

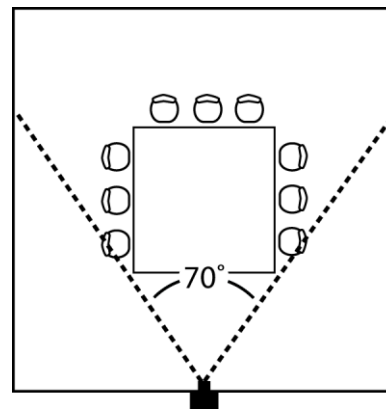
The Ideal Videoconferencing Room

With diminishing budgets and projections of tight economic conditions in the near future, videoconferencing is being turned to increasingly for meetings, seminars, workshops, classes and more. This can save money in travel costs and make better use of the time of faculty and staff.

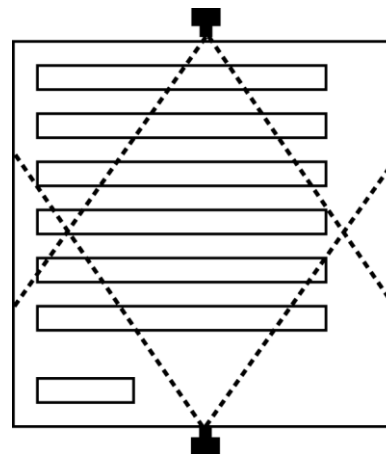
But just like any other tools and learning resources we use in teaching and training, it makes a difference to use the best principles and practices in designing and furnishing a videoconferencing facility. Here are some tips and suggestions gleaned from a number of sources including colleagues, current publications and personal experience.

Room Service

As the King says in *Alice in Wonderland*, “Begin at the beginning” – and so we begin with the shape of the room itself. The ideal videoconferencing room should be square or rectangular, and if the latter, with less than a 2:1 length to width ratio. This keeps all participants within range of the camera and microphone(s). The wide angle setting of the camera will generally cover about 70 degrees.



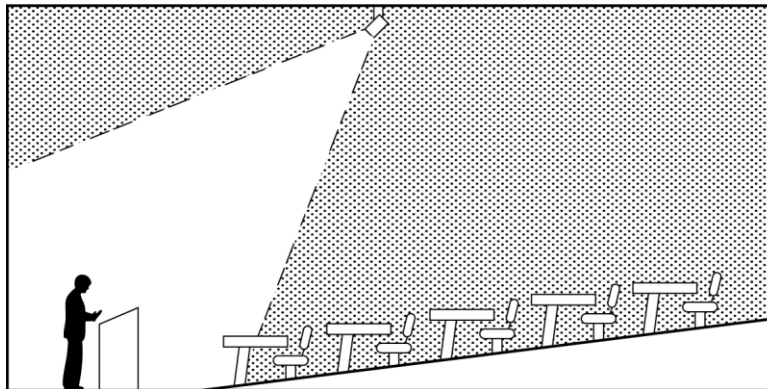
In situations where this ratio is not possible, such as auditoriums or certain classrooms, there should be separate cameras for lecturer/presenters and for audience/learners. A windowless room is best, but if windows are present they should be able to be covered completely with heavy drapery or shades that can totally obscure any outside illumination.



Let There Be Light

So if you can't have outside light, what can you have? The best lighting for videoconferencing is diffuse fluorescent, such as louvered ceiling lights set to cast their light downward at a 45-degree angle. The color temperature of these lights should be 3500 degrees Kelvin. Besides the shape of the room and the lighting, there are other visual factors to consider. The walls should be smooth and uniform without a lot of clutter. The wall color should be low contrast and light instead of dark; light blue, light green or beige are good choices. The lighting should also be even on the walls, with no hot spots or shadows. These things make it "easier" on the videoconferencing system in that it doesn't have to spend as many resources on portraying or renewing the background. Having a fixed or moveable University logo and name of the location in camera view helps others in the network or on outside calls identify who and where you are.

