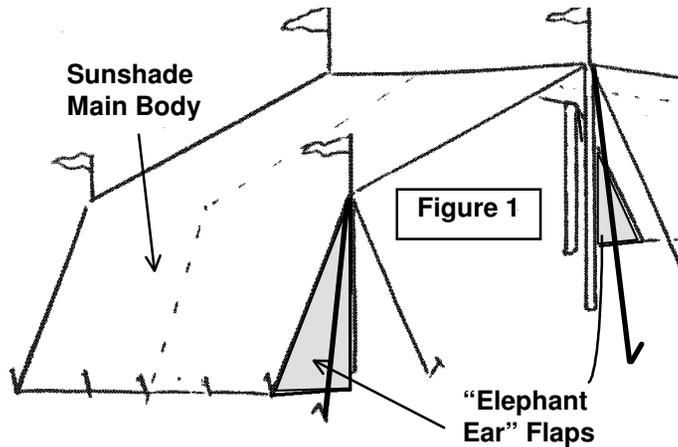


# Sunshade Owner's Manual

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**T**hank you for your selection of the DRAGONWING Sunshade. We are sure that your pavilion will weather many years of service, if you care for it properly. In this manual, you will find details on devising a framework for your sunshade, how to assemble and erect it, and how to care for it.



Your sunshade consists of two or three long panels of cloth forming the main body of the sunshade. It also has four “elephant ear” flaps which project out from the sides. (See figure 1.) These flaps, when staked out, can help regulate the amount of breeze coming under the sunshade. If you prefer, you may roll these up or fold them out of the way when not in use.

**CONSTRUCTING THE FRAMEWORK**

For your sunshade, you’ll need four side poles, each seven feet long. (The dimensions are not very critical.) You’ll also need about 160’ of rope. In addition, you’ll need the centerpoles in the following chart, depending on which sunshade you have:

Base Dimensions (depth times frontage)	# of Center Poles req.	Length of Center Poles
10’ x 20’	2	10
15’ x 20’	3	10
15’ x 25’	3	11
15’ x 30’	3	11

In any of the designs, you can use 2” x 2” “dimensional” lumber (actually 1 ½” x 1 ½”) or 1 5/8” “closet round” dowel for the side poles. For the center poles, I would go with something heavier, like a hardwood of equivalent cross section or (if you’re stuck with softwood) something like 2” x 4” “dimensional” lumber (actually 3 ½” x 1 ½”).

You’ll also need 26 stakes. For the four ropes going down from the center pole, you’ll want stakes at least fifteen inches long, as these ropes get a lot of stress. To make these, you could use lengths of "rebar" or 1/2" square or round stock with one end bent over to retain the rope. Grind the other end to a point, and you're in business. For the rest, I

recommend using 12" wire spikes with 3/8" fender washers. To keep the two together, buy a couple of feet of 1/2" vinyl hose (with a 3/8" inner diameter) or, even better, 1/2" "high-pressure" hose (with a 5/16" inner diameter) and cut it up into segments about 3/4" long. Put the washers onto the spike, then slide the hose segment on after it. This stake will last a very long time.

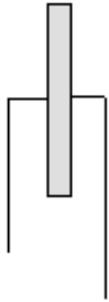
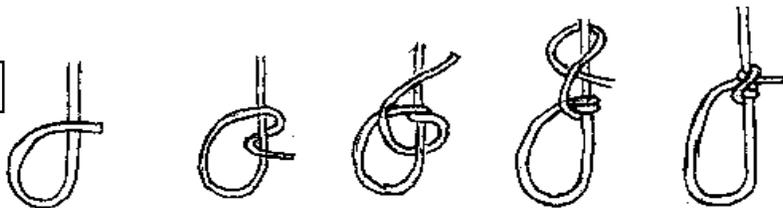


Figure 2

You'll also need some 3/8" rod stock to finish the poles. Each pole will need a six-inch piece. If you make it longer, you can fly a pennant off it. Wrap the end of each pole with filament tape and drill a hole in the top end that's three inches deep. Cut the rod stock to length, round off the ends, and insert the stud into the pole. (See figure 2). At our shop, we glue the rod in with epoxy or a urethane glue. Finally, apply the finish of your choice.

