

Records of Radio Aurora at Syowa Station, Antarctica  
from April 1970 to February 1971

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## 1. Introduction

Observations of radio aurora by means of the radar with frequency of 112.2 MHz have been carried out at Syowa Station, Antarctica, since March 1966 by representatives from the Radio Research Laboratories.

This report has been prepared in order to make the data available to scientists who are interested in this field.

The records covering the period from April 1970 to February 1971, with the form of A-scope and R-T scope displays on the 35 mm film, are deposited in the Radio Research Laboratories.

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

Radio Research Laboratories

Ministry of Posts and Telecommunications

2-1, Nukui-Kitamachi 4-chome, Koganei-shi,

Tokyo 184, Japan

## 2. Location

Syowa Station			
Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
69°00'S	39°35'E	69.6°S	77.1°E

### 3. Observers

Isao SHIRO (Radio Research Laboratories)

Toshirou SAKAMOTO (Radio Research Laboratories)

### 4. Method of measurement

The antenna was fixed with the direction of the magnetic south and an elevation angle of 25 degrees. The declination in the geomagnetic field at Syowa Station was  $45^{\circ}50'W$  in 1970.

The observation was continuously made at interval of 17:00 to 09:00 L.T. ( $45^{\circ}E.M.T. = U.T. + 3 \text{ hours}$ ) every day. However, a whole day observation was carried out only during June, August, September, and October in 1970.

Characteristics of the equipments are as follows:

Antenna	Rotatable 2 stacks of 8-element Yagi
	Gain: 13.6 dB (in common with transmission and reception)
	Polarization: horizontal
Main equipments	Frequency : 112.2 MHz
	Transmission power: ~ 20 kW (peak)
	Pulse width : 50~100 $\mu$ sec (variable)
	Repetition frequency: 50 Hz
Indicator and recorder	Maximum ranges: 1000 and 1500 km
	A-scope : 5-inch cathode ray oscilloscope
	1 step/min with 35 mm camera
	R-T scope: 5-inch cathode ray oscilloscope
	speed of 1 cm/min with 35 mm camera

An A-scope is one of indication methods on the plate of a cathode ray oscilloscope. On the plate the range and the intensity of reflecting radio wave are put on the abscissa and the ordinate, respectively.

An R-T scope is a modified A-scope. The range and the signal are put on the abscissa, and the time on the ordinate on record.

The indoor equipments, antenna, and examples of the records are shown in Figs. 1-3, respectively.

## 5. Explanation of tables

Time Interval of operation of the equipments (Table 1) and the appearance of radio aurora (Table 2) expressed in local time ( $45^{\circ}$  E.M.T.) are shown in separate tables.

The appearance of radio aurora is expressed by Range and Intensity of echo.





In the columns of June 26 to 29 and July 1, 1970 of Table 2, the presence of the echo was confirmed by means of the R-T scope data, on account of malfunction of the camera attached to the A-scope. Consequently, the intensity could not be read out.

## 6. Explanation of figure

Aspect of hourly occurrence of radio aurora echoes observed at Syowa Station is shown in Fig. 4 (a)-(k).

The intensity of the radio aurora is classified into four steps, and the intensity is expressed by the maximum value in the relevant time interval, *i.e.*, every hour.

The criterion of the classification is as follows:

Index	0		:	no echoes,
Index	1		:	1 dB ~ 10 dB,
Index	2		:	11 dB ~ 20 dB,
Index	3		:	more than 20 dB.

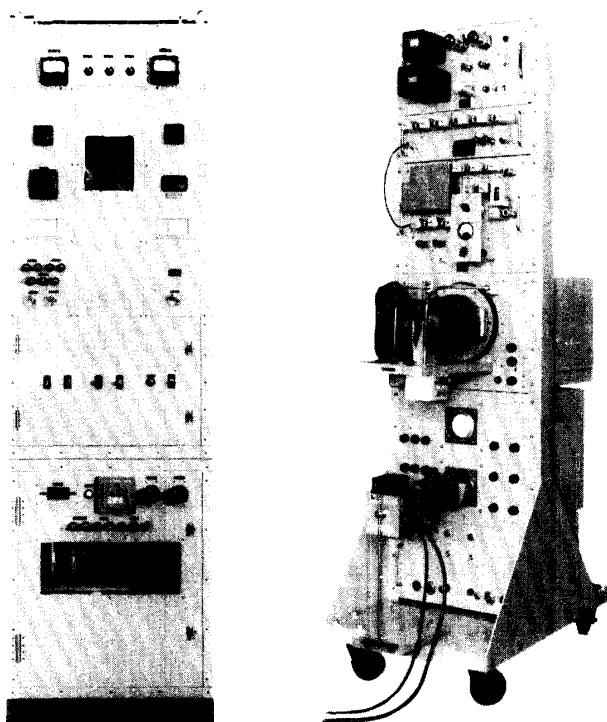
The presence of the echo in the relevant time interval involves the appearance of a short duration such as a few minutes.

The symbols in the figure denote as follows:

N : no observation,

F : failure of the observing equipments.

In the columns filled with the symbol F in June 26 to 29 and July 1 in the respective Fig. 4 (c) and (d), the presence of the echo was confirmed by means of the R-T scope data, on account of malfunction of the camera attached to the A-scope. Consequently, the intensity could not be read out.



(a)

(b)

Fig. 1. Indoor equipment.

(a) Transmitter for auroral radar.

(b) Receiver and indicator for auroral radar.

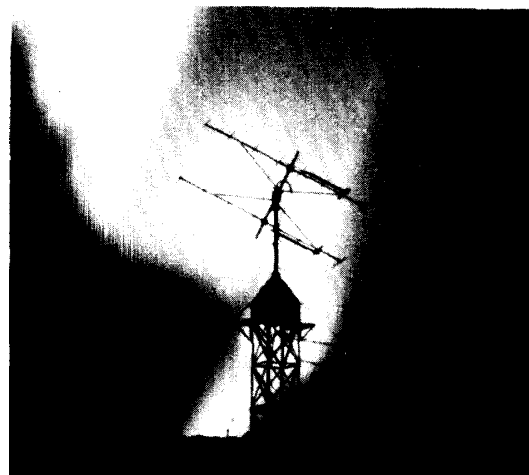


Fig. 2.

Antenna for auroral radar.

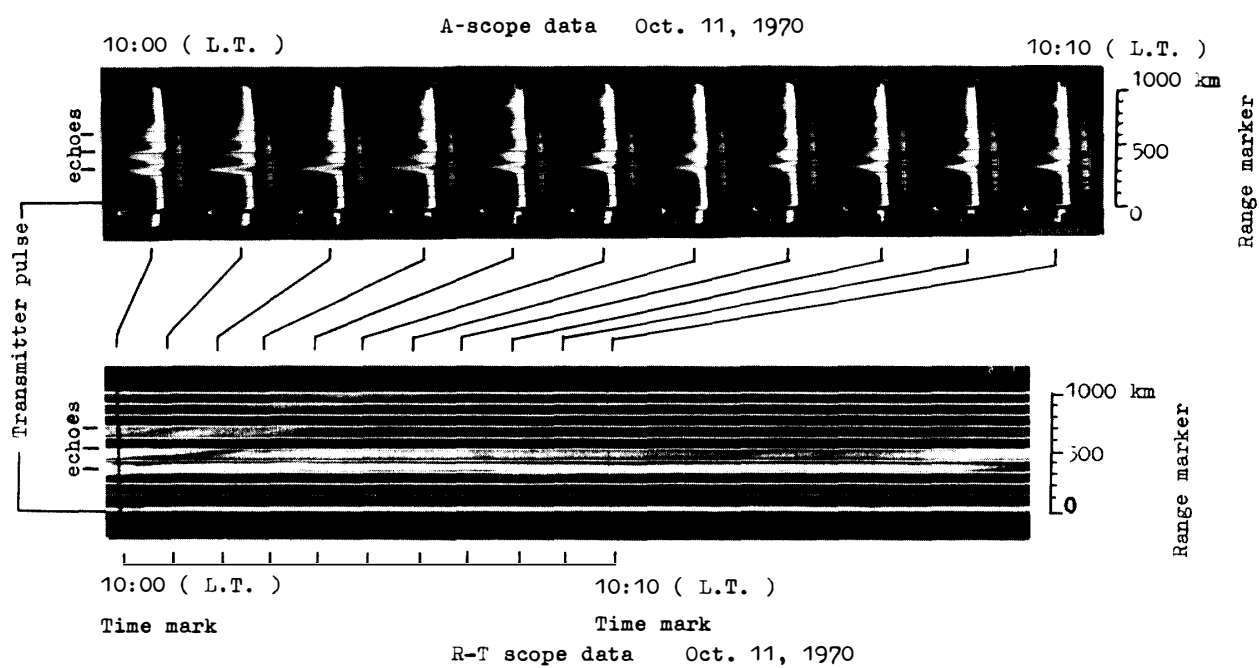


Fig. 3. Examples for the time variation of radar aurora echoes observed at Syowa Station.

Table 1. Time interval of operation of auroral radar  
at Syowa Station (April 1970 - February 1971).

Date	Obs ervingtime interval (45°E.M.T.)				T total obs erving time inter- val (h.m.)
	Starting time	Ending time	Starting time	Ending time	
1970 Apr. 25			22 40 -	23 59	1 20
26	00 00 -	11 00	17 30 -	23 59	17 30
27	00 00 -	12 45	17 30 -	23 59	19 15
28	00 00 -	09 15	17 30 -	23 59	15 45
29	00 00 -	09 05	17 30 -	23 59	15 35
30	00 00 -	09 00	17 30 -	23 59	15 30
May 1	00 00 -	09 10	17 50 -	23 59	15 20
2	00 00 -	10 15	10 55 - 13 10 14 40 - 15 20 17 50 - 23 59		19 10
3	00 00 -	01 15	23 10 -	23 59	2 05
4	00 00 -	10 58	17 07 -	23 59	17 50
5	00 00 -	12 15	17 30 -	23 59	18 45
6	00 00 -	09 30	17 30 -	23 59	16 00
7	00 00 -	08 35	17 05 -	23 59	15 30
8	00 00 -	01 20			1 20
9	01 35 -	10 00	17 00 -	23 59	16 25
10	00 00 -	06 50	17 50 -	23 59	13 00
11	00 00 -	10 00	17 00 -	23 59	17 00
12	00 00 -	08 10	17 40 -	23 59	14 30
13	00 00 -	10 20	17 40 -	23 59	16 40
14	00 00 -	08 30	17 30 -	23 59	15 00
15	00 00 -	09 48	17 30 -	23 59	16 20
16	00 00 -	08 50	16 10 -	23 59	16 40
17	00 00 -	23 59			24 00
18	00 00 -	00 30	00 45 -	23 59	23 45
19	00 00 -	08 35	17 30 -	23 59	15 05
20	00 00 -	09 35	17 40 -	23 59	15 55
21	00 00 -	08 25	17 20 -	23 59	15 05
22	00 00 -	10 10	17 40 -	23 59	16 30
23	00 00 -	08 30	17 45 -	23 59	14 45
24	00 00 -	11 35	17 05 -	23 59	18 30
25	00 00 -	08 30	17 00 -	23 59	15 30
26	00 00 -	09 00	17 30 -	23 59	15 30
27	00 00 -	09 35	15 00 -	23 59	18 35
28	00 00 -	22 45			22 45
29	00 10 -	23 50			23 40
30	00 00 -	08 10	08 25 -	23 59	23 45
May 31					
June 1	00 00 -	23 59			24 00
2	00 00 -	00 34	00 54 -	23 59	23 40
3	00 00 -	09 26	09 37 -	23 59	23 50
4	00 00 -	17 29	17 45 -	23 59	23 45
5	00 00 -	23 59			24 00
6	00 00 -	02 50	03 00 -	23 59	23 50
7	00 00 -	11 34	11 50 -	23 59	23 45
8	00 00 -	20 58	21 15 -	23 59	23 45
9	00 00 -	23 59			24 00
10	00 00 -	07 10	07 23 -	23 59	23 45
11	00 00 -	15 00	15 33 -	23 59	23 30
12	00 00 -	23 30	23 52 -	23 59	23 40
13	00 00 -	23 59			24 00
14	00 00 -	08 20	12 40 -	23 59	19 40
15	00 00 -	20 54	21 37 -	23 59	23 15
16	00 00 -	23 40			23 40
17			10 20 -	23 59	13 40
18	00 00 -	18 25	18 29 -	23 59	23 55
19	00 00 -	23 59			24 00
20	00 00 -	02 27	02 51 -	23 59	23 35
21	00 00 -	11 15	12 13 -	23 59	23 05
22	00 00 -	19 58	20 33 -	23 59	23 30
23	00 00 -	23 59			24 00
24	00 00 -	04 48	05 34 -	23 59	23 05
25	00 00 -	14 06	14 20 -	23 59	23 45
26	00 00 -	18 12			18 10
27					
28	-- See Section 5 in the text --				
29			16 15 -	23 59	7 45
30	00 00 -	23 59			24 00
July 1	00 00 -	01 55	18 00 -	23 59	7 55
2	00 00 -	09 02	16 54 -	23 59	16 05
3	00 00 -	00 46	17 02 -	23 59	7 45
4	00 00 -	09 50	17 02 -	23 59	16 50
5	00 00 -	07 43	17 04 -	23 59	14 40
6	00 00 -	10 29	17 08 -	23 59	17 20

Date	Observing time interval (45° E.M.T.)				Total observing time interval (h.m.)
	Starting time	Ending time	Starting time	Ending time	
July 7	00 00	- 07 26	17 07	- 23 59	14 15
8	00 00	- 10 01	18 49	- 23 59	15 10
9	00 00	- 09 29	17 51	- 23 59	15 40
10	00 00	- 11 05	17 48	- 23 59	17 15
11	00 00	- 07 23	17 43	- 23 59	13 40
12	00 00	- 09 17	17 57	- 23 59	15 15
13	00 00	- 09 30	17 25	- 23 59	16 05
14	00 00	- 11 26	17 47	- 23 59	17 35
15	00 00	- 06 57	17 46	- 23 59	13 15
16	00 00	- 09 27	17 21	- 23 59	16 10
17	00 00	- 08 48	17 25	- 23 59	15 25
18	00 00	- 09 09	17 25	- 23 59	15 45
19	00 00	- 09 13	17 40	- 23 59	15 30
20	00 00	- 10 00	17 35	- 23 59	16 25
21	00 00	- 09 00	17 13	- 23 59	15 45
22	00 00	- 07 46	17 45	- 23 59	14 00
23	00 00	- 10 47	17 40	- 23 59	17 05
24	00 00	- 10 30	17 50	- 23 59	16 40
25	00 00	- 08 20	17 55	- 23 59	14 25
26	00 00	- 11 06	17 50	- 23 59	17 15
27	00 00	- 04 02	17 40	- 23 59	10 20
28	00 00	- 07 36	17 45	- 23 59	13 50
29	00 00	- 10 20	17 55	- 23 59	16 25
30	00 00	- 09 04	17 31	- 23 59	15 35
31	00 00	- 00 48	01 02	- 23 59	23 50
Aug. 1	00 00	- 08 53	09 45	- 23 59	23 10
2	00 00	- 18 05	18 45	- 23 59	23 20
3	00 00	- 23 59			24 00
4	00 00	- 02 24	02 35	- 23 59	23 50
5	00 00	- 02 57	17 50	- 23 59	9 10
6	00 00	- 03 00	17 50	- 23 59	8 10
7	00 12	- 23 59			23 50
8	00 00	- 08 00	09 02	- 23 59	23 00
9	00 00	- 16 34	17 03	- 23 59	23 35
10	00 00	- 23 59			24 00
11	00 00	- 00 38	01 10	- 23 59	23 30
12	00 00	- 08 39	09 27	- 23 59	23 10
13	00 00	- 17 33	17 45	- 23 59	23 50
14	00 00	- 23 59			24 00
15	00 00	- 01 41	02 00	- 23 59	23 40
Aug. 16	00 00	- 09 17	09 48	- 23 59	23 30
17	00 00	- 17 19	17 31	- 23 59	23 50
18	00 00	- 23 59			24 00
19	00 00	- 02 00	02 11	- 23 59	23 50
20	00 00	- 09 40	10 07	- 23 59	23 30
21	00 00	- 16 57	17 10	- 23 59	23 50
22	00 00	- 23 59			24 00
23	00 00	- 00 17	00 32	- 23 59	23 45
24	00 00	- 08 00	09 02	- 23 59	23 00
25	00 00	- 16 27	16 40	- 23 59	23 50
26	00 00	- 23 59			24 00
27	00 00	- 00 27	00 39	- 23 59	23 50
28	00 00	- 08 05	08 13	- 23 59	23 55
29	00 00	- 15 06	15 20	- 23 59	23 45
30	00 00	- 20 27	20 40	- 23 59	23 50
31	00 00	- 20 55	21 02	- 23 59	23 55
Sep. 1	00 00	- 00 48	16 05 - 20 45 22 27 - 23 59		6 50
2	00 00	- 23 59			24 00
3	00 00	- 05 41	09 33	- 23 59	20 05
4	00 00	- 18 04	20 35	- 23 59	21 30
5	00 00	- 23 59			24 00
6	00 00	- 02 52	02 56	- 23 59	23 50
7	00 00	- 10 39	10 56	- 23 59	23 40
8	00 00	- 17 50	18 05	- 23 59	23 45
9	00 00	- 23 59			24 00
10	00 00	- 01 35	01 48	- 23 59	23 45
11	00 00	- 09 19	10 08	- 23 59	23 10
12	00 00	- 17 21	17 34	- 23 59	23 45
13	00 00	- 22 13	22 26	- 23 59	23 50
14	00 00	- 23 59			24 00
15	00 00	- 04 57	07 08	- 23 59	21 50
16	00 00	- 14 44	15 00	- 23 59	23 45
17	00 00	- 22 37	22 51	- 23 59	23 45
18	00 00	- 23 59			24 00
19	00 00	- 06 20	09 54	- 23 59	20 25
20	00 00	- 16 45	16 59	- 23 59	23 45
21	00 00	- 23 59			24 00
22	00 00	- 00 09	00 21	- 23 59	23 50
23	00 00	- 08 00	08 15	- 23 59	23 45

