Digitisation Guidelines for a Digital Collection Day: Digital Cameras

USING DIGITAL CAMERAS[1]

Summary

- Position one camera above a table like a 'copystand' (or a tall tripod)
- Position another camera on a tripod for flexible movement
- Consider how your items will be lit
- Configure camera settings
- Photograph the object first with the cloakroom/raffle ticket number
- Then capture the object without the ticket

A disadvantage of using a scanner to capture images of books or fragile papers is that the object must lie completely flat on the scanning bed, which may put pressure on the spine or damage pages. It is also quite a slow process. Using a digital camera, you can capture objects of any size or shape, without damaging them, and rapidly. Here are some general points to consider:

- Compact digital cameras are quite capable of delivering high-quality results. Digital SLR cameras (where the lenses are detachable) offer greater flexibility.
- Cameras in modern smartphones and tablets are good but the main problems are around a) holding the device steady; b) transferring files.
- On the tables where objects will be photographed you can set up a black cloth backdrop and table cover. You can also use book-props etc. (like the foam supports) if you have them.
- You can quickly transfer files between camera and computer using memory cards and a card-reader. This is not so easy with a phone or tablet.
- Locate the cameras in a well-lit area and put each camera on a tripod by a table.

In summary, **we recommend, if possible, using at least one digital SLR camera with a tripod as a minimum**, BUT you can make do with phones and tablets. The following step (1) is based on this recommendation. Steps 2 and 3 are about camera settings. Unless you are very familiar with the camera you are using, we suggest you avoid this and keep to the default AUTO settings on the camera.

[1] This guide is adapted from an original guide by Alun Edwards for the University of Oxford's RunCoCo project.

STEP 1: Setting up your camera

1.1 Picture Format

Digital cameras can take images in several different (file) formats. Whilst this is not generally an issue as there is software to convert between them, we recommend for this project that you **take your photos in the JPEG format** (which will create files .JPEG, or.JPG). Most cameras will be set to do this, but occasionally a camera will take images as RAW or TIFFs. Again, we can convert these but if you do know how to check this our recommended setting is:

Picture Format: JPEG, High Quality
2 megapixels and maximum of 5 megapixels
1600 pixels on the longest side

This is to capture images that are good enough quality, but not too large storage size.

1.2 Physical Set-up

As noted above there are two options for set-up: 1) using a copystand; 2) using a tripod. You can of course hold the camera, but this is no ideal for flat objects (postcards, letters, etc). You will often have to hold the camera with larger objects to allow you to get a lot of images from multiple angles.

1.2.1 Using a Copystand

A copystand is normally the most efficient way of photographing flat objects. If this is not available some tripods allow the central column to be braced in a horizontal position for overhead shots.

Figure 1: Copystand. Image courtesy of kaiser-fototechnik

Figure 2: Camera mounted on copystand, separate lights positioned either side

1.2.2 Using a Tripod

Position the camera on a tall tripod (1.5m high) with a horizontal bracket, facing the camera vertically downwards above the table. This allows you to quickly use it for taking pictures of flat objects (such as cards, papers). Alternatively, a smaller tripod might be used on the table to enable a sort of 'rostrum camera' or copystand arrangement.

Figure 3: Camera mounted on tripod with horizontal column

Check the **table is stable and level**, both left to right and front to back. If available use a spirit level and adjust the set up if necessary.

Remove the lens cap and if the camera has a neck strap, remove it or keep it away from the lens. Although this sounds obvious, **a lens cap can seriously damage an object** if it is dropped later on in the workflow.

1.3 Lighting

If you have lights, **position 2 or 4 lights of equal brightness and colour temperature (tungsten, fluorescent) on either side of the object**. Small objects (football size and smaller) can be illuminated with care using commonly available lights such as desk lamps.

It is highly probable that you do not have standalone lights. In which case **try to use natural light if possible** but be constantly aware of shadows.

Cameras often have built-in flash. These are difficult to test in terms of glare or shadows. We recommend that you **avoid using flash**. If you do have to use the flash, consider that: you may have to point the light at a large white surface, for example a small piece of white card; or you can direct the light through a loop of light diffusing material, such as tracing paper, attached to the built in flash.

