First Steps: Rip

Records are making a comeback, inspiring **Andy Channelle** to begin ripping his collection of vinyl to the computer for the first time...

The musical lives of most people over the age of 30 can be divided into two parts: pre- and post-CD. This point, usually in the mid to late 80s, marks the moment when they stopped buying music on large black discs with impressive sleeve art that could double up as teen-friendly wall decoration and, instead, began to acquire small shiny silver platters that came with uninspiring 'booklets' and the potential for 72 minutes of music (hence the term 'filler'). Many people decided that this was the ideal opportunity to re-buy all of their music on said discs so they could listen to them on micro hi-fi systems. For some, though, spending money on something they already owned seemed a bit of a con, and for others the music they had spent years collecting may not have been available on CD. The transition to music files such as MP3 and OGG was a bit easier for CD users, but vinyl fans were once again offered the opportunity to pay for their music a second time to play it on their computers, iPods etc.

There is a better solution than repeatedly paying for things that you already own, and it doesn't take a lot of expensive equipment. You will, however, need a turntable, a soundcard and a lead to connect the two together. Most mass-market turntables have phono connectors, while most soundcards have mini jack sockets, so a phono to jack converter may also be required (you should be able to get them from any electrical outlet). Software

Our expert

Andy Channelle
Andy has been taking his first steps in Linux software for the past six years and has been interested in technology since the advent of the Dragon 32.

## The Audacity interface

Transport controls
These big buttons control the playback, recording and navigation of audio files. You'll find, from left to right, pause, play, stop, skip to start, skip to end and record.

Secondary toolbar
Contains cut, copy and paste buttons as well as a slider to slow down or speed up playback.

Editing window
What you see will change depending upon the tool selected. To the left of the waveform (the blue peaky thing) are the track options, including track volume and pan, and mute/solo buttons – these are mostly used when working on multitrack projects.
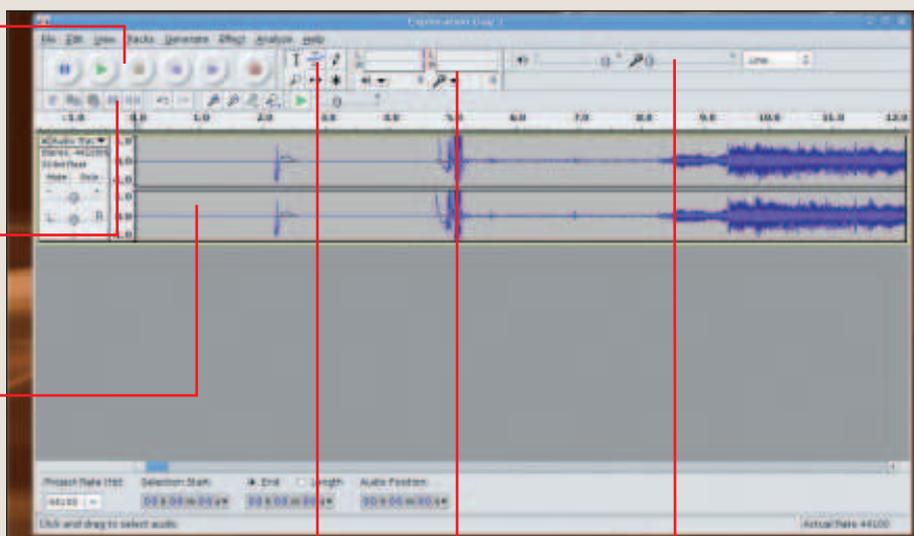
Main toolbar
This is where you'll find the most important tools for manipulating selected areas of a track.

Monitors
The monitor section gives you a visual impression of how loud your recording or playback is.

Faders
Control the input and output volume of your tracks and select the source for your original.

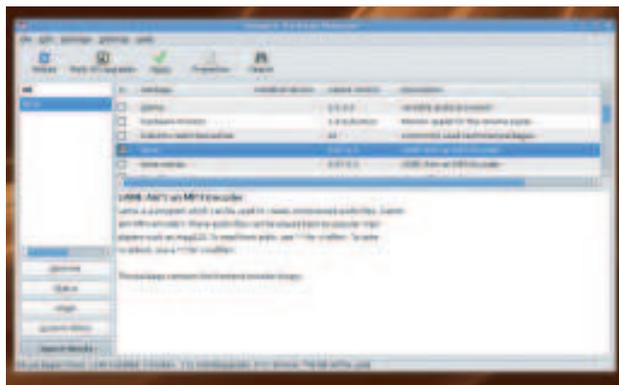» **Last month** Really Simple Syndication made even simpler, with our intro to RSS

