Using OccuRec

Occultation Recording Software by Hristo Pavlov

John Talbot, Reading Astronomical Society

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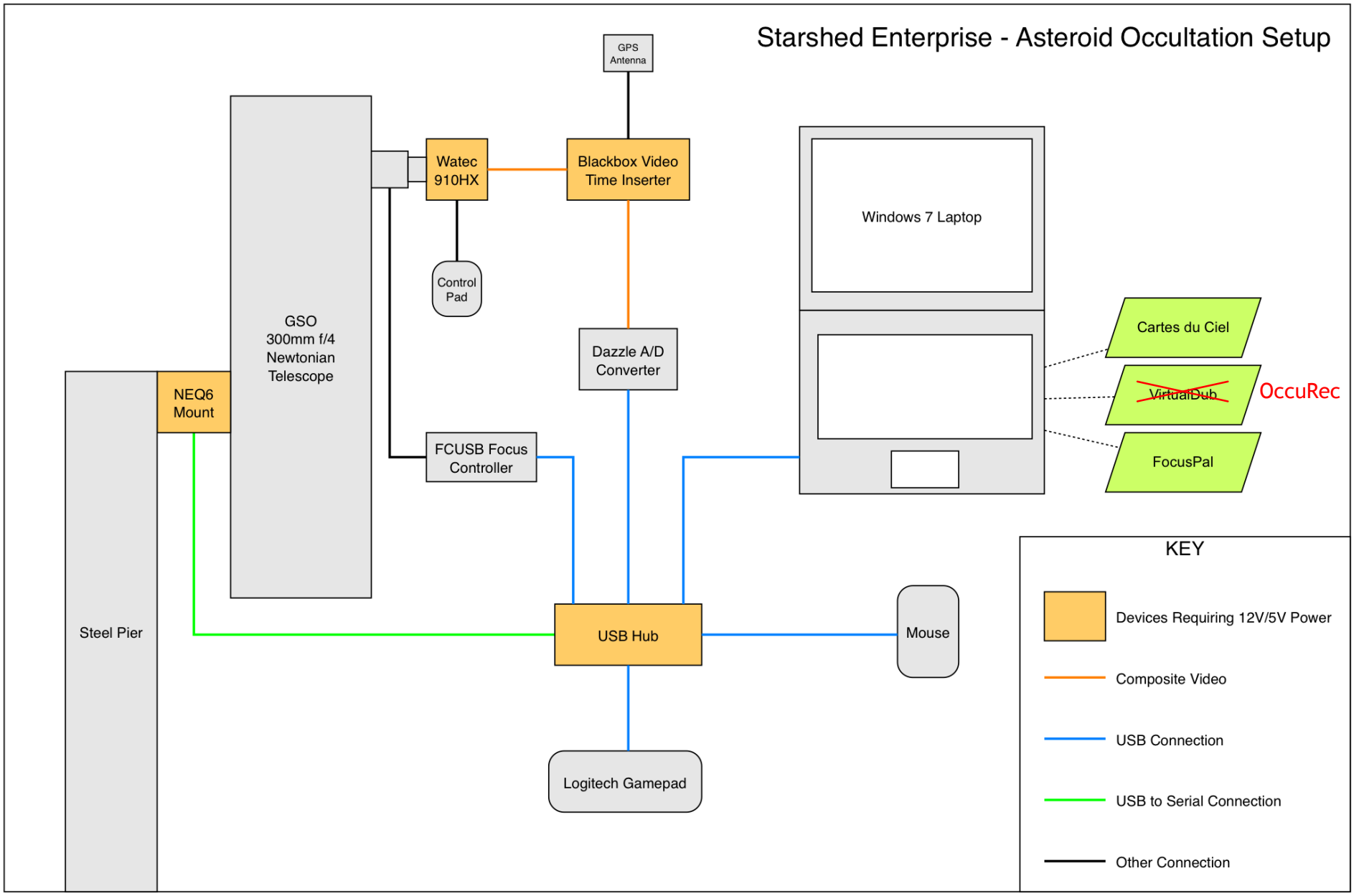
What is OccuRec?

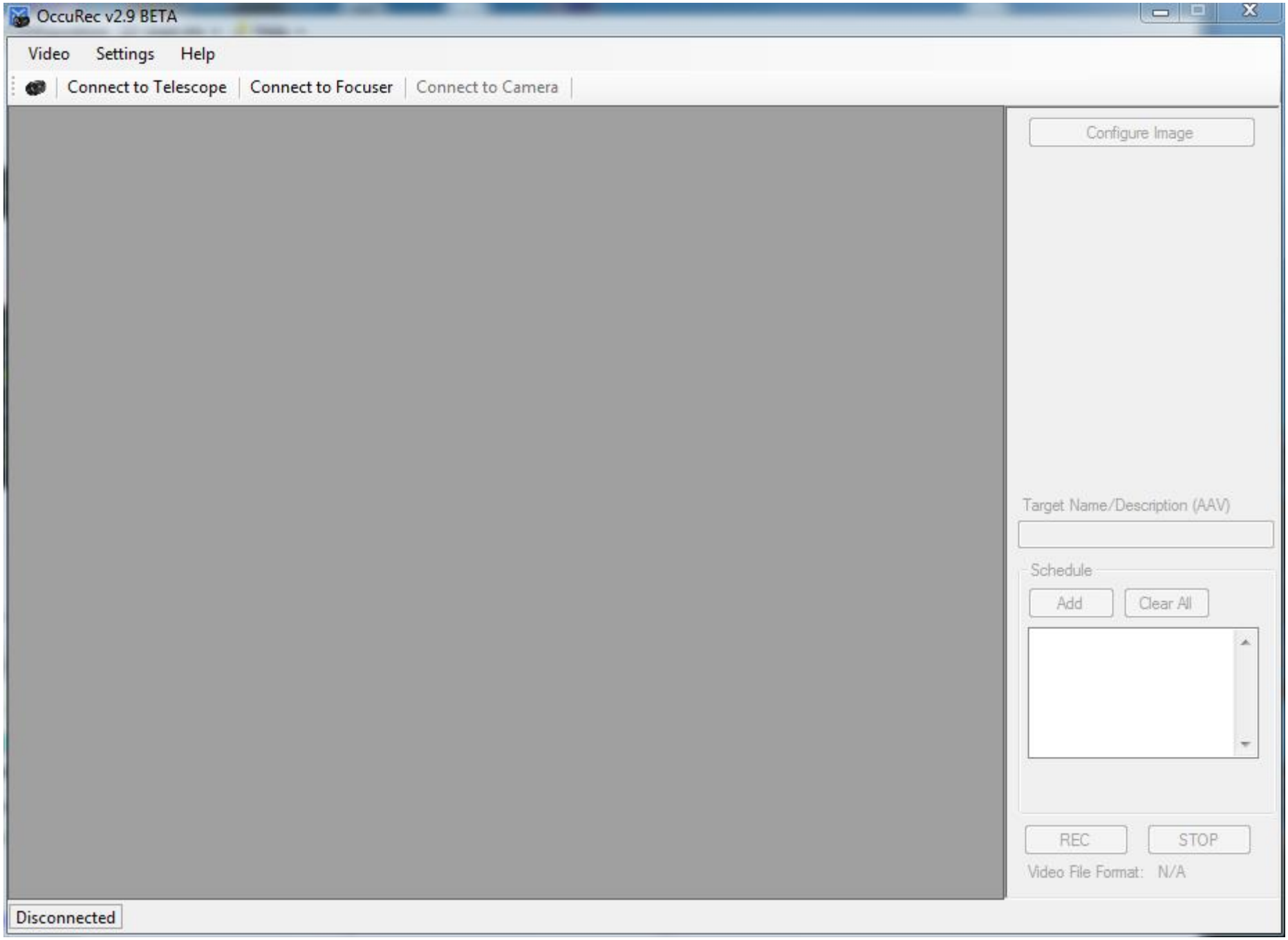
- *"OccuRec is an open source video recorder for Windows that has been specifically created to provide better options for recording Astronomical events, particularly using integrating video cameras. The software is capable of recognizing the integration periods on the fly. For a small number of video grabbers it can also read the IOTA-VTI timestamps on the fly. A new AAV file format has been created to support the new features of the software."* – Hristo Pavlov

