

**H2A**



**LUX MACHINA**

**“We’ll Do It Live!”**



# PHIL GALLER

**Co-President of Lux Machina Consulting  
NEP Virtual Studios  
Background in Film & Broadcast**

As a principal and founder at Lux Machina Consulting, Phil Galler strives to push the boundaries of technology and design in the entertainment industry. Focusing on in-camera visual effects, real-time mixed reality and the future of film making and live broadcast, he has been fortunate enough to find himself at the crossroads of technological innovation and creativity.







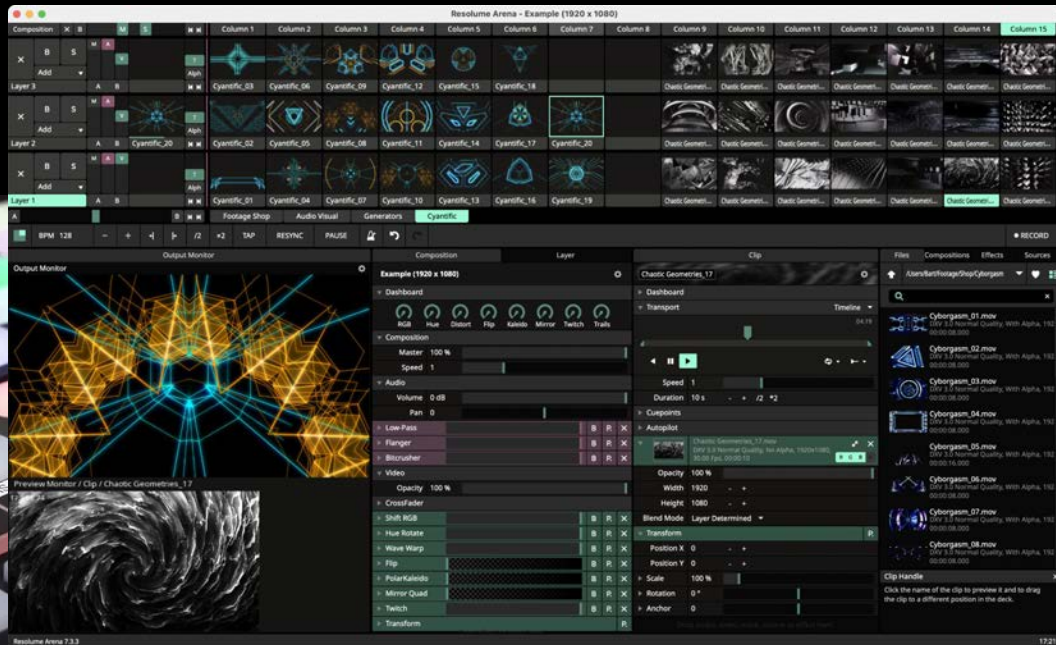
## Who We Are

Comprised of industry-leading experts, our team offers unparalleled knowledge and experience in:

- Virtual Production
- System & Show Control
- Technology Design & Sourcing
- Film & Broadcast Production
- Research and Development
- Software Development

Lux Machina provides premium consultation and on-the-ground production support while setting industry standards as leaders in innovation and technology.

# Screens Control History






# Screens Control History

The image shows a large arena stage set for the NFL Honors event. The central screen displays the NFL Honors logo, flanked by two side screens showing a live broadcast of Roscoe's House of Chicken & Waffles. The stage is illuminated with red and blue lights, and the foreground shows rows of empty stadium seats.





