CRUISE PARTICIPANT'S HANDBOOK

Information For Research Cruise Participants

Aboard ships of the British Antarctic Survey

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Please print double sided

Web Links

BAS INTERNET / intranet LINKS

1) Principal Scientists Handbook – Details of how to lead a cruise on BAS ships**:**
http://www.antarctica.ac.uk/living_and_working/research_ships/2002-549.pdf

2) Information on a specific cruise. Open the site and select the cruise you want to view.
http://www.antarctica.ac.uk/living_and_working/research_ships/cruises/index.php

3) Cabin Booklet – Ship Safety and Domestic Information**:**
ES: http://www.antarctica.ac.uk/living_and_working/research_ships/rrs_ernest_shackleton/es_cabin_info.pdf
JCR:

4) Virtual Tour: Plans/layouts of the ship and photos
JCR: http://www.antarctica.ac.uk/living_and_working/virtual/james_clark_ross/index.php
ES: http://www.antarctica.ac.uk/living_and_working/virtual/ernest_shackleton/index.php

5) Your personal itinerary

6) Visitors to the Antarctic: Personal, Financial and Medical requirements**:**
http://www.antarctica.ac.uk/staff/antarctic_visitors/introduction.php

7) Participants' Handbook: A guide to going South with British Antarctic Survey:
http://www.antarctica.ac.uk/staff/antarctic_visitors/handbook/handbook.pdf

8) Code of practice for safety in laboratories on JCR:
http://www.antarctica.ac.uk/living_and_working/research_ships/laboratories_code_of_practice.pdf

9) BAS Ships - General ship information and specifications**:**
JCR: http://www.antarctica.ac.uk/living_and_working/research_ships/rrs_james_clark_ross/technical_data.php
ES: http://www.antarctica.ac.uk/living_and_working/research_ships/rrs_ernest_shackleton/technical_data.php

10) Computing Facilities on ships
JCR: http://www.antarctica.ac.uk/staff/antarctic_visitors/computing/rrs_james_clark_ross.php
ES: http://www.antarctica.ac.uk/staff/antarctic_visitors/computing/rrs_ernest_shackleton.php

11) The Five year rolling Science and Logistics programme, Itineraries, Current Positions, List of Agents, Ship Diaries and Webcams for both ships
http://www.antarctica.ac.uk/living_and_working/research_ships/index.php

The following are only available on the BAS internal intranet (not the public website). Please contact Chris Hindley, BAS Ship Operations Manager cjhh@bas.ac.uk if you would like a copy.

12) Cargo Deadlines:
http://basweb/departments/purchasing_and_shipping/deadlines.html

13) Waste Management Handbook
http://basweb/information/manuals/docs/waste_management_handbook.pdf

14) Ship Safety Management System (ISM)
http://basweb/ships/sms/index.php

15) Science equipment deployed from JCR previously
http://basweb/ships/sms/rrs_james_clark_ross/science_instructions.php

CONTENTS

INTRODUCTION

This handbook should be read by all scientific cruise participants on BAS ships. It aims to provide background to the environment in which you will be living and working and advice on how to prepare for your cruise. On the reverse of the title page there are numbered links to both the BAS Internet and Intranet sites which expand on the various topics. To avoid repeating frequent links throughout this guide, an appropriate link number is shown eg [6]. This guide will give you an idea of what to expect and in turn what is expected of you before, during and after your cruise, and should be read in conjunction with the ships Cabin Booklet. [3]

If you are a Principal Scientist you must read the Principal Scientists Handbook [1], which outlines the steps that should be taken in undertaking the leadership of a cruise. This may be of interest even if you are not leading the cruise.

For information regarding activities in Antarctica (off the ship) please refer to the BAS Participants' Handbook. [7]

WELCOME from THE DIRECTOR of BAS

Dear Colleague,

This Handbook has been prepared to assist you, in your research cruise, in order that you might make best use of BAS ship facilities. The Handbook is applicable whether you are a BAS/NERC employee, or from a University or other external organisation.

