

Microsoft **Flight Simulator**

DLC



AEROSOFT

ANTARCTICA VOL. 1 - BRITISH ROTHERA AND BEYOND

Manual



Developed by: LimeSim
Manual: Aerosoft, LimeSim



Antarctica Vol. 1 - British Rothera and Beyond

Copyright: © 2021 / **Aerosoft GmbH**
Airport Paderborn/Lippstadt
D-33142 Büren, Germany
Tel: +49 (0) 29 55 7603-10
Fax: +49 (0) 29 55 7603-33



E-Mail: info@aerosoft.de
Internet: www.aerosoft.com

All trademarks and brand names are trademarks or registered trademarks of their respective owners. All rights reserved. / Alle Warenzeichen und Markennamen sind Warenzeichen oder eingetragene Warenzeichen ihrer jeweiligen Eigentümer. Alle Urheber- und Leistungsschutzrechte vorbehalten.

Manual

Add-on for

Microsoft Flight Simulator



Contents

Starting Off	6
System Requirements.....	6
Finding the Bases in Microsoft Flight Simulator	6
Support	7
Copyrights.....	7
Acknowledgments.....	7
The Airport	8
Features:	9
About Flying in Antarctica	11
Flying as a Pilot.....	13
Weather	15
Some Useful Weather Links	16
Radio Reports – Flight Following	17
Antarctic Communications.....	18
General.....	18
Aviation Comms in Antarctica	18
TIBA - Traffic Info Broadcasts by Aircraft - 126.90	21
Typical Phrases	22
British Ferry Flight from Canada to Antarctica ...	27
Flight Report	27
Flightplans	33
British Antarctic Survey Ferry Flights.....	33

History & Further Reading of Antarctic Aviation	34
Good to Know	35
F.A.Q.	36
Charts	38



Starting Off

System Requirements

In order for the scenery "Antarctica Vol. 1 - British Rothera and Beyond" to run as smoothly as possible, you need the following:

- Microsoft Flight Simulator
- OS: Windows XP, Windows VISTA, Windows 7, Windows 8 (fully updated), 64 bit version highly recommended
- DirectX: Direct X 9 compatible Graphics Card with minimal 1 Gb memory
- CPU: 3.0 GHz CPU (Intel Core2 Duo advised)
- RAM: 4 GB

Finding the Bases in Microsoft Flight Simulator

You will find the the bases by selecting either "Rothera Base", "Fossil Bluff Skiway" or "Sky Blu" on the airport selection map.

Alternatively you can select them by the following ICAO identifiers using the departure airport field on the simulator's map screen:

EGAR – Rothera Base

AQ80 – Fossil Bluff Skiway (fictional ICAO)

AQ85 – Sky Blu (fictional ICAO)

Support

Support for this product is offered by Aerosoft. We prefer to have a support forum for the simple reason that it is fast and efficient because customers help customers when we are not in the office:

<http://forum.aerosoft.com/>

And we advise the Scenery section in the Microsoft Flight Simulator subforum for any questions on this product. This should be your first stop for any support. If you prefer support by email please do accept that this could take a bit longer as it might be sent from person to person if necessary, and that email support during the weekends is always slow:

<https://helpdesk.aerosoft.com/portal/home>

We feel strongly about support. Buying one of our products gives you the right to waste our time with questions you feel might be silly. They are not.

Copyrights

This software, the manual, documentation, video images, and all the related materials are protected by copyright laws. The software is licensed, not sold. You may install and run one copy of the software on one computer for your personal, non-commercial use. The software, the manual and all related materials must not be copied, photocopied, translated, reverse engineered, decompiled or reduced to any electronic medium or machine legible form, neither completely nor in part, without the previous written permission of the developers of this software and Aerosoft GmbH.

Acknowledgments

A huge thanks goes to D. Hardie! He wrote a major part of this manual with in-depth knowledge of flying in Antarctica. Furthermore, he provided invaluable knowledge to make this addon come to life!



The Airport



Rothera is without a doubt the station in Antarctica with the most picturesque location! Located on a rocky outcrop overlooked by a massive glacier dotted with mountains to the west - it is surrounded by sea to all other directions with a line of the truly majestic mountains of the Antarctic Peninsula visible to the east on clear days.

The runway is squeezed between base and hangar buildings to the left and right and sea water at both ends. In essence it's a smaller version of Gibraltar (which is – surprise! – British, too): A stunning approach, a runway that's crossed by a road with traffic lights and surrounded by water.

To complete this addon, we have added the very remote bases of Fossil Bluff and Sky Blu even further south. Together they make a perfect playground for the Aerosoft Twin Otter!

A showcase scenery created by developers with more than 20 years of experience in MSFS development!

Features:

- THE Antarctic base with the most stunning location and best vistas!
- Lots and lots of animation including animals, vehicle, boats and people, including likely the first animated penguins and chain vehicles in flight simulator (trying to find all of them is probably what makes this scenery so much fun - so we're not revealing further details here.)
- Lots of custom created sounds of animals and vehicles (probably the first scenery in MSFS with sounds attached)
- Coverage beyond the base with stunning glacier cliffs dropping into the sea
- Hundreds of thousands of animated icebergs in a larger area around the base (at times it can be possible that the approach is blocked by a huge iceberg passing through!)
- Offsite locations of automated monitoring stations (marked as POIs so you can fly there for regular checks performing rough landings out in the field)
- Offsite landing strips of two British field locations with custom models and improved terrain imagery/elevation data: Sky Blu and Fossil Bluff
- Emergency airstrip location on the glacier above Rothera (alternative landing strip that **MUST** be used by local aircraft if there are incoming overseas aircraft)
- Carefully crafted landscape to merge with surround landscape - including updated waterbodies.
- Special technique used to add wind shear details to the vast white lands on the glacier.
- State of the art manual with dozens of pages of inside knowledge on flying in Antarctica, plus flightplans and simple charts!