Optional: If available, use a light-meter to check for even illumination. If the shadows are of equal density, then the light is even. If you do not have a light-meter, by holding a pencil upright in the centre of the place where an object will be placed you can see the level and direction of any shadow from the lighting.

Figure 4: Pencil on table showing shadows from the lights

- If the object could be damaged by light or heat, **switch the lights off when they are not needed** to set up the camera.
- Place the object on the table and adjust its position. Non-fragile objects which have an uneven surface may be held flat beneath a clean sheet of glass if available.
- **Adjust the height of the camera** to frame the object, rather than using the zoom function.
- If you know your camera well, avoid using focal lengths shorter than 35mm, but if you do not know how to change settings **keep the camera on AUTO**.

1.4 Take the picture!

Remember to **include the cloakroom/raffle ticket in the first shot**. Then **capture the object without the ticket**.

If a camera is raised on a tripod, it may be difficult to look through the viewfinder. Some cameras can be tethered to a computer. This also allows the operator to take control of most of the camera's functions from desk level.

STEP 2: Configure your camera settings

As noted above, we only recommend this step for people who are very familiar with the camera. Otherwise we suggest maintaining it on AUTO mode.

Summary

- By configuring some basic settings on your camera and taking it out of 'automatic' mode you can ensure you accurately photograph your objects.

All digital SLRs have an AUTO setting. In this mode the camera makes all the exposure decisions for you. This is fine for becoming more familiar with your SLR, but putting your camera into a manual setting will give you greater control to ensure that the object you are photographing is represented correctly.

All cameras will be different, but for simplicity put the camera into **Program (P) Mode**, which lets you alter just a few key settings, as described below:

2.1 Program Mode: Using Flash

In Program Mode the inbuilt flash will never pop up and fire automatically, no matter how dark the scene is. Instead, if you want to use it you will have to pop the flash up yourself.

Using your camera's inbuilt flash is generally not a good idea when taking photographs of objects as it will often result in unwanted flash glare bouncing off the item or hard shadows.

If you find the scene is too dark:

- Place the object by a window, or **seek out more natural light**;
- Use an off-camera flashgun and position the head to bounce the light off the ceiling or wall;

However, if you learn about how your camera works you may avoid using the flash in borderline light situations.

Below you may increase the ISO and adjust the **Exposure Compensation** to lighten your photograph.

2.2 Program Mode: Setting the ISO

The most common ISO speed settings are: 100, 200, 400 and 800. Depending on your digital camera model you may have much higher or lower ranges. On most SLRs you can see what the ISO setting is by looking at the rear LCD screen.

- In situations with lots of natural light or when using a flashgun, a lower ISO is fine.
- However, in situations of low light, the camera will slow down.
- Unless both camera and object are kept perfectly still the photograph will be blurred.
- To prevent blur use a tripod and increase the ISO setting on the camera.
- Note, however, a photo may look grainy with higher ISO. Use a low ISO number whenever possible.

2.3 Program Mode: Exposure Compensation

You may find that your photographs are either underexposed (too dark) or overexposed (too light or white). However, you can change the exposure to compensate for this:

- Look for the exposure compensation button. Often it is represented as a plus and minus sign (+/-), situated either near the shutter button or the upper right to the LCD screen on the back of the camera.
- To make the photograph lighter hold down the exposure button and turn the main dial stops to the right
- To make the photograph darker hold down the exposure button and turn the main dial stops to the left.

- This setting is particularly useful when photographing objects. For example, to photograph a dark object with a pattern or texture, you could slightly overexpose the image to bring out the patterns and shapes.

2.4 Program Mode: White Balance

There is one other useful setting that Program Mode allows you to fiddle with: white balance (WB).

- The colour of light differs according to where you are. Daylight tends to be bluer, whereas tungsten bulbs tend to be yellower. Cameras are quite good at compensating for this.
- However, if you notice your photos taking on a non-representative colour cast, you should adjust the white balance setting.
- It is likely that there will be a white balance (WB) button on the back of your SLR.

