VISUAL DISPLAYS

TEAMS ROOMS, HYBRID MEETING/TEACHING 2022
WEBINAR #11
ANSI/AVIXA ISCR STANDARD

29 November 2022

Greg Jeffreys

DISPLAYS, LIGHT & ENVIRONMENTAL EXPERTISE

PRODUCTS, SERVICES, SPECIALIST CONSULTANCY

Presenter – Greg Jeffreys

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- Managing Director of Visual Displays (formerly Paradigm AV)
- Specialist consultant in standards, displays, light & lighting, VC lighting, teaching space & meeting room design
  - Not an AV consultant!
- Current chair, AVIXA Standards Steering Committee
- Lead writer, PISCR image contrast standard – and new ISCR standard
- Task group chair ANSI/AVIXA DISCAS standard – image size, resolution, viewing positions/angles, content size guidance
- Task group working on AVIXA's new UX Design for AV (UXD4AV) standard
- President of InfoComm/AVIXA 2012, board member 2008-13
- Writer and teacher
- 2020 Outstanding Contribution Award – AV Technology Awards
- Proud associate of LTSMG & AV User Group
- Writing book on hybrid teaching and meeting spaces

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ANSI/AVIXA V201.01:2021
(revision and redesignation of ANSI/INFOCOMM 3M-2011, Projected Image System Contrast Ratio)

Image System Contrast Ratio

Image System Contrast Ratio Standard Task Group

NAME	COMPANY
Jonathan Brawn, Co-Chair	Brawn Consulting
Justin Watts, CTS, ITIL, Co-Chair	Apple Inc.
David Aleksandersen, ISF-C	Consultant
Jason Antinori, CTS	TELUS
Jay Catral	Konica Minolta Sensing Americas
Steve Cook	Draper Inc.
James Fife, CTS-D	rp visuals
Joseph Zoltan Gombos, CTS-D	Henderson Engineers
Jeff Griffeth, CTS-D	AVI Systems
Andrew Griffin, CTS-D, CTS-I	Georgia Institute of Technology
Greg Jeffreys	Visual Displays Ltd.
Bruce J. Manning, CTS-D	Shen Milsom & Wilke LLC
Thom Mullins, CTS-D	AEI, Inc.
Malcolm Savage	Stantec Australia Pty Ltd.
Joel Silver	Imaging Science Foundation, Inc.
Rhen Taylor, CTS	Milestone AV Technologies
Jeff Waldvogel	ABD Engineering & Design

Contrast

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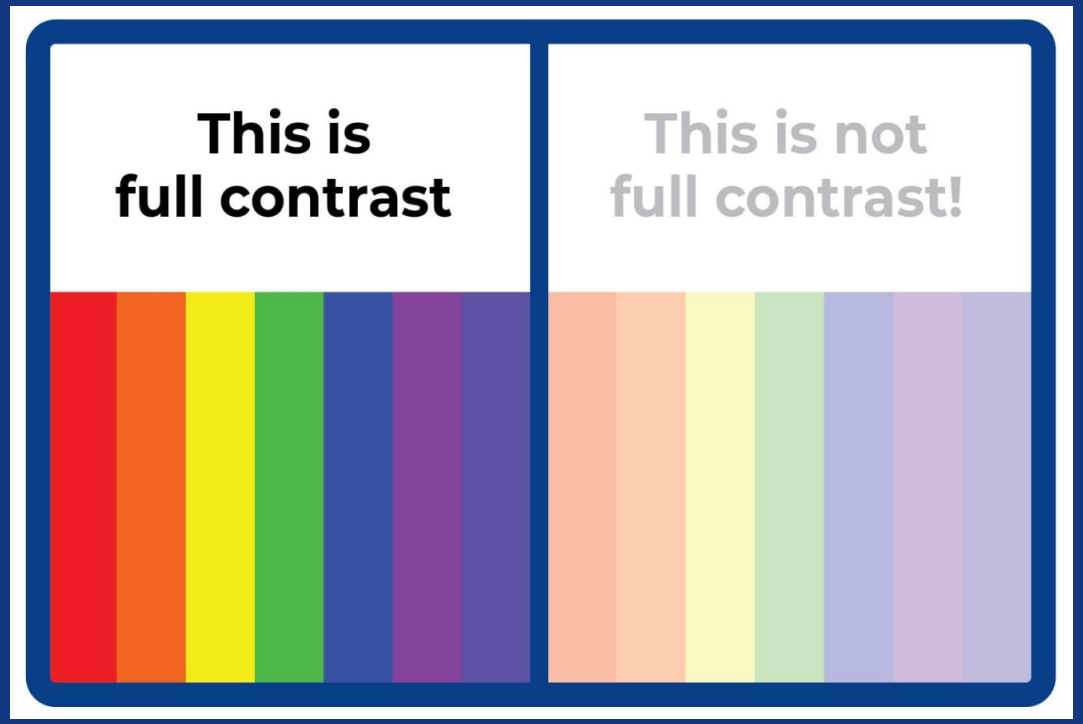

- Both examples are same ‘brightness’
- Low contrast images are perceived as low resolution, low quality

Image contrast comprises three elements

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Ambient light

How much will ambient light affect black levels?

Image contrast comprises three elements

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Ambient light

How much will ambient light affect black levels?

Screens – screen technology/type affects contrast

Image contrast comprises three elements

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Ambient light

How much will ambient light affect black levels?

Screens – screen technology/type affects contrast

Actual device's contrast ratio (ANSI - not the on/off figure!)

Contrast's three elements = complexity

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- These elements inter-react so cause uncertainty
- Possible cause of confusion and exaggerated performance claims!
- But each element is simple
- Even the science is simple!
  - You can use Excel sheets anyway
- Confirms that our subject is the 'display'
  - Combination of projector, screen – and ambient light