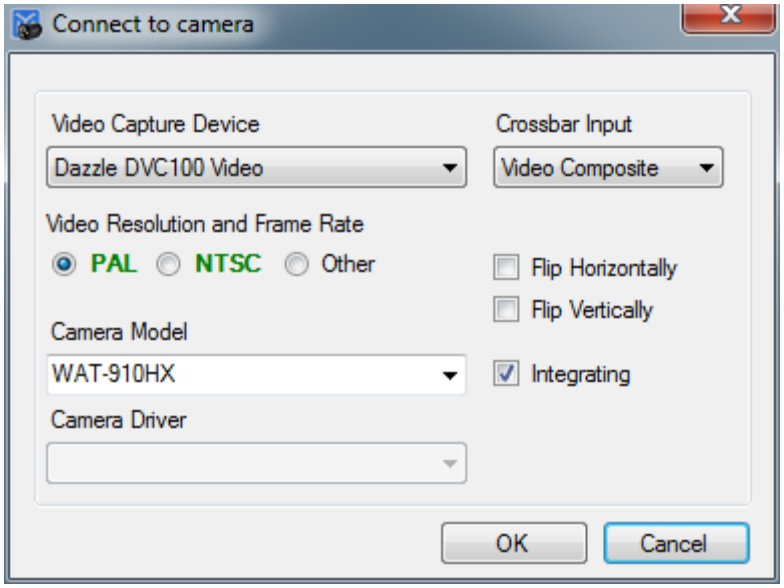
- http://www.hristopavlov.net/OccuRec/OccuRec.html

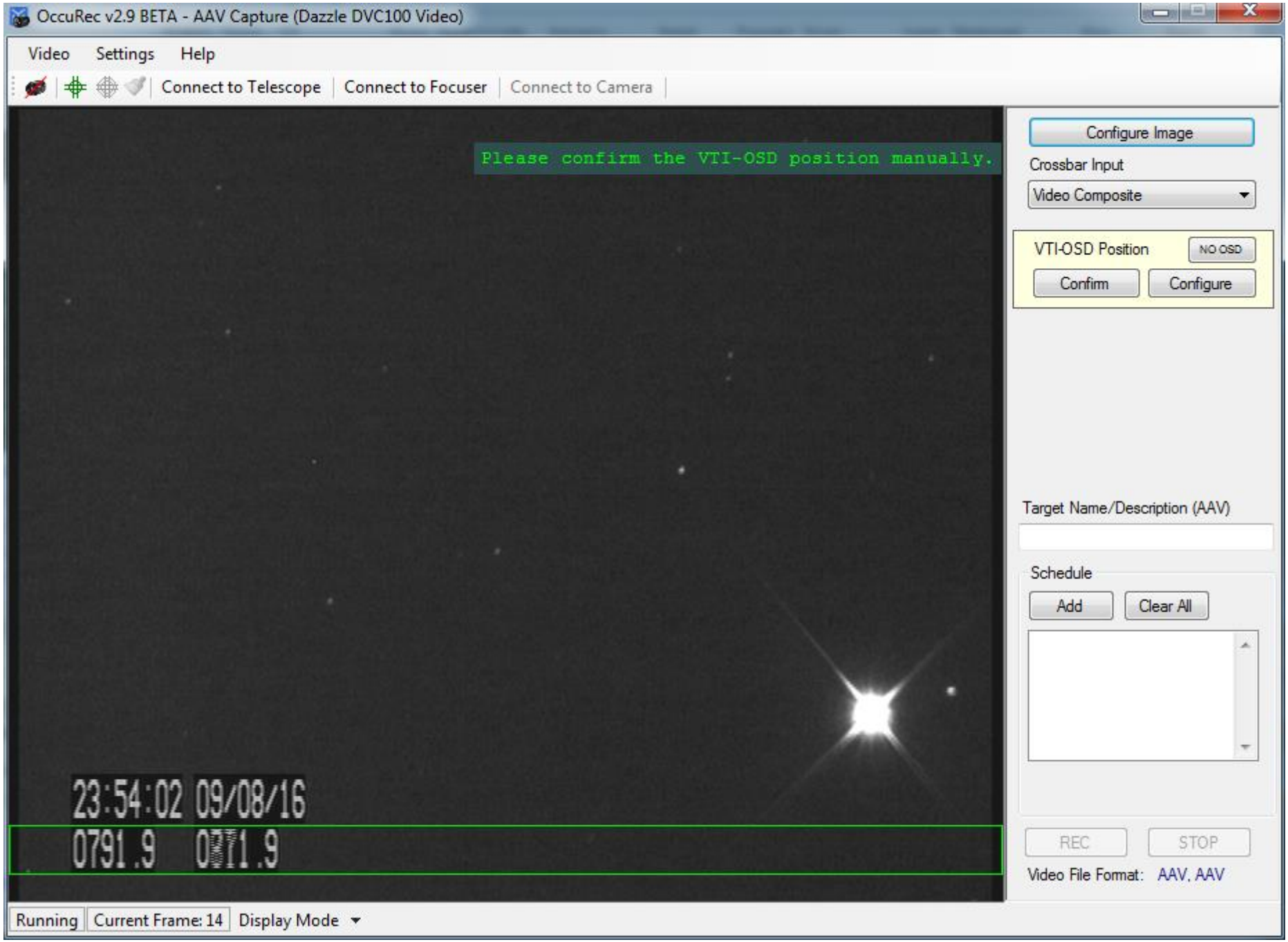
Why OccuRec?

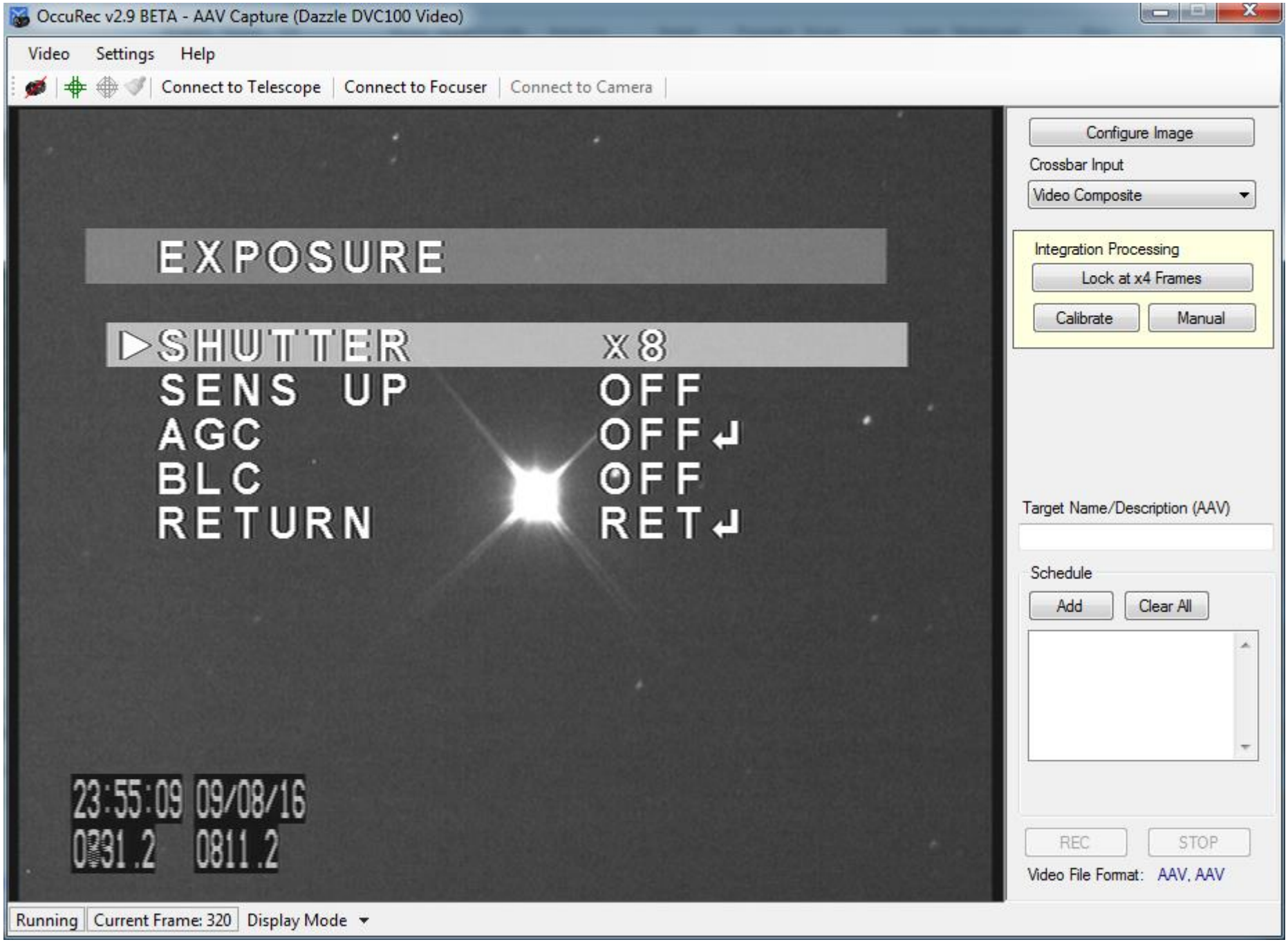
- Integrating cameras take exposures longer than the duration of a single video frame (40ms for PAL)
- This means the resulting image, when transferred to the frame rate, is repeated multiple times
- OccuRec detects the integrating periods and averages all repeated video frames and saves only one image for the integration period in the file
- Result is a smaller file with reduced noise
- It can also read the IOTA-VTI timestamp on the fly and store the time information with each image in the file

