

# Chapter 11

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## Recording Your Own Sampled Sounds

Now that you know how to send sounds to your friends, how about sharing some sounds that you record yourself? This chapter shows you how to record sounds in both Windows and Mac OS. You can record from a microphone, a CD, a MIDI or other file, or any device connected to your sound board's input jack. You can even record from two or more devices at once, so you can sing along with your favorite song, if you'd like. This chapter covers sampled sounds only, not MIDIs, MODs, or proprietary formats such as Shockwave or NetShow, all of which require special software.

What you'll learn:

- A bit about copyright law—what the law permits you to record and what it doesn't
- How to choose the audio properties for a recording (file format, sampling rate, and so on)
- How to use Windows Sound Recorder to record a new sound
- How to use Cool Edit 96 for Windows to record a new sound
- How to use SndSampler for Mac OS to record a new sound

## What You Should Know about Copyrights

Many of my Net friends would never think of breaking a law. In fact, some of them are in law enforcement and are rather uptight about it. Yet they quite casually record and pass around sound bites from movies, cartoons, popular songs, and other copyrighted material. They even publish copyrighted sounds on their Web sites. I don't think they would do this if they knew they were breaking the law.

Some Net users really don't care about copyrights. They freely copy whatever pleases them with the full knowledge that it is protected material. But I believe that most copyright infringement on the Net is casual and unintentional — people just don't realize they are breaking copyright laws. To keep you out of that category, this section briefly explains copyrights. From now on, if you infringe on someone else's copyright, at least it will be your conscious decision.

U.S. copyright law is quite complex, and international copyrights are even more so. There's no way I can explain it all here. All I can do is give you a few guidelines. You'll find links to some excellent Web sites on copyrights in Appendix D on the CD-ROM.

Any new work automatically has several rights associated with it, which are generally referred to as the copyright: the right to make reproductions, the right to perform it, the right to distribute it, the right to adapt or edit it, and so on. These rights are originally owned by the creators — the authors, composers, arrangers, performers — but are often sold to publishers or producers. Basically, you cannot record or distribute something that was written, composed, arranged, and/or performed by someone else unless you get proper permission from the copyright owners.

Copyright laws are softened a bit by the concept of “fair use,” which says that you may quote part of a copyrighted work for educational purposes. In addition, the Audio Home Recording Act of 1992 extends fair use to enable us to copy songs to audiotape for our own personal use. Can we stretch “audiotape” to include electronic

formats that weren't considered in 1992, such as sampled and streaming audio files? The experts are wrestling with that alligator now.

Copyrights don't last forever. When a work's rights expire, it passes into the *public domain*, meaning that it is owned by all of us and we are free to use it. In the United States, a work created before 1978 was automatically copyrighted for 28 years, and the copyright owner could extend it for another 28 years. Since the U.S. copyright laws changed in 1978, a work is protected for 50 years after the death of the creators. But there was a gray area in the '60s and '70s when expiring copyrights were extended so they would be covered by the new law when it went into effect. So it's not always easy to determine whether a particular work written earlier in this century is in the public domain. Works composed in earlier centuries—the music of Tchaikovsky, Mozart, Beethoven, and Verdi, for example—are clearly in the public domain. A recent recording of a public domain work, however, is copyrighted for the performers and arrangers.

What this boils down to is that you have the right to record, publish, perform, distribute, and so on, anything that you compose and arrange yourself. You can record, publish, and so on, public domain works as long as you're not using someone else's arrangement or performance.

**Note**

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Any works created by the U.S. government are automatically in the public domain.

How likely are you to get caught infringing a copyright? If you record a ten-second sound bite of Daffy Duck and pass it around to your chat buddies, your chances of getting caught are near zero. But if you create a large Web site offering thousands of downloadable sound bites from Warner Brothers cartoons, the next sound you hear might be a clutch of Warner Brothers lawyers knocking at your

door. Copyright owners no longer ignore what is happening on the Internet, not even on “amateur” sites.

