

# The Sound of Justice

*Ensuring that judges, attorneys, defendants, and court reporters can hear one another is a tall order. Here's what to consider.*

By Tim Kridel

One way that the judiciary encourages respect is by holding court in venues that are frequently cavernous and clad in high-end finishes such as marble and hardwoods.

Unfortunately that's also the kind of environment that gives acoustical designers, technology managers, and other AV pros fits.

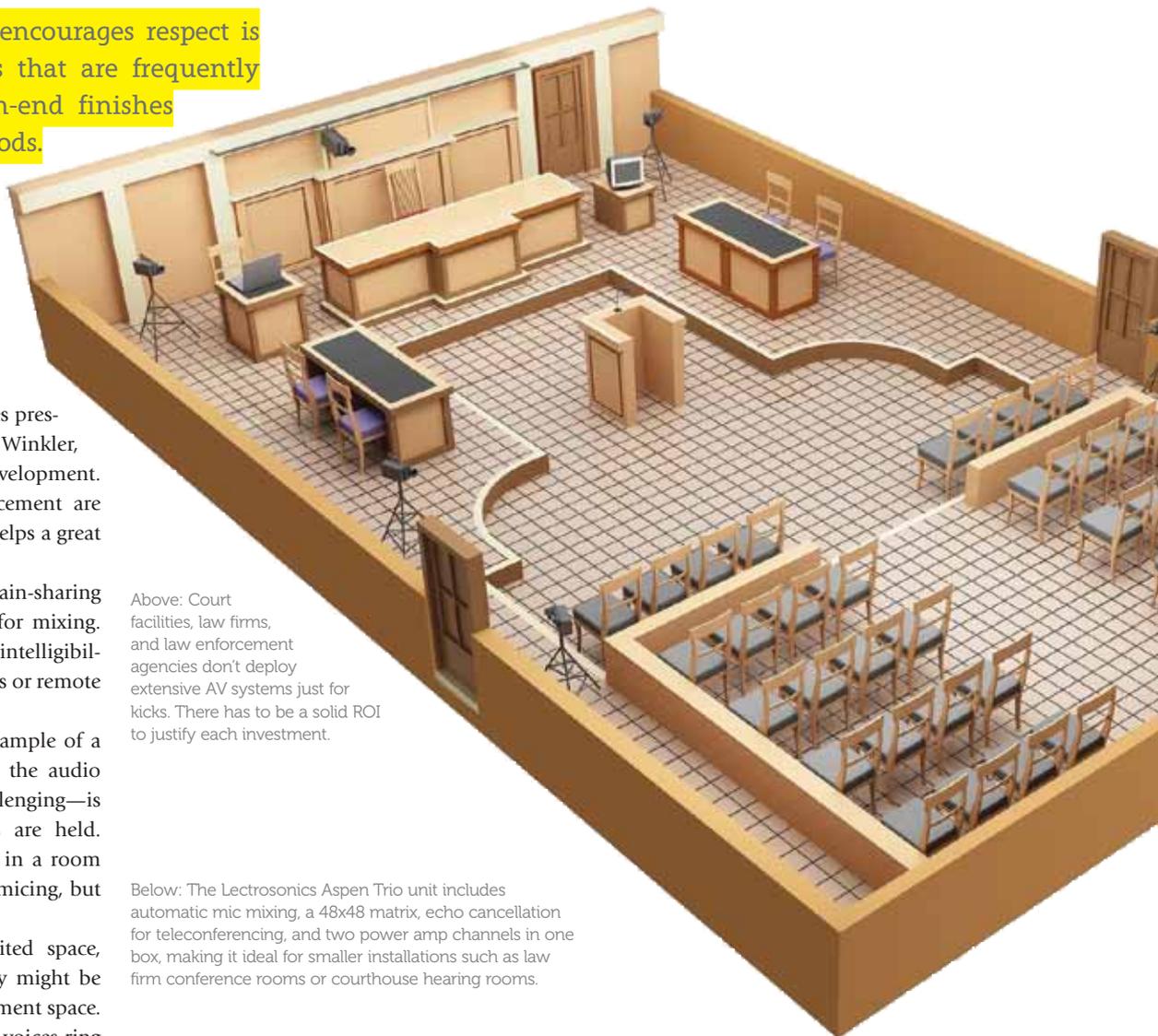
"Large rooms with reflective surfaces present particular challenges," said Karl Winkler, Lectrosonics director of business development. "Proper microphone choice and placement are step one. Then, proper gain structure helps a great deal to keep noise out of the system.

"Next is a good auto mixer using a gain-sharing method rather than a gated method for mixing. Finally, echo cancellation is critical for intelligibility at the far side, such as hearing rooms or remote sites via teleconference."