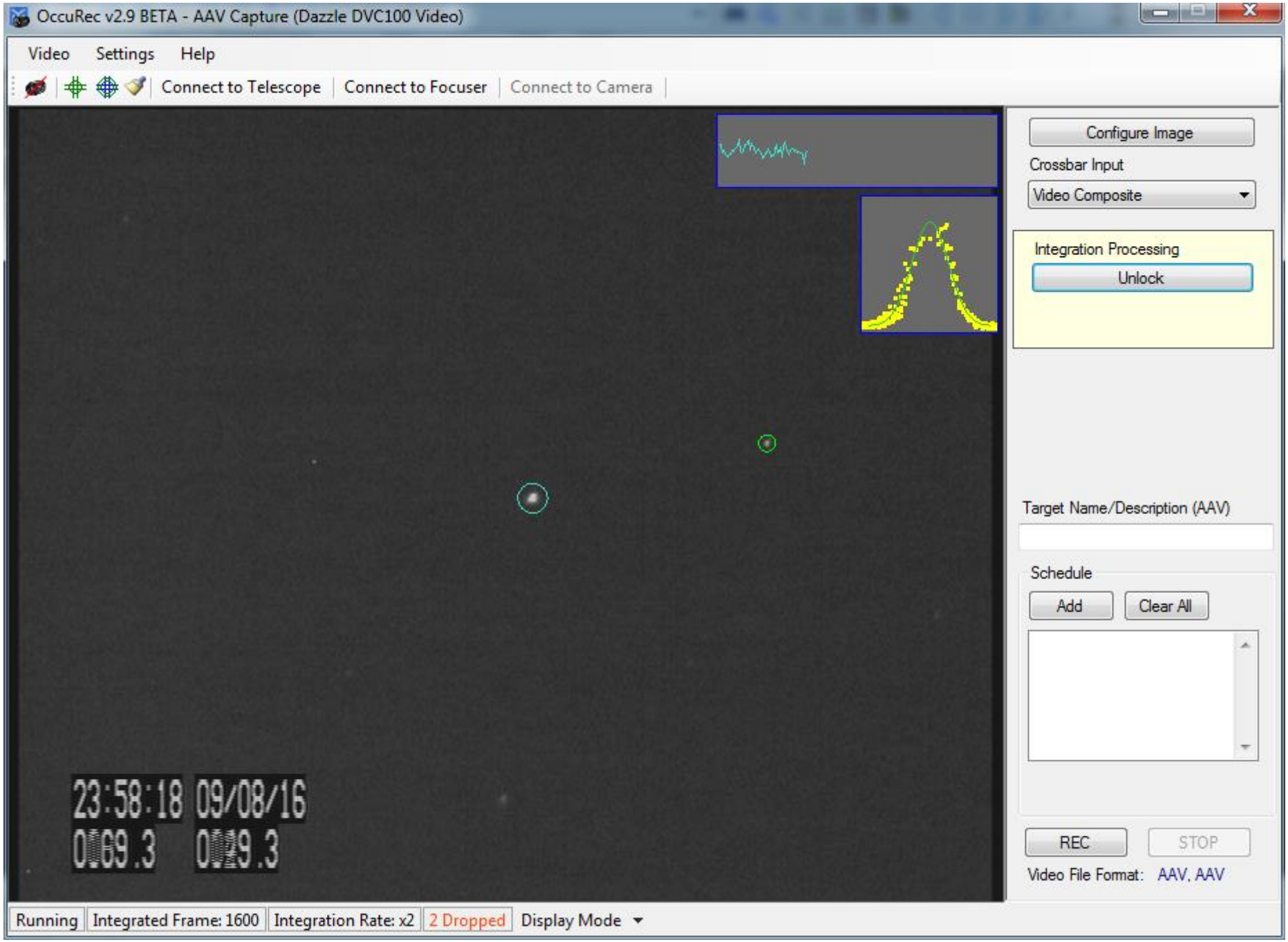

Starshed Enterprise - Asteroid Occultation Setup
GPS Antenna
Watec 910HX
Blackbox Video Time Inserter
Windows 7 Laptop
Control Pad
GSO 300mm f/4 Newtonian Telescope
Dazzle A/D Converter
Cartes du Ciel
VirtualDub
OccuRec
FocusPal
NEQ6 Mount
FCUSB Focus Controller
Steel Pier
USB Hub
Mouse
Logitech Gamepad
KEY
Devices Requiring 12V/5V Power
Composite Video
USB Connection
USB to Serial Connection
Other Connection

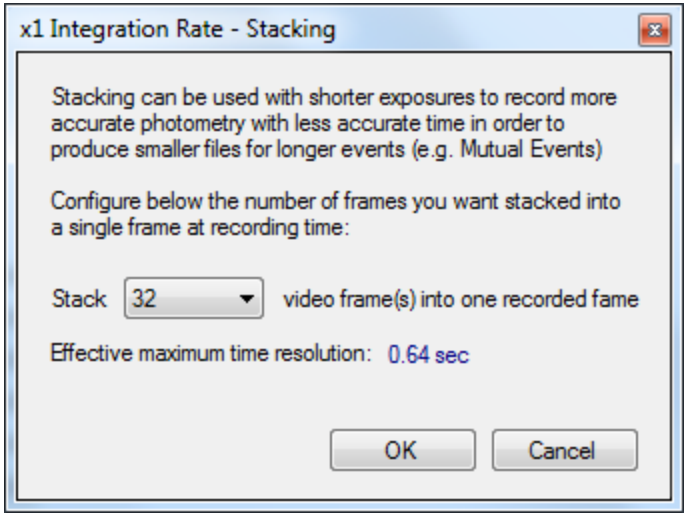

OccuRec v2.9 BETA
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
Configure Image
Target Name/Description (AAV)
Schedule
Add
Clear All
REC
STOP
Video File Format: N/A
Disconnected


Connect to camera
Video Capture Device
Dazzle DVC100 Video
Crossbar Input
Video Composite
Video Resolution and Frame Rate
PAL
NTSC
Other
Flip Horizontally
Flip Vertically
Camera Model
WAT-910HX
Integrating
Camera Driver
OK
Cancel

