

Records of All-Sky Camera Utilization

at Syowa Station, Antarctica

in 1970

Compiled by

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Two all-sky cameras were used in aurora observations in 1970 at Syowa Station, Antarctica. This report describes the availability of data to upper atmosphere physicists.

The original records are deposited at the Polar Research Center, National Science Museum.

Enquiries about the details of the data should be addressed to:

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1. Location

| CSAGI No. | Station | Geographic |         | Geomagnetic |       | Remarks                             |
|-----------|---------|------------|---------|-------------|-------|-------------------------------------|
|           |         | Lat. S     | Long. E | Lat.        | Long. |                                     |
| A984      | Syowa   | 69°00'     | 39°36'  | -69.6°      | 77.1° | Height about 15m. (above sea level) |

## 2. Observers

Mr. Masaru AYUKAWA (Polar Research Center, National Science Museum).

Mr. Heihachiro CHIBA (Earthquake Research Institute, University of Tokyo).

## 3. Instrumentation

Two cameras were used, that is, a 16mm Bolex movie camera (model H-16RX with  $f/1.4$ , 25mm focal length) and a 35mm Automax cine-pulse camera (model G-4SD with  $f/3.5$ , 40mm in the focal length of the main lens, with a fish-eye lens).

The 16mm camera was operated during clear nights between March 2 and September 29, 1970. Fifteen-second exposure was made at intervals of 30 seconds, with black and white film (Fuji 16mm HS, sensitivity: ASA 320). The film in a reel was 100 feet long.

The 35mm camera was operated during clear nights between March 2 and October 18, 1970. Two exposures were made every minute, i. e., 0-30 sec. and 40-55 sec. The film used was Kodak 35mm 4-X, sensitivity ASA 800, which was 400 feet long and rolled in a reel.

## 4. Obtained Records

Availability of data of 16mm camera and 35mm camera is shown in Figs. 1 and 2 (days of observation) and in Tables 1 and 2 (hours of observation), respectively. Marks in Figs. 1 and 2 are as follows:

|           |   |   |
|-----------|---|---|
| Dark area | : | All-sky camera was operated.                |
| Cross     | : | Not operated due to instrument malfunction. |

Blank : Not operated due to blizzard or overcast.

The second column of Tables 1 and 2 is the hours of operation (Universal Time) of the camera. The third column shows K-indices, among which the figures with underlines represent the intensity of geomagnetic activity when the camera was operated. The "X" marks in the third column denote lack of data due to malfunction of 3-axis fluxgate magnetometer.

The classification of K-indices at Syowa Station is as follows:

|         |   |   |   |                             |   |                          |   |
|---------|---|---|---|-----------------------------|---|--------------------------|---|
| K-Index | : | 0 | ( | $0^r$                       | ~ | $\langle 25^r \rangle$   | ) |
|         |   | 1 | ( | $25^r$                      | ~ | $\langle 50^r \rangle$   | ) |
|         |   | 2 | ( | $50^r$                      | ~ | $\langle 100^r \rangle$  | ) |
|         |   | 3 | ( | $100^r$                     | ~ | $\langle 200^r \rangle$  | ) |
|         |   | 4 | ( | $200^r$                     | ~ | $\langle 350^r \rangle$  | ) |
|         |   | 5 | ( | $350^r$                     | ~ | $\langle 600^r \rangle$  | ) |
|         |   | 6 | ( | $600^r$                     | ~ | $\langle 1000^r \rangle$ | ) |
|         |   | 7 | ( | $1000^r$                    | ~ | $\langle 1660^r \rangle$ | ) |
|         |   | 8 | ( | $1660^r$                    | ~ | $\langle 2500^r \rangle$ | ) |
|         |   | 9 | ( | more than 2500 <sup>r</sup> |   |                          | ) |

| MONTH \ DAY | 1 | 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 |  |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| MARCH       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| APRIL       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| MAY         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| JUNE        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| JULY        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| AUGUST      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| SEPTEMBER   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| OCTOBER     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |

Fig. 1. Days of observation by 16mm all-sky camera.

| MONTH \ DAY | 1 | 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 |  |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| MARCH       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| APRIL       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| MAY         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| JUNE        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| JULY        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| AUGUST      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| SEPTEMBER   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| OCTOBER     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |

Fig. 2. Days of observation by 35mm all-sky camera.

Table 1. Hours of operation of the 16mm all-sky camera at Syowa Station in 1970.

