



# ENABLE EVERY ROOM. ENABLE EVERY PERSON.



## Logitech Video Conferencing Technology Backgrounder

Logitech® ConferenceCams are changing the way teams collaborate, opening new possibilities and eliminating old boundaries. Logitech is making it possible for groups to collaborate anytime and anywhere with products designed for small to large-size rooms.

Logitech was an early pioneer of webcams over two decades ago and has contributed to video conference innovation ever since, helping to transform usage from a novelty to a genuine productivity tool in the process.

Until recently, companies that wanted high-quality group video conference capabilities had to invest in complicated, expensive telepresence systems that

frequently sat unused in rooms reserved mostly for executives. With the launch of the ConferenceCam BCC950 in 2012, Logitech introduced its first video conference solution specifically optimized for groups. As the first communications tool to combine a full HD webcam with a high-quality speakerphone capable of full-duplex communication in an all-in-one USB device, ConferenceCam BCC950 solved the pervasive user experience issues of the day.

Willing to make do with basic desktop capabilities, employees were taking their laptops into conference rooms as the new video conferencing solution but the quality of the experience wasn't that good. Putting a laptop at the end of a

conference room table, they'd squeeze and maneuver in front of an embedded camera, leaning in with enthusiasm, hoping the video might pick them up and trusting that what they said would actually be heard. But with personal space uncomfortably invaded, ideas were often left unsaid, members were left out, and collaboration was many times more awkward than awesome.

Now with GROUP and ConferenceCam Connect, Logitech has achieved breakthroughs in quality and affordability that have opened group video conferencing to the masses — solutions that make face-to-face collaboration available to everyone, anytime and anywhere for about the price of an office chair.

# Logitech ConferenceCams: The Technology Behind the Products

## Towards a Better Video Collaboration Experience

To design products that are so intuitive people actually love to use them, Logitech looks to customers to understand the right questions to ask and the user pain points to bring these products to market. In short, customer feedback informs innovation. So the first step in developing a new product is, always, to listen.

With regard to group video collaboration, customers told us they wanted better optics and sound quality than what was available with a webcam and laptop. High on the wish list: sharper video resolution, a wider field of view, and the ability to pan, tilt, and zoom — plus the ability to experience high-quality, natural-sounding audio on par with business-grade speakerphones.

In addition, IT managers recognize that plug-and-play simplicity equals fewer calls to the help desk, so ease of use is an ongoing priority for end users and IT organizations alike.

Logitech aspired to address each of these goals with the launch of the ConferenceCam category. From the original ConferenceCam BCC950 to the portable ConferenceCam Connect to the recently launched



Logitech designs, tests, and refines ConferenceCam optics to optimize image quality factors such as sharpness, distortion, tone reproduction, color accuracy and dynamic range. Test patterns (like the Siemens Star shown here) are used for calibration, alignment, and troubleshooting the signal path as well as fine-tuning corner-to-corner sharpness

Logitech GROUP, here's a look behind the scenes at what it takes to bring it all together.

### State-of-the-Art R&D

Logitech engineers shied away from off-the-shelf solutions, preferring to invent and build products in the ConferenceCam portfolio from the ground up to create game-changing results.

The optical lab at Logitech's Newark, California location, for example, is a hub for custom lens and optical system design to produce razor sharp, accurate images at all resolutions.

Logitech designs and optimizes all ConferenceCam lenses — one of the most important elements of a video camera — and works with manufacturers to produce optical components of outstanding quality. All Logitech ConferenceCams include autofocus optics certified by ZEISS® that deliver razor-sharp video resolution wherever the lens is pointed.

