

FEDERAL REPUBLIC OF GERMANY

ANTARCTIC TREATY

EXCHANGE OF INFORMATION UNDER ARTICLES III (1) AND VII (5) FOR 2003 – 2004

MODIFICATION OF ACTIVITIES PREVIOUSLY REPORTED FOR 2002 - 2003

**Federal Ministry
for Education, Science, Research and Technology**

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CONTENTS

PART I

PLANNED ANTARCTIC ACTIVITIES FOR 2003 – 2004

SECTION I:	Ships, aircraft and other vehicles	4
(a)	Ships	
(b)	Aircraft	
(c)	Other vehicles	
(d)	Military equipment	
SECTION II:	Dates of expeditions	4
(a)	Itinerary ANT-XXI Cruise legs of RV „Polarstern“	
(b)	Itinerary of SA „Agulhas“	
(c)	Itinerary of aircrafts D0228-101 (operated by AWI)	
(d)	Dronning Maud Land Air Network (DROMLAN)	
(e)	Itinerary of field parties	
SECTION III:	Bases and subsidiary stations	6
(a)	Summer and winter operation	
(b)	Summer operation only	
(c)	Closed facilities	
SECTION IV:	Personnel	7
(a)	Officers in charge of stations	
(b)	Officers in charge of field parties	
(c)	Officers in charge of ships	
(d)	Officers in charge of aircraft	
(e)	Numbers, occupations and specialisation's of personnel	
(f)	Military personnel and equipment	
SECTION V:	Armaments possessed by personnel	8
SECTION VI:	Activities and areas of operation	8
(a)	Ship operations	8
(b)	Aircraft operations	11
(c)	Stations	13
(d)	Field parties and activities at other stations	18
SECTION VII:	Principal scientific equipment	24
(a)	RV „Polarstern“	
(b)	Neumayer Station	
(c)	Dallmann Laboratory	
(d)	Kohnen Station	
(e)	GARS	
(f)	Do228-101 aircraft (Polar2, Polar4)	
SECTION VIII:	Transport and communication facilities	27
(a)	Surface transport vehicles	
(b)	Marine transport vehicles	
(c)	Communication facilities	
(d)	Airfields	
SECTION IX:	Facilities for rendering assistance	27
(a)	Aircraft	
(b)	Runways	
(c)	Fuel available	
(d)	Navigation aids (on land)	
(e)	Medical facilities	
(f)	Accommodations	

SECTION X:	Notice of expeditions to Antarctica not organised by the Federal Republic of Germany but organised in, calling at, or proceeding from the Territory of the Federal Republic of Germany (including tourism)	28
(a)	Tourist ships	
(b)	Sailing yachts	
SECTION XI:	Notification of unoccupied refuges and stations	28
SECTION XII:	Annual return of species killed or captured	29
SECTION XIII:	Notices of intended use of radio-isotopes	29
SECTION XIV:	Notice of intended use of scientific research rockets	29
SECTION XV:	Notice of ships carrying out substantial oceanographic research	29
SECTION XVI:	Summary of international co-operation	29
(a)	AWI expeditions	
(b)	Summary of German scientific activities in co-operation with other national operators	
(c)	Summary of logistic support provided by other national and non-governmental operators	
SECTION XVII:	Waste management report	30

PART II

MODIFICATIONS OF ACTIVITIES PREVIOUSLY REPORTED FOR 2002/2003

Comments and updates of previously notified activities	31
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ANNEXES

Annex I: Personnel	33
Annex II: Air operations	41
Annex III: Communication facilities	45
Annex IV: Waste management report	53

PART I

PLANNED ANTARCTIC ACTIVITIES FOR 2003 – 2004

Exchange of Information under Articles III(1) and VII(5) of the Antarctic Treaty (format as prescribed at the Annex to Treaty Recommendation VIII-6).

The Alfred Wegener Institute for Polar and Marine Research at the Helmholtz Association (AWI) coordinates German Antarctic activities as the national operator.

SECTION I: SHIPS AND OTHER VEHICLES

(a) Ships

RV "POLARSTERN", research and supply vessel/ice breaker, operated by AWI

SA "Agulhas", supply vessel/ice breaker, operated by SANAP (South Africa)

(b) Aircraft

2 aircraft DO228-101, Polar2 and Polar4, operated by DLR/AWI

2 helicopters MBB BO 105 CBS 5 on board RV Polarstern

(c) Other vehicles

Surface vehicle fleet at Neumayer Station (operated by AWI)

(d) Military equipment

None

SECTION II: DATES OF EXPEDITIONS

(a) Itinerary ANT-XXI Cruise legs of RV Polarstern in the Treaty area

leg	calls	dates	helicopters
<u>ANT XXI/2:</u>	Cape Town	ETD: 17 November 03	2 BO 105
	Neumayer	ETA: 29 November Supply Neumayer 03; ETD: 01 December 03 ETA: 18 January 04	
<u>ANT XXI/3:</u>	Cape Town	ETD: 21 January 04	2 BO 105
	Cape Town	ETA: 25 March 04 This leg concerns regions outside the Treaty Area.	
<u>ANT XXI/4:</u>	Cape Town	ETD: 27 March 04	none
	Cape Town	ETA: 06 May 04	

(b) Itinerary of SA Agulhas

leg	calls	dates	helicopters
	Cape Town:	ETD: 20 February 2004	none
	Neumayer:	ETD: 06 March 2004 Resupply Neumayer	
	Cape Town:	ETA: 19 March 2004	

SA Agulhas sails under charter contract for AWI and in co-operation with the South African National Antarctic Programme (SANAP). She is operated by Smit Pentow Marine (PTY) Ltd.

(c) Itinerary of aircraft Do228-101 (operated by AWI)

Ferry flight southbound: 2 aircraft Do228-101 (Polar2 and Polar4)

Route: Punta Arenas – Rothera – Halley - Neumayer

Date: 04 November 2003 – 27 November 2003

Ferry flight northbound: 2 aircraft Do228-101 (Polar2 and Polar4)

Route: Neumayer – Halley – Rothera – Punta Arenas

Date: 20 February 2004 – 14 March 2004

Scientific and logistic flight missions are scheduled from 27 November 2003 until 15 February 2004. Both aircraft will operate for scientific missions from Neumayer (Germany), Novo Airbase (Russia), SANAE IV (South Africa), and optional Troll (Norway). Logistic flights are scheduled between Neumayer, Kohnen (Germany), Novo Airbase (Russia), and Air Relay Points (ARP1, ARP2, and S17) of the Japanese Antarctic Research Expedition (JARE).

**(d) Donning Maud Land Air Network (DROMLAN)
Aircraft IL-76TD (operated by ALCI as commercial contractor)**

The aim of Dronning Maud Land Air Network (DROMLAN) is to provide intercontinental flights to/from Antarctica and feeder flights within Dronning Maud Land to any member country of Managers of National Antarctic Programs (COMNAP) in science related activities, including logistics. DROMLAN has been established as an international project by Belgium, Finland, Germany, India, Japan, Norway, Russia, South Africa, Sweden, and UK. Novo Airbase is operated by Russia (for details see AFIM). Aircraft IL-76TD will be operated by INTAARI/ALCI as non-governmental operator. DROMLAN national operators have concluded charter contracts with INTAARI/ALCI.

In the frame of DROMLAN altogether 6 intercontinental flights are scheduled for coming season in order to carry personnel and cargo of AWI (Germany), FIMR (Finland), NP (Norway), SPRS (Sweden), NIPR (Japan), NCAOR (India), and RAE (Russia) from Cape Town via Novo Airbase to various stations and summer camps in Dronning Maud Land.

IL-76TD flight schedule:

Flight number IL 1 – D: aircraft IL-76TD
Route: Cape Town – Novo Airbase - Cape Town
Scheduled dates: 06 November 2003 – 08 November 2003

Flight number IL 2 – D: aircraft IL-76TD
Route: Cape Town – Novo Airbase - Cape Town
Date: 10 November 2003 – 12 November 2003

Flight number IL 3 – D: aircraft IL-76TD
Route: Cape Town – Novo Airbase - Cape Town
Scheduled dates: 27 November 2003 – 29 November 2003

Flight number IL 4 – D: aircraft IL-76TD
Route: Cape Town – Novo Airbase - Cape Town
Scheduled dates: 03 December 2003 – 05 December 2003

Flight number IL 5 – D: aircraft IL-76TD
Route: Cape Town – Novo Airbase - Cape Town
Scheduled dates: 25 January 2004 – 31 January 2004

Flight number IL 6 – D: aircraft IL-76TD
Route: Cape Town – Novo Airbase - Cape Town
Scheduled dates: 10 February 2004 – 15 February 2004

Further details on flight operations see section VI and annex II.

(e) Itinerary of field parties

Field party	Dates of field work
Traverse Neumayer – Kohnen	11 – 21 December 2003
Traverse Kohnen - Neumayer	01 – 10 January 2004
Traverse Neumayer - Kohnen	14 January – 03 February 2004
Traverse Kohnen - Neumayer	15 – 24 February 2004
VISA Field party at Novo Airbase	10 November 2003 – 25 January 2004
Seal and acoustic group at Drescher Inlet	10 December 2003 – 20 January 2004

Further field parties are planned as part of scientific and logistic co-operation under responsibility of other national operators. For details including itineraries see sections VI. All personnel is noticed in annex I.

SECTION III: BASES AND SUBSIDIARY STATIONS

German Antarctic stations and bases are operated by AWI and DLR. Two summer bases, currently not used, are in the responsibility of BGR. Fuller details of the German Antarctic stations are to be found on the COMNAP Web Site: <http://www.comnap.aq>.

(a) Summer and winter operation

Station	Position	Opened	Remarks
Neumayer Station	70°39'S, 08°15'W	31 March 1992	Scientific station with observatories for meteorology, air chemistry, geophysics. Logistic base for aircraft missions and inland traverses. Operated by AWI. Permanently occupied.
German Antarctic Receiving Station (GARS)	63°19'S 57°54'W	since 1992	Scientific station for satellite data acquisition, VLBI and GPS measurements. Annex to Station General B. O'Higgins (Chile). Operated by DLR in co-operation with INACH (Chile). Not permanently occupied.

(b) Summer operation only

Station	Position	Opened	Remarks
Kohnen Station	75°00'S 00°04'E	11 January 2001	Scientific station for deep ice coring in the frame of EPICA. Operated by AWI. Occupied December 2003 –February 2004.
Dallmann Laboratory	62°14'S 58°40'W	since 1994	Scientific station with biological laboratories for shallow water research. SCUBA diving facilities under construction. Annex to Jubany Station (Argentina). Operated by AWI and DNA. Occupied November 2003 –May 2004.

(c) Closed facilities

Base	Position	Opened	Remarks
Lillie Marleen Hut	71°12'S 164°31'E	14 January 1980	Currently closed. Responsibility BGR.
Gondwana Station	74°38'S 164°13'E	23 January 1983	Currently closed. Responsibility BGR.

SECTION IV: PERSONNEL

For all participants see annex I.

(a) Officers in charge of stations

Neumayer Station

Station leader	Uwe Kapeske (AWI)	March 2003 - February 2004
Station leader	Anna Müller (AWI)	March 2004 - February 2005
Logistics operator	Jürgen Janneck (AWI)	29 November 2003 – 06 March 2004 (summer season)

Dallmann Laboratory

Station leader	Max Schwanitz (AWI)	October 2003 – March 2004
Station leader	Richard Steinmetz (AWI)	March 2004 – April 2004

Kohnen Station

Chief scientist	Sepp Kipfstuhl (AWI)	03 December 2003 - 15 February 2004
Station operator	Cord Drücker (AWI)	27 November 2003 – 06 March 2004

GARS

Chief scientist	Alfons Zimmer (DLR)	October 2003 – March 2004
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(b) Officers in charge of field parties

Field parties	Officer in charge
Traverses between Neumayer station and Kohnen station	Cord Drücker (AWI)
VISA Field Party at Novo Airbase	Mirko Scheinert (TU Dresden)
Seal and acoustic group at Drescher Inlet	Jochen Ploetz (AWI)

(c) Officers in charge of ships

RV POLARSTERNANT XXI/2	Master:	Udo Domke (F. Laeisz)
	Chief scientist:	Wolf Arntz (AWI)
ANT XXI/3	Master:	Uwe Pahl (F. Laeisz)
	Chief scientist:	Victor Smetacek (AWI)
ANT XXI/4	Master:	Uwe Pahl (F. Laeisz)
	Chief scientist:	Ulrich Bathmann (AWI)
SA AGULHAS	Resupply Neumayer	Master:
		Chief of cruise:
		NN (Smit Pentow (PTY) Ltd.)
		Jürgen Janneck (AWI)

(d) Officers in charge of aircraft's

Aircraft Do228-101	Chief pilot:	Stefan Grillenbeck (DLR)
	Chief scientist:	Daniel Steinhage (AWI)

Helicopters MBB BO105 CBS5

ANT XXI/2	Chief pilot:	Peter Alm (HSW)
	Chief technician:	Jens Brauer (HSW)

ANT XXI/3 Chief pilot: Juergen Buechner (HeliTransair)
 Chief technician: Oliver Feldt (Heli Transair)

(e) **Numbers, occupations and specialisation of personnel:** see annex I

(f) **Military personnel and equipment:** None

SECTION V: ARMAMENTS POSSESSED BY PERSONNEL

None.

SECTION VI: ACTIVITIES AND AREAS OF OPERATION

(a) **Ship operations**

RV "Polarstern" - leg ANT XXI/2:

Scientific objectives:

One of the outstanding results of the international „Polarstern“ expeditions EASIZ (Ecology of the Antarctic Sea Ice Zone) I-III has been the insight that iceberg strandings play an important role in structuring benthic biodiversity at the seafloor. We know from these studies that about 5% of the total shelf area of the eastern Weddell Sea is disturbed by iceberg scour. Within some topographically distinct areas which are usually referred to as „iceberg cemeteries“ or „iceberg rest places“, up to 50% of the seafloor may be affected by this kind of perturbation. Iceberg scour inflicts substantial damage, often destruction, on the established communities of the endo- and epifauna and of demersal fish. In the course of recovery, which is assumed to be a very slow process as compared with time scales in temperate or tropical regions, it is possible to distinguish different succession stages of recolonisation although these cannot yet be placed in an absolute temporal sequence. There may also be various alternative states during this process.

As iceberg scour disrupts or destroys older and more mature community stages, it creates space for taxa, which as „pioneer species“, initiate recolonisation of the affected areas, thus giving way to a gradual recovery of the community. Various hypotheses in the literature have attempted to describe the effect of such processes on biodiversity. The general result seems to be an enhancement of diversity on larger spatial scales due to the co-existence of a variety of different stages which all have their respective set of species. This may be the case, however, only for intermediate scour disturbance, and may not work if the impact scale is altered into one or the other direction, e.g. by a further increase of iceberg scour under continued global warming conditions. An alternate (and presumably shorter) way to study these processes is to cause artificial disturbance of different intensity at the seafloor.

Beside its effect on biodiversity, the time scale of the process of recolonisation and recovery after a disturbance may be considered an important question, because in comparison with communities at lower latitudes it illustrates the vulnerability and resilience of the polar ecosystem. This parameter is, as is biodiversity, of increasing importance in the context of the Antarctic Treaty and the Madrid Protocol, because conservation measures can be developed only considering these stability properties of the ecosystem.

The main programme thus intends to

- Quantify the dynamics of the shelf ice edge and the movements of icebergs using satellite remote sensing, helicopter and shipboard observation. The shelf ice edge will be measured from helicopters and compared with former measurements during EASIZ I-III. Iceberg displacement will be quantified in determined „restplace“ areas from helicopters and by the vessel's radar.
- Quantify the dynamics of the shelf ice edge and the movements of icebergs using satellite remote sensing, helicopter and shipboard observation. The shelf ice edge will be measured from helicopters and compared with former measurements during EASIZ I-III. Iceberg displacement will be quantified in determined „restplace“ areas from helicopters and by the vessel's radar.