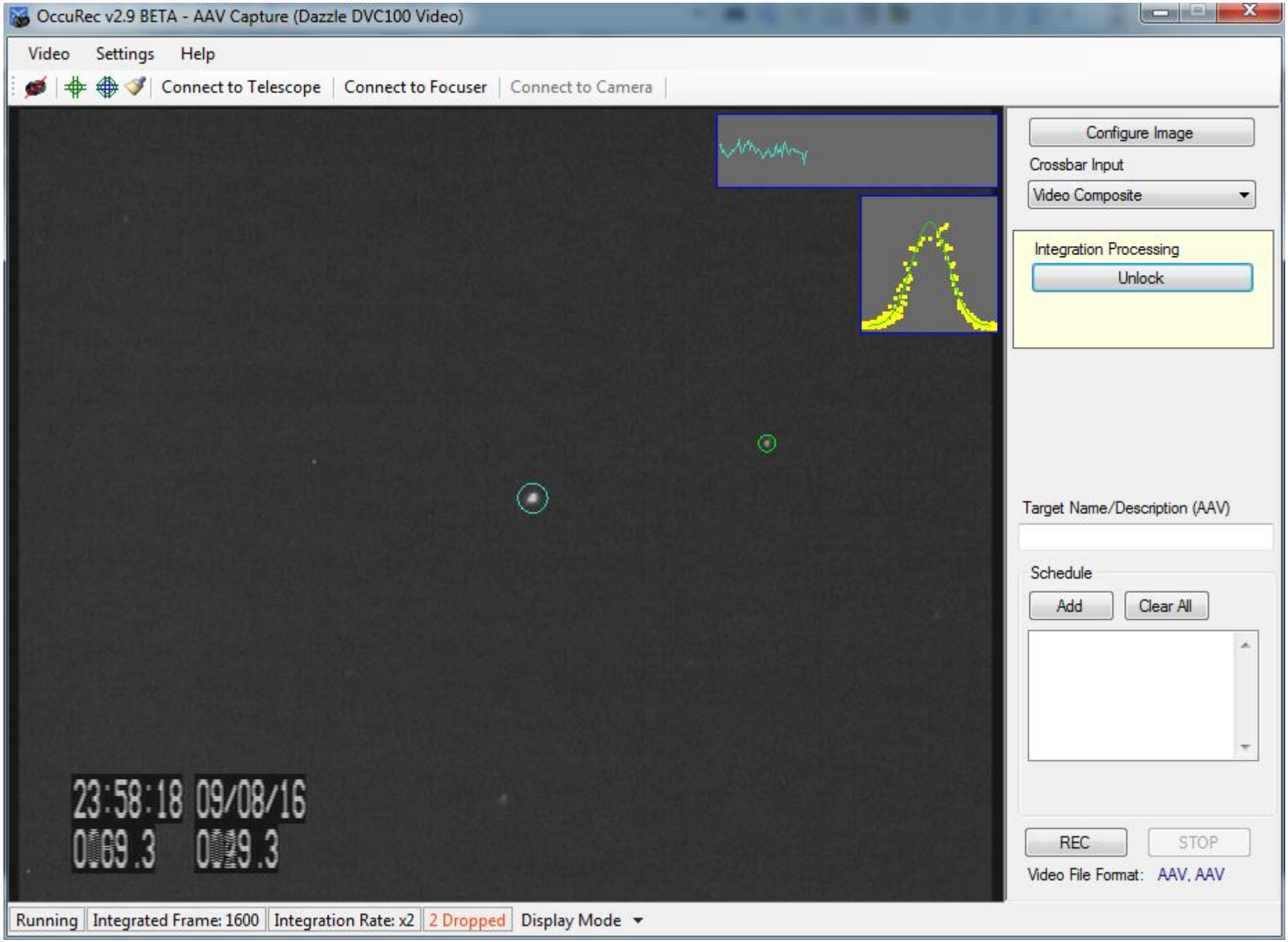

OccuRec v2.9 BETA - AAV Capture (Dazzle DVC100 Video)
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
Please confirm the VTI-OSD position manually.
23:54:02 09/08/16
0791.9
Configure Image
Crossbar Input
Video Composite
VTI-OSD Position
NO OSD
Confirm
Configure
Target Name/Description (AAV)
Schedule
Add
Clear All
REC
STOP
Video File Format: AAV, AAV
Running
Current Frame: 14
Display Mode

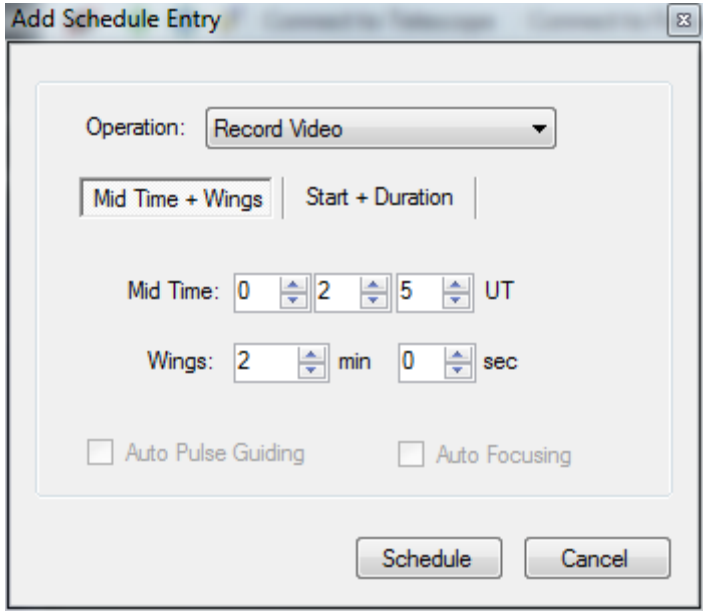

OccuRec v2.9 BETA - AAV Capture (Dazzle DVC100 Video)
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
EXPOSURE
▶SHUTTER x8
SENS UP OFF
AGC OFF
BLC OFF
RETURN RET
23:55:09 09/08/16
0331.2 0811.2
Configure Image
Crossbar Input
Video Composite
Integration Processing
Lock at x4 Frames
Calibrate
Manual
Target Name/Description (AAV)
Schedule
Add
Clear All
REC
STOP
Video File Format: AAV, AAV
Running
Current Frame: 320
Display Mode

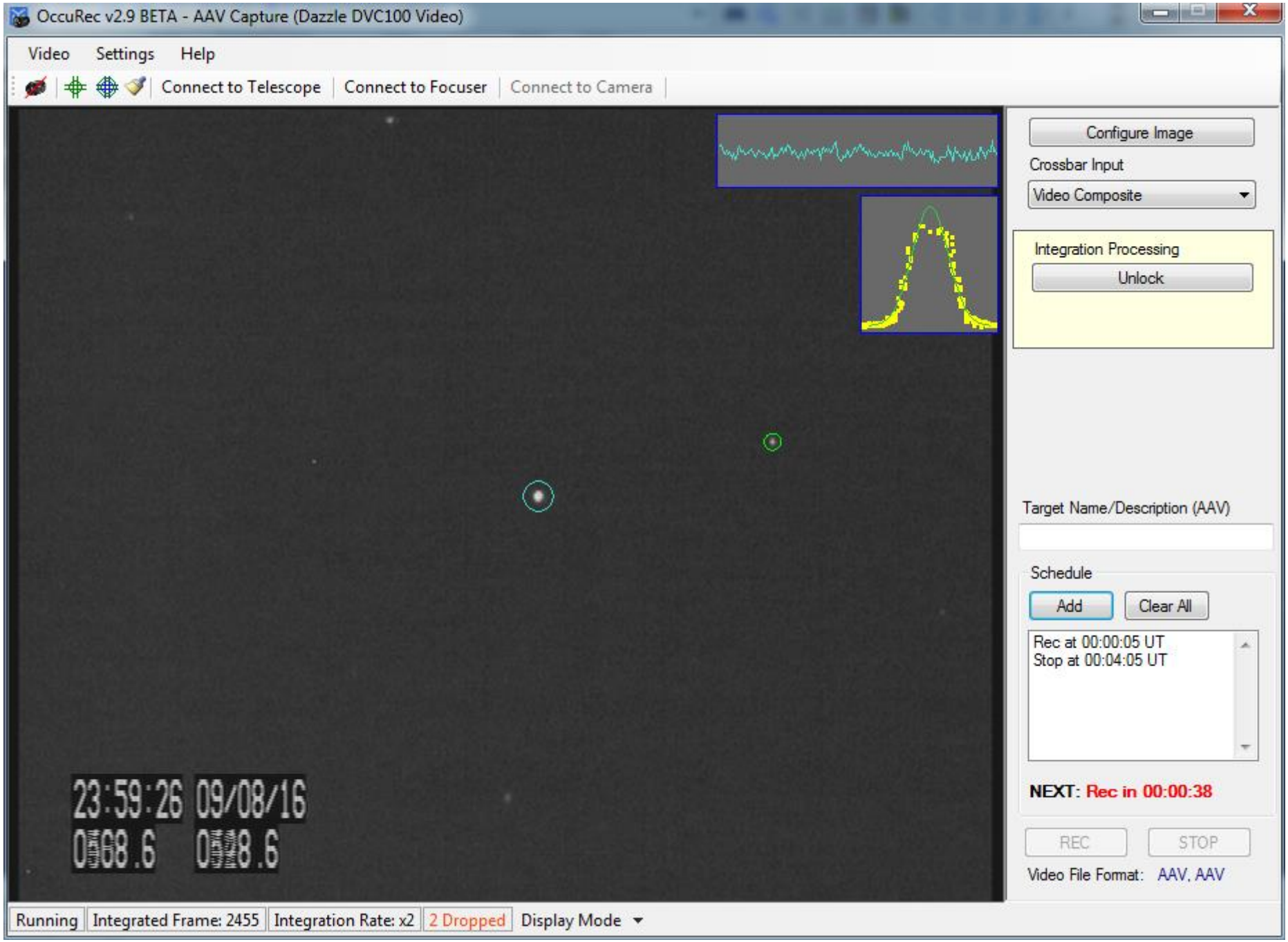

OccuRec v2.9 BETA - AAV Capture (Dazzle DVC100 Video)
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
Configure Image
Crossbar Input
Video Composite
Integration Processing
Unlock
23:58:18 09/08/16
Target Name/Description (AAV)
Schedule
Add
Clear All
REC
STOP
Video File Format: AAV, AAV
Running
Integrated Frame: 1600
Integration Rate: x2
2 Dropped
Display Mode

