SLEDDING EXPEDITION GEAR

BY JERRY KOBALENKO

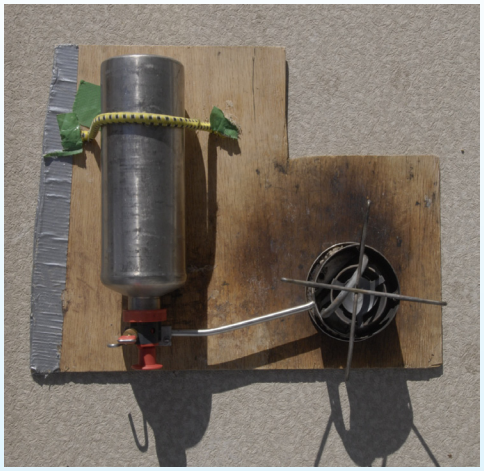
CAMP GEAR

• Tent & fly (either Keron 3GT for windy or solo trips or a mountaineering dome -- eg. Mountain Hardware's Trango 4 -- for more space.) Hilleberg's Keron tents are the best for wind, can be set up solo in a gale, are long, and the GT models have huge vestibules. But the tent itself is a little narrow for two big guys.
Dome tents work best in winds of 30mph or less and take longer to set up, but the ceiling is a little higher and the dome layout is more spacious than the Keron's tunnel. I've used dome tents in 50mph winds and had to weigh down the inside with rocks. Meanwhile, the Keron is solid even at 70mph, as long as it's well staked down.
Unlike mountaineering expeditions, where you mainly want to endure a brief summit push, you live in a tent for a month or two on a polar trek, so 12 pounds for two people or even one person is fine.

• Tent poles & extra pole & 3 pole repair sleeves
• 12 snow stakes & 14 five-inch nails (Keron) or 6 snow stakes & 6 nails (dome). Nails are used for staking on bare frozen ground or windblown ice.

Dome tents are freestanding and only need staking down in strong winds. The Keron is superior in gales but needs solid anchors even in calm weather. In late spring in the low Arctic, when the snow stays very soft, snow stakes no longer provide solid anchors for windy conditions. Only skis, poles, ice axes, etc. suffice. It's hard to have enough of those for all the Keron's tiedowns.

• 2 MSR stoves (XGK & Whisperlite), 3 pumps (including one or two of MSR's Arctic Pumps), foil wind-screen, stove board and Heat Exchanger.
The plywood stove board has a loop of bungie cord staple-gunned to it, which holds the fuel bottle securely. The wood insulates the stove from the snow, so your stove does not tip or list as it melts a hole in the snow. The unit can also sit inside the tent on the banker's box of sandwiches, for indoor cooking.



• White gas (.18 to .25 liter per person-day) .
.18 liters/day is a very spartan camp; .25 is quite sybaritic and includes about 10% extra in case of spillage, or if you want to heat the tent while making notes, etc. Note that I don't sweat much & don't drink a lot of water. Sweaters may need the full .25 liters/day.

• 10 fuel bottles, plus 1 or more 4-liter cans, as necessary.
MSR used to make titanium fuel bottles for expedition use but no longer do. It was a sponsored item that saved me just a pound in total, but would have cost $1,000 if bought retail. Nowadays these bottles sometimes fetch$250 each on eBay among ultralight fanatics.

• 2 Titanium pots & lids (2 liter capacity)
One pot serves only to melt/boil water; the other for cooking. Both are two liters, but one is taller and the other is wider, so they nest together. Suitable for one- and two-person parties. Larger groups can get a 4-liter titanium pot from traildesigns.com.

• Small aluminum frying pan and spatula.
For pancake/powdered omelette special breakfasts.

• 3 Bic lighters & superlighter (eg. torch lighters from Ronxs or Blazer) Matches are unnecessary. Just warm the lighter in your hat for a few minutes before use in the cold. One lighter lasts a whole expedition, but fire is so important that I carry several backups against failure/loss.

• Fuel hose or small funnel
To pour into fuel bottles from 4-liter fuel can without spillage.

• Plastic bowl & insulated cup
Important in bitter cold, so you can sip your hot choco-late with insouciance rather than hurriedly chug it down before it freezes. Only disadvantage: You can't warm your hands on an insulated cup.