| Day    | Hours (Universal Time)                                     | K - Index   | Remarks            |
|--------|--|---|--------------------|
| Mar. 2 | 18 <sup>h</sup> 09 <sup>m</sup> 00 <sup>s</sup>            | 6, 5, 4, 3, 2, 2, <u>2</u> , <u>4</u> ,                 |                    |
| 3      | -00 <sup>h</sup> 30 <sup>m</sup> 00 <sup>s</sup>           | <u>4</u> , 2, 2, 3, 2, 3, <u>4</u> , <u>6</u> ,         |                    |
| 4      | -00 32 00  | <u>5</u> , 4, 1, 2, 3, 3, <u>4</u> , <u>5</u> ,         |                    |
| 5      | -00 30 30  | <u>4</u> , 2, 2, 2, 2, 3, 5, 5,                         |                    |
| 6      | 19 14 30   | 6, 3, 2, 2, 2, 4, <u>5</u> , <u>5</u> ,                 |                    |
| 7      | -00 39 45  | <u>5</u> , 6, 3, 3, 3, 4, 6, 5,                         |                    |
| 9      | 19 46 15   | 5, 6, 3, 3, 2, 5, <u>3</u> , <u>6</u> ,                 |                    |
| 10     | -00 37 00  | <u>5</u> , 1, 2, 2, 2, 2, <u>2</u> , <u>2</u> ,         |                    |
| 11     | -00 54 00  | <u>1</u> , 1, 2, 2, 2, <u>1</u> , <u>1</u> , <u>2</u> , |                    |
| 12     | -01 26 45  | <u>3</u> , 3, 2, 2, 2, <u>2</u> , <u>1</u> , <u>1</u> , |                    |
| 13     | -01 01 15  | <u>1</u> , 2, 2, 2, 2, 2, 2, 2,                         |                    |
| 16     | 22 <sup>h</sup> 18 <sup>m</sup> 15 <sup>s</sup> - 23 31 15 | 1, 1, 1, 2, 2, 1, 1, <u>1</u> ,                         | Cloud              |
| 17     | 18 16 15   | 1, 0, 1, 2, 2, 2, <u>2</u> , <u>3</u> ,                 |                    |
| 18     | -01 33 45  | <u>3</u> , 1, 1, 2, 2, <u>2</u> , <u>2</u> , <u>4</u> , |                    |
| 19     | -01 10 15  | <u>2</u> , 2, 1, 2, 2, <u>2</u> , <u>1</u> , <u>3</u> , |                    |
| 20     | -01 38 15 ; 18 00 15 - 22 40 30                            | <u>3</u> , 1, 1, 2, 2, 2, <u>2</u> , <u>3</u> ,         | Overcast<br>- Snow |
| 25     | 16 58 15 - 22 15 30  | 1, 1, 1, 2, 2, <u>1</u> , <u>1</u> , <u>1</u> ,         | Overcast           |
| 26     | 18 58 15   | 3, 3, 1, 2, 2, 2, <u>2</u> , <u>2</u> ,                 |                    |
| 27     | -02 09 15  | <u>1</u> , 0, 1, 3, 2, <u>2</u> , <u>3</u> , <u>5</u> , |                    |
| 28     | -02 09 30  | <u>4</u> , 5, 3, 3, 2, <u>4</u> , <u>3</u> , <u>5</u> , |                    |
| 29     | -02 13 00 ; 16 41 45 - 20 48 00                            | <u>5</u> , 5, 2, 2, 2, <u>2</u> , <u>4</u> , <u>6</u> , | Overcast           |

| Day     | Hours (Universal Time)                                      | K-Index   | Remarks           |
|---------|---|---|-------------------|
| Mar. 30 | 20 <sup>h</sup> 18 <sup>m</sup> 45 <sup>s</sup>             | 6, 3, 3, 2, 3, 2, <u>3</u> , <u>4</u> ,                                 |                   |
| 31      | -00 <sup>h</sup> 22 <sup>m</sup> 45 <sup>s</sup>            | <u>3</u> , 5, 5, 4, 3, 4, 3, 6,   |                   |
| Apr. 2  | 16 38 45  | 0, 0, 1, 1, 1, <u>1</u> , <u>1</u> , <u>0</u> ,                         | Cloud             |
| 3       | -02 30 00   | <u>3</u> , 5, 4, 2, 1, <u>2</u> , <u>0</u> , <u>1</u> ,                 |                   |
| 4       | -02 33 00   | <u>4</u> , 2, 2, 1, 1, <u>0</u> , <u>0</u> , <u>1</u> ,                 |                   |
| 5       | -02 31 30 ; 16 <sup>h</sup> 56 <sup>m</sup> 45 <sup>s</sup> | <u>1</u> , 0, 2, 2, 1, <u>1</u> , <u>1</u> , 2,                         | Overcast          |
| 6       | 17 13 15  | 4, 4, 4, 4, 3, <u>2</u> , <u>1</u> , <u>5</u> ,                         |                   |
| 7       | -02 27 15   | <u>4</u> , 2, 3, 1, 1, 1, 0, 0,   |                   |
| 13      | 17 28 15  | 1, 1, 1, 1, 0, <u>0</u> , <u>0</u> , <u>0</u> ,                         |                   |
| 14      | -02 11 45   | <u>1</u> , 1, 1, 1, 0, 0, <u>0</u> , <u>2</u> ,                         | Cloud             |
| 15      | -01 58 15   | <u>1</u> , 1, 1, 0, 0, 2, <u>3</u> , <u>3</u> ,                         | Overcast          |
| 16      | -02 50 15   | <u>4</u> , 5, 4, 2, 1, 1, 5, 5,   | Cloud             |
| 19      | 15 52 00  | 5, 6, 5, 3, 3, <u>2</u> , <u>2</u> , <u>2</u> ,                         |                   |
| 20      | -03 09 15   | <u>2</u> , <u>4</u> , 2, 2, 2, <u>4</u> , <u>3</u> , <u>4</u> ,         |                   |
| 21      | -03 29 45   | <u>4</u> , <u>5</u> , 5, 4, 4, 6, 8, 6,                                 |                   |
| 27      | 15 48 15  | 6, 4, 2, 1, 1, <u>2</u> , <u>2</u> , <u>3</u> ,                         |                   |
| 28      | -03 56 30   | <u>5</u> , <u>4</u> , 2, 1, 1, 0, 1, 1,                                 |                   |
| 29      | 15 02 45 - 16 36 00   | 3, 3, 1, 1, 1, <u>2</u> , 3, 3,   | Overcast<br>-Snow |
| 30      | 15 40 30  | 6, 6, 3, 3, 1, <u>3</u> , <u>2</u> , <u>3</u> ,                         |                   |
| May 1   | -04 17 45   | <u>3</u> , <u>3</u> , 3, 1, <u>2</u> , <u>2</u> , <u>3</u> , <u>3</u> , |                   |
| 2       | -03 20 45 ; 14 25 15 - 15 30 45                             | <u>2</u> , <u>3</u> , 2, 1, <u>0</u> , <u>1</u> , 2, 4,                 | Overcast          |
| 3       | 16 13 45  | 2, 0, 1, 0, 1, <u>1</u> , <u>2</u> , <u>6</u> ,                         |                   |
| 4       | -03 53 45   | <u>4</u> , <u>1</u> , 1, 2, 1, 1, 0, 3,                                 |                   |

