Exploring Options for Creating Digital Recordings of Telephone Interviews Conducted on Analogue Phone Systems

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Why are Recordings Important?

- Quality Control
- Transcription
- Cognitive Batteries
- Recordings are the only deliverable data for some studies

Recording Software - Overview

- Challenges of Recording Software
- Solution: Sound eXchange
- Custom Implementation How-To

Recording Hardware - Overview

- Background of UWSC Recording Hardware
  - Analog vs VoIP
- Analog options considered
- Example recordings and post-call sound quality improvement

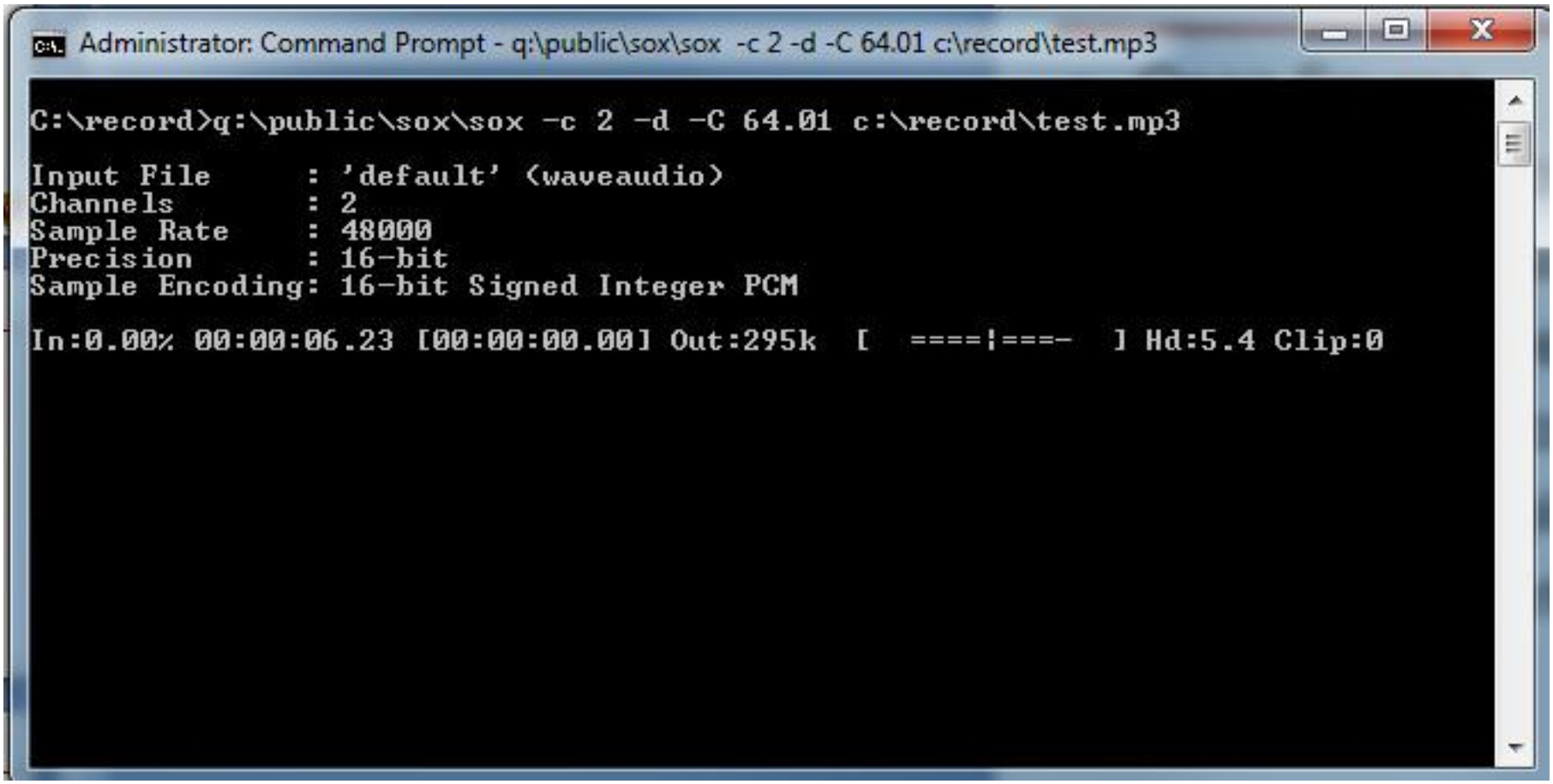
Challenges of Recording Software

- XP → Windows 7 transition
- Licensing costs
- Codec control
- Performance
- Automation
- Versatile for CATI and CAPI

