

Converting Vinyl LPs and Cassettes to CDs and MP3s



By Jake Ludington

Converting Vinyl LPs to CD

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About the Author | Jake Ludington is the author of over 1,000 tutorials on a variety of audio, imaging, and video related topics. You can subscribe to Jake's free weekly [Digital Lifestyle](#) newsletter for the latest reviews of multimedia software and hardware, editing tips, and useful gadgets for digital media enthusiasts. His book Easy Digital Home Movies is currently available from Amazon.com.

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Introduction

Converting audio from LPs and cassettes to a digital format is a time intensive process. Unlike ripping CDs to your computer, which takes mere seconds per CD, each album or cassette tape must be recorded in real time. A sixty minute album requires sixty minutes of record time, plus a few minutes of additional processing to lookup song titles, separate recordings into individual songs, and either burn a CD or save MP3s. This all sounds daunting, but you've got a secret weapon - this guide will help you simplify the recording process, using my hundreds of hours of experience to save you time.

This guide offers a few straightforward solutions, designed to utilize hardware you already own whenever possible. The primary focus is on using one of two methods for converting your analog media to digital. The first relies on hardware in your home entertainment center. The second method assumes you will need to acquire some hardware to transfer your LPs and cassettes using one of the readily available software solutions. Whether your goal is preservation of rare vinyl records or the conversion of your favorite books on tape to mp3, I've outlined the process from start to finish.

When the original version of this guide appeared in 2002, it was intended as a resource for people who want to listen to music from their record collection in places like their car or on their iPod. In my own experience, some of the best albums have never been re-released on CD, so converting vinyl was the only option I had to listen outside my house. My goal is to empower you to do the same using the best resources currently at your disposal.

What this Guide Is Not

This guide is not an attempt to make you an audiophile or convince you that you need to spend hundreds of dollars on new gear in order to make great sounding recordings of your music collection. I am one of those people who prefer listening to some kinds of music on vinyl. I'm not someone who believes I need to force my beliefs about music on you in order to get the most out of your collection.

Which Conversion Method Should You Use?

This guide provides several methods for converting vinyl records and cassettes to CDs and MP3s. You have the option to read straight through the guide and find the best option for your situation, but I've listed a few common scenarios below to help you get started as quickly as possible. If you fit the description of one of these common scenarios, simply click the link to jump to the section of the guide tailored to your needs.

[I have a turntable and records I'd like to convert to digital formats.](#)

[I have some old records, but I don't own a turntable](#) (or my turntable is no longer working).

[I have a cassette deck and some tapes I'd like to convert.](#)

[I have tapes I'd like to convert but I don't own a cassette deck.](#)

[I want to convert both my record collection and cassettes.](#)

I Have a Turntable - Where do I Start?

If you already own a turntable and a computer, you're most of the way to converting your old records to a digital format. The hardest part of the process is getting your stereo and your computer connected. You need two things to start recording those old records. The first thing you need is a cable to connect your home stereo to your computer. The second thing you need is audio recording software.

After walking through the hardware connection, you'll be presented with a few software options.

Hardware and Cabling Required

The rest of this tutorial assumes steps in this section have been followed. Making hardware connections is software independent, following the same steps, regardless of which audio applications are installed on your PC. Some of these things may seem obvious; I'm covering them to be sure you don't miss anything.

To transfer audio from your record collection:

You need an amplifier with Line Out connectors and a turntable. Line Out connectors are usually labeled Rec Out in the Tape section on the back of your receiver. Newer amplifiers have a pair of one red and one white RCA jacks representing the right and left sides of the stereo spectrum.

If your turntable has a built-in preamp, you don't need the amplifier. In this scenario, connect the RCA Line Out jacks from your pre-amped turntable to the Line In jack on your PC's sound card.

For cassette recording, simply connect the Tape Out connectors on the back of your cassette player to the Line In jack your PC's sound card.

Sound cards use 1/8-inch miniplugs for both input and output connections. When recording LPs or cassettes on your PC, connect the turntable or cassette deck to the Line In, which is frequently the black colored jack.



Cable Requirements

To connect a turntable or cassette deck to your computer, purchase a cable consisting of two male RCA plugs on one end and a stereo miniplug (1/8-inch male plug) on the other end. The cables shown below each have different colored RCA connectors; the colors on the outside of the cable don't change how it works, so if the colors don't match the colors of the jacks in the back of your stereo, don't worry, they will still work.



If your computer is an older laptop lacking a Line-In or microphone jack, a USB device like Griffin Technology's iMic will do the trick. iMic has two ports and a switch. The input port doubles as both a microphone and line-in connection. The switch is used to level the line, depending on how you use it. For recording cassettes and records, you want to use the line-in setting, not the microphone setting.

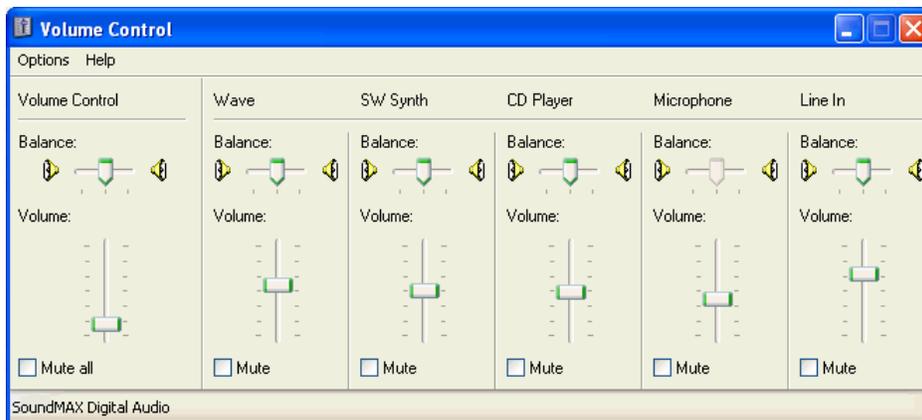


Check Your Connections

To verify your connection works properly, play a record on the turntable, with both your amplifier and computer turned on, after all the connections have been made. Assuming all cables were connected properly, the record will play through your computer speakers.

Troubleshooting

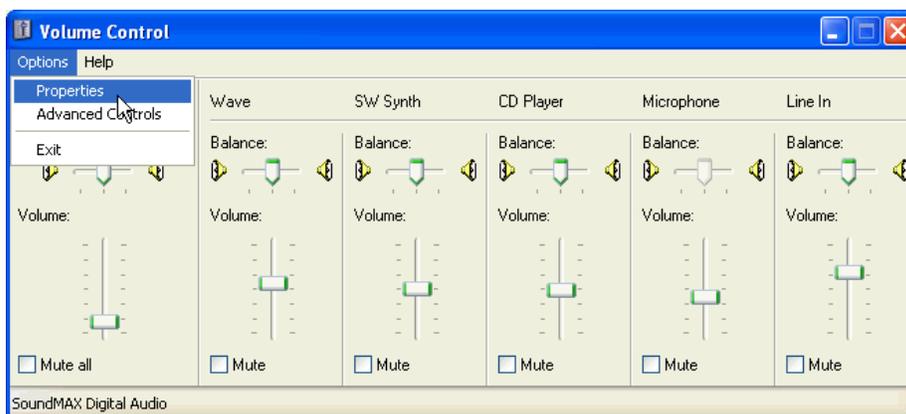
If you don't hear anything: First, make sure your speakers are turned on. Next, check each cable, making sure all connections are fitted to their appropriate jacks. Finally, double-click the speaker icon in the Windows system tray. Check to make sure the volume control for your PC is not muted, with the slider somewhere above the bottom (volume 0) position. Check the Line In slider verifying the Mute checkbox is unchecked with the slider above the bottom position.



Setting the Record Control

This step is only relevant if you are using a USB audio device.

One final step, relating to the **Volume Control**, is properly configuring your sound card for recording. Open the **Volume Control**, either by double-clicking the speaker icon in the task bar or by using **Start/Control Panel/Sounds and Multimedia**.

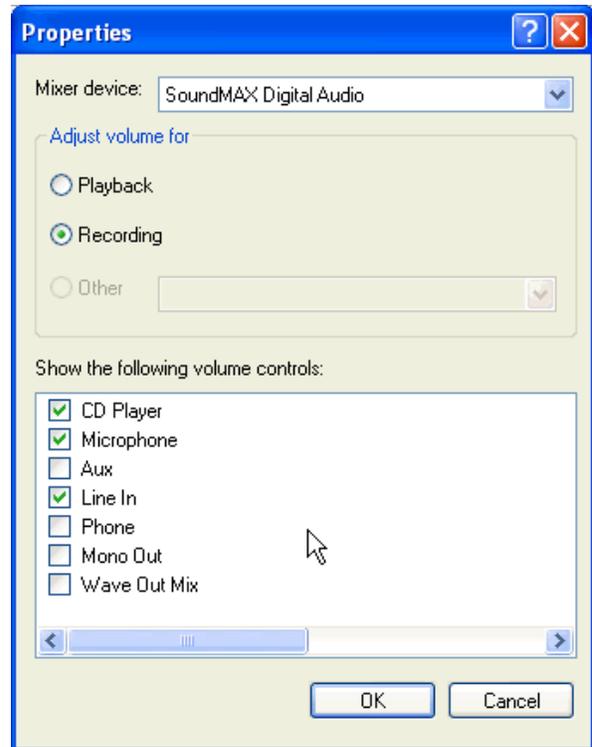
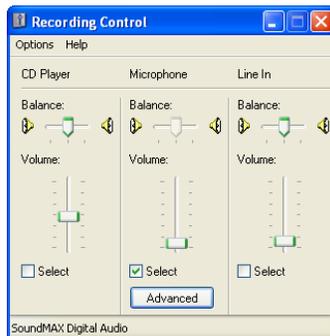


Choose Options/Properties from the Volume Control menu.

Select the **Recording** option in the **Adjust Volume For** box and click **OK**.

The **Volume Control** panel is replaced by the **Recording Control** panel. Check the Line In **Select** checkbox, which makes the Line In your default source for sound recording.

When you begin recording, adjust the level of your **Line In** as needed by moving the slider.



Choosing Recording Software

There are three primary choices to make when preparing to record. I highly recommend using a software application called [Spin It Again](#). It's not free, but you save so much time that it quickly pays for itself. Spin It Again automates many of the steps that normally require babysitting with other options.

To help make it more affordable, I negotiated to get a 20% discount on Spin It Again. Should you choose to use Spin It Again, [use coupon code JAKECONVERT](#) for the 20% discount. If you're on a tight budget, there is a free solution for converting using Audacity. The free way takes longer, but in this case you get what you pay for. I also outline several ways to do this with software you might have purchased in the past. I own all of the applications I talk about here and have used most of them for at least 5 years. I still find Spin It Again to be the easiest solution for the conversion process. The time saved is well worth the cost.

When deciding which software to use, choose from the following options:

[Show me the easiest audio recording method using Spin It Again](#)

[Show me the free audio recording method using Audacity](#)

Show me how to record audio with:

[Adobe Audition](#)

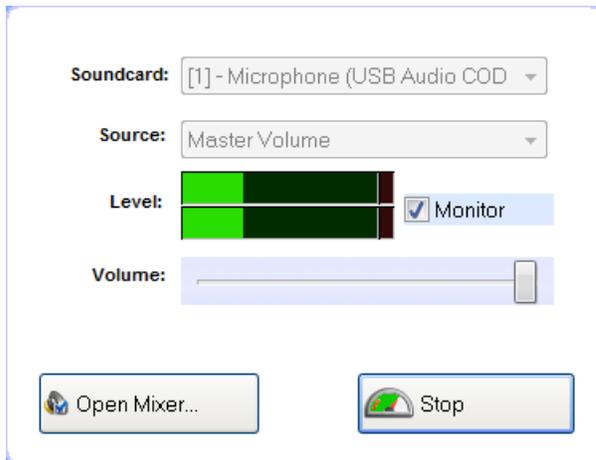
[Sound Forge](#)

[Cool Edit](#)

[Cakewalk Pyro](#)

Converting Vinyl LPs and Cassettes with Spin It Again

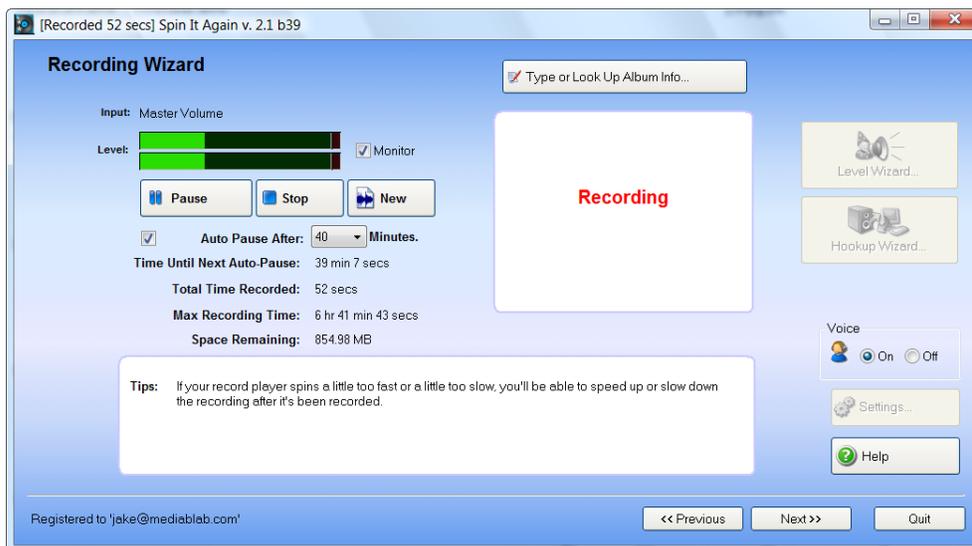
I bill Spin It Again as the easiest way to convert your old records and cassettes to digital formats because it is. The software automatically breaks the side of an album into separate tracks. It automatically removes pops and clicks from the turntable. Spin It Again does an excellent job with tape hiss too. With very minor prompting, it automatically finds all the data about the songs on your album so that files are properly labeled. Most importantly, if CDs are your end goal, CD burning is built right in so you don't ever need to leave the application interface. Spin It Again is truly a one stop solution.



