Setting up the Paramount ME + 12” Meade for CCD observing
(MDF, 8/05/06)

Attaching the Camera to the Telescope in the Dome:

1. The standard back-end for CCD observing is f/6 focal reducer + JMI motorized focuser + 2” CCD nosepiece + CFW8 filter wheel + ST-9E CCD camera. The nosepiece and filter wheel should remain attached to the camera in its case in the control room, but if the telescope was last used for visual observing, you will have to take off the JMI focuser and attach the focal reducer.

2. When you put the 2” nosepiece for the CCD camera into the back of the JMI focuser, make sure that the set screws are in the channel on the nosepiece, and tighten the screws seriously finger-tight.

3. Most of the cables for connecting the camera are in the black tool chest. Connect the power for the camera through the mount, and connect the DB25 data cable that comes out of the conduit from the control room to the CCD camera. Connect the 6-pin phone cable from the guider port on the camera to the guider port on the telescope. Finally, make sure the power for the JMI motorized focuser is connected to the mount. Tuck these cables in to keep them from snagging on anything, especially if the mount does a German flip.

4. Turn on the mount and “home” it by double-tapping on the joystick button. Open the dome shutter and disconnect the power cable for the dome shutter (tuck the cable behind one of the light fixtures). Remove the telescope aperture covers.

Connecting to the Camera and Telescope from the Control Room:

5. On the PC in the control room, launch both CCDSoft v.5 and TheSky v.6. In TheSky, choose “Telescope > Establish Connection”. You should see white crosshairs showing where the telescope is pointing.

6. In CCDSoft, choose “Camera > Setup”. Connect to the camera and set the temperature setpoint to about 30-40 degrees below the ambient temperature.

7. While the camera is cooling down, move the telescope to a nearby bright star (from magnitude 1 to 4) by clicking on the star in TheSky then hitting the “slew” button on the bottom of the info box that pops up (the slew button looks like a little green telescope).

8. In CCDSoft, click on the Focus tab on the camera control window, and take a short exposure (0.5 seconds or so) through the clear filter with 2x2 binning and continuous readout. You should see a doughnut on the screen, which is the out-of-focus bright star. If the telescope was last used for visual observing, you will have to go back to the dome and crank the coarse focus knob on the back of the telescope CCW for 3 to 5 turns. You might have to do this several times. When the star looks close to focus at 2x2 binning, you can stop the coarse focusing and use the JMI focuser. (If the star is not in the field of view of the camera when you start taking focus images, go out to the dome and center the star in the finderscope.)

9. Center the star use the “Telescope > Motion Controls” window in TheSky, then sync on the star by choosing “Sync” on the telescope tab in the info box for the star. Choose a fainter, nearby star for fine focus (magnitude of 6-9), and slew to it.
10. Using the focus tab in CCDSoft, take a single full-frame (1x1 binning) exposure of 1-3 seconds. Using the cursor, draw a small box around the star. The “subframe” box will become checked. Start taking continuous exposures again.

11. In TheSky, open “Telescope > Options > Focus Tools”. This will control the JMI motorized focuser. While watching the subframe read out in CCDSoft, click on the “In” or “Out” buttons until the star is sharp.

12. Recenter the star and sync TheSky again if necessary.

13. You are now ready to take CCD images. Save images in the “My Documents” folder in a subfolder with the year-month-date as the folder name. You can autosave a sequence of images by setting up a folder under the “autosave” tab and using the “Take Image” tab. In general, you should “Take Images” to take images for saving, and you should use the “Focus Tools” tab to take images for centering or focusing.