Lab #7b
I/O Card Part #2
Addressing
Rev c 3/27/08

Purpose:

To perform tests of the I/O Addressing circuit from lab #7.

Procedure:

1) Set up your address for 170H via the dip switches as per the following table

A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
0									X
Active Low input to 74LS138	Your dip switch								Active High input on pin 1 of 74LS138

2) Insert your board into the test jig and power up the circuit. Observe the current being supplied. If this value is high (above 500mA) or the Current Limited Light is lit **POWER DOWN IMMEDIATELY** and check your wiring paying special attention to power and ground connections. Also verify that your IC's are plugged in correctly (pin one on side A is pin 1 on Side B).

3) Place a logic probe on Pin 19 of the 74LS688 on your board. Verify that when the address is 170H and AEN=LOW on the Dip Switches on the test jig, the output is a LOW (any other time the output should be a high).

4) Change the address on the test jig from 170H to 171H and place the logic probe on pin 19 of the 74LS688. Is the output low? WHY? (Record the answer to be included in the report)

5) Now place the address of 170H on the test jig, with AEN=LOW. Now complete the truth table below by manipulating the inputs of the 74LS138 (A0, IOW and IOR).

Inputs			Outputs								Can
IOR	IOW	A0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Occur?
0	0	0									
0	0	1									
0	1	0									
0	1	1									
1	0	0									
1	0	1									
1	1	0									
1	1	1									

6) Out of the above, which combinations can actually occur on an ISA bus? Fill in the last column of the table accordingly.
7) What is the output of the 74LS138 under the following conditions:

Input		Output							
Test jig address	Your board address	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
370h	170h								
1F0h	170h								

     a) For the first line in the table, what input on the 138 causes the output shown?
     b) For the second line in the table, what input on the 138 causes the output shown?

8) Have the instructor check your work.
9) Remove your card from the test jig.
10) Write a program that will do the following:
     a) Output the value of 01h to port 170H
     b) Get input from port 170H
     c) Output the value of 01h to port 171H
     d) Get input from port 171H
     e) Loop back to a)
11) Transfer the compiled program to a floppy disk.
12) Connect the digital analyzer to your circuit as follows:

Channel	Signal
CH00	Not used
CH01	688 output
CH02	Not used
CH03	Not used
CH04	Not used
CH05	Not used
CH06	138 Y0
CH07	138 Y1
CH08	138 Y2
CH09	138 Y3
CH10	138 Y4
CH11	138 Y5
CH12	138 Y6
CH13	138 Y7
CH14	Not Used
CH15	Not Used

13) Install your card in the 486 computer (make sure the computer is OFF before installing the card).
14) Power up the computer (if the computer does not give you a DOS prompt in an appropriate time period, power down and ask the instructor for help.
15) Execute your program.
16) Set the digital analyzer to capture the image when CH01 and CH08 are LOW
17) Verify your answer for #5 using the digital analyzer outputs.
18) Show the digital analyzer output to the instructor and obtain a photo of the digital analyzer output for your report.

Table for #1, the current value on the power supply, answer for #4, table for #5 + #6, table for #7, answers for #7a and #7b, your program and the digital analyzer pictures should be included in your report.