| Day    | Hours (Universal Time)                                     | K-Index   | Remarks                |
|--------|--|---|------------------------|
| May 9  | 13 <sup>h</sup> 44 <sup>m</sup> 45 <sup>s</sup>            | 2, 2, 0, 0, <u>0</u> , <u>0</u> , <u>0</u> , <u>1</u> ,                         |                        |
| 10     | -05 <sup>h</sup> 02 <sup>m</sup> 30 <sup>s</sup>           | <u>1</u> , <u>1</u> , 1, 0, 0, 0, 0, 0,   |                        |
| 15     | 13 18 45   | 5, 1, 2, 2, <u>0</u> , <u>0</u> , <u>0</u> , <u>3</u> ,                         |                        |
| 16     | -04 57 45  | <u>3</u> , <u>2</u> , 1, 0, <u>0</u> , <u>0</u> , <u>1</u> , <u>4</u> ,         |                        |
| 17     | - ?  | 4, 5, 4, 1, <u>1</u> , <u>0</u> , <u>0</u> , <u>4</u> ,                         | End unidentified       |
| 18     | -05 02 30  | <u>4</u> , <u>4</u> , 1, 0, <u>1</u> , <u>0</u> , <u>1</u> , <u>1</u> ,         |                        |
| 19     | -04 56 15  | <u>2</u> , <u>3</u> , 2, 2, 1, 1, 3, 3,   |                        |
| 21     | 13 07 45   | 4, 2, 1, 1, <u>1</u> , <u>1</u> , <u>2</u> , <u>5</u> ,                         |                        |
| 22     | -06 11 15  | <u>5</u> , <u>4</u> , <u>2</u> , 1, 0, 2, 2, 2,                                 |                        |
| 26     | 15 <sup>h</sup> 41 <sup>m</sup> 30 <sup>s</sup> - 18 53 45 | 0, 0, 0, 0, 0, <u>0</u> , <u>0</u> , <u>3</u> ,                                 | Blizzard               |
| 27     | 19 04 45   | 2, 2, 3, 2, 1, 3, <u>5</u> , <u>5</u> ,   | Overcast               |
| 28     | -02 45 30  | <u>6</u> , 2, 1, 3, 5, 3, 4, 4,   |                        |
| June 4 | 12 27 45 - 23 37 30  | 5, 4, 3, 2, <u>2</u> , <u>2</u> , <u>0</u> , <u>4</u> ,                         | Overcast               |
| 5      | 12 21 45   | 3, 4, 3, 2, <u>0</u> , <u>0</u> , <u>0</u> , <u>0</u> ,                         |                        |
| 6      | -05 45 15  | <u>0</u> , <u>2</u> , 2, 1, <u>0</u> , <u>0</u> , <u>0</u> , <u>0</u> ,         |                        |
| 7      | -00 11 30  | <u>0</u> , 1, 0, 0, 0, 1, 2, 6,   | Snow                   |
| 10     | 12 41 00   | 3, 3, 2, 0, <u>1</u> , <u>2</u> , <u>2</u> , <u>1</u> ,                         |                        |
| 11     | -00 44 15  | <u>4</u> , 2, 0, 0, 0, 0, 0, 1,   | Overcast<br>-Snow      |
| 12     | -00 32 00 - 05 03 30 ; 13 05 00                            | <u>3</u> , <u>3</u> , 0, 0, <u>0</u> , <u>0</u> , <u>3</u> , <u>3</u> ,         | Snow-Overcast<br>-Fine |
| 13     | -06 03 00  | <u>3</u> , <u>1</u> , <u>3</u> , 3, <u>3</u> , <u>1</u> , <u>2</u> , <u>3</u> , |                        |
| 14     | -05 33 15  | <u>4</u> , <u>4</u> , 1, 0, 0, 0, 2, 2,   |                        |
| 15     | 12 38 15   | 5, 4, 3, 2, <u>2</u> , <u>1</u> , <u>3</u> , <u>4</u> ,                         | Overcast               |

| Day     | Hours (Universal Time)   | K-Index   | Remarks                |
|---------|--|---|------------------------|
| June 16 | -05 <sup>h</sup> 29 <sup>m</sup> 15 <sup>s</sup> ; 13 <sup>h</sup> 51 <sup>m</sup> 00 <sup>s</sup> - 21 <sup>h</sup> 03 <sup>m</sup> 00 <sup>s</sup> | <u>4</u> , <u>4</u> , 3, 0, <u>1</u> , <u>0</u> , <u>0</u> , <u>4</u> ,         | Overcast<br>-Snow      |
| 17      | 14 16 15 - 23 37 00  | 3, 0, 1, 1, <u>1</u> , <u>0</u> , <u>4</u> , <u>5</u> ,                         | Blizzard               |
| 19      | 13 09 15   | 5, 4, 2, 0, <u>0</u> , <u>0</u> , <u>3</u> , <u>4</u> ,                         |                        |
| 20      | -06 54 45  | <u>4</u> , <u>6</u> , <u>5</u> , 2, 2, <u>4</u> , <u>5</u> , <u>4</u> ,         | Cloud                  |
| 21      | -07 24 15  | <u>5</u> , <u>5</u> , <u>5</u> , 2, 2, 2, 2, 1,                                 |                        |
| 29      | 15 59 00   | 1, 1, 1, 0, 0, <u>2</u> , <u>3</u> , <u>3</u> ,                                 | Cloud                  |
| 30      | -06 11 00  | <u>0</u> , <u>0</u> , <u>3</u> , 2, <u>0</u> , <u>0</u> , <u>0</u> , <u>0</u> , |                        |
| July 1  | -05 25 45  | <u>3</u> , <u>4</u> , X, X, 2, 1, X, X,   | Overcast<br>- Snow     |
| 2       | 21 21 45   | 0, 2, 4, 2, 1, 0, 0, <u>0</u> ,   | Snow-Overcast<br>-Fine |
| 3       | -07 27 45  | <u>4</u> , <u>5</u> , <u>5</u> , 3, <u>2</u> , <u>0</u> , <u>1</u> , <u>6</u> , |                        |
| 4       | -05 47 30  | <u>6</u> , <u>5</u> , 5, 3, <u>1</u> , <u>1</u> , <u>0</u> , <u>2</u> ,         |                        |
| 5       | -07 40 30  | <u>2</u> , <u>5</u> , <u>3</u> , 1, 1, <u>3</u> , <u>0</u> , <u>3</u> ,         |                        |
| 6       | -06 36 15  | <u>6</u> , <u>4</u> , <u>4</u> , 4, <u>2</u> , <u>1</u> , <u>0</u> , <u>0</u> , | Overcast               |
| 7       | -06 46 30  | <u>1</u> , <u>1</u> , <u>1</u> , 1, <u>0</u> , <u>1</u> , <u>1</u> , <u>5</u> , | Cloud                  |
| 8       | -05 29 45  | <u>3</u> , <u>4</u> , 3, 1, <u>0</u> , <u>1</u> , <u>3</u> , <u>5</u> ,         |                        |
| 9       | -06 14 00  | <u>5</u> , <u>6</u> , <u>4</u> , 3, <u>3</u> , <u>3</u> , <u>5</u> , <u>6</u> , |                        |
| 10      | -05 48 15  | <u>7</u> , <u>3</u> , 1, 1, <u>1</u> , <u>2</u> , <u>5</u> , <u>4</u> ,         |                        |
| 11      | -05 17 15  | <u>5</u> , <u>2</u> , 2, 2, <u>1</u> , <u>2</u> , <u>4</u> , <u>5</u> ,         | Overcast               |
| 12      | -06 05 15  | <u>5</u> , <u>5</u> , <u>2</u> , 2, <u>1</u> , <u>1</u> , <u>2</u> , <u>4</u> , |                        |
| 13      | -04 23 00  | <u>4</u> , <u>4</u> , 2, 0, 0, 2, 1, 4,   | Overcast<br>-Snow      |
| 14      | 12 35 45   | 4, 3, 2, 2, <u>1</u> , <u>1</u> , <u>2</u> , <u>5</u> ,                         |                        |
| 15      | -01 33 30  | <u>4</u> , 3, 0, 2, 1, 0, <u>1</u> , <u>2</u> ,                                 | Overcast<br>-Snow      |





