CREATING TELEPRESENCE ENVIRONMENTS

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A $250,000 telepresence group system just isn't in your budget? Here are some tips for getting the best possible experience out of traditional videoconferencing endpoints, appliances, and even web cams including some options for "pro-modifying" existing telepresence solutions and what you need for an "on-stage" telepresence experience.

OFFICES & HOME OFFICES

Executives are integrating visual collaboration in their offices and home offices as prices drop on HD video endpoints, software clients and high-quality cameras. Here's how to create an effective studio environment.

BASICS

1. **Design Your Set:** Your office says a lot about you. Your "studio" tells the same story to people who visit through a camera. Give some thought to the background. When you need to make a good impression on a video call, a wider shot with a visible background beats a talking face captured from a laptop any day. Also, the farther away you are from the camera, the less annoying eye-line parallax issue will seem. And don't forget wardrobe! Even if you work from home, at the very least wear a collared shirt but make sure it isn't red because that doesn't look good on camera. Make sure you don't have a window behind you as well.

Mid-Grade: *Dual-Screens let you see your remote partner and the data you are collaborating on simultaneously.*

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2. **Light Yourself:** The easiest and most effective way to improve how you look on a videoconference is to light yourself properly. Ideally, the light would come directly in front of you or above at a 45-degree angle so your eyebrow doesn't cast a shadow over your eye socket. If you're on a budget, a simple Anglepoise lamp with a halogen or natural spectrum bulb will do the trick. Deluxe: color balance the light with your camera.

3. **Double Up:** Consider buying a second monitor. You can talk with your collaborator on one monitor and work with the data on the other. Dualview comes standard on Windows 7, Windows Vista and Windows XP, a simple matter of plugging the second monitor into the spare VGA / DVI port. Mac users and other/older operating systems may require a mini-DVI to analog cable or dual monitor software like UltraMon to correct for monitor sizes or simplify set up.

Premium: *Eye-Contact solutions from DVE (pictured) and TelePresence Tech can use any video codec and hide the camera behind a beam splitter for perfect eye-contact for one-on-one conferences.*

4. **Upgrade:** Just because your laptop or monitor came with an embedded camera and microphone doesn't mean you're stuck with them. Consider upgrading to an HD camera and a USB speakerphone, both ideal for your desk and your mobile office. They'll make a big difference with Skype calls as well.

The ClearOne Chat 50 is a USB speakerphone that improves audio on video calls and doubles as a speakerphone for Skype.

5. **Off-load:** Use a second computer as your video platform. Videoconferencing is so processor-intensive, unloading the job on another computer frees up your primary laptop or PC to work without bumps as you conference with colleagues. You'll maximize your video and data collaboration.

6. **Roll with It:** Mounting your videoconferencing setup to a computer desk with wheels makes it easy to capture you at your desk, at a conference table with other people, or more anywhere you want to be.

ROOM SYSTEM AND CLASSROOM BASICS

Screen Size and Placement: The bigger the better! LCD screens are generally superior to plasma — they weigh less and use less energy. We recommend at least a 50-inch screen mounted across from the primary seats on the long side of a conference table. Don't mount it at the head of the table unless you usually have more than four participants in a conference. Screens measuring 60 to 65 inches work best for effectively displaying all those extra participants. If you're working with a small group and want to keep things intimate, a beam-splitter display that hides the camera at eye-level can go a long way toward making the exchange feel natural. For larger groups, you can always use a LCD/DLP projector to project the primary image across a wall.

Sound and Acoustics: The quality of the sound is just as important as the quality of the video. You want the exchange to sound like everyone is in the same space, a trick that involves quality microphones placed in the right spots. Microphones can be hung from the ceiling or embedded in the table where they will occasionally, unfortunately, pick up the sound of papers shuffling.

Microphones will pick up sound reverberating off hard and flat surfaces in a room. You can dampen reverberations by installing sound-absorbing material to the ceiling and walls and angle up with spacers any large flat surfaces such as whiteboards and pictures.

Some telepresence solutions allow for multi-channel spatial audio. That means the sound comes from different directions depending on which site or screen is talking.

Camera Placement: To place a fixed camera, PTZ camera or a videoconferencing appliance, mount it underneath the primary display at approximate eye-level. Then point the camera in-between the two seats that would serve as the primary seats during a meeting. You want to capture and display the two primary participants at life-size proportions. Use camera pre-sets for capturing two participants, four participants, six participants, the entire room and a pre-set for capturing a whiteboard. For three or more screens, mount a camera under each screen at eye-level.

Furniture: A good conference table for telepresence should not be reflective, should keep participants properly positioned before the camera and include power and Ethernet jacks for collaborative work. A number of specialty furniture providers produce telepresence furniture, including AVTEQ and 2Allmedia.

Wall Finishes, Treatments and Acoustic Treatment: You want a color scheme for your walls that doesn't detract from the visual experience on the screen. Try muted, neutral colors such beige, tan, light gray, or light blue. Avoid busy patterns or stripes and any reflective surface that will be visible to the camera. Cover large windows if possible and apply acoustical treatments to the walls and ceilings to dampen reverberation.