## Deciding on Audio Properties

Before you begin a new recording, you need to decide what audio properties you want to use—the file format, the encoding, and properties such as sampling rate and sample size. Always keep in mind that you have to trade quality for size. For your own use, if you have enough disk space and RAM, you might prefer the highest quality you can achieve no matter how big the file gets. For exchanging on the Internet, small file size is more important than quality.



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**Tip**

You may make a high-quality recording for yourself and then convert it to a smaller size for sharing with others.

Should you make WAVs? Or perhaps SNDs or MP3s would be best? It depends on how you want to use the sounds you’re about to record. If you’re going to post them to a site that features a particular format—an MP3 newsgroup, perhaps—the answer is obvious. But what if you want to use a sound for the background of your own Web site? Or e-mail it to a group of friends?

If you’re making a short recording to share with Mac users, use the Macintosh SND or AIFF format. Choose WAV format for Windows users. If your audience will have both Windows and Mac users, I suggest that you use WAV, as that is the most common format on the Internet and many Mac users know how to deal with it.

Suppose you’re recording a sound to play in chat rooms. Choose the right format for your own system. If you’ll be sharing the sound with people on both systems, make a WAV version and a SND version.

But what about a long file—perhaps an entire song or a long voice message? Certainly you don’t want to make your friends

download a multimegabyte WAV or SND file. Consider using MP3 for a much smaller file. The drawback to the MP3 format, of course, is that some people can't play it yet. But that is changing rapidly. Windows 98's Media Player can handle MP3, for example. So can many third party players such as Jet-Audio. I suggest that you record the long version in MP3 format. Also, record a short version as a WAV and accompany it with a note about the MP3 version and where people can download MP3 players.

## Windows Sound Recorder

Windows comes with Sound Recorder, which provides basic recording features. For more advanced recording and editing, you'll need a third-party recorder. I have included one called Cool Edit on the book's CD-ROM. In the following sections, I'll show you how to use Sound Recorder first, then Cool Edit.

Windows Sound Recorder, shown in Figure 11-1, is a fairly simple application for recording WAVs up to 60 seconds long. You can start it by choosing Start ⇨ Programs ⇨ Accessories ⇨ Multimedia ⇨ Sound Recorder (Windows 95 or Windows NT) or Start ⇨ Programs ⇨ Accessories ⇨ Entertainment ⇨ Sound Recorder (Windows 98). If Sound Recorder isn't on your Start menu, I suggest you read through this section, including the description of Cool Edit, before you decide to install it. If you do want to install it, you'll need your Windows 95 or 98 installation disk(s) and the following instructions.



**Figure 11-1** *Sound Recorder is included with Windows 95, 98, and NT.*

How to install Sound Recorder:

1. Choose Start ⇨ Settings ⇨ Control Panel to open the Control Panel.
2. Open Add/Remove Programs.
3. Choose the Windows Setup tab.
4. Open Multimedia by double-clicking it.
5. Select Sound Recorder.



### Caution

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Be careful not to select or deselect any other item. If you add a check mark to another item, Windows installs that item. Worse, if you accidentally remove an existing check mark, Windows uninstalls that item.

6. Choose OK to close the Multimedia dialog box. Then choose OK to close the Add/Remove Programs Properties window.
7. At this point, Windows installs the items you selected. Follow the directions on the screen that tell you when to insert the Windows disk(s).

## Configuring your recording device

Before you can record, you need to tell Sound Recorder from which device to record. Double-click the Volume Control icon in your system tray to open your Volume Control window. Choose Options ⇨ Properties to open the Properties dialog box and then select Recording and choose OK. Now Volume Control displays your various recording sources in the Recording Control window, as shown in Figure 11-2. Select the devices you want to use in this recording by enabling the Select box below each device. You can select multiple devices, such as the CD audio and microphone. Then close the window.



