

Alfred's
Teach Yourself
Computer Audio

Speech and Telephony

(Free supplemental chapter, only available at www.alfred.com)

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SPEECH AND TELEPHONY

What you'll learn to do in this chapter:

- Make your computer react to spoken commands
- Make your computer talk back to you
- Create a voice print “password”
- Do computer-to-computer voice conferencing
- Use the computer for phone dialing
- Make telephone calls over the Internet

The various forms of technology covered in *Alfred's Teach Yourself Computer Audio* can easily be used to record, process and play back human speech just as well as music or any other sound. Speech is a universal human attribute, so it is no surprise that a number of different technologies and applications related to it have arisen on the various computer platforms.

The popular image of futuristic computing was largely derived from films such as *2001: A Space Odyssey* and the television series *Star Trek*. In these fictional depictions, it is taken for granted that computers can speak, and be spoken to, in a fairly natural manner. In reality, the fields of **speech recognition** and **speech synthesis** have been hotbeds of research and development for many years, and great strides have been made towards improving these technologies and making them accessible to the general computing public. While we're not quite at the *Star Trek* level yet, things have come a long, long way.

The Mac OS has offered built-in rudimentary voice command recognition and text-to-speech (TTS) capability since 1993. Such technologies have also

been available to Windows users for many years, but, until recently, users had to obtain them by way of purchasing and installing add-in upgrades of separate software packages. Apple has also led the field in **voice recognition**, allowing users to create system passwords based upon the unique sound of one's voice.

In addition to technologies that allow the computer to talk or listen, transmission technologies convey the user's voice to another location. Many businesses already use desktop **conferencing**, and some computer games now implement support for **voice chat**, allowing one to confer with teammates (or harass opponents) during the course of game play.

At the more grandiose end of the scale we have the burgeoning field of **computer telephony**, which seeks to augment or replace conventional telephones and switchboards with software and hardware solutions that run on general-purpose computers. **Voice Over IP (VoIP)**, a subset of computer telephony, pertains to the two-way transmission of speech using the Internet Protocol, essentially making the computer into a fancy (and possibly free) Internet telephone.

SPEECH RECOGNITION

Speech recognition involves making the computer “understand” and respond to spoken commands. Not to be confused with the concept of *voice recognition* (which we’ll cover later in this chapter), speech recognition is a means by which to control the computer by talking to it.

Speech recognition can provide a hands-free input device as a supplement or replacement for the mouse and keypad. Speech recognition can be of great importance to the physically disabled; it is likewise useful to those with limited typing skills, people whose hands are occupied with other tasks (like driving), those who suffer from carpal tunnel syndrome, and even busy executives who prefer to dictate rather than type.

To use speech recognition on any computer requires a microphone, either plugged into the sound card’s audio input or built into the computer or monitor. The rate and quality of speech recognition is closely related to the quality of the input signal; a faint, low-quality or noisy signal will be hard for the computer to understand. To help ensure acceptable performance, many speech recognition software packages bundle in a headset mic that meets the manufacturer’s minimum specifications. A high-quality mic with some type of noise filtering and good off-axis rejection is preferable, and a headset mic is ideal for ensuring consistent proximity between the mouth and diaphragm.¹

SPEECH RECOGNITION FOR MACINTOSH

The Macintosh operating system features **Speech Recognition Manager** technologies. In Mac OS 7 through OS 9, this includes the **Speech Recognition** and **SpeakableItems** system extensions, a folder under the Apple menu called **Speakable Items** (filled with scripts for each item), plus the *Speech* control panel. In OS X, the **Speech Preferences** panel is inside the System Preferences display, and most of the component parts are in the OS X **System > Library > Speech** folder.

Speech Recognition Manager is useful for controlling applications but not meant for dictation. It responds to a limited pre-set vocabulary and cannot handle arbitrary sentences. It does, however, allow the user to add any number of custom or personalized terms.

TIP

To make your own custom spoken commands, mouse-click on any file and speak the command “**Make this speakable.**” Alternately, you can drag any file or alias into the **Speakable Items** folder.

¹ *Off-axis rejection* means only transmitting sounds that emanate from the direction in which the mic is pointed, not picking up extraneous sounds from the side or rear.

The Speech Control Panel in Mac OS 8 & 9

Listening

Follow these steps to configure speech recognition in Mac OS 8 and OS 9:

- Go into the **Apple** menu, and from the **Control Panels** submenu choose the *Speech* control panel.
- Select **Listening** from the **Options** pop-up menu.



Fig. 1: The Listening view in the Speech control panel of Mac OS 8 & 9.

- By default, the computer is “listening” for speech recognition when the **Escape (Esc)** key is pressed. You can select an alternate hot key such as Delete, F5 through F15, or any of the punctuation keys by pressing the desired key while the **Key(s)** field is highlighted.
- The **Method** radio buttons allow you to toggle Listening on and off or make it active only while the hot key is pressed.

Speakable Items

To configure Speakable Items in OS 8 & 9, do the following:

- Select **Speakable Items** from the **Options** pop-up menu of the *Speech* control panel.