Recording Solution: Sound eXchange (SoX)

- Open Source
- Supports Windows, Linux, MacOS X
- Low system resource usage
- Command line execution
  - Versatile across modes, survey platforms
  - Easier to implement changes in the field

Recording Solution: Sound eXchange (SoX)



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Custom Implementation

- Scripting to start and stop
  - To start: Execute SoX with batch file parameter

    sox -c 2 -d -C 64.01 c:\record\filename.mp3
  - To stop: Execute Taskkill

    taskkill /f /im sox.exe

- Command line options
  - -c - # of channels
  - -d - use default recording device
  - -C - set compression bitrate

Custom Implementation

- MP3 encoding
  - Can include LAME dll files to enable on-the-fly encoding to mp3
  - Requires compiled Libmp3lame.dll
  - Significantly reduces transfer times from field machines

- Hiding execution
  - Monitoring interviewers for quality control
  - Preventing inadvertent shutdown
  - Freeware “quiet.exe” program

Background

- Increase in client demand for quality recordings
- Upgrade in software (Sox) opened up additional options
- Analog or VoIP

Analog or VoIP?

Analog

Pros

+ Reliability
+ Existing infrastructure
+ Quality

Cons

– Cost
– Quality

VoIP

Pros

+ Low cost
+ Computer integration
+ Wider array of recording options

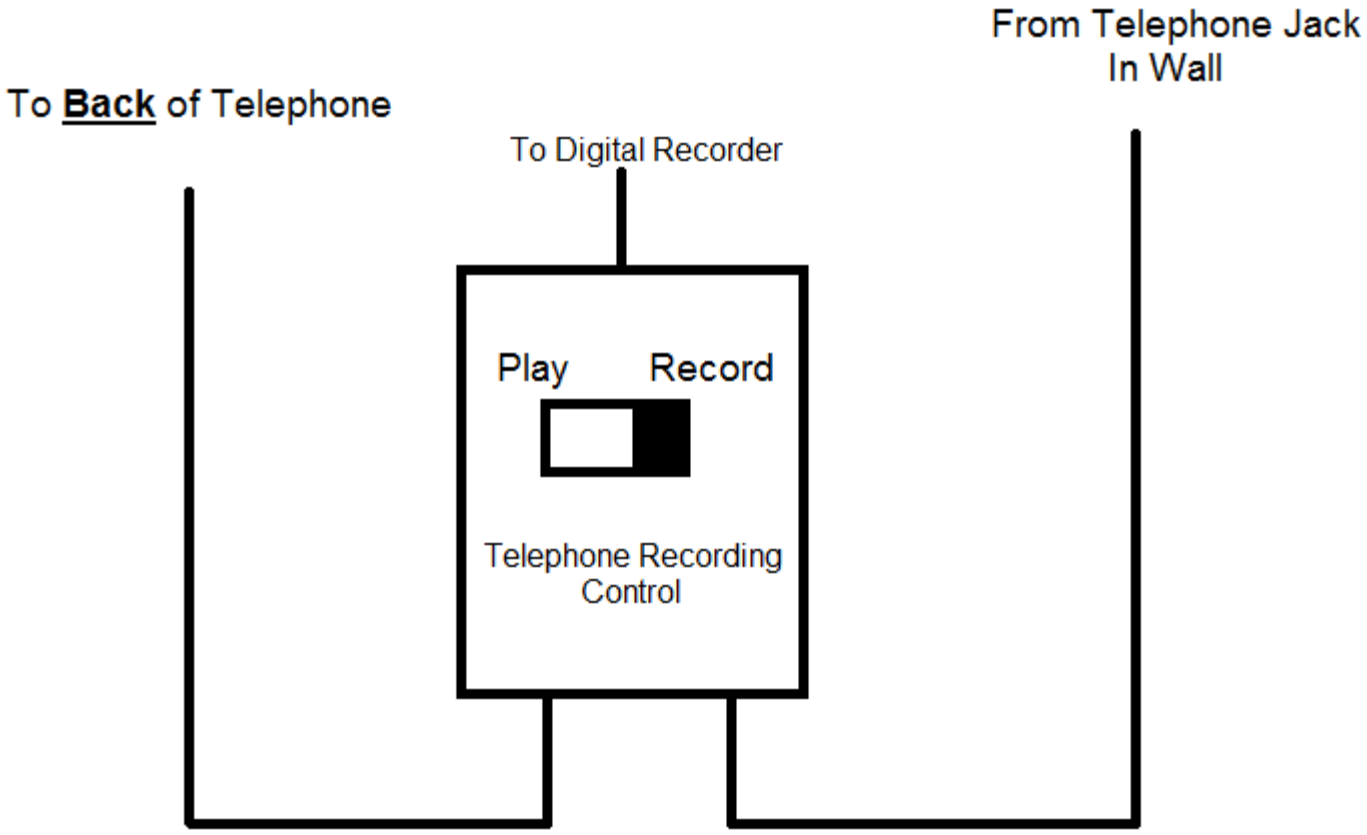
Cons

– Not supported at UW
– Potential service outages
– Quality
– Latency

Analog phone recording options

- Telephone Recording Control
- THAT-2
  - Telephone Handset Audio Tap
- Broadcast Host
  - Desktop Digital Hybrid

Telephone Recording Control



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Pros and Cons of Telephone Recording Control