MP3s from vinyl

requirements are even easier, as we'll be using the excellent open source *Audacity* software. Ripping vinyl may take a little longer than ripping CDs, as you have to record in real time, but the advantages are that you'll probably end up rediscovering a bunch of great tracks while you do it.
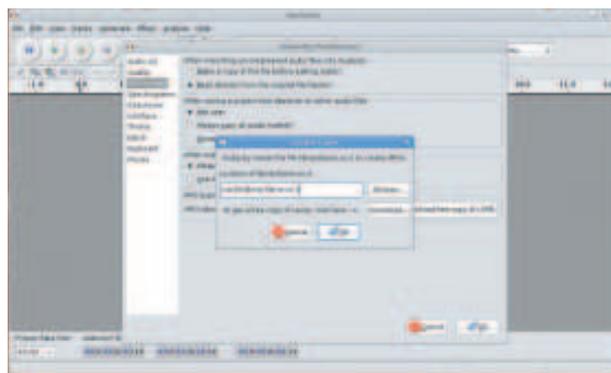
Set up your software

Audacity is probably the best free audio editing package available on any platform, and is available as a binary for various Linux distributions, as well as for OS X and Windows. The *Audacity* website (**http://audacity.sourceforge.net**) has the latest stable and development binaries available, and installation is usually just a case of downloading, decompressing and putting the files into a folder. You'll most likely find the software included within your normal package manager too if you want to use a version optimised for your distribution. Currently the stable version of the software is 1.2.6, but the more adventurous could opt for the development version, which is currently at version 1.3.4. Regardless of your version choice, you should still be able to follow this tutorial, as the core tools have not changed significantly between these versions. We will, however, be using the stable branch of the software, and would recommend you follow suit if you want to stay on the tried and tested route.

As we'll be saving the final files as MP3 files, we may need to do a few configuration jobs before we actually get to work on the task at hand. The first job is to check whether you have the *Lame* MP3 encoder installed and, if not, to install it. To do the former, launch *Audacity* and then do Edit > Preferences and look under the File Formats tab. Under the File Export Setup section near the bottom, click on Find Library and look for **libmp3lame.so** or **libmp3lame.so.0**. Another way to check is to open your file manager and look for either **/usr/local/lib/libmp3lame.so** or **/usr/lib/libmp3lame.so**.
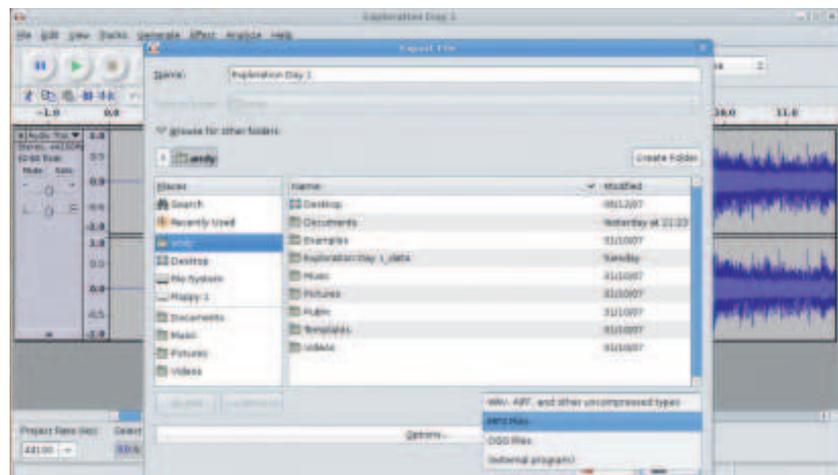

> *Audacity* **is automatically set up to check the most common locations for the file.**

If you don't find anything using either of these methods, you'll need to install *Lame* yourself – *Audacity* doesn't ship with the encoder because of patent issues surrounding the MP3 format. The simplest way to do this is to search in your distro's package manager for either **LAME** or **LAME_ENC**. In an Ubuntu-based distro, you'll need to launch *Synaptic* and then go into Settings > Repositories and select the option labelled 'Software restricted by legal or copyright issues (multiverse)'. Back in the main search engine, enter 'LAME', then look for **lame** and **liblame0** and tick the box to mark them for installation. Hit the Apply button and let *APT* do its magical stuff. Now close *Synaptic*, open *Audacity* and do Edit > Preferences one more time. In MP3 Export Setup, choose Find Library and hit Yes when asked if you'd like to search for the **libmp3lame.so** (shared object) file. Finally, add '.0' to the filename, click through the various warnings and close the dialog box. Now you should be able to export MP3 files from within *Audacity*, and we're ready to begin ripping. However, if you're using *Audacity* on »

> **You'll need to install** *Lame* **if you want to capture files as MP3s for your iPod (other music-playing devices are available).**

> **Ubuntu has a slightly convoluted way of accessing MP3 settings, but they are there.**

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» Ubuntu, there's one small hoop you'll need to go through. With a file open, select File > Export. If you click on the Options button, you'll notice that there are no options for MP3 encoding, so hit the little arrow next to the Browse For Other Folders arrow, use the drop-down list at the bottom-right to select MP3, then hit the Option button. It should all be there.

