

# Evora Documentation - Version 1.0

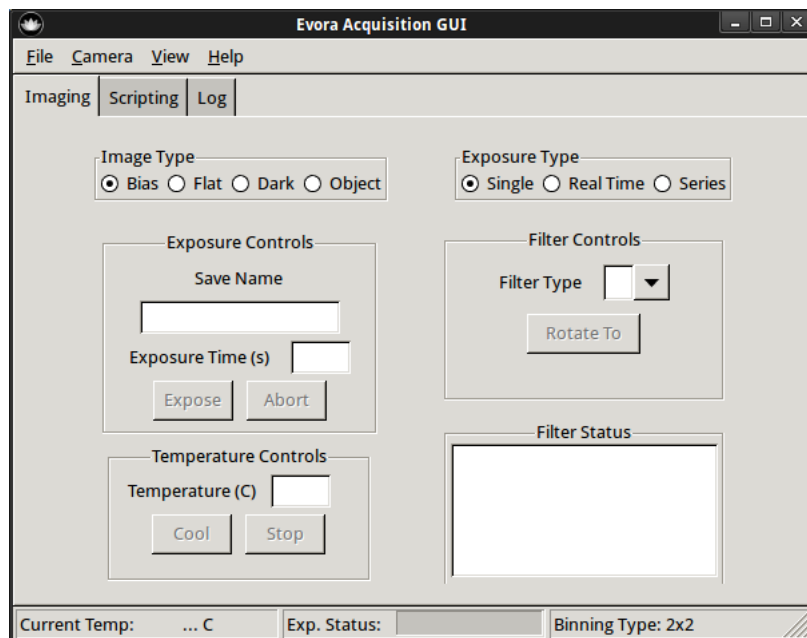
last edit by Tristan J. Hillis

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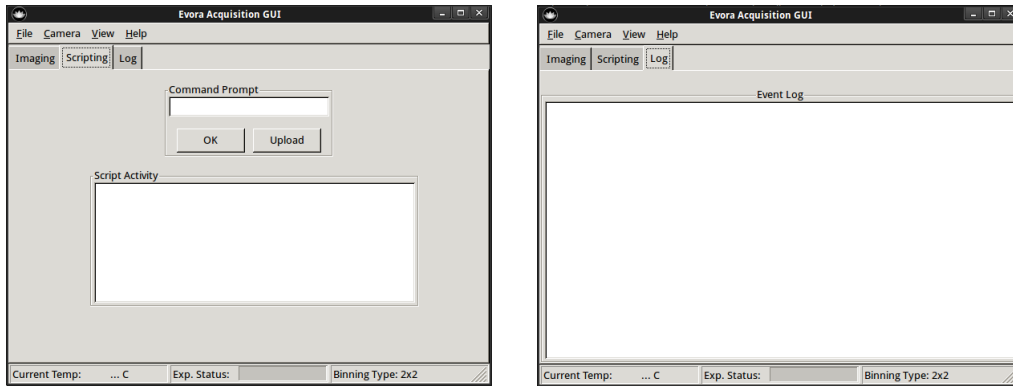
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## 1 Starting Up

Starting the executable named evora.exe you are greeted with a window that should look similar to the following; this will look different depending on the OS or Linux flavor.



First you will notice that buttons are grayed out to lock down the GUI until actually connected. This page controls the vast majority of the camera operations, from exposing, temperature control, and filter wheel slewing. One will notice the tabs in the upper left labeled *Imaging*, *Scripting*, and *Log*. Here are previews of the other two tabs to be covered in greater detail in later sections:



Now onto connecting to the camera; go to the **Camera** menu where there will be three options two of which are grayed out **Connect**, **Disconnect**, and **Shutdown**. Pressing **Connect** will cause the GUI to begin talking to the camera, Evora. Depending on the state of the camera it can take a few moments for the camera to initialize, otherwise it may connect right away. The two grayed out items **Disconnect** and **Shutdown** in the **Camera** menu will now be selectable while **Connect** is now grayed out. **Disconnect** will simply kill the GUI connection to the server and leave the current state of the camera untouched (e.g. the camera cooler will still run). **Shutdown** will both kill the connection to the server and properly shutdown the camera cooler and everything. The user should notice that the GUI has started tracking the temperature, in the bottom left, as well as unlocked certain buttons.