MOST MEETINGS ONLY HAVE ONE TO SIX PARTICIPANTS, SO DON'T GET HUNG UP ABOUT THE MAXIMUM NUMBER OF PEOPLE THE ROOM WILL HOLD. INSTEAD, FOCUS ON CREATING AN ENVIRONMENT THAT WILL MAXIMIZE THE QUALITY FOR THESE PARTICIPANTS.

Collaborative Tools:
"The usual and customary tools in their usual and customary format." That's what creates the most effective collaboration. Most telepresence solutions come with basic data collaboration that "screen scrape" what's on a local laptop (connected by VGA) and transmit the information to a dedicated data collaboration monitor(s) at the remote site. If your organization works extensively with hand-generated graphics on a whiteboard, then working with someone on the other end with an interactive whiteboard will optimize your virtual workflow. A number of additional tools can be incorporated into a telepresence environment for organizations that need more sophisticated collaboration capabilities.

Document Cameras and Ceiling Mounted Visualizers — These technologies let you collaborate on documents and physical objects. Ceiling-mounted visualizers made by WolfVision eliminate the clutter that a document camera sitting on the table.

A ceiling mounted visualizer allows you to share hand-generated graphics, documents, or physical objects with circuit board level detail.

Whiteboards, Interactive Whiteboards, and Digital Flipcharts — Whiteboards should be placed behind the main participants so they can be easily accessed and captured by the primary camera. You can set up a camera preset with a tight shot of the whiteboard to quickly share its contents. Interactive whiteboards can immediately digitize work, annotate documents and graphics, and whiteboard interactively between locations. Digital flipcharts capture hand-generated content through virtual "sheets" that can be virtually "taped to the wall," replicating a traditional flip chart brainstorming session.

High Definition Encoders / Decoders — Dedicated encoder/decoder solutions such as Extron's VN_Matrix are designed especially for organizations that need to work with high-resolution images, real-time video or real-time visualization information.

Room Control: If a telepresence and visual collaboration room isn't easy to use it won't get used. This is especially true in large organizations with hundreds, thousands, or even tens of thousands of potential users. The gold standard for control are menu–driven, touch-sensitive displays that let you pre-program your most frequently called remote locations and make the collaborative tools, camera presets, and other key features intuitively obvious.

LIGHTING:

To optimize your lighting, start by throwing out your standard fluorescent bulbs! If you are limited on budget or stuck with fluorescent fixtures, get full spectrum bulbs designed for video. The ideal color temperature should be between 3,000 and 3,500 degrees Kelvin, and about 70 foot candles of intensity at the subject.

Lighting for video can involve as many as four lighting positions, the Key Light being the most important. For most multi-purpose conference rooms, a strong color-balanced Key Light supported by additional full spectrum lighting in the room will work well enough. Just remember: you don't want regular meeting participants feeling like they're in a television studio.

Here are some additional options for an optimized broadcasting environment:

TO OPTIMIZE YOUR LIGHTING, START BY THROWING OUT YOUR STANDARD FLUORESCENT BULBS! IF YOU ARE LIMITED ON BUDGET OR STUCK WITH FLUORESCENT FIXTURES, GET FULL SPECTRUM BULBS DESIGNED FOR VIDEO. THE IDEAL COLOR TEMPERATURE SHOULD BE BETWEEN 3,000 AND 3,500 DEGREES KELVIN, AND ABOUT 70 FOOT CANDLES OF INTENSITY AT THE SUBJECT.

Key Light: Light shining on the subject from the front. These lights are generally placed high and at the center, or to each side of the seating area if two are required. Aim them downward at a 45-degree angle to light the face without the eyebrow casting a shadow over the eye-sockets.

