

Going Digital

ABOUT THIS HANDOUT

This handout is designed as a basic manual for documenting artwork with common digital cameras. It is designed as a reference you can use as you experiment with digital photography. The handout has three parts. The first describes some methods for taking the photographs and exercising control over lighting. The second part describes image editing or the process of adjusting color and “developing” your picture in the computer. The third part describes general features of most digital cameras with basic directions for operating a digital camera.

We will explore some simplified methods for documenting artwork. These methods are reliable but they can not reach the sophistication of a fully equipped photography studio or the skill level of a professional photographer. If you wish to go beyond the methods described here there are many books available describing studio techniques and sophisticated approaches to photographing artwork. You can also hire a professional photographer. There are advertisements for photographers in the Fallbrook Art Association newsletter under Art Supply Sources.

The photos illustrating this manual were done with a two megapixel Olympus point and shoot camera. I wish to demonstrate that a ordinary point and shoot digital camera can produce acceptable quality images for submission to juried shows.

Part One: TAKING THE PICTURES OF YOUR ARTWORK

Experiment!

No matter how experienced you are no matter what kind of equipment you use and regardless of what method you choose to photograph your artwork, do some experiments before you do the pictures you will submit. Many differing conditions affect any photograph and the best way to make sure you get the quality you need is to try things out in advance. Try out your method with your camera in the place that you will make your photographs. Go through all of the steps until you are able to view the finished image on the computer screen. This will teach you a lot and it will allow you to correct problems before you are stuck with bad pictures. If there is any rule about photographing artwork it is to always be willing to go back and try again until you get what you want.

Tripods

There is one expense that is nearly impossible to avoid when photographing artwork and that is a tripod. A tripod stops the camera from shaking. More importantly, it allows you to carefully align the picture in the camera's display and it allows you to move lights around and then go back and look at the camera's display to see the effect of the change. Tripods for digital point and shoot cameras can be lightweight and fairly expensive. Because digital single lens reflex cameras weigh more, their tripods have to be heavier and will cost more.

Backgrounds/Backdrops

For most flat artwork you can get away with a simple neutral background such as a neutral or white wall. Usually you will crop the picture to eliminate most background and simply show the artwork. Three-dimensional artwork can be more difficult to work with and the background is more important to the picture.

OUTDOOR PHOTOS USING SUNLIGHT

Outdoor Pictures

Before you do anything, turn the automatic flash off. Flash from the camera position practically guarantees a poor quality picture. The simplest setup for photographing artwork is to work outdoors. It is capable of producing good images with minimal equipment. You need something to hold the picture parallel to the camera and if at all possible, a tripod. With the outdoor setup you can get away without a tripod if you make sure your camera shutter speed is fast enough. If your camera lens is at a wide angle or normal setting, a shutter speed of 1/60th of a second or faster should be fast enough to prevent blurring. However, if you can, I recommend using a tripod because it is easier to align the image in the camera's display with a tripod.

The best outdoor light is not direct sun right on the artwork at midday. It tends to be too harsh and contrasty. If you use direct sunlight, do so in the morning roughly before 10:00 AM or the afternoon roughly after 2:00 PM. At those times the intensity of sunlight is reduced to manageable levels. The very best time to photograph artwork outdoors is one hour after sunrise or one hour before sunset. Avoid heavy overcast days because the clouds tend to cause the pictures to be too blue grey. Slight overcast or partial clouds are OK.

You can also use a porch or an interior room that is well lit by sun light that is not altered by colored glass windows or colored window treatments.

The most important thing is to think about where the light source (the sun) is in relation to your image. As with artificial light positioning your artwork so that the sun is about 45 degrees from the plane of a painting or drawing will give the best results.

You may have to try several outdoor locations until you find something that is reliable for your purposes, but with some experimentation you will get satisfactory images.