• 2 Lexan spoons, 1 Lexan knife

• Garbage bags to protect food from gasoline spills It's not only highly poisonous to eat gasoline-tainted food – it's almost impossible to do so. The taste is too gross.

• Cardboard Banker's box with lid for sandwiches, and kitchen "table" (1.3 lbs). Line the top of the lid with Mactac for water resistance/longevity.

• Polar bear alarm fence.
See www.kobalenko.com/geararchives2008.htm for details.

• Polycarbonate snow shovel
These lightweight shovels are not recommended as avalanche shovels, but are light and perfect for general winter camping. Hard to find these days; avalanche shovels are heavier but otherwise fine.

• Snow knife
Most commercial snow knives are too short. Inuit often use just a big old rip saw. The blade of mine is almost two feet long. It's a survival tool: If a polar bear or a storm destroys my tent, I can build a shelter. Mountaineers sometimes use them to build protective snow walls for their tent, but I've never found this necessary.

• Small ice ax with hammer on one end to stake the tent with nails on bare sea ice, and a pick on the other end to chop iceberg ice for melting.

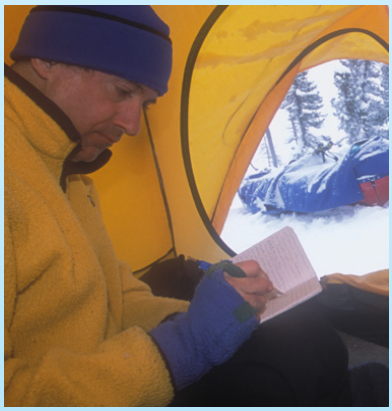
• Stephenson bag & big stuff sack from warmlite.com I ordered the bag with 10% overfill, and picked the version with a thick open-cell foam pad on the bot-tom. Some years ago, a thermophysiologist and I tested sleeping pads and other winter gear in his lab. I lay down in his cold locker at -20°C on a variety of insulators, with thermocouples attached to my back & rear. The Stephenson foam pad outperformed even a caribou fur rug. Do not accept their now-standard down air mattress; these do not insulate well in the cold.

• Overbag (for coldest trips only)
Custom made synthetic overbag to fit over the big Stephenson bag and add a little warmth and protect the vulnerable down from frost. Bag, overbag and integral foam pad together weigh 10 lbs – a typical weight for something that actually works at -54°C.

• 3/8" thick closed-cell foam pad
To sit on. Also adds extra warmth under the sleeping bag. You can't have too much insulation underneath.

• 1 folding camp chair
If you can bring one luxury item, make it this.

• Diary (2 or more for longer trips)
Clairefontaine makes the best notebooks. The good paper registers even cold pencil lead, and the binding does not crack in the cold. The ones with 96 sheets (about 200 pgs) last me approximately three weeks. The 48-sheet models are good on shorter trips, or as spillover pages for trips of 4-5 weeks. Moleskine notebooks are also good.



• 2 mechanical pencils & extra leads
Pen ink freezes in the cold.

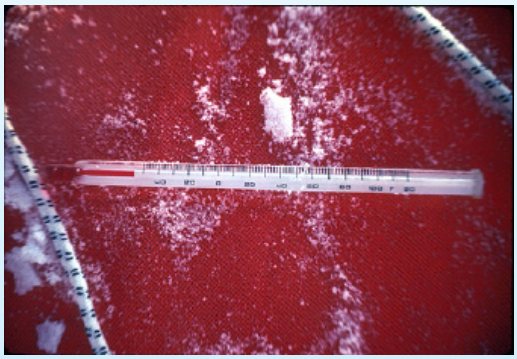
• 2 pens
For milder days or when heating the tent with the cook stove.

• Smart phone for its GPS, flashlight, star charts, altitude apps, as well as a dictation device. Phones don't like extreme cold, and apparently a sensor inside records too-cold temperatures and could void any warranty, but you can keep it permanently in a pouch around your neck, inside the bib pants.

• Music player, earbuds, car charger and custom-made 12-V battery compartment. (also charges satphones). The alternative, solar panels, are not great in winter but are fine in Antarctica and in the Arctic from mid-April on.

• AA lithium batteries
(enough for 3 battery changes/item)

• Petzl Duo LED 14 headlamp
In deep cold, a set of four AA lithiums gives approxi-mately 30 hours of light. Note that a headlamp is not necessary after the end of March in the High Arctic, because it's daylight all the time.