Specialized labs enable Logitech engineers to automate many test and measurement processes for consistency, repeatability, and speed. One such lab, an automated image quality test bench, measures MTF (modulation transfer function), distortion, and color accuracy under a variety of controlled lighting conditions. The results enable Logitech engineers to optimize each variable to ultimately

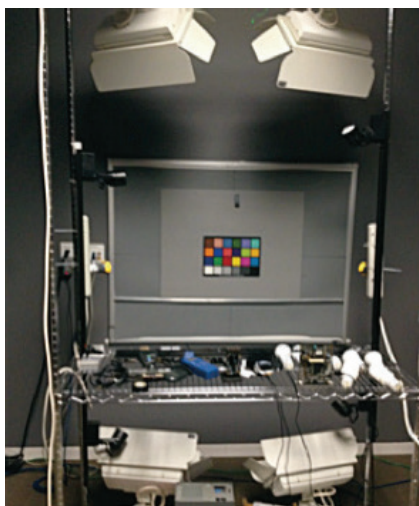
produce and manufacture optical systems that accurately and beautifully render shapes, contrast, color, and other visual details, even in low light environments.

Other Logitech labs zero in on optical variables such as sharpness and alignment. Without extensive testing and optimization, edges in a scene can be incorrectly sharpened such that the image appears unrealistic. Test patterns, such as a Siemens Star, help Logitech engineers adjust and verify lens attributes while the Optical Design lab measures lenses for accuracy, sharpness, clarity, and proper construction according to specification.

### See and Be Seen

One of the key attributes that distinguish a ConferenceCam from most laptop cameras and webcams involves Field of View (FOV): how many people can be seen through the camera lens at the same time.

Logitech ConferenceCams feature a wide-angle FOV suitable for seeing and interacting with multiple people seated at a conference table simultaneously, whereas many webcams and onboard cameras are typically tuned to "see" single individuals sitting in front of a computer screen. Unlike the "fish-eye" effect produced by some wide-angle optics, Logitech ConferenceCams are engineered to

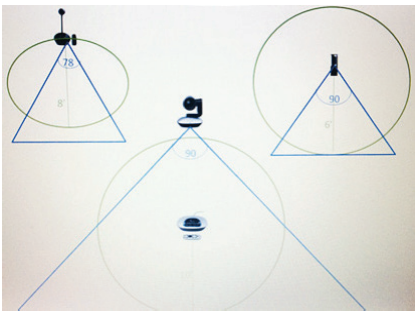


Logitech's automated image quality test bench measures optical performance under controlled lighting conditions ranging from fluorescent to daylight to ensure color accuracy

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minimize distortion and render a natural appearance to every-thing in the camera's field of view.

In addition to generously wide fields of view, Logitech ConferenceCams also feature the ability to pan and tilt. Logitech GROUP, for example, features a 260° pan range and the ability to tilt 130°, which provides an extra-wide visual range when meeting with mid-to-large sized groups.



Field of View (FOV) determines how many people can be seen through the camera lens.



GROUP features a 260° pan range and the ability to tilt 130°, which provides an extra-wide visual range when meeting with mid-sized groups.

Logitech ConferenceCam cameras also pan, tilt, and zoom (up to 10x lossless HD zoom on GROUP). Greater visual versatility increases the quality of face-to-face interaction, which makes for better, more productive meetings.

Far-end camera control<sup>2</sup> enables ConferenceCam Connect and GROUP users in one location to operate the camera pan, tilt and zoom functions of a Logitech Webcam C930e, BCC950, ConferenceCam Connect or GROUP

on the other end of the call. This feature — available for peer-to-peer calls in Microsoft® Lync® and Skype for Business deployments — provides unprecedented visual flexibility during video conference meetings.

## H.264 Video Compression

More than any other single factor, advances in compression technology have made video conferencing practical for widespread use. The reason is that, by reducing bandwidth, compression makes it possible to transmit huge amounts of video data over a network without overloading the network infrastructure.

Logitech was an early adopter of the H.264 video compression format. The high video quality achievable through a combination of H.264 compression, precision optics, and advanced engineering creates a realistic user experience during video conferences that ultimately leads to better meetings.



## SVC: Scalable Video Coding

Scalable Video Coding (SVC) extends the encoding of a high-quality video bitstream containing one or more subset bitstreams (or layers) that can be decoded by a variety of client de-vices — everything from mobile phones and tablets to laptops and HD screens.

An SVC encoder creates multiple streams of information, composed of a base layer and multiple enhancement layers that address spatial resolution (screen size), temporal resolution (frame rate), and the quality of the video signal. “Scalability” refers to the removal of parts of the video bitstream when decoded in order to adapt it to the various display capabilities of client devices and/or network bandwidth limitations.