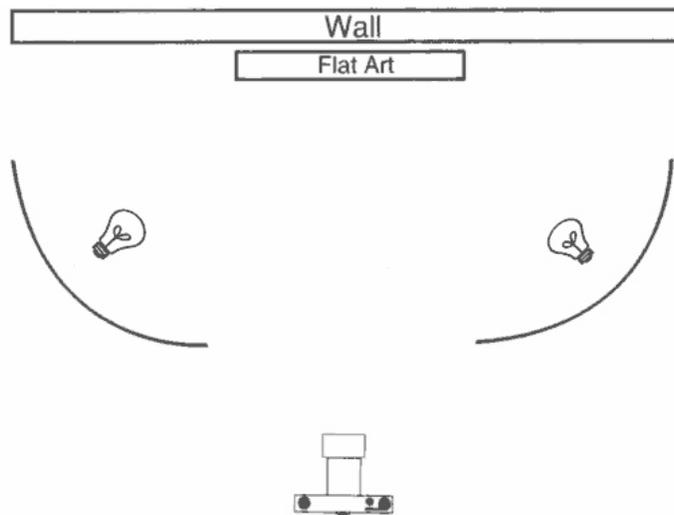
Before you do anything, **turn the automatic flash off**. Flash from the camera position practically guarantees a poor quality picture. The most reliable and simple method of photographing flat artwork is with a pair of



Outdoor Setup



Daylight Image



Basic Light Arrangement

tungsten lights. The artwork is hung from a wall or easel. If available a backdrop may be used. Simple “clamp on” light bulb housings are adequate for this purpose. You can also obtain floodlight kits that have the floodlight housings, lamp stands and bulbs. If possible get 250 or 500 watt floodlight bulbs that produce a 3200 degrees Kelvin color temperature. The total cost for this kind of setup is around \$100.00.

3200 degree photoflood light bulbs can be obtained from knowledgeable camera stores or on the internet from sources such as BH Photo Video (see web address immediately below.

<http://www.bhphotovideo.com>

For an example of an inexpensive Tungsten lamp enter **General Brand ECA Lamp** in the BH Photo Video search window on their web site.

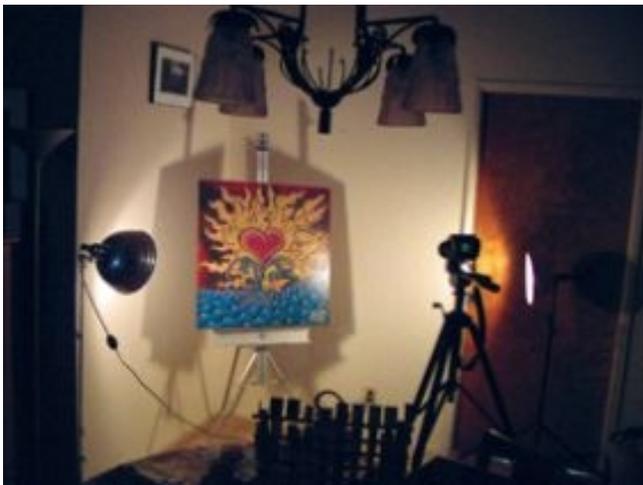
Place the light sources at about 45 degrees from the artwork as shown in the illustration. Move the lamps to a more extreme angle away from the camera if you see reflections.

Make sure the light on the picture is as even as possible. If necessary, use additional light sources for very large paintings. Uneven light is one of the biggest problems in photographing artwork. Before making a photograph, turn off all bright room lights and close windows this will get rid of reflections and oddly colored light.

Line the picture up in the cameras display very carefully. Make sure the image is not distorted. One way to do this is to imagine a perpendicular line coming directly out of the center of the picture. Align the lens with this line and then check the camera display for distortion. Move the camera up or down or from side to side until the picture lines up correctly.

Be certain to set the camera's white balance to tungsten. If your camera can not change its white balance you may be better taking the pictures outdoors as described earlier in this handout.

If your camera allows you to use a shutter release cable, use one. This prevents you from jiggling the camera when you release the shutter. Most point and shoot cameras do not allow shutter release cables. In this case learn to use the self timer in the camera. The self timer will release the shutter without shaking the camera.



