PIC Trainer Board Initial Test Procedures

The PIC Trainer Board is delivered with a pre-programmed PIC16F84A microcontroller unit (MCU marked as "1") that contains code for testing the interface between the PIC and the LEDs (LED3 – LED10), and with a blank PIC16F84A MCU (marked as "2") to be programmed for testing the both the programming function and the interface between the PIC and the Liquid Crystal Display (LCD). These tests are described below. The oscillator/resonator has been pre-wired on the trainer board for you. There are three ribbon cables (one 8-lead and two 2-leads) with male heading for you do the testing of the trainer board. Please refer to the following photo:

Photo1. Testing Wires: The 8 and 2 leads ribbon cables

Test #1 – PIC16F84A-to-LED Interface

NOTE: Refer to Figure 1 for guidance while making connections, setting switches, and inserting the PIC MCU.

1. Connect the eight-pin jumper between PORTB_18P_INTER connector X10 and DB_IO_INTER connector X6. The orientation of the jumper is not critical for this test. Interconnections presented in Brown.
2. Connect two short jumpers between RESONATOR_INTER connector SV4, pins 1 and 3, and PORTA_18P_INTER connector pins 7 and 8. Interconnections presented in Blue. (This has been done on the trainer for you already.)
3. Set switches S1-1 through 5 to OFF and S1-6 through 10 ON.
4. Set switches S4-1 and S4-2 ON.
5. Lift the handle of the Zero Insertion Force (ZIF) socket, IC4.
6. Insert the preprogrammed PIC16F84A into the ZIF socket. Make certain that the notch end of the PIC is facing the handle end of the socket and that the PIC is mounted closest to the handle end of the socket.
7. Lower the handle of the ZIF socket.

8. Plug the wall-mounted power supply connector plug into the trainer board Power Jack, J1.
9. Plug the power supply into an outlet.

NOTE: The program will run automatically when power is applied. The LEDs (LED3 through LED10) will turn on for about 0.5s and turn off for 0.5s. Then, LED3 – LED6 will light for 0.5s and turn off for 0.5s, followed by LED7 – LED10 turning on and off. This sequence will repeat until power is removed from the board.

