Digital Camera Setup for Constellation Photography

(Canon A580)

Above all else: Shoot from outside the city from a dark location and with little to no moon light.

Know it alls:
If you know what you are doing, by all means skip all the detailed instructions below. The basics are: set the time/date, switch to manual mode, turn off the flash, and set the exposure time for 10 to 15 seconds. Set the ISO to 800 or 1600. Set the resolution to “M1 – Normal” to get about 20 shots. Use the 2 sec self timer to fire the shutter without camera shake. Shoot from a dark site with little to no moon light. Adjust the exposure and ISO to get lots of stars with only modest light pollution showing in the shots. Zoom in to frame your constellation more tightly.

Details:
- Most manuals make little sense till you have the camera in front of you and ready to go. Here is a short cut guide, below, with the key info. Don't spend too long trying to figure out any given instruction. Start pushing buttons on the camera as soon as you have a rough idea what the instructions are trying to say. If you spend too long reading the manual or these instructions without trying things out on the camera, you will go insane.
- Batteries are installed. You are responsible for these. NOTE – Battery Compartment: Turn the camera upside down with the lens facing you. Pull the battery compartment ‘slide’ toward you and then to the right! If you just pull back, it will NOT open. Figure on a new set every few hours of operation. Alternatively, Ni-MH rechargeable batteries can be used if you have them. DO NOT use NiCad or regular, cheap, non alkaline batteries. If you remove the batteries from the camera for some time, it will probably forget your settings. Our camera is prone to reporting weak batteries, even when they are fine. Try removing the batteries and reinserting them and/or turn the camera off briefly. This usually fixes the problem. If it is cold, you may want to warm them with your hands or keep a spare set handy.
- The memory card is installed. This will allow you about 10 to 20 pictures before having to download to your computer. The number of remaining frames is displayed at the bottom right. The memory cards are small. You will probably need to erase poor pictures as you work at the telescope.
- The ON/OFF switch is on top of the camera and labeled On/Off.
- Leave the camera in Manual Mode. This is the dial on top of the camera.
  - Note: you are welcome to play around with the camera. However, if you turn the camera on and it is NOT in Manual Mode, it will forget some of the necessary settings. You will have to reset these by hand.
- After a few minutes the camera automatically turns off.
- Set the camera date. This will be very helpful to you in remembering when your photos were shot. But keep your own records anyway.

Menu SETTINGS (see diagram at end for control locations)
These have already been entered. I list them here for when they get screwed up. Mostly we want to turn everything off. No auto face detection (no it won’t work on the stars), turn off the flash (no way is it going to reach zillions of miles to the stars!), turn off the focus assist beam (that only goes 10 feet), etc.
- Turn On camera
• Press the Menu Button (#9)
• Press the top and bottom of the Control Ring (#12 and (#14) to move up and down the menu.
• Use the Left and Right Control Ring Buttons (#11) & (#13) to change the settings. (The setting is automatically locked in as soon as you go to the next line. No need for an <Ok> or anything like that.
• The Important Settings are:
  • Auto Focus Frame <Center> Unimportant, anything should work. <Center> may help keep stray light from screwing up your lens settings.
  • AF Point Zoom <Off>
  • Digital Zoom <Off>
  • Flash Settings: All <Off>
  • Self Timer: No adjustments needed.
  • AF Assist Beam <Off>
  • Review: What ever you like; I have set for 4 sec. This is how long the image appears on the screen after you have fired the shutter.
  • Review Info: I suggest you try <Off>. Info might be useful; I haven’t tried it.
  • Auto Category <Off>
  • Display Overlay <Grid Lines>; my recommendation.
  • Set Button: This is a special function button. It does not appear to be useful to us in the Manual Mode.
• When you have gotten to the bottom of the menu, one more click on (#14) takes you back to the very top line. Move one menu step to the right by pressing (#13). This will light up the icon with the hammer and wrench.
  • Under this list of settings, I recommend setting Auto Rotate to <Off>. This will maximally utilize the LCD for examining your images.
• Press the Menu button (#8) to exit the menu system

