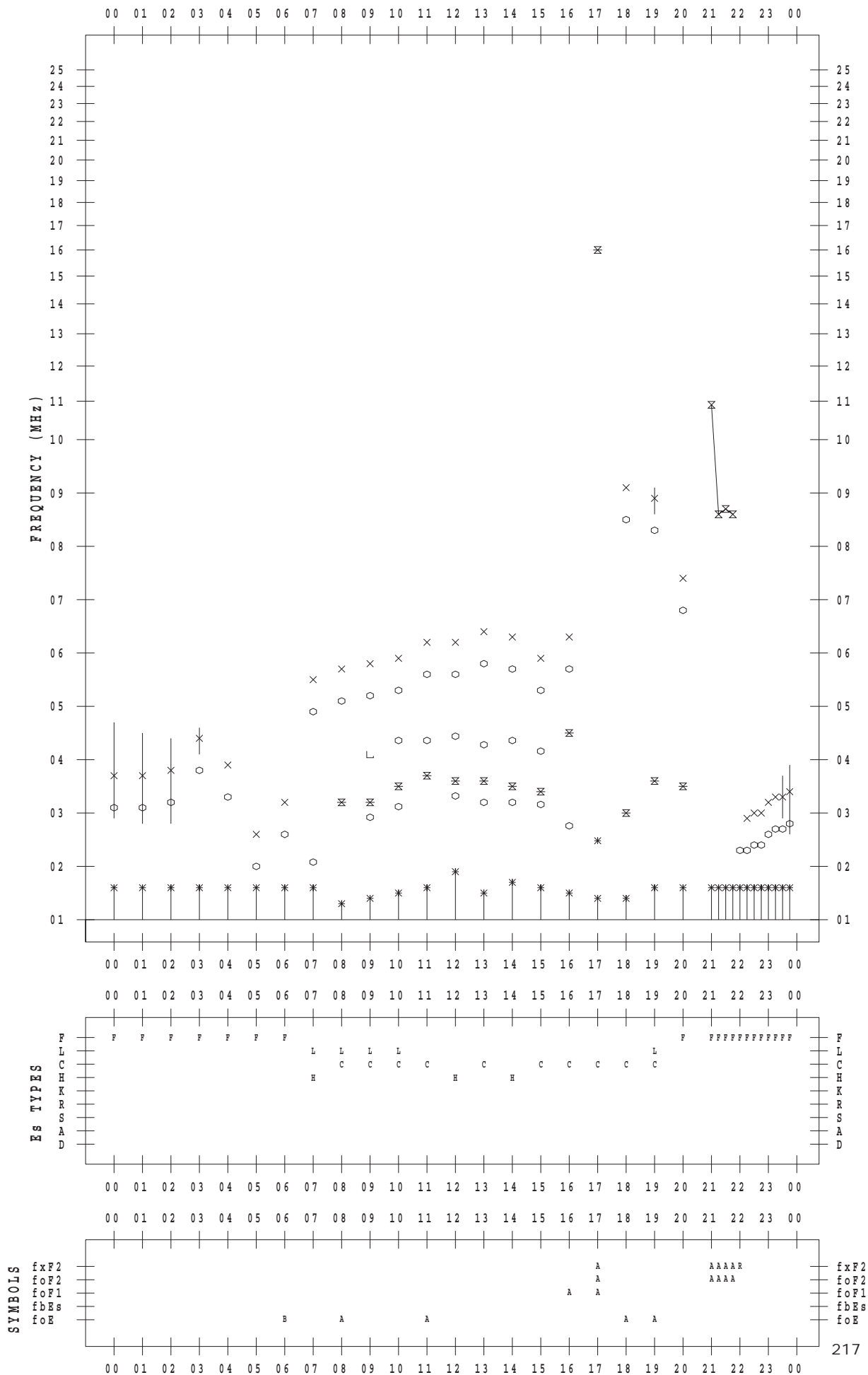
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 20

