

Rucksacks for amateur radio mountain goats



FIGURE 1: A new daysack (right) next to my old trusty daysack (left). The old one has a flap making it much more useful.



FIGURE 2: The Highlander Ben Nevis1, an economical rucksack. Measuring approximately 110cm x 40cm x 40cm, it has a volume of 85 litres, and weighs about 2.3kg. It costs about £80.

I have loved mountain trekking since walking the West Highlands Way in 1990. I have often been to the Franco-Swiss Alps, walking parts of the 650km-long path known as the 'GR5'. It's quite a climb and you need to be fit.

Essential equipment

In all my wanderings, I have found that a good rucksack is essential. I have become used to solo walking with large heavy packs with all the gear I might need to survive happily for a week in the mountains at around 2000m above sea level (asl). I have learned which pack system, and which equipment, works and which does not, so I thought my experience might be of use for radio amateurs who were thinking of taking their radio gear into high or wild places.

A rucksack is a large sack that you might use for travelling or trekking. A 'day sack' is a smaller bag used for short trips away, or for trips that are much less demanding. I would take both a rucksack and a day sack to the Alps. I can use the day sack instead of the main one for walks away from my camp site. From the point of view of amateur radio, I would use a rucksack for mountains and high hills where you have to walk some way before setting up your gear. I would use a day sack (if I could get all the gear into it) for shorter walks, for example, when I was simply moving away from a hilltop car park. But it all depends, of course, upon how much gear must be carried.

Rucksack key points

Firstly, your rucksack should be just large enough to take all the gear you need, *and no larger*. Otherwise, there is a tendency for you to take too much gear (which I have done too many times). Try not to get a large bag 'just in case' you might think you want a larger one later on.

Large bags, partly filled, tend to be unstable on your back, and this is something you definitely don't want when walking down a steep hill in wet conditions.

Secondly, good shoulder straps are really important, and are a key element if you are carrying heavy loads like batteries, radios etc. The straps should be at least 5cm in width, and should be made from strong foam-like material. There is often an additional strip about 15mm wide that goes above the foam, which is connected to the top of the bag. This strip takes a lot of the load. If this smaller strap is not wide enough, or the foam below it is too weak, it will dig into the foam, and this will dig into your shoulder, causing pain or even injury.

Thirdly, the strap that goes across the chest from the two shoulder straps is important for stability, as it locks the bag in place and stops it moving around on your back. The buckle on this strap often includes a built-in whistle which can be used to get attention in an emergency.

Finally, on the assumption that the main rucksack is of good integrity, the waist system must fit well and be of good design. This should be padded and, when properly tightened up along with the chest strap and shoulder straps, should be part of a stable system that allows a surprising amount of weight to be carried. When everything set up correctly, the load is spread out across the back, shoulders, and hips, and the heavy bag will not shift around at all when you move about. Even a bag that feels heavy to lift in your arms, feels much lighter and very stable when you are wearing it on your back.

Hoods and pockets

Always get a rucksack with a hood. This can be used to carry a coat if you don't need it while walking. You can simply fold the coat up and secure it between the straps and back of the rucksack. Without this, you will have to stuff the coat inside the bag, and it can use up a surprising amount of space. You can see in **Figure 1** my trusty old



FIGURE 3: The Nike SB shuttle backpack, a mid-range pack. Measuring approximately 80cm x 26cm x 20cm, it has a volume of about 40 litres. It weighs about 1.7kg, and costs about £80.



FIGURE 4: The Kajka, a top-end backpack. Measuring approximately 150cm x 60cm x 40cm, it has a volume of about 100 litres. It weighs about 4kg, and costs about £300

day sack (on the left) with a flap, and a lovely new bag without one (right). The older bag is considerably more versatile despite not having the better shoulder-strap system of the newer bag.