3200° Photoflood Setup



3200° Photoflood Picture

If purchasing special equipment is out of the question, you can improvise with household lamps and regular light bulbs. If you do this be sure to use ordinary light bulbs and don't use any tinted bulbs, including "cool white". Never use fluorescent light to take art photos unless they are specialized daylight bulbs. Be sure to remove lamp shades or any other material that will tint the light. Ordinary bulbs with a filament are a bit off but are the closest match to 3200 degree Kelvin bulbs.



House Lamp Setup



Image made with House Lamps

The problem of glass over pictures

If it is at all practical take glass off of pictures before photographing them. It is difficult to avoid reflections from the lights, the camera and objects in the room if glass is in front of the image. If you can not remove glass, set up your lights and camera and look very carefully at the camera display. If you see reflections of the lights move the lights to a tighter angle, say to 30 degrees from the picture instead of 45. When you have eliminated reflection from the lights, look carefully to see if you or the camera are reflected in the glass. If you are, move the camera back away from the light and then zoom in toward the picture, this will usually eliminate camera and tripod reflections. If you do not have a zoom lens you may be forced to take the glass off of the picture or borrow a camera with a zoom lens.



Ceramic Pot Photographed with two Tungsten Photofloods

PHOTOGRAPHING THREE DIMENSIONAL ARTWORK

It is more difficult to photograph three dimensional artwork than it is to photograph two dimensional artwork. The angle of the photograph is critical to the appearance of the image. The background is important and often backdrops can be critical. Finally, lighting is more challenging as you need to work with the light and dark areas to show the three dimensional nature of the artwork.

If you are a sculptor or if you are photographing three dimensional artwork I recommend that you get a book on photographing artwork and read it. You will be able to orient yourself to these problems and decide how far you want to go to get the pictures you desire. You may decide to invest in more elaborate equipment or to

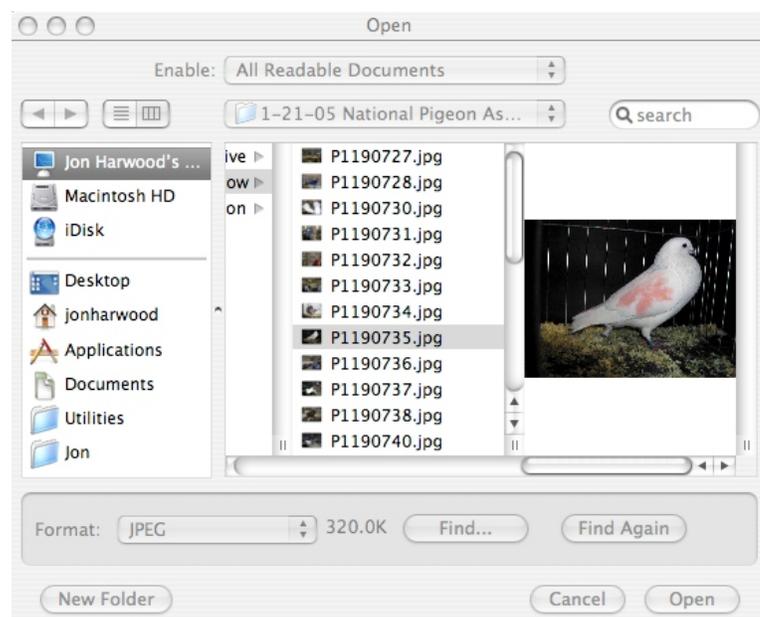
Still it is possible to get good pictures with a simple setup. I strongly recommend indoor photography for three dimensional work unless the work is of very large scale. You will need to find an acceptable neutral wall or some unobtrusive cloth to construct a background with. It is worth thinking about buying some backdrop paper that is made for photography. Once you have your background, find a good angle to photograph the piece from and then move the lights about until you get a good modeling of the piece. Then make your exposures. If you want to avoid strong shadows you may have to use more than two lights. You can also soften light by either improvising a neutral white colored translucent drape to hang over your lamps.

Part Two: IMAGE EDITING

There are many image editing programs on the market. Usually a digital camera will come with some type of image editor. Some programs are very sophisticated and some are simple. For this class we will explore some basic image editing procedures using features that are available in most image editing programs. Illustrations are taken from Adobe Photoshop Elements a lower priced program that offers many features. While your image editing program may have menu commands with slightly different names and in slightly different locations, most if not all of the features we discuss will be available in the program that came with your camera.