Date	Observing time interval (45°E.M.T.)				Total observing time interval (h.m.)
	Starting time	Ending time	Starting time	Ending time	
Sep. 24	00 00	- 15 40	15 55	- 23 59	23 45
25	00 00	- 23 31	23 45	- 23 59	23 45
26	00 00	- 23 59			24 00
27	00 00	- 06 47	07 11	- 23 59	23 35
28	00 00	- 14 51	15 17	- 23 59	23 35
29	00 00	- 23 59			24 00
30	00 00	- 00 21	00 35	- 23 59	23 45
Oct. 1	00 00	- 09 43	10 11	- 23 59	23 30
2	00 00	- 19 32	19 45	- 23 59	23 45
3	00 00	- 23 59			24 00
4	00 00	- 04 34	04 49	- 23 59	23 45
5	00 00	- 14 57	15 24	- 23 59	23 35
6	00 00	- 22 15	23 32	- 23 59	22 45
7	00 00	- 23 59			24 00
8	00 00	- 05 43	06 54	- 23 59	22 50
9	00 00	- 13 46	14 11	- 23 59	23 35
10	00 00	- 20 29	20 41	- 23 59	23 50
11	00 00	- 23 59			24 00
12	00 00	- 04 06	04 09	- 23 59	23 55
13	00 00	- 11 08	11 21	- 23 59	23 50
14	00 00	- 17 50	18 05	- 23 59	23 05
15	00 00	- 21 58	22 30	- 24 00	23 30
16	00 00	- 23 59			24 00
17	00 00	- 06 51	07 05	- 23 59	23 05
18	00 00	- 13 06	13 23	- 23 59	23 40
19	00 00	- 20 15			20 15
21			17 10	- 23 59	6 50
22	00 00	- 21 16	21 44	- 23 59	23 30
23	00 00	- 23 59			24 00
24	00 00	- 05 35	05 48	- 23 59	23 45
25	00 00	- 13 30	13 44	- 23 59	23 45
26	00 00	- 21 27	21 57	- 23 59	23 30
27	00 00	- 23 59			24 00
28	00 00	- 05 22	06 45	- 23 59	22 35
29	00 00	- 14 28	14 44	- 23 59	23 45
30	00 00	- 22 09	22 22	- 23 59	23 50
31	00 00	- 23 59			24 00
Nov. 1	00 00	- 05 50	17 00	- 23 59	12 50
2	00 00	- 08 30	17 00	- 23 59	15 30

Date	Observing time interval (45°E.M.T.)				Total observing time interval (h.m.)
	Starting time	Ending time	Starting time	Ending time	
Nov. 3	00 00	- 07 56	17 00	- 23 59	14 55
4	00 00	- 09 00	17 00	- 23 59	16 00
5	00 00	- 08 59	17 00	- 23 59	16 00
6	00 00	- 08 59	17 00	- 23 59	16 00
7	00 00	- 10 30	23 22	- 23 59	11 10
8	00 00	- 08 59	17 00	- 23 59	16 00
9	00 00	- 07 52	17 00	- 23 59	14 50
10	00 00	- 08 59	17 00	- 23 59	16 00
11	00 00	- 08 14	17 00	- 23 59	15 15
12	00 00	- 08 59	17 07	- 23 59	16 00
13	00 00	- 08 59	17 01	- 23 59	16 00
14	00 00	- 08 59	17 00	- 23 59	16 00
15	00 00	- 08 59	17 00	- 23 59	16 00
16	00 00	- 08 59	17 00	- 23 59	16 00
17	00 00	- 08 59	17 00	- 23 59	16 00
18	00 00	- 08 59	17 00	- 23 59	16 00
19	00 00	- 08 59	17 01	- 23 59	16 00
20	00 00	- 08 59	17 00	- 23 59	16 00
21	00 00	- 08 59	17 00	- 23 59	16 00
22	00 00	- 08 59	17 00	- 23 59	16 00
23	00 00	- 08 59	17 02	- 23 59	16 00
24	00 00	- 08 59	17 19	- 23 59	15 40
25	00 00	- 08 59	17 00	- 23 59	16 00
26	00 00	- 08 59	17 00	- 23 59	16 00
27	00 00	- 05 06	13 38	- 23 59	15 05
28	00 00	- 08 59	17 08	- 23 59	15 50
29	00 00	- 09 36	17 00	- 23 59	16 35
30	00 00	- 08 59	17 00	- 23 59	16 00
Dec. 1	00 00	- 08 59	22 50	- 23 59	10 10
2	00 00	- 08 59	17 00	- 23 59	16 00
3	00 00	- 08 03	17 00	- 23 59	15 00
4	00 00	- 08 59	17 05	- 23 35	15 30
7			17 01	- 23 59	7 00
8	00 00	- 08 59	17 00	- 23 59	16 00
9	00 00	- 08 31	17 11	- 23 59	15 20
10	00 00	- 04 00	17 10	- 23 59	10 50
11	00 00	- 08 50	21 35	- 23 59	11 15
12	00 00	- 08 59	17 00	- 23 59	16 00
13	00 00	- 02 30	19 00	- 21 45	7 00
			22 10	- 23 59	



Date	Observing time interval (45°E.M.T.)				Total observing time interval (h.m.)
	Starting time	Ending time	Starting time	Ending time	
Dec. 14	00 00 - 13 00		17 00 - 23 59		20 00
15	00 00 - 08 59		17 00 - 23 59		16 00
16	00 00 - 08 59		17 00 - 23 59		16 00
17	00 00 - 08 59		17 00 - 23 59		16 00
18	00 00 - 08 59		17 00 - 23 59		16 00
19	00 00 - 08 59		17 13 - 23 59		15 45
20	00 00 - 08 59		17 00 - 23 59		16 00
21	00 00 - 08 59		17 00 - 23 59		16 00
22	00 00 - 08 59		17 00 - 23 59		16 00
23	00 00 - 08 59		17 00 - 23 59		16 00
24	00 00 - 08 59		17 00 - 23 59		16 00
25	00 00 - 08 59		17 08 - 23 59		15 50
26	00 00 - 08 59		17 05 - 23 59		15 55
27	00 00 - 08 59		17 00 - 23 59		16 00
28	00 00 - 08 59		17 00 - 23 59		16 00
29	00 00 - 08 59		17 00 - 23 59		16 00
30	00 00 - 08 59		17 25 - 23 59		15 35
31	00 00 - 09 18		17 00 - 23 59		16 20
1971 Jan. 1	00 00 - 08 59		17 00 - 23 59		16 00
2	00 00 - 08 33		17 00 - 23 59		15 30
3	00 00 - 08 59		17 23 - 23 59		15 35
4	00 00 - 08 59		17 00 - 23 59		16 00
5	00 00 - 08 59		17 00 - 23 59		16 00
6	00 00 - 08 59		17 00 - 23 59		16 00
7	00 00 - 08 59		17 00 - 23 59		16 00
8	00 00 - 08 47		17 35 - 23 59		15 15
9	00 00 - 08 58		16 55 - 23 29		15 35
10			17 04 - 23 59		7 00
11	00 00 - 08 59		17 04 - 23 59		16 00
12	00 00 - 08 59		17 01 - 23 59		16 00
13	00 00 - 02 20				2 20
14			17 00 - 23 59		7 00
15	00 00 - 08 59		17 00 - 23 59		16 00
16	00 00 - 08 59		17 17 - 23 59		15 45
Jan. 17	00 00 - 08 59		17 00 - 23 59		16 00
18	00 00 - 08 59		17 00 - 20 05		12 05
19			17 00 - 23 59		7 00
20	00 00 - 08 59		14 40 - 23 59		18 20
21	00 00 - 00 23		00 28 - 23 59		23 55
22	00 00 - 08 07		17 00 - 23 59		15 10
23	00 00 - 08 59		17 00 - 23 59		16 00
24	00 00 - 07 54		17 00 - 23 59		15 00
25	00 00 - 08 59		17 29 - 23 59		15 30
26	00 00 - 08 59		17 05 - 23 59		16 00
27	00 00 - 09 00		17 01 - 23 59		16 00
28	00 00 - 08 51		17 00 - 23 59		15 50
29	00 00 - 09 00		17 20 - 23 59		15 40
30	00 00 - 08 00		17 01 - 23 59		15 00
31	00 00 - 09 00		17 00 - 23 59		16 00
Feb. 1	00 00 - 08 59		17 00 - 23 59		16 00
2	00 00 - 08 59		17 00 - 23 59		16 00
3	00 00 - 08 59		17 00 - 23 59		16 00
4	00 00 - 08 59		17 00 - 23 59		16 00
5	00 00 - 08 36		17 00 - 23 59		15 35
6	00 00 - 08 59		17 00 - 23 59		16 00
7	00 00 - 08 59		17 00 - 23 59		16 00
8	00 00 - 08 59		17 00 - 23 59		16 00
9	00 00 - 08 59		17 00 - 23 59		16 00
10	00 00 - 08 59		17 00 - 23 59		16 00
11	00 00 - 08 53		17 18 - 23 59		15 30
12	00 00 - 08 59		17 23 - 23 59		15 35
13	00 00 - 08 59		17 00 - 23 59		16 00
14	00 00 - 08 59		17 05 - 23 59		15 55
15	00 00 - 08 59		17 17 - 23 59		15 45
16	00 00 - 08 59		17 04 - 23 59		15 55
17	00 00 - 08 59		17 00 - 23 59		16 00
18	00 00 - 08 59		17 00 - 23 59		16 00
19	00 00 - 08 59		17 35 - 23 59		15 25
20	00 00 - 08 59		17 03 - 23 59		15 55

Table 2. Appearance of radio aurora at Syowa Station  
(Time interval in 45° East Meridian Time).

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
1970 Apr. 25	23 27 - 23 29	250 - 370	10 - 25	May 9	02 04 - 02 12	250 - 320	10 - 15
26	01 28 - 01 33	280 - 320	10 - 25	12	04 14 - 05 15	250 - 320	10 - 15
	01 38 - 01 45	250 - 350	25 - 30		05 25 - 05 39	250 - 320	10
	02 01 - 02 21	300 - 400	30		05 53 - 06 28	250 - 320	10 - 15
	02 29 - 02 37	300 - 350	15 - 20		07 00 - 07 05	250 - 320	10
	02 42 - 02 45	300 - 350	15 - 20		07 27 - 07 33	250 - 300	10
	02 51 - 02 55	280 - 320	15 - 20		18 51 - 19 53	280 - 320	10 - 20
	03 39 - 04 16	280 - 320	10		20 07 - 20 48	280 - 320	10 - 15
	05 48 - 06 07	280 - 320	15 - 20	13	00 05 - 00 16	250 - 400	15 - 20
	06 27 - 06 42	250 - 350	15 - 20		00 27 - 00 33	250 - 300	10
	23 02 - 23 10	250 - 320	15 - 20		02 19 - 02 25	250 - 320	10
27	00 09 - 00 20	250 - 400	25 - 30		04 42 - 04 57	250 - 320	10 - 15
	00 32 - 00 40	250 - 320	10		05 18 - 07 53	250 - 320	20 - 30
	00 47 - 00 53	250 - 350	15 - 20	14	02 51 - 02 59	280 - 350	15 - 20
	00 57 - 01 00	300 - 350	15 - 20		04 31 - 04 41	280 - 320	10 - 15
	01 04 - 01 14	250 - 380	15 - 20		06 18 - 06 28	280 - 320	10
	02 48 - 03 17	250 - 380	15 - 20		06 35 - 06 38	280 - 320	10
	03 30 - 04 13	280 - 350	15 - 20		07 07 - 07 14	280 - 320	10
	04 32 - 05 21	280 - 350	10 - 15		07 29 - 08 14	250 - 350	15 - 20
	07 51 - 08 28	280 - 350	15 - 20		21 02 - 23 00	280 - 320	10 - 20
	09 34 - 09 40	280 - 320	10 - 15		23 40 - 23 56	280 - 320	10
30	04 47 - 04 55	250 - 350	10		00 20 - 00 25	280 - 320	15
	05 03 - 05 32	280 - 330	10		01 52 - 02 10	280 - 350	15 - 20
	05 45 - 06 04	280 - 330	10		02 14 - 02 37	280 - 320	10 - 15
	06 31 - 06 46	280 - 330	10		02 52 - 03 00	250 - 320	10 - 15
	07 14 - 07 24	300 - 330	10		03 26 - 05 10	250 - 320	10 - 20
May 1	02 12 - 02 16	280 - 320	10	16	01 30 - 01 35	280 - 350	10
	02 29 - 02 34	280 - 320	10		02 59 - 03 10	280 - 320	5 - 10
	09 09 - 09 10	280 - 320	10	17	00 25 - 00 43	280 - 350	10 - 20
4	01 23 - 01 30	250 - 320	15 - 20		02 02 - 02 14	250 - 350	15 - 20
	01 36 - 02 18	250 - 350	20 - 25		02 27 - 04 10	250 - 380	20 - 25
	04 42 - 04 52	280 - 320	10 - 15		04 48 - 05 10	250 - 350	10
	19 53 - 20 15	280 - 320	10 - 15		07 24 - 09 20	250 - 350	20 - 30
5	02 22 - 02 28	280 - 320	10	18	01 56 - 02 00	280 - 320	10
	02 43 - 02 48	250 - 320	10		02 06 - 02 12	250 - 320	10 - 15
	02 57 - 03 01	250 - 320	10		05 20 - 06 27	280 - 350	10 - 20
	03 30 - 03 59	250 - 320	10 - 15	19	04 53 - 05 38	250 - 320	10 - 20
	04 35 - 05 17	250 - 320	10		05 48 - 07 03	250 - 350	15 - 20
6	02 16 - 02 31	250 - 320	10 - 15		07 17 - 07 48	220 - 350	20 - 30
	02 40 - 02 50	250 - 350	25 - 30		22 27 - 22 34	280 - 350	10

