FFI RAPPORT

EXAMPLES OF OPERATIONAL CAPABILITY OF NSAT-1
Phase-B Report

MELAND, Bente Jensløkken

FFI/RAPPORT-2003/01773

FFIE/834/170

Approved
Kjeller 9. May 2003

Vidar S Andersen
Director of Research

EXAMPLES OF OPERATIONAL CAPABILITY OF NSAT-1
Phase-B Report

MELAND, Bente Jensløkken

FFI/RAPPORT-2003/01773

FORSVARETS FORSKNINGSINSTITUTT
Norwegian Defence Research Establishment
P O Box 25, NO-2027 Kjeller, Norway

FORSVARETS FORSKNINGSINSTITUTT (FFI)
Norwegian Defence Research Establishment

P O BOX 25
N0-2027 KJELLER, NORWAY

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE
(when data entered)

REPORT DOCUMENTATION PAGE

1) PUBL/REPORT NUMBER	2) SECURITY CLASSIFICATION	3) NUMBER OF PAGES
FFI/RAPPORT-2003/01773	UNCLASSIFIED	129
1a) PROJECT REFERENCE	**2a) DECLASSIFICATION/DOWNGRADING SCHEDULE**	
FFIE/834/170	-	

4) TITLE

EXAMPLES OF OPERATIONAL CAPABILITY OF NSAT-1 Phase-B Report

5) NAMES OF AUTHOR(S) IN FULL (surname first)

MELAND, Bente Jensløkken

6) DISTRIBUTION STATEMENT

Approved for public release. Distribution unlimited. (Offentlig tilgjengelig)

7) INDEXING TERMS

IN ENGLISH:	IN NORWEGIAN:
a) Micro satellite	a) Mikro-satellitt
b) Maritime surveillance	b) Havovervåkning
c) Scenarios	c) Scenarier
d) Coverage	d) Dekning
e) Revisit times	e) Gjenbesøkstider

THESAURUS REFERENCE:

8) ABSTRACT

NSAT-1 is a Norwegian micro satellite primarily for surveillance of the Norwegian waters. Four scenarios are described and simulated to study the coverage and revisit times for NSAT-1.

The results shows that the Norwegian waters is covered nearly two times the required 4 times pr day. About 90 % of the revisit times will be about 1 ½ hour in Dwelling mode, decreasing to about 40 % in Scanning mode.

An "out-of-area" scenario shows that the Persian Gulf will be covered at least 2 times pr day. Downlinking these data to a ground station in Tromsø, the delay will be about 10 minutes in ascending orbit and about 1 ½ hour in descending orbit.

9) DATE	AUTHORIZED BY This page only	POSITION
9. May 2003	Vidar S Andersen	Director of Research

ISBN-82-464-0708-2

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE
(when data entered)

CONTENTS

Page

EXAMPLES OF OPERATIONAL CAPABILITY OF NSAT-1 Phase-B Report

1 INTRODUCTION

The NSAT-1 is a Norwegian micro-satellite primarily for surveillance of the Norwegian waters. The observations are based on receiving emmisions from X-band navigation radars. The conceptual definitions for NSAT-1 are given in [Narheim et al. (1)]. System requirements for the satellite are given in [Eriksen et al. (2)]

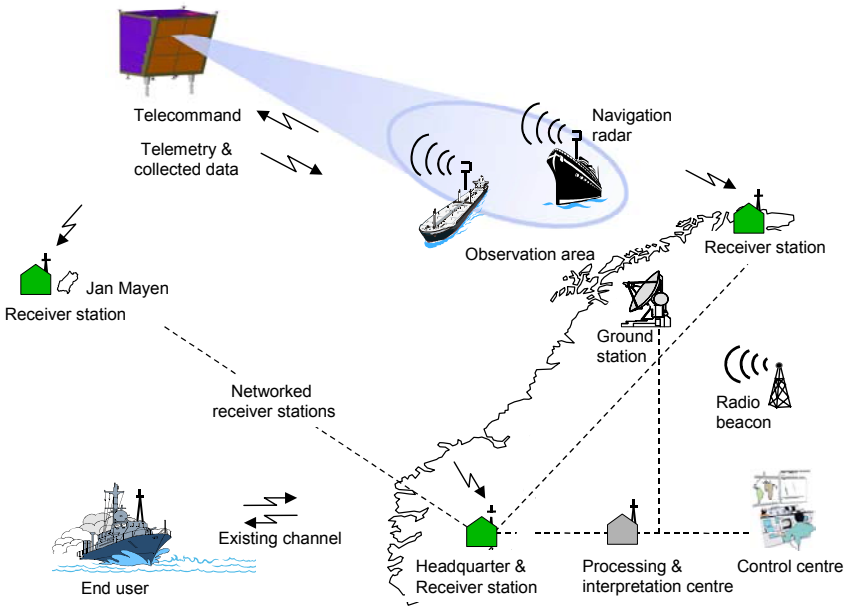

Figure 1.1 Overview of the NSAT-1 concept.

The main scenario is surveillance of the Norwegian waters. In addition three scenarios are developed to illustrate some possible operational capabilities for the satellite.

I: Surveillance of the Norwegian Waters
II: Towing a tanker along the Norwegian coast
III: Russian naval exercise near Spitzbergen
IV: Surveillance of the Persian Gulf

2 THE NSAT-1 OPERATION CONCEPT

All decisions for the operational aspects for the NSAT-1 are not settled at this stage. The concept described below is the concept used in the simulations of the scenarios.

The orbit is sun synchronous at a height of 600 km. The sensor system will give precise geolocation (better than 2 km) within an area of 750 km x 250 km. The observation area will be located about 1250 km to 2000 km from the ground track, looking forward or aside.

The sensor can be operating in one of three modes:

- Scanning mode
- Dwelling mode
- Steered mode

The different modes and the geometry of the observation scene are described below.

2.1 Observation geometry

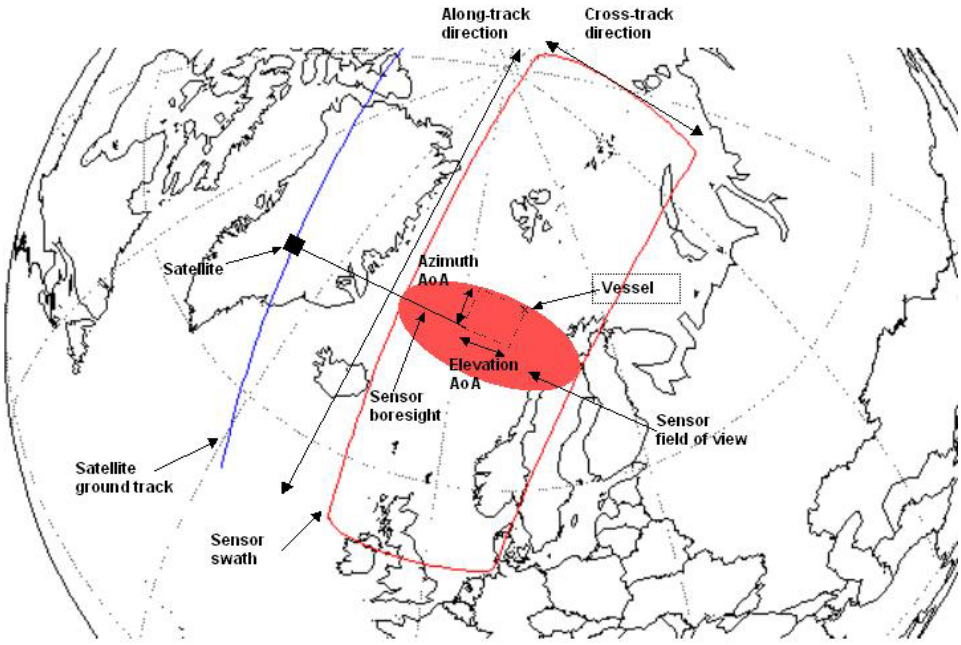

Figure 2.1 Satellite pass over Greenland showing instantaneous coverage(red ellipse) and swath for 8 minutes of operation (area inside red line).

The sensor field of view will be approximately 750 km x 250 km. The ground range from the satellite ground track to the closest part of the swath will be about 1250 km, the cross track distance will be 750 km. The outer part of the swath will then be about 2000 km from the satellite ground track.

2.2 Operational modes

The NSAT-1 spacecraft shall be steerable, which allows the following Direction Finding-sensor pointing modes for geographical and situational surveillance. Figure 2.2 shows the definition of the different coordinate systems needed for the definition of the different modes.

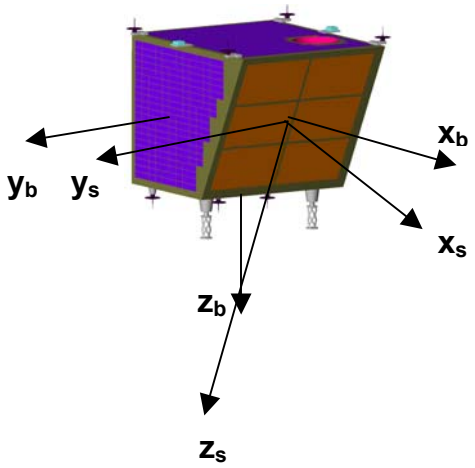

Figure 2.2 The conceptual design of NSAT-1 with the satellite body coordinate system (subscript b) and the sensor coordinate system (subscript s) shown. The antenna panel is shown in brown, and the antenna boresight is pointed down by a clockwise rotation of 29.75° of the sensor system relative to the body system.

2.2.1 Scanning mode

In Scanning mode the sensor scans a swath to one side of the satellite ground track at constant rate, with x_b-axis at a constant angle with the velocity vector and the z_b-axis pointed towards nadir.

2.2.2 Dwelling mode

In Dwelling mode the spacecraft slews to make the sensor dwell at the target as long as it is within reach. The x_s-axis is pointed towards the target.

2.2.3 Steered mode

In Steered mode the spacecraft slews to point the sensor sequentially at targets in different directions during the observation time. The x_s-axis is pointed towards the target.

3 NSAT-1 SCENARIO DESCRIPTION IN GENERAL

All the scenarios presented are for illustration of principles. They are not based on military studies. The choice of vessels and their trajectories are meant to illustrate the coverage and revisit times for different areas.

The four scenarios are simulated with the sensor in Dwelling mode and Scanning mode. The Steering mode has not been used in this study.

Scanning mode is used to study coverage of the entire Norwegian waters. Dwelling mode is used to study part of the area with higher priority.

The simulated period for all the scenarios is 48 hours. The satellite orbit is not exactly repeated, so a simulation for a different period of 48 hours may give a slightly different result. The chosen period for simulation is from noon the first of July till noon the third of July in 2004.

The scenarios are only on a coarse level. All simulation reports will be found in appendix D-F and only the conclusions will be presented in the chapters below.

4 I: SURVEILLANCE OF THE NORWEGIAN WATERS

The main scenario for the NSAT-1 is the surveillance of the Norwegian waters. Five places in this area are chosen to simulate the coverage and revisit times.

Figure 4.1 European map.

A map of Europe is shown in Figure 4.1, while Figure 4.2 shows the places in the Norwegian waters chosen for simulation.

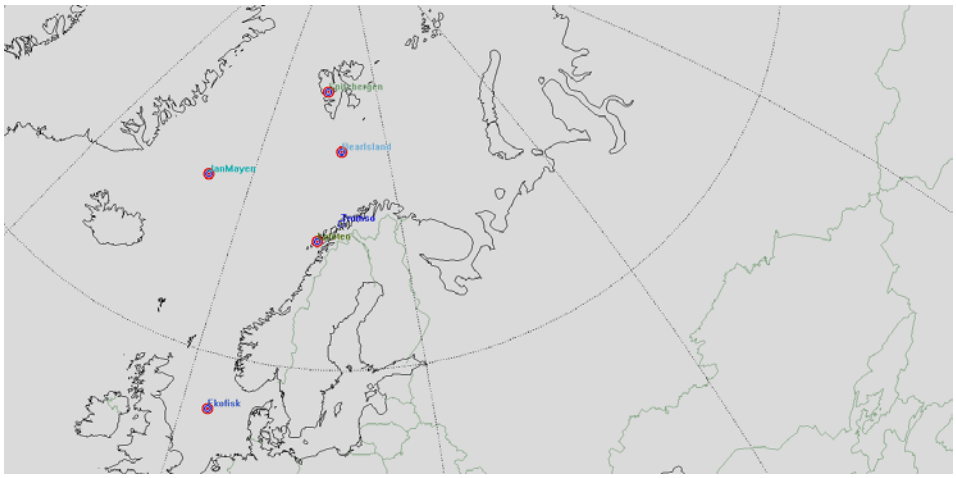

Figure 4.2 The chosen places for observations in the main scenario.

4.1 Dwelling mode

The NSAT-1 satellite used in dwelling mode, will be able to observe the different places in the area 12-26 times in this period.

Table 4.1 shows the number of observation periods for the five places in the scenario. For good accuracy the place is observed in the range between 1250 and 2000 km (ground range). In the pass with less accuracy, Lofoten is observed in the range between 2000 and 2300 km.

Place	**Passes with good accuracy < 2km**	**Passes with less accuracy > 2km**
Spitzbergen	26	-
Bear Island	22	-
Jan Mayen	22	-
Lofoten	21	1
Ekofisk	12	-

Table 4.1 Number of passes where the different places can be observed during the period of 48 hours.

The revisit tables given in Table 4.2 - Table 4.6 gives the time between two observations.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	12:19	1 h 34 min
2	1 Jul 2004	13:54	1 h 35 min
3	1 Jul 2004	15:30	1 h 36 min
4	1 Jul 2004	17:07	1 h 37 min
5	1 Jul 2004	18:45	1 h 37 min
6	1 Jul 2004	20:24	4 h 54 min
7	2 Jul 2004	01:19	1 h 35 min
8	2 Jul 2004	02:55	1 h 34 min
9	2 Jul 2004	04:31	1 h 36 min
10	2 Jul 2004	06:08	1 h 35 min
11	2 Jul 2004	07:44	1 h 34 min
12	2 Jul 2004	09:19	1 h 35 min
13	2 Jul 2004	10:55	1 h 35 min
14	2 Jul 2004	12:31	1 h 34 min
15	2 Jul 2004	14:06	1 h 35 min
16	2 Jul 2004	15:42	1 h 36 min
17	2 Jul 2004	17:19	1 h 38 min
18	2 Jul 2004	18:58	1 h 37 min
19	2 Jul 2004	20:37	4 h 53 min
20	3 Jul 2004	01:31	1 h 36 min
21	3 Jul 2004	03:07	1 h 34 min
22	3 Jul 2004	04:43	1 h 36 min
23	3 Jul 2004	06:20	1 h 35 min
24	3 Jul 2004	07:56	1 h 34 min
25	3 Jul 2004	09:31	1 h 35 min
26	3 Jul 2004	11:07	-

Table 4.2 Revisit table for Spitzbergen.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	12:18	1 h 34 min
2	1 Jul 2004	13:53	1 h 35 min
3	1 Jul 2004	15:29	1 h 36 min
4	1 Jul 2004	17:06	1 h 38 min
5	1 Jul 2004	18:45	8 h 10 min
6	2 Jul 2004	02:57	1 h 33 min
7	2 Jul 2004	04:32	1 h 35 min
8	2 Jul 2004	06:08	1 h 35 min
9	2 Jul 2004	07:44	1 h 35 min
10	2 Jul 2004	09:20	1 h 34 min
11	2 Jul 2004	10:55	1 h 34 min
12	2 Jul 2004	12:30	1 h 34 min
13	2 Jul 2004	14:05	1 h 35 min
14	2 Jul 2004	15:41	1 h 37 min
15	2 Jul 2004	17:19	1 h 37 min

16	3 Jul 2004	18:58	8 h 10 min
17	3 Jul 2004	03:09	1 h 33 min
18	3 Jul 2004	04:44	1 h 35 min
19	3 Jul 2004	06:20	1 h 34 min
20	3 Jul 2004	07:56	1 h 35 min
21	3 Jul 2004	09:32	1 h 34 min
22	3 Jul 2004	11:07	-

Table 4.3 Revisit table for Bear Island.

Observation nr	**Date**	**Time**	**Following gap duration**
1	1 Jul 2004	12:21	1 h 32 min
2	1 Jul 2004	13:55	1 h 34 min
3	1 Jul 2004	15:30	1 h 34 min
4	1 Jul 2004	17:05	1 h 36 min
5	1 Jul 2004	18:42	1 h 38 min
6	1 Jul 2004	20:21	8 h 13 min
7	2 Jul 2004	04:35	1 h 34 min
8	2 Jul 2004	06:10	1 h 35 min
9	2 Jul 2004	07:46	1 h 35 min
10	2 Jul 2004	09:22	1 h 35 min
11	2 Jul 2004	10:58	1 h 34 min
12	2 Jul 2004	12:33	1 h 32 min
13	2 Jul 2004	14:07	1 h 34 min
14	2 Jul 2004	15:42	1 h 34 min
15	2 Jul 2004	17:17	1 h 36 min
16	2 Jul 2004	18:54	1 h 39 min
17	2 Jul 2004	20:34	8 h 12 min
18	3 Jul 2004	04:47	1 h 34 min
19	3 Jul 2004	06:22	1 h 35 min
20	3 Jul 2004	07:58	1 h 35 min
21	3 Jul 2004	09:34	1 h 35 min
22	3 Jul 2004	11:10	-

Table 4.4 Revisit table for Jan Mayen.

Observation nr	**Date**	**Time**	**Following gap duration**
1	1 Jul 2004	12:19	1 h 32 min
2	1 Jul 2004	13:53	1 h 34 min
3	1 Jul 2004	15:28	1 h 36 min
4	1 Jul 2004	17:05	1 h 38 min
5	1 Jul 2004	18:44	8 h 14 min
6 *	1 Jul 2004	02:59	1 h 32 min
7	2 Jul 2004	04:34	1 h 35 min
8	2 Jul 2004	06:10	1 h 35 min
9	2 Jul 2004	07:46	1 h 35 min

10	2 Jul 2004	09:22	1 h 33 min
11	2 Jul 2004	10:57	1 h 33 min
12	2 Jul 2004	12:31	1 h 32 min
13	2 Jul 2004	14:05	1 h 34 min
14	3 Jul 2004	15:40	1 h 36 min
15	3 Jul 2004	17:17	1 h 40 min
16	2 Jul 2004	18:58	8 h 13 min
17	2 Jul 2004	03:11	1 h 34 min
18	3 Jul 2004	04:46	1 h 35 min
19	3 Jul 2004	06:22	1 h 35 min
20	3 Jul 2004	07:58	1 h 35 min
21	3 Jul 2004	09:34	1 h 32 min
22	3 Jul 2004	11:08	-

Table 4.5 Revisit table for Lofoten.
** pass with less accuracy*

Observation nr	**Date**	**Time**	**Following gap duration**
1	1 Jul 2004	15:27	1 h 32 min
2	1 Jul 2004	17:01	1 h 38 min
3	1 Jul 2004	18:39	9 h 58 min
4	2 Jul 2004	04:39	1 h 34 min
5	2 Jul 2004	06:14	1 h 35 min
6	2 Jul 2004	07:50	7 h 48 min
7	2 Jul 2004	15:39	1 h 33 min
8	2 Jul 2004	17:13	1 h 38 min
9	2 Jul 2004	18:52	9 h 58 min
10	3 Jul 2004	04:51	1 h 33 min
11	3 Jul 2004	06:26	1 h 36 min
12	2 Jul 2004	08:02	-

Table 4.6 Revisit table for Ekofisk.

4.2 Scanning mode

The NSAT-1 satellite used in scanning mode, will be able to observe the different places in the area 6-12 times in this period, 5-9 of these with good accuracy in geolocation. The Direction finding sensor will be operating side looking, for each orbit the sensor will look left or right to give best cover of the actual area.

Table 4.7 shows the number of observation periods for the five places in the scenario. For good accuracy the place is observed in the range between 1250 and 2000 km (ground range). In the passes with less accuracy the place is observed in the range between 1020 and 1140 km, except for the third observation of Lofoten which will be observed at 2007 km.

Place	Passes with good accuracy < 2km	Passes with less accuracy > 2km
Spitzbergen	8	-
Bear Island	5	1
Jan Mayen	6	5
Lofoten	9	3
Ekofisk	6	2

Table 4.7 Number of passes where the different places can be observed during the period of 48 hours.

The revisit tables are given in Table 4.8 - Table 4.12 gives the time between two observations.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	18:48	1 h 37 min
2	1 Jul 2004	20:25	4 h 54 min
3	2 Jul 2004	01:20	1 h 37 min
4	2 Jul 2004	02:57	16 h 2 min
5	2 Jul 2004	19:00	1 h 37 min
6	2 Jul 2004	20:38	4 h 54 min
7	3 Jul 2004	01:32	1 h 37 min
8	3 Jul 2004	03:10	-

Table 4.8 Revisit table for Spitzbergen.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	17:10	1 h 37 min
2	1 Jul 2004	18:47	8 h 12 min
3	2 Jul 2004	02:59	14 h 23 min
4 *	2 Jul 2004	17:22	1 h 37 min
5	2 Jul 2004	18:59	8 h 11 min
6	3 Jul 2004	03:11	-

Table 4.9 Revisit table for Bear Island.
** pass with less accuracy*

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	12:24	1 h 34 min
2 *	2 Jul 2004	13:58	6 h 24 min
3	2 Jul 2004	20:23	8 h 13 min
4	2 Jul 2004	04:36	6 h 24 min
5 *	2 Jul 2004	11:01	1 h 34 min
6	2 Jul 2004	12:35	1 h 34 min
7 *	2 Jul 2004	14:10	4 h 47 min
8 *	2 Jul 2004	18:58	1 h 37 min
9	2 Jul 2004	20:35	8 h 13 min
10	3 Jul 2004	04:48	6 h 24 min
11 *	3 Jul 2004	11:13	-

Table 4.10 Revisit table for Jan Mayen.
** passes with less accuracy*

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	12:21	6 h 23 min
2	1 Jul 2004	18:45	8 h 14 min
3 *	2 Jul 2004	03:00	1 h 37 min
4 *	2 Jul 2004	04:38	4 h 46 min
5	2 Jul 2004	09:24	1 h 34 min
6	2 Jul 2004	10:59	1 h 34 min
7	2 Jul 2004	12:33	4 h 46 min
8 *	2 Jul 2004	17:20	1 h 37 min
9	2 Jul 2004	18:57	8 h 14 min
10	3 Jul 2004	03:12	6 h 23 min
11	3 Jul 2004	09:36	1 h 34 min
12	3 Jul 2004	11:11	-

Table 4.11 Revisit table for Lofoten.
** passes with less accuracy*

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	15:30	3 h 11 min
2	1 Jul 2004	18:41	9 h 59 min
3	2 Jul 2004	04:41	3 h 12 min
4 *	2 Jul 2004	07:53	7 h 49 min
5 *	2 Jul 2004	15:42	3 h 12 min
6	2 Jul 2004	18:54	9 h 59 min
7	3 Jul 2004	04:53	3 h 11 min
8	3 Jul 2004	08:05	-

Table 4.12 Revisit table for Ekofisk.
** passes with less accuracy*

4.3 Comments to the results

The simulation results shows that the Norwegian waters will be covered 6-12 times in Scanning mode and high-priority parts of the area will be covered 12-26 times in Dwelling mode. This means that the area will be covered in average 4.5 times pr day in Scanning mode and parts of the area will be covered in average 10 times pr day in Dwelling mode.

In Dwelling mode the revisit tables shows that for Spitzbergen the largest gap between observations will be nearly 5 hours and for Ekofisk nearly 10 hours. For the other places the gap in Dwelling mode will be approximately 8 hours.

The revisit tables for the Scanning mode shows that the gap will increase for Spitzbergen and Bear Island, to respectively 16 and 14 hours. The other three places will retain almost the same largest gap size. The large gap values for Spitzbergen and Bear Island are caused by the dead zone straight under the satellite when scanning sideways. This can be avoided by using the Dwelling mode in these passes.

For 89% of the passes, revisit time will be about 1 ½ hour in Dwelling mode, decreasing to 38% in Scanning mode.

All the simulation results and reports are presented in appendix C.

5 II: TOWING A TANKER ALONG THE NORWEGIAN COAST

The Norwegian coast is long, and every day tankers are travelling along with different cargo. Due to accidents contaminating the environment, surveillance of these traffic will be desirable. The scenario describes a scene of towing a tanker along the Norwegian coast from Bergen to Bodø. The towboat keeps a steady speed of 10 knots, and the operation takes nearly 48 hours.

In this scenario, NSAT-1 will not be the primary sensor to monitor this voyage. The coastal radar system will be used. However, this scenario is used to show the capability of NSAT-1 at this latitude.

Figure 5.1 Norwegian map.

A Norwegian map is shown in Figure 5.1. Figure 5.2 shows the simulated trajectory for the scenario.

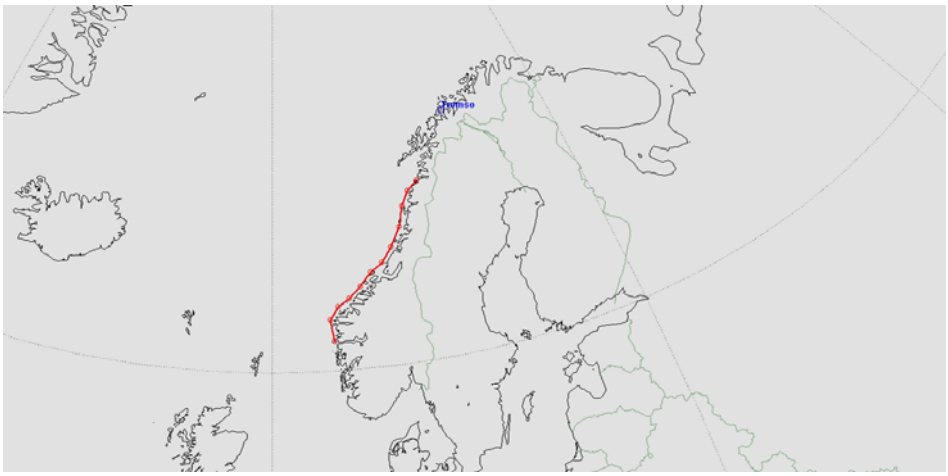

Figure 5.2 The red line illustrates the trajectory of the towed tanker.

5.1 Dwelling mode

The NSAT-1 satellite used in dwelling mode, will be able to observe the tanker 19 times in this period, 17 of these with the ability to give precise geolocation.

Passes with good accuracy < 2km	Passes with less accuracy > 2km
17	
	2

Table 5.1 The tanker can be observed 19 times during the period of 48 hours.

The accuracy in Table 5.1 is based on the ground range where the vessel is observed. A ground range between 1250 km and 2000 km will give the best accuracy. In the two passes with less accuracy, the vessel is observed in a ground range between 2000 km and 2300 km.

Observation nr	Date	Time	Following gap duration
1 *	1 Jul 2004	13:14	1 h 29 min
2	1 Jul 2004	14:45	1 h 29 min
3	1 Jul 2004	16:21	1 h 35 min
4	1 Jul 2004	17:57	9 h 57 min
5	2 Jul 2004	03:56	1 h 32 min
6	2 Jul 2004	05:30	1 h 35 min
7	2 Jul 2004	07:06	1 h 35 min
8	2 Jul 2004	08:42	1 h 30 min
9	2 Jul 2004	10:18	1 h 31 min
10 *	2 Jul 2004	11:51	1 h 30 min
11	2 Jul 2004	13:24	1 h 29 min
12	2 Jul 2004	14:58	1 h 34 min
13	2 Jul 2004	16:33	1 h 37 min
14	2 Jul 2004	18:11	9 h 49 min
15	3 Jul 2004	04:05	1 h 31 min
16	3 Jul 2004	05:41	1 h 35 min
17	3 Jul 2004	07:17	1 h 34 min
18	3 Jul 2004	08:52	1 h 30 min
19	3 Jul 2004	10:28	-

Table 5.2 Revisit table for the tanker.
** passes with less accuracy*

The tanker will be observed almost every 1 ½ hour during the day, except for about 10 hours in the afternoon.

5.2 Scanning mode

The NSAT-1 satellite used in scanning mode, will be able to observe the tanker 12 times in this period, 9 of these with the ability to give precise geolocation.

Passes with good accuracy < 2km	Passes with less accuracy > 2km
9	
	3

Table 5.3 The tanker can be observed 12 times during the period of 48 hours.

The accuracy in Table 5.3 is based on the ground range where the vessel is observed. A ground range between 1250 km and 2000 km will give the best accuracy. In two of the passes with less accuracy, the vessel is observed in a ground range between 2000 km and 2300 km. In the last pass with less accuracy, the vessel is observed in a ground range between 1000 km and 1250 km.

Observation nr	Date	Time	Following gap duration
1 *	1 Jul 2004	13:15	1 h 34 min
2	1 Jul 2004	14:49	3 h 11 min
3 *	1 Jul 2004	18:01	9 h 55 min
4	2 Jul 2004	03:56	4 h 47 min
5	2 Jul 2004	08:44	1 h 33 min
6	2 Jul 2004	10:18	1 h 33 min
7 *	2 Jul 2004	11:52	1 h 33 min
8	2 Jul 2004	13:26	4 h 47 min
9	2 Jul 2004	18:14	9 h 54 min
10	3 Jul 2004	04:08	4 h 47 min
11	3 Jul 2004	08:55	1 h 33 min
12	3 Jul 2004	10:29	-

Table 5.4 Revisit table for the tanker.
** passes with less accuracy*

5.3 Comments to the results

The towed tanker in the scenario will be observed 19 times in Dwelling mode, reduced to 12 times in Scanning mode. This means about 6-9 times pr day.

For both the Dwelling mode and the Scanning mode, the largest gap between observations will be nearly 10 hours.

For 89% of the passes, revisit time will be about 1 ½ hour in dwelling mode, decreasing to 45% in scanning mode.

All the simulation results and reports are presented in appendix D

6 III: RUSSIAN NAVAL EXERCISE NEAR SPITZBERGEN

The artic area is of great interest for Norway. The Norwegian claim to some of these ocean areas has been disputed, and regular Norwegian presence and surveillance are needed.

The scenario describes a Russian naval exercise near the Norwegian fisheries protection zone. A Norwegian Frigate is patrolling the coast of Spitzbergen. The area will be monitored for a period of 48 hours.

A map covering the artic area is shown in Figure 6.1. Figure 6.2 shows the trajectories of the vessels participating in the scenario. The trajectories are chosen to illustrate coverage in different parts of the area. More vessels close to each other will be observed by NSAT-1 at the same pass, and will not add new results from the scenario.

Figure 6.1 Map for the artic area.

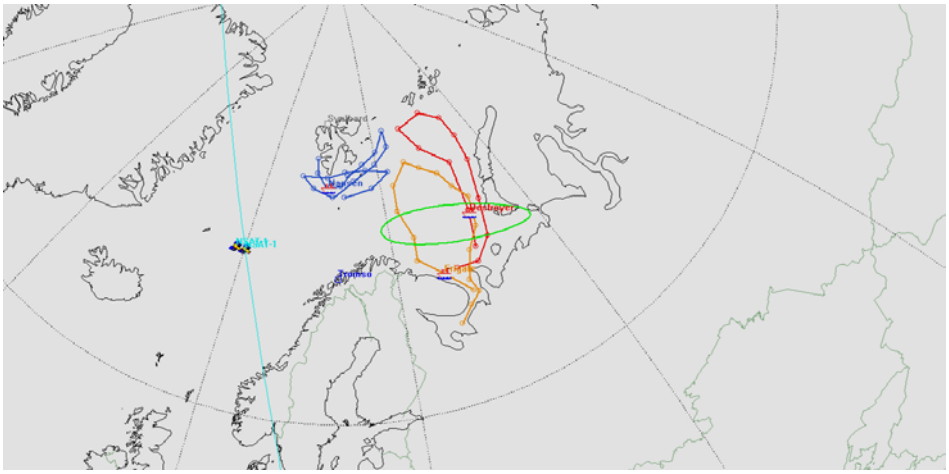

Figure 6.2 *Snapshot 1 Jul 2004 16:27:30.00 The green ellipse describes the observation area at this moment. The blue dots illustrate the trajectory of the Norwegian Frigate, the red dots illustrate the Russian Destroyer and the orange dots illustrate the trajectory of the Russian Frigate.*

6.1 Dwelling mode

The NSAT-1 satellite used in dwelling mode, will be able to observe the different vessels 21-26 times in this period.

Table 6.1 shows the number of observation periods for the three vessels in the scenario. For good accuracy the vessel is observed in the range between 1250 and 2000 km (ground range).

Vessel	**Passes with good accuracy < 2km**	**Passes with less accuracy > 2km**
KNM Nansen	25	-
Russian Destroyer	22	-
Russian Frigate	21	-

Table 6.1 *Number of passes where the different vessels can be observed during the period of 48 hours.*

The revisit tables given in Table 6.2 - Table 6.4 gives the time between two observations.

Observation nr	**Date**	**Time**	**Following gap duration**
1	1 Jul 2004	13:12	1 h 35 min
2	1 Jul 2004	14:48	1 h 35 min
3	1 Jul 2004	16:24	1 h 37 min
4	1 Jul 2004	18:02	1 h 38 min
5	1 Jul 2004	19:43	4 h 54 min

6	2 Jul 2004	00:37	1 h 34 min
7	2 Jul 2004	02:13	1 h 33 min
8	2 Jul 2004	03:49	1 h 35 min
9	2 Jul 2004	05:25	1 h 35 min
10	2 Jul 2004	07:01	1 h 35 min
11	2 Jul 2004	08:37	1 h 35 min
12	2 Jul 2004	10:13	1 h 34 min
13	2 Jul 2004	11:48	1 h 35 min
14	2 Jul 2004	13:24	1 h 34 min
15	2 Jul 2004	14:59	1 h 36 min
16	2 Jul 2004	16:36	1 h 37 min
17	2 Jul 2004	18:14	1 h 36 min
18	2 Jul 2004	19:53	6 h 32 min
19	3 Jul 2004	02:26	1 h 34 min
20	3 Jul 2004	04:02	1 h 35 min
21	3 Jul 2004	05:38	1 h 34 min
22	3 Jul 2004	07:13	1 h 35 min
23	3 Jul 2004	08:54	1 h 35 min
24	3 Jul 2004	10:25	1 h 33 min
25	3 Jul 2004	11:59	-

Table 6.2 Revisit table for KNM Fritjof Nansen.

Observation nr	**Date**	**Time**	**Following gap duration**
1	1 Jul 2004	13:08	1 h 35 min
2	1 Jul 2004	14:45	1 h 37 min
3	1 Jul 2004	16:24	8 h 09 min
4	2 Jul 2004	00:36	1 h 33 min
5	2 Jul 2004	02:12	1 h 33 min
6	2 Jul 2004	03:48	1 h 34 min
7	2 Jul 2004	05:24	1 h 34 min
8	2 Jul 2004	07:00	1 h 33 min
9	2 Jul 2004	08:35	1 h 34 min
10	2 Jul 2004	10:11	1 h 33 min
11	2 Jul 2004	11:46	1 h 34 min
12	2 Jul 2004	13:22	1 h 36 min
13	2 Jul 2004	15:00	1 h 38 min
14	2 Jul 2004	16:39	8 h 09 min
15	3 Jul 2004	00:50	1 h 34 min
16	3 Jul 2004	02:26	1 h 35 min
17	3 Jul 2004	04:02	1 h 35 min
18	3 Jul 2004	05:38	1 h 35 min
19	3 Jul 2004	07:14	1 h 33 min
20	3 Jul 2004	08:49	1 h 33 min
21	3 Jul 2004	10:24	1 h 31 min
22	3 Jul 2004	11:58	-

Table 6.3 Revisit table for the Russian Destroyer.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	13:09	1 h 35 min
2	1 Jul 2004	14:45	1 h 37 min
3	1 Jul 2004	16:23	9 h 49 min
4	2 Jul 2004	02:14	1 h 34 min
5	2 Jul 2004	03:50	1 h 35 min
6	2 Jul 2004	05:26	1 h 35 min
7	2 Jul 2004	07:02	1 h 34 min
8	2 Jul 2004	08:37	1 h 34 min
9	2 Jul 2004	10:12	1 h 34 min
10	2 Jul 2004	11:47	1 h 35 min
11	2 Jul 2004	13:23	1 h 35 min
12	2 Jul 2004	14:59	1 h 38 min
13	2 Jul 2004	16:38	8 h 11 min
14	3 Jul 2004	00:51	1 h 35 min
15	3 Jul 2004	02:27	1 h 35 min
16	3 Jul 2004	04:03	1 h 35 min
17	3 Jul 2004	05:39	1 h 35 min
18	3 Jul 2004	07:15	1 h 33 min
19	3 Jul 2004	08:50	1 h 32 min
20	3 Jul 2004	10:24	1 h 32 min
21	3 Jul 2004	11:58	-

Table 6.4 Revisit table for the Russian Frigate.

6.2 Scanning mode

The NSAT-1 satellite used in scanning mode, will then be able to observe the different vessels 7-12 times in this period, 6-7 of these with the ability to give good accuracy in geolocation. The Direction finding sensor will be operating side looking, for each orbit the sensor will look left or right to give best cover of the actual area.

Table 6.5 shows the number of observation periods for the three vessels in the scenario. For good accuracy the vessel is observed in the range between 1250 and 2000 km (ground range). In the passes with less accuracy the vessel is observed in the range between 1080 and 1215 km.

Vessel	Passes with good accuracy < 2km	Passes with less accuracy > 2km
KNM Nansen	7	
Russian Destroyer	6	3
Russian Frigate	7	1

Table 6.5 Number of passes where the different vessels can be observed during the period of 48 hours.

The revisit tables given in Table 6.6 - Table 6.8 gives the time between two observations.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	18:05	1 h 38 min
2	1 Jul 2004	19:43	4 h 55 min
3	2 Jul 2004	00:38	1 h 37 min
4	2 Jul 2004	02:15	16 h 1 min
5	2 Jul 2004	18:17	1 h 37 min
6	2 Jul 2004	19:54	6 h 33 min
7	3 Jul 2004	02:28	-

Table 6.6 Revisit table for KNM Fritjof Nansen.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	16:27	8 h 12 min
2	2 Jul 2004	00:39	1 h 36 min
3	2 Jul 2004	02:16	12 h 47 min
4	2 Jul 2004	15:04	1 h 37 min
5	2 Jul 2004	16:41	8 h 11 min
6	3 Jul 2004	00:52	6 h 24 min
7	3 Jul 2004	07:17	1 h 35 min
8	3 Jul 2004	08:52	1 h 34 min
9	3 Jul 2004	10:26	-

Table 6.7 Revisit table for the Russian Destroyer.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	16:26	9 h 51 min
2	2 Jul 2004	02:17	14 h 23 min
3	2 Jul 2004	16:40	8 h 13 min
4	3 Jul 2004	00:53	1 h 37 min
5	3 Jul 2004	02:30	4 h 48 min
6	3 Jul 2004	07:18	1 h 34 min
7	3 Jul 2004	08:52	1 h 33 min
8	3 Jul 2004	10:26	-

Table 6.8 Revisit table for the Russian Frigate.

6.3 Comments to the results

The simulation shows that the different vessels will be observed 21-25 times in Dwelling mode, decreasing until 7-9 times in Scanning mode. This means that the vessels in average will be observed 4 times pr day in Scanning mode and 11 times pr day in Dwelling mode.

Simulations in dwelling mode, gives a revisit situation where the largest gap between to observations is about 6 ½ hour for the Norwegian frigate sailing close to Spitzbergen and respectively 8 and nearly 10 hours for the Russian Destroyer and Frigate sailing near Novaya Zemlya.

When simulating in scanning mode, the gaps will increase until respectively 16 hours for the Norwegian Frigate, nearly 13 hours for the Russian Destroyer and 14 hours for the Russian Frigate. The large gap values are caused by the dead zone straight under the satellite. This can be avoided by using the Dwelling mode in these passes.

91% of the revisit times will be about 1 ½ hour in dwelling mode, decreasing to 48% in scanning mode.

All the simulation results and reports are presented in appendix E.

7 IV: SURVEILLANCE OF THE PERSIAN GULF

International operations are an increasing part of the Norwegian military operations. Out-of-area surveillance capability will therefore be of interest. The concept will then be passive surveillance and on-board data storage of the interesting area, followed by down linking of data when within reach of the ground station in Tromsø.

The scenario describes a surveillance of the Persian Gulf for a period of 48 hours.

A map of the Middle East are shown in Figure 7.1.

Figure 7.1 Map for the Middle East.

Three geographical marks are made in the map in Figure 7.2. The first mark is located in the southern part of the gulf, the second in the seaward approach to the gulf and the third in the northern part of the gulf.

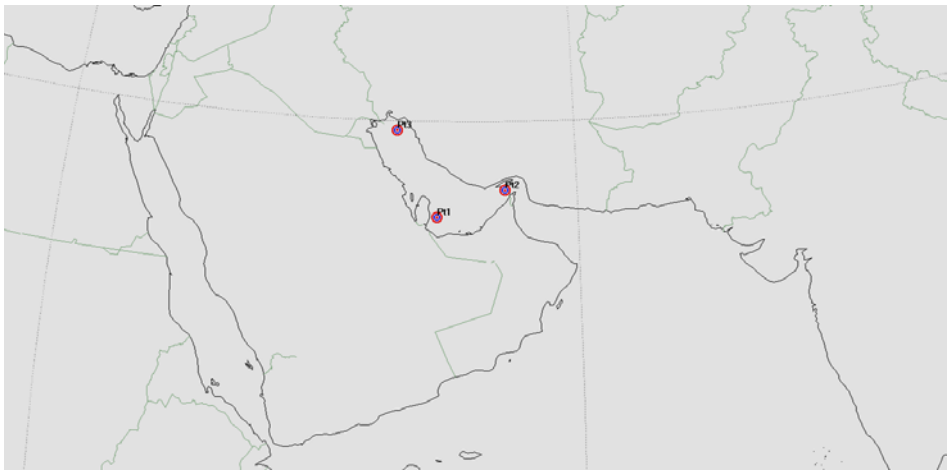

Figure 7.2 The map of the Persian Gulf with the three geographical points.

7.1 Dwelling mode

The NSAT-1 satellite used in dwelling mode, will be able to observe at least part of the area 8 times in this period.

Down linking access to Tromsø satellite station will be after about 12 minutes when the satellite is ascending and about 85 minutes when the satellite is descending.

Table 7.1 shows the number of observation periods for the three geographical points.

Point nr	Passes with good accuracy < 2km	Passes with less accuracy > 2km
1	7	-
2	6	-
3	8	-

Table 7.1 The table gives the number of times the geographical point is observed during the period of 48 hours.

The revisit tables given in Table 7.2 - Table 7.4 gives the time between two observations.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	13:00	1 h 32 min
2	1 Jul 2004	14:33	11 h 52 min
3	2 Jul 2004	02:26	1 h 38 min
4	2 Jul 2004	04:05	9 h 5 min
5	2 Jul 2004	13:11	1 h 32 min
6	2 Jul 2004	14:45	11 h 51 min
7	3 Jul 2004	12:38	-

Table 7.2 Revisit table for the first geographical point.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	12:59	1 h 31 min
2	1 Jul 2004	14:33	11 h 50 min
3	2 Jul 2004	02:25	10 h 44 min
4	2 Jul 2004	13:10	1 h 34 min
5	2 Jul 2004	14:46	11 h 48 min
6	3 Jul 2004	02:37	-

Table 7.3 Revisit table for the second geographical point.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	13:02	1 h 32 min
2	1 Jul 2004	14:34	11 h 50 min
3	2 Jul 2004	02:25	1 h 35 min
4	2 Jul 2004	04:02	9 h 4 min
5	2 Jul 2004	13:12	1 h 28 min
6	2 Jul 2004	14:46	11 h 50 min
7	3 Jul 2004	02:37	1 h 37 min
8	3 Jul 2004	04:15	-

Table 7.4 Revisit table for the third geographical point.

For "out-of-area" scenarios the satellite must downlink the observed data to a ground station. The ground station in Tromsø is chosen for this scenario. Table 7.5- Table 7.7 gives the delay between the time of observation and the time of downlink.

Date	Observation time	Downlink time	Delay
1 Jul 2004	13:00	13:10	10 min
1 Jul 2004	14:33	14:45	12 min
2 Jul 2004	02:26	03:51	1 h 25 min
2 Jul 2004	04:05	05:27	1 h 22 min
2 Jul 2004	13:11	13:22	11 min
2 Jul 2004	14:45	14:57	12 min
3 Jul 2004	02:38	04:03	1 h 25 min

Table 7.5 Delay before downlink to Tromsø ground station from first geographical point.

Date	Observation time	Downlink time	Delay
1 Jul 2004	12:59	13:10	11 min
1 Jul 2004	14:33	14:45	12 min
2 Jul 2004	02:25	03:51	1 h 26 min
2 Jul 2004	13:10	13:22	12 min
2 Jul 2004	14:46	14:57	11 min
3 Jul 2004	02:37	04:03	1 h 26 min

Table 7.6 Delay before downlink to Tromsø ground station from second geographical point.

Date	Observation time	Downlink time	Delay
1 Jul 2004	12:59	13:10	11 min
1 Jul 2004	14:33	14:45	12 min
2 Jul 2004	02:25	03:51	1 h 26 min
2 Jul 2004	04:02	05:27	1 h 25 min
2 Jul 2004	13:10	13:22	12 min
2 Jul 2004	14:45	14:57	12 min
3 Jul 2004	02:37	04:03	1 h 26 min
3 Jul 2004	04:15	05:39	1 h 24 min

Table 7.7 Delay before downlink to Tromsø ground station from third geographical point.

7.2 Scanning mode

The NSAT-1 satellite used in scanning mode, will be able to observe at least part of the area 5 times in this period.

Down linking access to Tromsø satellite station will be after about 8 minutes when the satellite is ascending and about 83 minutes when the satellite is descending.

Table 7.8 shows the number of observation periods for the three geographical points.

Point nr	Passes with good accuracy < 2km	Passes with less accuracy > 2km
1	3	-
2	1	2
3	4	-

Table 7.8 The table gives the number of times the geographical point is observed during the period of 48 hours.

The revisit tables given in Table 7.9 - Table 7.11 gives the time between two observations.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	13:02	15 h 03 min
2	2 Jul 2004	04:05	9 h 08 min
3	2 Jul 2004	13:14	-

Table 7.9 Revisit table for the first geographical point.

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	13:02	24 h 12 min
2 *	2 Jul 2004	13:14	1 h 35 min
3 *	2 Jul 2004	14:49	-

Table 7.10 Revisit table for the second geographical point.
** passes with less accuracy*

Observation nr	Date	Time	Following gap duration
1	1 Jul 2004	13:03	15 h 00 min
2	2 Jul 2004	04:04	9 h 10 min
3	2 Jul 2004	13:15	15 h 00 min
4	3 Jul 2004	04:16	-

Table 7.11 Revisit table for the third geographical point.

For "out-of-area" scenarios the satellite must downlink the observed data to a ground station. The ground station in Tromsø is chosen for this scenario. Table 7.12 - Table 7.14 gives the delay between observation and the time of downlink.

Date	Observation time	Downlink time	Delay
1 Jul 2004	13:02	13:10	8 min
2 Jul 2004	04:05	05:27	1 h 22 min
2 Jul 2004	13:14	13:22	8 min

Table 7.12 Delay before downlink to Tromsø ground station from first geographical point.

Date	Observation time	Downlink time	Delay
1 Jul 2004	13:02	13:10	8 min
2 Jul 2004	13:14	13:22	8 min
2 Jul 2004	14:49	14:57	8 min

Table 7.13 Delay before downlink to Tromsø ground station from second geographical point.

Date	Observation time	Downlink time	Delay
1 Jul 2004	13:03	13:10	7 min
2 Jul 2004	04:04	05:27	1 h 23 min
2 Jul 2004	13:15	13:22	7 min
3 Jul 2004	04:16	05:39	1 h 23 min

Table 7.14 Delay before downlink to Tromsø ground station from third geographical point.

7.3 Comments to the results

This scenario describes an "out-of-area" operation. The interesting area will be observed 8 times in dwelling mode, decreasing to 5 times in scanning mode. This means that the area will be covered about 2-4 times pr day.

For the dwelling mode, the largest gap between observations will be nearly 12 hours. According to the scanning mode, the largest gap between observations will pass 24 hours for one of the geographical points. The gap between observations for the other two geographical points will be approximately 15 hours.

50% of the revisit times will be about 1 ½ hour in dwelling mode, decreasing to 14% in scanning mode.

The given scenario gives a delay before downlinking to the ground station in Tromsø between 10 minutes in ascending orbit and 1 ½ hour in descending orbit.

All the simulation results and reports are presented in appendix F.

8 CONCLUSIONS

The orbit of NSAT-1 is optimised to cover the Norwegian waters frequently. This report describes the result of simulating four scenarios. Three of the scenarios are in Norwegian waters, while the last one is an "out-of-area" scenario in the Persian Gulf.

The study shows that the requirement of coverage more than 3 times pr day will be obtained. According to different sensor modes and placement in the area, the coverage will vary between 4 times (Ekofisk, scanning mode) and 14 times (Spitzbergen, dwelling mode) pr day.

Even in an "out-of-area" operation, the NSAT-1 will be able to cover the Persian Gulf 2-4 times pr day depending on the sensor mode.

The orbit period is nearly 1 ½ hour. The time gap between to observations will vary between 1 ½ and 16 hours (24 hours for one of the geographical points in the Persian Gulf).

For the scenarios in the Norwegian waters, about 90% of the revisit times will be about 1 ½ hour in dwelling mode. This will decrease to about 40% in scanning mode. The corresponding values for the "out-of-area" scenario will be respectively 50% and 14%.

Data from the observations in Norwegian waters are linked down to the ground station in Tromsø immediately. The "out-of-area" scenario gives a delay before downlinking to the ground station in Tromsø between 10 minutes in ascending orbit and 1 ½ hour in descending orbit.

9 REFERENCES

(1) Narheim B, Eriksen T, Høye G, Sagsveen B, and Wahl T (2001): A Norwegian Micro-satellite for Ocean Surveillance, NSAT-1 Phase–A Report

(2) Eriksen T, Narheim B, Høye G, Sagsveen B, Arneson V (2002): NSAT-1 System Requirements discussing and definition,, Restricted

(3) http://www.stk.com/

A SATELLITE TOOL KIT (STK)

A.1 Introduction to STK

The Satellite tool Kit (STK) is a simulation system developed by Analytical Graphics for the Aerospace Industry (3). Different scenarios can be simulated in a rather easy way. The system makes it possible to define different satellites, vessels, ground based sites and so on. The basic version of the system gives some limitations in our simulation. Comments to these are given together with the simulation results in later appendixes.

A.2 Parameter settings

Parameter settings in STK can be made in different ways. The settings, and where they are defined, are summarized below:

A.2.1 Settings for the total Scenario

Settings done in the *basis* menu:

Time period start	1 Jul 2004 12:00:00.00
Time period stop	3 Jul 2004 12:00:00.00
Epoch	1 Jul 2004 12:00:00.00

Settings done in the *animation* menu:

Start time	1 Jul 2004 12:00:00.00

A.2.2 Settings for the Satellite

Settings done in the *basis* menu:

Orbit Start time	1 Jul 2004 12:00:00.00
Orbit Stop time	3 Jul 2004 12:00:00.00
Orbit Epoch	1 Jul 2004 00:00:00.00

Settings done in the *Orbit Wizard* menu:
(These values will override the settings done in the basic menu)

Orbit Selection	Sun synchronous
Attitude	600 km
Local Time of Descending Node	06:00:00.00

Orbit Start	1 Jul 2004 12:00:00.00
Orbit Stop	3 Jul 2004 12:00:00.00
Time step	60.0 sec

A.2.3 Settings for the Direction Finding Sensor

These settings will be dependent of the scenario, and will vary in our three examples.

Settings done in the *basis* menu:

Scanning mode:

Cone Angle	5.0	deg
Azimuth	± 90.0	deg
Elevation	30.0	deg

Dwelling mode:

Cone Angle	65.0	deg
Azimuth	0.0	deg
Elevation	90.0	deg

B SIMULATION RESULTS – DEFINITIONS

The definitions presented below will be used in the presentations of the simulation results and reports in the later appendixes.

B.1 Azimuth and Elevation

The definition of the azimuth α_{az} and elevation α_{el} angles are given in Figure B.1 and Figure B.2.

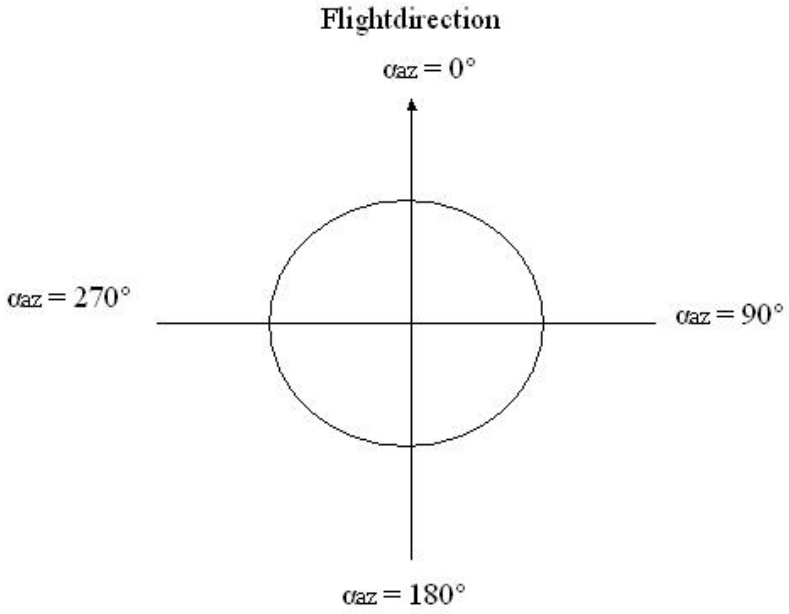

Figure B.1 Definition of the azimuth angle α_{az} used in the AER-reports

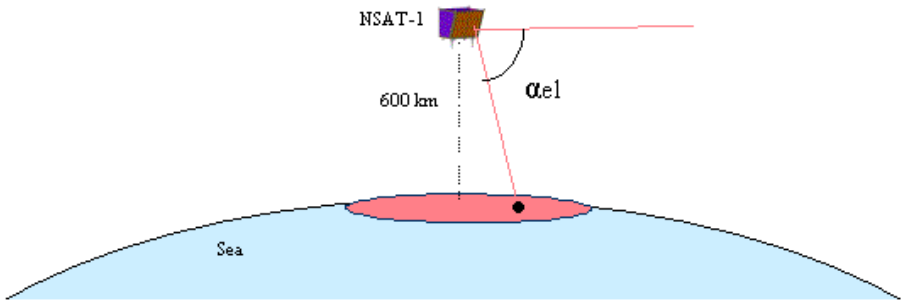

Figure B.2 Definition of the elevation angle α_{el} used in the AER-reports

B.2 Ground range and Slant range

The definition of the ground range R_g and the slant range R_s are given in Figure B.3.