- Describe undisturbed areas as a basement measure of the *status quo ante*. These areas will serve later as control sites.
- Inflict an artificial mechanical perturbation similar to iceberg scour by heavy trawling on one of these sites, to follow recolonisation and succession in the next decade.
- Recover artificial hard-bottom substrates deployed during ANT XV/3 off Cap Norvegia.
- Compare results on temporal and spatial succession in this area, in particular with regard to biodiversity, dominance and structural complexity, with published and own results from other marine ecosystems (shelf areas of the North Atlantic Ocean, Mediterranean, Humboldt Current upwelling, Arctic deep sea).
- Deduce (as a final goal) more general rules concerning the resilience of benthic marine ecosystems, and identify indicators of vulnerability, pioneer species, ecosystem engineers and other keystone species, which may be helpful for conservation management.

This main research programme represents a medium term approach and will last at least 10 years. After subjecting the „benthos garden“ community to artificial disturbance, this site is to be revisited in more or less regular time intervals (ideally every second year) to register succession patterns and exchange moorings for the registration of biotic and abiotic variables.

To make optimal use of RV „Polarstern“ and to consider the needs of other international and national groups working on the Antarctic shelf mostly within the frame of the EASIZ programme, the main programme will be combined with the following associated programmes:

- Benthic-pelagic coupling, trophic structure and energy flow under polar spring conditions
- Scale-related biodiversity studies of high Antarctic benthos communities in comparison with those from the Arctic
- Taxonomic biodiversity studies to complement the inventory of high Antarctic benthic species
- Phylogenetic and biogeographic relationships and genetic variability of sub- and high Antarctic fauna (includes study at Bouvet)
- Studies on invertebrate life histories, reproductive strategies and meroplanktonic larvae along the latitudinal gradient (includes Bouvet)
- Availability of fish as food for seals and seal foraging in Drescher Inlet
- Reaction of seals to sound (Drescher Inlet)
- Adaptive competence of Teleostei: material for the study of temperature adaptation of Zoarcidae and Nototheniidae (includes Bouvet)
- Chemical ecology: material for the study of natural marine products
- Measurements of atmospheric trace gases.

RV „Polarstern“ is scheduled to leave Cape Town, South Africa on 17 November 2003. On the way to the Antarctic continent, a two-day stay will be made near Bouvet Island to use baited traps and Agassiz trawls for the collection of benthos and fish to be studied within the various latitudinal gradient programmes. Most of the work planned for ANT XXI/2 will be carried out in the polynya area between Atka Bay and Drescher Inlet (Fig. 1), where we hope to arrive by the end of November if the ice situation allows. Equipment and provisions will be delivered to Neumayer station also depending on the ice situation. The seal and acoustics group will be transported to Drescher Inlet at the earliest convenience, and the participants remaining on board the vessel will be working predominantly off Kapp Norvegia during the entire month of December and the first week of January. The return to Cape Town will begin around 08 January, after picking up the Drescher party, and South Africa will be reached on 18 January 2004.

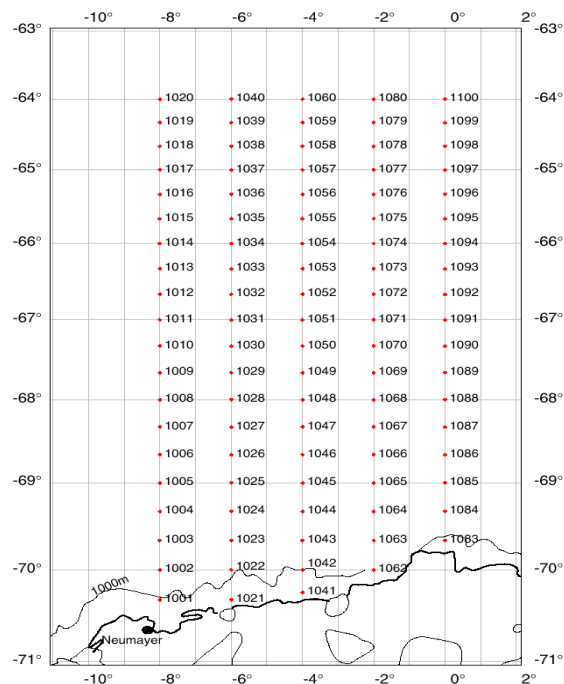
Scientific equipment: See section VII.

RV „Polarstern“ - leg ANT XXI/4:

Scientific objectives:

The Polarstern cruise ANT XXI/4 will start in Cape Town 27 March 2004. The cruise will focus on the biology (over-wintering) of Antarctic krill *Euphausia superba* in the Lazarev Sea between the Greenwich meridian to 20 ° E and 62° S to 70° S. The ship is expected back in Cape Town on 6 May 2004.

Map of the proposed investigation area for ANT XXI/4 with transects and station grid.



The overall aim of the cruise is embedded in the international programme GLOBAL OCEAN ECOSYSTEM DYNAMICS – GLOBEC and focuses on population dynamics of the Antarctic krill populations in the Lazarev Sea. The main questions to be addressed are: a) what is the abundance of krill, b) Do we see one or more populations, c) how does krill survive the winter? Based on the scarce historic data it is impossible to decide whether the Lazarev krill recruits from the Atlantic sector of the Southern Ocean (downstream expatriates) or if the population itself serves as breeding ground for the Weddell krill (upstream source population).

The core group of the project is supported by a BMBF-Forschungsverbund (proposal stage at moment), and consists of five scientific parties, which are now explained shortly. The observation of krill population dynamics will be carried out according to the CCMLR protocol with standard methods. An acoustic measuring group will support these investigations and will concentrate on under-sea-ice krill. Population dynamics has to be seen in the hydrographical field and, thus, a physical oceanographer group will concentrate on ocean currents and water mass distribution. Overwintering require special physiology of the organisms and especially finely tuned energy budgets. In this context the lipid metabolism of krill is of special interest.

Whale observations carried out by the international whaling commission from Australia accompany the research on krill. We concentrate on whale migration and behaviour in relation to krill populations, ocean hydrography and bottom topography. Another project from Belgium will focus on fish larval distribution applying molecular genetic techniques. The occurrence, distribution and behaviour of another group of krill predators, namely seabirds will be investigated by a Dutch group.

Especially krill larvae have high body metabolisms in late autumn as is reported of the populations from the Antarctic Peninsula. To maintain the high metabolic rates, krill larvae have to find and feed more or less constantly during autumn. Thus, part of our programme will concentrate on potential food items, phytoplankton and zooplankton, its distribution and abundance in relation to hydrography and krill populations.

Side programmes will focus on the biogeochemistry of the seafloor at the end of the growing season, i.e. after plankton material has reached the deep ocean interior. An air chemistry group will perform measurements for their Max-Doas-Experiment. Ice drift buoys will be deployed to monitor the ice movements over the following winter period. A journalist documents all scientific activities and provides information to the general public once back home.

Scientific equipment: See section VII.

SA “Agulhas” cruise: Neumayer – Cape Town

Logistic objectives: Resupply Neumayer station

Area of operation: Southern Atlantic and Weddell Sea, route Cape Town - Atka Bay.

(b) Aircraft operations

Dornier aircraft Do228-101

Both Dornier Do228-101 (Polar2 and Polar4) are ski-equipped aircraft. Polar4 will be used for logistic purposes only whereas Polar2 will be mainly used for aero geophysical measurements. During season 2003/2004 altogether 350 flight hours are scheduled for both aircraft. Among them 150 flight hours are planned for scientific missions. About 200 flight hours are allocated to support Kohnen station for European Project for Ice Coring in Antarctica (EPICA) and to support ice-coring activities of Japanese Antarctic Research Expedition (JARE) at Dome Fuji station. The aircraft will operate from Neumayer (German wintering base), Kohnen (German summer base), Novo Airbase close to Novolazarevskaya (Russian wintering base), and SANAE IV (South African wintering base).

Scientific objectives of aerogeophysical flight missions:

Project VISA III (120 h):

In 2003/04 further aerogeophysical flights for the VISA project (validation, condensation and interpretation von satellite data for determining magnetic field, gravity field, mass balance and structure of the crust of Antarctica by using airborne and ground based measurements) will be carried out. The aircraft will be equipped with gravimeter, altimeter, GPS, magnetometer, and radio echo sounding system.

These measurements will be used as ground truth measurements of CHAMP and GRACE satellite data as well as for mass balance studies and studies of the subglacial geology. The area of interest is located south of the Russian wintering base Novolazarevskaya, respectively between Novolazarevskaya and the South African wintering base SANAE IV. The aircraft measurements are combined with ground-based observations between Schirmacher Oasis and Wohlthat Massif.

Project SEAL IV (30 h):

SEAL is a combined project on SEA Level change by several German research centres carrying out modelling and mass balance studies. Fieldwork concentrates on major outlet glaciers and drainage basins in Dronning Maud Land. In 2003/04 it is planned to map the ice thickness in the vicinity of the grounding zone of Veststraumen and several unnamed outlet glacier between Jutulstraumen and Novolazarevskaya further east using Polar2 equipped with RES system and GPS. This together with flow velocities determined by SAR interferometry allows the evaluation of the mass flux of this outlet glacier.

Main scientific equipment used:

The scientific equipment of Polar2 consists of a radio echo-sounding device, a modified ships gravimeter, a laser altimeter, 2 geodetic GPS receiver, and a magnetometer. On ground 3 GPS reference stations and 2 magnetic base stations will be operated.

Area of activity:

Flights are planned in central Dronning Maud Land with Neumayer, Novo Airbase and SANAE IV as main bases for aerogeophysical programmes. Logistic flights are planned between Neumayer, Novolazarevskaya, and Kohnen. Further logistic flights are scheduled from Novo Airbase to Air Relay Points (ARP1, ARP2) and S 17 (close to Syowa station). These flights (about 16 flight hours in total) are used to send and pick up JARE drilling team for Dome Fuji station (Japan).

Dronning Maud Land Air Network (DROMLAN) - Iljushin aircraft (IL-76TD)

Area of activity:

As a member of the DROMLAN community, German expedition takes advantage of DROMLAN to transport personnel and cargo to the stations Neumayer and Kohnen as well as a field party bound for the region Schirmacher Oasis – Wohlthat Massif.

Logistic objectives of DROMLAN for German activities:

A great number of land-based scientific and logistic projects will be carried out during summer season from November 2003 until March 2004. In order to realize these activities, personnel will again be flown into Antarctica from Cape Town on board of a Russian cargo aircraft IL-76TD via Novo Airbase, and transported back the same way in the end of the campaign. The number of persons travelling this way is 62 in and 51 out. Also a substantial part of cargo will be sent down. Two Russian AN-2 aircraft will perform the feeder flights from Novo Airbase to Neumayer station. Because the elevation of Kohnen station is off limits for AN-2 aircraft, both Do228-101 aircraft supported by one Twin Otter aircraft of the British Antarctic Survey will perform the feeder flights up to the inland ice plateau.

The first flight scheduled early November will carry 3 scientists for Neumayer, among them one expert of the German Weather Service (DWD). As already during last season the DWD expert will provide flight weather forecast for DROMLAN in co-operation with the South African Weather Service at Cape Town.

The second flight scheduled mid November will carry the German-Russian field party for VISA including 4 German scientists. For the planned field works skidoos and extensive equipment will also be flown to Novo Airbase.

The third flight will carry 10 technicians in transit for Kohnen Station by the end of November, in order to reopen the station for drilling activities. Also the scientific leader for Dornier flight missions will travel for Novo Airbase.

The fourth flight scheduled early December will carry 17 scientists for Kohnen station as well as another 20 scientists and technicians for Neumayer station including the overwintering team for 2004.

The fifth and sixth flight are scheduled for end January and mid February, respectively. Another 8 scientists and experts will travel to Neumayer. Both return flights are to pick up in total 51 scientists and technicians from Neumayer and Kohnen from Novo Airbase back to Cape Town. DROMLAN activities will be completed by the last flight on 15 February 2004.

(c) Stations

Neumayer station

Scheduled season: 08 November 2003 – 06 March 2004

Up to 62 scientists, experts, pilots and technicians are going to temporarily stay at the station during summer season. Additionally visitors from other national programmes have noticed short time stays at the station site. UK, Russian and South African fixed wing and rotary aircraft are scheduled to land at Neumayer station for transport of personnel in the frame of scientific and logistic co-operation or refuelling.

Logistic and scientific activities:

Logistic activities:

At the beginning of December 2003 RV Polarstern is scheduled to call for Atka Bay to provide the bulk of material, equipment, and consumables for Neumayer and Kohnen. For summer activities the majority of personnel including the new overwintering staff will be moved in and out in the frame of DROMLAN. In co-operation with ship SA Agulhas resupply including waste disposal is scheduled for beginning of March 2004.

During season technical services will be provided for air operations such as runway maintenance, refuelling, communication, flight following, weather forecast. Both aircraft Do228-101 will be temporarily operated from Neumayer station.

Technical preparations of the supply traverses for Kohnen station are further task of logistics in December and January.

Maintenance works are planned at station building, vehicle hangar, eastern ramp, Radom antenna, ventilation shafts, emergency exits as well as different platforms of the observatories. The ceiling of the ice tunnel connecting the vehicle hangar with the station building has to be cut out, offering enough height for vehicles to be parked during winter.

The sensor array of the infrasound station IS27 has to be dug out and re-established at the accumulated snow surface. Contract personnel of a commercial company perform this great amount of physical work.

Outside the station a further container will be installed for the art project "Library on Ice" creating a place of silence and reflection at Neumayer. This project will be officially inaugurated next season.

The 23rd overwintering team will be replaced by its successors, a group of five women and four men (see annex I). The new team will be finally briefed during season.

Meteorological Observatory

For coming summer season no additional scientific project is planned. The focus is maintenance, extension of the equipment, and training as follows:

- Upgrade of the radiosonde system from DigiCora II to DigiCora III (Vaisala).
- Installation of the visibility sensor FS11 (Vaisala). This system will be used mainly for the aviation forecasting service.
- Installation of a repeater in order to make the reception of GPS-signals possible within the balloon-launching hall. This is needed to improve the wind-finding system.
- Installation of two ultra-sonic anemometers. After a one-year test these sensors shall replace the existing cup anemometers.
- Exchange of all radiation sensors with recently calibrated ones.
- Improvement of the ventilating system of the thermometers.
- Installation of bigger hard disks, as well as a colour-printer.
- Training of the overwinterer staff.
- Updating the data-acquisition and the processing programs.
- Preparation of the overwintering period 2004/2005.

DROMLAN weather forecast:

During summer season the Meteorological Observatory at Neumayer provides weather forecast services for DROMLAN and all nations working in the whole Dronning Maud Land. Weather forecasts are available for aviation, ships, and field activities. The forecaster is available via email, Iridium, Inmarsat A, (voice, fax) as well as HF or VHF daily from 06.00 to 22.00 UTC, if necessary or in emergency cases (SAR) 24 hours a day. Like in the last season a daily forecast with a general overview and a 72-hour weather forecast would be available as a daily services.

DROMLAN operations Daily service with weather forecasts for the following 48 hours or up to 4 or 5 days is provided for DROMLAN intercontinental flights from Cape Town, South Africa, to Novo Airbase, Antarctica as well as for regional feeder flights.

Three different numerical weather forecast models (ECMWF, GME, AMPS) and 3-hourly synoptic observations are used. Additionally upper air soundings, minimum once a day, and a satellite picture receiving station for highly spatially and timely resolved multi-channel pictures from the NOAA- and DMSP-satellites and meteorological data from ARGOS-platforms are operationally available.

Air Chemistry Observatory:

During the forthcoming summer campaign, activities at the Air Chemistry Observatory of Neumayer Station will focus on maintenance of the equipment, validation of the measured data, as well as practice of the new over-winterer. In addition a novel experiment for sampling of ambient air in specially designed stainless steel container (volume: 2000 cm³ at 2.5 bar) will be installed. The air samples are destined for analysis of volatile organic compounds (so-called VOCs) by the Institut für Meteorologie und Klimaforschung of the FZ Karlsruhe in Garmisch-Partenkirchen (IFU/FZ Karlsruhe). This experiment is part of the WMO Global Atmosphere Watch programme (GAW).

