## (Sinar Evolution System with Sinar CaptureFlow Software and TTI-Repro Graphic Workstation

This is a complex system that requires attention to details to acquire quality images. The system has a habit of changing settings, especially during the beginning of a session or when changing storage folders. It is imperative, especially at first, to check and double check all of the Capture and Process settings.

**OVERVIEW**

- Start up: turning on the camera system (camera, lights), computer, camera software.
- First time setup and CaptureFlow software overview.
- Session setup (white balance, setting neutral gray).
- Image acquisition workflow and file naming.
- Shutting down (lights, lens cap, computer).

**TURNING ON THE CAMERA SYSTEMS AND COMPUTER**

**If not on, turn on the iMac Computer** (switch is on the back left). Check to make sure the keyboard and mouse are on. Note: you will need to charge the mouse and keyboard periodically.
**Log in.**

**Lights for the Camera System:**

- Turn on the switch on bottom right back of power supply.
- Wait a minute or two for the system to stabilize.
- Use foot pedal to turn on the lights. This is done by hand.
- The lights should warm up for five minutes.
- Turn OFF overhead florescent lights.

Important: When done, be sure the camera system lights are turned off before the power supply is turned off. If the lights are on and the power supply is turned on it will blow bulbs.

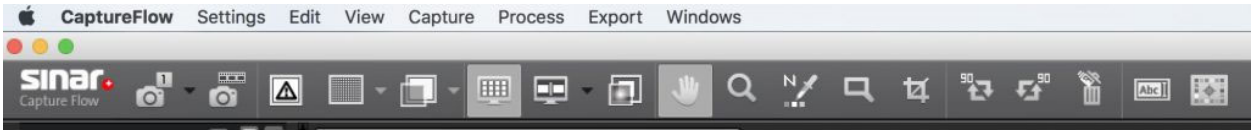
**Camera Connection to the Computer:**

- Make sure camera firewire (gray wire) is plugged in to the Firewire 800 Repeater (Unibrain) which is plugged into the iMac Thunderbolt to Firewire 800 adapter.
- Make sure the power for the Firewire 800 Repeater is plugged in.
- Make sure the battery backup is on.
- The camera will have a red light which should turn green once the computer is on.
- Be sure to take off the camera lens cap.

**Open the Camera Software**


- Open the Sinar CaptureFlow Software. It should be available as a logo in your task bar. If not, look for it in Applications.
- The camera light should turn green. The camera clicks several times.

**Sinar CaptureFlow Menu**




- Left to Right:
  Camera icon: click to take a picture. The number at the top right indicates the number of shots. This should be set to "**4**" (not "1" as showing).
- Camera icon with film strip: live image.
- ! in triangle: exposire warning.
- Square with dots: grid.
- Two squares: overlay.
- Square with squares: contact sheet. This is where you will see the image thumbnails are you acquire images and where you will rename them if necessary.
- Square with two squares: compare view.
- Hand:
- Magnifier: zoom in on image.
- N-dropper: neutral gray selector.

**First Time Camera Setup (double check each session)**

**Physical Settings**

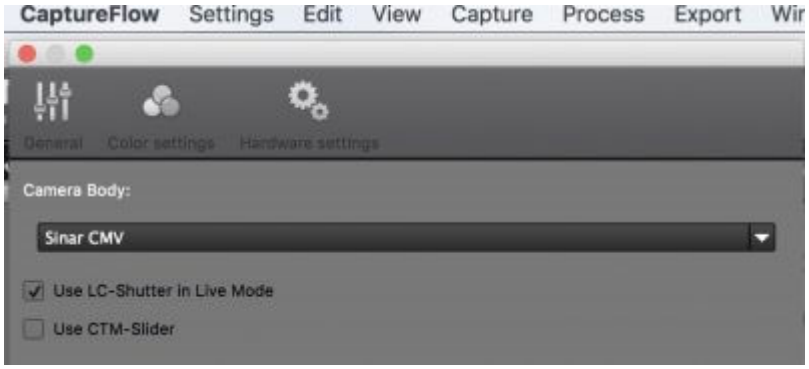
**Camera Position (physical setting on light table):**
- 25 1/4" = 1294 (dials on back left of stand control position)
- This should remain set between sessions, but check it!