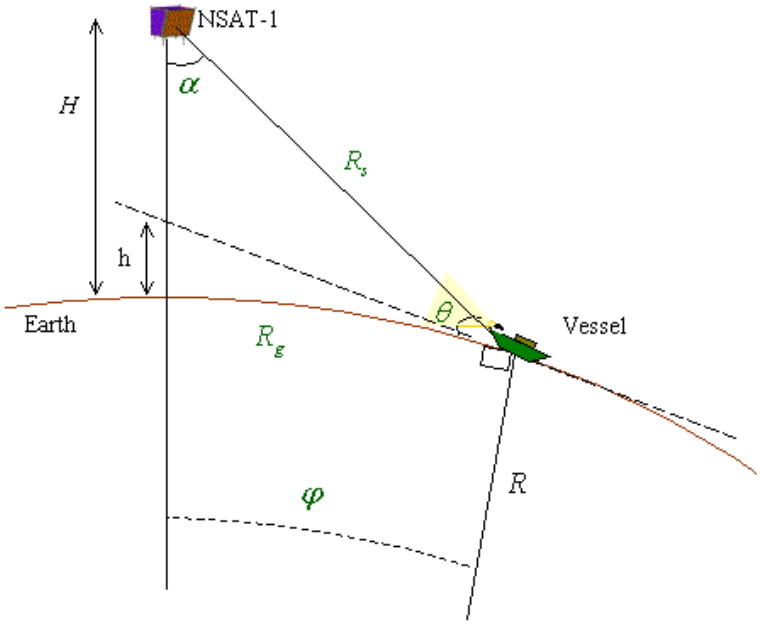

Figure B.3 Geometry for the satellite-target-earth system.

The Range in the AER-reports means the Slant Range.

C SIMULATION RESULTS FOR THE MAIN SCENARIO (I)

C.1 Access report

C.1.1 Direction Finding sensor in dwelling mode

24 Apr 2003 12:23:52

Satellite-NSAT-1-Sensor-ESM-To-Target-BearIsland, Target-Ekofisk, Target-JanMayen, Target-Lofoten, Target-Spitzbergen: Access Summary Report

ESM-To-BearIsland

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 12:17:42.93	1 Jul 2004 12:27:13.31	570.375
2	1 Jul 2004 13:52:51.68	1 Jul 2004 14:02:53.80	602.115
3	1 Jul 2004 15:28:44.57	1 Jul 2004 15:38:49.78	605.210
4	1 Jul 2004 17:05:49.94	1 Jul 2004 17:14:50.64	540.700
5	1 Jul 2004 18:44:35.70	1 Jul 2004 18:50:39.03	363.332
6	2 Jul 2004 02:56:02.24	2 Jul 2004 03:02:53.13	410.884
7	2 Jul 2004 04:31:55.72	2 Jul 2004 04:41:16.12	560.399
8	2 Jul 2004 06:07:56.56	2 Jul 2004 06:18:05.34	608.778
9	2 Jul 2004 07:43:50.31	2 Jul 2004 07:53:47.14	596.828
10	2 Jul 2004 09:19:26.64	2 Jul 2004 09:28:51.16	564.517
11	2 Jul 2004 10:54:39.11	2 Jul 2004 11:03:51.36	552.246
12	2 Jul 2004 12:29:37.06	2 Jul 2004 12:39:11.50	574.442
13	2 Jul 2004 14:04:49.54	2 Jul 2004 14:14:54.48	604.933
14	2 Jul 2004 15:40:50.09	2 Jul 2004 15:50:51.67	601.582
15	2 Jul 2004 17:18:06.30	2 Jul 2004 17:26:52.26	525.959
16	2 Jul 2004 18:57:08.07	2 Jul 2004 19:02:35.99	327.920
17	3 Jul 2004 03:08:01.88	3 Jul 2004 03:15:19.18	437.298
18	3 Jul 2004 04:43:57.65	3 Jul 2004 04:53:28.66	571.007
19	3 Jul 2004 06:19:58.20	3 Jul 2004 06:30:08.03	609.826
20	3 Jul 2004 07:55:50.32	3 Jul 2004 08:05:43.33	593.010
21	3 Jul 2004 09:31:23.83	3 Jul 2004 09:40:45.04	561.201
22	3 Jul 2004 11:06:33.51	3 Jul 2004 11:15:46.84	553.335

Global Statistics

Min Duration	16	2 Jul 2004 18:57:08.07	2 Jul 2004 19:02:35.99	327.920
Max Duration	19	3 Jul 2004 06:19:58.20	3 Jul 2004 06:30:08.03	609.826
Mean Duration				542.541
Total Duration				11935.898

ESM-To-Ekofisk

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 15:26:28.56	1 Jul 2004 15:34:17.09	468.532
2	1 Jul 2004 17:00:43.33	1 Jul 2004 17:10:39.34	596.009
3	1 Jul 2004 18:38:50.58	1 Jul 2004 18:45:30.39	399.805
4	2 Jul 2004 04:38:43.90	2 Jul 2004 04:44:18.54	334.644
5	2 Jul 2004 06:13:12.39	2 Jul 2004 06:23:05.58	593.192
6	2 Jul 2004 07:49:26.56	2 Jul 2004 07:57:43.96	497.400
7	2 Jul 2004 15:38:05.77	2 Jul 2004 15:46:25.75	499.980
8	2 Jul 2004 17:12:46.44	2 Jul 2004 17:22:39.16	592.715
9	2 Jul 2004 18:51:37.82	2 Jul 2004 18:57:04.99	327.172
10	3 Jul 2004 04:50:19.43	3 Jul 2004 04:57:04.62	405.191
11	3 Jul 2004 06:25:12.31	3 Jul 2004 06:35:08.39	596.083
12	3 Jul 2004 08:01:35.35	3 Jul 2004 08:09:20.86	465.514

Global Statistics

Min Duration	9	2 Jul 2004 18:51:37.82	2 Jul 2004 18:57:04.99	327.172
Max Duration	11	3 Jul 2004 06:25:12.31	3 Jul 2004 06:35:08.39	596.083
Mean Duration				481.353
Total Duration				5776.238

ESM-To-JanMayen

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 12:20:21.63	1 Jul 2004 12:28:27.40	485.767
2	1 Jul 2004 13:54:52.91	1 Jul 2004 14:03:26.58	513.665
3	1 Jul 2004 15:29:24.87	1 Jul 2004 15:39:01.42	576.559
4	1 Jul 2004 17:04:46.59	1 Jul 2004 17:14:54.51	607.914
5	1 Jul 2004 18:41:36.33	1 Jul 2004 18:50:48.52	552.196
6	1 Jul 2004 20:20:40.02	1 Jul 2004 20:26:11.70	331.687
7	2 Jul 2004 04:34:30.80	2 Jul 2004 04:39:36.25	305.451
8	2 Jul 2004 06:09:48.44	2 Jul 2004 06:18:52.60	544.162
9	2 Jul 2004 07:45:41.84	2 Jul 2004 07:55:49.32	607.489
10	2 Jul 2004 09:21:35.50	2 Jul 2004 09:31:15.75	580.250
11	2 Jul 2004 10:57:12.11	2 Jul 2004 11:05:49.55	517.436
12	2 Jul 2004 12:32:13.92	2 Jul 2004 12:40:19.39	485.465
13	2 Jul 2004 14:06:42.60	2 Jul 2004 14:15:23.60	520.999
14	2 Jul 2004 15:41:18.27	2 Jul 2004 15:51:01.75	583.480
15	2 Jul 2004 17:16:49.12	2 Jul 2004 17:26:55.89	606.764
16	2 Jul 2004 18:53:52.38	2 Jul 2004 19:02:48.62	536.240
17	2 Jul 2004 20:33:21.38	2 Jul 2004 20:38:00.13	278.745
18	3 Jul 2004 04:46:21.28	3 Jul 2004 04:52:14.72	353.440
19	3 Jul 2004 06:21:48.72	3 Jul 2004 06:31:07.69	558.968
20	3 Jul 2004 07:57:43.21	3 Jul 2004 08:07:51.19	607.977
21	3 Jul 2004 09:33:35.69	3 Jul 2004 09:43:08.77	573.073
22	3 Jul 2004 11:09:08.85	3 Jul 2004 11:17:39.23	510.380

Global Statistics

Min Duration	17	2 Jul 2004 20:33:21.38	2 Jul 2004 20:38:00.13	278.745
Max Duration	20	3 Jul 2004 07:57:43.21	3 Jul 2004 08:07:51.19	607.977
Mean Duration				510.823
Total Duration				11238.107

ESM-To-Lofoten

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 12:18:26.26	1 Jul 2004 12:25:58.28	452.024
2	1 Jul 2004 13:52:26.56	1 Jul 2004 14:01:34.98	548.425
3	1 Jul 2004 15:27:24.30	1 Jul 2004 15:37:29.63	605.334
4	1 Jul 2004 17:04:03.75	1 Jul 2004 17:13:20.22	556.469
5	1 Jul 2004 18:43:26.80	1 Jul 2004 18:48:20.79	293.991
6	2 Jul 2004 02:59:14.21	2 Jul 2004 03:02:32.10	197.889
7	2 Jul 2004 04:33:46.49	2 Jul 2004 04:42:41.91	535.419
8	2 Jul 2004 06:09:34.24	2 Jul 2004 06:19:40.46	606.217
9	2 Jul 2004 07:45:29.62	2 Jul 2004 07:54:51.10	561.489
10	2 Jul 2004 09:21:10.77	2 Jul 2004 09:28:56.47	465.698
11	2 Jul 2004 10:56:08.50	2 Jul 2004 11:02:59.06	410.560
12	2 Jul 2004 12:30:11.99	2 Jul 2004 12:37:55.23	463.239
13	2 Jul 2004 14:04:16.37	2 Jul 2004 14:13:35.66	559.295
14	2 Jul 2004 15:39:24.69	2 Jul 2004 15:49:30.94	606.245
15	2 Jul 2004 17:16:19.83	2 Jul 2004 17:25:19.24	539.412
16	2 Jul 2004 18:56:19.87	2 Jul 2004 18:59:58.05	218.177
17	3 Jul 2004 03:10:48.55	3 Jul 2004 03:15:28.52	279.967
18	3 Jul 2004 04:45:45.39	3 Jul 2004 04:54:58.50	553.107
19	3 Jul 2004 06:21:35.53	3 Jul 2004 06:31:41.20	605.667
20	3 Jul 2004 07:57:30.34	3 Jul 2004 08:06:41.13	550.791
21	3 Jul 2004 09:33:07.86	3 Jul 2004 09:40:42.21	454.344
22	3 Jul 2004 11:07:58.15	3 Jul 2004 11:14:49.50	411.344

Global Statistics

Min Duration	6	2 Jul 2004 02:59:14.21	2 Jul 2004 03:02:32.10	197.889
Max Duration	14	2 Jul 2004 15:39:24.69	2 Jul 2004 15:49:30.94	606.245
Mean Duration				476.141
Total Duration				10475.104

ESM-To-Spitzbergen

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 12:18:05.44	1 Jul 2004 12:28:07.02	601.578
2	1 Jul 2004 13:53:43.30	1 Jul 2004 14:03:54.47	611.170
3	1 Jul 2004 15:29:50.53	1 Jul 2004 15:39:55.19	604.660
4	1 Jul 2004 17:06:45.82	1 Jul 2004 17:16:05.70	559.881
5	1 Jul 2004 18:44:41.30	1 Jul 2004 18:52:22.12	460.816
6	1 Jul 2004 20:23:40.67	1 Jul 2004 20:28:39.96	299.292
7	2 Jul 2004 01:18:20.57	2 Jul 2004 01:22:52.07	271.500
8	2 Jul 2004 02:54:37.99	2 Jul 2004 03:02:00.18	442.189

9	2 Jul 2004 04:30:54.92	2 Jul 2004 04:40:04.53	549.614
10	2 Jul 2004 06:07:06.48	2 Jul 2004 06:17:07.65	601.167
11	2 Jul 2004 07:43:08.80	2 Jul 2004 07:53:20.57	611.769
12	2 Jul 2004 09:18:58.22	2 Jul 2004 09:29:01.23	603.012
13	2 Jul 2004 10:54:34.06	2 Jul 2004 11:04:30.81	596.754
14	2 Jul 2004 12:30:03.62	2 Jul 2004 12:40:06.48	602.865
15	2 Jul 2004 14:05:43.98	2 Jul 2004 14:15:55.71	611.725
16	2 Jul 2004 15:41:56.32	2 Jul 2004 15:51:57.87	601.550
17	2 Jul 2004 17:18:58.64	2 Jul 2004 17:28:09.33	550.687
18	2 Jul 2004 18:57:02.10	2 Jul 2004 19:04:26.20	444.100
19	2 Jul 2004 20:36:09.35	2 Jul 2004 20:40:43.68	274.324
20	3 Jul 2004 01:30:24.29	3 Jul 2004 01:35:20.83	296.543
21	3 Jul 2004 03:06:42.10	3 Jul 2004 03:14:21.09	458.990
22	3 Jul 2004 04:42:58.56	3 Jul 2004 04:52:17.45	558.893
23	3 Jul 2004 06:19:09.18	3 Jul 2004 06:29:13.52	604.341
24	3 Jul 2004 07:55:10.06	3 Jul 2004 08:05:21.31	611.246
25	3 Jul 2004 09:30:57.71	3 Jul 2004 09:40:59.43	601.720
26	3 Jul 2004 11:06:32.14	3 Jul 2004 11:16:29.00	596.855

Global Statistics

Min Duration	7	2 Jul 2004 01:18:20.57	2 Jul 2004 01:22:52.07	271.500
Max Duration	11	2 Jul 2004 07:43:08.80	2 Jul 2004 07:53:20.57	611.769
Mean Duration				524.125
Total Duration				13627.240

C.1.2 Direction Finding sensor pointing +90 degrees

24 Apr 2003 12:02:02

Satellite-NSAT-1-Sensor-ESM90-To-Target-BearIsland, Target-Ekofisk, Target-JanMayen, Target-Lofoten, Target-Spitzbergen: Access Summary Report

ESM90-To-BearIsland

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 17:10:12.66	1 Jul 2004 17:10:27.66	15.002
2	1 Jul 2004 18:47:18.35	1 Jul 2004 18:47:56.22	37.878
3	2 Jul 2004 02:59:07.21	2 Jul 2004 02:59:48.36	41.151
4	2 Jul 2004 17:22:14.78	2 Jul 2004 17:22:43.53	28.746
5	2 Jul 2004 18:59:34.61	2 Jul 2004 19:00:09.32	34.710
6	3 Jul 2004 03:11:19.59	3 Jul 2004 03:12:01.68	42.082

Global Statistics

Min Duration	1	1 Jul 2004 17:10:12.66	1 Jul 2004 17:10:27.66	15.002
Max Duration	6	3 Jul 2004 03:11:19.59	3 Jul 2004 03:12:01.68	42.082
Mean Duration				33.262
Total Duration				199.569

ESM90-To-Ekofisk

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 18:41:50.03	1 Jul 2004 18:42:30.56	40.532
2	2 Jul 2004 04:41:13.45	2 Jul 2004 04:41:49.29	35.835
3	2 Jul 2004 18:54:03.68	2 Jul 2004 18:54:38.84	35.157
4	3 Jul 2004 04:53:21.84	3 Jul 2004 04:54:02.61	40.771

Global Statistics

Min Duration	3	2 Jul 2004 18:54:03.68	2 Jul 2004 18:54:38.84	35.157
Max Duration	4	3 Jul 2004 04:53:21.84	3 Jul 2004 04:54:02.61	40.771
Mean Duration				38.074
Total Duration				152.295

ESM90-To-JanMayen

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 20:23:08.20	1 Jul 2004 20:23:43.35	35.147
2	2 Jul 2004 04:36:47.30	2 Jul 2004 04:37:19.91	32.610
3	2 Jul 2004 18:58:11.25	2 Jul 2004 18:58:29.43	18.181
4	2 Jul 2004 20:35:25.74	2 Jul 2004 20:35:55.64	29.897

	5	3 Jul 2004 04:48:59.55	3 Jul 2004 04:49:36.65	37.107

Global Statistics

Min Duration	3	2 Jul 2004 18:58:11.25	2 Jul 2004 18:58:29.43	18.181
Max Duration	5	3 Jul 2004 04:48:59.55	3 Jul 2004 04:49:36.65	37.107
Mean Duration				30.588
Total Duration				152.942

ESM90-To-Lofoten

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 18:45:37.95	1 Jul 2004 18:46:09.48	31.535
2	2 Jul 2004 03:00:42.51	2 Jul 2004 03:01:03.88	21.372
3	2 Jul 2004 04:38:06.03	2 Jul 2004 04:38:22.72	16.691
4	2 Jul 2004 17:20:44.94	2 Jul 2004 17:20:53.78	8.845
5	2 Jul 2004 18:57:57.13	2 Jul 2004 18:58:20.69	23.561
6	3 Jul 2004 03:12:53.56	3 Jul 2004 03:13:23.66	30.101

Global Statistics

Min Duration	4	2 Jul 2004 17:20:44.94	2 Jul 2004 17:20:53.78	8.845
Max Duration	1	1 Jul 2004 18:45:37.95	1 Jul 2004 18:46:09.48	31.535
Mean Duration				22.017
Total Duration				132.105

ESM90-To-Spitzbergen

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 18:48:10.56	1 Jul 2004 18:48:52.69	42.130
2	1 Jul 2004 20:25:54.37	1 Jul 2004 20:26:26.19	31.813
3	2 Jul 2004 01:20:21.86	2 Jul 2004 01:20:50.82	28.961
4	2 Jul 2004 02:57:58.05	2 Jul 2004 02:58:40.28	42.230
5	2 Jul 2004 19:00:22.95	2 Jul 2004 19:01:05.20	42.251
6	2 Jul 2004 20:38:11.86	2 Jul 2004 20:38:41.11	29.255
7	3 Jul 2004 01:32:36.83	3 Jul 2004 01:33:08.36	31.536
8	3 Jul 2004 03:10:10.59	3 Jul 2004 03:10:52.76	42.173

Global Statistics

Min Duration	3	2 Jul 2004 01:20:21.86	2 Jul 2004 01:20:50.82	28.961
Max Duration	5	2 Jul 2004 19:00:22.95	2 Jul 2004 19:01:05.20	42.251
Mean Duration				36.294
Total Duration				290.350

C.1.3 Direction Finding sensor pointing -90 degrees

24 Apr 2003 12:00:08

Satellite-NSAT-1-Sensor-ESM-90-To-Target-BearIsland, Target-Ekofisk, Target-JanMayen, Target-Lofoten, Target-Spitzbergen: Access Summary Report

ESM-90-To-BearIsland

No Access Found

ESM-90-To-Ekofisk

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 15:30:04.61	1 Jul 2004 15:30:41.19	36.586
2	2 Jul 2004 07:53:20.76	2 Jul 2004 07:53:49.62	28.857
3	2 Jul 2004 15:42:02.01	2 Jul 2004 15:42:29.65	27.639
4	3 Jul 2004 08:05:09.53	3 Jul 2004 08:05:46.53	37.008

Global Statistics

Min Duration	3	2 Jul 2004 15:42:02.01	2 Jul 2004 15:42:29.65	27.639
Max Duration	4	3 Jul 2004 08:05:09.53	3 Jul 2004 08:05:46.53	37.008
Mean Duration				32.522
Total Duration				130.089

ESM-90-To-JanMayen

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 12:24:06.59	1 Jul 2004 12:24:42.44	35.847
2	1 Jul 2004 13:58:56.48	1 Jul 2004 13:59:23.04	26.557
3	2 Jul 2004 11:01:18.70	2 Jul 2004 11:01:42.92	24.228
4	2 Jul 2004 12:35:58.70	2 Jul 2004 12:36:34.61	35.904
5	2 Jul 2004 14:10:52.35	2 Jul 2004 14:11:13.89	21.537
6	3 Jul 2004 11:13:09.89	3 Jul 2004 11:13:38.16	28.268

Global Statistics

Min Duration	5	2 Jul 2004 14:10:52.35	2 Jul 2004 14:11:13.89	21.537
Max Duration	4	2 Jul 2004 12:35:58.70	2 Jul 2004 12:36:34.61	35.904
Mean Duration				28.724
Total Duration				172.341

ESM-90-To-Lofoten

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 12:21:52.70	1 Jul 2004 12:22:31.88	39.174
2	2 Jul 2004 09:24:44.46	2 Jul 2004 09:25:22.73	38.278
3	2 Jul 2004 10:59:14.21	2 Jul 2004 10:59:53.33	39.120
4	2 Jul 2004 12:33:44.39	2 Jul 2004 12:34:22.88	38.488
5	3 Jul 2004 09:36:35.48	3 Jul 2004 09:37:14.55	39.065
6	3 Jul 2004 11:11:04.25	3 Jul 2004 11:11:43.40	39.147

Global Statistics

Min Duration	2	2 Jul 2004 09:24:44.46	2 Jul 2004 09:25:22.73	38.278
Max Duration	1	1 Jul 2004 12:21:52.70	1 Jul 2004 12:22:31.88	39.174
Mean Duration				38.879
Total Duration				233.272

ESM-90-To-Spitzbergen

No Access Found

C.2 AER report

C.2.1 Direction Finding sensor in dwelling mode

24 Apr 2003 12:24:57

Satellite-NSAT-1-Sensor-ESM-To-Target-BearIsland, Target-Ekofisk, Target-JanMayen, Target-Lofoten, Target-Spitzbergen: Inview Azimuth, Elevation, & Range

ESM-To-BearIsland

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 12:17:42.93	339.287	-25.000	2292.683728
1 Jul 2004 12:18:42.00	334.712	-26.519	1915.113799
1 Jul 2004 12:19:42.00	327.455	-29.475	1556.577009
1 Jul 2004 12:20:42.00	315.168	-34.351	1247.202536
1 Jul 2004 12:21:42.00	293.540	-40.308	1034.015655
1 Jul 2004 12:22:42.00	261.952	-42.302	982.892008
1 Jul 2004 12:23:42.00	234.138	-37.624	1116.527332
1 Jul 2004 12:24:42.00	217.433	-31.845	1381.898160
1 Jul 2004 12:25:42.00	207.890	-27.894	1718.203871
1 Jul 2004 12:26:42.00	202.043	-25.666	2090.418116
1 Jul 2004 12:27:13.31	199.847	-25.000	2292.683731

Min Elevation	1 Jul 2004 12:22:28.12	269.574	-42.523	977.654275
Max Elevation	1 Jul 2004 12:17:42.93	339.287	-25.000	2292.683728
Mean Elevation			-31.453	
Min Range	1 Jul 2004 12:22:28.12	269.574	-42.523	977.654275

Max Range	1 Jul 2004 12:27:13.31	199.847	-25.000	2292.683731
Mean Range				1602.565086

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:52:51.68	350.906	-25.000	2292.683737
1 Jul 2004 13:53:51.00	348.972	-26.670	1889.594742
1 Jul 2004 13:54:51.00	345.763	-30.229	1494.189144
1 Jul 2004 13:55:51.00	339.623	-37.329	1126.787204
1 Jul 2004 13:56:51.00	324.197	-50.763	828.154412
1 Jul 2004 13:57:51.00	271.508	-64.355	695.457283
1 Jul 2004 13:58:51.00	215.826	-51.746	814.833065
1 Jul 2004 13:59:51.00	199.365	-37.900	1107.205781
1 Jul 2004 14:00:51.00	192.944	-30.519	1472.092740
1 Jul 2004 14:01:51.00	189.622	-26.813	1866.364030
1 Jul 2004 14:02:51.00	187.610	-25.051	2273.535556
1 Jul 2004 14:02:53.80	187.535	-25.000	2292.683739

Min Elevation	1 Jul 2004 13:57:52.72	269.235	-64.373	695.344707
Max Elevation	1 Jul 2004 14:02:53.80	187.535	-25.000	2292.683739
Mean Elevation			-35.948	
Min Range	1 Jul 2004 13:57:52.72	269.235	-64.373	695.344707
Max Range	1 Jul 2004 14:02:53.80	187.535	-25.000	2292.683739
Mean Range				1512.798453

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 15:28:44.57	7.747	-25.000	2292.683729
1 Jul 2004 15:29:44.00	9.777	-26.657	1891.671460
1 Jul 2004 15:30:44.00	13.116	-30.164	1499.276937
1 Jul 2004 15:31:44.00	19.439	-37.102	1134.848462
1 Jul 2004 15:32:44.00	34.956	-50.059	838.181286
1 Jul 2004 15:33:44.00	85.153	-63.240	702.999933
1 Jul 2004 15:34:44.00	140.237	-51.761	814.635639
1 Jul 2004 15:35:44.00	157.612	-38.117	1099.986180
1 Jul 2004 15:36:44.00	164.440	-30.687	1459.716095
1 Jul 2004 15:37:44.00	167.967	-26.919	1849.861195
1 Jul 2004 15:38:44.00	170.095	-25.107	2253.439247
1 Jul 2004 15:38:49.78	170.256	-25.000	2292.683735

Min Elevation	1 Jul 2004 15:33:47.09	89.019	-63.291	702.643776
Max Elevation	1 Jul 2004 15:28:44.57	7.747	-25.000	2292.683729
Mean Elevation			-35.818	
Min Range	1 Jul 2004 15:33:47.09	89.020	-63.291	702.643776
Max Range	1 Jul 2004 15:38:49.78	170.256	-25.000	2292.683735
Mean Range				1510.831991

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 17:05:49.94	28.531	-25.000	2292.683735
1 Jul 2004 17:06:49.00	34.802	-26.304	1953.965429
1 Jul 2004 17:07:49.00	44.105	-28.530	1647.120083
1 Jul 2004 17:08:49.00	57.928	-31.496	1404.133695
1 Jul 2004 17:09:49.00	77.323	-34.006	1263.580302
1 Jul 2004 17:10:49.00	99.745	-34.065	1260.748152
1 Jul 2004 17:11:49.00	119.330	-31.615	1396.404624
1 Jul 2004 17:12:49.00	133.348	-28.638	1635.931490
1 Jul 2004 17:13:49.00	142.781	-26.377	1940.408078
1 Jul 2004 17:14:49.00	149.211	-25.026	2282.954165
1 Jul 2004 17:14:50.64	149.357	-25.000	2292.683732

Min Elevation	1 Jul 2004 17:10:20.16	88.959	-34.425	1243.781115
Max Elevation	1 Jul 2004 17:05:49.94	28.531	-25.000	2292.683735
Mean Elevation			-28.732	
Min Range	1 Jul 2004 17:10:20.16	88.956	-34.425	1243.781116
Max Range	1 Jul 2004 17:05:49.94	28.531	-25.000	2292.683735
Mean Range				1760.964862

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:44:35.70	54.275	-25.000	2292.683716
1 Jul 2004 18:45:35.00	63.922	-25.662	2091.434939
1 Jul 2004 18:46:35.00	75.598	-26.287	1957.188421
1 Jul 2004 18:47:35.00	88.567	-26.561	1907.937400
1 Jul 2004 18:48:35.00	101.584	-26.324	1950.260777
1 Jul 2004 18:49:35.00	113.378	-25.716	2078.340707
1 Jul 2004 18:50:35.00	123.264	-25.041	2277.225040
1 Jul 2004 18:50:39.03	123.856	-25.000	2292.683726

Min Elevation	1 Jul 2004 18:47:37.30	89.075	-26.561	1907.869937

Max Elevation	1 Jul 2004 18:44:35.70	54.275	-25.000	2292.683716
Mean Elevation			-25.699	
Min Range	1 Jul 2004 18:47:37.29	89.072	-26.561	1907.869934
Max Range	1 Jul 2004 18:50:39.03	123.856	-25.000	2292.683726
Mean Range			2105.969340	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:56:02.24	50.539	-25.000	2292.683745
2 Jul 2004 02:57:02.00	59.717	-25.814	2055.169368
2 Jul 2004 02:58:02.00	71.265	-26.723	1880.888009
2 Jul 2004 02:59:02.00	84.814	-27.327	1790.664112
2 Jul 2004 03:00:02.00	99.107	-27.277	1797.663076
2 Jul 2004 03:01:02.00	112.440	-26.602	1900.858022
2 Jul 2004 03:02:02.00	123.675	-25.685	2085.708661
2 Jul 2004 03:02:53.13	131.406	-25.000	2292.683738

Min Elevation	2 Jul 2004 02:59:27.78	90.965	-27.395	1781.448549
Max Elevation	2 Jul 2004 03:02:53.13	131.406	-25.000	2292.683738
Mean Elevation			-26.179	
Min Range	2 Jul 2004 02:59:27.79	90.968	-27.395	1781.448551
Max Range	2 Jul 2004 02:56:02.24	50.539	-25.000	2292.683745
Mean Range			2012.039841	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 04:31:55.72	26.278	-25.000	2292.683742
2 Jul 2004 04:32:55.00	31.752	-26.401	1936.071162
2 Jul 2004 04:33:55.00	40.098	-28.941	1605.840294
2 Jul 2004 04:34:55.00	53.237	-32.698	1331.596170
2 Jul 2004 04:35:55.00	73.520	-36.539	1155.530854
2 Jul 2004 04:36:55.00	99.341	-37.361	1125.649949
2 Jul 2004 04:37:55.00	122.298	-34.235	1252.658506
2 Jul 2004 04:38:55.00	137.862	-30.196	1496.790540
2 Jul 2004 04:39:55.00	147.704	-27.185	1810.565680
2 Jul 2004 04:40:55.00	154.114	-25.393	2162.932449
2 Jul 2004 04:41:16.12	155.840	-25.000	2292.683730

Min Elevation	2 Jul 2004 04:36:36.05	91.043	-37.599	1117.411506
Max Elevation	2 Jul 2004 04:31:55.72	26.278	-25.000	2292.683742
Mean Elevation			-29.904	
Min Range	2 Jul 2004 04:36:36.05	91.043	-37.599	1117.411506
Max Range	2 Jul 2004 04:31:55.72	26.278	-25.000	2292.683742
Mean Range			1678.454825	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 06:07:56.56	6.057	-25.000	2292.683743
2 Jul 2004 06:08:56.00	7.234	-26.681	1887.639283
2 Jul 2004 06:09:56.00	9.194	-30.294	1489.165088
2 Jul 2004 06:10:56.00	13.001	-37.671	1114.946057
2 Jul 2004 06:11:56.00	23.215	-52.713	802.450530
2 Jul 2004 06:12:56.00	80.268	-73.246	650.187353
2 Jul 2004 06:13:56.00	155.126	-56.296	761.973067
2 Jul 2004 06:14:56.00	167.896	-39.506	1056.849707
2 Jul 2004 06:15:56.00	172.261	-31.187	1424.617433
2 Jul 2004 06:16:56.00	174.431	-27.115	1820.606501
2 Jul 2004 06:17:56.00	175.722	-25.179	2228.620480
2 Jul 2004 06:18:05.34	175.877	-25.000	2292.683740

Min Elevation	2 Jul 2004 06:13:01.02	90.949	-73.518	649.167466
Max Elevation	2 Jul 2004 06:07:56.56	6.057	-25.000	2292.683743
Mean Elevation			-37.491	
Min Range	2 Jul 2004 06:13:01.02	90.950	-73.518	649.167466
Max Range	2 Jul 2004 06:07:56.56	6.057	-25.000	2292.683743
Mean Range			1485.201915	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 07:43:50.31	349.599	-25.000	2292.683741
2 Jul 2004 07:44:50.00	346.993	-26.662	1890.938513
2 Jul 2004 07:45:50.00	342.729	-30.134	1501.665467
2 Jul 2004 07:46:50.00	334.747	-36.836	1144.496015
2 Jul 2004 07:47:50.00	316.220	-48.445	862.770467
2 Jul 2004 07:48:50.00	269.453	-57.615	748.980283
2 Jul 2004 07:49:50.00	223.993	-47.875	872.055779
2 Jul 2004 07:50:50.00	206.202	-36.461	1158.473199
2 Jul 2004 07:51:50.00	198.462	-29.935	1517.633867
2 Jul 2004 07:52:50.00	194.302	-26.561	1907.825990
2 Jul 2004 07:53:47.14	191.840	-25.000	2292.683732

Min Elevation	2 Jul 2004 07:48:48.74	270.707	-57.621	748.923721
Max Elevation	2 Jul 2004 07:53:47.14	191.840	-25.000	2292.683732
Mean Elevation			-35.502	
Min Range	2 Jul 2004 07:48:48.73	270.710	-57.621	748.923721
Max Range	2 Jul 2004 07:43:50.31	349.599	-25.000	2292.683741
Mean Range			1471.837005	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 09:19:26.64	338.523	-25.000	2292.683723
2 Jul 2004 09:20:26.00	333.590	-26.503	1917.895946
2 Jul 2004 09:21:26.00	325.864	-29.365	1566.386169
2 Jul 2004 09:22:26.00	313.039	-33.926	1267.452052
2 Jul 2004 09:23:26.00	291.416	-39.132	1067.995974
2 Jul 2004 09:24:26.00	261.614	-40.504	1028.654511
2 Jul 2004 09:25:26.00	235.673	-36.267	1165.903647
2 Jul 2004 09:26:26.00	219.528	-31.118	1429.300519
2 Jul 2004 09:27:26.00	209.996	-27.540	1762.342502
2 Jul 2004 09:28:26.00	204.038	-25.506	2131.559667
2 Jul 2004 09:28:51.16	202.187	-25.000	2292.683736

Min Elevation	2 Jul 2004 09:24:08.89	270.349	-40.787	1021.043411
Max Elevation	2 Jul 2004 09:28:51.16	202.187	-25.000	2292.683736
Mean Elevation			-30.897	
Min Range	2 Jul 2004 09:24:08.89	270.350	-40.787	1021.043411
Max Range	2 Jul 2004 09:28:51.16	202.187	-25.000	2292.683736
Mean Range			1629.350768	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 10:54:39.11	335.135	-25.000	2292.683725
2 Jul 2004 10:55:39.00	329.540	-26.466	1924.466326
2 Jul 2004 10:56:39.00	320.988	-29.132	1587.610545
2 Jul 2004 10:57:39.00	307.329	-33.097	1309.788041
2 Jul 2004 10:58:39.00	286.013	-37.049	1136.749154
2 Jul 2004 10:59:39.00	259.223	-37.550	1119.070594
2 Jul 2004 11:00:39.00	236.279	-34.011	1263.361413
2 Jul 2004 11:01:39.00	221.201	-29.860	1523.807628
2 Jul 2004 11:02:39.00	211.802	-26.910	1851.182289
2 Jul 2004 11:03:39.00	205.710	-25.221	2214.931276
2 Jul 2004 11:03:51.36	204.726	-25.000	2292.683736

Min Elevation	2 Jul 2004 10:59:15.23	269.932	-37.950	1105.532971
Max Elevation	2 Jul 2004 11:03:51.36	204.726	-25.000	2292.683736
Mean Elevation			-29.936	
Min Range	2 Jul 2004 10:59:15.23	269.932	-37.950	1105.532971
Max Range	2 Jul 2004 11:03:51.36	204.726	-25.000	2292.683736
Mean Range			1683.303157	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 12:29:37.06	340.383	-25.000	2292.683724
2 Jul 2004 12:30:37.00	335.973	-26.569	1906.472277
2 Jul 2004 12:31:37.00	329.009	-29.624	1543.627541
2 Jul 2004 12:32:37.00	317.034	-34.771	1228.054912
2 Jul 2004 12:33:37.00	295.260	-41.318	1007.195685
2 Jul 2004 12:34:37.00	262.137	-43.718	950.741559
2 Jul 2004 12:35:37.00	232.994	-38.586	1084.897321
2 Jul 2004 12:36:37.00	216.077	-32.312	1353.712345
2 Jul 2004 12:37:37.00	206.659	-28.106	1693.418785
2 Jul 2004 12:38:37.00	200.970	-25.758	2068.307265
2 Jul 2004 12:39:11.50	198.653	-25.000	2292.683733

Min Elevation	2 Jul 2004 12:34:24.28	269.526	-43.930	946.197795
Max Elevation	2 Jul 2004 12:39:11.50	198.653	-25.000	2292.683733
Mean Elevation			-31.887	
Min Range	2 Jul 2004 12:34:24.28	269.526	-43.930	946.197795
Max Range	2 Jul 2004 12:39:11.50	198.653	-25.000	2292.683733
Mean Range			1583.799559	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:04:49.54	352.769	-25.000	2292.683734
2 Jul 2004 14:05:49.00	351.271	-26.687	1886.808072
2 Jul 2004 14:06:49.00	348.777	-30.304	1488.418713
2 Jul 2004 14:07:49.00	343.948	-37.641	1115.947312
2 Jul 2004 14:08:49.00	331.221	-52.217	808.722902
2 Jul 2004 14:09:49.00	274.297	-69.496	666.320029
2 Jul 2004 14:10:49.00	209.602	-54.180	784.889604

	2 Jul 2004 14:11:49.00	195.183	-38.696	1081.414367
	2 Jul 2004 14:12:49.00	189.953	-30.826	1449.748514
	2 Jul 2004 14:13:49.00	187.305	-26.942	1846.329278
	2 Jul 2004 14:14:49.00	185.716	-25.102	2255.053217
	2 Jul 2004 14:14:54.48	185.602	-25.000	2292.683738
Min Elevation	2 Jul 2004 14:09:51.98	269.200	-69.570	665.965708
Max Elevation	2 Jul 2004 14:04:49.54	352.769	-25.000	2292.683734
Mean Elevation			-36.841	
Min Range	2 Jul 2004 14:09:51.98	269.200	-69.570	665.965708
Max Range	2 Jul 2004 14:14:54.48	185.602	-25.000	2292.683738
Mean Range			1497.418290	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 15:40:50.09	10.144	-25.000	2292.683735
2 Jul 2004 15:41:50.00	12.745	-26.653	1892.432190
2 Jul 2004 15:42:50.00	16.968	-30.080	1505.988997
2 Jul 2004 15:43:50.00	24.816	-36.662	1150.938408
2 Jul 2004 15:44:50.00	42.809	-48.061	868.996633
2 Jul 2004 15:45:50.00	88.229	-57.558	749.521727
2 Jul 2004 15:46:50.00	134.441	-48.414	863.267403
2 Jul 2004 15:47:50.00	152.885	-36.899	1142.182699
2 Jul 2004 15:48:50.00	160.874	-30.209	1495.766410
2 Jul 2004 15:49:50.00	165.147	-26.720	1881.311110
2 Jul 2004 15:50:50.00	167.767	-25.030	2281.435388
2 Jul 2004 15:50:51.67	167.825	-25.000	2292.683737

Min Elevation	2 Jul 2004 15:45:50.79	89.003	-57.561	749.500106
Max Elevation	2 Jul 2004 15:50:51.67	167.825	-25.000	2292.683737
Mean Elevation			-34.690	
Min Range	2 Jul 2004 15:45:50.79	89.003	-57.561	749.500106
Max Range	2 Jul 2004 15:50:51.67	167.825	-25.000	2292.683737
Mean Range			1534.767370	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 17:18:06.30	31.415	-25.000	2292.683739
2 Jul 2004 17:19:06.00	38.266	-26.255	1963.151409
2 Jul 2004 17:20:06.00	48.133	-28.280	1673.856222
2 Jul 2004 17:21:06.00	62.253	-30.776	1453.314795
2 Jul 2004 17:22:06.00	80.978	-32.602	1337.015280
2 Jul 2004 17:23:06.00	101.539	-32.332	1352.544367
2 Jul 2004 17:24:06.00	119.308	-30.210	1495.663279
2 Jul 2004 17:25:06.00	132.347	-27.759	1734.519412
2 Jul 2004 17:26:06.00	141.408	-25.905	2034.833761
2 Jul 2004 17:26:52.26	146.483	-25.000	2292.683737

Min Elevation	2 Jul 2004 17:22:29.16	88.963	-32.785	1326.768796
Max Elevation	2 Jul 2004 17:18:06.30	31.415	-25.000	2292.683739
Mean Elevation			-28.412	
Min Range	2 Jul 2004 17:22:29.16	88.963	-32.785	1326.768796
Max Range	2 Jul 2004 17:18:06.30	31.415	-25.000	2292.683739
Mean Range			1763.026600	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:57:08.07	58.213	-25.000	2292.683737
2 Jul 2004 18:58:08.00	68.267	-25.568	2115.186123
2 Jul 2004 18:59:08.00	79.944	-26.020	2010.118235
2 Jul 2004 19:00:08.00	92.462	-26.120	1989.641571
2 Jul 2004 19:01:08.00	104.654	-25.809	2056.297087
2 Jul 2004 19:02:08.00	115.514	-25.263	2201.868944
2 Jul 2004 19:02:35.99	119.975	-25.000	2292.683724

Min Elevation	2 Jul 2004 18:59:51.97	89.098	-26.136	1986.482517
Max Elevation	2 Jul 2004 18:57:08.07	58.213	-25.000	2292.683737
Mean Elevation			-25.540	
Min Range	2 Jul 2004 18:59:51.94	89.092	-26.136	1986.482528
Max Range	2 Jul 2004 18:57:08.07	58.213	-25.000	2292.683737
Mean Range			2136.925632	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 03:08:01.88	47.168	-25.000	2292.683745
3 Jul 2004 03:09:01.00	55.862	-25.893	2037.477764
3 Jul 2004 03:10:01.00	67.215	-26.994	1838.413732
3 Jul 2004 03:11:01.00	81.030	-27.865	1721.690196
3 Jul 2004 03:12:01.00	96.141	-28.006	1704.897819
3 Jul 2004 03:13:01.00	110.565	-27.325	1790.994077

	3 Jul 2004 03:14:01.00	122.775	-26.239	1966.263184
	3 Jul 2004 03:15:01.00	132.380	-25.240	2209.028032
	3 Jul 2004 03:15:19.18	134.819	-25.000	2292.683728
Min Elevation	3 Jul 2004 03:11:40.63	90.984	-28.059	1698.825713
Max Elevation	3 Jul 2004 03:15:19.18	134.819	-25.000	2292.683728
Mean Elevation			-26.396	
Min Range	3 Jul 2004 03:11:40.60	90.975	-28.059	1698.825731
Max Range	3 Jul 2004 03:08:01.88	47.168	-25.000	2292.683745
Mean Range			1983.792475	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:43:57.65	23.560	-25.000	2292.683746
3 Jul 2004 04:44:57.00	28.515	-26.457	1926.065081
3 Jul 2004 04:45:57.00	36.192	-29.189	1582.401202
3 Jul 2004 04:46:57.00	48.714	-33.481	1289.708094
3 Jul 2004 04:47:57.00	69.370	-38.376	1091.573467
3 Jul 2004 04:48:57.00	97.766	-39.938	1044.384785
3 Jul 2004 04:49:57.00	123.366	-36.242	1166.871685
3 Jul 2004 04:50:57.00	139.912	-31.326	1415.320802
3 Jul 2004 04:51:57.00	149.869	-27.749	1735.756861
3 Jul 2004 04:52:57.00	156.142	-25.650	2094.437647
3 Jul 2004 04:53:28.66	158.553	-25.000	2292.683723

Min Elevation	3 Jul 2004 04:48:43.27	91.040	-40.103	1039.716332
Max Elevation	3 Jul 2004 04:53:28.66	158.553	-25.000	2292.683723
Mean Elevation			-30.764	
Min Range	3 Jul 2004 04:48:43.27	91.040	-40.103	1039.716332
Max Range	3 Jul 2004 04:43:57.65	23.560	-25.000	2292.683746
Mean Range			1630.171554	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 06:19:58.20	3.772	-25.000	2292.683745
3 Jul 2004 06:20:58.00	4.429	-26.706	1883.538644
3 Jul 2004 06:21:58.00	5.525	-30.378	1482.736613
3 Jul 2004 06:22:58.00	7.677	-37.965	1105.026849
3 Jul 2004 06:23:58.00	13.698	-53.978	787.224637
3 Jul 2004 06:24:58.00	71.593	-80.091	630.149359
3 Jul 2004 06:25:58.00	165.852	-58.097	744.462497
3 Jul 2004 06:26:58.00	173.585	-39.941	1044.292630
3 Jul 2004 06:27:58.00	176.076	-31.322	1415.572828
3 Jul 2004 06:28:58.00	177.298	-27.162	1813.917177
3 Jul 2004 06:29:58.00	178.023	-25.195	2223.615541
3 Jul 2004 06:30:08.03	178.117	-25.000	2292.683737

Min Elevation	3 Jul 2004 06:25:03.18	90.922	-80.638	629.025748
Max Elevation	3 Jul 2004 06:19:58.20	3.772	-25.000	2292.683745
Mean Elevation			-38.403	
Min Range	3 Jul 2004 06:25:03.18	90.927	-80.638	629.025748
Max Range	3 Jul 2004 06:19:58.20	3.772	-25.000	2292.683745
Mean Range			1476.325355	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:55:50.32	347.873	-25.000	2292.683735
3 Jul 2004 07:56:50.00	344.882	-26.644	1893.829242
3 Jul 2004 07:57:50.00	340.016	-30.042	1508.966317
3 Jul 2004 07:58:50.00	331.045	-36.448	1158.996279
3 Jul 2004 07:59:50.00	311.272	-46.908	888.552573
3 Jul 2004 08:00:50.00	267.935	-54.064	786.226252
3 Jul 2004 08:01:50.00	227.062	-45.679	910.992455
3 Jul 2004 08:02:50.00	209.020	-35.582	1193.268464
3 Jul 2004 08:03:50.00	200.680	-29.569	1548.399288
3 Jul 2004 08:04:50.00	196.086	-26.403	1935.628019
3 Jul 2004 08:05:43.33	193.487	-25.000	2292.683728

Min Elevation	3 Jul 2004 08:00:46.84	270.668	-54.094	785.887555
Max Elevation	3 Jul 2004 07:55:50.32	347.873	-25.000	2292.683735
Mean Elevation			-34.667	
Min Range	3 Jul 2004 08:00:46.84	270.668	-54.094	785.887555
Max Range	3 Jul 2004 07:55:50.32	347.873	-25.000	2292.683735
Mean Range			1491.838759	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 09:31:23.83	337.636	-25.000	2292.683724
3 Jul 2004 09:32:23.00	332.551	-26.482	1921.691777
3 Jul 2004 09:33:23.00	324.606	-29.281	1573.930143

	3 Jul 2004 09:34:23.00	311.560	-33.665	1280.375551
	3 Jul 2004 09:35:23.00	290.044	-38.501	1087.593953
	3 Jul 2004 09:36:23.00	261.157	-39.623	1053.440078
	3 Jul 2004 09:37:23.00	236.080	-35.618	1191.763186
	3 Jul 2004 09:38:23.00	220.191	-30.771	1453.681674
	3 Jul 2004 09:39:23.00	210.655	-27.371	1784.763699
	3 Jul 2004 09:40:23.00	204.634	-25.430	2152.252732
	3 Jul 2004 09:40:45.04	202.971	-25.000	2292.683730
Min Elevation	3 Jul 2004 09:36:04.43	270.299	-39.928	1044.677309
Max Elevation	3 Jul 2004 09:40:45.04	202.971	-25.000	2292.683730
Mean Elevation			-30.613	
Min Range	3 Jul 2004 09:36:04.43	270.299	-39.928	1044.677309
Max Range	3 Jul 2004 09:40:45.04	202.971	-25.000	2292.683730
Mean Range			1644.078204	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:06:33.51	335.331	-25.000	2292.683723
3 Jul 2004 11:07:33.00	329.832	-26.457	1925.981990
3 Jul 2004 11:08:33.00	321.370	-29.133	1587.583055
3 Jul 2004 11:09:33.00	307.811	-33.141	1307.464868
3 Jul 2004 11:10:33.00	286.507	-37.198	1131.407420
3 Jul 2004 11:11:33.00	259.490	-37.789	1110.924250
3 Jul 2004 11:12:33.00	236.272	-34.212	1253.745773
3 Jul 2004 11:13:33.00	221.062	-29.981	1513.865907
3 Jul 2004 11:14:33.00	211.620	-26.975	1841.398803
3 Jul 2004 11:15:33.00	205.520	-25.251	2205.440008
3 Jul 2004 11:15:46.84	204.423	-25.000	2292.683733

Min Elevation	3 Jul 2004 11:11:10.18	269.879	-38.167	1098.355924
Max Elevation	3 Jul 2004 11:15:46.84	204.423	-25.000	2292.683733
Mean Elevation			-30.012	
Min Range	3 Jul 2004 11:11:10.18	269.879	-38.167	1098.355924
Max Range	3 Jul 2004 11:15:46.84	204.423	-25.000	2292.683733
Mean Range			1678.470866	

Global Statistics

Min Elevation	3 Jul 2004 06:25:03.18	90.922	-80.638	629.025748
Max Elevation	2 Jul 2004 07:53:47.14	191.840	-25.000	2292.683732
Mean Elevation			-32.059	
Min Range	3 Jul 2004 06:25:03.18	90.927	-80.638	629.025748
Max Range	3 Jul 2004 04:43:57.65	23.560	-25.000	2292.683746
Mean Range			1651.056395	

ESM-To-Ekofisk

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 15:26:28.56	319.904	-25.000	2245.345979
1 Jul 2004 15:27:28.00	311.735	-26.230	1939.453949
1 Jul 2004 15:28:28.00	300.272	-27.994	1685.919631
1 Jul 2004 15:29:28.00	284.919	-29.739	1517.283632
1 Jul 2004 15:30:28.00	266.647	-30.418	1464.070816
1 Jul 2004 15:31:28.00	248.684	-29.486	1538.588043
1 Jul 2004 15:32:28.00	233.977	-27.671	1724.117536
1 Jul 2004 15:33:28.00	223.113	-25.974	1989.218143
1 Jul 2004 15:34:17.09	216.544	-25.000	2245.345985

Min Elevation	1 Jul 2004 15:30:22.89	268.244	-30.425	1463.597864
Max Elevation	1 Jul 2004 15:34:17.09	216.544	-25.000	2245.345985
Mean Elevation			-27.501	
Min Range	1 Jul 2004 15:30:22.85	268.257	-30.425	1463.597899
Max Range	1 Jul 2004 15:34:17.09	216.544	-25.000	2245.345985
Mean Range			1816.593746	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 17:00:43.33	0.164	-25.000	2245.345984
1 Jul 2004 17:01:43.00	0.727	-26.847	1836.318619
1 Jul 2004 17:02:43.00	1.665	-30.813	1435.563855
1 Jul 2004 17:03:43.00	3.544	-39.077	1060.024739
1 Jul 2004 17:04:43.00	9.206	-56.732	751.243203
1 Jul 2004 17:05:43.00	96.623	-82.450	620.666694
1 Jul 2004 17:06:43.00	167.273	-55.290	766.052654
1 Jul 2004 17:07:43.00	172.456	-38.403	1080.812501
1 Jul 2004 17:08:43.00	174.231	-30.497	1458.255742
1 Jul 2004 17:09:43.00	175.116	-26.698	1859.463055

	1 Jul 2004 17:10:39.34	175.614	-25.000	2245.345982
Min Elevation	1 Jul 2004 17:05:41.22	87.927	-82.536	620.532322
Max Elevation	1 Jul 2004 17:00:43.33	0.164	-25.000	2245.345984
Mean Elevation			-39.710	
Min Range	1 Jul 2004 17:05:41.22	87.926	-82.536	620.532322
Max Range	1 Jul 2004 17:00:43.33	0.164	-25.000	2245.345984
Mean Range			1396.281184	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:38:50.58	47.439	-25.000	2245.345991
1 Jul 2004 18:39:50.00	56.882	-25.880	2008.740833
1 Jul 2004 18:40:50.00	68.860	-26.844	1836.838448
1 Jul 2004 18:41:50.00	82.881	-27.444	1752.761447
1 Jul 2004 18:42:50.00	97.522	-27.318	1769.267597
1 Jul 2004 18:43:50.00	110.969	-26.550	1883.492594
1 Jul 2004 18:44:50.00	122.121	-25.572	2078.831449
1 Jul 2004 18:45:30.39	128.248	-25.000	2245.345981

Min Elevation	1 Jul 2004 18:42:10.30	87.860	-27.490	1746.872523
Max Elevation	1 Jul 2004 18:38:50.58	47.439	-25.000	2245.345991
Mean Elevation			-26.201	
Min Range	1 Jul 2004 18:42:10.34	87.869	-27.490	1746.872542
Max Range	1 Jul 2004 18:38:50.58	47.439	-25.000	2245.345991
Mean Range			1977.578043	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 04:38:43.90	59.520	-25.000	2245.345985
2 Jul 2004 04:39:43.00	69.568	-25.655	2059.071109
2 Jul 2004 04:40:43.00	81.603	-26.211	1943.125008
2 Jul 2004 04:41:43.00	94.695	-26.366	1914.893837
2 Jul 2004 04:42:43.00	107.528	-26.028	1978.412595
2 Jul 2004 04:43:43.00	118.929	-25.391	2125.377354
2 Jul 2004 04:44:18.54	124.764	-25.000	2245.345977