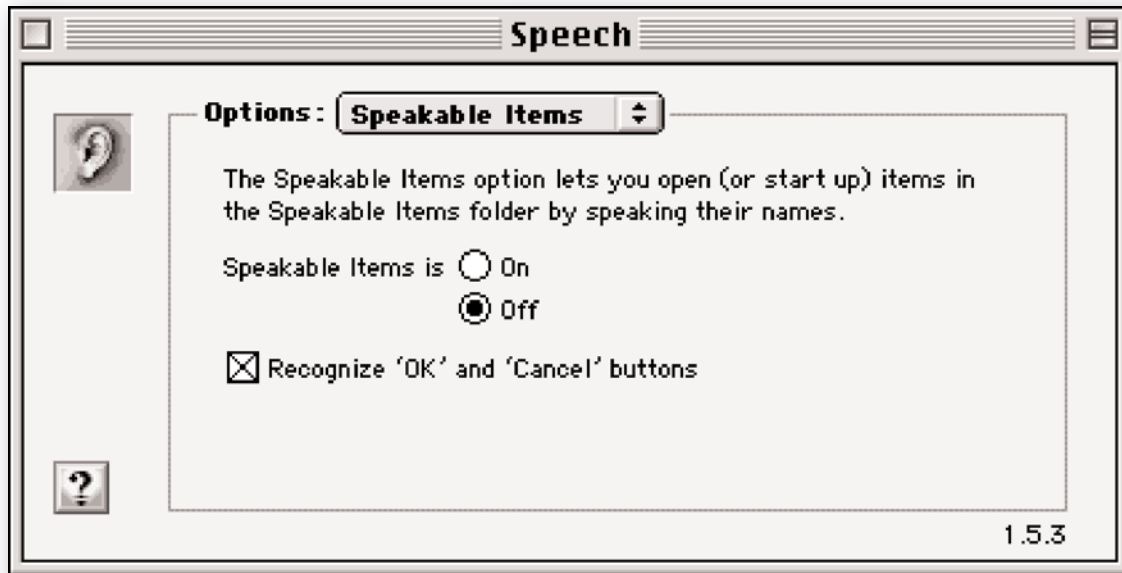


Fig. 2: The Speakable Items view in the Speech control panel of Mac OS 8 & 9.

- Mouse-click the radio buttons to enable or disable Speakable Items.
- You can view the entire list of installed Speakable Items by selecting the **Speakable Items** submenu from the **Apple** menu.
- Note the checkbox on the Speakable Items page, which allows for recognition of the **OK** and **Cancel** buttons; if you're serious about speech recognition, you'll want this checked on.

Feedback

Follow these steps to configure the manner of your computer's response to voice commands:

- Select **Feedback** from the **Options** pop-up menu of the *Speech* control panel.



Fig. 3: The Feedback view in the Speech control panel of Mac OS 8 & 9.

- By default, the computer will speak any (appropriate) responses to your voice commands. Disable spoken feedback by de-selecting the **Speak text feedback** checkbox.
- The computer can also play an alert sound when it recognizes a spoken command. Use the **Recognized** pop-up menu to select any or no alert sound.
- When speech recognition is active, a Feedback window is visible onscreen that displays your commands as well as certain computer responses. The **Character** pop-up menu of the control panel allows you to select from among different cartoon characters, and is purely for visual aesthetics.

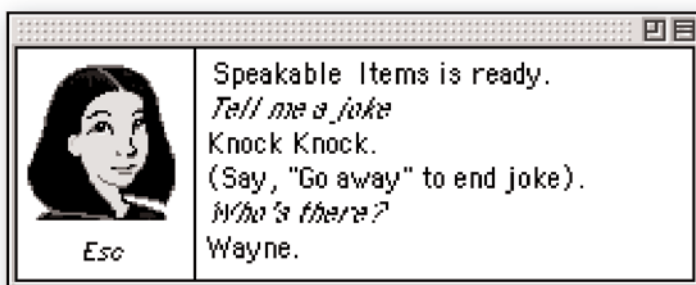


Fig. 4: A Feedback window as it might appear in Mac OS 8 or 9. OS X uses a cool-looking feedback "disk," as shown in figure 7.

The Speech Control Panel in Mac OS X

Listening

Follow these steps to configure speech recognition in Mac OS X:

- Open the **System Preferences** display and select the *Speech* Preferences.
- Mouse-click on the **Speech Recognition** tab.
- Click on the **Listening** sub-tab.



Fig. 5: The Listening tab of the Mac OS X Speech Preferences panel.

- By default, the computer is “listening” for speech recognition when the **Escape (Esc)** key is pressed. To select an alternate hot key, click on the **Change Key** button and define a new Listen Key in the resulting dialog.
- The **Listening Method** radio buttons allow you to toggle Listening on and off or make it active only while the hot key is pressed.

If speech recognition is toggled on, it is possible that the computer could respond to words not intended as commands. In early versions of Speech Recognition Manager, the computer would occasionally start to do crazy things because it “overheard” the user talking on the phone or chatting with a co-worker. To solve this problem, Apple has the concept of a computer **Name**. This feature allows the computer to respond to spoken commands only when it is addressed by its name. The default name is “Computer;” for optimal protection, give your computer a unique, unusual name and set the **Name is** pop-up menu to “Required before every command.”

Speakable Items

To configure Speakable Items in OS X 10.1.0 through 10.1.5, do the following:

- In the **Speech Recognition** Preferences pane, mouse-click the **On/Off** tab.

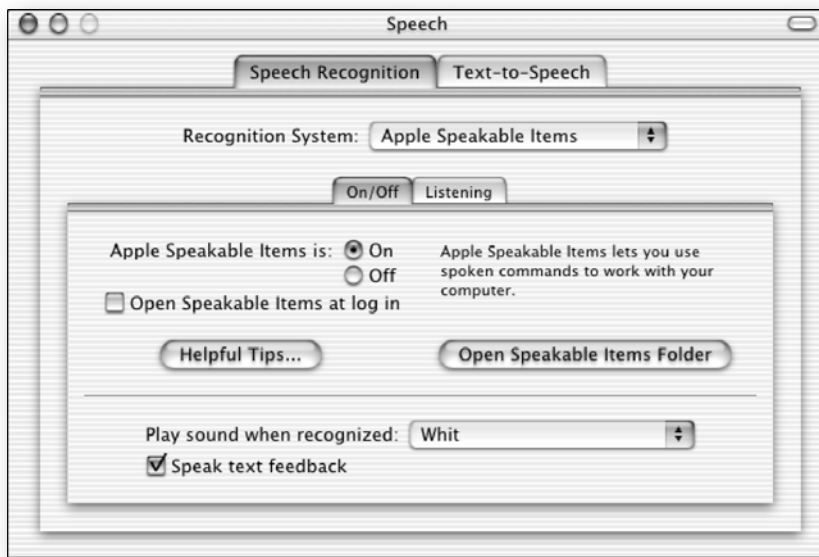


Fig. 6: Use the Speech Preferences dialog in OS X to control Speech Recognition features.

