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There are lots of different ways and philosophies on where things go in the pack. What I suggest below is just one of those ways -- the one I use. When I first began backpacking I started with the suggestions of David Caffey (Chief Philmont Ranger 1974-1977) in an older *Boyscout Fieldbook*. I have modified them to suit my liking and because today's packs are much different than the one illustrated there. You didn't see any internal frames back then and most packs didn't have [sternum straps](#), [load control straps](#), [compression straps](#) and [integrated water bottle holders](#) until a few years ago. Some didn't even have a [padded hip belt](#), just a bare strap/belt. Pack technology is much better these days. [As an aside, those in State College may want to go to Appalachian Outdoors (<http://www.theadventuresource.com/>) and look at the "wicker basket" pack up on the wall.] I use rather recent versions of internal and external frame packs as illustrations. Internal and external frame pack designs seem to be converging, with external frames sometimes taking on nearly the same profile as internal frames -- tall and narrow with a [lower \(sleeping bag\) compartment](#) -- and internal frames adding many [external pockets](#) and places (web daisy chains and [lash patches](#)) to hang things off the top, sides and back outside the pack -- areas where external frame have traditionally excelled. External frame packs have also become more flexible with poly/PVC frames. Both have added mechanisms to adjust the [shoulder strap](#) position, a feature first found only on a few external frames. For example, at first look it is hard to recognize that the Kelty Appalachin or Pacific Crest are external frame packs. Similarly, I am impressed with the number and design of external pockets on the Camtrails Wind River -- besides a drawstring divider between the [upper](#) and [lower](#) main compartments, it has two contoured tunnel [upper external pockets](#), a two compartment [front pocket](#) and a [top pocket](#), and an optional Kitchen Sink Pocket (pun intended, I'm sure). The Kelty Red Cloud is very similar. These examples of the blending together of the "best" features of traditional external and internal frames designs should all but remove the debate -- you can "have your cake and eat it too".

Pockets and Compartments for Stowing Gear.



To the left and right are somewhat typical external and internal frame packs. As the name implies, the external frame (often looks like a ladder) can be seen from the back of the pack (the side against your back). The frame stays of internal packs are often two 3/4" to 1" wide flat aluminum bars 20" to 30" long sewn into the back of the pack itself. One main difference is that the sleeping bag and tent are often lashed to the outside of an external frame at points #8 and #9, while, internal frames are designed so that, all gear can either be stored inside the main compartments or in the outside pockets. The first internal frames and specialized climbing ones have fewer outside pockets and require that much of what should be accessible be buried inside the large main compartment. Sorry.



After you've decided on your [list of backpacking equipment](#) to carry, you'll need to pack for the trail. Before getting into the details of matching equipment to compartments and pockets, consider the following observations:

- Small, frequently used items should go in your pants pockets, "throw" pockets on the pack, hung from your shoulder straps, or placed in other readily accessible place. These include knife, compass, map, whistle and watch.
 - Other items that need to be readily accessible to you or others should be in conspicuous outside pockets. These may include rain gear, first aid kit, sun and insect protection, trail snacks & lunch, bandana, some matches, toilet paper, digging trowel, and perhaps camera, binoculars and paper & pencil.
 - Packing several small similar items together in heavy plastic (ziplock) bags organizes items that could get "lost" inside the pack and keeps the contents dry even if the pack gets soaked. [\[Go to hints for packing in ziplock bags\]](#)
 - Items that must be kept dry but are too large for ziplock bags, like a sleeping bag, should be placed inside a heavy plastic bag and the opening closed with a "gooseneck". [\[Go to description and illustration of gooseneck closure\]](#)
 - Your water bottle should be easy to retrieve. The harder it is to drink, the more likely you are to get dehydrated.
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- Equipment you won't need until you make camp can be buried deep in the pack, but reserve an outside pocket for isolating your fuel and any other "smellables" that might contaminate food, clothing, tent or sleeping bag.
 - Assign each item a specific "home" in your pack so that it can be located quickly and always return it to that home.
 - Normally, arrange the pack's contents so that its center of gravity (heavy gear) is high and close to your back. [Compression straps](#) can help.

