Guidelines for Producing a Podcast Tour

This guide is based on our experience producing *A Podcast Tour of Campus Plants, Animals, and Science Art*, a project supported in part by a grant from the Stanford Institute for Creativity and the Arts (SiCa).

-- **Kim Hayworth and Darryl Wheye Fall, 2009**

There are three basic elements to consider when planning to produce a nature walk podcast: the equipment and software you will need, what's involved in preparing the content, and what's involved in producing the audio files. There's a great deal of information available online, but gathering it takes time. Reviewing the following guidelines should streamline that process.

Equipment

External hard drive	$81.98	**LaCie Rugged All-Terrain USB 2.0 (320 GB)** 	Great for managing all files related to project. (Archiving to CD-Rs for back ups is strongly recommended.) File Sizes for 3 minute stereo file: 30.3 WAVE (44.1 kHz, 16 bit CD Quality (original uncompressed recording format) 2.8 MB MP 3 at 128 kbps (good quality) (compressed version for publishing (distribution)
	$32.64	**SanDisk Cruzer Micro USB 2.0 (16 GB)** 	Good for quickly transferring larger files (.aup, .wav) that are "works in progress" to different machines.
SD HC Memory Card	$7.15	**Sandisk Secure Digital SD HC Memory Card (4GB)** 	Increases Zoom H2 recording capacity: 2 hours (at WAV 96 kHz) 6 hours (at WAV 44.1 kHz) 138 hours (MP3)
Earbuds	$20.49	**Sennheiser CX300-B** 	You will need to listen to your audio files during editing as though you were listening through your ipod.
Digital Recorder	$142.76	**Zoom H2 Handy Portable Stereo Recorder** 	~ 4-hour running time on 2 AA alkaline batteries Earbuds, stereo adapter cable, mic clip adapter, tripod stand, USB cable, AC adapter and a 512MB SD card are included with purchase Records in WAV 96kHz/48kHz/44.1kHz at 16-bit or 24-bit, MP3 to 320kbps and Variable Bit

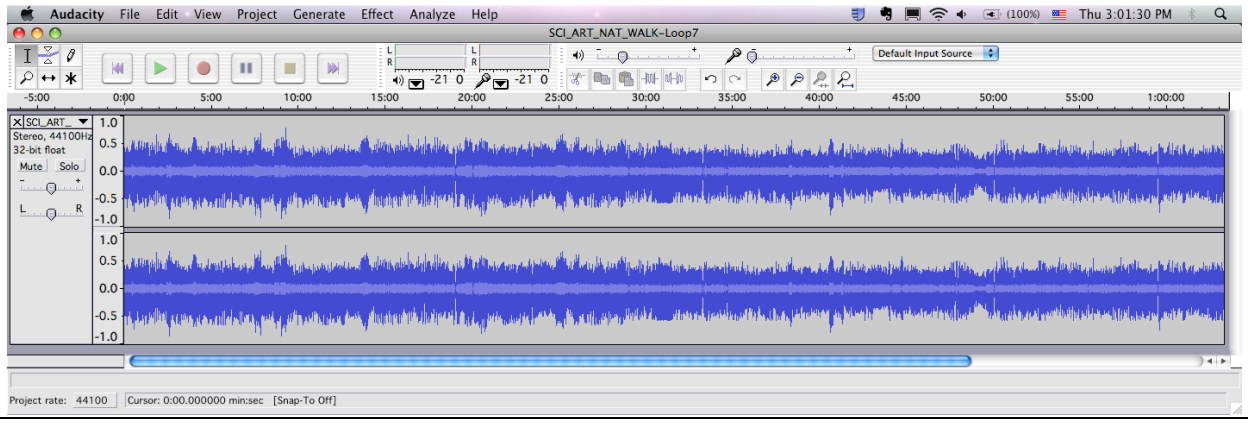
Online Storage	Varies	**Box.net**	Secure storage, management and sharing of audio files and documentation Lite Version is Free (1 GB storage, 5 Collaborators, 25 MB File Size Limit) Individual Version $9.95/month (5 GB storage, 10 collaborators, 1 GB file size limit)
CD-R	$16.78	**Memorex 700MB/80-Minute 52x Data CD-R Media (50-Pack Spindle)** 	You will need to burn copies of back-up files regularly.
Blog/Podcast Distribution	Free	**https://www.blogger.com/start** **https://feedburner.com**	Blogger is Google's blog-hosting site. Users can create podcasts by uploading audio files (mp3) in their blog posts. This generates a feed. A feed is a data document (Extensible Markup Language – XML format) that allows users to subscribe to regular updates, delivered automatically via a web portal, news reader, or email. The feed can then be optimized by Feedburner for use in iTunes and other podcatchers as well as for tracking podcast subscriber information.

