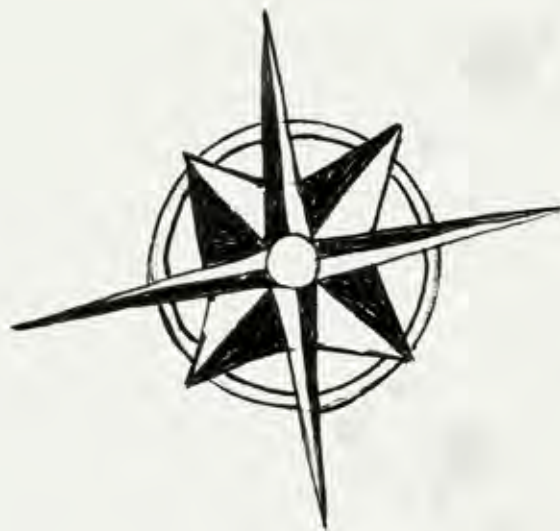


THE IT SURVIVAL GUIDE TO AUDIO CONFERENCING

**HOW TO AVOID UNHAPPY USERS,
UNPRODUCTIVE MEETINGS AND
HELP-DESK TICKETS**



BIAMP SYSTEMS

THE IT SURVIVAL GUIDE TO AUDIO CONFERENCING

AUDIO VISUAL: (aw-dee-oh-vizh-oo-uhl) (AV) adj. 1. The latest in a long list of IT responsibilities. 2. Source of help-desk tickets. 3. Category of sound and visual solutions such as audio and video conferencing.

If you've suddenly become responsible for managing your company's audio visual (AV) equipment, you're probably in survival mode. After all, AV is a far cry from deploying enterprise-wide CRM solutions or developing a data-storage strategy. It may be new territory, but the importance of the role you play in selecting and maintaining corporate AV systems will most likely grow.

AV is a broad category that encompasses many applications. The most common application for which IT managers are now responsible is conferencing. Audio and video conferencing systems are a key part of unified communication and collaboration strategies, a growing corporate trend. Coupled with this, conferencing hardware is going digital and increasingly being placed in corporate network infrastructures. IT managers who understand the unique requirements of AV systems and know how to avoid common audio pitfalls are an indispensable resource for their companies.

To succeed as the new "go-to" person for AV solutions in your organization, you need information. You need to know how to navigate a complex new terrain and find solutions to AV challenges like poor audio quality, user errors and system upgrades.

This Survival Guide is for any IT professional starting the journey into the land of AV. You'll learn how to navigate the AV landscape, find trusted resources, understand the language, and avoid making critical mistakes.

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STEP ONE: GET THE LAY OF THE LAND

Suddenly, you find yourself in unfamiliar territory. The first step in any survival situation is to survey your surroundings and look for familiar landmarks. The conferencing options may be new, but you'll find your network featured prominently in the AV landscape. Understanding the different conferencing options and how the network is used by AV systems will get you orientated.

Conferencing Options

A. Basic Audio Conferencing

The most basic audio conferencing scenario is a 4- to 6-person conference room that uses an IP or analog conference phone to call remote participants. A conference phone combines microphones, loudspeakers and user control into one integrated device. These phones often have built-in processing and acoustic echo cancellation (AEC) technology.



SURVIVAL TIP

Conference phones are designed for a small number of participants. If you push them beyond capacity, you'll end up with the "huddle" where users have to lean over the table to get close enough to hear and be heard. That kind of closeness is great for team building, but not so much for productive meetings. If you're getting complaints about your conference phones, it's time to look at a more advanced solution.



B. Advanced Audio Conferencing

An advanced audio conferencing system doesn't have built-in mics or loudspeakers; all these components are separate, giving the system more flexibility and control. The brain of the system is the digital signal processor (DSP). This appliance is installed in wiring closets or server rooms.

Installed audio conferencing systems are often part of a larger multimedia solution that includes electronic whiteboards, overhead projectors, sound reinforcement, video conferencing, web conferencing and touch-panel control systems.