BAS shore staff, marine staff and scientists must work closely together to achieve a successful and productive cruise. That requires an understanding of the regulatory framework and working practices within which a research ship must operate safely and efficiently. This handbook aims to provide that understanding.

Shipping, as an industry, is tightly regulated by the International Maritime Organisation (IMO). There is an International Safety Management (ISM) Code applicable to all ships including those operated by BAS. This regulates safety, environmental protection and security through the Ships Safety Management System and regulates all activities on the ship. Cruise participants are as much involved in the regime as are the ship's officers and crew. [14]

BAS ships have an excellent record of supporting science at sea, and all BAS staff involved in supporting cruises on shore or at sea are dedicated to making your cruise a success. Please let us know of any concerns that you may have and we will do our best to allay them.

Your main contact in BAS for your cruise is Chris Hindley, Ship Operations Manager (01223 221497 cjhh@bas.ac.uk) but please check with your Principal Scientist first as the information or answer to your question may already have been given.

Section 1

PRE-CRUISE PLANNING

PERSONAL

MEDICAL [6]

For most cruises BAS has a doctor or paramedic onboard, appointed by the BAS Medical Unit (BASMU). If one is not carried, due to the nature of the cruise or area of work; an officer with First Aid / Medical training will be responsible for medical matters onboard.

For BAS staff, the pre-employment medical, with later reviews based on age, forms the basis for long-term service including cruises. Non BAS personnel must complete a medical questionnaire, sent before the cruise (or downloaded from the web [6]) which will be assessed by BASMU. The final decision on fitness will rest with the Senior Medical Officer. Examinations can normally be completed by your G.P. Blood testing is a requirement regardless of the need to attend an examination.

DENTAL

There will not normally be a dentist onboard. You must ensure a good standard of dental health through your own dentist before joining the cruise.

PERSONAL MEDICATION

If you are taking prescribed drugs at the time of joining the ship, or are on a course of medication approved by a practitioner at the time of the medical examination, you should inform the Principal Scientist before joining, and the Master and Doctor when you join. Take a sufficient supply of your medication for the whole cruise plus the time it will take to return home (with a margin in case of delays).

PREGNANCY

If you are pregnant, BAS requires a written risk assessment for your specific case to be prepared through the Principal Scientist and discussed and agreed in writing with your own GP before the cruise. This is in your best interests, and ensures that the ship's Master is aware of potential problems. The Risk Assessment should take into account a wide range of risks including, but not limited to: -

Lone working	Heavy manual labour
Potential evacuation ashore	Limited medical facilities onboard
Ship movement and bad weather	Geographical area
Working practices	Use of hazardous materials
Term of the pregnancy	Age

and the need to involve shore authorities if anything untoward occurs.

BAS Directorate has the ultimate decision as to whether you are accepted for the cruise. The matter will be handled discreetly and sensitively.

INSURANCE

You should be aware that NERC/BAS does not insure its ships, staff or the equipment they carry. **All non-BAS staff should arrange appropriate Personal Insurance cover.**

Only NERC staff are covered for the consequences of accident or illness onboard.

If you bring your own equipment you should satisfy yourself and your parent organisation that you fulfil any insurance requirements deemed to be necessary, including cover for periods in transit.

In the event of an accident on the ship, BAS will appoint an Agent ashore to assist with arrangements. All costs incurred will be charged to the individual who may then claim costs back through the insurance company or their parent organisation. **You are advised to carefully check that you have adequate personal insurance cover and that your parent organisation recognise this liability to allow for these potential costs.**

Organisation insurance policies which provide an element of medical cover whilst staff are abroad may also include aspects of hospital cover and repatriation to the UK. Please note that when this type of cover is activated will depend on arrangements the Master may make in endeavouring to land the individual concerned. No actions of the insurance company or individual, will override the responsibilities of the Master or BAS. Any remedial/support actions by the parent organisation or an insurance company will be subject to agreement by BAS, the Agent and the Master.