In the case of Logitech ConferenceCams, lower temporal resolution (lower frame rate) enables users to participate in video conferences regardless of their client device, while also reducing the strain on the devices both sending and receiving the video. The result: extreme flexibility for users on the road, in the office, working from home, or any place else where productive collaboration happens.

## UVC: USB Video Class

UVC is an acronym for “USB video class” that describes devices capable of streaming video like webcams and ConferenceCams. UVC allows video and video features (i.e., pan, tilt and zoom, color balance, etc.) to work uniformly across most VC applications.

In addition to its plug-and-play characteristic, one of the key benefits of H.264 UVC 1.5 is that it offloads video encoding from the PC to the camera. The result is a smoother video stream, providing a positive response to user requests for a clearer picture with fewer dropouts. Plus, with substantially less demand on the computer's CPU<sup>3</sup>, computer crashes due to CPU overload are dramatically reduced — another benefit contributing to a positive overall user experience.

Logitech was the first company to build and release UVC 1.5 webcams and ConferenceCams that feature H.264 encoding in the camera. Now the combination of H.264 SVC in a UVC 1.5 camera is a standard feature on all Logitech ConferenceCams.

## Hear and Be Heard

Every Logitech ConferenceCam includes an enterprise-grade speakerphone, which provides an audio experience on par with the ConferenceCam's outstanding video qualities. Omni-directional microphones enable spherical pickup of audio from all directions while audio processing allows for full-duplex conversations. The result: a full sound experience and free-flowing conversation with no dropouts on either end of the call.

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Other business-grade audio enhancements include Digital Signal Processing (DSP) that enables precise tuning for both the mic and speaker so conversations sound more lifelike, wideband audio that ensures those on both sides of the call enjoy a rich, full-bodied listening experience, and acoustic echo cancellation and noise reduction technology to help users hear and be heard even in noisy workspaces.



Logitech GROUP, like all Logitech ConferenceCams, includes a speakerphone.

## Stringent Compliance Testing

Today's workplaces are abuzz with activity, much of it invisible in the form of sound waves and other signals transmitted by all manner of electronic devices. To comply with international electromagnetic emission standards, Logitech performs extensive on-site testing before submitting our products to third-party certification labs.

We use an Electromagnetic Compatibility (EMC) semi-anechoic chamber for such testing to ensure that our ConferenceCams don't interfere with other electronic products, including those that transmit TDMA/cell phone, Bluetooth®, USB, AM/FM and/or RF wireless signals.

This stringent compliance testing ensures that every Logitech ConferenceCam will integrate seamlessly into the wider business ecosystems where they're used.

## Raising the Bar: Wireless Screen-Mirror Projection

With ConferenceCam Connect, Logitech has introduced the ability to display content from a mobile device onto whatever HDMI-enabled screen



Beyond the door to this EMC chamber, Logitech performs tests to ensure compliance with international electromagnetic emission standards.



is used for the video conference, typically an HD TV panel. This means that any meeting participant can wirelessly "screen mirror" whatever they see on their compatible mobile device<sup>4</sup> onto the main video conference screen for everyone else to see.

Screen mirroring can be useful when giving a presentation, reviewing a spreadsheet, or sharing Internet content. With ConferenceCam Connect, this function is available out of the box for use with Android and Windows 8.1-compatible mobile devices.

## Broad Compatibility

All Logitech ConferenceCams offer multiple ways to connect. For starters, all are compatible with both PC and Mac<sup>5</sup>. ConferenceCam Connect and Logitech GROUP are also Google Chromebook-compatible<sup>6</sup> and feature Bluetooth and Near Field Communication (NFC) for wireless connectivity with mobile devices.

Logitech ConferenceCams offer plug-and-play compatibility across all UVC-compliant applications.

Compatible applications include Adobe® Connect™, Avaya®, Blue Jeans, BroadSoft, Cisco Jabber® and WebEx®, Citrix® GoToMeeting®, LifeSize® Connections™, Apple® FaceTime®, Google® Hangouts™ and Chat™, Microsoft® Lync®, Skype for Business, Skype™ and Office 365™, Vidyo®, and Zoom.