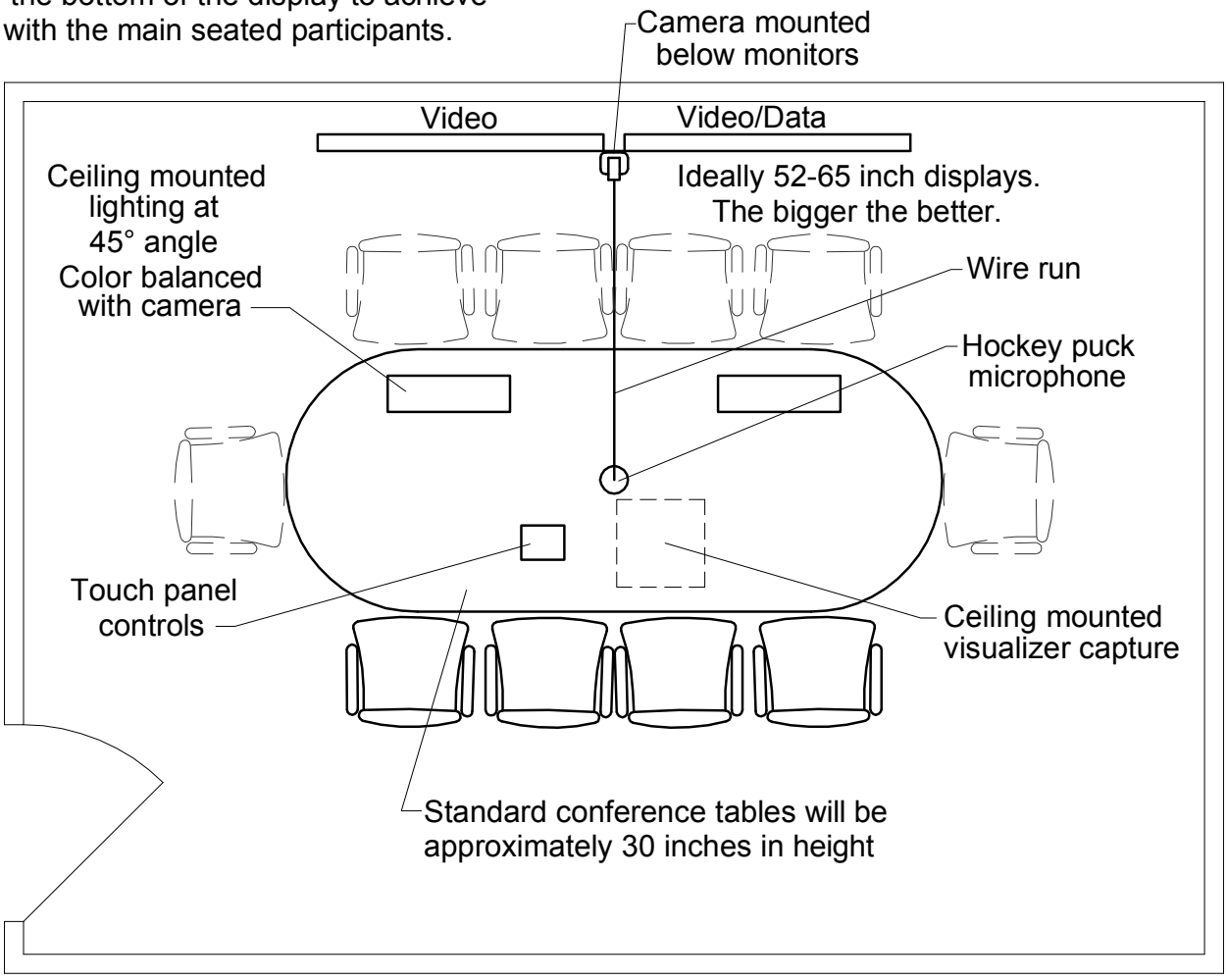
Fill Light: Lights shining on the subject from the front, but placed at a low angle to soften shadows under the eyes and chin.

Hair Light: Lights at the rear of the room, above the subjects and aimed downward to help separate the subjects from the background.

Backdrop lighting: Lights above and (if space allows) between the subject(s) and the background. Two lights are usually required, each aimed toward the opposite half of the background to evenly light it.

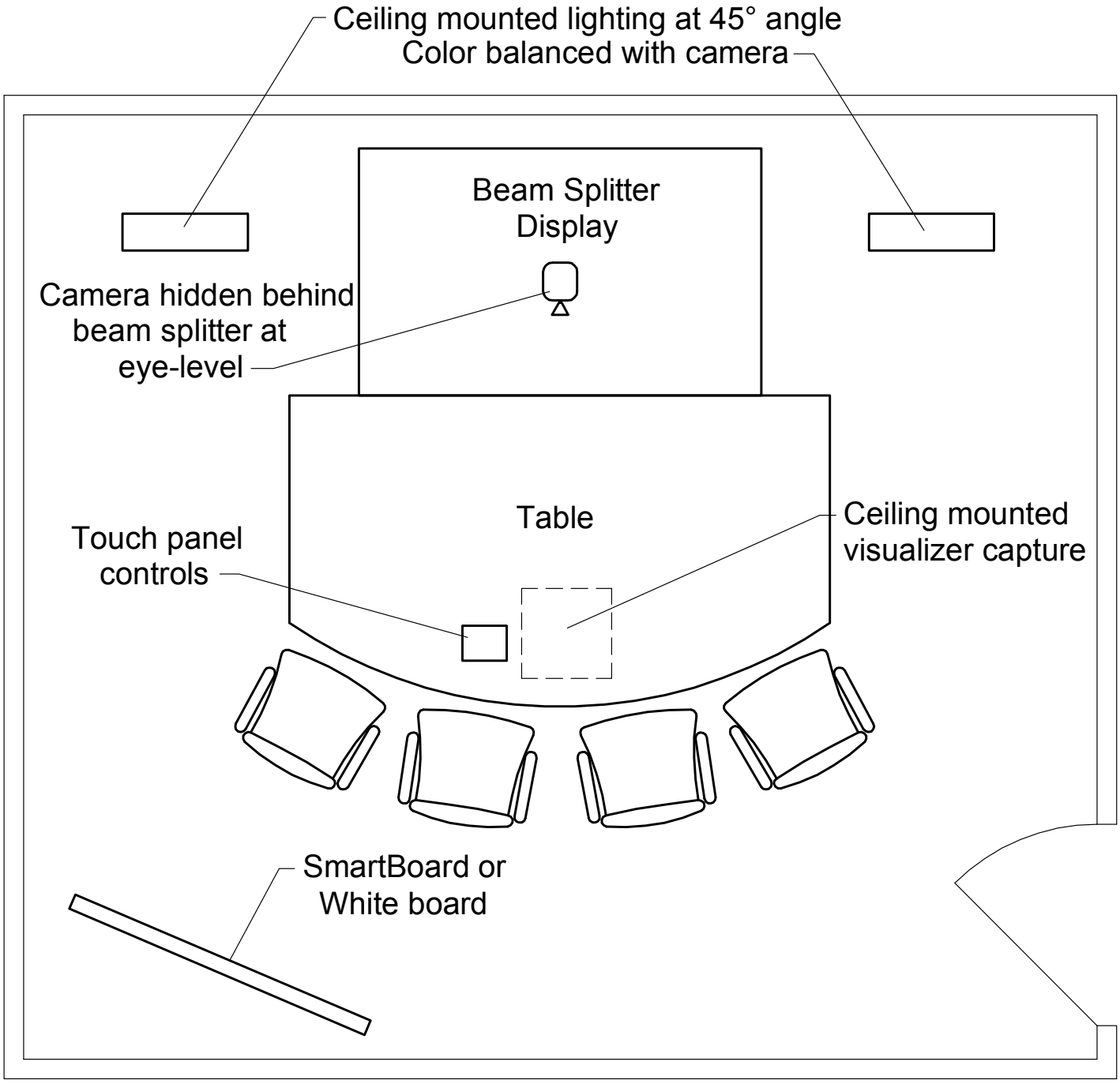
SPECIFIC ROOM LAYOUTS:
Small Group Conference Room – Traditional Videoconferencing System with PTZ Camera

