

A Brief Introduction to REAPER

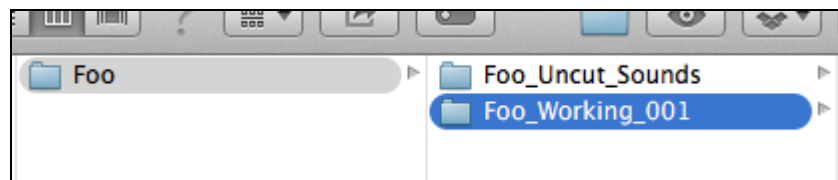
1 A Brief Introduction to This Document

This document should give you the jump-start you'll need to create some awesome radio pieces in REAPER. Here you'll find basic info about using REAPER as well as some best-practice tips, which you'll want to follow. Enjoy, and happy editing!

2 File Organization

Before playing with REAPER, let's devise a file organization scheme. This step's deceptively important, since skipping it won't physically prevent you from creating a cool piece, but ignoring it can cause problems when editing collaboratively, because REAPER stores local references to your sound.

Say you're working on a project called *Foo.RPP*. We suggest a hierarchy like the one below:



The topmost directory, *Foo*, stores two directories: *Foo_Uncut_Sounds*, and *Foo_Working_001*.

Foo_Uncut_Sounds contains copies of all the uncut sound files used to make the radio piece. It may store copies of entire half-hour interviews, hour-long tracks of ambient sound, recorded speeches, etc. You'll use bits and pieces of the sound from these, but you don't want to keep loading such big files into your REAPER workspace, because they take up RAM and CPU resources and slow things down. Additionally you want to keep them separate from your working folder, because if you ever share your working folder, you don't want to have to include such enormous files. Note: *Foo_Uncut_Sounds* is not where you store your raw sounds. You should store all your raw sounds elsewhere and back them up.

Foo_Working_001 contains your REAPER file (*.RPP*), the automatically generated backup file (*.RPP-bak*), all the sounds you'll use directly in your piece, automatically generated *.repeaks* files, and any renders (files you will make by mixing your sound -- these are the ultimate product of working in REAPER) you've produced. To keep track of your renders, be sure to put the date and time in their file names (ex. *Foo_Mar14_1632.wav* means: *Foo.RPP* rendered on March 14th at 4:32pm). Resist the urge to put "final" in any file names, because naming something "final" guarantees that it won't be.

If you want to send your project to a collaborator, you need only send over a zip of *Foo_Working_001*, since your REAPER file won't use any files in *Foo_Uncut_Sounds*.

If you want to make a radical change to your project, you simply need to make a copy of *Working_001* (*Foo_Working_002*) in *Foo*. This can even be done within REAPER.

Be sure you set up your hierarchy before you start adding sounds to REAPER. As aforementioned, REAPER uses relative file paths to access your files, so if you move or rename a file used in your project, REAPER will become sad and will mark the file "OFFLINE." A fix for this is explained later.

3 Installing REAPER

REAPER is available for download here (<http://www.reaper.fm/download.php>) for either Windows or Mac¹. Be sure to pick the proper version for your processor. You can purchase a license at <http://www.reaper.fm/purchase.php>. A discounted license (for individuals, nonprofit/educational organizations and small businesses) entitles you to the full version of REAPER, including two versions worth of updates; it's a very good deal.

If you're unsure whether you have a 32-bit, 64-bit, or PPC processor, you can find out using these instructions for Mac (<http://support.apple.com/kb/ht3696>), these instructions for Windows (<http://windows.microsoft.com/en-us/windows/32-bit-and-64-bit-windows#1TC=windows-7>).

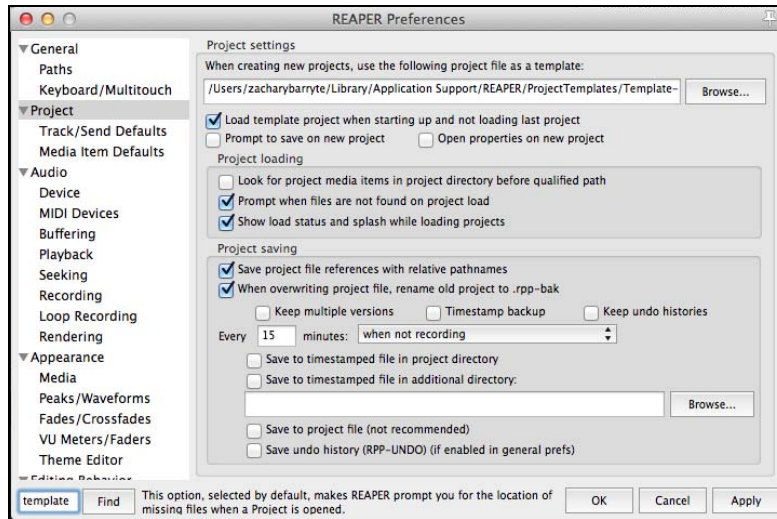
When you open REAPER for the first time, it may ask you to choose an audio device. For Windows machines it is best to use ASIO. You may need to download and install an ASIO driver. Free, easy-to-install drivers are available here (<http://www.asio4all.com/>). If you do fill out this dialog box, set "Request sample rate" to 44100 and "Request block size" to 512.