| Day     | Hours (Universal Time)                           |  | K-Index   | Remarks               |
|---------|--|--|---|-----------------------|
| Aug. 13 | -04 <sup>h</sup> 33 <sup>m</sup> 30 <sup>s</sup> | 14 <sup>h</sup> 54 <sup>m</sup> 00 <sup>s</sup>            | <u>2</u> , <u>2</u> , 2, 1, <u>1</u> , <u>1</u> , <u>2</u> , <u>5</u> , | Overcast<br>-Snow     |
| 14      | -04 36 00  | 13 44 30   | <u>2</u> , <u>4</u> , 0, 0, <u>0</u> , <u>1</u> , <u>0</u> , <u>3</u> , | Overcast              |
| 15      | -04 32 30  |  | <u>4</u> , <u>4</u> , 1, 0, 0, 0, 0, 5,                                 | Overcast<br>-Snow     |
| 17      |  | 14 26 45   | 5, 7, 7, 3, <u>4</u> , <u>5</u> , <u>5</u> , <u>6</u> ,                 |                       |
| 18      | -04 34 45  | 15 01 45   | <u>6</u> , <u>6</u> , 4, 3, 3, <u>6</u> , <u>5</u> , <u>5</u> ,         |                       |
| 19      | -04 10 30  |  | <u>5</u> , <u>3</u> , 2, 2, 1, 3, 2, 0,                                 | Overcast<br>-Blizzard |
| 20      |  | 13 <sup>h</sup> 58 <sup>m</sup> 15 <sup>s</sup> - 23 54 00 | 0, 0, 1, 0, <u>1</u> , <u>0</u> , <u>1</u> , <u>2</u> ,                 | Overcast<br>-Snow     |
| 22      |  | 15 17 15   | 0, 0, 1, 0, 1, <u>2</u> , <u>2</u> , <u>4</u> ,                         |                       |
| 23      | -04 42 30  | 14 08 30   | <u>3</u> , <u>4</u> , 1, 1, <u>1</u> , <u>1</u> , <u>0</u> , <u>0</u> , | Cloud                 |
| 24      | -04 28 30  |  | <u>1</u> , <u>3</u> , 0, 0, 0, 0, 2, 1,                                 |                       |
| 26      |  | 14 24 45   | 5, 4, 5, 4, <u>3</u> , <u>3</u> , <u>3</u> , <u>4</u> ,                 | Overcast<br>-Snow     |
| 27      | -04 04 30  | 14 22 30   | <u>4</u> , <u>4</u> , 3, 1, <u>1</u> , <u>3</u> , <u>3</u> , <u>5</u> , | Overcast              |
| 28      | -03 23 00  | 14 45 30   | <u>1</u> , <u>3</u> , 3, 0, <u>0</u> , <u>2</u> , <u>4</u> , <u>5</u> , |                       |
| 29      | -03 24 15  | 14 18 30   | <u>3</u> , <u>5</u> , 4, 2, <u>2</u> , <u>2</u> , <u>0</u> , <u>0</u> , |                       |
| 30      | -03 58 00 ; 14 28 45 -                           | 23 29 45   | <u>4</u> , <u>3</u> , 2, 1, <u>0</u> , <u>0</u> , <u>0</u> , <u>0</u> , | Overcast<br>-Snow     |
| 31      |  | 14 38 45   | 0, 3, 3, 1, <u>1</u> , <u>3</u> , <u>5</u> , <u>3</u> ,                 |                       |
| Sept. 1 | -03 05 15  |  | <u>2</u> , <u>1</u> , 4, 4, 1, 3, 4, 3,                                 |                       |
| 3       |  | 14 48 30   | 1, 5, 2, 2, <u>1</u> , <u>2</u> , <u>1</u> , <u>4</u> ,                 |                       |
| 4       | -03 47 00  | 14 38 30   | <u>3</u> , <u>3</u> , 1, 1, <u>1</u> , <u>1</u> , <u>2</u> , <u>4</u> , |                       |
| 5       | -03 16 30  |  | <u>4</u> , <u>3</u> , 1, 1, 0, 1, 2, 5,                                 | Cloud                 |
| 12      |  | 15 20 30   | 1, 2, 2, 1, 0, <u>0</u> , <u>0</u> , <u>1</u> ,                         |                       |
| 13      | -05 06 30  | 15 59 30   | <u>2</u> , <u>5</u> , 5, 3, 2, <u>2</u> , <u>5</u> , <u>5</u> ,         |                       |