SAFETY TRAINING

First Aid

BAS recommends that all cruise participants undertake First Aid At Work training although it is not mandatory. However if you do not have a First Aid At Work Certificate this could restrict your recreational activities should you get the opportunity to go ashore in Antarctica or other BAS operational areas.

If you are spending any significant time in Antarctica in transit or working you will be required to hold a First Aid At Work Certificate.

BAS staff can access the BAS First Aid Policy on the Intranet as follows:

http://basweb/information/admin_notices/2005/01_05.pdf

External Participants are welcome to contact BAS Personnel Section for further information.

Personal Survival

To work on open decks, you must have completed an **STCW 1995 Personal Survival Techniques course**. You must send a copy of a valid certificate to BAS before joining AND take the ORIGINAL certificate with you to the ship. BAS will organise courses for BAS employees, but visiting scientists (including AFI projects) must organise and fund their own training.

Your ORIGINAL CERTIFICATE MUST BE TAKEN ONBOARD; otherwise you will not be permitted to work on open decks.

Details of training colleges in the UK and overseas can be obtained from BAS. If you are involved in specialist high-risk activities such as (but not exclusively) diving, working with explosives, and radio chemicals you must attend appropriate training courses/demonstrate experience. Details of experience and training should be shown in Risk Assessments.

TRAVEL REQUIREMENTS

BAS will make the travel arrangements for your cruise. There is no opportunity for independent travel en route to your Antarctic destination. There is however scope for individuals to make their own travel arrangements when returning from Antarctica (you must ensure BAS Operations Group are aware of your plans). **All personally arranged travel is entirely the responsibility of the individual**. Refer to BAS notice: Independent travel when returning from overseas duty:

http://basweb.nerc-bas.ac.uk/operations/uploads/personnel_moves/store/travel_to_uk_under_own_arrangements.pdf

If you make private arrangements for after you leave the ship you must agree this with your Principal Scientist and inform BAS Ops (or the Master) of the details.

Do not leave home without your passport. It should have at least six months validity in excess of your planned date for return home at the end of the cruise. Some countries require this for transit. BAS can advise on the necessary visa, vaccination/inoculation[6], introduction letters (not usually necessary) and any other special requirements. If you fly to the Falklands via the RAF airbridge you will need a Yellow Fever inoculation to satisfy RAF regulations.

It is your responsibility to ensure that all your travel documents are correct for your planned itinerary. [5] If you are at all unsure please contact BAS Ops for advice.

WORK RELATED

RISK ASSESSMENTS

Make sure you have read, fully understood **and are committed to the Risk Assessments** for your cruise work. Remember you may be working in close proximity to someone with other tasks and you should be fully aware of the Risk Assessments for their activities as well. We take your safety very seriously and breaches of RA Controls and Precautions will not be tolerated.

LABORATORY FACILITIES

Refer to Annex 1 for details of Lab facilities etc on BAS ships. We hope these details will assist in planning your onboard workspace. Refer to the Lab Code of Practice for use of labs.[8]

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH

Staff accustomed to handling hazardous materials, such as chemicals, in a shore laboratory will find that the marine environment presents them with particular, unfamiliar problems. This should be considered when preparing Risk Assessments. All hazardous substances must be stored and used in a manner that withstands the ship's motion. Adequate means for safe transportation of chemicals to and around the ship must be ensured.

EXPLOSIVES

If you plan to use explosives discuss this with the Principal Scientist. Refer to:
The BAS "Code of Practice - Explosives".
http://basweb.nerc-bas.ac.uk/information/manuals/explosives/code_june_2007.pdf
BAS has an Explosives Officer who will be pleased to advise.

GASES

FULL PRESSURE GAS BOTTLES ARE NOT PERMITTED IN LABORATORIES (except for special cases of pure air, which are subject to prior agreement with BAS and the supply of special release arrangements). It is the science team's responsibility to supply any special fittings and piping required for connection to instruments in the laboratory and to reduce the gas pressure for its end use.

