Together But Distant

Technology Solutions for Real-Time Online Music Making

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Dana Zenobi, DMA - Assistant Professor of Music (Voice)

School of Music

Jordan College of the Arts

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But….What's My Motivation?

High Quality Audio & Video Is Possible
Lower Price Point Than Pre-Pandemic
Growing Community of Support

Online Lessons & Coachings
Regional Ensemble Collaboration (500 miles)
Long-Distance Master Classes
Rehearsals and Coachings

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Butler University School of Music
Numbers At A Glance

5000 Students Total
Mostly Residential

200 Students in School of Music
175 Undergraduates

25 Graduate Students

50 Voice Majors

4 Voice Faculty

4 Faculty/Staff Pianists

6 Collaborative Piano Graduate Assistants

Our Learning Journey

Course Components
- Weekly student-lead rehearsals with collaborative pianist
- Weekly performance class

Learning Outcomes
- Nuanced sense of phrasing and legato line
- Ability to resonate the solo voice over various musical textures.
- Spontaneity/sincerity on stage
- Excellent rapport and fine sense of ensemble with musical collaborators

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Instructional Needs

Real Time / Lagless/ Low Latency Connection
Time delay similar to being in the same physical space

High Audio Quality
Sound quality as close to the sound in person as possible.

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Pandemic Logistics

In-Person Classes, Masked & Socially Distanced
Large Music Classrooms & Halls Used for Classes of 10+
No University-Wide COVID Guidelines for Music

Voice Aerosol Rooms In Lilly Hall
3 Practice/Rehearsal Rooms With Ethernet Ports
1 Former Dance Studio
1 Small Recital Hall (150 Seats)
4 Instructor Studios
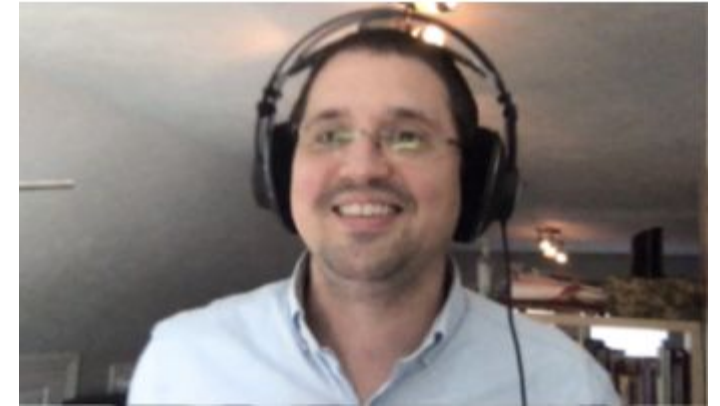2 Choral Rehearsal Rooms
2 Classrooms

What's Possibile? A Lot!

Consulting the Tech Experts

Dr. Ian Howell
IanHowellCountertenor.com
Soundjack Page

New England Conservatory Acoustic Vocal Pedagogy Program
Dr. Joshua Glasner
Dr. Nicholas Perna

