

Continental Field Manual

# Aircraft and Cargo

## Overview

Field parties conducting research within 100 miles of NSF McMurdo Station, including nearby areas inaccessible by ground vehicle, travel to their research locations via helicopter, while field parties working farther afield travel via fixed-wing aircraft.

Project principal investigators identify desired flight dates and destinations months in advance when submitting their Support Information Packages. Deadlines for submittal to USAP Cargo, commonly referred to as Science Cargo, are established each season by Science Cargo staff and included with the Fixed Wing or Helicopter instructions in the Crary Grantee Binder on arrival.

When project team members arrive at NSF McMurdo Station, flights approved in their Research Support Plan will have been established in a weekly schedule. Shortly after arrival, the team members meet with fixed-wing or helicopter office staff to discuss field plans in detail and obtain aircraft designations and allowable cabin loads. Exact flight dates and times are established the day before each flight, though the schedule is subject to last-minute changes due to weather conditions and aircraft availability.

## Cargo Procedures

*Note: Field team members should carefully review field-planning checklists for critical timelines well before flights are scheduled to occur.*

Field parties are responsible for preparing cargo and providing cargo information and passenger names to fixed-wing or helicopter office staff. For fixed-wing flights, cargo preparations take place at Science Cargo (Building 73), where items are packaged, weighed, labeled and given a shipping number.

Project personnel are responsible for gathering their cargo, including field gear, and transporting it or arranging for it to be transported to Science Cargo. For helicopter flights, project personnel must gather and weigh all their cargo and coordinate with helicopter technicians for transporting it to the helicopter pad. All cargo weights and dimensions must be submitted to the helicopter office 72 hours before the flight.

## Shipping Numbers

Any item slated to travel by fixed-wing aircraft must be given a shipping number. Forms for creating these numbers are available from Science Cargo. The forms list the weight and cube (volume in cubic feet) of each item, a

physical description, a deliver-by date, and the project number. The Science Cargo staff can assist in correctly assigning and recording shipping numbers. Field personnel should keep a list of these numbers and accompanying information for planning cargo loads.

## Hazardous Cargo

Cargo that is flammable, explosive, poisonous, radioactive, corrosive, under pressure, or capable of causing toxic fumes is considered hazardous for aircraft operations. Field team members should consult the hazardous cargo supervisor if there is any uncertainty as to whether an item is hazardous.

Hazardous cargo must be packaged, labeled, and handled in a specific way to minimize the danger to aircraft, passengers, and crew. This process, which is critical to life and health, takes time and cannot be rushed. Field party personnel must identify hazardous items in advance and submit them to the science cargo staff a minimum of five business days before a fixed-wing flight and a minimum of three days before a helicopter flight. Field teams that do not meet these deadlines should not expect last-minute service.

### Common Hazardous Cargo Items

- Acid batteries/car batteries
- Lithium batteries
- Aerosol spray cans (e.g., WD-40, paint)
- Isopropyl alcohol
- Hand sanitizer
- Burn paste
- Stove fuel (white gas)
- MSR fuel bottles (for deep-field survival bags and Whisperlite® stoves)
- Propane
- Fuel in drums (AN-8, mogas, premix)
- Jerry cans - full or empty (kerosene, mogas, premix, AN-8)
- Coleman® and Whisperlite® gas stoves
- Propane space heaters
- Kerosene heaters
- Explosives and detonators
- Generators
- Herman Nelsons
- Hurdy-gurdies
- Jiffy Drills
- Snowmobiles

- Pressurized gas cylinders (nitrogen, oxygen, helium)
- Fire extinguishers
- Matches

## Shippers Declaration for Dangerous Goods

Each hazardous item transported requires a Shippers Declaration for Dangerous Goods, commonly known as haz dec, which provides details on the item's type, packaging, and emergency response requirements. A haz dec for each hazardous item will be included with the flight manifest paperwork. Field personnel must keep copies of all haz decs, as flight crews will require the information if the hazardous items are returned from the field.

