

# Lesson: Introduction to Video Conferencing

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## Learning Objectives

On completion of this lesson, you will demonstrate an understanding of the components of a video conference. You will know how to:

- Define a video conference
- Define the advantages of video conferencing
- Define an audio conference
- Define a multi-site conference
- Recognize audio input and output devices
- Recognize video input and output devices

# What is Video Conferencing?



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Introduction to Video Conferencing

Video conferencing or video communications is the ability to communicate with other people as if they were in the same room. For video conferencing to really succeed, participants need to be able to see, hear and use meeting tools regardless of whether participants are in the same room or across the other side of the world.

Video conferencing is defined as (by [www.whatis.com](http://www.whatis.com)): “a live connection between people in separate locations for the purpose of communication, usually involving audio and often text as well as video. At its simplest, videoconferencing provides transmission of static images and text between two locations. At its most sophisticated, it provides transmission of full-motion video images and high-quality audio between multiple locations.”

## A Brief History



**VCS 3000**  
(Circa 1990)



**RCN I**  
(Circa 1994)

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**MXP 150**  
(Circa 2008)



**T3**  
(Circa 2009)

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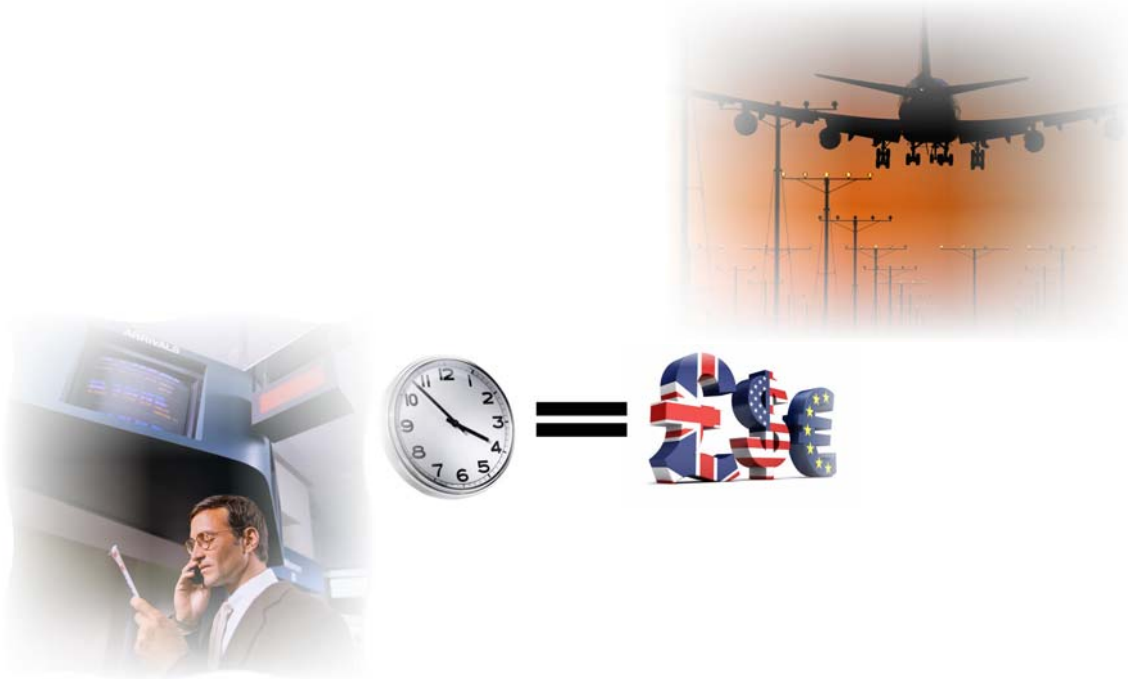
Introduction to Video Conferencing

Video conferencing, as a technology, has been around for approximately 40-50 years. However, the growth of video conferencing has depended heavily on the availability to run on a reliable digital communications network. It wasn't until the early 1990's that ISDN standards were introduced and, finally, video conferencing could begin to grow.

