TEXAS STATE UNIVERSITY

The rising STAR *of Texas*

E1.04 – PA System

Jason Farrell

Jesus Rivera III

Mohammed Al Dulaimi

Mohanad Rashad

Design

Our project is a portable public address (PA) system with a multi channel user-controlled audio mixer. The user will be able to adjust the channel volume of each input to produce a desired audio output.

Motivation

Currently the college rents a PA system for events such as Senior Design Day. Our project will replace the rented PA by designing and retrofitting a 6-channel audio mixer into an existing speaker system.

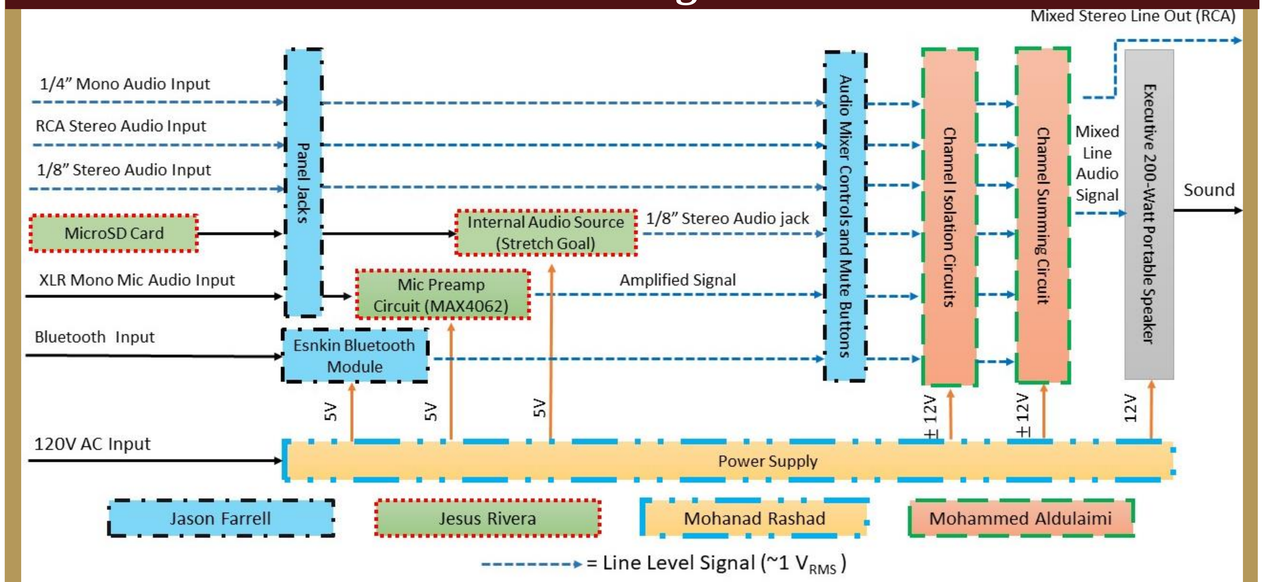
Key Features

6 Audio Channels/ Inputs

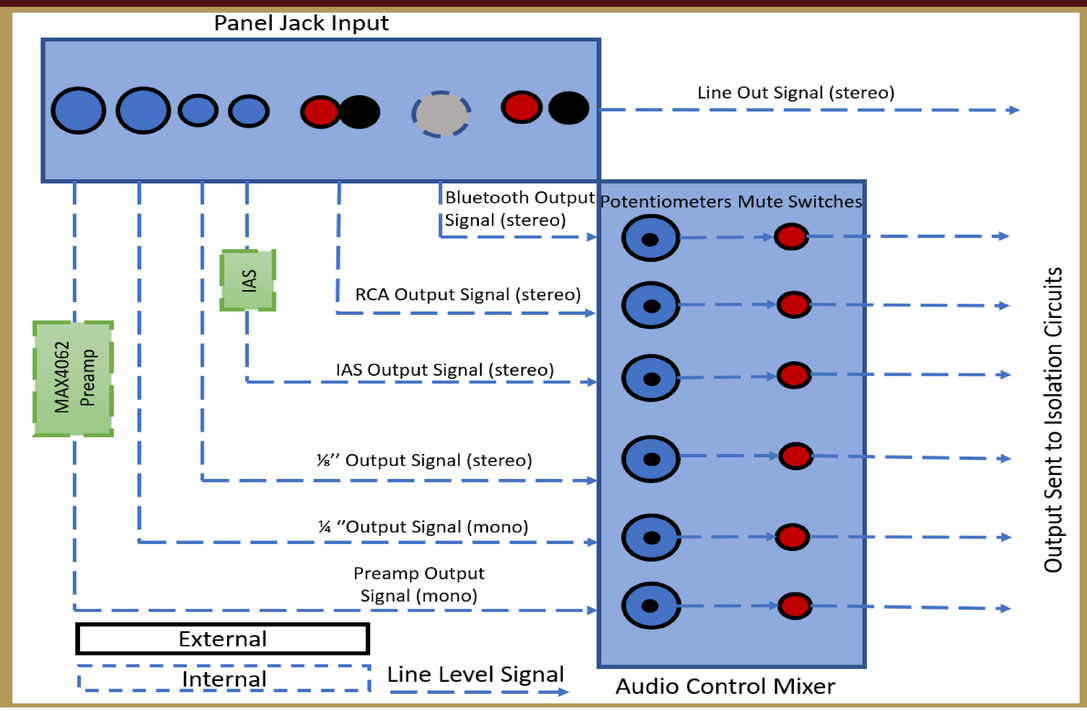
Stereo	Mono
Bluetooth	XLR
1/8”	1/4”
1/8”	
RCA	

- Internal Microphone Preamp
- Stereo RCA Line out
- Channel Mute Switches

Block Diagram



User Interface



Requirements

- 5 Mixer Inputs
- Mixer outputs to amplifier
- Budget $75
- Be fully characterized
- Must be portable
- Operate from 35 -20 kHz

D2 Objectives

D2 Plans	Dates
Completed Assembly	9/12/2022
Full System Testing Begin	9/12/2022
Full Testing Complete	11/25/2022
Final Test Pass	11/27/2022
Final Design Review	11/29/2022

Characterization

Hardware Performance Parameters

Parameter	Test Conditions	Min	Max	Units
dB at 10 Ft	Max audio level	50	90	dB
Microphone Preamp Gain	V_s = 10mV_{pk} @ 1 kHZ	16	58	dB (SPL)
Audio Mixer Frequency Response	V_s = 1V_{RMS}	35	20k	Hz
Audio Mixer THD	V_s = 1V_{RMS} @ 1 kHz		3	%
Audio Mixer SNR	V_s = 1V_{RMS} @ 1 kHz	60		dB
System Linear Distortion	V_s = 1V_{RMS}		1.5	dB
Channel Crosstalk	V_s = 1V_{RMS} @ 1 kHz		-60	dB

Acknowledgements

Project Sponsor: Mark Welker
Faculty Advisor: Dr. Karl Stephen
D2 Mentors: 2.04 Automated Pet Feeder