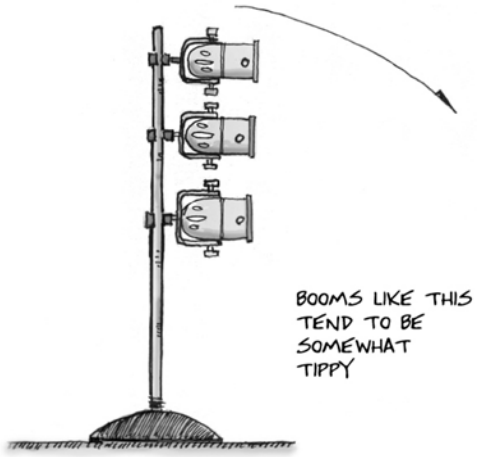
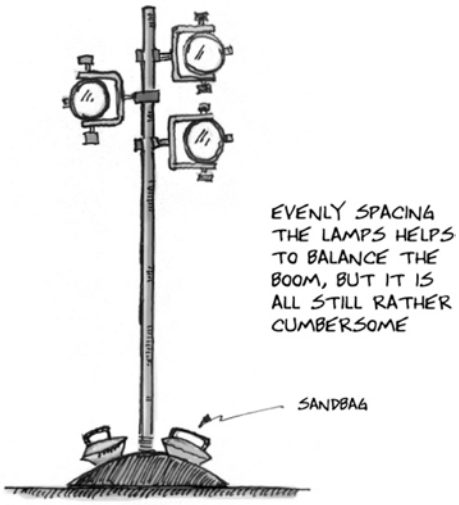
How Do You Make …

Ladders and Towers

Lighting towers are the modern equivalent of booms and/or ladders. They use space much more efficiently and are easier to travel, easier to set up, and much safer to use.



The problem with booms is that they tend to be tippy when over a certain height. Hanging an equal number of lights yoked out to either side will help, but that uses up a large amount of valuable wing space. The lights can be hung going onstage and on one side in order to conserve space, but this exacerbates the tipping problem. Most boom bases have no means to lag them to the floor for security, although it is possible to pile on a few sandbags to increase the weight of the base.



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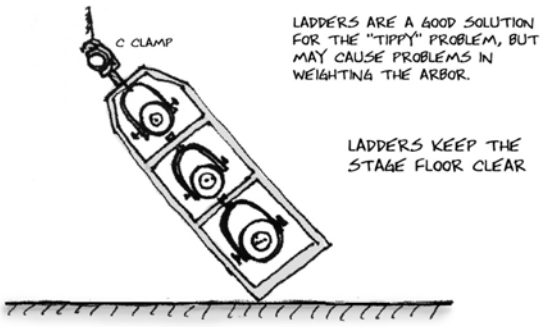
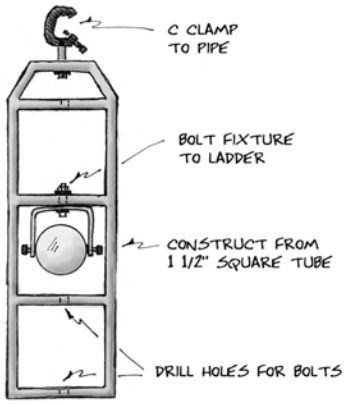
Ladders are used on the ends of electrics hanging over the stage. They allow electricians to hang lights downward off the pipe, effectively increasing the length of a batten used for side light. Ladders are nice, in that the floor under them is kept entirely clear of obstructions, and if your show has a lot of rolling units, they may be the best option. Even so, there is a problem when it comes to hanging them.

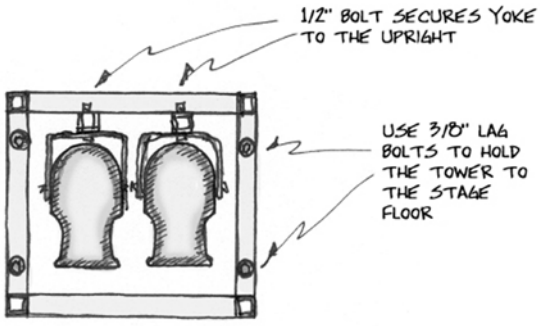


Many times ladders are several feet taller than the distance from the batten to the floor when it is at its lowest trim. This makes loading the weights a bit of a problem. Either you load the weights with the arbor somewhat low, which may not be possible (and is certainly not safe without taking extra precautions), or you must hang the ladder on the pipe at an angle and somehow straighten everything out as the pipe goes up. There really is no elegant solution to that problem, other than making sure that the ladders are not too tall for the system. But then they will probably be too short to work effectively. Stage work is full of things that are hard to do.



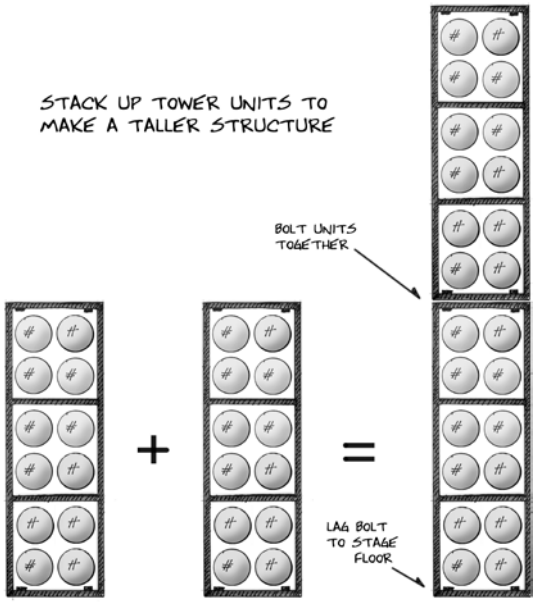
LADDER FOR 4 LIGHTS

Towers approach the problem from another direction. They are modular units connected together to form a taller structure. Lights fit inside the tower and are thus protected from actors and moving scenery. On a tour, the lights stay inside the towers for the move, just like a rock-and-roll truss. This saves a good deal of time remounting them for each city and reduces time spent focusing. Of course, this approach appeals to anyone's sense of what is neat and tidy, but I also like the way that the towers can be lagged to the floor. When properly done, bolting them to the floor is so secure that there should be no concern that they will tip over. It is important to use lag bolts that go all the way down into the subfloor so that they get a really good "bite." Towers are often used to hang other stuff backstage that has nothing to do with lighting, just because they are a convenient and sturdy structure.

