PERFORMANCE LUMINAIRES TO MAINSTREAM PRODUCTS

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- How has the real-time control of spatial and spectral distributions in the theatrical and performance lighting industry improved commercial lighting in the past and present, and how can it in the future?

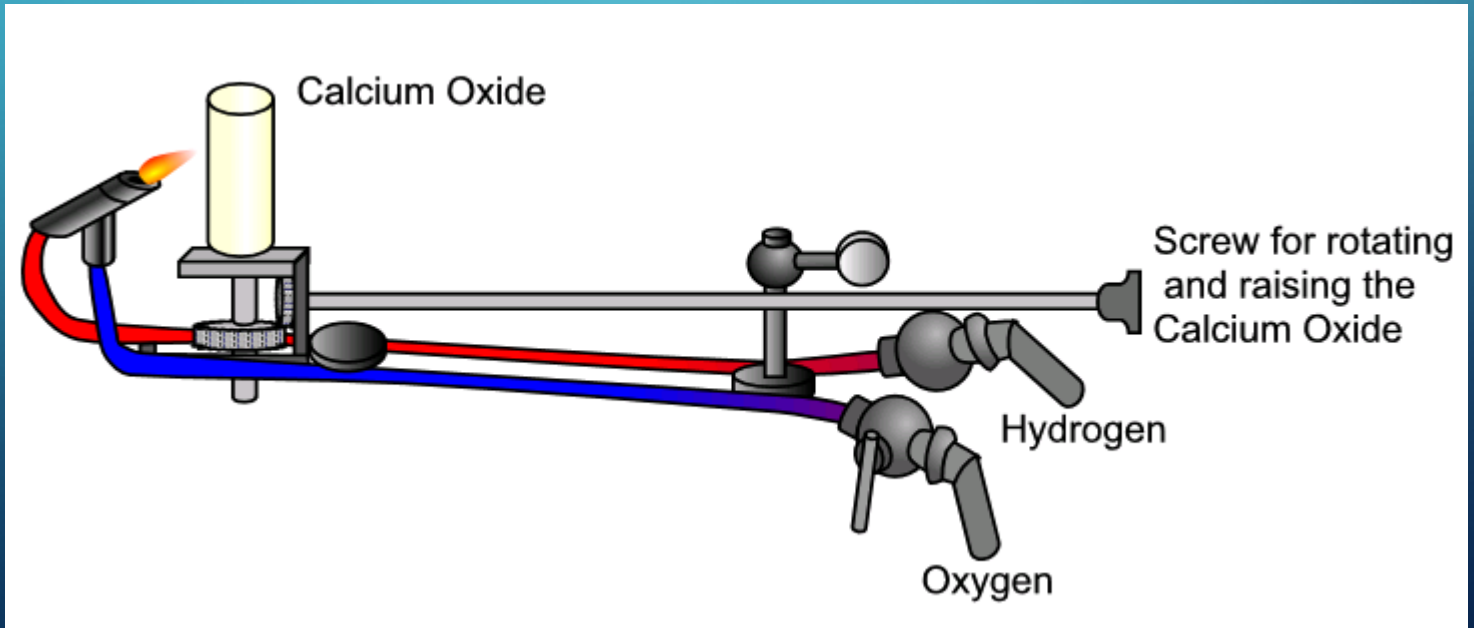
- With the advent of efficient SSL sources, current and cutting-edge theatrical lighting technologies have become increasingly more common place in the lighting industry as a whole and have been setting the stage for a better-quality commercial lighting industry. Many examples exist that show us why we should consider the theatrical lighting industry as a proven resource and development leader in the lighting industry. Current and new innovative theatrical lighting technologies have and may continue to presage future commercial lighting technology improvements.

DISCLAIMER

- THIS PRESENTATION, THE US DEPARTMENT OF ENERGY AND THE ILLUMINATING ENGINEERING SOCIETY DOES NOT INTEND TO ENDORSE ANY MANUFACTURER OR PRODUCTS THAT ARE FEATURED WITHIN THESE SLIDES

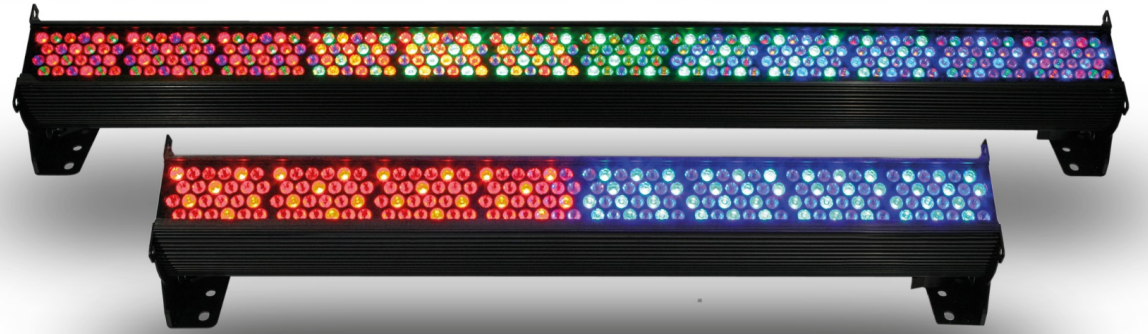
ALWAYS PUSHING THE LIMITS – TO BE IN THE "LIMELIGHT"

- An intense illumination is created when an oxyhydrogen flame is directed at a cylinder of lime (i.e. calcium oxide), which can be raised to white heat without melting. Limelight was first used in public in the Covent Garden Theatre in London in 1837 and enjoyed widespread use in theatres around the world in the 1860s and 1870s. Limelights were employed to highlight solo performers in the same manner as modern spotlights or followspots. Limelight was quickly replaced by electric arc lighting in the late 19th century.



