



# MANUAL

OBSERVATIONAL ASTROPHYSICS

## Startup

In the Dome: Open dome ports  
Turn on *Dome shutter main* power  
Turn on *Dome rotate main* power  
Turn on *hatch* power  
Open *UPPER shutter*  
Open *LOWER shutter*  
Check right fork: two switches down and one wheel turned to “left”  
Connect CCD Camera cables  
Check all cables so they’re not stretched!

Control room: Turn on the *Telescope Main Power* switch  
Start the computers (escape) and log in  
Plug in communication cable  
Run *Automachron* on both computers, sync (if necessary)  
Start *Autoslew*, choose ignore

## Calibrate

Autoslew: “**Mount** → Calibrate mount with Heidenhahn encoders”  
[√] Track position  
⊖ Star  
“**Dome** → Parameters and Status”  
[√] Connection enabled  
[√] Follow telescope  
“**Telescope** → Open Mirror Covers”  
“**Telescope** → Left focus”  
**[Select]**  
[Park 2]  
[Slew]

In the Dome: Remove dust caps (if any)  
Check mirrors

In Control room, Autoslew:  
**[Select]**  
[Park 1]  
[Slew]

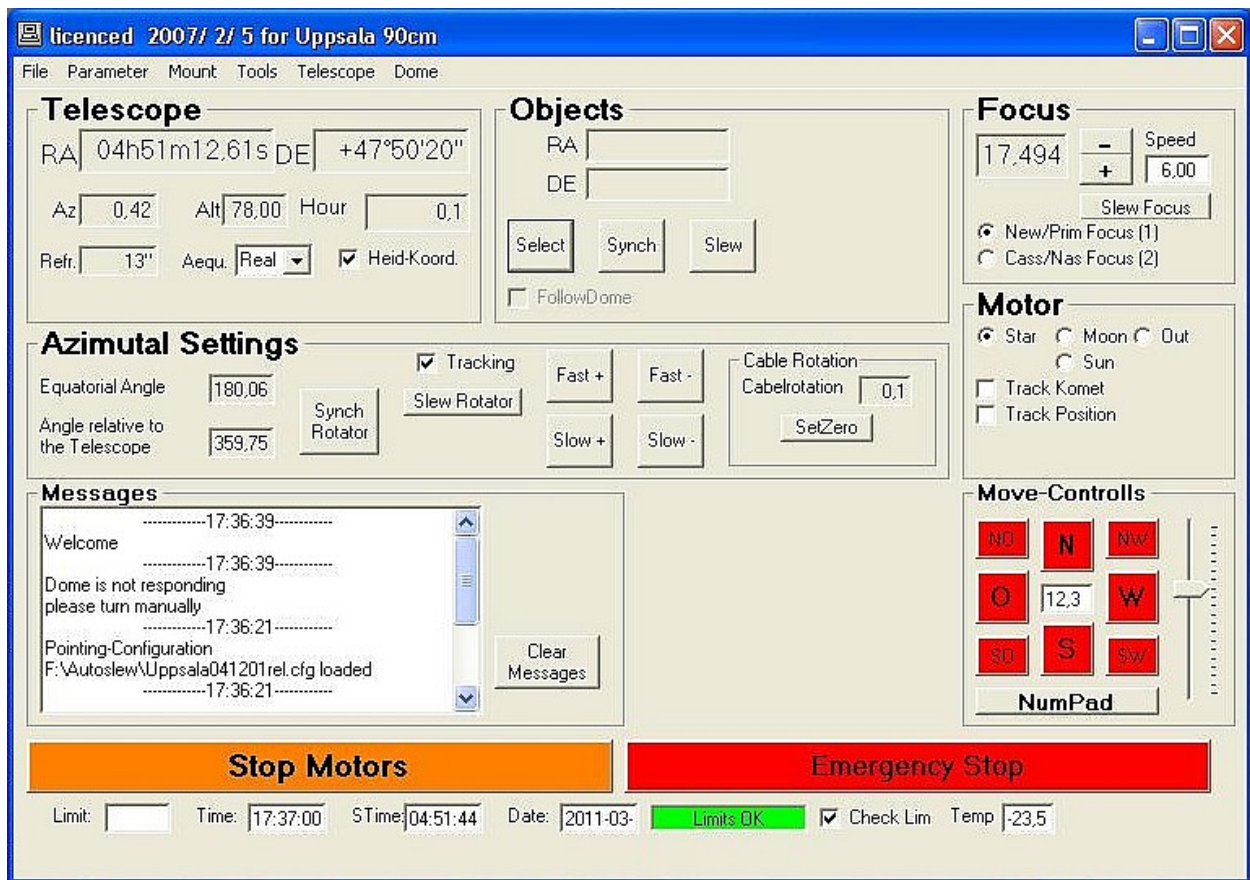


Fig. 1. Autoslew control window.

