ECEN 457
Lab 5: Three-Band Tone Control Circuit

PRELAB
The following circuit can be used for three-band active tone control of audio signals.

1. Calculate component values for the following specifications:
   • Bass: $A_{B,\text{max}} = +20$ dB, $A_{B,\text{min}} = -20$ dB, $f_B = 100$ Hz
   • Mid-range: $A_{M,\text{max}} = +20$ dB, $A_{M,\text{min}} = -20$ dB, $f_M = 1$ kHz
   • Treble: $A_{T,\text{max}} = +20$ dB, $A_{T,\text{min}} = -20$ dB, $f_T = 5$ kHz
   (See figures 3.15 and 3.16 in the textbook).
2. Simulate the circuit using LM 324 opamps with ±12 V supply and verify that the desired specifications are satisfied.

LAB PROCEDURE
1. Construct the three-band tone control circuit.
2. Measure the frequency response with the following conditions:
   • Bass boost, mid-range and treble flat.
   • Bass cut, mid-range and treble flat.
   • Mid-range boost, bass and treble flat.
   • Mid-range cut, bass and treble flat.
   • Treble boost, mid-range and bass flat.
   • Treble cut, mid-range and bass flat.
3. Test your circuit with an audio input signal.