MIRSI OBSERVER'S GUIDE

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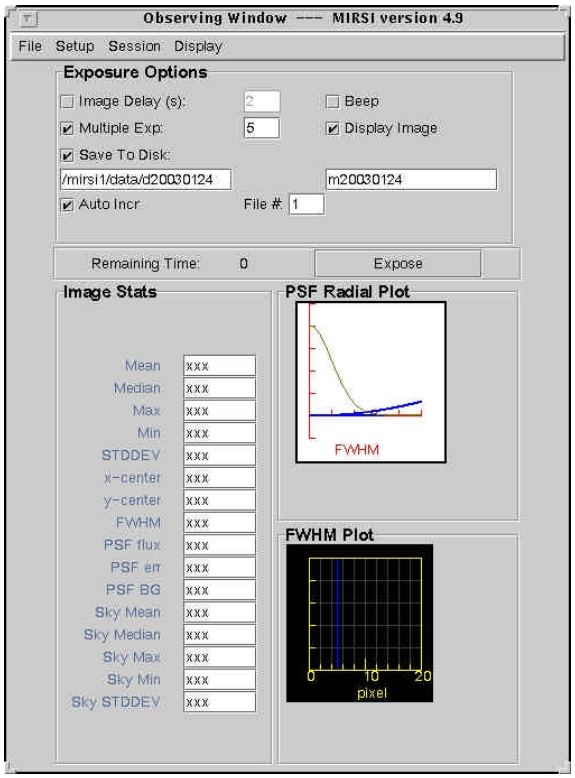
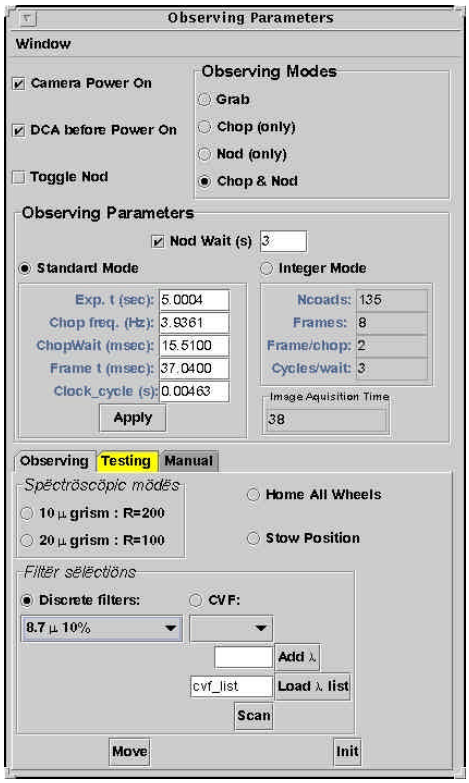
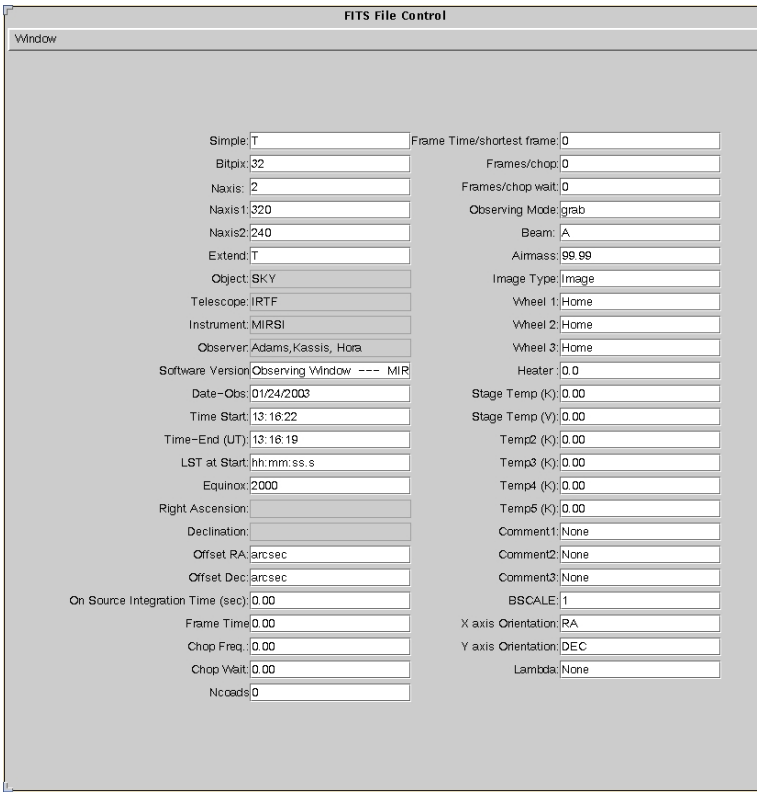
Operating MIRSI

