Observing Log Jan 2014

installed camera in AOL dome, initial shakedown observations. Photometric night. First part was out of focus, then things were better.

UT Jan 13

Nice photometric night, ran fine from end to end. Good data set for analysis.

BUT note the fits files, and consequently the photometry files, aren't in the stipulated bands. This was fixed for ut011414, but afflicts ut011314 and ut011214.

During the day on Jan 14 took an image of the sun at 1/8000 but still saturated.

UT Jan 14

Clouds during the afternoon. Took a few short daytime exposures to see clouds. Saturated at 1/1000. OK at 1/8000 sec. Image is ut011414.daytime.cr2, on CWS laptop at

/Users/cstubbs/data/skycam/ut011414

Took a set of diagnostic color bar frames to diagnose canon2fits.c. The relationship between MEF planes and colors is not what was assumed. Hacked makefits.sh script with what I believe to be a workaround. This is not a clear night, so far.

Chuck installed NIR sky monitoring photodiodes on the roof of the ALO building. Those are running tonight as well, pointed to zenith.

UT Jan 15.

Things to do during the daytime:

- re-reduce data from ut011314 - done
- take stopped-down images of the sun, for color and photometric calibration - done, but still saturated
- try to get a successful WCS header for at least one image. - done, but poor fit to the data
- source-on-a-stick calibration? - not done
- try power-off test - too chicken to try

UT Jan 16, 17

Transferred .cr2 files taken thus far to laptop for analysis at home. It's a good data set, ut011314 was photometric, the other nights had partial clouds.

Packed up gear, see link for next run that has list of items left in Chile.

Photodiodes left in place, that door is unlocked. The rest are locked.

Took daytime calibration images through clouds. Can be used to do astrometric calibration using RA, Dec of sun (see astrometry page on this wiki) as well as, perhaps, photometric calibration as well using attenuated sunlight.

Script for daytime calibration images is

daycals.sh

Jan 19, 2014

The observations for ut011814 ran properly, and reductions as well.

But for the night of ut011914, data collection ended after only 35 images:

ls -lrt gives:

-rw-r--r-- 1 christopherstubbs staff 31392789 Jan 20 00:19 ut011914.0033.short.cr2

-rw-r--r-- 1 christopherstubbs staff 17894481 Jan 20 00:19 ut011914.0034.long.cr2

-rw-r--r-- 1 christopherstubbs staff 31170237 Jan 20 00:20 ut011914.0035.short.cr2

But:

server:ut011914 christopherstubbs$ uptime

 5:23 up 5:03, 1 user, load averages: 0.31 0.55 0.63

server:ut011914 christopherstubbs$

so it would seem the power failed, or the system rebooted for some reason, 20 minutes after midnight and cron job ended. That's not entirely bad news, since it would appear we survived a power cycle or some other kind of failure, and system rebooted . But we did lose a night's worth of data.

Jan 30.

Have lost the ability to ssh into the data collection machine. So either power failed and it's off, or else network is down, or both.

So suspect ut012914 directory might have problems.

March 1, 2014.

We have had a few more power failures, as evidenced by reboots of the data collection machine. Can see this using "uptime" on command line. Nights of ut022614 and ut022714 both had this problem. Looks like we got all the images for ut022614 but not on ut022714. Neither had processing run to completion. So I made some recovery scripts, best to run in the afternoon or during data collection so as to avoid colliding with standard analysis that takes place after sunup.

~/fixnight.sh <utmmddyy> should run processing starting from fits file generation onwards, on a night's worth of images.

March 28 2014

Had another power failure during day of ut032714. But data collection and reduction seem to be going OK regardless

April 2, 2014

Oops- had an error in the crontab file that didn't include March 31 so we don't have data from that night. Fixed it and made sure all months have appropriate final dates.