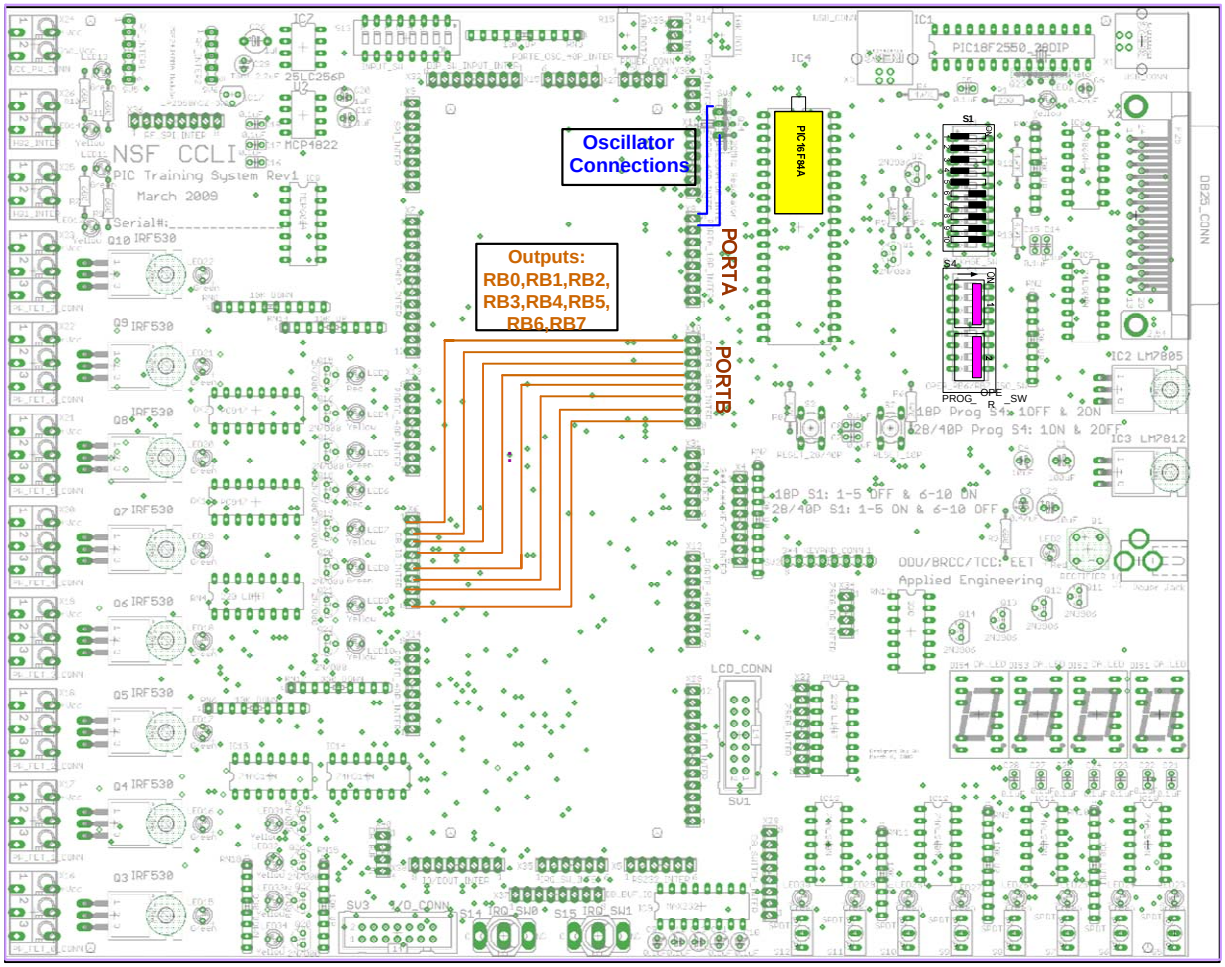

Figure 1. LED Test Interconnections, Switch Settings, and PIC Placement

Test #2 – LCD Module Parallel Communications

NOTE: Refer to Figure 2 for guidance while making connections, setting switches, and inserting the PIC MCU.

1. Connect the eight-pin jumper between PORTB_18P_INTER connector X10 and pins 1 – 8 of LCD_INTER connector X29. Make certain that pin 1 of X10 is connected to pin 1 of X29. Interconnections presented in Brown.
2. Connect a two-pin jumper between PORTA_18P_INTER connector X8, pins 1 and 2 and LCD_INTER connector pins 10 and 9, respectively. Note that X8 pin 1 is connected to X29 pin 10. Interconnections presented in Red.
3. Connect a two-pin jumper between X29, pins 11 and 12, to GND on connector X27, pins 3 and 4. This is the ground connection. Interconnections presented in Purple.
4. Connect two short jumpers between RESONATOR_INTER connector SV4, pins 1 and 3, and PORTA_18P_INTER connector pins 7 and 8. Interconnections presented in Blue. (This has been done on the trainer for you already.)
5. Connect the LCD 14 pin plug to the SV1 (LCD_CONN) socket that is located under the keypad. Do NOT plug LCD into SV3 Socket that will damage the LCD!
6. Set switches S1-1 through 5 to OFF and S1-6 through 10 ON.
7. Set switches S4-1 and S4-2 ON.
8. Lift the handle of the Zero Insertion Force (ZIF) socket IC4.
9. Insert the PIC16F84A into the ZIF socket. Make certain that the notch end of the PIC is facing the handle end of the socket and that the PIC is mounted closest to the handle end of the socket.
10. Lower the handle of the ZIF socket.
11. Refer to the document *Programming the PIC16F84 Using PICkit2* for instructions on programming the microcontroller.

    NOTE: Upon completion of programming, the program will run automatically and the LCD will display the message **Congratulations on the first line and ***Test Complete*** on the second line.**

    If the LED test or programming is unsuccessful, or if the programming is successful, but the LCD does not display the message, please contact Dr. Steve Hsiung (shsiung@odu.edu)(757-683-4606) or Richard Seriani (rseriani@tcc.edu)(757-410-7889) for assistance.