- Mouse-click the radio buttons to enable or disable Speakable Items.
- For greatest ease of use, mouse-click to enable the **Open Speakable Items at log in** checkbox.
- You can view the entire list of installed Speakable Items by clicking on the **Open Speakable Items Folder** button.

Feedback

When speech recognition is active, a Feedback window is visible onscreen that displays your commands as well as certain computer responses.

- By default, the computer will speak any (appropriate) responses to your voice commands. Disable spoken feedback by de-selecting the **Speak text feedback** checkbox in the **Speech Recognition** Preferences pane.
- The computer can also play an alert sound when it recognizes a spoken command. Use the **Play sound when recognized** pop-up menu to select any or no alert sound.



Fig. 7: The Feedback window as it appears in Mac OS X.

TIP

You don't have to shout or over-enunciate—the Speech Recognition Manager actually adapts to your voice and volume level after the first few commands. It also works best when only one user is giving commands to a particular computer. If another user is taking over, you may want to drag the Speech Preferences file (found in the **System Folder > Preferences**) to the trash. Speech Recognition Manager works best with adult voices and has a hard time with children's speech.

SPEECH RECOGNITION FOR WINDOWS

Unlike the Mac OS, the Windows operating system is not pre-loaded with speech recognition tools, but such capabilities can be added by installing retail third-party (or Microsoft-created) software tools.

The **Speech API (SAPI)** is used by developers to create software programs with speech recognition features. At the time of this writing, SAPI is in version 5.1 and is accessed by implementing the Microsoft Speech SDK (software development kit). The Speech SDK includes speech recognition engines that understand American English, “simplified” Chinese, and Japanese. Windows 98, 2000, ME, or XP is required for SAPI; Windows 95 is not supported.

One of the most prominent speech-enabled applications for Windows is Microsoft’s *Office XP* productivity suite. Office XP strives to deliver on the promise of

computer dictation, allowing people to talk instead of type, and has two speech recognition modes: **dictation mode**, which allows users to dictate memos, letters or e-mail messages, and **voice command mode**, which is for accessing menus and commands through voice input. Other useful speech recognition and dictation applications can be found from vendors such as IBM and ScanSoft.

At press time, Microsoft was cooking up what they hope will be an industry-wide specification known as Speech Application Language Tags (SALT). A group of XML elements, SALT is intended to help programmers create speech-enabled Web applications. On top of this, Microsoft has created a .NET Speech SDK, part of their grand .NET Web services initiative. The idea focuses on creating Web pages that can be spoken to.

SPEECH SYNTHESIS

Speech synthesis, also known as **text-to-speech** (TTS) involves using a computer voice to “read” text such as a letter, a Web page, or the words in a menu or dialog box. Appearing in the late 1970s as part of Ray Kurzweil’s book-reading machine for the blind, speech synthesis is of special importance to the blind and visually impaired, allowing access to the otherwise all-visual medium of computing.² Applications range from attention-getting “nags” in computer showrooms to sophisticated phone-based attendants and “expert” systems. Synthesized speech has also cropped up in music over the years, usually as a novelty robot voice.

SPEECH SYNTHESIS FOR MACINTOSH

Apple has been including its **MacinTalk** speech synthesis technologies in the Mac OS since 1993. This TTS feature is on by default in OS 8 and 9, but off by default in OS X. Under the default settings, it will read the contents of any dialog or prompt after a short delay. Apple offers 26 different voices, including four voices that speak Spanish.

The applicable system components include the **Speech Manager** system extension, the **MacinTalk** speech

synthesizer system extensions (MacinTalk 2, MacinTalk 3 and MacinTalk Pro, each offering different speech quality levels), the *Speech* control panel or Preferences pane, and the **Voices** folder in the extensions folder, which contains an assortment of different voices.

TTS is nicely integrated with the Apple *SimpleText* word processing program. Simply type **Command-H** to hear any open SimpleText document read back to you.

Configuring Text-to-Speech in Mac OS 8 & 9

- From the **Apple** menu, select **Control Panels** and open the *Speech* control panel.
- Select **Voice** from the **Options** pop-up menu to view the voice page. Any of the installed voices may be selected from the **Voice** pop-up menu; “Victoria” is one of the most natural sounding. The **Rate** slider allows you to adjust the talking speed; mid-range settings are best.
- Select **Talking Alerts** from the **Options** pop-up menu to determine whether alerts will be announced with an attention-getting **phrase**, with the spoken **alert text**, or both. Click the appropriate checkboxes on or off to configure your preferences.
- Adjust the **Wait before speaking** time-delay slider; we suggest using the lowest setting (0 seconds) for quickest response.