4 Installing Template and Configuration Files

Some of REAPER's factory defaults are nonideal for radio editing, so we've created a template for radio called Template-SP.360-2016-v1.RPP, which can be found here (<http://web.mit.edu/terrascope-radio/REAPER-practice/>). Within REAPER click on "Options" and select "Show REAPER resource path in explorer/finder". In the window that comes up, you'll see a folder called "ProjectTemplates". Download the template file and save it in that folder. Then set the template as the default for REAPER by selecting Options> Preferences or or pressing Ctrl-P (Cmd-comma for Mac²) to bring up REAPER Preferences, select Project, and Browse to find Template-SP.360-2016-v1.RPP.

¹ Sorry Linux... I mean, you could use Wine... but it might be simpler to borrow a machine...

² All future hotkeys listed should be identical for Mac and Windows if Mac users read "Ctrl" as "Cmd."



We have also created a set of preferences that we think are a good starting point for radio production in REAPER. It's saved in a configuration file called Config-SP.360-2016-v1.ReaperConfigZip at the same URL where you found the template file. Download this file and save it in the "Configurations" folder, which will be in the same directory where you found the ProjectTemplates folder. Now click on Options->Preferences and select "General". Then choose "Import configuration...", browse to this configuration file and choose it.

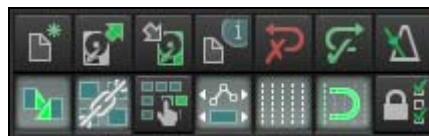
This configuration assumes you are using a Windows machine with ASIO chosen as your audio device and (just for specificity) a Conexant HD sound card. If this is not the case (and you will probably at least be using a different sound card, if not a different kind of machine entirely), go to Audio->Device and select the correct parameters for your audio device; then go to General and export this configuration, giving it whatever name you like; in the future, if you need to reconstruct your initial configuration, this is the one you will import.

5 Setting and Saving Defaults

[NOTE: You can ignore this section if you prefer to download and import the template and configuration file described in the previous section ("Installing the Template and Configuration File").]

If you don't want to use our template and configuration file, or want to learn about various defaults you can set, here's an alternative way to set up some slightly different defaults.

Open REAPER and locate the Main Toolbar in the upper lefthand corner.



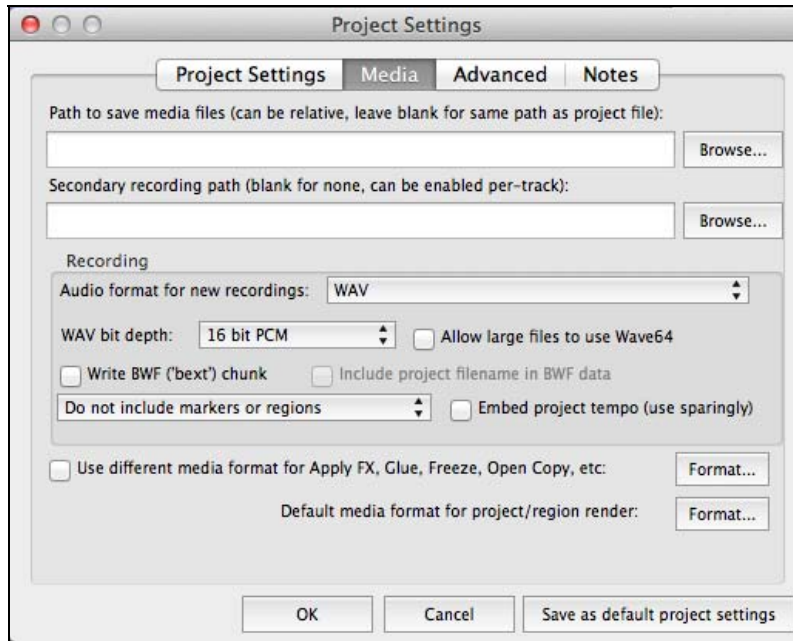
Match the settings above, in the bottom row, from left to right, by clicking to toggle buttons as appropriate to set the mouse-over-text to read: "Auto-crossfade enabled"; "Item edit grouping enabled, selection

grouping disabled”; “Ripple editing disabled”; “Envelope points move with media items”; “Grid lines enabled” or “Grid lines disabled” based on whether or not you find grids helpful; “Snap enabled”; and “Locking off.”

