Terms and Definitions

Scanning

HEIDELBERG

A/D Converter

Building block of a scanner. Converts the electric, analog signals to computer-ready, digital signals.
Drum Scanners versus Flatbed Scanners

Aliasing

The visibility of individual pixels, especially along diagonal lines and curves. Also known as staircasing because of the steps that appear. The lines look more jagged than smooth.
See Pixel
Bits and Bytes

Automatic Functions

Measures automatically undertaken by your scanner or software. For example:
● Gradation distortion
● Tonal range correction
● Original analysis
Scan Process

Bilevel Image

These images contain exclusively black and white pixels (and thus no gray shades and no colors). The text you're now reading is a bilevel original, for instance.
Image Assessment

Bit

The smallest information unit. The basis of all processes undertaken by the computer. Like a switch, a bit is either On or Off. On corresponds to 1, and Off to 0.
Bits and Bytes

Bit Depth

Defined by the number of bits which represent each pixel. Determines the number of representable shades of gray. The standard bit depth of a scanner is 8 bit and offers 256 different shades of gray.
Bits and Bytes

Bitmap

A digital image composed of a lot of tiny squares (pixels).
Bits and Bytes

Byte

Measurement unit for the size of a file, or the storage capacity of a data carrier is given in bytes, kilobytes, megabytes, and even gigabytes.

1 byte = 8 bits
1 kilobyte = 1,024 bytes
1 megabyte = 1,024 kilobytes
1 gigabyte = 1,024 megabytes
Bits and Bytes
Data Management

Calibration

A collective tuning or conformation of all system components including the monitor, scanner and printer.
System Calibration

Catchlight Image

An image on which tiny reflections and therefore very bright surface areas (so-called catchlights) pop up, as on eyeglass lenses or water surfaces.
Image Assessment
Scanning Heads Up Originals

CCD
Charge Coupled Device
Building block of every flatbed scanner.
Important for signal processing. This is where the transformation of light signals to electric signals takes place.
Drum Scanners versus Flatbed Scanners

CIE
Commission Internationale de l'Eclairage
This commission determines standards for color and lighting. It developed the Norm Color system and the Lab Color system.
Theory of Color

CMYK
The base colors of four color printing.
Cyan, Magenta, Yellow, and Black
Theory of Color

Color Cast Image
An Image with either a clear color imbalance or in which a single color dominates, as in old photos or pictures of sunsets.
Image Assessment
Scanning Heads-Up Originals

Color Image
A color image like a slide or photograph.
Image Assessment

Color Model
System that describes colors for objective color production.
The Norm Color and Lab Color systems, for instance.
Theory of Color

Color Profile
The color profile is a standardized profile used to describe the color spaces of input, representation, and output tools (reads scanner, monitor and printer).
System Calibration

Color Tone (Hue)
The description of the color of an object — red, green, blue, yellow, gray, …
Theory of Color

DAT Tapes
Data carriers for the transfer of larger amounts of data.
The description of these tapes is not yet standardized.
Data Management

Defocusing
See Descreening

Density
The resistance of a color layer to letting light through.
Mathematically, it's the logarithm of opacity.
Opacity and Density

Density Range
Describes the difference between the highest and lowest densities of an image. Usually 2.0 D for reflecting originals and 3.0 D or more for transparent originals.
Opacity and Density

Descreening
To avoid moiré effects, screened originals are scanned outside the focal range of the scanner and thus remain unfocused.
Image Assessment
Scanning Heads-Up Originals

Digital Camera
Camera with a special back wall on which CCDs are arranged in the form of a matrix.
Allows the direct digitalization of larger, three-dimensional objects which won't fit in a scanner.
Drum Scanners versus Flatbed Scanners

dpi

Dots per inch

Unit of measurement for the resolution of an output device like a printer or an imagesetter. Also often used to describe scan resolution.

Bits and Bytes

Drum Scanner

Scanner for which originals are mounted on a cylinder and scanned dot-by-dot.

Drum Scanners versus Flatbed Scanners

DTP

Desk Top Publishing

The preparation of all kinds of printed materials with help of a computer. This includes image and text production, layout and setting.

Data Management

EPS

Encapsulated Postscript

File format for DTP programs. Every EPS file consists of a mainfile with a preview image presented in rough data as well as individual files with the fine data of each color channel.

Data Management

Flatbed Scanner

A certain kind of scanner for which originals are first mounted on a horizontal tray and then scanned line-by-line.

