

The 2016 Heard Island Expedition FAQ

General

What is the Heard Island expedition?

It is a major scientific/communications expedition to Heard Island, an Australian subAntarctic island lying at 53°S 73°E. The island is extremely isolated and subject to extreme conditions. The theme of the expedition is “Discovering Life and Innovative Communications on the Most Extreme subAntarctic Island.” The project includes a search for unknown species and development of real-time communications technology for connecting remote sites with continental laboratories and personnel.

When will the expedition happen?

The voyage is scheduled for March 10 – April 22, 2016, with the stay on Heard Island about March 20 – April 12.

Who is organizing the expedition?

Cordell Expeditions, a nonprofit research group in Walnut Creek, California. The organization was founded in 1978 by Dr. Robert Schmieder. Historically, the focus of the group has been extremely isolated islands, especially underwater islands. The group has successfully carried out numerous scientific and amateur radio expeditions, destinations including Cordell Bank, Schmieder Bank, Rocas Alijos, Peter I Island, Easter Island, Heard Island, San Felix Island, Kure Atoll, and Clipperton Island. Radio operations have included 3YØPI, XRØY/Z, VKØIR, XRØX, K7C, TX5K, and others. For the Heard Island expedition, the group will use the callsign VKØEK.

What are the goals of the expedition?

- (1) Discover new species to complete the known biodiversity as a tool for testing model predictions of climate and climate change;
- (2) Make radio contacts with amateur radio operators worldwide;
- (3) Develop and deploy new technology for real-time communication with extremely isolated sites under extreme conditions.

How many people will be on the team?

14

How long will you be on Heard Island?

21 days

Do you have the landing permits?

The formal landing permits are issued only a few weeks before the departure, in order to confirm that the vessel inspection, insurance, fees, and other requirements are complete. However, the

project has been discussed in detail with the Australian Antarctic Division (AAD) for more than 2 years, and they have confirmed that there will be no difficulty in obtaining the landing permit.

Do you have the radio license?

Yes. Licence #1979539 VKØEK was issued by the Australian Communications and Media Authority: Register of Radio communications Licences, on Oct. 13, 2014, valid through June 4, 2017. It is available at <http://www.acma.gov.au>.

Will you have medical, emergency, safety, and other capabilities?

The Handbook will contain a detailed plan for responding to emergencies, and we will have specific personnel who have authority in certain situations. This is described in the Policies document, available here. All team members will have training in First Aid, CPR, emergency response.

Will you have insurance?

The expedition will carry liability Public Liability Insurance policy for US\$20 million as required by the AAD. In addition, the individual members will carry traveler's insurance, and will execute waivers for personal liability to cover specific threats such as personal injury.

Will you have a handbook for the team?

We will have a comprehensive Handbook that contains details about each major sector of the expedition. For the 1997 VKØIR expedition, our Handbook was about 110 pages long, and included the following sections:

- THE CAMPSITE
- EQUIPMENT
- COMPUTERS, NETWORKS, AND LOGS
- CLEANLINESS
- FOOD SERVICES
- MEDICAL
- POWER
- ANTENNAS
- RADIO OPERATIONS
- PILOTS
- SCIENCE
- EMERGENCY, PLANNING, AND RESPONSE

The Handbook is available [here](#).

What websites do you have?

The main expedition website is <http://www.heardisland.org>. The radio operations blog is at <http://www.vk0ek.org>. Details about the organization are available at www.cordell.org. The DXA website will be <http://www.dxa3.org>.

Will you be on social media?

Yes. The blogsite is www.vk0ek.org. There is a on Facebook and Twitter.

Logistics

What ship will you take to get to Heard Island?

The Braveheart, a very well-known and highly-respected ship and crew who have carried out many south polar expeditions, including 11 successful radioDXpeditions.

What port will you sail from?

Cape Town, South Africa

How will you land on Heard Island?

Landing will be done using Zodiacs.

