

An Introduction to Remote, Camera-Assisted Observing – Coming in from the Cold!

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ETX-60, Meade DSI III, Envisage, Remote Handbox



Things you will need...

A camera that can be controlled remotely...

- DSLR
 - OEM Software (EOS Utility)
 - ✓ Backyard EOS, Backyard Nikon
- Astronomical Camera (ZWO, QHY, etc.)
 - Sharpcap Pro
- Video Camera
 - MallinCam
 - ✓ Revolution Imager 2

A mount that can be controlled remotely...

- Remote Handbox (Meade, USB/Serial)
- Wireless handbox
- Starry Night Pro (ASCOM, USB)
- ✓ Sky Safari via SkyFi (WiFi)

All-in-ones (mount & camera via WiFi)

- ASI Air/Pro/Plus
- Modular Computers



Other things you may need...

- A USB repeater cable
- A powered USB Hub
- An extension cord to run power out to the mount
- A dry box to protect the power/cable connections
- ✓ Some way to seal the gaps in the window that you pass the cables through

Using your DSLR or Astro Camera for Remote Observing

- Imaging generally uses low to modest gain and long exposures to give high quality source images with low noise
- For real-time observing image quality and noise is much less of a concern, so you can use high gain and short exposures
- You can always switch between observing (high gain and short exposures) to imaging (low gain and long exposures) as needed
- You will quickly discover that raw, unprocessed source images do a great job of showing objects as they actually appear, though through a *much* larger telescope
- Set your camera's gain as high or nearly as high as it can go and start with short exposures; 1-5 seconds
- Adjust as needed.
- Note that Live View is generally not sensitive enough for real-time observing



Canon 550D, Starry Night Pro, Meade SN8, Orion Atlas

BackyardEOS 3.0.0 - Premium Edition 23:30:33

Camera Information Center

BULB 800
M Off +30c
RAW

ASCOM Focuser

Star

Weather Center

MC Design Setup

23:29:53 Imaging session started...
23:30:02 Imaging session completed successfully
23:30:08 PREVIEW_20130823-23h30m08s233Dms.JPG downloaded
View file status...

Image Center [PREVIEW_20130823-23h30m08s233Dms.JPG]



Histogram Center



22%

Capture Plan Center

Frame Type: LIGHTS Cable support: Camera USB Save To: PC Mirrorlock: 0

Target Name: MC Filter: Delay: 0

Exposures	Shutter	Duration	ISO	Pause	
1	16	B.A.B	30	800	0
2	0				
3	0				
4	0				
5	0				

01@20s 02@23h22m01s 01@23h22m22s 02@23h24m04s 03@23h26m04s 04@23h28m04s 05@23h30m37s 06@23h30m04s

LOGS Start Sequences Reset

Start Capture Stop Preview

Windows taskbar: Astronomy, BackyardEOS 3.0.0, Document1 - Micro..., EQMOD ASCOM EQ..., untafe1, EQMOD ASC, 11:30 PM

Canon 550D, Starry Night Pro, Meade SN8, Orion Atlas – 100%

BackyardEOS 3.0.0 - Premium Edition

23:30:55

Camera Information Center

BULB 800
M Off +30c
RAW

ASCOM Focuser

Weather Center

Histogram Center

Capture Plan Center

Frame Type: Cable support Save To: Mirror lock
LIGHTS Camera USB PC 0
Target Name Filter Delay
M2

Exposures	Shutter	Duration	ISO	Flare	
1	16	B.A.B	30	800	0
2	0				
3	0				
4	0				
5	0				

11:30:20 12 @ 23:02:05 13 @ 23:02:20 14 @ 23:02:35 15 @ 23:02:50 16 @ 23:03:05 17 @ 23:03:20 18 @ 23:03:35

Start Capture Live Preview

Astronomy BackyardEOS 3.0.0 - ... Document1 - Micro... EQMOD ASCOM EQ... untafe1 EQMOD ASC...

11:30 PM

Revolution Imager 2 Settings

SETUP MENU

1 / 2
SCENE SELECT CUSTOM↵
PICT ADJUST ↵
EZOOM ON↵
DIS OFF
PRIVACY MASK ↵
MOTION DET OFF
SYS SETTING ↵
EXIT↵

ADVANCED MENU

1 / 2
SHUTTER/AGC AUTO↵
WHITE BAL ATW↵
HLC/BLC OFF
ATR-EX OFF
DNR ↵
DAY/NIGHT DAY
IR OPTIMIZER ----
RETURN↵

AUTO SETUP

AE LEVEL 250
AGC MAX 36 DB
SENS UP AUTO
RETURN↵

For video there are a *lot* of settings that can be adjusted manually

You will want to experiment and converge to a solution that *minimizes the amount of fiddling!*