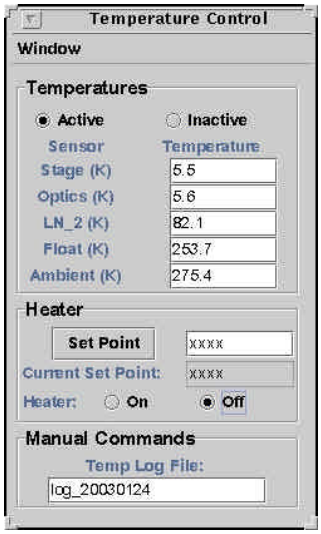
This procedure contains the steps for taking an exposure, assuming that the camera is ready for observations, the **mirsi** program running, and the camera, filter wheel, and temperature control initialized. Snapshot pictures of the software interface windows are included below.

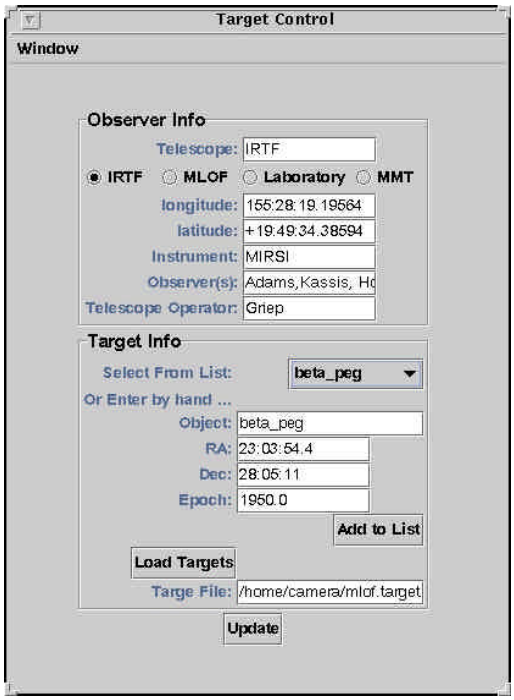
1. Open the **Observing Parameters** window (see snapshots on the following page).
    - Click on the **Observing** button.
    - Select an initial filter configuration, such as 8.7 μm. In **Observing** mode, the **mirsi** program will automatically select the appropriate aperture and blocking filter.
    - Press the **Move** button. The **Move** button should morph into **Stop**. When the wheels have reached their home positions, the **Move** button will appear again.
2. From the **Observing Parameters** window,
    - Choose an observing mode (grab, chop, nod, chop+nod).
    - Input the desired observing parameters in **Standard Mode** or **Integer Mode**. The **MIRSI SETUP** sheet (included below) should be handy for quick reference to these parameter values.
    - Press **Apply**. This sends the parameters to the camera controller and displays the approximate total time for the completion of the exposure.
3. From the **Observing Window**,
    - Verify that the data directory and file name root incorporates the current date.
    - The **File #** will automatically increment if **Save to Disk** is selected. In the data directory, the FITS file names will be designated as **m*YYYYMMDD*_####.fits** where #### stands for 0001, 0002, etc. Chop and/or nod images are stored as a single FITS file with FITS extensions corresponding to the different beams. Also, if the display mode is in beam subtraction, a differenced image file (e.g. **diff_0001.fits**) will be saved in addition to the usual FITS file.
    - Select the desired setup for image delay, save to disk, display image, etc.
    - Note this window contains real-time image statistics to help monitor the sky background, telescope focus, and overall image quality.
4. From the **Session** menu, open the **Target & Observer Info** window. Select the site and enter the observer and target object information.
5. From the **Display** menu, select the desired display mode (raw image or chop/nod difference).
6. Have the telescope operator set the chop throw to the desired distance.
7. Have the telescope operator define the nod beams.
8. In the main window, click **Expose** to start an exposure. Note: DO NOT **Abort** during an exposure, only between multiple exposures. If **display image** is selected, then when the exposure is finished, **mirsi** will automatically display the image in the ds9 window, in the selected display mode. For multiple exposures, **mirsi** will automatically display each image after acquisition.

