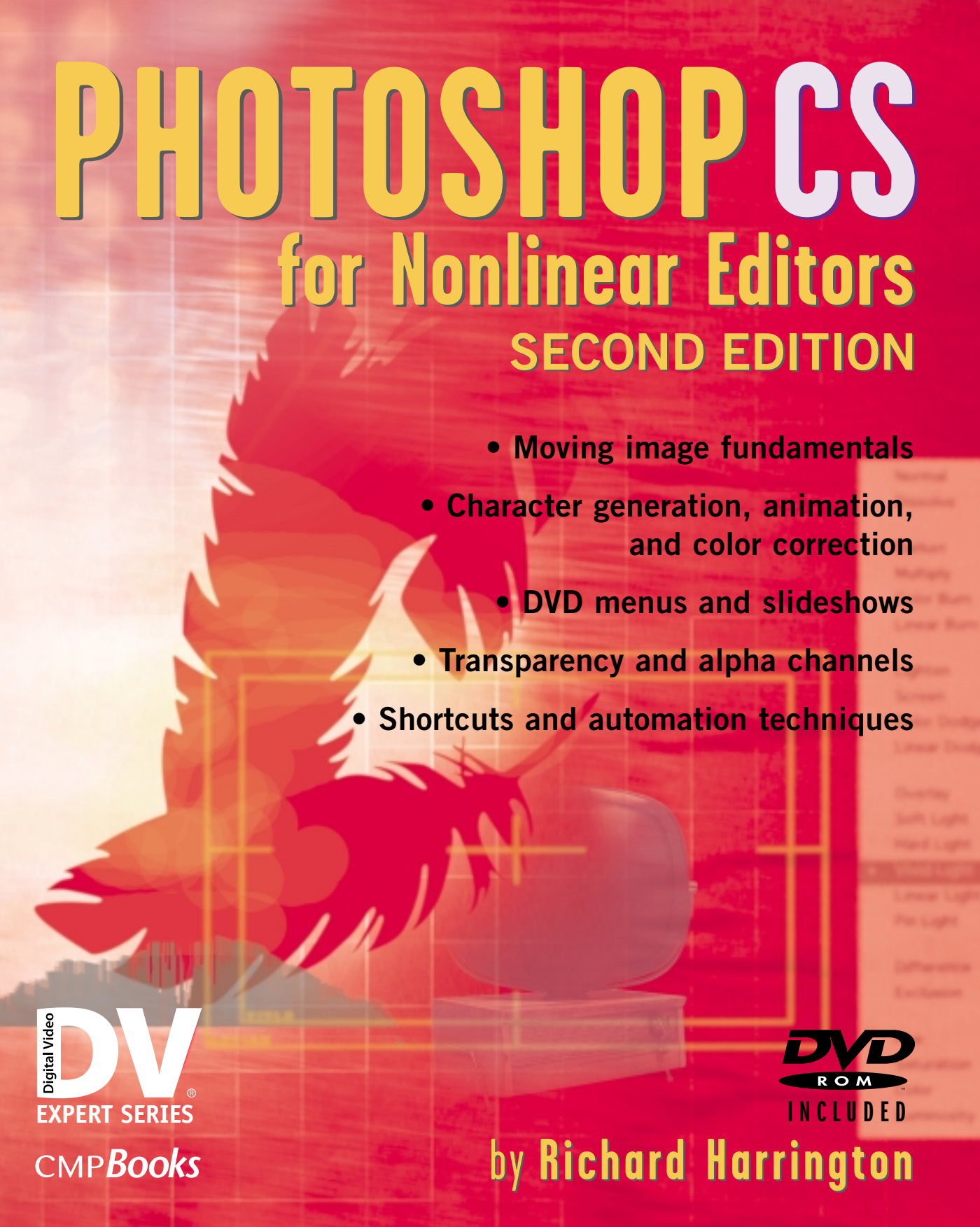
PHOTOSHOP CS

for Nonlinear Editors

SECOND EDITION

- Moving image fundamentals
- Character generation, animation, and color correction
- DVD menus and slideshows
- Transparency and alpha channels
- Shortcuts and automation techniques



Digital Video DV® EXPERT SERIES

CMPBooks

DVD ROM INCLUDED

by Richard Harrington

PHOTOSHOP CS for NONLINEAR EDITORS

Richard Harrington

Digital Video DV EXPERT SERIES

CMPBooks
San Francisco, CA

Contents

Chapter 2

Pixels: Time for Tech

When you create computer graphics, they are either raster or vector images. Photoshop supports both types of images, and it is common to mix the two in a single project. Newer versions of Photoshop contain vector type, which has the ability to be resized and edited within Photoshop. While all graphics for video end up as raster images, a clear understanding of the two categories will help you build, modify, and import artwork.