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
May 19	22 58 - 23 28	280 - 350	10	May 27	06 20 - 06 31	280 - 320	10
20	23 49 - 01 16	280 - 320	10 - 30		19 35 - 21 27	250 - 400	10 - 30
	03 08 - 03 15	280 - 320	10		21 30 - 22 05	280 - 350	10
	04 33 - 04 40	280 - 320	10	27 - 28	23 23 - 00 07	250 - 350	10 - 20
	05 12 - 05 18	300 - 320	10	28	00 49 - 00 58	280 - 350	10
	06 24 - 06 28	280 - 320	10		01 00 - 01 40	250 - 400	10 - 30
	06 51 - 09 05	250 - 380	10 - 30		01 44 - 02 57	250 - 400	10 - 30
	22 39 - 23 10	280 - 320	10		03 39 - 05 34	250 - 400	10 - 30
21	00 20 - 00 35	250 - 320	10 - 15		05 40 - 05 51	280 - 320	10
	01 10 - 01 25	280 - 320	10 - 20		06 15 - 06 25	280 - 320	10
	01 37 - 01 45	280 - 320	10		13 42 - 13 49	280 - 300	10
	01 52 - 02 00	250 - 320	10		13 51 - 14 10	280 - 320	10
	02 07 - 02 12	250 - 350	15 - 20		15 54 - 15 56	280 - 350	10
	02 19 - 02 50	250 - 380	10 - 15		16 43 - 17 04	250 - 350	10 - 15
	03 20 - 03 25	250 - 320	10		17 10 - 17 28	250 - 350	10 - 15
	05 07 - 06 23	250 - 350	10 - 20		17 57 - 20 50	250 - 350	10 - 15
	22 52 - 23 10	250 - 350	15 - 20		21 01 - 21 43	280 - 350	5 - 10
	23 17 - 23 20	280 - 320	10	29	02 16 - 02 26	250 - 350	10 - 25
22	02 28 - 02 29	280 - 380	20 - 25		02 37 - 02 46	250 - 350	20 - 30
	02 31 - 02 51	250 - 350	20 - 30		03 09 - 04 00	250 - 350	10 - 30
	03 01 - 03 10	250 - 320	10 - 15		04 40 - 04 46	280 - 320	10
	04 02 - 07 04	250 - 350	20 - 30		07 17 - 07 30	280 - 320	10
	08 06 - 08 08	280 - 350	10		07 51 - 08 04	280 - 320	10
	20 27 - 21 10	250 - 350	10 - 15		08 37 - 08 40	280 - 320	10
	22 05 - 22 27	280 - 320	10 - 15		09 14 - 09 23	250 - 320	10
23	02 27 - 02 45	280 - 350	10 - 15		09 40 - 09 52	250 - 320	5 - 10
	03 38 - 03 48	280 - 320	10		10 21 - 10 56	250 - 350	20 - 30
24	00 25 - 00 50	280 - 350	20 - 30	30	02 50 - 02 58	280 - 400	10 - 15
	01 09 - 01 15	250 - 380	10 - 15		03 20 - 03 50	250 - 350	20 - 30
	01 23 - 02 00	250 - 350	10 - 15		05 46 - 05 53	250 - 380	10 - 15
	02 14 - 02 26	250 - 320	10 - 15		07 01 - 07 07	280 - 380	5 - 10
	02 58 - 03 08	280 - 320	5 - 10		07 13 - 07 54	250 - 380	10 - 15
	03 35 - 04 54	250 - 350	10 - 20		19 44 - 21 16	280 - 350	5 - 10
25	02 24 - 03 10	250 - 380	15 - 20	31	03 00 - 03 07	280 - 350	5 - 10
	03 47 - 04 58	250 - 380	15 - 20		05 45 - 06 05	250 - 320	5 - 10
	05 11 - 05 36	250 - 320	10 - 15		06 21 - 06 30	280 - 350	10
	06 00 - 08 27	280 - 320	15 - 20	No observation periods due to failure of equipments			
26	01 15 - 01 17	250 - 320	10	May 3:	01 <sup>h</sup> 15 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>		
	01 39 - 01 44	280 - 320	10		17 <sup>h</sup> 00 <sup>m</sup> - 23 <sup>h</sup> 10 <sup>m</sup>		
27	02 46 - 02 57	300 - 350	10 - 20	8:	01 <sup>h</sup> 20 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>		
	04 10 - 04 37	280 - 320	10	9:	17 <sup>h</sup> 00 <sup>m</sup> - 01 <sup>h</sup> 35 <sup>m</sup>		
	04 48 - 05 26	300 - 320	10				

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
June 1	04 55 - 05 28	250 - 350	10 - 15	June 10	02 44 - 02 52	280 - 350	10
	05 37 - 07 06	280 - 380	20 - 30		02 58 - 04 17	250 - 350	10
	07 14 - 07 17	280 - 320	10		04 20 - 06 00	250 - 400	10 - 30
	07 35 - 08 05	250 - 380	15 - 20		20 00 - 20 15	280 - 320	5 - 10
	10 55 - 11 04	280 - 350	5 - 10		20 18 - 20 48	300 - 320	5
	15 16 - 15 26	250 - 350	5 - 10		21 17 - 21 23	280 - 320	5
	17 17 - 17 30	280 - 320	5 - 10		22 10 - 23 17	250 - 350	5 - 10
	18 00 - 22 25	280 - 350	5 - 10		23 25 - 23 30	250 - 300	5 - 10
	2 00 09 - 00 27	280 - 350	5 - 10	11	02 38 - 02 42	300 - 320	5
	03 40 - 04 00	250 - 380	10 - 15		03 14 - 03 16	250 - 400	10
3	00 40 - 00 50	250 - 320	5 - 10		03 34 - 03 40	280 - 400	10
	02 26 - 02 28	280 - 320	10		04 14 - 04 16	300 - 320	5
4	02 38 - 02 40	280 - 320	10		04 34 - 04 40	250 - 320	10 - 15
	05 00 - 05 13	250 - 350	10 - 15		04 52 - 05 01	250 - 320	10
	05 48 - 05 52	280 - 320	5 - 10		05 07 - 05 45	250 - 400	10 - 15
	06 35 - 07 00	280 - 350	10 - 15	12	03 17 - 03 51	280 - 350	10 - 15
	07 12 - 07 49	280 - 350	10 - 20		03 59 - 04 13	250 - 350	10 - 20
	08 30 - 08 51	250 - 320	10		04 44 - 05 28	250 - 400	10 - 25
	21 18 - 22 37	250 - 350	5 - 10		05 34 - 05 43	280 - 320	5 - 10
	23 05 - 23 32	250 - 350	5 - 10		22 23 - 22 27	280 - 350	10
	00 07 - 00 16	250 - 350	5		22 38 - 22 46	250 - 350	10 - 20
	02 01 - 02 10	250 - 320	10	13	03 21 - 03 33	280 - 350	10
	02 13 - 02 34	250 - 350	10 - 20		16 26 - 17 06	280 - 320	5
	03 19 - 03 27	250 - 320	20	14	00 00 - 00 05	300 - 320	5
	03 38 - 03 47	250 - 320	5 - 10		00 24 - 00 29	300 - 380	5 - 10
	04 47 - 04 55	280 - 400	5 - 10		00 55 - 01 04	250 - 320	5 - 15
5	02 26 - 02 30	250 - 320	5 - 10		01 21 - 01 30	250 - 350	10 - 20
	05 22 - 05 42	250 - 350	5 - 10		02 19 - 02 28	250 - 300	10
7	22 00 - 23 18	300 - 320	5 - 10		02 41 - 02 53	280 - 320	10
8	01 05 - 01 37	250 - 320	20 - 30		03 17 - 03 52	250 - 350	5 - 20
	01 58 - 03 18	250 - 400	5 - 30		04 15 - 05 54	250 - 400	5 - 30
	04 08 - 04 11	280 - 320	5 - 10	15	02 55 - 03 13	250 - 320	10
	04 17 - 06 47	250 - 400	10 - 30		03 17 - 07 05	220 - 400	5 - 30
	07 33 - 07 39	280 - 350	5 - 15		07 22 - 09 00	250 - 400	5 - 30
	07 56 - 09 37	250 - 400	5 - 30		09 11 - 10 00	250 - 350	5 - 20
	03 04 - 03 14	280 - 320	5 - 10		19 38 - 19 51	280 - 320	5 - 10
	03 40 - 03 42	280 - 320	10	16	02 44 - 03 06	250 - 350	10
	05 24 - 05 53	250 - 370	10 - 20		03 18 - 04 19	250 - 400	10 - 20
	22 10 - 22 14	280 - 320	5 - 10		04 24 - 06 10	250 - 400	10 - 30
	22 35 - 22 39	280 - 320	5 - 10		06 16 - 07 00	250 - 400	10 - 30
10	01 45 - 01 48	280 - 350	5 - 10		07 07 - 08 08	250 - 400	10 - 30
	02 24 - 02 35	280 - 350	10		08 22 - 09 00	250 - 400	10 - 30

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
June 17	20 34 - 20 51	280 - 320	5 - 10	June 20	17 10 - 19 20	280 - 320	10
	20 58 - 21 57	280 - 320	5 - 10		19 24 - 19 47	280 - 350	15
18	23 22 - 23 35	250 - 350	5 - 20		19 59 - 20 06	250 - 320	20 - 30
	00 30 - 00 42	250 - 300	5 - 10		21 53 - 22 09	280 - 350	10
	00 50 - 01 04	250 - 350	10	21	23 30 - 23 53	280 - 320	5 - 15
	01 09 - 01 17	250 - 300	5 - 10		00 03 - 00 15	280 - 320	10
	01 25 - 02 20	250 - 350	10 - 20		00 23 - 00 37	250 - 320	10 - 30
	02 31 - 05 58	250 - 400	10 - 30		00 46 - 00 53	280 - 320	5
	06 58 - 07 05	280 - 320	5		01 00 - 01 52	250 - 320	10 - 30
	07 18 - 07 25	280 - 320	10		02 06 - 02 56	250 - 350	10 - 15
	11 22 - 11 27	280 - 320	5		03 09 - 04 34	250 - 400	10 - 20
	11 30 - 11 53	250 - 400	10 - 30		04 45 - 08 21	250 - 400	10 - 30
	12 14 - 12 29	250 - 320	5 - 10		08 43 - 11 15	250 - 400	10 - 30
	13 44 - 13 47	250 - 300	5 - 10		12 22 - 12 24	280 - 320	5
	14 07 - 14 15	250 - 300	5 - 10		13 22 - 13 43	280 - 320	10
	14 28 - 14 32	250 - 300	5 - 10		14 40 - 14 45	280 - 310	5
	14 37 - 14 52	250 - 350	10		14 53 - 14 57	280 - 310	5
	15 05 - 18 53	220 - 400	10 - 20		20 20 - 21 13	280 - 320	5
	19 12 - 21 05	250 - 350	5 - 10	22	04 23 - 04 26	250 - 320	5
	21 15 - 21 27	280 - 320	5		04 33 - 05 54	280 - 320	10
	21 34 - 21 45	280 - 320	5	23	03 03 - 03 08	250 - 320	10
	21 57 - 22 16	280 - 320	5		03 18 - 03 32	250 - 320	10
	22 28 - 22 41	280 - 320	5		03 55 - 05 30	250 - 350	10 - 20
	01 18 - 01 20	280 - 400	15		05 48 - 06 03	250 - 320	10
19	01 26 - 01 28	280 - 320	10		22 20 - 22 35	280 - 320	5
	01 34 - 02 01	250 - 350	10	24 - 25	23 42 - 00 07	280 - 320	5
	03 47 - 05 32	250 - 350	5 - 20		03 03 - 03 05	280 - 310	10
	05 43 - 06 08	250 - 350	10 - 30	25	03 37 - 03 40	250 - 350	10
	06 13 - 07 03	250 - 400	10 - 30		04 05 - 04 17	250 - 350	10
	23 21 - 23 24	280 - 320	10	26	01 44 - 02 24	280 - 320	10
	23 40 - 23 44	280 - 300	5		06 33 - 06 42	250 - 320	10
	23 47 - 23 52	270 - 310	10		18 42 - 21 05	250 - 320	
20	00 08 - 00 10	250 - 320	15		22 18 - 22 33	280 - 320	
	02 10 - 02 13	250 - 320	5	26-27	23 20 - 01 17	250 - 350	
	02 17 - 02 19	280 - 310	10		05 04 - 08 20	250 - 400	
	02 55 - 03 00	250 - 310	10 - 15	27	12 12 - 12 14	320 - 350	-- See Section 5
	03 02 - 03 20	250 - 320	10		12 21 - 12 43	250 - 400	in the text --
	03 31 - 09 02	220 - 400	10 - 30		12 57 - 13 01	250 - 380	
	09 14 - 09 41	250 - 320	5 - 20		04 37 - 04 40	300 - 400	
	10 00 - 11 18	250 - 400	10 - 30	28	04 58 - 05 00	320 - 400	
	11 25 - 11 31	250 - 310	10		05 07 - 05 22	250 - 400	
	11 48 - 11 52	250 - 310	10	29	19 28 - 21 10	250 - 400	10 - 20

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
June 29	21 17 - 23 10	250 - 400	10 - 20	July 6	04 58 - 05 03	300 - 400	10
	23 22 - 23 30	320 - 370	10		05 16 - 05 25	280 - 380	10
29 - 30	23 52 - 00 23	280 - 370	10 - 20		05 31 - 05 40	300 - 400	10 - 15
30	02 00 - 02 12	280 - 380	5 - 10		06 38 - 08 00	280 - 400	15 - 20
No observation periods due to failure of equipments				8	00 10 - 00 34	250 - 320	10 - 20
	June 14: 08 <sup>h</sup> 20 <sup>m</sup> - 12 <sup>h</sup> 40 <sup>m</sup>				00 50 - 01 31	320 - 380	10 - 15
	16: 23 <sup>h</sup> 40 <sup>m</sup>				02 11 - 02 22	250 - 380	10
	17: - 10 <sup>h</sup> 20 <sup>m</sup>				04 47 - 05 05	280 - 550	10 - 20
	*26: 18 <sup>h</sup> 10 <sup>m</sup>				19 47 - 20 03	320 - 400	5
	29: - 16 <sup>h</sup> 15 <sup>m</sup>				20 07 - 20 10	320 - 400	10
* A camera trouble only attached to the A-scope.					20 25 - 20 32	350 - 380	5
					20 41 - 22 28	320 - 500	10 - 15
July 1	03 03 - 03 05	280 - 350		9	01 41 - 01 52	280 - 350	5 - 10
	04 37 - 04 41	320 - 500	-- See Section 5		02 07 - 02 11	320 - 380	5
	04 45 - 04 50	280 - 400	in the text --		02 24 - 03 40	250 - 550	10 - 30
	06 45 - 08 20	250 - 400			03 56 - 05 40	250 - 550	10 - 30
4	00 49 - 00 51	250 - 400	10 - 15		06 06 - 06 08	320 - 400	10
	01 18 - 01 21	280 - 380	5 - 10		06 22 - 07 28	320 - 550	15 - 20
	01 46 - 01 52	250 - 350	10		07 37 - 07 53	300 - 400	10 - 15
	01 56 - 02 52	220 - 600	30		08 02 - 08 55	250 - 700	10 - 30
	02 58 - 03 23	220 - 500	20 - 30		09 21 - 09 29	280 - 400	10 - 15
	03 27 - 03 57	220 - 700	15 - 30		17 51 - 18 05	280 - 400	10 - 15
	04 12 - 04 18	280 - 320	10		19 00 - 19 18	280 - 400	10 - 15
	04 44 - 04 48	250 - 350	10		20 00 - 20 07	300 - 400	10 - 20
	05 20 - 05 25	320 - 400	5 - 10		20 12 - 20 16	300 - 400	10
	05 29 - 05 34	320 - 380	10		21 31 - 21 56	280 - 400	10 - 20
	06 03 - 06 06	320 - 380	10		23 26 - 23 40	250 - 400	20 - 30
	06 31 - 06 35	320 - 380	10	9-10	23 48 - 00 25	250 - 550	10 - 15
	07 10 - 08 08	250 - 600	15 - 20	10	00 55 - 01 00	300 - 500	10 - 15
	08 34 - 08 37	250 - 400	10		01 10 - 01 14	320 - 400	10
	09 00 - 09 50	250 - 600	20 - 30		01 16 - 01 42	300 - 400	10 - 20
5	06 14 - 07 02	280 - 520	10 - 20		02 18 - 02 22	320 - 400	10
	07 23 - 07 32	320 - 370	10		02 57 - 03 32	250 - 700	10 - 30
	07 36 - 07 38	280 - 380	10		03 40 - 03 46	280 - 400	10 - 15
	19 06 - 19 11	300 - 400	10		05 56 - 05 58	280 - 400	10 - 15
	20 23 - 20 31	320 - 400	5 - 10		06 10 - 06 18	300 - 400	20
	20 41 - 20 55	320 - 400	5		06 27 - 06 34	280 - 400	20
6	02 41 - 02 45	250 - 300	10		20 13 - 20 18	300 - 380	5 - 10
	03 00 - 03 03	220 - 320	10		23 36 - 23 39	250 - 400	10 - 20
	03 17 - 03 36	220 - 380	10	11	02 50 - 02 58	320 - 400	10
	04 44 - 04 48	280 - 380	10		03 02 - 03 08	320 - 550	10 - 20
					03 13 - 03 18	280 - 550	10 - 30

