

Handsets and Interfaces



5 Chapter 5

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This chapter outlines the many benefits of today's well-designed and highly functional telephones.

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Think about your home telephone, your cell phone, or any one of the multiple electronic devices you use everyday. You expect—and appreciate—a well-designed product. You shop for these items with design and functionality in mind. With IP telephony, you can now bring the same high expectations into the office and into your search for handsets. Mediocre office telephones are a thing of the past because IP telephone handsets introduce so many more features and benefits.

The Need

Business workers rely on the telephone many hours out of the day, from collaborating with business partners and co-workers to interacting with and helping customers and suppliers. Call center professionals literally spend the entire day on their telephones. It's not enough to “make do” with a standard, feature-lacking desktop handset. To make employees more productive—and happier—you need to provide them with the tools they need to do their jobs optimally. You'll only do this when you present them with a handset that is ergonomically well-designed, has great sound quality, and features a multitude of capabilities at the touch of a button.

Ergonomics

Ergonomics is the science of designing products, machines and systems to maximize the safety, comfort and efficiency of the people who use them. Ergonomics takes into account psychology, physical measurement, environment, and more to ensure that products are adapted to suit workers and their specific needs. Keep ergonomics in mind as you look at the handsets and graphical user interfaces (GUIs) of each vendor's solutions. If your organization is a machine shop, the most important feature for your handsets may be a very loud ringer. If you have a call center staff, a bevy of features that help shorten the call cycle will be most beneficial. A law firm may require a system that logs incoming and outgoing calls and keeps this information on record for future reference. A recording studio may require ultra-clear sound quality to ensure recorded voices are pitch-perfect. Look at your organizational needs in terms of what you need a handset and GUI to do for your employees.

Sound

IP telephony, with its packet-based design, is able to deliver better than toll-quality sound with high-fidelity audio and innovative design. Better sound translates into productivity gains – shorter calls with fewer errors, increased sales because of the clarity of conversation between a sales person and customer, and increased caller satisfaction. Wideband audio is preferable over narrowband, because it has an increased range on the low end (50-300 Hz) and makes conversations sound less tinny and reduces error in translation. Look for a solution that supports both wideband and narrowband.

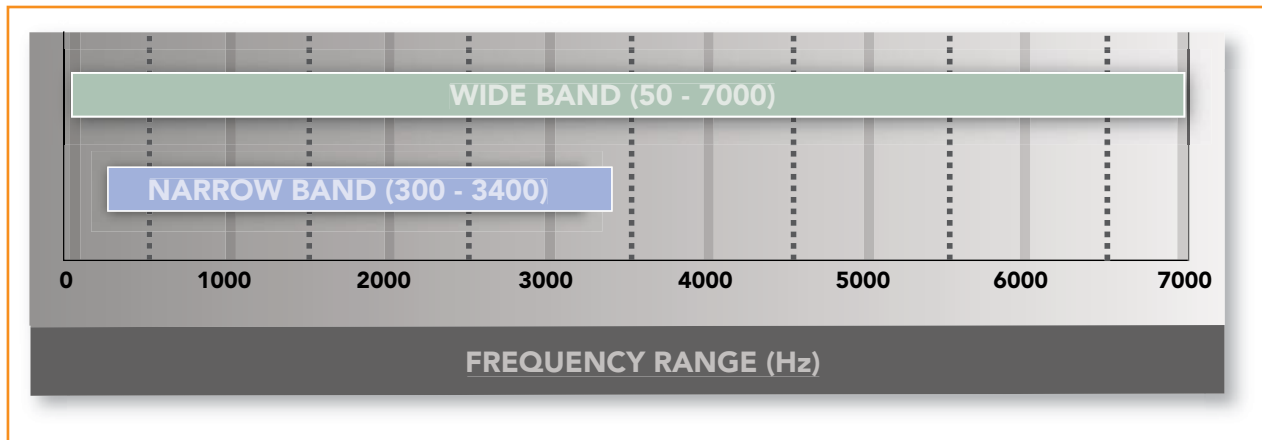


Figure 5.1 Wideband audio technology provides bandwidth from 50Hz to 7,000 Hz; narrowband provides 300 Hz to 3,400 Hz. Wideband delivers superior speech quality.

Speakerphone microphones are also an important part of sound quality consideration. Look for a solution that supports hi-fidelity sound and has a full-duplex operation speakerphone so audio flows freely on both ends (no delay if one speaker talks over another). Not all IP speakerphones are able to do this. In addition, ensure you choose a handset that meets the Americans with Disabilities Act (ADA) regulations for the hearing impaired, regardless of whether you have an immediate need or not. (More on ADA compliance will be covered later in this chapter.)

Screen Interface

IP telephones act more like computers than telephones—they have a bigger screen and more functionality attached to the screen. This screen also delivers more information about each call and prompts the user through the call with various options appearing on the screen. The user simply presses a corresponding key below the screen to accomplish any task while on the call (call forward, conference, etc.).