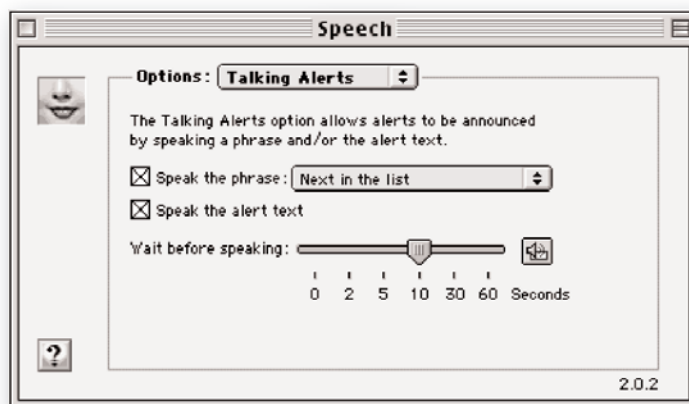


Fig. 8: Adjust speech synthesis parameters in the OS 8 & 9 Talking Alerts view.

² A real renaissance man, Ray Kurzweil developed the first book-reading machine for the blind. During the course of this pursuit he also advanced the field of optical character recognition (OCR), invented the text-to-speech synthesizer, and created the flatbed scanner. Musician Stevie Wonder was his first customer, and this story is recounted at <http://www.kurzweiltech.com/kcp.html>. Among other businesses, Kurzweil later founded a well-known musical instrument company.

Configuring Text-to-Speech in Mac OS X

- From the System Preferences display, select **Speech** and click the **Text-to-Speech** tab.

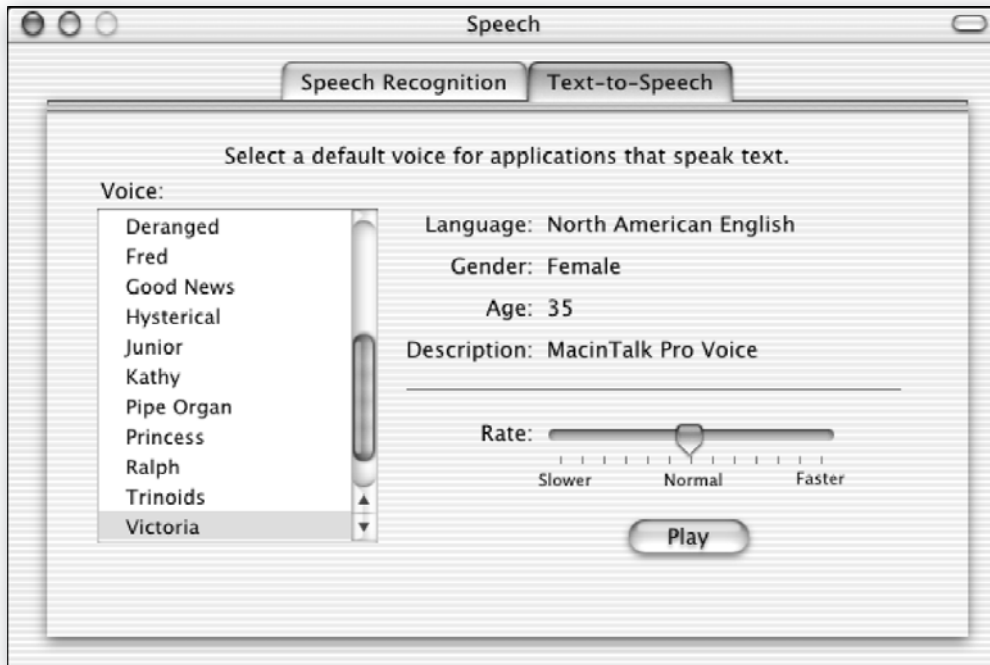


Fig. 9: The Text-to-Speech tab is used to control speech synthesis settings in Mac OS X.

- Any of the installed MacinTalk voices may be selected from the **Voice** list; “Victoria” is one of the most natural sounding.
- The **Rate** slider allows you to adjust the talking speed; mid-range settings are best.

The OS X *TextEdit* word processing utility includes TTS support. From the **Edit** menu, mouse-down to **Speech** and select **Start speaking** to hear your document read to you.

Note: Check out the **Tell Me a Joke** Speakable Item in any version of the Mac OS. It contains a sizeable selection of truly corny knock-knock jokes.

SPEECH SYNTHESIS FOR WINDOWS

Windows XP is the first version of Windows to include basic text-to-speech abilities. As already mentioned, Windows 95, 98, 2000 and ME are not pre-loaded with any speech synthesis or TTS tools, but can have such capabilities added in by installing third-party software programs.

The Speech Control Panel

Follow these steps to configure speech synthesis in Windows XP:

- From the **Start** menu, select the **Control Panel** submenu and choose the *Speech* control panel.
- Choose any installed voice from the **Voice Selection** pull-down menu. If you haven't installed any additional voices, you'll see only one selection: "Microsoft Sam."
- Adjust the rate of speech using the **Voice Speed** slider. A setting somewhere near the middle is usually best.
- If you have more than one audio output device installed on your computer, select between them by clicking the **Audio Output** button and choosing the preferred device in the resulting **Sound Output Settings** dialog.
- You can test the speech settings from within the control panel. Use the default test sentence provided, or enter your own custom sentence and then click the **Test** button.