NATS Does Soundjack Forum

Envisioning The Signal Flow

Envisioning The Signal Flow

AUDIO SIGNAL FLOW

Ethernet Port

FastMusicBox
(Mini-Computer)
Keyboard & Mouse

Microphone
Small Diaphragm Condenser
Flat Frequency Response

Audio Interface
Low Latency

Headphones
Open Backed
Wired

Separate device (laptop, phone) used for video.
Video element did have lag.
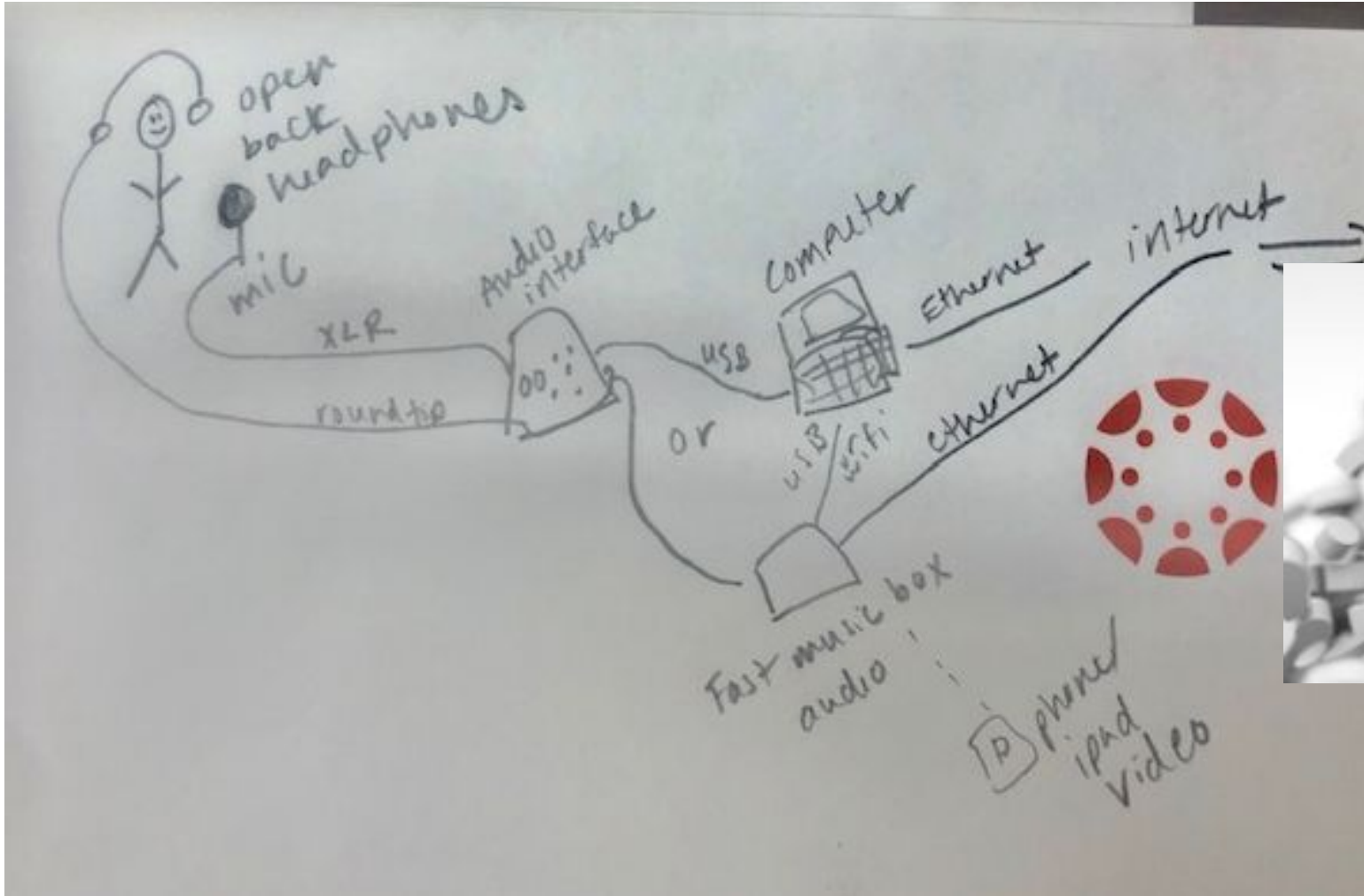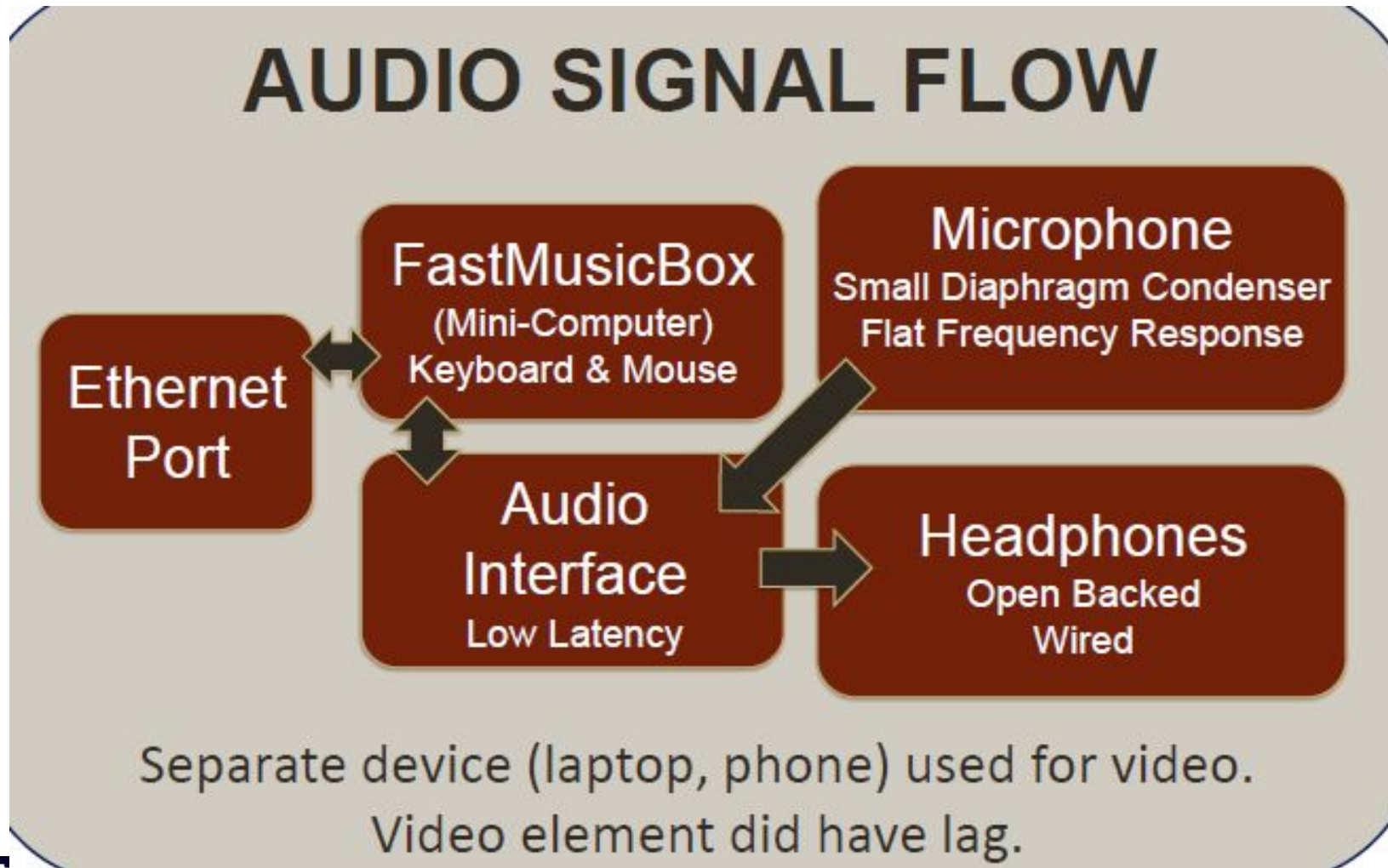
Equipment Needed