Will you be able to land at multiple places on the island?

Yes. The Braveheart will initially deposit the team at Atlas Cove, where they will set up the camp. The vessel crew will land and help set up the camp. Once the Atlas Cove camp is operational, a decision will be made when to land at Spit Bay, at the opposite end of the island.

Will the ship stay with you while you're on the island?

Yes. The ship will standby to be available for support at Atlas Cove, and various landing/pickup operations at other points, especially Spit Bay.

Will the ship be able to exchange team and supplies during the stay?

Yes. With the ship nearby, we will be able to board participants who might be ill, receive supplies including food and fuel, and transfer scientific specimens to the ship's holds for storage.

Are you going to split the team between Atlas Cove and Spit Bay?

Yes, weather and landing (sea conditions) willing. Atlas Cove will be the primary landing and campsite. However, there are two main reasons for occupying Spit Bay as well, at least during part of the stay at Heard Island, are:

(1) The radio path from Atlas Cove to the mid-and western North America is blocked by the volcano Big Ben. From Spit Bay, however, it is not blocked. This will enable contacts otherwise inaccessible from Atlas Cove.

(2) The regions around Spit Bay are scientifically important for the search for "Life in the Extremes." This area has many lagoons, open beaches, and recently deglaciated areas within which there are very likely undocumented species, the discovery of which is the primary goal of the scientific effort.

What will you use for shelters?

Our main shelters will be AirBeam tents, supplied by a cooperative agreement with HDT Global Technologies, Ohio. The shelters come fully equipped with floors, furniture, power and lighting, galley, and sanitary facilities. They erect in 15 minutes using an air compressor to inflate the rigid inflatable beams. They are insulated for extreme weather and are rated for high winds.

How are you going to provide food and water?

Major food will be supplied from the vessel at intervals. The campsite will have facilities for storing and preparing food; it is not contemplated to bring the food every day, so the campsite will have a store of food and the ability to prepare it.

What is your plan for electric power?

We will have multiple generators supplying about 15 kW at Atlas Cove, and about 5 kW at Spit Bay. The power distribution network is built into the shelters.

How will privacy, sanitation, and other personal needs be met?

We will provide separate facilities for privacy, bathing, changing, and personal needs.

How will you handle an emergency?

The Expedition Leader (or his designee) has authority to interrupt any or all operations to respond to an emergency. The Handbook provides a plan for managing an emergency. Among those emergencies that we might envision are a major medical problem (e.g., major trauma, massive infection, heart attack or stroke, unexplained death, etc.); a facilities or resources problem (e.g., fire, loss of fuel, water, food, etc.); missing person; loss of a major resource (e.g., the ATVs, generators, heating and cooking facilities, etc.); loss of contact with the vessel; emergency at a team member's home; etc.

The best defense against such emergencies, the one we have used successfully for past expeditions, is to do the "what-ifs": we imagine all possible scenarios and make a plan to respond to each one. In the overwhelming number of cases, the act of planning for a problem in fact eliminates the problem. In the case of Heard Island 1997, the planning was sufficiently comprehensive that when emergencies did arise (dislocated shoulder, inoperative ATV, flu epidemic), we were able to respond and control them easily.

When will you return to port?

Nominally April 22, 2016, although this will depend on both the itinerary and the sea conditions.

Radio operations

What are your radio operation goals?

The primary radio operational goal is to log as many All-Time-New-Ones (ATNOs) as possible. Closely tied to this is maximizing the number of unique callsigns in the log. We have detailed understanding of the strategy for achieving these goals.

Can you operate from both Atlas Cove and Spit Bay?

We believe that it is possible to make a visit to Spit Bay by 2 radio operators and 2 scientists, possibly for a nominal 1-week stay.

What is the plan for pilots?

