

## Conference Phone Buyer's Guide

Conference Phones are essential in most organizations. Almost every business, large or small, uses their conference phone regularly. Such regular use means choosing one is no light matter. The conference phone you choose today may still be in use at your organization in five or ten years, which means it's important to choose a resilient, adaptable solution.

### Pre-Purchase Considerations:

To make a well-informed decision about which conference phone will best suit your purposes, it's important to determine exactly what your anticipated use and goals are.

- Room size and design
- Other functions of the room (i.e. Do you also plan on installing a video conferencing solution? Do you need the conference phone solution to be easily stored when the room is utilized for another purpose?)
- Number of participants on a call
- Participant behavior
- Who are your primary remote participants?
- Desire connectivity
- Available IT support
- Scale of deployment
- Budget

Although not the only concerns when deciding on a make and model conference phone, these considerations should help you get an idea of reasonable expectations for your conference phone.

### Budget

Although not as intimidating as the cost of a video conferencing solution, conference phones can cost up to thousands of dollars, and may require additional services from your phone or internet service provider. Here's a breakdown of how much a conference phone can cost you:

- The conference phone itself ranges greatly in price. This is probably the first cost you thought of and you probably already have a price in mind. (\$250-\$2000)
- The cost in most areas for the materials and labor to wire an additional phone jack or Ethernet connection to your conference room. (\$175-\$250)
- Accessories. You can purchase everything from speakers to expansion microphones to power adapters to cases for your conference phone. You may also be content without any of these extras. (\$0-\$500)
- One-time cost for installation and the monthly fee for an additional telephone line. The price varies greatly by region and can even be free if you use certain IP services or presently have an open extension. (Varies)



*Polycom External Microphone*

## What's Important in a Conference Phone

Intelligibility is the main goal with voice conferencing. Although most people can relatively easily compensate for missing words and muddled sounds, the thought involved for “interpreting” a poor-quality call will detract from the efficiency and effectiveness of the conversation. There are five elements that contribute to the intelligibility of speech:

### Reverberation

Reverberation is the amount of echo that occurs between the person speaking and the microphone. Reverberations makes conversations more difficult to understand and is almost entirely affected by room characteristics, such as hard floors, walls and ceilings, as well as the size of the room and relationship between speaker and microphone. Reverberation can be controlled by careful room design and appropriate voice conference practices (such as refraining from pacing around the room while speaking).

### Interaction

Interaction is the degree to which participants are able to naturally interact with each other during a conference call. It is important for one talker to be able to interrupt a talker on the opposite end without disrupting the natural flow of conversation. If this is not possible, the dialogue will quickly become unnatural and awkward.

### Bandwidth

Bandwidth is the range of speech bandwidth carried from the speaker to the listener. With a traditional analog phone, about 20% of the frequencies (from 300Hz to 3.3kHz) of the human vocal range are carried. Many new IP phones and advanced video conferencing systems are able to carry frequencies up to 22kHz.

### Amplitude

Amplitude is a measure of how loud a talker seems to a listener. A quiet voice is much more difficult to understand than a loud one, and the listener who is far away from the loudspeaker will have a more difficult listening experience. Another thing that affects amplitude is the telephone carrier. The gains (which is the ratio between signal and background noise on your phone line) from different telephone lines can vary up to 20dB.

### Noise

Noise includes the sounds picked up by the microphone that are not supposed to be part of the conversation. This could include room noise caused by air conditioning or the fan of a projector. This is especially problematic in situations where an LCD projector is placed on the table next to the conference phone.

Fortunately, these elements will interact with each other and can compensate for one most elements that may be outside of your control. For example, making a room less reverberant may be too large an expense, but can be compensated for by increasing the bandwidth of the signal as well as the loudness.

## Optimizing for Intelligibility

Most problems used to be issues that everyone had to learn to live with. For example, bandwidth deficiency, caused by the limitations of analog phone lines, used to be incurable since it was a limitation

of the infrastructure. Now, bandwidth deficiencies can be dealt with by using standards-compliant IP telephony technology.

Even today, however, there are many elements of optimized voice communication that are somewhat uncontrollable. For instance, there may be a busy street right outside your conference room windows that causes much uncontrollable noise. You can, however, still maintain a high quality conference call by ensuring you have adequate bandwidth and amplification of your talkers.

## Types of Voice Conferencing Solutions

There are generally three types of voice group communication systems. Different systems are better designed for different applications, although here we are generally most interested in covering conference phones in great detail.

### The Speakerphone

A basic speakerphone is usually integrated within a desktop telephone, but may also be available as a separate unit. Most speakerphones only feature one microphone and no form of echo cancellation. Speakerphones are intended for use by one speaker, sitting directly in front of the phone, to use for hands-free conversation. Occasionally, small groups may use a speakerphone, but since they are not designed for group interactions, participants may find that poor sound quality detracts from productivity.



*Plantronics Speakerphone*

### The Conference Phone

A conference phone is one unit that is sometimes used with expansion microphones. A conference phone is designed as a means of communication for an entire room. Conference phones are generally as easy to use as regular telephone. Newer, advanced phones utilize many digital signal processing and echo cancelling techniques. This enables the conference phone to more accurately reproduce the voices of the participants despite noise, echo, computer and overhead fans, side conversations and a variety of acoustic challenges that can occur at any meeting.