lighting is at 45° angle relative to the speaker



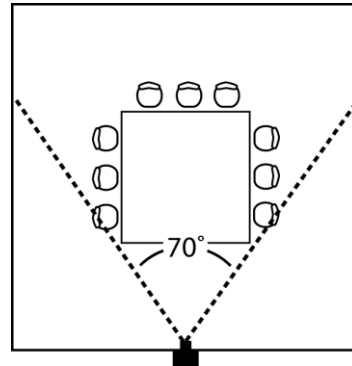
Sound Policies

The next thing to consider is sound, or the absence thereof. This somewhat cryptic statement is justified because the first step in getting high quality sound that you do want is to eliminate sound that you don't want. The worst offender in this regard is the heating, ventilation and air conditioning system (HVAC.) Mechanical devices such as heat exchangers and ventilation units should not be in the ceiling above the videoconferencing room or surrounding areas. There is a standard for evaluating the errant sound from HVAC, and it is called Noise Criterion or NC rating in the United States. The April 2009 issue of AV Technology suggests an NC rating of 20, or 30 at the maximum. Walls and doors also have a rating to determine how much sound passes through – the STC rating, or Sound Transmission Class. AV Technology magazine recommends an STC of 55 to 65 for walls, and says that doors should be solid wood with an STC rating of 40 to 55. Finally, you can deaden any unwanted ambient sound by carpeting the floors, treating about half the wall space with acoustical material, and using acoustical ceiling tiles.

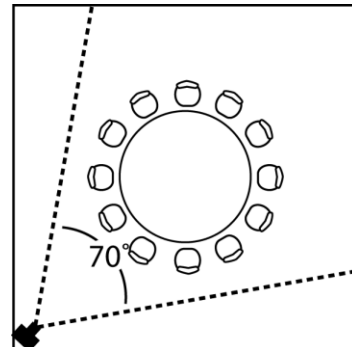
Candid Camera

Once you have the room itself set up for videoconferencing, you can add the equipment. Tom Hintz has a good rundown of videoconferencing systems at <http://video.ifas.ufl.edu/Models.HTM>, so I won't address that aspect here. Here are a few basic principles, however, that will help you in setting up your systems.

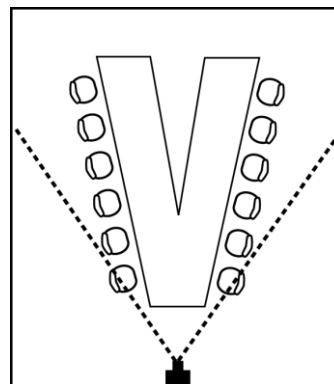
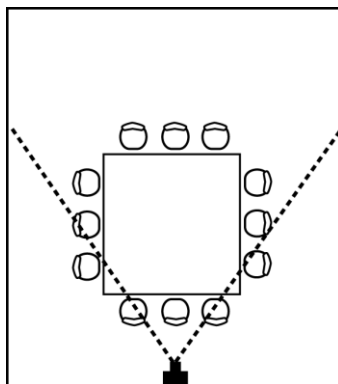
In smaller rooms, put the camera in the middle of the wall on one end, mounted high enough to cover the entire room or the portion of the room you want to televise.



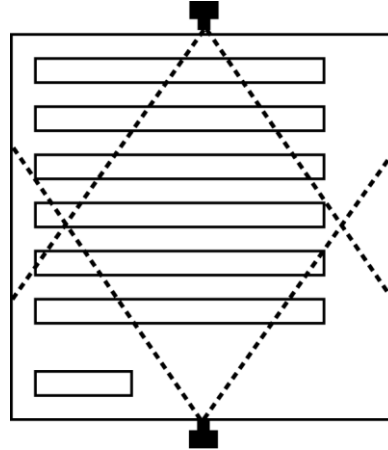
If a middle placement is not possible because of deficiencies in the design of the room (e.g. windows, doors or existing structures that can't be moved), you can put the camera in a corner.