Ambient light impacts every display type – in different ways

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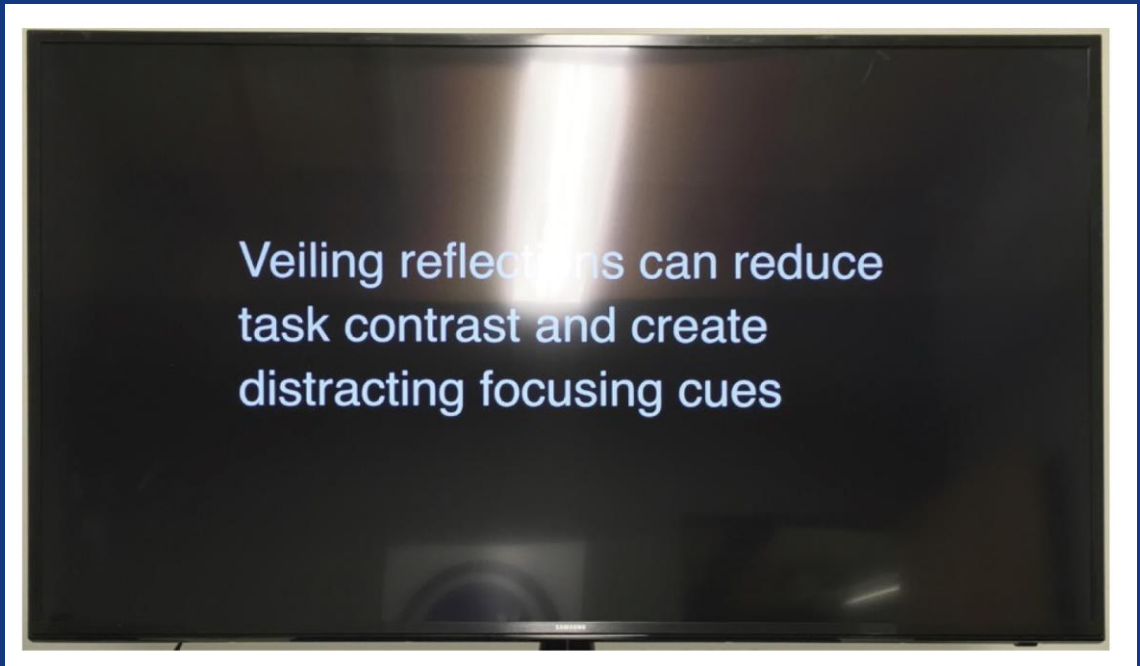

Flat panels (Large Format Displays)
Specular reflectivity

ALR Projection

Non-ALR projection
Diffused reflectivity

Contrast is a relative attribute

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…so??

- Contrast ratio does not define white or black levels – only the difference between the two
- Most displays are too bright – creating asthenopia ('eye strain')
- Modern hybrid meeting and teaching spaces used for long sessions – so asthenopia has to be actively designed out
- Task Luminance Ratio – max 3:1 is essential tool
  - Sets limit for peak white
  - Therefore selected contrast ratio defines black level

Asthenopia ('eye strain')

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TO CALCULATE TASK LUMINANCE		
Task luminance = *lx* / *pi* x PG		
[lux = lumen / m2]		
Ambient light in lux	400	*You should have 300-500 lux on a meeting room table*
Peak Gain of task (eg paper)	1	
TASK LUMINANCE =	*127*	cd/m^2 [nit]
Task luminance ratio	2.5	: 1
MAX DESIRED IMAGE LUMINANCE =	*318*	cd/m^2 [nit]
PISCR contrast ratio required	15	: 1
MAX PERMITTED BLACK LEVEL (relative to the max white level permitted on your image	*21*	cd/m^2 [nit]

Black levels are key
Download calculator here:
https://visualdisplaysltd.com/resources/tools/useful-calculator-tools

ANSI/AVIXA V201.01:2021

Image System Contrast Ratio

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- Designed for AV professionals
- Does not need expensive meters
- Based on needs of viewers
- Four viewing categories

- It measures the system results
  - It does not tell you how to achieve this
  - (But good advice in Appendix in document)

Viewing Criteria

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- The four viewing requirement categories defined by this Standard are:

- **Passive Viewing**
  - The viewer is able to recognize what the images are on a screen and can separate the text or the main image from the background under typical lighting for the viewing environment. There is passive engagement with the content (e.g., casual television viewing, basic PowerPoint).
- **Basic Decision Making**
  - The viewer can make decisions from the displayed image. The decisions are not dependent on critical details within the image. The viewer is actively engaged with the content (e.g., photos, typical informational presentations, public transportation informational displays).

Viewing Criteria

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- **Analytical Decision Making**
  - The viewer can make decisions from the displayed image based on critical details within the image. The viewer is fully engaged with these details of the content (e.g., architectural/engineering drawings, legal evidence, medical imaging and photography).

- **Full Motion Video**
  - The viewer is able to discern key elements present in the full motion video, including detail provided by the cinematographer or videographer necessary to support their story line and intent (e.g., home theatre).

Requirements

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Viewing Requirement Categories	Checkerboard Contrast Ratio	Sequential Contrast Ratio
Passive Viewing	7:1	7:1
Basic Decision Making	15:1	20:1
Analytical Decision Making	50:1	125:1
Full Motion Video	80:1	285:1

Viewing Category	Minimum System Contrast Ratio (Checkerboard Pattern)	Minimum System Contrast Ratio (Sequential Patterns)	Viewer Requirements	Environment – Example Characteristics	Examples
Passive Viewing	7:1	7:1	Images and text distinguishable from background. Passive engagement with content. Assimilation of detail not required. Informal viewing of content.	May have little control of ambient light. Ambient light may be high. Task lighting may not be ideal. Windows may have insufficient blinds or curtains. May be reflective surfaces (e.g., furniture).	Retail stores, marketing, or presentations of non-critical or informal information.
Basic Decision Making	15:1	20:1	Actively engaged with content. Assimilation of detail. Images and text are legible to the extent that decisions can be made. Decisions based on content itself, not assimilation of detail.	Moderate control of ambient light. Ambient light may be moderately high. Task lighting recommended.	Information displays, presentations containing detailed data and images (e.g., classrooms, meeting rooms, boardrooms, videoconferencing rooms, multi-purpose rooms, product illustrations, transportation departures/arrivals).

Viewing Category	Minimum System Contrast Ratio (Checkerboard Pattern)	Minimum System Contrast Ratio (Sequential Patterns)	Viewer Requirements	Environment – Example Characteristics	Examples
Analytical Decision Making	50:1	125:1	Images and text contain finest detail. Assimilation and analysis of finest detail. Analytical image assessment. Mission-critical image displays. Professional analysis of detail.	Highly controlled environment. Controlled ambient light. Focused task lighting. No ambient light directly affecting screen, black-out window treatments.	Engineering and architectural drawings, electrical schematics, forensic evidence, failure analysis, photographic evaluation (e.g., courtrooms).
Full Motion Video	80:1	285:1	High level of engagement with content. Films not viewed in a cinema.	Precisely controlled ambient light.	Controlled viewing environment (e.g., home theater, business screening room).

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Conformance to Standard

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- CONFORMS: The contrast ratios at all five measurement (viewing) locations meet or exceed the contrast ratios required by the identified viewing category.
- FAILS TO CONFORM: The contrast ratios at one or more of the five measurement (viewing) locations fail to meet the contrast ratios required by the identified viewing category.