Pixel by Any Other Name

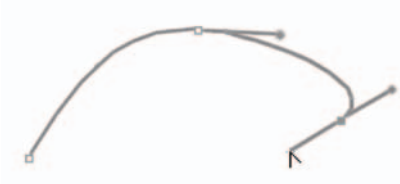
Picture elements, more commonly known as pixels, are the building blocks of the video industry. In Photoshop, you will edit pixels when working with your source photos and video frames.

The pixel is the building block upon which our industry is based. The term *pixel* is a fusion of the words *picture element*, and it is aptly named. The pixel is the smallest amount of space that exists in our creative universe. Pixels contain color, and these colors combine to form images. Raster images (also called bitmaps) are used for continuous tone or photorealistic images. If you continue to zoom in on an image, you can eventually see the pixel grid that forms an image.

To zoom:

- Use the Zoom tool.
- Press Cmd+= or – (Ctrl+= or –).
- To fill the screen, press Cmd+0 (Ctrl+0).
- To view actual pixels, press Cmd+Option+0 (Ctrl+Alt+0).

Raster images. When working with raster images, you edit pixels rather than shapes or objects directly. Proper selection techniques are important to get accurate results (see *Selecting and Extracting Images* on page 60 of Chapter 4). Raster images are resolution dependent in that they contain a specific number of pixels. Therefore, images will lose detail and appear jagged if they are scaled above 100 percent in the nonlinear editing system. If you need to scale an object such as a logo or title within the edit session, bring it in at maximum screen size, and scale down rather than up. For achieving a documentary pan-and-zoom



effect, a wide variety of plug-ins is available for most editing systems. The best solution, however, is to create the effect in Adobe After Effects (see "Professional Motion Control "Photography" with After Effects and Photoshop" on page 35).

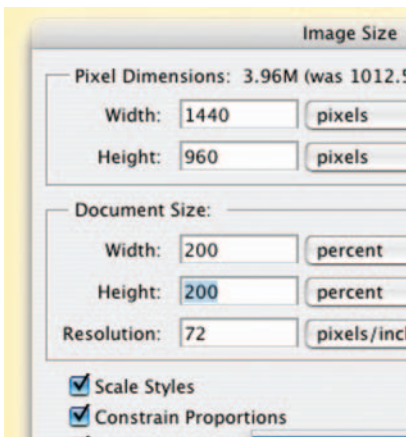
Vector Graphics. An understanding of vector graphics may seem out of place to many readers. Traditionally artists turn to Adobe Illustrator to work with vector graphics. While it is still necessary to use Illustrator for complex vector editing, Photoshop now provides its own set of powerful vector tools.

Always ask for the client logo as a vector file. It will give you greater flexibility when scaling. If you own Illustrator, splitting the file up is easy.

Vector graphics are often used for corporate logos and print pieces. Vector graphics are resolution independent because they are composed of lines and curves defined by mathematical objects called vectors. Vectors describe an image by its geometric characteristics or shapes. These vectors allow the vector file to be scaled to any size without losing detail or clarity. After Effects supports the use of vector graphics, and most motion graphic artists swear by vectors for achieving dramatic type effects involving scaling. Vector graphics are best used for shapes or logos, especially if scaling is involved.

Because video editing programs represent images by displaying them as pixels along a grid, all vector graphics are rasterized at some point for use in video. Vectors still offer great flexibility, which makes them desirable during the initial design phase. They also are resolution independent, an advantage if you ever need to take your work into a print environment.

Display Resolution



Newer monitors support a wide range of resolutions. Television monitors display only one resolution.