# Multi-Vertical Workflow

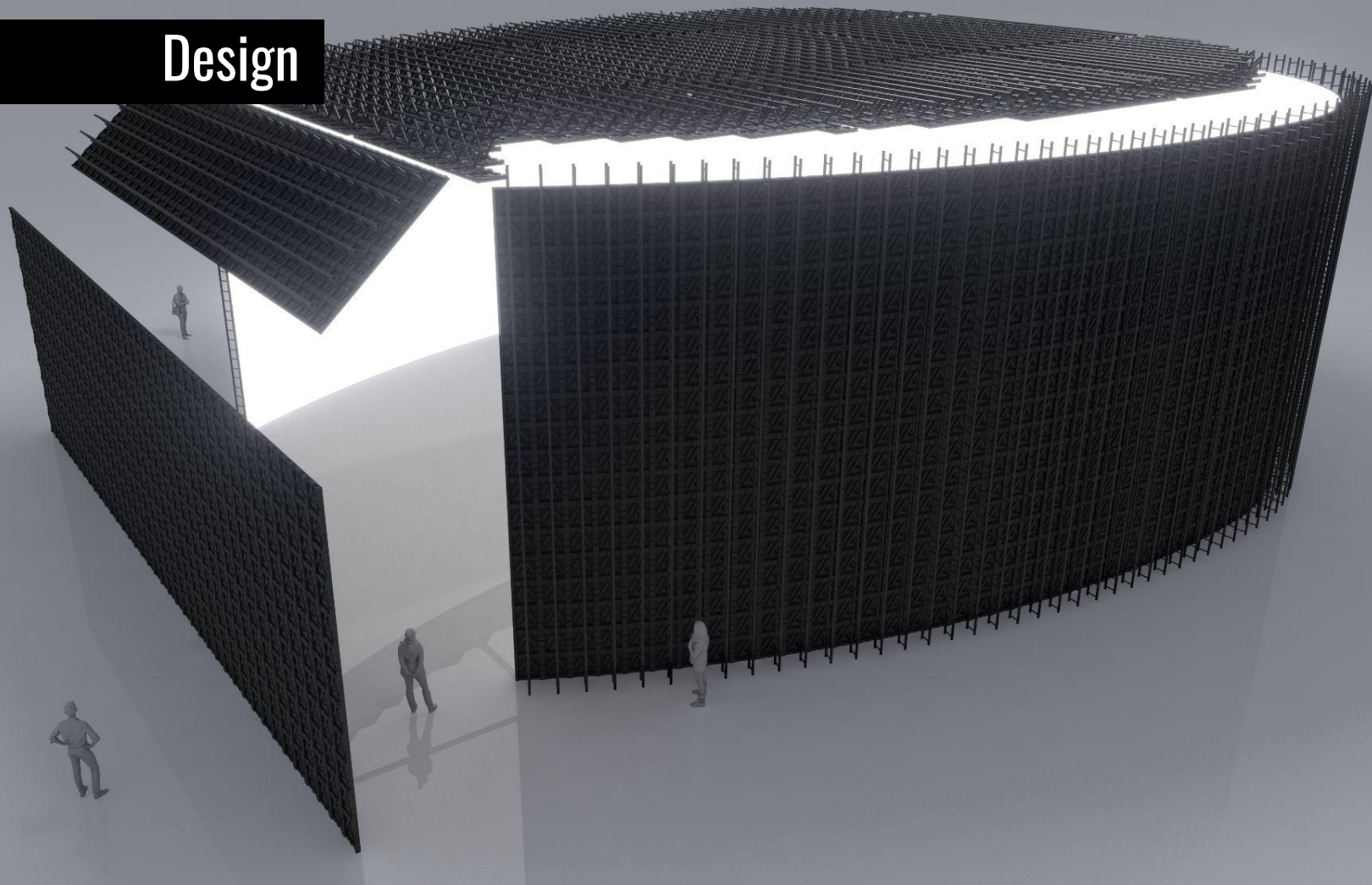
*A Design Process*

# Multi-Vertical Process - It Starts With Universal Design

- Monitoring
- Easy signal management
- Clear and quick access to information about signal status and health
- Flexible deployment of signal types