Checkerboard (intra-frame)test pattern

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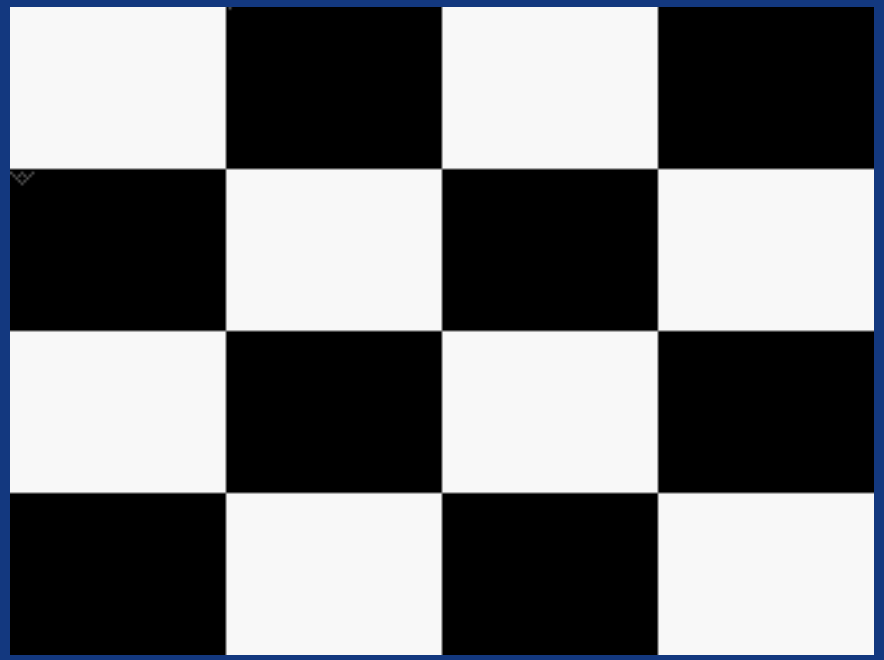
- What can we see on the same screen – at the same time



Sequential test patterns

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- Why 18% white?

Figure 4 – White window test pattern

Figure 5 – Full-screen black window test pattern

Test Equipment Required

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- Luminance ('spot') meter
- Completed Viewing Area Plan
- 16-zone black and white checkerboard test pattern (4 columns by 4 rows)
- Sequential test pattern
- Measurement form
- Tape measure or rangefinder

Test Equipment Examples

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Sekonic L-758 Cine

Konica-Minolta LS-100

Viewing locations

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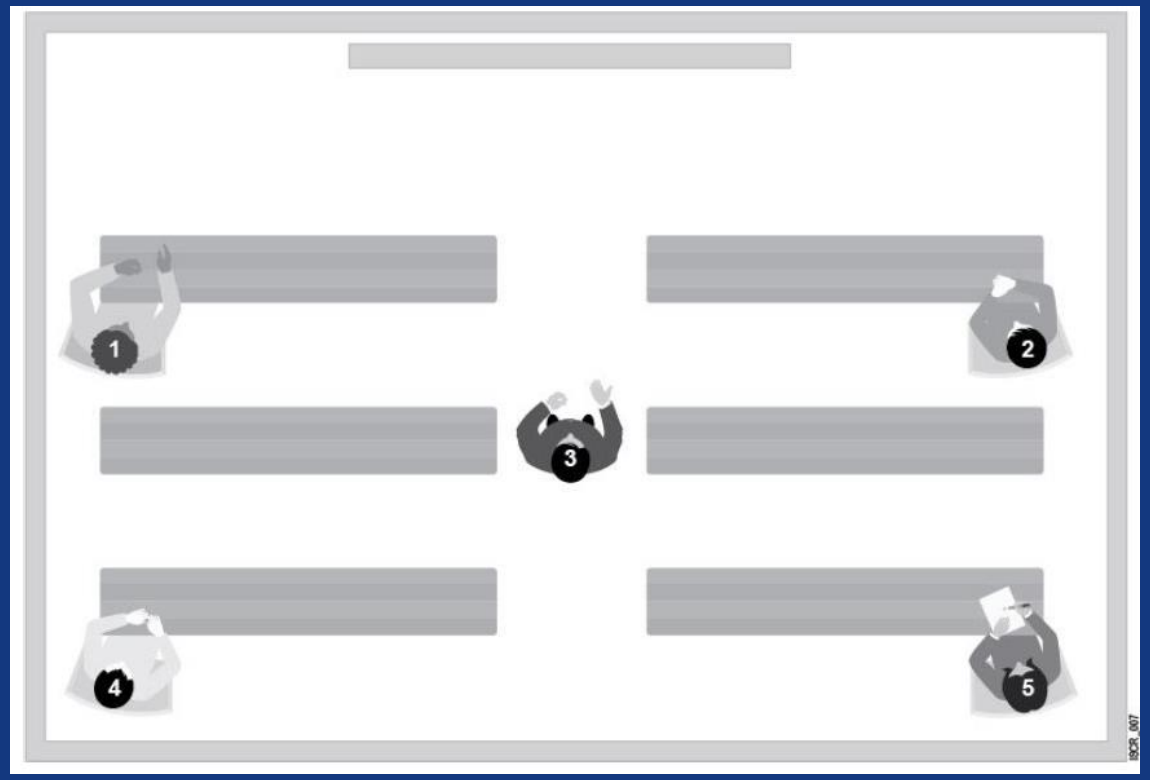

Viewing Area Plan

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- A. Image width and height
- B. Center of image (horizontal center line of screen)
- C. Plane of screen (vertical)

