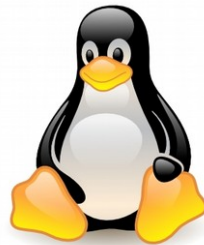
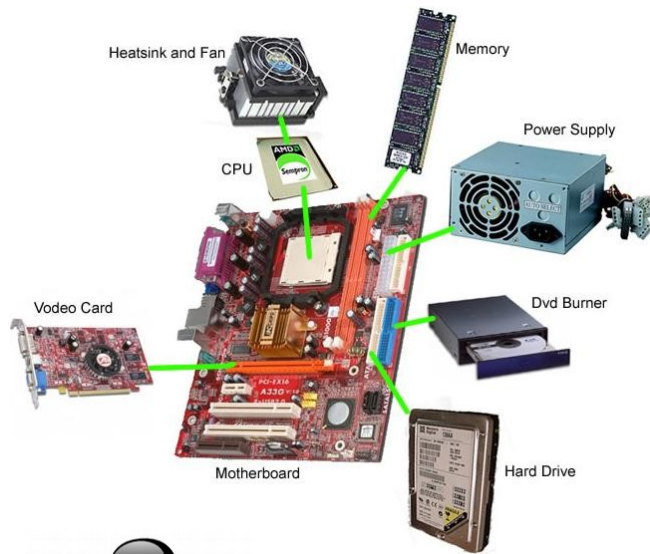


# Setting up a Digital Darkroom

## A guide



# Planning / Theory

## Considerations:

### What does the facility need to be capable of?

Downloading images from digital cameras, (in all Raw formats and jpg).

Viewing and editing of thumbnail images. (in all Raw formats and jpg)

Opening and manipulating images of all raw formats and jpg.

Photo-manipulation - colour correction, image resizing, cropping and other adjustments.

Preparation for print - including embedding correct profiles.

Saving in all suitable formats.

The ability to colour correct the screen to match standard colour space and print output.

## The facility

can be divided into three parts - Hardware, Operating System and Software.

### Hardware:

**Think of your computer as a workshop – it is where you go to work on your images.**

#### Your computer needs:

A processor(s) capable of working at what you consider a reasonable speed.

Disk space, enough hard disk storage (or network storage) for current work.

Memory, enough memory to enable the work required to take place within physical memory.

(This will depend on the operating system and software programs used as well as the largest files to be manipulated)

A monitor that is capable of being calibrated to match standard print output.

### Operating System:

**Think of the O.S. as the workbench – it is where you lay out your tools.**

Personal preference is the main consideration. The operating system plays no part in the quality of finished images and it is in many ways the least important part of the equation.

The choice of O.S. will determine the amount of memory you need and affect the your options when choosing software.

### Software:

**Think of the software as the tools use use to carry out the tasks.**

For a complete digital darkroom you will need a minimum of 2 pieces of software most photographers will use more.

A program or programs to to view, select and quickly adjust (multiple) images.

A program to carry out more complex manipulation of individual images.

# Practicality

## Hardware:

**Think of your computer as a workshop – it is where you go to work on your images.**

### Central Processing Unit (CPU) :

The CPU is the 'brain' of the computer.

The Central Processing Unit (CPU) or the processor is the portion of a computer system that carries out the instructions of a computer program. There are two makes of computer processors used in digital imaging Personal Computers. About 80% of computers run Intel chips and the remaining 20% on AMD, it does not matter which manufacturer you choose.

The faster the processor the quicker it will carry out the tasks you send it. Generally the faster the processor the more you pay. In practical terms a dual core processor should be enough to comfortably run a digital darkroom computer, if you want to spend more and have a slightly faster processor go for a quad core.

### Disk space:

Disks come in different sizes - the larger the disk the more you can store. Always back-up work on a second disk. The size of the disk needs to be large enough to hold the operating system ( between 500mb and 16gb depending on the system ), the programmes you install and the files you create.

Digital image files saved as tiff.

10"x8" image approx 20mb, 16"x12" image approx 50mb

Saving 20 16"x12" images will use 1gb of disk space.

While you can run a computer on a 40gb disk, 80gb will give more room to store files.

Most new computers will come with 250+ gb

### Memory:

In computer terms, memory is short term and anything stored in RAM is lost when the power is turned off. It is used to hold information while a programme or file is open. In digital imaging the image when opened it is held in ram. In order for your computer to work quickly and efficiently you need to have enough ram to hold your operating system the programmes you are using and the files you are working on. This will vary depending on each of the above. You only need as much as you are going to use. 4gb will be enough on some operating systems, while others will need more. To use more than 3gb of ram you need a 64bit Operating System.

### Monitors:

There are two main types of TFT monitor

#### TN panels

Most flat panel monitors are TN (Twisted Nematic) technology.

These are popular due to their low cost.

TN panels have relatively poor viewing angles although they have been recently improved upon using 'TN+film' technology, where a layer of special film is added.

Vertical viewing angles are especially bad. Looking at even a modern TN panel from above or below can result in colour shifts.

Many cheaper TN panels use 18-bit colour and deliver less accurate colours making them not ideal for applications such as photo editing.

Advantages: Cheap, most can be adjusted reasonably well

Disadvantage: Poor viewing angles – often uneven tonal display.