• Whisk broom
One of those understated but vital winter camping items. For sweeping snow from boots, the tent floor, clothing, and the walls of the tent in the morning. In extreme cold, snow behaves like white dust, rather than marginal water, but if you cook in the tent, or if the outside temperature rises above about -10C, then snow easily becomes wet and can affect clothing or equipment.

• Map Measurer
Very handy to figure mileage, but doesn't work well with self-printed digital maps

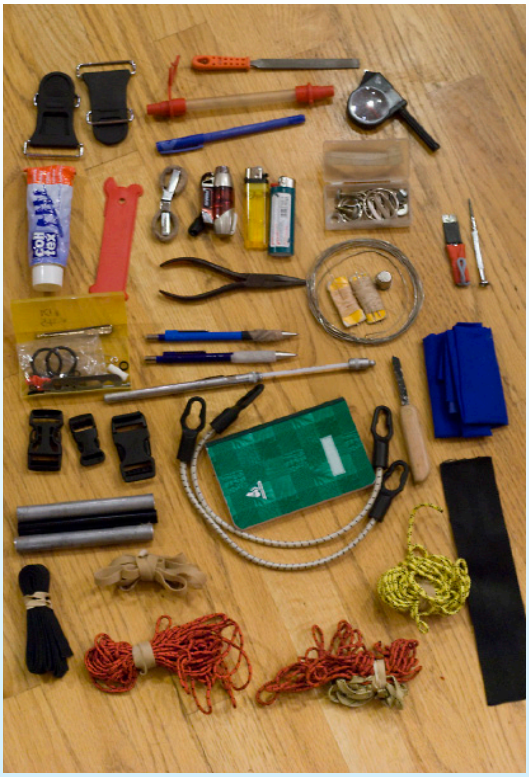
• Extra-large nylon pocket to hold the repair kit & the spare AA lithium batteries

• Thermometer

• Extra Ziplocs, plastic bags

• Cord, general purpose, various diameters.
If the expedition involves ice cap travel, a climbing rope, ice screws, climbing harness, crampons, prussik cords, etc.

• Repair kit: binding screws, needlenose pliers, thimble, stove kit, spare screws for ski bindings, metal O-rings, needles, thread, mini-scalpel, coil brass wire, extra Fastex, scrap of nylon for patching, folding scissors, extra 1/2" webbing, piece of seatbelt webbing, 2 bungies for Berwin bindings, spare carbide tips for snow cleats, mini-file, spare nylon ribbon for zipper loops, mini wire stripper for bear fence, jeweler's screwdriver for fence & eyeglasses, mini-hacksaw, spare rubber tips for climbing skins, rubber bands, Leki ski pole repair sleeve (which is actually the aluminum sleeve you use to join two poles together into an avalanche probe).



• Medical kit: Spenco Adhesive Knit (blister prevention), broad-spectrum antibiotic, dental antibiotic, roll of BSN medical tape.
The medical-quality glue on the Adhesive Knit and BSN tape work at -40° -- unlike moleskin, duct tape, etc.

MISC.

• toilet paper (double rolls). 1 double roll per 12 days
• toothbrush
• toothpaste
• floss
• zinc sunscreen
• lip balm
It's easy to find high SPF sunscreen but hard to track down equally potent lip balm. Anthelios (La Roche Posay) makes both. Three cheers for online shopping; I never see this brand in stores. Note that this brand of lip balm is not good in summer because it dissolves the latex nozzle on drink hoses.
• 2 fast-dry towel pieces
One as a facecloth, one as a crotch/bum cloth
• razor, soap
• nylon garbage bag

PERSONAL GEAR

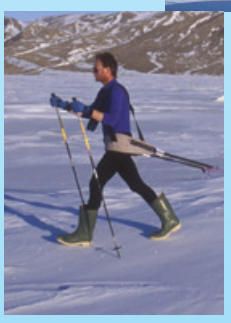
Hardware

• sled (7' for two months)
Mine weighs 19 lbs, including the sled cover -- a few pounds heavier than the primo-quality Acapulkas but a fraction of the price. I drag mine over gravel/rocks on land crossings, so have to replace it every few years to avoid excess friction. Mine costs $1,000, including $300 to have a nylon cover custom-sewn. I then pop-rivet the cover to the sled.

• 2 extra long straps which loop with Fastex.
They extend the pulling trace on open flats. On downhills, one is looped under the sled as a sled brake.