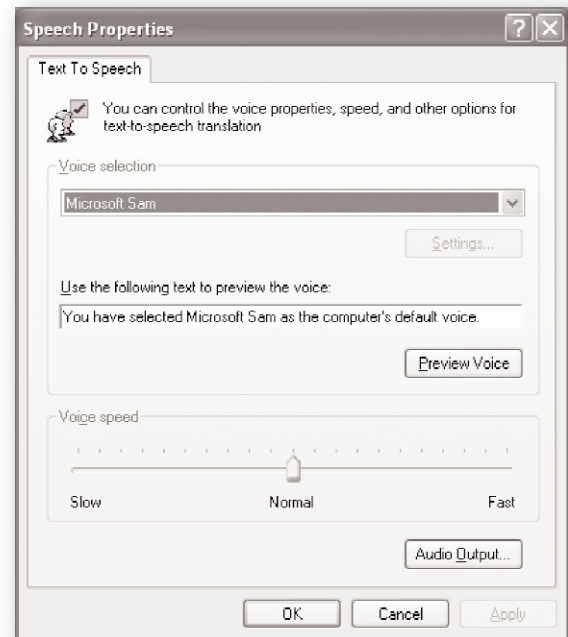


Fig. 10: The Speech control panel in Windows XP.



Fig. 11: The Text to Speech Sound Output Settings dialog in Windows XP.

The Narrator Accessory

Once you've configured the Speech control panel, you'll want to set up the **Narrator** accessory. Narrator is meant to work with *Notepad*, *WordPad*, control panels, Microsoft *Internet Explorer*, and the Windows desktop. It will read the name of the button or feature that the cursor is positioned over, and will also read the contents of dialogs. Unfortunately, it may not read predictably with other programs. To configure Narrator, follow these steps:

- From the **Start** menu, select **All Programs > Accessories > Accessibility > Narrator**, and click the checkboxes to select or de-select the features.
- **Announce events on screen** will read dialog boxes and prompts.
- **Read typed characters** will read what you're typing in *Notepad*, *WordPad* and other supported parts of the Windows operating system. We found that it will also say the names of typed characters in Microsoft *Word* and *Outlook*. Unfortunately it is very slow; it can't keep up with quick typing.
- **Move mouse pointer to the active item** helps the visually impaired by automatically positioning the cursor over the item currently being read, making it easy to click on.
- **Start Narrator minimized** causes Narrator to launch in the low-profile minimized view.

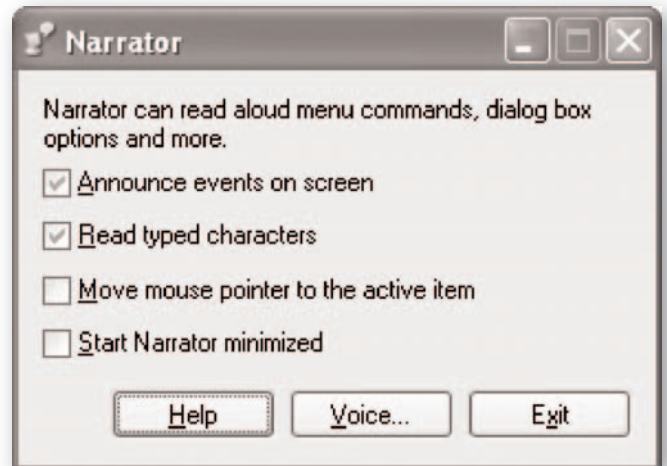


Fig. 12: The Narrator accessory in Windows XP will read system prompts, dialog boxes and words typed in certain programs.

- The **Voice** button opens the **Voice Settings** dialog. Click on any installed **Voice** to highlight and select it. You can also adjust the **Speed**, **Volume** and **Pitch** of the Narrator's text-to-speech feature. Mouse-click on any of the pull-down menus to change the default settings.

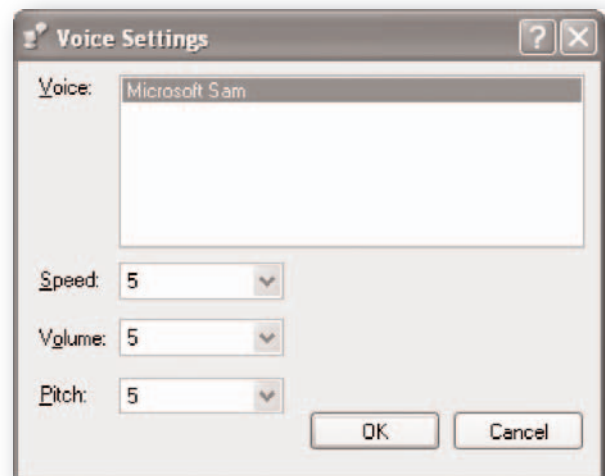


Fig. 13: The Voice Settings dialog of the Narrator accessory.

VOICE RECOGNITION

Voice recognition is a type of biometrics or “fingerprinting,” a way to control access to the system. Using voice recognition, the computer uses the sounds or patterns of a speaker’s voice to make an identification. Think of it as a type of password—one that is spoken instead of typed.

Apple’s **Voice Verification** feature, debuted in conjunction with the iMac, is part of Mac OS 9 only and went away in OS X. Voice Verification allows you to create a voiceprint password so you can log in verbally rather than by typing. To use this feature, you must have Account Manager access privileges, the Voice Verification document must be installed in the Extensions folder, and, of course, a microphone must be either built in or plugged in.

Configuring Voice Verification in Mac OS 9

- From the **Apple** menu select the **Control Panels** submenu and open the *Multiple Users* control panel.