Systems in the mid to late 1990's were expensive and only really a technology that larger multinational companies could afford and then only at the higher levels in the organisation. The decrease in endpoint price, increase in quality and functionality as well as global events, such as the Gulf wars, increased terrorist activity and, more recently, climate change concerns have fuelled the growth of video conferencing. In addition, just as the standardisation of ISDN networks fuelled the initial adoption in the early 1990's, the ability to run video conferencing over computer data networks has also fuelled growth in the past three years or so.

## Why Use Video Conferencing?

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Videoconferencing can speed up business processes and procedures in the same way that e-mail has revolutionised the way we share information. The most common reason for implementing video conferencing is to save travel costs. However other benefits are often more important.

First, it isn't just the cost of travel but the cost of the time taken to travel. Travel also causes wear and tear on an individual which reduces their effectiveness. Business travel isn't going to disappear completely but video conferencing can significantly reduce it and really make a difference to productivity.

On top of the time saving benefits there are also significant benefits in changing the way we do business. Video conferencing greatly improves communication between remote sites both within a company and between suppliers and customers. Product or project development times can be decreased and easily involve experts where ever they are. This can increase profit and the quality of the end result. Meetings are often more effective over video and can be held more often. This, in turn, enables companies to make decisions within smaller time frames solving urgent problems more quickly and also enabling companies to react to market changes faster.

# Environmental Considerations

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Video conferencing is a major way that companies can begin to reduce their carbon footprint. A recent independent survey showed “consumers and employees reward green companies” so using video conferencing also makes sense from both a financial and environmental position.

## Personal Benefits

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Video conferencing has personal benefits too. Less time away from the family is one benefit but also when you do have to travel you can use video conferencing to communicate back home as well.

# Types of Conferences

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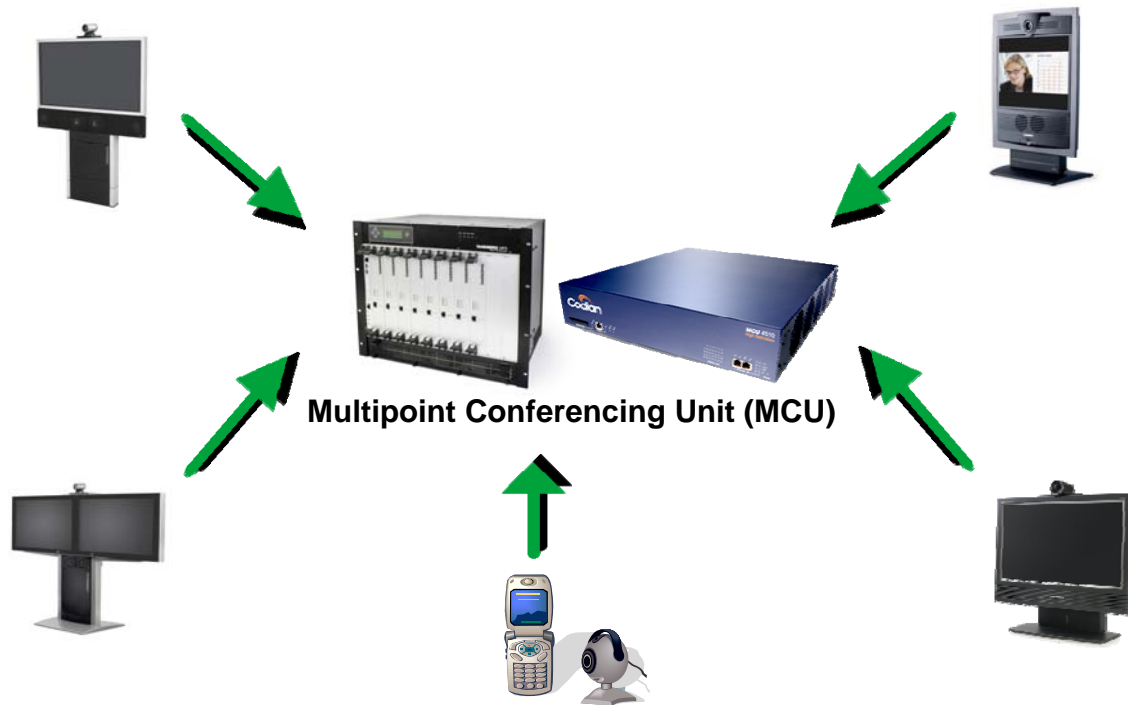
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Conferences can exist in several forms. At it's simplest, an audio conference is a connection between two individuals using a standard telephone. More complicated, it can involve numerous sites all connected with video, audio and data, all on different networks and speeds.