Geophysical observatory:

During the summer campaign 2003/2004 no additional scientific project is planned at Neumayer Station except maintenance works.

The former seismic observatory, where until last year among others the complete data acquisition system for recording the Earth's magnetic field was installed, was already dismantled to a great extent last summer season. The major part of the electronics was moved to the container of the infrasound station IS27. This season all other remaining installations shall be removed. Only the empty container shall be left in the firn cavern. This complete shutdown of the seismic observatory makes a new power supply for the magnetic observatory necessary since it was connected to mains via the seismic-observatory.

For the recording of the time variations of the Earth's magnetic field it is intended to install a new digital 3-component flux gate magnetometer. Compared to the old system this new recording system shows an excellent resolution and a much higher dynamic range. Measured data are transmitted already in digital form from the magnetic observatory to a notebook in the IS27 container. The new system shall avoid longer recording gaps, which recently increased somehow with the old system. It has to be installed and integrated into the station's computer network during this summer season. Most of the time, however, is needed to make the new over-winterers familiar with all the instruments and the routine works, which have to be done. This should thoroughly prepare them for their wintering time. Their assistance is also required for necessary service works at the IS27 infrasound array.

A special geophysics programme will be performed within the frame of the VISA project in the Wohlthat Massive area in Eastern Dronning Maud Land (see SECTION VI (d)). A part of this project is the installation of a temporary seismological network for the investigation of the local and regional seismicity. For a more precise localization of eventual earthquakes in this region recordings at the seismological network at Neumayer Station and at the broadband station at SANAE IV base shall also be incorporated if these local earthquakes are strong enough to produce clear, evaluable signals, even at distances of some 100 km. For this reason the regular service works at the remote seismological stations near Neumayer Station during the summer are of great importance. These remote stations are the seismological detection array VNA2 on Halvfjar Ryggen and the 3-component station VNA3 on Søråsen Ice Rise. However, first of all the service works are necessary to ensure an autonomous and continuous operation during the winter. Batteries have to be changed, and the antenna masts must be set up again at a higher level. Due to the annual accumulation of snow, which is especially high at station VNA3 (2-3 meters per year), at both stations the 3-component seismometers must also be recovered and installed again. The container at the array site VNA2 must eventually be pulled out of the snow. At least wind-accumulated snow masses around the container have to be removed and the surface must get levelled.

Service works at the Infrasound Array IS27 (CTBT-network):

In February 2003 the infrasound array IS27 at Neumayer Station started operation. It is one of 60 planned infrasound stations in the world. Four of these stations are located in Antarctica (Neumayer, Palmer Station, „Windless Bight“ (Mc Murdo), Davis). This global monitoring network should control the compliance with the Nuclear Test Ban Treaty (CTBT), in the case of infrasound the ban of testing nuclear weapons in the atmosphere.

The infrasound array at Neumayer Station has nine single recording stations with a microbarograph as sensor. The stations are arranged on a spiral with increasing distances to the central point of the array. Each sensor is connected to 16 or 32 porous plastic hoses of 15 meters length via non-porous plastic hoses of 10, 20 and 30 meters length. The porous plastic hoses are installed again within slit plastic tubes. They were radially laid out on the snow surface in order to reduce the wind-induced noise in the signal. Last season in total 6.4 km of hoses and tubes were laid out. Because of the continuous accumulation of snow of approx. 1 meter per year all hoses and tubes have to be recovered and laid out again this season.

For the official integration of IS27 into the International Monitoring System (IMS) two members of BGR, commissioned by the Comprehensive Test Ban Treaty Organization (CTBTO), will inspect and certify this station in February 2004.

Characterisation of the specific solar radiation conditions in the Antarctic with respect to climate change and ozone depletion (CASE)

Aim of this project is the investigation of the specific solar radiation conditions in the Antarctic, which are different from other areas of the Earth due to extremely high reflection of the ground (albedo). Relatively low cloud optical depths (in the ultraviolet part of the spectrum) and the significant ozone depletion further contribute to rather different radiation conditions. The investigation of these conditions will improve the understanding of the impact of climate change and ozone depletion in polar regions. The newly developed spectroradiometer can now be used to characterise both irradiance and radiance in dependence of wavelength from 290 to 1000 nm. It is aimed at conducting Antarctic field campaigns at a coastal and an inland station with special emphasis on spectral radiance as a function of incidence and azimuth angle. A coastal and an inland Antarctic station have been picked for field campaigns because of their different surroundings. The radiation parameters measured at the coastal Neumayer station are influenced by the albedo up to 40 km around the station, which also includes the albedo of the ocean surface. The results will be compared with state-of-the-art radiative transfer models to study the effect of inhomogeneous vs. homogeneous surface conditions surrounding the station. Furthermore a 3-D model will be developed to investigate the spectral radiance taking into account the bi-directional reflection function of the underlying surface.

The scientific equipment for CASE consists of a spectroradiometric system to measure spectral solar radiation. The main components are a spectroradiometer and a skyscanner. Further a field calibrator along with 100 Watt Halogen calibration lamps will be deployed for stability checks and calibration purposes. Equipment to run 1000 Watt calibration lamps will also be in use during the campaign. This equipment consists of a power supply, a HeNe-Laser and a digital multimeter. Ancillary measurements will be performed with a hand held Solar Light Microtops instrument to measure ozone column, a Solar Light biometer to measure erythral irradiance and a pyranometer to detect global irradiance.

This experiment will only be conducted at Neumayer. All the equipment will be placed inside a 20'-container. This container will provide the necessary weather protection to the instruments. Only the input optics will be attached to the walls or roof of the container.

Two scientists will take part to conduct the Antarctic experiment of CASE. Both persons will fly by DROMLAN at the beginning of November 2003. At the beginning of December 2003 one scientist will return from Neumayer same way. The other one will stay at Neumayer until March 6th, 2004.

Inspection by Federal Environmental Agency (UBA):

According to the act implementing the Protocol on environmental protection the responsible authority for approval of activities organised by Germany in the Antarctic is the Federal Environmental Agency. Additionally the agency is obliged to control whether the Treaty, the Protocol, and the stipulations described in the approval are adhered to. This also includes an evaluation of the impact of activities on the Antarctic environment.

The visit is primarily for preparing the licensing procedure regarding the replacement of Neumayer station by a new research station as well as dismantling the existing station. According to the Protocol of the Antarctic Treaty the construction of a new station requires an environmental impact study. During the visit basic information will be collected for the corresponding environmental impact studies.

Kohnen station and traverses (AWI)

Scheduled season: 27 November 2003 – 14 March 2004

Logistic objectives:

Like in the previous season, scientific and technical personnel required for the drilling and the maintenance of the station will fly to Antarctica. In this way a significantly prolonged drilling season and therefore an optimum drilling progress is ensured. This is made possible using a large transport aircraft for the flight from Cape Town to Novolazarevskaya and the Polar2 and Polar4 aircraft for the put in at Kohnen station. British Antarctic Survey will assist with a Twin Otter aircraft. In addition, two traverses will lead from Neumayer station to the EPICA drill camp (Kohnen-Station) to carry technical equipment, fuel, scientific equipment and material to maintain the base. The traverse route will be the same as in the past years. It leads across Ritscherflya, passes the mountain range Kottasberge and ends at Kohnen station on the Amundsenisen.

Scientific and logistic objectives:

Glaciological fieldwork

Along the traverse route from Neumayer station to the south of the mountain range Kottasberge the established stake net will be reread for accumulation studies. En route and in the vicinity of point DML05 all marked points will be resurveyed by GPS, especially the strain net installed in the 1999/2000 season around the drilling site.

European Project on Ice Coring in Antarctica (EPICA)

In the framework of the European Project for Ice Coring in Antarctica (EPICA) two deep ice cores are drilled. The main goal of EPICA is to gain more knowledge about the climatic history up to 700,000 years back in time. The first deep ice core is drilled at Dome C, the second in Dronning Maud Land (DML). The different origin of air masses and moisture transported to Antarctica either from the Indic-Pacific or from the Atlantic region should be reflected in the climate records at the two drill locations. Furthermore, the different snow accumulation rates at both sites will yield different time resolution of the measured parameters. The core from DML, where the long-term mean accumulation rate amounts to $64 \text{ kg m}^{-2} \text{ a}^{-1}$, will show higher time resolution, however, the maximum age of the ice at the glacial bed will be only about 200,000 years. The drilling in DML provides the first long record from the Atlantic sector of Antarctica and, accordingly, represents the first direct southern hemispheric counterpart to the Greenland ice core records. Therefore, it is expected to be especially suited to gain insight into the coupling of climatic variations in the northern and southern hemispheres.

At the beginning of the season the drill will be reinstalled. The drilling will then continue from the drill depth of 1564 m reached in the previous season for another approx. 1000 m. The hole has to be filled with a drilling liquid to compensate for the hydrostatic pressure of the surrounding ice. Each run will recover up to 3.5 m of ice core.

Length and diameter (98 mm) of each core piece will be measured and carefully archived, then the cores will be cut into 1 m pieces. Afterwards continuous, high resolution (3 mm steps) dielectric profiling (DEP) is performed. On selected depth intervals 1 m long and 1 cm thick strips of ice will be cut from the core to be used for physical property measurements. These include visual stratigraphy and videographic documentation of grain boundaries and clathrates with the aid of a microscope. Planned re-measurements in the lab will prove the influence of relaxation processes on the ice crystal size. Furthermore He samples are cut at selected depth intervals and stored in evacuated stainless steel containers. The cores sealed in PE bags will be packed into well-insulated PP-boxes for aircraft transport to Neumayer and further ship transport in frozen state to Bremerhaven. All other samplings and analyses on the DML ice core will be carried out at Bremerhaven or in the respective labs in Europe.

Air chemistry:

The main focus of our work at Kohnen Station (EPICA-DML) is maintenance of the automated aerosol sampler designed for year-round measurements. The equipment was set up during last summer campaign in a purpose-built container located in the clean-air sector about 300 m northeasterly of the drilling trench. Electric power supply is realized by a combination of a wind turbine and solar panels, buffered by Ni/Cd batteries. The aerosol sampler consists of 22 filter holders, each one equipped with a teflon/nylon filter combination. Hence in total 22 aerosol samples per year are achievable with an individual sampling period of 15 days. Now the aerosol sampler has to be exchanged and the samples will be analysed by ion chromatography. The project is a close cooperation with the Institut für Umweltphysik, University of Heidelberg (IUPH). From December 2003 to February 2004 complementary air chemistry investigations are scheduled. A high volume aerosol-sampling device will be operated with an individual sampling period of 2 days. The samples are destined for analysis of the ionic composition of the aerosol and the content of cosmogenic radionuclide (^{210}Pb , ^7Be , ^{10}Be , ^{36}Cl) by the IUPH.

Geophysics:

At Kohnen Station a 3-component STS-2 broadband seismometer together with a RefTek data acquisition unit was installed last summer campaign. If the system has operated continuously under the severe environmental conditions the 6 GB flash disk may almost have reached its capacity. Data will then have to be transferred to a laptop or another PC. In case this experiment was successful this station would be an important supplementation to the existing network including the station SNAE at SANAE IV station.

Dallmann Laboratory (AWI) as annex to Jubany station (Argentina)

Season: 21 October 2003 – 09 March 2004

Area of activity:

Potter Cove, King George Island, South Shetland Islands, Antarctica.

Scientific goals:

Title: Impact of UV Radiation (UVR) on the Succession of Benthic Primary Producers in Antarctica

Type of activity: Land based and diving investigation

The succession of macro- and microalgal communities in the Antarctic will be investigated in field experiments under various UV radiation (UVR) conditions and in the absence or presence of grazers. The observed differences in the succession process will be correlated to physiological traits of single species, especially in spores and germlings, which are the most vulnerable stages in their life histories. Photosynthetic activity of the different developmental stages will be measured routinely. Additionally we plan the determination of pigment composition, C:N ratios, content of UV protective pigments and of possible DNA damage. The experiments will start in spring, concomitant to the time of highest UVBR, due to the seasonal depletion of the ozone layer in the Antarctic region. Supplemental laboratory experiments will be conducted to determine the effects of UVR on spores and germlings of individual species. In addition to the above analyses, we plan to examine of UVR induced damage of cell fine structure and of the cytoskeleton. The results of both the field and laboratory experiments will allow us to predict the consequences of enhanced UVR for the diversity and stability of the algal community.

GARS O'Higgins (DLR) as annex to General Bernardo O'Higgins (Chile)

The German Antarctic Receiving Station (GARS O'Higgins) is logistically operated as annex to the Chilean station General Bernardo O'Higgins. A contract describes in detail the regulations of co-operation between DLR and INACH (Chile). The responsibilities are allocated as follows:

DLR for GARS O'Higgins in general and for satellite data acquisition.

- BKG for geodetic observations
- INACH for co-ordination and logistic support (Transportation, fuel supply etc.)
- ESAT as subcontractor for technical operation of infrastructure

See details: <http://www.caf.dir.de/>
<http://www.ivscc.gsfc.nasa.gov>
<http://www.inach.cl>

Scientific objectives:

Satellite data acquisition for remote sensing (subsequently data processing, archiving, distribution to other scientific users will take place at DLR/DFD in cooperation with ESA and other organizations). Reception of satellite data are foreseen for ERS2, ENVISAT, TERRA, AQUA, NOAAxx, etc. Geodesy (VLBI, permanent GPS, PRARE, gravimetry, sea level sensors, etc.), evaluation and utilization are performed by BKG.

Planned activities for season 2003/2004:

Campaign TF031001:	28 October 2003 – 11 December 2003
Maintenance and stand by period:	09 December 2003 – 08 January 2004 (remote operation in case of special tasks)
Campaign TF040103:	06 January 2004 – 11 March 2004 (exact dates have to be confirmed)

Planned future activities:

Actual planning is based on continuation of all previous activities. The logistic background allows further technical and scientific preparations such as:

Upgrade TT&C

- Implementation ENVISAT reception and other satellites such as CHAMP, TERRA, AQUA, and others.
- Repair, maintenance, improvement of antenna system and subsystems for data recording and pre-processing.
- Installation of independent equipment for NOAA-AVHRR reception.
- Improvement of computer and network components for applications under remote control
- Reconditioning and extension of infrastructure (container for fuel, new electric ups power system, replacement of both old electric generators, air conditioning of operating rooms, etc.)