This broad-based compatibility enables users to choose whichever video conferencing application they prefer with no need for additional software drivers.

## Stylish Design, Clever Features

Every ConferenceCam in the Logitech portfolio is designed with a rich feature set that makes each uniquely valuable in different settings and for a wide range of collaborative needs. The original ConferenceCam BCC950, for example, is an amazingly affordable all-in-one video conference solution ideal for small group collaboration in private offices, huddle rooms and home offices.

Logitech's award winning ConferenceCam Connect offers easy portability and an all-in-one design perfect for larger groups of one to six. The sleek cylindrical shape and lightweight design (27 ounces) makes ConferenceCam Connect easy to carry from office to office or toss into a carry-on bag for use in destinations more distant.

As the first ConferenceCam to run on battery power (as well as AC and USB), ConferenceCam Connect also offers flexibility to leave the power cord behind. Users can run video calls/screen mirroring for up to three hours or use the speakerphone for up to 15 hours with a fully charged battery. LED indicators report battery charge

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status during use. The time required to recharge the battery from AC power is three hours with the device idle.

Logitech GROUP, the newly released flagship in Logitech's video conference portfolio, offers best-in-class performance that easily turns any mid-size conference room into a video-enabled collaboration room for groups of up to 20 people. Extra touches like an LCD that displays call-related info (Caller ID, call duration, etc.) increase usefulness while multiple mounting options make installation fully customizable.

Every Logitech ConferenceCam also includes a remote control, providing the option to operate camera and call functions from either the remote or the

speakerphone. In addition, Kensington security slots integrated into ConferenceCam Connect and GROUP help provide simple security from theft.

## Business Certifications Ensure VC Compatibility

Although most PC webcams are USB video-class compliant, business certifications provide extra assurance of a seamless integration with leading VC applications.

For enterprise-level deployments, business certifications (i.e., Optimized for Microsoft® Lync®, Certified for Skype for Business, and Cisco® compatible?) provide confidence that our ConferenceCams are business-ready right out of the box.

In addition, members of the Logitech Collaboration Program<sup>8</sup> have implemented integrations to provide an enhanced user experience.

## Conclusion

Logitech has opened the door to a new era of business-grade video conferencing defined by ease of use, affordability, flexibility, and video conferencing software application independence. For businesses of every size, Logitech makes collaboration easy through brilliantly simple ConferenceCam solutions that real people love to use.

## Room Set-Up Determines Choice

Which ConferenceCam is best for Optimal A/V Performance



# Are you an enterprise deploying Skype for Business, Microsoft® Lync® or Cisco Jabber®?

You may qualify for a Logitech Video Collaboration product trial.

Apply at: [www.logitech.com/skypeforbusiness](http://www.logitech.com/skypeforbusiness)  
or [www.logitech.com/cisco](http://www.logitech.com/cisco)

To order, contact your reseller or call us at 800-308-8666



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<sup>1</sup> With Microsoft® Lync™ and Vidyo deployments;  
Lync requires plug-in download.

<sup>2</sup> With Microsoft® Lync™, Skype™, Cisco Jabber™  
and Vidyo deployments

<sup>3</sup> With NFC-enabled mobile devices

<sup>4</sup> See [www.logitech.com/ciscocompatibility](http://www.logitech.com/ciscocompatibility)  
for the latest version.

<sup>5</sup> Compatible with Windows® Vista®, Windows® 7  
and above; Mac® OS X® 10.6 and above

<sup>6</sup> Google Chromebook version 29.0.1547.70,  
Platform 4319.79.0 with: • 2.4 GHz Intel® Core 2  
Duo processor • 2 GB RAM or more • Hard drive  
space for recorded videos • USB 2.0 port (USB  
3.0 ready)

<sup>7</sup> See [www.logitech.com/ciscocompatibility](http://www.logitech.com/ciscocompatibility) for the  
latest version

<sup>8</sup> Refer to [www.logitech.com/lcp](http://www.logitech.com/lcp) for the current list  
of participants in the program

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