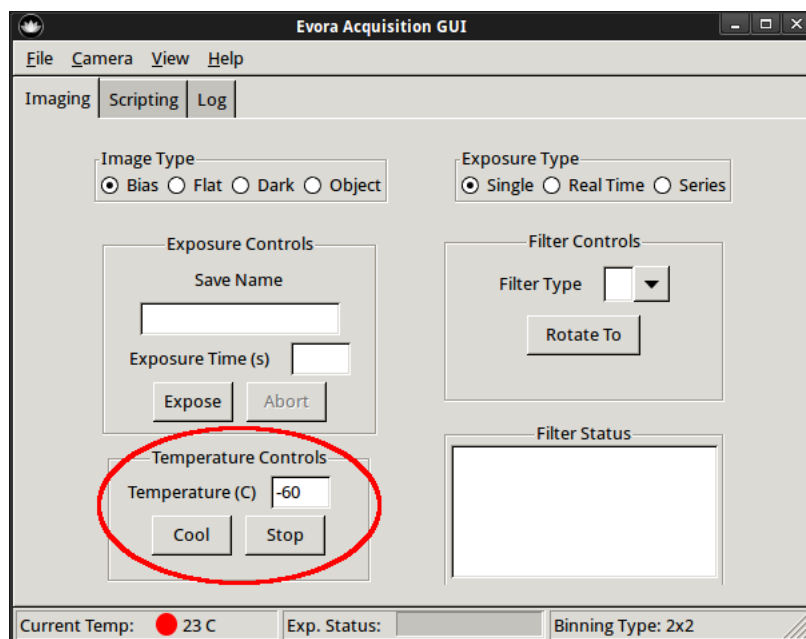
## 2 Filter

All the filter controls are handled through the main page and through the **File** menu. Starting at the **File** menu there will be a **Filter** sub-menu with **Connect** and **Refresh**. **Connect** will initialize the filter so the user may

start slewing to the various filter positions. **Refresh** (put explanation for refresh). Within the main imaging tab the user can use the *Filter Type* drop down menu to choose which filter to slew to. Once selected pressing the **Rotate To** button to change the current filter position to the one of choice.

### 3 Temperature

Using the controls on the main page the user can easily change the temperature. Within the text box the user can specify a temperature between the range of -80 to -10. Pressing the **Cool** button will start the cooling process and the **Stop** button will light up as seen in the figure below.

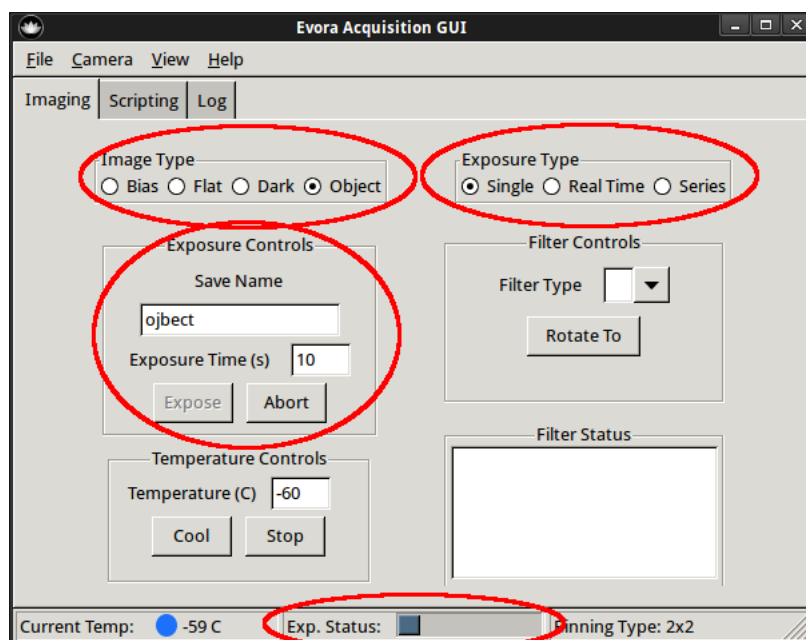


During cooling the user can specify a new temperature at any time, but also press the **Stop** button to begin the warming process. As the camera cools the color displayed in the bottom left will change depending on the state of the cooler. Green will signify that the camera has warmed up enough, red will indicate a transition of temperature, yellow signifies stabilizing of the cooler, and lastly blue will mean the cooler has finally stabilized. Finally, don't worry if the cooler status goes yellow and back to red before it is fully

stabilized; it likes to shoot past the target temperature, and also it may not stabilize on the exact temperature specified.