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- Normally, arrange the pack's contents so that its center of gravity (heavy gear) is high and close to your back. [Compression straps](#) can help. Where stability is vital, some comfort can be traded for the stability of a lower center of gravity by placing heavy gear in the bottom of the pack.

Now on to match-making. I will designate the pockets and compartments in the illustrations as follows:

1. **Upper Main Compartment.** It usually holds the bulky and heavy things (to keep weight over your skeleton). The external frame shown is "front-loading", meaning that it has a zippered door/flap that allows crewbies to place gear when the pack is lying down. The internal frame pack is "top-loading". The top pocket (#6) is swung off and all gear is loaded from the top like putting groceries into a shopping bag. On most newer design packs, that compartment has a draw string at the top to close it before it is covered by the top flap/pocket. Some external frames are also top-loading. Top-loading main compartments are often quite a bit larger than front-loading main compartments. Basically, everything that doesn't go somewhere else gets "dumped" into here.
2. **Lower Main Compartment.** It is often called the sleeping bag compartment, after its usual contents in internal frames. Generally, this compartment is front-loading with a heavy zipper. Because my sleeping bag is put in a stuff sack and lashed on the outside (at #8 or #9), I use this compartment on my external frame for clothing. Many external frames (especially ones with top-loading main compartments and older designs) don't have this second main compartment, so more is stored in the upper compartment. Sometimes the two compartments have a removable (drawstring or zipper) separator and it is incomplete so that long things (like tent poles) can "passed-through" both compartments. Instead, sometimes one of the external side pockets is not fastened to the main pack at the top and bottom to allow tent poles to be "passed-behind" or "tunnel" it to rest in a lower pocket.
3. **Left Upper Pocket.** Because of accessibility, this is a good place to put rain gear.
4. **Right Upper Pocket.** Because external pockets allow isolation of potentially contaminating items, this is a good place for the stove fuel bottle and other potential contaminants (toiletry articles) and things that can be washed if contaminated (cat hole/sump trowel).
5. **Front Pocket.** It is sometimes called a "shovel pocket". Because of accessibility and its prominent visible position, this is a good place for important things like the first aid kit, tour permit and medical forms. It may also be a place for a camera and binoculars. Frames without this pocket often have a "top pocket" that can be used for the same purpose.
6. **Other External Pockets.** They may include the top pocket on a top-loading main compartment (#6 of internal illustration), lower external pockets (lower-left #6 of external illustration) and elasticized throw pockets (middle #6 of external illustration). Except that I wouldn't put the fuel bottle or other contaminants in a top pocket for fear of contaminating the contents of main compartments, they can be used to distribute the contents of #3, #5 and #6. The lower left pocket is where I keep my compass, flashlight, ziplocked toilet paper and iodine bottle.
7. **Water Bottle Holder Pockets.** Sometimes they are specifically designed for this function. Other times extra external zippered or elasticized pockets can be used. Some packs have the bottle pockets near the top where #3 and #4 are pictured, with these pockets positioned lower. This provides "over-the-shoulder" access instead of "under-the-shoulder" access. Both work. If none of these are available, bottle bags [\$4 in Campmor] or canteen holders with belt loops or clips [Army surplus stores] can be used on the hip belt.
8. **Top Lash Points.** These points are often used for sleeping bags (in stuff sack), sleeping pads, tents (in bag) and ground cloths, especially on external frames (as pictured). The same purpose can be achieved by placing things between the top pocket (#6 of internal illustration) and the top-loading upper main compartment (#1 of internal illustration) and tightening the fastening straps. I don't recommend this if you don't have a drawstring on that compartment.
9. **Bottom Lash Points.** They serve the same purpose as those on top.