I leave most values at their default settings with the exception of these 5

PICT ADJUST

BRIGHTNESS 064
CONTRAST 34
SHARPNESS 08
HUE 064
COLOR GAIN 220

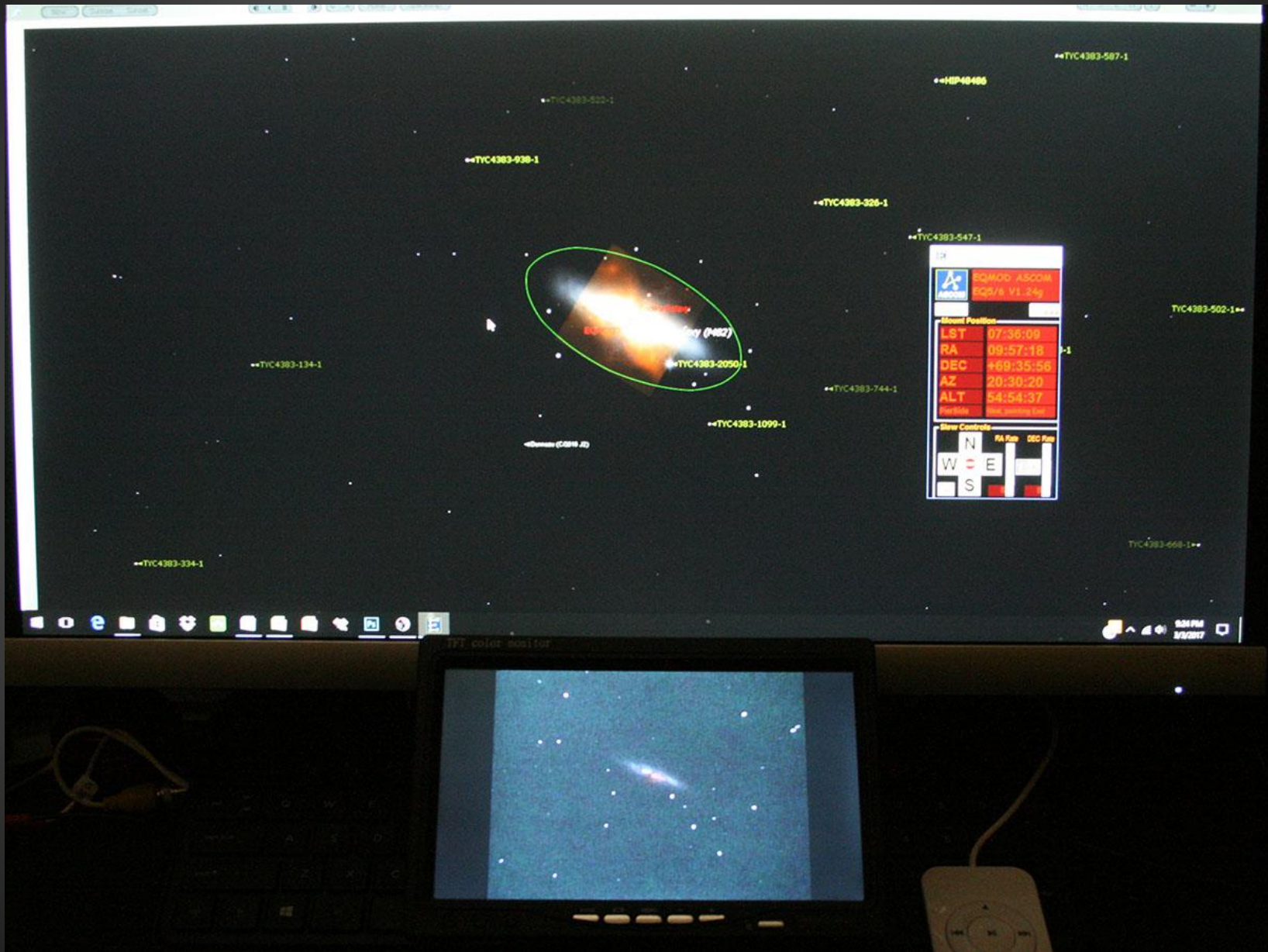
RETURN↵

DNR SETUP

LEVEL 3
RETURN↵

- AE LEVEL (Auto Exposure): 250, this sets the maximum exposure time to the maximum for this camera: 5 seconds
- AGC Max (Automatic Gain Control): 36, which is just below the maximum value
- SENS UP: AUTO, this controls how the camera adjusts the gain
- DNR (Digital Noise Reduction): 1-6, this sets the number of frames averaged as a running average
- BRIGHTNESS: This sets the screen brightness. This is the only setting that may need to be frequently adjusted.