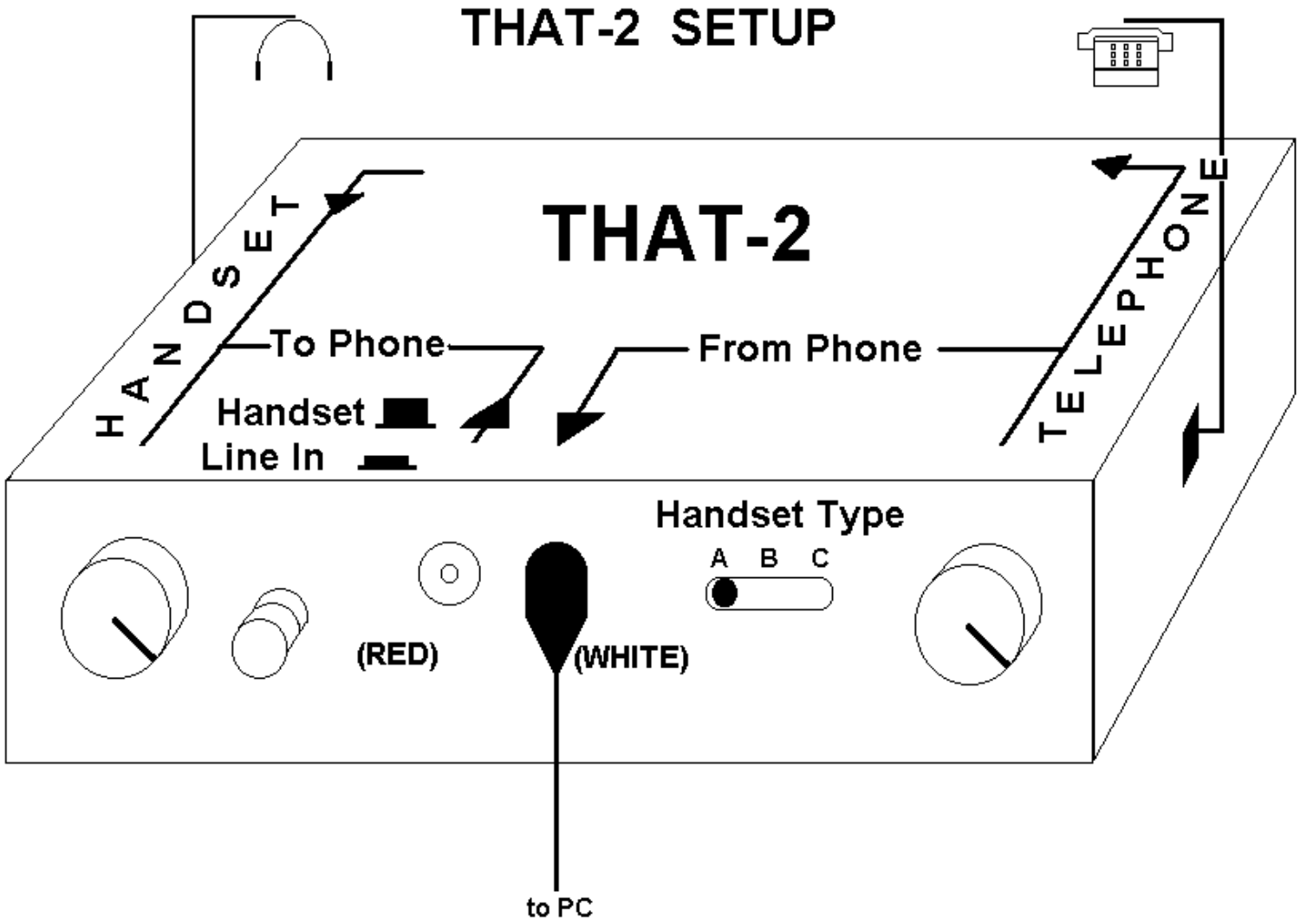
Pros

+ Simple to set up
+ Passive
+ Creates usable recordings for most purposes
+ Extremely low-cost option
+ $35 per unit, plus cost of recording option of choice (tape, digital)

Cons

− Recording files must be named and managed manually
− Equipment lacks durability
− Recordings are single channel
− R volume is often much quieter than INT