- Five measurement locations indicated

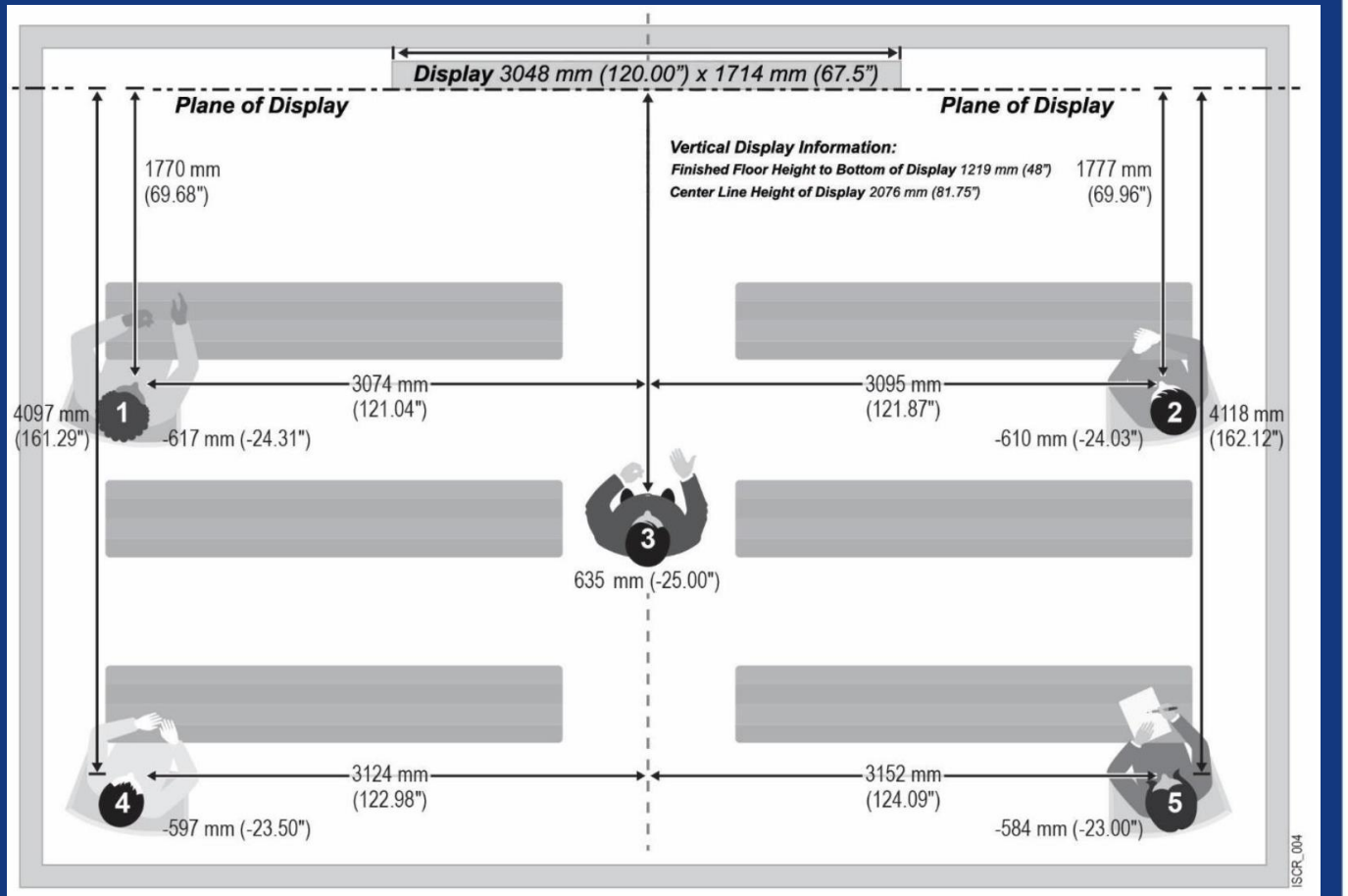

Figure A.1 – Viewing Area Plan – Classroom

Test Report

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- The Measurements Results Form includes the collected data, and the result of the data analysis in one place
- This can be included in the project documentation, and be provided to a client
- Note the 16 data points for each of the five locations for checkerboard

Annex B — Sample Forms
(informative)

B.1 Sample Measurement Conformance Form

Date of Test:					Location:						C=conform
Client:					Tester:						F=fail
Viewing Category:					Light Meter & Calibration Date:						
16-Zone Checkerboard Test Pattern Contrast Ratio											
Viewing Location 1	White 1	White 2	White 3	White 4	White 5	White 6	White 7	White 8	Avg	Contrast	C conform F fail
Luminance											
	Black 1	Black 2	Black 3	Black 4	Black 5	Black 6	Black 7	Black 8			
Luminance											
Viewing Location 2	White 1	White 2	White 3	White 4	White 5	White 6	White 7	White 8	Avg	Contrast	C conform F fail
Luminance											
	Black 1	Black 2	Black 3	Black 4	Black 5	Black 6	Black 7	Black 8			
Luminance											
Viewing Location 3	White 1	White 2	White 3	White 4	White 5	White 6	White 7	White 8	Avg	Contrast	C conform F fail
Luminance											
	Black 1	Black 2	Black 3	Black 4	Black 5	Black 6	Black 7	Black 8			
Luminance											
Viewing Location 4	White 1	White 2	White 3	White 4	White 5	White 6	White 7	White 8	Avg	Contrast	C conform F fail
Luminance											
	Black 1	Black 2	Black 3	Black 4	Black 5	Black 6	Black 7	Black 8			
Luminance											

USE IT & SUCCEED!

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- Specify new systems more effectively
- Specify systems with greater demonstrable expertise
- Get sign off without problems of subjectivity
- Create better tenders
  - (Or reply to tenders in a way to get noticed!)
- System health checks
- Use it to your competitive advantage
- Free to AVIXA members

Webinar programme

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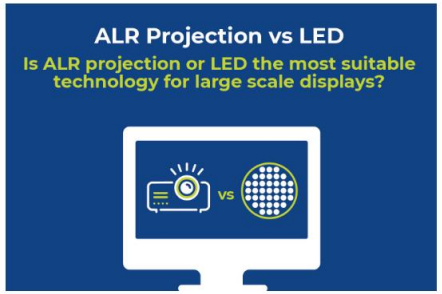
1 November 2022

MTR update - The latest developments in MTR design, Enhanced Meeting Rooms, Front Row display and the new Microsoft Signature Room

Join us on Tuesday 1 November 2022 at 4pm GMT...

Read more...



15 November 2022

ALR Projection vs. LED

Join us on Tuesday 15 November 2022 at 4pm GMT...

Read more...

We've made the Teams Rooms Webinar Series available to watch again or share with colleagues...

Watch the recordings here

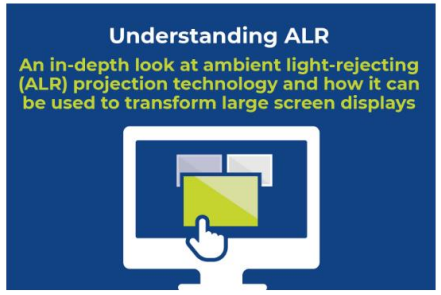
https://visualdisplaysltd.com/resources/resources/webinars

29 November 2022

Standards update - The new Avixa Image System Contrast Ratio (ISCR)

Join us on Tuesday 29 November 2022 at 4pm GMT...

Read more...

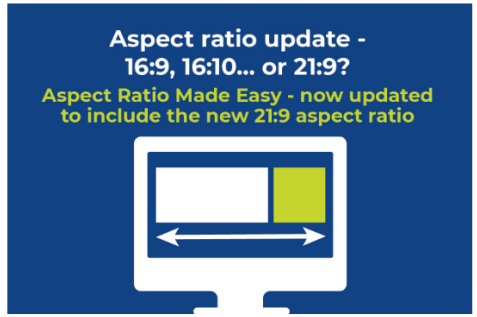


13 December 2022

Understanding ALR

Join us on Tuesday 13 December 2022 at 4pm GMT...

Read more...



10 January 2023

Aspect ratio update - 16:9, 16:10... or 21:9?

Join us on Tuesday 10 January 2023 at 4pm GMT...

Read more...

Specialist consultancy

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- Greg provides specialist consultancy in tightly-defined packages or on retainer:
  - Space design & configuration
  - Lighting and VC lighting design
  - Displays design
  - AV Standards
  - Environmental standards (including lighting)
- (This is NOT AV consultancy or design – it's complementary services and disciplines)
- Available through AV consultants and major AV integrators, except Government
- Greg holds current UK Government Security Clearance (SC)

GREG JEFFREYS CONSULTING LTD

greg@GJConsult.co.uk

…but it has to be Projection Done Properly!