The bottom border of the main video display should be approximately 44-46 inches from the ground depending on the height of the table with the top of the camera lens level with the bottom of the display to achieve good eye-line with the main seated participants.



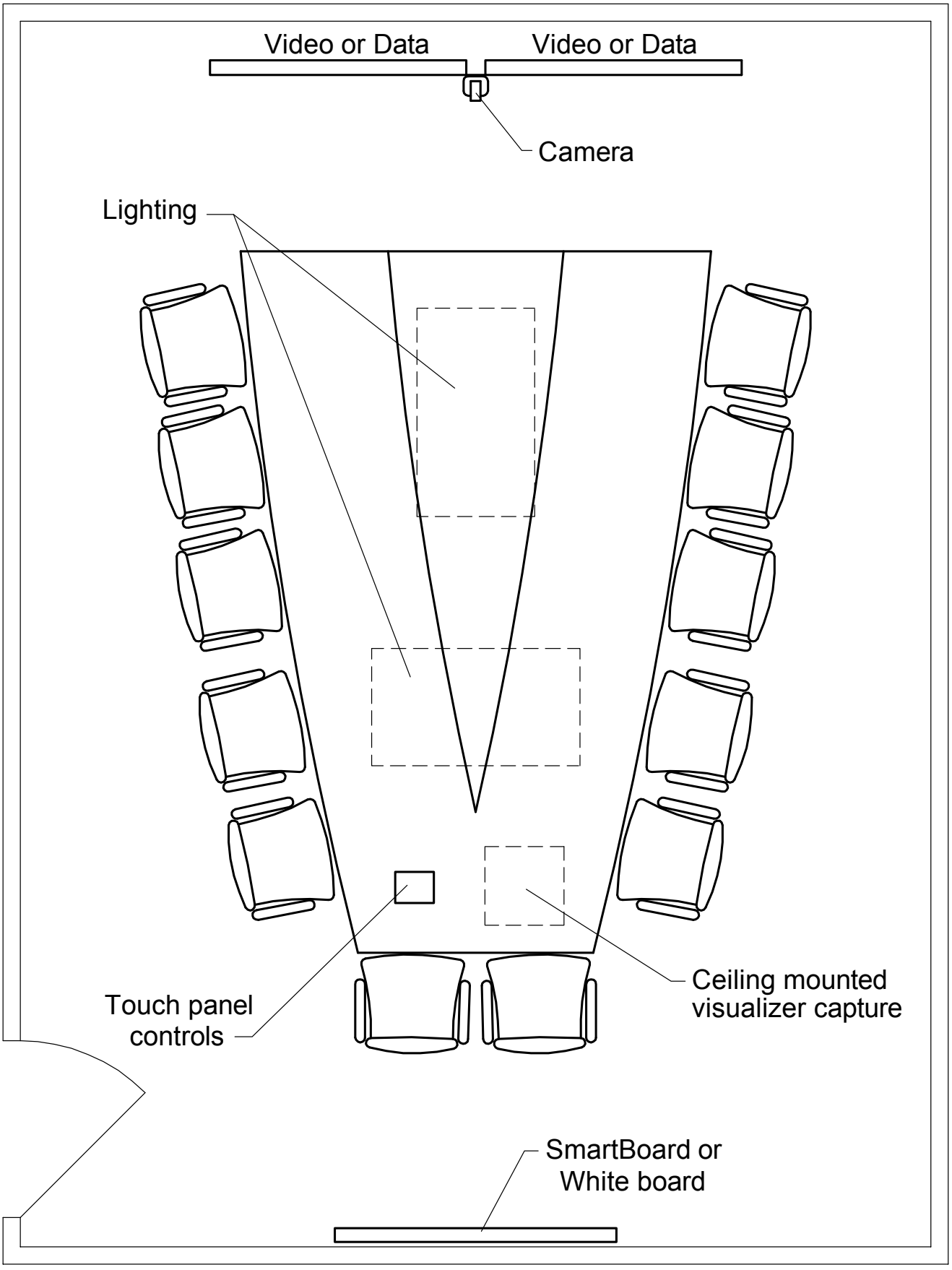
Small Group — Beam-Splitter Solutions

For small group situations, companies such as Digital Video Enterprises and Telepresence Tech make solutions that hide the camera at eye-level behind a piece of silvered glass called a beam splitter. This gives remote participants true eye contact and hides the camera and its attendant psychological baggage. (In other words, no one is as likely to act like they're "on-camera.")