## Retrograde Hazardous Cargo

When field parties return hazardous cargo to McMurdo Station, the cargo must be properly packaged and labeled. Each item must have its own separate and complete haz dec to give to the flight crew. Preserving the packaging, labels, and paperwork generated for the cargo's field deployment flight makes it easier to prepare the hazardous cargo for its return flight to McMurdo Station.

## Frozen Food

Frozen food for large, ASC-staffed field camps is pulled, packaged and turned over to Science Cargo by ASC personnel, after which the food is stored in McMurdo Station food service freezers. For smaller deep-field camps, field personnel pull the food as close as possible to the three-day advance deadline, after which the food is stored in the airfield freezer. A few hours before the flight, cargo personnel transport the frozen food to the aircraft. If the flight is delayed or canceled, field personnel must ensure the food is returned to the airfield freezer. For helicopter flights, the food is stored in the BFC freezer until it is ready for transport to the aircraft by the helicopter-technicians.

## Fixed-Wing Aircraft Operations

Projects entering the field via fixed-wing aircraft will fly on a LC-130 Hercules operated by the New York Air National Guard (NYANG) or on a Basler or Twin Otter operated by Kenn Borek Air, Ltd. (KBA). Flights on these aircraft are scheduled by personnel in the fixed-wing office.

*Note: Before deploying to the field, project personnel should carefully review camp put-in, daily tasking, and camp pull-out checklists, and they should meet with*

## **Baslers**

Baslers are twin-turbine, propeller-driven airplanes outfitted with skis. They are the larger of the two KBA aircraft used in Antarctica. Baslers are loaded and unloaded from a cargo door located toward the rear of the aircraft. They cannot accommodate Air Force pallets. Cargo and equipment should be packed in containers that can fit through the cargo door (84”L x 63”H to 93”L x 76”H) and can be moved by one or two people.

## **Twin Otters**

Twin Otter is a Canadian Short Takeoff and Landing utility aircraft that can fly and land in a wide variety of conditions. Like Baslers, they are equipped with skis, have twin engines, and are loaded and unloaded by hand through a rear cargo door. The space in a Twin Otter is limited, but it can be maximized by preparing cargo packages that are small and easily handled by one or two people.

## **LC-130s**

The LC-130 Hercules is the largest ski-equipped aircraft used in Antarctica. These airplanes have four turboprop engines and can carry more payload than either the Basler or Twin Otter. However, the LC-130 requires a longer landing and takeoff strip than either of the other two aircraft. LC-130s are loaded and unloaded through a large rear hatch with a ramp, which can accommodate a small forklift.

## **Bag Drag**

A process of weighing field personnel and their baggage, called “bag drag,” occurs at least 12 hours before an LC-130 flight. At this time, all personal gear (e.g., clothes and personal items) must be checked in. These things will not be available in the event of a flight cancellation. However, passengers are allowed one hand-carry bag, so passengers should place shoes, a change of clothes, and required toiletries (e.g., toothbrush) in this bag in case the flight is canceled. In addition, phones, radios, and weather kits must be hand-carried. This ensures the electronics will be warm and functional, so the field team can establish communication with McMurdo Station or another field camp before the plane departs. Air Services posts bag-drag information, the flight schedule, and updates on the transportation channel, at the Movement Cargo Center (MCC), and outside the dining facility in Building 155.

## Flight Day

All field personnel must report to MCC for transportation at the time listed on the flight schedule. All passengers are required to wear ECW gear, either USAP-issued or personal. If wearing personal ECW gear, passengers must present the yellow Bring-Your-Own ECW Clothing Program form. At the airfield, passengers must follow the directions of the loadmaster, who directs all movement in and around the aircraft.

Do not assume that all cargo details have been addressed. Inspect snowmobiles and make sure the keys are available. All survival gear (e.g., radios, sleep kits, tents, stoves and food) must be present. Check the cargo manifest against what is actually on the aircraft. If something is missing, immediately notify the loadmaster, who will tell the aircraft commander to halt flight preparations. Cargo staff will need to be advised that equipment is missing.