(d) Field parties and activities at other stations

Field Party: VISA validation campaign (AWI, TU Dresden, RAE)

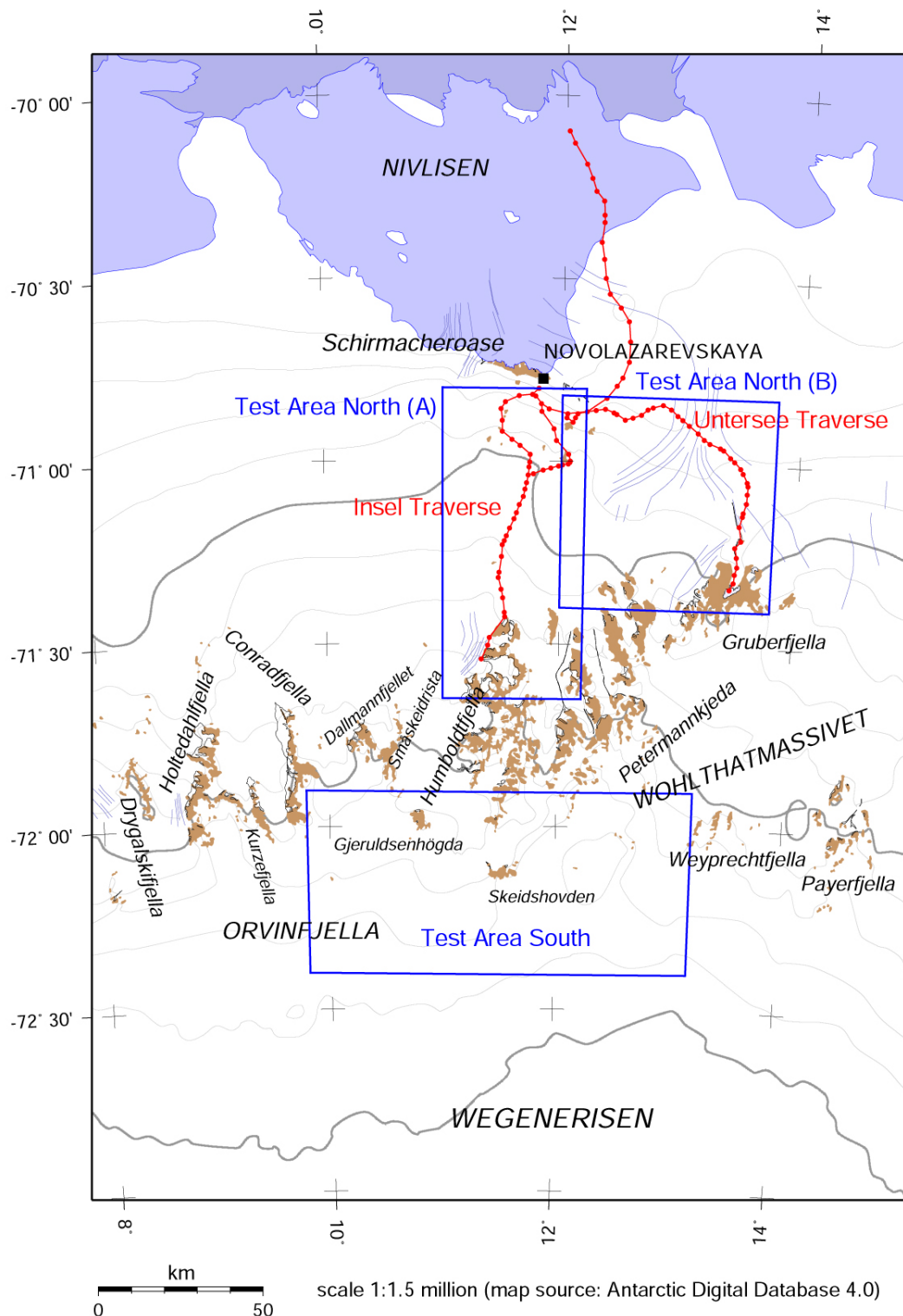
Officer in charge: Mirko Scheinert (Technical University Dresden)

Scheduled period: 10 November 2003 – 25 January 2004

Area: Novo Airbase (Russia), area between Schirmacher Oasis and Wohlthat Massif.

Scientific goals:

VISA (**V**alidation, **D**ensification and **I**nterpretation of **S**atellite Data for the Determination of Magnetic Field, Gravity Field, Ice Mass Balance and Structure of the Earth Crust in **A**ntarctica, Utilizing Airborne



MAP OF THE AREA OF INVESTIGATION WITH PLANNED TEST AREAS

and Terrestrial Measurements) is a mutual scientific project of TU Dresden and AWI, funded by the German Research Foundation.

VISA comprises relevant air-borne measurements (AWI), currently VISA III – see section VI (d) and ground-based measurements (TU Dresden), planned in the region between Schirmacher Oasis and Wohlthat Massif during summer season 2003/2004.

The polar regions and especially Antarctica with its ice sheet play a key role in the complex system "Earth". The interactions of the Antarctic ice sheet with the atmosphere, the world ocean and the solid earth significantly influence global processes like climate and changes of the global sea level. Therefore, the detailed knowledge of recent changes of the Antarctic ice sheet is of crucial,

interdisciplinary importance. All changes of the ice sheet have also to be regarded as mass changes, which yield temporal changes of the gravity field of the Earth. Hereby, mass transfers between the ice and the ocean as well as mass changes of the solid Earth due to load changes are included.

Such temporal variations of the Earth's gravity field are determined by satellite missions with a lifetime of up to five years. Hereby, one awaits also detailed statements on the status of the Antarctic ice sheet. The gravity field missions CHAMP (launched July 15, 2000), GRACE (launched March 17, 2002) and GOCE are capable to measure only an integrated gravity signal, which is also influenced by factors other than the mass balance of the ice sheet. Those factors are for example: changes in the lithosphere caused by postglacial rebound and tectonic processes as well as long-term changes in the atmospheric pressure variation.

It is necessary to record and to quantify all gravimetric signals in order to determine mass-induced effects and thus to minimize errors while calculating the mass balance of the ice sheet. Therefore, the results of the CHAMP, GRACE and GOCE missions should be validated by repeated airborne and terrestrial observations. Only such additional and densifying measurements in Antarctica will allow to make scientifically proven statements on the topical mass balance of the Antarctic ice sheet.

With an appropriate local and temporal resolution, geophysical, geodetic and glaciological observations are carried out for the purpose of the described validation in the frame of VISA project in Dronning Maud Land, Antarctica. Former airborne campaigns are a sound background for the flight programme this season. Terrestrial observations are now included along already investigated geodetic-glaciological traverses as well as within test areas of a size of about 2,500 to 5,000 km².

In the frame of the VISA project, five seismological stations will be deployed during the field campaign 2003/04 in the region of the Wohlthat Massif (eastern Dronning Maud Land, DML). These seismological stations are planned to be deployed together with the GPS-receivers on solid rock and will record data continuously. In addition to the GPS-measurements, the seismological recordings will contribute to a better understanding of neotectonic deformation processes and the dominating stress field in this region. One of the main goals is the mapping of seismic activity. As known from detections of the Neumayer seismological network and array, an increased seismic activity is observed in the coastal regions of western DML, especially in the regions of the Jutulstraumen glacier and offshore Kapp Norvegia. Due to the weak magnitudes of these events, they cannot be recorded on a global scale. Also in the coastal region of the Japanese Syowa station, weak local earthquakes were identified which are explained by postglacial rebound processes.

For the 2003/04 season five seismometers will be temporary deployed. One seismograph will be deployed at Novolazarevskaya Station, two seismographs also north of and two south of Wohlthat Massif. As far as possible, all stations will be deployed together with the GPS-receivers on outcrops.

Planned fieldwork:

The region Schirmacher Oasis – Wohlthat Massif is the first test area in the season 2003/04. Besides the airborne measurements the following terrestrial observations are planned to be carried out, which will be used for the detailed investigation of height changes, gravity changes and mass changes (and especially of the ablation/accumulation pattern):

- Geodetic measurements (static and kinematic GPS, precise gravimetry).
- Glaciological measurements (shallow firn cores, snow pits).
- Geophysical measurements (EMR).

In order to investigate the dynamics of the lithosphere, the following techniques will be applied:

- Geodetic measurements (GPS and gravimetry on bedrock: height and gravity changes)
- Geophysical measurements (seismology: estimation of the seismicity and focal mechanisms)

The region between Schirmacher Oasis and northern Wohlthat Massif is chosen to be the primary test area (cf. figure). This region is partly known because of earlier reconnaissance and measurements, especially along geodetic-glaciological traverses ("Untersee" traverse: Schirmacher Oasis – lake Untersee in the northern Gruber mountains, "Insel" traverse: Schirmacher Oasis – northern Humboldt mountains).

Comprising six scientists from Germany (see annex I (g)) and Russia (Areogeodezia), the VISA field group will operate on basis of field camps. The two Russian participant will join the field works. The other one will permanently stay at Novolazarevskaya station for geodetic measurements.

Logistics will be provided by AWI in cooperation with the Russian Antarctic Expedition (AARI/RAE). A respective cooperation agreement has been signed. Transport to/from Antarctica (personnel, equipment) will be provided within the framework of the DROMLAN flight program.

Field Party: Bioacoustic research on seals at the Drescher Inlet (AWI)

Officer in Charge: Jochen Ploetz (AWI)

Scheduled period: 10 December 2003 – 08 January 2004

Area: Drescher Inlet
RV Polarstern to Drescher Inlet will transport the seal and acoustic group during leg ANT XXI/2.

Scientific goals:

Marine mammals use sound for communication, prey detection and orientation. Derived from the hearing ability of humans (18 Hz – 20 kHz), sounds <18 Hz are termed infrasound, and >20 kHz ultrasound. Baleen whales and seals produce sounds in the infrasonic range, and in the range audible to humans. Toothed whale communication is mainly above 1 kHz, and their echolocation “clicks” are reaching far into the ultrasonic range. The sensitive hearing of marine mammals has led to concerns that intense anthropogenic sounds could impede communication, cause stress or damage hearing. The bioacoustic investigations at the Drescher Inlet are part of a new project on “Oceanic Acoustics” integrating the studies of geophysicists and zoologists to assess the need and scope of mitigation measures for the effects of anthropogenic sounds in the ocean, to develop acoustic census techniques and to examine the influence of man-made sound on the behaviour of marine mammals. The listening conditions in the Drescher Inlet are favourable because firm ice acts as an insulator to wind and wave noise so that, apart from ice rearing, little background noise will be present in the acoustic recordings. The first approach of our feasibility study comprises: (1) measurements of vocalizations of whales and seals and (2) observations of the behaviour of surfacing whales.

Planned work at sea:

Omni directional hydrophone systems will be lowered over the fast-ice edge to obtain sound records of whales and seals. The data will be used: (1) to identify and classify species-specific vocalizations, (2) to describe the time, frequency and amplitude characteristics of vocalizations, and (3) to analyse diurnal variation in vocalization rates of marine mammals. A digital video camera will be used to document the individual behaviour and the respiration (blow) rates of whales surfacing (between repetitive dives) directly at the ice edge. Finally, an infrared camera will be used to test whether surfacing whales can be detected by their own heat radiation.

Field Party:

Geophysical mapping of East Antarctic shield adjacent to the Transantarctic Mountains (BGR, NSF)

Officer in charge: Norbert Roland (BGR)

Scheduled period: 10 December 2003 – 5 February 2004

Area: central Transantarctic Mountains, including adjacent parts of the polar plateau between the Nimrod and Beardmore Glaciers

Scientific goals:

The primary objectives of this joint NSF-BGR project are to:

- characterize the magnetic and gravity signature of East Antarctic crustal basement exposed at the Ross margin (Nimrod Group).
- extend the magnetic data westward along a corridor across the polar ice cap in order to image the crust in ice-covered areas.
- obtain magnetic data over the Ross Orogen in order to image the ice-covered boundary between basement and supracrustal rocks, allowing us to better constrain the geometry of fundamental Ross structures.
- use the shape, trends, wavelengths, and amplitudes of magnetic anomalies to define magnetic domains in the shield, common building blocks for continent-scale studies of Precambrian geologic structure and evolution.

- obtain new ground-based geophysical and geological data to be used in checking and correlation of the geophysical data, as well as providing 3-D geological control on crustal structure in the Transantarctic Mountains.

Main scientific equipment: Aeromagnetic survey system installed on airborne platforms

Research platforms: DeHavilland DHC-6 twin otter aircraft, Helicopter AS350B2

The helicopter-borne and fixed-wing aeromagnetic investigations will take place from 14 December 2003 until 30 January 2004. Operational bases will be a camp on the Lennox King Glacier, with a smaller, satellite camp near Moody Nunatak. The Moody site will be the primary base of aircraft operations for this project.

Field Party:

Biological research on Antarctic seabirds, skuas, and Wilson's storm petrels (University Jena)

Officer in Charge: Peter Ulrich (University Jena)

Scheduled period: mid December 2003 – mid March 2004

Area: Potter Peninsula and Fildes Peninsula including Ardley Island, King George Island

Research platforms used: Dallmann Laboratory (Germany/Argentina)
Bellingshausen station (Russia)
Great Wall station (China)
Field hut on Ardley Island/Escudero station (Chile)

Scientific goals:

The density of scientific stations on the south-western part of King George Island has grown to the highest in the whole Antarctic and in 1979-80 Chile prepared a landing strip. These facilities have, furthermore, attracted growing numbers of scientists and tourists in transit. There have been diverse environmental effects from this concentration of human activity. The main thrusts of this project would be the counting and mapping of breeding birds (with the use of GPS and GIS) to allow comparisons between regions influenced by human activities with those without such influences. This also includes investigations how human activities (esp. air traffic and visitors) influence the birds in this region.

The second part of the program (ecology of Wilson's storm petrel (*oceanites oceanicus*) and skuas (*catharacta spec*) is the continuation of the investigation of population and feeding ecology of these two genus on King George Island.

The reproductive success of a sample of nests of Wilson's storm petrels has been followed for seven breeding seasons so far. We started a constant-effort monitoring site with a work scheme designed to minimize disturbance and follow the reproductive effort and the identity of a sample of nests effectively.

The aim of the study is to find links between the use of food and life history parameters of predators (Brown Skuas and South Polar Skuas) depending on the hierarchical status of each individual. The main part lies in the analysis of the connections between the place of an individual in a ranked order and the reproductive success resulting from the quality and quantity of its food intake.

Main scientific equipment used in the field:

Heart rate equipment, recorder and loud speakers for simulation experiment, video camera, GPS, metallic and plastic rings for banding.

Station: Amundsen-Scott - Amanda Neutrino Telescope (participation DESY)

National operator:

National Science Foundation/Raytheon Services in co-operation with University of Wisconsin (USA).

Participants:

DESY (Germany), University Wuppertal, University Mainz, LBNL Berkeley and 7 US Universities, 3 Swedish and 3 Belgian Universities, Imperial College London and University Caracas, Venezuela. For German participants see annex I (g).

Area of activity: Geographic South Pole, Amundsen Scott Station

Scientific goals:

Operation of the Amanda Neutrino Telescope. Investigation of high-energy cosmic neutrinos, search for dark matter and magnetic monopoles, monitoring of the Galaxy for Supernova bursts. Preparation of the construction of Ice Cube, the successor of Amanda.

Scientific Equipment: Amanda Telescope.

Planned activities:

- Time calibration of the Amanda-II neutrino telescope.
- Final upgrade of the full detector with Flash ADCs.
- Installation of new on-line processing software
- Installation of new servers and disk arrays
- Repair or exchange of failed electronics
- Test of first parts of the Ice Cube drilling system
- Installation of prototype ice tanks for an extensive air shower array, Ice Top.

Ship: RV Italica: Victoria-Land-Transect (participation AWI, University of Hamburg)

National operator: Italian National Antarctic Program (PNRA)
R/V Italica 2nd Oceanographic Campaign of 2004

Schedule:

R/V "Italica" will start working from Terra Nova Bay (TNB, Italian research base) on Feb. 3rd 2004. Work within the working area (see Table 1) will finish by Feb. 23rd 2004. "Italica" is expected back in Littleton (New Zealand) by March 6th 2004. As "Italica" does not start this leg from New Zealand, scientists will be transferred to TNB by plane via McMurdo Sound (US research base)

German Participants: see annex 1 (g)

Scientific goals:

Building up on our extensive knowledge of the benthic fauna of the Weddell Sea samples collected during this cruise will be used to answer questions in the fields of (1) biodiversity, (2) zoogeography, (3) physiology of aging, (4) ecology, and (5) microbiology.

A wide variety of crustacean samples will be used to clarify the long postulated but never proven assumption of circum-antarctic distribution of taxa in this group. Simultaneously crustaceans of the presumably same species will be collected in the Weddell Sea (by R/V "Polarstern"). Both types of samples will be compared using molecular methods and genetics (sample processing in home labs).

Collection of all size classes of Antarctic clams (*Adamussium colbecki*) will yield tissue samples, which can in turn be used to determine levels of enzyme activities and various other parameters. Mechanisms of aging can then be established for this species.

For Weddell Sea sponges a model to calculate age and growth rates of an individual has been established. Respiration experiments with Ross Sea sponges will clarify whether or not that model is also applicable for Ross Sea sponges.