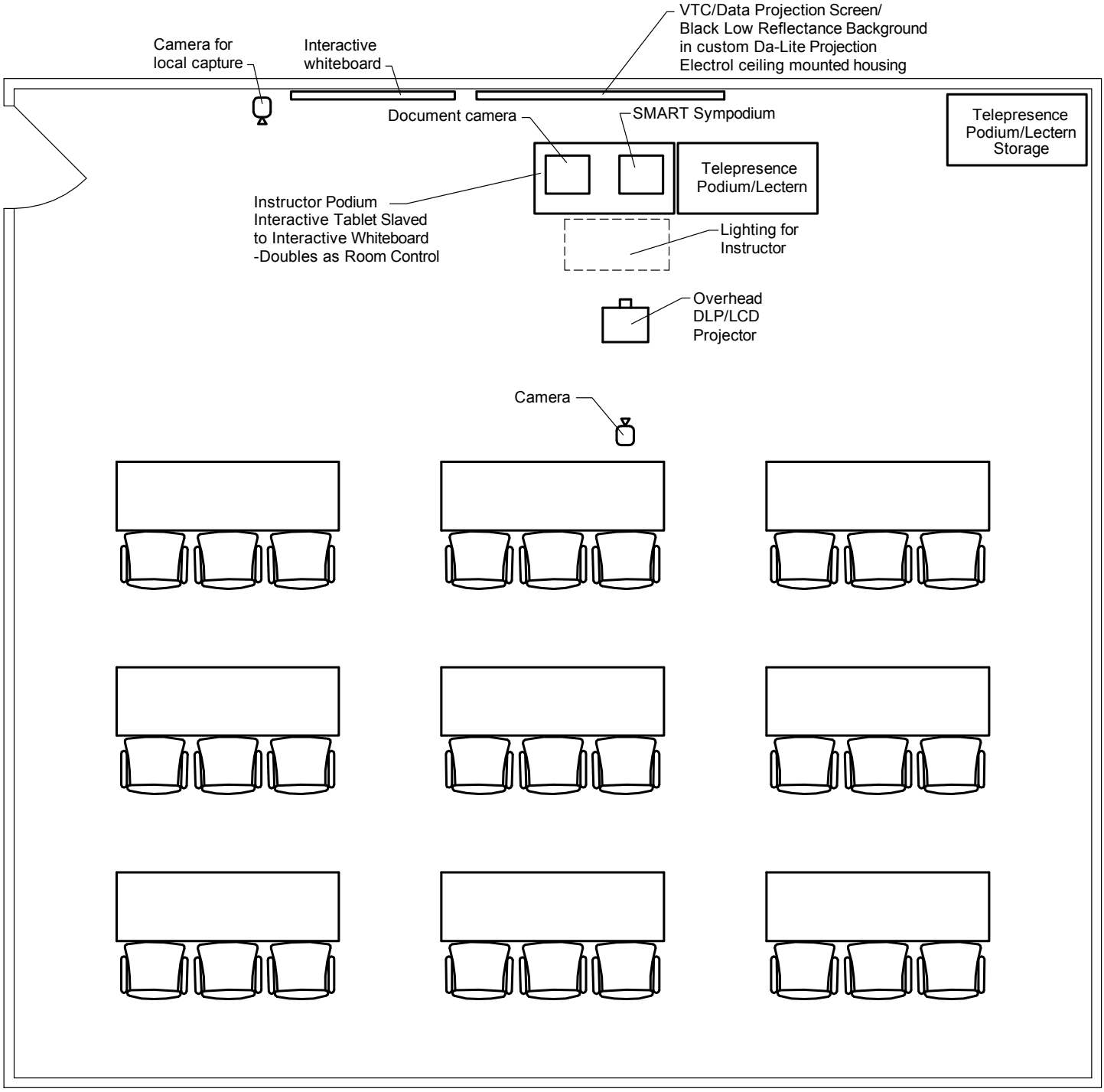
Conference Room —
Pan/Tilt/Zoom Camera

This conference room design features a trapezoidal table by INTEK. The shape allows everyone to be seen in a group meeting but has two seats at the head of the table for an optimized tight camera shot for one to two people. Each seat has data and power available. All the environmental basics for lighting, acoustics, camera placement, and color palette apply.