The quantity of pixels along the height and width of a raster image determines its screen (or display) size. Older computer monitors display 72 pixels per inch (ppi); newer monitors often display 96 ppi or higher. These display settings will often vary, ranging higher or lower, depending on your computer's video card. On the other hand, video monitors are not variable. Your video format will use a specific sized graphic; you cannot pack extra pixels in or change the dimensions or your audience's televisions. I'll go deeper into setting up pixel dimensions and pixel aspect ratio later in this chapter.

In order to get the maximum quality out of Photoshop, you must understand video's limitations. These limitations can be a hindrance, causing flicker on the screen if you improperly anti-alias fine details such as text or thin lines. They can also be a benefit. There are many affordable stock-photography collections with low-resolution files. Additionally, filters and image-processing techniques are several times faster for video-sized images than print.

It is possible to view many more pixels on your computer at one time than will fit in a standard video frame. For example, a 15-inch monitor can be configured to display 800 pixels horizontally and 600 pixels vertically. An 800 600 image would appear to fill the screen. On a 21-inch monitor configured to the same display settings, the same image would appear to fill the screen, but each pixel would be significantly larger. Changing the monitor's settings, however, could allow more pixels to fit on the screen, leaving empty space around our 800 600 image. However, while most computer monitors support multiple resolutions, television sets generally do not.

Check the display size in Photoshop. You'll usually want to view images at 100 percent, so that you can make accurate decisions about the display quality of effects. If this is not possible, view in even increments of 50 percent or 25 percent, because computers are very good at dividing by two.

Display size does matter! Be sure to view your image at 100 percent to make accurate decisions. If your monitor is not large enough, then view in even increments of 50 percent or 25 percent.

Image Resolution

The requirements of print differ greatly from those for video. It is necessary to work with a much higher quantity of pixels to produce satisfactory results when outputting to the printed page.

A common problem occurs when video professionals talk to their cousins in the print and web worlds. Although all camps speak the same language, both use some unique terms that often result in confusion and extra work on both sides. The most common term that causes problems is resolution. Video makers generally use the term pixels per inch or ppi; other industries use dots per inch, or dpi. The two terms are interchangeable.

If you have an object loaded on the clipboard, the New Document dialog will automatically size itself to match.

Print resolution. In print, using too low of a resolution results in pixelization—output with large, rough-looking pixels. Using too high a resolution image increases processing time and storage requirements and slows the output. Video and print pros have very different definitions of full size and high quality.

If you translate a 648 486 television screen into inches, it would be approximately 9 6.75 inches. At 72 ppi, the file size is approximately 900 kilobytes. If you asked a print professional for the same size image at high quality, you would likely get a file in the range of 4–60 megabytes. This is because print professionals often use resolutions of 150–600 ppi, depending upon output requirements.

There are no "dots per inch" (dpi) with video graphics. All that matters are the total pixels on screen.

Be sure to specify image resolution when working with outside artists and clients, or you will spend a lot of wasted time downsampling images. Print-ready images will quickly eat up your disk space and are

Salvaging Web Images for Use in Video

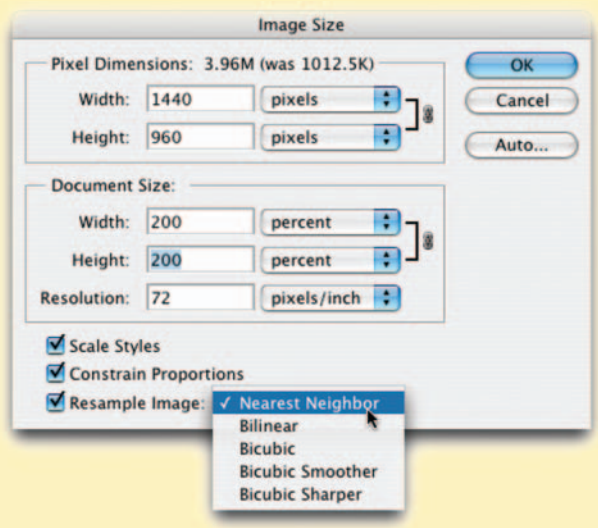
One of the worst things to happen to graphic artists was the proliferation of web pages for corporate clients and associations. Firms are moving virtually all of their assets on to the Internet and have placed such emphasis on their web sites that they have abandoned or lost track of traditional assets. It used to be far easier to get a high-quality, "camera-ready" ad slick with logos on it. Annual reports or brochures could always be found and scanned as well.

