Sound Booth Recording

Basic Procedures for OSU Students and Faculty

This procedures guide is intended to provide step-by-step instructions for recording audio using the soundproof booth in the east wing of Morrill 112. Section 1 covers the steps involved in recording to the Tascam HD-P2 portable stereo audio recorder. Section 2 covers the steps involved in recording directly to the iMac located in the east wing; this computer is in a master-slave relationship with monitor and keyboard in the sound booth.

1. Recording to the Tascam HD-P2 portable stereo audio recorder

   1.1. Select a microphone suited for the function and nature of your recording session.

   1.1.1. For very narrow phonetic analysis and/or for when mobile/hands-free operation is needed, choose the head-mounted Shure Beta53 phantom-powered omni-directional condenser (located in the equipment drawer in Dr. Preston’s office).

   NOTE: Condenser microphones such as the Beta53 are very sensitive. Because they pick up movement sounds, body and clothing noises, and other sounds related to activity in and around the recording space, they have a tendency to produce a somewhat “noisier” recording than dynamic microphones. Still, it is just this sensitivity that makes them so useful in careful acoustic analysis, particularly when positioned very close to the subject’s mouth. Head-mounted condensers, then, offer the dual advantage of sufficient sensitivity for careful analysis and freedom for the subject to type, manipulate pages, or move around without having to return to a fixed point.
1.1.1.1. Assemble the Beta53 following the instructions in the case.

1.1.1.2. Adjust the head mount to fit the subject’s head comfortably with the cord running down his or her back.

1.1.1.3. Adjust the position of the microphone to within an inch or so from his or her mouth.

1.1.1.4. Disconnect the XLR cable from the bottom of the desk-mounted Shure SM58 microphone in the sound booth and connect it to the cord on the Beta53; if necessary, feel free to move the desk's microphone, stand, and keyboard out of the way.

1.1.1.5. Be sure to return the XLR cable to the bottom of the SM58 when done with the session.

NOTE: So-called “phantom-powered” condenser microphones like the Beta53 use the XLR cord to convey both sound and power. Thus, they can only be used with audio devices equipped to supply 48V phantom power, such as the Tascam or the Sound Designs USBPre 1.5. Also, be aware that phantom power can be turned on or off at the source to save energy and to avoid damage to dynamic microphones. Thus, if the Beta53 appears not to be working, make sure that the phantom power is switched on. For the Tascam, the switch is labeled “Phantom” and is located near the top of the second column of switches on the topside of the device.

1.1.2. For routine phonetic analysis or for basically stationary operation, choose the desk-mounted Shure SM58 cardioid dynamic (located in the sound booth).

1.1.2.1. Position the subject where you want him or her.
1.1.2.1.1. Have the subject take a seat in whatever manner would be normal and comfortable for the expected duration of the recording.

1.1.2.1.2. Ask the subject to avoid unnecessary movement.

1.1.2.2. Position the microphone where you want it

1.1.2.2.1. Twisting the large, vertically-grooved ring on the stand counter-clockwise will allow for approximately three additional inches of tubing to be pulled from the stand, which can then be held stationary by clockwise twisting.

1.1.2.2.2. The microphone should ideally be a few inches from the subject’s mouth and angled slightly to the side to avoid picking up breathing sounds, which can be quite loud.

1.2. Set up the Tascam.

1.2.1. If it’s not already there, plug the XLR cable into the “L” jack of the “MIC/LINE” input located on the right-hand panel of the recorder.

1.2.1.1. Since monaural (mono or one-channel) recording is needed for all linguistic work, make sure of the following settings on the input control switches on the top of the machine:

- LEFT INPUT: MIC
- RIGHT INPUT: MIC
- MIC: EXT
- PHANTOM: ON (if using the Beta53) OFF (if using the SM58)
- LEFT PAD – 0dB
- RIGHT PAD – 0dB
• LOW CUT – OFF
• LIMITER – OFF
• STEREO LINK – OFF

1.2.1.2. Set the “INPUT” microphone volume control dial located on bottom right corner of the front panel to “8” (the number aligns with the white triangle to indicate the setting); although this two-part (inner/outer) dial can control left and right microphone inputs independently, as long as the two are operated as a single dial, there is no need to worry about the right input since you are not using that microphone.

*NOTE:* You may need to adjust this a little up or down depending on the strength of the voice of your subject.