Min Elevation	2 Jul 2004 04:41:31.36	92.131	-26.376	1913.141835
Max Elevation	2 Jul 2004 04:44:18.54	124.764	-25.000	2245.345977
Mean Elevation			-25.664	
Min Range	2 Jul 2004 04:41:31.32	92.122	-26.376	1913.141854
Max Range	2 Jul 2004 04:38:43.90	59.520	-25.000	2245.345985
Mean Range			2073.081695	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 06:13:12.39	9.093	-25.000	2245.345995
2 Jul 2004 06:14:12.00	10.749	-26.815	1841.183097
2 Jul 2004 06:15:12.00	13.536	-30.659	1446.504961
2 Jul 2004 06:16:12.00	19.040	-38.427	1080.047845
2 Jul 2004 06:17:12.00	34.023	-53.583	785.193170
2 Jul 2004 06:18:12.00	96.718	-68.240	667.107183
2 Jul 2004 06:19:12.00	152.583	-51.737	808.065333
2 Jul 2004 06:20:12.00	165.913	-37.416	1113.402490
2 Jul 2004 06:21:12.00	171.031	-30.153	1484.187520
2 Jul 2004 06:22:12.00	173.690	-26.564	1881.085948
2 Jul 2004 06:23:05.58	175.169	-25.000	2245.345996

Min Elevation	2 Jul 2004 06:18:09.12	92.094	-68.303	666.780163
Max Elevation	2 Jul 2004 06:13:12.39	9.093	-25.000	2245.345995
Mean Elevation			-37.599	
Min Range	2 Jul 2004 06:18:09.12	92.094	-68.303	666.780163
Max Range	2 Jul 2004 06:23:05.58	175.169	-25.000	2245.345996
Mean Range			1417.951776	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 07:49:26.56	328.353	-25.000	2245.345980
2 Jul 2004 07:50:26.00	320.974	-26.362	1915.618917
2 Jul 2004 07:51:26.00	310.220	-28.508	1630.345214
2 Jul 2004 07:52:26.00	294.863	-30.990	1423.315277
2 Jul 2004 07:53:26.00	275.046	-32.446	1332.530487
2 Jul 2004 07:54:26.00	254.449	-31.627	1381.455432
2 Jul 2004 07:55:26.00	237.580	-29.278	1556.742819
2 Jul 2004 07:56:26.00	225.550	-26.945	1821.626075
2 Jul 2004 07:57:26.00	217.257	-25.330	2142.187240
2 Jul 2004 07:57:43.96	215.304	-25.000	2245.345985

Min Elevation	2 Jul 2004 07:53:35.20	271.806	-32.476	1330.840694
Max Elevation	2 Jul 2004 07:57:43.96	215.304	-25.000	2245.345985

Mean Elevation			-28.149	
Min Range	2 Jul 2004 07:53:35.20	271.806	-32.476	1330.840694
Max Range	2 Jul 2004 07:57:43.96	215.304	-25.000	2245.345985
Mean Range			1769.451343	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 15:38:05.77	325.155	-25.000	2245.345995
2 Jul 2004 15:39:05.00	317.916	-26.366	1914.913032
2 Jul 2004 15:40:05.00	307.285	-28.544	1626.633542
2 Jul 2004 15:41:05.00	291.989	-31.104	1415.523276
2 Jul 2004 15:42:05.00	272.051	-32.665	1320.287509
2 Jul 2004 15:43:05.00	251.153	-31.879	1365.861255
2 Jul 2004 15:44:05.00	234.006	-29.473	1539.661694
2 Jul 2004 15:45:05.00	221.814	-27.064	1804.444593
2 Jul 2004 15:46:05.00	213.436	-25.390	2125.608011
2 Jul 2004 15:46:25.75	211.178	-25.000	2245.345980

Min Elevation	2 Jul 2004 15:42:15.83	268.190	-32.707	1317.922944
Max Elevation	2 Jul 2004 15:38:05.77	325.155	-25.000	2245.345995
Mean Elevation			-28.249	
Min Range	2 Jul 2004 15:42:15.83	268.190	-32.707	1317.922944
Max Range	2 Jul 2004 15:38:05.77	325.155	-25.000	2245.345995
Mean Range			1760.362489	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 17:12:46.44	5.289	-25.000	2245.345982
2 Jul 2004 17:13:46.00	7.082	-26.814	1841.416151
2 Jul 2004 17:14:46.00	10.076	-30.651	1447.065475
2 Jul 2004 17:15:46.00	15.946	-38.375	1081.695410
2 Jul 2004 17:16:46.00	31.707	-53.249	789.155249
2 Jul 2004 17:17:46.00	92.946	-66.965	673.967861
2 Jul 2004 17:18:46.00	146.978	-51.179	815.454843
2 Jul 2004 17:19:46.00	160.759	-37.234	1119.749776
2 Jul 2004 17:20:46.00	166.125	-30.087	1489.328756
2 Jul 2004 17:21:46.00	168.914	-26.540	1885.043066
2 Jul 2004 17:22:39.16	170.446	-25.000	2245.345982

Min Elevation	2 Jul 2004 17:17:42.65	87.904	-67.044	673.530275
Max Elevation	2 Jul 2004 17:22:39.16	170.446	-25.000	2245.345982
Mean Elevation			-37.372	
Min Range	2 Jul 2004 17:17:42.65	87.904	-67.044	673.530275
Max Range	2 Jul 2004 17:22:39.16	170.446	-25.000	2245.345982
Mean Range			1421.233505	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:51:37.82	56.076	-25.000	2245.345981
2 Jul 2004 18:52:37.00	66.243	-25.634	2063.912791
2 Jul 2004 18:53:37.00	78.303	-26.151	1954.288288
2 Jul 2004 18:54:37.00	91.297	-26.268	1932.501502
2 Jul 2004 18:55:37.00	103.929	-25.915	2001.351605
2 Jul 2004 18:56:37.00	115.093	-25.296	2151.745545
2 Jul 2004 18:57:04.99	119.643	-25.000	2245.345996

Min Elevation	2 Jul 2004 18:54:21.27	87.870	-26.286	1929.336365
Max Elevation	2 Jul 2004 18:51:37.82	56.076	-25.000	2245.345981
Mean Elevation			-25.609	
Min Range	2 Jul 2004 18:54:21.24	87.864	-26.286	1929.336377
Max Range	2 Jul 2004 18:57:04.99	119.643	-25.000	2245.345996
Mean Range			2084.927387	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:50:19.43	51.064	-25.000	2245.345983
3 Jul 2004 04:51:19.00	60.409	-25.900	2004.699016
3 Jul 2004 04:52:19.00	72.321	-26.902	1828.075194
3 Jul 2004 04:53:19.00	86.390	-27.555	1738.620499
3 Jul 2004 04:54:19.00	101.210	-27.463	1750.306304
3 Jul 2004 04:55:19.00	114.898	-26.686	1861.340449
3 Jul 2004 04:56:19.00	126.272	-25.670	2055.419814
3 Jul 2004 04:57:04.62	133.251	-25.000	2245.345997

Min Elevation	3 Jul 2004 04:53:42.21	92.141	-27.617	1730.850081
Max Elevation	3 Jul 2004 04:50:19.43	51.064	-25.000	2245.345983
Mean Elevation			-26.272	
Min Range	3 Jul 2004 04:53:42.23	92.146	-27.617	1730.850088
Max Range	3 Jul 2004 04:57:04.62	133.251	-25.000	2245.345997
Mean Range			1966.144157	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 06:25:12.31	3.935	-25.000	2245.345989
	3 Jul 2004 06:26:12.00	4.361	-26.846	1836.501361
	3 Jul 2004 06:27:12.00	5.094	-30.809	1435.862359
	3 Jul 2004 06:28:12.00	6.586	-39.074	1060.097733
	3 Jul 2004 06:29:12.00	11.129	-56.806	750.507532
	3 Jul 2004 06:30:12.00	101.485	-83.918	618.582873
	3 Jul 2004 06:31:12.00	173.466	-55.533	763.479741
	3 Jul 2004 06:32:12.00	177.684	-38.473	1078.579398
	3 Jul 2004 06:33:12.00	179.128	-30.520	1456.572372
	3 Jul 2004 06:34:12.00	179.860	-26.704	1858.423979
	3 Jul 2004 06:35:08.39	180.283	-25.000	2245.345992
Min Elevation	3 Jul 2004 06:30:10.46	92.073	-83.999	618.481008
Max Elevation	3 Jul 2004 06:25:12.31	3.935	-25.000	2245.345989
Mean Elevation			-39.880	
Min Range	3 Jul 2004 06:30:10.46	92.072	-83.999	618.481008
Max Range	3 Jul 2004 06:35:08.39	180.283	-25.000	2245.345992
Mean Range			1395.390848	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 08:01:35.35	322.975	-25.000	2245.345981
	3 Jul 2004 08:02:35.00	314.669	-26.224	1940.610750
	3 Jul 2004 08:03:35.00	303.107	-27.955	1690.464901
	3 Jul 2004 08:04:35.00	287.734	-29.632	1526.116283
	3 Jul 2004 08:05:35.00	269.597	-30.243	1477.229514
	3 Jul 2004 08:06:35.00	251.882	-29.299	1554.887903
	3 Jul 2004 08:07:35.00	237.400	-27.529	1741.904339
	3 Jul 2004 08:08:35.00	226.683	-25.888	2007.232536
	3 Jul 2004 08:09:20.86	220.567	-25.000	2245.345982
Min Elevation	3 Jul 2004 08:05:28.04	271.752	-30.255	1476.357550
Max Elevation	3 Jul 2004 08:09:20.86	220.567	-25.000	2245.345982
Mean Elevation			-27.419	
Min Range	3 Jul 2004 08:05:28.04	271.751	-30.255	1476.357550
Max Range	3 Jul 2004 08:09:20.86	220.567	-25.000	2245.345982
Mean Range			1825.459799	

Global Statistics

Min Elevation	3 Jul 2004 06:30:10.46	92.073	-83.999	618.481008
Max Elevation	3 Jul 2004 08:09:20.86	220.567	-25.000	2245.345982
Mean Elevation			-31.582	
Min Range	3 Jul 2004 06:30:10.46	92.072	-83.999	618.481008
Max Range	3 Jul 2004 04:57:04.62	133.251	-25.000	2245.345997
Mean Range			1702.427606	

ESM-To-JanMayen

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 12:20:21.63	323.076	-25.000	2285.730684
	1 Jul 2004 12:21:21.00	315.299	-26.186	1972.373519
	1 Jul 2004 12:22:21.00	304.321	-27.961	1707.304768
	1 Jul 2004 12:23:21.00	289.400	-29.843	1522.806575
	1 Jul 2004 12:24:21.00	271.163	-30.780	1450.870317
	1 Jul 2004 12:25:21.00	252.702	-30.025	1508.005490
	1 Jul 2004 12:26:21.00	237.314	-28.192	1680.880721
	1 Jul 2004 12:27:21.00	225.905	-26.368	1938.152393
	1 Jul 2004 12:28:21.00	217.744	-25.098	2250.156937
	1 Jul 2004 12:28:27.40	217.023	-25.000	2285.730682
Min Elevation	1 Jul 2004 12:24:24.52	270.049	-30.783	1450.643710
Max Elevation	1 Jul 2004 12:28:27.40	217.023	-25.000	2285.730682
Mean Elevation			-27.445	
Min Range	1 Jul 2004 12:24:24.55	270.038	-30.783	1450.643730
Max Range	1 Jul 2004 12:20:21.63	323.076	-25.000	2285.730684
Mean Range			1860.201209	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 13:54:52.91	327.306	-25.000	2285.730697
	1 Jul 2004 13:55:52.00	320.377	-26.295	1951.666473
	1 Jul 2004 13:56:52.00	310.194	-28.418	1656.210176
	1 Jul 2004 13:57:52.00	295.460	-31.021	1433.870144
	1 Jul 2004 13:58:52.00	275.885	-32.815	1323.215459

	1 Jul 2004 13:59:52.00	254.746	-32.301	1352.459390
	1 Jul 2004 14:00:52.00	236.992	-29.958	1513.410635
	1 Jul 2004 14:01:52.00	224.264	-27.458	1769.944043
	1 Jul 2004 14:02:52.00	215.531	-25.663	2086.229317
	1 Jul 2004 14:03:26.58	211.774	-25.000	2285.730682
Min Elevation	1 Jul 2004 13:59:09.76	269.546	-32.932	1316.853107
Max Elevation	1 Jul 2004 13:54:52.91	327.306	-25.000	2285.730697
Mean Elevation			-28.393	
Min Range	1 Jul 2004 13:59:09.76	269.546	-32.932	1316.853107
Max Range	1 Jul 2004 13:54:52.91	327.306	-25.000	2285.730697
Mean Range			1765.846702	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 15:29:24.87	341.157	-25.000	2285.730682
1 Jul 2004 15:30:24.00	337.059	-26.576	1901.567704
1 Jul 2004 15:31:24.00	330.471	-29.711	1533.839047
1 Jul 2004 15:32:24.00	318.963	-35.124	1210.929324
1 Jul 2004 15:33:24.00	297.252	-42.361	980.244803
1 Jul 2004 15:34:24.00	262.386	-45.376	915.670906
1 Jul 2004 15:35:24.00	231.513	-39.743	1048.620531
1 Jul 2004 15:36:24.00	214.286	-32.868	1320.304088
1 Jul 2004 15:37:24.00	204.984	-28.352	1663.265495
1 Jul 2004 15:38:24.00	199.458	-25.857	2040.810682
1 Jul 2004 15:39:01.42	197.059	-25.000	2285.730704

Min Elevation	1 Jul 2004 15:34:13.15	269.123	-45.555	912.236410
Max Elevation	1 Jul 2004 15:29:24.87	341.157	-25.000	2285.730682
Mean Elevation			-32.361	
Min Range	1 Jul 2004 15:34:13.15	269.123	-45.555	912.236410
Max Range	1 Jul 2004 15:39:01.42	197.059	-25.000	2285.730704
Mean Range			1562.428542	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 17:04:46.59	1.014	-25.000	2285.730690
1 Jul 2004 17:05:46.00	1.535	-26.715	1878.562214
1 Jul 2004 17:06:46.00	2.398	-30.423	1477.087913
1 Jul 2004 17:07:46.00	4.090	-38.111	1098.775090
1 Jul 2004 17:08:46.00	8.879	-54.458	780.786821
1 Jul 2004 17:09:46.00	67.405	-82.192	625.469549
1 Jul 2004 17:10:46.00	167.228	-58.098	743.565760
1 Jul 2004 17:11:46.00	173.185	-39.839	1045.878496
1 Jul 2004 17:12:46.00	175.092	-31.249	1418.344509
1 Jul 2004 17:13:46.00	176.023	-27.115	1817.241353
1 Jul 2004 17:14:46.00	176.568	-25.165	2227.154891
1 Jul 2004 17:14:54.51	176.628	-25.000	2285.730697

Min Elevation	1 Jul 2004 17:09:50.48	88.836	-82.725	624.622812
Max Elevation	1 Jul 2004 17:04:46.59	1.014	-25.000	2285.730690
Mean Elevation			-38.614	
Min Range	1 Jul 2004 17:09:50.48	88.843	-82.725	624.622812
Max Range	1 Jul 2004 17:14:54.51	176.628	-25.000	2285.730697
Mean Range			1473.693999	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:41:36.33	25.395	-25.000	2285.730684
1 Jul 2004 18:42:36.00	31.241	-26.403	1931.726484
1 Jul 2004 18:43:36.00	40.028	-28.878	1609.328120
1 Jul 2004 18:44:36.00	53.615	-32.401	1346.641452
1 Jul 2004 18:45:36.00	73.874	-35.736	1185.372645
1 Jul 2004 18:46:36.00	98.585	-36.149	1168.930543
1 Jul 2004 18:47:36.00	120.191	-33.195	1302.773796
1 Jul 2004 18:48:36.00	135.054	-29.547	1547.875292
1 Jul 2004 18:49:36.00	144.649	-26.831	1859.916776
1 Jul 2004 18:50:36.00	150.997	-25.219	2209.660366
1 Jul 2004 18:50:48.52	152.045	-25.000	2285.730692

Min Elevation	1 Jul 2004 18:46:12.28	88.739	-36.473	1156.501004
Max Elevation	1 Jul 2004 18:41:36.33	25.395	-25.000	2285.730684
Mean Elevation			-29.487	
Min Range	1 Jul 2004 18:46:12.28	88.739	-36.473	1156.501004
Max Range	1 Jul 2004 18:50:48.52	152.045	-25.000	2285.730692
Mean Range			1703.062441	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 20:20:40.02	57.400	-25.000	2285.730685

	1 Jul 2004 20:21:40.00	67.471	-25.590	2104.493982
	1 Jul 2004 20:22:40.00	79.213	-26.068	1995.946037
	1 Jul 2004 20:23:40.00	91.850	-26.185	1972.574091
	1 Jul 2004 20:24:40.00	104.188	-25.873	2037.315731
	1 Jul 2004 20:25:40.00	115.180	-25.308	2182.012841
	1 Jul 2004 20:26:11.70	120.259	-25.000	2285.730692
Min Elevation	1 Jul 2004 20:23:25.78	88.836	-26.198	1970.063122
Max Elevation	1 Jul 2004 20:26:11.70	120.259	-25.000	2285.730692
Mean Elevation			-25.575	
Min Range	1 Jul 2004 20:23:25.75	88.829	-26.198	1970.063134
Max Range	1 Jul 2004 20:26:11.70	120.259	-25.000	2285.730692
Mean Range			2123.400580	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 04:34:30.80	62.527	-25.000	2285.730682
2 Jul 2004 04:35:30.00	72.613	-25.511	2125.048313
2 Jul 2004 04:36:30.00	84.275	-25.880	2035.689804
2 Jul 2004 04:37:30.00	96.565	-25.904	2030.516347
2 Jul 2004 04:38:30.00	108.367	-25.567	2110.255651
2 Jul 2004 04:39:30.00	118.796	-25.054	2265.741603
2 Jul 2004 04:39:36.25	119.785	-25.000	2285.730683

Min Elevation	2 Jul 2004 04:37:03.60	91.150	-25.943	2022.121677
Max Elevation	2 Jul 2004 04:39:36.25	119.785	-25.000	2285.730683
Mean Elevation			-25.417	
Min Range	2 Jul 2004 04:37:03.58	91.148	-25.943	2022.121679
Max Range	2 Jul 2004 04:39:36.25	119.785	-25.000	2285.730683
Mean Range			2162.673297	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 06:09:48.44	29.729	-25.000	2285.730692
2 Jul 2004 06:10:48.00	35.861	-26.357	1940.097170
2 Jul 2004 06:11:48.00	44.989	-28.692	1627.717441
2 Jul 2004 06:12:48.00	58.783	-31.881	1377.704462
2 Jul 2004 06:13:48.00	78.593	-34.687	1230.131897
2 Jul 2004 06:14:48.00	101.913	-34.837	1223.444731
2 Jul 2004 06:15:48.00	122.237	-32.175	1359.847005
2 Jul 2004 06:16:48.00	136.551	-28.945	1602.843285
2 Jul 2004 06:17:48.00	146.033	-26.518	1911.495498
2 Jul 2004 06:18:48.00	152.429	-25.075	2258.095976
2 Jul 2004 06:18:52.60	152.830	-25.000	2285.730696

Min Elevation	2 Jul 2004 06:14:20.67	91.261	-35.199	1207.701572
Max Elevation	2 Jul 2004 06:09:48.44	29.729	-25.000	2285.730692
Mean Elevation			-29.015	
Min Range	2 Jul 2004 06:14:20.65	91.252	-35.199	1207.701583
Max Range	2 Jul 2004 06:18:52.60	152.830	-25.000	2285.730696
Mean Range			1736.621714	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 07:45:41.84	4.855	-25.000	2285.730688
2 Jul 2004 07:46:41.00	5.699	-26.697	1881.436283
2 Jul 2004 07:47:41.00	7.118	-30.367	1481.368517
2 Jul 2004 07:48:41.00	9.901	-37.927	1104.859924
2 Jul 2004 07:49:41.00	17.619	-53.726	789.225481
2 Jul 2004 07:50:41.00	77.442	-77.631	635.306113
2 Jul 2004 07:51:41.00	162.146	-57.312	750.987189
2 Jul 2004 07:52:41.00	171.760	-39.680	1050.432627
2 Jul 2004 07:53:41.00	174.930	-31.207	1421.160476
2 Jul 2004 07:54:41.00	176.496	-27.102	1819.074503
2 Jul 2004 07:55:41.00	177.428	-25.161	2228.451644
2 Jul 2004 07:55:49.32	177.528	-25.000	2285.730693

Min Elevation	2 Jul 2004 07:50:45.66	91.169	-77.972	634.404480
Max Elevation	2 Jul 2004 07:55:49.32	177.528	-25.000	2285.730693
Mean Elevation			-38.068	
Min Range	2 Jul 2004 07:50:45.66	91.170	-77.972	634.404480
Max Range	2 Jul 2004 07:55:49.32	177.528	-25.000	2285.730693
Mean Range			1477.813678	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 09:21:35.50	344.135	-25.000	2285.730683
2 Jul 2004 09:22:35.00	340.251	-26.607	1896.350913
2 Jul 2004 09:23:35.00	334.010	-29.824	1524.422620
2 Jul 2004 09:24:35.00	322.956	-35.498	1195.152296

	2 Jul 2004 09:25:35.00	301.355	-43.430	955.830464
	2 Jul 2004 09:26:35.00	264.682	-47.096	884.178045
	2 Jul 2004 09:27:35.00	232.053	-40.907	1016.582720
	2 Jul 2004 09:28:35.00	214.620	-33.414	1291.328423
	2 Jul 2004 09:29:35.00	205.496	-28.597	1637.462468
	2 Jul 2004 09:30:35.00	200.166	-25.964	2017.498287
	2 Jul 2004 09:31:15.75	197.696	-25.000	2285.730688
Min Elevation	2 Jul 2004 09:26:25.62	270.900	-47.250	881.524713
Max Elevation	2 Jul 2004 09:31:15.75	197.696	-25.000	2285.730688
Mean Elevation			-32.849	
Min Range	2 Jul 2004 09:26:25.62	270.900	-47.250	881.524713
Max Range	2 Jul 2004 09:31:15.75	197.696	-25.000	2285.730688
Mean Range			1544.569782	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 10:57:12.11	328.947	-25.000	2285.730691
2 Jul 2004 10:58:12.00	322.023	-26.334	1944.272839
2 Jul 2004 10:59:12.00	311.911	-28.521	1645.361273
2 Jul 2004 11:00:12.00	297.155	-31.241	1418.898792
2 Jul 2004 11:01:12.00	277.330	-33.164	1304.372946
2 Jul 2004 11:02:12.00	255.766	-32.666	1331.501300
2 Jul 2004 11:03:12.00	237.691	-30.222	1492.464695
2 Jul 2004 11:04:12.00	224.832	-27.610	1750.151784
2 Jul 2004 11:05:12.00	216.074	-25.740	2067.835444
2 Jul 2004 11:05:49.55	212.037	-25.000	2285.730693
Min Elevation 2 Jul 2004 11:01:30.81	270.485	-33.302	1297.124751
Max Elevation 2 Jul 2004 10:57:12.11	328.947	-25.000	2285.730691
Mean Elevation		-28.550	
Min Range 2 Jul 2004 11:01:30.81	270.485	-33.302	1297.124751
Max Range 2 Jul 2004 11:05:49.55	212.037	-25.000	2285.730693
Mean Range		1752.632046	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 12:32:13.92	322.962	-25.000	2285.730690
2 Jul 2004 12:33:13.00	315.222	-26.178	1974.030717
2 Jul 2004 12:34:13.00	304.255	-27.947	1708.972472
2 Jul 2004 12:35:13.00	289.354	-29.824	1524.391856
2 Jul 2004 12:36:13.00	271.142	-30.761	1452.230672
2 Jul 2004 12:37:13.00	252.696	-30.013	1509.020530
2 Jul 2004 12:38:13.00	237.310	-28.186	1681.528888
2 Jul 2004 12:39:13.00	225.895	-26.366	1938.490180
2 Jul 2004 12:40:13.00	217.726	-25.097	2250.259543
2 Jul 2004 12:40:19.39	217.006	-25.000	2285.730685
Min Elevation 2 Jul 2004 12:36:16.65	269.985	-30.764	1451.986053
Max Elevation 2 Jul 2004 12:32:13.92	322.962	-25.000	2285.730690
Mean Elevation		-27.437	
Min Range 2 Jul 2004 12:36:16.69	269.974	-30.764	1451.986075
Max Range 2 Jul 2004 12:32:13.92	322.962	-25.000	2285.730690
Mean Range		1861.038623	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:06:42.60	328.598	-25.000	2285.730687
2 Jul 2004 14:07:42.00	321.870	-26.335	1944.161675
2 Jul 2004 14:08:42.00	311.927	-28.564	1640.858623
2 Jul 2004 14:09:42.00	297.278	-31.397	1408.498294
2 Jul 2004 14:10:42.00	277.309	-33.492	1287.342843
2 Jul 2004 14:11:42.00	255.295	-33.073	1309.210206
2 Jul 2004 14:12:42.00	236.782	-30.549	1467.647273
2 Jul 2004 14:13:42.00	223.678	-27.813	1724.884215
2 Jul 2004 14:14:42.00	214.815	-25.847	2043.079717
2 Jul 2004 14:15:23.60	210.361	-25.000	2285.730685
Min Elevation 2 Jul 2004 14:11:03.12	269.487	-33.676	1278.079884
Max Elevation 2 Jul 2004 14:06:42.60	328.598	-25.000	2285.730687
Mean Elevation		-28.707	
Min Range 2 Jul 2004 14:11:03.12	269.487	-33.676	1278.079884
Max Range 2 Jul 2004 14:06:42.60	328.598	-25.000	2285.730687
Mean Range		1739.714422	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 15:41:18.27	343.372	-25.000	2285.730687
2 Jul 2004 15:42:18.00	339.723	-26.631	1892.393580
2 Jul 2004 15:43:18.00	333.838	-29.918	1516.722139

	2 Jul 2004 15:44:18.00	323.270	-35.827	1181.685236
	2 Jul 2004 15:45:18.00	301.897	-44.443	934.277639
	2 Jul 2004 15:46:18.00	263.419	-48.828	855.685182
	2 Jul 2004 15:47:18.00	228.957	-42.062	987.396335
	2 Jul 2004 15:48:18.00	211.361	-33.942	1264.941725
	2 Jul 2004 15:49:18.00	202.425	-28.831	1613.956449
	2 Jul 2004 15:50:18.00	197.277	-26.066	1996.225929
	2 Jul 2004 15:51:01.75	194.754	-25.000	2285.730704
Min Elevation	2 Jul 2004 15:46:10.01	269.079	-48.956	853.695799
Max Elevation	2 Jul 2004 15:51:01.75	194.754	-25.000	2285.730704
Mean Elevation			-33.323	
Min Range	2 Jul 2004 15:46:10.01	269.079	-48.956	853.695799
Max Range	2 Jul 2004 15:51:01.75	194.754	-25.000	2285.730704
Mean Range			1528.613237	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 17:16:49.12	3.820	-25.000	2285.730692
2 Jul 2004 17:17:49.00	5.012	-26.722	1877.302222
2 Jul 2004 17:18:49.00	6.982	-30.402	1478.696642
2 Jul 2004 17:19:49.00	10.816	-37.925	1104.917076
2 Jul 2004 17:20:49.00	21.245	-53.286	794.463497
2 Jul 2004 17:21:49.00	81.370	-73.621	648.025801
2 Jul 2004 17:22:49.00	153.994	-55.746	766.757938
2 Jul 2004 17:23:49.00	166.135	-39.185	1065.020899
2 Jul 2004 17:24:49.00	170.331	-31.019	1434.060596
2 Jul 2004 17:25:49.00	172.423	-27.025	1830.472024
2 Jul 2004 17:26:49.00	173.665	-25.131	2238.504781
2 Jul 2004 17:26:55.89	173.775	-25.000	2285.730701

Min Elevation	2 Jul 2004 17:21:52.42	88.819	-73.751	647.550185
Max Elevation	2 Jul 2004 17:26:55.89	173.775	-25.000	2285.730701
Mean Elevation			-37.505	
Min Range	2 Jul 2004 17:21:52.42	88.820	-73.751	647.550185
Max Range	2 Jul 2004 17:26:55.89	173.775	-25.000	2285.730701
Mean Range			1484.140239	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:53:52.38	28.817	-25.000	2285.730696
2 Jul 2004 18:54:52.00	35.281	-26.325	1945.998411
2 Jul 2004 18:55:52.00	44.776	-28.546	1642.750097
2 Jul 2004 18:56:52.00	58.804	-31.450	1405.070251
2 Jul 2004 18:57:52.00	78.260	-33.810	1271.405000
2 Jul 2004 18:58:52.00	100.408	-33.730	1275.383762
2 Jul 2004 18:59:52.00	119.577	-31.288	1415.734091
2 Jul 2004 19:00:52.00	133.301	-28.404	1657.619781
2 Jul 2004 19:01:52.00	142.576	-26.235	1963.008553
2 Jul 2004 19:02:48.62	148.627	-25.000	2285.730692

Min Elevation	2 Jul 2004 18:58:20.35	88.740	-34.146	1255.147539
Max Elevation	2 Jul 2004 19:02:48.62	148.627	-25.000	2285.730692
Mean Elevation			-28.979	
Min Range	2 Jul 2004 18:58:20.36	88.745	-34.146	1255.147543
Max Range	2 Jul 2004 18:53:52.38	28.817	-25.000	2285.730696
Mean Range			1714.843133	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 20:33:21.38	62.988	-25.000	2285.730684
2 Jul 2004 20:34:21.00	73.322	-25.446	2142.559203
2 Jul 2004 20:35:21.00	84.928	-25.714	2073.786467
2 Jul 2004 20:36:21.00	96.871	-25.655	2088.222431
2 Jul 2004 20:37:21.00	108.126	-25.302	2184.075686
2 Jul 2004 20:38:00.13	114.729	-25.000	2285.730706

Min Elevation	2 Jul 2004 20:35:40.70	88.863	-25.734	2069.231664
Max Elevation	2 Jul 2004 20:38:00.13	114.729	-25.000	2285.730706
Mean Elevation			-25.353	
Min Range	2 Jul 2004 20:35:40.72	88.868	-25.734	2069.231672
Max Range	2 Jul 2004 20:38:00.13	114.729	-25.000	2285.730706
Mean Range			2176.684196	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:46:21.28	57.350	-25.000	2285.730684
3 Jul 2004 04:47:21.00	67.168	-25.649	2089.740206
3 Jul 2004 04:48:21.00	78.897	-26.233	1963.344039
3 Jul 2004 04:49:21.00	91.812	-26.456	1922.256760

	3 Jul 2004 04:50:21.00	104.667	-26.188	1972.078310
	3 Jul 2004 04:51:21.00	116.248	-25.583	2106.263228
	3 Jul 2004 04:52:14.72	125.016	-25.000	2285.730689
Min Elevation	3 Jul 2004 04:49:18.08	91.172	-26.457	1922.148795
Max Elevation	3 Jul 2004 04:46:21.28	57.350	-25.000	2285.730684
Mean Elevation			-25.730	
Min Range	3 Jul 2004 04:49:18.09	91.175	-26.457	1922.148791
Max Range	3 Jul 2004 04:52:14.72	125.016	-25.000	2285.730689
Mean Range			2089.306274	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 06:21:48.72	26.358	-25.000	2285.730692
3 Jul 2004 06:22:48.00	31.828	-26.421	1928.584260
3 Jul 2004 06:23:48.00	40.190	-28.997	1597.849157
3 Jul 2004 06:24:48.00	53.401	-32.814	1323.312864
3 Jul 2004 06:25:48.00	73.873	-36.708	1147.682571
3 Jul 2004 06:26:48.00	99.934	-37.496	1119.490162
3 Jul 2004 06:27:48.00	122.966	-34.277	1248.969500
3 Jul 2004 06:28:48.00	138.477	-30.185	1495.368880
3 Jul 2004 06:29:48.00	148.248	-27.159	1810.872132
3 Jul 2004 06:30:48.00	154.601	-25.368	2164.520787
3 Jul 2004 06:31:07.69	156.201	-25.000	2285.730696

Min Elevation	3 Jul 2004 06:26:28.35	91.260	-37.757	1110.574215
Max Elevation	3 Jul 2004 06:31:07.69	156.201	-25.000	2285.730696
Mean Elevation			-29.948	
Min Range	3 Jul 2004 06:26:28.35	91.260	-37.757	1110.574215
Max Range	3 Jul 2004 06:31:07.69	156.201	-25.000	2285.730696
Mean Range			1673.464700	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:57:43.21	2.035	-25.000	2285.730687
3 Jul 2004 07:58:43.00	2.230	-26.732	1875.803530
3 Jul 2004 07:59:43.00	2.563	-30.464	1474.006365
3 Jul 2004 08:00:43.00	3.228	-38.223	1095.100663
3 Jul 2004 08:01:43.00	5.149	-54.865	776.251401
3 Jul 2004 08:02:43.00	47.628	-86.029	620.738475
3 Jul 2004 08:03:43.00	176.535	-58.419	740.625563
3 Jul 2004 08:04:43.00	178.918	-39.877	1044.793301
3 Jul 2004 08:05:43.00	179.676	-31.246	1418.549065
3 Jul 2004 08:06:43.00	180.050	-27.107	1818.442393
3 Jul 2004 08:07:43.00	180.275	-25.159	2229.233147
3 Jul 2004 08:07:51.19	180.299	-25.000	2285.730695

Min Elevation	3 Jul 2004 08:02:47.27	91.146	-87.118	619.963388
Max Elevation	3 Jul 2004 07:57:43.21	2.035	-25.000	2285.730687
Mean Elevation			-39.010	
Min Range	3 Jul 2004 08:02:47.27	91.147	-87.118	619.963388
Max Range	3 Jul 2004 08:07:51.19	180.299	-25.000	2285.730695
Mean Range			1472.083774	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 09:33:35.69	341.874	-25.000	2285.730683
3 Jul 2004 09:34:35.00	337.524	-26.566	1903.192131
3 Jul 2004 09:35:35.00	330.593	-29.642	1539.676552
3 Jul 2004 09:36:35.00	318.642	-34.842	1223.225616
3 Jul 2004 09:37:35.00	296.792	-41.492	1001.482552
3 Jul 2004 09:38:35.00	263.359	-43.936	944.882034
3 Jul 2004 09:39:35.00	234.023	-38.699	1079.934053
3 Jul 2004 09:40:35.00	217.121	-32.345	1349.865603
3 Jul 2004 09:41:35.00	207.755	-28.107	1690.437804
3 Jul 2004 09:42:35.00	202.114	-25.748	2065.931546
3 Jul 2004 09:43:08.77	199.865	-25.000	2285.730700

Min Elevation	3 Jul 2004 09:38:22.23	270.855	-44.155	940.268378
Max Elevation	3 Jul 2004 09:33:35.69	341.874	-25.000	2285.730683
Mean Elevation			-31.943	
Min Range	3 Jul 2004 09:38:22.23	270.856	-44.155	940.268378
Max Range	3 Jul 2004 09:43:08.77	199.865	-25.000	2285.730700
Mean Range			1579.099025	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:09:08.85	327.608	-25.000	2285.730695
3 Jul 2004 11:10:08.00	320.560	-26.283	1953.914436
3 Jul 2004 11:11:08.00	310.260	-28.363	1662.095636

	3 Jul 2004 11:12:08.00	295.477	-30.870	1444.458320
	3 Jul 2004 11:13:08.00	276.060	-32.537	1338.810189
	3 Jul 2004 11:14:08.00	255.289	-31.978	1371.744054
	3 Jul 2004 11:15:08.00	237.869	-29.707	1534.225073
	3 Jul 2004 11:16:08.00	225.321	-27.303	1790.756000
	3 Jul 2004 11:17:08.00	216.663	-25.582	2106.369455
	3 Jul 2004 11:17:39.23	213.254	-25.000	2285.730684
Min Elevation	3 Jul 2004 11:13:24.03	270.426	-32.627	1333.688575
Max Elevation	3 Jul 2004 11:09:08.85	327.608	-25.000	2285.730695
Mean Elevation			-28.262	
Min Range	3 Jul 2004 11:13:24.03	270.426	-32.627	1333.688575
Max Range	3 Jul 2004 11:09:08.85	327.608	-25.000	2285.730695
Mean Range			1777.383454	

Global Statistics

Min Elevation	3 Jul 2004 08:02:47.27	91.146	-87.118	619.963388
Max Elevation	3 Jul 2004 06:31:07.69	156.201	-25.000	2285.730696
Mean Elevation			-31.142	
Min Range	3 Jul 2004 08:02:47.27	91.147	-87.118	619.963388
Max Range	2 Jul 2004 20:38:00.13	114.729	-25.000	2285.730706
Mean Range			1702.268452	

ESM-To-Lofoten

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 12:18:26.26	317.599	-25.000	2279.793590
1 Jul 2004 12:19:26.00	308.984	-26.076	1990.662582
1 Jul 2004 12:20:26.00	297.353	-27.513	1759.998073
1 Jul 2004 12:21:26.00	282.488	-28.785	1616.176050
1 Jul 2004 12:22:26.00	265.603	-29.123	1583.737555
1 Jul 2004 12:23:26.00	249.367	-28.274	1669.341267
1 Jul 2004 12:24:26.00	235.936	-26.834	1856.414376
1 Jul 2004 12:25:26.00	225.742	-25.522	2117.566709
1 Jul 2004 12:25:58.28	221.409	-25.000	2279.793612

Min Elevation	1 Jul 2004 12:22:12.29	269.510	-29.157	1580.581896
Max Elevation	1 Jul 2004 12:18:26.26	317.599	-25.000	2279.793590
Mean Elevation			-26.903	
Min Range	1 Jul 2004 12:22:12.29	269.510	-29.157	1580.581896
Max Range	1 Jul 2004 12:25:58.28	221.409	-25.000	2279.793612
Mean Range			1905.942646	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:52:26.56	334.091	-25.000	2279.793590
1 Jul 2004 13:53:26.00	328.485	-26.479	1914.911116
1 Jul 2004 13:54:26.00	319.847	-29.175	1578.971527
1 Jul 2004 13:55:26.00	306.032	-33.163	1302.879733
1 Jul 2004 13:56:26.00	284.514	-37.079	1132.885043
1 Jul 2004 13:57:26.00	257.674	-37.465	1119.282372
1 Jul 2004 13:58:26.00	234.897	-33.865	1267.184806
1 Jul 2004 13:59:26.00	219.985	-29.733	1529.971971
1 Jul 2004 14:00:26.00	210.687	-26.820	1858.706002
1 Jul 2004 14:01:26.00	204.653	-25.161	2223.251801
1 Jul 2004 14:01:34.98	203.936	-25.000	2279.793591

Min Elevation	1 Jul 2004 13:57:00.79	269.028	-37.914	1104.042114
Max Elevation	1 Jul 2004 13:52:26.56	334.091	-25.000	2279.793590
Mean Elevation			-29.904	
Min Range	1 Jul 2004 13:57:00.79	269.028	-37.914	1104.042114
Max Range	1 Jul 2004 14:01:34.98	203.936	-25.000	2279.793591
Mean Range			1680.693777	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 15:27:24.30	356.650	-25.000	2279.793590
1 Jul 2004 15:28:24.00	356.173	-26.748	1870.015296
1 Jul 2004 15:29:24.00	355.369	-30.518	1468.099057
1 Jul 2004 15:30:24.00	353.771	-38.350	1089.790405
1 Jul 2004 15:31:24.00	349.152	-55.059	773.317867
1 Jul 2004 15:32:24.00	284.060	-82.978	623.615190
1 Jul 2004 15:33:24.00	189.211	-57.433	749.052032
1 Jul 2004 15:34:24.00	183.879	-39.472	1055.337660
1 Jul 2004 15:35:24.00	182.136	-31.053	1429.826051
1 Jul 2004 15:36:24.00	181.272	-27.008	1830.021578
1 Jul 2004 15:37:24.00	180.754	-25.108	2240.929509

	1 Jul 2004 15:37:29.63	180.716	-25.000	2279.793590
Min Elevation	1 Jul 2004 15:32:26.90	268.709	-83.226	623.256600
Max Elevation	1 Jul 2004 15:37:29.63	180.716	-25.000	2279.793590
Mean Elevation			-38.644	
Min Range	1 Jul 2004 15:32:26.91	268.707	-83.226	623.256600
Max Range	1 Jul 2004 15:27:24.30	356.650	-25.000	2279.793590
Mean Range			1474.132652	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 17:04:03.75	23.826	-25.000	2279.793609
1 Jul 2004 17:05:03.00	29.379	-26.434	1922.823520
1 Jul 2004 17:06:03.00	37.862	-29.026	1592.829027
1 Jul 2004 17:07:03.00	51.244	-32.841	1320.201734
1 Jul 2004 17:08:03.00	71.876	-36.666	1147.962326
1 Jul 2004 17:09:03.00	97.875	-37.331	1123.956338
1 Jul 2004 17:10:03.00	120.650	-34.082	1256.687923
1 Jul 2004 17:11:03.00	135.955	-30.042	1504.713409
1 Jul 2004 17:12:03.00	145.609	-27.071	1820.658981
1 Jul 2004 17:13:03.00	151.893	-25.319	2174.042325
1 Jul 2004 17:13:20.22	153.288	-25.000	2279.793603

Min Elevation	1 Jul 2004 17:08:41.82	88.579	-37.630	1113.634642
Max Elevation	1 Jul 2004 17:13:20.22	153.288	-25.000	2279.793603
Mean Elevation			-29.892	
Min Range	1 Jul 2004 17:08:41.82	88.579	-37.630	1113.634642
Max Range	1 Jul 2004 17:04:03.75	23.826	-25.000	2279.793609
Mean Range			1674.860254	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:43:26.80	61.122	-25.000	2279.793602
1 Jul 2004 18:44:26.00	71.332	-25.489	2126.213442
1 Jul 2004 18:45:26.00	83.028	-25.820	2045.208245
1 Jul 2004 18:46:26.00	95.224	-25.806	2048.460233
1 Jul 2004 18:47:26.00	106.828	-25.455	2135.470977
1 Jul 2004 18:48:20.79	116.202	-25.000	2279.793593

Min Elevation	1 Jul 2004 18:45:53.72	88.668	-25.861	2036.019121
Max Elevation	1 Jul 2004 18:48:20.79	116.202	-25.000	2279.793593
Mean Elevation			-25.428	
Min Range	1 Jul 2004 18:45:53.73	88.670	-25.861	2036.019122
Max Range	1 Jul 2004 18:43:26.80	61.122	-25.000	2279.793602
Mean Range			2152.490015	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:59:14.21	73.283	-25.000	2279.793597
2 Jul 2004 03:00:14.00	83.948	-25.263	2190.700787
2 Jul 2004 03:01:14.00	95.219	-25.304	2178.521992
2 Jul 2004 03:02:14.00	106.190	-25.096	2245.097594
2 Jul 2004 03:02:32.10	109.318	-25.000	2279.793590

Min Elevation	2 Jul 2004 03:00:53.19	91.298	-25.320	2173.713715
Max Elevation	2 Jul 2004 03:02:32.10	109.318	-25.000	2279.793590
Mean Elevation			-25.133	
Min Range	2 Jul 2004 03:00:53.16	91.294	-25.320	2173.713721
Max Range	2 Jul 2004 02:59:14.21	73.283	-25.000	2279.793597
Mean Range			2234.781512	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 04:33:46.49	31.365	-25.000	2279.793598
2 Jul 2004 04:34:46.00	37.777	-26.336	1940.618917
2 Jul 2004 04:35:46.00	47.241	-28.581	1636.795731
2 Jul 2004 04:36:46.00	61.284	-31.528	1398.210894
2 Jul 2004 04:37:46.00	80.848	-33.936	1263.739912
2 Jul 2004 04:38:46.00	103.181	-33.855	1267.695063
2 Jul 2004 04:39:46.00	122.482	-31.363	1409.005367
2 Jul 2004 04:40:46.00	136.253	-28.431	1652.418592
2 Jul 2004 04:41:46.00	145.535	-26.234	1959.537418
2 Jul 2004 04:42:41.91	151.520	-25.000	2279.793587

Min Elevation	2 Jul 2004 04:38:14.37	91.423	-34.280	1247.341170
Max Elevation	2 Jul 2004 04:33:46.49	31.365	-25.000	2279.793598
Mean Elevation			-29.026	
Min Range	2 Jul 2004 04:38:14.38	91.426	-34.280	1247.341172
Max Range	2 Jul 2004 04:33:46.49	31.365	-25.000	2279.793598
Mean Range			1708.760908	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 06:09:34.24	3.158	-25.000	2279.793591
	2 Jul 2004 06:10:34.00	3.575	-26.745	1870.447644
	2 Jul 2004 06:11:34.00	4.280	-30.503	1469.183909
	2 Jul 2004 06:12:34.00	5.684	-38.305	1091.222378
	2 Jul 2004 06:13:34.00	9.734	-54.963	774.363726
	2 Jul 2004 06:14:34.00	71.205	-83.619	622.715504
	2 Jul 2004 06:15:34.00	171.919	-57.778	745.788021
	2 Jul 2004 06:16:34.00	176.722	-39.625	1050.860959
	2 Jul 2004 06:17:34.00	178.276	-31.128	1424.732944
	2 Jul 2004 06:18:34.00	179.044	-27.045	1824.556045
	2 Jul 2004 06:19:34.00	179.503	-25.125	2235.232208
	2 Jul 2004 06:19:40.46	179.542	-25.000	2279.793593
Min Elevation	2 Jul 2004 06:14:37.43	91.328	-84.005	622.215855
Max Elevation	2 Jul 2004 06:09:34.24	3.158	-25.000	2279.793591
Mean Elevation			-38.736	
Min Range	2 Jul 2004 06:14:37.43	91.326	-84.005	622.215855
Max Range	2 Jul 2004 06:19:40.46	179.542	-25.000	2279.793593
Mean Range			1472.390877	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 07:45:29.62	339.300	-25.000	2279.793592
	2 Jul 2004 07:46:29.00	334.341	-26.538	1904.736472
	2 Jul 2004 07:47:29.00	326.551	-29.460	1553.359393
	2 Jul 2004 07:48:29.00	313.563	-34.113	1255.226787
	2 Jul 2004 07:49:29.00	291.580	-39.377	1058.137523
	2 Jul 2004 07:50:29.00	261.431	-40.613	1023.265789
	2 Jul 2004 07:51:29.00	235.567	-36.206	1165.393551
	2 Jul 2004 07:52:29.00	219.637	-31.018	1432.300376
	2 Jul 2004 07:53:29.00	210.264	-27.455	1767.499412
	2 Jul 2004 07:54:29.00	204.410	-25.445	2138.025260
	2 Jul 2004 07:54:51.10	202.797	-25.000	2279.793603
Min Elevation	2 Jul 2004 07:50:10.35	271.032	-40.957	1014.160932
Max Elevation	2 Jul 2004 07:45:29.62	339.300	-25.000	2279.793592
Mean Elevation			-30.930	
Min Range	2 Jul 2004 07:50:10.35	271.032	-40.957	1014.160932
Max Range	2 Jul 2004 07:54:51.10	202.797	-25.000	2279.793603
Mean Range			1623.411978	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 09:21:10.77	320.688	-25.000	2279.793601
	2 Jul 2004 09:22:10.00	312.447	-26.119	1982.057266
	2 Jul 2004 09:23:10.00	301.052	-27.695	1736.796566
	2 Jul 2004 09:24:10.00	286.121	-29.206	1576.081710
	2 Jul 2004 09:25:10.00	268.667	-29.761	1527.597949
	2 Jul 2004 09:26:10.00	251.558	-28.933	1601.760395
	2 Jul 2004 09:27:10.00	237.371	-27.339	1783.030901
	2 Jul 2004 09:28:10.00	226.701	-25.833	2042.421722
	2 Jul 2004 09:28:56.47	220.468	-25.000	2279.793609
Min Elevation	2 Jul 2004 09:25:03.60	270.571	-29.770	1526.884523
Max Elevation	2 Jul 2004 09:28:56.47	220.468	-25.000	2279.793609
Mean Elevation			-27.210	
Min Range	2 Jul 2004 09:25:03.55	270.585	-29.770	1526.884561
Max Range	2 Jul 2004 09:28:56.47	220.468	-25.000	2279.793609
Mean Range			1867.703747	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 10:56:08.50	312.433	-25.000	2279.793603
	2 Jul 2004 10:57:08.00	303.102	-25.915	2024.214447
	2 Jul 2004 10:58:08.00	291.043	-26.982	1833.912907
	2 Jul 2004 10:59:08.00	276.608	-27.713	1734.584432
	2 Jul 2004 11:00:08.00	261.273	-27.651	1742.311818
	2 Jul 2004 11:01:08.00	247.112	-26.839	1855.725936
	2 Jul 2004 11:02:08.00	235.434	-25.769	2056.983830
	2 Jul 2004 11:02:59.06	227.582	-25.000	2279.793613
Min Elevation	2 Jul 2004 10:59:33.78	270.008	-27.796	1724.405264
Max Elevation	2 Jul 2004 11:02:59.06	227.582	-25.000	2279.793613
Mean Elevation			-26.359	
Min Range	2 Jul 2004 10:59:33.79	270.003	-27.796	1724.405268
Max Range	2 Jul 2004 11:02:59.06	227.582	-25.000	2279.793613
Mean Range			1975.915073	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 12:30:11.99	319.178	-25.000	2279.793599
	2 Jul 2004 12:31:11.00	310.926	-26.103	1985.113724
	2 Jul 2004 12:32:11.00	299.510	-27.652	1742.148252
	2 Jul 2004 12:33:11.00	284.610	-29.121	1583.964547
	2 Jul 2004 12:34:11.00	267.268	-29.641	1537.738008
	2 Jul 2004 12:35:11.00	250.312	-28.814	1613.336255
	2 Jul 2004 12:36:11.00	236.244	-27.251	1795.158833
	2 Jul 2004 12:37:11.00	225.640	-25.779	2054.552456
	2 Jul 2004 12:37:55.23	219.695	-25.000	2279.793608
Min Elevation	2 Jul 2004 12:34:03.63	269.443	-29.652	1536.799999
Max Elevation	2 Jul 2004 12:30:11.99	319.178	-25.000	2279.793599
Mean Elevation			-27.151	
Min Range	2 Jul 2004 12:34:03.63	269.443	-29.652	1536.799999
Max Range	2 Jul 2004 12:37:55.23	219.695	-25.000	2279.793608
Mean Range			1874.622143	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 14:04:16.37	336.652	-25.000	2279.793595
	2 Jul 2004 14:05:16.00	331.563	-26.537	1905.027337
	2 Jul 2004 14:06:16.00	323.611	-29.425	1556.441130
	2 Jul 2004 14:07:16.00	310.437	-33.964	1262.390236
	2 Jul 2004 14:08:16.00	288.479	-38.963	1070.574425
	2 Jul 2004 14:09:16.00	258.955	-39.999	1040.185926
	2 Jul 2004 14:10:16.00	233.721	-35.740	1183.851683
	2 Jul 2004 14:11:16.00	217.994	-30.762	1450.280972
	2 Jul 2004 14:12:16.00	208.631	-27.328	1784.483542
	2 Jul 2004 14:13:16.00	202.735	-25.388	2154.069600
	2 Jul 2004 14:13:35.66	201.272	-25.000	2279.793602
Min Elevation	2 Jul 2004 14:08:56.03	268.978	-40.368	1029.912257
Max Elevation	2 Jul 2004 14:04:16.37	336.652	-25.000	2279.793595
Mean Elevation			-30.737	
Min Range	2 Jul 2004 14:08:56.03	268.978	-40.368	1029.912257
Max Range	2 Jul 2004 14:13:35.66	201.272	-25.000	2279.793602
Mean Range			1633.353823	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 15:39:24.69	359.787	-25.000	2279.793590
	2 Jul 2004 15:40:24.00	0.060	-26.730	1872.885041
	2 Jul 2004 15:41:24.00	0.510	-30.480	1470.920482
	2 Jul 2004 15:42:24.00	1.393	-38.278	1092.108249
	2 Jul 2004 15:43:24.00	3.928	-54.999	773.977262
	2 Jul 2004 15:44:24.00	56.093	-85.545	620.537886
	2 Jul 2004 15:45:24.00	172.737	-58.111	742.688807
	2 Jul 2004 15:46:24.00	175.785	-39.733	1047.745668
	2 Jul 2004 15:47:24.00	176.755	-31.173	1421.675753
	2 Jul 2004 15:48:24.00	177.226	-27.066	1821.450704
	2 Jul 2004 15:49:24.00	177.500	-25.135	2231.962425
	2 Jul 2004 15:49:30.94	177.524	-25.000	2279.793590
Min Elevation	2 Jul 2004 15:44:27.74	88.680	-86.244	619.941809
Max Elevation	2 Jul 2004 15:39:24.69	359.787	-25.000	2279.793590
Mean Elevation			-38.937	
Min Range	2 Jul 2004 15:44:27.74	88.681	-86.244	619.941809
Max Range	2 Jul 2004 15:39:24.69	359.787	-25.000	2279.793590
Mean Range			1471.294955	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 17:16:19.83	27.655	-25.000	2279.793593
	2 Jul 2004 17:17:19.00	33.910	-26.349	1938.256242
	2 Jul 2004 17:18:19.00	43.230	-28.656	1629.070152
	2 Jul 2004 17:19:19.00	57.200	-31.752	1384.017933
	2 Jul 2004 17:20:19.00	76.982	-34.378	1242.803376
	2 Jul 2004 17:21:19.00	99.898	-34.397	1241.891951
	2 Jul 2004 17:22:19.00	119.733	-31.793	1381.455098
	2 Jul 2004 17:23:19.00	133.754	-28.695	1625.140493
	2 Jul 2004 17:24:19.00	143.102	-26.377	1933.105431
	2 Jul 2004 17:25:19.00	149.438	-25.004	2278.364997
	2 Jul 2004 17:25:19.24	149.459	-25.000	2279.793594
Min Elevation	2 Jul 2004 17:20:49.36	88.574	-34.800	1223.649396
Max Elevation	2 Jul 2004 17:16:19.83	27.655	-25.000	2279.793593
Mean Elevation			-28.855	