Manual Mode Settings:
• Make sure the dial on top is set to Manual Mode and the camera display screen is showing the live image.
• Press Function Set (#7) to bring up a menu on the left side. It is again the case that the Control Ring can be used to move up and down (#12) & (#14) and change the setting (#11) & (#13).
  • The first line +/- 0 can be left on 0. It should have no effect in any case
  • The second line is for Auto White Balance. I suggest leaving that as is.
  • The third line (default Off) is for messing with the color space. Don’t; unless you are just playing.
  • The fourth line is for the exposure mode. I suggest leaving unchanged <Evaluative>, but it should not matter
  • The fifth line is for the degree of image compression. I suggest <normal>.
  • The sixth line is for the resolution. Try <M1> or <M2>. M1 provides for higher resolution with fewer shots. M2 is lower resolution
• Press Function Set (#7) again to exit this menu.
• Number of Shots:
  Fine – M1 allows 20+ frames.
  Fine - M2 allows 30+ frames.
  Plan on discarding you bad pictures as soon as you shoot them to save your memory card. Normal – M1 will yield the best quality.

Additional Manual Mode Settings:
• Flash Setting: With the camera on, press the Flash Control Button (#13) repeatedly until you get the No Flash Icon (a lightening bolt with a ‘no symbol’ through it)
• ISO Setting: Finally, press the ISO button (#12) until ISO 800 or 1600 shows. Try both, see which is best for your conditions by reviewing your shots on the view screen. This sets the sensitivity of the camera. ISO 800 is high and 1600 is very high (i.e more sensitive, thus more stars but also more sensitivity to light pollution)
• These last two settings lock in automatically as soon as you stop pressing the control ring.

• Take a few pictures of your naval.
• To look at the shots, switch the camera to play back mode. Slide the Control Switch (#6) downward to the ‘Playback’ icon.
  • Use the Control Ring, left and right, to step through the pictures.
  • Use the Zoom Control lever on top of the camera to zoom in on the displayed picture.
  • Use the Control Ring to move around the zoomed picture.
  • Press the Menu Button (#9) to exit the zoom mode.
• After shooting a few practice pictures, learn how to erase frames.
  • When displaying a picture, press Control Ring erase (#14). Then confirm by pressing Function Set (#7).
  • To erase all the images: Set the camera to Playback mode (#6). Press Menu (#9), Use the Control Ring to step down to Erase All, Press Function Set (#8), click Right Function Ring ((#13) to select OK, Press Function Set (#8) to erase all images.

Long time exposures:
• Now we need to know how to set long time exposures for the stars AND also how to use the Self Timer so we do not shake the camera while taking the exposure.
• Set Long Exposure: While in shooting mode, press the Function set button (#8). This will bring up the menu on the left side of the screen. Move the red high light box up to the +/- exposure compensation setting (second from the top) using the up/down keys (setting ring, (#12/14).
• Press the Display button (#10). This brings up the long exposure mode. Use the control ring (# 11 & 13) to set any exposure between 1 and 15 seconds. This setting will be remembered until you change it or turn the camera off. Try a few long exposures of your navel. Note that after the exposure, the camera indicates <Busy> for a length of time equal to the exposure. The camera is taking a ‘Dark Frame’ for noise reduction. That is good.
  • Note that despite all of our efforts to turn everything OFF, the camera may still fire a burst of orange flashes to try and auto focus. There does not seem
• **Self Timer:** Pressing the shutter button shakes the camera. We will use a 2 sec delay between the shutter press and the start of the exposure to prevent shake problems. When ready to shoot, press the control ring (#14) repeatedly until the 2 second Self Timer mode is selected. (A longer delay is not a problem, as long as you are a patient person.) This setting will be remembered until you turn the camera off.

• **Finally, finally:** Figure out how your tripod works in the comfort of your living room. I.e figure out how to take vertical and horizontal shots. Out in the dark and cold is not a good place to wrestle with a new piece of gear.

**Under the Stars:**

• Find a dark place where you can actually see some stars. Local lights are not necessarily a problem. It is the brightness of the sky which matters. Can you see lots of stars or is there lots of light pollution?

• Mount the camera on the tripod.

• Find some constellations. Use the ‘star wheel’.

• Point the camera at a constellation. You will probably have to just guess the aim. Little will be visible on the LCD screen or through the viewfinder except for a few of the brightest stars.

• Leave the camera at the wide angle zoom setting and turn on the long exposure mode and set the 2 sec self timer mode. I suggest 10 to 15 seconds of exposure. Shoot a few pictures and check to see that you are getting some sharp stars on the play back screen.