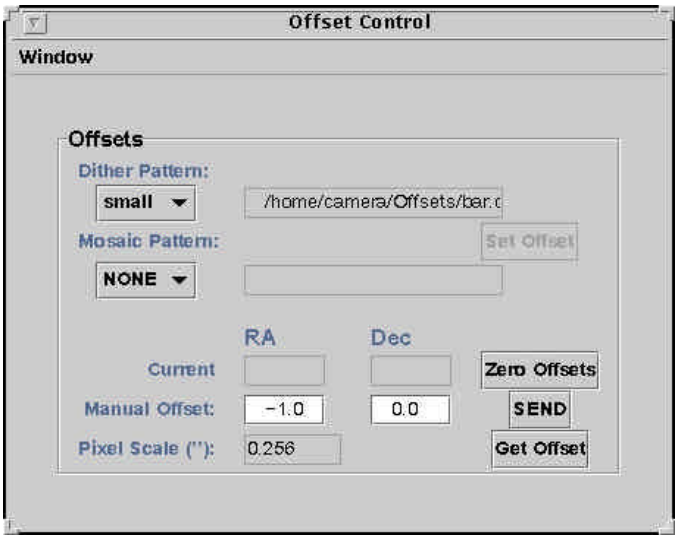

Observing Window --- MIRSI version 4.9
File Setup Session Display
Exposure Options
Image Delay (s): 2
Beep
Multiple Exp: 5
Display Image
Save To Disk:
/mirsi1/data/d20030124
m20030124
Auto Incr
File #: 1
Remaining Time: 0
Expose
Image Stats
Mean xxx
Median xxx
Max xxx
Min xxx
STDDEV xxx
x-center xxx
y-center xxx
FWHM xxx
PSF flux xxx
PSF err xxx
PSF BG xxx
Sky Mean xxx
Sky Median xxx
Sky Max xxx
Sky Min xxx
Sky STDDEV xxx
PSF Radial Plot
FWHM
FWHM Plot
0
10
20
pixel


Observing Parameters
Window
Camera Power On
DCA before Power On
Toggle Nod
Observing Modes
Grab
Chop (only)
Nod (only)
Chop & Nod
Observing Parameters
Nod Wait (s) 3
Standard Mode
Integer Mode
Exp. t (sec): 5.0004
Chop freq. (Hz): 3.9361
ChopWait (msec): 15.5100
Frame t (msec): 37.0400
Clock_cycle (s): 0.00463
Apply
Ncoads: 135
Frames: 8
Frame/chop: 2
Cycles/wait: 3
Image Aquisition Time
38
Observing
Testing
Manual
Spectroscopic modes
10 μ grism : R=200
20 μ grism : R=100
Home All Wheels
Stow Position
Filter selections
Discrete filters:
CVF:
8.7 μ 10%
Add λ
cvf_list
Load λ list
Scan
Move
Init


FITS File Control
Window
Simple: T
Bitpix: 32
Naxis: 2
Naxis1: 320
Naxis2: 240
Extend: T
Object: SKY
Telescope: IRTF
Instrument: MIRSI
Observer: Adams,Kassis, Hora
Software Version: Observing Window --- MIR
Date-Obs: 01/24/2003
Time Start: 13:16:22
Time-End (UT): 13:16:19
LST at Start: hh:mm:ss.s
Equinox: 2000
Right Ascension:
Declination:
Offset RA: arcsec
Offset Dec: arcsec
On Source Integration Time (sec): 0.00
Frame Time: 0.00
Chop Freq.: 0.00
Chop Wait: 0.00
Ncoads: 0
Frame Time/shortest frame: 0
Frames/chop: 0
Frames/chop wait: 0
Observing Mode: grab
Beam: A
Airmass: 99.99
Image Type: Image
Wheel 1: Home
Wheel 2: Home
Wheel 3: Home
Heater: 0.0
Stage Temp (K): 0.00
Stage Temp (V): 0.00
Temp2 (K): 0.00
Temp3 (K): 0.00
Temp4 (K): 0.00
Temp5 (K): 0.00
Comment1: None
Comment2: None
Comment3: None
BSCALE: 1
X axis Orientation: RA
Y axis Orientation: DEC
Lambda: None