− No ability to boost R volume

THAT-2



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Pros and Cons of THAT-2

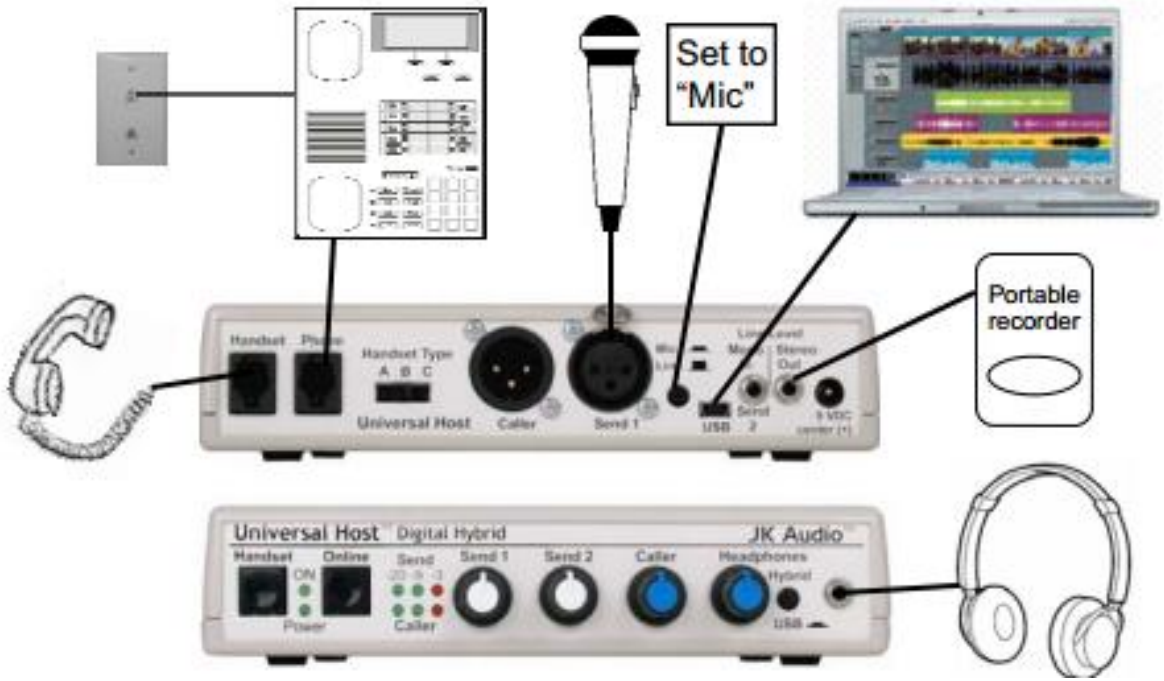
Advantages

+ Simple to set up and intuitive to use
+ Passive
+ Extreme durability
+ Creates passable recordings for most purposes
+ Relatively low-cost option
+ $225/unit; $365 total cost with supporting equipment