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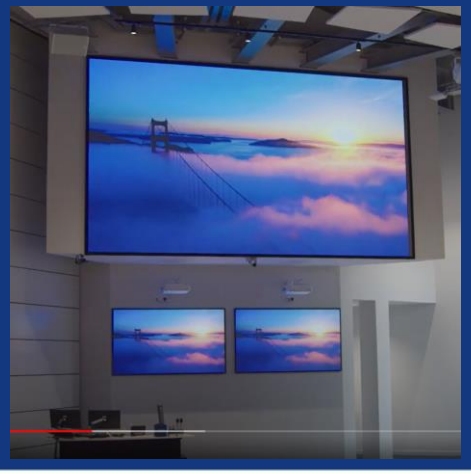
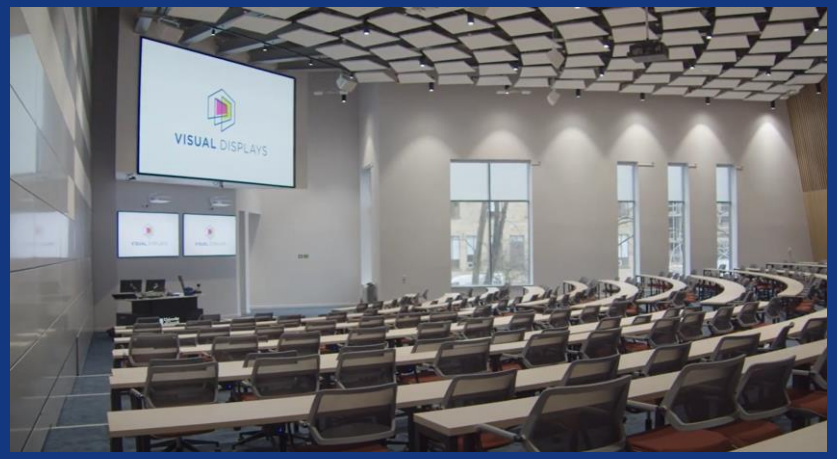
- **Both images are projected, shot with mobile phone – unretouched (no Photoshop!)**
- **Which one do we need for MTRs?**
- **What do we need for MTRs?!**
  - ✓ **AVIXA ISCR standard!**
  - ✓ **Focus on black levels**





https://youtu.be/W-cAxx_n8Gg

MTR Displays – Visual Displays' Quick Guide

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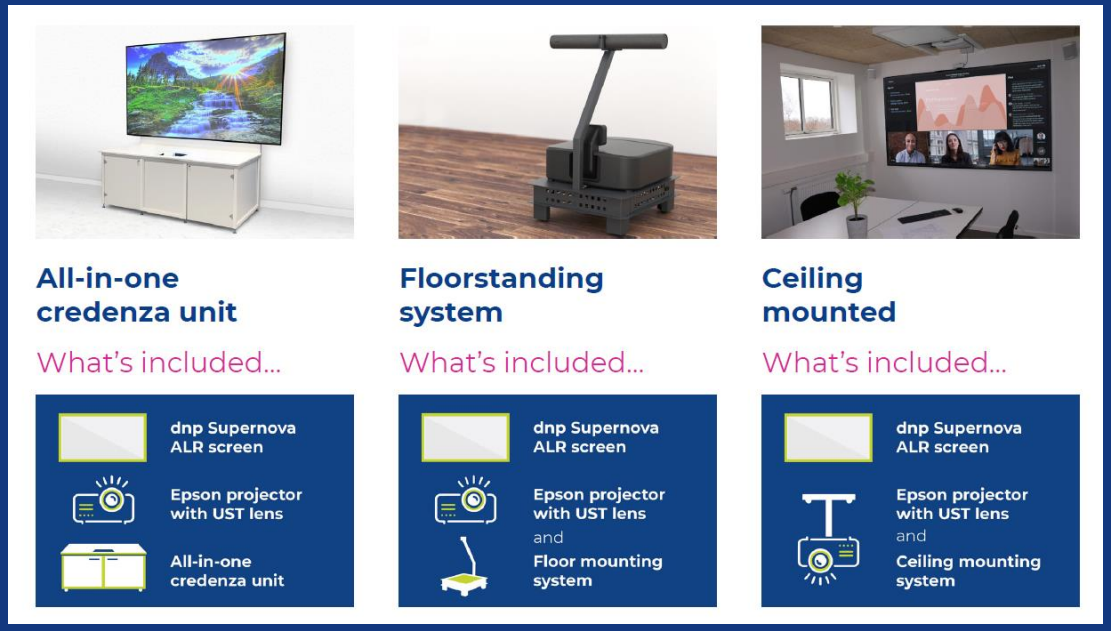
- Comprehensive coverage of specification issues
- Wide range of display choices and sizes
- Based in VDL's Digital Canvas
- Standards-curated bundles of dnp ALR (ambient light rejecting) screens, projectors, mounts/credenzas
- Download here:



AV User Group

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- https://www.avusergroup.com/

LTSMG – Learning and Teaching Spaces Management Group

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HE & FE campus technology managers association

LTSMG

https://ltsmg.co.uk/

Latest Microsoft materials

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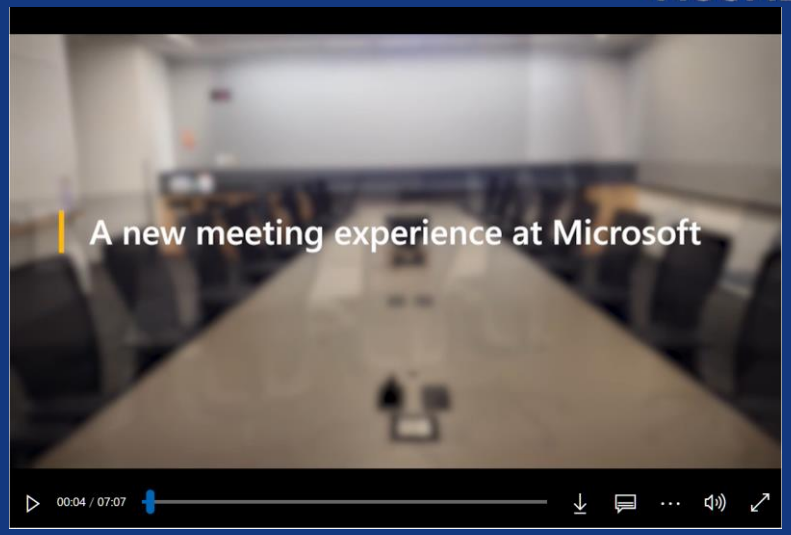
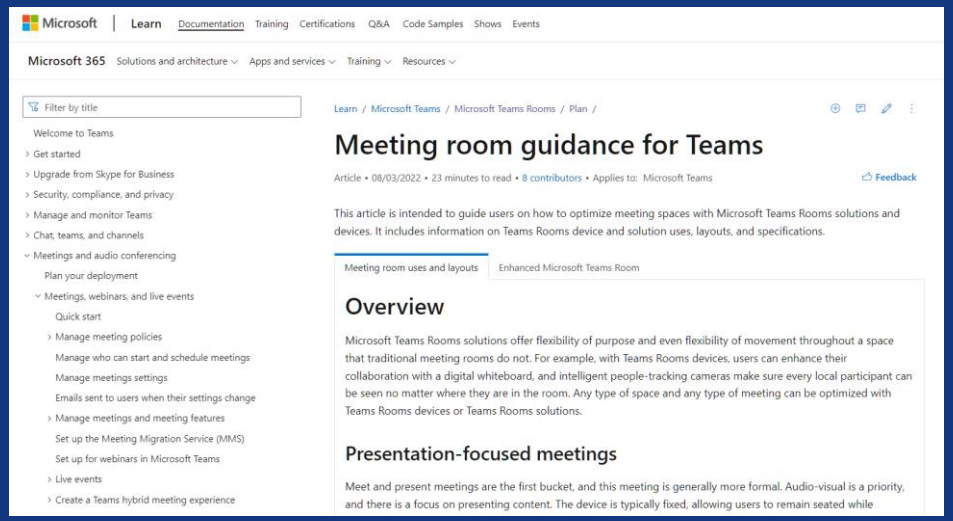
- Updated & extended Hive video
  - https://www.microsoft.com/en-us/videoplayer/embed/RE50xgt?autoplay=false



