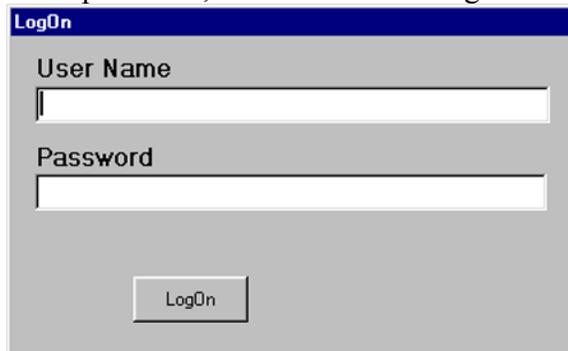
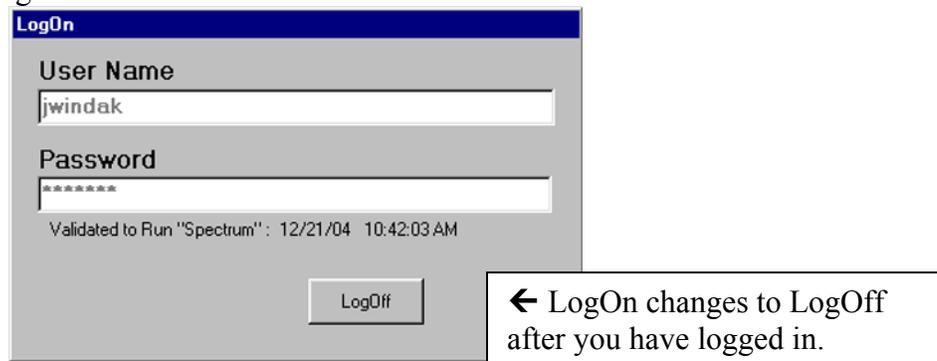


# FT-IR Microscope User's Booklet

- 1) Fill the detector with liquid nitrogen. To open the access door, push down and let the door spring up. Insert the funnel, and fill until the detector just begins to overflow.
- 2) Login with your user name & password, and click on the LogOn button.



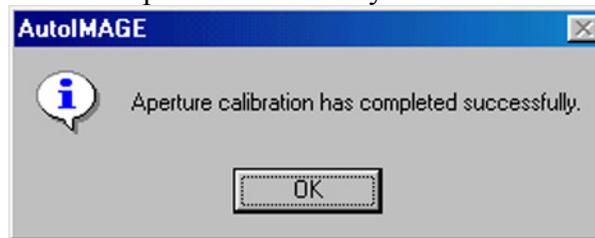
After you have clicked on the LogOn button, it will change to a LogOff button, which you will use to log off when you are finished using the instrument.



- 3) Double-click the Auto-Image icon on the desktop.
- 4) The Auto-Image program will load. It will say that it is going to “start system initialization”. Before you click OK, check to be sure that the microscope slide holders are pushed out of the way, so that nothing is blocking the path of the light beam.

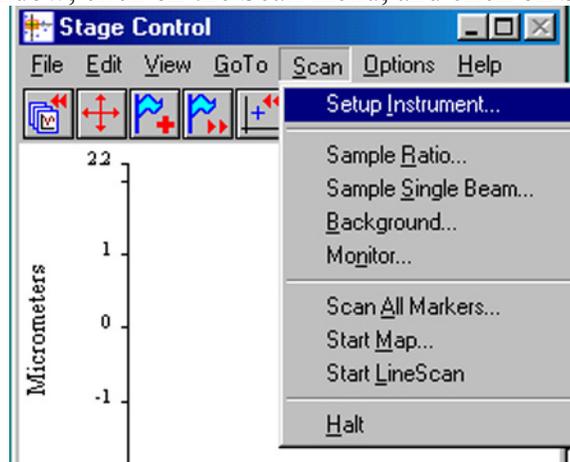


- 5) The initialization process takes approximately 1 ½ minutes. When it is finished, it should say that the “Aperture calibration has completed successfully.”