Servicing Trip May 20-22 2014, Coughlin & Stubbs

1. Installed new 5D Mark III camera since shutter has gone through many cycles by now.
2. Changed the lens to wider field lens, 10 mm focal length.
3. cleaned dust off exterior of the acrylic dome
4. changed out the hard disks to ones that are properly formatted, so we can write to them. Added 2x1.8 TB of disk, /Volumes/ALLSKY1 and /Volumes/ALLSKY2
5. edited initialize.sh script in home directory to set widest aperture on this new lens, to f/4.
6. changed to ISO 500 (takes effect night of May 22/23).

first night of new configuration was night of May 20, 21 2014. Images look nicely focused. So that part is fine. But I think we need to increase exposure times since we went from f2.8 to f/4. So I am going to change the scripts to have a short exposure of 3 sec and a long exposure of 30 sec. This adds 22 sec of integration time, and so also need to decrease the pause interval by 22 sec to keep same number of images. (IF we increased number of frames we wouldn't keep up in 24 hours of on-site analysis, unless we start making fits files as soon as data are taken. That might be a good idea anyway, but not for this trip...)

Note that 30 sec is longest exposure time that can be commanded from gphoto2, as far as we know.

server:~ christopherstubbs$ cp initialize.sh initialize.may20.sh

server:~ christopherstubbs$ cp startnight.sh startnight.may20.sh

server:~ christopherstubbs$ diff startnight.sh startnight.may20.sh

15c15

< gphoto2 --set-config=/main/capturesettings/shutterspeed=3

> gphoto2 --set-config=/main/capturesettings/shutterspeed=1

22c22

< gphoto2 --set-config=/main/capturesettings/shutterspeed=30

> gphoto2 --set-config=/main/capturesettings/shutterspeed=10

----
server:~ christopherstubbs$ diff initialize.sh initialize.may20.sh

34c34

< export pauseinterval=28

> export pauseinterval=50
ZZ

June 14, 2014.

Timing between images isn't working quite right. Images run way past morning twilight. We used to have about 72 seconds between images. Now it's more like 90 seconds. But the change in pause interval made above is equal to the difference in exposure times, so what's up? I think that we might not have turned off long exposure noise reduction? That would add another 30 seconds to each set. Seems I need to set pause interval to 18 seconds less than current value, or 10 seconds. So I will make that change in startnight.sh and we will have a shorter interval between images.

But we need to check noise reduction settings. Can gphoto do that?

