

Theremin

1 Introduction

The Theremin, a fascinating electronic musical creation from the 1920s, blends artistry and technology through hand movements that produce unique sounds. This project delves into its **circuitry, oscillators, and amplification**. By modernizing with up-to-date components, we aim to capture the harmony of analog electronics and artistic expression. This endeavor honors history while advancing sonic innovation. This proposal outlines our systematic exploration, enriching both the past and the present in sound

2 Requirements

- **Amplification:** Design amplifier stages with low noise and high gain to boost the weak signals generated by hand movements, maintaining audio fidelity.
- **Oscillators:** Implement stable and adjustable oscillator circuits to produce sine and square waveforms with variable frequencies, ensuring accurate pitch control.
- **Frequency and Volume Control:** Implement user-friendly controls for adjusting frequency and volume, enhancing playability and responsiveness.
- **Proximity Sensing:** Integrate capacitive proximity sensing elements, enabling hands-free control of pitch and volume through electromagnetic field interactions.
- **Power Supply:** Incorporate a stable power supply to provide the necessary voltage levels for the op-amps, oscillators, and other components.
- **Output:** Provide both line-level and headphone outputs for versatile audio connectivity.

3 Additional Rules

- Any change of the above specifications is negotiable only before the mid review.
- All the circuits should be simulated using software before the implementation.
- It is allowed to use an external PCB manufacturer for producing the circuits, and no marks will be reduced or added.
- Using any other pre-built ICs (other than transistors and op-amps) are prohibited.
- Regardless of the method of PCB manufacture, the full set of output files required to mass produce the PCBs, to assemble the circuit and to package it is required.
- Follow provided “General guidelines”.