Saying an installed audio system is a step above a conference phone is like saying a GPS is a step above a compass. In terms of quality and functionality, installed systems leave conference phones in the dust. That's why they are the system of choice for meeting rooms, boardrooms, training rooms, multimedia rooms, and presentation rooms.

C. Video Conferencing

Like audio conferencing, there are two types of video conferencing systems: the set-top unit and an installed system. The set-top video conferencing system has a built-in camera, microphone, display, loudspeaker, and codec. The codec converts video and audio to a digital signal, compresses it, and sends it over the network. It also decompresses the signal it receives so you can see and hear the remote participant.

The set-top is ideal for small rooms with a limited number of participants. If you have too many participants, you'll have the "huddle" once again, but this time it'll be on camera.

Installed video systems split out the different components, giving you a greater range of options for microphones, loudspeakers, cameras, display, and video and audio processing.

D. Telepresence

Another solution seeing impressive growth is telepresence. A step above high-end video conferencing, telepresence creates a highly realistic or immersive meeting experience where you feel like you are sitting across the table from the remote meeting participants. Complete telepresence solutions include multiple displays, video and audio conferencing capabilities, data sharing and other fixtures in the room. While there are lower-end systems, many come with a pretty hefty price tag—as high as \$300K or more for each end point.

Network Use

A. Ethernet

Many AV systems have network ports. A network connection lets you configure or control the system from your desk or remote location. This type of connection does not pass audio.

B. CobraNet®

CobraNet® is a Layer 2 Ethernet protocol that carries real-time, uncompressed digital audio over an Ethernet network. It is used to network the audio between multiple rooms. Using CobraNet can reduce costs by sharing audio processing resources between rooms.

If you want to learn more about networked audio and CobraNet, read the [Networked Media Systems](#)ⁱ white paper.

SURVIVAL TIP

Networked control is the perfect remedy for system-challenged users. Instead of making a trip to the meeting room only to discover someone has left the mute on, you can troubleshoot the problem from your desk or a remote location.

Since there is no compression, CobraNet is bandwidth intensive. For this reason, installers generally recommend putting CobraNet on a separate physical network or a VLAN.

C. VoIP

Once VoIP calling proved successful on the telecom front, AV manufacturers saw the potential of using the IP network for audio and video conferencing. The good news about VoIP-enabled conferencing systems is that it appears as just another network appliance with an IP address. It typically uses the commonly found session initiation protocol (SIP) to interact with the proxy server for all VoIP applications.

Want to learn more about VoIP conferencing solutions? Read [Bringing VoIP to the Conference Room](#)ⁱⁱ.

STEP TWO: LOOK FOR TRUSTED GUIDES

As your AV journey continues, you realize you can't go it alone. Regardless of your comfort level with audio conferencing equipment, you need resources to guide you through the process and steer you away from missteps that could land you in the swamp (the boss's office). There are four types of AV guides: AV consultants, AV integrators, manufacturers and industry organizations.



A. AV Consultants

An architect for new construction or renovation projects often brings in an AV consultant. The consultant typically creates a job specification based on customer requirements and sends it to integrators for bid. Acoustical consultants ensure the room design is optimal for conferencing.

B. AV Integrators

AV integrators are extremely helpful when you need an installed conferencing system. They come in many varieties—from global system design and integration firms to small local audio visual companies. Some provide consulting services but more generally, they handle the wiring, programming, installation, and support. If you don't currently work with an AV systems integrator, you can find one at www.infocomm.org.

C. Manufacturers

Many AV manufacturers have years of proven solutions, but are virtually unknown outside the AV sector. When evaluating AV vendors, name recognition alone can't be a mark of measure. Look instead at their longevity, success stories, and references. AV manufacturers sell their products through distribution channels that include manufacturer reps, dealers and integrators. The better manufacturers provide excellent customer support and offer training classes as well as online resources.

D. Industry Organizations

Industry organizations can be a hidden treasure of information. The AV industry has well established organizations that provide training and certification, knowledge resources,

events, and trade shows. Established in 1939, InfoComm International is one of the largest organizations. Synergistic Audio Concepts (SynAudCon) is an audio training company that provides training on the principles of audio and acoustics. The National Systems Contractors Association (NSCA) provides online resources about commercial electronic systems. Learn more at www.infocomm.org, www.synaudcon.com and www.nasca.org.