• sled sail (3.2 lbs)
Some expeditions use kites in Greenland and Antarctica, but the High Arctic is not windy enough. In the High Arctic, I use a sail maybe twice a month.

• harness
My belt is from an old backpack waist belt, worn backwards, with buckles replaced by loops in which two carabiners clip. A chest harness completes the ensemble.



• 3 light carabiners, two for sled harness, one misc.

• Fischer E99-style skis & Berwin bindings
The plastic heel of the bindings and the screws on the toe piece should be padded with medical tape. Note that Berwins (available from akers-ski.com) lift from the instep, like old three-pin bindings, and so are less mechanically efficient though cheaper than modern versions which lift from the toe. See kobalenko.com/gear.htm from 2017 for more info.

• Mohair climbing skins cut about 1" wide.
Mohair glides better than nylon, but the traction is adequate. Fish scales do not give enough traction for hauling, although Borge Ousland once had Fischer make skis with scales running the entire length of the ski, not just in the kick zone. This worked with lighter loads up to 150 lbs.

• extra tube of glue for skins
Some people screw the skins permanently onto their skis. I suppose you could also use Gorilla Glue. In soggy ski conditions, you'd want to use screws or permanent glue: It's a pain to reapply the skin glue in the cold.
• scraper for applying glue

• ski poles with powder baskets
I don't bring a spare pole. My Leki aluminum poles have only broken once, when I rapped the side of my ski sharply with it to dislodge some snow that had globbed underneath in mild conditions. I fixed it with one of Leki's pole repair sleeves.

• 12 ga. marine shotgun & 20 one-ounce slugs & 5 plastic slugs. Necessary in polar bear country. In Canada, plastic slugs are available from margosupplies.com. As with regular bullets, you need a firearms certificate to be allowed to purchase these in Canada.

• nylon shotgun envelope
For kayaking/wet trips, Watershed makes a ZipDry gun bag that is totally waterproof but it's a little fussy to open its heavy-duty Ziploc-type closure. I would not want to try to open it quickly in the cold. On winter trips, anyway, snow is like white dust, and moisture is less of an issue. Still, I have added a 3-mil plastic sleeve as a water-resistant inner liner.

• 20 Skyblazer flares as polar bear deterrents. The pen flares are not very useful, because some bears take several flares to deter, and you do not want to be unscrewing/screwing each time you want to fire a new flare. The Skyblazer II from Orionsignals.com fire by pulling a little tampon-like string.

• Snow cleats
With carbide tips, not wire coils, for travel on windblown sea ice.

• Swiss army knife (with saw)

• Stanley 1-qt vacuum bottle
Nice thing about a vacuum bottle, besides warm fluid, is that you can save time by filling it the night before, without having to sleep with it.

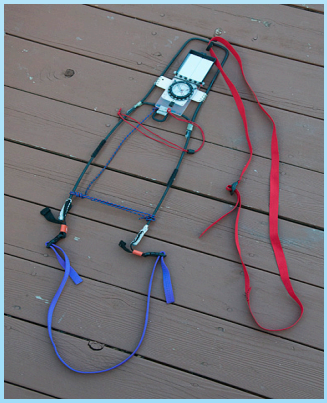
• 1-liter wide-mouth Nalgene bottle
The small-mouth Nalgenes are not suitable for the cold; they form ice plugs too easily. I drink from this bottle first, before the vacuum flask. I can finish it before the liquid freezes. On most days, however, I need to drink at most 1 liter during the day. The second liter is for sweltery May sledding and long (9+ hour) days.

• digital maps, printed on both sides

• VFR aeronautical charts of the travel area as an overview. Charter pilots all use these double-sided, 1:500,000 scale maps. Useful for overviews of long routes.

• Silva Ranger compass
The mirror doubles as a good shaving mirror and frostbite checker.

• homemade compass tray for navigation in bad visibility
In fog or whiteout conditions, you have to consult the compass every few steps, so it helps to keep it on a tray harness at waist or chest level, where it can be consulted at a glance . Clearly, the material chosen for the tray frame must not affect the compass needle.



• light day pack

• ski goggles

• binoculars
Kept handy in day pack or camera bag.
• watch
• sunglasses & case
• eyeglasses
I don't like sunglasses, except in the brightest sunlight, so I usually wear clear prescription glasses, coated for 100% UV blockage. For a little extra cost, the coating can be clear, without a yellow cast.