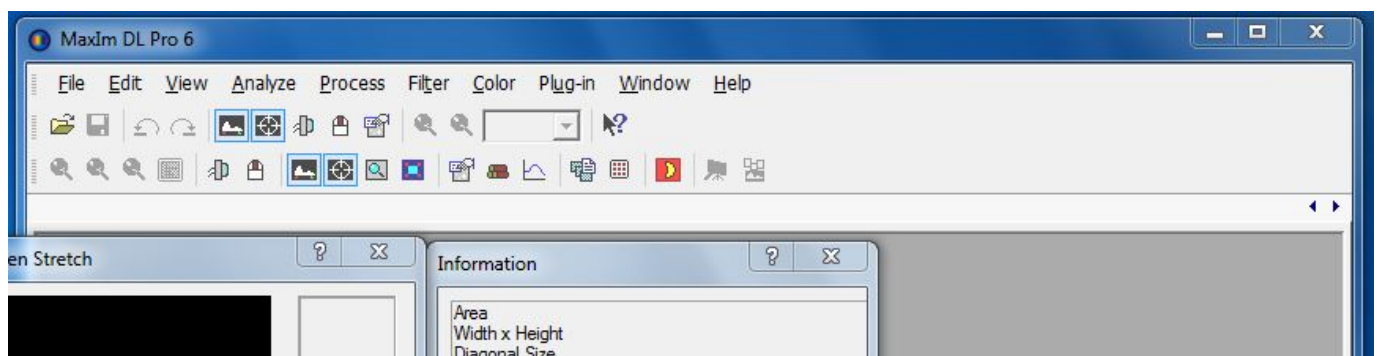


Fig 2. MaxIm DL control window

## Start instruments

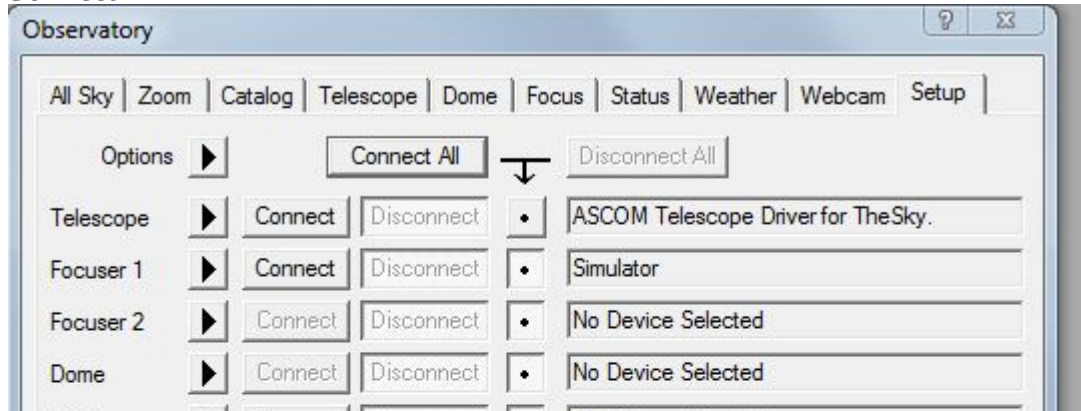
Switch CCD Camera Power on.

Start *MaximDL*

In MaximDL: **Observatory Control Window**



Select “*TheSky controlled telescope*” or “*ASCOM...TheSky*”  
**Connect**



In TheSky: Check that time equals the computer clock and is on Jcurrent (Data,time)

In MaximDL: **Camera Control Window/Setup/**



Camera Setup:

“Main CCD Camera” = SBIG Universal

Filter Wheel:

“Filter Wheel” = “SBIG Universal”