Before you get started with recording, make sure you followed the previous steps for hooking up your turntable to your computer. Spin It Again has a helpful wizard that walks through this if you're still not sure you've done it correctly.

The Recording Level Adjustment Wizard helps make sure you're recording audio at the proper level. Choose your sound card from the drop down menu and play a record on your turntable to help Spin It Again set levels correctly.

Once you have the hardware setup and testing out of the way, it's time to start recording. Before dropping the needle on your record and hitting the record button, you want to set the Auto Pause time under the record button. Pick the time closest to the length of the side you are recording, so that you can walk away and do something else without worrying about recording a bunch of silence. For instance, if the side of the record is 28 minutes, choose 30 minutes as the **Auto Pause After** time. After setting this you're ready to record.



Converting Vinyl LPs to CD (JakeLudington.com)

While recording is in progress, you can either wander away and do something else, or quickly look up the album info. Clicking the Type or Look Up Album Info button lets you provide partial information about the album, like the title and artist, making it easy for Spin It Again to supply the rest of the data about individual tracks. When side one is complete, pause the recording, turn the record over, and begin recording side two. Only after you've completed recording both sides should you click the Next button to move on to additional steps.

With both sides are recorded, move on to the processing phase of the conversion. Here Spin It Again shows you the track start and stop it calculated for each track on the album. You can adjust these by moving a slider to make sure you don't cut off a track before it reaches the end. One trick here is to look for spaces with a completely flat line between tracks, which indicates there is no audio. The software finds the right start and stop points most of the time, but occasionally some minor intervention is required.



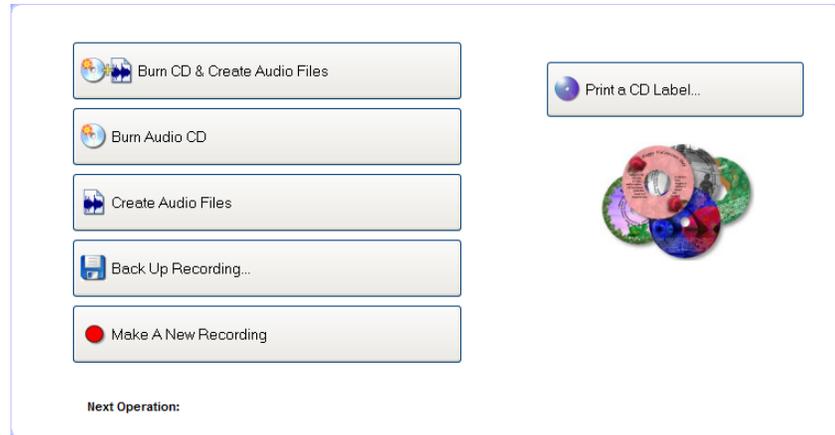
- < No Effects >
- < Create New Effect >
- Clean Anything!
- Damaged Record 1
- Damaged Record 2
- Damaged Tape 1
- Damaged Tape 2
- No PreAmp Blues
- Tape Clean & EQ
- Tape Light Cleaning
- Tape Noise BeGone
- Vinyl Clean & EQ
- Vinyl Declick & Decrackle
- Vinyl Light Clean & EQ
- Vinyl Light Cleaning
- Warped Mind

Another key component of this processing phase is cleaning any pops and clicks introduced by the record player. Quickly preview some of the tracks from the album by selecting tracks in the top section of the **Preview And Edit Your Recording** window and clicking the preview button. If it sounds good to you, don't bother processing the track. If you think the files need some improvement, choose a processing option from the **Cleaning & Effects Preset** list.

It's better to err on the side of light processing, so try settings like **Vinyl Light Cleaning** or **Vinyl Declick & Decrackle** before resorting to the **Clean Anything!** option. You can undo changes if the selection didn't solve the

sound issue. There is no correct choice here. The idea is to choose a setting that makes your recording sound the way you like it.

When you finish cleaning the audio tracks and adjusting track breaks, it's time to create the files. Spin It Again offers several self explanatory options for creating CDs, audio files or both.



Recording with an Ion USB Turntable



If you don't currently own a standard turntable, a USB Turntable is an excellent option for converting vinyl records to MP3 or CD. I specifically picked the Ion TTUSB Turntable because it is widely available and competitively priced. More importantly, it sounds just like similarly priced home stereo units that lack USB. In addition to having a USB connection, the turntable also includes RCA connections for connecting to your home theater receiver. If you opt to purchase an Ion USB Turntable, there are two software options

included in the box. One is the free **Audacity** product, which is detailed elsewhere in this guide. The second option in the box is **ez Vinyl Converter**, which is supposedly geared at beginners.

While the interface of **ez Vinyl Converter** keeps options to a minimum, it takes frustration to the maximum by forcing you to sit and listen to the entire album and click a button to split individual tracks. You are also required to use iTunes and can't even install the software without first installing iTunes.

I strongly recommend downloading Spin It Again and using it in conjunction with the Ion USB Turntable. You will be much happier with the experience despite spending a few extra dollars. After connecting the USB cable from the Ion to your PC, you can follow along with the steps in the section on Spin It Again.

If you insist on using ez Vinyl Converter, some basic directions are provided below.

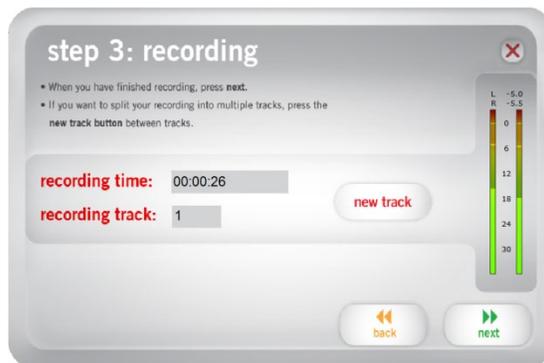
Using ez Vinyl Converter with your Ion USB Turntable

I've already indicated my dislike for the software bundled with the Ion turntable. Requiring iTunes for installation is a disservice to customers, especially since it only

Converting Vinyl LPs to CD (JakeLudington.com)

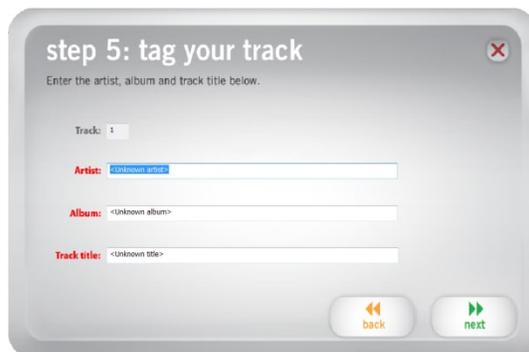
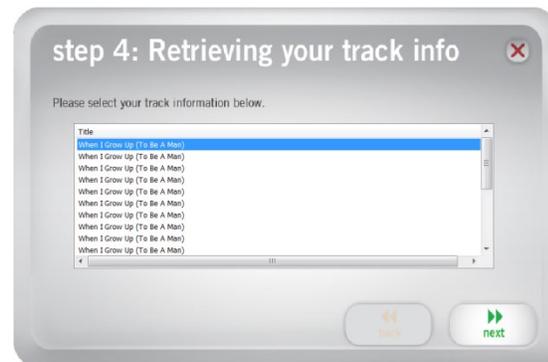
needs iTunes so songs can be added to the iTunes library when recording completes. ez Vinyl Converter also fails to consider your time, requiring you to sit and monitor progress if you want individual song files when recording completes. Because I recommend the Ion as a hardware option for converting Vinyl, I feel duty bound to walk through the recording process using bundled software.

Setting up the Ion hardware for recording is simple. Connect the power cord and plug it into the wall. Connect the USB cable and connect it to an open port on your computer. Windows XP and Windows Vista both recognize the turntable as an audio recording device automatically. Windows Vista users have one additional step prior to recording. You need to open the Control Panel > Hardware and Sound option, choose **Manage Audio Devices** and set the default format for the microphone USB Audio CODEC to **2 channel, 16 bit, 44100 Hz (CD Quality)** on the advanced tab of the Properties dialog box. This last bit is necessary to make sure you are recording in stereo, not mono.



After connecting the Ion turntable, you're ready to record. Launch ez Vinyl Converter and step through the wizard's minimal instructions. You will need to choose the turntable as your audio source before recording. Be sure to be there to click the new track button between songs, because there's no easy way to split songs later using ez Vinyl Converter.

Once you have the recordings completed, locating song data requires you to enter most of the details yourself. I found attempting to locate specific track information to be an exercise in frustration using ez Vinyl Converter. The list of track options for a single song is tremendously long and even after picking the song title out of the list, you are left with filling in details manually in many cases.



Once all the song data is entered for each track, ez Vinyl Converter exports songs to iTunes. Once in the iTunes music library, songs may be grouped for burning CDs, transferred to your iPod, or simply played from your computer. I have no problem with using iTunes as a music manager. I don't like not having the option to use Windows Media Player or something else as an alternative.

Do I need a Cassette Deck?

One scenario I recently ran into was someone with a bunch of books on tape with no cassette deck. They acquired the audio books as part of an auction lot and wanted a way to convert them. If you're in the same boat, I highly recommend simply buying a stereo Walkman for \$30 or less. Couple it with a cable with a miniplug on both ends (probably available at the same place you get the Walkman). Then jump back to the section on [deciding which software to use](#).

Audacity

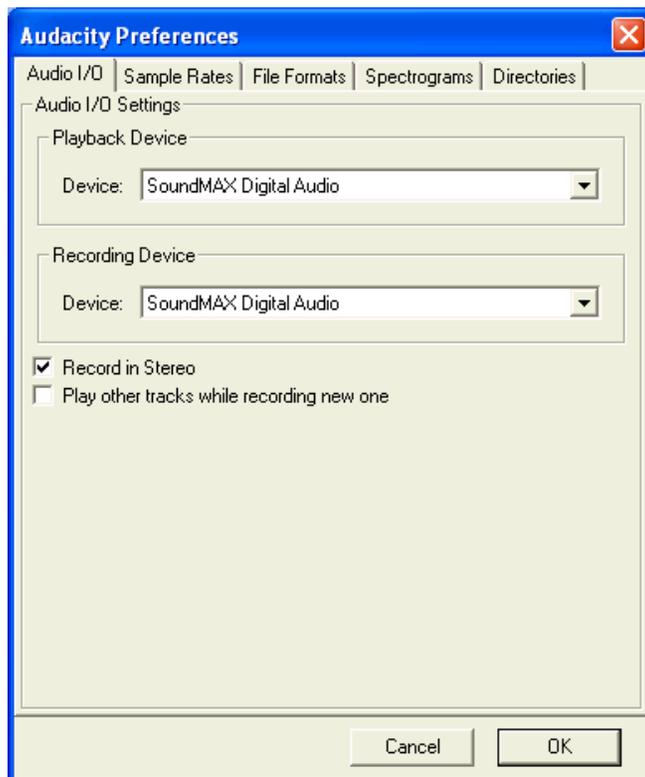
Audacity is a free multi-track recording tool. It's freely available online and also comes bundled with the Ion USB Turntable as the advanced audio editing solution. The software is currently available for Windows, Linux, FreeBSD, Classic Mac, and Mac OS X. Audacity performs identically on all platforms, making it the only audio editing solution that is truly cross-platform. [Download Audacity](#) to use this as your editing solution.

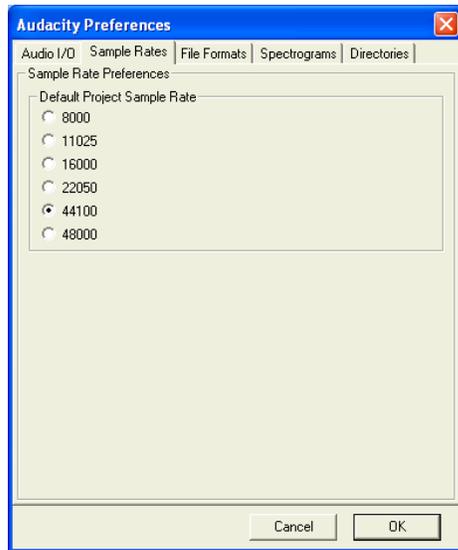
Step 1: Launch Audacity

Start/All
Programs/Audacity/Audacity

Step 2: Configure Audio Input/Output Preferences

1. From the menu, select **File** and choose **Preferences** (Ctrl+P on the keyboard).
2. Click the **Audio I/O** tab.
3. Verify your soundcard as the device selected for both **Playback Device** and **Recording Device**.
4. Check the **Record in Stereo** checkbox.





Step 3: Set the Sample Rate

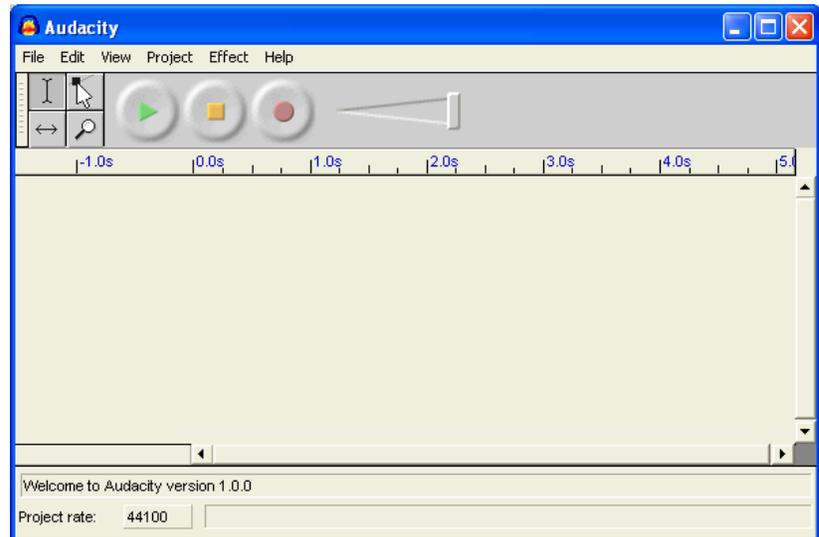
1. Click on the **Sample Rates** tab.
2. Select **44100**.
3. Click **OK**.

