

# HIGH TECH SURVEYING IN A LOW TECH WORLD

By Bob Halliday, O.L.S., C.L.S., O.L.I.P.

**O**n July 16, 2005, I left my home in Massey and traveled to the Sault Ste. Marie airport where I caught a flight to Thunder Bay. At check in, they told me my baggage was over-weight, and I would have to pay an extra fee. This wasn't a big surprise after carrying all this stuff in from the car. I was bringing a heavy suitcase, with enough clothing for two weeks, since I didn't know what washing facilities we would have available. I also had a heavy duffle bag with a sleeping bag, two pairs of hiking boots and rubber boots and other field equipment, plus a well-packed briefcase, a knapsack with a digital camera and a satellite phone and a laptop computer.

The next day, I flew to Yellowknife, via Winnipeg, Calgary and Edmonton. I was met there by Lloyd Taylor, a partner in Ollerhead and Associates Ltd., a land surveying firm based in Yellowknife. We were getting final preparations made, before heading into an exploration camp operated by a Canadian Mineral Exploration company. The project before us was a survey of 25 mineral claims, which had been staked at various times over the previous ten years.

During the next two days, the other two members of the team assembled, introductions were made, and final details were taken care of. Prior to my arrival, approximately 700 survey monuments and all of the bulky field gear had been sent ahead.

On July 20, Lloyd Taylor, CLS (Project Supervisor and Party Chief), John Adams (long-time friend of Lloyd's), Kyle Ollerhead (son of owner Varick Ollerhead) and I flew from Yellowknife to Rankin Inlet on a Canadian North jet, and from Rankin to the first camp on a Twin Otter chartered from Kenn Borek Air. This camp is an exploration camp located in the terri-

tory of Nunavut (just north of the Arctic Circle at Latitude 66-30). The camp consists of some prospector tents, plus a kitchen/washing facility, office tent, core shack and geologist's office. It sits beside one of the many small lakes in

relative and absolute locations. During the planning stage for this survey, approximate locations for these stakes had been determined. We used Leica Model 500 dual frequency GPS receivers for the survey measurements.



Camp

the area, on a relatively flat sand deposit. There are good gold prospects here, and some indication of diamond deposits.

While we were there, several diamond drills were operating in the area, and some geologists and students were doing prospecting work, and examining and "logging core." There was also a cook and two assistants preparing a varied menu for the hungry workforce. At times there were as many as forty people staying at this camp.

Our work consisted of looking for 2"x2" wooden stakes placed by the "staker," installing iron survey monuments where the stakes were found, and making GPS observations between the various monuments to determine their

First thing in the morning, the crews left camp aboard a helicopter, with enough survey monuments and marker posts for the day. A plan, or 'campaign' would have been worked out on the previous evening, and bundles of these monuments were set out at the appropriate locations. The crews normally worked on the same or adjoining claims, so that multiple simultaneous GPS observations could be made.

Depending upon availability of the helicopter, we flew out of camp between 7:00 and 7:30 AM each morning, and returned between 7:30 and 8:00 PM in the evening. Kyle would set up his GPS on the first monument planted in the morning, and I would walk ahead 450 m using a handheld GPS to look for the

next staker's post. Kyle logged a predetermined amount of GPS data, and then moved ahead to where I was. Each of us wore a pack weighing 30 to 50 lbs, and also carried survey bars and marker posts weighing another 20 lbs.



**Arctic Willow**

The biggest impediment to our work was the staking itself. Often, the stakes were difficult to find, sometimes impossible. As the project went on, and we started to understand how the staker thought, we could anticipate where the most likely spot would be for him to drop his stakes. This let us find them more quickly, and our daily averages improved.

The terrain varied between wide, flat-topped sandy moraines, narrow sandy ridges (eskers), 100 m high rock ridges, 500 m wide rock fields and swamps. Even in late July there was still snow around, but only in shaded areas on hillsides, and in narrow sheltered valleys. The survey bars we were using were 91 cm long, and went down their full depth without hitting frost on the uplands. However, the moss cover in the wet areas is apparently a good insulator because there was permafrost only 10 cm below surface there. Surprisingly, the bars went into the permafrost with only 15 or 20 blows from the hammers that we used. On one occasion, we spent over an hour trying to remove a bar from the permafrost, but eventually had

to give up, and leave it there.

I never saw vegetation more than 15 cm high: short grasses, mosses, various delicate flowers and arctic willow. Even the willow spreads out across the ground, but doesn't grow up. The

flowers are tiny – no more than 3 cm across, but quite interesting, and a welcome change from the dreary grey and black that make up the landscape. In this area, they weren't as plentiful as I had expected.