Law firm offices are an obvious example of a remote site, but another—one where the audio environment can be even more challenging—is the place where video arraignments are held. Ideally, all legal participants would sit in a room with the right lighting, acoustics, and micing, but that's not always the case.

For example, if the jail has limited space, budget, or both, the end of a hallway might be converted to a makeshift video arraignment space. That means that the legal participants' voices ring off the cinder block walls, creating intelligibility problems for the judge. In that situation, mic placement is key.

"The acoustics will be a nightmare—no sound absorption whatsoever," said Tim Root, Revolabs CTO and executive vice president of new business development. "So having a mic close to the per-



Above: Court facilities, law firms, and law enforcement agencies don't deploy extensive AV systems just for kicks. There has to be a solid ROI to justify each investment.

Below: The Lectrosonics Aspen Trio unit includes automatic mic mixing, a 48x48 matrix, echo cancellation for teleconferencing, and two power amp channels in one box, making it ideal for smaller installations such as law firm conference rooms or courthouse hearing rooms.



for appropriate coverage. "

But installing loudspeakers all over the courtroom might not be an option for reasons such as aesthetics, budgets, and cable runs. Conferencing mics with onboard speakers can be an alternative.

"These speakers do a fantastic job of creating a local sound field—basically a low-level, distributed sound system—which is a perfect solution for acoustically challenging environments like courthouses," said Patrick Herlihy, Media Vision USA senior product manager. "This local sound field also allows the overhead speakers to be kept at a lower level, resulting in greater pick-up pattern and gain before feedback from the conferencing microphones. That increases the quality of the audio both locally and remotely."

If the facility is new construction or a major remodel, there's more flexibility for speaker and mic placement.

"The speaker system should also be set up in multiple zones—typically four: judge, well, jury, and gallery—which will help to prevent feedback from open microphones," Lofredo said. "Feedback is created from a participant's audio coming from a ceiling speaker before it gets to an open microphone. So we zone out the judge's audio from the ceiling speaker that is in his/her zone."

Mics and loudspeakers increasingly aren't the only tools used to ensure a great audio experience in both courtrooms and adjunct facilities.

"One of the trends that started some time ago but continues to gather steam is the use of high-quality auto mixing," said Lectrosonics' Winkler. "For courtrooms in particular, this technology greatly enhances the ability of the courts to do automated recording and attendant-free sound rein-

***"Reducing the time in which trials can take place has a huge impact on the average per-trial cost and should be taken into account when assessing the ROI."***

***—AJ Shelat, Hall Research***

Ideal for government and legislative facilities, TAIDEN's flush-mounted unit features built-in electronic voting buttons.



# Making a Case for Convergence

*AV and IT are slowly converging in courthouses, prisons, and other legal facilities. That's creating opportunities to work more efficiently and effectively, but the jury is still out on the related challenges.*

By Tim Kridel

Add judicial and law enforcement facilities to the growing list of places where AV and IT are converging. And like their counterparts in general enterprise and other sectors, legal technology professionals face a variety of challenges, from security concerns to usability.

For example, enterprise IT managers often balk at

allowing AV traffic such as video to run over their networks for reasons such as security and bandwidth. There and in the legal sector, that resistance is starting to wane, partly because technology has evolved to address their concerns. Case in point: the use of video for applications such as remote arraignment and testimony.

"In early 2005, we saw an early adoption of videoconferencing over IP," said Adam Lofredo, ExhibitOne strategic account manager. "This was an IT nightmare since video consumed a lot of bandwidth. Eventually

the videoconferencing manufacturers co-created the H.264 video standard, which was a compression algorithm that allowed decent videoconferencing calls at much lower bandwidth: typically 384 kbps.

"At the same time, the IT industry started making investments in the 10/100 MB switches. This combination allowed us to see most videoconferencing today run over IP."

HDbaseT and Audio Video Bridging (AVB) are two other technologies increasingly used in courthouses and other facilities so audio and video can share the same Cat cabling. The next step is to have AV and IT share that and other infrastructure.

"We are currently not seeing the AV systems run over an existing network because of the network demands that AV requires," Lofredo said. "However, the IT and AV networks are being run in parallel and cohabit in the same backbone pathways and server rooms. Over the next few years, as IT departments deploy gigabit backbone systems, we will most likely see a harmonic convergence where AV and IT are all run on the same network."

It's important to ensure that sharing infrastructure doesn't make AV vulnerable to eavesdropping or create a back door into IT systems.

"It is critical to keep data secure, whether it's streaming video or sensitive data that is on the courthouse's network," said AJ Shelat, Hall Research vice president of sales. "As AV has evolved, so has IT, and they each have the tools to share the physical space and keep sensitive data secure."