The scientific team should ensure gas bottles are supplied in appropriate stillages for securing on external decks. Requirements should be discussed at the cruise planning stage. Adequate protection must be supplied for bottle regulators to avoid impact damage whilst the bottles are being handled, and corrosion while at sea.

SCIENCE EQUIPMENT – PREPARATION AND TRANSPORT

The BAS Purchasing/Shipping Section deals with the purchase and shipping of all materials and equipment for BAS, it manages the loading and discharge of cargo from BAS ships and the freighting of cargo commercially by sea and air.

Please make BAS (Purchasing)Shipping Section aware in the early stages of planning (at the latest at the PS Workshop/meeting) of requirements for shipping equipment for the cruise, and returning equipment, data and samples home.

BAS ships support many scientific cruises, and also carry cargo for many separate destinations. **It is critical that all equipment and materials loaded on board are properly marked and documented to ensure correct identification and shipment.** BAS will require details of all non-BAS equipment to be shipped and it must be packed, marked and documented to the BAS specifications. Please adhere strictly to the following requirements:

Packing - General Equipment

All equipment should be adequately packed to ensure that it can withstand multiple handling and stowage with other cargo. Packing is particularly important if equipment is being transported by commercial means (sea or air). BAS do not have packing facilities onboard ship or in Stanley.

Packing - Hazardous Materials

All materials and substances of a hazardous nature including explosives, flammable liquids and solids, radioactive substances, poisons and corrosives must be packed, marked and documented to comply with International Regulations for the carriage of Dangerous Goods by Sea (IMDG Code). This involves packing in UN tested and approved packs by authorised persons. Before BAS can agree to shipment, details of hazardous material must first be sent to the BAS Shipping Section for checking and authorisation.

Documentation

Lists of equipment for delivery to BAS ships should always include the following information:

Case Number	Package	Contents	Value	Weight	Dimensions	Volume
Bas will allocate number series.	Case, Bundle, Drum etc	Detailed list of contents	For customs.	in Kg	in Cms	in cubic metres

In the case of Hazardous cargo and Specimens there are special Bills of Lading (BOLs) requiring extra information.

From these lists BAS prepares the shipping documents and cargo manifest required by agents, the ship and Customs & Excise. Please note that customs entries are required for the equipment

of each cruise participant, this facilitates the re-importation of equipment back into the UK. The information is also used for planning the stowage of equipment onboard to ensure that it can be accessed when required.

Submission of Lists

Delivery & Loading
BAS Shipping Section require the cargo listing a minimum of two weeks before receipt into the docks is planned and the deadlines for the latest receipt of cargo can be found on the Purchasing and Shipping Intranet page [14] or by contacting BAS Shipping Section.
Installation of any equipment on the ship (including in laboratories) will be as agreed by the Principal Scientist and the Chief Officer, but all equipment requires documentation

Non BAS Freighted Equipment

Commercial Shipment
It is possible to ship cargo to meet BAS vessels at non UK ports possibly in South America or Stanley. **It should be noted that these options are costly and can be fraught with difficulty.** Due to cargo limitations some scientific equipment may be freighted commercially at BAS discretion

Seafreight

There are monthly non-BAS sailings to Stanley at present. From receipt of cargo into a UK port it takes six weeks to discharge at Stanley. The above instructions for BAS cargo also apply to commercial seafreight.

Airfreight

It can be difficult to airfreight equipment and materials to meet BAS ships. However if you decide to do this, BAS Shipping Section must be consulted to ensure that import documents are correctly worded and that our shipping agent is aware. Please note that air freighting hazardous materials is normally not possible, and this includes several types of batteries. It is not reliable to count on airfreight opportunities.

BAS CANNOT GUARANTEE ACCESS TO ANY RAF or LAN CHILE AIRFREIGHT FACILITIES TO THE FALKLANDS.