About Flying in Antarctica

Much of the following text has been written by D. Hardie who was flying Twin Otters in Antarctica for a few seasons during the last years. He was the most valuable supporter of "Antarctica Vol. 1 - British Rothera and Beyond". Based on his input and knowledge we created this scenery as close to the "real thing" as we could get:

"Flying in Antarctica is probably one of the most exhilarating environments on our planet.



It is unique in that it is remote and almost uninhabited, except for the few research stations manned by scientists from the countries of the world. The climate is harsh and there are no roads, no trees, and no buildings to get any sense of scale to the place.

The cold unpolluted air means that you can see for great distances and have spectacular views.

There are several mountain ranges, the most interesting lying to the north on the Antarctic Peninsula. From a pilot's perspective, Antarctica is a challenging but immensely rewarding environment and relatively few people ever get the opportunity to fly here. This new simulator brings maximum realism to a community of simulator pilots and allows them to experience for themselves the scenery, logistics and the challenges of operating safely here.

The Antarctic season only lasts for a maximum of 6 months, as the Austral summer quickly changes to winter when it becomes too cold and windy. Eventually, it is in total darkness for a few months of the year.



Flying cannot take place in these conditions so the opportunity is taken for maintenance to be carried out in Canada and the crews given a well-earned rest.

The flying season begins at the start of October, when the aircrafts are ferried south from Calgary and down through North and South America, where they are then configured onto skis. The final hop is made from Punta-Arenas over the Drake Passage and into Antarctica via Rothera Research Station-home to the British Antarctic Survey.

The ferry trip takes about two weeks and is an adventure in itself. Kenn Borek Air, currently the largest operator of Twin-otters in the world, send several aircrafts down to Antarctica via this route.

They have aircrafts in support of the NSF or National Science Foundation - American science funded program - as well as Antarctic Logistics Expeditions - a company which provide tours for climbers and tourists in the region. They also have a Basler- or turbine powered DC-3 on skis, which can carry the larger items of equipment, in Antarctica.

Once in Antarctica, the Kenn Borek machines disperse and the British Antarctic Survey aircraft operate from Rothera, and one aircraft from Halley to the east of the peninsula.

Kenn Borek aircraft continue to fly deeper into the continent via the blue ice runway at „Sky-Blu“, where they change onto board skis - much lighter and more rugged than the hydraulic wheel skis. From here they continue to Patriot Hills at the Ellsworth Mountains.



Then more machines fly onto McMurdo Research Station.

Patriot Hills is a seasonal logistics center and a depot for carrying climbers into the Vinson Massif, where they can then climb the highest mountain - Mount Vinson. The flight in here is a challenge and only contemplated in perfect weather.

Flying as a Pilot

To fly in the Antarctic, several extra skills are honed which are different from every other part of the world. Firstly, the ability to drag skis is important. The technique involves landing in a suitable area and then dragging the skis along the surface with just the right balance of power to keep the aircraft flying. The purpose of this is to dislodge any snow surface and expose any crevasses beneath, thus ensuring the area is safe to land on. The skis are trailed for about 30 seconds, the luxury of flying in Antarctica is that runways are not limited by length or obstacles for most of the time. Once this is completed, the pilot gets airborne again and at a low height usually commences a 270 degree turn to the right, so as to put the freshly made ski tracks on his left-hand side. A low circuit is then flown at a couple of hundred feet, and a close inspection is made - looking for crevasses before deciding that the location is safe to land on. The height is important, because if it is flown any higher, the subtle change in colour of the snow may be too difficult to see if a crevasse lurks beneath.



It is worth mentioning that the skis are of sufficient area to maintain the aircraft safely on the surface, of even a soft snow surface. To step outside, it is possible for the pilot to sink up to the knees if the surface is soft. When the aircraft is landed, it is usual to continue to taxi along the surface, creating a

taxi loop at each end of the newly formed runway, so as to create a preformed track to follow, when it is time to depart. Just before shutting down the engines, the aircraft is left to stand for a couple of minutes to allow the temperature of the ski undersurface to match that of the snow. The aircraft is then taxied forward another couple of meters and shutdown. The reason for this is to allow the heat generated by the friction of the skis over the snow to dissipate. If this is not done, then the skis often melt the surface layer which then quickly refreezes and sticks the aircraft to the surface. No amount of



power will dislodge the aircraft, and the only option is then to shut-down and dig around the skis to dislodge them from the ice beneath.

Takeoff on the snow is easy, but again a couple of techniques are worthy of comment. The Twin-Otter is vulnerable in the nose-ski area due to the heavy nose ski structure and the small nose gear attachment point. To prevent damage over bumpy surfaces, the control wheel is held full back whilst take-off power is applied. This is to keep the weight off the nose gear and to ensure an earliest takeoff distance, as well as preventing damage to the nose structure.

As soon as the aircraft becomes airborne, with the stall warner blaring, the pilot checks forward slightly to allow airspeed to increase for the climb-out.

When flying in Antarctica, safety is uppermost in the pilot's mind as help is usually a long way off.