| Day      | Hours (Universal Time)                           | K- Index                                | Remarks |
|----------|--|---|---------|
| Sept. 14 | -04 <sup>h</sup> 38 <sup>m</sup> 45 <sup>s</sup> | <u>5</u> , <u>4</u> , 2, 1, 3, 2, 4, 4, |         |

Table 2. Hours of operation of the 35mm all-sky camera at Syowa Station in 1970.

| Day    | Hours (Universal Time)                                     | K-Index   | Remarks                      |
|--------|--|---|------------------------------|
| Mar. 2 | 18 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>            | 6, 5, 4, 3, 2, 2, <u>2</u> , <u>4</u> ,                 |                              |
| 3      | -00 <sup>h</sup> 25 <sup>m</sup> 00 <sup>s</sup>           | <u>4</u> , 2, 2, 3, 2, 3, <u>4</u> , <u>6</u> ,         |                              |
| 4      | -00 34 00  | <u>5</u> , 4, 1, 2, 3, 3, <u>4</u> , <u>5</u> ,         |                              |
| 5      | -00 38 00  | <u>4</u> , 2, 2, 2, 2, 3, 5, 5,                         |                              |
| 6      | 19 08 00   | 6, 3, 2, 2, 2, 4, <u>5</u> , <u>5</u> ,                 |                              |
| 7      | -00 41 00  | <u>5</u> , 6, 3, 3, 3, 4, 6, 5,                         |                              |
| 9      | 19 42 00   | 5, 6, 3, 3, 2, 5, <u>3</u> , <u>6</u> ,                 |                              |
| 10     | -00 32 20  | <u>5</u> , 1, 2, 2, 2, 2, <u>2</u> , <u>2</u> ,         |                              |
| 11     | -00 55 20  | <u>1</u> , 1, 2, 2, 2, 1, <u>1</u> , <u>2</u> ,         |                              |
| 12     | -01 23 00  | <u>3</u> , 3, 2, 2, 2, <u>2</u> , <u>1</u> , <u>1</u> , |                              |
| 13     | -01 01 40  | <u>1</u> , 2, 2, 2, 2, 2, 2, 2,                         |                              |
| 16     | 22 <sup>h</sup> 15 <sup>m</sup> 00 <sup>s</sup> - 23 31 40 | 1, 1, 1, 2, 2, 1, 1, <u>1</u> ,                         | Cloud                        |
| 17     | 18 12 00   | 1, 0, 1, 2, 2, 2, <u>2</u> , <u>3</u> ,                 |                              |
| 18     | -01 36 40  | <u>3</u> , 1, 1, 2, 2, <u>2</u> , <u>2</u> , <u>4</u> , |                              |
| 19     | -01 10 55  | <u>2</u> , 2, 1, 2, 2, <u>2</u> , <u>1</u> , <u>3</u> , |                              |
| 20     | -01 37 40 ; 17 40 00 - 22 41 40                            | <u>3</u> , 1, 1, 2, 2, <u>2</u> , <u>2</u> , <u>3</u> , | Overcast<br>-Snow            |
| 25     | 17 00 00 - 22 15 55  | 1, 1, 1, 2, 2, <u>1</u> , <u>1</u> , <u>1</u> ,         | Overcast                     |
| 26     | 18 59 00   | 3, 3, 1, 2, 2, 2, <u>2</u> , <u>2</u> ,                 |                              |
| 27     | -02 10 50  | <u>1</u> , 0, 1, 3, 2, <u>2</u> , <u>3</u> , <u>5</u> , |                              |
| 28     | -02 08 00  | <u>4</u> , 5, 3, 3, 2, <u>4</u> , <u>3</u> , <u>5</u> , |                              |
| 29     | - ? ; 16 43 00 - 20 47 40                                  | <u>5</u> , 5, 2, 2, 2, <u>2</u> , <u>4</u> , <u>6</u> , | End unidentified<br>Overcast |