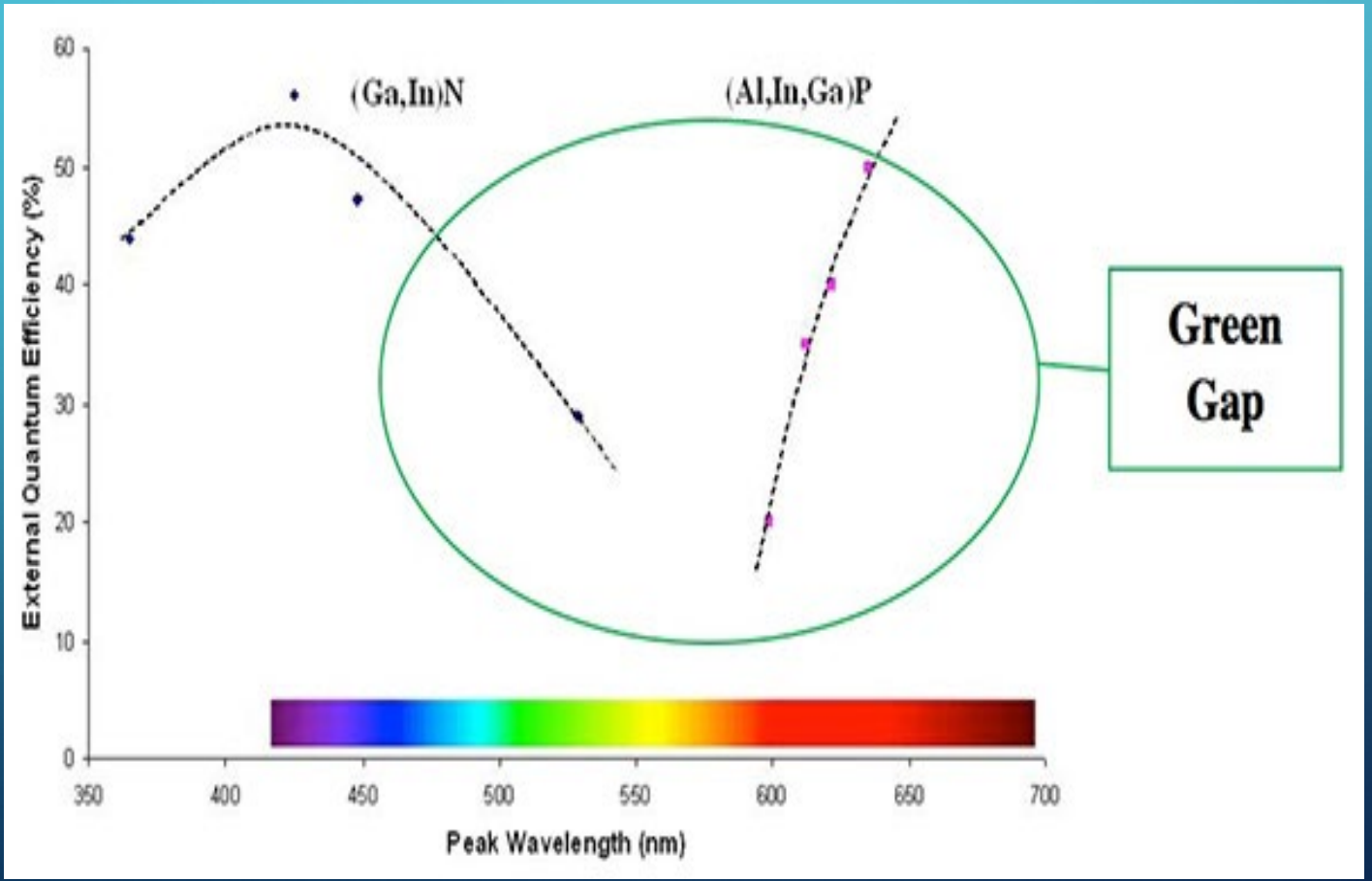
THEATRICAL LIGHTING LUMINAIRE TECHNOLOGIES

- High quality color changing luminaires in numerous form factors
- Homogenized LED color mixing; RGB, RGBA RGBW, RGBWA, RGBWA+UV, RGBL, RGBWA+L, Custom 7+ color arrays
- Lime/Mint LED's to improve color rendering of mixed whites
- Motorized luminaires; aiming, zoom, focus (pan & tilt of fixture, or mirror lights)
- Optical improvements (e.g., gathering and collimating LED arrays to create hard-edge beams, and point source optics for proper shadows)
- Beam shaping with shutters and barndoors