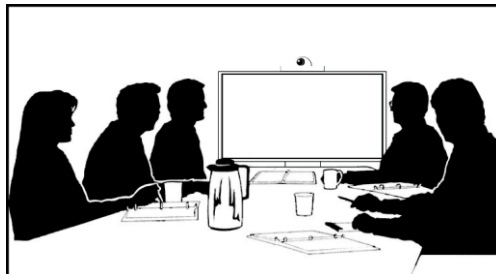
Since the field of view of the camera is wedge shaped with the apex at the camera, round, square or some rectangular tables can have portions closer to the camera out of view. A wedge-shaped table solves this problem.



In larger rooms such as big classrooms or auditoriums, it is best to have one camera for the instructor/presenters, and one for the audience/learners.

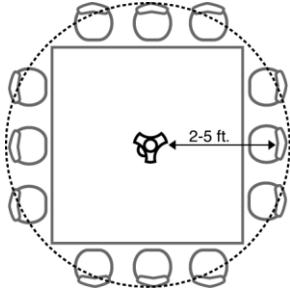


Place the image display that room participants will be watching as close to the camera as possible, so that people at the other end will perceive that you are looking at them. This can be a screen for an LCD projector, a flat panel display, or a conventional monitor. The bottom of this image display should be higher than 30 inches from the floor, which is the average table height. In larger rooms, make sure that there are additional monitors around the room so that everyone in the audience can see, and that there are one or more monitors for presenters to see what is going out to the other sites as well as the sites themselves and any other source that might be useful to the presenter (i.e. document cameras, computer screens, etc.). Place the monitor showing the other sites near the Presenter camera, so that the presenter can have virtual eye contact with the people at the remote sites.

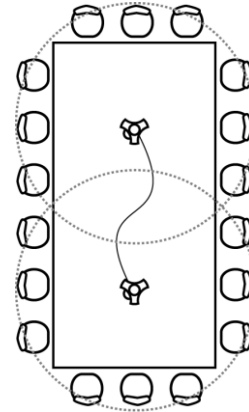


Testing, One Two

What kind of microphone system is best? In small rooms the single tabletop microphone that comes with most videoconferencing systems is sufficient.



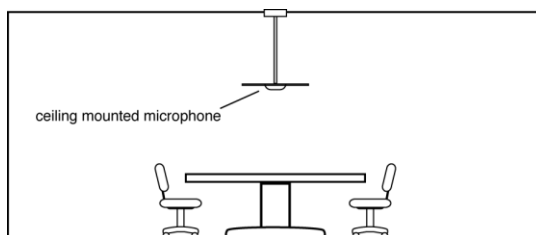
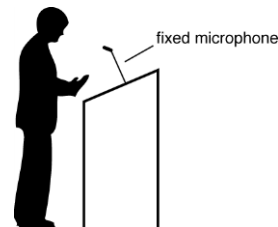
There are often auxiliary microphones that can be hooked into the original mic to cover larger areas.



For the best sound, all participants should be from two to five feet away from a microphone. Most systems have an echo cancellation feature, which prevents sound from your microphones coming back from the other sites' mics and causing feedback.

In classroom settings, we have found that desktop *Press to Talk* microphones work best for the students. This keeps extraneous conversations and noise from being picked up.

For instructors, fixed microphones on a podium or instructor station, or wireless microphones work well. The wireless mic allows instructors more freedom to roam, which is not necessarily good for the camera operator.



Ceiling mounted microphones keep the mics out of the way and allow easy reconfiguration of tables or desks, but they can have problems. Sometimes they are so far away from the participants that the audio levels must be turned up and consequently more ambient noise is heard

Also, sometimes multiple ceiling mics can interfere with each other, so they must be carefully balanced with a mixer. In any case the audio systems should cover a range from 20 Hz to 20 KHz, and there should be a 20-decibel difference between speech levels and background noise.

Alphanumeric Soup

New equipment and videoconferencing standards are continually making the videoconferencing experience better and better. High definition cameras and videoconferencing equipment (HD), wideband audio with AAC sound (an mp3 algorithm), H.264 video compression, H.239 data sharing, and H.460 IP connectivity to overcome NAT and firewall issues are some of these emerging technologies and standards. These things, along with a well-designed room and good support personnel, will make high-quality videoconferencing possible for all participants.

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