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Introduction to the South Orkney Islands

The South Orkney Islands group is located in the Southern Ocean, some 600 km (375 mi) north-east of the tip of the Antarctic Peninsula and 1,400 km (850 mi) south-west of Tierra del Fuego at the southern tip of South America. The islands have a total area of about 620 square kilometers (240 sq. mi). The largest island,



Figure 1 South Orkney Islands Location

Coronation, is mountainous with peaks rising to nearly 1,300 m above sea level and is mostly covered by glaciers. We operated from the smaller Signy Island which is also rugged and glaciated, its highest point rising to around 290 m. The ground is generally rocky, with the little vegetation comprising mainly of mosses. The temperature is moderated due to the surrounding ocean; however, the South Orkneys are buffeted by strong winds and receive much rain and snow throughout the summer.

The islands are claimed both by Britain and by Argentina, but since they are within Antarctic Treaty territory such claims are now held in abeyance. Britain and Argentina both maintain bases on the islands. The British Antarctic Survey base, Signy Research Station, was established in 1947. Initially operated year-round, it is now open only from November to April each year (southern hemisphere summer). Our operating location was approximately 1 km from Signy Research Station. The permanent residents of the South Orkneys include Antarctic fur seals, elephant seals, three different penguin species and various nesting species of sea birds.

Planning and Preparation

Shortly after the very successful VP6D Ducie Island 2018 DXpedition, members of the Perseverance DX Group (PDXG) identified several possible entities for our next project. All were remote islands, so we

contacted Nigel Jolly K6NRJ, owner of the RV Braveheart, inquiring about Braveheart's availability for the listed entities with South Orkney being one of them.

Nigel's reply was positive for a South Orkney Islands project. He outlined his commercial project schedule for August, 2019 through April, 2020 which included the VP6R Pitcairn Island DXpedition in October, 2019, several diving contracts, and a January, 2020 project near the Falkland Islands. Nigel wrote that he could pick up a radio team in Punta Arenas, Chile on February 15th, take us to Signy Island for a two-week DXpedition, and return the team to Chile on March 12th. After reviewing his proposed contract and pricing we accepted the proposal. Braveheart and Nigel have a long history of providing outstanding support to the DXpedition community; Nigel's son Matt was the skipper for this project.

The South Orkneys proved to be a popular choice and our on-island team was quickly named. Our international team comprised: Dave K3EL, Les W2LK, Gene K5GS as Team Leader and Co Team Leaders, respectively, Heye DJ9RR, Mike WA6O, Vadym UT6UD, Steve W1SRD, Walt N6XG, Laci HA0NAR, Ken NG2H,



Figure 2 VP8PJ Team at Punta Arenas (Photo K3EL)

Arliss W7XU, Rob N7QT, Hans-Peter HB9BXE and Alan VK6CQ. Many of the team members knew one another from previous PDXG or other DXpeditions or had met at ham radio events. We knew there would be significant interest from the DX community since the South Orkneys' most recent major DXpedition was VP8ORK in 2011, nine years previous to our proposed date. Anyone licensed or taking up DXing since 2011 would need

VP8O and they would now have an opportunity for a contact.

In preparing for the expedition we held several pre-expedition planning teleconferences. Topics included living on the island, antenna planning, operator scheduling, travel planning, permitting and licensing. The detailed plans were documented in the VP8PJ Operations Manual and shared with everyone prior to departure.

Operating from any Antarctic location is a challenge because even during the Austral summer bad weather can be expected. An early priority in planning was to identify shelters that would stand up to the



Figure 3 VP8PJ Campsite (W7XU Photo)

expected weather conditions so that the team could operate safely and effectively. We were able to secure two WeatherPort portable buildings with which we established a single campsite on the island. A separate smaller tent contained a toilet. One building housed the radio equipment with seven operating positions as well as a small camp kitchen in which we could reheat prepared food brought daily from the Braveheart. The other was equipped with 14 bunks for sleeping. Detailed layouts of the tents were prepared prior to departure to make sure everything we needed would fit and to facilitate setup on arrival.