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STEP THREE: START LEARNING THE LANGUAGE



Armed with guides and a map, you are still at a disadvantage unless you know the lingo. As with any discipline, audio visual has a lot of terms and concepts that are meaningless to the uninitiated. When talking to AV professionals, it helps to speak the same language.

A. Inputs and Outputs

All conferencing and multimedia rooms have inputs and outputs. Inputs are where the audio source originates and include microphones, computers, audio players and phone

lines. Outputs are the destination for the audio and include loudspeakers, phone lines (to send audio to the remote participants), recording devices and computers.

B. Signal Flow and Processing

Input signals pass through a digital signal processing component to improve signal quality on the way to the output. The path the audio signal takes from input to output is called the signal flow.

C. Noise Cancellation

HVAC systems, projectors, people coughing or paper shuffling create background noise (also called ambient noise), which is often picked up by microphones. If this noise is sent to the remote participants, it's very hard for them to hear the voice audio above the noise. Noise cancellation technology removes the noise from the audio signal being transmitted.

D. Acoustic Echo Cancellation (AEC)

Sound coming from your conference room's loudspeakers (remote-caller audio) causes echo when it's picked up by the local microphones and sent back to the remote caller. Or the remote mic picks up your audio and sends back the echo. AEC works at the near-end for the remote caller only and ideally is implemented at both ends of teleconferencing applications. So if you hear echo, it's a safe bet the problem is on the other end of the call and the remote caller is not using AEC. Echo cancellation compares audio signals being sent, and then eliminates duplicate signals, or echo.

E. CLM

Career Limiting Move is what happens to you when you install bad audio. This survival guide helps you avoid CLMs.

SURVIVAL TIP

Bandwidth in the land of AV is not necessarily the same as network bandwidth. It can refer to the frequency range of the audio signal. For example, the bandwidth of a wideband audio signal is 7kHz.

STEP FOUR: PROTECT YOUR RESOURCES

Now that you've gotten the lay of the land, gathered some trusted guides, and learned a few key terms, you're ready to protect what you've got. Your time, and that of your team, is your most important resource. A problematic conferencing system can generate a lot of help-desk tickets but more important, can impede business. If audio quality isn't your top priority when you evaluate systems, it will be later on when you are held accountable for how it works. Watch out for these pits of audio quicksand waiting to swallow up your resources.



A. Poor Room Acoustics

No room is free from acoustic problems. The larger the room and the more microphones you have, the greater the challenge. Countering acoustic events such as reflections and reverberation takes careful planning. Otherwise, even the highest quality audio system sounds bad. An experienced room and system designer is your best protection against poor acoustics.

Take the advice of AV industry expert Pat Brown. "If your sound system doesn't sound good, ask yourself the question, 'What have I done to provide a good acoustic environment?' If the answer is 'nothing,' then you got what you paid for."ⁱⁱⁱ

B. Improper Microphone and Loudspeaker Placement

Aesthetics can take priority over appropriate room design. Executives may decide they don't want microphones drilled into an expensive boardroom table or a loudspeaker placed on a certain wall. These requirements, along with budget constraints, make room design a tricky business. Just like a home theater, loudspeakers need to be spaced to provide maximum coverage and best performance in the room without creating acoustic dead spots.

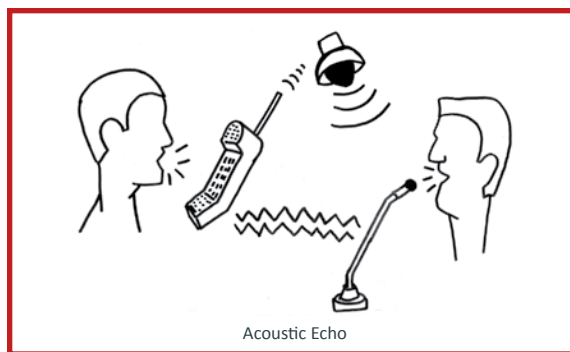
Microphone selection and placement is the other half of the equation. Microphones have a pickup pattern. Think of it as a flashlight beam. Sounds in the pickup pattern (or beam) are picked up and amplified. Some mics have a wide pattern and others are very narrow. The person talking must be the proper distance from the microphone and within the pickup pattern.