Sponge samples taken along transects and in all depths will be analyzed for their infaunal bacterial community.

Area of activity:

The expedition will be led and coordinated on R/V "Italica". "Italica" works in close cooperation with the R/V Tangaroa (New Zealand). For each transect shallow stations will be sampled by SCUBA-diving using a zodiac. Intermediate water depths will be sampled using an attached research vessel. Deeper stations will be sampled directly by R/V "Italica". Five transects (see Table 1) along Victoria Land (Ross Sea, Antarctica) will be sampled for marine benthic fauna. Eight stations along each transect will be chosen according to water depth. Stations will cover shallow water (<30 m) to 500 m water depth.

Scientific equipment:

All research will be ship borne. Equipment used includes CTD-Rosette, Bioness, Isaac Kid, Agassiz Trawl, grab, ROV, plankton net and gill net.

Table 1: Starting points of transects for Victoria-Land-Transect Cruise of R/V Italica in February 2004

Transect	Area	Latitude (S)	Longitude (E)
1	Coulman Island	073° 14'	169° 45'
2	Cape Hallett	072° 20'	170° 05'
3	Cape Hallett	072° 12'	170° 30'
4	Possession Island	071° 45'	170° 55'
5	Cape Adare	071° 15'	107° 15'

Ship: Research icebreaker R/V Aurora Australis (participation AWI)

National operator: ACE CRC, Hobart, and Tasmania, Australia
Australian Antarctic Division; ·
IASOS, University of Tasmania, Australia; ·

Schedule: Research icebreaker R/V Aurora Australis
Cruise V 1 2003/2004 -
ASAC project: 9 September – 1 November 2003

German participants: see annex I (g)

Scientific goals:

By virtue of its wide-swath coverage, ability to penetrate cloud cover and polar darkness, and its ability to distinguish sea ice from open ocean, satellite passive microwave remote sensing is a key polar research tool. It is the primary source of data on the large-scale distribution of global sea ice, yielding maps of the latter on a daily basis.

Recently launched on both the NASA Aqua satellite as AMSR-E and the Japanese satellite ADEOS II as AMSR, the Advanced Microwave Scanning Radiometer is a new generation, high performance instrument that marks a significant improvement over its predecessor, the DMSP Special Sensor Microwave/Imager or SSM/I (which is still operational). It offers both a higher spatial resolution and accuracy, due to the availability of more channels/frequencies.

The applicability and reliability of AMSR-E data as a key source of climate-related information depends upon their adequate validation. This is doubly important given that new standard products are now being derived. An Antarctic validation programme is therefore necessary to determine the accuracy of the retrieved Antarctic sea-ice products and identify and quantify error sources.

Area and activity:

The sea-ice experiment will take place within the seasonal sea-ice zone to the south of the Antarctic Divergence and between approximately 110 and 140°E. The exact location will be chosen during the cruise itself, depending on ice conditions.

Scientific equipment:

AWI contributes to the sea ice validation programme as part of the ASAC project. Specially developed instruments for sea ice investigation will be flown by helicopter (EM-bird) and operated on board the ship (ground penetrating Radar), respectively.

SECTION VII: PRINCIPAL SCIENTIFIC EQUIPMENT

(a) RV “Polarstern”

Main Communication Systems:

- 2 INMARSAT-B plants, NERA Saturn B
- 1 IRIDIUM System, EUROCOM MARINE

Working Deck Areas and laboratories:

- After Deck: 40 m long, 14 m width (partly fixed installations), 560 sq m
- Helicopter Deck: 18 m X 15 m, 270 sq m
- 15 Lab-Containers (ISO 20 ft) could be installed inside the ship at E-Deck (10), at F-Deck (5)
- 5 dry laboratories, 2 wet laboratories, 3 PC laboratories

Winch Systems:

- A-Frame (30 to) at after deck
- 2 traction winches (pull 30 to)
- 2 hydrographical winches (pull 5 to), armoured coaxial cable (11 mm, length 7000 m
- 1 hydrographical winch (pull 5 to), armoured coaxial cable (18 mm, length 8000 m operated on the traction winches
- 2 geological winches (pull 20 to) wire (18 mm, length 10.000 m) operated on the traction winches
- 1 cantilevered beam (5 to)
- 1 cantilevered beam (20 to)
- main crane (25 to, 25 m forward)

Midships crane (15 to at 16 m and 10 to at 24 m)

After deck crane, port, 5 to at 18 m

Scientific instrumentation:

- fiber optic based 100 MB network, 200 TP, RJ45 ports and 800 fiber optic direct connections
- 3 X SISCO 6509 routers
- Main computer system, 3 X SUN Enterprise 2500
- 30 PC, display and working PC (COMPAQ Deskpro 6600)
- Data-Logging system: PODAS, about 120 sensors
- Atlas Hydrographic DS 2 multibeam swath bathymetry system
- Atlas Hydrographics PARASOUND, parametric sub-bottom profiler
- SIMRAD Deep Water Sounder (DWS 500), scientific and navigation sounder
- SIMRAD EK 60 fishery sounder, four frequencies (38, 70, 120, 200 kHz)
- SCANMAR net sonde
- Acoustic Doppler Current Profiler (ADCP)
- Short Base under Water Navigation System, POSIDONIA 6000
- 2 X SeaBird Thermosalinograph, SBE 21
- 1 X CTD system, SEABIRD SBE 911 Plus, Deck unit SBE 11 Plus and 24 X 12 rosette sampler
- XBT-System, Sippican & Nautilus
- Ship Magnetometer
- Gravimeter
- Seismic compressor for air gun, Leobersdorfer, 32 l /minute, 210 bar
- Air gun handling equipment.
- Meteorological observatory including:
 - Radio Sounding System, VAISALA
 - All sensors and data acquisition system
 - SeaSpace HRPT-Satellite image receiving system

(b) Neumayer station

Main Communication Systems:

- Permanent Data Link via INTELSAT to Bremerhaven, 128 kBit/s including Vox and Fax
- 1 Iridium system, Eurocom Marine
- 1 INMARSAT-A-Plant, Vox, Fax and Telex

Computer and Network:

- Fiber optic based 100 MB network, 50 TP, RJ45 ports, direct access to the Internet
- 2 SISCO 2621 routers
- Main computer system, 2 X SUN Fire V120
- 10 Windows PC
- Wireless LAN, CISCO Aironet
- 3 Printers, Scanner and copy machine

Meteorological Observatory:

- Radio Sounding System – Digi Cora III (Vaisala)
- All sensors and data acquisition systems needed for data logging: Wind speed, wind direction (two levels 2, 10 m), Temperature (two levels 2, 10 m), humidity (two levels 2, 10 m), solar radiation, visibility, ceiling (BSRN station)
- SeaSpace HRPT-Satellite image receiving system
- Data logging system

Geophysical Observatory:

- Magnetometer station
- Glaciological work and measurements
- Infra Sound Network (IS 27)
- Data logging systems
- Seismometer network at different locations up to 100 km distance from station consisting of seismological detection array VN A2 at Halvfjar-Ryggen and 3-component station VN A3 on Søråsen Ice Rise.
- HF data link to the main station.

Air Chemistry Observatory:

- Air sampler using high and low volume pumps and impactors
- Particle counters
- Aerosol Sampler
- Trace gases detectors (DOAS)
- C-13, C-14 Samplers
- Data logging systems

(c) Kohnen Station

- ice coring equipment
- combined bench for measuring dielectric properties (DEP) and density
- continuous aerosol sampling equipment
- automatic weather stations
- 3-component STS-2 broadband seismometer together with a RefTek data acquisition unit
- automated aerosol sampler for year-round measurements
- wind turbine and solar panels

(d) Dallmann Laboratory

- wet and dry laboratories
- controlled temperature room with aquaria
- light microphysical equipment
- instruments for physiological studies
- spectroradiometer
- Scuba diving equipment and facilities
- Zodiak and boats for diving and dredging in shallow waters

(e) GARS O'Higgins

- antenna system and subsystems for data recording
- Satellite data acquisition system
- VLBI
- Permanent GPS
- Gravimeter
- Sea level sensors
- Computers and network components

(f) Do228-101 aircraft (Polar2, Polar4)

- aero-gravimeter
- aero-magnetometer
- radio-echo sounder
- GPS
- basic meteorological instrumentation

SECTION VIII: TRANSPORT AND COMMUNICATION FACILITIES

(a) Surface transport vehicles

Neumayer station:	8 track vehicles (Pistenbulli)
	6 tank containers

55 cargo sledges
 10 Skidoos
 18 Nansen sledges
 2 mobile field stations
 7 living containers
 2 Chieftains
 1 snow cutter

Kohnen station: 1 track vehicle (Pistenbulli)

Dallmann Laboratory: None

GARS O'Higgins: None

(b) Marine transport facilities

Dallmann Laboratory: Zodiaks and one small boat

(c) Communication facilities

See annex III.

(d) Airfields

Snow runways will be prepared at Neumayer Station and at Kohnen Station. Fuller information is provided in the document "Antarctic Flight Information Manual" produced by the Standing Committee on Antarctic Logistics and Operations (SCALOP) of the Council of Managers of National Antarctic Programmes (COMNAP). The document is updated annually prior to the start of the Antarctic summer season.

SECTION IX: FACILITIES FOR RENDERING ASSISTANCE

(a) Aircraft

One fixed wing aircraft Do228-101 (Polar4) operating from Neumayer station, Novo Airbase, and SANAE IV station.
 Two helicopters MBB 105 CBS on board RV Polarstern. Fuller information see annex II and AFIM.

(b) Runways

Snow runway at Neumayer Station. Fuller information see AFIM.

(c) Fuel available

For emergency aviation kerosene (JP 8 or Jet A1) at Neumayer station.

(d) Navigation aids (on land)

See annex III and AFIM.

(e) Medical facilities

RV Polarstern: 1 physician, hospital, one berth.
 Neumayer Station: 1 physician, hospital with X-ray, EG, ECG and anaesthetic equipment, one berth.

Kohnen Station: 1 physician.

(f) Accommodation

Emergency accommodation can be provided at Neumayer Station (20 additional berths), and on board RV "POLARSTERN" (space is limited).

**SECTION X:
NOTICE OF EXPEDITIONS TO ANTARCTICA NOT ORGANIZED BY
THE FEDERAL REPUBLIC OF GERMANY BUT ORGANIZED IN,
CALLING AT, OR PROCEEDING FROM THE TERRITORY OF THE
FEDERAL REPUBLIC OF GERMANY (INCLUDING TOURISM)**

(a) Tourist ships:

MV "Hanseatic" 7 cruises: December 2003 to February 2004.
approx. 100 until 140 passengers each
total number: max. 600 passengers.

Operator: Hapag-Lloyd Kreuzfahrten GmbH
Ballindamm 25, D-20095 Hamburg, GERMANY

MV "Bremen" 6 cruises: December 2003 to March 2004
approx. 100 until 135 passengers each
total number: max. 1120 passengers.

Operator: Hapag-Lloyd Kreuzfahrten GmbH
Ballindamm 25, D-20095 Hamburg, GERMANY

MS "World Discoverer" 7 cruises: November 2003 to March 2004
approx. 110 passengers each.
total number: max. 770 passengers.

Operator: Society Expeditions GmbH
Marcusallee 9, D-28359 Bremen, GERMANY

MS "Vistamar" 3 cruises: December 2003 to January 2004
approx. 100 until 120 passengers each.
total number: max. 360 passengers.

Operator: Plantoers & Partner GmbH
Olbernstr. 76, D-28195 Bremen, GERMANY

Sailing yachts:

(a) SY Sarah W. Vorwerk 2 voyages

(b) SY Santa Maria 2 voyages

SECTION XI: NOTIFICATION OF UNOCCUPIED REFUGEES AND STATIONS

None.

SECTION XII: ANNUAL RETURN OF SPECIES KILLED OR CAPTURED

None.

SECTION XIII: NOTICE OF INTENDED USE OF RADIO-ISOTOPES ON SCIENTIFIC INVESTIGATIONS

None.

SECTION XIV: NOTICE OF INTENDED USE OF SCIENTIFIC RESEARCH ROCKETS

None.

SECTION XV: NOTICE OF SHIPS CARRYING OUT SUBSTANTIAL OCEANOGRAPHIC RESEARCH PROGRAMMES

None.

SECTION XVI SUMMARY OF INTERNATIONAL COOPERATION

(a) AWI expeditions:

Foreign scientist will work on board RV Polarstern on all Antarctic cruise legs. Fuller details see section VI and annex I.

At Kohnen station 7 scientists and drilling experts UK, Brazil, Italy, Denmark, Sweden, France, and Norway joining the ice coring activities in the frame of EPICA

(b) Summary of German scientific activities in co-operation with other national operators

Altogether 34 German scientists are going to directly join programmes of other national operators or are going to perform field parties in co-operation or with logistic support by other national operators.

LOCATION	NATIONAL OPERATOR	GERMAN PARTICIPANTS
<u>Stations:</u> Amundsen-Scott/Amanda	NSF	8 (DESY)
<u>Field parties/areas of activity:</u> VISA field party and aircraft missions Novo Airbase/Novolazarevskaya	RAE	13 (AWI, TU Dresden)
Biological field party/King George Island Bellingshausen, Great Wall, Escudero	RAE, INACH, CHINARE 20	4 (Univ. Jena)
Geophysical mapping/Nimrod Beardmore glaciers	NSF	4 (BGR)
<u>Ships:</u> RV Italica	PNRA	2 (AWI)
RV Aurora Australis	AAD	3 (AWI)

(c) Summary of logistic support provided by other national and non-governmental operators

Argentina: Instituto Antartico Argentino (IAA) supports transport of personnel and cargo by ship (MS Irizar) to and from Dallmann laboratory at Jubany station. Logistic support is provided to operate the Dallmann Laboratory during summer season.

Chile: a) Instituto Antartico Chileno (INACH) supports the operation of GARS O'Higgins (German Antarctic Receiving Station), which is operated as annex station at the Chilean station General Bernardo O'Higgins.
b) Air transport is provided for personnel and cargo to Jubany station via Frei air base.
c) Accommodation for biological field party (University Jena) is provided at Ardley Island.

- China: a) Chinese Antarctic expedition provides accommodation for biological field party (University Jena)) at Great Wall station.
- Russia: a) The runway at Novo Airbase is operated by the Russian Antarctic Expedition. This runway will be used for DROMLAN intercontinental and feeder flights.
b) Accommodation of the biological field party (University of Jena) at Bellingshausen station.
- South Korea: The South Korean expedition supports transport of cargo for Dallmann Laboratory at Jubany station.
- South Africa: Directorate for Environmental Affairs and Tourism (DEAT) closely co-operates with AWI for resupply of Neumayer station by ship SA Agulhas) at the end of season and supports German aircraft operations in Dronning Maud Land.
- UK: a) Support for ferry flights of two aircraft Do228-101 via Rothera and Halley as well as transport of cargo by one Twin Otter aircraft from Novo Airbase to Kohnen station in the frame of EPICA.
b) Ship transport is provided for personnel by RRS "E. Shackleton" from Dallmann Laboratory/Jubany station back to Port Stanley at the end of season.
- Tourist ships: MS "Bremen" and MS "World Discoverer" will support travel of scientists and transport of cargo for Dallmann Laboratory at Jubany station.
- INTAARI/ALCI: a) Transport of personnel and cargo in the frame of DROMLAN for the German expedition by aircraft IL-76TD and AN-2 operated by INTAARI/ALCI as a commercial operator.
b) Support of Do228-101 for logistic and scientific flight missions from Novo Airbase.

SECTION XVII: WASTE MANAGEMANT REPORT

Waste management report for the period 1 October 2002 to 30 September 2003 see annex IV.

PART II

MODIFICATIONS OF ACTIVITIES PREVIOUSLY REPORTED FOR 2003/2004

Comments and updates of previously notified activities:

German summer activities and overwintering at Neumayer station have been performed as notified for 2002/2003. There have not been any significant deviations.