SOFTWARE (Overview below, followed on the next page by screenshots)

Audacity http://sourceforge.net/projects/audacity **Windows, Macintosh, Linux**	**GarageBand** http://www.apple.com/support/garageband **Macintosh Only**	**iTunes** http://www.apple.com/itunes/download **Windows and Macintosh**	**Levelator** http://www.conversationsnetwork.org/levelator **Windows and Macintosh**	**Peak** http://www.bias-inc.com/products/peakPro6/ **Macintosh Only**
Free, Open Source	Free software that comes with Macs	Free download	Free Download	$599 Peak Pro 6 ($399 Educational Pricing) $129 Peak LE 6 (Light Edition)
Audio recording, editing and effects (e.g., Fade in/Fade out, Boost audio levels) WAV (uncompressed) MP3 - LAME encoder	Audio recording, Enhanced podcasts Images Chapters Links .m4a format	Managing audio, syncing devices Metadata Lyrics/Transcripts File conversions CD importing and burning	Imports AIFF and WAV files only Adjusts the audio levels within an audio segment in addition to handling compression, normalization, and limiting.	Recording, editing, processing Automated batch file processing Digital signal processing tools

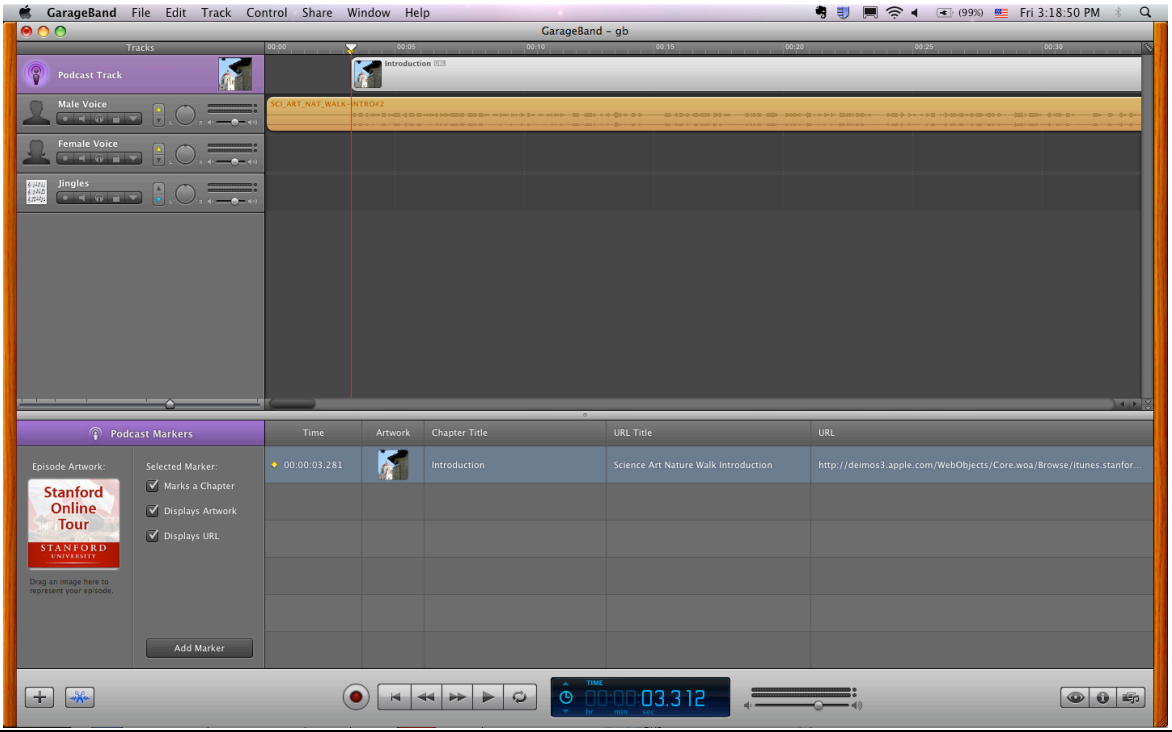
Audacity
Free Download
http://audacity.sourceforge.net
Macintosh, Windows, Unix
Digital Audio Recording, Editing, Multitrack Mixing and Effects

