

Digital Jumpstart Workshops: Audio

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What we'll cover

- Part 1: The Audio Signal and Preservation
- Part 2: Audio Capture
- Part 3: Basic editing

What makes a good recording?

- Let's listen to a couple of recordings...
 - Which is better, and why?
 - Let's listen once just to the audio, then
 - Let's listen and look at the wave forms

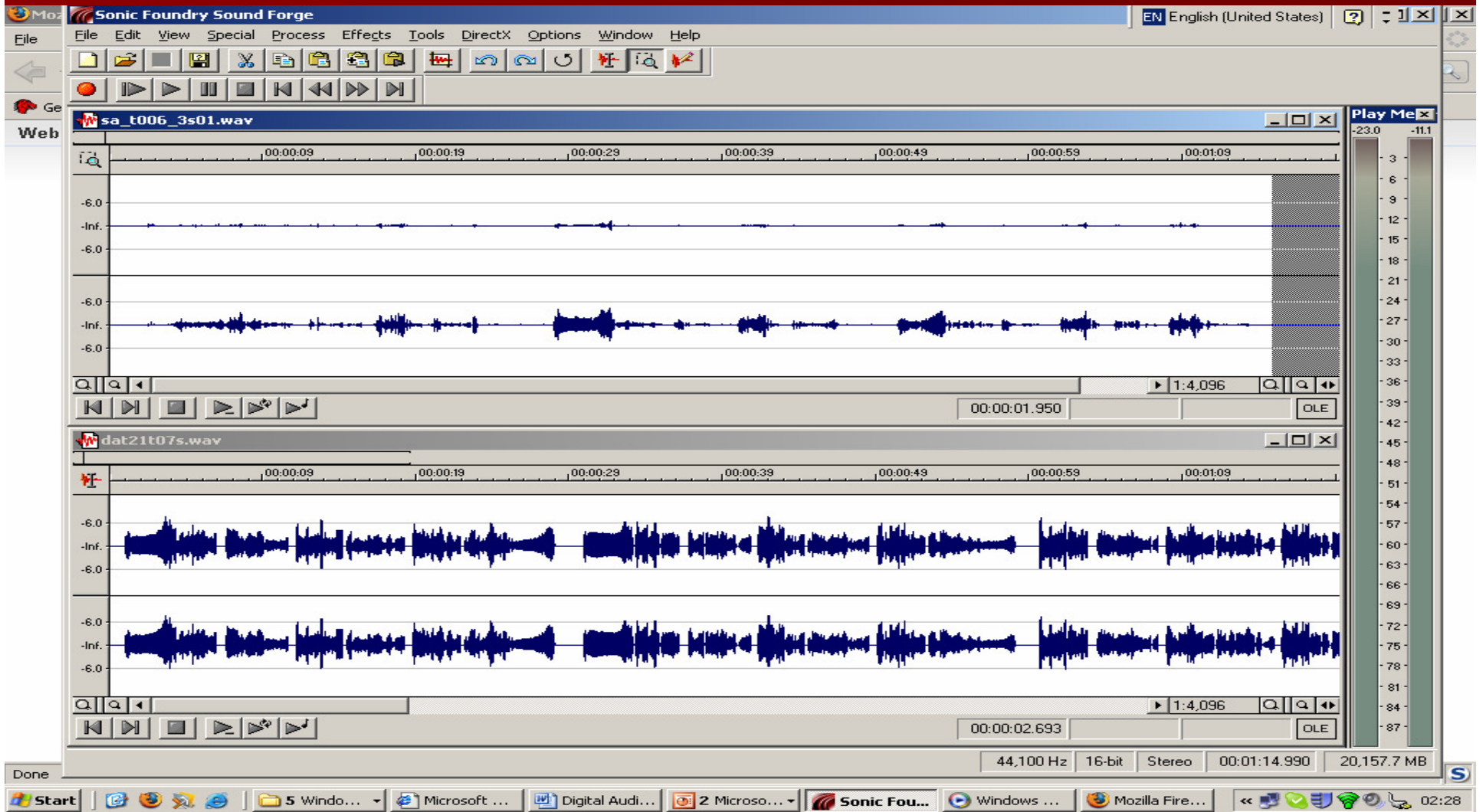
Sample 1



Sample 2



Comparing the previous two...



Quality considerations

- During recording: (1) level (sampling rate)
(2) Minimizing noise (ambient & machine)
- During capture: Sampling rate & Compression
 - Sampling rate (kHz + channels + bits (per second, per channel))
 - Compression: more or less “lossy”
 - Compression formats (e.g. **mp2**, **mp3**, .ogg, .wma)
 - “Lossless” formats (BIG!) for archiving, editing, hi-fi playback : mp4-als, Apple+ Win Lossless
 - “Lossy” formats (SMALL!) for online streaming, terr. radio: .mp3, .rma
- Bottom line: Samp= usually/at least 44.1 kHz, Comp= “less lossy”
 - Lossless or less lossy formats: .aiff (Mac), .wav (PC)

Open Audacity

(Audacity is free audio editing software)

- Open the sample audio file (...mp3)
- What is the sampling rate?
- How many channels (stereo or mono)?
- Is this a lossy or lossless format?

