



Equipment, Systems, and Network

Focus

“Watching a technician who’s trying to get your videoconferencing gear to work properly is much less stressful than watching an airline mechanic trying to fix the plane you’re on.”

—Fred S. Knight, Editor/Publisher
Business Communications Review

Audio Systems

Successful videoconferencing occurs when remote participants and on-site participants feel as if they are actually in the room together. One of the best ways to achieve this feeling, known as presence, is through the audio system. While video doesn’t have to be perfect in a videoconference, problems occur when the sound is distorted by an echo, a reverberation, or some other undesired effect. An old expression in videoconferencing states, “Lose the video and we talk. Lose the audio and we walk.”

How can you tell if a videoconference room needs sound treatment? Try this easy test: Does the room sound different when it is full of people? Since bodies are mostly water, they are excellent sound absorbers. If you can detect a sound difference when a room is empty of people, the room probably needs some type of additional acoustical treatment. Several common sources for audio problems can be easily identified and addressed.

The Speakers

The speakers in a TV set, even in the most expensive models, are poor performers when it comes to creating presence in a videoconference. Yet, many low cost or portable videoconferencing systems use only the TV speakers for **audio output**, or sound production. While participants may be able to hear a newscast clearly in spite of poor TV speakers, their small size, limited frequency range, non-responsiveness, or placement in a cabinet reduces presence.

By replacing the internal TV speakers with a pair of low cost, external high fidelity stereo speakers from a local electronics store, you can significantly improve the audio quality in a videoconference room. This is similar to improving the sound quality of a PC by adding small external speakers.

The Videoconference Room Design

Videoconference systems are often portable so they can be moved from conference room to conference room. These systems produce a good sound when used in well-designed rooms that contain acoustical tiles or panels, carpeted floors, and padded furniture for absorbing errant sounds. These features give the room a suitable sound quality—what professionals call an acoustically dead room. However, if a videoconference room is not well designed for sound, the audio quality can be affected. For example, large glass panels or several windows along a wall can create distracting sound reflections.

How can room problems be corrected? First, try closing the drapes or lowering the blinds. If the videoconference system can be moved within the room, place it in a different location, so its speakers project away from the glass panels. If lead time permits, paint the walls with a rough textured paint or install heavy flocked wallpaper on all the walls. This is called wall carpeting. In severe cases, install floor carpeting on one or more walls to dampen the distracting reflections.



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Figure 7-1: Typical conference room

Microphones

Unlike TV, videoconferencing is a two-way medium, so the quality of the microphones is important. If the sound quality is poor, improper placement of the microphones may be the culprit. If the presenters are too far away from the nearest microphone, they will sound to remote listeners like they're speaking from the bottom of a deep well. If they are too close to the microphone, their voices may boom or sound distorted. If they move books near the microphone, muffled sounds may be heard at the far end. If they shuffle papers, a crashing sound may be heard.

In a properly outfitted videoconference room, all presenters or participants should be able



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Figure 7-2: With a proper microphone, a participant should be able to speak in a normal voice tone and volume.

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to speak in a normal voice tone and volume while still being heard clearly at all videoconference sites. Pre-session testing should detect any problems and allow time for corrections. In some cases, the main presenter may need to use an additional lapel microphone. That should be a last resort because it may produce unnatural fidelity. Remember: any sites not actively participating in a discussion should mute or silence their microphones to prevent the pickup of potentially embarrassing side conversations and other distracting sounds.

Long-Delayed Echo

If a microphone at one site is too close to the audio output speakers, it may pick up the output of the speakers and re-send the sound through the videoconference network. This causes a low-level, long-delayed echo that distracts the speaker. Some speakers, upon hearing the sound of their own voice after a second or so of delay, become so distracted they cannot speak until the echo is corrected. The easy solution is to ask the offending videoconference site to turn down the sound volume coming from the speakers until the long-delayed echo disappears.

Video Systems

Camera operators frequently fail to control their motion cameras adequately. Even though videoconferencing systems usually come with at least one robotically controlled, auto-focus camera, mistakes can occur.

A videoconference camera often displays a **default shot**, an image of the videoconference room that is shown throughout the entire session. Usually, this is a long-range, wide-angle view of the room. Though all participants in the room can be seen by remote viewers, the viewers may have trouble determining who is talking. Even if they recognize the voice of the speaker, they will see only a few facial features, expressions, and gestures. This is similar to talking with someone in a normal tone of voice while standing on the opposite side of a large parking lot.



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Figure 7-3: This seating arrangement is not appropriate for a videoconference and would make camera operation extremely difficult.

The problem can be corrected if the videoconference camera is **zoomed in**, that is, extended for a close-up view of the current speaker. This can be a head and shoulders view, or it can be closer if needed.

Modern videoconference systems come with memories that store several robotically controlled motion camera positions. These remembered or stored camera positions are called **pre-sets** and can be very helpful in assuring consistent viewing.

Operating the Camera

Before a videoconference begins, move the robotic motion camera's pointing position to the person sitting in Chair No. 1 at the conference table, and then store this position in Pre-set No. 1. Continue doing this until the chair positions of all the main presenters are stored in their own pre-set. Then, when each person talks, the individual controlling the camera can push a single button so that the camera zooms to the speaker and auto-focuses on his or her specific image.