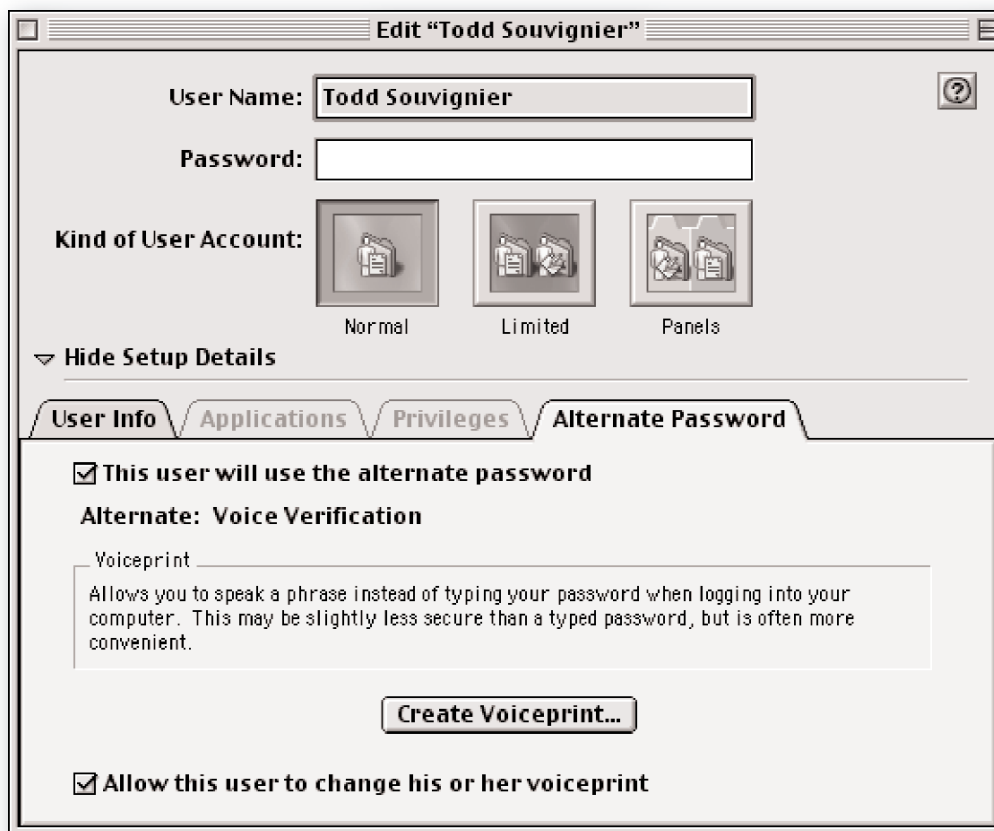


Fig. 14: The Multiple Users control panel in Mac OS 9 is used to set up Voice Verification.

- Click the **Options** button.
- In the **Global Multiple User Options** dialog, select the **Login** tab.
- Click on the **Allow Alternate Password** checkbox to enable it.
- Click the **Save** button to exit the dialog.
- Click on your name or icon in the Multiple Users control panel and click the **Open** button.
- Select the **Alternate Password** tab.
- Click on the checkbox labeled **This user will use the alternate password** to enable it.
- Click the **Create Voiceprint** button.

Creating a Voiceprint

The first Voiceprint Setup dialog displays the phrase that will be spoken as your password. If you wish to use a phrase other than the default, click the **Change Phrase** button and type in a new phrase. If the phrase is OK, click **Continue**. You will need to say the password phrase four (4) times.

- Click the **Record First** button to begin.
- In the **Recording** dialog, click the red **Record** button, say the phrase into the microphone, then click **Stop** button and then **Done**.



Fig. 15: Voice Recognition in Mac OS 9 requires that you record yourself saying the password phrase four separate times.

- Repeat the recording pass three more times. After the fourth recording, click the **Try it** button to check that the voiceprint password works.
- For alternate voiceprint passwords to operate, **Multiple User Accounts** must be turned on and each user must have a regular typed password.

TIP

Speak normally with an even tone and steady rate. Don't whisper or shout. Try to say the password phrase the same way each time.

VOICE CHAT AND TELECONFERENCING

Apple used to have a technology called **QuickTime Conferencing (QTC)** that allowed two-way picture and voice transmission over AppleTalk local area networks or the Internet. It was included on some early Power Macintosh computers and was embodied in a simple videoconferencing application called *Apple Media Conference (AMC)*. Unfortunately, it was all abandoned many years ago with QTC version 1.0.2 back in 1996, and is now considered a “legacy” technology (meaning it is obsolete), so no real information or support is available.

Mac OS X 10.2.x (Jaguar) includes an instant messaging application called *iChat*, which is compatible with *AOL Instant Messenger* and Mac.com buddy lists. Audio/video conferencing wouldn't arrive until OS X version 10.3 (Panther).

Meanwhile, Microsoft has continually supported and developed its conferencing technologies. The best known is Microsoft *NetMeeting*, which is supported by all versions of Windows covered in this book. NetMeeting allows for real-time audio/video conferencing and supports application sharing, instant messaging and use of file transfer features. The NetMeeting API, contained in the NetMeeting Platform SDK, allows developers to write their own conferencing applications.

NetMeeting is embodied in the familiar *MSN Messenger* chat client, also known as *Windows Messenger* in its XP-bundled configuration or as *Microsoft Messenger* in earlier editions. MSN Messenger provides instant messaging or “text chat” capabilities that are comparable in some ways to *AOL Instant Messenger* or *ICQ*, and allows you to do much better than just pass written messages; you can have voice conversations or even do videoconferencing—imagine your own PC-to-PC picture-phone!

There is also conferencing in DirectX as part of the DirectPlay networking API. **DirectPlay Voice** provides voice chat capabilities that allow gamers to consult with teammates or harass opponents during online multiplayer games. Programmers use DirectPlay Voice to add real-time voice communication to games or to create other applications that entail conferencing or two-way speech.

Conferencing in Windows with MSN Messenger

After you've download and installed MSN Messenger, you'll need to create a Hotmail or .NET Passport account if you don't already have one.³ This is all fairly painless, and Messenger (as we'll refer to it henceforth) will prompt and direct you through the process. Once that's complete, you're ready to use the program.

Setting up Your Hardware

- Plug your headphones into the headphone or speaker port of your sound card.