Workflow 1

- Recording – what your device can handle
 - Sound frequencies in kHz (kilohertz)
 - 44.1 kHz or higher for linguistic/musical work
 - (22 kHz - ok for some work)
- Capture – data transfer to computer
 - Memory cards (> USB) > computer
 - If your device is not digital – conversion from analog to digital, then capture

Workflow 2: formats/tasks

- Working – high- or average quality format
- Archiving – uncompressed formats
 - *Uncompressed/less compressed* formats best
 - Allows repurposing in future
- Presentation (web, CD, etc)
 - *Compressed* formats often better
 - Faster downloads, take less space

Devices and Compression

- Strongly recommended: lossless digital
 - solid-state recorder (CF/SD)
 - Archive Formats: .wav, aiff, (.au)
- Not recommended: MP3 recorders, dictaphones, cassette recorders
(may be ok for non-archival quality interviews)
- Switch default settings from mp3 (usually 32 kHz) to 44.1 kHz - newer iPods, others

(A note on analog recordings)

- We all have analog cassette recordings
- If you have them, preserve them asap!
(eg in Ctr for Digital Scholarship)
- These are fine:
 - as “heritage/legacy” materials
 - if you don’t have access to a digital device
- But for future recordings, ideally, we’d recommend *digital recording in 44.1 kHz .wav format*

Audio Editing

- Keep a pristine (unchanged) *original* version
 - LOCKSS (lots of copies keeps stuff safe)
 - You or others may want to go back to the original
- First, *save* a copy with a new name
 - Rename the file with a unique, concise, and explanatory label
 - develop your own system; recommend is date, lg code etc.

- **Playing, Selecting, Cutting, and Pasting**
 - To chop one file into two sessions
 - To excerpt a portion (segment/clause/utterance) for presentation
- **Exercise: cut a portion out of your recording and save it as a new file – play this file**
 - Icons or Shortcuts: Cntrl-X [ct] or Cnutrl-C [copy]
 - File-New, Cntrl-V [paste] -- then save under a new name
 - Other: Cntrl-t [Trim, removes material *outside* the selection], **Undo**, Trim Silence selection (e.g. to remove a long pause or goat noises from recording)

Navigating in Audacity

- Shortcut: [spacebar]=play
- Zooming in and out
 - use the (+/-) magnifying icons
 - Can zoom whole recording or a portion
 - Helps find boundaries to select and/or cut
- Practice “looping” a sound
 - Helps us find boundaries + do transcriptions
 - With the mouse, select part of the recording
 - Press Shift + play button

Exercise: Audio editing

- From your recording, chop the following:
 - Two whole utterances
 - Any two words from these utterances
 - Any two sounds
- Sometimes this process can be automated, if there are pauses between items (e.g. word lists, musical pieces)

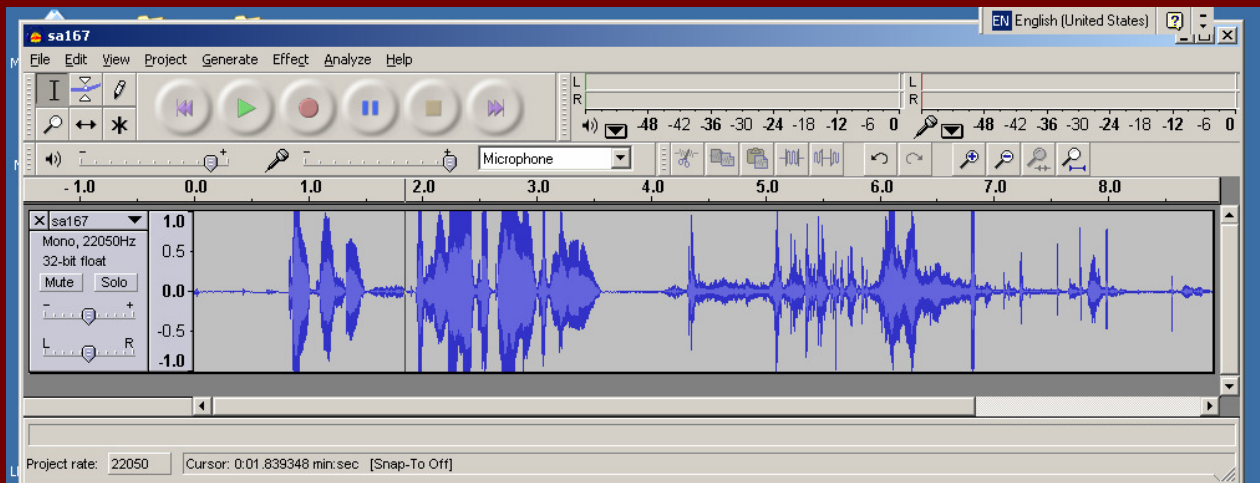
Types of Software

Consider: *Proprietary* (\$\$, code is business secret) vs. *non-proprietary* (usually free, open source); platform

- Audio editing
- Audio analysis
 - Acoustic (e.g. phonetic) analysis - Spectrogram, f_0 , intensity
 - Time-linking + annotation (audio only)
 - Time-linking + annotation (audio + video)

I have a bad recording...

- Too quiet (levels too low) – hard to hear
- Too loud – “clipping” (seen here)



More advanced Signal processing

- Noise removal (see next slide)
- Conversion wav to mp3 (“Lame” plug-in)

<http://audacity.sourceforge.net/help/faq?s=install&item=lame-mp3>

- Amplifying
- Concealing identity

Enhancement

- First: Save file under a different name!
- Extraneous noise: delete (Cntrl-X) or insert silence (Cntrl-L)
- Enhancing low-volume digital recordings
 - maximize signal-to-noise ratio
(wanted/unwanted sound data)
- Analyze – Silence Finder – Export Labels
(silences)

Recap

- Audio signal
 - Record and archive at highest possible quality;
 - Share in compressed formats (for eg internet)
- Audio capture
 - Transfer without (further) loss
 - Archive in a non-lossy format (never mp3)
- Audio editing
 - *ALWAYS* first save *and archive* a copy that is unenhanced, lossless, and stored in a non-proprietary format (or quasi-open such as .wav or .aif)
 - LOCKSS (**L**ots of **C**opies **K**eeps **S**tuff **S**afe)