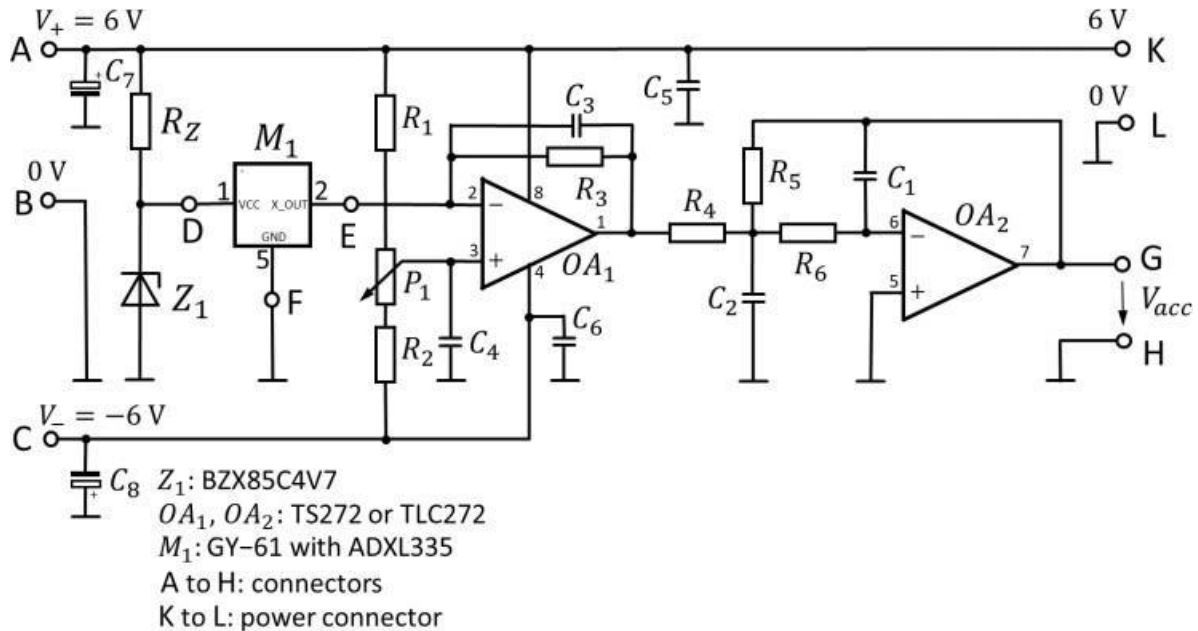


Schematic Diagram of Test Circuit



The circuit consists of operational amplifiers in combination with an active low pass filter. A sensor module of capacitive type is used to measure acceleration. The sensor module was powered by a Zener diode with constant voltage.

The circuit has two stages of amplification, the first of which is a subtracting amplifier (OA_1). The offset of sensor module is corrected by the first operational amplifier. This amplifier also eliminates the unwanted static acceleration which is also an offset. The inverting input of the amplifier is connected to the sensor input, ensuring voltage amplification. Whereas the non-inverting input is connected to a voltage divider that may be modified using the trimmer P_1 .

The sensor module (M_1) is driven by a Zener diode at pin 1, and pin 2 of the sensor module provides an output voltage proportional to the acceleration to the inverting input of subtracting amplifier. The pin 5 of the sensor module serves as a common ground for both the power supply and the output signal.

The second amplifier stage is an active second-order low-pass filter with multiple negative feedback. This low-pass filter is used to adapt the sensor's output voltage with desired acceleration range, to the input range of our Analog to Digital Converter of the microcontroller experimental board. It blocks the acceleration signal frequencies above the cut-off frequency.