Section 2

LIVING AND WORKING ONBOARD

LIVING

An explanatory 'Welcome Aboard' Cabin Booklet is in each cabin.[3] This explains ship routines, meals, domestic facilities and SAFETY - **EVERYONE MUST READ IT.**

TRAVEL TO/ARRIVAL AT THE SHIP

BAS Ops will advise you of your travel details in good time. You may view your travel arrangements online. [5]

In each port BAS has an appointed agent who will meet and assist you to join the ship. Assistance is arranged with agents by BAS but you can contact them direct in an emergency. They are in constant touch with the ship and BAS. [11]

You will usually join the ship a few days prior to sailing. If you arrive before the ship, accommodation will be arranged after liaison with your Principal Scientist.

Once on board, hand your passport and Personal Survival Training Certificate (if held) to the Purser and he will assist you in completing the formalities for sailing.

Read the Safety Notices in your cabin.

You will receive a comprehensive safety briefing shortly after boarding.

ACCOMMODATION ONBOARD

Scientific staff (except the Principal Scientist) will be accommodated in two, three or four berth cabins, each with bathroom/shower. However whenever possible we will allocate minimum occupancy within each cabin. It is your responsibility to keep your cabin clean and tidy.

Keys to cabins will be issued by the Purser on joining. Cabins should not be locked at sea but they should be locked in port, when unoccupied.

Scientific staff have full access to the Officers'/Scientists' lounge and the saloon on the JCR and all public rooms on Ernest Shackleton. You are asked to observe the dress code in the Cabin Book [3] when using these rooms and comply with all signs regarding working gear/footwear.

ACCESS WITHIN THE SHIP

There are certain areas of the ship that are out of bounds for scientific personnel unless specific permission has been granted. These include the Bridge, the Engine Control Room and all machinery spaces, the galley, non-scientific storerooms, engineering workshops, crew accommodation (and on JCR the Crew Mess Room and Crew Bar).

These constraints are for safety reasons and to permit the crew privacy in their own accommodation.

Should you wish to see the engine room the marine staff will be happy to organise a visit, please ask the Chief Engineer.

Scientific staff are requested to allow the catering staff adequate access to public rooms to facilitate cleaning.

ALCOHOL AND DRUG POLICY

BAS has an Alcohol and Drug policy. Refer to the Cabin Booklet for details.[3]

BAS operates a zero tolerance policy towards the use of banned drugs.
Anyone found infringing this policy will be discharged from the ship and may be liable to further disciplinary measures. You may also be breaking local laws when the ship is in port which can result in arrest and criminal proceedings.

RELATIONS WITH THE CREW

Marine staff serve onboard for much longer periods than scientific staff. The ship is their home and we ask you to respect the privacy of their accommodation. Marine staff are often on watches so please be quiet in crew accommodation areas.

The deck crew may advise scientists that certain activities on the external decks of the ship are unsafe. Please accept that they have a responsibility for the safety of scientists as well as themselves, and act as requested.

If you require assistance from the ship's deck staff, you should direct your requests to the Chief or Duty Officer to avoid any misunderstandings concerning the working regime.

COMMUNICATIONS

There are good communications facilities for both telephone and email onboard BAS ships and an ability to access the Internet although at peak times this can be slow. Please refer to the ship's Cabin Booklet for detailed information.[3]

GOING ASHORE IN ANTARCTICA (and BAS operational areas)

If during your cruise you have the opportunity to go ashore or visit an Antarctic Base you will be given a briefing on the ship. Limits of travel and activity will be explained as will all safety and environmental aspects. All instructions issued by the Base Commander or the briefing Officer onboard MUST be followed.

There is general information about living and working in Antarctica in the BAS Participants Handbook. [7]

WORKING

Science cruises typically last two to six weeks, during which time scientific work may continue 24 hours a day, 7 days a week, with personnel working 12-hour shifts. The Principal Scientist is responsible for cruise personnel, applying the hours of work/rest requirements, and for nominating a watch leader for each shift.