Most rucksacks have lots of pockets, and these are always useful to store often-used radio parts. You don't want to store these in the main section, as it is irritating to keep having to dig them out when you need them. Side pockets are also useful for quick and easy access to water bottles. Many rucksacks have gauze pockets on the lower parts of the sides, and these can be used also for a phone or camera, as you can put your hand down and get to them while walking, without having to take the rucksack off.

Examples for amateur radio mountain goats

I describe some representative types; I am not suggesting you buy exactly these bags. They may look a bit 'squished' in the photos (compared to the adverts), but that's because they have been used extensively.

The first rucksack in my list of three is the Highlander Ben Nevis1, a 'low-end' rucksack suitable for occasional use (see **Figure 2**). I have used this sort of bag for trekking in the Alps, and for days out with amateur radio gear. It is a nicely-designed rucksack, but it is completely let down by the stitching. A few years ago, while descending from about 1200m asl, one of the straps on this bag broke away from the padding just above my right shoulder. Luckily, I always carry a needle and thread, and so was able to stitch it up again and save the day. So why am I even mentioning this economical bag if the stitching is so poor? It is because I really like the design. If I were to sit down with a piece of paper to design a basic rucksack, it would probably be something just like this bag. However, because it has been made cheaply, it is quite light, and so if you want an economical rucksack you could do worse than buy this one. Be sure to get some strong thread (eg carpet thread), and add a lot more stitching to the shoulder straps before you use it.

Phil, G4UDU, told me he was looking to buy a high-end Osprey rucksack costing hundreds of pounds for a short trip from the rim of the Grand Canyon to the base and back again. Then he saw what looked like the perfect sack in a local shop for £20. He could see that it would not last long, and that the stitching was not good, but it had lots of pockets, a rain cover, and was the perfect size to take all

the gear he needed for the two-day trip. He purchased the bag, and it worked out perfectly. So, if you are just intending to do a one-off or a once-a-year activity, there may be inexpensive options available.

The second bag in my list is a mid-range backpack. The Nike SB Shuttle, which is actually a quality skateboard bag (**Figure 3**), is a superb example, and has some very interesting properties that a standard small day sack would not have. In size, it is somewhere between a day sack and a rucksack. This particular bag has a multitude of pockets, places to which you can tie things, and is really well made. The bag has zipped sections inside to separate pieces of gear from one another. It can comfortably take a small fibre mast (eg the Tactical 7000hds from SOTA beams), and still be able to zip up everything securely. With a day sack, you might have to carry the mast separately or have the end poking out the top. This is not good as it can either slowly undo the zip, or end up snagging on trees and other objects as you walk up.

This sack is designed for light loads, less than 10kg, so best for a QRP set-up perhaps. I recently took it out with my FT817, VSWR meter, MFJ-269, and 7Ah 12V battery, along with a homemade ground-plane antenna, water, tools, and all the cable, radials, and guy wires I needed. This all came to about 13kg, which was a bit too much weight for this small bag. The shoulder straps are not as good as they are in a large rucksack, and so you feel the weight of the load more.

The third rucksack in my list is the Kajka 100-litre rucksack from Fjall Raven (see **Figure 4**). This is beautifully-made. At first sight, it looks about the same size as the first rucksack I mentioned, but the hood system can extend much further, and the two side pockets are very large. I can find no fault with it, apart from the fact that the pack is quite heavy even before you have put anything in it. I guess that's a price you pay for such quality.

The bag can be filled from the top, but it also has good-quality zips running down the back which allows it to be opened up, so you can get to everything, rather than just through the top. This means that you don't have to take everything out to get at items at the bottom. It also means you can pack things into the bag really well, as you can make sure that there are no empty voids.

In May last year I took this rucksack on a trek up into the mountains

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FIGURE 5: A skate bag next to a standard 10m fibre mast (too large), and the much-smaller 'tactical' fibre mast.

to about 2000m asl. I took a lot of gear with me as I wanted to do some audio recording [1], and stay for longer, so needed more food. I took 28kg or so of gear, but this superb sack made this possible.