I went armed with a 30-30 rifle, for protection from polar bears, and carried it every day at the last camp, due to its proximity to the Arctic Ocean. I would like to have seen one from the air, but not while on the ground. I didn't end up seeing any at all. However, we did see numerous caribou (15 to 20 per day). We also had a few encounters with Arctic wolves. This happened right in two of the camps, and Lloyd and John ran into a mother with pups on two consecutive days while at the first camp. There was a small herd of musk-ox near the second camp, but the helicopter pilot couldn't find them when he tried to take us out and show them to us.

Around the camp, there was also a family of arctic ground squirrels, or 'sics-

sics' (which I assume is the Inuit name for them). They were cute, but messy. If any garbage was left around, they tore it open, and spread it around, just like dogs do at home. One of the squirrels also thought that the area under Lloyd's cot made a perfect latrine, and used it on several occasions. Lloyd pleaded with me to shoot it, since I had been dubbed 'The Hunter' by John, the camp set-up man. I thought some of the geologists (especially some of the young female variety) might take exception, and even try to use the rifle on the surveyors, so I declined.

There were a few species of songbirds, but not many. We did see ravens, jaegers and Arctic loons. The loons have two interesting calls: one sounds like a kitten calling (quite unexpected), and once I was sure I heard a person calling 'Hello' but could only see a pair of loons. I made the mistake of telling the rest of the gang. For the rest of the project, they asked me what type of bird had spoken to me that day.

As you know, there is 24-hour daylight during the summer in the Arctic. It's a strange phenomenon, but it doesn't really take much to get used to it. On my first night in Yellowknife, I got to the company bunkhouse around 11:30 PM. Introductions were made to the two men already staying there, and they went to bed. I had some computer drafting to work on, so I worked until 1:00 AM. Although the sun was down, it was still quite bright, and the streets were totally deserted. While in the barrens, no lights were needed to answer the call of nature at 3:00 or 4:00 AM. During our last week, we started seeing the most beautiful sunsets, but



**'sic-sic'**

still not full darkness. As I write this account at the end of October, it seems very strange to have full blackness by 7:30 PM instead of decent daylight at 2:00 AM. Despite the strangeness, sleep came easily. The tents were somewhat dark, being made of a heavy cotton material. Also, once we started surveying, our days were quite demanding physically.

A few days after arriving at our first camp we were told to get packed so that we could be moved to the second camp. We traveled much lighter for this side trip, since we were supposed to be only staying overnight. We loaded our personal gear, surveying gear and bars, plus four large propane tanks into the back of the Twin Otter, and off we went, about 40 minutes to the southwest.

This camp's airstrip is only 170 m long, so the pilot needs to get things just right. There is a river valley immediately in front of the airstrip, and rough land behind the airstrip, followed by another valley. Being a passenger, all I knew was that when we came in the first time, we slowed down, but at the last moment, the pilot gave full throttle, and up we went. The next time, we dropped much lower, and came in more slowly. This time we were below the level of the airstrip. We had to rise up slightly to get level with the airstrip and bumped down once or twice, then full throttle again and circle camp once more. I don't think that they have an emergency rescue squad at these camps, or else I'm sure one would have been idling alongside the runway. The third time we got down safely, we felt the massive pulse of full reverse on the twin engines, and we taxied over to the cook tent. The pilot (who was in training) said 'Sorry', helped us get out our gear, and was off again.

This camp is slightly south of the Arctic Circle. The routine was the same: out in the helicopter at 7:00 AM, look for the staker's posts and connect them with GPS. We ran into a large snowfield along the southern slope of a hill with musk-ox tracks, but didn't see any sign of the herd. Ralf the wolf was living near that camp, and came in one of the nights we were there. The next morning,



**Ralf**

there were tooth marks in the lid of the freezer located outside of the kitchen.

The cook here was more like a chef: great meals, and lots of fresh baking. I went fishing in a canyon about 2 km outside of camp one evening at around 10:30 PM. It was a pleasant hike, and a fabulous view, and I caught two small lake trout. At 2:00 AM when I returned to camp, there was a full moon hanging over the river to the east in the twilight.

We finished up at noon the following day, and then had to wait until evening for the Twin Otter to return for us, so Lloyd, John and I went fishing. Lloyd knew the magic spoon for trout and char

(a five of diamonds), and was appropriately equipped. As a result, he caught several trout. I was using different spoons, hooked one, but it broke my line. The water is wonderfully cool and clear, and fishing was a pleasant break.