- New online materials
  - https://learn.microsoft.com/en-us/microsoftteams/teams-meeting-room-guidance?tabs=uses



New AV Magazine feature

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AV MAGAZINE

MICROSOFT TEAMS ROOMS SPECIAL

Opportunity knocks for AV

Microsoft Teams Rooms (MTRs) represent a once-in-a-generation business opportunity for the AV industry. Here, **Greg Jeffreys** explains how...

https://edition.pagesuite-professional.co.uk/html5/reader/production/default.aspx?pubname=&edid=ee4e18d1-75b2-42e9-9670-d60d3620b73d&pnum=41

21:9 – the practical specification call today

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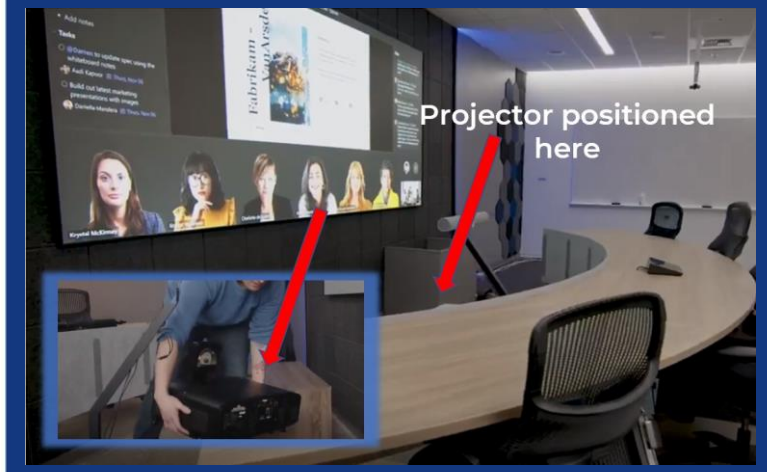
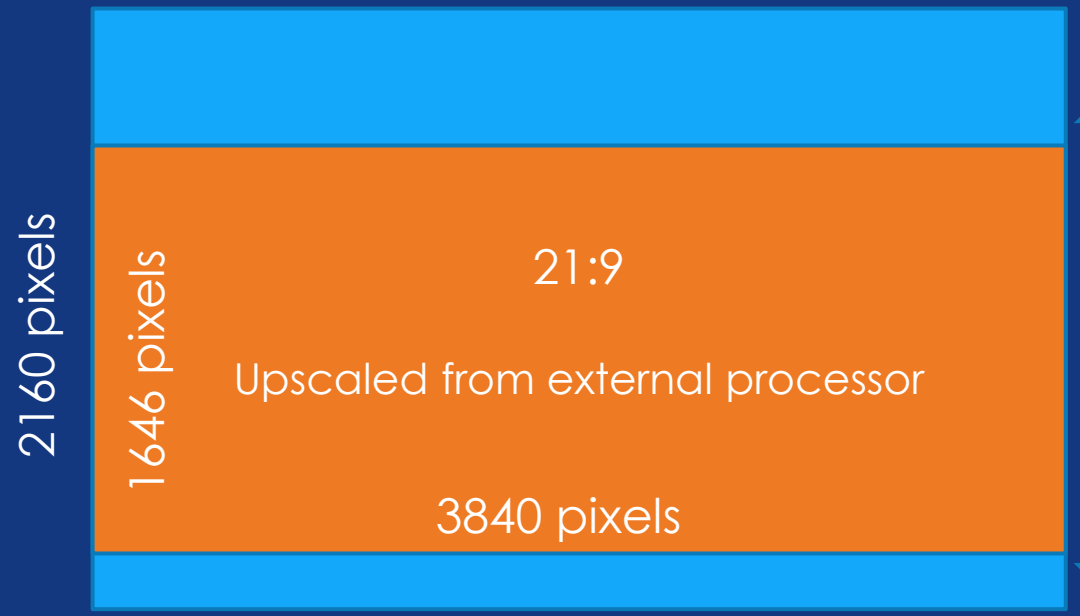


Aspect ratio 16:9 with 1920 x 1080 resolution or

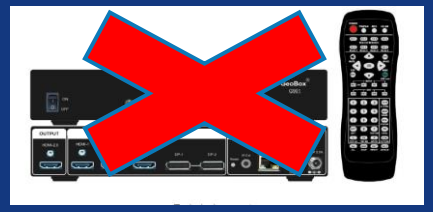
21:9 with 2560x1080 resolution



Using 16:9 at width of 21:9

- **You can have Front Row and all other screen layouts**
- **Front Row strip can be positioned vertically**
- **Background strips to match wall/background**

SOURCE(S)



External processor

Single 4K UHD (pixel shifted) projector

Epson EB-PU range now offers EDID to present 21:9 to MTR PC

Twin displays – not for Front Row!!

