

BACKstage

Technical Theatre for High Schools

Electricity Basics

West Virginia Formula

$$\text{Watts} = \text{Volts} * \text{Amps}$$

$$2400 = 120 * 20$$

In the USA, most electrical circuits are 20 amps and standard voltage is 120v. Maximum wattage of a circuit is 2400w

Ohms Law

$$V = IR \text{ (volts = amps * resistance (ohms))}$$

Dimmers: dimmer capacity in the USA is typically 2400w (2.4k). Dimmers are used with conventional incandescent luminaires

Non-Dim modules are used for solid state lighting (LEDs, etc.) Also known as relays or constants

Electrical Cable: 12/3 SOOW Power Cable is preferred for theatrical use (12-gauge, 3-wire)

Connectors/Plugs

Most common connectors/plugs are:

2 P and G (Stage Pin, 3 Pin, Union)



L6-20 (Twist Lock, NEMA))



Edison (Parallel Blade Grounded Connector)



PowerCON (Neutrik)



Wire Color

In the USA, standard electrical wire colors are:

GREEN: Ground

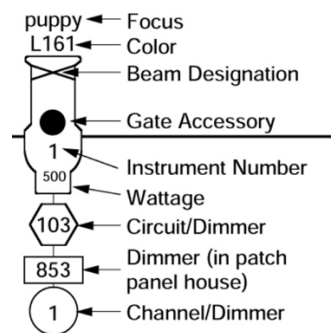
BLACK: Hot

White: Neutral

Reading a Light Plot/Lighting Paperwork

A light plot is a graphic representation of the lights and their positions in the theatre. There are too many drafting symbols to present here and it is recommended that you refer to https://www.dolphin.upenn.edu/pacshop/RP-2_2006.pdf for a fuller explanation.

6.14.2 Normal Luminaire Notation



Paperwork for lighting can include: Channel Hookup, Instrument Schedule, Dimmer Schedule, Circuit Schedule and Magic Sheet.

DMX (Digital Multiplex, DMX 512A)

The standard communication protocol used by light boards, dimmers and luminaires. 512 communication channels which constitute one universe.

Lightboard Basics

Although light boards offer a variety of functions, all allow the user to: patch channels/dimmers, create submasters, groups and record cues with discrete fade times.

Luminaires

Some common luminaires are:

Ellipsoidal Reflector Spotlight (ERS, Profile, Ellipsoidal)



Available in varied beam diameters/focal lengths, has internal shutters and can use a pattern, iris, top hat. Focused by "running the barrel"

Fresnel



A short to medium throw luminaire. Derives its name from its lens.

Top Hat



Inserted into the gel frame slot of a luminaire. Reduces light spill.

PAR (Parabolic Aluminized Reflector)



A durable/low tech luminaire. Derives its name from its lamp. Creates an oval beam of light and is focused by "spinning the bottle"

Barn Door



Inserted into the gel frame slot of a luminaire. Reduces light spill.

Source 4 PAR



Akin to a traditional PAR. Beam variation is created by changing the lens, rather than the lamp.

Two-fer (2-fer)



Electrical accessory enabling two devices to be plugged into one receptacle.

Color Frame



Metal or heat resistant device that holds the color media in front of a luminaire.

Accessories

Pattern (Gobo, Template)



Metal, glass or plastic template that is inserted (via pattern holder) into the gate of an ellipsoidal reflector spotlight

Resources

Designing with Light: An Introduction to Stage Lighting (Film)
6th Edition By J. Michael Gillette, Michael McNamara

Electricity for the Entertainment Electrician & Technician 2nd Edition
By Richard Cadena

Lighting Console Manuals

USITT RP-2, Recommended Practice for Theatrical Lighting Design Graphics
(2006). http://www.dolphin.upenn.edu/pacshop/RP-2_2006.pdf

Technical Theatre for Nontechnical People (2nd Ed.) Drew Campbell

USITT Publications available for purchase/download at usitt.org

Practical Projects for Teaching Lighting Design Vol. I
Practical Projects for Teaching Lighting Design Vol. 2

Iris



Inserted into the gate of an ellipsoidal reflector spotlight. Allows the user to adjust the beam diameter of the light.