Working Ethernet Port
Ethernet Cables
Wired Headphones
Microphone (& Optional Stand)
XLR Cables
Audio Interfaces
Software
Computer or Mini Computer

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No Wi Fi Allowed

For Real-Time Connection

Working Ethernet Port
Ethernet Cables

No Air Pods or Wireless Headphones

Headphones On, Please

All Users Wear Headphones
Echo Cancellation Off
Faster Connection

Open Backed Headphones
Allow Singer to Hear Self &
Collaborators

Choosing Audio Equipment
Microphones

**Our Goal: Capture sound in the student's room as accurately as possible**

- Pickup Pattern / Directionality – Omni vs. Cardiod
  - Beware proximity effect
- Frequency Response – Flat (microphone does not boost or attenuate frequency ranges)
- Max Sound Pressure Level – Can handle operatic sounds

Thanks: Dr. Josha Glasner – NEC Acoustic Vocal Pedagogy Program

Ian Howell Article on Mic Selection

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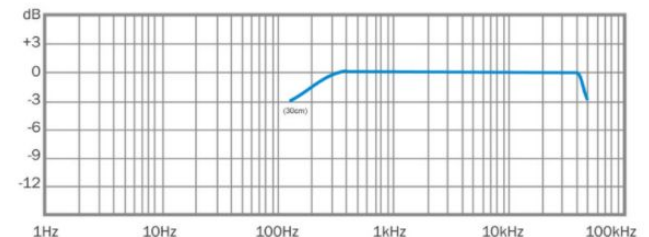
Choosing Audio Equipment
Audio Interfaces

- Low latency
- Relatively affordable
- High sound quality

Thanks: Dr. Joshua Glasner – NEC Acoustic Vocal Pedagogy Program

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Choosing Audio Equipment
Mic Cables & Stands

- XLR Cable – Connects Microphone and Audio Interface
  - Microphone Stand

Thanks: Dr. Josha Glasner – NEC Acoustic Vocal Pedagogy Program

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Software Options

Real Time Connection
Jamulus
JamKazam ($)
JackTrip
Soundjack

High Quality Audio (Some Lag)
Cleanfeed ($ Option)
LiveLab
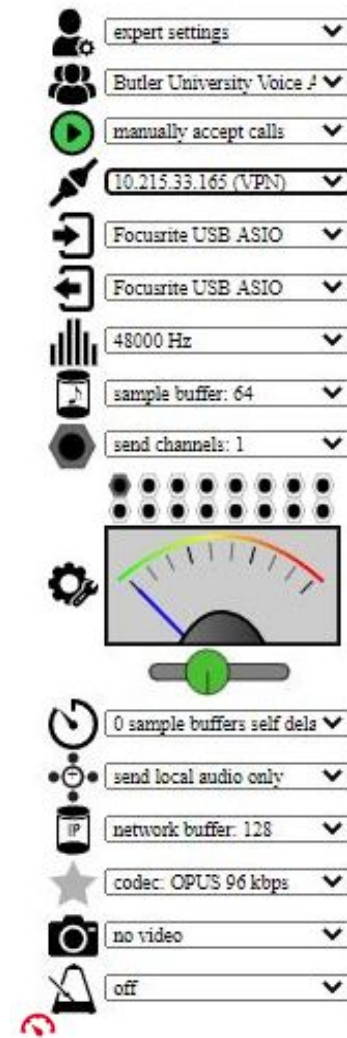
Why FastMusic Boxes?

