

BLUE/RED OBSERVING GUIDE

A step-by-step guide to take you from the start of the night to your first science exposure. Please read the "Using Blue/Red Channel" cheat sheet before proceeding with this guide. Be sure to upload your catalog of objects and offset stars before your run.

- 1) Create a directory in the mmtobs home directory for your data (%mkdir 120824).
- 2) Make sure you have the following open:
 - a. 2 IRAF windows (one for 'acquisition' and one for 'analysis'; click blue 'star' icon on the bottom dock)
 - b. ds9 (click the SAO icon on the bottom dock)
 - c. Blue or Red Channel GUI (click BCCS or RCCS icons on the bottom dock)
- 3) In an IRAF window change directory into your night specific directory created in step 1. Then type ccdacq to establish your acquisition window. DO NOT type any acquisition commands in the 'analysis' window, ever.
- 4) Print out log sheets (master copies are in the folder or found at <u>www.mmto.org</u> under Observer's Tools). Or, if you prefer, a more general spectrograph log sheet is available at http://james.as.arizona.edu/~psmith/90inch/spectlog.ps
- 5) In your acquisition window verify the detector temperature:

ecl> dete

The correct detector operating temperature is \sim -129 for Blue Channel \sim -137 for Red. If the detector temperature differs significantly from these values, alert the TO. If you get a communication error, try typing 'flpr' twice at the prompt. If this does not work, try exiting and restarting the IRAF window. If the problem persists, talk to the TO.

6) If desired, verify correct parameters in telpars, instrpars & detpars (using either epar or lpar command). Check the values given as Blue/Red and select as appropriate for the instrument you are using. Note that Red has more rows than columns.

```
a. telname = mmt
b. instrname = mmtbluechan/mmtredchan
c. detname = mmtbluechan/mmtredchan
d. first col = 1
e. last col = 2688/520 ; full size
f. firstrow = 1
g. lastrow = 512/1032 ; full size
h. colbin = 1/2
```

i. rowbin = 2/1

7) Take a test bias frame:

```
ecl> zeros
```

```
Number of exposures (1:) (1):
```

Verify counts of ~1950 (Blue Channel) or ~3300 (Red) & standard deviation of ~2.5, and no evidence of patterns. Again, if the bias does not look correct alert the TO.

- 8) If all looks good take several more bias frames the same way using zeros.
- 9) At beginning of the night determine the instrument focus using the lampfocuses & specfocus tasks – see separate cheat sheet for detailed description. The spectrograph generally will not be focused for you before your run begins.
- 10) Once instrument focus is determined from specfocus enter the value into the 'focus' box in the control GUI. Be sure to hit "Configure Spectrograph" at the bottom of the GUI, or it will not take effect.
- 11) Configure the spectrograph using drop-down menus for any calibrations required. Red channel grating changes must be done with the telescope above 70deg elevation. Blue gratings may be changed at any elevation.

If you require sky flats please talk to the TO well in advance of sunset. Recommended: you can begin taking test exposures (1 sec) just after sunset. When you can expose for 5 sec without saturating, use observe to take ~3-5 sky flats with a peak flux of ~20000 counts. Don't use imagetype = flat as this may interfere with the lamp system.

- 12) To take a lamp flat:
 - a. Verify toggle on 'lamps control box' is set to 'SCCS CONTROL' so the lamps can be switched on & off by the software tasks.
 - b. Confirm with TO that the videoscope is turned down so it is not damaged by the calibration lamps. The videoscope is always off during the day.

c.	ecl> epar compflat	
	nexpo = 1	Number of exposures
	exptime = 2	Exposure time (seconds)
	complamp = "BC"	Comparison lamp (*see below)
	<pre>objecttitle = "flat"</pre>	Object title
d.	<pre>^d to save edits and exit. Continuum lamps available -> ecl > compflat</pre>	DC = Dim Continuum BC = Bright Continuum

Calibration sources will be switched on & off automatically. For Blue Channel observing, counts for BC should range from ~2000-20000 for a 15 sec exposure, with low values in the blue (left).

13) To take a wavelength comparison:

- a. Verify toggle on 'lamps control box' is set to 'SCCS CONTROL' so the lamps can be switched on & off by the software tasks.
- b. Confirm with TO that the videoscope is turned down so it is not damaged by the calibration lamps. The videoscope is always off during the day.
- c. ecl> epar comps
 nexpo = 1
 exptime = 30
 complamp = "HeAr/Ne"
 objecttitle = "arc"
 Number of exposures
 Exposure time (seconds)
 Comparison lamp (*see below)
 Object title

^d to save edits and exit.

Arc lamps that are available include HeAr/Ne/ThAr/FeNe/HgCd (note: names are case sensitive and delimited by '/', order is not important).

ET = Etalon

If you are working shortward of ~3900A, we recommend use of the HgCd lamp.

d. ecl > comps

Calibration sources will be switched on & off automatically.

14) To take a science exposure:

```
a. ecl > observe
Image type (object | zero | dark | flat | comp | focus)
(object):
Exposure time (seconds) (0.:16200.) (20.):
Object title:
```

You can take all exposure types with observe, but it is necessary to use comps/ compflat for calibration frames in order to have the lamps controlled through the software correctly.

- b. If you need to *PAUSE* the exposure for any reason, press '**p**' in the acquisition window (the exposure must have more than 5 seconds left to be able to pause). Once you have paused the integration you have the following options:
 - i. RESUME type a 'r'. Exposure will continue to the end of the integration time
 - ii. *STOP* type a '**S**' (note capitals). Exposure will stop immediately and be saved to file
 - iii. ABORT type a 'A' (note capitals). Exposure will NOT be saved, image will be lost
- c. For many more helpful hints & tips please see "An Observer's Guide to Taking CCD Data with ICE" by P. Massey et al., 2000. A hardcopy should be in the instrument's folder, or you can find it on our website.
- 15) If you wish to do repeat any exposures with exactly the same configuration, use mores.
- 16) At the end of your run you must take a copy of your data with you. The **mmtobs** account will be reset in the morning for the next observer. If you have an emergency and lose your data please

contact us as soon as possible, as some data files may be accessible temporarily. However, we do not take responsibility for your data so it is safest to take it with you.