*Note: All USAP personnel must attend a fixed-wing aircraft training course before boarding an aircraft for the first time.*

## Aircraft Specifications

Aircraft Specifications			
	Twin Otter	Basler	LC-130
<b>Max. seating</b>	19 passengers, 2 pilots	18 passengers, 2 pilots, 1 flight attendant	40 passengers, 2 pilots, 1 navigator, 1 flight engineer, 2 loadmasters
<b>Max. flight time (round trip)</b>	~10 hours (with fuel stops)	~10 hours	~8 hours
<b>Cargo door</b>	Side door (4'8"x5'1")	Side door (5'11"x4'8")	Aft door with ramp (10'x9'2")
<b>Cargo area</b>	126 cu. ft.	1,225 cu. ft.	4016 cu. ft., variable configurations, holds up to six pallets

### Allowable Cabin Load

The amount of weight allotted for cargo and passengers on a given flight is called the Allowable Cabin Load (ACL). The ACL will vary depending on each aircraft's capacity, how far the aircraft must fly, and landing conditions at the destination, among other factors. The ACL for any given flight is determined during the flight's planning stage and is subject to change up until the day of flight. A field team's total weight of cargo and passengers cannot exceed the specified ACL.

### Cargo on KBA Aircraft

- Field parties must help load and unload the aircraft.

- Full fuel drums are unloaded by rolling them down a cargo ramp.
- Snowmobiles are lifted to and from the cargo door or slid on a cargo ramp.

## Flight Time Estimates, in Hours

(One-Way from McMurdo Station)

	Twin Otter	Basler	LC-130
<b>Siple Dome</b>	3.3	2.5	2
<b>Byd Camp</b>	6	4.5	3
<b>WAIS Divide</b>	6 (including a fuel stop)	5	3.3
<b>South Pole</b>	6 (including a fuel stop)	4.5	2.7

## Preparing for Camp Put-In, Fixed-Wing

Camp put-in may require multiple flights. If so, field team members must ensure all essential, life-sustaining supplies and equipment are on the first put-in flight in case the second flight is delayed. This includes radios and satellite phones, sleep kits, stoves, matches, extra clothing, tents, and enough food, fuel, and water for an extended period. There have been cases where a field party waited two weeks for a second flight that was supposed to arrive on the same day as the first. Field teams must be flexible and develop “worst case” alternative plans.

### Radio Communications

Before field deployment, project personnel must obtain a frequency assignment plan and radio call sign from Central Comms. Also, every member of the field party should attend the Field Party Shop radio briefing, during which shop personnel will issue field radios and Iridium® phones and provide use instructions.

### Ski-Way Preparation

Field teams should discuss ski-way preparation for the pull-out flight with fixed-wing office staff before deployment. Team members should pack a few extra bamboo poles, flags, and large black garbage bags to use as ski-way markers. The flags also help identify wind speed and direction. This task will be specific to location so prior planning is essential.

### Reconnaissance Flights

The NYANG, KBA or personnel at the fixed-wing office may determine that

an aerial reconnaissance (recce) flight is required to assess landing conditions for the aircraft before the put-in flight. Fixed-wing office staff will work with the aircraft operator and the project team to define the scope and requirements of the recce.

## Camp Put-In, Fixed-Wing

### Communication and Shelter

During camp put-in, but before the aircraft departs, the field team must make radio contact with Central Comms. The team must also erect a tent for shelter. The most efficient way to do this is to split the team into two groups. One sets up a tent and lights a stove (well away from the aircraft and turning area), while the other sets up the radio and antenna (also well away from the aircraft), and establishes communication.

### Altitude and Grid North

Before the plane departs, one member of the field party must obtain the altitude of the camp site and the location of Grid North from the aircraft navigator or pilot. Grid North should be marked immediately with two flagged bamboo poles. The altitude is used to set the altimeter in the meteorological kit. Both parameters are necessary for weather observations and reporting.