We do not plan to implement the traditional team of pilots. Instead, we will provide a link on DXA for anyone to send an e-mail to the team. The traffic to and from the island will be managed by our local California team, using software developed for this purpose. We will encourage DXers to provide feedback, suggestions, and comments, but it will not be possible or appropriate to request individual schedules for making contacts.

What radios will you use?

Elecraft K3, KPA-500, OM amplifiers.

What antennas will you use?

Phased vertical arrays for low bands, Yagis for high bands. We have extensive design, implementation, and supply support from N6BT, Force-12/InnovAntennas, and Array Solutions.

What computers and networking will you use?

Laptops running Windows 7.

What logging software will you use?

N1MM+. We have used this application for many previous radio operations, including Kure Atoll 2005 and Clipperton 2013. The application provides for automatic networking with all other computers.

We will have at least one high-power WiFi at Atlas Cove, able to link not only the radio operators, but also support other satellite-linked applications such as the Administrator's chat. Individuals who travel outside the camp will carry a cell-phone with GPS capability. This will provide not only real-time communications to the central communications site, but also emergency response, interpersonal communication for coordinating the activities, and even the potential for direct island-to-internet voice communications (e.g., Skype).

Will you give priority to any particular area (NA, EU, etc.)?

To a first approximation, we will log stations that we can hear and work most quickly and reliably, with no priority or bias based on politics or geography. The only criteria, at least for the major part of the operation, will be reliability and speed, and a preference for ATNOs and uniques. Toward the end of the operation, we will consider compensatory strategies to ensure fair opportunities and

smooth out the statistics. For instance, if one region (e.g., Western North America) is under-represented according to the known number of DXers, we will consider altering our working technique.

What bands and modes will you use?

We will use CW, SSB and RTTY on the amateur bands from 160-10 m from the Atlas Cove site. We will prioritize stations on the strongest bands whenever there is good propagation, in order to try to maximize ATNOs. We will focus the Spit Bay operation on working NA West and Central.

What is DXA?

DXA is a relatively simple application that runs on a separate computer connected between the logging computers and the satellite link. It is essentially a daemon that watches the radio activity but does not modify it in any way. Data copied from the logs are uploaded to a central server and used to generate the graphics on the client browser. Anyone with an ordinary browser can watch as the screen is automatically updated once per minute showing the activities of the previous minute. This enables a DXer to get confirmation of a valid contact while there is still time to correct a mistake (e.g., the operator mistyped the callsign).

DXA totally eliminates the need for duplicate contacts and the threat of pirates. It also provides an extraordinary supplementary experience for the DXer—he has the sense of watching the action, and even participating. In both DXpeditions where it was used previously (K7C, TX5K), the DXA website attracted about 40 million hits. It is so popular that we believe it will eventually become a standard for major expeditions. A complete description of DXA is provided by the book *DXA: The Real-time Online Radio Log Server*, by Robert Schmieder, KK6EK.

Will you use OQRS?

Yes. We are implementing a fast-service option linked from the DXA screen. Immediately after making a QSO (and getting confirmation of the contact), the DXer can click a button to order a QSL card, a certificate, souvenirs, and other products and services. This capability will provide an expedited response during the DXpedition.

Will you use ClubLog?

Yes. Immediately after the conclusion of the VKØEK operation, we will upload the entire log to ClubLog. This facility provides various functions, including QSL service, statistics, leaderboards, etc. We choose to not upload to ClubLog until after shutdown in order to give the DXers the opportunity to make use of the various services provided directly by VKØEK.

Will you upload to Logbook of the World (LotW)?

Yes, within 6 months after the end of the DXpedition, as agreed with our sponsoring organizations.

Do you have a QSL manager?

Yes. The Diablo DXers, a consortium of members from local radio clubs, will process the QSL requests. This group will ensure that the process is accurate and efficient. We will respond to QSL requests through the various available channels: direct mailing, buro, electronic, etc.

Field science

What are the field science goals?