On the level

Ripping is not as simple as hitting a button, because the music on those big black discs isn't digital (see Analogue vs Digital boxout, below-right). The first step to perfect samples is to ensure that your turntable is plugged into the right jack socket and that your 'levels' are correct. Audio equipment usually outputs a line level signal, so it needs to be plugged into the Line In connection on your soundcard. If you take the audio output from your turntable and feed it into the Mic input, the signal will be boosted to such an extent that you'll just end up with hideous noise. Overloading an analogue recording can sometimes lead to a fairly pleasant noise because of the warmth of the distortion that is introduced into the recording; overloading a digital recording leads to a bit-crushing mess that only Lou Reed could love. To check your levels, make sure the correct input is selected from the drop-down list to the right of all the sliders and drop the needle on to your record. Audio will be going into your computer, but you won't hear anything. Click on the disclosure arrow next to the microphone icon below the meters and select Start Monitoring; now you should hear your glorious vinyl coursing through the computer. You'll also see the meters begin to jiggle and dance. Meters are important – watch them to make sure that the longest bar doesn't go red, as this will

> **"One of the useful things about having music in a digital format is that we can add metadata."**

cause clipping on your track. During the bulk of the track, you want them to be showing lots of dark green and a thin slither of blue. If the meters are consistently showing red or light green you'll need to adjust the signal by turning the volume down on the turntable. Beware: lots of older records were mixed to sound good, usually without the intention of filling every element of the harmonic spectrum, so you should expect lots of peaks and troughs in the audio. Try to find the loudest section of an album or song and make sure that it doesn't hit the red.

Now we're ready to begin ripping, so plug in some decent speakers or a pair of headphones, hit the Record button in the
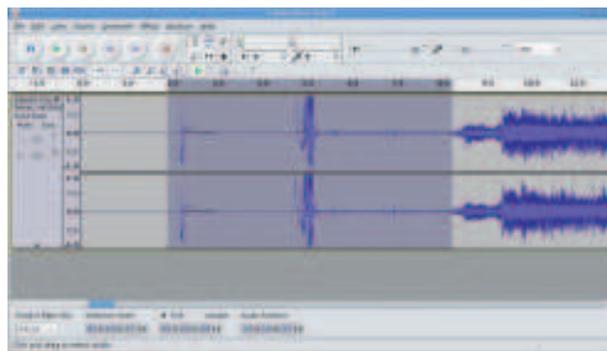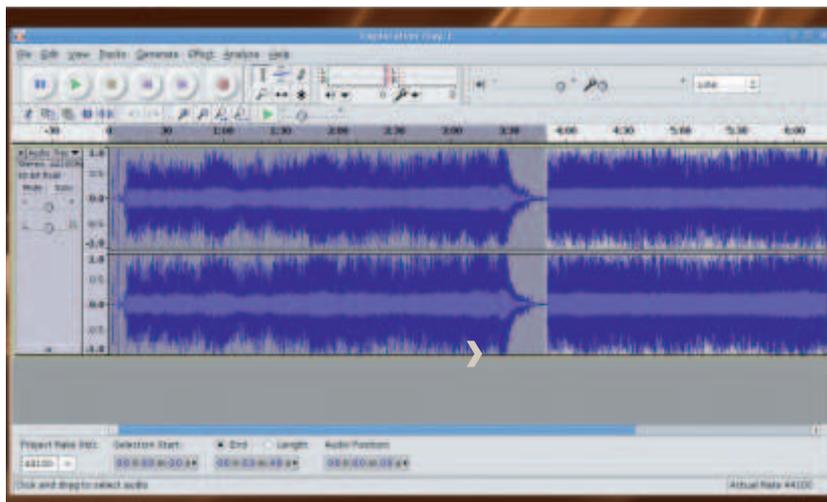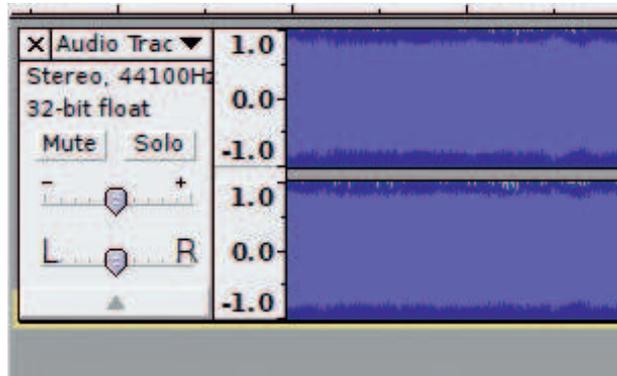