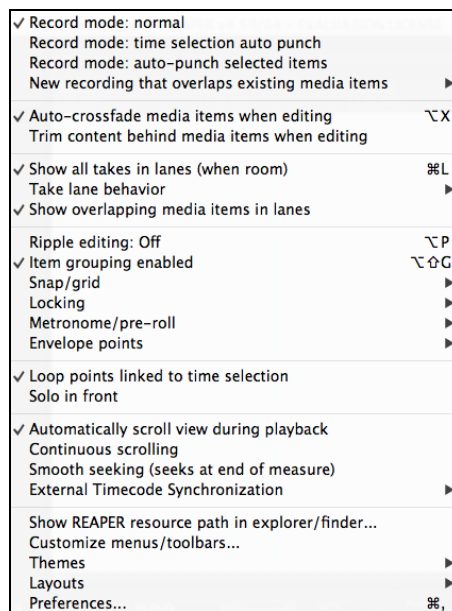
Next press Alt-L to bring up Snap/Grid Settings. Uncheck “Selection” in the category “selection/markers/cursor,” and uncheck all boxes (“Media items,” “Selection,” “Cursor”) in the “to grid” section. You may also uncheck “Grid snap settings follow grid visibility,” and “Snap to grid at any distance,” in case you anticipate turning on snap to grid in the future.



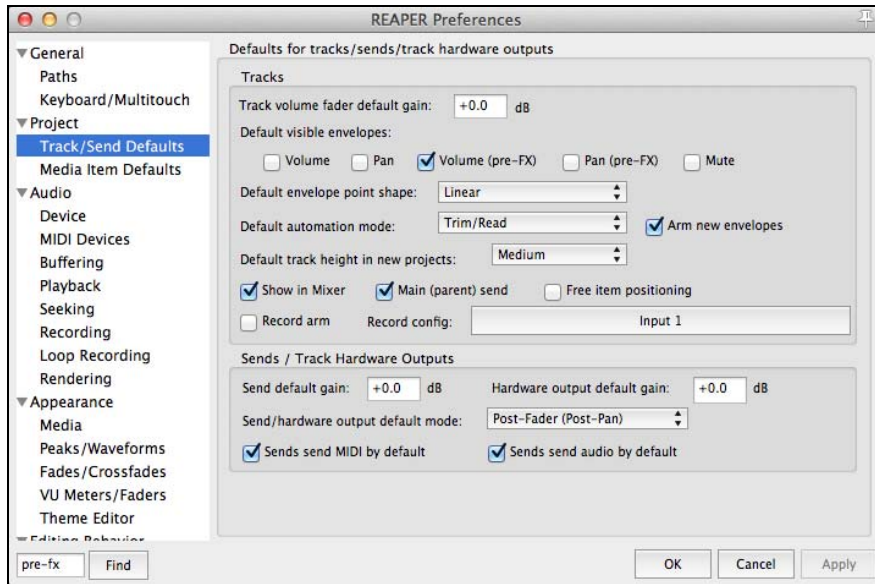
Now selecting File->Project Settings to bring up Project Settings. Under the Media tab, set “WAV bit depth:” to “16 bit PCM,” and uncheck “Write BWF (‘best’) chunk.” Then select Save as default project settings in the bottom right.



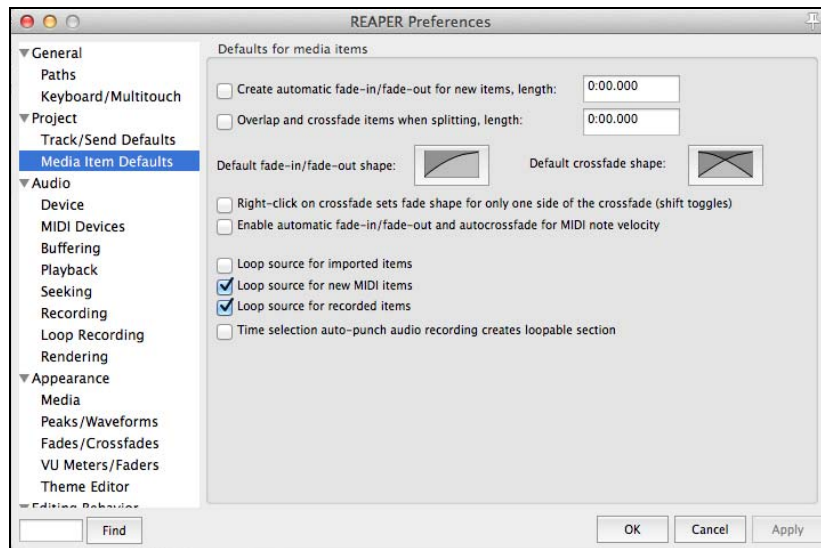
Select Options from the Menu Bar and check “Show all takes in lanes (when room).”



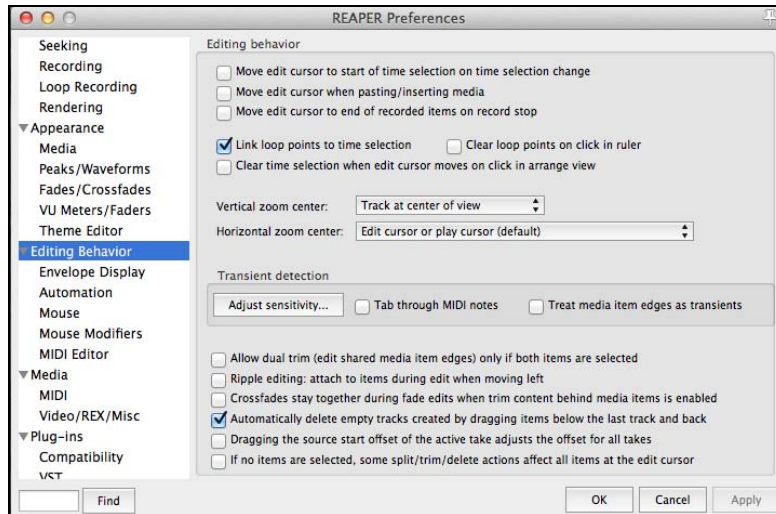
Then bring up REAPER Preferences and select Projects->Track/Send Defaults, and, under “Default visible envelopes:” check “Volume (pre-FX).”