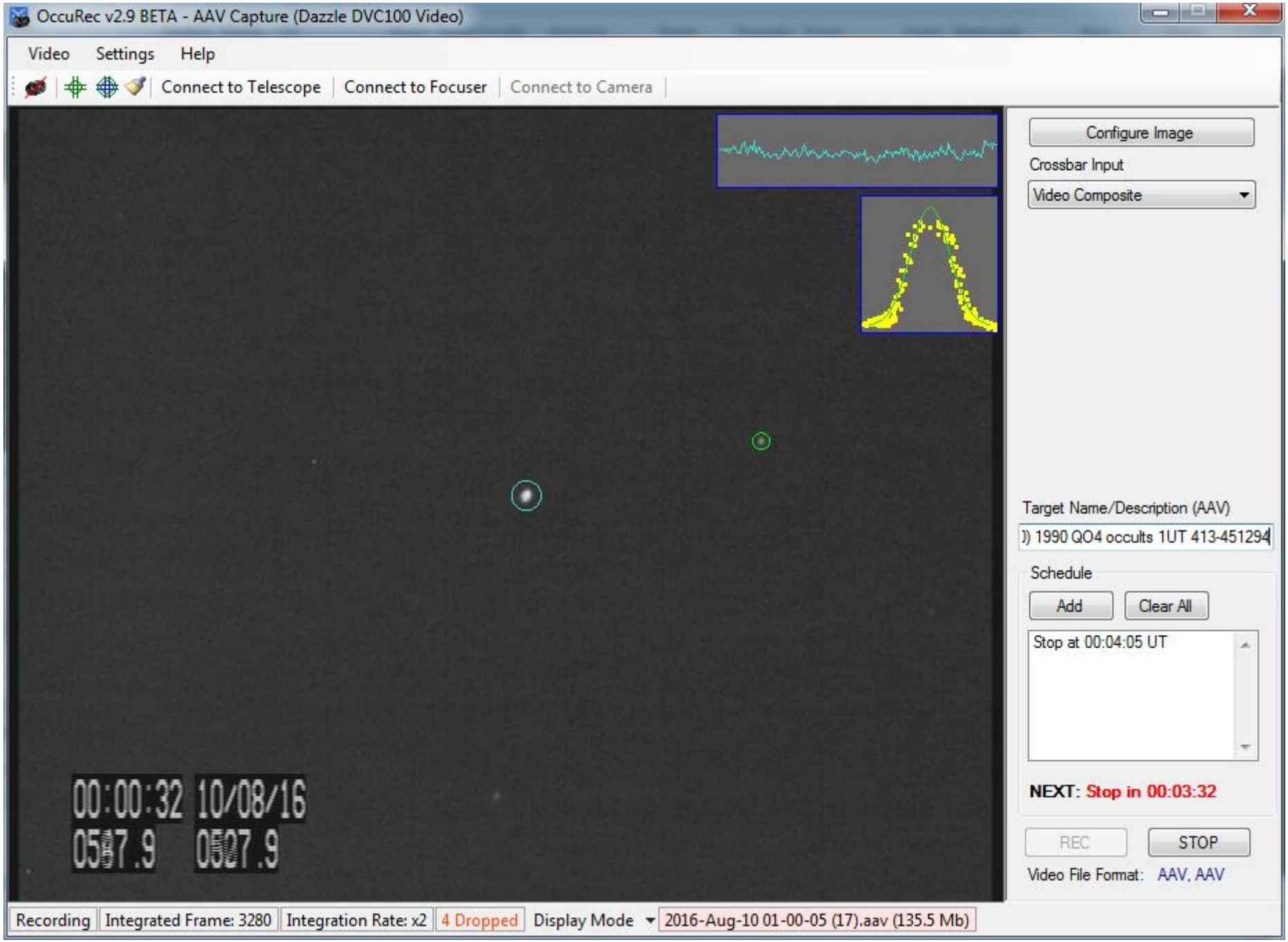


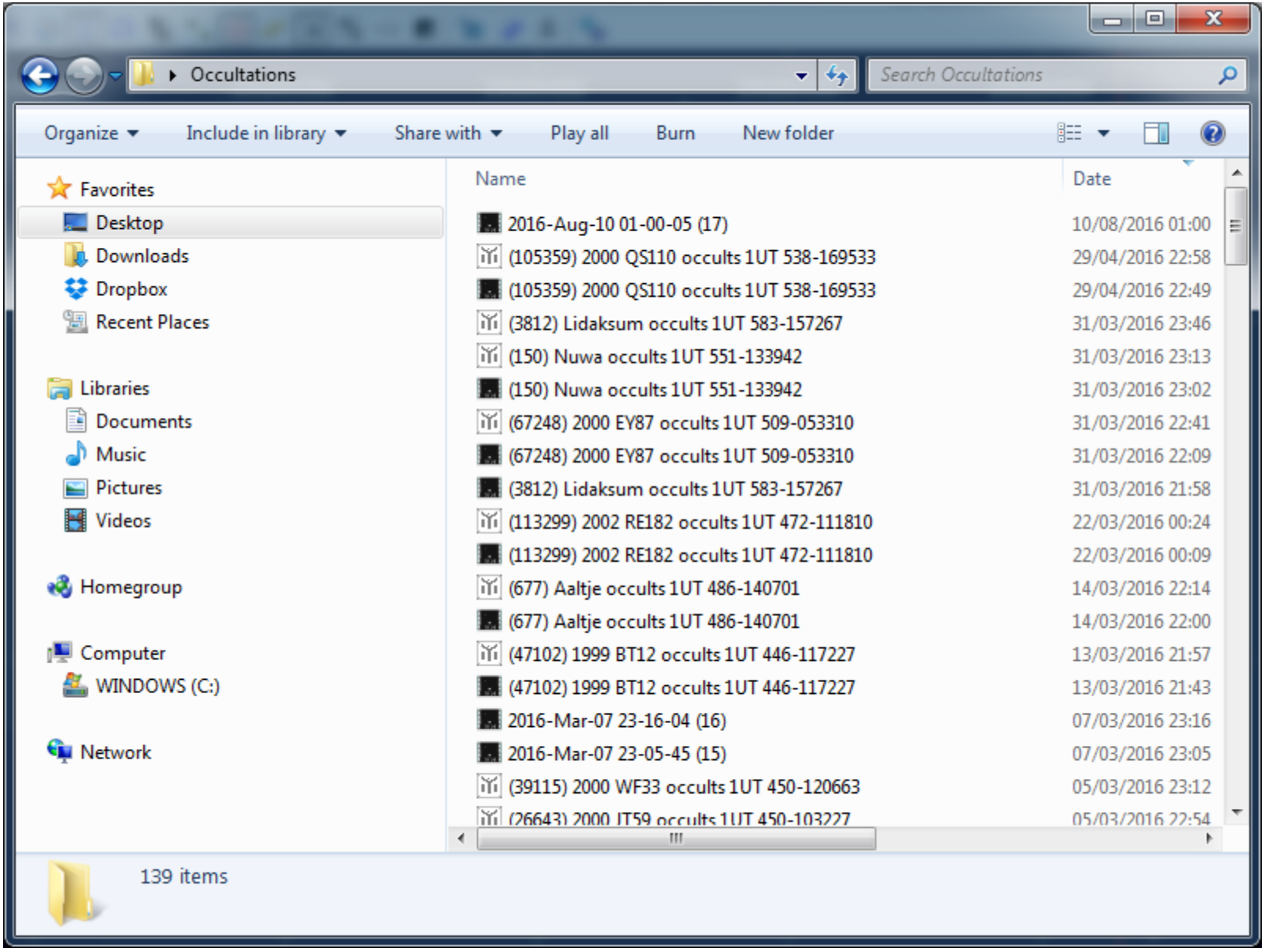
Useful for non-integrating cameras or integrating cameras set to x1 frames integration (i.e. no integration) when time accuracy is less important.