gphoto list all

```
server:M christopherstubbs$ sudo gphoto2 --list-all-config

Password:

/main/actions/uilock

Label: UI Lock

Type: TOGGLE

Current: 2

/main/actions/syncdatetime

Label: Synchronize camera date and time with PC

Type: TOGGLE

Current: 0

/main/actions/autofocusdrive

Label: Drive Canon DSLR Autofocus

Type: TOGGLE

Current: 0

/main/actions/manualfocusdrive

Label: Drive Canon DSLR Manual focus

Type: RADIO

Current: None

Choice: 0 Near 1

Choice: 1 Near 2

Choice: 2 Near 3

Choice: 3 None

Choice: 4 Far 1

Choice: 5 Far 2

Choice: 6 Far 3

/main/actions/eoszoom

Label: Canon EOS Zoom

Type: TEXT

Current: 0

/main/actions/eoszoomposition
```

```
Label: Canon EOS Zoom Position

Type: TEXT

Current: 0,0

/main/actions/eosviewfinder

Label: Canon EOS Viewfinder

Type: TOGGLE

Current: 2

/main/actions/eosremoterelease

Label: Canon EOS Remote Release

Type: RADIO

Current: None

Choice: 0 None

Choice: 1 Press Half

Choice: 2 Press Full

Choice: 3 Release Half

Choice: 4 Release Full

/main/settings/datetime

Label: Camera Date and Time

Type: DATE

Current: 1402752550

Printable: Sat Jun 14 13:29:10 2014

/main/settings/reviewtime

Label: Quick Review Time

Type: RADIO

Current: 2 seconds

Choice: 0 None

Choice: 1 2 seconds

Choice: 2 4 seconds

Choice: 3 8 seconds

Choice: 4 Hold

/main/settings/output

Label: Camera Output

Type: RADIO

Current: Undefined

Choice: 0 Undefined
```

```
Choice: 1 TFT

Choice: 2 PC

Choice: 3 TFT + PC

Choice: 4 Unknown value 0004

Choice: 5 Unknown value 0005

Choice: 6 Unknown value 0006

Choice: 7 Unknown value 0007

/main/settings/movierecord

Label: Movie Recording

Type: TEXT

Current: 0

/main/settings/evfmode

Label: EVF Mode

Type: RADIO

Current: 1

Choice: 0 0

Choice: 1 1

/main/settings/ownername

Label: Owner Name

Type: TEXT

Current:

/main/settings/artist

Label: Artist

Type: TEXT

Current:

/main/settings/copyright

Label: Copyright

Type: TEXT

Current:

/main/settings/customfuncex

Label: Custom Functions Ex

Type: TEXT

Current: 10,c189,d1a3,0,

/main/settings/autopoweroff

Label: Auto Power Off

Type: TEXT
```

```
Current: 0

/main/settings/capturetarget

Label: Capture Target

Type: RADIO

Current: Internal RAM

Choice: 0 Internal RAM

Choice: 1 Memory card

/main/settings/capture

Label: Capture

Type: TOGGLE

Current: 0

/main/status/serialnumber

Label: Serial Number

Type: TEXT

Current: 61c20f91c1cb455e9fdade06e8876681

/main/status/manufacturer

Label: Camera Manufacturer

Type: TEXT

Current: Canon Inc.

/main/status/cameramodel

Label: Camera Model

Type: TEXT

Current: Canon EOS 5D Mark III

/main/status/deviceversion

Label: Device Version

Type: TEXT

Current: 3-1.2.3

/main/status/vendorextension

Label: Vendor Extension

Type: TEXT

Current: None

/main/status/model

Label: Camera Model

Type: TEXT

Current: 2147484293
```

```
/main/status/ptpversion
Label: PTP Version
Type: TEXT
Current: 256
/main/status/batterylevel
Label: Battery Level
Type: TEXT
Current: 100%
/main/status/lensname
Label: Lens Name
Type: TEXT
Current: EF8-15mm f/4L FISHEYE USM
/main/status/eosserialnumber
Label: Serial Number
Type: TEXT
Current: 182029002980
/main/status/shuttercounter
Label: Shutter Counter
Type: TEXT
Current: 4508
/main/status/availableshots
Label: Available Shots
