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Lighting

The area most related to power is that of lighting. Lighting is an important part to any big show, and is often the most important technical aspect in a theatrical production. Lighting can evoke moods such as fear and happiness, or establish a setting such as a moonlit beach or a prison cell. At other times, lighting can add flash, sparkle, energy and life to a performance. Still at other times, lighting can simply provide illumination so we can see what is going on. Though I could go on for pages on lighting and lighting aesthetics, I will again point you in the direction of your local library for some very good books on stage and video lighting. Many of these books have simple, low-cost solutions for achieving effects such as rain or a crescent moon, and also provide examples that you can try. Details such as power and fixtures are often given as well. You may wish to purchase a book for the crew as a reference guide, or make your own from all of your research.

Incendescence

Incandescence works by running a current through a filament enclosed in a glass chamber in which there is no air. The current heats the filament to such a high temperature, it glows. In a regular light bulb (the kind you use at home in your bedroom) the filament is made of carbon and glows a sort of yellowish white. In stage lighting, the filament is either carbon or tungsten and can glow from a very reddish white, to a white that is almost bluish. These are colour temperatures, and can be covered in a book on video lighting.

Color Temperature

Without going into great detail, a light's colour temperature refers to how red or blue white light is. Regular incandescent lighting in your home is closer to red, while the white light generated outdoors is more blue in colour. To us, they're all white light, but to a video camera, they are different. I'll cover that later. Color temperature is measured with the Kelvin scale, representing the color temperature of the heat. Street lights are around 1200K, soft white CFLs around 2700K, bright white around 5400K, and daylight around 6000K.

Types of Fixtures

As said before, the three most common fixture types at L'Am are the ellipsoidal, the fresnel and the scoop.

Ellipsoidals

Ellipsoidals throw a very focused beam of light and work by projecting light through a clear lens. These are also called Lekos (a brand name) or Source 4s (another brand name). They are generally used to light small areas, or are used as part of a lighting effect such as casting the light in shapes. Ellipsoidals produce hard shadows and can be diffused to a point. You can use gobos with these lights to achieve effects such as vertical blinds, the shadows from a tree in the window or an artistic effect such as a swirl or other pattern. While l'Am doesn't have any gobos, but ellipsoidals are used in the Market Square, Drama Room and the Stage.

Fresnels

Fresnel spotlights have a moveable bulb and lens that allow you to make the beam very wide and diffused or tight and focused. The fresnel is the workhorse of theatre and video lighting, and is one of the most flexible fixtures you will use. Barn doors give you the opportunity to spread the beam more, or make it more focused. Fresnels come in a variety of intensities and are usually hung in the lighting grid. Once you figure out how to control the light from a fresnel, you can make very beautiful lighting designs.

Scoops

The scoop light has no lens and uses a reflector that looks like a scoop, hence its name. They generally throw a broad and diffused beam of light, and are usually used to light large areas of a stage or performance area. Right now, scoops on the stage, drama room, and market square.

Intelligent Lights

Intelligent lights or Moving Heads are the lights that you see at big concerts, in music videos and at night clubs. They work by using mirrors on stepper motors to aim and focus the light beam, as well as some fancy colour changing and pattern changing hardware to make the light do cool things like scroll through 16 colours. These lights are often controlled with a separate control device and require some extra cabling. Most intelligent fixtures can be mounted easily in a grid, powered and set-up in a short amount of time. They also work on stands and can add snap or energy to your production.

Other Fixtures

I'll briefly cover some other lighting fixtures here, and make general references to them as this manual goes on. Again, for a detailed description of these lights, visit the web for more info. Contact the manufacturers as well if you ever have to rent lights.

Zip lights are smaller and work by internally reflecting the light before it is emitted from the fixture's cavity. The light is often very diffused and difficult to control.

Parkans (a brand name) are often used to provide illumination for a large area such as a stage or the corner of a room. These are usually scaled down ellipsoidals or open lights in groupings of four or eight. They are also inexpensive, and can be fitted with colour media or some effects devices.

Strobe lights flash light at a given frequency and can create interesting motion effects on moving objects. (This works well with dancers). Strobes can be gelled with any colour, and are usually mounted on stands.

Other lighting fixtures are too specialised to list, but they can provide you with a wide range of lighting solutions when putting on a show. Remember though to keep it simple.

Accessories

Lights would be boring if all we could do was aim them and only get white light from them.

Gels/Color Media

Enter the gel or as it is more correctly called colour media. Gels allow you to colour correct lights to a certain colour temperature, diffuse light, reflect it or simply change its hue. You'll often want to change light colour for a particular scene or to establish a mood. Gels are specially designed to withstand the heat of a light, and are flexible enough to cut with scissors and fold back on themselves. Gels can be mixed, such as a diffusion and colour gel, and can create an entire world of effects limited only by the creativity of the lighting designer.

Gobos

Gobos can either be purchased or made with aluminium foil. Also called cookies, gobos are preset patterns that can be projected by a focused beam of light. They are almost always placed over ellipsoidals and can provide effects such as swirls, the shadow of vertical blinds, a city skyline or a general artistic pattern.

Flags and Reflectors

Flags are generally used in video productions, but they are used in theatre as well. They are simply black pieces of cloth that block light. The cloth is fire resistant and can be hung from a lighting grid. Reflectors can be used to reflect a diffused version of the light to fill in shadow areas. For this, aluminium foil on a stiff card works very well.

Controls

All lighting fixtures require power, and often some form of control. On each fixture in the grid, you will find a power connector (also called a pig-tail) and a data connector which connects to a central dimmer pack that controls the voltage going to the fixture.

