BSOP Stream Setup Guide

Purpose: this document contains information attempting to explain how the BSOP streaming events are produced.

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Meeting Setup Punchlist

General Setup

1. Enter the building
2. Ensure we actually have the reservation and people are cleared out
3. Turn on all lights
4. Make room on the stage for equipment
5. Put a 6-foot table on the stage by the audio equipment
6. Guide any/all volunteers to help with tables and chairs
    a. The round tables need to load up onto racks and to be put away
    b. The chairs can remain in the main room
        i. Two columns with a central aisle
        ii. A generous 3–4 feet between each row; prioritize accessibility
        iii. Comfortable buffer between each chair
    c. Prioritize 8-foot tables for the silent auction and/or raffle space
    d. Prioritize 6-foot tables for vendors

Audio Setup

1. Turn on house audio system
2. Pair any phone to the Bluetooth, play music
    a. House audio level for Bluetooth input should remain constant
    b. Use phone volume as slider/controllerm
3. Mute all “rooms” (overhead speakers)
4. Ensure stage front speakers are on (and up!)
5. Try a mic vocal check — have some gusto
    a. Feedback? Turn down the mic input
    b. Quiet? Try turning up the mic to 80 percent and then the main level itself
6. The stage front speakers and the mic should all be fairly loud to start
    a. It’s an empty room!
7.

Video Setup

(TODO)

Universal and Consistent Settings

Produced Feed

- Use hardware acceleration if/when possible
- Limit the bitrate, setting Constant Bit Rate (CBR), at roughly…
    - For upload bandwidth >= 6 mbps — 3000 kbps
    - For upload bandwidth < 4 mbps — 1500 kbps (this is barely workable)
    - Otherwise — 2000 kbps
    - In rare case where we have >= 10 mbps — 4000 kbps limit

When necessary, a 5G phone tethered to a laptop is quite workable for streaming so long as the upload bandwidth is sufficient and uninterrupted. (Observed on 2021-10-26 in the Milwaukie Center parking lot: 17 mbps upload, 150 mbps download)

Wifi within the Milwaukie Center is sufficient for streaming.

Zoom Configurations

- Audio
    - Fully separate Zoom outputs from inputs (e.g. headphones separated from mics)
    - Disable almost all of the advanced noise cancelling options to prevent undesired cutouts
        - “Original Sound” set to “On” might be needed
    - Attempt to use whatever input has the same time sync as the video feed
        - E.g. match the “USB Audio Capture Device“ to “USB Video Capture Device”
- Video
    - Enable HD
    - Disable touch up
    - Select the appropriate video input
        - E.g. match the “USB Video Capture Device” to “USB Audio Capture Device”
- Screen share
    - Skip this! It gets low network priority for quality and framerate

Audio Configurations

Voice inputs

NOTE: these are approximate references. The actual, required values vary by how each person talks, how they are holding/using the mic, the background noise, and interference

- For headset and/or handheld mics

    - Compression
        - Ratio: 3:1
        - Attack Time: 20 ms
        - Release time: 50 ms
        - Threshold: -48 dB
        - Gain reduction: 2 dB
        - Knee: soft
        - Makeup gain: 2 dB
    - Gate
        - Attack: 10 ms
        - Threshold: 54 dB
    - Limiter
    - EQ
        - TBD: http://prosoundformula.com/how-to-eq-vocals/
- For on-camera audio
    - Compression
        - Ratio: 6:1
        - Attack Time: 20 ms
        - Release time: 50 ms
        - Threshold: -56 dB
        - Gain reduction: 2 dB
        - Knee: soft
        - Makeup gain: 2 dB
    - Gate
        - Attack: 10 ms
        - Threshold: 58 dB
    - Limiter
    - EQ
        - TBD: http://prosoundformula.com/how-to-eq-vocals/

Option A: Simple Setup

1. One JVC camera
    a. HDMI out
    b. USB 3.0 HDMI capture
    c. USB into computer
2. Zoom
    a. USB camera as AV input

Feedback

October 2021: this is generally the most reliable way to do it. Trying to use OBS into Zoom appears constrained by the processing overhead of multiple simultaneous video streams and the result

Option B: OBS to Zoom (Advanced)

