AVIV ATF 105 SpectroFluorimeter

Starting the Instrument:

NOTE: The order that the power supplies are turned on is very IMPORTANT!

Never fire lamp when instrument power switch is on.

1. Turn on Lamp Power and Cooling Switch
2. Turn on Cooler
3. Wait for lamp ready light to appear
4. Fire lamp by pressing red start button
5. Make sure lamp is ignited and drawing current (Red LED Display)
    a. If lamp doesn't ignite, wait until lamp ready light appears again before re-trying. Note how many attempts it takes to fire lamp in the logbook.
6. Turn on CPU and instrument switch
7. Wait 5 minutes before starting software
8. Let lamp warm up for > 45 minutes

Shutting down the instrument:

1. Quit software
2. Shut down Windows
3. Record lamp hours
4. Turn off lamp power and cooling switch
5. Turn off CPU and instrument switch

Running an experiment:

1. Start software by double clicking on Aviv software. You can change all the current settings by double clicking the left values in the left panel.

    a. Set Excitation/Emission wavelength and bandwidth

    b. Set temperature to desired value

    c. Set stir speed

    d. Change folder that data is saved to – under displays

Note: Changing these values moves the monochromator and slit widths and takes a few seconds. Wait until done before entering next value.

The ATF has a Photo-Multiplier Tube (PMT) that detects light emitted. For each sample that you put into the ATF you have to set the dynode voltage such that the light reaching PMT is in a measurable range. The Maximum absorbance for the PMT is 5.

2. To set the PMT voltage, click on the box on the left hand side of window with PMT and QC information (see figure below).   Set the PMT Control to 80%, when sample is in the instrument and you have set the monochromator and slit widths. When you do this, the Dynode voltage is adjusted such that the signal is 80% of the maximum amount the PMT can detect (80% of 5 = 4).

Note: If you are taking emission spectra and you don't know where your maximum signal is going to be, set the PMT at a wavelength you suspect is the maximum, collect a quick spectra and then once you have maximum go to that wavelength and set PMT Control again. If you are setting up a temperature melt or a chemical denaturation, you must figure out if fluorescence is going to increase or decrease and then set the PMT Control accordingly.

> Setting the QC signal corrects the Raw Signal for when there are fluctuations in the lamp output. By setting the QC to 1, you configure the ATF such that the light output at that moment becomes the baseline output. As long as the lamp has no fluctuations, the QC remains at 1 and the Corrected Signal equals the Raw Signal. Increases in lamp output result in QC >1 correcting the raw signal down while decreases in lamp output result in QC<1 correcting the raw signal up. A "noisy" QC Signal indicates unsteady lamp output during an experiment.

3. To set the QC Signal, go to same box that you used to set PMT voltage and click the Autoset=1 button. If you change the PMT voltage, monochromators, slit width you have to also re-set the QC Signal.

Note: when there are large deviations between the Raw Signal and the Sample Signal it indicates that the lamp is old and may need to be replaces. Please send notify center manager, Katie Tripp
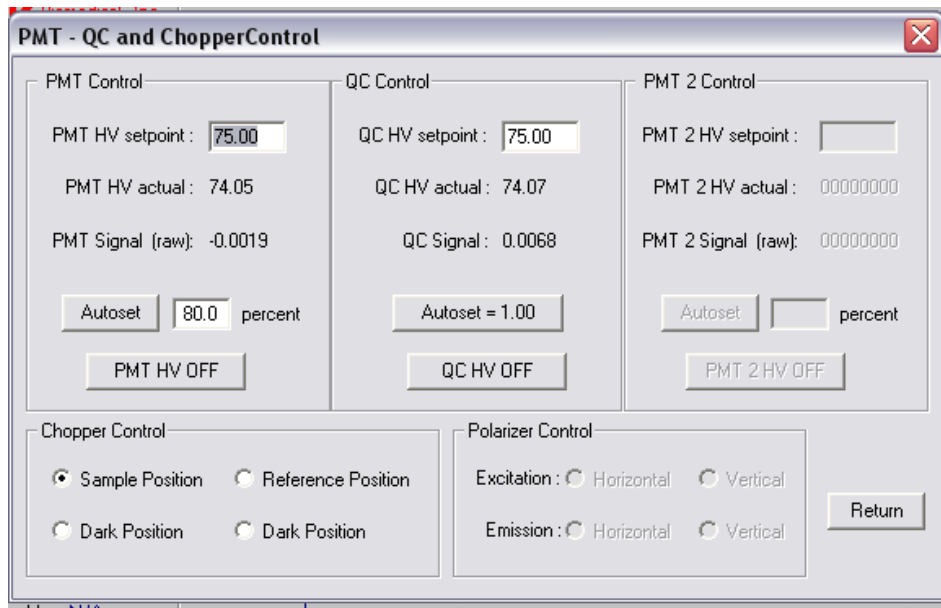
4. To set up experiment, under main control panel:
   a. Select configure experiment panel
   b. Select experiment configuration: select experiment type; set parameters for experiment

         c. Select data set/save option

         d. Click on exit/save configuration

5. Click run experiment

6. Save experiment panel will appear when experiment is complete

7. Saving, exporting and loading data is done through data browser (located in the displays menu)

8. Data is modified through math operations

9. Axis can be rescaled by right-clicking mouse button next to the axis to be changed

         a. Click and drag area to be zoomed

Schematic of ATF light path (courtesy of A. Robinson)