**Camera Lens**:
- Be sure to remove lens cap and to replace it when done!
- **f stop: f17 1/2** (i.e., right end of bar is just up to f18 line) (but if specimen is thick and more depth of field is needed may increase up to f32; our experimentation though has shown this doesn't help much.) * 1 f stop is doubling or halfing of exposure
  Note: Be sure to double check the f stop at the start of each session. If you are having trouble with setting the gray scale, it is likely to be off.

**Camera Focus:** you should not try to check or set the camera focus until you have set the white balance and gray scale. See below.

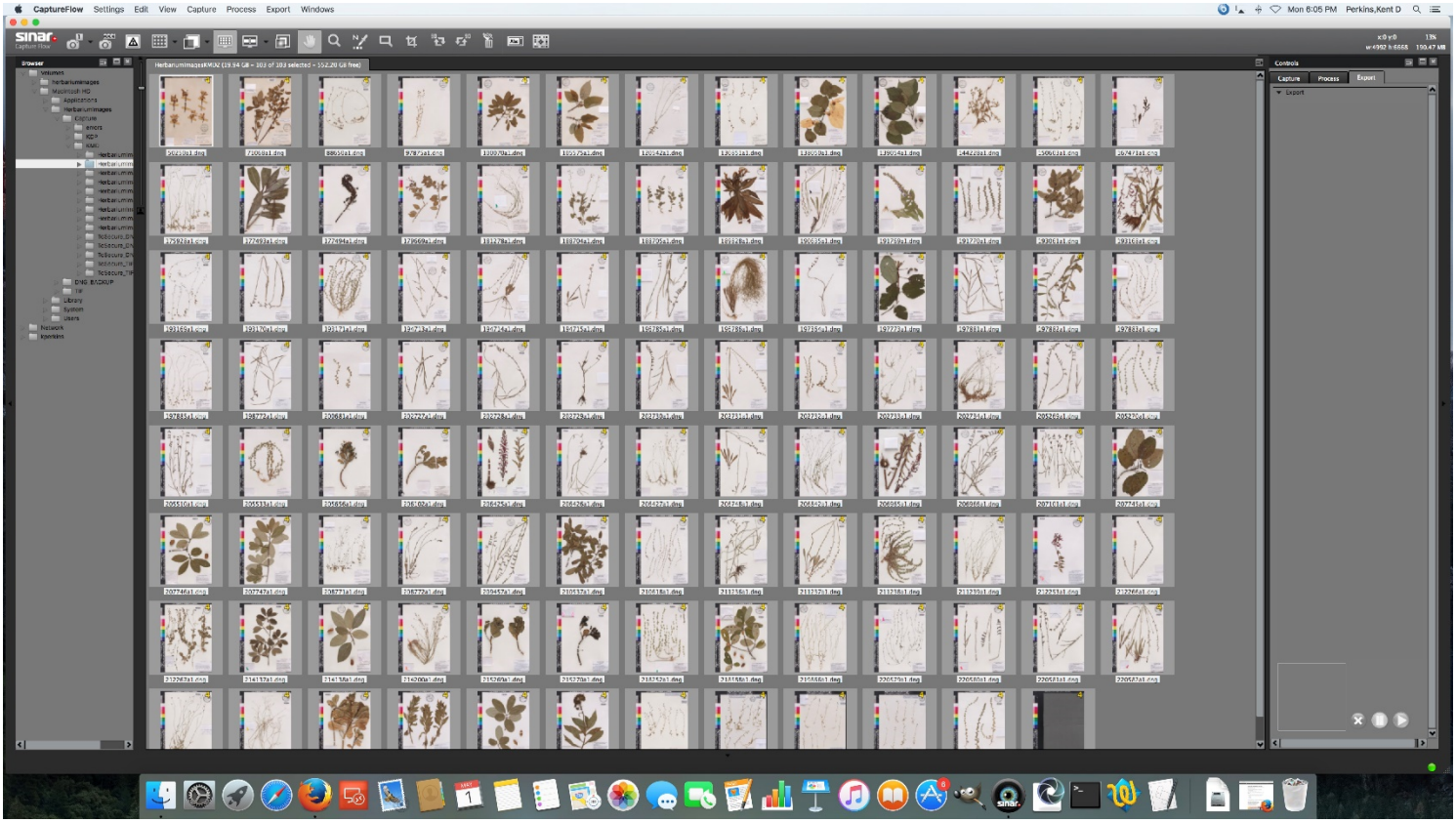
**SOFTWARE SETTINGS (set for first time, check each session)**