But not all resources will be shared, including between just AV users. For example, court security might not want to use the same camera systems that support video arraignment. An InfoComm—



Phoenix, Arizona-based ExhibitOne has designed more than 1,500 courtroom systems, including this one.

American Institute of Architects committee that's developing AV guides for designing courts and correctional facilities has explored that kind of sharing.

"They keep saying no, that they want better cameras for what they're doing—such as video arraignment—than what the court security people will have," said Bob Schwartz, a committee member who's also HOK group vice president and justice project designer.

### OBJECTION: WHO'S IN CHARGE OF THE TECHNOLOGY?

Someone has to run all of those AV and IT systems, regardless of whether they're converged.

"It varies by jurisdiction, but it could be the court clerk, a bailiff, sometimes the court reporter," Schwartz said. "I think you're pretty lucky if you've got an AV person in the courthouse."

Day-to-day operations aren't a minor issue. It's just the opposite: If AV and IT systems aren't working effectively together or at all, it undermines their ROI. Even so, it's not uncommon for court reporters and other legal professionals to have AV and IT operations more or less dropped in their lap with little training.

"While the AV systems may be managed and maintained by someone who is highly trained and experienced, depending on budgets, it is often likely that the user of the system will have only basic training to use the system efficiently in order to get the job done," said Hall Research's Shelat. "Whether it is



Large legislative venues pose many of the same challenges as courthouses and government facilities—ensuring consistent audiovisual performance with an interface easily usable by myriad participants. **The Connecticut Legislative Office Building, pictured here, features a customized audio unit with a bronze-plate finish. The microphone system is part of the TAIDEN HCS-4100 Digital Conferencing System line.**

the bailiff or someone else, the responsible person in the room already has a core job, and controlling the AV routing is just an added responsibility they are charged with. "

One reason for limited training is money.

**"In a world where everyone is trying to cut their budgets, there are an increasing number of those responsible for these systems that have not been properly trained in AV,"** said Patrick Herlihy, Media Vision USA senior product manager. **"This makes it incumbent upon us as AV professionals to ensure that the technology we bring to the table is designed and integrated to be as user-friendly and intuitive as**

**possible."**

When comparing vendors and integrators for an AV or IT project, another thing to look for is their ability to train staff on newly installed systems.

"Proper training for basic features and operation should be a major consideration," Shelat said. "We have seen the knowledge level vary considerably from one facility to another, but also from one bailiff to another. It is the job of the dealer and/or installer to provide adequate documentation and training for each installation."

AV/IT training also varies significantly at the law school level, so it's a mistake to assume that attorneys will always know how to run a control panel or connect their laptop to the projector.

"Insofar as I am aware, most law schools do not address AV issues except insofar as they might come up as issues in a given course," said Fred Lederer, William & Mary Law School Chancellor professor of law. "Even then, a criminal procedure course, for example, might not even discuss the existence of remote arraignment or for Sixth Amendment confrontation clause purposes, remote testimony.

"A fair number of law schools do have technology-enhanced courtrooms for training students in trial practice. The degree to which that technology is used is very unclear and likely dependent on each individual teacher."

## Legal BYOD: Bring Your Own Dilemma?

One big difference between courtrooms and enterprise conference rooms is that the latter often limit the types of laptops, tablets and other devices that they'll support from an AV perspective. That leaves courthouse technology managers to figure out which interfaces to support at attorneys' tables and elsewhere.

"Increasingly courtrooms are moving towards a bring-your-own-device (BYOD) model, where more attorneys bring their personal devices, including iPads and various tablet devices," said Martin Gruen, deputy director of the Center for Legal & Court Technology, a joint experimental project of the William & Mary Law School and the National Center for State Courts. "Knowing this ahead of time, and planning for these work style differences and expectations, ensures that every word is captured and recorded."

But that's easier said than done. For example, each courtroom would need the most commonly used adapters to connect devices to AV gear such as projectors. If that's the strategy for dealing with BYOD, then it's important to keep an eye on which interfaces device vendors are adding and dropping from their product lineups.

Unless a case involves, say, copyright infringement, it's unlikely that an attorney or expert witness would need to display content that's HDCP protected. Even so, content protection is something to keep in mind when troubleshooting because it's not uncommon for a device such as a Mac to turn on HDCP even when the content doesn't require it.

One way to minimize BYOD headaches is to provide PCs in each courtroom. Then attorneys, expert witnesses, and other non-staff can bring in their content on a disk or flash drive. But that option might not fly.

"If their computer doesn't have the same fonts, it throws off the formatting," said Bob Schwartz, HOK group vice president and justice project designer.

Although tablets, laptops, and even smartphones are the best-known examples of BYOD, they're not the only types of devices that technology managers and courtroom staff have to contend with. Document cameras are another.

"The variety of hardware presents a challenge because they're all sources that need to be integrated into the system," Gruen said.