These days you ask for a logo and you get a 200 200 pixel GIF from the client's web site. These images suck and should be avoided at all costs. No matter what your client says, the logo exists as a higher quality file. If they have a business card, it exists. There are several approaches you can try before accepting Garbage In.

- Ask if there's an in-house web department or printer. Call these people and ask for a better logo. While you're at it, ask for a style guide.
- Search the web site for a press area. Many times high-quality logos are available for download to the media.
- Download an annual report or brochure as a PDF. Often times these are saved at 150 dpi or better (or even as vector files!). You can import a multi-page PDF into Photoshop (File>Automate>Multi-Page PDF to PSD). You can also import a single page by choosing File>Import>PDF Image.
- Ask for the business card and scan it at as high a ppi setting as you can. If your scanner has a de-screen filter, use it.

So how to salvage these images? I have seen editors and art departments spend days recreating logos. In larger facilities, this ordeal is often repeated because of poor communication and archives. So always ask everyone remotely experienced in using a computer if they have ever done work for the client before. But if you must "salvage" a web logo, remember this: Garbage In = Garbage Out. Vector programs as such as Adobe Illustrator—or the unfortunately nearly forgotten Adobe Streamline—can help here, but it is very hard to pull something from a 50 50 pixel source. The results you get will be mediocre at best.

The fastest solution I have developed involves "up-resing" via the Image Size command (Image>Image Size). Computers are good at duplication, so blow the logo up 200 percent and choose Nearest Neighbor as the Interpolation method. The resulting image is soft but may pass quality control. Some adventurous souls attempt to rebuild the text by font matching. If you know the name of the font used, this is a fair approach. If you are hunting, you will need a huge font collection and chances are you will get close, but not exactly right. You do not want to be to blame when the "logo police" arrive.



difficult to transport electronically due to their large size. Filters and image adjustments take "forever" on large images, especially if you are used to video or web work. The only advantage to this extra information is that you can have more control over cropping and scaling of the final photo. Unless I plan on doing dramatic moves on an image in After Effects, I request outside artists to provide images at 150 dpi; this involves the least work for all parties.

Web resolution. High-resolution images won't always be your problem, though. With the proliferation of image-rich web sites, clients are often providing artwork directly from web sites. While this is a convenient way to find images, it offers many problems. Web images are a low-resolution medium. While Photoshop builds web and video images at 72 ppi by default, it is rare to find full-screen web graphics due to download times. Larger images tend to be sliced up as well, making it difficult to reformat them for video. The worst problem, however, is compression.

Web graphics generally employ three file types: GIF, JPEG, and PNG. These compression schemes discard information; especially color detail, to achieve smaller file size. The Graphics Interchange Format (GIF) is most commonly used to display indexed-color graphics. Indexed color supports only 256 colors and should never be used for video source material.

The Joint Photographic Experts Group (JPEG) format is extremely common. It can be found in web pages and digital cameras. Most web images are highly compressed and do not hold up well when reformatted for video. Digital cameras that use at least a 2.1 megapixel system and are set to high or fine quality can produce acceptable results. Be careful when working with JPEGs; they may be set to CMYK or grayscale color modes. It is necessary to convert these to RGB before using them in the nonlinear editing system, or unpredictable color changes may occur.

The least likely format that you may encounter is PNG. The Portable Network Graphics (PNG) format can be used for lossless compression and for display of images on the World Wide Web. There are two varieties of PNG, 8-bit (PNG-8) and 24-bit (PNG-24). These two formats support RGB, indexed color, and grayscale modes, as well as interlacing. Of all the web formats, the PNG-24 is most desirable (least awful) for video purposes. The file size of a PNG file is significantly larger than GIF or JPEG. This will give you more information to work with. PNG files are very uncommon because older web browsers do not support them and the large file size deters many web designers.

Avoid web graphics at all costs. Both you and the client will be very disappointed with the results when using a web-ready graphic. If clients insist that the web-ready format is all that's available, dig deeper. Ask them for a business card. If their logo is on that card, then it must exist in a print-ready format (somewhere). Ask who designs the cards or how they get additional cards at work. After a phone call or two, you will have the appropriate EPS or AI file.

Photoshop lets you create new, preset file sizes. Do a search for the file Default New Doc Sizes.txt. If you can't find it under OSX, contextual click on the Photoshop CS icon, choose Show Package contents, and then choose Contents>Required>Default New Doc Sizes.txt.