- From the CaptureFlow Menu choose CaptureFlow (right of the Apple logo) / Preferences / Hardware Settings
- Select Sinar CMV under Camera Body
- Check Use LC-Shutter in Live Mode
- Use CTM-Slider should be unchecked.
- Close out of this and go back to the main CaptureFlow menu.



**Initial Work Screen with Thumbnail View**

This is the working screen for image acquisition. The left column area is the folder navigator area and the right column area is where the controls will show.



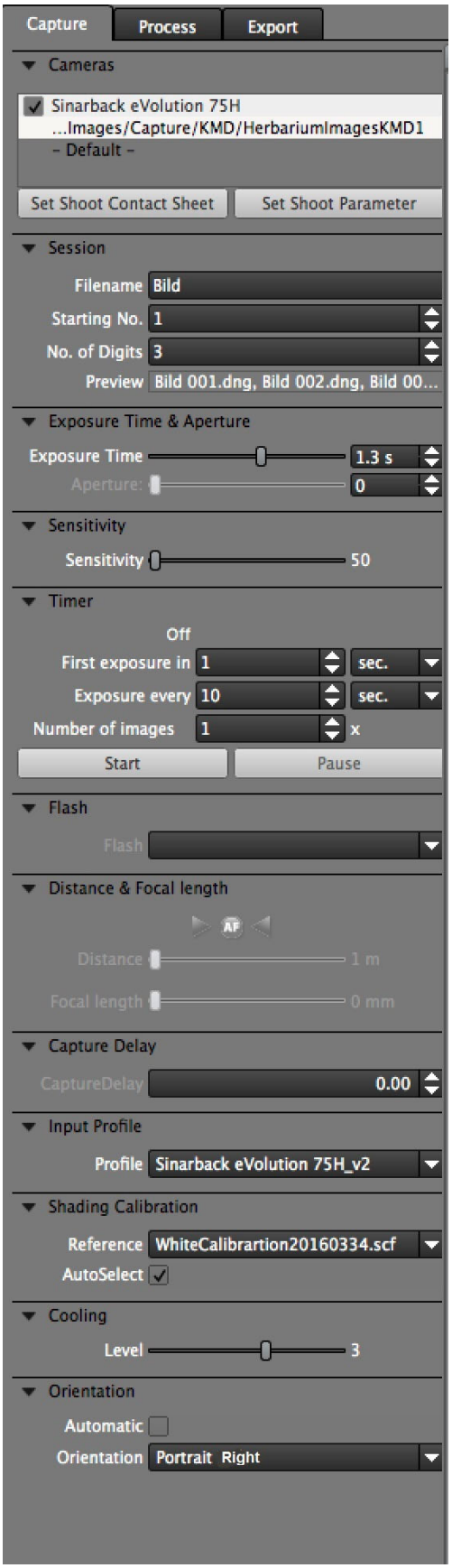
**Controls**

The controls column area should be visible, typically on the right. If not, choose Windows / Dock Widgets / Controls Dock Widget and make it moveable or dock it somewhere. The Controls window has three tabs: Capture, Process and Export.