The principal goal of the scientific work is to extend the known biodiversity of Heard Island. The overall theme of the biological research is Discovering Life in the Extremes. It is predicted that perhaps 200 species remain to be discovered there; extension of the species list will enable stronger comparisons with the predictions of climate models and the effects of climate change. Within this general concept, we will carry out a range of observations, measurements, and exploration to take advantage of the opportunity of this visit, the first in more than a decade.

What are some of the field science projects that will be done?

We plan to conduct surveys of the megafauna; make collections of soil, lagoon water, sediment, and other materials in search of undescribed organisms; search recently deglaciated areas for relictual plants; document the presence of plastic and other debris, and interpret it in terms of flux from South Georgia and South Sandwich islands; study the geology of the Laurens Peninsula and other formations; obtain aerial photographs and video, including possibly aerial geomagnetic surveys; obtain soil cores of the Nullarbor and low-lying glaciers; obtain sediment cores from the shallow lagoons near Spit Bay; and other similar studies.

The amateur radio operation itself will yield a large body of data on the propagation of radio waves around the volcano. We will use state-of-the-art modeling software that can use these data as input, enabling us to both understand the limitations of the models and to make inferences about the structure of the volcano.

What is the plan for carrying out the field science?

The general procedure will be to examine a wide variety of habitats. By its very nature, this activity involves many projects in many locations: on the beaches, in the surfline and shallow subtidal, in and around the penguin rookeries and seal wallows, in the gravel beds of terminal moraines, in the deep rock flour of the Nullarbor cemented by constant downfiltering penguin and seal excreta, within the areas recently exposed by retreating glaciers, in the numerous glacial melt lagoons and in the ice of the glaciers themselves, on the slopes and on the slopes of the active volcano Big Ben, and other places.

What special equipment will you be taking for the scientific activities?

We will deploy a science lab at the main campsite (Atlas Cove). It will provide working area and surfaces, lighting (including UV lamps), sterile storage and clean conditions, sieves, filters, fixing agents, analytical chemicals, centrifuge, warming trays, microscopes, dyes, glassware, basic tools, water testing kits, etc.

Can you make use of any equipment left on the island from previous expeditions?

No. The former occupation sites are almost totally disintegrated and are considered heritage sites, as such off-limits.

How will you process and store the specimens?

Dr. Carlos Nascimento, a senior organic chemist, will manage the work area as a user facility. Specimens will be assessed, classified, and either fixed or stored live. We plan to communicate with our collaborators from the island, to provide guidance and decisions for processing the specimens. The entire collection will be carefully packed for transport to Fremantle and shipment by air from there.

Where will the specimens go once the expedition is complete?

They will be distributed to specialists, especially scientists with positions within the AAD, Australian scientific institutions, and persons with expertise in extreme environments. We welcome collaborations with any scientists who wish to obtain documented specimens or observations from Heard Island, or the ocean along the track of the vessel (Cape Town to Heard Island to Fremantle).

Who will own the specimens, photos, and other records?

The Policies document (obtained at www.heardisland.org) contains the definitions of ownership of intellectual property, particularly images. The specimens formally belong to the Australian government, but presumably they will be permanently accessioned into the collections of the institutions that analyze and describe them.

Financial

What is the total budget for the expedition?

The vessel cost is \$350,000 for 14 passengers. Add to this potential costs for:

- Computers and networking
- Electrical and water supplies
- Expenses relating to interfacing with the AAD
- Facilities including shelters (tents)
- Fees, including dock and transfer fees, license fees
- Fuel for electricity, cooking, and heating
- Furniture and sleeping facilities
- Generators
- Insurance and other surcharges
- Radio equipment
- Software development
- Transportation and temporary storage of equipment
- Website development and ISP charges
- WiFi and satellite phone and terminal rental, satellite time.

The budget lists these and other costs in detail, which bring the overall budget to around \$550,000. We are obtaining donations and loans of certain equipment and services from commercial sponsors that will reduce the amount of cash needed. We face the usual challenge to pay for equipment and

services before completion of the expedition, hence we encourage and appreciate donations in advance.