1.2.1.3. Set the “PHONES” headphone volume control dial located on the left-hand side of the front panel to “OFF”.

1.2.1.4. To operate the power switch located on the top left corner of the recorder, push down (toward the front panel) and release; it will not stay in an “on” position, but when you have pushed it down, the recorder will come on.

1.2.1.5. When the Tascam is powered up, first you will see a logo screen, then a “Please Wait” screen. The screen will then ask you to “SELECT” to format the media or to “CANCEL” to use it as is. Both buttons are on the top of the machine in the right-hand column of switches next to the jog wheel. Normally, you will have a formatted media card in the machine, and you should press CANCEL.

1.2.1.6. The screen will now show you a “MAIN MENU” list from “Project Menu” to “Fire Wire Dock.”

1.2.1.7. Use the jog wheel on the top of the machine to navigate among choices. If you have already begun a project, select “Project Menu.” Use the “SELECT” button on the top of the machine. If you want to start a new project, select “Change/New Project.”

1.2.1.8. The “Change/New Project” menu will list any old recordings (with a project #), or it will allow you to choose a new one under “Create New Project.”

1.2.1.9. When you create a new project, the screen will ask if you want to “Use Default Template.” Press “SELECT”. You will then be shown a screen with the new project # (e.g., Proj19). You could rename it here or just use the number. Whatever you do, you must save it by pressing “SELECT” when “save” is darkened.

1.2.1.10. The Tascam is now ready to record.
1.3. If using the Beta53, it is now safe to turn the microphone on.

1.3.1. Move the switch only one position up to the straight-line logo; do not set it on the cutout position, the last position with a logo with an angular line.

1.4. Record your session.

1.4.1. Record a test passage first.

1.4.1.1. Press the red “REC” button on the front of the machine.

1.4.1.2. Have the subject say a few words for test purposes.

1.4.1.3. After your respondent has said a few words, press “STOP” on the top panel.

1.4.1.4. Turn the internal speaker on by adjusting the “PHONES” dial on the left front of the machine.

1.4.1.5. Press “PLAY” on the top panel and check to see that the test passage was recorded; repeat as needed.

1.4.1.6. If satisfied with the recording (i.e., it can be heard clearly through the internal speaker), return the “PHONES” dial to the “OFF” position.

NOTE: If you have had to turn the record volume up very high (well above the midpoint), try adjusting the microphone and/or speaker position to get a better recording.

1.4.2. Record the session in earnest.
1.4.2.1. Record using the same procedures outlined in Step 1.4.1 above.

1.4.2.2. Press the “STOP” button when you are through recording.

1.4.2.3. If you hit the “PAUSE” button on the front of the machine, you will get a separate “TAKE” number (a new .wav file) when you resume by hitting REC.

*NOTE:* It's actually probably a good idea to “PAUSE” from time to time so that your .wav files will not be so large.

1.5. Transfer your recording to the iMac.

1.5.1. Turn off the Tascam using the switch on the lower left corner of the top panel, and confirm that you want to leave the settings as they are; if you are using the Beta53, don’t forget to turn off the microphone or its internal battery will run down.

1.5.2. Select the transfer option that best suits your needs in moving the files from the Tascam to the iMac, physical or Firewire transfer:

1.5.2.1. Physical transfer (slower):

1.5.2.1.1. Remove the media card from the right-hand panel of the Tascam; first, lift up the small, black ejector lever and then depress it...
to partially eject the media card (please exercise caution when performing this function or you could damage the ejector lever).

1.5.2.1.2. Insert the card into the Zeikos 57-in-1 Memory Card Reader/Writer, attached to the iMac via USB.

1.5.2.1.3. When successfully read, you will see the folder for the card (often just called “Untitled”) appear on the iMac screen.

1.5.2.1.4. Projects are listed in folders in the main card folder.

1.5.2.1.5. Double clicking on one of these folders will reveal the .wav “takes” of your project inside another folder called “Audio Files”; these are the .wav files needed for working in Praat.

1.5.2.1.6. Copy the files you want to work with to a new folder on the iMac desktop; it is recommended that you preserve copies of your original files so that you can recover from catastrophic errors without jeopardizing your data.