| Day     | Hours (Universal Time)                                     | K-Index   | Remarks          |
|---------|--|---|------------------|
| Mar. 30 | 20 <sup>h</sup> 20 <sup>m</sup> 00 <sup>s</sup>            | 6, 3, 3, 2, 3, 2, <u>3</u> , <u>4</u> ,                                 |                  |
| 31      | -00 <sup>h</sup> 23 <sup>m</sup> 55 <sup>s</sup>           | <u>3</u> , 5, 5, 4, 3, 4, 3, 6,   |                  |
| Apr. 2  | 16 40 00   | 0, 0, 1, 1, 1, <u>1</u> , <u>1</u> , <u>0</u> ,                         | Cloud            |
| 3       | -02 30 40  | <u>3</u> , 5, 4, 2, 1, <u>2</u> , <u>0</u> , <u>1</u> ,                 |                  |
| 4       | -02 33 40  | <u>4</u> , 2, 2, 1, 1, 0, 0, 1,   |                  |
| 13      | 17 29 00   | 1, 1, 1, 1, 0, <u>0</u> , <u>0</u> , <u>0</u> ,                         |                  |
| 14      | -02 12 40  | <u>1</u> , 1, 1, 1, 0, 0, <u>0</u> , <u>2</u> ,                         | Cloud            |
| 15      | -01 56 40  | <u>1</u> , 1, 1, 0, 0, 2, <u>3</u> , <u>3</u> ,                         | Overcast         |
| 16      | -02 50 40  | <u>4</u> , 5, 4, 2, 1, 1, 5, 5,   | Cloud            |
| 19      | 15 55 00   | 5, 6, 5, 3, 3, <u>2</u> , <u>2</u> , <u>2</u> ,                         |                  |
| 20      | -03 08 40  | <u>2</u> , <u>4</u> , 2, 2, 2, <u>4</u> , <u>3</u> , <u>4</u> ,         |                  |
| 21      | -03 26 40  | <u>4</u> , <u>5</u> , 5, 4, 4, 6, 8, 6,                                 |                  |
| May 10  | 13 44 00   | 1, 1, 1, 0, <u>0</u> , <u>0</u> , <u>0</u> , <u>0</u> ,                 |                  |
| 11      | -04 29 55  | <u>0</u> , <u>0</u> , 0, 0, 0, 0, 0, 4,                                 |                  |
| 14      | 15 07 00   | 4, 3, 3, 1, 1, <u>3</u> , <u>3</u> , <u>5</u> ,                         |                  |
| 15      | -05 07 55  | <u>5</u> , <u>1</u> , 2, 2, <u>0</u> , <u>0</u> , <u>0</u> , <u>3</u> , |                  |
| 16      | -04 55 40  | <u>3</u> , <u>2</u> , 1, 0, <u>0</u> , <u>0</u> , <u>1</u> , <u>4</u> , |                  |
| 17      | - ?  | <u>4</u> , <u>5</u> , 4, 1, <u>1</u> , <u>0</u> , <u>0</u> , <u>4</u> , | End unidentified |
| 18      | -05 00 40  | <u>4</u> , <u>4</u> , 1, 0, <u>1</u> , <u>0</u> , <u>1</u> , <u>1</u> , |                  |
| 19      | -04 54 40  | <u>2</u> , <u>3</u> , 2, 2, 1, 1, 3, 3,                                 |                  |
| 21      | 13 08 00   | 4, 2, 1, 1, <u>1</u> , <u>1</u> , <u>2</u> , <u>5</u> ,                 |                  |
| 22      | -05 33 55  | <u>5</u> , <u>4</u> , 2, 1, 0, 2, 2, 2,                                 |                  |
| 26      | 15 <sup>h</sup> 42 <sup>m</sup> 00 <sup>s</sup> - 18 54 55 | 0, 0, 0, 0, 0, <u>0</u> , <u>0</u> , 3,                                 | Blizzard         |
| 27      | 19 06 00   | 2, 2, 3, 2, 1, <u>3</u> , <u>5</u> , <u>5</u> ,                         | Overcast         |



| Day  |    | Hours (Universal Time)                           |   | K-Index   | Remarks                |
|------|----|--|---|---|------------------------|
| July | 1  | -05 <sup>h</sup> 25 <sup>m</sup> 40 <sup>s</sup> |   | <u>3</u> , <u>4</u> , X, X, 2, 1, X, X,   | Overcast<br>-Snow      |
|      | 2  |  | 21 <sup>h</sup> 23 <sup>m</sup> 00 <sup>s</sup> | 0, 2, 4, 2, 1, 0, 0, <u>0</u> ,   | Snow-Overcast<br>-Fine |
|      | 3  | -07 28 55  | 12 59 00  | <u>4</u> , <u>5</u> , <u>5</u> , 3, <u>2</u> , <u>0</u> , <u>1</u> , <u>6</u> , |                        |
|      | 4  | -05 48 40  | 14 05 00  | <u>6</u> , <u>5</u> , 5, 3, <u>1</u> , <u>1</u> , <u>0</u> , <u>2</u> ,         |                        |
|      | 5  | -07 40 40  | 17 06 00  | <u>2</u> , <u>5</u> , <u>3</u> , 1, 1, <u>3</u> , <u>0</u> , <u>3</u> ,         |                        |
|      | 6  | -06 36 00  | 12 52 00  | <u>6</u> , <u>4</u> , <u>4</u> , 4, <u>2</u> , <u>1</u> , <u>0</u> , <u>0</u> , | Overcast               |
|      | 7  | -06 46 40  | 14 15 00  | <u>1</u> , <u>1</u> , <u>1</u> , 1, <u>0</u> , <u>1</u> , <u>1</u> , <u>5</u> , | Cloud                  |
|      | 8  | -05 29 40  | 12 48 00  | <u>3</u> , <u>4</u> , 3, 1, <u>0</u> , <u>1</u> , <u>3</u> , <u>5</u> ,         |                        |
|      | 9  | -06 14 40  | 13 13 00  | <u>5</u> , <u>6</u> , <u>4</u> , 3, <u>3</u> , <u>3</u> , <u>5</u> , <u>6</u> , |                        |
|      | 10 | -05 48 40  | 12 42 00  | <u>7</u> , <u>3</u> , 1, 1, <u>1</u> , <u>2</u> , <u>5</u> , <u>4</u> ,         |                        |
|      | 11 | -05 20 40  | 12 38 00  | <u>5</u> , <u>2</u> , 2, 2, <u>1</u> , <u>2</u> , <u>4</u> , <u>5</u> ,         | Overcast               |
|      | 12 | -06 06 40  | 12 45 00  | <u>5</u> , <u>5</u> , <u>2</u> , 2, <u>1</u> , <u>1</u> , <u>2</u> , <u>4</u> , |                        |
|      | 13 | -04 21 40  |   | <u>4</u> , <u>4</u> , 2, 0, 0, 2, 1, 4,   | Overcast<br>-Snow      |
|      | 14 |  | 12 36 00  | 4, 3, 2, 2, <u>1</u> , <u>1</u> , <u>2</u> , <u>5</u> ,                         |                        |
|      | 15 | -01 32 55  | 18 16 00  | <u>4</u> , 3, 0, 2, 1, 0, <u>1</u> , <u>2</u> ,                                 | Overcast<br>-Snow      |
|      | 16 | -07 19 40  | 12 46 00  | <u>4</u> , <u>2</u> , <u>0</u> , 0, <u>1</u> , <u>1</u> , <u>0</u> , <u>0</u> , | Snow<br>-Fine          |
|      | 17 | -06 10 55  | 12 40 00  | <u>3</u> , <u>0</u> , <u>0</u> , 1, <u>0</u> , <u>1</u> , <u>2</u> , <u>5</u> , |                        |
|      | 18 | -05 26 40  |   | <u>3</u> , <u>3</u> , 1, 0, 0, 0, 1, 2,   |                        |
|      | 21 |  | 12 55 00  | 5, 4, 2, 1, <u>3</u> , <u>2</u> , <u>5</u> , <u>5</u> ,                         |                        |
|      | 22 | -07 57 40  | 13 44 00  | <u>4</u> , <u>3</u> , <u>2</u> , 2, <u>0</u> , <u>2</u> , <u>4</u> , <u>5</u> , |                        |
|      | 23 | -05 19 40  |   | <u>5</u> , <u>2</u> , 2, 1, 1, 0, 2, 0,   | Overcast               |
|      | 25 |  | 12 35 00  | 6, 6, 6, 5, <u>3</u> , <u>2</u> , <u>2</u> , <u>6</u> ,                         |                        |





