Describe the basic principles of converting originals into digital files

TERMS USED IN DIGITAL IMAGE REPRODUCTION

(a) 'Screening'
The process by which the tonal variations of a continuous tone image are simulated by a pattern of dots.

(b) 'Screen Angle'
The angle at which the screen ruling lines in conventional screening patterns, the purpose of which is to prevent moire patterns.

Moire Patterns
Removing Moire Patterns
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Scanning Line and Tone
Download, read notes and answer questions
Postscript Halftone Screening
Download, read notes and answer questions

(c) 'Screen Ruling"
The number of lines in a given distance in conventional screen ruling patterns - referred to as lines per inch (lpi) or lines per centimetre (lpc)

(d) 'Image Resolution'
The amount of information contained in the image, usually expressed as dots per inch (dpi)

(e) 'Bitmap'
A digital image made of dots or pixels.

(f) 'Vector'
A digital image made up of lines and curves.
Example of bitmap and vector images:
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As a general rule, an image resolution needs to be twice the screen ruling that will be used to print the image e.g, 150 screen requires 300 dpi image resolution.

For bitmap image, there is a mathematical relationship between the image size, resolution and file size and that the amount of digital information contained in the file will determine the maximum size at which it can be printed for any given resolution.

A vector image is defined mathematically as a series of lines or curves and the image can be enlarged without reducing quality.

Scanning

Different models of scanners have different characteristics, which will usually determine the quality that can be achieved. Generally drum scanners produce better results than flatbed models when originals need to be enlarged.

Scanners may scan images in RGB format and then convert the information to CMYK prior to displaying the image on screen, or may leave the scan in RGB for conversion at a later stage of processing.

After scanning it is possible to alter many attributes of a bitmap by use of phot-editing software (Adobe Photoshop), although it is not usually possible to compensate for a lack of detail in the original scan.

Examples of scanners

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Colour

If colour is being viewed on monitors for retouching purposes the monitors must be calibrated to show the colours accurately.

It is usually possible to obtain the CMYK values for a particular colour in an image displayed on a monitor. These values can be used to see how the colour will print by reference to a printed CMYK colour chart.

Open a picture in Adobe Photshop: checkout CMYK values on part of the picture.

Terminology

Highlights: light areas of an image
Shadows: dark areas of an image
Midtones: mid areas of an image

Brightness: refers to the overall lightness of an image or selection.
Contrast: the difference between the lightest and darkest portion of an image.

Grey Component Replacement (GCR):

A technique for reducing the amount of cyan, magenta and yellow in an area and replacing them with an appropriate level of black.

Colour Gamut

A gamut is the range of colours that a colour system can display or print. The spectrum of colours seen by the human eye is wider than the gamut available in any colour model.

The lab colour mode in Adobe Photoshop has the largest gamut encompassing all colours in the RGB and CMYK gamuts.

The colour model with the smallest gamut is CMYK.

Dot Gain

This may be defined as the condition which causes a thickening of the halftone dot on the printed sheet. Dot gain can be caused by a number of different factors, both on the press and during platemaking.

Factors to be considered when correcting an image

(a) Contrast
Does the image look flat or too contrasted

(b) Sharpness
Does the image looked blurred

(c) Colour Cast
Does the image appear to have too much of one particular colour in certain areas.

(d) Dust and Scratches
Are there blemishes from the scanning of the original