135 ° E MEAN TIME



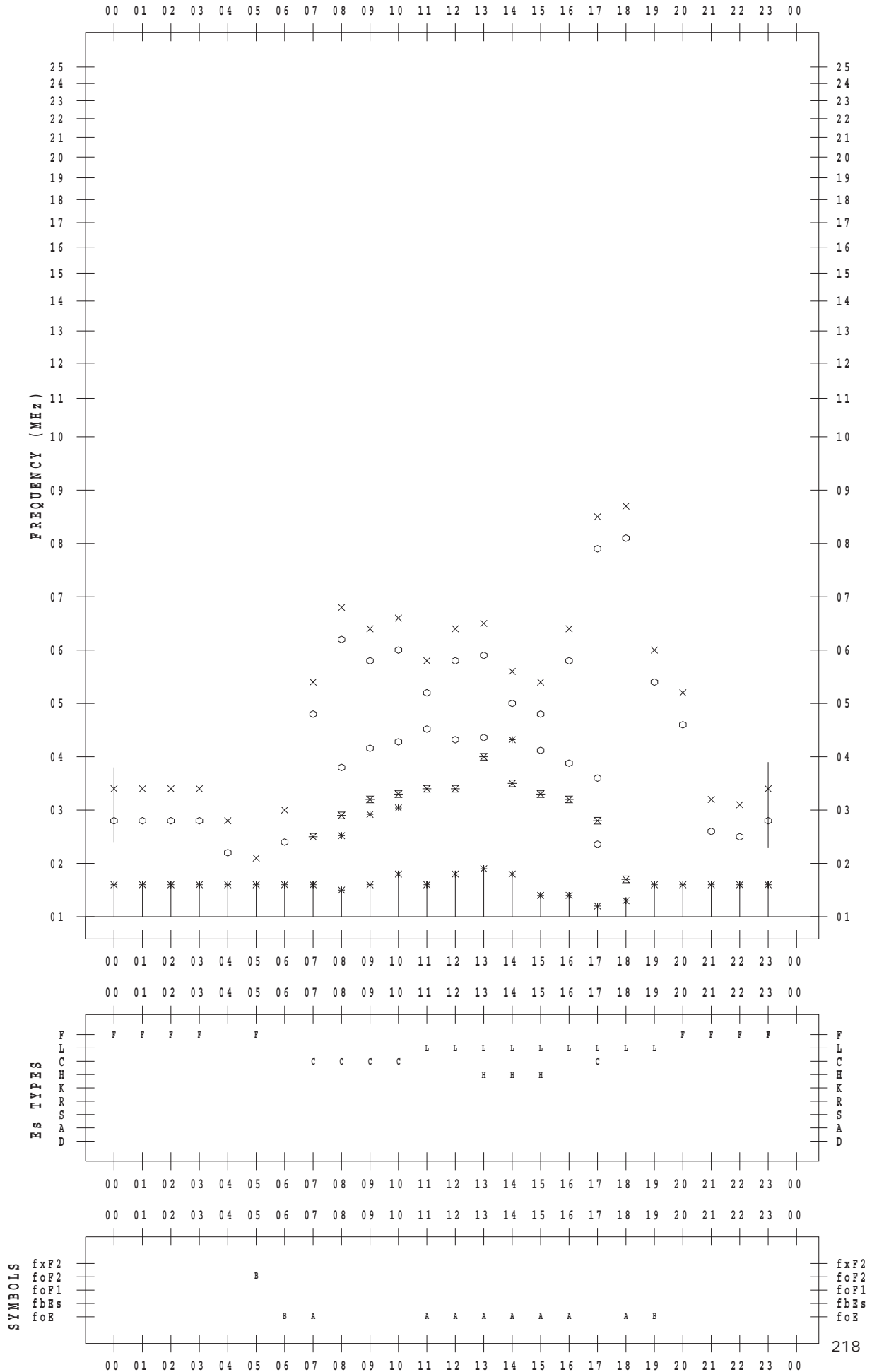
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 21

135 ° E MEAN TIME



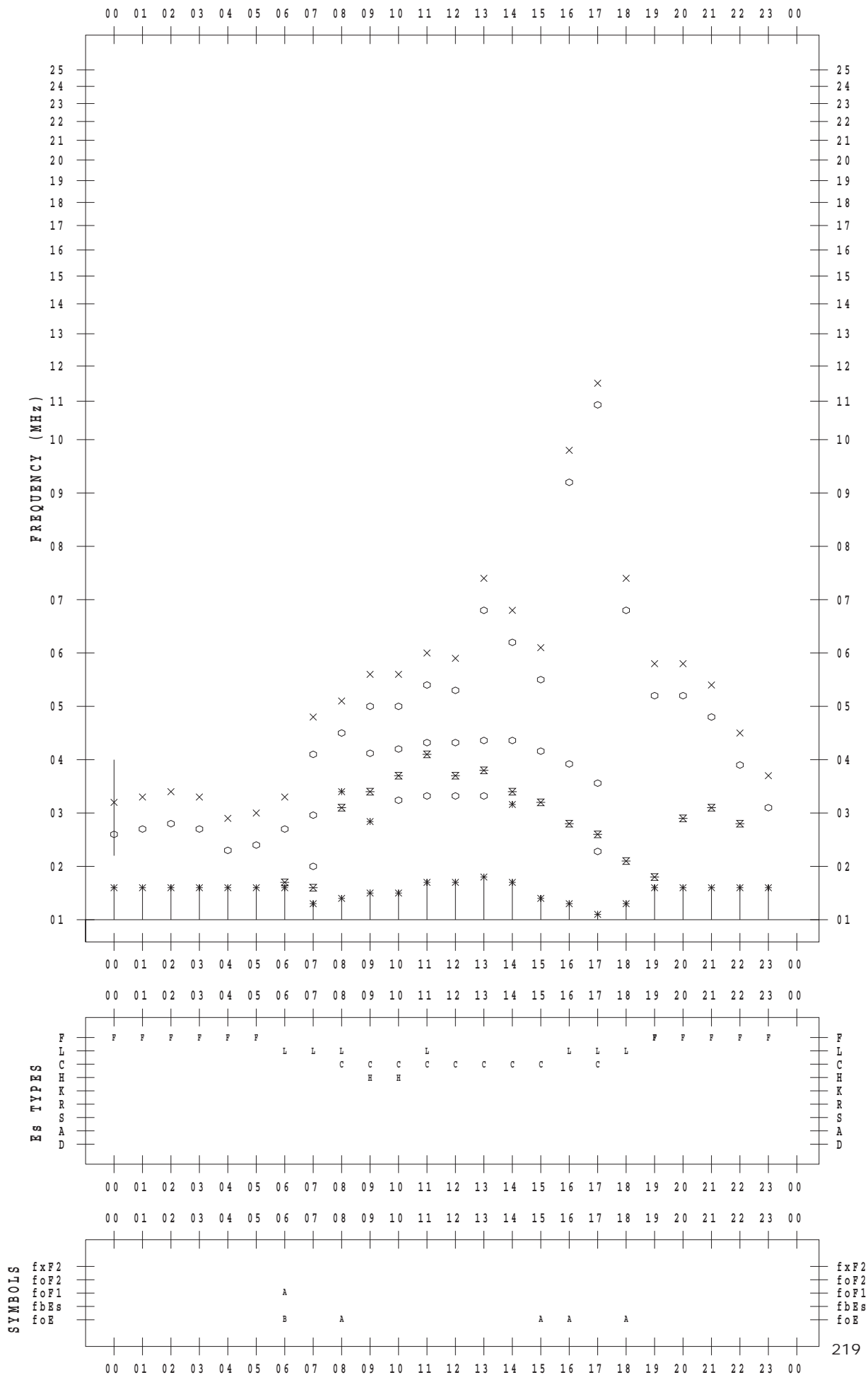
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 22

