

# Arena Rigging

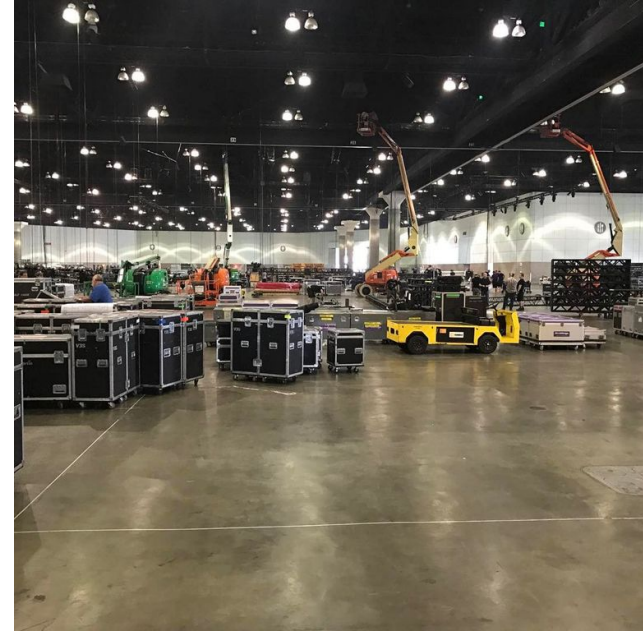


Concerts and Corporate

# Arena Vs. Theatrical Rigging

Theatre is mostly working with established points and counterweight systems. You can bring the lineset in, attach your rigging points, weight it and fly it. Done.

Working in a colosseum, arena or convention center doesn't have this luxury. In these environments, you have to create the things to hang from before you can hang something. It's an incredibly different beast with almost an entirely different skillset.



LA Convention Center

# How it's done

Working in an arena space usually follows the same steps in order to hang something.

1. Place the points.
2. Wrap the **beams** where a **points** will go.
3. Hang the points.
4. Power the **motors** at the points.
5. **Wrap** the **truss**.
6. Attach the motors to the wraps.
7. Take the truss to a working height.
8. Take the truss to **trim**.

# I know some of those words.

**Beam:** A structural part of the building, usually something like an I-beam or wooden beam.

**Points:** The spot where a motor will hang. The chain, motor and wrap are often referred to as “the point” as well.

**Motor:** A motor climbs up and down chain. Each motor has a hook attached to it that things are attached to or hung from. Motors are rated for carrying different weights. Typically ¼ ton, ½ ton, 1 ton and 2 ton.

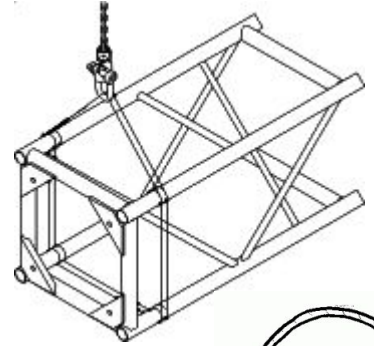


# More Vocab

**Truss:** Structural framework of welded aluminum or steel. Very strong and modular. Multiple pieces can be attached together to create varying lengths.

**Wrap:** For truss usually **Gacflex** is used. There are many different methods of wrapping a truss. A successful wrap evenly distributes weight and doesn't damage the truss. A wrap incorporates a shackle in it that the motors hook attaches to.

For the beam, we use steel cable, shackles and burlap to wrap around it.

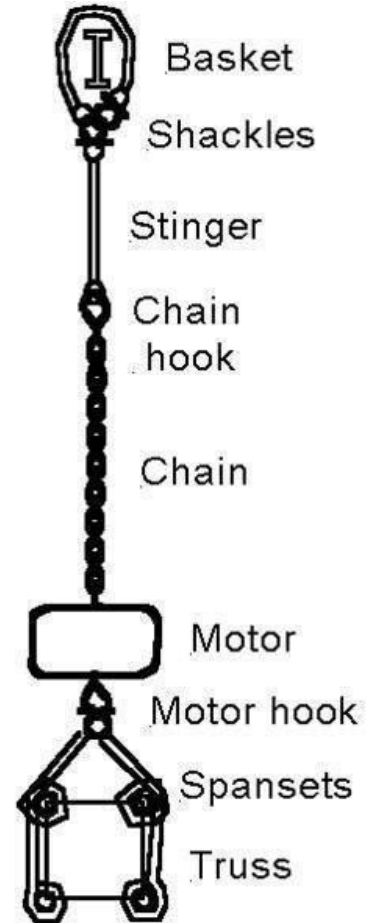


# Mooooore Vocab

**Gacflex:** A single metal wire wrapped in a circle several times covered in fabric. Very strong, bendable and does not damage or scrap things.