The illustrations were made with a Macintosh computer, but PC's have the same commands and features, so it makes little difference what type of computer you have.

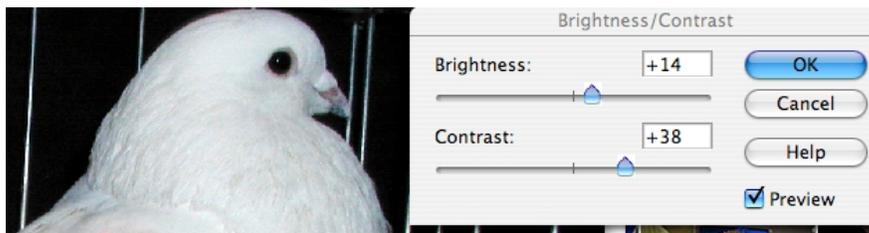
Picture
Adjustme
nt



Import Image Files: Image editors will have some provision for importing the files from your camera to the program. You then save the images from the image editing program to your computer hard drive. Another way to get the files out of your camera and into the computer is to remove the memory card from the camera place it into a card reader and then find an icon for the card on the computer desktop or in the “My Computer” file. If you use this method, you copy the files to your hard drive by dragging and dropping them from the card icon to the hard drive.

Open Image files: If you transferred the files from your camera directly into your image editing program they are already open. If you have your files on the hard drive you have to open them first using your image editor. You can open files with the “open” command in your program. You can also double click the program icon. Double clicking sometimes opens a different program than you want, so if this happens, just open the image editing program you want and then use the program’s “open” command to find the file. Most image editors have a preview frame in the “open” command window that lets you be sure to get the right file.

Automatic Picture Adjustment: Many image editing programs have automatic features for adjusting the brightness and the color of your pictures. These are usually very good to use and can save you lots of time. The trick with automatic controls is to use judgment. If you click on an automatic control and you like the result, keep it. On occasion an automatic control will make your picture worse. If this happens then immediately go to the edit menu. The first command under the edit menu is “undo” click on this and the picture will return to its previous state. We will be talking about how to use manual controls when automatic controls fail. With Adobe Photoshop Elements, the automatic controls are the first group under the “Enhance” menu. The Auto Levels control is usually the best one and it is often all you need to use to get a picture with good brightness, contrast and color. Experiment with the automatic controls in your program and you may find they make picture adjusting quite simple.



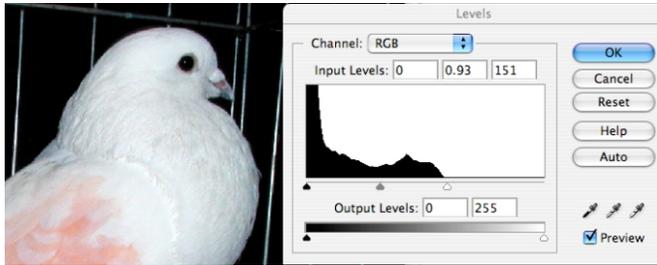
Manual Adjustment

Manual Picture Adjustment: Not every image editing program has automatic controls and sometimes automatic controls make your pictures worse. In these situations you can use the manual controls to fix your pictures.

Brightness and Contrast: These controls will fix pictures that are too bright or dark or which have too much or too little contrast. The controls are found under the “Enhance” menu under “Adjust Lighting”. The controls work by moving the sliders to the right or left. They usually turn up on the same panel because they often affect each other. So remember that when you brighten or darken a picture adjust the contrast next. If you adjust the contrast, make sure to adjust the brightness next. When both are OK, close the panel.