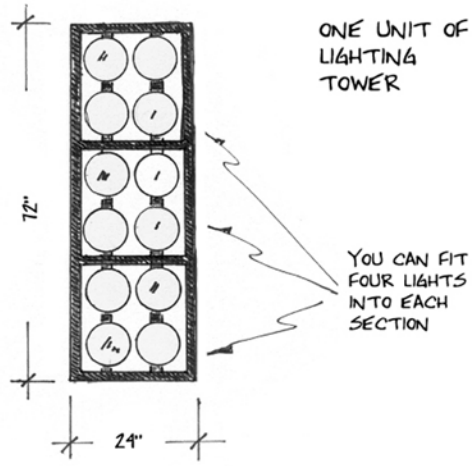


PLAN VIEW

Towers are usually constructed in either 6- or 8-foot sections, and when joined together can make a structure 12, 16, or 18 feet tall. Twelve feet is enough overall height in a smaller venue; 18 feet is about the maximum safe height. The taller the tower, the more difficult it is to stand up, and the more inherently unstable it will be. Sections smaller than 6 feet in height are problematic from the standpoint of being overly complicated to build for too little height.

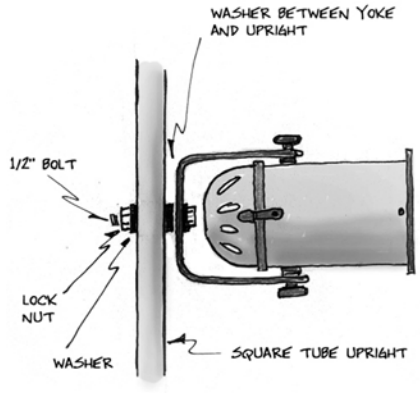


This design for a tower creates a unit that is wide enough for two lights to fit side by side. It provides enough space for the shutters to operate, but there isn't much room to point the lights very far up or downstage when two of them are side by side. It is best to make the tower as thin as possible in order to save on deck space, so a tradeoff must be made between room for the lights inside the tower and room for scenery to move on- and offstage. A 2-foot-square tower seems to be about the right size.



This design allows for twelve lights on 1-foot centers in each section of tower. On a 12-foot tall tower, that would mean a capacity of 24 units per side, and 32 for a 16-foot tower. Of course, most of the time the spaces in the middle are not really used for lighting, but can be an excellent location for a sound or video monitor, a fog machine, or some other piece of equipment. The best places for the lights are at the extreme bottom and top.

Use square tube to construct the tower. Chapter 21 in the printed book has loads of information on cutting and welding square tubing. The tower is really just a box with some vertical members connected by horizontals. Make the towers as one solid piece rather than as a series of bolt-together frames. In addition, there are two vertical square tubes that run up the inside back of the tower that are used to connect the lights themselves. It isn't necessary to use any C-clamps; just drill a hole in the upright and use ½″ bolts that are 2½″ long through the square tube and the light yoke. Use washers throughout to make it easier to turn the light when focusing. If you intend to leave the lights in the towers for an extended period, it might be worthwhile to invest in some nylon lock nuts that will keep just the right tension on the bolt and lessen the chance that the nut might vibrate off.

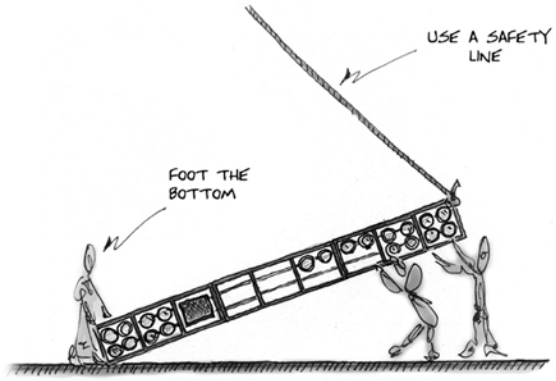


LIGHT BOLTED TO UPRIGHT ON A LIGHTING TOWER

Provide four holes in the top and bottom of each tower section so that it can be bolted to another section or to the floor. Make the placement of all the holes exactly the same so that each of the sections can fit together interchangeably.

When setting up the show, hang all of the lights in the various tower sections before standing them up. Lay the sections out on the floor, bolt in the lights, and bolt the sections together in the order they will work.

Place the tower so that the bottom section is close to where the tower will eventually live. Use two people to foot the tower, and everyone else on the crew to walk it up. If there is any doubt about the ability of the hands to control the tower on its way up, use a *safety line* on the top of the tower. You can use a regular bull line coming down from the grid, rail, or electrics jump. Jockey the tower into final position, and lag it to the floor right away. Make sure that you use bolts which are large enough to hold the tower securely, at *least* $\frac{3}{8}'' \times 4''$.



PUT THE BOTTOM IN PLACE, AND WALK THE TOWER UP