Disadvantages

− Single-channel recordings cannot be easily edited to boost volume of R
− R volume is routinely much quieter than INT
− No ability to boost R volume

Broadcast Host Diagram



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Pros and Cons of Broadcast Host

Advantages

- + Separates R/INT sides of conversation into separate channels; ability to boost volume post-interview
- + Better volume control in call
  - + Can boost both sides of conversation within limits
- + Better quality microphone

Disadvantages

- – More complicated system
- – Settings more susceptible to being incorrectly set by interviewers
- – Requires special training and good understanding of equipment
- – Relatively expensive
  - – $495/unit; $825 with supporting equipment

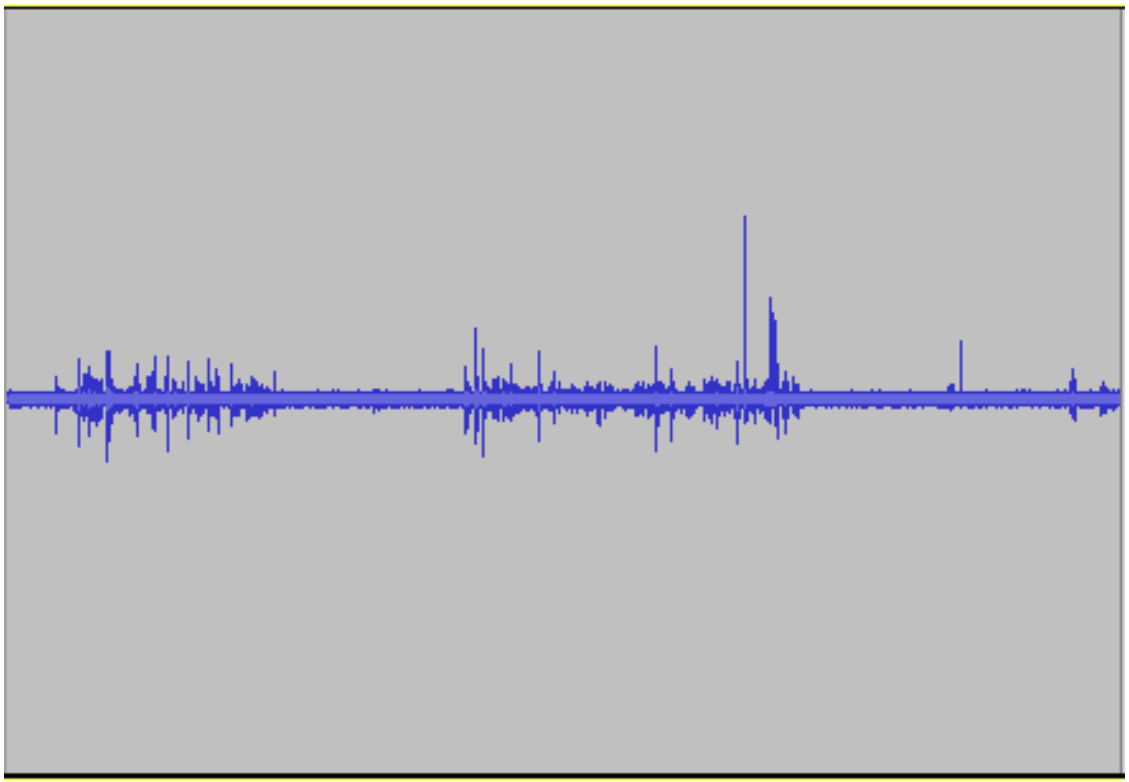
One vs Two Channel Recording

- Single Channel (Mono)
  - Reduced quality due to crosstalk
  - Cannot easily edit volume of one side of conversation independent of the other