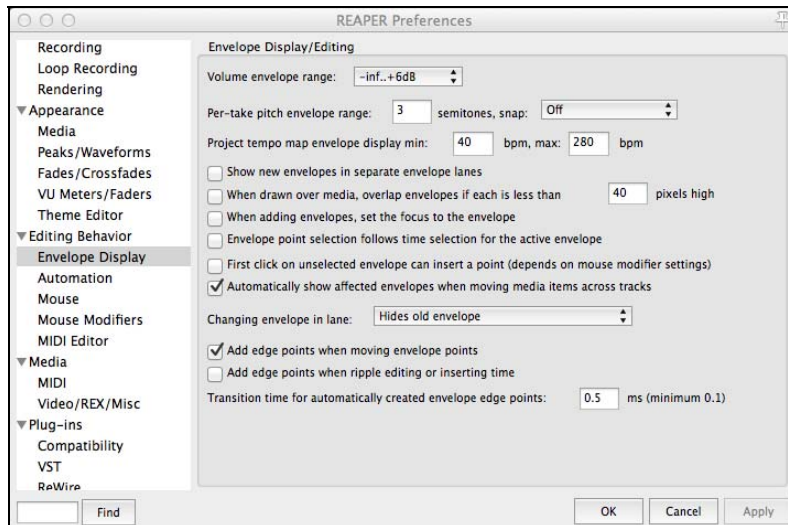
Select Project->Media Item Defaults. Uncheck “Create automatic fade-in/fade-out for new items, length: [0:00.010]” and set the fade length to 0:00.000, and uncheck “Loop source for imported items.”



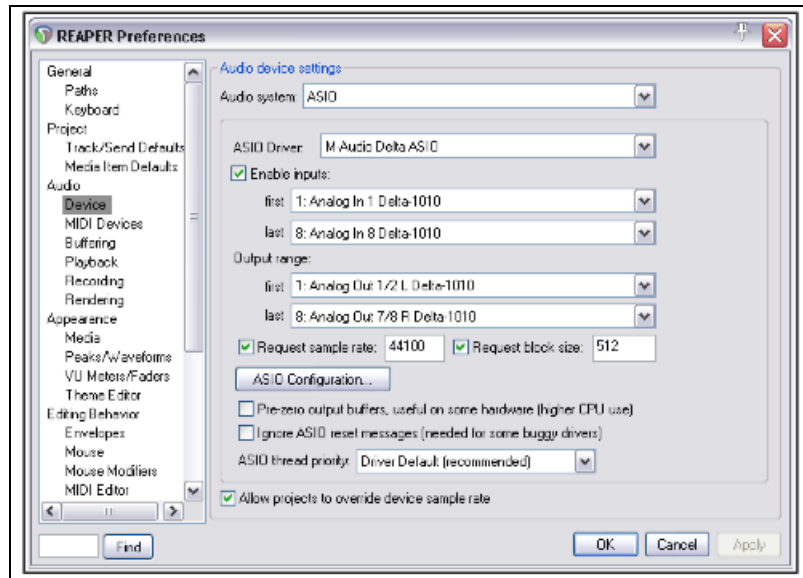
Select Editing Behavior. Uncheck “Move edit cursor when pasting/inserting media,” and uncheck “If no items are selected, split/trim/delete actions affect all items at the edit cursor.”



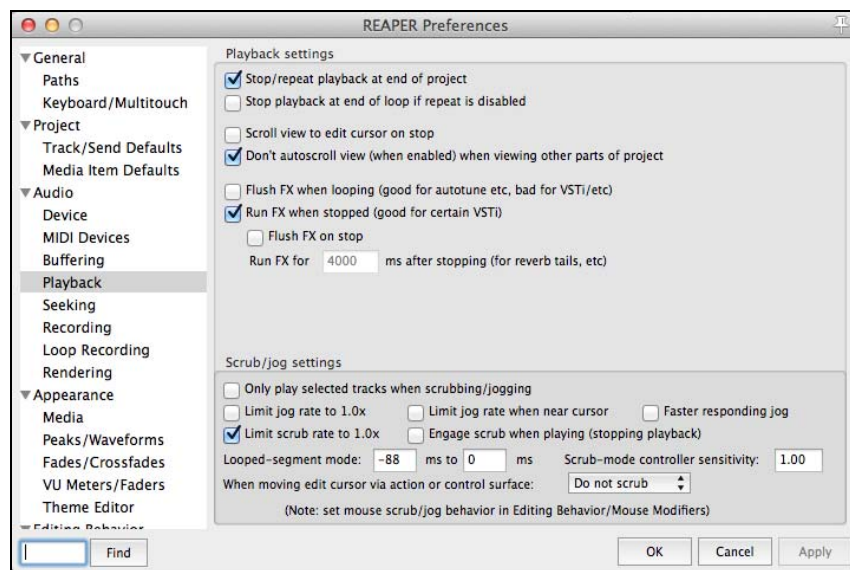
Select Editing Behavior->Envelope Display and uncheck “Show envelopes in separate envelope lanes.”