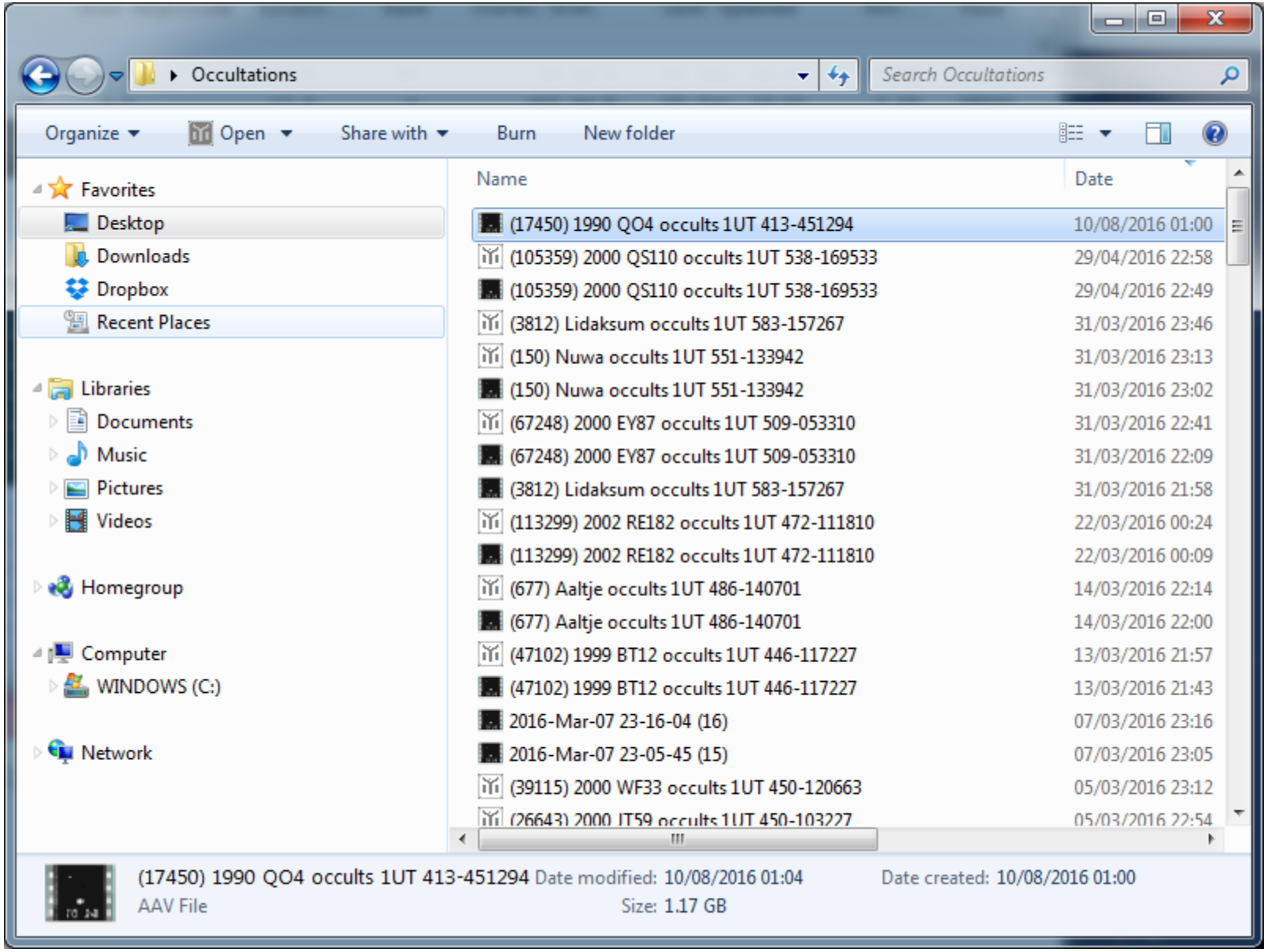

OccuRec v2.9 BETA - AAV Capture (Dazzle DVC100 Video)
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
Configure Image
Crossbar Input
Video Composite
Integration Processing
Unlock
23:58:18 09/08/16
Target Name/Description (AAV)
Schedule
Add
Clear All
REC
STOP
Video File Format: AAV, AAV
Running
Integrated Frame: 1600
Integration Rate: x2
2 Dropped
Display Mode

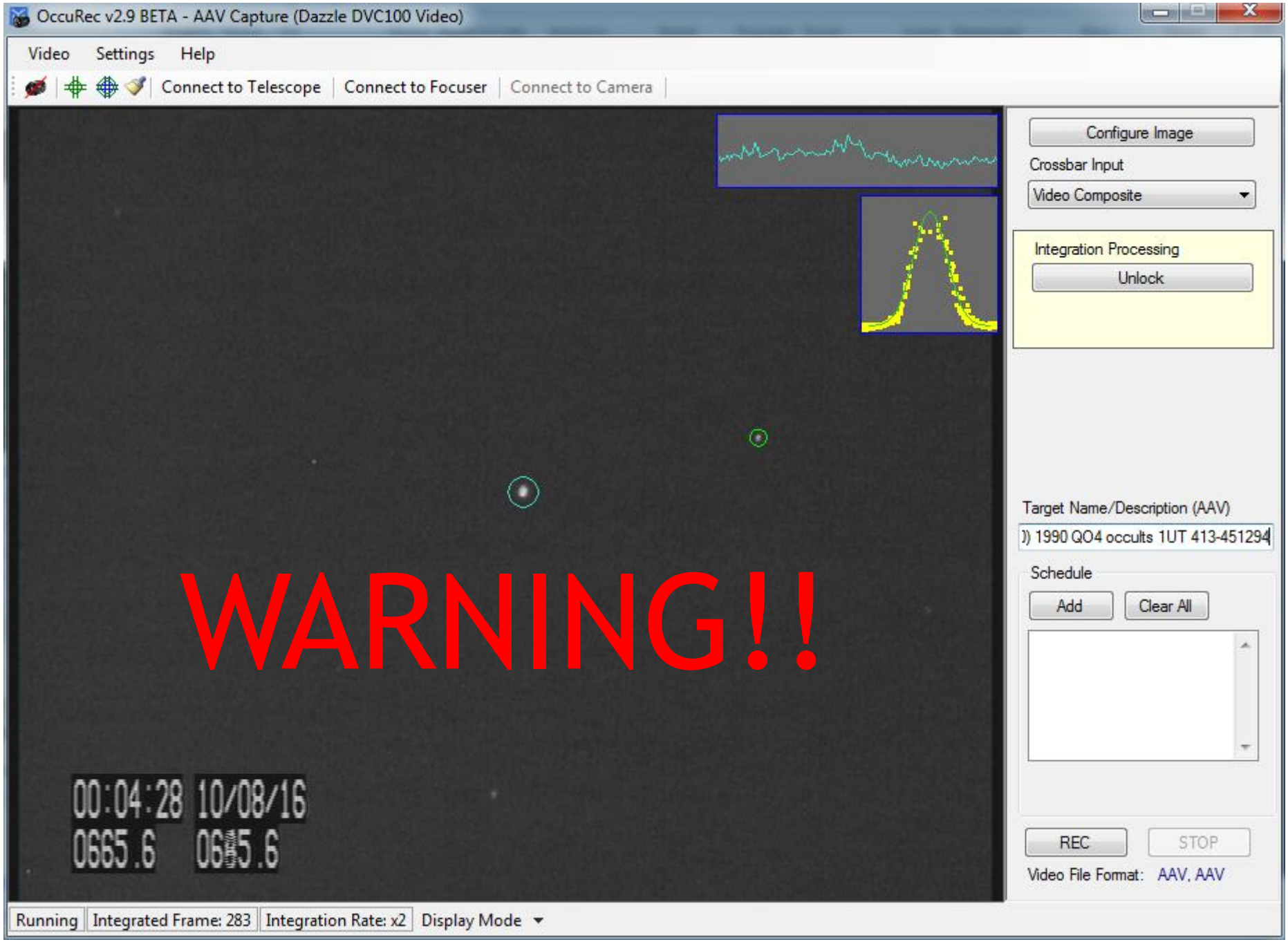

Add Schedule Entry
Operation:
Record Video
Mid Time + Wings
Start + Duration
Mid Time:
0
2
5
UT
Wings:
2
min
0
sec
Auto Pulse Guiding
Auto Focusing
Schedule
Cancel