LABORATORY USAGE

Ships Laboratories are small and usually shared by different projects. It is important for everyone to be considerate of other users and work in a tidy manner. It is your responsibility to keep your workspace clean and tidy. All laboratory regulations and guidelines apply as they do in the UK. However there are extra risks in ship laboratories and the ship-specific Lab. Code of Practice and Cruise Risk Assessments should be thoroughly read before undertaking any lab work onboard. The Code of Practice and the Risk Assessments for the cruise are available in the laboratories.[8]

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH

Many substances are capable of damaging your health. They include not only recognised hazard substances, such as chemicals used in laboratory processes, but also domestic substances. Product guidelines should be read and adhered to.
Compliance with COSHH is BAS policy.

The ship carries COSHH hazard data sheets. The Safety Officer (Chief Engineer Officer) is responsible for these files, which are kept in the Ship's Office and the laboratory spaces. In addition, a database of chemical hazard information is available on the ship's computers. Hazard data sheets and COSHH assessments shall be consulted before use of substances.

Hazard data sheets shall be obtained from the supplier when any substance without a filed hazard data sheet is brought onboard. The new hazard data sheet shall be passed to the Safety Officer.

DISPOSAL OF HAZARDOUS MATERIAL

SHIP'S DRAINS
Please refer to the notices in each working area onboard regarding ship's drainage systems and disposal of waste material.

NO radioactive substances, toxic compounds, hazardous chemicals or biological specimens are to be disposed of via laboratory sinks.

For general waste disposal refer to the Cabin Book [3], the ships Waste Management Policy and the Waste Management Handbook. [13]

NOTHING OF ANY DESCRIPTION IS EVER TO BE THROWN OVERBOARD.

ACCIDENT AND INCIDENT REPORTING

ALL accidents, incidents and "near misses" must be reported to the ship's Safety Officer.

BAS ships have a good safety culture and reporting of 'near misses' **experienced OR witnessed** can help prevent future accidents.
Reports are composed without identifying specific people whenever possible, and you don't have to have been personally involved to make a report.

Do something positive to protect yourself and your colleagues in the future. Learn from "Near Misses".

BIG OR SMALL – REPORT THEM **ALL**

Section 3

END OF CRUISE ARRANGEMENTS

DOMESTIC ARRANGEMENTS

At the end of the cruise, vacate your cabin as instructed by the Master/Purser. Cabins and work spaces must be left clean and tidy. (As you would hope to find them).

ALL KEYS MUST BE RETURNED TO THE PURSER OR CHIEF OFFICER BEFORE YOU LEAVE THE SHIP.

Ensure you collect your passport and PST Certificate from the Purser; remove all personal effects from scientific spaces, and properly dispose of rubbish.

Please make sure that you remove, pack and mark ALL your equipment. Unmarked equipment is almost impossible to trace after a lapse of several months, (and probably several science teams and hundreds of tons of equipment and cargo being moved on and off the ship in various ports). BAS is not responsible for anything left on the ship once you have left unless it has been properly documented and packed.

Check that the Master/Purser knows your travel arrangements, so he can ensure that the Agent supplies necessary transport etc.

RETURN OF EQUIPMENT/SAMPLES

GENERAL EQUIPMENT

Please address all queries to the BAS Purchasing and Shipping Section.

Unless otherwise arranged, all science equipment will be returned to the UK on BAS ships at the end of the Antarctic season.

Science equipment and materials should be returned in the same packaging and retain the same case number. This will simplify documentation and allow the original list to be modified with the deletion of items not being returned. Bills of Lading MUST be submitted through the Chief Officer.

As far as sea conditions allow, all your own equipment should be packed, marked and documented as directed by the Chief Officer BEFORE the ship arrives at the final port.

HAZARDOUS WASTE

All hazardous waste is returned to the UK for disposal. Waste should be documented on a Bill of Lading and the packages marked and identified by numbers issued by the Chief Officer. Refer also to the BAS Waste Management Handbook [13] and Ships Waste Management Policy for guidance.

SAMPLES

Samples collected during a cruise must be documented on a Bill of Lading and the packages identified by a number issued by the Chief Officer. The description of the specimens should be as complete as possible. This is particularly important where import licences are required. The special BOLs for specimens MUST be used.