TIP

Headphones are strongly recommended for conferencing; you'll get echo and feedback if you listen through speakers. Although any old set of "cans" will do, you can also get Madonna-style headphone-plus-microphone headsets or telephone-style handsets that have standard eighth-inch stereo input and output mini-plugs.

- Plug your microphone into the microphone input port (audio input) of your sound card. If you're not using a powered mic, plug into a mic preamp or a powered channel on a mixing console, then route the console or preamp to the audio input port of your sound card.
- In Windows, check the **Audio** tab of your *Sounds and Multimedia* control panel to make sure that you have the correct sound card selected as the Sound Recording and Playback devices.⁴
- Open the *Volume Control* accessory to make sure that the Microphone channel is not muted and that the Microphone volume and master volume channels are at their maximum levels.
- Open the *Recording Control* accessory and make sure that the Microphone channel is selected (checked **on**) and that the volume is up.
- Open *Messenger* if it's not already visible onscreen. From the **Tools** menu, select the **Audio Tuning Wizard**.
- Click on the Audio Tuning Wizard's **Next** button to go through the pages to double-check your audio configuration. It will help you find the right headphone or speaker volume levels and will automatically adjust the mic input volume level to an optimal setting. (Note that this adjustment of the volume level will be reflected in the *Recording Control* accessory.)

Note: If you wish to do videoconferencing, you will need a digital video camera attached to your computer. Such cameras are readily available and generally simple to use. As this is an audio book, we shall forego the instructions for setting up and configuring video cameras. Refer to the instructions that came with your camera.

³ Hotmail is a free Web-based e-mail service run by Microsoft. Becoming a Hotmail member gets you into the Microsoft .NET Passport program, a user-authentication system that is part of Microsoft's big .NET Web Services initiative. Hotmail is cool because its basic version is free, and e-mail can be checked or sent from any Web-connected computer. Passport is likewise nifty, making it easy to shop online at any Passport-enabled Web site; it can remember all your billing, shipping and credit card information so checkout takes only a few mouse clicks.

⁴ Detailed information regarding the *Sounds and Multimedia* control panel is provided in chapter 4 of *Teach Yourself Computer Audio*.

Starting a Session

- From the **Actions** menu, select **Start a Voice Conversation** to start a teleconference or **Start NetMeeting** (relabeled **Start a Video Conversation** in Windows XP) for a videoconference. In the resultant dialog, select the contact with whom you wish to conference, then click **OK**.

TIP

If the person you wish to contact is currently online, simply right-click the name in the main *MSN Messenger* window and select **Start a Voice Conversation** for voice chat or **Start NetMeeting** (**Start a Video Conversation** in XP) for a videoconference.



Fig. 16: Another way to begin a teleconference in Messenger is to mouse-click on More at the bottom of the window and select Start a Voice Conversation from the pop-up menu.

- If the person you wish to speak to is not already in your Contacts list, click the **Other** tab and enter his or her e-mail address. Note that the contact must have Messenger installed and be a .NET Passport user with a supported e-mail address such as from Hotmail.com, MSN.com, or Microsoft.com.

COMPUTER TELEPHONY

Computer telephony, in its purest form, involves routing voice traffic over data networks. This area, also known as **Voice over IP (VoIP)**, has attracted intense hype and speculation, combined with much disappointment. Tantalized by the idea of making cheap or free long-distance calls over a computer, end-users have been turned off by the relative complexity of configuring their systems and problems such as echo or latency. Tech investors, cable networks and Internet Service Providers eager to jump into the phone business may find it difficult to build such services, attract and retain customers, and compete with the well-established phone companies.

There are other computer telephone applications in addition to voice over IP, from call-notification systems and voice mail management to the replacement of PBX switchboards and fancy voice-activated information retrieval systems. All of this is fairly specialized stuff, and none of it is included in the off-the-shelf computer operating systems.

Apple's **Telephone Manager API** provided a programming interface for telephony services in Mac OS versions 8 and 9. Software programmers could use the Telephone Manager to provide rudimentary features such as on-screen dialing and answering machine functions. The Telephone Manager didn't really catch on and is another one of those "legacy" technologies that has been left by the wayside and is not part of OS X. Although Apple did distribute a Telephone Manager Software Development Kit (SDK), no telephony applications were included as built-in or bundled features, and there is no longer any support for developers in this area.

Microsoft, however, has kept its telephony initiatives going strong and continues to push the development of new Windows telephony applications. Developers use the **Telephony Application Programming Interfaces (TAPIs)** and corresponding platform SDK to create software for making, routing and storing calls over the Internet or Public Switched Telephone Networks (that's the "plain old telephone system" to you or me). These APIs can also be used to create voice mail systems, switchboard products, and information retrieval systems.

For Windows XP, there's also an API called the **Real-Time Communications Client API (RTC)**, which lets developers create programs for making PC-to-PC, PC-to-phone, or phone-to-phone calls over the Internet. Both voice and video can be transmitted on PC-to-PC calls with RTC.

While all these APIs are very interesting and useful to software engineers, from an end-user's perspective, the rubber meets the road in the *Phone Dialer* accessory and the *MSN Messenger* application.

Using Voice over IP with MSN Messenger

In addition to the conferencing capabilities mentioned above, MSN Messenger has a very hip VoIP feature. Setting up Messenger to make phone calls involves the same steps as setting up for teleconferencing, including the need for a Hotmail or .NET Passport account. Once your account is set up, proceed as follows:

- Open MSN Messenger if it's not already visible onscreen.
- Mouse-click on **Make a Phone Call** in the lower **I want to** section of the Messenger display. (In MSN Messenger 6.0, select **Make a Phone Call** from the **Actions** menu.) The **Phone** dialog will appear, with its straightforward keypad interface.