Select Audio->Device. Set “Request sample rate” to 44100 and “Request block size” to 512. If you are running REAPER in Windows, you may select the "Audio system" that matches the name of your sound card, but that may give you strange results just when you don't want them. It is far preferable to choose ASIO. Free and easy-to-install Windows ASIO drivers can be found here (<http://www.asio4all.com/>).



Select Audio->Playback and from “When moving edit cursor via action or control surface:” select “Do not scrub.”



Select Apply, then Okay, in the bottom right of REAPER Preferences. Your defaults should be saved.

If you want, you may also turn your defaults into a configuration file by selecting General and exporting the configuration, giving it whatever name you like.

6 Saving and Backing Up

In addition to saving frequently (Ctrl-S), you'll want to back up your projects. Though REAPER generates a backup whenever you save (RPP-bak), don't rely on it. Just as you'll be backing up your raw sounds, you'll want to back up your REAPER projects.

7 Editing

We'll now walk through a few examples to explain basic techniques you'll use in REAPER. In these examples, we'll be using the audio files *Sugarloaf_tracks-II.wav* and *Sugarloaf_CAT_riding.wav*, which can be found here (<http://web.mit.edu/terrascope-radio/REAPER-practice/>).

To follow along, create the folder *Sugarloaf*, containing two subfolders *Sugarloaf_Working_001* and *Sugarloaf_Uncut_Sounds*. Save *Sugarloaf_tracks-II.wav* and *Sugarloaf_CAT_riding.wav*, to *Sugarloaf_Uncut_Sounds*. When you view the sound in REAPER, you'll notice that one file is mono and the other is stereo. REAPER can easily handle both types in the same project.

7.1 Example: Laying Up

This example will show you how to lay up audio in REAPER. First, we'll create a clip of the usable audio from the large, mostly-unusable *Sugarloaf_tracks-II.wav*, to save space when sharing the project. Then we'll arrange sound into the skeleton of what we want for the final piece.

Begin by opening REAPER, creating a New Project called *Sugarloaf.RPP*, and saving it in *Sugarloaf_Working_001*. Create a new track (Ctrl-T). You'll see some buttons appear on the left and a strip of highlighted space to the right.



Now we'll add sound. Click the track to select it, then select Insert->Media File³ from the Menu Bar and Open *Sugarloaf_tracks-II.wav* from *Sugarloaf_Uncut_Sounds*. The sound should appear in your timeline.

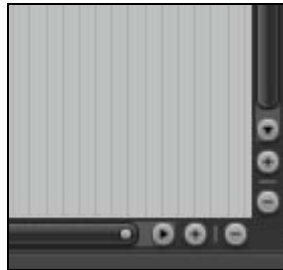


Listen to some of the track by clicking to place the cursor, then pressing either Space or Enter to play. To stop and reset the cursor to the start time, press Space. To stop and keep the cursor at its current time, press Enter. You can finely adjust the cursor's position using the left and right arrow keys by dragging it

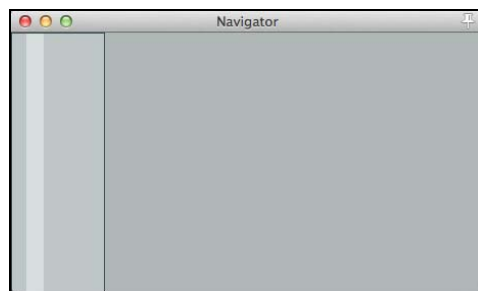
³ Dragging and dropping also works. If you do, be sure your files are in the proper place.

with the mouse.

For especially fine adjustment, zoom in and out by using the up and down arrow keys and navigating with the horizontal scrollbar at the bottom of the timeline. In Windows, you can click and drag on the timeline to create a selection, then use Ctrl-PageUp or Ctrl-PageDown to zoom in to a selection or zoom out to show entire project respectively. You can also use the + or - buttons to zoom. Scroll up and down or left and right with the scroll bars.