## Multiple Site Conferencing – Multipoint



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A multipoint conference is a conference with more than two sites. These could be video participants, audio participants or data only participants.

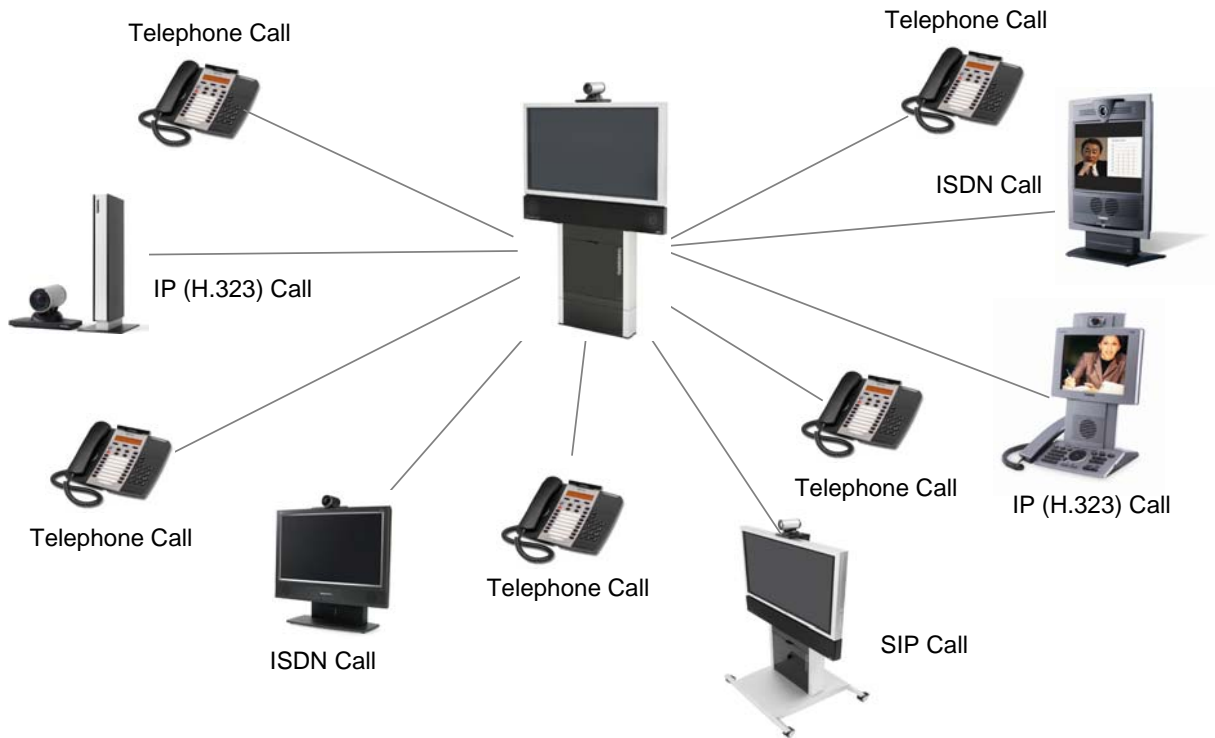
Multipoint conferences are created using a multipoint conference unit or MCU.

There are three possible ways an organization can choose to hold multipoint conferences:

- they can purchase their own multipoint hardware to install within their own network
- they can upgrade some end point systems to support mutlipointing internally , or
- they can use a third party supplier



## Using the Internal Multipoint System



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### Using the system's internal MCU

Most TANDBERG MXP systems have an optional built-in MCU which supports up to six video calls and five telephone calls, including yourself, for high-end systems, and four video calls and three telephone calls including yourself for the mid- and lower end systems.

## Video conference components

Display

Cameras

Microphone

Amplifier

Speakers

Echo cancellation

Networks

User interface

Cables

Peripheral equipment

Codec

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Introduction to Video Conferencing

In order to understand how video conferencing works it is important to recognize the component parts of the system. The TCAP course will look closely at the following areas:

The display – for example a plasma screen

Cameras

Microphones

Sound mixers

Speakers

Echo cancellation

The networks used to carry video conference traffic

The user interfaces – for example the remote control and the web interface

Cables

Peripheral equipment – for example a laptop or second camera and the Codec which is the main brain of the system.