Design



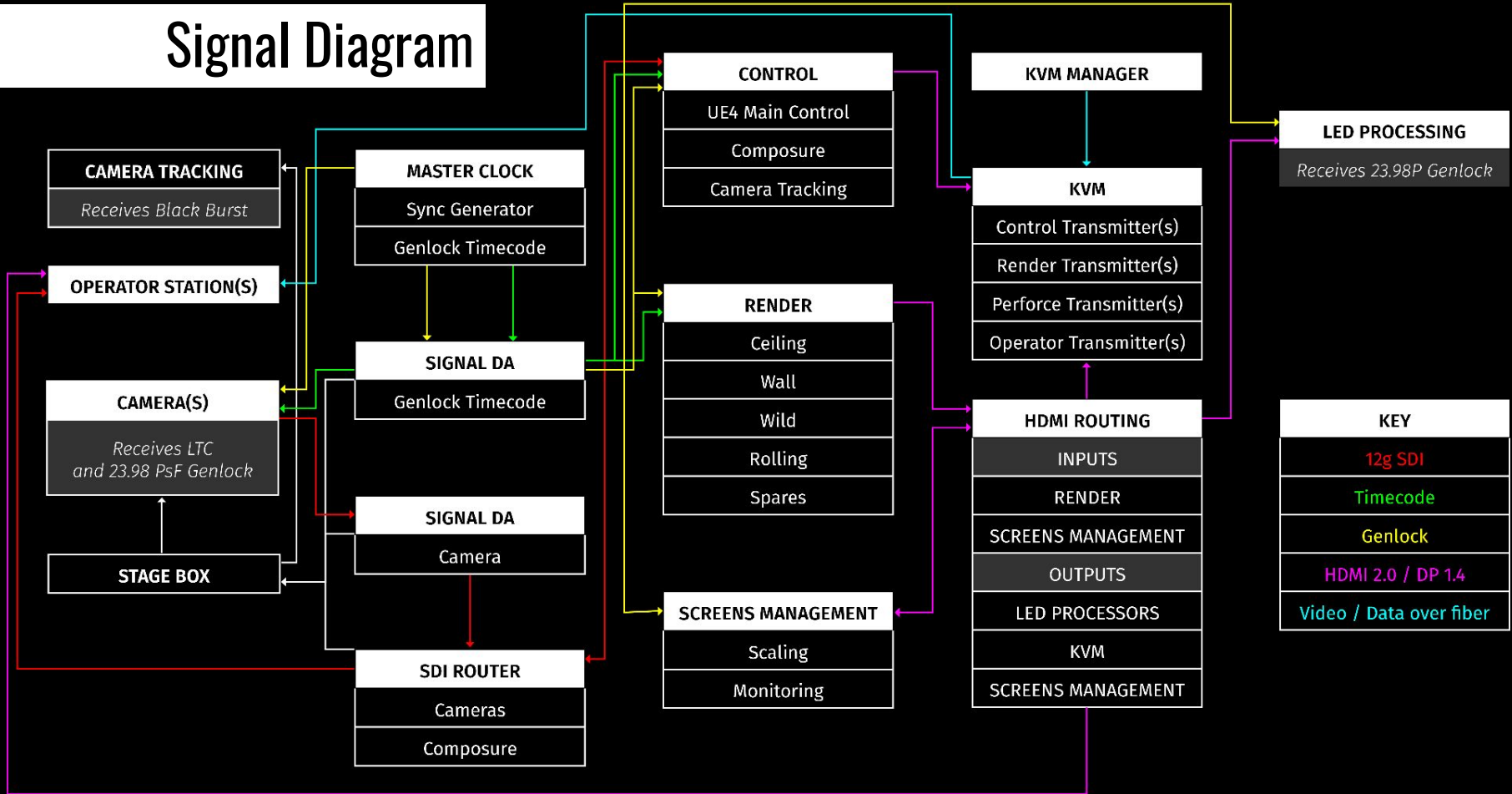


# Signal Workflow

## Signals Used In Broadcast & Virtual Production

- Genlock
- LTC
- Networking Signals of all kinds
- Camera Tracking Data
- FIZ Data
- Lens Distortion

# Signal Diagram



# Machine Room





# Multi-Cam Example

A detailed view of a professional Sony Venice camera rig. The camera is black and heavily equipped with various accessories. On top, there are several microphones with white foam covers. A Dionic XT monitor is attached to the side, displaying a video feed. An Anton Bauer battery is visible on the front. The camera is surrounded by a complex network of cables and connectors. The background is a blurred outdoor scene.