As soon as a field party is dropped off, they establish HF communications by field radio, as this is the only means they have of summoning assistance if they need support. The pilot's job is not done when flying the aircraft, as the aeroplane must be safely unloaded, bringing skidoos, sledges, tents, fuel and supplies to the field camps. Depending on the distance to the camp, it is not impossible for a field party to be entirely self-sufficient for a couple of weeks, with the contents of one or two plane loads.

Some flights, the pilot is able to carry fuel for the entire round trip - usually a three-hour endurance, plus an hour of reserve fuel. Other times, the fuel must be taken along as fuel drums, which are then deposited so that they can be used on the return journey. The Twin-Otter will carry three 40-gallon fuel drums inside - or 300lbs of fuel-per drum. Careful planning uses the least amount of fuel, as the cost of transporting fuel into remote locations rises rapidly the further away one flies.

Weather

Unlike the rest of the world, weather reports can be tricky to obtain and at times unreliable. Satellite imagery is used and relayed verbally by radio to pilots either from met forecasters on station or else on location at the depots. Many sites do not have a manned presence, if even they have ever



been visited before, so inputs are reserved until weather is perfect - clear blue skies, bright sunshine, and no overhead cloud cover. This is to enable the best chance of spotting crevassing as mentioned earlier.





Some Useful Weather Links

http://amrc.ssec.wisc.edu/data/view-data.php?action=list&product=sa_tellite/composite

For real time satellite weather images.

<http://amrc.ssec.wisc.edu/data/>

This one is the best for all sorts of weather information live from Antarctica.

<https://www.bas.ac.uk/data/our-data/images/webcams/rothera-webcam/>

Live webcam for Rothera Research Station.

http://www.antarctica.ac.uk/met/rothera_forecast/realtime.html

Weather forecasts and current weather reports from the same base – in some cases even including cloud type information in addition to the cloud layers. A perfect source to create realistic Antarctic weather themes in MSFS!

<http://www.bom.gov.au/ant/handbook/handbook.shtml>

“The International Antarctic Weather Forecasting Handbook” is a perfect lecture for those interested in some more in-depth knowledge about weather in Antarctica.

Radio Reports – Flight Following

No formal air traffic control exists as such. The position and therefore potential search area of an aircraft is radioed into base every 30 minutes until touchdown, so that the flight-follower is aware of where an aircraft is. No ground radar exists, so positions are plotted on a large plotting chart at the home base. Once on ground, the time of next call is transmitted before shutting down the aircraft.

Flying days are long due to the continuous hours of daylight and at the end of the six months, the air crews are ready to begin the long ferry trip home, back for maintenance.

Ferry fuel tanks are again installed for the flight home and skis are removed and packed away for next season, once they reach Punta-Arena’s airport at the southern end of Chile, South America.

It is an enjoyable journey home, flying along the coast of Chile, up through South America, Panama, Mexico, then across the US and into Canada.”





Antarctic Communications

...written by D. Hardie, mainly focusing on Communications around the Peninsula bases, which should be similar all over Antarctica. Please note that this chapter should be seen as [guideline for online pilots](#) because MSFS is not be able to offer you an "ATC" like that:

General

Some information on the way communications work in the Antarctic may prove to be of some interest generally, as well as specifically to the users of this add-on.

„Comms.“ are perhaps the most important aspect of living and working in Antarctica, whether they be on an individual level or at an international base to base level.

These are achieved by a variety of means. Those mentioned here are by no means exhaustive and several other specific technologies are available.

Interpersonal communications is achieved on base by using a series of handheld VHF radios between key personnel. These are also used for field scientific parties who may be spread a distance apart by a few hundred yards, when travelling by skiddoo.

The uniquely ultra-cold environment coupled with exposure to sunspot activity due to the closer distance to sun radiation can cause a lot of static interference with radios. In such cases, the VHF and HF radios may be affected as to be unusable. Satellite Iridium phones may sometimes be used, but they too can be affected by solar storms and are much more expensive to operate.

Aviation Comms in Antarctica

The aircraft operating in the Antarctic are typically fitted with two VHF radios and two HF radios, as well as an individual satellite phone in the cockpit which can be removed if required.

During operations close to base - within about 50-80 miles - the VHF

radios are used, much the same as in any normal air traffic control situation at any airport in the world.

All radios are tested on the ground before flight and after the engines started, so that any problems are recognised and steps can be taken to correct any faults. Once the aircraft is airborne, the change to HF radios occurs and position checks are transmitted every 30 minutes flying time.

Details given are current position, altitude, next waypoint position, estimated time of arrival, and then the next waypoint after that. This follows a set format and is adhered to, so any other pilot flying in the vicinity will know that another aircraft is en-route and its approximate current location.

As times between transmissions may be as much as 30 minutes, there may be long silences on the radio, so any other aircraft getting into the air is given an update on any other aircraft activity by the „Flight Follower“.

The Flight Follower is a communications expert at Rothera whose job it is to listen in to all aircraft transmissions and plot them on a large board in the Operations Tower, showing the Antarctic region. He can then relay messages from other aircrafts, provides updated in-flight weather reports, as well as logistical information to the pilots.

The Flight Follower provides an Air-Ground Radio Information service which effectively provides all information that could be of help to air operations as well as boating operations around Rothera.



Once airborne a pilot must state „Airborne“, and similarly when landing deep field must make a statement of intention to land with the ski status (usually skis down), along with the position. The exception to this is at Sky Blu, where the blue ice runway is so hard that landings are usually

carried out on the wheels with „skis-up“. The Borek aircraft change onto Board skis shortly after arrival in Antarctica, offering a more



rugged and lighter landing gear, which has not any associated problems of the hydraulically operated skis springing a leak.