## IPS panels

The most expensive panels are currently based on IPS (In-plane switching) technology. They can achieve very wide viewing angles and excellent colour rendition. More recent S-IPS (Super IPS) panels achieve similar quality but at a much reduced cost. For critical colour-based work, S-IPS panels offer the best quality but they are not without disadvantages. Their internal design means slightly less of the viewable area is given over to actually producing light, sometimes resulting in reduced brightness. Black levels can also suffer a little when viewed at wider angles.



A 19" TN screen will cost from about £70 +

19" IPS screen will cost from about £100 +

Larger screens will cost more

You pay your money and make your choice – **but avoid any monitor with a glossy reflective screen as you will see as much of your own reflection as you will the image, and they are virtually impossible to calibrate for print output.**

## Operating System:

**Think of the O.S. as the workbench – it is where you lay out your tools.**

**Personal preference is the main consideration.** The operating system plays no part in the quality of finished images and is in many ways the least important part of the equation but often the most contentious.

PCs originated with the IBM PC and although until recently IBM still produced PCs most are clones using the architecture originating from IBM but made by other companies. All computers use basically the same range of hardware components.

Nearly 85% of the worlds computers run on the **Microsoft Windows** operating system.

Apple computers have a market share of about 5% most run **MacOS**

The **Linux** operating system will run on any computer. About 6% of the worlds PCs run Linux.

The choice of O.S. will determine the amount of memory you need and affect the your options when choosing software.

**The key element** here is that while MS Windows and Linux will run on any PC, to easily run MacOS you need to buy your PC from Apple, and pay about 3-4 times the price for it. All computers including those made by Apple are either Intel or AMD based and use basically the same range of hardware components. There is no practical advantage in using a Mac over any other make of PC.

**Linux** is the fastest most efficient OS, it runs 498 of the worlds 500 most powerful computers. MacOS and Windows use more of your computers resources to run so leave you less to work with you images, therefore you need a faster computer with more memory to achieve the same speed.

Windows is the most at risk from virus attack, MacOS less so and Linux the most secure.



### **Software:**

**Think of the software as the tools use use to carry out the tasks.**

**For a complete digital darkroom you will need a minimum of 2 pieces of software most photographers will use more.**

#### **A program or programs to to view, select and quickly adjust (multiple) images:**

In addition to an image manipulation programme it is important to have an easy way to view, choose and edit images. Ideally these programmes will also show RAW files as thumbnails, as well as jpg and tif files. Proprietary - camera software will show files from one type of camera but where images are obtained from different cameras 'third party' software is a better option. Luckily there are many Open Source pieces of Software available for Linux and to a slightly lesser extent Windows. Mac users have less choice.

#### **Software includes:**

Xnview, Picasa, Nikon NX, Canon Photo Pro, Aperture, Gthumb, RawTherepee, Raw Studio, IrfanView, iPhoto, Lightroom. Not all software is available for all operating systems

#### **A program to carry out more complex manipulation of individual images.**

**Why do you need these programmes?**

**Opening and converting raw files:** Not all photo-manipulation software will do this.

**Cropping:** One of the most common tasks in digital imaging is to crop an image to change the shape or proportions, or to remove unwanted parts on the edges of the frame.

**Resizing:** Images are measured in physical size and resolution. For most uses an image will need to be a specific size. Pictures can be re-sized and their resolution altered for these purposes.

**Colour Changes:** There are occasions when the colour of an image might need to be changed, either to correct a problem, or to deliberately alter the original. Brightness and contrast can also be adjusted.

**Graphic Effects:** These programmes can be used to alter images and turn them in to graphics.

**Graphic design:** Most photo-manipulation programmes can also be used to create graphic design. They are a good choice for creating posters and leaflets based on images.

**Software includes:**

Photoshop, Photoshop Elements, Paintshop Pro, Gimp.

Not all software is available for all operating systems

To open raw files in Photoshop you need a version of Photoshop that has been produced no less than a year earlier than your camera was launched.

Open source software can be freely updated as new cameras are released.

**Your Choice:****If you want the fastest most economical option that will allow you to work with images from any camera and obtain best quality results:**

Buy a PC with a dual core processor, 4gb or 8gb of ram, install Linux, Gimp, Ufrw and any other software you need.

You will then be able to view, edit and manipulate images from any camera (including Raw files if required) and save in all standard file formats.

Second user PC cost approx. £50

Operating System and Software – Free

Monitor £100- £1000

**If you want to work with the latest version of Photoshop:**

Buy a PC with a dual core processor, 8gb of ram, Windows 7 or 10 - 64bit.

PC plus Windows cost approx. £400

Photoshop £600 or £120 per year

Monitor £100- £1000

**If you want to use Mac OS and work with the latest version of Photoshop:**

Buy a MacPro.

PC from £2500

Photoshop £600 or £120 per year

Monitor £100- £1000

**As an alternative:**

You can buy either a Windows PC or Apple Mac and run Open Source software, saving the cost of Photoshop, but then you might as well run Linux – save more money and get a quicker computer.

Avoid any monitor with a glossy reflective screen as you will see as much of your own reflection as you will the image, and they are virtually impossible to calibrate for print output. **This rules out Apple iMacs and Apple Screens.**

**The quality of your images is not affected by the make of computer, the OS or software that you use, it is determined by your skill as a photographer and your competence in the digital darkroom.**