Make sure to consider carefully the size of the screen, with your users in mind. Is it big enough that after a long day of work, it's still pleasing to the eye? Is the display big and bright enough to see clearly after four hours on the phone? In addition, work with the phone and test what features are available and how easy those features are to access for a call center worker taking up to 50 calls an hour. Is there a message waiting light to ensure no message is missed?

User Considerations

Another characteristic to consider is the feel of the phone, since that is another source of fatigue for users. The phone should minimize shoulder and neck pain and fatigue, and it should essentially fit most users comfortably. The handset should not be too light or too heavy—try and get a phone with a balanced weight of about 170-190 grams. Also, consider a handset with a grip that is covered with a smooth rubber material, as opposed to the slippery plastic kind that can become uncomfortable during long telephone calls.

Keypad Functionality

Many systems will come with fixed-feature keys. Make sure those features are the one most pertinent to the needs of your employees. Fixed features usually include transfer, conference, intercom, voice mail dialup, directory, and redial. If a system relies mostly on soft keys, consider how difficult it may be for all your users to get those soft keys set up and working. Will you end up having to go around to every employee's phone to program two or three soft key functions? Soft keys are beneficial to have, but they should not be used for standard functions—these should be on hard keys. Some functions that you should look for on fixed-feature keys include:

- **Directory:** This key should be linked to a quick-dial program that allows a caller to dial by name using the telephone keypad (7 for S, 2 for A, 6 for M, which would bring up names that match beginning letters “SAM”).
- **Redial:** This function key should do more than simply dial the last number dialed—it should allow you to press it and see an historical list of outbound, inbound and missed calls.
- **Personal options:** This feature key should allow for easy management of personal options, such as ring tone and call handling preferences.
- **Voice mail:** This key should provide quick and easy access to voice mail messages.

Soft Keys

Soft keys are multi-function keys that use part of the telephone display to identify their function at any moment. They are usually located directly underneath the display and their use changes depending on where the user is in the call process. You can set some soft keys for use by all of your employees, and you can choose to leave some to the discretion of each user. Make sure the setup of soft keys is straightforward before allowing users to set up their own. If the IP telephony system you've chosen does not offer handset soft keys that are easy to set up or change, make sure the solution allows you to either set the soft keys for each user (or block users from trying to set up their own) or the ability to choose not to use the soft keys at all. This will minimize user confusion and frustration if the solution is difficult to edit.

Business vs. Basic Phones

Basic phones differ greatly from business phones in that they offer few or no additional functions beyond answering and hanging up. Business phones streamline tasks and offer users productivity enhancing features. You'll find that some vendors offer most functionality via soft keys, while others rely on numerous hard keys—one function per key. Your employees may fare best with fixed function keys, or classic business phones, which generally have a button per task. Some vendors do not offer this, however, relying mostly on soft keys. Still other phones offer a fixed number of hard keys and some extra hard keys that you can program to fit your organizational needs. These are optimal for organizations with workgroups that need specific functions to be programmed into keys.

Easy to Manage

You want to make sure the phones you are getting with the IP telephony system you choose are plug-and-play, particularly if you have a large organization with many locations, some of which have no technical staff on-hand for installation support. Non-technical employees should be able to plug in their phone and start working. When it's plugged in, the phone should automatically get its IP address, subnet mask, and gateway, as well as the accurate time from a time server. Handset updates should be equally as hands-off for employees—updates should be automatic as they are released by the vendor.

Aesthetics

While most businesses do not place emphasis on how a phone looks over the functionality, it is still an important consideration. A phone that is pleasing to the eye is as impressive as a beautiful desk or sleek-looking computer. Consider your options with your chosen vendor and ask about variety. What colors do their phones come in? Are there smaller versions for users who need minimal functionality? Are there ruggedized versions of the IP phones for public area usage? Look for a solution that will fit all your needs, with phones that are consistent in appearance and look classy throughout your organization.

Phone Choices

In an IP telephony solution, the IP-PBX manages telephones throughout the enterprise and acts as a gateway to both voice and data networks. Any kind of telephone, whether it be analog, IP or a soft phone, can connect to the IP-PBX via the network and calls are routed via the network instead of the public switched telephone network.

Analog phones

A regular analog telephone, the same ones you've been using throughout your organization until now, can be used in an IP telephony solution to input the caller's voice into the system. Once in the system, a series of analog-to-digital conversions and other processes change the voice signals into data, which is then transmitted over the LAN, WAN, or Internet. The voice data is then converted back into sound by the recipient's phone. Most IP telephony systems will allow you to use your existing analog telephones with the solution—forever or until you are able to afford and/or replace them with IP telephones. Be sure that your vendor will allow you to phase out older analog phones with their IP phones over time so you can maximize your existing equipment.

IP phones

IP telephones (or IP endpoints) actually perform the analog-to-digital and/or digital-to-analog conversions and can plug directly into the LAN or WAN. VoIP system vendors usually offer a variety of IP telephones so that you can choose different models based on various segments in your user population. Your legal department may need multi-line handsets with easy conference call capabilities. A manufacturing floor needs a phone with fewer bells and whistles but good, loud sound and a rugged exterior. Receptionists need handsets with many more fixed feature buttons so that they can handle calls quickly and accurately.