SECTION II: DATES OF EXPEDITIONS

SECTION II (e):

Aircraft IL-76 TD performed all intercontinental flights in the frame of Dronning Maud Land Air Network (DROMLAN). The previously notified aircraft TU 154 was not used.

Annex II, part 1-5:

The AN-2 aircraft only completed one test flight for Kohnen station. Due to the high elevation of Kohnen station this aircraft could not perform feeder flights for personnel and cargo. Thus aircraft Do228-101 performed all feeder flights between Novo Airbase and Kohnen station. In the beginning of season one Twin Otter aircraft (BAS) supported Kohnen flight operations.

SECTION IV: PERSONNEL

Neumayer Station:

At Neumayer station Mike Hänle (cook of the over-wintering staff for 2003) had to be replaced because of medical reasons in January 2003.

Over-wintering staff 2003 (updated list):

Kapieske, Dr. Uwe	station leader, physician	AWI
Ramson, Wolfgang	station engineer	AWI/F.Laeisz
Müller, Ulf	electrician	AWI/F.Laeisz
Riess, Felix	electronics engineer	AWI/F.Laeisz
Schumann, Holger	cook	AWI/F.Laeisz
Käßbohrer, Johannes	scientist-air chemistry	AWI
Lange, Dietrich	scientist-geophysics	AWI
Bayer, Bettina	scientist-geophysics	AWI
Konantz, Bernd	scientist-meteorology	AWI
Weber, Ina	scientist-geophysics	AWI

GARS – German Antarctic Receiving Station

At GARS one more scientist worked at the station. Two technicians from INACH notified as NN are included in the updated list.

GARS updated list:

Zimmer, Alfons	chief scientist	DLR
Reiniger, Klaus	scientist	DLR
Ziegelturm, Werner	scientist	DLR
Specht, Michael	scientist	DLR
Artemenko, Ruslan	scientist	DLR
Wojdziak, Rainer	scientist	BKG
Ploetz, Christian	scientist	BKG
Schwarz, Walter	scientist	BKG
Ordenes, Julian	technician	INACH
Paplo, Colombo	technician	INACH
Wende, Willi	scientist	ESAT
Jaschke, Birger	technician	ESAT
Deschamps, Eduardo	technician	ESAT
de Silva, Nelson	technician	ESAT
Nascimento, Robson	technician	ESAT

Summary

All operations went well, no serious accidents or environmental damages occurred during the reporting period.

All expeditions could rely on a close and efficient international co-operation in logistic and science.

ANNEX I: PERSONNEL

(a) RV “Polarstern”

ANT XXI/2: Expedition staff

Surname	Given name	Institute/company
Ahammer	Heinz	AWI
Alm	Peter Hans	HSW
Arntz	Wolf	AWI
Avila	Conxita	CEAB Blanes
Ballesteros	Manuel	Uni Barcelona
Beyer	Kerstin	AWI
Bock	Christian	AWI
Bohlmann	Harald	Isitec
Bornemann	Horst	AWI
Brauer	Jens	HSW
Brey	Thomas	AWI
Brodte	Eva-Maria	AWI
Broyer, de	Claude	IRSNB Brüssel
Cope	Therese	BAS
Debenham	Casey	Uni Alaska
Dimmler	Werner	Fielax
Gerdes	Dieter	AWI
Gili	Josep Maria	CSIC Barcelona
Gutt	Julian	AWI
Heilmeyer	Olaf	Isitec
Hill	Heinz-Günther	DWD
Hirse	Timo	AWI
Isla	Enrique	CSIC Barcelona
Jacob	Ute	AWI
Janneck	Jürgen	AWI
Knust	Rainer	AWI
Koschnick	Nils	AWI
Kretschmann	Rolf-Paul	manpower
Lavaleije	Marc	NIOZ
Liebsch	Nikolai	IfM Kiel
Linse	Katrin	BAS
Mark	Felix	AWI
Michels	Jan	AWI
Mintenbeck	Katja	AWI
Mirhja	Mandana	AWI
Nyssen	Fabienne	IRSNB Brüssel
Pasternak	Anna	Shirshov Moskau
Plötz	Jochen	AWI
Potthoff	Michael	AWI
Raupach	Micheal	Uni Bochum
Rauschert	Martin	AWI
Redetzky	Jörg	HSW
Rodriguez	Estefania	CSIC Barcelona
Rodriguez y Baena	Alessia	Uni Genua
Rose	Armin	FIS Wilhelmshaven
Rossi	Sergio	CSIC Barcelona
Schulz	Harry	Fielax
Seidler	Kai	HSW
Simon	Elke	Simon Verlag
Simon	Joachim	Simon Verlag
Sonnabend	Hartmut	DWD
Teixido	Nuria	CSIC Barcelona
Thatje	Sven	AWI
Vareschi	Ekkehard	Uni Oldenburg
Vendrell	Begona	CSIC Barcelona
Watanabe	Yuuki	Uni Tokio
Wevill	David	Uni York
Witt	Ralf	AWI

ANNEX I: PERSONNEL

Zauke

Gerd-Peter

Uni Oldenberg

ANT XXI/2: Ship's crew (Reederei F. Laeisz GmbH)

Affiliation	Surname	Given name
Master	Domke	Udo
1. Offc.	Grundmann	Uwe
Ch. Eng.	Pluder	Andreas
2. Offc.	Spielke	Steffen
2. Offc.	Peine	Lutz
2 Offc.	Fallei	Holger
Doctor	Kohlberg	Eberhard
R.Offc.	Koch	Georg
1. Eng.	Delff	Wolfgang
2. Eng.	Ziemann	Olaf
3. Eng.	NN	
Electr.	Muhle	Heiko
FielaxElo	Baier	Ulrich
FielaxElo	Fröb	Martin
FielaxElo	Muhle	Helmut
FielaxElo	Roschinsky	Jörg
Boatsw.	Loidl	Reiner
Carpenter	Reise	Lutz
A. B.	Gil Iglesias	Luis
A. B.	Pousada Martinez	S.
A. B.	Winkler	Michael
A. B.	Guse	Hartmut
A. B.	Hagemann	Manfred
A. B.	Schmidt	Uwe
A. B.	Bastigkeit	Kai
A. B.	NN	
A. B.	Bäcker	Andreas
Mot-man	Ipsen	Micheal
Mot-man	Voy	Bernd
Mot-man	Elsner	Klaus
Mot-man	Hartmann	Ernst-Uwe
Mot-man	Grafe	Jens
Storek	Preußner	Jörg
Cook	Haubold	Wolfgang
Cooksmate	Völske	Thomas
Cooksmate	Silinski	Frank
1. Stwdess	Jürgens	Monika
Stwdess/KS	Wöckener	Martina
2. Stwdess	Czyborra	Bärbel
2. Stwdess	Silinski	Carmen
2. Stwdess	Gaude	Hans-Jürgen
2. Steward	Möller	Wolfgang
2. Steward	Huang	Wu-Mei
Laundrym.	Yu Kwok	Yuen

ANT XXI/4: Expedition staff

Surname	Given name	Institute/company
Bathmann	Ulrich	AWI
Baumann	Ludmilla	AWI
Bergström	Bo	BfF
Demmler	Petra	Journalistin
Dubischar	Corinna	AWI
Engeler	Alexander	AWI
Fach	Bettina	AWI
Flores	Hauke	ALTERRA
Fuentes		AWI

ANNEX I: PERSONNEL

Gensheimer	Michale	AWI
Guerra	Citlali	AWI
Herrmann	Regine	AWI
Kitchener	John	AAD
Kreibich	Tobias	Universität Bremen
Kruse	Svenja	AWI
Marx	Ulrike	AWI
Meyer	Bettina	AWI
Pakhomov	Evgeny	UBC
Rodenhagen	Johannes	FIELAX
Sauter	Eberhard	AWI
Schöling	Susanne	BfF
Siegel	Volker	BfF
Sinreich	Roman	IfU
Stübing	Dorothea	Universität Bremen
Teschke		AWI
Thiele	Deborah	IWC
Thomasson	Maria	BfF
van de Putte	Anton	LAE
Van Franeker	Jan	ALTERRA
Wegener	Jan	AWI
NN		IWC
NN		IWC
NN		IWC
NN		BfF
NN		Optimare
NN		Optimare
NN		Optimare
NN		AWI
NN		DWD
NN		DWD

ANT XXI/4: Ship's crew (Reederei F. Laeisz GmbH)

Affiliation	Surname	Given name
Master	Pahl	Uwe
1. Offc.	Grundmann	Uwe
Ch. Eng.	Schulz	Volker
2. Offc.	Thieme	Wolfgang
2. Offc.	Spielke	Steffen
2 Offc.	Grimm	Sebastian
Doctor	Baiersdorf	Hansheinrich
R.Offc.	Hecht	Andreas
1. Eng.	Erreth	Gyula
2. Eng.	NN	
2. Eng.	Simon	Wolfgang
Electr.	Holtz	Hartmut
Fielax-Elo	Dimmler	Werner
Fielax-Elo	Verhoeven	Roger
Fielax-Elo	Baier	Ulrich
Fielax-Elo	Piskorzynski	Andreas
Boatsw.	Clasen	Burkhard
Carpenter	Neisner	Winfried
A. B.	Kreis	Reinhard
A. B.	Schultz	Ottomar
A. B.	Burzan	G.-Ekkehard
A. B.	Schröder	Norbert
A. B.	Moser	Siegfried
A. B.	NN	
A. B.	Hartwig-Labahn	Andreas
Apprentice	Niehusen	Arne
Mot-man	Arias Iglesias	Enrique
Mot-man	Firtz	Günter

ANNEX I: PERSONNEL

Mot-man	Krösche	Eckard
Mot-man	Dinse	Horst
Storek	Beth	Detlef
Cook	Fischer	Matthias
Cooksmate	Tupy	Mario
Cooksmate	Möller	Wolfgang
1. Stwdess	Dinse	Petra
Stwdess/KS	Schöndorfer	Otilie
2. Stwdess	Streit	Christina
2. Stwdess	Schmidt	Maria
2. Stwdess	Deuß	Stefanie
2. Steward	Tu	Jian Min
2. Steward	Wu	Chi Lung
Laundrym.	Yu	Chung Leung

(b) SA “Aguilhas” voyage Neumayer – Cape Town

passengers

Janneck, Jürgen	engineer	AWI
Ahammer, Heinz	engineer	AWI
Witt, Ralf	technician	AWI
NN	student	Uni Hannover
Wuttke, Sigrid	scientist	Uni Hannover
Drücker, Cord	technician	AWI
Weynand, Markus	technician	AWI
Schubert, Holger	technician	AWI/F. Laeisz
Köhler, Jens	technician	AWI/F. Laeisz
Brehme, Andreas	technician	AWI/F. Laeisz
Krischat, Joachim	technician	AWI/F. Laeisz
Wauer, Ulrike	physician	AWI
Ackermann, Adolf	cook	AWI/F. Laeisz
Normann, Martin	technician	Kässbohrer
Ramson, Wolfgang	engineer	AWI/F. Laeisz
Müller, Ulf	electrician	AWI/F. Laeisz
Käßbohrer, Johannes	airchemist	AWI

(c) Aircraft Do228-101 (Polar2, Polar4)

Crew

Grillenbeck, Stefan	chief pilot	DLR
Weber, Phillip	pilot	DLR
Schirmer, Frank	technician	DLR
Hahn, Andreas	pilot	DLR
Otto, Wolf-Christian	pilot	DLR
Meinecke, Dirk	technician	DLR

Science

Steinhage, Daniel	scientific mission leader	AWI
Radke, Chris	aero-geophysicist	Optimare
Lampert, Phillip	aero-geophysicist	Optimare

(d) Neumayer Station

Over-wintering staff 2003

Kapieske, Dr. Uwe	station leader, physician	AWI
Ramson, Wolfgang	station engineer	AWI/F. Laeisz
Müller, Ulf	electrician	AWI/F. Laeisz
Riess, Felix	electronics engineer	AWI/F. Laeisz
Schumann, Holger	cook	AWI/F. Laeisz
Käßbohrer, Johannes	scientist-air chemistry	AWI
Lange, Dietrich	scientist-geophysics	AWI
Bayer, Bettina	scientist-geophysics	AWI
Konantz, Bernd	scientist-meteorology	AWI

ANNEX I: PERSONNEL

Weber, Ina	scientist-geophysics	AWI
Over-wintering staff 2004		
Müller, Dr. Anna	station leader, physician	AWI
Penske, Armin	station engineer	AWI/F.Laeisz
Kühl, Uwe	electrician	AWI/F.Laeisz
Peters, Frank	electronics engineer	AWI/F.Laeisz
Wagner, Klaus	cook	AWI/F.Laeisz
Richter, Astrid	scientist-air chemistry	AWI
Ehlers, Birte-Marie	scientist-geophysics	AWI
Waich, Gertrud	scientist-geophysics	AWI
Wohanka, Karolina	scientist-meteorology	AWI
Seasonal staff for 2003/2004		
Logistics		
Janneck, Jürgen	coordination, engineer	AWI
Ahammer, Heinz	engineer	AWI
Witt, Ralf	technician, maintenance (IS27)	AWI
Kretschmann, Rolf-Paul	technician	maintenance company
Hofmann, Jörg	scientist, IT maintenance	Fielax
Weidt, M.	student, side survey NM III	Uni Hannover
Maintenance team		
Sulzbach, Frank	technician	maintenance company
Hartmann, Marcel	technician	maintenance company
Pyrska, Boleslaw	technician	maintenance company
Bohlmann, Matthias	technician	maintenance company
Spinkel, Andre	technician	maintenance company
Suhl, Dennis	technician	maintenance company
Thierbach, Olaf	technician	maintenance company
Inspections		
Gernandt, Hartwig	NM station visit/inspection	AWI
Wagner, Eberhard	engineer, NM inspection	F. Laeisz
Ross-Reginek, Ellen	NM station visit/inspection	Umweltbundesamt (UBA)
Science		
König-Langlo, Gert	meteorologist	AWI
NN	geophysicist	AWI
Bassus, Rainer	engineer, maintenance IS27	BGR
Henger, Manfred	scientist	BGR
Hartmann, Gernot	scientist	BGR
Seckmeyer, Gunther	scientist, CASEUni Hannover	
Wuttke, Sigrid	scientist, CASEUni Hannover	
Möller, Hans-Joachim	weather forecaster	DWD
Brauner, Ralf	weather forecaster	DWD
<u>(e) Kohnen Station (EPICA)</u>		
Science and logistics staff		
Kipfstuhl, Sepp	physicist prop 1, leader scientific	AWI
Grigoriev, Dimitri	physicist prop 2United Kingdom	
Hamann, Ilka	scientist, logging	AWI
Lambrecht, Anja	geophysicist, DEP 1	AWI
Faria, Sergio	DEP 2	Brazil
Marino, Federica	packing	Italy
Wilhelms, Frank	scientist, chief driller	AWI
Sheldon, Simon	technician, driller mechanic	Denmark
Lawer, Gunther	technician, driller	AWI
Frenzel, Andreas	scientist, driller	AWI
Hörnby, Kerstin	technician, driller	Sweden
Lambrecht, Astrid	scientist, driller	AWI

ANNEX I: PERSONNEL

Schmitt, Jochen	technician, driller	Norway
Hofmann, Georg	technician, driller	France
Fritsche, Dietrich	scientist, driller	AWI-Potsdam
Kacsmarska, Marcena	technician, driller	Norway
Trenke, Marcus	technician, driller	AWI/F. Laeisz
Drücker, Cord	technician, leader logistics	AWI
Weynand, Markus	technician	AWI
Stoof, Günter	technician	AWI-Potsdam
Schubert, Holger	technician	AWI/F. Laeisz
Köhler, Jens	technician	AWI/F. Laeisz
Brehme, Andreas	technician	AWI/F. Laeisz
Krischat, Joachim	technician	AWI/F. Laeisz
Wauer, Ulrike	physician	AWI
Ackermann, Adolf	cook	AWI/F. Laeisz
Normann, Martin	technician, vehicles	Kässbohrer
Miller, Heinrich	scientist, station visit/inspection	AWI