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
July 11	03 22 - 03 48	280 - 400	10 - 20	July 16	04 06 - 04 08	300 - 400	10
	04 06 - 05 25	250 - 750	10 - 30		04 15 - 04 27	280 - 500	10 - 25
	19 59 - 20 02	350 - 400	10		04 33 - 05 17	250 - 650	10
12	01 40 - 01 53	250 - 400	10 - 20	18	05 23 - 05 30	280 - 400	5 - 10
	02 02 - 02 19	280 - 500	10 - 20		00 45 - 00 50	280 - 380	10
	02 25 - 02 40	280 - 380	5 - 10		05 13 - 06 12	280 - 500	10 - 15
	02 46 - 02 57	250 - 350	10 - 20	19	00 21 - 00 25	300 - 400	10
	03 06 - 03 20	250 - 400	10		03 12 - 03 15	300 - 400	10
	03 31 - 03 41	280 - 320	10	20	03 20 - 03 23	300 - 400	10
	05 34 - 06 10	250 - 520	10 - 30		04 45 - 05 08	300 - 400	10
	06 16 - 06 40	250 - 520	10 - 30		05 21 - 05 29	300 - 400	10
	06 47 - 06 58	280 - 380	10		05 42 - 05 48	300 - 400	10
	07 15 - 07 18	280 - 320	5		05 52 - 06 20	280 - 400	10 - 15
	07 21 - 07 25	320 - 380	5 - 10		23 05 - 23 14	300 - 400	10
	21 35 - 21 47	320 - 380	5 - 10		01 53 - 02 42	250 - 450	10 - 20
	01 43 - 01 56	280 - 380	5 - 10		02 48 - 04 12	250 - 550	10 - 25
	02 30 - 02 42	280 - 380	5 - 10		04 36 - 04 53	250 - 400	10 - 15
	02 57 - 03 21	250 - 650	10 - 20		04 59 - 05 25	280 - 450	10 - 15
13	03 25 - 03 50	280 - 380	5 - 10		05 39 - 06 58	280 - 550	10 - 15
	04 07 - 04 33	280 - 550	5 - 25		07 48 - 08 16	280 - 400	10 - 15
	04 42 - 05 08	280 - 500	5 - 25		17 13 - 17 48	250 - 400	10
	05 45 - 06 43	250 - 400	5 - 15		20 07 - 20 18	300 - 400	5
	20 02 - 20 10	320 - 520	10		20 31 - 21 06	300 - 400	5 - 10
	20 24 - 20 45	280 - 400	10		21 40 - 21 55	280 - 400	10
	21 16 - 21 38	280 - 420	5 - 20	22	00 01 - 00 17	300 - 400	5 - 10
	00 38 - 00 46	320 - 380	5		01 37 - 01 44	280 - 400	10
	01 20 - 01 25	280 - 320	5		02 16 - 02 20	320 - 400	5
	01 29 - 01 38	280 - 400	20		02 53 - 03 08	280 - 350	5 - 10
	02 35 - 03 03	280 - 420	10		03 21 - 03 59	250 - 400	10 - 15
	03 12 - 03 22	350 - 520	5 - 10		06 50 - 07 11	280 - 400	5 - 10
	03 58 - 04 10	280 - 400	10		19 25 - 19 43	280 - 500	5 - 10
	04 17 - 05 56	250 - 500	10 - 20		19 50 - 20 27	280 - 550	5 - 10
	06 03 - 06 12	280 - 380	5 - 10		02 09 - 03 00	250 - 600	10 - 15
	22 00 - 22 23	280 - 400	5 - 10		03 18 - 03 44	250 - 550	10 - 25
	01 43 - 01 46	280 - 520	10 - 20		03 54 - 04 16	250 - 550	10 - 25
15	01 53 - 02 03	250 - 380	10		04 45 - 04 48	350 - 420	10
	02 52 - 03 00	280 - 380	10		05 04 - 05 15	250 - 400	10
	05 20 - 05 24	320 - 380	5		05 31 - 05 36	320 - 380	5
	05 30 - 05 46	280 - 420	5 - 10		05 41 - 06 17	280 - 550	10 - 15
	05 52 - 06 08	280 - 400	5 - 15	24	20 53 - 21 42	320 - 400	5 - 10
16	03 07 - 03 11	250 - 500	10 - 15		03 50 - 07 50	250 - 700	10 - 30
	03 22 - 03 39	250 - 400	10		07 57 - 08 14	250 - 400	10 - 15

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
July 24	08 22 - 08 30	280 - 400	10 - 20	July 29	22 07 - 22 19	250 - 350	5
	08 35 - 10 10	280 - 500	10 - 20		22 32 - 22 38	280 - 350	5
	19 34 - 22 42	250 - 550	5 - 20	30	07 25 - 08 05	250 - 400	5 - 10
25	01 45 - 02 16	250 - 700	10 - 20		08 12 - 08 51	250 - 500	10 - 15
	02 31 - 02 34	300 - 400	10	31	08 57 - 09 00	300 - 350	5
	02 53 - 03 27	250 - 580	10 - 20		00 17 - 00 27	320 - 400	5
	04 00 - 04 22	250 - 700	10 - 15		02 24 - 02 31	320 - 400	5 - 10
	04 47 - 05 11	250 - 400	10 - 15		02 46 - 03 03	320 - 380	5
	05 20 - 05 25	320 - 550	5 - 10		04 48 - 04 51	350 - 400	5
	05 29 - 07 03	250 - 700	10 - 30		05 02 - 05 08	280 - 320	5
	07 11 - 07 35	250 - 600	5 - 10		05 17 - 05 25	300 - 400	10
	07 53 - 08 19	250 - 550	10 - 20		05 32 - 06 54	250 - 550	5 - 15
	00 30 - 00 35	750 - 850	5		07 13 - 07 29	450 - 550	5
	00 38 - 00 48	250 - 550	10 - 25		18 45 - 22 36	320 - 550	5 - 10
	01 31 - 01 37	280 - 400	10		23 17 - 23 23	250 - 400	5
26	02 41 - 02 56	250 - 550	10		23 30 - 23 37	250 - 380	5
	03 00 - 03 21	250 - 400	10 - 20	No observation periods due to failure of equipments			
	03 28 - 03 39	300 - 400	5	July *1: 01 <sup>h</sup> 55 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
	04 17 - 05 14	250 - 550	10 - 25	3: 00 <sup>h</sup> 45 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
	05 19 - 07 18	250 - 550	10 - 25	* A camera trouble only attached to the A-scope.			
	07 32 - 07 36	320 - 380	5	Aug. 1	00 46 - 00 51	320 - 400	5
	08 47 - 09 11	280 - 400	5 - 10		01 15 - 01 24	250 - 750	10 - 15
	09 35 - 10 22	280 - 550	5 - 15		00 02 - 00 09	350 - 400	5
27	00 57 - 01 04	250 - 700	10 - 15		00 31 - 00 38	350 - 400	5
	01 13 - 01 43	250 - 500	10 - 30		02 16 - 02 25	300 - 500	10
	18 10 - 18 43	250 - 400	10		02 44 - 02 56	280 - 550	10
	20 41 - 20 48	320 - 400	5		03 13 - 03 20	320 - 380	5
	20 54 - 20 59	350 - 400	5		03 33 - 03 36	320 - 380	5
	21 15 - 21 26	320 - 380	5		04 20 - 05 58	280 - 550	10 - 15
	21 32 - 21 45	320 - 400	5		06 25 - 06 29	320 - 380	5
	21 55 - 22 07	300 - 400	5 - 10		06 33 - 07 02	250 - 400	5
	22 45 - 22 49	280 - 380	5		07 12 - 07 20	300 - 400	10
	28 02 03 - 02 06	300 - 400	10	5	00 03 - 00 10	320 - 380	5
28	02 22 - 02 25	250 - 380	5		00 30 - 00 39	320 - 380	5
	01 26 - 01 56	320 - 400	5 - 10		01 30 - 01 32	350 - 380	5
29	06 16 - 06 20	320 - 380	5	6	02 53 - 03 02	280 - 500	10
	06 50 - 10 20	250 - 750	10 - 30		01 15 - 01 23	300 - 400	5
	18 05 - 18 08	280 - 500	5 - 10		01 33 - 01 42	300 - 350	5
	19 02 - 19 40	250 - 500	5 - 10		02 08 - 02 16	300 - 350	5
	20 32 - 20 45	320 - 380	5				
	20 55 - 21 15	250 - 400	10 - 15				
	21 27 - 21 37	320 - 350	5 - 10				



Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Aug. 6	23 43 - 23 57	300 - 500	5	Aug. 11	03 57 - 04 16	300 - 700	5 - 10
	01 04 - 01 20	280 - 400	5		05 31 - 07 22	280 - 750	10 - 20
7	01 28 - 05 33	250 - 800	10 - 30	12	01 32 - 01 44	300 - 400	5 - 10
	05 41 - 06 16	280 - 500	10 - 25		01 51 - 08 06	250 - 800	5 - 30
	10 00 - 10 06	320 - 400	5		22 20 - 23 08	280 - 550	5 - 10
	23 10 - 23 16	320 - 380	5	13	00 24 - 00 33	320 - 550	5
	23 34 - 23 57	300 - 500	5		00 45 - 00 58	280 - 520	5
8	00 18 - 00 34	280 - 700	10 - 20		01 30 - 01 40	300 - 650	5 - 10
	00 44 - 00 56	230 - 750	10 - 30		02 40 - 03 05	300 - 600	5 - 10
	01 00 - 03 05	250 - 800	10 - 30		03 34 - 03 50	280 - 550	10
	03 10 - 07 10	250 - 800	10 - 30		05 13 - 06 11	250 - 750	10 - 20
	07 24 - 07 30	300 - 350	5		21 48 - 22 27	280 - 650	5 - 15
	07 45 - 07 50	300 - 350	5		23 22 - 23 32	300 - 400	5
	09 18 - 09 21	300 - 500	5		00 31 - 00 40	280 - 900	10
	10 48 - 12 25	250 - 650	10 - 30	14	00 48 - 01 58	250 - 900	10 - 20
	12 37 - 14 54	250 - 700	5 - 15		02 05 - 02 10	320 - 380	5
	21 20 - 22 00	300 - 500	5 - 10		02 17 - 02 23	280 - 380	5
	22 22 - 22 48	300 - 550	5		02 25 - 02 37	250 - 550	10
	22 58 - 23 08	280 - 500	5		05 55 - 07 32	250 - 900	10 - 20
	23 13 - 23 35	400 - 750	5		07 50 - 08 03	280 - 400	10 - 15
9	00 31 - 01 24	300 - 750	10 - 15	15	00 18 - 01 00	320 - 550	5
	01 38 - 02 36	250 - 750	10 - 30		01 31 - 01 41	320 - 500	5
	03 00 - 05 22	250 - 800	10 - 30		02 30 - 02 47	300 - 750	5
	05 27 - 05 30	400 - 550	10		04 20 - 06 45	280 - 850	10 - 20
	06 00 - 08 27	280 - 800	10 - 30		06 53 - 06 57	480 - 550	5
	08 46 - 08 49	300 - 500	5	16	01 25 - 03 12	250 - 850	5 - 20
	18 36 - 18 53	300 - 700	5		04 16 - 06 21	280 - 850	5 - 20
	19 05 - 19 12	280 - 380	5		06 54 - 07 05	450 - 650	5
	19 36 - 19 58	300 - 500	10		07 11 - 07 23	420 - 500	5
	20 11 - 21 35	300 - 750	10 - 15		07 49 - 07 54	280 - 380	5
	21 50 - 22 20	300 - 400	5		08 01 - 08 19	280 - 400	5
10	02 49 - 02 53	320 - 380	5		20 40 - 21 36	300 - 650	5
	03 00 - 03 06	350 - 400	5		22 00 - 23 35	300 - 650	5
	03 31 - 03 50	300 - 400	5	17	01 08 - 01 41	250 - 900	5 - 20
	04 14 - 05 25	280 - 800	10 - 20		02 21 - 02 30	300 - 400	5
	05 39 - 06 32	250 - 550	10 - 20		02 39 - 08 12	250 - 900	10 - 30
	20 31 - 20 35	320 - 500	5		08 35 - 09 03	300 - 400	5 - 10
	21 04 - 21 08	350 - 400	5		09 17 - 10 51	250 - 900	10 - 30
11	01 14 - 01 18	450 - 550	5		11 16 - 13 03	250 - 900	5 - 20
	01 51 - 01 54	350 - 550	5		13 28 - 14 14	300 - 650	5 - 10
	02 38 - 02 44	250 - 380	5		15 37 - 17 02	300 - 750	5 - 25
	02 58 - 03 05	300 - 650	10		17 31 - 19 56	300 - 750	5 - 10

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Aug. 17	20 37 - 21 34	250 - 650	10 - 20	Aug. 24	04 40 - 04 52	280 - 500	5 - 15
	21 46 - 21 51	300 - 400	5		04 57 - 05 01	300 - 400	5
	22 37 - 22 53	300 - 400	5		05 11 - 06 40	250 - 900	5 - 20
	23 32 - 23 40	300 - 550	5	24-25	23 14 - 00 01	300 - 1000	10
	01 18 - 02 10	250 - 850	10 - 30	25	00 07 - 03 35	280 - 550	10 - 15
18	02 30 - 03 08	250 - 650	10 - 20		04 08 - 04 30	280 - 750	5 - 15
	03 37 - 03 40	300 - 400	5		09 42 - 09 46	320 - 380	5
	03 44 - 10 55	250 - 900	10 - 30		09 56 - 09 58	320 - 380	5
	11 02 - 11 26	280 - 550	5		17 08 - 17 36	300 - 500	5
	13 17 - 17 21	250 - 650	5 - 10		19 19 - 20 37	300 - 600	5
	17 58 - 19 08	300 - 650	5 - 10	25-26	22 30 - 02 28	250 - 850	5 - 20
	20 20 - 23 01	250 - 650	5 - 20	26	02 57 - 03 12	300 - 350	5
	00 32 - 01 28	250 - 750	5 - 15		03 18 - 03 44	300 - 500	5 - 10
	02 00 - 07 00	250 - 1050	10 - 30		04 02 - 04 09	300 - 350	5
	19 46 - 19 56	300 - 500	5		06 49 - 09 26	250 - 1000	10 - 30
19	20 30 - 20 50	300 - 550	10		09 47 - 09 51	280 - 320	5
	21 11 - 21 16	300 - 500	10		10 06 - 10 25	300 - 500	5
	02 58 - 03 07	300 - 400	5		10 57 - 11 26	250 - 480	5
	03 32 - 03 40	450 - 550	5		13 42 - 16 28	250 - 850	5 - 10
	00 27 - 00 34	300 - 400	5	26-27	17 47 - 00 13	300 - 850	5 - 15
20	01 50 - 03 32	280 - 550	10	27	00 22 - 00 26	300 - 500	10
	03 43 - 03 55	280 - 400	5		00 39 - 01 13	300 - 1050	10 - 20
	04 12 - 06 11	300 - 800	10 - 30		02 44 - 06 23	250 - 1050	10 - 20
	23 11 - 23 46	300 - 550	5		07 27 - 09 20	250 - 700	5 - 20
	23 52 - 23 57	280 - 550	5 - 10		09 29 - 09 40	250 - 550	5 - 15
21	00 10 - 00 19	300 - 550	10	27-28	17 30 - 01 49	250 - 1050	10 - 20
	00 44 - 00 52	300 - 500	10	28	05 16 - 05 21	300 - 400	5
	01 52 - 02 00	300 - 1050	5		05 35 - 05 40	300 - 400	5
	02 27 - 02 37	300 - 400	10		08 34 - 08 44	250 - 650	10
	18 17 - 22 11	300 - 1050	5 - 20		08 54 - 09 16	250 - 400	10 - 15
22	22 16 - 23 29	300 - 650	5 - 10		18 12 - 20 18	280 - 1050	5 - 10
	02 33 - 02 46	300 - 400	10 - 15		20 30 - 20 53	280 - 500	5
	02 51 - 02 57	280 - 400	10		21 15 - 21 48	280 - 550	5
	03 06 - 03 22	850 - 1050	10		22 30 - 22 43	250 - 400	5
	03 56 - 04 24	900 - 1050	5		23 11 - 23 15	300 - 550	10
23	05 16 - 07 33	250 - 1050	10 - 25		23 30 - 23 47	300 - 550	5 - 10
	00 13 - 00 38	300 - 600	5	29	00 06 - 01 20	250 - 1050	5 - 10
	00 53 - 01 12	300 - 400	5		01 27 - 03 08	250 - 1050	5 - 25
	01 30 - 01 41	300 - 500	5		04 45 - 04 52	400 - 700	5
	01 48 - 01 55	300 - 400	10		05 17 - 08 37	250 - 1050	5 - 25
24	03 15 - 03 21	400 - 550	5		18 17 - 18 44	320 - 550	5
	03 34 - 03 40	300 - 450	5	29 - 30	23 21 - 00 11	300 - 550	5