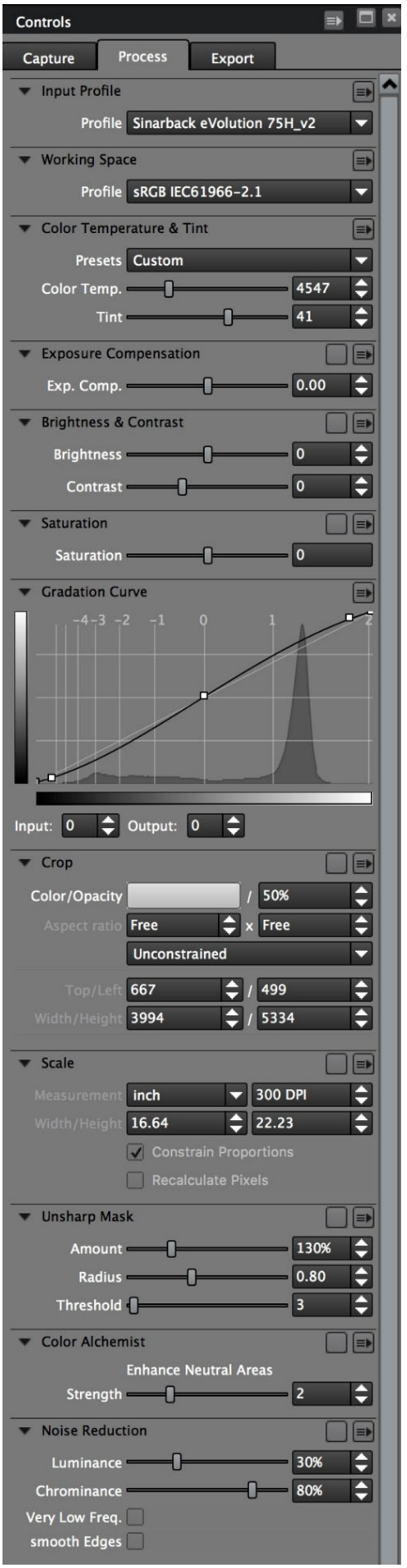
The following are the settings. If you change image acquisition folders the system may change settings, so please review all of the setting carefully.

**Controls : Capture tab (check each session, probably stays ok)**

- Cameras: Sinarback Evolution 75H (below this the default folder is partially shown).
- Session: Initially this is: Prefix: Bld, Starting No.: 1, No. Digits: 3. You can change this to Filename [blank] and set the starting number to the first catalog number of a series of catalog numbers you are imaging and number of digits to 6. This will increment the image numbers. You may have to reset this after you setup the white balance and grey scale or there is an image error.
- Exposure time: 1.3 seconds (can be increased to 1.6 seconds for better depth of field)
- Aperture: 0
- Sensitivity: 50
- Timer: Off
- Flash: (blank, can't change)
- Distance & focal length: AF (although we have focus set manually?)
- Capture delay: 0.00
- Input Profile: Sinarback eVoltion 75H_v2
- Shading Calibration: file name for white balance set recently: whitebalance[date] * Note: when changing folders this may get UNSET.
- Cooling Level: 3
- Orientation: Portrait Right



**Controls : Process tab (check each session, often needs to be reset)**




- Input Profile: Sinar eVolution 75H_v2
- Working Space: sRGB IEC 61966-2.1: Works well for web but color saturation isn't as good as Adobe RGB 1998. But the Adobe doesn't embed in JPEG2000 images.
- Color Temperature & Tint (these change based on white balance and gray scale)
  Presets: Custom
  Color Temp.: 4547
  Tint: 41

The following boxes should be UNCHECKED all the way down on the right.

- Exposure Compensation
- Brightness Contrast
- Saturation
- Crop
- Scale
- Unsharp Mask
- Color Alchemist
- Noise Reduction

Gradation Curve: ???? Kevin

Flash: none (this is troublesome to set; may say Flash: early, click on late then none)

**Controls : Export tab**

The export tab will show images as they are exported. The export process is explained after the image acquisition.

**SESSION SETUP FOR IMAGE ACQUISITION** (do these for each session, or after bulbs burn out)

**Set the camera on 4 shots!!!** The camera setting is at the left of the top bar, or from the top menu choose Capture / Capture / 4 shot.

**Set White Balance**

- Put a full sheet of solid white paper on the photo stand. This paper MUST be wrinkle free and clean. Marks on the paper will appear in all subsequent images. Make sure magnets are not in the image.
- Capture (in menu bar) / Shading Calibration
- Click on the camera icon (on left, has a "1" next to it)
- Start Calibration (button)
- Fill in file name for white balance: whitebalanceYYYYMMDD
- Close
- This should save the white balance file. Make sure this file name shows in the Shading Calibration section of the Capture settings.