(f) Dallmann Laboratory

Schwanitz, Max	station leader	AWI
Steinmetz, Richard	station leader	AWI
Wlochowicz, Dirk	technician	ISITEC
Zacher, Katharina	scientist	AWI
Wulff, Angela	scientist	Uni Göteborg
Zanker, Heidi	scientist	AWI
Kahles, Anja	scientist	Uni Jena
Gladbach, David	scientist	Uni Jena
Wilbert, Norbert	scientist	Uni Bonn

(g) GARS O'Higgins – German Antarctic Receiving Station

Zimmer, Alfons	scientific leader	DLR-DFD
Reiniger, Klaus	scientist	DLR-DFD
Ziegltrum, Werner	scientist	DLR-DFD
Specht, Michael	scientist	DLR-DFD
Kiening Rainer	scientist	DLR-DFD
NN	scientist	DLR-DFD
Wojdziak, Rainer	scientist	BKG
Ploetz, Christian	scientist	BKG
Schwarz, Walter	scientist	BKG
NN	scientist	BKG
Wende, Willi	scientist	ESAT
Jaschke, Birgit	technician	ESAT
Deschamps, Eduardo	technician	ESAT
De Silva, Nelson	technician	ESAT

(g) Other stations, ships and field parties

Field Party: VISA validation campaign (AWI, TU Dresden, RAE)

Scheinert, M.	scientist, geodesy	TU Dresden
Römer, Swen	scientist, geodesy	TU Dresden
Anschütz, Helgard	scientist, geophysics/glaciology	AWI
Rotschky, Gerit	scientist, geophysics/glaciology	AWI

Field Party: Bioacoustic research on seals at the Drescher Inlet (AWI)

Ploetz, Joachim	scientist, leader	AWI
Bornemann, Horst	scientist	AWI
Liebsch, Nikolai	scientist	IFM Kiel
Mirhaj Mandana	student	AWI
Watanabe, Yuuki	student	NIPR

ANNEX I: PERSONNEL

Field Party:

Geophysical mapping of East Antarctic shield adjacent to the Transantarctic Mountains (BGR, NSF)

Roland, Norbert	geologist	BGR
Damaske, Detlef	geophysicist	BGR
Möller, Heinz-Dieter	technician	BGR
Goldmann, Felix	technician	BGR

Field Party:

Biological research on Antarctic seabirds, skuas, and Wilson's storm petrels (University Jena)

Peter, Ulrich	biologist, leader	Jena University
Welcker, Jörg	PhD student	Jena University
Mustafa, Osama	PhD student	Jena University
Fröhlich, Anne	student	Jena University
Grunewald, Uwe	PhD student	Jena University
Ritz, Markus	PhD student	Jena University
Büsser, Christina	PhD student	Jena University
Gladbach, David	student	Jena University
Kahles, Anja	student	Jena University

Station: Amundsen-Scott - Amanda Neutrino Telescope (participation DESY)

Bernardi, Elisa	scientist	DESY
Schlenstedt, Stefan	scientist	DESY
Boersma, David	scientist	DESY
Leuthold, Matthias	scientist	DESY
Ackermann, Markus	scientist	DESY
Feser, Thomas	scientist	University of Mainz
Messarius, Timo	scientist	University of Wuppertal
Wagner, Wolfgang	scientist	University of Wuppertal

Ship: RV Italica: Victoria-Land-Transect (participation AWI, University of Hamburg)

Gatti, Susanne	scientist	AWI
Rehm, Peter	scientist	University of Hamburg

Ship: Research icebreaker R/V Aurora Australis (participation AWI)

Otto, Dennis	scientist	AWI
Pfaffling, Andreas	scientist	AWI
Richter, Ingo-Alexander	scientist	AWI

ANNEX II: AIR OPERATIONS IN 2003/2004

Part A

Contact Information - Air Operations

Country /Address	Operations/Logistics Contact Officers	Position	Office Telephone/Fax E-mail
GERMANY AWI Postfach 12 0161 D- 27515 Bremerhaven DLR Postfach 1116 D-82230 Wessling	Dr. Hartwig Gernandt Heinz Finkenzeller	Head of Logistics AWI Head of polar aircraft operations	phone: +49-471-4831-1160 fax:: +49-471-4831-1355 hgernandt@awi-bremerhaven.de phone: +49-8153-28-2982 fax: +49-8153-28-1347 heinz.finkenzeller@dlr.de

Part B

Yes, it is intended to conduct air operations in Antarctic during the forthcoming summer season for which the following information sheets are attached:

Sheet 1 Intercontinental Operation	Yes
Sheet 2 Continental Operations	Yes
Sheet 3 Ship Based Operations	Yes
Sheet 4 Other Airborne Operations (e.g. Balloons or Rockets)	Yes
Sheet 5 Aircraft Description	Yes

Part C

for details see AFIM (Antarctic Flight Information Manual): update submitted

	Station	Latitude/Longitude	INMARSAT
Primary Air Information Stations	Neumayer Station	70°39'S / 08°15'W	voice +871-1120-171 fax +871-1120-172 tlx +0581-1120 171 Iridium +8816-214-19947
Secondary Air Information	RV Polarstern	Southern Atlantic Atka Bay Weddell Sea	phone: +871-321-842-611 fax: +871-321-842-612 tlx: +0581-321-842-614

ANNEX II: AIR OPERATIONS IN 2003/2004

PART 1 INTER-CONTINENTAL FLIGHTS

Route	No. of Flights	Flight Level or Altitude (ft/m)	Approximate Date or Period of Flight(s)	No. and Type of Aircraft per Flight
Bremerhaven Punta Arenas Rothera, Halley Neumayer	1 ferry flight southbound 1 ferry flight northbound	variable max. 7 500 m	November - December 03 February - March 04	2 aircraft Do228-101 (Polar2 and Polar4)
Cape Town Novo Airbase Cape Town DROMLAN international project	roundtrip flight ¹⁾ round trip flight ¹⁾ round trip flight ¹⁾ roundtrip flight ¹⁾ round trip flight ¹⁾ round trip flight ¹⁾		06 November 2003 10 November 2003 27 November 2003 03 December 2003 25 January 2004 10 February 2004	1 aircraft IL-76 TD 1 aircraft IL-76TD 1 aircraft IL-76TD 1 aircraft IL-76TD 1 aircraft IL-76TD 1 aircraft IL-76TD

¹⁾ Intercontinental flights are performed as part of the Dronning Maud Land Air Network (DROMLAN). DROMLAN has been established as an international project by Belgium, Finland, Germany, India, Japan, Norway, Russia, South Africa, Sweden, UK. Novo Airbase is operated by Russia (for details see AFIM). Aircraft IL-76TD will be operated by INTAARI/ALCI as non-governmental operator. DROMLAN national operators have concluded charter contracts with INTAARI/ALCI.

PART 2 INTRA-CONTINENTAL FLIGHTS

Routes	Flight Hours	Flight Level or Altitude (m)	Approximate Date or Period of Flight(s)	No. and Type of Aircraft per Flight
Neumayer Novo Airbase Kohnen E-Base SANA E IV	scientific missions 150 hours logistic missions 200 hours	500 – 3.600 m without oxygen	27 November 2003 until 15 February 2004	1 aircraft Do228-101 Polar2 2 aircraft Do228-101 Polar4 and Polar2
Neumayer Novo Airbase	logistic missions about 76 hours ¹⁾ for AWI activities	100 - 2.000 m without oxygen	08 November 2003 until 15 February 2004	2 aircraft AN-2 ¹⁾

¹⁾ Logistic missions with AN-2 are part of the feeder flight service of DROMLAN from Novo Airbase bound for various stations in Dronning Maud Land.

PART 3 SHIP BASED OPERATIONS

Route	No. of Flights	Flight Level or Altitude (ft/m)	Approximate Date or Period of Flight(s)	No. and Type of Aircraft per Flight
RV POLARSTERN ANT XXI/2 Southern Atlantic Atka Bay, Drescher Inlet Weddell Sea	occasionally	200 – 1 500 m	November 2003 until January 2004	2 helicopters MBB BO 105 CBS 5

ANNEX II: AIR OPERATIONS IN 2003/2004

PART 4 OTHER AIRBORNE OPERATIONS (e.g. Balloons, Rockets etc.)

Route	No. of Flights	Maximum altitude (ft/m)	Type of device	Other information
Neumayer Station 70°39'S; 08°15'W	one per day	approx. 36.000 m	rubber balloon with radiosonde and electrochemical ozonesonde	atmospheric research

PART 5 AIRCRAFT DESCRIPTION

Full name of Aircraft	Short Name	F/R (a)	W/S (b)	Number of Aircraft	Flight Level or Altitude (ft/m) (c)	Pax Capacity	Radio Equipment
MBB BO 105 CBS 5	BO 105	R	S	2	100 – 1500 m	4	VHF HF
Do228-101 Polar2 Polar4	DO 228	F	W or S	2	100 – 3600 m without oxygen	6	INMARSAT C VHF HF

Full name of Aircraft	Navigation Equipment	Max. Range (d)	Type of Fuel	SAR
MBB BO 105 CBS 5	Mag. Compass Gyro ADF GPS	100 NM	JP 8	Maritime and polar survival clothes Survival bag Capacity for patients' transportation
Do228-101 Polar2 Polar4	GNS-X (GPS) INS Mag. Compass ADF TCAS	800 NM	JP 8	Maritime and polar survival clothes Survival bag Capacity for patients' transportation automatic pattern

- (a) Fixed ((F) or rotary (R) wing
- (b) Wheeled (W) or ski (S) equipped
- (c) Refer to explanatory notes, item 3
- (d) Indicate helicopter maximum range over water in brackets

Descriptions of aircraft operated in the frame of DROMLAN are notified by the responsible operators.

Annex III: INFORMATION ON TELECOMMUNICATIONS EQUIPMENT AND SCHEDULES FOR THE YEAR 2003 - 2004

COUNTRY: FEDERAL REPUBLIC OF GERMANY

ADDRESS FOR CORRESPONDENCE ON THIS INFORMATION:

FOUNDATION
ALFRED WEGENER INSTITUTE FOR
POLAR AND MARINE RESEARCH
COLUMBUSSTRASSE
D- 27568 BREMERHAVEN

STATION: DALMANN/JUBANY

CALL SIGN:

LATITUDE: 62° 14'S

LONGITUDE: 58° 40'W

ALTITUDE: 10M

INMARSAT B (ATLANTIC EAST)

TEL.: 00870 - 382-623-512
E-Mail: Dalmann@awi-bremerhaven.de
In the Subject: User name

FAX: 00870 - 382-623-513

TRANSMITTERS				RECEIVERS				REMARKS
TYPE	FREQUENCY BANDS	TPYES OF EMISSIONS, POWER	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.)	TYPE	FREQUENCY BANDS	TYPES OF RECEPTION	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
TRANSCEIVERS								
Rhode & Schwarz XK859C1	1.5-30 MHz	A1A,J3E (USB, LSB) H3E, F1B, J2B 1000 W	synthesized 10 Hz steps		1.5-30 MHz	<u>A1A, A1B, J3E (USB, LSB)</u> H2A, H2B, H3E, R3E, F1A, F1B, J2B	synthesized 10 Hz steps	Transceiver and Transceiver (Main-Emergency)
YAESU FT-757 GX	1.5 - 30 MHz	A1A, J3E (USB, LSB) A3E, G3E 100 W	synthesized 10 Hz steps		05.-30 MHz	A1A, F1A J3E (USB, LSB) A3E, F3E, G3E	synthesized 10 Hz steps	Portable Transceiver
ICOM M700TY	1.6-23 MHz	A1A, F1A, J3E (USB, LSB) H3E 150 W	synthesized 100 Hz steps		1.6-24 MHz	A1A, F1A, J3E (USB, LSB) H3E, A3E	synthesized 100 Hz steps	Field Transceiver
AEG TELEFUNKEN SE 6861	1.5-30 MHz	A1A, J3E (USB) 20 W	synthesized 100 Hz steps		1.5-30 MHz	A1A, J3E USB	synthesized 100 Hz steps	Field Transceiver
				Rohde & Schwarz EK 085	10 kHz-30 MHz	<u>A1A, A1B, A2A, A2B, A3E, H2A, H2B, H3E, R2A, R3E, J2A, J2B, J3E (USB, LSB) F1A, F1B, F1C</u>	synthesized 10 Hz steps	Receiver
				DEBEG 7204	10 kHz-30 MHz	A1A, A2A, J3E (SB), A3E, H3E, F1A, F1B	synthesized 100 Hz steps	Receiver
AEG TELEFUNKEN	Maritime VHF: ch.6,	G3E	Crystals		Maritime VHF: Ch.	G3E	Crystals	Local and Vehicles

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FAX: 00870 - 382-623-513

TRANSMITTERS				RECEIVERS				REMARKS
TYPE	FREQUENCY BANDS	TPYES OF EMISSIONS, POWER	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.)	TYPE	FREQUENCY BANDS	TYPES OF RECEPTION	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Telecar 9-160, TE + Power Amplifier	9, 10, 15, 16	10 W			6, 9, 10, 15, 16 156,300-156,800 MHz			Transceiver
AEG TELEFUNKEN Teleport N	Maritime VHF: Ch. 6,9	G3E	Crystals		Maritime VHF: Ch. 6, 9 156,300-156,450 MHz	G3E	Crystals	Portable Transceiver 10 W Talk
BECKER AR 2011/25 AR 2009/25	Air-VHF: 118,0-135,975 MHz	A3E 10 W	synthesized 25 kHz steps		Air-VHF: 118,0-135,975 MHz	A3E	synthesized 25 kHz steps	Local and Field Transceiver
Satcom Terminals: Magnavox MX 2400 (DEBEG 3240)	1636.5-1645.0 MHz	Telex voice/fax data	25 kHz steps		1535.0-1543.5 MHz	Telex voice/fax data	25 kHz steps	INMARSAT Standard Local Satcom

Annex III: INFORMATION ON TELECOMMUNICATIONS EQUIPMENT AND SCHEDULES FOR THE YEAR 2003 - 2004

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TRANSMITTERS				RECEIVERS				REMARKS
TYPE (1)	FREQUENCY BANDS (2)	TPYES OF EMISSIONS, POWER (3)	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.) (4)	TYPE (5)	FREQUENCY BANDS (6)	TYPES OF RECEPTION (7)	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.) (8)	 (9)
INTELSAT PERMANENT LINK, NEUMAYER-AWI- BREMERHAVEN 128 Kbit/S German Telekom data, voice, fax	6351.7425 MHz	20 W	Fixd		4127.2825 MHz		Fixed	Anntenna: Andrew 3,7 m Radom: Ratech, 5,5 m as Housing for the Antenna; operational since 13.2.1999

Annex III: INFORMATION ON TELECOMMUNICATIONS EQUIPMENT AND SCHEDULES FOR THE YEAR 2003 - 2004

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In the Subject: User name

FAX: 00870 - 382-623-513

Antennas		FACSIMILE		TELEPRINTER		REMARKS	LIST OF AVAILABLE FREQUENCIES
TYPE	Azimuth in Degrees or Omni	Type and Index of Co-operation	DRUM SPEED	Type	Speed (Baud)		
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
HF-Multi-Dipole	N-S and E-W						Fixed Point-to-Point (short range): 3212, 4023, 5177, 6834, 7830 kHz Ships: all permitted maritime HF-radio freq.-ba Watch: 6264, 8265 kHz (U) Aircrafts: 3046, 4703.5, 5703, 6693, 8992.5, 11190, 13225.5, 15026, 17983 kHz Air-VHF: 118.0 - 135.975 MHz
HF-Diversity (for Revr.)	Omni, N-S, E-W						
VHF-9-E1.-Yagi	Rotable 0...360°						