C. Low Quality Audio System

Selecting the right type of system for your room size and use requirements makes a big difference to your users' experience. Avoid the "huddle" with an installed system when you have too many participants for a conference phone. The system needs to have advanced audio technologies to ensure clear, natural sounding audio. One of the most common complaints from users in a conference is poor audio quality. Echo and noise cancellation are critical features for any conferencing system but not all echo and noise cancellation technology is comparable. That's where equipment demos and references help you evaluate systems.

D. User Controls

Outside of audio quality, ease of use—both in managing and operating—is likely the highest contributor to the success or failure of the meeting. If your audio system is a conference phone, the control device is easy—it’s called a dial pad. But when you move into more complex systems, myriad control options confront you. On the less complicated side are wall-mounted control panels or remote controls that handle dialing and volume. On the other end of the spectrum are touch panels that control everything from dialing to projection screens to lighting. Choose carefully. The more intuitive the control, the fewer complaints you’ll have.



E. Management and Maintenance

If you can’t fix a problem because you are stuck off site or a user can’t figure out how to make a call, the meeting will be delayed and productivity lost. Networked systems give you the power to monitor and control all applications and components from anywhere on the network—even remotely. To learn more, read the [Networked Media Systemsⁱ](#) white paper.

Keep an eye to the future and make sure you can easily integrate additional products as the need arises. For example, will you be able to easily add new functionality, such as IPv6 compatibility, or will you need to rip out and replace your system? Installed audio conferencing systems that are card-based make it easy for you to expand inputs and outputs as necessary, including VoIP, Telephone, AEC and even amplifier module cards.

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STEP FIVE: KNOW YOUR BOUNDARIES



The final key to survival is to know your boundaries. Should you scale the rock face on your own or have someone at the top throw you a rope? The same principle applies to audio visual. You could spend decades gaining expertise in all facets of AV, but unless you’re looking for a new career, it’s better to get the guidance you require to survive, and maybe even get ahead.

You don’t have to master audio theory and room design, but it is critical to understand what factors contribute to poor audio quality and a bad user experience. You don’t have to know how to program the system, but you should understand when to choose a conferencing phone and when you need an installed system. By knowing how to ask about networked control and audio capabilities, you’ll spare yourself some setbacks down the road.

A. Your Secret Weapon

With years of VoIP experience, Biamp Systems continues to deliver innovative, quality conferencing solutions for the enterprise. To learn more about professional VoIP conferencing systems, room considerations and network requirements, visit the Biamp Systems web site at www.biamp.com. You'll find a number of resources including learning modules, configuration questionnaires and technical notes ranging from system design and examples to product integration.

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ABOUT BIAMP SYSTEMS

Biamp Systems is a leading manufacturer of professional-quality AV systems and products. Through a worldwide network of systems integrators, distributors, and independent representative firms, Biamp delivers products that meet the audio requirements for a range of applications, including corporate boardrooms, conference centers, performing-arts venues, courtrooms, educational campuses, hospitals, stadiums and recreational facilities.

Biamp is headquartered in Beaverton, Oregon (USA), its base of operation for more than 30 years. The company's innovation is reflected in systems that provide the greatest efficiencies to customers, and unmatched performance and cost savings to end users.

To speak to a Biamp representative, please call +1. 503. 641. 7287 or use the online contact form at www.biamp.com.

References

¹The Rise of Distributed Audio over Ethernet Networks, Biamp Systems, 2010. http://www.biamp.com/micro/nms/whitepaper/Biamp_The_Rise_of_Distributed_Audio-over-Ethernet_Networks.pdf

²Bringing VoIP to the Conference Room: How IT Managers Can Enhance the User Experience, Biamp Systems, 2010.

³The Weakest Link – The Reason for “Bad Sound” in Your Venue May Not Be the Sound System! Pat Brown, 2010. <http://www.synaudcon.com/resources/content/the-weakest-link-the-reason-for-bad-sound-in-your-venue-may-not-be-the-sound-system/>