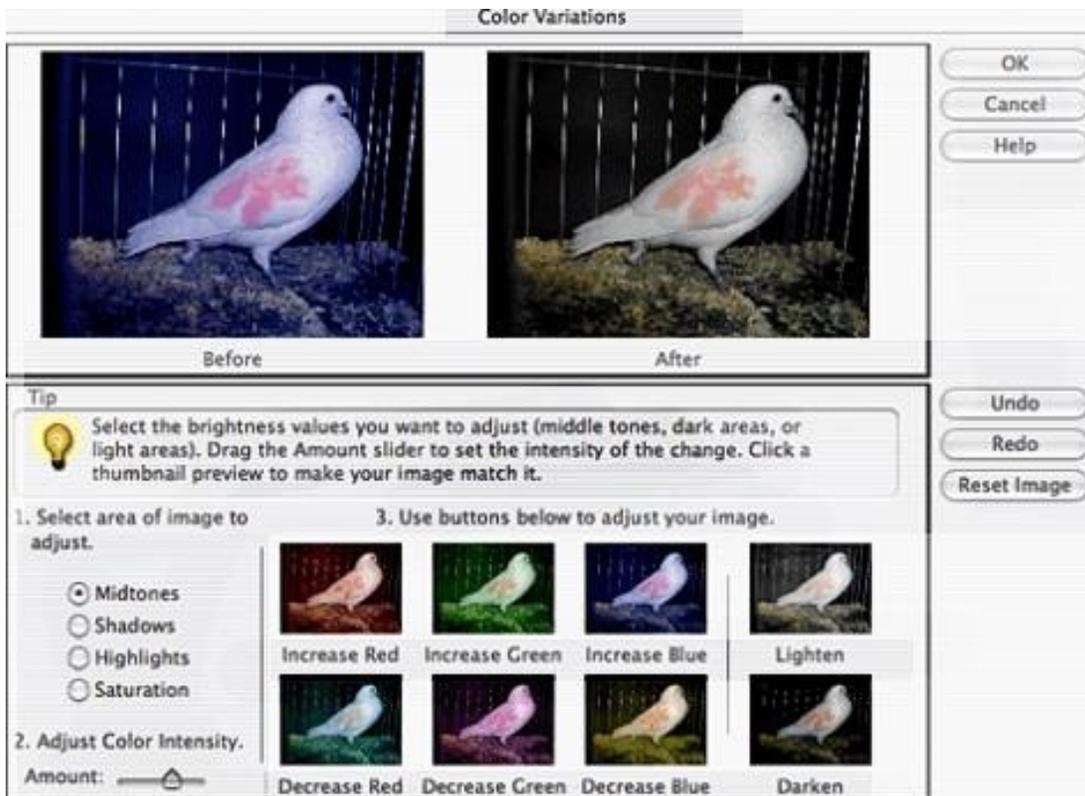
Levels: (You can skip this control if it is confusing to you.) A more advanced way to adjust image brightness and darkness is to adjust the levels. The levels panel is found in Adobe Photoshop Elements under the

“Enhance” menu command under Adjust Lighting. The levels control does about the same thing as brightness and contrast but it is more sophisticated. If you have this control try using it before you use Brightness and Contrast.



Levels

The trick with the levels command is to look at the graph in the panel. The graph shows the pixels (dots) of the picture arranged by their brightness with dark pixels on the left and bright pixels on the right. With this picture there aren't too many bright pixels. To correct the picture use the three small arrows just below the graph. Move the arrow on the right until it is just below the beginning of the pixel graph. Do the same with the arrow on the left. Then move the center arrow back and forth until the picture looks right. You will get a greatly improved picture using this method.



Color Adjustment: Different programs may use different ways to adjust color. Some show you the image and have you click on a color wheel to get various amounts of color change. Others use sliders for each set of colors. Adobe Photoshop Elements uses another common method of changing color which is easy to use.

If you are looking at this illustration in black and white, you will have to imagine the colors. You change colors by clicking on one of the small images that has been tinted with color. After you click on it you will see a before and after version to show you what the picture will look like. If you like the result, you click OK to change the image. You can select highlights, midtones, shadows, etc and the color changes will be made mostly in those parts of the picture. You can also adjust the intensity of the color change. Some image editing programs will use sliders instead of pictures to adjust the color. With these, you move the sliders around until the picture looks right on the computer screen.