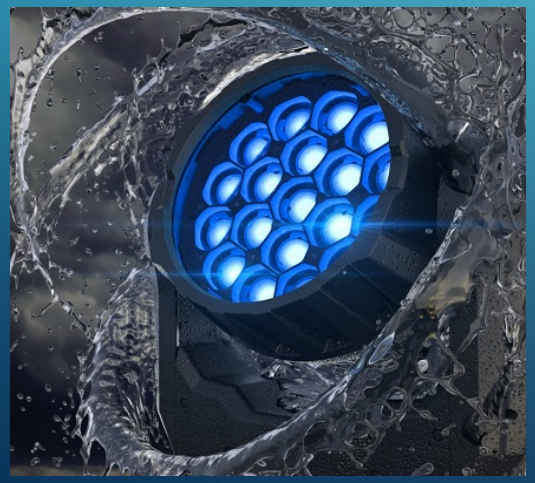


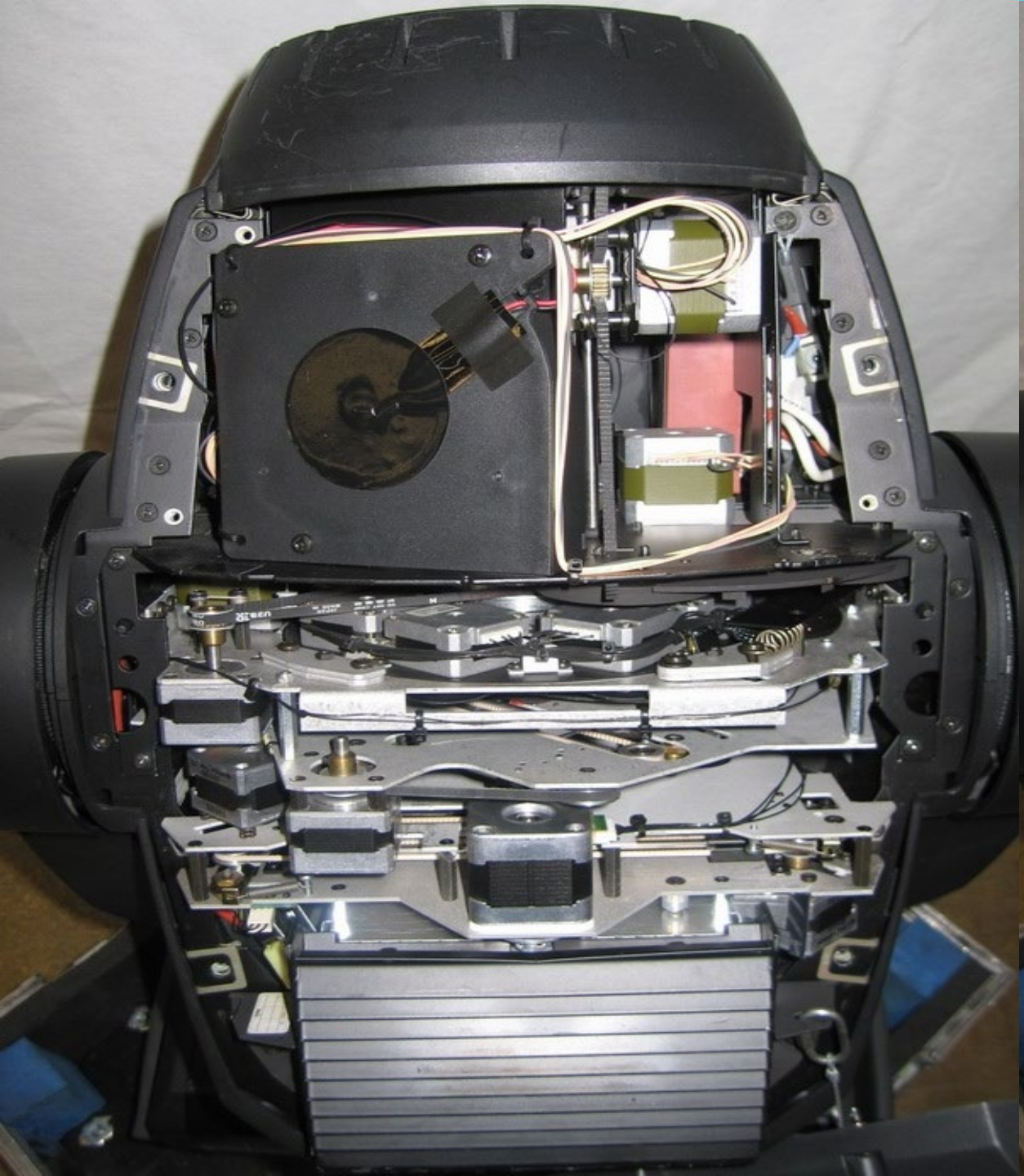
LIME EMITTERS

RGBA+L (LIME GREEN) OR RGB+L ADDRESSES “LED GREEN GAP”



