

BAND PASS FILTER FOR COLOR ORGAN

PROJECT REPORT

Submitted for the course: NETWORK THEORY(ECE2001)

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CERTIFICATE

This is to certify that the project work entitled “Band pass filter for color organ” that is being submitted by Vaibhav jha,prakarjain,Mohith,Yamini,Anupriyam for Network Theory (ECE 2001) is a record of bonafide work done under my supervision. The contents of this Project, in full or in parts, have neither been taken from any other source nor have been submitted for any other CAL course.

Place : Vellore

Date : 26/04/2017

Signature of Students:

Signature of

Signature of the faculty:

ACKNOWLEDGEMENT

I would like to thank VELLORE INSTITUTE OF TECHNOLOGY for giving us a chance to improve our technical skills . I wish to express my deep gratitude and sincere thanks to our faculty Mr.Yogesh Kumar Choukiker . VIT for encouragement and guidance he provided to our team . His sympathetic and immense motivation which has sustained all efforts at all stages of this project work. In the last we would like to thank our Chancellor for providing us the platform to perform the project work . I would like to thank our parents for their cooperation guidance and support.

Thank you!!!

ABSTRACT

Bandpass filters are widely used in wireless transmitters and receivers. The main function of such a filter in a transmitter is to limit the bandwidth of the output signal to the band allocated for the transmission. This prevents the transmitter from interfering with other stations . In a receiver, a bandpass filter allows signals within a selected range of frequencies to be heard or decoded , while preventing signals at unwanted frequencies from getting through . A bandpass filter also optimizes the signal to noise ratio and sensitivity of a receiver.

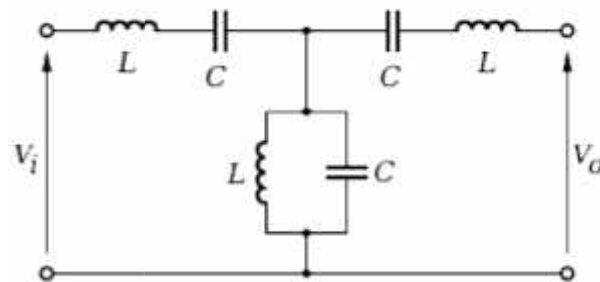
In both transmitting and receiving applications , well designed bandpass filters , having the optimum bandwidth for the mode and speed of communication being used , maximize the number of signal transmitters that can exist in a system , while minimizing the interference or competition among signals.

This project deals with design of bandpass filter for color organ.

INTRODUCTION :

A **band-pass filter** (also spelled bandpass) is a device that passes frequencies within a certain range and rejects (attenuates) frequencies outside that range. An example of an analogue electronic band-pass filter is an RLC circuit (a resistor–inductor–capacitor circuit). These filters can also be created by combining a low-pass filter with a high-pass filter. An ideal bandpass filter would have a completely flat passband (e.g. with no gain/attenuation throughout) and would completely attenuate all frequencies outside the passband. Additionally, the transition out of the passband would have brickwall characteristics.

In practice, no bandpass filter is ideal. The filter does not attenuate all frequencies outside the desired frequency range completely; in particular, there is a region just outside the intended passband where frequencies are attenuated, but not rejected.



A medium complexity signals of a bandpass filter

The bandwidth of the filter is simply the difference between the upper and lower cutoff frequencies. The shape factor is the ratio of bandwidths measured using two different attenuation values to determine the cutoff frequency.

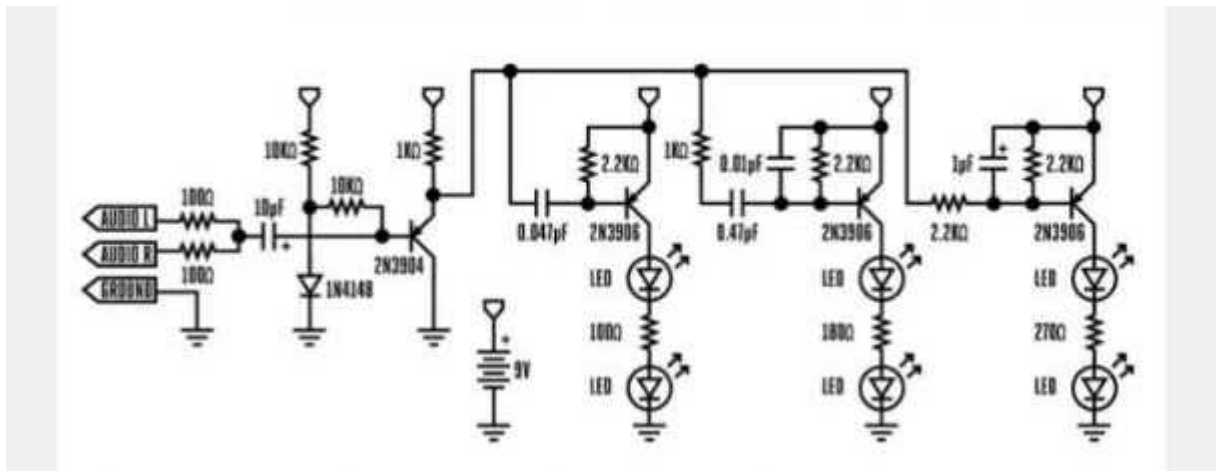
A band-pass filter can be characterized by its Q factor. The Q-factor is the inverse of the fractional bandwidth. A high-Q filter will have a narrow passband and a low-Q filter will have a wide passband. These are respectively referred to as

narrow-band and wide-band filters. low-Q filter will have a wide passband. These are respectively referred to as narrow-band and wide-band filters.

COLOR ORGAN :

The term color organ refers to a tradition of mechanical then electromechanical, devices built to represent sound or to accompany music in a visual medium- by any number of means. Become popularly associated with electronic devices that are responded to their music inputs with light shows.

CIRCUIT DIAGRAM :



COMPONENTS FOR THE DESIGN OF CIRCUIT:

- 10Kohm resistor
- 2N3904
- Diode
- 2-100ohm resistor
- 2N3906
- 2.2 kohm

- ✚ 0.47 microF
- ✚ 2-Blue led
- ✚ 100 ohm,180 ohm
- ✚ 0.01 microF
- ✚ 2-Green led
- ✚ 1 microF
- ✚ 2-Red led
- ✚ 270 ohm
- ✚ 1N4148 diode

Conclusion :

The key driving factor for the study and realization of novel band pass filter circuits is their wide applications in different areas such as communication, control, consumer electronics, medical electronics, industrial electronics, etc. These circuits are mainly realized by current mode devices due to their low power consumption, higher bandwidth and better signal linearity. In this project , we have designed a band pass filter for a color organ that will be used to provide lighting for a rock concert . The color organ will provide a stage lightning that will correspond to the sound level and frequency of the music.

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