- If you hold this down and turn the command dial you will see various icons in the LCD screen, for example:
    - a light bulb
    - the sun
    - a cloud
    - and a fluorescent bulb.
- However, it is the 'manual' or 'custom' white balance setting that will give your most accurate representation of light and colour in your photograph. Consult your camera's manual for the exact method, but usually it follows the following process:
    1. Use the WB button and command dial to set your camera to 'Manual/Custom WB'
    2. Take a picture of something completely white (a piece of white paper - completely fill the frame with the white so no other colour enters).
    3. Go to 'Manual/Custom WB' in your functions menu and select the photograph you just took to set the WB.
    4. Note that the colour of light changes throughout the day so you may reset the WB at regular intervals.

2.5 Set the image type to JPEG

As noted above, **set the camera or scanning software to capture the image as a high-quality JPEG** (.jpeg) ideally at minimum of 2 megapixels and maximum of 5 megapixels. In general, the image size should be 1600 pixels on the longest side. This is to capture images that are good enough quality, but not too large memory size.

USING A FLATBED SCANNER

STEP 1: PREPARING A FLAT-BED SCANNER

Summary:

- Spend time to calibrate the scanner to save time and prevent distortion of the original scan.

The easiest way to digitise 2D objects (two-dimensional objects) is by using a flatbed scanner. However, there are two issues to consider: 1) Fragile manuscripts which will be damaged by the lid of the flatbed scanner and 3D should be digitised in colour using a digital camera; 2) Scanning can be slow and for rapid photography we recommend a digital camera.

Scanners are normally operated from a tethered computer connected via USB or Firewire cables.

Set up the flat-bed scanner connected to a computer (with scanning software installed) on a large table, or with additional table space next to this. The computer screen should be in relatively low light for the operator to check the quality of the scanned images on screen.

Also follow normal procedures to ensure that the screen is not affected by glare from windows etc. and that the chair and desk are at an appropriate height for the operator.

A flatbed scanner has a large (A4+) glass plate onto which the original object is placed face down, and the lid is then closed. The scanner's sensor passes below the object as it scans; this may take a few seconds or over a minute depending on the size of the original and chosen resolution.

Using a good standard of scanner (rather than a cheap, entry-level one) should speed up the digitisation process as you may automate some of the procedures like colour and contrast. Having 2 flatbed scanners, with 2 operators, will reduce delays when there are a lot of objects to digitise during the Digital Collection Day.

1.1 Why calibrate a scanner?

There are a number of factors that affect the quality of a scan and there are a number of ways in which to ensure that the scan is of the highest possible quality. The process of inputting these settings and controlling these factors is known as 'calibration'.

To ensure that you achieve the best, most accurate, colour reproduction from your scan, calibration sets the imaging device to a known state, ensuring that it provides consistent results each time it is used. Making the original scan as accurate as possible avoids having to manipulate the image later (for example with Adobe Photoshop). Doing so saves time and prevents the distortion of the original scan.

1.2 What are the factors that determine the quality of a scan?

1.2.1 Optical Resolution:

- Resolution is the number of pixels that form a digital image, and determines its quality. It is expressed as ppi (pixels per inch) or dpi (dots per inch). In general the more detail in the original object, the higher the capture resolution should be.
- For the Digital Collection Day **a resolution of 300ppi** should be used.
- This should provide adequate detail for most photographs, postcards, posters and prints.

1.2.2 Colour Depth or Bit depth:

- Bit depth describes the number of colours that can be represented digitally. Bit depth ranges from 1-bit colour which displays 2 colours – black and white, to 32-bit

and above which display billions of colours. You should scan at 24-bit colour or 'truecolour' which best mimics the real world, producing over 16.7 million colours.

1.2.3 JPEG or Tiff

For the Digital Collection Day you should save images as high quality **.jpeg**. This is to capture images that are good enough quality, but not too large memory size.

However, best practice is to save the images as uncompressed files. Tiff is the best format for the master file as it:

- Retains all the information that was created by the capture device
- Retains any capture device colour management information
- Uses no compression

The TIFF format gives high quality files that are ideal for storage and archival purposes. Set up a method of saving images related to their IDNumber (see below 3.1)

STEP 2: PREPARING TO SCAN AT A DIGITAL COLLECTION DAY

Summary:

- Spend time before each Digital Collection Day calibrating the scanner and setting up the work area on the computer

The above settings ensure that your scanner is capable of capturing the image to the required quality. Next, for best practice you need to ensure that the scanner will capture the original item as accurately as possible.