AUTOMATED LED LUMINAIRES





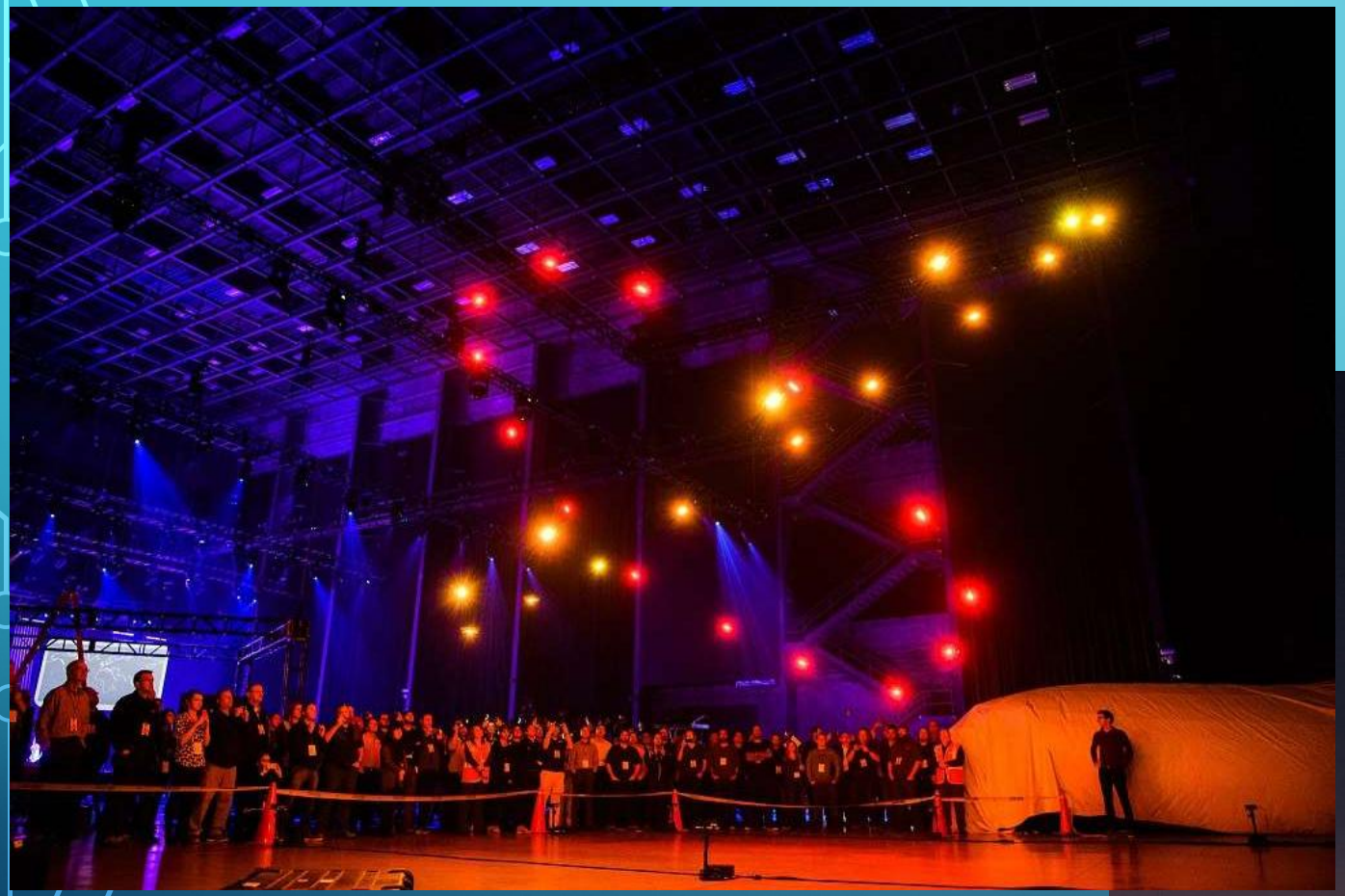
FIRST LASER SOURCE LUMINAIRE

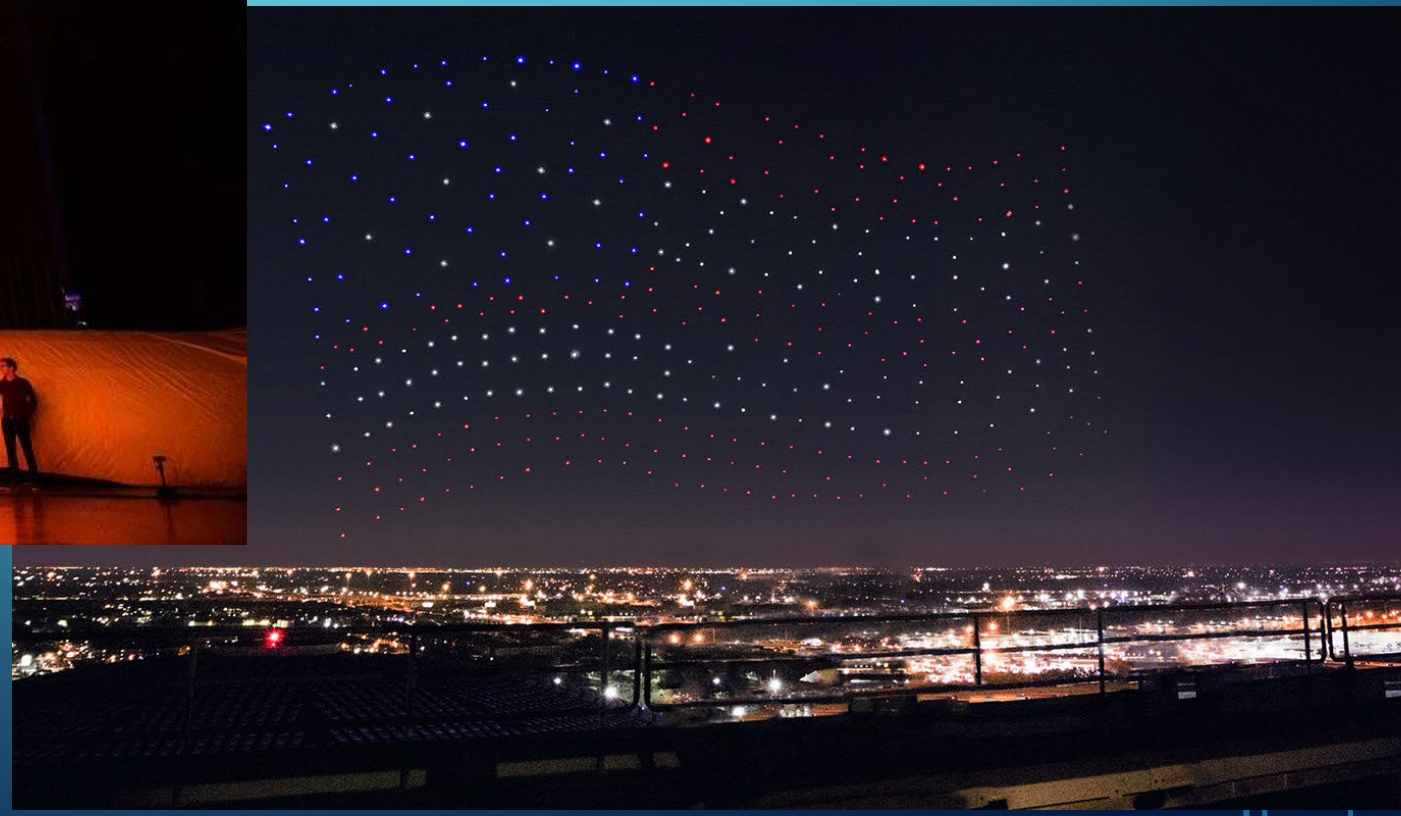
- https://youtu.be/-KgVMLXxEeU

LED VIDEO WALLS
AS LIGHTING AND AS SCENERY

THE KING
HAS