Drum Scanners versus Flatbed Scanners

Gigabyte
See Byte

Gradation
Describes the relationship between the input and output tonal values of an image manipulation.
Without manipulation the input and output values correspond exactly.
Prior to Scanning
Scanning Heads-Up Originals
Scanning with Image Manipulation

Gradation Distortion
The scanner can distort the gradation to allow the RGB image of the monitor to correspond to the perception of the human eye.
See Gradation
Prior to Scanning
Scan Process

Grayscale Image
Generally called black and white picture. All colors are represented as various shades of gray.
Image Assessment

Halo Effect
Can arise in extraordinarily sharpened drawings.
Halos form around catchlights. The bright areas of the image spread out and fewer details are seen in the image.
Scanning Heads-Up Originals

Heads-Up Original
Originals which have to be scanned in a special way because of the form in which they're presented or because the image's subject is somehow unusual.
Image Assessment
Scanning Heads-up Originals

High Key Image

A typical Heads-Up Original.
An image that depicts a very bright subject and therefore shows very little contrast. For example, a polar bear in the snow.
Image Assessment
Prior to Scanning
Scanning Heads-Up Originals

Image Shadow

The darkest point on an image and thus the point with the highest density.
Opacity and Density
Scanning Heads-Up Originals
Scanning with Image Manipulation

Interpolation

Way of raising the resolution to exceed the maximum physical resolution of the scanner so that greater enlargements can be achieved. New pixels are added to those already present. The color of the new pixels is drawn from the surrounding ones.
Prior to Scanning

Image Highlight

The brightest point of an image which is to be reproduced. The point of least density.
Opacity and Density
Scanning Heads-Up Originals
Scanning with Image Manipulation

IT8 Document

Standardized color document for the calibration of the scanner.
System Calibration

Kilobyte
See Byte

Megabyte
See Byte
Bits and Bytes
Data Management

MOD
Magnetic Optical Disk.
Storage medium for large amounts of data.
MODs with memories of 620 MB and 1.2 GB are common.
Data Management

Lab Color Space
A three-dimensional color space standardized by CIE in 1976.
Theory of Color

Low Key Image
Also a typical Heads-Up Original.
An image depicting a very dark subject with very little contrast and a minimal tonal range. For example, a black plate on a dark blue table cloth.
Image Assessment
Prior to Scanning
Data Management

Moiré Effect
Pops up in scans of screened originals.
Arises through the overlapping influence of more than one screen, like the scan screen of the scanner and the print screen of the original. Looks like small stars or lines in the image. The image structure looks like it's made of fabric.
Image Assessment
Scanning Heads-Up Originals

lpi / lpcm
Unit which describes the image resolution of a printout.
Gives the number of picture lines in a certain area (per inch).
Image Assessment
Prior to Scanning
Data Management

Mottling

Surface effect across an entire image which often arises when an image is overfocused.

Refers to the visibility of individual pixels or even of film grains.
Scanning Heads-Up Originals

Opacity

The resistance of a color layer to letting light through.

Opacity is calculated by dividing the intensity of incident light by the amount of light which either passes through or which is reflected by the original.
Opacity and Density

Overexposed / Underexposed

Originals which, because of technical flaws rather than subject matter, are very dark and underexposed or very bright and overexposed.
Image Assessment
Scanning Heads-Up Originals

Noise

This term has nothing to do with the sound volume of your scanner.

It refers to the electrical interference which can lead to individually misread pixels.
Drum Scanners versus Flatbed Scanners

Overview Scan

The first of three sub-scans in the scan process.

The whole tray is scanned so that an area can be selected for the pre-scan which follows.
Scan Process

Norm Color System

Standardized by the CIE in 1931. Also called the XYZ Color System. Often represented by the xy graphic (shoe sole).
Theory of Color

Pixel

This term refers to an image point and is made from the words Picture and Element.

Individual pixels become visible as tiny squares in the picture when the scan involves either a vast enlargement or a low scan resolution.

Bits and Bytes

PMT

Photomultiplier Tube

The component of a drum scanner in which the incoming light signal is transformed into an electric signal and then amplified.

Drum Scanners versus Flatbed Scanners

Posterisation

The product of stretching the tonal range.

Dark tones are darkened further while brighter tones are simultaneously brightened. A few shades of gray no longer appear. The image's histogram shows holes, the course of tonal values is interrupted. Contrasts in the image widen and details can get lost.

Prior to Scanning

Pre Scan

The second sub-scan of the whole scan process following the overview Scan.

The pre-determined area is scanned with standardized settings to produce a preview image.

Scan Process

Reflecting Original

An original which reflects incident light.

A photo or newspaper clipping, for example.

