

## Experiment 2 : Active Filters

Department: 電機三

Name : 楊正彥

Student ID : b03901086

Class Number : 三早

## 1. Experiment Objectives

1.1. To design Second-Order Active Filter by using OP-Amp as an active device, and resistance and capacitance as passive devices.

## 2. Experiment Setups

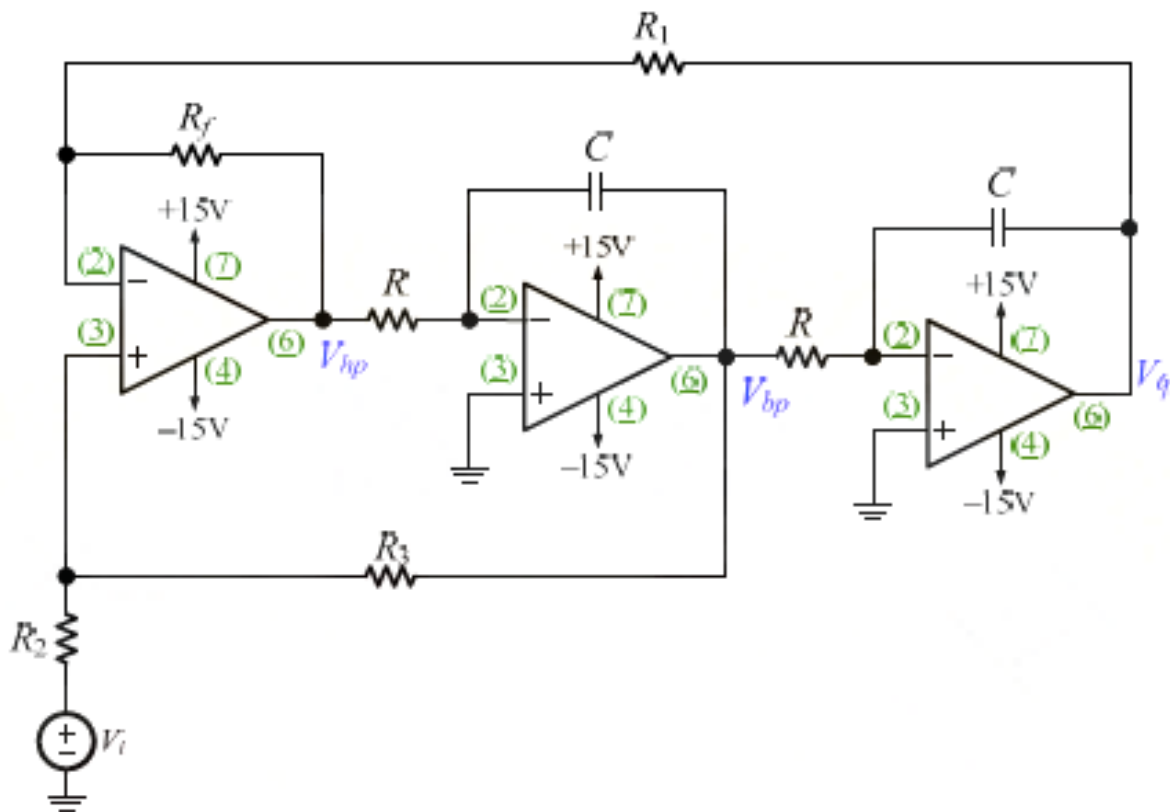


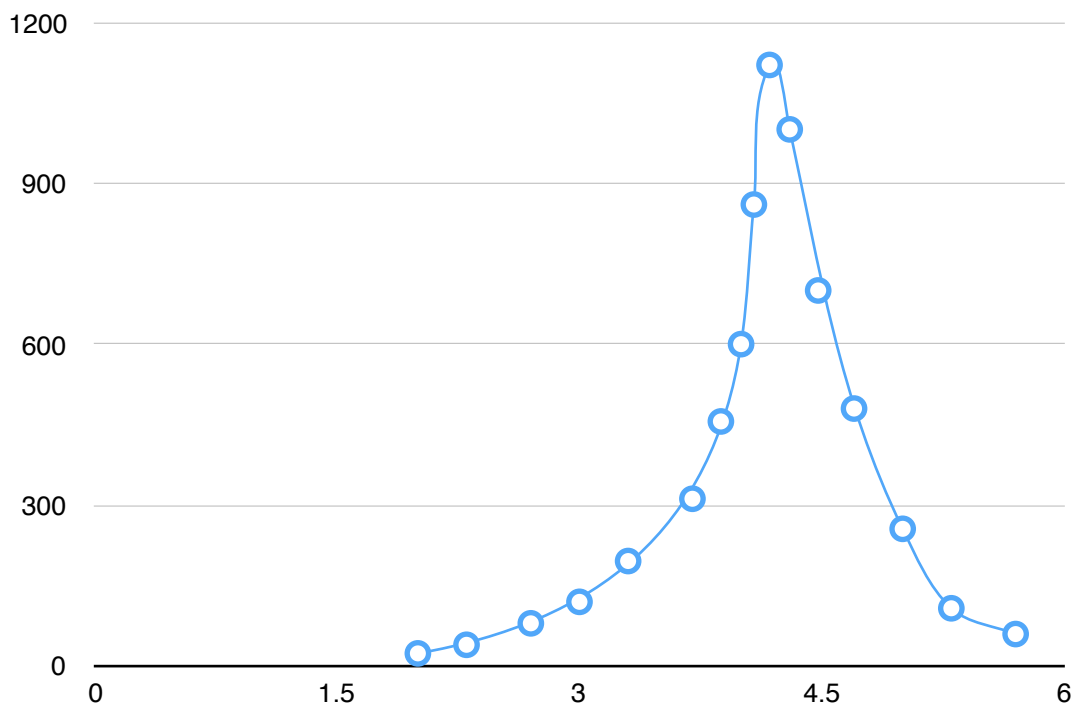
Fig. 1 Two-Integral-Loop Active Filter

### 3. Labs Work

3.1. We chose to build the TIL active filter circuit with resistances  $R_1 = R_2 = R_3 = R = R_f = 1\text{k}\Omega$  and the capacitances  $C_1 = C_2 = 0.01\ \mu\text{F}$ .

3.2. The output voltage's relations to the log of signal's frequency are shown in the table below.

f (Hz)	Vin (mV)	Vout (mV)	Vout/Vin (V/V)
100	960	24	0.03
200	1000	40	0.04
500	1000	80	0.08
1000	1000	120	0.12
2000	1000	196	0.20
5000	1000	312	0.31
7500	960	456	0.48
10000	1040	600	0.58
12000	960	860	0.90
15000	960	1120	1.17
20000	1000	1000	1.00
30000	1020	700	0.69
50000	1040	480	0.46
100000	1040	256	0.25
200000	1000	108	0.11
500000	1000	60	0.06



3.3. The upper 3dB-frequency of the filter = 28000 Hz.

3.4. The lower 3dB-frequency of the filter = 11000 Hz.