Find the rope, and a knife. Cut two lengths, each 30' long. Find the midpoint of each length and tie a loop there. We'll call this the "fixed" loop because it doesn't adjust. Measure down five feet in each direction from this fixed loop and tie a simple overhand knot at that point. At each end of the rope segment, tie a slip knot into each end, and slide the knot so the distance from the fixed loop to each end of the rope is about 12' long. Figure 3 shows you how to tie a slip knot, if you don't know how. These ropes are your center

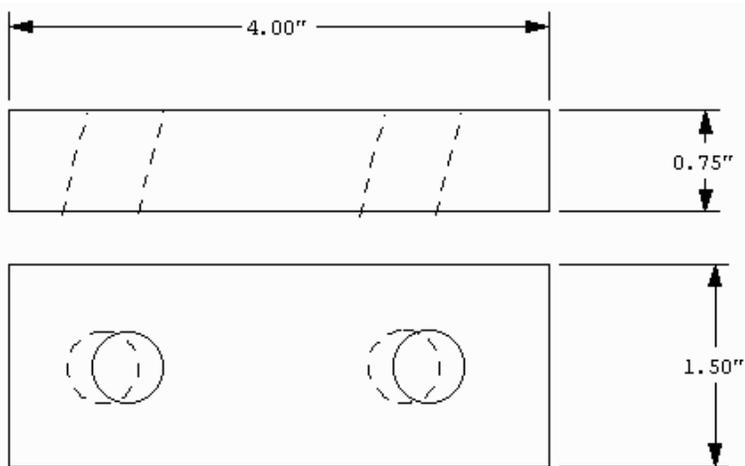
Figure 3



pole guy ropes.

Slip-knots work very well on most synthetic ropes, but not as well on natural ropes such as sisal or manila. On these ropes, it's easier to use a rope slider. Figure 4, on the next page, is a diagram of the kind of slide that Dragonwing uses on its tents. The length is really not critical; the greater the length, the more leverage you can put on them but the more slack they put into the rope when released. Our sliders are made from 1" x 2" (actually 1 1/2" by 3/4") red oak, available at most large lumber centers. Don't use plywood or softwood. The holes are 1/8" larger than the diameter of your rope. Note that the holes are drilled at an angle. The slider should be threaded so that the holes are parallel to the rope when the rope is slack. This increases the "bite" on the rope when the

slider is tightened. Be sure to "chamfer" or bevel the edges of the hole so they won't eat into the rope.



**Figure 4**

When we make rope sets at our factory, we mark these center-pole rope assemblies with a little piece of ribbon in the fixed loop, so we can tell them apart from the other rope assemblies. We advise you to scrounge up some yarn or ribbon and do likewise.

Now cut four lengths, each 25' long. For each length, find the midpoint, and tie a fixed loop there. From this fixed loop, measure and make two

knots, one at three feet and one at four feet. Finally, finish each end as you did the others, with a slip knot or a slider. Adjust the loops so that these rope segments are about 8' long. These ropes will be for your side poles.

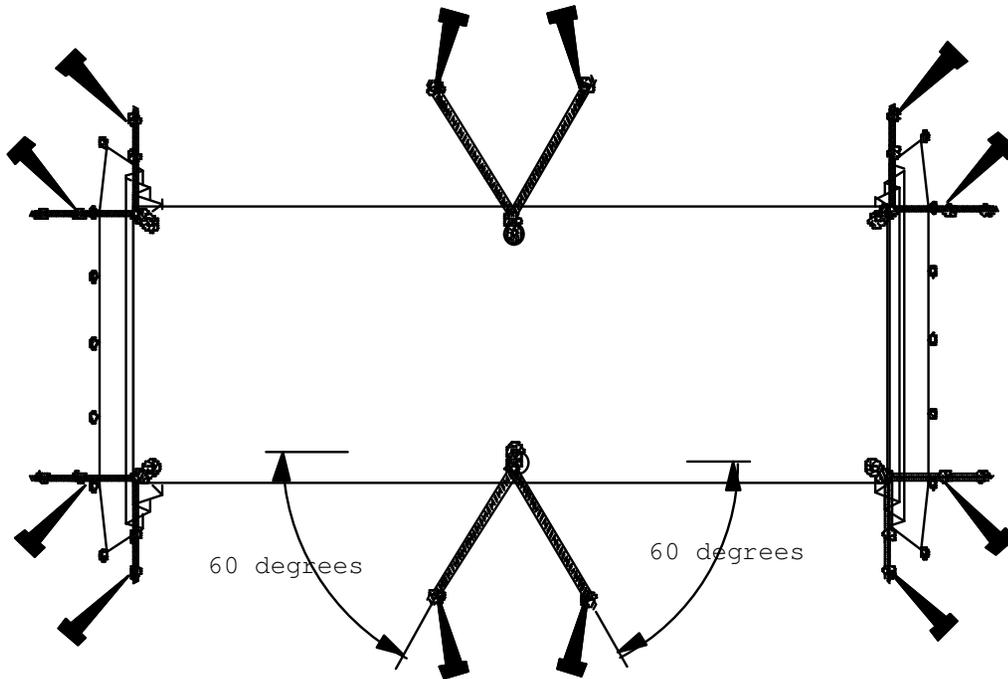
**SETTING UP YOUR SUNSHADE**

Decide where you want to pitch the sunshade, and lay out the fabric there. Remember that the guy ropes will project about five feet out from the sunshade, and be sure to allow for that if you need to leave a walkway clear out front. Your "frontage dimension" (from one side to the other) will be about ten feet less than the space the sunshade takes up when it's flat on the ground.