Type: TEXT
Current: 11188
/main/imgsettings/imageformat
Label: Image Format
Type: RADIO
Current: RAW
Choice: 0 Large Fine JPEG
Choice: 1 Large Normal JPEG
Choice: 2 Medium Fine JPEG
Choice: 3 Medium Normal JPEG
Choice: 4 Small Fine JPEG
Choice: 5 Small Normal JPEG
Choice: 6 Smaller JPEG
Choice: 7 Tiny JPEG
```

```
Choice: 8 RAW + Large Fine JPEG

Choice: 9 RAW + Large Normal JPEG

Choice: 10 RAW + Medium Fine JPEG

Choice: 11 RAW + Medium Normal JPEG

Choice: 12 Unknown value 04d3

Choice: 13 Unknown value 04d2

Choice: 14 Unknown value 04e3

Choice: 15 Unknown value 04f3

Choice: 16 mRAW + Large Fine JPEG

Choice: 17 mRAW + Large Normal JPEG

Choice: 18 mRAW + Medium Fine JPEG

Choice: 19 mRAW + Medium Normal JPEG

Choice: 20 Unknown value 14d3

Choice: 21 Unknown value 14d2

Choice: 22 Unknown value 14e3

Choice: 23 Unknown value 14f3

Choice: 24 sRAW + Large Fine JPEG

Choice: 25 sRAW + Large Normal JPEG

Choice: 26 sRAW + Medium Fine JPEG

Choice: 27 sRAW + Medium Normal JPEG

Choice: 28 Unknown value 24d3

Choice: 29 Unknown value 24d2

Choice: 30 Unknown value 24e3

Choice: 31 Unknown value 24f3

Choice: 32 RAW

Choice: 33 mRAW

Choice: 34 sRAW

/main/imgsettings/imageformatsd

Label: Image Format SD

Type: RADIO

Current: RAW

Choice: 0 Large Fine JPEG

Choice: 1 Large Normal JPEG

Choice: 2 Medium Fine JPEG

Choice: 3 Medium Normal JPEG
```

```
Choice: 4 Small Fine JPEG

Choice: 5 Small Normal JPEG

Choice: 6 Smaller JPEG

Choice: 7 Tiny JPEG

Choice: 8 RAW + Large Fine JPEG

Choice: 9 RAW + Large Normal JPEG

Choice: 10 RAW + Medium Fine JPEG

Choice: 11 RAW + Medium Normal JPEG

Choice: 12 Unknown value 04d3

Choice: 13 Unknown value 04d2

Choice: 14 Unknown value 04e3

Choice: 15 Unknown value 04f3

Choice: 16 mRAW + Large Fine JPEG

Choice: 17 mRAW + Large Normal JPEG

Choice: 18 mRAW + Medium Fine JPEG

Choice: 19 mRAW + Medium Normal JPEG

Choice: 20 Unknown value 14d3

Choice: 21 Unknown value 14d2

Choice: 22 Unknown value 14e3

Choice: 23 Unknown value 14f3

Choice: 24 sRAW + Large Fine JPEG

Choice: 25 sRAW + Large Normal JPEG

Choice: 26 sRAW + Medium Fine JPEG

Choice: 27 sRAW + Medium Normal JPEG

Choice: 28 Unknown value 24d3

Choice: 29 Unknown value 24d2

Choice: 30 Unknown value 24e3

Choice: 31 Unknown value 24f3

Choice: 32 RAW

Choice: 33 mRAW

Choice: 34 sRAW

/main/imgsettings/imageformatcf

Label: Image Format CF

Type: RADIO

Current: RAW

Choice: 0 Large Fine JPEG
```

```
Choice: 1 Large Normal JPEG

Choice: 2 Medium Fine JPEG

Choice: 3 Medium Normal JPEG

Choice: 4 Small Fine JPEG

Choice: 5 Small Normal JPEG

Choice: 6 Smaller JPEG

Choice: 7 Tiny JPEG

Choice: 8 RAW + Large Fine JPEG

Choice: 9 RAW + Large Normal JPEG

Choice: 10 RAW + Medium Fine JPEG

Choice: 11 RAW + Medium Normal JPEG

Choice: 12 Unknown value 04d3

Choice: 13 Unknown value 04d2

Choice: 14 Unknown value 04e3

Choice: 15 Unknown value 04f3

Choice: 16 mRAW + Large Fine JPEG

Choice: 17 mRAW + Large Normal JPEG

Choice: 18 mRAW + Medium Fine JPEG

Choice: 19 mRAW + Medium Normal JPEG

Choice: 20 Unknown value 14d3

Choice: 21 Unknown value 14d2

Choice: 22 Unknown value 14e3

Choice: 23 Unknown value 14f3

Choice: 24 sRAW + Large Fine JPEG

Choice: 25 sRAW + Large Normal JPEG

Choice: 26 sRAW + Medium Fine JPEG

Choice: 27 sRAW + Medium Normal JPEG

