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Build a Stand for your Super Cat Alcohol Stove

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[The Super Cat alcohol stove](#) has generated a lot of interest since its plans were released into the public domain in late January, 2005. Much of the appeal, I think, comes from the fact that the stove is so simple and yet works so well.

However, the Super Cat just might be an example of a piece of ultralight backpacking gear that's actually a little too light. As discussed in the build instructions, a fair amount of caution must be exercised when using the stove on uneven ground or in windy environments, since its miniscule weight (0.2 oz) makes it prone to tipping or blowing over under those conditions.

Probably the best way to improve the Super Cat's stability for real-world trail use is to add a simple stand. An appropriate stand can: (1) widen the stove's footprint; (2) raise the stove to insulate it from the surface below; (3) minimize the number of contact points with the ground; and (4) add just enough weight to help stabilize the stove.

The stand discussed here takes an hour or two to build and is fun to make. It uses widely available tools and inexpensive materials. Built as described, it weighs about 1½ ounces. Of course, you're not required to stick to these plans, so feel free to implement your own modifications. By the way, if you're interested in seeing some of my early prototypes, you can [find them here](#).

Design Notes



Stand alone



Stand with stove "plugged-in" to docking socket

Docking Socket

Central to the design of this stand is a "docking socket" that serves as an interface between the

stove and the stand. The socket eliminates the need to drill holes in the bottom of your Super Cat in order to mount it to a stand. It also permits you to "plug-in" or remove your stove from the stand at will, meaning that you can move your Super Cat to different stands should you care to. By the way, many thanks to Bruce Strickling ("bstwo") for the contribution of his ideas that lead to the creation of the docking socket.

The docking socket is simply the bottom of another 3 ounce pet food can whose side walls been cut down to a height of 5/8" or so. It needs to be tall enough to support the stove, but short enough that it doesn't cover the stove's bottom row of vent holes. To be able to fit the stove down into the socket, a small slit must also be cut in the socket sidewall to allow the sides to expand enough to accommodate the insertion of the stove. Once inserted, a snug "friction fit" will keep the stove firmly in place until it's deliberately removed from the socket. The socket is attached to the base as described below.

The Base

Although the base of the stand could potentially be constructed from any number of materials, a few key criteria have to be satisfied when making a selection:

- Must be able to withstand the heat generated by the stove (eliminates most plastics).
- Must be lightweight, but rigid enough to provide torsional (twisting) stability.
- Must be strong enough to support the weight of a pot full of water (up to 2 pounds or possibly more).
- Must be easy to work with.

The best material I've found so far is 1/8" thick, brown hardboard ("Masonite"). It's cheap, lightweight, strong, heat tolerant, and easy to cut with a handheld jig saw. A 2' x 2' piece can be purchased from Home Depot for less than \$2.00.

Masonite is fairly flame resistant, at least for this purpose. Because it's possible that some fuel might splash onto the base when the stove is filled, it's important that the hardboard not catch fire from the spilled alcohol when the stove is lighted.

To assess flame tolerance, I conducted a number of tests in which I placed a completed stand into the bottom of an aluminum pan, then doused it heavily with denatured alcohol (much more than would probably ever be spilled by accident). When the whole affair was ignited, the alcohol would typically burn for a minute or so, but the Masonite would survive without problem. There were usually scorch marks around some of the edges (I think from the alcohol burning under the stand in the bottom of the pan), but the hardboard itself never caught fire.

I also tried to deliberately set the Masonite aflame by holding a butane lighter under an edge. It took a while, but it eventually began burning. Even when ignited, however, it burned slowly and was easy to blow out. The bottom line is that I think Masonite is sufficiently flame resistant to serve well for the stand. And in reality of course, if lots of alcohol were to be spilled on the stand (or elsewhere) while filling the stove, any prudent backpacker would allow the spill to evaporate before putting a match to it (a caution discussed in the build instructions for the stove).