Keeping the sunshade on the ground, slip all the pole studs through their respective grommets except for the center-most center pole, if you have a three-panel sunshade) and put the loops of the ropes onto the studs (remember that the center pole ropes have little ribbons on the loops, right?). It is helpful, but not absolutely necessary, to have some sort of retaining device on the tops of the studs to keep the loops on the studs.

Undo the center pole ropes and lay them out so that they are at roughly a sixty degree angle from the sunshade. (See figure 1, below.) Find the guide knot tied about one third of the way down the rope from the top. That knot is where you're going to drive the

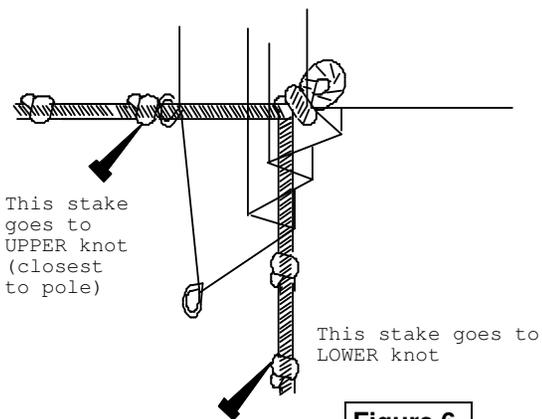
center pole stakes. (If you bought the stake set from Dragonwing along with the fabric, the center pole stakes are the biggest ones). Set all four of these stakes, slip the guy rope loops over the stakes, and proceed to the corners.



**Figure 5. The sunshade on the ground, ropes spread with guide knots marking the stake locations**

Each of the corner ropes has not one, but two guide knots. This is because the stakes for the side ropes (the ones going parallel to the main body of the sunshade) have to be

closer to the pole tops *when the sunshade is on the ground*. When the poles are raised, the peak in the roof will move the side poles closer to the center poles than they were on the ground, and all the stakes will end up the same distance from the poles. There are two knots so you can use the same rope for either a side rope or a

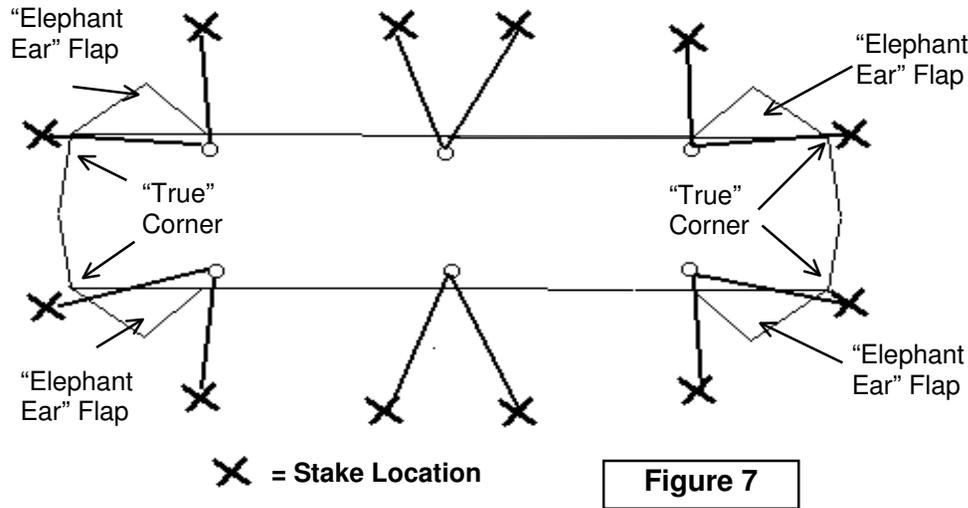


**Figure 6**

front-to-back rope, depending on which knot you use. (See figure 6, at left.)

So use the upper knots (the ones closest to the pole top) for the side ropes and the lower knots for the front-to-back ropes. Drive the stakes in and slip the rope loops onto the stakes.

Now raise all the poles, starting with the side poles and then the center poles (including that center-most center pole if you have one). If the wind is strong, you should be raising the windward poles first, then the leeward poles. As each pole is raised, the guy ropes will help stabilize it. When all the poles are up, adjust the guy rope lengths for tension and lack of wrinkles. In particular, pay attention to any sag between the center poles, and remove as much as you can by tensioning the center pole ropes. Then you can stake down the sides as described below.