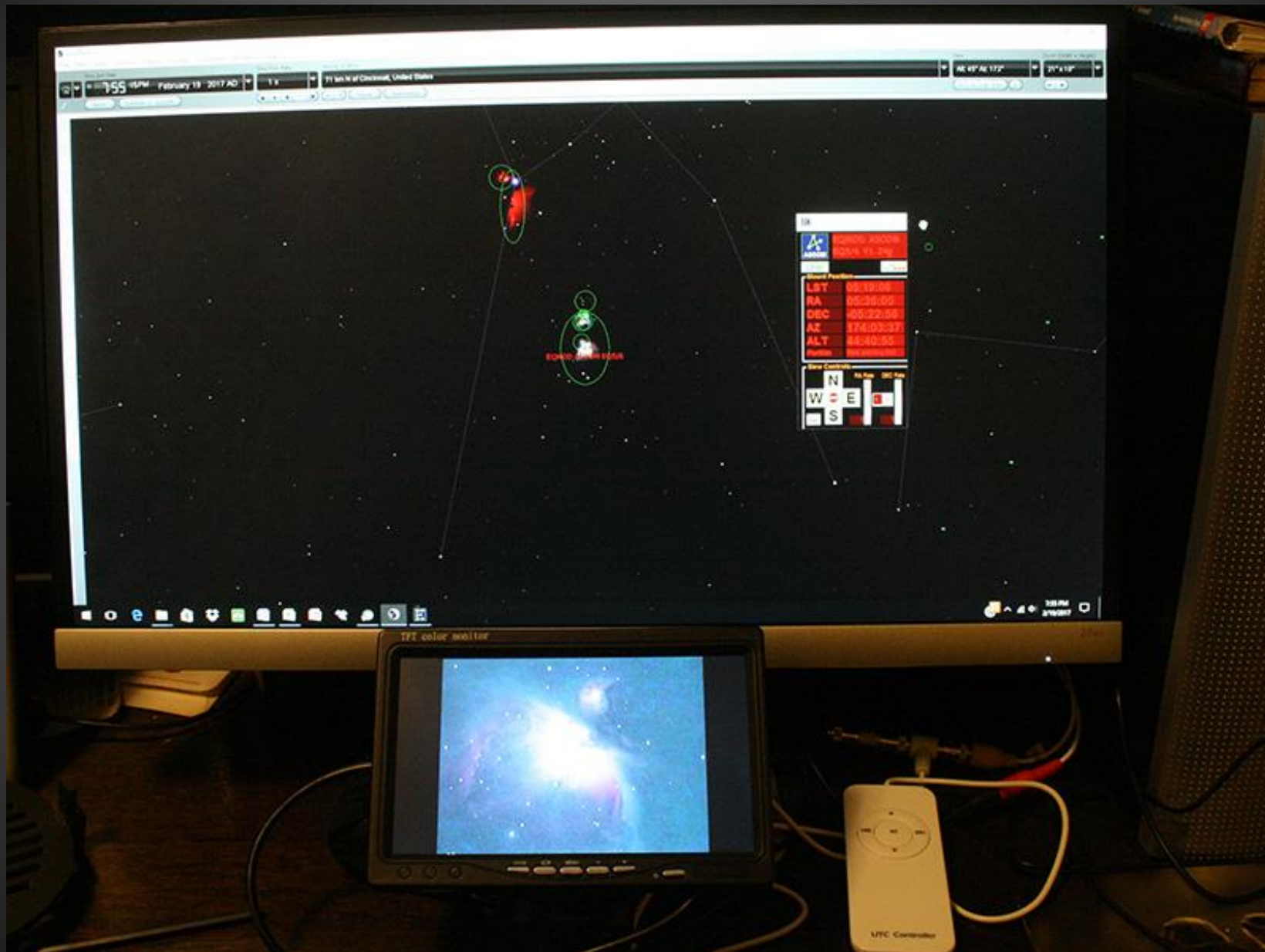
Revolution Imager 2, Starry Night Pro, 10" SCT @ f/2.3, Orion Atlas