## Camp Communications, Fixed-Wing

### Daily Check-in

At a pre-arranged time every day, field parties must engage in radio communication with McMurdo Station via Central Comms. Radio communication between some areas of Antarctica and McMurdo Station is poor. Sometimes it is necessary for field parties to relay their daily check-in through South Pole Station, a major field camp or another remote field party. If a field party fails to make the daily check-in, the Emergency Operations Center is activated and the emergency response chain is started, activating the Search and Rescue team. In addition to the daily check-in, field teams may speak with the fixed-wing office anytime between 0730 and 1730 daily in order to pass along information or request resupplies, schedule changes, or camp pull-out times.

## Weather Observations

Field teams may be required to provide weather observations during daily communications and should be prepared with the information in the correct order. Field teams may also be asked to relay weather information for another field party.

When an aircraft mission to the camp is planned, field team personnel are required to report weather observations hourly, beginning six hours before the scheduled launch of an LC-130 and three hours before a Kenn Borek aircraft launch. These observations continue until the aircraft lands. Refer to the Weather section for more information.

## Camp Pull-Out, Fixed-Wing

The camp pull-out schedule must be coordinated with Fixed-Wing personnel, who will need detailed information regarding the weight, cube and type of returning (“retro”) cargo; the estimated weights and dimensions of any cargo pallets; and the handling requirements of any scientific samples (e.g., Keep Frozen, Do Not Freeze). Ice core samples can require additional lead time, so please discuss this in advance of pull out.

## Waste Removal

Remote, deep-field groups must return all waste to McMurdo Station. This may or may not include human waste. See the Environmental section for more detail.

## Equipment Staging

The field camp must be entirely broken down. All gear must be staged and ready for quick loading when the aircraft arrives. For LC-130 flights, all gear must be palletized.

## Retrograde Hazardous Cargo

When field parties return hazardous cargo to McMurdo Station, it must be properly packaged and labeled, in a manner similar to how it was originally shipped (e.g., matches in foil, 12-volt batteries in wooden boxes). Each item must have its own separate and complete hazardous declaration (haz dec) to give to the flight crew. Preserving the packaging, labels, and paperwork generated for the cargo’s field deployment flight makes it easier to prepare the cargo for its return flight to McMurdo Station. Partially full fuel drums should be tightly capped and tipped on their side to confirm a good seal.

*Caution: When tipping the drums, ensure that spill containment is in place to catch any leakage. Containment must also be used if the drums are shipped on their side. Snowmobiles must have between ¼- and ½-tank of fuel. No more and no less.*

## **Ski-Way Preparation**

The ski-way should be prepared well in advance of the aircraft's arrival, per the requirements provided by Fixed-Wing Office staff before the field team deployed.

## **Weather Observations**

Field teams must provide hourly weather reports for the pull-out flight, as noted in the weather section.

## **Communication with Incoming Aircraft**

The field team member assigned to the radio is responsible for communicating all requested information to the incoming aircraft. This person should know the condition of the ski-way, the current wind conditions, and the altimeter setting. While on final approach, the aircraft commander will not want to respond to radio transmissions, but they will appreciate short statements regarding changes in weather, particularly wind direction.

*Note: Do not interfere with the aircraft during final approach unless there is an emergency.*

## **Returning to NSF McMurdo Station**

Return all field equipment to the appropriate work center. Package and mark cargo that will be shipped to the U.S. Specific instructions for this process are in "Instructions for Packaging and Shipping," a document sent to all researchers before they deploy to Antarctica.

## **Helicopter Operations**

USAP operates a small fleet of helicopters in the McMurdo Station area under Federal Aviation Administration regulations. There are two different models: the AS350B3s (known as either "squirrels" or "A-Stars") and Bell 212's. The helicopters are single-piloted, which means the pilots are responsible for all aspects of the aircraft's operation.

The maximum payload and maximum flight time of a helicopter depend on several factors, but the numbers listed below can be used for general-purpose planning.

