Glossary

arc A portion of the circumference of an **oval,** not including the bounding radii or any part of the oval's interior.

arithmetic transfer mode A specification for how QuickDraw should draw or copy color images into a bitmap or pixel map. Arithmetic modes perform add, subtract, and blend operations on the red, green, and blue component values of RGB colors.

background color The color of the pixels wherever no drawing has taken place. By default, the background color is white.

background pattern The pattern displayed in a graphics port when an area is erased or when pixels are scrolled out of it.

background printing A feature supported by some printer drivers that allows the user to work with an application while documents are printing. These printer drivers send printing data to a spool file in the PrintMonitor Documents folder inside the System Folder.

basic graphics port The drawing environment provided by **basic QuickDraw.** A basic graphics port is defined by a data structure of type `GrafPort` and contains the information that basic QuickDraw uses to create and manipulate onscreen either black-and-white images or color images that employ the **eight-color system.**

basic QuickDraw The set of QuickDraw routines that you use to create and manipulate graphics information in a graphics port. All Macintosh computers have basic QuickDraw routines in ROM. See also **Color QuickDraw.**

bit image A collection of bits in memory that forms a grid—that is, a rectangular pattern of bits. The bit image is pointed to in the `baseAddr` field of a `BitMap` record. Compare **pixel image.**

bitmap A data structure of type `BitMap` that represents the positions and states of a corresponding set of pixels, which can be either black and white or the eight predefined colors provided by basic QuickDraw. A bitmap is contained within a **basic graphics port.** See also **pixel map.**

bit pattern An 8-by-8 pixel image drawn by default in black and white, although any two colors can be used on a color screen. A bit pattern can be repeated indefinitely to form a repeating design (such as stripes) when drawing lines and shapes or when filling areas on the screen. See also **pixel pattern.**

Boolean transfer mode A specification of which Boolean operation QuickDraw should perform when drawing or copying an image into a bitmap or pixel map. Boolean transfer modes that draw patterns are called **pattern modes;** Boolean transfer modes that copy images or draw text are called **source modes.** Compare **arithmetic transfer mode.**

boundary rectangle A rectangle (by default, the entire main screen) that links the local coordinate system of a graphics port to QuickDraw's global coordinate system and defines the area of the pixel image or bit image into which QuickDraw can draw. The boundary rectangle is stored in either the pixel map or the bitmap.

bounding rectangle A rectangle used to define other shapes, such as ovals and rounded rectangles. The lines of bounding rectangles completely enclose the shapes they bound; in other words, no pixels from these shapes lie outside the infinitely thin lines of the bounding rectangles.

clipping region A region to which an application can limit drawing. The initial clipping region of a graphics port is an arbitrarily large rectangle: one that covers the entire QuickDraw coordinate plane. An application can set the clipping region to any arbitrary region, to aid in drawing inside the graphics port.

CLUT See **color lookup table.**

color bank A structure into which all the colors of a picture, pixel map, or bitmap are gathered by the Picture Utilities or by your application for later selection. The Picture Utilities generate a color bank consisting of a **histogram** to a resolution of 5 bits per color.

color graphics port The sophisticated color drawing environment provided by **Color QuickDraw.** A color graphics port is defined by a data structure of type `CGrafPort` and contains the information that Color QuickDraw uses to create and manipulate grayscale and color images onscreen.

colorize To use the `CopyBits` procedure to copy colors into black-and-white images.

color lookup table (CLUT) A data structure that maps color indexes specified with QuickDraw into actual color values. Color lookup tables are internal to certain types of **graphics devices.** Compare **color table.**

Color Manager A set of system software routines that supply color-selection support for **Color QuickDraw.** Most applications never need to call the Color Manager directly.

Color Picker Utilities A set of system software routines that enable your application to solicit color choices from users. The Color Picker Utilities also provide routines that allow your application to convert colors between those specified in `RGBColor` records as used by Color QuickDraw and those used in other color models, such as the CMYK model used by most color printers.

