# Software Oscilloscope

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## Overview

Using the the sound card which is normally found in the PC, and with the aid of oscilloscope software we developed, we can make a PC made oscilloscope, which is easy to use and make,

We also made simple signal generator for the trial purpose

# Specifications

We created a probe, for the audio card, and used mic in input as our oscilloscope input, the probe is made to limit and protect the audio card inside the PC from damage, and we can achieve as high as 150 V AC or More using limiter circuit and protection circuit,

The circuit is made in 4 stages

1st AC coupling and High input impedance

2nd Input protection for High voltage input

3rd amplifier for x1 or x10

4th trimming the output to appropriate signal

The second related project is signal generator, for the trying process, by the mean of op amp LM324 to generate multiple kinds of signal, such as Square, Triangular

Lastly we developed early release of software for the oscilloscope, written in Python

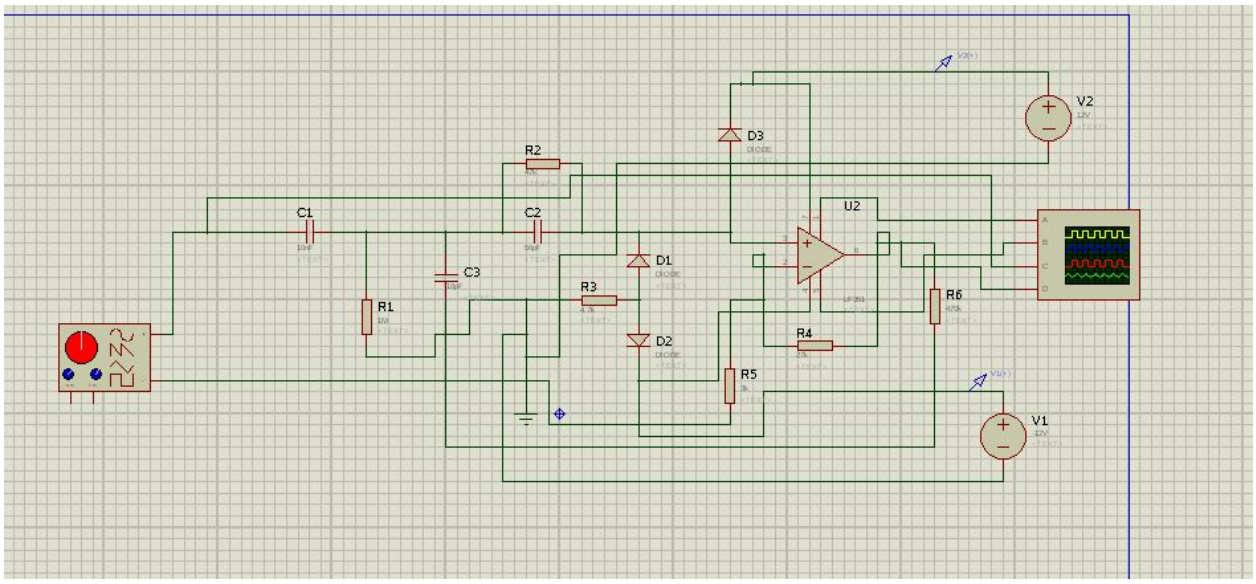
# Components

1. The input Probe
    a. first circuit full limiter and protection and amp
        i. Capacitors 0.1 uf,20pF, 100pF,
        ii. Restances 1M, 47k, 4.7k, 27k, 3k, 100k
        iii. 3 Diodes 1N914
        iv. TL082 Op amp
    b. Second alternative circuit only limiter for protection
        i. Resistance 4.7k
        ii. POT 1M
        iii. 2 Diodes 1N4148

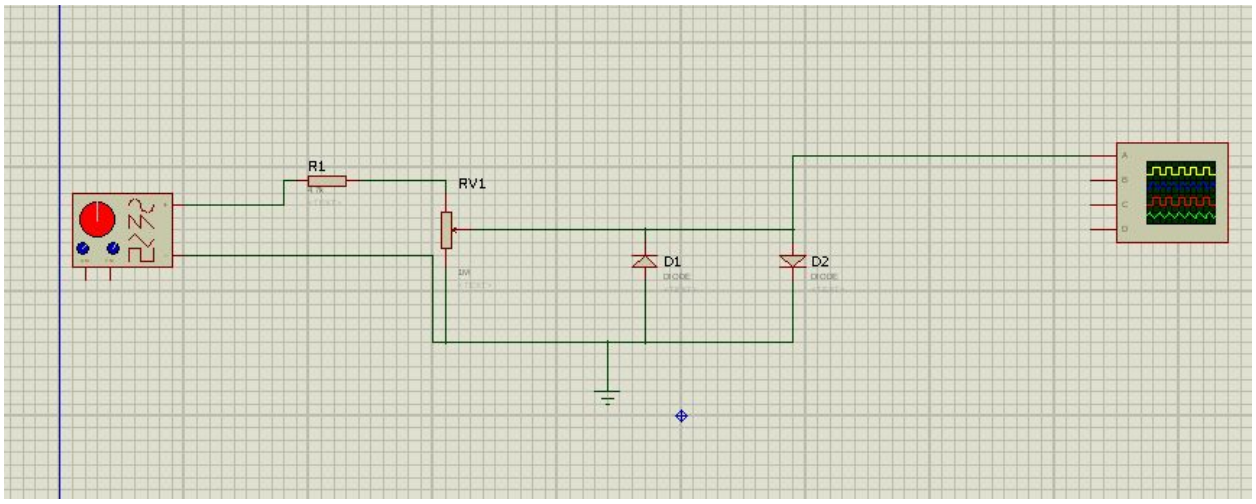
2. The Function generator
    a. Op amp LM324
    b. Capacitors 1uF, 33nF, 10nF
    c. Resistors 22k, 4 * 100k, 2 * 10k, 220k
    d. POT 100k and 2 * 570k

## Schematic

First probe circuit with limiter and protection for up to 150 V AC



Another simpler probe circuit to protect it




Function generator circuit