Min Range	2 Jul 2004 17:20:49.37	88.577	-34.800	1223.649394
Max Range	2 Jul 2004 17:25:19.24	149.459	-25.000	2279.793594
Mean Range				1746.699351

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:56:19.87	68.731	-25.000	2279.793593
2 Jul 2004 18:57:19.00	79.240	-25.306	2177.816630
2 Jul 2004 18:58:19.00	90.622	-25.398	2151.093405
2 Jul 2004 18:59:19.00	101.842	-25.219	2204.472061
2 Jul 2004 18:59:58.05	108.654	-25.000	2279.793612

Min Elevation	2 Jul 2004 18:58:08.92	88.696	-25.402	2149.950515
Max Elevation	2 Jul 2004 18:56:19.87	68.731	-25.000	2279.793593
Mean Elevation			-25.185	
Min Range	2 Jul 2004 18:58:08.90	88.691	-25.402	2149.950522
Max Range	2 Jul 2004 18:59:58.05	108.654	-25.000	2279.793612
Mean Range				2218.593860

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 03:10:48.55	65.238	-25.000	2279.793600
3 Jul 2004 03:11:48.00	75.547	-25.454	2135.616005
3 Jul 2004 03:12:48.00	87.190	-25.733	2065.304821
3 Jul 2004 03:13:48.00	99.204	-25.677	2078.568104
3 Jul 2004 03:14:48.00	110.545	-25.319	2173.923800
3 Jul 2004 03:15:28.52	117.426	-25.000	2279.793592

Min Elevation	3 Jul 2004 03:13:08.60	91.327	-25.754	2060.296374
Max Elevation	3 Jul 2004 03:15:28.52	117.426	-25.000	2279.793592
Mean Elevation			-25.364	
Min Range	3 Jul 2004 03:13:08.62	91.331	-25.754	2060.296378
Max Range	3 Jul 2004 03:10:48.55	65.238	-25.000	2279.793600
Mean Range				2168.833320

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:45:45.39	27.513	-25.000	2279.793598
3 Jul 2004 04:46:45.00	33.229	-26.425	1924.452138
3 Jul 2004 04:47:45.00	41.885	-28.958	1599.311965
3 Jul 2004 04:48:45.00	55.405	-32.615	1332.780585
3 Jul 2004 04:49:45.00	75.870	-36.157	1167.311073
3 Jul 2004 04:50:45.00	101.168	-36.654	1148.374387
3 Jul 2004 04:51:45.00	123.273	-33.554	1282.661263
3 Jul 2004 04:52:45.00	138.315	-29.732	1529.996133
3 Jul 2004 04:53:45.00	147.931	-26.910	1844.752061
3 Jul 2004 04:54:45.00	154.255	-25.242	2197.196911
3 Jul 2004 04:54:58.50	155.374	-25.000	2279.793612

Min Elevation	3 Jul 2004 04:50:22.11	91.422	-36.976	1136.571907
Max Elevation	3 Jul 2004 04:54:58.50	155.374	-25.000	2279.793612
Mean Elevation			-29.659	
Min Range	3 Jul 2004 04:50:22.11	91.422	-36.976	1136.571907
Max Range	3 Jul 2004 04:54:58.50	155.374	-25.000	2279.793612
Mean Range				1689.674884

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 06:21:35.53	359.955	-25.000	2279.793591
3 Jul 2004 06:22:35.00	359.621	-26.737	1871.828753
3 Jul 2004 06:23:35.00	359.069	-30.494	1469.891199
3 Jul 2004 06:24:35.00	357.988	-38.307	1091.161804
3 Jul 2004 06:25:35.00	354.881	-55.050	773.415214
3 Jul 2004 06:26:35.00	296.986	-84.922	621.156234
3 Jul 2004 06:27:35.00	188.489	-57.890	744.738238
3 Jul 2004 06:28:35.00	184.811	-39.631	1050.685429
3 Jul 2004 06:29:35.00	183.631	-31.120	1425.299953
3 Jul 2004 06:30:35.00	183.055	-27.037	1825.748089
3 Jul 2004 06:31:35.00	182.718	-25.120	2236.974579
3 Jul 2004 06:31:41.20	182.691	-25.000	2279.793593

Min Elevation	3 Jul 2004 06:26:38.43	271.316	-85.421	620.654387
Max Elevation	3 Jul 2004 06:31:41.20	182.691	-25.000	2279.793593
Mean Elevation			-38.859	
Min Range	3 Jul 2004 06:26:38.43	271.298	-85.421	620.654387
Max Range	3 Jul 2004 06:31:41.20	182.691	-25.000	2279.793593
Mean Range				1472.540556

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)

	3 Jul 2004 07:57:30.34	336.622	-25.000	2279.793590
	3 Jul 2004 07:58:30.00	331.089	-26.498	1911.609332
	3 Jul 2004 07:59:30.00	322.566	-29.240	1573.013919
	3 Jul 2004 08:00:30.00	308.840	-33.346	1293.325493
	3 Jul 2004 08:01:30.00	287.179	-37.467	1119.228209
	3 Jul 2004 08:02:30.00	259.808	-37.952	1102.776962
	3 Jul 2004 08:03:30.00	236.585	-34.218	1250.261469
	3 Jul 2004 08:04:30.00	221.534	-29.926	1514.012555
	3 Jul 2004 08:05:30.00	212.238	-26.915	1843.947216
	3 Jul 2004 08:06:30.00	206.246	-25.203	2209.525812
	3 Jul 2004 08:06:41.13	205.373	-25.000	2279.793593
Min Elevation	3 Jul 2004 08:02:05.71	270.982	-38.392	1088.426928
Max Elevation	3 Jul 2004 08:06:41.13	205.373	-25.000	2279.793593
Mean Elevation			-30.070	
Min Range	3 Jul 2004 08:02:05.71	270.983	-38.392	1088.426928
Max Range	3 Jul 2004 08:06:41.13	205.373	-25.000	2279.793593
Mean Range			1670.662559	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 09:33:07.86	318.941	-25.000	2279.793604
3 Jul 2004 09:34:07.00	310.468	-26.072	1991.428307
3 Jul 2004 09:35:07.00	298.895	-27.531	1757.667830
3 Jul 2004 09:36:07.00	284.038	-28.846	1610.193524
3 Jul 2004 09:37:07.00	267.065	-29.228	1574.136635
3 Jul 2004 09:38:07.00	250.674	-28.389	1656.924863
3 Jul 2004 09:39:07.00	237.098	-26.926	1842.274149
3 Jul 2004 09:40:07.00	226.807	-25.580	2102.550205
3 Jul 2004 09:40:42.21	222.079	-25.000	2279.793594

Min Elevation	3 Jul 2004 09:36:55.01	270.505	-29.254	1571.710835
Max Elevation	3 Jul 2004 09:33:07.86	318.941	-25.000	2279.793604
Mean Elevation			-26.952	
Min Range	3 Jul 2004 09:36:55.01	270.505	-29.254	1571.710835
Max Range	3 Jul 2004 09:33:07.86	318.941	-25.000	2279.793604
Mean Range			1899.418079	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:07:58.15	312.462	-25.000	2279.793612
3 Jul 2004 11:08:58.00	303.083	-25.924	2022.306076
3 Jul 2004 11:09:58.00	291.014	-26.996	1831.711735
3 Jul 2004 11:10:58.00	276.560	-27.733	1732.157469
3 Jul 2004 11:11:58.00	261.199	-27.671	1739.799873
3 Jul 2004 11:12:58.00	247.015	-26.854	1853.283786
3 Jul 2004 11:13:58.00	235.324	-25.778	2054.713055
3 Jul 2004 11:14:49.50	227.407	-25.000	2279.793597

Min Elevation	3 Jul 2004 11:11:23.83	269.935	-27.817	1721.921753
Max Elevation	3 Jul 2004 11:14:49.50	227.407	-25.000	2279.793597
Mean Elevation			-26.370	
Min Range	3 Jul 2004 11:11:23.84	269.930	-27.817	1721.921757
Max Range	3 Jul 2004 11:07:58.15	312.462	-25.000	2279.793612
Mean Range			1974.194900	

Global Statistics

Min Elevation	2 Jul 2004 15:44:27.74	88.680	-86.244	619.941809
Max Elevation	3 Jul 2004 11:14:49.50	227.407	-25.000	2279.793597
Mean Elevation			-30.694	
Min Range	2 Jul 2004 15:44:27.74	88.681	-86.244	619.941809
Max Range	2 Jul 2004 11:02:59.06	227.582	-25.000	2279.793613
Mean Range			1743.587161	

ESM-To-Spitzbergen

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 12:18:05.44	350.038	-25.000	2299.347767
1 Jul 2004 12:19:05.00	347.783	-26.650	1896.322527
1 Jul 2004 12:20:05.00	344.075	-30.138	1503.545109
1 Jul 2004 12:21:05.00	337.072	-36.988	1140.360322
1 Jul 2004 12:22:05.00	320.214	-49.445	848.232659
1 Jul 2004 12:23:05.00	271.117	-60.882	721.372455
1 Jul 2004 12:24:05.00	220.393	-50.069	838.993639
1 Jul 2004 12:25:05.00	202.801	-37.373	1126.628575
1 Jul 2004 12:26:05.00	195.581	-30.337	1487.975385
1 Jul 2004 12:27:05.00	191.786	-26.750	1879.935065

	1 Jul 2004 12:28:05.00	189.473	-25.036	2285.571193
	1 Jul 2004 12:28:07.02	189.411	-25.000	2299.347765
Min Elevation	1 Jul 2004 12:23:06.22	269.727	-60.889	721.317398
Max Elevation	1 Jul 2004 12:18:05.44	350.038	-25.000	2299.347767
Mean Elevation			-35.306	
Min Range	1 Jul 2004 12:23:06.23	269.725	-60.889	721.317398
Max Range	1 Jul 2004 12:18:05.44	350.038	-25.000	2299.347767
Mean Range			1527.302705	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:53:43.30	357.676	-25.000	2299.347755
1 Jul 2004 13:54:43.00	357.261	-26.691	1889.580646
1 Jul 2004 13:55:43.00	356.569	-30.346	1487.290521
1 Jul 2004 13:56:43.00	355.211	-37.928	1107.626467
1 Jul 2004 13:57:43.00	351.396	-54.089	786.840592
1 Jul 2004 13:58:43.00	301.588	-82.980	625.658776
1 Jul 2004 13:59:43.00	189.237	-58.894	738.082756
1 Jul 2004 14:00:43.00	184.140	-40.194	1038.446170
1 Jul 2004 14:01:43.00	182.538	-31.426	1410.648420
1 Jul 2004 14:02:43.00	181.756	-27.212	1809.830363
1 Jul 2004 14:03:43.00	181.293	-25.223	2220.243252
1 Jul 2004 14:03:54.47	181.225	-25.000	2299.347767

Min Elevation	1 Jul 2004 13:58:48.85	269.493	-84.045	624.206576
Max Elevation	1 Jul 2004 13:53:43.30	357.676	-25.000	2299.347755
Mean Elevation			-38.749	
Min Range	1 Jul 2004 13:58:48.86	269.461	-84.045	624.206575
Max Range	1 Jul 2004 14:03:54.47	181.225	-25.000	2299.347767
Mean Range			1476.078624	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 15:29:50.53	9.765	-25.000	2299.347762
1 Jul 2004 15:30:50.00	12.181	-26.623	1900.928134
1 Jul 2004 15:31:50.00	16.125	-30.025	1512.550954
1 Jul 2004 15:32:50.00	23.468	-36.617	1154.070389
1 Jul 2004 15:33:50.00	40.514	-48.316	865.857396
1 Jul 2004 15:34:50.00	86.373	-58.976	737.350497
1 Jul 2004 15:35:50.00	135.390	-49.639	845.333970
1 Jul 2004 15:36:50.00	154.080	-37.471	1123.207831
1 Jul 2004 15:37:50.00	161.931	-30.479	1477.253900
1 Jul 2004 15:38:50.00	166.075	-26.853	1863.497691
1 Jul 2004 15:39:50.00	168.599	-25.094	2264.297174
1 Jul 2004 15:39:55.19	168.771	-25.000	2299.347768

Min Elevation	1 Jul 2004 15:34:52.79	89.281	-59.008	737.073298
Max Elevation	1 Jul 2004 15:39:55.19	168.771	-25.000	2299.347768
Mean Elevation			-35.008	
Min Range	1 Jul 2004 15:34:52.79	89.281	-59.008	737.073298
Max Range	1 Jul 2004 15:39:55.19	168.771	-25.000	2299.347768
Mean Range			1528.586956	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 17:06:45.82	25.007	-25.000	2299.347757
1 Jul 2004 17:07:45.00	30.577	-26.373	1945.015133
1 Jul 2004 17:08:45.00	39.027	-28.849	1617.295406
1 Jul 2004 17:09:45.00	52.203	-32.470	1346.376751
1 Jul 2004 17:10:45.00	72.254	-36.105	1173.697854
1 Jul 2004 17:11:45.00	97.472	-36.851	1145.350357
1 Jul 2004 17:12:45.00	119.948	-33.886	1271.074320
1 Jul 2004 17:13:45.00	135.376	-30.026	1512.459853
1 Jul 2004 17:14:45.00	145.234	-27.118	1823.335914
1 Jul 2004 17:15:45.00	151.695	-25.376	2173.053876
1 Jul 2004 17:16:05.70	153.406	-25.000	2299.347767

Min Elevation	1 Jul 2004 17:11:25.67	89.219	-37.083	1136.939411
Max Elevation	1 Jul 2004 17:16:05.70	153.406	-25.000	2299.347767
Mean Elevation			-29.732	
Min Range	1 Jul 2004 17:11:25.67	89.218	-37.083	1136.939411
Max Range	1 Jul 2004 17:16:05.70	153.406	-25.000	2299.347767
Mean Range			1691.486817	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:44:41.30	42.467	-25.000	2299.347747
1 Jul 2004 18:45:41.00	50.876	-25.972	2024.524751
1 Jul 2004 18:46:41.00	62.008	-27.247	1804.960786

	1 Jul 2004 18:47:41.00	75.987	-28.379	1665.742831
	1 Jul 2004 18:48:41.00	91.795	-28.739	1628.178542
	1 Jul 2004 18:49:41.00	107.226	-28.080	1699.118201
	1 Jul 2004 18:50:41.00	120.347	-26.837	1865.913861
	1 Jul 2004 18:51:41.00	130.577	-25.625	2105.277498
	1 Jul 2004 18:52:22.12	136.095	-25.000	2299.347751
Min Elevation	1 Jul 2004 18:48:31.63	89.288	-28.753	1626.829429
Max Elevation	1 Jul 2004 18:44:41.30	42.467	-25.000	2299.347747
Mean Elevation			-26.764	
Min Range	1 Jul 2004 18:48:31.63	89.288	-28.753	1626.829429
Max Range	1 Jul 2004 18:52:22.12	136.095	-25.000	2299.347751
Mean Range			1932.490219	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 20:23:40.67	61.747	-25.000	2299.347753
1 Jul 2004 20:24:40.00	71.839	-25.478	2144.053272
1 Jul 2004 20:25:40.00	83.391	-25.810	2060.494291
1 Jul 2004 20:26:40.00	95.477	-25.812	2060.092190
1 Jul 2004 20:27:40.00	107.034	-25.483	2142.856327
1 Jul 2004 20:28:39.96	117.230	-25.000	2299.347753

Min Elevation	1 Jul 2004 20:26:10.28	89.490	-25.858	2049.651633
Max Elevation	1 Jul 2004 20:28:39.96	117.230	-25.000	2299.347753
Mean Elevation			-25.431	
Min Range	1 Jul 2004 20:26:10.28	89.491	-25.858	2049.651633
Max Range	1 Jul 2004 20:23:40.67	61.747	-25.000	2299.347753
Mean Range			2167.698598	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 01:18:20.57	65.552	-25.000	2299.347752
2 Jul 2004 01:19:20.00	75.797	-25.411	2162.906379
2 Jul 2004 01:20:20.00	87.260	-25.647	2099.780845
2 Jul 2004 01:21:20.00	98.998	-25.573	2118.597310
2 Jul 2004 01:22:20.00	110.036	-25.232	2217.232605
2 Jul 2004 01:22:52.07	115.394	-25.000	2299.347764

Min Elevation	2 Jul 2004 01:20:36.34	90.472	-25.659	2096.699878
Max Elevation	2 Jul 2004 01:22:52.07	115.394	-25.000	2299.347764
Mean Elevation			-25.311	
Min Range	2 Jul 2004 01:20:36.37	90.477	-25.659	2096.699887
Max Range	2 Jul 2004 01:22:52.07	115.394	-25.000	2299.347764
Mean Range			2199.535443	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:54:37.99	46.436	-25.000	2299.347752
2 Jul 2004 02:55:37.00	55.027	-25.892	2042.039220
2 Jul 2004 02:56:37.00	66.294	-27.009	1839.446457
2 Jul 2004 02:57:37.00	80.071	-27.915	1718.450841
2 Jul 2004 02:58:37.00	95.229	-28.097	1697.185019
2 Jul 2004 02:59:37.00	109.776	-27.433	1779.368147
2 Jul 2004 03:00:37.00	122.127	-26.336	1951.722996
2 Jul 2004 03:01:37.00	131.848	-25.311	2192.526602
2 Jul 2004 03:02:00.18	134.960	-25.000	2299.347774

Min Elevation	2 Jul 2004 02:58:19.16	90.691	-28.138	1692.511033
Max Elevation	2 Jul 2004 02:54:37.99	46.436	-25.000	2299.347752
Mean Elevation			-26.444	
Min Range	2 Jul 2004 02:58:19.12	90.681	-28.138	1692.511058
Max Range	2 Jul 2004 03:02:00.18	134.960	-25.000	2299.347774
Mean Range			1979.937201	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 04:30:54.92	28.903	-25.000	2299.347767
2 Jul 2004 04:31:54.00	34.867	-26.319	1954.959425
2 Jul 2004 04:32:54.00	43.796	-28.625	1639.852767
2 Jul 2004 04:33:54.00	57.311	-31.821	1385.333069
2 Jul 2004 04:34:54.00	76.876	-34.741	1231.000050
2 Jul 2004 04:35:54.00	100.269	-35.071	1216.397132
2 Jul 2004 04:36:54.00	120.946	-32.473	1346.197509
2 Jul 2004 04:37:54.00	135.578	-29.187	1584.930978
2 Jul 2004 04:38:54.00	145.257	-26.682	1891.063120
2 Jul 2004 04:39:54.00	151.765	-25.175	2236.129632
2 Jul 2004 04:40:04.53	152.680	-25.000	2299.347768

Min Elevation	2 Jul 2004 04:35:29.82	90.780	-35.360	1204.032916

Max Elevation	2 Jul 2004 04:30:54.92	28.903	-25.000	2299.347767
Mean Elevation			-29.099	
Min Range	2 Jul 2004 04:35:29.82	90.780	-35.360	1204.032916
Max Range	2 Jul 2004 04:40:04.53	152.680	-25.000	2299.347768
Mean Range			1734.959929	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 06:07:06.48	13.219	-25.000	2299.347766
2 Jul 2004 06:08:06.00	16.065	-26.601	1904.593337
2 Jul 2004 06:09:06.00	20.684	-29.911	1521.836140
2 Jul 2004 06:10:06.00	29.133	-36.155	1171.761230
2 Jul 2004 06:11:06.00	47.640	-46.551	895.939070
2 Jul 2004 06:12:06.00	89.740	-54.739	779.463222
2 Jul 2004 06:13:06.00	132.756	-46.999	887.991122
2 Jul 2004 06:14:06.00	151.893	-36.467	1159.714879
2 Jul 2004 06:15:06.00	160.571	-30.080	1508.155400
2 Jul 2004 06:16:06.00	165.292	-26.686	1890.359811
2 Jul 2004 06:17:06.00	168.213	-25.029	2288.295825
2 Jul 2004 06:17:07.65	168.277	-25.000	2299.347764

Min Elevation	2 Jul 2004 06:12:07.13	90.735	-54.743	779.420103
Max Elevation	2 Jul 2004 06:07:06.48	13.219	-25.000	2299.347766
Mean Elevation			-34.101	
Min Range	2 Jul 2004 06:12:07.14	90.737	-54.743	779.420103
Max Range	2 Jul 2004 06:07:06.48	13.219	-25.000	2299.347766
Mean Range			1550.567131	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 07:43:08.80	0.286	-25.000	2299.347768
2 Jul 2004 07:44:08.00	0.211	-26.670	1893.107361
2 Jul 2004 07:45:08.00	0.091	-30.303	1490.651133
2 Jul 2004 07:46:08.00	359.860	-37.848	1110.312113
2 Jul 2004 07:47:08.00	359.218	-54.018	787.656781
2 Jul 2004 07:48:08.00	347.364	-85.590	622.532128
2 Jul 2004 07:49:08.00	182.264	-59.637	731.620528
2 Jul 2004 07:50:08.00	181.368	-40.463	1031.010872
2 Jul 2004 07:51:08.00	181.094	-31.543	1403.022684
2 Jul 2004 07:52:08.00	180.963	-27.267	1802.192015
2 Jul 2004 07:53:08.00	180.887	-25.246	2212.647118
2 Jul 2004 07:53:20.57	180.876	-25.000	2299.347752

Min Elevation	2 Jul 2004 07:48:14.71	270.570	-88.990	620.614458
Max Elevation	2 Jul 2004 07:43:08.80	0.286	-25.000	2299.347768
Mean Elevation			-39.049	
Min Range	2 Jul 2004 07:48:14.71	270.570	-88.990	620.614458
Max Range	2 Jul 2004 07:43:08.80	0.286	-25.000	2299.347768
Mean Range			1473.620688	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 09:18:58.22	351.419	-25.000	2299.347772
2 Jul 2004 09:19:58.00	349.332	-26.665	1893.900186
2 Jul 2004 09:20:58.00	345.906	-30.187	1499.622477
2 Jul 2004 09:21:58.00	339.397	-37.167	1133.934407
2 Jul 2004 09:22:58.00	323.367	-50.154	837.763168
2 Jul 2004 09:23:58.00	272.456	-62.818	706.768094
2 Jul 2004 09:24:58.00	218.860	-51.100	824.448739
2 Jul 2004 09:25:58.00	201.785	-37.730	1114.300605
2 Jul 2004 09:26:58.00	194.987	-30.475	1477.483692
2 Jul 2004 09:27:58.00	191.451	-26.807	1870.705962
2 Jul 2004 09:28:58.00	189.308	-25.058	2277.222347
2 Jul 2004 09:29:01.23	189.217	-25.000	2299.347773

Min Elevation	2 Jul 2004 09:23:59.74	270.312	-62.834	706.654687
Max Elevation	2 Jul 2004 09:18:58.22	351.419	-25.000	2299.347772
Mean Elevation			-35.680	
Min Range	2 Jul 2004 09:23:59.74	270.312	-62.834	706.654687
Max Range	2 Jul 2004 09:29:01.23	189.217	-25.000	2299.347773
Mean Range			1519.570435	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 10:54:34.06	348.002	-25.000	2299.347750
2 Jul 2004 10:55:34.00	345.195	-26.645	1897.260183
2 Jul 2004 10:56:34.00	340.634	-30.055	1510.109054
2 Jul 2004 10:57:34.00	332.176	-36.558	1156.266124
2 Jul 2004 10:58:34.00	313.130	-47.501	879.343054
2 Jul 2004 10:59:34.00	268.562	-55.679	769.250849

	2 Jul 2004 11:00:34.00	225.381	-46.848	890.642828
	2 Jul 2004 11:01:34.00	207.218	-36.113	1173.399258
	2 Jul 2004 11:02:34.00	199.065	-29.815	1529.733767
	2 Jul 2004 11:03:34.00	194.630	-26.523	1918.003145
	2 Jul 2004 11:04:30.81	192.003	-25.000	2299.347749
Min Elevation	2 Jul 2004 10:59:32.43	270.003	-55.687	769.165893
Max Elevation	2 Jul 2004 10:54:34.06	348.002	-25.000	2299.347750
Mean Elevation			-35.067	
Min Range	2 Jul 2004 10:59:32.43	270.002	-55.687	769.165893
Max Range	2 Jul 2004 10:54:34.06	348.002	-25.000	2299.347750
Mean Range			1483.882160	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 12:30:03.62	350.704	-25.000	2299.347769
2 Jul 2004 12:31:03.00	348.619	-26.649	1896.607755
2 Jul 2004 12:32:03.00	345.177	-30.153	1502.343044
2 Jul 2004 12:33:03.00	338.645	-37.091	1136.636256
2 Jul 2004 12:34:03.00	322.628	-49.984	840.236833
2 Jul 2004 12:35:03.00	272.188	-62.602	708.321934
2 Jul 2004 12:36:03.00	218.645	-51.089	824.607439
2 Jul 2004 12:37:03.00	201.395	-37.752	1113.547502
2 Jul 2004 12:38:03.00	194.518	-30.492	1476.252493
2 Jul 2004 12:39:03.00	190.939	-26.817	1869.200316
2 Jul 2004 12:40:03.00	188.768	-25.063	2275.536387
2 Jul 2004 12:40:06.48	188.669	-25.000	2299.347766

Min Elevation	2 Jul 2004 12:35:05.04	269.689	-62.623	708.165625
Max Elevation	2 Jul 2004 12:30:03.62	350.704	-25.000	2299.347769
Mean Elevation			-35.641	
Min Range	2 Jul 2004 12:35:05.04	269.692	-62.623	708.165625
Max Range	2 Jul 2004 12:30:03.62	350.704	-25.000	2299.347769
Mean Range			1520.165458	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:05:43.98	358.976	-25.000	2299.347755
2 Jul 2004 14:06:43.00	358.874	-26.663	1894.212185
2 Jul 2004 14:07:43.00	358.701	-30.290	1491.592973
2 Jul 2004 14:08:43.00	358.360	-37.825	1111.099941
2 Jul 2004 14:09:43.00	357.401	-53.968	788.242255
2 Jul 2004 14:10:43.00	340.265	-85.387	622.723079
2 Jul 2004 14:11:43.00	181.984	-59.669	731.350519
2 Jul 2004 14:12:43.00	180.632	-40.482	1030.493417
2 Jul 2004 14:13:43.00	180.215	-31.553	1402.356887
2 Jul 2004 14:14:43.00	180.011	-27.272	1801.391128
2 Jul 2004 14:15:43.00	179.889	-25.249	2211.696461
2 Jul 2004 14:15:55.71	179.869	-25.000	2299.347769

Min Elevation	2 Jul 2004 14:10:49.82	269.432	-88.482	620.747798
Max Elevation	2 Jul 2004 14:15:55.71	179.869	-25.000	2299.347769
Mean Elevation			-39.030	
Min Range	2 Jul 2004 14:10:49.81	269.433	-88.482	620.747798
Max Range	2 Jul 2004 14:15:55.71	179.869	-25.000	2299.347769
Mean Range			1473.654531	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 15:41:56.32	11.525	-25.000	2299.347770
2 Jul 2004 15:42:56.00	14.348	-26.612	1902.813020
2 Jul 2004 15:43:56.00	18.919	-29.942	1519.305830
2 Jul 2004 15:44:56.00	27.295	-36.241	1168.386503
2 Jul 2004 15:45:56.00	45.761	-46.788	891.693688
2 Jul 2004 15:46:56.00	88.353	-55.146	774.972740
2 Jul 2004 15:47:56.00	131.794	-47.202	884.446226
2 Jul 2004 15:48:56.00	150.824	-36.532	1157.249897
2 Jul 2004 15:49:56.00	159.395	-30.103	1506.338677
2 Jul 2004 15:50:56.00	164.042	-26.695	1888.828810
2 Jul 2004 15:51:56.00	166.910	-25.033	2286.800754
2 Jul 2004 15:51:57.87	166.982	-25.000	2299.347771

Min Elevation	2 Jul 2004 15:46:57.02	89.267	-55.150	774.937372
Max Elevation	2 Jul 2004 15:41:56.32	11.525	-25.000	2299.347770
Mean Elevation			-34.191	
Min Range	2 Jul 2004 15:46:57.03	89.269	-55.150	774.937372
Max Range	2 Jul 2004 15:51:57.87	166.982	-25.000	2299.347771
Mean Range			1548.294307	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)

	2 Jul 2004 17:18:58.64	27.087	-25.000	2299.347772
	2 Jul 2004 17:19:58.00	33.061	-26.334	1952.064746
	2 Jul 2004 17:20:58.00	41.980	-28.665	1635.665095
	2 Jul 2004 17:21:58.00	55.514	-31.909	1379.855097
	2 Jul 2004 17:22:58.00	75.182	-34.886	1224.514910
	2 Jul 2004 17:23:58.00	98.755	-35.228	1209.647153
	2 Jul 2004 17:24:58.00	119.555	-32.582	1339.930705
	2 Jul 2004 17:25:58.00	134.214	-29.247	1579.359921
	2 Jul 2004 17:26:58.00	143.875	-26.713	1886.009577
	2 Jul 2004 17:27:58.00	150.353	-25.189	2231.310306
	2 Jul 2004 17:28:09.33	151.329	-25.000	2299.347762
Min Elevation	2 Jul 2004 17:23:33.89	89.220	-35.522	1197.281609
Max Elevation	2 Jul 2004 17:28:09.33	151.329	-25.000	2299.347762
Mean Elevation			-29.159	
Min Range	2 Jul 2004 17:23:33.89	89.220	-35.522	1197.281609
Max Range	2 Jul 2004 17:18:58.64	27.087	-25.000	2299.347772
Mean Range			1730.641186	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:57:02.10	44.782	-25.000	2299.347771
2 Jul 2004 18:58:02.00	53.508	-25.916	2036.792199
2 Jul 2004 18:59:02.00	64.817	-27.050	1833.405639
2 Jul 2004 19:00:02.00	78.656	-27.970	1711.989889
2 Jul 2004 19:01:02.00	93.887	-28.153	1690.774019
2 Jul 2004 19:02:02.00	108.488	-27.478	1773.387610
2 Jul 2004 19:03:02.00	120.862	-26.366	1946.300604
2 Jul 2004 19:04:02.00	130.582	-25.327	2187.555290
2 Jul 2004 19:04:26.20	133.818	-25.000	2299.347750

Min Elevation	2 Jul 2004 19:00:44.08	89.307	-28.195	1686.036883
Max Elevation	2 Jul 2004 18:57:02.10	44.782	-25.000	2299.347771
Mean Elevation			-26.473	
Min Range	2 Jul 2004 19:00:44.04	89.297	-28.195	1686.036906
Max Range	2 Jul 2004 18:57:02.10	44.782	-25.000	2299.347771
Mean Range			1975.433419	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 20:36:09.35	64.319	-25.000	2299.347762
2 Jul 2004 20:37:09.00	74.598	-25.419	2160.560469
2 Jul 2004 20:38:09.00	86.078	-25.663	2095.724984
2 Jul 2004 20:39:09.00	97.849	-25.595	2112.998682
2 Jul 2004 20:40:09.00	108.928	-25.253	2210.353931
2 Jul 2004 20:40:43.68	114.727	-25.000	2299.347755

Min Elevation	2 Jul 2004 20:38:26.49	89.525	-25.678	2092.186563
Max Elevation	2 Jul 2004 20:40:43.68	114.727	-25.000	2299.347755
Mean Elevation			-25.322	
Min Range	2 Jul 2004 20:38:26.52	89.530	-25.678	2092.186571
Max Range	2 Jul 2004 20:36:09.35	64.319	-25.000	2299.347762
Mean Range			2196.388931	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 01:30:24.29	63.049	-25.000	2299.347751
3 Jul 2004 01:31:24.00	73.216	-25.474	2145.265310
3 Jul 2004 01:32:24.00	84.761	-25.794	2064.212956
3 Jul 2004 01:33:24.00	96.812	-25.786	2066.201449
3 Jul 2004 01:34:24.00	108.315	-25.453	2151.031332
3 Jul 2004 01:35:20.83	117.967	-25.000	2299.347752

Min Elevation	3 Jul 2004 01:32:52.61	90.509	-25.836	2054.572532
Max Elevation	3 Jul 2004 01:35:20.83	117.967	-25.000	2299.347752
Mean Elevation			-25.418	
Min Range	3 Jul 2004 01:32:52.59	90.506	-25.836	2054.572528
Max Range	3 Jul 2004 01:35:20.83	117.967	-25.000	2299.347752
Mean Range			2170.901092	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 03:06:42.10	44.159	-25.000	2299.347754
3 Jul 2004 03:07:42.00	52.615	-25.968	2025.414805
3 Jul 2004 03:08:42.00	63.759	-27.226	1807.919443
3 Jul 2004 03:09:42.00	77.717	-28.332	1670.826512
3 Jul 2004 03:10:42.00	93.458	-28.670	1635.160155
3 Jul 2004 03:11:42.00	108.797	-28.008	1707.489479
3 Jul 2004 03:12:42.00	121.839	-26.780	1875.143769

	3 Jul 2004 03:13:42.00	132.021	-25.587	2115.035089
	3 Jul 2004 03:14:21.09	137.274	-25.000	2299.347745
Min Elevation	3 Jul 2004 03:10:31.67	90.709	-28.686	1633.529102
Max Elevation	3 Jul 2004 03:14:21.09	137.274	-25.000	2299.347745
Mean Elevation			-26.730	
Min Range	3 Jul 2004 03:10:31.67	90.710	-28.686	1633.529102
Max Range	3 Jul 2004 03:06:42.10	44.159	-25.000	2299.347754
Mean Range			1937.298306	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:42:58.56	26.826	-25.000	2299.347772
3 Jul 2004 04:43:58.00	32.450	-26.374	1944.809334
3 Jul 2004 04:44:58.00	40.949	-28.834	1618.717290
3 Jul 2004 04:45:58.00	54.165	-32.411	1349.743065
3 Jul 2004 04:46:58.00	74.176	-35.967	1179.188829
3 Jul 2004 04:47:58.00	99.201	-36.658	1152.502471
3 Jul 2004 04:48:58.00	121.480	-33.728	1278.888528
3 Jul 2004 04:49:58.00	136.824	-29.930	1520.274300
3 Jul 2004 04:50:58.00	146.668	-27.066	1831.013137
3 Jul 2004 04:51:58.00	153.141	-25.350	2180.699799
3 Jul 2004 04:52:17.45	154.761	-25.000	2299.347754

Min Elevation	3 Jul 2004 04:47:38.10	90.781	-36.898	1143.649466
Max Elevation	3 Jul 2004 04:52:17.45	154.761	-25.000	2299.347754
Mean Elevation			-29.665	
Min Range	3 Jul 2004 04:47:38.10	90.781	-36.898	1143.649466
Max Range	3 Jul 2004 04:42:58.56	26.826	-25.000	2299.347772
Mean Range			1695.866571	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 06:19:09.18	11.427	-25.000	2299.347762
3 Jul 2004 06:20:09.00	13.893	-26.633	1899.271763
3 Jul 2004 06:21:09.00	17.908	-30.035	1511.724306
3 Jul 2004 06:22:09.00	25.381	-36.609	1154.359906
3 Jul 2004 06:23:09.00	42.655	-48.195	867.810406
3 Jul 2004 06:24:09.00	88.251	-58.535	741.295457
3 Jul 2004 06:25:09.00	136.489	-49.317	850.166657
3 Jul 2004 06:26:09.00	155.186	-37.336	1127.939605
3 Jul 2004 06:27:09.00	163.113	-30.419	1481.779041
3 Jul 2004 06:28:09.00	167.316	-26.825	1867.942850
3 Jul 2004 06:29:09.00	169.886	-25.081	2268.800691
3 Jul 2004 06:29:13.52	170.040	-25.000	2299.347758

Min Elevation	3 Jul 2004 06:24:11.42	90.720	-58.558	741.089203
Max Elevation	3 Jul 2004 06:29:13.52	170.040	-25.000	2299.347758
Mean Elevation			-34.915	
Min Range	3 Jul 2004 06:24:11.42	90.720	-58.558	741.089203
Max Range	3 Jul 2004 06:19:09.18	11.427	-25.000	2299.347762
Mean Range			1530.815517	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:55:10.06	358.924	-25.000	2299.347761
3 Jul 2004 07:56:10.00	358.534	-26.700	1888.085054
3 Jul 2004 07:57:10.00	357.893	-30.364	1485.909385
3 Jul 2004 07:58:10.00	356.639	-37.966	1106.345801
3 Jul 2004 07:59:10.00	353.117	-54.186	785.719292
3 Jul 2004 08:00:10.00	304.264	-83.435	625.007901
3 Jul 2004 08:01:10.00	189.505	-58.887	738.143958
3 Jul 2004 08:02:10.00	184.835	-40.176	1038.941073
3 Jul 2004 08:03:10.00	183.370	-31.415	1411.384339
3 Jul 2004 08:04:10.00	182.658	-27.206	1810.745138
3 Jul 2004 08:05:10.00	182.240	-25.219	2221.325367
3 Jul 2004 08:05:21.31	182.180	-25.000	2299.347752

Min Elevation	3 Jul 2004 08:00:15.71	270.578	-84.532	623.624657
Max Elevation	3 Jul 2004 08:05:21.31	182.180	-25.000	2299.347752
Mean Elevation			-38.796	
Min Range	3 Jul 2004 08:00:15.71	270.542	-84.532	623.624656
Max Range	3 Jul 2004 07:55:10.06	358.924	-25.000	2299.347761
Mean Range			1475.858568	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 09:30:57.71	350.670	-25.000	2299.347771
3 Jul 2004 09:31:57.00	348.442	-26.640	1898.048752
3 Jul 2004 09:32:57.00	344.769	-30.119	1505.048537

	3 Jul 2004 09:33:57.00	337.836	-36.959	1141.410134
	3 Jul 2004 09:34:57.00	321.141	-49.438	848.347727
	3 Jul 2004 09:35:57.00	272.078	-61.062	719.951737
	3 Jul 2004 09:36:57.00	220.888	-50.247	836.425286
	3 Jul 2004 09:37:57.00	203.248	-37.456	1123.722196
	3 Jul 2004 09:38:57.00	196.042	-30.376	1485.039141
	3 Jul 2004 09:39:57.00	192.263	-26.768	1877.049476
	3 Jul 2004 09:40:57.00	189.964	-25.043	2282.758971
	3 Jul 2004 09:40:59.43	189.890	-25.000	2299.347774
Min Elevation	3 Jul 2004 09:35:58.58	270.273	-61.073	719.860063
Max Elevation	3 Jul 2004 09:30:57.71	350.670	-25.000	2299.347771
Mean Elevation			-35.342	
Min Range	3 Jul 2004 09:35:58.58	270.275	-61.073	719.860063
Max Range	3 Jul 2004 09:40:59.43	189.890	-25.000	2299.347774
Mean Range			1526.374792	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:06:32.14	348.006	-25.000	2299.347750
3 Jul 2004 11:07:32.00	345.214	-26.642	1897.749870
3 Jul 2004 11:08:32.00	340.673	-30.051	1510.449119
3 Jul 2004 11:09:32.00	332.250	-36.556	1156.345116
3 Jul 2004 11:10:32.00	313.261	-47.523	878.960506
3 Jul 2004 11:11:32.00	268.642	-55.774	768.251714
3 Jul 2004 11:12:32.00	225.299	-46.924	889.291489
3 Jul 2004 11:13:32.00	207.118	-36.149	1172.001888
3 Jul 2004 11:14:32.00	198.972	-29.832	1528.376828
3 Jul 2004 11:15:32.00	194.546	-26.531	1916.694303
3 Jul 2004 11:16:29.00	191.917	-25.000	2299.347749

Min Elevation	3 Jul 2004 11:11:30.57	269.963	-55.781	768.180745
Max Elevation	3 Jul 2004 11:16:29.00	191.917	-25.000	2299.347749
Mean Elevation			-35.089	
Min Range	3 Jul 2004 11:11:30.57	269.962	-55.781	768.180745
Max Range	3 Jul 2004 11:06:32.14	348.006	-25.000	2299.347750
Mean Range			1483.346939	

Global Statistics

Min Elevation	2 Jul 2004 07:48:14.71	270.570	-88.990	620.614458
Max Elevation	1 Jul 2004 15:39:55.19	168.771	-25.000	2299.347768
Mean Elevation			-32.823	
Min Range	2 Jul 2004 07:48:14.71	270.570	-88.990	620.614458
Max Range	2 Jul 2004 03:02:00.18	134.960	-25.000	2299.347774
Mean Range			1661.726936	

C.2.2 Direction Finding sensor pointing +90 degrees

24 Apr 2003 12:02:33

Satellite-NSAT-1-Sensor-ESM90-To-Target-BearIsland, Target-Ekofisk, Target-JanMayen, Target-Lofoten, Target-Spitzbergen: Inview Azimuth, Elevation, & Range

ESM90-To-BearIsland

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 17:10:12.66	86.119	-34.400	1244.937937
1 Jul 2004 17:10:22.00	89.654	-34.423	1243.850447
1 Jul 2004 17:10:27.66	91.795	-34.400	1244.935392

Min Elevation	1 Jul 2004 17:10:20.16	88.959	-34.425	1243.781115
Max Elevation	1 Jul 2004 17:10:12.66	86.119	-34.400	1244.937937
Mean Elevation			-34.408	
Min Range	1 Jul 2004 17:10:20.16	88.959	-34.425	1243.781115
Max Range	1 Jul 2004 17:10:12.66	86.119	-34.400	1244.937937
Mean Range			1244.574592	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:47:18.35	84.902	-26.534	1912.485454
1 Jul 2004 18:47:43.25	90.386	-26.558	1908.327781
1 Jul 2004 18:47:56.22	93.239	-26.534	1912.480552

Min Elevation	1 Jul 2004 18:47:37.29	89.072	-26.561	1907.869934
Max Elevation	1 Jul 2004 18:47:18.35	84.902	-26.534	1912.485454

Mean Elevation			-26.542	
Min Range	1 Jul 2004 18:47:37.29	89.072	-26.561	1907.869934
Max Range	1 Jul 2004 18:47:18.35	84.902	-26.534	1912.485454
Mean Range			1911.097929	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:59:07.21	86.049	-27.352	1787.323615
2 Jul 2004 02:59:34.43	92.559	-27.391	1782.064684
2 Jul 2004 02:59:48.36	95.883	-27.352	1787.328927

Min Elevation	2 Jul 2004 02:59:27.78	90.965	-27.395	1781.448549
Max Elevation	2 Jul 2004 02:59:48.36	95.883	-27.352	1787.328927
Mean Elevation			-27.365	
Min Range	2 Jul 2004 02:59:27.78	90.965	-27.395	1781.448549
Max Range	2 Jul 2004 02:59:48.36	95.883	-27.352	1787.328927
Mean Range			1785.572409	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 17:22:14.78	83.986	-32.714	1330.727088
2 Jul 2004 17:22:33.16	90.353	-32.779	1327.076516
2 Jul 2004 17:22:43.53	93.937	-32.714	1330.722619

Min Elevation	2 Jul 2004 17:22:29.16	88.963	-32.785	1326.768796
Max Elevation	2 Jul 2004 17:22:14.78	83.986	-32.714	1330.727088
Mean Elevation			-32.736	
Min Range	2 Jul 2004 17:22:29.16	88.963	-32.785	1326.768796
Max Range	2 Jul 2004 17:22:14.78	83.986	-32.714	1330.727088
Mean Range			1329.508741	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:59:34.61	85.457	-26.117	1990.185826
2 Jul 2004 18:59:57.14	90.185	-26.134	1986.811667
2 Jul 2004 19:00:09.32	92.738	-26.117	1990.181284

Min Elevation	2 Jul 2004 18:59:51.97	89.099	-26.136	1986.482518
Max Elevation	2 Jul 2004 18:59:34.61	85.457	-26.117	1990.185826
Mean Elevation			-26.123	
Min Range	2 Jul 2004 18:59:51.97	89.099	-26.136	1986.482518
Max Range	2 Jul 2004 18:59:34.61	85.457	-26.117	1990.185826
Mean Range			1989.059592	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 03:11:19.59	85.661	-28.003	1705.300964
3 Jul 2004 03:11:47.05	92.615	-28.053	1699.430623
3 Jul 2004 03:12:01.68	96.311	-28.003	1705.306416

Min Elevation	3 Jul 2004 03:11:40.63	90.984	-28.059	1698.825713
Max Elevation	3 Jul 2004 03:12:01.68	96.311	-28.003	1705.306416
Mean Elevation			-28.020	
Min Range	3 Jul 2004 03:11:40.63	90.984	-28.059	1698.825713
Max Range	3 Jul 2004 03:12:01.68	96.311	-28.003	1705.306416
Mean Range			1703.346001	

Global Statistics

Min Elevation	1 Jul 2004 17:10:20.16	88.959	-34.425	1243.781115
Max Elevation	2 Jul 2004 18:59:34.61	85.457	-26.117	1990.185826
Mean Elevation			-29.199	
Min Range	1 Jul 2004 17:10:20.16	88.959	-34.425	1243.781115
Max Range	2 Jul 2004 18:59:34.61	85.457	-26.117	1990.185826
Mean Range			1660.526544	

ESM90-To-Ekofisk

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:41:50.03	82.888	-27.444	1752.745134
1 Jul 2004 18:42:17.02	89.511	-27.485	1747.518333
1 Jul 2004 18:42:30.56	92.827	-27.444	1752.733491

Min Elevation	1 Jul 2004 18:42:10.30	87.861	-27.490	1746.872523
Max Elevation	1 Jul 2004 18:41:50.03	82.888	-27.444	1752.745134
Mean Elevation			-27.458	
Min Range	1 Jul 2004 18:42:10.30	87.861	-27.490	1746.872523
Max Range	1 Jul 2004 18:41:50.03	82.888	-27.444	1752.745134

Mean Range				1750.998986

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 04:41:13.45	88.192	-26.353	1917.283077
	2 Jul 2004 04:41:36.89	93.350	-26.374	1913.537531
	2 Jul 2004 04:41:49.29	96.075	-26.353	1917.294058
Min Elevation	2 Jul 2004 04:41:31.36	92.130	-26.376	1913.141835
Max Elevation	2 Jul 2004 04:41:49.29	96.075	-26.353	1917.294058
Mean Elevation			-26.360	
Min Range	2 Jul 2004 04:41:31.36	92.130	-26.376	1913.141835
Max Range	2 Jul 2004 04:41:49.29	96.075	-26.353	1917.294058
Mean Range				1916.038222

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 18:54:03.68	84.039	-26.264	1933.295679
	2 Jul 2004 18:54:26.44	88.997	-26.284	1929.678059
	2 Jul 2004 18:54:38.84	91.696	-26.264	1933.284849
Min Elevation	2 Jul 2004 18:54:21.27	87.871	-26.286	1929.336365
Max Elevation	2 Jul 2004 18:54:03.68	84.039	-26.264	1933.295679
Mean Elevation			-26.270	
Min Range	2 Jul 2004 18:54:21.27	87.870	-26.286	1929.336365
Max Range	2 Jul 2004 18:54:03.68	84.039	-26.264	1933.295679
Mean Range				1932.086196

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 04:53:21.84	87.088	-27.569	1736.840985
	3 Jul 2004 04:53:48.18	93.624	-27.613	1731.364719
	3 Jul 2004 04:54:02.61	97.198	-27.569	1736.852689
Min Elevation	3 Jul 2004 04:53:42.21	92.140	-27.617	1730.850082
Max Elevation	3 Jul 2004 04:54:02.61	97.198	-27.569	1736.852689
Mean Elevation			-27.583	
Min Range	3 Jul 2004 04:53:42.21	92.140	-27.617	1730.850082
Max Range	3 Jul 2004 04:54:02.61	97.198	-27.569	1736.852689
Mean Range				1735.019464

Global Statistics

Min Elevation	3 Jul 2004 04:53:42.21	92.140	-27.617	1730.850082
Max Elevation	2 Jul 2004 18:54:03.68	84.039	-26.264	1933.295679
Mean Elevation			-26.918	
Min Range	3 Jul 2004 04:53:42.21	92.140	-27.617	1730.850082
Max Range	2 Jul 2004 18:54:03.68	84.039	-26.264	1933.295679
Mean Range				1833.535717

ESM90-To-JanMayen

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 20:23:08.20	85.110	-26.178	1973.900836
	1 Jul 2004 20:23:31.43	90.035	-26.196	1970.459856
	1 Jul 2004 20:23:43.35	92.558	-26.178	1973.894920
Min Elevation	1 Jul 2004 20:23:25.78	88.836	-26.198	1970.063122
Max Elevation	1 Jul 2004 20:23:08.20	85.110	-26.178	1973.900836
Mean Elevation			-26.184	
Min Range	1 Jul 2004 20:23:25.78	88.836	-26.198	1970.063122
Max Range	1 Jul 2004 20:23:08.20	85.110	-26.178	1973.900836
Mean Range				1972.751871

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 04:36:47.30	87.802	-25.928	2025.323738
	2 Jul 2004 04:37:08.74	92.208	-25.941	2022.440881
	2 Jul 2004 04:37:19.91	94.502	-25.928	2025.329353
Min Elevation	2 Jul 2004 04:37:03.60	91.150	-25.943	2022.121677
Max Elevation	2 Jul 2004 04:37:19.91	94.502	-25.928	2025.329353
Mean Elevation			-25.932	
Min Range	2 Jul 2004 04:37:03.60	91.150	-25.943	2022.121677
Max Range	2 Jul 2004 04:37:19.91	94.502	-25.928	2025.329353
Mean Range				2024.364657

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)

	2 Jul 2004 18:58:11.25	85.342	-34.111	1256.831114
	2 Jul 2004 18:58:23.12	89.777	-34.143	1255.304339
	2 Jul 2004 18:58:29.43	92.133	-34.111	1256.827431
Min Elevation	2 Jul 2004 18:58:20.35	88.740	-34.146	1255.147539
Max Elevation	2 Jul 2004 18:58:11.25	85.342	-34.111	1256.831114
Mean Elevation			-34.121	
Min Range	2 Jul 2004 18:58:20.35	88.740	-34.146	1255.147539
Max Range	2 Jul 2004 18:58:11.25	85.342	-34.111	1256.831114
Mean Range			1256.320961	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 20:35:25.74	85.873	-25.723	2071.858202
	2 Jul 2004 20:35:44.93	89.710	-25.733	2069.442171
	2 Jul 2004 20:35:55.64	91.850	-25.723	2071.853002
Min Elevation	2 Jul 2004 20:35:40.70	88.863	-25.734	2069.231664
Max Elevation	2 Jul 2004 20:35:25.74	85.873	-25.723	2071.858202
Mean Elevation			-25.726	
Min Range	2 Jul 2004 20:35:40.70	88.863	-25.734	2069.231664
Max Range	2 Jul 2004 20:35:25.74	85.873	-25.723	2071.858202
Mean Range			2071.051125	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 04:48:59.55	87.129	-26.432	1926.540303
	3 Jul 2004 04:49:23.74	92.410	-26.455	1922.555970
	3 Jul 2004 04:49:36.65	95.227	-26.432	1926.546491
Min Elevation	3 Jul 2004 04:49:18.09	91.176	-26.457	1922.148791
Max Elevation	3 Jul 2004 04:49:36.65	95.227	-26.432	1926.546491
Mean Elevation			-26.440	
Min Range	3 Jul 2004 04:49:18.09	91.176	-26.457	1922.148791
Max Range	3 Jul 2004 04:49:36.65	95.227	-26.432	1926.546491
Mean Range			1925.214255	

Global Statistics

Min Elevation	2 Jul 2004 18:58:20.35	88.740	-34.146	1255.147539
Max Elevation	2 Jul 2004 20:35:25.74	85.873	-25.723	2071.858202
Mean Elevation			-27.681	
Min Range	2 Jul 2004 18:58:20.35	88.740	-34.146	1255.147539
Max Range	2 Jul 2004 20:35:25.74	85.873	-25.723	2071.858202
Mean Range			1849.940574	

ESM90-To-Lofoten

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 18:45:37.95	85.451	-25.848	2038.998982
	1 Jul 2004 18:45:58.02	89.545	-25.860	2036.240725
	1 Jul 2004 18:46:09.48	91.880	-25.848	2038.992657
Min Elevation	1 Jul 2004 18:45:53.72	88.668	-25.861	2036.019121
Max Elevation	1 Jul 2004 18:45:37.95	85.451	-25.848	2038.998982
Mean Elevation			-25.852	
Min Range	1 Jul 2004 18:45:53.72	88.668	-25.861	2036.019121
Max Range	1 Jul 2004 18:45:37.95	85.451	-25.848	2038.998982
Mean Range			2038.077455	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 03:00:42.51	89.284	-25.315	2174.979766
	2 Jul 2004 03:00:56.25	91.876	-25.319	2173.817870
	2 Jul 2004 03:01:03.88	93.315	-25.315	2174.984334
Min Elevation	2 Jul 2004 03:00:53.19	91.298	-25.320	2173.713715
Max Elevation	2 Jul 2004 03:01:03.88	93.315	-25.315	2174.984334
Mean Elevation			-25.317	
Min Range	2 Jul 2004 03:00:53.19	91.298	-25.320	2173.713715
Max Range	2 Jul 2004 03:01:03.88	93.315	-25.315	2174.984334
Mean Range			2174.593990	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 04:38:06.03	88.281	-34.250	1248.766940
	2 Jul 2004 04:38:17.13	92.462	-34.277	1247.496954