Cropping: Often your pictures will have things in them that distract from the picture. When this happens you can crop or trim the picture. To do this use the crop tool. It will look something like this: You select the tool and then drag it over the area you want to keep. When you press “return” or click “OK” the picture on the screen is trimmed. **CROPPING IS VERY IMPORTANT. You should always crop your pictures of flat artwork close to the edges of the piece. If you leave a distracting background in your submission it will convince the judge that you do not understand professional presentation standards.**

Image Size: This is a very important control. If your image editing program doesn’t have something like this you may want to find one that does since it makes it possible to assure that your image will print well and display on a computer screen in the way you want it to.

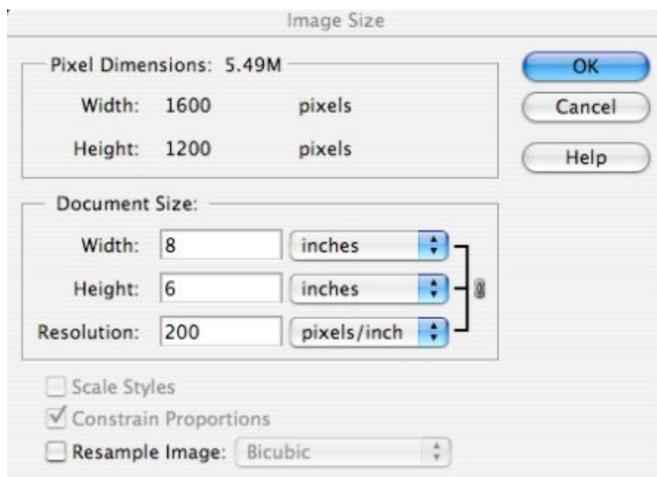


Image Size

The parts of this screen you will use are in the Document Size section and the resample image check box that is just below the Document Size section. The width and height controls will adjust each other automatically to keep your image distortion free. Don’t uncheck the Constrain Proportions check box and your image will automatically stay in proportion.

The key to using this control is the resample image box. If Resample image is checked the computer will change the total number of pixels in the image.

The second key to using the image size control is to understand the difference in the resolution you need to show an image on the computer screen versus the

resolution you need for printing. Due to the laws of physics, you need a lot of pixels for printing and you don’t need many pixels for viewing on the screen. For our purposes we will learn how to adjust image size for viewing on a computer screen.

To adjust a picture for submission to a show.

The prospectus for the show will give you some kind of guideline for picture size. The commonest sort of guideline will be to tell you a dimension for the longest side of the picture and a number of dots per inch such as 10 inches by 72 dpi. Some shows will tell you how many pixels the longest side can be such as 1000

pixels. If there is no guideline, I recommend that you make the longest side of your image 1000 pixels by 72 dpi. To get to this do the following.

- a. Make sure the Resample Image box is unchecked. Then set the width control to how wide you want the longest side of the picture to be. The height of the picture will adjust automatically. So for a 1000 pixel side you will change the measurement for the longest side to pixels using the drop down menu next to the measurement. Then enter 1000. For 10 inches you leave the measurement in inches and enter 10.
- b. Now click on the Resample Image box and a check will appear. Look at the resolution box. If the number is higher than the number of pixels you want in your image, enter the correct number into the pixels/inch section. (If the number is lower than the number of pixels go to part “c” below.) Click on OK and the image will be adjusted so that it looks right on the screen.
- c. If the number in the resolution box is below 72 you can enter 72 and the computer will adjust it but your picture may get fuzzy. The best thing to do in this situation to take the picture again using the highest camera resolution you can get. That should give you enough pixels to push the resolution up to or above 72.

The whole business of image resolution is confusing! If you learn about it you will have a much easier time printing pictures and sharing pictures by e-mail. So if you focus on any one control taught in this class learn about Image Size. It will solve many problems for you. Practice with Image Size and observe what it does to your pictures and eventually it will make sense to you.