DRONES DEPLOYED AS LIGHTING

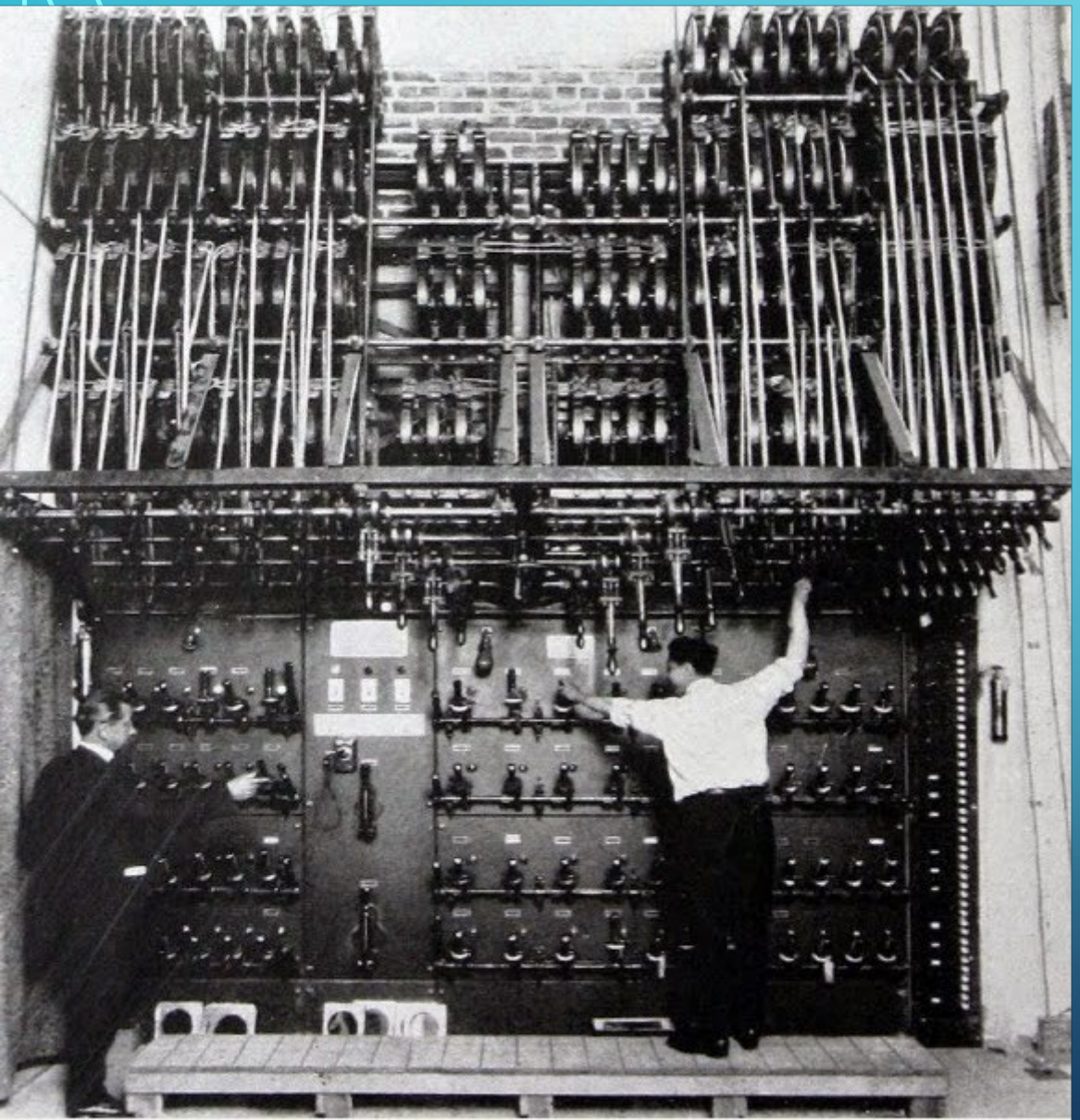


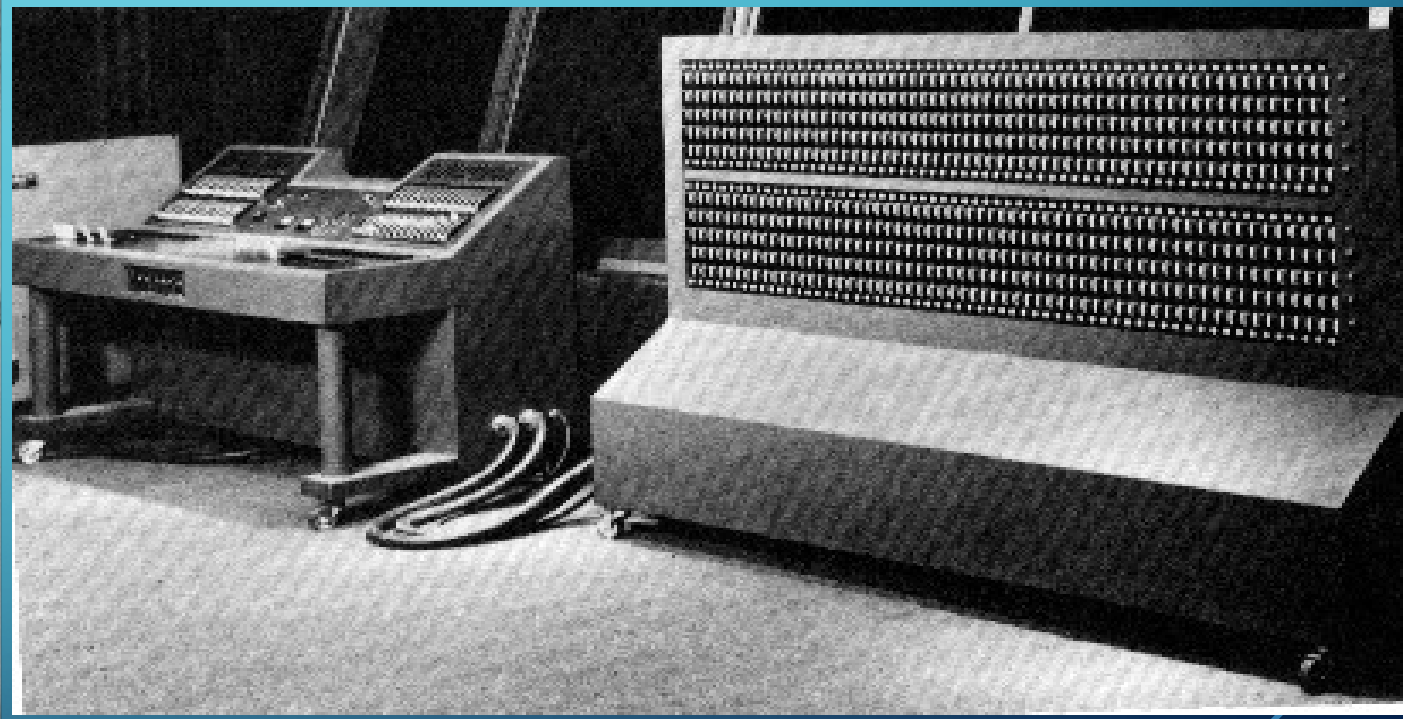


THEATRICAL LIGHTING CONTROL TECHNOLOGIES

- Multiple channel controls supporting various LED color engines and tunable white
- Digital controls (e.g., DMX and sACN) allowing better resolution and independent control of multiple fixtures
- RDM – Remote Device Management
- High-resolution dimming of LED's
- High performance dimming over the entire dimming curve