## 4 Exposing

There are many different options to go over here most of which are circled in the image below.



First we will start with binning; the default is set to **2x2** and is indicated in the lower right status bar. This option is changed by going to the **File** menu, then the **Binning** sub-menu, and subsequently checking one of the available binning types.

Next we move to starting exposures. There are a number of options that need to be first specified before you can take an exposure. First there is the image type of which you can select *bias*, *flat*, *dark*, or *object*. *Bias* is the default set choice and will simply read out the camera CCD with a zero second exposure time. *Flat* will allow the user to label the image as such and acts like a regular exposure, *dark* will take an exposure of a specified time while keeping the shutter closed, and lastly *object* will act much like the flat option only acting as a label for the science image.

The user must also specify a name under the *Save Name* field, and then subsequently give an exposure time, which can be of decimal value (if the exposure type is set to bias then the exposure time if **forced** to 0 seconds). It is necessary to choose what exposure type to use with **Single** exposure set as the default. This **Single** exposure is self explanatory in that the camera takes a single image. **Real time** acts as a way to constantly take exposures until the abort button is pressed so that the user may get an object on target, for example. In the case of **Real time** no save name is necessary and the field will be filled out as such, note that because of this functionality these images are simply saved to a temporary folder and not to be used for science. The last option under exposure type is series. Choosing this and setting a save name the user will be prompted to specify how many images they want once they hit expose (default is set to one). The name will be appended with a standard numbering format.

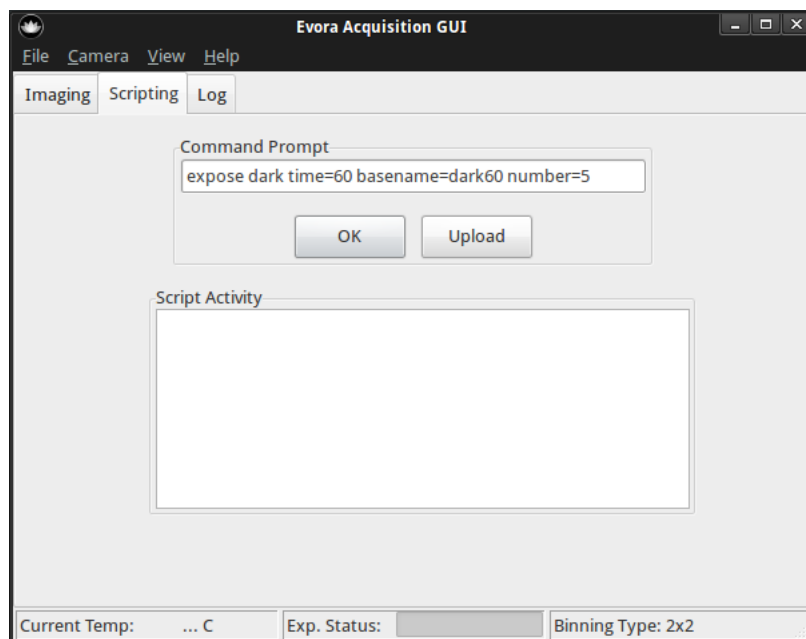
After choosing all the appropriate options you are ready to expose. Hitting the **Expose** button will gray it out so the user can not hit it again arbitrarily, but will light up the **Abort** button while also starting the exposure progress bar in the bottom middle of the GUI. Pressing abort will stop the current exposure immediately, thus forfeiting that image.

One will notice that when an exposure is done, if the image window is not open, a image viewing window will open automatically for the purpose of quick inspection of the most recent image. This window, if closed, can be reopened by going to the **View** menu and clicking **Image**. The image will be updated every time a new image comes in and will continuously open automatically if closed. A rudimentary contrast slider is provided, but will always be reset to the default value with a new incoming image. Along with this contrast slider is also an invert gray scale functionality, rendering stars black and the background white. Useful, statistics on the image counts are given in the status bar along the bottom of the image window. This, then, concludes how to take an image through the main window.

## 5 Scripting

The Evora GUI has the capability for scripting; simple commands can be typed out to control all the same GUI wide and camera attributes. Future versions will support the uploading of text files with script lines effectively being able layout an entire night's science in one file.