Date	Time interval	Range (km)	Intensity (dB)
Aug. 30	00 23 - 00 32	300 - 400	5
	00 40 - 01 22	300 - 400	5
	03 40 - 03 52	850 - 1050	5
	03 56 - 04 21	250 - 1050	5 - 15
	04 47 - 04 57	300 - 400	5
	05 30 - 07 14	250 - 1050	10 - 20
	07 43 - 07 53	250 - 320	10
	18 22 - 20 16	300 - 1050	5 - 15
	20 40 - 20 43	300 - 400	5
	22 34 - 22 42	350 - 650	5
31	23 14 - 00 25	300 - 550	5 - 10

No observation periods due to failure of equipments

August 5: 02<sup>h</sup>58<sup>m</sup> - 17<sup>h</sup>50<sup>m</sup>

6: 03<sup>h</sup>00<sup>m</sup> - 17<sup>h</sup>50<sup>m</sup>

Sep.	1	00 30 - 00 48	300 - 500	5 - 10	
		18 18 - 20 45	300 - 1050	5 - 10	
		23 08 - 00 45	300 - 1050	10 - 15	
	2	01 03 - 01 13	250 - 1050	10	
		01 28 - 01 53	250 - 1050	10	
		02 07 - 04 56	250 - 1050	10 - 30	
		05 04 - 05 53	250 - 1050	10 - 15	
		06 12 - 06 15	300 - 550	10	
		06 45 - 06 50	300 - 550	10 - 15	
		07 52 - 08 01	300 - 500	10	
19 00 - 19 06		300 - 400	5 - 10		
2-3	19 40 - 20 42	300 - 750	5 - 15		
	3	20 47 - 00 15	300 - 1050	5 - 15	
		00 54 - 01 12	300 - 1050	5	
		02 11 - 02 24	300 - 500	5	
		18 23 - 19 02	300 - 1050	5	
	3-4	22 31 - 22 39	300 - 400	5	
		23 57 - 00 05	300 - 1000	5	
		4	01 04 - 01 26	250 - 1050	5
			01 34 - 02 24	250 - 1050	10 - 15
	02 56 - 03 04		300 - 550	5	
03 46 - 03 56	300 - 550		5		
04 10 - 04 33	250 - 750		10		
05 33 - 06 21	250 - 750		10 - 15		
08 47 - 08 55	300 - 400		5		

Sep. 4	20 04 - 20 15	300 - 550	5
	00 25 - 00 37	300 - 400	5
	00 52 - 01 05	300 - 400	5
	02 47 - 03 43	300 - 1050	5 - 15
	06 28 - 06 57	300 - 400	10
	23 21 - 23 28	300 - 550	5
	01 05 - 01 08	300 - 500	5
	04 50 - 05 01	300 - 400	5
	00 32 - 00 36	300 - 400	5
	02 08 - 02 13	400 - 550	5
6	04 39 - 04 47	300 - 500	5
	21 34 - 21 51	250 - 550	10
	22 21 - 22 35	300 - 400	5
	03 13 - 03 28	300 - 550	5
	02 28 - 02 58	300 - 700	5 - 10
7	03 03 - 04 37	300 - 550	5 - 15
	04 56 - 07 47	300 - 750	5 - 20
	07 52 - 08 46	250 - 550	5 - 10
	05 12 - 05 15	300 - 400	5
	04 03 - 04 50	300 - 400	5
8	07 50 - 09 28	250 - 550	10 - 25
	19 08 - 19 25	400 - 700	5
	20 06 - 20 12	300 - 400	5
	22 28 - 22 36	300 - 380	5
	23 23 - 23 27	250 - 350	10
13-14	23 51 - 00 03	250 - 350	10 - 15
	00 10 - 00 17	250 - 350	5
	00 20 - 00 26	250 - 350	5
	00 36 - 00 46	250 - 350	5 - 10
	02 04 - 02 11	250 - 750	10 - 15
14	02 18 - 03 25	250 - 550	10 - 25
	04 57 - 06 16	250 - 650	10 - 20
	16 54 - 17 27	300 - 550	5
	17 50 - 18 04	300 - 550	5
	18 44 - 19 26	300 - 550	5
14-15	22 04 - 22 18	300 - 400	5
	23 41 - 00 20	250 - 380	5
	00 30 - 00 53	280 - 350	5
	02 56 - 03 02	280 - 550	10
	03 23 - 03 27	400 - 500	5
15	03 42 - 03 49	300 - 550	5
	07 08 - 07 27	250 - 550	10 - 20

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Sep. 15	07 44 - 07 55	250 - 550	10	Sep. 24	04 46 - 04 58	300 - 550	5 - 10
	22 15 - 22 40	300 - 450	10		06 24 - 07 10	300 - 650	5 - 10
16	04 53 - 04 58	300 - 400	10		21 40 - 22 26	300 - 550	5 - 10
	22 35 - 23 28	300 - 550	5 - 10		22 45 - 22 50	300 - 400	5
17	01 30 - 01 35	300 - 400	5	25	00 46 - 00 58	300 - 550	5
	05 16 - 05 42	250 - 550	5 - 10		01 19 - 01 24	300 - 500	5
	05 47 - 06 30	300 - 550	5 - 10		02 09 - 02 28	300 - 400	5
	22 51 - 23 17	300 - 550	5		02 36 - 02 43	300 - 400	5
18	01 35 - 01 40	300 - 400	5		02 50 - 03 04	300 - 550	5
	05 12 - 05 59	300 - 650	10 - 15		03 15 - 03 30	300 - 550	5
	06 25 - 06 23	300 - 650	10		06 26 - 07 42	300 - 550	5 - 15
	21 16 - 21 25	350 - 550	5		07 47 - 07 55	550 - 650	5
	23 20 - 23 42	300 - 550	5		21 07 - 21 28	300 - 550	5
	23 53 - 01 14	300 - 400	5 - 10		22 12 - 22 50	300 - 550	5
18-19	05 18 - 05 27	300 - 550	5	26	05 30 - 06 14	300 - 550	10
	20 45 - 21 10	250 - 550	5 - 10		06 20 - 07 40	250 - 750	10 - 15
19	22 38 - 22 45	250 - 400	10		07 54 - 08 00	300 - 400	5
	00 36 - 01 38	250 - 850	5 - 20		23 15 - 23 20	600 - 750	5
20	08 25 - 08 58	250 - 550	10 - 20	27	01 49 - 01 57	650 - 1050	10
	19 18 - 19 29	300 - 400	5		02 05 - 02 11	300 - 1050	5
	19 33 - 20 14	300 - 550	5		02 30 - 10 39	250 - 1050	10 - 30
	23 36 - 23 39	300 - 400	5		17 21 - 18 50	300 - 750	5
21	00 28 - 00 57	300 - 550	5 - 10		19 17 - 22 20	250 - 1050	10 - 25
	01 27 - 01 36	300 - 400	5		23 05 - 23 23	300 - 550	10
	02 16 - 02 40	300 - 850	5 - 10	28	01 17 - 01 23	800 - 1050	10
	03 33 - 03 52	800 - 1050	5		01 43 - 03 04	300 - 1050	5 - 15
	04 16 - 04 24	300 - 400	5		03 28 - 03 53	300 - 700	5
	04 35 - 05 44	300 - 1050	5 - 20		06 16 - 06 32	300 - 400	10
	06 15 - 07 00	300 - 700	5 - 10		06 42 - 07 00	300 - 500	5 - 15
	07 26 - 08 10	300 - 550	5 - 15	29	01 46 - 02 45	300 - 700	5
	17 22 - 18 11	300 - 700	5 - 10		02 57 - 03 30	300 - 550	5 - 10
	19 21 - 19 53	300 - 550	5	30	01 00 - 01 06	400 - 750	10
	21 27 - 21 30	300 - 550	10		01 41 - 01 50	300 - 800	10
	21 51 - 22 47	300 - 550	5 - 10		02 18 - 02 40	400 - 1050	5 - 10
22	04 42 - 06 12	300 - 850	5 - 10		05 04 - 07 56	250 - 750	10 - 25
	06 34 - 06 42	300 - 400	10	No observation periods due to failure of equipments			
	07 08 - 08 11	300 - 550	5 - 15	September 1: 00 <sup>h</sup> 48 <sup>m</sup> - 16 <sup>h</sup> 05 <sup>m</sup>			
	20 11 - 21 03	300 - 550	5	20 <sup>h</sup> 45 <sup>m</sup> - 22 <sup>h</sup> 27 <sup>m</sup>			
23	02 57 - 03 07	300 - 400	5	3: 05 <sup>h</sup> 40 <sup>m</sup> - 09 <sup>h</sup> 30 <sup>m</sup>			
	03 35 - 03 41	300 - 750	5	4: 18 <sup>h</sup> 04 <sup>m</sup> - 20 <sup>h</sup> 35 <sup>m</sup>			
24	00 00 - 00 07	300 - 400	5	15: 04 <sup>h</sup> 57 <sup>m</sup> - 07 <sup>h</sup> 08 <sup>m</sup>			
	03 18 - 03 32	300 - 500	5 - 10	19: 06 <sup>h</sup> 20 <sup>m</sup> - 09 <sup>h</sup> 54 <sup>m</sup>			

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Oct. 1	00 20 - 00 50	300 - 1050	5 - 10	Oct. 8	01 50 - 02 00	300 - 1050	10
	00 58 - 01 08	600 - 1050	5 - 10	9	02 28 - 03 21	450 - 1050	10
	01 23 - 01 35	800 - 1050	5 - 10		03 34 - 03 48	850 - 1050	5
	02 00 - 02 23	300 - 750	5 - 15		22 23 - 22 33	600 - 850	5
	03 00 - 03 07	300 - 400	5	10	19 43 - 20 08	650 - 1050	5
	03 27 - 03 32	300 - 550	5		20 17 - 20 29	300 - 850	10
	03 36 - 05 27	250 - 1050	5 - 20	10-11	20 41 - 00 43	300 - 850	10 - 20
	21 26 - 21 34	300 - 550	5	11	01 40 - 01 48	400 - 1050	10
	21 47 - 23 30	250 - 1050	5 - 15		02 12 - 02 20	300 - 1050	10
					02 36 - 11 33	250 - 1050	10 - 30
2	01 30 - 01 40	250 - 400	5		14 18 - 20 33	300 - 1050	10 - 15
	02 46 - 05 30	300 - 1050	5 - 20		22 23 - 22 52	250 - 850	10
	21 40 - 22 20	300 - 400	5	12	01 40 - 01 44	300 - 350	5
	22 34 - 22 57	300 - 650	5		02 48 - 04 06	250 - 1050	10 - 20
3	00 13 - 00 16	300 - 400	5		04 09 - 06 30	250 - 1050	10 - 30
	02 00 - 02 51	300 - 650	10		06 55 - 09 16	250 - 1050	10 - 30
	03 15 - 07 28	250 - 1050	10 - 30		10 06 - 10 12	250 - 400	10 - 15
	18 47 - 19 00	300 - 1050	5		10 17 - 10 25	250 - 350	10 - 20
	19 30 - 20 00	300 - 550	5	13	01 45 - 01 50	300 - 550	5
	21 31 - 21 57	300 - 550	5		03 15 - 03 30	300 - 500	10
	22 43 - 22 51	550 - 1050	10		18 16 - 18 58	300 - 1050	5 - 10
4	22 58 - 23 20	300 - 850	10		20 41 - 21 40	300 - 1050	5 - 15
	00 11 - 00 26	300 - 550	10	13-14	22 53 - 00 00	300 - 550	10
	01 00 - 01 05	850 - 1050	10	14	00 02 - 00 06	300 - 650	5
	01 27 - 04 12	300 - 1050	5 - 25		00 28 - 00 53	300 - 550	5 - 10
	04 49 - 06 00	250 - 1050	10 - 25		01 08 - 01 12	300 - 400	5
	06 10 - 06 30	250 - 1100	10 - 15		01 19 - 01 24	300 - 400	10 - 15
	06 47 - 08 27	250 - 1050	10 - 30		01 34 - 01 38	300 - 400	5
	10 02 - 10 06	350 - 550	5 - 10		03 25 - 03 40	300 - 650	5
	12 16 - 12 39	250 - 1050	5 - 15		03 48 - 04 44	250 - 1050	10 - 15
	13 35 - 13 46	350 - 750	10		05 40 - 07 27	250 - 1050	10 - 20
	19 50 - 20 01	300 - 400	5	15	00 29 - 00 43	300 - 550	5
	20 14 - 20 44	300 - 750	5 - 10		01 00 - 01 38	250 - 550	10
5	01 07 - 01 10	300 - 400	10		01 53 - 01 58	300 - 400	10
	01 21 - 01 34	300 - 1050	10		23 34 - 23 38	300 - 400	5
	02 41 - 03 37	300 - 1050	10 - 15	16	01 06 - 01 22	300 - 400	5
	03 50 - 06 20	250 - 1050	10 - 20		14 28 - 16 34	300 - 1050	5 - 15
6	02 16 - 05 34	300 - 1050	5 - 15		17 16 - 18 30	300 - 1050	5 - 15
	22 03 - 22 15	300 - 750	10		19 57 - 20 08	250 - 550	10
	23 32 - 23 43	300 - 400	5		20 56 - 20 59	300 - 400	5
7	00 17 - 00 53	250 - 650	10		21 04 - 21 12	300 - 500	10
8	00 08 - 00 34	300 - 550	5		21 31 - 21 56	300 - 500	10
	00 43 - 00 52	300 - 550	5				