Step 4: Recording

1. Click the **Record** button (the red dot) and start playing your record/cassette.
2. Click the **Stop** button (the yellow square) when recording is finished.

Step 5: Preview the Recording

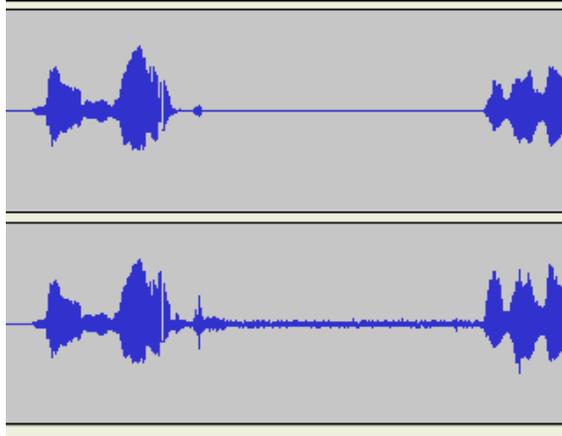
Listen to at least a portion of the recording, to determine if the recording quality is satisfactory. If the level sounds good and the track is not distorted, proceed to the next step.



Step 6: Create Multiple Tracks

Either stop, and then restart the record process for each track on the LP, or record an entire side of the LP and divide the file to individual tracks when the side is finished recording. Make sure to save the raw audio track before splitting it, so you have a backup of the original.

To create multiple tracks from one larger track, select the section you want to use for the new track, copy the section, and then paste it into a new file.



Step 7: Noise Reduction

Audacity doesn't have a simple noise reduction wizard like some of the consumer applications outlined in this guide. Instead the process is performed manually.

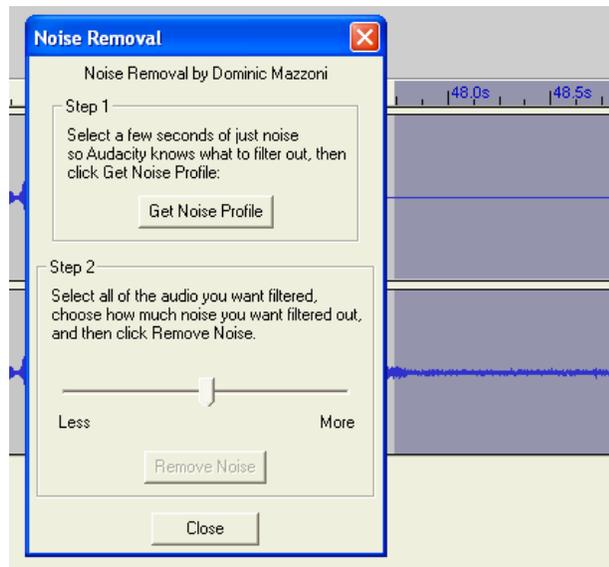
1. Zoom out the audio track by selecting the magnifying glass and clicking on the audio track, making it easy to select a section of silence in the track. (Notice all the noise appears to be on the right channel of this track.)

2. Select the section with noise in the recording and launch the **Noise Removal** tool by clicking **Effects/Noise Removal** on the menu.

3. Get the noise profile from this segment of audio by clicking the **Get Noise Profile** button.

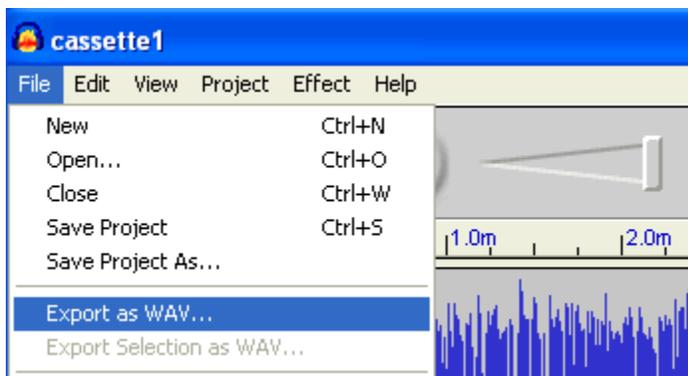
4. Once Audacity has a Noise Profile, select the entire audio track and click **Remove Noise**.

5. Listen to the result. If the track sounds like all the tape his or excess noise from the LP is gone, save the file and continue to the next track.



Step 8: Saving Tracks

Save your finished track by choosing File/Export As WAV.



Using Cakewalk Pyro

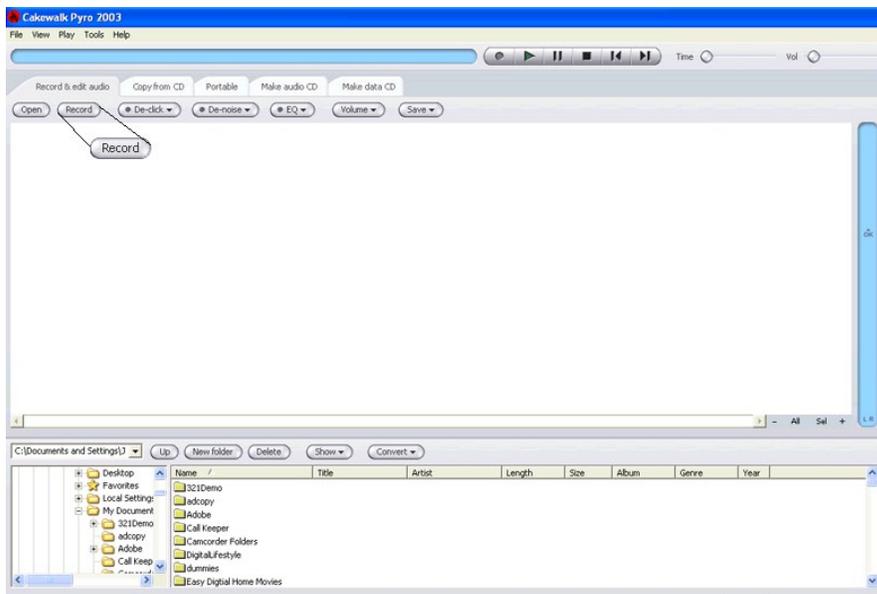
Cakewalk is best known as a company that creates outstanding multi-track editing software for the home recording industry. Pyro takes some of the recording technology and puts a consumer face on it. Converting vinyl or cassettes to CD using Pyro is slightly different with each version. If you can track down a copy of Cakewalk Pyro 2003, it is highly competitive with Spin It Again for ease of use. Newer versions changed the interface and made the process more complicated.

Step 1: Launch Cakewalk Pyro

Start/All Programs/Cakewalk/Cakewalk Pyro/Cakewalk Pyro

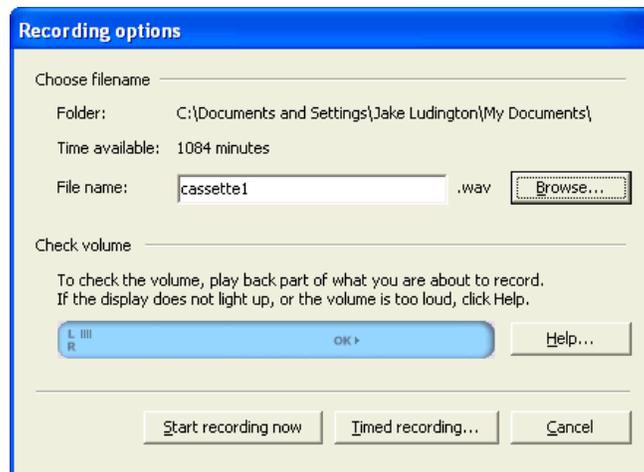
Step 2: Record

Press the Record button to launch the Record window.



Step 3: Configure Record Options

1. Name your audio file.
2. Browse to the location where the audio will be saved. (By default, files are saved in the My Documents folder.)
3. Play a short section of your LP or cassette to verify levels fall in the OK range.
4. Click Start recording now.



Step 4: Stop Recording

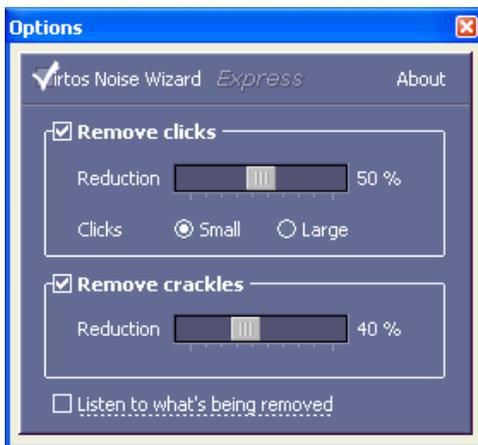
When the end of a side is reached, press the **Stop** button.



Step 5: Splitting Tracks

Pyro records an entire side of an LP or cassette as one large track. Fortunately, Pyro is the one app listed in this guide that provides an easy interface for splitting large tracks into smaller ones. Simply find the points in the complete side where the song changes, click the grey bar below the track window, and then slide the split marker to obtain more precision.

The Split bar appears just above the scrollbar in the image below.



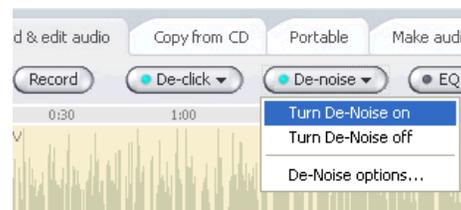
Step 6: Removing Noise

Pyro contains two separate tools for removing noise. The De-click tool works well for eliminating noise from vinyl LPs, while the De-noise tool is used to remove hiss from cassette tape recordings. Both work exceptionally well with almost no configuration. In fact, I merely turned them on, processed my tracks and noticed an amazing difference in clarity.

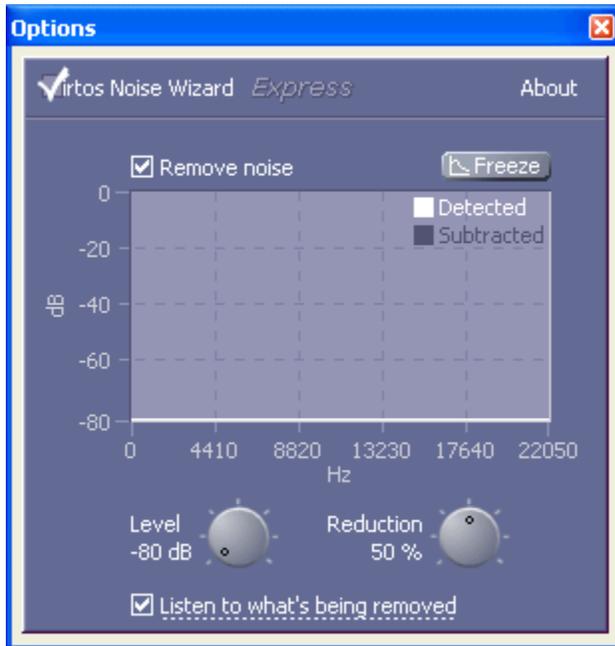
To use the De-click tool, click the **De-click** button and choose **De-click options**.

Click **Listen to what's being removed**, and then click the **Play** button in Pyro. Adjust the levels to eliminate more noise as necessary.

Uncheck the Listen to what's being removed button, then Turn De-Click on.



Assuming you like what you hear in the with the De-Click turned on, it's time to move to the file saving step.



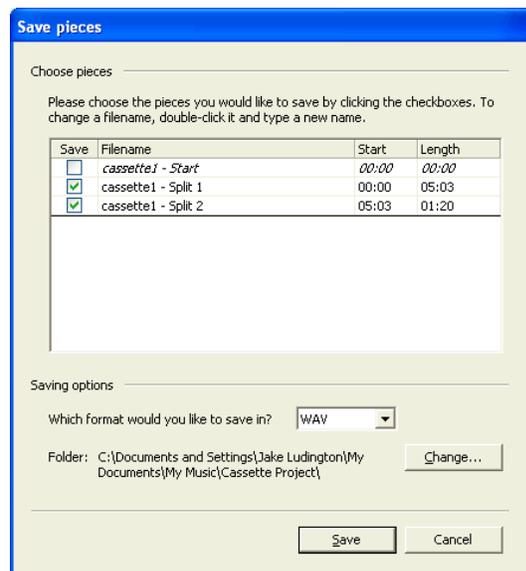
De-noise filtering for cassettes works in a similar fashion. Open the De-noise filtering options by clicking the De-noise button and selecting **De-noise options**.

Click **Listen to what's being removed**, and then click the **Play** button in Pyro. Adjust the levels to eliminate more noise as necessary. Uncheck the Listen to what's being removed button, then Turn De-Noise on. Assuming you like what you hear in the with the De-Noise turned on, it's time to save your files.