This module will introduce you to the different displays, cameras, microphones, amplifiers and speakers available from TANDBERG.

# Displays

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A monitor of some sort is needed to display the far end picture. There are four main types:

- Plasma screens
- LCDs (Liquid Crystal Display)
- Projectors
- CRT (Cathode Ray Tube) – what most of us would refer to as a TV.

## Which to Use?

### Plasma

- **Pros:** screen's phosphor coating creates lifelike color
- **Cons:** vulnerable to burn in

### LCD

- **Pros:** panels weigh less than plasma and use less energy;
- **Cons:** picture slightly less natural than top plasmas; limited size

### TV

- **Pros:** cheap and excellent image quality
- **Cons:** heavy, bulky, no HD support

### Projector

- **Pros:** large size image, light weight
- **Cons:** camera and projector positioning can be difficult



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There are advantages and disadvantages of all 4 types.

Plasma screens look professional, have larger screen sizes and take up less space. However they can be expensive, are very heavy which you need to consider when wall mounting and they can suffer burn in. Burn in occurs when the same image is displayed for long periods of time to the point when the image is visible even when the plasma is off.

LCD screens are lighter and cheaper than Plasma screens but the image isn't as good. However when ever we talk about picture quality we should remember that the image will only be as good as the weakest point and this isn't often the display. Like a plasma, an LCD takes up little space and looks professional.

TV's or CRT monitors, particularly 100hz versions, have an excellent quality image. However they are bulky and seen as yesterdays technology – which they are. They also do not support High Definition formats.

Projectors can be a good choice in certain room layouts, particularly where a very large image projection is required. You will have to be careful though about where you position the camera.

## Cameras

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HD Camera



Document Camera



WAVE II Camera

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There are many different types of cameras on the market that can be used with your video conference system. TANDBERG systems either have a fixed camera or a PTZ camera. PTZ stands for Pan Tilt Zoom. Fixed cameras are used on personal units and can only be moved manually. PTZ cameras, as the name suggests, can be moved left to right (pan), up and down (tilt) and can zoom in and out.

TANDBERG systems come with either a WAVEII camera or a High Definition camera – both are pictured here. Any camera can be used with the system and often different cameras are used as a second camera or a camera designed to show documents – also shown above.

# Microphones

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Unidirectional microphone



Omni directional microphone

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Most stand-alone video conference systems have either a unidirectional or omnidirectional microphone. Both types are shown here. A unidirectional microphone picks up sound from one direction while an omnidirectional microphone picks up sound from all directions. We will be discussing microphones in more detail later on.

## Amplifiers and Speakers



**TANDBERG MXP 6000 Profile with  
built in speakers and amplifier**



**TANDBERG 8000 MXP  
&  
Satellite speakers**



**Standard LCD screen with  
built in amplifier and speakers**

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As with monitors, cameras and microphones, there are many different types of amplifiers and speakers. First, we need to be clear about what each component does. An amplifier is a device that takes a very small electrical signal and converts it into a larger electrical signal. This electrical signal is then converted into sound waves by the speaker. Both parts are essential to enable you to hear the audio from the far end. The amplifier and speaker you are using may be built into the video conference system itself as in the case of the personal units or be built into the display you are using or be a separate unit.

## DIGITAL NAM (Natural Audio Module)

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- Produces a natural and optimal sound for videoconferencing
- All audio processing performed digitally
  - Digital audio signal processing
  - Digital audio signal filtering (crossovers and equalization)
- Stereo output for satellite speakers



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Introduction to Video Conferencing

The **DNAM** (Digital Natural Audio Module) is a specially designed TANDBERG audio module for producing a natural and optimal sound for videoconferencing. All audio processing is performed digitally and additional speakers can be added to the system.

The DNAM audio system has two main components: the DNAM amplifier and DNAM speaker system. The speaker system is available in several different formats to suit different system types.

The **Mini-DNAM** audio system is a smaller, more compact version of the DNAM system and is especially designed for smaller units.