• snowshoes (sometimes)
GV snowshoes have excellent bindings. They ratchet down like snowboard bindings. Often skis are enough, but snowshoes are superior in deep snow or rough sea ice.

• pee bottle. Just an old one-liter Nalgene. Be sure to pour the pee outside immediately, or it will be frozen by morning!

Software

• 1 pr Expedition mukluks, extra wide, one size larger than normal, and extra wide, from mukluks.com. Note: sizes larger than 12 extra-wide may or may not fit the Berwin bindings.

• 1 pr. kamiks
You need to be in an arctic village to get these. Just track down an Inuit woman who's willing to make them. She'll do an outline of your socked foot and the height of your leg to the knee, and will mail the completed kamiks to you. Cost, including duffles, is $500 and up. If you have only one pair, spring kamiks (shown) are more versatile. The fur on winter ka-miks doesn't seem to add much warmth, and spring kamiks are 100% waterproof for quick dips in melt-water. (If you slog all day through meltwater pools on early summer sea ice, the sealskin eventually becomes saturated, and water seeps in.)

• 1 pr. nylon overboots for kamiks
Helps in a wind, and also protects the kamiks when skiing in Berwin bindings. The overboots don't last very long – one or two expeditions – but they're easy to make. They're just Cordura envelopes with closed-cell foam on the bottom and drawcords around the ankle and knees.

• 1 pr. fleece duffles for kamiks
Duffles are knee-high leggings that fit over socks for insulation. Kamiks themselves have little warmth: They're just soft skin envelopes. The Inuit use wool for duffles, but fleece lasts much longer. Just find fleece that's abrasion-resistant. My duffles have lasted 20 years.

• 1 pr thin socks, 1 thick, 2 medium
The thick pair is exclusively for use in camp and in the sleeping bag.

• 2 sets long underwear
Second set only if the trip's longer than a month.

• 1 pr fleece wristlets, thick or thin fleece, depending on whether it's a winter or spring expedition.

• 2 pr. thick gloves + 2 pr thin ones
I don't use actual mitts, just overmitts. But some people's hands get colder than mine do.

• 1 pr. insulated overmitts.
For wind and cold. Mine have a zipper along the side, so I can poke my hands out without removing the mitts, if conditions are temporarily warmer or I need to take pictures, etc. This zippered model is an old item, no longer manufactured, but can be custom-made.

• 1 pr. overmitt shells
Fit over the overmitts. For the worst conditions.

• 1 yellow fleece jacket
For photography, yellow is better in overcast, red in sunshine, so it's good to carry both colors.

• 1 Lycra tights. Some wouldn't be caught dead in these runner's tights, but they're a perfect middle layer in most cold conditions, and on windless late spring days, they're all a sledder needs.

• GoreTex bib pants, drop seat vital

• red GoreTex shell with fur ruff

• Gorilla balaclava from Outdoor Research
The nose piece fastens on with Velcro and can be removed and de-iced over the stove in the evening.

• Thick fleece balaclava for camp

• light polypro balaclava
Make sure it formfits. Many leave little gaps around the temples when you pull the balaclava over your nose. Those gaps are painful in a wind.

• 300-weight fleece hat, custom-made to pull fully down over the ears.

• Insulated camp pants, eg. Forty Below pants from Feathered Friends
• superbooties(see kobalenko.com/geararchives2008.htm)
• Rock & Ice down parka from Feathered Friends
These last three items are the secret of a happy winter camp. With them, you can sit around comfortably at -50°, outside the sleeping bag.

• 1 pr. fleece pants
winter trips only; mainly for use in the sleeping bag or while traveling in blizzards.

• sun visor
Like those oversized visors Japanese women like so much.

• Underpants, 1 pr/wk
You may also want to invest in a Hazardous Waste container to carry out the soiled ones.

• Vapor Barrier socks
For winter only. Under the 24-hr spring sun, boots dry outside overnight. Keeps boots from becoming blocks of ice as foot moisture slowly accumulates in them over the weeks. Commercial VB socks take up a lot of space in the boots; and thin bread bags often tear, even if changed every day. After a lot of experimentation, I prefer large Ziploc bags, held around the ankle with medical tape.

• Several pr Insolator insoles for kamiks/superbooties
They're partly neoprene, and a pair gets pretty flattened out after 7 to 10 days of walking on them.