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Antennas		FACSIMILE		TELEPRINTER		REMARKS	LIST OF AVAILABLE FREQUENCIES
TYPE (10)	Azimuth in Degrees or Omni (11)	Type and Index of Co-operation (12)	DRUM SPEED (13)	Type (14)	Speed (Baud) (15)	(16)	(17)
VHF-Vertical (2x)	Omni						Watch: 121.500 MHz 123.450 MHz (summer Maritime VHF: 156.300-156.800 MhZ (ch. 6, 9, 10, 15, 16)
Parabolic in Radome	Automatic Tracking	for MX 2400 - INMARSAT A (Atlantic-East- Satellite)					
Landmobile TT-3001 Opt. 002	Omni	for TT-3022A- INMARSAT C					Watch: ch. 9, 16

Annex III: INFORMATION ON TELECOMMUNICATIONS EQUIPMENT AND SCHEDULES FOR THE YEAR 2003 - 2004

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In the Subject: User name

FAX: 00870 - 382-623-513

Time Schedule with other Stations UTC			Frequencies used		Circuit		Conduct		Remarks
Station worked (18)	open (19)	close (20)	TRANSMITTING (21)	Receiving (22)	Type Emiss. (CCIR (23)	Type of Traffice (24)	Simplex or Duplex (25)	Sideband (26)	(27)
Halley	1200	1215	9106	9106	J3E	Metobs	SX	USB	daily
Sanae IV	1130	1200	5190 or 6210	5190 or 6210	J3E	MetObs	SX	USB	daily
Rothera	1155	1215	9106 or 11055	9106 or 11055	J3E	MetObs	SX	USB	daily
Amundsen-Scott	1000	1015	11553	11533	J3E		Sx	USB	sunday

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TYPE (1)	FREQUENCY BANDS (2)	TPYES OF EMISSIONS, POWER (3)	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.) (4)	TYPE (5)	FREQUENCY BANDS (6)	TYPES OF RECEPTION (7)	FREQUENCY SELECTION (CRYSTAL, VFO, ETC.) (8)	(9)
INMARSAT B Plant STN Used for Voix, Fax and Data 64 kBit/s	Standard	20 W		INMARSAT B Plant STN	Standard	Vox, Fax, Data		

Antennas		FACSIMILE		TELEPRINTER		REMARKS	LIST OF AVAILABLE FREQUENCIES
TYPE (10)	Azimuth in Degrees or Omni (11)	Type and Index of Co-operation (12)	DRUM SPEED (13)	Type (14)	Speed (Baud) (15)	(16)	(17)
Flat Pannel - Antenna for INMARSAT							

Annex III: INFORMATION ON TELECOMMUNICATIONS EQUIPMENT AND SCHEDULES FOR THE YEAR 2003 - 2004

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INMARSAT B Plant STN Used for Voix, Fax and Data 64 kBit/s	Standard	20 W		INMARSAT B Plant STN	Standard	Vox, Fax, Data		

Antennas		FACSIMILE		TELEPRINTER		REMARKS	LIST OF AVAILABLE FREQUENCIES
TYPE (10)	Azimuth in Degrees or Omni (11)	Type and Index of Co-operation (12)	DRUM SPEED (13)	Type (14)	Speed (Baud) (15)	(16)	(17)
Flat Pannel - Antenna for INMARSAT							

PART 1 GENERAL

Country : GERMANY

Waste management official: Heinz Ahammer (only for logistics department)

Job title: Logistics Coordinator

Postal address: Alfred Wegener Institute
for Polar and Marine Research
Postfach 12 01 61
D-27 568 Bremerhaven
Germany

Telephone number: 0471-48 31 1163

Facsimile number: 0471-48 31 1355

Telex number: 283 695 polar d

Electronic mail number: hhammer@awi-bremerhaven.de

PART 2 TRAINING OF EXPEDITION MEMBERS

- 1) Is training given to expedition members on waste management? :
- | | Yes | No |
|---------------------------------|-----|----|
| prior to leaving for Antarctica | X | |
| while in Antarctica | X | |
| written material available | X | |
- 2) Are expeditions advised of any PVC products being provided?
- | | Yes | No |
|--|-----|----|
| | X | |
- 3) Are expeditions advised that pesticides, polychlorinated biphenyls (PCBs), non-sterile soil or polystyrene beads, chips or similar forms of packaging shall not be sent to the Antarctica?
- | | Yes | No |
|--|-----|----|
| | X | |

PART 3 WASTE REDUCTION PROGRAMS

- 1) Waste reduction implementation during last year
- Clean-up of residues of domestic solid waste and all other waste of over-wintering 02/03. Use of special polyethylen- and steel-container with special closure mechanism for removal of all domestic solid waste from Treaty Area.
- 2) Programs planned during the reporting year to clean up waste disposal and abandoned work sites:

Not applicable in 2002/2003 season

- 3) Arrangements for analysing or monitoring the environmental effects of Antarctic wastes and waste management systems:

Instructions on scientific and logistics personnel to reduce packing material and to guarantee its complete removal.

- 4) New waste reduction initiatives planned for introduction in the reporting year:

none

PART 4 DISPOSAL ROUTES OF WASTES

Waste and scrap from traverses and Kohnen station were transported to Neumayer station.

Waste from field automatic seismological station was transported to Neumayer station.

The complete waste from the Neumayer station including traverses and field stations has been removed from the Treaty area on board RV POLARSTERN and SA AGULHAS.

PART 6 INVENTORY OF PAST ACTIVITIES

Name	Position (Lat, Long)	Extent of area (m ²)	Type of Activity	Period of Occupation		Average Level of Activity	Remnants & Date Last Visited	Disposal Plans & Dates
G.v. Neum.St.	70°37S/08°22W	olde Station	Overw. St.	80/81	91/92	permanent	March 1992	fully removed
Neumayer St.	70°39S/08°15W	new Station	Overw. St.	91/92	present	permanent	Summer 01/02	waste removed
Forster St.	70°46S/11°50W		Summer St.	87/88	95/96	permanent	Summer 95/96	fully clean up
Filchner St.	77°09S/50°38W		Summer St.	81/82	Febr. 1997	Jan.-Febr.	Febr.99	fully removed
Drescher St.	72°53S/19°10W		Summer St.	85/86	94/95	Jan.-Febr.	Summer 95	fully removed
Drescher	72°53S/19°10W		Field camp	1998		Jan.-Febr.	Summer 98	fully removed
Windy Corner	70°17S/09°46W		Fuel Depot	Dec.89	Febr. 2000	15*200 L Jet A1	Febr. 00	Waste removed
DML 05	75°05'S/0°04'E		Summer St.	Jan./ Febr.	errection	Jan. – Febr.	Febr. 00	Waste removed
new name:				2001	present			
Kohnen St.	75°05'S/0°04'E		Summer St.	Jan./ Febr.	present	Jan. - Febr.	Febr. 02	Waste removed
Dallmann	62°14S/58°40W		Summer St.	1994	present	Oct. - May	Summer 01/02	Annex to Jubany, Argentina
Laboratory								
Kottas Basis	74°12'S/9°45'W		Fuel Depot	1985	present	1.600 L Jet A1	Dez. – Febr. 2000	waste removed
Camp			Airfield			14.650 L Fuel	Dez. 01 – Febr. 02	

PART 7 INDIVIDUAL WASTE MANAGEMENT SUMMARY

Name of Vessel	FS POLARSTERN	Position (Scotia and Antarctic Peninsula)	Weddel Sea,	Location Category-	Coastal ice free	☐
(For field camps give total number of sites)		Number of days occupied	52		Inland ice free	☐
		(For vessels, give number of days in Antarctic Treaty area)			Coastal ice sheet	☐
					Inland ice sheet	☐
					Ice shelf	☐
		Average daily population:			Vessel	☒
		-- Summer	approx. 44 Crew and approx. 50 scientists and logistics personnel			☐

GROUP 1 - SEWAGE & DOMESTIC LIQUIDS

TYPE	DISPOSAL METHODS								Quantity *	Comments
	Removed from Treaty area	Removed to station	Sea or sea ice	Ice pit	Maceration	RBC	Inceneration (describe type)	Other		
Sewage	cleaned		X							
Black water	cleaned		X							
Sewage treatment /eg. RBC) residue	X									

GROUP 2 - OTHER LIQUID CHEMICALS & WASTES (INCLUDING FUELS & LUBRICANTS)

TYPE	DISPOSAL METHODS			Quantity *	Comments
	Removed from Treaty area	Removed to station	Other		
Photographic chemicals	X			(Optional)	
Other liquid chemicals	X				
Fuels	X				
Arctic Diesel	X				
Slop	X				
Lubricants	X				
Heavy metals and/or harmful persistent compounds	X				
Other liquid wastes (please list)					

* Quantities: L = Litres, CM = Cubic Metres, Kgs = Kilograms, No. = Number

GROUP 3 - COMBUSTIBLE WASTES

TYPE	DISPOSAL METHODS								Quantity *	Comments
	Removed from Treaty area	Landfill	Removed to station	Sea or sea ice	Open burn	Basic incineration	High temp. incinerator	Other		
Paper products	X								(Optional)	
Untreated wood	X									
Treated wood										
Food scraps	X									
PVC	X									
Polyurethane & polystyrene foams	X									
Other plastics	X									
Rubber	X									
Cultures of micro-organisms										
Other (please list)										
Note - show in "Comments" column whether combustion emissions are controlled or monitored and provide details separately.										

GROUP 4 - OTHER SOLID WASTES

TYPE	DISPOSAL METHODS							Quantity *	Comments
	Removed from Treaty area	Landfill	Removed to station	Sea or sea ice	Ice pit	Remains on site	Other		
Glass	X							(Optional)	
Aluminium	X								
Other metals	X								
Batteries	X								
Non-liquid chemicals	X								
Fuel drums (empty)	X								
Incinerator residue	X								
Other solid wastes (detail)									

* Quantities: L = Litres, CM = Cubic Metres, Kgs = Kilograms, No. = Number

GROUP 5 - RADIOACTIVE WASTES

TYPE (Please list isotopes)	DISPOSAL METHODS		Quantity *	Comments
	Removed from Treaty area	Other		
none			(Optional)	

* Quantities: L = Litres, CM = Cubic Metres, Kgs = Kilograms, No. = Number

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PART 7 INDIVIDUAL WASTE MANAGEMENT SUMMARY

Name of Fixed site/Field Camps in general	Neumayer station	Position (Lat, Long)	70° 39 S/08° 15 W	Location Category-	Coastal ice free	☐
(For field camps give total number of sites)	and traverses	Number of days occupied	permanently		Inland ice free	☐
		(For vessels, give number of days in Antarctic Treaty area)			Coastal ice sheet	☐
		(Summer-visitors: approx. 77 days)			Inland ice sheet	☐
		Average daily population:			Ice shelf	☒
		-- Summer	max 49 Pers.		Vessel	☐
		-- Winter	10 Pers.			☐

GROUP 1 - SEWAGE & DOMESTIC LIQUIDS

TYPE	DISPOSAL METHODS								Quantity *	Comments
	Removed from Treaty area	Removed to station	Sea or sea ice	Ice pit	Maceration	RBC	Inceneration (describe type)	Other		
Sewage			X					biologically cleaned	14 -21 CM per week	per summer
								biologically cleaned	6 - 10 CM per week	per winter
Grey and black water			X							
Sewage treatment, sludge	X									

GROUP 2 - OTHER LIQUID CHEMICALS & WASTES (INCLUDING FUELS & LUBRICANTS)

TYPE	DISPOSAL METHODS			Quantity *	Comments
	Removed from Treaty area	Removed to station	Other		
Photographic chemicals				400 L	
Other liquid chemicals	X			50 L	desinfection solution
Fuels; Diesel (Slop)	X			1400 L	
Fuels				1800 L	
Fuels					
Lubricants					
Heavy metals and/or harmful					
Persistent compounds					
Other liquid wastes (please list)	X			60 L	old paints

* Quantities: L = Litres, CM = Cubic Metres, Kgs = Kilograms, No. = Number

GROUP 3 - COMBUSTIBLE WASTES

TYPE	DISPOSAL METHODS								Quantity *	Comments
	Removed from Treaty area	Landfill	Removed to station	Sea or sea ice	Open burn	Basic incineration	High temp. incinerator	Other	(Optional)	
Paper products	X								14,6 CM	
Untreated wood	X								1,8 CM	
Treated wood										
Food scraps	X								27,8 CM	
PVC	X								0,5 CM	
Polyurethane & polystyrene foams										
Other plastics										
Activ carbon	X								0,3 CM	
Cultures of micro-organisms										
Oily rags	X								1,0 CM	
Granulate	X								5,0 CM	
Quarz sand	X								0,2 CM	
Note - show in "Comments" column whether combustion emissions are controlled or monitored and provide details seperately.										

GROUP 4 - OTHER SOLID WASTES

TYPE	DISPOSAL METHODS							Quantity *	Comments
	Removed from Treaty area	Landfill	Removed to station	Sea or sea ice	Ice pit	Remains on site	Other	(Optional)	
Glass	X							5,3 CM	
Scrap	X							6,1 CM	
Other metals	X							5,0 CM	
Batteries	X							0,7 CM	
Non-liquid chemicals									
Fuel drums (empty)									
Filter lubricants	X							0,5 CM	
Sewage sludge	X							0,6 CM	
domestic wastes	X							7,0 CM	
fluorescent lamp	X							90 No.	
toner cartridge	X							0,1 CM	

* Quantities: L = Litres, CM = Cubic Metres, Kgs = Kilograms, No. = Number

GROUP 5 - RADIOACTIVE WASTES

TYPE (Please list isotopes)	DISPOSAL METHODS		Quantity * (optional)	Comments
	Removed from Treaty area	Other		
none				

* Quantities: L = Litres, CM = Cubic Metres, Kgs = Kilograms, No. = Number

PART 7 INDIVIDUAL WASTE MANAGEMENT SUMMARY

Name of Fixed site/Field Camps in general	Kohnen station	Position (Lat, Long)	75°05 S, 0°04 E	Location Category-	Coastal ice free	☐
	Waste and scrap from traverses and station were transported back to Neumayer station	Number of day occuoied	70		Inland ice free	☐
		Average daily population	27		Coastal ice sheet	☐
					Inland ice sheet	☒
					Ice shelf	☐
					Vessel	☐

PART 7 INDIVIDUAL WASTE MANAGEMENT SUMMARY

Name of Fixed site/Field Camps in general	GARS O'Higgins	Position (Lat, Long)	63°19 S / 57°54 W	Location Category-	Coastal ice free	☒
	Annex to General Bernardo O'Higgins (Chile)	Number of days occupied	about 170		Inland ice free	☐
		Average daily population summer	10		Coastal ice sheet	☐
		winter			Inland ice sheet	☐
					Ice shelf	☐
					Vessel	☐

PART 7 INDIVIDUAL WASTE MANAGEMENT SUMMARY

Name of Fixed site/Field Camps in general/Vessel	Dallmann Laboratory	Position (Lat, Long)	62°14'S,58°40'W	Location Category-	Coastal ice free	☐
	Annex to Jubany station (Argentina)				Inland ice free	☒
(For field camps give total number of sites)		Number of days occupied	163		Coastal ice sheet	☐
		(For vessels, give number of days in Antarctic Treaty area)			Inland ice sheet	☐
		Average daily population:			Ice shelf	☐
		-- Summer	70 Jubany; 12 Dallmann Laboratory		Vessel	☐
		-- Winter	20 Jubany; none Dallmann			☐

GROUP 1 - SEWAGE & DOMESTIC LIQUIDS

TYPE	DISPOSAL METHODS								Quantity *	Comments
	Removed from Treaty area	Removed to station	Sea	Ice pit	Maceration	RBC	Inceneration (describe type)	Other		
Sewage			X						biologically cleaned	45 CM per week Sommer
Grey water			X						biologically cleaned	13 CM per week Winter
Sewage treatment sludgeX	x									appr 300 Kgs per year