Where I Pack My Gear

Upper Main Compartment (#1) <ul style="list-style-type: none"> • Cookware -- utensils, cup, cleaning pad, dish towel and stove inside cook kit, all in stuff sack • Food and matches in ziplock bags stowed in a stuff sack used only for "smellables" • Toiletries in bag -- sunscreen, lip balm, insect repellent, biodegradable soap, toothbrush & paste, bathing towel, emergency coins • Bear bag and rope (lashed on outside if soiled) • "Yummy bag" and sump strainer in plastic bag • Extra garbage and ziplock bags • Water bag or collapsible container 	Lower Main Compartment (#2) <ul style="list-style-type: none"> • Complete change of cloths -- light "liner" socks, heavy wool socks, underwear, pants, shirt, each "rolled" & sealed together in gallon ziplock bag (wear other set) • Clothing appropriate for the season in gallon ziplock bag(s) -- gloves, ear muffs, other hat (wear brimmed felt hat), wool/flannel shirt, sweater or coat • Camp footwear (if not hung on exterior compression strap) 	Left Upper Pocket (#3) <ul style="list-style-type: none"> • Rain jacket or poncho • Pack cover
Right Upper Pocket (#4) <ul style="list-style-type: none"> • Stove fuel bottle in ziplock bag • Matches (spares) and fire starters in waterproof container 	Front Pocket (#5) <ul style="list-style-type: none"> • First aid kit and personal medicines • Bandana (with first aid kit) • Camping/tour permits 	Other External Pockets (#6) <ul style="list-style-type: none"> • Lower Left Pocket <ul style="list-style-type: none"> • Flashlight • Regular compass

<ul style="list-style-type: none"> • Repair kit -- duct tape, sewing kit, tent pole sleeve, zip ties in ziplock bag • Light rope or twine • Trowel for digging sump, cat holes 	<ul style="list-style-type: none"> • Medical forms • Maps inside ziplock bag (usually in pants pocket) • Pencil and paper, diary • Advancement, training materials 	<ul style="list-style-type: none"> • Pocket knife & watch (if not in pants pocket) • Toilet paper in ziplock bag • Iodine • Shoulder Strap Pouch <ul style="list-style-type: none"> • Camera • Binoculars • Whistle and mini compass hang from shoulder strap
Water Bottle Holders (#7) <ul style="list-style-type: none"> • Two 1 qt. Lexan water bottles -- one for "clear" water, other for "mix" 	Top Lash Points (#8) <ul style="list-style-type: none"> • Tent, stakes, poles and ground cloth rolled together inside tent bag 	Bottom Lash Points (#9) <ul style="list-style-type: none"> • Sleeping bag in plastic bag inside stuff sack • Foam sleeping pad wrapped around stuff sack

Shakedown.

A scout or crewbie is always prepared. And, one way to make sure is to have a pack shakedown. This is especially true for inexperienced backpackers, but is also useful for everyone, since what you leave behind can't be retrieved and whatever you take will burden you. Even those experienced scouts who go to Philmont are subjected to dumping their pack contents onto their bunks and having a ranger comb through it with them. So, even more important is it for the novice. Bring your [equipment checklist](#) to the shakedown.

How do shakedowns work? The crew gets together a day or two before departure on a trek/tour and each spreads all equipment, clothing, and provisions on a table, bunk, floor or ground cloth. Each item is considered carefully. Is it necessary? If so, it is put in one pile. If not, it is put in a separate pile (to be left home). Each item on your list is checked off to be sure all the basics but nothing more is in the "keep" pile. It helps to pair off in "buddies", for one to call out each item on the list and for the other to hold that item up. The first then checks it off. Then they switch roles. Buddy newbies with experienced crewbies, so they can offer advice. After going through everything once, go through it again. Finally, take one last look through the pile designated to stay home. If you aren't already at maximum pack weight, you may decide that some of the items could make your trip more pleasant. If you are like me, the answer may be yes for a book, binoculars, or a camera, but remember that ounces add up quickly. An ounce in the morning feels like a pound at night. The more thorough your shakedown, the lighter your load.

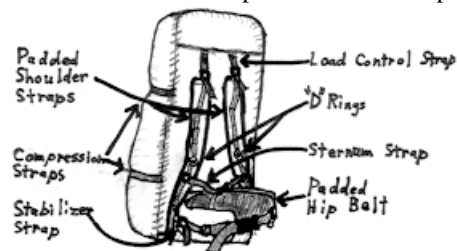
Another interesting concept is to do a shakedown after you get back from a trek, to remove items that you didn't need and won't pack again. The more experience crewbies get, the lighter their pack is likely to become.

Total Pack Weight.