Choice: 28 Unknown value 24d3

Choice: 29 Unknown value 24d2

Choice: 30 Unknown value 24e3

Choice: 31 Unknown value 24f3

Choice: 32 RAW

Choice: 33 mRAW

Choice: 34 sRAW

/main/imgsettings/iso
```

```
Label: ISO Speed

Type: RADIO

Current: 500

Choice: 0 Auto

Choice: 1 100

Choice: 2 125

Choice: 3 160

Choice: 4 200

Choice: 5 250

Choice: 6 320

Choice: 7 400

Choice: 8 500

Choice: 9 640

Choice: 10 800

Choice: 11 1000

Choice: 12 1250

Choice: 13 1600

Choice: 14 2000

Choice: 15 2500

Choice: 16 3200

Choice: 17 4000

Choice: 18 5000

Choice: 19 6400

Choice: 20 Unknown value 007b

Choice: 21 Unknown value 007d

Choice: 22 12800

Choice: 23 Unknown value 0083

Choice: 24 Unknown value 0085

Choice: 25 25600

/main/imgsettings/whitebalance

Label: WhiteBalance

Type: RADIO

Current: Daylight

Choice: 0 Auto

Choice: 1 Daylight

Choice: 2 Shadow
```

```
Choice: 3 Cloudy

Choice: 4 Tungsten

Choice: 5 Fluorescent

Choice: 6 Flash

Choice: 7 Manual

Choice: 8 Color Temperature

/main/imgsettings/whitebalanceadjusta

Label: WhiteBalance Adjust A

Type: RADIO

Current: 0

Choice: 0 -9

Choice: 1 -8

Choice: 2 -7

Choice: 3 -6

Choice: 4 -5

Choice: 5 -4

Choice: 6 -3

Choice: 7 -2

Choice: 8 -1

Choice: 9 0

Choice: 10 1

Choice: 11 2

Choice: 12 3

Choice: 13 4

Choice: 14 5

Choice: 15 6

Choice: 16 7

Choice: 17 8

Choice: 18 9

/main/imgsettings/whitebalanceadjustb

Label: WhiteBalance Adjust B

Type: RADIO

Current: 0

Choice: 0 -9

Choice: 1 -8
```

```
Choice: 2 -7

Choice: 3 -6

Choice: 4 -5

Choice: 5 -4

Choice: 6 -3

Choice: 7 -2

Choice: 8 -1

Choice: 9 0

Choice: 10 1

Choice: 11 2

Choice: 12 3

Choice: 13 4

Choice: 14 5

Choice: 15 6

Choice: 16 7

Choice: 17 8

Choice: 18 9

/main/imgsettings/whitebalancexa

Label: WhiteBalance X A

Type: TEXT

Current: 0

/main/imgsettings/whitebalancexb

Label: WhiteBalance X B

Type: TEXT

Current: 0

/main/imgsettings/colorspace

Label: Color Space

Type: RADIO

Current: sRGB

Choice: 0 sRGB

Choice: 1 AdobeRGB

/main/capturesettings/focusmode

Label: Focus Mode

Type: RADIO

Current: Unknown value 0003

Choice: 0 One Shot
```

```
Choice: 1 AI Focus

Choice: 2 AI Servo

Choice: 3 Unknown value 0003

/main/capturesettings/autoexposuremode

Label: Canon Auto Exposure Mode

Type: RADIO

Current: Manual

Choice: 0 P

Choice: 1 TV

Choice: 2 AV

Choice: 3 Manual

Choice: 4 Bulb

Choice: 5 A_DEP

Choice: 6 DEP

Choice: 7 Custom

Choice: 8 Lock

Choice: 9 Green

Choice: 10 Night Portrait

Choice: 11 Sports

Choice: 12 Portrait

Choice: 13 Landscape

Choice: 14 Closeup

Choice: 15 Flash Off

/main/capturesettings/drivemode

Label: Drive Mode

Type: RADIO

Current: Single

Choice: 0 Single

Choice: 1 Continuous high speed

Choice: 2 Continuous low speed

Choice: 3 Single silent

Choice: 4 Continuous silent

Choice: 5 Timer 10 sec

Choice: 6 Timer 2 sec

/main/capturesettings/picturestyle
```

```
Label: Picture Style

Type: RADIO

Current: Standard

Choice: 0 Unknown value 0087

Choice: 1 Standard

Choice: 2 Portrait

Choice: 3 Landscape

Choice: 4 Neutral

Choice: 5 Faithful

Choice: 6 Monochrome

Choice: 7 User defined 1

Choice: 8 User defined 2

Choice: 9 User defined 3
/main/capturesettings/aperture

Label: Aperture

Type: RADIO

Current: 4

Choice: 0 4

Choice: 1 4.5

Choice: 2 5