12x Sony Venice Cameras

Genlock of Multiple Flavors

Cine Encoders

Camera Tracking

Broadcast System Integration

A dark, blue-tinted photograph of a broadcast studio for the League of Legends Worlds 2020 tournament. The room is filled with multiple computer monitors displaying various game-related content, including a large map on the right and several smaller feeds on the left. A person is visible in the foreground, working at a desk with a laptop and other equipment. The overall atmosphere is professional and high-tech.

# League of Legends: Worlds 2020

# Worlds 2020

A virtual stage performance for Worlds 2020. The scene is set in a futuristic cityscape with neon lights and digital billboards. A male performer in a black t-shirt and a female performer in a white jacket and blue pants are on stage. A large camera rig is visible in the foreground, and a large screen displays the word 'OVER'.

4 Broadcast Cameras

Multi-Cam Frustum Switching

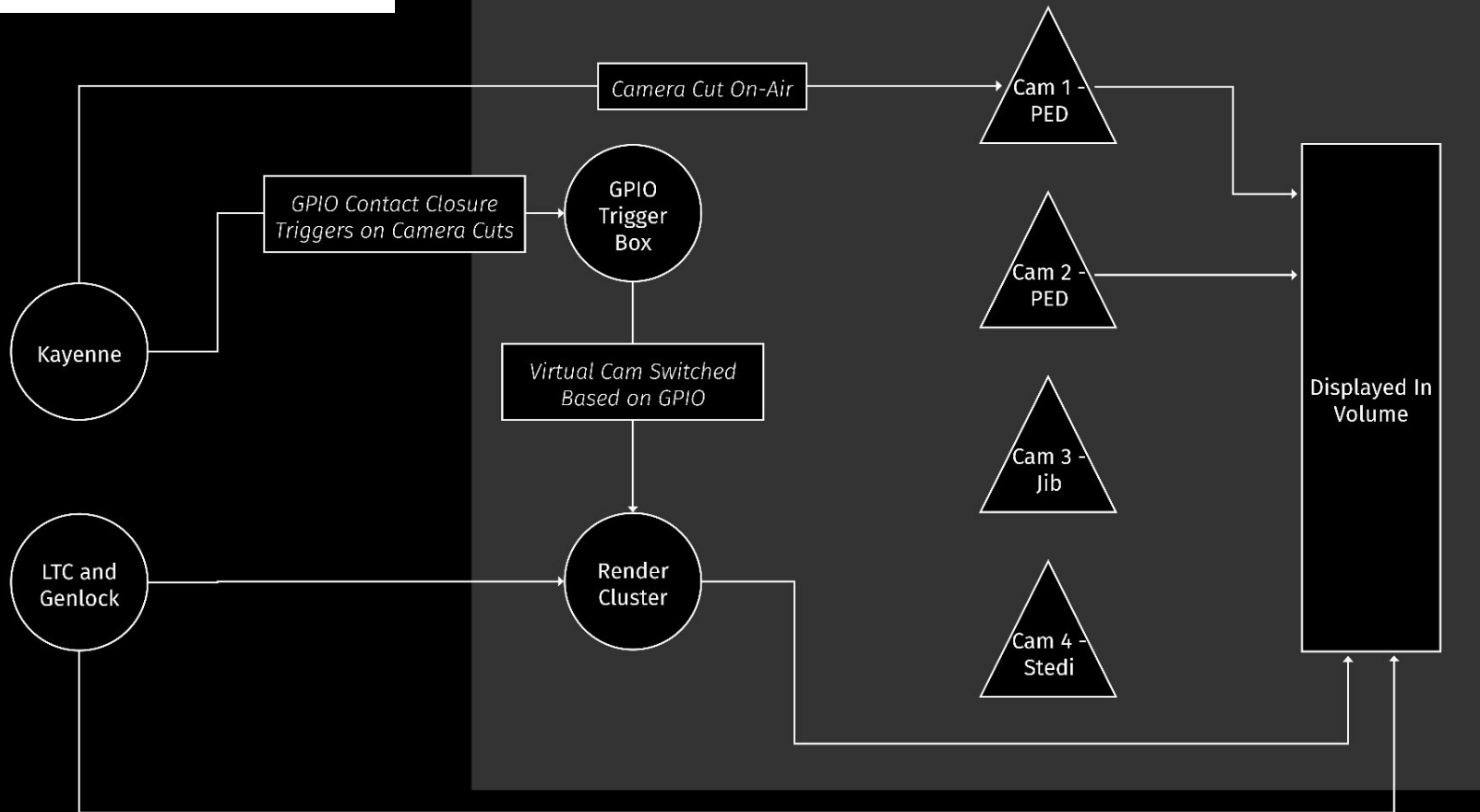
240 Hours of Live Content

Player / Talent Interactivity

Broadcast System Integration



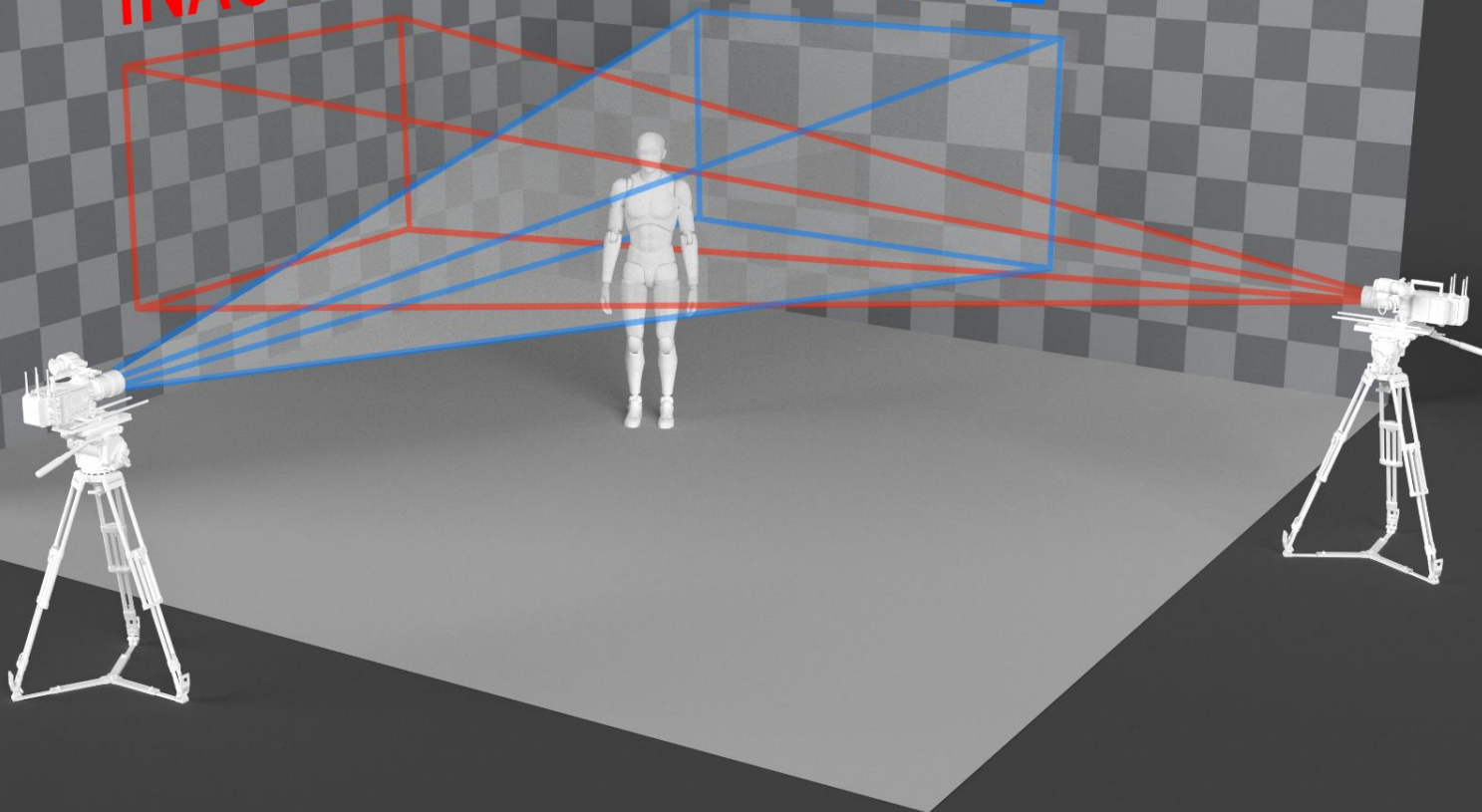
# Worlds 2020



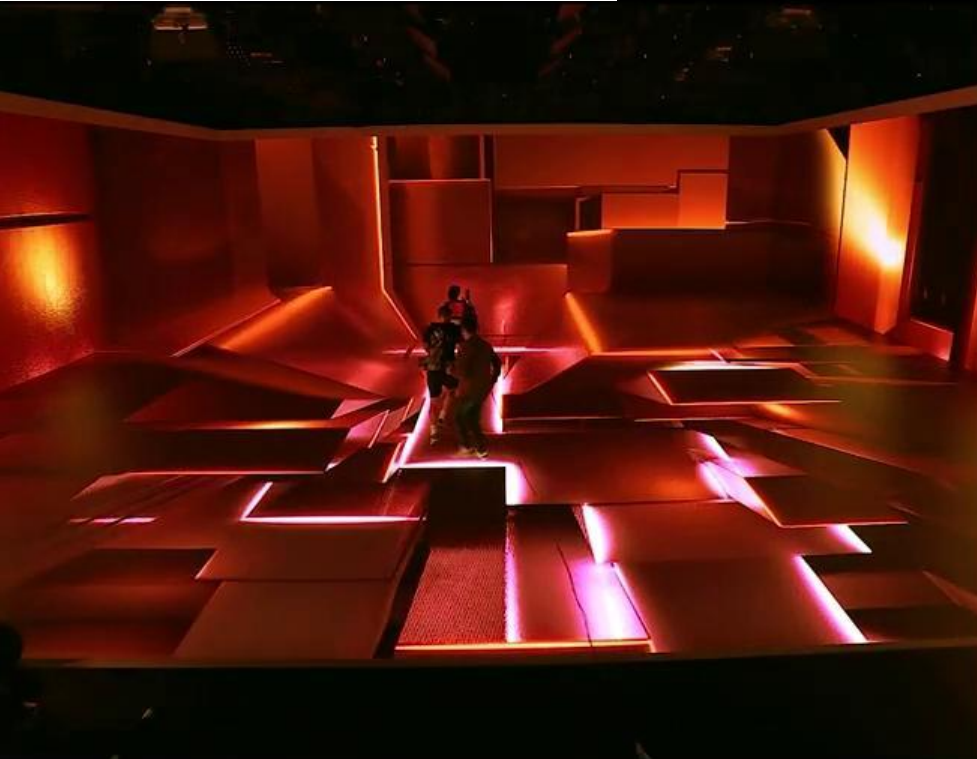
Worlds 2020

INACTIVE

ACTIVE



# Worlds 2020



***SEMIFINALS SHOW OPEN SHOT ON XR STAGE***



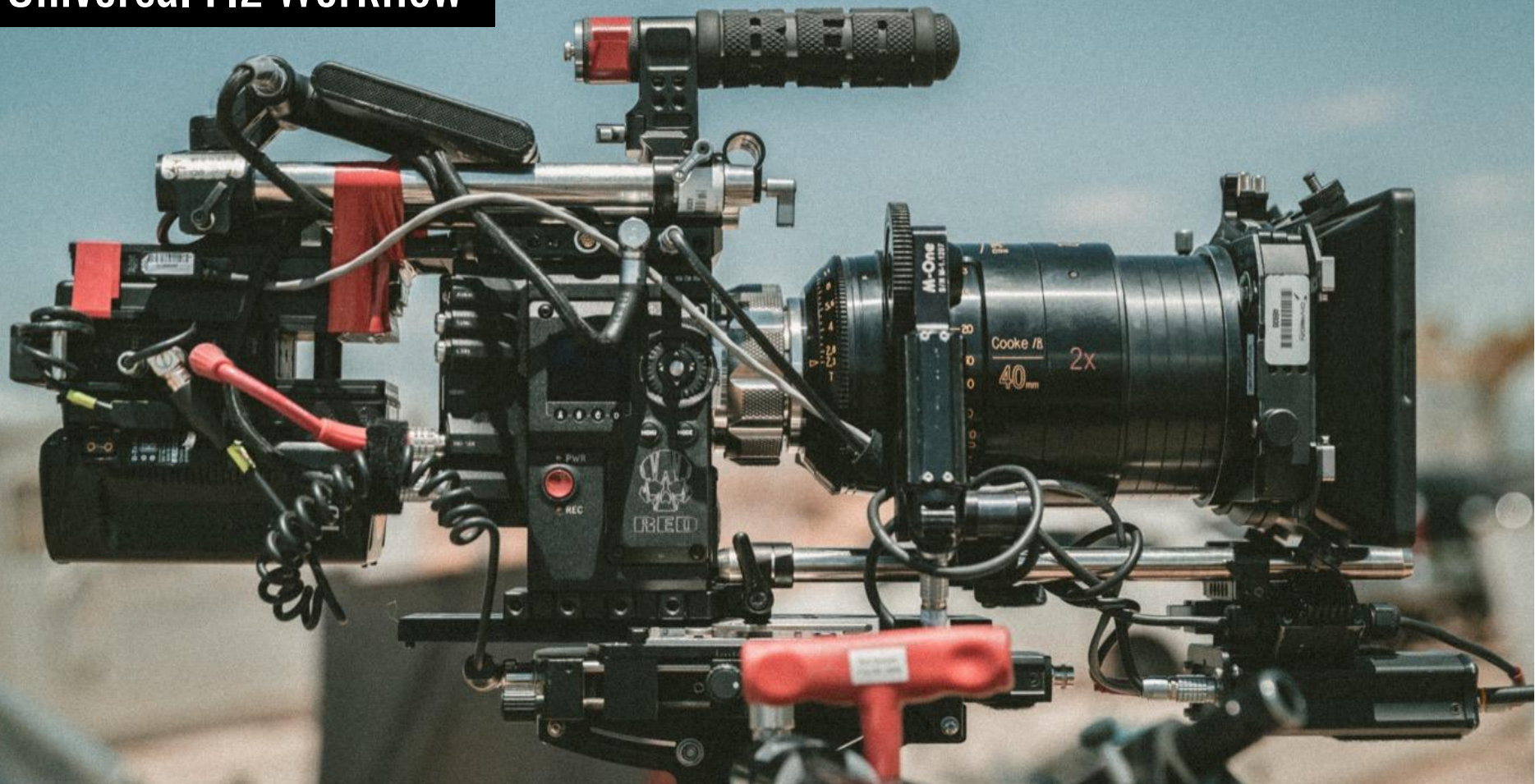
***SEMIFINALS SHOW OPEN***



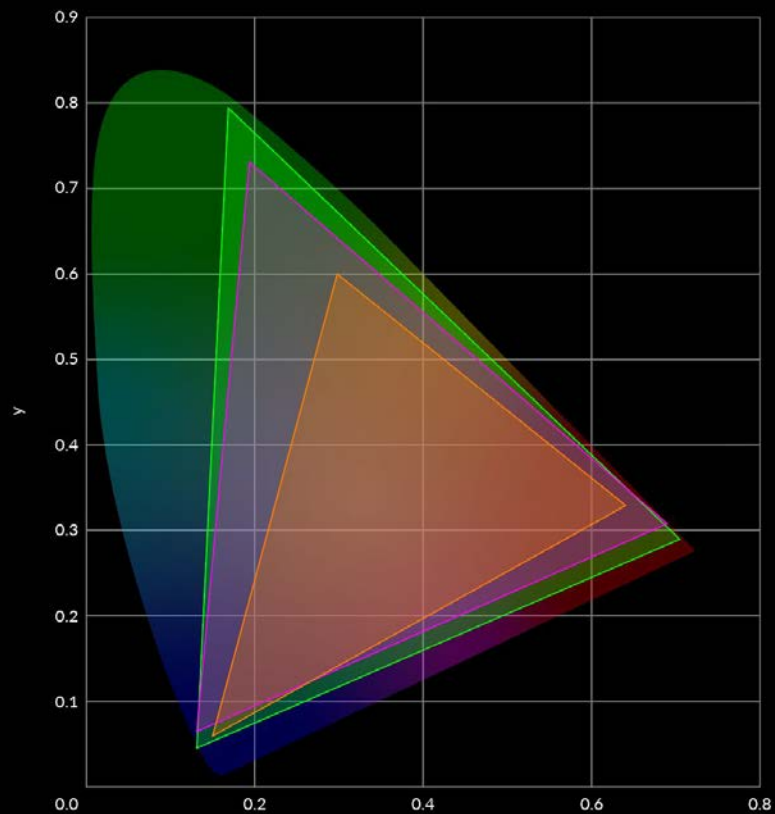