Fade in/Fade out; Adjust audio levels; Import/Export AIFF, WAV (uncompressed) and MP3 via LAME encoder



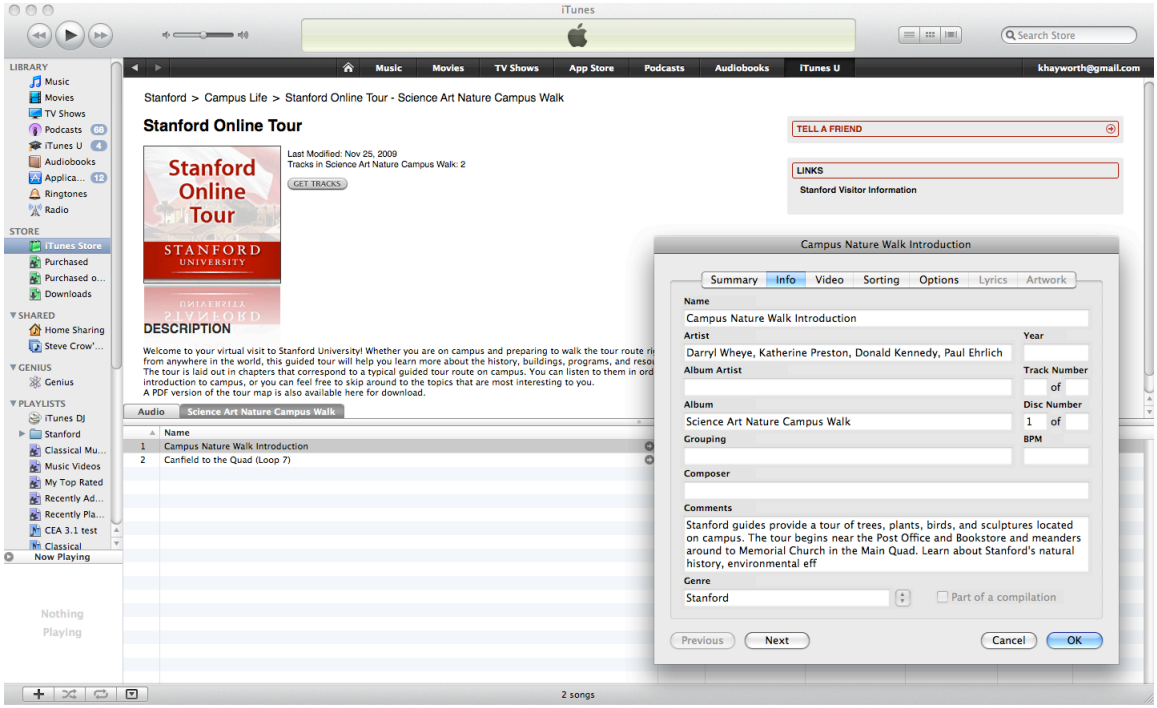
GarageBand
Macintosh only
Comes free with all Macintosh computers (part of iLife Suite)
Can be purchased or upgraded $39 (Academic Pricing)

Audio Recording, Enhanced Podcasts Images Chapters Links .m4a format



iTunes
Free Download
http://www.apple.com/itunes/download
Windows, Macintosh
Interface to manage digital media devices.