Once an aircraft has landed, the pilot transmits this to home base along with a time of next communication so that the flight follower will know when to expect the next call and the aircraft may then be shut down.

If the HF radios are not readable due to static, then the same reports can be made by satellite phone to the Rothera operations tower via the normal phone lines.

Sledge parties rely for their very survival on HF radios. Their very first task when dropped off by aircraft and before it leaves is for the field team to set up the radio and establish radio communications, as this is the only way the team can communicate with home base and summon assistance in an emergency or to request more supplies or a pickup by aircraft.

The Pilot will not leave the team until he is satisfied that they can communicate correctly with home base. The position reports are usually by reference to pre-designated waypoints or else by actual reference to GPS latitudes and longitudes, enabling a precise location to be found.

Each international base has its own communication frequency as stated in the AFIM (Antarctic Flight Information Manual), a published document by agreement with all member states that have a claim to sectors of Antarctica.

Most bases respect the use of English, the internationally agreed language, but not all adhere to it, depending on the ability and competence of the radio operator to speak in English.

Requests by pilots for a runway report or weather can be quite subjective and open to interpretation as some ground radio operators have very little formal training in aviation weather reporting. In fact this author flew one individual to a forward supply depot, at short notice, where he was to spend a few weeks manning the radios and carrying out resupply tasks and making weather observations.

When asked what training he had received the individual was

surprised to hear of his forthcoming duties and replied that he had had „no training“ at all. It then followed a brief crash course in meteorology and weather observation reporting for the remaining duration of the flight.

TIBA - Traffic Information Broadcasts by Aircraft - 126.90

This is exactly as it sounds and is used primarily as a listening frequency on which pilots monitor other pilot's transmissions giving position reports and more importantly any weather conditions or reports on the surface condition (i.e. soft snow or hard polished slippery ice) which may be of interest. Fuel states may also be transmitted such as numbers of fuel drums remaining, if re-fuelling is to take place on arrival.

The frequency is generally used as a chat frequency between pilots (reports can be made of icing conditions in flight) but respect is made also so that it is not cluttered up with irrelevant chatter when another aircraft may need it for transmitting some important information.

The other frequency which is monitored is 121.5 MHz - the international distress frequency. No transmissions may be made on this except for an emergency situation.

To summarise, VHF radios are used for aircraft comms close to base and HF radios are used further away. Satellite phones are used when the VHF and HF radios are unusable for whatever reason. And they may make calls anywhere across the world.



Typical Phrases

...on a Twin Otter flight from Rothera to Fossil Bluff.



The flight begins once the pre-flight walk around has been completed, the fuel uplift has been entered in the aircraft technical log, and a copy of the load sheet has been handed to the ground crew.

Before engine start, a check of the VHF radio is made:

Aircraft: „Rothera Radio, this is Victor Papa Foxtrot Bravo Bravo requesting radio check and airfield information.“

Rothera Ops Tower: „Roger Victor Papa Foxtrot Bravo Bravo, this is Rothera Radio reading you strength five, are you ready to copy the latest weather?“

Aircraft: „Roger Rothera, go ahead.“

Rothera: „The latest weather ob (abbreviation for observation) at time 1100 zulu (note zulu is the aeronautical term for Greenwich Mean Time, which is the time set on the aircraft clock, and which is entered in the aircraft papers, log, tech log, etc.) is wind 360 at 12 knots, visibility 8 km, cloud few at 1000 feet, temperature zero, dew point minus 8, QNH 1012.“

Aircraft: „Roger weather copied, QNH 1012“

Note it is not necessary to read back all of the weather, but it is mandatory to read back any altimeter pressure setting – QNH value.

Aircraft: „This is VP-FBB ready for start“.

Rothera: „Roger V-BB, start at your discretion, time check 1101 zulu.“

Aircraft engines are now started, and the after start check-list is carried out from memory using a panel scan technique and then backed up with reading and confirming from a paper checklist,

stowed in the map pocket just inside the pilots cockpit door.

Once the generators are brought online and the aircraft is self-powered, the signal is given for the ground crew to disconnect the ground powers supply and a radio check is made on the other radios.

Aircraft: „This is V-BB radio check on fives“ – this is referring to the HF frequency on the number one HF radio box selected to 5080.

Rothera: „Roger V-BB , reading you strength five“

Aircraft: „This is V-BB radio check on sevens“ - this is the radio frequency selected to 7775.

Rothera: „Roger V-BB reading you strength five“

Radio strength is graduated in five increments from one being the weakest and barely audible to five being the loudest and clearest radio signal.

There is no measure of this in the cockpit and is purely a subjective assessment done by the pilot.

Aircraft: „Rothera Traffic this is VP-FBB entering and backtracking runway three six“.

Rothera: „V-BB, roger, there is no known traffic to affect you, report ready for departure.“

Aircraft: „Roger, wilco“

The aircraft now enters and backtracks the runway. Whilst taxiing, the pilot does some of the pre-take-off checks and at the end of the runway turns around and lines up along the take-off runway direction. He now does a few checks, flight controls, power run up, and checks that the auto feather and beta-back-up propeller systems are functioning correctly. See a Twin-otter specific manual for exact details of how this is checked.

Aircraft: „Rothera traffic this is V-BB ready for departure“.

Rothera: „Roger, V-BB, surface wind now 350 12 gusting 15 knots, take-off at your discretion.“

Aircraft: „Roger, V-BB rolling runway 36“



When airborne:

Aircraft: „V-BB is airborne“.

Rothera: „Roger V-BB, your airborne time is at 1108 zulu, next report passing waypoint bravo.“

Aircraft: „Roger next call bravo“.