We were concerned about the weight of material that we had to transport and the time it would take to put up the shelters. To address these issues, we designed and built a prefabricated floor system using

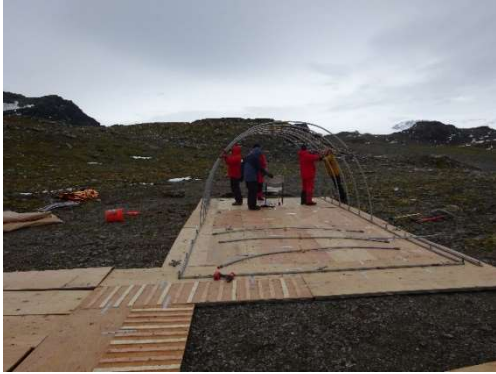


Figure 4 Prefabricated floor (NG3H Photo)

plywood sheets supported on metal construction studs. The plywood was cut into sheets that were small enough for one person to handle in windy conditions. These would be laid down next to each other and joined together to form a solid floor. Several team members traveled to California in the summer of 2019 to prepare the WeatherPort buildings and prefabricate the floor. We decided to operate from the same site that VP8ORK used, near Waterpipe Beach on the eastern side of Signy Island. This site has a sheltered anchorage, and the camp location slightly inland is protected from the worst of the wind by several low rocky knolls immediately surrounding the camp.

The island is well-positioned for propagation to Europe (EU) and North America (NA), however the location of our camp with hills immediately to the north and east made the take-off for NA less favorable than that to EU, which is straight over water. Asia (AS) and much of Oceania (OC) are challenging from the South Orkneys with a path over the South Pole. Both South America (SA) and Africa (AF) are relatively close with excellent propagation much of the time. These considerations were key design factors for the expedition. At the bottom of the solar cycle, only a few bands would be open at any one time so the antenna plan and station design were developed to address propagation and paths, allowing two or more stations to operate simultaneously on the most active bands. Much of the antenna preparation work was performed by Walt N6XG and Steve W1SRD. Several team members met in California to help consolidate, assemble, test and pack antennas and equipment for sea shipment.

The South Orkney Islands are located at, and below, 60 degrees south, which places them under the Antarctic Treaty System. A DXpedition is considered a tourist activity which is permitted under the Antarctic Treaty, but requires an environmental assessment and a waste permit, issued by a signatory country of the Antarctic Treaty System. Being an American led project, we interacted with the US Department of State (Polar Affairs), the National Science Foundation and the Environmental Protection Agency. The permit process took about 8 months from start to finish. We had input from Ralph K0IR, who managed the process for VP8ORK. The various agencies were helpful throughout the process, and keenly focused on their mission of protecting the environment in accord with the provisions of the Antarctic Treaty. We created two detailed documents that answered many questions about the project including explanations of our intended activities, and of the capabilities of the Braveheart. While a travel visa is not required to visit Antarctica, each team member was responsible to ensure he had the proper documents to enter Chile.

The radio license and call sign proved to be surprisingly elusive. Previous DXpeditions to the South Orkneys applied and received the license/call sign from the Falkland Islands telecommunications authority. We were unable to get a license from the Falkland Islands; while we were organizing the expedition the Falklands telecommunications authority was being restructured and their licensing process was temporarily suspended. After a conference call with the ARRL we decided to use VP8/VP8DXU. Team member Arliss W7XU

was the holder of VP8DXU, so it made sense to use his call. Subsequently, Alan VK6CQ joined the team. Alan held VP8PJ issued during his working years in Antarctica. His license was specifically issued for the British Antarctic Territories, which include the South Orkney Islands, so it was an easy decision to change to this call. Using the shorter call sign was applauded by the DX community.

Travel and Set-Up

The team met in Punta Arenas, a popular transit point for visitors to Antarctica and Patagonia. We spent a few days buying last minute items, including a three-day supply of emergency food should the weather make replenishment from the Braveheart impossible. We enjoyed a visit with members of the Radio Club of Punta Arenas, CE8RPA, and took in the sights.