Opacity and Density

Removable Disk

A store for larger amounts of data.

Functions like a computer hard-drive, but removable like a CD. Well suited for data transfer because the disk format is standardized.

Common sizes include 44 MB, 88 MB, and 270 MB.

Data Management

RGB

Red, Green, and Blue

The primary colors of a monitor or scanner. If all three colors are fully retained, white light is produced.

Theory of Color

Saturation

Often used in the meaning of colorfulness.

The more saturated a color is, the richer it appears.

Color saturation increases from the inside to the outside along one plane of the Lab model.

Theory of Color

Scan

The last sub-scan after overview scan and pre scan. The actual scan process with all the final settings.

Scan Process
Prior to Scanning
and all "Scanning" chapters

Scanner

Scanners produce digital computer images of originals.

There are technically different kinds of scanners, including the drum scanner and the flatbed scanner.

Drum Scanners versus Flatbed Scanners

Scanning

An original is scanned in order to produce a digital computer image which allows further work.
Drum Scanners versus Flatbed Scanners.

Scan Resolution

Refers to the number of individual scans undertaken in a certain area, measured in dpi.
It's generally true that a higher scan resolution improves the quality of the computer image.
Bits and Bytes
Prior to Scanning
Data Management

Screen Counter

Used to measure the screen ruling. The screen counter is laid on the original. The original's screen ruling lies in the area in which a moiré can be seen.
See Moiré Effect
Image Assessment

Screen Dot

The printout dot of a printer.
A screen dot is made of several picture points which can be either black or white. The darker the screen dot, the more black picture points it has.
Image Assessment

Screened Original

Grayscale or color images that have been printed and are therefore screened.
Image Assessment
Scanning Heads-Up Originals

Screening Factor

Used in calculating scan resolution in order to optimize scan results when the scan is intended for screen printing. For high quality scans, always enter a screening factor of 2.
Prior to Scanning

Screen Ruling

(For those who want to verify their solution to our surprise no. 1: 72 lpi)

In printing, it indicates the number of screen lines per unit area. A 60 line screen displays 60 print lines per square inch. Denser line grouping corresponds to a higher print quality.
Image Assessment
Prior to Scanning
Data Management

Sharpening

Also called USM (for Unsharpmasking).

Refers to a technical process for focusing originals by sharpening image contours.
Image Assessment
Scanning Heads-Up Originals

Sizing Factor

The sizing factor indicates the extent beyond the original size that the computer image should be enlarged for printing. Mathematically, it's the printout size divided by the size of the original. If you're enlarging an original from 1 x 1 inches to 3 x 3 inches, the sizing factor is 3. (or 300%)
Prior to Scanning

Speckling

Just like mottling, speckling is an effect of over-focusing the original. The smallest irregularities of the image become visible. Single bright pixels which are caused by noise show up in otherwise dark regions.

Scanning Heads-Up Originals

Spectral Photometer

Tool for color measurement.
The spectral photometer splits up every color into individual color components, which can then be described in units of measurement.

Theory of Color

Standard Original

An original that doesn't show any particular features (which doesn't necessarily mean that it's boring). Slides or photographs that show a very balanced tonal distribution, and for that reason can be very simply and automatically scanned.

Image Assessment
Scanning Heads-Up Originals

Stray Light

In image areas where bright and dark surfaces are tightly packed together, light sometimes strays to the side of the bright picture points and gets picked up by neighboring CCDs. They in turn assume values that are too bright and the scanner results become falsified. This danger is greater with the line-by-line scanning of flatbed scanners than with the point-by-point scanning of drum scanners.

Drum Scanners versus Flatbed Scanners.

TIFF
Tagged Image File Format
The most popular image format, supported by every system. Therefore, this system is well suited for data transfer.
Data Management

Tonal Range
A histogram depicting 256 bars, corresponding to all the different shades of gray, can be produced for any original. The height of the bar shows exactly how many pixels have that particular shade.

The distribution of the bars from dark to light indicates the original's tonal range. For example, high key images only have a very small tonal range because almost all pixels lie in the bright region.
Prior to Scanning
Scanning Heads-Up Originals

Tonal Range Correction
A measure automatically undertaken by the scanner or software. If the original analysis determines that the pixel distribution is irregular, the tonal range is stretched to optimize the image.
Scan Process
Scanning Heads-Up Originals
Scanning with Image Manipulation

Transparent Originals
An original which lets through incident light.
A slide or a negative, for example.
Opacity and Density

USM
See Sharpening

XYZ Color System
See Norm Color System

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tions is part of the book ''The
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