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Oct. 16	23 35 - 23 52	300 - 650	5	Oct. 23	23 02 - 23 10	300 - 550	5
17	01 51 - 02 22	250 - 1050	10 - 20	23-24	23 27 - 00 20	300 - 1050	5 - 10
	03 36 - 03 47	300 - 550	5 - 10	24	01 23 - 01 32	300 - 550	5 - 10
	04 00 - 04 42	300 - 750	5 - 15		01 54 - 02 21	300 - 1050	5 - 15
	04 54 - 04 59	300 - 400	10		03 08 - 03 30	250 - 550	10
	05 06 - 05 45	300 - 750	5 - 10		03 43 - 04 46	300 - 550	5
	13 51 - 16 10	300 - 1050	10 - 15		06 36 - 09 20	250 - 1050	5 - 15
	17 16 - 17 20	300 - 750	5		21 31 - 21 45	300 - 550	5
	18 01 - 18 04	300 - 500	10		22 08 - 22 52	300 - 850	5 - 10
	19 37 - 19 44	300 - 400	10	25	04 00 - 06 20	300 - 850	5 - 10
	19 50 - 20 07	300 - 500	5		19 21 - 20 09	300 - 1050	10
17-18	20 37 - 00 12	250 - 1050	5 - 15	26	04 24 - 04 33	400 - 500	5
18	00 56 - 01 39	300 - 1050	10 - 15		05 23 - 06 00	250 - 1050	5 - 20
	02 03 - 02 08	300 - 1050	10	27	02 11 - 02 15	400 - 500	5
	02 33 - 07 21	250 - 1050	5 - 30		02 34 - 02 48	400 - 800	5
	18 01 - 19 27	300 - 850	10 - 15		03 12 - 03 34	600 - 1050	5
	19 40 - 21 54	300 - 1050	5 - 15		05 30 - 07 25	300 - 850	10 - 20
	22 03 - 22 34	300 - 550	5 - 10	28	00 14 - 00 20	300 - 1050	5 - 10
19	01 02 - 01 22	300 - 400	5		00 49 - 00 53	300 - 400	5
	04 23 - 04 42	300 - 550	10		01 10 - 01 21	300 - 1050	10
	05 17 - 06 11	300 - 1050	5 - 10		01 38 - 01 54	300 - 400	5
	07 31 - 07 50	250 - 550	15		02 00 - 02 14	300 - 1050	5 - 10
	18 22 - 18 50	300 - 1050	5		04 07 - 04 18	400 - 1050	5
	19 08 - 20 00	300 - 1050	5		04 44 - 04 55	300 - 1050	5 - 15
22	02 34 - 02 38	550 - 700	5 - 10		06 45 - 08 40	250 - 1050	10 - 30
	03 17 - 03 19	380 - 450	5		08 52 - 08 55	300 - 550	10
	03 30 - 03 34	250 - 350	5		17 51 - 17 58	300 - 750	5
	03 38 - 03 43	750 - 1050	5 - 10		18 14 - 18 33	300 - 750	5
	04 02 - 04 21	300 - 850	5 - 10		20 00 - 21 40	300 - 1050	5 - 10
	04 27 - 04 52	300 - 950	5 - 10	28 - 29	22 33 - 00 14	250 - 750	5 - 10
	05 26 - 08 58	250 - 1050	10 - 25	29	00 50 - 00 57	300 - 750	5
	15 24 - 21 16	300 - 1050	5 - 15		01 34 - 01 52	750 - 1050	5
	21 44 - 22 01	300 - 850	10 - 15		04 07 - 04 22	450 - 750	5
	22 15 - 23 17	300 - 1050	10 - 15		19 46 - 21 00	300 - 750	5
22-23	23 33 - 00 18	300 - 1050	10		22 09 - 22 29	300 - 400	5 - 10
23	01 22 - 02 05	300 - 1050	10		22 35 - 22 49	250 - 400	5 - 10
	05 00 - 05 58	300 - 1050	10 - 15		22 55 - 23 20	250 - 500	5 - 10
	06 15 - 08 10	300 - 850	5 - 20	29-30	23 57 - 00 14	650 - 1050	5
	08 48 - 09 48	250 - 550	10 - 15	30	00 34 - 01 02	300 - 650	5 - 10
	16 02 - 17 54	300 - 1050	5 - 10		01 38 - 01 41	300 - 400	5
	18 52 - 19 16	300 - 500	5		01 56 - 02 03	300 - 400	5
	20 32 - 22 22	250 - 750	5 - 15		02 39 - 03 06	300 - 1050	5

Date	Time interval	Range (km)	Intensity (dB)
Oct. 30	03 36 - 04 40	300 - 1050	10 - 15
	05 27 - 07 41	300 - 1050	5 - 20

No observation periods due to failure of equipments

October 14: 21<sup>h</sup>50<sup>m</sup> - 23<sup>h</sup>40<sup>m</sup>

19: 20<sup>h</sup>15<sup>m</sup>  
21: - 17<sup>h</sup>10<sup>m</sup>

Nov. 1	02 04 - 02 11	750 - 1050	10
	01 53 - 01 57	400 - 650	5
3	02 03 - 02 17	300 - 500	5
	02 26 - 02 35	300 - 900	5 - 10
4	04 37 - 07 18	250 - 1050	10 - 25
	07 39 - 07 54	250 - 1050	10 - 20
5	19 24 - 22 35	300 - 1050	5 - 15
	23 34 - 23 54	300 - 500	5
6	00 04 - 00 12	250 - 400	5 - 10
	00 21 - 01 36	300 - 1050	5 - 15
7	01 51 - 02 25	300 - 750	5
	03 58 - 04 05	400 - 1050	5
8	04 57 - 07 38	300 - 1050	5 - 15
	00 32 - 00 42	300 - 900	5 - 10
9	02 48 - 03 30	300 - 1050	5 - 15
	05 28 - 06 23	750 - 1050	5
10	06 33 - 08 59	250 - 1050	10 - 25
	23 30 - 23 43	400 - 700	5
11	00 22 - 00 35	400 - 1050	5
	00 48 - 00 52	300 - 400	5
12	01 11 - 01 17	300 - 400	5
	02 33 - 02 50	300 - 1050	5 - 10
13	03 22 - 03 35	300 - 550	5
	03 50 - 04 00	300 - 500	5
14	05 15 - 05 20	400 - 550	10
	05 42 - 05 51	300 - 750	5 - 10
15	06 00 - 06 32	300 - 1050	5 - 20
	17 00 - 19 08	300 - 1050	5 - 15
16	03 57 - 07 06	250 - 1050	5 - 20
	07 17 - 10 05	250 - 1050	10 - 25
17	02 40 - 02 46	300 - 700	5 - 10
	02 57 - 03 04	400 - 1050	5 - 10
18	04 04 - 04 08	550 - 950	5
	04 28 - 04 35	850 - 1050	5

Date	Time interval	Range (km)	Intensity (dB)
Nov. 8	04 55 - 05 26	300 - 1050	5 - 15
	05 46 - 06 31	300 - 1050	10
9	20 41 - 20 50	400 - 550	5
	23 41 - 23 46	300 - 550	5
10	03 41 - 03 50	400 - 900	5 - 10
	04 00 - 04 05	600 - 900	5 - 10
11	04 32 - 04 40	700 - 1050	5 - 10
	05 19 - 05 38	300 - 900	5 - 10
12	07 31 - 08 44	280 - 700	5 - 15
	17 24 - 18 15	300 - 900	5 - 10
13	18 20 - 19 30	300 - 1050	5 - 10
	19 47 - 20 29	300 - 1050	5 - 10
14	21 30 - 21 41	300 - 600	5
	01 28 - 01 32	450 - 550	5
15	03 05 - 03 18	500 - 750	5 - 10
	03 28 - 03 34	300 - 950	5 - 10
16	03 43 - 04 09	400 - 1050	5 - 10
	04 43 - 07 28	300 - 1050	5 - 15
17	18 22 - 19 40	300 - 800	5 - 10
	23 34 - 23 40	700 - 1000	5
18	23 49 - 23 54	300 - 800	5 - 10
	05 40 - 06 27	300 - 1000	5 - 10
19	17 07 - 17 25	300 - 1050	5 - 10
	04 21 - 04 41	300 - 1050	5 - 10
20	05 26 - 06 43	400 - 1050	5 - 15
	07 02 - 07 04	300 - 400	5
21	17 01 - 17 49	300 - 700	5
	18 25 - 22 06	300 - 800	5 - 10
22	22 14 - 22 19	400 - 600	5
	22 30 - 22 50	300 - 700	5
23	01 58 - 02 04	300 - 500	5
	02 21 - 02 25	300 - 400	5
24	03 06 - 03 20	300 - 800	5 - 10
	04 34 - 04 38	300 - 800	5 - 10
25	19 15 - 21 08	300 - 700	5 - 10
	23 52 - 23 56	300 - 400	5
26	01 15 - 01 20	500 - 800	5
	01 25 - 01 28	600 - 700	5
27	01 41 - 01 44	800 - 900	5
	02 59 - 03 09	300 - 700	5 - 10
28	19 33 - 19 56	300 - 600	5
	23 19 - 23 23	300 - 600	5

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Nov. 17	02 45 - 02 52	500 - 800	5	Nov. 22	05 28 - 05 33	300 - 400	5
	03 22 - 03 36	300 - 700	5		05 38 - 05 44	600 - 800	5
	03 40 - 04 57	300 - 1050	5 - 15		05 50 - 06 03	300 - 1000	5
	06 27 - 06 51	300 - 800	5 - 15		06 20 - 06 35	300 - 700	5 - 10
18	03 41 - 03 50	800 - 1050	5		06 39 - 07 37	500 - 1050	5 - 10
	03 54 - 04 06	800 - 1000	5		07 41 - 07 45	800 - 1050	5
	04 12 - 04 24	400 - 1050	5		17 00 - 18 45	350 - 1000	5 - 20
	17 05 - 17 47	300 - 700	5 - 15		18 49 - 18 51	300 - 400	5
	18 29 - 19 03	300 - 800	5 - 10		18 54 - 19 44	400 - 700	5 - 10
	00 18 - 00 36	300 - 700	5 - 10		19 50 - 20 14	300 - 600	5 - 10
	01 06 - 01 22	300 - 500	5		20 52 - 20 54	600 - 700	5
	01 50 - 02 04	300 - 1050	5 - 10		22 59 - 23 37	250 - 800	5 - 15
19	02 07 - 02 41	300 - 1050	5 - 15	23	00 42 - 00 57	300 - 600	5 - 10
	02 53 - 02 56	500 - 600	5		01 02 - 01 08	300 - 400	10
	03 12 - 03 21	300 - 600	5 - 10		01 13 - 01 21	300 - 400	5
	03 25 - 03 31	800 - 1050	5		01 25 - 01 32	300 - 400	5 - 10
	03 43 - 03 48	400 - 1000	5 - 10		01 47 - 02 07	600 - 1050	5 - 10
	04 01 - 04 15	300 - 500	5		02 11 - 02 16	300 - 1050	5 - 10
	05 16 - 05 22	300 - 600	5		02 23 - 02 27	400 - 1000	5
	05 28 - 05 59	300 - 600	5 - 15		02 30 - 02 58	600 - 1050	5 - 10
	06 21 - 06 26	300 - 400	5		03 01 - 03 08	300 - 1050	5 - 10
	06 36 - 08 59	300 - 1050	5 - 20		04 02 - 04 43	300 - 1050	5 - 20
	02 44 - 02 53	300 - 400	5		04 55 - 05 06	300 - 1000	5 - 10
	04 50 - 05 06	300 - 700	5		05 09 - 05 34	300 - 1050	5 - 15
21	05 31 - 07 03	300 - 1050	5 - 20		05 40 - 05 44	600 - 800	5
	07 11 - 07 34	300 - 600	5 - 15		05 52 - 07 40	300 - 1050	5 - 20
	17 37 - 17 40	300 - 400	10		08 00 - 08 05	300 - 400	5
	17 52 - 19 58	300 - 800	10 - 25		08 11 - 08 16	300 - 400	5
	20 39 - 20 51	400 - 600	5		08 23 - 08 59	300 - 950	5 - 10
	20 59 - 21 08	400 - 800	5		17 01 - 17 27	300 - 1000	5 - 15
	21 14 - 21 18	300 - 600	5		23 53 - 23 57	450 - 550	5
	21 46 - 21 50	600 - 800	5	24	00 01 - 00 07	450 - 550	5
	21 56 - 22 01	400 - 600	5		00 41 - 00 46	300 - 400	5
	22 16 - 22 42	300 - 600	5 - 10		01 28 - 01 30	300 - 400	5
	22 50 - 23 14	300 - 800	5 - 10		01 34 - 01 37	300 - 400	5 - 10
22	00 00 - 01 29	300 - 600	10		03 32 - 03 38	450 - 700	5 - 10
	01 59 - 02 02	300 - 400	5		06 02 - 06 12	400 - 700	5 - 15
	02 05 - 02 22	300 - 500	5		18 33 - 20 13	300 - 700	5 - 10
	02 30 - 02 49	300 - 600	5 - 10		20 18 - 20 26	350 - 650	5 - 10
	03 10 - 03 29	300 - 400	10		20 38 - 20 46	300 - 450	5
	04 18 - 04 42	300 - 700	5 - 10		20 57 - 21 04	300 - 600	5 - 10
	05 02 - 05 24	300 - 1000	5 - 20		21 36 - 22 00	450 - 750	5



Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Nov. 24	22 20 - 22 22	450 - 550	5	Dec. 7	23 42 - 23 45	400 - 600	5
25	01 44 - 01 51	300 - 600	5 - 10	8	00 11 - 00 14	300 - 400	5
	02 21 - 02 23	300 - 400	5		00 19 - 00 23	300 - 400	5
	03 27 - 03 39	300 - 400	5		01 32 - 01 37	300 - 400	5
	04 11 - 04 16	300 - 400	5		02 02 - 02 29	250 - 1050	10 - 25
	04 45 - 04 58	300 - 800	5 - 15		02 44 - 03 06	350 - 1050	10 - 20
	05 04 - 06 17	300 - 1050	5 - 15		03 09 - 03 23	250 - 700	5 - 25
	17 16 - 18 34	300 - 950	5 - 10		03 36 - 04 03	300 - 550	5 - 15
	19 00 - 20 01	300 - 700	5 - 10		04 07 - 04 09	300 - 400	5
	20 19 - 20 36	300 - 800	5 - 10		04 18 - 04 20	500 - 600	15
26	00 08 - 00 13	300 - 550	5		04 44 - 08 46	250 - 1050	5 - 30
	00 24 - 00 36	300 - 800	5 - 15		17 00 - 17 35	250 - 1050	5 - 30
	03 40 - 03 54	600 - 1000	5 - 10		21 12 - 21 48	300 - 800	5 - 10
	03 57 - 04 16	300 - 1050	5 - 15		22 43 - 23 10	300 - 800	5 - 10
	04 20 - 04 59	400 - 1000	5 - 10	9	00 12 - 00 18	400 - 800	5 - 10
	05 19 - 05 21	400 - 600	5		00 31 - 00 47	300 - 700	5 - 15
	05 24 - 05 26	600 - 700	5		02 02 - 02 04	900 - 1000	10
	19 07 - 19 18	300 - 800	5		04 02 - 04 11	400 - 1000	5
	19 30 - 19 39	300 - 1000	5		04 19 - 04 31	600 - 1050	5 - 10
	19 48 - 19 50	400 - 500	5		04 38 - 05 36	600 - 1050	5 - 15
	20 25 - 20 28	300 - 500	5		05 47 - 05 58	350 - 1000	5 - 10
27	01 29 - 01 43	300 - 800	5 - 15		06 12 - 06 51	300 - 800	5 - 15
	01 49 - 03 29	400 - 1000	5 - 15		07 10 - 07 20	800 - 1000	10
28	01 14 - 01 18	350 - 700	5		07 43 - 08 16	300 - 650	5 - 10
	05 55 - 07 20	300 - 800	5 - 15	10	02 18 - 02 28	400 - 650	5 - 10
	07 40 - 07 45	300 - 400	5	12	05 01 - 05 16	300 - 800	5 - 10
	07 50 - 07 58	300 - 500	5 - 10	13	20 50 - 20 52	300 - 400	10
	17 46 - 18 15	350 - 1000	5 - 10	14	04 32 - 04 57	300 - 1050	5 - 20
No observation period due to failure of equipments					05 02 - 05 04	400 - 500	10
November 7: 17 <sup>h</sup> 00 <sup>m</sup> - 23 <sup>h</sup> 22 <sup>m</sup>					05 36 - 05 44	300 - 500	5 - 15
Dec. 2	22 20 - 22 23	300 - 400	10		05 54 - 06 09	300 - 850	5 - 10
	22 58 - 23 12	350 - 700	5 - 10		06 23 - 06 26	300 - 400	5
3	04 00 - 04 13	300 - 1000	5 - 15		06 36 - 07 09	300 - 1050	5 - 20
7	17 01 - 18 38	300 - 1050	5 - 15		07 22 - 07 43	300 - 600	5 - 20
	18 46 - 18 56	600 - 800	5		07 49 - 08 11	300 - 700	5 - 30
	20 20 - 20 28	600 - 950	5 - 10		08 46 - 10 20	250 - 800	5 - 30
	20 49 - 20 52	600 - 800	5		10 25 - 10 41	300 - 800	5 - 10
	20 56 - 21 07	600 - 1000	5		10 48 - 10 55	300 - 400	5
	21 33 - 23 31	400 - 1000	5 - 15		10 59 - 11 33	250 - 1050	5 - 15
					12 35 - 12 41	250 - 400	5 - 10
					17 05 - 17 09	850 - 1000	5
					17 22 - 17 30	300 - 950	5