On February 14th our equipment was loaded aboard Braveheart. We departed Punta Arenas on February 15th for the planned six-day transit to Signy Island. A Garmin inReach personal locator allowed many of you (and our families) to follow our progress across the South Atlantic and the Southern Ocean. The seas were reasonably calm and the winds helpful. About a day away from Signy we started seeing ice, and for the last night the vessel proceeded very slowly while keeping extra watch for the smaller bergs that might not be seen on radar yet may be capable of putting a hole in the ship. We arrived at Signy earlier than planned but were disappointed to find access to our intended landing spot blocked by upwards of 100 m of pack ice. The



Figure 5 Pack ice along shore line (K3EL Photo)

skipper and team members investigated the extent of the ice and concluded it would be too dangerous to land people and equipment. Alternative landing sites were evaluated, and we contacted the staff at Signy Research Station to tap into their local knowledge. They told us that the ice had blown in the night before, and a change in wind direction was expected that evening which would likely move the ice out. The next morning the ice was dispersed enough to begin ferrying people and equipment to the island using an aluminum hulled boat especially constructed to operate around ice.



Figure 6 L-R Dave K3EL - Gene K5GS (W7XU Photo)

The radio and campsite equipment were ferried ashore. Being relatively late in the season, there were very few fur seals at our landing site on Waterpipe Beach so we were able to transfer equipment across the slippery, rocky foreshore. The Braveheart crew and the radio team moved the equipment approximately 300 meters up a steep and rugged slope to the camp location. A second location was used for landing of personnel, by stepping out of the boat onto boulders and then climbing up rocks to reach the campsite path. To facilitate this landing the crew constructed a temporary ladder that was removed at the end of the project.

The first priority was to establish shelter, and the prefabricated tent flooring was placed on the ground and the buildings erected. This was followed by parallel workstreams of antenna construction, equipment setup, and furnishing of the sleeping and operating tents.

Signy Island is mountainous, with many hills and very rocky and uneven ground. One had to be careful when walking as losing one's footing could be dangerous. Being outside could be hazardous since the weather was cold and windy, with rain and snow most days, and very little sunshine. The temperature hovered around freezing most of the time, and the wind and precipitation made it feel colder. Assembling antennas and anything else with small pieces of hardware was difficult in the harsh climate.

Meals were taken on the island. Breakfast foods were stored on the island and regularly replenished by Braveheart. Weather permitting, each day two hot meals were brought ashore. Except for an occasional trip back to the ship for a shower and a warm bed everyone stayed on the island for the duration of the DXpedition.

We were well-supported by manufacturers and distributors of amateur radio equipment: Elecraft loaned eight K3s transceivers, KPA-500 amplifiers, P3 panadapters, KAT-500 tuners and a KPA-1500 amplifier; DX Engineering donated coax, connectors, tools, antenna parts and accessories; WiMo (Europe) donated two triband and two WARC band Moxon antennas. Spiderbeam provided a substantial discount on the telescoping masts and Arlan Communications loaned (and later discounted) their RadioSport headsets. Low Band Systems discounted high power band pass filters which were a great help in reducing interstation interference. The DX Store and ON5UR QSL Print Services subsidized QSL card production. Inmarsat Government donated communications equipment and services. Mastrant and Clamcleat each donated guying ropes and fittings. The generosity of these manufacturers and distributors is greatly appreciated.

Team members provided SPE and OM Power amplifiers. Logging computers were Lenovo X-230 laptops belonging to PDXG. Many of the Pelican and other shipping cases were loaned by Paul N6PSE (Intrepid DX Group) and Jim K8JRK, while others came from the team.

The antennas included: two EAntenna triband Moxons, two EAntenna 12/17 WARC Moxon antennas, verticals on 60, 80 and 160, four squares on 30 and 40, a dipole for 40, and VDAs for HF. The high wind conditions proved to be a challenge for the verticals, with regular maintenance required to keep them up; better guying using stakes rather than attachment to surface rocks improved wind survival. The Moxons were situated on



Figure 7 Moxon and Vertical Antennas (W7XU Photo)

the Marble Knolls, low rocky ridges that surrounded our camp. This gave them enhanced effective height above. The EAntennas and Spiderbeam aluminum masts withstood the rigors of Antarctica and performed well in this exposed location.

The terrain and location of our campsite prevented us from having internet access from the island; we were too close to the mountains to the north. Braveheart was just far enough away from the mountains to get a signal but the weather conditions made the landing too hazards for us to go back to the ship every day.

We kept in contact with the Pilot team using our

Garmin inReach's texting capability, not perfect for long detailed reporting, but good enough to pass pilot reports. When back on the ship we used our Inmarsat satellite phone for voice calls to home and to the chief pilot, Glenn KE4KY, and the Inmarsat BGAN to upload logs and exchange emails with the pilot and support teams.