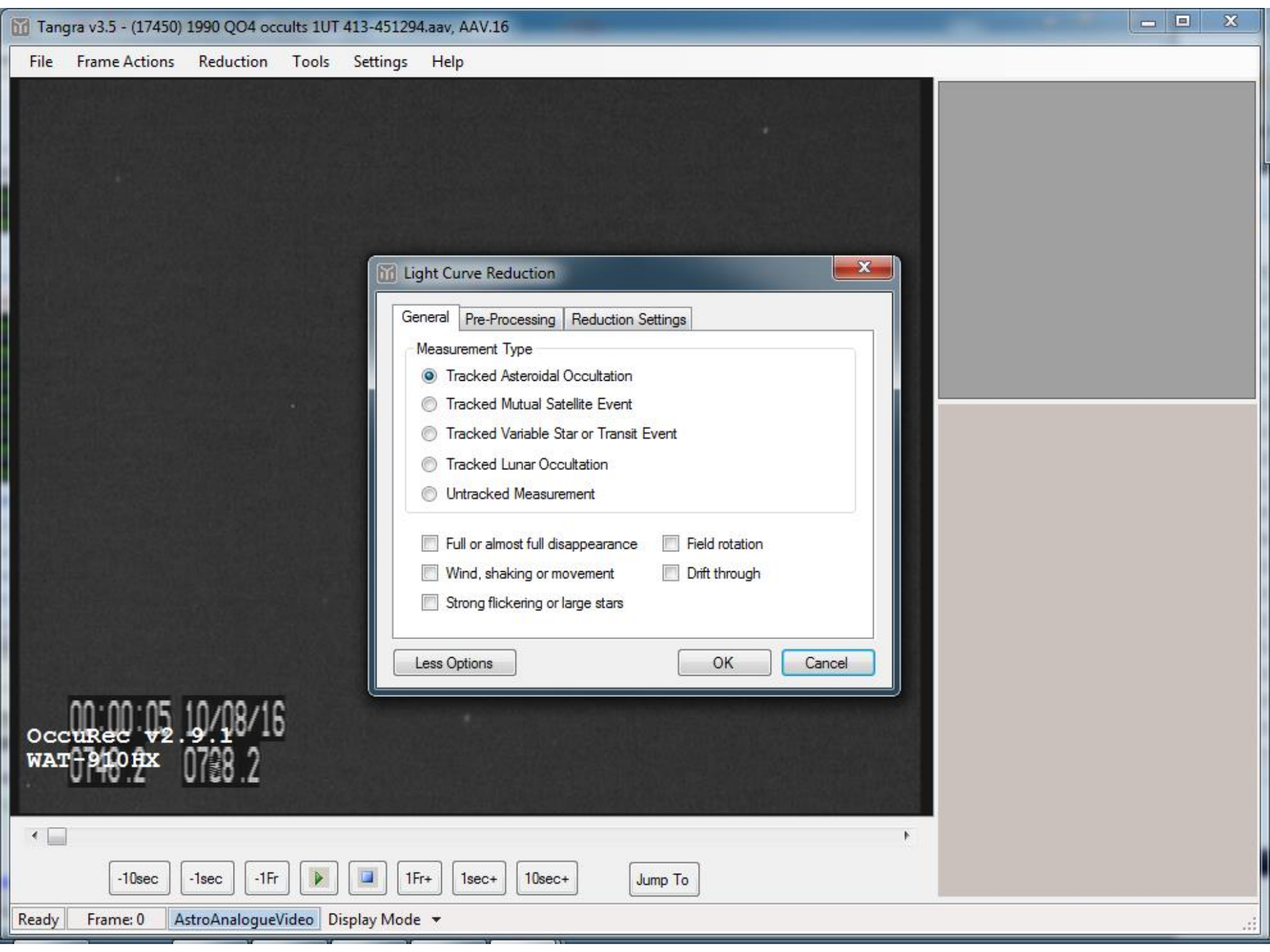

OccuRec v2.9 BETA - AAV Capture (Dazzle DVC100 Video)
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
Configure Image
Crossbar Input
Video Composite
Integration Processing
Unlock
23:59:26 09/08/16
Target Name/Description (AAV)
Schedule
Add
Clear All
Rec at 00:00:05 UT
Stop at 00:04:05 UT
NEXT: Rec in 00:00:38
REC
STOP
Video File Format: AAV, AAV
Running
Integrated Frame: 2455
Integration Rate: x2
2 Dropped
Display Mode

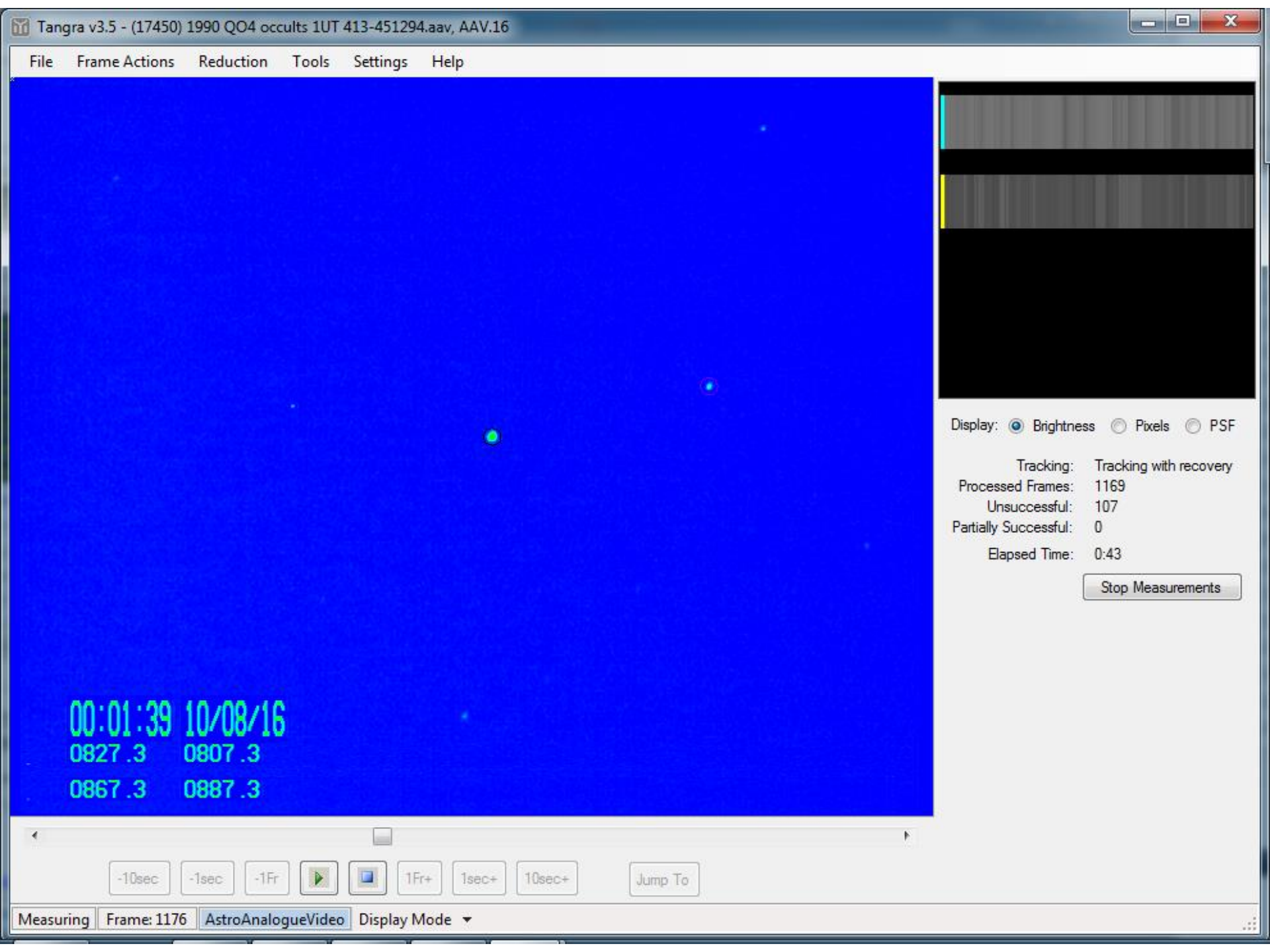

OccuRec v2.9 BETA - AAV Capture (Dazzle DVC100 Video)
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
Configure Image
Crossbar Input
Video Composite
00:00:32 10/08/16
Target Name/Description (AAV)
)) 1990 QO4 occults 1UT 413-451294
Schedule
Add
Clear All
Stop at 00:04:05 UT
NEXT: Stop in 00:03:32
REC
STOP
Video File Format: AAV, AAV
Recording
Integrated Frame: 3280
Integration Rate: x2
4 Dropped
Display Mode
2016-Aug-10 01-00-05 (17).aav (135.5 Mb)