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Dec. 14	17 40 - 17 45	300 - 400	5	Dec. 22	03 47 - 03 56	600 - 1000	5 - 10
	17 50 - 18 13	300 - 600	5		04 20 - 04 26	850 - 1000	5
	18 21 - 18 29	300 - 400	5		04 35 - 04 40	800 - 950	5
	18 36 - 18 42	300 - 400	5		05 03 - 08 51	300 - 1050	5 - 25
	20 40 - 21 06	300 - 600	5 - 15	23	01 09 - 01 18	300 - 600	5 - 15
	22 04 - 22 24	300 - 700	5 - 20		01 30 - 01 37	300 - 700	5 - 10
	22 58 - 23 19	300 - 500	5 - 20		01 43 - 01 53	300 - 850	5 - 10
	23 36 - 23 51	350 - 600	5 - 10		02 13 - 02 17	700 - 850	5
15	00 07 - 00 16	300 - 600	5 - 10		04 05 - 04 10	300 - 400	5
	00 21 - 00 29	300 - 700	5 - 10		06 04 - 06 17	300 - 950	5 - 10
	00 57 - 00 12	600 - 1050	5 - 10		08 01 - 08 37	300 - 550	5 - 15
	01 19 - 01 27	300 - 1050	5	24	03 30 - 03 32	300 - 400	10
	01 34 - 01 53	300 - 1000	5 - 20		03 38 - 03 46	300 - 800	5 - 10
	02 11 - 02 15	400 - 1000	5 - 10		04 05 - 04 17	400 - 600	5 - 10
	02 36 - 02 44	300 - 550	5 - 10		04 24 - 08 59	300 - 1050	5 - 30
	05 24 - 06 25	300 - 1050	5 - 25	26	07 29 - 08 37	300 - 800	5 - 15
16	08 46 - 08 58	250 - 400	5 - 15		08 56 - 08 58	300 - 400	5
	18 16 - 19 53	300 - 1000	5 - 10	27	19 23 - 19 41	400 - 800	5 - 10
	21 08 - 21 13	350 - 700	5		22 13 - 22 17	300 - 400	5
	04 38 - 04 41	950 - 1050	10	28	00 07 - 00 19	300 - 400	10
	04 47 - 05 45	600 - 1050	5 - 15		05 46 - 06 11	300 - 950	5 - 15
	05 57 - 06 42	500 - 1050	5 - 15		06 29 - 06 40	300 - 1000	5 - 10
	06 49 - 07 03	300 - 600	5		06 55 - 06 58	300 - 400	5
	07 46 - 08 09	300 - 800	5 - 15		17 48 - 19 11	300 - 600	5 - 10
17	08 25 - 08 42	300 - 650	5 - 10		22 47 - 23 06	200 - 400	5 - 10
	08 48 - 08 59	300 - 550	5 - 10		23 23 - 23 40	250 - 400	5 - 15
	01 46 - 01 53	400 - 800	5 - 10	29	00 04 - 00 07	250 - 300	5
	02 00 - 02 07	600 - 900	5		02 27 - 02 36	300 - 800	5 - 10
19	04 13 - 04 41	450 - 1000	5 - 15		06 17 - 06 26	400 - 600	5
	05 34 - 05 39	400 - 550	5 - 15		06 56 - 08 11	300 - 750	5 - 15
	06 12 - 06 17	300 - 400	10		08 21 - 08 51	300 - 500	5 - 10
	01 11 - 01 22	300 - 400	5		21 15 - 21 29	300 - 600	5 - 15
	01 39 - 01 51	300 - 500	5	30	01 47 - 01 59	300 - 650	5 - 10
	04 05 - 05 02	250 - 700	5 - 20		02 11 - 02 26	300 - 1050	5 - 25
	05 09 - 05 24	300 - 600	5 - 15		02 33 - 03 19	300 - 1050	5 - 20
	03 40 - 03 44	500 - 700	5		04 10 - 04 13	300 - 600	10
20	03 55 - 04 20	300 - 700	5 - 10		04 24 - 04 47	300 - 400	5 - 10
	04 26 - 04 43	300 - 1000	10		06 39 - 06 51	300 - 800	5
	05 01 - 05 16	300 - 1000	5 - 10		07 02 - 08 05	300 - 600	5 - 25
	05 33 - 05 37	800 - 1000	5	No observation periods due to failure of equipment			
21	02 14 - 02 18	400 - 1000	5	December 1: 17 <sup>h</sup> 00 <sup>m</sup> - 22 <sup>h</sup> 50 <sup>m</sup>			
	02 24 - 02 37	300 - 1050	5 - 10				

Date	Time interval	Range (km)	Intensity (dB)
December 4: 23 <sup>h</sup> 35 <sup>m</sup> - 17 <sup>h</sup> 00 <sup>m</sup>			
7: 04 <sup>h</sup> 00 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
11: 17 <sup>h</sup> 00 <sup>m</sup> - 21 <sup>h</sup> 35 <sup>m</sup>			
13: 02 <sup>h</sup> 30 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
17 <sup>h</sup> 00 <sup>m</sup> - 19 <sup>h</sup> 00 <sup>m</sup>			
21 <sup>h</sup> 45 <sup>m</sup> - 22 <sup>h</sup> 10 <sup>m</sup>			
1971 Jan. 1	04 37 - 05 12	300 - 750	10
2	04 31 - 04 36	450 - 700	10
	06 16 - 06 49	300 - 550	10
	07 00 - 08 23	300 - 1050	10 - 20
	17 22 - 17 43	300 - 650	10
	18 38 - 18 53	300 - 550	5 - 10
	21 26 - 21 35	300 - 650	5 - 10
3	06 38 - 07 50	300 - 700	10 - 25
	17 23 - 18 02	300 - 700	5 - 10
	19 16 - 19 40	300 - 650	5
	19 58 - 20 05	300 - 400	5
	20 33 - 20 56	300 - 550	5 - 10
	21 43 - 21 55	300 - 700	5
4	01 12 - 01 27	300 - 750	5 - 10
	17 04 - 17 45	300 - 750	5 - 10
5	04 55 - 05 07	300 - 550	5 - 10
	05 46 - 06 02	300 - 550	5 - 10
6	00 49 - 00 52	300 - 400	5
10	22 40 - 22 47	300 - 400	5
11	00 07 - 00 25	300 - 400	5
	01 05 - 01 08	300 - 400	5
	18 34 - 18 48	300 - 400	5
12	06 39 - 07 02	300 - 650	5 - 10
15	18 34 - 18 48	400 - 650	5
	19 07 - 19 12	450 - 550	5
18	17 00 - 17 13	450 - 750	5
20	03 16 - 03 55	400 - 1050	5 - 15
	07 45 - 08 13	300 - 950	5
	08 32 - 08 59	400 - 750	5
21	06 37 - 06 51	550 - 750	5
22	04 00 - 04 20	300 - 750	5
	05 50 - 06 23	300 - 1050	5 - 10
	06 34 - 07 45	300 - 1050	5 - 10
Date	Time interval	Range (km)	Intensity (dB)
Jan. 23	06 11 - 06 24	250 - 400	5 - 10
	06 41 - 06 47	300 - 400	5
	07 11 - 07 16	300 - 400	5
	07 24 - 07 54	250 - 400	5 - 10
25	03 14 - 03 19	250 - 320	5
	08 27 - 08 59	250 - 400	5 - 10
27	22 56 - 23 27	250 - 300	5 - 10
27 - 28	23 38 - 00 03	250 - 320	5 - 10
28	00 10 - 00 14	250 - 320	10
	00 46 - 01 21	250 - 320	5 - 10
	06 52 - 07 25	250 - 400	5 - 15
	07 42 - 08 51	250 - 400	10 - 15
	17 30 - 17 47	280 - 400	5
	19 06 - 19 21	250 - 400	5 - 10
	23 03 - 23 22	250 - 320	5
29	07 49 - 08 04	250 - 400	5 - 10
30	07 08 - 07 12	300 - 400	5
	07 51 - 07 59	250 - 400	10 - 15
31	00 02 - 00 21	250 - 320	5
	01 19 - 01 25	280 - 320	5
	08 33 - 08 41	250 - 400	5 - 10
No observation periods due to failure of equipments			
January 9: 23 <sup>h</sup> 30 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
10: 02 <sup>h</sup> 20 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
13: 20 <sup>h</sup> 05 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
14: 20 <sup>h</sup> 05 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
18: 20 <sup>h</sup> 05 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
19: 20 <sup>h</sup> 05 <sup>m</sup> - 09 <sup>h</sup> 00 <sup>m</sup>			
Feb. 1	07 43 - 07 53	280 - 400	5 - 10
	08 01 - 08 18	250 - 400	5 - 10
	08 30 - 08 46	250 - 400	5 - 10
4	04 48 - 05 26	280 - 400	5
	05 48 - 06 06	280 - 400	5
	06 16 - 06 36	250 - 400	5 - 10
6	03 36 - 03 42	250 - 320	5
	05 45 - 06 22	250 - 400	5 - 10
	06 41 - 07 04	250 - 400	5 - 10
7	05 00 - 05 13	280 - 400	5
	06 35 - 06 40	300 - 400	5
	06 56 - 07 04	300 - 400	5
	07 18 - 07 33	280 - 400	5 - 10

Date	Time interval	Range (km)	Intensity (dB)	Date	Time interval	Range (km)	Intensity (dB)
Feb. 7	07 52 - 08 04	280 - 400	5	Feb. 15	08 50 - 08 55	300 - 400	5
8	05 49 - 05 54	280 - 400	5		19 02 - 19 18	250 - 350	5
	06 01 - 06 36	280 - 400	5 - 10		19 47 - 19 52	300 - 400	5 - 10
	07 09 - 07 14	300 - 400	5		21 05 - 21 17	250 - 400	5 - 20
	07 34 - 07 47	300 - 400	5 - 10		21 21 - 21 25	200 - 300	5
9	02 49 - 02 56	250 - 400	10 - 15		22 00 - 22 14	250 - 400	5 - 20
10	03 30 - 03 34	250 - 400	5 - 10	16	01 12 - 01 44	250 - 400	5 - 15
	04 40 - 04 43	300 - 400	5		04 39 - 04 42	300 - 400	10
	04 46 - 04 51	250 - 350	5		04 46 - 05 04	250 - 400	5 - 25
	05 53 - 06 01	250 - 400	5 - 10		05 17 - 05 23	250 - 400	5 - 10
12	05 58 - 06 07	300 - 400	5 - 10		04 04 - 06 25	250 - 400	5 - 15
	06 10 - 06 12	300 - 400	5		07 34 - 07 40	300 - 400	5 - 10
	06 27 - 06 40	250 - 400	5 - 15		08 12 - 08 14	250 - 400	10
	06 46 - 06 49	300 - 400	5	17	02 57 - 03 00	250 - 300	10
14	22 29 - 22 32	250 - 350	5 - 10		04 52 - 05 01	250 - 350	5 - 10
15	00 48 - 00 57	250 - 350	5 - 10	18	06 43 - 06 46	300 - 400	5
	05 21 - 05 29	250 - 400	5	19	06 07 - 07 13	250 - 400	5 - 15
	05 41 - 05 56	250 - 400	5 - 10		08 08 - 08 24	250 - 350	5
	06 07 - 06 41	250 - 400	5 - 15	20	05 54 - 05 59	300 - 400	5
	06 57 - 07 47	250 - 400	5 - 15		23 20 - 23 37	250 - 400	10
	08 07 - 08 23	250 - 350	5 - 15		23 42 - 23 46	250 - 350	5

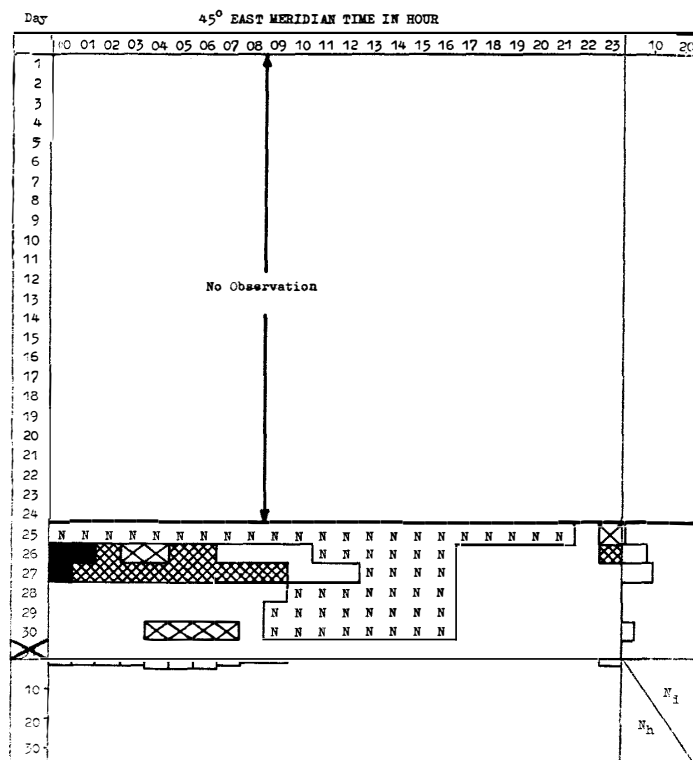


Fig. 4(a). April 1970

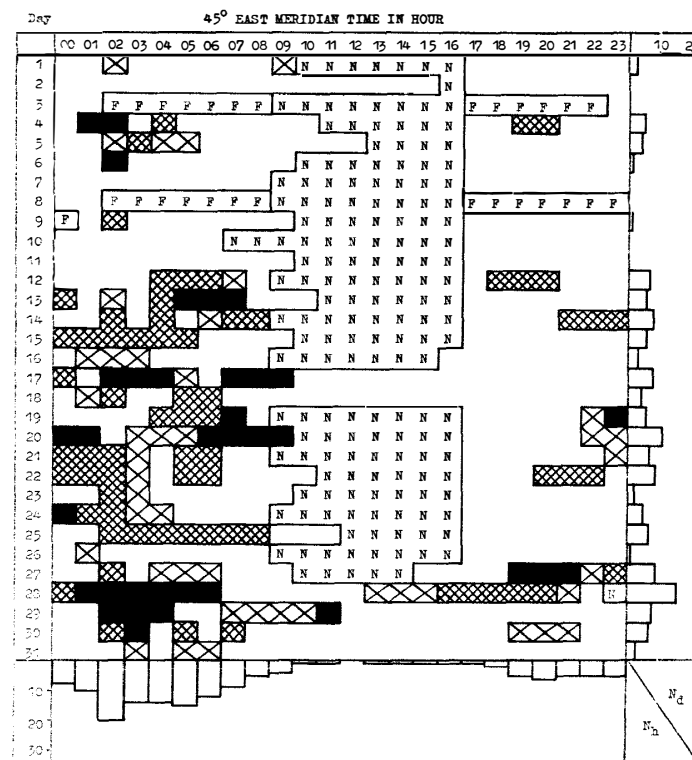





Fig. 4(b). May 1970

Note:  $N_d$  and  $N_h$  denote daily and hourly occurrence frequencies, together with the 'auroral echo intensity indices' 1, 2, and 3, in the relevant month, respectively.

