



ABCs of Videoconference Rooms

by John Gregory and Lisa Horan

BUILDING

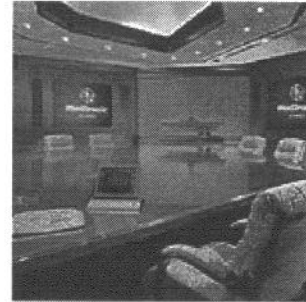
- [Frame-and-Panel Cabinetry](#)
- [ABCs of Videoconference Rooms](#)

The technology of videoconferencing — two or more people at different locations communicating through video and audio — places new demands on traditional conference rooms. Each meeting location becomes, in effect, a broadcast studio, so once-simple conference rooms have become more complicated to design.

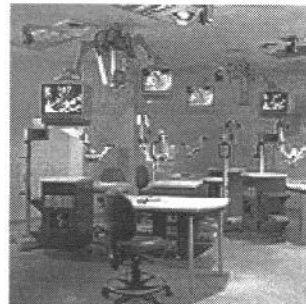
Videoconferencing can involve two people at different locations communicating one to one, or an individual broadcasting to numerous locations, or many people at many locations talking and interacting with each other in a multipoint conference.

Although the choice and design of electronic components are most often delegated to specialists, architects should be aware of how the spaces they design will affect the performance of a videoconferencing system.

Like the choice between buying a sports car and a pickup truck, the choice of technology depends less on the options available (there are many) than on what your clients' needs are. Systems range from those of minimum quality, with low frame rates and resolutions, to those capable of broadcast-quality transmissions. >>>



A conference room for a medical technology developer has three display screens, two camera locations at the front and rear walls, and flush-mounted microphones in the conference table. Photo: Audio Visual Innovations, Inc.



A surgical room at the University of Florida Brain Institute in Gainesville includes ceiling-mounted cameras and connections for fluoroscopes and other instruments. Doctors at remote sites can collaborate during procedures. Photo: Audio Visual Innovations, Inc.

Continue...

POPQUIZ



ABCs of Videoconference Rooms

BUILDING

- [Frame-and-Panel Cabinetry](#)
- [ABCs of Videoconference Rooms](#)

AND MORE

- [Daily Building](#)
- [Classic Home](#)
- [Competitions](#)
- [Conferences](#)
- [Events & Exhibits](#)
- [Architecture Forum](#)
- [Architects Directory](#)
- [Architecture Books](#)
- [ArchWeek Library](#)
- [Web Directory](#)
- [Weekly Building](#)
- [Marketplace](#)
- [About ArchWeek](#)
- [Search](#)
- [Contribute](#)
- [Back Issues](#)
- [Current Contents](#)
- [Subscribe Free](#)

POPQUIZ

continued

Every videoconferencing system consists of two main elements: the electronic components — a compression and decompression device (CODEC), transmission equipment, cameras, displays, microphones, and speakers — and the environment in which these components are located. When selected and designed correctly, electronics and environment complement each other and create an effective system.

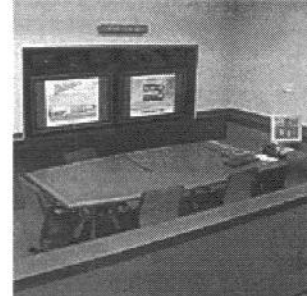
The Architectural Space

The size, shape, and materials of the conference room or other videoconferencing environment are critical. Maintaining a clutter-free back wall is important because it reduces the amount of information the CODEC's processor has to deal with and improves audio and video quality.

The size of the room should be determined by its intended use and audience size and by the intended image size. A general rule of thumb is that the participants should be between two to six times farther away from the screen than the screen is wide.

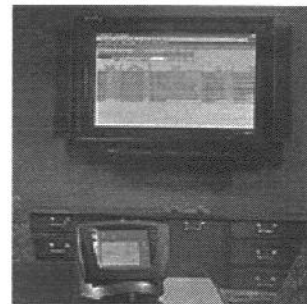
For instance, for optimal viewing of a 60-inch (1.5-meter) diagonal display — which is 36 inches (91 centimeters) high and 48 inches (1.2 meters) wide — the observers should sit between 8 and 24 feet (2.4 and 7.2 meters) away from the screen.

Screen sizes range from 13 inches (33 centimeters) to 20 feet (6 meters) and come in various forms including televisions, plasma



In a videoconferencing room of the Joint Forces Staff College in Virginia Beach, Virginia, cameras are mounted above the display screens, but the table can also be used for conventional meetings.

Photo: Audio Visual Innovations, Inc.



At Progress Telecom's Global Network Operations Center in St. Petersburg, Florida, a conference room incorporates a flat panel plasma display, videoconferencing camera, and CODEC.

Photo: Audio Visual Innovations, Inc.



displays, and projection screens. The bottom of the display should be at least 42 inches (107 centimeters) above the finished floor, so ceiling height may limit possible sizes.