2.1. Check the accuracy of the scan:

A key factor that determines whether the scan is an accurate representation is whether the colours of the object being digitised are correctly represented. You can adjust these settings in an image editing programme such as Adobe Photoshop and save them to your scanner. This can be done in the following ways:

- Use a greyscale patch. The black and white on the printed strip of graduated tones are of known value and can be measured in a programme like Adobe Photoshop to ensure accuracy. Consult the user guide

Figure 5: Greyscale patch

- Adjusting to the tone curve. This can bring out the optimum colour and brightness of the original.

Please refer to your own scanner and image editor user manuals to insert your own guidelines here.

2.2. Test Scan

For best practice, before starting to scan at a Digital Collection Day, you should check that all your settings are correct by carrying out a test scan and performing a basic Quality Control (QC) process.

1. View your image in your image editing software.
2. Zoom out and maximise the window to check that the entire item has been digitised and that nothing has been lost in the scan;
3. Then, zoom in to check that all the important detail is clear and not blurred. The small print of any writing should be clearly legible;
4. If necessary, rotate the image so that it is the right way up: **IMAGE > ROTATE**
5. Check the black and white levels on the greyscale patch
6. If you do not get a reading within 10-15 of the above, the scanner settings are incorrect.
7. You need to go through the guidelines (above) **Preparing to scan a collection of items**
8. Don’t save the test image as this is a practice scan to check the values

STEP 3: SCANNING DURING A COLLECTION DAY

Summary:

- Scanning contributors’ objects during a collection day
- Include the cloakroom/raffle ticket in the first scan.
- Then capture the object without the ticket.

3.1 Set up a folder in the work area on the computer

i. On the computer open the folder you set up for this Digital Collection Day
ii. Add a folder labelled the IDNumber of the contributor (taken from the Story form)
iii. Open that named folder and add a folder with the label of the raffle/cloakroom number from the Story form. For example: *BRA001 > 459*
iv. Configure the work area for the scanner for this particular contributor, so that scans for this submission will now be added to this folder. It may be also possible to actually set the filename to have a prefix of the IDNumber.

3.2 Scanning

1. Check that the stored setting is the one that you created at the start of the Digital Collection Day.
2. Place the item to be scanned on the scanner bed and preview. Include the cloakroom/raffle ticket in the first scan.
    a. The scanner may automatically crop the image. To ensure that this does not crop the edges of the object place a postcard (for example) on to the flat-bed with some blank card on top to provide a small margin.
    b. For speed during the Digital Collection Day you should prepare to scan images in colour at 300dpi or 300ppi so time is not wasted changing settings between each submission;
    c. If, however, you have a large batch of scans to do of a similar type of object (like the pages of a diary) you may follow best practice, for example:
        i. For any document, map, or item where colour is important and provides extra meaning or where the aesthetic value of reproducing it in colour outweighs the resource factors such as cost, scan time, image file size and storage set the scanner to 24-bit True colour;
        ii. For paper media where manuscripts have been clearly written or printed and where there is good contrast set the scanner to Bi-tonal;
        iii. For paper media where contrast is less well defined use Greyscale;
        iv. For black and white photographs use Greyscale;
3. If you are happy with the preview image, scan and save. When the 'Save As' window appears enter a unique filename which should be prefixed with the number of the ticket from the Story form, for example: 459001 and the next image should be 459002 and the next 459003;
    a. For best practice, save the file in the Tiff format;
    b. However for the Digital Collection Day you must choose **JPEG (.jpg)**
    c. Make sure that the 'ICC Profile: Adobe RGB (1998)' box is ticked;
4. Click SAVE.

