Learning Objectives:

1. Building an H-Bridge from discrete components.
2. Controlling an H-Bridge via Software (Avoiding Shorts!)
3. Controlling a (relatively) high load device (motor)

Step 1: Using your knowledge gained from the previous H-Bridge and Current Buffer labs, design and build an H-Bridge that will allow your UBW to control four “switching” transistors to drive a DC motor in the four configurations allowed by an H-Bridge: Forward, Reverse, Break, Freewheel.

*Hint:* Make sure that you test each transistor and your basic current buffer circuit to ensure that it will switch enough power to start the motor individually before building an H-Bridge circuit made up of four of them.

Step 2: Draw a schematic of your circuit:
Step 3: Write software to control your H-Bridge so that you can type single commands and it will automatically set the switches appropriately. Be SURE to turn all transistors OFF before switching to a different mode. Be especially sure to never short power to ground!

List which pins should be “ON” or “High” for the following states:

Forward: _______________
Reverse: _______________
Break: _______________
FreeWheel: _____________

Step 4: Demonstrate your H-Bridge to the TA / Instructor. We will provide power using the bench power supply, or you can use your own power supply, as long as the power is NOT provided by the USB bus or UBW.