## Helicopter Specifications

Helicopter Specifications		
	A-Star 350 Helicopter	Bell 212 Helicopter
<b>Max. payload</b>	3 passengers or 800 lbs.	8 passengers or 1800 lbs.
<b>Max. flight time</b>	2 hours 30 minutes	2 hours 30 minutes
<b>Hatch</b>	5' 6" x 3' 6"	7' 8" x 4' 2"
<b>Cargo bay</b>	16" x 20" x 27"	7' 8" x 4' 2" x 7' 11"

## Helicopter Pad

Aviation administrative and logistics offices, including those of the helicopter supervisor and aviation coordinator, are located in the maintenance hangar at the helicopter pad (helo-pad). The small silver structure to the side of the hangar is the passenger terminal, where field team members report for a flight. A helicopter technician (heli-tech) briefs deploying field personnel there and later escorts them to the helicopter. Personnel may walk to this terminal without clearance or escort.

*Caution: Never drive onto the helo-pad without radio clearance. Never walk onto the heli-pad without escort.*

## Preparing for Camp Put-in, Helicopter

Before camp put-in, field parties must confirm with the helicopter office a plan for the entire season, from put-in to pull-out. This plan should include estimated dates for camp moves, day trips, close support and resupply.

### Flight Requests and Cargo

Three days before an intended flight, the field team must submit a flight request to the helicopter office via the McMurdo Intranet. This request must include estimated cargo weights, the names of the passengers, and a list of hazardous cargo. The field party is responsible for bringing hazardous cargo to Science Cargo for packaging no later than three business days before the scheduled flight.

The day before the flight, the field party must collect all cargo, including BFC equipment, MEC equipment, and science equipment, and arrange for its transport to the helo-pad. Special arrangements can be made for gear or equipment that the team needs to use until the day of the flight. A heli-tech will prepare the cargo load(s) and provide a final manifest to the pilot.

The helicopter schedule is posted by 1900 on the McMurdo intranet. A copy is also sent to each of the passengers. Unexpected or emergency flight requests should be communicated to the helicopter office as soon as possible.

## Planning Information for Helicopters

Since weight is critical in determining cargo capacity, each passenger will be weighed before the flight. All cargo must be weighed and its volume determined by science project personnel.

## Resupply Cargo

To reduce flight hours for camp put-in, field teams should use the resupply system. If teams intend to move camp locations during the season or use helicopter support for day trips from a camp, resupply is an economical use of helicopter time to receive additional food, fuel, and equipment. The helicopter is coming anyway and may have room for the requested items.

Field teams prepare resupply by packing boxes with desired items and keeping a careful inventory of each box. Boxes are marked and equipment items tagged with the science group number, the item or box number, the destination, and the weight in pounds. If the project has been allocated a cage, non-hazardous items are stored there. When resupply of a hazardous item is required, field teams must give two-day notice for USAP cargo staff to deliver it to the helicopter pad.

Field teams provide copies of the resupply inventory to the BFC supervisor and helicopter office, and they take a copy into the field. When resupply is required, field teams need only contact the helo-pad staff and request a specific box (e.g., box #2) from the cage. If no one is available in the helicopter office, team members can make the resupply request through Central Comms.

## Camp Put-In, Helicopter

The helicopter office must be able to notify the field team quickly of schedule changes, if any, on the day of the flight. If a member of the field team was issued a pager, it must remain switched on. If the team does not have a pager, helicopter office staff must know where to contact team members. Changes to flight schedules often occur and are generally the result of deteriorating weather.

All personnel and equipment must be at the helo-pad 30 to 45 minutes before the flight. All passengers are required to wear ECW gear, either USAP-issued or personal. If wearing personal ECW gear, passengers must present the yellow

Bring-Your-Own ECW Clothing Program form. For safety reasons, no one is allowed to board a helicopter unless properly attired.

*Note: All USAP personnel must attend a helicopter training course before boarding a helicopter for the first time.*

## Loading the Aircraft

In McMurdo Station, the helo-pad staff will load and unload the helicopter. At field locations, field team members must perform this function. The pilot is ultimately responsible for passenger safety and will determine if the helicopter can be loaded or unloaded with the rotors running. At certain times, the pilot may request that a heli-tech accompany the aircraft into the field to help load or unload cargo.

## Boarding

A heli-tech will lead field team members to the helicopter when the pilot is ready for boarding. At the helicopter, either the pilot or a heli-tech will give a final safety briefing and point out where survival bags are located. Once seated, passengers must strap themselves in and connect to the helicopter intercom system. Passengers must not talk to the pilot during takeoff or landing.

