Basic Operating Procedure

Starting UP

1. Turn on power to the computer connected to the Instron.
2. Turn on power to the Instron. The power switch is on the right bottom rear of the frame.
3. You will see a countdown begin on the display on the left hand side of the instron, which will countdown to 2 and remain at 2 until the Bluehill program is opened on the computer. The control Panel will also display a red light on "frame standby" until the Bluehill program has been opened.
4. Open the Bluehill program from the computer's desktop. Enter "operator" for the user name and password. You will now be on the Home screen (Fig. 1). To get back to this screen at any time, click on the Bluehill icon, which will be on the upper left side of the screen when you are not on the home screen.
5. Click on the Load Cell icon in the upper right of the screen, and calibrate the load cell (Fig 1).
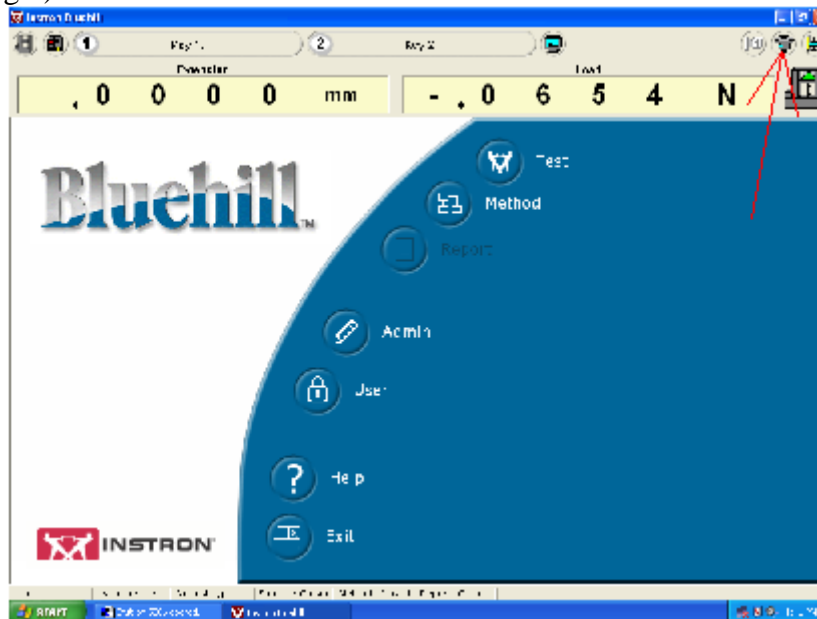

Figure 1: Bluehill program Home screen

6. Now open the compressed air valve to the frame. This air allows you to manually open and close the pneumatic grips with the foot controller.

Running a Test

If the test you wish to run already has a method file then you will continue with this next step. If not, go to the "Creating New Method Files" section.

1. From the home screen click on the "Test" icon.
2. Choose a test method file containing the test parameters that you want to use to run your tests. You can choose from a recently used method or "Browse" through the computer files for other methods. You can read a description of the method file

by clicking once on the file name, and choose the method file by double clicking on it or clicking the next button.

3. Next, you will be asked to enter the name and choose a location for the sample data file.

4. If you choose a prompted test, then follow the instructions until the testing is complete. If you choose an unprompted test, enter all of the required inputs and run your tests.

5. Mounting a Specimen in the pneumatic grips:
    a. Use the grip adjusting screws to create an opening between the grip faces large enough for the specimen to be loaded easily and small enough to ensure a minimum time period for complete closure of the grip faces
    b. Use the control panel to make the separation between the grips, such that the specimen will be in contact with the entire length of the faces, and their will be a length of the specimen between the grips. Push the "Reset GL" button on the control panel.

    Note: The grip faces are 25mm and the minimum separation between the upper and lower grip faces is 13mm so the length of the specimen must be greater than 63mm.

    c. Place the specimen between the grip faces in the upper grip, and ensure that the specimen is in the center of the faces, and is in contact with the entire length of the faces. Then press the footswitch to close the upper grip.
    d. Next hold the sample directly between the lower grip faces and press the footswitch again to close the lower grip on the sample. This completes the mounting of the specimen.
    e. Once the test of the specimen is complete, hold it and press the footswitch to open the grips.

6. Once the testing is complete, click on the "finish" icon (figure 2) to end the test. An output file (in either pdf or .doc format) for your experiment will be saved under the name and at the location you gave at the beginning of the experiment.
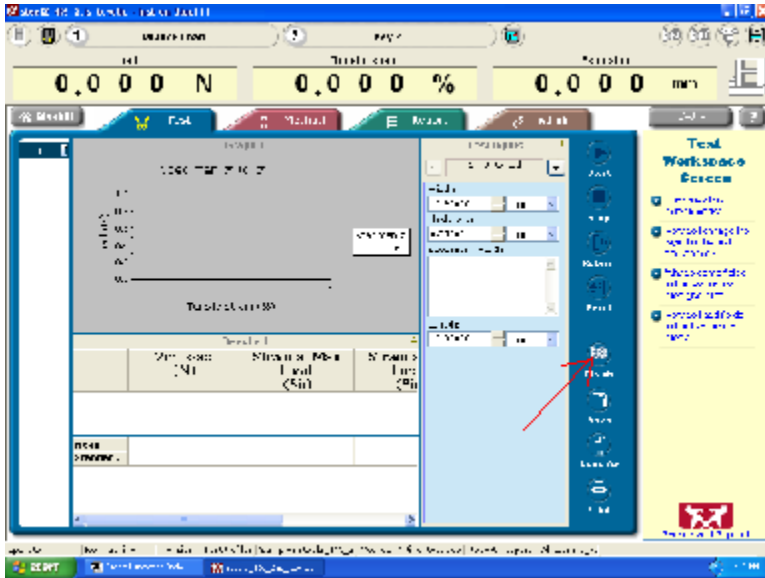
Figure 2: Testing Screen