Index 1  Index 2  Index 3 

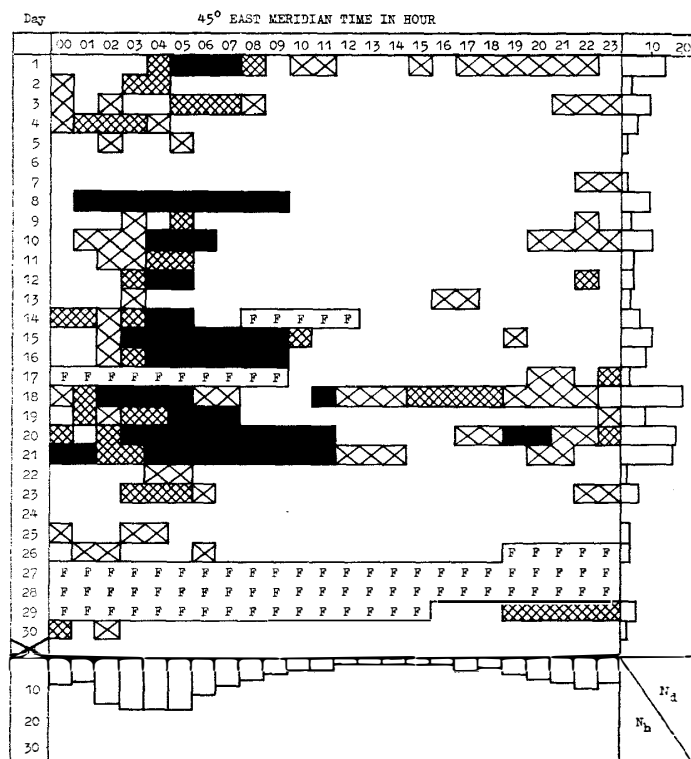


Fig. 4(c). June 1970

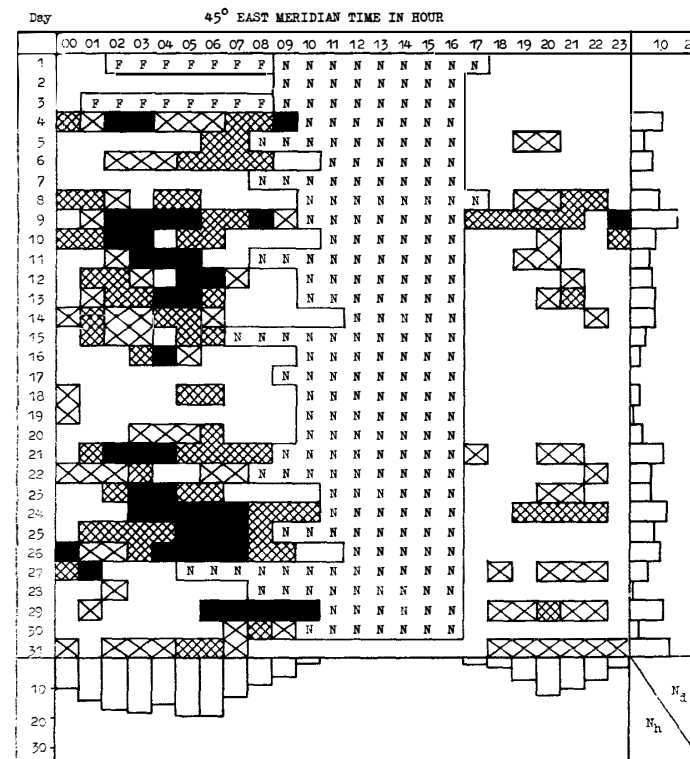





Fig. 4(d). July 1970

Note:  $N_d$  and  $N_h$  denote daily and hourly occurrence frequencies, together with the 'auroral echo intensity indices' 1, 2, and 3, in the relevant month, respectively.

Index 1  Index 2  Index 3 

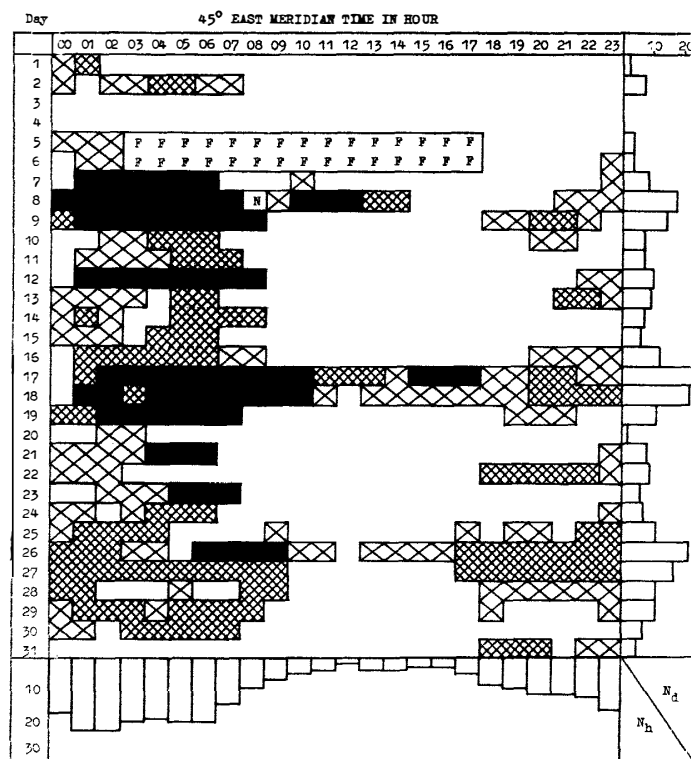


Fig. 4(e). August 1970

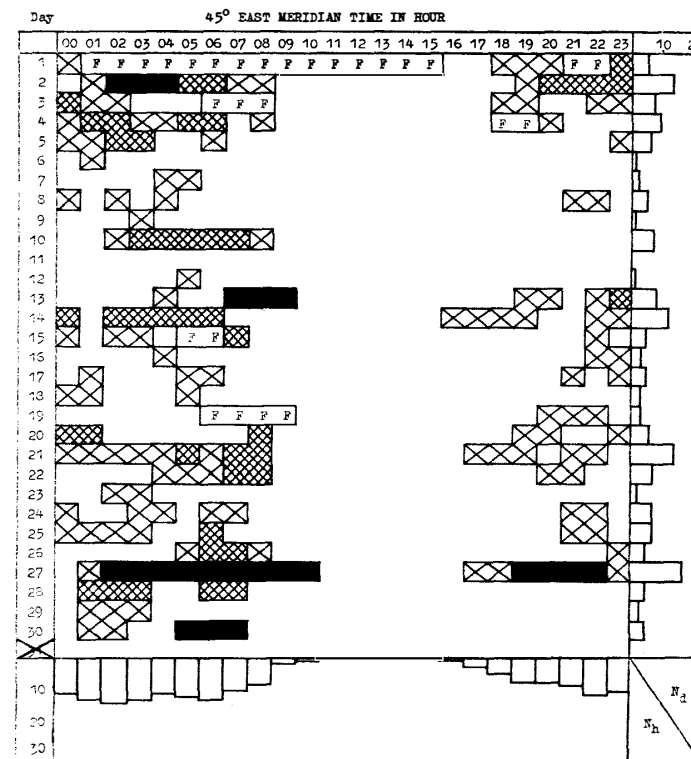





Fig. 4(f). September 1970

Note:  $N_d$  and  $N_h$  denote daily and hourly occurrence frequencies, together with the 'auroral echo intensity indices' 1, 2, and 3, in the relevant month, respectively.

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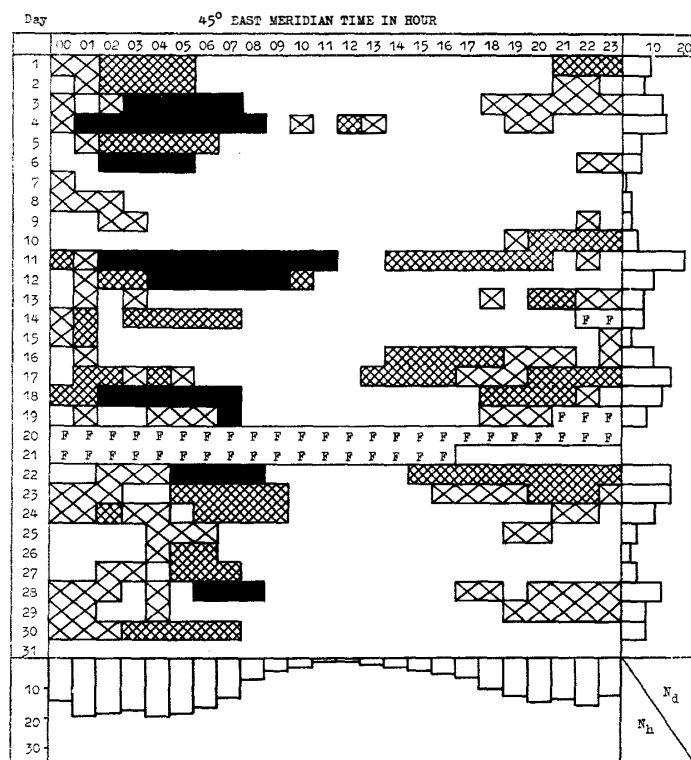


Fig. 4(g). October 1970

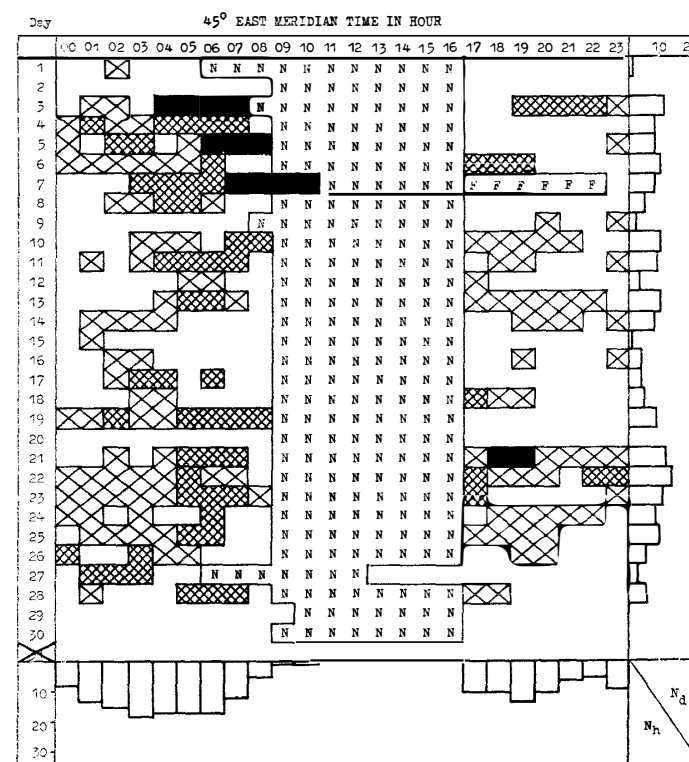





Fig. 4(h). November 1970

Note:  $N_d$  and  $N_h$  denote daily and hourly occurrence frequencies, together with the 'auroral echo intensity indices' 1, 2, and 3, in the relevant month, respectively.

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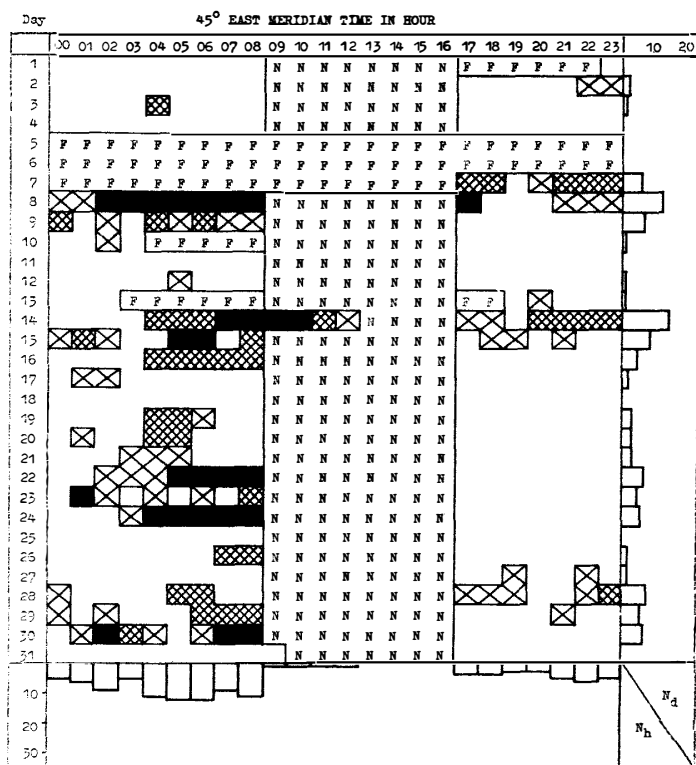


Fig. 4(i). December 1970

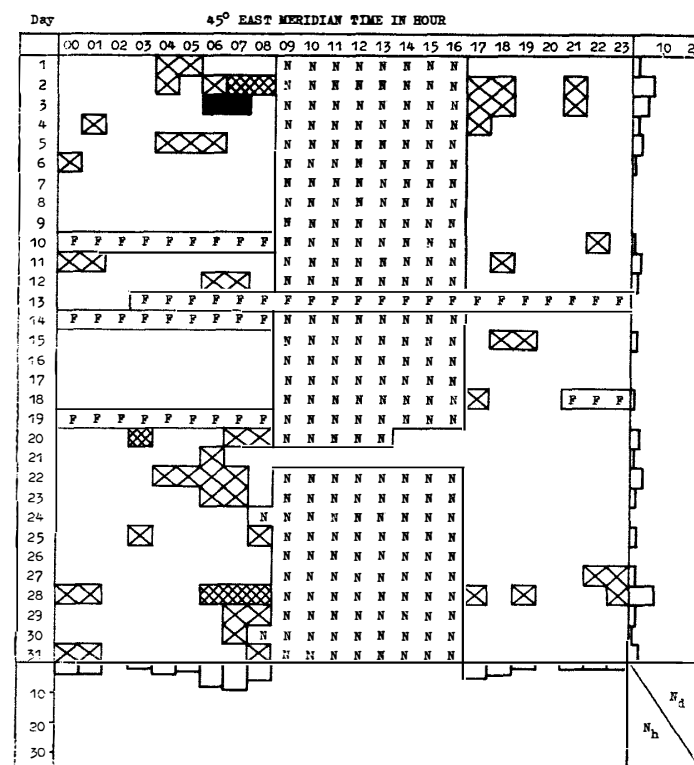





Fig. 4(j). January 1971

Note:  $N_d$  and  $N_h$  denote daily and hourly occurrence frequencies, together with the 'auroral echo intensity indices' 1, 2, and 3, in the relevant month, respectively.

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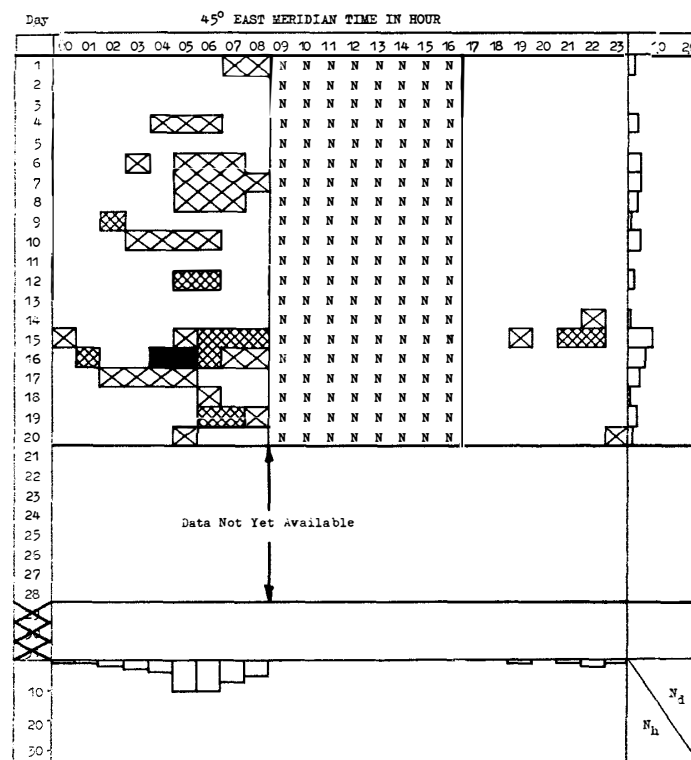




Fig. 4(k). February 1971

Note:  $N_d$  and  $N_h$  denote daily and hourly occurrence frequencies, together with the 'auroral echo intensity indices' 1, 2, and 3, in the relevant month, respectively.

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