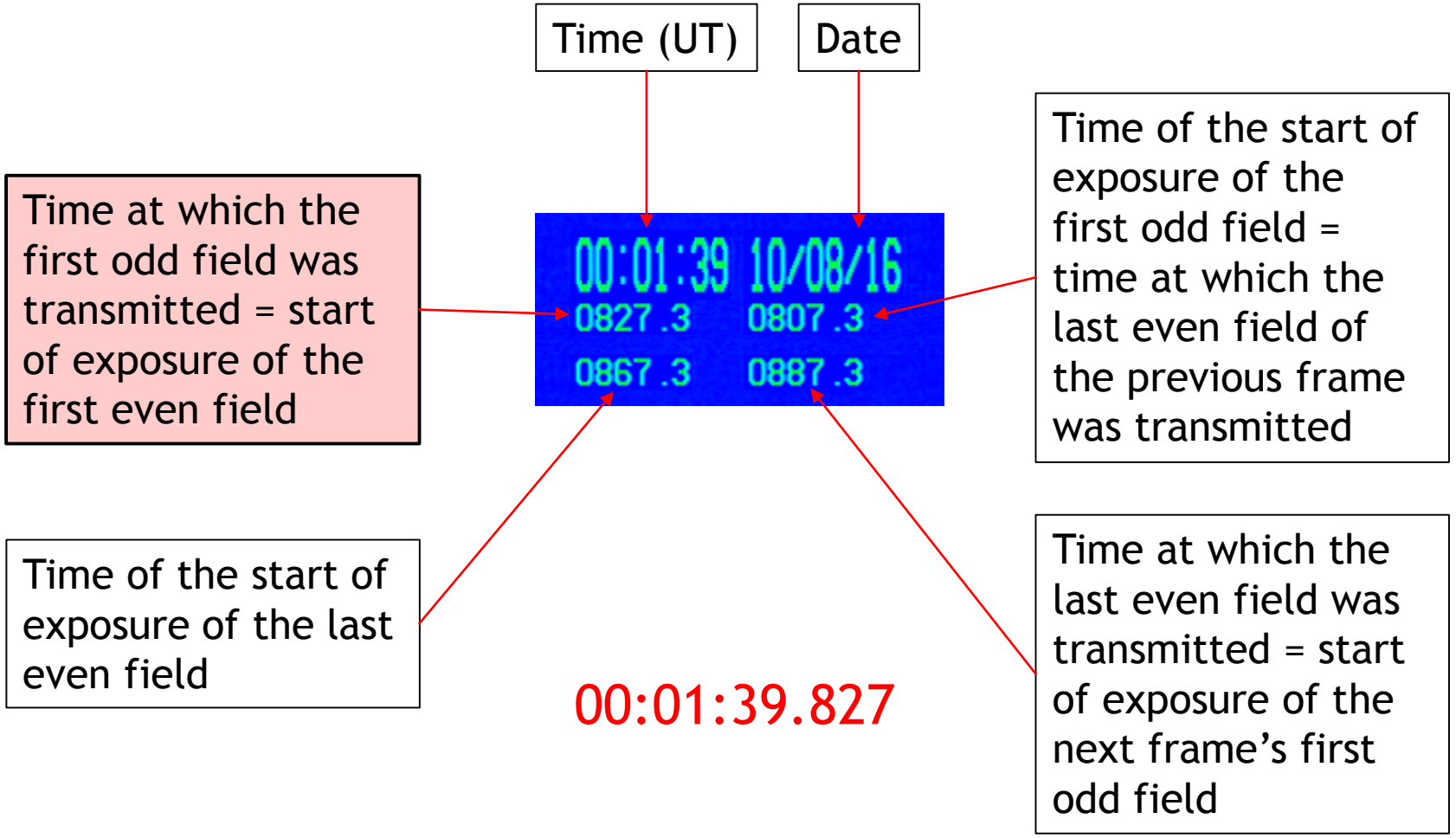

Occultations
Search Occultations
Organize
Include in library
Share with
Play all
Burn
New folder
Favorites
Desktop
Downloads
Dropbox
Recent Places
Libraries
Documents
Music
Pictures
Videos
Homegroup
Computer
WINDOWS (C:)
Network
Name
Date
2016-Aug-10 01-00-05 (17) 10/08/2016 01:00
(105359) 2000 QS110 occults 1UT 538-169533 29/04/2016 22:58
(105359) 2000 QS110 occults 1UT 538-169533 29/04/2016 22:49
(3812) Lidaksum occults 1UT 583-157267 31/03/2016 23:46
(150) Nuwa occults 1UT 551-133942 31/03/2016 23:13
(150) Nuwa occults 1UT 551-133942 31/03/2016 23:02
(67248) 2000 EY87 occults 1UT 509-053310 31/03/2016 22:41
(67248) 2000 EY87 occults 1UT 509-053310 31/03/2016 22:09
(3812) Lidaksum occults 1UT 583-157267 31/03/2016 21:58
(113299) 2002 RE182 occults 1UT 472-111810 22/03/2016 00:24
(113299) 2002 RE182 occults 1UT 472-111810 22/03/2016 00:09
(677) Aaltje occults 1UT 486-140701 14/03/2016 22:14
(677) Aaltje occults 1UT 486-140701 14/03/2016 22:00
(47102) 1999 BT12 occults 1UT 446-117227 13/03/2016 21:57
(47102) 1999 BT12 occults 1UT 446-117227 13/03/2016 21:43
2016-Mar-07 23-16-04 (16) 07/03/2016 23:16
2016-Mar-07 23-05-45 (15) 07/03/2016 23:05
(39115) 2000 WF33 occults 1UT 450-120663 05/03/2016 23:12
(26643) 2000 JT59 occults 1UT 450-103227 05/03/2016 22:54
139 items


Occultations
Search Occultations
Organize
Open
Share with
Burn
New folder
Favorites
Desktop
Downloads
Dropbox
Recent Places
Libraries
Documents
Music
Pictures
Videos
Homegroup
Computer
WINDOWS (C:)
Network
Name
Date
(17450) 1990 QO4 occults 1UT 413-451294 10/08/2016 01:00
(105359) 2000 QS110 occults 1UT 538-169533 29/04/2016 22:58
(105359) 2000 QS110 occults 1UT 538-169533 29/04/2016 22:49
(3812) Lidaksum occults 1UT 583-157267 31/03/2016 23:46
(150) Nuwa occults 1UT 551-133942 31/03/2016 23:13
(150) Nuwa occults 1UT 551-133942 31/03/2016 23:02
(67248) 2000 EY87 occults 1UT 509-053310 31/03/2016 22:41
(67248) 2000 EY87 occults 1UT 509-053310 31/03/2016 22:09
(3812) Lidaksum occults 1UT 583-157267 31/03/2016 21:58
(113299) 2002 RE182 occults 1UT 472-111810 22/03/2016 00:24
(113299) 2002 RE182 occults 1UT 472-111810 22/03/2016 00:09
(677) Aaltje occults 1UT 486-140701 14/03/2016 22:14
(677) Aaltje occults 1UT 486-140701 14/03/2016 22:00
(47102) 1999 BT12 occults 1UT 446-117227 13/03/2016 21:57
(47102) 1999 BT12 occults 1UT 446-117227 13/03/2016 21:43
2016-Mar-07 23-16-04 (16) 07/03/2016 23:16
2016-Mar-07 23-05-45 (15) 07/03/2016 23:05
(39115) 2000 WF33 occults 1UT 450-120663 05/03/2016 23:12
(26643) 2000 JT59 occults 1UT 450-103227 05/03/2016 22:54
(17450) 1990 QO4 occults 1UT 413-451294 Date modified: 10/08/2016 01:04 Date created: 10/08/2016 01:00
AAV File Size: 1.17 GB


OccuRec v2.9 BETA - AAV Capture (Dazzle DVC100 Video)
Video
Settings
Help
Connect to Telescope
Connect to Focuser
Connect to Camera
Configure Image
Crossbar Input
Video Composite
Integration Processing
Unlock
WARNING!!
00:04:28 10/08/16
0665.6
Target Name/Description (AAV)
)) 1990 QO4 occults 1UT 413-451294
Schedule
Add
Clear All
REC
STOP
Video File Format: AAV, AAV
Running
Integrated Frame: 283
Integration Rate: x2
Display Mode


Tangra v3.5 - (17450) 1990 QO4 occults 1UT 413-451294.aav, AAV.16
File
Frame Actions
Reduction
Tools
Settings
Help
Light Curve Reduction
General
Pre-Processing
Reduction Settings
Measurement Type
Tracked Asteroidal Occultation
Tracked Mutual Satellite Event
Tracked Variable Star or Transit Event
Tracked Lunar Occultation
Untracked Measurement
Full or almost full disappearance
Field rotation
Wind, shaking or movement
Drift through
Strong flickering or large stars
Less Options
OK
Cancel
OccuRec v2.9.1
WAT-910HX
-10sec
-1sec
-1Fr
1Fr+
1sec+
10sec+
Jump To
Ready
Frame: 0
AstroAnalogueVideo
Display Mode


Tangra v3.5 - (17450) 1990 QO4 occults 1UT 413-451294.aav, AAV.16
File
Frame Actions
Reduction
Tools
Settings
Help
00:01:39 10/08/16
0827.3 0807.3
0867.3 0887.3
Display: Brightness Pixels PSF
Tracking: Tracking with recovery
Processed Frames: 1169
Unsuccessful: 107
Partially Successful: 0
Elapsed Time: 0:43
Stop Measurements
-10sec
-1sec
-1Fr
1Fr+
1sec+
10sec+
Jump To
Measuring
Frame: 1176
AstroAnalogueVideo
Display Mode



"*AOTA needs to know the START time of the camera OUTPUT (not exposure) to correctly determine the event time.*" – Nb. this is also true for Tangra

In Conclusion

- OccuRec is a useful recording software for occultations
- Reduces file size and noise for integrating cameras
- Makes analysing videos quicker and easier
- Timestamps are easy to read and understandable
- If you have an IOTA-VTI it will store the times as well

However!

- Always disconnect and reconnect camera between multiple events!!
- Dropped frames require careful consideration and correction during analysis!!

Thank you

john.talbot@readingastro.org.uk