Soft phones

A soft phone is essentially software that is used to make calls over an IP telephony system using a personal desktop computer and either a headset connected to the computer's sound card, or a telephone connected to the computer using an adapter. It behaves like a traditional phone but usually offers much more information to the user, depending on the vendor's GUI. When a call comes into a station with a softphone, an icon appears on the computer screen, which allows the user to either answer it by clicking on an icon, or ignore the call by clicking on another icon, which in turn sends the caller to either voice mail or another employee.

Often, vendors offer an application that allows traveling employees to gain access to the robust feature set of their desktop computer from wherever they are working—at home or on the road. A user simply logs into the system from the local phone and has access to all of the same functions he or she would enjoy while in the office.

WiFi phones

WiFi phones use signals much like those used by cordless telephones. The WiFi phone receives signals which allow you to wirelessly connect to the network via wireless access points (APs). Unlike traditional cell phones, the technology of WiFi phones allows them to transmit data at really high speed, but areas of coverage are limited by the reach of the AP being utilized. There are also hot spots available in various locations (restaurants, Starbucks, libraries, etc.) that allow you to access the Internet using your own WiFi service (or a service utilized by your organization).

One drawback to WiFi phones is the fact that some things can impede on the quality of the calls, such as how many people are using the same hot spot, how close the WiFi phone user is to the access points, WiFi card capabilities, and possible obstructions to the AP (such as a wall). Another drawback is that WiFi technology does not offer the level of security offered with standard Internet access. More on security will be covered in the following chapter.

Want a SIP?

Session Initiation Protocol (SIP), a signaling protocol, is used for establishing a session in an IP network—from a simple two-way telephone call to a multi-media conference call session with many participants. The IP telephony industry has recently adopted SIP, an RFC standard (RFC 3261) from the Internet Engineering Task Force (IETF), as the protocol of choice for signaling because of its ability to facilitate Internet applications by working with other protocols. It is not the be-all and end-all of protocols—it was designed to be a facilitation mechanism, not an all-inclusive solution. Its flexibility is what makes it so powerful, and an all-inclusive approach does not offer this level of flexibility.

Essentially, SIP establishes, manipulates and tears down sessions, and its main purpose is to help session originators deliver invitations to potential session participants wherever they may be. It uses URLs to address participants and SDP to convey session information and it's easy to combine SIP with other applications, like Web browsers and messaging. The bottom line is that it's a modular approach to maximizing IP telephony protocols. SIP can find and invite call invitees wherever they are. It facilitates multi-media calls with many participants who may join and leave at will.

American Disabilities Act (ADA) Compliance

Your IP telephony system must comply with the American Disabilities Act (ADA) of 1990 and associated regulations issued by Federal agencies that define guidelines for accessibility by individuals with disabilities. These guidelines include requirements for telephones and telephone systems, and they include the “ADA Standard for Accessible Design” (Pt. 36, Appendix A, Section 4.31, Telephones) and the 508 provision for TDD/TTYs. A few of these requirements include:

- **Volume Control:** Telephones should have volume controls that provide a gain adjustable up to a minimum of 20 dB. The telephones should provide at least one intermediate step of 12 dB for incremental volume control.
- **Automatic Volume Reset:** The telephone should automatically reset the volume to the default level after every use.
- **Hearing Aid Compatibility:** The telephone must have a means for effective magnetic wireless coupling to hearing technologies.
- **Minimized Interference:** Interference to hearing technologies, including hearing aids, cochlear implants, and assistive listening devices, shall be reduced to the lowest possible level that allows a user of hearing technologies to use the telephone.

- Support for TDD/TTYs: Products that transmit or conduct information or communication shall pass through cross-manufacturer, non-proprietary, industry-standard codes, translation protocols, formats or other information necessary to provide the information or communication in a usable format. Technologies which use encoding, signal compression, format transformation, or similar techniques shall not remove information needed for access or shall restore it upon delivery.
- Controls and Keys: Controls and keys shall be tactilely discernible without activating the controls or keys. These controls and keys shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls and keys shall be 5 lbs. maximum. If key repeat is supported, the delay before repeat shall be adjustable to at least 2 seconds. The status of all controls or keys should be visually discernible, and discernible either through touch or sound.
- The cord from the telephone to the handset shall be at least 29 inches (735 mm) long.
- A wall-mounted object should not protrude into the walkway more than four inches to ensure visually impaired individuals do not run into them.

The Bottom Line

By now, you have either chosen your IP telephony vendor or at least narrowed it down to a short list. Take the telephone characteristics into account to help you finalize the decision. If you have already made your choice, look carefully at all of the models your vendor offers and choose the right phone for each user in your organization: Multi-function telephones for receptionists, soft phone licenses or WiFi phones for travelers, basic but ruggedized phones for warehouses and manufacturing floors. At this stage in the IP telephony game, you have more options than ever and you don't need to make one model work for everyone. What you do need to do is make sure your users are more productive because of the phones, and that your choice complies with the ADA. The next chapter will cover how you can secure your IP telephony communications.