After passengers disembark the helicopter, the pilot will listen on Channel 7 and will not depart until a field team member establishes radio contact and calls out the helicopter's tail number. If communication cannot be established because of radio malfunction, the field party will be flown back to McMurdo Station.

*Note: Field parties should test radio equipment before deploying to the field.*

## Helicopter Safety Guidelines

When exiting or approaching the helicopter, remain in the pilot's view. Proceed in a crouch. Do not approach the helicopter without the pilot's visual acknowledgment. Never, ever reach up or chase after a hat or other article that has blown away.

- Any movement on the helicopter pad must be authorized by the helo-pad staff, either on the pad or in the hangar.
- **ALWAYS** obey the pilot's orders.
- **NEVER** approach a helicopter until the pilot gives a thumbs-up signal.
- **NEVER** walk near the tail rotor; always approach from the front of the

helicopter.

- Carry long loads, such as bamboo poles, Scott tents, or survey rods low and level to the ground.
- Do not smoke in or near the helicopter.
- Remain seated with seat belts fastened at all times.
- Wear a helmet.
- Assume the crash position if warned by the pilot.
- In the event of an emergency, remain in the aircraft until all motion has stopped.
- Know the location and operation of emergency exits.
- Know the location of first-aid kits.
- Know the location of aircraft survival equipment.

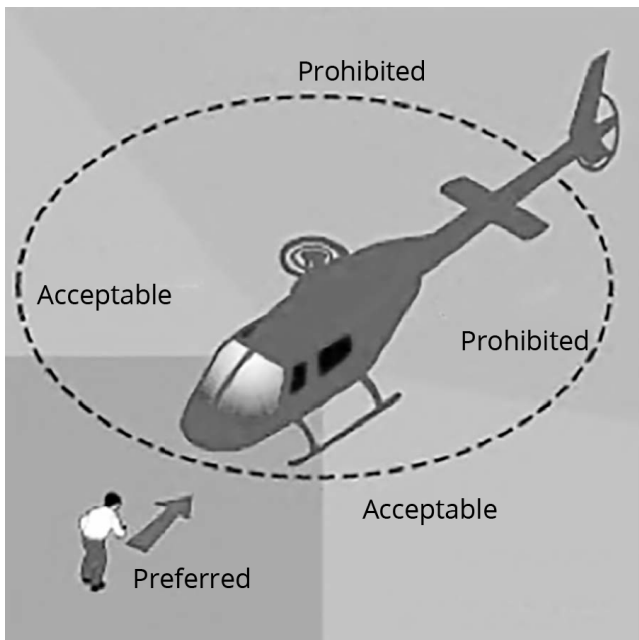
## Survival Equipment

For all flights, helicopter pad staff will ensure sufficient survival bags are on board to accommodate all passengers. If a flight is for a camp put-in and all the required camp survival gear is aboard the aircraft, no survival bags are required.

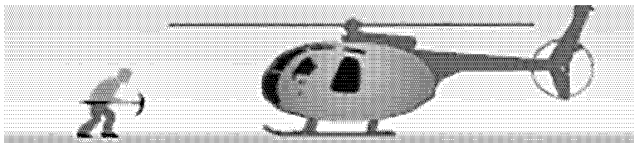
## Day Trips

Projects intending to remain in the field for the day must have at least two people, survival bags, proper clothing, urine bottles, plastic bags for human waste, and a VHF radio. All personnel should keep in mind that there is a chance they may be stuck in the field overnight. It is wise to pack extra water, extra high-energy food, extra warm clothes, reading material, and a toothbrush. Sunscreen, ear plugs, and a thermos with hot liquid are also recommended.

## Safety Around Helicopters



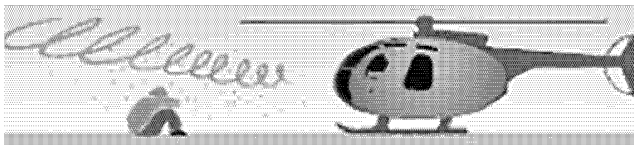
Do not approach without the pilot's visual acknowledgment. Remain in the pilot's view. Proceed in a crouching manner. Never, ever reach up or chase after a hat or other article that has blown away.



