Prerequisites

This procedure is used when installing the CCDS instrument to the 2.4m telescope Multiple Instrument System (MIS). Instrument rotator needs to face North.

Equipment Needed

- Canned air.
- Allen wrenches.
- Adjustable wrench.

Hardware Installation

Pump the vacuum and fill the dewar with liquid Nitrogen. Move the instrument and handler onto the hydraulic floor of the telescope.

Remove the CCD power supply if still attached to the telescope.

Pull the downward looking optics out.
Turn the Fairchild guider power supply off.

Remove the guider access plate.

Loosen the clamps on the guider camera.

Remove the guider camera and change the lens to 135mm with the focus set between infinity and the next marking down (20m), the aperture set wide open (f2.8)

Install the guider camera and align the marks. Clamp the guider and refit the the cover plate.
Turn the Fairchild guider power supply on.

Dust off the top of the instrument and remove the cover plate.

Dust off the slit and filters.

Put two bolts in the MIS and use them to align the instrument during raising it up to the MIS unit using the hydraulic floor. The head electronics box faces North, CCD to the West and instrument electronics box to the South. Take care not to bump the optics on the instrument on the MIS unit.

Bolt the instrument onto the MIS unit.
Plug in the acquisition computer network cable to the SBIG guider camera. No network lights will appear until the CCDS acquisition computer is powered up.

Plug in the power strip to the mains connection.

Lower the hydraulic floor and remove the handler.

Plug in the fiber optics to the CCD head electronics.
Attach bolts through the MIS and into the instrument in addition to the instrument clamping points as an extra precaution.

Balance the telescope according to the table on the side of the mirror cell.

<table>
<thead>
<tr>
<th>Balances</th>
<th>N/S</th>
<th>Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>1850</td>
<td>1000</td>
</tr>
<tr>
<td>MKIII</td>
<td>2250</td>
<td>700</td>
</tr>
<tr>
<td>Modspec</td>
<td>2612</td>
<td>850</td>
</tr>
<tr>
<td>TIFKAM</td>
<td>2710</td>
<td>975</td>
</tr>
<tr>
<td>CCD8</td>
<td>2330</td>
<td>775</td>
</tr>
<tr>
<td>8K</td>
<td>2530</td>
<td>1550</td>
</tr>
</tbody>
</table>

Set vertical weights to 1875

Set horizontal weights to 775

In the computer room, connect the telescope optical fibers to the IC computer. Red to receive, blue to transmit. Turn on the Caliban disks and the IC computer. Reboot the IC computer if it was already on. Make sure that the IC computer can see the Caliban disks.
In the control room, disconnect video in and out from the DTI and connect both cables to the Seitzer guider (TV guider) card in the guider PC. Make sure that “Guider” is selected. Install the IC monitor, CCDS Acquisition monitor & keyboard & mouse. Turn on IC and Acquisition computers.

In the computer room, change the PC parallel port cable to the Seitzer guider cable (TV guider). Make sure the CCDS Acquisition camera computer and IC computer is on.

Software Installation

1. Power cycle the Instrument Electronics (IE) and Head Electronics (HE) boxes on the instrument.
2. On CCDS acquisition computer, log in as “visitor”. This should take you into the SBIG gui.
3. On CCDS acquisition computer, click on “Setup”.
4. On CCDS acquisition computer, turn temperature regulation on and adjust the set point to -20. Click “Okay” when done.
5. On CCDS acquisition computer, click on “Focus” and set exposure time to 1. Click on “Okay” to see a guider image.
6. Reboot the hiltner computer by logging out and typing “reboot” at the prompt.
7. In the computer room, type “c” on the IC computer to select CCDS. All of the boxes in the lower part of the screen should be highlighted if everything is okay. If not, type “exit” then “mono” then “c” to restart.
8. Log into hiltner
9. In an xterm, type “telconfig” and follow the prompts.
10. From the background menu, select “Telescope control – XTCS”.
11. From the background menu, select “Telescope control – XMIS”.
12. On both the XTCS and XMIS displays click on initialize.
13. In the XMIS gui, click on “in” for Retrocam prism.
14. In the XMIS gui, turn on the flat lamp to see the slit on the SBIG camera on a 1 second exposure.
15. On XMIS, select “Preset – Center” on guider section of gui.
16. Turn up the voltage on the guider image intensifier to see a guider image.
17. From the background menu, select “Data Acquisition – Isis”.
18. From the background menu, select “MDM TCS Agent”.
19. In the MDM TCS Agent gui, type “tcinit”.
20. In the MDM TCS Agent gui, type “tcstatus”.
21. From the background menu, select “Data Acquisition – Caliban”.
22. From the background menu, select “Data Acquisition – Prospero”.
23. In the Prospero window, type “startup” and everything should come up green. If not, restart
Caliban and type “startup” in Prospero again.
24. In the Prospero window, type “runinit”
25. Click on the IRAF icon to bring up IRAF.
26. Click on the DS9 icon to bring up DS9.
27. Both of the above can also be brought up from the background menu on the Data Acquisition menu.
28. Select “Data acquisition – Retrocam” from the background menu. Type “retrocam” in the window that appears to start Retrocam.
29. In the XMIS gui, turn on the Neon lamps.
30. In the Prospero window, type “grooves 350” for the 350 line grating. If another grating is installed, then put its number here.
31. In the Prospero window, type “order 1”
32. In the Prospero window, type “newcenter 5700”
33. In the Prospero window, type “exp 1”
34. In the Prospero window, type “comp”
35. In the Prospero window, type “go”
36. In the Prospero window, using the “center” command, move the grating to -7 as displayed in the “grattilt” value on the Prospero gui.
37. In the Prospero window, type “setslit 100” to move the slit to 100 microns.
38. In the Prospero window, type “pwd” to see the directory path.
39. In IRAF, change to the current image directory and type “disp<filename>” to see the image.
40. On the XMIS gui, turn off the comparison lamps.
41. On the XTCS gui, move Retrocam to the “out” position.
42. On the guider PC, type “ctrl/alt/del” to reboot the computer.
43. On the guider PC, type “cd tvguider”
44. On the guider PC, type “tvguider -i” and follow the prompts. Type “p” to change the parameters, fraction of guide motion is set to 0.5.
45. On the DFM controller, turn on TCS power, drives & autoguider.
46. On the guider PC, type “m”
47. On the guider PC, type “n” or “e” or “s” or “w”.
48. On the TCS, make sure that the command is received and that the telescope moves. Repeat the above for each direction.
49. Check the telescope balance.
50. Turn off drives.
51. On the DFM controller, turn off TCS power, drives & autoguider.

Grating Change

To change the grating, send the grating to “gratzero” in the prospero window. Once there the grating can be changed. Undo the power connector to the grating mechanism and remove the allen bolts from the grating mechanism. Pull the grating out and change. Install the mechanism back, install the allen bolts and refit the power connector. In Prospero, type “grooves 150” for the 150 line grating, change the number if a different grating is installed. In Prospero, type “order 1” for a first order grating, change the number if a different grating is used. In Prospero, type “center 5700” to move the grating to 5700. Put on the comp lamp and take an image. Find the emission lines and identify their wavelengths. In Prospero type “newcenter <number>” where <number> is the wavelength where the grating is currently.