**Figure 11-2** You select the devices you want to record from in the Recording Control window.

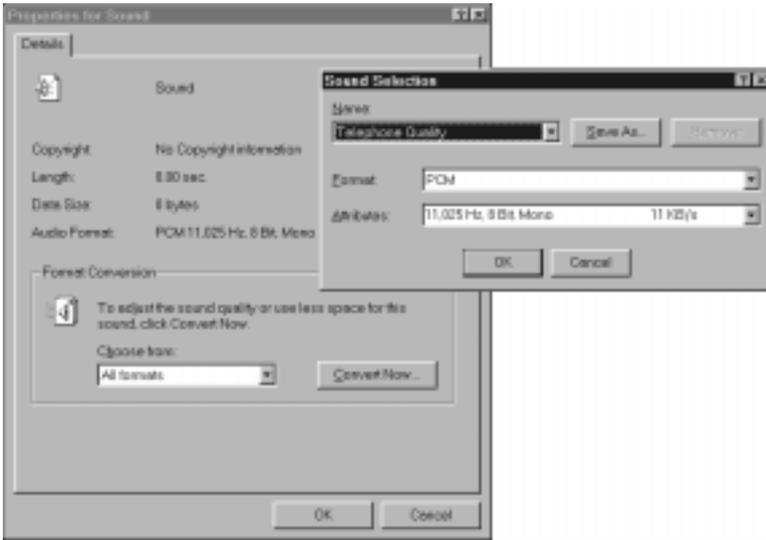


### Note

If your system tray doesn't show a Volume Control icon, you can start Volume Control in Windows 95 and Windows NT by choosing Start ⇨ Programs ⇨ Accessories ⇨ Multimedia ⇨ Volume Control. For Windows 98, choose Entertainment instead of Multimedia.

## Setting the recording properties

The next step is to set the recording properties for your upcoming recording. In the Sound Recorder window, choosing File ⇨ Properties opens the Properties for Sound dialog box, shown in Figure 11-3. Select Recording Formats from the Format Conversion drop-down list. Then choose Convert Now to open the Sound Selection dialog box, also shown in Figure 11-3.



**Figure 11-3** *Sound Recorder uses these dialog boxes to set the properties for the upcoming recording.*

In the Sound Selection dialog box, the Name drop-down list provides these named setups:

- **CD Quality**— 44 kHz sampling rate, 16-bit samples, stereo, PCM encoding
- **Radio Quality**— 22 kHz sampling rate, 8-bit samples, mono, PCM encoding
- **Telephone Quality**— 11 kHz sampling rate, 8-bit samples, mono, PCM encoding

If you don't want to use one of these, you can select your own settings in the Format and Attributes drop-down lists. Notice in particular that all three named setups use PCM encoding, which offers no compression. The Format drop-down lists all the codecs available on your system. You may want to select a codec that will compress your recording to keep the file size small. But stick to the

popular codecs — described in Chapter 1 — which other people are likely to have. You can assign a name to your own setup by choosing the Save As button. Then your setup will appear in the Name drop-down list for future recordings.

**Tip**

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The Remove button becomes available only when you select one of your own named setups. You cannot remove CD Quality, Radio Quality, or Telephone Quality.

## Making the recording

Now you're ready to make your recording using the controls in the Sound Recorder window. The following two procedures show you step-by-step how to record from the microphone and from the CD-ROM drive.

How to record from your microphone using Sound Recorder:

1. Make sure your microphone is plugged into the microphone jack at the back of your computer.
2. Select Microphone and set its volume in the Recording Control window (refer back to Figure 11-2).
3. Set the recording properties (refer back to Figure 11-3).
4. Choose the Record button to start recording.
5. Make your recording.
6. Choose the Stop button to stop recording.
7. Choose the Play button to listen to your recording.