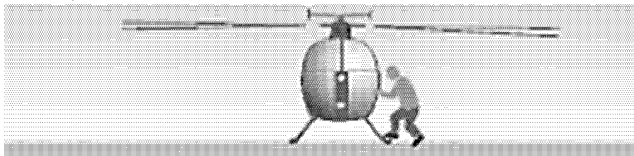
Carry supplies and tools horizontally and below waist level.



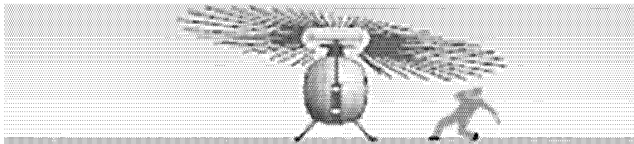
Always approach or exit on the downslope for more clearance.



If blinded by snow or grit, stop, crouch lower, or sit down and wait for help.



If disembarking while the helicopter is at the hover, get out and off in a smooth unhurried manner.



Never approach or leave when the engine and rotors are running down or starting up.

## Flight Time Estimates

(One-Way)

Destination	Time from McMurdo
Allan Hills	One hour
Cape Crozier	35 minutes
Cape Bird	30 minutes
Dry Valleys	35 to 40 minutes
Koettlitz Glacier	30 minutes
Marble Point	31 minutes (47 minutes with external load)
Minna Bluff	30 minutes
Mount Erebus	30 minutes
Lake Hoare	34 minutes (50 minutes with external load)

## Camp Communications, Helicopter

### Radio Equipment

All groups departing for the field are required to have VHF radios with the field party frequency plan. During the pilot brief, team members should discuss which channel will be used for helicopter-to-field-team communications. For a camp put-in, field teams must have the following equipment:

- HF radio(s)
- Handsets
- Antennas
- Batteries and recharging capabilities for the duration of the field stay
- A complete back-up radio

### Daily Communications

After passengers disembark, the helicopter cannot leave until a team member has communicated with the pilot on the VHF radio. If communication cannot be established because of radio malfunction, the field party will be flown back to McMurdo Station.

*Note: Field parties should test radio equipment before deploying to the field.*

Every field group must make daily radio contact with Central Comms. Established field camps with phones can simply call in. Field teams at camps using HF radio communication have various options if radio contact with McMurdo Station is poor; they can relay through another camp, South Pole

Station or Scott Base. The required daily check-in is extremely important, and various levels of SAR response will be initiated if a field party fails to make its daily check-in.

If a flight is scheduled for a field camp, the field party will be asked to provide a local weather observation between 0700 and 0730. Also, if the field party needs to make changes or if there is any other information to convey regarding support for that day, they must contact the helicopter office at that time. It is important to impart this information before 0730, which is when helicopter operations personnel begin developing the operational plan for that day.

Before returning from the field, all field parties need to contact the housing department in McMurdo Station to arrange accommodation.

## Field Resupply

In camps with phone access to McMurdo Station, field parties can call individual departments for resupply items. These departments will notify the helicopter office of the resupply. Resupply requests can also be communicated via radio to the helicopter office. If no one is available there, field teams may communicate directly with Central Comms, which will relay the information to the helicopter office. Helicopter operations staff will coordinate the requests with work center personnel, who will provide weight and cube information for load planning.

## Schedule Changes

New flight requests and changes to flight schedules must be submitted three days in advance. Requests may be communicated over the radio or telephone, or they may be written and passed to the helo-pad staff via a pilot.

## Loading the Aircraft

In McMurdo Station, the helo-pad staff will load and unload the helicopter. In the field, field team members must perform this function. On most 212-supported missions, a heli-tech will be on board to assist with loading and unloading, but heli-techs do not fly on A-Stars, so all field team members are responsible for knowing how to perform this function. The pilot is ultimately responsible for passenger safety and will determine if the helicopter can be loaded or unloaded with the rotors turning. However, all passengers have the right to request that the rotors be shut down if there is any safety concern.