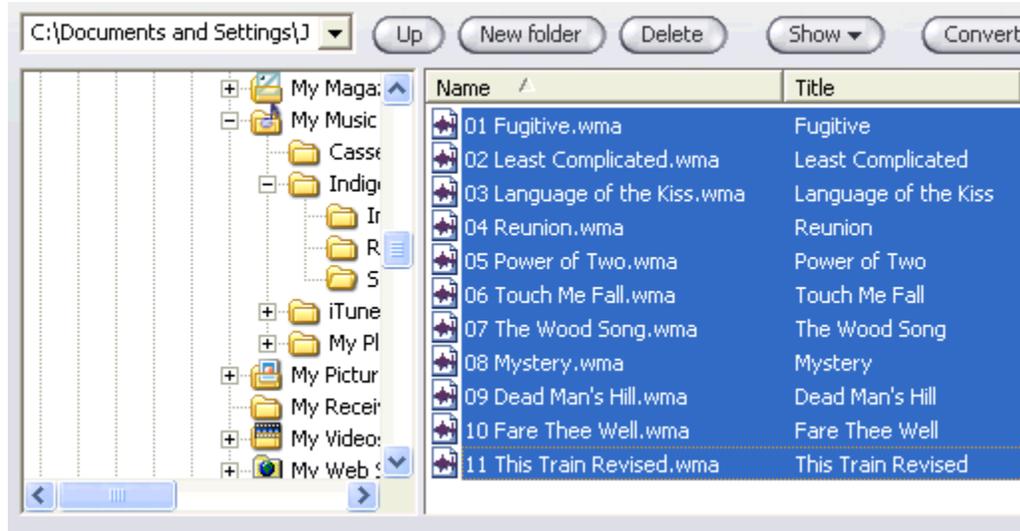
Step 7: Saving Tracks

Once your track has been split and noise removal is in place, it's time to save the individual tracks. Cakewalk breaks them out, allowing individual tracks to be unselected if they aren't intended to be kept.

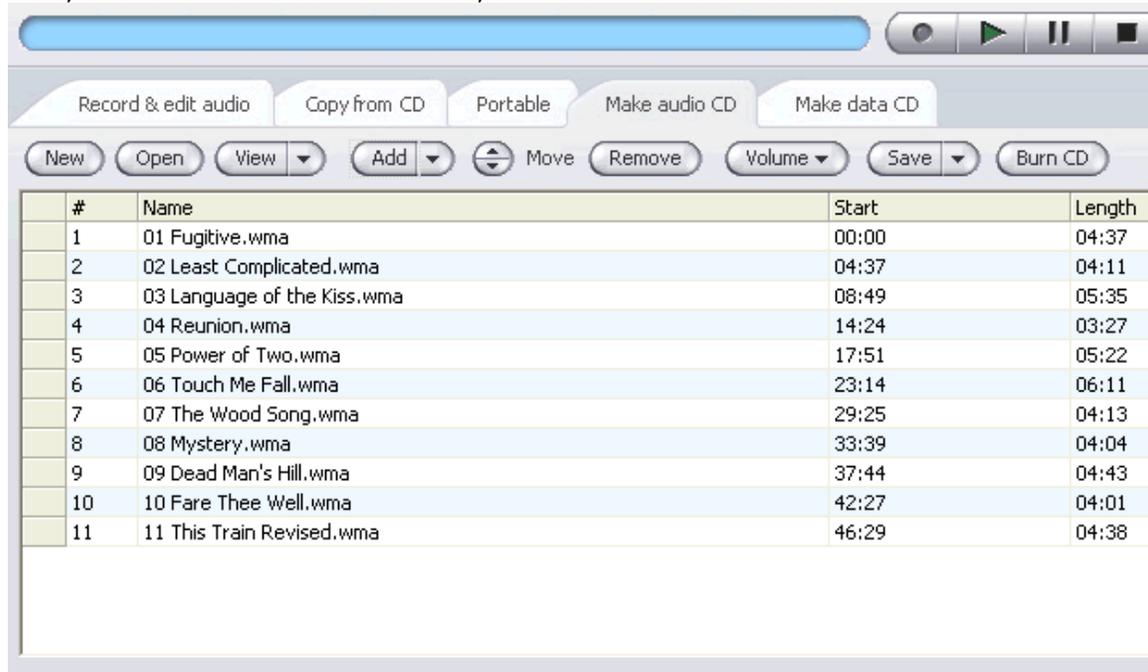


Step 8: Recording a CD

Pyro conveniently includes a burning utility within the application. To record a completed project, first select the tracks in the Files view at the bottom of the Pyro window.



Next, click the **Make audio CD** tab, and then click the **Add** button.



Click **Burn CD**, and then insert a blank CD in the burner and click **OK**.

Recording LPs using Adobe Audition

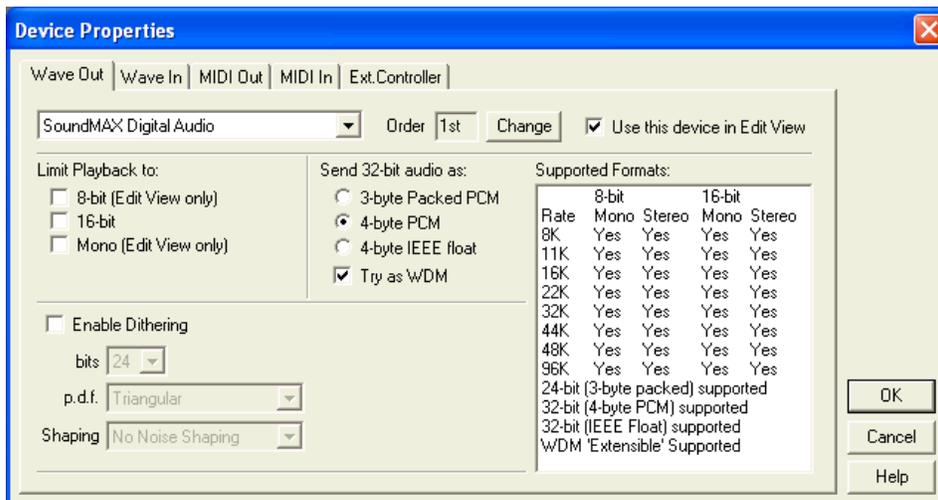
Adobe list Audition as being version 1.0, which is only partially true. Audition was known as Cool Edit Pro until Adobe purchased it in 2003. Cool Edit was widely recognized as an easy-to-use multi-track audio editing tool. Adobe made very few changes beyond switching the name. Integration with Adobe Premiere and After Effects makes it great for editing video for audio. Priced at \$299, Audition is among the more expensive options outlined here. Great built-in noise reduction makes it an outstanding tool for recording analog tracks, if you can find uses for all the other features too.

Step 1: Launch Adobe Audition

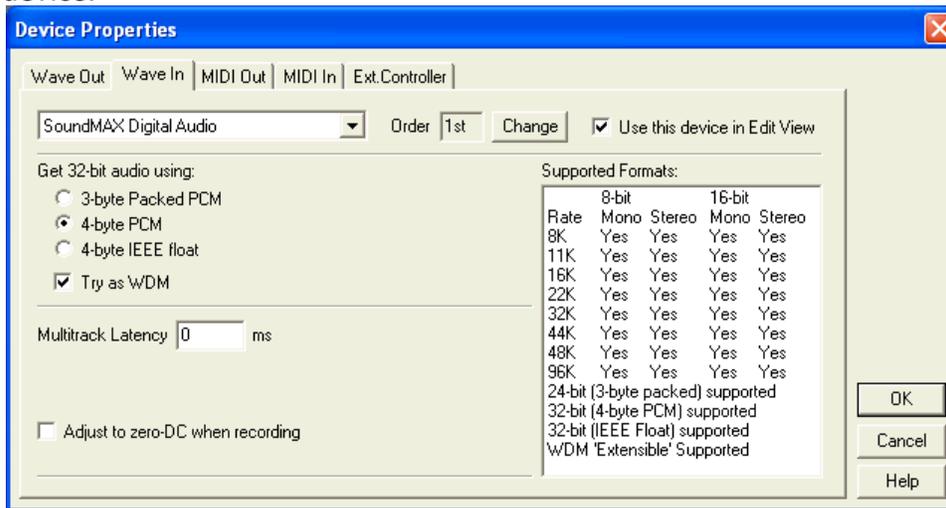
Start/All Programs/Adobe Audition

Step 2: Verify Sound Card Settings

1. Click the **Options** menu and choose **Device Properties**.
2. One the **Wave Out** tab, verify your sound card as the selected output device.



3. Click on the **Wave In** tab to make sure your sound card is selected as the input device.



4. Click **OK**.

Step 3: Verify Volume Levels

1. Activate volume monitoring by selecting **Options/Monitor Record Level(s)** from the menu or pressing F10 on the keyboard.
2. Play something on your turntable.



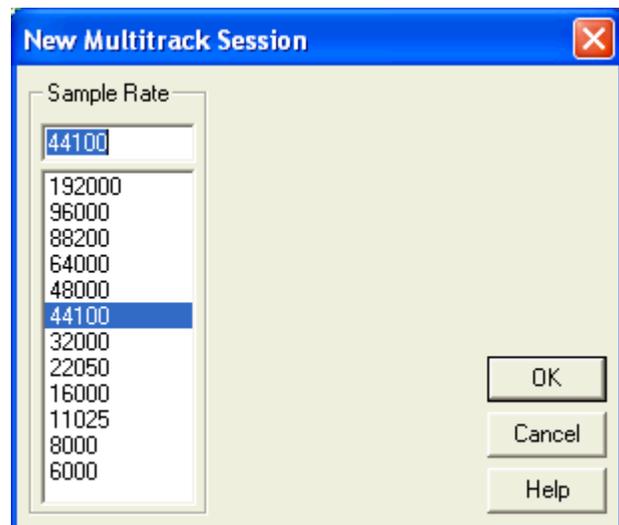
If the peak volume of your audio is much greater or less than about -2db, adjust the Line In volume slider in your Mixer's Record Control panel until your VU meters peak in the -2db range. (If the peak volume is closer to -3db or -1db, the volume is still acceptable, but distortion will occur above the 0db threshold.) Most important is to make sure you don't have the Line In cranked to the point where you're system isn't recognizing audio dynamics. The level should rise and fall with the volume of the songs, ranging from as low as -30 to -40dB, all the way up to the -2dB range.

Step 4: Create Your Project

Create a new file by choosing **File/New** or by using CTRL+N on the keyboard. Since you are ultimately planning to burn your recording to CD, you'll want to select 44100 as the Sample Rate, Stereo as the Channels selection, and 16-bit as the Resolution.

Step 5: Start Recording

Click the **Record** button (the red dot) and start playing your record.



Step 4: Select Project Options

Step 6: Recording Individual Tracks

Either stop and then restart the record process for each track on the LP, or record the whole thing and edit the file to individual tracks when the side of the LP has completed. You'll want to save your raw audio tracks before editing them, as a precautionary measure.

Step 7: Audit Your Audio

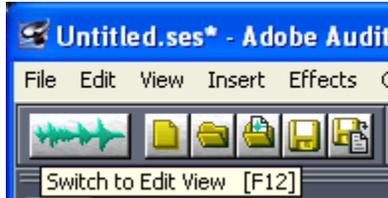
Playback a portion of the recorded track, to determine if the sound is acceptable.

Step 8: Using Noise Reduction

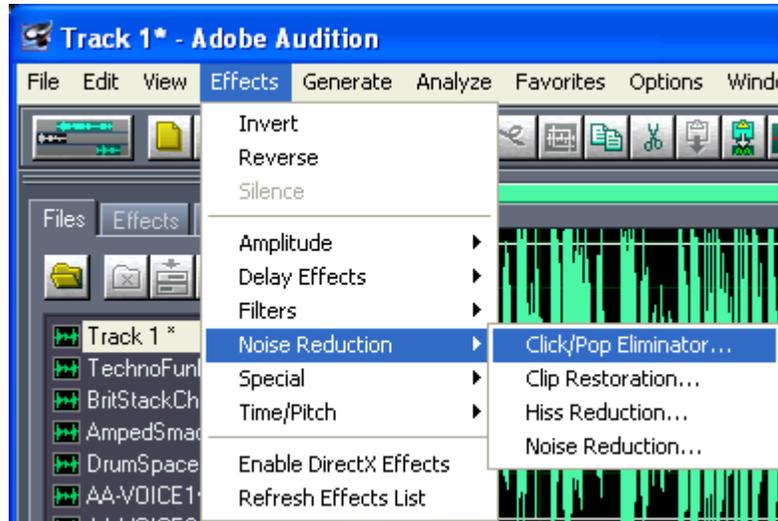
The Audition Noise Reduction Effect includes two tools for improving the sound of recordings of cassettes and LPs. A Click/Pop Eliminator automatically removes noises caused by dust and imperfections in LP grooves. Hiss Reduction eliminates the hiss commonly associated with recordings from cassettes.

Eliminate Clicks and Pops

1. To use the Click/Pop Eliminator, first switch to **Edit View** by clicking the button below the File menu.



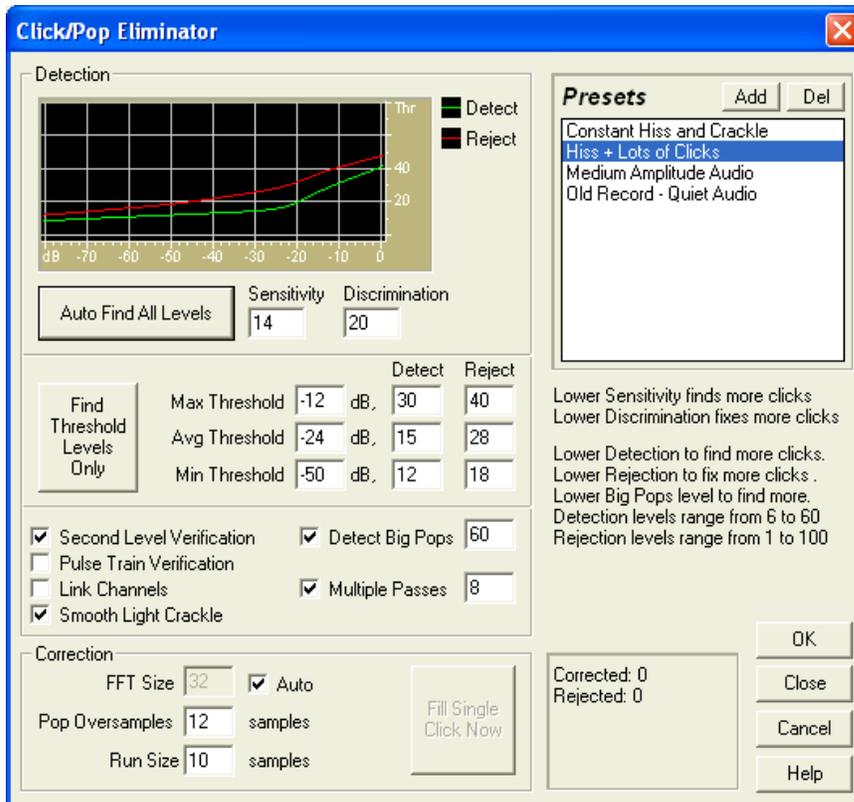
2. From the **Effects** menu, first select **Noise Reduction**, then choose **Click/Pop Eliminator**.