GETTING DIGITAL PICTURES WITHOUT A CAMERA

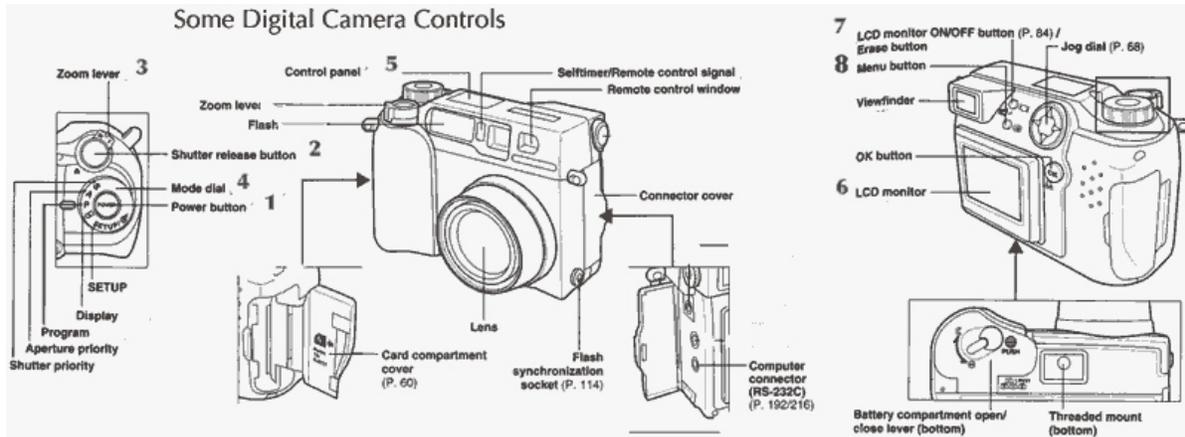
You may be able to get good digital files if you work in small sizes on flat paper. Drawings, watercolors and similar images that are small enough to fit on a scanner can often be scanned to give an image that is as good or better than a camera image. Scanners are often less work than cameras. So if you work in these formats, consider using a flatbed desktop scanner.

Part Three: TAKING PICTURES WITH A DIGITAL CAMERA

Two basic types of digital cameras.

“Point and Shoot”: A large variety of small cameras designed with the consumer in mind. They provide automatic operation and usually offer some special settings. These cameras may be low cost, low resolution versions or may have high resolution with many options and a high price.

Single Lens Reflex (SLR): These cameras look a lot like the 35mm SLR film camera. They usually have high resolution, take different interchangeable lenses and feature a viewfinder that peers through the lens to show what you are shooting. These are usually high priced cameras and some are designed for professional use.



DIGITAL CAMERA CONTROLS:

This illustration shows where “typical” camera controls are.

Front/Top

- 1) Power Switch
- 2) Shutter Button
- 3) Zoom Control
- 4) Mode Control (May offer a variety of automatic picture taking options depending on the camera maker)
- 5) Exposure Indicator (shows how many pictures were taken) Usually shows battery condition

Back:

- 6) Image Display Screen (LCD Monitor)
- 7) Image Display On/Off Switch
- 8) Menus
- a. Set Up Menu: May allow changing camera light sensitivity. This almost always allows **adjustment of camera resolution**. Will allow you to erase the memory card and may allow selective erasing of images. Allows choosing image format type (JPEG, TIFF, RAW, etc.).
- b. Picture Taking Menu: Turns flash on or off. May allow macro photography. (see explanation later) Turns self timer on or off. Allows **exposure adjustment**, allows changes in “white balance”

Megapixels: The amount of detail recorded by a camera’s sensor is expressed in megapixels. A photograph is made up of colored and shaded dots. A two megapixel is equal to one million dots. For pictures that will be submitted to shows for judging, a two megapixel camera is adequate. That is because images that will be displayed on a computer screen or a digital projector do not need as many pixels as a print requires. If your camera will be used for other photographic purposes then you may want as much pixel capacity as you can afford.