Creating a New Method File

If the experiment you wish to run does not have a current method file, you can follow these steps to create a new method file.

1. Click on the "Method" icon from the Home screen.
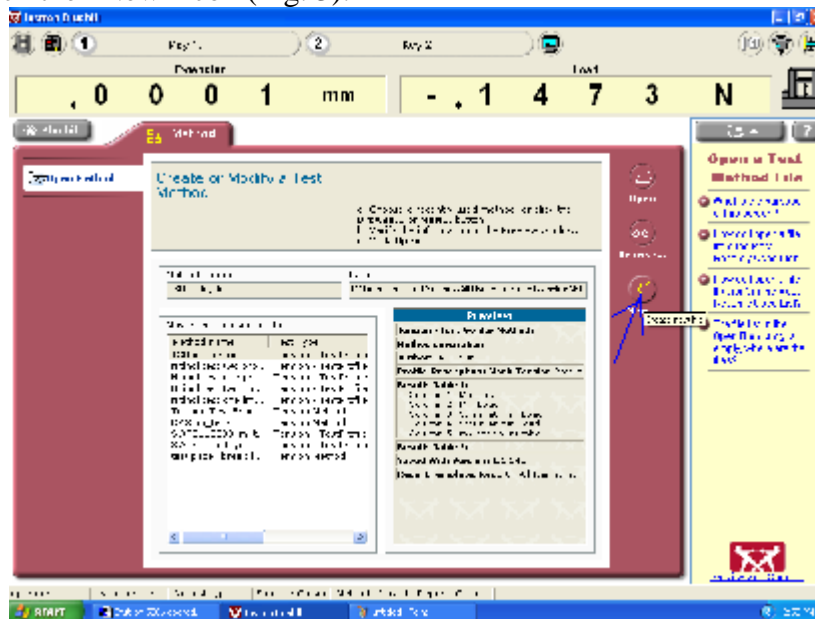2. Click the "New" icon (Fig. 3).

Figure 3: Method File Screen

3. Next, choose the test type for the method that you want to create from the pull down menu, and click on create.

4. Click the "Save As" icon and save the method with a name unique to what the method will be used for.
5. Next, go through all of the navigation bar items on the left of the screen and make changes to the parameters in the test method. You have the opportunity to set up the information about samples, the controls of the experiment, the output tables, graphs, and reports. You also have the ability to set up the method as a prompted test.
6. You are now ready to use the test method to run specimen tests.
7. Click the "Print" icon if you want a copy of the method parameters that you set up.
8. When you are finished click the "save & close" icon on the lower right side of the screen.

Create a Variation of an Existing Method File

1. Click on the "Method" icon from the Home screen.
2. Open the method you wish to modify. You can choose from a recently used method or "Browse" through the computer files for other methods.
3. Click the "Save As" icon and save the method as your new method. This will not erase the old Method.
4. Now you can make changes to the method parameters, and when you are finished click the "save & close icon" on the lower right side of the screen.

Shutting Down

1. Shut off the air pressure to the frame.
2. Close and open the grips to relieve the excess air pressure in the lines.
3. Save and close anything Method or Test you are working on.
4. Exit the Bluehill program.
5. Properly shut down the computer and turn off the power to the monitor.
6. Shut off the power to the Instron.

Some Useful Test Methods

The following is a list and description of some of the test methods that I have made for the Instron tests. "Nitinol Test Two" has already proven useful in my preliminary experiments, which I will further explain later. I will create more test methods and modify these ones as the need arises for experiments in the future.

1. "**Nitinol Test One**"- This test method allows you to Stretch a sample to some strain and then take the sample back to 0% strain at a constant rate. The sample can cycle through this as many times as you wish. To choose the rate, max strain, min strain, and number of cycles, open the method file and go to "Method"-"Control"-"Test"-"Profiler". From this screen you can make all of the necessary changes.

2. "**Nitinol Test Two**"- This test method allows you to Stretch a sample to some strain at a constant rate, hold for a specified amount of time, and then take the sample back to 0 strain at a constant rate. The sample can cycle through this as many times as you wish. To choose the rate, max strain, length of holding time and number of cycles, open the method file and go to "Method"-"Control"-"Test"-"Profiler". From this screen you can make all of the necessary changes.

3. "**Tension Test**"- This test method allows you to Stretch a specimen until it breaks. It displays a stress-strain graph in order to make important observations about the mechanical characteristics of the specimen.