| Day     | Hours (Universal Time)  | K-Index   | Remarks           |
|---------|---|---|-------------------|
| Aug. 20 | 13 <sup>h</sup> 59 <sup>m</sup> 00 <sup>s</sup> - 23 <sup>h</sup> 54 <sup>m</sup> 40 <sup>s</sup> | 0, 0, 1, 0, <u>1</u> , <u>0</u> , <u>1</u> , <u>2</u> ,                 | Overcast<br>-Snow |
| 22      | 15 18 00  | 0, 0, 1, 0, 1, <u>2</u> , <u>2</u> , <u>4</u> ,                         |                   |
| 23      | -04 <sup>h</sup> 42 <sup>m</sup> 40 <sup>s</sup>  | <u>3</u> , <u>4</u> , 1, 1, <u>1</u> , <u>1</u> , <u>0</u> , <u>0</u> , | Cloud             |
| 24      | -04 29 40   | <u>1</u> , <u>3</u> , 0, 0, <u>0</u> , <u>0</u> , <u>2</u> , <u>1</u> , |                   |
| 25      | -01 44 40   | <u>1</u> , 2, 2, 3, 2, 2, <u>2</u> , <u>3</u> ,                         | Overcast<br>-Snow |
| 26      | -05 47 00   | <u>5</u> , <u>4</u> , 5, 4, <u>3</u> , <u>3</u> , <u>3</u> , <u>4</u> , | Overcast<br>-Snow |
| 27      | -04 04 40   | <u>4</u> , <u>4</u> , 3, 1, <u>1</u> , <u>3</u> , <u>5</u> , <u>5</u> , | Overcast          |
| 28      | -03 23 40   | <u>1</u> , <u>3</u> , 3, 0, <u>0</u> , <u>2</u> , <u>4</u> , <u>5</u> , |                   |
| 29      | -03 23 55   | <u>3</u> , <u>5</u> , 4, 2, <u>2</u> , <u>2</u> , <u>0</u> , <u>0</u> , |                   |
| 30      | -03 58 30 ; 14 29 00 - 23 30 30   | <u>4</u> , <u>3</u> , 2, 1, <u>0</u> , <u>0</u> , <u>0</u> , <u>0</u> , | Overcast<br>-Snow |
| 31      | 14 39 00  | 0, 3, 3, 1, <u>1</u> , <u>3</u> , <u>5</u> , <u>3</u> ,                 |                   |
| Sept. 1 | -03 05 30   | <u>2</u> , <u>1</u> , 4, 4, <u>1</u> , <u>3</u> , <u>4</u> , <u>3</u> , |                   |
| 2       | -04 19 40   | <u>4</u> , <u>3</u> , 2, 3, <u>1</u> , <u>2</u> , <u>2</u> , <u>4</u> , |                   |
| 3       | -03 34 55   | <u>1</u> , <u>5</u> , 2, 2, <u>1</u> , <u>2</u> , <u>1</u> , <u>4</u> , |                   |
| 4       | -03 44 55   | <u>3</u> , <u>3</u> , 1, 1, <u>1</u> , <u>1</u> , <u>2</u> , <u>4</u> , |                   |
| 5       | -03 16 30   | <u>4</u> , <u>3</u> , 1, 1, 0, <u>1</u> , <u>2</u> , <u>5</u> ,         | Cloud             |
| 6       | -05 02 55   | <u>0</u> , <u>1</u> , 1, 0, 0, <u>0</u> , <u>2</u> , <u>4</u> ,         |                   |
| 7       | -03 30 30   | <u>2</u> , <u>0</u> , 1, 0, 1, <u>0</u> , <u>3</u> , <u>4</u> ,         |                   |
| 8       | -03 32 55   | <u>1</u> , <u>1</u> , 3, 1, 0, <u>1</u> , <u>4</u> , <u>2</u> ,         |                   |
| 9       | -04 20 55   | <u>2</u> , <u>1</u> , 1, 1, 0, <u>0</u> , <u>3</u> , <u>4</u> ,         |                   |
| 10      | -00 42 55   | <u>5</u> , 5, 2, 0, 0, 0, 0, 0,   | Overcast          |
| 12      | 15 21 00  | 1, 2, 2, 1, 0, <u>0</u> , <u>0</u> , <u>1</u> ,                         |                   |