1.5.2.1.7. Return the media card back to the Tascam when you are done copying the files.
1.5.2.2. Firewire transfer (faster):

1.5.2.2.1. Attach the Tascam to the iMac using the available Firewire cable located near the Tascam.

1.5.2.2.2. Press the “MENU” button.

1.5.2.2.3. Use the jog dial to maneuver to “FIREWIRE DOCK” and press the “SELECT” button.

1.5.2.2.4. When successfully connected, you will see the folder for the Tascam (often just called “Untitled”) appear on the iMac screen; at this point, you should not disconnect or power off the Tascam without “ejecting” the connection first from the iMac.

1.5.2.2.5. Projects are listed in folders in the Tascam folder.

1.5.2.2.6. Double clicking on one of these folders will reveal the .wav “takes” of your project inside another folder called “Audio Files”; these are the .wav files needed for working in Praat.

1.5.2.2.7. Copy the files you want to work with to a new folder on the iMac desktop; it is recommended that you preserve copies of your original files so that you can recover from catastrophic errors without jeopardizing your data.

1.5.2.2.8. When ready to disconnect the Tascam from the iMac, simply drag the “Untitled” folder icon to the trash bin icon on the dock (the bin will become an eject button as the icon approaches it).

1.5.2.2.9. It is now safe to disconnect and power off the Tascam.
2. Recording directly to Praat on the east wing iMac

2.1. Wake up or power up (it is rarely turned off) the iMac.

2.2. Set up the Sound Designs USBPre 1.5 audio interface device (located in the equipment drawer in Dr. Preston's office).

2.2.1. Obtain both a USBPre interface and a USB cable from the equipment drawer (there may be an extra USB cable available on the iMac's external USB hub, but don't count on it).

2.2.2. Connect the USB cable between the port on the lower right-hand corner of the right face of the USBPre and any open port on the iMac's external USB hub (or any available port on the iMac itself).

2.2.3. If no connection is available, it is safest to disconnect either or both of the Zeikos 57-in-1 Memory Card Reader/Writer and the Fujitsu ScanSnap S1500M; please remember to reconnect any disconnected equipment when you have completed your recording session.

2.2.4. If you plan to use the phantom power setting on the USBPre to operate the Shure Beta53 condenser microphone, you may need to disconnect all but two or three essential USB components (e.g., keyboard, mouse, and possibly the sound booth monitor) to draw sufficient power; please remember to reconnect any disconnected equipment when you have completed your recording session.

2.3. Remove the XLR cable from the Tascam HD-P2 portable stereo audio recorder and attach it to the "MIC 1" input on the left side of the USBPre.
2.4. Select a microphone suited for the function and nature of your recording session; see Step 1.1 above for more information.

2.5. Configure the USBPre to accept the signal from the microphone (see above illustration).

2.5.1. If you are using the head-mounted Beta53, be sure to depress the phantom power button, labeled as “48V PH” and located on the bottom left of the front panel between the two sets of knobs and under the first column of monitor
LEDs (see Step 2.2.4 above regarding power); a red LED above the button will indicate that power is flowing to the microphone.

2.5.2. If you are using the desk-mounted Shure SM58, be sure that the light above the “48V PH” button is off.

2.5.3. If necessary, use the “1” button next to the phantom power button to cycle through the input options to select the “MIC” setting for the Channel 1 input.

2.5.4. Depress the “MONO” button located on the bottom right of the front panel between the two sets of knobs and under the “POWER” LED; a red LED above the button will indicate that USBPre is accepting a monaural (mono) as opposed to binaural (stereo) signal.

2.5.5. Turn the “2” knob all the way counter-clockwise to ensure that no signal is coming in from the Channel 2 input.

2.5.6. Turn the “MIX” and “PHONES” knobs to the 12 o’clock position.

*NOTE: This manual assumes that you will not use headphones connected to the USBPre to monitor the output signal but will instead rely on headphones connected to the iMac. As such, the “MIX” and “PHONES” knobs will serve no purpose. If, however, you wish to monitor output from the USBPre instead of the iMac (this will require a System Preferences change on the “Output” tab of iMac “Sound” preferences window routing the signal from the default “Headphones” to “USBPre Microphone Interface”; see Step 2.6.5 below), then physically move the headphones from the iMac to the jack on the right panel of the USBPre. Now, the “MIX” knob controls how much sound is going through the USBPre into the headphones and how much through the iMac into the headphones, and the “PHONES” knob controls the output volume of the headphones. The headphone jacks on the USBPre accept both the larger 1/4” and smaller 1/8” stereo inputs.*
2.6. Configure the iMac to accept microphone input from the USBPre.