How much a crewbie's pack weighs depends on the length of the trek, the food and equipment you **must** carry, and your personal preferences for optional (luxury) items. Traveling with a crew allows tents, food, cooking gear, and other crew gear to be divided. The amount of weight that a crewbie **can** carry depends on a lot of physical factors (size, physical condition, age, experience) and terrain. Former Philmont Chief Ranger Caffey suggested that a pack weighing up to 20% of body weight usually can be carried pretty well. A useful rule I've seen and adopted is that **MAXIMUM** packing weight not exceed the greater of 20 lbs. or 25% of body weight [That is 20 lbs. up to 80 lbs.; 25 lbs. for 100 lbs.; 30 lbs. for 120 lbs.; 35 lbs. for 140 lbs. 40 lbs. for 160 lbs.; above 40 lbs -- get real and repack; much higher and you should leave the kitchen sink at home.] Remember that these are maximums and many crewbies may struggle at these weights. I would aim for Caffey's 20%. This weight includes food and full water bottles. A large hand-held fish scale is what I use to measure crewbies' pack weight. In almost all excess weight cases, nonessential items can be found to be left behind or shared/crew gear can be redistributed to bigger, stronger, more experienced crew members. Remember, excessive weight and the resultant fatigue from overexertion can lead to lose of fun, irritability, and injuries.

Straps for Comfort and Control of Your Pack.

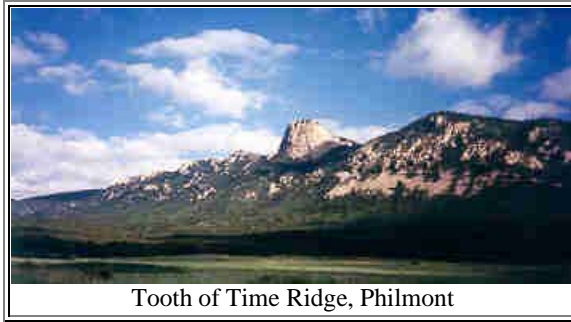
One of the biggest advances in pack technology has been the addition of helpful functional straps.