**Tip**

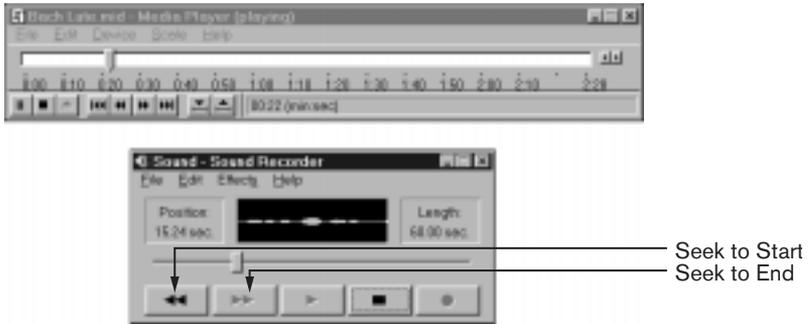
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If you can hear your breath hitting the microphone, try getting farther away from the mic next time. If that doesn't work, place the mic to one side of your mouth. Or tape something over the mic, such as a tissue, a piece of paper, or a piece of cloth.

How to record from a CD using Sound Recorder:

1. Get Sound Recorder ready by following these steps:
  - a. Select CD Audio and set its volume in the Recording Control window (refer back to Figure 11-2). Make sure Microphone is not selected unless you want to sing along.
  - b. Set the recording properties.
2. Get the CD ready by following these steps:
  - a. Place it in your CD-ROM drive.
  - b. Start up your CD player program. (It probably starts automatically when you put the CD in the drive.)
  - c. Locate the point on the CD where you want to start recording.
  - d. Pause the CD at that point.
3. Choose Sound Recorder's Record button, then quickly start the CD.
4. When you have recorded the sound you want, choose Sound Recorder's Stop button to stop recording.
5. Choose the CD player's stop button to stop playing the CD.
6. Choose Sound Recorder's Play button to listen to your recording.

Any device attached to your sound board's Line In jack, such as a radio, TV, or tape player, can be used as a sound source by choosing Line-In in the Recording Control window. You can also record MIDIs played on your sound board's synthesizer. In Figure 11-4, I am using Media Player to play a MIDI while I record it with Sound Recorder. Keep in mind that a MIDI file is much, much smaller than a sampled recording, so there's little reason to make a sampled recording of a MIDI unless you want to change it somehow. You might, for example, want to sing along with it.



**Figure 11-4** You can record MIDI's played by your sound board.

If you're not satisfied with your recording, you can record over it by choosing the Seek to Start button, shown in Figure 11-4. Then choose the Record button and record it again. If you want to add to the end of the current recording, choose the Seek to End button, also shown in the margin, and then choose Record to continue recording. You can also change just a portion of the recording. You'll see how to do that in Chapter 12, which shows you how to edit sound files.

When you're satisfied with your recording, choose File ⇨ Save to save it. A common Save As box lets you choose a file format, give it a name, and select a folder for it.

## Overcoming Sound Recorder's time limit

Unfortunately, Sound Recorder places a time limit on your recordings. The maximum time depends on your recording properties. A Telephone Quality recording, for example, is limited to 60 seconds. Higher quality recordings have shorter time limits. As soon as you click the record button, you'll see the Length value jump from 0.00 seconds to the time limit, expressed in seconds. The best way around the time limit is to use a different recorder, such as Cool

Edit. But if you don't want to do that for some reason, you can work around Sound Recorder's time limit.

Assume that you are using Telephone Quality recording with a 60-second time limit. For voice recordings, start the recording as normal. At 60 seconds, the recorder turns itself off automatically. Simply stop talking while you click the record button again, then keep on going. Sound Recorder extends the time limit by another 60 seconds. You can keep on extending the time limit in 60-second increments until you finish your recording.

But what if you're making a recording where you don't want to pause every 60 seconds? Perhaps you're trying to record a 3 minute and 12 second song (192 seconds), and you don't want three little gaps in it. Go ahead and record the song as described above, with the gaps. Keep recording at the end until Sound Recorder's Position shows 192.00 seconds and then click the stop button. (You probably won't stop it right on 192.00, but you'll be close.) Now you've got a file of exactly the right length in memory. Simply click the Seek to Start button to return to the beginning of the file, then record over it. This time, you'll be able to record the entire file without pausing.

