Using the AlphaStep500 Stylus Profilometer

This machine does not need to be reserved. If you are using it several times in one day, you may leave the system on.

The AlphaStep Profilometer can provide angstrom resolution of step edges, pits, bumps. The stylus travels from left to right, starting at the X mark on the monitor. To avoid peeling a film up, it may be easier to travel down a step edge rather than up. The sharper the step edge the easier it will be to measure height. The system rarely needs calibration, but a calibration sample is available.

1) If you have a CCMR Coral account, enable the instrument in Coral. If you do not have a Coral account, write your usage down on the clipboard.
2) Turn on the computer and follow instructions on screen (ESC to boot, ENTER TO INITIALIZE)
3) Let the system warm up for 5-10 minutes during which time you can:
    a. Place sample on the stage, further to rear may help with alignment
    b. Close the Plexiglas cover to reduce air currents around the stylus
    c. Use adjustment knobs on left of instrument to situate sample beneath stylus
4) Press F5 to activate the camera on-screen.
5) Press and hold the DOWN ARROW to raise the stage. Adjust the stage to keep the light spot near your scan region. Release the DOWN ARROW when the stylus makes contact with the substrate.
6) You can move the stage slowly, while the stylus is in contact, to position the scan start point.
7) You may change the scan parameters by pressing ESC and selecting RECIPE, VIEW/MODIFY
    a. **Scan Length**. Default is 500 microns. Range is 1 micron to 5 mm. Longer scan lengths may begin to measure substrate curvature
    b. **Vertical Range/Resolution**. Default is 13 micron/1 angstrom. Can select 300 micron/25 angstrom if the data goes off scale due to sample tilt.
    c. Press ESC once parameters are set.
8) Press F8 (START) to begin the scan. Avoid bumping the table while the scan is in progress.
9) Manipulating the scan data:
    a. Wait until the stylus returns to the start position (rehomes after scan)
    b. If the sample has any tilt to it, you will need to LEVEL the data.
        i. Press F10 (LEVEL) and left/right red cursor lines will appear
        ii. Use trackball or left/right arrow keys to move the cursors
        iii. Press the trackball button or space bar to toggle between the left/right cursors
        iv. Place left/right cursors on a region that you know is flat and press F10/LEVEL to level the data to those two cursor points.
        v. The cursors should change to blue
    c. Vertical heights and horizontal distances are calculated between the blue cursors. Use the left/right arrow keys and space bar to toggle the left/right cursors
10) Turn on the printer and press PRINTSCREEN to send screen to the printer.
11) When finished:
    a. Press F5 to activate the camera and press the UP ARROW to lower the stage and remove your sample.
    b. Press ESC to return to the menu and select EXIT, SHUTDOWN TO DOS, y
    c. Turn off the computer
    d. Clean up your work area, leave the area cleaner than you found it.
    e. Log out of Coral if enabled.

Exporting data to 3.5” floppy disk (Not all disks work, older high density or double high density disks may work better. Sometimes only one file can export, so double check)

1) After taking a scan, press F4 to save raw+summary data to database. Save as a filename with no “#” or other symbols. You may need to save a recipe name also.
2) To export data from database:
    a. Press ESC and go to DATA menu,
    b. go to CATALOG
    c. Press F2 to recall, find your file name, highlight and press F3 to export
    d. Select N to export as ASCII
    e. Write down the scan lengths as that information might be hard to see later
    f. Take other data if needed
3) When done, exit to DOS instead of just shutting down.
4) Data is saved to the c:/tencor/exp/sdata directory
    a. Type “cd exp”, enter
    b. Type “cd sdata”, enter
    c. Type “dir” to see all files in the directory
5) Insert disk and type copy [filename.rwt] a: “copy scan.rwt a:”
6) Import into excel
    a. First two columns may be summary data, in Angstroms
    b. All data are in the other columns, but there are 16 columns of that data.
    c. You probably need to create your own x-axis scale to plot to scale using known scan lengths