Exterior windows allow enormous amounts of natural light to enter a room. While human eyes normally adjust to this lighting after a few minutes, the motion video videoconference camera does not have the same adjustment capability. If the camera is allowed to view a window, the auto shutter closes down significantly and the room looks like the inside of a cave. To solve this problem, draw the blinds over the windows, point the camera away from the windows, or use a room without windows.

Clothing and Backgrounds

Participants in a videoconference should wear solid color shirts or blouses that are light blue, gray or earth tones. Other colors, especially bright red or bright white, may make the clothing seem battery powered. Avoid stripes and patterned clothing that can seem to vibrate in video.



Figure 7-4: Camera controls can be pre-set to focus on individual participants.

Tip

When focusing a camera on an individual, remember that a person's image looks best when seen from the waist up, with about 10 percent of the picture area left above his or her head. If you'll need to focus on different groups of people during a videoconference, use pre-sets to create up to four views or segments of the room. During the conference, simply press one of your pre-set buttons to move the camera instead of trying to manually pan and zoom, which can be cumbersome.

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Don't forget the wall that's behind the speakers. Most conference rooms are painted a soft off-white color, which appears pale yellow to a videoconference camera. Most everything else the camera includes in the wall shot will also look yellow. The wall behind participants should be a flat, medium blue or gray color for best contrast. At the least, temporarily remove any artwork, photographs, or other designs on the wall. These complex images make the CODEC work harder, which further degrades the image clarity and motion of the participants.

Control Systems

Before a videoconference, familiarize yourself with the remote or console device that operates the CODEC. This device also controls the camera position and audio volume. Ask for a demonstration of its use and get answers to any questions you may have. Test the device before you use it. If possible, practice with the controls until they feel natural. This will reduce fumbling and give you confidence while you are conducting the actual session.



Courtesy of Tandberg

Figure 7-5: A remote control or console device allows users to place calls, adjust volume, and pan or zoom the camera.

Peripheral Equipment

In addition to audio, video, and control systems, most videoconference systems are equipped with several other devices. One of the more common is a videocassette recorder (VCR) that records either the outgoing or the incoming video. Though a VCR can be switched back and forth to record, it will not be able to record both incoming and outgoing images at the same time. Even if the actual meeting is not recorded, a VCR can be helpful during the test session. Use it to record the outgoing video so you can view how others will see your site. Watch the tape recording several times so you will be better prepared for the actual meeting.

The test session is also a good time to become familiar with how scan converters change PC images to TV format. During the test, you can view the slides or other objects you wish to present. This is the time to determine if any changes are needed to improve clarity.

Take-Along Equipment

A presenter normally takes the same things to a videoconference as he or she would take to any other meeting, including note pads, pager, cell phone, or a PDA. When you use a laptop computer to display slides, two additional steps are needed.

- Determine during the test session if the videoconference scan converter is compatible with your laptop.
- Take along the laptop battery charger so the laptop internal battery doesn't fail in the middle of a presentation.

Two connections are needed for the laptop—AC power and the video output port. Make certain the battery charger power cord reaches the AC power outlet. Some videoconference rooms have an outlet on the conference table, but others have only wall outlets. The connection to the video output port is usually on the conference table too, but don't count on that. You may need a special extension cable.

Finally, if you need to connect to the local area network (LAN) to retrieve presentation slides, e-mail, or other data, make certain the videoconference room has a LAN connection and that its cable reaches the laptop on the conference table. This is especially important if you are planning to conduct a simultaneous **dataconference**, such as Microsoft NetMeeting[®], with the other videoconference participants. In addition to communicating with audio and video, a dataconference allows participants to exchange graphics, transfer files, and use a text-based chat program.



Activity 7-1: Correcting Audio Problems

After the last two meetings held in a videoconference room you manage, participants have complained to you about being unable to hear the speakers. Prepare a checklist of the items you should examine in order to correct the problem.

Checklist for Correcting Audio Problems

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Activity 7-3: Improving the View

In past videoconferences, you've noticed that the view seen by observers is often of a room instead of a speaker; color sometimes is distorted; and patches of black occur during which the speaker can be heard but not seen. Occasionally, the person shown on camera is not the person speaking, or the view of the person is so far away that facial expressions cannot be seen. What recommendations would you make for improving the video?

Improving Video

Problem

Recommended Correction

1. View is of a room, although a person is speaking.

2. Everything looks pale yellow.

3. The scene goes black.

4. One person speaks, but another's face is shown.

5. The speaker's full body is shown, but facial expressions and gestures can't be seen.

Activity 7-4: Upgrading the Videoconference Room



A videoconference room used by the industrial waste company where you work is described below. Presenters often complain that the room is unsuitable. Analyze what is wrong with the room and describe what should be done to improve it for videoconferencing. If something other than the room appears to be a problem, identify the issue and suggest how to correct it.

Description of Room, Viewing, and Listening Conditions

Your company is located in a former high school building, and the large auditorium is used for videoconferences. Presenters stand or sit on the stage, and the video camera operator stands at the back of the room. Rows of large windows, some with drapes, run down two sides of the auditorium. To add brightness to the rooms, all walls and a large partition behind the speakers are painted white.

Viewers sit in the auditorium chairs and watch four televisions that drop from the ceiling at appropriate points. Often, the viewers have trouble understanding what is being said by the presenters.

Recently, viewers have been frustrated because what is seen on television flashes between bright or harsh colors, a blackout, or a long shot of the speaker.

Room problems and recommended corrections: _____

Non-room issues and recommended corrections: _____