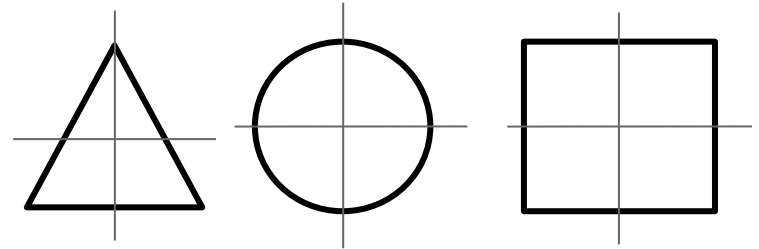
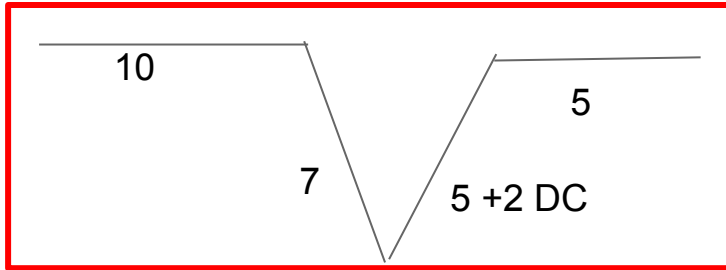
**Trim:** The final height of the truss. Often measured using a laser measurer to make sure each point is exactly where it needs to be.

This is your typical setup from the beam all the way down to the truss. The basket and stingers are both varying lengths of steel cable.



# 1. Place the points

**Rigging Diagram:** A rigging diagram shows steel cable lengths for a bridle. The top flat parts represent lengths that go around a beam. The diagonals show lengths from those beams to a single point. “+2 DC” means an additional 2 lengths of deck chain as well as the 5 feet.

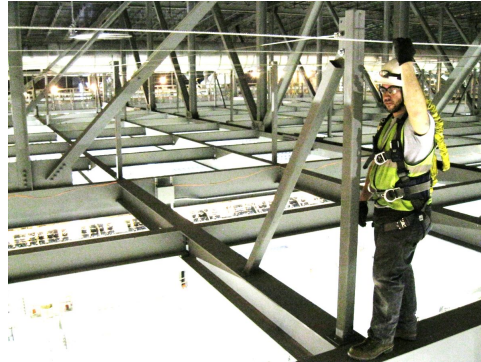


**Floor Marker:** A floor marker shows exactly where a point should go in the space. They are represented by a triangle, circle or square with a cross through it. The shape indicates what kind of motor goes there. Triangle is  $\frac{1}{2}$  ton, circle is 1 ton, squares are 2 ton. Points are typically found through making an X and Y grid with very long measuring tape.

## 2. Wrap the Beam where the points go.

So first you have to get to the beams in the air. There are two ways of doing this: walking the beams or using a lift. Walking the beams means you put on a harness, clip into a safety line and walk on the beams with a rope. You lower the rope where someone attaches all the hardware you need to wrap the beam.

With a lift, you can drive yourself under and to the beam with all the hardware in the lift with you.





# Wrap the Beam (Cont.)

90% of beam wrapped while walking the beams will be with steel cable and shackles in what is known as a “Rock and Roll Basket,” pictured here. The steel cable goes around the beam and the shackles is attached to the other shackle. Between the steel cable in the beam will be burlap. It exists purely to protect the beam from rubbing against the steel.

Wrapping a beam in a lift is the same setup, but only one shackle.

Beams can be wrapped in Gacflex, but it's rare.



### 3. Hang the points.

This step typically happens while the previous step happens. At one end of the chain of a chain motor is a hook. This hook is attached to the wrap around the beam for when it's roped up. The hook will be roped up separately when using a lift.

In places like hotel ballrooms, the points will already be hung in the air, hidden in the ceilings. In these cases, it's just a matter of finding which points are being using and hanging motors from them.



## 4. Power the Motors at the points

There are many different types of motors out there with various power requirements and control methods, but most of them are all powered via a specific **power distributor**.