Temperature Control
Window
Temperatures
Active
Inactive
Sensor
Temperature
Stage (K) 5.5
Optics (K) 5.6
LN_2 (K) 82.1
Float (K) 253.7
Ambient (K) 275.4
Heater
Set Point
xxxx
Current Set Point: xxxx
Heater: On Off
Manual Commands
Temp Log File:
log_20030124





Target Lists

Target information is gathered by the host program and entered into the image FITS headers. Currently, the host program does not yet send coordinates to the telescope control system. The host program can upload a file containing a list of targets or coordinates. This feature speeds up the process of updated the target information into the FITS header. A target file requires the form
Object_name RA DEC Epoch
e.g. (note the underscore in the name string):

Orion_nebula 05:05:50 +05:30:29 2000

To load the target list, first from the **Session** menu select **Target & Observer Info**, and then load the file. Alternatively, an observer can enter the target information manually, and optionally add the target to the current list.

Standard stars

For point source flux calibration, the MIRSI team typically uses bright targets from a list of mid-infrared standard stars in the *MIRAC3 User's Manual* (W. Hoffmann & J. Hora 1999). A number of these stars should be available in the target list.

Telescope offsets and dither/mosaic procedures

Telescope offsets can be sent from the MIRSI host software to the telescope control system. Under the **Session** menu, open the **Offset Commands** window. Manually enter the offsets (in arcsec) and press the **Send** button.

To load an automated, 4-step dither pattern, choose tiny (1″); small (10″); medium (20″); or large (60″). A custom dither pattern of an arbitrary number of steps can be created in a file with 2 columns of offset, e.g. **example.off** (Note the last two rows are 0.0 0.0):

-5.0 0.0
-5.0 5.0
0.0 10.0
0.0 –5.0
5.0 5.0
10.0 0.0
0.0 0.0
0.0 0.0

and subsequently uploaded by the host software. The directory for offset files is currently **/home/camera/Offsets**.

Automated mosaic patterns are available as 2×2, 3×3, or 4×4 field patterns. The current default field-of-view is 60″. There is an option to load a custom mosaic file analogous to a custom dither file.

Once the observing parameters and dither and/or mosaic patterns are specified, simply click **Expose** to start the sequence, then sit back, relax and enjoy the show.

Log sheets

The following sheets will facilitate the observer in logging his/her observations. Use the setup sheet to keep an organized record of typical frame times, chop rates, etc. for upcoming exposures. At the end of the night, the log sheets should be duplicated and a copy given to a member(s) of the MIRSI team.

MIRSI SETUP

Date UT _____ Data directory _____
Site _____ Gain_____e-/ADU Readout noise _____ e- Pixel scale ____¢¢/pix
FOV _____¢ ´ _____¢ Chop wait _____ms Nod wait _____s Linear range 0 -_____ADU
Notes: _____

File No.	Time UT	l (μm)	Frame time (ms)	Chop freq (Hz)	Sky level (ADU) (Blank subtract)	Overhead Ratio (total time / on-source time)	Comments
		Blank					
		2.2					
		4.9					
		7.8					
		8.7					
		9.8					
		N-band					
		10.3 MLOF					
		11.6					
		12.282					
		12.5					
		18.5					
		20.9					
		25.9					
		CVF short					
		CVF mid					
		CVF long					
		Grism 7-14					
		Grism 18-26					

MIRSI OBSERVING LOG

Page _____

Date UT _____ Data directory _____

Notes: _____

File No.	Time UT	Object	l µm	Frame time (ms)	Exp. Time (s)	Mode G/C/ N/CN	Chop freq (Hz)	Offset file(.off)	Airmass	Comments Purpose, Focus, FWHM, dither, throw, weather, etc.