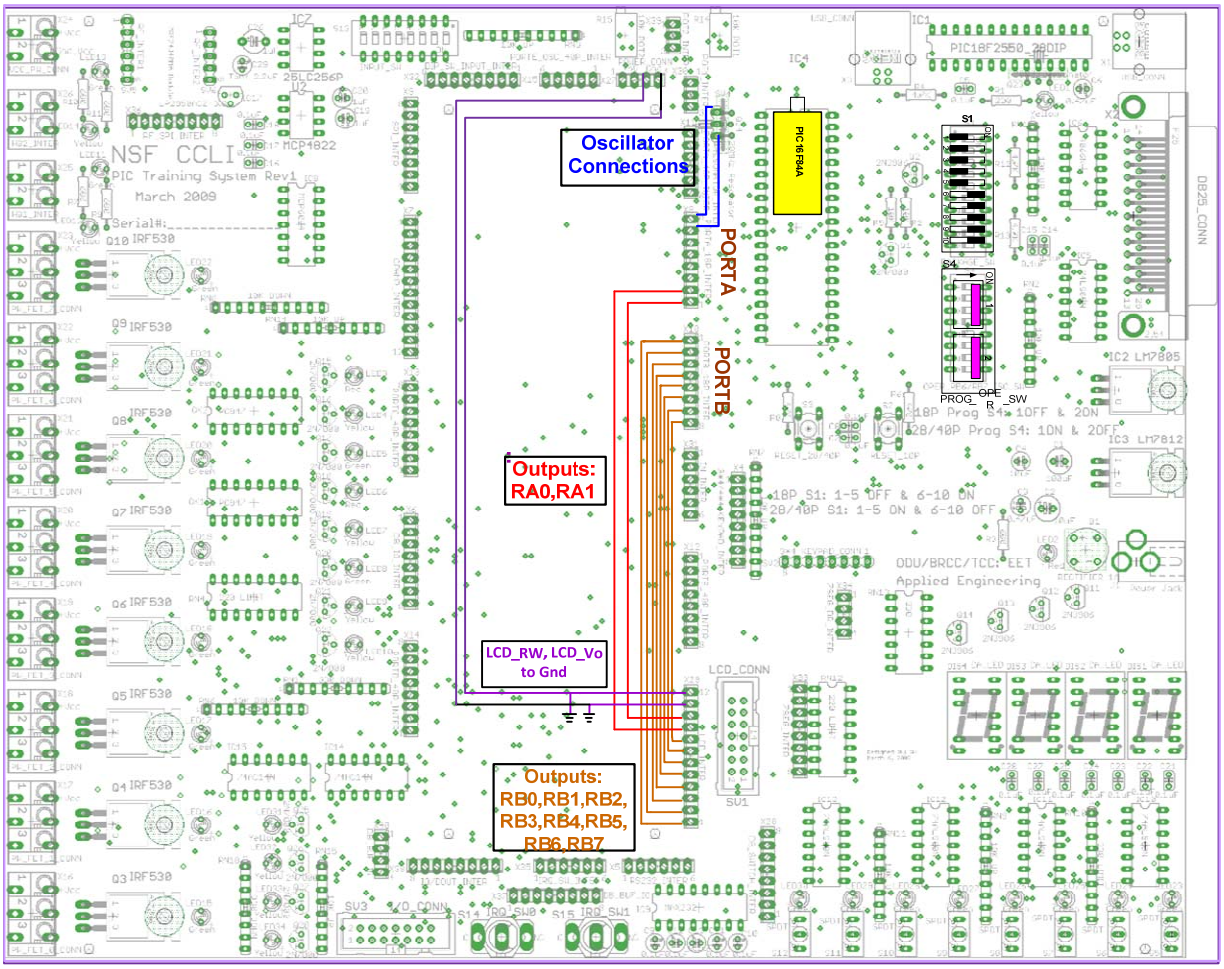

Figure 2. LCD Test Interconnections, Switch Settings, and PIC Placement