- **Padded Shoulder Straps** go from the pack just behind/below the top of the shoulder, over the shoulder, and back down to the pack somewhere near the hip belt (bottom). When crewbies experience sore shoulders it is often because too much weight is being carried by the shoulders -- the shoulder straps are lifting the weight off the hip belt. Two remedies are (1) loosening the shoulder straps, and (2) changing the position where the straps attach to the pack. If loosening the straps causes the pack to "fall away off the back" and the straps attach to the pack well below your shoulders, the pack (or adjustment) may be too short for your [torso length](#) and the shoulder straps could be moved up on the pack (or some allow the hip belt to be moved down). If it "falls away" and the straps attach above your shoulders, you may need to move them down (move the hip belt up) on the pack. The shoulder straps should attach to the pack just below shoulder level. Another potential remedy for the "falling away" problem is to tighten the [load control straps](#), if the pack has them. If problems persist and you are out of adjustments, a different pack may be necessary.
- **Sternum Strap** goes from one shoulder strap to the other across the chest. Not all packs have this strap, but one I find a near necessity. Sternum strap retrofit kits are available and a lashing strap *with a quick release buckle* from one shoulder strap to the other is a potential in-the-field substitute. This strap, when pulled tight, relieves the pressure of the shoulder straps on the arms and distributes the pressure across the chest. When crewbies experience numbness in their arms, it can often be relieved by tightening the sternum strap.
- **Padded Hip Belt** attaches to the bottom of the pack and goes around the waist. The weight of the pack should rest on your hips, not your shoulders. This requires that the hip belt be pulled fairly tight and that the shoulder straps not lift the pack. The shoulder straps should mostly just keep the pack from falling backwards off of the back. To demonstrate this with younger scouts I sometimes lean a little forward and pull my arms completely out of the shoulder straps while walking down a smooth trail. This is a demonstration that makes the point and is not quickly forgotten. Newbies should not try this!
- **Stabilizer Straps** go from the sides of the hip belt to the pack on internal frames (and some external frames). They are needed because the "block" of padding at the bottom of the pack rests on the hips just above the tail bone. It also provides a nice fulcrum for the pack to rock on as you walk, which causes instability. By tightening these straps, the pack is restricted from side-to-side motion.
- **Load Control Straps** extend from shoulder straps just in front of the shoulder to the top of the pack. Not all packs have these. When pulled tight, they pull the pack weight in close to the shoulders. When loosened, they allow the pack to "fall off the back". These are useful features on steep and/or rocky climbs. Tightening them while going up hill brings the weight in closer so you don't need to bend over quite as much to maintain your balance. Going down hill, you may want the weight to be off the back (straps loosened), so that if you stumble, you fall backward against the hill rather than forward down the hill.
- **Compression Straps** generally go horizontally around the main compartment of external frame packs from the edges of the pack near the frame, or the frame itself. They serve two purposes. First, if you have a "front-loading" pack with a zipper flap opening [like the traditional "bookbag" pack], they relieve stress off the zipper, so it is very important that you snug them. Some internal frame "rucksacks" and "daypacks" also are front-loading. Especially with heavy firm loads, zippers can rupture and spill the guts of your pack. The one I use every day to hike to the office is such an internal frame and will rupture the zipper with heavy books if the compression straps aren't snug. Second, the straps keep the contents from shifting and help organize the weight. Without compression straps, the contents of a large compartment will be loose and always settle to the bottom (yet we usually want weight high and close to the shoulders). The compression straps constrict the compartment's diameter, forcing the contents to stay higher. Think of it like squeezing the middle of a tube of toothpaste to get contents out the top. Large compartment top-loading internal frames are very analogous to the tooth paste tube example. Internal frames may have zig-zag compression straps (or elasticized "bungies") on the two sides or across the front. You will usually only find the zig-zag straps on climbing or "small contour" packs because they are just where the external pockets usually are. Their purpose is also to squeeze up and secure the contents. Some internal packs already have tall narrow profiles, so squeezing up the contents is not as crucial, but holding the contents steady is still important. They may have vertical compression straps running up and down almost the length of the pack. These straps relieve the pressure off the lower (sleeping bag) compartment zipper, secure the top cover, and compress the contents down to make the pack more stable. They sometimes are left long at the bottom so that they can double as lashing straps for securing things external to the pack.
- **Load Lifting Straps** (not shown in illustration) are appearing on higher end internal (and a few external) frame packs to keep them from sagging and close to the torso. They attached to the bottom of the shoulder strap and to the bottom/side of the pack and are designed to lift and snug the lower part of the pack into the lumbar area of the back. This is not just a shoulder strap length adjustment as on many packs but specifically designed for this function.
- **Loosening Straps in Unsure Footing** allows you to jettison the pack if you falter. Your pack can be shed quickly, if the hipbelt and sternum strap buckles are disconnected, by simply lowering/relieving your shoulders. This was something they taught us at Philmont for walking logs across streams/rivers (like at Fish Camp).

Hoisting the Pack Onto Your Back

The best way to learn how to get the pack onto your back without straining is to watch experienced backpackers do it, then practice imitating them. The first time, do it with an empty pack, then work yourself up to the full weight you will carry. At the beginning or when the pack is heavy, it helps to loosen the [shoulder straps](#) a little. I bring the pack up to rest on my knee/thigh/hip with the back ([strap side](#)) facing me, then lean it to one side. I slip the closest arm through the shoulder strap and, with a smooth motion, swing it around behind me, reach down and catch it by sliding the other (free) arm through the other (free) shoulder strap. A couple of small jumps or jiggles allows me to position it squarely high on my shoulders (for stability and so that the [hip belt](#) is above my hips). Then I clip the hip belt, followed by adjusting the shoulder straps and fastening the [sternum strap](#).



I would like to add other other web resources related to this subject. If you have one please [email it to me](#).

Related Resources:

- Appalachian Outdoors (<http://www.theadventuresource.com/>)
- Campmor (<http://www.campmor.com/>)
- REI (<http://www.rei.com/>)
- The Outdoor Outlet (<http://www.outdooroutlet.com>)
- *Philmont Guidebook to Adventure* (paper)
- *BSA Fieldbook* (paper)
- **Lashings & Knots**
 - [The Knotting Dictionary of Kännet](#)
 - [Knots on the Web](#)
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<http://www.personal.psu.edu/faculty/r/p/rpc1/bbb/packing.htm>

Updated: Mon, 24 Apr 2000 12:40:06 GMT

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