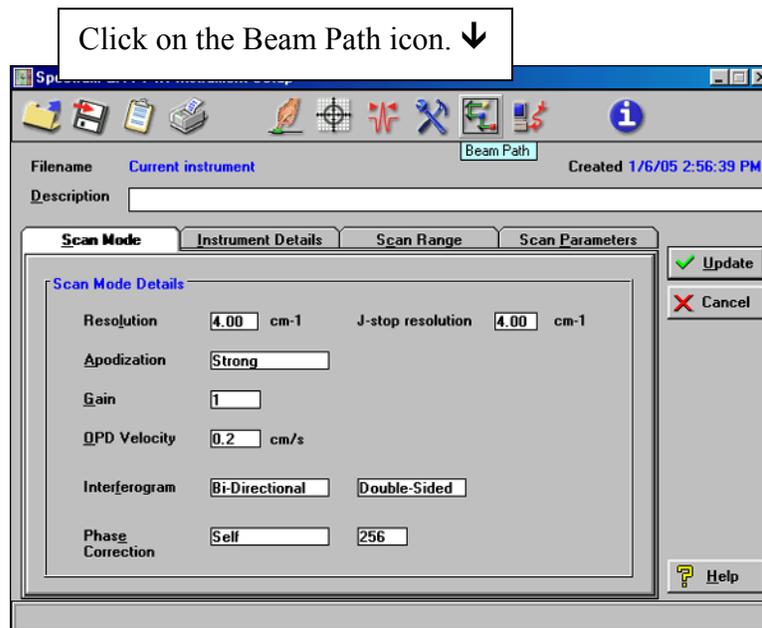


**If, for some reason, it cannot successfully calibrate the aperture, it will give you an error message. If this happens, exit from the AutoImage software, and then re-launch AutoImage again.**

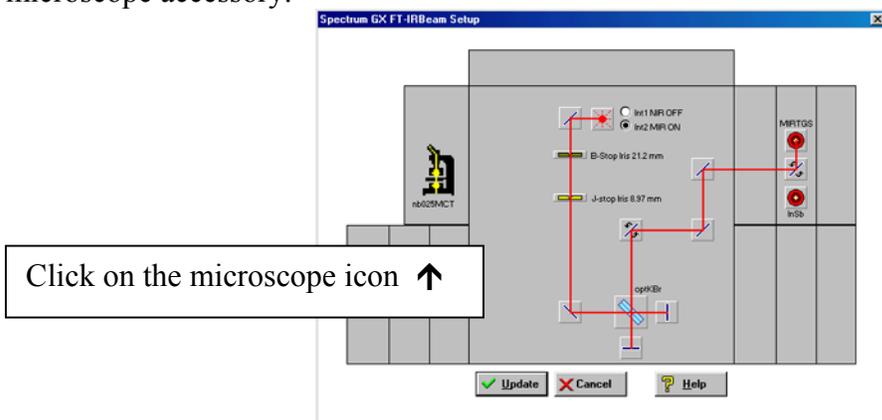
- 6) In the Stage Control window, click on the Scan menu, and click on Setup Instrument.



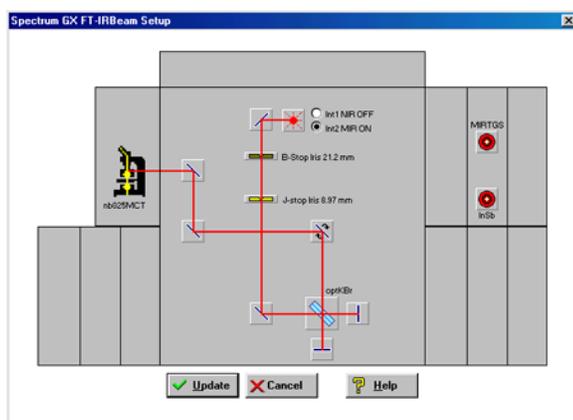
- 7) You will see the instrument setup page come up. Click on the Beam Path icon.



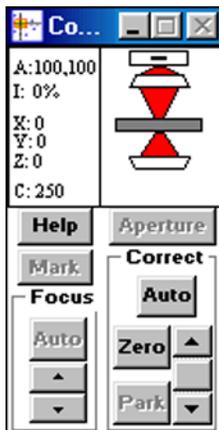
- 8) You will see the beam path page come up. Click on the microscope icon to direct the IR beam to the microscope accessory.



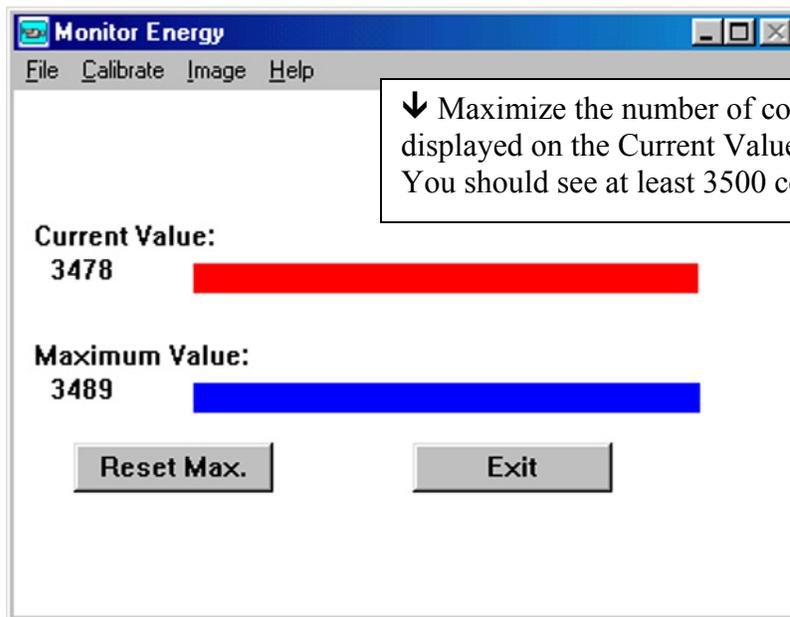
The beam path changes to the microscope accessory.