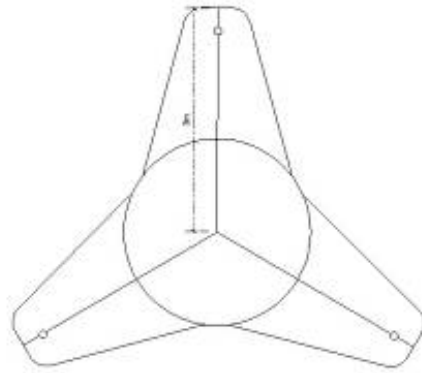
Support Legs

Finally, to the base, you'll want to add three legs that are 1/2" to 3/4" high. In addition to raising the base off the ground for thermal isolation, these legs create a tripod support that will maximize stability on most uneven surfaces. The legs can even be "rubberized" (see below) to improve traction. Small machine screws (with nuts and washers) installed through holes in the base work well as legs. Brass or stainless steel screws are preferable in order to prevent rust.

Build Instructions

Step 1: Build the base. To begin, [download the template for the base here](#). The template is a small Acrobat (PDF) file that should be printed at full scale, then cut out with scissors and traced with a pencil or felt-tipped pen onto the Masonite hardboard. Alternatively, after cutting out the paper template, you can also just tape it to the surface of the Masonite using transparent tape (2" wide clear packing tape works well). An advantage of the tape technique is that it offers better visibility when sawing.

Next, cut the base from the Masonite using a handheld or bench-mounted jig saw with appropriate blade. After sawing, you can clean up the edges of the base with a wood rasp, file, and/or sandpaper.



Template for base



Base cut from Masonite

Step 2: Construct the docking socket. Construct the docking socket from a clean, 3 ounce pet food can (or equivalent) that's identical to the one used for your stove. When cleaning the can, you can remove any sticky label adhesive with Goo Gone, Goof Off, or similar solvent.

Cut the walls of the can down to a height of about 5/8" (a sturdy pair of household scissors should cut easily through the soft aluminum). If the wall is a bit too high after the stove is inserted, you can always trim it later.



Start with a new can



Completed docking socket
(note vertical slit with hole at base)

Next, cut a single vertical slit in the sidewall from top to bottom (i.e., 5/8" long). To keep the slit

from expanding beyond the cut, drill or punch a small (1/8") hole in the bottom of the can near the base of the slit as a "rip-stopper". Finally, cut or round the corners at the top of the slit to eliminate their sharp points. You can see the slit and the rip-stopper hole in the photos both above and below.

Before proceeding, I'd suggest that you test the wall height by plugging your Super Cat stove into the completed docking socket. If you find that the socket covers any portion of the stove's lower row of vent holes, you can trim the walls of the socket as necessary.

Step 3: Mount the docking socket. Mount the completed docking socket to the center of the base. I'd suggest using three 1/8" diameter, 1/4" grip range aluminum pop rivets with backing plates. You'll need to drill 3 holes (1/8" diameter) through both the socket and the base. Space the three pop rivets equally around the inside of the socket as shown below (aligning the rivets with the axis of the base legs is best).



Pop rivets, plates and rivet tool



**Docking socket
mounted to base**

While you have your electric drill handy, drill three more holes (sized appropriately to the leg screws you're using) near the ends of each of the base flanges as indicated on the paper template. To make it easy, just overlay the template onto the base to mark the hole positions.

By the way, if you don't have a pop rivet tool, you can also mount the socket to the base using three short machine screws (#4 or #6) with nuts and washers. However, you'll want to use screws with heads that are as flat as possible or the stove may not fit deeply enough into the socket to achieve a tight fit.

Some users (including myself) have also tried attaching the docking socket to the base using [J-B Weld](#), a high-temperature epoxy. Though this adhesive is rated for use up to 500°F, it usually fails quickly in this application and is therefore not recommended.

Step 4: Install the legs. Install the three machine screw legs at the ends of each of the tripod flanges using a flat washer under the screw head and a lock washer under the nut. Tighten securely, but don't overdo it.



**#6 brass machine screws
used for legs (5/8" long)**



Legs mounted on base

(viewed from bottom)

Note: photo perspective makes legs look tilted, but they're actually straight.

For better traction, especially on rocky surfaces, you can "rubberize" the three legs by coating them with a layer of glue from a utility glue gun. Inexpensive (\$5 or less) glue guns can be found lots of places, including the crafts department at Wal-Mart. Tool handle rubberizing dip, available in small cans at most hardware stores, also works.



Legs coated with glue gun

(shown is an [earlier version](#) of the stand)

Your stand is now ready to go. Just plug your Super Cat stove firmly into the docking socket and cook away.

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