135 ° E MEAN TIME



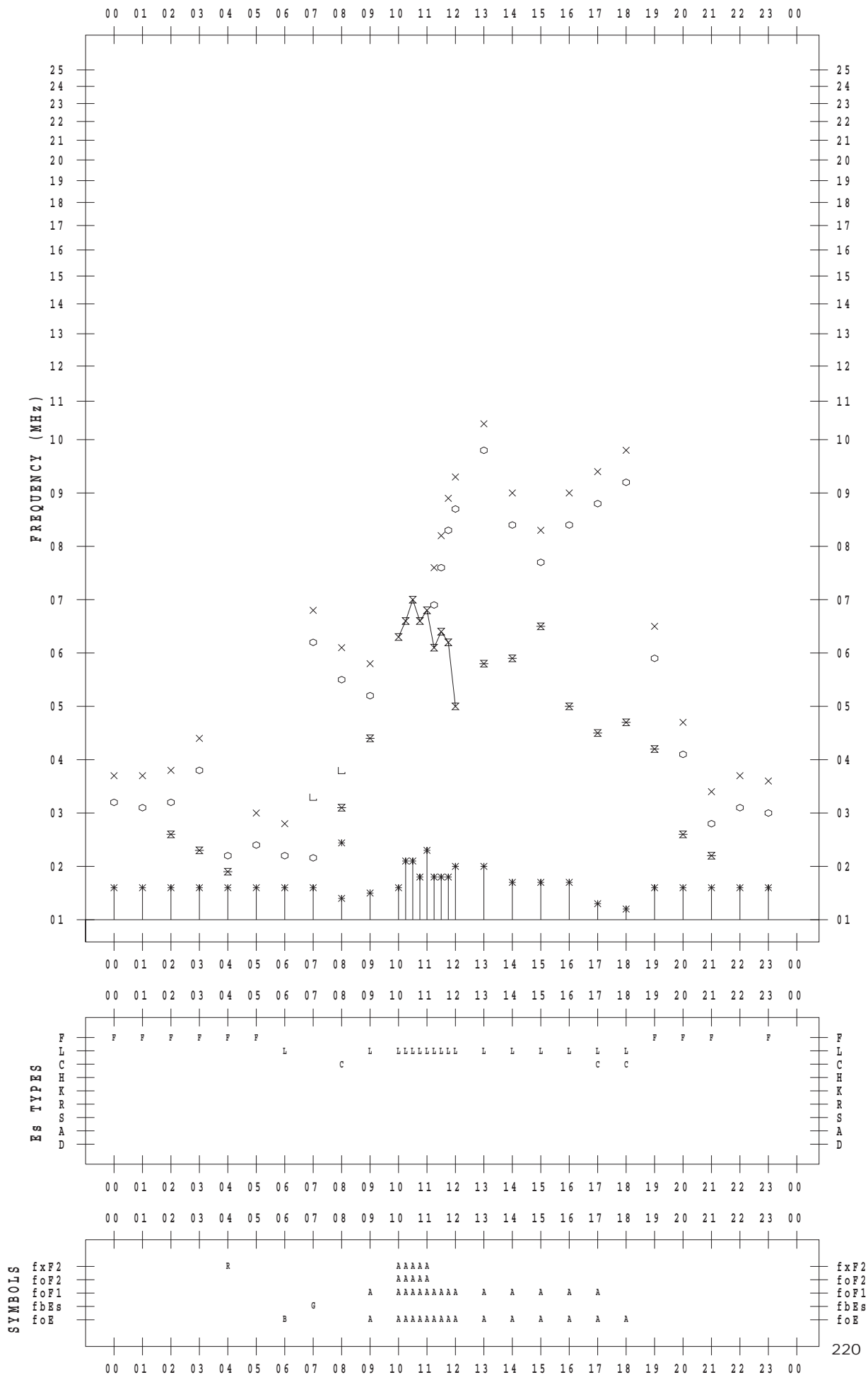
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 23

