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Jerky Pictures and Sound Are History. Video Conferencing Is All Grown Up.



Peter Yates for The New York Times

Kevin Callahan of Seattle equipped his Power Mac G5 with Apple's iChat videoconferencing software, iSight camera and mic package, GarageBand music mixer and carefully selected lighting equipment to teach guitar over the Internet.

By PETER WAYNER
Published: June 16, 2005

When Kevin Callahan started offering classical guitar lessons over an Internet video link, he wanted the sound to be as close as possible to being in the same room. After experimenting, he built a system that channeled three guitars, a microphone, and an orchestral synthesizer through a professional mixing board to his Macintosh. From there, he blended the sound with [Apple's](#) GarageBand software before sending it out over the Internet.

"It's not necessary," he explained a bit nonchalantly, "but it gives me quite a bit of flexibility."



Now, he sits in his studio in Seattle and teaches students in Florida, California, Massachusetts and Spain. Some of his local students even use the system when time or illness keeps them from traveling to his house.

More and more people are exploring the options Mr. Callahan has, as videoconferencing grows up. Faster computers and Internet connections make it possible to replace the pixelated, jerky pictures the size of a postage stamp with a full-screen image that updates as gracefully as

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DVForge offers a camera holder called SightFlex that can be positioned midscreen for eye-to-eye conversations.

a movie. Better microphones and sound-mixing tools offer richer and more realistic sound.

This higher quality, alas, also exposes more aesthetic flaws and gives rise to an arms race to improve the quality of the sound, the lighting and the picture. Special software packages that enhance the image quality are appearing, and dedicated hardware is becoming common. Some businesses are even building special studios for videoconferences.

Practically every part of the video chatting experience can be enhanced, but it helps to begin with a good camera. There are a number of adequate ones on the market at prices lower than \$50, but many rely on low-grade sensors using C.M.O.S. technology (for complementary metal oxide semiconductor) that offer lower resolutions and send fewer frames a second. From Logitech (www.logitech.com), for example, the low-end QuickCam for notebooks has a \$39.99 list price and delivers 15 frames a second at a maximum resolution of 640 by 480 pixels.

A better camera like Logitech's top-line Orbit (\$129.99) uses a technology called C.C.D. arrays, for charge-coupled devices, which helps generate better color fidelity at a higher speed. The Orbit can produce 30 frames a second if the main computer has enough processing power.

Video resolution is not the only target for improvement. Apple (www.apple.com), for instance, added a better noise-canceling microphone to its iSight camera, priced at \$149.99. The newest version of the Macintosh operating system also includes a more sophisticated video compression algorithm called H.264.

Some users are even turning to hand-held video recorders and connecting them to their computers. While these devices are often much more expensive than basic cameras built for computers, they often have the internal electronics that make it possible to attach them to a computer. More important, they usually have better sensors and better lenses that generate richer, more detailed images.

The camera is just the beginning. Practically everyone agrees that good lighting is essential. Room lights may leave uneven shadows on your face, and bright windows in the background can overwhelm the camera and turn a face into a black hole. Many are now turning on desk lamps or other lights behind the camera to add more light to the face of the person behind the computer.

"The first item on my list is having good lighting," said Bob Summers, the president of nanoCom, the company behind the video chat program iSpQ (pronounced "I speak"). "Office lighting is horrible. Having nice, soft lighting is essential. What you want to do is make the video compressor work better at what it does."

The compression algorithms in the video chat software save bandwidth by detecting large blocks of similar colors and replacing them with a mathematical shorthand. Noise and extra shadows create extraneous detail and reduce the opportunities for savings. That is why it is often best to wear clothes with solid colors and speak before a simple, unadorned backdrop.

If your desk lamp is proving inadequate, Griffin Technology (www.griffintechology.com) is now selling the SightLight, a doughnut that sells for about \$35 and wraps around the Apple iSight camera to bathe the camera's target in what the promotional literature calls "a direct but diffused light." It illuminates without generating too much glare.

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Some other improvements are mechanical. One frequently cited problem is the disconnection between the image on the screen and the camera set up to the side. No one can look at the screen and the camera at the same time and so eyes never meet.

Logitech is trying to solve this by placing its Orbit camera on the end of a nine-inch boom that lets it rest in the middle of the screen. While the camera eclipses part of the screen, the user can look at the screen and the camera at the same time. If both sides use it, eyes can come much closer to gazing into each other.

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