• Examine the image

  • Do you see stars? Is the background overly dark or light? If too dark, increase the ISO setting higher and the exposure longer, up to the max of 15 sec @ ISO 1600. If the sky background is too light, use ISO 800 and shorten you exposure. If your exposure drops below, about 8 secs, you may be shooting from a location with too much light pollution or excess moon light. Finally, examine your image using maximum zoom magnification. It should look reasonably sharp without zig zag star trails. If you have zig zags, it means the camera shook during the exposure. If so, try a few more shots being more careful to not bump anything.

  • Still unsatisfactory? Bring me your results and let’s talk.

**ZOOM:**

After you get some good pictures, your may what to try zooming closer. When doing this you will almost certainly want to increase your ISO to 1600 also. The camera’s widest zoom setting is good for when you are not quite sure of your aim and/or where the constellation is. If you can see your constellation in the images, center the camera on it, and zoom in a little to give a better shot. When you zoom the lens in the dark, it’s hard to tell how much you have zoomed since little is visible through the viewfinder. I found the following three zoom settings useful.

• 1) Zoom out to the widest angle setting.

• 2) Zoom in until the lens has the ‘least’ extension away from the camera. This gives a nice intermediate setting. (When you zoom the lens through its full range, note that it sticks out far from the camera, moves closer, then sticks back out. We want the point of least extension.)

• 3) Zoom in (telephoto, closer) until the lens is half way between the point of ‘least’ extension and maximum telephoto extension. This is about the longest I recommend.
• Note that zooming in means your aim has to be more accurate (i.e. you should see the constellation in your images to confirm your pointing). Secondly, it is the nature of most ‘Point and Shoot’ zoom lenses that their f stop increases at more telephoto settings. This means your pictures will be dimmer, other things being equal. You will want to increase the ISO speed and/or exposure setting to compensate.

Examples:
Be sure to check out the examples on my web site to get a feeling for what is possible with your camera... You will find that, with care and dark skies, amazing pictures are possible. The pictures straight out of the camera should look pretty good. If you have any photo manipulation skills, you can improve the picture by adjusting the brightness and contrast. If this is all Greek to you, bring you picture by on a USB key and I will do it for you. (I prefer, you come in person rather than emailing me as I would like you to observe the process in action.)

Camera to Computer Transfer:
The good news is our Canon A580 is a simple camera. You have two choices for image transfer:

1. Do **NOT** load any software from the Canon CD. Just hook your camera to your computer USB port using the provided cable. The computer will recognize the camera as a USB storage device. Copy your pictures to the desired computer location. Manage the pictures with your existing photo software. **NOTE:** When finished, I recommend you use the camera erase function to clear the memory card. I have **NOT** tested erasing under computer control. This might mess up the card formatting. Test at your own risk! The advantage of this method is no new software is loaded on your computer to muck it up.

or

2. Follow the Canon Instructions and load the Canon software from the Canon CD. This may be best if you have minimal computer literacy. After the software is loaded, you may hook the camera to the computer USB port using the provided cable. The software will automatically detect the camera, start up, and assist you with the transfer of pictures to your computer.

Essentials Check List:
• Spare batteries
• Dark Sky, little to no moon light.
• ISO 800 to 1600
• Resolution Normal M1 or M2
• Wide angle zoom setting to start
• Camera stable on tripod
• Long exposure mode set for 10 to 15 seconds
• Self timer set to 2 sec
• Flash off.
• Do it. Press that button.
• Check image on LCD to make sure you really captured some stars.
• Erase junk to save memory for good pictures.
Controls

1. Indicators (p. 43)
2. Power Button (p. 15)
3. Mode Dial (pp. 15, 66)
4. Zoom Lever (pp. 55, 103)
   - Shooting: Wide Angle/Telephoto
   - Playback: Index/Magnify
5. Shutter Button (p. 15)
6. Mode Switch (p. 18)
7. Print/Share Button (pp. 20, 31, 101)
8. FUNC./SET (Function/Set) Button (p. 44)
9. MENU Button (p. 45)
10. DISP. (Display) Button (p. 53)
11. (Macro)/ Button (p. 60)
12. Jump/ISO/ Button (pp. 65, 107)
13. Flash/ Button (p. 59)
14. (Continuous)/(Self-timer)/ (Single Image Erase)/ Button (pp. 19, 61, 75)