135 ° E MEAN TIME



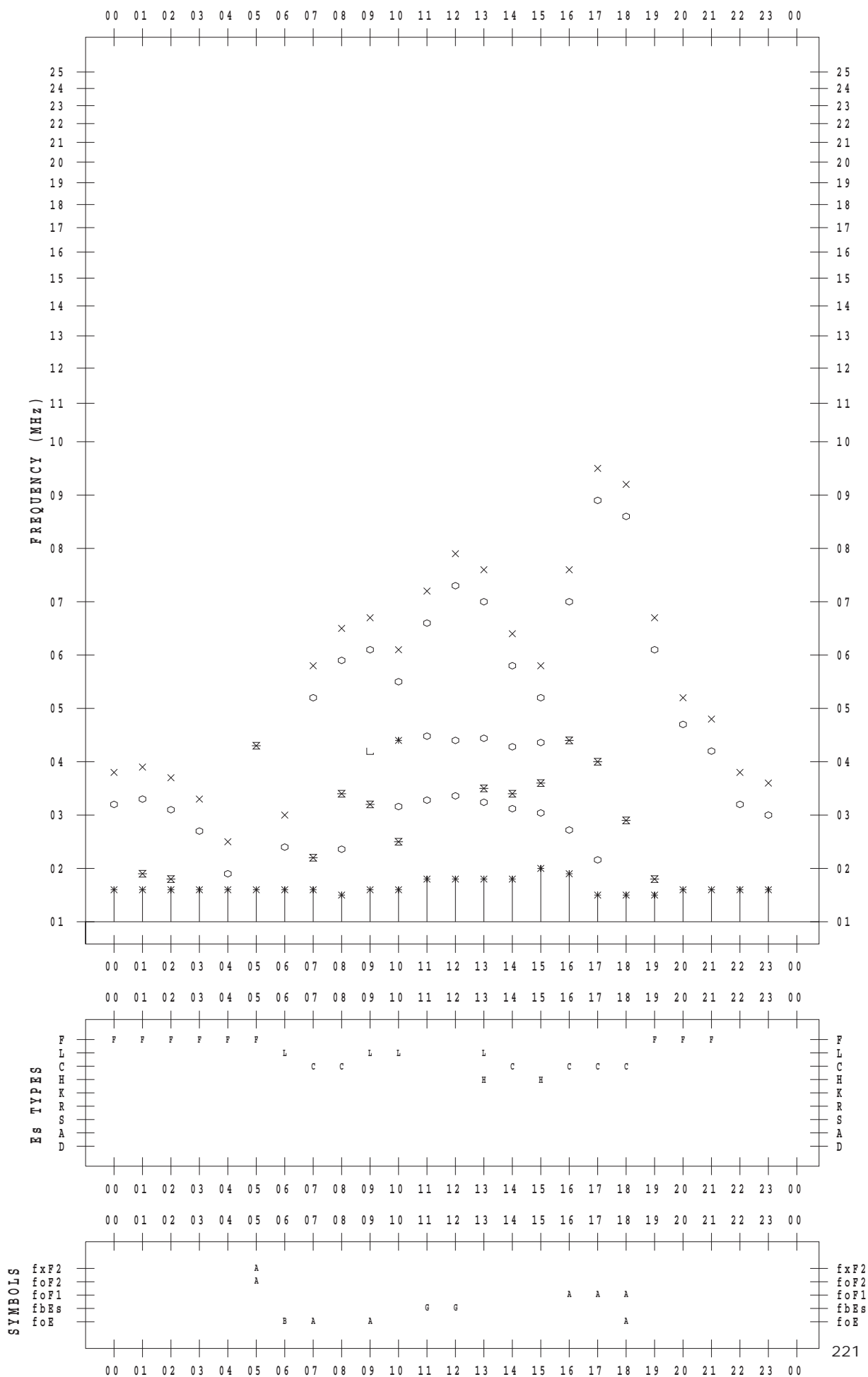
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 24