Another way to make a longer recording is to open one that's at least that long, then record over it. You can use any file that's long enough. Be sure to choose Save As instead of Save so you don't overwrite the original recording. When you use this method, you may need to trim the end of the recording, where your new sound ended and the original sound continues to the end of the file. You'll see how to trim recordings in Chapter 12.



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**Note**

Long recordings eat up memory. Be sure to close all other applications to free up as much memory as possible before starting to record. If you get an out-of-memory message, you may have to add more memory before you can make the recording.

## Cool Edit for Windows

The easiest way around Sound Recorder's limitations is to use a third-party program such as Cool Edit from Syntrillium. I chose Cool Edit because it offers so many features. Let's take a quick look at the full range of Cool Edit's features and how you can use them:

- It can play, edit, mix, and convert many sound formats: WAV, AIFF, Macintosh SND (only PCM encoding), AU, Raw PCM, RealAudio 3.0, MP1, and MP2, among others.
- You can edit all or any portion of a sound. For a stereo recording, you can edit the channels separately.
- You can work on several files at once.
- Special effects include Reverb, Delay, Echo, 3D Echo Chamber, Flanging, and Distortion.
- Other transformations include Reverse, Inverse, adding silence, modifying the amplitude, and adjusting the time and the pitch.
- You can generate specific tones by frequency and amplitude, DTMF tones (telephone touch tones), brainwave sounds (sounds that induce relaxation, sleep, and meditation), or just plain noise. You can also select a clipping, such as a dog bark, and use it as a sound sample to generate music. Now *your* dog can sing "Jingle Bells."
- You can filter out specific frequencies or filter out noise.
- You have the choice of several different views: waveform, spectral analysis, frequency analysis, and statistics.

This chapter, however, merely shows you how to make a sampled recording with Cool Edit. Chapter 12 shows you some basic editing tools. Then you'll be on your own to explore Cool Edit's advanced features.

## The fine print

Cool Edit 96's shareware fee is \$25 for the Lite version or \$50 for the full version. It works with Windows 95, 98, and NT. Until you register Cool Edit 96, you can use only a few functions at a time, an extremely effective way to get you to register.

## Getting ready to record

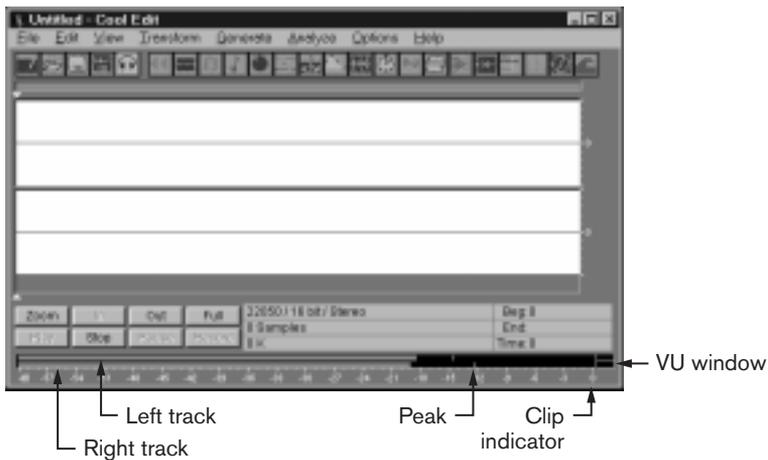
Before recording in Cool Edit 96, select your source device in the Recording Control window (refer back to Figure 11-2). When you start the unregistered version of Cool Edit 96, you must select which functions you want to use. Be sure to select the group that includes Save so you can save your new recording. When you get to the Cool Edit 96 window, choose File ⇨ New to open the dialog box shown in Figure 11-5. Select your recording properties and choose OK. When you return to the main Cool Edit 96 window, you'll see the properties in the status area.