**[Connect]**

**[Cooler On]**

**[Cooler]** Set temperature (20° beneath ambient temp. No higher than 80 %)

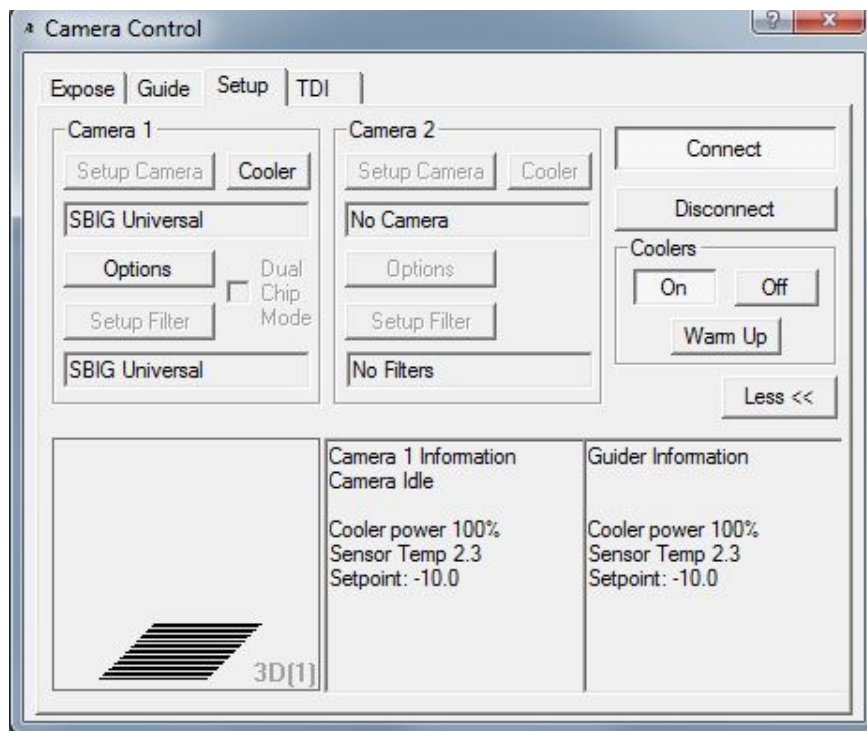


Fig 3. CCD Control window

Pull down the shades inside the control room and **turn off the light in the Dome** Be sure to have your **Observation logs** handy

## Prepare for Saving

Create folder: **My documents**

File/ New / Folder (Name convention: NyearMonthDay, e.g. N160309)

In MaximDL: **File/Settings/FITS header**

Change FITS Header, [Set]

Make a bias exposure:

**Camera control window/Expose/**  
bias



In MaximDL: **Camera control/Expose/Options/Set image save path:**

New Folder (NYMMDD)

## Make an exposure

In MaximDL:

**Camera Control Window/Expose/**

Choose frame type: light/bias/flat/dark

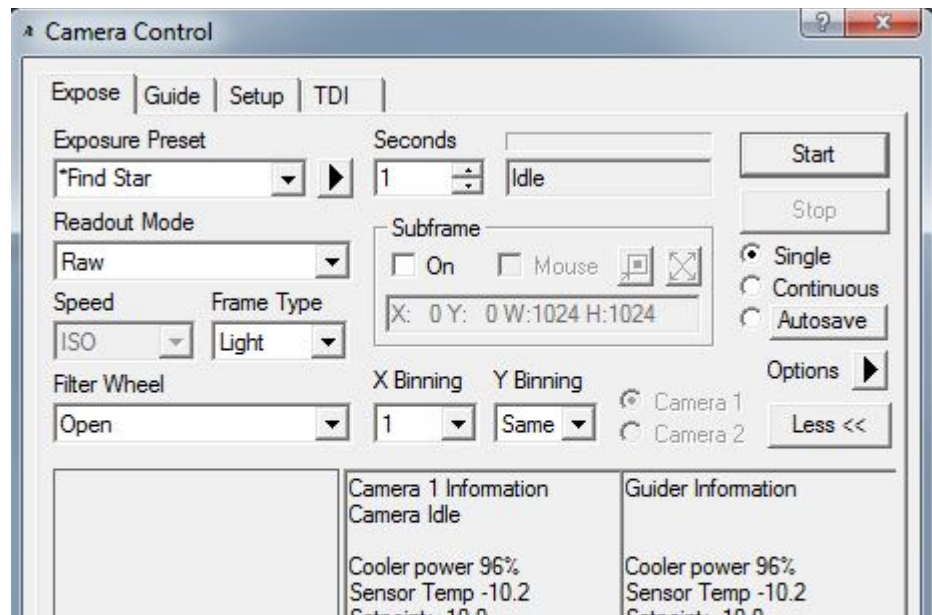
Choose filter: U/B/V/R/I (/open)

Set exposure time

Single

[Start]

(Save)