| Day      | Hours (Universal Time)                                    | K-Index   | Remarks               |
|----------|---|---|-----------------------|
| Sept. 13 | -05 <sup>h</sup> 05 <sup>m</sup> 30 <sup>s</sup> 16 00 00 | <u>2</u> , <u>5</u> , 5, 3, 2, <u>2</u> , <u>5</u> , <u>5</u> , |                       |
| 14       | -04 37 55 15 31 00  | <u>5</u> , <u>4</u> , 2, 1, 3, <u>2</u> , <u>4</u> , <u>4</u> , |                       |
| 15       | -04 37 55 15 42 00  | <u>6</u> , <u>5</u> , 3, 1, 1, <u>0</u> , <u>2</u> , <u>3</u> , |                       |
| 16       | -04 29 55 15 51 00  | <u>3</u> , <u>2</u> , 2, 0, 0, <u>0</u> , <u>1</u> , <u>1</u> , |                       |
| 17       | -03 57 55 17 18 00  | <u>3</u> , <u>4</u> , 3, 1, 0, <u>1</u> , <u>1</u> , <u>3</u> , |                       |
| 18       | -01 57 55 15 40 00  | <u>3</u> , 4, 2, 2, 0, <u>1</u> , <u>2</u> , <u>3</u> ,         |                       |
| 19       | -03 13 55 15 48 00  | <u>2</u> , <u>5</u> , 3, 2, 2, <u>3</u> , <u>5</u> , <u>5</u> , | Overcast              |
| 20       | -02 42 55 15 45 00  | <u>3</u> , 4, 3, 2, 1, <u>3</u> , <u>3</u> , <u>5</u> ,         |                       |
| 21       | -02 31 55 15 53 00  | <u>5</u> , 4, 4, 3, 2, <u>3</u> , <u>3</u> , <u>3</u> ,         | Overcast<br>-Blizzard |
| 22       | -02 46 55 16 01 00  | <u>4</u> , 4, 2, 2, 0, <u>3</u> , <u>2</u> , <u>5</u> ,         | Overcast<br>-Snow     |
| 23       | -01 57 00 16 10 00  | <u>3</u> , 2, 2, 2, 1, <u>1</u> , <u>1</u> , <u>2</u> ,         |                       |
| 24       | -01 54 55 15 53 00  | <u>3</u> , 3, 2, 2, 0, <u>1</u> , <u>3</u> , <u>2</u> ,         | Cloud                 |
| 25       | -02 20 55 16 07 00  | <u>1</u> , 4, 3, 1, 0, <u>1</u> , <u>2</u> , <u>1</u> ,         |                       |
| 26       | -01 47 00 16 30 00  | <u>1</u> , 3, 2, 1, 1, <u>0</u> , <u>1</u> , <u>5</u> ,         |                       |
| 27       | -01 38 55 17 02 00  | <u>5</u> , 5, 5, 1, 1, <u>4</u> , <u>4</u> , <u>5</u> ,         |                       |
| 28       | -01 31 55 17 40 00  | <u>3</u> , 1, 1, 1, 0, <u>0</u> , <u>0</u> , <u>1</u> ,         |                       |
| 29       | -04 04 55 16 54 00  | <u>1</u> , <u>1</u> , 2, 1, 0, <u>0</u> , <u>0</u> , <u>2</u> , |                       |
| 30       | -03 31 55 17 44 00  | <u>2</u> , <u>3</u> , 2, 1, 0, <u>0</u> , <u>0</u> , <u>3</u> , |                       |
| Oct. 1   | -02 32 55 17 00 00  | <u>5</u> , 1, 2, 1, 1, <u>0</u> , <u>4</u> , <u>4</u> ,         | Overcast<br>-Fine     |
| 2        | -01 43 55   | <u>5</u> , 2, 2, 2, 0, 1, 2, 3,                                 | Cloud                 |
| 4        | 18 13 00  | 5, 6, 3, 3, 2, 2, <u>3</u> , <u>4</u> ,                         |                       |
| 5        | -01 07 55 17 52 00  | <u>4</u> , 3, 3, 1, 0, <u>0</u> , <u>3</u> , <u>2</u> ,         | Overcast<br>-Blizzard |

| Day    | Hours (Universal Time)   | K-Index   | Remarks  |
|--------|--|---|----------|
| Oct. 6 | -00 <sup>h</sup> 35 <sup>m</sup> 55 <sup>s</sup> ; 17 <sup>h</sup> 48 <sup>m</sup> 00 <sup>s</sup> - 23 <sup>h</sup> 58 <sup>m</sup> 00 <sup>s</sup> | <u>3</u> , 1, 1, 1, 0, <u>0</u> , <u>1</u> , <u>6</u> , |          |
| 7      | 17 48 00 - 23 33 55  | 0, 1, 1, 0, 0, <u>0</u> , <u>0</u> , <u>3</u> ,         | Overcast |
| 8      | 18 33 00   | 1, 2, 2, 1, 0, 0, <u>0</u> , <u>2</u> ,                 |          |
| 9      | -02 12 55 19 36 00   | <u>2</u> , 1, 2, 1, 0, 0, <u>0</u> , <u>0</u> ,         | Overcast |
| 10     | -00 21 55  | <u>1</u> , 2, 2, 1, 0, 2, 4, 4,                         | Overcast |
| 11     | 18 25 00 - 22 17 55  | 4, 5, 5, 3, 2, 3, <u>5</u> , <u>4</u> ,                 | Overcast |
| 12     | 19 46 00 - 23 21 55  | 5, 6, 3, 1, 1, 0, <u>0</u> , <u>0</u> ,                 |          |
| 13     | 19 46 00   | 1, 3, 3, 1, 1, 1, <u>2</u> , <u>2</u> ,                 |          |
| 14     | -00 17 55 19 52 00   | <u>4</u> , 4, 2, 1, 1, 0, <u>1</u> , <u>4</u> ,         |          |
| 15     | -00 10 55  | <u>4</u> , 2, 2, 1, 0, 0, 1, 1,                         |          |
| 16     | 20 17 00 - 22 59 55  | 1, 1, 1, 3, 3, 3, <u>5</u> , <u>4</u> ,                 | Cloud    |
| 17     | 17 51 00   | 3, 2, 3, 2, 3, <u>4</u> , <u>7</u> , <u>5</u> ,         |          |
| 18     | -00 37 55 ; 21 26 00 - 23 40 55  | <u>6</u> , 5, 3, 2, 3, 3, 3, <u>5</u> ,                 | Overcast |