Typically you attach a power cable to the distributor which then divvies the power to the motors. This is also the point where the controller (a **Pendant**) is plugged in. This will allow you to move selected motors up or down.

From the distributor, motor cables are run to the motors.



# Motor Operation

Using chain motors is deceptively difficult to do. Once your motors have motor cable run to them, and the distro has power, you can control them via the pendant. Pendants have 3 main features, a row of **switches**, a “**Go**” button and “**Kill**” button.

The **switches** have three positions. Up, neutral and down. Each switch correlates to the motor plugged into that number.

**Go** will make motors move in whatever direction their switch is flipped to.

**Kill** toggles the go button to do nothing or work. Keep the pendant killed unless someone is actively using it.



# Motor Operation (cont)

Being certain of what motors you're controlling and what direction they need to go is essential. It seems so simple, but accidentally flipping the wrong switch or accidentally tapping go happens surprisingly often.

Make sure you always call out loudly whenever you operate motors. You'll want to say which motors (or which piece of equipment, truss, speaker, etc) are moving, what direction and to where. "Truss going up to working height" "Stage Left Speaker going to above head height"

Pictured left



## 5. Wrap the Truss

Once motors are powered, they are **floated** just off the ground to make room for truss or whatever it being hung underneath. To attach truss to the floating motor, we must wrap it with gacflex. There are many ways to wrap truss. Which you use depends on the size of truss, how balanced the truss is and how tight the wrap needs to be. The two most common you'll find are **three-point** and **X-wrap**. These are both done with 6' Gacflex on 12" truss.

Before we continue, you'll need to know some wrapping terminology:

**Choke:**

**Basket:**

# Doing the wraps

Three Point Wrap:

X Wrap:

## **6, 7 and 8. The easy parts.**

Once the truss is wrapped, it's simply a matter of hooking the motor hook into the shackle of the wrap. Take the motor up just until it begins to take the weight of what you're hanging. If there are multiple motors on the object (like truss), do this with each motor.

Once each motor has weight, you can move them all at the same time using a pendant to float the object to a working height.

Once it's dlogos to go, raise the object to it's final trim height. You can find the height by either attaching a long, soft tape measurer to it, or eyeballing it and then using a laser measure to make sure it's perfect.



# Workflow

For a smaller show, you can get away with doing all of these steps for all of the points at the same time. Often, you'll have to work one truss at a time. For some of the truly large shows, you can have people still hanging points from the beams while at the same time getting truss into the air.

# Other types of points

Mainly, you'll be hanging truss in an arena, but there are a few other very common things:

**LED walls:** LED walls are typically hung from truss. They have brackets that must be rigged from the truss and the LED panels hang from these brackets. Only a few rows of panels can be done at a time, so a rigger will have to keep an eye on the wall, raising the truss whenever the new game row is ready to be assembled.

**Audio Points:** Speakers are often hung on their own on a single point. Audio crew will generally provide the hardware to hang it. Once it's hung and at trim, tie line will be tied to the speaker and then to another point to make sure it aims in the correct direction.

# More points

**Cable Picks:** This is a **spanset** that is wrapped around cable and the. Attached to a point. It is used to keep cable in the air higher and out of the way. If it's a small amount of cable, tie line is also a viable cable pick.

**Spanset** is like gacflex, but has no metal wire, it is just a strong loop of fabric. It can bend more than gacflex, but with no metal core, weaker and less safe.

There are, of course, many other sorts of points; from hanging scenery to flying ballet acts. Each situation is unique but more or less follows the same formuladetailed on this presentation.

**Safety**

# How not to kill people

Like rigging in a theatre, making sure you have correct load calculations and that all of your equipment is rated to handle it is key. Don't try to lift two tons with a one ton motor, don't hang 15 heavy cables with one small tie line.

One of the biggest dangers of rigging is **never rushing your work**. Rigging is doing a lot of very easy things in a specific sequence. Forgetting or messing up any single thing could lead to disaster. The challenge is that pretty much everything is waiting for you. Lights can't start hanging until their truss is in the air. Projection needs their projectors flown, audio needs to move their speaker over and the set isn't fitting right. All of these issues are demanding your attention. You have to go into a zen state and deal with it one at a time. **Nothing we do and I mean nothing we do is worth getting hurt over**. We are a luxury industry. It's not worth it.