- Carry supplies and tools horizontally and below waist level.
- Always approach or exit on the downslope for more clearance.

- If blinded by snow or grit, stop, crouch lower, or sit down and wait for help.
- If disembarking while the helicopter is at a hover, get out and off in a smooth unhurried manner.
- **NEVER** approach or leave when the engine and rotors are running down or starting up.
- **NEVER** approach a helicopter from the rear.
- **NEVER** move upslope near a helicopter when the rotors are in motion.

## Boarding

On 212-supported missions, a heli-tech will lead field team members to the helicopter when the pilot is ready for boarding. On A-Star flights, the pilot will indicate when passengers should board. Once seated, passengers must strap themselves in and connect to the helicopter intercom system. They must not talk to the pilot during takeoff or landing.

## Survival Equipment

For all flights, helicopter pad staff will ensure sufficient survival bags are on board to accommodate all passengers.

## Camp Pull-Out, Helicopter

Field teams that return unneeded material and equipment to McMurdo Station throughout the season will find their camp pull-out relatively easy. To ensure that all camp items are picked up and nothing blows away, two team members should remain in the field to accompany the last flight.

## Returning Material from the Field

The most efficient way to return material from the field is to use resupply flights, camp moves, and day-use helicopter flights. This reduces the number of pull-out flights. During the daily communication with Helo Ops staff, field groups can pass information concerning retrograde material so it can be incorporated into the schedule on flights of opportunity. Remember: helicopters can sling loads back to McMurdo Station or to Marble Point for staging, so don't let boxes and barrels pile up at camp. Retrograde it early! Label waste properly, per instructions from the environmental and waste management departments.

## Scientific Sample Shipment to NSF McMurdo Station

Scientific samples represent the end-product of years of planning, months of work, and extensive funding by the NSF. They are irreplaceable. Therefore,

all personnel involved with handling or transporting samples must follow an established procedure to ensure the preservation of scientific data.

This procedure addresses the unaccompanied transport of scientific samples from the field to McMurdo Station via helicopters or fixed-wing aircraft. It is designed to minimize the potential for loss or damage of these samples during transport, receipt, and storage. However, it is not meant to reduce flexibility. For example, if a field team member wishes to load samples on a helicopter but does not have the proper form, the samples will still be accepted, and all personnel will do their best to ensure they are properly handled.

## Procedure

If a field team intends to send unaccompanied samples from the field to McMurdo Station, team members should discuss the process with the Crary Laboratory staff before deploying to the field. Crary staff will provide the team with either “Sensitive Sample” Chain of Custody (COC) forms and green DayGlo labels or “Non-Sensitive Sample” COC forms and pink DayGlo labels, depending on sample requirements. COC forms and labels are available for all samples sent unaccompanied to McMurdo Station from the field.

In general, grantees package the samples, notify either the Crary Laboratory point of contact (ext. 44188, pager 855, or at [mcm-Lab-Samples@usap.gov](mailto:mcm-Lab-Samples@usap.gov)) or the Science Cargo supervisor, schedule pickup with aviation operations, and make necessary entries on the appropriate COC form.

It is the grantee’s responsibility to package samples in a manner that adequately protects them against temperature variations and vibration during transport. Packaging should be sufficient to cover extended periods due to weather or other delays. Appropriately colored DayGlo notices should be attached to sample boxes for ease of identification and tracking. These brightly colored labels draw attention to the boxes and reduce the likelihood that they will be misplaced or overlooked.

It is also important to enter on the COC form the aircraft tail number and the time samples were placed on the aircraft. The pilots, loadmasters, helicopter technicians, ground crew, Crary personnel, USAP cargo personnel, and others involved in the cargo process will fill out their portions of the COC and deliver the samples to the appropriate location.

The following information should be provided in any correspondence or radio communication regarding the samples:

- Number of containers
- Storage requirements

- Time of pickup
- ETA in McMurdo Station