To access the PNG-24 format choose File>Save for Web. This great format can store transparency with no need to manually create an alpha channel. Check your NLE or compositing application to see if a PNG file will work.

Web formats are great…for the Internet! Don't use JPEG, GIF, or PNG in your video projects. If you have to use a web format, choose PNG-24. It is the most versatile of all the web formats and even supports transparency.

Computer and Video Issues

Video traces its history to early pioneers such as John Logie Baird, who managed to record a recognizable human face on video in 1925. The first microcomputer became available in 1960, developed by Digital Equipment. For a mere $120,000, it included a keyboard and mouse. These two technologies existed very independently of each other for many years. All computer pixels are square in their native format. Professional video applications generally use pixels that are non-square.

NTSC: The National Televison Standards Committee developed the North American broadcast standard in 1953. The group is jokingly referred to as "Never Twice the Same Color."

PAL: Developed in the early 1960s, the Phase Alternate Line format is the standarid for most of Europe.

The National Television Standards Committee, known as the NTSC, set the standard that television screens fit the 4 3 aspect ratio. This is often interpreted by video boards as an image that is 648 486 pixels. Those countries that use the PAL format use boards that work with images that measure 768 576 square pixels. If designing for square–pixel systems, it is easy because no conversions are necessary.

Of course, if you offer a standard, it will be broken. In an effort to pack more pixels and increase resolution, the ITU-R.BT601 video standard was developed. It is often called D1 (after the D1 format invented by Sony in 1986 which was the first component digital format available). In NTSC standards, the native "board" size of a D1 frame is 720 486 non-square pixels. The PAL format uses 720 576 non-square pixels.

This format has evolved into the Digital Video (DV) standard, which is employed in the consumer DV format, as well as DVCAM and DVCPRO tape and DVD authoring. The native size for DV frames is 720 480 non-square pixels for NTSC format, six less than the D1 format. The PAL DV format is identical to the standard PAL format and remains unchanged at 720 576 non-square pixels. These pixels are played back on analog televisions, which must display them as square pixels at the 4 3 aspect ratio.

Houston, we have a problem.

Discussing pixel aspect ratio is about as much fun as going to the Art Institute of Chicago and spending all your time discussing the doorknobs. Yes, they too are important, but hardly interesting. Please bear with me as I try to resolve this dilemma in a clear and orderly fashion.

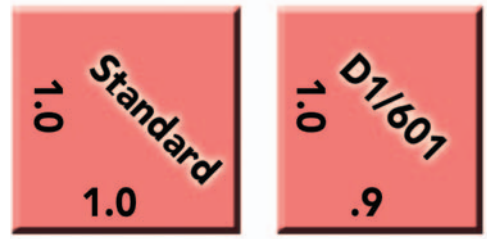
Pixel Aspect Ratio

Remember, video is displayed on standard televisions at a 4 3 aspect ratio. Even video that has a different native size must be eventually converted. Natively, an NTSC D1/DV pixel is taller than it is wide, approximately 0.9 to 1. PAL pixels on the other hand are wider than they are tall, 1.066 to 1.

Many video editing systems, as well as After Effects, can work with square pixel images, ensuring that they display correctly throughout the editing stage. These video applications must resize square pixel graphics to conform to digital video's non-square pixel shape. To avoid this

problem, however, many designers choose to manually stretch or interpret their images within Photoshop, which offers powerful interpolation tools that produce exceptional scaling. Before going any further, let me say three things:

- First, there are many conflicting opinions on what size to build graphics and what application to use when resizing them.
- Second, *read the manual* that shipped with your editing software because different companies have their own procedures for each editing system.
- Third, if using Photoshop CS, build your graphics with the non-square pixel presets and avoid a big headache.