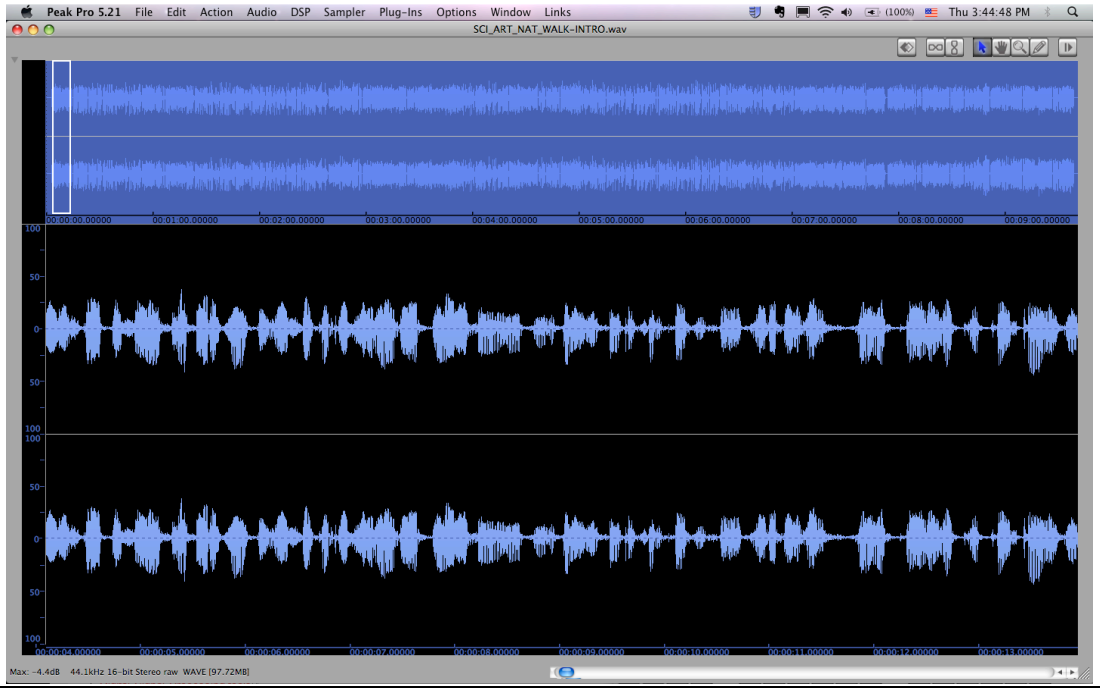
Add/Edit Metadata; Lyrics/Transcripts; File conversions; CD import and burning



Levelator
Free Download
http://www.conversationsnetwork.org/levelator
Windows, Macintosh, Linux
Imports AIFF and WAV files only
Adjusts the audio levels within an audio segment in addition to handling compression, normalization and limiting.

Peak
$599 Peak Pro 6 ($399 Educational Pricing)
$129 Peak LE 6 (Light Edition)
http://www.bias-inc.com/products/peakPro6/
Macintosh Only

Recording, Editing, Processing; Automated batch file processing; Digital Signal Processing tools



PREPARING THE CONTENT & EDITING RECORDINGS FOR A WALKING TOUR—A FEW SUGGESTIONS

- **Pick stopping points along your route carefully**: Consider the time between stops and the amount of information you need to convey while standing still.
- **Record directions:** Number each "direction". Photograph any that might confuse the listener and photograph each stopping point. Transcribe the directions and use them as an outline for your script.
- **Time your route:** Audio files should not exceed one hour.
- **Write the script or the basis for your narration or dialog:** Read it while walking your route. Make sure it can be completed within one hour.
- **Record:** Consider the suggestions for producing recordings (below).
- **Edit your recording**: Eliminate as many problems as possible (speaker errors, unwanted noise, dialog that is too long, fails to engage, etc.). Back up your files frequently!
- **Create separate tracks with sound effects, when appropriate:** If importing files that you did not produce, be sure to match speeds. Decide if you want the sounds to fade it and fade out.
- **Create an mp3 version:** Listen to this version while walking your route so you can time it against a natural walking pace, match the script to the distance between stopping points, and know when to insert sound effects.
- **Continue editing and testing the length and pace:** Eliminate mismatches until satisfied with the pace, the stopping points, the script, the sound effects, and the overall length.
- **Produce a map:** Include direction numbers (see above) and photos where needed. Save as a pdf that can be downloaded with the podcast (audio) files.
- **Create an html:** Include links to the map (pdf) and podcast (mp3) files on this "information page."
- **Betatest:** Create an evaluation form. Select a group of individuals whose interests span the focus of podcast. Set a time limit and provide the url for your "information page." Revise the podcast as recommended.
- **Publish your podcast:** Upload your file to a website (and to iTunes, when appropriate). Create a download link and add instructions: To download the files right-click (control-click if you're on a Mac) the link for the mp3 (or mp4) file, and choose 'Save Link As.' Once you've downloaded the files, open them in iTunes. You can then create a playlist (File>New Playlist) and move the mp3s (or mp4s) into the new playlist. After that, just sync your shuffle. If you have a new shuffle, you should be able to select the playlist.