PERSONAL EFFECTS

All personal effects left unaccompanied on board must be returned to the UK as cargo. A C3 Declaration and a Bill of Lading must be completed before each owner leaves the ship - without these documents BAS cannot obtain clearances from HM Customs in the UK when the goods are landed.

BAS CLOTHING

BAS Clothing kit bags must be returned complete to the Chief Officer at the end of a cruise. He will complete the cargo documentation for their return.

NON BAS MOVEMENT OF EQUIPMENT

If you have specific requirements to transport your own equipment independently of BAS arrangements, make sure that all necessary documentation and booking details are copied to the Master for the BAS appointed Agents in the port concerned. Failure to do this may lead to problems, extra costs for you and the inability to ensure proper follow up actions when the ship has left port.

Annex 1

LABORATORY LAYOUT

JAMES CLARK ROSS

The following notes are designed to assist users in allocating spaces to equipment. The standard bench depth is 800 mm, without making allowance for obstructions on the bulkheads. Where attachment rails are fitted in bench tops they are normally situated 100 mm and 550 mm from the front edge.

Upper deck

Wet laboratory

Outboard bench - waist height. Two large vulcathene sinks (900 x 600 mm, 400 mm deep, h+c fresh plus uncontaminated seawater) separated by 1550 mm of bench with attachment rails. Cupboards under. Extraction hood over forward sink - two 240 V waterproof sockets (standard square pin) in bulkhead over Sorting table - two 240 V waterproof sockets (standard square pin) in bulkhead over.

Aft inboard bench - 1820 mm bench with attachment rails and single kneehole, two drawer units - two 240 V waterproof sockets (standard square pin) in bulkhead over.

Forward inboard bench - 1600 mm bench with attachment rails and single kneehole, drawer unit - one 240 V waterproof socket (standard square pin) in bulkhead over.

Main laboratory - outboard portion

Outboard bench - Waist height. Two large vulcathene sinks (900 x 600 mm, 400 mm deep, h+c fresh plus uncontaminated seawater) separated by 2060 mm of bench with attachment rails. Cupboards under. Note that there are no electrical sockets on the bulkhead behind this bench, although there are two 240 V double sockets on the adjacent forward bulkhead.

Spur bench -Waist height, 2500 mm long by 1000 mm deep (attachment rails standard distances from port edge) with single large kneehole separating drawer units - short run of benchtop forward of it - two 240 V double sockets and one 115 V double socket in bulkhead at forward end.

Inboard bench - 2500 mm bench with attachment rails and single kneehole with drawer units either side - five 240 V double sockets and two 115 V double sockets, Ethernet port, clock junction box. Fume cupboard with hazchem cupboard under.

Repeaters for ship's master clock, ship's log, winch monitoring system. Switches for uncontaminated seawater pumps.

Main laboratory - inboard portion

Main benching - 3,900 mm bench with attachment rails and 1,000 mm deep for most of its length - one large junction box on bulkhead towards aft end, with 550 mm height under - eight 240 V double sockets and four 115 V double sockets, Ethernet port - three drawer units and one cupboard and two kneeholes. Short length of additional benching forward.

Short bench aft on starboard bulkhead with four 240 V double sockets and two 115 V double sockets.

Biochemistry laboratory

Main benching - Waist height, 4650 mm bench with attachment rails and two kneeholes - two drawer and two cupboard units under. Vulcathene sink forward, with h+c fresh plus uncontaminated seawater. Gas taps at forward end of main benching. Refrigerator under. Five 240 V double sockets, Ethernet port, clock junction box. Junction boxes on bulkhead

make attachment of equipment greater than 330 mm high difficult on the aft 900 mm of the main bench.