THE MASTERS OF CONTROL





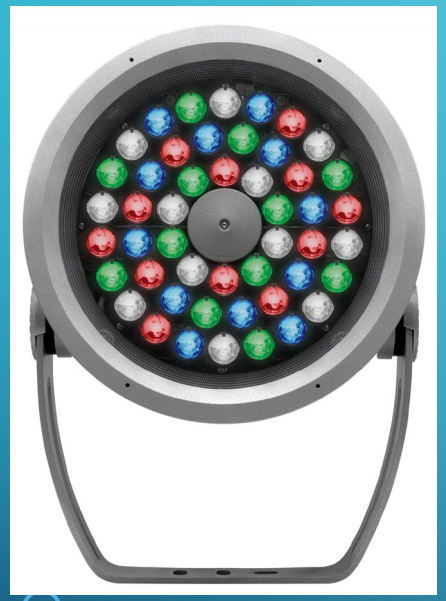
S1
S2
S3

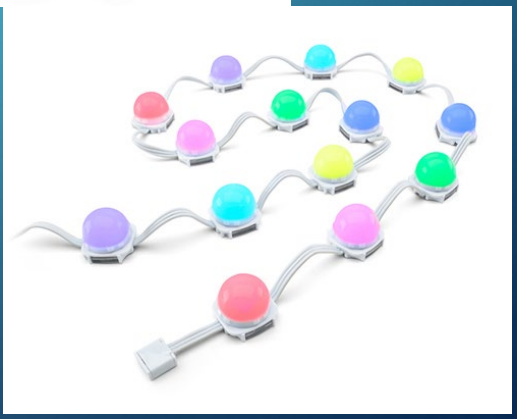
DMX – THE UNIVERSAL CONTROL PROTOCOL

- 1986 – "DMX" (Digital Multiplex) protocol is introduced as a proposed universal control protocol (Modified RS-485)
- 1999 - DMX-512A is approved as official ANSI standard
  - Each DMX "Universe" is 512 independent control channels (1-512)
- Expanded DMX Control Systems
- Ethernet based DMX protocol distribution
  - sACN – Streaming Advanced Control Network, 63,999 universes (32,767,488 channels)
  - ArtNet – 32,768 Universes (16 million channels)
- RDM = Remote Device Management protocol
  - Remote "control" of fixtures features and limited feedback from fixtures
  - RDM Signal is carried over the DMX cable in conjunction with the DMX signal

- **DMX and RDM is now being widely used in Commercial Fixtures**
  - **Manufacturer option on many products**

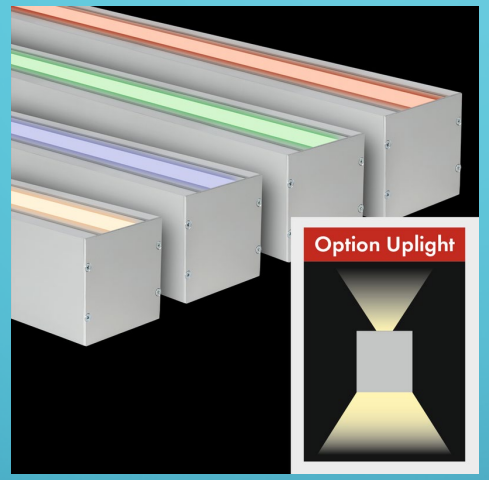
TYPES OF ARCHITECTURAL DMX FIXTURES: EXTERIOR FIXTURES