Radio Operations

The first contact was made on 40m CW with DL2HRF on 22 February and the final contact was on 30m CW with WA6RRI on 6 March. A few minutes after the first QSO was logged two additional stations came on line. The next morning, the team continued antenna and campsite buildout and by the end of that day most stations were operational. We were delighted to find good propagation and reasonably strong signals to many parts of the world, with EU being the best. Later into the expedition conditions dropped off a little, but overall, we had few complaints about propagation.

During periods of good propagation all seven operating positions were in action. As high-bands

propagation waned during the night SSB usually dropped out first. The SSB operations would shift to FT8, where a single operator could handle multiple FT8 stations simultaneously. The radio operations plan included a rack of high-power bandpass filters manufactured by Low Band Systems. Even with our Moxon and vertical antennas in close proximity to one another the combination of Elecraft radios and LBS filters proved to be very effective and we had very little interstation interference.

An important aspect of VP8PJ planning was operator scheduling. We used a similar plan to the one that was used on Ducie Island, VP6D. For each four-hour shift operators were scheduled on four or five stations,



Figure 8 All Stations Operational (NG2H Photo)

depending on expected band activity, with the remaining stations available for any other team member to use. The scheduled operators worked under a designated shift captain who decided which bands/modes had priority during their operating shift. Operators using an open station could choose to do whatever they wanted so long as the band/mode was not already occupied by a scheduled operator since the scheduled operator always had priority. This process ensured that all team members had a sufficient amount of operating time, while providing an opportunity for extra time on-the-air for those who wanted more radio time. Every few days each of the three radio teams would move their start time by four hours, thus over the project's duration each team experienced different geographic openings and band conditions.

After the WSJT-X (RR73) machine generated dupes were removed, the QSO count was 83,782. Thousands of these duplicate QSOs were removed by the PDXG Log Search/OQRS software. The application looks at each FT8 contact and deletes subsequent QSOs for that call sign within a two minute window of the first QSO, i.e. the machine generated duplicate QSO(s).

QSO distribution was: EU 52.7%, NA 34.8%, AS 6.4%, SA 4.5% and AF/ OC 1.6%, with 20,523 unique call signs and 168 DXCC entities, see Figure 9 for additional details.

We had 773 "Not in Log" (busted call) inquiries, which is a very small number for 83,782 QSOs. This was a good indication that the VP8PJ operators paid close attention to logging accuracy. However, there were a few pirates operating and unfortunately some claimed QSOs were for dates, times and/or bands when we were operating elsewhere or off the air.

Each morning we'd look at the N1MM+ graphs and see that we were making between 5,500 QSOs per day from the first full day of operating to 9,200 QSOs per day on the best operating day. Considering the propagation and less than perfect paths, signals from all over the world were good. Pilot reports and over the air reports indicated we were being heard without too much difficulty on most bands, and even 10 and 12 opened a few times. We used WSJT-X software version (2.2.0) with the fox/hound operating mode and most

callers understood the FT8 operating protocol. However, some callers didn't get the message straight away and were calling below 1,000 Hz. This improved as more people got the hang of fox/hound operation.

As with VP6D, it was interesting to see the popularity of FT8 not just amongst the callers, but also with the DXpedition operators; perhaps the chance to remove the headphones and relax was a welcome break from the adrenaline rush of working a pileup on the other modes.

BAND/MODE	CW	FT8	RTTY	SSB	TOTAL QSO	TOTAL %
160 m	1232	828	0	0	2060	2.46 %
80 m	2515	2563	0	190	5268	6.29 %
60 m	0	1559	0	0	1559	1.86 %
40 m	6824	5704	14	1979	14521	17.33 %
30 m	8799	5226	737	0	14762	17.62 %
20 m	8396	3534	1232	5762	18924	22.59 %
17 m	6920	4985	417	4719	17041	20.34 %
15 m	4089	1925	40	1351	7405	8.84 %
12 m	1083	595	0	46	1724	2.06 %
10 m	285	233	0	0	518	0.62 %
TOTAL QSO	40143	27152	2440	14047	83782	100 %
TOTAL %	47.91 %	32.41 %	2.91 %	16.77 %		

Figure 9 Band - Mode Statistics

During the voyage to Signy Island we operated as ZL1NA/MM and also had a WSPR station operating as VP8PJ.