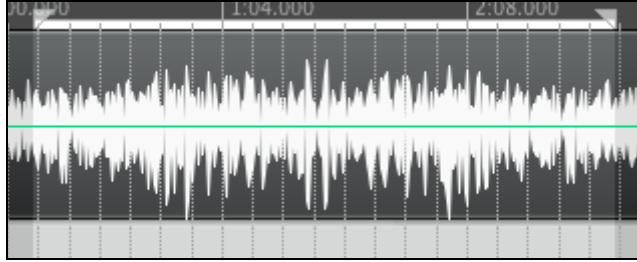
You can also call up a Navigator window (View->Navigator or Ctrl-Alt-V) that shows an overview of your project. You can scroll through your project by dragging the box in the Navigator that corresponds to the section of your project that is currently on screen. You can change the on-screen view by right-clicking and dragging in the Navigator to define a new view.



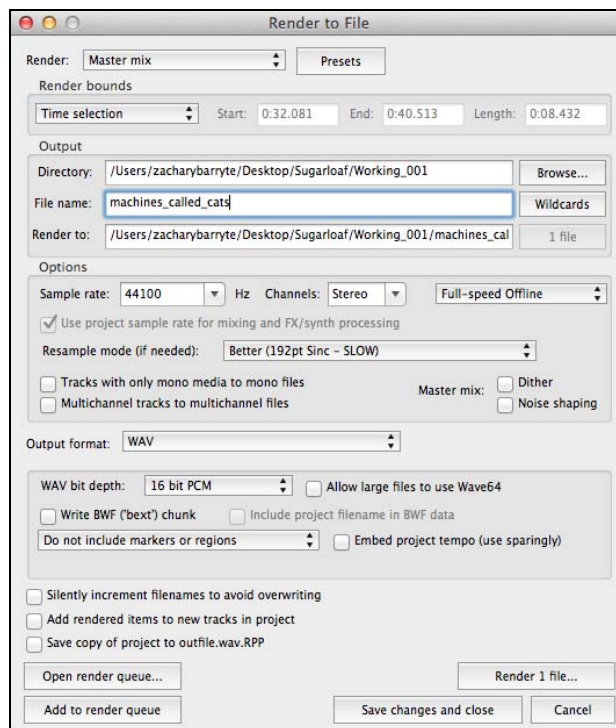
As you may notice, some of the sound in this file is not usable for this project (can you figure out why?), so we want to make the file shorter by extracting only the sound we might use in this piece. This is a short example, so the space saved won't be huge, but when you're working on larger pieces, you can expect hour-long audio, of which roughly 5 or 10 minutes are usable.

Let's create a clip of just the usable sound.

Create a selection over the usable audio (which in this file begins at around 1:30 and ends around 3:00) by clicking and dragging across the top of the timeline. If the selection wasn't quite right, you can click and drag the markers or delete the selection and start over by pressing Esc. Be sure to leave 30 - 40 s on both ends to buffer your clip (so in this case, start your selection around 1:00 and end it around 3:30).



Click on the track to be sure it's selected, and press Alt-Ctrl-R to bring up Render to File. Under "Render bounds:" select "Time selection." Give the file a reasonable name, and if needed, Browse to *Sugarloaf_Working_001*. Check to see that you are saving to .wav format, with a bit depth of "16 bit PCM" -- rendering to .wav is nondestructive, unlike rendering to .mp3, which degrades your sound. Then select "Render 1 File" in the bottom righthand corner.



To double-check, you should be able to find the clip saved to *Sugarloaf_Working_001*, alongside *Sugarloaf.RPP* and *Sugarloaf.RPP-bak*.

Once you have your clipped sound, select the unclipped audio in REAPER, and delete it (Delete). If you need the sound again, it is still in *Sugarloaf_Uncut_Sounds*, and, if this were your sound, it would be stored with your raw sound elsewhere and backed up. Now your project no longer relies on the large, mostly-unusable file. Since you do want the audio from the clipped sound, add the clipped sound that you just created to your file.

You can listen to *Sugarloaf_CAT_riding.wav*, which we want for its ambient sound, by adding and listening, and, if you do, you'll notice it's mostly usable. We don't need to clip it, so let's copy it into *Sugarloaf_Working_001*, and add it to the project in a new track. If you do these out of order, REAPER

will be sad and declare your sound OFFLINE.

When you add sound, note that REAPER adds sound at the cursor position, and that it will allow you to place sounds at the same time in the same track. It may split into lanes and automatically add a crossfade if your defaults tell it to; however, we would like them in separate tracks.

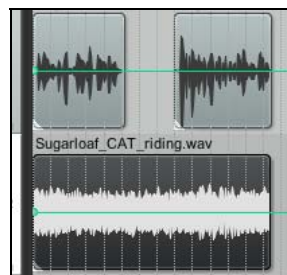
We want two parts of the clipped audio (“Big, yellow machines called ‘cats’ scale the mountain up, down and crosswise,” and “Driving up the side of a mountain after dark is something that few people or machines ever do.”), separated by a few seconds, and under them, ambi from Sugarloaf_CAT_riding.wav.

To do this, you’ll need to shorten your clips. One way to do this is by slicing. Either highlight only the section you want, select the clip, and press Shift-S to clip a section; or place the cursor, select the clip, and press S to slice at the cursor. Slices can be moved independently of each other. You can delete the slices you don’t need.