Color QuickDraw The set of QuickDraw routines that you use to create and manipulate graphics information in a **color graphics port.** You can use Color QuickDraw to create a color image and then display it on any type of screen—black and white, color, or grayscale. Most Color QuickDraw routines are in ROM on Macintosh computers that use an MC68020 or faster processor. See also **basic QuickDraw.**

ColorSync Utilities A set of system software routines and algorithms that assist you in matching colors between screens and input and output devices such as scanners and printers.

color table A collection of colors available for a pixel image on indexed devices. Color tables are specified by either `ColorTable` records or `'clut'` resource types. The Color Manager stores a color table for the currently available colors in the graphics device's CLUT. Compare **color lookup table.**

current device The graphics device on which drawing is actually taking place. A handle to its `GDevice` record is stored in the global variable `TheGDevice`.

current printer The printer that the user last selected from the Chooser.

cursor A 256-bit image defined by a 16-by-16 bit square. The mouse driver displays the cursor on the screen and maps the movement of the mouse to relative locations on the screen as the user moves the mouse. The cursor follows the movement of the mouse or shows where the user's next action will take place. The cursor can be an arrow, an I-beam, a crossbar, a wristwatch, or another appropriate image. Called the pointer in Macintosh user documentation. See also **insertion point.**

Cursor Utilities A collection of system software routines for creating and using **cursors,** including color and animated cursors.

data fork The part of a file that contains data accessed using the File Manager. This data usually corresponds to data entered by the user. Compare **resource fork.**

deferred printing A method of printing whereby some printer drivers record each page of a document's printed image in a structure similar to a QuickDraw picture, which the driver writes to a spool file. An application must use the `PrPicFile` procedure to send the spool file to the printer. Deferred printing is also known as *spool printing*. Compare **draft-quality printing.**

device list A linked list containing the `GDevice` records for a user's computer system. The global variable `DeviceList` holds a handle to the first record in the list.

direct colors Up to 16 million colors that have a direct correlation between a value placed in a graphics device and the color displayed onscreen.

direct device A plug-in video card, a video interface built into a Macintosh computer, or an offscreen graphics world that supports up to 16 million colors having a direct correlation between a value placed in the device and the color displayed onscreen. Compare **indexed device.**

direct pixel A pixel displayed on a **direct device.** Direct pixels can have **pixel values** of 16 or 32 bits.

discrete resolution A printing resolution that has been predefined by a printer driver. A printer supporting discrete resolution prints only a limited number of such resolutions. Compare **variable resolution.**

dithering A technique for mixing existing colors together to create the illusion of a third color that may be unavailable on a particular device.

dpi Dots per inch in the x and y directions; used to measure the resolution of a screen or printer. The higher the value, the finer the detail of the image.

draft-quality printing The method by which printer drivers convert into drawing operations calls only to QuickDraw's text-drawing routines. The printer driver sends these routines directly to the printer instead of using **deferred printing** to capture the entire image for a page in a spool file. Draft-quality printing, which is supported on the ImageWriter printer driver, produces quick, low-quality drafts of text documents that are printed straight down the page, from top to bottom and left to right. Compare **enhanced draft-quality printing.**

eight-color system The eight predefined colors provided by **basic QuickDraw** for display on color screens and color printers.

enhanced draft-quality printing The method by which some printer drivers print bitmaps, pixel maps, and text without writing to or reading from a spool file. The ImageWriter printer driver, for example, supports enhanced draft-quality printing. Compare **deferred printing, draft-quality printing.**

erase To draw both the outline of a shape and its interior with the background pattern for the current graphics port. The background pattern is typically solid white on a black-and-white screen or a solid background color on a color screen. Making the shape blend into the background pattern of the graphics port effectively erases the shape.

extended version 2 picture format The format for all pictures created with the `OpenCPicture` function. Available on all Macintosh computers running System 7, this format allows applications to specify resolutions when creating images.

fill To draw both the outline of a shape and its interior with any pattern you specify. The procedure transfers the pattern with the `patCopy` pattern mode, which directly copies your requested pattern into the shape.

font substitution Substitution of a screen font for a printer font by a printer driver. PostScript printer drivers may substitute PostScript printer fonts for bitmapped screen fonts.

foreground color The color of the "ink" used for bit patterns and for the graphics pen when drawing. By default, the foreground color is black.

frame To draw the outline of a shape (such as a rectangle) using the size, pattern, and pattern mode of the graphics pen for the current graphics port. The interior of the shape is unaffected, allowing previously existing pixels in the image to show through.

`GDevice` record A data structure of type `GDevice` that holds information about the physical characteristics of a video device or offscreen graphics world, including a pixel map that describes the pixel depth for that video device or offscreen graphics world, information about whether the video device or offscreen graphics world supports indexed or direct colors, and—for indexed devices—specifications for the colors that are currently available for the video device or offscreen graphics world. System software allocates and initializes one `GDevice` record for each installed video device and stores the record in the system's **device list.**

global coordinate system The coordinate system that represents all potential QuickDraw drawing space. The origin of the global coordinate system—that is, the point (0,0)—is at the upper-left corner of the **main screen.** Compare **local coordinate system.**

glyph The distinct representation of a character in a form that a screen or printer can display. A glyph may represent one character (the lowercase *a*), more than one character (the *fi* ligature, two characters but one glyph), or a nonprinting character (the space character).

