



DANIEL KNIGHT

Loading the arbor

How to add counterweight without a loading bridge

BY BILL SAPSIS



IN LAST MONTH'S ISSUE we discussed working with counterweight systems. We reviewed the safest ways to load and unload counterweights and how to operate the system. The assumption, for the purposes of that article, was that the rigging system was built with a loading bridge—a platform up in the theatre's flyspace that allows you to load counterweights on the arbor while the batten is down at deck level.

The fact is that the theatres where many of you work, for reasons best left to a different forum, do not have a loading bridge. Consequently, the operation of the

One way to add weight without a loading bridge: hang only as many instruments on the batten, left, as two stagehands can safely handle. Pull the arbor down to the deck, balance the weight, below, and repeat.



counterweight system, in particular the loading and unloading of counterweight, is more difficult and, if not handled properly, dangerous.

To look at the problems associated with theatres that do not have loading bridges, let's take a typical scenario and work it through.

It's eight o'clock on a Saturday morning and you're at the theatre with five other crew members. The object of today's exercise is to hang the lights onstage for the upcoming show as quickly as possible and get back to bed. To accomplish this you have to go through a number of steps.

Step 1. You identify which pipe batten you are to use for the lights.

Step 2. After establishing that the batten is "in weight," you lower it to its low trim, four feet above the stage floor.

Step 3. You and your crew hang the lights and run all the cables needed to operate them.

Step 4. You should be figuring out how much weight you have placed on the pipe batten and then adding that amount of counterweight into the arbor. The problem is that the arbor is up at the ceiling and you have no way to safely reach it and put the weights into it. What to do, what to do?

There are several ways to safely approach this problem. The method you choose will be determined by the resources you have at hand. But all of the methods have one thing in common: they all allow you to maintain control of the weight at all times in a safe and organized way.

Option 1

As soon as you put a couple of lights onto the pipe you are in an out of balance condition. To balance the system you will have to pull the counterweight arbor back down to the floor and load the weights into the arbor there. Instead of putting all of the lights onto the batten at one time, only put on the number of lights that have a combined weight that can be safely handled by two experienced flypeople. For the sake of discussion, let's say that the combined weight of four of

your lighting units is roughly 100 pounds. Once the lights are hung on the pipe the two flypeople should pull the arbor down to the ground and engage the rope lock.

If two people cannot pull the arbor down to the stage floor, do not add a third person. Lower the pipe back to low trim and take off one of the lights. You should never use more than two people on the operating line of a counterweight system, because there just isn't enough room to safely have three people pulling on the same rope. There's a good chance of someone getting hurt (catching an elbow in the eye, for example) and letting go at the wrong time.

Okay. So we have two people pulling the rope and lowering the arbor. Once the arbor reaches the stage floor and the rope lock is engaged, one of those two people continues to hold onto the arbor (remember, it's still out of balance by 100 pounds or so) and the other helps a third technician load the appropriate weight into the arbor. Once you have a balanced system you can bring the pipe down and add more lights. Repeat the process until all of the lights and cable are hung on the pipe and you have the correct amount of weight in the arbor.

Option 2

The second approach to this problem involves the use of a block and tackle. To do that you must have an appropriately rated tie-off point (that is, a location that a professional rigger or engineer has established is adequate to support the loads) for that block and tackle on the floor under the counterweight arbor. Many theatres do not have this tie-off point, and would have to have one installed by a professional rigger.

Attach the top of the block and tackle to the bottom of the counterweight arbor and the bottom of the block and fall to the tie-off point in the floor. Not only does the block and tackle have to be strong enough for the contemplated actions, it also has to be long enough to run from the floor up to the ceiling.

Once the block and tackle is in place, lower the pipe batten to low trim and begin hanging lights. The block and tackle will give the operator a mechanical advantage so that he or she can pull more weight than a person without it. Keeping in mind the two persons on the rope rule, load as many lights onto the pipe as the two people can safely handle. Once that is accomplished, the two flypeople use the block and tackle line to pull the arbor down to the floor. Once the arbor is down and the rope lock engaged, then one of the flypeople continues to hold down the arbor via the block and tackle line and the other flyperson helps load the counterweight. Repeat as necessary to finish the job. By using the block and tackle you not only increase the amount of weight that can be pulled at one time but you also increase the amount of control you have over the operation. Remember, control is the key element to maintaining safety.

Option 3

The third option involves the use of an electrical winch device called a capstan winch. This device replaces the block and tackle we used in the second option. It is a winch with a motor that turns a smooth rope drum. It requires a rated attachment point on the floor under the locking rail and a separate tie-off point for a pulley on the floor underneath the counterweight arbor you are going to be loading or unloading. A rope is attached to the bottom of the arbor, run through the pulley at the floor and then wrapped around the drum of the capstan winch at least three times. The flyperson then pays out or takes up the slack in the rope as the winch is run and the arbor goes up or down. This winch is a very useful tool and will help make the load in or load out run much more smoothly and quickly. However, it takes a seasoned professional to run one properly. A capstan winch should only be operated by someone who has been trained in the proper use of the

winch and has spent a good deal of time practicing with it in no-load situations.

There are other methods for dealing with a theatre that does not have a loading bridge, but, in my opinion, the three options discussed here are the safest. They all require that a minimum number of people are involved and they all allow for continual control of the system. ▼