Choice: 3 5.6

Choice: 4 6.3

Choice: 5 7.1

Choice: 6 8

Choice: 7 9

Choice: 8 10

Choice: 9 11

Choice: 10 13

Choice: 11 14

Choice: 12 16

Choice: 13 18

Choice: 14 20

Choice: 15 22
/main/capturesettings/shutterspeed

Label: Shutter Speed

Type: RADIO
```

```
Current: 30

Choice: 0 30

Choice: 1 25

Choice: 2 20

Choice: 3 15

Choice: 4 13

Choice: 5 10

Choice: 6 8

Choice: 7 6

Choice: 8 5

Choice: 9 4

Choice: 10 3.2

Choice: 11 2.5

Choice: 12 2

Choice: 13 1.6

Choice: 14 1.3

Choice: 15 1

Choice: 16 0.8

Choice: 17 0.6

Choice: 18 0.5

Choice: 19 0.4

Choice: 20 0.3

Choice: 21 1/4

Choice: 22 1/5

Choice: 23 1/6

Choice: 24 1/8

Choice: 25 1/10

Choice: 26 1/13

Choice: 27 1/15

Choice: 28 1/20

Choice: 29 1/25

Choice: 30 1/30

Choice: 31 1/40

Choice: 32 1/50

Choice: 33 1/60
```

```
Choice: 34 1/80

Choice: 35 1/100

Choice: 36 1/125

Choice: 37 1/160

Choice: 38 1/200

Choice: 39 1/250

Choice: 40 1/320

Choice: 41 1/400

Choice: 42 1/500

Choice: 43 1/640

Choice: 44 1/800

Choice: 45 1/1000

Choice: 46 1/1250

Choice: 47 1/1600

Choice: 48 1/2000

Choice: 49 1/2500

Choice: 50 1/3200

Choice: 51 1/4000

Choice: 52 1/5000

Choice: 53 1/6400

Choice: 54 1/8000

/main/capturesettings/meteringmode

Label: Metering Mode

Type: RADIO

Current: Evaluative

Choice: 0 Evaluative

Choice: 1 Partial

Choice: 2 Spot

Choice: 3 Center-weighted average

/main/capturesettings/bracketmode

Label: Bracket Mode

Type: TEXT

Current: 0

/main/capturesettings/aeb

Label: Auto Exposure Bracketing

Type: RADIO
```

```
Current: off

Choice: 0 off

Choice: 1 +/- 1/3

Choice: 2 +/- 2/3

Choice: 3 +/- 1

Choice: 4 +/- 1 1/3

Choice: 5 +/- 1 2/3

Choice: 6 +/- 2

Choice: 7 +/- 2 1/3

Choice: 8 +/- 2 2/3

Choice: 9 +/- 3

/main/other/d402

Label: PTP Property 0xd402

Type: TEXT

Current: Canon EOS 5D Mark III

/main/other/d407

Label: PTP Property 0xd407

Type: TEXT

Current: 1

/main/other/d406

Label: PTP Property 0xd406

Type: TEXT

Current: Unknown Initiator

/main/other/d303

Label: PTP Property 0xd303

Type: TEXT

Current: 1

/main/other/5001

Label: Battery Level

Type: MENU

Current: 100

Choice: 0 100

Choice: 1 0

Choice: 2 75

Choice: 3 0
```

```
Choice: 4 50

server:M christopherstubbs$
```

So it seems no access to noise reduction settings?

In any event, am going to change pause interval to 10 seconds.

June 25 2014. Stubbs.

Noticed that we ceased getting good data on ut062114, but this went undetected until today. Did a remote reboot of the Mac Mini and are hoping this will recover things.

An external disk that had vanished from mounted disks re-appeared as well. But one other one did not.

Sep 2 2014. Coughlin.

Mike noticed that we ceased getting data on ut082114, but this went undetected until today (so we are missing data from 082114-083114. Did a remote reboot of the Mac Mini yesterday to recover the hard drives and this restored gphoto, which was the problem.

Sept 7 2014. Stubbs

There was an error in the cronfile times for August so that for the entire period 080114 to 082114 we started taking data one hour later than we should have. Have edited file file to fix it.

Sep 20 2014. Coughlin.

No data from last night (so we are missing data from 091914-091914. Did a remote reboot of the Mac Mini, but this has not fixed the problem