graphics device Anything into which QuickDraw can draw. There are three types of graphics devices: video devices (such as plug-in video cards and built-in video interfaces) that control screens, offscreen graphics worlds (which allow your application to build complex images off the screen before displaying them), and printing graphics ports. For a video device or an offscreen graphics world, Color QuickDraw stores state information in a **`GDevice` record.**

graphics pen A metaphorical device for performing drawing operations onscreen. Your application can set this pen to different sizes, patterns, and colors.

graphics port A drawing environment, defined by a `GrafPort` record (**basic graphics port**) or `CGrafPort` record (**color graphics port**), that contains all the information QuickDraw needs to transmit drawing operations from bits in memory to onscreen pixels.

gray region The region that represents all available desktop area—that is, a collection of rounded rectangles representing the display areas of all screens available to a computer.

hairlines Printed lines that are less than 1/72 of an inch wide.

highlighting A QuickDraw capability that displays background bits or pixels in a distinctive visual way, such as inverting them.

high-quality printing Printing that produces documents using all of the fonts and formatting that the user has included.

histogram A **color bank** composed of frequency counts of each color within a picture, pixel map, or bitmap at a particular resolution.

hot spot The portion of the cursor that must be positioned over a screen object before mouse clicks can have an effect on that object. Designated as a point (not a bit) in the image of the cursor. The mouse driver uses the hot spot to align the cursor with the mouse location.

idle procedure A routine that handles events and updates information while system software completes a task. For example, applications displaying a print status dialog box while a printer driver directs output to a printer typically use an idle procedure that checks for user-generated events indicating that the user wishes to cancel the printing.

imaging The construction and display of graphical information. Such graphical information can consist of shapes, pictures, and text and can be displayed on output devices such as screens and printers.

indexed colors A set of up to 256 colors contained in a video data interface called a **color lookup table** (or, more commonly, a CLUT). Video devices and offscreen graphics worlds that use indexed colors support pixels of 1-bit, 2-bit, 4-bit, or 8-bit depths.

indexed device A plug-in video card, a video interface built into a Macintosh computer, or an offscreen graphics world that supports up to 256 colors in a **color lookup table.** Indexed devices support pixels of 1-bit, 2-bit, 4-bit, or 8-bit depths. Compare **direct device.**

indexed pixel A pixel displayed on an **indexed device.** Indexed pixels can have **pixel values** of 1, 2, 4, or 8 bits.

insertion point The position where text will be inserted, usually marked by a blinking vertical bar.

inverse table A special data structure arranged by the Color Manager in such a manner that, given an arbitrary RGB color, the Color Manager can very rapidly look up its pixel value.

invert To reverse the colors of all pixels within a shape. On a black-and-white screen, this changes all the black pixels in the shape to white and all the white pixels to black. Inverting operates on color pixels in color graphics ports, but the results are predictable only with direct pixels.

job dialog box A dialog box—usually displayed by an application in response to the user choosing the Print command—that solicits printing information from the user, such as the number of copies to print, the print quality, and the range of pages to print.

line A graphic image defined by two points: the current location of the **graphics pen** and its destination. The graphics pen, which can draw with different patterns, hangs below and to the right of the defining points.

line layout error The difference between the width of the printed line and the width of the screen line after the printer driver has performed **font substitution.** Certain printer drivers compensate for this by distributing the error to **major glyphs** and **minor glyphs.**

local coordinate system The coordinate system defined by the **port rectangle** of a graphics port. When the Window Manager creates a window, it places the origin of the local coordinate system at the upper-left corner of the window's port rectangle. Compare **global coordinate system.**

luminance The intensity of light in a color. Color QuickDraw uses a color's luminance to convert the color to an appropriate grayscale color.

main screen In a drawing environment with multiple screens, the screen with the menu bar. QuickDraw maps the (0,0) origin point of the coordinate plane to the main screen's upper-left corner, and other screens are positioned adjacent to it. Compare **startup screen.**

major error The amount of line layout error that a printer driver applies to the space glyph.

major glyph On a printed page, a space glyph, to which printer drivers apply most of the **line layout error.** Compare **minor glyph.**

minor error The amount of line layout error that a printer driver applies to nonspace glyphs.

minor glyph On a printed page, a nonspace glyph, to which printer drivers apply the **line layout error** that remains after applying most of the error to **major glyphs.**

offscreen graphics world A sophisticated environment for preparing complex color or black-and-white images before displaying them on the screen. An offscreen graphics world is defined in a private data structure referred to by a pointer of type `GWorldPtr`.