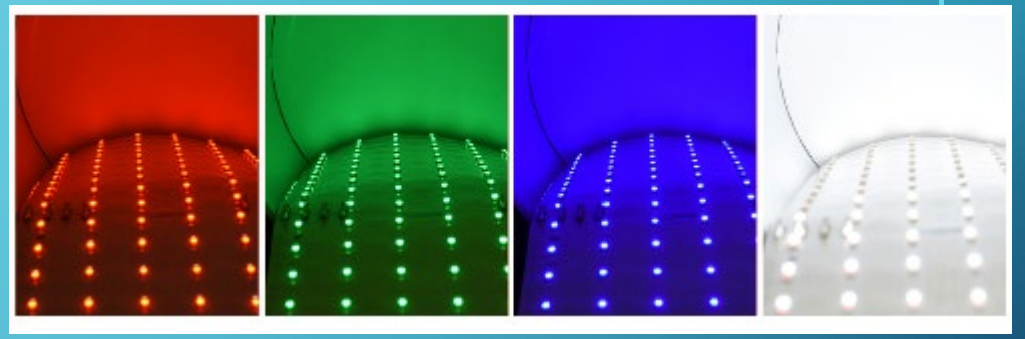


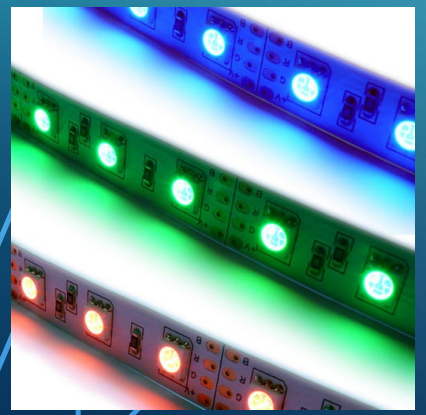


TYPES OF ARCHITECTURAL DMX FIXTURES: LANDSCAPE FIXTURES

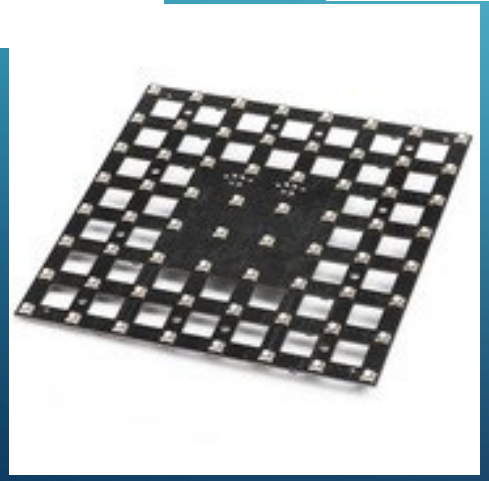
TYPES OF ARCHITECTURAL DMX FIXTURES: INTERIOR COMMERCIAL FIXTURES

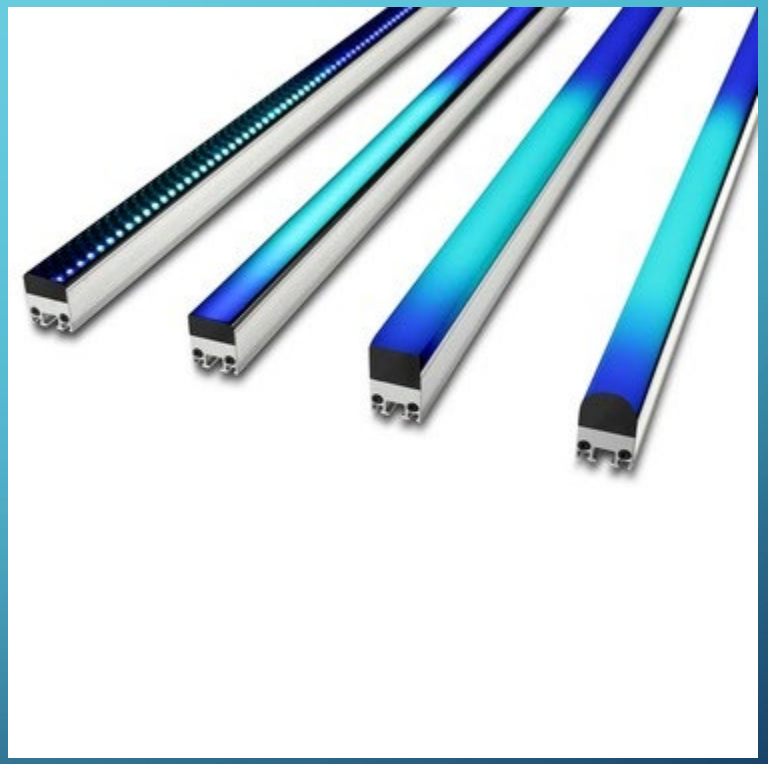


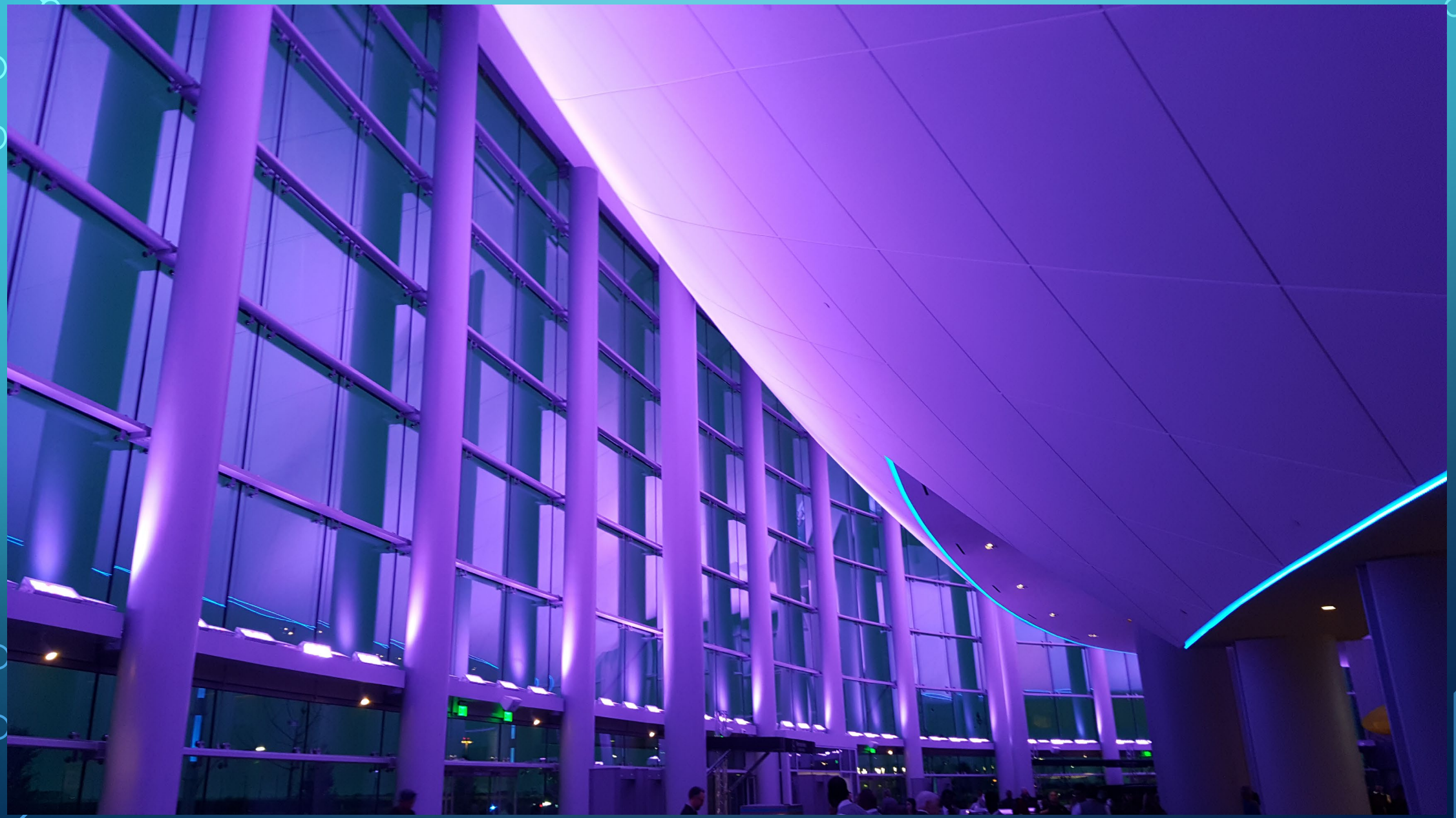




TYPES OF ARCHITECTURAL DMX FIXTURES: LOW-RES VIDEO FIXTURES







THANK YOU!

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