What are the individual team members paying?

The cost to the participants is \$18k, which is 56% of the total expedition cost.

Why is the participant cost so high?

By far the largest expense is the ship. Transportation to the Southern Ocean is exceedingly difficult to find and is exceptionally expensive, a result partially of increased fuel costs, insurance, and competitive tourism.

What does the participant fee cover?

It covers everything from point of departure (Cape Town, South Africa) to final destination (Fremantle, Western Australia).

Who is managing the finances? Is there an independent audit?

The Expedition Organizer/Leader Dr. Robert Schmieder manages the finances under the title of Cordell Expeditions, which he founded as a nonprofit organization in 1978. Dr. Schmieder has appointed an independent financial Administrator, Dr. Anders Jepsen, to monitor and certify the financial operations.

Will you provide openness about the finances?

The finances are open to the team and sponsors. Periodic summaries will be published to ensure that there is enough money for operations and that it is being properly managed. It is expected that an interim report will be issued around the time of the expedition, a preliminary post-expedition report 6 months later, and a final report about a year after the expedition. Over 30 years of organizing and budgeting expeditions, Cordell Expeditions has generally hit the budget within 5%, and sometimes (e.g., Kure, 2005) within 1%.

Are you depending on donations or loans of major equipment?

Yes. All the major radio equipment, including radios, amplifiers, coax, and antennas, will be provided by commercial radio equipment sponsors. Some of the facilities, generators, and other major equipment is being provided by other corporate sponsors. In particular, we have established a partnership with HDT Global, which will provide the tents and ancillary equipment for the main shelters.

Will you sell souvenirs, and if so, how much will it raise?

Yes. Cordell Expeditions was the first to offer souvenirs to help support a DXpedition (Easter Island 1995). The book VKØIR Heard Island was printed by FunkAmateur and earned the expedition about \$20,000 from sales. With the availability of modern souvenir manufacturing and online distribution, we can expect that souvenirs could raise perhaps \$25,000.

What is the Angel Fund?

The Angel Fund was created in Dec. 2014 by a private anonymous donor to provide up to \$50k in funds on a matching basis. Qualified donations are matched equally from the fund, and provided to

the general fund of the expedition. Originally the fund had a minimum qualifying donation of \$1000, but that offer expired March 31, 2015. Since then the Angel has opened the fund to donations above \$100 at the Visalia International DX Convention, the Dayton Hamvention, and the Ham Radio Convention in Friedrichshafen, Germany. Dr. Anders Jepsen, a professional financial and business executive is the Administrator of the fund. He oversees the Angel Fund as well as the finances of the entire expedition. He can be reached at AJViking@aol.com.

Will radio clubs contribute to the DXpedition?

Yes. The radio team leader Dave Lloyd K3EL is the interface to radio clubs. He can be reached at k3el@earthlink.net.

Will the major radio foundations contribute to the DXpedition?

Yes. The Northern California DX Foundation (NCDXF) has contributed \$50,000, the International DX Association (INDEXA) has contributed \$4000, and the German DX Foundation has contributed \$7200. We are still expecting major donations from organizations, and many smaller donations from individuals. The full list of sponsors can be seen at www.heardisland.org/SPONSORS/.

If there is surplus when it is finished, what happens to the money?

The first obligation will be to the creditors: if there are balances due to the vessel, to suppliers, and/or to lenders, those will be retired first. If there remains a surplus, it will be distributed among the participants, up to \$3000 returned to each team member to partially offset their fees.

What if there is deficit when it is finished?

If there is a deficit, the participants and sponsors will be asked to retire it. This will be included in the Participation Agreement. However, because it is usually very difficult to collect money after an event, there is considerable pressure on the organizer and managers to do the budget and fundraising correctly, and we are confident that the budget will be raised and appropriately managed.