A blue-tinted photograph of two individuals in a server room. They are wearing face shields and masks, working at a desk with multiple computer monitors. The person on the left is wearing a cap and a face shield, looking at a monitor. The person on the right is also wearing a face shield and mask, looking at a laptop. The background shows server racks.

**What's Next??**

# Universal FIZ Workflow



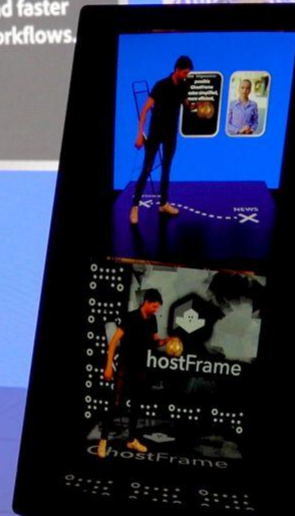
# Automating Color Workflow







the "impossible  
possible  
GhostFrame  
creates simplified,  
more efficient,  
and faster  
workflows.



**Multi-Cam ICVFX Workflow**

# What's Next??

## What's Next - Future Facing

- 2110 inclusive of PTP (2059-2) incorporated into every camera body, film or broadcast!
- Easier to use HDR and timing/signal evaluation tools
- Stock Libraries of lens distortion data
- Flexible high resolution, fast displays
- Improved high bandwidth production equipment (100/200/400)





**THANK YOU**