## Set up a sequence

In MaximDL: **Camera Control Window/Expose/Autosave**

Autosave Filename: target

Options/Setup Sequence

Image = Light

Filter = R

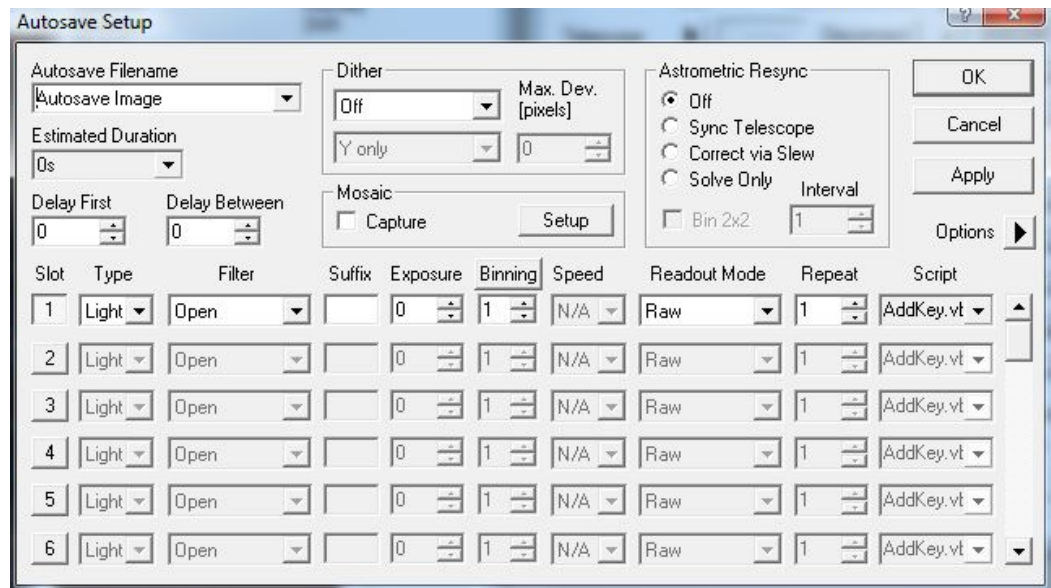
Suffix =

Exp. Time = 5 s

Binning = 2 (1)

Number = 2

[Start]



## Setup Mosaic Sequence

In MaximDL: **Camera Control Window/Autosave/**



Options/Setup Mosaic

3 3

1.0 1.0

Options

Enable Mosaic capture

When done:  Enable Mosaic capture

## Focus

In TheSky: Slew to a region with lots of stars (click in window, telescope marker)

In MaximDL: **Camera Control Window/Expose**



Take a 2 s exposure

Subframe + mouse

Draw a box around a fairly bright star in the image

Continuous

“Seconds” = 2 s

“Binning” = 2 (1)

“Delay” = 0

[Start]

**Camera Control Window/Expose/Options/** (Display Large Statistics)

FWHM should be as low as possible (<3–4 for ok focus)

In Autoslew: **Tools/Focus**

Set large step size first e.g. 0.5 (1.0)

[Move Diff in/out]

When ok focus has been reached set smaller step size and:

Continue focusing to get as low FWHM as possible

Make note of new focus value

[Exit]

In MaximDL: **Camera Control Window/Focus**

[Stop] ([Reset])

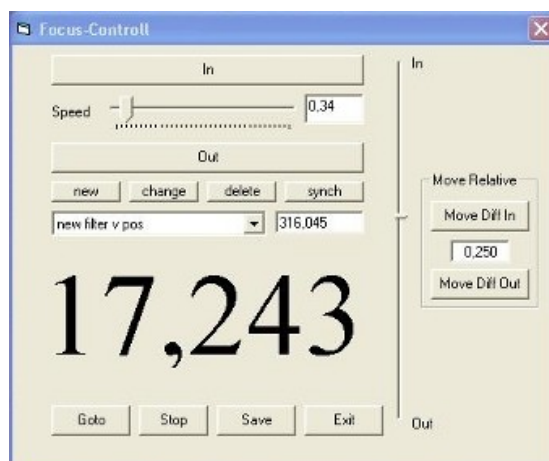


Fig. 4. Focusmenu

## Shutdown

In MaximDL: **Camera Control Window/Setup**   
[Warm up]

In MaximDL: **Telescope Control Window/Setup**   
[Disconnect]

In TheSky: **Telescope/Link/Terminate**  
Exit TheSky

Pull up the shades inside the control room and turn on the light in the Dome

In Autoslew: **[Select]**  
[Park 2]  
[Slew]

In the Dome: Check mirrors and put on dust caps

In Autoslew: **Telescope/Close Mirror Covers**  
**[Select]**  
[Park 1]  
[Slew]  
**Dome/Parameters and Status**  
 Follow Telescope  
 Connection Enabled  
Check to see that the Azimuth is not changing  
**Exit Autoslew**

In MaximDL: **Camera Control Window/Setup**  
If the temperature has reached ambient (or cooler power:0%):  
**[Cooler off]**  
**[Disconnect]**  
Switch the CCD Camera Power off

In the Dome: Unplug the power and USB cables from the camera and hang them up  
Move the dome counterclockwise just to the left of the sensor  
Turn off the 3 power switches

In MaximDL: **Exit**

## **Save data**

Make copy on CD (Nero) and on backup disc:

if using psftp.exe

[Run]

open observer@snell.astro.uu.se

cd /Volumes/wtdata2/2011/

lcd "C:\Documents and Settings\observer\My Documents\NXXYYZZ\"

mkdir NXXYYZZ

cd NXXYYZZ

mput \*.fit

## **Shut down power**

Turn off both computers

**Turn off the "Telescope Main Power" switch**

Turn off lights and lock the doors

**THINK! HAVE YOU FORGOTTEN ANYTHING?**