Portable
Affordable
Customizable
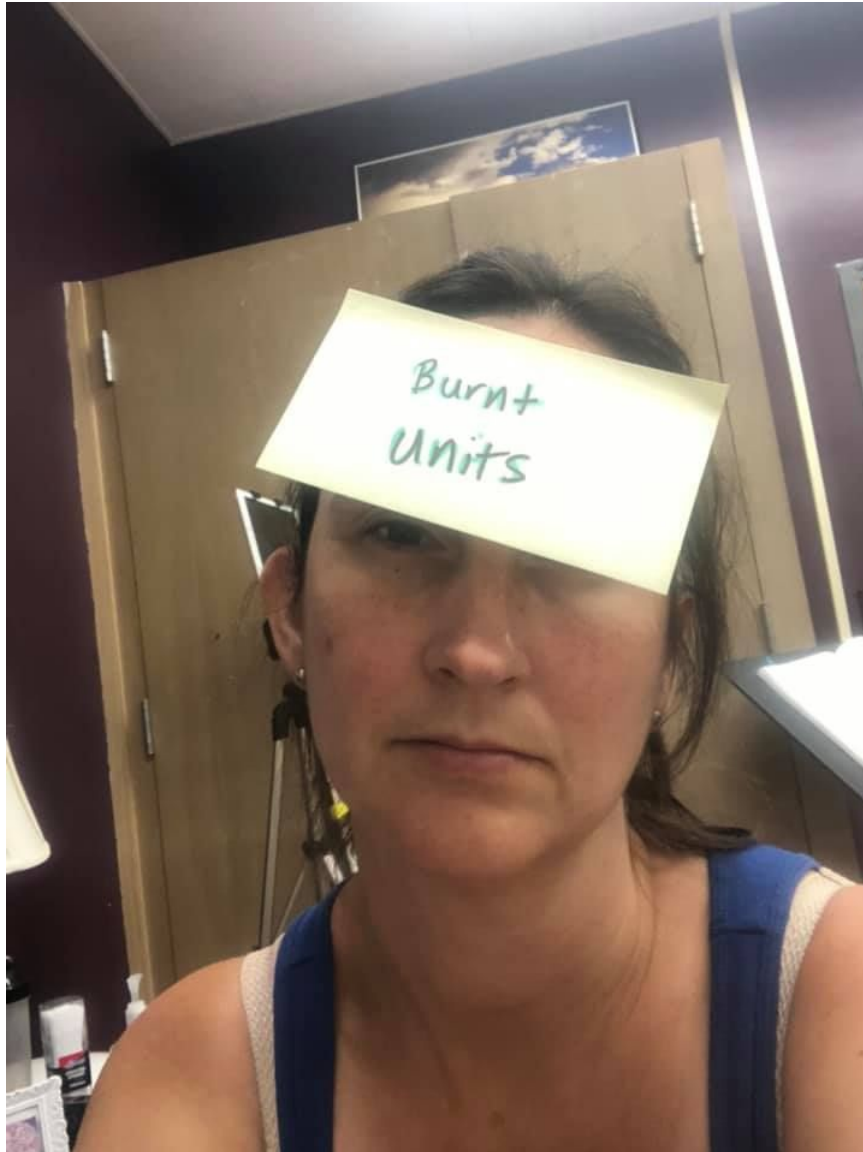User Support

Thanks to Christian Hoene

Building the FastMusic Boxes

Ian Howell's How–To Page
All the Ordering Options at Symonics

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Challenges & Modifications

No Broadcasting SSID on Campus Network

Option to Disable FMB Wi-Fi
Thank You To Christian Hoene for OS Modification

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Challenges & Modifications

Monitors and Keyboards Not Portable
7" Touchscreen Display

Thank you to Michael Denny for the design idea

Butler University School of Music
Challenges & Modifications

Crashes & Failed Connections
Troubleshooting Guides & Reassurance
One-Way Recordings in Rehearsals
Backup Plans

Thank you to Alex Carot and Christian Hoene for support

Finally….Success!

Weekly Voice Lessons
Weekly Collaborative Rehearsals
Opera Theater Rehearsals
14 FastMusic Boxes
3 Instructor Studios
4 Voice-Designated Aerosol Rooms
4 In-Home Studios (Indy Metro Area)
3 Portable Sets

Studio Performance Classes
4 Classroom Macs Plus Above

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Learning Outcomes

COVID Safety Not Compromised

Continued High Quality Technique Instruction
Including Tone Quality

Singers Able to Sing Unmasked

Pre-COVID Pace of Student Progress Maintained

Collaborative Piano Continued In Lessons

Student-Led Collaborative Rehearsals

Recorded Tracks More Musical

Students Familiar with Low-Latency Technology

New Developments

Real Time Video With Soundjack*
Connection Speed Even Faster
Distance Extended

Broadcasting Live Distributed Performances
Plug And Play Units with Audio Interface
Low Latency Training Added to Curricula

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*Not with FastMusic Box; Computer Only