3. Choose the preset configuration that most closely matches your audio. The descriptions are reasonably accurate for most common noise issues.

4. Click the **Auto Find All Levels**, which performs an analysis on your recording.

Following the analysis, click **OK**, and then listen back to the result. If the noise reduction is satisfactory, it's time to save the file. If not, undo the changes and reopen the Click/Pop Eliminator to adjust the settings for a better result.



Eliminating Tape Hiss

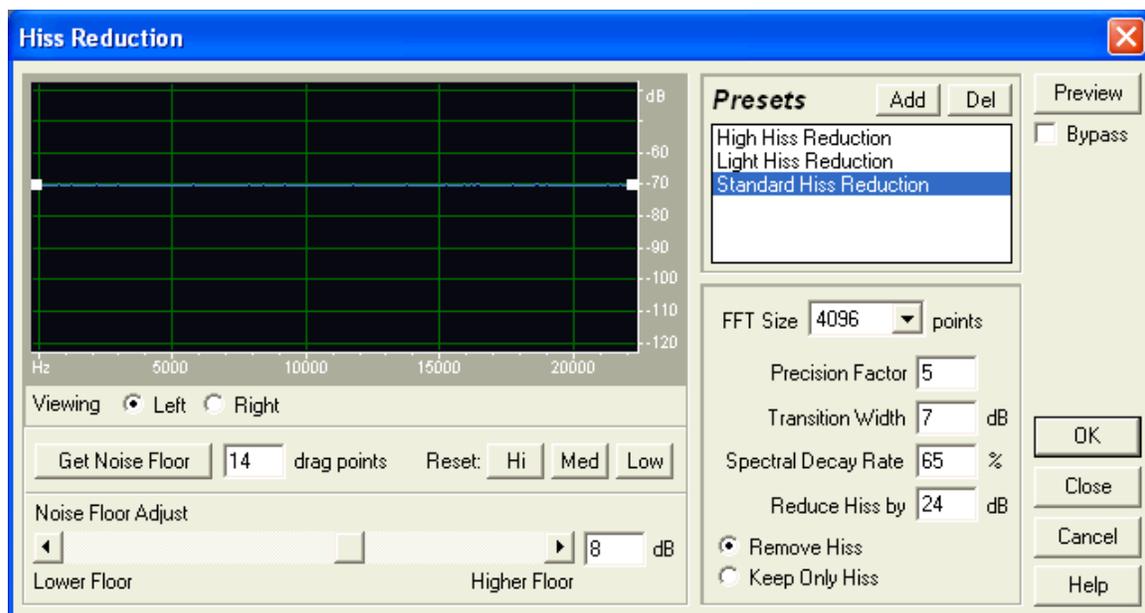
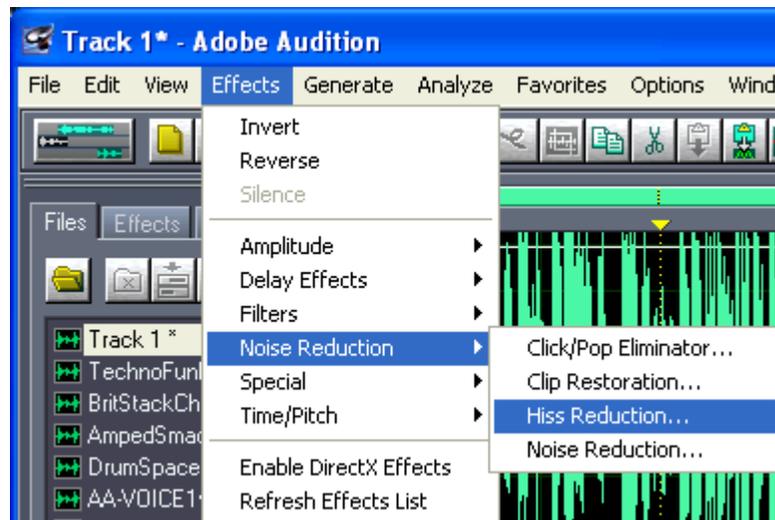
Hiss Reduction is also accessible in the Edit View.

1. Open Hiss Reduction by selecting the **Effects** menu, choosing **Noise Reduction**, and then clicking **Hiss Reduction**.

2. Choose a Hiss Reduction preset profile from the list of presets.

3. Preview the noise reduction by clicking the **Preview** button.

4. Adjust settings as necessary. If the noise reduction is acceptable, click **OK**.



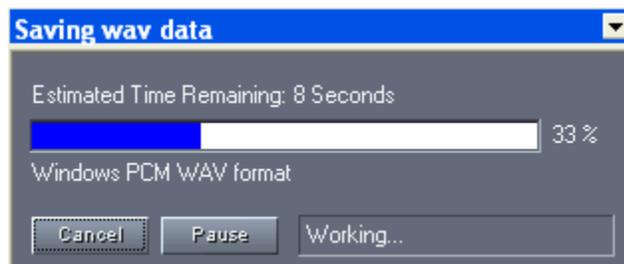
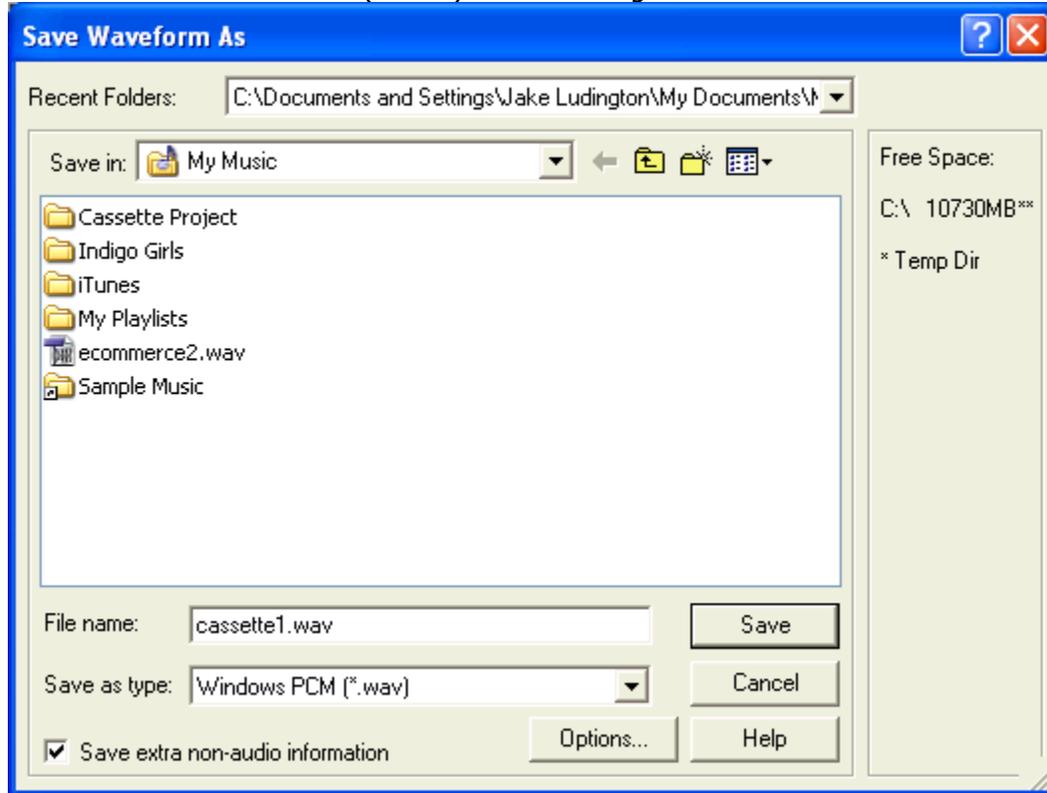
Just like using the **Click/Pop Eliminator**, listen to the result to make sure you achieve a desirable result. If the result doesn't improve the recording, **Undo** the **Hiss Reduction** and repeat these steps as necessary until satisfactory results are achieved.

As I will echo in many places throughout this guide, in my experience, software noise reduction requires some guess work, in order to determine the best sound for your particular recording. The final result is a matter of both personal taste, as well as

trial and error to achieve desired results. In most cases, the software presets in Adobe Audition will provide you with a satisfactory result.

Step 9: Saving Your Audio

Save file as Windows PCM (*.wav) for recording to CD-Audio later.



Recording LPs using Cool Edit 2000

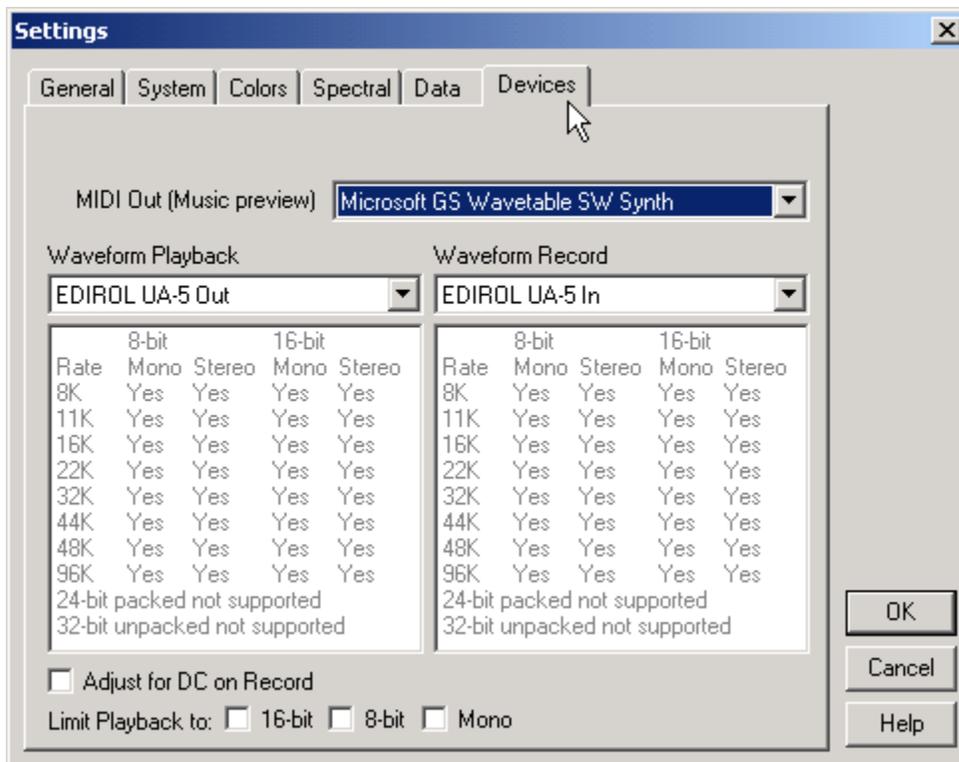
Cool Edit 2000 is one of the easiest applications for full-featured audio recording. Cool Edit Pro was acquired by Adobe and renamed Audition in 2003, with Cool Edit 2000 and the rest of the product line being discontinued. This section of the guide will sound very similar to what appears in the Adobe Audition section because of the product similarity. If you already have a copy of Cool Edit 2000, or can find a used copy, this is a great tool for recording LPs and cassettes. Some help is still available for Cool Edit users in the Adobe forums at adobe.com.

Step 1: Launch Cool Edit

Start/All Programs/Cool Edit/Cool Edit

Step 2: Verify Sound Card Settings

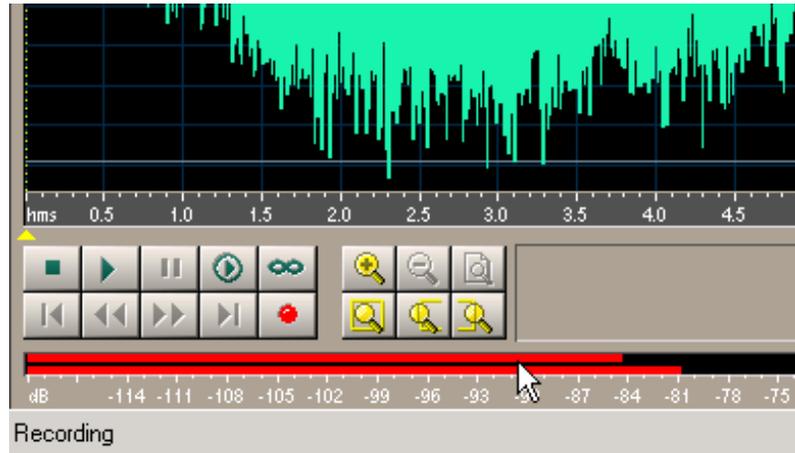
1. Click the **Options** menu and choose **Settings**.
2. Click on the **Devices** tab.
3. Verify your sound card as the device selected for both **Waveform Playback** and **Waveform Record**.



Step 3: Verify Volume Levels

1. Double-click the VU meters to turn them on (The VU meters are those red lines just below the play controls at the bottom of the Cool Edit workspace in the picture below).
2. Play something on your turntable.