We returned to the first camp that evening, and spent the following week finishing the claims there. A few caribou were starting to move around by then. We often encountered the remains of caribou lying on the ground, bones cleaned off by wolves. Being here makes you feel like you are a part of a life and death struggle.

We finished up the claims, and were



**Real Time GPS**

asked to provide an accurate baseline, and to locate a number of diamond drill holes. Using a Leica Real Time GPS system, we tied in an existing set of points, and determined a 'best fit' line, and then established a number of rock bars on this line. We also tied into two monuments on an existing boundary of Inuit-owned land, to maintain a common reference datum.

Then the waiting started. We were ready to move on to our third camp, but the Twin Otter was not available. It was based at Rankin Inlet, and there was constant fog over Hudson Bay that week. Three days later, when the plane could fly, some canoe trippers had an explosion and needed to be evacuated, so the Twin Otter went for them instead. I would like to have seen the Twin land on the tundra, given our experience where we were landing on a 'runway.' Finally, after seven days, we moved on. The ceiling was quite low, so the pilot also had to fly low, following the valleys to keep below the clouds. We flew over a wolf, but didn't see any other wildlife.

This camp had only been opened the day before we arrived, specifically so that we could survey the claims in that area. A small crew of geologists also came in, but there were only a total of 10 of us in camp, including the cook 'Chuckie.' The camp sits beside a small deep lake, and is quite picturesque. The first night there, the wind caused the stoves to downdraft. I staggered out of

the tent around 4:00 AM with some carbon monoxide problems, and went around to the other tents, to make sure everyone was alive.

We were much further north now; only 30 km from Committee Bay, and the air was cooler. The first day, we encountered a valley with 20' high snow banks and caves through the snow, so the helicopter landed on top for a photo-op.

We were now getting into the groove, and our production rate picked up. Everyone wanted to get home. We had minor equipment issues (such as one GPS unit shutting down three hours before we were finished), but with minimal overlap of data, Lloyd was able to resolve the ambiguities for the requisite baselines.

Despite the pressure to perform, there was still time for fun. One evening I went 'heli-fishing' with the pilot and three of the geologists. We flew to a likely looking feature on a mid-sized river and tried our luck. Four nice lake trout and one char got a one-way flight back to camp.

The geology students were always up to some antic or other. One night I sat down to eat, and was told they were all 'going to the beach.' There was a 15 m wide by 2 m deep snow bank at the west end of the little lake beside the camp. Each took turns riding on a plastic tarp while two others dragged the rider down the snow bank and into the ice-cold lake. Screams and laughter were heard everywhere.

The last few nights were relatively clear, and we had some magnificent sunsets. Still not fully dark, but colourful sunsets.

Finally, on August 15, after an afternoon of anticipation the Twin Otter came in for us. The pilots refueled, and off we went, directly down the coast of Hudson Bay to Rankin Inlet, arriving around 9:30 PM. We slept in the crew house. I was up at 6:30 AM the next morning, and back at the airport for 8:00 AM, hoping to get a seat on the 'CalmAir' flight from Rankin to Winnipeg via Arviat and Churchill. At first I was told I had a seat, but not enough weight capacity for my luggage. It was sort of like standby. I managed to get on, and arrived in Winnipeg around 2:00 PM.

What culture shock! From a tent for a kitchen to a major hotel with chefs. I enjoyed a leisurely afternoon, and finished off some office work while watching MASH and MacGyver reruns. The following morning I was in the airport at 5:00 AM for a 6:00 AM flight from Winnipeg to Thunder Bay, via Red Lake and Sioux Lookout. Security was tight - I was told to open my Tim Hortons coffee and take a drink. The amusing part was that the same flight stopped at Sioux Lookout. They sent us into the main building at the airport where we mixed with other unscreened passengers, and then returned to the plane without any security whatsoever.

I was back in Sault Ste. Marie around 11:00 AM where I had to re-learn my driving skills. I made a brief stop into the Land Registry Office, and then off for home. Well, almost. I detoured into Elliot Lake where I bought some flowers and made a surprise visit to my wife. Then home in time to do evening chores and get re-acquainted with my son and daughter. Home never looked better.



**Bob Halliday**, OLS, CLS is the owner of Halliday Surveying Inc., which is based in Espanola, Ontario. He can be reached by email at: [rdhols@hallidaysurveying.com](mailto:rdhols@hallidaysurveying.com). Visit his Web site: [www.hallidaysurveying.com](http://www.hallidaysurveying.com).



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