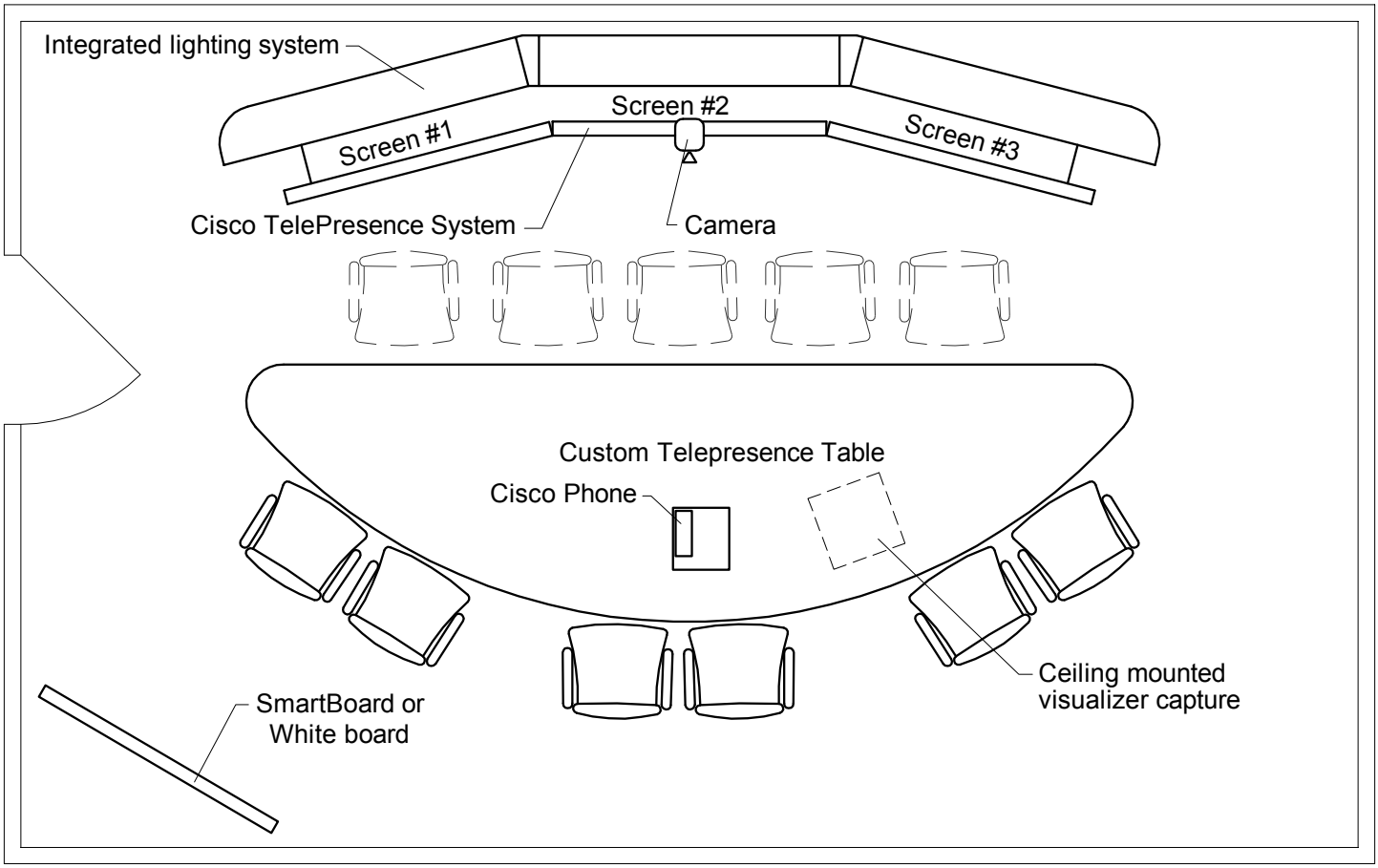
Training Room Telepresence Podium/Lectern & Traditional Videoconferencing

This telepresence classroom design is for an organization with multiple geographically dispersed training locations. The design allows for instructors to use a telepresence podium/lectern to teach to one or more remote classrooms simultaneously. The design includes a custom-built Da-Lite Professional Electrol ceiling-mounted projection screen that features both a standard screen for the front projection of a remote videoconferencing location or data/video along with a 2nd extreme low reflectance black velour background. The black background absorbs light allowing the instructor to appear as a volumetric image on a telepresence podium at the remote site(s). All the environmental basics for lighting, acoustics, camera placement, and color palette apply.



"Pro-Modifying" Existing Telepresence Environments

Multi-Purpose Cisco CTS 3010 Group System – One of the more popular requests for "pro-modifying" existing telepresence group systems is to separate the table from the screen so that the room can be used as a traditional meeting room. Here is an illustrative floorplan of what a pro-modified Cisco CTS 3010 looks like with a custom table and five additional seats. Further pro-modifications can include improving the collaborative capabilities of the room with a ceiling-mounted visualizer to share documents and physical objects and a SMART Board to allow annotation of documents, creation of hand-generated graphics, and interactive whiteboarding between locations.



Polycom RPX Distance Learning Classroom with Stand-Up Presentation Area

Here is a design that the Human Productivity Lab created for a "Pro-Modified" Polycom RPX with a stand-up presentation environment where an instructor can be captured more naturally standing at a lectern "teaching in the round." This design has an additional camera to capture and instructor or student at an interactive whiteboard, which would be displayed on one of the four panels of the remote classroom's video wall.