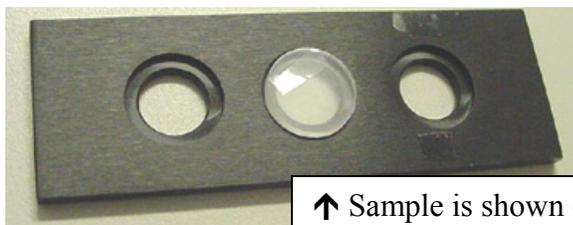
- 9) Click on Update, and the beam path window will close. Then click on Update again to close the Instrument Setup page.
- 10) In the Stage Control window, click on the Scan menu, and click on Monitor. When the Monitor dialog box comes up, click on Energy, and click OK. You will see a display showing the counts of energy seen by the detector. There should be at least 3500 counts. If there are not, you need to adjust the lower Cassegrain mirror to focus the beam. To do this, click on the  and  buttons in the control panel in the “Correct” section.



← Use the  and  buttons in the Correct section to maximize the energy counts displayed in the Current Value graph.



- 11) Position your sample on the microscope slide. If you are doing transmission on a small sample, you may need to place the sample on a KBr disk.



↑ Sample is shown on KBr disk on microscope slide.

- 12) Carefully place the slide on the microscope stage. There is not much clearance room for you to do this. You may need to adjust the position of the slide holders. Please be careful not to drop anything into the Cassegrain mirror below.

**Please Note: If you do accidentally drop a sample into the Cassegrain mirror below, please contact me for help. Please do not try to remove the sample yourself.**

- 13) Using the joystick control, adjust the sample stage so that the light beam spot is focused on the sample.



Rotating the joystick knob clockwise will cause the microscope stage to lower.

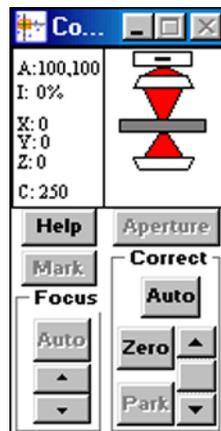
Rotating the knob counterclockwise will cause the stage to raise.

Moving the knob to the left or right, or back and forth will cause the stage to move accordingly.

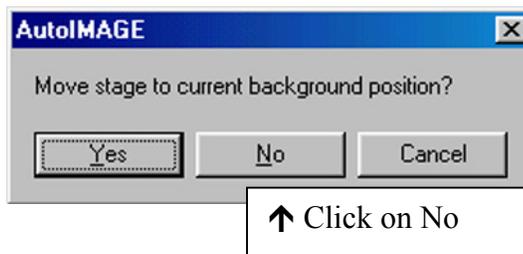


- 14) Using the joystick, move the stage to a location where there is a dividing line at the edge of the sample visible in the camera window. Move the aperture to an area where there is no sample, only blank KBr. Then focus on the surface of the KBr using the  and  arrows in the Focus section of the Control window. You will know when the KBr disk is in focus by clearly seeing any scratches on its surface.

Click on the  and  buttons in the Focus section of the Control window to focus the background image. →



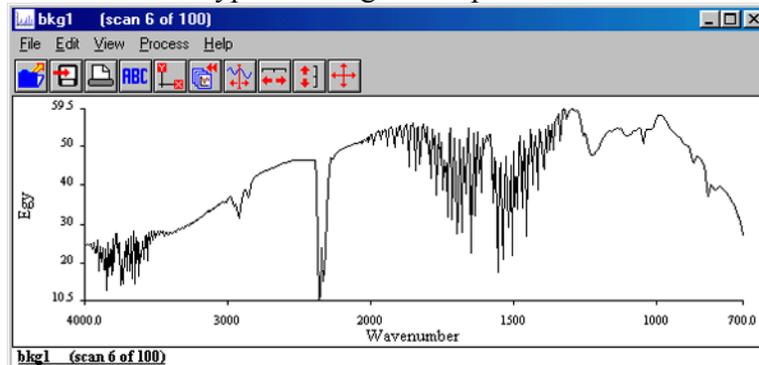
- 15) Click on the Scan menu, and click on Background... Give the background a filename, and then select how many scans you wish to collect (perhaps 100 – 200 scans), and click on OK.
- 16) The software will ask whether you want to move the stage to the current background position. **The answer is No, you want it to stay right where it is.**



17) The system will then collect your background spectrum.