❯ Those first two stabs in the waveform are the crackle and pop from a badly manufactured (or scratched) vinyl disc.

transport bar and drop the needle. Enjoy. If your computer has a fair amount of memory, it's quite sensible to record one side of an album as a single track – we can divide it up later. If, however, you're working on an older machine, it might be worth the extra effort to rip each song individually. In this case, wait for the track to finish, hit the Stop button and then do File > Save Project As... and render the audio to your hard disk. Now do File > Close to close the current file, then hit the Record button again, put the needle on the record and do the second track. It's a bit of a pain, but it's worth it in the end. Once side 1 is done and dusted, save your file, flip the disc and crack on with side 2.

What we now have is a version of the album in two separate tracks that are saved as large .aup files, but what we need is a collection of MP3s that we can play with *Rhythmbox* or *Amarok*.

Open side 1. It's a good idea to listen to a few areas to ensure you have a decent recording before you spend the time refining things. To do this, use the scroll bar at the bottom of the screen to navigate the tracks and, using the selection tool, click somewhere in a track and hit the Play button. Playback will begin from where you just clicked. Seek out areas of high or low volume, as indicated by either very wide or narrow bands in the waveform respectively, and play through these to check the levels. You can use the zoom tools to reveal more of the waveform, so zoom out until you can see some individual tracks on the screen; you'll notice these because there should be a few seconds of relative quiet visible on the waveform, but be careful not to be caught out by false endings – check if you're unsure. With the selection tool, click and drag your mouse from one end of the track to the other, highlighting the waveform as you go. Now do File > Export Selection... then save the file as a WAV file if you have the space, or as an MP3 if you're short of

❯ **By highlighting a selection of the file, we can ensure that any changes happen only on that part.**

❯ If your audio file looks like this, you really need to lower your levels. There's nothing nice about digital distortion.

space. The reason for choosing a WAV format now is that we'll revisit these tracks for a little bit of cleaning up later, and saving in a lossless format will mean a better quality MP3 at the end. Do this for each of the tracks on both sides of the album and, once you've finished, delete the original recording.

After 15 years of listening to CDs, the noise that comes from vinyl records can be a bit of a shock, so the next stage in the process is to clean things up a little by working on individual tracks. So do File > Open and bring in the first track from your album. The first thing we're going to do is trim the beginning and end of the track to clear away the noise of the needle artlessly hitting scratches on the record. With the selection tool, drag across the file from the beginning to the point where the music kicks in. Now select Generate > Silence and hit the OK button. The formerly noisy section will be replaced with a John Cage-esque moment of quiet. Now do the same for the end of the song.

If you have a fade out or trailing note at the end of the song, judging where it ends can be a pain, so we're going to engineer a fade to complete silence. Highlight the last few seconds of the song (or longer if it has a really long fade), then select Effects > Fade Out and then do OK. You'll notice that the waveform changes and at the end of the track you have some silence.

You may now find that you have an unnecessarily large gap at the start and end of your track. We can get rid of these by highlighting the offending region and hitting Delete. Remember, though, that you probably want a couple of seconds between each track for the purposes of emotional separation (man), so keep one second at the beginning and end for this purpose.

If you're ripping from a cassette you might find the Effect > Remove Noise option handy (in which case you'll want to sample a few seconds of fuzz from the beginning of the tape), but otherwise we're going to leave the tracks as they were intended to be heard. You could, of course, remaster your entire record collection – in which case you'll want to play with Normalise, Compressor, Click Removal and Leveller, which are all under the Effect menu, but be aware that you can make very drastic changes to the way that the music sounds if you're not careful.