135 ° E MEAN TIME



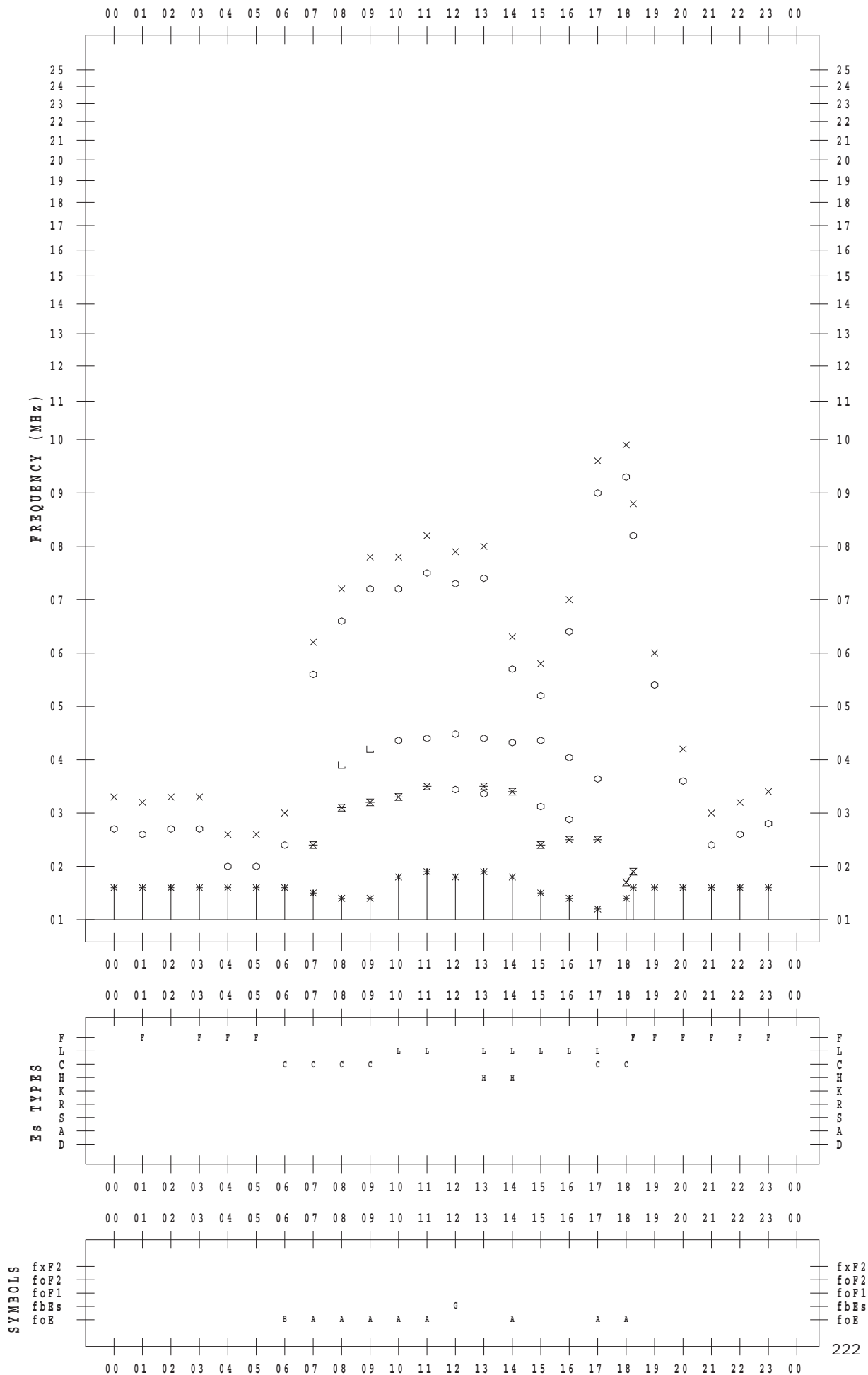
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 25