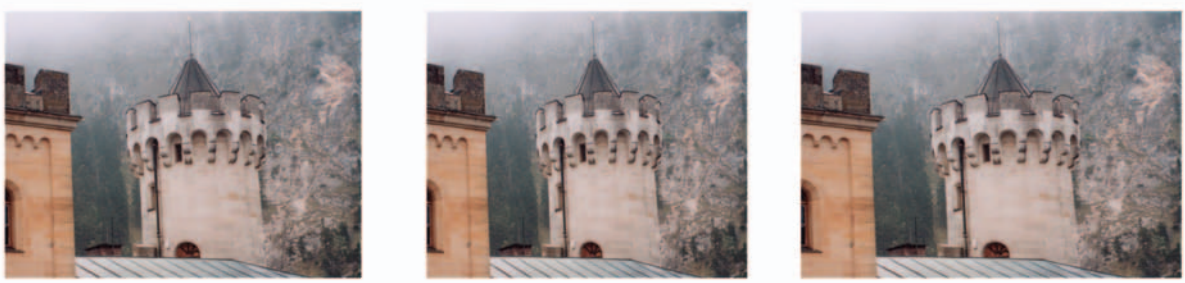


A standard square and NTSC D1 pixel.

With those three points cleared, here are your options for building graphics that will work for most users on most systems.

Step 1 Determine the native size of your video frame. Frame size can be found in your NLE's manual, or you can export out a single frame. If you are working with a traditional (switcher-based) analog system, the frame likely equates to 648 486 for NTSC or 768 576 for PAL in square pixels. Most hardware-dependent nonlinear systems, such as Avid Media Composer and Symphony, Media 100, or Accelerated Premiere-based systems, use the D1 (or ITU-R.BT601) format. The native size is 720 486 non-square pixel image for NTSC or 720 576 non-square pixel image for PAL. Recently, many DV solutions have appeared. These use a 720 480 non-square pixel image for NTSC and 720 576 non-square pixel image for PAL.

Step 2 Design your graphics in Photoshop. Depending on your version of Photoshop, your technique will vary. Photoshop CS offers the monumental change of non-square pixel support. Chances are that not every computer in your shop or that you will encounter while freelancing will have Photoshop CS.



(Left) Original image viewed viewed in D1 editing system such as Avid Media Composer.
(Middle) Same image viewed in Photoshop with NTSC standard.
Right) Same image viewed in Photoshop with PAL standard.

You can quickly find out the details of a document by Option+clicking (Alt+click) on the Document Info bar.

Every edit system and manufacturer has unique requirements. Be sure to see Appendix C for specific suggestions for leading editing and motion graphics applications.

Method #1: Using Photoshop CS

Photoshop CS supports non-square pixels—life is good!

- Create all new documents using the built-in templates that match your editing system. This can be found in the New Image dialog box accessed by choosing File>New or by pressing Cmd+N (Ctrl+N).
- If working with square pixel images (such as those from scanners, stock photo collections, or digital cameras) be sure to reinterpret the pixels. This can be done in three ways.
  - — Drag the square pixel images into a non-square document.
  - — Paste the square pixel images into a non-square document by pressing Cmd+V (Ctrl+V).
  - — Place square pixel images into a non-square document by choosing File>Place.
- If you are working with a frame grab or exported frame from a video editing application that uses non-square pixels, you must identify it to Photoshop. Choose Image>Pixel Aspect Ratio and select the right preset for your country and screen shape. If pasting a frame from your clipboard (such as one copied from a QuickTime movie) Photoshop will interpret the file correctly when pasting into a non-square document.

Method #2: Using Photoshop 7 (or earlier)

Design your graphics in Photoshop 7 (or earlier) using square pixels. When the design is finished, you then need to resize your graphic for video usage and force the pixel aspect ratio to change. There are two major camps: those who recommend stretching horizontally and those who prefer stretching vertically. In the spirit of Dr. Seuss' Sneetches, I'll call them the 'Zontals and the Verts.

The 'Zontals argue that it is best to maintain the same number of scan lines throughout. This is usually done by using an image size such as 648 486 for NTSC D1. This method helps maintain fine details, such as text, by not compressing them. Using this approach, the final image is stretched horizontally to 720 486 (Image>Image Size, Constrain Pro-

Design versus Production

You will most often have two distinct versions of your Photoshop files: one for design and one for production. Your design files include all of your layers, vector type, blend modes, and layer effects. These are meant to be editable in the future so you can make client changes.

Production files on the other hand are meant to be imported into your NLE/Compositing Application/DVD authoring environment. These often contain flattened layers and must have their layer effects merged as well. Production files are often saved into a portable (easy to move across applications and platforms) format such as PICT or TARGA. By employing the two-format method, you will ensure maximum flexibility and compatibility.