

# Lighting and Special Effects

by

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New York State School Music Association (NYSSMA)

TI:ME Northeast Regional Conference

Rochester, New York

December 1, 2016

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## Lighting and Special Effects

One element that is often overlooked in concerts and performances is the application of lighting to enhance the program. Greater attention is typically given to lighting for musicals and dramas but concerts of bands, choirs, and orchestras can often be enhanced with simple lighting and a little planning.

Lighting can be used to set a mood for the concert and special programs and can have a great impact. The lighting team also typically handles special effects such as bubbles, fog, and snow.



## The History of Lighting



















## Modern Lighting

- Effective lighting is becoming an expectation of contemporary audiences.







## Typical Concert Lighting Plan

- Lights are at or near full for the entry of the audience into the auditorium.
- A few minutes before the concert, the lights are dimmed and raised again a couple of times.
- When the concert begins, lights are dimmed and a movable spotlight follows the director on stage. Students have sufficient lighting to see their parts. There is different lighting on stage and in the audience.
- During each announcement between songs, a spotlight is directed to the speaker.
- At intermission, or close of the program, the lights go dim before going to full again. If there is an intermission, this cycle repeats.



## The Lighting Team

- **Lighting Board Operator:** Typically this person sits at a lighting board and controls when and how the various lights which are wired to the board are used.
- **Lighting Designer:** This individual works with other directors to design the lighting that will be used.
- **Lighting Set Builder:** Many lighting ideas require special placement of lights, and reflective surfaces. At times there will be teams who are charged with setting the lighting, and/or building sets for the lighting.



## Making It Work

Ideally, there will be a system of lights wired into a control board which can be operated by an individual.



# Lighting Board



# Lighting

## **Typical setup:**

- **Analog and/or DMX lighting controller (computer, iPad, board, console, foot switch, etc.) and traditional and/or intelligent fixtures**
- **iPad/Computer**
  - **USB to DMX interface**
  - **DMX software**
  - **VNC or iPad app matching the software**



# Lighting Terms

- **DMX** - language sent between computers and/or lighting boards to light fixtures to control them.
- **Fixture** - one lighting unit (can, spot, intelligent device, etc.). Can be selected on a board, and controlled using the board's controls (dimmers, etc.). Can be connected to or used with similar devices to cover large areas.
- **Scene** - the settings of several lighting fixtures. Can be programmed on a board, and recalled as needed.
- **Chase** - a sequence of scenes. Can be programmed on a board, and recalled as needed.
- **Intelligent lighting** - a lighting fixture with a unique set of automated and controllable behaviors.
- **Behavior** - anything an intelligent fixture can do - change colors, change direction, create patterns,
- **PAR** - Parabolic Aluminum Reflector - traditional lighting fixture, measured in 1/8 inches. 64 = eight inches.

# Lighting

## Analog Systems

- Each light fixture is wired into a specific controller on a board.
- Operating a dimmer for that fixture turns it up or down.
- A master dimmer may turn all lights up or down.
- Usually these are spots, or single color lights.

## Digital Systems

- Each light fixture is wired in series and assigned to a specific controller on a board.
- Operating the assigned dimmer for that fixture turns it up or down.
- A master dimmer may turn all lights up or down.
- Each fixture, depending on its level of intelligence, may contain numerous behaviors, which can be executed from the board.
- Color is one of many behaviors of intelligent lighting.



# Lighting

Programming a Lighting Board (GOOD LUCK):

<https://www.youtube.com/watch?v=eymp8JuYXSQ>

Programming a Chauvet DMX Lighting Board:

<https://youtu.be/dJQAZsNwcv4>

[https://youtu.be/nVbVI4s\\_pQ4](https://youtu.be/nVbVI4s_pQ4)

Programming a Chauvet using MIDI:

<https://youtu.be/TIQPGW-gHGE>

# Lighting

DMX Operator

[https://www.youtube.com/watch?v=95hm95Jbb\\_o](https://www.youtube.com/watch?v=95hm95Jbb_o)



# What is DMX?

- DMX512 - Digital Multiplex for 512 pieces of information
- Standard for digital network control of lighting.
- 512 channels, value of 0-255 on any channel
- Daisy-chain "master" (Computer, Light Board, MIDI Controller, Intelligent Lights) and multiple "slave" devices (Intelligent lights) using DMX cables.
- Traditional fixtures, LEDs, movers, scanners, fog machines, hazers, effects, etc.