Note: there is no Alpha waypoint, but the first waypoint is bravo a point to the south of Rothera about 40 mins flying time by Twin Otter. Successive waypoints are charlie, delta, and echo, which take the aircraft about 10 mins flying time from the forward supply depot Fossil-Bluff.

Every 30 mins, the met office issue a weather „ob“, obtained from the Rothera Met Office, which in turn gets the information by HF radio or sat-phone from the various field camps or field supply depots. Again, the weather is copied onto the pilots navigation log, and the QNH (sea-level pressure reading) is read back.

Note that at some locations there is no reliable QNH setting, if no-one exists on the ground. In this case, a best guess QNH is set. More importantly, great reliance is placed on the radio altimeter which gives the height above the surface up to 2500 feet. Above this height and the pressure altimeter is used with a healthy margin for any high ground beneath.

Aircraft: „This is V-BB with position report“

Rothera: „Go-ahead“

Aircraft: „V-BB is at position Bravo at time 1148 zulu, altitude 5000 feet, estimate charlie time 1228 zulu, delta next“.

Rothera: „Roger charlie time 1228 zulu, next report charlie“

Aircraft: „Wilco“.

Similar position reports are made at charlie, delta and echo, or if heading in a different direction then latitudes and longitudes will be read out every 30 mins flying time. The purpose of this is to allow a „flight-follower“ at Rothera to plot the position of the aircraft on a large board of the Antarctic in the ops tower and therefore know the

general area the pilot is operating in at any one time as there is no radar surveillance.

The flight continues and once VHF comms is lost, the position reports are made on the HF radio equipment, which are usually much noisier with static background hissing and crackles.

When approaching Fossil Bluff (in this case our destination) and within range - approximately 15 mins flying time - the VHF radio is used to talk to the ground party to obtain their latest weather situation.

Further mention may be made as to the on-board cargo plus on-board passengers, as well as what cargo or personnel will be embarking for the next flight.

On final approach a HF transmission is made to Rothera:

Aircraft: „Rothera this is V-BB on finals for Fossil Bluff, skis are down“.

Rothera: „V-BB roger, next report on the deck.“

Aircraft: „Wilco“.

Note the status of the skis (up or down) is always made to serve as a final check for the pilot to double check that his skis are actually in the required position, even though this should be ascertained in the landing checklist.

Aircraft: „Fossil-Bluff this is V-BB on finals for the skiway, skis are down.“

Fossil Bluff Apple Hut: „V-BB - roger skis down“.

Once on the ground the pilot taxis in towards the fuel drums where refuelling and offloading of cargo can take place and carries out the after-landing checklist.

Aircraft on HF: „Rothera, this is V-BB, on the deck at Fossil-Bluff, shutting down, next radio call will be in one hour and thirty minutes from now.“

Rothera: „Roger Bravo Bravo, next call in one hour and thirty from now, time now 1330 zulu.“

The aircraft is then shutdown, and further communications can be carried out using the aircraft radio, using the aircraft batteries, but only for short periods of time to preserve the battery life in the ultra cold environment. Once the engines are started again and the generators connected, the onboard battery will recharge, as there is no ground power supply at remote field stations away from Rothera.



British Ferry Flight from Canada to Antarctica

This is a flight done by the BAS Twin Otters every season.

Please note that the Flightplan files supplied with “Antarctica Vol. 1 - British Rothera and Beyond” (see Google Earth™ KMZ file in the installation folder) do not exactly match the flights described here as the flight route can vary slightly from year to year. It’s up to you which flight routing you choose.

Flight Report

Text by D. Hardie who was a Twin Otter Pilot.

The Antarctic Ferry-flights are the punctuation to the start and end of the flying season.

A lot of preparations go into these flights and the goal is simple: To fly the aeroplanes as quickly as possible from Canada to Punta Arenas, in readiness for the final leg over the Drake Passage, fully configured with Skis, and into Antarctica.

Pilots arrive in Calgary at the start of the trip to stock up on 2 weeks worth of provisions which have to be loaded into the aircraft for the pilot and his mechanic. The flights start early in the morning and finish in the late afternoon/evening so there is seldom time to go to shops and buy food en-route. All of the food and equipment, including aircraft spares and personal clothing, is carefully weighed and loaded into the aircraft. The two large ferry tanks are installed in the aircraft by now and the equipment has to be carefully installed as there is very little room for manoeuvre inside the Twin Otters.



First, a couple of words about the fuel capacity of the Twin-Otter aeroplane:

The ferry tanks hold 1576 lb of fuel in each tank, which gives the aeroplanes an extra 6 hours of endurance. This is in addition to the standard tanks which are located in the lower fuselage under the cabin floor. The capacity of the two tanks are 1235 lbs in the forward tank and 1341 lbs in the rear tank.

The wing tip tanks hold a further 300lbs in each side, which adds another hour onto the endurance. (Note the Twin-Otter uses 600 lbs fuel per hour which makes the arithmetic easy. This is 10lbs per minute of flying, so all the pilot has to do is multiply the flight time in minutes by 10 and you have the required fuel for the flight).

Thus, we have a total fuel capacity of 6334 lbs or 10 and a half hours of flight before the engines will stop.

When you are flight planning, don't forget to add in a contingency, as well as fuel for diversion and for taxiing on the ground too.

The flight plans are submitted at the flight briefing office on the morning of departure, but international clearances are usually arranged a few weeks in advance. A commercial company is used to obtain the "Overflight" clearance numbers to satisfy the various countries regulatory authorities and the aircraft insurance certificates must also be in order to comply with this.