Participant chairs should be positioned so that each person has a clear view of the display(s) and an unobstructed view from the camera(s). This can be accomplished by using a uniquely shaped table or providing two cameras strategically placed at the sides of the viewing surface and angled to pick up opposite sides of a conventional table. Keeping the cameras close to eye level creates the most comfortable viewing angle.

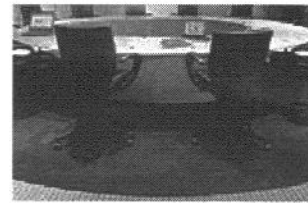
For wall surfaces, fiberboard with a textile wrap is acoustically and visually the best solution, and light, neutral shades of beige, gray, or blue in matte finishes are recommended. Ideally, walls should not be parallel to one another.

Lights

If conference participants or objects in the room are to be captured on camera, lighting is a key environmental factor. You can avoid the "raccoon effect" — dark circles around participants' eyes — by installing fluorescent fixtures that provide reflected light.

A fixture with a louvered diffuser angled at 45 degrees and a relatively reflective table surface provide an acceptable solution. Still better is a specialty fixture manufactured by Lutron (creative model number: 2' x 2' Recessed VT Fixture). It has a parabolic reflector inside and it fits above the ceiling line in a standard ceiling grid.

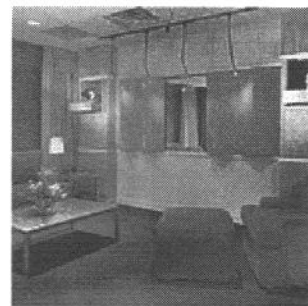
This Lutron fixture is dimmable and is reasonably priced, especially considering the results it provides. While other manufacturers offer above-ceiling fixtures, these do not provide light distribution as effectively as Lutron's model.



An executive boardroom for IMR Global uses a Pictoretel system with a below-screen camera to link various locations.

The room optimizes seating, sight lines, and lighting.

Photo: Audio Visual Innovations, Inc.



St. John and Partners, a market research firm in Jacksonville, Florida, has a room specially designed for conducting focus groups, with video cameras, microphones, and a two-way mirror.

The recording devices are in the adjacent boardroom.

Photo: Audio Visual Innovations, Inc.

Click on thumbnail images to view full-size pictures.

Audio Considerations

Ambient sound levels in a videoconferencing room are important considerations because they affect speech intelligibility. For optimum audio quality, the room should be quiet and isolated from noise in adjacent spaces. The ideal noise criterion for ambient sound is NC20, with NC30 as an acceptable maximum.

The walls should have a sound transmission rating of STC 56 or better, and doors should be STC 42 or better. In lieu of insulation in the interior partitions, a surface-mounted fiberboard system on a standard wall can absorb both noise from outside the room and reflections within the room.

To minimize ambient sound, glass and windows should be used sparingly. If glass cannot be avoided, provide curtains to reduce its reflectivity.

Any overhead ducts should be curved to minimize noise, and variable air volume (VAV) boxes should not be located directly above the meeting space. The acoustically ideal videoconferencing environment is an interior room distant from any mechanical rooms. If motors and fans in adjacent spaces are unavoidable, isolating their vibration from the structure can minimize noise levels.

Audio Electronics

Two electronic components that affect both acoustics and aesthetics of a videoconferencing environment are microphones and speakers. Tabletop microphones work best but are obtrusive and therefore not typically an attractive alternative. Generally, the more visible a microphone is, the better its audio quality will be.

One way to make microphones less obtrusive is to suspend them from the ceiling. This only works, however, if the ceiling height is 9 feet (2.7 meters) or lower and if the room has good acoustics. If the room is reflective, ceiling microphones will make the room sound

hollow and cave-like.

Speakers amplify the transmitted sound in the receiving room. Ceiling speakers mounted above the seated participants work best. However front-wall speakers are acceptable in small rooms, as long as the number of participants is 5 or fewer and each is situated 8 to 10 feet (2.4 to 3.0 meters) away from the display and speakers.

Local voice reinforcement can be accomplished in a large room, but this significantly increases the cost because it requires an elaborate audio mix structure to avoid feedback. One solution is a "logic-controlled" system that switches off speakers near the active microphone while attenuating speakers farther away.

Another method, called "mix minus" audio, requires that each speaker run on its own amplified audio buss, and that an active microphone signal be reinjected out of phase into local speakers. This cancels the active microphone's audio completely from adjacent speakers.

But such electronic component considerations are just part of designing a videoconferencing system. Neither electronics nor room design can overcome the shortcomings of the other. A well-lit, quiet room with a clean, neutral background are a necessity for an effective videoconferencing space.

John Gregory and Lisa Horan are with Audio Visual Innovations, Inc. a presentation technology provider headquartered in Tampa, Florida, with offices nationwide.