*Polycom SoundStation2  
Analog Conference Phone*

There are many models of conference phone that meet the needs of different environments where conference calls may take place. Later sections of this paper will explore the different types of conference phones available.

### Installed Audio Conferencing Systems

Installed audio conferencing systems include all of the components found in a conference phone but separated into individual elements so they may be placed where necessary to deliver the most optimized conferencing experience. Installed audio systems may also be part of an integrated room video conferencing system and used for both voice and

video conferencing applications. Installed audio systems are generally used for large rooms and can help reduce some of the common problems such as feedback, multiple echo canceller mixes and other noise and audio problems, thanks to advanced digital signal processing capabilities.

## VoIP vs. Analog

There are many differences between VoIP and analog phones.

### Analog Conference Phones

Analog conference phones are much like analog desk phones—they plug in to the analog phone port and connect via the analog phone line network. Analog conference phones also have the similar advantages and disadvantages.

Choosing an analog conference phone may be ideal if:

- You have a limited budget
- Currently your business uses only analog phones, and you're not ready to switch to VoIP
- You don't have the appropriate Ethernet connections and aren't ready to install them

It's also important to note that you can use an ATA (analog telephone adapter) with most conference phones when you do decide to make the switch to VoIP in your office. However, using an ATA will not give you the increased functionality you find in IP conference phones, just the ability to use it on the IP network.

### IP Conference Phones

VoIP conference phones use the Voice over Internet Protocol to transmit the conference call. With IP conference phones, you find similar advantages to IP desk phones. Benefits of VoIP conference phones include:

- More features
- Better sound quality due to higher bandwidth range
- Automated functions
- Better performance with more customizable options
- Simplified wiring (you won't need a separate voice and data port in the room)

## Choosing the Conference Phone

There are three primary considerations that will determine if a particular conference phone will work for you. They include: the size of the room and amount of participants in a conference call, the type of connectivity you need, and the features you want. You will want to be certain the phone you choose is designed for the room size and connectivity you have. If there are any features you absolutely cannot live without, make sure the phone has those, too.

### Size of Room and Amount of Participants

There is some wiggle room if, say, you have 10 participants but only two primary speakers. However, you should never try to use a phone designed for a very small, 4-person room in a huge boardroom, and it is unnecessary to use a phone designed for a large space in your home office.

### **SOHO or very small conference room**

When there are less than 4 participants, you can generally get away with a less featured phone. You'll need a conference phone with about five to seven feet of microphone coverage. If it is just going to be one participant in his or her home office, a desktop phone with a good speakerphone (or perhaps a specialized, independent speakerphone, especially if you intend to connect via USB to use a PC client for conferencing) may be completely suitable for this environment.

### **Standard Conference Room**

Conventional conference rooms will seat up to 10 participants. Since there's a larger size involved, there will be more acoustic challenges, including as more room echo and ambient noise, so you may want to choose a conference phone with advanced echo and noise cancellation. Use your discretion, however, since most standard conference rooms also include features such as a higher ceiling, upholstered furniture, and drapes and other decorative wall hangings which will work together and eliminate some of the echo.

In smaller standard conference rooms, you'll need a conference phone with roughly 10-12 feet of range. Medium and larger conference rooms will most likely need a conference phone that can attach to expansion microphones to ensure adequate coverage.

### **The Large Standard Conference Room**

Very large rooms, 20x30 feet or larger are still in the range of most standard conference phones with expansion microphones. You may experience better sound quality, however, if you choose a conference phone that features independent echo cancellation and gain management for each microphone.

In larger rooms, it's also important to anticipate (or observe, if you can) the behavior of the conference participants. If everyone's going sit where you put them, good. An advanced conference phone with expansion microphones should deliver great results. However, if you think participants will be tempted to walk in this larger space, you may want to choose a system that can integrate wearable microphones for at least a few speakers. Ceiling-mounted microphones can also be a viable solution.

### **The Board Room**

A very large room, 25x45 feet or larger, is most often designed more for aesthetics than acoustics. With rooms this large, a tabletop system is simply impossible to work with. The entire room needs to have adequate audio and microphone coverage; otherwise participants will have a hard time communicating throughout the conference call.

## **Connectivity**

The most common connectivity choice is between IP and analog. If you determine that VoIP is the solution for you, you may also want to consider whether a PoE option would work for you, since it requires less wiring, which saves money, but demands use of a PoE switch, which can be expensive if you're not already using one.

Most of the time, you can use adapters for IP phones when using analog lines and vice versa, you will lose many features by using the hardware with an incompatible infrastructure.

Although less common, there are also phones that can connect to a computer via USB interface, for voice conferencing over the public Internet, and some phones can connect via a cell phone or to the cellular network.



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## Features

HD sound, PoE capabilities, touch screens, call recording, headset connections and upgradable software are all features available on many conference phones. Choose only those that you think you will actually need. For example, don't feel like you have to pay extra to get call recording capabilities when your phone system can already do this. Consult with your IT staff if you have any questions regarding phone system and conference phone interoperability.

## More Information

Still have questions? Contact the friendly sales staff at Video Conferencing Supply for answers. We'd love to help you find your perfect conference phone.

## Works Cited:

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