Lab 3a. The Sky #1

Equipment
- Celestial Sphere; Color Pens; (and preferably a clear night though this is not essential).

Mini Lecture prior to Lab, Procedure, & Setup
- Please go over the main definitions of RA, Dec, Equator, etc. The students keep the descriptive pages of the pre-lab. These are good for reference and definitions.
- Show them what is where of the Celestial Sphere and how to use it.

General Procedure & Lab Setup
- If this is a night-lab and the sky is clear, please take the students outside and let them find Polaris and a few constellations prior to doing part I.
- In part II, section 1, please demonstrate how to turn the Celestial Sphere.
- In section 2, please have one partner read out the words in capital letters (e.g., horizon, declination, etc.) and the other locate that on the Celestial Sphere. This will make section 3 easier.
- In part III students will often forget to draw the stellar paths, please remind them if they do.
- If the photocopies are not good, you might need a better picture. You can download it from the Anglo-Australian Web-Site. It is one of David Malin's pictures.
- Quiz question #2 can be done at home, if time becomes an issue.

Notes & Suggestions
- If the students have problems with the table, just pick an example (maybe Boston at ~50^{o}) and do the whole row together with the students.
- Sometimes students do not know what to do with the picture in the quiz question. Please have them hold picture at arms length in front of them, and follow the instructions in the text next to the picture.
- The main challenge of this lab is translating the 2-dimensional drawings in the pre-lab to 3-dimensional shapes on the Celestial Sphere, and then visualizing what is really happening in the night sky.

General Concepts & What students might get out of this Lab
- A sense of direction and how to find Polaris and other constellations
- A feeling about stellar motions in the sky, and why and how the sky changes throughout the night.
- An idea about how the night sky changes with location on earth.
- Maybe some basics about coordinate systems, though this is not the main goal

Scientific Methodologies
- Geometrical Visualizations (which is sometimes totally new to students)