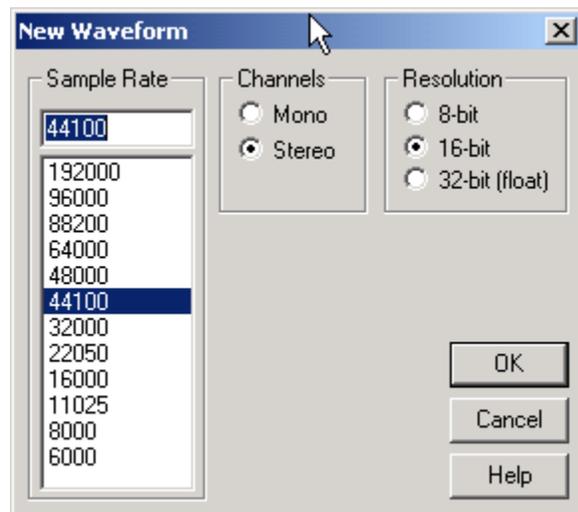
If the peak volume of your audio is much greater or less than about -2db, adjust the Line In volume slider in your Mixer's Record Control panel until your VU meters peak in the -2db range. (If the peak volume is closer to -3db or -1db, the volume is still acceptable, but distortion will occur



above the 0db threshold.) Most important is to make sure you don't have the Line In cranked to the point where your system isn't recognizing audio dynamics. The level should rise and fall with the volume of the songs, ranging from as low as -30 to -40dB, all the way up to the -2dB range.

Step 4: Create Your Project

Create a new file by choosing **File/New** or by using Ctrl+N on the keyboard. Since you are ultimately planning to burn your recording to CD, you'll want to select 44100 as the Sample Rate, Stereo as the Channels selection, and 16-bit as the Resolution.



Step 4: Select Project Options

Step 5: Start Recording

Click the record button (the red dot) and start playing your record.

Step 6: Recording Individual Tracks

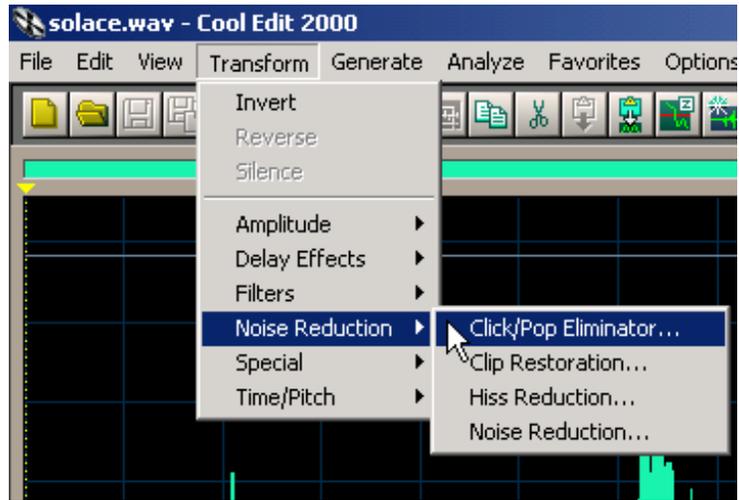
Either stop and then restart the record process for each track on the LP, or record the whole thing and edit the file to individual tracks when the side of the LP has completed. You'll want to save your raw audio tracks before editing them, as a precautionary measure.

Step 7: Audit Your Audio

Playback at least some portion of the recording, to determine if you like the sound or not.

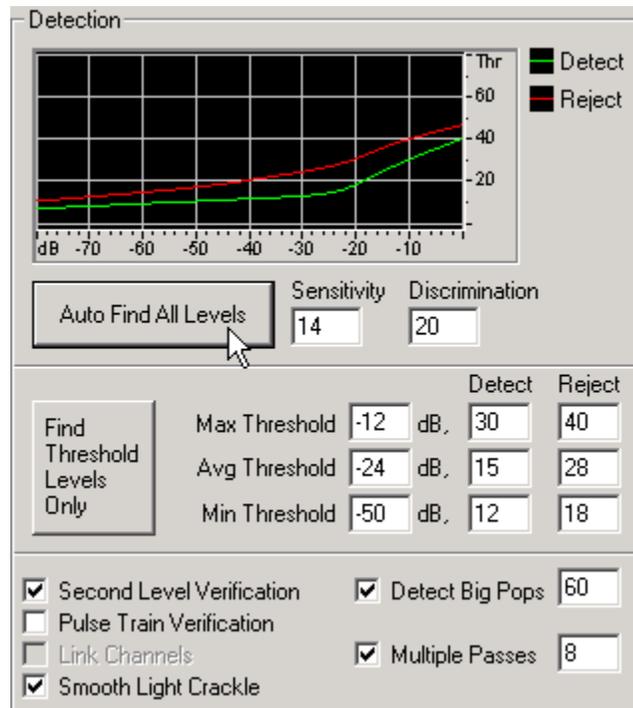
Step 8: Using Noise Reduction

The Cool Edit Audio Cleanup plug-in is a great investment for cleaning the imported LP tracks. The Audio Cleanup plug-in contains a Click/Pop Eliminator, which does an outstanding job of automatically removing all those noises caused by dust and imperfections in the LP grooves. The Click/Pop Eliminator works in a simple point-click fashion. Simply select **Transform/Noise Reduction/Click/Pop Eliminator**, as shown below.

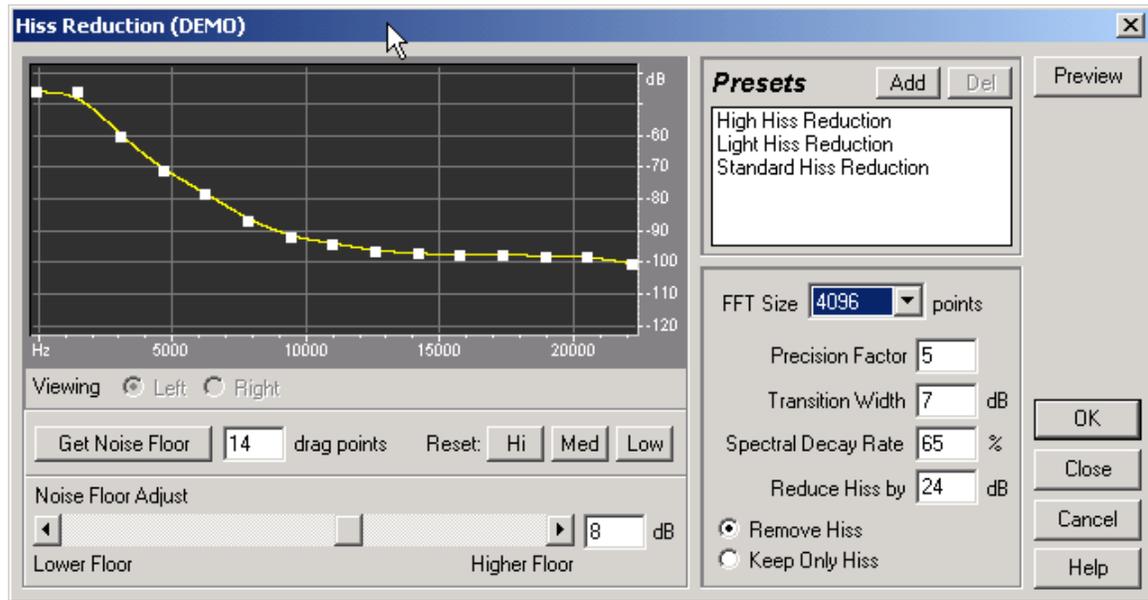


With the Click/Pop Eliminator open, click the **Auto Find All Levels**, which performs an analysis on your recording.

Following the analysis, click **OK** and then listen back to the result. If you are satisfied with the sound quality after using click/pop reduction, save the changes to the file. If not, undo the changes and reopen the Click/Pop Eliminator to adjust the settings for a better result.



If you recorded audio from a cassette tape, the **Hiss Reduction** tool will be the plug-in you want to use. The Hiss Reduction plug-in has 3 presets that work for most tape hiss issues. Select one of the preset Hiss Reductions and then click OK.



Just like the Click/Pop Eliminator, you'll want to listen back to the result to make sure you are happy with the sound after applying the reduction. If the result doesn't improve the recording, Undo the Hiss Reduction and repeat these steps as necessary until satisfactory results are achieved.

In my experience, software noise reduction requires some guess work, in order to determine the best sound for your particular recording. The final result is a matter of both personal taste, and some trial and error to achieve desired results. In most cases, the software presets in Cool Edit will provide you with a satisfactory result.

Step 9: Saving Your Audio

Save file as Windows PCM (*.wav) for recording to CD-Audio later.

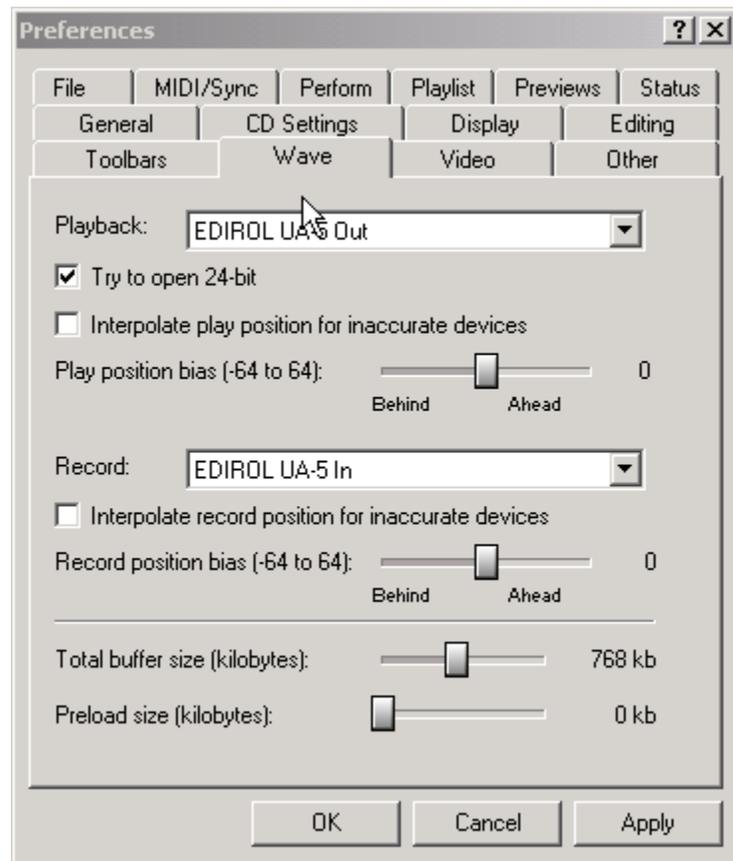
Recording LPs using Sound Forge

For the purposes of recording your audio tracks from vinyl, both Sound Forge and Sound Forge XP Studio are identical in user interface. Sound Forge has considerably more functionality, including support for DirectX plug-ins, however, a longer feature list comes with a larger price tag, and in most cases you won't use the extra features. To download either application for demo or purchase visit [Sony Media Software](#) online.

Step 1: Launch Sound Forge

Step 2: Configure Preferences

1. From the menu, choose **Options** and then select **Preferences**.
2. Click on the **Wave** tab.
3. Verify your soundcard as the device selected for both **Playback** and **Record**.



Step 3: Prepare to Record

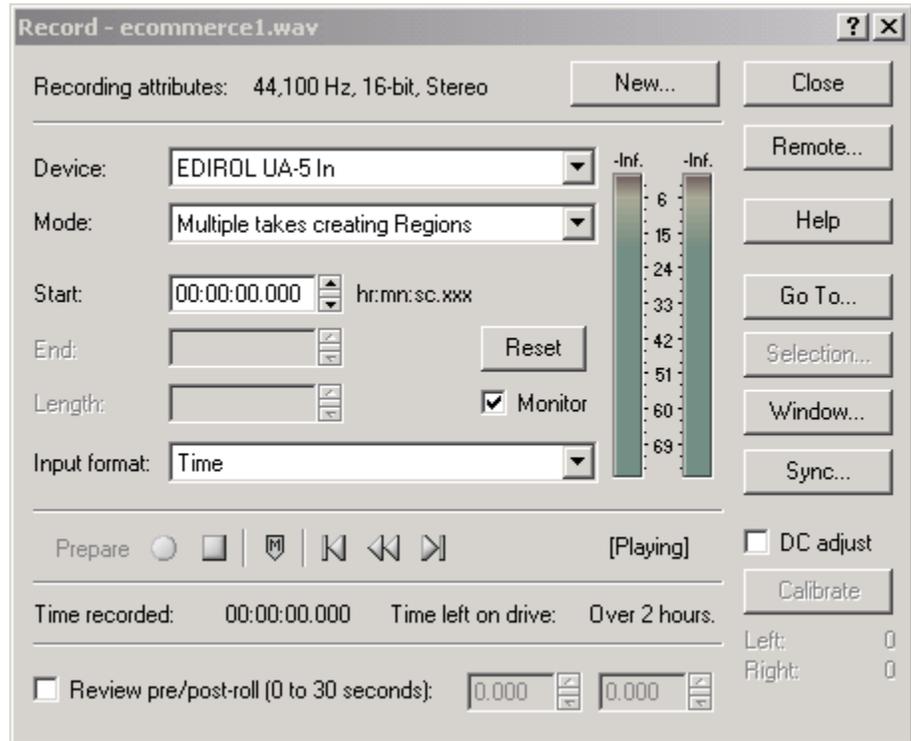
1. Click the **Record** button (Ctrl+R on your keyboard).

2. Check the checkbox next to **Monitor**, so that the levels are displaying in the Record VU meters.

3. Play something on your turntable.

If the meter peaks at anything greater or less than about -2db, adjust the Line In volume slider in the Mixer's Record Control panel until

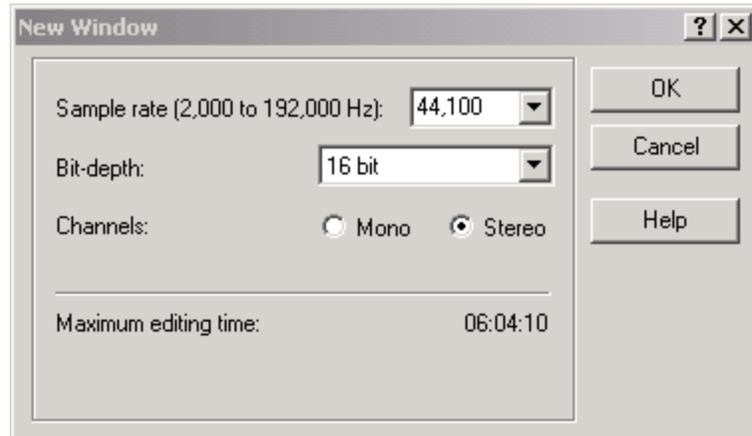
your VU meters are peaking in that -2db range. (Anywhere between -3db or -1db is acceptable. Volumes peaking consistently above 0db result in distorted sound.) Most important is to make sure the Line In isn't cranked to the point where the system doesn't recognize a change in audio dynamics. Normal dynamics rise and fall with the volume of the song, ranging anywhere from as low as -30 to -40dB, all the way up to the -2dB range.