A few notes on Customs and Immigration are perhaps worthy of discussion. When planning to fly from one country to another, pilots cannot just decide to fly to wherever it suits them best. Each country has a „Port of Entry“ or several „Ports of Entry“ which are recognised first landing destinations. This is where the customs formalities are completed and customs inspectors may inspect the contents of the aircraft to ensure that only recognised goods are being carried through the country. Consequently, if the weather deteriorates at the „Port of Entry“, then a diversion must be nominated which is also a „Port of entry“, or if this is not possible then the customs authorities must be notified so that special arrangements can be made. To do otherwise may incur a hefty fine and legal proceedings!

The first leg from „Springbank, Calgary“ to Casper in Wyoming is

flown just as winter is beginning in the Northern Hemisphere, so there is an incentive to depart soon before the snow fall begins. The aeroplane is heavily laden and the aeroplane is very slow to climb, especially when departing Springbank, which is already 3937 feet above sea level.

On a clear day the view is enjoyable, flying over the forests of Canada - watch out for the view of the Rocky Mountains to the west and then over the canyons and badlands into the US Border, passing some Native American Indian Reservations and down into Casper itself. Watch out for the site of the Little Bighorn Battlefield on your left as you pass Billings and head towards Sheridan.

Casper is situated at the base of an escarpment and there are always some interesting business jets here as well as executive military turboprops. There are also some Cessna Caravans based here which fly the mail for Fed-Ex. The airfield itself goes back to 1942 and was a large training airfield for WW2 bomber crews including B-17 flying fortresses, B-24's and B-29's. Many of the original war-time hangers and buildings still survive to this day.

The second day consists of two flights - Casper down into Liberal, Kansas for a refuelling stop. This is to comply with US regulations which do not permit any fuel to be carried in the ferry tanks. There is an aircraft museum here and several cold war jets are parked at the end of the parking ramp. You can take a closer look at these whilst you refuel.

After a quick pit-stop, the journey continues from Casper down to Hobby Airport-one of the airports in Houston, Texas. Of note are the many oil wells and „nodding donkeys“ to be seen through the state. The night is spent here and the aircraft are parked up at the Atlantic Aviation executive terminal on the north-eastern side of the airfield. Departure in the morning will be early for the long leg over the Gulf of Mexico down to Cozumel, Mexico.

Day Three begins with a climb out amidst the busy early morning commercial jet departures from Hobby, Houston. Several oil platforms are seen on the initial climb out to cruising height over the sea.

Much of the flight is over featureless ocean but usually in sunshine.



There is no option for a quick diversion out here if things go wrong, so „Point of no return“ calculations are made so that the pilot knows when to turn back or when to continue to destination.

A rest day is usually taken in Cozumel before pressing on once again, crossing the sea, then the coast of Honduras and Nicaragua, before making the spectacular arrival into Panama City airport alongside the Panama Canal. Be careful here as there are several airfields within close proximity, including one on the downwind leg. The arched bridge over the canal is a prominent landmark here. The airport was the scene of the attack by US forces against the drug funded Noriega administration in 1990. The city itself has many high-rise buildings and is an impressive sight.

Park your aircraft here and clear customs and pay your landing fees and fuel bill.

When departing Panama, watch out for the hill straight ahead on take-off, if departing initially to the north. The hill has been systematically cut away in steps as you fly towards it, in an effort to improve the terrain clearance for aircraft. The airport is busy and you will see other Twin Otters arriving and departing on schedules for Air Panama.

After a few hours over the sea, you will fly over equatorial jungle and now land at Guayaquil in Ecuador. Congratulations, you have now crossed the equator into the southern half of our planet.

Guayaquil - an international airport used by jets as well as turboprops, - is situated in the heart of an overcrowded city. An engine failure here on take-off with full ferry fuel is going to give marginal climb performance and if there is no other option then a ditching in the Guayas river adjacent to the airport seems the „best“ course of action.

Park your aircraft here, refuel and clear customs.

Watch out also for the giant tea-cup perched atop the hill to the side of the runway as you depart, before setting off towards Arica – the northernmost airport in Chile.

En-route you pass Lima in Peru, which is a preferred tech-stop airport to take on more fuel if required. Also on this leg you will pass the

famous Nazca lines in the Atacama Desert.

Arica lies on the coast but is on the edge of a desert. Chilean permits and customs formalities are carried out here which allows the journey to continue all the way down the Chilean coast - the longest country in the world. There are spectacular views of the Andes on the way along. They are situated well inland though, so the distant volcanoes look quite serene when seen on the approach into Puerto Montt. Watch out for the Very Large Telescope on the hilltop at Cerro Paranal, they look like four large white cubes on the ridgeline, and also the recently famous Chilean volcano at Puyehue-Cordon Caulle.

When you arrive at Puerto Montt, park here.

Flying the last leg from Puerto Montt to Puntas Arenas is one of the most spectacular segments of the journey, flying high up at 17000 feet on oxygen; you get a wonderful view of the Torres del Paine mountain peaks between waypoint Kilak and Puerto Natales on the left hand side of the aircraft. If the weather is bad it can be hidden from view within the clouds. Strong winds from the west may bring turbulence over this area with strong up and downdrafts which can exceed the performance capability of a heavy weight ferry aircraft. Coupled with the potential for picking up clear and rime ice due to the moist supercooled air from the sea, rapid airframe ice build-ups are a further hazard of flying this section of the route. Careful study of the en-route weather systems is advisable here. If the weather looks bad, it's best to wait another day.