Below is, again, another image of the scripting tab. Within, there are two boxes the command prompt, where the client inputs commands, and the status box, where help messages and pertinent information on the camera is displayed (e.g. the completion of an image). There are also the button *Ok* and *Upload*. *Ok* runs the command and currently the *Upload* button does not do anything. The user can also press enter after a command has been written to run it.



## 5.1 Command List

Below is a comprehensive reference list for all the different commands that can be executed. Whoever is reading this can click on the links within this list that will take them to the explanation section for that particular command.

### Set Commands:

```
[?] set binning X
[?] set filter X
[?] set temp XX
[?] set help binning
```

```
[?] set help filter
[?] set help temp
```

#### **Expose Commands:**

```
[?] expose bias name=imname number=XX
[?] expose dark name=imname number=XX time=XX
[?] expose flat name=imname number=XX time=XX
[?] expose object name=imname number=XX time=XX
[?] expose abort
[?] expose help abort
[?] expose help bias
[?] expose help dark
[?] expose help flat
[?] expose help object
```

#### **Filter Commands:**

```
[?] filter home
[?] filter refresh
```

#### **Help Commands:**

```
[?] help set
[?] help expose
[?] help filter
```

## **5.2 Explanation**

**set binning X:** Set the binning GUI wide. X is replaced by a 1 or 2 to indicate 1x1 or 2x2 binning, respectively.

**set filter X:** Set the filter position by replacing X with a number between 1 and 6 indicating the exact position.

**set temp XX:** Set the cooler temperature by replacing XX with a value between -80 and -10 °C. To warm-up the camera, effectively turning off the cooler, replace XX with **warmup** to do so.

**set help binning:** Displays text in the scripting status box on how to set the binning with **set binning**



**set help filter:** Displays text in the scripting status box on how to set the filter position with **set filter**

**set help temp:** Displays text in the scripting status box on how to set the camera temperature or warm it up using the command **set temp**

**expose bias basename=imname number=XX:** Take several biases by setting the base name and the number of images to be acquired. Replace the **XX** in **number** with an integer number of images. The commands that follow after **bias** can come in any order. To continue where you left off in a numbered series of exposures just type out the full name of the next image that should be taken.

**expose dark basename=imname number=XX time=XX:** Take several darks by setting the base name, the number of images to be acquired, and the time of each exposure. Replace the **XX** in **number** and **time** with an integer number of images and a float value in seconds, respectively. The commands that follow after **dark** can come in any order. To continue where you left off in a numbered series of exposures just type out the full name of the next image that should be taken.

**expose flat basename=imname number=XX time=XX:** Take several flats by setting the base name, the number of images to be acquired, and the time of each exposure in seconds. Replace the **XX** in **number** and **time** with an integer and a float value, respectively. The commands that follow after **dark** can come in any order. To continue where you left off in a numbered series of exposures just type out the full name of the next image that should be taken.

**expose object basename=imname number=XX time=XX:** Take several flats by setting the base name, the number of images to be acquired, and the time of each exposure in seconds. Replace the **XX** in **number** and **time** with an integer and a float value, respectively. The commands that follow after **dark** can come in any order. To continue where you left off in a numbered series of exposures just type out the full name of the next image that should be taken.

**expose abort:** Use this command to abort any current running acquisition. This means it will stop exposures started through the script and those started through the main *Imaging* tab.

**expose help bias:** Displays text in the scripting status box on how to take several biases using the command **expose bias**

**expose help dark:** Displays text in the scripting status box on how to take several darks using the command **expose dark**

**expose help flat:** Displays text in the scripting status box on how to take several flats using the command **expose flat**

**expose help object:** Displays text in the scripting status box on how to take several objects using the command **expose object**

**expose help abort:** Displays text in the scripting status box on how to abort an in progress acquisition by using the command **expose abort**

**filter home:**

**filter refresh:**

**help set:** Displays text in the scripting status box on what the **set** command does and how to get more information through using **set help** on individual sub-commands of **binning**, **filter**, and **temp**.

**help expose:** Displays text in the scripting status box on what the **expose** command is used for. It also displays the commands needed to get more information individually on **abort**, **bias**, **dark**, **flat**, and **object** using **expose help**.

**help filter:** Displays text in the scripting status box on what the **filter** command does as well as how to display information on each command individually with **filter help**.