

Laboratory 1 – 2016

Build an amplifier circuit

Using the components supplied in your kit, build the *Amplifier with Gain=20* on page 5 of the attached LM386 data sheet. Build your amplifier on the breadboard provided in the kit. Figure 1 shows the internal connections of a breadboard. The symbols used for various circuit elements are shown in Figure 2. Figures 4, 5 and 6 will help you to build the amplifier circuit.

Figure 3, together with Table 1, explain how to determine resistor ratings. Use them to make sure that you understand resistor ratings. If, for example, a resistor has red-yellow-orange-gold bands, then, from Table 1, you can read off that it is a 24 kΩ resistor with a 5% tolerance.

Task 1: Show one of the laboratory demonstrators that your amplifier works.

Note: It is your responsibility to make sure that the demonstrator signs off on the class list that you have completed each task. Every laboratory task is an SP (Satisfactory Performance) requirement for this course.

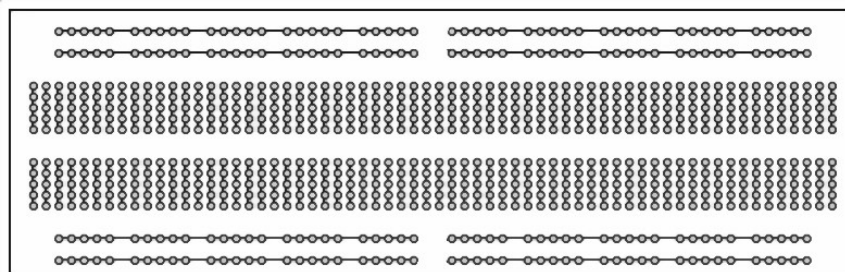


Figure 1: Internal connections of a breadboard

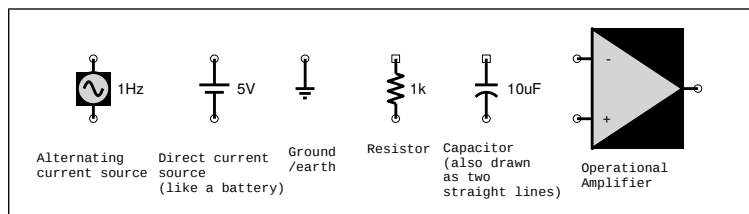


Figure 2: Symbols for some circuit element

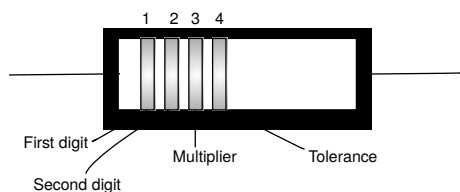


Figure 3: Resistor colour bands

Table 1: Resistor colour code

Digit	Colour	Multiplier	No. of zeros
10% tolerance	Silver	0.01	-2
5% tolerance	Gold	0.1	-1
0	Black	1	0
1	Brown	10	1
2	Red	100	2
3	Orange	1 k	3
4	Yellow	10 k	4
5	Green	100 k	5
6	Blue	1 M	6
7	Violet	10 M	7
8	Gray		
9	White		

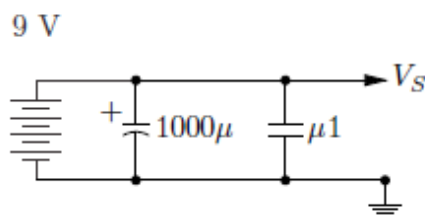


Figure 4: Power supply circuit

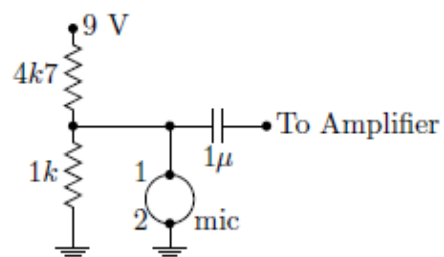


Figure 5: Microphone circuit

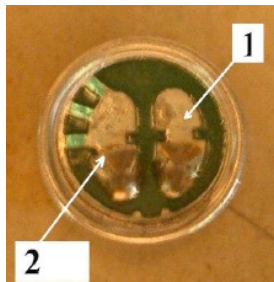


Figure 6: Microphone pin connections

Introduction to the oscilloscope

An oscilloscope is an electronic measuring instrument that is widely used by engineers and scientists. An oscilloscope lets you see electrical signals in circuits by drawing a graph that shows how signals change over time.

You are required to teach yourself how to use an oscilloscope. The principles of operation of an oscilloscope are described in Section 3.2 of the lecture notes. There is also a large amount of information available on the Internet on using an oscilloscope – use this to become familiar with how an oscilloscope works. An example of useful tutorial material can be found at <http://www.youtube.com/watch?v=g0tBJIOEz00>.

Task 2: Display the output across the loudspeaker of your amplifier on an oscilloscope.