opcode A value passed to a routine, such as the `DrawPicture` or `PrGeneral` procedure, that determines how the routine should operate.

oval A circular or elliptical shape defined by the bounding rectangle that encloses it. The oval is completely enclosed within the infinitely thin lines of its bounding rectangle, and never includes any pixels lying outside the bounding rectangle. If the bounding rectangle is square (that is, has equal width and height), then the oval is a circle.

page rectangle The rectangle marking the boundaries of the printable area on a page. The upper-left corner of the page rectangle always has the coordinates (0,0). The coordinates of the lower-right corner give the maximum page height and width attainable on the given printer; these coordinates are specified by the units used to express the resolution of the printing graphics port. For example, the lower-right corner of a page rectangle used by the PostScript LaserWriter printer driver for an 8.5-by-11-inch U.S. letter page is (730,552) at 72 dpi.

paint To draw the outline of a shape and its interior with the pattern of the graphics pen, using the pattern mode of the graphics pen**.**

Palette Manager A set of system software routines that allows your application to specify the colors that it needs on a window-by-window basis. The Palette Manager makes the colors available (within application-determined ranges) in a graceful manner.

paper rectangle The rectangle that describes the size of a piece of paper on which a page is printed. This rectangle is defined in the same coordinate system as the **page rectangle.** Thus, the upper-left coordinates of the paper rectangle are typically negative and its lower-right coordinates are greater than those of the page rectangle.

pattern An image that can be repeated indefinitely to form a repeating design when drawing lines and shapes or when filling areas on the screen. See also **bit pattern, pixel pattern.**

pattern mode A specification of which Boolean operation QuickDraw should perform when drawing patterns into bitmaps or pixel maps. See also **source mode.**

pen See **graphics pen.**

picture A saved sequence of QuickDraw drawing commands (and, optionally, **picture comments**) that your application can play back later with the `DrawPicture` procedure; also, the image resulting from these commands.

picture comment A command or data used for special processing by output devices, such as printer drivers. Picture comments are usually stored in the definition of a picture or are included in the code an application sends to a printer driver.

picture opcode A number that the `DrawPicture` procedure uses to determine what object to draw or what mode to change for subsequent drawing.

Picture Utilities A set of system software routines for extracting information—such as pixel depth and colors—in pictures and pixel maps.

pixel Short for *picture element*, the smallest dot that QuickDraw can draw; also, the visual representation of that dot on the screen. On a black-and-white screen, each single-color phosphor dot is a pixel that represents a bit in memory—white if the bit is 0, black if it's 1. On a color screen, three phosphor dots (red, green, and blue) compose each color pixel, which represents up to 48 bits in memory. On a grayscale screen, a white phosphor dot whose intensity can vary is a pixel that usually represents 1, 2, 4, or 8 bits in memory.

pixel depth The number of bits per pixel in a pixel image. Pixels on indexed devices can be 1, 2, 4, or 8 bits deep. (A pixel image that is 1 bit deep is equivalent to a bit image.) Pixels on direct devices can be 16 or 32 bits deep.

pixel image A collection of pixels in memory that forms a grid—a rectangular pattern of pixels. The pixel image is pointed to in the `baseAddr` field of a `PixMap` record. Compare **bit image.**

pixel map A data structure of type `PixMap` that represents the positions and states of a corresponding set of color pixels. A handle to a pixel map is contained within a **color graphics port.** See also **bitmap.**

pixel pattern An image that can be repeated indefinitely to form a repeating design (such as stripes) or tone (such as gray) when drawing lines and shapes or when filling areas on the screen. A pixel pattern can use color at any pixel depth and can be of any width and height that's a power of 2. See also **bit pattern.**

pixel value A number used by system software and a graphics device to represent a color. The translation from the color that an application specifies in an `RGBColor` record to a pixel value is performed at the time the application draws the color. The process differs for indexed and direct devices.

point The intersection of a horizontal grid line and vertical grid line on the coordinate plane, defined by a horizontal and a vertical coordinate.

polygon A graphic shape defined by any sequence of points representing the polygon's vertices, connected by straight lines from one point to the next.

port rectangle An entry in a **graphics port** that represents the area of the graphics port available for drawing—ordinarily, the content region of a window.