"Productized" Learning and Enhanced Collaboration Bundle

Rear Projection SMART Board
Allows for inter-active whiteboarding/ annotation between sites

Doubles as large fomat display & UI for AMX/Crestron programming

Collaboration PC
Shared PC with client's productivity, ERP and distance learning applications

Powers the SMART Board and SMART Sympodium

Document Camera & Physical Object Visualizer

VN-Matrix - High resolution image/video codec

VGA cable for sharing laptop content

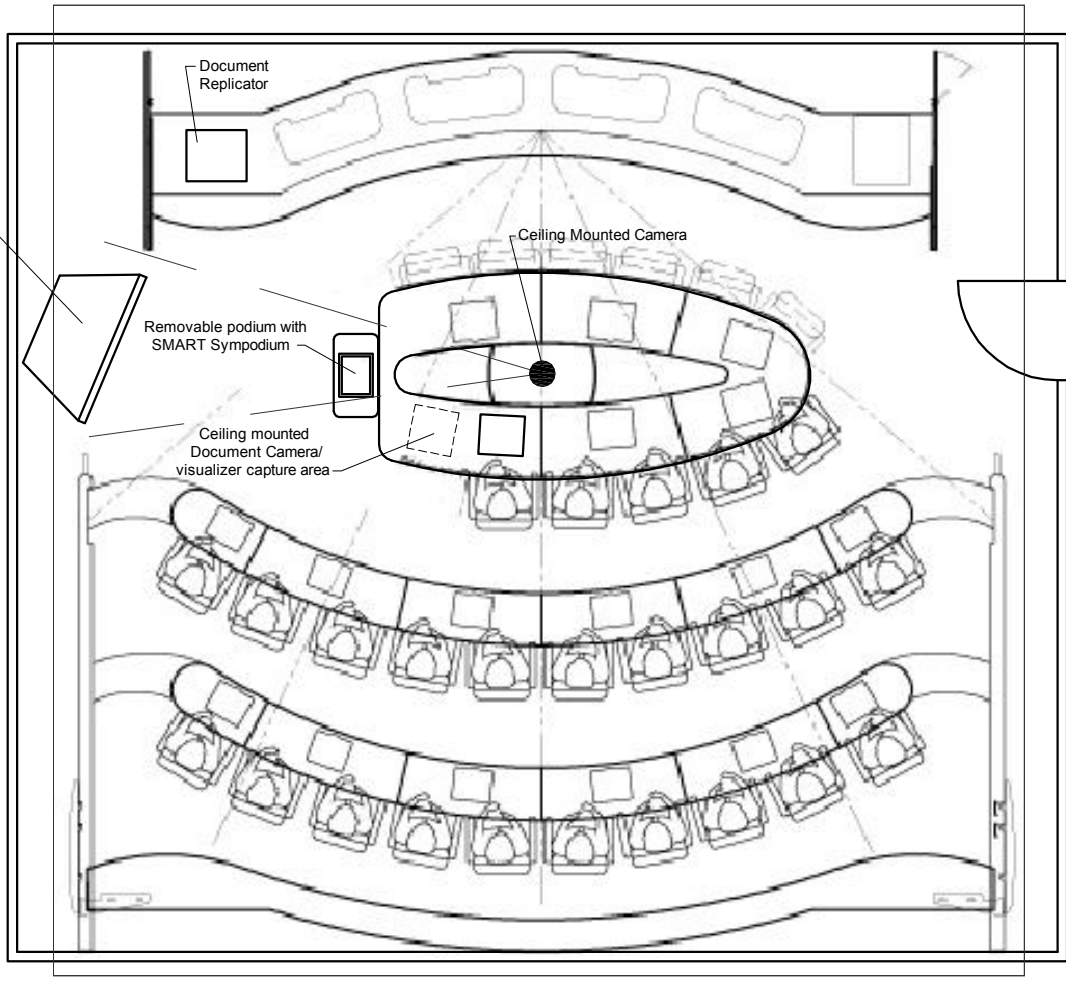
Classroom Functionality

Stand up presentation environment where the instructor can be captured standing at a podium using the primary RPX camera and/or presenting at the SmartBoard by a 5th camera codec in the environment.

AMX/Crestron functionality delivered to the SmartBoard and Sympodium

"Productized" learning and enhanced collaboration bundle can be deployed to other client sites for sitance learning or where improved collaboration capabilities are required.

Content can be captured and archived to client's knowledge management platform.



