

# Power, Cables and Accessories

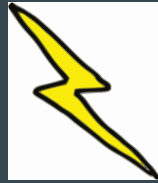
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I donno man. Something witty.

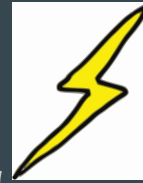
# POWAH

Knowing how much power is used and available super important. You don't want to blow stuff up (generally).

We must learn to calculate such things



WITH SCIENCE



# The West Virginia Rule

The West Virginia rule is talking about the formula for calculating watts, volts and amps:

$$W=VA$$

This means Watts = Volts times Amps.

If you know two of the things, you can figure out the third.



# In case you forgot:

**Amperage:** How much power is is being used

**Voltage:** How fast that power is moving

**Watts:** A measurement of of the two.

Think of it as a river with a dam. Amps is how wide and deep the river is, voltage is how fast the water is moving and watts is a dam that measures how much water is passing through it.

# 'Merica

In America, we use 120v as a standard. That's what's in our wall plugs. So we generally always know the V of  $W=VA$ .

Say we know something is pulling 10 amps. How many watts is that?

$$W=VA \text{ so } W=120 * 10$$

So we know that at ten amps, a thing is pulling 1200 watts of power.

I love our electrical standards!



# More on that

How many amps is a thing taking is it is 750 watts?

$$W=V*A$$

$$750=120 * A$$

$$750/120=A$$

$$6.25=A$$

A 750 Watt thing is taking 6.25 amps.

# So why is this useful?

750w is one of the standard source 4 lamp wattages. Knowing it's 6.25 amps will come in handy often.

How many 750w lamps can we plug into 20A?

3. That's 18.75 amps. If we did 4, that'd be 25 amps, too much for the circuit, which would blow a fuse or trip a breaker.

# Power in Theatre



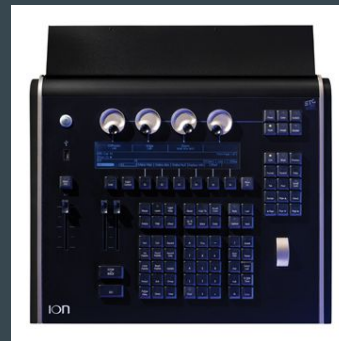
# The Flow of Power and Data:

Power from a company switch or Hardwired into the building.



A Dimmer Rack controls the power and sends it to the lights.

A Lighting console tells the dimmers how much power to send where.



Dimmer send power to a circuit with light plugged into it.



# Company switches

This is a typical company switch. These are basically GIANT outlets that give us TONS of power. This one pictures is 400 amps. Compare that to a normal wall outlet in your home: 20 amps.

You can see on the bottom a number of receptacles that you'd plug into.

- Green - Ground
- White - Neutral
- Black - Phase A
- Red - Phase B
- Blue - Phase C

You plug cables from this into your dimmer rack.



# Dimmers, foo's.

So this is a dimmer rack. It's made of a bunch of those little dimmer modules. You can get them in various sizes; anywhere from 2-96. You can have multiple racks, multiple sizes of racks, multiple brands of racks all working in (relative) harmony.



Dimmer Rack



Dimmer Module

# SO LIGHTING

So how do we get power (and data) from point A to point B?

**CABLES:** Cables are a bunch of wires inside of a rubber hose with a connector at each end. The wires inside are different depending on the purpose. Data cables have small, little wires. Power cable have big, thick wires. The three main power cables you're going to deal with in theatre are standard **Power Cable**, **Socapex** and **Camlock**.

# Cables

You've already used and seen lots of standard cables. Our standard cables are thick and made for theatre and entertainment. They're way beefier than your house cables.

**Socapex:** Basically 6 cables bundled into one big cable. Very heavy, but handy if you need to plug a lot of lights in far away from plugs.



# Cables

**Camlock Cable** is big, thick cable. This is usually used to plug dimmers or motors into a generator or company switch.



# Accessories

**Top Hats:** Made to shield excess light from spilling into the audience. Also helps hide lights from view. Also, it looks like a top hat.



**Barn Doors:** Made for lights that don't have shutters. lets you cut light off of objects you don't want lite like walls, or people.



# Accessories

**Side Arms:** These attach to the yoke of a light to space it off of whatever you're hanging from.



**Doughnut:** These go into the gel slot of a light. It helps get rid of extra light. Particularly used to sharpen light bleed on a gobo.



**Concentric Circles:** Like a tophat for a par or fresnel.



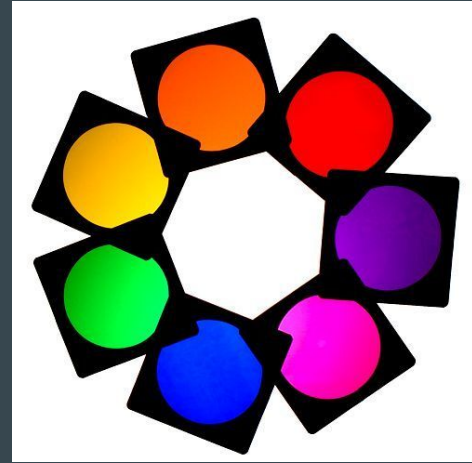


# Gel

Gel is a translucent sheet that is placed in front of the light that makes it a different color.

It comes in sheets or rolls that are cut down to a size to fit a gel holder.

Gel holders come in a variety of sizes, so for each show, you need to find out how many of what size you need.



# Working with gel

There are many companies that make many colors of gel. When you're sent to get gel, you'll get usually a letter and number. the letter is the company and the number is the gel number.

So R09 is Rosco 09, an amber

L201 is Lee 201, a light blue

Rosco and Lee are the two biggest Gel companies. Apollo, GAM and Eurocolor are also fairly common.