The last few hours of the flight fly over barren hills leading into boggy and rocky windswept landscapes which are a feature of the arrival into Punta Arenas. The airfield here is almost always windy, but there is a triangular pattern of runways which gives plenty of options for an into wind landing. Park here.

At Punta Arenas, a day is then spent fitting skis to the aircraft and making any final adjustments before heading out on the last long leg over the Drake Passage and down into the Antarctic. Chilean Air Force Dragonflys A-37'Bs can be seen along with a residential Ilyushin IL76 transporter which runs expeditions from here down to the blue ice runway at Patriot Hills and the Union Glacier on behalf of Antarctic Logistics and Expeditions.



Once stocked up with last minute supplies and the aircraft all fuelled up for the last long flight, take a last look back at Punta Arenas as you climb up and head „south“ over the bay. It is the last look at civilisation, greenery and vegetation you will see for six months.

The final ferry flight sector must be undertaken with special pre-flight care. The flight is a PNR or point-of-no-return flight, up to which point a turn-back may still be made. After the PNR, the flight must be continued come hell or high water. If the weather at destination were to deteriorate, a landing on a clear patch on the Antarctic continent may have to be considered until conditions improve. To this end, Antarctic survival equipment and survival rations are carried on board.

A careful study of the satellite weather charts is advisable, along with the meteorological forecast for the destination. The flight is usually carried out with the crew wearing survival suits and lifejackets, although a ditching in such a tempestuous sea would have a slim chance of survival for long, let alone a successful rescue.

Radio position reports are made by high frequency HF radio at designated 30-minute waypoints once out of range of the shorter very high frequency VHF radios used in commercial airspace.

After 8 hours of flying - welcome to the Antarctic, you have completed an amazing ferry trip and can now begin the hard work of the Antarctic flying season for the next 6 months.

Flightplans

We have added some real-world flight plans to this addon. To open them in MSFS go to “World Map” “More” “Load/Save” Select one of the PLN files from the addon’s installation directory.

British Antarctic Survey Ferry Flights

The British Antarctic survey flies its Twin Otters from Canada (Calgary) all the way down to Rothera (Antarctica) when the season begins and back north after the season is over. For more information about this flight read the chapter “British Ferry Flight from Canada to Antarctica”.

This flight plan can be found as a Google Earth™ KMZ file in the addon’s installation directory and provides a good reference to create your own flights in MSFS (initially we provided PLN files for these too but they tend to crash MSFS when navdata change while MSFS is being updated. But you can still use the KMZ file as a reference).





History and Further Reading of Antarctic Aviation

The early history of Antarctic Aviation has been covered thoroughly in Malcom Mellor's **Notes on Antarctic Aviation**, which can be downloaded for free from the US Army Corps of Engineer's website:

<https://erdc-library.erdcdren.mil/jspui/handle/11681/9167>

Although quite outdated, this is probably the best lecture on Antarctic Aviation and also contains a lot of information on other areas of Antarctic Aviation than history.

Antarctica is probably the harshest environment to fly on the world. Aircrafts that are severely damaged are often written off and left in the ice because a recovery and repair would be just too expensive. Contrary to that, there have been some very impressive recoveries in the past years where crashed aircraft have been provisionally repaired and brought off the continent for further repairs.



Good to Know

Note the person talking to a Skua next to the runway. It's dedicated to a staff worker working here for many seasons who became best friend of that bird returning here every year from Mallorca (the bird, not the worker!). That same worker also places lights on the drums along the runway if there is an aircraft approaching in the dark.

If you keep looking you will find a small zodiac steering to and from a group of islands to the southwest where it will meet a group of Orca whales.

Higher up on the glacier is a long emergency skiway marked by drums. If the Dash 7 is flying from Punta Arenas to Rothera to bring in personnel and cargo and reaches the point of no return, it has to land in Rothera come hell or high water. From that moment on, the runway in Rothera has to stay clear until the Dash 7 touches down. If for whatever reason one of the Twin Otters comes in during that timeframe, it has to touch down at the emergency skiway on the glacier above the base and wait there until the Dash 7 has landed. The reason is simple: If the Twin Otter has an accident, an engine shutdown or anything else happens on the runway in Rothera, the runway would be blocked and the Dash 7 couldn't land anywhere else. Unlike a Twin Otter the wheeled Dash 7 can't touch down on the glacier!

As soon as the Dash 7 has landed and the pilots of the Twin Otter have finished their cup of tea they can take off again and land at Rothera.



F.A.Q.

Q: It's always pitch dark night – no matter which daytime I set!

A: This usually happens in a period between May-August when there's the polar night. Change the season to something like February or March (use "World Map" "Flight Conditions" Then "Day" settings center right) and you should have plenty of daylight. But note that even in those Antarctic summer months the sun angle is rather low.

Q: Why is the sea around Rothera always covered in ice? Looks a bit weird with the ship and orcas piercing through the ice!

A: Those animations have been created assuming that the sea around the base is mostly ice free, which is usually the case during the summer months, when all flying takes place. We haven't been able to recreate this problem happening in earlier MSFS versions during final testing of this addon. In case it happens again, raise the temperature above 0°C and you should be fine.

Q: From a distance I see a straight line in the water north of Rothera!

A: A known issue that is due to the tiling system MSFS uses for the water shapes. Unfortunately, it cannot be fixed at this stage but higher settings (particularly "Terrain Level of Detail" and "Terrain Vector Data") should lower this effect.

Q: Ships, boats and whales don't follow the surface of the sea in high waves!