ON-STAGE TELEPRESENCE

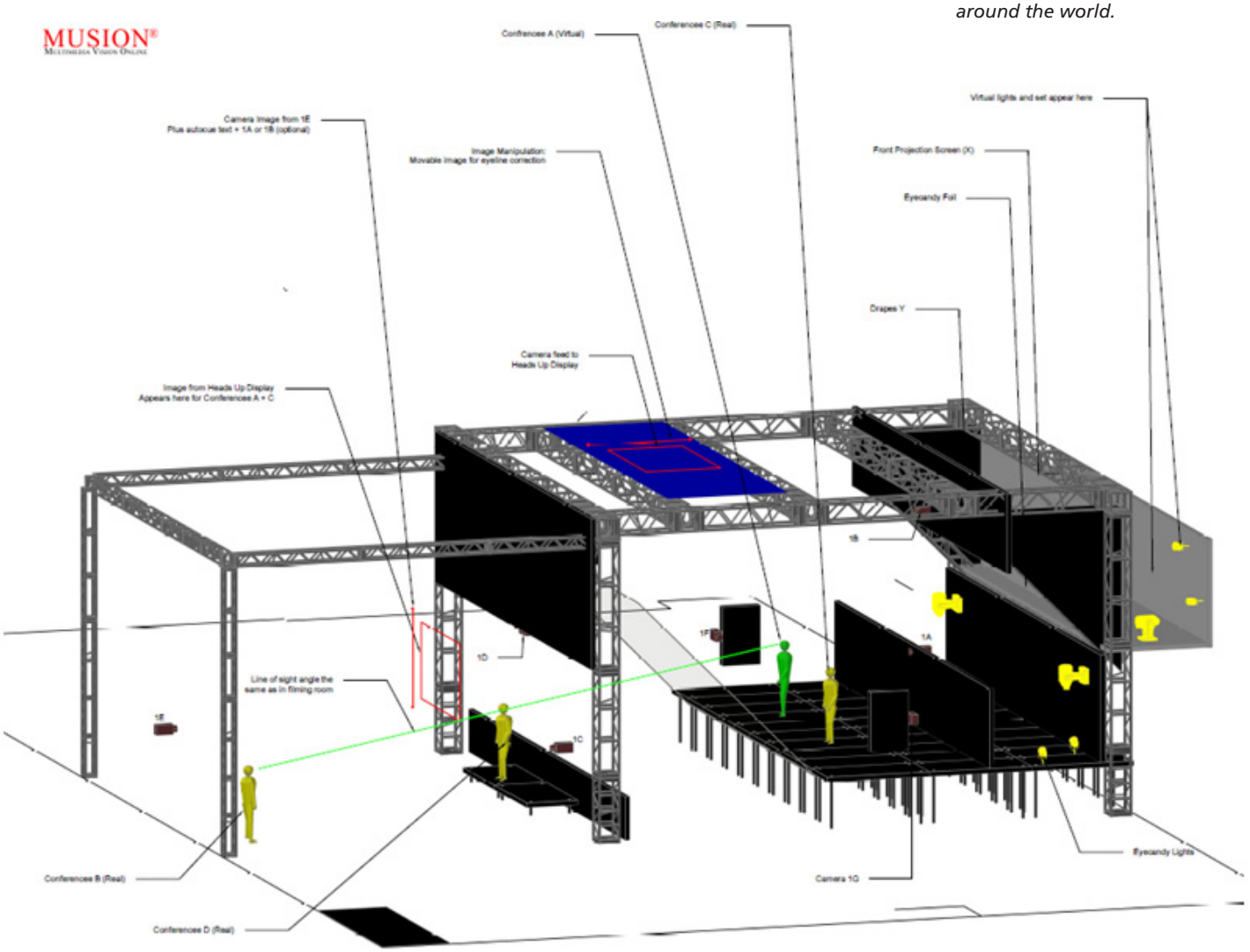
On-Stage Telepresence can take the form of a live interactive presentation. A remote presenter can appear life-size and interact with local participants and free-floating digital content in multiple locations. Pre-recorded content can also be used to recreate anything from a one-person presentation to a complete theatrical production on the scale of the Grammy Awards.

Vendors include MUSION and Digital Video Enterprises. MUSION's Eye-liner is shown in both examples. Eyeliner installations can be to up to 330 feet /100m wide, but standard apparatus tend to be approximately 13 ft – 23 ft / 4m - 7m wide and 13 ft – 23 ft / 4m – 7m deep. Typical image size from a single projector is approximately 16 ft / 5m wide by 9.5 ft / 3m high.

The Eye-liner system incorporates a "performer's stage" equipped with state-of-the-art LED lighting. It's usually boxed with hard panelling or dark draping along the sides and back of the system. The Eyeliner polymer screen sits on a 45° angle between the stage and the audience. At least one high-powered, high-definition video projector is mounted in front of the foil, projecting onto either the floor or ceiling depending on foil orientation.

On-Stage Telepresence applications are designed to work in public performance areas such as concert venues, theatres, exhibition centres, nightclubs, marquees, large office environments, retail stores and TV studios. The cost to rent a MUSION on-stage experience starts at $40,000 / £25,000 per day excluding the videoconferencing platform.

A Virtual Presenter (Left) is able to interact with a live presenter (right) in one or more remote locations around the world.



ABOUT THE AUTHORS

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Bryan Hellard is President of Hellard Design, a telepresence and visual collaboration design firm and was one of the original architects of the TeleSuite, which became the Polycom RPX.

RESOURCES:

Guidelines for Video Conference Room Acoustics – Cisco Systems
http://www.cisco.com/en/US/docs/telepresence/endpoint/misc/user_guide/video_conferencing_room_acoustics_guidelines_ver01.pdf
Videoconferencing Room Primer – Cisco Systems
http://www.cisco.com/en/US/docs/telepresence/endpoint/misc/user_guide/video_conferencing_room_primer_ver02.pdf
Integrators Reference manual for Polycom HDX Systems - Polycom
http://supportdocs.polycom.com/PolycomService/support/global/documents/support/setup_maintenance/products/video/hdx_irm.pdf
Guidelines for Room Lighting:
http://belle.netera.ca/docs/lighting.pdf

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