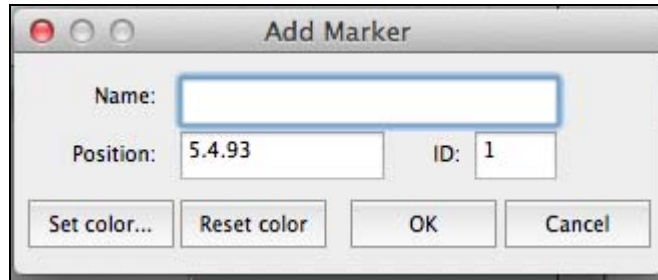
Alternatively, you can hover over the edge of the clip until you see a white left/right arrow pair, click and drag inward to change the clip length. If you go in too far, you can always drag back out. REAPER will always allow you to drag a clip back to its original length, so you can use this and slicing to size your clips appropriately. REAPER also allows you to drag past a clip’s end or beginning, but it should fill the space with silence, and you can tell it’s done this, because it marks the end and beginning of the clip with a divot.

Use slicing and dragging in/out to shorten your clips, then reposition them to look like the image below. You may find it helpful to first position the voice clips, then the ambi below it, and drag the ambi to the proper length.



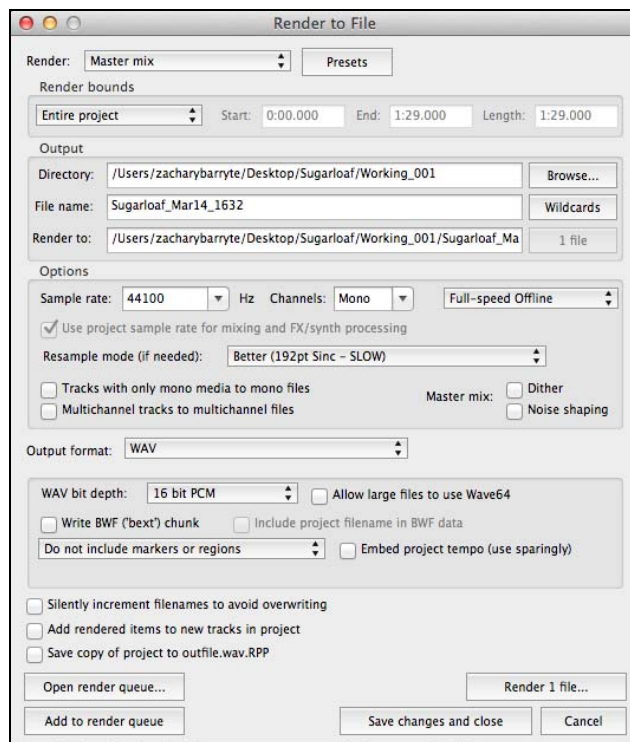
You’re almost ready to render. Let’s give it a listen. The ambi will sound unusually loud, because we haven’t adjusted volume (which we’ll show you how to do in the next section). If you hear anything else weird though and want to make note of it, it might be helpful to add a marker, a visual pointer to any location along your timeline.

To add a marker at the location of the cursor, press Shift-M. You'll be prompted to enter some info.



You can jump forward and backward between markers using left and right brackets, or jump to markers 1-10 (as indicated by the marker ID above) with keys 0-9 (0 for 10). To delete a marker, right-click it and select "Remove Marker." To edit it, you can double-click it or right-click and select the appropriate option for that.

Once you're satisfied, let's render. Bring up Render to File, and, this time, set the "Render bounds:" to "Entire project." Name your render with a date and time⁴, and then Render to File. For "Channels" choose "Mono." If you have a file in which stereo sound is important, you can render to stereo, but mono files are only half the size of stereo files, so choose them when you do not need stereo. Even if a file contains stereo tracks, you can still render it to mono.



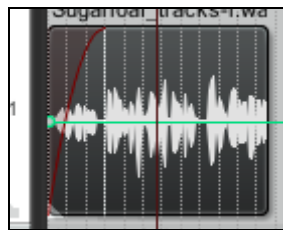
⁴ Not "final," and remember we would render Foo.RPP on March 14th at 4:32pm as Foo_Mar14_1632.wav.

Congratulations! You created and rendered a lay up.

7.2 Example: Adding Fades, and Adjusting Envelopes

This example continues from the previous one and will show you how to add fades to smooth the transition into and out of our sound, and how to adjust the volume envelopes. We will add fades to our clips and lower the volume on the ambi when it plays under the voicing.

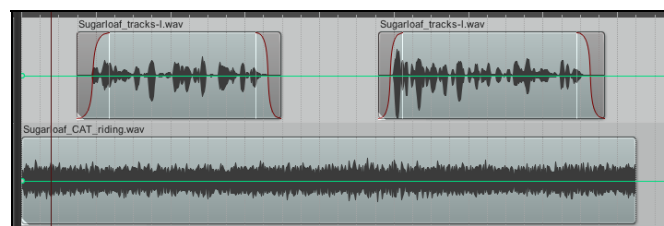
Begin in Sugarloaf.RPP. We'll start by applying preset fades to the voice clips. To do this, hover over the top-left corner of the first clip until your mouse icon becomes an image of a concave down curve. Click and drag into the clip to extend a red curve. This is a preset fade.