135 ° E MEAN TIME



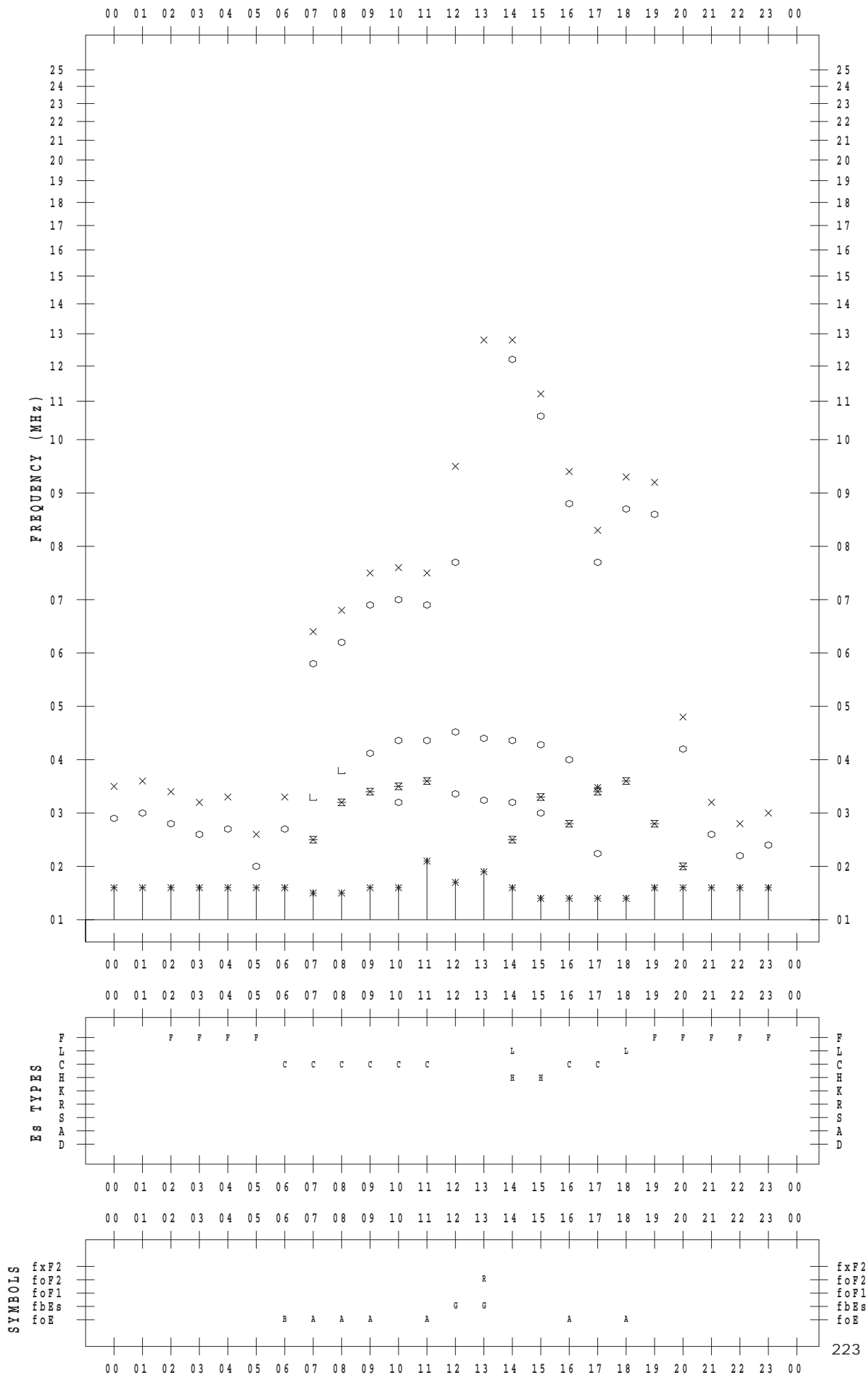
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 26

135 ° E MEAN TIME





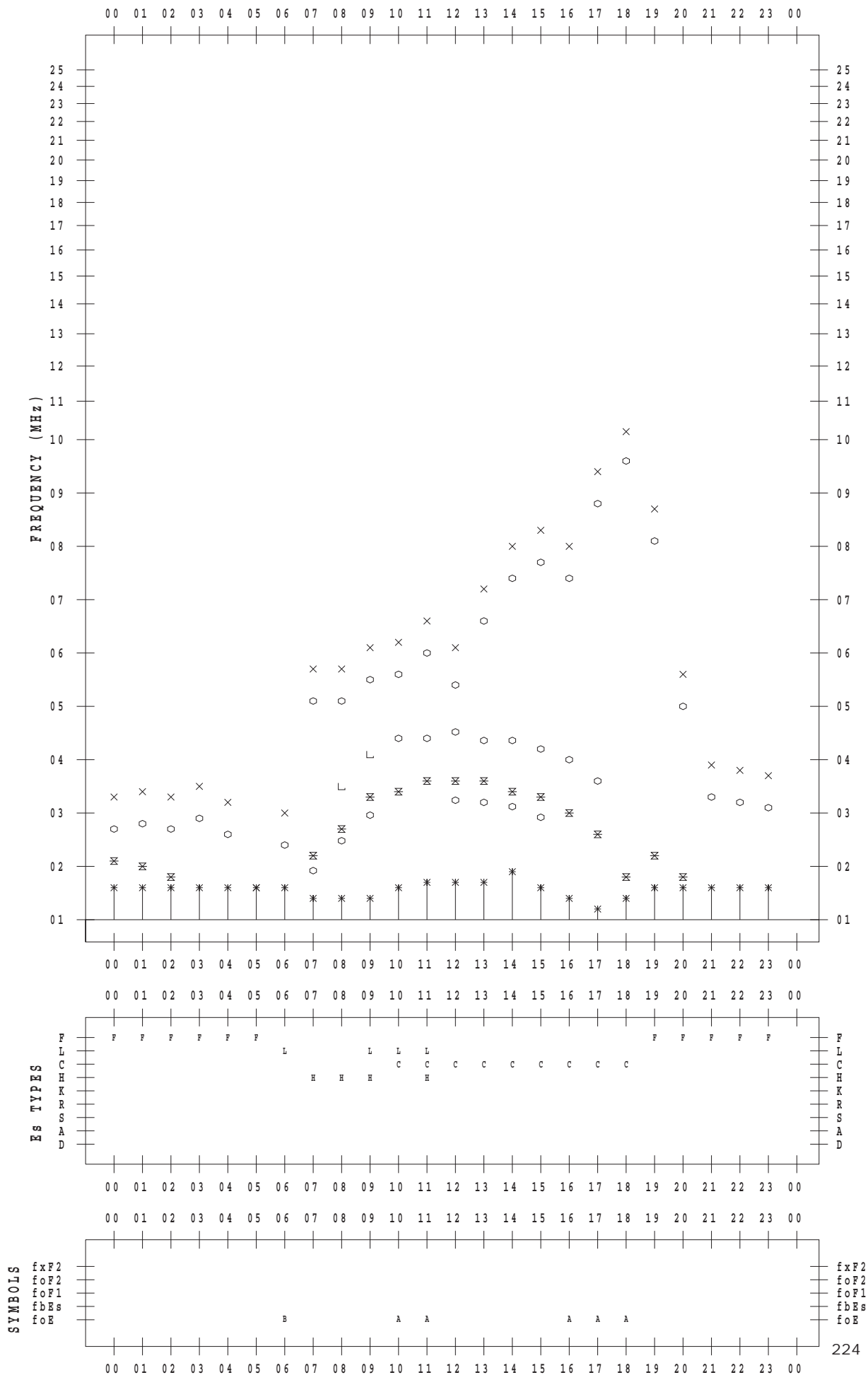
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 27