**Set Neutral Gray**

- Place gray cards on stand.
- Capture an image.
- Choose the filmstrip mode from tools bar at top.
- Choose View (in menu) / Full Sheet.
- Click the dropper in the tools bar. The cursor should turn to a dropper when you drag around the image.
- Move the cursor around on the sheet. There will be three numbers showing to the right of the cursor. Find a place where all of the numbers are even, all 87 or 88, (e.g., 87, 87, 87).
  * It is often hard to find an even setting. At first the image may be way too dark or light, so just click somewhere a few times. It also helps to then take another picture of the gray cards and try on the new picture.
- Click (this sets the neutral gray).
- Immediately, click on hand so you don't accidentally reset the neutral gray.
- Choose Contact Sheet in tool bar.
- Choose folder on the left of the screen where you want to save images. If the folder browser is not showing, you can select Browser in Windows (menu bar).

**Camera Focus Check**

- In general, the camera focus should stay set between sessions. Be sure to double check the focus on the first few images in a session.

**Camera Focus Setting (only if based on the focus check, the focus is off)**

- Make sure the camera physical position is set at 25 1/4" = 1294 (dials on back left of stand control position).
- Choose closed eye for live shot setting in toolbox symbol menu. The eye will open.
- Display Live Image go into Focus Mode (Capture / Focus mode or Command-F).
- Display grid to get specimen straight.
- Focus the image by turning the rotating wheel on the camera. You may need to rock it back and forth until you can get it just right.

**IMAGE LAYOUT**

**Light table layout (template area for specimens)**


- two metal 90-degree angles at front left and right of table
- magnetic ruler with cm scale towards specimen at back right of table
- Tiffen color bar with color blocks towards specimen at back left of table and to left of ruler
- Specimen is positioned horizontally with label at front left between the 90=degree angles. The ruler and color bar may be adjusted to sit flush to the border of the specimen, if far off, but they don't need to be adjusted each time. They should always be even.

**CAPTURING IMAGES**

**Image Storage and Logging**

- Raw image files acquired by the Sinar system will have the .dng extension. These will be converted to .tif later.
- New images are stored in folders in Volumes\MacintoshHD\herbariumimages\Capture\KMD\ HerbariumImages* (* = initials of imaging person and folder numbers, 1, 2, …)
- Image sets are recorded in our imaging log pages. The sets are assigned names later. Please fill in the date, the HerbariumImages folder number, starting/ending accession number, set description, and your initials. Break the sets up into logical groups based on the set description.
- !!! Make sure "4" is showing at top right of camera image (left side of tool bar).
- Place a specimen on the light table as shown.
- Check the fragment packet for parts that are not represented on the sheet and place them on the sheet in a blank area.
- Use magnets to weigh down parts popping up.
- Click on the camera symbol (left side of tool bar) or COMMAND+N to take an image.
  Be sure 4 shots are taken ("4" shows on the top right of the image).
- The camera will make a series of clicks and there will be a red light at the bottom left of the screen. Once it is done the camera will beep and the light will turn green.
- If the orientation is set correctly, the image should be correctly oriented. The ruler and color bar should be on the left of the image. Otherwise, rotate it and go to Controls / Capture Tab and set Orientation to Portrait Right.
- Name the image by clicking on the file name below the thumbnail. The image name is based on our naming convention (below):

**Image Naming Convention for Sinar Images**

Normal images:

Accession number + image designation letter (see chart below) + image number (usually a1).
E.g., 230111a1.dng, 555Aaa2.dng, p555a1.dng., 112555g1.dng, 112555g2.dng, B12231a1.

**FLAS Accession Number:**
* Vascular Plants: A non-zero padded number from 1 to 6 digits plus an optional capital letter.
* Bryophytes: "B" plus a non-zero padded number from 1 to 5 digits.
* Lichens: "L" plus a non-zero padded number from 1 to 5 digits.
* Algae: "A" plus a non-zero padded number from 1 to 5 digits.
* Wood: "w" plus a non-zero padded number from 1 to 5 digits.

