ABSTRACT

In this final project, teaching aids have been designed to help teachers demonstrate how analog and digital Bandpass filters work. Bandpass filter is a filter that passes signals with a certain frequency which is limited by the lower cut-off frequency and upper cut-off frequency and dampens signals that are below the lower cut-off frequency and above the upper cut-off frequency.

The design of this bandpass filter has specifications that pass the frequency of 20 - 80Hz. The method used to realize the filter is the butterworth filter method. The procedure of this method starts from determining filter specifications, finding the laplace transfer function and designing analog filter hardware, while for digital filters it is obtained by changing the analog filter's laplace transfer function into a discrete transfer function.

After designing the bandpass filter, the filter design is tested by simulation in Ltspice and Matlab software to ensure whether the designed filter meets the specified specifications. After doing the simulation test, the next step is to implement it into hardware in the form of an OP-AMP circuit for analog filters and a microcontroller for digital filters.

Keywords :, Bandpass Filter, frequency, cut-off frequency, ADC and DAC, Demonstration Kit, OP-AMP