135 ° E MEAN TIME



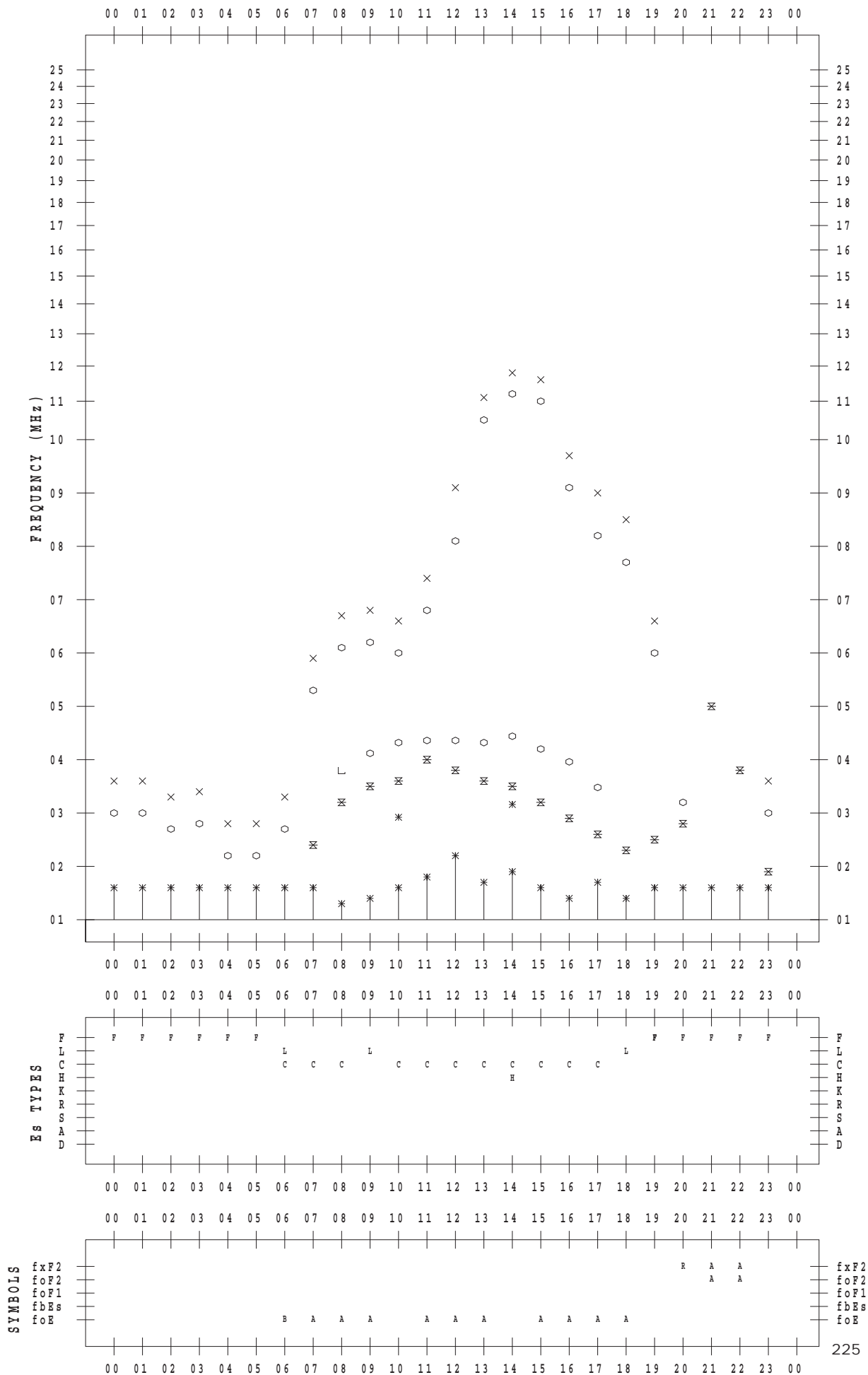
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 28