# MIDI

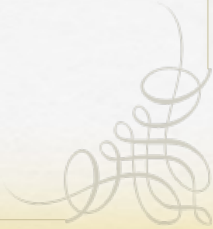
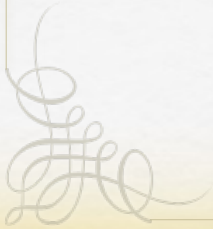
- Some DMX interfaces have MIDI inputs.
- Some boards and intelligent light fixtures can be programmed to respond to MIDI triggers.
- The MIDI source can be a keyboard, or a click track played with any DAW software.
- MIDI can accomplish complex tasks in a single moment beyond the scope of human operation.
- However, it can be tedious and complicated to program.
- Best use of MIDI is to use an existing audio track and to record (and later edit) live lighting instructions from a MIDI keyboard using DAW software.





## Making It Work

The use of moving spotlights will require additional personnel, and as productions increase in complexity, the personnel required to execute the lighting plan will increase.



## Planning

- Review the concert with the person in charge of lighting well in advance of the program.
- Lighting may sometimes require special placement of fixtures, wiring enhancements, or the building of lighting “sets.”
- In some cases, additional equipment (extra spots) may need to be rented or special supplies purchased (different color filters for the various lights).

## Lighting Checklist

- Prior to the rehearsal, all lighting fixtures should be wired and placed as desired for the program. Setup may take some time so this team will need plenty of advanced notice.
- With lighting teams, rehearsal will be extremely important. Any dress rehearsal, or other rehearsals immediately before a production should include the lighting team. These rehearsals are opportunities for the lighting team to practice the effects that have been planned, and to take note of any special circumstances. In almost every case, rehearsal reveals new insights on how the lighting plan must be executed.
- If the lighting plan includes making adjustments to the placement of lighting fixtures during the performance, then special attention must be given to this.
- After the production, power down any equipment as necessary and permit it to cool before moving it. Put away any equipment as necessary.

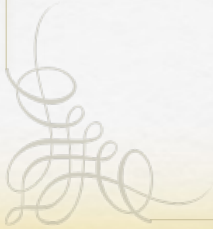
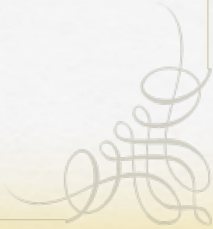


## Lighting

- After the production, power down any equipment as necessary and permit it to cool before moving it. Put away any equipment as necessary.



## Lighting Gear

- Some of the commonly used tools of lighting are stage lights, trusses, racks, light boards, special lighting, spotlights, and effects such as fog, snow, and bubble machines.
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## Lighting Gear

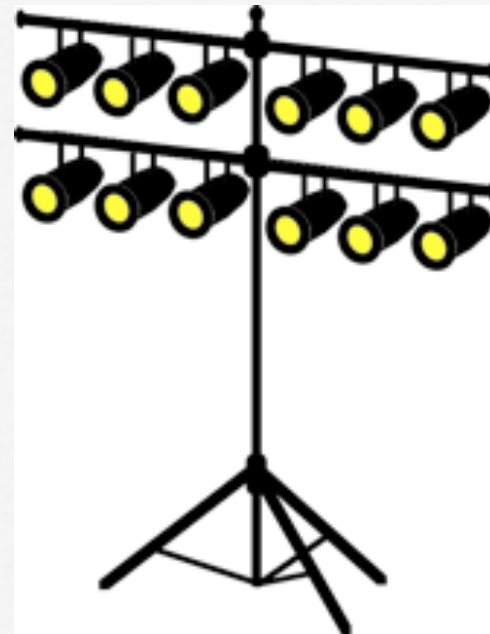
- Permanently mounted lighting cans.





## Lighting Gear

- Temporary or movable lighting stand with cans.



## Lighting Gear

- Trusses for building temporary lighting sets.



## Spot Lights

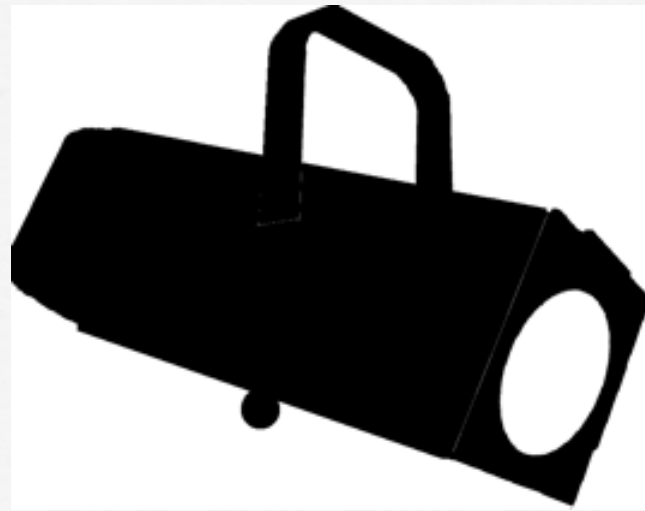
- A manually operated, movable spotlight





## Spot Lights

- A truss-mounted fixed spotlight.