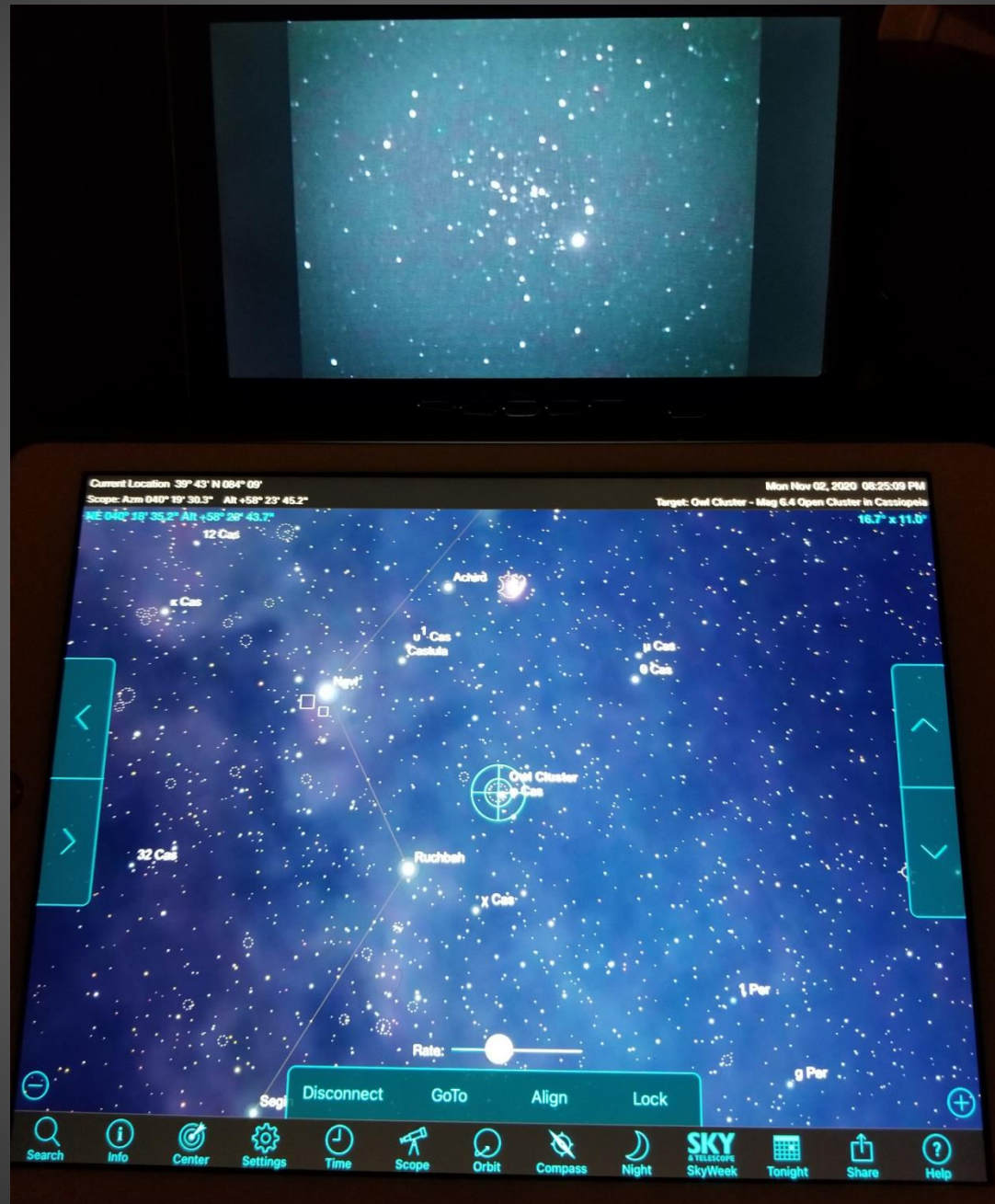
Example Screen Shot: M82, 10" SCT @ f/2.3



Revolution Imager 2, Starry Night Pro, Orion StarBlast, Orion Atlas



Revolution Imager 2, SkySafari/SkyFi, Meade 8" LX200 GPS @ f/2.4



Example R12 Systems



ETX-60



ETX-80



LXD75 StarBlast



LXD75 Comet Catcher



LXD75 SN8



10" f/6.3 LX200GPS
@ f/2.3



8" f/6.3 LX200GPS
@ f/2.4

Closing Thoughts...



Remote observing is a great way to put your imaging gear to work as an observing aid

It is particularly convenient on nights where it simply isn't comfortable to be out at the scope.

I find that I can use this approach to make use of nights that I ordinarily would have missed due to extreme cold, or heat, humidity, and mosquitoes

With my imaging gear it can be very pleasant to flow back'n forth between observing mode and imaging mode, capturing simple images to record my observations

Having access to the raw, unprocessed source images shows the objects as they actually appear

The Revolution Imager 2 is very simple with a very low fiddle-factor

With the RI2 I can easily reach my local skyglow limit of magnitude 18-ish, meaning that I can literally see all that there is to see from the comfort of my house

Questions?