Step 4: Start Recording

1. From the Record window, click on the **New...** button. Since the goal is to burn the final recording to CD, select **44,100** as the **Sample rate**, **16 bit** as the **Bit-depth**, and set the **Channels** to **Stereo**. Click **OK** when you've adjusted these settings.

2. Click the **Record** button (the red dot in the Record window or Ctrl+R on the keyboard) and start playing your record.



Step 5: Splitting Tracks

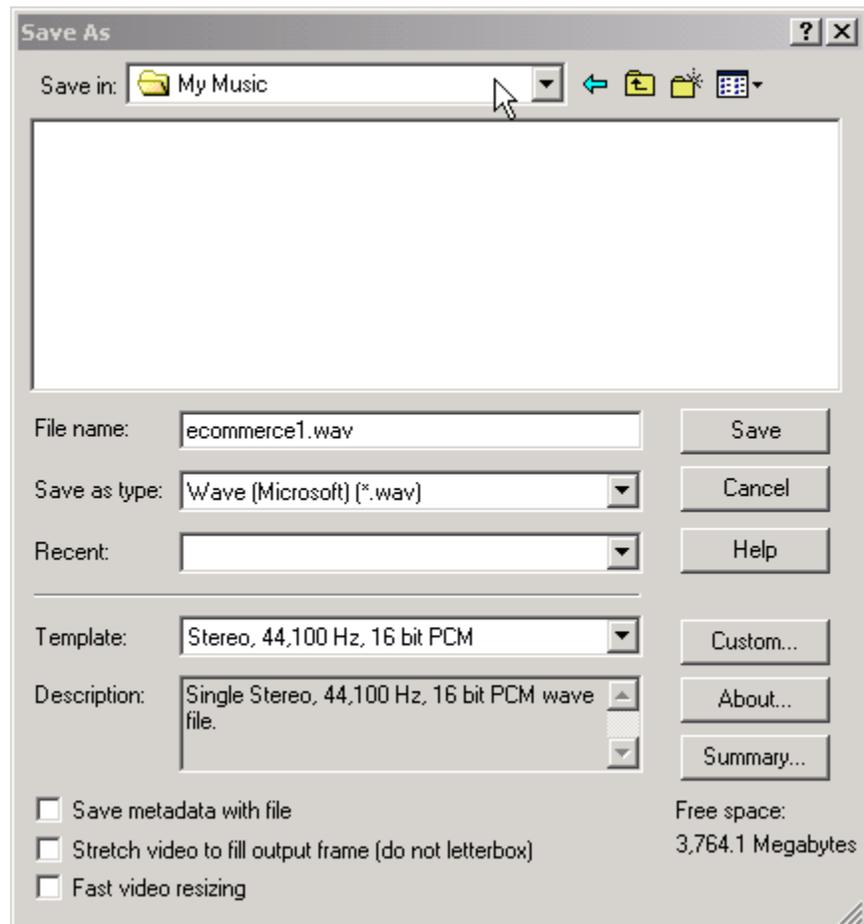
To create individual tracks, either stop and then restart the record process for each track on the LP, or record an entire side, and then split the individual tracks when the side is completed.

Step 6: Saving Files

Save file as Wave (Microsoft) (*.wav). Choose the Template: Stereo, 44,100 Hz, 16 bit PCM.

Step 7: File Review

Playback a portion of the recording, to determine if your recording turned out as expected.



Step 8: Noise Reduction

Noise Reduction for Sound Forge comes in the form of an additional plug-in, downloadable from the Sony Media Software website. Sound Forge XP Studio does not have an option to support DirectX plugins. If you are using XP Studio, check out information on Ray Gun at the end of this document, or download Cakewalk Pyro 2003. Both are excellent noise reduction solutions.

As of this writing, the Sound Forge Noise Reduction plugin currently costs US \$279.97 in downloadable format. It works outstandingly well, but certainly isn't priced with consumers in mind. Unfortunately, to make serious use of Sound Forge as a tool for cleaning up your imported LP and cassette tracks, you need this tool or a similar DirectX noise reduction plug-in from a third party vendor.

The process of cleaning up the noise, once you have the plugin, is reasonably straightforward. With the audio track open in Sound Forge, go to DirectX/Click and Crackle Removal. Once inside, select one of the preset configurations from the Name: drop down list. In most cases, you'll be able to use **Default for vinyl recordings** or **More conservative for vinyl recordings**, to get your desired result.

If the preset options don't deliver a desirable result, undo your changes, reselect the preset and then modify it's settings just slightly with the slider bars, until the Click and Crackle plugin eliminates all the noise without distorting the audio track. Once you find a custom setting to suit your needs, save those settings using the **Save As...** button, saving you time on the next album you convert.

As an alternative to the Click and Crackle Removal Tool, Sony also includes a **Vinyl Restoration** tool, which is designed to remove clicking and crackling, while also dropping out the overall broadband noise common in older recordings. In my experience, the Click and Crackle Removal Tool, combined with the basic Sound Forge Noise Reduction Tool is a more effective solution than trying to get the all-in-one **Vinyl Restoration** plugin to work properly.

Recording LPs using Analog Recorder

Plus! Analog Recorder originally shipped as part of the Digital Media Plus! Pack for Windows XP. It's no longer supported and will not work with XP SP2. I have kept this in the guide purely as a point of reference.

The first part of this tutorial sets up basic parameters for your computer and audio source. Now it's time to start the recording process.

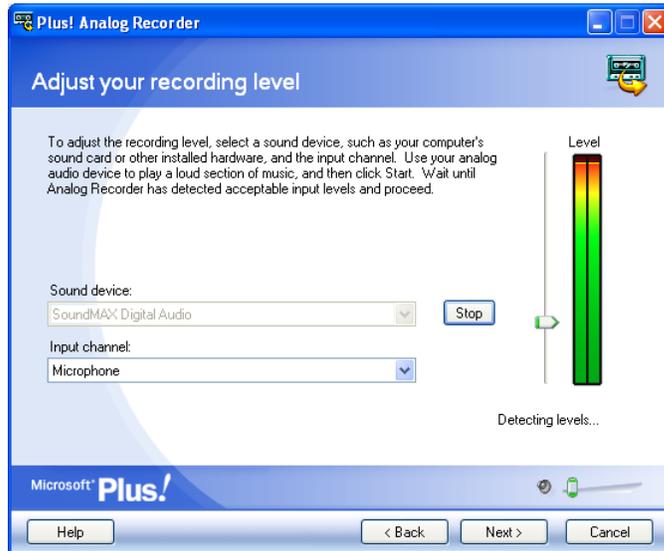
Step 1: Launch Analog Recorder

Start/All Programs/Microsoft Plus! Digital Media Edition/Plus! Analog Recorder



The first screen welcomes you to Analog Recorder and offers quick links to help files. Click Next to begin using the application.

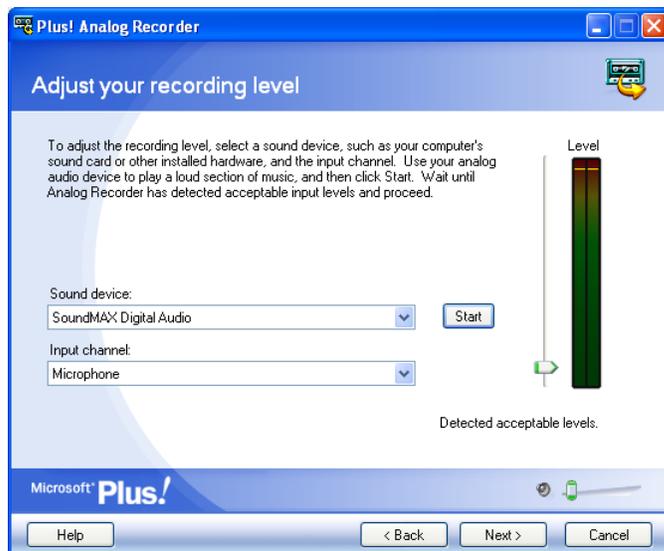
Step 2: Adjust Your Recording Level.



Your computer's sound card should already be selected by default in the Sound device drop down menu.

The second drop down menu, Input channel, lets you choose the port your record player or cassette deck is connected to. Make sure Line In is selected.

At this point, you need to push play on the cassette deck or put the needle on your record. Click the Start button on the screen so Analog Recorder can adjust the audio level on your system.

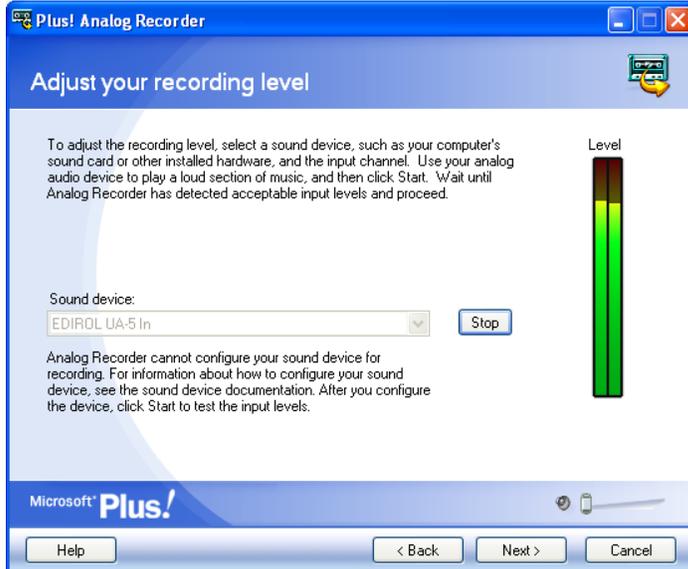


For USB Audio Devices Only

If you are using a USB audio device, like the Creative Extigy or an Edirol UA-5, like, Analog Recorder can't automatically adjust the sound level. It does auto-adjust the Griffin Technology iMic without issue.

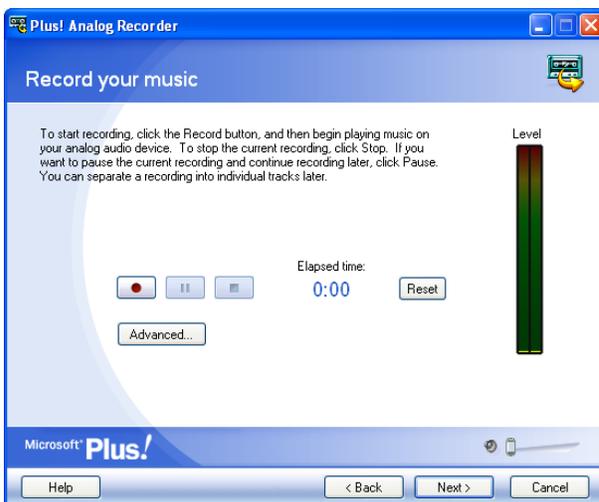
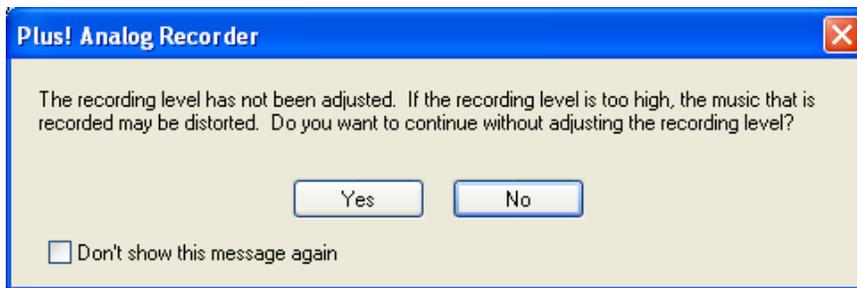
Once the application detects acceptable levels, click Next.

External Audio Devices



For external devices, manually adjust the input volume using the Recording Control screen. The Level meter on the right hand side of the screen should never be a solid red color. The level may jump into the red, but should remain in the green and yellow zones to prevent distortion.

Once volume is adjusted to an appropriate level, click Next. A box like the one below will pop-up, informing you levels haven't been automatically adjusted. If you are comfortable with your level settings, click Yes. Proceed to the next step.



Step 3: Record Your Music

Before clicking the Record button, rewind the tape or move the needle back to the beginning of your record.



Advanced Recording Options

The Advanced button presents the options of having Analog Recorder automatically split your recording into tracks and set the maximum recording time. The default maximum recording time should be acceptable. If you are recording a speech or book on tape, I recommend unchecking Automatically detect and split tracks. Analog Recorder

recognizes long pauses in speaking as new tracks, creating many 2-3 second tracks you will need to combine later.