PostScript printer driver A printer driver that converts each QuickDraw drawing operation into the equivalent PostScript drawing operation. The driver sends the converted drawing operations to the printer—typically, a laser printer. The printer interprets the PostScript drawing operations and renders the image, thereby off-loading image processing from the computer.

printer driver A device driver that translates QuickDraw drawing routines and sends the translated instructions and data to the current printer.

printer resource file A file containing all the resources needed to run the Printing Manager with a particular printer.

printing graphics port The printing environment defined by a `TPrPort` record, which contains a QuickDraw graphics port (either a `GrafPort` or `CGrafPort` record) plus additional information used by the printer driver and system software. An application prints text and graphics by drawing into a printing graphics port using QuickDraw drawing routines, just as if drawing on the screen.

printing loop Application-supplied code that handles printing needs, such as presenting the job dialog box and determining the range of pages to be printed.

Printing Manager A collection of system software routines that your application can use to print from the Macintosh computer to any type of connected printer.

QuickDraw A collection of system software routines that performs graphics operations on the user's screen. See also **basic QuickDraw** and **Color QuickDraw.**

QuickDraw GX A collection of graphics, typography, and printing routines that provide provides applications with sophisticated color publishing capabilities. QuickDraw GX augments the capabilities of **QuickDraw.**

QuickDraw printer driver A printer driver that renders images on the Macintosh computer and then sends the rendered images in the form of bitmaps or pixel maps to the printer, which might be a dot-matrix printer, an ink jet printer, a laser printer, or a plotter.

rectangle (1) A mathematical entity defined either by its four boundaries (upper, left, lower, and right) or by two points (the upper-left and lower-right corners). Rectangles are used to define active areas on the screen, to assign coordinate systems to graphical entities, and to specify the locations and sizes for various graphical operations. (2) A rectangular shape drawn onscreen with a QuickDraw procedure such as `FrameRect` or `PaintRect`.

region An arbitrary area or set of areas on the QuickDraw coordinate plane. The outline of a region should be one or more closed loops.

resolution The degree of detail at which a device such as a printer or a screen can display an image. Resolution is usually specified in dots per inch, or **dpi,** in the x and y directions. The higher the value, the finer the detail of the image.

resource fork The part of a file that contains the files' resources, which contain data accessed using the Resource Manager. This data usually corresponds to data—such as menu, icon, and control definitions—created by the developer, but it may also include data created by the user while the application is running. Compare **data fork.**

`RGBColor` record A data structure of type `RGBColor` used to specify a color by its red, green, and blue components, with each component defined as a 16-bit integer. Color QuickDraw compares such a 48-bit value with the colors actually available on a screen's video device at execution time and chooses the closest match.

RGB color value A value that indicates the red, green, and blue components of a color. An RGB color value is specified in an **`RGBColor` record.**

rounded rectangle A rectangle with rounded corners. The figure is defined by a bounding rectangle and the width and height of the ovals forming the corners. The corner width and corner height are limited to the width and height of the bounding rectangle itself; if they are set larger, the rounded rectangle becomes an oval.

scrap The storage area maintained by the Scrap Manager to hold the last data cut or copied by the user. The scrap can reside either in memory or on disk.

source mode A specification of which Boolean operation QuickDraw should perform when copying images or text into bitmaps or pixel maps. See also **pattern mode.**

spool file A temporary disk file used by an application to store data; generally used to save memory.

spool printing See **deferred printing.**

standard state The size and location that an application deems the most convenient for a window.

startup screen The screen on which the "happy Macintosh" icon appears. By default, the menu bar appears on the startup screen. Compare **main screen.**

style dialog box A dialog box—usually displayed by an application in response to the user choosing the Page Setup command—allowing the user to specify printing options (such as the paper size and the printing orientation) that an application needs to format the document.

`TPrint` record A data structure of type `TPrint`. A `TPrint` record contains fields that specify the Printing Manager version, information about the printer (such as its resolution in dpi), and the dimensions of the paper rectangle.

`TPrJob` record A data structure of type `TPrJob`. The `TPrJob` job record contains information about a particular print job; for instance, the first and last pages to be printed, the number of copies, and the printing method (either draft-quality or deferred).

transfer mode A specification, either Boolean or arithmetic, of how QuickDraw should draw or copy images into a bitmap or pixel map. See **arithmetic transfer mode** and **Boolean transfer mode.**

user state The size and location that the user has established for a window.

variable resolution Any printing resolution within a range bounded by maximum and minimum values. Compare **discrete resolution.**

video device A piece of hardware, such as a plug-in video card or a built-in video interface, that controls a screen.

visible region The part of a window's graphics port that's actually visible on the screen—that is, the part that's not covered by other windows.

wedge A pie-shaped segment of an **oval,** bounded by a pair of radii joining at the oval's center.

window origin The upper-left corner of a window. Usually specified with a vertical coordinate of 0 and a horizontal coordinate of 0, the window origin is the upper-left corner of the port rectangle of a graphics port and is expressed in coordinates local to the graphics port.

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