**Image designation letters** (there will help populate the database with the image description):

| Letter | Image of |
|---|---|
| a | sheet (entire specimen) |
| b | fragment packet contents |
| c | plant close-up (formerly, bottom of plant, may include rootstock). This may be leaves, roots or sections of plant. |
| g | sheet prepared for Global Plant Initiative, plants.jstor.org [leaf lower side: deprecated, use c] |
| i | inflorescence |
| j | flower |
| k | infructescence |
| m | fruit |
| n | seed (if large) |
| p | pollen or spore(s) |
| s | sheet for SERNEC project with Photo e-box |
| v | seed vial contents |
| x | photo of fresh plant or plant in the field |
| z | photo on sheet or of textual material accompanying the specimen |

**Image number:**
The image number for an image designation category for a specimen, starting with "1".
E.g., 123a1.dng, 123a2.dng, if two images of the sheet are taken.

Nonsecure Images (species listed as endangered, from certain protected localities such as National Parks):
As above except "_nonsecure" is appended to the file name.

* The Collection Manager may indicate if a specimen or species needs to be secured. Typically, Florida species listed as endangered with a defined location are secured and the locality is redacted. The Atlas of Florida Plants (https://florida.plantatlas.usf.edu/) may be consulted to determine if a Florida species is endangered. The localities for collections from National Parks are also redacted. The selection of what specimens are secured (redacted) is somewhat subjective. E.g., although *Torreya taxifolia* is endangered, it makes little sense to redact the localities of those specimens from Torreya State Park. Information on redaction of localities is provided in the documents on image post-processing.

**Image Set Records**

Image sets are recorded in our imaging log file. The sets are assigned numbers later. Please fill in the date, starting/ending accession number, set description and your initials. Break the sets up into logical groups based on the set description.

**Automatic Image Naming**

1. If you have a long sequence of specimens in accession (barcode) number order, you can set up the system for sequential file naming based on the number series.
2. On the Capture Settings Tab of the Contact Sheet, find the Session settings.
   File Name Prefix: make this blank.
   Starting Number: set to the first accession number.
   Number of digits: 6
3. CAUTION: if you are imaging a set of sequential accession numbers, make sure the numbers always correspond to the specimens. If something is out of order, you will have to correct the error and reset the Session settings.
4. The file name suffix, "a1", can be added by a script run by the Collection Manager. But, do not mix sequential named files with no "a1" suffix in the same folder set as those that are manually named.

- Remove the sheet and mark it with pencil backslash at the bottom as far to the left as possible. This should be over the check or circle on the sheet.
- Put another sheet on stand. – REPEAT…..

**QUALITY CONTROL WHILE IMAGING**

- Choose filmstrip view from the tool bar and inspect the first image for clarity, focus and artifacts (wrinkled white background, marks that are not on the sheet).
- Make sure the sheet is even and fully in the image.
- Make sure the ruler, color bar and label are correctly positioned.
- You can zoom in on the image via View (menu bar) / Zoom 100%.
- You can un-zoom via View (menu bar) / Fit to Screen.
- Choose contact sheet view from the tool bar to continue imaging.
- Keep a check on subsequent images.

**END OF SESSION PROOFING**

- Choose filmstrip view from the tool bar and compare the file name below the image to the accession number on the sheet. Double check.
- If the number is incorrect, go back to the contact sheet and click on the image name under the thumbnail and rename the image.

**SHUTDOWN**

- Close CaptureFlow
- DO NOT shutdown the iMac
- Turn off lights, **then**
- Turn off light power supply (big switch on front, actually the back of the power supply facing us).
- NEVER turn off the power supply first and never leave the lights on. If you do, when you turn on the power supply the next time it will blow out all of the lights.
- **Put lens cap on camera.**

**EXPORTING IMAGES (This is done by the Collection Manager)**

**Controls : Export tab**

The export tab will show images as they are exported. The export process is explained after the image acquisition.

- Export Space: mode: Working Space (same as CaptureSpace)
- Click for dialog box and it should say:
- Space: SRGB IEC 61966-2.1, Intent: Perceptual
- Crop : no
- Scale: **Unchecked!** Else, will crash export.