Bear in mind that content production can take a long time (weeks to months), if you must research your topic and provide the basis for dialogs. Editing can also weeks to months, if your original recordings are flawed either by speaker errors (slurred words, mispronunciations, inappropriate tone of voice, etc.) introduced errors (ambient noises, changes in the distance from or angle to the mic, variation in recording conditions (large v. small rooms, etc.), or recordings that just don't turn out as you hoped they would.

RECORDING THE AUDIO FILES—A FEW SUGGESTIONS

The Recording Session

- **Choose the right location**: A studio is best. If one is not available, choose an area where sound will be absorbed (e.g., through a carpet, wall coverings, or acoustic tile), where street noise is minimal, and where echoes will not occur (e.g., a smaller space).
- **Minimize background noise**: Whenever possible turn off computers, phones, printers, fans and air conditioning, if audible.
- **Turn OFF cell phones**: Even when the ringer is silenced, the inaudible radio frequency pulses phones use to communicate with cell towers will be audible—and annoying--in your recording. (Compare top and bottom tracks in the graphic to the right. The top shows these 'durka' sounds.)
- **Record 10 seconds of room tone**: Room tone refers to the ambient, natural sounds in your location. Recording 10 seconds of ambient sound allows you to replace unwanted audio such as coughs, throat-clearing, the

sound of breathing, page turning, or other noises. If you replace an unwanted sound with room tone, your edit will less detectable than one using a patch of computer-generated silence.

- **Record entire sequences or segments in one session and in complete blocks**: It's very difficult—and very time-consuming--to match tone, pacing, pitch, and ambient noise from session to session.

The Microphone

- **Set audio levels low enough to avoid clipping (sound distortion)**: This kind of sound distortion occurs then the audio is too loud (over 0 dB). Keep your audio levels between -6 dB to -3 dB. Audio levels that are too low can be boosted (normalized) in post-production, but distortion caused by clipping cannot be corrected.
- **Use a windscreen or pop filter with your microphone**: Placing a wind screen that fits directly over the microphone (e.g., black foam cover on the Zoom H2 recorder) or positioning a pop filter, (e.g., made from nylon and coat hanger) in front of the microphone (1" away from the mic) prevents the puffs of air from "P" and "B" sounds (plosives) from reaching the mic.
- **Carefully measure your distance from the digital recorder's microphone** (e.g., place it the distance of an 8 ½" x 11" piece of paper), and sit on a chair that is at a constant height and keep it constant distance from the mic. Changing in the distance and angle will change the recording levels. Listeners will be able to detect these changes.
- **Do not move or touch the microphone while recording**: Although you can't hear it, such action will be recorded.
- **Record at a slight angle (not directly in front of microphone, but off to side--about 20 degrees off center):** This can reduce speech-generated pops, lip smacking, clicking sounds, and sibilant "s" sounds (hissing).
- **When recording dialogs, be careful to position both people equidistant from the mic.** Failing to do so can lead to one voice to appear in the left channel and the other in the right channel. Should this occur, one way to correct to the uneven levels in left and right channels is by merging both channels (stereo) into one (mono)**.** To convert a stereo track to mono in **Audacity**:
    - Click the arrow (on the left) and select 'Split Stereo Track' from the drop-down menu. You will notice that track has been split into left and right channels you can control.
    - To make both tracks mono, click the arrow by the top (left channel) waveform (on the left of the top waveform's 1.0 marking) and select "mono" from the drop-down menu.
    - Click on the lower (right channel) arrow (on the left of the bottom waveform's 1.0 marking) and select "mono" from the drop-down menu. At this point, the boxes to the left of both the top and bottom waveforms should say "mono." If either still says 'right' or 'left,' ensure that you followed the above steps and switched each channel to mono in the drop-down menu.
    - Adjust levels for tracks
    - Apply Quick Mix.