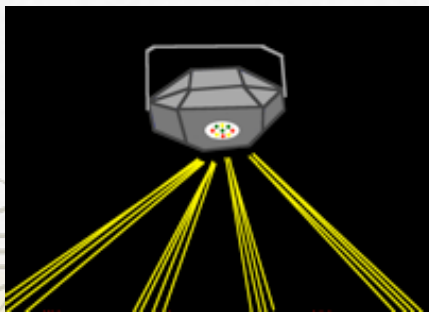
# Intelligent Lights

- Behaviors - Many lighting fixtures execute specific patterns at random or on command.
- A microphone may monitor the music and the fixture may respond with different effects depending on the music.
- Some intelligent fixtures may be controlled by DMX lighting boards and/or computers.

## *LEDs*



## *Lasers*



## Intelligent Lights

- While many lighting fixtures depend on lighting changes to create a sense of lighting, some have an extensible range of motion in the fixture.

### *Movable Heads*











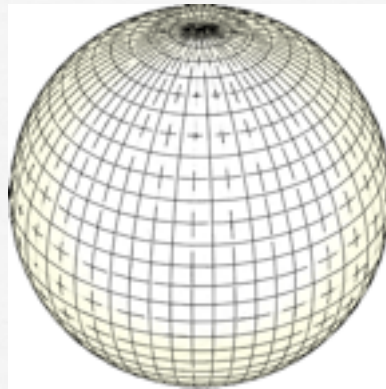






# Intelligent Lights

## *Disco Balls*





## Special Effects

- These machines produce bubbles with a rotating wand and fan.

### *Bubble Machine*



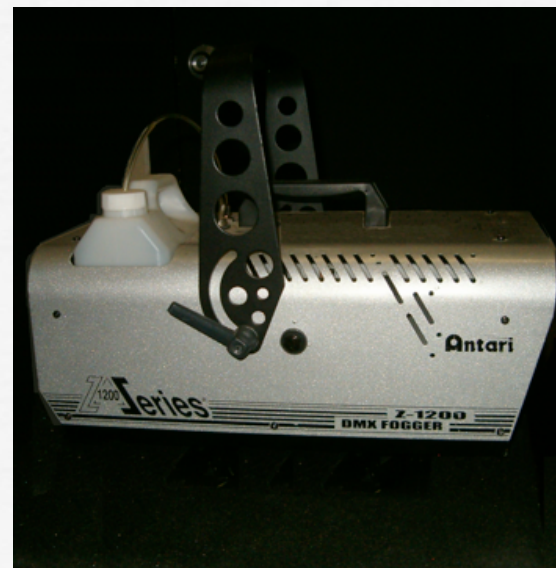


## Special Effects

- Fog, Snow, Bubbles

- Each of these machines produces output which is generally harmless (bubbles and snow yield soapy water, etc.). All of them, however, do produce some moisture, so delicate musical instruments and other things which might be harmed by moisture may need to be placed out of the way. As a precaution, any individual with breathing difficulties or phobias of enclosures may also need to be directed to a space away from the effects.

### *Fog Machine*











## Lighting Communicates

Having a creative lighting team who can associate lighting options with action in the drama is invaluable. Some basic ideas are given in the tables below, but, again, a creative team will brainstorm much more.



## Lighting Communicates

### **Full Light**

- Brightness of day
- Community
- Large groups
- Energy

### **Dim lights**

- Intimacy
- Quiet
- Reflection
- Romance

### **Dark to Light**

The program begins  
Sunrise  
Hope is rising  
A character has achieved enlightenment

### **Light To Dark**

The program ends  
• Sunset  
Hope is lost  
A character is facing difficult times



## Lighting Communicates

**Colored Lights** (depending on context)

- Red – anger, passion, love,  
blushingBlue – cool, dark, night, quiet  
(not loud), soft (not hard), blues,  
depressionYellow – brightness, hope,  
awakening, Green – springtime, hope,  
envy, jealousy





# Black Lights

Continue





# ITUNES DEMO

Control iTunes Visualizer    ? - Shows/hides the help screen    M -  
Changes the mode    P - Changes the color palette    I - Displays the  
track information

C - Toggles "auto-cycle" (which is turned on by default)    F - Toggles  
the "freeze mode"    N - Shows/hides the "smoke" in the background    L  
- Toggles camera lock    A - 'A' key or 'S' key while the visualizer is on,  
increase

or reduce the number of 'particles' around each 'sphere'  
+ - "+" and "-" changes the size or contrast of the particles.