**Set at time of export:**

- Interpolation Quality: A
- Format: TIFF
- Depth: 8 bits
- Apply unsharp mask settings from file.
- Options:
- Byte order: Windows (not Mac)

Create a folder on the destination for .tif images.
Create a direcory according to our final image processing naming convention.
Set Number_YYYMMMDD_description of set_Initials of imager
In CaptureShop select an image folder
Highlight all images in the folder. Click the first, hold down shift and click on the last.
Choose Export from the Toolbox : Capture : Export tab.
Select the Export Button.
From the export filename window choose OPTIONS.
Change the file type from Mac to Windows.
Once all are exported, move the .sti images to a folder with the same name as the above .tif in the sti_backup folder on the iMac.

**SPECIAL INSTRUCTIONS / TROUBLESHOOTING**

**Editing of NonSecure Images**

Nonsecure images are exported from raw .dng files to .tif files via CaptureFlow. The .tif files may then be opened with Adobe Photoshop and edited as follows:

- **Command O** (or file / open).
- **Choose image** _nonsecure and open.
- **Command +** (five times): zooms in on image.
- Move mouse to label area on bottom right of image.
- Read label and look for all detailed localities including references to roads, latitude/longitude, section/township/range, specific place names.
- **Command O** for the dropper and place dropper near text you want to obscure, then click left mouse
- **Command P** for brush. Brush settings are:
  50 or 65 px diameter, 100% opacity; 100% flow, mode: normal
  Hold left mouse and drag brush over area to obscure (neatly).
- **Press T** for text tool. The text should be set as:
  Arial 14 pt., red: ff0000 (255,0,0).
  Place cursor where text was obscured, click mouse and type
  [locality obscured]
  Highlight this and copy with Command C. You can then use Command V to paste in future images.
- **Command E** to merge layers.
- **Command Shift S** for Save As. Remove "_nonsecure" from file name and save as a .tif. Don't save over existing file! Settings should be:
  Image Compression: none
  Pixel Order: Interleaved (RGBRGB)
  Byte Order: IBM PC
  Image Pyramid: unchecked
  Embedded color profile: SRGB IEC61966-21
- Command W will close current image.

**Installing the Sensor White Reference File**

When the CaptureFlow is first installed, the program will need to have the Sensor White reference file installed. This is done with the CD of the old Capture eXposure.
The sensor white reference file is: 281279.Sensor.white.ref
If can be copied to a portable hard drive and selected. Follow the program instructions.

**Burned out Light Bulbs in the Lighting System**

If one bulb burns out, they will all go out. This is by design, so the system is not used with a bulb burned out.

- Wear latex gloves and DO NOT TOUCH BULBS, except by the outer rims or base. Caution, they may be hot, if they were recently on.
- In order to assist in determining which bulb is burned out, use the voltmeter. Put the two metals probes on each of the bulbs pins. It will not register a current when a bulb is burned out. Tip: bulbs tend to turn a but rosy before they burn out. It is a good idea to periodically look at the bulbs (while off).
- Remove the burned out bulb and replace it with a new one. If multiple bulbs are burning out, or there are several that appear rosy, replace them all.
- The system occasionally blows all the bulbs. This has not happened much since we changed the outlet for the power supply. Be sure not to turn on the power supply after turning on the switch for the bulbs. The surge is very likely to burn out all of the bulbs.

**Other Problems / Issues**

Where is the contact sheet with the image folders and thumbnails?
-On the CaptureFlow tool bar, choose the icon for the contact sheet.

Why is the image green?
-Check the F stop and exposure time.
-Set the gray balance.

**SUMMARY OF THE QUICK KEYS**

| | |
|---|---|
| COMMAND+N | Take a picture |
| COMMAND+ | Delete a picture |
| COMMAND+ | Live image |
| COMMAND+ | Hide |
| COMMAND+ | Select all |
| COMMAND+ | Deselect |
| COMMAND+ | Quit / Exit |
| Z | Zoom in. While in zoom mode hold Alt/Option key for zoom out. |
| N | Neutral color picker |
| C | Crop |
| A | Selector |
| H | Pan |
| I | Color info picker |
| P | Preview |

**TECHNICAL NOTES ABOUT CAPTUREFLOW**

Configuration files:
Global: \library\Application Support\Sinar\CaptureShop\
Users: \users\kperkins\library\Application Support\Sinar\CapureShop\

**TECHNICAL CAMERA NOTES**

Increasing ISO increases noise. It also increases the ability for a smaller aperture (= higher f-stop number) which requires a longer exposure time.