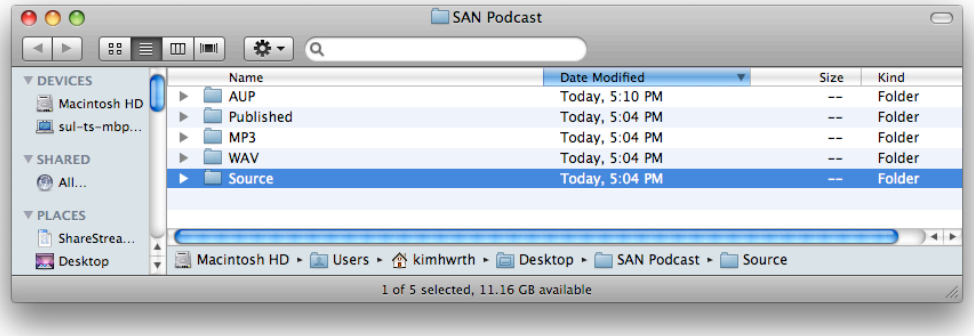
The Voices

- **Drink water during recording session**: This prevents clicking and mouth (smacking) noises.
- **Use a natural tone and pace**: Besides lending realism to the recording, it will make additions and deletions during the editing process less detectable.
- **Avoid speaking louder when starting new paragraphs and pages than when ending them.**
- **Avoid taking deep breaths between phrases:** These sounds will be audible and distracting to the listener.
- **Do not turn script pages while speaking or when other people are speaking**. Format your script so page-turning is restricted to natural pauses that can be edited out.

MANAGING YOUR PROJECT—A FEW SUGGESTIONS

File Structures/Work Flow

Folder Structure:



1. Source Files

These are the original raw files from your source (digital recorder). Do not modify these WAV (or AIFF) files.

2. File Types

AUP

These are **Audacity** project files. The generated folders are very large. As noted, be sure to use only copies of source files when editing and save your files frequently. During editing, delete unwanted audio; insert additional audio; reduce noise; patch in corrections; modify amplification (volume), pitch, and so forth; and add separate tracks for sound effects, being careful to match speeds, fade in/out, and so forth.

WAV

If you have a single track recording, export the edited version of your AUP project as a WAV file, and run it through **Levelator** to optimize the audio. **Levelator** should be the **last** step before listening to the final iteration and exporting it as an mp3 (or m4a) version (See MP3, below).

If you have multiple tracks, save each as a WAV, run **Levelator** on each, create a new AUP file, import all tracks, listen, export as a WAV, and export that WAV as an mp3 (or m4a) version (See MP3, below).

MP3

Open your finalized WAV file in **Audacity** and export it as mp3 file. Follow the prompts to add the metadata (Name, Artists, Date, Comments).

.m4a

Import your finalized WAV or AIFF file into **GarageBand**. Add images, chapters, or web links to create an "enhanced" podcast, and then save as an m4a file for use in **iTunes** on Macintosh or Windows and on Apple devices such as iPods and iPhones.

3. Back-up Files

As noted, be sure to back up your AUP files frequently. The software is known to crash easily. It is also known to lose sound (even though the audio waves remain

visible). Smaller files might be safer (15 minutes of recording or less). Working directly on your desktop might be safer, too.

> **NOTE:** If you need to make further edits or additions, always use a copy of the WAV (or AIFF file) or AUP files and re-output to mp3. **Never edit an mp3** (compressed) version because it will reduce audio quality.

4. **File Naming Conventions**
   The best format is the standard 8.3--that is, using a maximum of 8 alphanumeric characters and a 3 letter extension (e.g., SAN.wav; SAN.aup; or SAN.mp3). Avoid using spaces or non-alphanumeric characters (/, !, &, etc) in file names. Use underscores (_) instead of spaces in the file name.

5. **Version Control**
   Online collaboration sites (such as Google docs or box.net) have version control features that allow you to track changes over time, make comments, or revert to previous versions if necessary.

6. **Published File Folder**
   Put all mp3 (or .m4a) files that have been posted online (published) into this folder. (See graphic, above.)

As noted, there's a great deal of information available online, but this guide, we hope, will give you a general impression of what would be involved in producing a podcast tour of the plants and animals (and, possibly science art) in your area.