Guide: https://www.youtube.com/watch?v=S46Zz1TUeyQ

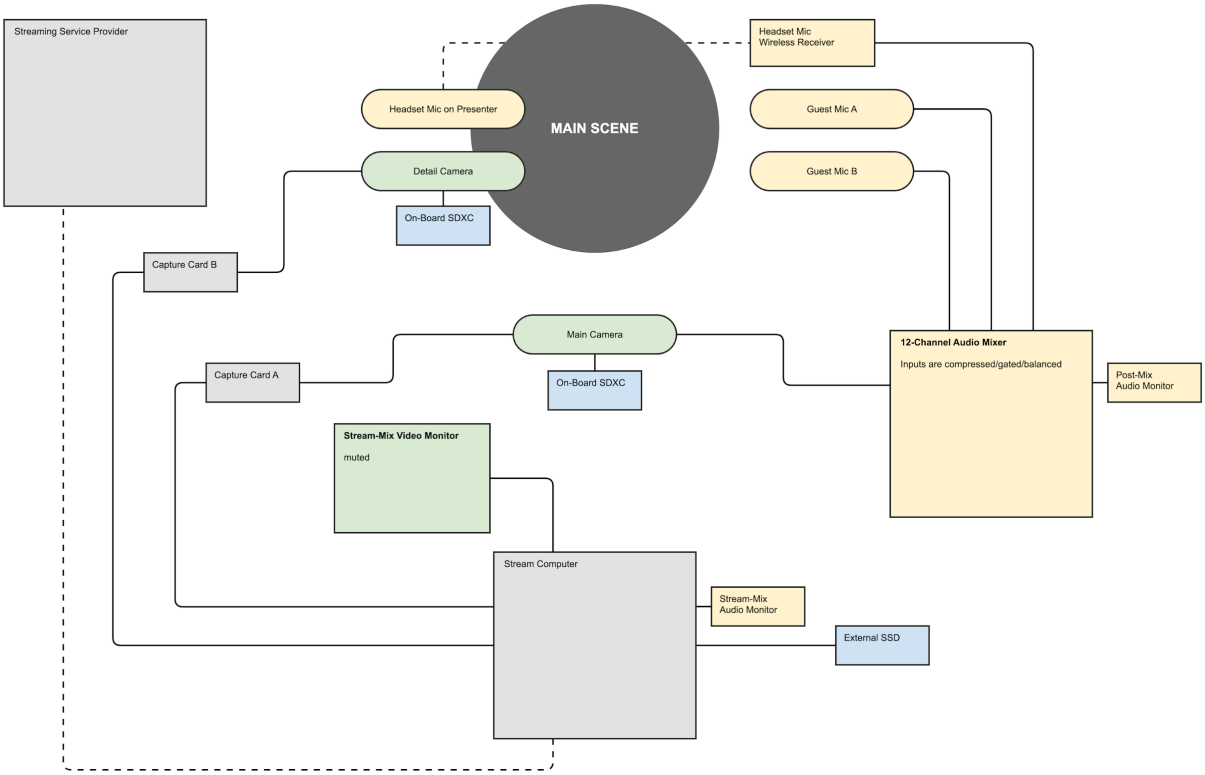
Downloads

https://obsproject.com/
https://ndi.tv/tools/
https://zoom.us/download#client_4meeting

The Setup

1. Multiple JVC cameras
    a. Recording to internal memory
        i. These will produce the master video for later editing
    b. Audio
        i. The final audio mix goes into the main camera, which records only the input audio (e.g. microphones)
        ii. The secondary/detail camera may record internal audio (e.g. room sound)
    c. Outputs
        i. HDMI output from cameras (1080p)
        ii. USB 3.0 HDMI capture card
        iii. USB into computer
        iv. Computer HDMI to external monitor
2. Audio mixer
    a. Wireless headset mic input (Sennheiser)
        i. NO +48V
        ii. Set as headset device
        iii. Compression in
            1. 3:1?
        iv. Noise Gate in
            1. -58 dB threshold
            2. >= 10 ms attack
    b. Wired mic input
        i. YES +48V
        ii. Set as podium device
        iii. Compression in
            1. 6:1 ?
        iv. Noise Gate in
            1. -58 dB threshold
            2. >= 10 ms attack
    c. Main mix

        i. Send it out on main (R/L) or aux (mono) to the main camera input
    d. Stream mix/monitor
        i. Aux channels 3+4 stereo output
        ii. Input to HDMI capture card's audio inputs
3. OBS
    a. Use "Scenes" however desired
        i. It's useful to have a final scene that references all of the sub scenes
        ii. The audio inputs are convenient on a scene that is always enabled
    b. NDI virtual output
        i. Tools menu >
        ii. NDI output settings >
        iii. Main output
    c. Enable audio monitoring to external headphones
4. NDI virtual input
    a. Output from OBS
    b. Can feed synced video and audio into Zoom
5. Zoom
    a. Video feed (option 1) — best outcome
        i. Enable HD
        ii. NDI virtual input as video
        iii. NDI virtual input as audio
        iv. Do not screen share
    b. Screen share (option 2) — easy, low framerate
        i. Disable Video HD (e.g. built in webcam)
        ii. Optimize for video
        iii. Share computer sound (ensures sync of video + audio)
        iv. Mute mic input
        v. Select the NDI monitor or the OBS monitor as the window to share


Streaming Service Provider
MAIN SCENE
Headset Mic
Wireless Receiver
Headset Mic on Presenter
Guest Mic A
Detail Camera
Guest Mic B
On-Board SDXC
Capture Card B
Main Camera
12-Channel Audio Mixer
Inputs are compressed/gated/balanced
Capture Card A
On-Board SDXC
Post-Mix
Audio Monitor
Stream-Mix Video Monitor
muted
Stream Computer
Stream-Mix
Audio Monitor
External SSD