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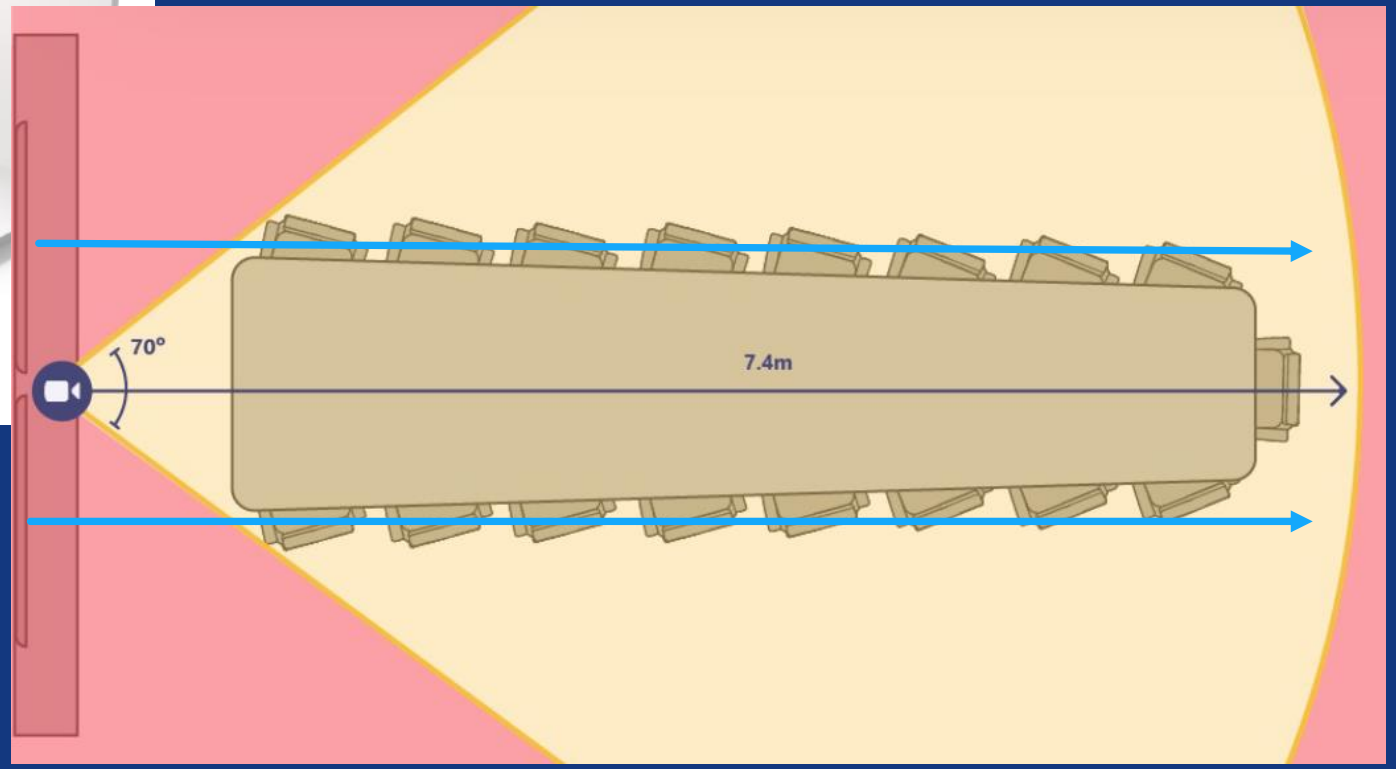
Midsize meeting room



Standards

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Is it a Standard, a Best Practice or just a BOM (Bill of Materials)

The word 'standard' itself starts with two meanings:

1. Relating to a level of quality;
2. Relating to a norm or a model, in this context meaning, for example, a room specification that can be replicated globally. In this second category, this is often reduced to the minimum viable content, a Bill of Materials (BOM).

- In AVIXA we focus on 'performance standards' – describing good outcomes and user experiences in measurable (and repeatable) metrics
- Use related environmental standards too.

Visual Displays Ltd supplies these displays

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Part of the VDL Digital Canvas range

Full packages can include:

1. Lab meter & laser survey of spaces (if needed)
2. Standards-curated system specification for each space
3. 3D CAD design and full installation instructions
4. ALR (ambient light rejecting screen)
5. Projector mount, framework & camera mount
6. You can buy the specified projector from us or locally

- We ship globally

Do you have an evaluation space?

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- Speed of change and development very rapid
- Workflows = work in progress
- Display layouts – how many new versions in 2022/23?!
  - User-created layouts
- Need to see how room self-presents to other rooms
- If you can't have evaluation spaces then you need reference spaces

Let us help you design and build your test spaces.

VDL Digital Canvas – Freestanding, complete, UST projection

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Find out more visit:
www.visualdisplaysltd.com/meeting-board-room-screens/teams-rooms

Curved screen
VDL Digital Canvas

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- Reciprocity – remote & in-person are more equal
- Organic, human-friendly configuration
- UST vs standard lens
  - Impact on camera position
- Wide range of aspect ratios and resolutions
- IP and tools based on our simulation & immersive display modelling tools
- Part of our design consultancy

Our background in immersive brought us here

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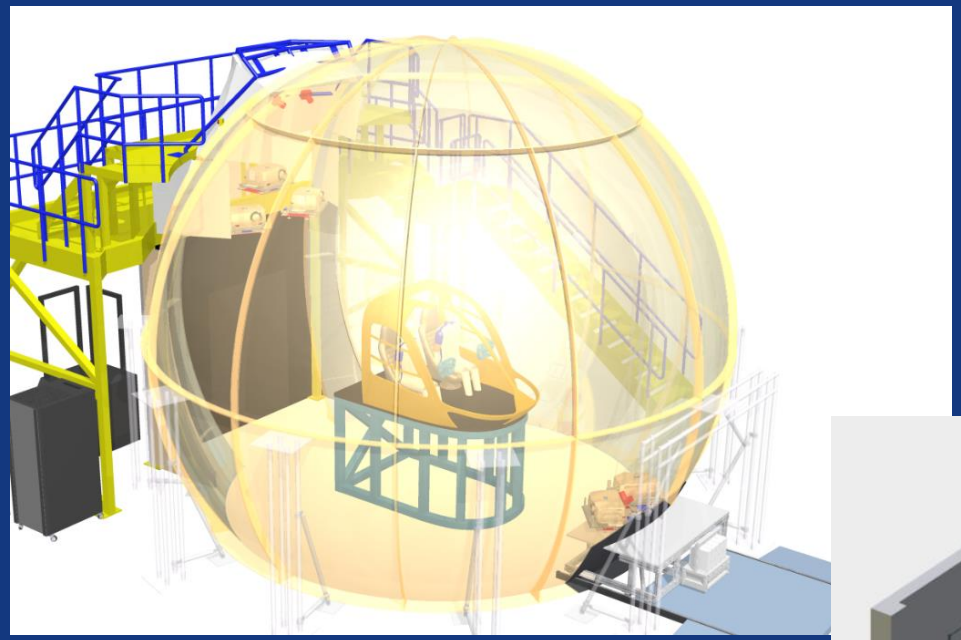