Power

A dimmer pack is used to control the intensity of the light and is often confused with a circuit. I'll make the distinctions clear in just a moment. Each lighting fixture also has attached to it a safety chain so it doesn't slip off of the grid. Should you ever have to hang a light, be aware of these three connectors and lighting safety. You will want to make sure that the light can not possibly fall from the grid, even if the power and data cables come loose. There are tricks of wrapping the cable around the bar, but you'll have to figure that out for yourself Once the light can receive power and some sort of control data, you're ready to light the stage.

Data

From the dimmer pack(s) comes a multi-pin connector which connects to your lighting control board. Inputs for the lighting connectors can be found in the cafetorium, the Market Square and the drama room. This multi-pin connector can then send data to the lights from the control board. From the board, you can fade individual lights or groups of lights, set parameters for different scenes, set fades to and from blackout, recall scene data and store that data on disk. Some effects such as flashing the lights may also be possible. Check with your board's manual. Be sure you understand the board before you plunge in and start using it in a show. If possible, select a time to run through the commands so that you are familiar with them come showtime. If this isn't possible, make your transitions before the show.

Channels vs Dimmers vs Circuits

It is important here to make the distinction between circuits, dimmers and channels. A circuit in lighting refers to the physical connections of the wires that make the light go on or off. Circuits don't fade. They can only be opened and closed to turn the light off and on respectively. A dimmer provides the light the ability to vary its output intensity in direct proportion to the voltage at the input. A dimmer is essentially a fancy switch that lets you make the light darker or brighter. A channel is a path on which the data can travel to control a light's parameters such as how much it can dim. Many circuits can be on the same dimmer, all controlled by one channel on a control board Be sure you understand the difference between these three things in order to avoid confusion.

Lighting Safety

Even if you aren't the one to mount lights in the grid for policy reasons, lighting safety is important to know. Please check with the school board's policy, and keep a copy of it on file. Be sure that someone is familiar with the procedures. If you are a TP or an LD, you should be able to trust your lighting crew with any fixture, either mounted on a stand or placed in the grid. All lights run on electricity. Be sure you are familiar with safety procedures surrounding power hook-ups. If you are mounting the fixture on a stand, be sure the stand is stable and that it won't tip. Keep the stand out of heavy people traffic, but make sure it is accessible by your crew should you have to change something. If you are nervous about the stand tipping over, use sandbags to secure it. Set lip lights in teams of two or three, and never by yourself. Once your lights and stand are set up, check to make sure that you can get power to the light. Be sure that the cord reaches with enough slack to remain on the ground until it reaches the base of the stand. If you have a data connection to make, make sure the cable is long enough and that it is secure. Twist the cable around the stand a few times before running it along the floor. Turn the light on and ensure you are receiving power. Make sure the light can be controlled from its controller if it has one. Should you have to re-aim a light, turn it off, re-aim it and then turn it on again. This also applies if the light must be moved. Lights can get hot, so wear protective gloves and use your head when working on a light. Don't wear loose articles of clothing. If you must, tuck it in or tape it to your body with masking or scotch tape. Should you find yourself on a ladder, riser or scaffolding, make sure you have someone at the bottom watching out for you. A team of three here is ideal. One person to watch you at the bottom, and another to help you mount the light. Stay focused on your task when mounting a light, and pay attention! Save the social talk for your lunch break, or until you're sure that the light won't fall. Keep this in mind when you are adding gobos or gels to lights. If you have to change a bulb, never touch the glass part with your bare hands. The oils from your fingers can heat up and make the bulb explode. Use gloves or the cloth that came with the new bulb. If you have to, use a scarf or your shirt to install the bulb. Do this only as a last resort though. Change the bulb once the light has cooled down. Usually, a half hour to an hour is a good cooling time, depending on the fixture. Keep your lights away from water or moisture/ Of it is cold outside and you’ve loaded lights in from a truck or car, keep the cases closed and let the lights warm up to the rooms temperature. If any condensation appears, use a static free cloth to wipe the moisture away. It is better to leave the lights alone until they are warm and dry though.

Tips & Tricks

- Here arc a few pointers in lighting. If you discover any in your travels with the AV Crew, note them in here, add them to this wiki page and share them amongst your fellow crew
- Label your power and data connectors clearly. Use big bold printing. Capital letters work best. lie sure that you label the stands and the cool part of fixtures as well. Knowing which light is going where is very important, especially if you have to troubleshoot. This also applies for any extra dimmer packs you may
- Keep your gels in envelopes when they aren't being used. This will prolong their lives. Be sure envelopes and gels arc labelled

- Get a light meter or borrow one from the Photography department. It is a good way of checking for uni corm lighting down a key area of your stage. It is better to use a reflected light meter as opposed to an incident light
- Clip gels to your fixtures with wooden clothes clips. This is much faster than fitting the gel into the light's holder. Be sure the clips are wooden because plastic ones will
- Tape lighting cables as you would power cables. Be sure that any excess cable is out of everyone's
- If you arc using a strobe light in a show, be sure to inform the audience that you will be doing so. Stroboscopic effects can cause those who have epilepsy to have
- Centralize your lighting controllers if you are using more than one in a big show.

Conclusion & Operating Aesthetics

Running lights is not as easy as turning on the light switch in your bedroom. Good lighting operators can operate with a smooth and fluid hand, and make subtle transitions that are barely noticeable by the audience. The faders on a lighting board should never be jerked or moved violently. if you make a mistake, correct it as slowly as possible. The audience will not notice a gradual transition. They will notice one that comes up all of a sudden. Trust your director or SM if they give you a suggestion about your operation. If it helps, work with a stopwatch or timer to time your transitions. Mark and label your board as well as your disks. Most of all, keep your eyes and ears open and pay attention to what you are doing.

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