2.6.1. Click on the Apple icon on the upper left corner of the toolbar.

2.6.2. Select “System Preferences...”

2.6.3. Select “Sound”.

2.6.4. Select “USBPre Microphone Interface” on the “Input” tab.

2.6.5. Make sure “Headphones” is selected on the “Output” tab (see the note for Step 2.5.6 for additional output options).

2.6.6. Close the “Sound” preferences window.

2.7. Select headphone configuration best suited for monitoring the output signal in your session.

2.7.1. If you would like the subject to be able to hear the output, be sure that the headphone cord labeled as “AUDIO” is inserted into one jack in the iMac’s yellow headphone splitter located on the bottom corner of the back of the monitor (on what would be the right hand side as viewed from the screen side).
2.7.2. If you do not want the sound from the headphones in the sound booth to possibly be heard over the recording, be sure that the headphone cord labeled as “AUDIO” is not inserted into one jack in the iMac’s yellow headphone splitter; please remember to reconnect the headphones when you have completed your recording session.

2.7.3. Whatever option you choose with respect to the headphone cord labeled as “AUDIO,” be sure that the cord for the KOSS headphones lying next to the iMac is inserted into one jack in the iMac’s yellow headphone splitter located on the bottom corner of the back of the monitor.

2.8. With the sound booth door shut, take a series of volume level readings of representative speech using the USBPre’s monitor LEDs and adjust the input volume control accordingly using the knob labeled as “1”, the left-most knob on the front panel of the USBPre.

2.8.1. Begin with the knob at the 12 o’clock position, turning it up or down depending on the monitor reading until you are satisfied with the level (a good position for the SM58 is likely to be at around the 3 o’clock position); a good volume level will register on the USBPre’s monitor LEDs as follows:

- No register at all when no speech is occurring;
- Usually in the mid green range (around -12 db) during most quiet speech;
- Occasionally peak into the upper green range (-6 db) during loud speech;
- Always below the red range (0 db) during speech.

2.8.2. Record the sound in Praat.

2.8.2.1. Launch Praat from the dock on the iMac; it is the icon shaped like a mouth above an ear.
2.8.2.2. Select “Record Mono Sound...” from the “New” menu at the top of the “Praat Objects” window.

2.8.2.3. Select “Mono” under the “Channels” option, “USBPre Microphone Interface” under the “Input source” option, and “44100 Hz” under the “Sampling frequency” option.

2.8.2.4. Take a series of volume level readings to insure a clean input signal.

2.8.2.4.1. A good volume level will register on Praat’s monitor as follows:
   - No register at all when no speech is occurring;
   - Usually in the upper green range during most speech;
   - Occasionally peak into the yellow range during loud speech;
   - Always below the red range during speech.

2.8.2.4.2. Adjust the Channel 1 volume control on the USBPre as needed.

2.8.2.5. Inform the subject that you are ready to begin recording.

2.8.2.5.1. Have the subject take a few deep breaths before recording.

2.8.2.5.2. If using the desk-mounted SM58, ask the subject to turn away from the microphone to cough or sneeze, as these will be very loud and may affect the recording.

2.8.2.5.3. Press “Record” on Praat and count down aloud from five.

2.8.2.6. Monitor the input levels during recording on the USBPre and Praat;

2.8.2.7. It is a good practice while recording to use the clock on the iMac to make note of the time you began recording as well as any peaks.
2.8.2.8. If you are satisfied with the recording, give it a logical name and click “Save to list & Close”.

2.8.2.9. Click on the file in the list and select “Write to WAV file...” from the “Write” menu at the top of the “Praat Objects” window to save the original recording to a location on the iMac.

2.8.3. Convert the recording to the proper format for analysis.

2.8.3.1. Select “Resample...” from the “Convert” menu at the bottom right of the “Praat Objects” window.

2.8.3.2. Make sure that “New sampling frequency (Hz)” is set to 10000, and “Precision (samples)” is set to 50.

2.8.3.3. Click “OK”.

2.8.3.4. Click on the file in the list and select “Write to WAV file...” from the “Write” menu at the top of the “Praat Objects” window to save the converted recording to a location on the iMac.

2.9. You are now free to record again or begin analyzing the recording.