	2 Jul 2004 04:38:22.72	94.569	-34.250	1248.770797
Min Elevation	2 Jul 2004 04:38:14.37	91.422	-34.280	1247.341170
Max Elevation	2 Jul 2004 04:38:22.72	94.569	-34.250	1248.770797
Mean Elevation			-34.259	
Min Range	2 Jul 2004 04:38:14.37	91.422	-34.280	1247.341170
Max Range	2 Jul 2004 04:38:22.72	94.569	-34.250	1248.770797
Mean Range			1248.344897	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 17:20:44.94	86.863	-34.791	1224.059779
	2 Jul 2004 17:20:49.90	88.783	-34.800	1223.655278
	2 Jul 2004 17:20:53.78	90.287	-34.791	1224.057689
Min Elevation	2 Jul 2004 17:20:49.37	88.577	-34.800	1223.649394
Max Elevation	2 Jul 2004 17:20:44.94	86.863	-34.791	1224.059779
Mean Elevation			-34.794	
Min Range	2 Jul 2004 17:20:49.37	88.577	-34.800	1223.649394
Max Range	2 Jul 2004 17:20:44.94	86.863	-34.791	1224.059779
Mean Range			1223.924249	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 18:57:57.13	86.443	-25.397	2151.514069
	2 Jul 2004 18:58:12.71	89.420	-25.402	2150.111852
	2 Jul 2004 18:58:20.69	90.945	-25.397	2151.509106
Min Elevation	2 Jul 2004 18:58:08.92	88.696	-25.402	2149.950515
Max Elevation	2 Jul 2004 18:57:57.13	86.443	-25.397	2151.514069
Mean Elevation			-25.398	
Min Range	2 Jul 2004 18:58:08.92	88.696	-25.402	2149.950515
Max Range	2 Jul 2004 18:57:57.13	86.443	-25.397	2151.514069
Mean Range			2151.045009	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 03:12:53.56	88.303	-25.743	2062.969002
	3 Jul 2004 03:13:13.07	92.226	-25.753	2060.532392
	3 Jul 2004 03:13:23.66	94.354	-25.743	2062.975135
Min Elevation	3 Jul 2004 03:13:08.60	91.327	-25.754	2060.296374
Max Elevation	3 Jul 2004 03:13:23.66	94.354	-25.743	2062.975135
Mean Elevation			-25.746	
Min Range	3 Jul 2004 03:13:08.60	91.327	-25.754	2060.296374
Max Range	3 Jul 2004 03:13:23.66	94.354	-25.743	2062.975135
Mean Range			2062.158843	

Global Statistics

Min Elevation	2 Jul 2004 17:20:49.37	88.577	-34.800	1223.649394
Max Elevation	2 Jul 2004 03:01:03.88	93.315	-25.315	2174.984334
Mean Elevation			-28.561	
Min Range	2 Jul 2004 17:20:49.37	88.577	-34.800	1223.649394
Max Range	2 Jul 2004 03:01:03.88	93.315	-25.315	2174.984334
Mean Range			1816.357407	

ESM90-To-Spitzbergen

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 18:48:10.56	83.668	-28.685	1633.634960
	1 Jul 2004 18:48:38.09	91.017	-28.746	1627.470391
	1 Jul 2004 18:48:52.69	94.907	-28.685	1633.631067
Min Elevation	1 Jul 2004 18:48:31.63	89.289	-28.753	1626.829429
Max Elevation	1 Jul 2004 18:48:10.56	83.668	-28.685	1633.634960
Mean Elevation			-28.706	
Min Range	1 Jul 2004 18:48:31.63	89.289	-28.753	1626.829429
Max Range	1 Jul 2004 18:48:10.56	83.668	-28.685	1633.634960
Mean Range			1631.578806	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 20:25:54.37	86.277	-25.845	2052.650090
	1 Jul 2004 20:26:15.21	90.487	-25.857	2049.939265
	1 Jul 2004 20:26:26.19	92.703	-25.845	2052.647666
Min Elevation	1 Jul 2004 20:26:10.28	89.491	-25.858	2049.651633

Max Elevation	1 Jul 2004 20:25:54.37	86.277	-25.845	2052.650090
Mean Elevation			-25.849	
Min Range	1 Jul 2004 20:26:10.28	89.491	-25.858	2049.651633
Max Range	1 Jul 2004 20:25:54.37	86.277	-25.845	2052.650090
Mean Range			2051.745674	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 01:20:21.86	87.625	-25.650	2099.118870
2 Jul 2004 01:20:40.31	91.252	-25.659	2096.881617
2 Jul 2004 01:20:50.82	93.319	-25.650	2099.121001

Min Elevation	2 Jul 2004 01:20:36.34	90.472	-25.659	2096.699878
Max Elevation	2 Jul 2004 01:20:50.82	93.319	-25.650	2099.121001
Mean Elevation			-25.653	
Min Range	2 Jul 2004 01:20:36.34	90.472	-25.659	2096.699878
Max Range	2 Jul 2004 01:20:50.82	93.319	-25.650	2099.121001
Mean Range			2098.373829	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:57:58.05	85.325	-28.081	1699.054008
2 Jul 2004 02:58:26.15	92.473	-28.131	1693.229904
2 Jul 2004 02:58:40.28	96.059	-28.080	1699.057843

Min Elevation	2 Jul 2004 02:58:19.16	90.691	-28.138	1692.511033
Max Elevation	2 Jul 2004 02:58:40.28	96.059	-28.080	1699.057843
Mean Elevation			-28.097	
Min Range	2 Jul 2004 02:58:19.16	90.691	-28.138	1692.511033
Max Range	2 Jul 2004 02:58:40.28	96.059	-28.080	1699.057843
Mean Range			1697.113918	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 19:00:22.95	83.911	-28.137	1692.617862
2 Jul 2004 19:00:50.17	90.866	-28.190	1686.584408
2 Jul 2004 19:01:05.20	94.700	-28.137	1692.614057

Min Elevation	2 Jul 2004 19:00:44.08	89.307	-28.195	1686.036883
Max Elevation	2 Jul 2004 19:00:22.95	83.911	-28.137	1692.617862
Mean Elevation			-28.155	
Min Range	2 Jul 2004 19:00:44.08	89.307	-28.195	1686.036883
Max Range	2 Jul 2004 19:00:22.95	83.911	-28.137	1692.617862
Mean Range			1690.605442	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 20:38:11.86	86.640	-25.668	2094.663159
2 Jul 2004 20:38:30.50	90.316	-25.677	2092.373028
2 Jul 2004 20:38:41.11	92.407	-25.668	2094.661026

Min Elevation	2 Jul 2004 20:38:26.49	89.525	-25.678	2092.186563
Max Elevation	2 Jul 2004 20:38:11.86	86.640	-25.668	2094.663159
Mean Elevation			-25.671	
Min Range	2 Jul 2004 20:38:26.49	89.525	-25.678	2092.186563
Max Range	2 Jul 2004 20:38:11.86	86.640	-25.668	2094.663159
Mean Range			2093.899071	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 01:32:36.83	87.330	-25.823	2057.508383
3 Jul 2004 01:32:57.02	91.399	-25.835	2054.804707
3 Jul 2004 01:33:08.36	93.682	-25.823	2057.510807

Min Elevation	3 Jul 2004 01:32:52.59	90.506	-25.836	2054.572528
Max Elevation	3 Jul 2004 01:33:08.36	93.682	-25.823	2057.510807
Mean Elevation			-25.827	
Min Range	3 Jul 2004 01:32:52.59	90.506	-25.836	2054.572528
Max Range	3 Jul 2004 01:33:08.36	93.682	-25.823	2057.510807
Mean Range			2056.607966	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 03:10:10.59	85.114	-28.620	1640.313927
3 Jul 2004 03:10:38.12	92.425	-28.680	1634.164226
3 Jul 2004 03:10:52.76	96.307	-28.620	1640.317855

Min Elevation	3 Jul 2004 03:10:31.67	90.709	-28.686	1633.529102
Max Elevation	3 Jul 2004 03:10:52.76	96.307	-28.620	1640.317855
Mean Elevation			-28.640	

Min Range	3 Jul 2004 03:10:31.67	90.709	-28.686	1633.529102
Max Range	3 Jul 2004 03:10:52.76	96.307	-28.620	1640.317855
Mean Range				1638.265336

Global Statistics

Min Elevation	1 Jul 2004 18:48:31.63	89.289	-28.753	1626.829429
Max Elevation	2 Jul 2004 01:20:50.82	93.319	-25.650	2099.121001
Mean Elevation			-27.075	
Min Range	1 Jul 2004 18:48:31.63	89.289	-28.753	1626.829429
Max Range	2 Jul 2004 01:20:50.82	93.319	-25.650	2099.121001
Mean Range				1869.773755

C.2.3 Direction Finding sensor pointing -90 degrees

24 Apr 2003 12:01:28

Satellite-NSAT-1-Sensor-ESM-90-To-Target-BearIsland, Target-Ekofisk, Target-JanMayen, Target-Lofoten, Target-Spitzbergen: Inview Azimuth, Elevation, & Range

ESM-90-To-BearIsland

No Access Found

ESM-90-To-Ekofisk

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 15:30:04.61	273.946	-30.343	1469.654182
	1 Jul 2004 15:30:28.39	266.525	-30.417	1464.145921
	1 Jul 2004 15:30:41.19	262.537	-30.343	1469.663140
Min Elevation	1 Jul 2004 15:30:22.89	268.244	-30.425	1463.597864
Max Elevation	1 Jul 2004 15:30:41.19	262.537	-30.343	1469.663140
Mean Elevation			-30.368	
Min Range	1 Jul 2004 15:30:22.89	268.244	-30.425	1463.597864
Max Range	1 Jul 2004 15:30:41.19	262.537	-30.343	1469.663140
Mean Range				1467.821081

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 07:53:20.76	276.884	-32.403	1334.999691
	2 Jul 2004 07:53:39.24	270.381	-32.470	1331.167095
	2 Jul 2004 07:53:49.62	266.733	-32.403	1334.991853
Min Elevation	2 Jul 2004 07:53:35.20	271.806	-32.476	1330.840694
Max Elevation	2 Jul 2004 07:53:20.76	276.884	-32.403	1334.999691
Mean Elevation			-32.425	
Min Range	2 Jul 2004 07:53:35.20	271.806	-32.476	1330.840694
Max Range	2 Jul 2004 07:53:20.76	276.884	-32.403	1334.999691
Mean Range				1333.719546

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 15:42:02.01	273.111	-32.638	1321.769166
	2 Jul 2004 15:42:20.43	266.547	-32.700	1318.349846
	2 Jul 2004 15:42:29.65	263.263	-32.638	1321.776737
Min Elevation	2 Jul 2004 15:42:15.83	268.190	-32.707	1317.922944
Max Elevation	2 Jul 2004 15:42:29.65	263.263	-32.638	1321.776737
Mean Elevation			-32.658	
Min Range	2 Jul 2004 15:42:15.83	268.190	-32.707	1317.922944
Max Range	2 Jul 2004 15:42:29.65	263.263	-32.638	1321.776737
Mean Range				1320.631916

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 08:05:09.53	277.462	-30.175	1482.508939
	3 Jul 2004 08:05:33.67	270.008	-30.247	1476.928711
	3 Jul 2004 08:05:46.53	266.045	-30.175	1482.499911
Min Elevation	3 Jul 2004 08:05:28.04	271.751	-30.255	1476.357550
Max Elevation	3 Jul 2004 08:05:09.53	277.462	-30.175	1482.508939
Mean Elevation			-30.199	
Min Range	3 Jul 2004 08:05:28.04	271.751	-30.255	1476.357550

Max Range	3 Jul 2004 08:05:09.53	277.462	-30.175	1482.508939
Mean Range				1480.645854

Global Statistics

Min Elevation	2 Jul 2004 15:42:15.83	268.190	-32.707	1317.922944
Max Elevation	3 Jul 2004 08:05:09.53	277.462	-30.175	1482.508939
Mean Elevation			-31.413	
Min Range	2 Jul 2004 15:42:15.83	268.190	-32.707	1317.922944
Max Range	3 Jul 2004 08:05:09.53	277.462	-30.175	1482.508939
Mean Range				1400.704599

ESM-90-To-JanMayen

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 12:24:06.59	275.713	-30.701	1456.523732
1 Jul 2004 12:24:29.90	268.343	-30.776	1451.175073
1 Jul 2004 12:24:42.44	264.385	-30.701	1456.523466

Min Elevation	1 Jul 2004 12:24:24.52	270.049	-30.783	1450.643710
Max Elevation	1 Jul 2004 12:24:06.59	275.713	-30.701	1456.523732
Mean Elevation			-30.726	
Min Range	1 Jul 2004 12:24:24.52	270.049	-30.783	1450.643710
Max Range	1 Jul 2004 12:24:06.59	275.713	-30.701	1456.523732
Mean Range				1454.740757

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:58:56.48	274.294	-32.866	1320.413707
1 Jul 2004 13:59:13.70	268.131	-32.926	1317.168245
1 Jul 2004 13:59:23.04	264.796	-32.866	1320.415537

Min Elevation	1 Jul 2004 13:59:09.76	269.546	-32.932	1316.853107
Max Elevation	1 Jul 2004 13:59:23.04	264.796	-32.866	1320.415537
Mean Elevation			-32.886	
Min Range	1 Jul 2004 13:59:09.76	269.546	-32.932	1316.853107
Max Range	1 Jul 2004 13:59:23.04	264.796	-32.866	1320.415537
Mean Range				1319.332497

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 11:01:18.70	274.906	-33.245	1300.135857
2 Jul 2004 11:01:34.15	269.265	-33.298	1297.353675
2 Jul 2004 11:01:42.92	266.066	-33.245	1300.134019

Min Elevation	2 Jul 2004 11:01:30.81	270.485	-33.302	1297.124751
Max Elevation	2 Jul 2004 11:01:18.70	274.906	-33.245	1300.135857
Mean Elevation			-33.263	
Min Range	2 Jul 2004 11:01:30.81	270.485	-33.302	1297.124751
Max Range	2 Jul 2004 11:01:18.70	274.906	-33.245	1300.135857
Mean Range				1299.207851

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 12:35:58.70	275.651	-30.683	1457.878821
2 Jul 2004 12:36:21.94	268.312	-30.757	1452.497133
2 Jul 2004 12:36:34.61	264.318	-30.683	1457.878880

Min Elevation	2 Jul 2004 12:36:16.65	269.985	-30.764	1451.986053
Max Elevation	2 Jul 2004 12:36:34.61	264.318	-30.683	1457.878880
Mean Elevation			-30.707	
Min Range	2 Jul 2004 12:36:16.65	269.985	-30.764	1451.986053
Max Range	2 Jul 2004 12:36:34.61	264.318	-30.683	1457.878880
Mean Range				1456.084945

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:10:52.35	273.494	-33.627	1280.494089
2 Jul 2004 14:11:06.36	268.279	-33.671	1278.298661
2 Jul 2004 14:11:13.89	265.479	-33.627	1280.495824

Min Elevation	2 Jul 2004 14:11:03.12	269.487	-33.676	1278.079884
Max Elevation	2 Jul 2004 14:11:13.89	265.479	-33.627	1280.495824
Mean Elevation			-33.642	
Min Range	2 Jul 2004 14:11:03.12	269.487	-33.676	1278.079884
Max Range	2 Jul 2004 14:11:13.89	265.479	-33.627	1280.495824
Mean Range				1279.762858

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 11:13:09.89	275.397	-32.557	1337.672616
	3 Jul 2004 11:13:27.85	269.081	-32.622	1333.979140
	3 Jul 2004 11:13:38.16	265.455	-32.557	1337.670794
Min Elevation	3 Jul 2004 11:13:24.03	270.426	-32.627	1333.688575
Max Elevation	3 Jul 2004 11:13:09.89	275.397	-32.557	1337.672616
Mean Elevation			-32.579	
Min Range	3 Jul 2004 11:13:24.03	270.426	-32.627	1333.688575
Max Range	3 Jul 2004 11:13:09.89	275.397	-32.557	1337.672616
Mean Range			1336.440850	

Global Statistics

Min Elevation	2 Jul 2004 14:11:03.12	269.487	-33.676	1278.079884
Max Elevation	2 Jul 2004 12:36:34.61	264.318	-30.683	1457.878880
Mean Elevation			-32.301	
Min Range	2 Jul 2004 14:11:03.12	269.487	-33.676	1278.079884
Max Range	2 Jul 2004 12:36:34.61	264.318	-30.683	1457.878880
Mean Range			1357.594960	

ESM-90-To-Lofoten

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 12:21:52.70	275.081	-29.088	1587.013857
	1 Jul 2004 12:22:18.12	267.847	-29.151	1581.152320
	1 Jul 2004 12:22:31.88	263.937	-29.088	1587.016447
Min Elevation	1 Jul 2004 12:22:12.29	269.510	-29.157	1580.581896
Max Elevation	1 Jul 2004 12:22:31.88	263.937	-29.088	1587.016447
Mean Elevation			-29.109	
Min Range	1 Jul 2004 12:22:12.29	269.510	-29.157	1580.581896
Max Range	1 Jul 2004 12:22:31.88	263.937	-29.088	1587.016447
Mean Range			1585.060875	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 09:24:44.46	276.249	-29.694	1533.248562
	2 Jul 2004 09:25:09.52	268.810	-29.762	1527.494768
	2 Jul 2004 09:25:22.73	264.895	-29.694	1533.245544
Min Elevation	2 Jul 2004 09:25:03.60	270.571	-29.770	1526.884523
Max Elevation	2 Jul 2004 09:24:44.46	276.249	-29.694	1533.248562
Mean Elevation			-29.717	
Min Range	2 Jul 2004 09:25:03.60	270.571	-29.770	1526.884523
Max Range	2 Jul 2004 09:24:44.46	276.249	-29.694	1533.248562
Mean Range			1531.329624	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 10:59:14.21	275.027	-27.748	1730.274860
	2 Jul 2004 10:59:40.08	268.386	-27.791	1725.016086
	2 Jul 2004 10:59:53.33	264.989	-27.748	1730.274799
Min Elevation	2 Jul 2004 10:59:33.77	270.008	-27.796	1724.405264
Max Elevation	2 Jul 2004 10:59:14.21	275.027	-27.748	1730.274860
Mean Elevation			-27.762	
Min Range	2 Jul 2004 10:59:33.77	270.008	-27.796	1724.405264
Max Range	2 Jul 2004 10:59:14.21	275.027	-27.748	1730.274860
Mean Range			1728.521915	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 12:33:44.39	275.105	-29.577	1543.188636
	2 Jul 2004 12:34:09.66	267.664	-29.644	1537.427524
	2 Jul 2004 12:34:22.88	263.779	-29.577	1543.191551
Min Elevation	2 Jul 2004 12:34:03.63	269.443	-29.652	1536.799999
Max Elevation	2 Jul 2004 12:34:22.88	263.779	-29.577	1543.191551
Mean Elevation			-29.599	
Min Range	2 Jul 2004 12:34:03.63	269.443	-29.652	1536.799999
Max Range	2 Jul 2004 12:34:22.88	263.779	-29.577	1543.191551
Mean Range			1541.269237	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 09:36:35.48	276.100	-29.184	1578.146469

	3 Jul 2004 09:37:01.04	268.773	-29.248	1572.324960
	3 Jul 2004 09:37:14.55	264.911	-29.184	1578.143768
Min Elevation	3 Jul 2004 09:36:55.01	270.505	-29.254	1571.710835
Max Elevation	3 Jul 2004 09:36:35.48	276.100	-29.184	1578.146469
Mean Elevation			-29.205	
Min Range	3 Jul 2004 09:36:55.01	270.505	-29.254	1571.710835
Max Range	3 Jul 2004 09:36:35.48	276.100	-29.184	1578.146469
Mean Range			1576.205066	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:11:04.25	274.965	-27.768	1727.808012
3 Jul 2004 11:11:30.10	268.319	-27.812	1722.526810
3 Jul 2004 11:11:43.40	264.904	-27.768	1727.808342

Min Elevation	3 Jul 2004 11:11:23.83	269.935	-27.817	1721.921753
Max Elevation	3 Jul 2004 11:11:43.40	264.904	-27.768	1727.808342
Mean Elevation			-27.783	
Min Range	3 Jul 2004 11:11:23.83	269.935	-27.817	1721.921753
Max Range	3 Jul 2004 11:11:43.40	264.904	-27.768	1727.808342
Mean Range			1726.047721	

Global Statistics

Min Elevation	2 Jul 2004 09:25:03.60	270.571	-29.770	1526.884523
Max Elevation	2 Jul 2004 10:59:14.21	275.027	-27.748	1730.274860
Mean Elevation			-28.863	
Min Range	2 Jul 2004 09:25:03.60	270.571	-29.770	1526.884523
Max Range	2 Jul 2004 10:59:14.21	275.027	-27.748	1730.274860
Mean Range			1614.739073	

ESM-90-To-Spitzbergen

No Access Found

D SIMULATION RESULTS FOR THE SCENARIO II

D.1 Simulated trajectories

Latitude	Longitude	Speed (km/sec)	Time
61.17198834	4.99380534	0.005	1 Jul 2004 12:00:00.00
62.01658579	4.75515922	0.005	1 Jul 2004 17:16:33.90
62.53943183	5.51087195	0.005	1 Jul 2004 21:10:43.65
62.82096431	6.46545645	0.005	2 Jul 2004 00:24:23.82
63.26337250	7.49958966	0.005	2 Jul 2004 04:24:03.68
63.78621854	8.57349723	0.005	2 Jul 2004 08:47:37.72
64.10796995	9.68717915	0.005	2 Jul 2004 12:25:22.45
64.67103491	10.68153801	0.005	2 Jul 2004 16:48:43.53
65.43519451	11.79521993	0.005	2 Jul 2004 22:22:10.97
66.23957303	12.43160960	0.005	3 Jul 2004 03:36:28.34
66.80263800	13.26687104	0.005	3 Jul 2004 07:39:39.37
67.16460833	14.38055297	0.005	3 Jul 2004 11:10:16.44

D.2 Access report

D.2.1 Direction Finding sensor in dwelling mode

Satellite-NSAT-1-Sensor-ESM-To-Ship-Tankskip: Access Summary Report

ESM-To-Tankskip

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:14:43.45	1 Jul 2004 13:16:24.49	101.032
2	1 Jul 2004 14:45:59.75	1 Jul 2004 14:53:49.42	469.670
3	1 Jul 2004 16:20:10.18	1 Jul 2004 16:30:07.52	597.344
4	1 Jul 2004 17:56:59.99	1 Jul 2004 18:05:49.34	529.351
5	2 Jul 2004 03:55:03.67	2 Jul 2004 03:59:02.37	238.699
6	2 Jul 2004 05:29:17.76	2 Jul 2004 05:38:49.00	571.236
7	2 Jul 2004 07:05:04.29	2 Jul 2004 07:14:50.27	585.974
8	2 Jul 2004 08:41:09.13	2 Jul 2004 08:48:40.31	451.184
9	2 Jul 2004 10:17:13.05	2 Jul 2004 10:21:04.63	231.578
10	2 Jul 2004 11:51:36.89	2 Jul 2004 11:54:30.13	173.243
11	2 Jul 2004 13:23:54.93	2 Jul 2004 13:30:27.45	392.517
12	2 Jul 2004 14:57:18.68	2 Jul 2004 15:06:37.76	559.086
13	2 Jul 2004 16:32:39.75	2 Jul 2004 16:42:38.58	598.822
14	2 Jul 2004 18:10:42.51	2 Jul 2004 18:18:02.93	440.420
15	3 Jul 2004 04:04:52.02	3 Jul 2004 04:12:11.85	439.826
16	3 Jul 2004 05:40:13.49	3 Jul 2004 05:50:09.87	596.385
17	3 Jul 2004 07:16:05.05	3 Jul 2004 07:25:43.01	577.964
18	3 Jul 2004 08:51:54.62	3 Jul 2004 08:59:43.74	469.120
19	3 Jul 2004 10:27:09.33	3 Jul 2004 10:33:15.96	366.628

Global Statistics

Min Duration	1	1 Jul 2004 13:14:43.45	1 Jul 2004 13:16:24.49	101.032
Max Duration	13	2 Jul 2004 16:32:39.75	2 Jul 2004 16:42:38.58	598.822
Mean Duration				441.583
Total Duration				8390.077

D.2.2 Direction Finding sensor pointing +90 degrees

25 Mar 2003 10:33:03
Satellite-NSAT-1-Sensor-ESM90-To-Ship-Tankskip: Access Summary Report

ESM90-To-Tankskip

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 18:01:15.56	1 Jul 2004 18:01:33.46	17.901
2	2 Jul 2004 03:56:49.94	2 Jul 2004 03:57:15.87	25.933
3	2 Jul 2004 18:14:01.68	2 Jul 2004 18:14:43.52	41.840
4	3 Jul 2004 04:08:11.07	3 Jul 2004 04:08:52.92	41.847

Global Statistics

Min Duration	1	1 Jul 2004 18:01:15.56	1 Jul 2004 18:01:33.46	17.901
Max Duration	4	3 Jul 2004 04:08:11.07	3 Jul 2004 04:08:52.92	41.847
Mean Duration				31.880
Total Duration				127.522

D.2.3 Direction Finding sensor pointing -90 degrees

25 Mar 2003 10:32:00
Satellite-NSAT-1-Sensor-ESM-90-To-Ship-Tankskip: Access Summary Report

ESM-90-To-Tankskip

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:15:28.51	1 Jul 2004 13:15:39.08	10.571
2	1 Jul 2004 14:49:35.95	1 Jul 2004 14:50:13.16	37.214
3	2 Jul 2004 08:44:35.20	2 Jul 2004 08:45:14.12	38.918
4	2 Jul 2004 10:18:56.68	2 Jul 2004 10:19:20.86	24.183
5	2 Jul 2004 11:52:54.34	2 Jul 2004 11:53:12.42	18.081
6	2 Jul 2004 13:26:51.88	2 Jul 2004 13:27:30.25	38.371
7	3 Jul 2004 08:55:30.25	3 Jul 2004 08:56:07.99	37.743
8	3 Jul 2004 10:29:54.21	3 Jul 2004 10:30:30.89	36.673

Global Statistics

Min Duration	1	1 Jul 2004 13:15:28.51	1 Jul 2004 13:15:39.08	10.571
Max Duration	3	2 Jul 2004 08:44:35.20	2 Jul 2004 08:45:14.12	38.918
Mean Duration				30.219
Total Duration				241.753

D.3 AER report

Azimuth, Elevation and (slant)Range-report (AER-report).

D.3.1 Direction Finding sensor in dwelling mode

Satellite-NSAT-1-Sensor-ESM-To-Ship-Tankskip: Inview Azimuth, Elevation, & Range

ESM-To-Tankskip

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:14:43.45	278.744	-25.000	2260.708243
1 Jul 2004 13:15:43.00	267.484	-25.082	2231.972200
1 Jul 2004 13:16:24.49	259.665	-25.000	2260.721310

Min Elevation	1 Jul 2004 13:15:33.97	269.206	-25.085	2231.016111
Max Elevation	1 Jul 2004 13:14:43.45	278.744	-25.000	2260.708243
Mean Elevation				-25.027

Min Range	1 Jul 2004 13:15:33.96	269.207	-25.085	2231.016111
Max Range	1 Jul 2004 13:16:24.49	259.665	-25.000	2260.721345
Mean Range				2251.133918

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 14:45:59.75	319.894	-25.000	2261.416400
1 Jul 2004 14:46:59.00	311.766	-26.183	1958.257473
1 Jul 2004 14:47:59.00	300.395	-27.880	1706.347096
1 Jul 2004 14:48:59.00	285.255	-29.555	1538.566873
1 Jul 2004 14:49:59.00	267.292	-30.219	1484.586567
1 Jul 2004 14:50:59.00	249.583	-29.348	1556.564400
1 Jul 2004 14:51:59.00	234.978	-27.614	1738.688517
1 Jul 2004 14:52:59.00	224.108	-25.971	2000.479522
1 Jul 2004 14:53:49.42	217.348	-25.000	2261.476987

Min Elevation	1 Jul 2004 14:49:54.63	268.637	-30.224	1484.244785
Max Elevation	1 Jul 2004 14:53:49.42	217.348	-25.000	2261.477021
Mean Elevation				-27.419
Min Range	1 Jul 2004 14:49:54.59	268.649	-30.224	1484.244811
Max Range	1 Jul 2004 14:53:49.42	217.348	-25.000	2261.477021
Mean Range				1834.042648

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 16:20:10.18	352.438	-25.000	2262.143588
1 Jul 2004 16:21:10.00	351.046	-26.793	1853.668451
1 Jul 2004 16:22:10.00	348.711	-30.611	1455.473455
1 Jul 2004 16:23:10.00	344.092	-38.410	1084.172877
1 Jul 2004 16:24:10.00	331.261	-54.086	781.768340
1 Jul 2004 16:25:10.00	265.990	-71.404	654.178948
1 Jul 2004 16:26:10.00	204.412	-53.255	791.520115
1 Jul 2004 16:27:10.00	192.225	-37.980	1098.127363
1 Jul 2004 16:28:10.00	187.740	-30.403	1470.886082
1 Jul 2004 16:29:10.00	185.442	-26.693	1869.533822
1 Jul 2004 16:30:07.52	184.096	-25.000	2262.220304

Min Elevation	1 Jul 2004 16:25:08.79	268.305	-71.418	654.119763
Max Elevation	1 Jul 2004 16:30:07.52	184.096	-25.000	2262.220335
Mean Elevation				-38.149
Min Range	1 Jul 2004 16:25:08.79	268.298	-71.418	654.119763
Max Range	1 Jul 2004 16:30:07.52	184.096	-25.000	2262.220335
Mean Range				1416.699395

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 17:56:59.99	28.390	-25.000	2262.837988
1 Jul 2004 17:57:59.00	34.901	-26.356	1927.040242
1 Jul 2004 17:58:59.00	44.573	-28.630	1625.022147
1 Jul 2004 17:59:59.00	58.888	-31.574	1390.226437
1 Jul 2004 18:00:59.00	78.676	-33.886	1261.817583
1 Jul 2004 18:01:59.00	100.946	-33.661	1272.833837
1 Jul 2004 18:02:59.00	119.950	-31.122	1419.854365
1 Jul 2004 18:03:59.00	133.439	-28.234	1666.662030
1 Jul 2004 18:04:59.00	142.527	-26.100	1975.305003
1 Jul 2004 18:05:49.34	147.891	-25.000	2262.894772

Min Elevation	1 Jul 2004 18:01:24.45	88.166	-34.162	1248.608141
Max Elevation	1 Jul 2004 18:05:49.34	147.891	-25.000	2262.894787
Mean Elevation				-28.956
Min Range	1 Jul 2004 18:01:24.45	88.165	-34.162	1248.608141
Max Range	1 Jul 2004 18:05:49.34	147.891	-25.000	2262.894787
Mean Range				1706.449440

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 03:55:03.67	69.561	-25.000	2265.974154
2 Jul 2004 03:56:03.00	80.111	-25.367	2148.884312
2 Jul 2004 03:57:03.00	91.701	-25.520	2107.630798
2 Jul 2004 03:58:03.00	103.300	-25.367	2148.707304
2 Jul 2004 03:59:02.37	113.882	-25.000	2265.994020

Min Elevation	2 Jul 2004 03:57:03.06	91.713	-25.520	2107.630756
Max Elevation	2 Jul 2004 03:55:03.67	69.561	-25.000	2265.974154
Mean Elevation				-25.251
Min Range	2 Jul 2004 03:57:03.06	91.713	-25.520	2107.630756
Max Range	2 Jul 2004 03:59:02.37	113.882	-25.000	2265.994043
Mean Range				2187.438117

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)

	2 Jul 2004 05:29:17.76	21.899	-25.000	2266.488265
	2 Jul 2004 05:30:17.00	26.438	-26.566	1892.714537
	2 Jul 2004 05:31:17.00	33.633	-29.575	1538.615895
	2 Jul 2004 05:32:17.00	45.842	-34.526	1232.692367
	2 Jul 2004 05:33:17.00	67.430	-40.595	1021.198806
	2 Jul 2004 05:34:17.00	99.186	-42.680	969.337905
	2 Jul 2004 05:35:17.00	127.224	-37.943	1100.262044
	2 Jul 2004 05:36:17.00	144.010	-32.048	1361.937755
	2 Jul 2004 05:37:17.00	153.568	-28.003	1694.126152
	2 Jul 2004 05:38:17.00	159.414	-25.707	2062.065432
	2 Jul 2004 05:38:49.00	161.653	-25.000	2266.541286
Min Elevation	2 Jul 2004 05:34:03.56	91.748	-42.892	964.478686
Max Elevation	2 Jul 2004 05:29:17.76	21.899	-25.000	2266.488265
Mean Elevation			-31.604	
Min Range	2 Jul 2004 05:34:03.56	91.747	-42.892	964.478686
Max Range	2 Jul 2004 05:38:49.00	161.653	-25.000	2266.541266
Mean Range			1582.361859	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 07:05:04.29	348.953	-25.000	2267.019653
2 Jul 2004 07:06:04.00	345.952	-26.721	1867.550338
2 Jul 2004 07:07:04.00	341.035	-30.269	1482.635573
2 Jul 2004 07:08:04.00	331.845	-36.976	1133.760604
2 Jul 2004 07:09:04.00	311.110	-47.882	867.957813
2 Jul 2004 07:10:04.00	265.590	-54.531	777.406068
2 Jul 2004 07:11:04.00	225.565	-45.198	916.033017
2 Jul 2004 07:12:04.00	208.563	-35.113	1206.908085
2 Jul 2004 07:13:04.00	200.702	-29.259	1566.599978
2 Jul 2004 07:14:04.00	196.353	-26.211	1956.433325
2 Jul 2004 07:14:50.27	194.163	-25.000	2267.073496

Min Elevation	2 Jul 2004 07:09:57.29	271.531	-54.669	775.862164
Max Elevation	2 Jul 2004 07:05:04.29	348.953	-25.000	2267.019653
Mean Elevation			-34.742	
Min Range	2 Jul 2004 07:09:57.29	271.532	-54.669	775.862164
Max Range	2 Jul 2004 07:14:50.27	194.163	-25.000	2267.073463
Mean Range			1482.670723	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 08:41:09.13	319.486	-25.000	2267.547473
2 Jul 2004 08:42:09.00	310.815	-26.110	1976.217604
2 Jul 2004 08:43:09.00	299.088	-27.591	1744.339013
2 Jul 2004 08:44:09.00	284.053	-28.902	1600.104550
2 Jul 2004 08:45:09.00	266.960	-29.240	1568.534597
2 Jul 2004 08:46:09.00	250.573	-28.349	1656.184068
2 Jul 2004 08:47:09.00	237.089	-26.862	1845.780992
2 Jul 2004 08:48:09.00	226.910	-25.518	2109.324070
2 Jul 2004 08:48:40.31	222.718	-25.000	2267.587155

Min Elevation	2 Jul 2004 08:44:54.68	271.090	-29.278	1565.053550
Max Elevation	2 Jul 2004 08:41:09.13	319.486	-25.000	2267.547473
Mean Elevation			-26.952	
Min Range	2 Jul 2004 08:44:54.68	271.090	-29.278	1565.053550
Max Range	2 Jul 2004 08:48:40.31	222.718	-25.000	2267.587127
Mean Range			1892.846614	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 10:17:13.05	292.809	-25.000	2267.952546
2 Jul 2004 10:18:13.00	281.699	-25.384	2145.515842
2 Jul 2004 10:19:13.00	269.616	-25.528	2107.178918
2 Jul 2004 10:20:13.00	257.613	-25.341	2157.730619
2 Jul 2004 10:21:04.63	248.125	-25.000	2267.968344

Min Elevation	2 Jul 2004 10:19:08.83	270.466	-25.528	2106.962019
Max Elevation	2 Jul 2004 10:17:13.05	292.809	-25.000	2267.952546
Mean Elevation			-25.251	
Min Range	2 Jul 2004 10:19:08.81	270.470	-25.528	2106.962023
Max Range	2 Jul 2004 10:21:04.63	248.125	-25.000	2267.968340
Mean Range			2189.269254	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 11:51:36.89	286.231	-25.000	2268.336558
2 Jul 2004 11:52:36.00	275.120	-25.237	2188.955993
2 Jul 2004 11:53:36.00	263.397	-25.225	2192.536705

	2 Jul 2004 11:54:30.13	253.251	-25.000	2268.348184
Min Elevation	2 Jul 2004 11:53:03.51	269.741	-25.267	2179.864026
Max Elevation	2 Jul 2004 11:51:36.89	286.231	-25.000	2268.336558
Mean Elevation			-25.116	
Min Range	2 Jul 2004 11:53:03.52	269.741	-25.267	2179.864026
Max Range	2 Jul 2004 11:54:30.13	253.251	-25.000	2268.348199
Mean Range			2229.544360	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:23:54.93	309.441	-25.000	2268.818431
2 Jul 2004 13:24:54.00	299.900	-25.866	2027.593969
2 Jul 2004 13:25:54.00	287.685	-26.822	1852.531241
2 Jul 2004 13:26:54.00	273.377	-27.399	1769.777772
2 Jul 2004 13:27:54.00	258.501	-27.231	1792.569492
2 Jul 2004 13:28:54.00	244.953	-26.432	1917.082470
2 Jul 2004 13:29:54.00	233.813	-25.462	2125.060957
2 Jul 2004 13:30:27.45	228.699	-25.000	2268.856924

Min Elevation	2 Jul 2004 13:27:11.22	269.077	-27.433	1765.337744
Max Elevation	2 Jul 2004 13:23:54.93	309.441	-25.000	2268.818431
Mean Elevation			-26.152	
Min Range	2 Jul 2004 13:27:11.26	269.068	-27.433	1765.337768
Max Range	2 Jul 2004 13:30:27.45	228.699	-25.000	2268.856948
Mean Range			2002.786407	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:57:18.68	336.882	-25.000	2269.366256
2 Jul 2004 14:58:18.00	331.926	-26.563	1894.826914
2 Jul 2004 14:59:18.00	324.103	-29.528	1543.714693
2 Jul 2004 15:00:18.00	311.004	-34.246	1246.304602
2 Jul 2004 15:01:18.00	288.766	-39.548	1051.036775
2 Jul 2004 15:02:18.00	258.377	-40.682	1019.436263
2 Jul 2004 15:03:18.00	232.576	-36.154	1165.034609
2 Jul 2004 15:04:18.00	216.794	-30.941	1434.394184
2 Jul 2004 15:05:18.00	207.522	-27.392	1771.092880
2 Jul 2004 15:06:18.00	201.724	-25.399	2142.540585
2 Jul 2004 15:06:37.76	200.283	-25.000	2269.420643

Min Elevation	2 Jul 2004 15:01:58.23	268.605	-41.072	1009.172234
Max Elevation	2 Jul 2004 14:57:18.68	336.882	-25.000	2269.366256
Mean Elevation			-30.950	
Min Range	2 Jul 2004 15:01:58.23	268.605	-41.072	1009.172234
Max Range	2 Jul 2004 15:06:37.76	200.283	-25.000	2269.420665
Mean Range			1618.833491	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 16:32:39.75	6.997	-25.000	2269.920466
2 Jul 2004 16:33:39.00	9.035	-26.715	1870.040279
2 Jul 2004 16:34:39.00	12.414	-30.344	1477.868364
2 Jul 2004 16:35:39.00	18.883	-37.538	1114.641466
2 Jul 2004 16:36:39.00	35.123	-50.961	822.117741
2 Jul 2004 16:37:39.00	88.320	-63.623	697.623234
2 Jul 2004 16:38:39.00	141.558	-50.980	821.851070
2 Jul 2004 16:39:39.00	157.808	-37.555	1114.071716
2 Jul 2004 16:40:39.00	164.269	-30.357	1476.892839
2 Jul 2004 16:41:39.00	167.634	-26.725	1868.527678
2 Jul 2004 16:42:38.58	169.660	-25.000	2269.978201

Min Elevation	2 Jul 2004 16:37:39.03	88.361	-63.623	697.623196
Max Elevation	2 Jul 2004 16:42:38.58	169.660	-25.000	2269.978217
Mean Elevation			-36.800	
Min Range	2 Jul 2004 16:37:39.03	88.361	-63.623	697.623196
Max Range	2 Jul 2004 16:42:38.58	169.660	-25.000	2269.978217
Mean Range			1436.684823	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:10:42.51	43.410	-25.000	2270.524875
2 Jul 2004 18:11:42.00	52.184	-25.967	2007.169068
2 Jul 2004 18:12:42.00	63.696	-27.171	1801.899024
2 Jul 2004 18:13:42.00	77.853	-28.140	1680.350698
2 Jul 2004 18:14:42.00	93.438	-28.312	1661.404914
2 Jul 2004 18:15:42.00	108.293	-27.570	1748.348229
2 Jul 2004 18:16:42.00	120.764	-26.384	1926.462998
2 Jul 2004 18:17:42.00	130.471	-25.297	2172.718044
2 Jul 2004 18:18:02.93	133.271	-25.000	2270.570549

Min Elevation	2 Jul 2004 18:14:22.55	88.355	-28.365	1655.699625
Max Elevation	2 Jul 2004 18:18:02.93	133.271	-25.000	2270.570564
Mean Elevation			-26.538	
Min Range	2 Jul 2004 18:14:22.51	88.346	-28.365	1655.699644
Max Range	2 Jul 2004 18:18:02.93	133.271	-25.000	2270.570564
Mean Range			1948.827600	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:04:52.02	46.780	-25.000	2274.364449
3 Jul 2004 04:05:52.00	55.604	-25.965	2010.143026
3 Jul 2004 04:06:52.00	67.093	-27.154	1806.176052
3 Jul 2004 04:07:52.00	81.213	-28.106	1685.724015
3 Jul 2004 04:08:52.00	96.747	-28.269	1667.645694
3 Jul 2004 04:09:52.00	111.558	-27.530	1755.301545
3 Jul 2004 04:10:52.00	124.006	-26.354	1934.156269
3 Jul 2004 04:11:52.00	133.710	-25.279	2181.360684
3 Jul 2004 04:12:11.85	136.375	-25.000	2274.408716

Min Elevation	3 Jul 2004 04:08:32.09	91.562	-28.324	1661.679369
Max Elevation	3 Jul 2004 04:04:52.02	46.780	-25.000	2274.364449
Mean Elevation			-26.517	
Min Range	3 Jul 2004 04:08:32.05	91.552	-28.324	1661.679393
Max Range	3 Jul 2004 04:12:11.85	136.375	-25.000	2274.408711
Mean Range			1954.364494	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 05:40:13.49	12.416	-25.000	2274.938475
3 Jul 2004 05:41:13.00	14.941	-26.689	1877.018494
3 Jul 2004 05:42:13.00	19.101	-30.207	1490.094231
3 Jul 2004 05:43:13.00	26.925	-36.997	1134.775472
3 Jul 2004 05:44:13.00	45.270	-48.828	854.040868
3 Jul 2004 05:45:13.00	92.729	-58.308	740.254922
3 Jul 2004 05:46:13.00	138.903	-48.273	862.823623
3 Jul 2004 05:47:13.00	156.558	-36.632	1148.131246
3 Jul 2004 05:48:13.00	164.172	-30.010	1505.636749
3 Jul 2004 05:49:13.00	168.258	-26.587	1893.887481
3 Jul 2004 05:50:09.87	170.669	-25.000	2274.997943

Min Elevation	3 Jul 2004 05:45:11.81	91.515	-58.314	740.204515
Max Elevation	3 Jul 2004 05:40:13.49	12.416	-25.000	2274.938475
Mean Elevation			-35.685	
Min Range	3 Jul 2004 05:45:11.80	91.512	-58.314	740.204515
Max Range	3 Jul 2004 05:50:09.87	170.669	-25.000	2274.997914
Mean Range			1459.690864	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:16:05.05	344.781	-25.000	2275.510142
3 Jul 2004 07:17:05.00	340.896	-26.658	1882.377895
3 Jul 2004 07:18:05.00	334.661	-29.961	1509.719049
3 Jul 2004 07:19:05.00	323.525	-35.809	1180.090569
3 Jul 2004 07:20:05.00	301.462	-43.991	941.962006
3 Jul 2004 07:21:05.00	263.818	-47.544	874.921860
3 Jul 2004 07:22:05.00	231.131	-40.941	1013.771652
3 Jul 2004 07:23:05.00	214.059	-33.322	1293.401097
3 Jul 2004 07:24:05.00	205.187	-28.508	1642.601906
3 Jul 2004 07:25:05.00	200.012	-25.901	2024.607016
3 Jul 2004 07:25:43.01	197.756	-25.000	2275.567146

Min Elevation	3 Jul 2004 07:20:54.03	271.247	-47.764	871.241608
Max Elevation	3 Jul 2004 07:16:05.05	344.781	-25.000	2275.510142
Mean Elevation			-32.967	
Min Range	3 Jul 2004 07:20:54.03	271.248	-47.764	871.241608
Max Range	3 Jul 2004 07:25:43.01	197.756	-25.000	2275.567114
Mean Range			1537.684576	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 08:51:54.62	321.611	-25.000	2275.970236
3 Jul 2004 08:52:54.00	313.425	-26.149	1973.768173
3 Jul 2004 08:53:54.00	302.061	-27.785	1724.080908
3 Jul 2004 08:54:54.00	287.041	-29.385	1558.637611
3 Jul 2004 08:55:54.00	269.328	-30.006	1506.243420
3 Jul 2004 08:56:54.00	251.892	-29.166	1578.398550
3 Jul 2004 08:57:54.00	237.461	-27.503	1759.548973
3 Jul 2004 08:58:54.00	226.666	-25.924	2019.910674
3 Jul 2004 08:59:43.74	220.004	-25.000	2276.004648

Min Elevation	3 Jul 2004 08:55:49.14	270.799	-30.012	1505.826410
Max Elevation	3 Jul 2004 08:51:54.62	321.611	-25.000	2275.970236
Mean Elevation			-27.324	
Min Range	3 Jul 2004 08:55:49.10	270.811	-30.012	1505.826438
Max Range	3 Jul 2004 08:59:43.74	220.004	-25.000	2276.004625
Mean Range			1852.507021	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 10:27:09.33	307.249	-25.000	2276.387282
3 Jul 2004 10:28:09.00	297.269	-25.773	2053.570740
3 Jul 2004 10:29:09.00	284.967	-26.534	1903.528044
3 Jul 2004 10:30:09.00	271.060	-26.887	1846.564460
3 Jul 2004 10:31:09.00	257.050	-26.606	1891.352894
3 Jul 2004 10:32:09.00	244.501	-25.874	2030.983338
3 Jul 2004 10:33:09.00	234.191	-25.081	2247.303523
3 Jul 2004 10:33:15.96	233.144	-25.000	2276.413787

Min Elevation	3 Jul 2004 10:30:12.64	270.196	-26.888	1846.374710
Max Elevation	3 Jul 2004 10:27:09.33	307.249	-25.000	2276.387282
Mean Elevation			-25.844	
Min Range	3 Jul 2004 10:30:12.66	270.191	-26.888	1846.374716
Max Range	3 Jul 2004 10:33:15.96	233.144	-25.000	2276.413782
Mean Range			2065.763008	

Global Statistics

Min Elevation	1 Jul 2004 16:25:08.79	268.305	-71.418	654.119763
Max Elevation	3 Jul 2004 07:16:05.05	344.781	-25.000	2275.510142
Mean Elevation			-30.280	
Min Range	1 Jul 2004 16:25:08.79	268.298	-71.418	654.119763
Max Range	3 Jul 2004 10:33:15.96	233.144	-25.000	2276.413782
Mean Range			1747.831419	

D.3.2 Direction finding sensor pointing +90 degrees

25 Mar 2003 10:33:28
Satellite-NSAT-1-Sensor-ESM90-To-Ship-Tankskip: Inview Azimuth, Elevation, & Range

ESM90-To-Tankskip

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:01:15.56	84.823	-34.128	1250.227965
1 Jul 2004 18:01:26.93	89.100	-34.159	1248.734566
1 Jul 2004 18:01:33.46	91.552	-34.127	1250.270819

Min Elevation	1 Jul 2004 18:01:24.45	88.166	-34.162	1248.608141
Max Elevation	1 Jul 2004 18:01:33.46	91.552	-34.127	1250.270810
Mean Elevation			-34.138	
Min Range	1 Jul 2004 18:01:24.45	88.165	-34.162	1248.608141
Max Range	1 Jul 2004 18:01:33.46	91.552	-34.127	1250.270810
Mean Range			1249.744450	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 03:56:49.94	89.141	-25.512	2109.625103
2 Jul 2004 03:57:06.29	92.345	-25.520	2107.749547
2 Jul 2004 03:57:15.87	94.222	-25.513	2109.519218

Min Elevation	2 Jul 2004 03:57:03.08	91.717	-25.520	2107.630753
Max Elevation	2 Jul 2004 03:56:49.94	89.141	-25.512	2109.625103
Mean Elevation			-25.515	
Min Range	2 Jul 2004 03:57:03.08	91.716	-25.520	2107.630753
Max Range	2 Jul 2004 03:56:49.94	89.141	-25.512	2109.625103
Mean Range			2108.964623	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:14:01.68	82.906	-28.304	1662.261430
2 Jul 2004 18:14:28.89	90.018	-28.359	1656.307936
2 Jul 2004 18:14:43.52	93.833	-28.303	1662.331670

Min Elevation	2 Jul 2004 18:14:22.55	88.356	-28.365	1655.699625
Max Elevation	2 Jul 2004 18:14:43.52	93.833	-28.303	1662.331662
Mean Elevation			-28.322	

Min Range	2 Jul 2004 18:14:22.55	88.356	-28.365	1655.699625
Max Range	2 Jul 2004 18:14:43.52	93.833	-28.303	1662.331662
Mean Range			1660.300345	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:08:11.07	86.091	-28.263	1668.326219
3 Jul 2004 04:08:38.90	93.340	-28.318	1662.378163
3 Jul 2004 04:08:52.92	96.985	-28.264	1668.206314

Min Elevation	3 Jul 2004 04:08:32.09	91.562	-28.324	1661.679369
Max Elevation	3 Jul 2004 04:08:11.07	86.091	-28.263	1668.326219
Mean Elevation			-28.281	
Min Range	3 Jul 2004 04:08:32.09	91.562	-28.324	1661.679369
Max Range	3 Jul 2004 04:08:11.07	86.091	-28.263	1668.326219
Mean Range			1666.303566	

Global Statistics

Min Elevation	1 Jul 2004 18:01:24.45	88.166	-34.162	1248.608141
Max Elevation	2 Jul 2004 03:56:49.94	89.141	-25.512	2109.625103
Mean Elevation			-29.064	
Min Range	1 Jul 2004 18:01:24.45	88.165	-34.162	1248.608141
Max Range	2 Jul 2004 03:56:49.94	89.141	-25.512	2109.625103
Mean Range			1671.328246	

D.3.3 Direction Finding sensor pointing –90 degrees

25 Mar 2003 10:32:29

Satellite-NSAT-1-Sensor-ESM-90-To-Ship-Tankskip: Inview Azimuth, Elevation, & Range

ESM-90-To-Tankskip

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:15:28.51	270.247	-25.084	2231.365192
1 Jul 2004 13:15:35.05	269.000	-25.085	2231.029778
1 Jul 2004 13:15:39.08	268.231	-25.084	2231.322435

Min Elevation	1 Jul 2004 13:15:33.97	269.205	-25.085	2231.016111
Max Elevation	1 Jul 2004 13:15:28.51	270.247	-25.084	2231.365192
Mean Elevation			-25.084	
Min Range	1 Jul 2004 13:15:33.97	269.206	-25.085	2231.016111
Max Range	1 Jul 2004 13:15:28.51	270.247	-25.084	2231.365192
Mean Range			2231.239135	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 14:49:35.95	274.364	-30.143	1490.471376
1 Jul 2004 14:49:59.81	267.044	-30.218	1484.724757
1 Jul 2004 14:50:13.16	262.954	-30.145	1490.375076

Min Elevation	1 Jul 2004 14:49:54.63	268.637	-30.224	1484.244785
Max Elevation	1 Jul 2004 14:49:35.95	274.364	-30.143	1490.471376
Mean Elevation			-30.169	
Min Range	1 Jul 2004 14:49:54.63	268.637	-30.224	1484.244785
Max Range	1 Jul 2004 14:49:35.95	274.364	-30.143	1490.471376
Mean Range			1488.523736	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 08:44:35.20	276.699	-29.207	1571.487989
2 Jul 2004 08:45:00.95	269.280	-29.271	1565.720829
2 Jul 2004 08:45:14.12	265.494	-29.208	1571.458862

Min Elevation	2 Jul 2004 08:44:54.68	271.090	-29.278	1565.053550
Max Elevation	2 Jul 2004 08:44:35.20	276.699	-29.207	1571.487989
Mean Elevation			-29.229	
Min Range	2 Jul 2004 08:44:54.68	271.090	-29.278	1565.053550
Max Range	2 Jul 2004 08:44:35.20	276.699	-29.207	1571.487989
Mean Range			1569.555893	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 10:18:56.68	272.943	-25.521	2108.804762
2 Jul 2004 10:19:12.12	269.795	-25.528	2107.097144

	2 Jul 2004 10:19:20.86	268.015	-25.521	2108.768185
Min Elevation	2 Jul 2004 10:19:08.83	270.466	-25.528	2106.962019
Max Elevation	2 Jul 2004 10:18:56.68	272.943	-25.521	2108.804762
Mean Elevation			-25.523	
Min Range	2 Jul 2004 10:19:08.83	270.466	-25.528	2106.962019
Max Range	2 Jul 2004 10:18:56.68	272.943	-25.521	2108.804762
Mean Range			2108.223364	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 11:52:54.34	271.540	-25.264	2180.876726
2 Jul 2004 11:53:06.05	269.243	-25.267	2179.941979
2 Jul 2004 11:53:12.42	267.995	-25.264	2180.819463

Min Elevation	2 Jul 2004 11:53:03.51	269.741	-25.267	2179.864026
Max Elevation	2 Jul 2004 11:52:54.34	271.540	-25.264	2180.876726
Mean Elevation			-25.265	
Min Range	2 Jul 2004 11:53:03.51	269.742	-25.267	2179.864026
Max Range	2 Jul 2004 11:52:54.34	271.540	-25.264	2180.876726
Mean Range			2180.546056	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:26:51.88	273.904	-27.391	1770.938549
2 Jul 2004 13:27:16.58	267.737	-27.430	1765.768746
2 Jul 2004 13:27:30.25	264.329	-27.392	1770.758898

Min Elevation	2 Jul 2004 13:27:11.22	269.078	-27.433	1765.337744
Max Elevation	2 Jul 2004 13:26:51.88	273.904	-27.391	1770.938549
Mean Elevation			-27.404	
Min Range	2 Jul 2004 13:27:11.22	269.078	-27.433	1765.337744
Max Range	2 Jul 2004 13:26:51.88	273.904	-27.391	1770.938549
Mean Range			1769.155397	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 08:55:30.25	276.502	-29.933	1512.122744
3 Jul 2004 08:55:55.16	268.977	-30.004	1506.466722
3 Jul 2004 08:56:07.99	265.109	-29.934	1512.094045