Typical background spectrum:

There are strong water vapor & CO<sub>2</sub> peaks because the microscope stage is open to the room air.



18) Move the stage to where the sample is present, by clicking and dragging the red aperture box in the microscope display window. Then, focus on the surface of the sample by clicking on the  and  buttons in the Focus section of the Control window.

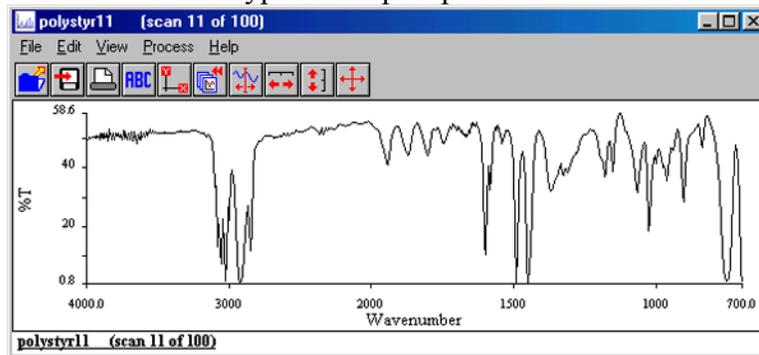
Click on the Scan menu, and Sample Ratio...

You will need to enter a filename, and select how many scans your wish to collect. Click on OK

19) The system will then collect your sample spectrum.

Typical sample spectrum:

The water vapor & CO<sub>2</sub> peaks will mostly cancel out if they are at the same level in both the background and sample scans.



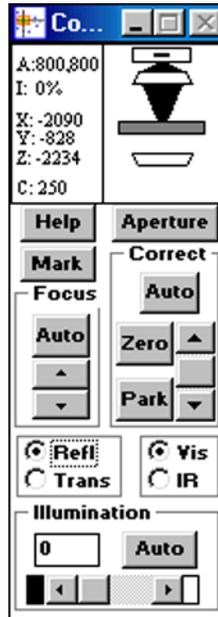
20) Click on the File menu of the spectrum window, and click on Save As... Navigate to the folder where you want to save the data. Give the spectrum a filename and click on OK.

21) Your sample must be very thin in order to obtain a good transmission spectrum. For thick or opaque samples, you may need to try reflectance IR. To run a sample by reflectance, place it on the gold-plated mirror on the microscope slide.



↑ Sample is shown on gold-plated mirror on microscope slide.

22) For Reflectance work, click on the button labeled "Refl" in the Control window.

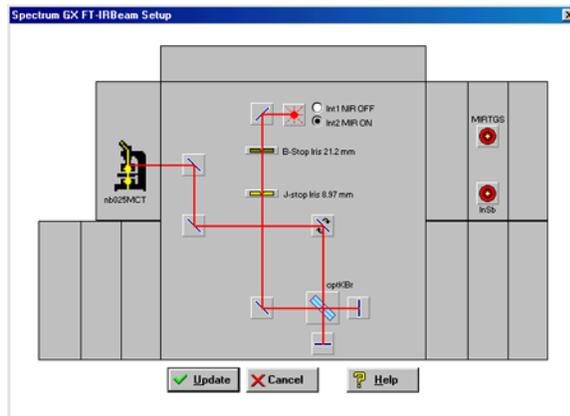


Click on the button labeled “Refl” → to switch to Reflectance mode.

23) When running in Reflectance mode, focus on the surface of the gold-plated mirror, and then collect a background spectrum. Then move the aperture to the sample area, and focus on the surface of the sample. Then do collect a Sample Ratio spectrum.

24) When you are finished using the microscope IR, please do the following steps:

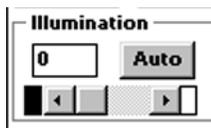
- Remove your sample and slide from the microscope.
- Click on the Scan menu, and click on Setup Instrument. When the instrument setup window comes up, click on the beampath icon. In the beampath window, click on the MIRTGS detector, and then click on Update.



← Click on MIRTGS to switch back to the standard mid-IR detector.

- Click on Update again to close the Instrument Setup window.
- Turn the Illumination setting to zero, in the Control window.

Set the Illumination to zero before exiting from the software. This will turn the lamp off.



- Exit from the AutoImage software.
- Click on the LogOff button of the Login program. Please remember to do this, otherwise you will keep accumulating time that you will be billed for.

**LogOn**

User Name  
jwindak

Password  
\*\*\*\*\*

Validated to Run "Spectrum" : 12/21/04 10:42:03 AM

LogOff

**←Please remember to click on the LogOff button when you are finished.**