Ready for output

One of the useful things about having music in a digital format is that we can add metadata to the file, which makes managing a large collection of music so much easier. To add this information, do File > Open Metadata Editor and add as much or as little information as you think is required. The bits you're going to use most are the artist and song title, but as with anything, the more data you can provide, the easier it is to find later on. When you're finished, hit the Done button to dismiss the dialog box and get
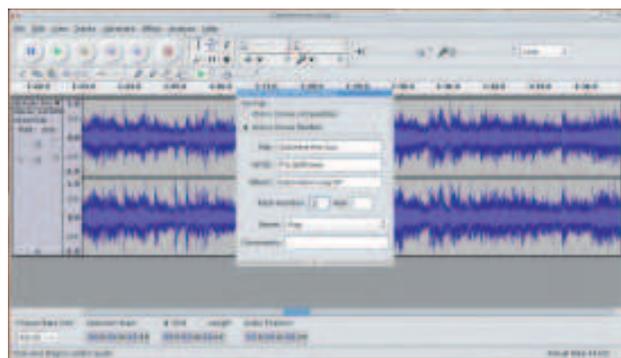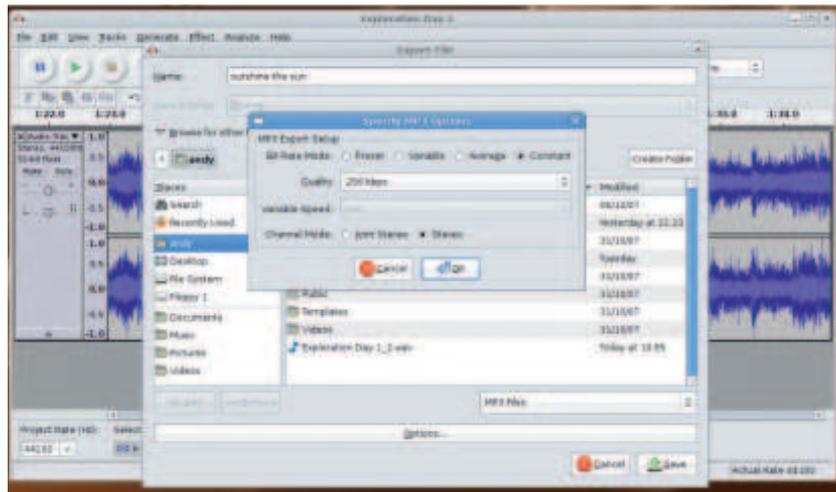
› As with most computer things, bigger numbers mean better quality.

back to the music. This information will stay with your track as long as you save in a format that is capable of retaining it, so OGG and MP3 are good, but many WAV files will lose it.

We're finally ready to render the first track as an MP3. Choose File > Export (in earlier versions of *Audacity*, the action is File > Export MP3). As mentioned above, you may need to do Browse For Other Folders to enable the MP3 export options, but once this is done, hit the Options button to configure the format. There are loads of options here, but it's usually enough to remember that larger numbers in the Quality settings (which is defined in kilobits per second) will result in better quality files and bigger file sizes. Most people rip at either 128 or 256kbps, and it's worth remembering that, while it's possible to downsample a file – for example, if you wanted to fit more content on to a small MP3 player, upscaling a 128kbps file to 256kbps won't add anything to the music. You might even decide to make master recordings of your tracks with no compression (as WAV files for example) to keep as backups, then re-encode to MP3 for playback on a mobile device or your computer. When you're happy with the settings, supply a filename, hit OK and watch as the MP3 is encoded to your disk, ready for adding to *Amarok* or some other audio player.

Ripping a large collection of records to your computer can be something of a chore – but most people would regard it, like music itself, a labour of love. And let's face it, if you didn't want to listen to these things, you wouldn't have bought them in the first place. Just be ready to realise that the Toni Basil single you bought in a fevered rush in 1982 is, in fact, possibly the worst record ever made in the history of civilisation. Of course, we can say this, because we didn't buy that record – it was a present. Honest. **LXF**

› Adding metadata (such as the name of the artist) to your songs makes them easier to manage as part of a large library.

Analogue vs digital

Back in the olden days, all music was analogue – that is, it was recorded and then encoded on to tape or vinyl as a continuous stream of information. If you were to look at the sound in an oscilloscope – which enables you to visualise audio – it would appear as a series of curves that get wider as the music increases in volume and narrower during the quiet bits.

When sound is digitised it is converted into a series of discrete samples. The music on a CD, for example, is composed of 44,100 samples per second, and hence is a 44.1kHz sample. Just like images, these samples also come in various bit depths – CDs are 16-bit, but professional audio recording tends to be either 24- or 32-bit. The higher the sample and bit rate, the closer the sample is to analogue fidelity.

» Next month We'll be creating and editing photo galleries on the web using F-Spot