Min Elevation	3 Jul 2004 08:55:49.14	270.799	-30.012	1505.826410
Max Elevation	3 Jul 2004 08:55:30.25	276.502	-29.933	1512.122744
Mean Elevation			-29.957	
Min Range	3 Jul 2004 08:55:49.14	270.799	-30.012	1505.826410
Max Range	3 Jul 2004 08:55:30.25	276.502	-29.933	1512.122744
Mean Range			1510.227837	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 10:29:54.21	274.565	-26.856	1851.235189
3 Jul 2004 10:30:18.45	268.816	-26.885	1846.858650
3 Jul 2004 10:30:30.89	265.869	-26.857	1851.142290

Min Elevation	3 Jul 2004 10:30:12.64	270.196	-26.888	1846.374710
Max Elevation	3 Jul 2004 10:29:54.21	274.565	-26.856	1851.235189
Mean Elevation			-26.866	
Min Range	3 Jul 2004 10:30:12.64	270.196	-26.888	1846.374710
Max Range	3 Jul 2004 10:29:54.21	274.565	-26.856	1851.235189
Mean Range			1849.745376	

Global Statistics

Min Elevation	1 Jul 2004 14:49:54.63	268.637	-30.224	1484.244785
Max Elevation	1 Jul 2004 13:15:28.51	270.247	-25.084	2231.365192
Mean Elevation			-27.437	
Min Range	1 Jul 2004 14:49:54.63	268.637	-30.224	1484.244785
Max Range	1 Jul 2004 13:15:28.51	270.247	-25.084	2231.365192
Mean Range			1838.402099	

E SIMULATION RESULTS FOR THE SCENARIO III

E.1 Simulated trajectories

Latitude	Longitude	Speed (km/sec)	Time
77.60600517	13.07512826	0.015	1 Jul 2004 12:00:00.00
76.63461402	13.30288891	0.015	1 Jul 2004 13:57:16.19
75.66298749	16.06923920	0.015	1 Jul 2004 16:19:00.37
75.81778928	19.74021547	0.015	1 Jul 2004 18:09:37.02
76.49730473	21.71941934	0.015	1 Jul 2004 19:49:27.73
77.16287277	25.95485691	0.015	1 Jul 2004 22:10:46.15
77.85618564	30.49898898	0.015	2 Jul 2004 00:35:44.60
79.17076439	34.13545407	0.015	2 Jul 2004 03:36:38.29
78.05827333	34.29906433	0.015	2 Jul 2004 05:50:49.80
77.04516005	29.57593698	0.015	2 Jul 2004 08:43:55.62
76.10785137	23.15796456	0.015	2 Jul 2004 12:16:01.09
75.07686260	17.59139131	0.015	2 Jul 2004 15:44:04.78
75.59696245	12.60724758	0.015	2 Jul 2004 18:28:34.52
76.33114276	9.36181263	0.015	2 Jul 2004 20:38:19.52
76.35676610	16.11564308	0.015	2 Jul 2004 23:50:32.45
76.73523477	20.97627975	0.015	3 Jul 2004 02:14:18.30
76.76821722	26.74841692	0.015	3 Jul 2004 04:53:49.14
76.41988185	32.84335410	0.015	3 Jul 2004 07:49:14.80
75.52376492	27.73959319	0.015	3 Jul 2004 10:53:20.74
75.52376492	27.73959319	0.015	3 Jul 2004 10:53:20.75
75.07574769	20.58461152	0.015	3 Jul 2004 14:38:42.69

Table 9.1 Trajectory for KNM Fridjof Nansen

Latitude	Longitude	Speed (km/sec)	Time
69.87888306	46.09962068	0.015	1 Jul 2004 12:00:00.00
72.23721119	48.01830895	0.015	1 Jul 2004 16:53:52.62
75.56767590	49.52983903	0.015	1 Jul 2004 23:38:25.17
77.27661692	43.62967170	0.015	2 Jul 2004 04:03:24.15
78.98320594	39.85985585	0.015	2 Jul 2004 07:49:18.75
79.44241212	48.49153079	0.015	2 Jul 2004 11:11:39.30
78.44402286	53.94028224	0.015	2 Jul 2004 14:05:48.82
76.93195770	54.76233542	0.015	2 Jul 2004 17:09:19.90
75.11550542	53.95898612	0.015	2 Jul 2004 20:49:32.63
72.54943550	51.21312967	0.015	3 Jul 2004 02:12:11.19

70.18194918	49.12568796	0.015	3 Jul 2004 07:08:32.01
68.92919374	45.40425065	0.015	3 Jul 2004 10:46:02.69
69.03903525	41.36772032	0.015	3 Jul 2004 13:41:02.90

Table 9.2 Trajectory for Russian Destroyer

Latitude	**Longitude**	**Speed (km/sec)**	**Time**
67.28641047	42.56194617		1 Jul 2004 12:00:00.00
69.02906158	38.37344325		1 Jul 2004 16:41:35.22
70.28350487	34.51185382		1 Jul 2004 20:22:57.66
71.80558166	35.03758249		1 Jul 2004 23:27:30.49
73.71898603	32.88253666		2 Jul 2004 03:30:34.70
75.43868725	33.39734977		2 Jul 2004 06:58:30.85
76.76404768	37.95702227		2 Jul 2004 10:25:41.93
76.08167093	41.43296611		2 Jul 2004 12:33:55.54
75.28089245	45.24730915		2 Jul 2004 15:03:04.52
74.12204670	47.12956423		2 Jul 2004 17:35:02.20
73.00601060	49.41965302		2 Jul 2004 20:10:34.05
71.11134702	47.95012486		3 Jul 2004 00:05:17.92
69.84310898	44.72763041		3 Jul 2004 03:25:46.00
68.02814072	42.56738528		3 Jul 2004 07:23:33.88
67.06157608	43.34827139		3 Jul 2004 09:25:24.26
66.39527659	41.30576019		3 Jul 2004 11:31:30.13
65.42661795	38.92150886		3 Jul 2004 14:16:54.90

Table 9.3 Trajectory for Russian Frigate

E.2 Access report

E.2.1 Direction Finding sensor in dwelling mode

25 Mar 2003 10:13:39
Satellite-NSAT-1-Sensor-ESM-To-Ship-Destroyer, Ship-Frigate, Ship-Nansen: Access Summary Report

ESM-To-Destroyer

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:08:50.94	1 Jul 2004 13:18:58.52	607.582
2	1 Jul 2004 14:45:35.34	1 Jul 2004 14:55:04.15	568.811
3	1 Jul 2004 16:24:24.85	1 Jul 2004 16:30:53.92	389.067
4	2 Jul 2004 00:36:29.62	2 Jul 2004 00:42:58.01	388.383
5	2 Jul 2004 02:12:22.93	2 Jul 2004 02:21:14.66	531.726
6	2 Jul 2004 03:48:24.97	2 Jul 2004 03:58:19.07	594.105
7	2 Jul 2004 05:24:21.38	2 Jul 2004 05:34:32.39	611.005
8	2 Jul 2004 07:00:10.38	2 Jul 2004 07:10:18.30	607.925
9	2 Jul 2004 08:35:46.31	2 Jul 2004 08:45:47.52	601.212
10	2 Jul 2004 10:11:09.88	2 Jul 2004 10:21:15.20	605.323
11	2 Jul 2004 11:46:45.24	2 Jul 2004 11:56:56.22	610.986
12	2 Jul 2004 13:22:51.57	2 Jul 2004 13:32:47.59	596.021

13	2 Jul 2004 14:59:53.23	2 Jul 2004 15:08:46.28	533.043
14	2 Jul 2004 16:38:11.68	2 Jul 2004 16:44:40.00	388.311
15	3 Jul 2004 00:49:25.43	3 Jul 2004 00:56:09.60	404.162
16	3 Jul 2004 02:25:26.39	3 Jul 2004 02:34:48.79	562.400
17	3 Jul 2004 04:01:36.35	3 Jul 2004 04:11:46.05	609.698
18	3 Jul 2004 05:37:42.16	3 Jul 2004 05:47:17.48	575.312
19	3 Jul 2004 07:13:31.00	3 Jul 2004 07:21:48.48	497.481
20	3 Jul 2004 08:48:44.28	3 Jul 2004 08:56:12.30	448.019
21	3 Jul 2004 10:23:12.91	3 Jul 2004 10:31:07.87	474.960
22	3 Jul 2004 11:57:34.92	3 Jul 2004 12:00:00.00	145.079

Global Statistics

Min Duration	22	3 Jul 2004 11:57:34.92	3 Jul 2004 12:00:00.00	145.079
Max Duration	7	2 Jul 2004 05:24:21.38	2 Jul 2004 05:34:32.39	611.005
Mean Duration				515.937
Total Duration				11350.612

ESM-To-Frigate

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:08:34.17	1 Jul 2004 13:18:27.77	593.604
2	1 Jul 2004 14:44:41.54	1 Jul 2004 14:54:34.97	593.431
3	1 Jul 2004 16:22:45.43	1 Jul 2004 16:30:25.15	459.721
4	2 Jul 2004 02:13:58.62	2 Jul 2004 02:21:09.19	430.570
5	2 Jul 2004 03:49:37.17	2 Jul 2004 03:59:08.08	570.910
6	2 Jul 2004 05:25:24.87	2 Jul 2004 05:35:33.61	608.741
7	2 Jul 2004 07:01:05.94	2 Jul 2004 07:11:03.10	597.152
8	2 Jul 2004 08:36:28.42	2 Jul 2004 08:46:06.86	578.440
9	2 Jul 2004 10:11:36.00	2 Jul 2004 10:21:19.78	583.783
10	2 Jul 2004 11:46:43.64	2 Jul 2004 11:56:43.50	599.858
11	2 Jul 2004 13:22:15.95	2 Jul 2004 13:32:24.48	608.522
12	2 Jul 2004 14:58:52.35	2 Jul 2004 15:08:14.73	562.381
13	2 Jul 2004 16:37:05.95	2 Jul 2004 16:43:54.16	408.207
14	3 Jul 2004 00:50:49.31	3 Jul 2004 00:55:41.65	292.337
15	3 Jul 2004 02:26:17.71	3 Jul 2004 02:35:10.24	532.531
16	3 Jul 2004 04:02:21.20	3 Jul 2004 04:12:28.14	606.943
17	3 Jul 2004 05:38:29.73	3 Jul 2004 05:48:05.21	575.474
18	3 Jul 2004 07:14:29.50	3 Jul 2004 07:22:22.84	473.342
19	3 Jul 2004 08:49:49.45	3 Jul 2004 08:55:57.61	368.160
20	3 Jul 2004 10:23:59.52	3 Jul 2004 10:30:33.28	393.758
21	3 Jul 2004 11:57:43.07	3 Jul 2004 12:00:00.00	136.934

Global Statistics

Min Duration	21	3 Jul 2004 11:57:43.07	3 Jul 2004 12:00:00.00	136.934
Max Duration	6	2 Jul 2004 05:25:24.87	2 Jul 2004 05:35:33.61	608.741
Mean Duration				503.562
Total Duration				10574.800

ESM-To-Nansen

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:11:48.42	1 Jul 2004 13:21:47.78	599.356
2	1 Jul 2004 14:47:16.75	1 Jul 2004 14:57:26.39	609.639
3	1 Jul 2004 16:23:31.15	1 Jul 2004 16:33:16.46	585.316
4	1 Jul 2004 18:01:28.03	1 Jul 2004 18:09:16.81	468.774
5	1 Jul 2004 19:41:15.68	1 Jul 2004 19:45:16.62	240.939
6	2 Jul 2004 00:36:11.23	2 Jul 2004 00:41:00.88	289.649
7	2 Jul 2004 02:12:05.13	2 Jul 2004 02:20:05.55	480.419
8	2 Jul 2004 03:48:10.87	2 Jul 2004 03:57:45.62	574.747
9	2 Jul 2004 05:24:32.05	2 Jul 2004 05:34:42.08	610.031
10	2 Jul 2004 07:00:41.68	2 Jul 2004 07:10:51.42	609.732
11	2 Jul 2004 08:36:37.45	2 Jul 2004 08:46:30.71	593.253
12	2 Jul 2004 10:12:16.88	2 Jul 2004 10:21:59.08	582.198
13	2 Jul 2004 11:47:43.56	2 Jul 2004 11:57:30.54	586.981
14	2 Jul 2004 13:23:09.98	2 Jul 2004 13:33:13.08	603.100
15	2 Jul 2004 14:58:56.63	2 Jul 2004 15:09:06.27	609.640
16	2 Jul 2004 16:35:34.04	2 Jul 2004 16:45:13.81	579.768
17	2 Jul 2004 18:13:18.49	2 Jul 2004 18:21:27.54	489.049
18	2 Jul 2004 19:52:17.43	2 Jul 2004 19:57:38.55	321.118
19	3 Jul 2004 02:25:05.92	3 Jul 2004 02:31:54.05	408.127
20	3 Jul 2004 04:01:06.38	3 Jul 2004 04:10:22.47	556.090
21	3 Jul 2004 05:37:07.57	3 Jul 2004 05:47:15.89	608.319
22	3 Jul 2004 07:12:57.66	3 Jul 2004 07:22:59.31	601.649
23	3 Jul 2004 08:48:40.08	3 Jul 2004 08:58:21.85	581.768

24	3 Jul 2004 10:24:13.24	3 Jul 2004 10:33:43.13	569.886
25	3 Jul 2004 11:59:31.05	3 Jul 2004 12:00:00.00	28.950

Global Statistics

Min Duration	25	3 Jul 2004 11:59:31.05	3 Jul 2004 12:00:00.00	28.950
Max Duration	9	2 Jul 2004 05:24:32.05	2 Jul 2004 05:34:42.08	610.031
Mean Duration				511.540
Total Duration				12788.500

E.2.2 Direction Finding sensor pointing +90 degrees

11 Mar 2003 12:22:07

Satellite-NSAT-1-Sensor-ESM90-To-Ship-Destroyer, Ship-Frigate, Ship-Nansen: Access Summary Report

ESM90-To-Destroyer

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 16:27:19.27	1 Jul 2004 16:27:59.17	39.894
2	2 Jul 2004 00:39:24.09	2 Jul 2004 00:40:03.84	39.747
3	2 Jul 2004 02:16:36.56	2 Jul 2004 02:17:01.61	25.046
4	2 Jul 2004 15:04:07.53	2 Jul 2004 15:04:31.97	24.434
5	2 Jul 2004 16:41:06.25	2 Jul 2004 16:41:45.99	39.738
6	3 Jul 2004 00:52:27.53	3 Jul 2004 00:53:08.36	40.827

Global Statistics

Min Duration	4	2 Jul 2004 15:04:07.53	2 Jul 2004 15:04:31.97	24.434
Max Duration	6	3 Jul 2004 00:52:27.53	3 Jul 2004 00:53:08.36	40.827
Mean Duration				34.948
Total Duration				209.687

ESM90-To-Frigate

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 16:26:13.87	1 Jul 2004 16:26:55.64	41.773
2	2 Jul 2004 02:17:13.09	2 Jul 2004 02:17:54.93	41.840
3	2 Jul 2004 16:40:09.85	2 Jul 2004 16:40:50.83	40.980
4	3 Jul 2004 00:53:00.48	3 Jul 2004 00:53:31.78	31.297
5	3 Jul 2004 02:30:33.10	3 Jul 2004 02:30:55.65	22.555

Global Statistics

Min Duration	5	3 Jul 2004 02:30:33.10	3 Jul 2004 02:30:55.65	22.555
Max Duration	2	2 Jul 2004 02:17:13.09	2 Jul 2004 02:17:54.93	41.840
Mean Duration				35.689
Total Duration				178.446

ESM90-To-Nansen

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 18:05:01.83	1 Jul 2004 18:05:43.61	41.781
2	1 Jul 2004 19:43:03.12	1 Jul 2004 19:43:28.90	25.784
3	2 Jul 2004 00:38:20.05	2 Jul 2004 00:38:50.90	30.843
4	2 Jul 2004 02:15:44.61	2 Jul 2004 02:16:25.56	40.955
5	2 Jul 2004 18:17:02.51	2 Jul 2004 18:17:42.44	39.926
6	2 Jul 2004 19:54:40.31	2 Jul 2004 19:55:14.34	34.021
7	3 Jul 2004 02:28:09.07	3 Jul 2004 02:28:50.09	41.024

Global Statistics

Min Duration	2	1 Jul 2004 19:43:03.12	1 Jul 2004 19:43:28.90	25.784
Max Duration	1	1 Jul 2004 18:05:01.83	1 Jul 2004 18:05:43.61	41.781
Mean Duration				36.333
Total Duration				254.334

E.2.3 Direction Finding sensor pointing -90 degrees

11 Mar 2003 12:24:23
Satellite-NSAT-1-Sensor-ESM-90-To-Ship-Destroyer, Ship-Frigate, Ship-Nansen: Access Summary Report

ESM-90-To-Destroyer

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	3 Jul 2004 07:17:23.22	3 Jul 2004 07:17:56.51	33.296
2	3 Jul 2004 08:52:08.89	3 Jul 2004 08:52:48.34	39.454
3	3 Jul 2004 10:26:52.10	3 Jul 2004 10:27:29.51	37.402

Global Statistics

Min Duration	1	3 Jul 2004 07:17:23.22	3 Jul 2004 07:17:56.51	33.296
Max Duration	2	3 Jul 2004 08:52:08.89	3 Jul 2004 08:52:48.34	39.454
Mean Duration				36.717
Total Duration				110.152

ESM-90-To-Frigate

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	3 Jul 2004 07:18:07.63	3 Jul 2004 07:18:45.22	37.586
2	3 Jul 2004 08:52:35.66	3 Jul 2004 08:53:12.44	36.778
3	3 Jul 2004 10:26:57.65	3 Jul 2004 10:27:36.06	38.418

Global Statistics

Min Duration	2	3 Jul 2004 08:52:35.66	3 Jul 2004 08:53:12.44	36.778
Max Duration	3	3 Jul 2004 10:26:57.65	3 Jul 2004 10:27:36.06	38.418
Mean Duration				37.594
Total Duration				112.782

ESM-90-To-Nansen

No Access Found

E.3 AER report

E.3.1 Direction Finding sensor in dwelling mode

25 Mar 2003 10:15:29
Satellite-NSAT-1-Sensor-ESM-To-Ship-Destroyer, Ship-Frigate, Ship-Nansen: Inview Azimuth, Elevation, & Range

ESM-To-Destroyer

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 13:08:50.94	356.464	-25.000	2284.443191
	1 Jul 2004 13:09:50.00	355.939	-26.703	1879.723439
	1 Jul 2004 13:10:50.00	355.052	-30.402	1478.286163
	1 Jul 2004 13:11:50.00	353.301	-38.067	1099.964389
	1 Jul 2004 13:12:50.00	348.343	-54.353	781.811846
	1 Jul 2004 13:13:50.00	290.153	-81.870	625.883776
	1 Jul 2004 13:14:50.00	190.886	-58.127	743.149981
	1 Jul 2004 13:15:50.00	184.656	-39.861	1045.022266
	1 Jul 2004 13:16:50.00	182.654	-31.260	1417.293401
	1 Jul 2004 13:17:50.00	181.669	-27.119	1816.093413
	1 Jul 2004 13:18:50.00	181.083	-25.166	2225.954892
	1 Jul 2004 13:18:58.52	181.018	-25.000	2284.627740
Min Elevation	1 Jul 2004 13:13:54.65	268.770	-82.422	624.969745
Max Elevation	1 Jul 2004 13:18:58.52	181.018	-25.000	2284.627829
Mean Elevation			-38.577	

Min Range	1 Jul 2004 13:13:54.65	268.765	-82.422	624.969745
Max Range	1 Jul 2004 13:18:58.52	181.018	-25.000	2284.627829
Mean Range				1473.521208

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 14:45:35.34	21.615	-25.000	2286.178700
1 Jul 2004 14:46:35.00	26.718	-26.475	1919.257903
1 Jul 2004 14:47:35.00	34.568	-29.209	1578.213541
1 Jul 2004 14:48:35.00	47.306	-33.452	1289.512745
1 Jul 2004 14:49:35.00	68.082	-38.173	1096.837220
1 Jul 2004 14:50:35.00	96.135	-39.526	1055.024463
1 Jul 2004 14:51:35.00	121.184	-35.866	1180.275775
1 Jul 2004 14:52:35.00	137.446	-31.097	1428.828431
1 Jul 2004 14:53:35.00	147.304	-27.629	1748.028007
1 Jul 2004 14:54:35.00	153.546	-25.590	2104.921553
1 Jul 2004 14:55:04.15	155.777	-25.000	2286.345698

Min Elevation	1 Jul 2004 14:50:19.58	88.716	-39.726	1049.217455
Max Elevation	1 Jul 2004 14:55:04.15	155.777	-25.000	2286.345781
Mean Elevation			-30.638	
Min Range	1 Jul 2004 14:50:19.58	88.715	-39.726	1049.217455
Max Range	1 Jul 2004 14:55:04.15	155.777	-25.000	2286.345781
Mean Range				1633.947640

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 16:24:24.85	51.087	-25.000	2287.889360
1 Jul 2004 16:25:24.00	60.450	-25.742	2068.716329
1 Jul 2004 16:26:24.00	72.084	-26.516	1912.969610
1 Jul 2004 16:27:24.00	85.380	-26.956	1841.854428
1 Jul 2004 16:28:24.00	99.065	-26.805	1865.283810
1 Jul 2004 16:29:24.00	111.646	-26.155	1979.729935
1 Jul 2004 16:30:24.00	122.219	-25.354	2170.350632
1 Jul 2004 16:30:53.92	126.677	-25.000	2287.999441

Min Elevation	1 Jul 2004 16:27:39.28	88.890	-26.977	1838.739737
Max Elevation	1 Jul 2004 16:30:53.92	126.677	-25.000	2287.999519
Mean Elevation			-25.941	
Min Range	1 Jul 2004 16:27:39.31	88.897	-26.977	1838.739758
Max Range	1 Jul 2004 16:30:53.92	126.677	-25.000	2287.999519
Mean Range				2051.849193

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 00:36:29.62	53.082	-25.000	2295.507018
2 Jul 2004 00:37:29.00	62.470	-25.736	2075.351756
2 Jul 2004 00:38:29.00	74.099	-26.502	1919.700162
2 Jul 2004 00:39:29.00	87.389	-26.934	1848.949500
2 Jul 2004 00:40:29.00	101.068	-26.780	1873.107692
2 Jul 2004 00:41:29.00	113.643	-26.133	1988.685502
2 Jul 2004 00:42:29.00	124.213	-25.339	2180.827573
2 Jul 2004 00:42:58.01	128.544	-25.000	2295.580114

Min Elevation	2 Jul 2004 00:39:43.88	90.807	-26.954	1845.981043
Max Elevation	2 Jul 2004 00:36:29.62	53.082	-25.000	2295.507018
Mean Elevation			-25.928	
Min Range	2 Jul 2004 00:39:43.91	90.814	-26.954	1845.981061
Max Range	2 Jul 2004 00:42:58.01	128.544	-25.000	2295.580030
Mean Range				2059.713665

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:12:22.93	32.220	-25.000	2296.560457
2 Jul 2004 02:13:22.00	38.781	-26.256	1965.373300
2 Jul 2004 02:14:22.00	48.393	-28.342	1668.708243
2 Jul 2004 02:15:22.00	62.354	-31.001	1438.594193
2 Jul 2004 02:16:22.00	81.285	-33.079	1311.786270
2 Jul 2004 02:17:22.00	102.518	-32.944	1319.063144
2 Jul 2004 02:18:22.00	120.989	-30.722	1458.453523
2 Jul 2004 02:19:22.00	134.448	-28.086	1697.294660
2 Jul 2004 02:20:22.00	143.701	-26.083	1999.524187
2 Jul 2004 02:21:14.66	149.448	-25.000	2296.654116

Min Elevation	2 Jul 2004 02:16:48.88	90.823	-33.347	1297.623208
Max Elevation	2 Jul 2004 02:12:22.93	32.220	-25.000	2296.560457
Mean Elevation			-28.651	
Min Range	2 Jul 2004 02:16:48.90	90.829	-33.347	1297.623216
Max Range	2 Jul 2004 02:21:14.66	149.448	-25.000	2296.654013
Mean Range				1745.201209

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 03:48:24.97	15.876	-25.000	2297.543202
	2 Jul 2004 03:49:24.00	19.278	-26.557	1911.260683
	2 Jul 2004 03:50:24.00	24.778	-29.728	1536.436748
	2 Jul 2004 03:51:24.00	34.572	-35.477	1198.737047
	2 Jul 2004 03:52:24.00	54.407	-44.203	941.248283
	2 Jul 2004 03:53:24.00	92.117	-49.804	842.626712
	2 Jul 2004 03:54:24.00	128.810	-43.608	953.958850
	2 Jul 2004 03:55:24.00	147.724	-35.009	1218.709960
	2 Jul 2004 03:56:24.00	157.132	-29.457	1559.911544
	2 Jul 2004 03:57:24.00	162.462	-26.414	1936.572762
	2 Jul 2004 03:58:19.07	165.599	-25.000	2297.640308
Min Elevation	2 Jul 2004 03:53:22.08	90.724	-49.812	842.512395
Max Elevation	2 Jul 2004 03:48:24.97	15.876	-25.000	2297.543202
Mean Elevation			-33.660	
Min Range	2 Jul 2004 03:53:22.08	90.724	-49.812	842.512395
Max Range	2 Jul 2004 03:58:19.07	165.599	-25.000	2297.640235
Mean Range			1517.695100	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 05:24:21.38	3.007	-25.000	2298.642110
	2 Jul 2004 05:25:21.00	3.573	-26.686	1889.962964
	2 Jul 2004 05:26:21.00	4.520	-30.331	1488.261497
	2 Jul 2004 05:27:21.00	6.374	-37.873	1109.317292
	2 Jul 2004 05:28:21.00	11.550	-53.857	789.439564
	2 Jul 2004 05:29:21.00	65.789	-81.047	628.857546
	2 Jul 2004 05:30:21.00	167.221	-58.614	740.504020
	2 Jul 2004 05:31:21.00	174.125	-40.140	1039.833823
	2 Jul 2004 05:32:21.00	176.313	-31.412	1411.361391
	2 Jul 2004 05:33:21.00	177.381	-27.208	1810.121028
	2 Jul 2004 05:34:21.00	178.012	-25.221	2220.263897
	2 Jul 2004 05:34:32.39	178.103	-25.000	2298.757979
Min Elevation	2 Jul 2004 05:29:26.90	90.533	-81.856	627.390141
Max Elevation	2 Jul 2004 05:24:21.38	3.007	-25.000	2298.642110
Mean Elevation			-38.533	
Min Range	2 Jul 2004 05:29:26.90	90.544	-81.856	627.390140
Max Range	2 Jul 2004 05:34:32.39	178.103	-25.000	2298.757920
Mean Range			1477.110259	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 07:00:10.38	354.769	-25.000	2299.701635
	2 Jul 2004 07:01:10.00	353.473	-26.678	1891.979769
	2 Jul 2004 07:02:10.00	351.329	-30.283	1492.309935
	2 Jul 2004 07:03:10.00	347.177	-37.640	1117.451770
	2 Jul 2004 07:04:10.00	336.104	-52.542	805.565943
	2 Jul 2004 07:05:10.00	278.828	-71.980	655.966933
	2 Jul 2004 07:06:10.00	207.703	-55.564	770.528554
	2 Jul 2004 07:07:10.00	194.327	-39.211	1067.006308
	2 Jul 2004 07:08:10.00	189.666	-31.051	1436.076214
	2 Jul 2004 07:09:10.00	187.338	-27.052	1833.350970
	2 Jul 2004 07:10:10.00	185.952	-25.157	2242.653113
	2 Jul 2004 07:10:18.30	185.804	-25.000	2299.809365
Min Elevation	2 Jul 2004 07:05:14.34	270.282	-72.165	655.205158
Max Elevation	2 Jul 2004 07:00:10.38	354.769	-25.000	2299.701635
Mean Elevation			-37.263	
Min Range	2 Jul 2004 07:05:14.34	270.281	-72.165	655.205158
Max Range	2 Jul 2004 07:10:18.30	185.804	-25.000	2299.809364
Mean Range			1492.700042	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 08:35:46.31	350.738	-25.000	2300.390528
	2 Jul 2004 08:36:46.00	348.550	-26.660	1895.193897
	2 Jul 2004 08:37:46.00	344.952	-30.175	1500.936426
	2 Jul 2004 08:38:46.00	338.126	-37.114	1136.027448
	2 Jul 2004 08:39:46.00	321.475	-49.865	842.127658
	2 Jul 2004 08:40:46.00	271.154	-61.721	714.978750
	2 Jul 2004 08:41:46.00	219.528	-50.347	835.143653
	2 Jul 2004 08:42:46.00	202.327	-37.406	1125.692235
	2 Jul 2004 08:43:46.00	195.344	-30.325	1489.254348
	2 Jul 2004 08:44:46.00	191.686	-26.735	1882.931008
	2 Jul 2004 08:45:46.00	189.459	-25.027	2289.995168
	2 Jul 2004 08:45:47.52	189.414	-25.000	2300.425310

Min Elevation	2 Jul 2004 08:40:46.92	270.074	-61.725	714.947502
Max Elevation	2 Jul 2004 08:35:46.31	350.738	-25.000	2300.390528
Mean Elevation			-35.448	
Min Range	2 Jul 2004 08:40:46.92	270.072	-61.725	714.947502
Max Range	2 Jul 2004 08:45:47.52	189.414	-25.000	2300.425200
Mean Range			1526.091369	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 10:11:09.88	352.695	-25.000	2300.689788
2 Jul 2004 10:12:09.00	351.075	-26.652	1896.825503
2 Jul 2004 10:13:09.00	348.379	-30.209	1498.332700
2 Jul 2004 10:14:09.00	343.195	-37.398	1126.032421
2 Jul 2004 10:15:09.00	329.809	-51.506	819.144748
2 Jul 2004 10:16:09.00	275.203	-67.814	675.803351
2 Jul 2004 10:17:09.00	212.553	-53.731	791.195647
2 Jul 2004 10:18:09.00	197.113	-38.620	1085.396123
2 Jul 2004 10:19:09.00	191.427	-30.818	1452.784165
2 Jul 2004 10:20:09.00	188.541	-26.950	1849.168784
2 Jul 2004 10:21:09.00	186.809	-25.115	2258.081125
2 Jul 2004 10:21:15.20	186.670	-25.000	2300.716620

Min Elevation	2 Jul 2004 10:16:12.52	269.688	-67.906	675.314401
Max Elevation	2 Jul 2004 10:11:09.88	352.695	-25.000	2300.689788
Mean Elevation			-36.568	
Min Range	2 Jul 2004 10:16:12.52	269.688	-67.906	675.314401
Max Range	2 Jul 2004 10:21:15.20	186.670	-25.000	2300.716533
Mean Range			1504.514248	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 11:46:45.24	0.845	-25.000	2300.580532
2 Jul 2004 11:47:45.00	1.172	-26.693	1889.846297
2 Jul 2004 11:48:45.00	1.713	-30.355	1486.991715
2 Jul 2004 11:49:45.00	2.773	-37.962	1106.731171
2 Jul 2004 11:50:45.00	5.761	-54.228	785.395463
2 Jul 2004 11:51:45.00	51.265	-84.108	624.251168
2 Jul 2004 11:52:45.00	171.857	-58.945	737.775530
2 Jul 2004 11:53:45.00	175.822	-40.174	1039.230580
2 Jul 2004 11:54:45.00	177.060	-31.407	1412.230898
2 Jul 2004 11:55:45.00	177.660	-27.201	1812.047164
2 Jul 2004 11:56:45.00	178.011	-25.217	2223.006751
2 Jul 2004 11:56:56.22	178.060	-25.000	2300.503216

Min Elevation	2 Jul 2004 11:51:50.69	89.415	-85.363	622.869100
Max Elevation	2 Jul 2004 11:46:45.24	0.845	-25.000	2300.580532
Mean Elevation			-38.858	
Min Range	2 Jul 2004 11:51:50.70	89.464	-85.363	622.869098
Max Range	2 Jul 2004 11:46:45.24	0.845	-25.000	2300.580532
Mean Range			1476.549207	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:22:51.57	13.608	-25.000	2299.819148
2 Jul 2004 13:23:51.00	16.891	-26.579	1908.688867
2 Jul 2004 13:24:51.00	22.183	-29.802	1531.016881
2 Jul 2004 13:25:51.00	31.681	-35.712	1189.526061
2 Jul 2004 13:26:51.00	51.348	-44.904	927.260291
2 Jul 2004 13:27:51.00	90.349	-51.058	825.090452
2 Jul 2004 13:28:51.00	128.460	-44.411	937.282435
2 Jul 2004 13:29:51.00	147.373	-35.340	1204.996013
2 Jul 2004 13:30:51.00	156.562	-29.592	1548.791441
2 Jul 2004 13:31:51.00	161.710	-26.472	1927.318503
2 Jul 2004 13:32:47.59	164.790	-25.000	2299.736008

Min Elevation	2 Jul 2004 13:27:49.51	89.213	-51.063	825.019837
Max Elevation	2 Jul 2004 13:22:51.57	13.608	-25.000	2299.819148
Mean Elevation			-33.988	
Min Range	2 Jul 2004 13:27:49.51	89.211	-51.063	825.019837
Max Range	2 Jul 2004 13:22:51.57	13.608	-25.000	2299.819148
Mean Range			1509.047827	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:59:53.23	30.371	-25.000	2298.799678
2 Jul 2004 15:00:53.00	37.006	-26.277	1962.630708
2 Jul 2004 15:01:53.00	46.639	-28.382	1665.197718
2 Jul 2004 15:02:53.00	60.648	-31.068	1434.589639
2 Jul 2004 15:03:53.00	79.665	-33.165	1307.760012

	2 Jul 2004 15:04:53.00	100.985	-33.019	1315.570339
	2 Jul 2004 15:05:53.00	119.490	-30.768	1455.759722
	2 Jul 2004 15:06:53.00	132.936	-28.111	1695.269834
	2 Jul 2004 15:07:53.00	142.160	-26.097	1997.864860
	2 Jul 2004 15:08:46.28	147.938	-25.000	2298.689774
Min Elevation	2 Jul 2004 15:04:19.66	89.166	-33.432	1293.775061
Max Elevation	2 Jul 2004 14:59:53.23	30.371	-25.000	2298.799678
Mean Elevation			-28.689	
Min Range	2 Jul 2004 15:04:19.69	89.175	-33.432	1293.775072
Max Range	2 Jul 2004 14:59:53.23	30.371	-25.000	2298.799678
Mean Range			1743.213228	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 16:38:11.68	51.532	-25.000	2297.550806
2 Jul 2004 16:39:11.00	60.920	-25.731	2077.920213
2 Jul 2004 16:40:11.00	72.542	-26.491	1922.667552
2 Jul 2004 16:41:11.00	85.805	-26.919	1852.255790
2 Jul 2004 16:42:11.00	99.445	-26.765	1876.488599
2 Jul 2004 16:43:11.00	111.979	-26.124	1991.757329
2 Jul 2004 16:44:11.00	122.516	-25.337	2183.211079
2 Jul 2004 16:44:40.00	126.832	-25.000	2297.465952
Min Elevation 2 Jul 2004 16:41:25.77	89.189	-26.938	1849.337117
Max Elevation 2 Jul 2004 16:38:11.68	51.532	-25.000	2297.550806
Mean Elevation		-25.921	
Min Range 2 Jul 2004 16:41:25.81	89.199	-26.938	1849.337137
Max Range 2 Jul 2004 16:38:11.68	51.532	-25.000	2297.550806
Mean Range		2062.414665	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 00:49:25.43	51.401	-25.000	2290.387223
3 Jul 2004 00:50:25.00	60.629	-25.790	2059.139787
3 Jul 2004 00:51:25.00	72.191	-26.654	1890.980310
3 Jul 2004 00:52:25.00	85.645	-27.203	1806.860704
3 Jul 2004 00:53:25.00	99.729	-27.119	1818.911366
3 Jul 2004 00:54:25.00	112.812	-26.453	1925.353015
3 Jul 2004 00:55:25.00	123.834	-25.575	2111.637655
3 Jul 2004 00:56:09.60	130.552	-25.000	2290.279320
Min Elevation 3 Jul 2004 00:52:47.61	90.970	-27.253	1799.866527
Max Elevation 3 Jul 2004 00:56:09.60	130.552	-25.000	2290.279330
Mean Elevation		-26.099	
Min Range 3 Jul 2004 00:52:47.64	90.976	-27.253	1799.866534
Max Range 3 Jul 2004 00:49:25.43	51.401	-25.000	2290.387223
Mean Range		2024.193673	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 02:25:26.39	25.908	-25.000	2288.819530
3 Jul 2004 02:26:26.00	31.330	-26.427	1929.300462
3 Jul 2004 02:27:26.00	39.583	-29.011	1597.625109
3 Jul 2004 02:28:26.00	52.655	-32.868	1321.134877
3 Jul 2004 02:29:26.00	73.046	-36.873	1142.271689
3 Jul 2004 02:30:26.00	99.281	-37.785	1110.243416
3 Jul 2004 02:31:26.00	122.622	-34.558	1236.725467
3 Jul 2004 02:32:26.00	138.324	-30.380	1481.319210
3 Jul 2004 02:33:26.00	148.177	-27.277	1795.693682
3 Jul 2004 02:34:26.00	154.561	-25.433	2148.488680
3 Jul 2004 02:34:48.79	156.402	-25.000	2288.664229
Min Elevation 3 Jul 2004 02:30:07.73	91.138	-38.016	1102.510559
Max Elevation 3 Jul 2004 02:34:48.79	156.402	-25.000	2288.664317
Mean Elevation		-30.056	
Min Range 3 Jul 2004 02:30:07.73	91.139	-38.016	1102.510559
Max Range 3 Jul 2004 02:25:26.39	25.908	-25.000	2288.819530
Mean Range		1667.298759	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:01:36.35	3.079	-25.000	2287.196922
3 Jul 2004 04:02:36.00	3.523	-26.713	1879.510154
3 Jul 2004 04:03:36.00	4.268	-30.404	1478.988426
3 Jul 2004 04:04:36.00	5.739	-38.045	1101.239593
3 Jul 2004 04:05:36.00	9.897	-54.297	782.808193
3 Jul 2004 04:06:36.00	63.410	-82.768	624.702117
3 Jul 2004 04:07:36.00	170.711	-58.615	739.036969
3 Jul 2004 04:08:36.00	176.110	-40.083	1039.228366

	3 Jul 2004 04:09:36.00	177.822	-31.373	1410.509018
	3 Jul 2004 04:10:36.00	178.661	-27.180	1808.593999
	3 Jul 2004 04:11:36.00	179.160	-25.197	2217.892984
	3 Jul 2004 04:11:46.05	179.224	-25.000	2287.022020
Min Elevation	3 Jul 2004 04:06:41.28	91.114	-83.590	623.525524
Max Elevation	3 Jul 2004 04:11:46.05	179.224	-25.000	2287.022133
Mean Elevation			-38.723	
Min Range	3 Jul 2004 04:06:41.28	91.133	-83.590	623.525524
Max Range	3 Jul 2004 04:01:36.35	3.079	-25.000	2287.196922
Mean Range			1471.394063	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 05:37:42.16	342.323	-25.000	2285.514739
3 Jul 2004 05:38:42.00	338.015	-26.588	1899.378997
3 Jul 2004 05:39:42.00	331.187	-29.693	1535.288301
3 Jul 2004 05:40:42.00	319.369	-34.971	1217.503514
3 Jul 2004 05:41:42.00	297.552	-41.810	993.500905
3 Jul 2004 05:42:42.00	263.675	-44.426	934.581973
3 Jul 2004 05:43:42.00	233.873	-39.063	1068.646241
3 Jul 2004 05:44:42.00	216.869	-32.541	1338.492998
3 Jul 2004 05:45:42.00	207.523	-28.206	1679.078154
3 Jul 2004 05:46:42.00	201.920	-25.796	2054.450842
3 Jul 2004 05:47:17.48	199.592	-25.000	2285.343757

Min Elevation	3 Jul 2004 05:42:29.83	270.942	-44.632	930.366035
Max Elevation	3 Jul 2004 05:47:17.48	199.592	-25.000	2285.343825
Mean Elevation			-32.100	
Min Range	3 Jul 2004 05:42:29.83	270.941	-44.632	930.366035
Max Range	3 Jul 2004 05:37:42.16	342.323	-25.000	2285.514739
Mean Range			1571.980038	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:13:31.00	325.380	-25.000	2283.806817
3 Jul 2004 07:14:30.00	317.965	-26.223	1964.058079
3 Jul 2004 07:15:30.00	307.300	-28.128	1687.206143
3 Jul 2004 07:16:30.00	292.458	-30.274	1487.802069
3 Jul 2004 07:17:30.00	273.743	-31.514	1400.331765
3 Jul 2004 07:18:30.00	254.329	-30.845	1445.633300
3 Jul 2004 07:19:30.00	238.076	-28.839	1612.369088
3 Jul 2004 07:20:30.00	226.150	-26.776	1867.698221
3 Jul 2004 07:21:30.00	217.741	-25.310	2179.820726
3 Jul 2004 07:21:48.48	215.683	-25.000	2283.700588

Min Elevation	3 Jul 2004 07:17:39.73	270.524	-31.541	1398.539124
Max Elevation	3 Jul 2004 07:21:48.48	215.683	-25.000	2283.700651
Mean Elevation			-27.791	
Min Range	3 Jul 2004 07:17:39.73	270.524	-31.541	1398.539124
Max Range	3 Jul 2004 07:13:31.00	325.380	-25.000	2283.806817
Mean Range			1821.242680	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 08:48:44.28	317.420	-25.000	2282.556931
3 Jul 2004 08:49:44.00	308.726	-26.048	1998.002967
3 Jul 2004 08:50:44.00	297.067	-27.426	1772.603462
3 Jul 2004 08:51:44.00	282.305	-28.616	1634.236129
3 Jul 2004 08:52:44.00	265.685	-28.897	1606.207399
3 Jul 2004 08:53:44.00	249.774	-28.063	1694.120768
3 Jul 2004 08:54:44.00	236.590	-26.686	1881.456859
3 Jul 2004 08:55:44.00	226.538	-25.440	2141.602164
3 Jul 2004 08:56:12.30	222.741	-25.000	2282.456419

Min Elevation	3 Jul 2004 08:52:28.30	270.079	-28.940	1602.140323
Max Elevation	3 Jul 2004 08:56:12.30	222.741	-25.000	2282.456426
Mean Elevation			-26.797	
Min Range	3 Jul 2004 08:52:28.30	270.078	-28.940	1602.140322
Max Range	3 Jul 2004 08:48:44.28	317.420	-25.000	2282.556931
Mean Range			1921.471455	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 10:23:12.91	321.005	-25.000	2281.255980
3 Jul 2004 10:24:12.00	313.008	-26.145	1977.696455
3 Jul 2004 10:25:12.00	301.814	-27.809	1723.451568
3 Jul 2004 10:26:12.00	286.899	-29.484	1551.784596
3 Jul 2004 10:27:12.00	269.108	-30.205	1492.330735
3 Jul 2004 10:28:12.00	251.408	-29.410	1558.259988

	3 Jul 2004 10:29:12.00	236.684	-27.714	1735.098849
	3 Jul 2004 10:30:12.00	225.670	-26.069	1992.917501
	3 Jul 2004 10:31:07.87	218.172	-25.000	2281.144367
Min Elevation	3 Jul 2004 10:27:10.41	269.594	-30.205	1492.286233
Max Elevation	3 Jul 2004 10:31:07.87	218.172	-25.000	2281.144339
Mean Elevation			-27.426	
Min Range	3 Jul 2004 10:27:10.41	269.593	-30.205	1492.286232
Max Range	3 Jul 2004 10:23:12.91	321.005	-25.000	2281.255980
Mean Range			1843.771115	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:57:34.92	335.614	-25.000	2281.067779
3 Jul 2004 11:58:34.00	330.352	-26.488	1914.109412
3 Jul 2004 11:59:34.00	322.143	-29.264	1571.256304
3 Jul 2004 12:00:00.00	317.167	-30.942	1437.954418

Min Elevation	3 Jul 2004 12:00:00.00	317.167	-30.942	1437.954342
Max Elevation	3 Jul 2004 11:57:34.92	335.614	-25.000	2281.067779
Mean Elevation			-27.924	
Min Range	3 Jul 2004 12:00:00.00	317.167	-30.942	1437.954342
Max Range	3 Jul 2004 11:57:34.92	335.614	-25.000	2281.067779
Mean Range			1801.096978	

Global Statistics

Min Elevation	2 Jul 2004 11:51:50.69	89.415	-85.363	622.869100
Max Elevation	2 Jul 2004 00:36:29.62	53.082	-25.000	2295.507018
Mean Elevation			-32.352	
Min Range	2 Jul 2004 11:51:50.70	89.464	-85.363	622.869098
Max Range	2 Jul 2004 10:21:15.20	186.670	-25.000	2300.716533
Mean Range			1666.976411	

ESM-To-Frigate

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:08:34.17	347.430	-25.000	2277.973358
1 Jul 2004 13:09:34.00	344.765	-26.702	1876.479732
1 Jul 2004 13:10:34.00	340.392	-30.236	1488.864053
1 Jul 2004 13:11:34.00	332.166	-37.030	1134.266319
1 Jul 2004 13:12:34.00	313.021	-48.660	857.141301
1 Jul 2004 13:13:34.00	265.777	-57.244	750.639834
1 Jul 2004 13:14:34.00	221.612	-47.296	879.531218
1 Jul 2004 13:15:34.00	204.234	-36.130	1167.946959
1 Jul 2004 13:16:34.00	196.577	-29.758	1527.238946
1 Jul 2004 13:17:34.00	192.428	-26.463	1916.884727
1 Jul 2004 13:18:27.77	190.078	-25.000	2278.128447

Min Elevation	1 Jul 2004 13:13:30.94	268.776	-57.279	750.309113
Max Elevation	1 Jul 2004 13:18:27.77	190.078	-25.000	2278.128539
Mean Elevation			-35.411	
Min Range	1 Jul 2004 13:13:30.94	268.776	-57.279	750.309113
Max Range	1 Jul 2004 13:18:27.77	190.078	-25.000	2278.128539
Mean Range			1468.644990	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 14:44:41.54	12.558	-25.000	2279.452733
1 Jul 2004 14:45:41.00	15.770	-26.635	1888.306437
1 Jul 2004 14:46:41.00	20.969	-29.966	1510.692939
1 Jul 2004 14:47:41.00	30.399	-36.108	1169.150287
1 Jul 2004 14:48:41.00	50.355	-45.751	907.500085
1 Jul 2004 14:49:41.00	90.950	-52.062	808.852403
1 Jul 2004 14:50:41.00	129.670	-44.745	927.091362
1 Jul 2004 14:51:41.00	148.124	-35.364	1199.276873
1 Jul 2004 14:52:41.00	156.961	-29.552	1545.282759
1 Jul 2004 14:53:41.00	161.892	-26.424	1924.626186
1 Jul 2004 14:54:34.97	164.723	-25.000	2279.601723

Min Elevation	1 Jul 2004 14:49:38.12	88.664	-52.083	808.584668
Max Elevation	1 Jul 2004 14:54:34.97	164.723	-25.000	2279.601816
Mean Elevation			-34.237	
Min Range	1 Jul 2004 14:49:38.12	88.663	-52.083	808.584668
Max Range	1 Jul 2004 14:54:34.97	164.723	-25.000	2279.601816
Mean Range			1494.530344	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)

	1 Jul 2004 16:22:45.43	41.497	-25.000	2280.901027
	1 Jul 2004 16:23:45.00	49.924	-26.011	2004.573599
	1 Jul 2004 16:24:45.00	61.159	-27.343	1783.056482
	1 Jul 2004 16:25:45.00	75.339	-28.528	1642.698608
	1 Jul 2004 16:26:45.00	91.413	-28.899	1605.458169
	1 Jul 2004 16:27:45.00	107.069	-28.197	1678.266056
	1 Jul 2004 16:28:45.00	120.305	-26.894	1847.803303
	1 Jul 2004 16:29:45.00	130.559	-25.634	2089.995051
	1 Jul 2004 16:30:25.15	135.947	-25.000	2281.011691
Min Elevation	1 Jul 2004 16:26:35.15	88.734	-28.915	1603.944709
Max Elevation	1 Jul 2004 16:30:25.15	135.947	-25.000	2281.011795
Mean Elevation			-26.834	
Min Range	1 Jul 2004 16:26:35.15	88.733	-28.915	1603.944709
Max Range	1 Jul 2004 16:30:25.15	135.947	-25.000	2281.011795
Mean Range			1912.640443	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 02:13:58.62	47.931	-25.000	2290.201628
	2 Jul 2004 02:14:58.00	56.783	-25.886	2037.408360
	2 Jul 2004 02:15:58.00	68.243	-26.954	1843.348657
	2 Jul 2004 02:16:58.00	82.083	-27.765	1732.746150
	2 Jul 2004 02:17:58.00	97.085	-27.851	1722.327619
	2 Jul 2004 02:18:58.00	111.302	-27.153	1813.944913
	2 Jul 2004 02:19:58.00	123.294	-26.095	1993.315438
	2 Jul 2004 02:20:58.00	132.726	-25.143	2238.880478
	2 Jul 2004 02:21:09.19	134.225	-25.000	2290.314978
Min Elevation	2 Jul 2004 02:17:34.00	91.068	-27.921	1713.944302
Max Elevation	2 Jul 2004 02:13:58.62	47.931	-25.000	2290.201628
Mean Elevation			-26.316	
Min Range	2 Jul 2004 02:17:33.98	91.061	-27.921	1713.944310
Max Range	2 Jul 2004 02:21:09.19	134.225	-25.000	2290.314895
Mean Range			1995.832024	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 03:49:37.17	23.191	-25.000	2291.701104
	2 Jul 2004 03:50:37.00	28.130	-26.488	1920.008187
	2 Jul 2004 03:51:37.00	35.766	-29.275	1574.103650
	2 Jul 2004 03:52:37.00	48.311	-33.685	1279.123926
	2 Jul 2004 03:53:37.00	69.233	-38.752	1079.476859
	2 Jul 2004 03:54:37.00	98.200	-40.335	1033.120420
	2 Jul 2004 03:55:37.00	124.114	-36.446	1158.868221
	2 Jul 2004 03:56:37.00	140.629	-31.385	1411.102729
	2 Jul 2004 03:57:37.00	150.477	-27.754	1734.787134
	2 Jul 2004 03:58:37.00	156.654	-25.641	2096.108128
	2 Jul 2004 03:59:08.08	158.984	-25.000	2291.853183
Min Elevation	2 Jul 2004 03:54:22.73	91.070	-40.522	1027.992206
Max Elevation	2 Jul 2004 03:49:37.17	23.191	-25.000	2291.701104
Mean Elevation			-30.887	
Min Range	2 Jul 2004 03:54:22.73	91.069	-40.522	1027.992206
Max Range	2 Jul 2004 03:59:08.08	158.984	-25.000	2291.853081
Mean Range			1624.568504	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 05:25:24.87	3.755	-25.000	2293.206104
	2 Jul 2004 05:26:24.00	4.416	-26.683	1887.748616
	2 Jul 2004 05:27:24.00	5.530	-30.337	1486.035400
	2 Jul 2004 05:28:24.00	7.716	-37.898	1107.378251
	2 Jul 2004 05:29:24.00	13.820	-53.869	788.576081
	2 Jul 2004 05:30:24.00	71.480	-79.902	630.615802
	2 Jul 2004 05:31:24.00	165.503	-58.064	744.850026
	2 Jul 2004 05:32:24.00	173.379	-39.910	1045.289596
	2 Jul 2004 05:33:24.00	175.915	-31.298	1417.365955
	2 Jul 2004 05:34:24.00	177.158	-27.145	1816.541548
	2 Jul 2004 05:35:24.00	177.895	-25.186	2227.070123
	2 Jul 2004 05:35:33.61	177.986	-25.000	2293.361406
Min Elevation	2 Jul 2004 05:30:29.28	90.850	-80.462	629.443990
Max Elevation	2 Jul 2004 05:25:24.87	3.755	-25.000	2293.206104
Mean Elevation			-38.358	
Min Range	2 Jul 2004 05:30:29.28	90.853	-80.462	629.443990
Max Range	2 Jul 2004 05:35:33.61	177.986	-25.000	2293.361300
Mean Range			1478.169909	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 07:01:05.94	349.975	-25.000	2294.636049
	2 Jul 2004 07:02:05.00	347.513	-26.640	1895.487441
	2 Jul 2004 07:03:05.00	343.446	-30.113	1503.981085
	2 Jul 2004 07:04:05.00	335.804	-36.869	1143.687282
	2 Jul 2004 07:05:05.00	317.811	-48.801	857.446799
	2 Jul 2004 07:06:05.00	270.083	-58.731	738.949091
	2 Jul 2004 07:07:05.00	222.898	-48.575	861.017171
	2 Jul 2004 07:08:05.00	205.189	-36.724	1149.042009
	2 Jul 2004 07:09:05.00	197.639	-30.037	1510.095494
	2 Jul 2004 07:10:05.00	193.613	-26.602	1901.964528
	2 Jul 2004 07:11:03.10	191.208	-25.000	2294.751803
Min Elevation	2 Jul 2004 07:06:04.52	270.581	-58.732	738.940821
Max Elevation	2 Jul 2004 07:01:05.94	349.975	-25.000	2294.636049
Mean Elevation			-35.736	
Min Range	2 Jul 2004 07:06:04.52	270.582	-58.732	738.940821
Max Range	2 Jul 2004 07:11:03.10	191.208	-25.000	2294.751715
Mean Range			1468.278069	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 08:36:28.42	342.266	-25.000	2295.716515
	2 Jul 2004 08:37:28.00	338.152	-26.571	1907.796441
	2 Jul 2004 08:38:28.00	331.589	-29.689	1539.124997
	2 Jul 2004 08:39:28.00	320.137	-35.083	1215.072337
	2 Jul 2004 08:40:28.00	298.530	-42.325	982.881837
	2 Jul 2004 08:41:28.00	263.704	-45.414	916.565192
	2 Jul 2004 08:42:28.00	232.706	-39.820	1048.355017
	2 Jul 2004 08:43:28.00	215.393	-32.927	1319.769114
	2 Jul 2004 08:44:28.00	206.055	-28.392	1662.982090
	2 Jul 2004 08:45:28.00	200.515	-25.886	2041.013306
	2 Jul 2004 08:46:06.86	198.033	-25.000	2295.821719
Min Elevation	2 Jul 2004 08:41:17.63	270.147	-45.578	913.423175
Max Elevation	2 Jul 2004 08:36:28.42	342.266	-25.000	2295.716515
Mean Elevation			-32.373	
Min Range	2 Jul 2004 08:41:17.63	270.147	-45.578	913.423175
Max Range	2 Jul 2004 08:46:06.86	198.033	-25.000	2295.821659
Mean Range			1565.918051	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 10:11:36.00	343.318	-25.000	2296.723766
	2 Jul 2004 10:12:35.00	339.586	-26.567	1909.094232
	2 Jul 2004 10:13:35.00	333.549	-29.744	1534.796335
	2 Jul 2004 10:14:35.00	322.847	-35.403	1201.663278
	2 Jul 2004 10:15:35.00	301.755	-43.512	955.918483
	2 Jul 2004 10:16:35.00	264.886	-47.680	875.929136
	2 Jul 2004 10:17:35.00	231.248	-41.531	1002.514784
	2 Jul 2004 10:18:35.00	213.382	-33.790	1275.181065
	2 Jul 2004 10:19:35.00	204.140	-28.801	1621.015729
	2 Jul 2004 10:20:35.00	198.779	-26.075	2001.370615
	2 Jul 2004 10:21:19.78	196.093	-25.000	2296.822685
Min Elevation	2 Jul 2004 10:16:27.87	269.711	-47.772	874.379879
Max Elevation	2 Jul 2004 10:11:36.00	343.318	-25.000	2296.723766
Mean Elevation			-33.009	
Min Range	2 Jul 2004 10:16:27.87	269.711	-47.772	874.379879
Max Range	2 Jul 2004 10:21:19.78	196.093	-25.000	2296.822661
Mean Range			1542.820919	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 11:46:43.64	350.035	-25.000	2296.161726
	2 Jul 2004 11:47:43.00	347.844	-26.659	1893.230890
	2 Jul 2004 11:48:43.00	344.220	-30.181	1499.073427
	2 Jul 2004 11:49:43.00	337.339	-37.133	1134.447137
	2 Jul 2004 11:50:43.00	320.543	-49.882	841.259835
	2 Jul 2004 11:51:43.00	270.109	-61.584	715.512409
	2 Jul 2004 11:52:43.00	218.882	-50.177	836.970158
	2 Jul 2004 11:53:43.00	201.746	-37.313	1128.079157
	2 Jul 2004 11:54:43.00	194.764	-30.274	1491.839890
	2 Jul 2004 11:55:43.00	191.097	-26.705	1885.586158
	2 Jul 2004 11:56:43.00	188.861	-25.009	2292.666624
	2 Jul 2004 11:56:43.50	188.847	-25.000	2296.070757
Min Elevation	2 Jul 2004 11:51:43.56	269.451	-61.585	715.500638
Max Elevation	2 Jul 2004 11:46:43.64	350.035	-25.000	2296.161726

