CS 3651: H-Bridge Lab   (A&B Groups work together)

Name(s):   _____

                _____

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.