Setting up for Voice Service

- Click the **Get Started Here** button.
- A browser window will open, displaying ads from a number of voice service providers who have partnered with Microsoft. Check out the different offers by clicking the **Learn More** links and find one that meets your needs. We happened to go with iConnectHere.com only because they were the cheapest.
- Once you've selected a voice service provider, sign up for one of their calling plans. Once your order is placed, there will be a brief delay—usually just a few minutes, but possibly as long as 24 hours—while your new service is established. Use this time to get your hardware hooked up by following the same steps as when setting up to do conferencing. (See “Setting up Your Hardware” under Conferencing with MSN Messenger, p.17.) Note that the **Audio Tuning Wizard** may be accessed from the **Tools** menu of the **Phone** window.



Fig. 17: Use the Messenger Phone dialog to set up your Voice over IP service.

- Once your voice service has been established at the service provider, you should receive an e-mail confirming the service. You'll be able to see that your service is active when opening the **Phone** window; the voice service provider's logo will appear at the top of the window and the **Enter Phone Number** field will be accessible.



Fig. 18: Once your VoIP service has been activated, the service provider logo will appear.

Making a Call

- When calling within the United States, the number 1 must precede the area code and phone number, which is the default setting. A pull-down menu that contains all supported country names and corresponding country codes is provided for international calling.
- To place a phone call, type the area code and phone number to be dialed from your computer keypad, or mouse-click the buttons of the on-screen keypad.
- Once the number is entered, mouse-click on the **Dial** button. When the connection is made, you can speak normally into the microphone.

TIP

Although the aforementioned setup routine sounds like a lot of work, it's actually very easy and makes total sense. The hardest part is remembering to turn on the microphone in the *Recording Control* accessory display. Once things are correctly set up, it's truly very easy—even fun.

In tests on Windows ME and Windows XP with a 1.5 Mbps cable modem service, we were impressed by the quality of service, relatively low latency, and the low cost of the calls—far less expensive than the cheapest conventional landline or cellular long distance plans. The main downside is that people with conventional phones cannot call you on your computer, as Messenger only does outgoing calls, so you will still need a regular phone. Also, remember that local calls are billed at the same rate as long distance calls, which is another good reason to keep the landline plugged in.

Using Microsoft Phone Dialer

The venerable *Phone Dialer* application actually dates back to 1981. It's not a voice application *per se*; it just dials the phone for you. In order to use Phone Dialer, you need to have a modem in your computer that is plugged into a telephone line with a real telephone plugged into an extension of the same phone line. If you only have access to one phone jack, get a telephone line splitter and plug the modem and the phone into the same socket.

Before you start dialing, make sure the modem dialing properties are correctly configured. How you get to the setup screen depends on the version of Windows you are running:

Configuring Dialing Options

- In Windows XP, go to the **Start** menu > **Control Panels** > **Printers and Other Hardware** and open the *Phone and Modem Options* control panel. In the **Dialing Rules** tab, click on a Location to highlight it, then click the **Edit** button. In the resulting **Edit Location** dialog, click the **General** tab.
- In Windows ME, go to the **Start** menu > **Settings** > **Control Panel** and open the *Telephony* control panel. Click the **My Locations** tab.
- In Windows 2000, go to the **Start** menu > **Settings** > **Control Panel** and open the *Phone and Modem Options* control panel. In the **Dialing Rules** tab, click on a Location to highlight it, then click the **Edit** button. In the resulting **Edit Location** dialog, click the **General** tab.
- Use the pull-down menu to select a **Country/region**. Enter your telephone area code (or city code) in the **Area code** field.
- If you have to dial special numbers (like 9, for example) to get an outside line or make a long distance call, enter those access numbers in the appropriate fields.
- If you want to disable call waiting, click the **disable call waiting** checkbox and enter the disable code (or select from the pull-down menu).
- Use the radio buttons to select **Tone** or **Pulse** dialing.

TIP

If you're not sure whether you're on Tone or Pulse, try Tone (the default setting). Most contemporary phone networks are touch-tone systems; old-fashioned pulse dialing is quite rare at this point.

- If you use a calling card to dial long distance, click on the **Calling Card** tab (or the **Calling Card** button in Windows ME) and enter your access code, card number, and PIN number as appropriate.
- Once you've finished configuring the dialing options, click **OK** to save your settings and exit the control panel. Now you're ready to start dialing!



Fig. 17: Your telephone and modem must be plugged into the same phone line for the Phone Dialer accessory to work.

Dialing

- Go to the **Start** menu > **Programs** > **Accessories** > **Communications** and open the *Phone Dialer* accessory.
- Enter the **Number to dial** by mouse-clicking the buttons on-screen, or just type the number into the field using your computer keypad.
- Click the **Dial** button to begin dialing.
- When you see the **Call Status** dialog, pick up the telephone handset. Mouse-click the **Talk** button, or press **Enter** or **Return** on your computer keyboard.
- When the call is complete, mouse-click the **Hang Up** button.
- If you want to set up one-touch speed-dial numbers, mouse-click on any empty location under **Speed dial**, enter a name and telephone number, then click **OK** to save.

Note: In Windows 2000 and XP, the Phone Dialer is a far more complicated accessory provided by the Active Voice Corporation. This third-party OEM Phone Dialer includes IP conferencing features and other extraneous stuff that we'll skip over here since conferencing was covered earlier within the context of *MSN Messenger*. The phone dialing aspects in Windows 2000 and XP are fairly self-evident: Click the **Dial** button and enter a phone number; make sure the **Dial As** radio button selection is on **Phone Call**, then click the **Place Call** button.