If there is a long pause on a cassette or record, like the end of a side, Analog Recorder presents a message like this:

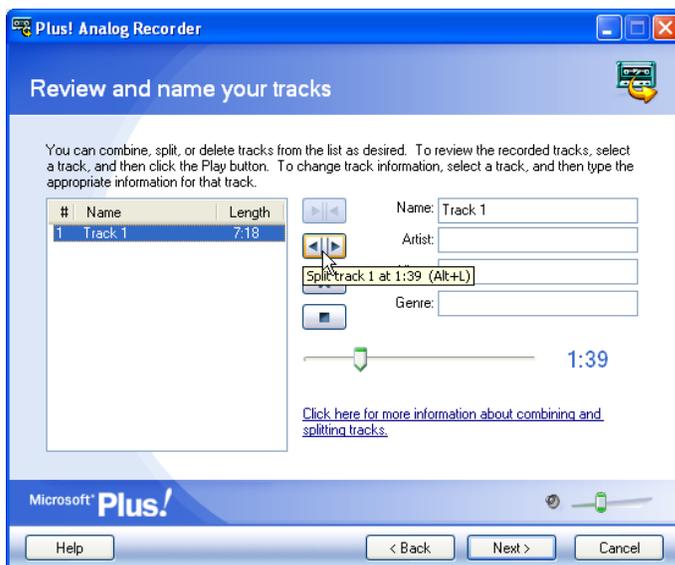


Step 4: Review and name your tracks

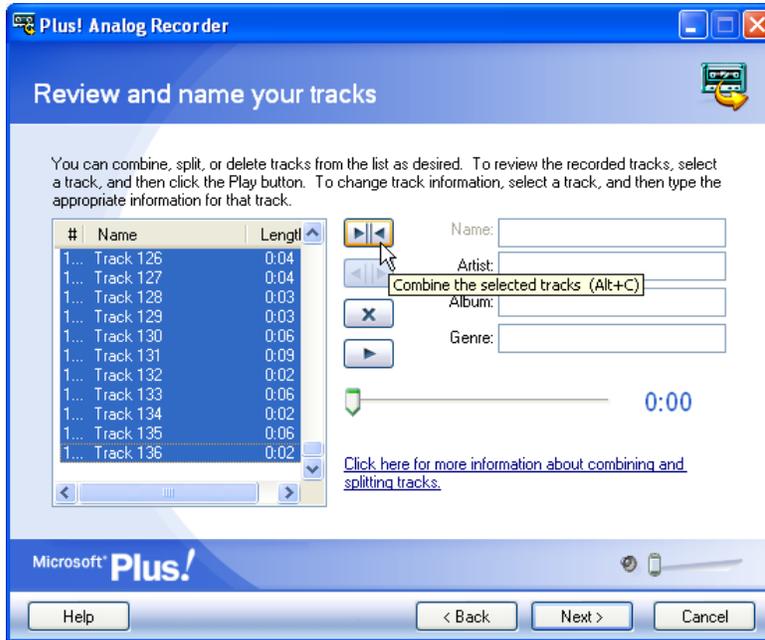
For music cassettes and records, include song title, artist name, album, and genre for easy cataloging.

For

audio books or speeches, you can divide large tracks into smaller segments, making it easier to listen to the recording in smaller blocks. Highlight the track in the list you want to split. Click Play or drag the slider to the point in the recording where you want the split to occur, and then click the split tracks button.



Splitting tracks is also useful for eliminating silence. If your cassette has a long lead-time at the beginning (or empty space at the end), find the point where the audio starts and click the Split Tracks button at that point. You can then discard the silent segment.



Unfortunately, the only undo for this process is recombining the tracks with the Combine Tracks feature.

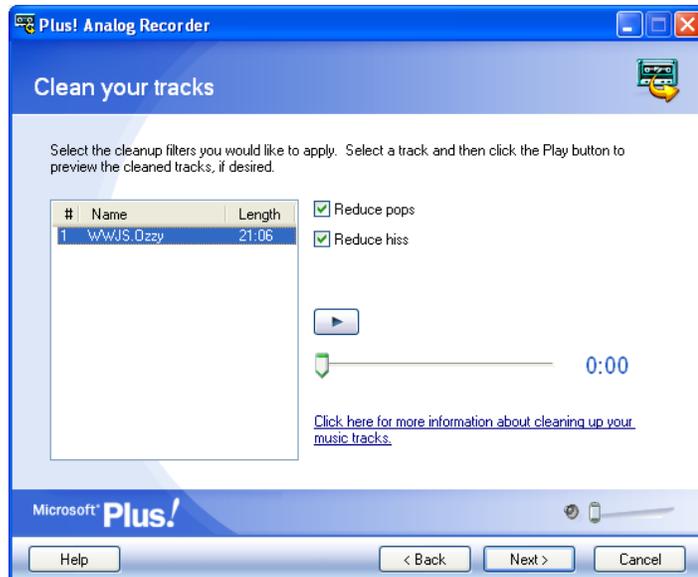
If Analog Recorder divided a track incorrectly, combine the individual tracks using the Combine Tracks feature. Hold down the CTRL key, and then click each track you want to combine. When all tracks are selected, click the button with the arrows pointing toward each other.

Step 5: Clean your tracks

Typically, you will need both pop and hiss removal on vinyl records. Cassettes generally require hiss removal only. Test the cleaning process by clicking the preview button, to make sure your audio isn't distorted. If the audio sounds clean, click the Next button.

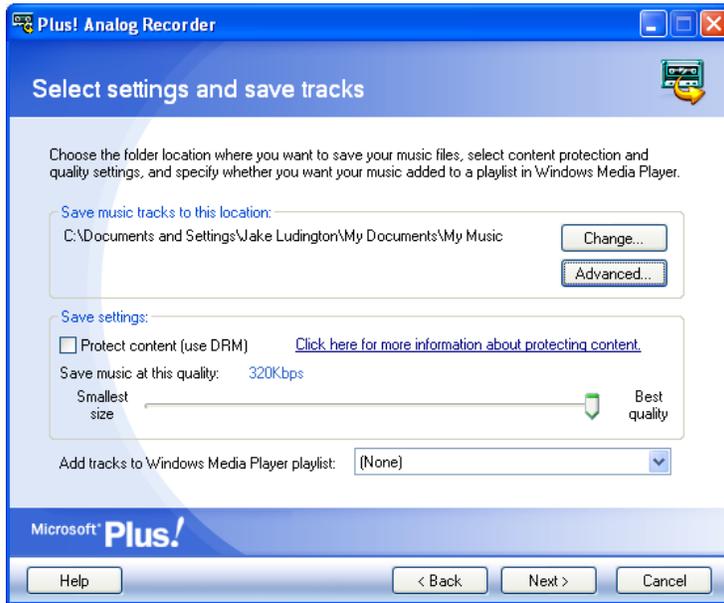
Reduce Pops - This feature removes popping and crackling commonly heard on old records, giving the audio a cleaner sound.

Reduce Hiss - This feature eliminates tape hiss from your recordings.



Before you clean all your tracks... Test the pop and hiss removal with one track first. Once you have a combination that sounds good for one track, apply it to all tracks. This saves time, preventing the need to re-run the entire process on all tracks. It's still a good idea to preview at least 30 seconds of each track making sure they sound good.

Step 6: Select settings and save tracks

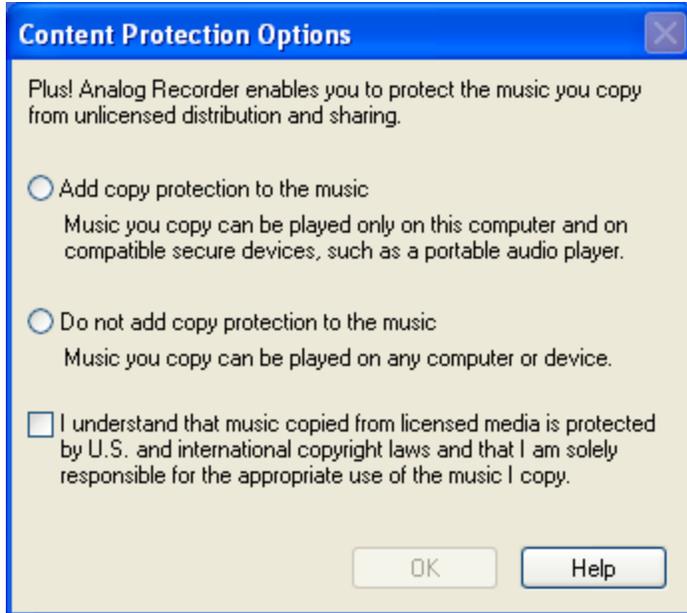


By default, Analog Recorder saves tracks in the My Music folder. If you catalog your music differently, change this to the folder where your music is stored.

Unless you need to conserve hard drive space, I recommend leaving the Save music at this Quality slider on the highest setting.

For easy burning of your tracks to CD later, I recommend creating a new Windows Media playlist named for the artist and album.

Digital Rights Management (DRM)

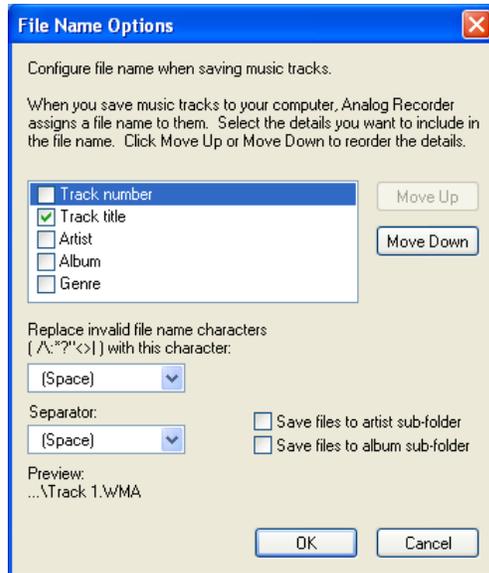


This feature is an inconvenience if you plan to play your files on a computer other than the one you created the tracks on. In theory it keeps people from copying your files, in practice it often means you will have difficulty using them.

DRM configuration options are limited, with Microsoft offering a limited selection of choices. The disclaimer statement is presented the first time you use Analog Recorder.

Advanced File Naming Options

The Advanced button presents naming and organization options making file cataloging easier.

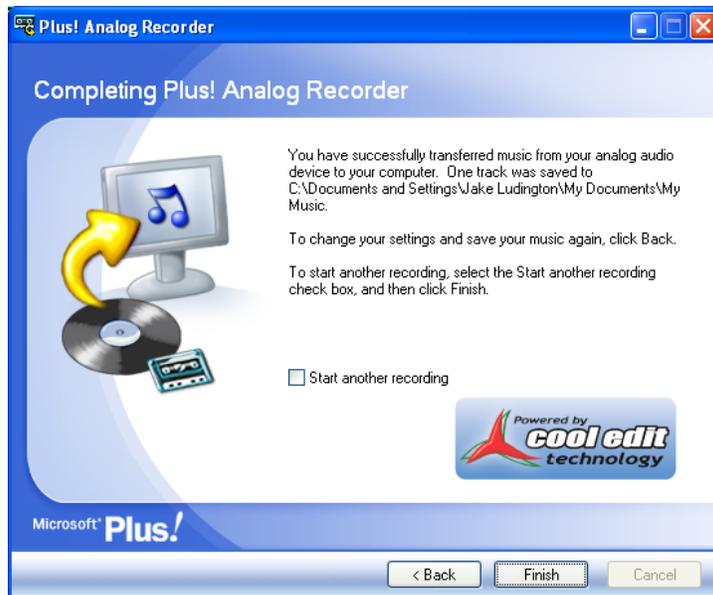


Clicking the Advanced button allows you to select a naming scheme. File names can be based on any combination of track number, track name, album title, artist, and/or genre.

Checking Save files to artist sub-folder and Save file to album sub-folder automates saving files in folders organized by artist and album.

After configuring all these settings, click Next.

Step 7: Saving your tracks

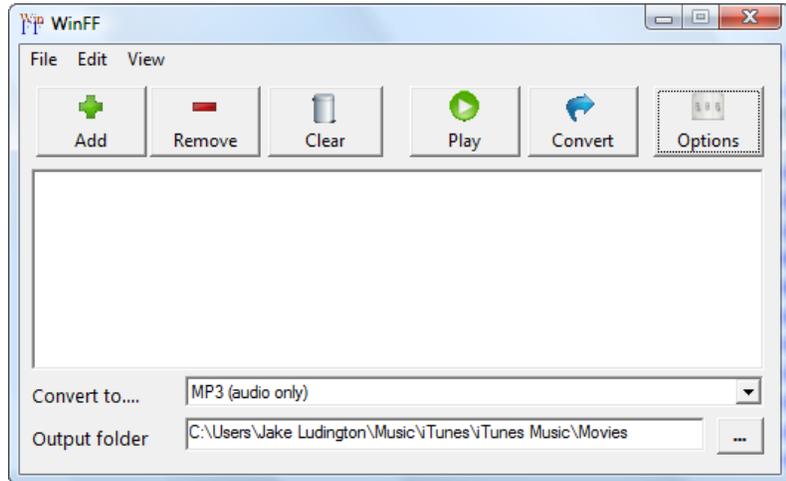


The only thing to do during this step is wait. Analog Recorder must process each track and save it as a WMA file.

At this point, you've completed the process of converting your analog audio to digital. If you want your file in some format other than WMA, the following steps will get you where you want to go.

Converting WMA to MP3

There are numerous choices for converting WMA files to MP3. I really like a freeware app called [WinFF](#) for batch processing many files. I specifically include this in this guide because Plus! Analog Recorder only outputs WMA files and many portable devices (like the iPod) don't support WMA.



After you install WinFF, launch the application and add WMA files you want to convert to MP3. Choose MP3 (audio only) in the Convert to option and pick the Output folder. Then hit the Convert button and wander off while the application chugs through all of your WMA files. This option defaults to 160 kbps, but you can configure it for any of the supported MP3 bitrates.

Burning Audio to CD

Spin It Again and Cakewalk Pyro both include a CD burning option integrated in the application interface. Audacity, Adobe Audition, Sound Forge, and Cool Edit all require you to burn CDs using separate software. Microsoft includes CD burning support in Windows Media Player, which is covered below. iTunes also includes CD burning support.

After opening Windows Media Player, click on the Burn tab at the top of the interface. Drag the album or songs you want to burn to CD to the burn list on the right hand side of the application window. Insert a blank disk in your CD burner. Verify Windows Media Player is configured to burn an Audio CD (not a Data CD). Click the **Start Burn** button.