Important things to consider

Always take a water-proof and wind-proof coat, even if it looks sunny when you start your day. This is especially important for the type of activities we radio amateurs do. We may well get very hot climbing up, but then, after setting everything up, we will be quite passively sitting working stations. So, once you have set up your station, you need to take off your damp sweaty shirt, allow a few minutes to dry off (skin dries quickly if it's not raining), replace your shirt with a dry one and add layer(s) for warmth, and then a wind-proof jacket.

Whatever the time of year you go into the mountains, always take a good hat with an all-around brim, rather than a baseball hat, and sun cream. You can get sun-burnt at high altitude even in the winter. Sunglasses are not always needed, if you have a hat.

If you are driving up to a hill car park, and setting everything up by your car, trainers will do. Walking boots are essential though if you are walking any distance in hills or mountains. This is especially so in wet conditions.

For any trip, make sure you carry food and plenty of still water. Take a thermos of hot water, even in summer. You can't drink hot water as quickly as cold, so you end up sipping the hot water regularly, and I think you hydrate much more effectively.

How much weight can I carry?

I am 1.74m tall and 73kg in weight. I often carry about 25kg, which is therefore about one third of my body weight. This is rather too much weight to carry, but for solo trekking,

were you have to take everything including food and some water, there may be little choice. As a radio amateur making a single day trip to the hills or mountains, one can take far less of course. If you are new to carrying a rucksack, then don't exceed 10-15kg.

Rucksacks and water proofing

Even if your rucksack maker claims that your rucksack is waterproof, you should assume that it is not. If you get into torrential rain, water will get in even if the sack is made entirely of waterproof material. If there is a gap in a zip, or a cover is not closed properly, water gets in. Instead of relying on the rucksack to keep everything dry, always wrap everything in thin bin liners. You don't need to tape these up, but use large ones and fold them around each object a few times. Many packs these days have waterproof covers, often to be found rolled up in the top or bottom pocket. The cover has a built-in draw string that allows it to fit snugly around most of the outside of the sack. These really do help to keep the contents dry in bad weather, as long as there are no poles sticking out of the bag etc. Also, remember that the ground on hills and high places is often damp, and sitting on this for long periods can be miserable. Even a fertiliser-type bag can do as a mat to sit on, and a couple are light and easy to pack.

Needle and thread

I think the needle and thread must rate as one of the most-important human inventions of all time. A reel of strong thread and needle fits nicely into an old 35mm film can, takes very little space, and adds very little weight to a pack, yet it can be a most important 'save the day' device. It is also useful to carry elastic bands and bungees for holding, mending, and securing things when out in the wilds.

Solo v group

In an ideal world, going in a group is far safer than going on you own. But getting a number of busy people together regularly is not easy, so solo trips are bound to happen. Solo walking can be exquisitely rewarding, exciting and inspiring [1]. You just need to concentrate, and make better plans for solo trips.

You must spend a bit of time learning to walk with a backpack. The key thing is to find your own pace: if you go too slowly, it is almost as exhausting as going too quickly. Once you get the right speed for your style of breathing, you can learn to maintain a steady pace. With a heavy pack, you need to rest regularly, even if you don't feel the need to do so. This is especially important when coming down, as it is then that accidents are more likely to happen. Use walking poles, especially when going down hill. One stick will improve your control, two will save your knees. Always take at least one stick.

Daylight

Work out how much daylight you will have for your trip for the time of year before you go out. It will get darker earlier in bad weather of course, so build in lots of time to get down from a hill well before dusk.

Take a head torch with you, even if you intend only to go out on the hills in daylight hours. If you are with others, do not to look directly at their faces while wearing a head torch. I was in a storm in the Alps one year, and while we were taking the tent down to go down to lower heights, I kept momentarily blinding my hiking partner every time I looked at her.