When you stake down the sides, start with the loops at the "true" corners (not the loops at the elephant ears), as shown in Figure 7. Next, stake down the "elephant-ear" flaps if you wish. At the central stake loop at the base of the sunshade, pull the loop out (that is, away from the sunshade) as far as you can to impart maximum tension to the shade at that that point. Yes, the loop will no longer be in a straight line with the corner loops; the resulting arc is what you want. Then put the stake in there. Do the same with the remaining stake loops, if you use them. By pulling out on the loops this way, you greatly increase the fabric's tension and, consequently, its ability to shed water and resist luffing. (Under most wind conditions, you'll probably only have to use every other stake loop.)

Breaking down the sunshade is pretty much the reverse of the above procedure. First remove the side stakes. Then drop the poles, starting with the center poles and finishing with the side poles. Finally, remove the guy rope stakes. My favorite way to store the guy ropes is to fold them into wide loops, like a lasso, and then tie the loop in a loose overhand knot to keep the loops together.

Some people like to fold the sunshade neatly, but I prefer to stuff it back into the bag. According to sailing lore, this method keeps the cloth from getting creased in the same places all the time and therefore extends the life of the sunshade. It's also much easier for one person to do.

### ***HIGH-WIND CAMPING***

Your 12" tent stakes should suffice in all but the windiest weather, or in all but the loosest soil. But if you have an abundance of either condition, or a combination of the two, here are some things you can do to keep yourself connected to terra firma:

1. Use longer stakes. Many people have pieces of re-bar, 18" or more. My usual preference is to drive a piece of 1" x 2" furring lumber (at least a foot long or so) into the ground, with the wide side facing the tent, and then drive in the tent stake immediately behind it (that is, against the side of the slat that isn't facing the tent), so that the tent ropes pull the stake tight against the slat. This works because it's not so much the depth of the stake that counts, but the area of stake that presents itself to the dirt. The slat effectively triples the size of the stake.
2. Use more stakes. Tie additional lengths of rope to each of the pole studs and run them out to their own stakes. Don't get them too close to the other stakes. Some people like to put large steel rings on the end of their ropes so they can drive multiple stakes into the same loop, sort of crossing them as they're driven in.
3. Increase your footprint. Extend the rope beyond the distances mentioned above. You should have enough rope to let you bring the stakes out over eight feet away from the top of the pole if necessary. The only trouble with this method is that it creates more of a tripping hazard, so make sure the ropes are well flagged.

### ***ODDS AND ENDS***

Some SCA kingdom tourney laws require, and we wholeheartedly recommend, that you attach yellow or white flags to the guy ropes to keep your comrades from tripping on them or colliding with them in the dark.

If you string ropes between the side poles on the inside and hang curtains from them, you can create rooms and "closets" to keep mundane stuff out of sight and give you a little more privacy. A large curtain over the front or back helps block out the wind, but make sure you're not loading the poles or guy ropes unduly.

If you're going to put an ornament or banner over any of the pole studs, don't make it very large or heavy. Higher winds can put a lot of stress on the ornament, and your embellishment may take flight and become an airborne missile.

One of the nice features of this sunshade design is that sunshades of equal width (frontage) can be set up in tandem. The second one gets set up directly behind the first one and uses the rear poles of the first one for its own front poles. This means that for the second one, you'll only need half as many poles (plus the middle one if it's one of the three-panel models). You also won't need as much rope, since the poles shared by the two sunshades will be stabilized by the sunshades themselves (although a little more rope certainly wouldn't hurt if it's windy).

### ***CARING FOR YOUR SUNSHADE***

The first rule is: make sure that the fabric parts are free from being abraded by anything, particularly when being transported. Keep the stakes in their own canvas bag when you're not using them.

The second rule is: don't store the sunshade wet. Find a dry, large area to air the sunshade if you bring it home wet, and make sure it's dry before you put it into storage. Also, remember that if you use ropes that are made of a natural fiber, they may take longer to dry than the fabric, and will certainly rot if given half a chance. If you must store the pavilion before the ropes are dry, take them off the canopy and dry them separately.

The third rule is: don't clean the pavilion with anything harsher than warm water and a mild soap or detergent. My rule of thumb is that if it's mild enough for your hands to be in (like dish soap or shampoo), it's mild enough for the pavilion. Using anything stronger may shorten the life of the fabric. Also, be sure to rinse the fabric well. And then rinse it again. (This is because sunlight and soap combined will weaken the fabric far worse than either would by itself.)

We wish you many years of happiness in your Dragonwing sunshade. If you have any questions or comments, or if you would like to know more about our products, feel free to call us at (916) 922-5501 or write us at **Dragonwing, P. O. Box 13322, Sacramento, CA 95813-3322**. If we're not in, we'll have a voice-mail/fax machine ready to take your message.

Or you can email us at **dragonwing@midtown.net** or contact us via our web site at **<http://midtown.net/dragonwing/>**