Using the Camera for Automatic picture taking:

- 1) Automatic functions are usually adequate for most situations. Take many pictures and erase the poor ones. With most cameras, press the shutter release part way down and you will see a light or signal indicating OK. Push the release the rest of the way to take the picture.
- 2) **Learn to adjust exposure.** Digital cameras are usually adjustable by two *f* stops up or down. One *f* stop is an increase twice (multiplied by 2) or decrease in exposure of ½ (divided by 2). If the picture is too bright decrease the exposure. If the picture is too dark increase the exposure. If your pictures are consistently too dark or too light, leave the exposure adjustment that corrects the problem set all the time. Adjusting exposure is an important skill for photographing artwork. If colors are too washed out, decrease the exposure until you get a suitable picture. If colors are too muddy, increase the exposure until they are acceptable.
- 3) **Autofocus:** Most cameras offer automatic focus. This is usually just fine without adjustment for the purpose of photographing artwork.
- 4) **Macro focus:** Many cameras have a macro focus adjustment, this is for taking extreme close ups at a few inches away from the lens. This would only be used if you are photographing a very miniature artwork on the scale of jewelry.
- 5) **Viewfinder:** Many cameras offer an optical view finding system of some type. The viewfinder makes it easy to take pictures quickly. Unless your camera is a single lens reflex you will not want to use the optical viewfinder for artwork since the point and shoot type are not precise enough to frame your picture accurately.
- 6) **Image Display Screen:** Most cameras have an image display screen that gives a “live” picture of exactly what will be recorded by the camera. This screen is the most accurate way to frame an image for a point and shoot camera. With a single lens reflex you are looking through the picture taking lens so the viewfinder is the only way to frame a picture with most of these cameras. The image display screen also often shows battery condition and other picture information such as exposure adjustment.
- 7) **Memory Card:** Most digital cameras have some type of removable memory card. You may need to remove the card if you transfer images to the computer using a card reader.
- 8) **Batteries:** Digital cameras love to use up batteries. So it is a good idea to have your camera on its charger prior to a session of taking pictures of artwork. If you will be working for a long time it is possible to run many cameras while they are plugged into their charger. If you plan to do this, look at your camera manual and make sure it can run off the household current.
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TRANSFERRING PICTURES FROM THE CAMERA TO YOUR COMPUTER:

Memory Cards:

Megapixels vs Megabytes. These terms sound the same but they are not. Megapixels are the total number of dots your camera uses to make a picture. Megabytes tell you how much memory space each picture uses up on your memory card or your computer’s hard disk.

Most digital cameras have a removable memory card of some type. The card will have a specific capacity. The number of pictures a card can hold will be dependent on the image size. Images made up of many megapixels need more megabytes of memory space on the card. A two megapixel image may occupy less than a megabyte of space on the card where an eight megapixel image might use up four or more megabytes of space on your card. Usually you can purchase larger cards than the one supplied with the camera.

Direct Computer Connection: Most camera makers provide a cable of some type to connect the camera directly to the computer. The camera directions will explain how to download pictures to the computer hard drive.

Card Reader: Many manufactures make readers that you connect to your computer. The card can be removed from the camera, inserted into the reader and then pictures may be downloaded to the computer hard drive.

Built in camera memory: Some cameras have built in memory that you download to the computer using the direct computer connection cable. The capacity of built in memory is usually much smaller than the capacity of removable cards.

WHAT ABOUT FILE FORMATS?

Digital cameras and photo editing software deal with images that are in “bitmap” format. The bitmap is a record of every dot that makes up the photograph. Each dot is recorded in color and shade. **Bitmap files are big** because they have so much information in them. A bitmap file that is complete is an **uncompressed** file. A picture may take up lots of memory card space if it is not compressed. Uncompressed files fill big hard drives up quickly. Because of the problem of big files, it is typical for files to be saved in a **compressed format**. A compressed format such as JPEG may reduce file size to 10% of the original file.

Compressing files can lower their quality slightly but most consumers will not care about this because the loss of quality is very small. The gallery calls for artists that I have seen request that files be submitted in the JPEG compressed format.

Consumer cameras often record and save their images in a compressed format automatically. When you download your images to the computer from these cameras they are already JPEG, so you don't have to worry so much about filling up your hard drive with giant picture bitmap files.

Many high quality cameras save their images in an uncompressed format like RAW or TIFF. These large file formats preserve all image information. With RAW format there is an advantage to processing the images in a compatible image editor that has a special feature for working with RAW format images. After the image is processed in RAW format or in TIFF the image can be converted to JPEG for submission.