# Sillouhettes



## Scrim (Fabric)

Continue



# Northern Lights

Choreography by  
Robert Gardner

Lighting by  
Kenneth Pugin

Full stage shot to show Northern Lights effect

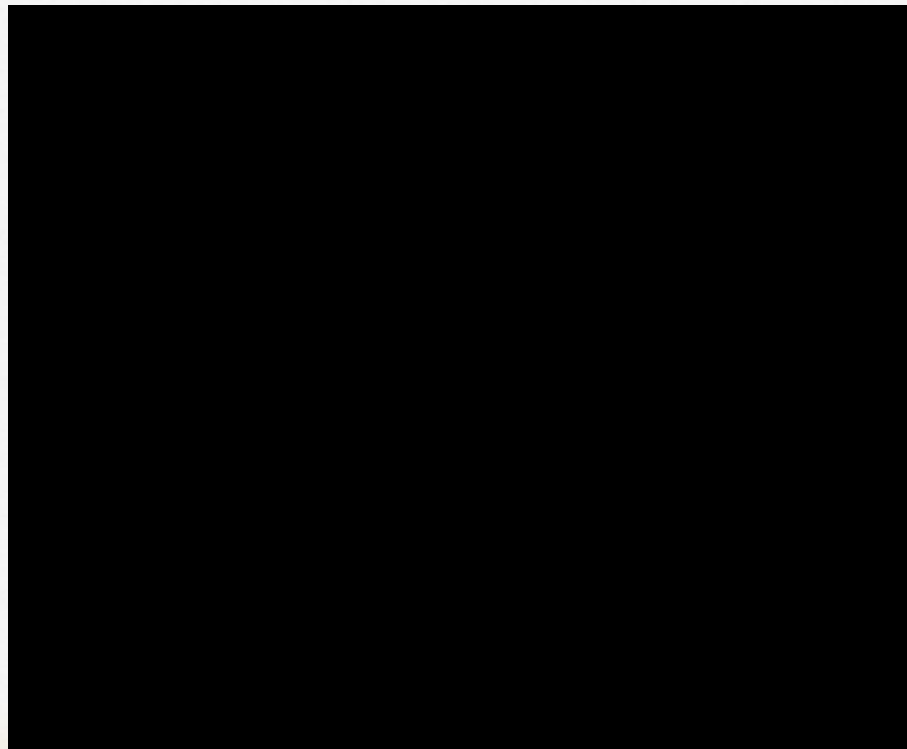


# Adam and Eve

Play from web (if available)



# Adam and Eve









## Projection

- Show lyrics
- Show video
- Set mood



## Projection Software

- PowerPoint
  - Keynote
  - Media Shout
  - SongShow Plus
  - Easy Worship
  - ProPresenter
- 
- 

## Troubleshooting

- The lighting person should always know where the circuit breaker board is located, and how to find and reset a circuit that may be blown.
- Having a ladder or lift is a great help in installing new fixtures, replacing bulbs, and correcting wiring issues.
- Extension cords for temporary lighting must be rated to carry sufficient wattage for the lighting being operated. These cords should be taped to the floor.
- Any power strips used should have a built in circuit breaker. Older power strips with fuses should be replaced. Fuses are too difficult to replace under pressure.



## Troubleshooting

- **Dimmer switches**
- Replace failed switches.
- Listen for noise in the sound.
  - If the hum or noise appears as the switch is operated, relocate the dimmer switch, or the lines that it controls.
  - Plug audio systems into “power cleaner” strips to filter out dimmer strip noises.



## Lighting Web Sites 1

✿ <http://www.rosebrand.com/>

✿ [http://www.sewwhatinc.com/custom\\_spandex.php](http://www.sewwhatinc.com/custom_spandex.php)

✿ <http://www.vincentlighting.com/resources/ideas.php>

✿ <http://www.etcconnect.com/>



## Lighting Companies

✱ Moving Heads Intelligent - **Martin**

✱ DJ Gear - **American DJ**

✱ LEDs - **Elation**

✱ Conventional Lighting - **Altman**

✱ High End - **Digital Lighting**

# Distributors

- Sweetwater
- Musician's Friend
- [stagelightingstore.com](http://stagelightingstore.com)
- [americandj.com](http://americandj.com)



## PRICES

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✿ Musician's Friend web pages.



# DMX

- ✿ “About DMX” web page.

- ✿ iPhone DMX apps.

- ✿ Revo\_4.pdf



## Lighting Choices

✱ American DJ web pages (choices).



Snow

UVF Christmas Concert  
12:57 to 14:00





# Lighting and Special Effects

With thanks to

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