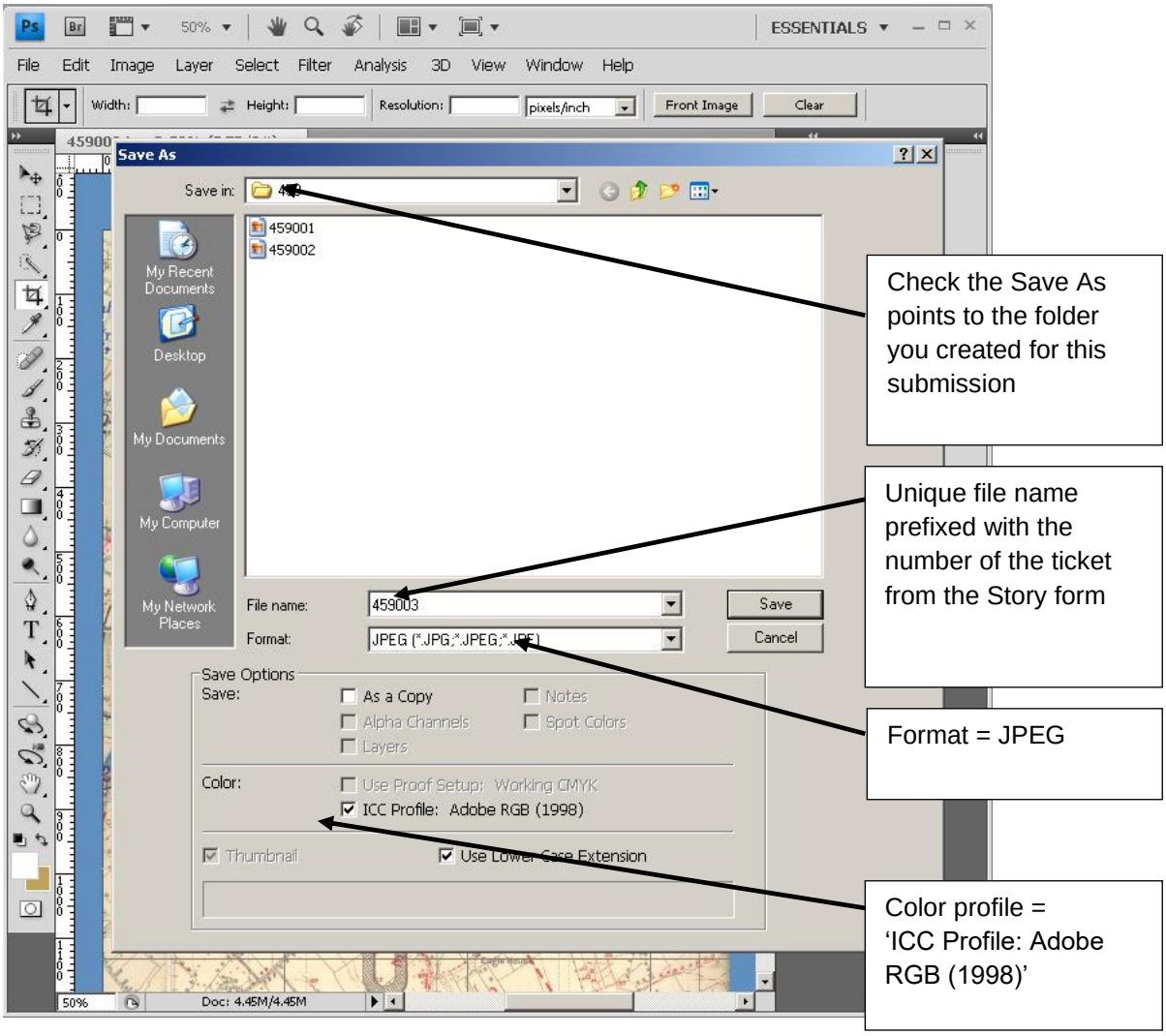

Figure 2 Photoshop Save As window

5. Once an image is saved in this way, it is the 'Master' image - it has not been altered in any way and should be kept for reference/archival purposes;
6. The image may need to be cropped and the resolution changed in order to prepare it for Web publication
7. Close the saved image and start the process again:
    a. You should capture the object properly without the ticket.
    b. Then:
        - If the next image is another page from a diary or the next page of a letter, for example, you will be working under the same ticket number from the Story form;

- If this is a new object or a submission from a different contributor you must be careful to set up another Story folder in the work area on the computer.