**Figure 11-5** You select the recording properties for a new sound recording in Cool Edit 96's New Waveform window.

## Using the VU meters

To check your volume level, start the source and double-click Cool Edit 96's VU meter window, shown in Figure 11-6, to start the VU meters. The example in the figure is for a stereo recording, with the left track on top and the right on the bottom. For a mono recording, only one meter appears in the VU meter window.



**Figure 11-6:** *The VU meters monitor the volume of the sound source.*

The decibel markings in the VU window are negative numbers because they express the relationship to the maximum volume, indicated by 0dB. Anything above the maximum volume is clipped—it is not recorded. A track's clip indicator lights up when the track gets clipped; it stays lit until you turn it off again by clicking it.

The peak indicators show where each track recently peaked in volume. Each peak indicator moves up with the volume, but as the volume drops back, the peak indicator sticks for about 1.5 seconds to give you a chance to see exactly where the peak occurred.

Adjust the source device's volume until you're satisfied with the result on the VU meters. After your sound check, double-click the meters again to stop them. (The Record and Play buttons won't become available again until you stop the meters.)

## Making the recording

At last you're ready to start recording. Choose the Record button and start the sound source. As you record, you'll see the current time, number of samples, and file size in the status area. The waveform display doesn't react unless you choose Options ⇨ Settings and enable Live Update During Record. Choose the Stop button to stop recording. Then choose the Play button to hear the results.



### Tip

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If you decide to rerecord the sound, choose File ⇨ New to get rid of the current recording and start over. (You don't need to repeat the volume test.)

When you are satisfied with your recording, choose File ⇨ Save As to open a Save As box. When you select the file type, if the Options button becomes available, choose it to configure options for the format. Figure 11-7 shows an example of the options for the AU format, where you can choose which form of encoding you want to use.



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**Figure 11-7** *Cool Edit 96 displays these options for the AU file format.*

And that's it as far as making a new recording goes. Obviously, there's a lot more to Cool Edit 96, but most of its features help you edit sound files. You learn more about them in Chapter 12.

## Recording Mac Sounds with SndSampler

In Chapter 5, you saw how to record a new system alert sound using the recorder in the Alert Sounds panel. But since that limits you to recording a ten-second snd resource in the System file, you'll probably want some other way to record sounds that aren't alerts. This book's CD-ROM includes a shareware sound editor called SndSampler 3.5.2 by Alan Glenn and M. Q. Edison. Briefly, here's what it can do:

- Record sounds from the selected sound source in AIFF or System 7 SND format
- Edit sounds in AIFF or System 7 format
- Add special effects: Reverse, Echo, Reverb, Chorus, and a few others
- Import (convert) WAVs, AUs, Sun, NeXT, and raw audios to AIFF format
- If you have QuickTime 1.6 or later, import QuickTime movie sound tracks and CD audio tracks into AIFF format
- Export sounds to WAV, Sun, NeXT, and raw audio format

You learn about its importing, exporting, and editing capabilities in Chapter 12. This chapter shows you how to use SndSampler to record sounds.

My one big complaint about SndSampler is that it does not give you much help. It has no balloon help or Guide. It does provide an electronic user's manual, but it's not thorough. So you're often on your own to figure out how to use it. I hope this book fills in some of the gaps.

## The fine print

SndSampler's shareware registration fee is \$20 (U.S.). You can try it out free of charge for 30 days. It works on any Mac running System 7.0 or later. If your Mac doesn't have 16-bit audio hardware, you must have Sound Manager 3.0 or later installed in order to play 16-bit sounds.

## Recording sounds

To record a new sound, start SndSampler and Choose File → New to open the window in Figure 11-8, where you select the input device, the sound properties, and a few other recording options. Notice in particular the option called “Record directly to disk.” Normally, sound data is stored in memory as you record it. Its size is limited by the amount of available memory. You can work around size problems by bypassing memory and recording directly to disk. But you might not care for the results, because you can't open, play, or edit sounds that don't fit in memory.



**Figure 11-8** *SndSampler displays this window to collect information for a new recording.*



### Caution

If the dialog box does not seem to recognize your selected input device – if it offers the wrong options, for example – it's better to choose Bypass than OK. Bypass retains the default recording parameters, while OK changes them to the ones indicated in the dialog box.