Departure

A DXpedition team needs to create a departure plan. It begins by merging the team's plan into the skipper's departure schedule, and removing non essential equipment from the island as soon as we determined what was not needed. Antennas will gradually be removed, stations disassembled and packed for shipment. This process typically begins about three days before the planned departure date, but of course the actual departure will depend on weather and sea conditions. The skipper was providing regular weather forecasts, and the day before our planned shutdown, he told us we would have one more day to operate.

The tides and sea conditions would be more favorable if we left on the morning of March 7th. Also, an early morning departure would give us better visibility in navigating the ice fields as we departed. This new schedule meant we would have a final day of very intense activity, taking down the remaining antennas,



Figure 10 Waterpipe Beach Staging Area (K3EL Photo)

equipment, and tents, transporting everything to the shore and transferring it to the Braveheart. By the afternoon of March 6th much of the equipment was staged on Waterpipe Beach, and we were revitalized with a cup of hot soup near the beach. Then three team members went back to the ship to assist the crew with stowing equipment as it came back from the island, while the remainder of the team transferred equipment down the beach and through the waves to the small boat which made multiple trips between the beach and the Braveheart. This required several team members wearing waders to

stand in the very cold water for several hours. With everything properly stowed and a workaround to ensure nothing was left on the island, the remaining team and crew returned to the ship.

The return to Punta Arenas was uneventful. With following seas, we arrived sooner than expected. We were greeted in Punta Arenas by immigration and customs officials, a health inspector and our customs broker. After several hours of formalities, we were permitted to leave the ship and our equipment was transferred to the customs broker.

Reflections

Once back in Punta Arenas we became fully aware of the worldwide Covid19 crisis. Team members had previously booked return flights between March 13 – 17. Several of them rebooked for an earlier departure.

With time to relax we looked back over the past several weeks. Very few people in the world get to walk on Antarctica, even fewer are permitted to camp overnight. The consensus was that VP8PJ had been a successful expedition for the island participants. We hope it was a good experience for those of you chasing us in the pileups. We enjoyed hearing from people who contacted us, be they a mega-station looking for a full house, or a QRP operator needing an ATNO. A consistent theme from many who wrote was they had “fun” working VP8PJ, and we had fun working you.

We set up a Groups.io reflector prior to departure, many of your comments were summarized by the pilots and forwarded to us. Other island activities included collecting marine sediment samples for scientific research and partnering with several schools to supplement STEM education through classroom presentations about the expedition.

One of the most meaningful comments on the reflector was written by John Miller K6MM, President of the Northern California DX Foundation, addressed to Chief Pilot Glenn KE4KY: “Kudos to both the on-island team, and to you and the other members of the off-island team. VP8PJ has been one of the most well-run DXpeditions in the last decade “

Wrap Up

We would like to acknowledge the help and support of many groups and individuals who contributed to South Orkney Islands 2020. We appreciate the major financial sponsorship from the Northern California DX Foundation (NCDXF), the German DX Foundation (GDXF), The American Radio Relay League Colvin Award, Clipperton DX Club and the Far East DX-ploiters for their very generous support, and that of the many other clubs and foundations. Please review the list of Corporate and Club/Foundation sponsors at sorkney.com, they deserve your support.

Over 1,700 individual donations were processed via the website, including 103 Premier Donors (contributing \$200, or more) and over 1,600 DXers added a contribution to their OQRS confirmation request. The on-island team were supported by many individuals, and in particular we would like to recognize our Chief Pilot Glenn, KE4KY, and his pilot team of: Mason KM4SII, Cesar PY2YP, Bjorn ON9CFG, Alex 4L5A, Andre V51B, Hiro JA1WSX and Luke VK3HJ.

Managing the early donor program was Doris K0BEE, and Tim M0URX who processes your QSL confirmations and uploads your LoTW confirmations.

Among the highlights of the project were giving many DXers an ATNO and/or band fills, putting people on the Honor Roll, logging thousands of FT8 contacts, the first 60-meter operation from Signy Island, and working with a fantastic team of amateur radio operators.

We must also recognize Matt Jolly and his Braveheart crew who were as much a part of the project's success as the radio team.

Until the next time, thank you for your interest in VP8PJ South Orkney Islands 2020.