Stretch the curve by dragging in or out, and change the curve's basic function by right-clicking and selecting a different preset from the resulting dropdown list. Listen to the different curves⁵.



Set fade ins/outs for both voicing clips. Be sure to shorten the clips to the length you want.



For our ambi track, however, preset fades won't give us the full effect we want. We want the ambi to play quietly under the voicing, and come up in the space between them. We can do this by adjusting the volume envelope, which is represented in REAPER by the green line running through your track. If you

⁵ If you have difficulty hearing over the ambi, try muting the ambi track or soloing the voicing track using the M and S buttons (on the left of the track) respectively. Muting causes a track to remain silent. Soloing a track causes only soloed tracks to play, even muted ones. If you use mute and solo, be sure to remember to reset your tracks before rendering.

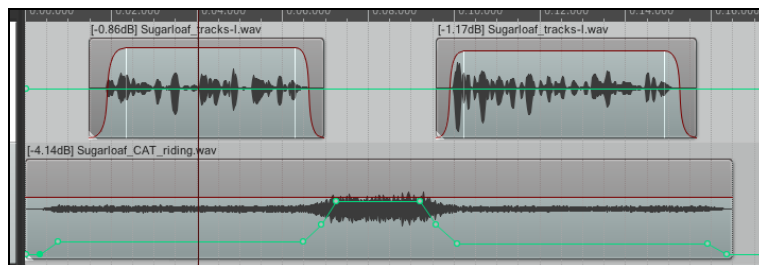
don't see a green line running through your track, go to the left side of your track, click "Trim," which will bring up an Envelopes for your track, then check "Volume (Pre-FX)." If the green line then appears below your audio, bring up REAPER Preferences, select Editing Behavior->Envelope Display and uncheck "Show new envelopes in separate envelope lanes."

You can manipulate the volume envelope by adding points (Shift-click), deleting points (Alt click), and by moving points or lines (click and drag). When you do this, you'll notice the waveform of your audio will morph accordingly. REAPER will let you stretch the waveform above the top of the containing box, but you'll want to avoid this, because that may cause your sound to become distorted.

Apply transformations to the volume envelope of the ambi to fade in and stay low until the break in the voicing, come up in the clear, come back down when the voicing begins again, and fade out.



If the relative volumes of your clips don't sound quite right, for each audio clip, hover over the top until your mouse icon becomes an image of a black up/down arrow pair. Click and drag along the arrows to adjust the overall clip volume (red bar). As with the volume envelope, the waveform will respond accordingly.



When you're satisfied, listen to your piece. Watch the VU meter in the Master in the bottom left. Your volume should be peaking somewhere between -12 dB and -3 dB.



If you want to adjust your entire piece, you can use the volume knob on the left. Alternatively, you can press Ctrl-Shift-M to bring up the Master as a track and adjust its volume envelope as you did other clips.

Congratulations! You added envelopes to a piece!

8 Why is REAPER doing this horrible thing??

If REAPER's doing something horrible, check out this section. Maybe the answer's here.

Q: Why is REAPER letting me extend clips past the beginning/end by looping around to the end/beginning??

This is a REAPER default that we suggested changing. Uncheck "Loop source for imported media items" in REAPER Preferences to prevent it from doing this. REAPER will still let you drag past the beginning or end, but will fill the void with silence.

Q: Why is REAPER telling me that my clips are OFFLINE??

A: REAPER cannot find your file. Either the file was moved from the location from which it was added to the project, or it was renamed after it was added (or both...). To fix this, you'll have to locate your file. If you close and reopen REAPER, it will ask you to find any offline files. Do this.

Q: Why won't REAPER let me put my clip where I want to put my clip??

A: Likely the Snap/Grid Settings have been set to snap your clips to the grid. You can bring up Snap/Grid Settings with Alt-L and change them, or you can set Snap to be off by default.

Q: Why does REAPER keep moving my cursor to the end of the new clips I add or paste in??

A: REAPER does this by default, and we suggested changing it. To change this default, in REAPER Preferences, select Editing Behavior. Uncheck "Move edit cursor when pasting/inserting media."

9 Useful Hotkeys

There's a long list here (<http://user.cockos.com/~glazfolk/REAPERKeyboardShortcuts.pdf>), which you should check out, but here are just a few useful ones.

Action	Hotkey
save	Ctrl-S
undo	Ctrl-Z
redo (if possible)	Ctrl-Shift-Z
play	Space or Enter
stop (and reset cursor to start time)	Space
stop (and keep cursor at current time)	Enter
slice selection	Shift-S
slice clip	S
Zoom in	Up Arrow
Zoom out	Down Arrow
Zoom into selection (Windows only)	Ctrl-PageUp
Zoom out of selection (Windows only)	Ctrl-PageDown
copy selection	Ctrl-Shift-C
copy clip	Ctrl-C
paste	Ctrl-V
add marker	Shift-M
go to next marker	right bracket
go to previous marker	left bracket