When you choose OK, the recording window opens, as you can see in Figure 11-9. The title bar shows your recording properties. You can also see how long your sound can be based on your selected properties and the amount of available memory. In the example, I can record a 1 minute and 6 second sound with a 22 kHz sampling rate, 8-bit sample size, and one channel.

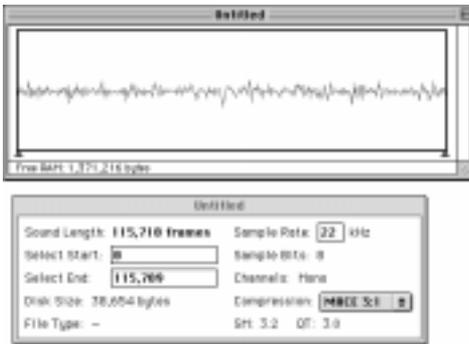


**Figure 11-9** *SndSampler's recording windows gives you the controls to make a recording (but not play it back).*

The two rows of blocks near the middle of the dialog box are your volume meters. The top row is labeled “L/m” for left/mono because it displays the volume of the left track for a stereo recording or the only track for a monaural recording. The bottom row is labeled “R” for right. The volume indicators work even when you're not recording, so you can test and adjust the volume before you start. Just start the sound source and watch the volume levels. The blocks light up from left to right to show the volume level. Most of the blocks are green, for normal volume, but the last two are red to warn you that the volume is too high. Adjust the volume of the sound source as needed until the blocks stay in the green zone.

When you're ready to record, choose the Record button and start the sound source. Record Time Remaining and Data Bytes Recorded update constantly as the recording progresses. The Pause button pauses the recording without stopping it; click it again to continue recording. Choose Stop when you're done. Then your only choice is OK to close the Recording window.

When the window closes, SndSampler's two editing windows appear, as shown in Figure 11-10. The top window displays the sound sample as a waveform. It's interesting to look at, but it doesn't provide much useful information when you're recording. It becomes valuable when you edit the sound, because you can select portions of the wave to work on. You'll learn how to do that in Chapter 12, the editing chapter.



**Figure 11-10** SndSampler displays a waveform window on top and a statistics window below.

The bottom window displays statistics for the sound:

- Sound Length shows the number of recorded frames. A *frame* consists of one sample from each track. The first frame of a stereo recording, for example, contains sample 1 for the left track followed by sample 1 for the right track. In the example in Figure 11-10, there are 115,710 frames. Since it is a mono recording, that means there are also 115,710 samples in the recording.

- Sample Rate shows the sampling rate, which is 22 kHz in the example.
- Sample Bits shows the sample size, which is 8 bits in the example.
- Channels shows mono or stereo.
- Compression shows the compression method, which is MACE 3:1 in the example. You can convert to a different method by selecting another one from the pop-up menu.
- SM and QT show your current versions of Sound Manager and QuickTime, which are Sound Manager 3.2 and QuickTime 3 in the example. SndSampler relies on Sound Manager and QuickTime for part of its function, so these version numbers can be important.
- Select Start and Select End come into use when you select part of the waveform to edit. They're explained in Chapter 12.
- Disk Size shows the file size, in bytes. It is 38,654 in the example, or about 38K. (That is roughly the 115,710 samples divided by the compression ratio of 3:1, give or take a few bytes.)
- File Type shows the file's type, AIFF or System 7. The example shows no file type because this recording has not yet been saved.

To listen to your new recording, choose File ⇨ Play. If you decide you don't like it and want to rerecord it, choose File ⇨ New to start over. When you're satisfied with it, choose File ⇨ Save As so you can select a file type (AIFF or System 7), give it a name, and choose a folder for it.

## What's Next?

Recording your own sounds is fun, but what about adding special effects like echo and reverse? How about fading in and out? Or mixing two or more files together? Chapter 12 explains all these editing techniques and more.