SOURCING sounds

In the second part of this series, **PAUL CHETTER** continues fitting a Hornby '4MT' with digital sound. This month, he sources and prepares the sounds ready for downloading to the chip.
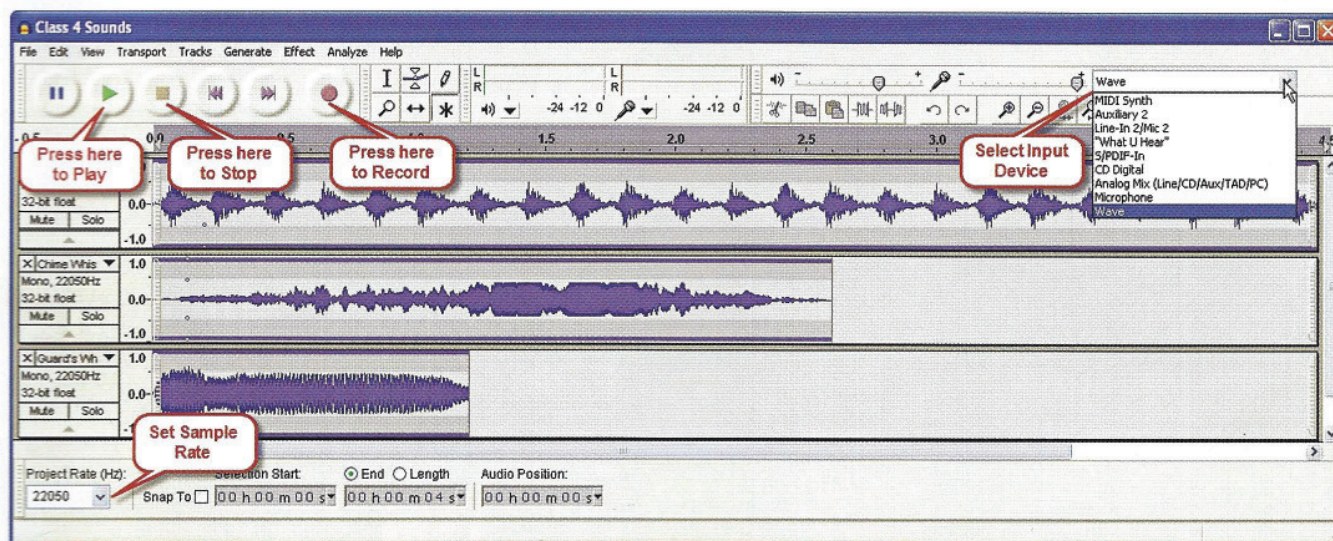

Figure I

L AST MONTH I fitted a Digital Command Control (DCC) chip to Hornby's British Railways '4MT' 4-6-0, and having completed that the next step is to source appropriate sounds for the locomotive. There are three options when it comes to sound - use authentic sounds from the real thing, choose alternative sounds that are 'close enough', or you can create a substitute.

While many modellers strive for perfection, sound is an extremely variable and subjective entity. I have live recordings of the same locomotive, on the same stretch of track made at different times of the same day and they sound markedly different: which one is the authentic sound?

When you take into account the technical constraints, particularly the small speakers needed to fit 'OO' gauge models, the best you can realistically expect to achieve is a collection of sounds that evoke the spirit of the original. Helpfully there are a number of tricks you can employ to set the scene.

Sound sources

The internet can be a great place to search for sounds, but much that you hear will belong to someone. It is often fine to use downloaded material for your own purposes, but you may need permission. You should not use these materials for gain without the copyright

owner's written agreement.

You will find sound libraries - some free, some requiring payment - with extensive archives and there are a number of railway specific archives which can be a good place to start your search. You might be surprised, too, at the amount of railway related items on YouTube! There are videos and DVDs that may have what you need, and don't overlook radio and TV broadcasts as potential suppliers either. Downloading sound files from current decoders isn't an option as the files are digitally encrypted to prevent this.

If you can make your own original recordings you can use them as you wish. There are opportunities to record steam locomotives on mainline metals or you could try one of the many preserved lines, and this means you can get the sounds you want without considering copyright issues.

However, sometimes it proves impossible to get an individual real sound. If so, make one up: you can always replace it later. Remember that coconut shells clapped together give a good impression of horse's hooves, and a bit of imagination can produce suitable sounds

from a wide range of objects. I have put a realistic steam blast file on the *Hornby Magazine* website that's actually a manipulated recording of something. Have a listen and try to work out what it might be. There's no prizes, but I'll tell you what it is next time!