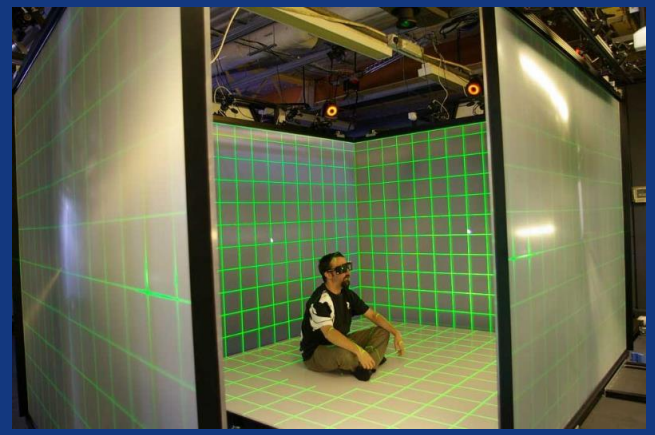

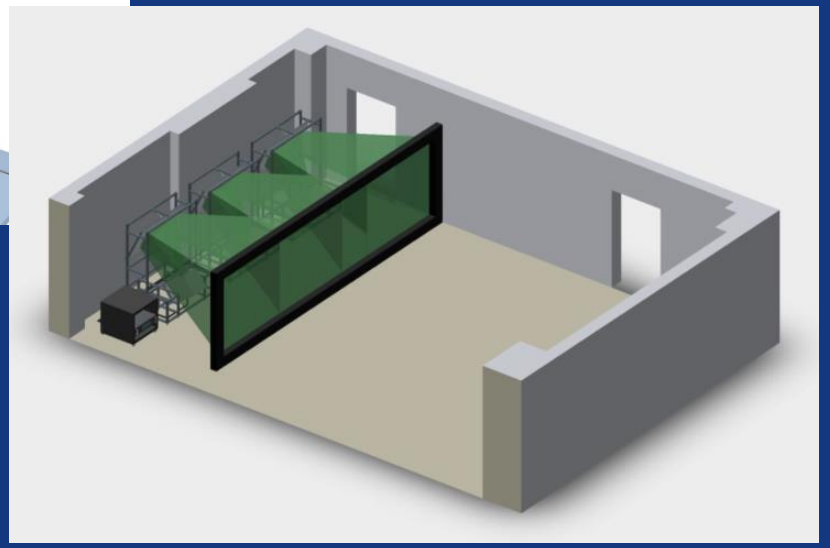

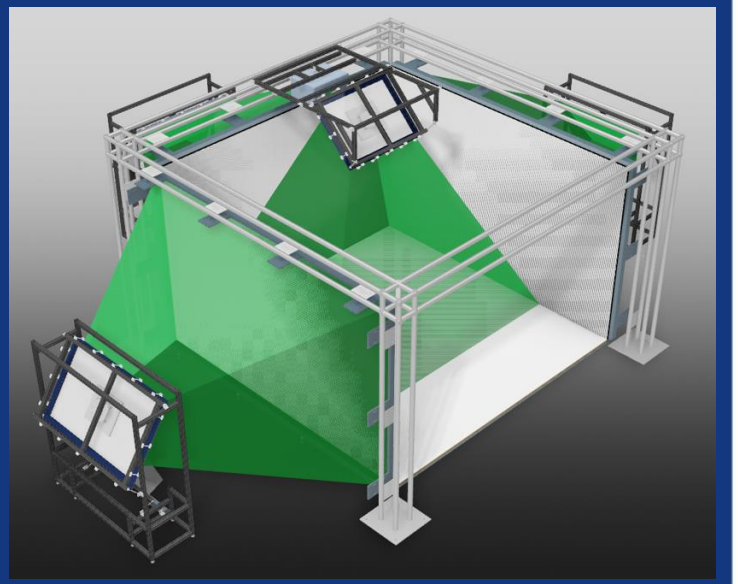

Simulation & immersive displays

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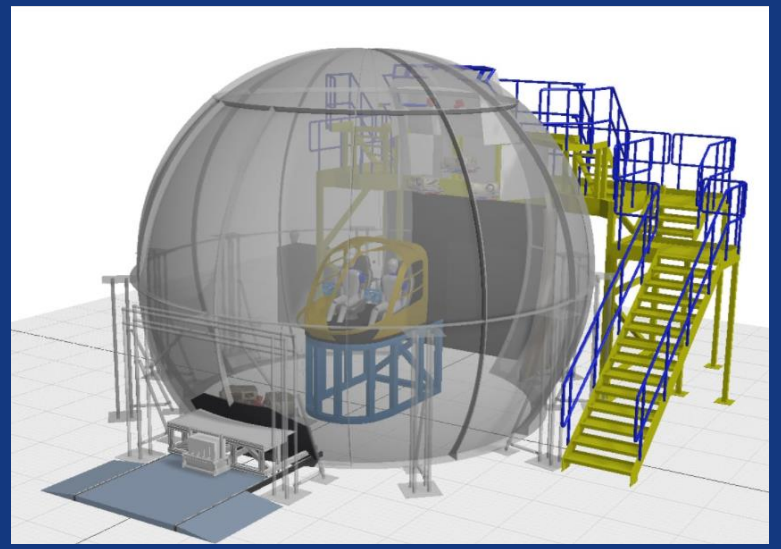
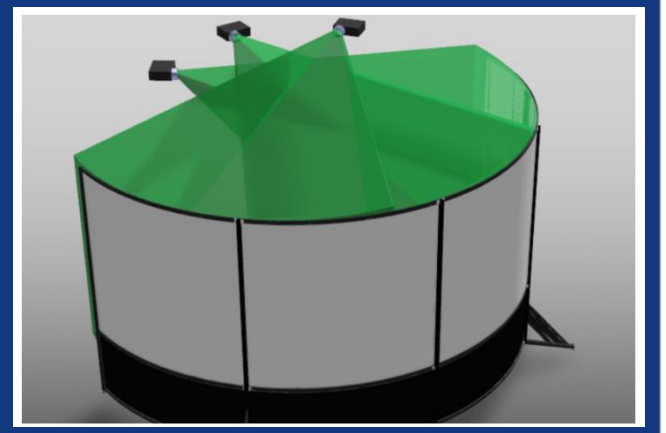
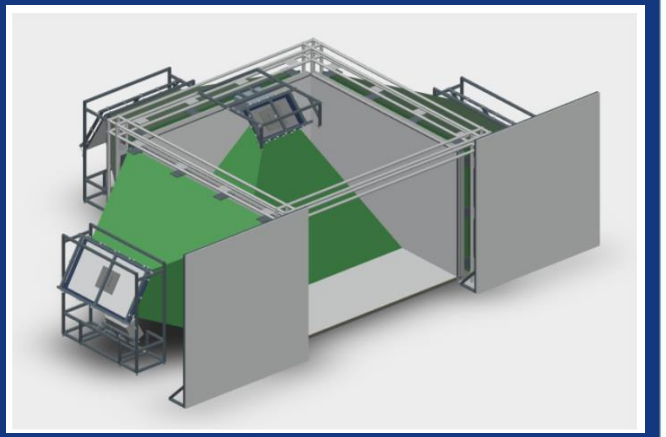
- Breaking the Fourth Wall
- Thinking in ‘cues’







What we can do for you

Use any or all of our services

- Specialist consultancy
  - (not AV consultancy!!)
- Design
- Manufacture
- Solutions & technology
  - VDL Digital Canvas Displays
  - Projection screens of all types
  - Immersive displays
- Proof of concept, product development, system troubleshooting
- Advanced laser tools

- We work actively with all parts of the channel - from end user through to reseller
- All hardware and solutions supplied through reseller/integrator channel

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www.VisualDisplaysLtd.com

Greg Jeffreys, Director

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