- Two Channel (Stereo)
  - Can boost volume of each channel individually

One channel example

THAT-2 Example



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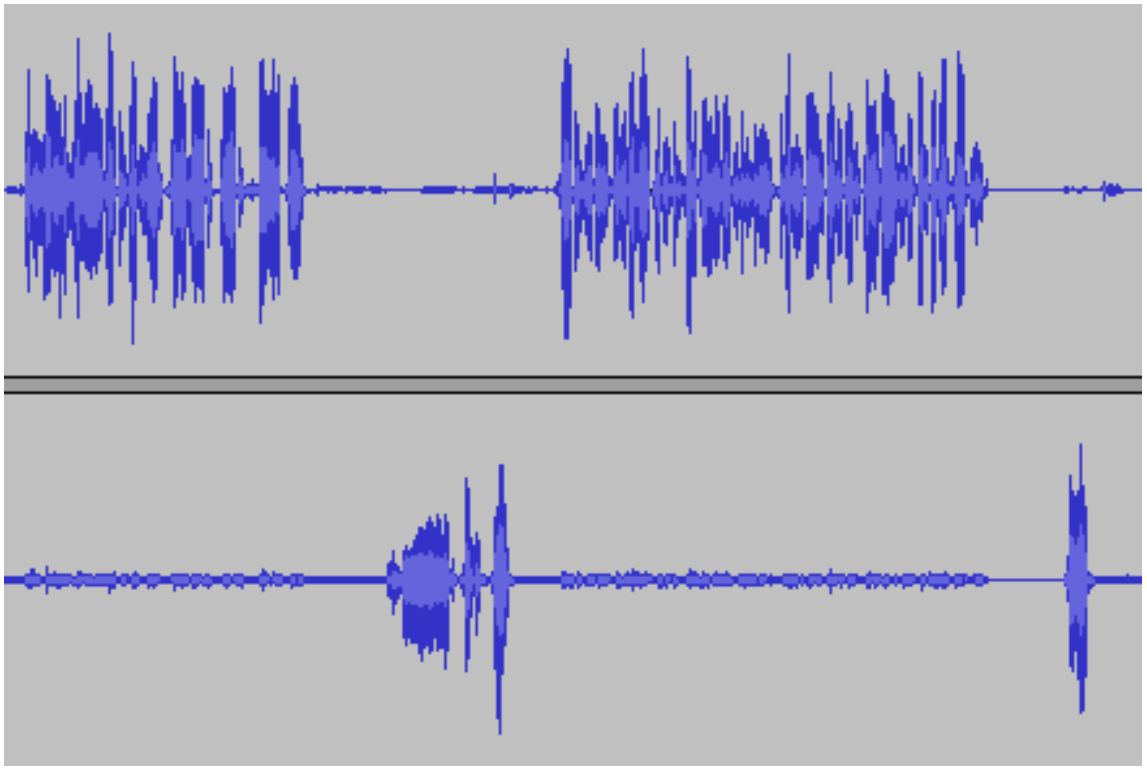
Two channel sound example

Broadcast Host Example



Lessons Learned -- Hardware

- Hardware
  - Depends heavily on existing infrastructure and desired future capabilities.
  - If the highest quality recordings are desired, the ability to make two channel recordings is highly recommended.

  - UWSC currently uses a mix of THAT-2 and Broadcast Host equipment
  - Transitioning incrementally to Broadcast Host units

Lessons Learned – Software

- Software
  - Selected Sound eXchange based on cost, codec support, performance, and automation
  - Implemented additional functionality – scripted start/stop, mp3 encoding, hidden execution
  - SoX's basic functionality was simple to implement
  - Versatile enough to standardize software across multiple modes and platforms

Acknowledgements

Steve Coombs

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Eric White

Download Locations

- Sox:
  - http://sourceforge.net/projects/sox/files/sox/
- LAME mp3:
  - http://www.rarewares.org/mp3-lame-libraries.php
- Quiet:
  - http://joeware.net/freetools/tools/quiet/index.htm

Thank You!

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