I've also placed the sounds that I will be using in the rest of this article, some useful links and a tutorial which goes into more detail than possible here on the *Hornby Magazine* website if you want to try doing this for yourself. These files are my original work, and you can use them royalty-free, but please acknowledge me as the copyright owner.

Sound capture

Now that you have decided on your sounds you will need to capture them so that they can be edited and saved in the correct format for your decoder. In my experience, if you can play a sound on or through your computer, you can capture, edit and save it. I use a free program called *Audacity* but there are many others and if you already have one that works, there is no reason not to continue using it.

I use *Audacity* because it has a good balance between ease of use and powerful features. **»**

TIP

To work on a sound, you must 'select' it by clicking in the box to the left of the track. If you wish to select only a portion of a track, click at the start and drag to the end of your chosen segment. In either case, the track or segment changes colour to indicate the selection is active.

Capturing steam sounds can be complicated by location, wind direction and other factors, but it is possible to record your own sounds with a little care. In 1962 BR '4MT' 75071 leaves Windsor Hill tunnel on the climb to Masbury summit with a Bournemouth-Bath stopping service.
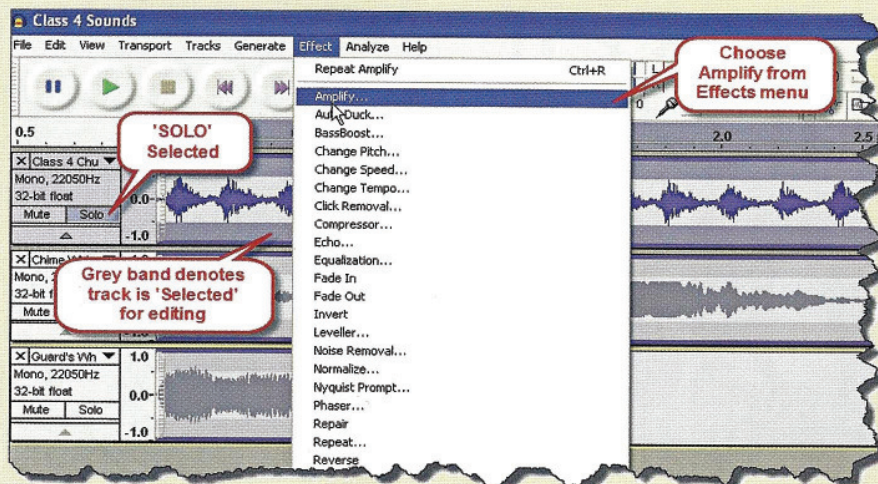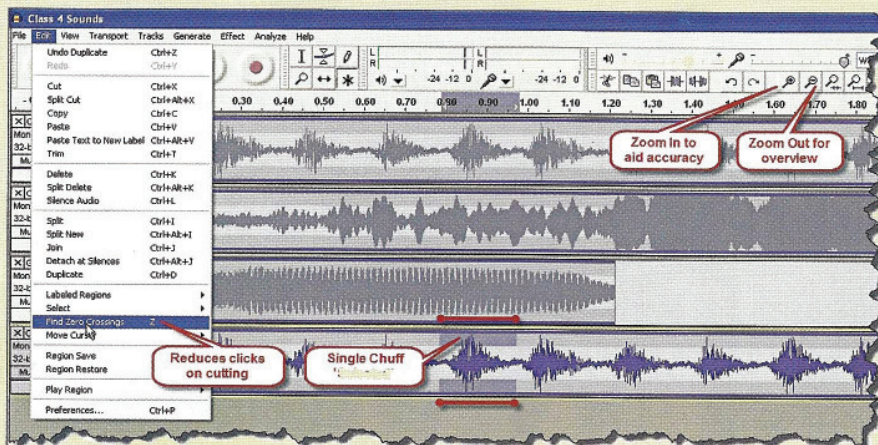Patrick Russel/Rail Archive Stephenson.

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

It works on most formats, there are regular updates and it has a very active forum where you can get rapid help and support. Before opening *Audacity*, you should determine the exact file format your sound decoder requires. For the Zimo MX640 decoder, this is Mono, 8-bit resolution, 11kHz or 22kHz sample rate WAV files. You cannot load any other format onto these decoders.

On the Audacity workbench (Fig 1), select your sound source from the options on the toolbar. On the transport controls, press the red button to record through your computer, the yellow square to stop, and the green arrow to play it back. If you already have audio files you can **Import** them using the **File** menu.