	Mean Elevation		-35.410	
Min Range	2 Jul 2004 11:51:43.56	269.450	-61.585	715.500638
Max Range	2 Jul 2004 11:46:43.64	350.035	-25.000	2296.161726
	Mean Range		1525.908181	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:22:15.95	3.803	-25.000	2295.291245
2 Jul 2004 13:23:15.00	4.896	-26.667	1891.441127
2 Jul 2004 13:24:15.00	6.720	-30.277	1491.336093
2 Jul 2004 13:25:15.00	10.256	-37.677	1115.278768
2 Jul 2004 13:26:15.00	19.801	-52.891	800.596954
2 Jul 2004 13:27:15.00	77.271	-74.348	646.453690
2 Jul 2004 13:28:15.00	154.937	-56.658	758.648152
2 Jul 2004 13:29:15.00	166.981	-39.585	1055.041728
2 Jul 2004 13:30:15.00	171.039	-31.205	1424.146155
2 Jul 2004 13:31:15.00	173.044	-27.119	1821.196273
2 Jul 2004 13:32:15.00	174.230	-25.182	2230.061118
2 Jul 2004 13:32:24.48	174.374	-25.000	2295.197256

Min Elevation	2 Jul 2004 13:27:20.15	89.104	-74.662	645.366199
Max Elevation	2 Jul 2004 13:22:15.95	3.803	-25.000	2295.291245
	Mean Elevation		-37.634	
Min Range	2 Jul 2004 13:27:20.15	89.106	-74.662	645.366199
Max Range	2 Jul 2004 13:22:15.95	3.803	-25.000	2295.291245
	Mean Range		1485.390713	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:58:52.35	23.522	-25.000	2294.365648
2 Jul 2004 14:59:52.00	28.949	-26.427	1932.239938
2 Jul 2004 15:00:52.00	37.211	-29.025	1598.367758
2 Jul 2004 15:01:52.00	50.323	-32.915	1320.068910
2 Jul 2004 15:02:52.00	70.833	-36.962	1140.254698
2 Jul 2004 15:03:52.00	97.255	-37.871	1108.513630
2 Jul 2004 15:04:52.00	120.689	-34.590	1236.607307
2 Jul 2004 15:05:52.00	136.375	-30.378	1483.252515
2 Jul 2004 15:06:52.00	146.181	-27.269	1799.520442
2 Jul 2004 15:07:52.00	152.518	-25.429	2153.903666
2 Jul 2004 15:08:14.73	154.338	-25.000	2294.253327

Min Elevation	2 Jul 2004 15:03:33.53	88.967	-38.111	1100.532600
Max Elevation	2 Jul 2004 14:58:52.35	23.522	-25.000	2294.365648
	Mean Elevation		-30.079	
Min Range	2 Jul 2004 15:03:33.53	88.967	-38.111	1100.532600
Max Range	2 Jul 2004 14:58:52.35	23.522	-25.000	2294.365648
	Mean Range		1669.213440	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 16:37:05.95	48.769	-25.000	2293.013535
2 Jul 2004 16:38:05.00	57.891	-25.799	2058.821663
2 Jul 2004 16:39:05.00	69.466	-26.696	1885.338943
2 Jul 2004 16:40:05.00	83.013	-27.287	1796.348786
2 Jul 2004 16:41:05.00	97.265	-27.227	1804.687454
2 Jul 2004 16:42:05.00	110.534	-26.556	1908.965033
2 Jul 2004 16:43:05.00	121.704	-25.650	2094.443771
2 Jul 2004 16:43:54.16	129.121	-25.000	2292.916216

Min Elevation	2 Jul 2004 16:40:29.96	88.954	-27.350	1787.709634
Max Elevation	2 Jul 2004 16:37:05.95	48.769	-25.000	2293.013535
	Mean Elevation		-26.152	
Min Range	2 Jul 2004 16:40:29.98	88.960	-27.350	1787.709639
Max Range	2 Jul 2004 16:37:05.95	48.769	-25.000	2293.013535
	Mean Range		2016.816925	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 00:50:49.31	63.801	-25.000	2285.333050
3 Jul 2004 00:51:49.00	74.050	-25.480	2133.004961
3 Jul 2004 00:52:49.00	85.678	-25.796	2054.322682
3 Jul 2004 00:53:49.00	97.787	-25.775	2059.225435
3 Jul 2004 00:54:49.00	109.307	-25.428	2147.197952
3 Jul 2004 00:55:41.65	118.284	-25.000	2285.264945

Min Elevation	3 Jul 2004 00:53:15.54	91.039	-25.833	2045.969472
Max Elevation	3 Jul 2004 00:50:49.31	63.801	-25.000	2285.333050
	Mean Elevation		-25.413	
Min Range	3 Jul 2004 00:53:15.55	91.041	-25.833	2045.969472
Max Range	3 Jul 2004 00:50:49.31	63.801	-25.000	2285.333050

Mean Range				2160.724837

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 02:26:17.71	32.153	-25.000	2283.969588
3 Jul 2004 02:27:17.00	38.683	-26.294	1950.714711
3 Jul 2004 02:28:17.00	48.265	-28.444	1652.710501
3 Jul 2004 02:29:17.00	62.279	-31.205	1420.799805
3 Jul 2004 02:30:17.00	81.441	-33.385	1292.361603
3 Jul 2004 02:31:17.00	103.032	-33.255	1299.136857
3 Jul 2004 02:32:17.00	121.756	-30.935	1439.283711
3 Jul 2004 02:33:17.00	135.301	-28.198	1679.344076
3 Jul 2004 02:34:17.00	144.553	-26.128	1982.638612
3 Jul 2004 02:35:10.24	150.330	-25.000	2283.839837

Min Elevation	3 Jul 2004 02:30:44.13	91.225	-33.672	1277.793116
Max Elevation	3 Jul 2004 02:35:10.24	150.330	-25.000	2283.839870
Mean Elevation			-28.784	
Min Range	3 Jul 2004 02:30:44.14	91.232	-33.672	1277.793122
Max Range	3 Jul 2004 02:26:17.71	32.153	-25.000	2283.969588
Mean Range				1728.479930

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:02:21.20	6.566	-25.000	2282.442225
3 Jul 2004 04:03:21.00	7.798	-26.719	1876.088082
3 Jul 2004 04:04:21.00	9.846	-30.384	1478.980350
3 Jul 2004 04:05:21.00	13.836	-37.853	1106.633830
3 Jul 2004 04:06:21.00	24.610	-53.013	797.312928
3 Jul 2004 04:07:21.00	83.451	-72.851	650.564768
3 Jul 2004 04:08:21.00	155.200	-55.682	766.979512
3 Jul 2004 04:09:21.00	167.931	-39.226	1063.111876
3 Jul 2004 04:10:21.00	172.357	-31.052	1430.700524
3 Jul 2004 04:11:21.00	174.573	-27.043	1826.080661
3 Jul 2004 04:12:21.00	175.897	-25.137	2233.348006
3 Jul 2004 04:12:28.14	176.020	-25.000	2282.262033

Min Elevation	3 Jul 2004 04:07:24.78	91.270	-73.000	649.989830
Max Elevation	3 Jul 2004 04:12:28.14	176.020	-25.000	2282.262146
Mean Elevation			-37.413	
Min Range	3 Jul 2004 04:07:24.78	91.271	-73.000	649.989830
Max Range	3 Jul 2004 04:02:21.20	6.566	-25.000	2282.442225
Mean Range				1482.875400

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 05:38:29.73	342.885	-25.000	2280.702657
3 Jul 2004 05:39:29.00	338.701	-26.585	1897.252904
3 Jul 2004 05:40:29.00	332.004	-29.718	1531.525945
3 Jul 2004 05:41:29.00	320.351	-35.089	1211.235550
3 Jul 2004 05:42:29.00	298.557	-42.172	983.834137
3 Jul 2004 05:43:29.00	264.062	-45.005	922.087347
3 Jul 2004 05:44:29.00	233.651	-39.464	1055.720039
3 Jul 2004 05:45:29.00	216.542	-32.730	1326.529669
3 Jul 2004 05:46:29.00	207.240	-28.287	1668.189174
3 Jul 2004 05:47:29.00	201.696	-25.826	2044.414366
3 Jul 2004 05:48:05.21	199.357	-25.000	2280.526189

Min Elevation	3 Jul 2004 05:43:17.48	271.103	-45.200	918.261017
Max Elevation	3 Jul 2004 05:48:05.21	199.357	-25.000	2280.526274
Mean Elevation			-32.262	
Min Range	3 Jul 2004 05:43:17.48	271.102	-45.200	918.261017
Max Range	3 Jul 2004 05:38:29.73	342.885	-25.000	2280.702657
Mean Range				1563.819816

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:14:29.50	321.942	-25.000	2278.910284
3 Jul 2004 07:15:29.00	313.832	-26.153	1974.778438
3 Jul 2004 07:16:29.00	302.573	-27.806	1722.805200
3 Jul 2004 07:17:29.00	287.625	-29.450	1553.933478
3 Jul 2004 07:18:29.00	269.883	-30.131	1497.354678
3 Jul 2004 07:19:29.00	252.306	-29.319	1565.515555
3 Jul 2004 07:20:29.00	237.709	-27.638	1743.569589
3 Jul 2004 07:21:29.00	226.787	-26.018	2001.751986
3 Jul 2004 07:22:22.84	219.576	-25.000	2278.760708

Min Elevation	3 Jul 2004 07:18:26.15	270.750	-30.132	1497.211447
Max Elevation	3 Jul 2004 07:22:22.84	219.576	-25.000	2278.760728
Mean Elevation			-27.390	

Min Range	3 Jul 2004 07:18:26.15	270.751	-30.132	1497.211448
Max Range	3 Jul 2004 07:14:29.50	321.942	-25.000	2278.910284
Mean Range				1846.375546

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 08:49:49.45	307.441	-25.000	2277.028930
3 Jul 2004 08:50:49.00	297.504	-25.775	2053.502477
3 Jul 2004 08:51:49.00	285.216	-26.545	1901.972985
3 Jul 2004 08:52:49.00	271.297	-26.909	1843.412033
3 Jul 2004 08:53:49.00	257.249	-26.636	1886.750171
3 Jul 2004 08:54:49.00	244.650	-25.902	2025.275082
3 Jul 2004 08:55:49.00	234.296	-25.101	2240.866436
3 Jul 2004 08:55:57.61	232.999	-25.000	2276.905849

Min Elevation	3 Jul 2004 08:52:53.54	270.218	-26.911	1843.115639
Max Elevation	3 Jul 2004 08:55:57.61	232.999	-25.000	2276.905744
Mean Elevation			-25.859	
Min Range	3 Jul 2004 08:52:53.57	270.210	-26.911	1843.115649
Max Range	3 Jul 2004 08:49:49.45	307.441	-25.000	2277.028930
Mean Range				2063.214245

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 10:23:59.52	309.923	-25.000	2275.528023
3 Jul 2004 10:24:59.00	300.344	-25.861	2033.211129
3 Jul 2004 10:25:59.00	288.175	-26.805	1858.707657
3 Jul 2004 10:26:59.00	273.936	-27.376	1776.054943
3 Jul 2004 10:27:59.00	259.132	-27.213	1798.350677
3 Jul 2004 10:28:59.00	245.634	-26.426	1921.870138
3 Jul 2004 10:29:59.00	234.516	-25.468	2128.604910
3 Jul 2004 10:30:33.28	229.288	-25.000	2275.438937

Min Elevation	3 Jul 2004 10:27:16.42	269.608	-27.410	1771.533293
Max Elevation	3 Jul 2004 10:30:33.28	229.288	-25.000	2275.438904
Mean Elevation			-26.144	
Min Range	3 Jul 2004 10:27:16.47	269.597	-27.410	1771.533316
Max Range	3 Jul 2004 10:23:59.52	309.923	-25.000	2275.528023
Mean Range				2008.470802

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:57:43.07	325.850	-25.000	2274.204612
3 Jul 2004 11:58:43.00	318.580	-26.318	1940.533378
3 Jul 2004 11:59:43.00	308.080	-28.406	1652.814624
3 Jul 2004 12:00:00.00	304.332	-29.103	1583.533400

Min Elevation	3 Jul 2004 12:00:00.00	304.332	-29.103	1583.533330
Max Elevation	3 Jul 2004 11:57:43.07	325.850	-25.000	2274.204612
Mean Elevation			-27.207	
Min Range	3 Jul 2004 12:00:00.00	304.332	-29.103	1583.533330
Max Range	3 Jul 2004 11:57:43.07	325.850	-25.000	2274.204612
Mean Range				1862.771504

Global Statistics

Min Elevation	2 Jul 2004 05:30:29.28	90.850	-80.462	629.443990
Max Elevation	2 Jul 2004 03:49:37.17	23.191	-25.000	2291.701104
Mean Elevation			-31.831	
Min Range	2 Jul 2004 05:30:29.28	90.853	-80.462	629.443990
Max Range	2 Jul 2004 10:21:19.78	196.093	-25.000	2296.822661
Mean Range				1672.684774

ESM-To-Nansen

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:11:48.42	349.506	-25.000	2297.267491
1 Jul 2004 13:12:48.00	347.141	-26.656	1894.229573
1 Jul 2004 13:13:48.00	343.253	-30.148	1502.028546
1 Jul 2004 13:14:48.00	335.916	-36.977	1140.314499
1 Jul 2004 13:15:48.00	318.410	-49.214	851.425755
1 Jul 2004 13:16:48.00	269.759	-59.838	729.661102
1 Jul 2004 13:17:48.00	220.979	-49.266	850.638782
1 Jul 2004 13:18:48.00	203.408	-37.009	1139.138800
1 Jul 2004 13:19:48.00	196.050	-30.165	1500.689065
1 Jul 2004 13:20:48.00	192.151	-26.664	1892.812664
1 Jul 2004 13:21:47.78	189.772	-25.000	2297.134097

Min Elevation	1 Jul 2004 13:16:48.11	269.642	-59.838	729.660682
Max Elevation	1 Jul 2004 13:11:48.42	349.506	-25.000	2297.267491
Mean Elevation			-35.994	
Min Range	1 Jul 2004 13:16:48.11	269.642	-59.838	729.660682
Max Range	1 Jul 2004 13:11:48.42	349.506	-25.000	2297.267491
Mean Range			1463.212761	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 14:47:16.75	0.020	-25.000	2296.089318
1 Jul 2004 14:48:16.00	0.207	-26.686	1888.627076
1 Jul 2004 14:49:16.00	0.518	-30.356	1485.468034
1 Jul 2004 14:50:16.00	1.124	-37.991	1104.854144
1 Jul 2004 14:51:16.00	2.840	-54.370	783.172154
1 Jul 2004 14:52:16.00	35.938	-85.579	622.201370
1 Jul 2004 14:53:16.00	174.904	-58.987	736.843784
1 Jul 2004 14:54:16.00	177.163	-40.143	1039.246449
1 Jul 2004 14:55:16.00	177.865	-31.378	1412.811771
1 Jul 2004 14:56:16.00	178.203	-27.179	1812.991475
1 Jul 2004 14:57:16.00	178.399	-25.202	2224.209958
1 Jul 2004 14:57:26.39	178.424	-25.000	2295.971749

Min Elevation	1 Jul 2004 14:52:21.53	89.237	-87.354	620.895524
Max Elevation	1 Jul 2004 14:47:16.75	0.020	-25.000	2296.089318
Mean Elevation			-38.989	
Min Range	1 Jul 2004 14:52:21.53	89.239	-87.354	620.895524
Max Range	1 Jul 2004 14:47:16.75	0.020	-25.000	2296.089318
Mean Range			1475.207273	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 16:23:31.15	17.326	-25.000	2295.014486
1 Jul 2004 16:24:31.00	21.507	-26.544	1912.127787
1 Jul 2004 16:25:31.00	28.084	-29.556	1550.276191
1 Jul 2004 16:26:31.00	39.368	-34.694	1232.070024
1 Jul 2004 16:27:31.00	60.137	-41.545	1001.856244
1 Jul 2004 16:28:31.00	93.294	-44.793	928.709627
1 Jul 2004 16:29:31.00	123.987	-39.886	1046.306949
1 Jul 2004 16:30:31.00	141.862	-33.226	1303.575076
1 Jul 2004 16:31:31.00	151.658	-28.655	1635.052461
1 Jul 2004 16:32:31.00	157.492	-26.061	2003.174089
1 Jul 2004 16:33:16.46	160.488	-25.000	2295.042033

Min Elevation	1 Jul 2004 16:28:23.68	88.925	-44.867	927.211141
Max Elevation	1 Jul 2004 16:33:16.46	160.488	-25.000	2295.042008
Mean Elevation			-32.269	
Min Range	1 Jul 2004 16:28:23.68	88.925	-44.867	927.211141
Max Range	1 Jul 2004 16:33:16.46	160.488	-25.000	2295.042008
Mean Range			1563.927724	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:01:28.03	40.936	-25.000	2295.255141
1 Jul 2004 18:02:28.00	49.245	-26.015	2012.731685
1 Jul 2004 18:03:28.00	60.311	-27.375	1785.423654
1 Jul 2004 18:04:28.00	74.393	-28.630	1637.751394
1 Jul 2004 18:05:28.00	90.543	-29.089	1592.603785
1 Jul 2004 18:06:28.00	106.443	-28.432	1658.473086
1 Jul 2004 18:07:28.00	119.963	-27.107	1823.045291
1 Jul 2004 18:08:28.00	130.447	-25.791	2062.184565
1 Jul 2004 18:09:16.81	136.998	-25.000	2295.271054

Min Elevation	1 Jul 2004 18:05:22.30	88.978	-29.095	1592.093120
Max Elevation	1 Jul 2004 18:09:16.81	136.998	-25.000	2295.271029
Mean Elevation			-26.938	
Min Range	1 Jul 2004 18:05:22.26	88.967	-29.095	1592.093142
Max Range	1 Jul 2004 18:09:16.81	136.998	-25.000	2295.271029
Mean Range			1906.971073	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 19:41:15.68	67.477	-25.000	2296.335116
1 Jul 2004 19:42:15.00	77.825	-25.341	2180.867089
1 Jul 2004 19:43:15.00	89.160	-25.487	2139.333288
1 Jul 2004 19:44:15.00	100.509	-25.351	2177.900190
1 Jul 2004 19:45:15.00	111.004	-25.010	2292.334402
1 Jul 2004 19:45:16.62	111.270	-25.000	2296.380252

Min Elevation	1 Jul 2004 19:43:16.12	89.375	-25.487	2139.319322
Max Elevation	1 Jul 2004 19:45:16.62	111.270	-25.000	2296.380315

	Mean Elevation		-25.198	
Min Range	1 Jul 2004 19:43:16.12	89.374	-25.487	2139.319321
Max Range	1 Jul 2004 19:45:16.62	111.270	-25.000	2296.380315
	Mean Range		2230.525056	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 00:36:11.23	63.895	-25.000	2298.590196
2 Jul 2004 00:37:11.00	74.119	-25.459	2148.894607
2 Jul 2004 00:38:11.00	85.659	-25.756	2072.863500
2 Jul 2004 00:39:11.00	97.640	-25.727	2079.762169
2 Jul 2004 00:40:11.00	109.024	-25.389	2168.826003
2 Jul 2004 00:41:00.88	117.464	-25.000	2298.643890

Min Elevation	2 Jul 2004 00:38:36.10	90.677	-25.787	2065.470930
Max Elevation	2 Jul 2004 00:36:11.23	63.895	-25.000	2298.590196
	Mean Elevation		-25.388	
Min Range	2 Jul 2004 00:38:36.10	90.678	-25.787	2065.470931
Max Range	2 Jul 2004 00:41:00.88	117.464	-25.000	2298.643969
	Mean Range		2177.930061	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:12:05.13	41.067	-25.000	2299.623924
2 Jul 2004 02:13:05.00	49.100	-26.051	2007.913964
2 Jul 2004 02:14:05.00	59.969	-27.517	1768.376128
2 Jul 2004 02:15:05.00	74.098	-28.958	1606.763859
2 Jul 2004 02:16:05.00	90.692	-29.596	1548.492726
2 Jul 2004 02:17:05.00	107.312	-28.974	1605.168021
2 Jul 2004 02:18:05.00	121.495	-27.538	1765.607046
2 Jul 2004 02:19:05.00	132.423	-26.068	2004.544612
2 Jul 2004 02:20:05.00	140.519	-25.007	2296.846869
2 Jul 2004 02:20:05.55	140.583	-25.000	2299.706782

Min Elevation	2 Jul 2004 02:16:05.43	90.814	-29.596	1548.489773
Max Elevation	2 Jul 2004 02:12:05.13	41.067	-25.000	2299.623924
	Mean Elevation		-26.971	
Min Range	2 Jul 2004 02:16:05.43	90.814	-29.596	1548.489773
Max Range	2 Jul 2004 02:20:05.55	140.583	-25.000	2299.706777
	Mean Range		1920.304393	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 03:48:10.87	23.202	-25.000	2300.342947
2 Jul 2004 03:49:10.00	28.089	-26.427	1935.608339
2 Jul 2004 03:50:10.00	35.660	-29.116	1591.954203
2 Jul 2004 03:51:10.00	47.971	-33.355	1298.182824
2 Jul 2004 03:52:10.00	68.277	-38.259	1096.890847
2 Jul 2004 03:53:10.00	96.450	-39.999	1044.106932
2 Jul 2004 03:54:10.00	122.257	-36.450	1160.545653
2 Jul 2004 03:55:10.00	139.083	-31.525	1404.405532
2 Jul 2004 03:56:10.00	149.220	-27.891	1721.667558
2 Jul 2004 03:57:10.00	155.598	-25.738	2078.025900
2 Jul 2004 03:57:45.62	158.320	-25.000	2300.233752

Min Elevation	2 Jul 2004 03:52:58.34	90.749	-40.118	1040.757154
Max Elevation	2 Jul 2004 03:57:45.62	158.320	-25.000	2300.233855
	Mean Elevation		-30.796	
Min Range	2 Jul 2004 03:52:58.34	90.749	-40.118	1040.757154
Max Range	2 Jul 2004 03:48:10.87	23.202	-25.000	2300.342947
	Mean Range		1630.178590	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 05:24:32.05	8.041	-25.000	2299.210152
2 Jul 2004 05:25:32.00	9.728	-26.664	1893.910122
2 Jul 2004 05:26:32.00	12.496	-30.187	1499.600151
2 Jul 2004 05:27:32.00	17.779	-37.244	1131.156268
2 Jul 2004 05:28:32.00	31.156	-50.943	826.590736
2 Jul 2004 05:29:32.00	83.088	-66.988	680.179617
2 Jul 2004 05:30:32.00	145.909	-54.108	786.590513
2 Jul 2004 05:31:32.00	162.331	-39.015	1072.811916
2 Jul 2004 05:32:32.00	168.376	-31.075	1434.251970
2 Jul 2004 05:33:32.00	171.436	-27.101	1825.766958
2 Jul 2004 05:34:32.00	173.269	-25.191	2230.387456
2 Jul 2004 05:34:42.08	173.507	-25.000	2299.086459

Min Elevation	2 Jul 2004 05:29:37.14	90.760	-67.169	679.161089
Max Elevation	2 Jul 2004 05:34:42.08	173.507	-25.000	2299.086563
	Mean Elevation		-36.543	

Min Range	2 Jul 2004 05:29:37.14	90.760	-67.169	679.161089
Max Range	2 Jul 2004 05:24:32.05	8.041	-25.000	2299.210152
Mean Range				1498.295193

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 07:00:41.68	355.694	-25.000	2298.285129
2 Jul 2004 07:01:41.00	354.560	-26.665	1893.245278
2 Jul 2004 07:02:41.00	352.679	-30.258	1493.781199
2 Jul 2004 07:03:41.00	349.041	-37.607	1118.289697
2 Jul 2004 07:04:41.00	339.290	-52.662	803.855330
2 Jul 2004 07:05:41.00	282.892	-73.802	648.722733
2 Jul 2004 07:06:41.00	205.659	-56.696	758.646904
2 Jul 2004 07:07:41.00	193.139	-39.661	1053.406873
2 Jul 2004 07:08:41.00	188.913	-31.256	1421.600503
2 Jul 2004 07:09:41.00	186.824	-27.151	1818.108237
2 Jul 2004 07:10:41.00	185.587	-25.200	2226.634247
2 Jul 2004 07:10:51.42	185.423	-25.000	2298.194238

Min Elevation	2 Jul 2004 07:05:46.58	270.546	-74.155	647.454820
Max Elevation	2 Jul 2004 07:10:51.42	185.423	-25.000	2298.194350
Mean Elevation				-37.580
Min Range	2 Jul 2004 07:05:46.58	270.547	-74.155	647.454820
Max Range	2 Jul 2004 07:00:41.68	355.694	-25.000	2298.285129
Mean Range				1486.064197

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 08:36:37.45	346.634	-25.000	2297.392728
2 Jul 2004 08:37:37.00	343.464	-26.611	1901.826966
2 Jul 2004 08:38:37.00	338.327	-29.924	1520.096147
2 Jul 2004 08:39:37.00	328.977	-36.079	1174.296341
2 Jul 2004 08:40:37.00	309.047	-45.838	908.744236
2 Jul 2004 08:41:37.00	267.988	-52.287	808.469655
2 Jul 2004 08:42:37.00	228.893	-44.794	929.057452
2 Jul 2004 08:43:37.00	210.498	-35.312	1205.610599
2 Jul 2004 08:44:37.00	201.735	-29.498	1556.196807
2 Jul 2004 08:45:37.00	196.851	-26.393	1940.051999
2 Jul 2004 08:46:30.71	194.058	-25.000	2297.305200

Min Elevation	2 Jul 2004 08:41:34.06	270.349	-52.309	808.187098
Max Elevation	2 Jul 2004 08:46:30.71	194.058	-25.000	2297.305291
Mean Elevation				-34.249
Min Range	2 Jul 2004 08:41:34.07	270.349	-52.309	808.187098
Max Range	2 Jul 2004 08:36:37.45	346.634	-25.000	2297.392728
Mean Range				1503.549830

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 10:12:16.88	342.605	-25.000	2296.720045
2 Jul 2004 10:13:16.00	338.647	-26.550	1912.003175
2 Jul 2004 10:14:16.00	332.296	-29.652	1542.591543
2 Jul 2004 10:15:16.00	321.199	-35.065	1216.045569
2 Jul 2004 10:16:16.00	300.055	-42.523	978.363231
2 Jul 2004 10:17:16.00	264.968	-46.089	903.955069
2 Jul 2004 10:18:16.00	233.001	-40.512	1029.174102
2 Jul 2004 10:19:16.00	215.250	-33.358	1297.053145
2 Jul 2004 10:20:16.00	205.789	-28.630	1638.257268
2 Jul 2004 10:21:16.00	200.222	-26.010	2014.817962
2 Jul 2004 10:21:59.08	197.506	-25.000	2296.650256

Min Elevation	2 Jul 2004 10:17:07.99	270.055	-46.191	902.068503
Max Elevation	2 Jul 2004 10:21:59.08	197.506	-25.000	2296.650322
Mean Elevation				-32.581
Min Range	2 Jul 2004 10:17:07.99	270.054	-46.191	902.068503
Max Range	2 Jul 2004 10:12:16.88	342.605	-25.000	2296.720045
Mean Range				1556.875579

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 11:47:43.56	344.068	-25.000	2295.998853
2 Jul 2004 11:48:43.00	340.465	-26.589	1904.928421
2 Jul 2004 11:49:43.00	334.656	-29.808	1529.233252
2 Jul 2004 11:50:43.00	324.287	-35.600	1193.260151
2 Jul 2004 11:51:43.00	303.442	-44.121	942.689692
2 Jul 2004 11:52:43.00	265.579	-48.811	857.472791
2 Jul 2004 11:53:43.00	230.675	-42.363	982.001950
2 Jul 2004 11:54:43.00	212.624	-34.204	1254.943961
2 Jul 2004 11:55:43.00	203.470	-29.000	1601.341348
2 Jul 2004 11:56:43.00	198.215	-26.168	1981.989598

	2 Jul 2004 11:57:30.54	195.458	-25.000	2295.920961
Min Elevation	2 Jul 2004 11:52:37.06	269.767	-48.881	856.379929
Max Elevation	2 Jul 2004 11:57:30.54	195.458	-25.000	2295.920992
Mean Elevation			-33.333	
Min Range	2 Jul 2004 11:52:37.06	269.767	-48.881	856.379929
Max Range	2 Jul 2004 11:47:43.56	344.068	-25.000	2295.998853
Mean Range			1530.889180	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:23:09.98	351.161	-25.000	2295.222567
2 Jul 2004 13:24:09.00	349.242	-26.649	1894.379014
2 Jul 2004 13:25:09.00	346.051	-30.178	1499.015843
2 Jul 2004 13:26:09.00	339.965	-37.215	1131.352651
2 Jul 2004 13:27:09.00	324.757	-50.543	831.602299
2 Jul 2004 13:28:09.00	272.832	-64.321	695.977865
2 Jul 2004 13:29:09.00	216.508	-51.991	811.978448
2 Jul 2004 13:30:09.00	199.773	-38.056	1102.527897
2 Jul 2004 13:31:09.00	193.277	-30.605	1466.543943
2 Jul 2004 13:32:09.00	189.926	-26.860	1860.326617
2 Jul 2004 13:33:09.00	187.900	-25.075	2267.178808
2 Jul 2004 13:33:13.08	187.791	-25.000	2295.137412

Min Elevation	2 Jul 2004 13:28:11.53	269.485	-64.358	695.733110
Max Elevation	2 Jul 2004 13:33:13.08	187.791	-25.000	2295.137418
Mean Elevation			-35.958	
Min Range	2 Jul 2004 13:28:11.53	269.485	-64.358	695.733110
Max Range	2 Jul 2004 13:23:09.98	351.161	-25.000	2295.222567
Mean Range			1512.603614	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:58:56.63	3.192	-25.000	2294.378345
2 Jul 2004 14:59:56.00	4.116	-26.682	1888.447888
2 Jul 2004 15:00:56.00	5.650	-30.313	1488.217830
2 Jul 2004 15:01:56.00	8.634	-37.781	1111.544126
2 Jul 2004 15:02:56.00	16.795	-53.310	795.349401
2 Jul 2004 15:03:56.00	74.571	-76.603	639.109644
2 Jul 2004 15:04:56.00	158.504	-57.421	751.043304
2 Jul 2004 15:05:56.00	168.998	-39.816	1048.171207
2 Jul 2004 15:06:56.00	172.452	-31.297	1417.708016
2 Jul 2004 15:07:56.00	174.149	-27.160	1814.882194
2 Jul 2004 15:08:56.00	175.150	-25.199	2223.691523
2 Jul 2004 15:09:06.27	175.281	-25.000	2294.284500

Min Elevation	2 Jul 2004 15:04:01.41	89.249	-77.023	637.899058
Max Elevation	2 Jul 2004 14:58:56.63	3.192	-25.000	2294.378345
Mean Elevation			-37.965	
Min Range	2 Jul 2004 15:04:01.41	89.251	-77.023	637.899058
Max Range	2 Jul 2004 14:58:56.63	3.192	-25.000	2294.378345
Mean Range			1480.568998	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 16:35:34.04	19.432	-25.000	2294.269951
2 Jul 2004 16:36:34.00	24.012	-26.514	1916.852128
2 Jul 2004 16:37:34.00	31.130	-29.403	1563.508070
2 Jul 2004 16:38:34.00	43.057	-34.146	1257.280878
2 Jul 2004 16:39:34.00	63.870	-40.022	1042.313930
2 Jul 2004 16:40:34.00	94.634	-42.369	981.574423
2 Jul 2004 16:41:34.00	122.717	-38.095	1101.062402
2 Jul 2004 16:42:34.00	139.993	-32.325	1353.429852
2 Jul 2004 16:43:34.00	149.915	-28.240	1678.996909
2 Jul 2004 16:44:34.00	155.987	-25.877	2042.009647
2 Jul 2004 16:45:13.81	158.805	-25.000	2294.326668

Min Elevation	2 Jul 2004 16:40:23.83	89.133	-42.484	978.850286
Max Elevation	2 Jul 2004 16:45:13.81	158.805	-25.000	2294.326746
Mean Elevation			-31.545	
Min Range	2 Jul 2004 16:40:23.83	89.132	-42.484	978.850286
Max Range	2 Jul 2004 16:45:13.81	158.805	-25.000	2294.326746
Mean Range			1593.238623	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:13:18.49	38.036	-25.000	2294.808474
2 Jul 2004 18:14:18.00	45.846	-26.087	1997.520427
2 Jul 2004 18:15:18.00	56.582	-27.653	1748.703267
2 Jul 2004 18:16:18.00	70.765	-29.261	1576.498059

	2 Jul 2004 18:17:18.00	87.744	-30.062	1508.121967
	2 Jul 2004 18:18:18.00	104.974	-29.473	1557.531420
	2 Jul 2004 18:19:18.00	119.702	-27.934	1714.331885
	2 Jul 2004 18:20:18.00	130.969	-26.320	1952.225291
	2 Jul 2004 18:21:18.00	139.235	-25.137	2244.731333
	2 Jul 2004 18:21:27.54	140.326	-25.000	2294.849855
Min Elevation	2 Jul 2004 18:17:22.92	89.191	-30.067	1507.718385
Max Elevation	2 Jul 2004 18:13:18.49	38.036	-25.000	2294.808474
Mean Elevation			-27.193	
Min Range	2 Jul 2004 18:17:22.96	89.202	-30.067	1507.718410
Max Range	2 Jul 2004 18:21:27.54	140.326	-25.000	2294.849933
Mean Range			1888.932198	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 19:52:17.43	59.290	-25.000	2295.716165
2 Jul 2004 19:53:17.00	69.305	-25.541	2124.407556
2 Jul 2004 19:54:17.00	80.934	-25.962	2024.441229
2 Jul 2004 19:55:17.00	93.328	-26.037	2008.564939
2 Jul 2004 19:56:17.00	105.349	-25.723	2078.723953
2 Jul 2004 19:57:17.00	116.041	-25.194	2226.492928
2 Jul 2004 19:57:38.55	119.458	-25.000	2295.767290

Min Elevation	2 Jul 2004 19:54:57.95	89.376	-26.058	2004.153287
Max Elevation	2 Jul 2004 19:52:17.43	59.290	-25.000	2295.716165
Mean Elevation			-25.494	
Min Range	2 Jul 2004 19:54:57.92	89.370	-26.058	2004.153294
Max Range	2 Jul 2004 19:57:38.55	119.458	-25.000	2295.767392
Mean Range			2150.587723	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 02:25:05.92	50.982	-25.000	2296.830293
3 Jul 2004 02:26:05.00	60.061	-25.784	2064.938171
3 Jul 2004 02:27:05.00	71.554	-26.661	1893.276219
3 Jul 2004 02:28:05.00	84.984	-27.237	1805.143156
3 Jul 2004 02:29:05.00	99.115	-27.180	1813.211040
3 Jul 2004 02:30:05.00	112.298	-26.525	1916.305540
3 Jul 2004 02:31:05.00	123.432	-25.638	2100.167404
3 Jul 2004 02:31:54.05	130.834	-25.000	2296.836158

Min Elevation	3 Jul 2004 02:28:30.07	90.901	-27.299	1796.525263
Max Elevation	3 Jul 2004 02:25:05.92	50.982	-25.000	2296.830293
Mean Elevation			-26.128	
Min Range	3 Jul 2004 02:28:30.09	90.904	-27.299	1796.525266
Max Range	3 Jul 2004 02:31:54.05	130.834	-25.000	2296.836260
Mean Range			2023.338498	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:01:06.38	27.549	-25.000	2296.879532
3 Jul 2004 04:02:06.00	33.292	-26.375	1943.229695
3 Jul 2004 04:03:06.00	41.925	-28.812	1619.962236
3 Jul 2004 04:04:06.00	55.275	-32.311	1354.914126
3 Jul 2004 04:05:06.00	75.267	-35.704	1189.211950
3 Jul 2004 04:06:06.00	99.934	-36.267	1166.864153
3 Jul 2004 04:07:06.00	121.782	-33.390	1295.482757
3 Jul 2004 04:08:06.00	136.901	-29.716	1537.277408
3 Jul 2004 04:09:06.00	146.669	-26.947	1847.631762
3 Jul 2004 04:10:06.00	153.128	-25.290	2196.731249
3 Jul 2004 04:10:22.47	154.513	-25.000	2296.880074

Min Elevation	3 Jul 2004 04:05:44.55	91.016	-36.532	1156.704753
Max Elevation	3 Jul 2004 04:01:06.38	27.549	-25.000	2296.879532
Mean Elevation			-29.528	
Min Range	3 Jul 2004 04:05:44.55	91.016	-36.532	1156.704753
Max Range	3 Jul 2004 04:10:22.47	154.513	-25.000	2296.880121
Mean Range			1704.096813	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 05:37:07.57	7.710	-25.000	2296.755347
3 Jul 2004 05:38:07.00	9.270	-26.660	1893.382597
3 Jul 2004 05:39:07.00	11.854	-30.208	1497.199917
3 Jul 2004 05:40:07.00	16.816	-37.360	1126.538117
3 Jul 2004 05:41:07.00	29.594	-51.437	819.520640
3 Jul 2004 05:42:07.00	83.182	-68.413	672.203913
3 Jul 2004 05:43:07.00	148.231	-54.518	781.587028
3 Jul 2004 05:44:07.00	163.802	-39.043	1071.500099

	3 Jul 2004 05:45:07.00	169.439	-31.043	1435.750752
	3 Jul 2004 05:46:07.00	172.282	-27.068	1829.450863
	3 Jul 2004 05:47:07.00	173.983	-25.168	2235.901859
	3 Jul 2004 05:47:15.89	174.178	-25.000	2296.725328
Min Elevation	3 Jul 2004 05:42:11.81	90.927	-68.589	671.295687
Max Elevation	3 Jul 2004 05:37:07.57	7.710	-25.000	2296.755347
Mean Elevation			-36.743	
Min Range	3 Jul 2004 05:42:11.82	90.928	-68.589	671.295687
Max Range	3 Jul 2004 05:37:07.57	7.710	-25.000	2296.755347
Mean Range			1496.376372	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:12:57.66	351.921	-25.000	2296.438047
3 Jul 2004 07:13:57.00	349.877	-26.659	1893.259990
3 Jul 2004 07:14:57.00	346.502	-30.194	1498.176232
3 Jul 2004 07:15:57.00	340.074	-37.216	1131.579463
3 Jul 2004 07:16:57.00	324.142	-50.349	834.543387
3 Jul 2004 07:17:57.00	272.556	-63.216	703.610836
3 Jul 2004 07:18:57.00	218.558	-51.182	822.919737
3 Jul 2004 07:19:57.00	201.719	-37.707	1114.493699
3 Jul 2004 07:20:57.00	195.047	-30.443	1478.971153
3 Jul 2004 07:21:57.00	191.581	-26.782	1873.210291
3 Jul 2004 07:22:57.00	189.482	-25.041	2280.589873
3 Jul 2004 07:22:59.31	189.418	-25.000	2296.400405
Min Elevation	3 Jul 2004 07:17:58.51	270.657	-63.228	703.524647
Max Elevation	3 Jul 2004 07:12:57.66	351.921	-25.000	2296.438047
Mean Elevation			-35.732	
Min Range	3 Jul 2004 07:17:58.51	270.657	-63.228	703.524647
Max Range	3 Jul 2004 07:12:57.66	351.921	-25.000	2296.438047
Mean Range			1518.682759	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 08:48:40.08	342.744	-25.000	2295.829899
3 Jul 2004 08:49:40.00	338.696	-26.580	1906.366177
3 Jul 2004 08:50:40.00	332.268	-29.705	1537.815828
3 Jul 2004 08:51:40.00	321.032	-35.136	1212.765268
3 Jul 2004 08:52:40.00	299.674	-42.545	977.685713
3 Jul 2004 08:53:40.00	264.593	-45.927	906.817484
3 Jul 2004 08:54:40.00	232.975	-40.303	1034.759355
3 Jul 2004 08:55:40.00	215.417	-33.224	1303.850266
3 Jul 2004 08:56:40.00	206.026	-28.557	1645.446792
3 Jul 2004 08:57:40.00	200.485	-25.973	2022.073440
3 Jul 2004 08:58:21.85	197.844	-25.000	2295.750987
Min Elevation	3 Jul 2004 08:53:30.98	270.289	-46.055	904.431403
Max Elevation	3 Jul 2004 08:58:21.85	197.844	-25.000	2295.751069
Mean Elevation			-32.541	
Min Range	3 Jul 2004 08:53:30.98	270.289	-46.055	904.431403
Max Range	3 Jul 2004 08:48:40.08	342.744	-25.000	2295.829899
Mean Range			1558.105564	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 10:24:13.24	339.217	-25.000	2294.881365
3 Jul 2004 10:25:13.00	334.485	-26.527	1914.996473
3 Jul 2004 10:26:13.00	327.073	-29.452	1559.346957
3 Jul 2004 10:27:13.00	314.614	-34.221	1253.860937
3 Jul 2004 10:28:13.00	293.011	-39.917	1045.380781
3 Jul 2004 10:29:13.00	262.076	-41.704	997.833371
3 Jul 2004 10:30:13.00	234.903	-37.197	1131.904032
3 Jul 2004 10:31:13.00	218.358	-31.635	1395.798337
3 Jul 2004 10:32:13.00	208.795	-27.801	1730.311763
3 Jul 2004 10:33:13.00	202.895	-25.630	2100.929996
3 Jul 2004 10:33:43.13	200.747	-25.000	2294.813357
Min Elevation	3 Jul 2004 10:28:58.23	269.983	-41.940	992.002992
Max Elevation	3 Jul 2004 10:33:43.13	200.747	-25.000	2294.813387
Mean Elevation			-31.280	
Min Range	3 Jul 2004 10:28:58.23	269.983	-41.940	992.002992
Max Range	3 Jul 2004 10:24:13.24	339.217	-25.000	2294.881365
Mean Range			1610.914306	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 11:59:31.05	343.033	-25.000	2294.563334
3 Jul 2004 11:59:50.30	341.968	-25.383	2167.205967

	3 Jul 2004 12:00:00.00	341.377	-25.619	2103.494850
Min Elevation	3 Jul 2004 12:00:00.00	341.377	-25.619	2103.494747
Max Elevation	3 Jul 2004 11:59:31.05	343.033	-25.000	2294.563334
Mean Elevation			-25.334	
Min Range	3 Jul 2004 12:00:00.00	341.377	-25.619	2103.494747
Max Range	3 Jul 2004 11:59:31.05	343.033	-25.000	2294.563334
Mean Range			2188.421384	

Global Statistics

Min Elevation	1 Jul 2004 14:52:21.53	89.237	-87.354	620.895524
Max Elevation	1 Jul 2004 14:47:16.75	0.020	-25.000	2296.089318
Mean Elevation			-32.532	
Min Range	1 Jul 2004 14:52:21.53	89.239	-87.354	620.895524
Max Range	2 Jul 2004 03:48:10.87	23.202	-25.000	2300.342947
Mean Range			1652.135897	

E.3.2 Direction Finding sensor pointing +90 degrees

11 Mar 2003 12:23:36

Satellite-NSAT-1-Sensor-ESM90-To-Ship-Destroyer, Ship-Frigate, Ship-Nansen: Inview Azimuth, Elevation, & Range

ESM90-To-Destroyer

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 16:27:19.27	84.298	-26.941	1844.078049
1 Jul 2004 16:27:45.60	90.343	-26.973	1839.274580
1 Jul 2004 16:27:59.17	93.455	-26.942	1844.023715

Min Elevation	1 Jul 2004 16:27:39.28	88.890	-26.977	1838.739738
Max Elevation	1 Jul 2004 16:27:19.27	84.298	-26.941	1844.078049
Mean Elevation			-26.952	
Min Range	1 Jul 2004 16:27:39.27	88.889	-26.977	1838.739737
Max Range	1 Jul 2004 16:27:19.27	84.298	-26.941	1844.078049
Mean Range			1842.458781	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 00:39:24.09	86.267	-26.919	1851.225996
2 Jul 2004 00:39:50.50	92.328	-26.950	1846.569189
2 Jul 2004 00:40:03.84	95.387	-26.919	1851.323015

Min Elevation	2 Jul 2004 00:39:43.88	90.807	-26.954	1845.981043
Max Elevation	2 Jul 2004 00:40:03.84	95.387	-26.919	1851.322993
Mean Elevation			-26.929	
Min Range	2 Jul 2004 00:39:43.88	90.806	-26.954	1845.981043
Max Range	2 Jul 2004 00:40:03.84	95.387	-26.919	1851.322993
Mean Range			1849.706067	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:16:36.56	86.419	-33.290	1300.610379
2 Jul 2004 02:16:52.70	92.189	-33.342	1297.910163
2 Jul 2004 02:17:01.61	95.371	-33.286	1300.812119

Min Elevation	2 Jul 2004 02:16:48.88	90.823	-33.347	1297.623208
Max Elevation	2 Jul 2004 02:17:01.61	95.371	-33.286	1300.812082
Mean Elevation			-33.306	
Min Range	2 Jul 2004 02:16:48.88	90.822	-33.347	1297.623208
Max Range	2 Jul 2004 02:17:01.61	95.371	-33.286	1300.812082
Mean Range			1299.777554	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 15:04:07.53	84.812	-33.376	1296.681421
2 Jul 2004 15:04:23.29	90.471	-33.427	1294.035334
2 Jul 2004 15:04:31.97	93.584	-33.374	1296.766746

Min Elevation	2 Jul 2004 15:04:19.66	89.167	-33.432	1293.775061
Max Elevation	2 Jul 2004 15:04:31.97	93.584	-33.374	1296.766727
Mean Elevation			-33.392	
Min Range	2 Jul 2004 15:04:19.66	89.167	-33.432	1293.775061
Max Range	2 Jul 2004 15:04:31.97	93.584	-33.374	1296.766727
Mean Range			1295.827834	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 16:41:06.25	84.722	-26.905	1854.429993
	2 Jul 2004 16:41:32.49	90.730	-26.934	1849.940519
	2 Jul 2004 16:41:45.99	93.815	-26.903	1854.794845
Min Elevation	2 Jul 2004 16:41:25.77	89.189	-26.938	1849.337116
Max Elevation	2 Jul 2004 16:41:45.99	93.815	-26.903	1854.794781
Mean Elevation			-26.914	
Min Range	2 Jul 2004 16:41:25.78	89.190	-26.938	1849.337116
Max Range	2 Jul 2004 16:41:45.99	93.815	-26.903	1854.794781
Mean Range				1853.055119

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 00:52:27.53	86.239	-27.214	1805.383211
	3 Jul 2004 00:52:54.22	92.529	-27.249	1800.463274
	3 Jul 2004 00:53:08.36	95.858	-27.211	1805.752524
Min Elevation	3 Jul 2004 00:52:47.61	90.970	-27.253	1799.866527
Max Elevation	3 Jul 2004 00:53:08.36	95.858	-27.211	1805.752476
Mean Elevation			-27.224	
Min Range	3 Jul 2004 00:52:47.62	90.971	-27.253	1799.866527
Max Range	3 Jul 2004 00:53:08.36	95.858	-27.211	1805.752476
Mean Range				1803.866336

Global Statistics

Min Elevation	2 Jul 2004 15:04:19.66	89.167	-33.432	1293.775061
Max Elevation	2 Jul 2004 16:41:45.99	93.815	-26.903	1854.794781
Mean Elevation			-29.120	
Min Range	2 Jul 2004 15:04:19.66	89.167	-33.432	1293.775061
Max Range	2 Jul 2004 16:41:45.99	93.815	-26.903	1854.794781
Mean Range				1657.448615

ESM90-To-Frigate

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 16:26:13.87	82.963	-28.842	1610.989138
	1 Jul 2004 16:26:40.85	90.285	-28.909	1604.451684
	1 Jul 2004 16:26:55.64	94.294	-28.847	1610.484017
Min Elevation	1 Jul 2004 16:26:35.15	88.733	-28.915	1603.944709
Max Elevation	1 Jul 2004 16:26:13.87	82.963	-28.842	1610.989138
Mean Elevation			-28.866	
Min Range	1 Jul 2004 16:26:35.15	88.733	-28.915	1603.944709
Max Range	1 Jul 2004 16:26:13.87	82.963	-28.842	1610.989138
Mean Range				1608.641613

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 02:17:13.09	85.820	-27.867	1720.309421
	2 Jul 2004 02:17:40.89	92.802	-27.915	1714.637280
	2 Jul 2004 02:17:54.93	96.321	-27.867	1720.326002
Min Elevation	2 Jul 2004 02:17:34.00	91.068	-27.921	1713.944302
Max Elevation	2 Jul 2004 02:17:54.93	96.321	-27.867	1720.325993
Mean Elevation			-27.883	
Min Range	2 Jul 2004 02:17:34.00	91.067	-27.921	1713.944302
Max Range	2 Jul 2004 02:17:54.93	96.321	-27.867	1720.325993
Mean Range				1718.424234

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 16:40:09.85	84.162	-27.309	1793.320799
	2 Jul 2004 16:40:36.32	90.474	-27.346	1788.271591
	2 Jul 2004 16:40:50.83	93.929	-27.306	1793.753229
Min Elevation	2 Jul 2004 16:40:29.96	88.955	-27.350	1787.709633
Max Elevation	2 Jul 2004 16:40:50.83	93.929	-27.306	1793.753159
Mean Elevation			-27.320	
Min Range	2 Jul 2004 16:40:29.96	88.956	-27.350	1787.709633
Max Range	2 Jul 2004 16:40:50.83	93.929	-27.306	1793.753159
Mean Range				1791.781873

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)

	3 Jul 2004 00:53:00.48	87.991	-25.821	2048.663539
	3 Jul 2004 00:53:20.86	92.118	-25.832	2046.305809
	3 Jul 2004 00:53:31.78	94.326	-25.819	2049.098333
Min Elevation	3 Jul 2004 00:53:15.54	91.039	-25.833	2045.969472
Max Elevation	3 Jul 2004 00:53:31.78	94.326	-25.819	2049.098241
Mean Elevation			-25.824	
Min Range	3 Jul 2004 00:53:15.54	91.040	-25.833	2045.969472
Max Range	3 Jul 2004 00:53:31.78	94.326	-25.819	2049.098241
Mean Range			2048.022561	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 02:30:33.10	87.215	-33.624	1280.212425
3 Jul 2004 02:30:48.04	92.650	-33.666	1278.097635
3 Jul 2004 02:30:55.65	95.418	-33.619	1280.436916

