

# Spex Fluorolog 1680 Spectrofluorimeter

Updated May 27, 2008

Instrument instructions can be found at:

<http://academic.bowdoin.edu/chemistry/resources/instructions.shtml>

If you have any problems with the instrument or would like to get trained, please contact Celeste

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## 1. Protocol

- a. **Read instructions carefully before using instrument.** Reading the bold sentences in each category will tell you what you need to know to run the instrument.
  - i. Bullets are under the bold sentences when more detail is required.

## 2. Startup Procedure

- a. **Turn on cooling system.**
  - i. H<sub>2</sub>O (valve at ~45degrees) and PMT power supply.
- b. **Verify the controller PC is OFF.**
- c. **Turn on ELXE 500W power supply.**
  - i. This will turn on the lamp fan and monochromators.
- d. **Press the “Start” button to turn the lamp on.**
  - i. Allow the lamp to warm up for thirty minutes.
- e. **Turn controller PC on. It is not necessary to turn on the monitor.**
- f. **Turn on the Dell computer and login** (use your Bowdoin account).
  - i. First time users only.
    1. Create a folder to store your data.
      - a. Open Windows Explorer.
        - i. (Start > All Programs > Accessories > Windows Explorers).
      - b. Go to Desktop > My Computer > Local Disk (C:) > DATAMAX > DATA.
      - c. Create a data folder.
        - i. Click once on the DATA folder to highlight it.
        - ii. Go to (File > New > Folder).
        - iii. Type in your name or initials to name that folder.
    2. Configure a network printer and set it as default.
      - a. Make sure you are connected to the Bowdoin network.
      - b. Go to Start > Run.
      - c. Type in the location of the printer.
        - i. First floor – “\\madison\werner”.
        - ii. Second floor – “\\madison\dahlia”.
      - d. Click OK.
      - e. Set printer as default.
        - i. Start > Printers and Faxes.

- ii. Right click on printer you just added.
  - iii. In the menu, select “Set as Default Printer”.
- g. **Enter sample information in Spex log sheet.**
- h. **Open Instrument Control Center** (Start > All Programs > DataMax\_32 > Instrument Control Center).
- i. **Click OK when the “Layout Selection” window appears.**
- j. **Set Ex calibration.**
  - i. Look on the Ex monochromator (next to the lamp), and change the value in the Calibration Entry box.
  - ii. Click OK.
- k. **Set Em calibration.**
  - i. Look at the Em monochromator (right of sample compartment), and change the value in the Calibration Entry box.
  - ii. Click OK.
- l. **Bring hardware back to correct settings.**
  - i. Click Yes.
- m. **The “Instrument Control Center – FL2\_2T2.Lay” will appear on the screen.**

### 3. Experiment Parameters

- a. **Go to Applications > Experiment.**
- b. **Go to Collect > Experiment.**
- c. **Hit the “Exp Type...” to select the type of scan you would like to do.**
- d. **Set scan parameters.**
  - i. Start and Stop values for the scan.
  - ii. Increment and Integration Time.
  - iii. Wavelength for excitation or to monitor emission.
  - iv. Enter sample/collection information in the Sample and Real Time Processing Information.
- e. **Click DataFile button to select where the spectrum will be saved.**
- f. **Set signals** (click Signals button).
  - i. S is sample and R is reference.
  - ii. If you use R, you must put a negative sign in front of it to make it positive.
  - iii. Typically you would monitor “S”, “-S/R”, and “-R”. Use these settings if you plan on correcting your spectrum.
- g. **Set the high voltage for PMT tube** (click HV (on) button).
  - i. If you are monitoring both “S” and “R”, make sure each one has a voltage.
  - ii. The typical settings are S = 900 V and R = 400 V.
- h. **Set slits.**
  - i. Manually adjust the four slits on the instrument.

### 4. Collect Spectrum

- a. **Insert your sample and click the Run button.**
  - i. Click OK if you get any messages about the slits.
- b. **Remove your sample.**

## 5. Correct Spectrum

- a. **Correct spectrum.**
  - i. The signals collected should be S, -S/R, and -R. -S/R will correct the excitation part of the scan.
  - ii. Open the Math Functions window (Arithmetic > Functions).
  - iii. Function is “multiply”.
  - iv. Operand is “Term File\*k”.
  - v. K is “1”.
  - vi. The term file should already be selected (c:\datamax\emcor96.spc).
  - vii. Hit the Apply button.
  - viii. The top window will be the corrected spectrum, the bottom window will be the original file and the correction file.
  - ix. Click OK.
- b. **Add spectrum to new file** (click Add New button).
  - i. The corrected spectrum will be saved as MATHFUNC.
- c. **Save spectrum** (File > Save As).
  - i. Select the graph that contains the corrected spectrum by clicking on it.
  - ii. Enter a new filename and save.

## 6. Print Spectrum

- a. **Print spectrum** (File > Print)

## 7. Export spectrum

- a. **Using “Copy Screen As” method.**
  - i. Go to Edit > Copy Screen As > Data.
  - ii. Open Excel and go to Edit > Paste.
  - iii. Data will appear in two columns labeled “x” and “y”.
- b. **Using a converter.**
  - i. Go to Options > Parameters.
  - ii. Click on the “Converters” button.
  - iii. Choose converter.
  - iv. Click “Add”.
  - v. Uncheck “Rename Opened Files to \*.SPC”.
  - vi. Click OK.
  - vii. Click OK.
  - viii. Go to File > Save As.
  - ix. Use the “List Files of Type” pull down menu and the extension for you selected converter will be there.

## 8. Shutdown Procedure

- a. **Turn the lamp (press the “Stop” button) and cooling system off. Leave the lamp fan and water on.**
- b. **Turn off the controller PC.**
- c. **Logoff the Dell computer.**
- d. **After fifteen minutes, turn off the lamp fan and the water.**