You will see that I have opened *Audacity* and loaded the sounds you can find on the *Hornby Magazine* website. I set the Project Rate to 22050 Hz (22 kHz sample rate) in the bottom left hand corner. It is always a good idea to work from a copy of the original file so that if you make a major mistake you don't have to record or download it again. Each file has its own track showing the waveforms, the height of which illustrates the volume. To listen to an individual sound, press the **Solo** button to the left of the track, then the green arrow. The files were recorded at different levels, but it will make it easier later if we standardise them now as otherwise the locomotive will sound distinctly odd when it is running. **Select** the top track. Open the **Effect** menu and click on **Amplify** (Fig 2). The Amplify box opens which, by default, will adjust the peak volume on this track to the maximum before distortion sets in (known as clipping). To allow headroom for

any subsequent changes, type -1.0 in the **New Peak Amplitude (dB)** box (Fig 3). Press **OK** and note the changes. Repeat for the other tracks and the levels will all be the same

Steamy sounds

The basis of good steam locomotive sound files are the exhaust sounds from the blastpipe, so that's where we'll start.

Select the duplicated 'Chuffs' track and listen to it as a solo (Fig 4). You can clearly hear the characteristic four beats of a two cylinder locomotive - two exhaust notes per cylinder on each driving wheel revolution. The sound decoder will need separate audio files for each chuff in a 'set' of four.

To make it easier to work, use the **Zoom In** tool (magnifying glass with + symbol) to expand the waveforms. Using them as a guide, select the leading chuff of four (click and drag the cursor). This 'cutting' can produce unwanted sounds so to minimise this problem, take the **Find Zero Crossings** option from the **Edit** menu. The programme will then move your cuts to their optimum positions automatically.

Take note of the length (time) of your selection, and use the **Export Selection** option from the **File** menu. If **Edit Metadata** box appears, make sure there are no entries (use **Clear** button) then click **OK** (Fig 5).

We now see the **Export File** dialogue box which allows us to save the audio file. Give the file a meaningful name, e.g. Class 4 Chuff 1_1 (the 1_1 is important when compiling later). In the **Save as type:** dropdown select **Other uncompressed files**, then press the **Options**
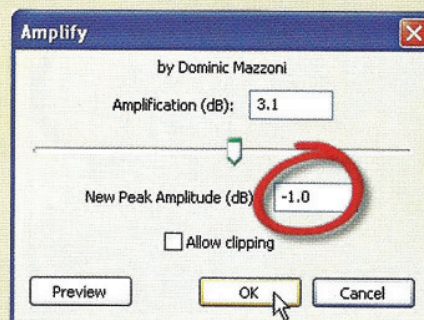
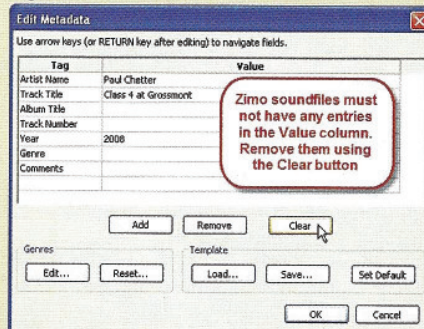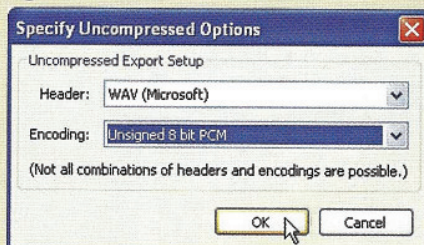button and from the resulting **Encoding** dropdown select **Unsigned 8 bit PCM** and press **OK** (Fig 6). Press the **Save** button and Audacity will produce the correct file type. Make a note of where the file is being saved to and try to keep all of the files for this project in the same location.

Repeat this process for the next three chuffs, trying to make each file length close to that of the leading chuff. When saving, change the file name endings to 1_2, 1_3 and 1_4 respectively. The other sounds can simply be exported as they are. I suggest names like Long, Short, or Guard's Whistle as appropriate. You just need to be able to identify them later so it's up to you.

Although we have barely scratched the surface of Audacity's powerful functions, you now have all the basic moves to get your audio files ready for programming into your decoder. When you have finished, the **Save as** option from the **File** menu will preserve your Audacity project.

Meanwhile, there are further useful and interesting options available from the **Effect** menu. I find **BassBoost**, **Change Pitch**, **Fade In and Out** to be my most used options for steam projects. You can have fun with many of them, and they are all reversible (**Undo** in the **Edit** menu) so have a go! Try adding a touch of **GVerb** to the long chime whistle for an atmospheric effect.

● Next issue, we'll examine sound decoder options and I'll explain why I chose the MX640. I'll also show how to compile the sound project file and programme the decoder. If you've got this far, you're well on the way. **HM**