Maps, compass, phones and GPS

Copy or print a map for your journey, and make sure that it covers a larger range than you intend to cover. If possible, laminate it or use a zip-lock waterproof bag. Every day, I walk up to a small hill here to the north of Brighton, which I know extremely well. However, when a sea mist comes in, I can get completely disorientated. In this case, however, I am only ever about a quarter of a mile from the houses around, so I am never going to get into any trouble, but out on a mountain in the wilds where you might not be so familiar with the terrain, things can be scary. Hence know how to use a compass, and always take one. Do *not* under any circumstance rely *solely* on your mobile phone for directions in the mountains. The mobile-phone signals vary wildly in signal strength in mountainous country, and you can easily be stuck where there is no signal. An independent GPS device can, of course, be useful, and does not use the terrestrial network, so is less likely to be without a signal, but a map and compass don't need a battery.

Even with the best equipment, it's possible to get into difficulties on a mountain. Hold on to your nerve, and have a plan. Sometimes staying put is the best option, sometimes not. Leave the plan for five minutes and then reassess. If you decide to go down, don't make any fast moves or rush anything. Are there any non-essential things that you can leave behind to save weight to make descending safer? Although you should leave only footprints in the mountains, no one will blame you if you must leave gear because of an emergency. If you do leave gear, wrap it up properly and leave it somewhere safe and easy to find so you can come back to collect it another day when conditions are better. You would not want to leave a transceiver behind, but you could leave Yagi antennas, masts, and other bulky items for example. Double check your plan in your mind. Don't do anything quickly, or rushed. Be mindful of everything you do. Move slowly and purposefully, never rush.

Particular amateur radio issues

Think very carefully about what you *really* need on your trip. Do you really need to take that extra battery pack, or that bulky solar charger? You may find you don't actually use them, or there may be no sunshine to make it worthwhile. Solar chargers vary considerably in performance, and with UV levels etc. If it's a one-day trip, they may not be worth the bother. It may well be worth getting a Li-ion battery to replace a lead-acid battery, as there is a considerable difference in weight. Remember to check the charge levels of all batteries you will be using a few days before heading out. Take spare fuses as that in-line fuse in the 12V power supply lead will blow when out on the top of a mountain!

Metal or fibre masts

Fibre masts (eg those sold by SOTA beams) seem to be lighter, and are as strong as comparable aluminium masts (see **Figure 5**). They also do not corrode. But fibre-masts sections are held by friction, so sometimes you have to use aluminium masts if you want to support heavier antennas. You can tape fibre sections together, and if using a fibre telescopic mast as a permanent installation, you can use 'heat shrink' between sections so they don't slip with wind movement etc. Metal masts are easier to use with guy wires, as fibre masts can collapse if the forces created by the guys ropes pull down too much.

If you do use aluminium masts, try not to use too thin a tube thickness in order to save weight. I once set up a ten-wavelength-per-side 144MHz V-beam on a local hilltop to make some measurements with the Kent beacon. I used very-thin aluminium poles to support the set-up, as I needed three for the



V antenna. It required quite a tension to keep the wires straight and, at one stage, a gust of wind caused one of the masts to bend, which of course led to the end of the experiments for that day.

Take basic tools

Plan your trip well in advance so you have time to think about it, and remember everything you might need. It is incredibly frustrating to get out onto a hill and find you are missing one thing that would make everything easier or better. If your antenna uses insulators, bolts, or butterfly nuts, take a spare. Other essentials include insulation tape, screwdrivers, wire strippers, a small adjustable spanner, a proper Swiss army knife, a Leatherman-type multi-tool, a portable logbook, a pen (and a spare) and a pencil, a watch, a torch, a pack of Paracetamol. See **Figure 6**.

Being an amateur radio mountain goat can be very rewarding, and I recommend it.

Acknowledgements

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References

[1] Jonathan Hare's YouTube channel for 'cow bells'

FIGURE 6: The skateboard bag I used for a day trip, with everything I needed including water, transceiver, 20-10m ground-plane antenna (a), and the antenna deployed out in a field north of Brighton (b).