A: Unfortunately, until releasing this add-on MSFS still doesn't allow us to have moving objects follow the surface of the sea. As much as we'd like to have everything piercing the waves as in real world, this currently isn't possible in MSFS. Instead, everything on the sea will follow a fixed path as if the surface would be flat.

Q: I cannot land on the research ship's helipad!

A: Unfortunately, until releasing this add-on MSFS still doesn't allow us to equip moving objects with hard landable surfaces. To make up for this we placed a copy of the same ship as a non-moving object in

a bay to the east (see POIs on the map to find it). This one does have a landable helipad.

Q: The ground surface at Fossil Bluff and Sky Blu looks more like dirt terrain and not like snow from close-up!

A: As of now MSFS doesn't allow to change the attributes of how terrain looks from very close to something that looks more like snow (with the exception for 3D terrains as can be seen at Rothera's emergency skiway, which however doesn't allow us to place map-selectable airports). You can however activate a little snow in the weather settings, which will change how the terrain looks to something more matching from closeup.

Q: There are strange loud sounds when switching from inside to outside view!

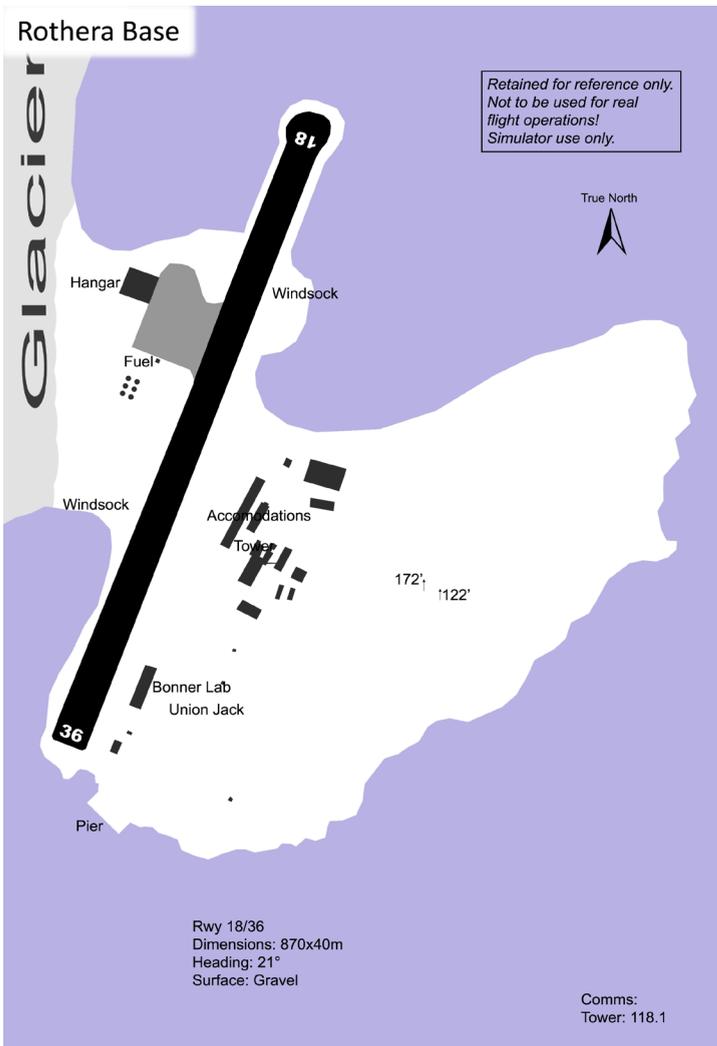
A: This seems to be a small bug in the MSFS sound engine that causes sounds of the animated vehicles in the area to become excessively loud once you switch to outside view. As if you would be next to each source and then getting normal again once MSFS has recalculated the actual distance to the source. Usually shouldn't take more than a second.

Q: The sea around Rothera is always frozen! Looks weird with whales piercing through the ice and ships/boats "driving on it" without leaving a trace!

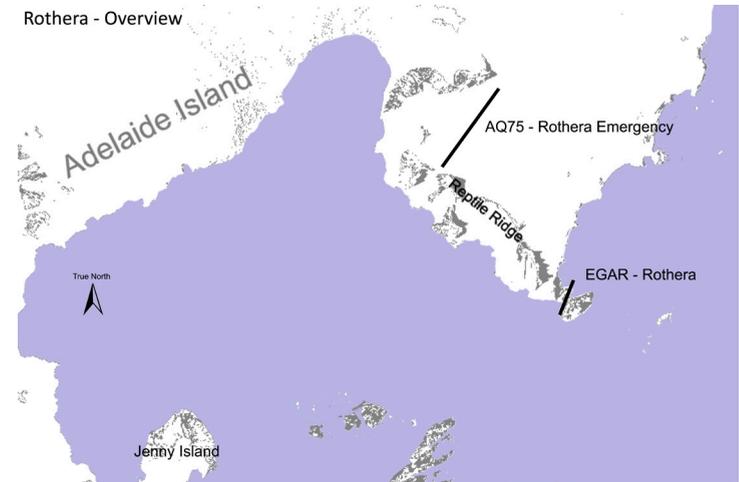
A: For reasons unknown to us this almost ALWAYS happens when you have everything set to "LIVE" for your flight (including weather). Once you set your own weather or choose from existing weather themes it shouldn't happen anymore. Online weather services are not very reliable down there anyway. Instead we recommend to use the weather sources mentioned in this manual to create your own real-world weather.



Charts



Rothera - Overview



English



A GUIDE TO

FLIGHT SIMULATOR



SoFly