135 ° E MEAN TIME



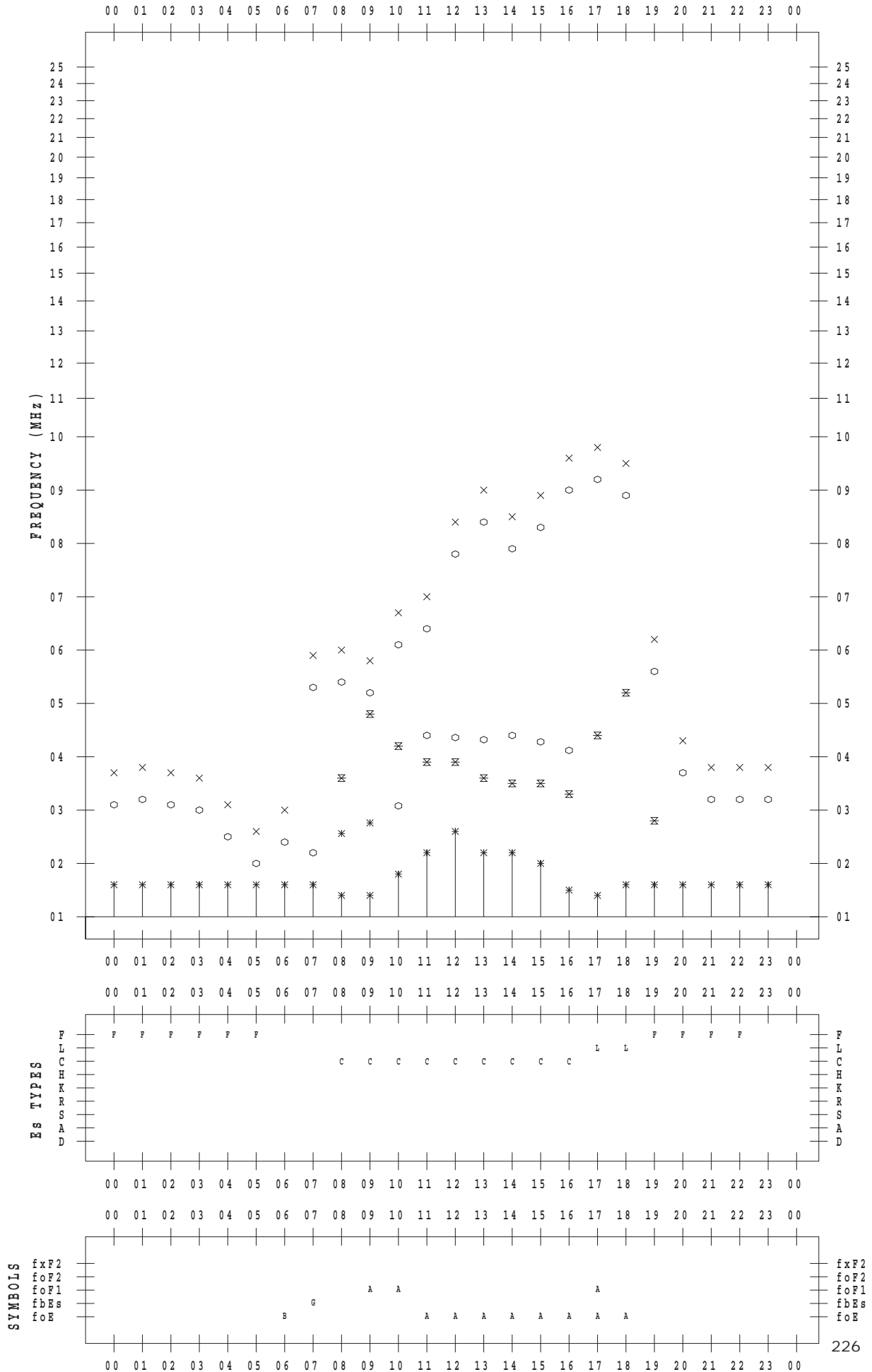
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 29

135 ° E MEAN TIME



# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 9 / 30

135 ° E MEAN TIME