Min Elevation	3 Jul 2004 02:30:44.13	91.225	-33.672	1277.793116
Max Elevation	3 Jul 2004 02:30:55.65	95.418	-33.619	1280.436880
Mean Elevation			-33.636	
Min Range	3 Jul 2004 02:30:44.13	91.226	-33.672	1277.793116
Max Range	3 Jul 2004 02:30:55.65	95.418	-33.619	1280.436880
Mean Range			1279.582325	

Global Statistics

Min Elevation	3 Jul 2004 02:30:44.13	91.225	-33.672	1277.793116
Max Elevation	3 Jul 2004 00:53:31.78	94.326	-25.819	2049.098241
Mean Elevation			-28.706	
Min Range	3 Jul 2004 02:30:44.13	91.226	-33.672	1277.793116
Max Range	3 Jul 2004 00:53:31.78	94.326	-25.819	2049.098241
Mean Range			1689.290521	

ESM90-To-Nansen

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 18:05:01.83	83.374	-29.025	1598.660478
1 Jul 2004 18:05:28.85	90.778	-29.087	1592.768214
1 Jul 2004 18:05:43.61	94.811	-29.019	1599.212892

Min Elevation	1 Jul 2004 18:05:22.30	88.979	-29.095	1592.093120
Max Elevation	1 Jul 2004 18:05:43.61	94.811	-29.019	1599.212825
Mean Elevation			-29.044	
Min Range	1 Jul 2004 18:05:22.30	88.978	-29.095	1592.093120
Max Range	1 Jul 2004 18:05:43.61	94.811	-29.019	1599.212825
Mean Range			1596.880528	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 19:43:03.12	86.883	-25.480	2141.216884
1 Jul 2004 19:43:20.19	90.154	-25.487	2139.505696
1 Jul 2004 19:43:28.90	91.822	-25.481	2141.154297

Min Elevation	1 Jul 2004 19:43:16.12	89.375	-25.487	2139.319321
Max Elevation	1 Jul 2004 19:43:03.12	86.883	-25.480	2141.216884
Mean Elevation			-25.482	
Min Range	1 Jul 2004 19:43:16.12	89.374	-25.487	2139.319321
Max Range	1 Jul 2004 19:43:03.12	86.883	-25.480	2141.216884
Mean Range			2140.625626	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 00:38:20.05	87.464	-25.774	2068.494460
2 Jul 2004 00:38:40.56	91.572	-25.786	2065.706206
2 Jul 2004 00:38:50.90	93.642	-25.776	2068.049137

Min Elevation	2 Jul 2004 00:38:36.09	90.676	-25.787	2065.470930
Max Elevation	2 Jul 2004 00:38:20.05	87.464	-25.774	2068.494460
Mean Elevation			-25.779	
Min Range	2 Jul 2004 00:38:36.09	90.676	-25.787	2065.470930
Max Range	2 Jul 2004 00:38:20.05	87.464	-25.774	2068.494460
Mean Range			2067.416601	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:15:44.61	84.902	-29.515	1555.526628
2 Jul 2004 02:16:11.30	92.488	-29.589	1549.050656
2 Jul 2004 02:16:25.56	96.533	-29.520	1555.068321

Min Elevation	2 Jul 2004 02:16:05.43	90.814	-29.596	1548.489773
Max Elevation	2 Jul 2004 02:15:44.61	84.902	-29.515	1555.526628
Mean Elevation			-29.541	
Min Range	2 Jul 2004 02:16:05.43	90.814	-29.596	1548.489773
Max Range	2 Jul 2004 02:15:44.61	84.902	-29.515	1555.526628
Mean Range			1553.215202	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 18:17:02.51	83.208	-29.981	1514.655599
2 Jul 2004 18:17:28.62	90.867	-30.060	1508.260699
2 Jul 2004 18:17:42.44	94.914	-29.988	1514.065787

Min Elevation	2 Jul 2004 18:17:22.92	89.190	-30.067	1507.718385
Max Elevation	2 Jul 2004 18:17:02.51	83.208	-29.981	1514.655599
Mean Elevation			-30.009	
Min Range	2 Jul 2004 18:17:22.92	89.190	-30.067	1507.718385
Max Range	2 Jul 2004 18:17:02.51	83.208	-29.981	1514.655599
Mean Range			1512.327362	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 19:54:40.31	85.718	-26.040	2007.930250
2 Jul 2004 19:55:02.68	90.360	-26.057	2004.426033
2 Jul 2004 19:55:14.34	92.777	-26.042	2007.418335

Min Elevation	2 Jul 2004 19:54:57.95	89.376	-26.058	2004.153287
Max Elevation	2 Jul 2004 19:54:40.31	85.718	-26.040	2007.930250
Mean Elevation			-26.046	
Min Range	2 Jul 2004 19:54:57.94	89.376	-26.058	2004.153287
Max Range	2 Jul 2004 19:54:40.31	85.718	-26.040	2007.930250
Mean Range			2006.591539	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 02:28:09.07	85.939	-27.255	1802.577138
3 Jul 2004 02:28:36.35	92.387	-27.295	1797.066220
3 Jul 2004 02:28:50.09	95.632	-27.259	1802.024749

Min Elevation	3 Jul 2004 02:28:30.07	90.900	-27.299	1796.525263
Max Elevation	3 Jul 2004 02:28:09.07	85.939	-27.255	1802.577138
Mean Elevation			-27.270	
Min Range	3 Jul 2004 02:28:30.07	90.900	-27.299	1796.525263
Max Range	3 Jul 2004 02:28:09.07	85.939	-27.255	1802.577138
Mean Range			1800.556036	

Global Statistics

Min Elevation	2 Jul 2004 18:17:22.92	89.190	-30.067	1507.718385
Max Elevation	1 Jul 2004 19:43:03.12	86.883	-25.480	2141.216884
Mean Elevation			-27.596	
Min Range	2 Jul 2004 18:17:22.92	89.190	-30.067	1507.718385
Max Range	1 Jul 2004 19:43:03.12	86.883	-25.480	2141.216884
Mean Range			1811.087556	

E.3.3 Direction Finding sensor pointing -90 degrees

11 Mar 2003 12:24:57

Satellite-NSAT-1-Sensor-ESM-90-To-Ship-Destroyer, Ship-Frigate, Ship-Nansen: Inview Azimuth, Elevation, & Range

ESM-90-To-Destroyer

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 07:17:23.22	275.976	-31.462	1403.696529
3 Jul 2004 07:17:45.20	268.714	-31.533	1399.105934
3 Jul 2004 07:17:56.51	264.983	-31.459	1403.868708

Min Elevation	3 Jul 2004 07:17:39.73	270.524	-31.541	1398.539124
Max Elevation	3 Jul 2004 07:17:56.51	264.983	-31.459	1403.868690
Mean Elevation			-31.485	
Min Range	3 Jul 2004 07:17:39.73	270.524	-31.541	1398.539124
Max Range	3 Jul 2004 07:17:56.51	264.983	-31.459	1403.868690
Mean Range			1402.223724	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 08:52:08.89	275.504	-28.875	1608.354684
	3 Jul 2004 08:52:34.30	268.396	-28.933	1602.735585
	3 Jul 2004 08:52:48.34	264.478	-28.871	1608.762178
Min Elevation	3 Jul 2004 08:52:28.30	270.078	-28.940	1602.140322
Max Elevation	3 Jul 2004 08:52:48.34	264.478	-28.871	1608.762129
Mean Elevation			-28.893	
Min Range	3 Jul 2004 08:52:28.30	270.078	-28.940	1602.140322
Max Range	3 Jul 2004 08:52:48.34	264.478	-28.871	1608.762129
Mean Range			1606.617483	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 10:26:52.10	275.175	-30.129	1498.240804
	3 Jul 2004 10:27:16.93	267.600	-30.196	1493.041092
	3 Jul 2004 10:27:29.51	263.775	-30.123	1498.752357
Min Elevation	3 Jul 2004 10:27:10.42	269.591	-30.205	1492.286232
Max Elevation	3 Jul 2004 10:27:29.51	263.775	-30.123	1498.752292
Mean Elevation			-30.149	
Min Range	3 Jul 2004 10:27:10.42	269.591	-30.205	1492.286232
Max Range	3 Jul 2004 10:27:29.51	263.775	-30.123	1498.752292
Mean Range			1496.678084	

Global Statistics

Min Elevation	3 Jul 2004 07:17:39.73	270.524	-31.541	1398.539124
Max Elevation	3 Jul 2004 08:52:48.34	264.478	-28.871	1608.762129
Mean Elevation			-30.176	
Min Range	3 Jul 2004 07:17:39.73	270.524	-31.541	1398.539124
Max Range	3 Jul 2004 08:52:48.34	264.478	-28.871	1608.762129
Mean Range			1501.839764	

ESM-90-To-Frigate

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 07:18:07.63	276.368	-30.056	1503.272776
	3 Jul 2004 07:18:32.06	268.953	-30.125	1497.827849
	3 Jul 2004 07:18:45.22	264.969	-30.051	1503.627080
Min Elevation	3 Jul 2004 07:18:26.15	270.749	-30.132	1497.211447
Max Elevation	3 Jul 2004 07:18:45.22	264.969	-30.051	1503.627039
Mean Elevation			-30.077	
Min Range	3 Jul 2004 07:18:26.16	270.749	-30.132	1497.211447
Max Range	3 Jul 2004 07:18:45.22	264.969	-30.051	1503.627039
Mean Range			1501.575902	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 08:52:35.66	274.465	-26.881	1847.701713
	3 Jul 2004 08:52:59.52	268.794	-26.908	1843.628518
	3 Jul 2004 08:53:12.44	265.727	-26.878	1848.235943
Min Elevation	3 Jul 2004 08:52:53.54	270.217	-26.911	1843.115639
Max Elevation	3 Jul 2004 08:53:12.44	265.727	-26.878	1848.235851
Mean Elevation			-26.889	
Min Range	3 Jul 2004 08:52:53.54	270.216	-26.911	1843.115639
Max Range	3 Jul 2004 08:53:12.44	265.727	-26.878	1848.235851
Mean Range			1846.522058	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 10:26:57.65	274.270	-27.370	1776.783042
	3 Jul 2004 10:27:22.61	268.068	-27.405	1772.103766
	3 Jul 2004 10:27:36.06	264.731	-27.367	1777.274294
Min Elevation	3 Jul 2004 10:27:16.42	269.607	-27.410	1771.533292
Max Elevation	3 Jul 2004 10:27:36.06	264.731	-27.367	1777.274222
Mean Elevation			-27.381	
Min Range	3 Jul 2004 10:27:16.43	269.607	-27.410	1771.533292
Max Range	3 Jul 2004 10:27:36.06	264.731	-27.367	1777.274222
Mean Range			1775.387034	

Global Statistics

Min Elevation	3 Jul 2004 07:18:26.15	270.749	-30.132	1497.211447

Max Elevation	3 Jul 2004 08:53:12.44	265.727	-26.878	1848.235851
Mean Elevation			-28.116	
Min Range	3 Jul 2004 07:18:26.16	270.749	-30.132	1497.211447
Max Range	3 Jul 2004 08:53:12.44	265.727	-26.878	1848.235851
Mean Range			1707.828331	

ESM-90-To-Nansen

No Access Found

F SIMULATION RESULTS FOR THE SCENARIO IV

F.1 Access report

F.1.1 Direction Finding sensor in dwelling mode

11 Mar 2003 12:29:23
Satellite-NSAT-1-Sensor-ESM-To-Target-Pt1, Target-Pt2, Target-Pt3: Access Summary Report

ESM-To-Pt1

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:00:46.59	1 Jul 2004 13:04:14.63	208.040
2	1 Jul 2004 14:33:12.37	1 Jul 2004 14:42:23.82	551.448
3	2 Jul 2004 02:26:07.79	2 Jul 2004 02:35:26.51	558.722
4	2 Jul 2004 04:05:14.79	2 Jul 2004 04:06:48.07	93.282
5	2 Jul 2004 13:11:27.14	2 Jul 2004 13:17:19.49	352.351
6	2 Jul 2004 14:45:27.79	2 Jul 2004 14:54:09.90	522.115
7	3 Jul 2004 02:38:02.50	3 Jul 2004 02:47:30.93	568.426

Global Statistics

Min Duration	4	2 Jul 2004 04:05:14.79	2 Jul 2004 04:06:48.07	93.282
Max Duration	7	3 Jul 2004 02:38:02.50	3 Jul 2004 02:47:30.93	568.426
Mean Duration				407.769
Total Duration				2854.384

ESM-To-Pt2

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 12:59:14.07	1 Jul 2004 13:05:51.13	397.066
2	1 Jul 2004 14:33:47.17	1 Jul 2004 14:42:15.78	508.603
3	2 Jul 2004 02:25:29.59	2 Jul 2004 02:34:59.36	569.762
4	2 Jul 2004 13:10:33.54	2 Jul 2004 13:18:20.27	466.727
5	2 Jul 2004 14:46:16.29	2 Jul 2004 14:53:50.88	454.584
6	3 Jul 2004 02:37:30.75	3 Jul 2004 02:46:55.31	564.560

Global Statistics

Min Duration	1	1 Jul 2004 12:59:14.07	1 Jul 2004 13:05:51.13	397.066
Max Duration	3	2 Jul 2004 02:25:29.59	2 Jul 2004 02:34:59.36	569.762
Mean Duration				493.550
Total Duration				2961.303

ESM-To-Pt3

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:02:17.70	1 Jul 2004 13:05:25.33	187.626
2	1 Jul 2004 14:34:23.13	1 Jul 2004 14:43:46.85	563.722
3	2 Jul 2004 02:25:13.00	2 Jul 2004 02:34:10.26	537.257
4	2 Jul 2004 04:02:06.81	2 Jul 2004 04:08:04.82	358.010
5	2 Jul 2004 13:12:54.69	2 Jul 2004 13:18:32.02	337.337
6	2 Jul 2004 14:46:34.24	2 Jul 2004 14:55:37.32	543.079
7	3 Jul 2004 02:37:02.31	3 Jul 2004 02:46:22.92	560.613
8	3 Jul 2004 04:15:03.90	3 Jul 2004 04:18:51.95	228.057

Global Statistics

Min Duration	1	1 Jul 2004 13:02:17.70	1 Jul 2004 13:05:25.33	187.626
Max Duration	2	1 Jul 2004 14:34:23.13	1 Jul 2004 14:43:46.85	563.722
Mean Duration				414.463
Total Duration				3315.702

F.1.2 Direction Finding sensor pointing +90 degrees

25 Mar 2003 10:26:46
Satellite-NSAT-1-Sensor-ESM90-To-Target-Pt1, Target-Pt2, Target-Pt3: Access Summary Report

ESM90-To-Pt1

No Access Found

ESM90-To-Pt2

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	2 Jul 2004 14:49:45.28	2 Jul 2004 14:50:21.34	36.067

ESM90-To-Pt3

No Access Found

F.1.3 Direction Finding sensor pointing -90 degrees

25 Mar 2003 10:25:05
Satellite-NSAT-1-Sensor-ESM-90-To-Target-Pt1, Target-Pt2, Target-Pt3: Access Summary Report

ESM-90-To-Pt1

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:02:19.01	1 Jul 2004 13:02:42.37	23.355
2	2 Jul 2004 04:05:56.12	2 Jul 2004 04:06:06.66	10.540
3	2 Jul 2004 13:14:05.01	2 Jul 2004 13:14:41.91	36.905

Global Statistics

Min Duration	2	2 Jul 2004 04:05:56.12	2 Jul 2004 04:06:06.66	10.540
Max Duration	3	2 Jul 2004 13:14:05.01	2 Jul 2004 13:14:41.91	36.905
Mean Duration				23.600
Total Duration				70.801

ESM-90-To-Pt2

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:02:13.44	1 Jul 2004 13:02:52.07	38.628
2	2 Jul 2004 13:14:11.60	2 Jul 2004 13:14:42.54	30.942

Global Statistics

Min Duration	2	2 Jul 2004 13:14:11.60	2 Jul 2004 13:14:42.54	30.942
Max Duration	1	1 Jul 2004 13:02:13.44	1 Jul 2004 13:02:52.07	38.628
Mean Duration				34.785
Total Duration				69.570

ESM-90-To-Pt3

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:03:41.09	1 Jul 2004 13:04:02.06	20.966
2	2 Jul 2004 04:04:47.10	2 Jul 2004 04:05:24.26	37.155
3	2 Jul 2004 13:15:25.60	2 Jul 2004 13:16:01.36	35.755
4	3 Jul 2004 04:16:45.17	3 Jul 2004 04:17:10.52	25.356

Global Statistics

Min Duration	1	1 Jul 2004 13:03:41.09	1 Jul 2004 13:04:02.06	20.966
Max Duration	2	2 Jul 2004 04:04:47.10	2 Jul 2004 04:05:24.26	37.155
Mean Duration				29.808
Total Duration				119.232

F.2 AER report

F.2.1 Direction Finding sensor in dwelling mode

11 Mar 2003 12:29:48

Satellite-NSAT-1-Sensor-ESM-To-Target-Pt1, Target-Pt2, Target-Pt3: Inview Azimuth, Elevation, & Range

ESM-To-Pt1

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 13:00:46.59	287.748	-25.000	2152.229244
	1 Jul 2004 13:01:46.00	276.113	-25.413	2043.082873
	1 Jul 2004 13:02:46.00	263.474	-25.510	2020.597537
	1 Jul 2004 13:03:46.00	251.140	-25.226	2089.369585
	1 Jul 2004 13:04:14.63	245.686	-25.000	2152.229243
Min Elevation	1 Jul 2004 13:02:30.67	266.725	-25.524	2017.573028
Max Elevation	1 Jul 2004 13:04:14.63	245.686	-25.000	2152.229243
Mean Elevation			-25.230	
Min Range	1 Jul 2004 13:02:30.63	266.732	-25.524	2017.573045
Max Range	1 Jul 2004 13:00:46.59	287.748	-25.000	2152.229244
Mean Range			2091.501697	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 14:33:12.37	11.642	-25.000	2152.229245
	1 Jul 2004 14:34:12.00	15.471	-27.015	1760.980886
	1 Jul 2004 14:35:12.00	21.870	-31.021	1389.249862
	1 Jul 2004 14:36:12.00	34.049	-38.222	1065.043405
	1 Jul 2004 14:37:12.00	60.519	-47.975	846.797566
	1 Jul 2004 14:38:12.00	104.718	-49.442	824.450494
	1 Jul 2004 14:39:12.00	135.367	-40.078	1010.979699
	1 Jul 2004 14:40:12.00	149.423	-32.156	1319.964271
	1 Jul 2004 14:41:12.00	156.567	-27.623	1684.313564
	1 Jul 2004 14:42:12.00	160.743	-25.287	2073.835619
	1 Jul 2004 14:42:23.82	161.363	-25.000	2152.229232
Min Elevation	1 Jul 2004 14:37:47.89	86.555	-50.784	805.632686
Max Elevation	1 Jul 2004 14:33:12.37	11.642	-25.000	2152.229245
Mean Elevation			-33.529	
Min Range	1 Jul 2004 14:37:47.89	86.555	-50.784	805.632686
Max Range	1 Jul 2004 14:33:12.37	11.642	-25.000	2152.229245
Mean Range			1480.006713	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 02:26:07.79	15.161	-25.000	2152.229250
	2 Jul 2004 02:27:07.00	18.069	-27.041	1757.401063
	2 Jul 2004 02:28:07.00	23.061	-31.242	1374.972599
	2 Jul 2004 02:29:07.00	33.012	-39.294	1032.846076
	2 Jul 2004 02:30:07.00	58.073	-52.140	788.039226
	2 Jul 2004 02:31:07.00	112.553	-55.942	745.316228
	2 Jul 2004 02:32:07.00	147.938	-43.306	933.183688
	2 Jul 2004 02:33:07.00	161.257	-33.456	1251.377013
	2 Jul 2004 02:34:07.00	167.477	-28.167	1624.226483
	2 Jul 2004 02:35:07.00	170.994	-25.510	2020.635179
	2 Jul 2004 02:35:26.51	171.826	-25.000	2152.229237
Min Elevation	2 Jul 2004 02:30:47.32	93.440	-57.371	731.441184
Max Elevation	2 Jul 2004 02:26:07.79	15.161	-25.000	2152.229250
Mean Elevation			-35.100	
Min Range	2 Jul 2004 02:30:47.32	93.440	-57.371	731.441184
Max Range	2 Jul 2004 02:26:07.79	15.161	-25.000	2152.229250
Mean Range			1439.314186	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 04:05:14.79	282.498	-25.000	2152.229243
	2 Jul 2004 04:06:14.00	270.751	-25.084	2127.847130

	2 Jul 2004 04:06:48.07	264.031	-25.000	2152.229245
Min Elevation	2 Jul 2004 04:06:01.43	273.261	-25.091	2125.920794
Max Elevation	2 Jul 2004 04:05:14.79	282.498	-25.000	2152.229243
Mean Elevation			-25.028	
Min Range	2 Jul 2004 04:06:01.43	273.261	-25.091	2125.920794
Max Range	2 Jul 2004 04:06:48.07	264.031	-25.000	2152.229245
Mean Range			2144.101873	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:11:27.14	304.390	-25.000	2152.229239
2 Jul 2004 13:12:27.00	293.831	-25.958	1928.607685
2 Jul 2004 13:13:27.00	280.681	-26.859	1782.514663
2 Jul 2004 13:14:27.00	265.795	-27.209	1735.269196
2 Jul 2004 13:15:27.00	251.018	-26.771	1795.054311
2 Jul 2004 13:16:27.00	238.121	-25.837	1951.963771
2 Jul 2004 13:17:19.49	228.956	-25.000	2152.229240

Min Elevation	2 Jul 2004 13:14:23.45	266.694	-27.210	1735.078414
Max Elevation	2 Jul 2004 13:17:19.49	228.956	-25.000	2152.229240
Mean Elevation			-26.091	
Min Range	2 Jul 2004 13:14:23.42	266.700	-27.210	1735.078423
Max Range	2 Jul 2004 13:17:19.49	228.956	-25.000	2152.229240
Mean Range			1928.266872	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:45:27.79	21.018	-25.000	2152.229238
2 Jul 2004 14:46:27.00	26.931	-26.797	1791.406563
2 Jul 2004 14:47:27.00	36.310	-30.005	1461.004203
2 Jul 2004 14:48:27.00	51.785	-34.627	1197.388536
2 Jul 2004 14:49:27.00	76.128	-38.604	1053.234633
2 Jul 2004 14:50:27.00	104.639	-37.814	1078.024532
2 Jul 2004 14:51:27.00	126.424	-33.250	1261.552770
2 Jul 2004 14:52:27.00	139.811	-28.957	1547.605444
2 Jul 2004 14:53:27.00	147.988	-26.177	1889.143844
2 Jul 2004 14:54:09.90	151.974	-25.000	2152.229247

Min Elevation	2 Jul 2004 14:49:48.59	86.543	-38.995	1041.568375
Max Elevation	2 Jul 2004 14:54:09.90	151.974	-25.000	2152.229247
Mean Elevation			-30.623	
Min Range	2 Jul 2004 14:49:48.59	86.543	-38.995	1041.568375
Max Range	2 Jul 2004 14:54:09.90	151.974	-25.000	2152.229247
Mean Range			1558.381901	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 02:38:02.50	6.260	-25.000	2152.229255
3 Jul 2004 02:39:02.00	6.950	-27.134	1745.000460
3 Jul 2004 02:40:02.00	8.175	-31.700	1346.589821
3 Jul 2004 02:41:02.00	10.822	-41.339	978.435460
3 Jul 2004 02:42:02.00	20.268	-61.959	693.554391
3 Jul 2004 02:43:02.00	141.669	-76.814	621.765453
3 Jul 2004 02:44:02.00	173.196	-49.655	821.363766
3 Jul 2004 02:45:02.00	177.690	-35.545	1159.339099
3 Jul 2004 02:46:02.00	179.447	-28.968	1546.649508
3 Jul 2004 02:47:02.00	180.387	-25.831	1953.049837
3 Jul 2004 02:47:30.93	180.702	-25.000	2152.229237

Min Elevation	3 Jul 2004 02:42:46.83	93.521	-81.119	611.828550
Max Elevation	3 Jul 2004 02:47:30.93	180.702	-25.000	2152.229237
Mean Elevation			-38.995	
Min Range	3 Jul 2004 02:42:46.81	93.425	-81.119	611.828528
Max Range	3 Jul 2004 02:38:02.50	6.260	-25.000	2152.229255
Mean Range			1379.109662	

Global Statistics

Min Elevation	3 Jul 2004 02:42:46.83	93.521	-81.119	611.828550
Max Elevation	3 Jul 2004 02:47:30.93	180.702	-25.000	2152.229237
Mean Elevation			-32.310	
Min Range	3 Jul 2004 02:42:46.81	93.425	-81.119	611.828528
Max Range	3 Jul 2004 02:38:02.50	6.260	-25.000	2152.229255
Mean Range			1607.831679	

ESM-To-Pt2

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)

1 Jul 2004 12:59:14.07	310.351	-25.000	2155.485023
1 Jul 2004 13:00:14.00	300.499	-26.157	1894.820229
1 Jul 2004 13:01:14.00	287.570	-27.466	1704.793857
1 Jul 2004 13:02:14.00	271.914	-28.299	1612.123157
1 Jul 2004 13:03:14.00	255.430	-28.089	1634.027485
1 Jul 2004 13:04:14.00	240.637	-26.989	1766.298246
1 Jul 2004 13:05:14.00	228.851	-25.678	1986.638164
1 Jul 2004 13:05:51.13	223.054	-25.000	2155.485028

Min Elevation	1 Jul 2004 13:02:32.74	266.728	-28.356	1606.381745
Max Elevation	1 Jul 2004 12:59:14.07	310.351	-25.000	2155.485023
Mean Elevation			-26.585	
Min Range	1 Jul 2004 13:02:32.78	266.717	-28.356	1606.381775
Max Range	1 Jul 2004 13:05:51.13	223.054	-25.000	2155.485028
Mean Range			1863.708899	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 14:33:47.17	24.551	-25.000	2155.485024
1 Jul 2004 14:34:47.00	31.252	-26.719	1804.583248
1 Jul 2004 14:35:47.00	41.517	-29.604	1493.787544
1 Jul 2004 14:36:47.00	57.538	-33.369	1256.662001
1 Jul 2004 14:37:47.00	80.504	-36.037	1141.138361
1 Jul 2004 14:38:47.00	105.487	-34.971	1183.658297
1 Jul 2004 14:39:47.00	124.875	-31.351	1369.224499
1 Jul 2004 14:40:47.00	137.529	-27.945	1649.481170
1 Jul 2004 14:41:47.00	145.656	-25.692	1983.653931
1 Jul 2004 14:42:15.78	148.517	-25.000	2155.485017

Min Elevation	1 Jul 2004 14:38:01.21	86.578	-36.160	1136.508222
Max Elevation	1 Jul 2004 14:42:15.78	148.517	-25.000	2155.485017
Mean Elevation			-29.569	
Min Range	1 Jul 2004 14:38:01.21	86.578	-36.160	1136.508222
Max Range	1 Jul 2004 14:33:47.17	24.551	-25.000	2155.485024
Mean Range			1619.315909	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:25:29.59	4.630	-25.000	2155.485016
2 Jul 2004 02:26:29.00	4.912	-27.123	1748.284842
2 Jul 2004 02:27:29.00	5.426	-31.680	1348.900961
2 Jul 2004 02:28:29.00	6.552	-41.344	979.010372
2 Jul 2004 02:29:29.00	10.661	-62.411	690.782599
2 Jul 2004 02:30:29.00	161.444	-79.838	614.765304
2 Jul 2004 02:31:29.00	178.914	-50.272	813.208860
2 Jul 2004 02:32:29.00	180.908	-35.765	1151.611401
2 Jul 2004 02:33:29.00	181.680	-29.064	1539.442492
2 Jul 2004 02:34:29.00	182.098	-25.878	1946.258927
2 Jul 2004 02:34:59.36	182.246	-25.000	2155.485037

Min Elevation	2 Jul 2004 02:30:14.56	93.384	-86.164	605.685136
Max Elevation	2 Jul 2004 02:25:29.59	4.630	-25.000	2155.485016
Mean Elevation			-39.398	
Min Range	2 Jul 2004 02:30:14.56	93.383	-86.164	605.685136
Max Range	2 Jul 2004 02:34:59.36	182.246	-25.000	2155.485037
Mean Range			1376.657801	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:10:33.54	321.251	-25.000	2155.485016
2 Jul 2004 13:11:33.00	313.177	-26.502	1837.567551
2 Jul 2004 13:12:33.00	301.412	-28.723	1570.592601
2 Jul 2004 13:13:33.00	284.917	-31.017	1390.721443
2 Jul 2004 13:14:33.00	264.627	-31.919	1334.692397
2 Jul 2004 13:15:33.00	244.822	-30.619	1417.637249
2 Jul 2004 13:16:33.00	229.267	-28.240	1618.129622
2 Jul 2004 13:17:33.00	218.294	-26.135	1898.692681
2 Jul 2004 13:18:20.27	212.078	-25.000	2155.485019

Min Elevation	2 Jul 2004 13:14:27.05	266.702	-31.931	1333.991445
Max Elevation	2 Jul 2004 13:10:33.54	321.251	-25.000	2155.485016
Mean Elevation			-28.128	
Min Range	2 Jul 2004 13:14:27.06	266.701	-31.931	1333.991445
Max Range	2 Jul 2004 13:18:20.27	212.078	-25.000	2155.485019
Mean Range			1708.778176	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:46:16.29	34.920	-25.000	2155.485021

	2 Jul 2004 14:47:16.00	43.491	-26.402	1853.564223
	2 Jul 2004 14:48:16.00	55.549	-28.339	1608.079425
	2 Jul 2004 14:49:16.00	71.700	-30.149	1451.421670
	2 Jul 2004 14:50:16.00	90.636	-30.673	1413.933270
	2 Jul 2004 14:51:16.00	108.721	-29.473	1504.476165
	2 Jul 2004 14:52:16.00	123.107	-27.487	1702.212090
	2 Jul 2004 14:53:16.00	133.535	-25.737	1974.341464
	2 Jul 2004 14:53:50.88	138.145	-25.000	2155.485027
Min Elevation	2 Jul 2004 14:50:03.32	86.568	-30.715	1410.994046
Max Elevation	2 Jul 2004 14:46:16.29	34.920	-25.000	2155.485021
Mean Elevation			-27.584	
Min Range	2 Jul 2004 14:50:03.32	86.568	-30.715	1410.994046
Max Range	2 Jul 2004 14:53:50.88	138.145	-25.000	2155.485027
Mean Range			1757.666484	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 02:37:30.75	355.939	-25.000	2155.485016
	3 Jul 2004 02:38:30.00	354.018	-27.089	1752.778424
	3 Jul 2004 02:39:30.00	350.703	-31.508	1359.395823
	3 Jul 2004 02:40:30.00	343.833	-40.503	1000.420331
	3 Jul 2004 02:41:30.00	323.061	-57.455	731.163108
	3 Jul 2004 02:42:30.00	248.436	-65.313	671.777815
	3 Jul 2004 02:43:30.00	208.762	-46.803	866.762873
	3 Jul 2004 02:44:30.00	198.349	-34.653	1197.196915
	3 Jul 2004 02:45:30.00	193.965	-28.631	1579.343656
	3 Jul 2004 02:46:30.00	191.596	-25.698	1982.369839
	3 Jul 2004 02:46:55.31	190.899	-25.000	2155.485032
Min Elevation	3 Jul 2004 02:42:13.04	273.363	-67.334	660.272651
Max Elevation	3 Jul 2004 02:37:30.75	355.939	-25.000	2155.485016
Mean Elevation			-37.059	
Min Range	3 Jul 2004 02:42:13.04	273.365	-67.334	660.272651
Max Range	3 Jul 2004 02:46:55.31	190.899	-25.000	2155.485032
Mean Range			1404.743530	

Global Statistics

Min Elevation	2 Jul 2004 02:30:14.56	93.384	-86.164	605.685136
Max Elevation	3 Jul 2004 02:37:30.75	355.939	-25.000	2155.485016
Mean Elevation			-31.911	
Min Range	2 Jul 2004 02:30:14.56	93.383	-86.164	605.685136
Max Range	2 Jul 2004 02:34:59.36	182.246	-25.000	2155.485037
Mean Range			1601.659429	

ESM-To-Pt3

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 13:02:17.70	285.679	-25.000	2163.176806
	1 Jul 2004 13:03:17.00	274.050	-25.341	2069.818354
	1 Jul 2004 13:04:17.00	261.620	-25.369	2062.950850
	1 Jul 2004 13:05:17.00	249.673	-25.060	2145.174581
	1 Jul 2004 13:05:25.33	248.111	-25.000	2163.176803
Min Elevation	1 Jul 2004 13:03:51.55	266.901	-25.402	2054.772129
Max Elevation	1 Jul 2004 13:05:25.33	248.111	-25.000	2163.176803
Mean Elevation			-25.154	
Min Range	1 Jul 2004 13:03:51.54	266.905	-25.402	2054.772133
Max Range	1 Jul 2004 13:02:17.70	285.679	-25.000	2163.176806
Mean Range			2120.859479	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 14:34:23.13	7.336	-25.000	2163.176803
	1 Jul 2004 14:35:23.00	10.069	-27.056	1761.535247
	1 Jul 2004 14:36:23.00	14.695	-31.287	1375.979622
	1 Jul 2004 14:37:23.00	23.952	-39.514	1029.117091
	1 Jul 2004 14:38:23.00	48.094	-53.206	776.930910
	1 Jul 2004 14:39:23.00	105.840	-58.031	727.062261
	1 Jul 2004 14:40:23.00	142.839	-44.372	913.292165
	1 Jul 2004 14:41:23.00	155.848	-33.924	1232.252336
	1 Jul 2004 14:42:23.00	161.748	-28.397	1605.733975
	1 Jul 2004 14:43:23.00	165.027	-25.632	2002.252634
	1 Jul 2004 14:43:46.85	165.950	-25.000	2163.176816
Min Elevation	1 Jul 2004 14:39:04.82	86.696	-59.425	714.938248
Max Elevation	1 Jul 2004 14:43:46.85	165.950	-25.000	2163.176816

Mean Elevation			-35.584	
Min Range	1 Jul 2004 14:39:04.82	86.696	-59.425	714.938248
Max Range	1 Jul 2004 14:43:46.85	165.950	-25.000	2163.176816
Mean Range			1431.864533	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 02:25:13.00	24.617	-25.000	2163.176810
2 Jul 2004 02:26:13.00	29.803	-26.866	1787.866628
2 Jul 2004 02:27:13.00	38.133	-30.316	1442.113865
2 Jul 2004 02:28:13.00	52.577	-35.727	1155.166363
2 Jul 2004 02:29:13.00	77.658	-41.292	981.983739
2 Jul 2004 02:30:13.00	110.142	-41.147	985.593515
2 Jul 2004 02:31:13.00	134.801	-35.490	1164.533794
2 Jul 2004 02:32:13.00	148.963	-30.140	1455.098260
2 Jul 2004 02:33:13.00	157.169	-26.759	1803.347617
2 Jul 2004 02:34:10.26	162.121	-25.000	2163.176812

Min Elevation	2 Jul 2004 02:29:41.88	93.321	-42.231	959.458021
Max Elevation	2 Jul 2004 02:34:10.26	162.121	-25.000	2163.176812
Mean Elevation			-31.774	
Min Range	2 Jul 2004 02:29:41.87	93.321	-42.231	959.458021
Max Range	2 Jul 2004 02:34:10.26	162.121	-25.000	2163.176812
Mean Range			1510.205740	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 04:02:06.81	311.396	-25.000	2163.176816
2 Jul 2004 04:03:06.00	301.027	-25.952	1937.572699
2 Jul 2004 04:04:06.00	287.950	-26.880	1785.907632
2 Jul 2004 04:05:06.00	273.065	-27.275	1732.726842
2 Jul 2004 04:06:06.00	258.202	-26.873	1786.935148
2 Jul 2004 04:07:06.00	245.178	-25.943	1939.200473
2 Jul 2004 04:08:04.82	234.931	-25.000	2163.176818

Min Elevation	2 Jul 2004 04:05:05.69	273.143	-27.275	1732.725432
Max Elevation	2 Jul 2004 04:08:04.82	234.931	-25.000	2163.176818
Mean Elevation			-26.132	
Min Range	2 Jul 2004 04:05:05.70	273.143	-27.275	1732.725432
Max Range	2 Jul 2004 04:08:04.82	234.931	-25.000	2163.176818
Mean Range			1929.813775	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:12:54.69	302.471	-25.000	2163.176815
2 Jul 2004 13:13:54.00	291.862	-25.866	1954.232279
2 Jul 2004 13:14:54.00	278.789	-26.633	1822.159830
2 Jul 2004 13:15:54.00	264.287	-26.863	1788.260019
2 Jul 2004 13:16:54.00	250.100	-26.403	1858.202716
2 Jul 2004 13:17:54.00	237.773	-25.547	2021.087776
2 Jul 2004 13:18:32.02	231.221	-25.000	2163.176802

Min Elevation	2 Jul 2004 13:15:43.47	266.864	-26.875	1786.632334
Max Elevation	2 Jul 2004 13:12:54.69	302.471	-25.000	2163.176815
Mean Elevation			-25.902	
Min Range	2 Jul 2004 13:15:43.47	266.864	-26.875	1786.632334
Max Range	2 Jul 2004 13:12:54.69	302.471	-25.000	2163.176815
Mean Range			1967.185177	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 14:46:34.24	16.069	-25.000	2163.176802
2 Jul 2004 14:47:34.00	20.880	-26.904	1782.550918
2 Jul 2004 14:48:34.00	28.695	-30.515	1427.761945
2 Jul 2004 14:49:34.00	42.598	-36.430	1128.531732
2 Jul 2004 14:50:34.00	68.207	-43.047	941.073042
2 Jul 2004 14:51:34.00	103.450	-43.286	935.875485
2 Jul 2004 14:52:34.00	129.759	-36.796	1115.317234
2 Jul 2004 14:53:34.00	144.086	-30.772	1409.896159
2 Jul 2004 14:54:34.00	152.085	-27.054	1761.772601
2 Jul 2004 14:55:34.00	156.982	-25.072	2141.679097
2 Jul 2004 14:55:37.32	157.196	-25.000	2163.176803

Min Elevation	2 Jul 2004 14:51:05.54	86.681	-44.393	912.866223
Max Elevation	2 Jul 2004 14:55:37.32	157.196	-25.000	2163.176803
Mean Elevation			-31.807	
Min Range	2 Jul 2004 14:51:05.54	86.682	-44.393	912.866223
Max Range	2 Jul 2004 14:55:37.32	157.196	-25.000	2163.176803
Mean Range			1542.801074	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 02:37:02.31	15.787	-25.000	2163.176821
	3 Jul 2004 02:38:02.00	18.887	-27.017	1766.784982
	3 Jul 2004 02:39:02.00	24.141	-31.122	1386.599677
	3 Jul 2004 02:40:02.00	34.467	-38.882	1047.491024
	3 Jul 2004 02:41:02.00	59.453	-50.918	805.709589
	3 Jul 2004 02:42:02.00	110.831	-54.516	762.048717
	3 Jul 2004 02:43:02.00	145.770	-42.881	944.727507
	3 Jul 2004 02:44:02.00	159.651	-33.382	1258.377405
	3 Jul 2004 02:45:02.00	166.240	-28.178	1628.204854
	3 Jul 2004 02:46:02.00	169.985	-25.540	2022.573752
	3 Jul 2004 02:46:22.92	170.932	-25.000	2163.176803
Min Elevation	3 Jul 2004 02:41:42.80	93.308	-55.733	749.165167
Max Elevation	3 Jul 2004 02:46:22.92	170.932	-25.000	2163.176803
Mean Elevation			-34.767	
Min Range	3 Jul 2004 02:41:42.80	93.307	-55.733	749.165167
Max Range	3 Jul 2004 02:37:02.31	15.787	-25.000	2163.176821
Mean Range			1449.897376	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	3 Jul 2004 04:15:03.90	296.188	-25.000	2163.176819
	3 Jul 2004 04:16:03.00	284.717	-25.466	2039.540473
	3 Jul 2004 04:17:03.00	272.005	-25.638	2001.063290
	3 Jul 2004 04:18:03.00	259.414	-25.401	2055.156408
	3 Jul 2004 04:18:51.95	250.042	-25.000	2163.176814
Min Elevation	3 Jul 2004 04:16:57.87	273.107	-25.640	2000.720081
Max Elevation	3 Jul 2004 04:15:03.90	296.188	-25.000	2163.176819
Mean Elevation			-25.301	
Min Range	3 Jul 2004 04:16:57.84	273.111	-25.640	2000.720088
Max Range	3 Jul 2004 04:15:03.90	296.188	-25.000	2163.176819
Mean Range			2084.422761	

Global Statistics

Min Elevation	1 Jul 2004 14:39:04.82	86.696	-59.425	714.938248
Max Elevation	2 Jul 2004 04:08:04.82	234.931	-25.000	2163.176818
Mean Elevation			-30.716	
Min Range	1 Jul 2004 14:39:04.82	86.696	-59.425	714.938248
Max Range	3 Jul 2004 02:37:02.31	15.787	-25.000	2163.176821
Mean Range			1672.800807	

F.2.2 Direction Finding sensor pointing +90 degrees

22 Apr 2003 12:37:43

Satellite-NSAT-1-Sensor-ESM90-To-Target-Pt1, Target-Pt2, Target-Pt3: Inview Azimuth, Elevation, & Range

ESM90-To-Pt1

No Access Found

ESM90-To-Pt2

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 14:49:45.28	80.786	-30.629	1416.943666
	2 Jul 2004 14:50:09.04	88.407	-30.706	1411.593482
	2 Jul 2004 14:50:21.34	92.341	-30.629	1416.926277

Global Statistics

Min Elevation	2 Jul 2004 14:50:03.32	86.568	-30.715	1410.994046
Max Elevation	2 Jul 2004 14:49:45.28	80.786	-30.629	1416.943666
Mean Elevation			-30.655	
Min Range	2 Jul 2004 14:50:03.32	86.568	-30.715	1410.994047
Max Range	2 Jul 2004 14:49:45.28	80.786	-30.629	1416.943666
Mean Range			1415.154475	

ESM90-To-Pt3

No Access Found

F.2.3 Direction Finding sensor pointing -90 degrees

07 May 2003 09:22:05

Satellite-NSAT-1-Sensor-ESM-90-To-Target-Pt1, Target-Pt2, Target-Pt3: Inview Azimuth, Elevation, & Range

ESM-90-To-Pt1

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 13:02:19.01	269.197	-25.516	2019.321760
	1 Jul 2004 13:02:34.57	265.896	-25.523	2017.769070
	1 Jul 2004 13:02:42.37	264.243	-25.516	2019.334126
Min Elevation	1 Jul 2004 13:02:30.67	266.725	-25.524	2017.573028
Max Elevation	1 Jul 2004 13:02:42.37	264.243	-25.516	2019.334126
Mean Elevation			-25.518	
Min Range	1 Jul 2004 13:02:30.67	266.725	-25.524	2017.573028
Max Range	1 Jul 2004 13:02:42.37	264.243	-25.516	2019.334126
Mean Range			2018.808318	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 04:05:56.12	274.321	-25.090	2126.261771
	2 Jul 2004 04:06:03.03	272.941	-25.091	2125.952380
	2 Jul 2004 04:06:06.66	272.215	-25.090	2126.255836
Min Elevation	2 Jul 2004 04:06:01.42	273.263	-25.091	2125.920793
Max Elevation	2 Jul 2004 04:05:56.12	274.321	-25.090	2126.261771
Mean Elevation			-25.090	
Min Range	2 Jul 2004 04:06:01.42	273.263	-25.091	2125.920793
Max Range	2 Jul 2004 04:05:56.12	274.321	-25.090	2126.261771
Mean Range			2126.156662	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 13:14:05.01	271.350	-27.171	1740.204787
	2 Jul 2004 13:14:29.60	265.136	-27.206	1735.650994
	2 Jul 2004 13:14:41.91	262.030	-27.171	1740.221998
Min Elevation	2 Jul 2004 13:14:23.44	266.694	-27.210	1735.078414
Max Elevation	2 Jul 2004 13:14:41.91	262.030	-27.171	1740.221998
Mean Elevation			-27.183	
Min Range	2 Jul 2004 13:14:23.44	266.694	-27.210	1735.078414
Max Range	2 Jul 2004 13:14:41.91	262.030	-27.171	1740.221998
Mean Range			1738.692593	

Global Statistics

Min Elevation	2 Jul 2004 13:14:23.44	266.694	-27.210	1735.078414
Max Elevation	2 Jul 2004 04:05:56.12	274.321	-25.090	2126.261771
Mean Elevation			-25.930	
Min Range	2 Jul 2004 13:14:23.44	266.694	-27.210	1735.078414
Max Range	2 Jul 2004 04:05:56.12	274.321	-25.090	2126.261771
Mean Range			1961.219191	

ESM-90-To-Pt2

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	1 Jul 2004 13:02:13.44	272.068	-28.296	1612.470781
	1 Jul 2004 13:02:38.75	265.061	-28.350	1606.973346
	1 Jul 2004 13:02:52.07	261.381	-28.295	1612.488129
Min Elevation	1 Jul 2004 13:02:32.74	266.729	-28.356	1606.381745
Max Elevation	1 Jul 2004 13:02:52.07	261.381	-28.295	1612.488129
Mean Elevation			-28.314	
Min Range	1 Jul 2004 13:02:32.74	266.729	-28.356	1606.381745
Max Range	1 Jul 2004 13:02:52.07	261.381	-28.295	1612.488129
Mean Range			1610.644085	

	Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
	2 Jul 2004 13:14:11.60	272.082	-31.851	1338.724099
	2 Jul 2004 13:14:31.63	265.105	-31.924	1334.406268
	2 Jul 2004 13:14:42.54	261.312	-31.851	1338.739163

Min Elevation	2 Jul 2004 13:14:27.05	266.701	-31.931	1333.991445
Max Elevation	2 Jul 2004 13:14:42.54	261.312	-31.851	1338.739163
Mean Elevation			-31.875	
Min Range	2 Jul 2004 13:14:27.05	266.702	-31.931	1333.991445
Max Range	2 Jul 2004 13:14:42.54	261.312	-31.851	1338.739163
Mean Range			1337.289843	

Global Statistics

Min Elevation	2 Jul 2004 13:14:27.05	266.701	-31.931	1333.991445
Max Elevation	1 Jul 2004 13:02:52.07	261.381	-28.295	1612.488129
Mean Elevation			-30.094	
Min Range	2 Jul 2004 13:14:27.05	266.702	-31.931	1333.991445
Max Range	1 Jul 2004 13:02:52.07	261.381	-28.295	1612.488129
Mean Range			1473.966964	

ESM-90-To-Pt3

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
1 Jul 2004 13:03:41.09	269.077	-25.396	2056.156892
1 Jul 2004 13:03:54.98	266.189	-25.402	2054.920460
1 Jul 2004 13:04:02.06	264.716	-25.396	2056.167567

Min Elevation	1 Jul 2004 13:03:51.55	266.901	-25.402	2054.772129
Max Elevation	1 Jul 2004 13:04:02.06	264.716	-25.396	2056.167567
Mean Elevation			-25.398	
Min Range	1 Jul 2004 13:03:51.55	266.901	-25.402	2054.772129
Max Range	1 Jul 2004 13:04:02.06	264.716	-25.396	2056.167567
Mean Range			2055.748307	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 04:04:47.10	277.851	-27.234	1737.954827
2 Jul 2004 04:05:11.77	271.601	-27.270	1733.284469
2 Jul 2004 04:05:24.26	268.443	-27.234	1737.938391

Min Elevation	2 Jul 2004 04:05:05.70	273.142	-27.275	1732.725432
Max Elevation	2 Jul 2004 04:04:47.10	277.851	-27.234	1737.954827
Mean Elevation			-27.246	
Min Range	2 Jul 2004 04:05:05.70	273.142	-27.275	1732.725432
Max Range	2 Jul 2004 04:04:47.10	277.851	-27.234	1737.954827
Mean Range			1736.392562	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
2 Jul 2004 13:15:25.60	271.228	-26.842	1791.307800
2 Jul 2004 13:15:48.84	265.549	-26.872	1787.055627
2 Jul 2004 13:16:01.36	262.492	-26.842	1791.323862

Min Elevation	2 Jul 2004 13:15:43.46	266.864	-26.875	1786.632334
Max Elevation	2 Jul 2004 13:16:01.36	262.492	-26.842	1791.323862
Mean Elevation			-26.852	
Min Range	2 Jul 2004 13:15:43.46	266.865	-26.875	1786.632334
Max Range	2 Jul 2004 13:16:01.36	262.492	-26.842	1791.323862
Mean Range			1789.895763	

Time (UTCG)	Azimuth (deg)	Elevation (deg)	Range (km)
3 Jul 2004 04:16:45.17	275.829	-25.630	2002.817757
3 Jul 2004 04:17:01.90	272.240	-25.639	2000.932403
3 Jul 2004 04:17:10.52	270.392	-25.630	2002.805199

Min Elevation	3 Jul 2004 04:16:57.87	273.107	-25.640	2000.720081
Max Elevation	3 Jul 2004 04:16:45.17	275.829	-25.630	2002.817757
Mean Elevation			-25.633	
Min Range	3 Jul 2004 04:16:57.86	273.107	-25.640	2000.720081
Max Range	3 Jul 2004 04:16:45.17	275.829	-25.630	2002.817757
Mean Range			2002.185120	

Global Statistics

Min Elevation	2 Jul 2004 04:05:05.70	273.142	-27.275	1732.725432
Max Elevation	1 Jul 2004 13:04:02.06	264.716	-25.396	2056.167567
Mean Elevation			-26.282	
Min Range	2 Jul 2004 04:05:05.70	273.142	-27.275	1732.725432
Max Range	1 Jul 2004 13:04:02.06	264.716	-25.396	2056.167567
Mean Range			1896.055438	

F.3 Downlink report

11 Mar 2003 12:30:27
Satellite-NSAT-1-Sensor-ESM-To-Facility-Tromso: Access Summary Report

ESM-To-Tromso

Access	Start Time (UTCG)	Stop Time (UTCG)	Duration (sec)
1	1 Jul 2004 13:10:50.31	1 Jul 2004 13:19:51.68	541.372
2	1 Jul 2004 14:45:40.15	1 Jul 2004 14:55:42.10	601.953
3	1 Jul 2004 16:21:54.11	1 Jul 2004 16:31:36.66	582.547
4	1 Jul 2004 18:00:14.86	1 Jul 2004 18:07:09.13	414.270
5	2 Jul 2004 03:51:24.56	2 Jul 2004 03:59:36.45	491.882
6	2 Jul 2004 05:27:09.10	2 Jul 2004 05:37:09.99	600.893
7	2 Jul 2004 07:03:04.37	2 Jul 2004 07:12:52.87	588.506
8	2 Jul 2004 08:38:49.36	2 Jul 2004 08:47:24.49	515.131
9	2 Jul 2004 10:14:01.66	2 Jul 2004 10:21:35.81	454.145
10	2 Jul 2004 11:48:27.20	2 Jul 2004 11:56:21.45	474.250
11	2 Jul 2004 13:22:40.11	2 Jul 2004 13:31:51.43	551.314
12	2 Jul 2004 14:57:38.34	2 Jul 2004 15:07:43.39	605.049
13	2 Jul 2004 16:34:05.47	2 Jul 2004 16:43:37.09	571.615
14	2 Jul 2004 18:12:47.65	2 Jul 2004 18:19:02.19	374.534
15	3 Jul 2004 02:29:02.99	3 Jul 2004 02:31:20.57	137.586
16	3 Jul 2004 04:03:22.69	3 Jul 2004 04:11:57.71	515.017
17	3 Jul 2004 05:39:10.26	3 Jul 2004 05:49:14.90	604.645
18	3 Jul 2004 07:15:05.27	3 Jul 2004 07:24:46.68	581.409
19	3 Jul 2004 08:50:47.52	3 Jul 2004 08:59:12.57	505.049
20	3 Jul 2004 10:25:54.08	3 Jul 2004 10:33:25.65	451.569

Global Statistics

Min Duration	15	3 Jul 2004 02:29:02.99	3 Jul 2004 02:31:20.57	137.586
Max Duration	12	2 Jul 2004 14:57:38.34	2 Jul 2004 15:07:43.39	605.049
Mean Duration				508.137
Total Duration				10162.737

DISTRIBUTION LIST

FFIE **Dato:** 9. May 2003

RAPPORTTYPE (KRYSS AV)	RAPPORT NR.	REFERANSE	RAPPORTENS DATO
X RAPP ☐ NOTAT ☐ RR	2003/01773	FFIE/834/170	9. May 2003
RAPPORTENS BESKYTTELSESGRAD		ANTALL TRYKTE UTSTEDT	ANTALL SIDER
Unclassified		29	129
RAPPORTENS TITTEL		FORFATTER(E)	
EXAMPLES OF OPERATIONAL CAPABILITY OF NSAT-1 Phase-B Report		MELAND, Bente Jensløkken	
FORDELING GODKJENT AV FORSKNINGSSJEF		FORDELING GODKJENT AV AVDELINGSSJEF:	
Vidar S Andersen		Johnny Bardal	

EKSTERN FORDELING

ANTALL	EKS NR	TIL
1		FO/E v/ Ktr. sjef Magne Thunestvedt
1		FOHK v/ KK Kjetil Utne
1		FKN v/ OK Egil Vasstrand
1		FO/FST v/KK Rolf M Stein

INTERN FORDELING

ANTALL	EKS NR	TIL
9		FFI-Bibl
1		FFI-ledelse
1		FFIE
1		FFISYS
1		FFIBM
1		FFIN
1		Vidar S Andersen, FFIE
5		Forfattereksemplar
5		Restopplag Bibl
		Elektronisk fordeling:
		Torkild Eriksen, ToE
		Gudrun K Høye, GKH
		Bjørn T Narheim, BTN
		Vegard Arneson, VAr
		Jan Hammerstad, JaH
		Hans Øhra, HOh
		Morten Mjanger, FFIE
		Bendik Sagsveen, BAS
		Per Helge Andersen, PHA
		Terje Wahl, TeW
		FFI-veven