Microbiology laboratory

Main bench is waist height and comprises stainless steel tray approx 2000 mm. Aft of this is 740 mm of benchtop without attachment rails. Four cupboard and one drawer unit under, no kneehole. Forward is 1550 mm of benchtop with attachment rails and vulcathene sink - h+c fresh plus uncontaminated seawater - four 240 V double sockets along the port bulkhead and two 240 V double sockets on the starboard bulkhead - Ethernet port and clock junction box.

Laminar flow cabinet (Astec SC 1200 AC) with cupboard under. Virtually inaccessible benchtop with attachment rails aft and hazchem cupboard under.

Preparation laboratory

Main bench (forward) - lipped vulcathene waist-height bench without attachment rails surrounds large sink (900 x 600 mm, 400 mm deep, h+c fresh plus uncontaminated seawater) and is also partly occupied by the pure water supply unit (Elgastat UHP) - underway instrumentation (SeaBird Electronics thermosalinograph and Turner Designs through-flow fluorometer) on bulkhead - uncontaminated seawater supply enters the laboratory suite here - three 240V double sockets.

Benching to starboard occupied by scintillation counter (Beckman LS 6000SC) with hazchem cupboard under. Wooden three-shelf racking for chemicals or sample bottles. Fume cupboard with h+c fresh - hazchem cupboard under.

Aft bench - waist height 1600 mm with attachment rails and Gallenkamp oven under - two 240 V double sockets.

Roller-fronted shelving unit on port side aft.

Chemistry laboratory

Vulcathene-topped benching, waist height, around three sides of the lab, all fitted with Unistrut attachment rail.

Inboard bench 2355 mm long, non-standard 600 mm depth. Attachment rails are standard distance from front of bench, so that the back rail is very close to the bulkhead. There are large junction boxes at the forward end of this bench, limiting the height of attached equipment to about 350 mm. Three 240 V double sockets, Ethernet port, ship clock junction box. One drawer unit and one cupboard unit under, single kneehole plus stowage space in comer.

Forward bench 2250 mm, again non-standard depth 600 mm with the same proviso re the attachment rails.

Five 240 V double sockets on this bulkhead. Extension of pure water supply. One cupboard and one drawer unit under, single kneehole.

Outboard bench 2325 mm, standard 800 mm depth, lipped edge. Vulcathene sink with h+c fresh plus uncontaminated seawater supply. Manifolded gas supply and compressed air. One cupboard unit under but sink and trap take up much space, large kneehole or stowage.

Two four-shelf wooden racks for chemical storage.

Forecastle deck

Winch control room

Contains CTD deck unit.

Underway instrumentation and control room - starboard portion

Aft bench contains the Navigation System, ADCP and Oceanlogger PCs.

A spur bench consisting of two 800 mm units back to back and 2780 mm long extends into the space - on the aft side there is a drawer unit and a cupboard unit separated by a kneehole, whilst the for'ard side comprises a drawer unit cupboard and two kneeholes. Electrical sockets are provided along the bulkhead only, comprising six 240 V double sockets and two 115 V double sockets. For'ard of this is space for racked equipment, provided with seven 240 V double sockets and two 115 V double sockets, whilst aft there is a short length of benching 1200 mm long, with cupboard and kneehole under - three 240 V double sockets behind

Underway instrumentation and control room - port portion

The two chart tables (light tables with chart drawers under) occupy the forward part.

The XBT deck unit and PC occupy the short length of bench aft, next to the doorway, with a drawer unit and kneehole under, three 240 V double sockets on the bulkhead.

There is a run of bench along the outboard side of the lab, with a double width spur in the middle with a kneehole to either side of it (under the main bench). The spur benching extends 1220 mm into the lab, with a total width of 1600 mm and with attachment rail on both sides, running athwartships - there is a kneehole and drawer unit under the aft side of this spur and two drawer units under the forward side. The overall length of the outboard benching is 4750 mm, with attachment rails running the entire length. The lengths of benching either side of the spur are 1400 mm forward and 950 mm aft (between the spur and the XBT benching). Power points are provided along the bulkhead only - eight 240 V double sockets and two 115 V double sockets.

ERNEST SHACKLETON