

Project Summary

The problem this design solves was turning an older desk phone that was no longer in use into an assistive device for live performance and public address. The dialpad of the deskphone functions as a USB keyboard that sends out keypress signals to the connected computer. These keys are hotkeys in a DJ software, Serato DJ Pro, for jumping to a specific time point in a song (Mode 1) and playing sound samples (Mode 2). The corded phone of the desk phone serves as a PA microphone. Picking it up off the dock unmutes it. The switch on the side of the desk phone controls the activation of a voice modulator. A strobe effect on the microphone input is created by a 555-MOSFET. In Mode 3 of the desk phone, users can record from the microphone up to 4 tracks, playback through the output TS jack, and overwrite the recorded tracks by pressing buttons on the dialpad. Buttons in the left column are dedicated for recording, while buttons in the center column are for playing back. To overwrite a track, we simply record again on an existing track. The final output signal is delivered out through a mono audio connection, with a 1/4" TS male jack. This signal has a voltage less than 100mV peak-to-peak with negligible DC offset.

The first phases include identifying key features we would want to see on this device: USB keyboard, voice modulation, and voice recording. Each member then picked up a feature that they are interested in developing. We work individually at the beginning and come together toward the end for enclosure. During the development phase, we recognized the issue of having not enough I/O pins to implement both USB keyboard feature and voice recording feature on a single microcontroller. We found a potential solution of using parallel-in serial-out shift register to achieve reducing total I/O pins needed for the features. However, we didn't get the shift register to work properly before the time we needed to place the order of our PCB. Therefore we decided to have two microcontrollers working with each other to solve this issue of shortage of I/O pins.

Some key lessons we learned from this project include the importance of communication and the importance of diverse ideas. Good communication is the basis for identifying mistakes in the early phases of the project, rather than later. And diversity yields a more well-rounded consideration.



Project Timeline